



# **Peace Airshed Zone Association**

## **Ambient Air Monitoring Network Summary**

**Continuous Ambient Air Quality Monitoring Program  
Monthly Report  
December 2016**

January 31, 2017

**Alberta Environment**  
11<sup>th</sup> Floor, Oxbridge Place  
9820-106 Street  
Edmonton Alberta T5K 2J6

**RE: Peace Airshed Zone Association (PAZA) – December 2016 Ambient Air Report**

Enclosed is the PAZA Ambient Monitoring Network Report for the month of December 2016.

This report is submitted by PAZA on behalf of the industrial member companies to satisfy the requirements of the following facility Operating Approvals:

| Company                                        | Facility            | LSD             | EPEA Approval Number |
|------------------------------------------------|---------------------|-----------------|----------------------|
| Advantage Oil & Gas Ltd.                       | Glacier             | 05-02-076-13-W6 | 262479-00-00         |
| Alberta Power (2000) Ltd.<br>(an ATCO company) | Sturgeon            | SW-06-069-21-W5 | 10283-02-02          |
| ATCO Power Canada                              | Poplar Hill         | 11-19-073-08-W6 | 67774-01-01          |
| ATCO Power Canada                              | Valleyview          | SW-06-069-21-W5 | 147709-01-01         |
| AltaGas Ltd.                                   | Pouce Coupe         | 03-03-081-13-W6 | 247673-00-00         |
|                                                | Ante Creek          | 02-26-068-25-W5 | 266694-00-00         |
|                                                | Gordondale          | 16-31-78-11-W6M | 287474-00-00         |
| Apache Canada Ltd.                             | House Mountain      | 01-08-070-10-W5 | 10137-02-02          |
| Birchcliff Energy Ltd.                         | Pouce Coupe         | 03-22-078-12-W6 | 252529-00-00         |
| Canadian Natural Resources Limited             | Bonanza             | 11-25-081-11-W6 | 00000029-01-00       |
|                                                | Progress/Gordondale | 01-01-077-10-W6 | 00010036-02-00       |
|                                                | Gold Creek          | 13-26-067-05-W6 | 00010446-02-00       |

| <b>Company</b>                           | <b>Facility</b>                | <b>LSD</b>      | <b>EPEA Approval Number</b> |
|------------------------------------------|--------------------------------|-----------------|-----------------------------|
| Canfor Forest Products                   | Teepee Creek                   | SE-2-074-04-W6  | 00001635-02-00              |
|                                          | Sturgeon/Valleyview            | 02-02-069-22-W5 | 1633-02-00                  |
|                                          | Grande Prairie                 | SW-23-071-06-W6 | 152645-01-00                |
| Conocophillips Canada Energy Partnership | Wembley                        | 06-19-073-08-W6 | 00000212-01-00              |
| Devon Canada                             | NW Belloy (Dunvegan)           | 16-36-079-03-W6 | 00009810-02-00              |
|                                          | Eaglesham (South)              | 02-14-077-25-W5 | 00047669-01-00              |
|                                          | North Normanville              | 03-36-079-23-W5 | 00047455-01-00              |
|                                          | West Culp                      | 05-34-078-25-W6 | 00136284-00-00              |
|                                          | Cecil                          | 08-15-084-08-W6 | 00010032-02-00              |
| Encana Corporation                       | Sexsmith                       | 04-08-075-07-W6 | 00010002-01-00              |
| Enerplus Resources                       | Pouce Coupe                    | SW-06-069-21-W5 | 1464-02-03                  |
| Exshaw Oil Corporation                   | Spirit River                   | 03-10-077-07-W6 | 344521-00-00                |
| Grande Prairie Generation Inc.           | Northern Prairie Power Project | 04-19-073-08-W6 | 00238762-00-00              |
| Long Run Exploration                     | Eaglesham                      | 01-25-076-01-W6 | 00241532-00-00              |
|                                          | Kakut                          | 14-12-075-03-W6 | 00248469-00-00              |
|                                          | Donnelly                       | 06-01-077-21-W5 | 00000087-02-00              |
|                                          | Puskwaskau                     | 03-26-074-01-W6 | 00017524-01-00              |
| Longview Oil Corp.                       | Sunset House                   | 06-22-070-20-W5 | 138884-01-00                |
| Penn West Petroleum Ltd.                 | Tangent                        | 13-29-080-23-W5 | 00001746-02-00              |

| Company                              | Facility                           | LSD             | EPEA Approval Number |
|--------------------------------------|------------------------------------|-----------------|----------------------|
|                                      | Pouce Coupe                        | 16-07-078-11-W6 | 00000614-01-00       |
| Petrus Resources                     | Rycroft                            | 08-25-077-06-W6 | 11351-02-00          |
|                                      | Spirit River                       | 08-34-077-06-W6 | 11096-02-00          |
| Spectra Energy Midstream Corporation | Fourth Creek                       | 16-11-082-09-W6 | 00000263-01-00       |
|                                      | Gordondale                         | 11-26-079-09-W6 | 00011495-01-01       |
|                                      | Pouce Coupe/Bonanza                | 3-23-080-13-W6  | 00070203-01-01       |
| Suncor Energy Inc.                   | Progress                           | 07-22-078-09-W6 | 00011428-02-00       |
| TAQA North Ltd.                      | Valhalla                           | 13-21-076-09-W6 | 00017620-01-00       |
| Veresen Energy                       | Hythe Brainard                     | 11-18-074-12-W6 | 00010910-02-00       |
| Weyerhaeuser Canada                  | Grande Prairie Pulp and Wood Plant | 01-14-070-05-W6 | 00000113-02-00       |

Included in this report is a summary of the monthly continuous monitoring, detailed hourly average reports and multipoint calibration reports of all instruments. Operational summaries can be found on the “Monthly Continuous Data Summary” and “Continuous Network Equipment Summary” pages of the report.

**Continuous Monitoring:** Six (6) Stations including Henry Pirker (Grande Prairie), Evergreen Park, Smoky Heights, Beaverlodge, Valleyview, and Rycroft-Portable.

During the month of December, the following events were noted:

**Henry Pirker Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Henry Pirker station.
- ◆ All analyzers and sensors at the Henry Pirker station had an operational uptime greater than 90% for the month of December.

**Evergreen Park Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Evergreen Park station.
- ◆ All analyzers and sensors at the Evergreen Park station had an operational uptime greater than 90% for the month of December.

**Smoky Heights Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Smoky Heights station.
- ◆ All analyzers and sensors at the Smoky Heights station had an operational uptime greater than 90% for the month of December.

**Beaverlodge Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Beaverlodge station,
- ◆ All analyzers and sensors at the Beaverlodge station had an operational uptime greater than 90% for the month of December.

**Valleyview Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Valleyview station, with the exception of two 1-hour exceedances for H<sub>2</sub>S on December 9, 2016 for the hours ending at 17:00 and 18:00 MST. The concentrations recorded were 38 ppb (17:00) and 21 ppb (18:00), which is greater than the 1-hour AAAQO of 10 ppb. Refer to the attached non-compliance report for details (AEP #319081).
- ◆ All analyzers and sensors at the Valleyview station had an operational uptime greater than 90% for the month of December.

**Donnelly Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Donnelly station.
- ◆ All analyzers and sensors at the Donnelly station had an operational uptime greater than 90% for the month of December

**Rycroft-Portable Station:**

- ◆ The measured ambient air quality was within the AAAQO for the Rycroft-Portable station.
- ◆ All analyzers and sensors at the Rycroft-Portable station had an operational uptime greater than 90% for the month of December.

♦ **Passive Monitoring - 46 Stations throughout the PAZA zone:**

There were five duplicate sites sampled in the month of December: Hythe, Fitzsimmons, Crooked Creek, High Prairie, and Girouxville 3 (H<sub>2</sub>S). The passive sample analyses were performed by MAXXAM Analytics Inc.

A summary of the passive data collected are reported as follows:

- Monthly average concentrations for SO<sub>2</sub> passives ranged from 0.1 ppb to 1.2 ppb, with a mean of 0.3 ppb.
- Monthly average concentrations for NO<sub>2</sub> passives ranged from 0.4 ppb to 11.3 ppb, with a mean of 2.1 ppb.
- Monthly average concentrations for O<sub>3</sub> passives ranged from 22.0 ppb to 41.9 ppb, with a mean of 32.2 ppb.
- Monthly average concentrations for H<sub>2</sub>S passives ranged from 0.1 ppb to 0.4 ppb, with a mean of 0.3 ppb.

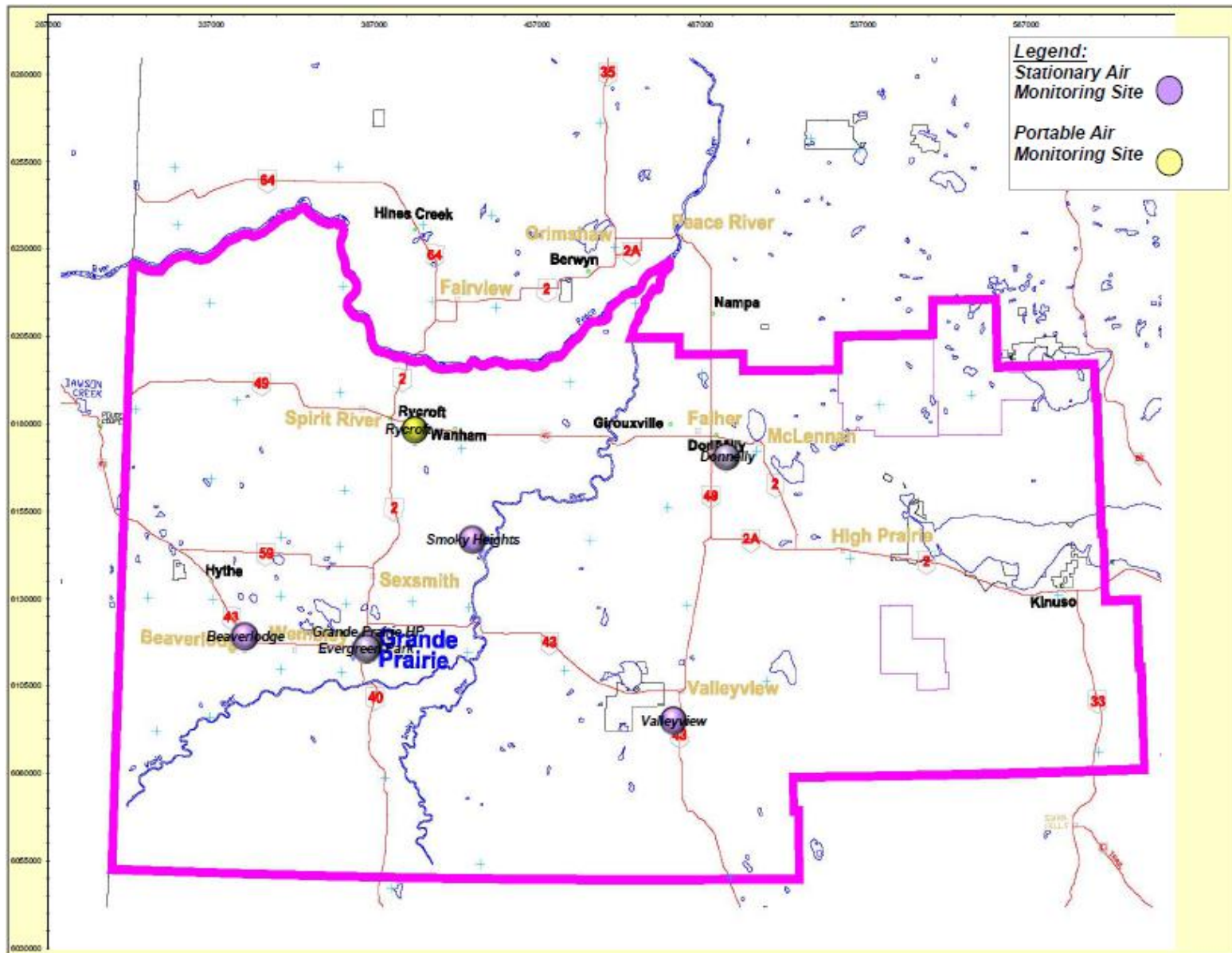
If you have any questions or concerns, please contact Patrick Andersen at 403.505.1041 or the PAZA office at 780.833.4343.

On Behalf of the  
Peace Airshed Zone Association



Patrick Andersen, B.Sc.  
Program Manager

## Location of PAZA Continuous Monitoring Stations



## PAZA Monthly Continuous Data Summary

| Dec-2016Peace Airshed Zone Association |            |       |                  |                    |            |       | Maximum Recorded Values |              |              |        |                         |                     |
|----------------------------------------|------------|-------|------------------|--------------------|------------|-------|-------------------------|--------------|--------------|--------|-------------------------|---------------------|
|                                        |            |       |                  |                    |            |       | 1-hr                    |              | 24-hr / 8-hr |        |                         |                     |
| Pollutant<br>(units)                   | Objectives |       | Station          | Monthly<br>Average | Exceedence |       | Conc                    | Day          | Conc         | Day    | Operational<br>Time (%) | Calibration<br>Date |
|                                        | 1-hr       | 24-hr |                  |                    | 1-hr       | 24-hr |                         |              |              |        |                         |                     |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Henry Pirker     | 0.3                | 0          | 0     | 7.4                     | Dec-12 08:00 | 1.1          | Dec-12 | 99.6%                   | Dec-05              |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Evergreen Park   | 0.2                | 0          | 0     | 7.0                     | Dec-06 20:00 | 0.7          | Dec-10 | 99.9%                   | Dec-07              |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Smoky Heights    | 0.6                | 0          | 0     | 7.0                     | Dec-28 03:00 | 1.9          | Dec-11 | 99.7%                   | Dec-15              |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Beaverlodge      | 0.3                | 0          | 0     | 1.6                     | Dec-15 10:00 | 0.8          | Dec-15 | 100.0%                  | Dec-14              |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Valleyview       | 0.7                | 0          | 0     | 14.5                    | Dec-30 15:00 | 3.5          | Dec-28 | 99.2%                   | Dec-16              |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Donnelly         | 0.2                | 0          | 0     | 2.2                     | Dec-30 13:00 | 0.7          | Dec-14 | 99.7%                   | Dec-09              |
| SO <sub>2</sub> (ppb)                  | 172        | 48    | Rycroft-Portable | 0.3                | 0          | 0     | 3.7                     | Dec-30 12:00 | 0.7          | Dec-30 | 99.3%                   | Dec-13              |
| NO (ppb)                               |            |       | Henry Pirker     | 10.3               | -          | -     | 188.1                   | Dec-20 11:00 | 39.1         | Dec-20 | 99.5%                   | Dec-05              |
| NO <sub>2</sub> (ppb)                  | 159        | 106   | Henry Pirker     | 14.5               | 0          | 0     | 57.7                    | Dec-20 10:00 | 31.9         | Dec-15 | 99.5%                   | Dec-05              |
| NO <sub>x</sub> (ppb)                  |            |       | Henry Pirker     | 25.0               | -          | -     | 245.9                   | Dec-20 11:00 | 64.5         | Dec-20 | 99.5%                   | Dec-05              |
| NO (ppb)                               |            |       | Beaverlodge      | 1.2                | -          | -     | 47.4                    | Dec-16 13:00 | 6.3          | Dec-07 | 100.0%                  | Dec-14              |
| NO <sub>2</sub> (ppb)                  | 159        | 106   | Beaverlodge      | 5.5                | 0          | 0     | 28.6                    | Dec-20 15:00 | 14.4         | Dec-07 | 100.0%                  | Dec-14              |
| NO <sub>x</sub> (ppb)                  |            |       | Beaverlodge      | 6.6                | -          | -     | 74.7                    | Dec-16 13:00 | 20.4         | Dec-07 | 100.0%                  | Dec-14              |
| NO (ppb)                               |            |       | Rycroft-Portable | 0.5                | -          | -     | 14.5                    | Dec-10 11:00 | 2.0          | Dec-16 | 99.3%                   | Dec-13              |
| NO <sub>2</sub> (ppb)                  | 159        | 106   | Rycroft-Portable | 3.8                | 0          | 0     | 21.2                    | Dec-07 23:00 | 12.6         | Dec-17 | 99.3%                   | Dec-13              |
| NO <sub>x</sub> (ppb)                  |            |       | Rycroft-Portable | 4.0                | -          | -     | 25.8                    | Dec-07 23:00 | 14.5         | Dec-17 | 99.3%                   | Dec-13              |
| O <sub>3</sub> (ppb)                   | 82         |       | Henry Pirker     | 20.3               | 0          | -     | 39.3                    | Dec-21 06:00 | 36.4         | Dec-18 | 99.5%                   | Dec-05              |
| O <sub>3</sub> (ppb) - 8-hr            |            |       | Henry Pirker     |                    | 0          |       |                         |              | 37.8         | Dec-18 |                         | -                   |
| O <sub>3</sub> (ppb)                   | 82         |       | Beaverlodge      | 29.0               | 0          | -     | 41.6                    | Dec-19 02:00 | 39.9         | Dec-19 | 100.0%                  | Dec-14              |
| O <sub>3</sub> (ppb) - 8-hr            |            |       | Beaverlodge      |                    | 0          |       |                         |              | 40.5         | Dec-19 |                         | -                   |
| O <sub>3</sub> (ppb)                   | 82         |       | Rycroft-Portable | 28.5               | 0          | -     | 43.0                    | Dec-19 02:00 | 41.7         | Dec-19 | 99.3%                   | Dec-13              |
| O <sub>3</sub> (ppb) - 8-hr            |            |       | Rycroft-Portable |                    | 0          |       |                         |              | 42.5         | Dec-19 |                         | -                   |
| CO (ppm)                               | 13         |       | Henry Pirker     | 0.25               | 0          | -     | 1.5                     | Dec-20 08:00 | 0.5          | Dec-20 | 99.6%                   | Dec-06              |
| CO (ppm) - 8-hr                        | 5          |       | Henry Pirker     |                    | 0          |       |                         |              | 0.9          | Dec-20 |                         | -                   |



## PAZA Monthly Continuous Data Summary – continued

| Dec-2016Peace Airshed Zone Association |    |    |                  |       |   |   | Maximum Recorded Values |              |              |        |        |        |
|----------------------------------------|----|----|------------------|-------|---|---|-------------------------|--------------|--------------|--------|--------|--------|
|                                        |    |    |                  |       |   |   | 1-hr                    |              | 24-hr / 8-hr |        |        |        |
| THC (ppm)                              |    |    | Henry Pirker     | 2.1   | - | - | 3.2                     | Dec-26 21:00 | 2.7          | Dec-26 | 99.5%  | Dec-06 |
| CH <sub>4</sub> (ppm)                  |    |    | Henry Pirker     | 2.1   | - | - | 3.2                     | Dec-26 21:00 | 2.7          | Dec-26 | 99.5%  | Dec-06 |
| NMHC (ppm)                             |    |    | Henry Pirker     | 0.0   | - | - | 0.0                     | Dec-05 11:00 | 0.0          | Dec-05 | 99.5%  | Dec-06 |
| THC (ppm)                              |    |    | Rycroft-Portable | 1.8   | - | - | 2.1                     | Dec-16 23:00 | 2.0          | Dec-17 | 99.2%  | Dec-12 |
| CH <sub>4</sub> (ppm)                  |    |    | Rycroft-Portable | 1.8   | - | - | 2.1                     | Dec-16 23:00 | 2.0          | Dec-17 | 99.2%  | Dec-12 |
| NMHC (ppm)                             |    |    | Rycroft-Portable | 0.0   | - | - | 0.0                     | Dec-13 14:00 | 0.0          | Dec-13 | 99.2%  | Dec-12 |
| TRS (ppb)                              |    |    | Henry Pirker     | 0.3   | - | - | 1.3                     | Dec-20 10:00 | 0.7          | Dec-15 | 99.5%  | Dec-06 |
| TRS (ppb)                              |    |    | Evergreen Park   | 0.4   | - | - | 1.5                     | Dec-20 13:00 | 0.7          | Dec-26 | 99.9%  | Dec-07 |
| TRS (ppb)                              |    |    | Smoky Heights    | 0.3   | - | - | 0.9                     | Dec-16 21:00 | 0.5          | Dec-17 | 100.0% | Dec-15 |
| TRS (ppb)                              |    |    | Rycroft-Portable | 0.3   | - | - | 0.5                     | Dec-15 01:00 | 0.4          | Dec-14 | 99.3%  | Dec-12 |
| H <sub>2</sub> S (ppb)                 | 10 | 3  | Valleyview       | 0.2   | 2 | 0 | 38.4                    | Dec-09 17:00 | 3.2          | Dec-09 | 99.2%  | Dec-16 |
| H <sub>2</sub> S (ppb)                 | 10 | 3  | Donnelly         | 0.1   | 0 | 0 | 2.3                     | Dec-23 12:00 | 0.4          | Dec-23 | 99.6%  | Dec-09 |
| PM <sub>2.5</sub> (µg/m3)              | 80 | 30 | Henry Pirker     | 6.0   | 0 | 0 | 33.5                    | Dec-01 21:00 | 15.3         | Dec-25 | 99.6%  | Dec-20 |
| PM <sub>2.5</sub> (µg/m3)              | 80 | 30 | Evergreen Park   | 3.7   | 0 | 0 | 24.5                    | Dec-25 12:00 | 11.9         | Dec-25 | 99.3%  | Dec-07 |
| PM <sub>2.5</sub> (µg/m3)              | 80 | 30 | Smoky Heights    | 5.5   | 0 | 0 | 67.8                    | Dec-07 18:00 | 16.9         | Dec-23 | 100.0% | Dec-15 |
| PM <sub>2.5</sub> (µg/m3)              | 80 | 30 | Beaverlodge      | 4.7   | 0 | 0 | 42.7                    | Dec-02 06:00 | 15.0         | Dec-02 | 93.8%  | Dec-20 |
| PM <sub>2.5</sub> (µg/m3)              | 80 | 30 | Rycroft-Portable | 2.4   | 0 | 0 | 25.1                    | Dec-23 09:00 | 8.2          | Dec-25 | 99.2%  | Nov-04 |
| RH (%)                                 |    |    | Henry Pirker     | 65.7  | - | - | 84.7                    | Dec-22 04:00 | 79.1         | Dec-22 | 99.5%  | -      |
| RH (%)                                 |    |    | Evergreen Park   | 70.0  | - | - | 97.4                    | Dec-22 08:00 | 88.4         | Dec-22 | 99.9%  | -      |
| RH (%)                                 |    |    | Beaverlodge      | 72.6  | - | - | 100.0                   | Dec-22 04:00 | 96.4         | Dec-22 | 100.0% | -      |
| RH (%)                                 |    |    | Valleyview       | 59.9  | - | - | 96.0                    | Dec-22 14:00 | 87.2         | Dec-02 | 99.3%  | -      |
| SR (W/m <sup>2</sup> )                 |    |    | Henry Pirker     | 21.1  | - | - | 228.6                   | Dec-01 14:00 | 40.4         | Dec-01 | 99.5%  | -      |
| Temp (°C)                              |    |    | Henry Pirker     | -12.6 | - | - | 3.8                     | Dec-21 15:00 | 1.3          | Dec-21 | 99.5%  | -      |
| Temp (°C)                              |    |    | Evergreen Park   | -12.6 | - | - | 4.6                     | Dec-21 14:00 | 2.7          | Dec-21 | 99.9%  | -      |
| Temp (°C)                              |    |    | Smoky Heights    | -13.3 | - | - | 3.3                     | Dec-21 16:00 | 0.6          | Dec-21 | 100.0% | -      |
| Temp (°C)                              |    |    | Beaverlodge      | -11.9 | - | - | 2.8                     | Dec-21 14:00 | 0.3          | Dec-21 | 100.0% | -      |
| Temp (°C)                              |    |    | Valleyview       | -12.0 | - | - | 5.1                     | Dec-21 16:00 | 2.7          | Dec-21 | 99.3%  | -      |
| Temp (°C)                              |    |    | Donnelly         | -12.7 | - | - | 3.5                     | Dec-21 13:00 | 1.2          | Dec-21 | 100.0% | -      |
| Temp (°C)                              |    |    | Rycroft-Portable | -12.9 | - | - | 3.6                     | Dec-02 16:00 | 1.2          | Dec-21 | 99.5%  | -      |

## PAZA Monthly Continuous Data Summary – continued

| Dec-2016 Peace Airshed Zone Association |  |  |                  |      |   |   | Maximum Recorded Values |              |              |        |        |   |
|-----------------------------------------|--|--|------------------|------|---|---|-------------------------|--------------|--------------|--------|--------|---|
|                                         |  |  |                  |      |   |   | 1-hr                    |              | 24-hr / 8-hr |        |        |   |
| WSPD s (km/hr)                          |  |  | Henry Pirker     | 10.1 | - | - | 51.0                    | Dec-14 04:00 | 22.1         | Dec-18 | 100.0% | - |
| WSPD s (km/hr)                          |  |  | Evergreen Park   | 13.0 | - | - | 59.0                    | Dec-18 07:00 | 33.9         | Dec-28 | 99.9%  | - |
| WSPD s (km/hr)                          |  |  | Smoky Heights    | 13.8 | - | - | 45.0                    | Dec-18 09:00 | 28.7         | Dec-18 | 100.0% | - |
| WSPD s (km/hr)                          |  |  | Beaverlodge      | 12.1 | - | - | 54.0                    | Dec-18 13:00 | 35.0         | Dec-19 | 100.0% | - |
| WSPD s (km/hr)                          |  |  | Valleyview       | 5.2  | - | - | 25.0                    | Dec-18 10:00 | 13.3         | Dec-18 | 99.3%  | - |
| WSPD s (km/hr)                          |  |  | Donnelly         | 13.4 | - | - | 43.0                    | Dec-21 10:00 | 27.1         | Dec-19 | 94.5%  | - |
| WSPD s (km/hr)                          |  |  | Rycroft-Portable | 11.7 | - | - | 40.0                    | Dec-05 00:00 | 29.7         | Dec-04 | 94.5%  | - |
| WSPD v (km/hr)                          |  |  | Henry Pirker     | 6.0  | - | - | 48.0                    | Dec-14 04:00 | 21.2         | Dec-18 | 100.0% | - |
| WSPD v (km/hr)                          |  |  | Evergreen Park   | 9.8  | - | - | 58.0                    | Dec-18 07:00 | 33.6         | Dec-28 | 99.9%  | - |
| WSPD v (km/hr)                          |  |  | Smoky Heights    | 9.7  | - | - | 45.0                    | Dec-18 09:00 | 28.1         | Dec-18 | 100.0% | - |
| WSPD v (km/hr)                          |  |  | Beaverlodge      | 7.9  | - | - | 54.0                    | Dec-18 13:00 | 34.1         | Dec-19 | 100.0% | - |
| WSPD v (km/hr)                          |  |  | Valleyview       | 3.3  | - | - | 25.0                    | Dec-18 10:00 | 12.0         | Dec-18 | 99.3%  | - |
| WSPD v (km/hr)                          |  |  | Donnelly         | 9.2  | - | - | 43.0                    | Dec-21 10:00 | 25.3         | Dec-19 | 94.5%  | - |
| WSPD v (km/hr)                          |  |  | Rycroft-Portable | 8.8  | - | - | 40.0                    | Dec-05 00:00 | 29.0         | Dec-04 | 94.5%  | - |
| WDIR                                    |  |  | Henry Pirker     | WSW  | - | - | -                       | -            | -            | -      | 100.0% | - |
| WDIR                                    |  |  | Evergreen Park   | WSW  | - | - | -                       | -            | -            | -      | 99.9%  | - |
| WDIR                                    |  |  | Smoky Heights    | SW   | - | - | -                       | -            | -            | -      | 100.0% | - |
| WDIR                                    |  |  | Beaverlodge      | W    | - | - | -                       | -            | -            | -      | 100.0% | - |
| WDIR                                    |  |  | Valleyview       | W    | - | - | -                       | -            | -            | -      | 99.3%  | - |
| WDIR                                    |  |  | Donnelly         | SW   | - | - | -                       | -            | -            | -      | 94.5%  | - |
| WDIR                                    |  |  | Rycroft-Portable | SW   | - | - | -                       | -            | -            | -      | 94.5%  | - |

# Continuous Network Equipment Summary

## PAZA – Henry Pirker Station

### General Station Issues:

Power disruption on December 6.

| Parameter                 | Make    | Model     | Notes                                                           |
|---------------------------|---------|-----------|-----------------------------------------------------------------|
| SO <sub>2</sub>           | TEI     | 43i       | Power disruption at the station resulted in an uptime of 99.6%. |
| NOx/NO/NO <sub>2</sub>    | TEI     | 42i       | Power disruption at the station resulted in an uptime of 99.5%. |
| O <sub>3</sub>            | TEI     | 49i       | Power disruption at the station resulted in an uptime of 99.5%. |
| CO                        | TEI     | 48C       | Power disruption at the station resulted in an uptime of 99.6%. |
| THC/CH <sub>4</sub> /NMHC | TEI     | 55I       | Power disruption at the station resulted in an uptime of 99.5%. |
| TRS                       | TEI     | 45C       | Power disruption at the station resulted in an uptime of 99.5%. |
| PM <sub>2.5</sub>         | Sharp   | 5030      | Power disruption at the station resulted in an uptime of 99.6%. |
| RH                        | Met One | 083D      | Power disruption at the station resulted in an uptime of 99.5%. |
| ET                        | Met One | 083D      | Power disruption at the station resulted in an uptime of 99.5%. |
| SR                        | Met One | 096-1     | Power disruption at the station resulted in an uptime of 99.5%. |
| WS / WD                   | Met One | 010C/020C | No operational issues observed.                                 |

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**PAZA – Evergreen Park Station**

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**General Station Issues**

Data logger malfunction on December 7.

| Parameter         | Make          | Model | Notes                                                                                                        |
|-------------------|---------------|-------|--------------------------------------------------------------------------------------------------------------|
| SO <sub>2</sub>   | TEI           | 43i   | Data logger malfunction resulted in an uptime of 99.9%                                                       |
| TRS               | TEI           | 43C   | Data logger malfunction resulted in an uptime of 99.9%                                                       |
| PM <sub>2.5</sub> | Sharp         | 5030  | Data logger malfunction, analyzer maintenance, and instrument malfunctioning resulted in an uptime of 99.3%. |
| ET                | Met One/Gill  | 083D  | Data logger malfunction resulted in an uptime of 99.9%                                                       |
| RH                | Met One/Gill  |       | Data logger malfunction resulted in an uptime of 99.9%                                                       |
| WS / WD           | Met One/ Gill |       | Data logger malfunction resulted in an uptime of 99.9%                                                       |

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**PAZA – Smoky Heights Station**

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**General Station Issues**

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| Parameter         | Make    | Model     | Notes                                                     |
|-------------------|---------|-----------|-----------------------------------------------------------|
| SO <sub>2</sub>   | TEI     | 43C       | Instrument malfunctioning resulted in an uptime of 99.7%. |
| TRS               | TEI     | 43i       | No operational issues observed.                           |
| PM <sub>2.5</sub> | Sharp   | 5030      | No operational issues observed.                           |
| ET                | Met One | 083D      | No operational issues observed.                           |
| WS / WD           | Met One | 010C/020C | No operational issues observed.                           |

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**PAZA – Beaverlodge Station**

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**General Station Issues**

| Parameter                           | Make     | Model | Notes                                                                             |
|-------------------------------------|----------|-------|-----------------------------------------------------------------------------------|
| SO <sub>2</sub>                     | TEI      | 43CTL | No operational issues observed.                                                   |
| NO <sub>x</sub> /NO/NO <sub>2</sub> | TEI      | 42C   | No operational issues observed.                                                   |
| O <sub>3</sub>                      | TEI      | 49C   | No operational issues observed.                                                   |
| PM <sub>2.5</sub>                   | Sharp    | 5030  | Instrument malfunctioning and analyzer maintenance resulted in an uptime of 93.8% |
| ET                                  | n/a      | n/a   | No operational issues observed.                                                   |
| RH                                  | n/a      | n/a   | No operational issues observed.                                                   |
| WS / WD                             | Blue Sky | 857   | No operational issues observed.                                                   |

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**PAZA – Valleyview Station**

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**General Station Issues**

Power disruption on December 14.

| Parameter        | Make | Model     | Notes                                                           |
|------------------|------|-----------|-----------------------------------------------------------------|
| SO <sub>2</sub>  | TEI  | 43i       | Power disruption at the station resulted in an uptime of 99.2%. |
| H <sub>2</sub> S | TEI  | 43A       | Power disruption at the station resulted in an uptime of 99.2%. |
| ET               | Gill | Met Pak 3 | Power disruption at the station resulted in an uptime of 99.3%. |
| RH               | Gill | Met Pak 3 | Power disruption at the station resulted in an uptime of 99.3%. |
| WS / WD          | Gill | Met Pak 3 | Power disruption at the station resulted in an uptime of 99.3%. |

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**PAZA – Donnelly Station**

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**General Station Issues**

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| Parameter        | Make   | Model            | Notes                                                                                                                            |
|------------------|--------|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| SO <sub>2</sub>  | TEI    | 43i              | Instrument malfunctioning resulted in an uptime of 99.7%.                                                                        |
| H <sub>2</sub> S | Thermo | 450i             | Instrument malfunctioning resulted in an uptime of 99.6%.                                                                        |
| ET               | Gill   | RM Young<br>5103 | No operational issues observed.                                                                                                  |
| WS / WD          | Gill   | RM Young<br>5103 | Instrument malfunctioning, attributed to precipitation causing the wind instrument to freeze up, resulted in an uptime of 94.5%. |

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**PAZA – Portable-Rycroft**

**General Station Issues**

Power disruption December 12-13.

| Parameter                 | Make  | Model     | Notes                                                                                                                                                                  |
|---------------------------|-------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SO <sub>2</sub>           | TEI   | 43i       | A power disruption at the station resulted in an uptime of 99.3%.                                                                                                      |
| NOx/NO/NO <sub>2</sub>    | TEI   | 42i       | A power disruption at the station resulted in an uptime of 99.3%.                                                                                                      |
| O <sub>3</sub>            | TEI   | 49i       | A power disruption at the station resulted in an uptime of 99.3%.                                                                                                      |
| TRS                       | TEI   | 39C       | A power disruption at the station resulted in an uptime of 99.3%.                                                                                                      |
| THC/CH <sub>4</sub> /NMHC | TEI   | 55i       | A power disruption at the station and data logger malfunction resulted in an uptime of 99.2%.                                                                          |
| PM <sub>2.5</sub>         | Sharp | 5030      | A power disruption at the station, data logger malfunction, and analyzer maintenance resulted in an uptime of 99.2%.                                                   |
| ET                        | Gill  | Met Pak 3 | A power disruption at the station resulted in an uptime of 99.5%.                                                                                                      |
| WS / WD                   | Gill  | Met Pak 3 | A power disruption at the station and instrument malfunctioning (attributed to precipitation causing the wind instrument to freeze up) resulted in an uptime of 94.5%. |

PAZA  
Henry Pirker Station  
Monthly Summary Tables, Graphs and  
Roses

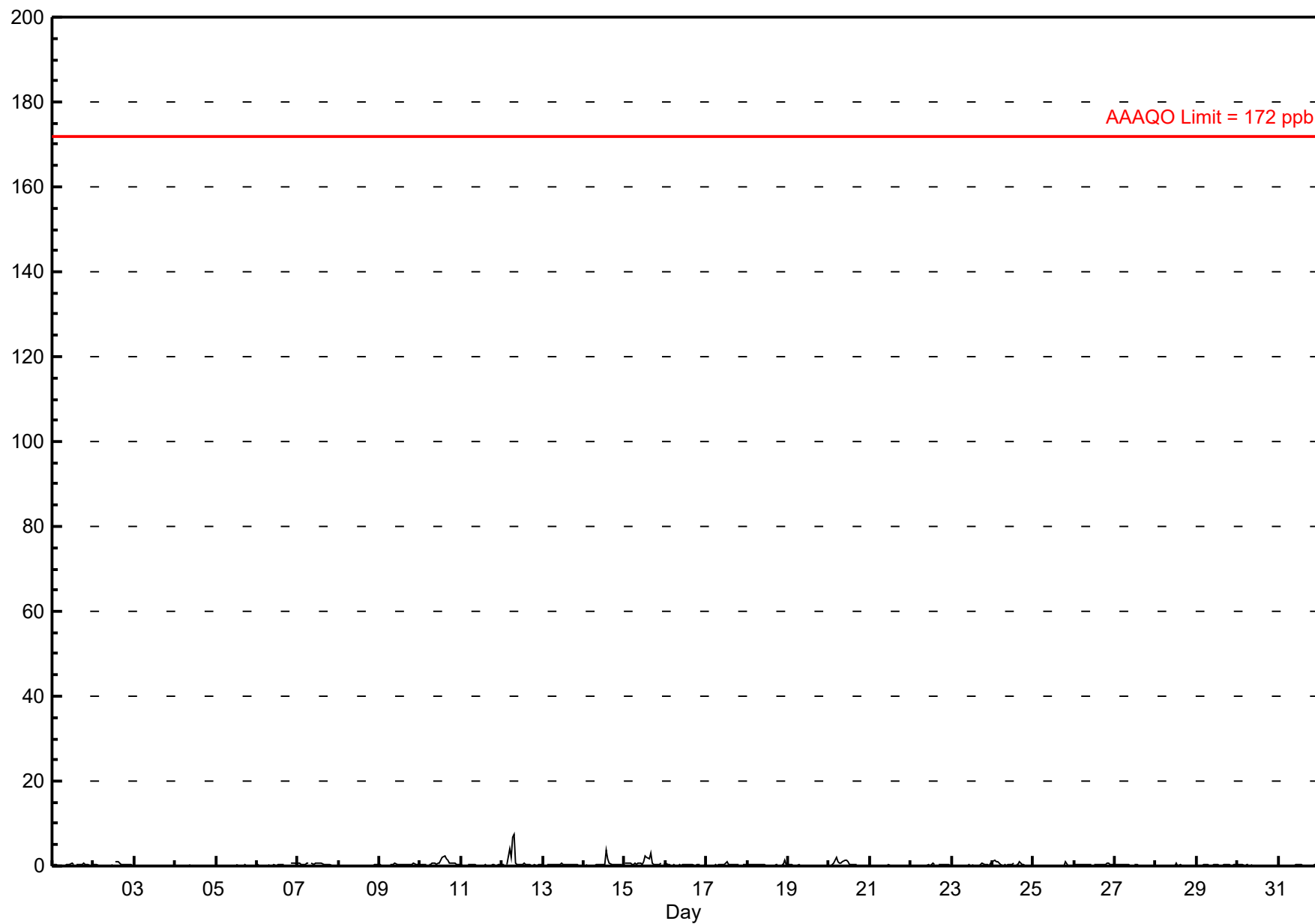
# Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Henry Pirker - December 2016**

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 7.4 ppb on Dec 12 08:00 Maximum Daily Average: 1.1 ppb on Dec 12                                                                                                                                                                                                                             |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 707<br>Hours of Missing Data: 37<br>Hours of Calibration: 34<br>Percent Operational Time: 99.6 |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 0 ppb on Dec 3 16:00 Minimum Daily Average: 0.0 ppb on Dec 4<br>Maximum Diurnal Average: 0.5 ppb at hour 14 Minimum Diurnal Average: 0.2 ppb at hour 24<br>Monthly Average: 0.30 ppb Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.6 P <sub>99</sub> = 2.3 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |
| Day                                                                                                                                                                                                                                                                                                                                                            | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        | Daily Average | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                                | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                                                                                                                                     |               |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 0  | A  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.6           |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.9           |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.2           |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.0           | 0.2           |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | C  | C  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.3           |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | P  | P  | P  | 1  | 1  | 1  | 0                                                                                                                                      | 0.3           | 0.7           |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                          | 1                             | 1 | 0 | 0 | 0 | 1 | 1 | A | 1 | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.4           | 0.6           |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.4           |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.6           |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | A | 0 | 0 | 1 | 1 | 0  | 1  | 1  | 1  | 2  | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0                                                                                                                                      | 0.8           | 2.5           |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.3           |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | A | 0 | 4 | 2 | 7 | 7 | 1 | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 1.1           | 7.4           |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.5           |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                         | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 4  | 2  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A                                                                                                                                      | 0.5           | 3.7           |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1  | 0  | 1  | 2  | 2  | 2  | 3  | 1  | 0  | 0  | 0  | 0  | 1  | A  | 0                                                                                                                                      | 0.8           | 3.0           |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0                                                                                                                                      | 0.3           | 0.5           |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                      | 0.3           | 1.0           |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 1  | 0                                                                                                                                      | 0.3           | 1.4           |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.4           |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.6           | 2.1           |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.2           |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 1  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.7           |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0                                                                                                                                      | 0.2           | 0.8           |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | A  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.5           | 1.3           |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.9           |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.6           |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.3           |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.7           |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.5           |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.5           |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.4           |
| 0.3 0.3 0.2 0.2 0.4 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.4 0.5 0.4 0.3 0.3 0.2 0.2 0.3 0.2 0.2 0.2 0.2                                                                                                                                                                                                                                                                |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                        |               |               |
| 1.0 1.3 1.1 0.9 4.0 2.1 6.9 7.4 1.1 1.3 1.3 1.1 2.4 3.7 2.5 3.0 1.2 0.8 0.8 0.9 0.7 0.7 1.4 0.7                                                                                                                                                                                                                                                                |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                        |               |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                                                                                                                                                                                                                                                |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb 30-day 11 ppb                                                                                                                                                                                                                                                                        |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |

## Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Henry Pirker - December 2016



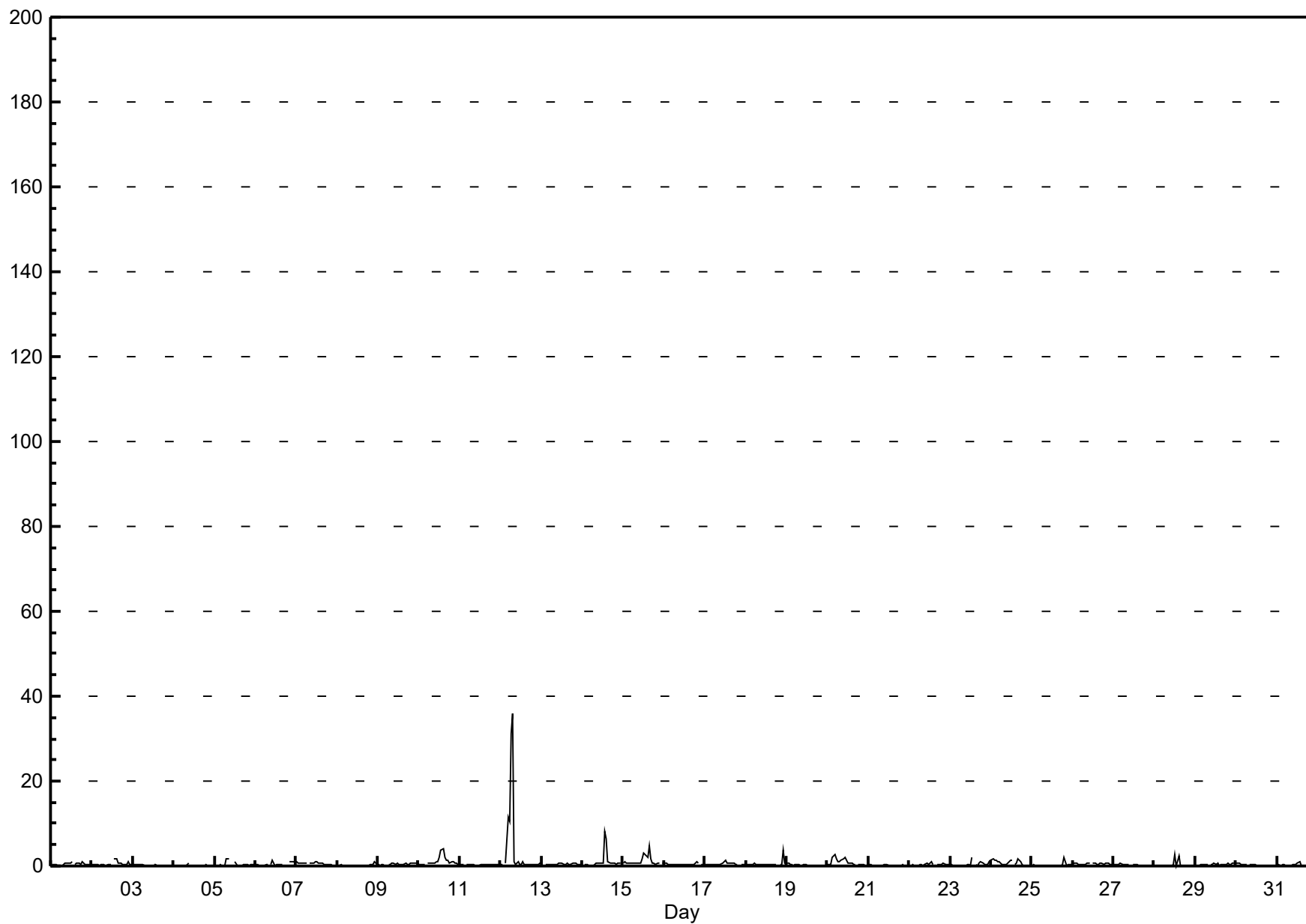
# Hourly Maximums

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Henry Pirker - December 2016

| Maximum Value: 35.8 ppb on Dec 12 08:00                                                             |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 4.2 ppb on Dec 12                                                                                                                   |    |    |    |    | Hours in Service: 744          |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|----|----|----|----|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|--------------------------------|---------------|
| Minimum Value: 0 ppb on Dec 3 16:00                                                                 |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.2 ppb on Dec 4                                                                                                                    |    |    |    |    | Hours of Data: 707             |               |
| Maximum Diurnal Average: 1.6 ppb at hour 8                                                          |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.3 ppb at hour 24                                                                                                                |    |    |    |    | Hours of Missing Data: 37      |               |
| Monthly Average: 0.59 ppb                                                                           |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 0.9 P <sub>99</sub> = 3.5 |    |    |    |    | Hours of Calibration: 34       |               |
|                                                                                                     |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Percent Operational Time: 99.6 |               |
| Day                                                                                                 | Hourly Period Ending At (MST) |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Daily Average                  | Daily Maximum |
|                                                                                                     | 1                             | 2 | 3 | 4 | 5  | 6  | 7  | 8  | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24 |                                |               |
| 1-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 1 | 1  | 1  | 1  | 1  | A  | 0  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.4                            | 0.9           |
| 2-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0  | 0  | A  | 2  | 2  | 1  | 1  | 0  | 0                                                                                                                                                          | 0  | 1  | 0  | 0  | 0.5                            | 1.6           |
| 3-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                            | 0.3           |
| 4-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 1  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                            | 0.6           |
| 5-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 2  | 2 | A  | C  | C  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.4                            | 1.7           |
| 6-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | P  | P  | P                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.5                            | 1.4           |
| 7-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1  | 1  | 1  | A  | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.5                            | 0.9           |
| 8-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 1  | 0  | 0.2                            | 0.9           |
| 9-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0  | A  | 0  | 0  | 1 | 1  | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.4                            | 0.8           |
| 10-Dec                                                                                              | 0                             | 0 | 0 | 0 | A  | 1  | 1  | 1  | 1 | 1  | 1  | 1  | 2  | 4  | 4  | 2  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 0  | 1.1                            | 4.1           |
| 11-Dec                                                                                              | 0                             | 0 | 0 | A | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 12-Dec                                                                                              | 0                             | 0 | A | 1 | 11 | 11 | 31 | 36 | 1 | 0  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 1  | 4.2                            | 35.8          |
| 13-Dec                                                                                              | 1                             | A | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 1  | 1  | 1  | 0  | 0  | 1  | 0  | 0  | 1  | 1                                                                                                                                                          | 1  | 0  | 0  | 0  | 0.5                            | 0.8           |
| 14-Dec                                                                                              | A                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 1 | 1  | 1  | 1  | 1  | 8  | 7  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | A  | 1.1                            | 8.0           |
| 15-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1 | 1  | 1  | 2  | 3  | 3  | 2  | 5  | 2  | 1  | 1  | 0                                                                                                                                                          | 1  | 1  | A  | 1  | 1.2                            | 4.6           |
| 16-Dec                                                                                              | 1                             | 1 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 1                                                                                                                                                          | 1  | A  | 0  | 0  | 0.4                            | 0.9           |
| 17-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0                                                                                                                                                          | A  | 0  | 0  | 0  | 0.5                            | 1.3           |
| 18-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 1  | 0  | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A                                                                                                                                                          | 0  | 0  | 4  | 1  | 0.5                            | 3.9           |
| 19-Dec                                                                                              | 1                             | 1 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                            | 0.5           |
| 20-Dec                                                                                              | 0                             | 0 | 0 | 2 | 3  | 2  | 1  | 1  | 1 | 2  | 2  | 1  | 1  | 1  | 1  | 0  | 0  | A  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.9                            | 2.6           |
| 21-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                            | 0.3           |
| 22-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 1  | 0  | 1  | 1  | 0  | A  | 0  | 0  | 0  | 0                                                                                                                                                          | 1  | 0  | 0  | 0  | 0.3                            | 1.0           |
| 23-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 1  | 0  | 0  | 2  | A  | 0  | 0  | 1  | 1  | 1                                                                                                                                                          | 0  | 0  | 0  | 1  | 0.4                            | 2.0           |
| 24-Dec                                                                                              | 1                             | 2 | 1 | 1 | 1  | 1  | 0  | 0  | 0 | 0  | 1  | 1  | 1  | A  | 0  | 1  | 2  | 1  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.7                            | 1.9           |
| 25-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 2                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                            | 2.2           |
| 26-Dec                                                                                              | 0                             | 1 | 1 | 0 | 0  | 0  | 0  | 0  | 1 | 1  | 1  | A  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 1                                                                                                                                                          | 1  | 1  | 0  | 0  | 0.5                            | 0.7           |
| 27-Dec                                                                                              | 0                             | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                            | 0.5           |
| 28-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0 | A  | 0  | 0  | 3  | 0  | 2  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.4                            | 2.6           |
| 29-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A | 0  | 0  | 1  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                                          | 0  | 0  | 1  | 1  | 0.3                            | 0.7           |
| 30-Dec                                                                                              | 1                             | 1 | 1 | 0 | 0  | 0  | 0  | A  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                            | 0.6           |
| 31-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0 | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 1  | 1  | 0  | 0.3                            | 0.9           |
| 0.4 0.4 0.3 0.4 0.7 0.7 1.4 1.6 0.5 0.4 0.5 0.6 0.7 1.0 0.8 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.3         |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Average                |               |
| 1.4 1.6 1.4 2.2 11.5 10.5 31.2 35.8 1.7 1.6 2.2 1.8 3.0 8.0 6.6 4.6 1.9 1.2 1.1 2.2 1.0 1.2 3.9 1.0 |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Maximum                |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                     |                               |   |   |   |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |                                |               |

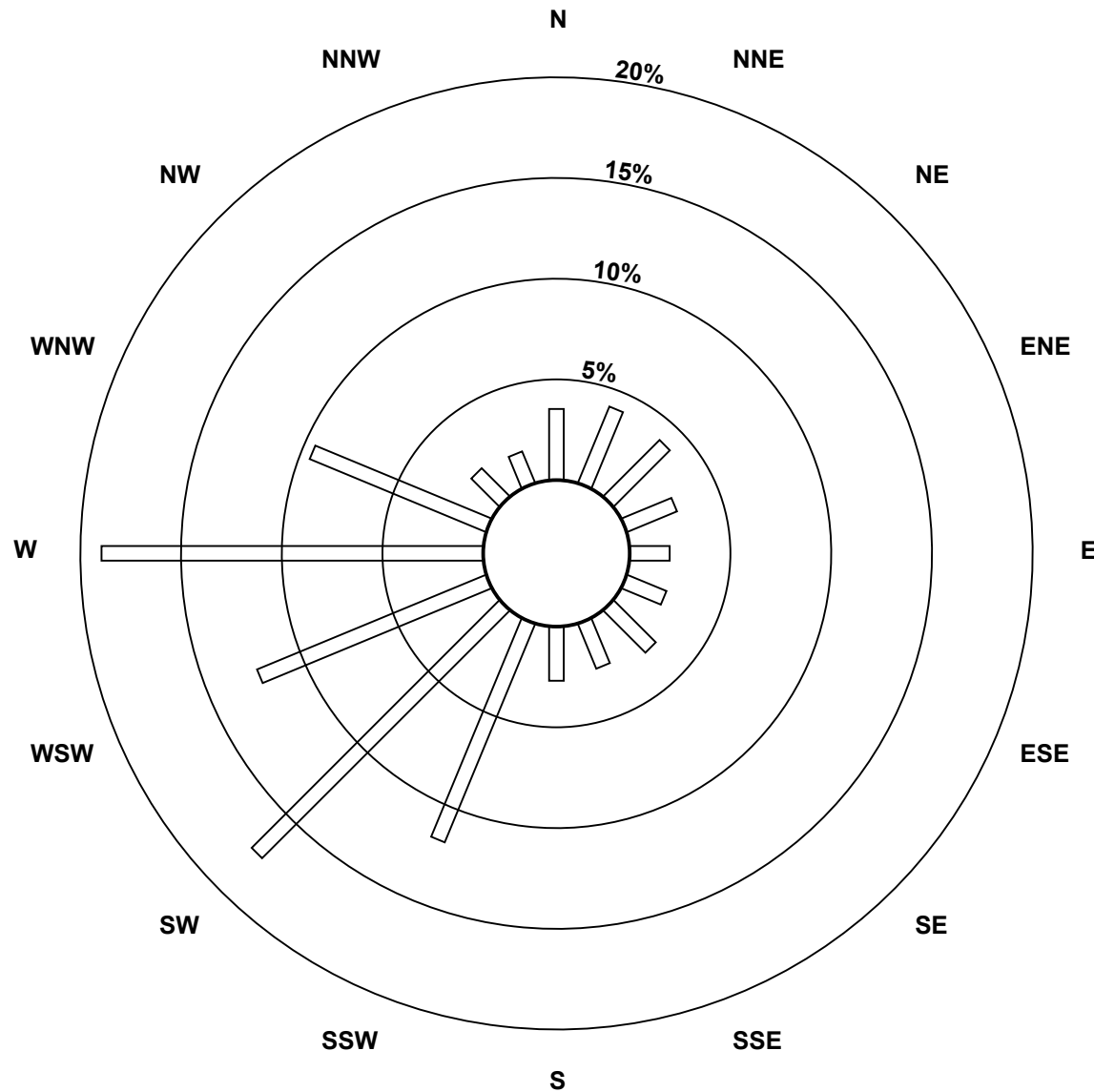
## Hourly Maximums

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Henry Pirker - December 2016**

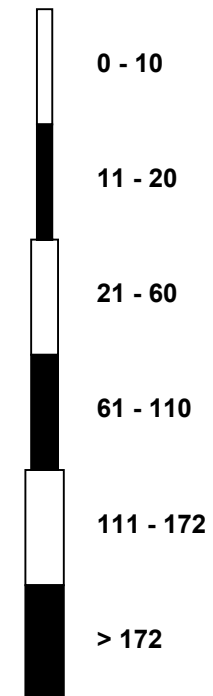


## Pollutant Rose

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Henry Pirker - December 2016

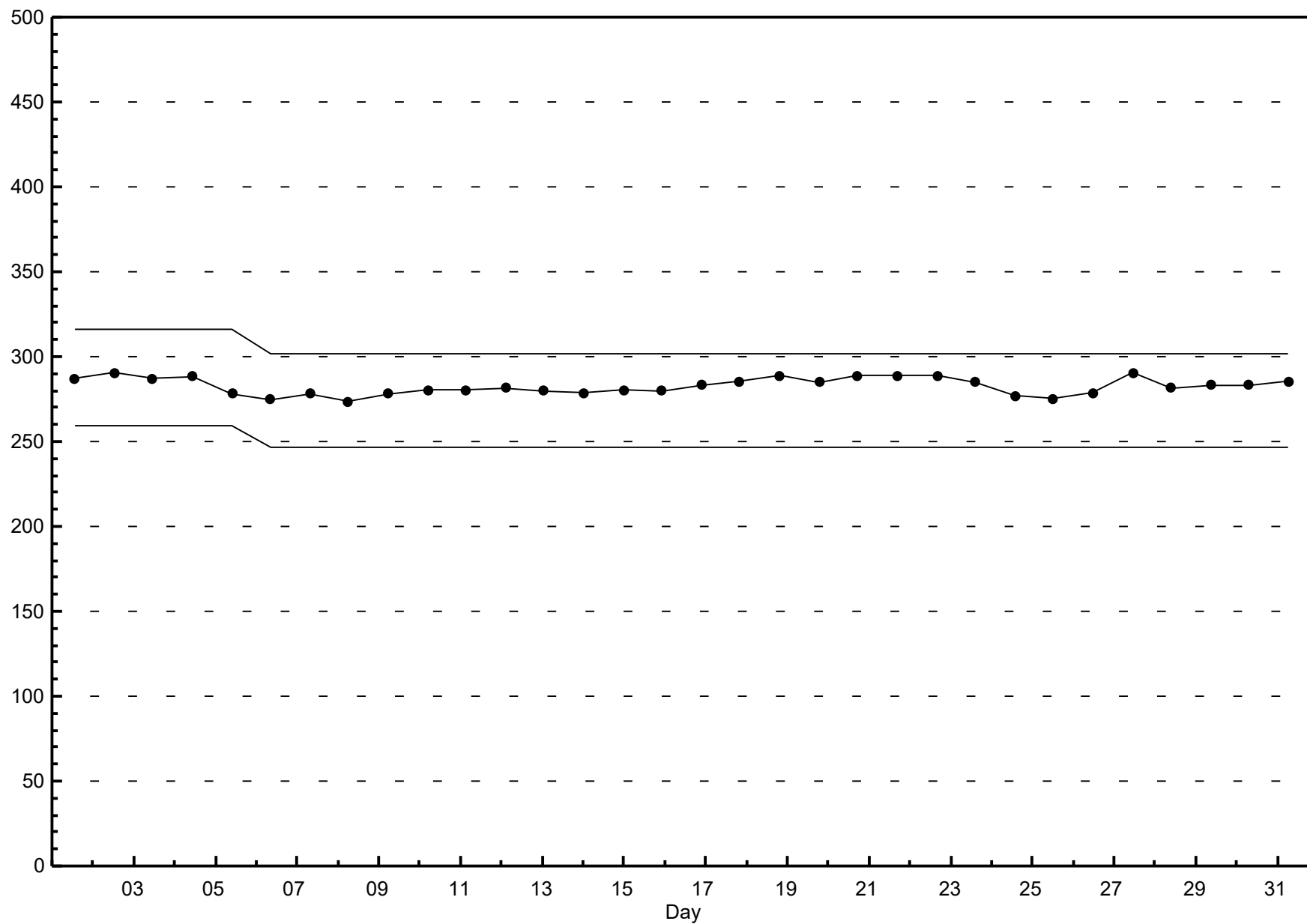


### Pollutant Classes (ppb)



## Span Responses

Sulphur Dioxide (SO<sub>2</sub>)  
Henry Pirker - December 2016





# Hourly Averages

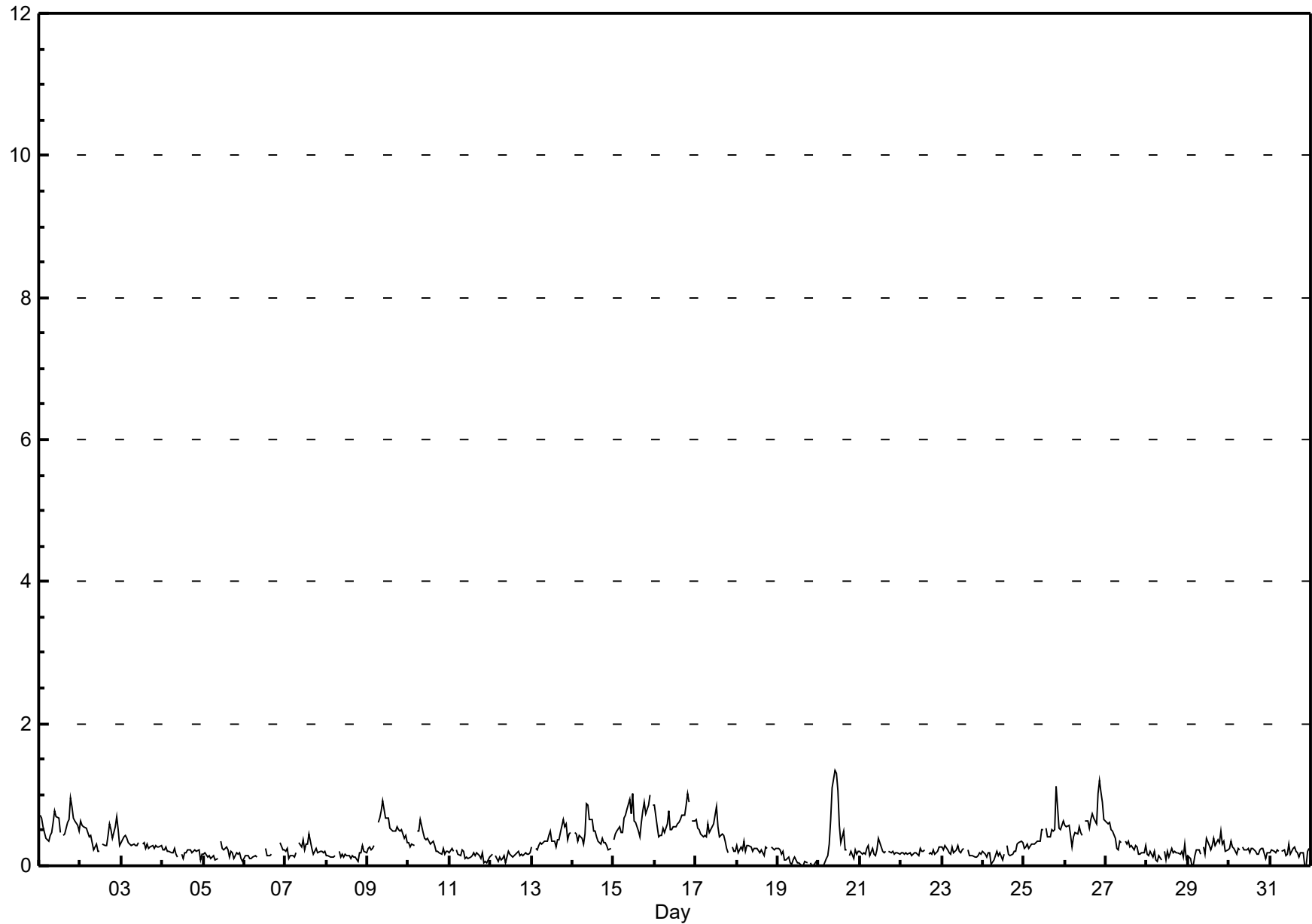
Total Reduced Sulphur (TRS) - ppb

Henry Pirker - December 2016

| Maximum Value: 1.3 ppb on Dec 20 10:00      |                               |                   |     |     |     |     |     |                               |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.7 ppb on Dec 15                                                                                                                   |     |     |     |     |     |                 |               |     |  |  |  |  |  |  |  |  |  |  | Hours in Service: 744          |  |
|---------------------------------------------|-------------------------------|-------------------|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----------------|---------------|-----|--|--|--|--|--|--|--|--|--|--|--------------------------------|--|
| Minimum Value: 0 ppb on Dec 19 15:00        |                               |                   |     |     |     |     |     |                               |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.1 ppb on Dec 19                                                                                                                   |     |     |     |     |     |                 |               |     |  |  |  |  |  |  |  |  |  |  | Hours of Data: 705             |  |
| Maximum Diurnal Average: 0.4 ppb at hour 10 |                               |                   |     |     |     |     |     |                               |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.3 ppb at hour 5                                                                                                                 |     |     |     |     |     |                 |               |     |  |  |  |  |  |  |  |  |  |  | Hours of Missing Data: 39      |  |
| Monthly Average: 0.31 ppb                   |                               |                   |     |     |     |     |     |                               |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.0 |     |     |     |     |     |                 |               |     |  |  |  |  |  |  |  |  |  |  | Hours of Calibration: 35       |  |
|                                             |                               |                   |     |     |     |     |     |                               |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |     |     |     |     |     |                 |               |     |  |  |  |  |  |  |  |  |  |  | Percent Operational Time: 99.5 |  |
| Day                                         | Hourly Period Ending At (MST) |                   |     |     |     |     |     |                               |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |     |     |     |     |     | Daily Average   | Daily Maximum |     |  |  |  |  |  |  |  |  |  |  |                                |  |
|                                             | 1                             | 2                 | 3   | 4   | 5   | 6   | 7   | 8                             | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19                                                                                                                                                         | 20  | 21  | 22  | 23  | 24  |                 |               |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 1-Dec                                       | 1                             | 1                 | 1   | 0   | 0   | 0   | 0   | 0                             | 1   | 1   | 1   | 1   | 0   | A   | 0   | 0   | 0   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 0   | 0.6             | 1.0           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 2-Dec                                       | 1                             | 1                 | 1   | 1   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 1                                                                                                                                                          | 1   | 0   | 1   | 1   | 1   | 0               | 0.4           | 0.7 |  |  |  |  |  |  |  |  |  |  |                                |  |
| 3-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.3             | 0.4           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 4-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 5-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.4           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 6-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | A   | C   | C   | C   | 0   | 0   | 0   | 0   | 0   | P   | P                                                                                                                                                          | P   | P   | 0   | 0   | 0   | --              | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 7-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | A                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.4           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 8-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | 0   | A   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.1             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 9-Dec                                       | 0                             | 0                 | 0   | 0   | 0   | A   | 1   | 1                             | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 0   | 0   | 1   | 1                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.5             | 0.9           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 10-Dec                                      | 0                             | 0                 | 0   | 0   | A   | 0   | 0   | 1                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.3             | 0.6           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 11-Dec                                      | 0                             | 0                 | 0   | A   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.1             | 0.2           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 12-Dec                                      | 0                             | 0                 | A   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.1             | 0.2           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 13-Dec                                      | 0                             | A                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 1   | 1   | 1   | 0   | 0   | 0.4             | 0.7           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 14-Dec                                      | A                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 1   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | A   | 0.4             | 0.9           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 15-Dec                                      | 0                             | 0                 | 0   | 1   | 0   | 0   | 1   | 1                             | 1   | 1   | 1   | 1   | 1   | 1   | 0   | 0   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | A   | 1   | 0.7             | 1.0           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 16-Dec                                      | 1                             | 1                 | 0   | 0   | 0   | 1   | 0   | 1                             | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | A   | 1   | 1   | 0.6             | 1.0           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 17-Dec                                      | 1                             | 1                 | 1   | 0   | 0   | 0   | 0   | 1                             | 0   | 1   | 1   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | A   | 0   | 0   | 0   | 0.4             | 0.8           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 18-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | A   | 0   | 0   | 0   | 0.2             | 0.4           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 19-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | A                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.1             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 20-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 1                             | 1   | 1   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | A   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.4             | 1.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 21-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.4           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 22-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 23-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 24-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 25-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | 0   | 1   | 1   | A   | 1   | 0   | 0   | 1   | 0   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.4             | 1.1           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 26-Dec                                      | 1                             | 1                 | 1   | 0   | 0   | 0   | 0   | 0                             | 1   | 0   | 0   | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.6             | 1.2           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 27-Dec                                      | 1                             | 1                 | 1   | 1   | 0   | 0   | 0   | 0                             | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.3             | 0.6           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 28-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 29-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | 0                             | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.5           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 30-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | 0   | A                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| 31-Dec                                      | 0                             | 0                 | 0   | 0   | 0   | 0   | A   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0                                                                                                                                                          | 0   | 0   | 0   | 0   | 0   | 0.2             | 0.3           |     |  |  |  |  |  |  |  |  |  |  |                                |  |
|                                             |                               | 0.3               | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                           | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                                                                                                                                                        | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | Diurnal Average |               |     |  |  |  |  |  |  |  |  |  |  |                                |  |
|                                             |                               | 0.9               | 0.7 | 0.6 | 0.5 | 0.5 | 0.7 | 0.7                           | 1.1 | 1.3 | 1.3 | 1.1 | 0.8 | 0.6 | 0.6 | 0.6 | 0.7 | 0.8 | 1.0                                                                                                                                                        | 1.1 | 1.2 | 1.0 | 0.9 | 0.9 | Diurnal Maximum |               |     |  |  |  |  |  |  |  |  |  |  |                                |  |
| C - Calibration                             |                               | P - Power Failure |     |     |     |     |     | A - Automated Daily Zero Span |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |     |     |     |     |     |                 |               |     |  |  |  |  |  |  |  |  |  |  |                                |  |

## Hourly Averages

Total Reduced Sulphur (TRS) - ppb  
Henry Pirker - December 2016



# Hourly Maximums

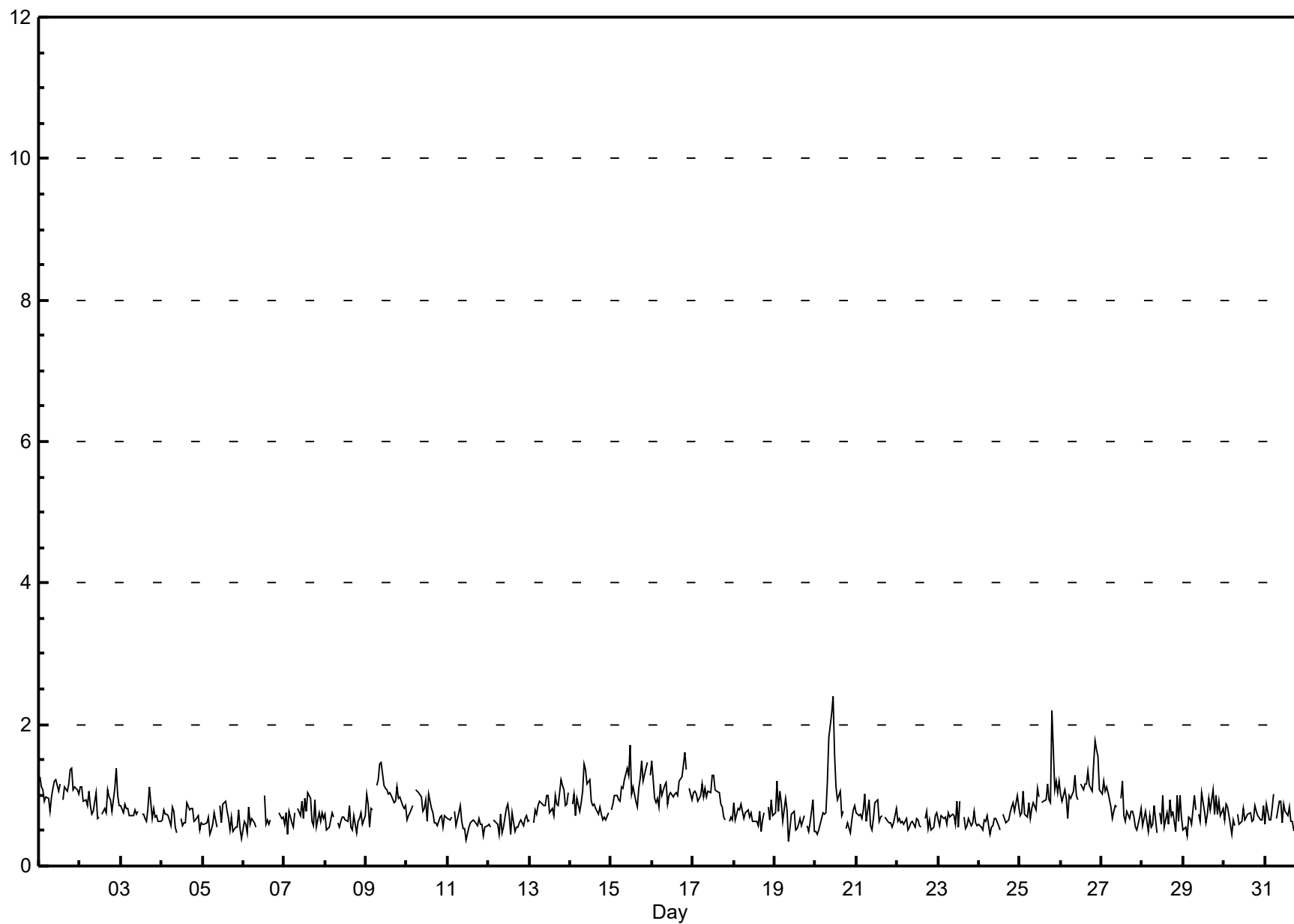
Total Reduced Sulphur (TRS) - ppb

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| Maximum Value: 2.4 ppb on Dec 20 11:00                                                              |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 1.1 ppb on Dec 26                                                                                                                   |    |    |    |    | Hours in Service: 744     |               |
|-----------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|---------------------------|---------------|
| Minimum Value: 0 ppb on Dec 19 09:00                                                                |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.6 ppb on Dec 11                                                                                                                   |    |    |    |    | Hours of Data: 705        |               |
| Maximum Diurnal Average: 0.9 ppb at hour 12                                                         |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.8 ppb at hour 5                                                                                                                 |    |    |    |    | Hours of Missing Data: 39 |               |
| Monthly Average: 0.81 ppb                                                                           |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.8 Q <sub>3</sub> = 0.9 P <sub>90</sub> = 1.1 P <sub>99</sub> = 1.6 |    |    |    |    | Hours of Calibration: 35  |               |
|                                                                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.5                                                                                                                             |    |    |    |    |                           |               |
| Day                                                                                                 | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Daily Average             | Daily Maximum |
|                                                                                                     | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24 |                           |               |
| 1-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1.1                       | 1.4           |
| 2-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.9                       | 1.4           |
| 3-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.8                       | 1.1           |
| 4-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 0.9           |
| 5-Dec                                                                                               | 1                             | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1                                                                                                                                                          | 1  | 1  | 1  | 0  | 0.6                       | 0.9           |
| 6-Dec                                                                                               | 1                             | 1 | 0 | 1 | 1 | 1 | 1 | 1 | A | C  | C  | C  | 1  | 1  | 1  | 1  | 1  | P  | P  | P                                                                                                                                                          | P  | 1  | 1  | 1  | --                        | 1.0           |
| 7-Dec                                                                                               | 1                             | 1 | 0 | 1 | 1 | 1 | 1 | A | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 1.0           |
| 8-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                       | 0.9           |
| 9-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | A | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1.0                       | 1.5           |
| 10-Dec                                                                                              | 1                             | 1 | 1 | 1 | A | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.8                       | 1.1           |
| 11-Dec                                                                                              | 1                             | 1 | 1 | A | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 0  | 1  | 1  | 0.6                       | 0.9           |
| 12-Dec                                                                                              | 1                             | 1 | A | 1 | 1 | 1 | 0 | 1 | 0 | 1  | 1  | 1  | 1  | 0  | 1  | 0  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                       | 0.9           |
| 13-Dec                                                                                              | 1                             | A | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.9                       | 1.2           |
| 14-Dec                                                                                              | A                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | A  | 0.9                       | 1.5           |
| 15-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | A  | 1  | 1.1                       | 1.7           |
| 16-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2                                                                                                                                                          | 1  | A  | 1  | 1  | 1.1                       | 1.6           |
| 17-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | A  | 1  | 1  | 1  | 1.0                       | 1.3           |
| 18-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | A                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 0.9           |
| 19-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1                                                                                                                                                          | 0  | 1  | 1  | 0  | 0.7                       | 1.2           |
| 20-Dec                                                                                              | 0                             | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | 1  | 1.0                       | 2.4           |
| 21-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 1.0           |
| 22-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                       | 0.8           |
| 23-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 0.9           |
| 24-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 1.0           |
| 25-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 2                                                                                                                                                          | 1  | 1  | 1  | 1  | 1.0                       | 2.2           |
| 26-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 2  | 2  | 2  | 1  | 1.1                       | 1.8           |
| 27-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.8                       | 1.2           |
| 28-Dec                                                                                              | 1                             | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 1.0           |
| 29-Dec                                                                                              | 1                             | 1 | 0 | 1 | 1 | 1 | 1 | 1 | A | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.8                       | 1.1           |
| 30-Dec                                                                                              | 1                             | 1 | 1 | 1 | 0 | 1 | 1 | A | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 0.9           |
| 31-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                       | 1.0           |
| 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.9 0.9 0.9 0.9 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Average           |               |
| 1.5 1.2 1.1 1.1 1.0 1.2 1.1 1.2 1.8 2.1 2.4 1.7 1.3 1.1 1.1 1.2 1.3 1.3 1.5 2.2 1.8 1.7 1.5 1.3     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Maximum           |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |                           |               |

## Hourly Maximums

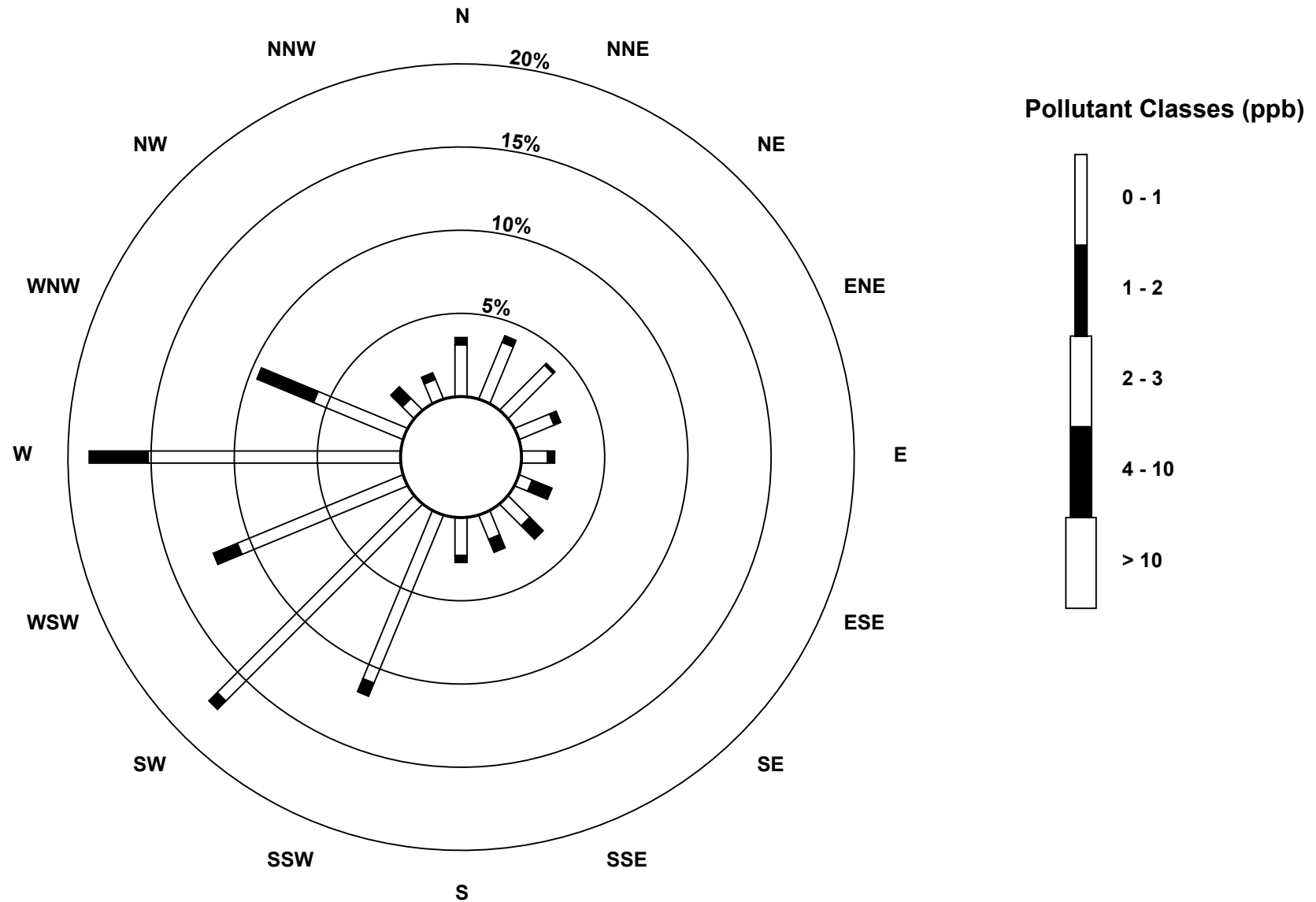
Total Reduced Sulphur (TRS) - ppb  
Henry Pirker - December 2016

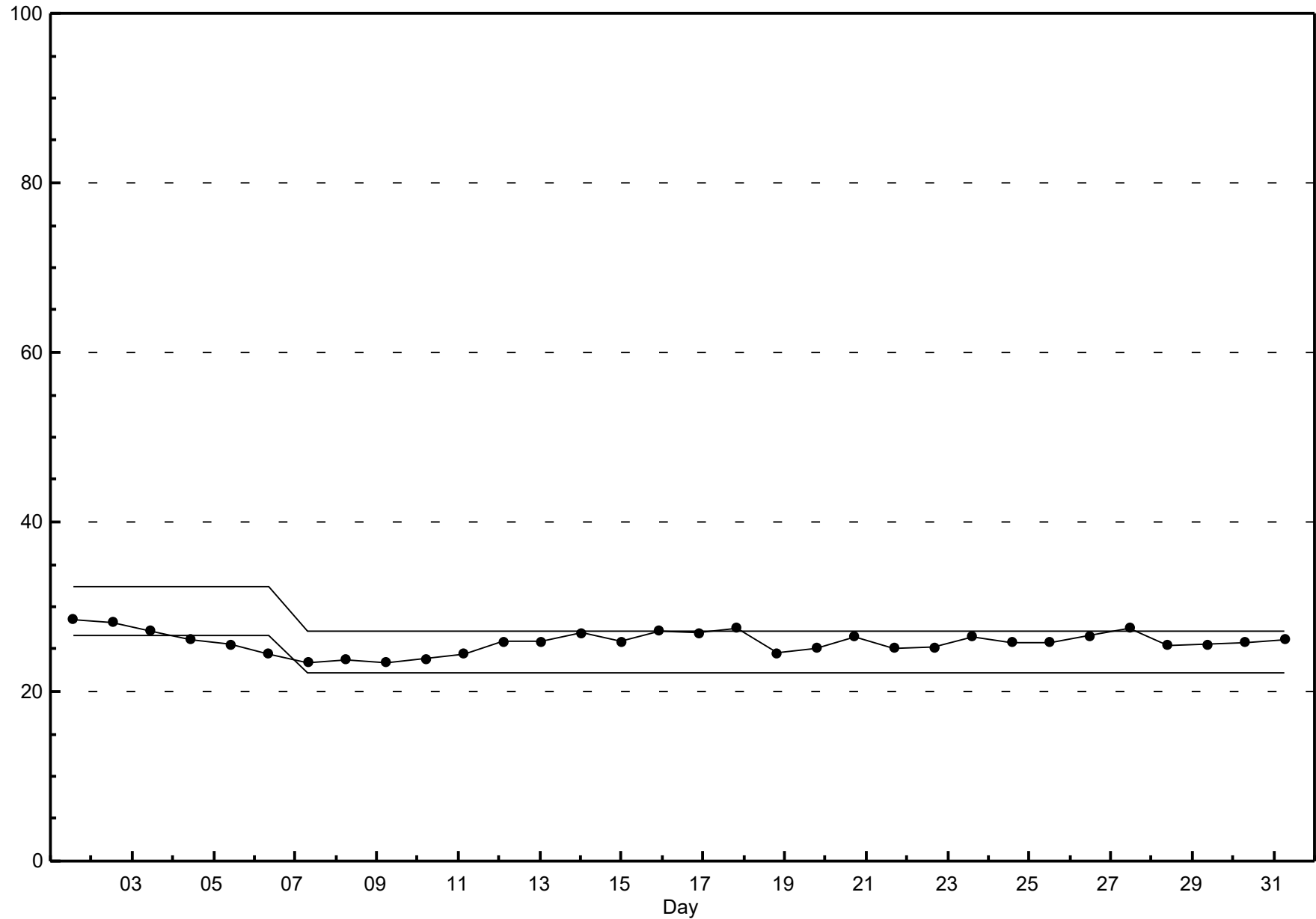


# Pollutant Rose

Total Reduced Sulphur (TRS) - ppb

Henry Pirker - December 2016





# Hourly Averages

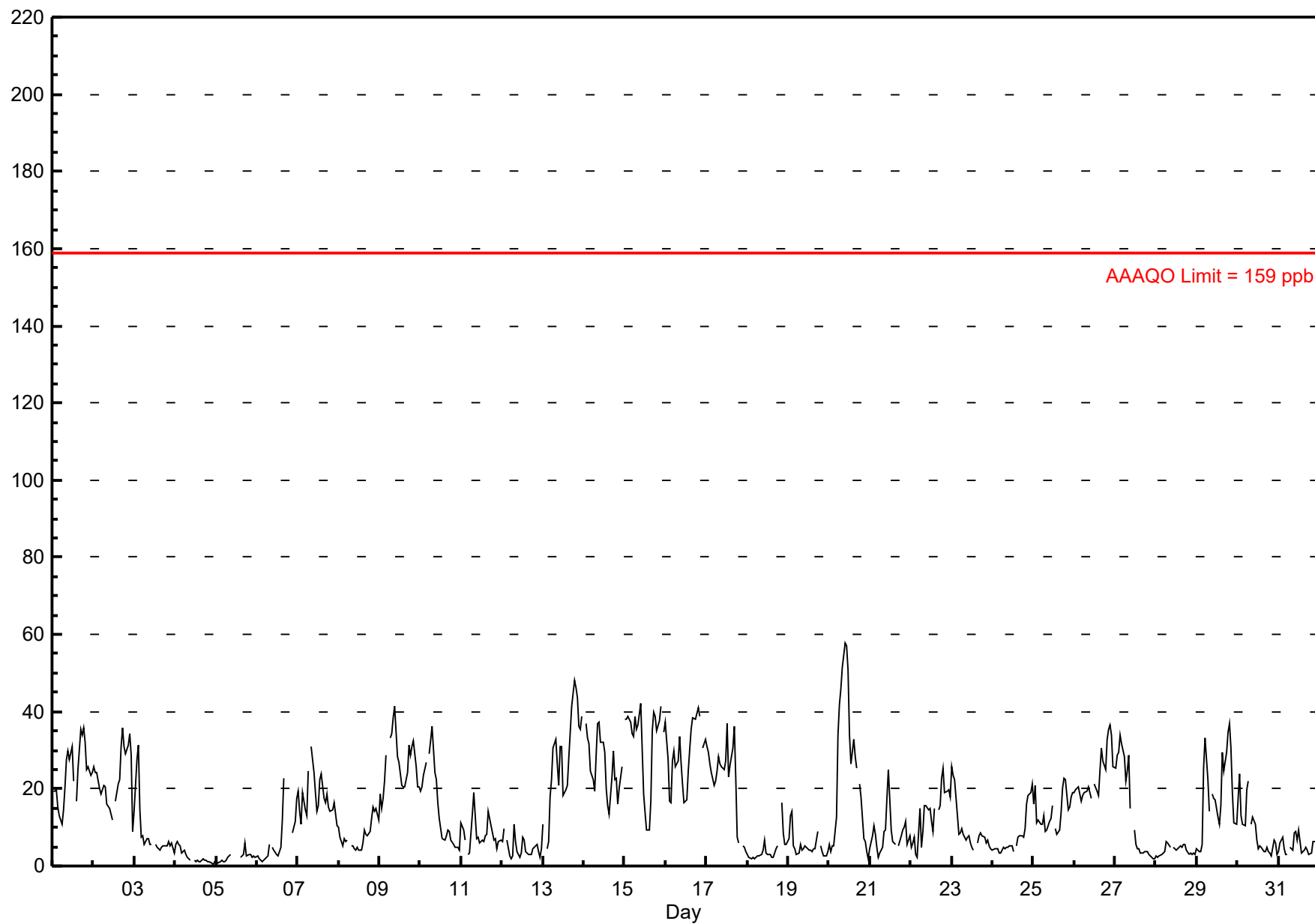
Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Henry Pirker - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 57.7 ppb on Dec 20 10:00 Maximum Daily Average: 31.9 ppb on Dec 15                                                                                                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 704<br>Hours of Missing Data: 40<br>Hours of Calibration: 36<br>Percent Operational Time: 99.5 |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 0 ppb on Dec 4 23:00 Minimum Daily Average: 2.3 ppb on Dec 5<br>Maximum Diurnal Average: 17.5 ppb at hour 9 Minimum Diurnal Average: 10.8 ppb at hour 14<br>Monthly Average: 14.45 ppb Percentiles: P <sub>1</sub> = 1.1 P <sub>10</sub> = 2.9 Q <sub>1</sub> = 4.7 Median = 10.2 Q <sub>3</sub> = 22.5 P <sub>90</sub> = 32.2 P <sub>99</sub> = 45.3 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |
| Day                                                                                                                                                                                                                                                                                                                                                                  | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        | Daily Average | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                                      | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                                                                                                                                     |               |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                                | 20                            | 19 | 20 | 15 | 13 | 11 | 14 | 21 | 28 | 30 | 27 | 31 | 22 | A  | 17 | 25 | 35 | 34 | 36 | 32 | 25 | 26 | 23 | 24                                                                                                                                     | 23.8          | 35.9          |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                                | 26                            | 24 | 24 | 20 | 18 | 20 | 21 | 20 | 16 | 15 | 13 | 12 | A  | 17 | 21 | 22 | 31 | 36 | 31 | 29 | 31 | 34 | 29 | 9                                                                                                                                      | 22.6          | 35.8          |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                                | 14                            | 28 | 31 | 15 | 7  | 8  | 6  | 7  | 7  | 6  | 6  | A  | 5  | 5  | 4  | 4  | 5  | 5  | 5  | 5  | 6  | 5  | 6  | 3                                                                                                                                      | 8.5           | 31.4          |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                                | 6                             | 6  | 6  | 5  | 3  | 4  | 3  | 2  | 2  | 2  | A  | 2  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 1  | 1  | 1  | 0  | 1                                                                                                                                      | 2.4           | 6.3           |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                                | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 3  | A  | C  | C  | C  | C  | 2  | 3  | 3  | 6  | 3  | 3  | 3  | 2  | 3  | 2                                                                                                                                      | 2.3           | 6.1           |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                                | 3                             | 2  | 1  | 1  | 2  | 2  | 3  | 6  | A  | 5  | 4  | 3  | 3  | 4  | 5  | 12 | 23 | P  | P  | P  | P  | 9  | 12 | 17                                                                                                                                     | 6.0           | 22.8          |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                                | 19                            | 14 | 11 | 19 | 14 | 13 | 25 | A  | 31 | 24 | 19 | 14 | 16 | 22 | 24 | 17 | 16 | 18 | 15 | 14 | 14 | 17 | 14 | 10                                                                                                                                     | 17.5          | 30.9          |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                                | 10                            | 8  | 5  | 7  | 6  | 7  | A  | 5  | 5  | 5  | 4  | 5  | 4  | 4  | 6  | 9  | 8  | 8  | 9  | 12 | 15 | 14 | 15 | 12                                                                                                                                     | 8.0           | 15.2          |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                                | 19                            | 15 | 18 | 22 | 29 | A  | 33 | 34 | 38 | 41 | 28 | 27 | 24 | 21 | 20 | 21 | 24 | 31 | 29 | 31 | 32 | 26 | 21 | 20                                                                                                                                     | 26.3          | 41.4          |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                               | 19                            | 20 | 24 | 27 | A  | 29 | 32 | 36 | 24 | 22 | 16 | 12 | 10 | 7  | 7  | 8  | 9  | 9  | 7  | 6  | 5  | 5  | 5  | 4                                                                                                                                      | 14.9          | 36.3          |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                               | 11                            | 9  | 7  | A  | 3  | 3  | 13 | 19 | 13 | 7  | 8  | 6  | 7  | 6  | 8  | 8  | 14 | 11 | 9  | 7  | 7  | 5  | 6  | 7                                                                                                                                      | 8.4           | 18.9          |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                               | 6                             | 10 | A  | 7  | 3  | 2  | 3  | 11 | 6  | 4  | 2  | 3  | 8  | 7  | 4  | 3  | 3  | 3  | 4  | 5  | 6  | 4  | 2  | 5                                                                                                                                      | 4.7           | 10.9          |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                               | 11                            | A  | 4  | 6  | 18 | 22 | 31 | 33 | 26 | 21 | 31 | 31 | 18 | 20 | 21 | 28 | 35 | 41 | 48 | 46 | 44 | 36 | 35 | 39                                                                                                                                     | 28.1          | 48.0          |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                               | A                             | 37 | 33 | 32 | 25 | 23 | 20 | 29 | 37 | 37 | 32 | 32 | 30 | 20 | 16 | 13 | 23 | 30 | 22 | 23 | 16 | 20 | 26 | A                                                                                                                                      | 26.1          | 37.2          |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                               | 38                            | 38 | 39 | 37 | 34 | 33 | 39 | 36 | 37 | 42 | 30 | 19 | 14 | 9  | 9  | 17 | 35 | 40 | 39 | 35 | 38 | 42 | A  | 35                                                                                                                                     | 31.9          | 42.3          |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                               | 37                            | 28 | 17 | 16 | 27 | 30 | 26 | 27 | 33 | 27 | 21 | 16 | 17 | 25 | 30 | 35 | 38 | 38 | 40 | 41 | 39 | A  | 31 | 33                                                                                                                                     | 29.2          | 40.9          |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                               | 31                            | 29 | 27 | 24 | 21 | 22 | 25 | 28 | 26 | 26 | 25 | 27 | 37 | 23 | 26 | 31 | 36 | 23 | 8  | 6  | A  | 5  | 5  | 4                                                                                                                                      | 22.4          | 37.0          |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                               | 3                             | 2  | 2  | 2  | 2  | 2  | 3  | 2  | 3  | 4  | 7  | 3  | 3  | 3  | 2  | 2  | 3  | 4  | 5  | A  | 16 | 8  | 6  | 6                                                                                                                                      | 4.1           | 16.5          |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                               | 7                             | 13 | 14 | 5  | 4  | 3  | 3  | 5  | 4  | 5  | 5  | 4  | 4  | 4  | 4  | 5  | 5  | 9  | A  | 5  | 4  | 3  | 3  | 4                                                                                                                                      | 5.3           | 14.0          |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                               | 6                             | 4  | 5  | 5  | 13 | 34 | 42 | 46 | 51 | 58 | 57 | 51 | 34 | 27 | 33 | 28 | 25 | A  | 21 | 18 | 7  | 6  | 4  | 2                                                                                                                                      | 25.1          | 57.7          |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                               | 4                             | 8  | 10 | 8  | 5  | 2  | 3  | 5  | 9  | 9  | 18 | 25 | 9  | 6  | 6  | 6  | A  | 5  | 8  | 9  | 10 | 12 | 6  | 8                                                                                                                                      | 8.3           | 25.1          |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                               | 5                             | 6  | 8  | 3  | 2  | 15 | 5  | 9  | 16 | 16 | 15 | 15 | 11 | 9  | 15 | A  | 15 | 16 | 23 | 25 | 19 | 19 | 20 | 18                                                                                                                                     | 13.1          | 25.4          |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                               | 26                            | 24 | 22 | 13 | 8  | 9  | 10 | 8  | 7  | 8  | 8  | 6  | 5  | 4  | A  | 6  | 8  | 9  | 8  | 8  | 6  | 7  | 5  | 4                                                                                                                                      | 9.4           | 25.9          |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                               | 4                             | 4  | 5  | 4  | 3  | 3  | 5  | 4  | 5  | 5  | 5  | 5  | 4  | A  | 5  | 7  | 8  | 8  | 7  | 10 | 16 | 18 | 19 | 21                                                                                                                                     | 7.7           | 21.4          |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                               | 16                            | 21 | 11 | 12 | 11 | 11 | 13 | 9  | 9  | 12 | 12 | 16 | A  | 10 | 8  | 9  | 14 | 20 | 23 | 23 | 15 | 15 | 18 | 19                                                                                                                                     | 14.2          | 22.8          |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                               | 19                            | 20 | 21 | 19 | 17 | 18 | 19 | 19 | 21 | 19 | 17 | A  | 21 | 19 | 18 | 25 | 30 | 27 | 25 | 33 | 35 | 37 | 34 | 26                                                                                                                                     | 23.5          | 36.6          |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                               | 25                            | 29 | 30 | 34 | 32 | 28 | 22 | 25 | 29 | 15 | A  | 9  | 5  | 5  | 4  | 4  | 3  | 4  | 4  | 4  | 3  | 2  | 2  | 2                                                                                                                                      | 13.9          | 34.0          |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                               | 2                             | 2  | 3  | 3  | 3  | 4  | 6  | 6  | 5  | A  | 5  | 4  | 4  | 5  | 5  | 5  | 6  | 6  | 4  | 3  | 3  | 3  | 3  | 3                                                                                                                                      | 4.0           | 6.3           |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                               | 5                             | 4  | 4  | 5  | 25 | 33 | 22 | 14 | A  | 19 | 17 | 17 | 13 | 11 | 16 | 29 | 25 | 30 | 35 | 37 | 30 | 19 | 11 | 11                                                                                                                                     | 18.8          | 36.7          |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                               | 18                            | 24 | 13 | 11 | 11 | 20 | 22 | A  | 11 | 13 | 11 | 7  | 5  | 5  | 5  | 4  | 4  | 5  | 4  | 3  | 3  | 7  | 6  | 3                                                                                                                                      | 9.2           | 23.8          |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                               | 4                             | 6  | 7  | 5  | 3  | 3  | A  | 5  | 4  | 9  | 9  | 7  | 9  | 3  | 4  | 4  | 5  | 4  | 3  | 3  | 6  | 6  | 7  | 5                                                                                                                                      | 5.2           | 9.4           |
| 13.8 15.1 14.1 12.9 12.1 13.8 16.2 16.4 17.5 17.3 16.2 14.6 12.2 10.8 11.5 13.1 16.4 16.6 16.4 16.4 15.7 13.7 12.5 11.9                                                                                                                                                                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                        |               |               |
| 38.0 38.0 38.7 37.4 34.3 34.0 41.9 45.7 51.5 57.7 57.0 50.8 37.0 26.6 33.0 35.4 38.3 41.4 48.0 46.4 43.5 41.5 35.2 39.0                                                                                                                                                                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                        |               |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                                                                                                                                                                                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb 24-hr 106 ppb                                                                                                                                                                                                                                                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |

## Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Henry Pirker - December 2016





# Hourly Maximums

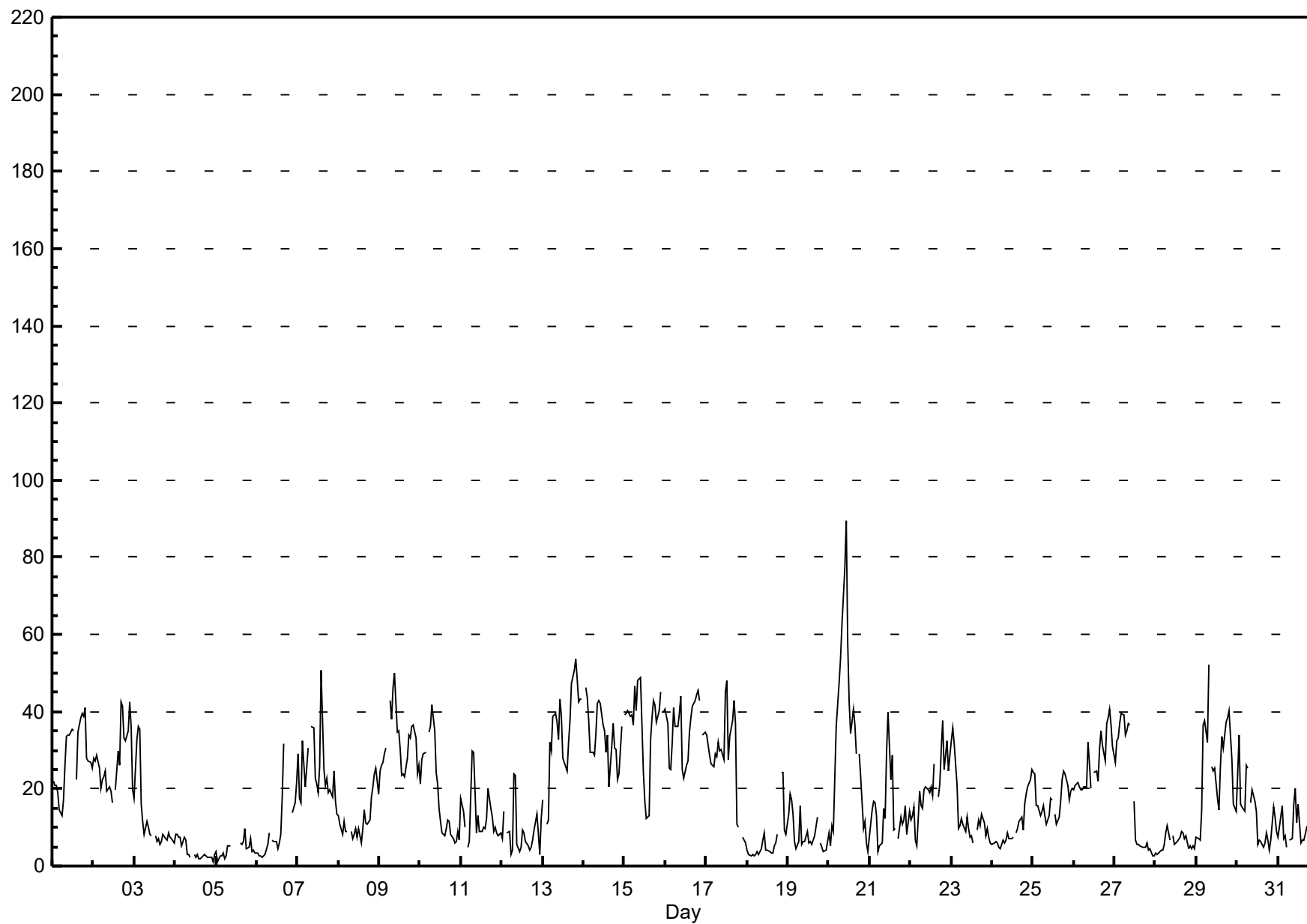
Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Henry Pirker - December 2016

| Maximum Value: 89.5 ppb on Dec 20 11:00                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 36.5 ppb on Dec 15                                                                                                                      |    |    |    |                 | Hours in Service: 744          |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|--------------------------------|---------------|
| Minimum Value: 1 ppb on Dec 4 23:00                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 3.9 ppb on Dec 4                                                                                                                        |    |    |    |                 | Hours of Data: 704             |               |
| Maximum Diurnal Average: 23.6 ppb at hour 10                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 14.8 ppb at hour 14                                                                                                                   |    |    |    |                 | Hours of Missing Data: 40      |               |
| Monthly Average: 19.05 ppb                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 2.1 P <sub>10</sub> = 4.6 Q <sub>1</sub> = 7.2 Median = 15.6 Q <sub>3</sub> = 29.4 P <sub>90</sub> = 38.3 P <sub>99</sub> = 51.7 |    |    |    |                 | Hours of Calibration: 36       |               |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |                 | Percent Operational Time: 99.5 |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |                 | Daily Average                  | Daily Maximum |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                             | 21 | 22 | 23 | 24              |                                |               |
| 1-Dec                                                                                                                   | 22                            | 21 | 21 | 19 | 14 | 13 | 17 | 26 | 33 | 34 | 34 | 35 | 35 | A  | 22 | 35 | 38 | 39 | 39 | 41                                                                                                                                                             | 28 | 27 | 27 | 25              | 28.1                           | 41.1          |
| 2-Dec                                                                                                                   | 28                            | 27 | 29 | 25 | 20 | 22 | 23 | 25 | 19 | 20 | 19 | 16 | A  | 20 | 30 | 26 | 42 | 42 | 33 | 32                                                                                                                                                             | 35 | 42 | 36 | 20              | 27.6                           | 42.4          |
| 3-Dec                                                                                                                   | 18                            | 33 | 36 | 35 | 16 | 11 | 8  | 11 | 10 | 8  | 8  | A  | 8  | 6  | 7  | 5  | 6  | 8  | 7  | 7                                                                                                                                                              | 8  | 7  | 7  | 6               | 12.1                           | 36.3          |
| 4-Dec                                                                                                                   | 8                             | 8  | 8  | 7  | 5  | 7  | 7  | 3  | 3  | 2  | A  | 3  | 2  | 3  | 2  | 2  | 3  | 3  | 3  | 2                                                                                                                                                              | 2  | 2  | 1  | 3               | 3.9                            | 8.2           |
| 5-Dec                                                                                                                   | 4                             | 1  | 3  | 3  | 3  | 2  | 3  | 5  | 5  | A  | C  | C  | C  | C  | 6  | 6  | 6  | 10 | 5  | 5                                                                                                                                                              | 7  | 4  | 4  | 3               | 4.4                            | 9.9           |
| 6-Dec                                                                                                                   | 3                             | 3  | 3  | 2  | 3  | 3  | 6  | 9  | A  | 7  | 6  | 6  | 4  | 6  | 8  | 18 | 32 | P  | P  | P                                                                                                                                                              | P  | 14 | 16 | 21              | 8.9                            | 31.8          |
| 7-Dec                                                                                                                   | 29                            | 18 | 16 | 33 | 21 | 25 | 31 | A  | 36 | 36 | 23 | 21 | 19 | 26 | 51 | 25 | 21 | 23 | 19 | 20                                                                                                                                                             | 18 | 25 | 17 | 13              | 24.5                           | 50.9          |
| 8-Dec                                                                                                                   | 13                            | 11 | 8  | 12 | 9  | 9  | A  | 9  | 7  | 8  | 10 | 7  | 10 | 6  | 10 | 14 | 11 | 11 | 12 | 18                                                                                                                                                             | 21 | 24 | 26 | 19              | 12.3                           | 25.5          |
| 9-Dec                                                                                                                   | 25                            | 26 | 27 | 29 | 31 | A  | 43 | 38 | 46 | 50 | 35 | 35 | 30 | 23 | 24 | 23 | 28 | 34 | 33 | 36                                                                                                                                                             | 36 | 33 | 24 | 26              | 32.0                           | 50.1          |
| 10-Dec                                                                                                                  | 21                            | 27 | 29 | 29 | A  | 34 | 36 | 42 | 35 | 24 | 21 | 15 | 12 | 9  | 8  | 10 | 12 | 12 | 8  | 7                                                                                                                                                              | 6  | 6  | 9  | 7               | 18.2                           | 41.9          |
| 11-Dec                                                                                                                  | 18                            | 14 | 10 | A  | 5  | 6  | 30 | 29 | 20 | 9  | 13 | 9  | 9  | 10 | 10 | 12 | 20 | 15 | 13 | 9                                                                                                                                                              | 10 | 8  | 8  | 9               | 12.8                           | 29.8          |
| 12-Dec                                                                                                                  | 7                             | 14 | A  | 9  | 9  | 3  | 4  | 24 | 23 | 6  | 4  | 5  | 9  | 9  | 6  | 5  | 4  | 5  | 7  | 9                                                                                                                                                              | 13 | 8  | 3  | 12              | 8.7                            | 24.0          |
| 13-Dec                                                                                                                  | 17                            | A  | 11 | 12 | 32 | 30 | 39 | 39 | 37 | 33 | 43 | 39 | 28 | 26 | 25 | 32 | 38 | 47 | 51 | 54                                                                                                                                                             | 48 | 42 | 43 | 43              | 35.2                           | 53.5          |
| 14-Dec                                                                                                                  | A                             | 46 | 44 | 38 | 29 | 29 | 29 | 34 | 42 | 43 | 42 | 36 | 35 | 29 | 34 | 21 | 31 | 37 | 31 | 30                                                                                                                                                             | 22 | 24 | 36 | A               | 33.8                           | 46.2          |
| 15-Dec                                                                                                                  | 39                            | 39 | 40 | 39 | 39 | 37 | 47 | 40 | 48 | 49 | 37 | 24 | 17 | 12 | 13 | 33 | 38 | 43 | 42 | 37                                                                                                                                                             | 40 | 45 | A  | 40              | 36.5                           | 48.7          |
| 16-Dec                                                                                                                  | 41                            | 37 | 25 | 25 | 32 | 41 | 36 | 36 | 40 | 44 | 25 | 23 | 26 | 27 | 35 | 38 | 42 | 43 | 44 | 46                                                                                                                                                             | 43 | A  | 34 | 35              | 35.5                           | 45.6          |
| 17-Dec                                                                                                                  | 34                            | 31 | 29 | 27 | 26 | 29 | 28 | 32 | 30 | 30 | 27 | 45 | 48 | 27 | 34 | 38 | 43 | 37 | 11 | 10                                                                                                                                                             | A  | 7  | 7  | 6               | 27.6                           | 48.2          |
| 18-Dec                                                                                                                  | 4                             | 3  | 3  | 3  | 3  | 3  | 4  | 3  | 5  | 7  | 9  | 4  | 4  | 4  | 3  | 4  | 5  | 6  | 8  | A                                                                                                                                                              | 24 | 24 | 9  | 8               | 6.5                            | 24.3          |
| 19-Dec                                                                                                                  | 13                            | 19 | 17 | 14 | 6  | 5  | 6  | 16 | 6  | 6  | 6  | 9  | 6  | 6  | 6  | 7  | 8  | 13 | A  | 6                                                                                                                                                              | 5  | 4  | 4  | 6               | 8.4                            | 18.8          |
| 20-Dec                                                                                                                  | 9                             | 5  | 11 | 9  | 36 | 42 | 47 | 54 | 63 | 77 | 89 | 58 | 43 | 34 | 41 | 37 | 29 | A  | 29 | 23                                                                                                                                                             | 10 | 11 | 6  | 4               | 33.3                           | 89.5          |
| 21-Dec                                                                                                                  | 8                             | 15 | 17 | 16 | 13 | 4  | 5  | 6  | 15 | 12 | 29 | 40 | 22 | 29 | 9  | 10 | A  | 7  | 13 | 11                                                                                                                                                             | 12 | 16 | 8  | 14              | 14.4                           | 39.8          |
| 22-Dec                                                                                                                  | 12                            | 13 | 15 | 7  | 5  | 19 | 15 | 15 | 20 | 21 | 20 | 19 | 20 | 18 | 27 | A  | 18 | 21 | 30 | 38                                                                                                                                                             | 25 | 33 | 25 | 29              | 20.2                           | 37.6          |
| 23-Dec                                                                                                                  | 32                            | 36 | 32 | 21 | 10 | 11 | 12 | 11 | 9  | 13 | 10 | 8  | 8  | 6  | A  | 9  | 12 | 11 | 13 | 11                                                                                                                                                             | 8  | 10 | 7  | 6               | 13.3                           | 35.7          |
| 24-Dec                                                                                                                  | 6                             | 6  | 6  | 6  | 5  | 4  | 7  | 6  | 7  | 9  | 7  | 7  | 8  | A  | 8  | 10 | 12 | 13 | 9  | 16                                                                                                                                                             | 19 | 21 | 22 | 25              | 10.4                           | 25.2          |
| 25-Dec                                                                                                                  | 24                            | 24 | 16 | 15 | 13 | 14 | 16 | 13 | 11 | 13 | 17 | 17 | A  | 13 | 11 | 13 | 17 | 22 | 24 | 24                                                                                                                                                             | 21 | 17 | 19 | 20              | 17.2                           | 24.5          |
| 26-Dec                                                                                                                  | 20                            | 21 | 22 | 21 | 20 | 20 | 20 | 21 | 32 | 27 | 20 | A  | 24 | 25 | 22 | 30 | 35 | 31 | 27 | 37                                                                                                                                                             | 38 | 41 | 36 | 31              | 27.0                           | 40.7          |
| 27-Dec                                                                                                                  | 27                            | 32 | 33 | 37 | 40 | 39 | 34 | 35 | 37 | 37 | A  | 17 | 7  | 6  | 6  | 5  | 5  | 5  | 5  | 6                                                                                                                                                              | 4  | 4  | 3  | 3               | 18.5                           | 39.7          |
| 28-Dec                                                                                                                  | 3                             | 3  | 3  | 4  | 4  | 6  | 8  | 11 | 7  | A  | 8  | 5  | 6  | 7  | 8  | 9  | 9  | 7  | 8  | 4                                                                                                                                                              | 5  | 4  | 5  | 5               | 6.1                            | 10.6          |
| 29-Dec                                                                                                                  | 7                             | 7  | 7  | 15 | 36 | 38 | 32 | 52 | A  | 26 | 25 | 26 | 17 | 14 | 26 | 34 | 31 | 37 | 39 | 40                                                                                                                                                             | 34 | 28 | 16 | 14              | 26.1                           | 52.3          |
| 30-Dec                                                                                                                  | 24                            | 34 | 16 | 15 | 14 | 26 | 25 | A  | 16 | 20 | 17 | 14 | 6  | 7  | 6  | 5  | 6  | 9  | 7  | 4                                                                                                                                                              | 7  | 15 | 13 | 9               | 13.7                           | 34.1          |
| 31-Dec                                                                                                                  | 8                             | 10 | 16 | 7  | 8  | 5  | A  | 7  | 7  | 16 | 20 | 11 | 16 | 6  | 7  | 7  | 8  | 10 | 10 | 9                                                                                                                                                              | 11 | 10 | 11 | 7               | 9.9                            | 20.1          |
| 17.4 19.5 18.4 17.8 16.9 17.9 21.3 22.5 23.1 23.6 22.3 19.8 17.1 14.8 16.7 17.3 20.3 20.7 20.0 20.4 19.4 18.6 16.1 15.7 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    | Diurnal Average |                                |               |
| 40.7 46.2 43.7 38.7 39.7 41.8 47.4 53.7 62.6 77.2 89.5 57.9 48.2 34.3 50.9 38.3 42.9 47.4 50.8 53.5 48.4 45.1 43.4 43.3 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    | Diurnal Maximum |                                |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |                 |                                |               |

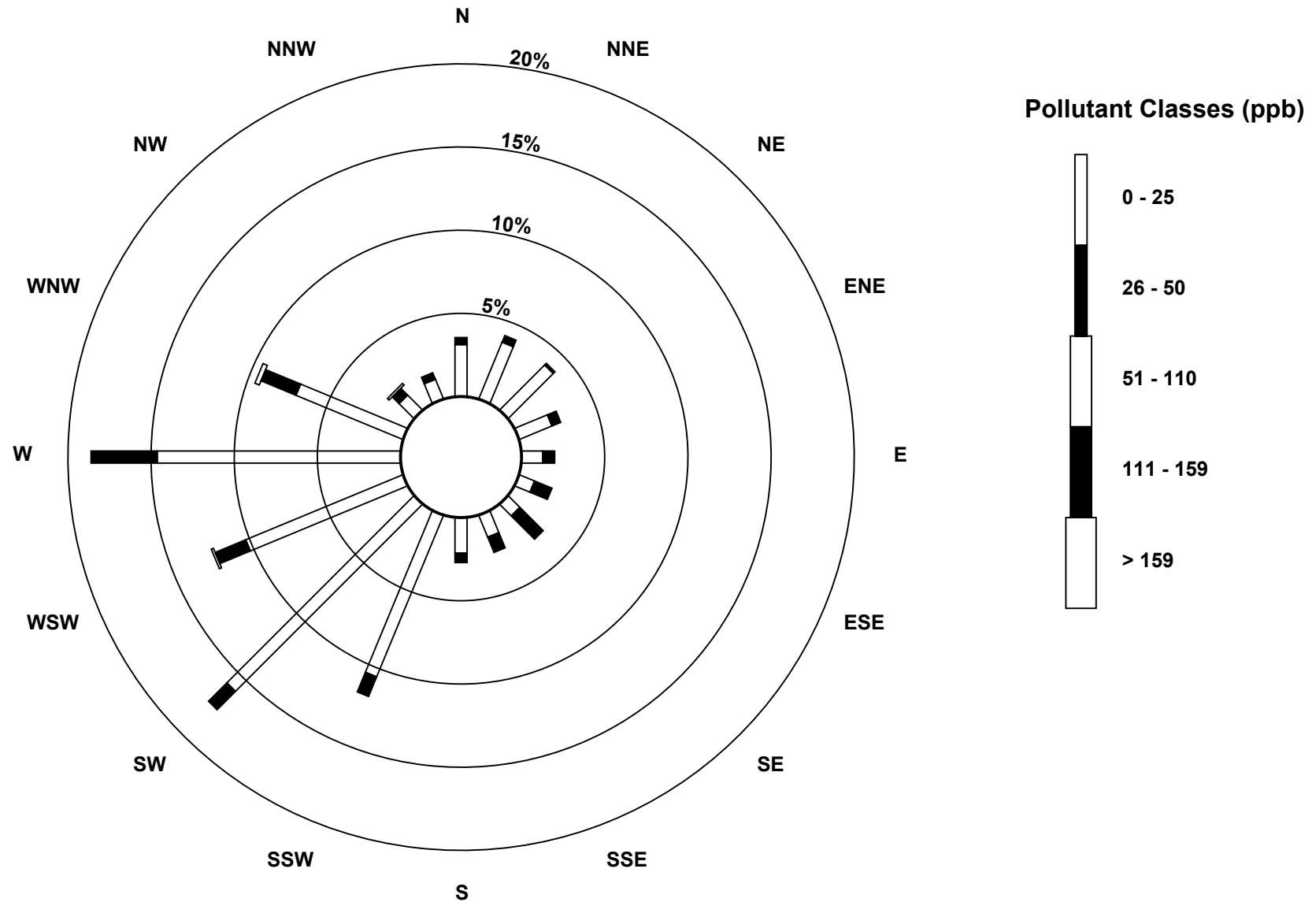
## Hourly Maximums

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Henry Pirker - December 2016**



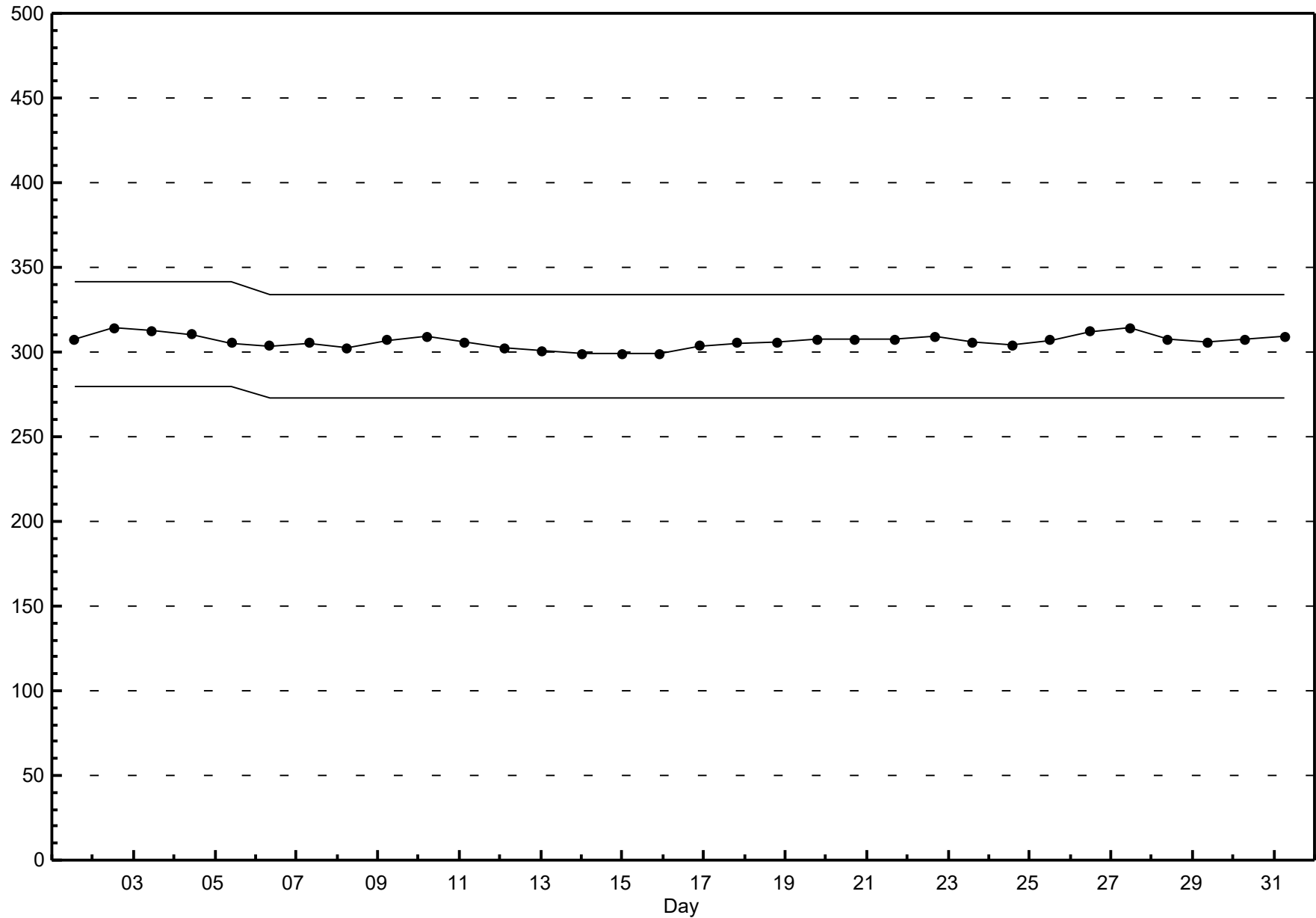
# Pollutant Rose

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Henry Pirker - December 2016



## Span Responses

**Nitrogen Dioxide (NO<sub>2</sub>)**  
**Henry Pirker - December 2016**



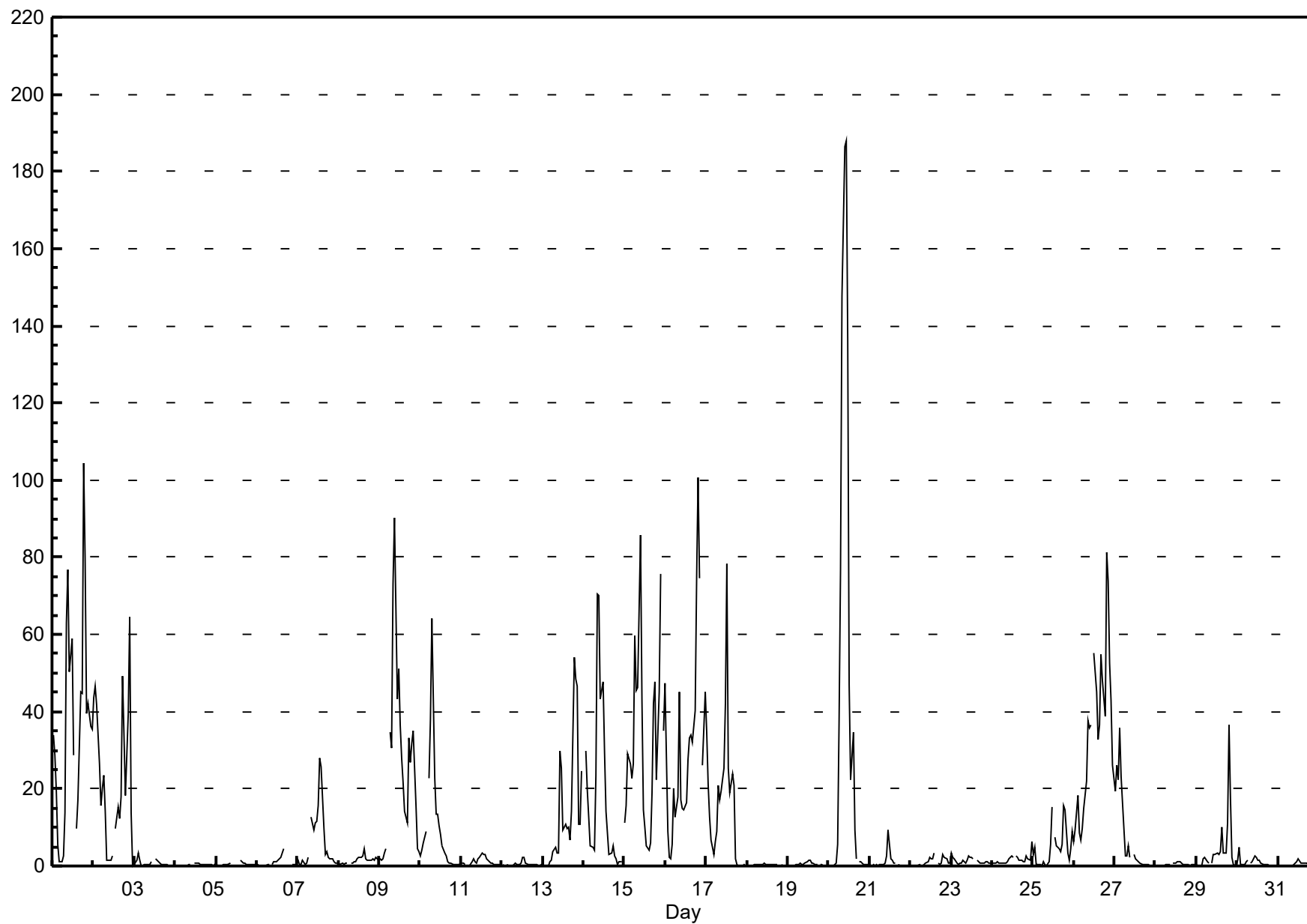
# Hourly Averages

**Nitrogen Oxide (NO) - ppb**  
**Henry Pirker - December 2016**

| Maximum Value: 188.1 ppb on Dec 20 11:00                                                                                      |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    | Maximum Daily Average: 39.1 ppb on Dec 20                                                                                                                    |    |    |    |    |                 |               |       |  |  | Hours in Service: 744     |  |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|-------------------|----|----|----|-------------------------------|-----|-----|-----|-----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|-------|--|--|---------------------------|--|
| Minimum Value: 0 ppb on Dec 22 05:00                                                                                          |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    | Minimum Daily Average: 0.3 ppb on Dec 18                                                                                                                     |    |    |    |    |                 |               |       |  |  | Hours of Data: 704        |  |
| Maximum Diurnal Average: 21.5 ppb at hour 10                                                                                  |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    | Minimum Diurnal Average: 3.2 ppb at hour 5                                                                                                                   |    |    |    |    |                 |               |       |  |  | Hours of Missing Data: 40 |  |
| Monthly Average: 10.31 ppb                                                                                                    |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.3 Median = 1.3 Q <sub>3</sub> = 9.9 P <sub>90</sub> = 35.6 P <sub>99</sub> = 84.7 |    |    |    |    |                 |               |       |  |  | Hours of Calibration: 36  |  |
|                                                                                                                               |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    | Percent Operational Time: 99.5                                                                                                                               |    |    |    |    |                 |               |       |  |  |                           |  |
| Day                                                                                                                           | Hourly Period Ending At (MST) |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Daily Average   | Daily Maximum |       |  |  |                           |  |
|                                                                                                                               | 1                             | 2  | 3  | 4                 | 5  | 6  | 7  | 8                             | 9   | 10  | 11  | 12  | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                           | 21 | 22 | 23 | 24 |                 |               |       |  |  |                           |  |
| 1-Dec                                                                                                                         | 34                            | 29 | 20 | 6                 | 1  | 1  | 2  | 14                            | 63  | 77  | 50  | 59  | 29 | A  | 10 | 15 | 17 | 45 | 45 | 104                                                                                                                                                          | 80 | 40 | 42 | 36 | 35              | 36.5          | 104.5 |  |  |                           |  |
| 2-Dec                                                                                                                         | 44                            | 47 | 42 | 26                | 15 | 20 | 23 | 14                            | 1   | 2   | 2   | 2   | A  | 10 | 15 | 12 | 18 | 49 | 34 | 18                                                                                                                                                           | 39 | 64 | 14 | 0  | 0               | 22.3          | 64.5  |  |  |                           |  |
| 3-Dec                                                                                                                         | 0                             | 2  | 3  | 2                 | 0  | 0  | 0  | 0                             | 0   | 0   | 1   | A   | 2  | 2  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0               | 0.7           | 3.3   |  |  |                           |  |
| 4-Dec                                                                                                                         | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | 0   | 0   | A   | 1   | 1  | 1  | 1  | 0  | 1  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.8   |  |  |                           |  |
| 5-Dec                                                                                                                         | 1                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | 1   | A   | C   | C   | C  | C  | 1  | 1  | 1  | 1  | 1  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0               | 0.5           | 1.3   |  |  |                           |  |
| 6-Dec                                                                                                                         | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | A   | 1   | 1   | 1   | 2  | 2  | 2  | 4  | 4  | P  | P  | P                                                                                                                                                            | P  | 0  | 0  | 0  | 0               | 1.0           | 4.3   |  |  |                           |  |
| 7-Dec                                                                                                                         | 1                             | 0  | 0  | 2                 | 0  | 1  | 2  | A                             | 13  | 9   | 11  | 12  | 16 | 28 | 26 | 10 | 3  | 4  | 2  | 2                                                                                                                                                            | 2  | 1  | 1  | 1  | 1               | 6.4           | 27.8  |  |  |                           |  |
| 8-Dec                                                                                                                         | 1                             | 0  | 1  | 0                 | 1  | 1  | A  | 1                             | 1   | 1   | 1   | 2   | 2  | 2  | 3  | 4  | 2  | 2  | 1  | 1                                                                                                                                                            | 2  | 2  | 2  | 1  | 1.5             | 4.5           |       |  |  |                           |  |
| 9-Dec                                                                                                                         | 2                             | 1  | 2  | 4                 | 5  | A  | 35 | 30                            | 73  | 90  | 43  | 51  | 36 | 28 | 22 | 14 | 11 | 33 | 27 | 32                                                                                                                                                           | 35 | 15 | 4  | 4  | 26.0            | 90.3          |       |  |  |                           |  |
| 10-Dec                                                                                                                        | 3                             | 4  | 6  | 9                 | A  | 23 | 38 | 64                            | 23  | 14  | 13  | 10  | 8  | 5  | 3  | 2  | 1  | 1  | 1  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 10.0            | 64.3          |       |  |  |                           |  |
| 11-Dec                                                                                                                        | 1                             | 1  | 0  | A                 | 0  | 0  | 1  | 2                             | 1   | 1   | 2   | 2   | 3  | 3  | 3  | 2  | 2  | 1  | 1  | 1                                                                                                                                                            | 0  | 0  | 0  | 0  | 1.2             | 3.5           |       |  |  |                           |  |
| 12-Dec                                                                                                                        | 0                             | 0  | A  | 0                 | 0  | 0  | 0  | 0                             | 1   | 0   | 0   | 1   | 2  | 2  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.5             | 2.4           |       |  |  |                           |  |
| 13-Dec                                                                                                                        | 0                             | A  | 0  | 0                 | 1  | 1  | 4  | 5                             | 3   | 3   | 30  | 25  | 9  | 11 | 10 | 10 | 7  | 14 | 54 | 48                                                                                                                                                           | 47 | 11 | 11 | 25 | 14.3            | 54.2          |       |  |  |                           |  |
| 14-Dec                                                                                                                        | A                             | 30 | 20 | 13                | 5  | 5  | 4  | 24                            | 70  | 70  | 43  | 48  | 29 | 14 | 9  | 3  | 3  | 5  | 3  | 2                                                                                                                                                            | 0  | 1  | 1  | A  | 18.3            | 70.4          |       |  |  |                           |  |
| 15-Dec                                                                                                                        | 11                            | 16 | 29 | 26                | 23 | 26 | 60 | 45                            | 46  | 86  | 43  | 15  | 10 | 5  | 4  | 6  | 19 | 42 | 48 | 23                                                                                                                                                           | 45 | 76 | A  | 35 | 32.1            | 85.8          |       |  |  |                           |  |
| 16-Dec                                                                                                                        | 47                            | 9  | 2  | 2                 | 6  | 20 | 13 | 18                            | 45  | 17  | 15  | 14  | 16 | 28 | 33 | 34 | 32 | 40 | 75 | 101                                                                                                                                                          | 74 | A  | 26 | 45 | 30.9            | 100.8         |       |  |  |                           |  |
| 17-Dec                                                                                                                        | 35                            | 21 | 12 | 7                 | 3  | 6  | 9  | 21                            | 17  | 19  | 25  | 42  | 78 | 25 | 19 | 24 | 21 | 2  | 0  | 0                                                                                                                                                            | A  | 0  | 0  | 0  | 16.9            | 78.5          |       |  |  |                           |  |
| 18-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | 0   | 0   | 1   | 0   | 1  | 1  | 1  | 0  | 0  | 0  | 0  | A                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.3             | 0.6           |       |  |  |                           |  |
| 19-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 1                             | 0   | 0   | 1   | 1   | 1  | 1  | 1  | 1  | 0  | 0  | A  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.5             | 1.3           |       |  |  |                           |  |
| 20-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 1  | 6  | 38 | 77                            | 148 | 186 | 188 | 136 | 47 | 23 | 35 | 9  | 2  | A  | 1  | 1                                                                                                                                                            | 0  | 0  | 0  | 0  | 39.1            | 188.1         |       |  |  |                           |  |
| 21-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | 0   | 1   | 3   | 9   | 2  | 1  | 1  | 1  | A  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.9             | 9.2           |       |  |  |                           |  |
| 22-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | 0   | 1   | 1   | 2   | 2  | 2  | 3  | A  | 1  | 0  | 1  | 3                                                                                                                                                            | 2  | 2  | 1  | 1  | 1.0             | 3.3           |       |  |  |                           |  |
| 23-Dec                                                                                                                        | 3                             | 2  | 2  | 1                 | 1  | 1  | 1  | 1                             | 1   | 2   | 3   | 2   | 2  | 2  | A  | 2  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.4             | 3.3           |       |  |  |                           |  |
| 24-Dec                                                                                                                        | 1                             | 1  | 1  | 1                 | 1  | 1  | 1  | 1                             | 1   | 1   | 2   | 3   | 2  | A  | 3  | 2  | 2  | 1  | 1  | 1                                                                                                                                                            | 3  | 2  | 1  | 6  | 1.7             | 6.3           |       |  |  |                           |  |
| 25-Dec                                                                                                                        | 3                             | 5  | 0  | 1                 | 0  | 0  | 1  | 0                             | 0   | 1   | 6   | 15  | A  | 7  | 5  | 4  | 4  | 6  | 16 | 15                                                                                                                                                           | 3  | 2  | 4  | 9  | 4.7             | 15.6          |       |  |  |                           |  |
| 26-Dec                                                                                                                        | 6                             | 9  | 18 | 9                 | 7  | 10 | 15 | 22                            | 38  | 36  | 37  | A   | 55 | 45 | 33 | 37 | 55 | 48 | 39 | 81                                                                                                                                                           | 74 | 52 | 43 | 26 | 34.5            | 81.4          |       |  |  |                           |  |
| 27-Dec                                                                                                                        | 19                            | 26 | 23 | 36                | 23 | 9  | 3  | 2                             | 5   | 2   | A   | 3   | 2  | 2  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 6.9             | 35.9          |       |  |  |                           |  |
| 28-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 0  | 0  | 0  | 0                             | 0   | A   | 1   | 1   | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.4             | 1.1           |       |  |  |                           |  |
| 29-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 2  | 2  | 1  | 1                             | A   | 1   | 3   | 3   | 3  | 3  | 4  | 10 | 3  | 3  | 11 | 36                                                                                                                                                           | 18 | 2  | 0  | 0  | 4.7             | 36.4          |       |  |  |                           |  |
| 30-Dec                                                                                                                        | 1                             | 5  | 0  | 0                 | 0  | 1  | 2  | A                             | 1   | 1   | 3   | 2   | 2  | 1  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 1.0             | 4.9           |       |  |  |                           |  |
| 31-Dec                                                                                                                        | 0                             | 0  | 0  | 0                 | 0  | 0  | A  | 0                             | 0   | 0   | 1   | 1   | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 0                                                                                                                                                            | 0  | 0  | 1  | 0  | 0.5             | 1.8           |       |  |  |                           |  |
| 7.2 7.0 6.1 4.8 3.2 4.5 8.7 11.9 19.1 21.5 18.9 16.6 13.1 9.1 8.3 7.1 8.0 10.4 14.6 15.5 13.4 9.2 5.0 6.4                     |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Average |               |       |  |  |                           |  |
| 47.4 46.7 41.9 35.9 23.2 26.5 59.7 76.9 147.7 186.4 188.1 136.4 78.5 45.2 34.6 36.6 54.9 49.2 104.5 100.8 74.5 75.8 42.9 45.2 |                               |    |    |                   |    |    |    |                               |     |     |     |     |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Maximum |               |       |  |  |                           |  |
| C - Calibration                                                                                                               |                               |    |    | P - Power Failure |    |    |    | A - Automated Daily Zero Span |     |     |     |     |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                 |               |       |  |  |                           |  |

## Hourly Averages

Nitrogen Oxide (NO) - ppb  
Henry Pirker - December 2016



# Hourly Maximums

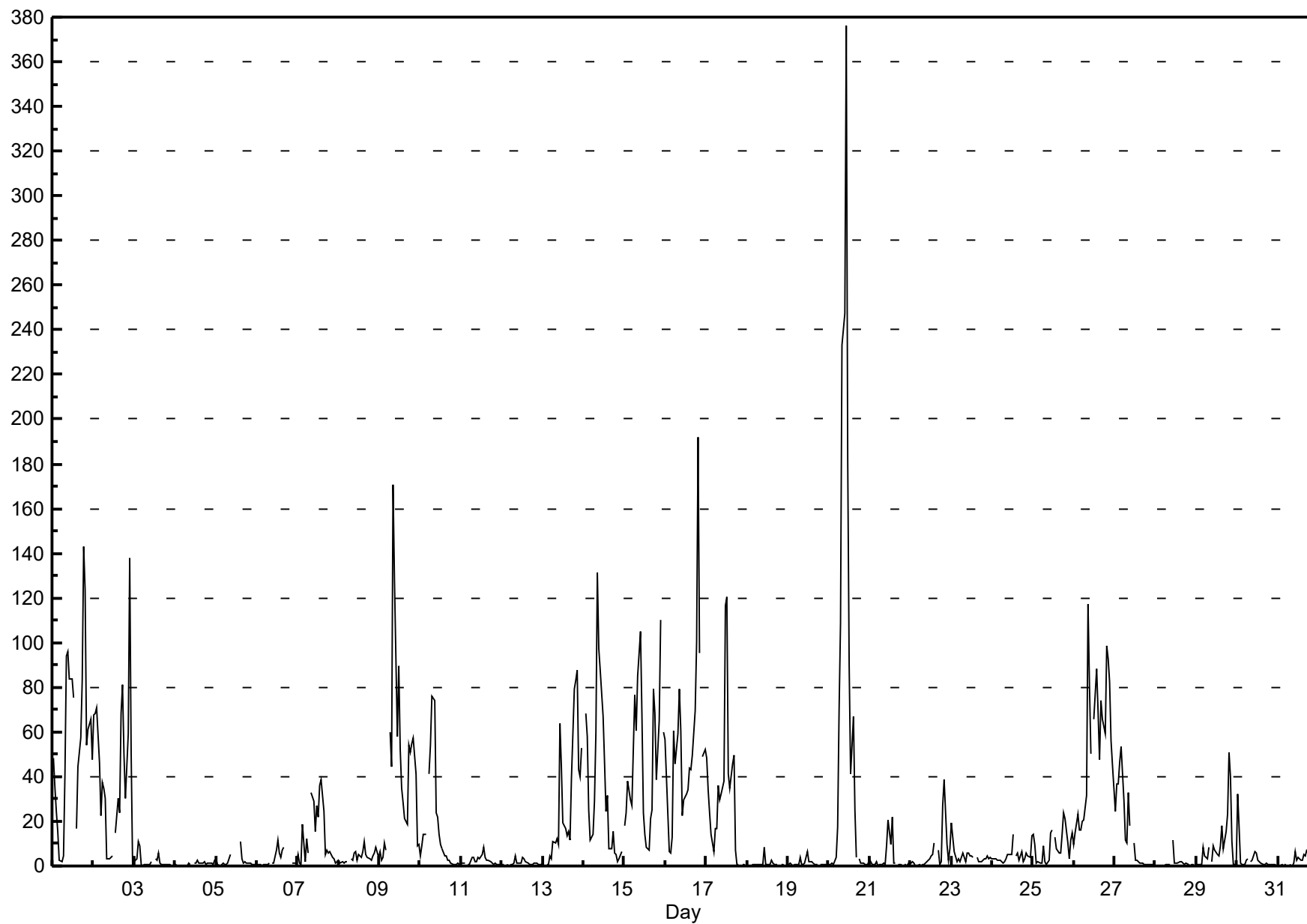
Nitrogen Oxide (NO) - ppb

Henry Pirker - December 2016

| Maximum Value: 375.9 ppb on Dec 20 11:00    |                               |                   |      |      |      |      |                               |       |       |       |       |       |       |      |      |      |      |      |       | Maximum Daily Average: 64.2 ppb on Dec 20                                                                                                                      |      |       |      |      |                 |               |  |  |  | Hours in Service: 744          |  |
|---------------------------------------------|-------------------------------|-------------------|------|------|------|------|-------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|-----------------|---------------|--|--|--|--------------------------------|--|
| Minimum Value: 0 ppb on Dec 21 21:00        |                               |                   |      |      |      |      |                               |       |       |       |       |       |       |      |      |      |      |      |       | Minimum Daily Average: 1.0 ppb on Dec 18                                                                                                                       |      |       |      |      |                 |               |  |  |  | Hours of Data: 704             |  |
| Maximum Diurnal Average: 38.7 ppb at hour 9 |                               |                   |      |      |      |      |                               |       |       |       |       |       |       |      |      |      |      |      |       | Minimum Diurnal Average: 6.5 ppb at hour 5                                                                                                                     |      |       |      |      |                 |               |  |  |  | Hours of Missing Data: 40      |  |
| Monthly Average: 18.34 ppb                  |                               |                   |      |      |      |      |                               |       |       |       |       |       |       |      |      |      |      |      |       | Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.9 Median = 3.6 Q <sub>3</sub> = 21.9 P <sub>90</sub> = 59.4 P <sub>99</sub> = 128.3 |      |       |      |      |                 |               |  |  |  | Hours of Calibration: 36       |  |
|                                             |                               |                   |      |      |      |      |                               |       |       |       |       |       |       |      |      |      |      |      |       |                                                                                                                                                                |      |       |      |      |                 |               |  |  |  | Percent Operational Time: 99.5 |  |
| Day                                         | Hourly Period Ending At (MST) |                   |      |      |      |      |                               |       |       |       |       |       |       |      |      |      |      |      |       |                                                                                                                                                                |      |       |      |      | Daily Average   | Daily Maximum |  |  |  |                                |  |
| 1-Dec                                       | 48                            | 35                | 25   | 16   | 3    | 2    | 4                             | 41    | 94    | 96    | 83    | 84    | 75    | A    | 17   | 44   | 57   | 83   | 143   | 124                                                                                                                                                            | 54   | 61    | 65   | 47   | 56.6            | 143.1         |  |  |  |                                |  |
| 2-Dec                                       | 68                            | 68                | 71   | 47   | 23   | 37   | 35                            | 30    | 3     | 3     | 4     | 5     | A     | 15   | 30   | 24   | 69   | 81   | 50    | 30                                                                                                                                                             | 59   | 138   | 51   | 1    | 40.9            | 137.9         |  |  |  |                                |  |
| 3-Dec                                       | 2                             | 3                 | 11   | 9    | 1    | 0    | 0                             | 0     | 0     | 1     | 2     | A     | 3     | 2    | 6    | 1    | 1    | 1    | 1     | 0                                                                                                                                                              | 0    | 1     | 0    | 0    | 2.0             | 11.0          |  |  |  |                                |  |
| 4-Dec                                       | 1                             | 0                 | 0    | 0    | 0    | 0    | 0                             | 0     | 1     | 1     | A     | 1     | 1     | 2    | 1    | 1    | 1    | 2    | 1     | 1                                                                                                                                                              | 1    | 1     | 0    | 2    | 1.0             | 2.4           |  |  |  |                                |  |
| 5-Dec                                       | 3                             | 0                 | 0    | 0    | 1    | 1    | 1                             | 1     | 5     | A     | C     | C     | C     | C    | 11   | 4    | 1    | 2    | 1     | 1                                                                                                                                                              | 1    | 1     | 1    | 0    | 1.9             | 10.8          |  |  |  |                                |  |
| 6-Dec                                       | 1                             | 1                 | 0    | 0    | 0    | 0    | 1                             | 1     | A     | 1     | 2     | 7     | 12    | 6    | 4    | 7    | 9    | P    | P     | P                                                                                                                                                              | P    | 2     | 1    | 1    | 2.9             | 11.7          |  |  |  |                                |  |
| 7-Dec                                       | 5                             | 1                 | 1    | 19   | 2    | 12   | 6                             | A     | 33    | 29    | 15    | 27    | 22    | 36   | 39   | 25   | 5    | 7    | 6     | 7                                                                                                                                                              | 4    | 3     | 2    | 2    | 13.3            | 38.6          |  |  |  |                                |  |
| 8-Dec                                       | 3                             | 1                 | 2    | 2    | 2    | 2    | A                             | 3     | 3     | 6     | 6     | 3     | 5     | 4    | 7    | 11   | 5    | 4    | 3     | 3                                                                                                                                                              | 4    | 6     | 8    | 4    | 4.2             | 11.0          |  |  |  |                                |  |
| 9-Dec                                       | 6                             | 3                 | 4    | 11   | 7    | A    | 60                            | 44    | 170   | 128   | 58    | 90    | 52    | 35   | 28   | 21   | 19   | 54   | 51    | 55                                                                                                                                                             | 57   | 41    | 9    | 10   | 44.1            | 170.4         |  |  |  |                                |  |
| 10-Dec                                      | 4                             | 9                 | 14   | 14   | A    | 41   | 54                            | 76    | 74    | 24    | 22    | 14    | 10    | 8    | 4    | 4    | 3    | 2    | 1     | 1                                                                                                                                                              | 1    | 1     | 1    | 1    | 16.7            | 75.7          |  |  |  |                                |  |
| 11-Dec                                      | 2                             | 1                 | 1    | A    | 0    | 1    | 4                             | 4     | 2     | 2     | 4     | 3     | 5     | 8    | 4    | 3    | 2    | 2    | 1     | 1                                                                                                                                                              | 1    | 1     | 1    | 0    | 2.3             | 8.2           |  |  |  |                                |  |
| 12-Dec                                      | 1                             | 1                 | A    | 0    | 0    | 1    | 0                             | 1     | 4     | 1     | 1     | 2     | 4     | 3    | 2    | 1    | 1    | 1    | 1     | 2                                                                                                                                                              | 1    | 0     | 0    | 1    | 1.2             | 4.5           |  |  |  |                                |  |
| 13-Dec                                      | 2                             | A                 | 0    | 0    | 4    | 3    | 11                            | 10    | 12    | 10    | 64    | 45    | 19    | 17   | 13   | 16   | 12   | 39   | 79    | 83                                                                                                                                                             | 88   | 43    | 40   | 53   | 28.9            | 87.7          |  |  |  |                                |  |
| 14-Dec                                      | A                             | 68                | 58   | 25   | 11   | 14   | 29                            | 60    | 131   | 97    | 88    | 67    | 46    | 24   | 32   | 8    | 8    | 16   | 6     | 5                                                                                                                                                              | 2    | 3     | 6    | A    | 36.5            | 131.2         |  |  |  |                                |  |
| 15-Dec                                      | 18                            | 24                | 38   | 30   | 27   | 52   | 77                            | 61    | 85    | 105   | 67    | 24    | 14    | 8    | 7    | 21   | 25   | 79   | 68    | 39                                                                                                                                                             | 65   | 110   | A    | 60   | 48.0            | 110.2         |  |  |  |                                |  |
| 16-Dec                                      | 57                            | 23                | 6    | 6    | 13   | 61   | 46                            | 60    | 79    | 61    | 23    | 30    | 33    | 34   | 44   | 43   | 50   | 70   | 101   | 192                                                                                                                                                            | 95   | A     | 49   | 52   | 53.3            | 192.2         |  |  |  |                                |  |
| 17-Dec                                      | 48                            | 34                | 24   | 14   | 6    | 17   | 17                            | 36    | 30    | 32    | 38    | 116   | 120   | 41   | 35   | 46   | 50   | 7    | 1     | 1                                                                                                                                                              | A    | 0     | 0    | 0    | 31.0            | 120.3         |  |  |  |                                |  |
| 18-Dec                                      | 1                             | 0                 | 0    | 0    | 0    | 0    | 0                             | 1     | 1     | 0     | 8     | 1     | 1     | 1    | 3    | 1    | 1    | 0    | 1     | A                                                                                                                                                              | 0    | 1     | 0    | 0    | 1.0             | 8.5           |  |  |  |                                |  |
| 19-Dec                                      | 1                             | 1                 | 1    | 0    | 0    | 0    | 1                             | 4     | 1     | 1     | 1     | 6     | 2     | 2    | 2    | 2    | 1    | 1    | A     | 1                                                                                                                                                              | 0    | 0     | 0    | 0    | 1.2             | 6.2           |  |  |  |                                |  |
| 20-Dec                                      | 0                             | 0                 | 1    | 1    | 4    | 18   | 69                            | 109   | 233   | 247   | 376   | 181   | 90    | 41   | 67   | 25   | 4    | A    | 3     | 2                                                                                                                                                              | 1    | 0     | 1    | 0    | 64.2            | 375.9         |  |  |  |                                |  |
| 21-Dec                                      | 3                             | 1                 | 1    | 0    | 2    | 0    | 0                             | 1     | 1     | 1     | 9     | 21    | 9     | 22   | 1    | 2    | A    | 0    | 0     | 0                                                                                                                                                              | 0    | 1     | 0    | 2    | 3.4             | 21.9          |  |  |  |                                |  |
| 22-Dec                                      | 1                             | 2                 | 1    | 0    | 0    | 0    | 0                             | 0     | 1     | 1     | 3     | 3     | 4     | 5    | 10   | A    | 7    | 1    | 2     | 27                                                                                                                                                             | 39   | 9     | 3    | 8    | 5.6             | 38.6          |  |  |  |                                |  |
| 23-Dec                                      | 19                            | 13                | 6    | 2    | 3    | 2    | 4                             | 6     | 2     | 5     | 6     | 5     | 4     | 4    | A    | 4    | 2    | 2    | 2     | 3                                                                                                                                                              | 3    | 4     | 3    | 4    | 4.8             | 19.3          |  |  |  |                                |  |
| 24-Dec                                      | 3                             | 3                 | 3    | 2    | 3    | 2    | 1                             | 2     | 3     | 5     | 5     | 5     | 14    | A    | 5    | 6    | 3    | 6    | 2     | 3                                                                                                                                                              | 6    | 5     | 4    | 14   | 4.6             | 14.2          |  |  |  |                                |  |
| 25-Dec                                      | 14                            | 10                | 2    | 2    | 1    | 1    | 9                             | 2     | 0     | 3     | 15    | 16    | A     | 13   | 8    | 6    | 6    | 14   | 24    | 22                                                                                                                                                             | 11   | 3     | 12   | 15   | 9.0             | 23.8          |  |  |  |                                |  |
| 26-Dec                                      | 10                            | 15                | 23   | 16   | 16   | 20   | 21                            | 31    | 117   | 81    | 50    | A     | 66    | 88   | 69   | 48   | 74   | 65   | 59    | 99                                                                                                                                                             | 93   | 82    | 56   | 45   | 54.1            | 117.0         |  |  |  |                                |  |
| 27-Dec                                      | 25                            | 36                | 37   | 47   | 53   | 29   | 12                            | 10    | 33    | 18    | A     | 11    | 3     | 2    | 2    | 1    | 1    | 1    | 0     | 0                                                                                                                                                              | 1    | 1     | 0    | 0    | 14.0            | 53.2          |  |  |  |                                |  |
| 28-Dec                                      | 0                             | 0                 | 0    | 0    | 0    | 0    | 0                             | 1     | 1     | A     | 12    | 1     | 1     | 2    | 2    | 2    | 1    | 1    | 1     | 0                                                                                                                                                              | 0    | 0     | 0    | 0    | 1.2             | 11.8          |  |  |  |                                |  |
| 29-Dec                                      | 1                             | 0                 | 0    | 1    | 8    | 5    | 3                             | 8     | A     | 2     | 9     | 7     | 5     | 4    | 9    | 18   | 8    | 15   | 23    | 51                                                                                                                                                             | 40   | 11    | 1    | 0    | 10.0            | 50.9          |  |  |  |                                |  |
| 30-Dec                                      | 32                            | 17                | 1    | 0    | 1    | 3    | 3                             | A     | 2     | 2     | 7     | 6     | 3     | 2    | 1    | 1    | 1    | 1    | 0     | 0                                                                                                                                                              | 0    | 0     | 0    | 0    | 3.7             | 32.2          |  |  |  |                                |  |
| 31-Dec                                      | 0                             | 0                 | 0    | 0    | 1    | 0    | A                             | 0     | 0     | 1     | 6     | 3     | 4     | 3    | 3    | 5    | 5    | 7    | 7     | 2                                                                                                                                                              | 1    | 2     | 2    | 1    | 2.4             | 7.3           |  |  |  |                                |  |
| 12.6                                        |                               | 12.5              | 11.1 | 8.9  | 6.5  | 10.8 | 16.2                          | 20.8  | 38.7  | 33.3  | 35.1  | 28.0  | 22.4  | 15.5 | 15.5 | 13.3 | 14.3 | 19.4 | 22.0  | 26.0                                                                                                                                                           | 21.7 | 17.7  | 10.7 | 10.9 | Diurnal Average |               |  |  |  |                                |  |
| 67.7                                        |                               | 68.3              | 71.1 | 46.6 | 53.2 | 60.5 | 76.8                          | 108.9 | 233.4 | 247.5 | 375.9 | 181.5 | 120.3 | 87.9 | 68.9 | 47.7 | 74.3 | 83.0 | 143.1 | 192.2                                                                                                                                                          | 95.3 | 137.9 | 65.4 | 59.7 | Diurnal Maximum |               |  |  |  |                                |  |
| C - Calibration                             |                               | P - Power Failure |      |      |      |      | A - Automated Daily Zero Span |       |       |       |       |       |       |      |      |      |      |      |       |                                                                                                                                                                |      |       |      |      |                 |               |  |  |  |                                |  |

## Hourly Maximums

**Nitrogen Oxide (NO) - ppb**  
**Henry Pirker - December 2016**





# Hourly Averages

Oxides of Nitrogen (NO<sub>x</sub>) - ppb

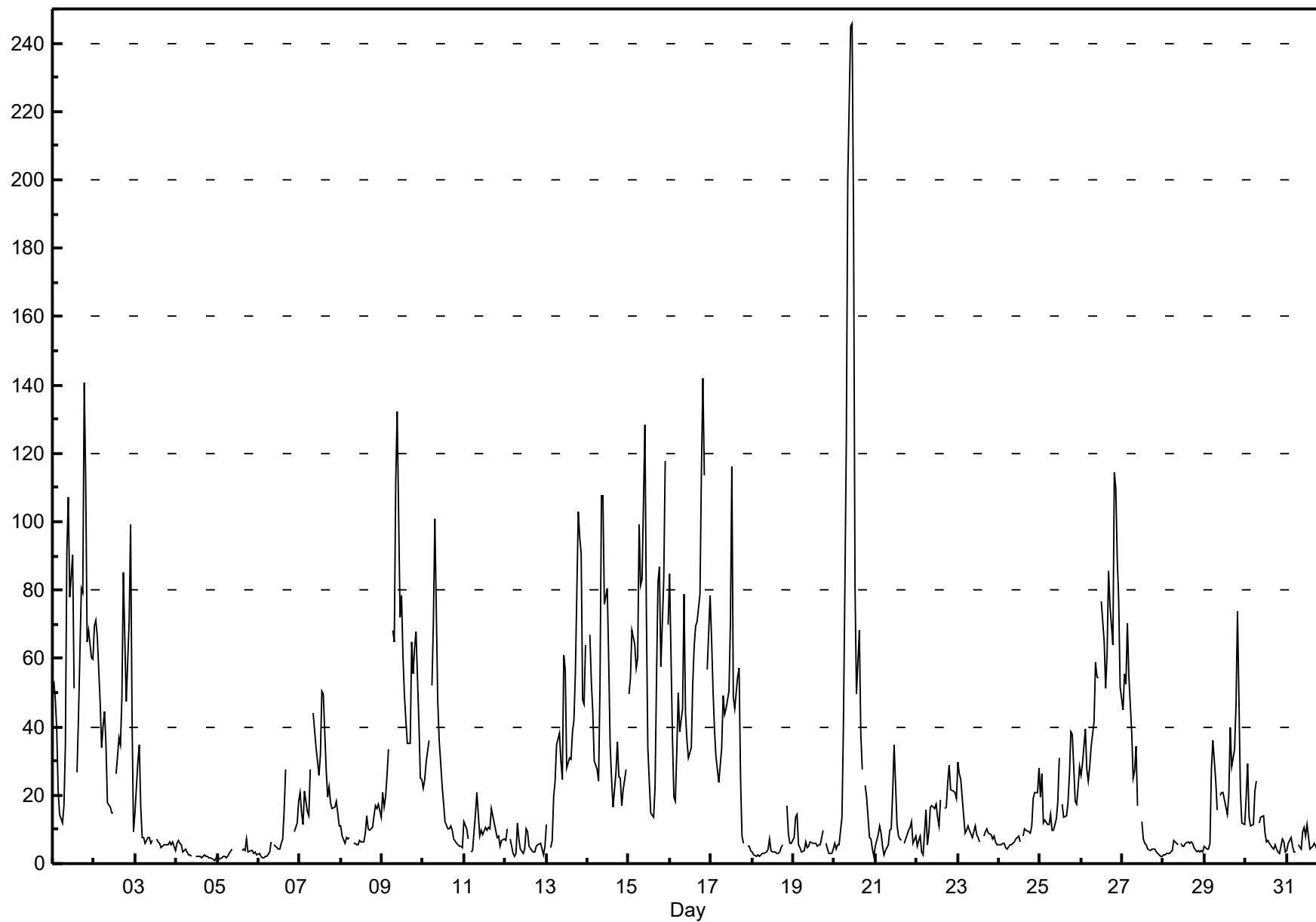
Henry Pirker - December 2016

| Maximum Value: 245.9 ppb on Dec 20 11:00                                                                                          |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     | Maximum Daily Average: 64.6 ppb on Dec 20                                                                                                                       |     |     |    |    | Hours in Service: 744     |               |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|----|---------------------------|---------------|
| Minimum Value: 1 ppb on Dec 4 23:00                                                                                               |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     | Minimum Daily Average: 2.9 ppb on Dec 4                                                                                                                         |     |     |    |    | Hours of Data: 704        |               |
| Maximum Diurnal Average: 39.1 ppb at hour 10                                                                                      |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     | Minimum Diurnal Average: 15.6 ppb at hour 5                                                                                                                     |     |     |    |    | Hours of Missing Data: 40 |               |
| Monthly Average: 25.04 ppb                                                                                                        |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     | Percentiles: P <sub>1</sub> = 1.7 P <sub>10</sub> = 3.4 Q <sub>1</sub> = 5.6 Median = 11.7 Q <sub>3</sub> = 34.2 P <sub>90</sub> = 65.9 P <sub>99</sub> = 127.4 |     |     |    |    | Hours of Calibration: 36  |               |
|                                                                                                                                   |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     | Percent Operational Time: 99.5                                                                                                                                  |     |     |    |    |                           |               |
| Day                                                                                                                               | Hourly Period Ending At (MST) |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     |                                                                                                                                                                 |     |     |    |    | Daily Average             | Daily Maximum |
| 1-Dec                                                                                                                             | 54                            | 48 | 39 | 21 | 14 | 12 | 17 | 35  | 91  | 107 | 78  | 90  | 51  | A  | 27 | 42 | 81 | 79 | 141 | 112                                                                                                                                                             | 65  | 68  | 60 | 60 | 60.5                      | 140.8         |
| 2-Dec                                                                                                                             | 70                            | 71 | 66 | 47 | 34 | 40 | 44 | 35  | 18  | 17  | 15  | 15  | A   | 26 | 37 | 35 | 49 | 85 | 66  | 48                                                                                                                                                              | 71  | 99  | 42 | 9  | 45.2                      | 99.2          |
| 3-Dec                                                                                                                             | 15                            | 29 | 35 | 17 | 8  | 8  | 6  | 7   | 7   | 6   | 7   | A   | 7   | 6  | 6  | 5  | 5  | 6  | 6   | 6                                                                                                                                                               | 7   | 5   | 6  | 4  | 9.3                       | 34.9          |
| 4-Dec                                                                                                                             | 6                             | 7  | 6  | 6  | 4  | 4  | 3  | 2   | 2   | 2   | A   | 2   | 2   | 2  | 2  | 2  | 2  | 2  | 2   | 2                                                                                                                                                               | 2   | 1   | 1  | 2  | 2.9                       | 6.6           |
| 5-Dec                                                                                                                             | 2                             | 1  | 2  | 2  | 2  | 2  | 2  | 3   | 4   | A   | C   | C   | C   | C  | 4  | 4  | 4  | 7  | 4   | 4                                                                                                                                                               | 4   | 3   | 3  | 3  | 3.1                       | 7.1           |
| 6-Dec                                                                                                                             | 3                             | 2  | 2  | 2  | 2  | 2  | 3  | 6   | A   | 5   | 5   | 4   | 4   | 6  | 7  | 16 | 27 | P  | P   | P                                                                                                                                                               | P   | 9   | 12 | 18 | 7.3                       | 27.4          |
| 7-Dec                                                                                                                             | 21                            | 15 | 11 | 21 | 15 | 14 | 27 | A   | 44  | 34  | 30  | 26  | 32  | 51 | 50 | 27 | 20 | 22 | 18  | 16                                                                                                                                                              | 17  | 18  | 15 | 11 | 24.1                      | 50.6          |
| 8-Dec                                                                                                                             | 11                            | 8  | 6  | 7  | 7  | 7  | A  | 6   | 6   | 6   | 5   | 7   | 6   | 6  | 9  | 14 | 10 | 10 | 11  | 14                                                                                                                                                              | 17  | 16  | 17 | 14 | 9.6                       | 17.4          |
| 9-Dec                                                                                                                             | 21                            | 17 | 20 | 26 | 33 | A  | 68 | 65  | 112 | 132 | 72  | 78  | 60  | 49 | 42 | 35 | 35 | 65 | 56  | 63                                                                                                                                                              | 68  | 41  | 25 | 24 | 52.5                      | 132.1         |
| 10-Dec                                                                                                                            | 22                            | 25 | 30 | 36 | A  | 52 | 71 | 101 | 47  | 36  | 30  | 23  | 18  | 12 | 10 | 10 | 11 | 10 | 7   | 6                                                                                                                                                               | 5   | 5   | 5  | 4  | 25.1                      | 101.0         |
| 11-Dec                                                                                                                            | 12                            | 10 | 7  | A  | 3  | 4  | 14 | 21  | 14  | 8   | 10  | 8   | 11  | 10 | 11 | 10 | 16 | 12 | 10  | 8                                                                                                                                                               | 8   | 5   | 7  | 7  | 9.8                       | 21.0          |
| 12-Dec                                                                                                                            | 7                             | 10 | A  | 7  | 3  | 2  | 3  | 12  | 7   | 4   | 3   | 4   | 10  | 9  | 5  | 4  | 4  | 4  | 5   | 6                                                                                                                                                               | 6   | 4   | 3  | 5  | 5.5                       | 11.8          |
| 13-Dec                                                                                                                            | 12                            | A  | 5  | 7  | 19 | 24 | 35 | 38  | 30  | 25  | 61  | 57  | 28  | 31 | 31 | 38 | 42 | 56 | 103 | 95                                                                                                                                                              | 91  | 48  | 47 | 64 | 42.8                      | 102.9         |
| 14-Dec                                                                                                                            | A                             | 67 | 54 | 45 | 30 | 28 | 24 | 53  | 108 | 108 | 76  | 81  | 59  | 35 | 24 | 17 | 27 | 36 | 25  | 25                                                                                                                                                              | 17  | 22  | 27 | A  | 44.8                      | 107.8         |
| 15-Dec                                                                                                                            | 49                            | 54 | 68 | 64 | 57 | 60 | 99 | 81  | 83  | 129 | 73  | 34  | 24  | 15 | 14 | 23 | 54 | 82 | 87  | 58                                                                                                                                                              | 83  | 118 | A  | 70 | 64.4                      | 128.5         |
| 16-Dec                                                                                                                            | 85                            | 37 | 19 | 18 | 33 | 50 | 38 | 45  | 79  | 44  | 36  | 31  | 34  | 52 | 64 | 70 | 71 | 79 | 115 | 142                                                                                                                                                             | 114 | A   | 57 | 78 | 60.5                      | 142.1         |
| 17-Dec                                                                                                                            | 66                            | 51 | 39 | 31 | 24 | 29 | 34 | 49  | 44  | 45  | 51  | 70  | 116 | 49 | 46 | 55 | 57 | 25 | 8   | 6                                                                                                                                                               | A   | 5   | 5  | 4  | 39.5                      | 115.9         |
| 18-Dec                                                                                                                            | 3                             | 3  | 2  | 3  | 2  | 3  | 3  | 3   | 3   | 4   | 7   | 4   | 4   | 3  | 3  | 3  | 4  | 5  | 6   | A                                                                                                                                                               | 17  | 9   | 6  | 6  | 4.5                       | 17.0          |
| 19-Dec                                                                                                                            | 7                             | 14 | 14 | 6  | 5  | 3  | 4  | 6   | 5   | 5   | 6   | 6   | 6   | 6  | 5  | 6  | 5  | 10 | A   | 6                                                                                                                                                               | 4   | 3   | 3  | 4  | 6.0                       | 14.5          |
| 20-Dec                                                                                                                            | 6                             | 4  | 6  | 5  | 14 | 40 | 80 | 123 | 200 | 245 | 246 | 188 | 81  | 50 | 68 | 38 | 28 | A  | 23  | 19                                                                                                                                                              | 8   | 7   | 4  | 2  | 64.6                      | 245.9         |
| 21-Dec                                                                                                                            | 5                             | 8  | 11 | 9  | 5  | 3  | 4  | 5   | 10  | 10  | 21  | 35  | 12  | 8  | 7  | 7  | A  | 6  | 8   | 10                                                                                                                                                              | 11  | 12  | 6  | 8  | 9.6                       | 34.8          |
| 22-Dec                                                                                                                            | 5                             | 7  | 8  | 3  | 3  | 16 | 5  | 9   | 17  | 17  | 16  | 17  | 14  | 11 | 18 | A  | 16 | 16 | 24  | 29                                                                                                                                                              | 21  | 21  | 21 | 19 | 14.5                      | 28.7          |
| 23-Dec                                                                                                                            | 30                            | 26 | 25 | 14 | 9  | 10 | 11 | 10  | 8   | 9   | 11  | 8   | 7   | 6  | A  | 8  | 9  | 10 | 9   | 9                                                                                                                                                               | 7   | 8   | 6  | 5  | 11.1                      | 29.7          |
| 24-Dec                                                                                                                            | 5                             | 6  | 6  | 6  | 4  | 4  | 6  | 6   | 6   | 6   | 7   | 8   | 6   | A  | 8  | 10 | 10 | 9  | 9   | 11                                                                                                                                                              | 19  | 21  | 21 | 28 | 9.7                       | 28.1          |
| 25-Dec                                                                                                                            | 19                            | 26 | 12 | 13 | 12 | 11 | 14 | 10  | 10  | 13  | 18  | 31  | A   | 17 | 13 | 14 | 18 | 26 | 39  | 38                                                                                                                                                              | 18  | 17  | 22 | 28 | 19.2                      | 38.7          |
| 26-Dec                                                                                                                            | 26                            | 29 | 39 | 28 | 24 | 28 | 34 | 41  | 59  | 55  | 54  | A   | 77  | 65 | 51 | 61 | 86 | 76 | 64  | 115                                                                                                                                                             | 110 | 89  | 77 | 52 | 58.3                      | 114.6         |
| 27-Dec                                                                                                                            | 45                            | 55 | 52 | 70 | 55 | 38 | 25 | 27  | 34  | 17  | A   | 12  | 7   | 6  | 6  | 4  | 4  | 4  | 4   | 4                                                                                                                                                               | 3   | 3   | 2  | 2  | 21.0                      | 70.2          |
| 28-Dec                                                                                                                            | 3                             | 2  | 3  | 3  | 3  | 4  | 7  | 7   | 5   | A   | 6   | 5   | 5   | 6  | 6  | 6  | 6  | 6  | 5   | 3                                                                                                                                                               | 4   | 3   | 4  | 4  | 4.6                       | 6.7           |
| 29-Dec                                                                                                                            | 5                             | 4  | 4  | 6  | 28 | 36 | 24 | 16  | A   | 20  | 21  | 21  | 16  | 14 | 20 | 40 | 28 | 33 | 47  | 74                                                                                                                                                              | 48  | 21  | 12 | 11 | 23.9                      | 73.6          |
| 30-Dec                                                                                                                            | 19                            | 29 | 14 | 11 | 11 | 21 | 24 | A   | 12  | 14  | 14  | 9   | 6   | 7  | 6  | 4  | 4  | 6  | 4   | 4                                                                                                                                                               | 3   | 7   | 6  | 3  | 10.4                      | 29.1          |
| 31-Dec                                                                                                                            | 4                             | 6  | 8  | 5  | 3  | 3  | A  | 5   | 4   | 9   | 10  | 8   | 12  | 4  | 5  | 5  | 6  | 5  | 4   | 4                                                                                                                                                               | 7   | 7   | 7  | 6  | 6.0                       | 11.6          |
| 21.3 22.4 20.4 17.9 15.6 18.6 25.2 28.6 36.9 39.1 35.4 31.5 25.6 20.2 20.1 20.4 24.6 27.2 31.2 32.2 29.4 23.3 17.7 18.6           |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     |                                                                                                                                                                 |     |     |    |    | Diurnal Average           |               |
| 84.9 71.3 68.2 70.2 57.3 60.3 99.1 123.2 199.9 245.0 245.9 188.0 115.9 65.0 68.1 69.5 85.7 85.3 140.8 142.1 113.7 117.7 77.3 78.3 |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     |                                                                                                                                                                 |     |     |    |    | Diurnal Maximum           |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                   |                               |    |    |    |    |    |    |     |     |     |     |     |     |    |    |    |    |    |     |                                                                                                                                                                 |     |     |    |    |                           |               |

## Hourly Averages

Oxides of Nitrogen (NO<sub>x</sub>) - ppb

Henry Pirker - December 2016



# Hourly Maximums

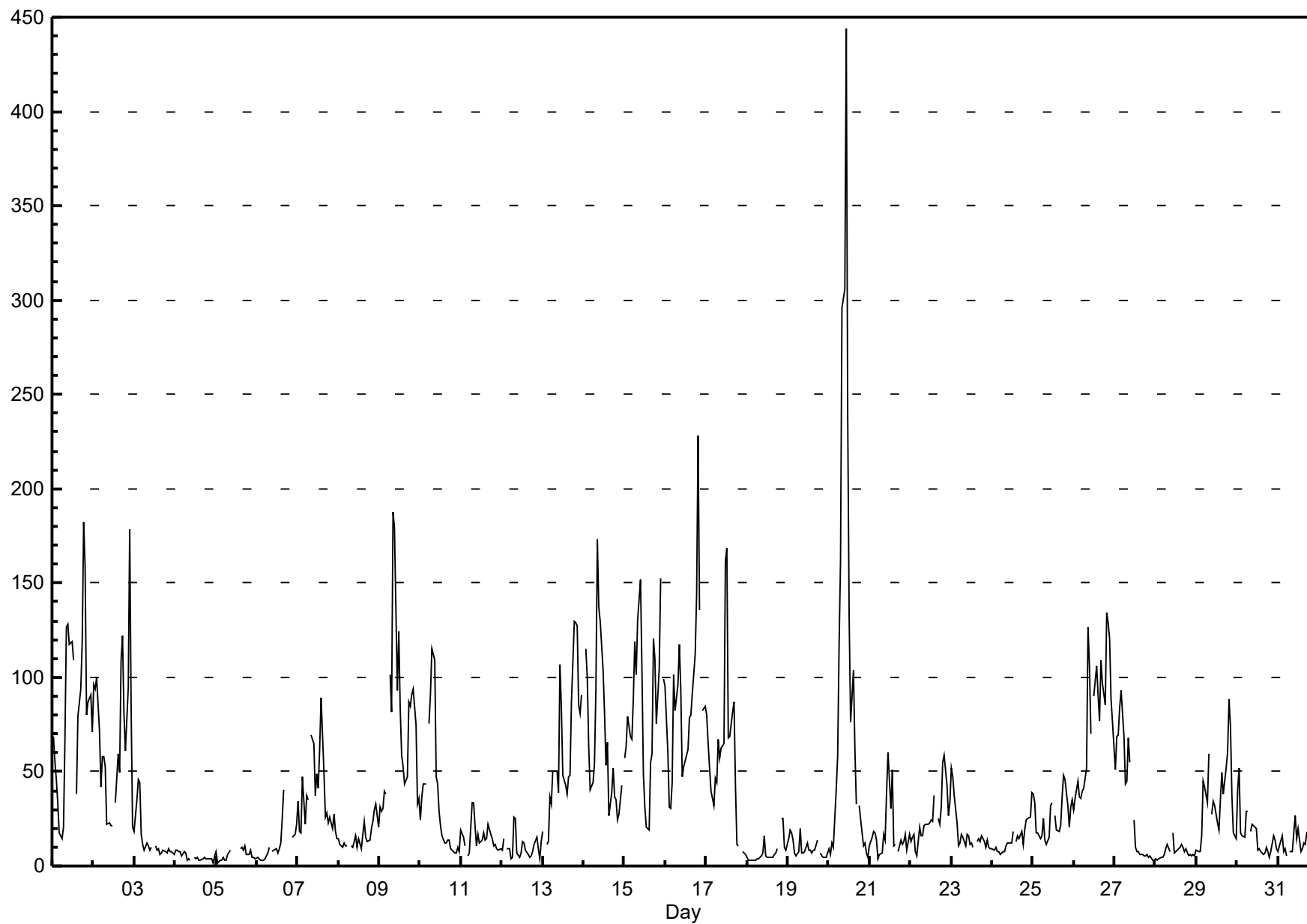
Oxides of Nitrogen (NO<sub>x</sub>) - ppb

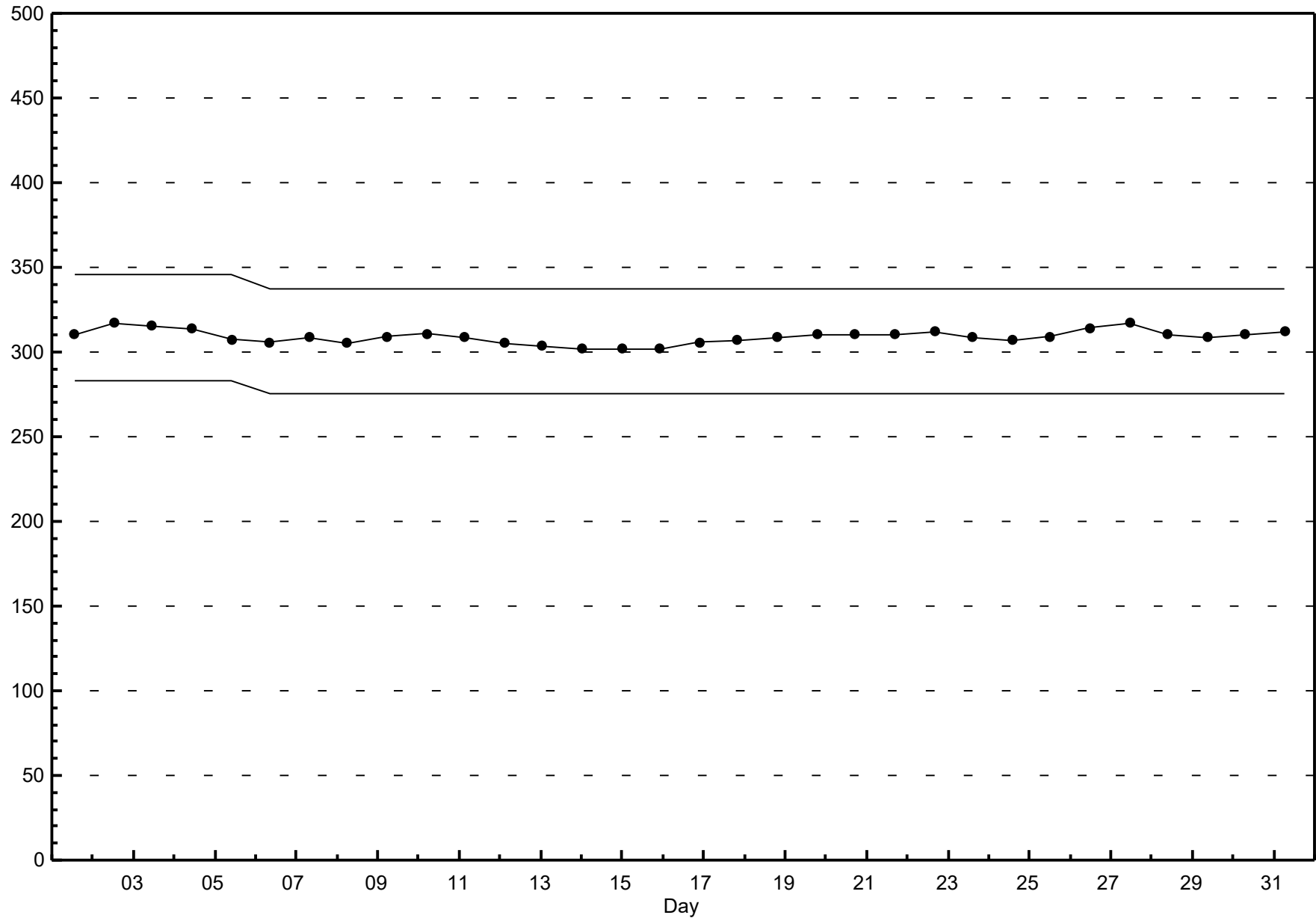
Henry Pirker - December 2016

| Maximum Value: 443.7 ppb on Dec 20 11:00                                                                                                  |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     | Maximum Daily Average: 95.5 ppb on Dec 20                                                                                                                       |     |     |    |    | Hours in Service: 744          |               |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|----|----|--------------------------------|---------------|
| Minimum Value: 1 ppb on Dec 4 23:00                                                                                                       |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     | Minimum Daily Average: 4.9 ppb on Dec 4                                                                                                                         |     |     |    |    | Hours of Data: 704             |               |
| Maximum Diurnal Average: 59.6 ppb at hour 9                                                                                               |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     | Minimum Diurnal Average: 23.3 ppb at hour 5                                                                                                                     |     |     |    |    | Hours of Missing Data: 40      |               |
| Monthly Average: 36.84 ppb                                                                                                                |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     | Percentiles: P <sub>1</sub> = 3.0 P <sub>10</sub> = 5.3 Q <sub>1</sub> = 8.7 Median = 18.1 Q <sub>3</sub> = 50.0 P <sub>90</sub> = 93.8 P <sub>99</sub> = 179.2 |     |     |    |    | Hours of Calibration: 36       |               |
|                                                                                                                                           |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     |                                                                                                                                                                 |     |     |    |    | Percent Operational Time: 99.5 |               |
| Day                                                                                                                                       | Hourly Period Ending At (MST) |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     |                                                                                                                                                                 |     |     |    |    | Daily Average                  | Daily Maximum |
| 1-Dec                                                                                                                                     | 69                            | 56  | 46  | 33 | 17 | 15  | 21  | 68  | 126 | 128 | 117 | 119 | 109 | A   | 38  | 79 | 94  | 119 | 182 | 159                                                                                                                                                             | 80  | 87  | 91 | 71 | 83.7                           | 182.3         |
| 2-Dec                                                                                                                                     | 96                            | 94  | 100 | 71 | 42 | 58  | 58  | 53  | 22  | 23  | 21  | 21  | A   | 34  | 60  | 50 | 109 | 122 | 81  | 61                                                                                                                                                              | 94  | 178 | 83 | 21 | 67.5                           | 178.4         |
| 3-Dec                                                                                                                                     | 18                            | 35  | 46  | 44 | 17 | 12  | 9   | 12  | 10  | 8   | 10  | A   | 11  | 9   | 9   | 6  | 7   | 9   | 8   | 7                                                                                                                                                               | 9   | 8   | 8  | 6  | 13.8                           | 45.8          |
| 4-Dec                                                                                                                                     | 9                             | 8   | 8   | 8  | 5  | 8   | 7   | 3   | 4   | 3   | A   | 4   | 4   | 5   | 3   | 3  | 4   | 5   | 4   | 4                                                                                                                                                               | 3   | 4   | 1  | 6  | 4.9                            | 8.5           |
| 5-Dec                                                                                                                                     | 8                             | 2   | 3   | 3  | 5  | 3   | 3   | 6   | 8   | A   | C   | C   | C   | C   | 9   | 10 | 8   | 11  | 6   | 6                                                                                                                                                               | 9   | 4   | 5  | 4  | 5.9                            | 10.9          |
| 6-Dec                                                                                                                                     | 4                             | 4   | 3   | 3  | 3  | 4   | 7   | 10  | A   | 8   | 8   | 9   | 7   | 9   | 12  | 25 | 41  | P   | P   | P                                                                                                                                                               | P   | 15  | 17 | 22 | 11.1                           | 40.7          |
| 7-Dec                                                                                                                                     | 34                            | 19  | 17  | 47 | 22 | 38  | 35  | A   | 69  | 65  | 37  | 49  | 41  | 62  | 90  | 50 | 26  | 28  | 23  | 26                                                                                                                                                              | 20  | 27  | 18 | 15 | 37.3                           | 89.6          |
| 8-Dec                                                                                                                                     | 14                            | 12  | 10  | 12 | 11 | 10  | A   | 11  | 10  | 13  | 16  | 10  | 15  | 9   | 17  | 23 | 15  | 13  | 14  | 20                                                                                                                                                              | 24  | 30  | 33 | 20 | 15.7                           | 32.6          |
| 9-Dec                                                                                                                                     | 31                            | 29  | 31  | 39 | 38 | A   | 101 | 81  | 188 | 179 | 93  | 124 | 83  | 59  | 52  | 44 | 47  | 87  | 84  | 91                                                                                                                                                              | 94  | 74  | 33 | 36 | 74.7                           | 188.0         |
| 10-Dec                                                                                                                                    | 25                            | 37  | 43  | 44 | A  | 76  | 91  | 115 | 109 | 47  | 44  | 29  | 21  | 16  | 12  | 13 | 14  | 14  | 9   | 8                                                                                                                                                               | 7   | 7   | 10 | 7  | 34.7                           | 115.3         |
| 11-Dec                                                                                                                                    | 19                            | 16  | 11  | A  | 5  | 7   | 34  | 33  | 22  | 11  | 17  | 12  | 14  | 18  | 14  | 14 | 22  | 17  | 14  | 10                                                                                                                                                              | 11  | 9   | 9  | 9  | 15.1                           | 33.8          |
| 12-Dec                                                                                                                                    | 8                             | 15  | A   | 9  | 9  | 4   | 5   | 26  | 25  | 7   | 5   | 7   | 13  | 12  | 8   | 6  | 5   | 6   | 8   | 11                                                                                                                                                              | 15  | 9   | 4  | 13 | 10.0                           | 26.0          |
| 13-Dec                                                                                                                                    | 19                            | A   | 12  | 13 | 37 | 33  | 50  | 50  | 50  | 39  | 107 | 84  | 48  | 43  | 38  | 47 | 48  | 87  | 130 | 129                                                                                                                                                             | 127 | 86  | 81 | 90 | 62.9                           | 129.9         |
| 14-Dec                                                                                                                                    | A                             | 115 | 100 | 63 | 41 | 44  | 54  | 94  | 173 | 138 | 130 | 104 | 81  | 54  | 66  | 27 | 39  | 52  | 37  | 35                                                                                                                                                              | 24  | 27  | 43 | A  | 70.0                           | 173.0         |
| 15-Dec                                                                                                                                    | 57                            | 63  | 79  | 68 | 67 | 89  | 119 | 102 | 131 | 152 | 104 | 49  | 31  | 21  | 19  | 55 | 60  | 121 | 110 | 75                                                                                                                                                              | 105 | 153 | A  | 99 | 83.7                           | 152.6         |
| 16-Dec                                                                                                                                    | 95                            | 60  | 31  | 31 | 44 | 101 | 83  | 96  | 118 | 93  | 47  | 53  | 59  | 62  | 79  | 80 | 91  | 112 | 144 | 228                                                                                                                                                             | 136 | A   | 82 | 85 | 87.4                           | 227.8         |
| 17-Dec                                                                                                                                    | 80                            | 65  | 52  | 40 | 32 | 46  | 44  | 67  | 57  | 63  | 65  | 162 | 169 | 68  | 69  | 82 | 87  | 42  | 11  | 11                                                                                                                                                              | A   | 8   | 7  | 6  | 57.9                           | 168.9         |
| 18-Dec                                                                                                                                    | 5                             | 3   | 3   | 3  | 3  | 3   | 4   | 4   | 5   | 7   | 16  | 5   | 5   | 5   | 4   | 4  | 6   | 7   | 9   | A                                                                                                                                                               | 25  | 25  | 10 | 8  | 7.3                            | 25.0          |
| 19-Dec                                                                                                                                    | 14                            | 19  | 18  | 14 | 7  | 5   | 7   | 20  | 7   | 7   | 8   | 12  | 8   | 9   | 7   | 9  | 8   | 14  | A   | 7                                                                                                                                                               | 5   | 4   | 5  | 7  | 9.6                            | 20.2          |
| 20-Dec                                                                                                                                    | 9                             | 6   | 12  | 10 | 40 | 58  | 117 | 162 | 296 | 306 | 444 | 238 | 132 | 76  | 104 | 62 | 33  | A   | 32  | 25                                                                                                                                                              | 11  | 12  | 7  | 4  | 95.5                           | 443.7         |
| 21-Dec                                                                                                                                    | 11                            | 16  | 18  | 17 | 14 | 4   | 6   | 7   | 16  | 13  | 39  | 61  | 31  | 51  | 11  | 11 | A   | 8   | 13  | 12                                                                                                                                                              | 13  | 17  | 9  | 16 | 17.9                           | 60.5          |
| 22-Dec                                                                                                                                    | 13                            | 15  | 17  | 7  | 6  | 20  | 16  | 16  | 21  | 22  | 22  | 23  | 25  | 24  | 37  | A  | 25  | 22  | 32  | 55                                                                                                                                                              | 59  | 42  | 27 | 33 | 25.1                           | 58.7          |
| 23-Dec                                                                                                                                    | 52                            | 47  | 38  | 23 | 11 | 12  | 17  | 15  | 11  | 16  | 16  | 11  | 12  | 10  | A   | 13 | 14  | 13  | 16  | 13                                                                                                                                                              | 10  | 14  | 10 | 9  | 17.5                           | 52.1          |
| 24-Dec                                                                                                                                    | 9                             | 8   | 10  | 8  | 7  | 6   | 8   | 7   | 10  | 12  | 12  | 13  | 18  | A   | 13  | 16 | 15  | 18  | 12  | 19                                                                                                                                                              | 25  | 25  | 26 | 39 | 14.6                           | 38.8          |
| 25-Dec                                                                                                                                    | 38                            | 34  | 17  | 18 | 14 | 16  | 25  | 14  | 12  | 15  | 32  | 33  | A   | 26  | 19  | 19 | 21  | 37  | 48  | 46                                                                                                                                                              | 32  | 21  | 31 | 35 | 26.2                           | 48.0          |
| 26-Dec                                                                                                                                    | 30                            | 36  | 45  | 37 | 36 | 39  | 41  | 52  | 127 | 106 | 70  | A   | 90  | 106 | 91  | 77 | 109 | 97  | 85  | 134                                                                                                                                                             | 129 | 121 | 88 | 76 | 79.2                           | 134.4         |
| 27-Dec                                                                                                                                    | 51                            | 69  | 69  | 84 | 93 | 68  | 43  | 45  | 68  | 55  | A   | 24  | 10  | 8   | 8   | 6  | 6   | 5   | 5   | 6                                                                                                                                                               | 5   | 5   | 3  | 3  | 32.2                           | 93.1          |
| 28-Dec                                                                                                                                    | 4                             | 3   | 4   | 5  | 5  | 6   | 9   | 12  | 8   | A   | 18  | 7   | 8   | 8   | 10  | 11 | 10  | 8   | 9   | 5                                                                                                                                                               | 6   | 5   | 6  | 5  | 7.4                            | 17.8          |
| 29-Dec                                                                                                                                    | 8                             | 8   | 8   | 16 | 45 | 42  | 34  | 59  | A   | 28  | 34  | 32  | 23  | 19  | 35  | 50 | 38  | 52  | 60  | 88                                                                                                                                                              | 74  | 37  | 17 | 15 | 35.7                           | 88.2          |
| 30-Dec                                                                                                                                    | 41                            | 52  | 17  | 16 | 15 | 29  | 29  | A   | 19  | 22  | 21  | 20  | 9   | 9   | 8   | 6  | 7   | 10  | 7   | 5                                                                                                                                                               | 7   | 16  | 13 | 10 | 16.8                           | 51.7          |
| 31-Dec                                                                                                                                    | 8                             | 11  | 16  | 8  | 9  | 5   | A   | 7   | 8   | 18  | 27  | 14  | 20  | 8   | 9   | 12 | 11  | 18  | 17  | 12                                                                                                                                                              | 12  | 12  | 13 | 9  | 12.3                           | 27.0          |
| 29.3 31.8 29.4 26.5 23.3 28.7 37.1 43.0 59.6 55.3 56.4 47.4 39.1 29.8 31.7 30.3 34.0 39.7 41.7 45.1 40.3 36.1 26.3 26.0                   |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     |                                                                                                                                                                 |     |     |    |    | Diurnal Average                |               |
| 96.0 114.9 100.2 84.0 93.1 101.4 118.7 161.7 296.1 306.2 443.7 238.3 168.9 105.7 103.7 81.7 109.3 121.8 182.3 227.8 135.7 178.4 91.1 99.4 |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     |                                                                                                                                                                 |     |     |    |    | Diurnal Maximum                |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                           |                               |     |     |    |    |     |     |     |     |     |     |     |     |     |     |    |     |     |     |                                                                                                                                                                 |     |     |    |    |                                |               |

## Hourly Maximums

Oxides of Nitrogen (NO<sub>x</sub>) - ppb  
Henry Pirker - December 2016





# Hourly Averages

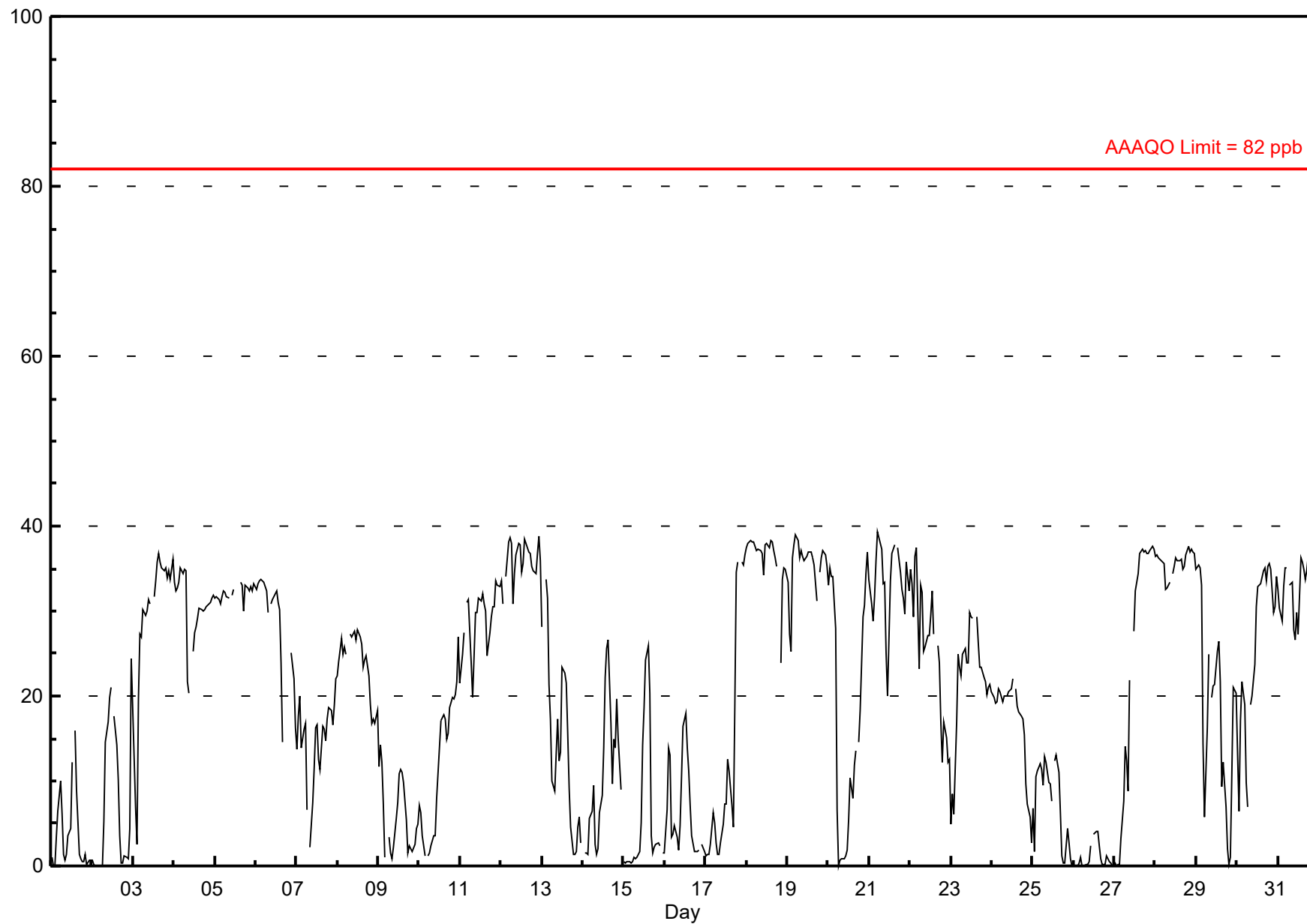
Ozone (O<sub>3</sub>) - ppb

Henry Pirker - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 39.3 ppb on Dec 21 06:00 Maximum Daily Average: 36.4 ppb on Dec 18                                                                                                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 705<br>Hours of Missing Data: 39<br>Hours of Calibration: 35<br>Percent Operational Time: 99.5 |                 |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|
| Minimum Value: 0 ppb on Dec 2 04:00 Minimum Daily Average: 1.0 ppb on Dec 26<br>Maximum Diurnal Average: 25.2 ppb at hour 14 Minimum Diurnal Average: 17.1 ppb at hour 9<br>Monthly Average: 20.28 ppb Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 6.9 Median = 21.6 Q <sub>3</sub> = 33.0 P <sub>90</sub> = 36.3 P <sub>99</sub> = 38.3 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |                 |               |
| Day                                                                                                                                                                                                                                                                                                                                                                   | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        | Daily Average   | Daily Maximum |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                                 | 1                             | 0  | 0  | 3  | 6  | 10 | 6  | 1  | 1  | 1  | 4  | 12 | A  | 16 | 9  | 1  | 1  | 1  | 0  | 1  | 0  | 1  | 1  | 3.5                                                                                                                                    | 15.9            |               |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                                 | 1                             | 0  | 0  | 0  | 0  | 0  | 0  | 5  | 15 | 17 | 20 | 21 | A  | 18 | 14 | 10 | 4  | 0  | 0  | 1  | 1  | 1  | 4  | 24                                                                                                                                     | 6.8             | 24.5          |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                                 | 19                            | 7  | 2  | 20 | 27 | 27 | 30 | 30 | 30 | 31 | 31 | A  | 32 | 34 | 36 | 37 | 36 | 35 | 35 | 35 | 34 | 35 | 34 | 36                                                                                                                                     | 29.2            | 36.8          |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                                 | 33                            | 32 | 33 | 33 | 35 | 34 | 35 | 35 | 22 | 20 | A  | 25 | 27 | 28 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32                                                                                                                                     | 30.4            | 35.1          |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                                 | 31                            | 32 | 31 | 31 | 32 | 32 | 32 | 32 | 32 | A  | 32 | 33 | C  | C  | C  | 33 | 33 | 30 | 33 | 33 | 32 | 33 | 32 | 33                                                                                                                                     | 32.1            | 33.4          |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                                 | 33                            | 33 | 33 | 34 | 34 | 33 | 32 | 30 | A  | 31 | 31 | 32 | 32 | 31 | 30 | 24 | 15 | P  | P  | P  | P  | 25 | 22 | 16                                                                                                                                     | 29.0            | 33.7          |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                                 | 14                            | 18 | 20 | 14 | 16 | 17 | 7  | A  | 2  | 7  | 12 | 16 | 17 | 13 | 11 | 16 | 16 | 15 | 17 | 19 | 18 | 17 | 19 | 22                                                                                                                                     | 14.9            | 22.0          |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                                 | 22                            | 24 | 27 | 25 | 26 | 25 | A  | 27 | 27 | 27 | 28 | 27 | 28 | 27 | 26 | 23 | 24 | 25 | 22 | 19 | 17 | 17 | 17 | 18                                                                                                                                     | 23.8            | 27.7          |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                                 | 12                            | 14 | 12 | 7  | 1  | A  | 3  | 1  | 1  | 2  | 6  | 7  | 11 | 11 | 11 | 10 | 6  | 2  | 2  | 2  | 3  | 4  | 5  | 5                                                                                                                                      | 5.9             | 14.2          |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                                | 7                             | 6  | 4  | 1  | A  | 1  | 2  | 2  | 4  | 3  | 8  | 11 | 14 | 17 | 18 | 17 | 15 | 16 | 19 | 20 | 20 | 20 | 22 | 27                                                                                                                                     | 11.9            | 27.0          |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                                | 22                            | 25 | 28 | A  | 31 | 31 | 24 | 20 | 25 | 30 | 30 | 31 | 31 | 32 | 31 | 30 | 25 | 28 | 29 | 31 | 31 | 33 | 33 | 33                                                                                                                                     | 28.8            | 33.5          |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                                | 34                            | 31 | A  | 34 | 38 | 39 | 38 | 31 | 34 | 37 | 38 | 38 | 35 | 36 | 38 | 38 | 37 | 37 | 35 | 35 | 34 | 37 | 39 | 36                                                                                                                                     | 35.9            | 38.8          |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                                | 28                            | A  | 34 | 32 | 21 | 17 | 10 | 9  | 13 | 17 | 12 | 13 | 23 | 23 | 22 | 16 | 9  | 5  | 1  | 1  | 2  | 5  | 6  | 3                                                                                                                                      | 14.0            | 33.7          |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                                | A                             | 1  | 2  | 1  | 6  | 6  | 9  | 2  | 1  | 2  | 6  | 8  | 14 | 22 | 26 | 27 | 17 | 10 | 15 | 14 | 20 | 15 | 9  | A                                                                                                                                      | 10.6            | 26.7          |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                                | 1                             | 0  | 0  | 1  | 0  | 1  | 1  | 1  | 1  | 2  | 5  | 14 | 19 | 24 | 26 | 20 | 4  | 1  | 2  | 2  | 3  | 2  | A  | 1                                                                                                                                      | 5.7             | 26.0          |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                                | 2                             | 7  | 14 | 13 | 3  | 4  | 5  | 3  | 2  | 5  | 11 | 16 | 18 | 14 | 11 | 7  | 4  | 2  | 2  | 2  | 2  | A  | 3  | 2                                                                                                                                      | 6.5             | 17.9          |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                                | 1                             | 1  | 1  | 2  | 6  | 5  | 3  | 1  | 1  | 3  | 5  | 7  | 7  | 13 | 11 | 7  | 5  | 19 | 35 | 36 | A  | 36 | 35 | 37                                                                                                                                     | 12.1            | 36.7          |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                                | 37                            | 38 | 38 | 38 | 38 | 38 | 37 | 37 | 37 | 37 | 34 | 38 | 38 | 38 | 38 | 38 | 37 | 36 | 35 | A  | 24 | 34 | 35 | 35                                                                                                                                     | 36.4            | 38.3          |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                                | 33                            | 27 | 25 | 36 | 38 | 39 | 38 | 36 | 37 | 37 | 36 | 36 | 37 | 37 | 37 | 36 | 36 | 31 | A  | 35 | 36 | 37 | 37 | 35                                                                                                                                     | 35.4            | 39.0          |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                                | 33                            | 35 | 34 | 34 | 28 | 7  | 0  | 1  | 1  | 1  | 1  | 2  | 5  | 10 | 8  | 12 | 14 | A  | 15 | 18 | 29 | 31 | 34 | 37                                                                                                                                     | 17.0            | 37.0          |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                                | 34                            | 31 | 29 | 32 | 36 | 39 | 39 | 37 | 33 | 33 | 25 | 20 | 34 | 37 | 37 | 38 | A  | 37 | 35 | 33 | 32 | 30 | 36 | 32                                                                                                                                     | 33.4            | 39.3          |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                                | 35                            | 33 | 29 | 36 | 37 | 23 | 33 | 32 | 25 | 26 | 27 | 27 | 30 | 32 | 27 | A  | 26 | 24 | 17 | 12 | 17 | 15 | 12 | 12                                                                                                                                     | 25.6            | 37.5          |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                                | 5                             | 8  | 6  | 17 | 25 | 23 | 22 | 25 | 26 | 24 | 24 | 30 | 29 | 29 | A  | 29 | 26 | 23 | 23 | 22 | 22 | 20 | 21 | 21                                                                                                                                     | 21.8            | 29.9          |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                                | 21                            | 20 | 19 | 19 | 21 | 21 | 19 | 20 | 20 | 20 | 21 | 21 | 22 | A  | 21 | 19 | 18 | 18 | 17 | 15 | 10 | 7  | 6  | 3                                                                                                                                      | 17.2            | 22.1          |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                                | 7                             | 2  | 10 | 11 | 12 | 11 | 10 | 13 | 12 | 10 | 10 | 8  | A  | 12 | 13 | 11 | 6  | 1  | 0  | 0  | 4  | 3  | 1  | 0                                                                                                                                      | 7.3             | 13.0          |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                                | 0                             | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 1  | 2  | A  | 4  | 4  | 4  | 2  | 1  | 0  | 0  | 1  | 1  | 1  | 0  | 0                                                                                                                                      | 1.0             | 4.0           |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                                | 0                             | 0  | 0  | 0  | 3  | 8  | 14 | 12 | 9  | 22 | A  | 28 | 32 | 33 | 34 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 38 | 37                                                                                                                                     | 23.1            | 37.6          |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                                | 37                            | 37 | 36 | 36 | 36 | 36 | 33 | 33 | 33 | A  | 34 | 35 | 36 | 36 | 36 | 36 | 35 | 35 | 37 | 38 | 37 | 37 | 37 | 37                                                                                                                                     | 35.7            | 37.6          |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                                | 35                            | 35 | 35 | 33 | 14 | 6  | 16 | 25 | A  | 20 | 21 | 21 | 25 | 27 | 22 | 9  | 12 | 7  | 2  | 0  | 1  | 11 | 21 | 20                                                                                                                                     | 18.2            | 35.3          |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                                | 13                            | 7  | 17 | 22 | 19 | 10 | 7  | A  | 19 | 20 | 24 | 31 | 33 | 33 | 33 | 35 | 35 | 34 | 35 | 36 | 35 | 30 | 30 | 34                                                                                                                                     | 25.7            | 35.5          |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                                | 33                            | 30 | 29 | 33 | 35 | 35 | A  | 33 | 33 | 28 | 27 | 30 | 27 | 36 | 36 | 35 | 34 | 35 | 36 | 36 | 32 | 31 | 30 | 31                                                                                                                                     | 32.4            | 36.4          |
| 19.4 17.8 18.3 20.0 20.9 19.3 17.4 18.5 17.1 17.7 19.4 21.8 24.0 25.2 24.2 23.1 19.8 19.7 19.6 19.4 19.4 21.1 21.7 22.1<br>37.4 38.0 38.3 38.2 38.2 39.3 38.7 37.4 37.1 36.8 37.9 37.9 37.9 37.5 38.4 38.1 37.2 37.4 37.2 37.6 36.9 37.3 38.8 37.3                                                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                        | Diurnal Maximum |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span<br>Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb 24-hr na                                                                                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |                 |               |

## Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Henry Pirker - December 2016



# Hourly Maximums

Ozone (O<sub>3</sub>) - ppb

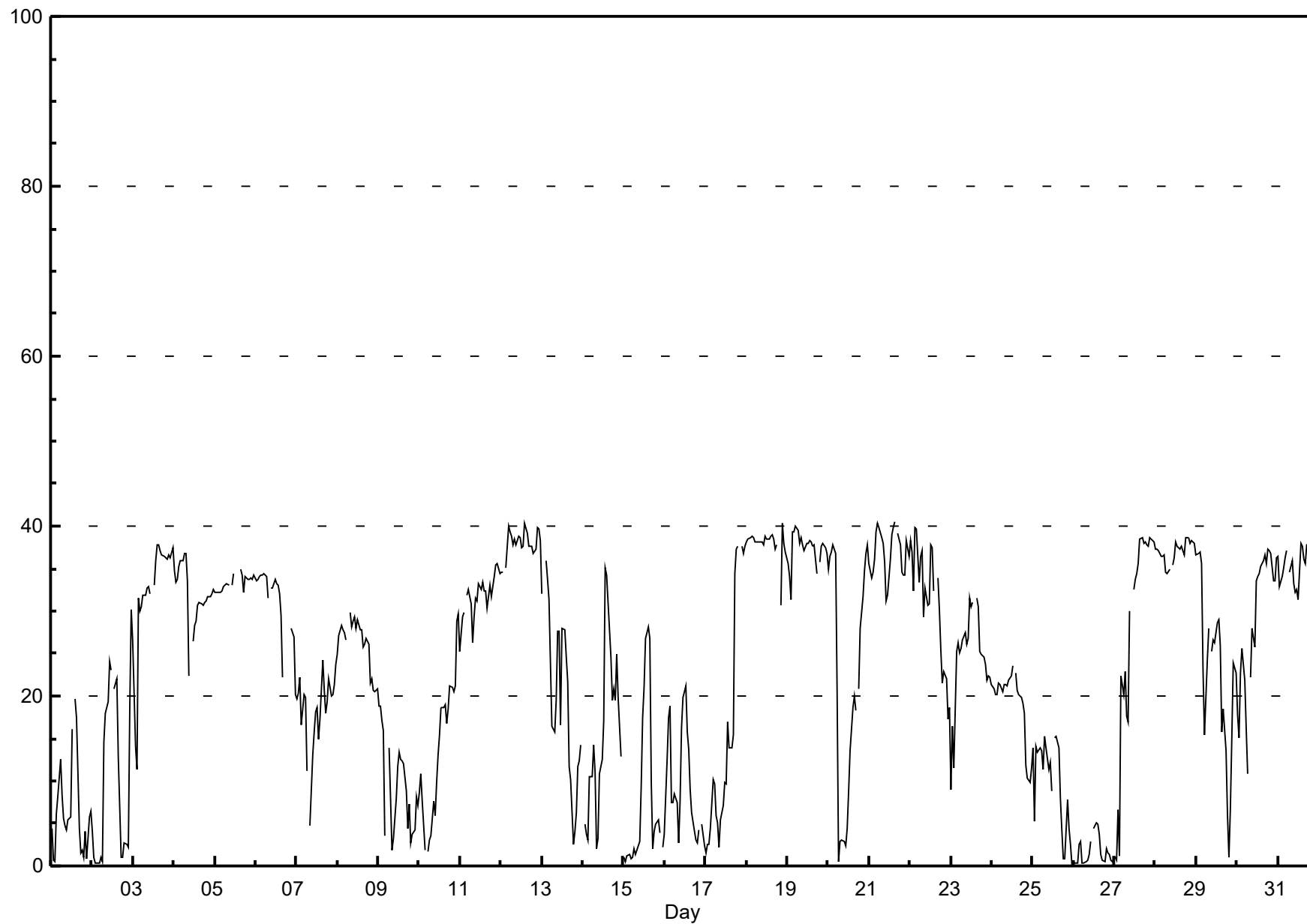
Henry Pirker - December 2016

| Maximum Value: 40.4 ppb on Dec 21 16:00                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 38.0 ppb on Dec 18                                                                                                                       |    |    |    |                 | Hours in Service: 744     |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|---------------------------|---------------|
| Minimum Value: 0 ppb on Dec 26 00:00                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 1.7 ppb on Dec 26                                                                                                                        |    |    |    |                 | Hours of Data: 705        |               |
| Maximum Diurnal Average: 27.8 ppb at hour 14                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 20.0 ppb at hour 9                                                                                                                     |    |    |    |                 | Hours of Missing Data: 39 |               |
| Monthly Average: 23.19 ppb                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 2.9 Q <sub>1</sub> = 12.0 Median = 26.1 Q <sub>3</sub> = 34.8 P <sub>90</sub> = 37.8 P <sub>99</sub> = 39.9 |    |    |    |                 | Hours of Calibration: 35  |               |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.5                                                                                                                                  |    |    |    |                 |                           |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                 |    |    |    |                 | Daily Average             | Daily Maximum |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                              | 21 | 22 | 23 | 24              |                           |               |
| 1-Dec                                                                                                                   | 4                             | 1  | 0  | 6  | 8  | 13 | 8  | 6  | 5  | 4  | 5  | 6  | 16 | A  | 20 | 17 | 4  | 2  | 2  | 1                                                                                                                                                               | 4  | 1  | 6  | 6               | 6.3                       | 19.7          |
| 2-Dec                                                                                                                   | 4                             | 1  | 0  | 0  | 0  | 1  | 0  | 14 | 18 | 19 | 24 | 23 | A  | 21 | 22 | 13 | 7  | 1  | 1  | 3                                                                                                                                                               | 3  | 2  | 19 | 30              | 9.9                       | 30.2          |
| 3-Dec                                                                                                                   | 27                            | 14 | 11 | 32 | 30 | 31 | 32 | 32 | 33 | 33 | 32 | A  | 33 | 36 | 38 | 38 | 37 | 37 | 36 | 36                                                                                                                                                              | 36 | 37 | 36 | 38              | 32.3                      | 37.8          |
| 4-Dec                                                                                                                   | 35                            | 33 | 34 | 35 | 36 | 36 | 37 | 37 | 34 | 22 | A  | 26 | 28 | 29 | 31 | 31 | 31 | 31 | 31 | 31                                                                                                                                                              | 32 | 32 | 32 | 33              | 32.0                      | 36.9          |
| 5-Dec                                                                                                                   | 32                            | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | A  | 33 | 34 | C  | C  | C  | 35 | 34 | 32 | 34 | 34                                                                                                                                                              | 34 | 34 | 34 | 34              | 33.3                      | 34.9          |
| 6-Dec                                                                                                                   | 34                            | 34 | 34 | 34 | 34 | 34 | 34 | 32 | A  | 33 | 33 | 34 | 33 | 33 | 32 | 30 | 22 | P  | P  | P                                                                                                                                                               | P  | 28 | 27 | 20              | 31.3                      | 34.4          |
| 7-Dec                                                                                                                   | 20                            | 20 | 22 | 17 | 20 | 20 | 11 | A  | 5  | 13 | 16 | 18 | 19 | 15 | 17 | 24 | 21 | 18 | 19 | 22                                                                                                                                                              | 20 | 20 | 21 | 24              | 18.3                      | 24.3          |
| 8-Dec                                                                                                                   | 25                            | 27 | 28 | 28 | 28 | 27 | A  | 30 | 28 | 29 | 29 | 28 | 29 | 28 | 28 | 26 | 26 | 27 | 26 | 22                                                                                                                                                              | 22 | 21 | 21 | 21              | 26.1                      | 29.8          |
| 9-Dec                                                                                                                   | 19                            | 19 | 17 | 16 | 4  | A  | 14 | 8  | 2  | 3  | 8  | 12 | 13 | 12 | 12 | 12 | 9  | 4  | 7  | 3                                                                                                                                                               | 4  | 4  | 8  | 7               | 9.4                       | 18.8          |
| 10-Dec                                                                                                                  | 9                             | 11 | 8  | 2  | A  | 2  | 3  | 4  | 8  | 6  | 10 | 13 | 15 | 19 | 19 | 19 | 17 | 18 | 21 | 21                                                                                                                                                              | 20 | 21 | 29 | 30              | 14.0                      | 29.7          |
| 11-Dec                                                                                                                  | 25                            | 29 | 30 | A  | 32 | 32 | 31 | 26 | 29 | 32 | 31 | 33 | 33 | 33 | 32 | 32 | 30 | 33 | 32 | 33                                                                                                                                                              | 34 | 35 | 36 | 34              | 31.7                      | 35.7          |
| 12-Dec                                                                                                                  | 35                            | 35 | A  | 35 | 40 | 39 | 39 | 38 | 39 | 38 | 39 | 39 | 37 | 38 | 40 | 39 | 38 | 38 | 38 | 37                                                                                                                                                              | 37 | 40 | 40 | 38              | 38.0                      | 40.3          |
| 13-Dec                                                                                                                  | 32                            | A  | 36 | 34 | 31 | 24 | 16 | 16 | 20 | 28 | 28 | 17 | 28 | 28 | 25 | 22 | 12 | 10 | 2  | 4                                                                                                                                                               | 6  | 12 | 12 | 14              | 19.8                      | 35.9          |
| 14-Dec                                                                                                                  | A                             | 5  | 4  | 3  | 10 | 11 | 14 | 11 | 2  | 3  | 11 | 13 | 17 | 35 | 34 | 31 | 25 | 19 | 21 | 20                                                                                                                                                              | 25 | 20 | 13 | A               | 15.7                      | 35.1          |
| 15-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 2  | 3  | 9  | 17 | 21 | 27 | 28 | 27 | 10 | 2  | 4  | 5                                                                                                                                                               | 5  | 4  | A  | 2               | 7.6                       | 28.1          |
| 16-Dec                                                                                                                  | 4                             | 13 | 18 | 19 | 8  | 7  | 9  | 8  | 3  | 8  | 16 | 20 | 21 | 16 | 14 | 9  | 6  | 4  | 3  | 3                                                                                                                                                               | 4  | A  | 5  | 2               | 9.5                       | 21.2          |
| 17-Dec                                                                                                                  | 2                             | 2  | 3  | 4  | 10 | 10 | 6  | 5  | 2  | 5  | 7  | 10 | 10 | 17 | 14 | 14 | 15 | 34 | 37 | 38                                                                                                                                                              | A  | 38 | 37 | 38              | 15.6                      | 37.7          |
| 18-Dec                                                                                                                  | 38                            | 38 | 39 | 39 | 39 | 38 | 38 | 38 | 38 | 38 | 38 | 39 | 39 | 38 | 39 | 39 | 38 | 37 | 38 | A                                                                                                                                                               | 31 | 40 | 38 | 37              | 38.0                      | 40.4          |
| 19-Dec                                                                                                                  | 36                            | 34 | 31 | 39 | 39 | 40 | 40 | 38 | 39 | 38 | 37 | 38 | 38 | 38 | 38 | 38 | 38 | 34 | A  | 36                                                                                                                                                              | 38 | 38 | 38 | 37              | 37.3                      | 40.0          |
| 20-Dec                                                                                                                  | 35                            | 36 | 37 | 38 | 37 | 20 | 0  | 3  | 3  | 3  | 2  | 4  | 9  | 14 | 19 | 20 | 18 | A  | 21 | 28                                                                                                                                                              | 32 | 35 | 37 | 38              | 21.2                      | 37.8          |
| 21-Dec                                                                                                                  | 36                            | 34 | 35 | 36 | 39 | 40 | 40 | 39 | 38 | 36 | 31 | 32 | 36 | 39 | 40 | 40 | A  | 39 | 38 | 35                                                                                                                                                              | 34 | 34 | 38 | 36              | 36.8                      | 40.4          |
| 22-Dec                                                                                                                  | 38                            | 37 | 32 | 40 | 40 | 33 | 36 | 37 | 29 | 33 | 31 | 31 | 38 | 38 | 32 | A  | 34 | 30 | 25 | 21                                                                                                                                                              | 23 | 22 | 17 | 19              | 31.2                      | 39.8          |
| 23-Dec                                                                                                                  | 9                             | 17 | 12 | 25 | 26 | 25 | 26 | 27 | 27 | 26 | 27 | 32 | 30 | 31 | A  | 32 | 31 | 25 | 25 | 24                                                                                                                                                              | 24 | 22 | 22 | 22              | 24.6                      | 31.5          |
| 24-Dec                                                                                                                  | 21                            | 21 | 20 | 20 | 22 | 21 | 20 | 21 | 21 | 21 | 22 | 22 | 24 | A  | 23 | 21 | 20 | 20 | 19 | 18                                                                                                                                                              | 12 | 10 | 10 | 12              | 19.2                      | 23.5          |
| 25-Dec                                                                                                                  | 14                            | 5  | 14 | 13 | 14 | 14 | 11 | 15 | 14 | 11 | 12 | 9  | A  | 15 | 15 | 14 | 8  | 4  | 1  | 1                                                                                                                                                               | 8  | 4  | 3  | 0               | 9.6                       | 15.3          |
| 26-Dec                                                                                                                  | 1                             | 0  | 0  | 3  | 3  | 0  | 0  | 1  | 1  | 1  | 3  | A  | 4  | 5  | 5  | 4  | 1  | 1  | 0  | 2                                                                                                                                                               | 2  | 1  | 1  | 0               | 1.7                       | 5.0           |
| 27-Dec                                                                                                                  | 1                             | 1  | 7  | 1  | 22 | 20 | 23 | 18 | 17 | 30 | A  | 33 | 34 | 34 | 36 | 38 | 39 | 38 | 38 | 38                                                                                                                                                              | 38 | 39 | 38 | 38              | 26.9                      | 38.6          |
| 28-Dec                                                                                                                  | 37                            | 37 | 37 | 36 | 36 | 37 | 35 | 34 | 35 | A  | 35 | 36 | 38 | 38 | 37 | 38 | 37 | 37 | 39 | 39                                                                                                                                                              | 38 | 38 | 38 | 38              | 37.0                      | 38.7          |
| 29-Dec                                                                                                                  | 37                            | 37 | 37 | 36 | 23 | 15 | 24 | 28 | A  | 25 | 27 | 26 | 29 | 29 | 26 | 16 | 18 | 14 | 6  | 1                                                                                                                                                               | 7  | 15 | 24 | 23              | 22.7                      | 37.0          |
| 30-Dec                                                                                                                  | 18                            | 15 | 23 | 26 | 22 | 16 | 11 | A  | 22 | 28 | 26 | 34 | 34 | 34 | 35 | 36 | 37 | 36 | 37 | 37                                                                                                                                                              | 37 | 34 | 34 | 36              | 29.0                      | 37.3          |
| 31-Dec                                                                                                                  | 36                            | 33 | 34 | 35 | 36 | 37 | A  | 35 | 36 | 33 | 32 | 32 | 31 | 38 | 38 | 36 | 36 | 38 | 38 | 37                                                                                                                                                              | 36 | 35 | 33 | 33              | 35.2                      | 38.0          |
| 22.1 20.7 21.2 22.9 24.1 22.6 20.5 21.8 20.0 20.8 22.5 24.5 26.3 27.8 27.2 26.3 23.3 22.9 22.1 21.6 22.2 23.9 24.8 24.7 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                 |    |    |    | Diurnal Average |                           |               |
| 38.2 38.4 38.7 39.8 40.0 40.3 39.9 38.7 38.6 38.2 38.7 38.8 38.5 39.0 40.3 40.4 38.6 39.2 38.7 38.6 38.0 40.4 39.7 38.3 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                 |    |    |    | Diurnal Maximum |                           |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                 |    |    |    |                 |                           |               |



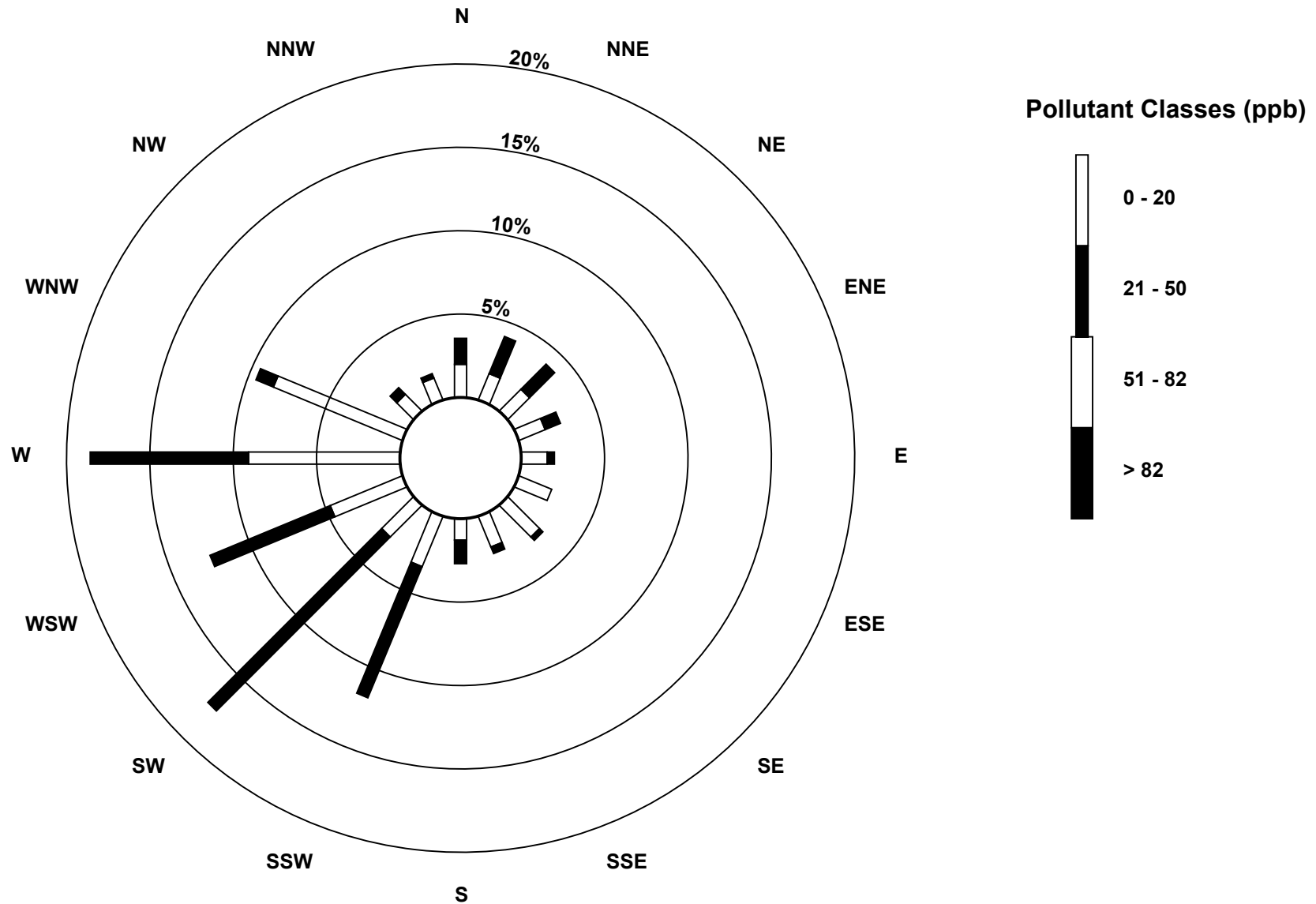
## Hourly Maximums

Ozone (O<sub>3</sub>) - ppb  
Henry Pirker - December 2016



# Pollutant Rose

Ozone (O<sub>3</sub>) - ppb  
Henry Pirker - December 2016



# Eight Hour Running Averages

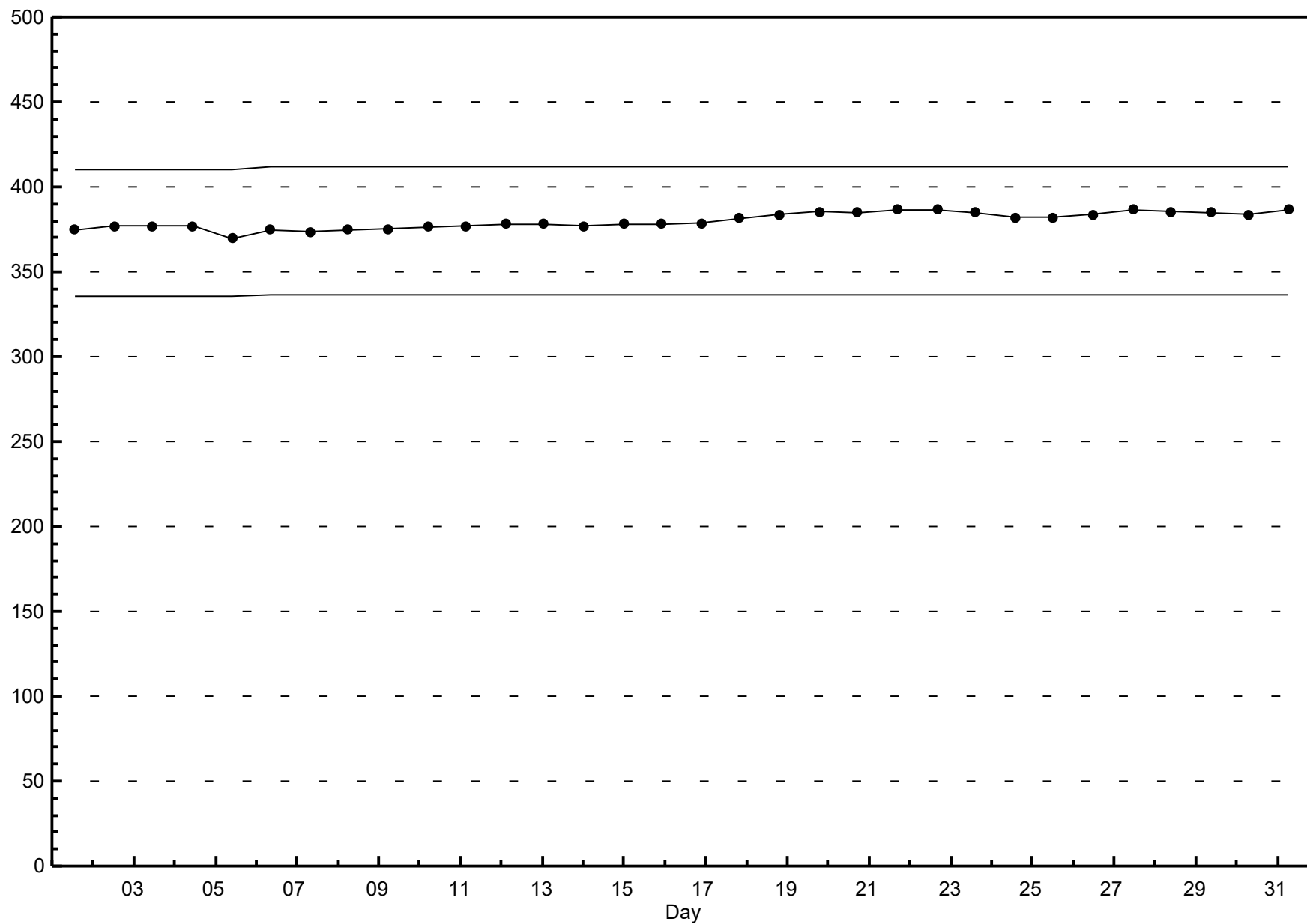
Ozone (O<sub>3</sub>) - ppb

Henry Pirker - December 2016

| Maximum Value: 37.8 ppb on Dec 18 08:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|------|
| Minimum Value: 0.1 ppb on Dec 26 07:00                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 730             |      |
| Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 2.8 Q <sub>1</sub> = 7.6 Median = 20.4 Q <sub>3</sub> = 32.4 P <sub>90</sub> = 35.4 P <sub>99</sub> = 37.3 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 14      |      |
|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 7        |      |
|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.1 |      |
| Day                                                                                                                                                            | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Daily Maximum                  |      |
|                                                                                                                                                                | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |                                | 24   |
| 1-Dec                                                                                                                                                          | 0                             | 0  | 0  | 1  | 2  | 3  | 3  | 4  | 3  | 4  | 4  | 5  | 4  | 6  | 7  | 7  | 7  | 6  | 6  | 4  | 4  | 2  | 1  | 6.8                            |      |
| 2-Dec                                                                                                                                                          | 1                             | 1  | 1  | 0  | 0  | 0  | 0  | 1  | 2  | 5  | 7  | 10 | 11 | 14 | 16 | 16 | 15 | 12 | 10 | 7  | 6  | 4  | 3  | 5                              | 16.4 |
| 3-Dec                                                                                                                                                          | 6                             | 7  | 7  | 10 | 13 | 16 | 20 | 20 | 22 | 25 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 34 | 35 | 35 | 35 | 35 | 35 | 35                             | 35.2 |
| 4-Dec                                                                                                                                                          | 35                            | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 32 | 31 | 31 | 30 | 28 | 28 | 27 | 26 | 27 | 29 | 29 | 30 | 30 | 30 | 31 | 31                             | 34.6 |
| 5-Dec                                                                                                                                                          | 31                            | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | N  | N  | N  | N  | N  | N  | N  | 32 | 32 | 32 | 32                             | 32.5 |
| 6-Dec                                                                                                                                                          | 32                            | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 32 | 32 | 32 | 32 | 31 | 31 | 30 | 28 | 28 | 27 | N  | N  | N  | N  | N                              | 33.2 |
| 7-Dec                                                                                                                                                          | N                             | N  | 19 | 18 | 18 | 17 | 15 | 15 | 13 | 12 | 11 | 11 | 11 | 10 | 11 | 12 | 14 | 14 | 15 | 15 | 16 | 16 | 17 | 18                             | 19.1 |
| 8-Dec                                                                                                                                                          | 19                            | 20 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 27 | 27 | 27 | 26 | 26 | 26 | 25 | 24 | 23 | 22 | 21 | 20                             | 27.2 |
| 9-Dec                                                                                                                                                          | 18                            | 17 | 16 | 14 | 12 | 12 | 10 | 7  | 6  | 4  | 3  | 3  | 5  | 5  | 6  | 7  | 8  | 8  | 7  | 7  | 6  | 5  | 4  | 3                              | 18.4 |
| 10-Dec                                                                                                                                                         | 3                             | 4  | 4  | 4  | 4  | 4  | 4  | 3  | 3  | 2  | 3  | 4  | 6  | 8  | 10 | 12 | 13 | 14 | 16 | 17 | 18 | 18 | 18 | 20                             | 19.7 |
| 11-Dec                                                                                                                                                         | 21                            | 22 | 23 | 23 | 25 | 26 | 27 | 26 | 26 | 27 | 27 | 28 | 28 | 28 | 29 | 30 | 30 | 30 | 30 | 30 | 29 | 30 | 30 | 30                             | 30.3 |
| 12-Dec                                                                                                                                                         | 31                            | 32 | 32 | 33 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 37 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 36 | 36 | 36 | 36 | 36                             | 37.0 |
| 13-Dec                                                                                                                                                         | 35                            | 35 | 35 | 34 | 32 | 30 | 25 | 22 | 19 | 19 | 16 | 14 | 14 | 15 | 17 | 17 | 17 | 15 | 14 | 12 | 10 | 7  | 6  | 4                              | 35.1 |
| 14-Dec                                                                                                                                                         | 3                             | 3  | 3  | 3  | 3  | 4  | 4  | 4  | 4  | 4  | 4  | 5  | 6  | 8  | 10 | 13 | 15 | 16 | 17 | 18 | 19 | 18 | 16 | 14                             | 18.6 |
| 15-Dec                                                                                                                                                         | 12                            | 10 | 8  | 7  | 4  | 2  | 1  | 1  | 1  | 1  | 1  | 3  | 5  | 8  | 11 | 14 | 14 | 14 | 14 | 12 | 10 | 8  | 5  | 2                              | 14.2 |
| 16-Dec                                                                                                                                                         | 2                             | 3  | 4  | 6  | 6  | 6  | 6  | 6  | 6  | 6  | 6  | 6  | 8  | 9  | 10 | 10 | 11 | 10 | 9  | 7  | 5  | 4  | 3  | 2                              | 10.6 |
| 17-Dec                                                                                                                                                         | 2                             | 2  | 2  | 2  | 2  | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 4  | 5  | 6  | 7  | 7  | 9  | 13 | 16 | 18 | 21 | 25 | 29                             | 28.8 |
| 18-Dec                                                                                                                                                         | 33                            | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 38 | 38 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 35 | 35 | 34 | 34                             | 37.8 |
| 19-Dec                                                                                                                                                         | 33                            | 32 | 31 | 31 | 33 | 34 | 34 | 34 | 35 | 36 | 37 | 37 | 37 | 37 | 37 | 37 | 36 | 36 | 36 | 36 | 35 | 35 | 35 | 35                             | 37.2 |
| 20-Dec                                                                                                                                                         | 35                            | 35 | 35 | 35 | 34 | 30 | 26 | 21 | 17 | 13 | 9  | 5  | 2  | 3  | 4  | 5  | 7  | 7  | 9  | 12 | 15 | 18 | 22 | 25                             | 35.4 |
| 21-Dec                                                                                                                                                         | 28                            | 29 | 30 | 32 | 33 | 34 | 35 | 35 | 34 | 35 | 34 | 33 | 33 | 32 | 32 | 32 | 32 | 33 | 34 | 36 | 35 | 34 | 34 | 33                             | 35.7 |
| 22-Dec                                                                                                                                                         | 34                            | 33 | 32 | 33 | 34 | 33 | 32 | 32 | 31 | 30 | 30 | 29 | 28 | 29 | 28 | 28 | 28 | 28 | 26 | 24 | 22 | 20 | 18 | 17                             | 33.6 |
| 23-Dec                                                                                                                                                         | 14                            | 12 | 11 | 12 | 13 | 14 | 15 | 17 | 19 | 21 | 23 | 25 | 25 | 26 | 27 | 27 | 27 | 27 | 27 | 26 | 25 | 24 | 23 | 22                             | 27.4 |
| 24-Dec                                                                                                                                                         | 22                            | 21 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 20 | 20 | 20 | 19 | 19 | 17 | 16 | 14 | 12                             | 21.7 |
| 25-Dec                                                                                                                                                         | 10                            | 8  | 7  | 7  | 7  | 8  | 8  | 9  | 10 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 10 | 9  | 7  | 6  | 6  | 5  | 3  | 2                              | 11.2 |
| 26-Dec                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 2  | 2  | 2  | 3  | 2  | 2  | 2  | 2  | 1  | 1  | 1                              | 2.5  |
| 27-Dec                                                                                                                                                         | 0                             | 0  | 0  | 0  | 1  | 2  | 3  | 5  | 6  | 9  | 10 | 14 | 18 | 22 | 24 | 28 | 32 | 34 | 35 | 36 | 36 | 37 | 37 | 37                             | 37.1 |
| 28-Dec                                                                                                                                                         | 37                            | 37 | 37 | 37 | 37 | 36 | 36 | 35 | 35 | 35 | 34 | 34 | 34 | 34 | 35 | 35 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 37                             | 37.0 |
| 29-Dec                                                                                                                                                         | 37                            | 37 | 36 | 36 | 33 | 29 | 26 | 25 | 24 | 21 | 19 | 18 | 19 | 22 | 23 | 21 | 20 | 18 | 16 | 13 | 10 | 8  | 8  | 9                              | 36.5 |
| 30-Dec                                                                                                                                                         | 9                             | 9  | 11 | 14 | 16 | 16 | 14 | 13 | 14 | 16 | 17 | 18 | 20 | 24 | 28 | 28 | 30 | 32 | 34 | 34 | 34 | 34 | 34 | 34                             | 34.4 |
| 31-Dec                                                                                                                                                         | 33                            | 33 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 32 | 32 | 32 | 30 | 31 | 31 | 32 | 32 | 32 | 34 | 34 | 35 | 34 | 34 | 33                             | 35.0 |
| 37.0 37.0 36.9 37.1 37.3 37.5 37.7 37.8 37.7 37.6 37.2 37.2 37.1 37.0 37.1 37.2 37.2 37.1 37.3 37.2 36.2 36.7 37.1 37.1                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximums               |      |
| N - Not Valid                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |      |

## Span Responses

Ozone (O<sub>3</sub>)  
Henry Pirker - December 2016



# Hourly Averages

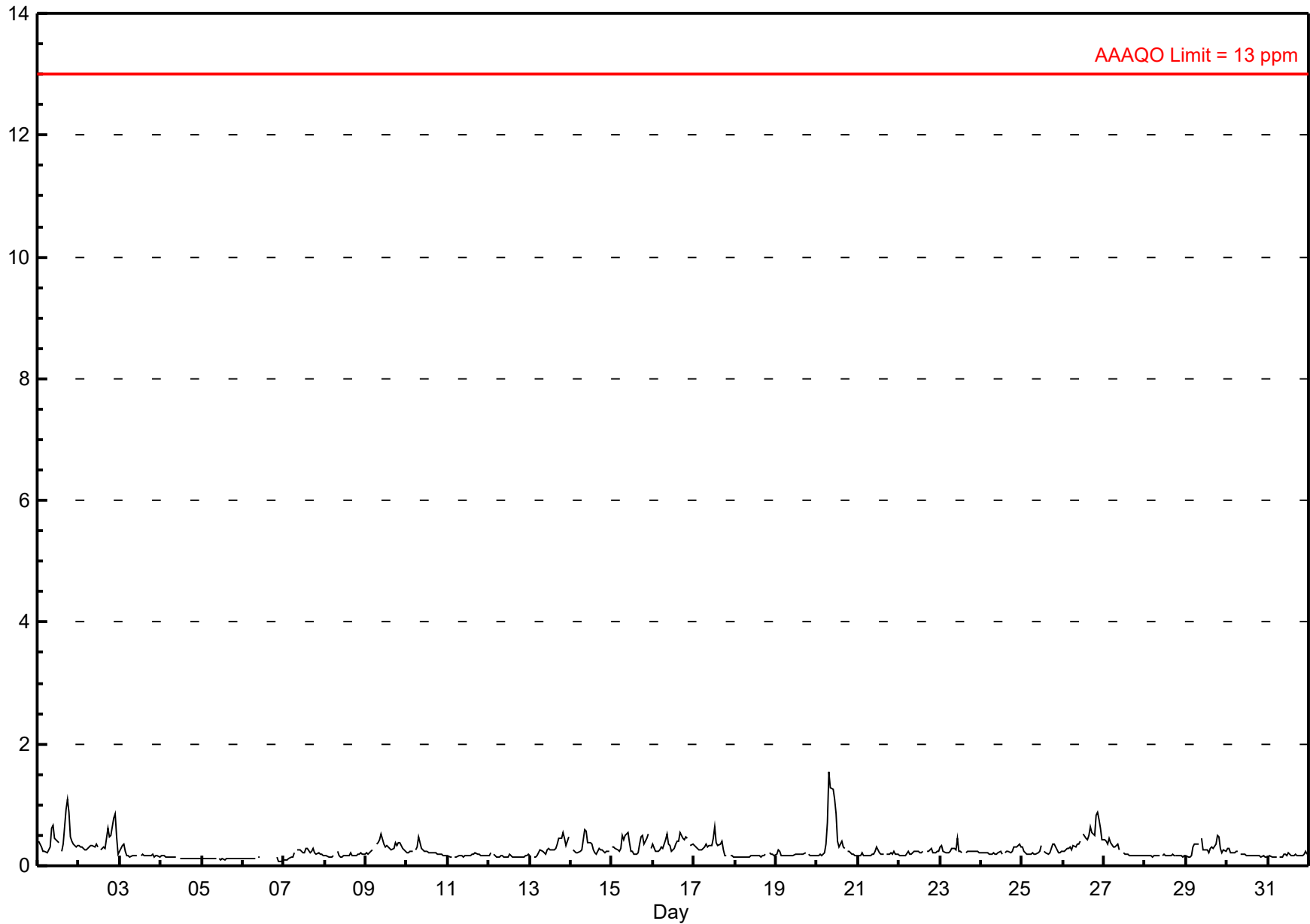
Carbon Monoxide (CO) - ppm

Henry Pirker - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 1.54 ppm on Dec 20 08:00 Maximum Daily Average: 0.47 ppm on Dec 20                                                                                                                                                                                                                                       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Hours in Service: 744<br>Hours of Data: 706<br>Hours of Missing Data: 38<br>Hours of Calibration: 35<br>Percent Operational Time: 99.6 |               |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 0.0 ppm on Dec 6 15:00 Minimum Daily Average: 0.11 ppm on Dec 5<br>Maximum Diurnal Average: 0.31 ppm at hour 10 Minimum Diurnal Average: 0.20 ppm at hour 5<br>Monthly Average: 0.249 ppm Percentiles: P <sub>1</sub> = 0.10 P <sub>10</sub> = 0.14 Q <sub>1</sub> = 0.16 Median = 0.21 Q <sub>3</sub> = 0.29 P <sub>90</sub> = 0.41 P <sub>99</sub> = 0.84 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                        |               |               |
| Day                                                                                                                                                                                                                                                                                                                                                                        | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                        | Daily Average | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24                                                                                                                                     |               |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.4                           | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.6 | 0.7 | 0.4 | 0.4 | 0.4 | A   | 0.2 | 0.3 | 0.9 | 1.1 | 0.9 | 0.5 | 0.4 | 0.4 | 0.3 | 0.3                                                                                                                                    | 0.44          | 1.08          |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.3                           | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | A   | 0.3 | 0.3 | 0.4 | 0.6 | 0.5 | 0.5 | 0.8 | 0.8 | 0.5 | 0.2                                                                                                                                    | 0.38          | 0.84          |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.2                           | 0.3 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1                                                                                                                                    | 0.19          | 0.36          |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.2                           | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | A   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1                                                                                                                                    | 0.13          | 0.17          |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | A   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1                                                                                                                                    | 0.11          | 0.13          |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | A   | 0.1 | 0.1 | C   | C   | C   | 0.0 | 0.0 | 0.0 | P   | P   | P   | 0.1 | 0.1 | 0.1 | 0.1                                                                                                                                    | --            | 0.15          |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | A   | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.20          | 0.29          |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.2                           | 0.2 | 0.1 | 0.2 | 0.1 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.17          | 0.23          |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.3 | A   | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 | 0.3 | 0.3 | 0.2 | 0.2                                                                                                                                    | 0.31          | 0.52          |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | A   | 0.3 | 0.3 | 0.5 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.23          | 0.46          |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.1 | 0.2 | A   | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.17          | 0.21          |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | A   | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.16          | 0.21          |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | A   | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.3 | 0.4 | 0.5                                                                                                                                    | 0.30          | 0.54          |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                                     | A                             | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 0.6 | 0.6 | 0.4 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | A                                                                                                                                      | 0.30          | 0.59          |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.3                           | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 | 0.5 | 0.4 | 0.5 | 0.6 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | A   | 0.3                                                                                                                                    | 0.35          | 0.55          |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.4                           | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | 0.3 | 0.3 | 0.2 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 | A   | 0.3 | 0.4                                                                                                                                    | 0.36          | 0.54          |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.3                           | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 | 0.5 | 0.6 | 0.4 | 0.3 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.30          | 0.64          |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.16          | 0.22          |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.18          | 0.25          |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.4 | 0.7 | 1.5 | 1.3 | 1.2 | 1.1 | 0.8 | 0.4 | 0.3 | 0.4 | 0.3 | 0.3 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.47          | 1.54          |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.19          | 0.30          |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.22          | 0.28          |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.3                           | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.5 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.25          | 0.46          |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3                                                                                                                                    | 0.24          | 0.36          |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.3                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.24          | 0.35          |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | A   | 0.5 | 0.4 | 0.4 | 0.5 | 0.6 | 0.6 | 0.5 | 0.8 | 0.9 | 0.8 | 0.6 | 0.4                                                                                                                                    | 0.45          | 0.87          |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.4                           | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.25          | 0.45          |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.17          | 0.18          |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.2                           | 0.2 | 0.1 | 0.2 | 0.3 | 0.3 | 0.4 | 0.3 | A   | 0.4 | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | 0.5 | 0.3 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.29          | 0.49          |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.3                           | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.1 | 0.1                                                                                                                                    | 0.19          | 0.29          |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                                     | 0.1                           | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | A   | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                    | 0.17          | 0.23          |
| 0.22 0.22 0.21 0.20 0.20 0.21 0.25 0.30 0.31 0.31 0.28 0.26 0.25 0.23 0.22 0.22 0.27 0.29 0.28 0.28 0.27 0.25 0.23 0.21                                                                                                                                                                                                                                                    |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Diurnal Average                                                                                                                        |               |               |
| 0.42 0.41 0.36 0.45 0.39 0.36 0.71 1.54 1.29 1.25 1.08 0.84 0.64 0.44 0.42 0.49 0.92 1.08 0.87 0.83 0.87 0.84 0.63 0.48                                                                                                                                                                                                                                                    |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Diurnal Maximum                                                                                                                        |               |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                                                                                                                                                                                                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                        |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm 24-hr na                                                                                                                                                                                                                                                                                                       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                        |               |               |

## Hourly Averages

Carbon Monoxide (CO) - ppm  
Henry Pirker - December 2016

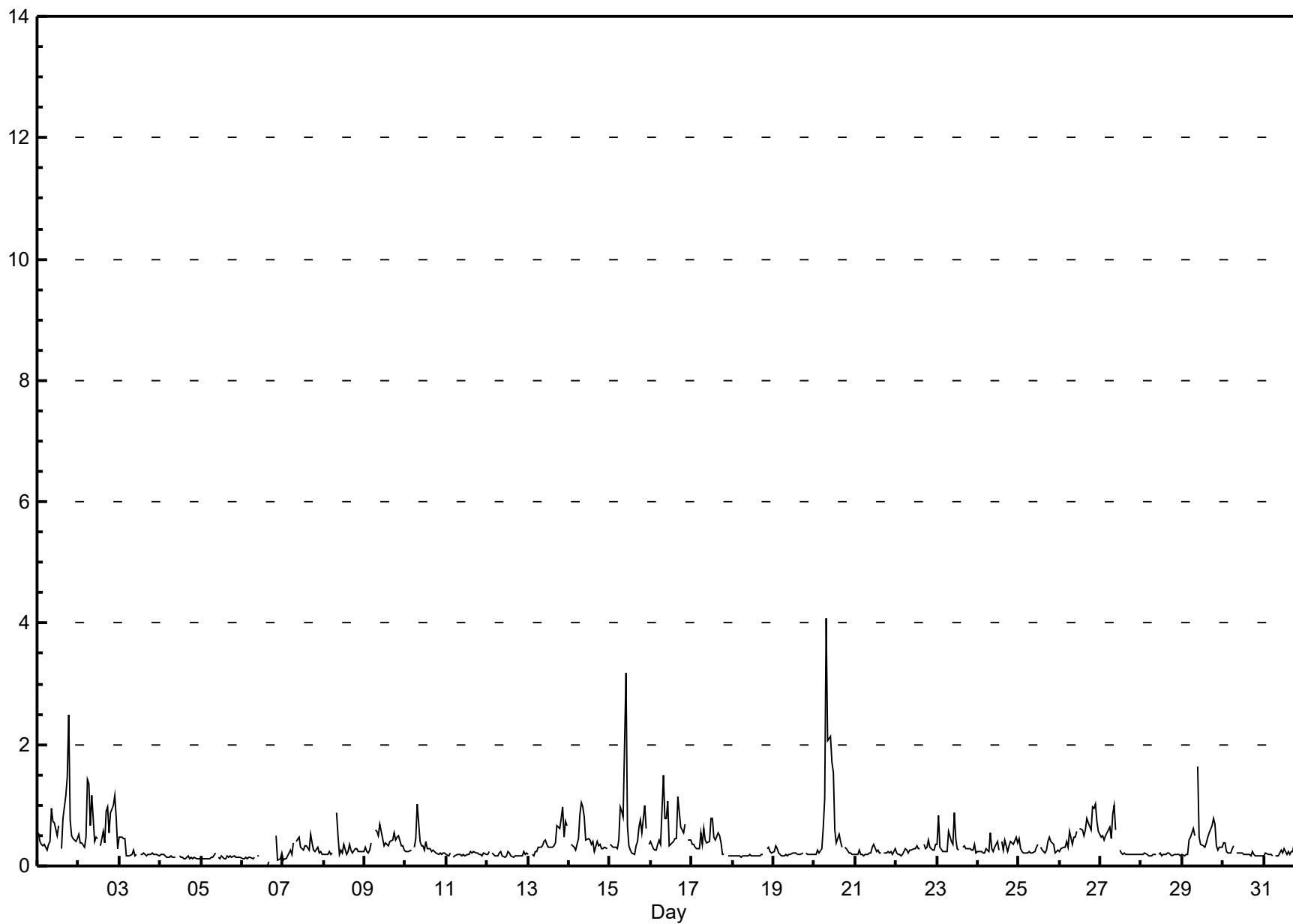


## Henry Pirker - December 2016

| Maximum Value: 4.08 ppm on Dec 20 08:00     |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.78 ppm on Dec 20                                                                                                                         |     |     |     |                   | Hours in Service: 744          |                               |  |
|---------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-------------------|--------------------------------|-------------------------------|--|
| Minimum Value: 0.0 ppm on Dec 6 15:00       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.14 ppm on Dec 5                                                                                                                          |     |     |     |                   | Hours of Data: 706             |                               |  |
| Maximum Diurnal Average: 0.59 ppm at hour 8 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.24 ppm at hour 4                                                                                                                       |     |     |     |                   | Hours of Missing Data: 38      |                               |  |
| Monthly Average: 0.349 ppm                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.12 P <sub>10</sub> = 0.16 Q <sub>1</sub> = 0.19 Median = 0.25 Q <sub>3</sub> = 0.40 P <sub>90</sub> = 0.62 P <sub>99</sub> = 1.61 |     |     |     |                   | Hours of Calibration: 35       |                               |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                   | Percent Operational Time: 99.6 |                               |  |
| Day                                         | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                   | Daily Average                  | Daily Maximum                 |  |
|                                             | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20                                                                                                                                                                | 21  | 22  | 23  | 24                |                                |                               |  |
| 1-Dec                                       | 0.5                           | 0.4 | 0.4 | 0.3 | 0.4 | 0.2 | 0.4 | 0.4 | 0.9 | 0.7 | 0.7 | 0.5 | 0.7 | A   | 0.3 | 0.8 | 1.2 | 1.5 | 2.5 | 0.8                                                                                                                                                               | 0.5 | 0.4 | 0.4 | 0.5               | 0.66                           | 2.49                          |  |
| 2-Dec                                       | 0.5                           | 0.4 | 0.4 | 0.3 | 0.5 | 1.4 | 1.4 | 0.7 | 1.2 | 0.4 | 0.5 | 0.5 | A   | 0.3 | 0.6 | 0.4 | 0.9 | 1.0 | 0.5 | 0.9                                                                                                                                                               | 1.0 | 1.2 | 0.8 | 0.3               | 0.69                           | 1.41                          |  |
| 3-Dec                                       | 0.5                           | 0.5 | 0.5 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.24                           | 0.47                          |  |
| 4-Dec                                       | 0.2                           | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | A   | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1                                                                                                                                                               | 0.1 | 0.1 | 0.1 | 0.1               | 0.15                           | 0.18                          |  |
| 5-Dec                                       | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | A   | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.1 | 0.2                                                                                                                                                               | 0.1 | 0.1 | 0.1 | 0.1               | 0.14                           | 0.22                          |  |
| 6-Dec                                       | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | A   | 0.2 | 0.2 | C   | C   | C   | 0.0 | 0.0 | 0.1 | P   | P   | P                                                                                                                                                                 | 0.5 | 0.1 | 0.1 | 0.2               | --                             | 0.50                          |  |
| 7-Dec                                       | 0.1                           | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.4 | A   | 0.4 | 0.5 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.5 | 0.4 | 0.3 | 0.2                                                                                                                                                               | 0.3 | 0.2 | 0.2 | 0.2               | 0.28                           | 0.53                          |  |
| 8-Dec                                       | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.9 | 0.5 | 0.2 | 0.3 | 0.2 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.28                           | 0.88                          |  |
| 9-Dec                                       | 0.3                           | 0.2 | 0.2 | 0.3 | 0.4 | A   | 0.6 | 0.6 | 0.5 | 0.7 | 0.5 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.5 | 0.4 | 0.5                                                                                                                                                               | 0.5 | 0.3 | 0.3 | 0.3               | 0.28                           | 0.69                          |  |
| 10-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.3 | A   | 0.3 | 0.4 | 1.0 | 0.4 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.3 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.30                           | 1.02                          |  |
| 11-Dec                                      | 0.2                           | 0.2 | 0.2 | A   | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.19                           | 0.23                          |  |
| 12-Dec                                      | 0.2                           | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.19                           | 0.24                          |  |
| 13-Dec                                      | 0.2                           | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.7 | 0.6 | 0.8                                                                                                                                                               | 1.0 | 0.5 | 0.7 | 0.7               | 0.42                           | 0.97                          |  |
| 14-Dec                                      | A                             | 0.3 | 0.3 | 0.3 | 0.3 | 0.5 | 0.8 | 1.0 | 1.0 | 0.8 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | 0.4 | 0.3 | 0.4 | 0.3                                                                                                                                                               | 0.3 | 0.3 | 0.3 | A                 | 0.45                           | 1.03                          |  |
| 15-Dec                                      | 0.4                           | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 1.0 | 0.9 | 0.8 | 3.2 | 0.7 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.4 | 0.6 | 0.8 | 0.6                                                                                                                                                               | 1.0 | 0.6 | A   | 0.4               | 0.62                           | 3.17                          |  |
| 16-Dec                                      | 0.4                           | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 1.5 | 0.8 | 0.8 | 1.1 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 1.1 | 0.7 | 0.6 | 0.5                                                                                                                                                               | 0.7 | A   | 0.4 | 0.4               | 0.56                           | 1.49                          |  |
| 17-Dec                                      | 0.4                           | 0.4 | 0.3 | 0.3 | 0.3 | 0.5 | 0.3 | 0.6 | 0.4 | 0.4 | 0.4 | 0.8 | 0.8 | 0.5 | 0.4 | 0.6 | 0.5 | 0.4 | 0.2 | 0.2                                                                                                                                                               | A   | 0.2 | 0.2 | 0.2               | 0.40                           | 0.78                          |  |
| 18-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A                                                                                                                                                                 | 0.3 | 0.3 | 0.2 | 0.2               | 0.18                           | 0.30                          |  |
| 19-Dec                                      | 0.2                           | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.21                           | 0.33                          |  |
| 20-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.3 | 0.6 | 1.1 | 4.1 | 2.1 | 2.1 | 1.7 | 1.6 | 0.6 | 0.4 | 0.5 | 0.4 | 0.3 | A   | 0.3 | 0.3                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.78                           | 4.08                          |  |
| 21-Dec                                      | 0.2                           | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 0.2 | 0.3 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.3               | 0.23                           | 0.37                          |  |
| 22-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | A   | 0.3 | 0.3 | 0.3 | 0.4                                                                                                                                                               | 0.3 | 0.3 | 0.3 | 0.3               | 0.27                           | 0.42                          |  |
| 23-Dec                                      | 0.4                           | 0.8 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.6 | 0.4 | 0.4 | 0.9 | 0.5 | 0.3 | 0.3 | A   | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                                                                                                                                                               | 0.3 | 0.3 | 0.4 | 0.2               | 0.36                           | 0.89                          |  |
| 24-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.5 | 0.3 | 0.2 | 0.3 | 0.4 | 0.3 | A   | 0.4 | 0.3 | 0.4 | 0.2 | 0.3 | 0.4                                                                                                                                                               | 0.4 | 0.4 | 0.5 | 0.4               | 0.32                           | 0.54                          |  |
| 25-Dec                                      | 0.5                           | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | A   | 0.3 | 0.3 | 0.2 | 0.3 | 0.4 | 0.5 | 0.4                                                                                                                                                               | 0.4 | 0.2 | 0.2 | 0.3               | 0.29                           | 0.47                          |  |
| 26-Dec                                      | 0.2                           | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.6 | 0.3 | 0.5 | 0.5 | 0.6 | A   | 0.6 | 0.6 | 0.5 | 0.6 | 0.8 | 0.7 | 0.6 | 1.0                                                                                                                                                               | 1.0 | 1.0 | 0.7 | 0.6               | 0.56                           | 1.02                          |  |
| 27-Dec                                      | 0.5                           | 0.5 | 0.4 | 0.5 | 0.5 | 0.6 | 0.5 | 0.9 | 1.0 | 0.6 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.37                           | 1.00                          |  |
| 28-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.19                           | 0.22                          |  |
| 29-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.4 | 0.5 | 0.6 | 0.5 | A   | 1.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.4 | 0.5 | 0.5 | 0.7 | 0.8 | 0.7                                                                                                                                                               | 0.3 | 0.3 | 0.3 | 0.3               | 0.46                           | 1.64                          |  |
| 30-Dec                                      | 0.4                           | 0.4 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | A   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.2 | 0.2               | 0.22                           | 0.38                          |  |
| 31-Dec                                      | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | A   | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.4 | 0.2                                                                                                                                                               | 0.2 | 0.2 | 0.3 | 0.2               | 0.22                           | 0.38                          |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Average   |                                |                               |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Maximum   |                                |                               |  |
| C - Calibration                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | P - Power Failure |                                | A - Automated Daily Zero Span |  |

## Hourly Maximums

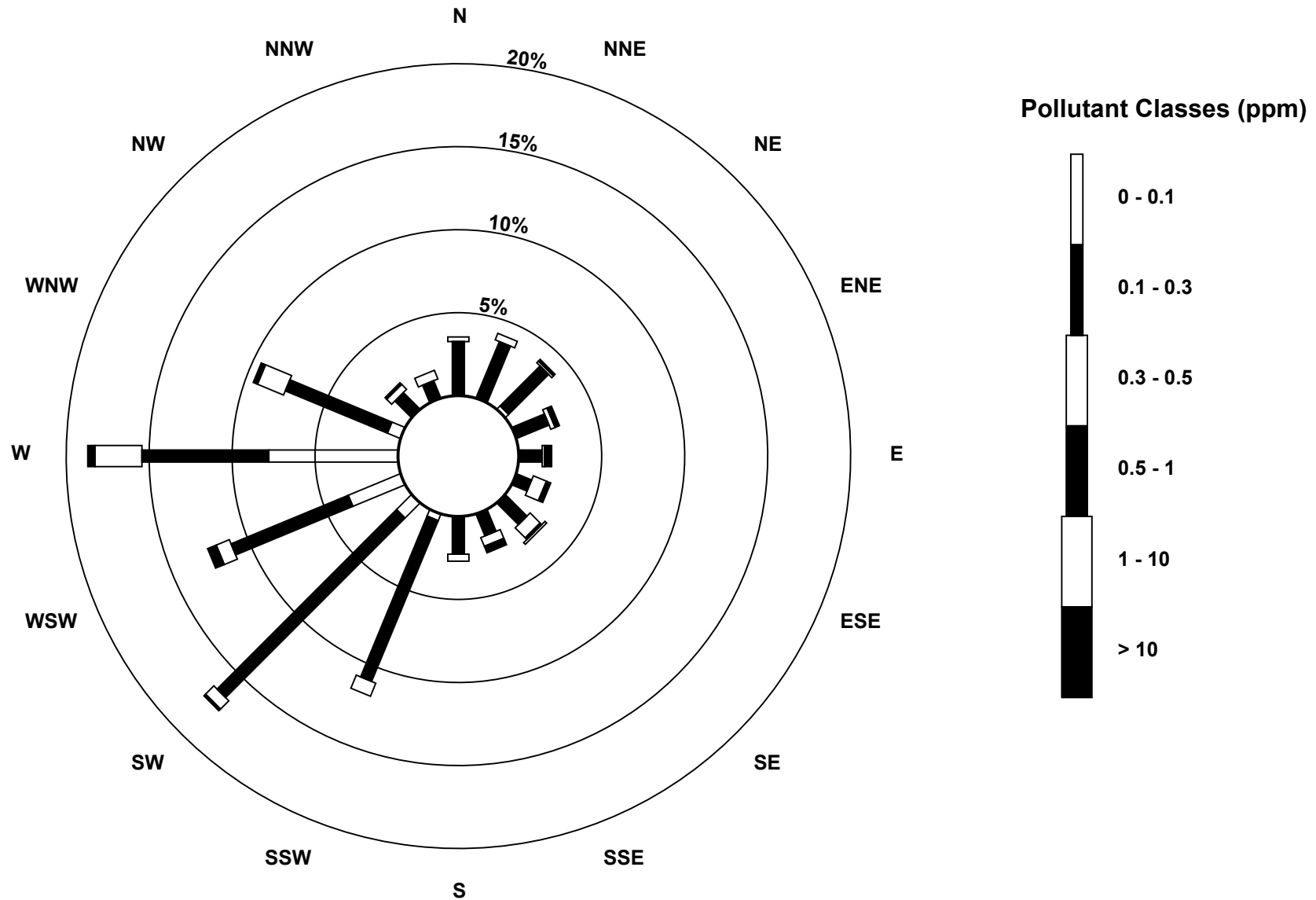
Carbon Monoxide (CO) - ppm  
Henry Pirker - December 2016





# Pollutant Rose

Carbon Monoxide (CO) - ppm  
Henry Pirker - December 2016



# Eight Hour Running Averages

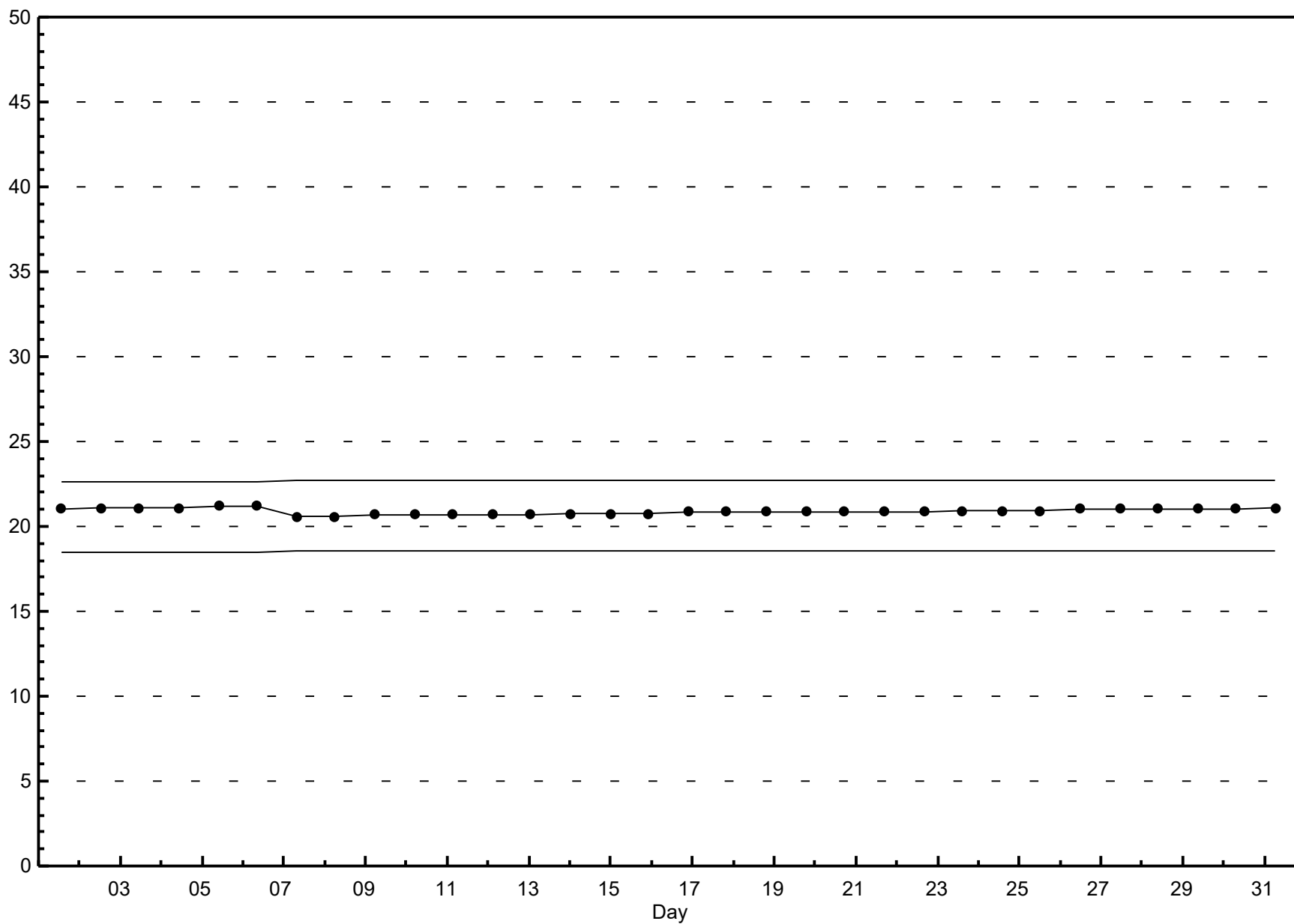
Carbon Monoxide (CO) - ppm

Henry Pirker - December 2016

| Number of Exceedences (AAAQO): 8-hr: 0<br>Maximum Value: 0.94 ppm on Dec 20 13:00                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Hours in Service: 744<br>Hours of Data: 731<br>Hours of Missing Data: 13<br>Hours of Calibration: 9<br>Percent Operational Time: 99.5 |     |     |     |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------|
| Minimum Value: 0.10 ppm on Dec 7 02:00                                                                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     |               |
| Percentiles: P <sub>1</sub> = 0.11 P <sub>10</sub> = 0.15 Q <sub>1</sub> = 0.17 Median = 0.22 Q <sub>3</sub> = 0.30 P <sub>90</sub> = 0.40 P <sub>99</sub> = 0.70 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     |               |
| Day                                                                                                                                                               | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     | Daily Maximum |
|                                                                                                                                                                   | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                    | 22  | 23  | 24  |               |
| 1-Dec                                                                                                                                                             | 0.5                           | 0.5 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6                                                                                                                                   | 0.6 | 0.6 | 0.6 | 0.62          |
| 2-Dec                                                                                                                                                             | 0.5                           | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5                                                                                                                                   | 0.5 | 0.6 | 0.5 | 0.55          |
| 3-Dec                                                                                                                                                             | 0.5                           | 0.5 | 0.5 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.52          |
| 4-Dec                                                                                                                                                             | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1                                                                                                                                   | 0.1 | 0.1 | 0.1 | 0.16          |
| 5-Dec                                                                                                                                                             | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1                                                                                                                                   | 0.1 | 0.1 | 0.1 | 0.12          |
| 6-Dec                                                                                                                                                             | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | N   | N   | N   | N   | N   | N   | N   | N   | N                                                                                                                                     | N   | N   | N   | 0.13          |
| 7-Dec                                                                                                                                                             | N                             | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.25          |
| 8-Dec                                                                                                                                                             | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.20          |
| 9-Dec                                                                                                                                                             | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                                                                                                                                   | 0.3 | 0.3 | 0.3 | 0.38          |
| 10-Dec                                                                                                                                                            | 0.3                           | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.31          |
| 11-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.18          |
| 12-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.17          |
| 13-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4                                                                                                                                   | 0.4 | 0.4 | 0.4 | 0.43          |
| 14-Dec                                                                                                                                                            | 0.4                           | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.45          |
| 15-Dec                                                                                                                                                            | 0.3                           | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                                                                                                                                   | 0.3 | 0.4 | 0.4 | 0.41          |
| 16-Dec                                                                                                                                                            | 0.4                           | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4                                                                                                                                   | 0.4 | 0.4 | 0.4 | 0.45          |
| 17-Dec                                                                                                                                                            | 0.4                           | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3                                                                                                                                   | 0.3 | 0.2 | 0.2 | 0.40          |
| 18-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.18          |
| 19-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.21          |
| 20-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 0.6 | 0.7 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3                                                                                                                                   | 0.3 | 0.2 | 0.2 | 0.94          |
| 21-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.21          |
| 22-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.24          |
| 23-Dec                                                                                                                                                            | 0.2                           | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.29          |
| 24-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3                                                                                                                                   | 0.3 | 0.3 | 0.3 | 0.29          |
| 25-Dec                                                                                                                                                            | 0.3                           | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3                                                                                                                                   | 0.3 | 0.3 | 0.3 | 0.30          |
| 26-Dec                                                                                                                                                            | 0.3                           | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6                                                                                                                                   | 0.6 | 0.7 | 0.6 | 0.66          |
| 27-Dec                                                                                                                                                            | 0.6                           | 0.6 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.62          |
| 28-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.17          |
| 29-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3                                                                                                                                   | 0.3 | 0.3 | 0.3 | 0.34          |
| 30-Dec                                                                                                                                                            | 0.3                           | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.32          |
| 31-Dec                                                                                                                                                            | 0.2                           | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2                                                                                                                                   | 0.2 | 0.2 | 0.2 | 0.18          |
| 0.62 0.61 0.59 0.54 0.48 0.42 0.39 0.44 0.58 0.71 0.83 0.91 0.94 0.93 0.89 0.73 0.61 0.55 0.61 0.62 0.62 0.63 0.66 0.65                                           |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     |               |
| Diurnal Maximums                                                                                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     |               |
| N - Not Valid                                                                                                                                                     |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 8-hr 5 ppm                                                                                                        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                       |     |     |     |               |

## Span Responses

**Carbon Monoxide (CO)**  
**Henry Pirker - December 2016**



# Hourly Averages

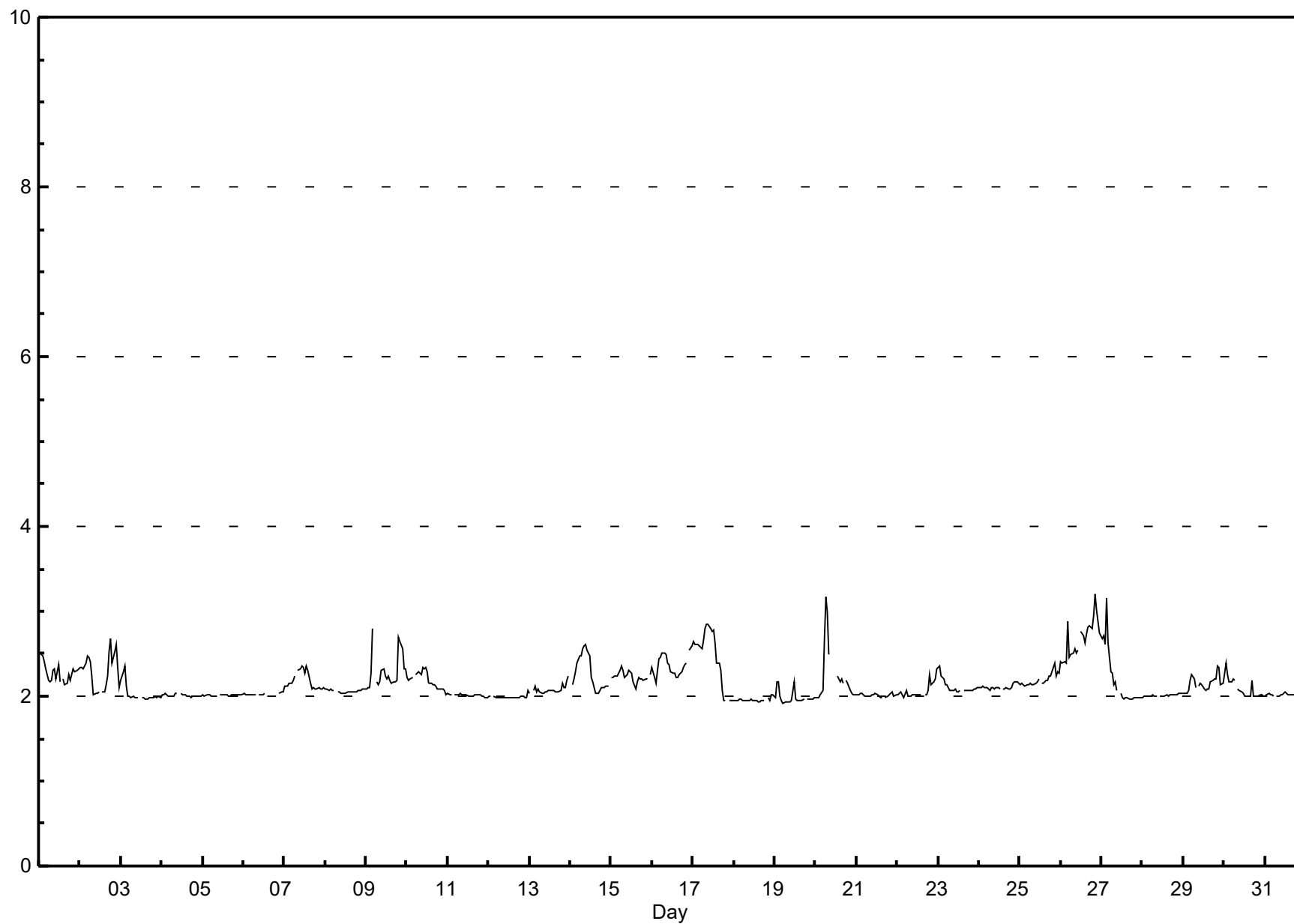
Total Hydrocarbons (THC) - ppm

Henry Pirker - December 2016

| Maximum Value: 3.20 ppm on Dec 26 21:00                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.68 ppm on Dec 26                                                                                                                         |     |     |     | Hours in Service: 744     |               |      |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------------------|---------------|------|
| Minimum Value: 1.9 ppm on Dec 19 06:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 1.96 ppm on Dec 18                                                                                                                         |     |     |     | Hours of Data: 701        |               |      |
| Maximum Diurnal Average: 2.20 ppm at hour 7                                                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 2.10 ppm at hour 15                                                                                                                      |     |     |     | Hours of Missing Data: 43 |               |      |
| Monthly Average: 2.149 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 1.94 P <sub>10</sub> = 1.98 Q <sub>1</sub> = 2.01 Median = 2.07 Q <sub>3</sub> = 2.22 P <sub>90</sub> = 2.40 P <sub>99</sub> = 2.85 |     |     |     | Hours of Calibration: 39  |               |      |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.5                                                                                                                                    |     |     |     |                           |               |      |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Daily Average             | Daily Maximum |      |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                | 22  | 23  | 24  |                           |               |      |
| 1-Dec                                                                                                                   | 2.5                           | 2.5 | 2.5 | 2.4 | 2.3 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.2 | 2.4 | 2.2 | A   | 2.0 | 2.2 | 2.1 | 2.2 | 2.3 | 2.2 | 2.3                                                                                                                                                               | 2.3 | 2.3 | 2.3 | 2.29                      | 2.51          |      |
| 2-Dec                                                                                                                   | 2.3                           | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.4 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0 | A   | A   | 2.0 | 2.1 | 2.1 | 2.2 | 2.5 | 2.7 | 2.4                                                                                                                                                               | 2.5 | 2.6 | 2.3 | 2.1                       | 2.29          | 2.68 |
| 3-Dec                                                                                                                   | 2.2                           | 2.3 | 2.4 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.03                      | 2.36          |      |
| 4-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.01                      | 2.04          |      |
| 5-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.01                      | 2.02          |      |
| 6-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | C   | C   | C   | 2.0 | P   | P   | P   | P                                                                                                                                                                 | 2.0 | 2.0 | 2.1 | --                        | 2.06          |      |
| 7-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.2 | A   | 2.3 | 2.3 | 2.4 | 2.3 | 2.3 | 2.4 | 2.3 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.18                      | 2.36          |      |
| 8-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.06                      | 2.09          |      |
| 9-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.3 | 2.8 | A   | 2.2 | 2.1 | 2.2 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.7 | 2.6                                                                                                                                                               | 2.6 | 2.3 | 2.3 | 2.29                      | 2.80          |      |
| 10-Dec                                                                                                                  | 2.2                           | 2.2 | 2.2 | 2.2 | A   | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.0 | 2.19                      | 2.34          |      |
| 11-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.01                      | 2.03          |      |
| 12-Dec                                                                                                                  | 2.0                           | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.1 | 1.99                      | 2.07          |      |
| 13-Dec                                                                                                                  | 2.0                           | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.2 | 2.2 | 2.08                      | 2.24          |      |
| 14-Dec                                                                                                                  | A                             | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | 2.6 | 2.6 | 2.5 | 2.5 | 2.2 | 2.2 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | A   | 2.27                      | 2.61          |      |
| 15-Dec                                                                                                                  | 2.2                           | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.4 | 2.3 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2                                                                                                                                                               | 2.2 | A   | 2.3 | 2.24                      | 2.35          |      |
| 16-Dec                                                                                                                  | 2.3                           | 2.2 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4                                                                                                                                                               | A   | 2.5 | 2.6 | 2.36                      | 2.59          |      |
| 17-Dec                                                                                                                  | 2.6                           | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.7 | 2.8 | 2.8 | 2.9 | 2.8 | 2.8 | 2.8 | 2.6 | 2.4 | 2.4 | 2.3 | 2.1 | 1.9 | 1.9 | A                                                                                                                                                                 | 1.9 | 1.9 | 2.0 | 2.46                      | 2.86          |      |
| 18-Dec                                                                                                                  | 2.0                           | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 1.96                      | 2.02          |      |
| 19-Dec                                                                                                                  | 2.0                           | 2.2 | 2.2 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.2 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 1.98                      | 2.17          |      |
| 20-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.1 | 2.7 | 3.2 | 3.0 | 2.5 | C   | C   | C   | C   | 2.2 | 2.2 | 2.2 | 2.2 | A   | 2.2 | 2.1 | 2.1                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.24                      | 3.16          |      |
| 21-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.0 | 2.0 | 2.01                      | 2.06          |      |
| 22-Dec                                                                                                                  | 2.0                           | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 2.3 | 2.1                                                                                                                                                               | 2.2 | 2.2 | 2.3 | 2.06                      | 2.33          |      |
| 23-Dec                                                                                                                  | 2.3                           | 2.3 | 2.2 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.11                      | 2.35          |      |
| 24-Dec                                                                                                                  | 2.1                           | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2                                                                                                                                                               | 2.2 | 2.2 | 2.2 | 2.11                      | 2.18          |      |
| 25-Dec                                                                                                                  | 2.1                           | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | A   | 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.3                                                                                                                                                               | 2.4 | 2.2 | 2.3 | 2.19                      | 2.39          |      |
| 26-Dec                                                                                                                  | 2.4                           | 2.4 | 2.4 | 2.4 | 2.9 | 2.5 | 2.5 | 2.5 | 2.6 | 2.5 | 2.5 | A   | 2.8 | 2.7 | 2.6 | 2.7 | 2.8 | 2.8 | 2.8 | 3.0 | 3.2                                                                                                                                                               | 3.0 | 2.9 | 2.8 | 2.68                      | 3.20          |      |
| 27-Dec                                                                                                                  | 2.7                           | 2.7 | 2.6 | 3.1 | 2.6 | 2.3 | 2.3 | 2.1 | 2.2 | 2.1 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.20                      | 3.15          |      |
| 28-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.01                      | 2.03          |      |
| 29-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.1 | 2.2 | 2.2 | 2.2 | 2.1 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.4                                                                                                                                                               | 2.3 | 2.1 | 2.2 | 2.15                      | 2.35          |      |
| 30-Dec                                                                                                                  | 2.3                           | 2.4 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | A   | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.09                      | 2.39          |      |
| 31-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.03                      | 2.10          |      |
| 2.16 2.17 2.17 2.18 2.19 2.18 2.20 2.17 2.17 2.16 2.16 2.14 2.13 2.12 2.10 2.10 2.11 2.11 2.12 2.15 2.17 2.14 2.13 2.13 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Average           |               |      |
| 2.69 2.71 2.62 3.15 2.89 2.68 3.16 2.98 2.84 2.86 2.80 2.76 2.78 2.71 2.63 2.73 2.81 2.83 2.79 2.95 3.20 3.02 2.88 2.75 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Maximum           |               |      |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                           |               |      |

## Hourly Averages

Total Hydrocarbons (THC) - ppm  
Henry Pirker - December 2016



# Hourly Maximums

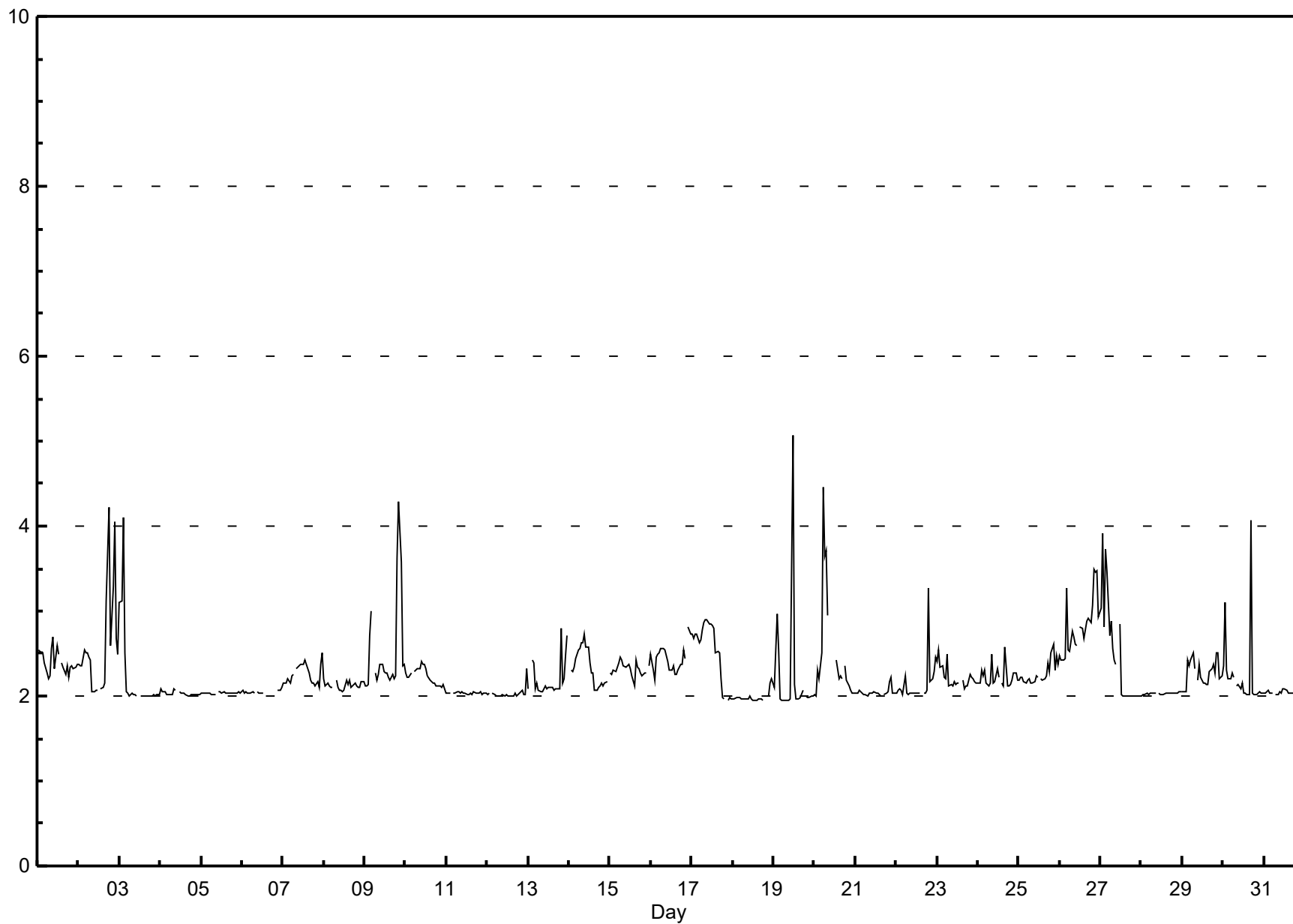
Total Hydrocarbons (THC) - ppm

Henry Pirker - December 2016

| Maximum Value: 5.07 ppm on Dec 19 12:00                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.82 ppm on Dec 26                                                                                                                         |     |     |     | Hours in Service: 744     |                 |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|---------------------------|-----------------|---------------|
| Minimum Value: 1.9 ppm on Dec 19 06:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 1.99 ppm on Dec 18                                                                                                                         |     |     |     | Hours of Data: 701        |                 |               |
| Maximum Diurnal Average: 2.33 ppm at hour 12                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 2.14 ppm at hour 15                                                                                                                      |     |     |     | Hours of Missing Data: 43 |                 |               |
| Monthly Average: 2.254 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 1.96 P <sub>10</sub> = 2.01 Q <sub>1</sub> = 2.03 Median = 2.14 Q <sub>3</sub> = 2.35 P <sub>90</sub> = 2.61 P <sub>99</sub> = 4.05 |     |     |     | Hours of Calibration: 39  |                 |               |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.5                                                                                                                                    |     |     |     |                           |                 |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                           | Daily Average   | Daily Maximum |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20                                                                                                                                                                | 21  | 22  | 23  | 24                        |                 |               |
| 1-Dec                                                                                                                   | 2.5                           | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.2 | 2.2 | 2.6 | 2.7 | 2.3 | 2.6 | 2.5 | A   | 2.4 | 2.3 | 2.3 | 2.4 | 2.2 | 2.3                                                                                                                                                               | 2.3 | 2.3 | 2.3 | 2.4                       | 2.40            | 2.69          |
| 2-Dec                                                                                                                   | 2.4                           | 2.4 | 2.3 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.1 | 2.1 | 2.2 | 3.1 | 3.7 | 4.2 | 2.6                                                                                                                                                               | 3.3 | 4.1 | 2.7 | 2.5                       | 2.62            | 4.22          |
| 3-Dec                                                                                                                   | 3.1                           | 3.1 | 4.1 | 2.5 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.0                       | 2.22            | 4.10          |
| 4-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | A   | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.0                       | 2.03            | 2.08          |
| 5-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.1 | 2.0                       | 2.03            | 2.05          |
| 6-Dec                                                                                                                   | 2.1                           | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | A   | 2.1 | 2.0 | 2.0 | 2.0 | C   | C   | C   | 2.0 | P   | P   | P                                                                                                                                                                 | P   | 2.1 | 2.1 | 2.1                       | --              | 2.10          |
| 7-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.3 | A   | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.3 | 2.2 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.2 | 2.1 | 2.4 | 2.5                       | 2.26            | 2.51          |
| 8-Dec                                                                                                                   | 2.2                           | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.2 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.2 | 2.2                       | 2.12            | 2.19          |
| 9-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.7 | 3.0 | A   | 2.3 | 2.2 | 2.3 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.2 | 2.2 | 3.6                                                                                                                                                               | 4.3 | 3.6 | 2.3 | 2.4                       | 2.51            | 4.30          |
| 10-Dec                                                                                                                  | 2.3                           | 2.2 | 2.2 | 2.3 | A   | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.2 | 2.2 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.1                       | 2.23            | 2.41          |
| 11-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.0 | 2.0 | 2.0                       | 2.04            | 2.05          |
| 12-Dec                                                                                                                  | 2.0                           | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.0 | 2.0 | 2.3                       | 2.03            | 2.32          |
| 13-Dec                                                                                                                  | 2.1                           | A   | 2.4 | 2.4 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.8                                                                                                                                                               | 2.2 | 2.2 | 2.5 | 2.7                       | 2.20            | 2.80          |
| 14-Dec                                                                                                                  | A                             | 2.3 | 2.3 | 2.3 | 2.4 | 2.5 | 2.6 | 2.6 | 2.6 | 2.7 | 2.6 | 2.6 | 2.4 | 2.3 | 2.3 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.2 | 2.2 | A                         | 2.34            | 2.73          |
| 15-Dec                                                                                                                  | 2.3                           | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.5 | 2.4 | 2.4 | 2.3 | 2.3 | 2.4 | 2.3 | 2.2 | 2.1 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2                                                                                                                                                               | 2.3 | 2.3 | A   | 2.4                       | 2.32            | 2.45          |
| 16-Dec                                                                                                                  | 2.5                           | 2.3 | 2.2 | 2.5 | 2.5 | 2.5 | 2.6 | 2.6 | 2.5 | 2.5 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.5                                                                                                                                                               | 2.4 | A   | 2.8 | 2.7                       | 2.44            | 2.82          |
| 17-Dec                                                                                                                  | 2.7                           | 2.7 | 2.7 | 2.7 | 2.6 | 2.7 | 2.8 | 2.9 | 2.9 | 2.9 | 2.8 | 2.9 | 2.8 | 2.8 | 2.5 | 2.5 | 2.5 | 2.2 | 2.0 | 2.0                                                                                                                                                               | A   | 2.0 | 2.0 | 2.0                       | 2.54            | 2.90          |
| 18-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A                                                                                                                                                                 | 2.0 | 2.0 | 2.1 | 2.2                       | 1.99            | 2.21          |
| 19-Dec                                                                                                                  | 2.1                           | 2.5 | 3.0 | 2.5 | 2.0 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 5.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | A   | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.0                       | 2.21            | 5.07          |
| 20-Dec                                                                                                                  | 2.0                           | 2.0 | 2.3 | 2.2 | 2.5 | 4.5 | 3.6 | 3.7 | 3.0 | C   | C   | C   | C   | 2.4 | 2.2 | 2.2 | 2.2 | A   | 2.3 | 2.2                                                                                                                                                               | 2.1 | 2.1 | 2.0 | 2.0                       | 2.51            | 4.46          |
| 21-Dec                                                                                                                  | 2.0                           | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1                                                                                                                                                               | 2.2 | 2.2 | 2.0 | 2.0                       | 2.05            | 2.22          |
| 22-Dec                                                                                                                  | 2.0                           | 2.1 | 2.1 | 2.1 | 2.0 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 3.3                                                                                                                                                               | 2.2 | 2.2 | 2.3 | 2.5                       | 2.14            | 3.27          |
| 23-Dec                                                                                                                  | 2.4                           | 2.5 | 2.3 | 2.4 | 2.2 | 2.2 | 2.5 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 | 2.2 | A   | 2.2 | 2.1 | 2.1 | 2.1 | 2.3                                                                                                                                                               | 2.2 | 2.2 | 2.2 | 2.2                       | 2.22            | 2.55          |
| 24-Dec                                                                                                                  | 2.1                           | 2.1 | 2.3 | 2.2 | 2.3 | 2.2 | 2.1 | 2.2 | 2.5 | 2.1 | 2.2 | 2.3 | 2.2 | A   | 2.2 | 2.1 | 2.6 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.2 | 2.3 | 2.3 | 2.2                       | 2.22            | 2.58          |
| 25-Dec                                                                                                                  | 2.2                           | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | A   | 2.2 | 2.2 | 2.2 | 2.2 | 2.4 | 2.3 | 2.5                                                                                                                                                               | 2.6 | 2.3 | 2.5 | 2.4                       | 2.26            | 2.61          |
| 26-Dec                                                                                                                  | 2.5                           | 2.4 | 2.4 | 2.4 | 3.3 | 2.5 | 2.5 | 2.8 | 2.7 | 2.6 | 2.6 | A   | 2.8 | 2.8 | 2.7 | 2.8 | 2.9 | 2.9 | 2.9 | 3.1                                                                                                                                                               | 3.5 | 3.5 | 3.5 | 2.9                       | 2.82            | 3.49          |
| 27-Dec                                                                                                                  | 3.0                           | 3.9 | 2.8 | 3.7 | 3.5 | 2.7 | 2.9 | 2.6 | 2.4 | 2.4 | A   | 2.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.0                       | 2.47            | 3.92          |
| 28-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.1 | 2.1                       | 2.03            | 2.05          |
| 29-Dec                                                                                                                  | 2.1                           | 2.1 | 2.1 | 2.4 | 2.4 | 2.4 | 2.5 | 2.3 | A   | 2.2 | 2.4 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.3 | 2.3 | 2.4 | 2.3                                                                                                                                                               | 2.5 | 2.5 | 2.2 | 2.2                       | 2.27            | 2.51          |
| 30-Dec                                                                                                                  | 2.3                           | 3.1 | 2.3 | 2.2 | 2.2 | 2.3 | 2.2 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 4.1 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.1 | 2.0 | 2.0                       | 2.24            | 4.06          |
| 31-Dec                                                                                                                  | 2.0                           | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.1                       | 2.05            | 2.14          |
| 2.25 2.31 2.32 2.32 2.30 2.30 2.30 2.27 2.25 2.23 2.20 2.33 2.19 2.17 2.14 2.15 2.26 2.20 2.22 2.29 2.31 2.28 2.23 2.24 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                           | Diurnal Average |               |
| 3.10 3.92 4.10 3.73 3.47 4.46 3.64 3.71 2.96 2.90 2.84 5.07 2.83 2.80 2.68 2.78 4.06 3.68 4.22 3.63 4.30 4.05 3.48 2.92 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                           | Diurnal Maximum |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                           |                 |               |

## Hourly Maximums

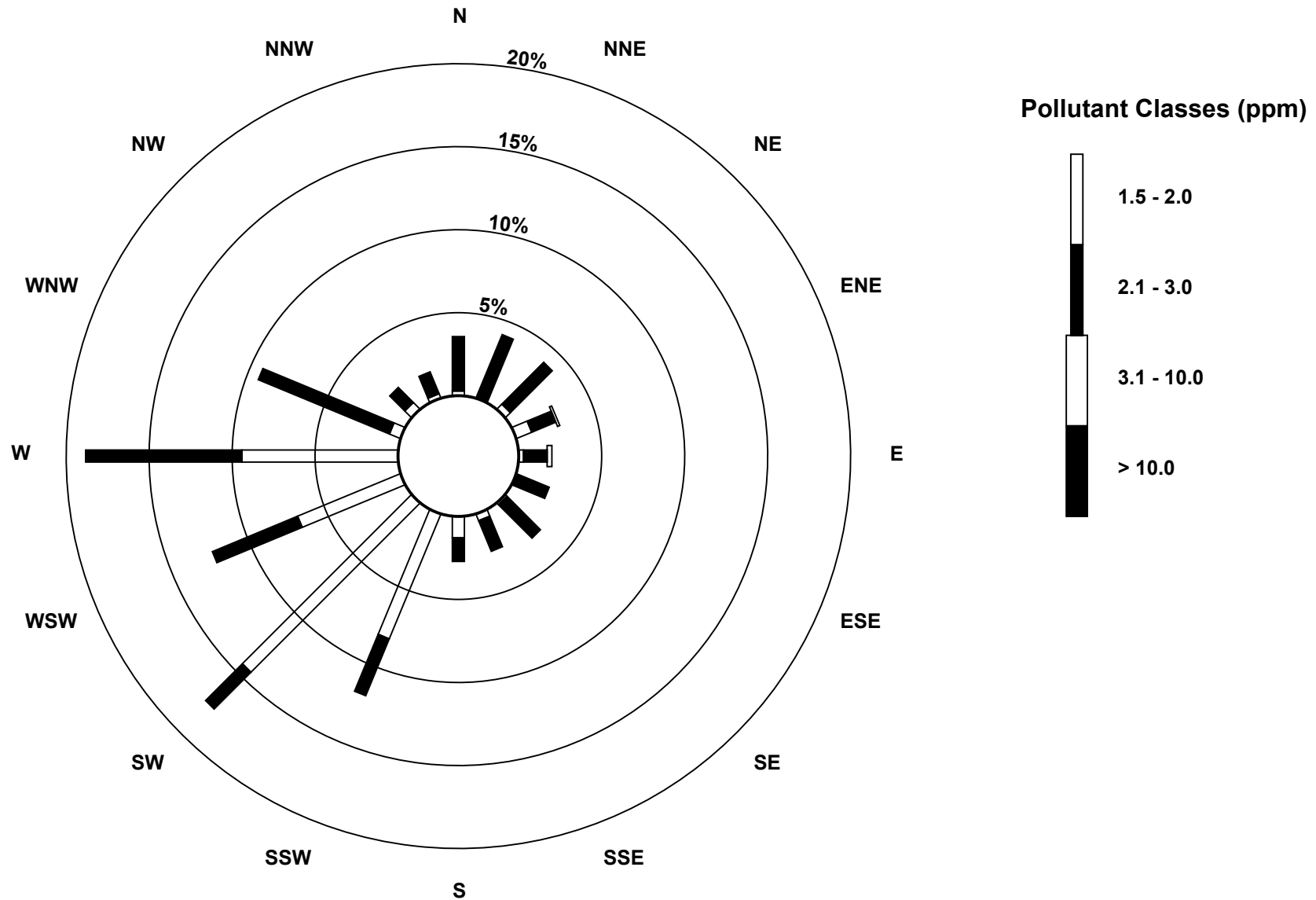
Total Hydrocarbons (THC) - ppm  
Henry Pirker - December 2016



# Pollutant Rose

Total Hydrocarbons (THC) - ppm

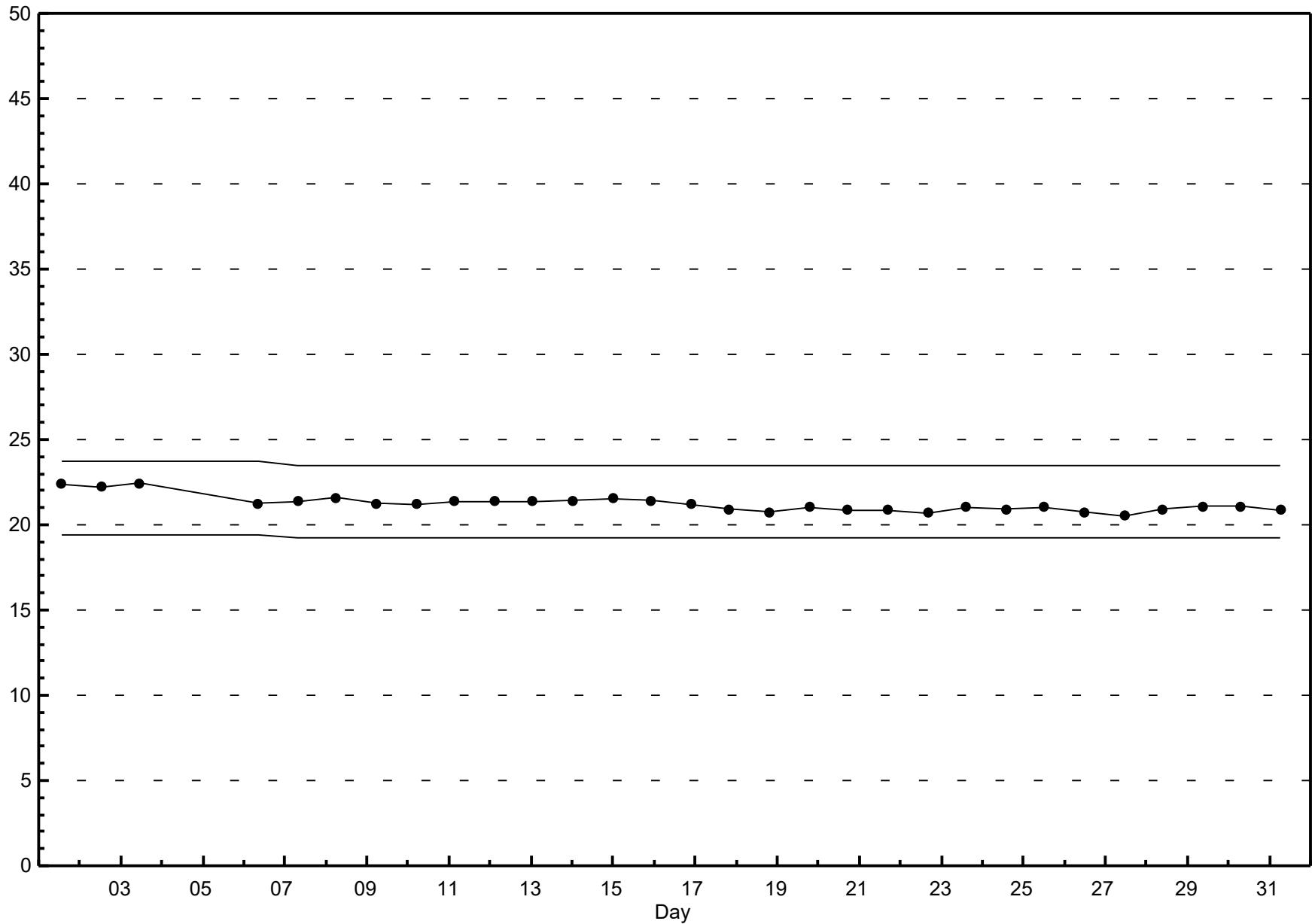
Henry Pirker - December 2016





## Span Responses

Total Hydrocarbons (THC)  
Henry Pirker - December 2016



# Hourly Averages

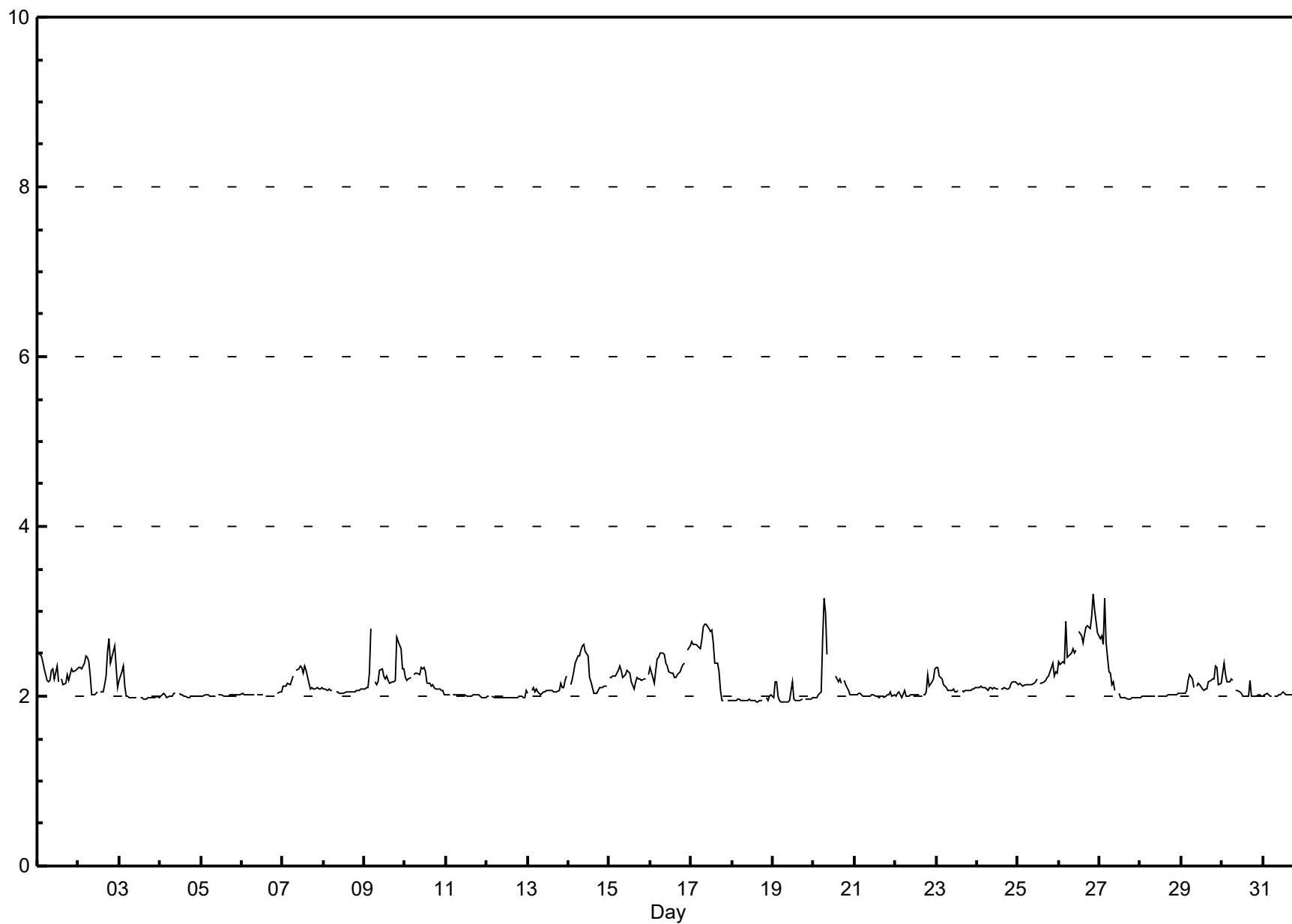
Methane (CH<sub>4</sub>) - ppm

Henry Pirker - December 2016

| Maximum Value: 3.20 ppm on Dec 26 21:00                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.68 ppm on Dec 26                                                                                                                         |     |     |                 | Hours in Service: 744     |               |      |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------------------|---------------|------|
| Minimum Value: 1.9 ppm on Dec 19 06:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 1.96 ppm on Dec 18                                                                                                                         |     |     |                 | Hours of Data: 701        |               |      |
| Maximum Diurnal Average: 2.20 ppm at hour 7                                                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 2.10 ppm at hour 15                                                                                                                      |     |     |                 | Hours of Missing Data: 43 |               |      |
| Monthly Average: 2.147 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 1.94 P <sub>10</sub> = 1.98 Q <sub>1</sub> = 2.01 Median = 2.07 Q <sub>3</sub> = 2.22 P <sub>90</sub> = 2.40 P <sub>99</sub> = 2.85 |     |     |                 | Hours of Calibration: 39  |               |      |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.5                                                                                                                                    |     |     |                 |                           |               |      |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |                 | Daily Average             | Daily Maximum |      |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                | 22  | 23  | 24              |                           |               |      |
| 1-Dec                                                                                                                   | 2.5                           | 2.5 | 2.5 | 2.4 | 2.3 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.2 | 2.4 | 2.2 | A   | 2.2 | 2.1 | 2.2 | 2.3 | 2.2 | 2.3 | 2.3                                                                                                                                                               | 2.3 | 2.3 | 2.3             | 2.28                      | 2.51          |      |
| 2-Dec                                                                                                                   | 2.3                           | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.4 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0 | A   | A   | 2.0 | 2.0 | 2.1 | 2.2 | 2.5 | 2.7 | 2.4                                                                                                                                                               | 2.5 | 2.6 | 2.3             | 2.1                       | 2.29          | 2.68 |
| 3-Dec                                                                                                                   | 2.2                           | 2.3 | 2.4 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.03                      | 2.36          |      |
| 4-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.01                      | 2.04          |      |
| 5-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.01                      | 2.02          |      |
| 6-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | C   | C   | C   | 2.0 | P   | P   | P   | P                                                                                                                                                                 | 2.0 | 2.0 | 2.1             | --                        | 2.05          |      |
| 7-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.2 | A   | 2.3 | 2.3 | 2.4 | 2.3 | 2.3 | 2.4 | 2.3 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1             | 2.18                      | 2.36          |      |
| 8-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1             | 2.06                      | 2.09          |      |
| 9-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.3 | 2.8 | A   | 2.2 | 2.1 | 2.2 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.7 | 2.6                                                                                                                                                               | 2.6 | 2.3 | 2.3             | 2.28                      | 2.80          |      |
| 10-Dec                                                                                                                  | 2.2                           | 2.2 | 2.2 | 2.2 | A   | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.0             | 2.19                      | 2.34          |      |
| 11-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.01                      | 2.02          |      |
| 12-Dec                                                                                                                  | 2.0                           | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.1             | 1.99                      | 2.07          |      |
| 13-Dec                                                                                                                  | 2.0                           | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.2 | 2.2             | 2.08                      | 2.24          |      |
| 14-Dec                                                                                                                  | A                             | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 | 2.6 | 2.6 | 2.5 | 2.5 | 2.2 | 2.2 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | A               | 2.27                      | 2.61          |      |
| 15-Dec                                                                                                                  | 2.2                           | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2                                                                                                                                                               | 2.2 | A   | 2.3             | 2.24                      | 2.35          |      |
| 16-Dec                                                                                                                  | 2.3                           | 2.2 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4                                                                                                                                                               | A   | 2.5 | 2.6             | 2.36                      | 2.59          |      |
| 17-Dec                                                                                                                  | 2.6                           | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.7 | 2.8 | 2.8 | 2.9 | 2.8 | 2.8 | 2.8 | 2.6 | 2.4 | 2.4 | 2.3 | 2.1 | 2.0 | 1.9 | A                                                                                                                                                                 | 1.9 | 1.9 | 2.0             | 2.46                      | 2.85          |      |
| 18-Dec                                                                                                                  | 2.0                           | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 1.96                      | 2.02          |      |
| 19-Dec                                                                                                                  | 2.0                           | 2.2 | 2.2 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.2 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 1.98                      | 2.17          |      |
| 20-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.1 | 2.7 | 3.2 | 3.0 | 2.5 | C   | C   | C   | C   | 2.2 | 2.2 | 2.2 | 2.1 | A   | 2.2 | 2.1 | 2.1                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.24                      | 3.16          |      |
| 21-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.0 | 2.0             | 2.01                      | 2.06          |      |
| 22-Dec                                                                                                                  | 2.0                           | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 2.3 | 2.1                                                                                                                                                               | 2.2 | 2.2 | 2.3             | 2.06                      | 2.33          |      |
| 23-Dec                                                                                                                  | 2.3                           | 2.3 | 2.2 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1             | 2.11                      | 2.35          |      |
| 24-Dec                                                                                                                  | 2.1                           | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2                                                                                                                                                               | 2.2 | 2.2 | 2.2             | 2.10                      | 2.18          |      |
| 25-Dec                                                                                                                  | 2.1                           | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | A   | 2.2 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.3                                                                                                                                                               | 2.4 | 2.2 | 2.3             | 2.19                      | 2.39          |      |
| 26-Dec                                                                                                                  | 2.4                           | 2.4 | 2.4 | 2.4 | 2.9 | 2.5 | 2.5 | 2.5 | 2.6 | 2.5 | 2.5 | A   | 2.8 | 2.7 | 2.6 | 2.7 | 2.8 | 2.8 | 2.8 | 3.0 | 3.2                                                                                                                                                               | 3.0 | 2.9 | 2.8             | 2.68                      | 3.20          |      |
| 27-Dec                                                                                                                  | 2.7                           | 2.7 | 2.6 | 3.1 | 2.6 | 2.3 | 2.3 | 2.1 | 2.2 | 2.1 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.19                      | 3.15          |      |
| 28-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.01                      | 2.03          |      |
| 29-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.1 | 2.2 | 2.2 | 2.2 | 2.1 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.4                                                                                                                                                               | 2.3 | 2.1 | 2.2             | 2.15                      | 2.35          |      |
| 30-Dec                                                                                                                  | 2.3                           | 2.4 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | A   | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0             | 2.09                      | 2.38          |      |
| 31-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.1 | 2.1             | 2.03                      | 2.10          |      |
| 2.16 2.17 2.17 2.18 2.19 2.17 2.20 2.17 2.17 2.16 2.16 2.14 2.13 2.12 2.10 2.10 2.11 2.11 2.12 2.15 2.17 2.14 2.13 2.13 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     | Diurnal Average |                           |               |      |
| 2.68 2.71 2.61 3.15 2.88 2.68 3.16 2.97 2.84 2.85 2.80 2.76 2.78 2.71 2.63 2.72 2.81 2.83 2.79 2.95 3.20 3.02 2.88 2.75 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     | Diurnal Maximum |                           |               |      |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |                 |                           |               |      |

## Hourly Averages

**Methane (CH<sub>4</sub>) - ppm**  
**Henry Pirker - December 2016**



# Hourly Maximums

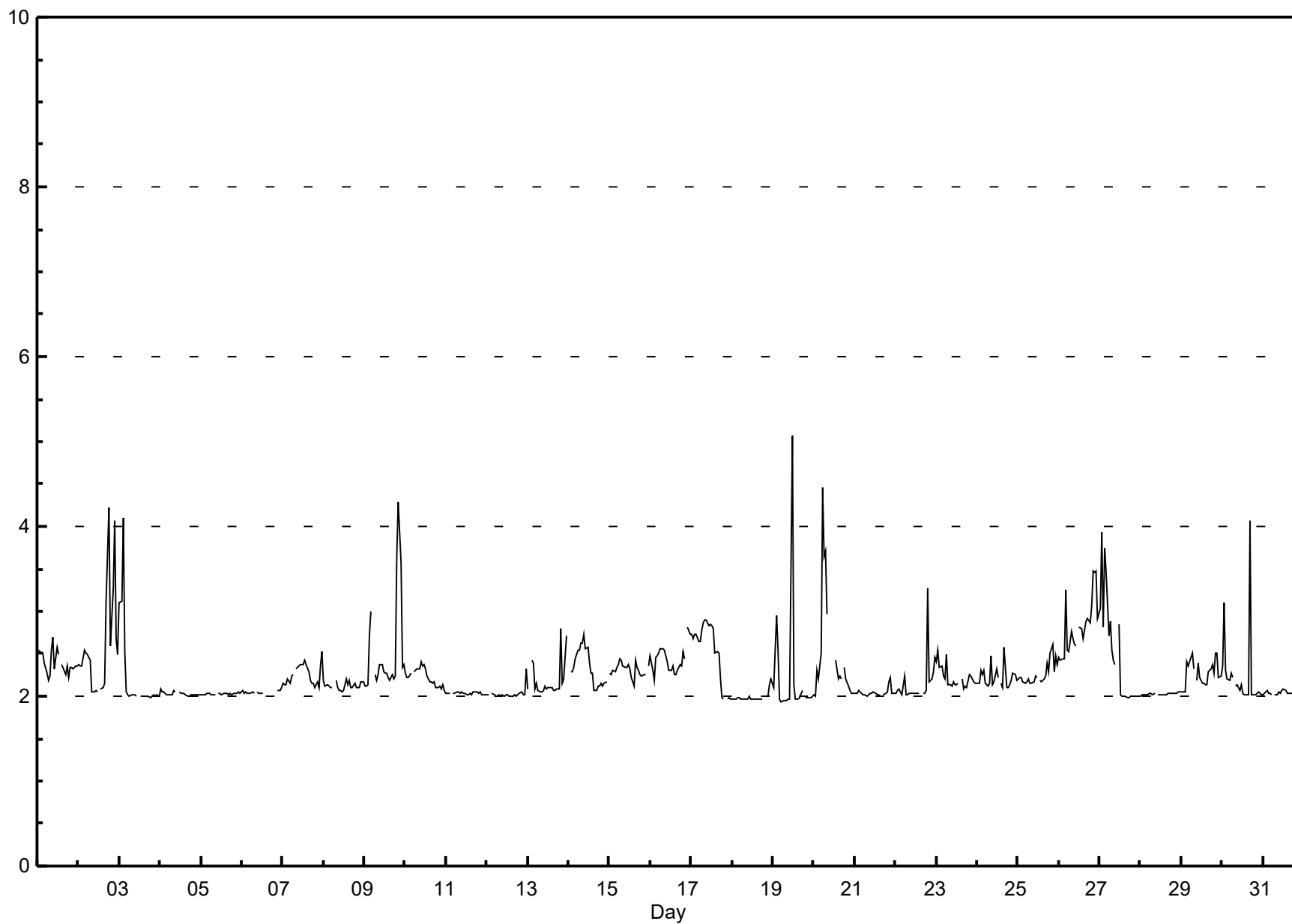
Methane (CH<sub>4</sub>) - ppm

Henry Pirker - December 2016

| Maximum Value: 5.08 ppm on Dec 19 12:00                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.82 ppm on Dec 26                                                                                                                         |     |     |     | Hours in Service: 744          |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|--------------------------------|---------------|
| Minimum Value: 1.9 ppm on Dec 19 06:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 1.99 ppm on Dec 18                                                                                                                         |     |     |     | Hours of Data: 701             |               |
| Maximum Diurnal Average: 2.33 ppm at hour 12                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 2.14 ppm at hour 15                                                                                                                      |     |     |     | Hours of Missing Data: 43      |               |
| Monthly Average: 2.252 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 1.96 P <sub>10</sub> = 2.00 Q <sub>1</sub> = 2.03 Median = 2.13 Q <sub>3</sub> = 2.34 P <sub>90</sub> = 2.61 P <sub>99</sub> = 4.06 |     |     |     | Hours of Calibration: 39       |               |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Percent Operational Time: 99.5 |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Daily Average                  | Daily Maximum |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                | 22  | 23  | 24  |                                |               |
| 1-Dec                                                                                                                   | 2.5                           | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.2 | 2.2 | 2.5 | 2.7 | 2.3 | 2.6 | 2.5 | A   | 2.4 | 2.3 | 2.3 | 2.4 | 2.2 | 2.3 | 2.3                                                                                                                                                               | 2.3 | 2.4 | 2.4 | 2.39                           | 2.69          |
| 2-Dec                                                                                                                   | 2.4                           | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.0 | 2.1 | 2.2 | 3.1 | 3.7 | 4.2 | 2.6 | 3.3                                                                                                                                                               | 4.1 | 2.7 | 2.5 | 2.62                           | 4.23          |
| 3-Dec                                                                                                                   | 3.1                           | 3.1 | 4.1 | 2.5 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.22                           | 4.10          |
| 4-Dec                                                                                                                   | 2.1                           | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | A   | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.03                           | 2.08          |
| 5-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.1 | 2.0 | 2.03                           | 2.05          |
| 6-Dec                                                                                                                   | 2.1                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | C   | C   | C   | 2.0 | P   | P   | P   | P                                                                                                                                                                 | 2.1 | 2.1 | 2.1 | --                             | 2.10          |
| 7-Dec                                                                                                                   | 2.2                           | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.3 | A   | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.3 | 2.2 | 2.1 | 2.2 | 2.1 | 2.2                                                                                                                                                               | 2.1 | 2.4 | 2.5 | 2.26                           | 2.52          |
| 8-Dec                                                                                                                   | 2.2                           | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | A   | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.2 | 2.2 | 2.12                           | 2.20          |
| 9-Dec                                                                                                                   | 2.1                           | 2.1 | 2.1 | 2.7 | 3.0 | A   | 2.3 | 2.2 | 2.3 | 2.4 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.3 | 2.2 | 2.2 | 3.6 | 4.3                                                                                                                                                               | 3.6 | 2.3 | 2.4 | 2.51                           | 4.29          |
| 10-Dec                                                                                                                  | 2.3                           | 2.2 | 2.2 | 2.3 | A   | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.23                           | 2.41          |
| 11-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.04                           | 2.05          |
| 12-Dec                                                                                                                  | 2.0                           | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1                                                                                                                                                               | 2.0 | 2.0 | 2.3 | 2.03                           | 2.32          |
| 13-Dec                                                                                                                  | 2.1                           | A   | 2.4 | 2.4 | 2.1 | 2.2 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.8 | 2.2                                                                                                                                                               | 2.2 | 2.5 | 2.7 | 2.19                           | 2.79          |
| 14-Dec                                                                                                                  | A                             | 2.3 | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.6 | 2.6 | 2.7 | 2.6 | 2.6 | 2.4 | 2.3 | 2.3 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1                                                                                                                                                               | 2.2 | 2.2 | A   | 2.34                           | 2.73          |
| 15-Dec                                                                                                                  | 2.3                           | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 | 2.4 | 2.3 | 2.2 | 2.1 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.3                                                                                                                                                               | 2.3 | A   | 2.4 | 2.32                           | 2.45          |
| 16-Dec                                                                                                                  | 2.5                           | 2.3 | 2.2 | 2.5 | 2.5 | 2.5 | 2.6 | 2.6 | 2.5 | 2.5 | 2.4 | 2.3 | 2.3 | 2.4 | 2.2 | 2.3 | 2.3 | 2.4 | 2.4 | 2.5 | 2.4                                                                                                                                                               | A   | 2.8 | 2.7 | 2.43                           | 2.82          |
| 17-Dec                                                                                                                  | 2.7                           | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.8 | 2.9 | 2.9 | 2.9 | 2.8 | 2.9 | 2.8 | 2.8 | 2.5 | 2.5 | 2.5 | 2.2 | 2.0 | 2.0 | A                                                                                                                                                                 | 2.0 | 2.0 | 2.0 | 2.54                           | 2.90          |
| 18-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A                                                                                                                                                                 | 2.0 | 2.1 | 2.2 | 1.99                           | 2.20          |
| 19-Dec                                                                                                                  | 2.1                           | 2.5 | 3.0 | 2.5 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 5.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | A   | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.21                           | 5.08          |
| 20-Dec                                                                                                                  | 2.0                           | 2.0 | 2.3 | 2.2 | 2.5 | 4.5 | 3.6 | 3.7 | 3.0 | C   | C   | C   | C   | 2.4 | 2.2 | 2.2 | 2.2 | A   | 2.3 | 2.2 | 2.1                                                                                                                                                               | 2.1 | 2.0 | 2.0 | 2.51                           | 4.46          |
| 21-Dec                                                                                                                  | 2.0                           | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 2.2                                                                                                                                                               | 2.2 | 2.0 | 2.0 | 2.04                           | 2.21          |
| 22-Dec                                                                                                                  | 2.0                           | 2.1 | 2.1 | 2.1 | 2.0 | 2.2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.1 | 3.3 | 2.2                                                                                                                                                               | 2.2 | 2.3 | 2.5 | 2.14                           | 3.27          |
| 23-Dec                                                                                                                  | 2.4                           | 2.5 | 2.3 | 2.4 | 2.2 | 2.2 | 2.5 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 | 2.2 | A   | 2.2 | 2.1 | 2.1 | 2.1 | 2.3 | 2.2                                                                                                                                                               | 2.2 | 2.2 | 2.2 | 2.22                           | 2.54          |
| 24-Dec                                                                                                                  | 2.1                           | 2.2 | 2.3 | 2.2 | 2.3 | 2.2 | 2.1 | 2.2 | 2.5 | 2.1 | 2.2 | 2.3 | 2.2 | A   | 2.2 | 2.1 | 2.6 | 2.1 | 2.1 | 2.1 | 2.2                                                                                                                                                               | 2.3 | 2.3 | 2.2 | 2.22                           | 2.58          |
| 25-Dec                                                                                                                  | 2.2                           | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | A   | 2.2 | 2.2 | 2.2 | 2.2 | 2.4 | 2.3 | 2.5 | 2.6                                                                                                                                                               | 2.3 | 2.5 | 2.4 | 2.26                           | 2.61          |
| 26-Dec                                                                                                                  | 2.5                           | 2.4 | 2.4 | 2.4 | 3.3 | 2.5 | 2.5 | 2.8 | 2.7 | 2.6 | 2.6 | A   | 2.8 | 2.8 | 2.7 | 2.8 | 2.9 | 2.9 | 2.9 | 3.1 | 3.5                                                                                                                                                               | 3.5 | 3.5 | 2.9 | 2.82                           | 3.48          |
| 27-Dec                                                                                                                  | 3.0                           | 3.9 | 2.8 | 3.7 | 3.5 | 2.7 | 2.9 | 2.5 | 2.4 | 2.4 | A   | 2.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.47                           | 3.93          |
| 28-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 2.03                           | 2.05          |
| 29-Dec                                                                                                                  | 2.1                           | 2.1 | 2.1 | 2.4 | 2.4 | 2.4 | 2.5 | 2.3 | A   | 2.2 | 2.4 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.3 | 2.3 | 2.4 | 2.3 | 2.5                                                                                                                                                               | 2.5 | 2.2 | 2.2 | 2.27                           | 2.51          |
| 30-Dec                                                                                                                  | 2.4                           | 3.1 | 2.3 | 2.2 | 2.2 | 2.3 | 2.2 | A   | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 4.1 | 2.0 | 2.0 | 2.0 | 2.0                                                                                                                                                               | 2.1 | 2.0 | 2.0 | 2.24                           | 4.07          |
| 31-Dec                                                                                                                  | 2.0                           | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | A   | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1                                                                                                                                                               | 2.1 | 2.1 | 2.1 | 2.05                           | 2.13          |
| 2.24 2.31 2.32 2.32 2.29 2.30 2.29 2.27 2.25 2.23 2.20 2.33 2.19 2.17 2.14 2.15 2.26 2.20 2.21 2.29 2.31 2.28 2.23 2.23 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Average                |               |
| 3.09 3.93 4.10 3.74 3.46 4.46 3.64 3.71 2.96 2.90 2.84 5.08 2.84 2.79 2.68 2.78 4.07 3.68 4.23 3.63 4.29 4.06 3.48 2.92 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Maximum                |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                                |               |

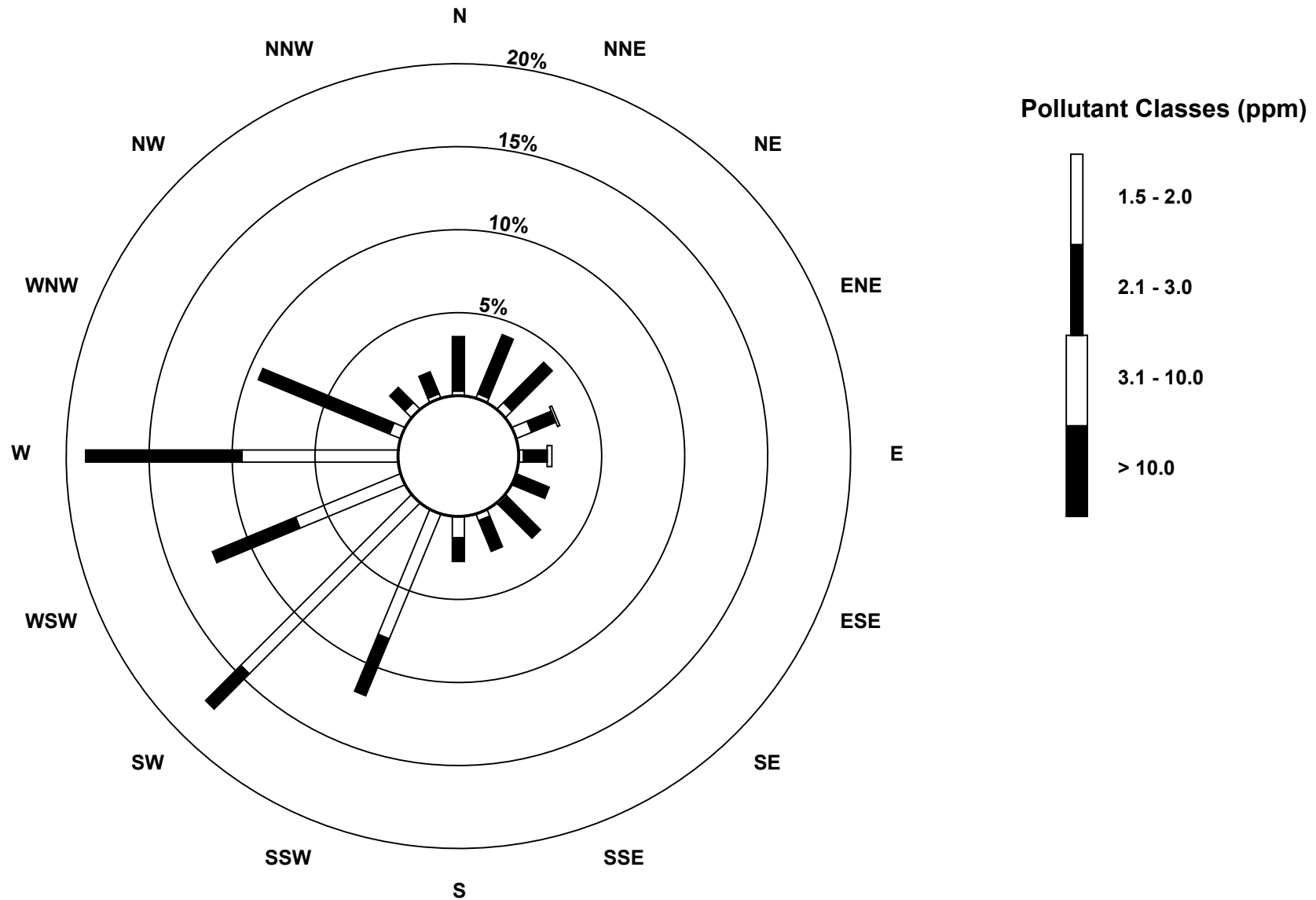
## Hourly Maximums

**Methane (CH<sub>4</sub>) - ppm**  
**Henry Pirker - December 2016**



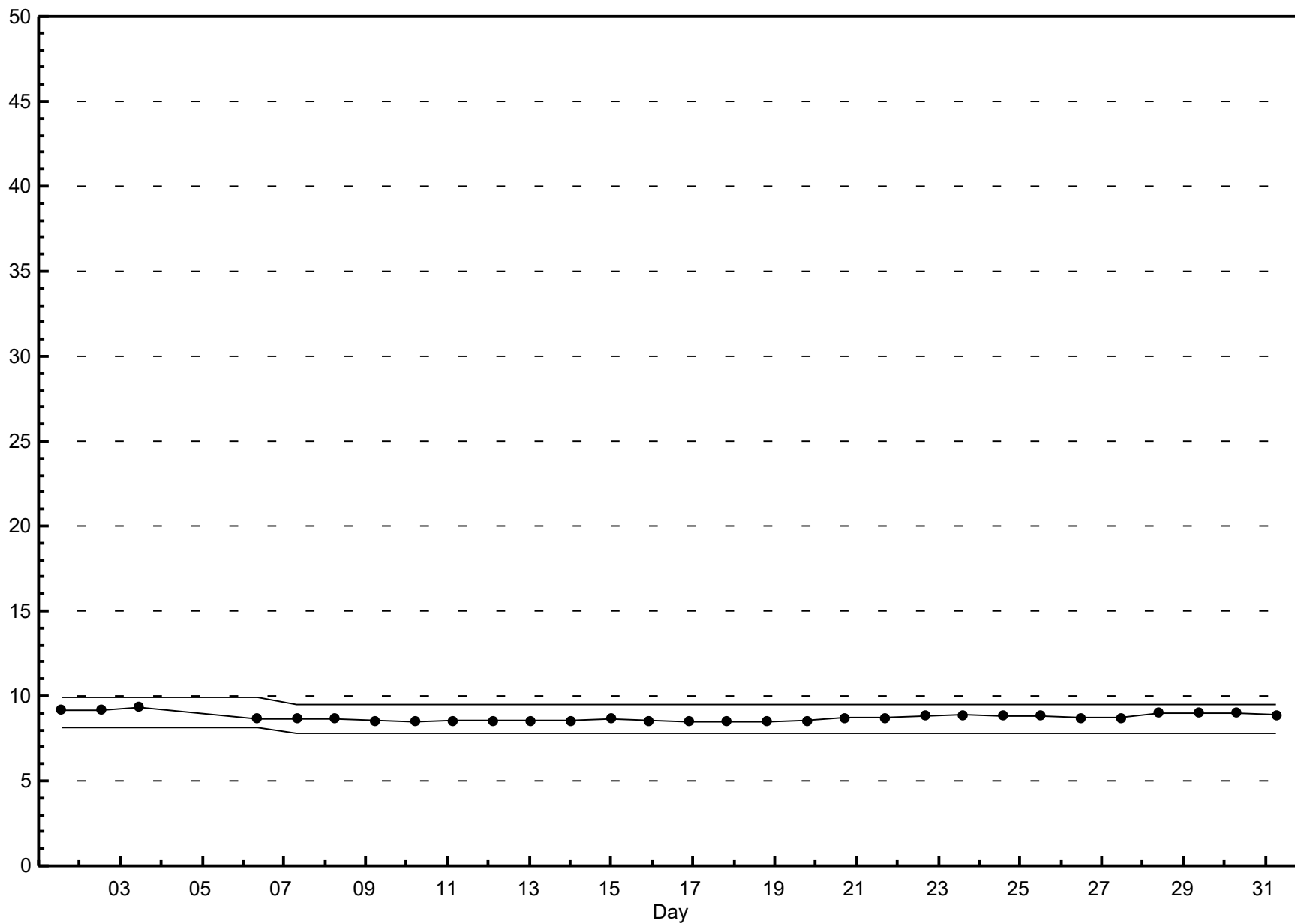
# Pollutant Rose

Methane (CH<sub>4</sub>) - ppm  
Henry Pirker - December 2016



## Span Responses

**Methane (CH<sub>4</sub>)**  
**Henry Pirker - December 2016**



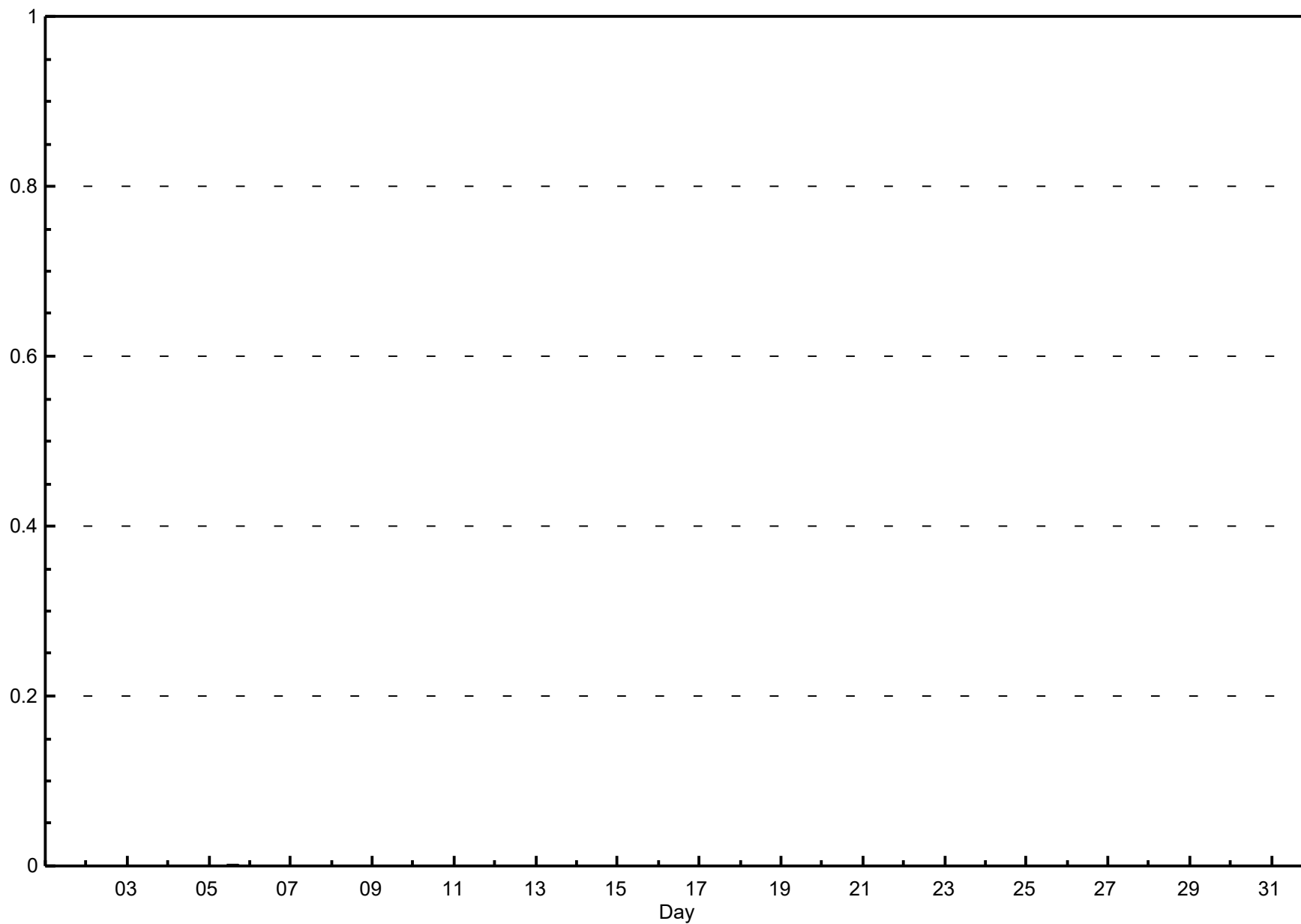
# Hourly Averages

Non Methane Hydrocarbon (NMHC) - ppm

Henry Pirker - December 2016

| Maximum Value: 0.00 ppm on Dec 5 11:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.00 ppm on Dec 5                                                                                                                          |     |     |     |     | Hours in Service: 744          |               |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|--------------------------------|---------------|--|--|--|
| Minimum Value: 0.0 ppm on Dec 1 01:00                                                                                   |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.00 ppm on Dec 7                                                                                                                          |     |     |     |     | Hours of Data: 701             |               |  |  |  |
| Maximum Diurnal Average: 0.00 ppm at hour 14                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.00 ppm at hour 7                                                                                                                       |     |     |     |     | Hours of Missing Data: 43      |               |  |  |  |
| Monthly Average: 0.000 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.00 P <sub>10</sub> = 0.00 Q <sub>1</sub> = 0.00 Median = 0.00 Q <sub>3</sub> = 0.00 P <sub>90</sub> = 0.00 P <sub>99</sub> = 0.00 |     |     |     |     | Hours of Calibration: 39       |               |  |  |  |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |     | Percent Operational Time: 99.5 |               |  |  |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |     | Daily Average                  | Daily Maximum |  |  |  |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20                                                                                                                                                                | 21  | 22  | 23  | 24  |                                |               |  |  |  |
| 1-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 2-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 3-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 4-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 5-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 6-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | C   | C   | C   | 0.0 | P   | P   | P                                                                                                                                                                 | P   | 0.0 | 0.0 | 0.0 | --                             | 0.00          |  |  |  |
| 7-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 8-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 9-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 10-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 11-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 12-Dec                                                                                                                  | 0.0                           | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 13-Dec                                                                                                                  | 0.0                           | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 14-Dec                                                                                                                  | A                             | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | A   | 0.00                           | 0.00          |  |  |  |
| 15-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | A   | 0.0 | 0.00                           | 0.00          |  |  |  |
| 16-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | A   | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 17-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | A   | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 18-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A                                                                                                                                                                 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 19-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 20-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | C   | C   | C   | C   | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 21-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 22-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 23-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 24-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 25-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 26-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 27-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 28-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 29-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 30-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 31-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0 | 0.00                           | 0.00          |  |  |  |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |     | Diurnal Average                |               |  |  |  |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |     | Diurnal Maximum                |               |  |  |  |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |     |                                |               |  |  |  |





# Hourly Maximums

Non Methane Hydrocarbon (NMHC) - ppm

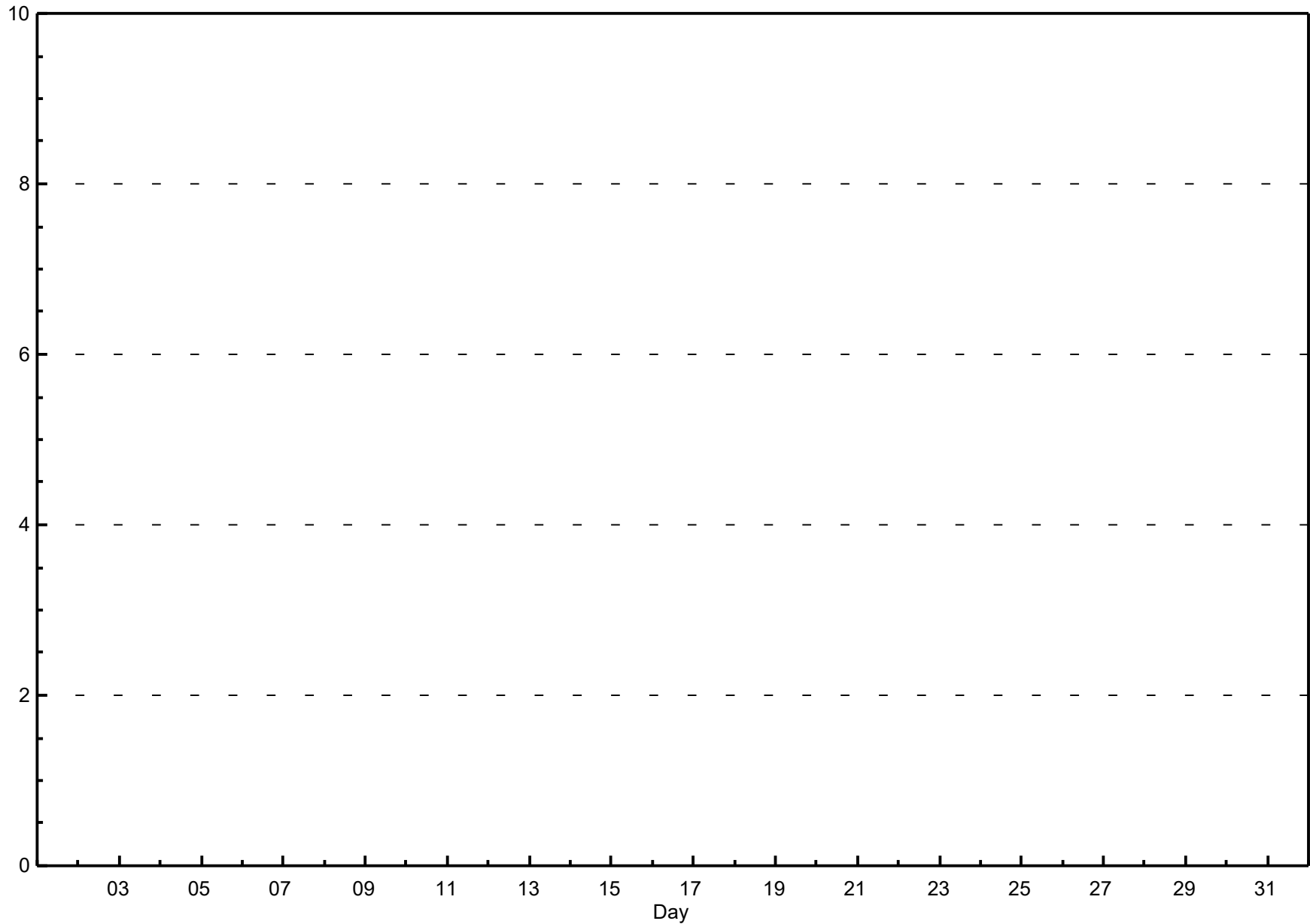
Henry Pirker - December 2016

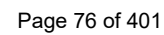
| Maximum Value: 0.00 ppm on Dec 5 13:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.00 ppm on Dec 5                                                                                                                          |     |     |     |                 | Hours in Service: 744          |               |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----------------|--------------------------------|---------------|--|--|--|
| Minimum Value: 0.0 ppm on Dec 7 02:00                                                                                   |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.00 ppm on Dec 22                                                                                                                         |     |     |     |                 | Hours of Data: 701             |               |  |  |  |
| Maximum Diurnal Average: 0.00 ppm at hour 19                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.00 ppm at hour 8                                                                                                                       |     |     |     |                 | Hours of Missing Data: 43      |               |  |  |  |
| Monthly Average: 0.001 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.00 P <sub>10</sub> = 0.00 Q <sub>1</sub> = 0.00 Median = 0.00 Q <sub>3</sub> = 0.00 P <sub>90</sub> = 0.00 P <sub>99</sub> = 0.00 |     |     |     |                 | Hours of Calibration: 39       |               |  |  |  |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                 | Percent Operational Time: 99.5 |               |  |  |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                 | Daily Average                  | Daily Maximum |  |  |  |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20                                                                                                                                                                | 21  | 22  | 23  | 24              |                                |               |  |  |  |
| 1-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 2-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 3-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 4-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 5-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 6-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | C   | C   | C   | 0.0 | P   | P   | P                                                                                                                                                                 | P   | 0.0 | 0.0 | 0.0             | --                             | 0.00          |  |  |  |
| 7-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 8-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 9-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 10-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 11-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 12-Dec                                                                                                                  | 0.0                           | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 13-Dec                                                                                                                  | 0.0                           | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 14-Dec                                                                                                                  | A                             | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | A               | 0.00                           | 0.00          |  |  |  |
| 15-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | A   | 0.0             | 0.00                           | 0.00          |  |  |  |
| 16-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | A   | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 17-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | A   | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 18-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A                                                                                                                                                                 | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 19-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 20-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | C   | C   | C   | C   | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 21-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 22-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 23-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 24-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 25-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 26-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 27-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 28-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 29-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 30-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 31-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0 | 0.0             | 0.00                           | 0.00          |  |  |  |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Average |                                |               |  |  |  |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Maximum |                                |               |  |  |  |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                 |                                |               |  |  |  |

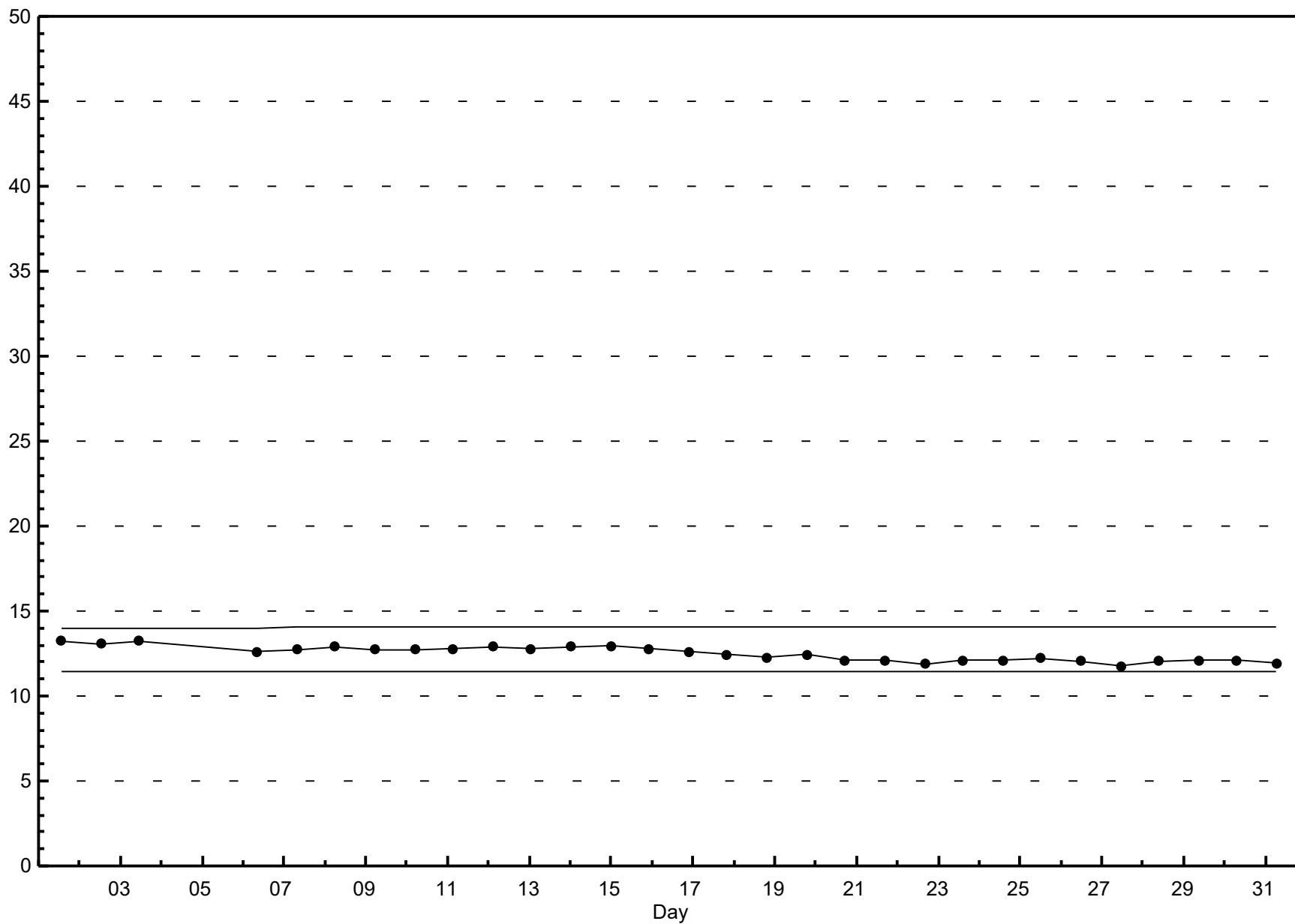
**Hourly Maximums**

**Non Methane Hydrocarbon (NMHC) - ppm**

**Henry Pirker - December 2016**





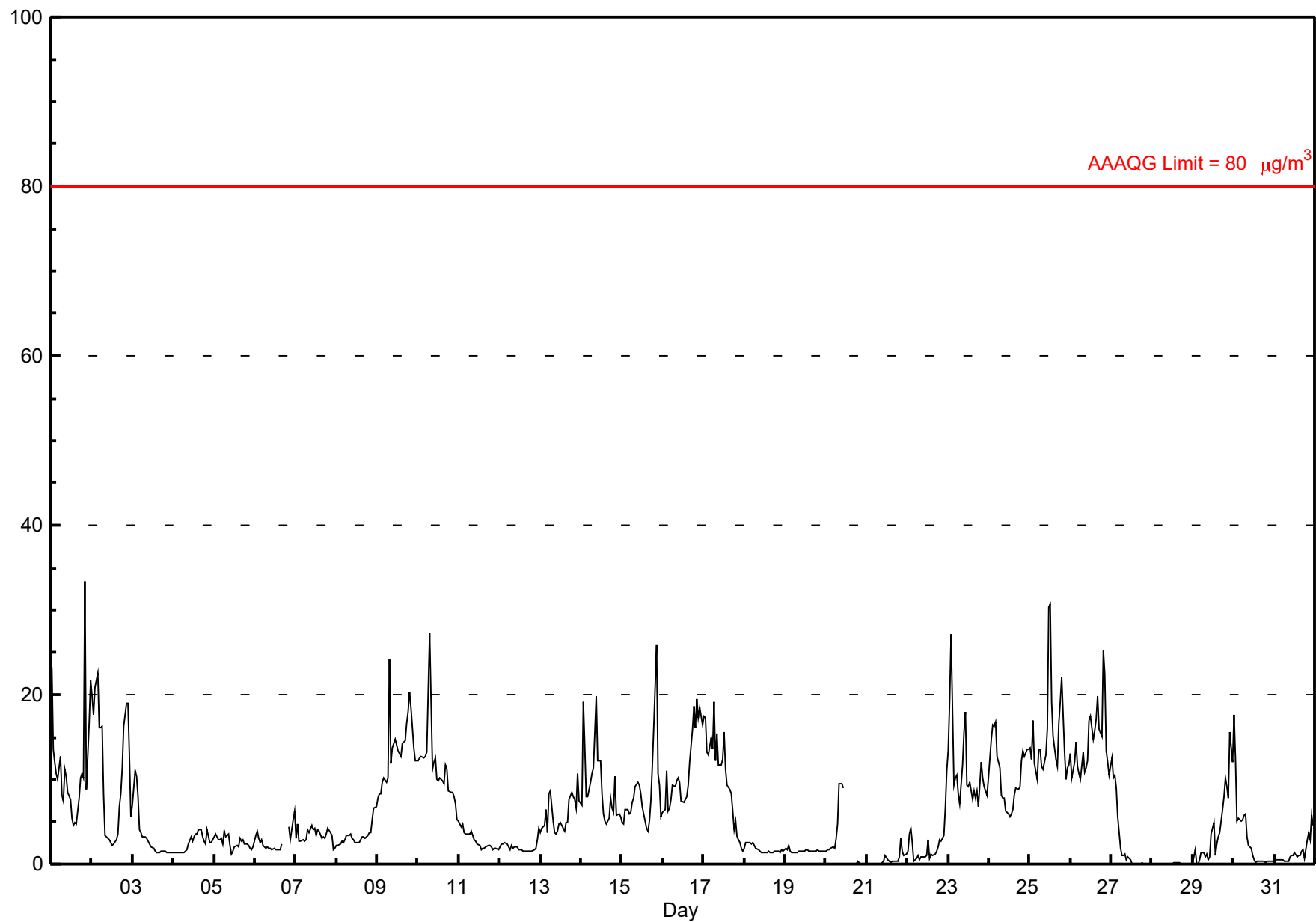


# Hourly Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Henry Pirker - December 2016

| Number of Exceedences: 1-hr: 0 24-hr: 0<br>Maximum Value: 33.5 µg/m³ on Dec 1 21:00<br>Maximum Daily Average: 15.3 µg/m³ on Dec 25                                                                                                                                                                                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 735<br>Hours of Missing Data: 9<br>Hours of Calibration: 6<br>Percent Operational Time: 99.6 |    |    |    |                 |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|---------------|
| Minimum Value: 0 µg/m³ on Dec 20 18:00<br>Maximum Diurnal Average: 8.1 µg/m³ at hour 21<br>Monthly Average: 6.03 µg/m³<br>Minimum Daily Average: 0.0 µg/m³ on Dec 28<br>Minimum Diurnal Average: 4.4 µg/m³ at hour 15<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 1.6 Median = 3.6 Q <sub>3</sub> = 9.7 P <sub>90</sub> = 13.8 P <sub>99</sub> = 24.6 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                      |    |    |    |                 |               |
| Day                                                                                                                                                                                                                                                                                                                                                                                   | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                      |    |    |    | Daily Average   | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                                                       | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21                                                                                                                                   | 22 | 23 | 24 |                 |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 23                            | 14 | 12 | 11 | 10 | 13 | 8  | 8  | 11 | 10 | 8  | 8  | 5  | 5  | 5  | 5  | 8  | 10 | 11 | 10 | 33                                                                                                                                   | 9  | 17 | 22 | 11.4            | 33.5          |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 20                            | 18 | 21 | 23 | 16 | 16 | 16 | 8  | 3  | 3  | 3  | 3  | 2  | 2  | 3  | 4  | 7  | 8  | 11 | 16 | 19                                                                                                                                   | 19 | 13 | 6  | 10.8            | 22.6          |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 7                             | 11 | 10 | 8  | 4  | 4  | 3  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 2  | 1  | 1                                                                                                                                    | 1  | 1  | 1  | 3.3             | 11.0          |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 3  | 3  | 3  | 4  | 4  | 4  | 4  | 3  | 3  | 2  | 4                                                                                                                                    | 3  | 3  | 3  | 2.5             | 4.1           |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 3                             | 3  | 3  | 3  | 3  | 2  | 4  | 3  | 3  | 2  | 1  | 1  | 2  | 2  | 2  | 3  | 3  | 3  | 2  | 2  | 2                                                                                                                                    | 2  | 2  | 2  | 2.5             | 3.9           |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 3                             | 4  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | P  | P  | P  | 4                                                                                                                                    | 3  | 5  | 6  | 2.7             | 6.3           |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 3                             | 5  | 3  | 3  | 3  | 3  | 3  | 4  | 4  | 5  | 4  | 4  | 3  | 4  | 4  | 3  | 3  | 3  | 4  | 4  | 4                                                                                                                                    | 3  | 2  | 2  | 3.4             | 4.7           |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 2                             | 2  | 2  | 3  | 3  | 3  | 3  | 3  | 4  | 3  | 3  | 2  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 4                                                                                                                                    | 5  | 7  | 7  | 3.4             | 6.8           |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                                                 | 8                             | 8  | 8  | 10 | 10 | 10 | 10 | 24 | 12 | 14 | 15 | 14 | 13 | 13 | 13 | 14 | 15 | 17 | 18 | 20 | 18                                                                                                                                   | 14 | 12 | 12 | 13.4            | 24.3          |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                                                | 12                            | 13 | 13 | 13 | 13 | 13 | 20 | 27 | 11 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 12 | 11 | 9  | 8  | 8                                                                                                                                    | 8  | 7  | 5  | 11.5            | 27.2          |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                                                | 5                             | 4  | 5  | 4  | 4  | 3  | 3  | 4  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                    | 2  | 2  | 2  | 2.8             | 5.1           |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 2  | 2  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                    | 2  | 3  | 4  | 2.0             | 4.3           |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                                                | 4                             | 4  | 5  | 6  | 4  | 8  | 9  | 5  | 4  | 4  | 4  | 5  | 5  | 4  | 4  | 5  | 5  | 8  | 9  | 8  | 8                                                                                                                                    | 7  | 11 | 8  | 5.8             | 10.6          |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                                                | 7                             | 19 | 14 | 8  | 8  | 10 | 11 | 11 | 16 | 20 | 12 | 12 | 8  | 6  | 5  | 5  | 5  | 8  | 7  | 6  | 10                                                                                                                                   | 6  | 6  | 6  | 9.4             | 19.8          |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                                                | 5                             | 5  | 6  | 6  | 6  | 6  | 7  | 8  | 9  | 10 | 9  | 8  | 7  | 6  | 4  | 4  | 5  | 8  | 12 | 16 | 26                                                                                                                                   | 11 | 9  | 6  | 8.3             | 25.9          |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                                                | 6                             | 6  | 11 | 6  | 7  | 8  | 9  | 9  | 10 | 10 | 10 | 7  | 7  | 8  | 8  | 9  | 12 | 16 | 19 | 16 | 20                                                                                                                                   | 17 | 18 | 16 | 11.1            | 19.6          |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                                                | 17                            | 17 | 13 | 13 | 15 | 14 | 19 | 12 | 15 | 12 | 12 | 12 | 16 | 11 | 9  | 9  | 8  | 6  | 4  | 5  | 3                                                                                                                                    | 2  | 2  | 1  | 10.4            | 19.2          |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 2  | 2  | 3  | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2                                                                                                                                    | 1  | 2  | 2  | 1.7             | 2.6           |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                    | 2  | 2  | 2  | 1.6             | 2.1           |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 2  | 2  | 2  | 2  | 2  | 3  | 5  | 9  | 10 | 9  | C  | C  | C  | C  | C  | C  | 0  | 0  | 0  | 0                                                                                                                                    | 0  | 0  | 0  | 2.6             | 9.5           |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                                                | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 3                                                                                                                                    | 1  | 1  | 1  | 0.5             | 3.1           |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 4  | 4  | 3  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 3  | 1  | 1  | 1  | 1  | 2  | 2  | 3  | 3                                                                                                                                    | 3  | 7  | 11 | 2.3             | 11.1          |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                                                | 13                            | 19 | 27 | 9  | 10 | 10 | 8  | 7  | 12 | 16 | 18 | 9  | 9  | 10 | 8  | 9  | 8  | 9  | 7  | 12 | 10                                                                                                                                   | 9  | 9  | 8  | 11.1            | 27.1          |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                                                | 10                            | 15 | 17 | 16 | 17 | 13 | 11 | 8  | 8  | 8  | 6  | 6  | 6  | 6  | 6  | 8  | 9  | 9  | 9  | 12 | 13                                                                                                                                   | 13 | 13 | 14 | 10.5            | 16.9          |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                                                | 14                            | 12 | 17 | 12 | 10 | 14 | 13 | 11 | 11 | 13 | 16 | 30 | 31 | 19 | 15 | 12 | 12 | 17 | 19 | 22 | 13                                                                                                                                   | 10 | 11 | 12 | 15.3            | 30.7          |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                                                | 13                            | 10 | 12 | 14 | 12 | 11 | 10 | 13 | 11 | 11 | 12 | 17 | 18 | 15 | 16 | 17 | 20 | 16 | 15 | 25 | 22                                                                                                                                   | 13 | 12 | 11 | 14.4            | 25.2          |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                                                | 12                            | 10 | 11 | 9  | 6  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                    | 0  | 0  | 0  | 2.3             | 12.5          |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                                                | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                    | 0  | 0  | 0  | 0.0             | 0.1           |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                                                | 0                             | 2  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 4  | 5  | 1  | 2  | 3  | 4  | 6  | 8  | 10 | 9                                                                                                                                    | 8  | 16 | 12 | 4.0             | 15.6          |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                                                | 18                            | 12 | 5  | 5  | 5  | 5  | 6  | 6  | 3  | 2  | 2  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                    | 0  | 0  | 0  | 3.1             | 17.7          |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                                                | 1                             | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 1  | 3  | 4                                                                                                                                    | 3  | 6  | 5  | 1.5             | 5.7           |
| 7.0 7.4 7.5 6.4 5.7 5.8 6.2 6.2 5.6 5.8 5.7 5.7 5.6 4.7 4.4 4.6 5.2 5.7 6.0 7.2 8.1 5.7 6.4 6.0                                                                                                                                                                                                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                      |    |    |    | Diurnal Average |               |
| 23.3 19.2 27.1 22.6 16.9 16.1 20.3 27.2 15.7 19.8 17.9 30.3 30.7 19.2 15.7 17.0 19.8 16.6 19.2 25.2 33.5 19.0 18.5 21.7                                                                                                                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                      |    |    |    | Diurnal Maximum |               |
| C - Calibration P - Power Failure                                                                                                                                                                                                                                                                                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                      |    |    |    |                 |               |
| Alberta Ambient Air Quality Guideline (AAAQG): 1-hr 80 µg/m³ Alberta Ambient Air Quality Objective (AAAQO): 24-hr 30 µg/m³                                                                                                                                                                                                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                      |    |    |    |                 |               |



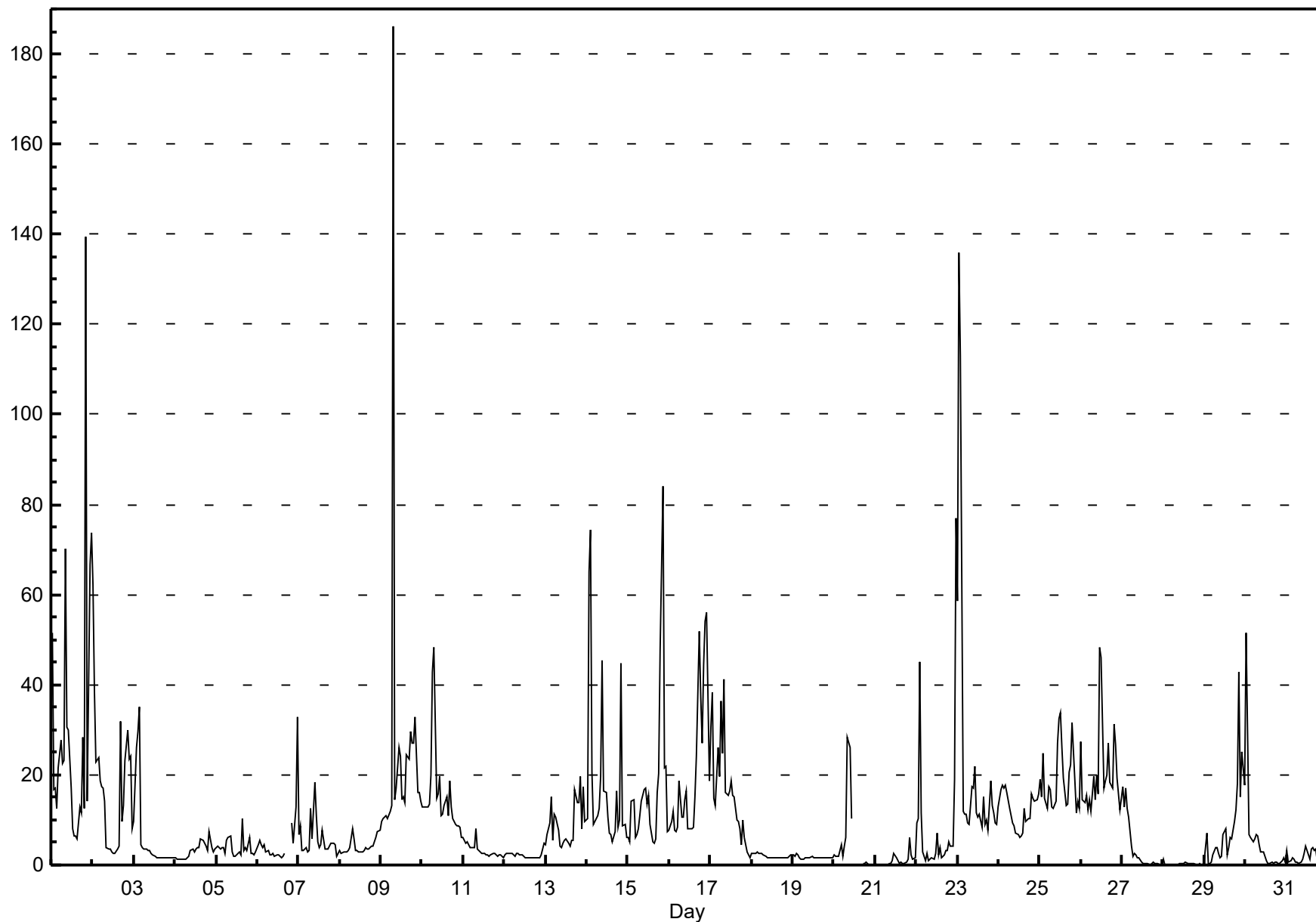
# Hourly Maximums

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Henry Pirker - December 2016

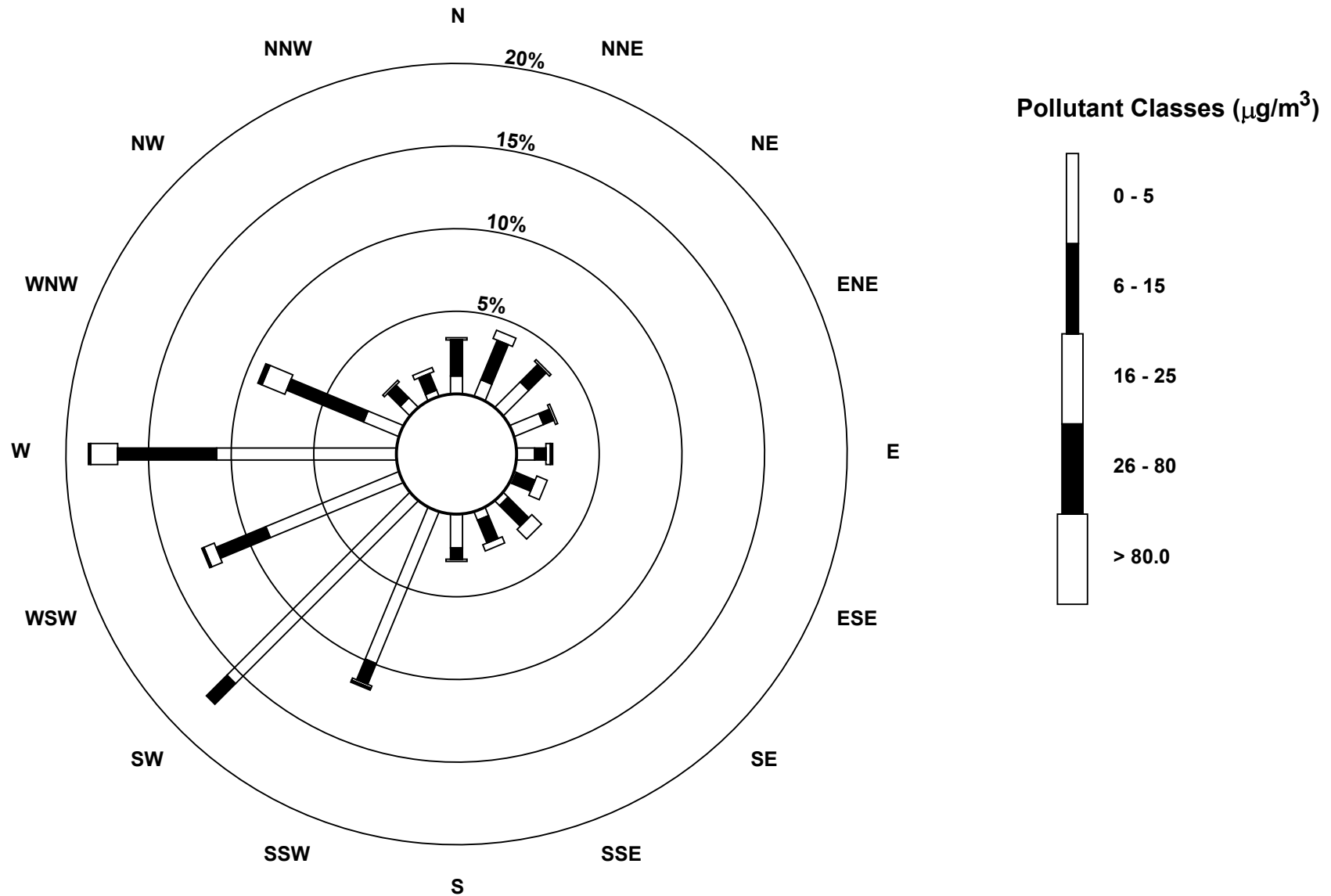
| Maximum Value: 186.1 μg/m³ on Dec 9 08:00                                                                                   |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 30.3 μg/m³ on Dec 1                                                                                                                    |    |    |     |                 | Hours in Service: 744    |  |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|----|----|----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|-----------------|--------------------------|--|
| Minimum Value: 0 μg/m³ on Dec 20 23:00                                                                                      |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.2 μg/m³ on Dec 28                                                                                                                    |    |    |     |                 | Hours of Data: 735       |  |
| Maximum Diurnal Average: 19.0 μg/m³ at hour 21                                                                              |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 5.7 μg/m³ at hour 15                                                                                                                 |    |    |     |                 | Hours of Missing Data: 9 |  |
| Monthly Average: 10.32 μg/m³                                                                                                |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.8 Q <sub>1</sub> = 2.0 Median = 5.0 Q <sub>3</sub> = 13.5 P <sub>90</sub> = 23.2 P <sub>99</sub> = 72.0 |    |    |     |                 | Hours of Calibration: 6  |  |
|                                                                                                                             |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.6                                                                                                                                |    |    |     |                 |                          |  |
| Day                                                                                                                         | Hourly Period Ending At (MST) |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |     | Daily Average   | Daily Maximum            |  |
|                                                                                                                             | 1                             | 2   | 3   | 4  | 5  | 6  | 7  | 8   | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21                                                                                                                                                            | 22 | 23 | 24  |                 |                          |  |
| 1-Dec                                                                                                                       | 52                            | 17  | 17  | 13 | 22 | 28 | 22 | 23  | 70 | 31 | 30 | 17 | 8  | 6  | 6  | 6  | 13 | 12 | 28 | 12 | 139                                                                                                                                                           | 14 | 67 | 74  | 30.3            | 139.3                    |  |
| 2-Dec                                                                                                                       | 62                            | 39  | 23  | 24 | 19 | 17 | 17 | 14  | 4  | 4  | 4  | 3  | 3  | 3  | 3  | 4  | 32 | 10 | 13 | 23 | 30                                                                                                                                                            | 24 | 24 | 8   | 16.9            | 62.0                     |  |
| 3-Dec                                                                                                                       | 10                            | 26  | 30  | 35 | 4  | 4  | 4  | 3   | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                             | 2  | 1  | 6.1 | 35.1            |                          |  |
| 4-Dec                                                                                                                       | 2                             | 1   | 1   | 1  | 1  | 1  | 1  | 2   | 2  | 3  | 4  | 3  | 4  | 4  | 4  | 6  | 5  | 5  | 4  | 3  | 7                                                                                                                                                             | 4  | 3  | 4   | 3.2             | 7.5                      |  |
| 5-Dec                                                                                                                       | 4                             | 4   | 4   | 4  | 4  | 3  | 6  | 6   | 6  | 3  | 2  | 2  | 2  | 3  | 2  | 10 | 3  | 4  | 3  | 6  | 3                                                                                                                                                             | 3  | 2  | 3   | 3.8             | 10.2                     |  |
| 6-Dec                                                                                                                       | 5                             | 6   | 5   | 4  | 5  | 3  | 3  | 2   | 2  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 3  | P  | P  | P  | 9                                                                                                                                                             | 5  | 13 | 33  | 5.3             | 32.9                     |  |
| 7-Dec                                                                                                                       | 7                             | 9   | 3   | 3  | 4  | 3  | 3  | 12  | 6  | 18 | 11 | 5  | 4  | 5  | 8  | 4  | 4  | 3  | 4  | 5  | 5                                                                                                                                                             | 5  | 2  | 3   | 5.6             | 18.2                     |  |
| 8-Dec                                                                                                                       | 3                             | 3   | 3   | 3  | 3  | 3  | 4  | 8   | 6  | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 4  | 3  | 4  | 4  | 5                                                                                                                                                             | 6  | 7  | 8   | 4.1             | 8.2                      |  |
| 9-Dec                                                                                                                       | 10                            | 10  | 11  | 11 | 10 | 12 | 13 | 186 | 15 | 17 | 26 | 24 | 14 | 15 | 14 | 24 | 24 | 30 | 27 | 33 | 16                                                                                                                                                            | 16 | 14 |     | 25.0            | 186.1                    |  |
| 10-Dec                                                                                                                      | 13                            | 13  | 13  | 13 | 13 | 20 | 43 | 48  | 15 | 16 | 20 | 11 | 11 | 13 | 15 | 11 | 19 | 13 | 10 | 9  | 9                                                                                                                                                             | 8  | 6  |     | 15.5            | 48.4                     |  |
| 11-Dec                                                                                                                      | 6                             | 5   | 5   | 5  | 4  | 4  | 4  | 8   | 4  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                             | 2  | 2  | 2   | 3.3             | 8.1                      |  |
| 12-Dec                                                                                                                      | 2                             | 2   | 3   | 3  | 3  | 2  | 2  | 2   | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                             | 2  | 3  | 5   | 2.3             | 4.9                      |  |
| 13-Dec                                                                                                                      | 4                             | 7   | 9   | 15 | 5  | 11 | 11 | 8   | 4  | 4  | 5  | 6  | 6  | 5  | 4  | 6  | 6  | 17 | 14 | 14 | 20                                                                                                                                                            | 8  | 17 | 10  | 8.9             | 19.7                     |  |
| 14-Dec                                                                                                                      | 10                            | 65  | 74  | 21 | 9  | 10 | 11 | 13  | 20 | 45 | 16 | 16 | 11 | 7  | 7  | 5  | 7  | 16 | 8  | 10 | 45                                                                                                                                                            | 9  | 9  | 6   | 18.8            | 74.3                     |  |
| 15-Dec                                                                                                                      | 6                             | 5   | 14  | 15 | 6  | 7  | 8  | 11  | 14 | 17 | 17 | 13 | 15 | 9  | 5  | 5  | 6  | 16 | 20 | 48 | 84                                                                                                                                                            | 21 | 22 | 7   | 16.3            | 84.0                     |  |
| 16-Dec                                                                                                                      | 8                             | 10  | 12  | 8  | 7  | 8  | 19 | 11  | 11 | 14 | 16 | 8  | 8  | 8  | 8  | 15 | 24 | 52 | 37 | 27 | 45                                                                                                                                                            | 54 | 56 | 19  | 20.2            | 56.0                     |  |
| 17-Dec                                                                                                                      | 31                            | 38  | 15  | 13 | 26 | 20 | 36 | 25  | 41 | 16 | 15 | 17 | 19 | 15 | 15 | 10 | 10 | 8  | 5  | 10 | 6                                                                                                                                                             | 3  | 2  | 2   | 16.6            | 41.2                     |  |
| 18-Dec                                                                                                                      | 2                             | 3   | 3   | 3  | 3  | 3  | 2  | 2   | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                             | 2  | 2  | 2   | 2.0             | 2.7                      |  |
| 19-Dec                                                                                                                      | 2                             | 2   | 3   | 2  | 2  | 1  | 1  | 2   | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                             | 2  | 2  | 2   | 1.7             | 2.6                      |  |
| 20-Dec                                                                                                                      | 2                             | 2   | 2   | 2  | 4  | 2  | 4  | 6   | 28 | 26 | 10 | C  | C  | C  | C  | C  | C  | 0  | 0  | 1  | 0                                                                                                                                                             | 0  | 0  | 0   | 5.0             | 28.3                     |  |
| 21-Dec                                                                                                                      | 0                             | 0   | 0   | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 1  | 3  | 2  | 1  | 0  | 1  | 0  | 0  | 1  | 1  | 6                                                                                                                                                             | 2  | 1  | 2   | 0.9             | 6.2                      |  |
| 22-Dec                                                                                                                      | 9                             | 10  | 45  | 12 | 3  | 1  | 3  | 1   | 1  | 1  | 1  | 3  | 7  | 2  | 4  | 2  | 2  | 3  | 3  | 5  | 4                                                                                                                                                             | 4  | 19 | 77  | 9.3             | 77.0                     |  |
| 23-Dec                                                                                                                      | 59                            | 136 | 113 | 12 | 11 | 11 | 9  | 9   | 17 | 17 | 22 | 12 | 11 | 11 | 8  | 15 | 9  | 10 | 8  | 19 | 13                                                                                                                                                            | 12 | 9  | 9   | 23.5            | 136.0                    |  |
| 24-Dec                                                                                                                      | 13                            | 17  | 18  | 17 | 18 | 16 | 12 | 11  | 9  | 9  | 7  | 7  | 6  | 6  | 7  | 13 | 10 | 10 | 10 | 16 | 15                                                                                                                                                            | 14 | 15 | 16  | 12.1            | 17.7                     |  |
| 25-Dec                                                                                                                      | 19                            | 15  | 25  | 15 | 13 | 17 | 17 | 13  | 13 | 14 | 27 | 33 | 34 | 26 | 19 | 13 | 14 | 21 | 22 | 31 | 18                                                                                                                                                            | 11 | 14 | 13  | 19.1            | 33.9                     |  |
| 26-Dec                                                                                                                      | 27                            | 14  | 14  | 15 | 12 | 15 | 12 | 20  | 14 | 20 | 16 | 48 | 46 | 17 | 19 | 20 | 27 | 18 | 17 | 31 | 27                                                                                                                                                            | 19 | 16 | 12  | 20.7            | 48.2                     |  |
| 27-Dec                                                                                                                      | 17                            | 13  | 17  | 13 | 11 | 4  | 2  | 3   | 2  | 2  | 2  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0                                                                                                                                                             | 0  | 0  | 0   | 3.7             | 17.5                     |  |
| 28-Dec                                                                                                                      | 1                             | 0   | 0   | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                             | 0  | 0  | 0   | 0.2             | 1.4                      |  |
| 29-Dec                                                                                                                      | 1                             | 7   | 0   | 0  | 1  | 2  | 4  | 4   | 3  | 2  | 2  | 7  | 8  | 2  | 4  | 6  | 6  | 10 | 12 | 18 | 43                                                                                                                                                            | 15 | 25 | 18  | 8.3             | 42.8                     |  |
| 30-Dec                                                                                                                      | 51                            | 30  | 7   | 6  | 5  | 6  | 7  | 7   | 4  | 3  | 3  | 2  | 1  | 0  | 0  | 1  | 0  | 1  | 1  | 0  | 0                                                                                                                                                             | 1  | 2  | 1   | 5.7             | 51.4                     |  |
| 31-Dec                                                                                                                      | 3                             | 1   | 1   | 2  | 1  | 1  | 1  | 0   | 1  | 1  | 2  | 4  | 3  | 1  | 4  | 4  | 3  | 4  | 1  | 7  | 14                                                                                                                                                            | 10 | 12 | 9   | 3.7             | 13.8                     |  |
| 14.3 16.4 15.7 9.3 7.4 7.6 9.1 14.8 10.4 9.7 8.9 8.6 7.9 5.8 5.7 6.5 8.0 9.2 8.8 11.3 19.0 9.0 12.0 11.7                    |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |     | Diurnal Average |                          |  |
| 62.0 136.0 113.0 35.1 26.2 27.8 42.9 186.1 70.3 45.4 30.0 48.2 46.1 26.1 19.3 24.4 31.8 51.9 37.4 47.5 139.3 54.2 66.8 77.0 |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |     | Diurnal Maximum |                          |  |
| C - Calibration P - Power Failure                                                                                           |                               |     |     |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |     |                 |                          |  |





# Pollutant Rose

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>  
Henry Pirker - December 2016



# Hourly Averages

External Temperature (ET) - °C

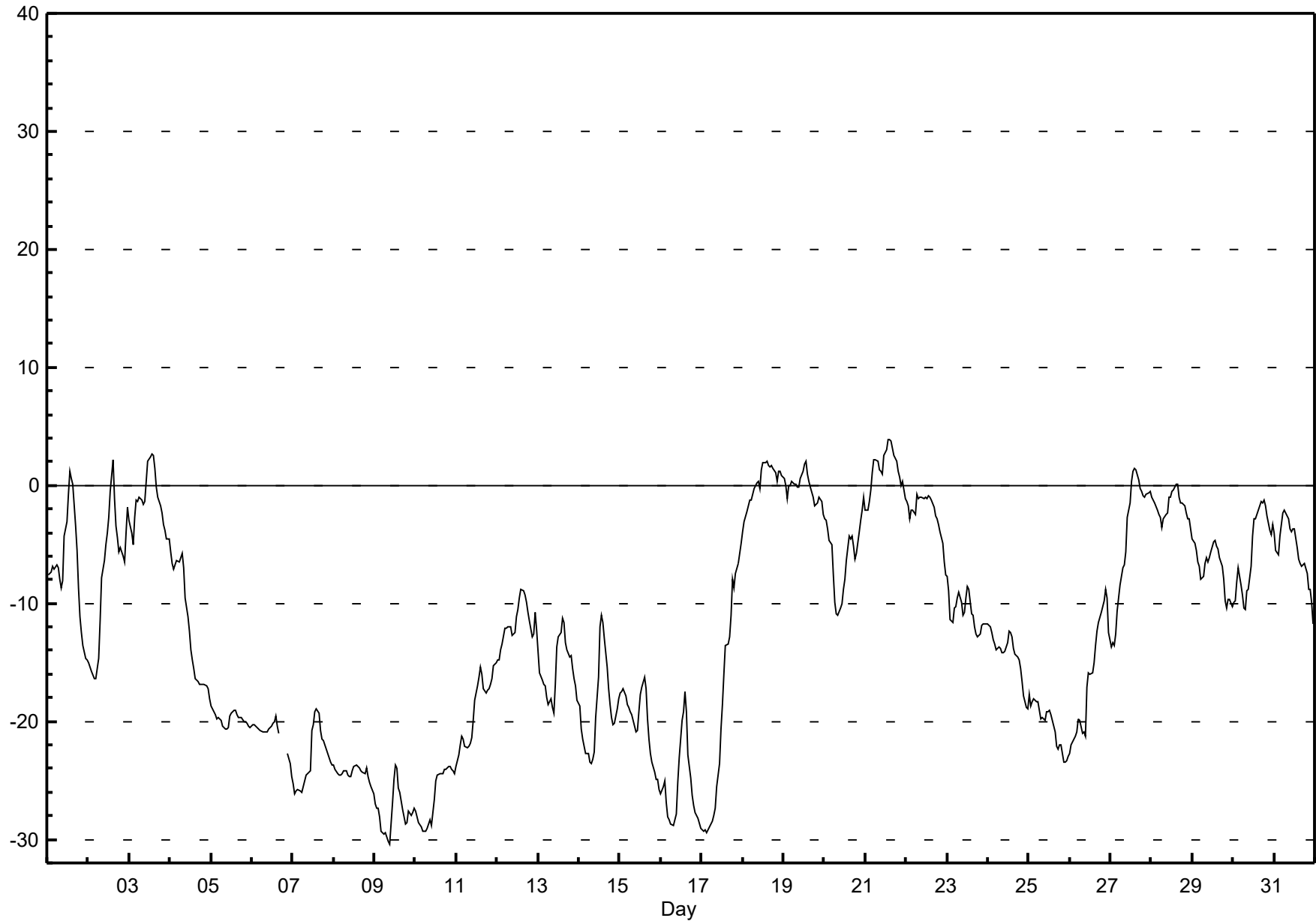
Henry Pirker - December 2016

| Maximum Value: 3.8 °C on Dec 21 15:00       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 1.3 °C on Dec 21                                                                                                                              |     |     |     |                 | Hours in Service: 744    |  |  |  |
|---------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----------------|--------------------------|--|--|--|
| Minimum Value: -30 °C on Dec 9 10:00        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: -27.6 °C on Dec 9                                                                                                                             |     |     |     |                 | Hours of Data: 740       |  |  |  |
| Maximum Diurnal Average: -9.8 °C at hour 15 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: -14.1 °C at hour 3                                                                                                                          |     |     |     |                 | Hours of Missing Data: 4 |  |  |  |
| Monthly Average: -12.62 °C                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = -29.3 P <sub>10</sub> = -25.0 Q <sub>1</sub> = -20.5 Median = -12.4 Q <sub>3</sub> = -3.8 P <sub>90</sub> = -0.5 P <sub>99</sub> = 2.5 |     |     |     |                 | Hours of Calibration: 0  |  |  |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.5                                                                                                                                       |     |     |     |                 |                          |  |  |  |
| Day                                         | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     | Daily Average   | Daily Maximum            |  |  |  |
|                                             | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                   | 22  | 23  | 24  |                 |                          |  |  |  |
| 1-Dec                                       | -8                            | -7  | -7  | -7  | -7  | -7  | -7  | -8  | -9  | -8  | -4  | -3  | -1  | 1   | 1   | 0   | -4  | -6  | -9  | -11 | -13                                                                                                                                                                  | -14 | -15 | -15 | -6.9            | 1.1                      |  |  |  |
| 2-Dec                                       | -15                           | -15 | -16 | -16 | -16 | -16 | -15 | -12 | -8  | -6  | -5  | -4  | -3  | -1  | 2   | -1  | -3  | -4  | -6  | -5  | -6                                                                                                                                                                   | -6  | -4  | -2  | -7.6            | 2.2                      |  |  |  |
| 3-Dec                                       | -3                            | -4  | -5  | -3  | -1  | -1  | -1  | -1  | -2  | -1  | 0   | 2   | 2   | 3   | 3   | 1   | 0   | -1  | -2  | -2  | -3                                                                                                                                                                   | -4  | -5  | -5  | -1.4            | 2.7                      |  |  |  |
| 4-Dec                                       | -6                            | -7  | -7  | -7  | -6  | -7  | -6  | -6  | -7  | -10 | -11 | -12 | -14 | -15 | -15 | -16 | -17 | -17 | -17 | -17 | -17                                                                                                                                                                  | -17 | -17 | -18 | -12.0           | -5.6                     |  |  |  |
| 5-Dec                                       | -19                           | -19 | -19 | -20 | -20 | -20 | -20 | -20 | -21 | -21 | -21 | -20 | -19 | -19 | -19 | -19 | -20 | -20 | -20 | -20 | -20                                                                                                                                                                  | -20 | -20 | -20 | -19.8           | -18.7                    |  |  |  |
| 6-Dec                                       | -20                           | -20 | -20 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -20 | -20 | -20 | -20 | -20 | -21 | P   | P   | P   | P                                                                                                                                                                    | -23 | -24 | -25 | -21.0           | -19.6                    |  |  |  |
| 7-Dec                                       | -25                           | -26 | -26 | -26 | -26 | -26 | -26 | -25 | -25 | -24 | -24 | -21 | -20 | -19 | -19 | -19 | -21 | -22 | -22 | -22 | -23                                                                                                                                                                  | -23 | -23 | -24 | -23.2           | -19.0                    |  |  |  |
| 8-Dec                                       | -24                           | -24 | -24 | -25 | -24 | -24 | -24 | -24 | -25 | -25 | -25 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -25                                                                                                                                                                  | -25 | -26 | -26 | -24.4           | -23.7                    |  |  |  |
| 9-Dec                                       | -27                           | -27 | -27 | -28 | -29 | -30 | -29 | -30 | -30 | -30 | -27 | -25 | -24 | -24 | -26 | -26 | -27 | -28 | -29 | -29 | -28                                                                                                                                                                  | -28 | -28 | -27 | -27.6           | -23.7                    |  |  |  |
| 10-Dec                                      | -28                           | -28 | -29 | -29 | -29 | -29 | -29 | -29 | -28 | -29 | -28 | -27 | -25 | -25 | -24 | -24 | -24 | -24 | -24 | -24 | -24                                                                                                                                                                  | -24 | -24 | -24 | -26.4           | -23.9                    |  |  |  |
| 11-Dec                                      | -24                           | -23 | -22 | -21 | -21 | -22 | -22 | -22 | -22 | -21 | -20 | -18 | -17 | -16 | -15 | -16 | -17 | -18 | -17 | -17 | -17                                                                                                                                                                  | -16 | -15 | -15 | -19.0           | -15.0                    |  |  |  |
| 12-Dec                                      | -15                           | -15 | -14 | -13 | -12 | -12 | -12 | -12 | -12 | -13 | -12 | -11 | -11 | -10 | -9  | -9  | -9  | -10 | -11 | -11 | -13                                                                                                                                                                  | -13 | -11 | -12 | -11.7           | -8.9                     |  |  |  |
| 13-Dec                                      | -14                           | -16 | -16 | -17 | -17 | -18 | -19 | -18 | -19 | -19 | -17 | -14 | -13 | -12 | -11 | -12 | -13 | -14 | -15 | -14 | -16                                                                                                                                                                  | -16 | -17 | -18 | -15.6           | -11.3                    |  |  |  |
| 14-Dec                                      | -19                           | -21 | -21 | -22 | -23 | -23 | -23 | -24 | -23 | -23 | -20 | -16 | -12 | -11 | -12 | -13 | -15 | -17 | -19 | -20 | -20                                                                                                                                                                  | -20 | -19 | -18 | -18.9           | -11.0                    |  |  |  |
| 15-Dec                                      | -18                           | -17 | -17 | -18 | -19 | -19 | -19 | -19 | -20 | -21 | -21 | -19 | -18 | -17 | -16 | -17 | -20 | -22 | -23 | -23 | -24                                                                                                                                                                  | -25 | -25 | -26 | -20.1           | -16.2                    |  |  |  |
| 16-Dec                                      | -26                           | -26 | -25 | -27 | -28 | -28 | -29 | -29 | -28 | -28 | -25 | -23 | -20 | -19 | -17 | -19 | -23 | -25 | -26 | -27 | -28                                                                                                                                                                  | -28 | -28 | -29 | -25.5           | -17.4                    |  |  |  |
| 17-Dec                                      | -29                           | -29 | -29 | -29 | -29 | -29 | -29 | -28 | -27 | -26 | -24 | -21 | -19 | -16 | -14 | -13 | -13 | -11 | -8  | -9  | -8                                                                                                                                                                   | -7  | -6  | -5  | -19.0           | -4.9                     |  |  |  |
| 18-Dec                                      | -4                            | -3  | -2  | -2  | -1  | -1  | -1  | 0   | 0   | 0   | 0   | 1   | 2   | 2   | 2   | 2   | 2   | 2   | 1   | 1   | 0                                                                                                                                                                    | 1   | 1   | 1   | 0.2             | 2.1                      |  |  |  |
| 19-Dec                                      | 1                             | 0   | -1  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1   | 2   | 2   | 1   | 0   | 0   | -1  | -2  | -2  | -1                                                                                                                                                                   | -1  | -1  | -2  | -0.2            | 2.1                      |  |  |  |
| 20-Dec                                      | -3                            | -3  | -4  | -5  | -5  | -8  | -10 | -11 | -11 | -10 | -10 | -9  | -8  | -6  | -4  | -5  | -4  | -5  | -6  | -6  | -4                                                                                                                                                                   | -3  | -2  | -1  | -5.9            | -0.9                     |  |  |  |
| 21-Dec                                      | -2                            | -2  | -1  | 0   | 1   | 2   | 2   | 2   | 1   | 1   | 1   | 3   | 3   | 4   | 4   | 4   | 3   | 3   | 2   | 1   | 1                                                                                                                                                                    | 0   | 0   | -1  | 1.3             | 3.8                      |  |  |  |
| 22-Dec                                      | -1                            | -2  | -3  | -2  | -2  | -2  | -1  | -1  | -1  | -1  | -1  | -1  | -1  | -1  | -1  | -1  | -2  | -3  | -3  | -3  | -4                                                                                                                                                                   | -5  | -6  | -8  | -2.3            | -0.7                     |  |  |  |
| 23-Dec                                      | -8                            | -9  | -11 | -12 | -10 | -10 | -10 | -9  | -10 | -11 | -11 | -10 | -9  | -9  | -11 | -11 | -12 | -13 | -13 | -13 | -12                                                                                                                                                                  | -12 | -12 | -12 | -10.7           | -7.7                     |  |  |  |
| 24-Dec                                      | -12                           | -12 | -12 | -13 | -13 | -14 | -14 | -14 | -14 | -14 | -14 | -13 | -12 | -13 | -13 | -14 | -14 | -15 | -15 | -16 | -17                                                                                                                                                                  | -18 | -19 | -19 | -14.3           | -11.8                    |  |  |  |
| 25-Dec                                      | -18                           | -19 | -18 | -18 | -18 | -18 | -19 | -20 | -20 | -20 | -19 | -19 | -19 | -19 | -20 | -21 | -22 | -22 | -22 | -22 | -23                                                                                                                                                                  | -23 | -23 | -23 | -20.3           | -17.8                    |  |  |  |
| 26-Dec                                      | -23                           | -22 | -22 | -21 | -21 | -20 | -20 | -21 | -21 | -21 | -17 | -16 | -16 | -16 | -15 | -14 | -12 | -12 | -11 | -10 | -10                                                                                                                                                                  | -9  | -10 | -12 | -16.3           | -8.8                     |  |  |  |
| 27-Dec                                      | -14                           | -13 | -14 | -13 | -11 | -8  | -8  | -7  | -7  | -6  | -3  | -1  | 0   | 1   | 1   | 1   | 0   | 0   | -1  | -1  | -1                                                                                                                                                                   | -1  | -1  | -1  | -4.3            | 1.5                      |  |  |  |
| 28-Dec                                      | -1                            | -1  | -1  | -2  | -2  | -3  | -4  | -3  | -2  | -2  | -1  | -1  | 0   | 0   | 0   | 0   | -1  | -1  | -1  | -2  | -2                                                                                                                                                                   | -3  | -3  | -4  | -1.8            | 0.1                      |  |  |  |
| 29-Dec                                      | -5                            | -5  | -6  | -6  | -7  | -8  | -8  | -7  | -6  | -6  | -6  | -6  | -5  | -5  | -5  | -5  | -6  | -7  | -8  | -10 | -10                                                                                                                                                                  | -10 | -10 | -10 | -6.9            | -4.5                     |  |  |  |
| 30-Dec                                      | -10                           | -10 | -8  | -7  | -9  | -9  | -10 | -10 | -9  | -9  | -7  | -4  | -3  | -3  | -2  | -2  | -1  | -2  | -1  | -2  | -3                                                                                                                                                                   | -4  | -4  | -3  | -5.5            | -1.2                     |  |  |  |
| 31-Dec                                      | -4                            | -5  | -6  | -4  | -3  | -2  | -2  | -2  | -3  | -4  | -4  | -4  | -4  | -5  | -6  | -7  | -7  | -7  | -7  | -7  | -9                                                                                                                                                                   | -9  | -10 | -12 | -5.5            | -2.1                     |  |  |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     | Diurnal Average |                          |  |  |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     | Diurnal Maximum |                          |  |  |  |
| P - Power Failure                           |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     |                 |                          |  |  |  |

## Hourly Averages

External Temperature (ET) - °C

Henry Pirker - December 2016



## Hourly Averages

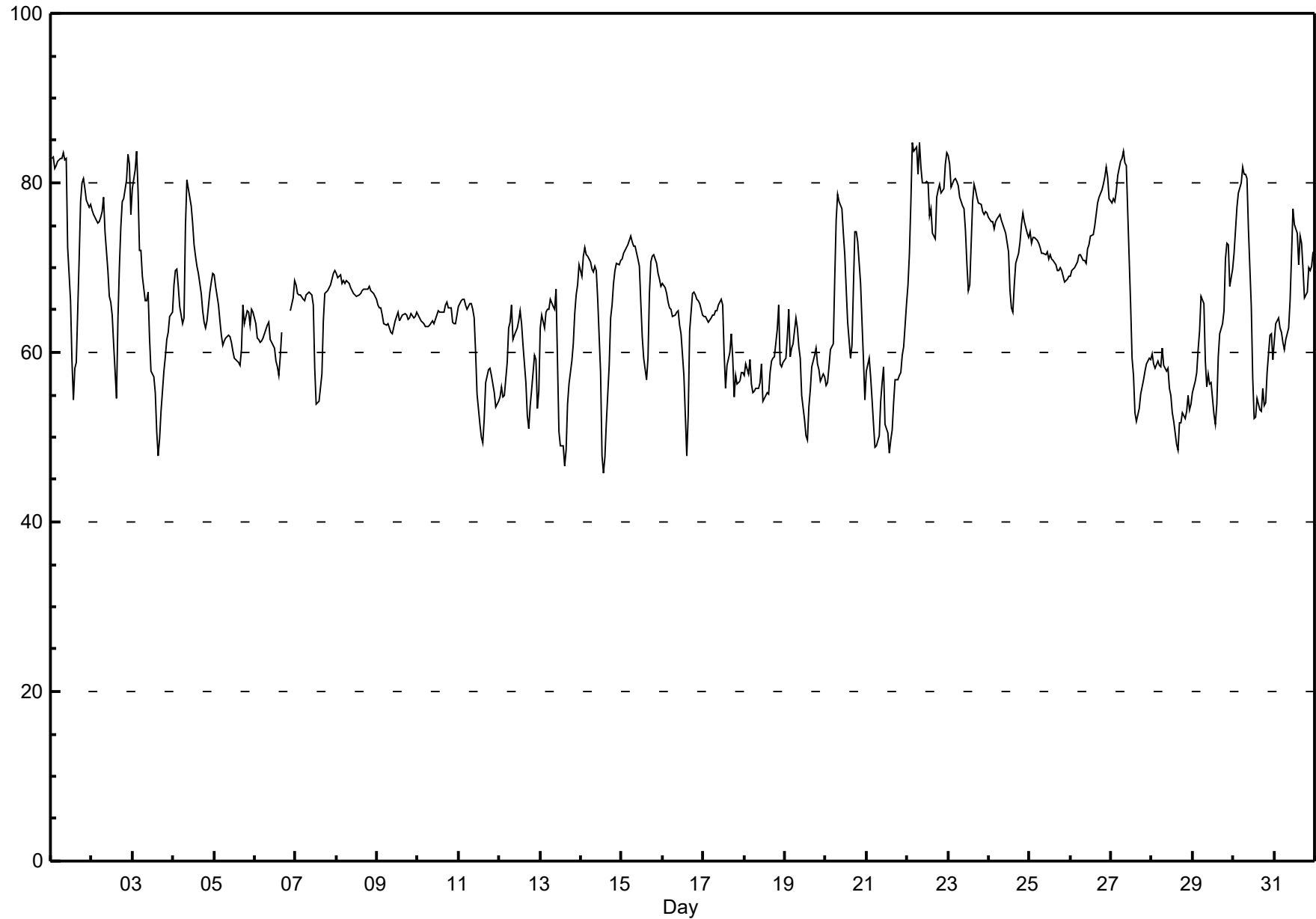
Relative Humidity (RH) - %

Henry Pirker - December 2016

| Maximum Value: 84.7 % on Dec 22 04:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 79.1 % on Dec 22                                                                                                                           |    |    |    |    | Hours in Service: 744          |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|--------------------------------|---------------|
| Minimum Value: 46 % on Dec 14 14:00                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 54.9 % on Dec 21                                                                                                                           |    |    |    |    | Hours of Data: 740             |               |
| Maximum Diurnal Average: 68.7 % at hour 8                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 59.1 % at hour 15                                                                                                                        |    |    |    |    | Hours of Missing Data: 4       |               |
| Monthly Average: 65.65 %                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 48.4 P <sub>10</sub> = 54.6 Q <sub>1</sub> = 59.1 Median = 65.1 Q <sub>3</sub> = 71.5 P <sub>90</sub> = 78.1 P <sub>99</sub> = 83.4 |    |    |    |    | Hours of Calibration: 0        |               |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Percent Operational Time: 99.5 |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Daily Average                  | Daily Maximum |
| 1-Dec                                                                                                                   | 83                            | 83 | 82 | 82 | 83 | 83 | 83 | 84 | 83 | 83 | 72 | 66 | 59 | 54 | 58 | 59 | 71 | 78 | 80 | 81                                                                                                                                                                | 79 | 78 | 77 | 77 | 75.7                           | 83.5          |
| 2-Dec                                                                                                                   | 77                            | 76 | 76 | 75 | 75 | 76 | 77 | 78 | 74 | 70 | 67 | 66 | 64 | 61 | 55 | 64 | 70 | 75 | 78 | 78                                                                                                                                                                | 80 | 83 | 82 | 76 | 73.1                           | 83.4          |
| 3-Dec                                                                                                                   | 79                            | 82 | 84 | 79 | 72 | 72 | 69 | 66 | 66 | 67 | 62 | 58 | 57 | 55 | 51 | 48 | 50 | 53 | 58 | 59                                                                                                                                                                | 62 | 62 | 64 | 65 | 64.1                           | 83.7          |
| 4-Dec                                                                                                                   | 68                            | 70 | 70 | 68 | 65 | 63 | 64 | 75 | 80 | 79 | 77 | 75 | 73 | 71 | 70 | 69 | 67 | 65 | 64 | 63                                                                                                                                                                | 64 | 67 | 68 | 69 | 69.4                           | 80.3          |
| 5-Dec                                                                                                                   | 69                            | 68 | 66 | 64 | 62 | 61 | 61 | 62 | 62 | 62 | 61 | 60 | 59 | 59 | 59 | 59 | 60 | 66 | 63 | 65                                                                                                                                                                | 65 | 63 | 65 | 65 | 62.7                           | 69.2          |
| 6-Dec                                                                                                                   | 63                            | 62 | 62 | 61 | 61 | 62 | 63 | 63 | 63 | 62 | 61 | 61 | 59 | 58 | 57 | 60 | 62 | P  | P  | P                                                                                                                                                                 | P  | 65 | 66 | 68 | 62.0                           | 68.4          |
| 7-Dec                                                                                                                   | 68                            | 67 | 67 | 67 | 66 | 66 | 67 | 67 | 67 | 67 | 66 | 58 | 54 | 54 | 54 | 57 | 64 | 67 | 67 | 67                                                                                                                                                                | 68 | 69 | 69 | 70 | 64.7                           | 69.7          |
| 8-Dec                                                                                                                   | 69                            | 69 | 69 | 68 | 69 | 68 | 68 | 68 | 68 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 67 | 68                                                                                                                                                                | 67 | 67 | 67 | 66 | 67.6                           | 69.3          |
| 9-Dec                                                                                                                   | 66                            | 65 | 65 | 64 | 63 | 63 | 63 | 63 | 62 | 62 | 64 | 64 | 65 | 64 | 64 | 64 | 65 | 64 | 64 | 64                                                                                                                                                                | 65 | 64 | 64 | 65 | 64.1                           | 65.6          |
| 10-Dec                                                                                                                  | 64                            | 64 | 64 | 63 | 63 | 63 | 63 | 63 | 64 | 63 | 64 | 64 | 65 | 65 | 65 | 65 | 66 | 66 | 65 | 65                                                                                                                                                                | 64 | 63 | 63 | 64 | 64.1                           | 65.9          |
| 11-Dec                                                                                                                  | 65                            | 66 | 66 | 66 | 66 | 65 | 66 | 66 | 65 | 64 | 60 | 55 | 51 | 50 | 49 | 52 | 56 | 58 | 58 | 57                                                                                                                                                                | 56 | 55 | 54 | 54 | 59.3                           | 66.2          |
| 12-Dec                                                                                                                  | 55                            | 56 | 55 | 55 | 59 | 63 | 64 | 66 | 61 | 62 | 63 | 64 | 65 | 63 | 61 | 56 | 53 | 51 | 54 | 56                                                                                                                                                                | 60 | 59 | 53 | 55 | 58.6                           | 65.6          |
| 13-Dec                                                                                                                  | 63                            | 64 | 63 | 65 | 65 | 65 | 66 | 65 | 65 | 67 | 59 | 51 | 49 | 49 | 47 | 48 | 54 | 56 | 59 | 61                                                                                                                                                                | 65 | 67 | 68 | 70 | 60.5                           | 70.3          |
| 14-Dec                                                                                                                  | 69                            | 71 | 72 | 71 | 71 | 71 | 70 | 69 | 70 | 70 | 66 | 58 | 48 | 46 | 48 | 52 | 59 | 64 | 66 | 68                                                                                                                                                                | 70 | 71 | 70 | 71 | 65.0                           | 72.3          |
| 15-Dec                                                                                                                  | 71                            | 72 | 72 | 73 | 73 | 74 | 73 | 73 | 72 | 71 | 70 | 66 | 62 | 59 | 57 | 59 | 67 | 71 | 71 | 72                                                                                                                                                                | 70 | 69 | 69 | 68 | 68.9                           | 73.7          |
| 16-Dec                                                                                                                  | 68                            | 68 | 67 | 66 | 65 | 65 | 64 | 64 | 65 | 65 | 63 | 62 | 57 | 52 | 48 | 53 | 63 | 67 | 67 | 67                                                                                                                                                                | 66 | 66 | 66 | 64 | 63.3                           | 68.2          |
| 17-Dec                                                                                                                  | 64                            | 64 | 64 | 64 | 64 | 64 | 64 | 65 | 65 | 66 | 66 | 66 | 60 | 56 | 58 | 60 | 62 | 59 | 55 | 57                                                                                                                                                                | 56 | 57 | 58 | 58 | 61.3                           | 66.2          |
| 18-Dec                                                                                                                  | 57                            | 59 | 57 | 59 | 56 | 55 | 55 | 56 | 56 | 56 | 59 | 54 | 55 | 55 | 55 | 58 | 59 | 59 | 59 | 63                                                                                                                                                                | 66 | 59 | 58 | 59 | 57.7                           | 65.6          |
| 19-Dec                                                                                                                  | 59                            | 62 | 65 | 59 | 61 | 61 | 64 | 63 | 61 | 59 | 55 | 52 | 50 | 50 | 54 | 56 | 58 | 60 | 61 | 59                                                                                                                                                                | 58 | 57 | 58 | 57 | 58.2                           | 65.2          |
| 20-Dec                                                                                                                  | 56                            | 56 | 58 | 60 | 61 | 69 | 76 | 79 | 78 | 77 | 74 | 71 | 67 | 64 | 59 | 61 | 68 | 74 | 74 | 73                                                                                                                                                                | 68 | 64 | 59 | 54 | 66.7                           | 78.6          |
| 21-Dec                                                                                                                  | 58                            | 59 | 57 | 54 | 52 | 49 | 49 | 50 | 54 | 57 | 58 | 52 | 51 | 48 | 50 | 51 | 54 | 57 | 57 | 57                                                                                                                                                                | 58 | 60 | 61 | 66 | 54.9                           | 65.8          |
| 22-Dec                                                                                                                  | 68                            | 72 | 78 | 85 | 84 | 84 | 81 | 85 | 82 | 80 | 80 | 80 | 80 | 76 | 77 | 74 | 73 | 78 | 79 | 80                                                                                                                                                                | 79 | 79 | 82 | 84 | 79.1                           | 84.7          |
| 23-Dec                                                                                                                  | 83                            | 82 | 80 | 80 | 80 | 80 | 80 | 78 | 77 | 77 | 74 | 71 | 67 | 68 | 78 | 80 | 79 | 78 | 78 | 77                                                                                                                                                                | 77 | 76 | 77 | 76 | 77.3                           | 83.2          |
| 24-Dec                                                                                                                  | 76                            | 75 | 75 | 75 | 75 | 76 | 76 | 76 | 75 | 75 | 74 | 72 | 67 | 65 | 65 | 68 | 71 | 72 | 73 | 75                                                                                                                                                                | 76 | 75 | 74 | 74 | 73.1                           | 76.4          |
| 25-Dec                                                                                                                  | 74                            | 73 | 74 | 74 | 73 | 73 | 72 | 72 | 72 | 72 | 72 | 71 | 72 | 71 | 71 | 70 | 70 | 70 | 70 | 70                                                                                                                                                                | 68 | 69 | 69 | 69 | 71.2                           | 74.2          |
| 26-Dec                                                                                                                  | 69                            | 70 | 70 | 70 | 71 | 71 | 71 | 71 | 71 | 71 | 72 | 73 | 74 | 74 | 75 | 76 | 78 | 78 | 79 | 80                                                                                                                                                                | 81 | 82 | 81 | 78 | 74.4                           | 81.9          |
| 27-Dec                                                                                                                  | 78                            | 78 | 78 | 79 | 81 | 83 | 83 | 84 | 82 | 82 | 77 | 66 | 59 | 57 | 53 | 52 | 53 | 55 | 56 | 57                                                                                                                                                                | 58 | 59 | 59 | 59 | 67.8                           | 83.7          |
| 28-Dec                                                                                                                  | 60                            | 59 | 58 | 59 | 58 | 58 | 60 | 58 | 58 | 58 | 56 | 55 | 53 | 52 | 49 | 49 | 52 | 52 | 53 | 52                                                                                                                                                                | 53 | 55 | 53 | 54 | 55.2                           | 60.5          |
| 29-Dec                                                                                                                  | 55                            | 57 | 58 | 60 | 63 | 67 | 66 | 59 | 56 | 57 | 56 | 57 | 53 | 52 | 54 | 59 | 62 | 63 | 65 | 71                                                                                                                                                                | 73 | 73 | 68 | 70 | 61.4                           | 72.9          |
| 30-Dec                                                                                                                  | 72                            | 74 | 77 | 79 | 80 | 82 | 81 | 81 | 80 | 75 | 65 | 57 | 52 | 52 | 55 | 53 | 53 | 56 | 54 | 54                                                                                                                                                                | 58 | 62 | 62 | 59 | 65.6                           | 81.9          |
| 31-Dec                                                                                                                  | 61                            | 63 | 64 | 63 | 62 | 61 | 60 | 61 | 63 | 66 | 71 | 77 | 75 | 74 | 70 | 74 | 73 | 70 | 66 | 67                                                                                                                                                                | 70 | 70 | 70 | 72 | 67.7                           | 77.0          |
| 67.4 67.9 68.1 68.0 67.7 68.2 68.4 68.7 68.3 68.0 66.2 63.5 60.9 59.4 59.1 60.4 63.1 65.0 65.3 66.1 66.6 66.6 66.3 66.4 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Diurnal Average                |               |
| 83.2 83.0 83.7 84.7 83.7 84.3 83.0 84.7 82.7 82.8 80.0 80.1 79.9 76.0 77.9 79.8 79.1 78.3 80.1 80.6 80.6 83.4 82.3 83.5 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Diurnal Maximum                |               |
| P - Power Failure                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    |                                |               |

## Hourly Averages

Relative Humidity (RH) - %  
Henry Pirker - December 2016



## Hourly Averages

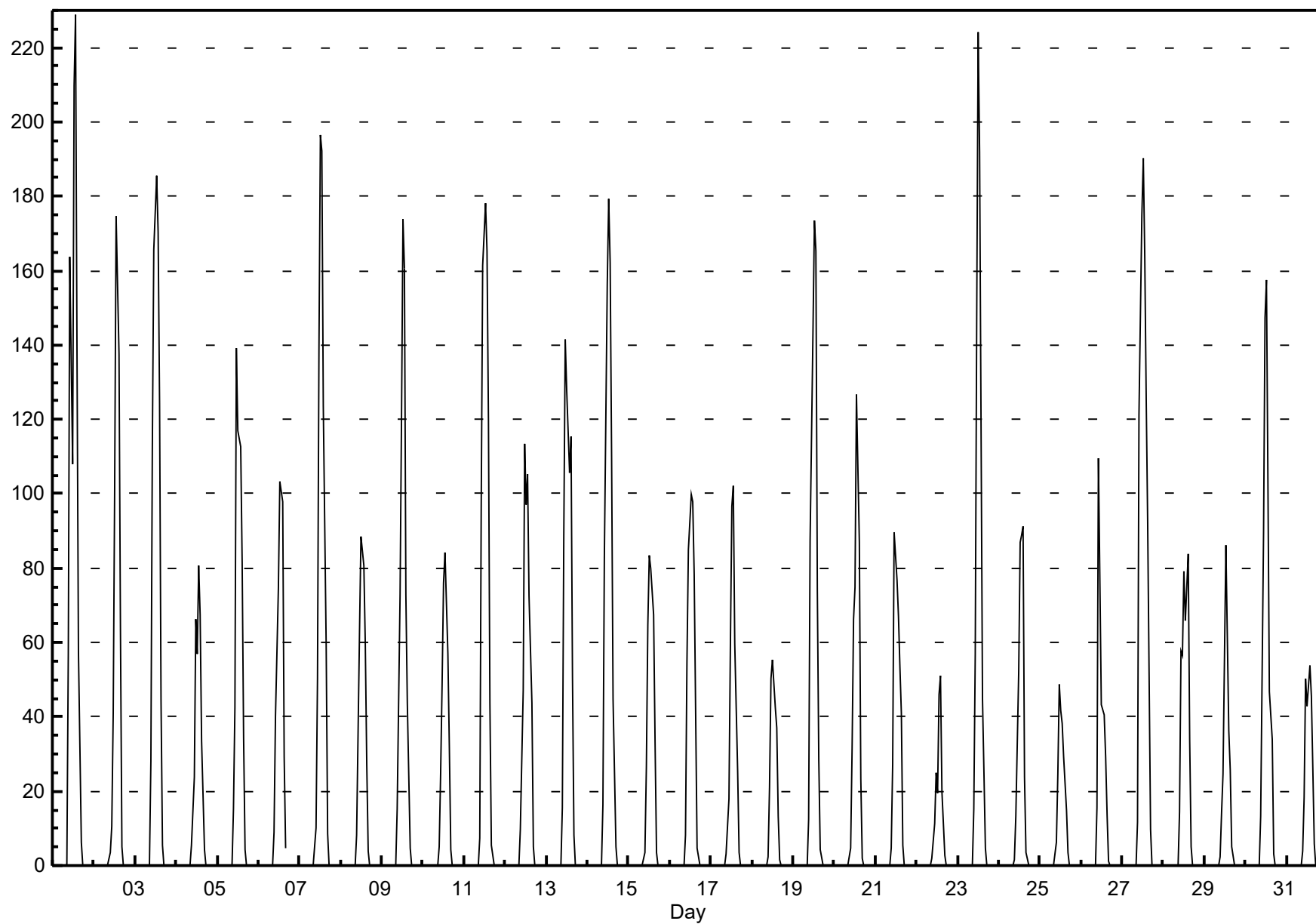
Solar Radiation (SR) - W/m<sup>2</sup>

Henry Pirker - December 2016

|                                                                                                                 |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    |                                                                                                                                                                |    |    |    |                 |                                |               |       |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|-----|-----|-----|-----|-----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|--------------------------------|---------------|-------|
| Maximum Value: 228.6 W/m <sup>2</sup> on Dec 1 14:00                                                            |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    | Maximum Daily Average: 40.4 W/m <sup>2</sup> on Dec 1                                                                                                          |    |    |    |                 | Hours in Service: 744          |               |       |
| Minimum Value: 0 W/m <sup>2</sup> on Dec 1 01:00                                                                |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    | Minimum Daily Average: 7.4 W/m <sup>2</sup> on Dec 22                                                                                                          |    |    |    |                 | Hours of Data: 740             |               |       |
| Maximum Diurnal Average: 113.6 W/m <sup>2</sup> at hour 13                                                      |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    | Minimum Diurnal Average: 0.0 W/m <sup>2</sup> at hour 1                                                                                                        |    |    |    |                 | Hours of Missing Data: 4       |               |       |
| Monthly Average: 21.05 W/m <sup>2</sup>                                                                         |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 15.2 P <sub>90</sub> = 84.4 P <sub>99</sub> = 188.7 |    |    |    |                 | Hours of Calibration: 0        |               |       |
|                                                                                                                 |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    |                                                                                                                                                                |    |    |    |                 | Percent Operational Time: 99.5 |               |       |
| Day                                                                                                             | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    |                                                                                                                                                                |    |    |    |                 | Daily Average                  | Daily Maximum |       |
|                                                                                                                 | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11  | 12  | 13  | 14  | 15  | 16 | 17 | 18 | 19 | 20                                                                                                                                                             | 21 | 22 | 23 | 24              |                                |               |       |
| 1-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 164 | 108 | 210 | 229 | 138 | 58 | 6  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 40.4          | 228.6 |
| 2-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4  | 10  | 41  | 102 | 175 | 138 | 63 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 22.4          | 174.7 |
| 3-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 112 | 166 | 185 | 170 | 124 | 45 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 34.8          | 185.4 |
| 4-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6  | 24  | 66  | 57  | 81  | 67  | 34 | 4  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 14.1          | 80.6  |
| 5-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 42  | 139 | 117 | 113 | 82  | 34 | 4  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 22.8          | 139.0 |
| 6-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9  | 40  | 74  | 103 | 100 | 98  | 29 | 5  | P  | P  | P                                                                                                                                                              | P  | 0  | 0  | 0               | 0                              | 22.9          | 103.3 |
| 7-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 50  | 138 | 197 | 192 | 124 | 59 | 8  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 32.5          | 196.6 |
| 8-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8  | 35  | 63  | 89  | 81  | 59  | 27 | 4  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 15.3          | 88.5  |
| 9-Dec                                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 73  | 121 | 174 | 160 | 73  | 44 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 27.7          | 173.8 |
| 10-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5  | 25  | 49  | 76  | 84  | 57  | 32 | 4  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 13.8          | 84.2  |
| 11-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7  | 96  | 161 | 178 | 165 | 119 | 44 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 32.4          | 178.3 |
| 12-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 47  | 113 | 97  | 105 | 73  | 44 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 20.6          | 113.3 |
| 13-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 89  | 141 | 128 | 105 | 116 | 51 | 8  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 27.2          | 141.3 |
| 14-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 83  | 156 | 179 | 162 | 110 | 45 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 31.5          | 179.1 |
| 15-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3  | 27  | 65  | 83  | 80  | 67  | 33 | 3  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 15.1          | 83.4  |
| 16-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8  | 55  | 85  | 100 | 98  | 78  | 41 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 19.6          | 99.9  |
| 17-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3  | 18  | 60  | 97  | 102 | 60  | 25 | 3  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 15.4          | 102.2 |
| 18-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2  | 21  | 50  | 55  | 42  | 37  | 13 | 1  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 9.3           | 55.4  |
| 19-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 87  | 144 | 174 | 165 | 74  | 29 | 4  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 28.7          | 173.6 |
| 20-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5  | 32  | 66  | 75  | 127 | 87  | 23 | 2  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 17.4          | 126.7 |
| 21-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5  | 27  | 90  | 77  | 67  | 54  | 41 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 15.2          | 89.7  |
| 22-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2  | 11  | 25  | 20  | 46  | 51  | 20 | 3  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 7.4           | 50.9  |
| 23-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 57  | 147 | 224 | 192 | 45  | 25 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 29.6          | 224.0 |
| 24-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2  | 13  | 52  | 87  | 89  | 91  | 24 | 3  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 15.1          | 91.4  |
| 25-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6  | 25  | 49  | 42  | 38  | 29  | 15 | 3  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 8.6           | 48.6  |
| 26-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 109 | 77  | 43  | 41  | 29  | 14 | 1  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 13.7          | 109.4 |
| 27-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 121 | 175 | 190 | 164 | 125 | 92 | 10 | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 37.1          | 190.2 |
| 28-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 58  | 56  | 79  | 66  | 84  | 34 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 16.5          | 83.8  |
| 29-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2  | 14  | 25  | 86  | 61  | 36  | 26 | 5  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 10.7          | 86.0  |
| 30-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 90  | 147 | 158 | 104 | 47  | 34 | 3  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 24.8          | 157.6 |
| 31-Dec                                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4  | 18  | 50  | 43  | 54  | 46  | 26 | 6  | 0  | 0  | 0                                                                                                                                                              | 0  | 0  | 0  | 0               | 0                              | 10.3          | 53.8  |
| 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 10.7 54.0 93.6 113.6 111.5 78.0 36.2 4.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0    |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    |                                                                                                                                                                |    |    |    | Diurnal Average |                                |               |       |
| 0.0 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.4 56.9 163.9 175.1 224.0 228.6 138.4 92.4 9.9 0.1 0.0 0.0 0.0 0.0 0.0 0.0 |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    |                                                                                                                                                                |    |    |    | Diurnal Maximum |                                |               |       |
| P - Power Failure                                                                                               |                               |   |   |   |   |   |   |   |   |    |     |     |     |     |     |    |    |    |    |                                                                                                                                                                |    |    |    |                 |                                |               |       |

## Hourly Averages

Solar Radiation (SR) - W/m<sup>2</sup>  
Henry Pirker - December 2016





## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Henry Pirker - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 3                             | 3   | 3   | 5   | 5   | 6   | 5   | 4   | 2   | 3   | 3   | 1   | 3   | 3   | 3   | 1   | 2   | 2   | 3   | 5   | 3   | 3   | 4   | 2   | 2.3           | 6.2           |
| Dir    | 285                           | 287 | 288 | 278 | 292 | 302 | 293 | 256 | 250 | 241 | 263 | 273 | 188 | 185 | 153 | 252 | 39  | 77  | 271 | 279 | 302 | 284 | 290 | 259 | 274.5         | 302.4         |
| 2 Spd  | 2                             | 3   | 2   | 3   | 2   | 3   | 2   | 5   | 5   | 4   | 5   | 7   | 7   | 5   | 3   | 5   | 2   | 5   | 5   | 3   | 3   | 3   | 4   | 5   | 1.1           | 7.4           |
| Dir    | 297                           | 284 | 282 | 282 | 297 | 276 | 272 | 74  | 72  | 67  | 68  | 76  | 85  | 93  | 246 | 273 | 163 | 149 | 149 | 84  | 121 | 160 | 111 | 228 | 105.4         | 85.1          |
| 3 Spd  | 4                             | 2   | 3   | 5   | 8   | 7   | 12  | 11  | 9   | 13  | 9   | 12  | 14  | 19  | 22  | 23  | 18  | 19  | 17  | 14  | 12  | 13  | 12  | 14  | 11.6          | 23.3          |
| Dir    | 138                           | 138 | 144 | 236 | 244 | 221 | 199 | 186 | 189 | 200 | 206 | 216 | 207 | 212 | 216 | 218 | 225 | 214 | 216 | 222 | 231 | 218 | 208 | 216 | 212.3         | 218.0         |
| 4 Spd  | 11                            | 11  | 11  | 12  | 14  | 13  | 10  | 16  | 20  | 23  | 24  | 24  | 26  | 24  | 23  | 25  | 23  | 21  | 20  | 20  | 20  | 20  | 22  | 22  | 17.3          | 25.7          |
| Dir    | 202                           | 204 | 206 | 208 | 214 | 218 | 264 | 257 | 275 | 276 | 278 | 276 | 279 | 277 | 277 | 278 | 279 | 277 | 273 | 275 | 274 | 276 | 274 | 274 | 265.9         | 279.0         |
| 5 Spd  | 19                            | 17  | 18  | 15  | 18  | 19  | 19  | 17  | 17  | 17  | 14  | 15  | 17  | 17  | 17  | 15  | 15  | 10  | 17  | 14  | 13  | 14  | 12  | 13  | 15.8          | 19.4          |
| Dir    | 274                           | 273 | 265 | 266 | 276 | 277 | 275 | 272 | 271 | 270 | 257 | 265 | 269 | 266 | 273 | 275 | 278 | 273 | 277 | 279 | 276 | 272 | 263 | 272 | 271.7         | 277.2         |
| 6 Spd  | 13                            | 14  | 15  | 14  | 13  | 13  | 12  | 13  | 12  | 12  | 14  | 15  | 15  | 13  | 13  | 9   | 7   | 8   | 8   | 9   | 10  | 8   | 8   | 5   | 11.2          | 15.0          |
| Dir    | 270                           | 274 | 278 | 273 | 273 | 267 | 258 | 257 | 261 | 264 | 256 | 263 | 264 | 262 | 253 | 251 | 249 | 253 | 270 | 272 | 269 | 258 | 262 | 287 | 264.4         | 263.2         |
| 7 Spd  | 4                             | 4   | 4   | 5   | 4   | 3   | 3   | 3   | 3   | 5   | 3   | 2   | 5   | 6   | 4   | 1   | 4   | 5   | 4   | 5   | 4   | 4   | 4   | 3   | 2.0           | 5.6           |
| Dir    | 293                           | 276 | 296 | 301 | 272 | 283 | 198 | 205 | 301 | 293 | 237 | 280 | 274 | 283 | 183 | 36  | 39  | 29  | 35  | 46  | 26  | 346 | 359 | 29  | 313.2         | 282.7         |
| 8 Spd  | 4                             | 6   | 5   | 4   | 5   | 2   | 4   | 5   | 5   | 6   | 6   | 5   | 7   | 6   | 6   | 5   | 6   | 5   | 5   | 5   | 5   | 5   | 4   | 4   | 4.2           | 7.0           |
| Dir    | 38                            | 77  | 47  | 237 | 51  | 87  | 33  | 52  | 70  | 58  | 80  | 66  | 52  | 45  | 37  | 32  | 28  | 34  | 31  | 2   | 1   | 352 | 10  | 4   | 41.0          | 52.1          |
| 9 Spd  | 1                             | 2   | 3   | 3   | 3   | 2   | 3   | 1   | 1   | 3   | 3   | 5   | 4   | 4   | 6   | 6   | 7   | 6   | 4   | 5   | 5   | 5   | 4   | 3   | 2.2           | 7.1           |
| Dir    | 84                            | 344 | 17  | 114 | 126 | 86  | 317 | 265 | 224 | 280 | 262 | 251 | 249 | 108 | 9   | 262 | 261 | 273 | 280 | 265 | 261 | 295 | 270 | 216 | 273.3         | 260.6         |
| 10 Spd | 4                             | 4   | 2   | 1   | 1   | 3   | 4   | 4   | 6   | 6   | 7   | 5   | 4   | 8   | 10  | 11  | 8   | 10  | 12  | 14  | 16  | 14  | 15  | 10  | 6.6           | 15.9          |
| Dir    | 194                           | 197 | 189 | 138 | 159 | 206 | 286 | 266 | 267 | 271 | 278 | 283 | 167 | 278 | 281 | 281 | 282 | 267 | 256 | 255 | 263 | 252 | 256 | 251 | 260.0         | 263.0         |
| 11 Spd | 10                            | 11  | 14  | 14  | 12  | 13  | 10  | 11  | 12  | 15  | 15  | 14  | 14  | 14  | 11  | 12  | 12  | 15  | 17  | 18  | 14  | 17  | 16  | 15  | 13.3          | 18.3          |
| Dir    | 210                           | 214 | 232 | 252 | 252 | 253 | 221 | 227 | 224 | 220 | 223 | 218 | 212 | 211 | 220 | 231 | 212 | 219 | 218 | 224 | 234 | 222 | 235 | 229 | 225.5         | 223.7         |
| 12 Spd | 15                            | 12  | 15  | 16  | 24  | 23  | 18  | 11  | 19  | 26  | 26  | 21  | 18  | 17  | 20  | 22  | 22  | 20  | 16  | 16  | 13  | 17  | 23  | 15  | 18.1          | 26.3          |
| Dir    | 235                           | 226 | 223 | 230 | 258 | 258 | 258 | 238 | 260 | 263 | 269 | 256 | 237 | 239 | 255 | 258 | 260 | 257 | 253 | 253 | 253 | 255 | 257 | 248 | 252.1         | 263.2         |
| 13 Spd | 9                             | 6   | 7   | 8   | 7   | 6   | 6   | 6   | 8   | 9   | 8   | 5   | 6   | 5   | 6   | 6   | 5   | 6   | 5   | 2   | 1   | 2   | 3   | 2   | 5.1           | 9.4           |
| Dir    | 207                           | 247 | 258 | 255 | 221 | 212 | 214 | 231 | 258 | 270 | 261 | 231 | 222 | 224 | 203 | 199 | 218 | 237 | 246 | 268 | 285 | 263 | 302 | 281 | 237.7         | 270.5         |
| 14 Spd | 3                             | 4   | 3   | 48  | 2   | 27  | 7   | 9   | 1   | 3   | 4   | 5   | 3   | 6   | 8   | 8   | 7   | 6   | 6   | 6   | 3   | 20  | 2   | 1   | 4.2           | 48.4          |
| Dir    | 268                           | 252 | 173 | 137 | 166 | 138 | 156 | 146 | 67  | 245 | 252 | 262 | 197 | 242 | 254 | 260 | 256 | 283 | 299 | 285 | 262 | 134 | 235 | 173 | 175.3         | 136.8         |
| 15 Spd | 1                             | 1   | 2   | 2   | 1   | 0   | 3   | 2   | 2   | 15  | 22  | 7   | 7   | 8   | 7   | 7   | 4   | 5   | 29  | 19  | 1   | 10  | 2   | 2   | 3.0           | 29.2          |
| Dir    | 186                           | 194 | 273 | 301 | 243 | 226 | 327 | 300 | 328 | 152 | 106 | 285 | 283 | 270 | 257 | 251 | 185 | 176 | 135 | 140 | 205 | 120 | 290 | 217 | 163.4         | 134.9         |
| 16 Spd | 2                             | 5   | 7   | 5   | 1   | 5   | 1   | 1   | 4   | 3   | 4   | 13  | 3   | 2   | 3   | 2   | 2   | 9   | 21  | 7   | 14  | 19  | 25  | 18  | 3.8           | 25.0          |
| Dir    | 196                           | 199 | 225 | 256 | 270 | 260 | 244 | 286 | 303 | 300 | 305 | 30  | 353 | 259 | 247 | 225 | 192 | 151 | 148 | 134 | 125 | 133 | 145 | 120 | 148.6         | 144.5         |
| 17 Spd | 23                            | 2   | 4   | 4   | 4   | 2   | 10  | 4   | 3   | 2   | 1   | 1   | 3   | 3   | 4   | 4   | 4   | 8   | 13  | 10  | 13  | 13  | 18  | 19  | 3.7           | 22.7          |
| Dir    | 121                           | 18  | 303 | 81  | 296 | 158 | 115 | 305 | 125 | 356 | 320 | 233 | 142 | 183 | 245 | 280 | 268 | 247 | 226 | 260 | 237 | 245 | 218 | 217 | 217.4         | 121.1         |
| 18 Spd | 23                            | 25  | 25  | 27  | 32  | 33  | 29  | 33  | 24  | 17  | 9   | 21  | 26  | 28  | 35  | 33  | 25  | 20  | 16  | 12  | 5   | 10  | 8   | 7   | 21.2          | 34.9          |
| Dir    | 214                           | 213 | 219 | 222 | 218 | 218 | 219 | 218 | 230 | 226 | 217 | 229 | 229 | 235 | 239 | 243 | 236 | 219 | 216 | 214 | 202 | 196 | 155 | 160 | 222.2         | 238.7         |
| 19 Spd | 2                             | 3   | 2   | 10  | 13  | 20  | 24  | 25  | 29  | 28  | 23  | 18  | 19  | 20  | 21  | 23  | 21  | 14  | 13  | 18  | 22  | 21  | 21  | 13  | 16.6          | 28.8          |
| Dir    | 139                           | 80  | 144 | 182 | 192 | 200 | 203 | 207 | 215 | 218 | 219 | 239 | 235 | 238 | 242 | 236 | 242 | 227 | 220 | 217 | 218 | 219 | 210 | 189 | 218.2         | 214.9         |
| 20 Spd | 11                            | 12  | 4   | 3   | 2   | 1   | 1   | 1   | 1   | 0   | 2   | 3   | 4   | 4   | 3   | 5   | 6   | 6   | 6   | 8   | 14  | 16  | 20  | 30  | 5.9           | 30.4          |
| Dir    | 191                           | 202 | 262 | 282 | 276 | 7   | 83  | 129 | 255 | 326 | 287 | 301 | 264 | 272 | 242 | 196 | 207 | 191 | 199 | 209 | 203 | 213 | 209 | 218 | 215.0         | 217.7         |
| 21 Spd | 13                            | 8   | 8   | 10  | 14  | 23  | 25  | 25  | 14  | 12  | 6   | 4   | 10  | 16  | 16  | 17  | 23  | 17  | 11  | 7   | 6   | 6   | 10  | 6   | 12.5          | 24.9          |
| Dir    | 212                           | 206 | 198 | 195 | 196 | 210 | 206 | 209 | 207 | 204 | 206 | 195 | 176 | 188 | 194 | 194 | 193 | 191 | 187 | 175 | 168 | 170 | 188 | 217 | 197.5         | 208.8         |
| 22 Spd | 8                             | 6   | 6   | 8   | 7   | 5   | 8   | 9   | 9   | 7   | 3   | 5   | 5   | 4   | 5   | 6   | 7   | 4   | 5   | 4   | 5   | 4   | 4   | 3   | 4.7           | 8.7           |
| Dir    | 280                           | 256 | 291 | 275 | 265 | 202 | 252 | 222 | 205 | 204 | 223 | 221 | 272 | 231 | 234 | 309 | 318 | 271 | 244 | 290 | 306 | 293 | 288 | 286 | 257.9         | 205.2         |

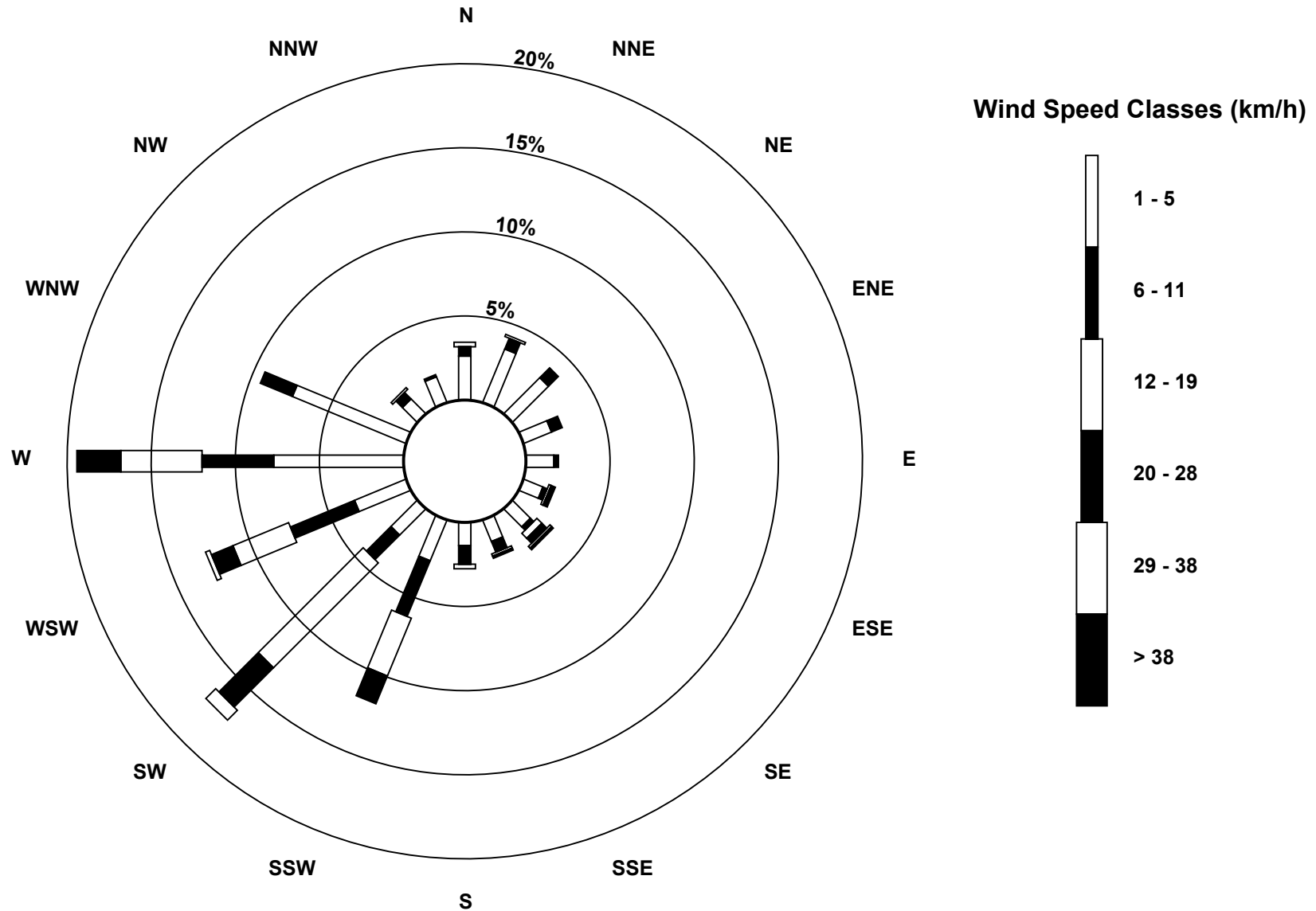
## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Henry Pirker - December 2016

| Day                                                                                | Hourly Period Ending At (MST) |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       | Daily Average   | Daily Maximum |  |                                 |  |
|------------------------------------------------------------------------------------|-------------------------------|-------|---------|-------|----------|-------|----------|-------|----------|-------|-------|-------|-------|-------|-------|-------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-----------------|---------------|--|---------------------------------|--|
|                                                                                    | 1                             | 2     | 3       | 4     | 5        | 6     | 7        | 8     | 9        | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18                                                                                                                                                                  | 19    | 20    | 21    | 22    | 23    | 24    |                 |               |  |                                 |  |
| 23 Spd                                                                             | 3                             | 3     | 4       | 3     | 3        | 3     | 4        | 5     | 7        | 6     | 5     | 6     | 7     | 7     | 7     | 6     | 7     | 4                                                                                                                                                                   | 4     | 4     | 5     | 5     | 5     | 5     | 4.4             | 7.5           |  |                                 |  |
| Dir                                                                                | 319                           | 348   | 293     | 40    | 27       | 14    | 27       | 18    | 34       | 37    | 19    | 36    | 33    | 30    | 24    | 29    | 355   | 16                                                                                                                                                                  | 37    | 41    | 33    | 359   | 2     | 6     | 19.5            | 30.4          |  |                                 |  |
| 24 Spd                                                                             | 5                             | 5     | 4       | 5     | 6        | 6     | 5        | 4     | 5        | 5     | 5     | 4     | 5     | 4     | 3     | 3     | 5     | 4                                                                                                                                                                   | 5     | 5     | 4     | 3     | 2     | 3     | 3.9             | 6.4           |  |                                 |  |
| Dir                                                                                | 11                            | 8     | 17      | 21    | 6        | 7     | 348      | 17    | 13       | 5     | 13    | 11    | 359   | 344   | 357   | 15    | 44    | 49                                                                                                                                                                  | 57    | 69    | 42    | 49    | 104   | 88    | 22.0            | 5.6           |  |                                 |  |
| 25 Spd                                                                             | 1                             | 5     | 1       | 2     | 2        | 1     | 3        | 4     | 2        | 2     | 1     | 3     | 1     | 4     | 5     | 2     | 3     | 1                                                                                                                                                                   | 2     | 3     | 4     | 3     | 2     | 3     | 1.7             | 4.9           |  |                                 |  |
| Dir                                                                                | 39                            | 347   | 174     | 341   | 112      | 261   | 326      | 295   | 282      | 262   | 242   | 87    | 252   | 293   | 260   | 276   | 275   | 295                                                                                                                                                                 | 336   | 304   | 284   | 270   | 278   | 263   | 293.1           | 347.2         |  |                                 |  |
| 26 Spd                                                                             | 2                             | 0     | 3       | 3     | 1        | 1     | 0        | 2     | 2        | 2     | 1     | 2     | 2     | 4     | 3     | 0     | 2     | 2                                                                                                                                                                   | 0     | 1     | 3     | 4     | 1     | 3     | 0.4             | 4.1           |  |                                 |  |
| Dir                                                                                | 269                           | 126   | 114     | 128   | 164      | 299   | 103      | 148   | 301      | 287   | 230   | 247   | 276   | 271   | 276   | 195   | 264   | 274                                                                                                                                                                 | 195   | 103   | 97    | 87    | 214   | 293   | 242.3           | 86.9          |  |                                 |  |
| 27 Spd                                                                             | 1                             | 3     | 1       | 2     | 2        | 1     | 2        | 1     | 2        | 4     | 5     | 7     | 16    | 17    | 18    | 24    | 23    | 24                                                                                                                                                                  | 23    | 22    | 20    | 22    | 23    | 19    | 10.8            | 24.0          |  |                                 |  |
| Dir                                                                                | 281                           | 325   | 30      | 75    | 341      | 78    | 222      | 100   | 115      | 208   | 208   | 211   | 200   | 203   | 210   | 209   | 218   | 216                                                                                                                                                                 | 213   | 215   | 213   | 217   | 219   | 222   | 213.6           | 208.5         |  |                                 |  |
| 28 Spd                                                                             | 15                            | 14    | 15      | 15    | 15       | 15    | 12       | 16    | 18       | 18    | 19    | 18    | 18    | 19    | 19    | 21    | 17    | 17                                                                                                                                                                  | 20    | 20    | 15    | 19    | 18    | 15    | 16.9            | 20.6          |  |                                 |  |
| Dir                                                                                | 221                           | 221   | 220     | 219   | 215      | 216   | 206      | 217   | 218      | 217   | 219   | 221   | 229   | 233   | 225   | 217   | 222   | 226                                                                                                                                                                 | 224   | 220   | 226   | 216   | 212   | 202   | 219.5           | 217.4         |  |                                 |  |
| 29 Spd                                                                             | 13                            | 9     | 6       | 1     | 3        | 4     | 5        | 7     | 6        | 2     | 4     | 2     | 4     | 4     | 2     | 5     | 1     | 1                                                                                                                                                                   | 2     | 4     | 4     | 7     | 5     | 4     | 0.9             | 13.2          |  |                                 |  |
| Dir                                                                                | 209                           | 255   | 275     | 252   | 61       | 85    | 66       | 75    | 66       | 40    | 23    | 36    | 48    | 76    | 10    | 299   | 50    | 18                                                                                                                                                                  | 11    | 265   | 272   | 294   | 289   | 268   | 319.2           | 208.7         |  |                                 |  |
| 30 Spd                                                                             | 3                             | 3     | 7       | 7     | 8        | 4     | 4        | 7     | 8        | 8     | 11    | 16    | 19    | 17    | 14    | 15    | 19    | 15                                                                                                                                                                  | 17    | 16    | 15    | 9     | 9     | 11    | 10.5            | 19.0          |  |                                 |  |
| Dir                                                                                | 261                           | 204   | 206     | 217   | 202      | 205   | 243      | 247   | 231      | 215   | 198   | 225   | 218   | 226   | 231   | 230   | 234   | 239                                                                                                                                                                 | 230   | 229   | 245   | 249   | 253   | 258   | 229.5           | 234.3         |  |                                 |  |
| 31 Spd                                                                             | 10                            | 9     | 6       | 6     | 10       | 11    | 10       | 8     | 7        | 2     | 6     | 6     | 5     | 12    | 12    | 10    | 8     | 11                                                                                                                                                                  | 13    | 9     | 6     | 9     | 9     | 9     | 6.8             | 12.9          |  |                                 |  |
| Dir                                                                                | 250                           | 245   | 273     | 292   | 267      | 253   | 238      | 250   | 267      | 272   | 286   | 291   | 344   | 4     | 357   | 341   | 324   | 314                                                                                                                                                                 | 313   | 298   | 270   | 281   | 268   | 277   | 289.6           | 313.1         |  |                                 |  |
| Spd                                                                                | 4.9                           | 4.6   | 4.8     | 4.8   | 5.4      | 5.9   | 5.5      | 5.9   | 5.4      | 6.0   | 5.1   | 5.7   | 6.2   | 6.9   | 7.8   | 8.2   | 7.3   | 6.8                                                                                                                                                                 | 6.6   | 6.4   | 6.1   | 6.3   | 7.1   | 6.4   | Diurnal Average |               |  |                                 |  |
| Dir                                                                                | 224.6                         | 237.2 | 241.5   | 221.2 | 239.3    | 227.0 | 231.3    | 227.9 | 240.7    | 240.0 | 241.5 | 248.9 | 237.8 | 241.0 | 245.6 | 246.0 | 244.7 | 236.7                                                                                                                                                               | 226.2 | 236.4 | 241.4 | 228.9 | 231.1 | 230.8 | Diurnal Maximum |               |  |                                 |  |
| Spd                                                                                | 23.3                          | 25.3  | 24.9    | 48.4  | 32.3     | 32.9  | 28.7     | 32.6  | 28.8     | 28.0  | 25.9  | 23.5  | 26.5  | 28.3  | 34.9  | 33.2  | 25.4  | 23.6                                                                                                                                                                | 29.2  | 21.7  | 21.6  | 22.1  | 25.0  | 30.4  | Diurnal Maximum |               |  |                                 |  |
| Dir                                                                                | 213.8                         | 213.2 | 218.7   | 136.8 | 218.4    | 218.1 | 218.5    | 217.9 | 214.9    | 217.9 | 269.3 | 275.6 | 228.5 | 234.9 | 238.7 | 242.6 | 235.8 | 216.2                                                                                                                                                               | 134.9 | 214.7 | 218.5 | 216.9 | 144.5 | 217.7 |                 |               |  |                                 |  |
| Maximum Speed Value: 48 km/h on Dec 14 04:00                                       |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       | Minimum Speed Value: 0 km/h on Dec 26 19:00                                                                                                                         |       |       |       |       |       |       |                 |               |  | Hours in Service: 744           |  |
| Maximum Daily Speed Average: 21.2 km/h on Dec 18                                   |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       | Minimum Daily Speed Average: 0.4 km/h on Dec 26                                                                                                                     |       |       |       |       |       |       |                 |               |  | Hours of Data: 744              |  |
| Maximum Diurnal Speed Average: 8.2 km/h at hour 16                                 |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       | Minimum Diurnal Speed Average: 4.6 km/h at hour 2                                                                                                                   |       |       |       |       |       |       |                 |               |  | Hours of Missing Data: 0        |  |
| Monthly Average Velocity: 6.04 km/h 236.52 deg                                     |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       | Speed Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 3.5 Median = 6.2 Q <sub>3</sub> = 14.2 P <sub>90</sub> = 20.2 P <sub>99</sub> = 28.7 |       |       |       |       |       |       |                 |               |  | Percent Operational Time: 100.0 |  |
| All monthly, daily, and diurnal averages have been calculated using vector methods |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
|                                                                                    |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| Frequency Distribution                                                             |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| Speed Range (km/h)                                                                 |                               |       |         |       |          |       |          |       |          |       |       |       |       |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| Direction                                                                          | 0 to 5                        |       | 5 to 11 |       | 11 to 19 |       | 19 to 28 |       | 28 to 38 |       | > 38  |       | Total |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| North                                                                              | 38                            |       | 9       |       | 2        |       | 0        |       | 0        |       | 0     |       | 49    |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| NorthEast                                                                          | 34                            |       | 18      |       | 1        |       | 0        |       | 0        |       | 0     |       | 53    |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| East                                                                               | 24                            |       | 10      |       | 0        |       | 1        |       | 0        |       | 0     |       | 35    |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| SouthEast                                                                          | 20                            |       | 7       |       | 4        |       | 6        |       | 1        |       | 1     |       | 39    |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| South                                                                              | 30                            |       | 18      |       | 16       |       | 2        |       | 0        |       | 0     |       | 66    |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| SouthWest                                                                          | 35                            |       | 42      |       | 87       |       | 41       |       | 10       |       | 0     |       | 215   |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| West                                                                               | 90                            |       | 67      |       | 52       |       | 29       |       | 0        |       | 0     |       | 238   |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| NorthWest                                                                          | 36                            |       | 11      |       | 2        |       | 0        |       | 0        |       | 0     |       | 49    |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |
| Total                                                                              | 307                           |       | 182     |       | 164      |       | 79       |       | 11       |       | 1     |       | 744   |       |       |       |       |                                                                                                                                                                     |       |       |       |       |       |       |                 |               |  |                                 |  |

## Wind Rose

Wind Speed (WS) (km/h)  
Henry Pirker - December 2016



## Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

Henry Pirker - December 2016

| Maximum Speed: 51 km/h on Dec 14 04:00                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Speed Average: 22.1 km/h on Dec 18                                                                                                              |    |    |    |    |                 |               |  |  |  | Hours in Service: 744           |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|--|--|--|---------------------------------|--|
| Minimum Speed: 1 km/h on Dec 15 06:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Speed Average: 2.8 km/h on Dec 26                                                                                                               |    |    |    |    |                 |               |  |  |  | Hours of Data: 744              |  |
| Maximum Diurnal Speed Average: 11.8 km/h at hour 19                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Speed Average: 7.6 km/h at hour 2                                                                                                             |    |    |    |    |                 |               |  |  |  | Hours of Missing Data: 0        |  |
| Monthly Average Speed: 10.08 km/h                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 1.6 P <sub>10</sub> = 2.9 Q <sub>1</sub> = 4.4 Median = 7.2 Q <sub>3</sub> = 14.5 P <sub>90</sub> = 20.6 P <sub>99</sub> = 31.7 |    |    |    |    |                 |               |  |  |  | Percent Operational Time: 100.0 |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    | Daily Average   | Daily Maximum |  |  |  |                                 |  |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                            | 21 | 22 | 23 | 24 |                 |               |  |  |  |                                 |  |
| 1-Dec                                                                                                                   | 3                             | 4  | 3  | 6  | 5  | 6  | 6  | 4  | 4  | 3  | 4  | 2  | 3  | 3  | 3  | 2  | 2  | 3  | 5  | 5                                                                                                                                                             | 3  | 3  | 5  | 3  | 3.7             | 6.2           |  |  |  |                                 |  |
| 2-Dec                                                                                                                   | 7                             | 3  | 2  | 4  | 3  | 4  | 3  | 5  | 6  | 4  | 5  | 8  | 8  | 6  | 4  | 5  | 3  | 5  | 5  | 4                                                                                                                                                             | 3  | 4  | 5  | 6  | 4.7             | 7.6           |  |  |  |                                 |  |
| 3-Dec                                                                                                                   | 4                             | 4  | 5  | 7  | 8  | 7  | 12 | 11 | 9  | 13 | 9  | 12 | 14 | 19 | 22 | 23 | 18 | 19 | 17 | 14                                                                                                                                                            | 12 | 14 | 12 | 14 | 12.5            | 23.5          |  |  |  |                                 |  |
| 4-Dec                                                                                                                   | 11                            | 11 | 11 | 12 | 14 | 13 | 11 | 16 | 20 | 23 | 24 | 24 | 26 | 24 | 24 | 25 | 23 | 21 | 20 | 20                                                                                                                                                            | 20 | 20 | 22 | 22 | 19.0            | 25.8          |  |  |  |                                 |  |
| 5-Dec                                                                                                                   | 19                            | 17 | 18 | 15 | 18 | 20 | 19 | 18 | 17 | 17 | 14 | 15 | 17 | 17 | 17 | 15 | 15 | 11 | 17 | 14                                                                                                                                                            | 13 | 15 | 12 | 13 | 16.0            | 19.5          |  |  |  |                                 |  |
| 6-Dec                                                                                                                   | 13                            | 14 | 15 | 14 | 13 | 13 | 12 | 13 | 12 | 12 | 14 | 15 | 15 | 13 | 13 | 9  | 7  | 8  | 9  | 9                                                                                                                                                             | 11 | 8  | 8  | 6  | 11.4            | 15.2          |  |  |  |                                 |  |
| 7-Dec                                                                                                                   | 5                             | 6  | 7  | 5  | 7  | 8  | 9  | 9  | 3  | 5  | 10 | 5  | 7  | 6  | 8  | 4  | 4  | 5  | 4  | 5                                                                                                                                                             | 4  | 5  | 5  | 3  | 5.8             | 9.7           |  |  |  |                                 |  |
| 8-Dec                                                                                                                   | 4                             | 6  | 6  | 12 | 5  | 7  | 4  | 5  | 6  | 6  | 7  | 6  | 7  | 6  | 7  | 6  | 6  | 5  | 5  | 5                                                                                                                                                             | 5  | 5  | 4  | 4  | 5.8             | 11.5          |  |  |  |                                 |  |
| 9-Dec                                                                                                                   | 7                             | 3  | 4  | 3  | 3  | 3  | 4  | 3  | 3  | 7  | 4  | 5  | 4  | 16 | 14 | 6  | 7  | 7  | 8  | 8                                                                                                                                                             | 5  | 6  | 6  | 5  | 5.9             | 16.0          |  |  |  |                                 |  |
| 10-Dec                                                                                                                  | 4                             | 4  | 3  | 2  | 1  | 3  | 5  | 5  | 7  | 7  | 7  | 6  | 12 | 9  | 10 | 11 | 9  | 10 | 12 | 14                                                                                                                                                            | 16 | 14 | 15 | 11 | 8.1             | 16.1          |  |  |  |                                 |  |
| 11-Dec                                                                                                                  | 10                            | 11 | 14 | 14 | 12 | 13 | 10 | 11 | 12 | 15 | 15 | 14 | 14 | 14 | 11 | 12 | 12 | 15 | 18 | 18                                                                                                                                                            | 14 | 17 | 17 | 15 | 13.7            | 18.5          |  |  |  |                                 |  |
| 12-Dec                                                                                                                  | 15                            | 12 | 16 | 16 | 24 | 23 | 18 | 12 | 19 | 26 | 26 | 21 | 18 | 17 | 20 | 22 | 22 | 20 | 16 | 16                                                                                                                                                            | 13 | 17 | 23 | 15 | 18.6            | 26.4          |  |  |  |                                 |  |
| 13-Dec                                                                                                                  | 9                             | 7  | 8  | 8  | 7  | 6  | 6  | 6  | 8  | 10 | 8  | 5  | 6  | 6  | 7  | 6  | 5  | 6  | 5  | 3                                                                                                                                                             | 4  | 3  | 6  | 3  | 6.1             | 9.6           |  |  |  |                                 |  |
| 14-Dec                                                                                                                  | 4                             | 5  | 14 | 51 | 16 | 33 | 23 | 18 | 17 | 9  | 6  | 5  | 3  | 7  | 9  | 8  | 7  | 6  | 6  | 6                                                                                                                                                             | 10 | 27 | 3  | 1  | 12.2            | 51.4          |  |  |  |                                 |  |
| 15-Dec                                                                                                                  | 2                             | 1  | 3  | 3  | 2  | 1  | 4  | 3  | 3  | 23 | 41 | 7  | 7  | 8  | 8  | 7  | 4  | 10 | 37 | 22                                                                                                                                                            | 3  | 22 | 9  | 7  | 9.8             | 41.5          |  |  |  |                                 |  |
| 16-Dec                                                                                                                  | 3                             | 5  | 8  | 11 | 4  | 6  | 14 | 4  | 4  | 4  | 6  | 17 | 8  | 5  | 3  | 7  | 7  | 14 | 25 | 12                                                                                                                                                            | 24 | 33 | 35 | 30 | 12.1            | 35.1          |  |  |  |                                 |  |
| 17-Dec                                                                                                                  | 38                            | 11 | 4  | 13 | 8  | 9  | 21 | 6  | 11 | 10 | 5  | 1  | 4  | 4  | 5  | 4  | 6  | 8  | 13 | 10                                                                                                                                                            | 13 | 14 | 18 | 19 | 10.7            | 37.9          |  |  |  |                                 |  |
| 18-Dec                                                                                                                  | 23                            | 25 | 25 | 27 | 32 | 33 | 29 | 33 | 24 | 18 | 9  | 22 | 27 | 28 | 35 | 33 | 26 | 20 | 16 | 12                                                                                                                                                            | 5  | 10 | 9  | 8  | 22.1            | 35.0          |  |  |  |                                 |  |
| 19-Dec                                                                                                                  | 2                             | 3  | 3  | 10 | 13 | 20 | 24 | 25 | 29 | 28 | 23 | 18 | 19 | 21 | 21 | 23 | 21 | 14 | 13 | 18                                                                                                                                                            | 22 | 22 | 21 | 13 | 17.7            | 28.9          |  |  |  |                                 |  |
| 20-Dec                                                                                                                  | 11                            | 12 | 6  | 4  | 5  | 2  | 2  | 2  | 3  | 2  | 3  | 3  | 4  | 4  | 3  | 5  | 6  | 6  | 6  | 8                                                                                                                                                             | 14 | 16 | 21 | 31 | 7.4             | 30.6          |  |  |  |                                 |  |
| 21-Dec                                                                                                                  | 13                            | 8  | 8  | 10 | 14 | 23 | 25 | 25 | 14 | 12 | 6  | 5  | 10 | 16 | 16 | 17 | 23 | 17 | 11 | 7                                                                                                                                                             | 6  | 6  | 10 | 7  | 12.9            | 25.0          |  |  |  |                                 |  |
| 22-Dec                                                                                                                  | 9                             | 6  | 6  | 8  | 7  | 5  | 8  | 9  | 9  | 7  | 4  | 5  | 5  | 5  | 6  | 7  | 7  | 5  | 5  | 4                                                                                                                                                             | 5  | 4  | 4  | 3  | 6.0             | 8.9           |  |  |  |                                 |  |
| 23-Dec                                                                                                                  | 3                             | 3  | 5  | 3  | 3  | 4  | 4  | 5  | 7  | 6  | 5  | 6  | 8  | 8  | 7  | 7  | 7  | 4  | 5  | 4                                                                                                                                                             | 5  | 5  | 5  | 5  | 5.1             | 7.7           |  |  |  |                                 |  |
| 24-Dec                                                                                                                  | 5                             | 5  | 4  | 5  | 7  | 6  | 5  | 4  | 5  | 5  | 5  | 5  | 5  | 4  | 3  | 4  | 5  | 4  | 5  | 5                                                                                                                                                             | 4  | 3  | 3  | 4  | 4.6             | 6.6           |  |  |  |                                 |  |
| 25-Dec                                                                                                                  | 3                             | 8  | 8  | 3  | 3  | 2  | 3  | 4  | 2  | 2  | 2  | 3  | 2  | 4  | 5  | 3  | 3  | 2  | 3  | 4                                                                                                                                                             | 4  | 3  | 3  | 3  | 3.4             | 8.2           |  |  |  |                                 |  |
| 26-Dec                                                                                                                  | 2                             | 1  | 3  | 3  | 2  | 2  | 2  | 2  | 3  | 3  | 2  | 2  | 4  | 5  | 4  | 2  | 2  | 2  | 2  | 3                                                                                                                                                             | 4  | 4  | 3  | 4  | 2.8             | 4.7           |  |  |  |                                 |  |
| 27-Dec                                                                                                                  | 3                             | 5  | 3  | 3  | 4  | 2  | 3  | 4  | 5  | 5  | 5  | 8  | 16 | 17 | 18 | 24 | 23 | 24 | 23 | 22                                                                                                                                                            | 20 | 22 | 23 | 19 | 12.6            | 24.2          |  |  |  |                                 |  |
| 28-Dec                                                                                                                  | 15                            | 15 | 15 | 15 | 16 | 15 | 12 | 16 | 18 | 18 | 19 | 18 | 19 | 19 | 19 | 21 | 17 | 17 | 20 | 20                                                                                                                                                            | 15 | 19 | 19 | 16 | 17.1            | 20.7          |  |  |  |                                 |  |
| 29-Dec                                                                                                                  | 13                            | 9  | 7  | 4  | 4  | 4  | 5  | 7  | 6  | 3  | 4  | 3  | 4  | 4  | 3  | 5  | 2  | 2  | 3  | 5                                                                                                                                                             | 5  | 7  | 5  | 4  | 4.9             | 13.4          |  |  |  |                                 |  |
| 30-Dec                                                                                                                  | 3                             | 4  | 7  | 8  | 8  | 4  | 4  | 7  | 8  | 8  | 11 | 16 | 19 | 17 | 14 | 15 | 19 | 15 | 17 | 17                                                                                                                                                            | 15 | 9  | 9  | 11 | 11.1            | 19.1          |  |  |  |                                 |  |
| 31-Dec                                                                                                                  | 10                            | 9  | 7  | 7  | 10 | 11 | 10 | 9  | 7  | 2  | 6  | 6  | 5  | 12 | 13 | 10 | 8  | 11 | 13 | 9                                                                                                                                                             | 6  | 9  | 10 | 9  | 8.8             | 13.0          |  |  |  |                                 |  |
| 8.8 7.6 8.0 9.8 9.0 9.9 10.2 9.7 9.7 10.2 10.0 9.3 10.3 11.1 11.3 11.2 10.5 10.2 11.8 10.5 9.9 11.7 11.2 10.0           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    | Diurnal Average |               |  |  |  |                                 |  |
| 37.9 25.5 25.0 51.4 32.4 33.3 28.9 32.7 28.9 28.1 41.5 23.7 26.7 28.5 35.0 33.3 25.6 23.7 37.1 22.1 24.4 33.2 35.1 30.6 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    | Diurnal Maximum |               |  |  |  |                                 |  |

All monthly, daily, and diurnal averages have been calculated using scalar methods

# Hourly Standard Deviations

Wind Direction (WD) - deg  
Henry Pirker - December 2016

|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|----|----|----|----|----|---------------|
| Maximum Value: 97.6 deg on Dec 20 10:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744           |    |    |    |    |    |               |
| Minimum Value: 3.6 deg on Dec 12 22:00                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 744              |    |    |    |    |    |               |
|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 0        |    |    |    |    |    |               |
| Percentiles: P <sub>1</sub> = 4.7 P <sub>10</sub> = 6.1 Q <sub>1</sub> = 7.8 Median = 15.8 Q <sub>3</sub> = 35.1 P <sub>90</sub> = 63.0 P <sub>99</sub> = 88.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0         |    |    |    |    |    |               |
|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 100.0 |    |    |    |    |    |               |
| Day                                                                                                                                                            | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    | Daily Maximum |
|                                                                                                                                                                | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                              | 20 | 21 | 22 | 23 | 24 |               |
| 1-Dec                                                                                                                                                          | 33                            | 26 | 24 | 18 | 21 | 9  | 27 | 28 | 65 | 42 | 27 | 60 | 17 | 16 | 25 | 32 | 47 | 19 | 54                              | 26 | 16 | 21 | 47 | 45 | 65.4          |
| 2-Dec                                                                                                                                                          | 52                            | 33 | 44 | 28 | 52 | 53 | 57 | 63 | 25 | 18 | 14 | 14 | 12 | 55 | 47 | 29 | 75 | 15 | 31                              | 48 | 46 | 34 | 49 | 32 | 74.7          |
| 3-Dec                                                                                                                                                          | 49                            | 80 | 58 | 59 | 12 | 11 | 7  | 10 | 10 | 9  | 12 | 11 | 8  | 8  | 6  | 6  | 7  | 6  | 6                               | 9  | 10 | 8  | 8  | 7  | 79.9          |
| 4-Dec                                                                                                                                                          | 5                             | 6  | 5  | 7  | 6  | 6  | 20 | 6  | 7  | 7  | 5  | 6  | 5  | 6  | 6  | 5  | 6  | 6  | 6                               | 6  | 7  | 6  | 6  | 6  | 20.2          |
| 5-Dec                                                                                                                                                          | 6                             | 7  | 7  | 8  | 7  | 7  | 7  | 8  | 7  | 7  | 8  | 9  | 8  | 7  | 7  | 7  | 6  | 11 | 6                               | 6  | 7  | 9  | 7  | 6  | 11.1          |
| 6-Dec                                                                                                                                                          | 6                             | 6  | 6  | 8  | 8  | 8  | 8  | 5  | 8  | 8  | 6  | 8  | 8  | 11 | 8  | 8  | 7  | 5  | 11                              | 7  | 9  | 11 | 10 | 35 | 34.7          |
| 7-Dec                                                                                                                                                          | 14                            | 35 | 39 | 9  | 46 | 49 | 60 | 60 | 14 | 19 | 49 | 40 | 35 | 18 | 49 | 84 | 12 | 9  | 13                              | 12 | 19 | 22 | 28 | 24 | 83.6          |
| 8-Dec                                                                                                                                                          | 23                            | 19 | 16 | 69 | 16 | 43 | 16 | 23 | 26 | 18 | 22 | 20 | 15 | 18 | 16 | 17 | 16 | 17 | 21                              | 20 | 16 | 20 | 19 | 29 | 68.9          |
| 9-Dec                                                                                                                                                          | 48                            | 33 | 39 | 25 | 21 | 65 | 37 | 72 | 65 | 62 | 34 | 7  | 9  | 72 | 61 | 17 | 11 | 20 | 62                              | 41 | 18 | 16 | 33 | 48 | 72.3          |
| 10-Dec                                                                                                                                                         | 17                            | 17 | 47 | 56 | 34 | 22 | 29 | 37 | 27 | 35 | 15 | 15 | 70 | 31 | 13 | 11 | 17 | 13 | 7                               | 6  | 7  | 5  | 8  | 13 | 69.7          |
| 11-Dec                                                                                                                                                         | 10                            | 9  | 9  | 6  | 5  | 5  | 11 | 10 | 10 | 7  | 10 | 7  | 8  | 8  | 11 | 12 | 7  | 7  | 7                               | 8  | 8  | 8  | 7  | 7  | 12.2          |
| 12-Dec                                                                                                                                                         | 5                             | 7  | 7  | 6  | 8  | 4  | 5  | 17 | 14 | 5  | 6  | 6  | 6  | 8  | 5  | 5  | 5  | 5  | 5                               | 5  | 5  | 4  | 4  | 13 | 16.8          |
| 13-Dec                                                                                                                                                         | 20                            | 20 | 13 | 14 | 11 | 13 | 16 | 18 | 11 | 12 | 8  | 24 | 19 | 24 | 12 | 9  | 14 | 9  | 17                              | 67 | 62 | 45 | 48 | 53 | 67.4          |
| 14-Dec                                                                                                                                                         | 36                            | 31 | 64 | 36 | 49 | 77 | 70 | 84 | 68 | 53 | 41 | 16 | 26 | 25 | 17 | 11 | 8  | 13 | 10                              | 16 | 50 | 77 | 47 | 37 | 83.6          |
| 15-Dec                                                                                                                                                         | 29                            | 31 | 43 | 40 | 61 | 82 | 28 | 42 | 40 | 61 | 85 | 13 | 12 | 10 | 13 | 8  | 24 | 54 | 71                              | 69 | 47 | 76 | 60 | 65 | 84.7          |
| 16-Dec                                                                                                                                                         | 36                            | 16 | 22 | 50 | 55 | 45 | 64 | 67 | 13 | 46 | 41 | 58 | 53 | 48 | 26 | 74 | 53 | 83 | 76                              | 72 | 86 | 96 | 87 | 89 | 95.7          |
| 17-Dec                                                                                                                                                         | 83                            | 53 | 23 | 88 | 57 | 65 | 85 | 32 | 80 | 66 | 47 | 68 | 18 | 32 | 43 | 29 | 51 | 22 | 12                              | 18 | 15 | 12 | 7  | 7  | 88.4          |
| 18-Dec                                                                                                                                                         | 7                             | 8  | 6  | 6  | 5  | 5  | 7  | 5  | 7  | 14 | 16 | 8  | 7  | 6  | 5  | 5  | 5  | 7  | 11                              | 10 | 9  | 15 | 9  | 16 | 16.1          |
| 19-Dec                                                                                                                                                         | 53                            | 36 | 48 | 11 | 8  | 7  | 7  | 7  | 6  | 5  | 6  | 8  | 7  | 7  | 7  | 8  | 7  | 8  | 8                               | 6  | 6  | 6  | 8  | 8  | 52.8          |
| 20-Dec                                                                                                                                                         | 9                             | 7  | 47 | 57 | 65 | 64 | 78 | 66 | 74 | 98 | 72 | 30 | 23 | 25 | 29 | 13 | 14 | 11 | 21                              | 11 | 7  | 12 | 9  | 5  | 97.6          |
| 21-Dec                                                                                                                                                         | 8                             | 10 | 10 | 7  | 10 | 8  | 7  | 6  | 8  | 9  | 13 | 32 | 12 | 9  | 11 | 9  | 7  | 8  | 7                               | 9  | 11 | 8  | 11 | 29 | 32.0          |
| 22-Dec                                                                                                                                                         | 18                            | 8  | 13 | 7  | 18 | 13 | 15 | 17 | 9  | 16 | 20 | 14 | 20 | 16 | 33 | 35 | 9  | 24 | 7                               | 25 | 9  | 17 | 11 | 35 | 35.1          |
| 23-Dec                                                                                                                                                         | 33                            | 40 | 33 | 42 | 17 | 23 | 18 | 16 | 13 | 14 | 20 | 17 | 16 | 13 | 14 | 15 | 22 | 43 | 38                              | 38 | 14 | 21 | 14 | 17 | 42.6          |
| 24-Dec                                                                                                                                                         | 16                            | 19 | 19 | 14 | 16 | 15 | 20 | 25 | 19 | 19 | 16 | 19 | 20 | 21 | 32 | 33 | 16 | 18 | 17                              | 13 | 10 | 22 | 41 | 24 | 40.8          |
| 25-Dec                                                                                                                                                         | 77                            | 36 | 68 | 47 | 32 | 79 | 22 | 19 | 26 | 24 | 64 | 20 | 73 | 19 | 17 | 23 | 43 | 64 | 35                              | 32 | 17 | 31 | 38 | 24 | 78.5          |
| 26-Dec                                                                                                                                                         | 64                            | 93 | 19 | 24 | 90 | 78 | 79 | 55 | 59 | 60 | 81 | 59 | 65 | 49 | 51 | 84 | 57 | 32 | 92                              | 85 | 45 | 26 | 61 | 75 | 92.5          |
| 27-Dec                                                                                                                                                         | 81                            | 67 | 63 | 54 | 82 | 74 | 64 | 96 | 72 | 48 | 19 | 42 | 8  | 8  | 7  | 7  | 7  | 6  | 6                               | 7  | 6  | 6  | 6  | 8  | 96.4          |
| 28-Dec                                                                                                                                                         | 7                             | 6  | 7  | 6  | 6  | 5  | 7  | 5  | 5  | 5  | 5  | 6  | 7  | 7  | 8  | 5  | 6  | 8  | 9                               | 6  | 8  | 6  | 6  | 6  | 9.0           |
| 29-Dec                                                                                                                                                         | 9                             | 16 | 18 | 84 | 58 | 29 | 20 | 13 | 10 | 38 | 16 | 62 | 35 | 25 | 60 | 16 | 50 | 73 | 59                              | 33 | 22 | 12 | 10 | 22 | 83.6          |
| 30-Dec                                                                                                                                                         | 58                            | 34 | 13 | 17 | 7  | 24 | 25 | 19 | 11 | 21 | 8  | 13 | 6  | 7  | 6  | 7  | 8  | 6  | 7                               | 8  | 7  | 5  | 7  | 5  | 58.1          |
| 31-Dec                                                                                                                                                         | 5                             | 8  | 17 | 13 | 14 | 9  | 10 | 30 | 15 | 37 | 11 | 15 | 18 | 13 | 12 | 16 | 8  | 8  | 7                               | 6  | 15 | 12 | 9  | 7  | 36.8          |
| 83.5 92.5 68.1 88.4 89.7 81.9 84.9 96.4 80.3 97.6 84.7 68.0 73.5 72.3 61.1 83.7 74.7 83.4 91.8 84.6 85.7 95.7 86.5 89.3                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |               |

PAZA  
Evergreen Park Station  
Monthly Summary Tables, Graphs and  
Roses

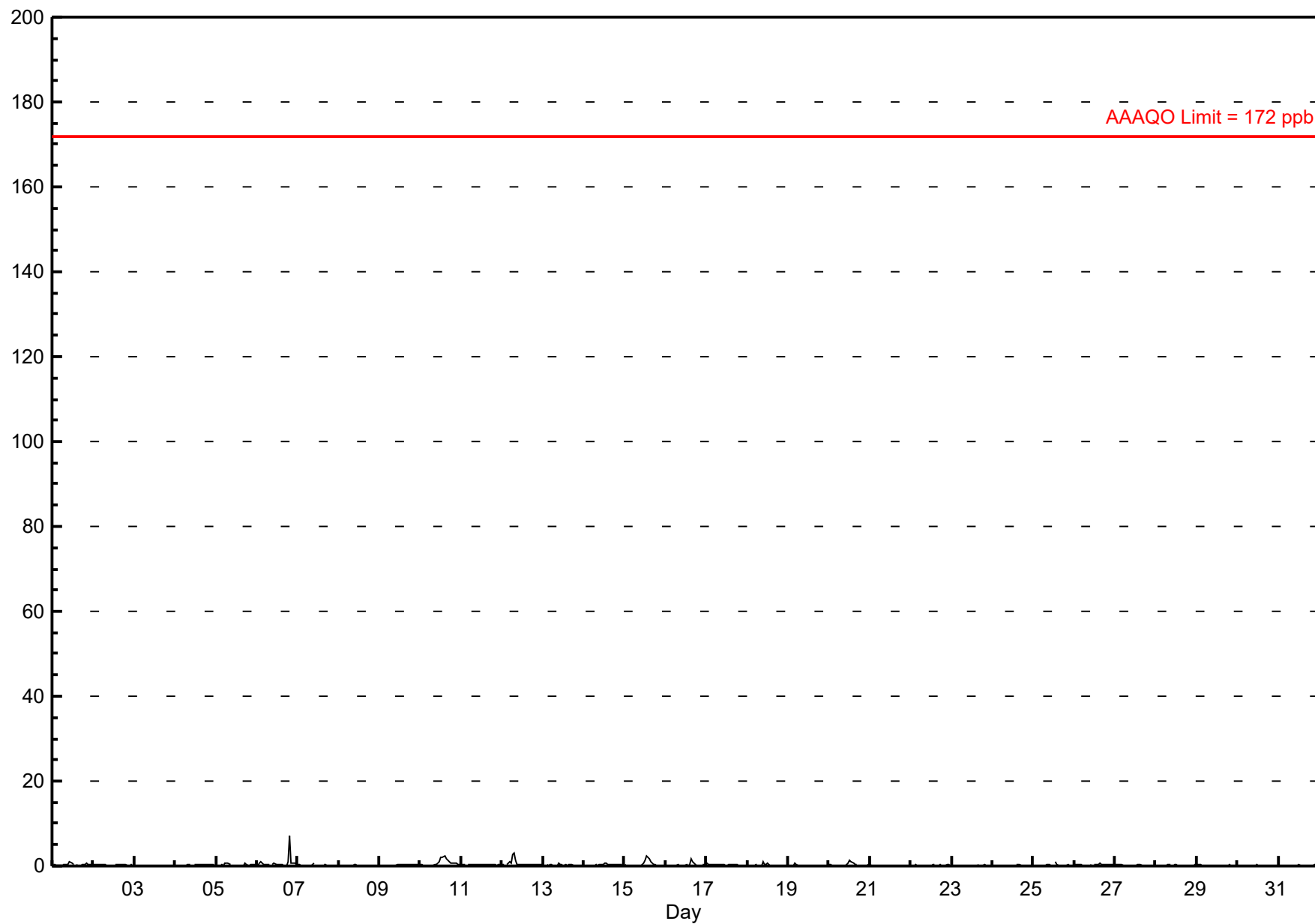
# Hourly Averages

## Sulphur Dioxide (SO<sub>2</sub>) - ppb Evergreen Park - December 2016

|                                                                                                                                                                                                                                                                                                                                                               |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                         |    |    |    |    |    |                 |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|-----------------------------------------------------------------------------------------|----|----|----|----|----|-----------------|---------------|
| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 7.0 ppb on Dec 6 20:00 Maximum Daily Average: 0.7 ppb on Dec 10                                                                                                                                                                                                                             |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 708                                             |    |    |    |    |    |                 |               |
| Minimum Value: 0 ppb on Dec 3 20:00 Minimum Daily Average: 0.0 ppb on Dec 3<br>Maximum Diurnal Average: 0.4 ppb at hour 20 Minimum Diurnal Average: 0.1 ppb at hour 4<br>Monthly Average: 0.23 ppb Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.4 P <sub>99</sub> = 1.8 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 36<br>Hours of Calibration: 35<br>Percent Operational Time: 99.9 |    |    |    |    |    |                 |               |
| Day                                                                                                                                                                                                                                                                                                                                                           | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                         |    |    |    |    |    | Daily Average   | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                               | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                                                                                      | 20 | 21 | 22 | 23 | 24 |                 |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 1  | 0  | 0  | 0  | 0.3             | 0.9           |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.3             | 0.5           |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.0             | 0.2           |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 0.4           |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 0.7           |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 1 | 1 | 1 | 0 | 0 | 0 | 0 | A | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                       | 7  | 1  | 1  | 1  | 0  | 0.7             | 7.0           |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 1  | D  | 1  | C  | C  | C  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 0.6           |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.4           |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                         | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 0.4           |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 2  | 2  | 2  | 2  | 1  | 1  | 1                                                                                       | 1  | 1  | 1  | 0  | 0  | 0.7             | 2.2           |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.3             | 0.5           |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | A | 0 | 1 | 1 | 3 | 3 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.6             | 2.9           |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 0.7           |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                        | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | A  | 0.2             | 0.7           |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0                                                                                       | 0  | 0  | 0  | A  | 0  | 0.4             | 2.3           |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 2  | 1  | 0  | 0                                                                                       | 0  | 0  | A  | 0  | 0  | 0.2             | 1.5           |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                        | 1                             | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | A  | 0  | 0  | 0  | 0.3             | 0.5           |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | A  | 0  | 0  | 0  | 0  | 0.2             | 1.1           |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.7           |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 1  | 1  | 0  | 0  | A  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.3             | 1.3           |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.2           |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.3           |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.3           |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.3           |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 1  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 1.0           |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 1  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.3             | 0.6           |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.4           |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.2             | 0.3           |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.3           |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.2           |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                        | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                       | 0  | 0  | 0  | 0  | 0  | 0.1             | 0.4           |
| 0.2 0.2 0.2 0.1 0.2 0.2 0.2 0.3 0.2 0.2 0.2 0.3 0.3 0.4 0.3 0.3 0.2 0.2 0.2 0.4 0.2 0.2 0.2 0.2 0.2                                                                                                                                                                                                                                                           |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                         |    |    |    |    |    | Diurnal Average |               |
| 0.5 0.7 1.1 0.7 1.0 0.8 2.7 2.9 1.2 1.1 0.9 1.1 1.9 2.3 2.2 1.7 1.2 1.0 0.9 7.0 0.7 0.7 0.5 0.4                                                                                                                                                                                                                                                               |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                         |    |    |    |    |    | Diurnal Maximum |               |
| C - Calibration D - DAS Failure A - Automated Daily Zero Span                                                                                                                                                                                                                                                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                         |    |    |    |    |    |                 |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb 30-day 11 ppb                                                                                                                                                                                                                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                         |    |    |    |    |    |                 |               |

## Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Evergreen Park - December 2016**





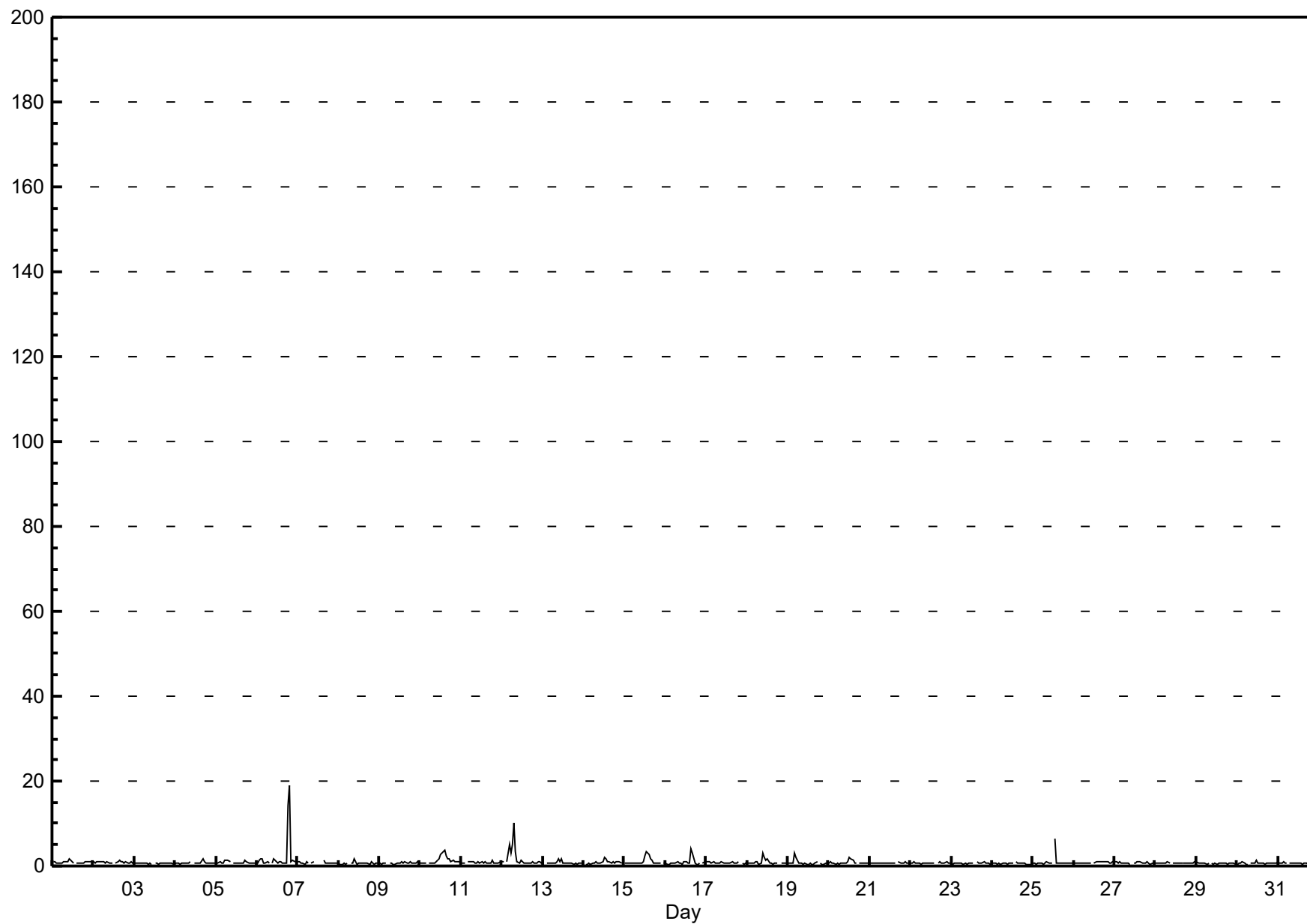
# Hourly Maximums

## Sulphur Dioxide (SO<sub>2</sub>) - ppb Evergreen Park - December 2016

| Maximum Value: 19.1 ppb on Dec 6 20:00      |                               |                 |     |     |     |     |     |                               |      |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.4 ppb on Dec 6                                                                                                                    |      |     |     |     |               |                 |  |  |  | Hours in Service: 744     |  |
|---------------------------------------------|-------------------------------|-----------------|-----|-----|-----|-----|-----|-------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|-----|-----|---------------|-----------------|--|--|--|---------------------------|--|
| Minimum Value: 0 ppb on Dec 16 11:00        |                               |                 |     |     |     |     |     |                               |      |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.6 ppb on Dec 3                                                                                                                    |      |     |     |     |               |                 |  |  |  | Hours of Data: 708        |  |
| Maximum Diurnal Average: 1.4 ppb at hour 20 |                               |                 |     |     |     |     |     |                               |      |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.7 ppb at hour 21                                                                                                                |      |     |     |     |               |                 |  |  |  | Hours of Missing Data: 36 |  |
| Monthly Average: 0.87 ppb                   |                               |                 |     |     |     |     |     |                               |      |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.7 Q <sub>3</sub> = 0.9 P <sub>90</sub> = 1.1 P <sub>99</sub> = 3.4 |      |     |     |     |               |                 |  |  |  | Hours of Calibration: 35  |  |
|                                             |                               |                 |     |     |     |     |     |                               |      |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.9                                                                                                                             |      |     |     |     |               |                 |  |  |  |                           |  |
| Day                                         | Hourly Period Ending At (MST) |                 |     |     |     |     |     |                               |      |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |     |     |     | Daily Average | Daily Maximum   |  |  |  |                           |  |
|                                             | 1                             | 2               | 3   | 4   | 5   | 6   | 7   | 8                             | 9    | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20                                                                                                                                                         | 21   | 22  | 23  | 24  |               |                 |  |  |  |                           |  |
| 1-Dec                                       | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 2   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.9           | 1.5             |  |  |  |                           |  |
| 2-Dec                                       | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.9           | 1.5             |  |  |  |                           |  |
| 3-Dec                                       | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 0    | 1   | 0   | A   | 1   | 1   | 0   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 0   | 0.6           | 0.8             |  |  |  |                           |  |
| 4-Dec                                       | 1                             | 1               | 1   | 0   | 1   | 1   | 1   | 1                             | 1    | 1   | A   | 1   | 1   | 1   | 1   | 1   | 2   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.8           | 1.7             |  |  |  |                           |  |
| 5-Dec                                       | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 2                             | 1    | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.8           | 1.5             |  |  |  |                           |  |
| 6-Dec                                       | 1                             | 1               | 2   | 2   | 1   | 1   | 1   | 1                             | A    | 1   | 2   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 14  | 19                                                                                                                                                         | 1    | 1   | 1   | 1   | 2.4           | 19.1            |  |  |  |                           |  |
| 7-Dec                                       | 1                             | 1               | 1   | 1   | 0   | 1   | 1   | A                             | 1    | 1   | D   | 1   | C   | C   | C   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.8           | 1.2             |  |  |  |                           |  |
| 8-Dec                                       | 1                             | 1               | 0   | 1   | 0   | 1   | A   | 1                             | 1    | 2   | 1   | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 0   | 1                                                                                                                                                          | 1    | 0   | 1   | 1   | 0.6           | 1.6             |  |  |  |                           |  |
| 9-Dec                                       | 1                             | 0               | 1   | 1   | 1   | A   | 1   | 1                             | 0    | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.7           | 1.0             |  |  |  |                           |  |
| 10-Dec                                      | 1                             | 1               | 1   | 1   | A   | 1   | 1   | 1                             | 1    | 1   | 1   | 2   | 3   | 3   | 4   | 2   | 2   | 2   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 1.3           | 3.8             |  |  |  |                           |  |
| 11-Dec                                      | 1                             | 1               | 1   | A   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.8           | 1.4             |  |  |  |                           |  |
| 12-Dec                                      | 1                             | 1               | A   | 1   | 5   | 3   | 5   | 10                            | 3    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 1.9           | 10.2            |  |  |  |                           |  |
| 13-Dec                                      | 1                             | A               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 2   | 1   | 2   | 1   | 1   | 1   | 1   | 1   | 1   | 0   | 1                                                                                                                                                          | 0    | 1   | 1   | 1   | 0.8           | 1.7             |  |  |  |                           |  |
| 14-Dec                                      | A                             | 0               | 0   | 1   | 0   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | A   | 0.9           | 2.2             |  |  |  |                           |  |
| 15-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | 2   | 3   | 3   | 2   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | A   | 1   | 1.1           | 3.2             |  |  |  |                           |  |
| 16-Dec                                      | 1                             | 0               | 0   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 0   | 1   | 1   | 1   | 1   | 4   | 3   | 1   | 0   | 0                                                                                                                                                          | 1    | A   | 1   | 1   | 0.9           | 4.0             |  |  |  |                           |  |
| 17-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | A    | 1   | 0   | 1   | 0.8           | 1.1             |  |  |  |                           |  |
| 18-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 0                             | 1    | 3   | 2   | 1   | 2   | 1   | 1   | 0   | 1   | 1   | 1   | A                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.9           | 3.2             |  |  |  |                           |  |
| 19-Dec                                      | 1                             | 1               | 1   | 1   | 3   | 2   | 1   | 1                             | 1    | 1   | 1   | 0   | 0   | 1   | 0   | 0   | 1   | 1   | A   | 1                                                                                                                                                          | 0    | 0   | 1   | 1   | 0.8           | 3.0             |  |  |  |                           |  |
| 20-Dec                                      | 1                             | 1               | 1   | 1   | 0   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | 2   | 2   | 1   | 1   | 1   | A   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.8           | 1.9             |  |  |  |                           |  |
| 21-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.7           | 1.0             |  |  |  |                           |  |
| 22-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 0   | 1                             | 1    | 1   | 1   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.7           | 0.9             |  |  |  |                           |  |
| 23-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 0                             | 1    | 0   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 0   | 0.6           | 1.0             |  |  |  |                           |  |
| 24-Dec                                      | 1                             | 1               | 1   | 0   | 1   | 0   | 1   | 1                             | 1    | 0   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 0    | 1   | 0   | 1   | 0.6           | 0.9             |  |  |  |                           |  |
| 25-Dec                                      | 1                             | 1               | 0   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | 1   | A   | 6   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.9           | 6.4             |  |  |  |                           |  |
| 26-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.8           | 1.1             |  |  |  |                           |  |
| 27-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | 0   | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 0   | 1   | 1   | 0.7           | 1.1             |  |  |  |                           |  |
| 28-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 1   | 1                             | 1    | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.7           | 0.9             |  |  |  |                           |  |
| 29-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | 0   | 1                             | A    | 1   | 0   | 1   | 0   | 1   | 1   | 1   | 1   | 1   | 0   | 1                                                                                                                                                          | 1    | 1   | 1   | 0   | 0.6           | 0.9             |  |  |  |                           |  |
| 30-Dec                                      | 0                             | 1               | 1   | 1   | 1   | 0   | 0   | A                             | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.6           | 1.5             |  |  |  |                           |  |
| 31-Dec                                      | 1                             | 1               | 1   | 1   | 1   | 1   | A   | 1                             | 1    | 1   | 1   | 1   | 1   | 1   | 0   | 1   | 1   | 1   | 0   | 1                                                                                                                                                          | 1    | 1   | 1   | 1   | 0.7           | 1.0             |  |  |  |                           |  |
|                                             |                               | 0.7             | 0.7 | 0.7 | 0.7 | 0.9 | 0.8 | 0.9                           | 1.1  | 0.8 | 0.9 | 0.8 | 0.9 | 0.9 | 1.2 | 0.9 | 1.0 | 0.9 | 0.8 | 1.1                                                                                                                                                        | 1.4  | 0.7 | 0.7 | 0.7 | 0.7           | Diurnal Average |  |  |  |                           |  |
|                                             |                               | 1.0             | 1.3 | 1.7 | 1.6 | 5.2 | 2.9 | 5.1                           | 10.2 | 3.4 | 3.2 | 1.9 | 1.8 | 2.7 | 6.4 | 3.8 | 4.0 | 3.1 | 1.5 | 14.3                                                                                                                                                       | 19.1 | 1.2 | 1.2 | 1.2 | 1.0           | Diurnal Maximum |  |  |  |                           |  |
| C - Calibration                             |                               | D - DAS Failure |     |     |     |     |     | A - Automated Daily Zero Span |      |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |     |     |     |               |                 |  |  |  |                           |  |

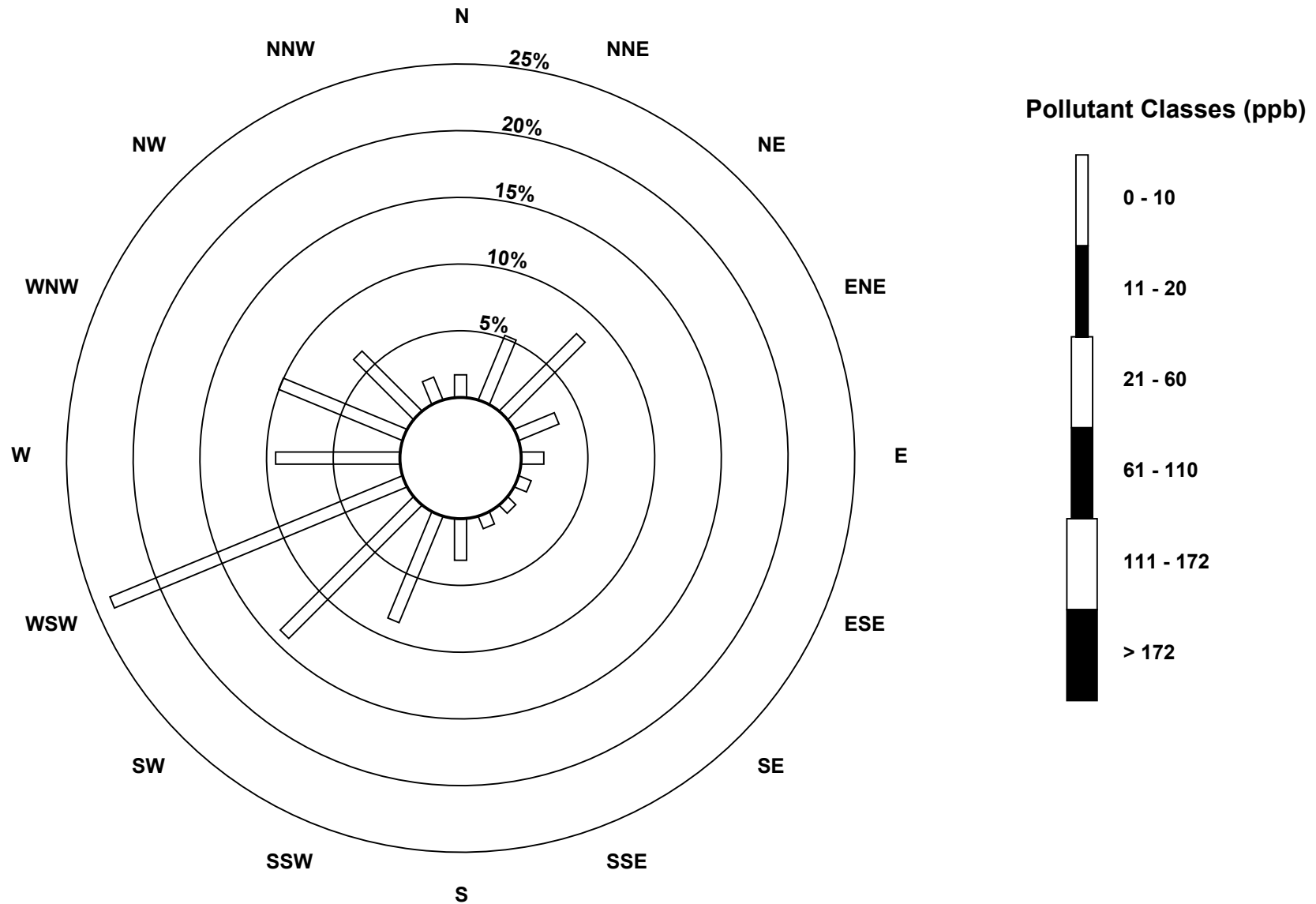
## Hourly Maximums

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Evergreen Park - December 2016**



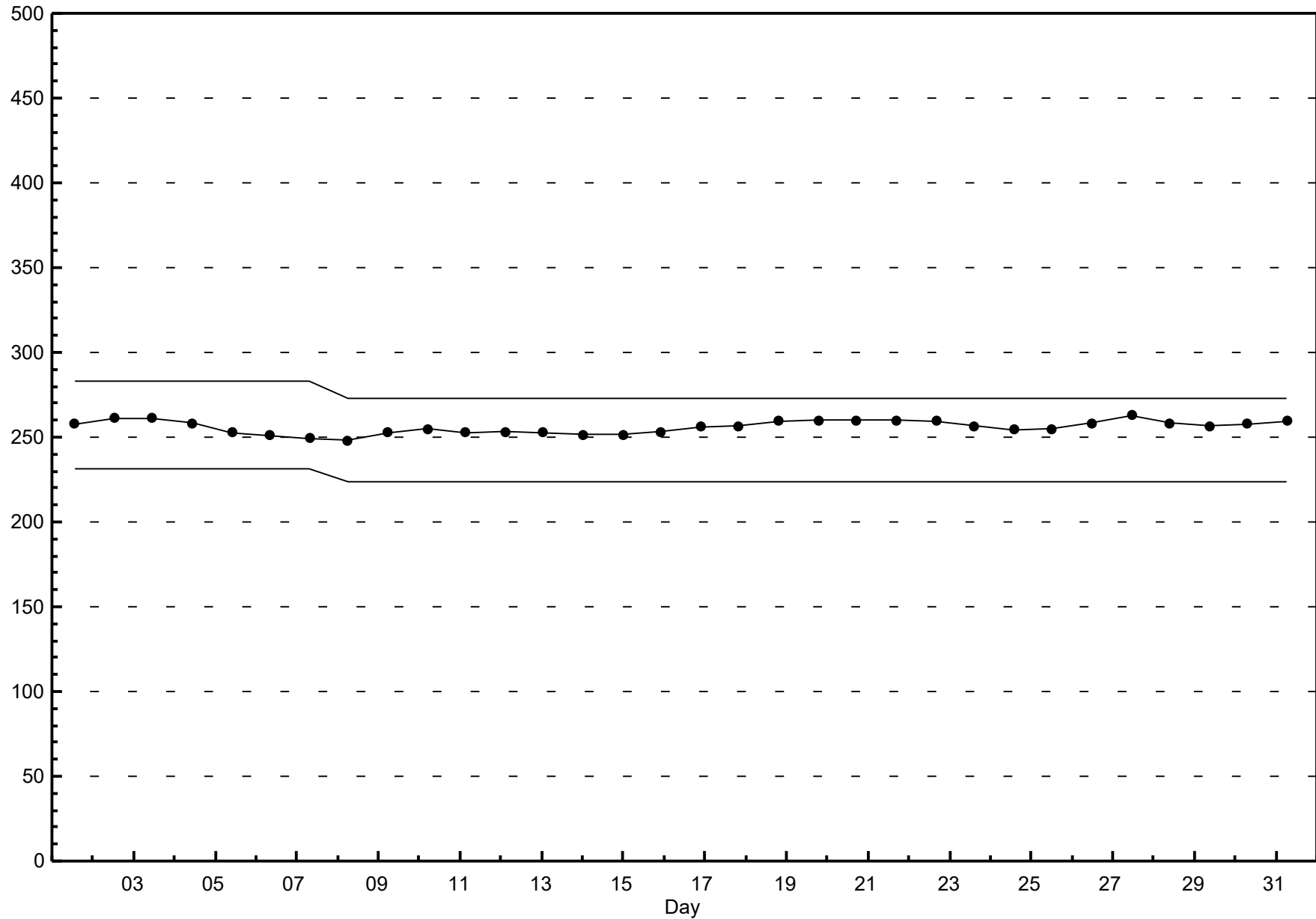
## Pollutant Rose

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Evergreen Park - December 2016**



## Span Responses

Sulphur Dioxide (SO<sub>2</sub>)  
Evergreen Park - December 2016



# Hourly Averages

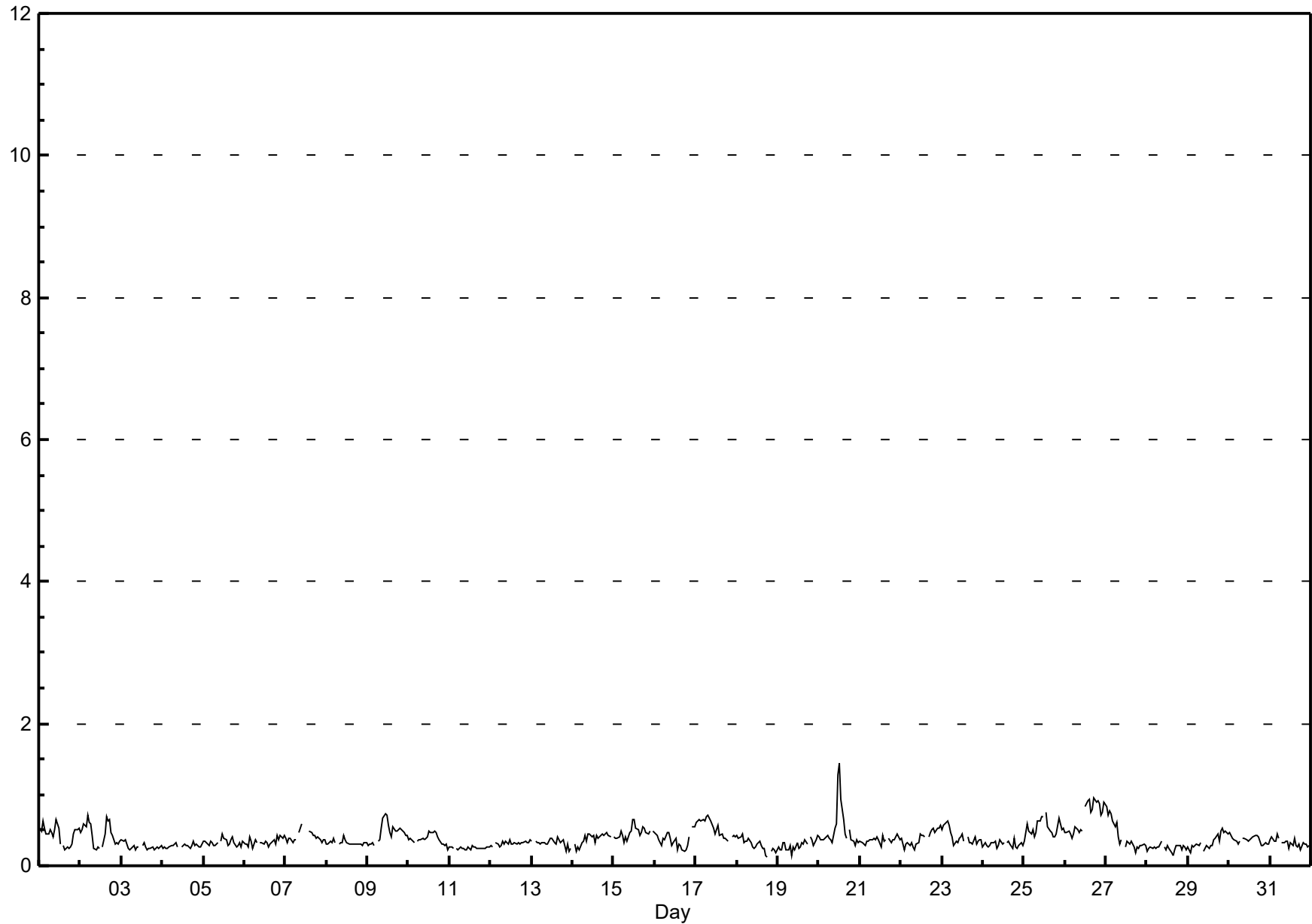
Total Reduced Sulphur (TRS) - ppb

Evergreen Park - December 2016

| Maximum Value: 1.5 ppb on Dec 20 13:00                                                                                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|---------------|
| Maximum Daily Average: 0.7 ppb on Dec 26                                                                                                                   |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 708             |               |
| Minimum Value: 0 ppb on Dec 18 19:00                                                                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 36      |               |
| Maximum Diurnal Average: 0.4 ppb at hour 13                                                                                                                |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 35       |               |
| Monthly Average: 0.38 ppb                                                                                                                                  |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.9 |               |
| Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.3 Median = 0.3 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.5 P <sub>99</sub> = 0.9 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |               |
| Day                                                                                                                                                        | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Daily Average                  | Daily Maximum |
| 1-Dec                                                                                                                                                      | 1                             | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 0.4                            | 0.7           |
| 2-Dec                                                                                                                                                      | 0                             | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 0  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.7           |
| 3-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 4-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.3           |
| 5-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.5           |
| 6-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 7-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 1  | D  | C  | C  | C  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.6           |
| 8-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 9-Dec                                                                                                                                                      | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 0.5                            | 0.7           |
| 10-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.5           |
| 11-Dec                                                                                                                                                     | 0                             | 0 | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.2                            | 0.3           |
| 12-Dec                                                                                                                                                     | 0                             | 0 | A | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 13-Dec                                                                                                                                                     | 0                             | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 14-Dec                                                                                                                                                     | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0.4                            | 0.5           |
| 15-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | A  | 0  | 0  | 0.5                            | 0.7           |
| 16-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 1  | 1  | 0.4                            | 0.6           |
| 17-Dec                                                                                                                                                     | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0.5                            | 0.7           |
| 18-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 19-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 20-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | A  | 1  | 0  | 0  | 0  | 0  | 0  | 0.5                            | 1.5           |
| 21-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.4           |
| 22-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 1  | 1  | 0  | 1  | 1  | 1  | 0.4                            | 0.6           |
| 23-Dec                                                                                                                                                     | 1                             | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.6           |
| 24-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 25-Dec                                                                                                                                                     | 0                             | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1  | 1  | 1  | A  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 0.5                            | 0.7           |
| 26-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1  | 0  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0.7                            | 1.0           |
| 27-Dec                                                                                                                                                     | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.8           |
| 28-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.3           |
| 29-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0.3                            | 0.5           |
| 30-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.4                            | 0.5           |
| 31-Dec                                                                                                                                                     | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0.3                            | 0.4           |
| 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4                                                    |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                |               |
| 0.8 0.7 0.8 0.7 0.7 0.6 0.7 0.7 0.7 0.7 0.7 1.3 1.5 0.9 0.9 0.8 0.8 1.0 0.9 0.9 0.9 0.7 0.7 0.9 0.9                                                        |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                |               |
| C - Calibration D - DAS Failure A - Automated Daily Zero Span                                                                                              |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |               |

## Hourly Averages

Total Reduced Sulphur (TRS) - ppb  
Evergreen Park - December 2016



# Hourly Maximums

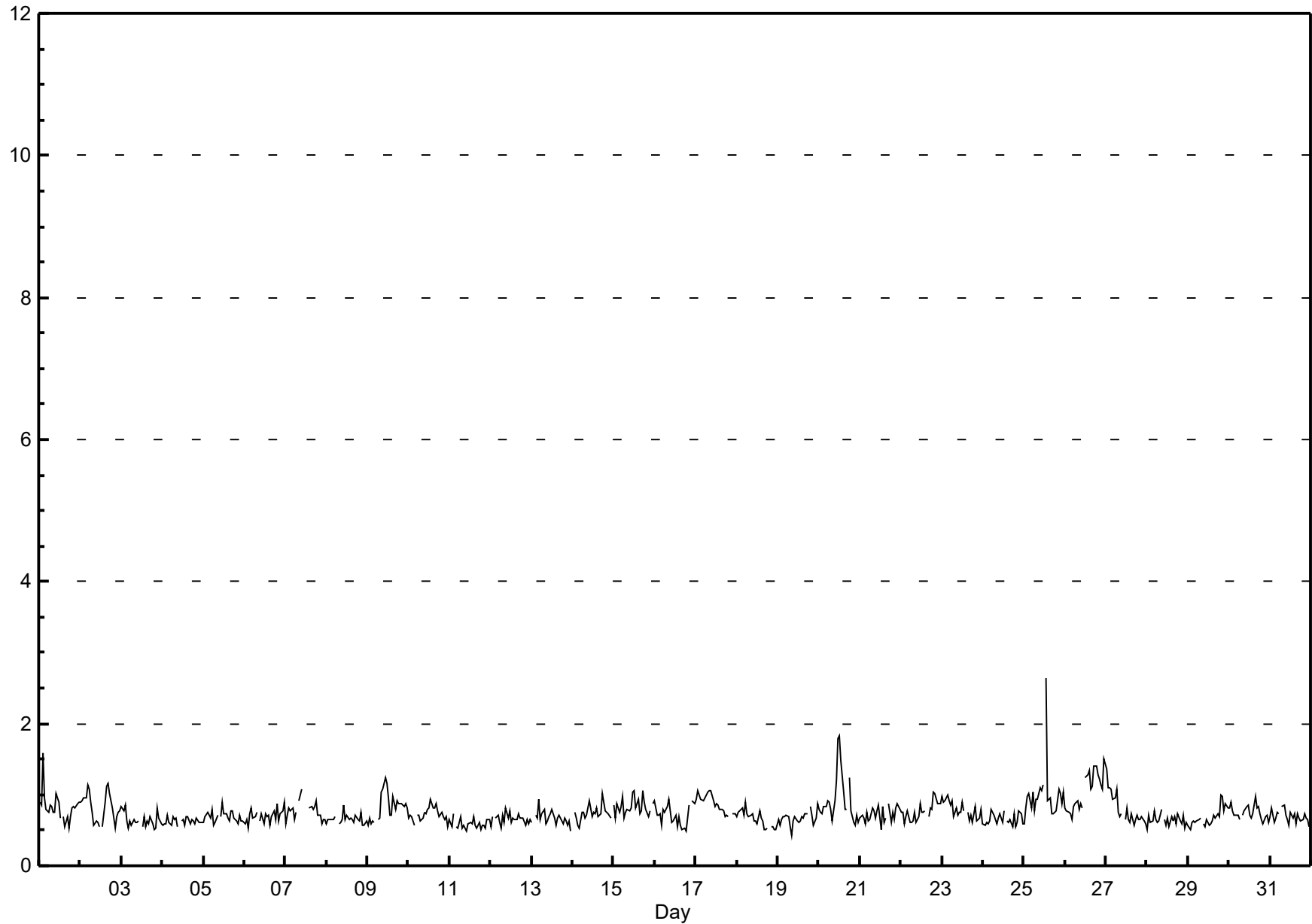
Total Reduced Sulphur (TRS) - ppb

Evergreen Park - December 2016

| Maximum Value: 2.6 ppb on Dec 25 14:00                                                              |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 1.0 ppb on Dec 26                                                                                                                   |    |    |    |    |     |                 |               |  |  | Hours in Service: 744          |  |
|-----------------------------------------------------------------------------------------------------|-------------------------------|---|---|-----------------|---|---|---|-------------------------------|---|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----|-----------------|---------------|--|--|--------------------------------|--|
| Minimum Value: 0 ppb on Dec 19 09:00                                                                |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.6 ppb on Dec 11                                                                                                                   |    |    |    |    |     |                 |               |  |  | Hours of Data: 708             |  |
| Maximum Diurnal Average: 0.8 ppb at hour 14                                                         |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.7 ppb at hour 22                                                                                                                |    |    |    |    |     |                 |               |  |  | Hours of Missing Data: 36      |  |
| Monthly Average: 0.75 ppb                                                                           |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 0.6 Median = 0.7 Q <sub>3</sub> = 0.8 P <sub>90</sub> = 0.9 P <sub>99</sub> = 1.4 |    |    |    |    |     |                 |               |  |  | Hours of Calibration: 35       |  |
|                                                                                                     |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |     |                 |               |  |  | Percent Operational Time: 99.9 |  |
| Day                                                                                                 | Hourly Period Ending At (MST) |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |     | Daily Average   | Daily Maximum |  |  |                                |  |
|                                                                                                     | 1                             | 2 | 3 | 4               | 5 | 6 | 7 | 8                             | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                                                                                                                                                         | 20 | 21 | 22 | 23 | 24  |                 |               |  |  |                                |  |
| 1-Dec                                                                                               | 1                             | 1 | 2 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.8             | 1.6           |  |  |                                |  |
| 2-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.8             | 1.2           |  |  |                                |  |
| 3-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | 1  | 1   | 0.6             | 0.9           |  |  |                                |  |
| 4-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.6             | 0.7           |  |  |                                |  |
| 5-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 6-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | A | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 7-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | A                             | 1 | 1  | D  | C  | C  | C  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.8             | 1.1           |  |  |                                |  |
| 8-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | 1 | A | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.8           |  |  |                                |  |
| 9-Dec                                                                                               | 1                             | 1 | 1 | 1               | 1 | A | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.8             | 1.2           |  |  |                                |  |
| 10-Dec                                                                                              | 1                             | 1 | 1 | 1               | A | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 11-Dec                                                                                              | 1                             | 1 | 1 | A               | 1 | 1 | 1 | 1                             | 1 | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.6             | 0.7           |  |  |                                |  |
| 12-Dec                                                                                              | 1                             | 1 | A | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.8           |  |  |                                |  |
| 13-Dec                                                                                              | 1                             | A | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0   | 0.7             | 0.9           |  |  |                                |  |
| 14-Dec                                                                                              | A                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | A   | 0.7             | 1.0           |  |  |                                |  |
| 15-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | A  | 1   | 0.8             | 1.1           |  |  |                                |  |
| 16-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0                                                                                                                                                          | 1  | 1  | A  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 17-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | A  | 1  | 1  | 1   | 0.9             | 1.1           |  |  |                                |  |
| 18-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | A  | 1  | 1  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 19-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 0 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 20-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | A  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.9             | 1.8           |  |  |                                |  |
| 21-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.7             | 0.9           |  |  |                                |  |
| 22-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.8             | 1.0           |  |  |                                |  |
| 23-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.8             | 1.0           |  |  |                                |  |
| 24-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 0.6             | 0.8           |  |  |                                |  |
| 25-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | A  | 3  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1   | 1.0             | 2.6           |  |  |                                |  |
| 26-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 2  | 1.0 | 1.5             |               |  |  |                                |  |
| 27-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.8 | 1.4             |               |  |  |                                |  |
| 28-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6 | 0.8             |               |  |  |                                |  |
| 29-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | 1                             | A | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7 | 1.0             |               |  |  |                                |  |
| 30-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | 1 | A                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7 | 1.0             |               |  |  |                                |  |
| 31-Dec                                                                                              | 1                             | 1 | 1 | 1               | 1 | 1 | A | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7 | 0.9             |               |  |  |                                |  |
| 0.7 0.7 0.8 0.7 0.7 0.8 0.7 0.7 0.7 0.7 0.8 0.8 0.8 0.8 0.7 0.7 0.7 0.8 0.7 0.7 0.7 0.7 0.7 0.7 0.7 |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |     | Diurnal Average |               |  |  |                                |  |
| 1.4 1.1 1.6 1.1 1.1 1.1 1.1 1.0 1.1 1.1 1.1 1.2 1.8 1.8 2.6 1.3 1.1 1.2 1.4 1.4 1.3 1.2 1.1 1.1 1.5 |                               |   |   |                 |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |     | Diurnal Maximum |               |  |  |                                |  |
| C - Calibration                                                                                     |                               |   |   | D - DAS Failure |   |   |   | A - Automated Daily Zero Span |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |     |                 |               |  |  |                                |  |

## Hourly Maximums

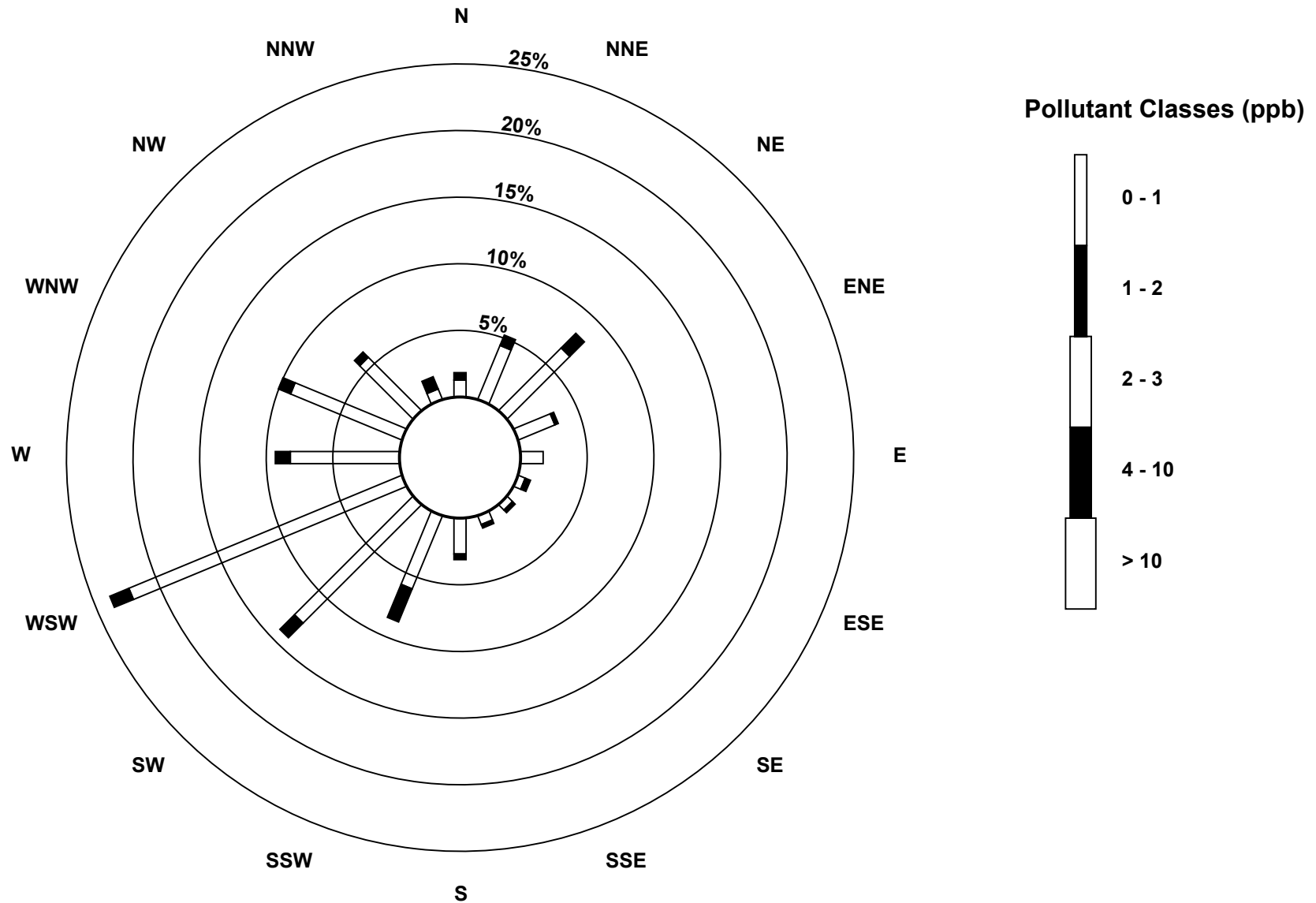
Total Reduced Sulphur (TRS) - ppb  
Evergreen Park - December 2016





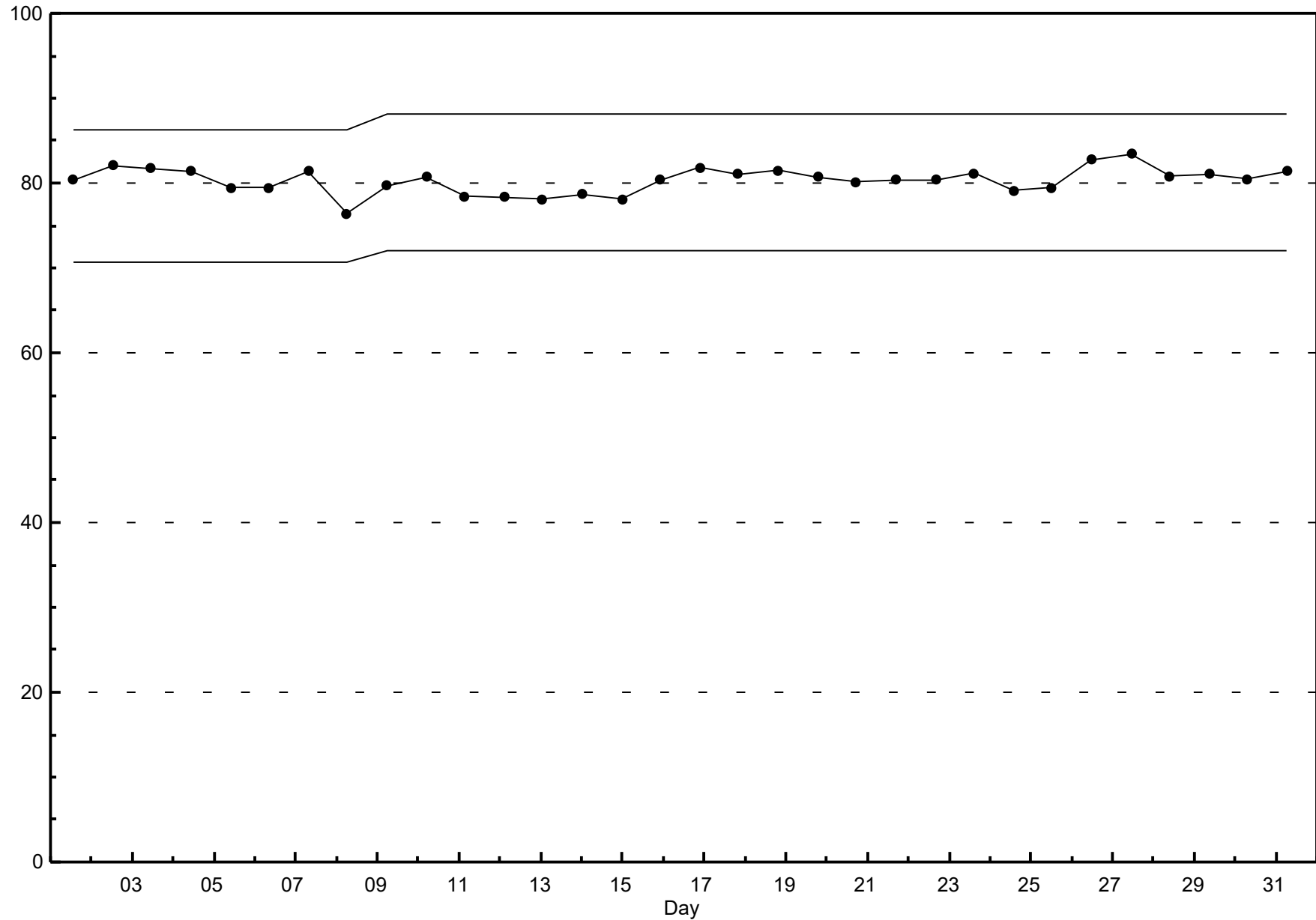
# Pollutant Rose

Total Reduced Sulphur (TRS) - ppb  
Evergreen Park - December 2016



## Span Responses

**Total Reduced Sulphur (TRS)**  
**Evergreen Park - December 2016**



# Hourly Averages

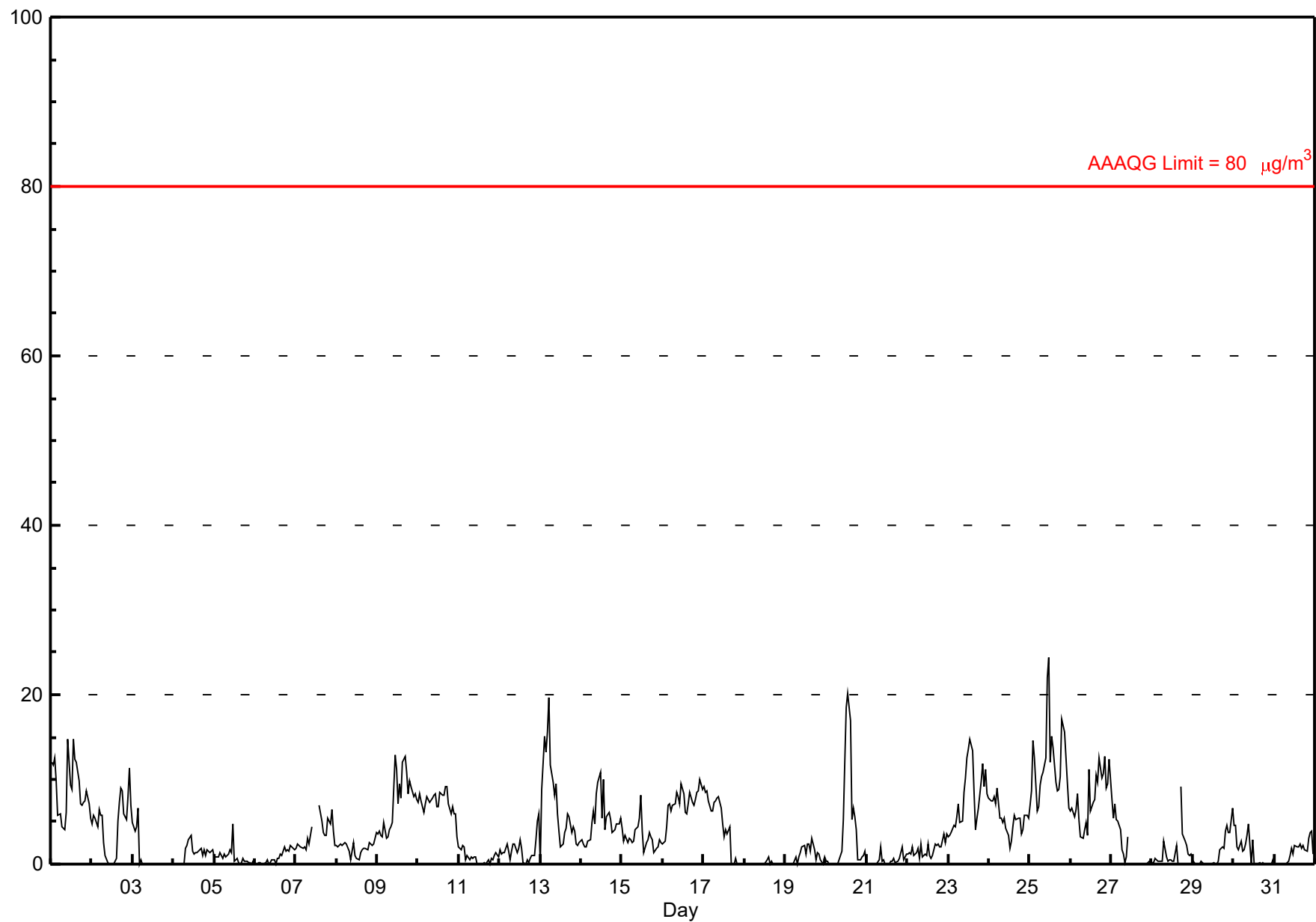
Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Evergreen Park - December 2016

|                                                                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |                                                                                                                                                                                                                                                                                                          |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------|--|
| Number of Exceedences: 1-hr: 0 24-hr: 0<br>Maximum Value: 24.5 µg/m³ on Dec 25 12:00<br>Minimum Value: 0 µg/m³ on Dec 2 11:00<br>Maximum Diurnal Average: 5.1 µg/m³ at hour 12<br>Monthly Average: 3.69 µg/m³ |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     | Maximum Daily Average: 11.9 µg/m³ on Dec 25<br>Minimum Daily Average: 0.1 µg/m³ on Dec 18<br>Minimum Diurnal Average: 3.0 µg/m³ at hour 7<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.5 Median = 2.3 Q <sub>3</sub> = 5.9 P <sub>90</sub> = 9.1 P <sub>99</sub> = 16.7 |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Hours in Service: 744<br>Hours of Data: 737<br>Hours of Missing Data: 7<br>Hours of Calibration: 2<br>Percent Operational Time: 99.3 |  |
| Day                                                                                                                                                                                                           | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     | Daily Average                                                                                                                                                                                                                                                                                            | Daily Maximum |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 1-Dec                                                                                                                                                                                                         | 12                            | 12 | 13 | 10 | 6  | 6  | 4  | 4  | 4  | 6  | 15 | 9  | 9  | 15 | 12 | 12 | 10 | 7  | 7  | 7  | 9  | 7  | 5  | 8.7 | 14.8                                                                                                                                                                                                                                                                                                     |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 2-Dec                                                                                                                                                                                                         | 5                             | 6  | 5  | 4  | 6  | 6  | 6  | 3  | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 5  | 7  | 9  | 9  | 6  | 5  | 8  | 11 | 7   | 4.6                                                                                                                                                                                                                                                                                                      | 11.4          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 3-Dec                                                                                                                                                                                                         | 5                             | 4  | 4  | 7  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0.8                                                                                                                                                                                                                                                                                                      | 6.6           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 4-Dec                                                                                                                                                                                                         | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 2  | 2  | 3  | 3  | 2  | 1  | 1  | 1  | 2  | 2  | 1  | 2  | 1  | 2  | 1  | 1  | 2   | 1.2                                                                                                                                                                                                                                                                                                      | 3.3           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 5-Dec                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 5  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0   | 0.8                                                                                                                                                                                                                                                                                                      | 4.7           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 6-Dec                                                                                                                                                                                                         | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 1  | 2  | 2  | 2   | 0.8                                                                                                                                                                                                                                                                                                      | 2.2           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 7-Dec                                                                                                                                                                                                         | 2                             | 2  | 2  | 2  | 2  | 2  | 2  | 3  | 2  | 4  | D  | 6  | C  | C  | 7  | 5  | 4  | 3  | 3  | 5  | 5  | 6  | 4  | 2   | 3.6                                                                                                                                                                                                                                                                                                      | 7.0           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 8-Dec                                                                                                                                                                                                         | 2                             | 2  | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 2  | 3  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 3  | 2  | 2  | 2  | 4   | 1.9                                                                                                                                                                                                                                                                                                      | 3.8           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 9-Dec                                                                                                                                                                                                         | 4                             | 4  | 3  | 3  | 5  | 3  | 3  | 4  | 4  | 5  | 13 | 11 | 7  | 9  | 8  | 12 | 13 | 11 | 8  | 10 | 9  | 8  | 8  | 8   | 7.2                                                                                                                                                                                                                                                                                                      | 13.0          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 10-Dec                                                                                                                                                                                                        | 7                             | 8  | 7  | 6  | 7  | 8  | 8  | 7  | 8  | 8  | 8  | 7  | 7  | 8  | 8  | 8  | 9  | 9  | 7  | 6  | 7  | 6  | 6  | 3   | 7.3                                                                                                                                                                                                                                                                                                      | 9.1           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 11-Dec                                                                                                                                                                                                        | 2                             | 2  | 2  | 2  | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 1   | 0.8                                                                                                                                                                                                                                                                                                      | 2.2           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 12-Dec                                                                                                                                                                                                        | 2                             | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 2  | 2  | 1  | 2  | 3  | 2  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 3  | 5  | 6   | 1.7                                                                                                                                                                                                                                                                                                      | 5.9           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 13-Dec                                                                                                                                                                                                        | 0                             | 9  | 15 | 13 | 16 | 20 | 12 | 10 | 8  | 9  | 6  | 4  | 2  | 2  | 4  | 4  | 6  | 6  | 4  | 4  | 4  | 2  | 2  | 3   | 6.8                                                                                                                                                                                                                                                                                                      | 19.6          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 14-Dec                                                                                                                                                                                                        | 3                             | 2  | 2  | 2  | 3  | 3  | 5  | 6  | 5  | 8  | 10 | 11 | 5  | 10 | 4  | 6  | 6  | 5  | 4  | 4  | 4  | 5  | 5  | 5   | 5.1                                                                                                                                                                                                                                                                                                      | 10.9          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 15-Dec                                                                                                                                                                                                        | 4                             | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 4  | 5  | 8  | 4  | 1  | 2  | 3  | 4  | 3  | 3  | 1  | 2  | 2  | 3  | 3   | 3.2                                                                                                                                                                                                                                                                                                      | 8.2           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 16-Dec                                                                                                                                                                                                        | 2                             | 3  | 4  | 7  | 7  | 6  | 7  | 7  | 9  | 8  | 7  | 9  | 8  | 6  | 6  | 7  | 8  | 7  | 7  | 8  | 8  | 9  | 10 | 9   | 7.1                                                                                                                                                                                                                                                                                                      | 10.0          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 17-Dec                                                                                                                                                                                                        | 9                             | 8  | 9  | 7  | 6  | 6  | 7  | 7  | 8  | 8  | 7  | 5  | 3  | 4  | 4  | 4  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0   | 4.3                                                                                                                                                                                                                                                                                                      | 9.1           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 18-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0.1                                                                                                                                                                                                                                                                                                      | 0.8           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 19-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 2  | 2  | 1  | 2  | 2  | 2  | 3  | 2  | 1  | 1  | 0  | 0  | 1   | 1.0                                                                                                                                                                                                                                                                                                      | 3.1           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 20-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 5  | 12 | 18 | 20 | 17 | 5  | 7  | 6  | 4  | 1  | 0  | 1  | 1  | 2   | 4.2                                                                                                                                                                                                                                                                                                      | 20.1          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 21-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 1  | 1  | 2  | 1  | 1   | 0.5                                                                                                                                                                                                                                                                                                      | 2.1           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 22-Dec                                                                                                                                                                                                        | 1                             | 1  | 1  | 2  | 1  | 1  | 2  | 1  | 2  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 4  | 2  | 4   | 1.7                                                                                                                                                                                                                                                                                                      | 3.6           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 23-Dec                                                                                                                                                                                                        | 3                             | 3  | 4  | 5  | 4  | 6  | 7  | 5  | 5  | 9  | 10 | 12 | 14 | 15 | 13 | 9  | 4  | 5  | 7  | 10 | 12 | 9  | 11 | 8   | 7.9                                                                                                                                                                                                                                                                                                      | 14.7          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 24-Dec                                                                                                                                                                                                        | 8                             | 7  | 7  | 8  | 7  | 9  | 5  | 5  | 5  | 5  | 4  | 3  | 2  | 3  | 4  | 6  | 5  | 6  | 5  | 4  | 4  | 6  | 6  | 5   | 5.4                                                                                                                                                                                                                                                                                                      | 8.9           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 25-Dec                                                                                                                                                                                                        | 7                             | 9  | 15 | 13 | 6  | 7  | 9  | 10 | 11 | 13 | 22 | 24 | 12 | 15 | 14 | 10 | 9  | 9  | 10 | 17 | 16 | 12 | 9  | 7   | 11.9                                                                                                                                                                                                                                                                                                     | 24.5          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 26-Dec                                                                                                                                                                                                        | 6                             | 7  | 6  | 6  | 8  | 5  | 3  | 3  | 4  | 5  | 3  | 11 | 6  | 7  | 8  | 10 | 10 | 12 | 10 | 11 | 13 | 9  | 9  | 12  | 7.8                                                                                                                                                                                                                                                                                                      | 12.7          |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 27-Dec                                                                                                                                                                                                        | 8                             | 5  | 7  | 5  | 5  | 4  | 2  | 1  | 0  | 1  | 3  | N  | N  | N  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 2.0                                                                                                                                                                                                                                                                                                      | 7.6           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 28-Dec                                                                                                                                                                                                        | 0                             | 0  | 1  | 0  | 0  | 0  | 0  | 3  | 1  | 0  | 1  | 0  | 0  | 0  | 2  | 0  | M  | 9  | 4  | 3  | 2  | 1  | 1  | 1   | 1.3                                                                                                                                                                                                                                                                                                      | 9.1           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 29-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 2  | 2  | 2  | 4  | 5  | 4  | 4   | 7                                                                                                                                                                                                                                                                                                        | 1.2           | 6.6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 30-Dec                                                                                                                                                                                                        | 5                             | 5  | 2  | 2  | 3  | 2  | 2  | 2  | 3  | 5  | 0  | 3  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1.4                                                                                                                                                                                                                                                                                                      | 4.7           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 31-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 1  | 3  | 4  | 4  | 1   | 1.3                                                                                                                                                                                                                                                                                                      | 3.9           |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 3.2 3.4 3.8 3.6 3.3 3.3 3.0 3.0 3.1 3.7 4.5 5.1 3.8 4.4 4.0 3.8 3.9 3.9 3.4 3.7 3.8 3.8 3.8 3.5                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     | Diurnal Average                                                                                                                                                                                                                                                                                          |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| 12.1 11.7 15.1 13.3 15.6 19.6 11.7 10.4 10.9 12.6 22.1 24.5 18.4 20.1 16.9 12.0 12.6 12.5 10.3 17.2 15.6 12.5 11.4 12.4                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     | Diurnal Maximum                                                                                                                                                                                                                                                                                          |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| C - Calibration D - DAS Failure M - Maintenance N - Not Valid                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |                                                                                                                                                                                                                                                                                                          |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |
| Alberta Ambient Air Quality Guideline (AAAQG): 1-hr 80 µg/m³ Alberta Ambient Air Quality Objective (AAAQO): 24-hr 30 µg/m³                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |                                                                                                                                                                                                                                                                                                          |               |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                                                      |  |

## Hourly Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Evergreen Park - December 2016



# Hourly Maximums

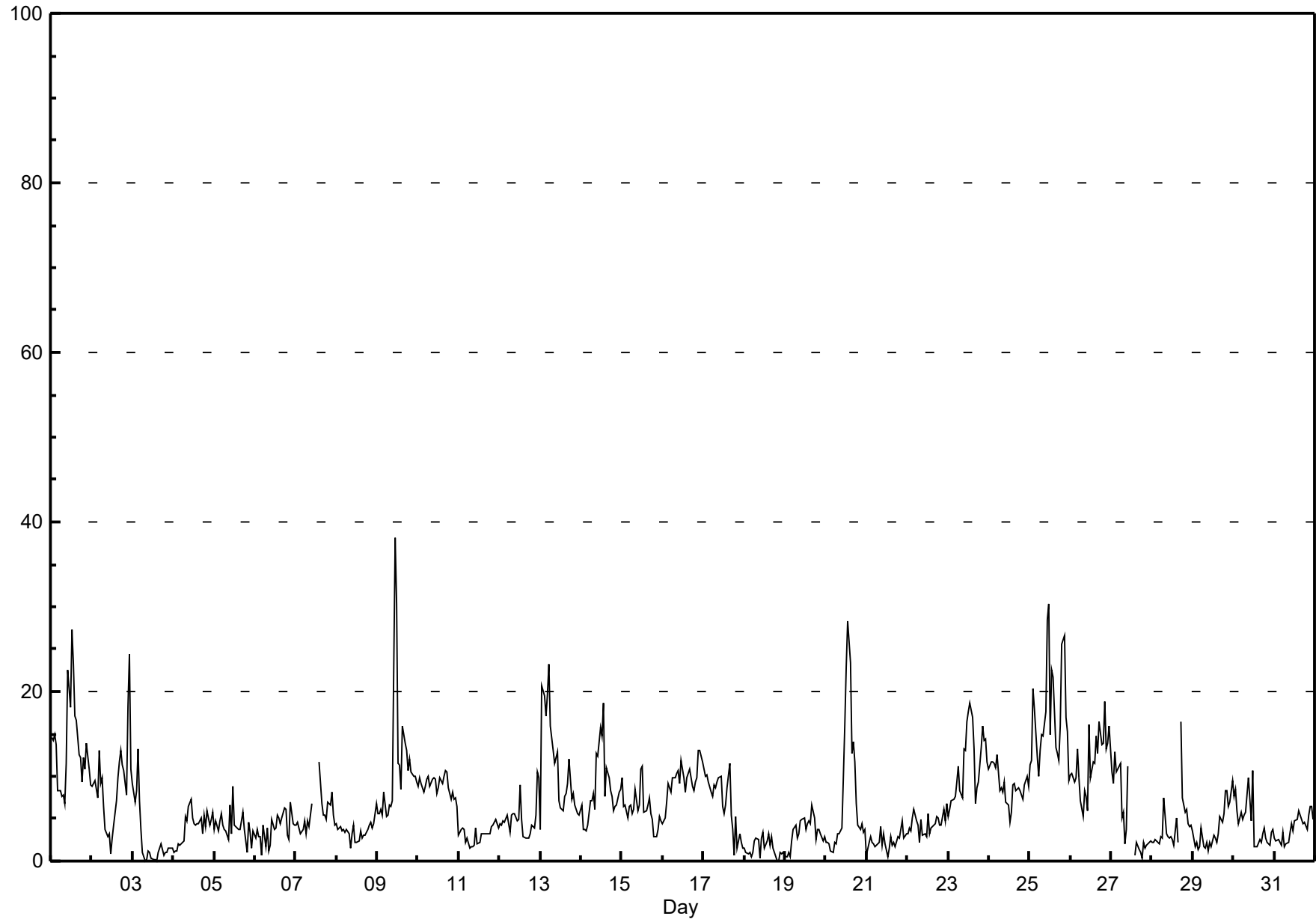
Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Evergreen Park - December 2016

| Maximum Value: 38.1 μg/m <sup>3</sup> on Dec 9 11:00                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 17.1 μg/m <sup>3</sup> on Dec 25                                                                                                      |    |    |    |    |                 |               |  |  |  | Hours in Service: 744          |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|--|--|--|--------------------------------|--|
| Minimum Value: 0 μg/m <sup>3</sup> on Dec 3 08:00                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 1.6 μg/m <sup>3</sup> on Dec 18                                                                                                       |    |    |    |    |                 |               |  |  |  | Hours of Data: 737             |  |
| Maximum Diurnal Average: 8.7 μg/m <sup>3</sup> at hour 12                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 5.4 μg/m <sup>3</sup> at hour 9                                                                                                     |    |    |    |    |                 |               |  |  |  | Hours of Missing Data: 7       |  |
| Monthly Average: 6.69 μg/m <sup>3</sup>                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 3.2 Median = 5.2 Q <sub>3</sub> = 9.1 P <sub>90</sub> = 13.0 P <sub>99</sub> = 26.0 |    |    |    |    |                 |               |  |  |  | Hours of Calibration: 2        |  |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                 |               |  |  |  | Percent Operational Time: 99.3 |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Daily Average   | Daily Maximum |  |  |  |                                |  |
| 1-Dec                                                                                                                   | 15                            | 14 | 15 | 14 | 8  | 8  | 8  | 8  | 7  | 11 | 22 | 18 | 27 | 23 | 17 | 17 | 13 | 12 | 9  | 12                                                                                                                                                           | 11 | 14 | 11 | 9  | 13.5            | 27.4          |  |  |  |                                |  |
| 2-Dec                                                                                                                   | 9                             | 9  | 10 | 7  | 13 | 9  | 10 | 6  | 4  | 3  | 3  | 1  | 3  | 4  | 7  | 10 | 12 | 13 | 11 | 11                                                                                                                                                           | 8  | 18 | 24 | 11 | 9.0             | 24.4          |  |  |  |                                |  |
| 3-Dec                                                                                                                   | 9                             | 7  | 8  | 13 | 7  | 4  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 1  | 1  | 2  | 1  | 1                                                                                                                                                            | 1  | 2  | 2  | 1  | 2.7             | 13.2          |  |  |  |                                |  |
| 4-Dec                                                                                                                   | 1                             | 1  | 1  | 2  | 2  | 2  | 2  | 5  | 5  | 6  | 7  | 5  | 4  | 4  | 4  | 4  | 5  | 3  | 5  | 4                                                                                                                                                            | 6  | 4  | 5  | 6  | 4.0             | 7.3           |  |  |  |                                |  |
| 5-Dec                                                                                                                   | 4                             | 5  | 4  | 5  | 6  | 4  | 4  | 3  | 3  | 7  | 3  | 9  | 4  | 4  | 4  | 4  | 5  | 6  | 4  | 1                                                                                                                                                            | 5  | 3  | 1  | 4  | 4.1             | 8.8           |  |  |  |                                |  |
| 6-Dec                                                                                                                   | 3                             | 4  | 3  | 3  | 1  | 4  | 2  | 4  | 1  | 2  | 5  | 4  | 4  | 5  | 5  | 4  | 5  | 6  | 6  | 3                                                                                                                                                            | 2  | 7  | 4  | 4  | 3.8             | 6.9           |  |  |  |                                |  |
| 7-Dec                                                                                                                   | 4                             | 5  | 4  | 3  | 4  | 5  | 3  | 5  | 4  | 7  | D  | 9  | C  | C  | 12 | 7  | 5  | 5  | 5  | 7                                                                                                                                                            | 7  | 8  | 5  | 4  | 5.6             | 11.7          |  |  |  |                                |  |
| 8-Dec                                                                                                                   | 4                             | 4  | 4  | 3  | 4  | 3  | 4  | 3  | 2  | 3  | 4  | 2  | 2  | 2  | 4  | 3  | 3  | 3  | 4  | 4                                                                                                                                                            | 5  | 4  | 4  | 7  | 3.6             | 6.8           |  |  |  |                                |  |
| 9-Dec                                                                                                                   | 6                             | 6  | 6  | 5  | 8  | 5  | 5  | 7  | 6  | 7  | 38 | 30 | 12 | 11 | 8  | 16 | 14 | 13 | 11 | 12                                                                                                                                                           | 11 | 10 | 10 | 9  | 11.1            | 38.1          |  |  |  |                                |  |
| 10-Dec                                                                                                                  | 9                             | 10 | 9  | 8  | 9  | 10 | 10 | 9  | 10 | 10 | 10 | 8  | 9  | 10 | 9  | 10 | 11 | 11 | 9  | 7                                                                                                                                                            | 8  | 7  | 7  | 6  | 8.9             | 10.7          |  |  |  |                                |  |
| 11-Dec                                                                                                                  | 3                             | 4  | 4  | 4  | 2  | 3  | 1  | 2  | 2  | 2  | 4  | 2  | 2  | 3  | 3  | 3  | 3  | 3  | 3  | 4                                                                                                                                                            | 4  | 5  | 5  | 4  | 3.1             | 5.0           |  |  |  |                                |  |
| 12-Dec                                                                                                                  | 4                             | 4  | 5  | 5  | 5  | 4  | 3  | 5  | 6  | 6  | 5  | 5  | 9  | 5  | 3  | 3  | 3  | 3  | 3  | 4                                                                                                                                                            | 4  | 5  | 11 | 10 | 5.0             | 10.5          |  |  |  |                                |  |
| 13-Dec                                                                                                                  | 4                             | 21 | 20 | 17 | 20 | 23 | 16 | 13 | 12 | 12 | 13 | 7  | 6  | 6  | 8  | 8  | 9  | 12 | 7  | 8                                                                                                                                                            | 7  | 6  | 6  | 5  | 11.0            | 23.2          |  |  |  |                                |  |
| 14-Dec                                                                                                                  | 7                             | 4  | 4  | 4  | 4  | 7  | 7  | 8  | 6  | 13 | 12 | 16 | 15 | 19 | 8  | 11 | 10 | 8  | 8  | 6                                                                                                                                                            | 6  | 7  | 8  | 8  | 8.5             | 18.6          |  |  |  |                                |  |
| 15-Dec                                                                                                                  | 10                            | 6  | 7  | 5  | 6  | 7  | 6  | 6  | 8  | 6  | 7  | 11 | 11 | 6  | 6  | 7  | 7  | 6  | 5  | 3                                                                                                                                                            | 3  | 4  | 5  | 5  | 6.3             | 11.3          |  |  |  |                                |  |
| 16-Dec                                                                                                                  | 4                             | 5  | 7  | 9  | 9  | 8  | 10 | 10 | 10 | 11 | 9  | 12 | 10 | 8  | 10 | 10 | 11 | 9  | 8  | 9                                                                                                                                                            | 10 | 13 | 13 | 12 | 9.5             | 13.0          |  |  |  |                                |  |
| 17-Dec                                                                                                                  | 11                            | 10 | 10 | 9  | 8  | 8  | 9  | 9  | 9  | 10 | 10 | 6  | 6  | 7  | 9  | 12 | 5  | 4  | 1  | 5                                                                                                                                                            | 2  | 3  | 2  | 1  | 6.9             | 11.6          |  |  |  |                                |  |
| 18-Dec                                                                                                                  | 2                             | 1  | 1  | 1  | 1  | 1  | 2  | 3  | 3  | 0  | 3  | 3  | 2  | 2  | 3  | 2  | 3  | 1  | 1  | 0                                                                                                                                                            | 0  | 1  | 1  | 1  | 1.6             | 3.5           |  |  |  |                                |  |
| 19-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 2  | 4  | 4  | 3  | 3  | 5  | 5  | 5  | 4  | 4  | 5  | 4  | 7  | 5  | 2  | 4                                                                                                                                                            | 4  | 3  | 2  | 3  | 3.4             | 6.6           |  |  |  |                                |  |
| 20-Dec                                                                                                                  | 2                             | 2  | 2  | 1  | 1  | 2  | 2  | 3  | 3  | 4  | 10 | 16 | 23 | 28 | 23 | 13 | 14 | 12 | 7  | 4                                                                                                                                                            | 4  | 4  | 3  | 4  | 7.9             | 28.3          |  |  |  |                                |  |
| 21-Dec                                                                                                                  | 1                             | 2  | 3  | 2  | 2  | 2  | 2  | 2  | 4  | 2  | 3  | 2  | 1  | 1  | 3  | 2  | 2  | 2  | 3  | 3                                                                                                                                                            | 4  | 5  | 3  | 3  | 2.4             | 4.7           |  |  |  |                                |  |
| 22-Dec                                                                                                                  | 3                             | 4  | 3  | 5  | 6  | 5  | 4  | 2  | 5  | 3  | 3  | 3  | 6  | 3  | 4  | 4  | 4  | 5  | 5  | 4                                                                                                                                                            | 4  | 6  | 5  | 7  | 4.4             | 6.8           |  |  |  |                                |  |
| 23-Dec                                                                                                                  | 5                             | 6  | 7  | 7  | 8  | 9  | 11 | 8  | 7  | 13 | 13 | 16 | 18 | 19 | 17 | 13 | 7  | 9  | 9  | 13                                                                                                                                                           | 16 | 14 | 14 | 12 | 11.4            | 18.7          |  |  |  |                                |  |
| 24-Dec                                                                                                                  | 11                            | 12 | 12 | 12 | 11 | 13 | 8  | 9  | 8  | 9  | 7  | 7  | 5  | 6  | 9  | 9  | 8  | 9  | 8  | 8                                                                                                                                                            | 7  | 9  | 10 | 9  | 8.9             | 12.6          |  |  |  |                                |  |
| 25-Dec                                                                                                                  | 11                            | 12 | 20 | 18 | 12 | 10 | 13 | 15 | 15 | 18 | 28 | 30 | 15 | 22 | 22 | 13 | 13 | 12 | 16 | 26                                                                                                                                                           | 27 | 17 | 15 | 10 | 17.1            | 30.3          |  |  |  |                                |  |
| 26-Dec                                                                                                                  | 10                            | 10 | 9  | 10 | 13 | 10 | 7  | 5  | 8  | 8  | 6  | 16 | 10 | 12 | 12 | 15 | 13 | 16 | 14 | 14                                                                                                                                                           | 19 | 13 | 14 | 16 | 11.6            | 18.8          |  |  |  |                                |  |
| 27-Dec                                                                                                                  | 11                            | 9  | 13 | 11 | 11 | 12 | 5  | 6  | 2  | 4  | 11 | N  | N  | N  | 1  | 2  | 1  | 1  | 0  | 2                                                                                                                                                            | 2  | 2  | 2  | 2  | 5.2             | 12.8          |  |  |  |                                |  |
| 28-Dec                                                                                                                  | 2                             | 2  | 3  | 2  | 2  | 3  | 3  | 7  | 3  | 3  | 3  | 3  | 3  | 2  | 5  | 2  | M  | 16 | 7  | 6                                                                                                                                                            | 6  | 4  | 4  | 4  | 4.2             | 16.4          |  |  |  |                                |  |
| 29-Dec                                                                                                                  | 3                             | 2  | 2  | 1  | 2  | 4  | 2  | 1  | 2  | 1  | 2  | 2  | 3  | 3  | 2  | 3  | 5  | 5  | 6  | 8                                                                                                                                                            | 8  | 6  | 7  | 9  | 3.8             | 9.4           |  |  |  |                                |  |
| 30-Dec                                                                                                                  | 8                             | 8  | 6  | 4  | 6  | 5  | 5  | 6  | 8  | 10 | 5  | 11 | 2  | 2  | 2  | 3  | 2  | 3  | 4  | 3                                                                                                                                                            | 2  | 2  | 3  | 4  | 4.7             | 10.6          |  |  |  |                                |  |
| 31-Dec                                                                                                                  | 3                             | 2  | 3  | 2  | 2  | 3  | 2  | 2  | 2  | 3  | 4  | 4  | 5  | 5  | 6  | 5  | 5  | 4  | 5  | 4                                                                                                                                                            | 5  | 6  | 6  | 5  | 3.9             | 6.4           |  |  |  |                                |  |
| 5.7 6.2 6.6 6.3 6.3 6.3 5.6 5.7 5.4 6.4 8.6 8.7 7.5 7.8 7.4 7.1 6.9 7.1 6.0 6.5 6.6 6.9 6.9 6.3                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Average |               |  |  |  |                                |  |
| 14.6 20.6 20.4 17.9 19.7 23.2 16.0 14.9 14.7 17.7 38.1 30.3 27.4 28.3 23.5 16.6 14.0 16.5 15.9 25.6 26.7 18.3 24.4 15.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Maximum |               |  |  |  |                                |  |
| C - Calibration D - DAS Failure M - Maintenance N - Not Valid                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                 |               |  |  |  |                                |  |

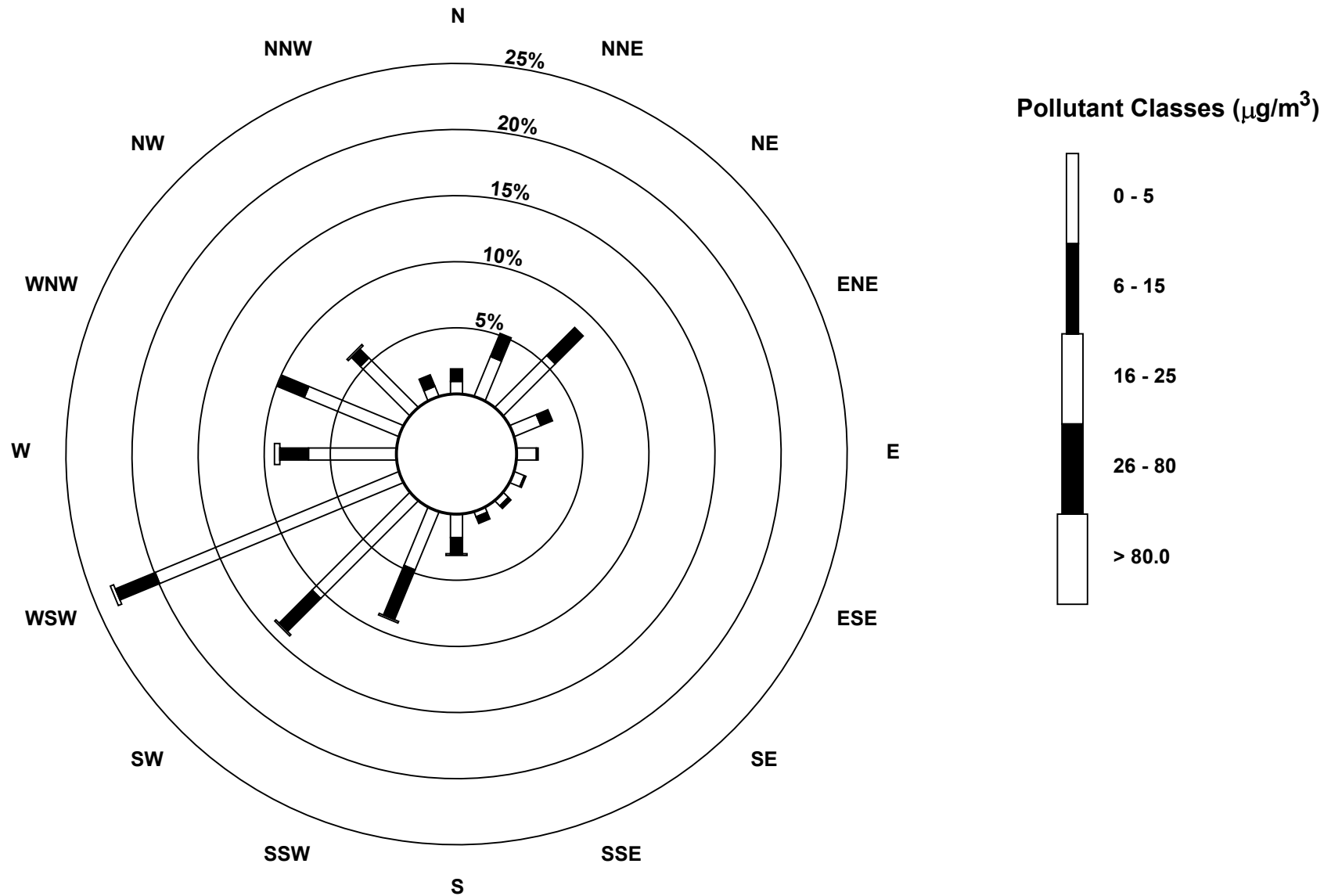
## Hourly Maximums

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Evergreen Park - December 2016



# Pollutant Rose

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>  
Evergreen Park - December 2016



# Hourly Averages

External Temperature (ET) - °C

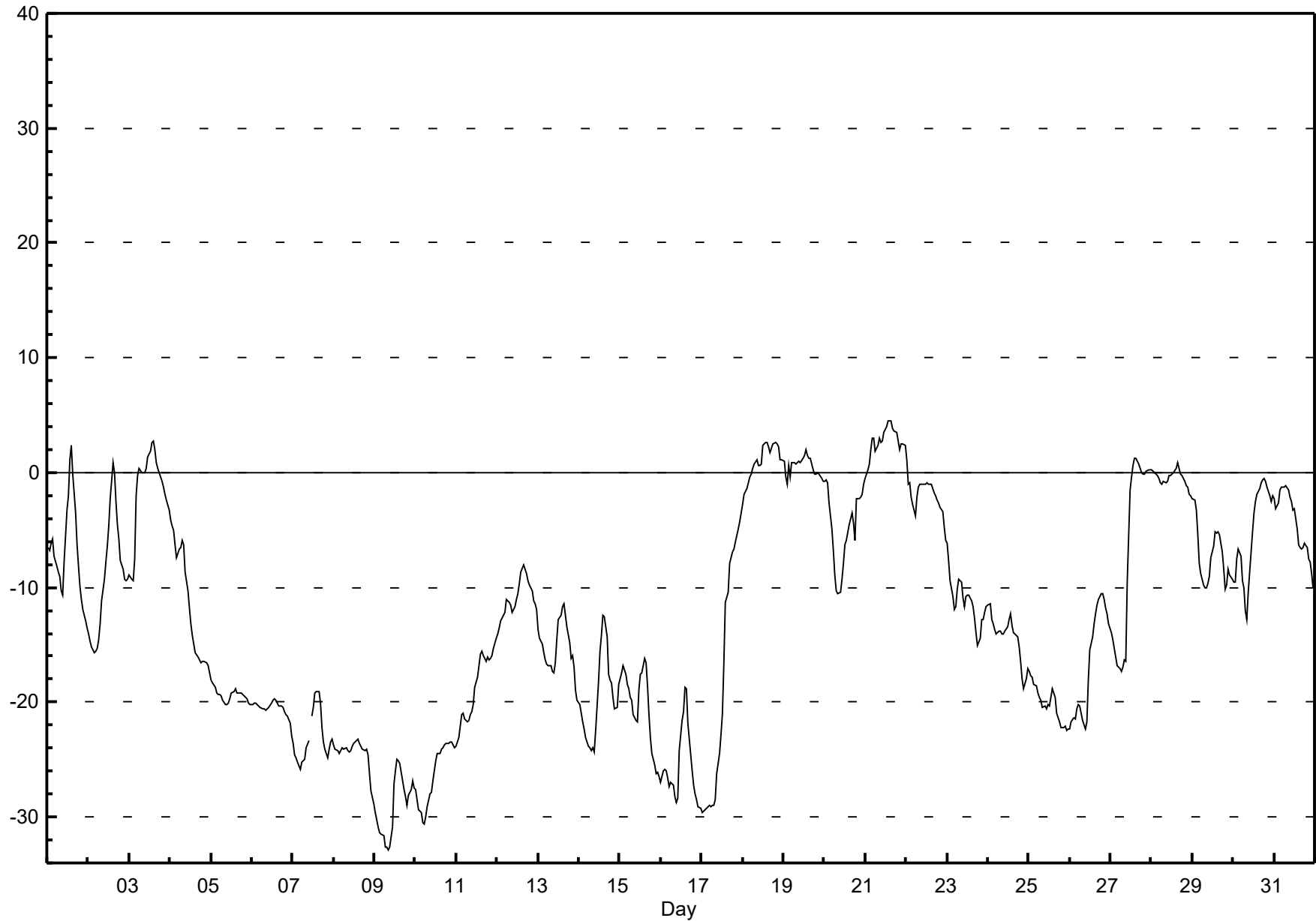
Evergreen Park - December 2016

| Maximum Value: 4.6 °C on Dec 21 14:00       |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       | Maximum Daily Average: 2.7 °C on Dec 21                                                                                                                             |       |       |       |       |               |                 |  |  |  | Hours in Service: 744    |  |
|---------------------------------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|---------------|-----------------|--|--|--|--------------------------|--|
| Minimum Value: -33 °C on Dec 9 09:00        |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       | Minimum Daily Average: -29.1 °C on Dec 9                                                                                                                            |       |       |       |       |               |                 |  |  |  | Hours of Data: 743       |  |
| Maximum Diurnal Average: -9.7 °C at hour 15 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       | Minimum Diurnal Average: -14.3 °C at hour 10                                                                                                                        |       |       |       |       |               |                 |  |  |  | Hours of Missing Data: 1 |  |
| Monthly Average: -12.58 °C                  |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       | Percentiles: P <sub>1</sub> = -30.9 P <sub>10</sub> = -25.0 Q <sub>1</sub> = -20.5 Median = -12.8 Q <sub>3</sub> = -2.7 P <sub>90</sub> = 0.3 P <sub>99</sub> = 3.4 |       |       |       |       |               |                 |  |  |  | Hours of Calibration: 0  |  |
|                                             |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       | Percent Operational Time: 99.9                                                                                                                                      |       |       |       |       |               |                 |  |  |  |                          |  |
| Day                                         | Hourly Period Ending At (MST) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       |                                                                                                                                                                     |       |       |       |       | Daily Average | Daily Maximum   |  |  |  |                          |  |
| 1-Dec                                       | -7                            | -7    | -6    | -6    | -7    | -8    | -9    | -9    | -10   | -11   | -8    | -3    | -2    | 1     | 2     | 0    | -4   | -6    | -8    | -10                                                                                                                                                                 | -11   | -12   | -13   | -14   | -6.9          | 2.3             |  |  |  |                          |  |
| 2-Dec                                       | -14                           | -15   | -15   | -16   | -16   | -15   | -15   | -13   | -11   | -9    | -8    | -6    | -5    | -2    | 1     | 0    | -2   | -5    | -6    | -8                                                                                                                                                                  | -8    | -9    | -9    | -9    | -9.0          | 0.9             |  |  |  |                          |  |
| 3-Dec                                       | -9                            | -9    | -9    | -8    | -2    | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 2     | 3     | 3     | 2    | 1    | 0     | 0     | -1                                                                                                                                                                  | -1    | -2    | -2    | -3    | -1.5          | 2.8             |  |  |  |                          |  |
| 4-Dec                                       | -4                            | -5    | -5    | -6    | -7    | -7    | -6    | -6    | -6    | -9    | -10   | -12   | -13   | -14   | -15   | -16  | -16  | -16   | -17   | -16                                                                                                                                                                 | -16   | -17   | -17   | -17   | -11.4         | -4.1            |  |  |  |                          |  |
| 5-Dec                                       | -18                           | -18   | -19   | -19   | -19   | -19   | -19   | -20   | -20   | -20   | -20   | -20   | -19   | -19   | -19   | -19  | -19  | -19   | -19   | -19                                                                                                                                                                 | -20   | -20   | -20   | -20   | -19.4         | -18.1           |  |  |  |                          |  |
| 6-Dec                                       | -20                           | -20   | -20   | -20   | -20   | -20   | -21   | -21   | -21   | -21   | -20   | -20   | -20   | -20   | -20   | -20  | -20  | -20   | -20   | -21                                                                                                                                                                 | -21   | -21   | -22   | -23   | -20.5         | -19.7           |  |  |  |                          |  |
| 7-Dec                                       | -24                           | -25   | -25   | -25   | -26   | -25   | -25   | -25   | -24   | -23   | D     | -21   | -20   | -19   | -19   | -19  | -20  | -22   | -24   | -24                                                                                                                                                                 | -25   | -24   | -23   | -23   | -23.1         | -19.1           |  |  |  |                          |  |
| 8-Dec                                       | -24                           | -24   | -24   | -24   | -24   | -24   | -24   | -24   | -24   | -24   | -24   | -24   | -23   | -23   | -23   | -24  | -24  | -24   | -24   | -24                                                                                                                                                                 | -25   | -26   | -28   | -29   | -24.5         | -23.2           |  |  |  |                          |  |
| 9-Dec                                       | -30                           | -30   | -31   | -31   | -32   | -32   | -33   | -33   | -33   | -33   | -31   | -27   | -26   | -25   | -25   | -25  | -27  | -28   | -28   | -29                                                                                                                                                                 | -28   | -28   | -27   | -27   | -29.1         | -25.0           |  |  |  |                          |  |
| 10-Dec                                      | -28                           | -28   | -29   | -30   | -30   | -31   | -30   | -29   | -28   | -28   | -27   | -26   | -25   | -25   | -24   | -24  | -24  | -24   | -24   | -24                                                                                                                                                                 | -23   | -23   | -24   | -24   | -26.3         | -23.5           |  |  |  |                          |  |
| 11-Dec                                      | -24                           | -23   | -22   | -21   | -21   | -21   | -22   | -22   | -21   | -21   | -20   | -19   | -18   | -17   | -16   | -16  | -16  | -16   | -16   | -16                                                                                                                                                                 | -16   | -16   | -15   | -14   | -18.7         | -14.5           |  |  |  |                          |  |
| 12-Dec                                      | -14                           | -14   | -13   | -13   | -12   | -11   | -11   | -11   | -12   | -12   | -12   | -11   | -11   | -10   | -9    | -8   | -8   | -9    | -9    | -10                                                                                                                                                                 | -10   | -11   | -11   | -12   | -11.0         | -8.1            |  |  |  |                          |  |
| 13-Dec                                      | -14                           | -14   | -15   | -16   | -16   | -17   | -17   | -17   | -17   | -17   | -17   | -15   | -13   | -12   | -12   | -11  | -12  | -13   | -15   | -16                                                                                                                                                                 | -16   | -17   | -19   | -20   | -15.3         | -11.5           |  |  |  |                          |  |
| 14-Dec                                      | -20                           | -21   | -22   | -22   | -23   | -24   | -24   | -24   | -24   | -24   | -22   | -18   | -16   | -14   | -12   | -13  | -14  | -18   | -18   | -18                                                                                                                                                                 | -20   | -21   | -20   | -18   | -19.6         | -12.5           |  |  |  |                          |  |
| 15-Dec                                      | -18                           | -17   | -17   | -18   | -18   | -19   | -20   | -20   | -21   | -22   | -22   | -19   | -18   | -17   | -16   | -17  | -19  | -21   | -23   | -24                                                                                                                                                                 | -25   | -26   | -26   | -26   | -20.4         | -16.2           |  |  |  |                          |  |
| 16-Dec                                      | -27                           | -26   | -26   | -26   | -27   | -27   | -27   | -27   | -28   | -29   | -28   | -24   | -22   | -21   | -19   | -19  | -22  | -25   | -26   | -27                                                                                                                                                                 | -28   | -28   | -29   | -29   | -25.7         | -18.7           |  |  |  |                          |  |
| 17-Dec                                      | -30                           | -29   | -29   | -29   | -29   | -29   | -29   | -29   | -28   | -26   | -25   | -23   | -21   | -17   | -11   | -10  | -8   | -7    | -7    | -7                                                                                                                                                                  | -6    | -5    | -4    | -4    | -18.4         | -3.6            |  |  |  |                          |  |
| 18-Dec                                      | -3                            | -2    | -1    | -1    | 0     | 0     | 0     | 1     | 1     | 1     | 1     | 1     | 2     | 3     | 3     | 2    | 2    | 3     | 3     | 3                                                                                                                                                                   | 2     | 1     | 1     | 1     | 1.0           | 2.7             |  |  |  |                          |  |
| 19-Dec                                      | 1                             | 0     | -1    | 1     | 0     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 2     | 2     | 1     | 1    | 0    | 0     | 0     | 0                                                                                                                                                                   | 0     | -1    | -1    | -1    | 0.5           | 2.0             |  |  |  |                          |  |
| 20-Dec                                      | -1                            | -1    | -1    | -3    | -5    | -7    | -9    | -10   | -10   | -10   | -9    | -8    | -6    | -6    | -5    | -4   | -4   | -4    | -6    | -2                                                                                                                                                                  | -2    | -2    | -2    | -1    | -4.9          | -0.7            |  |  |  |                          |  |
| 21-Dec                                      | 0                             | 0     | 1     | 2     | 3     | 3     | 2     | 2     | 3     | 3     | 3     | 3     | 4     | 5     | 4     | 4    | 4    | 4     | 3     | 3                                                                                                                                                                   | 2     | 2     | 3     | 2     | 2.7           | 4.6             |  |  |  |                          |  |
| 22-Dec                                      | 1                             | -1    | -1    | -2    | -3    | -4    | -2    | -1    | -1    | -1    | -1    | -1    | -1    | -1    | -1    | -1   | -2   | -2    | -2    | -3                                                                                                                                                                  | -3    | -3    | -5    | -6    | -2.0          | 1.1             |  |  |  |                          |  |
| 23-Dec                                      | -6                            | -8    | -9    | -11   | -12   | -12   | -10   | -9    | -10   | -11   | -12   | -11   | -11   | -11   | -11   | -12  | -13  | -14   | -15   | -14                                                                                                                                                                 | -13   | -13   | -12   | -12   | -11.2         | -6.1            |  |  |  |                          |  |
| 24-Dec                                      | -12                           | -11   | -13   | -13   | -14   | -14   | -14   | -14   | -14   | -14   | -14   | -13   | -13   | -12   | -13   | -14  | -14  | -14   | -15   | -16                                                                                                                                                                 | -18   | -19   | -18   | -17   | -14.3         | -11.5           |  |  |  |                          |  |
| 25-Dec                                      | -17                           | -18   | -18   | -18   | -19   | -19   | -20   | -20   | -20   | -20   | -21   | -20   | -20   | -20   | -19   | -20  | -21  | -21   | -22   | -22                                                                                                                                                                 | -22   | -22   | -22   | -22   | -20.1         | -17.3           |  |  |  |                          |  |
| 26-Dec                                      | -22                           | -22   | -21   | -21   | -21   | -20   | -20   | -22   | -22   | -22   | -22   | -18   | -15   | -14   | -13   | -12  | -12  | -11   | -11   | -11                                                                                                                                                                 | -11   | -12   | -12   | -13   | -16.7         | -10.5           |  |  |  |                          |  |
| 27-Dec                                      | -14                           | -15   | -15   | -16   | -17   | -17   | -17   | -17   | -16   | -16   | -10   | -2    | 0     | 1     | 1     | 1    | 1    | 0     | 0     | 0                                                                                                                                                                   | 0     | 0     | 0     | 0     | -7.0          | 1.3             |  |  |  |                          |  |
| 28-Dec                                      | 0                             | 0     | 0     | 0     | -1    | -1    | -1    | -1    | -1    | -1    | 0     | 0     | 0     | 0     | 0     | 1    | 0    | 0     | 0     | -1                                                                                                                                                                  | -1    | -1    | -2    | -2    | -0.5          | 0.8             |  |  |  |                          |  |
| 29-Dec                                      | -2                            | -2    | -3    | -5    | -8    | -9    | -10   | -10   | -10   | -10   | -9    | -7    | -6    | -5    | -5    | -5   | -5   | -7    | -8    | -10                                                                                                                                                                 | -10   | -8    | -9    | -9    | -7.3          | -2.3            |  |  |  |                          |  |
| 30-Dec                                      | -10                           | -10   | -8    | -7    | -7    | -9    | -10   | -12   | -13   | -10   | -7    | -5    | -3    | -3    | -2    | -1   | -1   | -1    | -1    | -1                                                                                                                                                                  | -1    | -2    | -2    | -2    | -5.3          | -0.5            |  |  |  |                          |  |
| 31-Dec                                      | -2                            | -3    | -3    | -1    | -1    | -1    | -1    | -1    | -1    | -2    | -2    | -3    | -3    | -5    | -6    | -7   | -7   | -7    | -6    | -7                                                                                                                                                                  | -8    | -8    | -9    | -10   | -4.4          | -1.2            |  |  |  |                          |  |
|                                             |                               | -13.2 | -13.5 | -13.6 | -13.8 | -14.0 | -14.2 | -14.2 | -14.3 | -14.3 | -14.3 | -13.2 | -11.9 | -11.0 | -10.3 | -9.7 | -9.8 | -10.5 | -11.2 | -11.8                                                                                                                                                               | -12.2 | -12.4 | -12.6 | -12.9 | -13.1         | Diurnal Average |  |  |  |                          |  |
|                                             |                               | 1.1   | 0.3   | 0.8   | 2.0   | 3.1   | 3.0   | 1.9   | 2.4   | 3.0   | 2.6   | 2.7   | 3.5   | 4.0   | 4.6   | 4.5  | 4.5  | 3.9   | 3.6   | 3.5                                                                                                                                                                 | 2.8   | 2.5   | 2.4   | 2.5   | 2.4           | Diurnal Maximum |  |  |  |                          |  |
| D - DAS Failure                             |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       |                                                                                                                                                                     |       |       |       |       |               |                 |  |  |  |                          |  |



## Hourly Averages

External Temperature (ET) - °C  
Evergreen Park - December 2016



# Hourly Averages

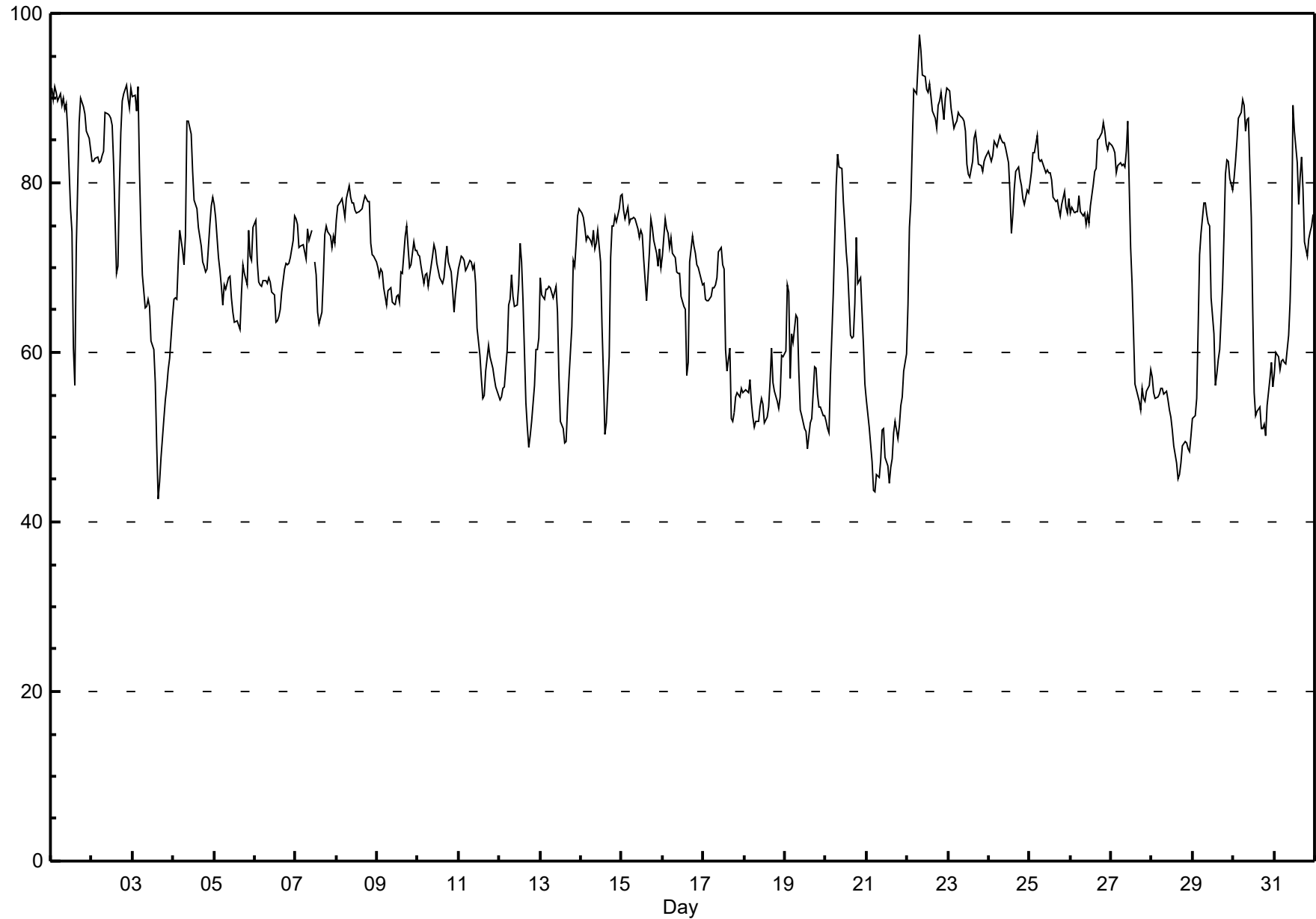
Relative Humidity (RH) - %

Evergreen Park - December 2016

| Maximum Value: 97.4 % on Dec 22 08:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 88.4 % on Dec 22                                                                                                                           |               |               |  |  |  |  |  |  |  | Hours in Service: 744    |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|--|--|--|--|--|--|--|--------------------------|--|
| Minimum Value: 43 % on Dec 3 16:00                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 49.7 % on Dec 21                                                                                                                           |               |               |  |  |  |  |  |  |  | Hours of Data: 743       |  |
| Maximum Diurnal Average: 73.5 % at hour 10                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 63.6 % at hour 15                                                                                                                        |               |               |  |  |  |  |  |  |  | Hours of Missing Data: 1 |  |
| Monthly Average: 70.02 %                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 45.5 P <sub>10</sub> = 52.8 Q <sub>1</sub> = 60.3 Median = 70.7 Q <sub>3</sub> = 78.2 P <sub>90</sub> = 86.1 P <sub>99</sub> = 91.2 |               |               |  |  |  |  |  |  |  | Hours of Calibration: 0  |  |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.9                                                                                                                                    |               |               |  |  |  |  |  |  |  |                          |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   | Daily Average | Daily Maximum |  |  |  |  |  |  |  |                          |  |
| 1-Dec                                                                                                                   | 91                            | 90 | 91 | 91 | 90 | 91 | 89 | 90 | 89 | 89 | 86 | 77 | 74 | 60 | 56 | 72 | 87 | 90 | 90 | 89 | 88 | 86 | 85 | 84                                                                                                                                                                | 84.4          | 91.3          |  |  |  |  |  |  |  |                          |  |
| 2-Dec                                                                                                                   | 83                            | 83 | 83 | 83 | 82 | 82 | 83 | 84 | 88 | 88 | 88 | 88 | 87 | 82 | 69 | 70 | 79 | 86 | 90 | 91 | 91 | 90 | 89 | 91                                                                                                                                                                | 84.6          | 91.5          |  |  |  |  |  |  |  |                          |  |
| 3-Dec                                                                                                                   | 90                            | 90 | 89 | 91 | 82 | 74 | 69 | 65 | 65 | 66 | 65 | 61 | 60 | 56 | 49 | 43 | 45 | 48 | 52 | 54 | 56 | 58 | 59 | 64                                                                                                                                                                | 64.7          | 91.4          |  |  |  |  |  |  |  |                          |  |
| 4-Dec                                                                                                                   | 66                            | 66 | 66 | 71 | 74 | 72 | 70 | 74 | 87 | 87 | 86 | 81 | 78 | 77 | 77 | 75 | 73 | 71 | 70 | 69 | 70 | 75 | 77 | 78                                                                                                                                                                | 74.7          | 87.4          |  |  |  |  |  |  |  |                          |  |
| 5-Dec                                                                                                                   | 77                            | 76 | 71 | 70 | 68 | 66 | 68 | 67 | 69 | 69 | 67 | 65 | 64 | 64 | 63 | 63 | 67 | 70 | 69 | 68 | 74 | 71 | 71 | 75                                                                                                                                                                | 68.8          | 77.4          |  |  |  |  |  |  |  |                          |  |
| 6-Dec                                                                                                                   | 76                            | 71 | 68 | 68 | 68 | 68 | 68 | 68 | 69 | 68 | 67 | 67 | 64 | 64 | 64 | 65 | 67 | 70 | 71 | 70 | 70 | 71 | 73 | 76                                                                                                                                                                | 68.8          | 76.1          |  |  |  |  |  |  |  |                          |  |
| 7-Dec                                                                                                                   | 76                            | 75 | 72 | 73 | 73 | 72 | 71 | 74 | 73 | 74 | D  | 71 | 69 | 65 | 63 | 65 | 69 | 74 | 75 | 74 | 74 | 72 | 74 | 73                                                                                                                                                                | 71.8          | 75.7          |  |  |  |  |  |  |  |                          |  |
| 8-Dec                                                                                                                   | 76                            | 77 | 78 | 78 | 77 | 76 | 78 | 80 | 78 | 78 | 78 | 77 | 76 | 77 | 77 | 77 | 78 | 78 | 78 | 78 | 73 | 71 | 71 | 71                                                                                                                                                                | 76.5          | 79.6          |  |  |  |  |  |  |  |                          |  |
| 9-Dec                                                                                                                   | 70                            | 69 | 70 | 69 | 68 | 66 | 67 | 67 | 68 | 66 | 66 | 67 | 67 | 66 | 69 | 69 | 74 | 75 | 72 | 70 | 70 | 73 | 72 | 72                                                                                                                                                                | 69.2          | 74.9          |  |  |  |  |  |  |  |                          |  |
| 10-Dec                                                                                                                  | 72                            | 71 | 70 | 68 | 69 | 69 | 68 | 69 | 71 | 73 | 72 | 70 | 70 | 69 | 68 | 69 | 71 | 73 | 71 | 69 | 67 | 65 | 67 | 68                                                                                                                                                                | 69.6          | 72.8          |  |  |  |  |  |  |  |                          |  |
| 11-Dec                                                                                                                  | 70                            | 71 | 71 | 71 | 70 | 70 | 71 | 71 | 70 | 70 | 68 | 63 | 60 | 57 | 55 | 55 | 58 | 61 | 60 | 59 | 58 | 57 | 56 | 55                                                                                                                                                                | 63.5          | 71.4          |  |  |  |  |  |  |  |                          |  |
| 12-Dec                                                                                                                  | 54                            | 55 | 56 | 56 | 60 | 66 | 66 | 69 | 67 | 65 | 66 | 68 | 73 | 71 | 66 | 54 | 51 | 49 | 50 | 52 | 56 | 60 | 60 | 62                                                                                                                                                                | 60.5          | 72.8          |  |  |  |  |  |  |  |                          |  |
| 13-Dec                                                                                                                  | 69                            | 67 | 66 | 67 | 68 | 68 | 68 | 66 | 67 | 68 | 65 | 57 | 52 | 51 | 49 | 50 | 54 | 57 | 63 | 71 | 70 | 73 | 76 | 77                                                                                                                                                                | 64.1          | 76.9          |  |  |  |  |  |  |  |                          |  |
| 14-Dec                                                                                                                  | 76                            | 76 | 75 | 73 | 74 | 73 | 73 | 74 | 72 | 73 | 74 | 71 | 63 | 57 | 50 | 52 | 59 | 71 | 75 | 75 | 76 | 75 | 77 | 79                                                                                                                                                                | 70.6          | 78.5          |  |  |  |  |  |  |  |                          |  |
| 15-Dec                                                                                                                  | 79                            | 77 | 76 | 77 | 75 | 76 | 76 | 76 | 76 | 75 | 74 | 74 | 74 | 71 | 66 | 69 | 72 | 76 | 75 | 73 | 72 | 70 | 72 | 70                                                                                                                                                                | 73.7          | 78.6          |  |  |  |  |  |  |  |                          |  |
| 16-Dec                                                                                                                  | 71                            | 76 | 75 | 74 | 72 | 74 | 72 | 71 | 70 | 69 | 69 | 67 | 66 | 65 | 57 | 59 | 71 | 74 | 72 | 72 | 70 | 70 | 69 | 68                                                                                                                                                                | 69.7          | 75.7          |  |  |  |  |  |  |  |                          |  |
| 17-Dec                                                                                                                  | 68                            | 66 | 66 | 66 | 67 | 68 | 68 | 68 | 69 | 72 | 72 | 70 | 70 | 60 | 58 | 60 | 52 | 52 | 53 | 55 | 55 | 55 | 56 | 55                                                                                                                                                                | 62.5          | 72.4          |  |  |  |  |  |  |  |                          |  |
| 18-Dec                                                                                                                  | 56                            | 56 | 55 | 57 | 54 | 52 | 51 | 52 | 52 | 54 | 55 | 54 | 52 | 52 | 54 | 57 | 61 | 56 | 55 | 54 | 53 | 55 | 60 | 59                                                                                                                                                                | 54.8          | 60.6          |  |  |  |  |  |  |  |                          |  |
| 19-Dec                                                                                                                  | 60                            | 68 | 67 | 57 | 62 | 61 | 64 | 64 | 58 | 53 | 53 | 51 | 51 | 49 | 50 | 52 | 52 | 58 | 58 | 55 | 54 | 54 | 53 | 53                                                                                                                                                                | 56.5          | 68.0          |  |  |  |  |  |  |  |                          |  |
| 20-Dec                                                                                                                  | 52                            | 51 | 51 | 57 | 67 | 73 | 80 | 83 | 82 | 82 | 78 | 75 | 72 | 70 | 62 | 62 | 62 | 66 | 74 | 68 | 69 | 65 | 61 | 56                                                                                                                                                                | 67.3          | 83.5          |  |  |  |  |  |  |  |                          |  |
| 21-Dec                                                                                                                  | 54                            | 51 | 49 | 47 | 44 | 44 | 46 | 45 | 47 | 51 | 51 | 48 | 47 | 45 | 46 | 48 | 51 | 52 | 50 | 51 | 54 | 55 | 58 | 60                                                                                                                                                                | 49.7          | 59.8          |  |  |  |  |  |  |  |                          |  |
| 22-Dec                                                                                                                  | 66                            | 75 | 78 | 85 | 91 | 91 | 94 | 97 | 96 | 93 | 92 | 91 | 91 | 92 | 90 | 88 | 88 | 86 | 89 | 90 | 91 | 88 | 90 | 91                                                                                                                                                                | 88.4          | 97.4          |  |  |  |  |  |  |  |                          |  |
| 23-Dec                                                                                                                  | 91                            | 91 | 89 | 87 | 87 | 87 | 88 | 88 | 88 | 87 | 86 | 82 | 81 | 81 | 83 | 85 | 86 | 84 | 82 | 82 | 81 | 83 | 83 | 83                                                                                                                                                                | 85.2          | 91.0          |  |  |  |  |  |  |  |                          |  |
| 24-Dec                                                                                                                  | 84                            | 83 | 83 | 85 | 85 | 84 | 86 | 85 | 85 | 85 | 84 | 82 | 79 | 74 | 76 | 79 | 81 | 82 | 81 | 80 | 78 | 77 | 79 | 79                                                                                                                                                                | 81.5          | 85.6          |  |  |  |  |  |  |  |                          |  |
| 25-Dec                                                                                                                  | 80                            | 81 | 84 | 84 | 86 | 83 | 83 | 83 | 82 | 81 | 82 | 81 | 81 | 80 | 78 | 78 | 78 | 77 | 76 | 77 | 79 | 77 | 76 | 78                                                                                                                                                                | 80.2          | 85.6          |  |  |  |  |  |  |  |                          |  |
| 26-Dec                                                                                                                  | 76                            | 77 | 77 | 77 | 77 | 78 | 77 | 76 | 76 | 75 | 76 | 75 | 77 | 80 | 81 | 82 | 85 | 85 | 86 | 87 | 86 | 85 | 84 | 85                                                                                                                                                                | 80.0          | 87.1          |  |  |  |  |  |  |  |                          |  |
| 27-Dec                                                                                                                  | 84                            | 84 | 84 | 81 | 82 | 82 | 82 | 82 | 84 | 87 | 72 | 68 | 62 | 56 | 56 | 54 | 53 | 56 | 55 | 54 | 55 | 56 | 58 | 58                                                                                                                                                                | 69.6          | 87.3          |  |  |  |  |  |  |  |                          |  |
| 28-Dec                                                                                                                  | 57                            | 55 | 55 | 55 | 55 | 56 | 56 | 55 | 55 | 54 | 53 | 52 | 51 | 49 | 47 | 45 | 46 | 47 | 49 | 50 | 49 | 49 | 48 | 50                                                                                                                                                                | 51.6          | 57.1          |  |  |  |  |  |  |  |                          |  |
| 29-Dec                                                                                                                  | 52                            | 52 | 55 | 63 | 72 | 74 | 78 | 78 | 76 | 75 | 75 | 67 | 62 | 56 | 57 | 59 | 60 | 68 | 74 | 81 | 83 | 82 | 80 | 79                                                                                                                                                                | 69.1          | 82.8          |  |  |  |  |  |  |  |                          |  |
| 30-Dec                                                                                                                  | 80                            | 83 | 85 | 88 | 88 | 90 | 89 | 86 | 87 | 88 | 76 | 65 | 55 | 53 | 53 | 54 | 51 | 51 | 52 | 50 | 54 | 57 | 59 | 56                                                                                                                                                                | 68.7          | 89.7          |  |  |  |  |  |  |  |                          |  |
| 31-Dec                                                                                                                  | 57                            | 60 | 59 | 58 | 59 | 59 | 59 | 59 | 62 | 66 | 73 | 89 | 86 | 82 | 78 | 81 | 83 | 79 | 73 | 71 | 73 | 74 | 75 | 76                                                                                                                                                                | 70.5          | 89.2          |  |  |  |  |  |  |  |                          |  |
| 71.4 71.7 71.4 71.8 72.4 72.4 72.8 73.2 73.4 73.5 72.7 70.3 68.3 65.7 63.6 64.2 66.6 68.4 69.0 69.1 69.4 69.3 69.9 70.4 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                                                   |               |               |  |  |  |  |  |  |  |                          |  |
| 91.2 90.9 91.3 91.4 91.1 90.6 93.9 97.4 95.7 92.7 92.5 91.0 90.7 91.8 90.1 88.4 87.6 90.0 89.6 90.5 91.5 90.1 90.0 91.1 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                                                   |               |               |  |  |  |  |  |  |  |                          |  |
| D - DAS Failure                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |               |               |  |  |  |  |  |  |  |                          |  |

## Hourly Averages

**Relative Humidity (RH) - %**  
**Evergreen Park - December 2016**



# Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Evergreen Park - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 1                             | 1   | 4   | 5   | 3   | 4   | 4   | 4   | 1   | 2   | 2   | 1   | 4   | 1   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1.3           | 4.8           |
| Dir    | 276                           | 243 | 288 | 259 | 329 | 226 | 245 | 232 | 148 | 243 | 244 | 230 | 197 | 211 | 217 | 27  | 50  | 98  | 211 | 255 | 263 | 209 | 254 | 197 | 244.9         | 259.1         |
| 2 Spd  | 1                             | 1   | 1   | 2   | 1   | 1   | 1   | 3   | 5   | 4   | 4   | 2   | 2   | 1   | 2   | 7   | 3   | 4   | 1   | 4   | 1   | 1   | 2   | 4   | 1.0           | 7.0           |
| Dir    | 38                            | 26  | 23  | 8   | 45  | 359 | 53  | 54  | 42  | 55  | 55  | 62  | 45  | 43  | 258 | 275 | 224 | 195 | 224 | 49  | 53  | 40  | 150 | 57  | 40.4          | 275.0         |
| 3 Spd  | 2                             | 4   | 0   | 3   | 8   | 22  | 22  | 21  | 22  | 29  | 28  | 30  | 32  | 34  | 37  | 41  | 31  | 37  | 31  | 28  | 24  | 23  | 22  | 19  | 22.4          | 41.2          |
| Dir    | 83                            | 180 | 105 | 337 | 247 | 233 | 235 | 225 | 227 | 230 | 233 | 236 | 233 | 239 | 239 | 245 | 245 | 240 | 237 | 241 | 247 | 244 | 237 | 238 | 237.5         | 244.8         |
| 4 Spd  | 15                            | 14  | 18  | 12  | 14  | 19  | 15  | 14  | 25  | 32  | 29  | 31  | 30  | 31  | 30  | 27  | 25  | 21  | 21  | 24  | 25  | 26  | 28  | 23  | 20.1          | 31.9          |
| Dir    | 233                           | 229 | 233 | 247 | 242 | 242 | 255 | 264 | 309 | 320 | 319 | 313 | 313 | 315 | 310 | 314 | 313 | 305 | 297 | 309 | 311 | 312 | 313 | 303 | 298.1         | 319.7         |
| 5 Spd  | 22                            | 15  | 19  | 17  | 19  | 23  | 22  | 20  | 17  | 19  | 18  | 17  | 21  | 19  | 22  | 22  | 15  | 10  | 21  | 22  | 12  | 15  | 13  | 12  | 18.0          | 22.8          |
| Dir    | 309                           | 302 | 301 | 298 | 305 | 307 | 311 | 308 | 303 | 298 | 298 | 292 | 302 | 301 | 307 | 302 | 309 | 301 | 311 | 322 | 293 | 307 | 297 | 293 | 304.0         | 306.7         |
| 6 Spd  | 10                            | 15  | 18  | 16  | 15  | 13  | 15  | 15  | 13  | 16  | 15  | 14  | 16  | 15  | 15  | 12  | 9   | 7   | 7   | 11  | 10  | 9   | 7   | 5   | 12.2          | 18.3          |
| Dir    | 270                           | 298 | 307 | 303 | 295 | 289 | 289 | 294 | 294 | 294 | 295 | 273 | 289 | 289 | 276 | 264 | 281 | 273 | 274 | 295 | 284 | 296 | 286 | 282 | 288.7         | 307.4         |
| 7 Spd  | 4                             | 4   | 2   | 0   | 2   | 0   | 0   | 3   | 1   | 1   | D   | 2   | 5   | 4   | 6   | 3   | 2   | 3   | 3   | 1   | 0   | 2   | 2   | 1   | 0.9           | 6.2           |
| Dir    | 288                           | 279 | 288 | 180 | 195 | 284 | 23  | 205 | 92  | 302 | D   | 322 | 237 | 322 | 354 | 34  | 58  | 42  | 42  | 202 | 245 | 16  | 25  | 59  | 329.7         | 353.9         |
| 8 Spd  | 5                             | 4   | 6   | 4   | 2   | 2   | 4   | 4   | 4   | 4   | 4   | 6   | 6   | 8   | 9   | 10  | 7   | 6   | 7   | 3   | 3   | 1   | 0   | 1   | 4.2           | 9.9           |
| Dir    | 56                            | 72  | 53  | 67  | 80  | 84  | 54  | 91  | 80  | 89  | 69  | 88  | 61  | 36  | 36  | 35  | 50  | 47  | 43  | 34  | 33  | 353 | 74  | 208 | 55.2          | 35.3          |
| 9 Spd  | 1                             | 1   | 3   | 1   | 0   | 1   | 3   | 2   | 1   | 0   | 0   | 1   | 2   | 3   | 5   | 6   | 7   | 6   | 3   | 4   | 4   | 3   | 4   | 6   | 1.7           | 6.9           |
| Dir    | 170                           | 200 | 185 | 184 | 170 | 36  | 41  | 197 | 201 | 76  | 51  | 230 | 233 | 251 | 343 | 299 | 286 | 292 | 255 | 210 | 292 | 279 | 229 | 218 | 259.9         | 285.7         |
| 10 Spd | 7                             | 5   | 2   | 1   | 3   | 4   | 1   | 0   | 4   | 5   | 7   | 10  | 10  | 14  | 16  | 14  | 8   | 7   | 10  | 12  | 13  | 14  | 14  | 13  | 7.0           | 16.1          |
| Dir    | 227                           | 218 | 193 | 134 | 185 | 199 | 210 | 199 | 266 | 292 | 300 | 300 | 309 | 304 | 316 | 317 | 303 | 293 | 286 | 283 | 292 | 284 | 285 | 286 | 288.9         | 315.9         |
| 11 Spd | 11                            | 13  | 17  | 19  | 16  | 14  | 11  | 13  | 19  | 16  | 18  | 22  | 28  | 28  | 26  | 22  | 22  | 18  | 26  | 26  | 26  | 25  | 25  | 20  | 19.8          | 27.9          |
| Dir    | 239                           | 238 | 255 | 269 | 269 | 261 | 258 | 258 | 250 | 250 | 252 | 252 | 253 | 255 | 255 | 253 | 244 | 243 | 242 | 250 | 251 | 247 | 250 | 256 | 251.8         | 253.2         |
| 12 Spd | 20                            | 19  | 20  | 22  | 24  | 27  | 22  | 17  | 22  | 20  | 29  | 22  | 23  | 26  | 23  | 23  | 23  | 23  | 21  | 21  | 18  | 20  | 20  | 19  | 21.1          | 28.9          |
| Dir    | 256                           | 262 | 247 | 258 | 278 | 293 | 289 | 259 | 272 | 279 | 300 | 280 | 257 | 263 | 278 | 289 | 284 | 292 | 286 | 290 | 281 | 257 | 265 | 255 | 274.7         | 300.4         |
| 13 Spd | 21                            | 21  | 15  | 13  | 15  | 14  | 17  | 17  | 17  | 12  | 17  | 20  | 23  | 19  | 19  | 15  | 12  | 10  | 4   | 1   | 3   | 2   | 3   | 4   | 12.6          | 22.8          |
| Dir    | 259                           | 259 | 273 | 280 | 271 | 265 | 261 | 268 | 270 | 254 | 253 | 257 | 262 | 266 | 256 | 263 | 255 | 252 | 214 | 272 | 231 | 182 | 184 | 204 | 260.0         | 262.0         |
| 14 Spd | 3                             | 3   | 2   | 1   | 2   | 1   | 1   | 5   | 2   | 4   | 4   | 9   | 13  | 11  | 9   | 6   | 5   | 3   | 8   | 4   | 4   | 2   | 3   | 4   | 3.9           | 13.0          |
| Dir    | 200                           | 204 | 200 | 202 | 213 | 38  | 206 | 202 | 217 | 204 | 247 | 238 | 253 | 243 | 269 | 245 | 239 | 289 | 317 | 258 | 272 | 236 | 242 | 253 | 245.9         | 253.0         |
| 15 Spd | 3                             | 1   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 1   | 2   | 4   | 8   | 10  | 9   | 8   | 6   | 1   | 2   | 1   | 3   | 0   | 4   | 2   | 2.1           | 9.6           |
| Dir    | 263                           | 246 | 275 | 286 | 195 | 192 | 12  | 68  | 217 | 208 | 198 | 293 | 317 | 305 | 257 | 269 | 250 | 265 | 204 | 209 | 198 | 214 | 220 | 217 | 263.3         | 305.3         |
| 16 Spd | 4                             | 6   | 9   | 9   | 5   | 10  | 5   | 6   | 3   | 4   | 3   | 0   | 5   | 6   | 6   | 4   | 0   | 1   | 0   | 0   | 1   | 1   | 0   | 1   | 3.5           | 10.5          |
| Dir    | 215                           | 243 | 235 | 252 | 233 | 222 | 238 | 229 | 263 | 218 | 181 | 180 | 212 | 211 | 272 | 222 | 175 | 185 | 359 | 202 | 219 | 201 | 332 | 199 | 230.1         | 222.2         |
| 17 Spd | 1                             | 0   | 2   | 2   | 2   | 1   | 2   | 2   | 3   | 2   | 4   | 4   | 6   | 1   | 5   | 4   | 19  | 16  | 22  | 20  | 23  | 38  | 44  | 45  | 10.7          | 44.7          |
| Dir    | 202                           | 202 | 206 | 201 | 209 | 196 | 208 | 194 | 200 | 224 | 219 | 212 | 199 | 213 | 301 | 262 | 236 | 264 | 234 | 256 | 255 | 246 | 245 | 244 | 243.1         | 243.6         |
| 18 Spd | 43                            | 45  | 41  | 46  | 50  | 47  | 58  | 55  | 44  | 18  | 15  | 16  | 35  | 35  | 35  | 31  | 25  | 25  | 32  | 24  | 21  | 19  | 6   | 11  | 31.7          | 58.5          |
| Dir    | 244                           | 241 | 240 | 247 | 248 | 248 | 246 | 245 | 244 | 225 | 231 | 242 | 243 | 247 | 261 | 256 | 247 | 232 | 240 | 232 | 221 | 212 | 186 | 201 | 242.0         | 245.8         |
| 19 Spd | 6                             | 2   | 10  | 16  | 14  | 38  | 42  | 41  | 49  | 50  | 49  | 37  | 40  | 42  | 38  | 40  | 35  | 31  | 34  | 38  | 40  | 35  | 25  | 28  | 31.9          | 49.9          |
| Dir    | 187                           | 127 | 207 | 217 | 240 | 225 | 230 | 229 | 239 | 243 | 246 | 254 | 250 | 251 | 254 | 246 | 255 | 246 | 242 | 240 | 243 | 245 | 236 | 230 | 241.0         | 242.8         |
| 20 Spd | 29                            | 31  | 23  | 2   | 1   | 2   | 0   | 1   | 1   | 1   | 1   | 2   | 1   | 5   | 4   | 6   | 4   | 3   | 5   | 24  | 24  | 25  | 29  | 43  | 10.5          | 43.4          |
| Dir    | 235                           | 235 | 238 | 232 | 22  | 44  | 118 | 133 | 166 | 36  | 34  | 347 | 219 | 248 | 252 | 231 | 246 | 217 | 238 | 234 | 232 | 238 | 235 | 239 | 236.5         | 238.6         |
| 21 Spd | 34                            | 21  | 19  | 26  | 33  | 29  | 23  | 34  | 39  | 31  | 27  | 31  | 33  | 41  | 41  | 43  | 47  | 39  | 29  | 18  | 17  | 23  | 25  | 23  | 30.2          | 47.2          |
| Dir    | 235                           | 230 | 223 | 229 | 232 | 223 | 210 | 224 | 231 | 223 | 225 | 224 | 220 | 224 | 225 | 225 | 223 | 222 | 220 | 220 | 214 | 224 | 227 | 233 | 224.7         | 223.2         |
| 22 Spd | 9                             | 7   | 6   | 3   | 1   | 5   | 6   | 7   | 13  | 13  | 6   | 8   | 6   | 5   | 4   | 2   | 6   | 4   | 6   | 4   | 6   | 3   | 1   | 2   | 4.1           | 12.6          |
| Dir    | 272                           | 247 | 265 | 347 | 259 | 189 | 236 | 254 | 236 | 223 | 208 | 215 | 260 | 259 | 293 | 326 | 13  | 302 | 251 | 298 | 324 | 335 | 287 | 212 | 256.1         | 235.5         |

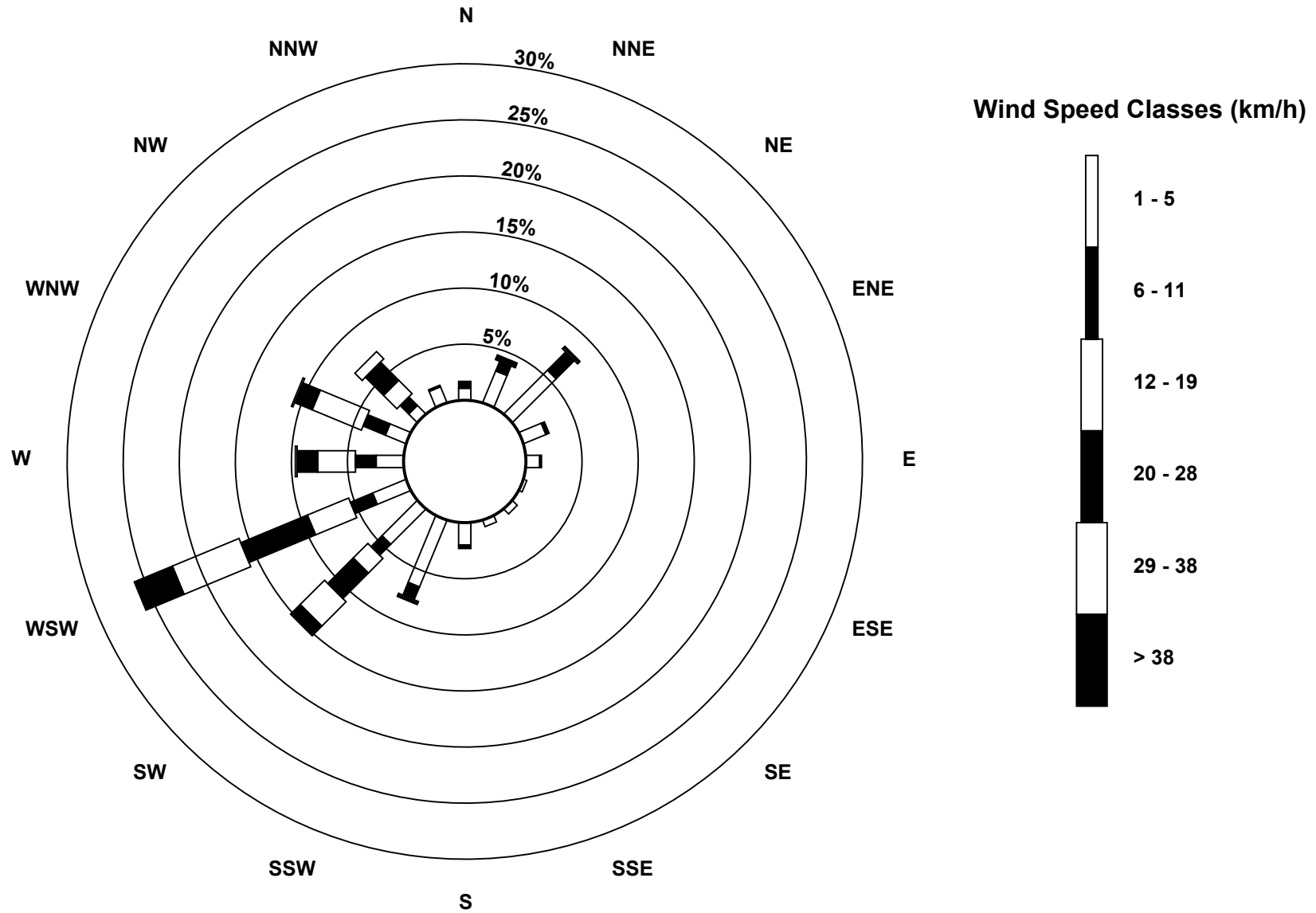


**Wind Speed (km/h)**  
**Wind Direction (deg)**  
**Evergreen Park - December 2016**

Page 117 of 401

## Wind Rose

Wind Speed (WS) (km/h)  
Evergreen Park - December 2016



# Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

Evergreen Park - December 2016

| Maximum Speed: 59 km/h on Dec 18 07:00                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Speed Average: 33.9 km/h on Dec 28                                                                                                              |                 |               |  |  |  |  |  | Hours in Service: 744          |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|--|--|--|--|--|--------------------------------|--|--|--|
| Minimum Speed: 0 km/h on Dec 17 02:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Speed Average: 1.5 km/h on Dec 26                                                                                                               |                 |               |  |  |  |  |  | Hours of Data: 743             |  |  |  |
| Maximum Diurnal Speed Average: 16.7 km/h at hour 14                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Speed Average: 10.6 km/h at hour 4                                                                                                            |                 |               |  |  |  |  |  | Hours of Missing Data: 1       |  |  |  |
| Monthly Average Speed: 12.95 km/h                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 2.8 Median = 7.4 Q <sub>3</sub> = 21.9 P <sub>90</sub> = 32.2 P <sub>99</sub> = 46.0 |                 |               |  |  |  |  |  | Percent Operational Time: 99.9 |  |  |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               | Daily Average   | Daily Maximum |  |  |  |  |  |                                |  |  |  |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                                                                                                                                                            |                 |               |  |  |  |  |  |                                |  |  |  |
| 1-Dec                                                                                                                   | 2                             | 2  | 4  | 6  | 4  | 5  | 4  | 4  | 4  | 4  | 3  | 1  | 4  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 0                                                                                                                                                             | 2.4             | 5.7           |  |  |  |  |  |                                |  |  |  |
| 2-Dec                                                                                                                   | 1                             | 2  | 1  | 3  | 2  | 2  | 1  | 3  | 5  | 4  | 4  | 2  | 3  | 3  | 4  | 8  | 4  | 4  | 2  | 5  | 3  | 3  | 3  | 6                                                                                                                                                             | 3.2             | 8.1           |  |  |  |  |  |                                |  |  |  |
| 3-Dec                                                                                                                   | 5                             | 5  | 3  | 12 | 8  | 22 | 22 | 21 | 22 | 29 | 28 | 30 | 32 | 34 | 37 | 42 | 31 | 37 | 32 | 28 | 25 | 23 | 22 | 19                                                                                                                                                            | 23.8            | 41.6          |  |  |  |  |  |                                |  |  |  |
| 4-Dec                                                                                                                   | 15                            | 14 | 18 | 13 | 14 | 19 | 15 | 14 | 26 | 32 | 30 | 32 | 31 | 32 | 31 | 28 | 26 | 22 | 22 | 25 | 25 | 26 | 28 | 24                                                                                                                                                            | 23.5            | 32.2          |  |  |  |  |  |                                |  |  |  |
| 5-Dec                                                                                                                   | 23                            | 15 | 20 | 17 | 19 | 24 | 23 | 21 | 18 | 20 | 19 | 18 | 22 | 20 | 23 | 23 | 16 | 11 | 23 | 22 | 13 | 16 | 14 | 12                                                                                                                                                            | 18.8            | 23.6          |  |  |  |  |  |                                |  |  |  |
| 6-Dec                                                                                                                   | 11                            | 15 | 19 | 17 | 16 | 14 | 15 | 15 | 14 | 16 | 16 | 15 | 18 | 16 | 16 | 12 | 9  | 7  | 8  | 11 | 10 | 10 | 7  | 5                                                                                                                                                             | 13.1            | 18.9          |  |  |  |  |  |                                |  |  |  |
| 7-Dec                                                                                                                   | 5                             | 4  | 2  | 1  | 2  | 1  | 1  | 3  | 1  | 1  | D  | 2  | 5  | 6  | 7  | 4  | 2  | 3  | 3  | 1  | 1  | 2  | 2  | 1                                                                                                                                                             | 2.6             | 6.7           |  |  |  |  |  |                                |  |  |  |
| 8-Dec                                                                                                                   | 5                             | 4  | 6  | 5  | 3  | 3  | 5  | 5  | 5  | 4  | 4  | 7  | 7  | 9  | 9  | 10 | 8  | 6  | 7  | 4  | 3  | 2  | 0  | 2                                                                                                                                                             | 5.1             | 10.2          |  |  |  |  |  |                                |  |  |  |
| 9-Dec                                                                                                                   | 2                             | 2  | 5  | 2  | 1  | 1  | 3  | 2  | 1  | 1  | 1  | 1  | 2  | 5  | 6  | 7  | 7  | 6  | 3  | 4  | 4  | 3  | 4  | 6                                                                                                                                                             | 3.2             | 7.1           |  |  |  |  |  |                                |  |  |  |
| 10-Dec                                                                                                                  | 7                             | 6  | 3  | 1  | 3  | 4  | 1  | 1  | 4  | 5  | 8  | 11 | 11 | 14 | 17 | 15 | 9  | 7  | 11 | 13 | 14 | 14 | 15 | 14                                                                                                                                                            | 8.6             | 16.8          |  |  |  |  |  |                                |  |  |  |
| 11-Dec                                                                                                                  | 12                            | 13 | 17 | 19 | 16 | 14 | 11 | 14 | 19 | 16 | 18 | 22 | 28 | 28 | 26 | 22 | 22 | 18 | 26 | 26 | 27 | 25 | 26 | 20                                                                                                                                                            | 20.2            | 28.1          |  |  |  |  |  |                                |  |  |  |
| 12-Dec                                                                                                                  | 20                            | 19 | 20 | 22 | 25 | 27 | 23 | 18 | 23 | 20 | 30 | 23 | 23 | 26 | 24 | 24 | 24 | 24 | 22 | 22 | 19 | 20 | 21 | 20                                                                                                                                                            | 22.5            | 29.8          |  |  |  |  |  |                                |  |  |  |
| 13-Dec                                                                                                                  | 21                            | 21 | 16 | 14 | 15 | 15 | 17 | 18 | 17 | 12 | 17 | 20 | 23 | 20 | 19 | 16 | 12 | 10 | 4  | 2  | 4  | 2  | 3  | 4                                                                                                                                                             | 13.4            | 23.2          |  |  |  |  |  |                                |  |  |  |
| 14-Dec                                                                                                                  | 3                             | 3  | 2  | 1  | 3  | 1  | 1  | 5  | 2  | 4  | 5  | 9  | 13 | 11 | 10 | 6  | 5  | 3  | 8  | 4  | 4  | 2  | 3  | 4                                                                                                                                                             | 4.8             | 13.4          |  |  |  |  |  |                                |  |  |  |
| 15-Dec                                                                                                                  | 3                             | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 2  | 4  | 8  | 10 | 9  | 8  | 6  | 2  | 2  | 1  | 3  | 0  | 4  | 2                                                                                                                                                             | 3.1             | 10.3          |  |  |  |  |  |                                |  |  |  |
| 16-Dec                                                                                                                  | 4                             | 6  | 9  | 9  | 6  | 11 | 5  | 6  | 3  | 4  | 3  | 1  | 5  | 7  | 6  | 4  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                             | 4.2             | 10.6          |  |  |  |  |  |                                |  |  |  |
| 17-Dec                                                                                                                  | 2                             | 0  | 2  | 2  | 2  | 1  | 2  | 2  | 3  | 2  | 5  | 5  | 6  | 2  | 6  | 7  | 19 | 17 | 22 | 22 | 24 | 39 | 44 | 45                                                                                                                                                            | 11.6            | 45.1          |  |  |  |  |  |                                |  |  |  |
| 18-Dec                                                                                                                  | 44                            | 45 | 41 | 46 | 50 | 47 | 59 | 55 | 44 | 19 | 15 | 16 | 35 | 36 | 35 | 32 | 25 | 26 | 32 | 24 | 21 | 20 | 6  | 11                                                                                                                                                            | 32.6            | 58.8          |  |  |  |  |  |                                |  |  |  |
| 19-Dec                                                                                                                  | 6                             | 3  | 10 | 16 | 14 | 38 | 42 | 41 | 49 | 50 | 50 | 37 | 41 | 43 | 39 | 40 | 36 | 31 | 34 | 39 | 40 | 35 | 25 | 28                                                                                                                                                            | 32.9            | 50.3          |  |  |  |  |  |                                |  |  |  |
| 20-Dec                                                                                                                  | 29                            | 31 | 24 | 5  | 2  | 2  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 5  | 4  | 6  | 4  | 3  | 6  | 24 | 24 | 26 | 30 | 44                                                                                                                                                            | 11.8            | 43.5          |  |  |  |  |  |                                |  |  |  |
| 21-Dec                                                                                                                  | 34                            | 21 | 19 | 26 | 33 | 30 | 23 | 34 | 40 | 31 | 27 | 31 | 33 | 42 | 42 | 44 | 48 | 39 | 29 | 19 | 17 | 23 | 25 | 23                                                                                                                                                            | 30.6            | 47.7          |  |  |  |  |  |                                |  |  |  |
| 22-Dec                                                                                                                  | 10                            | 7  | 7  | 3  | 1  | 6  | 8  | 7  | 13 | 13 | 6  | 9  | 7  | 6  | 5  | 3  | 6  | 5  | 6  | 5  | 7  | 3  | 2  | 3                                                                                                                                                             | 6.1             | 12.8          |  |  |  |  |  |                                |  |  |  |
| 23-Dec                                                                                                                  | 2                             | 3  | 2  | 2  | 3  | 3  | 3  | 4  | 8  | 11 | 7  | 6  | 9  | 12 | 10 | 8  | 6  | 0  | 3  | 1  | 1  | 2  | 1  | 3                                                                                                                                                             | 4.7             | 12.0          |  |  |  |  |  |                                |  |  |  |
| 24-Dec                                                                                                                  | 3                             | 1  | 1  | 5  | 7  | 7  | 8  | 7  | 7  | 6  | 5  | 4  | 5  | 4  | 4  | 3  | 2  | 3  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                             | 3.6             | 7.5           |  |  |  |  |  |                                |  |  |  |
| 25-Dec                                                                                                                  | 2                             | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 3  | 2  | 1  | 3  | 3  | 2  | 5  | 2  | 1  | 1  | 1  | 2  | 4  | 2  | 2  | 3                                                                                                                                                             | 2.1             | 4.8           |  |  |  |  |  |                                |  |  |  |
| 26-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 3  | 2  | 1  | 2  | 1  | 1  | 1  | 2  | 3  | 2  | 2  | 2  | 1  | 1  | 2  | 2  | 2  | 1  | 1                                                                                                                                                             | 1.5             | 3.0           |  |  |  |  |  |                                |  |  |  |
| 27-Dec                                                                                                                  | 4                             | 5  | 3  | 1  | 3  | 4  | 4  | 4  | 3  | 4  | 15 | 22 | 30 | 35 | 33 | 27 | 34 | 34 | 30 | 33 | 33 | 35 | 43 | 39                                                                                                                                                            | 20.0            | 42.5          |  |  |  |  |  |                                |  |  |  |
| 28-Dec                                                                                                                  | 39                            | 38 | 34 | 37 | 36 | 31 | 32 | 37 | 34 | 35 | 38 | 38 | 27 | 27 | 31 | 37 | 36 | 33 | 43 | 36 | 29 | 32 | 25 | 29                                                                                                                                                            | 33.9            | 42.6          |  |  |  |  |  |                                |  |  |  |
| 29-Dec                                                                                                                  | 25                            | 24 | 17 | 3  | 3  | 2  | 2  | 1  | 3  | 1  | 4  | 4  | 4  | 3  | 4  | 5  | 2  | 2  | 2  | 4  | 5  | 4  | 3  | 5                                                                                                                                                             | 5.4             | 24.5          |  |  |  |  |  |                                |  |  |  |
| 30-Dec                                                                                                                  | 4                             | 6  | 13 | 12 | 11 | 8  | 8  | 4  | 4  | 13 | 26 | 28 | 33 | 33 | 22 | 14 | 18 | 24 | 27 | 32 | 24 | 14 | 13 | 16                                                                                                                                                            | 16.9            | 33.2          |  |  |  |  |  |                                |  |  |  |
| 31-Dec                                                                                                                  | 13                            | 10 | 16 | 25 | 22 | 21 | 21 | 23 | 13 | 8  | 13 | 10 | 9  | 23 | 25 | 20 | 11 | 11 | 12 | 8  | 8  | 12 | 15 | 9                                                                                                                                                             | 15.0            | 25.0          |  |  |  |  |  |                                |  |  |  |
| 11.5 10.7 10.8 10.6 10.7 11.8 11.8 12.2 12.7 12.0 13.4 13.4 15.5 16.7 16.5 15.5 14.0 12.7 13.6 13.6 12.7 12.9 12.6 12.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               | Diurnal Average |               |  |  |  |  |  |                                |  |  |  |
| 43.5 45.1 41.0 45.9 50.1 47.2 58.8 55.2 49.5 50.3 49.9 37.8 40.9 42.6 41.7 43.6 47.7 39.4 42.6 38.7 40.0 38.7 43.9 45.1 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               | Diurnal Maximum |               |  |  |  |  |  |                                |  |  |  |
| D - DAS Failure                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |                 |               |  |  |  |  |  |                                |  |  |  |
| All monthly, daily, and diurnal averages have been calculated using scalar methods                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |                 |               |  |  |  |  |  |                                |  |  |  |

# Hourly Standard Deviations

Wind Direction (WD) - deg

Evergreen Park - December 2016

|                                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |    |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|----|----|----|----|----|----|---------------|
| Maximum Value: 99.3 deg on Dec 7 07:00                                                                                                                          |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |    |    |    |    |    |    |               |
| Minimum Value: 4.3 deg on Dec 4 00:00                                                                                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 743             |    |    |    |    |    |    |               |
|                                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 1       |    |    |    |    |    |    |               |
|                                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0        |    |    |    |    |    |    |               |
| Percentiles: P <sub>1</sub> = 5.2 P <sub>10</sub> = 6.8 Q <sub>1</sub> = 10.5 Median = 18.9 Q <sub>3</sub> = 43.9 P <sub>90</sub> = 76.1 P <sub>99</sub> = 93.7 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.9 |    |    |    |    |    |    |               |
| Day                                                                                                                                                             | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |    | Daily Maximum |
|                                                                                                                                                                 | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18                             | 19 | 20 | 21 | 22 | 23 | 24 |               |
| 1-Dec                                                                                                                                                           | 79                            | 74 | 30 | 38 | 39 | 44 | 26 | 42 | 79 | 77 | 59 | 32 | 15 | 34 | 41 | 54 | 33 | 89                             | 87 | 75 | 99 | 94 | 84 | 84 | 99.0          |
| 2-Dec                                                                                                                                                           | 72                            | 81 | 71 | 53 | 82 | 49 | 59 | 20 | 13 | 31 | 20 | 51 | 65 | 75 | 83 | 34 | 52 | 48                             | 86 | 58 | 89 | 82 | 55 | 68 | 89.2          |
| 3-Dec                                                                                                                                                           | 74                            | 69 | 84 | 72 | 17 | 8  | 6  | 6  | 9  | 6  | 7  | 8  | 7  | 7  | 7  | 8  | 9  | 7                              | 7  | 7  | 9  | 7  | 5  | 4  | 84.1          |
| 4-Dec                                                                                                                                                           | 5                             | 5  | 6  | 11 | 7  | 5  | 17 | 11 | 22 | 8  | 11 | 13 | 12 | 14 | 13 | 13 | 13 | 15                             | 15 | 14 | 14 | 14 | 13 | 15 | 22.1          |
| 5-Dec                                                                                                                                                           | 15                            | 17 | 17 | 13 | 15 | 16 | 15 | 14 | 15 | 16 | 16 | 17 | 18 | 18 | 16 | 14 | 15 | 19                             | 19 | 10 | 19 | 17 | 14 | 17 | 19.5          |
| 6-Dec                                                                                                                                                           | 15                            | 16 | 15 | 18 | 18 | 16 | 15 | 15 | 16 | 17 | 20 | 21 | 23 | 24 | 23 | 14 | 15 | 16                             | 22 | 20 | 16 | 21 | 17 | 21 | 24.2          |
| 7-Dec                                                                                                                                                           | 22                            | 20 | 63 | 91 | 48 | 97 | 99 | 32 | 35 | 74 | D  | 56 | 23 | 48 | 26 | 32 | 15 | 8                              | 6  | 82 | 83 | 44 | 19 | 36 | 99.3          |
| 8-Dec                                                                                                                                                           | 20                            | 40 | 22 | 29 | 40 | 39 | 21 | 37 | 31 | 34 | 34 | 34 | 40 | 21 | 17 | 22 | 21 | 27                             | 13 | 22 | 26 | 45 | 79 | 75 | 78.9          |
| 9-Dec                                                                                                                                                           | 52                            | 87 | 64 | 84 | 84 | 71 | 40 | 53 | 39 | 79 | 94 | 37 | 40 | 42 | 30 | 29 | 14 | 14                             | 31 | 11 | 32 | 34 | 23 | 10 | 94.3          |
| 10-Dec                                                                                                                                                          | 8                             | 12 | 35 | 35 | 11 | 11 | 48 | 94 | 35 | 17 | 24 | 22 | 23 | 17 | 17 | 19 | 18 | 16                             | 15 | 17 | 18 | 17 | 15 | 26 | 94.0          |
| 11-Dec                                                                                                                                                          | 12                            | 10 | 14 | 11 | 12 | 9  | 19 | 17 | 9  | 8  | 8  | 9  | 7  | 8  | 9  | 9  | 6  | 7                              | 7  | 8  | 9  | 8  | 8  | 14 | 19.5          |
| 12-Dec                                                                                                                                                          | 13                            | 16 | 8  | 12 | 14 | 12 | 14 | 18 | 17 | 16 | 15 | 17 | 11 | 11 | 15 | 15 | 14 | 13                             | 13 | 15 | 15 | 13 | 11 | 11 | 18.0          |
| 13-Dec                                                                                                                                                          | 8                             | 9  | 21 | 15 | 15 | 14 | 10 | 13 | 11 | 11 | 7  | 8  | 10 | 11 | 8  | 11 | 10 | 11                             | 13 | 91 | 52 | 23 | 19 | 19 | 91.2          |
| 14-Dec                                                                                                                                                          | 30                            | 24 | 23 | 65 | 61 | 75 | 31 | 10 | 34 | 26 | 47 | 17 | 13 | 10 | 24 | 18 | 14 | 34                             | 11 | 27 | 30 | 25 | 21 | 21 | 75.1          |
| 15-Dec                                                                                                                                                          | 34                            | 44 | 58 | 91 | 52 | 69 | 79 | 83 | 93 | 67 | 46 | 44 | 21 | 23 | 15 | 23 | 20 | 51                             | 41 | 65 | 15 | 87 | 41 | 48 | 93.4          |
| 16-Dec                                                                                                                                                          | 22                            | 9  | 11 | 17 | 35 | 11 | 11 | 21 | 32 | 17 | 30 | 91 | 59 | 33 | 21 | 56 | 92 | 90                             | 72 | 93 | 40 | 83 | 90 | 56 | 93.0          |
| 17-Dec                                                                                                                                                          | 37                            | 98 | 33 | 45 | 59 | 46 | 44 | 38 | 25 | 54 | 12 | 21 | 9  | 74 | 42 | 66 | 15 | 25                             | 10 | 26 | 11 | 7  | 6  | 7  | 98.3          |
| 18-Dec                                                                                                                                                          | 6                             | 6  | 7  | 7  | 7  | 7  | 6  | 7  | 8  | 11 | 18 | 29 | 7  | 7  | 10 | 10 | 8  | 7                              | 8  | 10 | 9  | 9  | 12 | 8  | 29.3          |
| 19-Dec                                                                                                                                                          | 10                            | 69 | 12 | 9  | 11 | 7  | 7  | 6  | 5  | 7  | 7  | 10 | 8  | 9  | 10 | 7  | 10 | 8                              | 5  | 6  | 6  | 7  | 7  | 6  | 69.2          |
| 20-Dec                                                                                                                                                          | 6                             | 6  | 6  | 85 | 82 | 49 | 88 | 86 | 80 | 69 | 88 | 51 | 77 | 22 | 21 | 11 | 28 | 54                             | 62 | 6  | 11 | 9  | 7  | 5  | 88.1          |
| 21-Dec                                                                                                                                                          | 5                             | 6  | 8  | 9  | 8  | 14 | 8  | 6  | 7  | 6  | 7  | 7  | 8  | 8  | 8  | 7  | 8  | 6                              | 6  | 6  | 5  | 7  | 7  | 7  | 13.6          |
| 22-Dec                                                                                                                                                          | 28                            | 25 | 23 | 19 | 59 | 19 | 45 | 22 | 11 | 12 | 25 | 15 | 33 | 22 | 30 | 43 | 13 | 38                             | 17 | 33 | 16 | 23 | 62 | 77 | 76.8          |
| 23-Dec                                                                                                                                                          | 56                            | 54 | 36 | 65 | 21 | 20 | 35 | 26 | 15 | 14 | 18 | 19 | 18 | 17 | 17 | 17 | 19 | 93                             | 42 | 75 | 53 | 27 | 49 | 16 | 93.1          |
| 24-Dec                                                                                                                                                          | 17                            | 47 | 72 | 15 | 16 | 21 | 19 | 15 | 15 | 20 | 21 | 36 | 29 | 47 | 33 | 22 | 30 | 28                             | 39 | 56 | 30 | 80 | 98 | 72 | 97.7          |
| 25-Dec                                                                                                                                                          | 38                            | 30 | 27 | 50 | 54 | 58 | 42 | 83 | 24 | 31 | 44 | 18 | 35 | 32 | 26 | 54 | 71 | 45                             | 24 | 44 | 26 | 34 | 46 | 47 | 83.4          |
| 26-Dec                                                                                                                                                          | 37                            | 73 | 65 | 76 | 67 | 60 | 64 | 87 | 84 | 84 | 92 | 91 | 67 | 71 | 80 | 76 | 60 | 67                             | 92 | 90 | 74 | 38 | 84 | 78 | 92.2          |
| 27-Dec                                                                                                                                                          | 38                            | 86 | 58 | 93 | 55 | 63 | 73 | 71 | 65 | 82 | 8  | 6  | 5  | 5  | 6  | 8  | 10 | 8                              | 7  | 5  | 7  | 7  | 7  | 6  | 92.7          |
| 28-Dec                                                                                                                                                          | 6                             | 6  | 6  | 5  | 6  | 5  | 5  | 7  | 6  | 7  | 7  | 7  | 9  | 7  | 6  | 7  | 7  | 6                              | 7  | 5  | 8  | 8  | 6  | 6  | 8.6           |
| 29-Dec                                                                                                                                                          | 5                             | 7  | 13 | 48 | 68 | 82 | 77 | 94 | 34 | 41 | 39 | 80 | 28 | 64 | 32 | 68 | 89 | 83                             | 82 | 42 | 36 | 39 | 42 | 33 | 93.8          |
| 30-Dec                                                                                                                                                          | 45                            | 21 | 9  | 12 | 10 | 12 | 12 | 55 | 33 | 15 | 5  | 6  | 7  | 6  | 10 | 12 | 11 | 11                             | 10 | 10 | 19 | 17 | 21 | 15 | 54.9          |
| 31-Dec                                                                                                                                                          | 14                            | 13 | 16 | 12 | 11 | 15 | 8  | 8  | 24 | 18 | 24 | 12 | 26 | 13 | 11 | 14 | 12 | 19                             | 18 | 23 | 18 | 16 | 8  | 27 | 27.4          |
| 78.9 98.3 84.1 92.7 84.1 97.4 99.3 94.0 93.4 83.8 94.3 91.4 76.7 75.1 83.5 76.4 91.6 93.1 92.2 93.0 99.0 93.9 97.7 84.3                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |    |               |
| D - DAS Failure                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |    |               |



PAZA  
Smoky Heights Station  
Monthly Summary Tables, Graphs and  
Roses

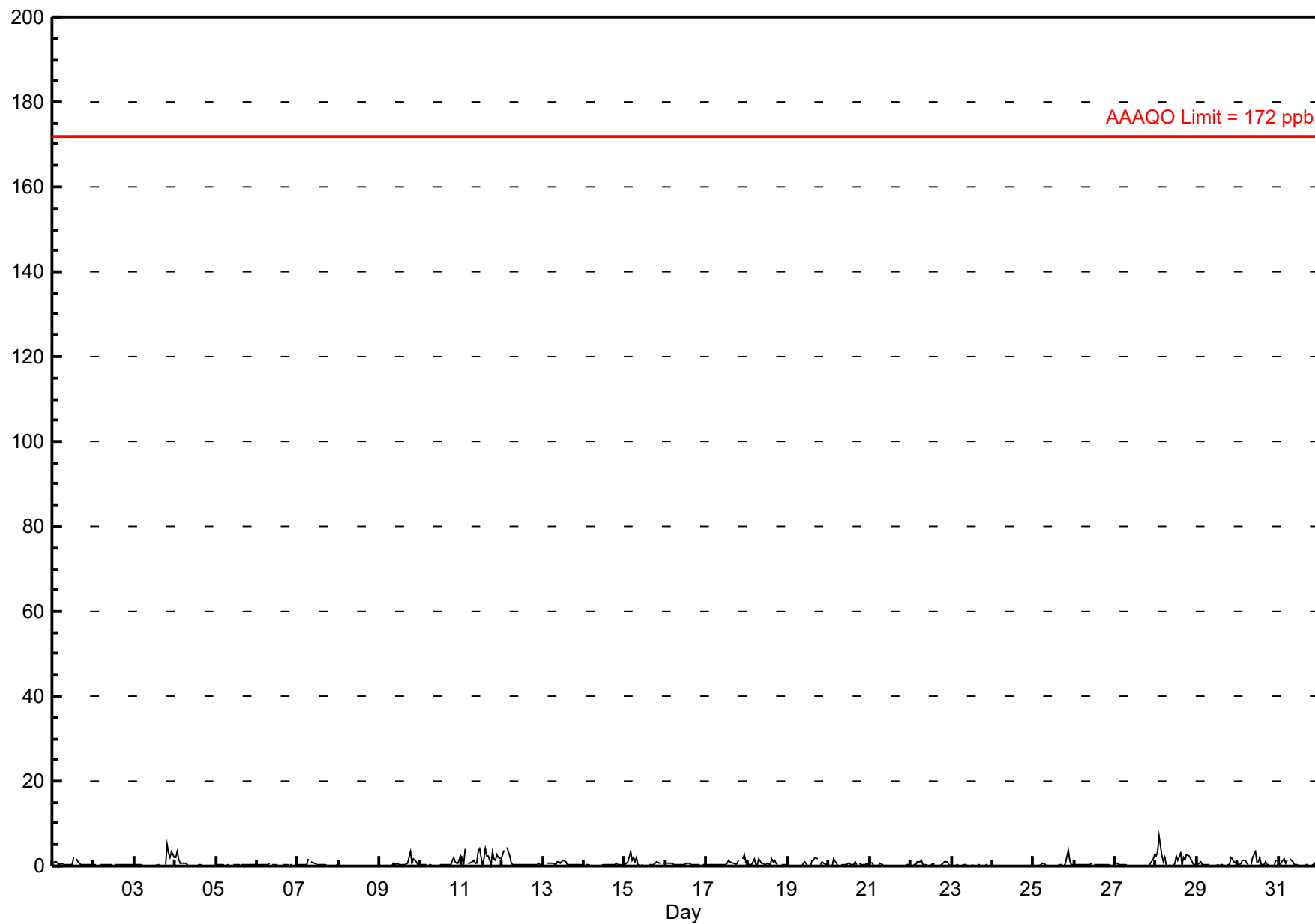
# Hourly Averages

## Sulphur Dioxide (SO<sub>2</sub>) - ppb Smoky Heights - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 7.0 ppb on Dec 28 03:00<br>Maximum Daily Average: 1.9 ppb on Dec 11 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 707<br>Hours of Missing Data: 37<br>Hours of Calibration: 35<br>Percent Operational Time: 99.7                                                                                                              |    |    |    |    |                 |               |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|
| Minimum Value: 0 ppb on Dec 8 05:00<br>Maximum Diurnal Average: 0.8 ppb at hour 3<br>Monthly Average: 0.55 ppb                        |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.0 ppb on Dec 8<br>Minimum Diurnal Average: 0.3 ppb at hour 9<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 1.4 P <sub>99</sub> = 3.5 |    |    |    |    |                 |               |
| Day                                                                                                                                   | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                     |    |    |    |    | Daily Average   | Daily Maximum |
|                                                                                                                                       | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                                                                                                                  | 21 | 22 | 23 | 24 |                 |               |
| 1-Dec                                                                                                                                 | 1                             | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0  | 0  | 0  | 2  | A  | 2  | 1  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.6             | 2.1           |
| 2-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.3             | 0.4           |
| 3-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | N  | N  | 0  | 5                                                                                                                                                                                                                                                   | 3  | 2  | 3  | 2  | 0.9             | 5.0           |
| 4-Dec                                                                                                                                 | 2                             | 3 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.5             | 3.3           |
| 5-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.2             | 0.3           |
| 6-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 1 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.2             | 0.6           |
| 7-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | 0 | 2 | A | 1 | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.4             | 1.7           |
| 8-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.0             | 0.1           |
| 9-Dec                                                                                                                                 | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 1 | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 3  | 1                                                                                                                                                                                                                                                   | 2  | 1  | 0  | 0  | 0.6             | 3.4           |
| 10-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 2                                                                                                                                                                                                                                                   | 1  | 1  | 1  | 2  | 0.5             | 2.0           |
| 11-Dec                                                                                                                                | 2                             | 1 | 4 | A | 1 | 1 | 1 | 1 | 1 | 1  | 3  | 4  | 0  | 2  | 4  | 2  | 2  | 0  | 3  | 2                                                                                                                                                                                                                                                   | 1  | 3  | 2  | 2  | 1.9             | 4.2           |
| 12-Dec                                                                                                                                | 3                             | 4 | A | 4 | 2 | 1 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 1  | 0  | 0  | 0.9             | 4.4           |
| 13-Dec                                                                                                                                | 1                             | A | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.6             | 1.2           |
| 14-Dec                                                                                                                                | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                                                                                                                                   | 0  | 0  | 0  | A  | 0.2             | 0.6           |
| 15-Dec                                                                                                                                | 0                             | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 0 | 0  | 0  | C  | C  | C  | 0  | 0  | 0  | 0  | 1  | 1                                                                                                                                                                                                                                                   | 1  | 1  | A  | 1  | 0.9             | 3.4           |
| 16-Dec                                                                                                                                | 1                             | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | A  | 0  | 0  | 0.4             | 0.8           |
| 17-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                                                                                                                   | A  | 2  | 3  | 1  | 0.7             | 2.7           |
| 18-Dec                                                                                                                                | 1                             | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 1 | 1  | 0  | 0  | 1  | 0  | 2  | 1  | 1  | 1  | 0  | A                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.7             | 1.8           |
| 19-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 0  | 0  | 0  | 1  | 1  | 2  | 2  | A  | 0                                                                                                                                                                                                                                                   | 1  | 1  | 0  | 0  | 0.5             | 1.9           |
| 20-Dec                                                                                                                                | 0                             | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 0  | 0  | 1  | 0  | A  | 1  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 1  | 0  | 0.4             | 1.6           |
| 21-Dec                                                                                                                                | 1                             | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.2             | 1.0           |
| 22-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0  | 0  | 0  | 0  | 1  | 0  | A  | 0  | 0  | 0  | 1                                                                                                                                                                                                                                                   | 1  | 1  | 0  | 0  | 0.5             | 1.3           |
| 23-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.2             | 0.2           |
| 24-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.0             | 0.2           |
| 25-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                                                                                                                                   | 4  | 1  | 0  | 0  | 0.4             | 3.7           |
| 26-Dec                                                                                                                                | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 1  | A  | 0  | 1  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 0  | 0  | 0.3             | 0.5           |
| 27-Dec                                                                                                                                | 1                             | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 1  | 2  | 3  | 0.4             | 2.7           |
| 28-Dec                                                                                                                                | 2                             | 3 | 7 | 2 | 1 | 2 | 0 | 0 | 0 | A  | 0  | 1  | 2  | 1  | 3  | 1  | 2  | 2  | 3  | 2                                                                                                                                                                                                                                                   | 2  | 1  | 0  | 0  | 1.7             | 7.0           |
| 29-Dec                                                                                                                                | 0                             | 1 | 1 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 2  | 2  | 1  | 1  | 0.4             | 2.1           |
| 30-Dec                                                                                                                                | 0                             | 0 | 1 | 1 | 2 | 1 | 0 | A | 0 | 2  | 3  | 1  | 1  | 2  | 0  | 0  | 1  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 0  | 1  | 2  | 0.9             | 3.4           |
| 31-Dec                                                                                                                                | 1                             | 0 | 1 | 2 | 1 | 1 | A | 2 | 1 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                   | 0  | 1  | 0  | 0  | 0.6             | 1.7           |
|                                                                                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                     |    |    |    |    | Diurnal Average |               |
|                                                                                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                     |    |    |    |    | Diurnal Maximum |               |
| C - Calibration N - Not Valid A - Automated Daily Zero Span                                                                           |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                     |    |    |    |    |                 |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb 30-day 11 ppb                                               |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                     |    |    |    |    |                 |               |

## Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Smoky Heights - December 2016**



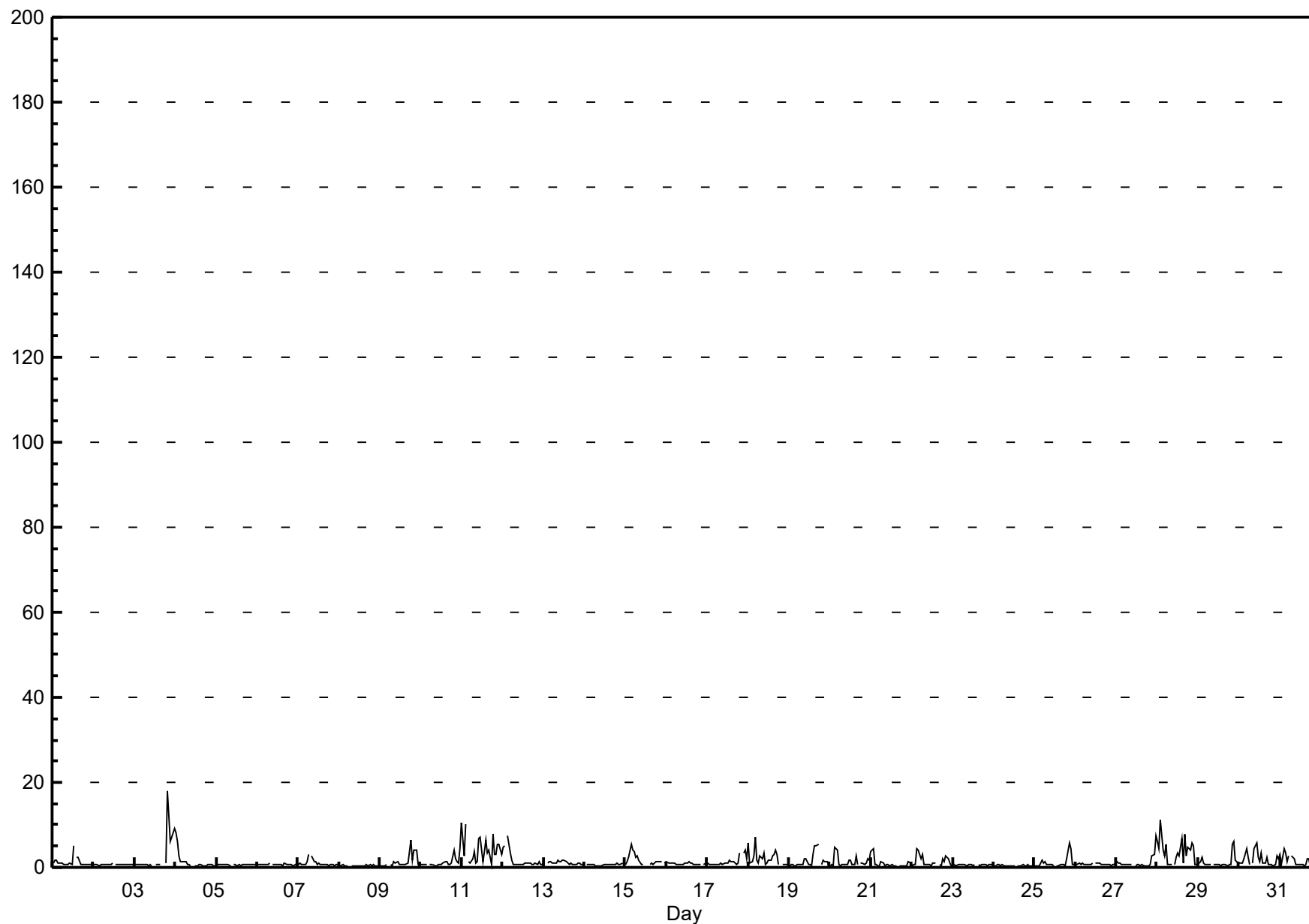
# Hourly Maximums

## Sulphur Dioxide (SO<sub>2</sub>) - ppb Smoky Heights - December 2016

| Maximum Value: 18.0 ppb on Dec 3 20:00     |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 4.1 ppb on Dec 11                                                                                                                   |      |      |     |     |     |                 |               |  |  | Hours in Service: 744          |  |
|--------------------------------------------|-------------------------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|-----|-----|-----------------|---------------|--|--|--------------------------------|--|
| Minimum Value: 0 ppb on Dec 25 03:00       |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.4 ppb on Dec 8                                                                                                                    |      |      |     |     |     |                 |               |  |  | Hours of Data: 707             |  |
| Maximum Diurnal Average: 2.0 ppb at hour 1 |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.9 ppb at hour 9                                                                                                                 |      |      |     |     |     |                 |               |  |  | Hours of Missing Data: 37      |  |
| Monthly Average: 1.37 ppb                  |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.7 Q <sub>3</sub> = 1.2 P <sub>90</sub> = 3.4 P <sub>99</sub> = 7.8 |      |      |     |     |     |                 |               |  |  | Hours of Calibration: 35       |  |
|                                            |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |      |     |     |     |                 |               |  |  | Percent Operational Time: 99.7 |  |
| Day                                        | Hourly Period Ending At (MST) |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |      |     |     |     | Daily Average   | Daily Maximum |  |  |                                |  |
| 1-Dec                                      | 1                             | 2   | 2    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 5   | A   | 2   | 2   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 1   | 1   | 1.2             | 5.1           |  |  |                                |  |
| 2-Dec                                      | 1                             | 1   | 1    | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 1   | 1   | 0.7             | 1.0           |  |  |                                |  |
| 3-Dec                                      | 1                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 0   | 1   | 0   | A   | 1   | 1   | 1   | 1   | N   | N   | 1                                                                                                                                                          | 18   | 12   | 6   | 7   | 9   | 3.0             | 18.0          |  |  |                                |  |
| 4-Dec                                      | 8                             | 6   | 3    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | A   | 0   | 0   | 1   | 1   | 1   | 0   | 1   | 0                                                                                                                                                          | 1    | 1    | 1   | 0   | 0   | 1.3             | 8.2           |  |  |                                |  |
| 5-Dec                                      | 0                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 0   | A   | 1   | 1   | 0   | 1   | 0   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 1   | 1   | 0.6             | 0.8           |  |  |                                |  |
| 6-Dec                                      | 1                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1   | 0   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 0   | 1   | 1   | 0.6             | 1.1           |  |  |                                |  |
| 7-Dec                                      | 1                             | 1   | 1    | 1   | 1   | 1   | 3   | A   | 3   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 0                                                                                                                                                          | 1    | 1    | 0   | 1   | 1   | 1.0             | 3.1           |  |  |                                |  |
| 8-Dec                                      | 0                             | 0   | 1    | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 0   | 1                                                                                                                                                          | 0    | 1    | 0   | 1   | 0   | 0.4             | 0.6           |  |  |                                |  |
| 9-Dec                                      | 0                             | 0   | 0    | 0   | 1   | A   | 1   | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 4   | 6                                                                                                                                                          | 2    | 4    | 4   | 1   | 1   | 1.4             | 6.3           |  |  |                                |  |
| 10-Dec                                     | 1                             | 1   | 1    | 1   | A   | 1   | 1   | 1   | 0   | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 4    | 2    | 1   | 1   | 4   | 1.1             | 4.2           |  |  |                                |  |
| 11-Dec                                     | 10                            | 3   | 10   | A   | 1   | 1   | 2   | 4   | 1   | 1   | 7   | 7   | 1   | 4   | 6   | 3   | 4   | 1   | 8                                                                                                                                                          | 3    | 3    | 5   | 6   | 3   | 4.1             | 10.4          |  |  |                                |  |
| 12-Dec                                     | 5                             | 5   | A    | 8   | 3   | 2   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 1   | 1   | 1.6             | 7.6           |  |  |                                |  |
| 13-Dec                                     | 1                             | A   | 1    | 1   | 1   | 1   | 1   | 1   | 2   | 1   | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 1   | 1   | 1.1             | 1.8           |  |  |                                |  |
| 14-Dec                                     | A                             | 1   | 1    | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 0   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 1   | A   | 0.7             | 1.1           |  |  |                                |  |
| 15-Dec                                     | 1                             | 1   | 2    | 5   | 4   | 4   | 2   | 3   | 2   | 1   | 1   | C   | C   | C   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | A   | 1   | 1.8             | 5.3           |  |  |                                |  |
| 16-Dec                                     | 1                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | A   | 1   | 1   | 0.9             | 1.3           |  |  |                                |  |
| 17-Dec                                     | 1                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 2   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 3    | A    | 3   | 4   | 2   | 1.3             | 4.1           |  |  |                                |  |
| 18-Dec                                     | 6                             | 1   | 1    | 3   | 7   | 2   | 1   | 3   | 2   | 4   | 1   | 1   | 2   | 2   | 3   | 3   | 4   | 3   | 1                                                                                                                                                          | A    | 1    | 1   | 1   | 1   | 2.2             | 7.2           |  |  |                                |  |
| 19-Dec                                     | 0                             | 1   | 1    | 0   | 0   | 1   | 1   | 1   | 1   | 2   | 2   | 1   | 1   | 0   | 3   | 5   | 5   | 5   | A                                                                                                                                                          | 1    | 2    | 1   | 1   | 0   | 1.5             | 5.3           |  |  |                                |  |
| 20-Dec                                     | 0                             | 1   | 0    | 5   | 4   | 1   | 0   | 1   | 1   | 1   | 1   | 2   | 2   | 1   | 1   | 3   | 1   | A   | 1                                                                                                                                                          | 1    | 1    | 1   | 2   | 2   | 1.3             | 4.8           |  |  |                                |  |
| 21-Dec                                     | 4                             | 4   | 1    | 1   | 0   | 0   | 1   | 1   | 0   | 1   | 1   | 0   | 1   | 0   | 0   | 0   | A   | 0   | 0                                                                                                                                                          | 0    | 0    | 0   | 1   | 1   | 0.9             | 4.3           |  |  |                                |  |
| 22-Dec                                     | 0                             | 1   | 1    | 4   | 4   | 2   | 3   | 1   | 1   | 1   | 1   | 0   | 1   | 1   | 1   | A   | 1   | 1   | 2                                                                                                                                                          | 2    | 3    | 2   | 1   | 0   | 1.4             | 4.4           |  |  |                                |  |
| 23-Dec                                     | 1                             | 1   | 0    | 1   | 1   | 1   | 1   | 1   | 0   | 1   | 1   | 1   | 0   | 1   | A   | 1   | 0   | 1   | 1                                                                                                                                                          | 1    | 0    | 1   | 1   | 1   | 0.6             | 0.7           |  |  |                                |  |
| 24-Dec                                     | 1                             | 0   | 1    | 1   | 0   | 1   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | A   | 1   | 0   | 0   | 1   | 0                                                                                                                                                          | 0    | 1    | 0   | 0   | 0   | 0.4             | 0.6           |  |  |                                |  |
| 25-Dec                                     | 0                             | 0   | 0    | 1   | 2   | 1   | 1   | 1   | 1   | 1   | 1   | 0   | A   | 0   | 0   | 1   | 1   | 1   | 0                                                                                                                                                          | 2    | 6    | 5   | 1   | 1   | 1.1             | 5.7           |  |  |                                |  |
| 26-Dec                                     | 1                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1    | 1    | 0   | 1   | 1   | 0.8             | 1.0           |  |  |                                |  |
| 27-Dec                                     | 2                             | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | A   | 0   | 1   | 1   | 0   | 1   | 1   | 0                                                                                                                                                          | 0    | 1    | 3   | 3   | 7   | 1.1             | 7.3           |  |  |                                |  |
| 28-Dec                                     | 6                             | 4   | 11   | 4   | 3   | 5   | 1   | 1   | 1   | A   | 1   | 2   | 3   | 3   | 7   | 1   | 8   | 3   | 5                                                                                                                                                          | 4    | 6    | 5   | 1   | 1   | 3.6             | 11.3          |  |  |                                |  |
| 29-Dec                                     | 1                             | 1   | 2    | 1   | 1   | 1   | 1   | 1   | A   | 1   | 1   | 1   | 1   | 0   | 1   | 1   | 1   | 0   | 1                                                                                                                                                          | 1    | 6    | 6   | 2   | 1   | 1.2             | 5.9           |  |  |                                |  |
| 30-Dec                                     | 1                             | 1   | 1    | 2   | 4   | 2   | 1   | A   | 1   | 5   | 6   | 2   | 1   | 4   | 1   | 1   | 2   | 1   | 1                                                                                                                                                          | 1    | 1    | 1   | 3   | 2   | 1.9             | 5.9           |  |  |                                |  |
| 31-Dec                                     | 3                             | 1   | 4    | 4   | 1   | 3   | A   | 3   | 2   | 1   | 1   | 1   | 1   | 1   | 0   | 1   | 2   | 2   | 0                                                                                                                                                          | 1    | 2    | 3   | 1   | 1   | 1.6             | 4.3           |  |  |                                |  |
| 2.0                                        |                               | 1.4 | 1.7  | 1.7 | 1.6 | 1.2 | 1.0 | 1.0 | 0.9 | 1.0 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.4 | 1.1 | 1.3                                                                                                                                                        | 1.8  | 1.9  | 1.9 | 1.4 | 1.5 | Diurnal Average |               |  |  |                                |  |
| 10.4                                       |                               | 6.0 | 11.3 | 7.6 | 7.2 | 5.4 | 3.1 | 3.8 | 2.6 | 4.5 | 6.7 | 7.1 | 5.1 | 3.6 | 6.7 | 5.1 | 7.7 | 5.3 | 7.7                                                                                                                                                        | 18.0 | 12.1 | 6.2 | 7.1 | 9.0 | Diurnal Maximum |               |  |  |                                |  |
| C - Calibration                            |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |      |     |     |     |                 |               |  |  |                                |  |
| N - Not Valid                              |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |      |     |     |     |                 |               |  |  |                                |  |
| A - Automated Daily Zero Span              |                               |     |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                            |      |      |     |     |     |                 |               |  |  |                                |  |

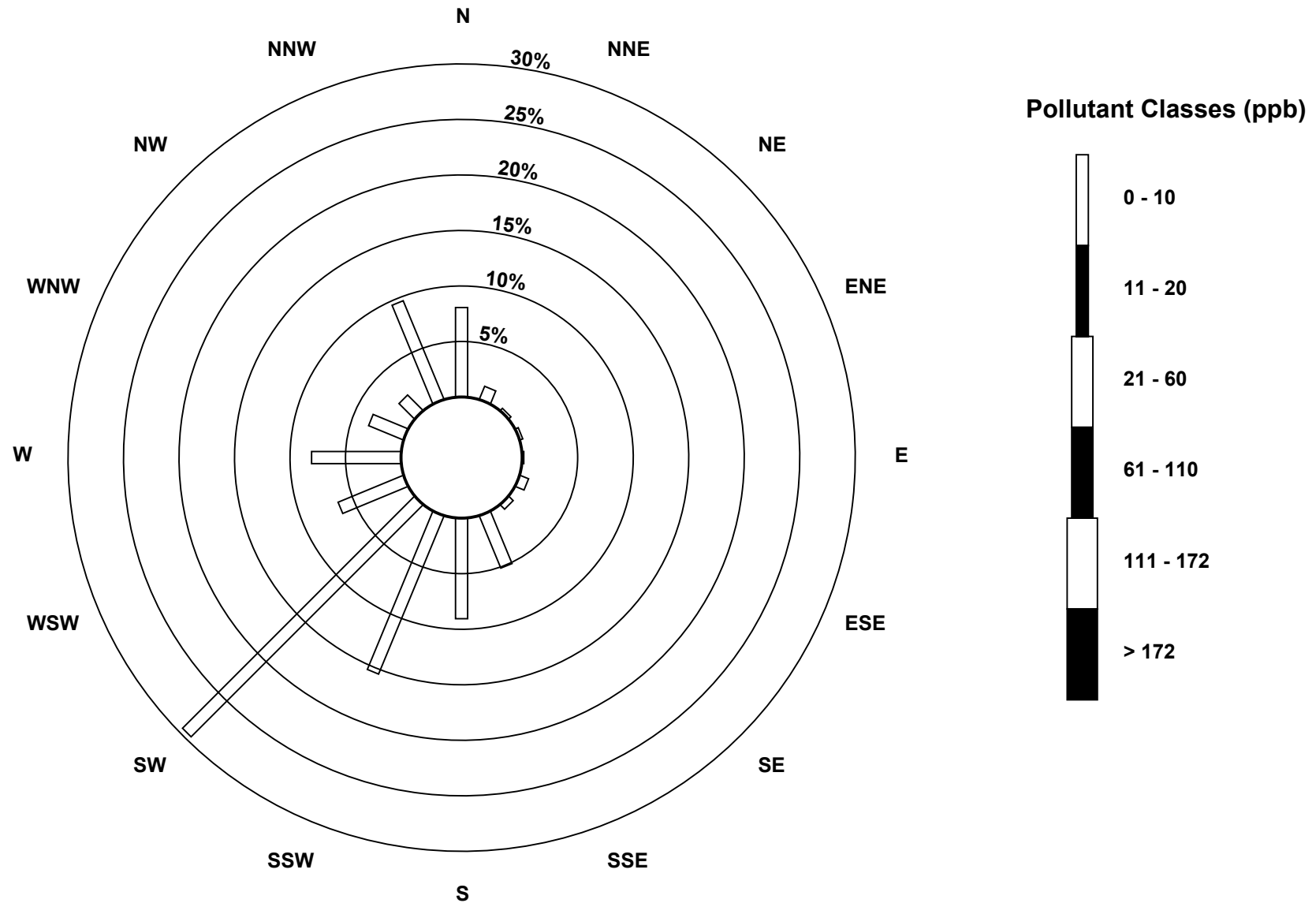
## Hourly Maximums

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Smoky Heights - December 2016**



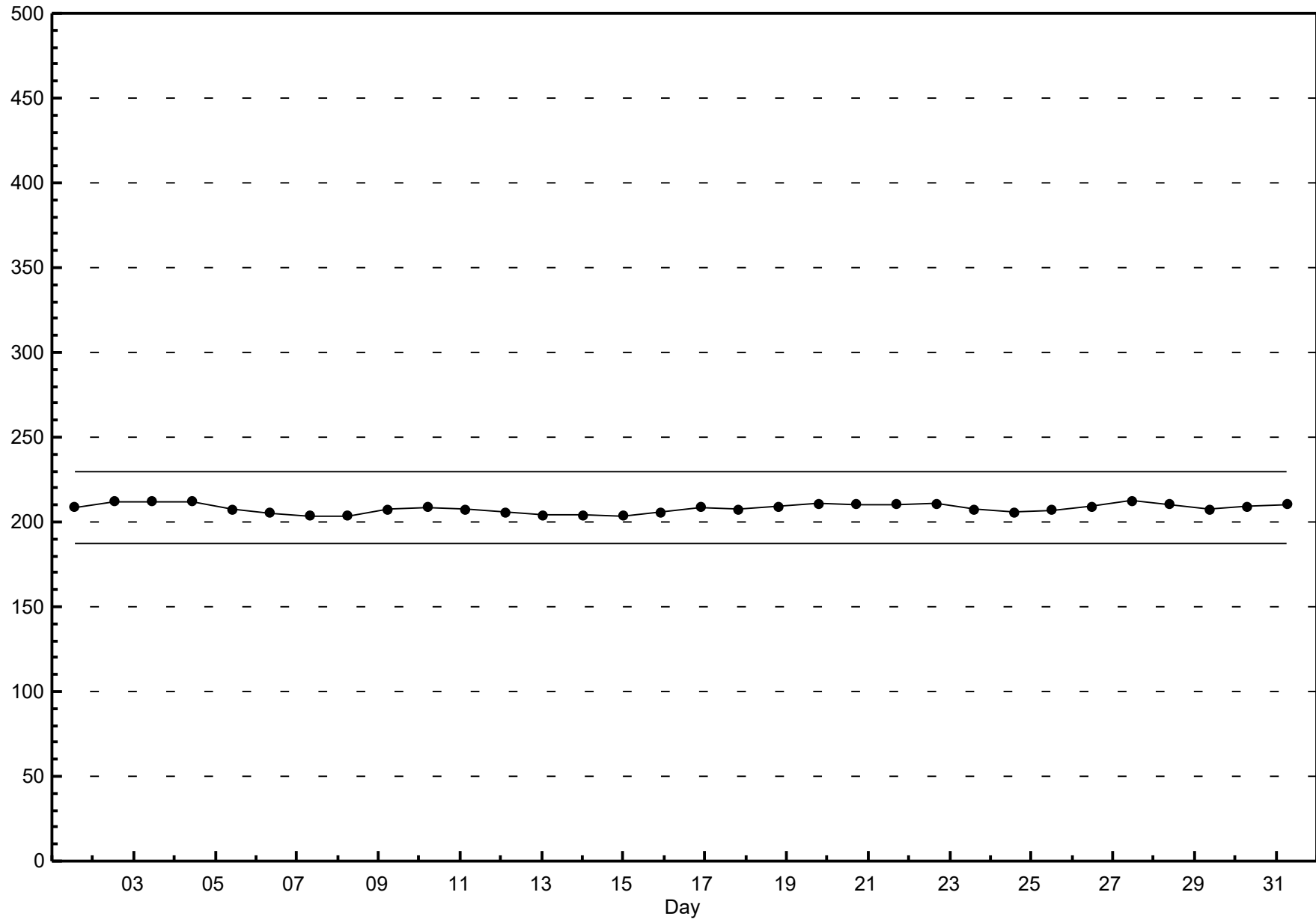
# Pollutant Rose

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Smoky Heights - December 2016



## Span Responses

Sulphur Dioxide (SO<sub>2</sub>)  
Smoky Heights - December 2016



# Hourly Averages

Total Reduced Sulphur (TRS) - ppb

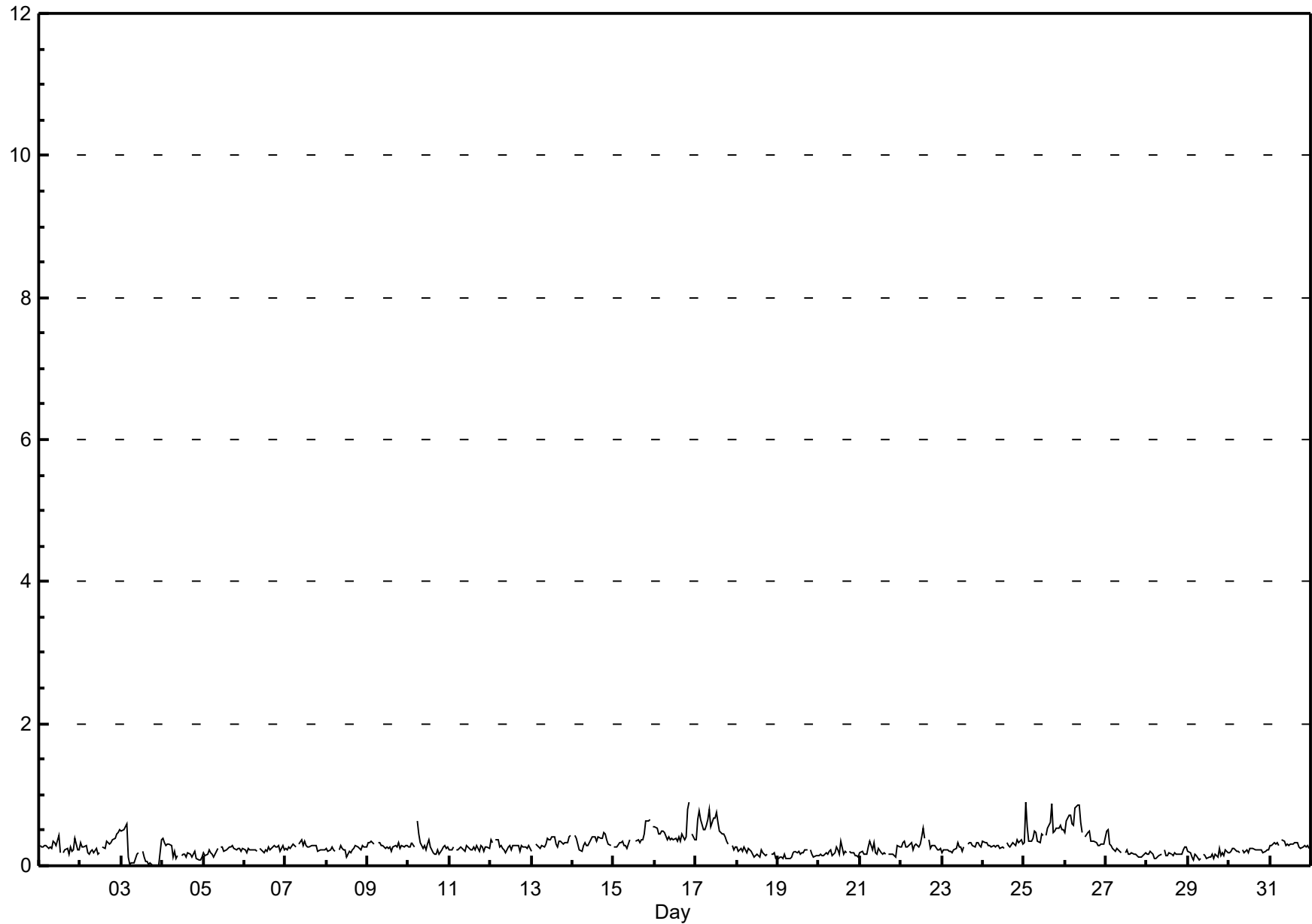
Smoky Heights - December 2016

| Maximum Value: 0.9 ppb on Dec 16 21:00                                                              |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 0.5 ppb on Dec 17                                                                                                                   |    |    |    |    |                               |               |  |  |  | Hours in Service: 744     |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-------------------------------|---------------|--|--|--|---------------------------|--|--|--|--|--|--|--|--|--|
| Minimum Value: 0 ppb on Dec 3 19:00                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.1 ppb on Dec 29                                                                                                                   |    |    |    |    |                               |               |  |  |  | Hours of Data: 709        |  |  |  |  |  |  |  |  |  |
| Maximum Diurnal Average: 0.3 ppb at hour 2                                                          |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.3 ppb at hour 16                                                                                                                |    |    |    |    |                               |               |  |  |  | Hours of Missing Data: 35 |  |  |  |  |  |  |  |  |  |
| Monthly Average: 0.28 ppb                                                                           |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.4 P <sub>99</sub> = 0.8 |    |    |    |    |                               |               |  |  |  | Hours of Calibration: 35  |  |  |  |  |  |  |  |  |  |
|                                                                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 100.0                                                                                                                            |    |    |    |    |                               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| Day                                                                                                 | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Daily Average                 | Daily Maximum |  |  |  |                           |  |  |  |  |  |  |  |  |  |
|                                                                                                     | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24 |                               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 1-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 2-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 1  | 0.3                           | 0.5           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 3-Dec                                                                                               | 0                             | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.6           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 4-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 5-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 6-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 7-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 8-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 9-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 10-Dec                                                                                              | 0                             | 0 | 0 | 0 | A | 1 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.6           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 11-Dec                                                                                              | 0                             | 0 | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 12-Dec                                                                                              | 0                             | 0 | A | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 13-Dec                                                                                              | 0                             | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 14-Dec                                                                                              | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | A  | 0.3                           | 0.5           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 15-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | C  | C  | C  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                                          | 1  | 1  | A  | 1  | 0.4                           | 0.6           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 16-Dec                                                                                              | 1                             | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                                          | 1  | A  | 0  | 0  | 0.5                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 17-Dec                                                                                              | 0                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | A  | 0  | 0  | 0  | 0.5                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 18-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 19-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.2           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 20-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 21-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 22-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 1  | 0  | A  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.5           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 23-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 24-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 25-Dec                                                                                              | 0                             | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 1  | 1  | 1  | 0  | 0  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.5                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 26-Dec                                                                                              | 0                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.5                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 27-Dec                                                                                              | 0                             | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.5           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 28-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 29-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.1                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 30-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.2                           | 0.3           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 31-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0  | 0.3                           | 0.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Average               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 0.6 0.9 0.8 0.7 0.6 0.6 0.8 0.9 0.9 0.6 0.7 0.7 0.7 0.6 0.5 0.6 0.9 0.5 0.5 0.8 0.9 0.6 0.5 0.6     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Maximum               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| C - Calibration                                                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | A - Automated Daily Zero Span |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |



## Hourly Averages

Total Reduced Sulphur (TRS) - ppb  
Smoky Heights - December 2016



# Hourly Maximums

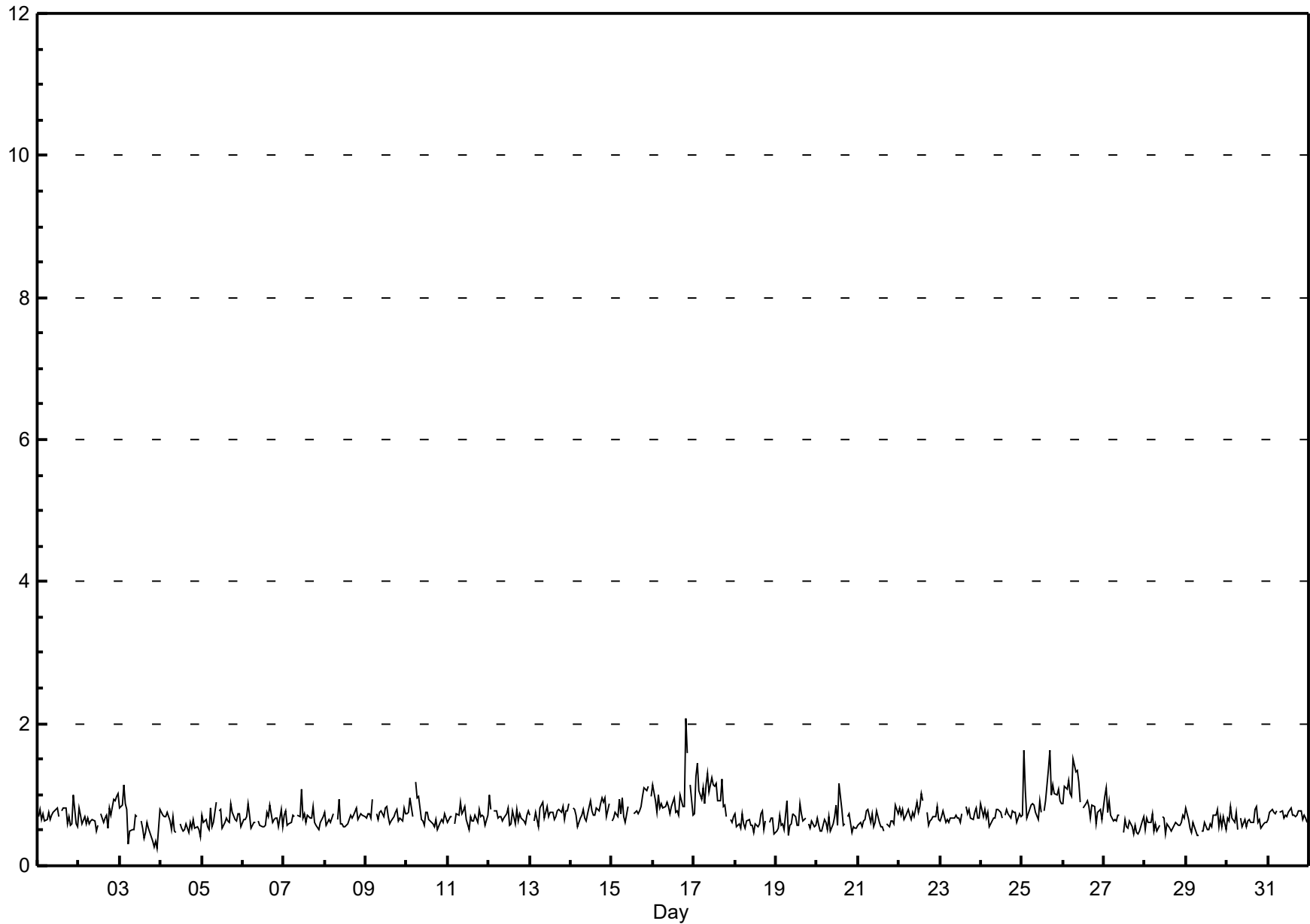
Total Reduced Sulphur (TRS) - ppb

Smoky Heights - December 2016

| Maximum Value: 2.1 ppb on Dec 16 20:00                                                          |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 1.0 ppb on Dec 17                                                                                                                   |    |    |    |    |                               |               |  |  |  | Hours in Service: 744     |  |  |  |  |  |  |  |  |  |
|-------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-------------------------------|---------------|--|--|--|---------------------------|--|--|--|--|--|--|--|--|--|
| Minimum Value: 0 ppb on Dec 3 23:00                                                             |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.6 ppb on Dec 3                                                                                                                    |    |    |    |    |                               |               |  |  |  | Hours of Data: 709        |  |  |  |  |  |  |  |  |  |
| Maximum Diurnal Average: 0.8 ppb at hour 2                                                      |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.7 ppb at hour 13                                                                                                                |    |    |    |    |                               |               |  |  |  | Hours of Missing Data: 35 |  |  |  |  |  |  |  |  |  |
| Monthly Average: 0.71 ppb                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.7 Q <sub>3</sub> = 0.8 P <sub>90</sub> = 0.9 P <sub>99</sub> = 1.3 |    |    |    |    |                               |               |  |  |  | Hours of Calibration: 35  |  |  |  |  |  |  |  |  |  |
|                                                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 100.0                                                                                                                            |    |    |    |    |                               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| Day                                                                                             | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Daily Average                 | Daily Maximum |  |  |  |                           |  |  |  |  |  |  |  |  |  |
|                                                                                                 | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24 |                               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 1-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 1.0           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 2-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 0  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 1.0           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 3-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1  | 1  | A  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 1  | 0.6                           | 1.1           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 4-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0  | A  | 1  | 1  | 0  | 1  | 1  | 0  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 0  | 0.6                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 5-Dec                                                                                           | 1                             | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 6-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 7-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | A | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 1.1           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 8-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 9-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | A | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 10-Dec                                                                                          | 1                             | 1 | 1 | 1 | A | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 1.2           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 11-Dec                                                                                          | 1                             | 1 | 1 | A | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 12-Dec                                                                                          | 1                             | 1 | A | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 1.0           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 13-Dec                                                                                          | 1                             | A | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 14-Dec                                                                                          | A                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | A  | 0.8                           | 1.0           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 15-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | C  | C  | C  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | A  | 1  | 0.8                           | 1.1           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 16-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2                                                                                                                                                          | 2  | A  | 1  | 1  | 0.9                           | 2.1           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 17-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | A  | 1  | 1  | 1  | 1.0                           | 1.4           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 18-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | A  | 1  | 1  | 0  | 0.6                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 19-Dec                                                                                          | 0                             | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 20-Dec                                                                                          | 1                             | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | 1  | 0.6                           | 1.2           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 21-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 0  | A  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 22-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 1.0           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 23-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 24-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.9           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 25-Dec                                                                                          | 1                             | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | A  | 1  | 1  | 1  | 2  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1.0                           | 1.6           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 26-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1.0                           | 1.5           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 27-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | A  | 0  | 1  | 1  | 1  | 1  | 0  | 1  | 0                                                                                                                                                          | 0  | 0  | 1  | 1  | 0.6                           | 1.1           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 28-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | A  | 1  | 1  | 0  | 1  | 1  | 0  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                           | 0.7           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 29-Dec                                                                                          | 1                             | 1 | 1 | 0 | 1 | 1 | 0 | 0 | A | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 30-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | A | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.6                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 31-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0.7                           | 0.8           |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 0.7 0.8 0.8 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Average               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| 1.1 1.6 1.4 1.2 1.0 1.2 1.5 1.3 1.3 1.2 1.2 1.1 1.1 1.2 0.9 1.4 1.6 1.0 1.1 2.1 1.6 1.1 1.1 1.0 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Maximum               |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |
| C - Calibration                                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | A - Automated Daily Zero Span |               |  |  |  |                           |  |  |  |  |  |  |  |  |  |

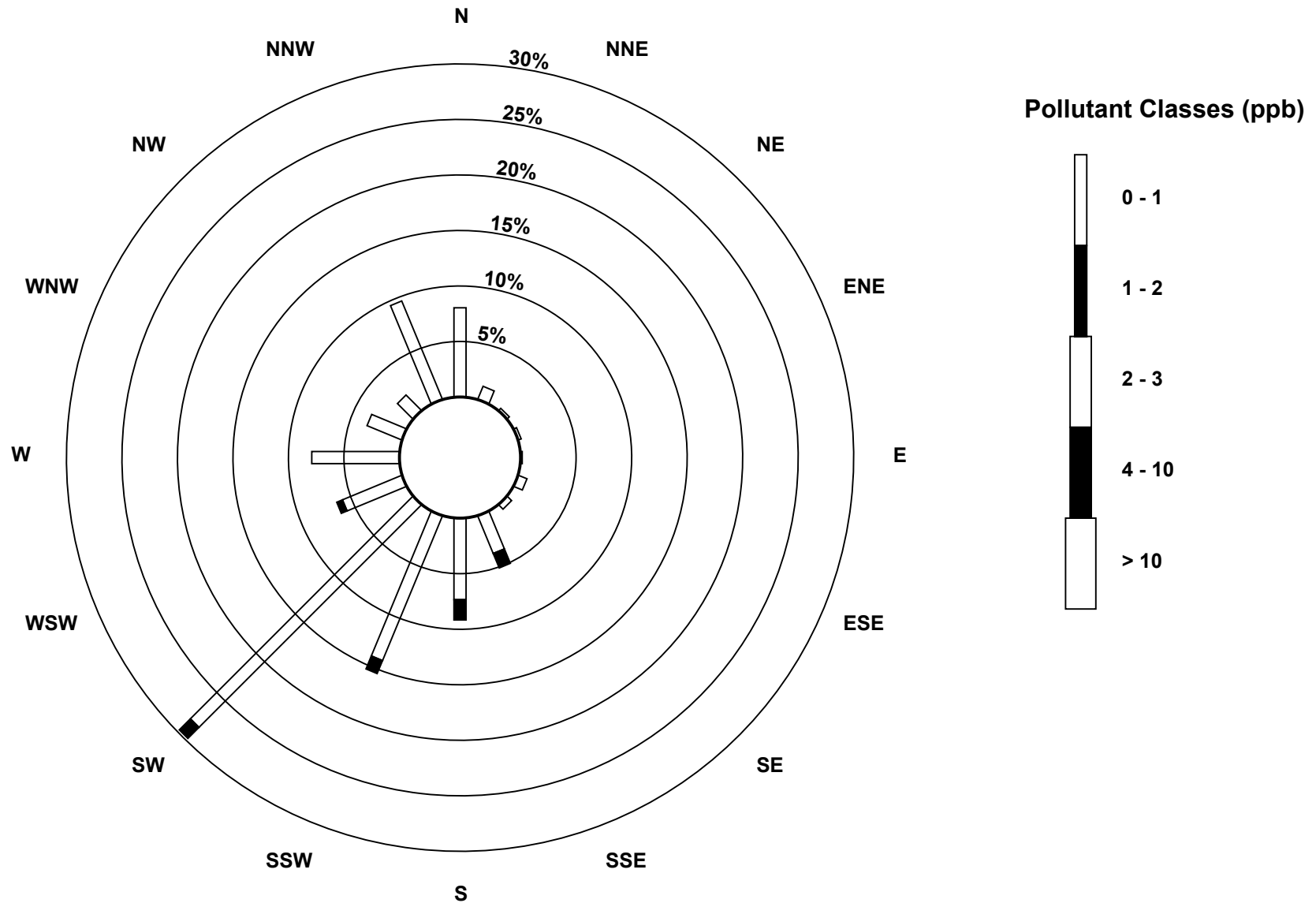
## Hourly Maximums

Total Reduced Sulphur (TRS) - ppb  
Smoky Heights - December 2016



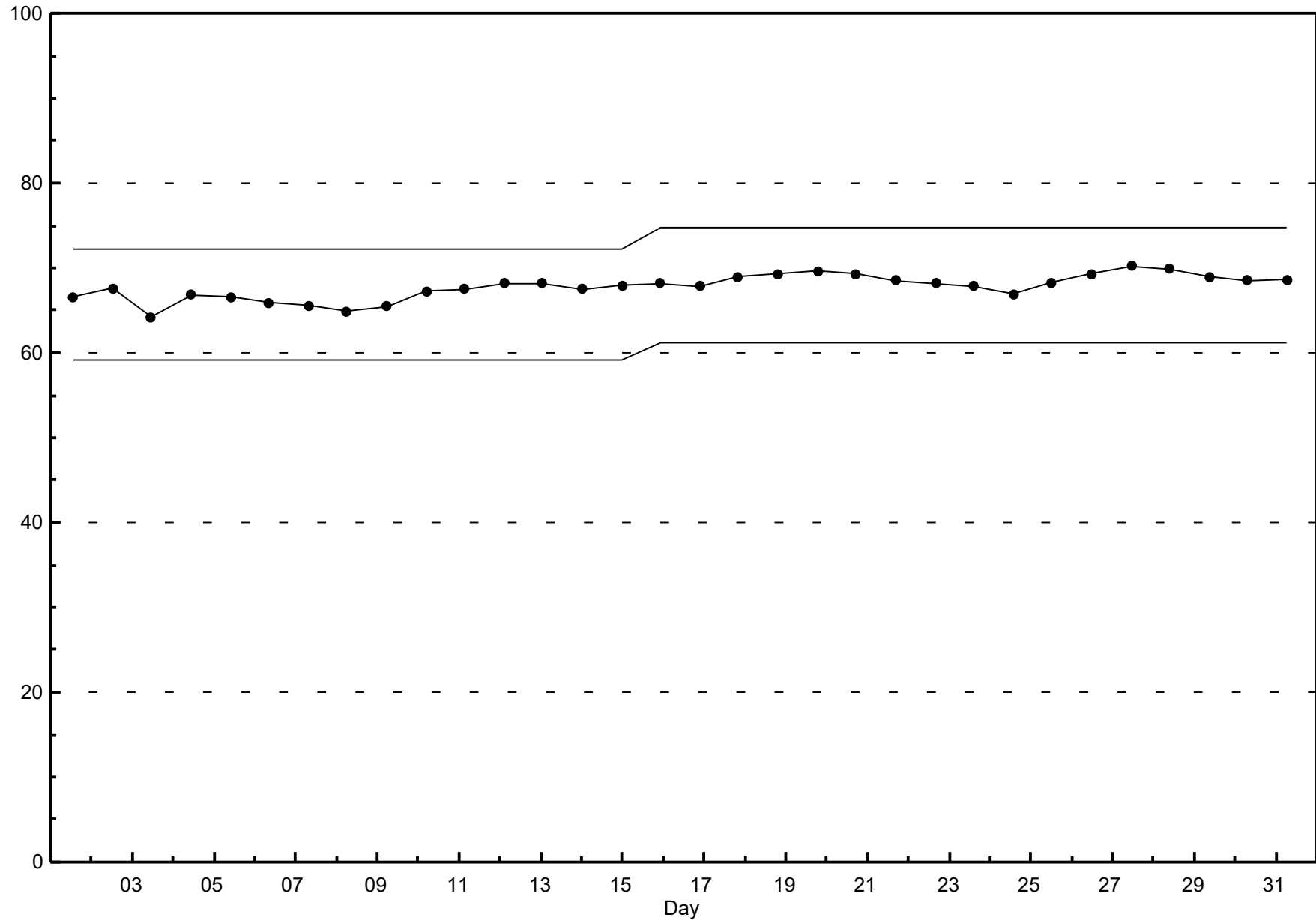
# Pollutant Rose

Total Reduced Sulphur (TRS) - ppb  
Smoky Heights - December 2016



## Span Responses

**Total Reduced Sulphur (TRS)**  
**Smoky Heights - December 2016**



# Hourly Averages

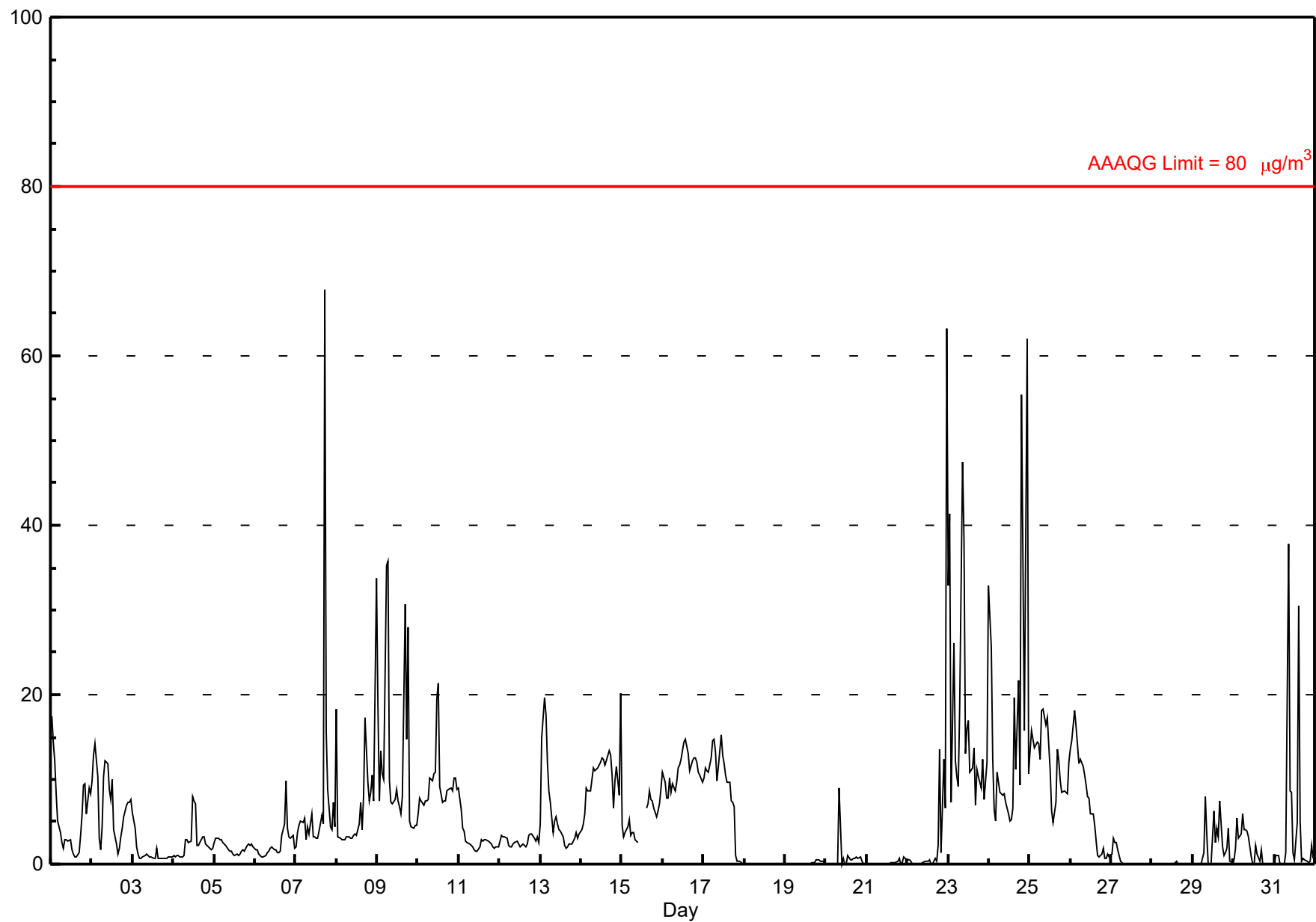
Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Smoky Heights - December 2016

| Number of Exceedences: 1-hr: 0 24-hr: 0<br>Maximum Value: 67.8 µg/m³ on Dec 7 18:00<br>Maximum Daily Average: 16.9 µg/m³ on Dec 23                                                                                                                                                                                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 740<br>Hours of Missing Data: 4<br>Hours of Calibration: 4<br>Percent Operational Time: 100.0 |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 0 µg/m³ on Dec 18 01:00<br>Maximum Diurnal Average: 7.3 µg/m³ at hour 9<br>Monthly Average: 5.54 µg/m³<br>Minimum Daily Average: 0.0 µg/m³ on Dec 18<br>Minimum Diurnal Average: 4.2 µg/m³ at hour 14<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.6 Median = 3.0 Q <sub>3</sub> = 8.4 P <sub>90</sub> = 12.6 P <sub>99</sub> = 35.4 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                       |               |               |
| Day                                                                                                                                                                                                                                                                                                                                                                                  | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                       | Daily Average | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                                                      | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                                                                                                                                    |               |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                                                | 17                            | 14 | 12 | 8  | 5  | 4  | 3  | 2  | 3  | 3  | 3  | 3  | 2  | 1  | 1  | 1  | 1  | 3  | 6  | 9  | 10 | 6  | 9  | 8                                                                                                                                     | 5.6           | 17.5          |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                                                | 10                            | 13 | 14 | 10 | 3  | 2  | 4  | 10 | 12 | 12 | 9  | 8  | 10 | 4  | 2  | 1  | 2  | 3  | 4  | 6  | 7  | 7  | 7  | 8                                                                                                                                     | 7.0           | 14.2          |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                                                | 6                             | 4  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                     | 1.3           | 6.1           |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                                                | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 3  | 3  | 3  | 3  | 8  | 7  | 7  | 2  | 2  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 2                                                                                                                                     | 2.6           | 8.0           |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 3  | 3  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 2  | 2  | 2  | 2  | 2                                                                                                                                     | 2.0           | 3.1           |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 3  | 5  | 10 | 4  | 3  | 3  | 3  | 2                                                                                                                                     | 2.3           | 9.8           |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                                                | 2                             | 4  | 4  | 5  | 5  | 5  | 3  | 4  | 3  | 6  | 3  | 3  | 3  | 3  | 4  | 6  | 5  | 68 | 16 | 9  | 4  | 4  | 7  | 4                                                                                                                                     | 7.6           | 67.8          |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                                                | 18                            | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 3  | 5  | 7  | 4  | 8  | 17 | 10 | 7  | 8  | 11 | 8  | 34                                                                                                                                    | 7.3           | 33.7          |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                                                | 19                            | 7  | 13 | 11 | 10 | 35 | 36 | 10 | 7  | 7  | 8  | 9  | 7  | 7  | 6  | 8  | 31 | 15 | 28 | 5  | 4  | 4  | 5  | 5                                                                                                                                     | 12.3          | 35.7          |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                                               | 6                             | 8  | 7  | 7  | 7  | 7  | 8  | 10 | 10 | 11 | 11 | 20 | 21 | 9  | 7  | 7  | 7  | 9  | 9  | 9  | 9  | 10 | 10 | 9                                                                                                                                     | 9.5           | 21.3          |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                                               | 9                             | 6  | 4  | 4  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 3  | 3  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                     | 2.9           | 8.9           |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                                               | 3                             | 3  | 3  | 3  | 3  | 2  | 2  | 2  | 2  | 3  | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 3  | 4  | 3  | 3  | 3  | 3  | 3                                                                                                                                     | 2.7           | 3.6           |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                                               | 5                             | 15 | 20 | 18 | 12 | 9  | 7  | 4  | 5  | 6  | 5  | 4  | 4  | 3  | 2  | 2  | 2  | 2  | 2  | 3  | 3  | 4  | 3  | 3                                                                                                                                     | 5.9           | 19.7          |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                                               | 4                             | 5  | 6  | 9  | 9  | 9  | 10 | 11 | 11 | 11 | 11 | 12 | 13 | 12 | 12 | 12 | 13 | 13 | 10 | 7  | 10 | 12 | 8  | 20                                                                                                                                    | 10.4          | 20.2          |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                                               | 5                             | 3  | 4  | 4  | 5  | 3  | 4  | 4  | 3  | 3  | C  | C  | C  | C  | 7  | 7  | 9  | 8  | 8  | 7  | 6  | 6  | 7  | 9                                                                                                                                     | 5.5           | 8.8           |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                                               | 11                            | 10 | 8  | 8  | 10 | 8  | 9  | 9  | 10 | 11 | 12 | 12 | 14 | 15 | 14 | 13 | 11 | 12 | 13 | 13 | 12 | 11 | 10 | 10                                                                                                                                    | 11.1          | 14.7          |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                                               | 10                            | 11 | 11 | 11 | 12 | 15 | 15 | 13 | 10 | 11 | 15 | 13 | 12 | 11 | 10 | 10 | 8  | 7  | 7  | 1  | 0  | 0  | 0  | 0                                                                                                                                     | 8.9           | 15.3          |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                     | 0.0           | 0.0           |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 1  | 0  | 0  | 0                                                                                                                                     | 0.1           | 0.5           |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 9  | 0  | 1  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0                                                                                                                                     | 0.7           | 9.0           |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 1  | 0                                                                                                                                     | 0.1           | 0.8           |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 2  | 14 | 1  | 12 | 7  | 63                                                                                                                                    | 4.3           | 63.3          |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                                               | 33                            | 41 | 7  | 26 | 12 | 10 | 9  | 19 | 48 | 38 | 13 | 16 | 17 | 11 | 11 | 14 | 7  | 11 | 10 | 9  | 12 | 8  | 10 | 12                                                                                                                                    | 16.9          | 47.5          |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                                               | 33                            | 26 | 12 | 7  | 5  | 11 | 8  | 8  | 8  | 8  | 7  | 6  | 5  | 5  | 7  | 20 | 11 | 22 | 9  | 56 | 36 | 16 | 62 | 11                                                                                                                                    | 16.6          | 62.1          |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                                               | 13                            | 16 | 15 | 14 | 14 | 14 | 12 | 18 | 18 | 16 | 17 | 14 | 11 | 6  | 5  | 7  | 14 | 12 | 10 | 8  | 9  | 9  | 8  | 12                                                                                                                                    | 12.2          | 18.2          |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                                               | 14                            | 15 | 18 | 16 | 14 | 12 | 12 | 11 | 10 | 9  | 8  | 8  | 6  | 6  | 5  | 3  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 1                                                                                                                                     | 7.3           | 18.2          |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                                               | 1                             | 3  | 2  | 3  | 2  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                     | 0.5           | 3.1           |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                     | 0.0           | 0.4           |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 0  | 0  | 0  | 0  | 0  | 1  | 8  | 4  | 0  | 0  | 0  | 6  | 3  | 4  | 3  | 7  | 2  | 1  | 1  | 2  | 4  | 0  | 0                                                                                                                                     | 2.0           | 8.0           |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                                               | 1                             | 2  | 5  | 3  | 4  | 6  | 4  | 4  | 4  | 3  | 1  | 0  | 0  | 2  | 1  | 0  | 2  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                     | 1.7           | 5.9           |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                                               | 0                             | 1  | 1  | 0  | 0  | 0  | 0  | 1  | 38 | 9  | 9  | 1  | 0  | 5  | 31 | 5  | 0  | 1  | 0  | 0  | 0  | 0  | 2  | 1                                                                                                                                     | 4.4           | 37.8          |
| 7.2 7.0 5.8 5.7 4.7 5.3 5.1 5.2 7.3 5.8 4.9 4.9 5.0 4.2 4.8 4.3 5.0 7.2 5.5 5.9 4.8 4.5 5.8 7.1                                                                                                                                                                                                                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                       |               |               |
| 33.0 41.3 19.7 26.1 14.4 35.3 35.7 18.7 47.5 38.2 17.2 19.5 21.3 14.7 30.5 19.7 30.7 67.8 27.9 55.5 36.4 15.8 62.1 63.3                                                                                                                                                                                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                       |               |               |
| C - Calibration                                                                                                                                                                                                                                                                                                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                       |               |               |
| Alberta Ambient Air Quality Guideline (AAAQG): 1-hr 80 µg/m³ Alberta Ambient Air Quality Objective (AAAQO): 24-hr 30 µg/m³                                                                                                                                                                                                                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                       |               |               |

## Hourly Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Smoky Heights - December 2016



# Hourly Maximums

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

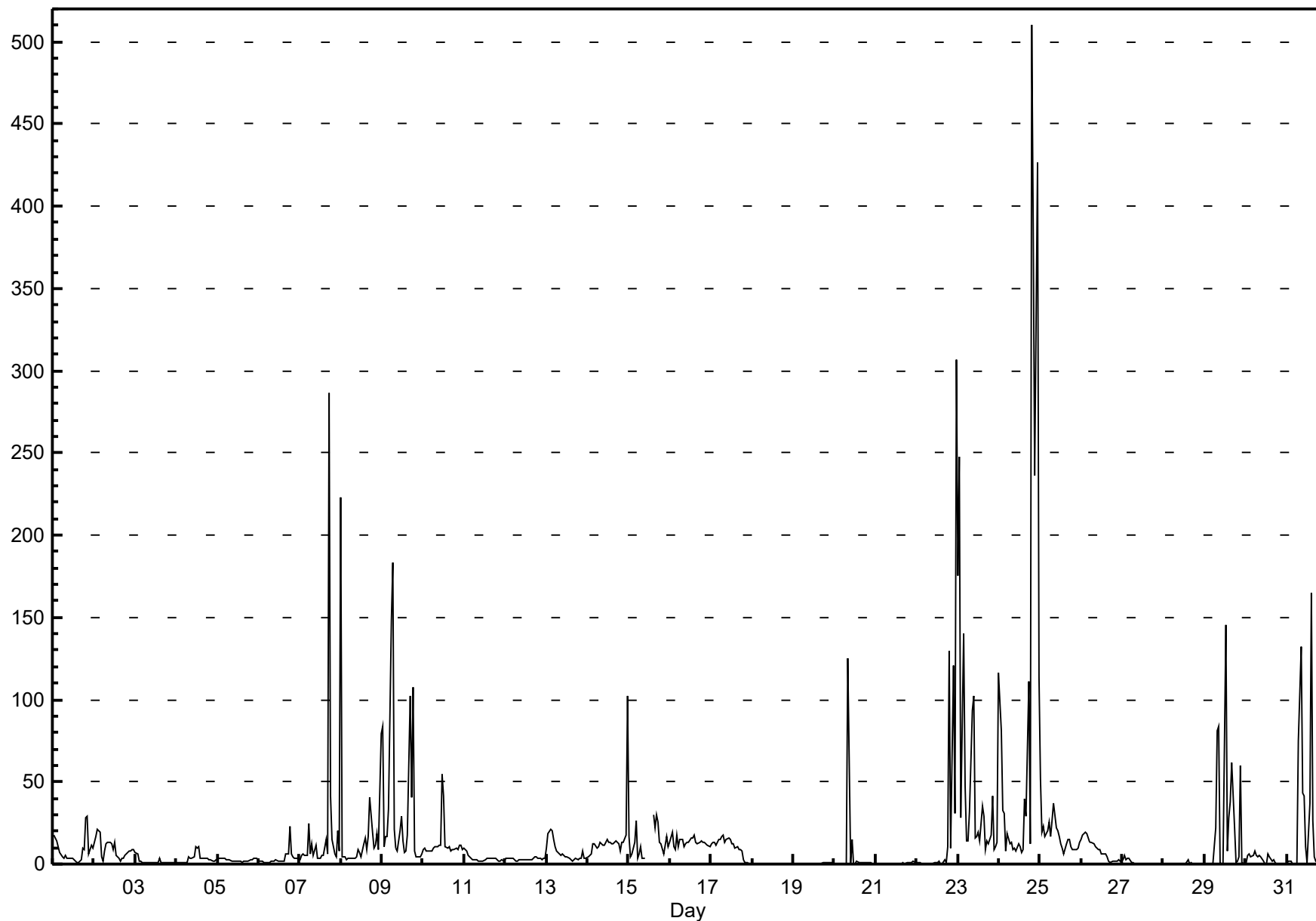
Smoky Heights - December 2016

| Maximum Value: 510.3 μg/m <sup>3</sup> on Dec 24 20:00                                                                                   |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     | Maximum Daily Average: 93.5 μg/m <sup>3</sup> on Dec 24                                                                                                        |     |     |                 |               | Hours in Service: 744           |  |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|----|-----|----|-----|-----|----|-----|-----|----|----|-----|----|-----|----|-----|-----|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------|---------------------------------|--|
| Minimum Value: 0 μg/m <sup>3</sup> on Dec 18 02:00                                                                                       |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     | Minimum Daily Average: 0.0 μg/m <sup>3</sup> on Dec 18                                                                                                         |     |     |                 |               | Hours of Data: 740              |  |
| Maximum Diurnal Average: 26.1 μg/m <sup>3</sup> at hour 20                                                                               |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     | Minimum Diurnal Average: 6.7 μg/m <sup>3</sup> at hour 14                                                                                                      |     |     |                 |               | Hours of Missing Data: 4        |  |
| Monthly Average: 14.19 μg/m <sup>3</sup>                                                                                                 |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.9 Median = 3.9 Q <sub>3</sub> = 12.4 P <sub>90</sub> = 21.8 P <sub>99</sub> = 225.6 |     |     |                 |               | Hours of Calibration: 4         |  |
|                                                                                                                                          |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     |                                                                                                                                                                |     |     |                 |               | Percent Operational Time: 100.0 |  |
| Day                                                                                                                                      | Hourly Period Ending At (MST) |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     |                                                                                                                                                                |     |     |                 | Daily Average | Daily Maximum                   |  |
|                                                                                                                                          | 1                             | 2   | 3  | 4   | 5  | 6   | 7   | 8  | 9   | 10  | 11 | 12 | 13  | 14 | 15  | 16 | 17  | 18  | 19  | 20  | 21                                                                                                                                                             | 22  | 23  | 24              |               |                                 |  |
| 1-Dec                                                                                                                                    | 18                            | 16  | 14 | 10  | 7  | 4   | 3   | 5  | 4   | 3   | 3  | 3  | 3   | 1  | 1   | 1  | 3   | 9   | 9   | 29  | 29                                                                                                                                                             | 7   | 12  | 10              | 8.5           | 29.0                            |  |
| 2-Dec                                                                                                                                    | 13                            | 17  | 21 | 19  | 4  | 2   | 8   | 12 | 13  | 14  | 12 | 9  | 14  | 5  | 3   | 2  | 3   | 4   | 5   | 7   | 8                                                                                                                                                              | 8   | 9   | 9               | 9.3           | 21.5                            |  |
| 3-Dec                                                                                                                                    | 7                             | 6   | 2  | 2   | 1  | 1   | 1   | 1  | 1   | 1   | 1  | 1  | 1   | 1  | 3   | 1  | 1   | 1   | 1   | 1   | 1                                                                                                                                                              | 1   | 1   | 1               | 1.6           | 7.1                             |  |
| 4-Dec                                                                                                                                    | 1                             | 1   | 1  | 1   | 1  | 1   | 1   | 4  | 4   | 4   | 4  | 10 | 9   | 10 | 3   | 3  | 3   | 4   | 4   | 3   | 2                                                                                                                                                              | 2   | 2   | 2               | 3.4           | 10.5                            |  |
| 5-Dec                                                                                                                                    | 3                             | 3   | 4  | 3   | 3  | 3   | 3   | 3  | 2   | 2   | 2  | 1  | 1   | 2  | 1   | 1  | 2   | 2   | 2   | 3   | 3                                                                                                                                                              | 3   | 3   | 3               | 2.5           | 3.6                             |  |
| 6-Dec                                                                                                                                    | 2                             | 2   | 1  | 1   | 1  | 1   | 1   | 2  | 2   | 2   | 3  | 2  | 2   | 2  | 2   | 2  | 6   | 6   | 23  | 6   | 4                                                                                                                                                              | 4   | 4   | 3               | 3.5           | 22.7                            |  |
| 7-Dec                                                                                                                                    | 3                             | 5   | 6  | 6   | 6  | 25  | 6   | 12 | 5   | 12  | 4  | 4  | 3   | 5  | 6   | 15 | 6   | 287 | 42  | 15  | 6                                                                                                                                                              | 5   | 20  | 8               | 21.3          | 286.7                           |  |
| 8-Dec                                                                                                                                    | 223                           | 5   | 4  | 3   | 3  | 3   | 4   | 4  | 4   | 4   | 9  | 7  | 4   | 13 | 16  | 9  | 16  | 41  | 20  | 9   | 11                                                                                                                                                             | 18  | 9   | 80              | 21.6          | 222.7                           |  |
| 9-Dec                                                                                                                                    | 84                            | 11  | 17 | 17  | 34 | 149 | 184 | 21 | 9   | 8   | 20 | 29 | 14  | 7  | 8   | 18 | 102 | 41  | 108 | 8   | 5                                                                                                                                                              | 5   | 5   | 6               | 37.8          | 183.6                           |  |
| 10-Dec                                                                                                                                   | 8                             | 10  | 8  | 8   | 8  | 8   | 10  | 10 | 10  | 11  | 11 | 55 | 42  | 10 | 10  | 11 | 8   | 9   | 9   | 10  | 9                                                                                                                                                              | 11  | 11  | 9               | 12.8          | 54.7                            |  |
| 11-Dec                                                                                                                                   | 9                             | 8   | 5  | 5   | 3  | 3   | 3   | 2  | 2   | 2   | 2  | 2  | 2   | 3  | 3   | 3  | 4   | 3   | 3   | 3   | 2                                                                                                                                                              | 2   | 2   | 2               | 3.3           | 9.5                             |  |
| 12-Dec                                                                                                                                   | 3                             | 4   | 4  | 4   | 3  | 3   | 2   | 2  | 3   | 3   | 3  | 3  | 3   | 3  | 3   | 2  | 3   | 4   | 4   | 4   | 3                                                                                                                                                              | 3   | 4   | 3               | 3.1           | 4.1                             |  |
| 13-Dec                                                                                                                                   | 9                             | 19  | 21 | 20  | 15 | 10  | 8   | 7  | 6   | 6   | 6  | 5  | 4   | 4  | 3   | 2  | 3   | 3   | 3   | 3   | 3                                                                                                                                                              | 8   | 3   | 4               | 7.3           | 21.0                            |  |
| 14-Dec                                                                                                                                   | 5                             | 5   | 6  | 13  | 12 | 9   | 11  | 13 | 12  | 12  | 12 | 15 | 13  | 13 | 13  | 13 | 14  | 14  | 12  | 8   | 14                                                                                                                                                             | 14  | 18  | 102             | 15.5          | 101.8                           |  |
| 15-Dec                                                                                                                                   | 16                            | 4   | 6  | 13  | 26 | 4   | 6   | 10 | 4   | 3   | C  | C  | C   | C  | 30  | 22 | 30  | 26  | 13  | 12  | 6                                                                                                                                                              | 11  | 17  | 10              | 13.5          | 30.2                            |  |
| 16-Dec                                                                                                                                   | 13                            | 19  | 11 | 8   | 18 | 11  | 15  | 15 | 11  | 12  | 13 | 14 | 16  | 16 | 18  | 14 | 12  | 13  | 14  | 13  | 13                                                                                                                                                             | 12  | 11  | 11              | 13.4          | 19.3                            |  |
| 17-Dec                                                                                                                                   | 13                            | 13  | 13 | 12  | 15 | 15  | 17  | 17 | 13  | 15  | 16 | 15 | 12  | 12 | 10  | 10 | 9   | 9   | 8   | 2   | 1                                                                                                                                                              | 1   | 0   | 0               | 10.3          | 17.3                            |  |
| 18-Dec                                                                                                                                   | 0                             | 0   | 0  | 0   | 0  | 0   | 0   | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0  | 0   | 0   | 0   | 0   | 0                                                                                                                                                              | 0   | 0   | 0               | 0.0           | 0.2                             |  |
| 19-Dec                                                                                                                                   | 0                             | 0   | 0  | 0   | 0  | 0   | 0   | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0  | 0   | 0   | 1   | 1   | 1                                                                                                                                                              | 1   | 1   | 0               | 0.2           | 1.0                             |  |
| 20-Dec                                                                                                                                   | 0                             | 0   | 0  | 0   | 0  | 0   | 0   | 0  | 125 | 0   | 15 | 0  | 0   | 2  | 1   | 1  | 1   | 1   | 1   | 1   | 1                                                                                                                                                              | 1   | 0   | 0               | 6.3           | 125.3                           |  |
| 21-Dec                                                                                                                                   | 0                             | 0   | 0  | 0   | 0  | 0   | 0   | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0  | 0   | 0   | 0   | 1   | 1                                                                                                                                                              | 0   | 1   | 1               | 0.3           | 1.4                             |  |
| 22-Dec                                                                                                                                   | 1                             | 1   | 0  | 0   | 0  | 0   | 0   | 0  | 0   | 0   | 1  | 0  | 1   | 2  | 0   | 0  | 2   | 1   | 10  | 129 | 10                                                                                                                                                             | 121 | 31  | 307             | 25.8          | 307.0                           |  |
| 23-Dec                                                                                                                                   | 175                           | 247 | 28 | 140 | 47 | 14  | 14  | 31 | 94  | 102 | 16 | 16 | 19  | 14 | 35  | 29 | 9   | 14  | 12  | 17  | 42                                                                                                                                                             | 9   | 11  | 13              | 47.9          | 247.4                           |  |
| 24-Dec                                                                                                                                   | 116                           | 82  | 33 | 31  | 8  | 19  | 12  | 13 | 9   | 10  | 8  | 12 | 10  | 7  | 9   | 40 | 30  | 111 | 13  | 510 | 387                                                                                                                                                            | 236 | 427 | 114             | 93.5          | 510.3                           |  |
| 25-Dec                                                                                                                                   | 52                            | 19  | 23 | 16  | 21 | 26  | 17  | 27 | 37  | 22  | 20 | 17 | 12  | 10 | 6   | 13 | 15  | 15  | 11  | 9   | 9                                                                                                                                                              | 9   | 10  | 13              | 17.9          | 52.2                            |  |
| 26-Dec                                                                                                                                   | 15                            | 18  | 19 | 18  | 16 | 14  | 13  | 12 | 11  | 10  | 9  | 9  | 7   | 7  | 6   | 4  | 1   | 1   | 2   | 2   | 2                                                                                                                                                              | 2   | 2   | 2               | 8.4           | 19.3                            |  |
| 27-Dec                                                                                                                                   | 3                             | 5   | 3  | 3   | 3  | 1   | 0   | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0  | 0   | 0   | 0   | 0   | 0                                                                                                                                                              | 0   | 0   | 0               | 0.8           | 5.1                             |  |
| 28-Dec                                                                                                                                   | 0                             | 0   | 0  | 0   | 0  | 0   | 0   | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 3   | 0  | 1   | 0   | 0   | 0   | 0                                                                                                                                                              | 0   | 0   | 0               | 0.2           | 2.9                             |  |
| 29-Dec                                                                                                                                   | 0                             | 0   | 0  | 0   | 0  | 0   | 22  | 81 | 83  | 1   | 0  | 0  | 145 | 8  | 28  | 38 | 62  | 22  | 1   | 2   | 5                                                                                                                                                              | 60  | 1   | 0               | 23.3          | 145.3                           |  |
| 30-Dec                                                                                                                                   | 1                             | 5   | 6  | 4   | 5  | 8   | 5   | 5  | 5   | 5   | 2  | 0  | 0   | 7  | 4   | 2  | 3   | 1   | 0   | 0   | 0                                                                                                                                                              | 0   | 0   | 0               | 2.8           | 7.8                             |  |
| 31-Dec                                                                                                                                   | 0                             | 2   | 2  | 0   | 0  | 0   | 0   | 75 | 133 | 43  | 41 | 11 | 1   | 37 | 164 | 27 | 5   | 1   | 1   | 0   | 1                                                                                                                                                              | 6   | 18  | 1               | 23.7          | 164.4                           |  |
| 25.6 17.0 8.4 11.5 8.4 10.8 11.8 12.4 19.4 9.9 7.7 8.0 11.3 6.7 12.5 9.1 11.4 20.7 10.7 26.1 18.6 18.0 20.5 23.1                         |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     |                                                                                                                                                                |     |     | Diurnal Average |               |                                 |  |
| 222.7 247.4 32.7 139.9 47.4 148.5 183.6 80.8 132.6 101.8 41.2 54.7 145.3 36.6 164.4 39.8 102.0 286.7 107.9 510.3 386.5 235.9 426.5 307.0 |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     |                                                                                                                                                                |     |     | Diurnal Maximum |               |                                 |  |
| C - Calibration                                                                                                                          |                               |     |    |     |    |     |     |    |     |     |    |    |     |    |     |    |     |     |     |     |                                                                                                                                                                |     |     |                 |               |                                 |  |



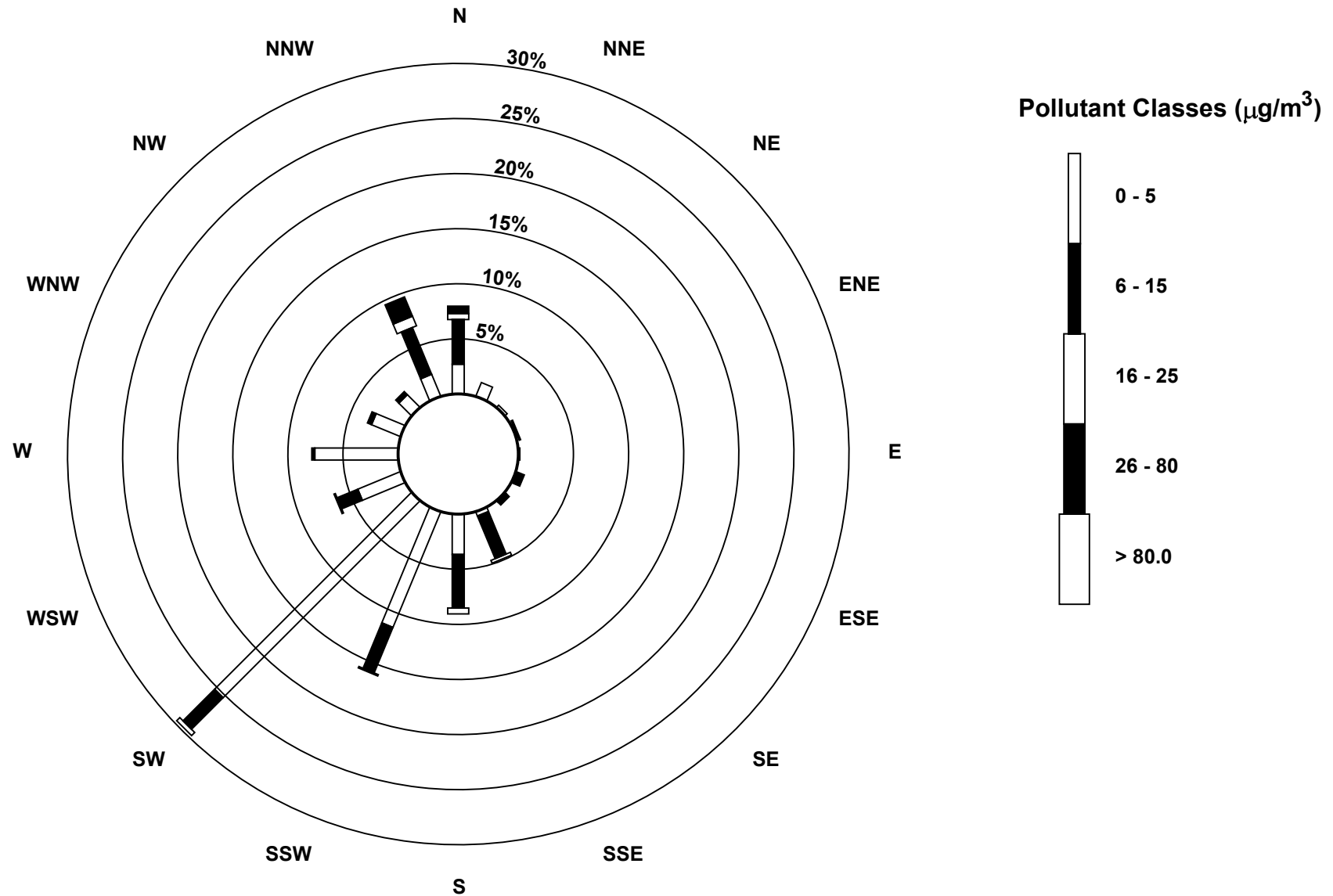
## Hourly Maximums

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Smoky Heights - December 2016



# Pollutant Rose

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>  
Smoky Heights - December 2016



# Hourly Averages

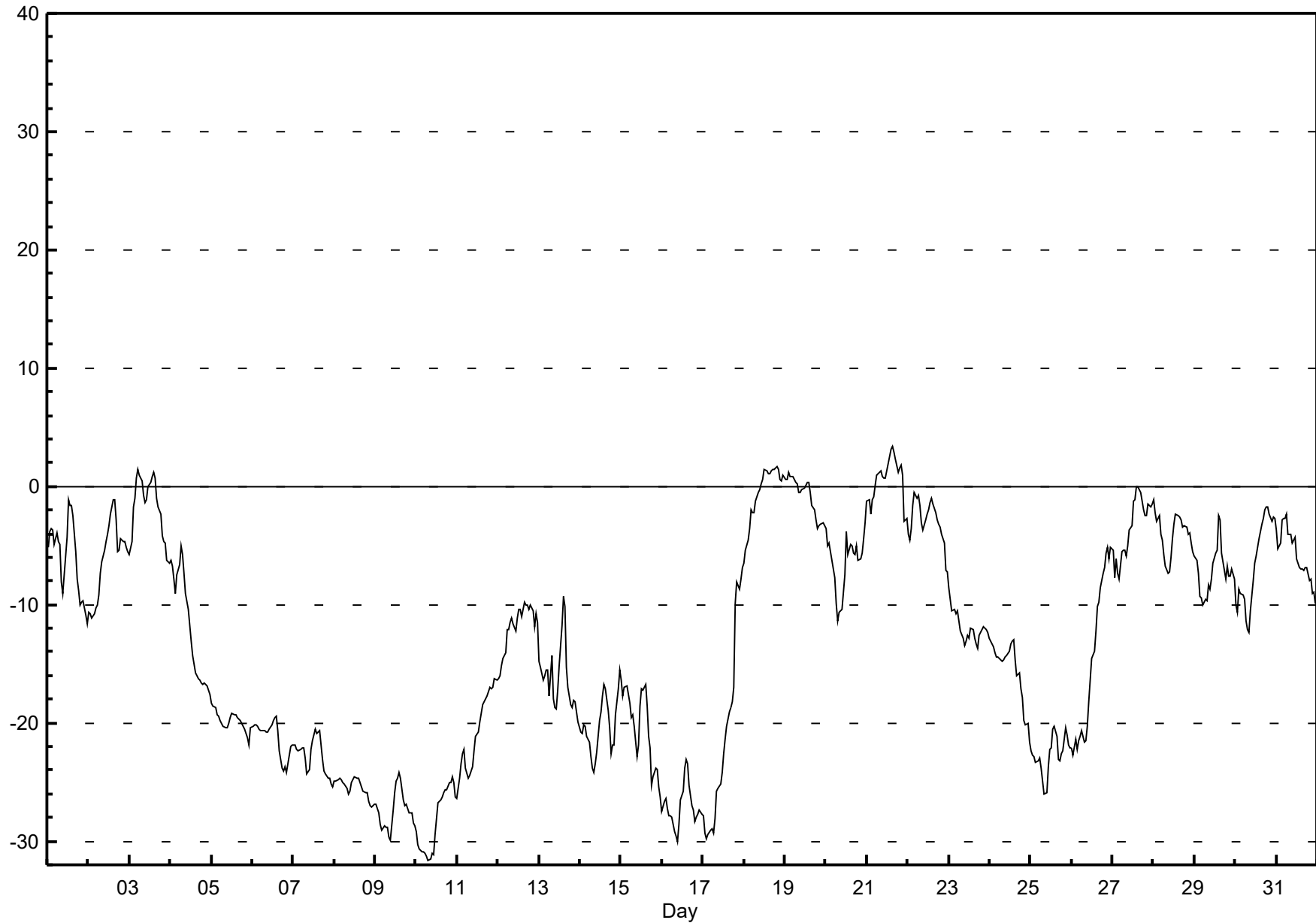
External Temperature (ET) - °C

Smoky Heights - December 2016

| Maximum Value: 3.3 °C on Dec 21 16:00        |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Maximum Daily Average: 0.6 °C on Dec 21                                                                                                                              |       |       |       |       |               |                 |  |  |  | Hours in Service: 744    |  |
|----------------------------------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|---------------|-----------------|--|--|--|--------------------------|--|
| Minimum Value: -32 °C on Dec 10 08:00        |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Minimum Daily Average: -28.3 °C on Dec 10                                                                                                                            |       |       |       |       |               |                 |  |  |  | Hours of Data: 744       |  |
| Maximum Diurnal Average: -11.1 °C at hour 15 |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Minimum Diurnal Average: -14.7 °C at hour 10                                                                                                                         |       |       |       |       |               |                 |  |  |  | Hours of Missing Data: 0 |  |
| Monthly Average: -13.25 °C                   |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Percentiles: P <sub>1</sub> = -30.9 P <sub>10</sub> = -25.9 Q <sub>1</sub> = -21.9 Median = -12.3 Q <sub>3</sub> = -4.7 P <sub>90</sub> = -1.1 P <sub>99</sub> = 1.8 |       |       |       |       |               |                 |  |  |  | Hours of Calibration: 0  |  |
|                                              |                               |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Percent Operational Time: 100.0                                                                                                                                      |       |       |       |       |               |                 |  |  |  |                          |  |
| Day                                          | Hourly Period Ending At (MST) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                                                                                                                                                                      |       |       |       |       | Daily Average | Daily Maximum   |  |  |  |                          |  |
| 1-Dec                                        | -5                            | -4    | -4    | -4    | -5    | -4    | -5    | -5    | -8    | -9    | -7    | -4    | -1    | -2    | -2    | -2    | -6    | -8    | -9    | -10                                                                                                                                                                  | -10   | -10   | -11   | -12   | -6.0          | -1.1            |  |  |  |                          |  |
| 2-Dec                                        | -11                           | -11   | -11   | -11   | -10   | -10   | -9    | -7    | -6    | -5    | -5    | -4    | -3    | -2    | -1    | -1    | -3    | -6    | -5    | -4                                                                                                                                                                   | -5    | -5    | -5    | -6    | -6.1          | -1.1            |  |  |  |                          |  |
| 3-Dec                                        | -6                            | -5    | -2    | -1    | 1     | 1     | 1     | 0     | -1    | -1    | -1    | 0     | 0     | 1     | 1     | 1     | -1    | -2    | -2    | -4                                                                                                                                                                   | -5    | -5    | -6    | -7    | -1.7          | 1.4             |  |  |  |                          |  |
| 4-Dec                                        | -6                            | -7    | -8    | -9    | -7    | -7    | -5    | -6    | -7    | -9    | -10   | -12   | -13   | -14   | -15   | -16   | -16   | -16   | -17   | -17                                                                                                                                                                  | -17   | -17   | -17   | -18   | -11.9         | -5.0            |  |  |  |                          |  |
| 5-Dec                                        | -18                           | -19   | -19   | -19   | -19   | -20   | -20   | -20   | -20   | -20   | -20   | -20   | -19   | -19   | -19   | -20   | -20   | -20   | -20   | -21                                                                                                                                                                  | -21   | -21   | -22   | -20   | -19.9         | -18.3           |  |  |  |                          |  |
| 6-Dec                                        | -20                           | -20   | -20   | -20   | -21   | -21   | -21   | -21   | -21   | -21   | -21   | -20   | -20   | -20   | -19   | -21   | -22   | -24   | -24   | -24                                                                                                                                                                  | -24   | -23   | -22   | -22   | -21.3         | -19.4           |  |  |  |                          |  |
| 7-Dec                                        | -22                           | -22   | -22   | -22   | -22   | -22   | -22   | -23   | -24   | -24   | -22   | -21   | -21   | -21   | -21   | -21   | -22   | -23   | -24   | -24                                                                                                                                                                  | -25   | -25   | -25   | -25   | -22.8         | -20.5           |  |  |  |                          |  |
| 8-Dec                                        | -25                           | -25   | -25   | -25   | -25   | -25   | -25   | -26   | -26   | -26   | -25   | -25   | -25   | -25   | -25   | -25   | -25   | -26   | -26   | -26                                                                                                                                                                  | -27   | -27   | -27   | -27   | -25.5         | -24.5           |  |  |  |                          |  |
| 9-Dec                                        | -27                           | -27   | -28   | -29   | -29   | -29   | -29   | -29   | -30   | -30   | -27   | -26   | -25   | -25   | -24   | -25   | -27   | -27   | -27   | -27                                                                                                                                                                  | -28   | -28   | -28   | -29   | -27.4         | -24.2           |  |  |  |                          |  |
| 10-Dec                                       | -29                           | -30   | -31   | -31   | -31   | -31   | -31   | -32   | -32   | -31   | -31   | -29   | -28   | -27   | -26   | -26   | -26   | -26   | -26   | -25                                                                                                                                                                  | -25   | -25   | -25   | -26   | -28.3         | -24.5           |  |  |  |                          |  |
| 11-Dec                                       | -26                           | -25   | -23   | -23   | -22   | -24   | -25   | -24   | -24   | -24   | -22   | -21   | -21   | -20   | -19   | -18   | -18   | -18   | -17   | -17                                                                                                                                                                  | -17   | -17   | -16   | -16   | -20.8         | -16.2           |  |  |  |                          |  |
| 12-Dec                                       | -16                           | -16   | -15   | -15   | -14   | -12   | -12   | -11   | -11   | -12   | -12   | -11   | -10   | -10   | -11   | -10   | -10   | -10   | -10   | -10                                                                                                                                                                  | -10   | -12   | -11   | -12   | -11.8         | -9.8            |  |  |  |                          |  |
| 13-Dec                                       | -15                           | -15   | -16   | -16   | -16   | -16   | -18   | -14   | -18   | -19   | -19   | -17   | -15   | -12   | -9    | -10   | -15   | -17   | -18   | -19                                                                                                                                                                  | -18   | -18   | -19   | -20   | -16.2         | -9.3            |  |  |  |                          |  |
| 14-Dec                                       | -21                           | -21   | -20   | -20   | -21   | -22   | -23   | -24   | -24   | -23   | -22   | -20   | -19   | -18   | -17   | -17   | -19   | -20   | -23   | -22                                                                                                                                                                  | -22   | -19   | -17   | -16   | -20.4         | -15.6           |  |  |  |                          |  |
| 15-Dec                                       | -16                           | -18   | -17   | -17   | -18   | -18   | -20   | -19   | -20   | -23   | -22   | -19   | -17   | -17   | -17   | -19   | -21   | -22   | -25   | -24                                                                                                                                                                  | -24   | -24   | -25   | -26   | -20.4         | -16.4           |  |  |  |                          |  |
| 16-Dec                                       | -27                           | -27   | -26   | -27   | -28   | -28   | -28   | -29   | -30   | -30   | -29   | -26   | -26   | -24   | -23   | -23   | -25   | -27   | -27   | -28                                                                                                                                                                  | -28   | -28   | -27   | -28   | -27.1         | -23.1           |  |  |  |                          |  |
| 17-Dec                                       | -28                           | -29   | -30   | -29   | -29   | -29   | -29   | -28   | -26   | -26   | -25   | -24   | -23   | -21   | -20   | -19   | -19   | -18   | -17   | -10                                                                                                                                                                  | -8    | -9    | -8    | -7    | -21.3         | -6.9            |  |  |  |                          |  |
| 18-Dec                                       | -7                            | -5    | -5    | -4    | -2    | -2    | -2    | -1    | -1    | 0     | 0     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 2                                                                                                                                                                    | 1     | 1     | 0     | 1     | -0.6          | 1.6             |  |  |  |                          |  |
| 19-Dec                                       | 1                             | 1     | 1     | 1     | 1     | 1     | 0     | 0     | -1    | -1    | 0     | 0     | 0     | 0     | 0     | 0     | -2    | -2    | -3    | -4                                                                                                                                                                   | -3    | -3    | -3    | -3    | -0.8          | 1.2             |  |  |  |                          |  |
| 20-Dec                                       | -4                            | -5    | -5    | -6    | -7    | -8    | -10   | -11   | -11   | -10   | -9    | -7    | -4    | -6    | -5    | -5    | -6    | -6    | -5    | -6                                                                                                                                                                   | -6    | -6    | -4    | -3    | -6.4          | -3.0            |  |  |  |                          |  |
| 21-Dec                                       | -1                            | -1    | -2    | -1    | -1    | 0     | 1     | 1     | 1     | 1     | 1     | 1     | 2     | 3     | 3     | 3     | 3     | 2     | 1     | 2                                                                                                                                                                    | 2     | 1     | -3    | -3    | 0.6           | 3.3             |  |  |  |                          |  |
| 22-Dec                                       | -4                            | -5    | -4    | -2    | -1    | -1    | -1    | -2    | -3    | -4    | -3    | -2    | -2    | -1    | -1    | -1    | -2    | -3    | -3    | -3                                                                                                                                                                   | -4    | -5    | -7    | -7    | -2.9          | -0.5            |  |  |  |                          |  |
| 23-Dec                                       | -9                            | -10   | -10   | -10   | -11   | -10   | -11   | -12   | -13   | -13   | -13   | -13   | -13   | -12   | -12   | -13   | -13   | -14   | -13   | -12                                                                                                                                                                  | -12   | -12   | -12   | -12   | -11.9         | -8.6            |  |  |  |                          |  |
| 24-Dec                                       | -13                           | -13   | -14   | -14   | -14   | -14   | -15   | -15   | -15   | -14   | -14   | -14   | -13   | -13   | -13   | -15   | -16   | -16   | -17   | -18                                                                                                                                                                  | -20   | -20   | -20   | -22   | -15.5         | -12.9           |  |  |  |                          |  |
| 25-Dec                                       | -22                           | -23   | -23   | -23   | -23   | -23   | -24   | -25   | -26   | -26   | -24   | -22   | -22   | -21   | -20   | -21   | -23   | -23   | -23   | -22                                                                                                                                                                  | -20   | -21   | -22   | -22   | -22.7         | -20.3           |  |  |  |                          |  |
| 26-Dec                                       | -22                           | -23   | -21   | -22   | -22   | -21   | -21   | -22   | -21   | -20   | -18   | -16   | -14   | -14   | -12   | -10   | -10   | -9    | -7    | -7                                                                                                                                                                   | -6    | -5    | -6    | -5    | -14.8         | -5.1            |  |  |  |                          |  |
| 27-Dec                                       | -5                            | -8    | -6    | -7    | -8    | -5    | -5    | -5    | -6    | -5    | -4    | -3    | -1    | -1    | 0     | 0     | -1    | -1    | -2    | -2                                                                                                                                                                   | -2    | -2    | -1    | -1    | -3.5          | 0.0             |  |  |  |                          |  |
| 28-Dec                                       | -1                            | -2    | -3    | -2    | -4    | -5    | -6    | -7    | -7    | -7    | -6    | -4    | -3    | -2    | -3    | -3    | -3    | -3    | -3    | -4                                                                                                                                                                   | -4    | -5    | -5    | -5    | -4.0          | -1.1            |  |  |  |                          |  |
| 29-Dec                                       | -6                            | -6    | -7    | -9    | -9    | -10   | -10   | -10   | -8    | -9    | -8    | -7    | -6    | -5    | -3    | -3    | -6    | -7    | -8    | -7                                                                                                                                                                   | -8    | -8    | -7    | -8    | -7.2          | -2.5            |  |  |  |                          |  |
| 30-Dec                                       | -10                           | -11   | -9    | -9    | -9    | -10   | -11   | -12   | -12   | -11   | -8    | -7    | -6    | -5    | -4    | -3    | -3    | -2    | -2    | -2                                                                                                                                                                   | -2    | -3    | -3    | -3    | -6.5          | -1.7            |  |  |  |                          |  |
| 31-Dec                                       | -4                            | -5    | -5    | -3    | -3    | -3    | -2    | -4    | -4    | -5    | -4    | -4    | -6    | -7    | -7    | -7    | -7    | -7    | -7    | -8                                                                                                                                                                   | -8    | -9    | -9    | -10   | -5.7          | -2.3            |  |  |  |                          |  |
|                                              |                               | -13.7 | -14.0 | -13.8 | -13.9 | -13.8 | -13.7 | -14.1 | -14.3 | -14.7 | -14.7 | -13.9 | -12.9 | -12.0 | -11.6 | -11.1 | -11.3 | -12.3 | -12.8 | -13.2                                                                                                                                                                | -13.0 | -13.1 | -13.1 | -13.4 | -13.5         | Diurnal Average |  |  |  |                          |  |
|                                              |                               | 0.6   | 0.6   | 1.2   | 0.9   | 0.8   | 1.4   | 1.0   | 1.1   | 1.3   | 0.9   | 0.7   | 0.7   | 1.9   | 2.6   | 3.2   | 3.3   | 3.0   | 2.3   | 1.5                                                                                                                                                                  | 1.6   | 1.9   | 1.0   | 0.5   | 0.9           | Diurnal Maximum |  |  |  |                          |  |

## Hourly Averages

External Temperature (ET) - °C  
Smoky Heights - December 2016



## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Smoky Heights - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 13                            | 14  | 14  | 10  | 11  | 13  | 10  | 4   | 11  | 7   | 10  | 14  | 10  | 8   | 9   | 9   | 8   | 8   | 8   | 8   | 6   | 8   | 8   | 7   | 9.1           | 14.5          |
| Dir    | 198                           | 226 | 236 | 239 | 230 | 239 | 252 | 261 | 232 | 220 | 222 | 229 | 212 | 218 | 212 | 207 | 206 | 230 | 234 | 222 | 216 | 208 | 179 | 185 | 222.3         | 229.0         |
| 2 Spd  | 8                             | 8   | 9   | 9   | 9   | 9   | 9   | 15  | 11  | 6   | 4   | 4   | 4   | 8   | 10  | 16  | 12  | 10  | 12  | 18  | 14  | 15  | 10  | 11  | 9.4           | 18.1          |
| Dir    | 186                           | 197 | 193 | 206 | 216 | 212 | 180 | 155 | 159 | 178 | 186 | 153 | 190 | 186 | 183 | 195 | 208 | 213 | 203 | 203 | 211 | 209 | 239 | 231 | 197.7         | 203.0         |
| 3 Spd  | 10                            | 13  | 14  | 17  | 20  | 28  | 28  | 28  | 19  | 18  | 16  | 16  | 27  | 25  | 27  | 31  | 24  | 26  | 28  | 22  | 22  | 23  | 19  | 21  | 21.2          | 30.9          |
| Dir    | 175                           | 178 | 182 | 184 | 210 | 213 | 210 | 205 | 209 | 205 | 209 | 210 | 218 | 217 | 216 | 217 | 217 | 220 | 227 | 227 | 229 | 223 | 217 | 220 | 212.7         | 216.5         |
| 4 Spd  | 19                            | 19  | 15  | 13  | 16  | 11  | 12  | 18  | 23  | 21  | 20  | 21  | 24  | 22  | 21  | 23  | 25  | 23  | 26  | 25  | 21  | 19  | 21  | 17  | 17.5          | 26.4          |
| Dir    | 224                           | 216 | 224 | 229 | 217 | 221 | 252 | 296 | 297 | 304 | 308 | 302 | 294 | 290 | 288 | 286 | 285 | 290 | 290 | 283 | 275 | 281 | 281 | 279 | 277.0         | 289.8         |
| 5 Spd  | 17                            | 15  | 19  | 16  | 20  | 20  | 18  | 20  | 14  | 12  | 9   | 11  | 14  | 17  | 17  | 19  | 18  | 16  | 16  | 14  | 14  | 8   | 4   | 10  | 14.9          | 20.5          |
| Dir    | 278                           | 277 | 280 | 278 | 272 | 271 | 283 | 276 | 270 | 257 | 274 | 277 | 272 | 278 | 283 | 277 | 279 | 277 | 273 | 283 | 286 | 266 | 241 | 272 | 275.7         | 276.4         |
| 6 Spd  | 10                            | 8   | 10  | 12  | 12  | 9   | 12  | 14  | 13  | 14  | 12  | 13  | 13  | 10  | 12  | 10  | 7   | 4   | 6   | 4   | 2   | 2   | 3   | 6   | 8.7           | 14.3          |
| Dir    | 270                           | 263 | 268 | 272 | 271 | 269 | 269 | 275 | 272 | 268 | 257 | 263 | 261 | 256 | 267 | 255 | 251 | 233 | 246 | 233 | 218 | 241 | 228 | 186 | 261.2         | 267.7         |
| 7 Spd  | 4                             | 4   | 4   | 4   | 1   | 2   | 5   | 4   | 2   | 1   | 5   | 3   | 3   | 0   | 0   | 3   | 6   | 5   | 5   | 6   | 5   | 7   | 7   | 7   | 2.4           | 7.1           |
| Dir    | 179                           | 192 | 228 | 244 | 192 | 349 | 359 | 349 | 12  | 335 | 20  | 79  | 43  | 29  | 5   | 1   | 0   | 354 | 342 | 350 | 331 | 330 | 330 | 328 | 341.4         | 330.5         |
| 8 Spd  | 9                             | 9   | 8   | 7   | 4   | 5   | 4   | 5   | 4   | 3   | 2   | 3   | 3   | 4   | 5   | 5   | 7   | 8   | 9   | 8   | 7   | 8   | 9   | 9   | 5.8           | 9.3           |
| Dir    | 358                           | 6   | 3   | 10  | 25  | 39  | 15  | 17  | 28  | 1   | 17  | 23  | 0   | 352 | 348 | 354 | 337 | 339 | 335 | 357 | 340 | 345 | 347 | 342 | 356.7         | 341.9         |
| 9 Spd  | 8                             | 9   | 9   | 7   | 7   | 7   | 7   | 6   | 6   | 6   | 7   | 7   | 7   | 7   | 7   | 6   | 9   | 10  | 10  | 11  | 11  | 8   | 3   | 5   | 7.3           | 10.6          |
| Dir    | 340                           | 342 | 344 | 359 | 354 | 346 | 345 | 345 | 351 | 354 | 345 | 355 | 1   | 360 | 356 | 338 | 337 | 344 | 349 | 352 | 360 | 2   | 69  | 17  | 351.3         | 359.7         |
| 10 Spd | 0                             | 3   | 5   | 3   | 4   | 3   | 3   | 4   | 4   | 3   | 3   | 1   | 3   | 3   | 6   | 4   | 4   | 6   | 6   | 5   | 4   | 8   | 12  | 11  | 3.2           | 11.7          |
| Dir    | 351                           | 231 | 231 | 201 | 207 | 231 | 163 | 164 | 207 | 146 | 172 | 64  | 172 | 356 | 330 | 319 | 239 | 226 | 179 | 214 | 231 | 246 | 241 | 222 | 224.0         | 241.4         |
| 11 Spd | 12                            | 12  | 16  | 16  | 15  | 12  | 10  | 18  | 19  | 19  | 20  | 23  | 24  | 26  | 27  | 30  | 28  | 27  | 29  | 31  | 27  | 26  | 29  | 28  | 21.7          | 31.0          |
| Dir    | 213                           | 227 | 226 | 236 | 253 | 228 | 210 | 218 | 216 | 212 | 218 | 225 | 219 | 223 | 229 | 228 | 229 | 226 | 223 | 227 | 222 | 228 | 225 | 224 | 224.6         | 227.1         |
| 12 Spd | 23                            | 21  | 21  | 19  | 14  | 20  | 18  | 18  | 21  | 27  | 29  | 29  | 26  | 19  | 13  | 23  | 23  | 28  | 26  | 29  | 22  | 17  | 24  | 20  | 20.8          | 29.4          |
| Dir    | 224                           | 219 | 222 | 230 | 232 | 280 | 270 | 270 | 276 | 275 | 278 | 276 | 280 | 248 | 240 | 271 | 268 | 265 | 268 | 274 | 265 | 248 | 269 | 261 | 261.1         | 277.5         |
| 13 Spd | 20                            | 16  | 15  | 12  | 17  | 18  | 18  | 18  | 20  | 19  | 18  | 14  | 8   | 7   | 7   | 9   | 6   | 7   | 8   | 9   | 11  | 10  | 8   | 8   | 11.9          | 20.3          |
| Dir    | 215                           | 208 | 218 | 221 | 218 | 229 | 234 | 259 | 239 | 235 | 236 | 237 | 226 | 191 | 225 | 253 | 222 | 194 | 166 | 179 | 219 | 234 | 226 | 204 | 224.5         | 239.4         |
| 14 Spd | 9                             | 9   | 9   | 8   | 7   | 8   | 8   | 7   | 6   | 5   | 6   | 4   | 5   | 3   | 5   | 4   | 4   | 6   | 3   | 2   | 4   | 4   | 4   | 7   | 4.1           | 9.4           |
| Dir    | 199                           | 189 | 185 | 189 | 159 | 160 | 160 | 166 | 152 | 173 | 169 | 150 | 116 | 122 | 149 | 122 | 183 | 248 | 249 | 251 | 143 | 253 | 311 | 336 | 175.6         | 199.4         |
| 15 Spd | 8                             | 3   | 6   | 7   | 8   | 7   | 3   | 5   | 5   | 0   | 8   | 2   | 3   | 2   | 1   | 2   | 1   | 4   | 7   | 11  | 11  | 5   | 10  | 10  | 2.9           | 10.9          |
| Dir    | 326                           | 351 | 335 | 329 | 328 | 319 | 336 | 329 | 298 | 328 | 268 | 275 | 154 | 185 | 245 | 152 | 230 | 227 | 205 | 240 | 247 | 210 | 181 | 189 | 263.6         | 247.2         |
| 16 Spd | 8                             | 11  | 5   | 8   | 9   | 11  | 11  | 7   | 10  | 11  | 8   | 5   | 6   | 5   | 7   | 6   | 5   | 6   | 6   | 7   | 7   | 8   | 11  | 8   | 6.8           | 11.0          |
| Dir    | 196                           | 214 | 192 | 187 | 226 | 188 | 174 | 149 | 176 | 174 | 177 | 121 | 119 | 151 | 161 | 170 | 192 | 184 | 222 | 222 | 220 | 224 | 229 | 210 | 190.0         | 174.3         |
| 17 Spd | 7                             | 7   | 9   | 11  | 10  | 8   | 10  | 12  | 12  | 11  | 9   | 9   | 9   | 10  | 9   | 10  | 7   | 9   | 12  | 24  | 27  | 24  | 23  | 24  | 10.9          | 26.7          |
| Dir    | 199                           | 162 | 162 | 167 | 164 | 161 | 170 | 180 | 184 | 178 | 160 | 157 | 150 | 153 | 150 | 157 | 164 | 155 | 173 | 218 | 224 | 229 | 228 | 227 | 189.7         | 224.1         |
| 18 Spd | 18                            | 18  | 19  | 26  | 35  | 28  | 29  | 35  | 45  | 35  | 37  | 36  | 41  | 36  | 34  | 31  | 31  | 28  | 27  | 28  | 24  | 13  | 15  | 18  | 28.1          | 45.1          |
| Dir    | 211                           | 218 | 227 | 225 | 227 | 219 | 213 | 222 | 228 | 219 | 217 | 219 | 226 | 232 | 230 | 229 | 220 | 222 | 222 | 221 | 218 | 191 | 182 | 178 | 220.2         | 227.6         |
| 19 Spd | 16                            | 19  | 23  | 28  | 32  | 30  | 39  | 42  | 37  | 38  | 41  | 38  | 34  | 30  | 25  | 19  | 17  | 21  | 21  | 22  | 25  | 26  | 26  | 26  | 26.8          | 42.2          |
| Dir    | 175                           | 172 | 179 | 179 | 198 | 204 | 211 | 218 | 217 | 225 | 230 | 232 | 236 | 234 | 227 | 220 | 218 | 226 | 224 | 228 | 222 | 223 | 227 | 226 | 216.9         | 218.1         |
| 20 Spd | 25                            | 20  | 21  | 18  | 12  | 9   | 12  | 8   | 6   | 7   | 8   | 8   | 7   | 9   | 11  | 11  | 14  | 12  | 13  | 12  | 20  | 20  | 29  | 30  | 13.7          | 30.0          |
| Dir    | 224                           | 228 | 223 | 227 | 188 | 194 | 226 | 218 | 203 | 287 | 255 | 221 | 207 | 199 | 201 | 215 | 213 | 211 | 210 | 228 | 210 | 213 | 228 | 225 | 219.2         | 224.5         |
| 21 Spd | 42                            | 31  | 15  | 22  | 25  | 23  | 30  | 36  | 37  | 30  | 24  | 22  | 24  | 25  | 26  | 34  | 32  | 31  | 23  | 24  | 26  | 18  | 13  | 15  | 25.5          | 41.6          |
| Dir    | 225                           | 220 | 191 | 172 | 179 | 201 | 213 | 216 | 215 | 213 | 211 | 198 | 192 | 190 | 204 | 203 | 203 | 201 | 208 | 203 | 200 | 212 | 241 | 219 | 206.0         | 225.3         |
| 22 Spd | 12                            | 14  | 15  | 17  | 16  | 13  | 14  | 9   | 9   | 9   | 9   | 4   | 5   | 3   | 3   | 2   | 2   | 6   | 6   | 6   | 6   | 6   | 5   | 7   | 6.3           | 17.0          |
| Dir    | 201                           | 229 | 228 | 225 | 225 | 214 | 211 | 207 | 216 | 230 | 245 | 197 | 250 | 236 | 278 | 250 | 268 | 283 | 311 | 327 | 322 | 331 | 317 | 344 | 238.7         | 224.7         |



## Hourly Averages

### Wind Speed (km/h)

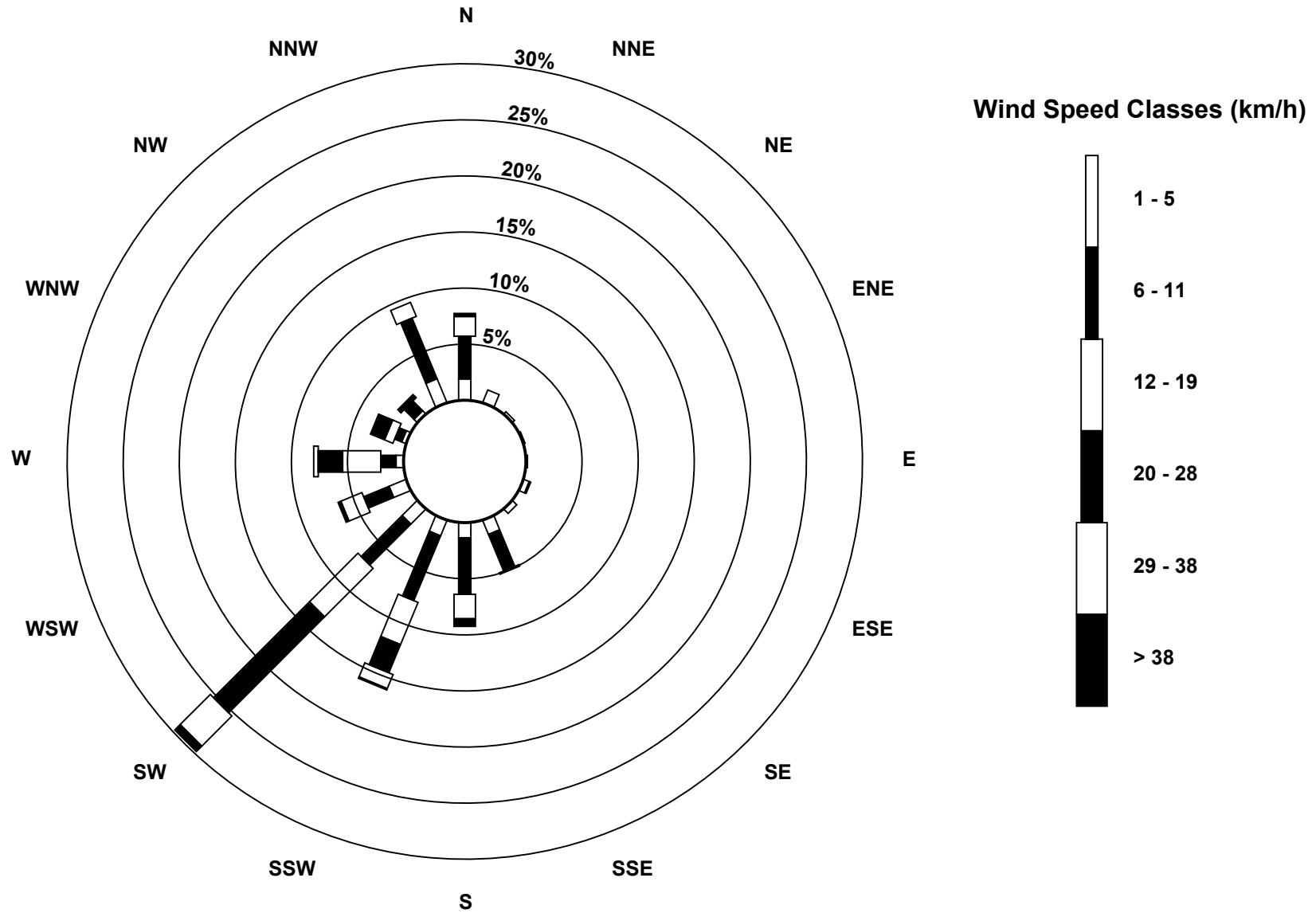
Wind Direction (deg)

## Smoky Heights - December 2016

| Day                                                                                | Hourly Period Ending At (MST) |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       |                                                    |       |       |       |       | Daily Average   | Daily Maximum |  |  |  |                        |  |  |  |     |
|------------------------------------------------------------------------------------|-------------------------------|-------|---------|-------|----------|-------|----------|-------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------------------------------|-------|-------|-------|-------|-----------------|---------------|--|--|--|------------------------|--|--|--|-----|
|                                                                                    | 1                             | 2     | 3       | 4     | 5        | 6     | 7        | 8     | 9        | 10                                                                                                                                                                   | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    | 20                                                 | 21    | 22    | 23    | 24    |                 |               |  |  |  |                        |  |  |  |     |
| 23 Spd                                                                             | 6                             | 6     | 7       | 7     | 7        | 7     | 7        | 9     | 10       | 10                                                                                                                                                                   | 12    | 12    | 12    | 12    | 9     | 11    | 11    | 11    | 13    | 12                                                 | 12    | 12    | 12    | 12    | 10.0            | 13.2          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 345                           | 354   | 348     | 350   | 346      | 345   | 359      | 345   | 345      | 348                                                                                                                                                                  | 360   | 7     | 359   | 359   | 358   | 348   | 357   | 352   | 354   | 355                                                | 354   | 359   | 358   | 353   | 353.9           | 353.7         |  |  |  |                        |  |  |  |     |
| 24 Spd                                                                             | 12                            | 13    | 14      | 15    | 14       | 14    | 14       | 13    | 12       | 10                                                                                                                                                                   | 8     | 7     | 8     | 7     | 7     | 7     | 5     | 4     | 4     | 5                                                  | 4     | 6     | 5     | 3     | 8.7             | 14.9          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 349                           | 344   | 348     | 356   | 355      | 346   | 341      | 334   | 332      | 346                                                                                                                                                                  | 343   | 341   | 354   | 344   | 347   | 346   | 350   | 331   | 329   | 332                                                | 339   | 356   | 348   | 328   | 344.6           | 355.6         |  |  |  |                        |  |  |  |     |
| 25 Spd                                                                             | 2                             | 3     | 4       | 2     | 2        | 0     | 1        | 1     | 4        | 4                                                                                                                                                                    | 3     | 3     | 5     | 6     | 7     | 8     | 6     | 7     | 8     | 10                                                 | 10    | 7     | 9     | 9     | 4.4             | 10.3          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 331                           | 239   | 237     | 201   | 276      | 266   | 118      | 228   | 181      | 162                                                                                                                                                                  | 152   | 143   | 187   | 212   | 227   | 227   | 199   | 193   | 224   | 233                                                | 228   | 209   | 198   | 199   | 211.0           | 227.9         |  |  |  |                        |  |  |  |     |
| 26 Spd                                                                             | 8                             | 9     | 11      | 11    | 10       | 11    | 8        | 8     | 7        | 8                                                                                                                                                                    | 7     | 9     | 10    | 9     | 11    | 11    | 11    | 8     | 8     | 9                                                  | 12    | 12    | 11    | 15    | 9.5             | 14.7          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 174                           | 179   | 179     | 176   | 193      | 178   | 156      | 183   | 181      | 194                                                                                                                                                                  | 182   | 199   | 187   | 206   | 213   | 198   | 202   | 210   | 198   | 198                                                | 179   | 178   | 200   | 187   | 188.8           | 186.6         |  |  |  |                        |  |  |  |     |
| 27 Spd                                                                             | 13                            | 14    | 21      | 14    | 15       | 20    | 21       | 20    | 24       | 23                                                                                                                                                                   | 29    | 25    | 35    | 35    | 37    | 35    | 30    | 24    | 23    | 22                                                 | 23    | 25    | 25    | 27    | 24.0            | 36.5          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 207                           | 201   | 198     | 222   | 204      | 210   | 214      | 212   | 210      | 207                                                                                                                                                                  | 207   | 217   | 216   | 212   | 217   | 221   | 215   | 215   | 214   | 213                                                | 217   | 227   | 224   | 229   | 214.5           | 217.0         |  |  |  |                        |  |  |  |     |
| 28 Spd                                                                             | 26                            | 22    | 23      | 25    | 22       | 23    | 22       | 20    | 21       | 22                                                                                                                                                                   | 22    | 23    | 25    | 27    | 25    | 21    | 20    | 20    | 24    | 24                                                 | 22    | 24    | 21    | 20    | 22.6            | 27.1          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 235                           | 235   | 230     | 232   | 234      | 231   | 232      | 233   | 234      | 235                                                                                                                                                                  | 232   | 227   | 225   | 231   | 231   | 234   | 232   | 222   | 228   | 225                                                | 228   | 230   | 235   | 230   | 230.8           | 230.8         |  |  |  |                        |  |  |  |     |
| 29 Spd                                                                             | 19                            | 15    | 10      | 10    | 11       | 11    | 12       | 5     | 4        | 6                                                                                                                                                                    | 6     | 6     | 4     | 1     | 2     | 2     | 6     | 5     | 8     | 10                                                 | 9     | 11    | 10    | 8     | 5.2             | 19.1          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 234                           | 221   | 159     | 158   | 192      | 229   | 229      | 205   | 224      | 212                                                                                                                                                                  | 243   | 295   | 1     | 329   | 289   | 327   | 10    | 300   | 245   | 250                                                | 254   | 327   | 295   | 297   | 242.1           | 233.5         |  |  |  |                        |  |  |  |     |
| 30 Spd                                                                             | 4                             | 9     | 13      | 19    | 18       | 16    | 12       | 11    | 12       | 18                                                                                                                                                                   | 24    | 23    | 23    | 22    | 24    | 20    | 19    | 24    | 26    | 24                                                 | 22    | 21    | 21    | 18    | 18.0            | 25.8          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 133                           | 206   | 229     | 220   | 218      | 209   | 196      | 192   | 198      | 223                                                                                                                                                                  | 233   | 229   | 216   | 224   | 226   | 216   | 214   | 224   | 234   | 232                                                | 231   | 229   | 242   | 230   | 222.4           | 234.4         |  |  |  |                        |  |  |  |     |
| 31 Spd                                                                             | 15                            | 13    | 7       | 16    | 15       | 14    | 11       | 7     | 4        | 4                                                                                                                                                                    | 4     | 12    | 23    | 22    | 17    | 12    | 11    | 13    | 14    | 8                                                  | 10    | 9     | 7     | 12    | 7.2             | 23.0          |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 204                           | 196   | 212     | 245   | 243      | 244   | 273      | 190   | 340      | 358                                                                                                                                                                  | 335   | 342   | 356   | 354   | 352   | 335   | 326   | 326   | 328   | 314                                                | 319   | 311   | 319   | 291   | 304.8           | 356.2         |  |  |  |                        |  |  |  |     |
| Spd                                                                                | 9.7                           | 9.5   | 9.0     | 9.3   | 10.1     | 9.9   | 9.7      | 9.6   | 10.1     | 9.6                                                                                                                                                                  | 9.9   | 8.9   | 9.0   | 9.1   | 9.6   | 10.2  | 9.4   | 9.8   | 10.2  | 10.9                                               | 10.8  | 9.8   | 10.1  | 10.2  | Diurnal Average |               |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 222.5                         | 220.1 | 220.8   | 220.7 | 223.0    | 226.1 | 226.5    | 228.6 | 230.6    | 231.8                                                                                                                                                                | 234.8 | 236.8 | 234.5 | 232.6 | 233.6 | 234.4 | 235.1 | 236.9 | 238.5 | 238.9                                              | 235.5 | 237.1 | 239.1 | 234.4 | Diurnal Maximum |               |  |  |  |                        |  |  |  |     |
| Spd                                                                                | 41.6                          | 31.1  | 23.2    | 27.8  | 34.9     | 30.0  | 38.6     | 42.2  | 45.1     | 37.8                                                                                                                                                                 | 40.7  | 37.7  | 40.8  | 35.9  | 36.5  | 34.5  | 32.2  | 31.2  | 29.1  | 31.0                                               | 27.1  | 26.4  | 28.7  | 30.0  | Diurnal Maximum |               |  |  |  |                        |  |  |  |     |
| Dir                                                                                | 225.3                         | 220.2 | 229.6   | 178.9 | 226.7    | 204.4 | 211.5    | 218.1 | 227.6    | 225.0                                                                                                                                                                | 230.5 | 232.0 | 226.3 | 232.2 | 217.0 | 221.1 | 202.7 | 201.2 | 223.1 | 227.1                                              | 221.8 | 223.0 | 224.9 | 224.5 |                 |               |  |  |  |                        |  |  |  |     |
| Maximum Speed Value: 45 km/h on Dec 18 09:00                                       |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       | Minimum Speed Value: 0 km/h on Dec 15 10:00        |       |       |       |       |                 |               |  |  |  | Hours in Service:      |  |  |  | 744 |
| Maximum Daily Speed Average: 28.1 km/h on Dec 18                                   |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       | Minimum Daily Speed Average: 2.4 km/h on Dec 7     |       |       |       |       |                 |               |  |  |  | Hours of Data:         |  |  |  | 744 |
| Maximum Diurnal Speed Average: 10.9 km/h at hour 20                                |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       | Minimum Diurnal Speed Average: 8.9 km/h at hour 12 |       |       |       |       |                 |               |  |  |  | Hours of Missing Data: |  |  |  | 0   |
| Monthly Average Velocity: 9.71 km/h 231.48 deg                                     |                               |       |         |       |          |       |          |       |          | Speed Percentiles: P <sub>1</sub> = 0.9 P <sub>10</sub> = 4.0 Q <sub>1</sub> = 6.9 Median = 11.1 Q <sub>3</sub> = 19.9 P <sub>90</sub> = 26.0 P <sub>99</sub> = 37.1 |       |       |       |       |       |       |       |       |       | Percent Operational Time:                          |       |       |       | 100.0 |                 |               |  |  |  |                        |  |  |  |     |
| All monthly, daily, and diurnal averages have been calculated using vector methods |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
|                                                                                    |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| Frequency Distribution                                                             |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| Speed Range (km/h)                                                                 |                               |       |         |       |          |       |          |       |          |                                                                                                                                                                      |       |       |       |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| Direction                                                                          | 0 to 5                        |       | 5 to 11 |       | 11 to 19 |       | 19 to 28 |       | 28 to 38 |                                                                                                                                                                      | > 38  |       | Total |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| North                                                                              | 23                            |       | 58      |       | 22       |       | 2        |       | 0        |                                                                                                                                                                      | 0     |       | 105   |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| NorthEast                                                                          | 7                             |       | 0       |       | 0        |       | 0        |       | 0        |                                                                                                                                                                      | 0     |       | 7     |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| East                                                                               | 2                             |       | 0       |       | 0        |       | 0        |       | 0        |                                                                                                                                                                      | 0     |       | 2     |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| SouthEast                                                                          | 12                            |       | 14      |       | 1        |       | 0        |       | 0        |                                                                                                                                                                      | 0     |       | 27    |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| South                                                                              | 19                            |       | 69      |       | 31       |       | 11       |       | 2        |                                                                                                                                                                      | 0     |       | 132   |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| SouthWest                                                                          | 24                            |       | 63      |       | 78       |       | 109      |       | 41       |                                                                                                                                                                      | 6     |       | 321   |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| West                                                                               | 12                            |       | 19      |       | 38       |       | 22       |       | 4        |                                                                                                                                                                      | 0     |       | 95    |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| NorthWest                                                                          | 13                            |       | 30      |       | 7        |       | 5        |       | 0        |                                                                                                                                                                      | 0     |       | 55    |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |
| Total                                                                              | 112                           |       | 253     |       | 177      |       | 149      |       | 47       |                                                                                                                                                                      | 6     |       | 744   |       |       |       |       |       |       |                                                    |       |       |       |       |                 |               |  |  |  |                        |  |  |  |     |

## Wind Rose

Wind Speed (WS) (km/h)  
Smoky Heights - December 2016



## Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

### Smoky Heights - December 2016

| Maximum Speed: 45 km/h on Dec 18 09:00                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744           |                 |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|-----------------|---------------|
| Maximum Daily Speed Average: 28.7 km/h on Dec 18                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 744              |                 |               |
| Minimum Speed: 1 km/h on Dec 7 15:00                                                                                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 0        |                 |               |
| Maximum Diurnal Speed Average: 14.6 km/h at hour 20                                                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 100.0 |                 |               |
| Monthly Average Speed: 13.76 km/h                                                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |                 |               |
| Minimum Daily Speed Average: 4.4 km/h on Dec 7                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |                 |               |
| Minimum Diurnal Speed Average: 12.8 km/h at hour 2                                                                                                             |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |                 |               |
| Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 4.4 Q <sub>1</sub> = 7.1 Median = 11.3 Q <sub>3</sub> = 20.0 P <sub>90</sub> = 26.2 P <sub>99</sub> = 36.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |                 |               |
| Day                                                                                                                                                            | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 | Daily Average   | Daily Maximum |
| 1-Dec                                                                                                                                                          | 13                            | 14 | 14 | 10 | 12 | 13 | 11 | 6  | 12 | 8  | 10 | 14 | 10 | 8  | 9  | 9  | 8  | 8  | 8  | 8  | 6  | 8  | 8  | 7                               | 9.8             | 14.5          |
| 2-Dec                                                                                                                                                          | 8                             | 8  | 9  | 9  | 9  | 9  | 9  | 15 | 11 | 7  | 5  | 4  | 5  | 8  | 11 | 16 | 14 | 10 | 13 | 18 | 14 | 15 | 11 | 12                              | 10.3            | 18.2          |
| 3-Dec                                                                                                                                                          | 10                            | 14 | 15 | 17 | 20 | 29 | 28 | 28 | 19 | 18 | 16 | 16 | 27 | 25 | 27 | 31 | 24 | 26 | 28 | 22 | 22 | 24 | 20 | 21                              | 21.9            | 30.9          |
| 4-Dec                                                                                                                                                          | 19                            | 19 | 15 | 13 | 16 | 11 | 12 | 18 | 23 | 21 | 20 | 22 | 24 | 22 | 21 | 23 | 25 | 23 | 26 | 25 | 21 | 19 | 21 | 17                              | 20.0            | 26.5          |
| 5-Dec                                                                                                                                                          | 17                            | 15 | 19 | 16 | 20 | 20 | 18 | 21 | 14 | 12 | 9  | 12 | 14 | 18 | 17 | 19 | 18 | 16 | 16 | 14 | 14 | 9  | 5  | 11                              | 15.2            | 20.6          |
| 6-Dec                                                                                                                                                          | 10                            | 8  | 10 | 12 | 12 | 10 | 12 | 14 | 13 | 14 | 12 | 13 | 13 | 10 | 12 | 11 | 7  | 5  | 6  | 4  | 2  | 2  | 3  | 6                               | 9.2             | 14.4          |
| 7-Dec                                                                                                                                                          | 5                             | 5  | 4  | 4  | 3  | 3  | 5  | 5  | 2  | 2  | 5  | 3  | 4  | 1  | 1  | 3  | 6  | 5  | 5  | 6  | 5  | 7  | 7  | 7                               | 4.4             | 7.2           |
| 8-Dec                                                                                                                                                          | 9                             | 9  | 9  | 7  | 4  | 5  | 4  | 5  | 4  | 3  | 2  | 3  | 4  | 4  | 5  | 5  | 7  | 8  | 9  | 9  | 7  | 8  | 9  | 9                               | 6.2             | 9.3           |
| 9-Dec                                                                                                                                                          | 8                             | 9  | 9  | 7  | 7  | 7  | 7  | 6  | 6  | 6  | 7  | 8  | 7  | 7  | 7  | 6  | 9  | 10 | 10 | 11 | 11 | 8  | 3  | 5                               | 7.6             | 10.7          |
| 10-Dec                                                                                                                                                         | 2                             | 3  | 5  | 3  | 4  | 3  | 4  | 5  | 5  | 4  | 4  | 2  | 3  | 4  | 6  | 5  | 5  | 6  | 6  | 6  | 5  | 8  | 12 | 11                              | 5.0             | 11.9          |
| 11-Dec                                                                                                                                                         | 12                            | 13 | 16 | 16 | 15 | 12 | 10 | 18 | 19 | 19 | 20 | 23 | 24 | 26 | 27 | 30 | 28 | 28 | 29 | 31 | 27 | 26 | 29 | 28                              | 21.9            | 31.0          |
| 12-Dec                                                                                                                                                         | 23                            | 21 | 21 | 19 | 14 | 20 | 18 | 18 | 21 | 27 | 30 | 30 | 26 | 19 | 14 | 23 | 23 | 28 | 26 | 29 | 22 | 18 | 24 | 21                              | 22.4            | 29.6          |
| 13-Dec                                                                                                                                                         | 20                            | 16 | 15 | 13 | 18 | 18 | 18 | 19 | 20 | 19 | 18 | 14 | 9  | 7  | 7  | 9  | 7  | 8  | 8  | 9  | 11 | 10 | 8  | 8                               | 12.9            | 20.3          |
| 14-Dec                                                                                                                                                         | 10                            | 9  | 9  | 8  | 7  | 8  | 8  | 7  | 6  | 5  | 7  | 5  | 6  | 5  | 6  | 4  | 4  | 6  | 3  | 3  | 4  | 4  | 4  | 7                               | 6.1             | 9.8           |
| 15-Dec                                                                                                                                                         | 8                             | 5  | 6  | 7  | 8  | 7  | 3  | 6  | 5  | 1  | 8  | 3  | 3  | 3  | 3  | 3  | 2  | 5  | 7  | 11 | 11 | 7  | 10 | 10                              | 5.9             | 10.9          |
| 16-Dec                                                                                                                                                         | 8                             | 11 | 7  | 9  | 9  | 11 | 11 | 7  | 10 | 11 | 8  | 6  | 6  | 5  | 7  | 6  | 6  | 6  | 6  | 7  | 7  | 8  | 11 | 8                               | 8.0             | 11.1          |
| 17-Dec                                                                                                                                                         | 7                             | 7  | 9  | 11 | 10 | 8  | 10 | 12 | 12 | 12 | 9  | 9  | 9  | 10 | 9  | 10 | 7  | 9  | 12 | 24 | 27 | 24 | 24 | 24                              | 12.7            | 26.9          |
| 18-Dec                                                                                                                                                         | 19                            | 18 | 19 | 26 | 35 | 28 | 29 | 36 | 45 | 35 | 37 | 36 | 41 | 36 | 34 | 31 | 31 | 29 | 27 | 28 | 24 | 13 | 15 | 18                              | 28.7            | 45.2          |
| 19-Dec                                                                                                                                                         | 16                            | 19 | 23 | 28 | 32 | 30 | 39 | 42 | 37 | 38 | 41 | 38 | 34 | 30 | 25 | 19 | 17 | 21 | 22 | 22 | 25 | 26 | 26 | 26                              | 28.2            | 42.4          |
| 20-Dec                                                                                                                                                         | 25                            | 20 | 21 | 18 | 12 | 10 | 12 | 8  | 10 | 8  | 9  | 9  | 9  | 10 | 11 | 11 | 14 | 12 | 13 | 12 | 20 | 20 | 29 | 30                              | 14.8            | 30.1          |
| 21-Dec                                                                                                                                                         | 42                            | 31 | 16 | 22 | 25 | 24 | 30 | 37 | 37 | 30 | 24 | 22 | 24 | 25 | 26 | 34 | 32 | 31 | 23 | 24 | 26 | 19 | 13 | 15                              | 26.4            | 41.6          |
| 22-Dec                                                                                                                                                         | 12                            | 14 | 15 | 17 | 16 | 13 | 14 | 9  | 9  | 9  | 9  | 4  | 5  | 3  | 4  | 3  | 2  | 6  | 6  | 6  | 6  | 6  | 6  | 7                               | 8.4             | 17.1          |
| 23-Dec                                                                                                                                                         | 6                             | 6  | 7  | 7  | 7  | 7  | 7  | 9  | 10 | 10 | 12 | 12 | 12 | 12 | 9  | 11 | 11 | 11 | 13 | 12 | 12 | 12 | 12 | 12                              | 10.1            | 13.3          |
| 24-Dec                                                                                                                                                         | 12                            | 13 | 14 | 15 | 14 | 14 | 14 | 13 | 12 | 10 | 8  | 8  | 8  | 7  | 7  | 7  | 6  | 4  | 4  | 5  | 4  | 6  | 5  | 4                               | 8.9             | 15.1          |
| 25-Dec                                                                                                                                                         | 3                             | 4  | 5  | 3  | 3  | 1  | 2  | 1  | 4  | 4  | 4  | 4  | 5  | 6  | 7  | 8  | 6  | 8  | 8  | 10 | 10 | 8  | 9  | 9                               | 5.4             | 10.4          |
| 26-Dec                                                                                                                                                         | 8                             | 10 | 11 | 11 | 10 | 11 | 8  | 8  | 7  | 8  | 7  | 9  | 10 | 10 | 11 | 11 | 12 | 9  | 8  | 9  | 12 | 13 | 12 | 15                              | 10.1            | 14.8          |
| 27-Dec                                                                                                                                                         | 14                            | 14 | 21 | 14 | 15 | 20 | 21 | 20 | 24 | 23 | 30 | 25 | 35 | 35 | 37 | 35 | 30 | 24 | 23 | 22 | 23 | 25 | 25 | 27                              | 24.3            | 36.7          |
| 28-Dec                                                                                                                                                         | 26                            | 22 | 23 | 25 | 22 | 23 | 22 | 20 | 21 | 22 | 22 | 23 | 25 | 27 | 25 | 21 | 20 | 20 | 24 | 24 | 22 | 25 | 21 | 20                              | 22.7            | 27.1          |
| 29-Dec                                                                                                                                                         | 19                            | 15 | 11 | 10 | 11 | 12 | 12 | 6  | 4  | 6  | 7  | 7  | 4  | 4  | 3  | 4  | 6  | 5  | 8  | 10 | 9  | 11 | 10 | 8                               | 8.5             | 19.1          |
| 30-Dec                                                                                                                                                         | 5                             | 10 | 14 | 19 | 18 | 16 | 13 | 11 | 12 | 19 | 24 | 24 | 23 | 22 | 24 | 20 | 19 | 24 | 26 | 24 | 23 | 22 | 21 | 18                              | 18.7            | 25.9          |
| 31-Dec                                                                                                                                                         | 15                            | 13 | 7  | 16 | 15 | 14 | 12 | 9  | 4  | 4  | 4  | 13 | 23 | 22 | 17 | 12 | 11 | 13 | 14 | 8  | 10 | 9  | 8  | 12                              | 12.0            | 23.1          |
| 13.3 12.8 12.9 13.3 13.6 13.5 13.6 14.1 14.2 13.4 13.8 13.5 14.6 14.0 13.8 14.2 13.5 13.7 14.2 14.6 14.4 13.6 13.5 14.0                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 | Diurnal Average |               |
| 41.6 31.2 23.2 27.9 35.1 30.0 38.9 42.4 45.2 37.9 40.8 37.7 40.9 36.0 36.7 34.6 32.3 31.3 29.3 31.0 27.2 26.5 28.8 30.1                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 | Diurnal Maximum |               |

All monthly, daily, and diurnal averages have been calculated using scalar methods



# Hourly Standard Deviations

Wind Direction (WD) - deg  
Smoky Heights - December 2016

|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |               |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|----|----|----|----|----|----|---------------|--|--|
| Maximum Value: 93.7 deg on Dec 15 10:00                                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744           |    |    |    |    |    |    |               |  |  |
| Minimum Value: 1.9 deg on Dec 27 20:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 744              |    |    |    |    |    |    |               |  |  |
|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 0        |    |    |    |    |    |    |               |  |  |
| Percentiles: P <sub>1</sub> = 2.5 P <sub>10</sub> = 3.5 Q <sub>1</sub> = 5.3 Median = 8.1 Q <sub>3</sub> = 14.6 P <sub>90</sub> = 27.9 P <sub>99</sub> = 79.5 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0         |    |    |    |    |    |    |               |  |  |
|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 100.0 |    |    |    |    |    |    |               |  |  |
| Day                                                                                                                                                           | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    | Daily Maximum |  |  |
|                                                                                                                                                               | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18                              | 19 | 20 | 21 | 22 | 23 | 24 |               |  |  |
| 1-Dec                                                                                                                                                         | 11                            | 9  | 6  | 7  | 8  | 4  | 15 | 65 | 14 | 29 | 18 | 4  | 9  | 7  | 7  | 3  | 5  | 6                               | 7  | 7  | 12 | 18 | 11 | 8  | 64.5          |  |  |
| 2-Dec                                                                                                                                                         | 6                             | 8  | 6  | 13 | 18 | 14 | 10 | 7  | 13 | 31 | 21 | 30 | 44 | 13 | 9  | 4  | 25 | 15                              | 14 | 6  | 8  | 7  | 19 | 16 | 44.5          |  |  |
| 3-Dec                                                                                                                                                         | 25                            | 26 | 14 | 13 | 4  | 5  | 3  | 4  | 11 | 4  | 7  | 9  | 3  | 4  | 4  | 3  | 4  | 4                               | 5  | 5  | 4  | 5  | 4  | 4  | 25.6          |  |  |
| 4-Dec                                                                                                                                                         | 5                             | 3  | 7  | 10 | 5  | 7  | 19 | 8  | 6  | 7  | 8  | 9  | 8  | 9  | 12 | 7  | 6  | 7                               | 4  | 7  | 8  | 8  | 8  | 11 | 18.9          |  |  |
| 5-Dec                                                                                                                                                         | 9                             | 10 | 8  | 10 | 7  | 7  | 7  | 7  | 11 | 9  | 18 | 14 | 9  | 10 | 9  | 7  | 9  | 7                               | 6  | 7  | 6  | 38 | 41 | 12 | 40.9          |  |  |
| 6-Dec                                                                                                                                                         | 12                            | 14 | 12 | 8  | 8  | 10 | 7  | 6  | 7  | 7  | 7  | 7  | 10 | 12 | 6  | 13 | 12 | 20                              | 16 | 41 | 33 | 34 | 16 | 18 | 40.7          |  |  |
| 7-Dec                                                                                                                                                         | 28                            | 28 | 18 | 27 | 87 | 68 | 12 | 60 | 49 | 53 | 18 | 29 | 50 | 92 | 75 | 32 | 15 | 9                               | 8  | 6  | 9  | 6  | 8  | 11 | 91.9          |  |  |
| 8-Dec                                                                                                                                                         | 10                            | 7  | 9  | 10 | 12 | 18 | 30 | 17 | 18 | 19 | 51 | 25 | 23 | 15 | 11 | 9  | 7  | 8                               | 7  | 12 | 7  | 7  | 5  | 6  | 51.0          |  |  |
| 9-Dec                                                                                                                                                         | 6                             | 7  | 5  | 17 | 8  | 5  | 6  | 5  | 7  | 6  | 6  | 17 | 7  | 6  | 8  | 8  | 7  | 7                               | 8  | 9  | 5  | 9  | 40 | 27 | 40.1          |  |  |
| 10-Dec                                                                                                                                                        | 85                            | 13 | 6  | 29 | 22 | 20 | 27 | 12 | 28 | 58 | 54 | 71 | 26 | 39 | 13 | 18 | 29 | 12                              | 20 | 23 | 19 | 10 | 9  | 17 | 85.2          |  |  |
| 11-Dec                                                                                                                                                        | 8                             | 6  | 4  | 6  | 6  | 9  | 6  | 3  | 4  | 3  | 7  | 3  | 3  | 4  | 5  | 3  | 3  | 3                               | 6  | 3  | 5  | 4  | 5  | 3  | 8.9           |  |  |
| 12-Dec                                                                                                                                                        | 3                             | 3  | 4  | 4  | 12 | 13 | 9  | 8  | 8  | 8  | 6  | 7  | 6  | 15 | 14 | 7  | 7  | 5                               | 6  | 5  | 18 | 25 | 8  | 23 | 24.9          |  |  |
| 13-Dec                                                                                                                                                        | 4                             | 7  | 5  | 11 | 9  | 10 | 5  | 21 | 4  | 2  | 3  | 8  | 25 | 10 | 20 | 10 | 46 | 35                              | 8  | 10 | 9  | 10 | 10 | 10 | 45.6          |  |  |
| 14-Dec                                                                                                                                                        | 16                            | 11 | 6  | 12 | 10 | 5  | 7  | 4  | 8  | 17 | 14 | 15 | 19 | 42 | 25 | 15 | 32 | 23                              | 25 | 69 | 39 | 26 | 30 | 12 | 68.5          |  |  |
| 15-Dec                                                                                                                                                        | 8                             | 43 | 22 | 9  | 14 | 14 | 21 | 14 | 10 | 94 | 27 | 81 | 24 | 53 | 70 | 59 | 69 | 27                              | 15 | 3  | 3  | 39 | 11 | 6  | 93.7          |  |  |
| 16-Dec                                                                                                                                                        | 7                             | 9  | 75 | 23 | 7  | 12 | 9  | 8  | 14 | 5  | 12 | 17 | 16 | 16 | 12 | 8  | 16 | 22                              | 9  | 6  | 7  | 7  | 6  | 13 | 74.5          |  |  |
| 17-Dec                                                                                                                                                        | 10                            | 17 | 5  | 7  | 5  | 6  | 5  | 13 | 8  | 9  | 8  | 11 | 6  | 5  | 7  | 8  | 9  | 8                               | 17 | 3  | 5  | 4  | 5  | 3  | 17.4          |  |  |
| 18-Dec                                                                                                                                                        | 8                             | 8  | 6  | 3  | 5  | 3  | 4  | 5  | 4  | 3  | 3  | 6  | 4  | 4  | 3  | 4  | 5  | 7                               | 3  | 6  | 7  | 10 | 8  | 7  | 9.8           |  |  |
| 19-Dec                                                                                                                                                        | 7                             | 4  | 3  | 4  | 6  | 3  | 7  | 5  | 3  | 3  | 3  | 3  | 3  | 3  | 5  | 11 | 8  | 4                               | 4  | 4  | 3  | 3  | 4  | 4  | 11.2          |  |  |
| 20-Dec                                                                                                                                                        | 3                             | 6  | 5  | 8  | 14 | 27 | 12 | 27 | 65 | 22 | 29 | 29 | 46 | 24 | 14 | 7  | 7  | 7                               | 12 | 20 | 8  | 7  | 5  | 5  | 65.2          |  |  |
| 21-Dec                                                                                                                                                        | 3                             | 6  | 17 | 5  | 5  | 13 | 4  | 4  | 3  | 3  | 4  | 4  | 3  | 4  | 4  | 4  | 3  | 4                               | 3  | 3  | 3  | 18 | 7  | 7  | 18.2          |  |  |
| 22-Dec                                                                                                                                                        | 8                             | 5  | 2  | 7  | 7  | 10 | 9  | 9  | 9  | 10 | 12 | 23 | 20 | 25 | 38 | 36 | 60 | 15                              | 17 | 8  | 9  | 9  | 26 | 6  | 59.6          |  |  |
| 23-Dec                                                                                                                                                        | 6                             | 14 | 9  | 7  | 7  | 6  | 10 | 8  | 7  | 6  | 6  | 7  | 6  | 6  | 11 | 6  | 16 | 5                               | 5  | 5  | 8  | 5  | 6  | 5  | 16.4          |  |  |
| 24-Dec                                                                                                                                                        | 17                            | 7  | 5  | 8  | 10 | 7  | 5  | 7  | 8  | 9  | 12 | 10 | 9  | 9  | 8  | 8  | 13 | 10                              | 5  | 9  | 13 | 7  | 13 | 17 | 17.4          |  |  |
| 25-Dec                                                                                                                                                        | 32                            | 59 | 49 | 51 | 55 | 81 | 76 | 61 | 19 | 28 | 30 | 18 | 21 | 8  | 2  | 8  | 15 | 15                              | 3  | 11 | 9  | 12 | 8  | 11 | 81.0          |  |  |
| 26-Dec                                                                                                                                                        | 18                            | 9  | 14 | 11 | 11 | 10 | 7  | 11 | 12 | 17 | 14 | 16 | 11 | 25 | 11 | 8  | 19 | 12                              | 13 | 8  | 15 | 22 | 17 | 5  | 25.0          |  |  |
| 27-Dec                                                                                                                                                        | 18                            | 10 | 4  | 12 | 13 | 4  | 4  | 6  | 5  | 4  | 4  | 6  | 4  | 4  | 6  | 3  | 3  | 3                               | 3  | 2  | 6  | 6  | 4  | 3  | 18.4          |  |  |
| 28-Dec                                                                                                                                                        | 3                             | 3  | 3  | 3  | 3  | 3  | 3  | 4  | 4  | 3  | 2  | 3  | 4  | 3  | 3  | 3  | 4  | 4                               | 4  | 3  | 6  | 5  | 4  | 3  | 6.4           |  |  |
| 29-Dec                                                                                                                                                        | 2                             | 17 | 15 | 6  | 14 | 11 | 11 | 79 | 23 | 13 | 14 | 16 | 32 | 92 | 83 | 78 | 30 | 38                              | 5  | 4  | 18 | 11 | 9  | 8  | 92.2          |  |  |
| 30-Dec                                                                                                                                                        | 36                            | 21 | 9  | 5  | 6  | 7  | 13 | 13 | 16 | 10 | 2  | 6  | 5  | 6  | 6  | 4  | 4  | 4                               | 6  | 4  | 5  | 5  | 5  | 5  | 36.0          |  |  |
| 31-Dec                                                                                                                                                        | 8                             | 4  | 18 | 4  | 7  | 6  | 18 | 44 | 16 | 29 | 14 | 18 | 6  | 9  | 8  | 6  | 6  | 6                               | 6  | 6  | 8  | 10 | 23 | 5  | 43.6          |  |  |
| 85.2 59.3 74.5 50.6 87.3 81.0 76.1 78.5 65.2 93.7 53.7 80.8 50.4 92.2 82.5 78.2 68.6 37.6 24.6 68.5 39.4 39.1 40.9 27.4                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |               |  |  |

PAZA  
Beaverlodge Station  
Monthly Summary Tables, Graphs and  
Roses

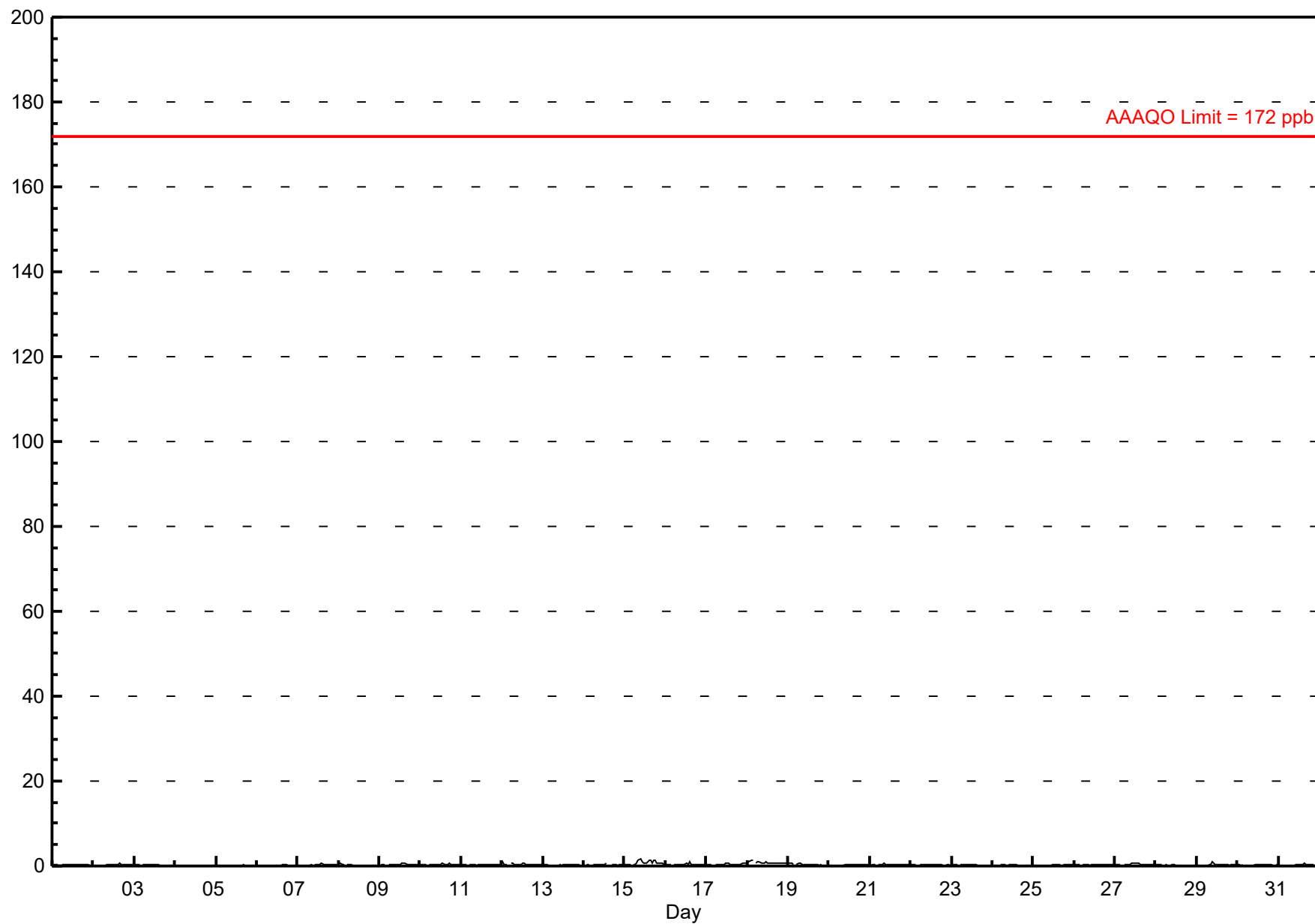
# Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Beaverlodge - December 2016**

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0                                         |   | Maximum Value: 1.6 ppb on Dec 15 10:00  |   | Maximum Daily Average: 0.8 ppb on Dec 15    |   | Hours in Service: 744                       |   | Hours of Data: 711        |   | Hours of Missing Data: 33                                                                                                                                  |    | Hours of Calibration: 33 |    | Percent Operational Time: 100.0 |    |    |    |    |    |    |    |    |    |                 |               |               |
|-----------------------------------------------------------------------------------------|---|-----------------------------------------|---|---------------------------------------------|---|---------------------------------------------|---|---------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------|----|---------------------------------|----|----|----|----|----|----|----|----|----|-----------------|---------------|---------------|
| Minimum Value: 0 ppb on Dec 5 04:00                                                     |   | Minimum Daily Average: 0.1 ppb on Dec 4 |   | Minimum Diurnal Average: 0.2 ppb at hour 24 |   | Maximum Diurnal Average: 0.4 ppb at hour 15 |   | Monthly Average: 0.28 ppb |   | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.2 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.5 P <sub>99</sub> = 1.2 |    |                          |    |                                 |    |    |    |    |    |    |    |    |    |                 |               |               |
| Day                                                                                     | 1 | 2                                       | 3 | 4                                           | 5 | 6                                           | 7 | 8                         | 9 | 10                                                                                                                                                         | 11 | 12                       | 13 | 14                              | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24              | Daily Average | Daily Maximum |
| 1-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.4           |
| 2-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.6           |
| 3-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.4           |
| 4-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.1           | 0.2           |
| 5-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.1           | 0.3           |
| 6-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.1           | 0.2           |
| 7-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.5           |
| 8-Dec                                                                                   | 0 | 1                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.6           |
| 9-Dec                                                                                   | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 1                               | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.6           |
| 10-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 1  | 1                               | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0               | 0.4           | 0.5           |
| 11-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.5           |
| 12-Dec                                                                                  | 1 | 0                                       | 0 | 1                                           | A | 1                                           | 1 | 1                         | 0 | 0                                                                                                                                                          | 0  | 1                        | 1  | 1                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.4           | 1.0           |
| 13-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.4           |
| 14-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 1                               | C  | C  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.8           |
| 15-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 1                         | 1 | 2                                                                                                                                                          | 1  | 1                        | 1  | 1                               | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0               | 0.8           | 1.6           |
| 16-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 1  | 0                               | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.4           | 0.9           |
| 17-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 1                        | 1  | 1                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1               | 0.4           | 0.8           |
| 18-Dec                                                                                  | 1 | 1                                       | 1 | 1                                           | A | 1                                           | 1 | 1                         | 1 | 1                                                                                                                                                          | 1  | 1                        | 1  | 1                               | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1               | 0.8           | 1.2           |
| 19-Dec                                                                                  | 1 | 1                                       | 1 | 0                                           | A | 0                                           | 1 | 1                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.6           |
| 20-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.4           |
| 21-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 1 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.6           |
| 22-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.3           |
| 23-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.3           |
| 24-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.4           |
| 25-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.4           |
| 26-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.3           | 0.4           |
| 27-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 1  | 1                        | 1  | 1                               | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.4           | 0.6           |
| 28-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.1           | 0.2           |
| 29-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 1                                                                                                                                                          | 1  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.9           |
| 30-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.2           |
| 31-Dec                                                                                  | 0 | 0                                       | 0 | 0                                           | A | 0                                           | 0 | 0                         | 0 | 0                                                                                                                                                          | 0  | 0                        | 0  | 0                               | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0               | 0.2           | 0.6           |
|                                                                                         |   |                                         |   |                                             |   |                                             |   |                           |   |                                                                                                                                                            |    |                          |    |                                 |    |    |    |    |    |    |    |    |    | Diurnal Average |               |               |
|                                                                                         |   |                                         |   |                                             |   |                                             |   |                           |   |                                                                                                                                                            |    |                          |    |                                 |    |    |    |    |    |    |    |    |    | Diurnal Maximum |               |               |
| C - Calibration A - Automated Daily Zero Span                                           |   |                                         |   |                                             |   |                                             |   |                           |   |                                                                                                                                                            |    |                          |    |                                 |    |    |    |    |    |    |    |    |    |                 |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb 30-day 11 ppb |   |                                         |   |                                             |   |                                             |   |                           |   |                                                                                                                                                            |    |                          |    |                                 |    |    |    |    |    |    |    |    |    |                 |               |               |

## Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Beaverlodge - December 2016**



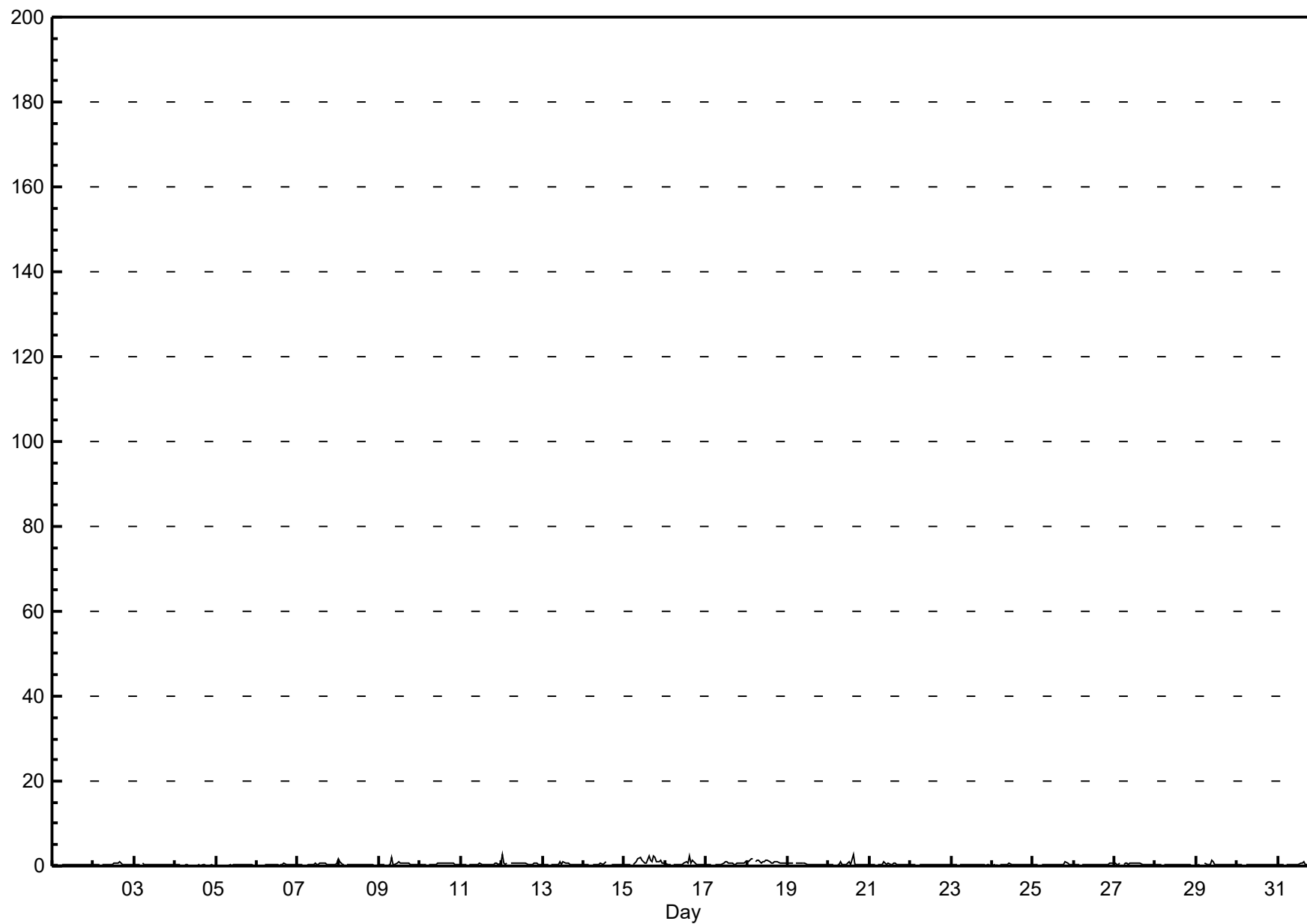
# Hourly Maximums

## Sulphur Dioxide (SO<sub>2</sub>) - ppb Beaverlodge - December 2016

| Maximum Value: 2.7 ppb on Dec 12 01:00                                                         |                               | Maximum Daily Average: 1.1 ppb on Dec 15                                                                                                                   |   | Hours in Service: 744           |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
|------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------------|---------------|
| Minimum Value: 0 ppb on Dec 4 11:00                                                            |                               | Minimum Daily Average: 0.2 ppb on Dec 4                                                                                                                    |   | Hours of Data: 711              |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
| Maximum Diurnal Average: 0.6 ppb at hour 15                                                    |                               | Minimum Diurnal Average: 0.3 ppb at hour 23                                                                                                                |   | Hours of Missing Data: 33       |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
| Monthly Average: 0.43 ppb                                                                      |                               | Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.3 Median = 0.3 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.7 P <sub>99</sub> = 2.0 |   | Hours of Calibration: 33        |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
|                                                                                                |                               |                                                                                                                                                            |   | Percent Operational Time: 100.0 |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
| Day                                                                                            | Hourly Period Ending At (MST) |                                                                                                                                                            |   |                                 |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | Daily Average | Daily Maximum |
| 1-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 0.5           |
| 2-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 1.1           |
| 3-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3           | 0.6           |
| 4-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2           | 0.3           |
| 5-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2           | 0.4           |
| 6-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2           | 0.6           |
| 7-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.4           | 0.8           |
| 8-Dec                                                                                          | 2                             | 1                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 1.9           |
| 9-Dec                                                                                          | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5           | 2.1           |
| 10-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0.5           | 0.7           |
| 11-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0.4           | 0.7           |
| 12-Dec                                                                                         | 3                             | 1                                                                                                                                                          | 0 | 1                               | A               | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.6           | 2.7           |
| 13-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 1.0           |
| 14-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 1.1           |
| 15-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1.1           | 2.4           |
| 16-Dec                                                                                         | 1                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.6           | 2.4           |
| 17-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.5           | 1.0           |
| 18-Dec                                                                                         | 1                             | 1                                                                                                                                                          | 2 | 2                               | A               | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1.0           | 1.6           |
| 19-Dec                                                                                         | 1                             | 1                                                                                                                                                          | 1 | 1                               | A               | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5           | 0.7           |
| 20-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5           | 2.6           |
| 21-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 1.1           |
| 22-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3           | 0.4           |
| 23-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3           | 0.5           |
| 24-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3           | 0.7           |
| 25-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.3           | 0.8           |
| 26-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0.4           | 0.6           |
| 27-Dec                                                                                         | 1                             | 0                                                                                                                                                          | 0 | 1                               | A               | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5           | 0.8           |
| 28-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2           | 0.4           |
| 29-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4           | 1.4           |
| 30-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3           | 0.4           |
| 31-Dec                                                                                         | 0                             | 0                                                                                                                                                          | 0 | 0                               | A               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3           | 1.1           |
| 0.5 0.4 0.4 0.4 -- 0.4 0.4 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.6 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.3 0.4 |                               |                                                                                                                                                            |   |                                 | Diurnal Average |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
| 2.7 1.1 1.6 1.6 -- 1.0 1.3 2.1 1.7 1.9 1.3 1.2 1.3 1.1 2.6 1.5 1.5 2.4 2.2 1.0 1.2 1.2 0.8 0.9 |                               |                                                                                                                                                            |   |                                 | Diurnal Maximum |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |
| C - Calibration                                                                                |                               | A - Automated Daily Zero Span                                                                                                                              |   |                                 |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |               |               |

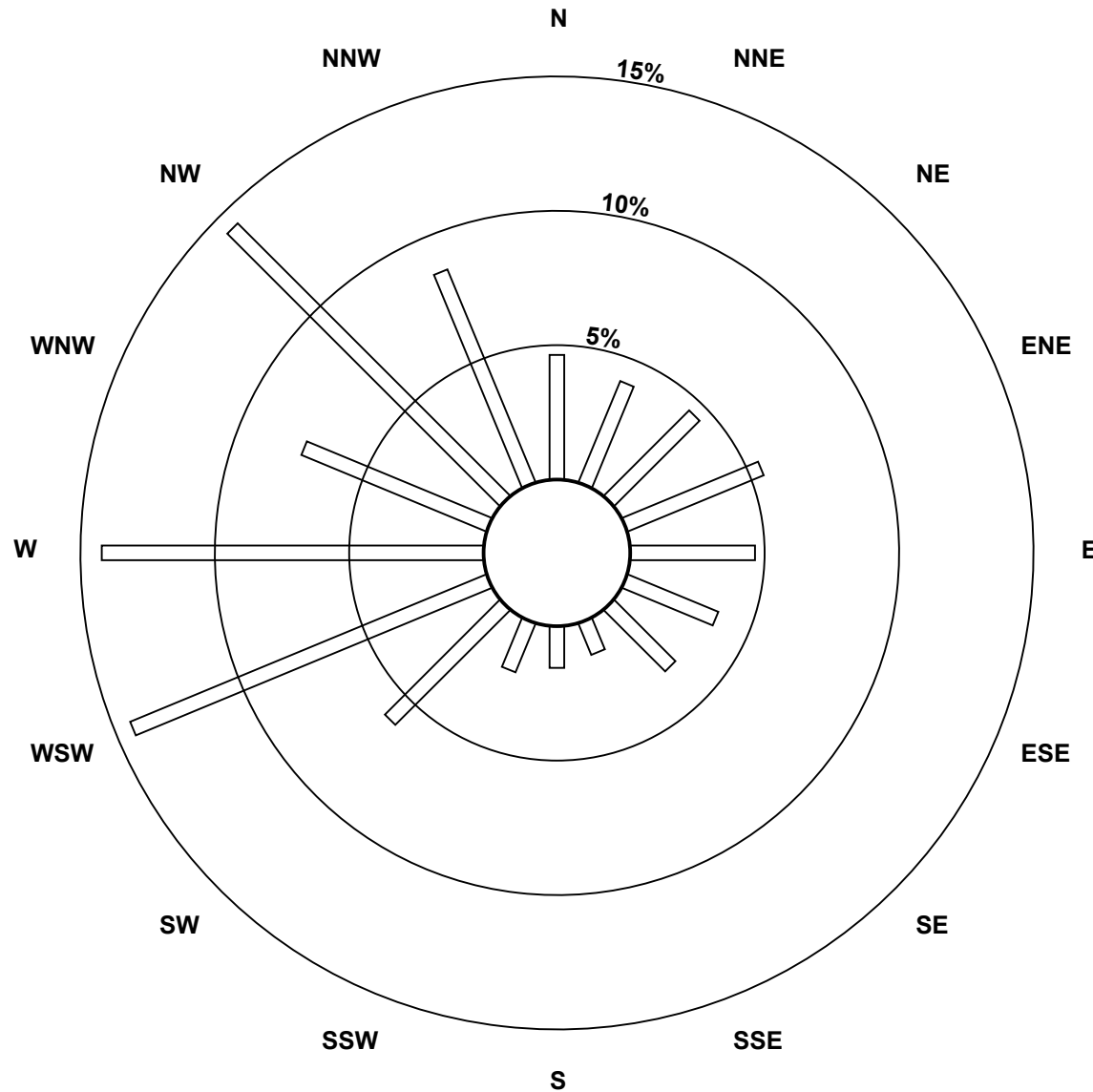
## Hourly Maximums

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Beaverlodge - December 2016**

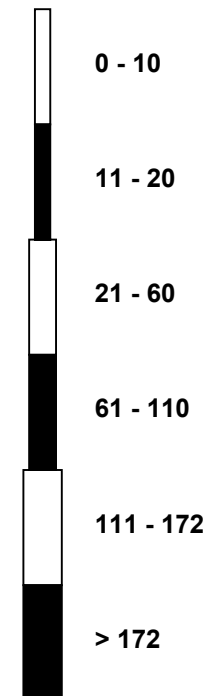


# Pollutant Rose

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Beaverlodge - December 2016

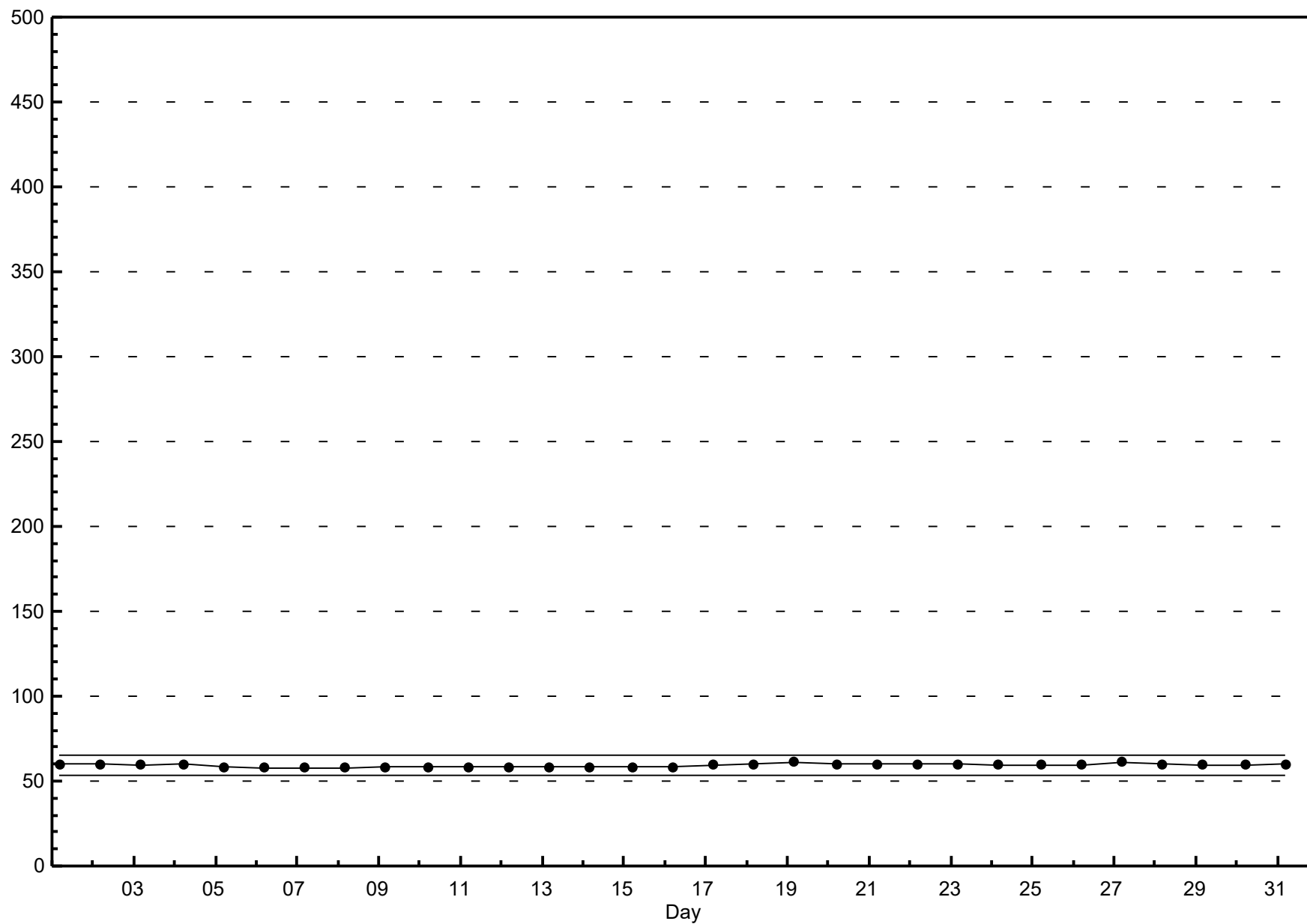


## Pollutant Classes (ppb)



## Span Responses

Sulphur Dioxide (SO<sub>2</sub>)  
Beaverlodge - December 2016





# Hourly Averages

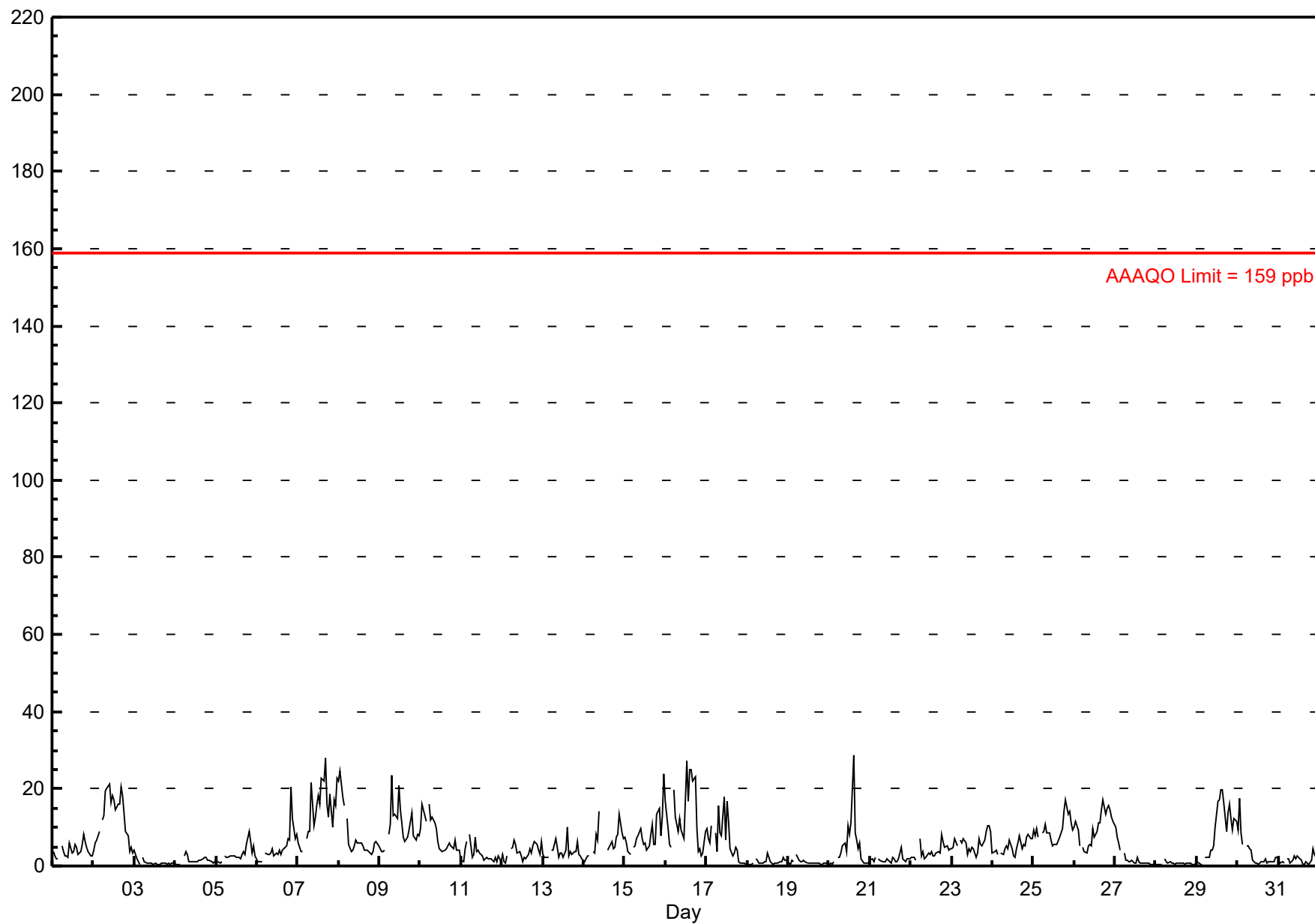
Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Beaverlodge - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 28.6 ppb on Dec 20 15:00 Maximum Daily Average: 14.1 ppb on Dec 7 |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 709                                                                                                                                                                                                            |    |                                                                                          |    |                 |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------|----|-----------------|---------------|---------------|
| Minimum Value: 0 ppb on Dec 28 04:00<br>Maximum Diurnal Average: 6.6 ppb at hour 17<br>Monthly Average: 5.47 ppb                    |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.7 ppb on Dec 28<br>Minimum Diurnal Average: 3.9 ppb at hour 4<br>Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.4 Median = 3.8 Q <sub>3</sub> = 7.3 P <sub>90</sub> = 13.3 P <sub>99</sub> = 23.7 |    | Hours of Missing Data: 35<br>Hours of Calibration: 35<br>Percent Operational Time: 100.0 |    |                 |               |               |
| Day                                                                                                                                 | Hourly Period Ending At (MST) |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                        |    |                                                                                          |    |                 | Daily Average | Daily Maximum |
|                                                                                                                                     | 1                             | 2  | 3  | 4  | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                                                                                                                     | 21 | 22                                                                                       | 23 | 24              |               |               |
| 1-Dec                                                                                                                               | 4                             | 2  | 2  | 2  | A | 5  | 4  | 3  | 2  | 2  | 6  | 3  | 4  | 6  | 5  | 3  | 4  | 6  | 8  | 7                                                                                                                                                                                                                                                      | 5  | 4                                                                                        | 3  | 3               | 4.0           | 8.2           |
| 2-Dec                                                                                                                               | 4                             | 6  | 7  | 9  | A | 12 | 13 | 19 | 20 | 21 | 16 | 18 | 17 | 15 | 16 | 16 | 20 | 18 | 14 | 9                                                                                                                                                                                                                                                      | 8  | 4                                                                                        | 5  | 3               | 12.7          | 21.3          |
| 3-Dec                                                                                                                               | 4                             | 2  | 1  | 1  | A | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 1  | 1                                                                                        | 1  | 1               | 1.0           | 4.2           |
| 4-Dec                                                                                                                               | 0                             | 0  | 0  | 0  | A | 3  | 4  | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2                                                                                                                                                                                                                                                      | 2  | 1                                                                                        | 1  | 1               | 1.4           | 3.9           |
| 5-Dec                                                                                                                               | 1                             | 1  | 1  | 1  | A | 3  | 2  | 2  | 2  | 3  | 3  | 3  | 2  | 2  | 2  | 3  | 4  | 3  | 6  | 9                                                                                                                                                                                                                                                      | 6  | 3                                                                                        | 5  | 3               | 3.0           | 9.0           |
| 6-Dec                                                                                                                               | 1                             | 1  | 1  | 1  | A | 3  | 3  | 3  | 3  | 5  | 3  | 3  | 3  | 4  | 3  | 4  | 4  | 5  | 7  | 7                                                                                                                                                                                                                                                      | 21 | 12                                                                                       | 7  | 8               | 5.0           | 20.7          |
| 7-Dec                                                                                                                               | 6                             | 5  | 4  | 4  | A | 7  | 9  | 9  | 21 | 11 | 13 | 16 | 18 | 16 | 23 | 22 | 28 | 16 | 13 | 19                                                                                                                                                                                                                                                     | 10 | 17                                                                                       | 16 | 23              | 14.1          | 28.1          |
| 8-Dec                                                                                                                               | 22                            | 24 | 18 | 16 | A | 12 | 6  | 4  | 4  | 5  | 7  | 6  | 6  | 6  | 5  | 4  | 4  | 3  | 3  | 4                                                                                                                                                                                                                                                      | 6  | 6                                                                                        | 5  | 5               | 7.8           | 24.5          |
| 9-Dec                                                                                                                               | 5                             | 4  | 4  | 4  | A | 8  | 11 | 24 | 13 | 14 | 12 | 21 | 15 | 11 | 7  | 6  | 8  | 9  | 12 | 14                                                                                                                                                                                                                                                     | 8  | 7                                                                                        | 8  | 8               | 10.0          | 23.5          |
| 10-Dec                                                                                                                              | 10                            | 16 | 15 | 11 | A | 16 | 12 | 13 | 11 | 10 | 6  | 4  | 4  | 4  | 4  | 4  | 5  | 6  | 5  | 4                                                                                                                                                                                                                                                      | 7  | 4                                                                                        | 4  | 4               | 7.9           | 15.9          |
| 11-Dec                                                                                                                              | 2                             | 1  | 4  | 6  | A | 8  | 2  | 3  | 7  | 4  | 4  | 3  | 3  | 1  | 2  | 2  | 2  | 2  | 1  | 1                                                                                                                                                                                                                                                      | 2  | 1                                                                                        | 2  | 1               | 2.9           | 8.3           |
| 12-Dec                                                                                                                              | 3                             | 1  | 1  | 2  | A | 4  | 5  | 7  | 6  | 3  | 4  | 2  | 1  | 2  | 2  | 3  | 4  | 4  | 5  | 6                                                                                                                                                                                                                                                      | 6  | 4                                                                                        | 3  | 6               | 3.7           | 6.5           |
| 13-Dec                                                                                                                              | 3                             | 2  | 2  | 2  | A | 4  | 4  | 7  | 5  | 2  | 3  | 3  | 2  | 4  | 10 | 2  | 4  | 3  | 4  | 4                                                                                                                                                                                                                                                      | 6  | 3                                                                                        | 3  | 2               | 3.7           | 10.1          |
| 14-Dec                                                                                                                              | 1                             | 2  | 3  | 3  | A | 4  | 3  | 8  | 7  | 14 | C  | C  | C  | C  | 4  | 5  | 6  | 4  | 5  | 8                                                                                                                                                                                                                                                      | 8  | 13                                                                                       | 9  | 7               | 6.0           | 14.3          |
| 15-Dec                                                                                                                              | 7                             | 6  | 4  | 3  | A | 5  | 5  | 7  | 8  | 10 | 7  | 6  | 6  | 4  | 5  | 8  | 11 | 6  | 5  | 14                                                                                                                                                                                                                                                     | 15 | 8                                                                                        | 13 | 24              | 8.1           | 24.0          |
| 16-Dec                                                                                                                              | 17                            | 10 | 5  | 5  | A | 20 | 13 | 9  | 12 | 9  | 8  | 7  | 27 | 17 | 25 | 25 | 22 | 23 | 10 | 4                                                                                                                                                                                                                                                      | 4  | 3                                                                                        | 3  | 9               | 12.5          | 27.4          |
| 17-Dec                                                                                                                              | 10                            | 7  | 6  | 10 | A | 9  | 4  | 16 | 8  | 8  | 18 | 7  | 17 | 12 | 4  | 3  | 4  | 5  | 4  | 1                                                                                                                                                                                                                                                      | 1  | 1                                                                                        | 1  | 0               | 6.7           | 17.8          |
| 18-Dec                                                                                                                              | 1                             | 0  | 0  | 1  | A | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 1  | 2                                                                                        | 1  | 2               | 1.1           | 3.2           |
| 19-Dec                                                                                                                              | 1                             | 1  | 1  | 1  | A | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 0  | 1                                                                                        | 1  | 0               | 0.9           | 2.9           |
| 20-Dec                                                                                                                              | 0                             | 1  | 0  | 1  | A | 2  | 2  | 3  | 5  | 6  | 4  | 11 | 8  | 11 | 29 | 9  | 7  | 5  | 6  | 2                                                                                                                                                                                                                                                      | 1  | 1                                                                                        | 1  | 1               | 5.0           | 28.6          |
| 21-Dec                                                                                                                              | 1                             | 2  | 1  | 2  | A | 2  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 2  | 2  | 1  | 1  | 2  | 5  | 2                                                                                                                                                                                                                                                      | 2  | 1                                                                                        | 2  | 2               | 1.7           | 4.9           |
| 22-Dec                                                                                                                              | 2                             | 2  | 2  | 1  | A | 7  | 3  | 4  | 2  | 2  | 3  | 3  | 4  | 3  | 3  | 3  | 4  | 3  | 8  | 6                                                                                                                                                                                                                                                      | 5  | 5                                                                                        | 4  | 5               | 3.7           | 8.1           |
| 23-Dec                                                                                                                              | 4                             | 5  | 7  | 5  | A | 7  | 6  | 7  | 6  | 3  | 5  | 4  | 5  | 4  | 2  | 3  | 7  | 6  | 5  | 7                                                                                                                                                                                                                                                      | 9  | 10                                                                                       | 11 | 9               | 6.0           | 10.6          |
| 24-Dec                                                                                                                              | 3                             | 4  | 4  | 3  | A | 3  | 3  | 4  | 5  | 5  | 7  | 4  | 3  | 2  | 4  | 6  | 8  | 5  | 5  | 5                                                                                                                                                                                                                                                      | 7  | 8                                                                                        | 7  | 7               | 5.0           | 8.1           |
| 25-Dec                                                                                                                              | 9                             | 8  | 10 | 7  | A | 9  | 9  | 11 | 9  | 9  | 7  | 5  | 6  | 6  | 6  | 7  | 9  | 10 | 14 | 17                                                                                                                                                                                                                                                     | 13 | 14                                                                                       | 11 | 9               | 9.3           | 17.2          |
| 26-Dec                                                                                                                              | 10                            | 11 | 9  | 5  | A | 5  | 4  | 3  | 5  | 6  | 5  | 10 | 7  | 9  | 11 | 11 | 14 | 17 | 14 | 15                                                                                                                                                                                                                                                     | 16 | 15                                                                                       | 13 | 12              | 9.9           | 17.2          |
| 27-Dec                                                                                                                              | 10                            | 7  | 6  | 4  | A | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 1  | 0                                                                                        | 0  | 0               | 2.1           | 9.9           |
| 28-Dec                                                                                                                              | 0                             | 0  | 0  | 0  | A | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 1  | 1                                                                                        | 0  | 0               | 0.7           | 1.7           |
| 29-Dec                                                                                                                              | 1                             | 1  | 1  | 0  | A | 2  | 2  | 2  | 4  | 4  | 5  | 10 | 17 | 17 | 20 | 20 | 17 | 9  | 14 | 16                                                                                                                                                                                                                                                     | 12 | 9                                                                                        | 12 | 11              | 9.0           | 19.9          |
| 30-Dec                                                                                                                              | 9                             | 18 | 9  | 6  | A | 5  | 5  | 5  | 4  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 1  | 1                                                                                        | 2  | 2               | 3.4           | 17.5          |
| 31-Dec                                                                                                                              | 2                             | 1  | 1  | 1  | A | 2  | 2  | 1  | 2  | 3  | 2  | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                      | 4  | 3                                                                                        | 2  | 3               | 1.7           | 4.4           |
| 5.0 4.9 4.2 3.9 -- 5.8 4.6 5.9 5.8 5.3 5.2 5.3 6.2 5.6 6.5 5.8 6.6 5.7 5.8 6.0 6.0 5.2 5.1 5.6                                      |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                        |    |                                                                                          |    | Diurnal Average |               |               |
| 22.0 24.5 17.7 15.8 -- 19.8 13.0 23.5 21.5 21.3 17.8 20.8 27.4 17.3 28.6 24.8 28.1 23.1 14.3 18.6 20.7 17.1 15.6 24.0               |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                        |    |                                                                                          |    | Diurnal Maximum |               |               |
| C - Calibration A - Automated Daily Zero Span                                                                                       |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                        |    |                                                                                          |    |                 |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb 24-hr 106 ppb                                                          |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                        |    |                                                                                          |    |                 |               |               |

## Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Beaverlodge - December 2016



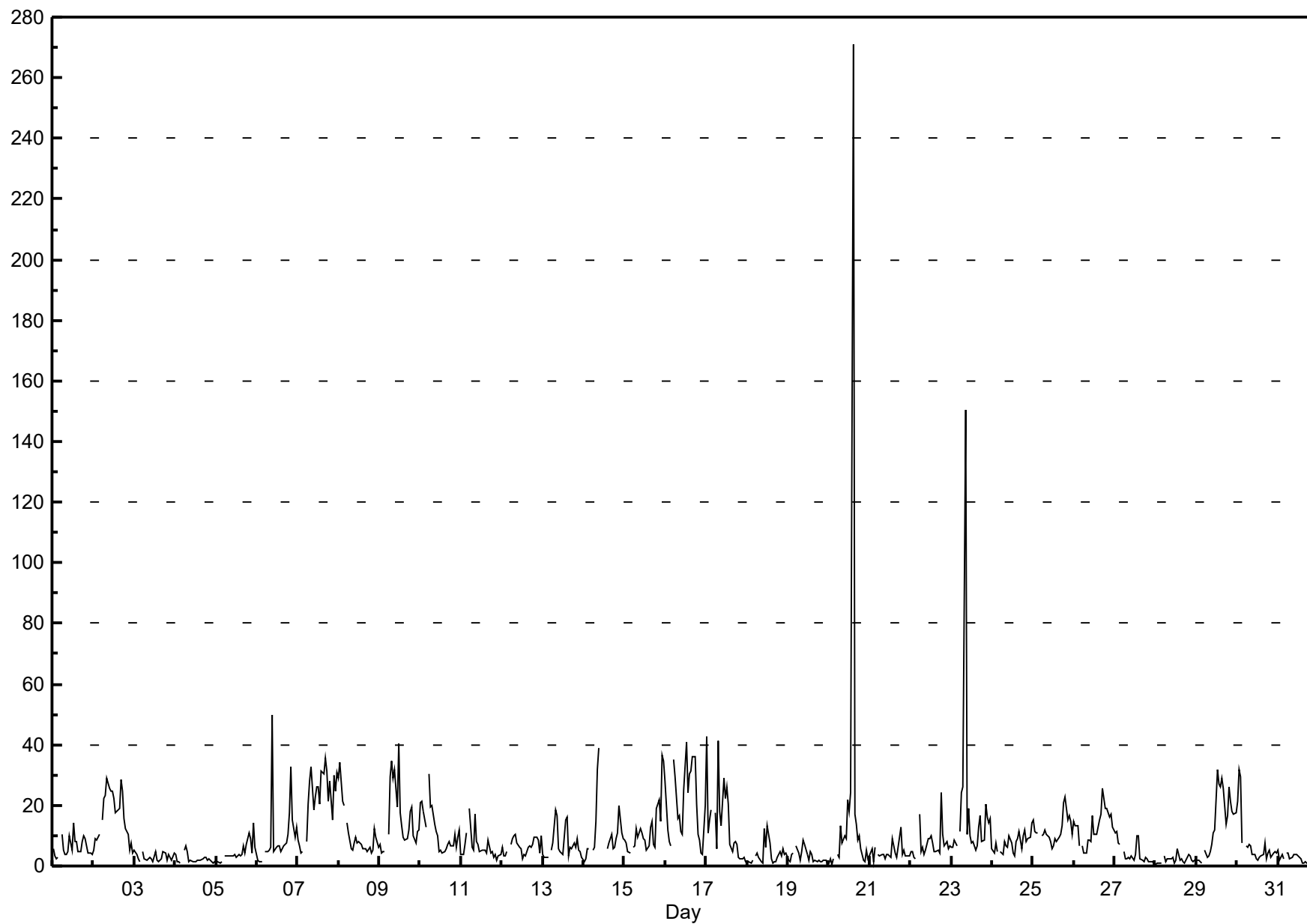
# Hourly Maximums

## Nitrogen Dioxide (NO<sub>2</sub>) - ppb Beaverlodge - December 2016

| Maximum Value: 271.0 ppb on Dec 20 15:00                                                                                |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    | Maximum Daily Average: 22.0 ppb on Dec 7                                                                                                                      |    |    |    |    | Hours in Service: 744           |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|---|----|----|----|-----|----|----|----|----|----|-----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|---------------------------------|---------------|
| Minimum Value: 0 ppb on Dec 28 01:00                                                                                    |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    | Minimum Daily Average: 2.0 ppb on Dec 28                                                                                                                      |    |    |    |    | Hours of Data: 709              |               |
| Maximum Diurnal Average: 17.0 ppb at hour 15                                                                            |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    | Minimum Diurnal Average: 5.8 ppb at hour 4                                                                                                                    |    |    |    |    | Hours of Missing Data: 35       |               |
| Monthly Average: 9.68 ppb                                                                                               |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    | Percentiles: P <sub>1</sub> = 0.8 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 3.5 Median = 6.2 Q <sub>3</sub> = 11.4 P <sub>90</sub> = 21.4 P <sub>99</sub> = 40.2 |    |    |    |    | Hours of Calibration: 35        |               |
|                                                                                                                         |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    |                                                                                                                                                               |    |    |    |    | Percent Operational Time: 100.0 |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    |                                                                                                                                                               |    |    |    |    | Daily Average                   | Daily Maximum |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5 | 6  | 7  | 8  | 9   | 10 | 11 | 12 | 13 | 14 | 15  | 16 | 17 | 18 | 19 | 20                                                                                                                                                            | 21 | 22 | 23 | 24 |                                 |               |
| 1-Dec                                                                                                                   | 6                             | 4  | 2  | 3  | A | 10 | 5  | 4  | 4   | 5  | 10 | 5  | 14 | 8  | 8   | 5  | 5  | 8  | 10 | 9                                                                                                                                                             | 7  | 4  | 4  | 4  | 6.3                             | 14.4          |
| 2-Dec                                                                                                                   | 5                             | 9  | 8  | 11 | A | 15 | 22 | 23 | 29  | 26 | 25 | 25 | 22 | 18 | 19  | 19 | 29 | 25 | 15 | 12                                                                                                                                                            | 10 | 5  | 7  | 4  | 16.7                            | 28.9          |
| 3-Dec                                                                                                                   | 5                             | 4  | 2  | 1  | A | 5  | 2  | 2  | 2   | 3  | 2  | 1  | 5  | 2  | 2   | 2  | 2  | 5  | 4  | 2                                                                                                                                                             | 4  | 3  | 2  | 4  | 2.9                             | 5.4           |
| 4-Dec                                                                                                                   | 4                             | 1  | 1  | 1  | A | 5  | 7  | 5  | 1   | 2  | 2  | 1  | 2  | 2  | 2   | 2  | 2  | 3  | 3  | 2                                                                                                                                                             | 2  | 2  | 1  | 1  | 2.3                             | 6.6           |
| 5-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | A | 4  | 3  | 3  | 3   | 3  | 3  | 4  | 3  | 4  | 3   | 4  | 7  | 4  | 7  | 11                                                                                                                                                            | 9  | 4  | 14 | 6  | 4.6                             | 14.2          |
| 6-Dec                                                                                                                   | 2                             | 1  | 1  | 1  | A | 5  | 5  | 5  | 6   | 50 | 5  | 6  | 7  | 7  | 5   | 5  | 7  | 8  | 10 | 18                                                                                                                                                            | 33 | 15 | 10 | 13 | 9.7                             | 49.9          |
| 7-Dec                                                                                                                   | 9                             | 6  | 4  | 5  | A | 8  | 20 | 28 | 33  | 18 | 23 | 26 | 26 | 20 | 31  | 30 | 36 | 31 | 22 | 28                                                                                                                                                            | 15 | 30 | 25 | 31 | 22.0                            | 35.7          |
| 8-Dec                                                                                                                   | 29                            | 34 | 21 | 20 | A | 14 | 11 | 6  | 5   | 8  | 10 | 7  | 8  | 7  | 5   | 6  | 6  | 5  | 6  | 4                                                                                                                                                             | 5  | 12 | 9  | 6  | 10.7                            | 34.3          |
| 9-Dec                                                                                                                   | 7                             | 4  | 5  | 5  | A | 10 | 30 | 35 | 29  | 32 | 19 | 40 | 18 | 13 | 9   | 9  | 9  | 12 | 18 | 19                                                                                                                                                            | 10 | 7  | 11 | 12 | 15.8                            | 40.5          |
| 10-Dec                                                                                                                  | 21                            | 21 | 18 | 13 | A | 30 | 19 | 20 | 14  | 11 | 10 | 5  | 5  | 4  | 5   | 6  | 7  | 8  | 7  | 7                                                                                                                                                             | 10 | 6  | 9  | 12 | 11.7                            | 30.4          |
| 11-Dec                                                                                                                  | 4                             | 4  | 7  | 11 | A | 19 | 6  | 5  | 17  | 8  | 7  | 5  | 5  | 5  | 5   | 4  | 9  | 4  | 5  | 3                                                                                                                                                             | 4  | 2  | 3  | 4  | 6.4                             | 19.1          |
| 12-Dec                                                                                                                  | 6                             | 3  | 3  | 5  | A | 7  | 9  | 10 | 10  | 8  | 6  | 6  | 2  | 4  | 3   | 6  | 7  | 6  | 7  | 10                                                                                                                                                            | 10 | 8  | 4  | 10 | 6.6                             | 10.5          |
| 13-Dec                                                                                                                  | 4                             | 3  | 3  | 3  | A | 5  | 8  | 18 | 17  | 6  | 5  | 4  | 4  | 15 | 16  | 4  | 6  | 6  | 8  | 6                                                                                                                                                             | 9  | 5  | 5  | 3  | 7.0                             | 18.4          |
| 14-Dec                                                                                                                  | 1                             | 2  | 6  | 6  | A | 5  | 6  | 15 | 32  | 39 | C  | C  | C  | C  | 6   | 8  | 10 | 6  | 6  | 9                                                                                                                                                             | 11 | 20 | 11 | 9  | 10.9                            | 39.1          |
| 15-Dec                                                                                                                  | 9                             | 7  | 5  | 4  | A | 6  | 6  | 12 | 9   | 13 | 11 | 9  | 8  | 5  | 7   | 13 | 15 | 7  | 6  | 19                                                                                                                                                            | 22 | 15 | 37 | 35 | 12.2                            | 36.8          |
| 16-Dec                                                                                                                  | 28                            | 12 | 8  | 7  | A | 35 | 29 | 16 | 17  | 11 | 10 | 25 | 41 | 24 | 30  | 31 | 36 | 36 | 20 | 10                                                                                                                                                            | 9  | 4  | 4  | 20 | 20.2                            | 40.9          |
| 17-Dec                                                                                                                  | 43                            | 11 | 15 | 18 | A | 17 | 6  | 41 | 18  | 13 | 29 | 22 | 26 | 21 | 7   | 5  | 8  | 8  | 7  | 3                                                                                                                                                             | 3  | 2  | 3  | 2  | 14.2                            | 42.7          |
| 18-Dec                                                                                                                  | 1                             | 1  | 1  | 2  | A | 4  | 4  | 3  | 1   | 1  | 12 | 6  | 14 | 7  | 2   | 1  | 1  | 1  | 3  | 5                                                                                                                                                             | 3  | 6  | 4  | 4  | 3.9                             | 13.5          |
| 19-Dec                                                                                                                  | 2                             | 2  | 4  | 4  | A | 6  | 4  | 2  | 5   | 9  | 7  | 4  | 2  | 5  | 4   | 1  | 2  | 1  | 2  | 2                                                                                                                                                             | 1  | 2  | 2  | 1  | 3.2                             | 8.6           |
| 20-Dec                                                                                                                  | 1                             | 2  | 1  | 2  | A | 4  | 3  | 13 | 8   | 10 | 9  | 22 | 18 | 24 | 271 | 17 | 14 | 8  | 10 | 6                                                                                                                                                             | 2  | 2  | 5  | 2  | 19.7                            | 271.0         |
| 21-Dec                                                                                                                  | 3                             | 6  | 2  | 6  | A | 4  | 3  | 4  | 4   | 3  | 4  | 4  | 3  | 9  | 6   | 4  | 3  | 6  | 13 | 4                                                                                                                                                             | 5  | 3  | 4  | 3  | 4.6                             | 12.8          |
| 22-Dec                                                                                                                  | 5                             | 5  | 3  | 2  | A | 17 | 5  | 6  | 4   | 5  | 9  | 9  | 10 | 7  | 5   | 5  | 5  | 4  | 24 | 11                                                                                                                                                            | 7  | 8  | 6  | 7  | 7.3                             | 24.2          |
| 23-Dec                                                                                                                  | 6                             | 6  | 9  | 7  | A | 11 | 24 | 26 | 151 | 10 | 19 | 10 | 8  | 8  | 5   | 6  | 13 | 16 | 8  | 9                                                                                                                                                             | 21 | 16 | 14 | 16 | 18.2                            | 150.5         |
| 24-Dec                                                                                                                  | 6                             | 4  | 8  | 5  | A | 5  | 4  | 8  | 7   | 6  | 10 | 8  | 4  | 3  | 8   | 9  | 11 | 6  | 10 | 12                                                                                                                                                            | 8  | 9  | 9  | 14 | 7.6                             | 14.1          |
| 25-Dec                                                                                                                  | 15                            | 11 | 11 | 11 | A | 10 | 10 | 12 | 11  | 9  | 8  | 6  | 6  | 9  | 8   | 9  | 11 | 13 | 21 | 23                                                                                                                                                            | 15 | 17 | 15 | 11 | 11.8                            | 22.9          |
| 26-Dec                                                                                                                  | 15                            | 13 | 13 | 7  | A | 7  | 4  | 4  | 8   | 8  | 8  | 17 | 10 | 10 | 13  | 15 | 17 | 26 | 19 | 19                                                                                                                                                            | 18 | 16 | 17 | 13 | 13.0                            | 25.7          |
| 27-Dec                                                                                                                  | 11                            | 11 | 8  | 7  | A | 5  | 2  | 2  | 3   | 2  | 3  | 2  | 4  | 10 | 10  | 2  | 2  | 2  | 3  | 2                                                                                                                                                             | 1  | 1  | 2  | 1  | 4.2                             | 11.3          |
| 28-Dec                                                                                                                  | 0                             | 1  | 1  | 1  | A | 3  | 2  | 2  | 2   | 2  | 3  | 1  | 2  | 6  | 2   | 2  | 2  | 1  | 2  | 4                                                                                                                                                             | 3  | 2  | 1  | 2  | 2.0                             | 5.9           |
| 29-Dec                                                                                                                  | 2                             | 2  | 2  | 1  | A | 5  | 3  | 3  | 5   | 7  | 11 | 12 | 32 | 27 | 26  | 29 | 26 | 14 | 17 | 26                                                                                                                                                            | 21 | 18 | 17 | 17 | 14.0                            | 31.6          |
| 30-Dec                                                                                                                  | 21                            | 32 | 30 | 7  | A | 7  | 6  | 7  | 7   | 4  | 4  | 2  | 2  | 3  | 3   | 4  | 8  | 2  | 4  | 5                                                                                                                                                             | 3  | 4  | 5  | 4  | 7.6                             | 31.9          |
| 31-Dec                                                                                                                  | 5                             | 2  | 4  | 2  | A | 4  | 4  | 2  | 3   | 4  | 4  | 4  | 3  | 2  | 1   | 1  | 1  | 1  | 1  | 5                                                                                                                                                             | 5  | 4  | 3  | 6  | 3.1                             | 5.9           |
| 8.9 7.3 6.6 5.8 -- 9.5 8.9 11.1 15.0 10.8 9.5 9.9 10.4 9.7 17.0 8.6 10.2 9.1 9.7 9.8 9.2 8.2 8.5 8.9                    |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    |                                                                                                                                                               |    |    |    |    | Diurnal Average                 |               |
| 42.7 34.3 29.5 20.2 -- 34.9 29.6 41.1 150.5 49.9 29.0 40.5 40.9 27.2 271.0 31.3 36.0 35.8 24.2 28.1 32.7 29.9 36.8 34.9 |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    |                                                                                                                                                               |    |    |    |    | Diurnal Maximum                 |               |
| C - Calibration A - Automated Daily Zero Span                                                                           |                               |    |    |    |   |    |    |    |     |    |    |    |    |    |     |    |    |    |    |                                                                                                                                                               |    |    |    |    |                                 |               |

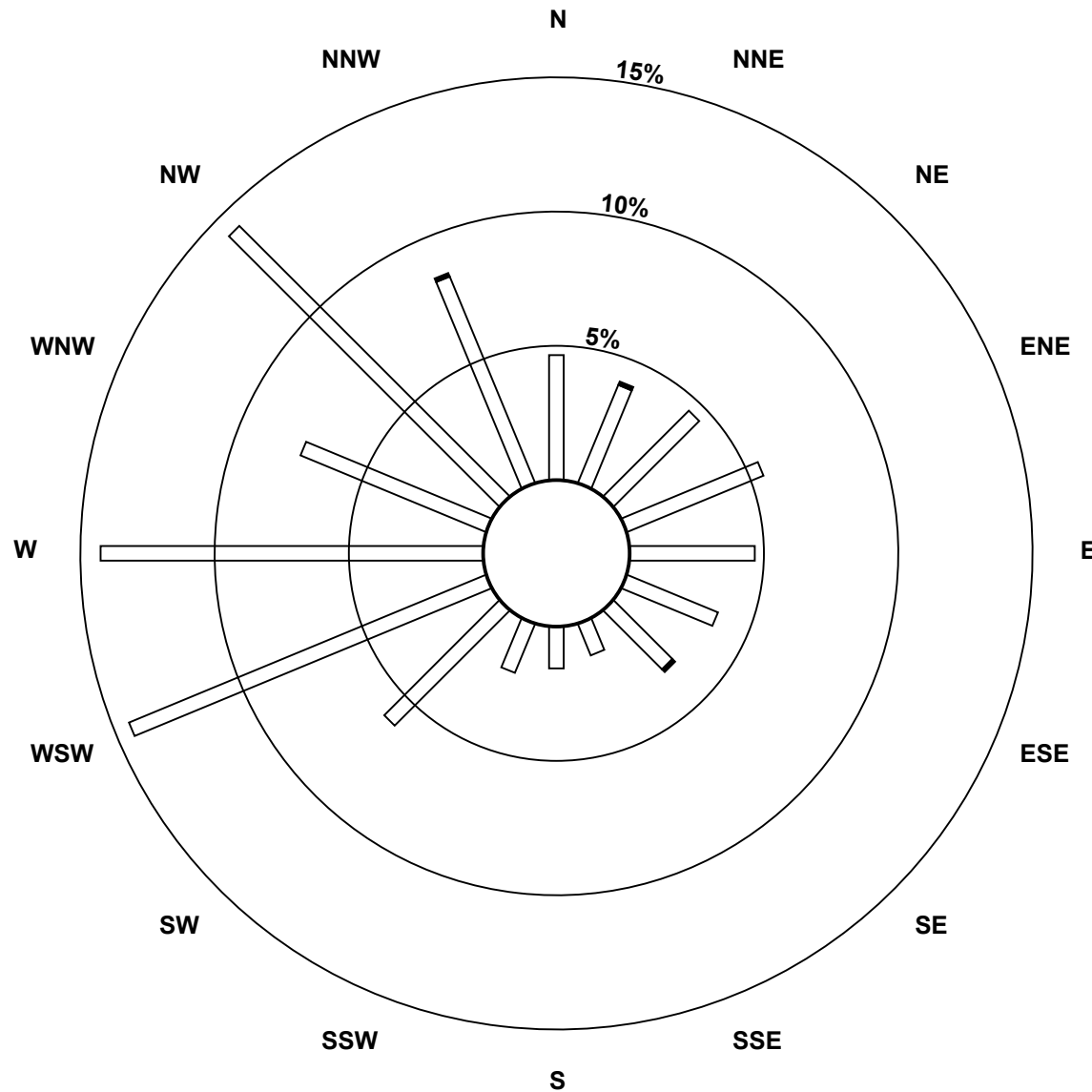
## Hourly Maximums

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Beaverlodge - December 2016**

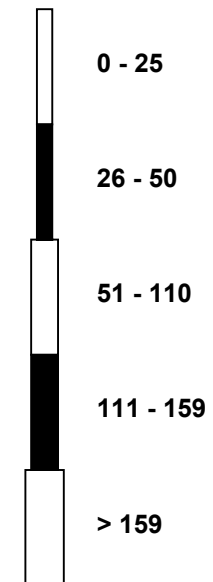


# Pollutant Rose

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Beaverlodge - December 2016

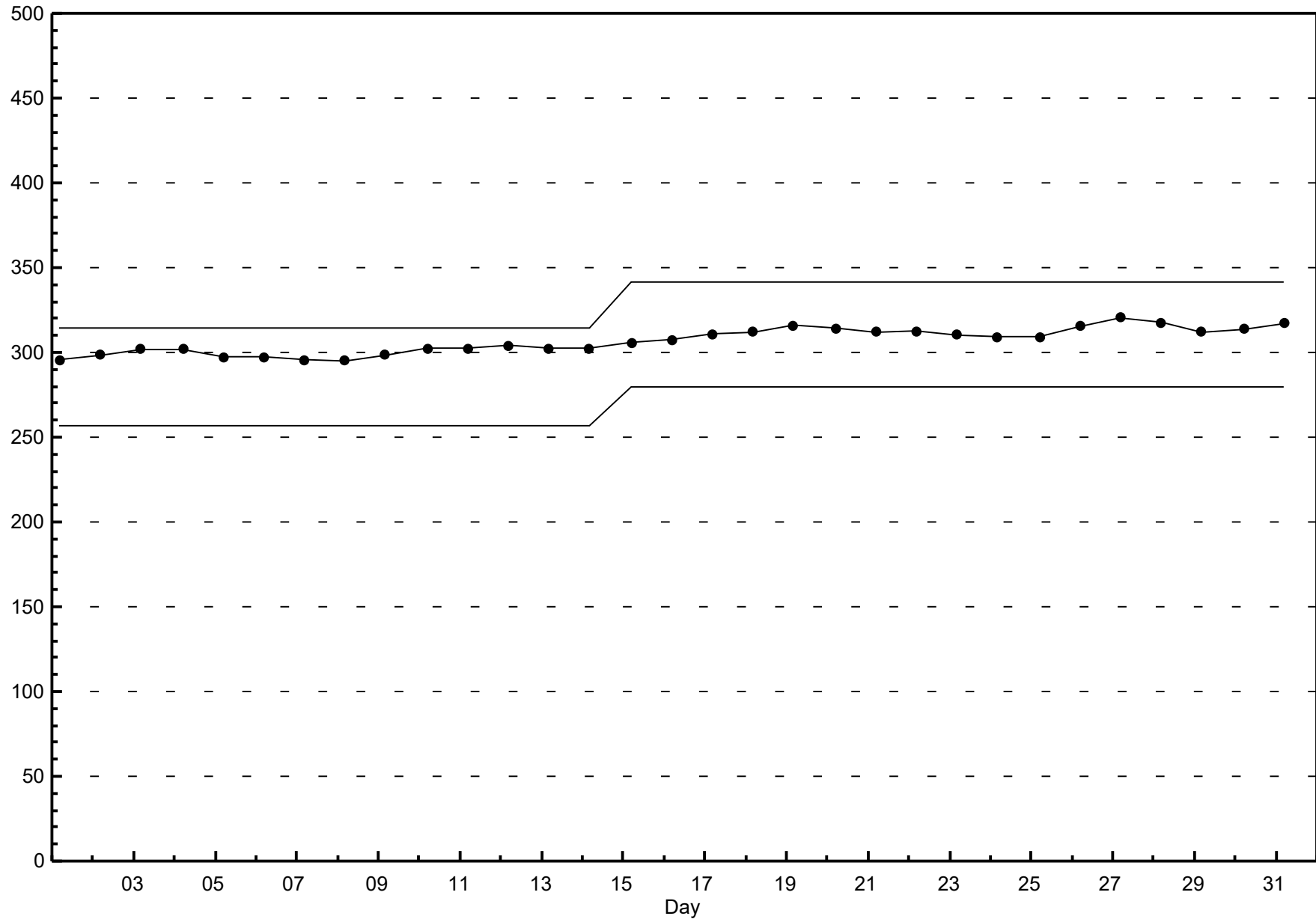


## Pollutant Classes (ppb)



## Span Responses

**Nitrogen Dioxide (NO<sub>2</sub>)**  
**Beaverlodge - December 2016**



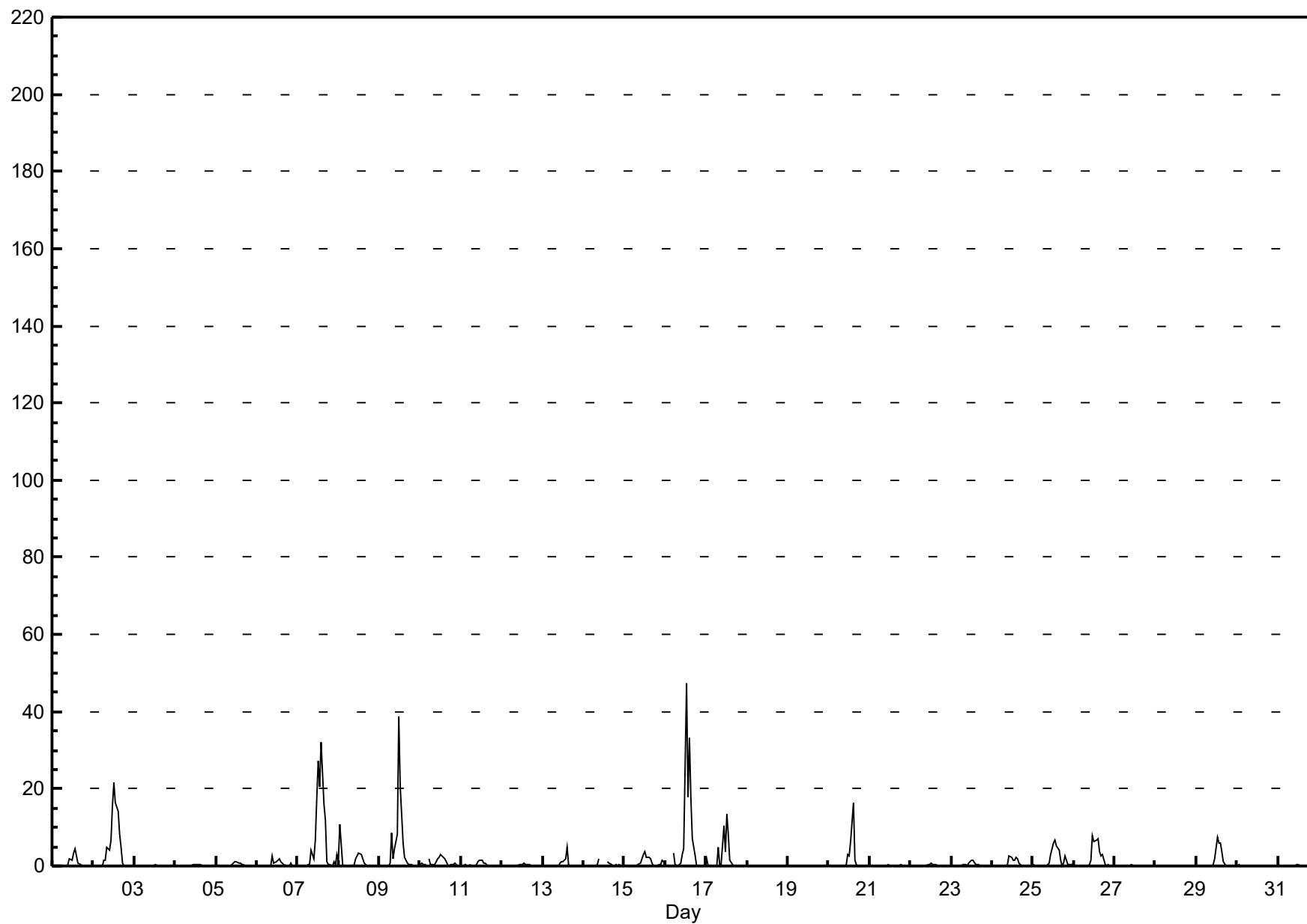
# Hourly Averages

## Nitrogen Oxide (NO) - ppb Beaverlodge - December 2016

| Maximum Value: 47.4 ppb on Dec 16 13:00                                                                |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 6.3 ppb on Dec 7                                                                                                                     |    |    |    |    | Hours in Service: 744           |               |  |  |  |
|--------------------------------------------------------------------------------------------------------|-------------------------------|----|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|---------------------------------|---------------|--|--|--|
| Minimum Value: 0 ppb on Dec 6 01:00                                                                    |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.0 ppb on Dec 27                                                                                                                    |    |    |    |    | Hours of Data: 709              |               |  |  |  |
| Maximum Diurnal Average: 5.9 ppb at hour 13                                                            |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.1 ppb at hour 4                                                                                                                  |    |    |    |    | Hours of Missing Data: 35       |               |  |  |  |
| Monthly Average: 1.19 ppb                                                                              |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 2.5 P <sub>99</sub> = 20.0 |    |    |    |    | Hours of Calibration: 35        |               |  |  |  |
|                                                                                                        |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |    | Percent Operational Time: 100.0 |               |  |  |  |
| Day                                                                                                    | Hourly Period Ending At (MST) |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |    | Daily Average                   | Daily Maximum |  |  |  |
|                                                                                                        | 1                             | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                          | 21 | 22 | 23 | 24 |                                 |               |  |  |  |
| 1-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 2  | 1  | 3  | 4  | 3  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.7                             | 4.5           |  |  |  |
| 2-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 1 | 2 | 5 | 4  | 7  | 15 | 22 | 16 | 14 | 8  | 5  | 1  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 4.4                             | 21.7          |  |  |  |
| 3-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.3           |  |  |  |
| 4-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.4           |  |  |  |
| 5-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.2                             | 1.0           |  |  |  |
| 6-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 2  | 1  | 1  | 1  | 2  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 1  | 0  | 0  | 0  | 0.5                             | 2.5           |  |  |  |
| 7-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 4 | 2  | 7  | 17 | 27 | 20 | 32 | 16 | 12 | 1  | 0  | 0                                                                                                                                                           | 0  | 1  | 0  | 3  | 6.3                             | 32.0          |  |  |  |
| 8-Dec                                                                                                  | 1                             | 11 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 2  | 3  | 3  | 3  | 2  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.2                             | 10.9          |  |  |  |
| 9-Dec                                                                                                  | 0                             | 0  | 0 | 0 | A | 0 | 1 | 9 | 2 | 4  | 8  | 39 | 21 | 13 | 6  | 2  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 4.7                             | 38.6          |  |  |  |
| 10-Dec                                                                                                 | 0                             | 1  | 1 | 0 | A | 2 | 1 | 0 | 0 | 1  | 2  | 2  | 3  | 3  | 2  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 1  | 0  | 0  | 0  | 0.9                             | 3.0           |  |  |  |
| 11-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.4                             | 1.5           |  |  |  |
| 12-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.2                             | 0.6           |  |  |  |
| 13-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 1  | 2  | 5  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.5                             | 4.7           |  |  |  |
| 14-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 1 | 2  | C  | C  | C  | C  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.3                             | 1.9           |  |  |  |
| 15-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 1  | 2  | 3  | 4  | 2  | 2  | 2  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 1  | 1  | 0.9                             | 3.8           |  |  |  |
| 16-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 3 | 0 | 0 | 0 | 1  | 3  | 5  | 47 | 18 | 33 | 17 | 7  | 3  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 6.0                             | 47.4          |  |  |  |
| 17-Dec                                                                                                 | 2                             | 0  | 0 | 0 | A | 0 | 0 | 5 | 0 | 0  | 11 | 4  | 14 | 8  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 2.0                             | 13.6          |  |  |  |
| 18-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.1           |  |  |  |
| 19-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.2           |  |  |  |
| 20-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 3  | 3  | 6  | 16 | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.3                             | 16.4          |  |  |  |
| 21-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.2           |  |  |  |
| 22-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.6           |  |  |  |
| 23-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 1  | 2  | 2  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.4                             | 1.6           |  |  |  |
| 24-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 2  | 2  | 2  | 1  | 2  | 2  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.6                             | 2.4           |  |  |  |
| 25-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 1  | 3  | 5  | 6  | 7  | 5  | 4  | 2  | 0  | 1  | 2                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.6                             | 6.8           |  |  |  |
| 26-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 1  | 8  | 6  | 7  | 7  | 4  | 2  | 3  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.8                             | 8.0           |  |  |  |
| 27-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.0                             | 0.2           |  |  |  |
| 28-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.0                             | 0.1           |  |  |  |
| 29-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 2  | 7  | 6  | 6  | 4  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.2                             | 7.4           |  |  |  |
| 30-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.4           |  |  |  |
| 31-Dec                                                                                                 | 0                             | 0  | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.1                             | 0.4           |  |  |  |
| 0.2 0.4 0.1 0.1 -- 0.2 0.1 0.6 0.5 0.7 1.9 3.9 5.9 4.2 4.6 2.2 1.1 0.3 0.1 0.2 0.1 0.1 0.1 0.2         |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |    | Diurnal Average                 |               |  |  |  |
| 1.7 10.9 0.5 0.5 -- 3.2 1.4 8.6 4.7 4.4 10.5 38.6 47.4 20.4 33.1 17.4 12.1 2.8 0.7 2.5 0.6 1.1 1.5 3.1 |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |    | Diurnal Maximum                 |               |  |  |  |
| C - Calibration A - Automated Daily Zero Span                                                          |                               |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |    |                                 |               |  |  |  |

## Hourly Averages

**Nitrogen Oxide (NO) - ppb**  
**Beaverlodge - December 2016**





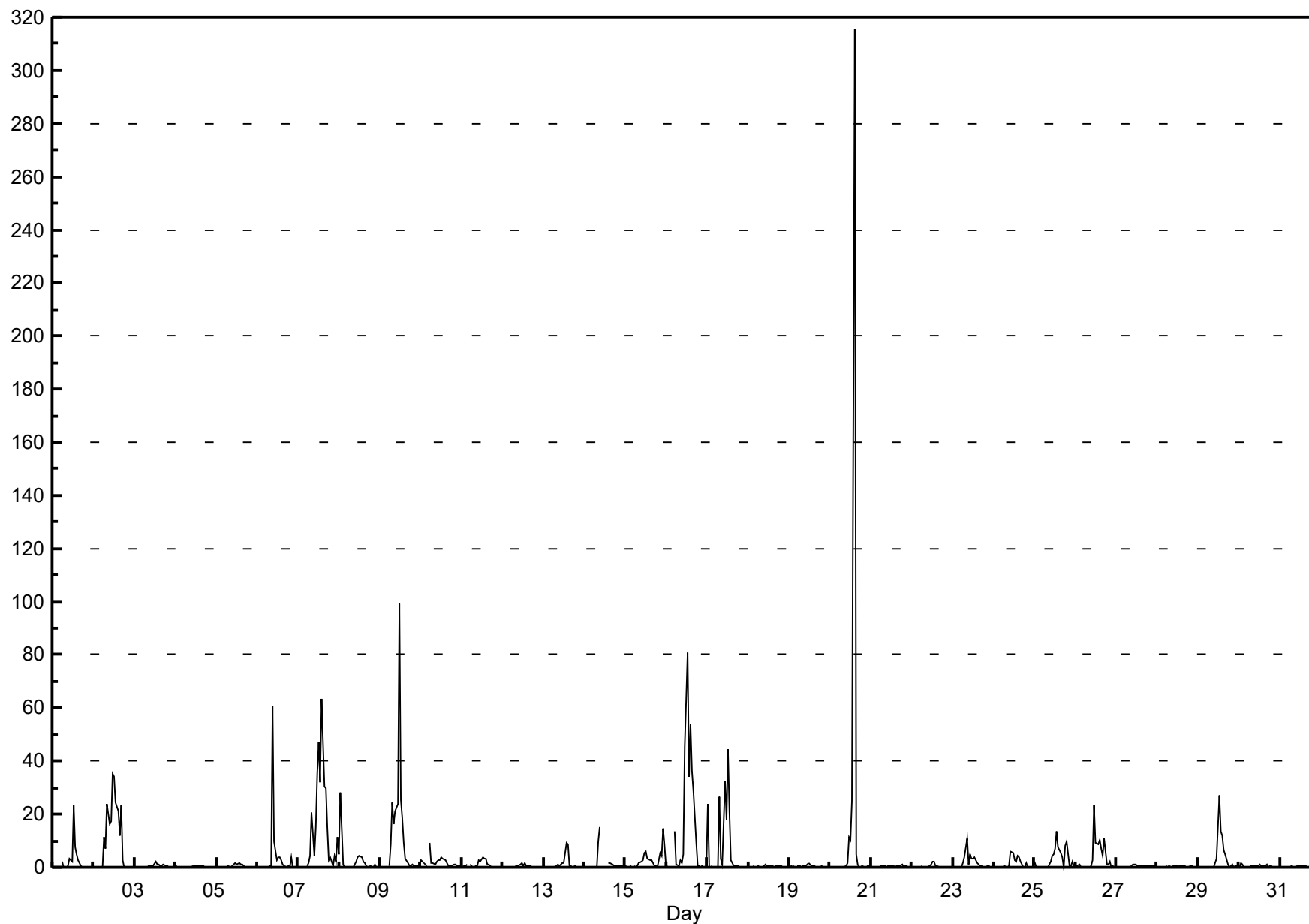
# Hourly Maximums

## Nitrogen Oxide (NO) - ppb Beaverlodge - December 2016

| Maximum Value: 315.6 ppb on Dec 20 15:00                                                                          |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    | Maximum Daily Average: 16.2 ppb on Dec 20                                                                                                                   |    |    |    |    | Hours in Service: 744     |               |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------|----|---|---|-------------------------------|----|----|----|----|----|----|-----|----|----|-----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|---------------------------|---------------|
| Minimum Value: 0 ppb on Dec 27 06:00                                                                              |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    | Minimum Daily Average: 0.2 ppb on Dec 31                                                                                                                    |    |    |    |    | Hours of Data: 709        |               |
| Maximum Diurnal Average: 17.3 ppb at hour 15                                                                      |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    | Minimum Diurnal Average: 0.2 ppb at hour 4                                                                                                                  |    |    |    |    | Hours of Missing Data: 35 |               |
| Monthly Average: 3.49 ppb                                                                                         |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.4 Q <sub>3</sub> = 1.4 P <sub>90</sub> = 7.6 P <sub>99</sub> = 43.8 |    |    |    |    | Hours of Calibration: 35  |               |
|                                                                                                                   |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    | Percent Operational Time: 100.0                                                                                                                             |    |    |    |    |                           |               |
| Day                                                                                                               | Hourly Period Ending At (MST) |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    |                                                                                                                                                             |    |    |    |    | Daily Average             | Daily Maximum |
|                                                                                                                   | 1                             | 2  | 3 | 4 | 5                             | 6  | 7  | 8  | 9  | 10 | 11 | 12  | 13 | 14 | 15  | 16 | 17 | 18 | 19 | 20                                                                                                                                                          | 21 | 22 | 23 | 24 |                           |               |
| 1-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 2  | 0  | 0  | 0  | 1  | 3  | 2   | 23 | 8  | 5   | 3  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 2.2                       | 23.5          |
| 2-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 11 | 7  | 24 | 16 | 18 | 35  | 34 | 24 | 21  | 12 | 23 | 3  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 10.0                      | 35.4          |
| 3-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 1  | 1  | 0  | 1   | 2  | 1  | 1   | 1  | 1  | 1  | 1  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.5                       | 2.3           |
| 4-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 0  | 1   | 1  | 1  | 1   | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.3                       | 0.8           |
| 5-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 1  | 1  | 2   | 1  | 2  | 1   | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.5                       | 1.8           |
| 6-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 61 | 10 | 3   | 4  | 4  | 3   | 1  | 0  | 0  | 1  | 0                                                                                                                                                           | 4  | 0  | 0  | 0  | 3.9                       | 60.7          |
| 7-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 2  | 4  | 20 | 5  | 15 | 35  | 47 | 32 | 63  | 30 | 30 | 15 | 3  | 4                                                                                                                                                           | 1  | 5  | 2  | 11 | 14.1                      | 63.4          |
| 8-Dec                                                                                                             | 5                             | 28 | 1 | 0 | A                             | 0  | 0  | 0  | 0  | 1  | 2  | 4   | 4  | 4  | 2   | 2  | 1  | 0  | 1  | 0                                                                                                                                                           | 0  | 1  | 0  | 0  | 2.5                       | 28.1          |
| 9-Dec                                                                                                             | 0                             | 0  | 0 | 0 | A                             | 0  | 8  | 24 | 16 | 21 | 24 | 100 | 26 | 18 | 9   | 3  | 2  | 1  | 1  | 1                                                                                                                                                           | 0  | 0  | 0  | 1  | 11.2                      | 99.5          |
| 10-Dec                                                                                                            | 3                             | 2  | 2 | 0 | A                             | 9  | 2  | 2  | 1  | 2  | 3  | 3   | 4  | 3  | 3   | 2  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1  | 2.0                       | 9.5           |
| 11-Dec                                                                                                            | 0                             | 0  | 1 | 1 | A                             | 1  | 0  | 0  | 0  | 1  | 3  | 2   | 4  | 3  | 3   | 1  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.0                       | 3.6           |
| 12-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 1  | 2   | 1  | 1  | 1   | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.4                       | 1.7           |
| 13-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 1  | 1  | 1  | 1  | 2   | 2  | 9  | 9   | 1  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.2                       | 9.0           |
| 14-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 10 | 15 | C  | C   | C  | C  | 2   | 1  | 1  | 0  | 0  | 0                                                                                                                                                           | 1  | 1  | 0  | 0  | 1.7                       | 15.4          |
| 15-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 2  | 2  | 3  | 6   | 6  | 3  | 3   | 3  | 2  | 1  | 0  | 0                                                                                                                                                           | 5  | 4  | 14 | 8  | 2.8                       | 14.4          |
| 16-Dec                                                                                                            | 1                             | 0  | 0 | 0 | A                             | 13 | 1  | 1  | 3  | 2  | 5  | 46  | 81 | 34 | 53  | 37 | 29 | 9  | 0  | 1                                                                                                                                                           | 0  | 0  | 0  | 0  | 13.7                      | 80.9          |
| 17-Dec                                                                                                            | 24                            | 0  | 0 | 0 | A                             | 0  | 0  | 27 | 3  | 1  | 33 | 18  | 44 | 21 | 3   | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 7.7                       | 44.3          |
| 18-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 1  | 1   | 0  | 0  | 1   | 0  | 0  | 0  | 0  | 1                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.3                       | 0.9           |
| 19-Dec                                                                                                            | 0                             | 0  | 0 | 1 | A                             | 0  | 0  | 0  | 0  | 1  | 0  | 2   | 1  | 0  | 1   | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.4                       | 1.5           |
| 20-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 2  | 11  | 10 | 25 | 316 | 5  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 16.2                      | 315.6         |
| 21-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 1  | 1  | 1  | 0  | 1  | 1   | 1  | 1  | 0   | 1  | 1  | 0  | 1  | 0                                                                                                                                                           | 1  | 0  | 0  | 0  | 0.4                       | 1.1           |
| 22-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 1  | 1   | 2  | 2  | 1   | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.4                       | 2.2           |
| 23-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 1  | 4  | 11 | 1  | 5  | 3   | 3  | 4  | 2   | 1  | 1  | 1  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 1.7                       | 11.0          |
| 24-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 1  | 6  | 6   | 3  | 2  | 4   | 4  | 2  | 0  | 0  | 2                                                                                                                                                           | 0  | 0  | 0  | 1  | 1.4                       | 5.7           |
| 25-Dec                                                                                                            | 1                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 2  | 4  | 5   | 7  | 14 | 8   | 5  | 4  | 0  | 8  | 10                                                                                                                                                          | 1  | 1  | 2  | 1  | 3.2                       | 13.7          |
| 26-Dec                                                                                                            | 1                             | 0  | 1 | 0 | A                             | 0  | 0  | 0  | 0  | 1  | 3  | 24  | 9  | 9  | 10  | 7  | 5  | 11 | 1  | 1                                                                                                                                                           | 2  | 0  | 0  | 0  | 3.7                       | 23.6          |
| 27-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 1  | 1   | 1  | 1  | 0   | 0  | 0  | 0  | 1  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.3                       | 1.0           |
| 28-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 1   | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.3                       | 0.6           |
| 29-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 1  | 3   | 27 | 14 | 12  | 7  | 5  | 1  | 0  | 0                                                                                                                                                           | 1  | 0  | 0  | 0  | 3.2                       | 27.0          |
| 30-Dec                                                                                                            | 0                             | 2  | 1 | 0 | A                             | 0  | 0  | 0  | 1  | 0  | 0  | 1   | 1  | 1  | 1   | 0  | 1  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.5                       | 1.9           |
| 31-Dec                                                                                                            | 0                             | 0  | 0 | 0 | A                             | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 1  | 0  | 0   | 0  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0  | 0.2                       | 0.6           |
| 1.2 1.2 0.3 0.2 -- 1.0 1.0 2.4 3.1 4.4 4.9 10.6 11.7 8.0 17.3 4.2 3.6 1.5 0.7 0.8 0.7 0.5 0.8 0.8                 |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    |                                                                                                                                                             |    |    |    |    | Diurnal Average           |               |
| 24.1 28.1 1.8 1.1 -- 13.5 11.2 26.8 23.8 60.7 32.8 99.5 80.9 34.1 315.6 36.6 29.6 14.6 8.0 10.0 5.5 4.5 14.4 11.4 |                               |    |   |   |                               |    |    |    |    |    |    |     |    |    |     |    |    |    |    |                                                                                                                                                             |    |    |    |    | Diurnal Maximum           |               |
| C - Calibration                                                                                                   |                               |    |   |   | A - Automated Daily Zero Span |    |    |    |    |    |    |     |    |    |     |    |    |    |    |                                                                                                                                                             |    |    |    |    |                           |               |

## Hourly Maximums

Nitrogen Oxide (NO) - ppb  
Beaverlodge - December 2016



# Hourly Averages

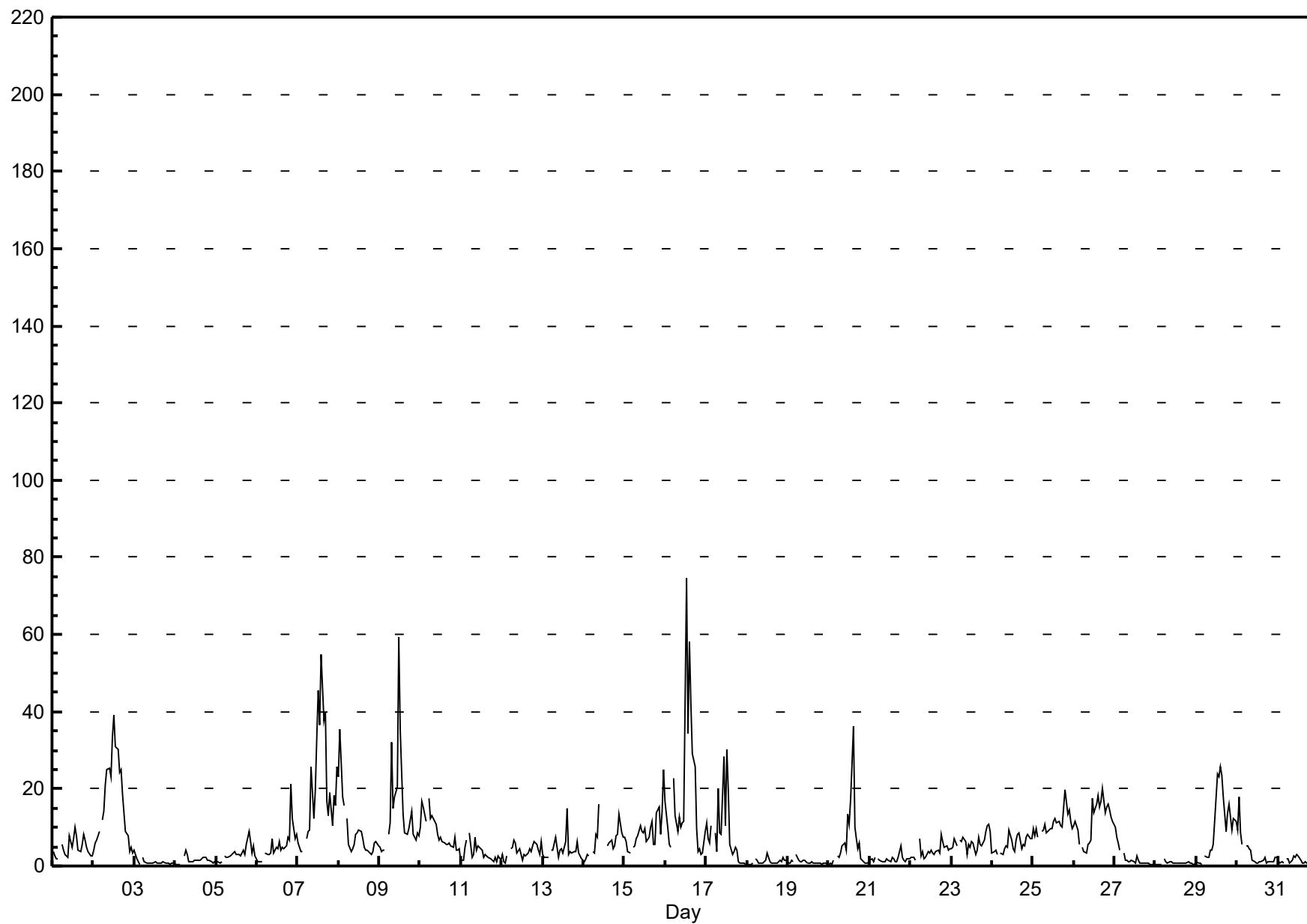
Oxides of Nitrogen (NO<sub>x</sub>) - ppb

Beaverlodge - December 2016

| Maximum Value: 74.7 ppb on Dec 16 13:00                                                                               |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 20.4 ppb on Dec 7                                                                                                                     |    |    |    |    | Hours in Service: 744           |               |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|---------------------------------|---------------|
| Minimum Value: 0 ppb on Dec 28 04:00                                                                                  |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.7 ppb on Dec 28                                                                                                                     |    |    |    |    | Hours of Data: 709              |               |
| Maximum Diurnal Average: 12.1 ppb at hour 13                                                                          |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 3.9 ppb at hour 4                                                                                                                   |    |    |    |    | Hours of Missing Data: 35       |               |
| Monthly Average: 6.64 ppb                                                                                             |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.5 Median = 4.1 Q <sub>3</sub> = 8.3 P <sub>90</sub> = 15.1 P <sub>99</sub> = 38.8 |    |    |    |    | Hours of Calibration: 35        |               |
|                                                                                                                       |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Percent Operational Time: 100.0 |               |
| Day                                                                                                                   | Hourly Period Ending At (MST) |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Daily Average                   | Daily Maximum |
|                                                                                                                       | 1                             | 2  | 3  | 4  | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                           | 21 | 22 | 23 | 24 |                                 |               |
| 1-Dec                                                                                                                 | 4                             | 2  | 2  | 2  | A | 5  | 4  | 3  | 3  | 2  | 8  | 5  | 7  | 10 | 8  | 4  | 4  | 6  | 8  | 7                                                                                                                                                            | 5  | 4  | 3  | 3  | 4.7                             | 10.1          |
| 2-Dec                                                                                                                 | 4                             | 6  | 7  | 9  | A | 12 | 14 | 21 | 25 | 25 | 23 | 34 | 39 | 31 | 30 | 24 | 25 | 19 | 14 | 9                                                                                                                                                            | 8  | 4  | 5  | 3  | 17.0                            | 39.0          |
| 3-Dec                                                                                                                 | 4                             | 2  | 1  | 1  | A | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.0                             | 4.2           |
| 4-Dec                                                                                                                 | 0                             | 0  | 0  | 0  | A | 3  | 4  | 3  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                            | 2  | 1  | 1  | 1  | 1.5                             | 3.9           |
| 5-Dec                                                                                                                 | 1                             | 1  | 1  | 1  | A | 3  | 2  | 2  | 2  | 3  | 3  | 4  | 3  | 3  | 3  | 3  | 4  | 3  | 6  | 9                                                                                                                                                            | 6  | 3  | 5  | 3  | 3.2                             | 9.1           |
| 6-Dec                                                                                                                 | 1                             | 1  | 1  | 1  | A | 3  | 3  | 3  | 4  | 7  | 3  | 5  | 4  | 6  | 4  | 5  | 5  | 5  | 7  | 7                                                                                                                                                            | 21 | 12 | 7  | 8  | 5.5                             | 21.2          |
| 7-Dec                                                                                                                 | 6                             | 5  | 4  | 4  | A | 7  | 9  | 9  | 26 | 12 | 20 | 33 | 45 | 37 | 55 | 38 | 40 | 17 | 13 | 19                                                                                                                                                           | 10 | 18 | 16 | 26 | 20.4                            | 54.7          |
| 8-Dec                                                                                                                 | 23                            | 35 | 18 | 16 | A | 12 | 6  | 4  | 4  | 6  | 8  | 8  | 9  | 9  | 7  | 5  | 4  | 4  | 3  | 3                                                                                                                                                            | 4  | 6  | 6  | 5  | 9.0                             | 35.3          |
| 9-Dec                                                                                                                 | 5                             | 4  | 4  | 4  | A | 8  | 11 | 32 | 15 | 18 | 21 | 59 | 35 | 24 | 13 | 9  | 8  | 10 | 12 | 14                                                                                                                                                           | 8  | 7  | 8  | 8  | 14.7                            | 59.4          |
| 10-Dec                                                                                                                | 10                            | 17 | 15 | 12 | A | 18 | 12 | 13 | 11 | 11 | 8  | 7  | 7  | 6  | 6  | 6  | 6  | 6  | 5  | 5                                                                                                                                                            | 7  | 4  | 4  | 4  | 8.8                             | 17.7          |
| 11-Dec                                                                                                                | 2                             | 1  | 5  | 7  | A | 8  | 2  | 3  | 8  | 4  | 5  | 5  | 4  | 2  | 3  | 3  | 2  | 2  | 2  | 1                                                                                                                                                            | 2  | 1  | 2  | 1  | 3.3                             | 8.5           |
| 12-Dec                                                                                                                | 3                             | 1  | 1  | 2  | A | 5  | 5  | 7  | 6  | 4  | 4  | 3  | 1  | 3  | 2  | 3  | 5  | 4  | 5  | 6                                                                                                                                                            | 6  | 4  | 3  | 6  | 3.9                             | 6.6           |
| 13-Dec                                                                                                                | 3                             | 2  | 2  | 2  | A | 4  | 4  | 7  | 5  | 2  | 4  | 4  | 3  | 6  | 15 | 3  | 4  | 3  | 4  | 4                                                                                                                                                            | 6  | 3  | 3  | 2  | 4.2                             | 14.8          |
| 14-Dec                                                                                                                | 1                             | 2  | 3  | 3  | A | 4  | 3  | 8  | 7  | 16 | C  | C  | C  | C  | 5  | 6  | 7  | 5  | 5  | 8                                                                                                                                                            | 8  | 14 | 9  | 7  | 6.3                             | 16.1          |
| 15-Dec                                                                                                                | 7                             | 6  | 4  | 3  | A | 5  | 5  | 7  | 8  | 10 | 9  | 9  | 10 | 6  | 7  | 10 | 11 | 6  | 5  | 14                                                                                                                                                           | 15 | 8  | 14 | 25 | 9.0                             | 25.0          |
| 16-Dec                                                                                                                | 17                            | 10 | 6  | 5  | A | 23 | 13 | 9  | 13 | 10 | 11 | 12 | 75 | 34 | 58 | 42 | 29 | 26 | 10 | 4                                                                                                                                                            | 5  | 3  | 3  | 9  | 18.5                            | 74.7          |
| 17-Dec                                                                                                                | 11                            | 7  | 6  | 10 | A | 9  | 4  | 20 | 9  | 8  | 28 | 10 | 30 | 20 | 6  | 3  | 4  | 5  | 4  | 1                                                                                                                                                            | 1  | 1  | 1  | 0  | 8.6                             | 30.3          |
| 18-Dec                                                                                                                | 1                             | 0  | 0  | 1  | A | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 2  | 2  | 2  | 1.1                             | 3.3           |
| 19-Dec                                                                                                                | 1                             | 1  | 1  | 1  | A | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 0  | 1.0                             | 2.9           |
| 20-Dec                                                                                                                | 0                             | 1  | 0  | 1  | A | 2  | 2  | 3  | 5  | 6  | 4  | 14 | 11 | 17 | 36 | 10 | 7  | 5  | 6  | 2                                                                                                                                                            | 1  | 1  | 1  | 1  | 5.9                             | 36.0          |
| 21-Dec                                                                                                                | 1                             | 2  | 1  | 2  | A | 2  | 1  | 1  | 1  | 1  | 2  | 2  | 1  | 2  | 2  | 1  | 1  | 2  | 5  | 2                                                                                                                                                            | 2  | 1  | 2  | 2  | 1.7                             | 5.0           |
| 22-Dec                                                                                                                | 2                             | 2  | 2  | 1  | A | 7  | 3  | 4  | 2  | 2  | 4  | 3  | 4  | 3  | 3  | 4  | 4  | 3  | 8  | 6                                                                                                                                                            | 5  | 5  | 4  | 5  | 3.8                             | 8.1           |
| 23-Dec                                                                                                                | 4                             | 5  | 7  | 5  | A | 7  | 6  | 8  | 6  | 3  | 5  | 5  | 6  | 6  | 3  | 4  | 7  | 6  | 5  | 7                                                                                                                                                            | 9  | 11 | 11 | 9  | 6.3                             | 10.6          |
| 24-Dec                                                                                                                | 3                             | 4  | 4  | 3  | A | 3  | 3  | 4  | 5  | 5  | 9  | 7  | 4  | 4  | 7  | 8  | 9  | 5  | 5  | 5                                                                                                                                                            | 7  | 8  | 7  | 7  | 5.6                             | 9.3           |
| 25-Dec                                                                                                                | 10                            | 8  | 10 | 7  | A | 9  | 9  | 11 | 9  | 9  | 10 | 10 | 12 | 12 | 11 | 12 | 10 | 10 | 15 | 20                                                                                                                                                           | 14 | 15 | 12 | 10 | 11.0                            | 19.7          |
| 26-Dec                                                                                                                | 10                            | 12 | 9  | 5  | A | 5  | 4  | 3  | 5  | 6  | 7  | 18 | 14 | 16 | 18 | 15 | 17 | 20 | 14 | 15                                                                                                                                                           | 16 | 15 | 13 | 12 | 11.7                            | 20.1          |
| 27-Dec                                                                                                                | 10                            | 7  | 6  | 4  | A | 3  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 0  | 0  | 0  | 2.1                             | 9.9           |
| 28-Dec                                                                                                                | 0                             | 0  | 0  | 0  | A | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 0  | 0  | 0.7                             | 1.7           |
| 29-Dec                                                                                                                | 1                             | 1  | 1  | 1  | A | 2  | 2  | 2  | 4  | 4  | 5  | 12 | 24 | 23 | 26 | 24 | 18 | 9  | 14 | 16                                                                                                                                                           | 13 | 9  | 12 | 12 | 10.2                            | 25.8          |
| 30-Dec                                                                                                                | 9                             | 18 | 9  | 6  | A | 5  | 5  | 5  | 4  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 2  | 2  | 3.5                             | 17.9          |
| 31-Dec                                                                                                                | 2                             | 1  | 1  | 1  | A | 2  | 2  | 1  | 2  | 3  | 2  | 3  | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 4  | 3  | 2  | 3  | 1.7                             | 4.5           |
| 5.1 5.3 4.2 3.9 -- 6.0 4.7 6.4 6.3 6.0 7.1 9.2 12.1 9.8 10.8 8.0 7.7 6.0 5.9 6.2 6.1 5.3 5.2 5.7                      |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Average                 |               |
| 23.0 35.3 18.0 15.8 -- 22.9 14.3 32.0 25.6 25.3 28.3 59.4 74.7 36.6 58.2 42.2 40.0 25.6 15.0 19.7 21.2 18.2 15.7 25.6 |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Maximum                 |               |
| C - Calibration A - Automated Daily Zero Span                                                                         |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                                 |               |

## Hourly Averages

Oxides of Nitrogen (NO<sub>x</sub>) - ppb  
Beaverlodge - December 2016



# Hourly Maximums

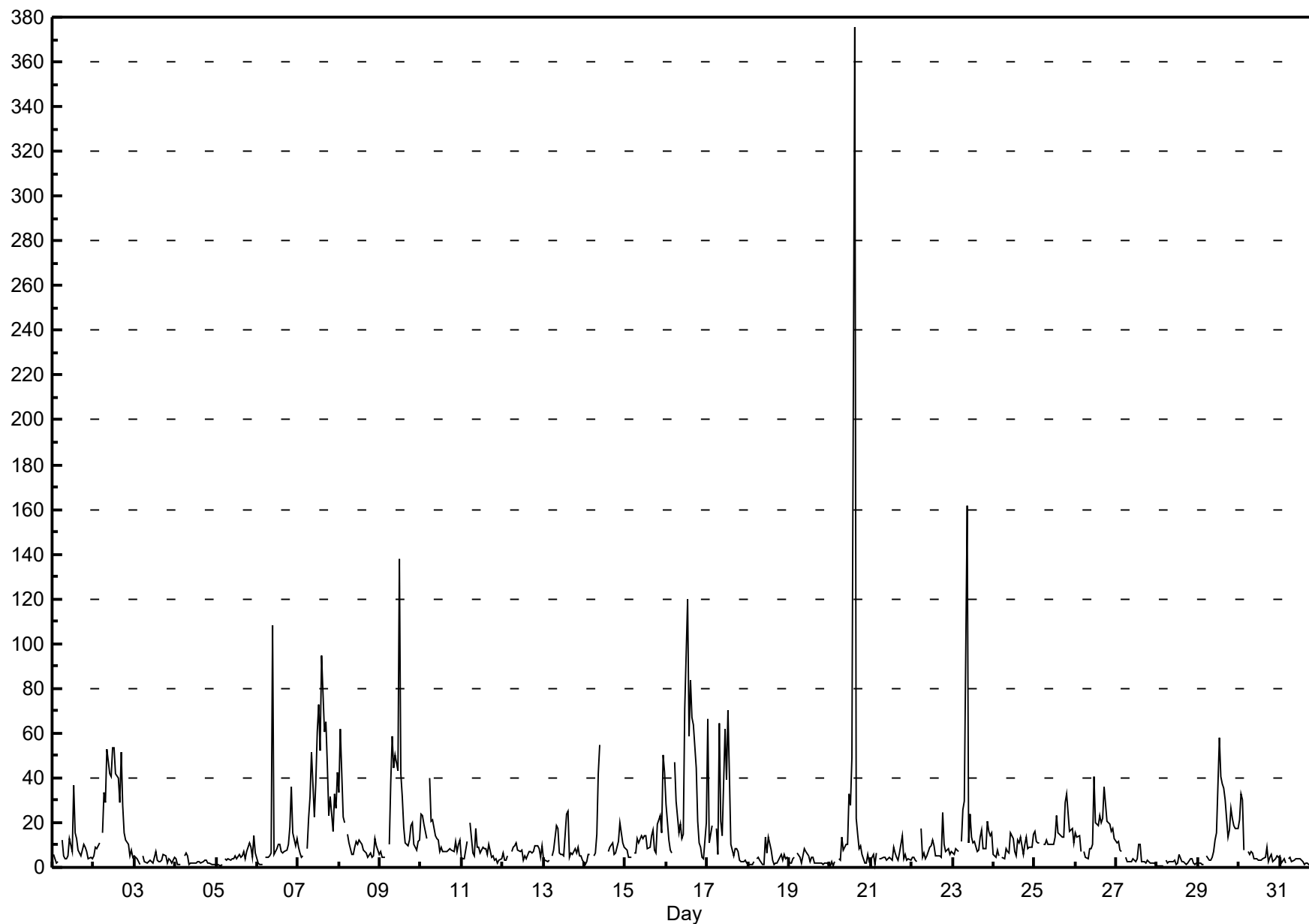
Oxides of Nitrogen (NO<sub>x</sub>) - ppb

Beaverlodge - December 2016

| Maximum Value: 375.5 ppb on Dec 20 15:00                                                                                   |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    | Maximum Daily Average: 35.7 ppb on Dec 7                                                                                                                      |    |    |    |                 | Hours in Service: 744     |  |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|---|----|----|----|-----|-----|----|-----|-----|----|-----|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|---------------------------|--|
| Minimum Value: 0 ppb on Dec 28 01:00                                                                                       |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    | Minimum Daily Average: 2.2 ppb on Dec 28                                                                                                                      |    |    |    |                 | Hours of Data: 709        |  |
| Maximum Diurnal Average: 27.4 ppb at hour 15                                                                               |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    | Minimum Diurnal Average: 5.9 ppb at hour 4                                                                                                                    |    |    |    |                 | Hours of Missing Data: 35 |  |
| Monthly Average: 12.66 ppb                                                                                                 |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.9 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 3.8 Median = 6.9 Q <sub>3</sub> = 13.2 P <sub>90</sub> = 28.9 P <sub>99</sub> = 77.1 |    |    |    |                 | Hours of Calibration: 35  |  |
|                                                                                                                            |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    | Percent Operational Time: 100.0                                                                                                                               |    |    |    |                 |                           |  |
| Day                                                                                                                        | Hourly Period Ending At (MST) |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    |                                                                                                                                                               |    |    |    | Daily Average   | Daily Maximum             |  |
|                                                                                                                            | 1                             | 2  | 3  | 4  | 5 | 6  | 7  | 8  | 9   | 10  | 11 | 12  | 13  | 14 | 15  | 16 | 17 | 18 | 19 | 20 | 21                                                                                                                                                            | 22 | 23 | 24 |                 |                           |  |
| 1-Dec                                                                                                                      | 6                             | 4  | 2  | 3  | A | 12 | 5  | 4  | 4   | 5   | 13 | 7   | 37  | 16 | 13  | 7  | 5  | 8  | 10 | 9  | 7                                                                                                                                                             | 4  | 4  | 4  | 8.3             | 37.0                      |  |
| 2-Dec                                                                                                                      | 5                             | 9  | 8  | 11 | A | 15 | 33 | 29 | 53  | 42  | 40 | 53  | 54  | 42 | 40  | 29 | 52 | 28 | 15 | 12 | 10                                                                                                                                                            | 5  | 7  | 4  | 26.0            | 53.6                      |  |
| 3-Dec                                                                                                                      | 5                             | 4  | 2  | 1  | A | 5  | 2  | 2  | 3   | 3   | 3  | 2   | 7   | 3  | 3   | 3  | 3  | 6  | 5  | 2  | 4                                                                                                                                                             | 3  | 2  | 4  | 3.4             | 7.0                       |  |
| 4-Dec                                                                                                                      | 4                             | 1  | 1  | 1  | A | 5  | 7  | 5  | 1   | 2   | 2  | 2   | 2   | 2  | 2   | 2  | 3  | 3  | 3  | 2  | 2                                                                                                                                                             | 2  | 1  | 1  | 2.5             | 6.7                       |  |
| 5-Dec                                                                                                                      | 1                             | 1  | 1  | 1  | A | 4  | 3  | 4  | 3   | 4   | 4  | 5   | 4   | 6  | 4   | 5  | 7  | 4  | 7  | 11 | 9                                                                                                                                                             | 4  | 14 | 6  | 4.9             | 14.3                      |  |
| 6-Dec                                                                                                                      | 2                             | 2  | 2  | 1  | A | 5  | 5  | 5  | 6   | 108 | 6  | 8   | 10  | 10 | 7   | 7  | 7  | 8  | 10 | 18 | 36                                                                                                                                                            | 15 | 10 | 13 | 13.1            | 107.9                     |  |
| 7-Dec                                                                                                                      | 9                             | 7  | 4  | 5  | A | 8  | 22 | 31 | 52  | 23  | 38 | 60  | 73  | 52 | 94  | 60 | 65 | 46 | 23 | 31 | 16                                                                                                                                                            | 33 | 27 | 42 | 35.7            | 94.4                      |  |
| 8-Dec                                                                                                                      | 34                            | 62 | 22 | 20 | A | 15 | 11 | 6  | 6   | 9   | 12 | 11  | 12  | 11 | 8   | 7  | 6  | 5  | 7  | 4  | 5                                                                                                                                                             | 13 | 9  | 6  | 13.0            | 61.5                      |  |
| 9-Dec                                                                                                                      | 7                             | 4  | 5  | 5  | A | 10 | 38 | 59 | 44  | 50  | 43 | 138 | 42  | 32 | 18  | 11 | 10 | 12 | 19 | 20 | 10                                                                                                                                                            | 8  | 11 | 12 | 26.5            | 137.7                     |  |
| 10-Dec                                                                                                                     | 24                            | 23 | 19 | 13 | A | 40 | 21 | 22 | 14  | 13  | 13 | 7   | 9   | 7  | 7   | 7  | 8  | 8  | 7  | 7  | 12                                                                                                                                                            | 7  | 10 | 12 | 13.4            | 39.7                      |  |
| 11-Dec                                                                                                                     | 4                             | 4  | 8  | 12 | A | 20 | 6  | 5  | 17  | 9   | 9  | 7   | 9   | 8  | 8   | 6  | 10 | 5  | 5  | 3  | 4                                                                                                                                                             | 2  | 4  | 4  | 7.3             | 20.3                      |  |
| 12-Dec                                                                                                                     | 6                             | 4  | 3  | 5  | A | 7  | 9  | 10 | 11  | 8   | 7  | 8   | 3   | 5  | 4   | 7  | 7  | 6  | 7  | 10 | 10                                                                                                                                                            | 9  | 4  | 10 | 6.9             | 10.6                      |  |
| 13-Dec                                                                                                                     | 4                             | 3  | 3  | 3  | A | 5  | 8  | 19 | 17  | 6   | 6  | 6   | 5   | 24 | 25  | 4  | 7  | 6  | 8  | 6  | 9                                                                                                                                                             | 5  | 5  | 3  | 8.1             | 25.2                      |  |
| 14-Dec                                                                                                                     | 1                             | 2  | 6  | 6  | A | 5  | 6  | 15 | 42  | 54  | C  | C   | C   | C  | 7   | 9  | 11 | 6  | 6  | 9  | 11                                                                                                                                                            | 20 | 11 | 9  | 12.5            | 54.4                      |  |
| 15-Dec                                                                                                                     | 9                             | 8  | 5  | 4  | A | 7  | 6  | 13 | 11  | 14  | 13 | 14  | 14  | 8  | 9   | 14 | 17 | 8  | 7  | 19 | 23                                                                                                                                                            | 16 | 50 | 42 | 14.4            | 50.0                      |  |
| 16-Dec                                                                                                                     | 28                            | 12 | 8  | 7  | A | 47 | 30 | 16 | 19  | 13  | 15 | 71  | 120 | 58 | 83  | 67 | 63 | 45 | 20 | 11 | 9                                                                                                                                                             | 5  | 4  | 20 | 33.5            | 119.9                     |  |
| 17-Dec                                                                                                                     | 66                            | 11 | 15 | 19 | A | 17 | 6  | 65 | 21  | 14  | 62 | 39  | 70  | 41 | 10  | 5  | 8  | 8  | 7  | 3  | 3                                                                                                                                                             | 2  | 3  | 2  | 21.6            | 70.3                      |  |
| 18-Dec                                                                                                                     | 1                             | 2  | 1  | 2  | A | 4  | 4  | 3  | 1   | 1   | 13 | 6   | 14  | 8  | 3   | 1  | 2  | 2  | 3  | 6  | 3                                                                                                                                                             | 6  | 4  | 4  | 4.1             | 13.6                      |  |
| 19-Dec                                                                                                                     | 2                             | 2  | 4  | 5  | A | 7  | 4  | 2  | 5   | 9   | 7  | 5   | 3   | 5  | 4   | 2  | 2  | 2  | 2  | 2  | 2                                                                                                                                                             | 2  | 2  | 1  | 3.4             | 8.6                       |  |
| 20-Dec                                                                                                                     | 1                             | 3  | 1  | 2  | A | 4  | 3  | 13 | 8   | 10  | 10 | 33  | 28  | 49 | 376 | 22 | 15 | 9  | 10 | 6  | 2                                                                                                                                                             | 2  | 5  | 3  | 26.7            | 375.5                     |  |
| 21-Dec                                                                                                                     | 3                             | 6  | 2  | 6  | A | 4  | 4  | 5  | 4   | 3   | 4  | 4   | 3   | 9  | 6   | 4  | 3  | 6  | 14 | 4  | 6                                                                                                                                                             | 3  | 4  | 3  | 4.8             | 13.9                      |  |
| 22-Dec                                                                                                                     | 5                             | 5  | 3  | 2  | A | 17 | 5  | 6  | 4   | 5   | 9  | 10  | 12  | 9  | 5   | 5  | 5  | 5  | 24 | 11 | 7                                                                                                                                                             | 8  | 6  | 7  | 7.6             | 24.3                      |  |
| 23-Dec                                                                                                                     | 6                             | 6  | 9  | 7  | A | 11 | 26 | 29 | 162 | 11  | 24 | 14  | 11  | 11 | 7   | 8  | 13 | 17 | 8  | 9  | 21                                                                                                                                                            | 16 | 14 | 16 | 19.8            | 161.5                     |  |
| 24-Dec                                                                                                                     | 6                             | 4  | 8  | 5  | A | 5  | 4  | 8  | 7   | 6   | 15 | 13  | 7   | 5  | 12  | 11 | 13 | 6  | 10 | 14 | 8                                                                                                                                                             | 9  | 9  | 15 | 8.7             | 15.4                      |  |
| 25-Dec                                                                                                                     | 16                            | 11 | 11 | 11 | A | 10 | 10 | 12 | 11  | 11  | 11 | 10  | 13  | 23 | 16  | 14 | 14 | 13 | 29 | 33 | 16                                                                                                                                                            | 17 | 17 | 11 | 14.7            | 32.9                      |  |
| 26-Dec                                                                                                                     | 15                            | 14 | 14 | 7  | A | 7  | 4  | 4  | 9   | 9   | 11 | 40  | 20  | 18 | 23  | 20 | 22 | 36 | 21 | 20 | 19                                                                                                                                                            | 16 | 17 | 13 | 16.5            | 40.3                      |  |
| 27-Dec                                                                                                                     | 11                            | 11 | 8  | 7  | A | 5  | 2  | 2  | 3   | 2   | 4  | 3   | 4   | 10 | 10  | 2  | 2  | 2  | 3  | 3  | 2                                                                                                                                                             | 2  | 2  | 1  | 4.4             | 11.4                      |  |
| 28-Dec                                                                                                                     | 0                             | 1  | 1  | 1  | A | 3  | 2  | 3  | 2   | 2   | 3  | 1   | 2   | 6  | 2   | 3  | 2  | 1  | 2  | 4  | 4                                                                                                                                                             | 2  | 1  | 2  | 2.2             | 6.0                       |  |
| 29-Dec                                                                                                                     | 2                             | 2  | 2  | 1  | A | 5  | 3  | 3  | 5   | 7   | 12 | 15  | 58  | 41 | 38  | 35 | 30 | 14 | 17 | 26 | 22                                                                                                                                                            | 18 | 17 | 17 | 17.0            | 58.1                      |  |
| 30-Dec                                                                                                                     | 21                            | 33 | 30 | 7  | A | 7  | 6  | 7  | 7   | 4   | 4  | 3   | 3   | 4  | 4   | 4  | 9  | 2  | 5  | 6  | 3                                                                                                                                                             | 4  | 5  | 4  | 7.9             | 33.0                      |  |
| 31-Dec                                                                                                                     | 5                             | 2  | 4  | 2  | A | 4  | 4  | 2  | 3   | 4   | 4  | 4   | 4   | 3  | 1   | 2  | 2  | 1  | 1  | 5  | 6                                                                                                                                                             | 4  | 3  | 6  | 3.3             | 5.9                       |  |
| 10.0 8.4 6.8 5.9 -- 10.3 9.7 13.2 17.9 14.9 13.9 20.0 21.8 17.6 27.4 12.4 13.6 10.5 10.2 10.5 9.7 8.5 9.2 9.6              |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    |                                                                                                                                                               |    |    |    | Diurnal Average |                           |  |
| 66.4 61.5 30.2 20.2 -- 47.3 38.0 64.7 161.5 107.9 61.5 137.7 119.9 58.5 375.5 67.0 65.1 45.9 28.9 32.9 36.3 32.7 50.0 42.5 |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    |                                                                                                                                                               |    |    |    | Diurnal Maximum |                           |  |
| C - Calibration A - Automated Daily Zero Span                                                                              |                               |    |    |    |   |    |    |    |     |     |    |     |     |    |     |    |    |    |    |    |                                                                                                                                                               |    |    |    |                 |                           |  |

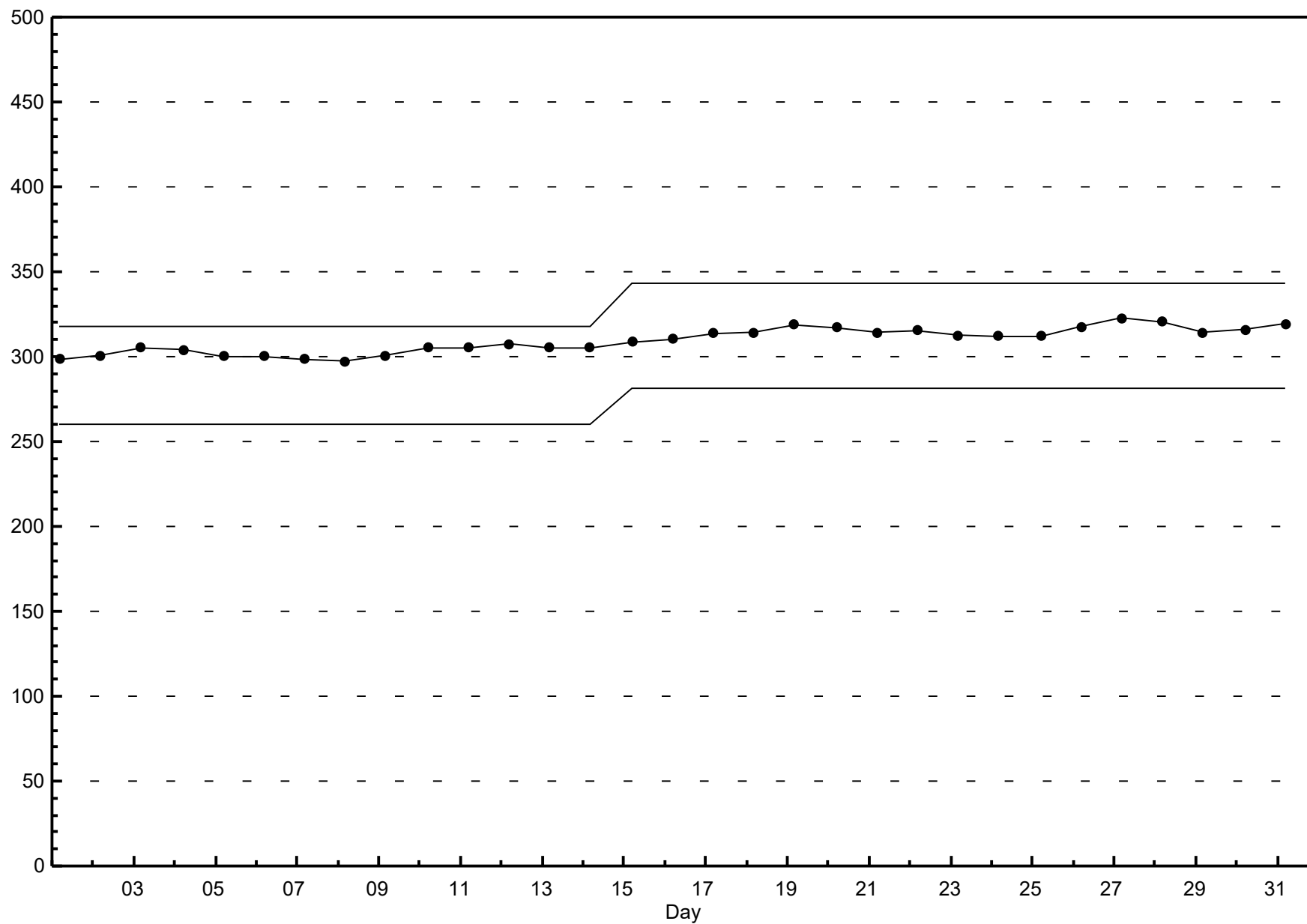
## Hourly Maximums

Oxides of Nitrogen (NO<sub>x</sub>) - ppb  
Beaverlodge - December 2016



## Span Responses

Oxides of Nitrogen (NO<sub>x</sub>)  
Beaverlodge - December 2016



# Hourly Averages

Ozone (O<sub>3</sub>) - ppb

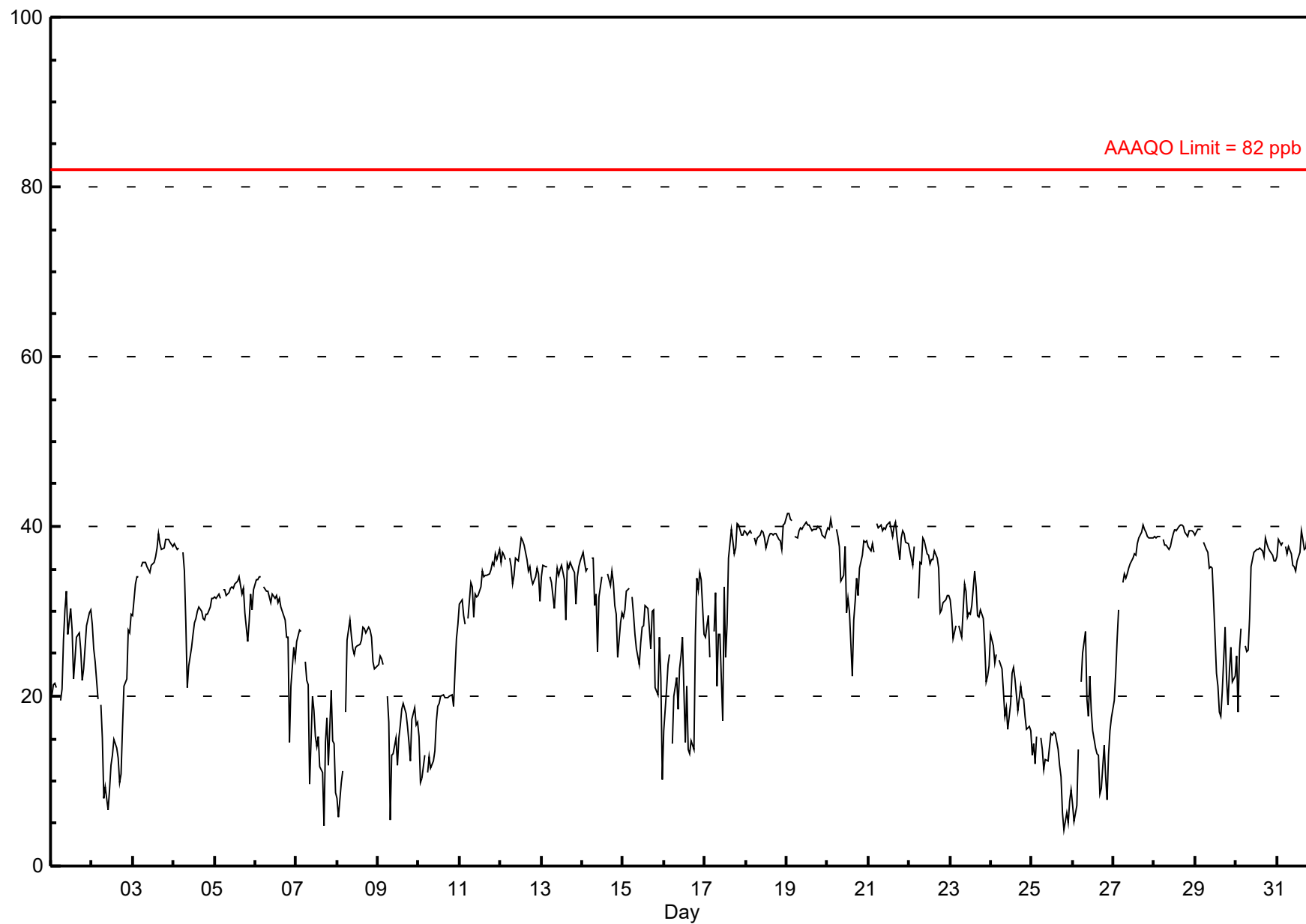
Beaverlodge - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 41.6 ppb on Dec 19 02:00 Maximum Daily Average: 39.9 ppb on Dec 19 |                               |    |    |    |   |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 710<br>Hours of Missing Data: 34<br>Hours of Calibration: 34<br>Percent Operational Time: 100.0 |               |               |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|---|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|-----------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 4 ppb on Dec 25 20:00<br>Maximum Diurnal Average: 29.8 ppb at hour 7<br>Monthly Average: 28.98 ppb                    |                               |    |    |    |   |    |    |    |    |    |    | Minimum Daily Average: 11.8 ppb on Dec 25<br>Minimum Diurnal Average: 28.0 ppb at hour 9<br>Percentiles: P <sub>1</sub> = 6.2 P <sub>10</sub> = 14.5 Q <sub>1</sub> = 22.4 Median = 31.3 Q <sub>3</sub> = 36.8 P <sub>90</sub> = 39.1 P <sub>99</sub> = 40.4 |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                         |               |               |
| Day                                                                                                                                  | Hourly Period Ending At (MST) |    |    |    |   |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                         | Daily Average | Daily Maximum |
|                                                                                                                                      | 1                             | 2  | 3  | 4  | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12                                                                                                                                                                                                                                                           | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                                                                                                                                      |               |               |
| 1-Dec                                                                                                                                | 20                            | 21 | 21 | 21 | A | 20 | 21 | 27 | 30 | 32 | 27 | 30                                                                                                                                                                                                                                                           | 28 | 22 | 24 | 27 | 27 | 25 | 22 | 23 | 26 | 28 | 30 | 30                                                                                                                                      | 25.4          | 32.4          |
| 2-Dec                                                                                                                                | 28                            | 26 | 24 | 20 | A | 19 | 15 | 8  | 9  | 7  | 9  | 12                                                                                                                                                                                                                                                           | 13 | 15 | 14 | 13 | 10 | 11 | 16 | 21 | 22 | 28 | 27 | 30                                                                                                                                      | 17.2          | 29.6          |
| 3-Dec                                                                                                                                | 29                            | 33 | 34 | 34 | A | 35 | 36 | 36 | 35 | 35 | 35 | 35                                                                                                                                                                                                                                                           | 36 | 36 | 37 | 39 | 38 | 37 | 38 | 39 | 38 | 39 | 38 | 38                                                                                                                                      | 36.1          | 39.2          |
| 4-Dec                                                                                                                                | 38                            | 38 | 37 | 37 | A | 37 | 35 | 29 | 21 | 24 | 26 | 27                                                                                                                                                                                                                                                           | 29 | 29 | 30 | 31 | 30 | 29 | 29 | 30 | 30 | 31 | 31 | 32                                                                                                                                      | 30.8          | 37.9          |
| 5-Dec                                                                                                                                | 32                            | 31 | 32 | 32 | A | 32 | 32 | 32 | 32 | 33 | 33 | 33                                                                                                                                                                                                                                                           | 33 | 34 | 34 | 33 | 32 | 33 | 30 | 26 | 29 | 32 | 30 | 32                                                                                                                                      | 31.9          | 34.1          |
| 6-Dec                                                                                                                                | 34                            | 34 | 34 | 34 | A | 33 | 32 | 32 | 32 | 31 | 32 | 31                                                                                                                                                                                                                                                           | 32 | 31 | 32 | 30 | 30 | 29 | 27 | 27 | 15 | 21 | 26 | 24                                                                                                                                      | 29.7          | 34.1          |
| 7-Dec                                                                                                                                | 26                            | 27 | 28 | 28 | A | 24 | 22 | 21 | 10 | 20 | 18 | 15                                                                                                                                                                                                                                                           | 14 | 15 | 12 | 11 | 5  | 15 | 17 | 12 | 21 | 15 | 14 | 9                                                                                                                                       | 17.3          | 27.9          |
| 8-Dec                                                                                                                                | 8                             | 6  | 10 | 11 | A | 18 | 27 | 29 | 27 | 26 | 25 | 26                                                                                                                                                                                                                                                           | 26 | 26 | 27 | 28 | 28 | 28 | 28 | 27 | 24 | 23 | 24 | 24                                                                                                                                      | 23.0          | 28.9          |
| 9-Dec                                                                                                                                | 24                            | 25 | 24 | 24 | A | 20 | 17 | 5  | 13 | 13 | 15 | 12                                                                                                                                                                                                                                                           | 15 | 17 | 18 | 19 | 18 | 16 | 15 | 12 | 17 | 19 | 17 | 17                                                                                                                                      | 17.1          | 24.7          |
| 10-Dec                                                                                                                               | 15                            | 10 | 10 | 13 | A | 11 | 13 | 12 | 12 | 14 | 17 | 19                                                                                                                                                                                                                                                           | 19 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 19 | 23 | 27 | 28                                                                                                                                      | 17.5          | 28.5          |
| 11-Dec                                                                                                                               | 31                            | 31 | 30 | 28 | A | 29 | 33 | 33 | 29 | 32 | 32 | 32                                                                                                                                                                                                                                                           | 33 | 35 | 34 | 34 | 34 | 34 | 35 | 36 | 35 | 37 | 36 | 37                                                                                                                                      | 33.1          | 37.3          |
| 12-Dec                                                                                                                               | 36                            | 37 | 37 | 36 | A | 36 | 35 | 33 | 34 | 36 | 36 | 37                                                                                                                                                                                                                                                           | 39 | 38 | 38 | 36 | 35 | 35 | 34 | 33 | 34 | 35 | 34 | 31                                                                                                                                      | 35.5          | 38.7          |
| 13-Dec                                                                                                                               | 34                            | 35 | 35 | 35 | A | 34 | 33 | 30 | 33 | 35 | 34 | 35                                                                                                                                                                                                                                                           | 35 | 34 | 29 | 36 | 35 | 36 | 35 | 35 | 31 | 34 | 35 | 36                                                                                                                                      | 34.2          | 36.0          |
| 14-Dec                                                                                                                               | 37                            | 36 | 35 | 35 | A | 36 | 36 | 31 | 32 | 25 | 32 | 34                                                                                                                                                                                                                                                           | C  | C  | C  | 34 | 33 | 35 | 33 | 31 | 30 | 25 | 29 | 30                                                                                                                                      | 32.4          | 36.9          |
| 15-Dec                                                                                                                               | 29                            | 30 | 32 | 33 | A | 32 | 30 | 27 | 26 | 24 | 26 | 28                                                                                                                                                                                                                                                           | 28 | 31 | 30 | 28 | 26 | 30 | 30 | 21 | 20 | 27 | 22 | 10                                                                                                                                      | 27.0          | 32.7          |
| 16-Dec                                                                                                                               | 16                            | 21 | 24 | 25 | A | 14 | 20 | 22 | 18 | 23 | 25 | 27                                                                                                                                                                                                                                                           | 15 | 21 | 14 | 13 | 15 | 14 | 27 | 34 | 33 | 35 | 34 | 27                                                                                                                                      | 22.4          | 34.6          |
| 17-Dec                                                                                                                               | 27                            | 28 | 29 | 25 | A | 28 | 32 | 21 | 27 | 27 | 17 | 33                                                                                                                                                                                                                                                           | 25 | 29 | 36 | 40 | 38 | 37 | 37 | 40 | 40 | 39 | 39 | 39                                                                                                                                      | 31.9          | 40.4          |
| 18-Dec                                                                                                                               | 39                            | 39 | 39 | 39 | A | 39 | 38 | 39 | 39 | 39 | 39 | 39                                                                                                                                                                                                                                                           | 38 | 39 | 39 | 39 | 39 | 39 | 39 | 38 | 38 | 37 | 40 | 40                                                                                                                                      | 38.9          | 40.3          |
| 19-Dec                                                                                                                               | 41                            | 42 | 41 | 41 | A | 39 | 39 | 40 | 40 | 40 | 40 | 40                                                                                                                                                                                                                                                           | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 39 | 39 | 39                                                                                                                                      | 39.9          | 41.6          |
| 20-Dec                                                                                                                               | 40                            | 40 | 41 | 40 | A | 40 | 39 | 38 | 34 | 34 | 38 | 30                                                                                                                                                                                                                                                           | 32 | 30 | 22 | 29 | 31 | 34 | 32 | 35 | 37 | 38 | 38 | 38                                                                                                                                      | 35.1          | 40.8          |
| 21-Dec                                                                                                                               | 38                            | 37 | 38 | 37 | A | 40 | 40 | 40 | 39 | 40 | 40 | 40                                                                                                                                                                                                                                                           | 41 | 40 | 39 | 40 | 40 | 39 | 36 | 39 | 39 | 39 | 38 | 38                                                                                                                                      | 39.0          | 40.5          |
| 22-Dec                                                                                                                               | 37                            | 36 | 35 | 38 | A | 32 | 36 | 36 | 39 | 38 | 37 | 37                                                                                                                                                                                                                                                           | 36 | 36 | 36 | 37 | 36 | 35 | 30 | 30 | 31 | 31 | 32 | 32                                                                                                                                      | 34.9          | 38.7          |
| 23-Dec                                                                                                                               | 31                            | 30 | 27 | 28 | A | 28 | 28 | 27 | 33 | 32 | 29 | 30                                                                                                                                                                                                                                                           | 30 | 31 | 35 | 33 | 29 | 29 | 30 | 29 | 26 | 22 | 22 | 24                                                                                                                                      | 28.8          | 34.8          |
| 24-Dec                                                                                                                               | 27                            | 26 | 24 | 25 | A | 24 | 23 | 21 | 18 | 19 | 16 | 19                                                                                                                                                                                                                                                           | 23 | 23 | 22 | 20 | 18 | 21 | 20 | 20 | 18 | 16 | 16 | 16                                                                                                                                      | 20.7          | 27.3          |
| 25-Dec                                                                                                                               | 13                            | 14 | 12 | 15 | A | 15 | 14 | 11 | 13 | 12 | 14 | 16                                                                                                                                                                                                                                                           | 15 | 16 | 16 | 14 | 12 | 10 | 6  | 4  | 6  | 5  | 8  | 9                                                                                                                                       | 11.8          | 15.7          |
| 26-Dec                                                                                                                               | 7                             | 5  | 7  | 14 | A | 22 | 25 | 28 | 20 | 18 | 22 | 18                                                                                                                                                                                                                                                           | 16 | 14 | 13 | 13 | 8  | 9  | 14 | 10 | 8  | 13 | 16 | 17                                                                                                                                      | 14.7          | 27.6          |
| 27-Dec                                                                                                                               | 20                            | 23 | 27 | 30 | A | 33 | 34 | 34 | 34 | 35 | 36 | 36                                                                                                                                                                                                                                                           | 37 | 37 | 38 | 39 | 39 | 40 | 40 | 39 | 39 | 39 | 39 | 39                                                                                                                                      | 35.0          | 40.1          |
| 28-Dec                                                                                                                               | 39                            | 39 | 39 | 39 | A | 38 | 38 | 38 | 37 | 38 | 38 | 39                                                                                                                                                                                                                                                           | 40 | 40 | 40 | 40 | 40 | 40 | 39 | 39 | 40 | 40 | 40 | 39                                                                                                                                      | 39.0          | 40.2          |
| 29-Dec                                                                                                                               | 39                            | 40 | 40 | 40 | A | 38 | 37 | 37 | 35 | 35 | 35 | 31                                                                                                                                                                                                                                                           | 23 | 21 | 18 | 18 | 21 | 28 | 22 | 19 | 23 | 26 | 22 | 22                                                                                                                                      | 29.1          | 39.7          |
| 30-Dec                                                                                                                               | 25                            | 18 | 25 | 28 | A | 26 | 25 | 26 | 29 | 35 | 37 | 37                                                                                                                                                                                                                                                           | 37 | 37 | 37 | 37 | 36 | 39 | 38 | 38 | 37 | 37 | 36 | 36                                                                                                                                      | 32.9          | 38.6          |
| 31-Dec                                                                                                                               | 36                            | 38 | 38 | 38 | A | 38 | 37 | 38 | 37 | 35 | 35 | 35                                                                                                                                                                                                                                                           | 36 | 37 | 39 | 39 | 37 | 37 | 39 | 38 | 34 | 35 | 35 | 34                                                                                                                                      | 36.8          | 39.5          |
| 28.9 28.9 29.3 29.7 -- 29.4 29.8 28.3 28.0 28.6 28.9 29.5 28.7 29.1 28.8 29.3 28.4 29.2 29.0 28.6 28.4 29.3 29.5 29.0                |                               |    |    |    |   |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                         |               |               |
| 41.5 41.6 40.8 40.7 -- 40.3 39.8 40.1 39.8 39.9 40.0 40.5 40.5 40.1 40.0 40.2 40.5 40.1 39.9 40.4 40.2 39.5 40.1 40.3                |                               |    |    |    |   |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                         |               |               |
| C - Calibration A - Automated Daily Zero Span                                                                                        |                               |    |    |    |   |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                         |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb 24-hr na                                                                 |                               |    |    |    |   |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                         |               |               |



## Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Beaverlodge - December 2016



# Hourly Maximums

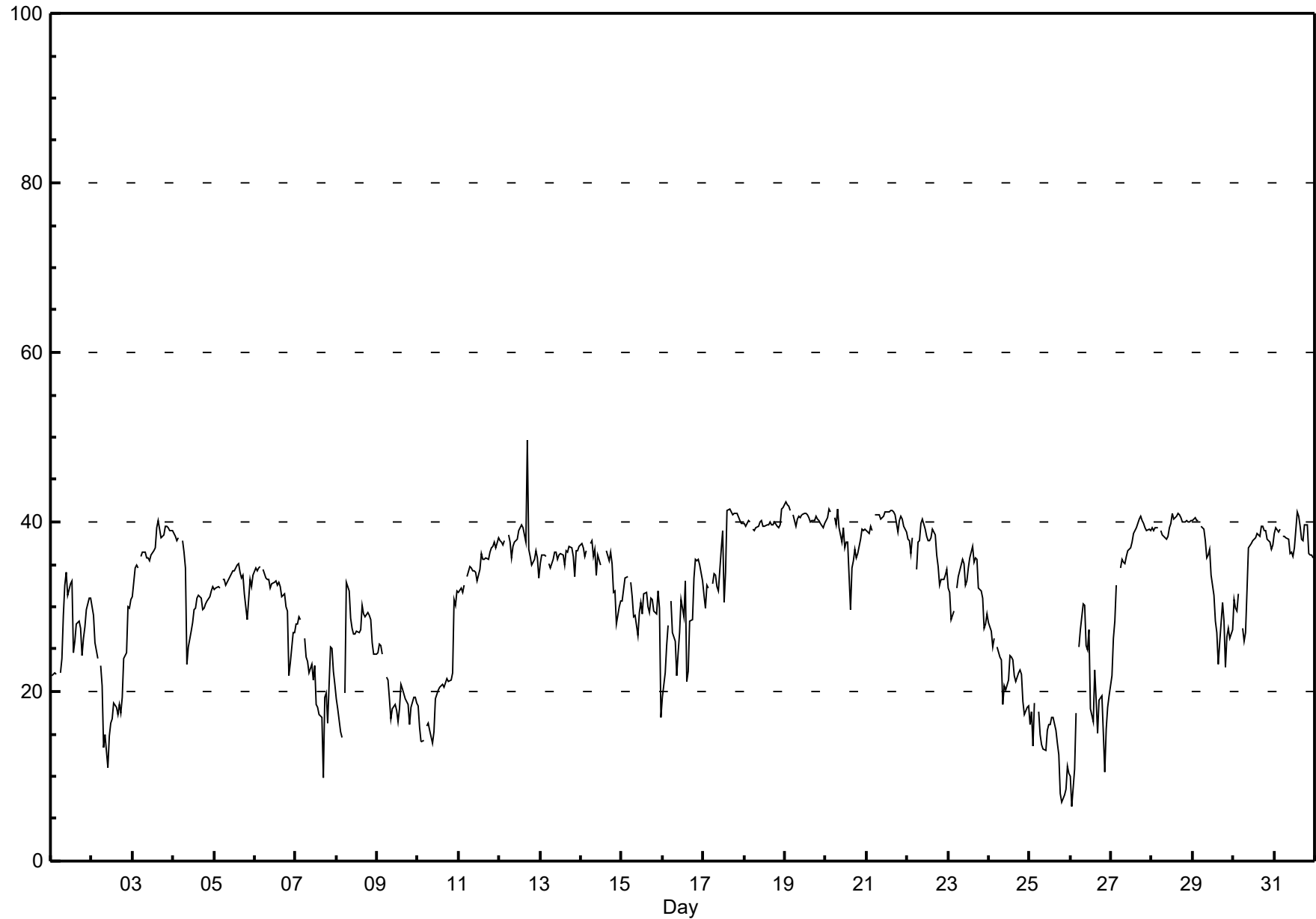
Ozone (O<sub>3</sub>) - ppb

Beaverlodge - December 2016

| Maximum Value: 49.7 ppb on Dec 12 17:00                                                                                    |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 40.6 ppb on Dec 19                                                                                                                         |    |    |    | Hours in Service: 744           |                 |               |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------------------|-----------------|---------------|
| Minimum Value: 6 ppb on Dec 26 02:00                                                                                       |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 13.7 ppb on Dec 25                                                                                                                         |    |    |    | Hours of Data: 710              |                 |               |
| Maximum Diurnal Average: 31.9 ppb at hour 12                                                                               |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 30.7 ppb at hour 20                                                                                                                      |    |    |    | Hours of Missing Data: 34       |                 |               |
| Monthly Average: 31.37 ppb                                                                                                 |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 10.3 P <sub>10</sub> = 18.4 Q <sub>1</sub> = 26.2 Median = 33.4 Q <sub>3</sub> = 38.1 P <sub>90</sub> = 40.1 P <sub>99</sub> = 41.5 |    |    |    | Hours of Calibration: 34        |                 |               |
|                                                                                                                            |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    | Percent Operational Time: 100.0 |                 |               |
| Day                                                                                                                        | Hourly Period Ending At (MST) |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |                                 | Daily Average   | Daily Maximum |
|                                                                                                                            | 1                             | 2  | 3  | 4  | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                                | 21 | 22 | 23 | 24                              |                 |               |
| 1-Dec                                                                                                                      | 22                            | 22 | 22 | 22 | A | 22 | 24 | 29 | 33 | 34 | 31 | 33 | 33 | 25 | 26 | 28 | 28 | 27 | 24 | 26                                                                                                                                                                | 28 | 30 | 31 | 31                              | 27.4            | 34.1          |
| 2-Dec                                                                                                                      | 30                            | 29 | 26 | 24 | A | 23 | 21 | 13 | 15 | 11 | 15 | 16 | 17 | 19 | 18 | 17 | 18 | 17 | 19 | 24                                                                                                                                                                | 25 | 30 | 30 | 31                              | 21.2            | 30.8          |
| 3-Dec                                                                                                                      | 31                            | 35 | 35 | 35 | A | 36 | 36 | 36 | 36 | 36 | 35 | 36 | 37 | 37 | 39 | 40 | 39 | 38 | 38 | 40                                                                                                                                                                | 39 | 39 | 39 | 39                              | 37.1            | 40.1          |
| 4-Dec                                                                                                                      | 39                            | 38 | 38 | 38 | A | 38 | 36 | 35 | 23 | 25 | 27 | 28 | 30 | 30 | 31 | 31 | 31 | 30 | 30 | 30                                                                                                                                                                | 31 | 31 | 32 | 32                              | 31.9            | 38.6          |
| 5-Dec                                                                                                                      | 32                            | 32 | 32 | 32 | A | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 34 | 33 | 34 | 31 | 28                                                                                                                                                                | 31 | 33 | 32 | 34                              | 33.0            | 35.1          |
| 6-Dec                                                                                                                      | 35                            | 34 | 35 | 35 | A | 34 | 33 | 33 | 33 | 32 | 33 | 33 | 33 | 33 | 33 | 32 | 31 | 31 | 30 | 29                                                                                                                                                                | 22 | 23 | 27 | 27                              | 31.4            | 34.7          |
| 7-Dec                                                                                                                      | 28                            | 28 | 29 | 29 | A | 26 | 24 | 23 | 22 | 23 | 21 | 23 | 19 | 18 | 17 | 17 | 10 | 19 | 20 | 16                                                                                                                                                                | 25 | 25 | 22 | 21                              | 22.0            | 28.8          |
| 8-Dec                                                                                                                      | 19                            | 18 | 15 | 15 | A | 20 | 33 | 32 | 29 | 27 | 27 | 27 | 27 | 27 | 30 | 29 | 29 | 29 | 29 | 29                                                                                                                                                                | 28 | 26 | 24 | 24                              | 25.7            | 32.9          |
| 9-Dec                                                                                                                      | 25                            | 26 | 25 | 24 | A | 22 | 21 | 19 | 17 | 18 | 19 | 18 | 16 | 18 | 21 | 20 | 19 | 19 | 18 | 16                                                                                                                                                                | 18 | 19 | 19 | 19                              | 19.9            | 25.6          |
| 10-Dec                                                                                                                     | 18                            | 16 | 14 | 14 | A | 16 | 16 | 15 | 14 | 15 | 19 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 21 | 21                                                                                                                                                                | 22 | 31 | 30 | 32                              | 20.0            | 31.8          |
| 11-Dec                                                                                                                     | 32                            | 32 | 32 | 33 | A | 34 | 35 | 35 | 34 | 34 | 34 | 33 | 34 | 36 | 36 | 36 | 36 | 36 | 37 | 37                                                                                                                                                                | 37 | 38 | 37 | 38                              | 34.9            | 38.1          |
| 12-Dec                                                                                                                     | 38                            | 38 | 37 | 38 | A | 38 | 38 | 36 | 37 | 38 | 38 | 39 | 39 | 40 | 39 | 38 | 50 | 37 | 36 | 35                                                                                                                                                                | 36 | 37 | 36 | 33                              | 37.8            | 49.7          |
| 13-Dec                                                                                                                     | 35                            | 36 | 36 | 36 | A | 35 | 35 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 35 | 37 | 36 | 37 | 37 | 36                                                                                                                                                                | 34 | 37 | 37 | 37                              | 36.0            | 37.2          |
| 14-Dec                                                                                                                     | 38                            | 37 | 36 | 37 | A | 38 | 38 | 36 | 37 | 34 | 36 | 35 | C  | C  | C  | 37 | 35 | 36 | 35 | 32                                                                                                                                                                | 32 | 28 | 30 | 31                              | 34.8            | 37.9          |
| 15-Dec                                                                                                                     | 31                            | 32 | 33 | 34 | A | 33 | 31 | 29 | 29 | 27 | 29 | 31 | 29 | 32 | 32 | 30 | 29 | 31 | 31 | 30                                                                                                                                                                | 29 | 32 | 30 | 17                              | 29.9            | 33.6          |
| 16-Dec                                                                                                                     | 19                            | 22 | 26 | 28 | A | 31 | 27 | 26 | 22 | 25 | 27 | 31 | 29 | 33 | 21 | 22 | 28 | 29 | 33 | 36                                                                                                                                                                | 35 | 36 | 35 | 33                              | 28.4            | 35.6          |
| 17-Dec                                                                                                                     | 31                            | 30 | 33 | 32 | A | 33 | 34 | 34 | 32 | 32 | 37 | 39 | 31 | 34 | 41 | 42 | 41 | 41 | 41 | 41                                                                                                                                                                | 41 | 40 | 40 | 40                              | 36.5            | 41.6          |
| 18-Dec                                                                                                                     | 40                            | 39 | 40 | 40 | A | 39 | 39 | 39 | 39 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40                                                                                                                                                                | 39 | 40 | 42 | 42                              | 39.8            | 41.7          |
| 19-Dec                                                                                                                     | 42                            | 42 | 42 | 41 | A | 41 | 39 | 40 | 41 | 40 | 41 | 41 | 41 | 41 | 41 | 40 | 40 | 40 | 41 | 40                                                                                                                                                                | 40 | 40 | 39 | 40                              | 40.6            | 42.3          |
| 20-Dec                                                                                                                     | 40                            | 40 | 41 | 41 | A | 41 | 40 | 42 | 39 | 38 | 39 | 37 | 38 | 38 | 30 | 35 | 35 | 37 | 36 | 36                                                                                                                                                                | 38 | 39 | 39 | 39                              | 38.1            | 41.5          |
| 21-Dec                                                                                                                     | 39                            | 39 | 39 | 39 | A | 41 | 41 | 41 | 40 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 39 | 40                                                                                                                                                                | 41 | 40 | 39 | 39                              | 40.3            | 41.4          |
| 22-Dec                                                                                                                     | 38                            | 38 | 36 | 38 | A | 34 | 38 | 38 | 40 | 40 | 39 | 38 | 38 | 38 | 38 | 39 | 38 | 36 | 35 | 33                                                                                                                                                                | 33 | 33 | 34 | 34                              | 36.8            | 40.3          |
| 23-Dec                                                                                                                     | 32                            | 32 | 28 | 29 | A | 32 | 34 | 34 | 36 | 35 | 32 | 33 | 35 | 36 | 37 | 35 | 36 | 36 | 32 | 32                                                                                                                                                                | 31 | 27 | 28 | 29                              | 32.7            | 37.1          |
| 24-Dec                                                                                                                     | 28                            | 27 | 25 | 26 | A | 25 | 24 | 24 | 18 | 21 | 20 | 21 | 24 | 24 | 24 | 22 | 21 | 22 | 23 | 22                                                                                                                                                                | 19 | 17 | 18 | 18                              | 22.4            | 28.1          |
| 25-Dec                                                                                                                     | 16                            | 18 | 14 | 19 | A | 18 | 15 | 14 | 13 | 13 | 15 | 16 | 16 | 17 | 17 | 15 | 14 | 13 | 8  | 7                                                                                                                                                                 | 8  | 9  | 11 | 10                              | 13.7            | 18.6          |
| 26-Dec                                                                                                                     | 10                            | 6  | 11 | 18 | A | 25 | 27 | 30 | 30 | 25 | 25 | 27 | 18 | 16 | 23 | 19 | 15 | 19 | 20 | 15                                                                                                                                                                | 10 | 16 | 18 | 20                              | 19.3            | 30.3          |
| 27-Dec                                                                                                                     | 22                            | 26 | 28 | 32 | A | 35 | 36 | 35 | 35 | 36 | 37 | 37 | 38 | 39 | 39 | 39 | 40 | 41 | 40 | 40                                                                                                                                                                | 39 | 39 | 39 | 39                              | 36.1            | 40.8          |
| 28-Dec                                                                                                                     | 39                            | 39 | 39 | 39 | A | 39 | 38 | 38 | 38 | 38 | 39 | 40 | 41 | 40 | 41 | 41 | 41 | 41 | 40 | 40                                                                                                                                                                | 40 | 40 | 40 | 40                              | 39.7            | 41.0          |
| 29-Dec                                                                                                                     | 40                            | 41 | 40 | 40 | A | 40 | 39 | 38 | 36 | 36 | 37 | 34 | 31 | 28 | 27 | 23 | 26 | 30 | 28 | 23                                                                                                                                                                | 26 | 28 | 26 | 27                              | 32.4            | 40.5          |
| 30-Dec                                                                                                                     | 31                            | 30 | 30 | 32 | A | 27 | 26 | 27 | 32 | 37 | 38 | 38 | 38 | 38 | 39 | 38 | 39 | 40 | 39 | 39                                                                                                                                                                | 38 | 38 | 37 | 37                              | 35.0            | 39.5          |
| 31-Dec                                                                                                                     | 39                            | 39 | 39 | 39 | A | 38 | 38 | 38 | 38 | 36 | 36 | 36 | 37 | 41 | 41 | 39 | 38 | 38 | 40 | 40                                                                                                                                                                | 36 | 36 | 36 | 36                              | 38.0            | 41.2          |
| 30.9 31.0 30.9 31.6 -- 31.8 31.9 31.5 30.9 30.9 31.5 31.9 31.3 31.6 31.6 31.6 31.6 31.7 31.8 31.3 30.7 30.7 31.5 31.5 31.3 |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |                                 | Diurnal Average |               |
| 42.3 42.1 41.9 41.4 -- 40.9 40.9 41.5 40.7 40.5 40.9 41.2 41.3 41.2 41.4 41.6 49.7 40.9 41.0 41.0 40.9 40.3 41.5 41.7      |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |                                 | Diurnal Maximum |               |
| C - Calibration A - Automated Daily Zero Span                                                                              |                               |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |                                 |                 |               |

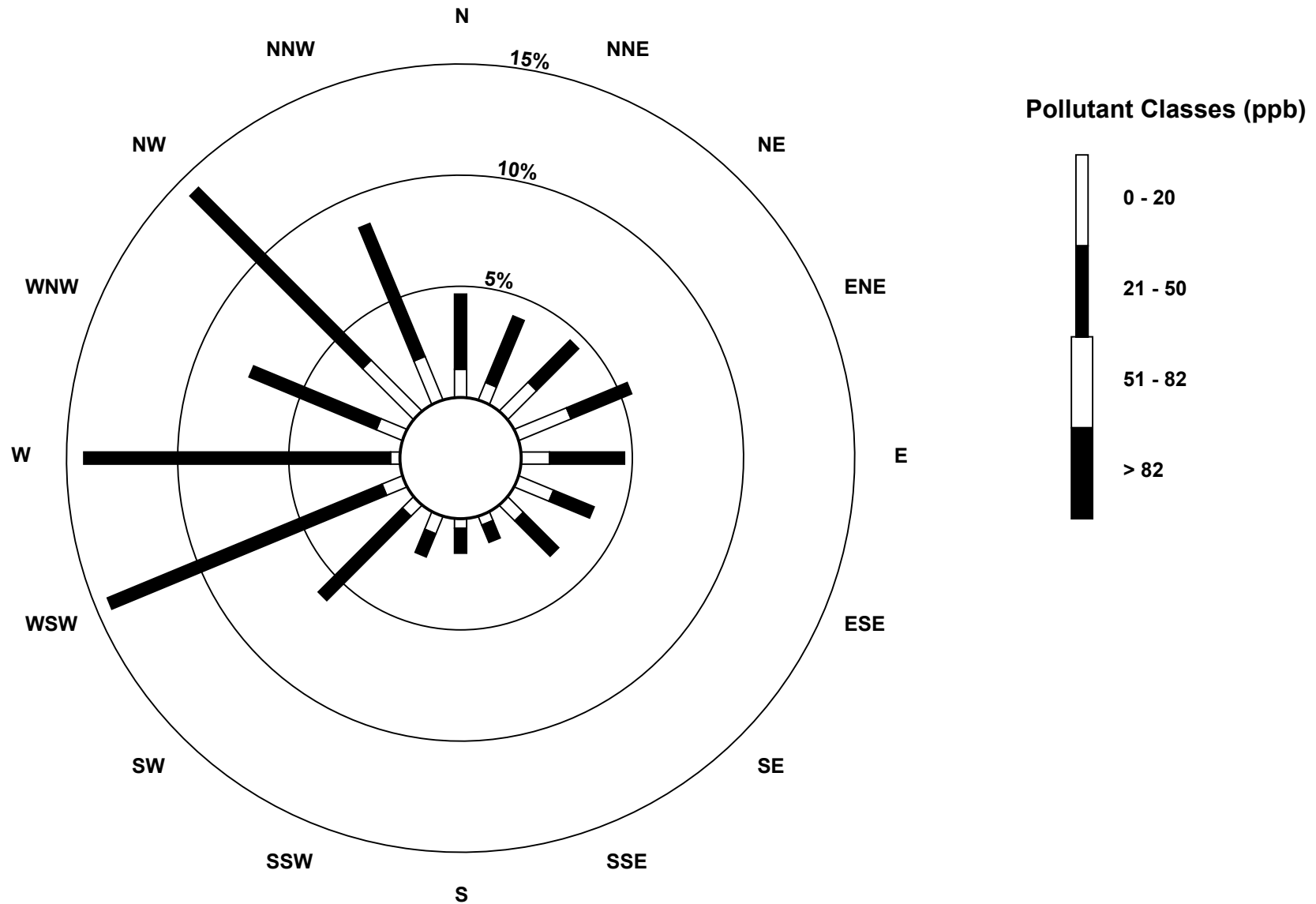
## Hourly Maximums

Ozone (O<sub>3</sub>) - ppb  
Beaverlodge - December 2016



# Pollutant Rose

Ozone (O<sub>3</sub>) - ppb  
Beaverlodge - December 2016



# Eight Hour Running Averages

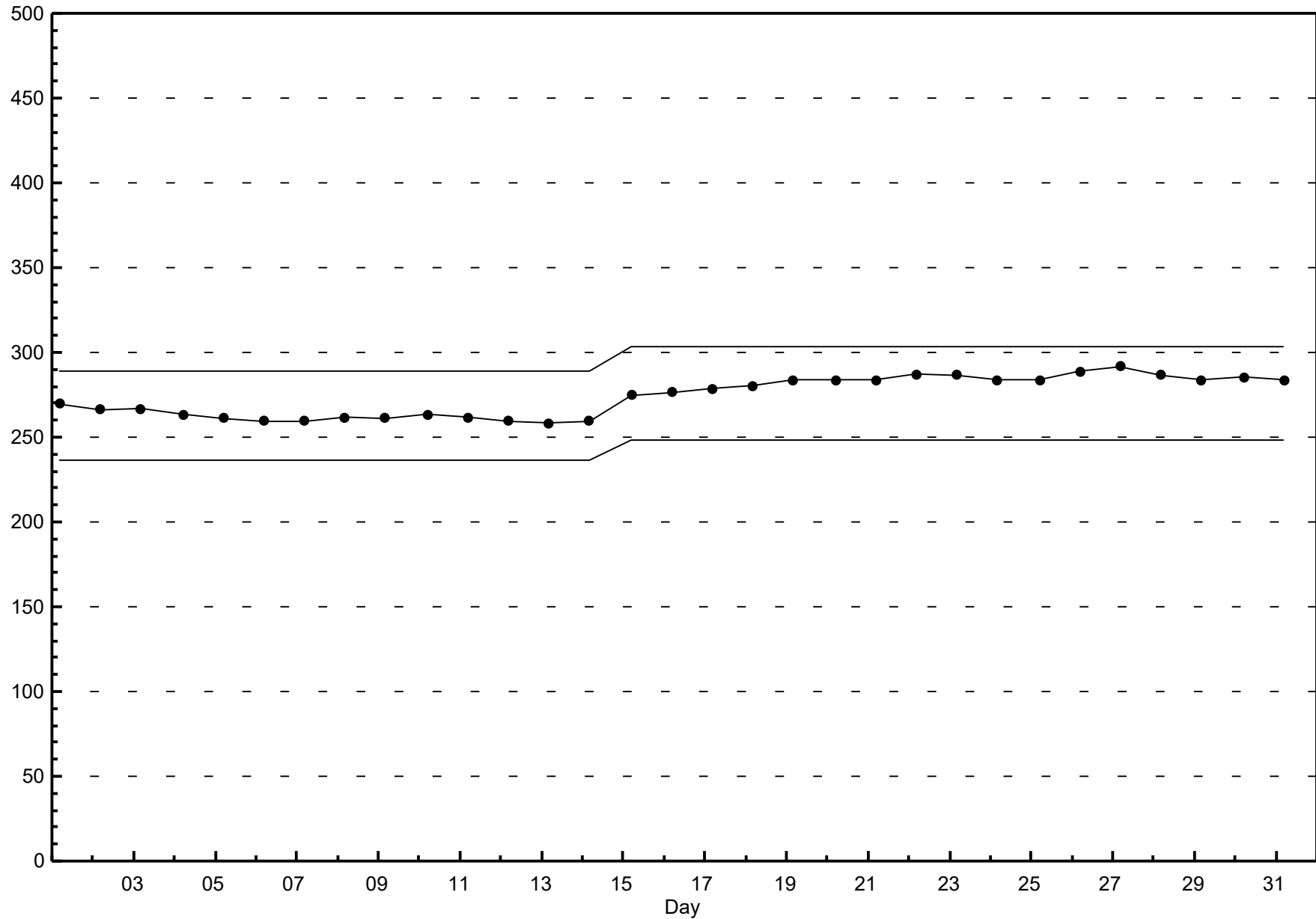
Ozone (O<sub>3</sub>) - ppb

Beaverlodge - December 2016

| Maximum Value: 40.5 ppb on Dec 19 06:00                                                                                                                          |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|
| Minimum Value: 6.4 ppb on Dec 26 02:00                                                                                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 738              |
| Percentiles: P <sub>1</sub> = 8.1 P <sub>10</sub> = 14.5 Q <sub>1</sub> = 22.2 Median = 30.8 Q <sub>3</sub> = 36.5 P <sub>90</sub> = 38.9 P <sub>99</sub> = 40.0 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 6        |
|                                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 6         |
|                                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 100.0 |
| Day                                                                                                                                                              | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Daily Maximum                   |
| 1-Dec                                                                                                                                                            | 8                             | 10 | 13 | 15 | 17 | 19 | 20 | 22 | 23 | 25 | 27 | 27 | 27 | 28 | 28 | 27 | 26 | 26 | 25 | 25 | 25 | 26 | 26 | 27.7                            |
| 2-Dec                                                                                                                                                            | 27                            | 27 | 27 | 26 | 27 | 25 | 23 | 20 | 17 | 15 | 12 | 11 | 11 | 11 | 11 | 11 | 12 | 13 | 14 | 15 | 17 | 19 | 21 | 26.9                            |
| 3-Dec                                                                                                                                                            | 23                            | 26 | 28 | 30 | 31 | 32 | 33 | 34 | 35 | 35 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 38 | 38.2                            |
| 4-Dec                                                                                                                                                            | 38                            | 38 | 38 | 38 | 38 | 38 | 37 | 36 | 33 | 31 | 30 | 28 | 28 | 27 | 27 | 28 | 29 | 29 | 30 | 30 | 30 | 30 | 30 | 38.0                            |
| 5-Dec                                                                                                                                                            | 30                            | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 33 | 33 | 32 | 31 | 31 | 31 | 31 | 33.1                            |
| 6-Dec                                                                                                                                                            | 31                            | 31 | 31 | 32 | 33 | 33 | 33 | 33 | 33 | 33 | 32 | 32 | 32 | 32 | 31 | 31 | 31 | 30 | 30 | 28 | 26 | 26 | 25 | 33.3                            |
| 7-Dec                                                                                                                                                            | 24                            | 24 | 24 | 24 | 26 | 26 | 26 | 25 | 23 | 22 | 20 | 19 | 18 | 17 | 16 | 14 | 14 | 13 | 13 | 13 | 13 | 14 | 13 | 26.1                            |
| 8-Dec                                                                                                                                                            | 14                            | 13 | 12 | 12 | 10 | 11 | 13 | 16 | 18 | 21 | 23 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 27.4                            |
| 9-Dec                                                                                                                                                            | 26                            | 25 | 25 | 24 | 24 | 23 | 22 | 20 | 18 | 17 | 15 | 14 | 14 | 13 | 14 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 16 | 25.6                            |
| 10-Dec                                                                                                                                                           | 16                            | 15 | 15 | 15 | 14 | 13 | 13 | 12 | 12 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 19 | 20 | 20 | 20 | 21 | 22 | 22.1                            |
| 11-Dec                                                                                                                                                           | 24                            | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 36 | 35.6                            |
| 12-Dec                                                                                                                                                           | 36                            | 36 | 36 | 36 | 37 | 36 | 36 | 36 | 36 | 35 | 35 | 36 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 36 | 35 | 35 | 34 | 36.9                            |
| 13-Dec                                                                                                                                                           | 34                            | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 33 | 34 | 34 | 34 | 34 | 34 | 34 | 35 | 35 | 34.6                            |
| 14-Dec                                                                                                                                                           | 35                            | 35 | 35 | 35 | 35 | 36 | 36 | 35 | 34 | 33 | 32 | 32 | 32 | 32 | N  | N  | N  | N  | N  | N  | 33 | 32 | 31 | 35.9                            |
| 15-Dec                                                                                                                                                           | 30                            | 30 | 29 | 30 | 30 | 31 | 31 | 30 | 30 | 29 | 28 | 28 | 28 | 27 | 28 | 28 | 28 | 28 | 29 | 28 | 27 | 27 | 25 | 30.8                            |
| 16-Dec                                                                                                                                                           | 22                            | 21 | 20 | 21 | 21 | 19 | 19 | 20 | 21 | 21 | 21 | 21 | 21 | 21 | 20 | 19 | 18 | 18 | 19 | 21 | 23 | 25 | 27 | 27.2                            |
| 17-Dec                                                                                                                                                           | 29                            | 31 | 31 | 30 | 29 | 28 | 28 | 27 | 27 | 27 | 25 | 27 | 26 | 27 | 29 | 31 | 32 | 34 | 35 | 37 | 39 | 39 | 39 | 38.8                            |
| 18-Dec                                                                                                                                                           | 39                            | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39.5                            |
| 19-Dec                                                                                                                                                           | 39                            | 40 | 40 | 40 | 40 | 41 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 39 | 40.5                            |
| 20-Dec                                                                                                                                                           | 39                            | 39 | 40 | 40 | 40 | 40 | 40 | 39 | 39 | 38 | 37 | 36 | 35 | 34 | 32 | 31 | 31 | 31 | 30 | 31 | 31 | 32 | 34 | 39.7                            |
| 21-Dec                                                                                                                                                           | 36                            | 37 | 37 | 38 | 38 | 38 | 38 | 39 | 39 | 39 | 39 | 40 | 40 | 40 | 40 | 40 | 40 | 39 | 39 | 39 | 39 | 39 | 39 | 40.0                            |
| 22-Dec                                                                                                                                                           | 38                            | 38 | 38 | 38 | 37 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 36 | 35 | 35 | 34 | 33 | 32 | 38.2                            |
| 23-Dec                                                                                                                                                           | 32                            | 31 | 30 | 30 | 30 | 30 | 29 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 32 | 31 | 31 | 31 | 31 | 30 | 29 | 28 | 31.6                            |
| 24-Dec                                                                                                                                                           | 26                            | 26 | 25 | 24 | 24 | 25 | 25 | 24 | 23 | 22 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 21 | 20 | 19 | 18 | 26.2                            |
| 25-Dec                                                                                                                                                           | 17                            | 17 | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | 11 | 9  | 8  | 17.5                            |
| 26-Dec                                                                                                                                                           | 7                             | 6  | 6  | 8  | 8  | 10 | 13 | 15 | 17 | 19 | 21 | 22 | 21 | 20 | 19 | 17 | 15 | 14 | 13 | 12 | 11 | 11 | 12 | 21.8                            |
| 27-Dec                                                                                                                                                           | 13                            | 15 | 17 | 19 | 21 | 24 | 26 | 29 | 31 | 33 | 34 | 35 | 35 | 36 | 36 | 37 | 38 | 38 | 39 | 39 | 39 | 39 | 39 | 39.1                            |
| 28-Dec                                                                                                                                                           | 39                            | 39 | 39 | 39 | 39 | 39 | 39 | 38 | 38 | 38 | 38 | 38 | 38 | 39 | 39 | 39 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 39.7                            |
| 29-Dec                                                                                                                                                           | 39                            | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 38 | 37 | 37 | 36 | 34 | 32 | 29 | 27 | 25 | 24 | 23 | 21 | 21 | 22 | 23 | 39.5                            |
| 30-Dec                                                                                                                                                           | 23                            | 22 | 22 | 24 | 24 | 24 | 24 | 25 | 25 | 28 | 29 | 31 | 32 | 33 | 34 | 36 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37.4                            |
| 31-Dec                                                                                                                                                           | 37                            | 37 | 37 | 37 | 37 | 37 | 37 | 38 | 38 | 37 | 37 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 37 | 38 | 38 | 37 | 36 | 37.8                            |
| Diurnal Maximums                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |
| N - Not Valid                                                                                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                 |

## Span Responses

Ozone (O<sub>3</sub>)  
Beaverlodge - December 2016

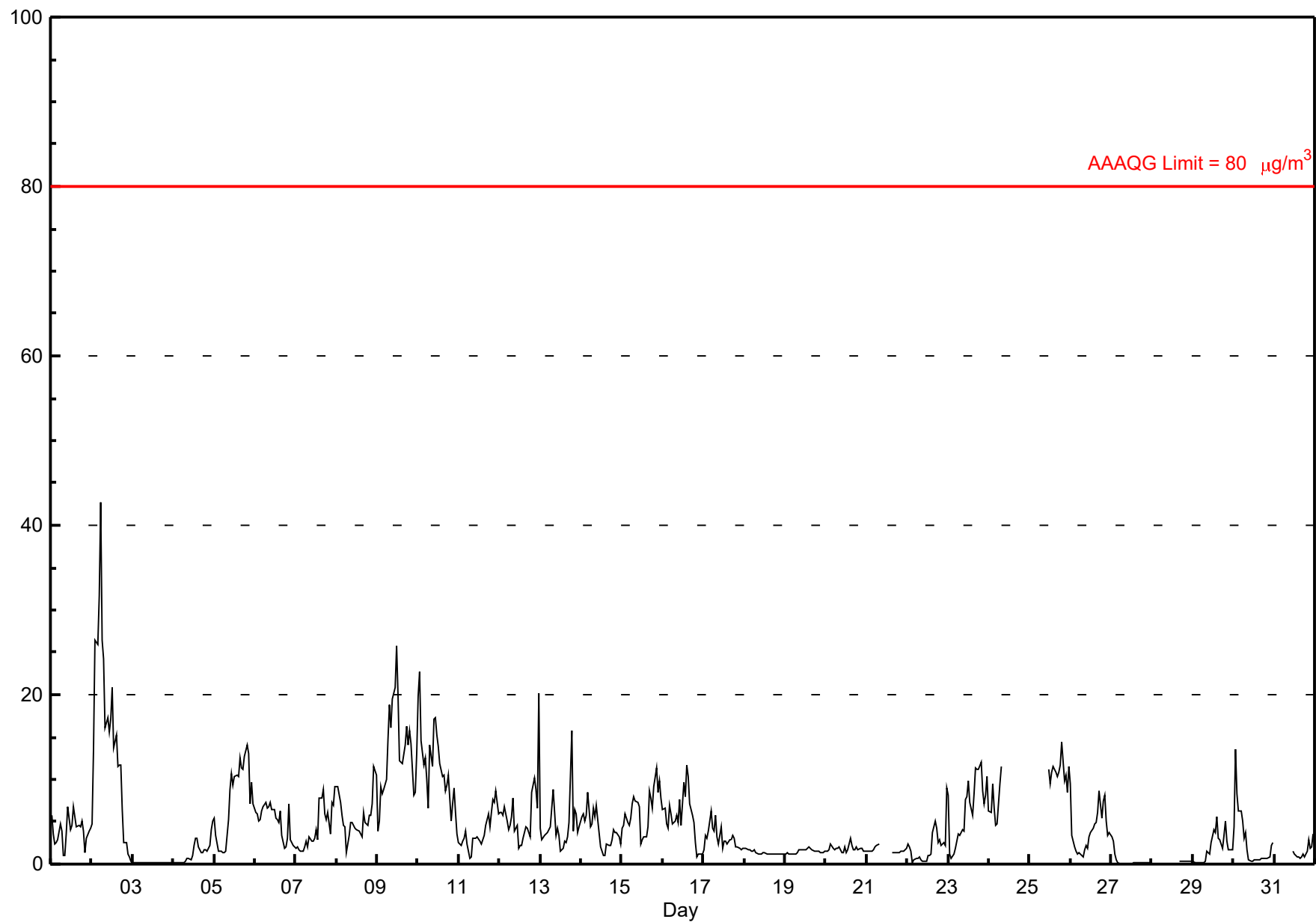


# Hourly Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Beaverlodge - December 2016

| Number of Exceedences: 1-hr: 0 24-hr: 0<br>Maximum Value: 42.7 µg/m³ on Dec 2 06:00<br>Minimum Value: 0 µg/m³ on Dec 27 06:00<br>Maximum Diurnal Average: 5.3 µg/m³ at hour 11<br>Monthly Average: 4.65 µg/m³ |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 15.0 µg/m³ on Dec 2<br>Minimum Daily Average: 0.2 µg/m³ on Dec 3<br>Minimum Diurnal Average: 4.0 µg/m³ at hour 22<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 1.4 Median = 3.1 Q <sub>3</sub> = 6.4 P <sub>90</sub> = 10.8 P <sub>99</sub> = 23.6 |    |    |    |                 | Hours in Service: 744<br>Hours of Data: 691<br>Hours of Missing Data: 53<br>Hours of Calibration: 7<br>Percent Operational Time: 93.8 |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Day                                                                                                                                                                                                           | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                          |    |    |    |                 | Daily Average                                                                                                                         | Daily Maximum |
| 1-Dec                                                                                                                                                                                                         | 6                             | 3  | 2  | 3  | 3  | 5  | 4  | 1  | 1  | 4  | 7  | 4  | 5  | 7  | 6  | 4  | 5  | 4  | 5  | 4                                                                                                                                                                                                                                                                                                        | 1  | 3  | 4  | 4               | 3.9                                                                                                                                   | 6.8           |
| 2-Dec                                                                                                                                                                                                         | 5                             | 14 | 27 | 26 | 32 | 43 | 26 | 24 | 16 | 17 | 16 | 17 | 21 | 14 | 15 | 11 | 12 | 12 | 6  | 3                                                                                                                                                                                                                                                                                                        | 3  | 1  | 1  | 0               | 15.0                                                                                                                                  | 42.7          |
| 3-Dec                                                                                                                                                                                                         | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                                                                        | 0  | 0  | 0  | 0               | 0.2                                                                                                                                   | 0.2           |
| 4-Dec                                                                                                                                                                                                         | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 1  | 2  | 3  | 3  | 2  | 1  | 1  | 2  | 2                                                                                                                                                                                                                                                                                                        | 1  | 2  | 4  | 5               | 1.4                                                                                                                                   | 5.1           |
| 5-Dec                                                                                                                                                                                                         | 5                             | 3  | 1  | 2  | 1  | 1  | 1  | 2  | 5  | 9  | 11 | 9  | 10 | 10 | 10 | 13 | 11 | 11 | 13 | 14                                                                                                                                                                                                                                                                                                       | 13 | 7  | 10 | 7               | 7.6                                                                                                                                   | 14.0          |
| 6-Dec                                                                                                                                                                                                         | 6                             | 6  | 5  | 5  | 6  | 7  | 7  | 7  | 7  | 7  | 6  | 7  | 5  | 5  | 5  | 6  | 3  | 2  | 2  | 3                                                                                                                                                                                                                                                                                                        | 7  | 3  | 2  | 2               | 5.1                                                                                                                                   | 7.3           |
| 7-Dec                                                                                                                                                                                                         | 2                             | 2  | 2  | 1  | 1  | 2  | 3  | 2  | 3  | 3  | 3  | 3  | 4  | 3  | 8  | 8  | 9  | 6  | 5  | 6                                                                                                                                                                                                                                                                                                        | 4  | 7  | 7  | 9               | 4.3                                                                                                                                   | 9.2           |
| 8-Dec                                                                                                                                                                                                         | 9                             | 9  | 7  | 6  | 5  | 4  | 1  | 3  | 5  | 5  | 5  | 4  | 4  | 4  | 4  | 3  | 6  | 5  | 5  | 6                                                                                                                                                                                                                                                                                                        | 6  | 7  | 11 | 10              | 5.6                                                                                                                                   | 11.5          |
| 9-Dec                                                                                                                                                                                                         | 4                             | 5  | 9  | 8  | 9  | 10 | 15 | 19 | 16 | 19 | 21 | 26 | 20 | 12 | 12 | 12 | 14 | 16 | 14 | 16                                                                                                                                                                                                                                                                                                       | 14 | 8  | 8  | 13              | 13.4                                                                                                                                  | 25.8          |
| 10-Dec                                                                                                                                                                                                        | 20                            | 23 | 15 | 12 | 12 | 10 | 7  | 14 | 12 | 17 | 17 | 15 | 14 | 12 | 10 | 10 | 9  | 9  | 11 | 5                                                                                                                                                                                                                                                                                                        | 7  | 9  | 6  | 4               | 11.6                                                                                                                                  | 22.7          |
| 11-Dec                                                                                                                                                                                                        | 2                             | 2  | 3  | 3  | 4  | 2  | 1  | 1  | 3  | 3  | 3  | 3  | 3  | 2  | 3  | 3  | 5  | 6  | 4  | 6                                                                                                                                                                                                                                                                                                        | 8  | 7  | 9  | 6               | 3.9                                                                                                                                   | 8.7           |
| 12-Dec                                                                                                                                                                                                        | 6                             | 6  | 6  | 7  | 5  | 4  | 5  | 6  | 8  | 4  | 5  | 2  | 2  | 2  | 3  | 4  | 4  | 4  | 3  | 9                                                                                                                                                                                                                                                                                                        | 10 | 9  | 7  | 20              | 5.8                                                                                                                                   | 20.1          |
| 13-Dec                                                                                                                                                                                                        | 4                             | 3  | 3  | 4  | 4  | 4  | 4  | 9  | 6  | 3  | 4  | 3  | 2  | 2  | 3  | 2  | 3  | 5  | 16 | 4                                                                                                                                                                                                                                                                                                        | 6  | 6  | 4  | 4               | 4.6                                                                                                                                   | 15.7          |
| 14-Dec                                                                                                                                                                                                        | 6                             | 6  | 5  | 6  | 8  | 4  | 5  | 7  | 6  | 7  | 5  | 2  | 1  | 1  | 1  | 2  | 2  | 2  | 3  | 4                                                                                                                                                                                                                                                                                                        | 4  | 4  | 3  | 2               | 4.0                                                                                                                                   | 8.4           |
| 15-Dec                                                                                                                                                                                                        | 4                             | 4  | 6  | 5  | 5  | 5  | 7  | 8  | 8  | 7  | 7  | 2  | 3  | 3  | 3  | 4  | 9  | 8  | 7  | 9                                                                                                                                                                                                                                                                                                        | 11 | 9  | 10 | 8               | 6.3                                                                                                                                   | 11.4          |
| 16-Dec                                                                                                                                                                                                        | 6                             | 7  | 5  | 4  | 7  | 6  | 5  | 5  | 6  | 5  | 8  | 5  | 10 | 8  | 12 | 10 | 7  | 6  | 5  | 3                                                                                                                                                                                                                                                                                                        | 1  | 1  | 1  | 1               | 5.5                                                                                                                                   | 11.8          |
| 17-Dec                                                                                                                                                                                                        | 2                             | 3  | 3  | 4  | 6  | 4  | 4  | 6  | 3  | 2  | 4  | 2  | 3  | 3  | 2  | 3  | 3  | 3  | 3  | 2                                                                                                                                                                                                                                                                                                        | 2  | 2  | 2  | 2               | 3.1                                                                                                                                   | 6.3           |
| 18-Dec                                                                                                                                                                                                        | 2                             | 2  | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                                                                        | 1  | 1  | 1  | 1               | 1.4                                                                                                                                   | 1.9           |
| 19-Dec                                                                                                                                                                                                        | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 1                                                                                                                                                                                                                                                                                                        | 1  | 1  | 1  | 1               | 1.5                                                                                                                                   | 2.0           |
| 20-Dec                                                                                                                                                                                                        | 2                             | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 1  | 1  | 2  | 1  | 2  | 3  | 2  | 2  | 2  | 2  | 2                                                                                                                                                                                                                                                                                                        | 2  | 2  | 2  | 1               | 1.8                                                                                                                                   | 3.1           |
| 21-Dec                                                                                                                                                                                                        | 1                             | 2  | 1  | 2  | 2  | 2  | 2  | 2  | C  | C  | C  | C  | C  | C  | C  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                                                                        | 2  | 2  | 2  | 2               | --                                                                                                                                    | 2.3           |
| 22-Dec                                                                                                                                                                                                        | 2                             | 2  | 1  | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 4  | 5  | 4  | 3  | 3                                                                                                                                                                                                                                                                                                        | 2  | 2  | 2  | 9               | 2.0                                                                                                                                   | 9.1           |
| 23-Dec                                                                                                                                                                                                        | 8                             | 1  | 1  | 1  | 2  | 3  | 4  | 3  | 4  | 4  | 8  | 8  | 10 | 7  | 6  | 8  | 11 | 11 | 11 | 12                                                                                                                                                                                                                                                                                                       | 9  | 7  | 8  | 10              | 6.5                                                                                                                                   | 12.0          |
| 24-Dec                                                                                                                                                                                                        | 6                             | 6  | 9  | 7  | 5  | 5  | 9  | 11 | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N                                                                                                                                                                                                                                                                                                        | N  | N  | N  | N               | --                                                                                                                                    | 11.5          |
| 25-Dec                                                                                                                                                                                                        | N                             | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | 11 | 10 | 11 | 11 | 10 | 11 | 12 | 14                                                                                                                                                                                                                                                                                                       | 10 | 11 | 8  | 11              | --                                                                                                                                    | 14.5          |
| 26-Dec                                                                                                                                                                                                        | 9                             | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 3  | 4  | 4  | 5  | 5  | 6  | 9  | 5  | 7                                                                                                                                                                                                                                                                                                        | 8  | 5  | 3  | 4               | 4.0                                                                                                                                   | 9.4           |
| 27-Dec                                                                                                                                                                                                        | 3                             | 3  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                                                                        | 0  | 0  | 0  | 0               | 0.4                                                                                                                                   | 3.2           |
| 28-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | N  | N  | N  | N  | N  | N  | N  | M  | 0  | 0  | 0  | 0                                                                                                                                                                                                                                                                                                        | 0  | 0  | 0  | 0               | --                                                                                                                                    | 0.4           |
| 29-Dec                                                                                                                                                                                                        | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 2  | 4  | 4  | 6  | 3  | 3  | 2  | 3  | 5                                                                                                                                                                                                                                                                                                        | 3  | 2  | 2  | 2               | 1.9                                                                                                                                   | 5.6           |
| 30-Dec                                                                                                                                                                                                        | 4                             | 14 | 8  | 6  | 6  | 5  | 3  | 4  | 2  | 1  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                                                                        | 1  | 1  | 2  | 2               | 2.7                                                                                                                                   | 13.6          |
| 31-Dec                                                                                                                                                                                                        | N                             | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                                                                                                                                                                        | 3  | 2  | 2  | 4               | --                                                                                                                                    | 3.6           |
| 4.4 4.6 4.4 4.1 4.5 4.6 4.1 4.9 4.6 4.9 5.3 4.9 5.1 4.5 4.9 4.8 4.9 4.8 4.9 4.8 4.7 4.0 4.1 4.9                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                          |    |    |    | Diurnal Average |                                                                                                                                       |               |
| 19.8 22.7 26.5 25.9 31.8 42.7 26.4 24.2 16.1 19.5 20.9 25.8 20.8 13.8 15.2 12.5 14.0 16.3 15.7 15.7 14.2 10.5 11.5 20.1                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                          |    |    |    | Diurnal Maximum |                                                                                                                                       |               |
| C - Calibration M - Maintenance N - Not Valid<br>Alberta Ambient Air Quality Guideline (AAAQG): 1-hr 80 µg/m³ Alberta Ambient Air Quality Objective (AAAQO): 24-hr 30 µg/m³                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                                                                          |    |    |    |                 |                                                                                                                                       |               |



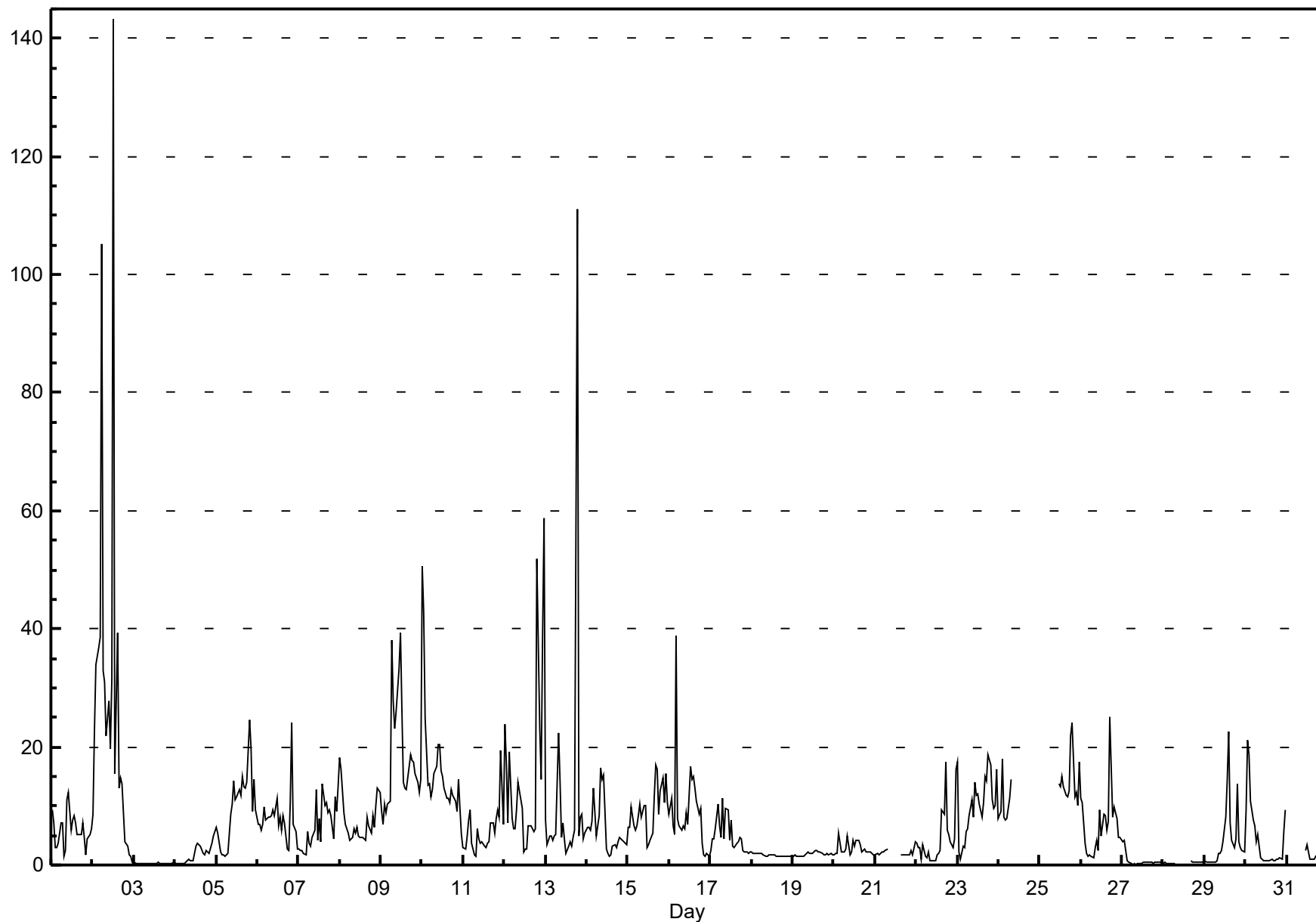


# Hourly Maximums

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

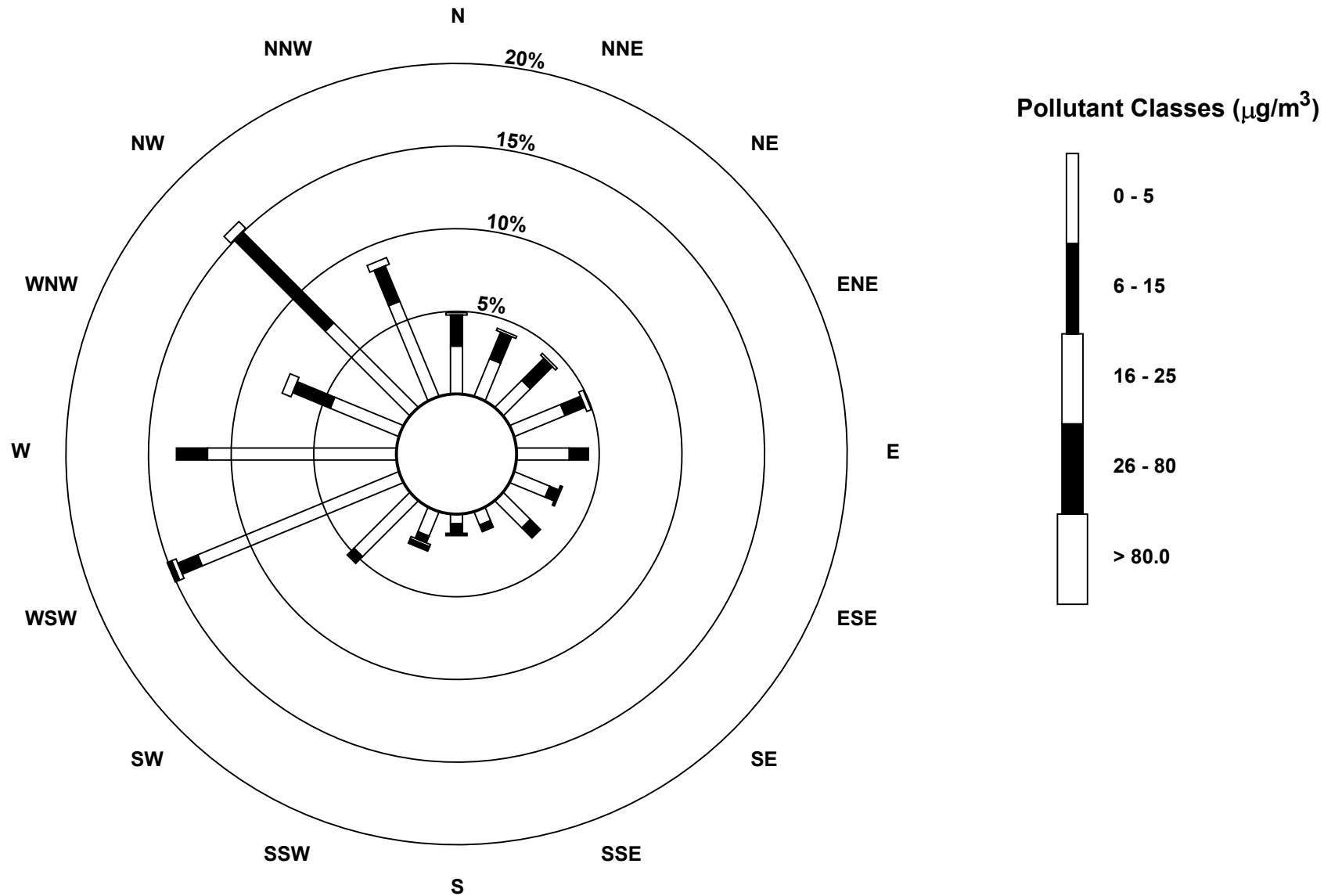
Beaverlodge - December 2016

| Maximum Value: 143.4 μg/m <sup>3</sup> on Dec 2 13:00                                                                      |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     | Maximum Daily Average: 27.9 μg/m <sup>3</sup> on Dec 2                                                                                                       |    |    |    |    | Hours in Service: 744          |               |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|-----|----|----|----|----|----|----|-----|----|----|----|----|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|--------------------------------|---------------|--|--|--|
| Minimum Value: 0 μg/m <sup>3</sup> on Dec 27 07:00                                                                         |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     | Minimum Daily Average: 0.2 μg/m <sup>3</sup> on Dec 3                                                                                                        |    |    |    |    | Hours of Data: 691             |               |  |  |  |
| Maximum Diurnal Average: 11.2 μg/m <sup>3</sup> at hour 13                                                                 |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     | Minimum Diurnal Average: 5.7 μg/m <sup>3</sup> at hour 22                                                                                                    |    |    |    |    | Hours of Missing Data: 53      |               |  |  |  |
| Monthly Average: 7.44 μg/m <sup>3</sup>                                                                                    |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     | Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 1.9 Median = 4.6 Q <sub>3</sub> = 9.5 P <sub>90</sub> = 15.6 P <sub>99</sub> = 39.6 |    |    |    |    | Hours of Calibration: 7        |               |  |  |  |
|                                                                                                                            |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     |                                                                                                                                                              |    |    |    |    | Percent Operational Time: 93.8 |               |  |  |  |
| Day                                                                                                                        | Hourly Period Ending At (MST) |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     |                                                                                                                                                              |    |    |    |    | Daily Average                  | Daily Maximum |  |  |  |
|                                                                                                                            | 1                             | 2  | 3  | 4  | 5  | 6   | 7  | 8  | 9  | 10 | 11 | 12 | 13  | 14 | 15 | 16 | 17 | 18 | 19  | 20                                                                                                                                                           | 21 | 22 | 23 | 24 |                                |               |  |  |  |
| 1-Dec                                                                                                                      | 9                             | 7  | 3  | 3  | 4  | 7   | 7  | 1  | 2  | 11 | 12 | 6  | 8   | 8  | 7  | 5  | 5  | 5  | 7   | 5                                                                                                                                                            | 2  | 4  | 5  | 6  | 5.8                            | 12.2          |  |  |  |
| 2-Dec                                                                                                                      | 9                             | 23 | 34 | 37 | 39 | 105 | 33 | 31 | 22 | 28 | 20 | 32 | 143 | 16 | 39 | 13 | 15 | 14 | 9   | 4                                                                                                                                                            | 3  | 2  | 1  | 0  | 27.9                           | 143.4         |  |  |  |
| 3-Dec                                                                                                                      | 0                             | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0  | 0   | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.2                            | 0.5           |  |  |  |
| 4-Dec                                                                                                                      | 0                             | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 1  | 1  | 1  | 2  | 3   | 4  | 3  | 3  | 2  | 2  | 2   | 2                                                                                                                                                            | 2  | 4  | 5  | 6  | 1.8                            | 5.6           |  |  |  |
| 5-Dec                                                                                                                      | 6                             | 5  | 2  | 2  | 2  | 1   | 2  | 2  | 8  | 10 | 14 | 11 | 11  | 13 | 12 | 15 | 13 | 13 | 14  | 25                                                                                                                                                           | 20 | 9  | 14 | 9  | 9.7                            | 24.7          |  |  |  |
| 6-Dec                                                                                                                      | 7                             | 7  | 6  | 7  | 10 | 8   | 8  | 8  | 8  | 9  | 8  | 11 | 7   | 8  | 6  | 8  | 7  | 3  | 2   | 10                                                                                                                                                           | 24 | 7  | 6  | 3  | 7.8                            | 24.2          |  |  |  |
| 7-Dec                                                                                                                      | 3                             | 2  | 2  | 2  | 2  | 6   | 4  | 3  | 5  | 6  | 13 | 4  | 8   | 4  | 14 | 10 | 10 | 9  | 9   | 8                                                                                                                                                            | 4  | 11 | 9  | 13 | 6.7                            | 13.7          |  |  |  |
| 8-Dec                                                                                                                      | 18                            | 16 | 9  | 7  | 6  | 5   | 4  | 5  | 6  | 5  | 6  | 5  | 5   | 5  | 4  | 4  | 8  | 7  | 5   | 8                                                                                                                                                            | 6  | 10 | 13 | 12 | 7.5                            | 18.3          |  |  |  |
| 9-Dec                                                                                                                      | 9                             | 7  | 10 | 9  | 10 | 11  | 38 | 28 | 23 | 26 | 33 | 39 | 26  | 14 | 13 | 13 | 17 | 19 | 18  | 18                                                                                                                                                           | 16 | 14 | 12 | 15 | 18.2                           | 39.4          |  |  |  |
| 10-Dec                                                                                                                     | 51                            | 43 | 25 | 14 | 14 | 11  | 13 | 16 | 17 | 21 | 21 | 16 | 15  | 13 | 11 | 11 | 10 | 13 | 12  | 11                                                                                                                                                           | 9  | 14 | 9  | 5  | 16.4                           | 50.6          |  |  |  |
| 11-Dec                                                                                                                     | 3                             | 3  | 5  | 8  | 9  | 4   | 2  | 1  | 6  | 4  | 4  | 4  | 3   | 3  | 4  | 4  | 7  | 7  | 5   | 8                                                                                                                                                            | 9  | 8  | 20 | 7  | 5.7                            | 19.5          |  |  |  |
| 12-Dec                                                                                                                     | 24                            | 17 | 7  | 19 | 8  | 6   | 6  | 9  | 14 | 12 | 9  | 2  | 3   | 3  | 7  | 7  | 6  | 6  | 6   | 52                                                                                                                                                           | 23 | 14 | 39 | 59 | 14.9                           | 58.7          |  |  |  |
| 13-Dec                                                                                                                     | 8                             | 3  | 5  | 5  | 4  | 5   | 5  | 22 | 14 | 5  | 7  | 4  | 2   | 3  | 4  | 3  | 5  | 6  | 111 | 5                                                                                                                                                            | 8  | 8  | 4  | 5  | 10.5                           | 111.1         |  |  |  |
| 14-Dec                                                                                                                     | 6                             | 6  | 6  | 7  | 13 | 5   | 7  | 8  | 16 | 14 | 15 | 3  | 2   | 1  | 2  | 3  | 3  | 3  | 4   | 5                                                                                                                                                            | 4  | 4  | 4  | 3  | 6.1                            | 16.4          |  |  |  |
| 15-Dec                                                                                                                     | 6                             | 6  | 10 | 7  | 6  | 7   | 8  | 10 | 8  | 10 | 10 | 3  | 3   | 4  | 5  | 12 | 17 | 16 | 8   | 12                                                                                                                                                           | 15 | 10 | 16 | 10 | 9.2                            | 17.1          |  |  |  |
| 16-Dec                                                                                                                     | 8                             | 11 | 7  | 5  | 39 | 8   | 7  | 6  | 7  | 6  | 9  | 7  | 17  | 15 | 15 | 13 | 11 | 8  | 10  | 4                                                                                                                                                            | 2  | 1  | 2  | 1  | 9.0                            | 38.9          |  |  |  |
| 17-Dec                                                                                                                     | 2                             | 4  | 4  | 6  | 10 | 7   | 5  | 11 | 4  | 9  | 9  | 4  | 8   | 3  | 3  | 4  | 4  | 5  | 4   | 2                                                                                                                                                            | 2  | 2  | 2  | 2  | 4.9                            | 11.4          |  |  |  |
| 18-Dec                                                                                                                     | 2                             | 2  | 2  | 2  | 2  | 2   | 2  | 2  | 1  | 1  | 2  | 2  | 2   | 2  | 1  | 1  | 1  | 1  | 1   | 1                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.6                            | 2.1           |  |  |  |
| 19-Dec                                                                                                                     | 1                             | 2  | 1  | 1  | 1  | 1   | 1  | 2  | 2  | 2  | 2  | 2  | 2   | 2  | 2  | 2  | 2  | 2  | 2   | 2                                                                                                                                                            | 2  | 2  | 2  | 2  | 1.8                            | 2.4           |  |  |  |
| 20-Dec                                                                                                                     | 2                             | 2  | 2  | 5  | 2  | 2   | 2  | 3  | 5  | 2  | 2  | 4  | 3   | 4  | 4  | 3  | 2  | 2  | 3   | 2                                                                                                                                                            | 2  | 2  | 2  | 2  | 2.7                            | 5.3           |  |  |  |
| 21-Dec                                                                                                                     | 2                             | 2  | 2  | 2  | 2  | 2   | 2  | 3  | C  | C  | C  | C  | C   | C  | C  | 2  | 2  | 2  | 2   | 2                                                                                                                                                            | 2  | 2  | 2  | 4  | --                             | 3.9           |  |  |  |
| 22-Dec                                                                                                                     | 4                             | 3  | 3  | 1  | 3  | 1   | 1  | 2  | 1  | 1  | 1  | 1  | 2   | 2  | 2  | 9  | 8  | 18 | 6   | 5                                                                                                                                                            | 4  | 3  | 4  | 16 | 4.2                            | 17.6          |  |  |  |
| 23-Dec                                                                                                                     | 17                            | 2  | 1  | 3  | 3  | 6   | 6  | 8  | 11 | 8  | 14 | 12 | 12  | 10 | 8  | 10 | 15 | 14 | 19  | 17                                                                                                                                                           | 11 | 10 | 10 | 16 | 10.1                           | 18.6          |  |  |  |
| 24-Dec                                                                                                                     | 8                             | 9  | 18 | 8  | 8  | 8   | 11 | 14 | N  | N  | N  | N  | N   | N  | N  | N  | N  | N  | N   | N                                                                                                                                                            | N  | N  | N  | N  | --                             | 18.0          |  |  |  |
| 25-Dec                                                                                                                     | N                             | N  | N  | N  | N  | N   | N  | N  | N  | N  | N  | 14 | 13  | 15 | 13 | 12 | 11 | 12 | 22  | 24                                                                                                                                                           | 11 | 12 | 10 | 18 | --                             | 24.2          |  |  |  |
| 26-Dec                                                                                                                     | 11                            | 11 | 4  | 2  | 1  | 2   | 1  | 1  | 3  | 4  | 2  | 9  | 5   | 9  | 8  | 6  | 7  | 25 | 8   | 10                                                                                                                                                           | 9  | 8  | 5  | 5  | 6.5                            | 25.1          |  |  |  |
| 27-Dec                                                                                                                     | 4                             | 4  | 2  | 1  | 0  | 0   | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0  | 0  | 0  | 0   | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.7                            | 4.1           |  |  |  |
| 28-Dec                                                                                                                     | 0                             | 0  | 0  | 0  | 0  | 0   | 0  | 0  | N  | N  | N  | N  | N   | N  | N  | M  | 1  | 0  | 0   | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | --                             | 0.7           |  |  |  |
| 29-Dec                                                                                                                     | 1                             | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 2  | 2  | 2  | 4  | 8   | 15 | 23 | 7  | 4  | 3  | 4   | 14                                                                                                                                                           | 4  | 3  | 2  | 2  | 4.3                            | 22.5          |  |  |  |
| 30-Dec                                                                                                                     | 9                             | 21 | 19 | 11 | 8  | 7   | 4  | 5  | 3  | 1  | 1  | 1  | 1   | 1  | 1  | 1  | 1  | 1  | 1   | 1                                                                                                                                                            | 1  | 1  | 6  | 9  | 4.7                            | 21.2          |  |  |  |
| 31-Dec                                                                                                                     | N                             | N  | N  | N  | N  | N   | N  | N  | N  | N  | N  | 2  | 3   | 1  | 1  | 1  | 1  | 1  | 1   | 8                                                                                                                                                            | 11 | 2  | 4  | 20 | --                             | 19.5          |  |  |  |
| 8.0 7.6 6.5 6.0 7.1 7.8 6.2 7.0 7.3 7.7 8.4 7.3 11.2 6.3 7.6 6.3 6.6 7.2 9.9 8.8 6.9 5.7 7.0 8.4                           |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     |                                                                                                                                                              |    |    |    |    | Diurnal Average                |               |  |  |  |
| 50.6 42.8 34.0 36.9 38.9 105.2 38.1 30.9 23.2 27.9 33.2 39.4 143.4 15.6 39.4 14.9 17.1 25.1 111.1 51.9 24.2 14.4 39.4 58.7 |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     |                                                                                                                                                              |    |    |    |    | Diurnal Maximum                |               |  |  |  |
| C - Calibration M - Maintenance N - Not Valid                                                                              |                               |    |    |    |    |     |    |    |    |    |    |    |     |    |    |    |    |    |     |                                                                                                                                                              |    |    |    |    |                                |               |  |  |  |



# Pollutant Rose

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>  
Beaverlodge - December 2016



# Hourly Averages

External Temperature (ET) - °C

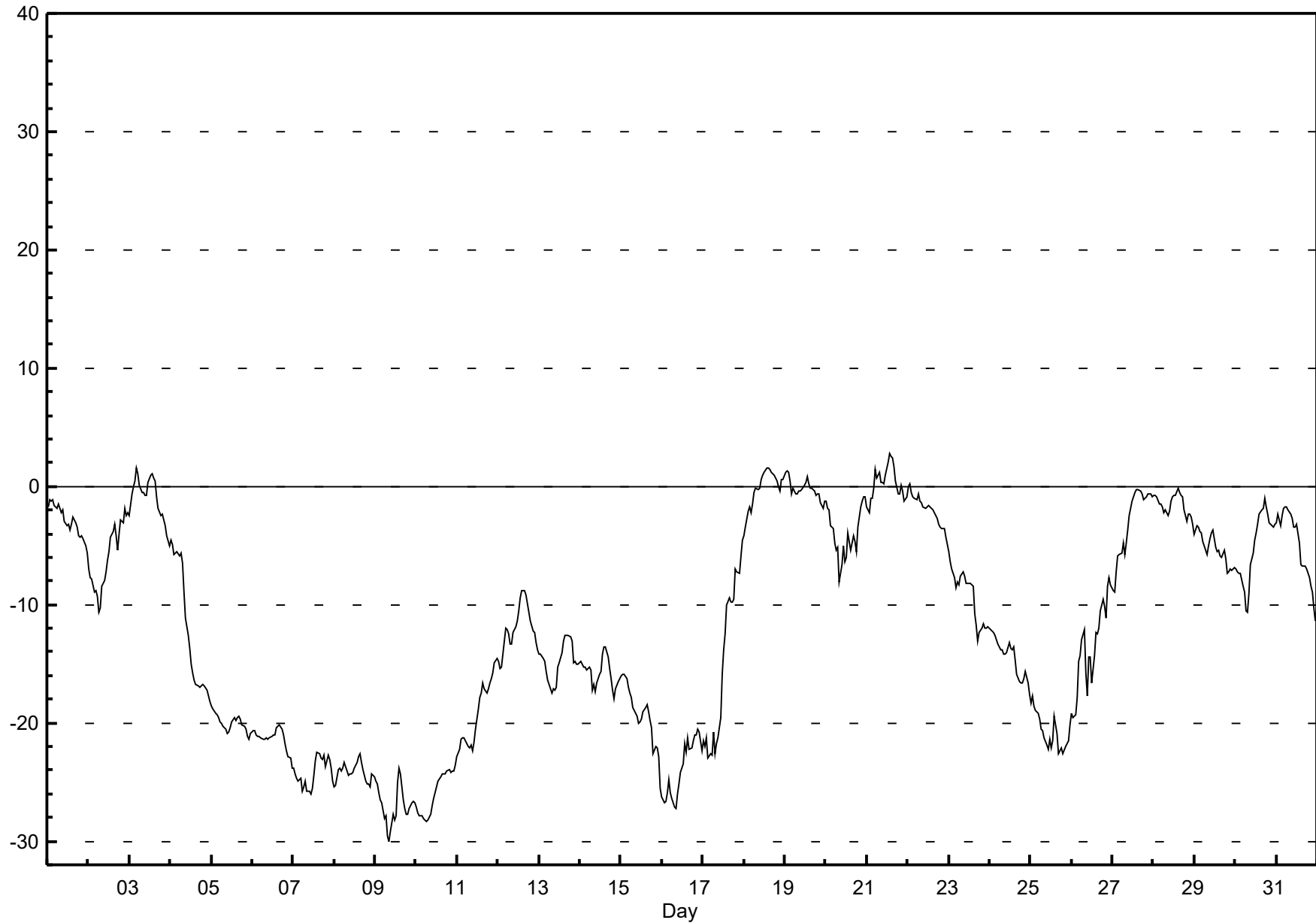
Beaverlodge - December 2016

| Maximum Value: 2.8 °C on Dec 21 14:00        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.3 °C on Dec 21                                                                                                                              |     |     |                 |               |               |       |  |  |  | Hours in Service: 744    |  |
|----------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------|---------------|-------|--|--|--|--------------------------|--|
| Minimum Value: -30 °C on Dec 9 09:00         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: -27.0 °C on Dec 9                                                                                                                             |     |     |                 |               |               |       |  |  |  | Hours of Data: 744       |  |
| Maximum Diurnal Average: -10.7 °C at hour 15 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: -12.9 °C at hour 9                                                                                                                          |     |     |                 |               |               |       |  |  |  | Hours of Missing Data: 0 |  |
| Monthly Average: -11.90 °C                   |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = -28.1 P <sub>10</sub> = -24.3 Q <sub>1</sub> = -20.6 Median = -11.9 Q <sub>3</sub> = -3.1 P <sub>90</sub> = -0.6 P <sub>99</sub> = 1.6 |     |     |                 |               |               |       |  |  |  | Hours of Calibration: 0  |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 100.0                                                                                                                                      |     |     |                 |               |               |       |  |  |  |                          |  |
| Day                                          | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |                 | Daily Average | Daily Maximum |       |  |  |  |                          |  |
|                                              | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                   | 22  | 23  | 24              |               |               |       |  |  |  |                          |  |
| 1-Dec                                        | -2                            | -1  | -1  | -1  | -2  | -2  | -2  | -2  | -2  | -2  | -3  | -3  | -3  | -4  | -3  | -3  | -3  | -3  | -4  | -4  | -4                                                                                                                                                                   | -4  | -5  | -6              | -2.9          | -1.1          |       |  |  |  |                          |  |
| 2-Dec                                        | -7                            | -8  | -8  | -9  | -9  | -9  | -11 | -10 | -8  | -8  | -7  | -6  | -6  | -4  | -4  | -3  | -4  | -5  | -4  | -3  | -3                                                                                                                                                                   | -2  | -2  | -2              | -6.0          | -1.9          |       |  |  |  |                          |  |
| 3-Dec                                        | -2                            | -1  | 0   | 0   | 2   | 1   | 0   | 0   | -1  | -1  | -1  | 0   | 1   | 1   | 1   | 0   | -1  | -2  | -2  | -2  | -3                                                                                                                                                                   | -3  | -4  | -5              | -0.9          | 1.5           |       |  |  |  |                          |  |
| 4-Dec                                        | -5                            | -5  | -6  | -6  | -5  | -6  | -6  | -6  | -9  | -11 | -13 | -14 | -15 | -16 | -16 | -17 | -17 | -17 | -17 | -17 | -17                                                                                                                                                                  | -17 | -18 | -18             | -12.2         | -4.6          |       |  |  |  |                          |  |
| 5-Dec                                        | -19                           | -19 | -19 | -19 | -19 | -20 | -20 | -20 | -20 | -21 | -21 | -20 | -20 | -20 | -20 | -20 | -19 | -20 | -20 | -20 | -20                                                                                                                                                                  | -21 | -21 | -21             | -21           | -20.0         | -18.5 |  |  |  |                          |  |
| 6-Dec                                        | -21                           | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -20 | -20 | -20 | -21 | -21 | -22 | -22                                                                                                                                                                  | -23 | -23 | -24             | -21.3         | -20.1         |       |  |  |  |                          |  |
| 7-Dec                                        | -24                           | -24 | -25 | -25 | -25 | -26 | -25 | -25 | -26 | -26 | -26 | -26 | -24 | -23 | -23 | -23 | -23 | -23 | -23 | -24 | -23                                                                                                                                                                  | -23 | -24 | -25             | -24.2         | -22.5         |       |  |  |  |                          |  |
| 8-Dec                                        | -25                           | -25 | -24 | -24 | -24 | -24 | -23 | -24 | -24 | -24 | -24 | -24 | -24 | -23 | -23 | -23 | -23 | -24 | -25 | -25 | -25                                                                                                                                                                  | -25 | -24 | -25             | -24.2         | -22.6         |       |  |  |  |                          |  |
| 9-Dec                                        | -25                           | -25 | -26 | -27 | -27 | -28 | -28 | -30 | -30 | -29 | -28 | -28 | -28 | -25 | -24 | -24 | -27 | -27 | -28 | -28 | -28                                                                                                                                                                  | -27 | -27 | -27             | -27           | -27.0         | -23.8 |  |  |  |                          |  |
| 10-Dec                                       | -27                           | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -28 | -27 | -26 | -26 | -25 | -25 | -25 | -24 | -24 | -24 | -24 | -24 | -24                                                                                                                                                                  | -24 | -24 | -24             | -25.9         | -23.5         |       |  |  |  |                          |  |
| 11-Dec                                       | -23                           | -22 | -21 | -21 | -21 | -21 | -22 | -22 | -22 | -22 | -22 | -21 | -19 | -18 | -17 | -17 | -17 | -17 | -17 | -17 | -16                                                                                                                                                                  | -16 | -15 | -15             | -19.2         | -14.6         |       |  |  |  |                          |  |
| 12-Dec                                       | -15                           | -15 | -15 | -14 | -12 | -12 | -12 | -13 | -13 | -12 | -12 | -11 | -10 | -9  | -9  | -9  | -9  | -10 | -11 | -11 | -12                                                                                                                                                                  | -12 | -13 | -14             | -12.0         | -8.8          |       |  |  |  |                          |  |
| 13-Dec                                       | -14                           | -14 | -15 | -15 | -16 | -16 | -17 | -18 | -17 | -17 | -17 | -15 | -15 | -14 | -13 | -13 | -13 | -13 | -13 | -13 | -15                                                                                                                                                                  | -15 | -15 | -15             | -14.8         | -12.6         |       |  |  |  |                          |  |
| 14-Dec                                       | -15                           | -15 | -15 | -15 | -15 | -15 | -16 | -17 | -17 | -17 | -17 | -16 | -16 | -14 | -14 | -14 | -14 | -15 | -16 | -17 | -18                                                                                                                                                                  | -17 | -16 | -16             | -15.8         | -13.5         |       |  |  |  |                          |  |
| 15-Dec                                       | -16                           | -16 | -16 | -16 | -17 | -18 | -18 | -19 | -19 | -19 | -20 | -20 | -20 | -19 | -19 | -19 | -19 | -20 | -20 | -23 | -22                                                                                                                                                                  | -22 | -23 | -26             | -19.3         | -15.9         |       |  |  |  |                          |  |
| 16-Dec                                       | -26                           | -27 | -27 | -26 | -25 | -26 | -26 | -27 | -27 | -26 | -25 | -24 | -23 | -22 | -22 | -21 | -22 | -22 | -21 | -21 | -21                                                                                                                                                                  | -20 | -21 | -22             | -23.9         | -20.5         |       |  |  |  |                          |  |
| 17-Dec                                       | -21                           | -22 | -21 | -23 | -23 | -23 | -21 | -23 | -22 | -21 | -19 | -16 | -14 | -13 | -10 | -9  | -10 | -10 | -10 | -7  | -7                                                                                                                                                                   | -7  | -6  | -5              | -15.1         | -4.5          |       |  |  |  |                          |  |
| 18-Dec                                       | -4                            | -3  | -2  | -2  | -2  | -1  | 0   | 0   | 0   | 0   | 1   | 1   | 1   | 2   | 2   | 1   | 1   | 1   | 1   | 0   | 0                                                                                                                                                                    | 0   | 1   | 1               | -0.2          | 1.6           |       |  |  |  |                          |  |
| 19-Dec                                       | 1                             | 1   | 1   | 1   | -1  | 0   | -1  | -1  | 0   | 0   | 0   | 0   | 0   | 1   | 0   | 0   | 0   | 0   | -1  | -1  | -1                                                                                                                                                                   | -1  | -2  | -1              | -0.2          | 1.3           |       |  |  |  |                          |  |
| 20-Dec                                       | -1                            | -2  | -2  | -3  | -4  | -5  | -5  | -5  | -8  | -7  | -5  | -6  | -6  | -4  | -5  | -5  | -4  | -5  | -5  | -3  | -2                                                                                                                                                                   | -1  | -1  | -1              | -4.0          | -0.9          |       |  |  |  |                          |  |
| 21-Dec                                       | -2                            | -2  | -1  | -1  | 0   | 1   | 1   | 1   | 0   | 0   | 0   | 1   | 2   | 3   | 3   | 2   | 2   | 0   | -1  | -1  | 0                                                                                                                                                                    | 0   | -1  | -1              | 0.3           | 2.8           |       |  |  |  |                          |  |
| 22-Dec                                       | 0                             | 0   | 0   | -1  | -1  | -1  | -1  | -1  | -1  | -2  | -2  | -2  | -2  | -2  | -2  | -2  | -2  | -3  | -3  | -3  | -4                                                                                                                                                                   | -4  | -4  | -5              | -2.0          | 0.2           |       |  |  |  |                          |  |
| 23-Dec                                       | -6                            | -6  | -7  | -8  | -9  | -8  | -8  | -8  | -7  | -8  | -8  | -8  | -8  | -8  | -8  | -11 | -12 | -13 | -12 | -12 | -12                                                                                                                                                                  | -12 | -12 | -12             | -9.3          | -5.5          |       |  |  |  |                          |  |
| 24-Dec                                       | -12                           | -12 | -12 | -13 | -13 | -13 | -14 | -14 | -14 | -14 | -14 | -13 | -14 | -14 | -14 | -15 | -16 | -16 | -17 | -17 | -16                                                                                                                                                                  | -16 | -17 | -18             | -14.4         | -11.9         |       |  |  |  |                          |  |
| 25-Dec                                       | -18                           | -18 | -19 | -19 | -19 | -20 | -21 | -21 | -21 | -22 | -22 | -21 | -22 | -22 | -19 | -21 | -23 | -22 | -22 | -23 | -22                                                                                                                                                                  | -22 | -21 | -20             | -20.8         | -17.7         |       |  |  |  |                          |  |
| 26-Dec                                       | -19                           | -20 | -19 | -18 | -15 | -14 | -13 | -12 | -16 | -18 | -14 | -14 | -17 | -14 | -12 | -12 | -12 | -11 | -10 | -10 | -11                                                                                                                                                                  | -8  | -8  | -8              | -13.6         | -7.7          |       |  |  |  |                          |  |
| 27-Dec                                       | -9                            | -9  | -7  | -6  | -6  | -6  | -5  | -6  | -5  | -4  | -3  | -1  | -1  | -1  | 0   | 0   | 0   | -1  | -1  | -1  | -1                                                                                                                                                                   | -1  | -1  | -1              | -3.0          | -0.2          |       |  |  |  |                          |  |
| 28-Dec                                       | -1                            | -1  | -1  | -1  | -1  | -2  | -2  | -2  | -3  | -2  | -1  | -1  | -1  | -1  | 0   | -1  | -1  | -1  | -2  | -3  | -2                                                                                                                                                                   | -2  | -3  | -3              | -1.6          | -0.2          |       |  |  |  |                          |  |
| 29-Dec                                       | -4                            | -3  | -3  | -4  | -4  | -5  | -5  | -6  | -5  | -4  | -4  | -4  | -5  | -6  | -5  | -6  | -6  | -5  | -6  | -7  | -7                                                                                                                                                                   | -7  | -7  | -7              | -5.3          | -3.3          |       |  |  |  |                          |  |
| 30-Dec                                       | -7                            | -7  | -7  | -7  | -8  | -9  | -11 | -11 | -9  | -7  | -6  | -5  | -4  | -3  | -2  | -2  | -2  | -1  | -2  | -2  | -3                                                                                                                                                                   | -3  | -3  | -3              | -5.2          | -1.0          |       |  |  |  |                          |  |
| 31-Dec                                       | -3                            | -2  | -3  | -2  | -2  | -2  | -2  | -2  | -2  | -3  | -3  | -3  | -3  | -5  | -7  | -7  | -7  | -7  | -7  | -8  | -8                                                                                                                                                                   | -9  | -10 | -11             | -5.0          | -1.7          |       |  |  |  |                          |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     | Diurnal Average |               |               |       |  |  |  |                          |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     | Diurnal Maximum |               |               |       |  |  |  |                          |  |

## Hourly Averages

External Temperature (ET) - °C

Beaverlodge - December 2016



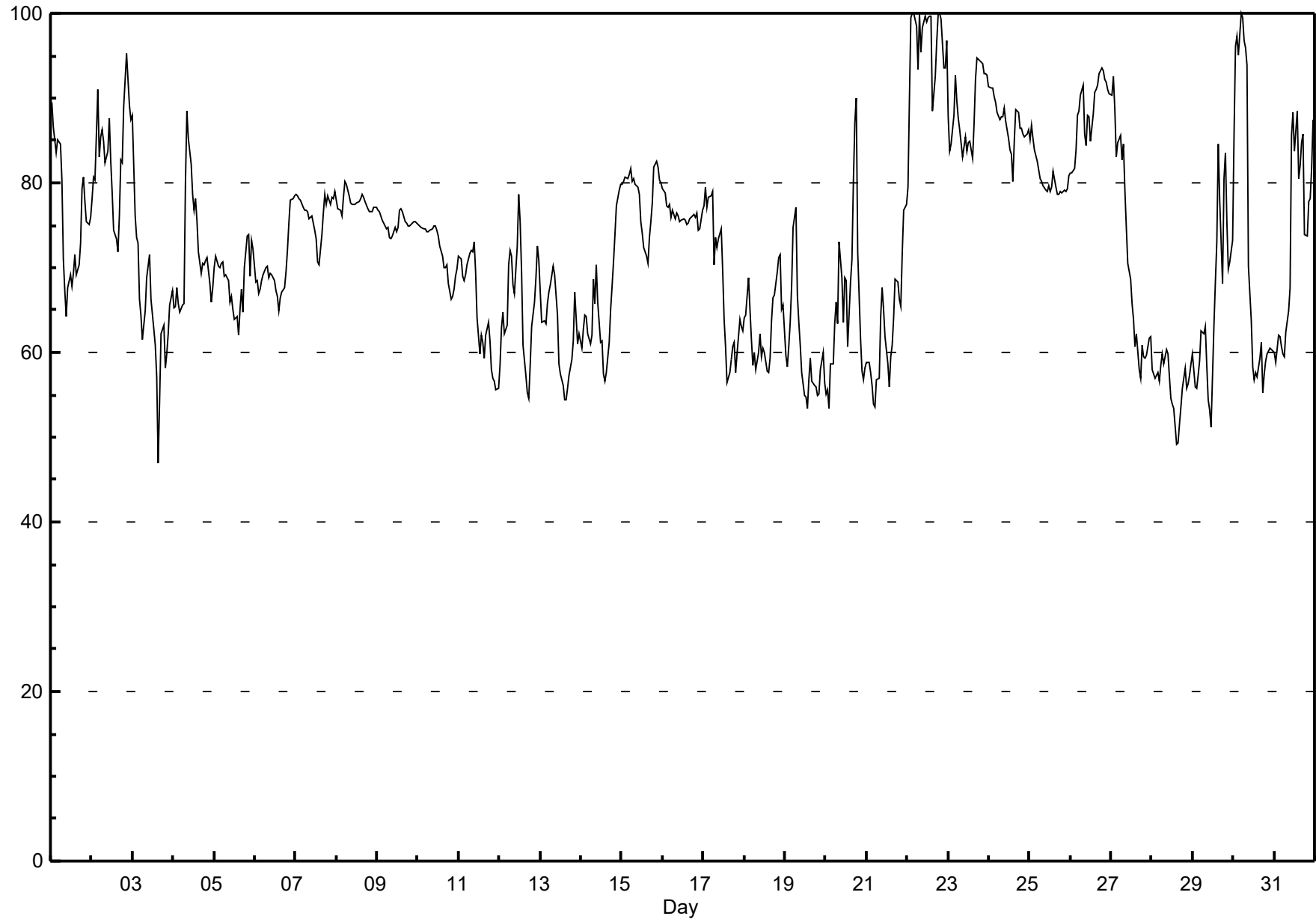
## Hourly Averages

Relative Humidity (RH) - %  
Beaverlodge - December 2016

| Maximum Value: 100.0 % on Dec 22 04:00                                                                                      |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     | Maximum Daily Average: 96.4 % on Dec 22                                                                                                                           |    |    |    |                 | Hours in Service: 744    |  |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|-----|-----|-----|----|----|-----|----|----|-----|----|----|-----|-----|----|----|----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|--------------------------|--|
| Minimum Value: 47 % on Dec 3 16:00                                                                                          |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     | Minimum Daily Average: 56.2 % on Dec 28                                                                                                                           |    |    |    |                 | Hours of Data: 744       |  |
| Maximum Diurnal Average: 74.6 % at hour 6                                                                                   |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     | Minimum Diurnal Average: 68.9 % at hour 15                                                                                                                        |    |    |    |                 | Hours of Missing Data: 0 |  |
| Monthly Average: 72.62 %                                                                                                    |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     | Percentiles: P <sub>1</sub> = 53.4 P <sub>10</sub> = 57.7 Q <sub>1</sub> = 63.3 Median = 72.3 Q <sub>3</sub> = 79.7 P <sub>90</sub> = 88.1 P <sub>99</sub> = 99.7 |    |    |    |                 | Hours of Calibration: 0  |  |
|                                                                                                                             |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     | Percent Operational Time: 100.0                                                                                                                                   |    |    |    |                 |                          |  |
| Day                                                                                                                         | Hourly Period Ending At (MST) |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     |                                                                                                                                                                   |    |    |    | Daily Average   | Daily Maximum            |  |
| 1-Dec                                                                                                                       | 90                            | 87 | 85  | 84  | 85  | 85 | 80 | 71  | 67 | 64 | 68  | 69 | 68 | 69  | 72  | 69 | 70 | 73 | 79  | 81  | 78                                                                                                                                                                | 75 | 75 | 76 | 75.8            | 89.6                     |  |
| 2-Dec                                                                                                                       | 78                            | 81 | 80  | 91  | 83  | 85 | 86 | 85  | 82 | 84 | 88  | 83 | 79 | 74  | 73  | 72 | 76 | 83 | 82  | 89  | 95                                                                                                                                                                | 92 | 89 | 87 | 83.3            | 95.3                     |  |
| 3-Dec                                                                                                                       | 88                            | 76 | 74  | 73  | 66  | 64 | 62 | 65  | 69 | 70 | 72  | 66 | 63 | 61  | 57  | 47 | 54 | 62 | 63  | 58  | 60                                                                                                                                                                | 62 | 66 | 67 | 65.2            | 88.0                     |  |
| 4-Dec                                                                                                                       | 65                            | 65 | 68  | 66  | 65  | 66 | 66 | 80  | 89 | 85 | 82  | 79 | 77 | 78  | 76  | 72 | 69 | 70 | 70  | 71  | 71                                                                                                                                                                | 68 | 66 | 68 | 72.1            | 88.6                     |  |
| 5-Dec                                                                                                                       | 70                            | 71 | 70  | 70  | 70  | 71 | 69 | 69  | 68 | 66 | 67  | 65 | 64 | 64  | 62  | 65 | 67 | 65 | 70  | 74  | 74                                                                                                                                                                | 69 | 73 | 72 | 68.6            | 73.9                     |  |
| 6-Dec                                                                                                                       | 68                            | 69 | 67  | 67  | 68  | 69 | 70 | 70  | 69 | 69 | 69  | 68 | 67 | 67  | 65  | 66 | 67 | 68 | 70  | 72  | 75                                                                                                                                                                | 78 | 78 | 78 | 69.8            | 78.4                     |  |
| 7-Dec                                                                                                                       | 79                            | 78 | 78  | 78  | 77  | 77 | 77 | 77  | 76 | 76 | 75  | 74 | 73 | 71  | 70  | 74 | 76 | 79 | 77  | 79  | 77                                                                                                                                                                | 78 | 78 | 79 | 76.4            | 79.0                     |  |
| 8-Dec                                                                                                                       | 78                            | 77 | 77  | 76  | 78  | 80 | 80 | 79  | 78 | 77 | 77  | 78 | 78 | 78  | 79  | 78 | 78 | 77 | 77  | 77  | 77                                                                                                                                                                | 77 | 77 | 77 | 77.7            | 80.2                     |  |
| 9-Dec                                                                                                                       | 77                            | 77 | 76  | 76  | 75  | 75 | 75 | 73  | 73 | 74 | 75  | 74 | 75 | 77  | 77  | 77 | 75 | 75 | 75  | 75  | 75                                                                                                                                                                | 75 | 75 | 75 | 75.2            | 77.0                     |  |
| 10-Dec                                                                                                                      | 75                            | 75 | 75  | 75  | 75  | 74 | 74 | 74  | 75 | 75 | 75  | 74 | 74 | 73  | 71  | 70 | 70 | 70 | 68  | 66  | 67                                                                                                                                                                | 68 | 69 | 70 | 72.1            | 75.1                     |  |
| 11-Dec                                                                                                                      | 71                            | 71 | 69  | 68  | 69  | 70 | 72 | 72  | 72 | 73 | 69  | 64 | 60 | 62  | 61  | 59 | 62 | 64 | 61  | 58  | 57                                                                                                                                                                | 57 | 56 | 56 | 64.8            | 73.1                     |  |
| 12-Dec                                                                                                                      | 58                            | 63 | 65  | 62  | 63  | 70 | 72 | 71  | 68 | 67 | 72  | 79 | 75 | 70  | 61  | 57 | 55 | 55 | 59  | 63  | 66                                                                                                                                                                | 69 | 72 | 71 | 66.0            | 78.7                     |  |
| 13-Dec                                                                                                                      | 67                            | 64 | 64  | 63  | 66  | 67 | 68 | 70  | 69 | 67 | 64  | 59 | 57 | 56  | 54  | 54 | 56 | 57 | 59  | 61  | 67                                                                                                                                                                | 64 | 61 | 62 | 62.4            | 70.3                     |  |
| 14-Dec                                                                                                                      | 61                            | 63 | 64  | 64  | 62  | 61 | 62 | 69  | 66 | 70 | 66  | 61 | 61 | 57  | 57  | 58 | 61 | 65 | 68  | 71  | 74                                                                                                                                                                | 77 | 79 | 80 | 65.7            | 79.9                     |  |
| 15-Dec                                                                                                                      | 80                            | 80 | 81  | 80  | 81  | 82 | 80 | 81  | 80 | 80 | 79  | 75 | 74 | 72  | 71  | 71 | 74 | 75 | 78  | 82  | 83                                                                                                                                                                | 82 | 80 | 80 | 78.3            | 82.6                     |  |
| 16-Dec                                                                                                                      | 79                            | 79 | 77  | 77  | 77  | 76 | 77 | 76  | 76 | 76 | 75  | 76 | 76 | 76  | 75  | 75 | 76 | 76 | 76  | 76  | 76                                                                                                                                                                | 74 | 75 | 77 | 76.2            | 79.4                     |  |
| 17-Dec                                                                                                                      | 77                            | 80 | 77  | 78  | 78  | 79 | 70 | 74  | 72 | 73 | 74  | 70 | 64 | 61  | 56  | 58 | 59 | 61 | 61  | 58  | 60                                                                                                                                                                | 64 | 63 | 62 | 67.9            | 79.5                     |  |
| 18-Dec                                                                                                                      | 64                            | 64 | 69  | 65  | 61  | 58 | 60 | 58  | 60 | 62 | 59  | 60 | 60 | 58  | 58  | 59 | 64 | 67 | 67  | 70  | 71                                                                                                                                                                | 72 | 65 | 66 | 63.2            | 71.6                     |  |
| 19-Dec                                                                                                                      | 60                            | 58 | 61  | 64  | 68  | 75 | 77 | 67  | 64 | 61 | 58  | 55 | 55 | 53  | 57  | 59 | 57 | 56 | 56  | 55  | 55                                                                                                                                                                | 58 | 60 | 56 | 60.1            | 77.2                     |  |
| 20-Dec                                                                                                                      | 55                            | 56 | 53  | 59  | 59  | 63 | 66 | 63  | 73 | 69 | 64  | 69 | 68 | 61  | 68  | 71 | 80 | 87 | 90  | 72  | 62                                                                                                                                                                | 58 | 57 | 58 | 65.8            | 90.0                     |  |
| 21-Dec                                                                                                                      | 59                            | 59 | 58  | 56  | 54  | 54 | 57 | 57  | 64 | 68 | 65  | 62 | 59 | 56  | 59  | 61 | 64 | 69 | 68  | 66  | 65                                                                                                                                                                | 72 | 77 | 77 | 62.7            | 77.4                     |  |
| 22-Dec                                                                                                                      | 80                            | 90 | 100 | 100 | 100 | 98 | 93 | 100 | 95 | 98 | 100 | 99 | 99 | 100 | 100 | 89 | 93 | 97 | 100 | 100 | 99                                                                                                                                                                | 93 | 94 | 97 | 96.4            | 100.0                    |  |
| 23-Dec                                                                                                                      | 88                            | 84 | 85  | 88  | 93  | 90 | 88 | 86  | 83 | 84 | 85  | 84 | 85 | 85  | 83  | 87 | 92 | 95 | 95  | 94  | 94                                                                                                                                                                | 93 | 93 | 93 | 88.5            | 94.7                     |  |
| 24-Dec                                                                                                                      | 91                            | 91 | 91  | 90  | 89  | 88 | 88 | 88  | 88 | 89 | 87  | 85 | 84 | 83  | 80  | 85 | 89 | 88 | 86  | 86  | 86                                                                                                                                                                | 85 | 86 | 86 | 87.1            | 91.4                     |  |
| 25-Dec                                                                                                                      | 85                            | 87 | 85  | 84  | 83  | 81 | 80 | 80  | 80 | 79 | 79  | 80 | 79 | 80  | 81  | 80 | 79 | 79 | 79  | 79  | 79                                                                                                                                                                | 79 | 79 | 81 | 80.7            | 86.8                     |  |
| 26-Dec                                                                                                                      | 81                            | 81 | 82  | 84  | 88  | 89 | 90 | 91  | 86 | 84 | 88  | 88 | 85 | 88  | 91  | 91 | 92 | 93 | 94  | 93  | 92                                                                                                                                                                | 92 | 91 | 91 | 88.5            | 93.6                     |  |
| 27-Dec                                                                                                                      | 90                            | 93 | 89  | 83  | 85  | 86 | 83 | 85  | 79 | 75 | 71  | 69 | 66 | 64  | 61  | 62 | 58 | 57 | 61  | 60  | 59                                                                                                                                                                | 60 | 62 | 62 | 71.5            | 92.6                     |  |
| 28-Dec                                                                                                                      | 58                            | 58 | 57  | 58  | 57  | 59 | 60 | 59  | 60 | 60 | 57  | 55 | 54 | 53  | 49  | 49 | 52 | 54 | 56  | 58  | 56                                                                                                                                                                | 56 | 57 | 59 | 56.2            | 60.4                     |  |
| 29-Dec                                                                                                                      | 60                            | 56 | 56  | 57  | 59  | 63 | 62 | 63  | 58 | 54 | 53  | 51 | 63 | 68  | 73  | 85 | 78 | 68 | 81  | 84  | 75                                                                                                                                                                | 70 | 71 | 73 | 65.9            | 84.6                     |  |
| 30-Dec                                                                                                                      | 86                            | 96 | 97  | 95  | 100 | 99 | 97 | 96  | 94 | 70 | 64  | 58 | 57 | 58  | 57  | 59 | 61 | 55 | 57  | 59  | 60                                                                                                                                                                | 60 | 60 | 60 | 73.2            | 100.0                    |  |
| 31-Dec                                                                                                                      | 60                            | 59 | 62  | 62  | 61  | 60 | 60 | 62  | 65 | 68 | 86  | 88 | 84 | 89  | 81  | 82 | 85 | 86 | 74  | 74  | 78                                                                                                                                                                | 78 | 82 | 87 | 73.7            | 88.6                     |  |
| 73.5 73.7 73.9 74.0 74.1 74.6 74.2 74.5 74.1 73.2 73.0 71.5 70.4 69.7 68.9 69.1 70.6 71.8 72.8 72.8 73.0 72.8 73.1 73.7     |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     |                                                                                                                                                                   |    |    |    | Diurnal Average |                          |  |
| 91.4 96.1 99.6 100.0 100.0 99.5 96.8 100.0 95.4 98.3 99.7 99.0 99.5 99.7 99.7 91.1 92.5 96.6 99.8 100.0 99.3 93.5 93.5 96.7 |                               |    |     |     |     |    |    |     |    |    |     |    |    |     |     |    |    |    |     |     |                                                                                                                                                                   |    |    |    | Diurnal Maximum |                          |  |

## Hourly Averages

Relative Humidity (RH) - %  
Beaverlodge - December 2016



## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Beaverlodge - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 5                             | 6   | 11  | 10  | 9   | 7   | 9   | 13  | 10  | 5   | 3   | 5   | 3   | 3   | 5   | 5   | 5   | 2   | 3   | 2   | 3   | 3   | 2   | 3   | 2.4           | 12.5          |
| Dir    | 286                           | 300 | 306 | 328 | 350 | 341 | 334 | 319 | 322 | 301 | 277 | 84  | 128 | 136 | 84  | 80  | 78  | 86  | 108 | 159 | 73  | 104 | 113 | 121 | 347           | 319           |
| 2 Spd  | 3                             | 2   | 2   | 1   | 2   | 3   | 1   | 4   | 2   | 3   | 1   | 3   | 5   | 3   | 4   | 2   | 4   | 1   | 3   | 4   | 5   | 3   | 6   | 2   | 0.8           | 5.7           |
| Dir    | 108                           | 130 | 179 | 202 | 207 | 255 | 120 | 204 | 316 | 359 | 66  | 251 | 290 | 355 | 25  | 73  | 172 | 155 | 145 | 193 | 65  | 166 | 196 | 193 | 181           | 196           |
| 3 Spd  | 4                             | 7   | 10  | 28  | 43  | 35  | 26  | 24  | 29  | 24  | 17  | 27  | 28  | 36  | 32  | 30  | 30  | 31  | 24  | 26  | 20  | 19  | 15  | 14  | 23.9          | 42.7          |
| Dir    | 207                           | 230 | 231 | 238 | 247 | 246 | 243 | 248 | 243 | 244 | 239 | 245 | 247 | 248 | 251 | 257 | 250 | 248 | 251 | 261 | 264 | 266 | 260 | 264 | 249           | 247           |
| 4 Spd  | 21                            | 19  | 14  | 20  | 22  | 18  | 13  | 14  | 20  | 21  | 21  | 20  | 21  | 22  | 24  | 21  | 19  | 17  | 16  | 16  | 19  | 21  | 21  | 16  | 17.2          | 23.9          |
| Dir    | 265                           | 265 | 259 | 267 | 271 | 276 | 305 | 318 | 330 | 334 | 328 | 328 | 328 | 325 | 320 | 323 | 324 | 324 | 328 | 327 | 324 | 327 | 327 | 331 | 312           | 320           |
| 5 Spd  | 17                            | 14  | 16  | 15  | 16  | 16  | 15  | 14  | 16  | 17  | 15  | 15  | 16  | 16  | 17  | 17  | 15  | 12  | 8   | 8   | 8   | 8   | 7   | 10  | 13.6          | 17.0          |
| Dir    | 324                           | 324 | 327 | 325 | 327 | 325 | 323 | 322 | 323 | 317 | 317 | 318 | 312 | 316 | 316 | 312 | 311 | 321 | 318 | 308 | 313 | 314 | 307 | 312 | 319           | 316           |
| 6 Spd  | 14                            | 12  | 15  | 14  | 13  | 12  | 12  | 12  | 12  | 10  | 12  | 14  | 13  | 11  | 10  | 11  | 9   | 10  | 8   | 8   | 4   | 4   | 5   | 6   | 10.4          | 15.1          |
| Dir    | 322                           | 325 | 322 | 323 | 314 | 315 | 314 | 314 | 314 | 311 | 312 | 304 | 304 | 297 | 301 | 310 | 322 | 333 | 343 | 318 | 304 | 315 | 332 | 323 | 316           | 322           |
| 7 Spd  | 4                             | 4   | 4   | 6   | 13  | 6   | 5   | 7   | 3   | 2   | 1   | 1   | 2   | 2   | 3   | 1   | 1   | 4   | 4   | 3   | 5   | 2   | 1   | 1   | 2.9           | 12.6          |
| Dir    | 332                           | 354 | 8   | 2   | 326 | 355 | 343 | 341 | 10  | 357 | 228 | 79  | 303 | 73  | 312 | 37  | 16  | 37  | 40  | 73  | 66  | 325 | 6   | 246 | 357           | 326           |
| 8 Spd  | 0                             | 1   | 1   | 2   | 4   | 5   | 4   | 9   | 9   | 8   | 10  | 10  | 8   | 7   | 4   | 8   | 10  | 11  | 10  | 6   | 5   | 5   | 2   | 5   | 5.4           | 11.1          |
| Dir    | 8                             | 339 | 34  | 123 | 155 | 124 | 118 | 115 | 104 | 105 | 124 | 129 | 125 | 136 | 111 | 108 | 104 | 99  | 94  | 94  | 86  | 54  | 55  | 11  | 107           | 99            |
| 9 Spd  | 6                             | 6   | 5   | 4   | 2   | 5   | 3   | 1   | 5   | 2   | 0   | 3   | 5   | 2   | 2   | 2   | 7   | 9   | 14  | 13  | 11  | 10  | 7   | 6   | 4.2           | 14.0          |
| Dir    | 27                            | 23  | 30  | 48  | 159 | 41  | 336 | 336 | 38  | 17  | 243 | 247 | 293 | 233 | 30  | 353 | 18  | 331 | 330 | 330 | 330 | 333 | 334 | 315 | 345           | 330           |
| 10 Spd | 6                             | 6   | 4   | 5   | 5   | 5   | 5   | 5   | 5   | 7   | 9   | 11  | 11  | 13  | 13  | 13  | 12  | 12  | 15  | 16  | 11  | 13  | 11  | 9   | 9.2           | 15.6          |
| Dir    | 308                           | 288 | 312 | 322 | 300 | 321 | 309 | 315 | 309 | 311 | 318 | 318 | 319 | 316 | 319 | 318 | 315 | 310 | 306 | 309 | 292 | 298 | 308 | 284 | 310           | 309           |
| 11 Spd | 12                            | 14  | 15  | 14  | 12  | 10  | 12  | 11  | 8   | 7   | 4   | 1   | 4   | 13  | 8   | 13  | 15  | 12  | 14  | 13  | 12  | 12  | 9   | 11  | 10.3          | 14.9          |
| Dir    | 261                           | 273 | 293 | 294 | 296 | 299 | 272 | 264 | 274 | 239 | 247 | 178 | 227 | 264 | 235 | 273 | 266 | 272 | 264 | 275 | 274 | 270 | 284 | 268 | 272           | 293           |
| 12 Spd | 9                             | 11  | 9   | 6   | 18  | 14  | 11  | 12  | 15  | 16  | 14  | 18  | 19  | 18  | 21  | 19  | 16  | 16  | 13  | 11  | 10  | 10  | 12  | 10  | 13.3          | 21.4          |
| Dir    | 276                           | 252 | 249 | 299 | 306 | 293 | 300 | 304 | 299 | 304 | 300 | 281 | 278 | 291 | 299 | 303 | 301 | 298 | 298 | 300 | 300 | 308 | 306 | 293 | 294           | 299           |
| 13 Spd | 10                            | 11  | 12  | 11  | 12  | 8   | 9   | 6   | 8   | 11  | 4   | 5   | 3   | 5   | 2   | 4   | 4   | 3   | 1   | 2   | 2   | 2   | 2   | 2   | 4.5           | 11.6          |
| Dir    | 299                           | 311 | 313 | 309 | 314 | 319 | 309 | 312 | 332 | 321 | 359 | 326 | 1   | 355 | 13  | 45  | 36  | 23  | 75  | 115 | 150 | 220 | 234 | 46  | 324           | 314           |
| 14 Spd | 3                             | 1   | 1   | 2   | 3   | 2   | 1   | 0   | 3   | 5   | 9   | 12  | 12  | 15  | 12  | 9   | 10  | 12  | 12  | 12  | 6   | 10  | 5   | 6   | 6.1           | 15.1          |
| Dir    | 59                            | 133 | 15  | 34  | 287 | 60  | 92  | 244 | 292 | 309 | 325 | 332 | 313 | 316 | 320 | 323 | 340 | 0   | 346 | 341 | 346 | 352 | 343 | 349 | 335           | 316           |
| 15 Spd | 5                             | 6   | 5   | 8   | 9   | 6   | 5   | 5   | 11  | 9   | 11  | 12  | 12  | 11  | 11  | 7   | 7   | 12  | 12  | 4   | 1   | 4   | 3   | 2   | 6.6           | 12.3          |
| Dir    | 338                           | 348 | 358 | 358 | 348 | 1   | 17  | 2   | 14  | 343 | 324 | 327 | 326 | 324 | 311 | 308 | 320 | 328 | 330 | 190 | 295 | 1   | 303 | 117 | 337           | 328           |
| 16 Spd | 4                             | 5   | 3   | 4   | 6   | 1   | 2   | 2   | 7   | 6   | 4   | 4   | 1   | 1   | 4   | 1   | 1   | 1   | 2   | 0   | 1   | 2   | 3   | 3   | 1.8           | 6.7           |
| Dir    | 61                            | 48  | 35  | 297 | 308 | 221 | 72  | 99  | 50  | 54  | 72  | 50  | 343 | 309 | 42  | 233 | 345 | 1   | 213 | 61  | 81  | 89  | 76  | 67  | 42            | 50            |
| 17 Spd | 3                             | 3   | 3   | 2   | 2   | 3   | 4   | 3   | 2   | 2   | 1   | 2   | 8   | 1   | 9   | 11  | 9   | 4   | 4   | 9   | 11  | 18  | 13  | 24  | 3.7           | 24.1          |
| Dir    | 90                            | 88  | 68  | 56  | 70  | 72  | 58  | 81  | 81  | 41  | 47  | 41  | 269 | 203 | 248 | 246 | 231 | 210 | 225 | 259 | 247 | 247 | 245 | 257 | 248           | 257           |
| 18 Spd | 30                            | 29  | 35  | 33  | 27  | 30  | 53  | 39  | 24  | 27  | 37  | 51  | 54  | 45  | 37  | 37  | 34  | 37  | 28  | 17  | 9   | 11  | 19  | 11  | 31.0          | 53.9          |
| Dir    | 247                           | 246 | 254 | 251 | 241 | 252 | 267 | 263 | 250 | 247 | 261 | 265 | 263 | 267 | 264 | 268 | 260 | 251 | 245 | 250 | 246 | 218 | 235 | 238 | 256           | 263           |
| 19 Spd | 19                            | 31  | 36  | 32  | 24  | 43  | 38  | 36  | 45  | 47  | 48  | 46  | 38  | 42  | 35  | 36  | 32  | 35  | 36  | 38  | 35  | 22  | 17  | 28  | 34.1          | 47.5          |
| Dir    | 237                           | 238 | 234 | 227 | 241 | 244 | 246 | 252 | 259 | 262 | 263 | 265 | 262 | 267 | 260 | 253 | 272 | 273 | 268 | 268 | 269 | 262 | 255 | 255 | 257           | 263           |
| 20 Spd | 30                            | 16  | 16  | 5   | 13  | 2   | 4   | 4   | 3   | 4   | 1   | 3   | 3   | 5   | 2   | 7   | 6   | 6   | 5   | 21  | 25  | 27  | 36  | 22  | 9.3           | 36.4          |
| Dir    | 251                           | 239 | 258 | 271 | 253 | 94  | 71  | 28  | 125 | 75  | 223 | 266 | 20  | 248 | 139 | 219 | 222 | 243 | 231 | 254 | 259 | 256 | 256 | 252 | 252           | 256           |
| 21 Spd | 6                             | 8   | 14  | 5   | 9   | 33  | 26  | 32  | 28  | 24  | 16  | 23  | 32  | 41  | 43  | 42  | 34  | 22  | 17  | 17  | 19  | 18  | 9   | 10  | 21.6          | 43.1          |
| Dir    | 190                           | 179 | 238 | 216 | 212 | 232 | 230 | 236 | 235 | 233 | 236 | 228 | 233 | 235 | 237 | 234 | 232 | 229 | 225 | 228 | 238 | 235 | 235 | 271 | 232           | 237           |
| 22 Spd | 13                            | 12  | 8   | 9   | 5   | 7   | 7   | 5   | 6   | 6   | 7   | 3   | 4   | 9   | 6   | 7   | 7   | 5   | 7   | 8   | 8   | 10  | 8   | 4   | 4.9           | 13.0          |
| Dir    | 290                           | 289 | 310 | 317 | 288 | 231 | 344 | 257 | 245 | 237 | 249 | 218 | 177 | 221 | 280 | 330 | 346 | 349 | 292 | 293 | 12  | 355 | 14  | 345 | 298           | 290           |



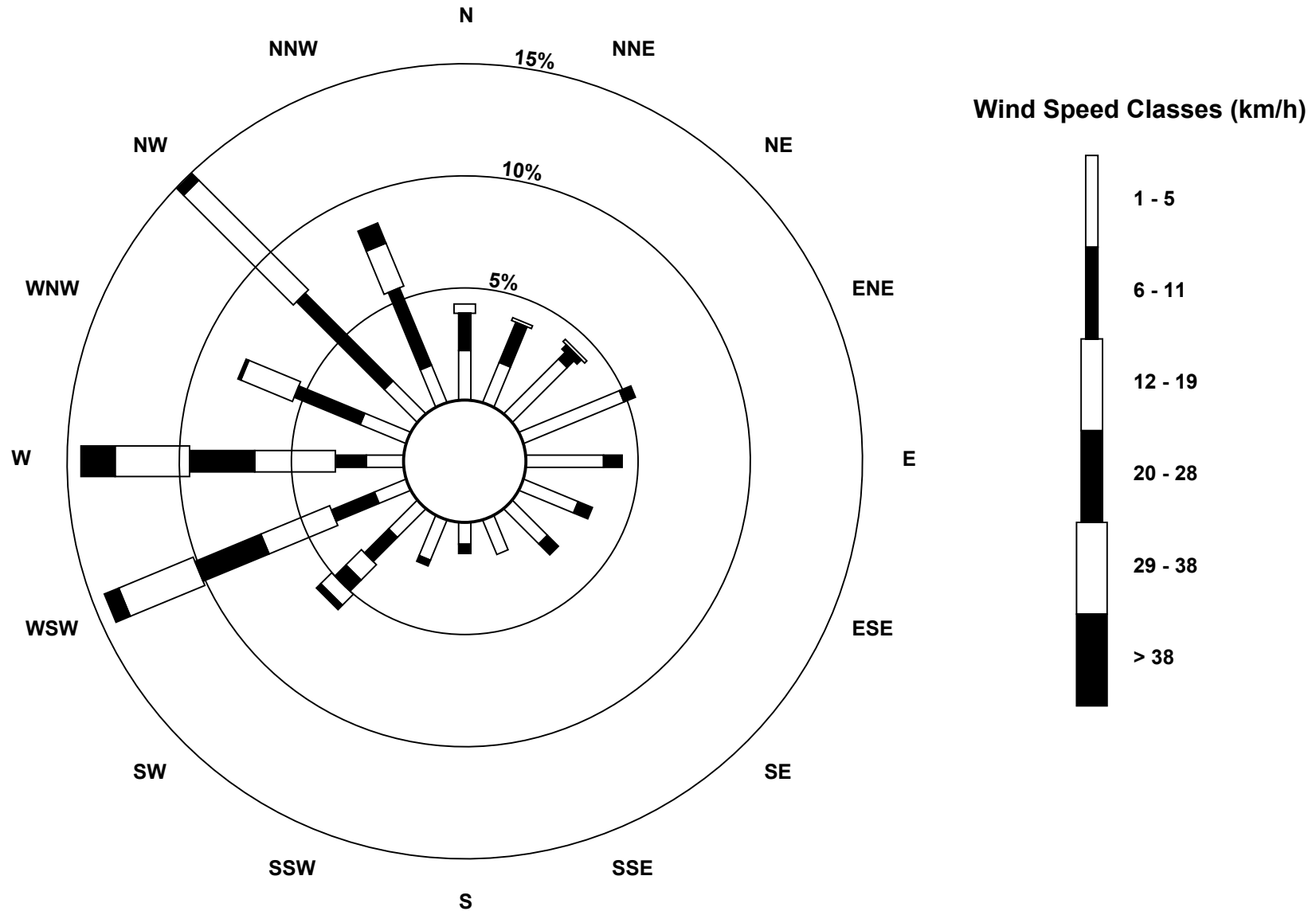
## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Beaverlodge - December 2016

| Day                                                                                | Hourly Period Ending At (MST) |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 | Daily Average   | Daily Maximum |
|------------------------------------------------------------------------------------|-------------------------------|------|---------|------|----------|------|----------|------|----------|------|------|------|-------|------|------|------|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|---------------------------------|-----------------|---------------|
|                                                                                    | 1                             | 2    | 3       | 4    | 5        | 6    | 7        | 8    | 9        | 10   | 11   | 12   | 13    | 14   | 15   | 16   | 17   | 18   | 19                                                                                                                                                                  | 20   | 21   | 22   | 23   | 24                              |                 |               |
| 23 Spd                                                                             | 7                             | 10   | 11      | 6    | 1        | 4    | 2        | 3    | 6        | 4    | 6    | 2    | 2     | 5    | 8    | 0    | 7    | 7    | 7                                                                                                                                                                   | 7    | 4    | 2    | 5    | 4                               | 2.7             | 11.3          |
| Dir                                                                                | 355                           | 13   | 16      | 16   | 270      | 163  | 99       | 14   | 95       | 115  | 2    | 332  | 275   | 266  | 354  | 84   | 340  | 251  | 279                                                                                                                                                                 | 298  | 292  | 273  | 279  | 319                             | 336             | 16            |
| 24 Spd                                                                             | 3                             | 3    | 3       | 6    | 7        | 8    | 7        | 3    | 2        | 1    | 1    | 1    | 6     | 2    | 1    | 3    | 2    | 3    | 2                                                                                                                                                                   | 5    | 1    | 2    | 2    | 1                               | 1.9             | 8.5           |
| Dir                                                                                | 8                             | 36   | 13      | 31   | 28       | 22   | 23       | 75   | 158      | 262  | 57   | 117  | 176   | 217  | 181  | 89   | 106  | 73   | 63                                                                                                                                                                  | 72   | 108  | 106  | 99   | 343                             | 55              | 22            |
| 25 Spd                                                                             | 3                             | 4    | 3       | 5    | 4        | 4    | 1        | 2    | 3        | 3    | 3    | 2    | 1     | 3    | 1    | 2    | 4    | 3    | 1                                                                                                                                                                   | 4    | 2    | 2    | 2    | 3                               | 1.4             | 5.2           |
| Dir                                                                                | 61                            | 121  | 156     | 144  | 152      | 94   | 333      | 75   | 63       | 51   | 43   | 62   | 250   | 264  | 111  | 174  | 146  | 82   | 92                                                                                                                                                                  | 342  | 66   | 143  | 30   | 44                              | 97              | 144           |
| 26 Spd                                                                             | 2                             | 3    | 6       | 6    | 5        | 3    | 2        | 2    | 2        | 2    | 3    | 1    | 2     | 1    | 1    | 1    | 1    | 3    | 3                                                                                                                                                                   | 4    | 4    | 2    | 2    | 2                               | 1.4             | 6.0           |
| Dir                                                                                | 89                            | 103  | 72      | 63   | 65       | 80   | 129      | 143  | 136      | 192  | 129  | 103  | 228   | 52   | 132  | 75   | 171  | 246  | 91                                                                                                                                                                  | 207  | 213  | 58   | 82   | 105                             | 109             | 63            |
| 27 Spd                                                                             | 2                             | 6    | 2       | 4    | 11       | 3    | 17       | 8    | 12       | 19   | 24   | 33   | 33    | 43   | 41   | 37   | 33   | 31   | 28                                                                                                                                                                  | 35   | 35   | 38   | 36   | 36                              | 22.9            | 42.6          |
| Dir                                                                                | 197                           | 129  | 131     | 255  | 236      | 283  | 241      | 237  | 246      | 245  | 244  | 251  | 245   | 248  | 249  | 244  | 250  | 252  | 251                                                                                                                                                                 | 259  | 257  | 260  | 261  | 266                             | 251             | 248           |
| 28 Spd                                                                             | 33                            | 31   | 29      | 26   | 26       | 29   | 28       | 26   | 18       | 19   | 28   | 28   | 39    | 31   | 22   | 27   | 30   | 35   | 20                                                                                                                                                                  | 16   | 25   | 23   | 22   | 15                              | 25.9            | 39.0          |
| Dir                                                                                | 269                           | 268  | 271     | 268  | 269      | 266  | 252      | 267  | 254      | 252  | 263  | 266  | 262   | 259  | 265  | 270  | 268  | 271  | 274                                                                                                                                                                 | 252  | 264  | 256  | 252  | 239                             | 263             | 262           |
| 29 Spd                                                                             | 18                            | 17   | 20      | 15   | 15       | 2    | 5        | 9    | 9        | 9    | 7    | 2    | 5     | 6    | 3    | 2    | 12   | 9    | 3                                                                                                                                                                   | 3    | 10   | 10   | 10   | 9                               | 2.9             | 20.1          |
| Dir                                                                                | 232                           | 234  | 241     | 246  | 255      | 213  | 96       | 80   | 77       | 78   | 92   | 153  | 267   | 309  | 11   | 265  | 331  | 24   | 157                                                                                                                                                                 | 285  | 316  | 337  | 335  | 358                             | 285             | 241           |
| 30 Spd                                                                             | 10                            | 7    | 1       | 5    | 5        | 1    | 3        | 6    | 6        | 19   | 19   | 30   | 31    | 19   | 15   | 16   | 15   | 24   | 20                                                                                                                                                                  | 20   | 13   | 12   | 6    | 10                              | 11.8            | 31.4          |
| Dir                                                                                | 321                           | 292  | 253     | 242  | 213      | 136  | 79       | 50   | 274      | 262  | 254  | 264  | 264   | 255  | 266  | 255  | 253  | 271  | 261                                                                                                                                                                 | 263  | 276  | 279  | 292  | 276                             | 266             | 264           |
| 31 Spd                                                                             | 12                            | 21   | 14      | 16   | 14       | 15   | 17       | 20   | 10       | 11   | 11   | 9    | 11    | 26   | 29   | 20   | 13   | 14   | 18                                                                                                                                                                  | 8    | 8    | 10   | 10   | 4                               | 9.5             | 28.9          |
| Dir                                                                                | 284                           | 272  | 276     | 278  | 287      | 279  | 282      | 272  | 296      | 300  | 300  | 299  | 342   | 38   | 42   | 35   | 8    | 358  | 13                                                                                                                                                                  | 347  | 327  | 334  | 327  | 300                             | 324             | 42            |
| Spd                                                                                | 7.1                           | 6.8  | 7.1     | 6.9  | 8.3      | 7.2  | 7.4      | 6.9  | 6.2      | 7.2  | 7.8  | 9.5  | 11.1  | 10.7 | 9.1  | 9.0  | 8.6  | 8.7  | 7.4                                                                                                                                                                 | 8.5  | 7.8  | 7.7  | 7.3  | 6.9                             | Diurnal Average |               |
| Dir                                                                                | 275                           | 270  | 275     | 277  | 274      | 269  | 274      | 275  | 279      | 277  | 276  | 274  | 270   | 272  | 279  | 274  | 278  | 282  | 281                                                                                                                                                                 | 276  | 279  | 280  | 278  | 278                             | Diurnal Maximum |               |
| Spd                                                                                | 33.3                          | 30.5 | 35.8    | 32.6 | 42.7     | 42.7 | 53.0     | 39.1 | 45.1     | 47.1 | 47.5 | 50.9 | 53.9  | 44.6 | 43.1 | 41.5 | 34.1 | 36.6 | 35.8                                                                                                                                                                | 38.1 | 35.3 | 38.3 | 36.4 | 36.2                            | Diurnal Maximum |               |
| Dir                                                                                | 269                           | 238  | 234     | 251  | 247      | 244  | 267      | 263  | 259      | 262  | 263  | 265  | 263   | 267  | 237  | 234  | 260  | 251  | 268                                                                                                                                                                 | 268  | 257  | 260  | 256  | 266                             |                 |               |
| Maximum Speed Value: 54 km/h on Dec 18 13:00                                       |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      | Minimum Speed Value: 0 km/h on Dec 8 01:00                                                                                                                          |      |      |      |      | Hours in Service: 744           |                 |               |
| Maximum Daily Speed Average: 34.1 km/h on Dec 19                                   |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      | Minimum Daily Speed Average: 0.8 km/h on Dec 26                                                                                                                     |      |      |      |      | Hours of Data: 744              |                 |               |
| Maximum Diurnal Speed Average: 11.1 km/h at hour 13                                |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      | Minimum Diurnal Speed Average: 6.2 km/h at hour 9                                                                                                                   |      |      |      |      | Hours of Missing Data: 0        |                 |               |
| Monthly Average Velocity: 7.94 km/h 275.8 deg                                      |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      | Speed Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 3.5 Median = 8.5 Q <sub>3</sub> = 15.6 P <sub>90</sub> = 28.2 P <sub>99</sub> = 43.9 |      |      |      |      | Percent Operational Time: 100.0 |                 |               |
| All monthly, daily, and diurnal averages have been calculated using vector methods |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
|                                                                                    |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| Frequency Distribution                                                             |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| Speed Range (km/h)                                                                 |                               |      |         |      |          |      |          |      |          |      |      |      |       |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| Direction                                                                          | 0 to 5                        |      | 5 to 11 |      | 11 to 19 |      | 19 to 28 |      | 28 to 38 |      | > 38 |      | Total |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| North                                                                              | 35                            |      | 32      |      | 9        |      | 0        |      | 0        |      | 0    |      | 76    |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| NorthEast                                                                          | 46                            |      | 13      |      | 0        |      | 2        |      | 1        |      | 0    |      | 62    |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| East                                                                               | 53                            |      | 17      |      | 1        |      | 0        |      | 0        |      | 0    |      | 71    |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| SouthEast                                                                          | 33                            |      | 8       |      | 0        |      | 0        |      | 0        |      | 0    |      | 41    |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| South                                                                              | 18                            |      | 4       |      | 0        |      | 0        |      | 0        |      | 0    |      | 22    |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| SouthWest                                                                          | 30                            |      | 20      |      | 19       |      | 15       |      | 17       |      | 5    |      | 106   |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| West                                                                               | 26                            |      | 21      |      | 45       |      | 33       |      | 40       |      | 16   |      | 181   |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| NorthWest                                                                          | 22                            |      | 66      |      | 84       |      | 13       |      | 0        |      | 0    |      | 185   |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |
| Total                                                                              | 263                           |      | 181     |      | 158      |      | 63       |      | 58       |      | 21   |      | 744   |      |      |      |      |      |                                                                                                                                                                     |      |      |      |      |                                 |                 |               |

## Wind Rose

Wind Speed (WS) (km/h)  
Beaverlodge - December 2016



# Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

Beaverlodge - December 2016

| Maximum Speed: 54 km/h on Dec 18 13:00              |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Maximum Daily Speed Average: 35.0 km/h on Dec 19                                                                                                              |      |      |      |      |                 |               |  |  |  | Hours in Service: 744           |  |
|-----------------------------------------------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|-----------------|---------------|--|--|--|---------------------------------|--|
| Minimum Speed: 1 km/h on Dec 16 20:00               |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Minimum Daily Speed Average: 3.3 km/h on Dec 25                                                                                                               |      |      |      |      |                 |               |  |  |  | Hours of Data: 744              |  |
| Maximum Diurnal Speed Average: 15.1 km/h at hour 14 |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Minimum Diurnal Speed Average: 9.8 km/h at hour 24                                                                                                            |      |      |      |      |                 |               |  |  |  | Hours of Missing Data: 0        |  |
| Monthly Average Speed: 12.05 km/h                   |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Percentiles: P <sub>1</sub> = 1.6 P <sub>10</sub> = 2.8 Q <sub>1</sub> = 4.5 Median = 8.6 Q <sub>3</sub> = 15.8 P <sub>90</sub> = 28.3 P <sub>99</sub> = 44.0 |      |      |      |      |                 |               |  |  |  | Percent Operational Time: 100.0 |  |
| Day                                                 | Hourly Period Ending At (MST) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                                                                                                                                               |      |      |      |      | Daily Average   | Daily Maximum |  |  |  |                                 |  |
|                                                     | 1                             | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20                                                                                                                                                            | 21   | 22   | 23   | 24   |                 |               |  |  |  |                                 |  |
| 1-Dec                                               | 5                             | 7    | 11   | 10   | 9    | 7    | 9    | 13   | 10   | 6    | 3    | 5    | 5    | 5    | 5    | 5    | 3    | 3    | 3    | 3                                                                                                                                                             | 3    | 4    | 3    | 3    | 5.9             | 12.6          |  |  |  |                                 |  |
| 2-Dec                                               | 3                             | 2    | 2    | 3    | 3    | 4    | 3    | 5    | 5    | 5    | 3    | 4    | 6    | 6    | 5    | 3    | 7    | 4    | 5    | 4                                                                                                                                                             | 6    | 5    | 7    | 5    | 4.4             | 6.8           |  |  |  |                                 |  |
| 3-Dec                                               | 6                             | 8    | 11   | 28   | 43   | 35   | 26   | 24   | 29   | 24   | 18   | 27   | 28   | 36   | 32   | 30   | 30   | 31   | 24   | 26                                                                                                                                                            | 20   | 19   | 15   | 15   | 24.4            | 42.8          |  |  |  |                                 |  |
| 4-Dec                                               | 21                            | 19   | 14   | 20   | 22   | 18   | 13   | 15   | 20   | 21   | 21   | 20   | 22   | 22   | 24   | 21   | 19   | 17   | 16   | 16                                                                                                                                                            | 19   | 21   | 21   | 16   | 19.2            | 24.0          |  |  |  |                                 |  |
| 5-Dec                                               | 17                            | 14   | 16   | 15   | 17   | 16   | 15   | 14   | 16   | 17   | 15   | 15   | 16   | 16   | 17   | 17   | 15   | 12   | 8    | 8                                                                                                                                                             | 8    | 8    | 8    | 10   | 13.7            | 17.1          |  |  |  |                                 |  |
| 6-Dec                                               | 14                            | 13   | 15   | 14   | 14   | 12   | 12   | 12   | 12   | 11   | 12   | 14   | 14   | 11   | 11   | 11   | 10   | 10   | 9    | 8                                                                                                                                                             | 4    | 4    | 5    | 7    | 10.8            | 15.2          |  |  |  |                                 |  |
| 7-Dec                                               | 4                             | 5    | 5    | 7    | 13   | 7    | 5    | 7    | 4    | 3    | 2    | 1    | 4    | 3    | 4    | 2    | 2    | 4    | 4    | 4                                                                                                                                                             | 5    | 3    | 2    | 2    | 4.2             | 12.6          |  |  |  |                                 |  |
| 8-Dec                                               | 2                             | 2    | 2    | 3    | 5    | 5    | 5    | 9    | 9    | 8    | 10   | 10   | 8    | 7    | 5    | 8    | 10   | 11   | 10   | 6                                                                                                                                                             | 6    | 5    | 3    | 5    | 6.4             | 11.3          |  |  |  |                                 |  |
| 9-Dec                                               | 6                             | 6    | 5    | 4    | 2    | 5    | 4    | 4    | 5    | 3    | 1    | 4    | 5    | 2    | 3    | 3    | 7    | 9    | 14   | 13                                                                                                                                                            | 11   | 10   | 7    | 6    | 5.7             | 14.1          |  |  |  |                                 |  |
| 10-Dec                                              | 6                             | 6    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 8    | 10   | 11   | 11   | 13   | 13   | 13   | 12   | 13   | 15   | 16                                                                                                                                                            | 11   | 14   | 12   | 10   | 9.5             | 15.7          |  |  |  |                                 |  |
| 11-Dec                                              | 12                            | 14   | 15   | 14   | 12   | 10   | 12   | 11   | 8    | 7    | 4    | 2    | 5    | 13   | 8    | 13   | 15   | 12   | 14   | 13                                                                                                                                                            | 12   | 12   | 9    | 11   | 10.8            | 14.9          |  |  |  |                                 |  |
| 12-Dec                                              | 9                             | 12   | 9    | 7    | 18   | 14   | 11   | 12   | 16   | 16   | 15   | 18   | 19   | 18   | 21   | 19   | 16   | 16   | 13   | 11                                                                                                                                                            | 10   | 10   | 12   | 10   | 13.8            | 21.5          |  |  |  |                                 |  |
| 13-Dec                                              | 10                            | 11   | 12   | 11   | 12   | 8    | 9    | 7    | 9    | 11   | 5    | 5    | 4    | 5    | 3    | 4    | 4    | 4    | 3    | 2                                                                                                                                                             | 2    | 3    | 3    | 2    | 6.2             | 11.6          |  |  |  |                                 |  |
| 14-Dec                                              | 3                             | 2    | 2    | 2    | 4    | 3    | 2    | 1    | 4    | 5    | 9    | 12   | 12   | 15   | 12   | 9    | 10   | 12   | 12   | 12                                                                                                                                                            | 6    | 10   | 5    | 6    | 7.1             | 15.1          |  |  |  |                                 |  |
| 15-Dec                                              | 5                             | 6    | 6    | 8    | 9    | 6    | 5    | 6    | 11   | 10   | 11   | 12   | 12   | 11   | 11   | 7    | 7    | 12   | 12   | 4                                                                                                                                                             | 3    | 5    | 4    | 2    | 7.7             | 12.3          |  |  |  |                                 |  |
| 16-Dec                                              | 4                             | 5    | 5    | 5    | 7    | 3    | 3    | 3    | 7    | 6    | 4    | 4    | 2    | 2    | 4    | 1    | 3    | 2    | 2    | 1                                                                                                                                                             | 2    | 2    | 3    | 3    | 3.6             | 6.9           |  |  |  |                                 |  |
| 17-Dec                                              | 3                             | 3    | 3    | 2    | 2    | 4    | 4    | 4    | 2    | 4    | 2    | 4    | 8    | 2    | 9    | 11   | 10   | 5    | 6    | 9                                                                                                                                                             | 11   | 18   | 13   | 24   | 6.8             | 24.2          |  |  |  |                                 |  |
| 18-Dec                                              | 30                            | 29   | 35   | 33   | 27   | 31   | 53   | 39   | 24   | 27   | 38   | 51   | 54   | 45   | 38   | 37   | 34   | 37   | 28   | 17                                                                                                                                                            | 9    | 11   | 19   | 11   | 31.6            | 54.1          |  |  |  |                                 |  |
| 19-Dec                                              | 19                            | 31   | 36   | 32   | 24   | 43   | 38   | 36   | 45   | 47   | 48   | 46   | 38   | 42   | 35   | 36   | 33   | 35   | 36   | 38                                                                                                                                                            | 35   | 23   | 17   | 28   | 35.0            | 47.6          |  |  |  |                                 |  |
| 20-Dec                                              | 30                            | 17   | 16   | 5    | 13   | 3    | 4    | 5    | 4    | 5    | 2    | 4    | 5    | 6    | 4    | 7    | 6    | 6    | 6    | 21                                                                                                                                                            | 25   | 27   | 36   | 22   | 11.6            | 36.5          |  |  |  |                                 |  |
| 21-Dec                                              | 8                             | 9    | 14   | 7    | 10   | 33   | 26   | 32   | 28   | 24   | 16   | 23   | 32   | 41   | 43   | 42   | 34   | 22   | 17   | 17                                                                                                                                                            | 19   | 18   | 9    | 10   | 22.3            | 43.1          |  |  |  |                                 |  |
| 22-Dec                                              | 13                            | 12   | 9    | 9    | 6    | 8    | 8    | 6    | 7    | 6    | 8    | 4    | 5    | 10   | 8    | 7    | 7    | 5    | 7    | 9                                                                                                                                                             | 8    | 10   | 8    | 4    | 7.6             | 13.0          |  |  |  |                                 |  |
| 23-Dec                                              | 7                             | 10   | 11   | 7    | 3    | 5    | 3    | 5    | 6    | 6    | 7    | 4    | 4    | 5    | 9    | 5    | 7    | 8    | 8    | 7                                                                                                                                                             | 4    | 3    | 5    | 4    | 6.0             | 11.3          |  |  |  |                                 |  |
| 24-Dec                                              | 4                             | 3    | 3    | 6    | 7    | 8    | 7    | 4    | 2    | 2    | 2    | 2    | 6    | 3    | 2    | 3    | 3    | 3    | 3    | 6                                                                                                                                                             | 2    | 2    | 3    | 4    | 3.7             | 8.5           |  |  |  |                                 |  |
| 25-Dec                                              | 4                             | 5    | 3    | 6    | 5    | 5    | 2    | 2    | 3    | 3    | 3    | 2    | 2    | 3    | 2    | 3    | 4    | 4    | 3    | 5                                                                                                                                                             | 3    | 2    | 3    | 4    | 3.3             | 5.9           |  |  |  |                                 |  |
| 26-Dec                                              | 2                             | 3    | 6    | 6    | 5    | 4    | 3    | 3    | 4    | 4    | 3    | 4    | 4    | 3    | 4    | 4    | 3    | 5    | 4    | 5                                                                                                                                                             | 5    | 2    | 3    | 3    | 3.7             | 6.2           |  |  |  |                                 |  |
| 27-Dec                                              | 5                             | 7    | 6    | 9    | 12   | 6    | 17   | 8    | 12   | 19   | 24   | 33   | 33   | 43   | 41   | 37   | 33   | 31   | 28   | 35                                                                                                                                                            | 35   | 38   | 36   | 36   | 24.4            | 42.7          |  |  |  |                                 |  |
| 28-Dec                                              | 33                            | 31   | 29   | 26   | 26   | 29   | 28   | 26   | 19   | 19   | 28   | 28   | 39   | 31   | 23   | 28   | 30   | 36   | 21   | 16                                                                                                                                                            | 25   | 23   | 23   | 16   | 26.3            | 39.1          |  |  |  |                                 |  |
| 29-Dec                                              | 18                            | 18   | 20   | 15   | 15   | 4    | 7    | 9    | 9    | 9    | 8    | 4    | 6    | 6    | 5    | 6    | 13   | 10   | 5    | 5                                                                                                                                                             | 11   | 11   | 10   | 9    | 9.7             | 20.3          |  |  |  |                                 |  |
| 30-Dec                                              | 10                            | 7    | 3    | 6    | 5    | 2    | 4    | 6    | 8    | 19   | 19   | 30   | 31   | 19   | 15   | 16   | 16   | 24   | 20   | 20                                                                                                                                                            | 13   | 12   | 7    | 10   | 13.4            | 31.4          |  |  |  |                                 |  |
| 31-Dec                                              | 12                            | 21   | 14   | 16   | 14   | 15   | 17   | 20   | 11   | 11   | 11   | 10   | 12   | 26   | 29   | 21   | 13   | 14   | 18   | 8                                                                                                                                                             | 8    | 10   | 10   | 4    | 14.4            | 29.0          |  |  |  |                                 |  |
|                                                     | 10.6                          | 10.8 | 11.0 | 11.0 | 11.9 | 11.6 | 11.6 | 11.4 | 11.4 | 11.8 | 11.7 | 13.4 | 14.5 | 15.1 | 14.3 | 13.8 | 13.4 | 13.5 | 12.0 | 11.8                                                                                                                                                          | 11.1 | 11.2 | 10.4 | 9.8  | Diurnal Average |               |  |  |  |                                 |  |
|                                                     | 33.3                          | 30.6 | 35.8 | 32.9 | 42.8 | 42.8 | 53.1 | 39.4 | 45.2 | 47.1 | 47.6 | 51.0 | 54.1 | 44.7 | 43.1 | 41.6 | 34.3 | 36.6 | 35.8 | 38.1                                                                                                                                                          | 35.4 | 38.4 | 36.5 | 36.2 | Diurnal Maximum |               |  |  |  |                                 |  |

All monthly, daily, and diurnal averages have been calculated using scalar methods

# Hourly Standard Deviations

Wind Direction (WD) - deg  
Beaverlodge - December 2016

| Maximum Value: 95.0 deg on Dec 26 16:00                                                                                                                        |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours in Service: 744           |      |      |      |      |      |      |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---------------------------------|------|------|------|------|------|------|---------------|
| Minimum Value: 2.0 deg on Dec 21 17:00                                                                                                                         |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours of Data: 744              |      |      |      |      |      |      |               |
| Percentiles: P <sub>1</sub> = 2.5 P <sub>10</sub> = 3.8 Q <sub>1</sub> = 6.0 Median = 10.4 Q <sub>3</sub> = 36.7 P <sub>90</sub> = 65.6 P <sub>99</sub> = 89.5 |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours of Missing Data: 0        |      |      |      |      |      |      |               |
|                                                                                                                                                                |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours of Calibration: 0         |      |      |      |      |      |      |               |
|                                                                                                                                                                |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Percent Operational Time: 100.0 |      |      |      |      |      |      |               |
| Day                                                                                                                                                            | Hourly Period Ending At (MST) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                 |      |      |      |      |      |      | Daily Maximum |
| 1-Dec                                                                                                                                                          | 47                            | 15   | 7    | 16   | 8    | 21   | 11   | 8    | 6    | 18   | 65   | 11   | 49   | 43   | 12   | 8    | 10   | 19                              | 37   | 61   | 24   | 36   | 45   | 22   | 65.2          |
| 2-Dec                                                                                                                                                          | 30                            | 55   | 40   | 69   | 62   | 45   | 76   | 41   | 93   | 53   | 85   | 63   | 37   | 64   | 45   | 58   | 60   | 78                              | 56   | 18   | 19   | 53   | 49   | 89   | 93.2          |
| 3-Dec                                                                                                                                                          | 70                            | 32   | 11   | 6    | 4    | 3    | 2    | 5    | 4    | 3    | 8    | 4    | 3    | 4    | 6    | 5    | 4    | 3                               | 3    | 3    | 6    | 6    | 6    | 8    | 69.8          |
| 4-Dec                                                                                                                                                          | 4                             | 3    | 4    | 4    | 3    | 6    | 14   | 10   | 6    | 7    | 6    | 9    | 7    | 7    | 5    | 6    | 6    | 6                               | 8    | 7    | 7    | 6    | 9    | 9    | 14.3          |
| 5-Dec                                                                                                                                                          | 6                             | 8    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 6    | 6    | 7    | 7    | 9    | 6    | 6    | 8    | 7                               | 6    | 7    | 9    | 8    | 6    | 8    | 8.9           |
| 6-Dec                                                                                                                                                          | 7                             | 8    | 7    | 8    | 7    | 6    | 6    | 6    | 6    | 6    | 8    | 7    | 7    | 8    | 20   | 9    | 13   | 8                               | 9    | 14   | 17   | 14   | 8    | 42   | 41.7          |
| 7-Dec                                                                                                                                                          | 35                            | 25   | 24   | 31   | 5    | 32   | 29   | 18   | 47   | 68   | 91   | 63   | 71   | 51   | 48   | 57   | 66   | 9                               | 43   | 44   | 14   | 74   | 70   | 83   | 91.3          |
| 8-Dec                                                                                                                                                          | 92                            | 70   | 56   | 55   | 17   | 12   | 34   | 12   | 7    | 7    | 7    | 6    | 7    | 11   | 34   | 18   | 12   | 10                              | 7    | 13   | 31   | 12   | 50   | 17   | 92.1          |
| 9-Dec                                                                                                                                                          | 9                             | 6    | 8    | 15   | 31   | 31   | 36   | 70   | 52   | 69   | 90   | 49   | 14   | 61   | 67   | 78   | 8    | 21                              | 3    | 5    | 10   | 9    | 10   | 9    | 89.5          |
| 10-Dec                                                                                                                                                         | 10                            | 16   | 13   | 10   | 8    | 7    | 8    | 10   | 7    | 6    | 8    | 8    | 8    | 8    | 8    | 7    | 6    | 8                               | 7    | 7    | 7    | 15   | 11   | 21   | 21.3          |
| 11-Dec                                                                                                                                                         | 6                             | 13   | 5    | 4    | 5    | 11   | 4    | 4    | 11   | 6    | 23   | 56   | 25   | 10   | 7    | 10   | 4    | 8                               | 8    | 5    | 8    | 8    | 7    | 5    | 55.5          |
| 12-Dec                                                                                                                                                         | 16                            | 18   | 10   | 40   | 7    | 5    | 9    | 4    | 5    | 13   | 8    | 5    | 6    | 5    | 4    | 5    | 4    | 3                               | 6    | 5    | 4    | 7    | 7    | 3    | 39.9          |
| 13-Dec                                                                                                                                                         | 4                             | 5    | 6    | 5    | 3    | 12   | 9    | 63   | 31   | 6    | 39   | 20   | 50   | 31   | 63   | 7    | 11   | 32                              | 85   | 30   | 29   | 63   | 63   | 22   | 84.9          |
| 14-Dec                                                                                                                                                         | 6                             | 69   | 63   | 43   | 59   | 54   | 75   | 87   | 37   | 14   | 16   | 9    | 6    | 6    | 6    | 6    | 10   | 7                               | 6    | 9    | 13   | 5    | 29   | 16   | 86.9          |
| 15-Dec                                                                                                                                                         | 21                            | 12   | 10   | 6    | 6    | 17   | 31   | 35   | 6    | 22   | 4    | 4    | 3    | 5    | 5    | 9    | 9    | 5                               | 3    | 31   | 65   | 32   | 68   | 64   | 67.8          |
| 16-Dec                                                                                                                                                         | 17                            | 8    | 73   | 39   | 36   | 69   | 31   | 50   | 6    | 15   | 18   | 58   | 71   | 88   | 14   | 60   | 79   | 85                              | 61   | 92   | 73   | 31   | 13   | 29   | 91.8          |
| 17-Dec                                                                                                                                                         | 23                            | 28   | 17   | 33   | 41   | 20   | 22   | 38   | 59   | 84   | 56   | 79   | 22   | 67   | 11   | 10   | 29   | 37                              | 64   | 12   | 9    | 3    | 7    | 4    | 84.0          |
| 18-Dec                                                                                                                                                         | 5                             | 4    | 5    | 8    | 5    | 10   | 3    | 7    | 6    | 4    | 6    | 3    | 4    | 5    | 5    | 5    | 4    | 3                               | 8    | 10   | 17   | 8    | 3    | 7    | 17.0          |
| 19-Dec                                                                                                                                                         | 5                             | 2    | 3    | 2    | 5    | 4    | 4    | 3    | 4    | 3    | 3    | 4    | 4    | 5    | 4    | 4    | 6    | 4                               | 3    | 3    | 3    | 10   | 7    | 4    | 9.9           |
| 20-Dec                                                                                                                                                         | 4                             | 22   | 18   | 28   | 15   | 75   | 30   | 45   | 51   | 21   | 66   | 73   | 55   | 48   | 58   | 15   | 12   | 54                              | 51   | 4    | 6    | 5    | 3    | 6    | 74.8          |
| 21-Dec                                                                                                                                                         | 38                            | 16   | 22   | 69   | 47   | 3    | 5    | 3    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 2    | 2    | 2                               | 2    | 3    | 3    | 2    | 6    | 19   | 68.8          |
| 22-Dec                                                                                                                                                         | 3                             | 7    | 23   | 6    | 30   | 31   | 23   | 25   | 16   | 13   | 8    | 78   | 60   | 11   | 34   | 9    | 11   | 13                              | 18   | 17   | 9    | 5    | 7    | 26   | 78.1          |
| 23-Dec                                                                                                                                                         | 8                             | 6    | 4    | 55   | 68   | 41   | 66   | 76   | 49   | 70   | 25   | 72   | 76   | 19   | 31   | 75   | 26   | 35                              | 11   | 9    | 36   | 51   | 16   | 17   | 76.5          |
| 24-Dec                                                                                                                                                         | 52                            | 23   | 37   | 11   | 6    | 5    | 15   | 45   | 33   | 50   | 35   | 47   | 7    | 51   | 70   | 20   | 28   | 19                              | 56   | 22   | 80   | 48   | 69   | 75   | 80.3          |
| 25-Dec                                                                                                                                                         | 62                            | 33   | 22   | 36   | 30   | 34   | 81   | 22   | 11   | 17   | 11   | 67   | 22   | 18   | 73   | 30   | 22   | 39                              | 87   | 44   | 60   | 68   | 69   | 40   | 87.4          |
| 26-Dec                                                                                                                                                         | 49                            | 16   | 17   | 19   | 42   | 34   | 56   | 46   | 59   | 67   | 38   | 88   | 72   | 90   | 81   | 95   | 78   | 76                              | 58   | 50   | 81   | 79   | 78   | 51   | 95.0          |
| 27-Dec                                                                                                                                                         | 65                            | 19   | 68   | 66   | 30   | 85   | 14   | 24   | 12   | 7    | 4    | 4    | 4    | 4    | 4    | 3    | 5    | 5                               | 4    | 3    | 3    | 4    | 4    | 3    | 85.1          |
| 28-Dec                                                                                                                                                         | 3                             | 3    | 3    | 3    | 4    | 4    | 7    | 5    | 9    | 4    | 6    | 5    | 5    | 4    | 7    | 8    | 4    | 4                               | 8    | 6    | 6    | 4    | 6    | 17   | 16.8          |
| 29-Dec                                                                                                                                                         | 9                             | 11   | 8    | 6    | 4    | 59   | 42   | 7    | 9    | 10   | 38   | 59   | 40   | 35   | 53   | 77   | 27   | 22                              | 54   | 70   | 12   | 18   | 6    | 17   | 76.9          |
| 30-Dec                                                                                                                                                         | 10                            | 10   | 93   | 43   | 10   | 56   | 17   | 20   | 53   | 4    | 4    | 3    | 4    | 9    | 8    | 10   | 14   | 6                               | 7    | 5    | 7    | 7    | 14   | 6    | 92.6          |
| 31-Dec                                                                                                                                                         | 7                             | 10   | 8    | 6    | 4    | 6    | 7    | 5    | 13   | 7    | 8    | 10   | 17   | 9    | 4    | 5    | 7    | 6                               | 5    | 16   | 5    | 6    | 8    | 50   | 49.7          |
|                                                                                                                                                                | 92.1                          | 69.8 | 92.6 | 68.9 | 67.8 | 85.1 | 81.1 | 86.9 | 93.2 | 84.0 | 91.3 | 87.8 | 76.5 | 90.4 | 80.8 | 95.0 | 79.3 | 84.6                            | 87.4 | 91.8 | 81.4 | 79.5 | 77.7 | 89.0 |               |

PAZA  
Valleyview Station  
Monthly Summary Tables, Graphs and  
Roses

# Hourly Averages

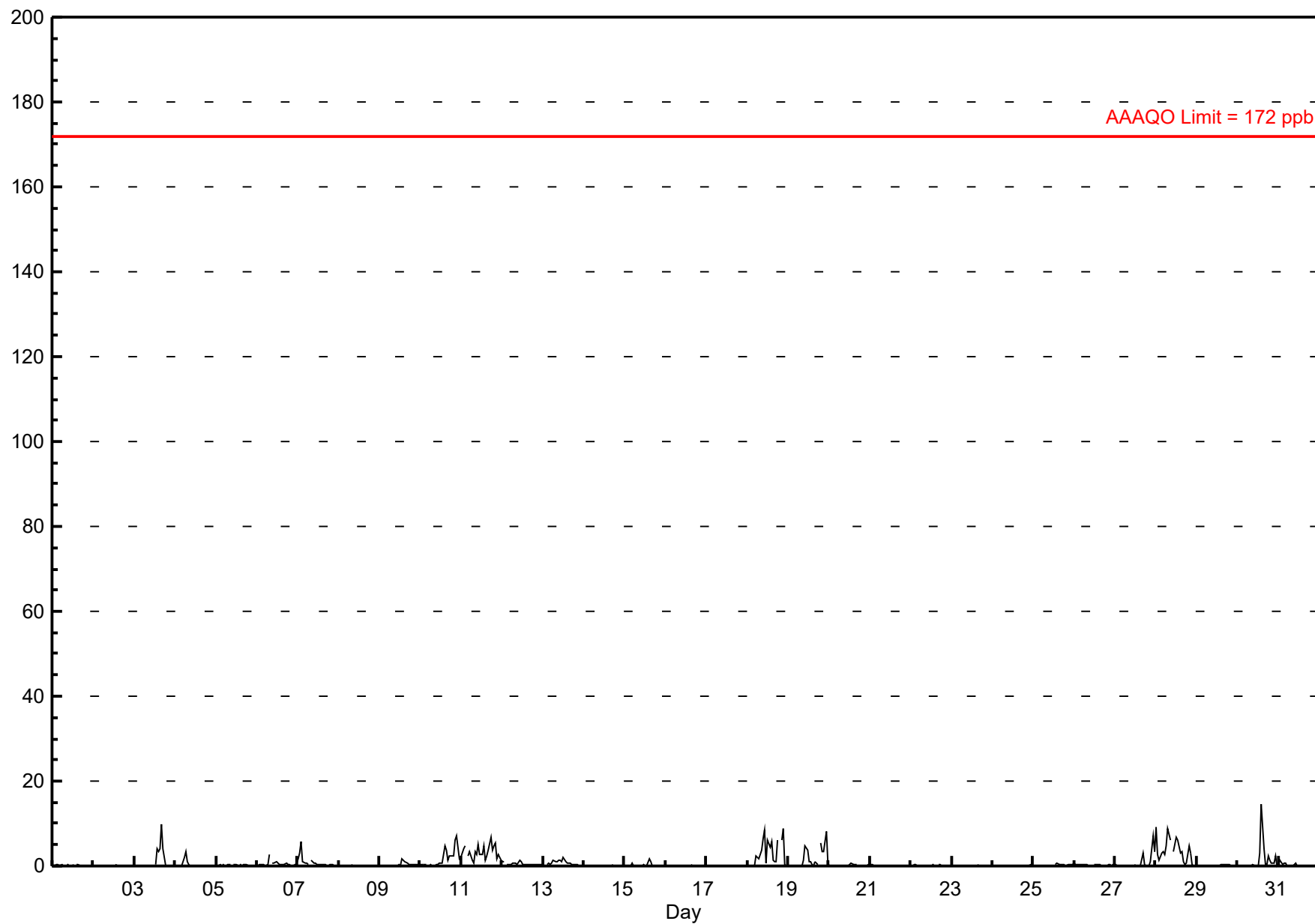
Sulphur Dioxide (SO<sub>2</sub>) - ppb

Valleyview - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 14.5 ppb on Dec 30 15:00 Maximum Daily Average: 3.5 ppb on Dec 28 |                               |   |   |   |   |   |   |   |   |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 704<br>Hours of Missing Data: 40<br>Hours of Calibration: 34<br>Percent Operational Time: 99.2 |    |    |    |    |                 |               |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|
| Minimum Value: 0 ppb on Dec 2 08:00<br>Maximum Diurnal Average: 1.4 ppb at hour 15<br>Monthly Average: 0.69 ppb                     |                               |   |   |   |   |   |   |   |   | Minimum Daily Average: 0.0 ppb on Dec 17<br>Minimum Diurnal Average: 0.3 ppb at hour 4<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 2.3 P <sub>99</sub> = 7.8 |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |
| Day                                                                                                                                 | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    | Daily Average   | Daily Maximum |
|                                                                                                                                     | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                                                                                                                                                                                                                                                   | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                     | 21 | 22 | 23 | 24 |                 |               |
| 1-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.2             | 0.4           |
| 2-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.0             | 0.2           |
| 3-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | A  | 0  | 4  | 3  | 4  | 10 | 4  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 1.1             | 9.8           |
| 4-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 0 | 0                                                                                                                                                                                                                                                    | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.3             | 3.3           |
| 5-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.2             | 0.3           |
| 6-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 3 | A | 1                                                                                                                                                                                                                                                    | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 1  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 1  | 0.5             | 2.6           |
| 7-Dec                                                                                                                               | 2                             | 3 | 6 | 1 | 1 | 1 | 0 | A | 1 | 1                                                                                                                                                                                                                                                    | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.8             | 5.9           |
| 8-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.1             | 0.3           |
| 9-Dec                                                                                                                               | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 2  | 1  | 1  | 1  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.3             | 1.7           |
| 10-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 1  | 1  | 1  | 5  | 4  | 1  | 2  | 2  | 3                                                                                                                                      | 6  | 7  | 4  | 2  | 1.8             | 7.1           |
| 11-Dec                                                                                                                              | 2                             | 4 | 5 | A | 2 | 4 | 1 | 1 | 3 | 3                                                                                                                                                                                                                                                    | 5  | 3  | 3  | 5  | 1  | 3  | 4  | 7  | 4  | 5                                                                                                                                      | 5  | 2  | 3  | 1  | 3.2             | 6.8           |
| 12-Dec                                                                                                                              | 1                             | 1 | A | 1 | 0 | 0 | 1 | 1 | 1 | 0                                                                                                                                                                                                                                                    | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.5             | 1.2           |
| 13-Dec                                                                                                                              | 0                             | A | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1                                                                                                                                                                                                                                                    | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.7             | 2.2           |
| 14-Dec                                                                                                                              | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | P  | P  | P  | P  | P  | P  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | A  | --              | 0.4           |
| 15-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 2  | 1  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | A  | 0  | 0.2             | 1.8           |
| 16-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | C  | C  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | A  | 0  | 0  | 0.0             | 0.3           |
| 17-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | A  | 0  | 0  | 0  | 0.0             | 0.1           |
| 18-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 4 | 6                                                                                                                                                                                                                                                    | 8  | 1  | 6  | 4  | 6  | 1  | 1  | 1  | 6  | A                                                                                                                                      | 6  | 9  | 0  | 0  | 2.9             | 8.7           |
| 19-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1                                                                                                                                                                                                                                                    | 5  | 4  | 1  | 1  | 0  | 0  | 1  | 0  | A  | 5                                                                                                                                      | 3  | 3  | 8  | 1  | 1.5             | 8.1           |
| 20-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 1  | 0  | 0  | 0  | A  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 1  | 0.2             | 0.7           |
| 21-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.1             | 0.2           |
| 22-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.1             | 0.5           |
| 23-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.0             | 0.3           |
| 24-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.0             | 0.2           |
| 25-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | A  | 0  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.2             | 0.8           |
| 26-Dec                                                                                                                              | 1                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.2             | 0.5           |
| 27-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                                                                                                                                                                                                                                                    | A  | 0  | 0  | 0  | 0  | 0  | 3  | 0  | 0  | 0                                                                                                                                      | 0  | 1  | 7  | 3  | 0.7             | 7.3           |
| 28-Dec                                                                                                                              | 9                             | 3 | 2 | 3 | 3 | 3 | 5 | 9 | 6 | A                                                                                                                                                                                                                                                    | 3  | 5  | 7  | 6  | 3  | 3  | 1  | 0  | 1  | 5                                                                                                                                      | 3  | 0  | 0  | 0  | 3.5             | 9.2           |
| 29-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.1             | 0.3           |
| 30-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 3  | 15 | 4  | 0  | 0  | 2  | 1                                                                                                                                      | 1  | 1  | 2  | 0  | 1.3             | 14.5          |
| 31-Dec                                                                                                                              | 0                             | 1 | 0 | 1 | 1 | 0 | A | 0 | 0 | 0                                                                                                                                                                                                                                                    | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.2             | 1.4           |
| 0.6 0.5 0.5 0.3 0.4 0.5 0.5 0.6 0.6 0.5 1.0 0.6 0.8 1.1 1.4 0.9 0.9 0.6 0.6 0.7 0.9 0.8 0.9 0.4                                     |                               |   |   |   |   |   |   |   |   |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    | Diurnal Average |               |
| 9.2 4.0 5.9 2.9 3.5 3.5 4.6 8.7 6.1 6.3 8.5 5.2 6.9 5.9 14.5 4.2 9.8 6.8 6.2 5.5 6.2 8.7 8.1 3.3                                    |                               |   |   |   |   |   |   |   |   |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    | Diurnal Maximum |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                     |                               |   |   |   |   |   |   |   |   |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb 30-day 11 ppb                                             |                               |   |   |   |   |   |   |   |   |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |

## Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Valleyview - December 2016**



# Hourly Maximums

Sulphur Dioxide (SO<sub>2</sub>) - ppb

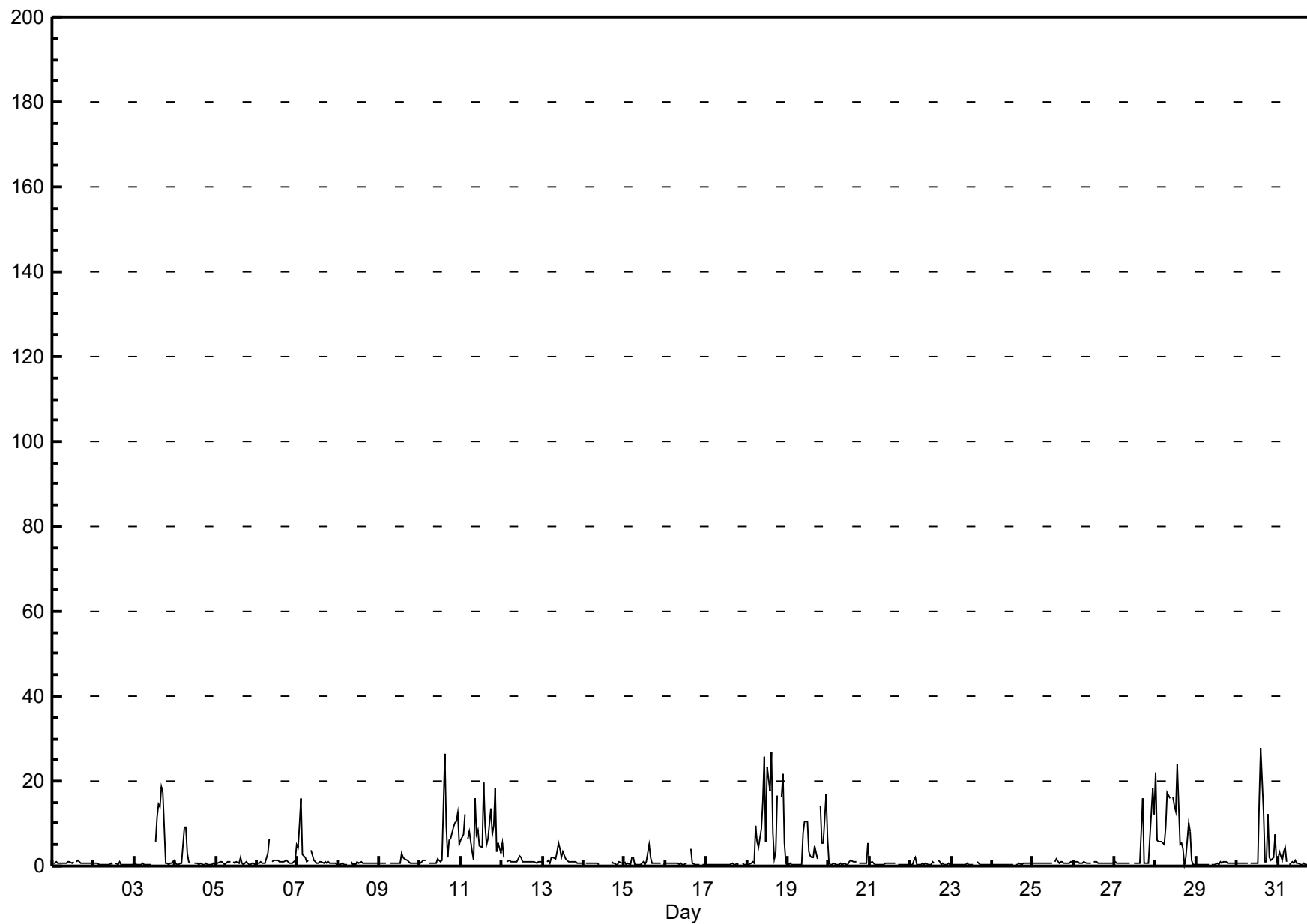
Valleyview - December 2016

| Maximum Value: 27.8 ppb on Dec 30 15:00                                                                            |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 9.6 ppb on Dec 18                                                                                                                    |    |    |    |     | Hours in Service: 744          |               |     |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|---|---|----|---|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----|--------------------------------|---------------|-----|
| Minimum Value: 0 ppb on Dec 4 15:00                                                                                |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.5 ppb on Dec 17                                                                                                                    |    |    |    |     | Hours of Data: 704             |               |     |
| Maximum Diurnal Average: 4.8 ppb at hour 15                                                                        |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 1.0 ppb at hour 4                                                                                                                  |    |    |    |     | Hours of Missing Data: 40      |               |     |
| Monthly Average: 2.18 ppb                                                                                          |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.5 Median = 0.7 Q <sub>3</sub> = 1.1 P <sub>90</sub> = 6.0 P <sub>99</sub> = 21.5 |    |    |    |     | Hours of Calibration: 34       |               |     |
|                                                                                                                    |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |     | Percent Operational Time: 99.2 |               |     |
| Day                                                                                                                | Hourly Period Ending At (MST) |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |     | Daily Average                  | Daily Maximum |     |
| 1-Dec                                                                                                              | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.7                            | 1.3           |     |
| 2-Dec                                                                                                              | 1                             | 1  | 1  | 0 | 0 | 0  | 0 | 0  | 0  | 0  | 1  | 0  | A  | 1  | 0  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0   | 0                              | 0.5           | 0.9 |
| 3-Dec                                                                                                              | 1                             | 0  | 0  | 0 | 0 | 1  | 0 | 0  | 0  | 0  | 0  | A  | 6  | 12 | 14 | 14 | 19 | 17 | 1  | 1                                                                                                                                                           | 0  | 1  | 1  | 1   | 4.0                            | 18.7          |     |
| 4-Dec                                                                                                              | 1                             | 0  | 0  | 1 | 1 | 9  | 9 | 3  | 1  | 1  | A  | 1  | 1  | 1  | 0  | 1  | 0  | 0  | 1  | 0                                                                                                                                                           | 0  | 0  | 1  | 0   | 1.4                            | 9.2           |     |
| 5-Dec                                                                                                              | 1                             | 1  | 1  | 1 | 1 | 0  | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 2  | 1  | 0  | 1  | 1  | 0                                                                                                                                                           | 0  | 1  | 1  | 0   | 0.8                            | 1.9           |     |
| 6-Dec                                                                                                              | 1                             | 1  | 1  | 1 | 1 | 1  | 3 | 6  | A  | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 5   | 1.5                            | 6.3           |     |
| 7-Dec                                                                                                              | 5                             | 10 | 16 | 3 | 2 | 1  | 1 | A  | 4  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 2.3                            | 16.1          |     |
| 8-Dec                                                                                                              | 1                             | 0  | 1  | 0 | 0 | 0  | A | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.6                            | 1.0           |     |
| 9-Dec                                                                                                              | 1                             | 1  | 1  | 1 | 1 | A  | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 3  | 2  | 2  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.9                            | 3.1           |     |
| 10-Dec                                                                                                             | 1                             | 1  | 1  | 1 | A | 1  | 1 | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 26 | 10 | 2  | 6  | 6  | 9                                                                                                                                                           | 10 | 11 | 13 | 5   | 4.9                            | 26.3          |     |
| 11-Dec                                                                                                             | 6                             | 8  | 12 | A | 7 | 8  | 3 | 1  | 16 | 8  | 9  | 5  | 4  | 20 | 9  | 5  | 7  | 14 | 7  | 9                                                                                                                                                           | 18 | 3  | 6  | 3   | 8.2                            | 19.7          |     |
| 12-Dec                                                                                                             | 5                             | 2  | A  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 1.3                            | 5.3           |     |
| 13-Dec                                                                                                             | 1                             | A  | 1  | 2 | 1 | 2  | 2 | 2  | 3  | 6  | 4  | 2  | 4  | 2  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 1.7                            | 5.5           |     |
| 14-Dec                                                                                                             | A                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | P  | P  | P  | P  | P  | P  | 1  | 1  | 1  | 0                                                                                                                                                           | 0  | 1  | 1  | A   | --                             | 1.1           |     |
| 15-Dec                                                                                                             | 1                             | 0  | 1  | 0 | 2 | 2  | 0 | 0  | 0  | 0  | 1  | 1  | 0  | 1  | 5  | 2  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | A  | 0   | 1.0                            | 5.2           |     |
| 16-Dec                                                                                                             | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 1  | 1  | C  | C  | 4  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | A  | 0  | 0  | 0   | 0.7                            | 4.2           |     |
| 17-Dec                                                                                                             | 0                             | 0  | 0  | 0 | 0 | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 1  | 0  | 0                                                                                                                                                           | A  | 1  | 0  | 0   | 0.5                            | 0.8           |     |
| 18-Dec                                                                                                             | 0                             | 0  | 1  | 1 | 1 | 10 | 6 | 4  | 9  | 15 | 26 | 6  | 23 | 17 | 27 | 8  | 2  | 3  | 17 | A                                                                                                                                                           | 16 | 22 | 5  | 1   | 9.6                            | 26.7          |     |
| 19-Dec                                                                                                             | 0                             | 1  | 0  | 0 | 0 | 0  | 0 | 0  | 0  | 8  | 10 | 10 | 3  | 3  | 2  | 2  | 5  | 2  | A  | 14                                                                                                                                                          | 5  | 5  | 17 | 6   | 4.2                            | 16.8          |     |
| 20-Dec                                                                                                             | 1                             | 0  | 0  | 1 | 0 | 0  | 0 | 1  | 1  | 1  | 0  | 0  | 1  | 2  | 1  | 1  | 1  | A  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 5   | 0.9                            | 5.3           |     |
| 21-Dec                                                                                                             | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 0                                                                                                                                                           | 0  | 0  | 0  | 0   | 0.6                            | 0.8           |     |
| 22-Dec                                                                                                             | 0                             | 0  | 1  | 2 | 0 | 0  | 0 | 1  | 0  | 1  | 0  | 0  | 0  | 1  | 1  | A  | 1  | 1  | 0  | 1                                                                                                                                                           | 0  | 0  | 1  | 0   | 0.7                            | 2.0           |     |
| 23-Dec                                                                                                             | 1                             | 0  | 0  | 0 | 0 | 0  | 0 | 0  | 0  | 1  | 0  | 1  | 1  | 0  | A  | 1  | 1  | 1  | 0  | 1                                                                                                                                                           | 0  | 1  | 0  | 1   | 0.5                            | 1.0           |     |
| 24-Dec                                                                                                             | 0                             | 0  | 0  | 0 | 0 | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.5                            | 0.7           |     |
| 25-Dec                                                                                                             | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 1  | 1  | A  | 1  | 2  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.8                            | 1.7           |     |
| 26-Dec                                                                                                             | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.7                            | 1.1           |     |
| 27-Dec                                                                                                             | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 16 | 1  | 1  | 1                                                                                                                                                           | 7  | 18 | 12 | 2.8 | 18.3                           |               |     |
| 28-Dec                                                                                                             | 22                            | 6  | 6  | 6 | 5 | 5  | 9 | 17 | 16 | A  | 16 | 14 | 13 | 24 | 5  | 6  | 4  | 0  | 2  | 10                                                                                                                                                          | 8  | 1  | 0  | 0   | 8.6                            | 24.2          |     |
| 29-Dec                                                                                                             | 0                             | 0  | 0  | 0 | 0 | 0  | 0 | 0  | A  | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                           | 1  | 1  | 1  | 1   | 0.6                            | 1.0           |     |
| 30-Dec                                                                                                             | 1                             | 1  | 1  | 1 | 1 | 1  | 1 | A  | 1  | 1  | 1  | 1  | 1  | 16 | 28 | 12 | 1  | 1  | 12 | 2                                                                                                                                                           | 1  | 2  | 7  | 1   | 4.0                            | 27.8          |     |
| 31-Dec                                                                                                             | 1                             | 3  | 1  | 3 | 5 | 1  | A | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 0                                                                                                                                                           | 0  | 0  | 0  | 0   | 1.1                            | 4.5           |     |
| 1.9 1.4 1.8 1.0 1.2 1.7 1.6 1.6 2.1 1.8 3.0 1.9 2.5 4.1 4.8 2.7 2.4 2.0 2.0 2.0 2.4 2.2 2.7 1.7                    |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |     | Diurnal Average                |               |     |
| 22.2 9.8 16.1 5.7 6.6 9.6 9.2 17.4 15.9 15.3 25.8 14.3 23.4 24.2 27.8 13.9 18.7 17.4 16.8 14.3 18.5 21.6 18.3 12.3 |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |     | Diurnal Maximum                |               |     |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                    |                               |    |    |   |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                             |    |    |    |     |                                |               |     |



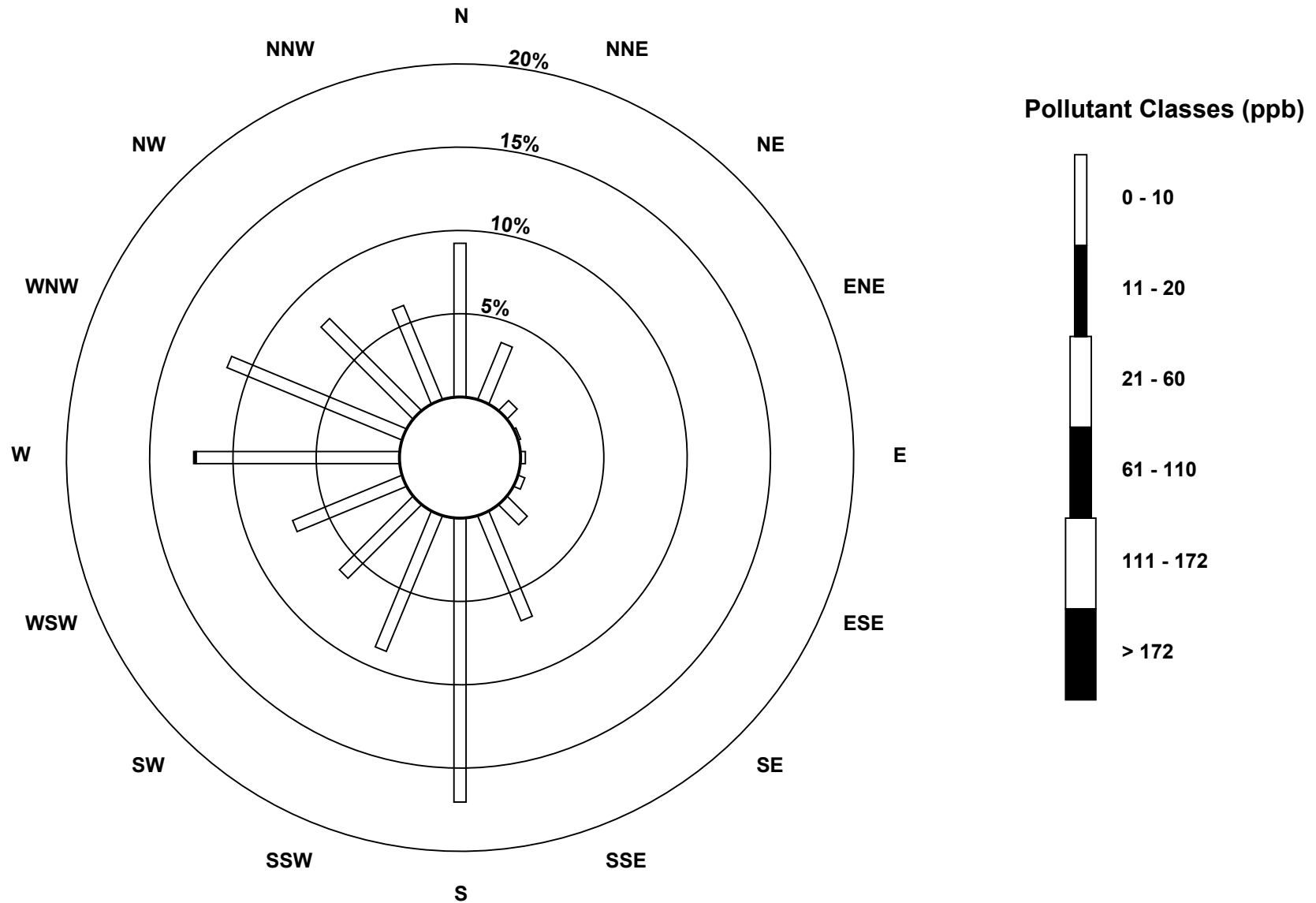
## Hourly Maximums

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Valleyview - December 2016**



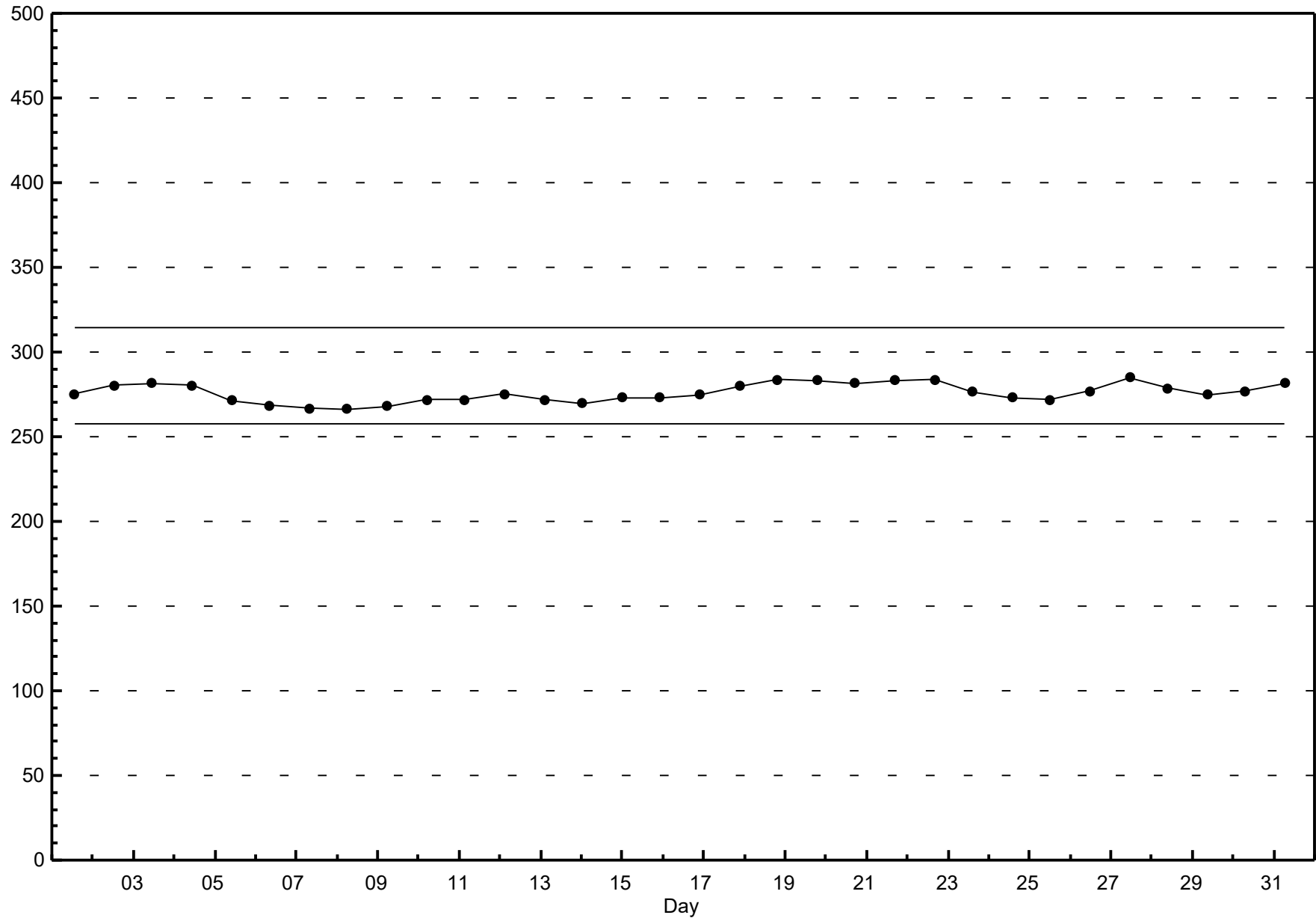
## Pollutant Rose

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Valleyview - December 2016**



## Span Responses

Sulphur Dioxide (SO<sub>2</sub>)  
Valleyview - December 2016



# Hourly Averages

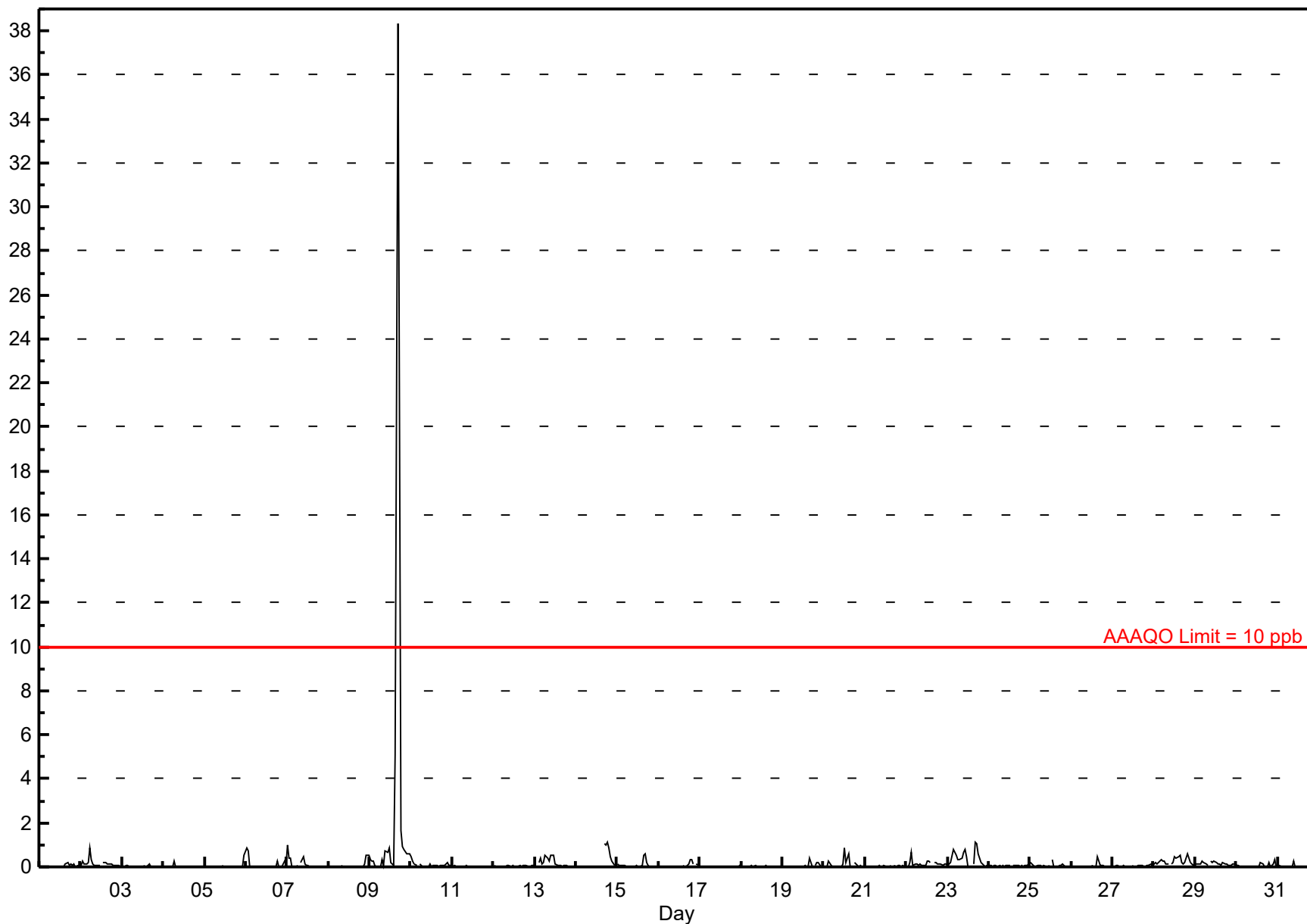
Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Valleyview - December 2016

|                                                 |                               |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      |                                                                                                                                                            |     |                                |     |     |     |                 |               |
|-------------------------------------------------|-------------------------------|-------------------|-----|-----|-----|-------------|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------|-----|-----|-----|-----------------|---------------|
| Number of Exceedences (AAAQO): 1-hr: 2 24-hr: 0 |                               |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      | Hours in Service: 744                                                                                                                                      |     |                                |     |     |     |                 |               |
| Maximum Value: 38.4 ppb on Dec 9 17:00          |                               |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      | Maximum Daily Average: 3.2 ppb on Dec 9                                                                                                                    |     | Hours of Data: 703             |     |     |     |                 |               |
| Minimum Value: 0 ppb on Dec 1 02:00             |                               |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      | Minimum Daily Average: 0.0 ppb on Dec 17                                                                                                                   |     | Hours of Missing Data: 41      |     |     |     |                 |               |
| Maximum Diurnal Average: 1.4 ppb at hour 17     |                               |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      | Minimum Diurnal Average: 0.1 ppb at hour 8                                                                                                                 |     | Hours of Calibration: 35       |     |     |     |                 |               |
| Monthly Average: 0.19 ppb                       |                               |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.3 P <sub>99</sub> = 1.1 |     | Percent Operational Time: 99.2 |     |     |     |                 |               |
| Day                                             | Hourly Period Ending At (MST) |                   |     |     |     |             |     |                               |     |     |     |     |     |     |     |     |     |      |                                                                                                                                                            |     |                                |     |     |     | Daily Average   | Daily Maximum |
|                                                 | 1                             | 2                 | 3   | 4   | 5   | 6           | 7   | 8                             | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18   | 19                                                                                                                                                         | 20  | 21                             | 22  | 23  | 24  |                 |               |
| 1-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.2           |
| 2-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | 1           | 0   | 0                             | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.2             | 0.9           |
| 3-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.1           |
| 4-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.3           |
| 5-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 1   | 0.0             | 0.6           |
| 6-Dec                                           | 1                             | 1                 | 0   | 0   | 0   | 0           | 0   | 0                             | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.8           |
| 7-Dec                                           | 1                             | 0                 | 0   | 0   | 0   | 0           | 0   | A                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 1.0           |
| 8-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | 0           | A   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 1   | 1   | 0.1             | 0.6           |
| 9-Dec                                           | 0                             | 0                 | 0   | 0   | 0   | A           | 0   | 0                             | 0   | 1   | 1   | 1   | 0   | 0   | 0   | 5   | 38  | 21   | 2                                                                                                                                                          | 1   | 1                              | 1   | 1   | 1   | 3.2             | 38.4          |
| 10-Dec                                          | 0                             | 0                 | 0   | 0   | A   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.4           |
| 11-Dec                                          | 0                             | 0                 | 0   | A   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.1           |
| 12-Dec                                          | 0                             | 0                 | A   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.1           |
| 13-Dec                                          | 0                             | A                 | 0   | 0   | 0   | 0           | 1   | 0                             | 0   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.2             | 0.6           |
| 14-Dec                                          | A                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | P   | P   | P   | P   | P   | P   | 1   | 1    | 1                                                                                                                                                          | 1   | 0                              | 0   | 0   | A   | --              | 1.1           |
| 15-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 1   | 1   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | A   | 0   | 0.1             | 0.6           |
| 16-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | C   | C   | C   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | A   | 0   | 0   | 0.1             | 0.3           |
| 17-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | A   | 0   | 0   | 0.0             | 0.1           |
| 18-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | A                              | 0   | 0   | 0   | 0.0             | 0.1           |
| 19-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | A                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.4           |
| 20-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 1   | 0   | 1   | 0   | A   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.9           |
| 21-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | A   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.1           |
| 22-Dec                                          | 0                             | 0                 | 0   | 1   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.2             | 0.6           |
| 23-Dec                                          | 0                             | 0                 | 0   | 1   | 1   | 1           | 0   | 0                             | 0   | 1   | 1   | 0   | 0   | 0   | A   | 0   | 1   | 1    | 1                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.4             | 1.1           |
| 24-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.2           |
| 25-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.3           |
| 26-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.5           |
| 27-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | 0   | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.1           |
| 28-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | 0   | A   | 0   | 0   | 0   | 0   | 0   | 1   | 0   | 0    | 0                                                                                                                                                          | 1   | 0                              | 0   | 0   | 0   | 0.3             | 0.6           |
| 29-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | 0                             | A   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.3           |
| 30-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | 0   | A                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.1             | 0.3           |
| 31-Dec                                          | 0                             | 0                 | 0   | 0   | 0   | 0           | A   | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0    | 0                                                                                                                                                          | 0   | 0                              | 0   | 0   | 0   | 0.0             | 0.3           |
|                                                 |                               | 0.1               | 0.1 | 0.1 | 0.1 | 0.1         | 0.1 | 0.1                           | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.3 | 1.4 | 0.8  | 0.2                                                                                                                                                        | 0.1 | 0.1                            | 0.1 | 0.1 | 0.1 | Diurnal Average |               |
|                                                 |                               | 1.0               | 0.8 | 0.4 | 0.8 | 0.7         | 0.9 | 0.5                           | 0.4 | 0.4 | 0.8 | 0.8 | 0.9 | 0.9 | 0.4 | 0.6 | 5.1 | 38.4 | 20.6                                                                                                                                                       | 1.6 | 0.9                            | 0.8 | 0.6 | 0.6 | Diurnal Maximum |               |
| C - Calibration                                 |                               | P - Power Failure |     |     |     |             |     | A - Automated Daily Zero Span |     |     |     |     |     |     |     |     |     |      |                                                                                                                                                            |     |                                |     |     |     |                 |               |
| Alberta Ambient Air Quality Objectives (AAAQO): |                               | 1-hr 10 ppb       |     |     |     | 24-hr 3 ppb |     |                               |     |     |     |     |     |     |     |     |     |      |                                                                                                                                                            |     |                                |     |     |     |                 |               |

## Hourly Averages

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Valleyview - December 2016



# Hourly Maximums

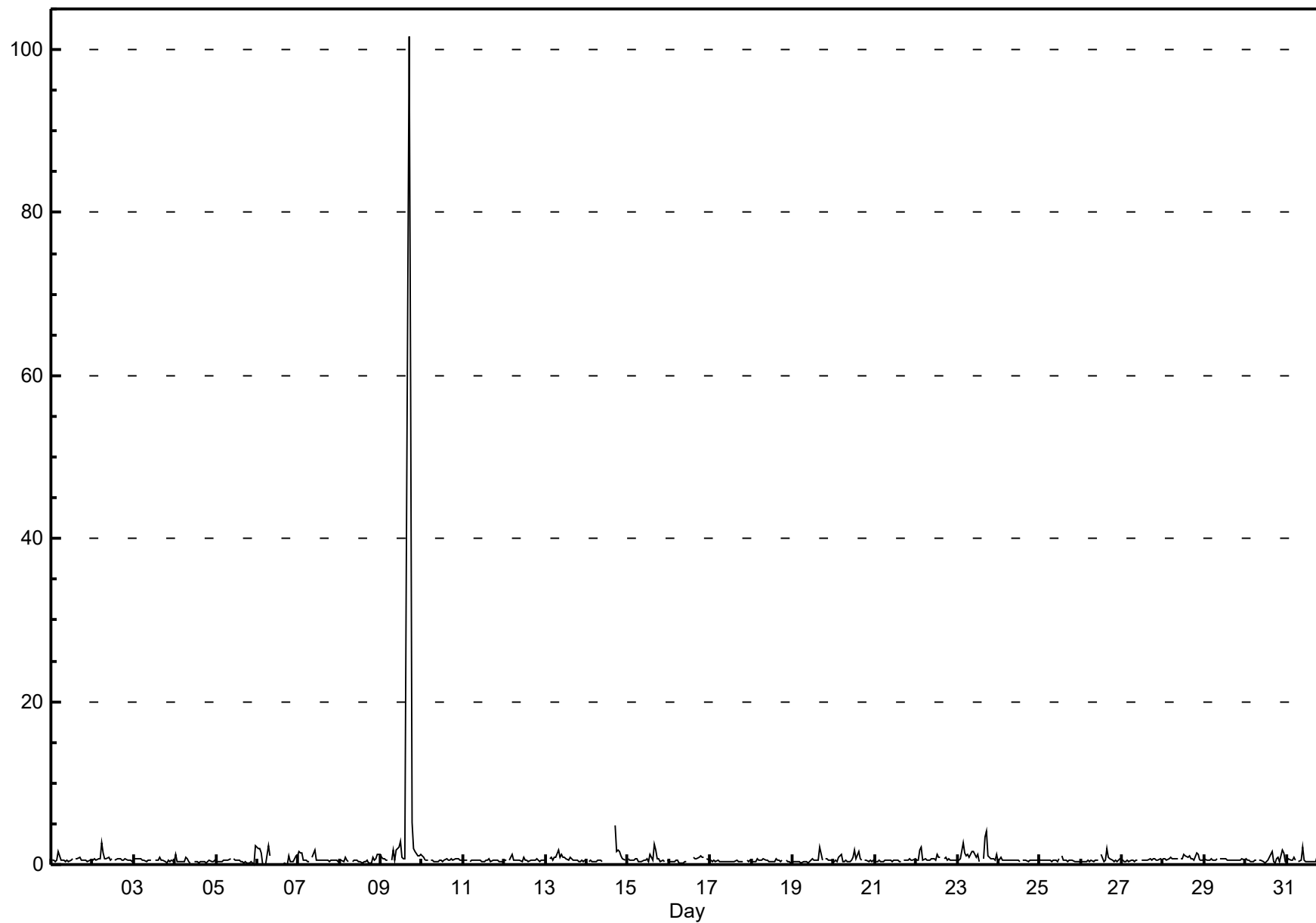
Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Valleyview - December 2016

| Maximum Value: 101.6 ppb on Dec 9 17:00                                                             |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    | Maximum Daily Average: 9.7 ppb on Dec 9                                                                                                                    |    |    |    |                 | Hours in Service: 744          |               |  |  |  |
|-----------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|-----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|--------------------------------|---------------|--|--|--|
| Minimum Value: 0 ppb on Dec 6 04:00                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    | Minimum Daily Average: 0.4 ppb on Dec 4                                                                                                                    |    |    |    |                 | Hours of Data: 703             |               |  |  |  |
| Maximum Diurnal Average: 4.2 ppb at hour 17                                                         |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    | Minimum Diurnal Average: 0.6 ppb at hour 9                                                                                                                 |    |    |    |                 | Hours of Missing Data: 41      |               |  |  |  |
| Monthly Average: 0.91 ppb                                                                           |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.4 Median = 0.5 Q <sub>3</sub> = 0.7 P <sub>90</sub> = 1.1 P <sub>99</sub> = 3.0 |    |    |    |                 | Hours of Calibration: 35       |               |  |  |  |
|                                                                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    |                                                                                                                                                            |    |    |    |                 | Percent Operational Time: 99.2 |               |  |  |  |
| Day                                                                                                 | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    |                                                                                                                                                            |    |    |    |                 | Daily Average                  | Daily Maximum |  |  |  |
|                                                                                                     | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17  | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24              |                                |               |  |  |  |
| 1-Dec                                                                                               | 0                             | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 1  | 0  | 0  | 1  | A  | 1  | 1  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | 0  | 1  | 0               | 0.6                            | 1.5           |  |  |  |
| 2-Dec                                                                                               | 0                             | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 0  | 0               | 0.8                            | 2.7           |  |  |  |
| 3-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0  | 0  | A  | 1  | 1  | 1  | 1  | 1   | 1  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0               | 0.5                            | 0.8           |  |  |  |
| 4-Dec                                                                                               | 1                             | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 1               | 0.4                            | 1.2           |  |  |  |
| 5-Dec                                                                                               | 0                             | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | A  | 1  | 0  | 1  | 0  | 0  | 0  | 0   | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 2               | 0.5                            | 2.3           |  |  |  |
| 6-Dec                                                                                               | 2                             | 2 | 1 | 0 | 0 | 0 | 2 | 1 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 0                                                                                                                                                          | 0  | 0  | 1  | 1               | 0.6                            | 2.4           |  |  |  |
| 7-Dec                                                                                               | 2                             | 1 | 1 | 1 | 0 | 0 | 0 | A | 1 | 2  | 1  | 0  | 1  | 0  | 0  | 1  | 1   | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0               | 0.7                            | 1.8           |  |  |  |
| 8-Dec                                                                                               | 0                             | 1 | 0 | 1 | 0 | 0 | A | 0 | 0 | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 0  | 1                                                                                                                                                          | 0  | 1  | 1  | 1               | 0.5                            | 1.3           |  |  |  |
| 9-Dec                                                                                               | 1                             | 1 | 1 | 1 | 1 | A | 1 | 2 | 0 | 2  | 2  | 3  | 1  | 1  | 1  | 36 | 102 | 59 | 5  | 2                                                                                                                                                          | 2  | 1  | 1  | 1               | 9.7                            | 101.6         |  |  |  |
| 10-Dec                                                                                              | 1                             | 1 | 1 | 1 | A | 0 | 1 | 0 | 0 | 0  | 1  | 1  | 0  | 0  | 1  | 0  | 0   | 1  | 0  | 1                                                                                                                                                          | 1  | 1  | 0  | 0               | 0.6                            | 1.1           |  |  |  |
| 11-Dec                                                                                              | 1                             | 1 | 1 | A | 0 | 1 | 1 | 0 | 1 | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 0   | 1  | 1  | 0                                                                                                                                                          | 1  | 0  | 0  | 0               | 0.5                            | 0.6           |  |  |  |
| 12-Dec                                                                                              | 0                             | 1 | A | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 0  | 1  | 1  | 1  | 0  | 1  | 1   | 0  | 0  | 1                                                                                                                                                          | 0  | 1  | 1  | 1               | 0.6                            | 1.2           |  |  |  |
| 13-Dec                                                                                              | 1                             | A | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 1  | 0  | 0                                                                                                                                                          | 0  | 1  | 0  | 1               | 0.7                            | 1.8           |  |  |  |
| 14-Dec                                                                                              | A                             | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0  | P  | P  | P  | P  | P  | P  | 5   | 2  | 2  | 2                                                                                                                                                          | 1  | 1  | 1  | A               | --                             | 4.8           |  |  |  |
| 15-Dec                                                                                              | 1                             | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1  | 1  | 1  | 0  | 1  | 1  | 2  | 2   | 1  | 1  | 0                                                                                                                                                          | 0  | 0  | A  | 1               | 0.7                            | 2.5           |  |  |  |
| 16-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0  | 0  | C  | C  | C  | 1  | 1  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | A  | 1  | 1               | 0.6                            | 1.0           |  |  |  |
| 17-Dec                                                                                              | 1                             | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0   | 0  | 0  | 0                                                                                                                                                          | 0  | A  | 1  | 0               | 0.4                            | 0.5           |  |  |  |
| 18-Dec                                                                                              | 0                             | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 0   | 0  | 0  | 1                                                                                                                                                          | A  | 1  | 0  | 0               | 0.5                            | 0.7           |  |  |  |
| 19-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 1  | 0  | 0  | 2   | 1  | A  | 1                                                                                                                                                          | 1  | 1  | 0  | 0               | 0.5                            | 2.1           |  |  |  |
| 20-Dec                                                                                              | 0                             | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 2  | 1  | 2  | 1  | 1   | A  | 0  | 1                                                                                                                                                          | 0  | 0  | 0  | 0               | 0.7                            | 1.8           |  |  |  |
| 21-Dec                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1  | 0  | 1  | 1  | 0  | 0  | 0  | A   | 1  | 0  | 1                                                                                                                                                          | 1  | 1  | 0  | 1               | 0.5                            | 0.7           |  |  |  |
| 22-Dec                                                                                              | 0                             | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 0  | 1  | 1  | 1  | A  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 0  | 1               | 0.8                            | 2.1           |  |  |  |
| 23-Dec                                                                                              | 1                             | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | 2  | 1  | 1  | 1  | 0  | A  | 1  | 3   | 4  | 1  | 1                                                                                                                                                          | 1  | 1  | 0  | 1               | 1.3                            | 4.1           |  |  |  |
| 24-Dec                                                                                              | 0                             | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1  | 0  | 0  | 0  | A  | 0  | 0  | 0   | 0  | 1  | 1                                                                                                                                                          | 1  | 0  | 1  | 1               | 0.5                            | 1.0           |  |  |  |
| 25-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0  | 0  | 1  | A  | 1  | 0  | 0  | 0   | 1  | 1  | 1                                                                                                                                                          | 0  | 0  | 0  | 0               | 0.5                            | 1.0           |  |  |  |
| 26-Dec                                                                                              | 0                             | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0  | 0  | A  | 1  | 0  | 0  | 2  | 1   | 1  | 1  | 0                                                                                                                                                          | 1  | 0  | 0  | 1               | 0.6                            | 1.9           |  |  |  |
| 27-Dec                                                                                              | 1                             | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0  | A  | 1  | 0  | 0  | 1  | 0  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | 0  | 1  | 1               | 0.5                            | 0.7           |  |  |  |
| 28-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 0  | 1               | 0.8                            | 1.4           |  |  |  |
| 29-Dec                                                                                              | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1   | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.6                            | 0.8           |  |  |  |
| 30-Dec                                                                                              | 1                             | 1 | 1 | 0 | 0 | 0 | 0 | A | 1 | 1  | 0  | 0  | 0  | 1  | 1  | 2  | 0   | 0  | 1  | 1                                                                                                                                                          | 0  | 2  | 1  | 0               | 0.6                            | 1.7           |  |  |  |
| 31-Dec                                                                                              | 0                             | 1 | 1 | 1 | 1 | 1 | A | 0 | 0 | 2  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0  | 1  | 0                                                                                                                                                          | 0  | 0  | 0  | 0               | 0.5                            | 2.2           |  |  |  |
| 0.6 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 1.9 4.2 2.6 0.8 0.7 0.6 0.6 0.6 0.6     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    |                                                                                                                                                            |    |    |    | Diurnal Average |                                |               |  |  |  |
| 1.9 2.0 1.8 2.7 1.5 2.7 2.4 1.8 1.6 2.2 2.1 2.8 1.8 1.3 1.6 36.1 101.6 58.6 5.1 1.9 1.7 1.7 1.4 2.3 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    |                                                                                                                                                            |    |    |    | Diurnal Maximum |                                |               |  |  |  |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |     |    |    |                                                                                                                                                            |    |    |    |                 |                                |               |  |  |  |

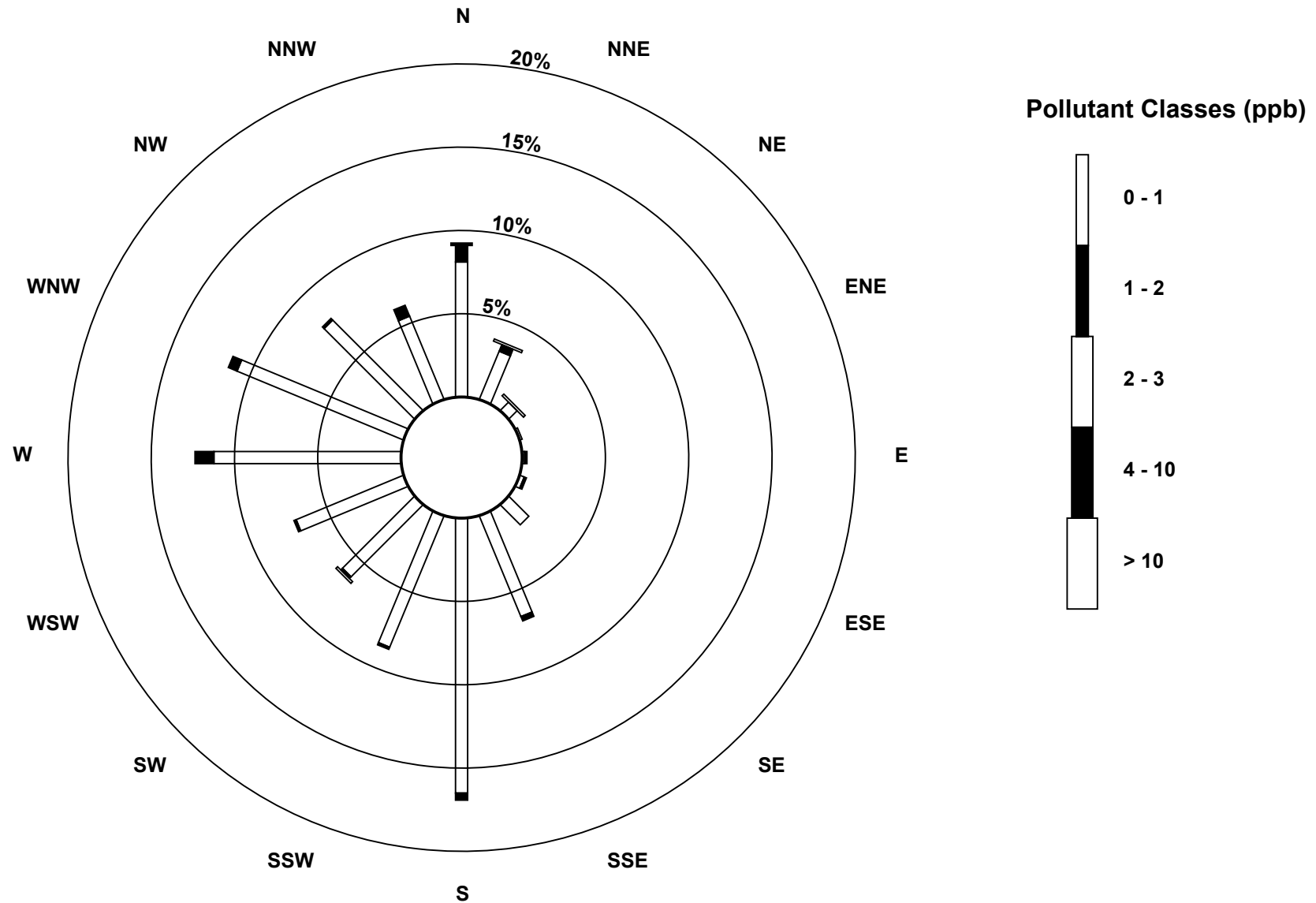
## Hourly Maximums

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Valleyview - December 2016



## Pollutant Rose

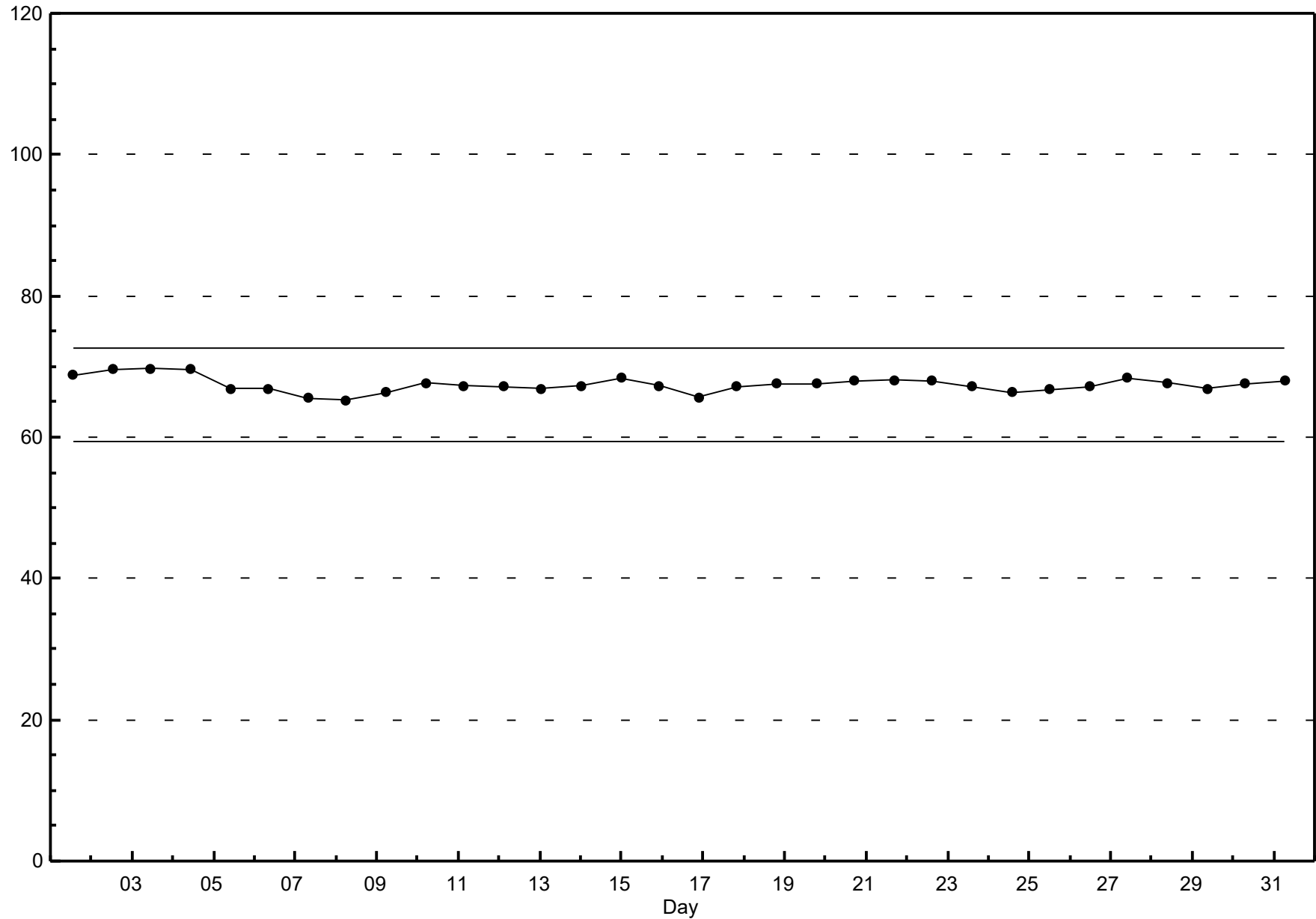
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Valleyview - December 2016





## Span Responses

Hydrogen Sulphide ( $\text{H}_2\text{S}$ )  
Valleyview - December 2016



# Hourly Averages

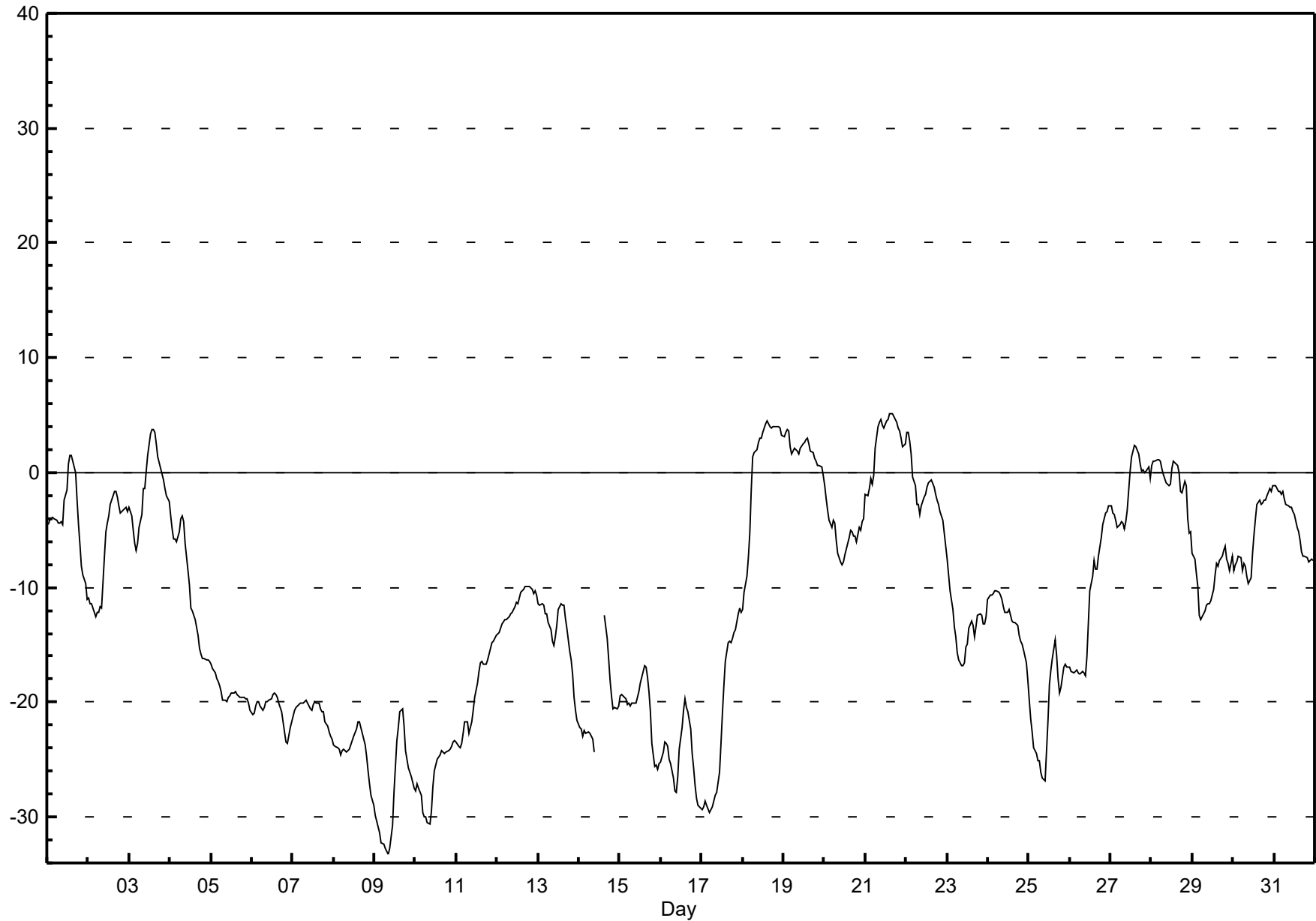
External Temperature (ET) - °C

Valleyview - December 2016

| Maximum Value: 5.1 °C on Dec 21 16:00       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.7 °C on Dec 21                                                                                                                             |     |     |                 |               | Hours in Service: 744    |  |
|---------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------|--------------------------|--|
| Minimum Value: -33 °C on Dec 9 09:00        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: -27.8 °C on Dec 9                                                                                                                            |     |     |                 |               | Hours of Data: 739       |  |
| Maximum Diurnal Average: -9.5 °C at hour 15 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: -13.6 °C at hour 9                                                                                                                         |     |     |                 |               | Hours of Missing Data: 5 |  |
| Monthly Average: -12.00 °C                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = -30.9 P <sub>10</sub> = -24.4 Q <sub>1</sub> = -20.1 Median = -12.1 Q <sub>3</sub> = -3.4 P <sub>90</sub> = 1.1 P <sub>99</sub> = 4.3 |     |     |                 |               | Hours of Calibration: 0  |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.3                                                                                                                                      |     |     |                 |               |                          |  |
| Day                                         | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |                 | Daily Average | Daily Maximum            |  |
|                                             | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                  | 22  | 23  | 24              |               |                          |  |
| 1-Dec                                       | -5                            | -4  | -4  | -4  | -4  | -4  | -4  | -4  | -4  | -4  | -2  | -1  | 1   | 1   | 1   | 0   | -2  | -5  | -6  | -8  | -9                                                                                                                                                                  | -10 | -11 | -3.9            | 1.5           |                          |  |
| 2-Dec                                       | -11                           | -11 | -11 | -12 | -13 | -12 | -12 | -12 | -12 | -7  | -5  | -4  | -4  | -3  | -2  | -2  | -2  | -3  | -3  | -3  | -3                                                                                                                                                                  | -3  | -3  | -3              | -6.5          | -1.6                     |  |
| 3-Dec                                       | -3                            | -4  | -5  | -6  | -7  | -6  | -5  | -4  | -1  | -1  | 0   | 2   | 3   | 4   | 4   | 3   | 3   | 1   | 0   | 0   | -1                                                                                                                                                                  | -1  | -2  | -3              | -1.2          | 3.8                      |  |
| 4-Dec                                       | -4                            | -5  | -6  | -6  | -6  | -5  | -4  | -4  | -4  | -6  | -8  | -10 | -12 | -12 | -12 | -13 | -14 | -15 | -16 | -16 | -16                                                                                                                                                                 | -16 | -16 | -16             | -10.2         | -3.8                     |  |
| 5-Dec                                       | -17                           | -17 | -17 | -18 | -18 | -19 | -19 | -20 | -20 | -20 | -20 | -19 | -19 | -19 | -19 | -19 | -19 | -20 | -20 | -20 | -20                                                                                                                                                                 | -20 | -20 | -21             | -19.1         | -16.6                    |  |
| 6-Dec                                       | -21                           | -21 | -20 | -20 | -20 | -20 | -21 | -20 | -20 | -20 | -20 | -20 | -19 | -19 | -19 | -20 | -20 | -21 | -22 | -23 | -23                                                                                                                                                                 | -24 | -22 | -22             | -20.7         | -19.2                    |  |
| 7-Dec                                       | -21                           | -21 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -21 | -21 | -20 | -20 | -20 | -20 | -21 | -21 | -21 | -22 | -22                                                                                                                                                                 | -23 | -23 | -23             | -20.8         | -19.9                    |  |
| 8-Dec                                       | -24                           | -24 | -24 | -24 | -25 | -24 | -24 | -24 | -24 | -24 | -24 | -23 | -23 | -22 | -22 | -22 | -22 | -23 | -24 | -25 | -26                                                                                                                                                                 | -27 | -28 | -29             | -24.2         | -21.7                    |  |
| 9-Dec                                       | -30                           | -30 | -31 | -31 | -32 | -32 | -33 | -33 | -33 | -33 | -31 | -28 | -26 | -23 | -22 | -21 | -21 | -22 | -24 | -25 | -26                                                                                                                                                                 | -27 | -27 | -27             | -27.8         | -20.6                    |  |
| 10-Dec                                      | -28                           | -27 | -27 | -28 | -30 | -30 | -30 | -31 | -31 | -29 | -27 | -26 | -25 | -25 | -25 | -24 | -24 | -24 | -24 | -24 | -24                                                                                                                                                                 | -24 | -23 | -23             | -26.5         | -23.3                    |  |
| 11-Dec                                      | -23                           | -24 | -24 | -24 | -23 | -22 | -22 | -23 | -22 | -22 | -21 | -20 | -18 | -17 | -17 | -16 | -17 | -17 | -16 | -16 | -15                                                                                                                                                                 | -15 | -15 | -14             | -19.2         | -14.2                    |  |
| 12-Dec                                      | -14                           | -14 | -14 | -13 | -13 | -13 | -13 | -13 | -12 | -12 | -12 | -11 | -11 | -11 | -10 | -10 | -10 | -10 | -10 | -10 | -10                                                                                                                                                                 | -11 | -10 | -11             | -11.6         | -9.9                     |  |
| 13-Dec                                      | -11                           | -12 | -11 | -12 | -12 | -12 | -13 | -14 | -15 | -15 | -14 | -13 | -12 | -11 | -11 | -12 | -13 | -14 | -16 | -16 | -18                                                                                                                                                                 | -20 | -21 | -22             | -14.1         | -11.5                    |  |
| 14-Dec                                      | -22                           | -22 | -23 | -23 | -23 | -23 | -23 | -23 | -23 | -24 | P   | P   | P   | P   | P   | -12 | -14 | -16 | -18 | -19 | -21                                                                                                                                                                 | -20 | -21 | -20             | -20.6         | -12.4                    |  |
| 15-Dec                                      | -20                           | -19 | -19 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -19 | -18 | -18 | -17 | -17 | -18 | -19 | -21 | -24 | -26                                                                                                                                                                 | -26 | -26 | -25             | -20.5         | -16.9                    |  |
| 16-Dec                                      | -25                           | -24 | -23 | -24 | -24 | -25 | -25 | -27 | -28 | -28 | -27 | -24 | -22 | -21 | -20 | -20 | -21 | -22 | -24 | -26 | -27                                                                                                                                                                 | -28 | -29 | -29             | -24.8         | -19.7                    |  |
| 17-Dec                                      | -29                           | -29 | -29 | -29 | -30 | -29 | -29 | -29 | -28 | -28 | -26 | -24 | -21 | -19 | -16 | -15 | -15 | -15 | -14 | -14 | -14                                                                                                                                                                 | -12 | -12 | -12             | -21.5         | -11.8                    |  |
| 18-Dec                                      | -12                           | -10 | -9  | -7  | -5  | -2  | 1   | 2   | 2   | 3   | 3   | 3   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4                                                                                                                                                                   | 4   | 3   | 0.6             | 4.5           |                          |  |
| 19-Dec                                      | 3                             | 4   | 4   | 4   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 3   | 3   | 3   | 3   | 2   | 2   | 2   | 1   | 1   | 1                                                                                                                                                                   | 0   | 0   | 2.0             | 3.7           |                          |  |
| 20-Dec                                      | -1                            | -2  | -3  | -4  | -5  | -4  | -4  | -6  | -7  | -8  | -8  | -8  | -7  | -7  | -6  | -5  | -5  | -6  | -5  | -6  | -5                                                                                                                                                                  | -5  | -4  | -4              | -5.2          | -1.2                     |  |
| 21-Dec                                      | -2                            | -2  | -1  | 0   | -1  | 0   | 2   | 4   | 4   | 5   | 4   | 4   | 4   | 5   | 5   | 5   | 5   | 5   | 4   | 4   | 4                                                                                                                                                                   | 3   | 2   | 3               | 2.7           | 5.1                      |  |
| 22-Dec                                      | 3                             | 3   | 3   | 2   | 0   | -1  | -3  | -3  | -4  | -3  | -2  | -2  | -1  | -1  | -1  | -1  | -1  | -2  | -2  | -3  | -3                                                                                                                                                                  | -4  | -5  | -6              | -1.6          | 3.5                      |  |
| 23-Dec                                      | -8                            | -9  | -10 | -12 | -13 | -14 | -16 | -16 | -17 | -17 | -17 | -15 | -15 | -14 | -13 | -13 | -14 | -13 | -12 | -12 | -12                                                                                                                                                                 | -13 | -13 | -13             | -13.4         | -7.5                     |  |
| 24-Dec                                      | -11                           | -11 | -11 | -11 | -10 | -10 | -10 | -11 | -11 | -12 | -12 | -12 | -12 | -12 | -13 | -13 | -13 | -13 | -14 | -15 | -15                                                                                                                                                                 | -15 | -17 | -18             | -12.6         | -10.3                    |  |
| 25-Dec                                      | -20                           | -21 | -23 | -24 | -25 | -25 | -25 | -26 | -27 | -27 | -24 | -22 | -18 | -17 | -16 | -15 | -16 | -18 | -19 | -19 | -17                                                                                                                                                                 | -17 | -17 | -17             | -20.6         | -14.6                    |  |
| 26-Dec                                      | -17                           | -17 | -17 | -17 | -17 | -17 | -18 | -17 | -17 | -18 | -16 | -13 | -10 | -9  | -8  | -8  | -8  | -7  | -6  | -5  | -4                                                                                                                                                                  | -4  | -3  | -3              | -11.6         | -3.0                     |  |
| 27-Dec                                      | -3                            | -4  | -4  | -4  | -5  | -4  | -4  | -4  | -5  | -4  | -3  | 0   | 1   | 2   | 2   | 2   | 2   | 1   | 0   | 0   | 0                                                                                                                                                                   | 0   | -1  | -1.4            | 2.4           |                          |  |
| 28-Dec                                      | 1                             | 1   | 1   | 1   | 1   | 1   | 0   | 0   | -1  | -1  | -1  | -1  | 0   | 1   | 1   | 1   | 0   | -2  | -2  | -1  | -1                                                                                                                                                                  | -4  | -5  | -5              | -0.6          | 1.1                      |  |
| 29-Dec                                      | -7                            | -8  | -9  | -10 | -12 | -13 | -12 | -12 | -12 | -11 | -11 | -11 | -10 | -9  | -8  | -8  | -8  | -7  | -7  | -6  | -7                                                                                                                                                                  | -8  | -9  | -7              | -9.3          | -6.4                     |  |
| 30-Dec                                      | -8                            | -8  | -8  | -7  | -7  | -9  | -8  | -8  | -9  | -10 | -9  | -7  | -5  | -4  | -3  | -2  | -3  | -3  | -2  | -2  | -2                                                                                                                                                                  | -1  | -2  | -1              | -5.4          | -1.1                     |  |
| 31-Dec                                      | -1                            | -1  | -2  | -2  | -2  | -2  | -2  | -3  | -3  | -3  | -3  | -3  | -4  | -5  | -5  | -6  | -7  | -7  | -7  | -7  | -8                                                                                                                                                                  | -8  | -8  | -8              | -4.4          | -1.1                     |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     | Diurnal Average |               |                          |  |
|                                             |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     | Diurnal Maximum |               |                          |  |
| P - Power Failure                           |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |                 |               |                          |  |

## Hourly Averages

External Temperature (ET) - °C  
Valleyview - December 2016



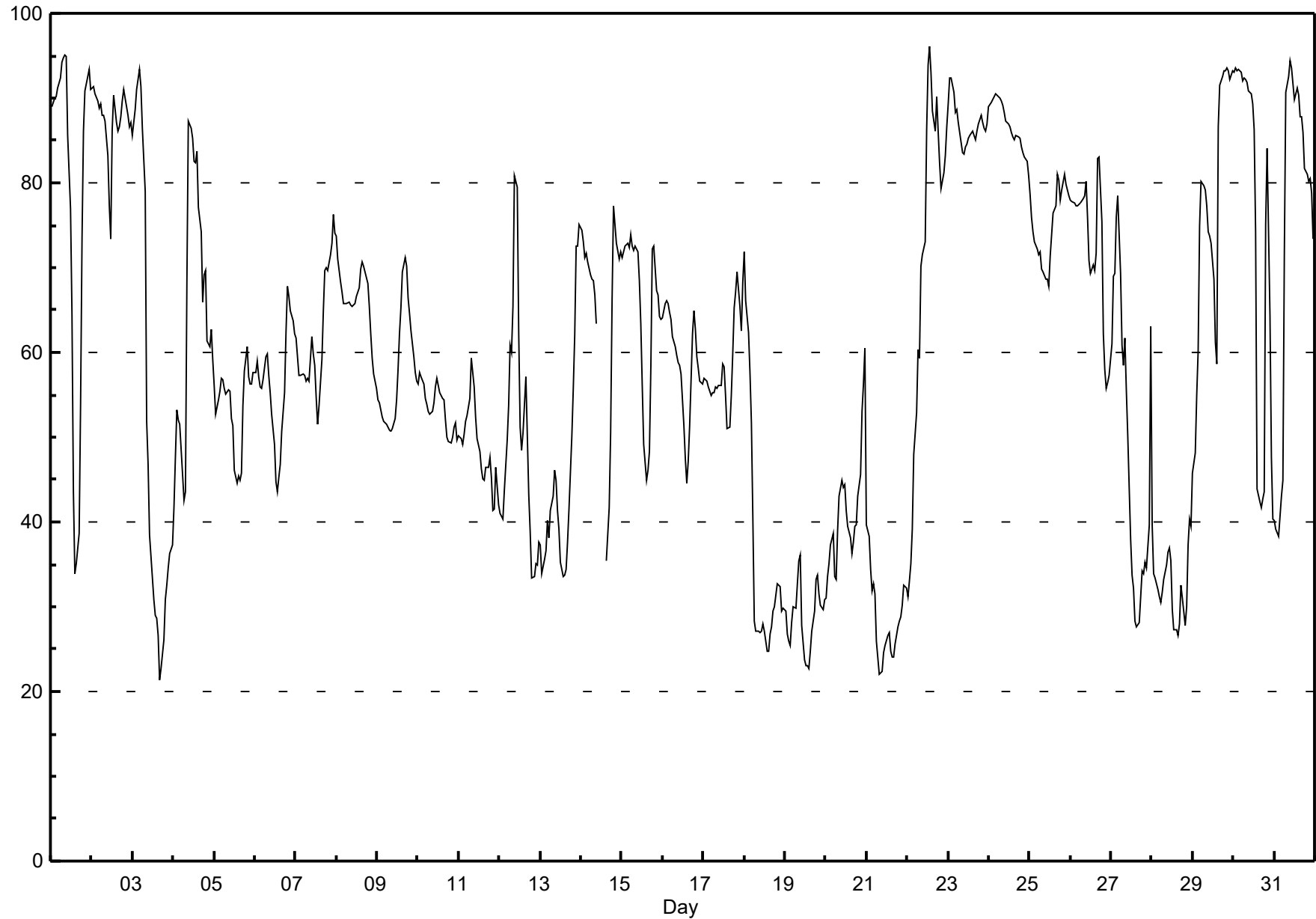
# Hourly Averages

Relative Humidity (RH) - %  
Valleyview - December 2016

| Maximum Value: 96.0 % on Dec 22 14:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 87.2 % on Dec 2                                                                                                                            |    |    |    |    | Hours in Service: 744    |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|--------------------------|---------------|
| Minimum Value: 21 % on Dec 3 17:00                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 28.4 % on Dec 21                                                                                                                           |    |    |    |    | Hours of Data: 739       |               |
| Maximum Diurnal Average: 63.3 % at hour 10                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 53.6 % at hour 15                                                                                                                        |    |    |    |    | Hours of Missing Data: 5 |               |
| Monthly Average: 59.88 %                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 23.1 P <sub>10</sub> = 31.5 Q <sub>1</sub> = 43.6 Median = 58.5 Q <sub>3</sub> = 77.0 P <sub>90</sub> = 88.6 P <sub>99</sub> = 93.5 |    |    |    |    | Hours of Calibration: 0  |               |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.3                                                                                                                                    |    |    |    |    |                          |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Daily Average            | Daily Maximum |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                                | 21 | 22 | 23 | 24 |                          |               |
| 1-Dec                                                                                                                   | 89                            | 89 | 90 | 90 | 91 | 92 | 94 | 95 | 95 | 95 | 86 | 77 | 65 | 43 | 34 | 35 | 39 | 54 | 73 | 86                                                                                                                                                                | 91 | 92 | 93 | 91 | 78.3                     | 95.0          |
| 2-Dec                                                                                                                   | 91                            | 91 | 90 | 90 | 89 | 89 | 88 | 88 | 87 | 83 | 77 | 73 | 86 | 90 | 87 | 86 | 87 | 88 | 90 | 91                                                                                                                                                                | 89 | 88 | 87 | 87 | 87.2                     | 91.4          |
| 3-Dec                                                                                                                   | 86                            | 89 | 91 | 92 | 93 | 91 | 86 | 79 | 52 | 47 | 38 | 36 | 31 | 29 | 29 | 27 | 21 | 23 | 26 | 31                                                                                                                                                                | 33 | 35 | 36 | 37 | 51.6                     | 93.3          |
| 4-Dec                                                                                                                   | 42                            | 48 | 53 | 52 | 51 | 46 | 43 | 44 | 68 | 87 | 86 | 85 | 82 | 82 | 84 | 77 | 74 | 66 | 69 | 70                                                                                                                                                                | 61 | 61 | 63 | 59 | 64.7                     | 87.3          |
| 5-Dec                                                                                                                   | 56                            | 53 | 54 | 55 | 57 | 57 | 56 | 55 | 56 | 55 | 52 | 51 | 46 | 45 | 45 | 45 | 46 | 54 | 58 | 61                                                                                                                                                                | 57 | 56 | 56 | 58 | 53.5                     | 60.6          |
| 6-Dec                                                                                                                   | 58                            | 59 | 57 | 56 | 56 | 57 | 60 | 60 | 57 | 55 | 53 | 49 | 45 | 44 | 45 | 47 | 51 | 55 | 62 | 68                                                                                                                                                                | 67 | 65 | 64 | 62 | 56.2                     | 67.8          |
| 7-Dec                                                                                                                   | 62                            | 59 | 57 | 57 | 58 | 57 | 57 | 57 | 57 | 62 | 60 | 59 | 55 | 52 | 54 | 59 | 65 | 70 | 70 | 70                                                                                                                                                                | 71 | 73 | 76 | 74 | 62.0                     | 76.3          |
| 8-Dec                                                                                                                   | 74                            | 71 | 68 | 67 | 66 | 66 | 66 | 66 | 66 | 65 | 66 | 66 | 67 | 68 | 70 | 71 | 70 | 70 | 68 | 65                                                                                                                                                                | 62 | 59 | 57 | 56 | 66.2                     | 73.8          |
| 9-Dec                                                                                                                   | 54                            | 54 | 53 | 52 | 52 | 52 | 51 | 51 | 51 | 51 | 52 | 54 | 58 | 62 | 65 | 69 | 71 | 70 | 66 | 64                                                                                                                                                                | 62 | 60 | 58 | 57 | 58.0                     | 71.2          |
| 10-Dec                                                                                                                  | 56                            | 58 | 57 | 56 | 55 | 54 | 53 | 53 | 53 | 54 | 56 | 57 | 56 | 55 | 55 | 54 | 52 | 50 | 49 | 49                                                                                                                                                                | 50 | 51 | 52 | 50 | 53.6                     | 57.6          |
| 11-Dec                                                                                                                  | 50                            | 50 | 49 | 50 | 52 | 53 | 55 | 59 | 58 | 56 | 52 | 50 | 48 | 46 | 45 | 45 | 46 | 46 | 48 | 45                                                                                                                                                                | 41 | 42 | 47 | 42 | 49.0                     | 59.3          |
| 12-Dec                                                                                                                  | 41                            | 41 | 40 | 44 | 50 | 54 | 61 | 60 | 65 | 81 | 79 | 62 | 51 | 49 | 51 | 57 | 50 | 43 | 39 | 33                                                                                                                                                                | 34 | 35 | 35 | 38 | 49.7                     | 80.8          |
| 13-Dec                                                                                                                  | 37                            | 34 | 36 | 37 | 40 | 38 | 41 | 43 | 46 | 45 | 41 | 39 | 35 | 34 | 34 | 34 | 38 | 42 | 50 | 56                                                                                                                                                                | 62 | 73 | 73 | 75 | 45.1                     | 75.0          |
| 14-Dec                                                                                                                  | 74                            | 73 | 71 | 72 | 71 | 69 | 69 | 68 | 67 | 63 | P  | P  | P  | P  | P  | 35 | 42 | 51 | 66 | 77                                                                                                                                                                | 75 | 73 | 71 | 72 | 66.3                     | 77.3          |
| 15-Dec                                                                                                                  | 71                            | 72 | 73 | 73 | 72 | 74 | 73 | 72 | 72 | 72 | 68 | 63 | 56 | 49 | 45 | 46 | 48 | 58 | 72 | 73                                                                                                                                                                | 67 | 67 | 64 | 64 | 65.2                     | 73.9          |
| 16-Dec                                                                                                                  | 64                            | 66 | 66 | 66 | 65 | 64 | 62 | 61 | 60 | 59 | 58 | 57 | 51 | 47 | 45 | 47 | 51 | 62 | 65 | 63                                                                                                                                                                | 59 | 58 | 57 | 56 | 58.7                     | 66.1          |
| 17-Dec                                                                                                                  | 57                            | 57 | 57 | 56 | 55 | 55 | 55 | 56 | 56 | 56 | 56 | 59 | 58 | 55 | 51 | 51 | 55 | 60 | 65 | 67                                                                                                                                                                | 70 | 65 | 62 | 68 | 58.4                     | 69.5          |
| 18-Dec                                                                                                                  | 72                            | 66 | 62 | 58 | 52 | 40 | 28 | 27 | 27 | 27 | 27 | 28 | 27 | 25 | 25 | 27 | 28 | 30 | 30 | 33                                                                                                                                                                | 33 | 32 | 29 | 30 | 35.9                     | 71.8          |
| 19-Dec                                                                                                                  | 30                            | 27 | 26 | 25 | 28 | 30 | 30 | 33 | 35 | 36 | 28 | 24 | 23 | 23 | 23 | 25 | 27 | 29 | 33 | 34                                                                                                                                                                | 32 | 30 | 30 | 31 | 28.8                     | 36.2          |
| 20-Dec                                                                                                                  | 31                            | 34 | 35 | 37 | 39 | 34 | 33 | 39 | 43 | 45 | 44 | 44 | 41 | 40 | 38 | 36 | 38 | 39 | 40 | 43                                                                                                                                                                | 46 | 53 | 56 | 61 | 41.2                     | 60.5          |
| 21-Dec                                                                                                                  | 40                            | 38 | 34 | 32 | 33 | 32 | 26 | 22 | 22 | 22 | 25 | 25 | 27 | 27 | 25 | 24 | 24 | 26 | 28 | 28                                                                                                                                                                | 29 | 30 | 32 | 32 | 28.4                     | 39.6          |
| 22-Dec                                                                                                                  | 31                            | 33 | 35 | 39 | 48 | 53 | 60 | 59 | 70 | 71 | 73 | 86 | 94 | 96 | 93 | 88 | 86 | 90 | 86 | 82                                                                                                                                                                | 79 | 81 | 83 | 87 | 71.1                     | 96.0          |
| 23-Dec                                                                                                                  | 89                            | 92 | 92 | 91 | 88 | 89 | 87 | 86 | 84 | 83 | 84 | 85 | 85 | 86 | 86 | 86 | 85 | 86 | 87 | 88                                                                                                                                                                | 87 | 87 | 86 | 87 | 86.9                     | 92.4          |
| 24-Dec                                                                                                                  | 89                            | 89 | 90 | 90 | 91 | 90 | 90 | 90 | 89 | 88 | 87 | 87 | 87 | 86 | 85 | 85 | 86 | 85 | 85 | 84                                                                                                                                                                | 84 | 83 | 83 | 81 | 86.9                     | 90.5          |
| 25-Dec                                                                                                                  | 79                            | 76 | 74 | 73 | 72 | 71 | 72 | 70 | 70 | 69 | 69 | 68 | 71 | 74 | 76 | 77 | 81 | 80 | 78 | 79                                                                                                                                                                | 81 | 80 | 79 | 79 | 74.9                     | 81.1          |
| 26-Dec                                                                                                                  | 78                            | 78 | 78 | 77 | 77 | 77 | 78 | 78 | 78 | 80 | 76 | 71 | 69 | 70 | 70 | 72 | 83 | 83 | 75 | 62                                                                                                                                                                | 58 | 56 | 56 | 57 | 72.4                     | 83.0          |
| 27-Dec                                                                                                                  | 61                            | 69 | 69 | 76 | 78 | 69 | 61 | 59 | 62 | 56 | 50 | 38 | 34 | 32 | 28 | 28 | 28 | 31 | 34 | 34                                                                                                                                                                | 35 | 35 | 40 | 63 | 48.7                     | 78.4          |
| 28-Dec                                                                                                                  | 40                            | 34 | 33 | 32 | 31 | 30 | 32 | 33 | 35 | 36 | 37 | 35 | 30 | 27 | 27 | 27 | 28 | 33 | 31 | 28                                                                                                                                                                | 30 | 37 | 40 | 39 | 32.8                     | 40.3          |
| 29-Dec                                                                                                                  | 46                            | 48 | 55 | 60 | 75 | 80 | 80 | 79 | 77 | 74 | 74 | 73 | 69 | 61 | 59 | 87 | 91 | 93 | 93 | 93                                                                                                                                                                | 94 | 93 | 92 | 93 | 76.6                     | 93.6          |
| 30-Dec                                                                                                                  | 93                            | 94 | 93 | 93 | 93 | 92 | 92 | 92 | 92 | 91 | 90 | 89 | 86 | 74 | 44 | 42 | 42 | 43 | 44 | 75                                                                                                                                                                | 84 | 64 | 48 | 40 | 74.7                     | 93.6          |
| 31-Dec                                                                                                                  | 40                            | 39 | 38 | 41 | 43 | 45 | 71 | 91 | 92 | 94 | 93 | 92 | 90 | 91 | 90 | 88 | 88 | 86 | 82 | 81                                                                                                                                                                | 80 | 81 | 79 | 73 | 74.5                     | 94.3          |
| 60.7 60.6 60.7 61.0 61.9 61.3 61.6 62.1 62.6 63.3 61.3 59.5 57.5 55.4 53.6 54.1 55.5 57.9 60.1 61.7 61.4 61.1 60.8 61.2 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Diurnal Average          |               |
| 93.1 93.6 93.2 93.4 93.3 92.4 94.3 94.7 95.0 94.9 93.5 91.8 93.9 96.0 93.0 88.5 91.5 92.5 93.2 93.3 93.6 93.2 93.4 93.2 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    | Diurnal Maximum          |               |
| P - Power Failure                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                   |    |    |    |    |                          |               |

## Hourly Averages

**Relative Humidity (RH) - %**  
**Valleyview - December 2016**



## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Valleyview - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 5                             | 4   | 3   | 2   | 2   | 1   | 2   | 1   | 1   | 1   | 1   | 1   | 1   | 2   | 5   | 3   | 1   | 1   | 1   | 0   | 1   | 0   | 0   | 0   | 1.0           | 4.8           |
| Dir    | 169                           | 175 | 176 | 181 | 198 | 185 | 157 | 152 | 141 | 224 | 229 | 154 | 257 | 312 | 304 | 274 | 270 | 179 | 195 | 224 | 169 | 203 | 224 | 188 | 200           | 169           |
| 2 Spd  | 1                             | 0   | 0   | 0   | 1   | 0   | 1   | 0   | 1   | 4   | 6   | 6   | 6   | 5   | 5   | 6   | 4   | 3   | 3   | 2   | 3   | 3   | 3   | 3   | 2.7           | 6.4           |
| Dir    | 204                           | 285 | 212 | 236 | 296 | 150 | 219 | 245 | 186 | 184 | 175 | 177 | 166 | 167 | 178 | 170 | 174 | 188 | 191 | 189 | 185 | 180 | 172 | 180 | 179           | 175           |
| 3 Spd  | 3                             | 1   | 1   | 2   | 2   | 4   | 4   | 4   | 4   | 3   | 3   | 3   | 8   | 13  | 8   | 8   | 16  | 10  | 8   | 11  | 10  | 9   | 5   | 6   | 5.2           | 15.6          |
| Dir    | 178                           | 185 | 252 | 220 | 212 | 208 | 188 | 154 | 167 | 175 | 158 | 206 | 250 | 259 | 257 | 262 | 269 | 259 | 249 | 247 | 255 | 251 | 243 | 247 | 242           | 269           |
| 4 Spd  | 3                             | 1   | 1   | 2   | 2   | 5   | 7   | 8   | 11  | 12  | 13  | 14  | 14  | 10  | 10  | 14  | 13  | 16  | 10  | 11  | 11  | 10  | 9   | 10  | 7.3           | 15.6          |
| Dir    | 227                           | 198 | 203 | 215 | 229 | 257 | 272 | 285 | 295 | 347 | 9   | 11  | 15  | 6   | 5   | 328 | 318 | 327 | 311 | 309 | 312 | 309 | 313 | 316 | 326           | 327           |
| 5 Spd  | 12                            | 15  | 14  | 11  | 10  | 9   | 9   | 6   | 6   | 7   | 7   | 5   | 8   | 9   | 7   | 7   | 5   | 3   | 4   | 3   | 4   | 5   | 5   | 5   | 7.3           | 14.5          |
| Dir    | 319                           | 322 | 326 | 320 | 316 | 320 | 315 | 320 | 321 | 329 | 322 | 304 | 315 | 312 | 301 | 315 | 304 | 306 | 297 | 296 | 304 | 315 | 303 | 282 | 315           | 322           |
| 6 Spd  | 5                             | 6   | 5   | 5   | 6   | 4   | 3   | 5   | 5   | 5   | 6   | 6   | 8   | 7   | 6   | 5   | 3   | 2   | 0   | 1   | 1   | 1   | 2   | 1   | 3.9           | 7.6           |
| Dir    | 282                           | 282 | 288 | 296 | 302 | 300 | 280 | 275 | 290 | 291 | 291 | 302 | 303 | 308 | 291 | 305 | 302 | 311 | 277 | 234 | 213 | 199 | 263 | 294 | 292           | 303           |
| 7 Spd  | 2                             | 3   | 4   | 3   | 2   | 3   | 3   | 2   | 1   | 2   | 3   | 4   | 4   | 4   | 6   | 5   | 4   | 2   | 2   | 4   | 3   | 3   | 3   | 3   | 2.5           | 6.2           |
| Dir    | 280                           | 283 | 285 | 285 | 301 | 308 | 322 | 320 | 284 | 290 | 328 | 346 | 340 | 343 | 341 | 18  | 27  | 43  | 8   | 11  | 8   | 19  | 29  | 33  | 341           | 341           |
| 8 Spd  | 3                             | 2   | 0   | 1   | 1   | 0   | 0   | 1   | 1   | 1   | 0   | 1   | 2   | 2   | 2   | 3   | 2   | 2   | 2   | 1   | 0   | 0   | 0   | 0   | 1.1           | 2.8           |
| Dir    | 14                            | 27  | 39  | 358 | 342 | 349 | 353 | 352 | 36  | 66  | 102 | 26  | 360 | 342 | 353 | 360 | 349 | 356 | 355 | 340 | 42  | 232 | 97  | 218 | 2             | 14            |
| 9 Spd  | 0                             | 0   | 0   | 1   | 0   | 10  | 8   | 8   | 4   | 1   | 0   | 0   | 1   | 3   | 4   | 2   | 1   | 1   | 0   | 0   | 1   | 0   | 0   | 0   | 0.6           | 9.6           |
| Dir    | 347                           | 236 | 357 | 348 | 321 | 183 | 183 | 203 | 193 | 327 | 25  | 4   | 7   | 349 | 351 | 353 | 19  | 35  | 229 | 346 | 353 | 350 | 353 | 174 | 208           | 183           |
| 10 Spd | 0                             | 1   | 1   | 1   | 1   | 0   | 0   | 0   | 0   | 1   | 0   | 3   | 4   | 4   | 4   | 5   | 6   | 6   | 5   | 4   | 4   | 4   | 4   | 6   | 2.5           | 6.2           |
| Dir    | 181                           | 261 | 254 | 235 | 156 | 157 | 211 | 178 | 185 | 175 | 192 | 285 | 302 | 326 | 277 | 313 | 301 | 285 | 298 | 286 | 278 | 279 | 289 | 288 | 288           | 285           |
| 11 Spd | 7                             | 8   | 6   | 6   | 6   | 8   | 5   | 3   | 9   | 9   | 12  | 13  | 12  | 12  | 12  | 14  | 12  | 13  | 13  | 16  | 15  | 16  | 10  | 7   | 10.0          | 16.3          |
| Dir    | 265                           | 276 | 266 | 250 | 258 | 273 | 256 | 232 | 273 | 263 | 268 | 274 | 279 | 278 | 279 | 281 | 272 | 270 | 270 | 271 | 274 | 283 | 289 | 319 | 274           | 271           |
| 12 Spd | 12                            | 12  | 13  | 14  | 10  | 11  | 13  | 12  | 10  | 4   | 7   | 14  | 14  | 13  | 13  | 13  | 14  | 13  | 11  | 13  | 13  | 10  | 10  | 13  | 11.5          | 14.2          |
| Dir    | 283                           | 277 | 287 | 290 | 301 | 304 | 306 | 308 | 318 | 308 | 305 | 308 | 309 | 300 | 291 | 286 | 296 | 304 | 292 | 306 | 305 | 296 | 304 | 309 | 299           | 308           |
| 13 Spd | 11                            | 12  | 12  | 10  | 7   | 9   | 8   | 3   | 3   | 9   | 10  | 12  | 10  | 12  | 8   | 6   | 4   | 1   | 2   | 2   | 2   | 1   | 1   | 1   | 5.9           | 12.4          |
| Dir    | 302                           | 286 | 282 | 277 | 283 | 282 | 275 | 273 | 269 | 276 | 277 | 279 | 292 | 292 | 300 | 295 | 324 | 313 | 135 | 136 | 153 | 154 | 192 | 202 | 284           | 282           |
| 14 Spd | 1                             | 1   | 1   | 1   | 2   | 1   | 1   | 2   | 0   | 1   | P   | P   | P   | P   | P   | 1   | 2   | 1   | 0   | 1   | 0   | 0   | 1   | 1   | 0.7           | 2.4           |
| Dir    | 202                           | 172 | 193 | 193 | 200 | 190 | 201 | 196 | 216 | 192 | P   | P   | P   | P   | P   | 296 | 342 | 162 | 114 | 197 | 159 | 128 | 173 | 180 | 200           | 342           |
| 15 Spd | 0                             | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2   | 2   | 1   | 1   | 1   | 3   | 4   | 1   | 1   | 2   | 1   | 1   | 1   | 0.4           | 3.8           |
| Dir    | 39                            | 166 | 208 | 195 | 222 | 222 | 150 | 90  | 332 | 173 | 300 | 347 | 349 | 358 | 224 | 267 | 287 | 292 | 273 | 178 | 157 | 204 | 179 | 204 | 283           | 292           |
| 16 Spd | 1                             | 2   | 2   | 2   | 0   | 1   | 0   | 1   | 2   | 2   | 2   | 2   | 1   | 2   | 2   | 3   | 0   | 0   | 0   | 0   | 0   | 1   | 0   | 0   | 1.0           | 2.9           |
| Dir    | 189                           | 197 | 183 | 184 | 355 | 177 | 188 | 185 | 172 | 191 | 178 | 174 | 194 | 201 | 236 | 250 | 165 | 336 | 29  | 221 | 179 | 183 | 193 | 175 | 195           | 250           |
| 17 Spd | 1                             | 1   | 1   | 0   | 0   | 1   | 1   | 1   | 1   | 2   | 1   | 2   | 3   | 3   | 2   | 0   | 2   | 2   | 1   | 1   | 2   | 2   | 1   | 2   | 1.3           | 3.3           |
| Dir    | 192                           | 189 | 201 | 226 | 180 | 198 | 204 | 202 | 197 | 201 | 184 | 180 | 179 | 182 | 174 | 231 | 182 | 200 | 167 | 196 | 178 | 182 | 166 | 192 | 187           | 179           |
| 18 Spd | 3                             | 3   | 3   | 2   | 3   | 5   | 14  | 18  | 20  | 25  | 18  | 13  | 11  | 19  | 21  | 22  | 22  | 19  | 17  | 20  | 13  | 13  | 5   | 5   | 12.0          | 24.8          |
| Dir    | 166                           | 166 | 162 | 177 | 194 | 257 | 277 | 277 | 273 | 269 | 265 | 255 | 262 | 275 | 277 | 280 | 280 | 282 | 275 | 276 | 267 | 266 | 215 | 177 | 268           | 269           |
| 19 Spd | 5                             | 5   | 5   | 5   | 5   | 4   | 6   | 16  | 19  | 19  | 23  | 23  | 22  | 21  | 15  | 10  | 11  | 13  | 12  | 16  | 15  | 16  | 13  | 9   | 11.3          | 23.2          |
| Dir    | 181                           | 189 | 191 | 181 | 168 | 184 | 193 | 247 | 250 | 259 | 270 | 275 | 281 | 282 | 286 | 289 | 287 | 286 | 276 | 272 | 276 | 276 | 267 | 250 | 264           | 270           |
| 20 Spd | 3                             | 2   | 1   | 1   | 3   | 2   | 2   | 2   | 1   | 1   | 0   | 1   | 1   | 1   | 1   | 1   | 0   | 1   | 0   | 2   | 3   | 3   | 3   | 2   | 1.2           | 3.3           |
| Dir    | 221                           | 184 | 150 | 131 | 157 | 177 | 207 | 208 | 167 | 194 | 282 | 279 | 29  | 307 | 187 | 179 | 167 | 188 | 163 | 171 | 193 | 188 | 167 | 228 | 188           | 221           |
| 21 Spd | 10                            | 4   | 8   | 3   | 3   | 4   | 12  | 18  | 24  | 24  | 15  | 8   | 12  | 10  | 8   | 10  | 12  | 14  | 12  | 8   | 8   | 6   | 4   | 4   | 9.4           | 24.1          |
| Dir    | 245                           | 229 | 243 | 207 | 160 | 154 | 236 | 242 | 249 | 251 | 248 | 227 | 232 | 228 | 218 | 227 | 231 | 232 | 228 | 222 | 218 | 209 | 191 | 190 | 233           | 251           |
| 22 Spd | 5                             | 7   | 4   | 2   | 0   | 1   | 1   | 1   | 1   | 2   | 0   | 1   | 1   | 2   | 3   | 3   | 5   | 3   | 4   | 3   | 4   | 3   | 5   | 3   | 1.3           | 7.4           |
| Dir    | 217                           | 239 | 257 | 247 | 350 | 175 | 155 | 155 | 185 | 181 | 207 | 191 | 302 | 337 | 299 | 314 | 330 | 346 | 343 | 338 | 354 | 358 | 355 | 350 | 304           | 239           |

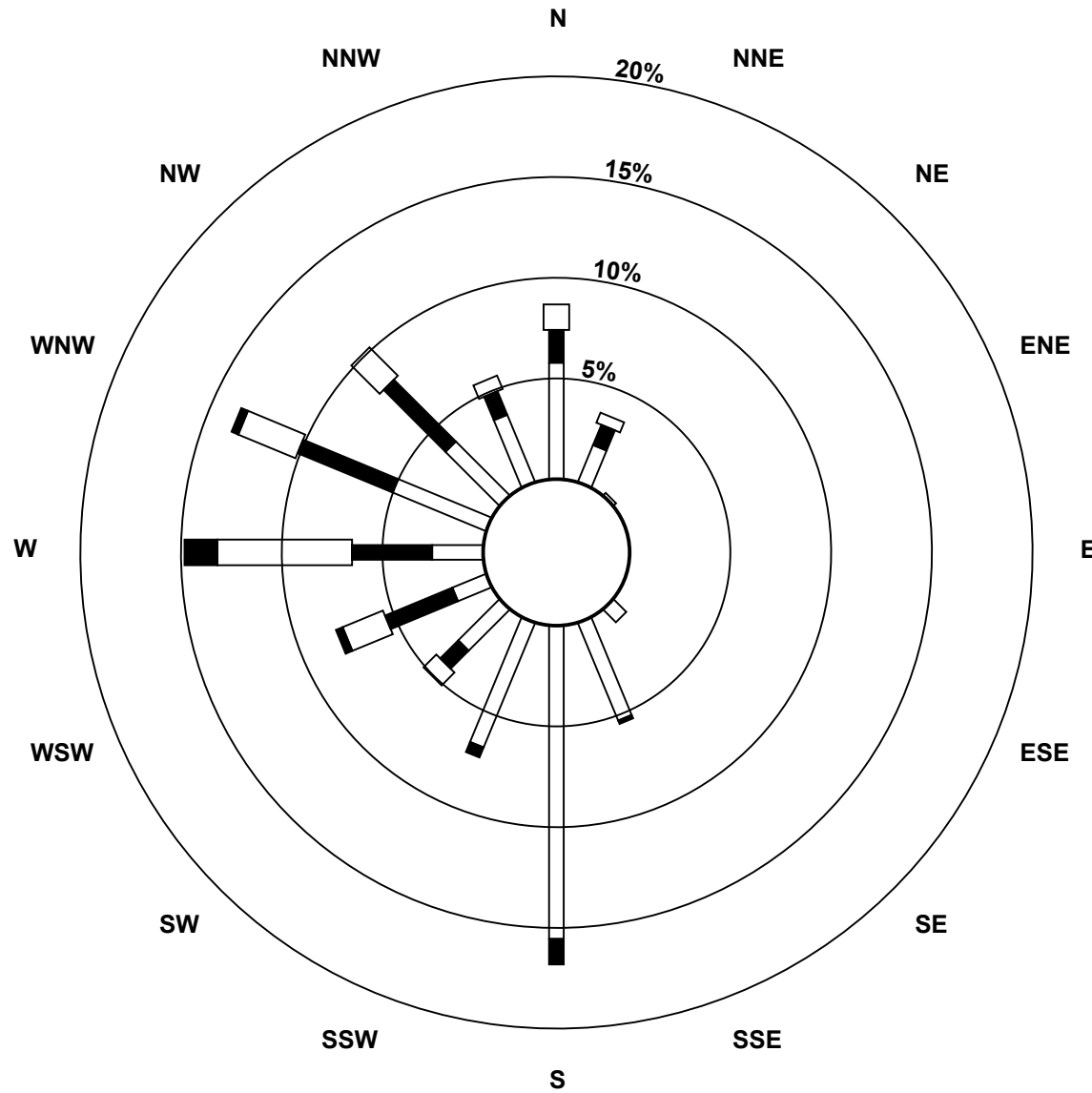
## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Valleyview - December 2016

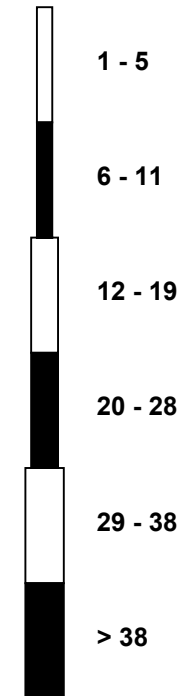
| Day                                                                                | Hourly Period Ending At (MST) |      |         |      |          |      |          |                                                                                                                                                                    |          |      |      |      |       |      |      |      |      |      |      |                                |      |      |      |      | Daily Average   | Daily Maximum |
|------------------------------------------------------------------------------------|-------------------------------|------|---------|------|----------|------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|------|------|-------|------|------|------|------|------|------|--------------------------------|------|------|------|------|-----------------|---------------|
|                                                                                    | 1                             | 2    | 3       | 4    | 5        | 6    | 7        | 8                                                                                                                                                                  | 9        | 10   | 11   | 12   | 13    | 14   | 15   | 16   | 17   | 18   | 19   | 20                             | 21   | 22   | 23   | 24   |                 |               |
| 23 Spd                                                                             | 1                             | 0    | 0       | 1    | 0        | 0    | 0        | 1                                                                                                                                                                  | 0        | 0    | 1    | 0    | 2     | 1    | 0    | 0    | 1    | 1    | 0    | 2                              | 0    | 1    | 0    | 1    | 0.5             | 2.5           |
| Dir                                                                                | 329                           | 290  | 185     | 1    | 318      | 174  | 166      | 5                                                                                                                                                                  | 326      | 20   | 357  | 5    | 10    | 344  | 189  | 242  | 345  | 344  | 2    | 7                              | 129  | 157  | 350  | 2    | 356             | 10            |
| 24 Spd                                                                             | 3                             | 2    | 5       | 6    | 10       | 9    | 7        | 8                                                                                                                                                                  | 7        | 8    | 8    | 6    | 4     | 6    | 6    | 6    | 5    | 3    | 5    | 1                              | 0    | 1    | 1    | 1    | 4.7             | 9.5           |
| Dir                                                                                | 8                             | 7    | 1       | 2    | 7        | 18   | 21       | 15                                                                                                                                                                 | 17       | 8    | 14   | 11   | 3     | 338  | 333  | 332  | 356  | 10   | 350  | 357                            | 28   | 343  | 336  | 263  | 3               | 7             |
| 25 Spd                                                                             | 0                             | 0    | 1       | 1    | 1        | 1    | 1        | 0                                                                                                                                                                  | 0        | 0    | 0    | 0    | 1     | 3    | 2    | 1    | 1    | 0    | 0    | 1                              | 3    | 4    | 4    | 4    | 0.5             | 4.0           |
| Dir                                                                                | 136                           | 180  | 223     | 152  | 184      | 266  | 174      | 329                                                                                                                                                                | 190      | 153  | 167  | 329  | 304   | 343  | 338  | 284  | 4    | 309  | 13   | 175                            | 174  | 178  | 171  | 173  | 192             | 178           |
| 26 Spd                                                                             | 4                             | 4    | 3       | 4    | 4        | 3    | 1        | 1                                                                                                                                                                  | 1        | 2    | 2    | 2    | 2     | 1    | 2    | 1    | 1    | 3    | 4    | 4                              | 4    | 7    | 7    | 5    | 2.8             | 6.6           |
| Dir                                                                                | 174                           | 172  | 179     | 173  | 176      | 177  | 185      | 193                                                                                                                                                                | 196      | 201  | 190  | 184  | 186   | 261  | 236  | 297  | 184  | 189  | 183  | 181                            | 189  | 173  | 174  | 177  | 182             | 174           |
| 27 Spd                                                                             | 2                             | 3    | 4       | 3    | 4        | 3    | 4        | 3                                                                                                                                                                  | 3        | 2    | 3    | 10   | 18    | 16   | 18   | 18   | 11   | 8    | 3    | 5                              | 6    | 9    | 20   | 15   | 7.0             | 20.1          |
| Dir                                                                                | 193                           | 185  | 177     | 179  | 170      | 179  | 182      | 177                                                                                                                                                                | 181      | 178  | 188  | 238  | 245   | 247  | 251  | 251  | 257  | 246  | 210  | 228                            | 229  | 254  | 267  | 259  | 240             | 267           |
| 28 Spd                                                                             | 12                            | 14   | 14      | 15   | 16       | 18   | 15       | 12                                                                                                                                                                 | 11       | 13   | 7    | 6    | 10    | 15   | 13   | 9    | 1    | 2    | 1    | 7                              | 5    | 2    | 3    | 2    | 8.6             | 17.9          |
| Dir                                                                                | 267                           | 280  | 282     | 279  | 276      | 278  | 273      | 264                                                                                                                                                                | 260      | 259  | 252  | 252  | 274   | 278  | 274  | 270  | 233  | 150  | 146  | 274                            | 258  | 143  | 154  | 155  | 269             | 278           |
| 29 Spd                                                                             | 2                             | 2    | 1       | 1    | 0        | 1    | 2        | 1                                                                                                                                                                  | 0        | 1    | 0    | 1    | 0     | 1    | 0    | 3    | 1    | 2    | 1    | 0                              | 1    | 0    | 1    | 0    | 0.1             | 2.9           |
| Dir                                                                                | 151                           | 155  | 139     | 161  | 195      | 193  | 197      | 192                                                                                                                                                                | 174      | 239  | 327  | 9    | 150   | 135  | 16   | 12   | 357  | 344  | 349  | 256                            | 143  | 262  | 103  | 335  | 158             | 12            |
| 30 Spd                                                                             | 1                             | 1    | 1       | 1    | 0        | 1    | 1        | 2                                                                                                                                                                  | 2        | 1    | 1    | 1    | 1     | 3    | 8    | 6    | 5    | 2    | 6    | 13                             | 7    | 6    | 9    | 9    | 2.9             | 13.3          |
| Dir                                                                                | 208                           | 166  | 182     | 174  | 175      | 192  | 187      | 163                                                                                                                                                                | 167      | 182  | 190  | 186  | 181   | 262  | 271  | 269  | 249  | 217  | 265  | 278                            | 314  | 264  | 271  | 297  | 265             | 278           |
| 31 Spd                                                                             | 12                            | 14   | 9       | 3    | 2        | 11   | 10       | 7                                                                                                                                                                  | 5        | 3    | 3    | 6    | 8     | 13   | 12   | 12   | 15   | 17   | 17   | 15                             | 11   | 8    | 8    | 9    | 8.0             | 17.5          |
| Dir                                                                                | 289                           | 281  | 287     | 280  | 293      | 321  | 307      | 292                                                                                                                                                                | 318      | 287  | 323  | 12   | 10    | 8    | 17   | 16   | 3    | 6    | 8    | 6                              | 2    | 346  | 350  | 332  | 343             | 6             |
| Spd                                                                                | 2.6                           | 2.8  | 2.7     | 2.1  | 1.7      | 2.3  | 2.9      | 3.3                                                                                                                                                                | 3.6      | 3.8  | 3.3  | 3.5  | 4.2   | 5.2  | 5.1  | 4.7  | 4.3  | 3.6  | 3.0  | 3.9                            | 3.1  | 3.1  | 2.6  | 2.5  | Diurnal Average |               |
| Dir                                                                                | 262                           | 265  | 270     | 267  | 271      | 269  | 264      | 263                                                                                                                                                                | 266      | 269  | 275  | 282  | 288   | 290  | 287  | 290  | 292  | 291  | 285  | 280                            | 275  | 269  | 272  | 275  | Diurnal Maximum |               |
| Spd                                                                                | 11.9                          | 14.5 | 14.1    | 15.4 | 16.5     | 17.9 | 15.4     | 17.9                                                                                                                                                               | 23.6     | 24.8 | 23.2 | 23.1 | 21.7  | 20.5 | 21.4 | 21.7 | 22.3 | 18.8 | 17.4 | 20.3                           | 15.1 | 16.3 | 20.1 | 14.7 | Diurnal Maximum |               |
| Dir                                                                                | 319                           | 322  | 326     | 279  | 276      | 278  | 273      | 242                                                                                                                                                                | 249      | 269  | 270  | 275  | 281   | 282  | 277  | 280  | 280  | 282  | 8    | 276                            | 276  | 283  | 267  | 259  |                 |               |
| Maximum Speed Value: 25 km/h on Dec 18 10:00                                       |                               |      |         |      |          |      |          | Minimum Speed Value: 0 km/h on Dec 9 23:00                                                                                                                         |          |      |      |      |       |      |      |      |      |      |      | Hours in Service: 744          |      |      |      |      |                 |               |
| Maximum Daily Speed Average: 12.0 km/h on Dec 18                                   |                               |      |         |      |          |      |          | Minimum Daily Speed Average: 0.1 km/h on Dec 23                                                                                                                    |          |      |      |      |       |      |      |      |      |      |      | Hours of Data: 739             |      |      |      |      |                 |               |
| Maximum Diurnal Speed Average: 5.2 km/h at hour 14                                 |                               |      |         |      |          |      |          | Minimum Diurnal Speed Average: 1.7 km/h at hour 5                                                                                                                  |          |      |      |      |       |      |      |      |      |      |      | Hours of Missing Data: 5       |      |      |      |      |                 |               |
| Monthly Average Velocity: 3.27 km/h 277.5 deg                                      |                               |      |         |      |          |      |          | Speed Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 1.0 Median = 2.9 Q <sub>3</sub> = 7.7 P <sub>90</sub> = 12.7 P <sub>99</sub> = 21.1 |          |      |      |      |       |      |      |      |      |      |      | Percent Operational Time: 99.3 |      |      |      |      |                 |               |
| All monthly, daily, and diurnal averages have been calculated using vector methods |                               |      |         |      |          |      |          |                                                                                                                                                                    |          |      |      |      |       |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| P - Power Failure                                                                  |                               |      |         |      |          |      |          |                                                                                                                                                                    |          |      |      |      |       |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| Frequency Distribution                                                             |                               |      |         |      |          |      |          |                                                                                                                                                                    |          |      |      |      |       |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| Speed Range (km/h)                                                                 |                               |      |         |      |          |      |          |                                                                                                                                                                    |          |      |      |      |       |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| Direction                                                                          | 0 to 5                        |      | 5 to 11 |      | 11 to 19 |      | 19 to 28 |                                                                                                                                                                    | 28 to 38 |      | > 38 |      | Total |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| North                                                                              | 78                            |      | 20      |      | 11       |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 109   |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| NorthEast                                                                          | 16                            |      | 0       |      | 0        |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 16    |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| East                                                                               | 4                             |      | 0       |      | 0        |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 4     |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| SouthEast                                                                          | 38                            |      | 0       |      | 0        |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 38    |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| South                                                                              | 186                           |      | 14      |      | 0        |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 200   |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| SouthWest                                                                          | 58                            |      | 16      |      | 10       |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 84    |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| West                                                                               | 44                            |      | 57      |      | 60       |      | 15       |                                                                                                                                                                    | 0        |      | 0    |      | 176   |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| NorthWest                                                                          | 50                            |      | 43      |      | 19       |      | 0        |                                                                                                                                                                    | 0        |      | 0    |      | 112   |      |      |      |      |      |      |                                |      |      |      |      |                 |               |
| Total                                                                              | 474                           |      | 150     |      | 100      |      | 15       |                                                                                                                                                                    | 0        |      | 0    |      | 739   |      |      |      |      |      |      |                                |      |      |      |      |                 |               |

## Wind Rose

Wind Speed (WS) (km/h)  
Valleyview - December 2016



Wind Speed Classes (km/h)





## Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

Valleyview - December 2016

| Maximum Speed: 25 km/h on Dec 18 10:00                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Speed Average: 13.3 km/h on Dec 18                                                                                                             |    |    |    |    |                 |               |     |  |  | Hours in Service: 744          |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|-----|--|--|--------------------------------|--|
| Minimum Speed: 0 km/h on Dec 9 23:00                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Speed Average: 0.9 km/h on Dec 23                                                                                                              |    |    |    |    |                 |               |     |  |  | Hours of Data: 739             |  |
| Maximum Diurnal Speed Average: 7.2 km/h at hour 14                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Speed Average: 3.6 km/h at hour 5                                                                                                            |    |    |    |    |                 |               |     |  |  | Hours of Missing Data: 5       |  |
| Monthly Average Speed: 5.18 km/h                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 1.2 Median = 3.1 Q <sub>3</sub> = 7.9 P <sub>90</sub> = 13.1 P <sub>99</sub> = 21.3 |    |    |    |    |                 |               |     |  |  | Percent Operational Time: 99.3 |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Daily Average   | Daily Maximum |     |  |  |                                |  |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                           | 21 | 22 | 23 | 24 |                 |               |     |  |  |                                |  |
| 1-Dec                                                                                                                   | 5                             | 4  | 3  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 5  | 3  | 1  | 1  | 1  | 0                                                                                                                                                            | 1  | 1  | 1  | 0  | 1.8             | 5.0           |     |  |  |                                |  |
| 2-Dec                                                                                                                   | 1                             | 1  | 1  | 0  | 1  | 1  | 2  | 1  | 1  | 4  | 6  | 6  | 6  | 5  | 5  | 6  | 5  | 3  | 3  | 2                                                                                                                                                            | 3  | 3  | 3  | 3  | 3               | 3.0           | 6.4 |  |  |                                |  |
| 3-Dec                                                                                                                   | 3                             | 1  | 2  | 2  | 2  | 4  | 4  | 4  | 4  | 3  | 3  | 4  | 8  | 13 | 9  | 8  | 16 | 10 | 8  | 12                                                                                                                                                           | 10 | 9  | 5  | 6  | 6.3             | 15.8          |     |  |  |                                |  |
| 4-Dec                                                                                                                   | 3                             | 1  | 1  | 2  | 2  | 5  | 8  | 9  | 11 | 14 | 13 | 14 | 14 | 10 | 10 | 14 | 13 | 16 | 10 | 11                                                                                                                                                           | 12 | 10 | 9  | 10 | 9.2             | 15.7          |     |  |  |                                |  |
| 5-Dec                                                                                                                   | 12                            | 15 | 14 | 11 | 10 | 9  | 9  | 7  | 6  | 7  | 7  | 5  | 9  | 10 | 7  | 7  | 5  | 4  | 4  | 3                                                                                                                                                            | 4  | 5  | 5  | 5  | 7.5             | 14.7          |     |  |  |                                |  |
| 6-Dec                                                                                                                   | 5                             | 6  | 5  | 5  | 6  | 4  | 3  | 5  | 5  | 5  | 6  | 6  | 8  | 7  | 6  | 5  | 3  | 2  | 0  | 1                                                                                                                                                            | 1  | 1  | 2  | 2  | 4.2             | 7.8           |     |  |  |                                |  |
| 7-Dec                                                                                                                   | 3                             | 3  | 4  | 3  | 2  | 3  | 3  | 2  | 2  | 2  | 3  | 4  | 4  | 4  | 6  | 5  | 4  | 2  | 2  | 4                                                                                                                                                            | 3  | 3  | 3  | 3  | 3.3             | 6.2           |     |  |  |                                |  |
| 8-Dec                                                                                                                   | 3                             | 2  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 3  | 2  | 2  | 2  | 1                                                                                                                                                            | 1  | 0  | 0  | 0  | 1.3             | 2.9           |     |  |  |                                |  |
| 9-Dec                                                                                                                   | 0                             | 1  | 1  | 1  | 2  | 10 | 9  | 10 | 8  | 1  | 0  | 1  | 1  | 3  | 4  | 2  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 0  | 0  | 0  | 2.4             | 10.0          |     |  |  |                                |  |
| 10-Dec                                                                                                                  | 0                             | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 1  | 1  | 3  | 5  | 4  | 5  | 5  | 6  | 6  | 5  | 4                                                                                                                                                            | 4  | 4  | 5  | 6  | 2.9             | 6.4           |     |  |  |                                |  |
| 11-Dec                                                                                                                  | 7                             | 8  | 6  | 6  | 6  | 9  | 5  | 3  | 9  | 9  | 12 | 14 | 12 | 12 | 13 | 14 | 12 | 13 | 14 | 16                                                                                                                                                           | 15 | 16 | 12 | 12 | 10.7            | 16.5          |     |  |  |                                |  |
| 12-Dec                                                                                                                  | 12                            | 13 | 13 | 14 | 10 | 11 | 13 | 12 | 10 | 4  | 8  | 14 | 14 | 13 | 14 | 13 | 14 | 13 | 11 | 14                                                                                                                                                           | 13 | 10 | 11 | 13 | 11.8            | 14.4          |     |  |  |                                |  |
| 13-Dec                                                                                                                  | 12                            | 12 | 13 | 10 | 8  | 9  | 8  | 3  | 4  | 9  | 10 | 12 | 10 | 12 | 8  | 6  | 4  | 2  | 2  | 2                                                                                                                                                            | 2  | 1  | 1  | 1  | 6.8             | 12.5          |     |  |  |                                |  |
| 14-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 2  | 1  | 1  | 2  | 1  | 1  | P  | P  | P  | P  | P  | 1  | 2  | 1  | 0  | 1                                                                                                                                                            | 1  | 0  | 1  | 1  | 1.1             | 2.4           |     |  |  |                                |  |
| 15-Dec                                                                                                                  | 0                             | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 2  | 2  | 1  | 1  | 1  | 3  | 4  | 2  | 1                                                                                                                                                            | 2  | 1  | 1  | 1  | 1.1             | 3.8           |     |  |  |                                |  |
| 16-Dec                                                                                                                  | 1                             | 2  | 2  | 2  | 1  | 1  | 0  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 3  | 3  | 0  | 1  | 0  | 0                                                                                                                                                            | 0  | 1  | 0  | 0  | 1.3             | 2.9           |     |  |  |                                |  |
| 17-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 2  | 3  | 3  | 2  | 1  | 2  | 2  | 2  | 1                                                                                                                                                            | 2  | 2  | 1  | 2  | 1.4             | 3.4           |     |  |  |                                |  |
| 18-Dec                                                                                                                  | 3                             | 3  | 3  | 2  | 3  | 6  | 14 | 18 | 20 | 25 | 19 | 13 | 11 | 19 | 22 | 22 | 23 | 19 | 17 | 21                                                                                                                                                           | 14 | 13 | 6  | 5  | 13.3            | 25.1          |     |  |  |                                |  |
| 19-Dec                                                                                                                  | 5                             | 6  | 6  | 5  | 5  | 4  | 6  | 16 | 19 | 19 | 23 | 23 | 22 | 21 | 16 | 11 | 11 | 14 | 12 | 17                                                                                                                                                           | 15 | 16 | 13 | 9  | 13.1            | 23.5          |     |  |  |                                |  |
| 20-Dec                                                                                                                  | 4                             | 2  | 2  | 2  | 3  | 3  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 2                                                                                                                                                            | 3  | 3  | 3  | 3  | 1.8             | 3.6           |     |  |  |                                |  |
| 21-Dec                                                                                                                  | 10                            | 4  | 8  | 5  | 3  | 4  | 12 | 18 | 24 | 24 | 15 | 8  | 12 | 10 | 8  | 10 | 12 | 14 | 12 | 8                                                                                                                                                            | 8  | 6  | 4  | 4  | 10.1            | 24.3          |     |  |  |                                |  |
| 22-Dec                                                                                                                  | 5                             | 7  | 4  | 2  | 1  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 2  | 3  | 3  | 5  | 3  | 4  | 3                                                                                                                                                            | 4  | 3  | 5  | 3  | 2.8             | 7.5           |     |  |  |                                |  |
| 23-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 1  | 1  | 3  | 1  | 0  | 0  | 1  | 1  | 0  | 2                                                                                                                                                            | 1  | 1  | 1  | 1  | 0.9             | 2.6           |     |  |  |                                |  |
| 24-Dec                                                                                                                  | 3                             | 2  | 5  | 6  | 10 | 9  | 7  | 8  | 7  | 8  | 8  | 6  | 5  | 6  | 6  | 6  | 5  | 3  | 5  | 1                                                                                                                                                            | 0  | 1  | 1  | 1  | 5.0             | 9.6           |     |  |  |                                |  |
| 25-Dec                                                                                                                  | 0                             | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 0  | 0  | 1  | 1  | 3  | 2  | 1  | 1  | 1  | 0  | 1                                                                                                                                                            | 3  | 4  | 4  | 4  | 1.2             | 4.1           |     |  |  |                                |  |
| 26-Dec                                                                                                                  | 4                             | 4  | 3  | 4  | 4  | 3  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 1  | 3  | 2  | 1  | 3  | 4  | 5                                                                                                                                                            | 4  | 7  | 7  | 5  | 3.1             | 6.6           |     |  |  |                                |  |
| 27-Dec                                                                                                                  | 2                             | 3  | 4  | 3  | 4  | 3  | 4  | 3  | 3  | 3  | 3  | 10 | 18 | 16 | 19 | 18 | 11 | 8  | 3  | 5                                                                                                                                                            | 6  | 9  | 20 | 15 | 8.0             | 20.4          |     |  |  |                                |  |
| 28-Dec                                                                                                                  | 12                            | 14 | 14 | 16 | 17 | 18 | 16 | 13 | 11 | 13 | 8  | 6  | 10 | 15 | 14 | 9  | 1  | 2  | 1  | 7                                                                                                                                                            | 5  | 2  | 3  | 3  | 9.5             | 18.1          |     |  |  |                                |  |
| 29-Dec                                                                                                                  | 2                             | 2  | 1  | 1  | 1  | 1  | 2  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 1  | 3  | 2  | 2  | 1  | 0                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.2             | 3.2           |     |  |  |                                |  |
| 30-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 0  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 3  | 8  | 6  | 5  | 2  | 6  | 13                                                                                                                                                           | 7  | 6  | 10 | 9  | 3.7             | 13.4          |     |  |  |                                |  |
| 31-Dec                                                                                                                  | 12                            | 15 | 9  | 4  | 4  | 11 | 11 | 7  | 6  | 3  | 3  | 6  | 8  | 13 | 12 | 13 | 15 | 18 | 18 | 15                                                                                                                                                           | 11 | 8  | 8  | 9  | 9.9             | 17.6          |     |  |  |                                |  |
| 4.3 4.3 4.3 3.7 3.6 4.4 4.8 5.0 5.3 5.4 5.3 5.7 6.6 7.2 7.1 6.6 6.0 5.5 4.9 5.6 5.0 4.8 4.6 4.5                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Average |               |     |  |  |                                |  |
| 12.1 14.7 14.2 15.6 16.6 18.1 15.5 18.3 23.7 25.1 23.5 23.3 21.9 20.7 21.6 21.9 22.6 19.1 17.6 20.6 15.3 16.5 20.4 14.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Maximum |               |     |  |  |                                |  |
| P - Power Failure                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                 |               |     |  |  |                                |  |
| All monthly, daily, and diurnal averages have been calculated using scalar methods                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                 |               |     |  |  |                                |  |

# Hourly Standard Deviations

Wind Direction (WD) - deg  
Valleyview - December 2016

| Maximum Value: 96.4 deg on Dec 25 08:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |    |    |    |    |    |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|----|----|----|----|----|---------------|
| Minimum Value: 5.2 deg on Dec 16 03:00                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 739             |    |    |    |    |    |               |
|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 5       |    |    |    |    |    |               |
| Percentiles: P <sub>1</sub> = 6.1 P <sub>10</sub> = 8.0 Q <sub>1</sub> = 9.9 Median = 14.9 Q <sub>3</sub> = 33.4 P <sub>90</sub> = 67.8 P <sub>99</sub> = 90.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0        |    |    |    |    |    |               |
|                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.3 |    |    |    |    |    |               |
| Day                                                                                                                                                            | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    | Daily Maximum |
|                                                                                                                                                                | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                             | 20 | 21 | 22 | 23 | 24 |               |
| 1-Dec                                                                                                                                                          | 9                             | 7  | 8  | 9  | 10 | 22 | 12 | 20 | 35 | 45 | 25 | 29 | 62 | 68 | 17 | 16 | 62 | 13 | 12                             | 22 | 29 | 56 | 69 | 67 | 68.8          |
| 2-Dec                                                                                                                                                          | 63                            | 91 | 70 | 52 | 84 | 52 | 45 | 51 | 23 | 9  | 8  | 9  | 11 | 17 | 8  | 6  | 7  | 16 | 12                             | 20 | 8  | 12 | 12 | 8  | 90.9          |
| 3-Dec                                                                                                                                                          | 7                             | 40 | 74 | 54 | 21 | 13 | 10 | 17 | 17 | 20 | 13 | 31 | 34 | 12 | 12 | 15 | 11 | 10 | 16                             | 6  | 7  | 7  | 10 | 9  | 73.9          |
| 4-Dec                                                                                                                                                          | 23                            | 10 | 8  | 9  | 19 | 19 | 11 | 15 | 9  | 29 | 9  | 9  | 8  | 11 | 9  | 18 | 11 | 6  | 12                             | 9  | 8  | 7  | 10 | 9  | 28.6          |
| 5-Dec                                                                                                                                                          | 9                             | 8  | 8  | 11 | 11 | 10 | 8  | 9  | 9  | 9  | 11 | 15 | 11 | 11 | 14 | 11 | 10 | 13 | 14                             | 14 | 14 | 10 | 15 | 8  | 14.9          |
| 6-Dec                                                                                                                                                          | 9                             | 9  | 12 | 14 | 11 | 9  | 12 | 11 | 12 | 13 | 13 | 12 | 12 | 12 | 12 | 13 | 15 | 16 | 35                             | 13 | 22 | 25 | 41 | 77 | 76.6          |
| 7-Dec                                                                                                                                                          | 22                            | 24 | 16 | 19 | 24 | 23 | 15 | 18 | 32 | 14 | 25 | 10 | 7  | 9  | 6  | 10 | 12 | 18 | 22                             | 9  | 11 | 19 | 12 | 12 | 32.4          |
| 8-Dec                                                                                                                                                          | 17                            | 35 | 42 | 36 | 13 | 65 | 70 | 25 | 50 | 40 | 46 | 27 | 43 | 15 | 25 | 16 | 8  | 16 | 7                              | 76 | 69 | 59 | 71 | 91 | 90.8          |
| 9-Dec                                                                                                                                                          | 87                            | 75 | 86 | 87 | 70 | 47 | 85 | 64 | 91 | 52 | 74 | 32 | 20 | 15 | 6  | 14 | 51 | 81 | 83                             | 68 | 34 | 67 | 73 | 54 | 91.1          |
| 10-Dec                                                                                                                                                         | 59                            | 54 | 36 | 20 | 24 | 19 | 74 | 51 | 19 | 15 | 51 | 20 | 23 | 16 | 21 | 31 | 13 | 14 | 18                             | 18 | 14 | 15 | 18 | 16 | 74.3          |
| 11-Dec                                                                                                                                                         | 15                            | 11 | 16 | 12 | 17 | 15 | 12 | 23 | 15 | 13 | 11 | 9  | 13 | 11 | 9  | 9  | 10 | 8  | 11                             | 7  | 11 | 9  | 47 | 57 | 56.6          |
| 12-Dec                                                                                                                                                         | 9                             | 8  | 9  | 8  | 11 | 9  | 10 | 8  | 8  | 14 | 13 | 10 | 10 | 12 | 12 | 10 | 10 | 10 | 12                             | 10 | 9  | 12 | 10 | 9  | 13.8          |
| 13-Dec                                                                                                                                                         | 11                            | 10 | 7  | 11 | 12 | 12 | 12 | 68 | 65 | 9  | 9  | 9  | 9  | 10 | 11 | 12 | 17 | 75 | 15                             | 30 | 16 | 27 | 45 | 18 | 74.7          |
| 14-Dec                                                                                                                                                         | 12                            | 24 | 12 | 18 | 8  | 10 | 10 | 7  | 70 | 20 | P  | P  | P  | P  | P  | 37 | 39 | 20 | 64                             | 53 | 79 | 92 | 17 | 16 | 92.2          |
| 15-Dec                                                                                                                                                         | 64                            | 70 | 54 | 19 | 90 | 55 | 75 | 91 | 94 | 88 | 55 | 20 | 18 | 19 | 79 | 24 | 16 | 6  | 77                             | 19 | 13 | 29 | 17 | 20 | 94.1          |
| 16-Dec                                                                                                                                                         | 25                            | 18 | 5  | 6  | 89 | 19 | 48 | 20 | 12 | 10 | 9  | 17 | 31 | 35 | 37 | 14 | 40 | 58 | 72                             | 91 | 39 | 20 | 70 | 35 | 90.5          |
| 17-Dec                                                                                                                                                         | 19                            | 19 | 13 | 37 | 24 | 15 | 14 | 13 | 10 | 11 | 18 | 17 | 10 | 10 | 21 | 66 | 29 | 43 | 53                             | 73 | 36 | 19 | 69 | 19 | 73.1          |
| 18-Dec                                                                                                                                                         | 13                            | 12 | 11 | 19 | 16 | 37 | 10 | 10 | 8  | 9  | 9  | 8  | 10 | 10 | 8  | 8  | 8  | 9  | 13                             | 10 | 15 | 11 | 27 | 7  | 37.2          |
| 19-Dec                                                                                                                                                         | 10                            | 10 | 9  | 10 | 9  | 13 | 14 | 18 | 6  | 9  | 9  | 9  | 8  | 8  | 9  | 10 | 13 | 10 | 10                             | 7  | 9  | 8  | 10 | 13 | 18.3          |
| 20-Dec                                                                                                                                                         | 22                            | 15 | 26 | 23 | 18 | 16 | 15 | 37 | 26 | 44 | 94 | 80 | 74 | 39 | 47 | 12 | 62 | 27 | 80                             | 19 | 8  | 8  | 23 | 40 | 93.8          |
| 21-Dec                                                                                                                                                         | 10                            | 23 | 19 | 44 | 12 | 14 | 29 | 16 | 6  | 6  | 10 | 12 | 10 | 12 | 15 | 13 | 13 | 12 | 14                             | 15 | 13 | 13 | 13 | 14 | 44.4          |
| 22-Dec                                                                                                                                                         | 18                            | 12 | 22 | 38 | 86 | 30 | 11 | 48 | 46 | 12 | 82 | 11 | 65 | 25 | 17 | 21 | 15 | 24 | 6                              | 20 | 10 | 11 | 9  | 14 | 85.9          |
| 23-Dec                                                                                                                                                         | 26                            | 82 | 46 | 85 | 82 | 80 | 85 | 53 | 71 | 71 | 47 | 51 | 21 | 32 | 79 | 73 | 31 | 8  | 74                             | 64 | 60 | 18 | 86 | 13 | 85.8          |
| 24-Dec                                                                                                                                                         | 7                             | 17 | 6  | 8  | 7  | 10 | 12 | 10 | 14 | 9  | 10 | 11 | 13 | 8  | 7  | 6  | 11 | 15 | 10                             | 43 | 26 | 22 | 27 | 60 | 60.4          |
| 25-Dec                                                                                                                                                         | 70                            | 19 | 30 | 28 | 32 | 48 | 62 | 96 | 70 | 62 | 76 | 36 | 36 | 13 | 49 | 58 | 19 | 79 | 80                             | 79 | 10 | 8  | 7  | 7  | 96.4          |
| 26-Dec                                                                                                                                                         | 7                             | 8  | 7  | 8  | 8  | 9  | 13 | 50 | 41 | 12 | 12 | 16 | 32 | 66 | 38 | 90 | 24 | 10 | 7                              | 9  | 17 | 8  | 7  | 8  | 90.0          |
| 27-Dec                                                                                                                                                         | 27                            | 15 | 7  | 7  | 14 | 14 | 10 | 10 | 55 | 29 | 10 | 12 | 6  | 7  | 7  | 8  | 9  | 13 | 12                             | 15 | 14 | 17 | 9  | 10 | 55.4          |
| 28-Dec                                                                                                                                                         | 9                             | 12 | 8  | 9  | 8  | 8  | 8  | 10 | 9  | 8  | 10 | 16 | 12 | 9  | 10 | 11 | 36 | 15 | 58                             | 18 | 25 | 36 | 31 | 49 | 57.6          |
| 29-Dec                                                                                                                                                         | 47                            | 33 | 54 | 77 | 78 | 26 | 8  | 20 | 76 | 24 | 57 | 55 | 44 | 40 | 92 | 27 | 76 | 10 | 12                             | 52 | 27 | 62 | 52 | 84 | 91.8          |
| 30-Dec                                                                                                                                                         | 20                            | 17 | 12 | 13 | 66 | 16 | 12 | 8  | 8  | 19 | 6  | 12 | 19 | 35 | 10 | 10 | 8  | 12 | 26                             | 9  | 17 | 21 | 16 | 11 | 66.4          |
| 31-Dec                                                                                                                                                         | 12                            | 7  | 11 | 54 | 65 | 12 | 11 | 12 | 17 | 25 | 22 | 16 | 12 | 7  | 9  | 13 | 7  | 7  | 9                              | 7  | 6  | 11 | 9  | 9  | 65.0          |
| 86.7 90.9 85.8 87.4 90.0 79.9 85.2 96.4 94.1 88.2 93.8 79.6 73.8 67.9 91.8 90.0 76.1 81.0 83.3 90.5 79.3 92.2 85.8 90.8                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |               |
| P - Power Failure                                                                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |               |

# PAZA

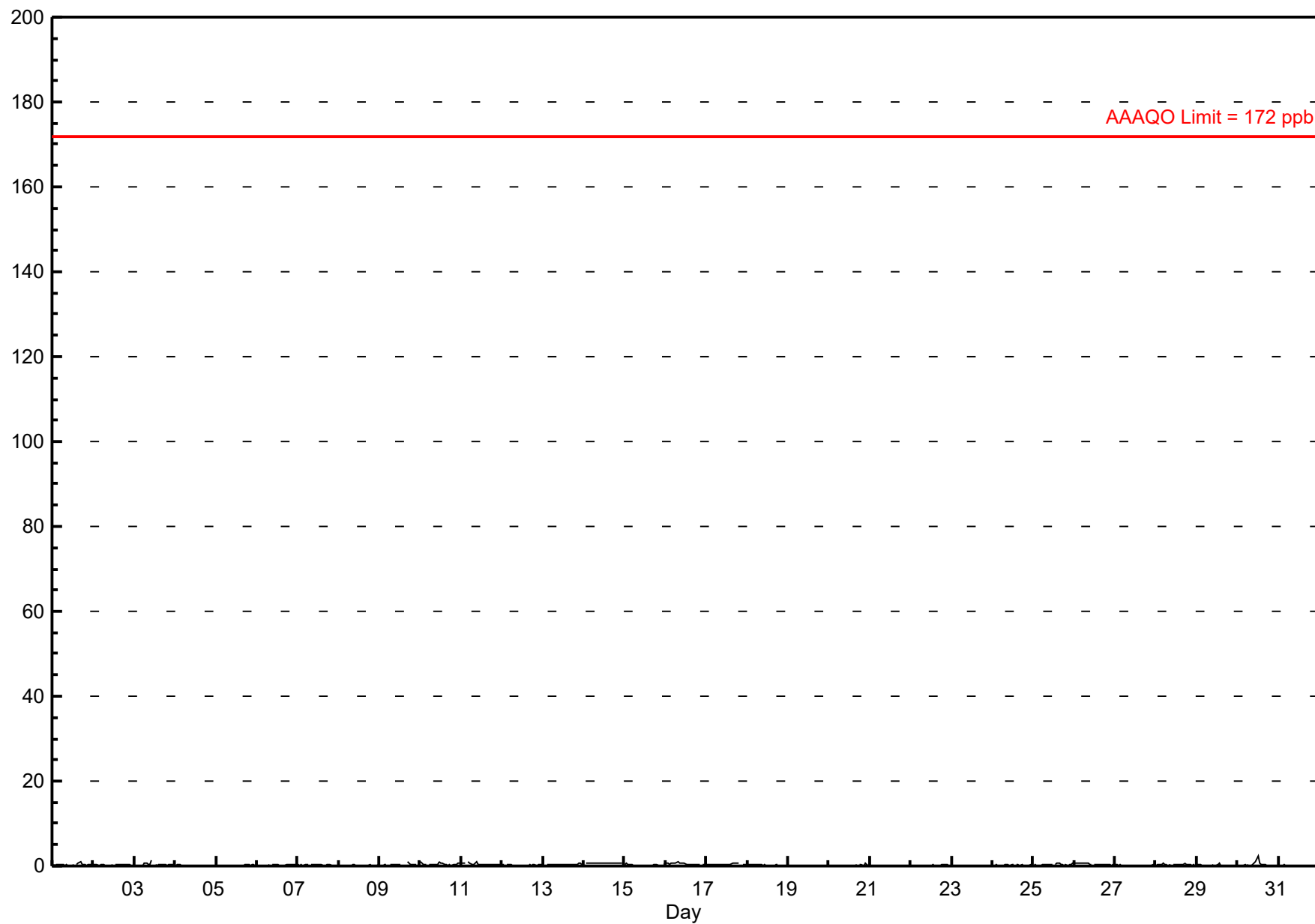
## Donnelly Station

### Monthly Summary Tables, Graphs and Roses

[illegible]

## Hourly Averages

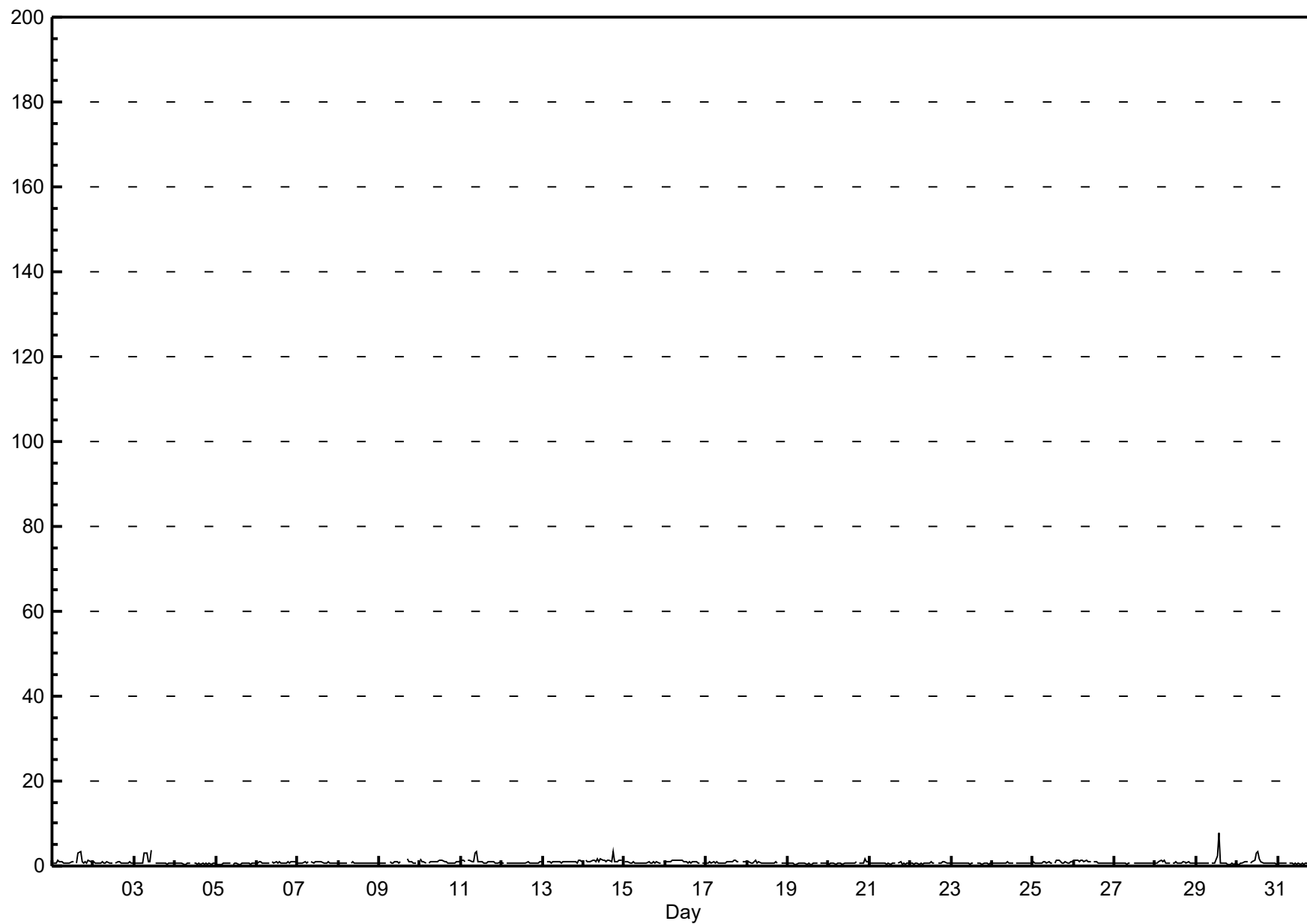
**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Donnelly - December 2016**



| Maximum Value: 7.7 ppb on Dec 29 14:00                                                          |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 1.3 ppb on Dec 14                                                                                                                   |    |    |    |                 |               |               |  | Hours in Service: 744          |  |  |  |
|-------------------------------------------------------------------------------------------------|-------------------------------|---|---|---------------|---|---|---|-------------------------------|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----------------|---------------|---------------|--|--------------------------------|--|--|--|
| Minimum Value: 0 ppb on Dec 31 23:00                                                            |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.6 ppb on Dec 31                                                                                                                   |    |    |    |                 |               |               |  | Hours of Data: 707             |  |  |  |
| Maximum Diurnal Average: 1.0 ppb at hour 14                                                     |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.7 ppb at hour 21                                                                                                                |    |    |    |                 |               |               |  | Hours of Missing Data: 37      |  |  |  |
| Monthly Average: 0.83 ppb                                                                       |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.7 Q <sub>3</sub> = 0.9 P <sub>90</sub> = 1.1 P <sub>99</sub> = 3.1 |    |    |    |                 |               |               |  | Hours of Calibration: 35       |  |  |  |
|                                                                                                 |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |                 |               |               |  | Percent Operational Time: 99.7 |  |  |  |
| Day                                                                                             | Hourly Period Ending At (MST) |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |                 | Daily Average | Daily Maximum |  |                                |  |  |  |
|                                                                                                 | 1                             | 2 | 3 | 4             | 5 | 6 | 7 | 8                             | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24              |               |               |  |                                |  |  |  |
| 1-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | A  | 1  | 3  | 3  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 1.1           | 3.4           |  |                                |  |  |  |
| 2-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 1.1           |  |                                |  |  |  |
| 3-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 1 | 3 | 3                             | 1 | 1  | 4  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0                                                                                                                                                          | 1  | 1  | 1  | 1               | 1.0           | 3.8           |  |                                |  |  |  |
| 4-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 0 | 0 | 1                             | 1 | 1  | A  | 1  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 0                                                                                                                                                          | 1  | 0  | 1  | 1               | 0.6           | 0.8           |  |                                |  |  |  |
| 5-Dec                                                                                           | 0                             | 0 | 0 | 0             | 1 | 1 | 1 | 1                             | 1 | 1  | A  | 1  | 1  | 1  | 0  | 0  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.6           | 0.8           |  |                                |  |  |  |
| 6-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | A | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 0.9           |  |                                |  |  |  |
| 7-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | A                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.8           | 1.1           |  |                                |  |  |  |
| 8-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | 1 | A | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 0.9           |  |                                |  |  |  |
| 9-Dec                                                                                           | 1                             | 1 | 1 | 1             | 1 | A | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | C  | C  | C  | 2  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | N  | N               | 0.9           | 1.6           |  |                                |  |  |  |
| 10-Dec                                                                                          | 2                             | 1 | 1 | 1             | A | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 1.0           | 1.8           |  |                                |  |  |  |
| 11-Dec                                                                                          | 1                             | 1 | 1 | A             | 1 | 1 | 1 | 1                             | 3 | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 1.2           | 3.5           |  |                                |  |  |  |
| 12-Dec                                                                                          | 1                             | 1 | A | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 0.9           |  |                                |  |  |  |
| 13-Dec                                                                                          | 1                             | A | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 1.0           | 1.4           |  |                                |  |  |  |
| 14-Dec                                                                                          | A                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 2 | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 4  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | A               | 1.3           | 3.5           |  |                                |  |  |  |
| 15-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | A  | 1               | 0.8           | 1.1           |  |                                |  |  |  |
| 16-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | A  | 1  | 1               | 1.0           | 1.4           |  |                                |  |  |  |
| 17-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | A  | 1  | 1  | 1               | 0.9           | 1.4           |  |                                |  |  |  |
| 18-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.8           | 1.3           |  |                                |  |  |  |
| 19-Dec                                                                                          | 1                             | 1 | 1 | 1             | 0 | 0 | 1 | 1                             | 1 | 1  | 1  | 0  | 1  | 0  | 0  | 1  | 1  | 1  | A  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.6           | 0.8           |  |                                |  |  |  |
| 20-Dec                                                                                          | 1                             | 1 | 1 | 1             | 0 | 1 | 1 | 1                             | 0 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1                                                                                                                                                          | 1  | 2  | 1  | 1               | 0.7           | 1.8           |  |                                |  |  |  |
| 21-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 0  | 1  | 0  | 1  | 1  | 1  | A  | 1  | 1  | 0                                                                                                                                                          | 1  | 0  | 1  | 1               | 0.6           | 1.0           |  |                                |  |  |  |
| 22-Dec                                                                                          | 1                             | 1 | 0 | 1             | 1 | 1 | 1 | 0                             | 1 | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 0.9           |  |                                |  |  |  |
| 23-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 0  | 1  | 1  | A  | 1  | 1  | 1  | 0  | 1                                                                                                                                                          | 1  | 1  | 0  | 1               | 0.6           | 0.8           |  |                                |  |  |  |
| 24-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 0.9           |  |                                |  |  |  |
| 25-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.9           | 1.2           |  |                                |  |  |  |
| 26-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 1.0           | 1.4           |  |                                |  |  |  |
| 27-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 0                             | 1 | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.7           | 0.8           |  |                                |  |  |  |
| 28-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1               | 0.9           | 1.3           |  |                                |  |  |  |
| 29-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | 1 | 1                             | A | 1  | 1  | 1  | 2  | 8  | 1  | 1  | 1  | 1  | 0  | 0                                                                                                                                                          | 0  | 1  | 0  | 1               | 1.0           | 7.7           |  |                                |  |  |  |
| 30-Dec                                                                                          | 0                             | 0 | 1 | 1             | 1 | 1 | 1 | A                             | 1 | 1  | 1  | 3  | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 0  | 1               | 1.0           | 3.5           |  |                                |  |  |  |
| 31-Dec                                                                                          | 1                             | 1 | 1 | 1             | 1 | 1 | A | 1                             | 1 | 0  | 1  | 0  | 1  | 0  | 1  | 0  | 1  | 1  | 0  | 0                                                                                                                                                          | 1  | 1  | 0  | 0               | 0.6           | 0.8           |  |                                |  |  |  |
| 0.8 0.8 0.8 0.8 0.8 0.8 0.9 0.8 0.9 0.9 0.9 0.9 0.9 1.0 0.8 0.8 0.9 0.9 0.8 0.8 0.7 0.8 0.8 0.8 |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    | Diurnal Average |               |               |  |                                |  |  |  |
| 1.8 1.4 1.4 1.3 1.3 1.4 3.1 3.0 3.2 3.5 3.8 3.0 3.5 7.7 1.4 3.2 3.4 3.5 1.1 1.2 1.2 1.8 1.4 1.1 |                               |   |   |               |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    | Diurnal Maximum |               |               |  |                                |  |  |  |
| C - Calibration                                                                                 |                               |   |   | N - Not Valid |   |   |   | A - Automated Daily Zero Span |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |                 |               |               |  |                                |  |  |  |

## Hourly Maximums

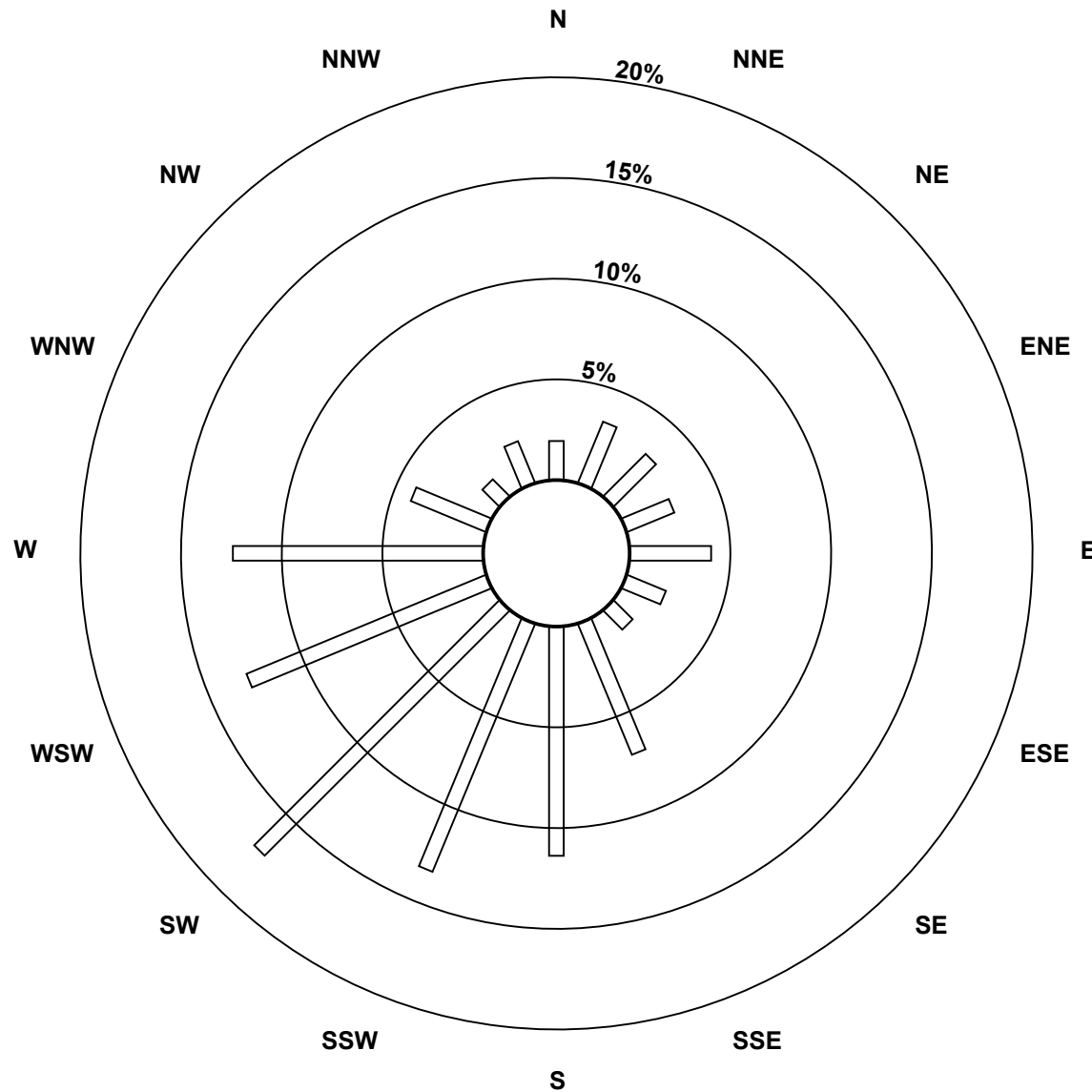
**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Donnelly - December 2016**



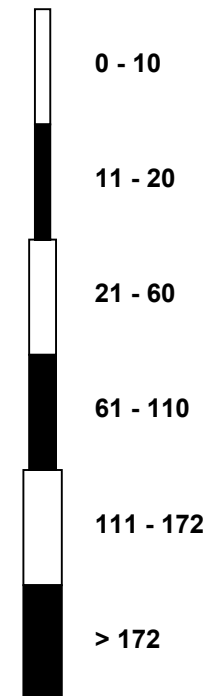
## Pollutant Rose

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Donnelly - December 2016



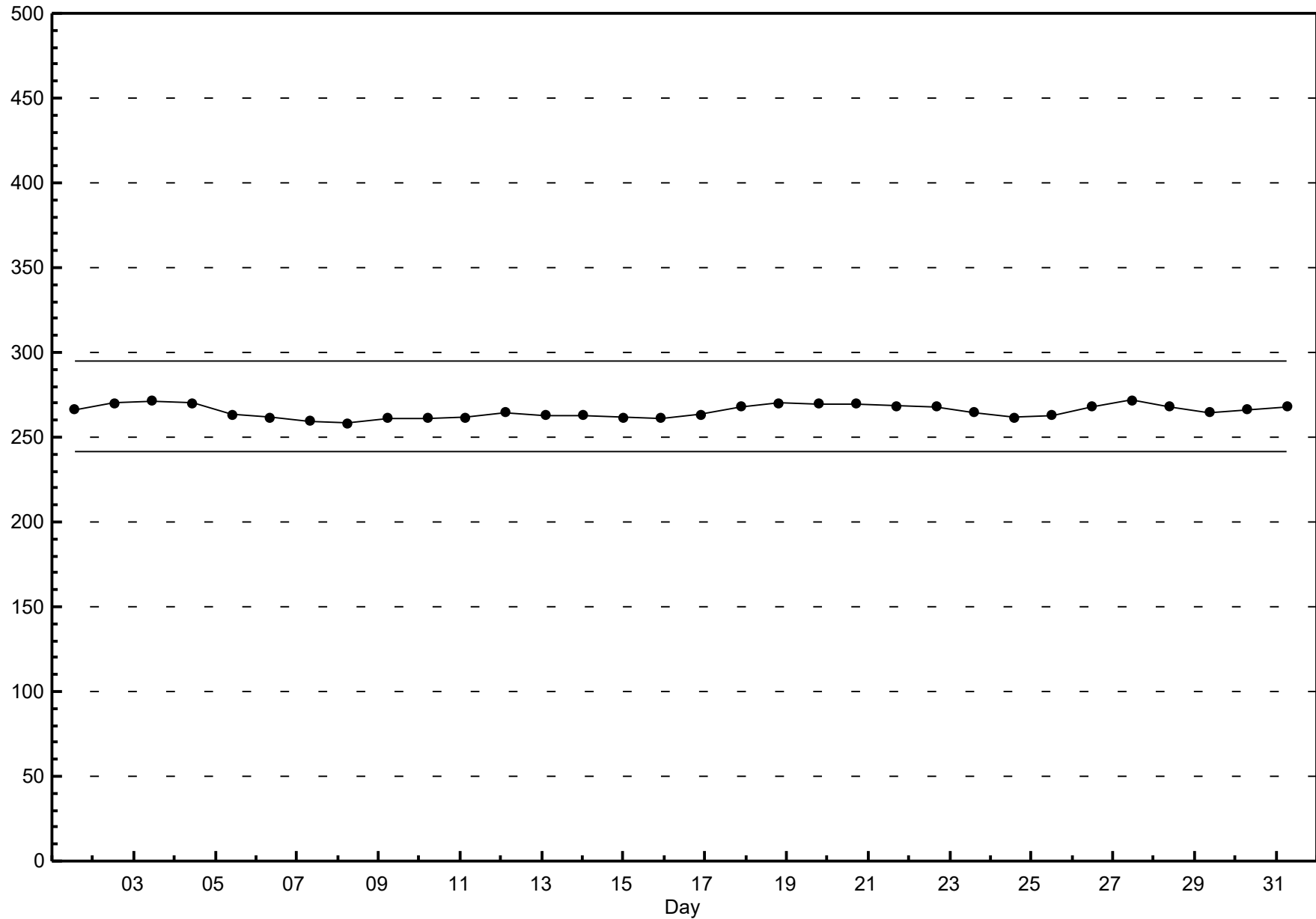
### Pollutant Classes (ppb)





## Span Responses

Sulphur Dioxide (SO<sub>2</sub>)  
Donnelly - December 2016



# Hourly Averages

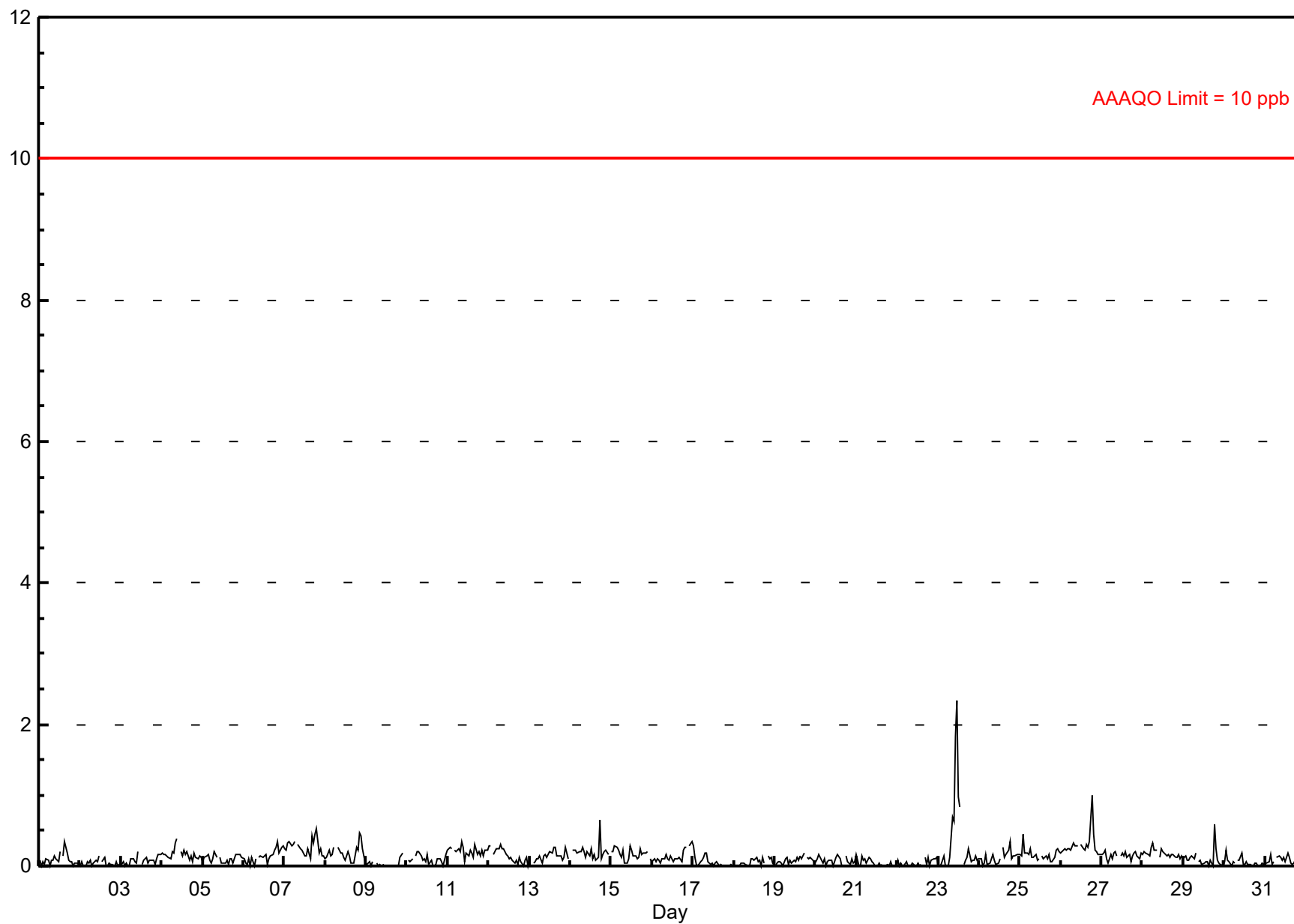
Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Donnelly - December 2016

|                                                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |                                |    |    |                 |               |
|-------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------|----|----|-----------------|---------------|
| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744                                                                                                                                      |    |                                |    |    |                 |               |
| Maximum Value: 2.3 ppb on Dec 23 12:00                                                          |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 0.4 ppb on Dec 23                                                                                                                   |    | Hours of Data: 705             |    |    |                 |               |
| Minimum Value: 0 ppb on Dec 1 02:00                                                             |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.0 ppb on Dec 2                                                                                                                    |    | Hours of Missing Data: 39      |    |    |                 |               |
| Maximum Diurnal Average: 0.2 ppb at hour 12                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.1 ppb at hour 16                                                                                                                |    | Hours of Calibration: 36       |    |    |                 |               |
| Monthly Average: 0.13 ppb                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.2 P <sub>99</sub> = 0.6 |    | Percent Operational Time: 99.6 |    |    |                 |               |
| Day                                                                                             | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |                                |    |    | Daily Average   | Daily Maximum |
|                                                                                                 | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22                             | 23 | 24 |                 |               |
| 1-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.4           |
| 2-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.0             | 0.1           |
| 3-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.2           |
| 4-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.2             | 0.4           |
| 5-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.2           |
| 6-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.3           |
| 7-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.3             | 0.5           |
| 8-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.2             | 0.5           |
| 9-Dec                                                                                           | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 0  | 0  | C  | C  | C  | C  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | N  | N  | --              | 0.2           |
| 10-Dec                                                                                          | N                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | N  | N  | 0.1             | 0.2           |
| 11-Dec                                                                                          | 0                             | 0 | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.2             | 0.4           |
| 12-Dec                                                                                          | 0                             | 0 | A | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.3           |
| 13-Dec                                                                                          | 0                             | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.3           |
| 14-Dec                                                                                          | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | A  | 0.2             | 0.6           |
| 15-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | A  | 0  | 0.2             | 0.3           |
| 16-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | A                              | 0  | 0  | 0.1             | 0.3           |
| 17-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | A  | 0                              | 0  | 0  | 0.1             | 0.3           |
| 18-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.1           |
| 19-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.2           |
| 20-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.2           |
| 21-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.0             | 0.2           |
| 22-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.0             | 0.1           |
| 23-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1  | 2  | 2  | 1  | 1  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.4             | 2.3           |
| 24-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.3           |
| 25-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.2             | 0.4           |
| 26-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.3             | 1.0           |
| 27-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.2             | 0.2           |
| 28-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.2             | 0.3           |
| 29-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.6           |
| 30-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.2           |
| 31-Dec                                                                                          | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0                              | 0  | 0  | 0.1             | 0.2           |
| 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.1 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.1 0.1 0.1 0.1 0.1 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |                                |    |    | Diurnal Average |               |
| 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.7 0.6 1.8 2.3 1.0 0.8 0.3 0.4 0.4 0.6 1.0 0.5 0.5 0.4 0.3 0.3 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |                                |    |    | Diurnal Maximum |               |
| C - Calibration N - Not Valid A - Automated Daily Zero Span                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |                                |    |    |                 |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb                         |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |                                |    |    |                 |               |

## Hourly Averages

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Donnelly - December 2016



# Hourly Maximums

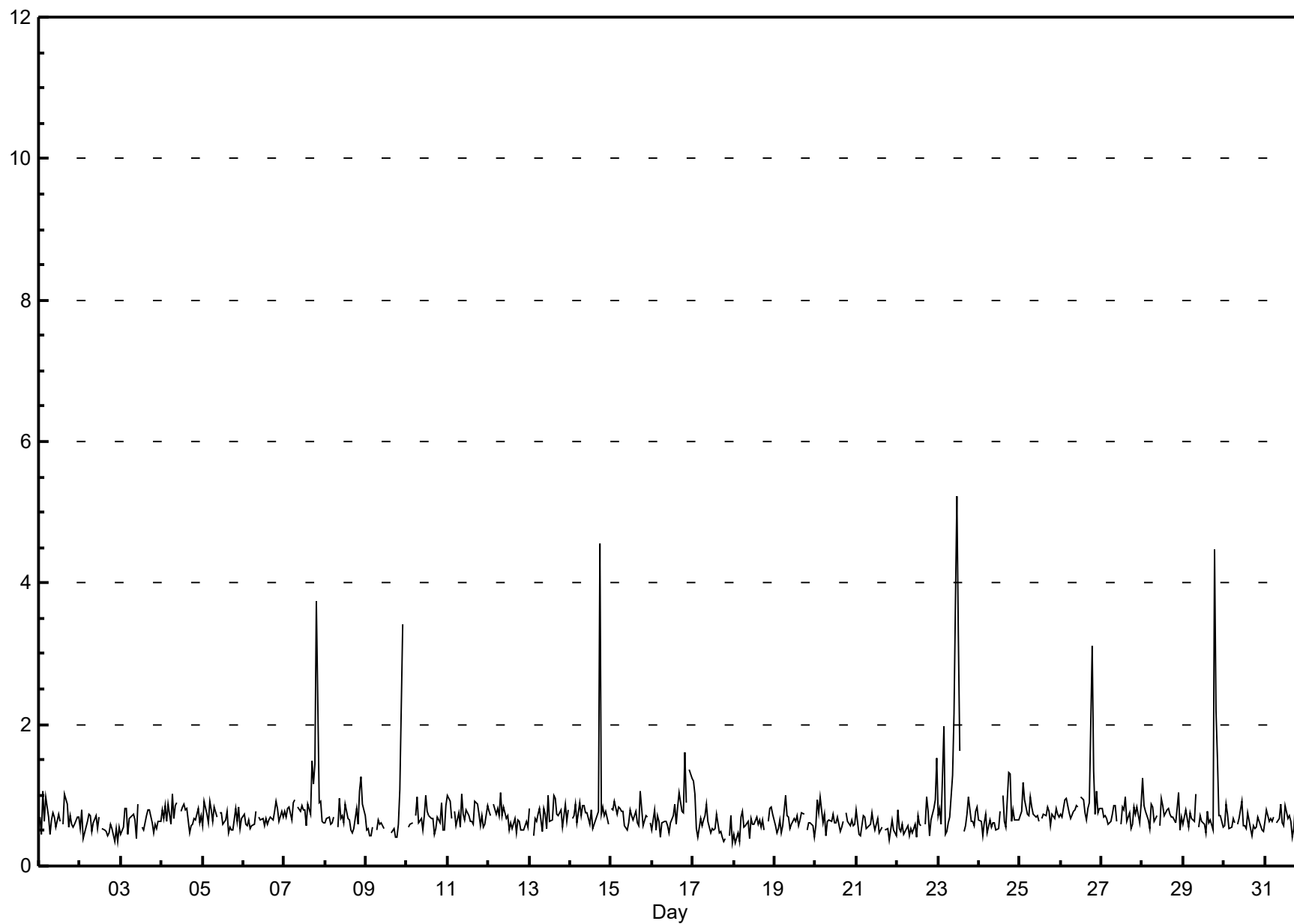
Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Donnelly - December 2016

| Maximum Value: 5.2 ppb on Dec 23 12:00                                                          |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 1.3 ppb on Dec 23                                                                                                                   |    |    |    |    |                 |               |               |     |  | Hours in Service: 744          |  |
|-------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|---------------|-----|--|--------------------------------|--|
| Minimum Value: 0 ppb on Dec 18 00:00                                                            |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.6 ppb on Dec 2                                                                                                                    |    |    |    |    |                 |               |               |     |  | Hours of Data: 705             |  |
| Maximum Diurnal Average: 0.9 ppb at hour 19                                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.6 ppb at hour 16                                                                                                                |    |    |    |    |                 |               |               |     |  | Hours of Missing Data: 39      |  |
| Monthly Average: 0.73 ppb                                                                       |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.7 Q <sub>3</sub> = 0.8 P <sub>90</sub> = 0.9 P <sub>99</sub> = 3.2 |    |    |    |    |                 |               |               |     |  | Hours of Calibration: 36       |  |
|                                                                                                 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |                 |               |               |     |  | Percent Operational Time: 99.6 |  |
| Day                                                                                             | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |                 | Daily Average | Daily Maximum |     |  |                                |  |
|                                                                                                 | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                                                                                                                                                         | 20 | 21 | 22 | 23 | 24              |               |               |     |  |                                |  |
| 1-Dec                                                                                           | 1                             | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.1           |     |  |                                |  |
| 2-Dec                                                                                           | 1                             | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 0  | 0  | 0                                                                                                                                                          | 1  | 1  | 0  | 1  | 0               | 1             | 0.6           | 0.8 |  |                                |  |
| 3-Dec                                                                                           | 0                             | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | 1  | 1               | 0.6           | 0.9           |     |  |                                |  |
| 4-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | A  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 5-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 0.9           |     |  |                                |  |
| 6-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 0.9           |     |  |                                |  |
| 7-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | A | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 4  | 1  | 1  | 1  | 1               | 1.0           | 3.7           |     |  |                                |  |
| 8-Dec                                                                                           | 1                             | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.3           |     |  |                                |  |
| 9-Dec                                                                                           | 1                             | 1 | 0 | 0 | 1 | A | 1 | 1 | 1 | 1  | 1  | C  | C  | C  | C  | 0  | 1  | 0  | 0                                                                                                                                                          | 1  | 1  | 3  | N  | N               | --            | 3.4           |     |  |                                |  |
| 10-Dec                                                                                          | N                             | 1 | 1 | 1 | A | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 11-Dec                                                                                          | 1                             | 1 | 1 | A | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 12-Dec                                                                                          | 1                             | 1 | A | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 13-Dec                                                                                          | 1                             | A | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 14-Dec                                                                                          | A                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 5  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | A               | 0.9           | 4.6           |     |  |                                |  |
| 15-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | A  | 1               | 0.7           | 1.1           |     |  |                                |  |
| 16-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 2  | 1  | A  | 1  | 1               | 0.8           | 1.6           |     |  |                                |  |
| 17-Dec                                                                                          | 1                             | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1  | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | A  | 0  | 1  | 0               | 0.6           | 1.2           |     |  |                                |  |
| 18-Dec                                                                                          | 0                             | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | A  | 1  | 1  | 1  | 1               | 0.6           | 0.8           |     |  |                                |  |
| 19-Dec                                                                                          | 1                             | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                                          | 1  | 1  | 1  | 1  | 0               | 0.6           | 1.0           |     |  |                                |  |
| 20-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | A  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 21-Dec                                                                                          | 1                             | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 0  | 1  | 1  | A  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | 1  | 0               | 0.6           | 0.8           |     |  |                                |  |
| 22-Dec                                                                                          | 1                             | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0  | 1  | 0  | 1  | 1  | 1  | A  | 1  | 1  | 1                                                                                                                                                          | 0  | 1  | 1  | 1  | 2               | 0.6           | 1.5           |     |  |                                |  |
| 23-Dec                                                                                          | 1                             | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 2  | 4  | 5  | 3  | 2  | A  | 0  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 1.3           | 5.2           |     |  |                                |  |
| 24-Dec                                                                                          | 1                             | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.3           |     |  |                                |  |
| 25-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.8           | 1.2           |     |  |                                |  |
| 26-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 3                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.9           | 3.1           |     |  |                                |  |
| 27-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.7           | 1.0           |     |  |                                |  |
| 28-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 1               | 0.8           | 1.2           |     |  |                                |  |
| 29-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | A | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 4                                                                                                                                                          | 2  | 2  | 1  | 1  | 1               | 0.9           | 4.5           |     |  |                                |  |
| 30-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | 1 | A | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0               | 0.6           | 0.9           |     |  |                                |  |
| 31-Dec                                                                                          | 1                             | 1 | 1 | 1 | 1 | 1 | A | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1                                                                                                                                                          | 1  | 1  | 1  | 1  | 0               | 0.6           | 0.9           |     |  |                                |  |
| 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.8 0.8 0.8 0.7 0.7 0.6 0.7 0.8 0.9 0.8 0.7 0.8 0.7 0.7 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Average |               |               |     |  |                                |  |
| 1.2 1.0 1.2 2.0 1.0 0.9 1.0 1.0 1.3 2.2 3.7 5.2 3.3 1.6 1.0 1.0 1.5 4.6 4.5 3.7 1.5 3.4 1.4 1.5 |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    | Diurnal Maximum |               |               |     |  |                                |  |
| C - Calibration N - Not Valid A - Automated Daily Zero Span                                     |                               |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |    |                 |               |               |     |  |                                |  |

## Hourly Maximums

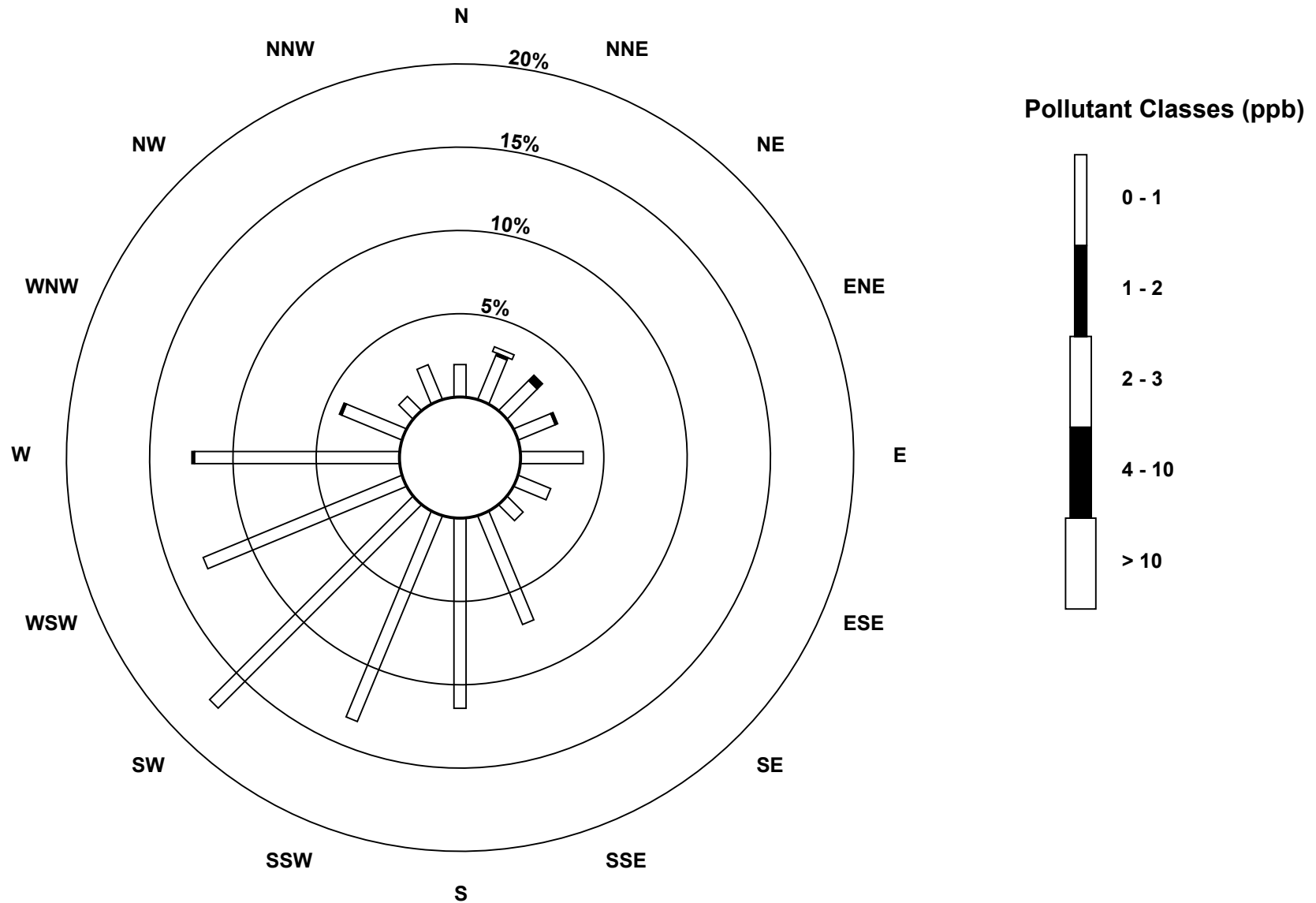
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Donnelly - December 2016



## Pollutant Rose

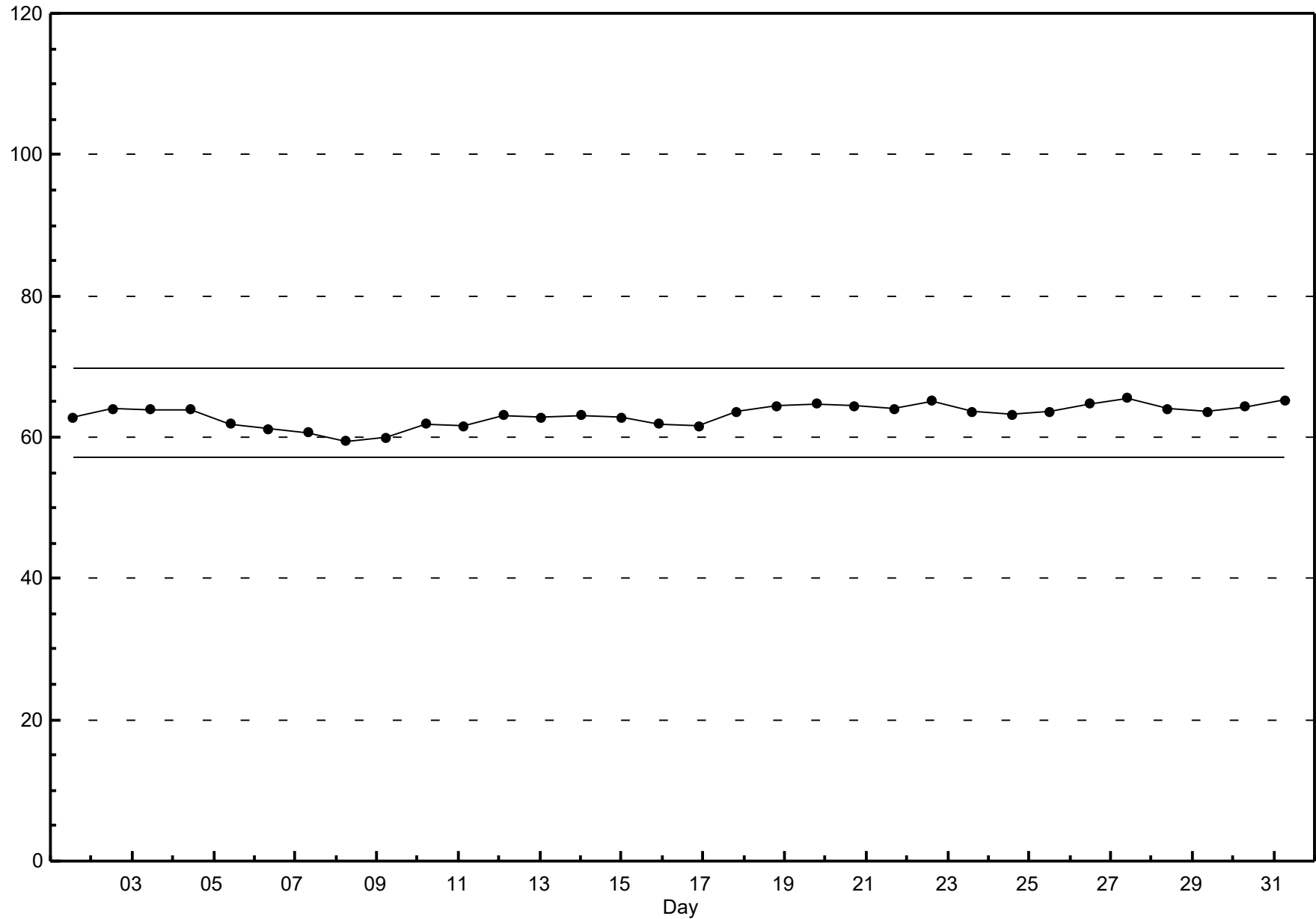
Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Donnelly - December 2016



## Span Responses

Hydrogen Sulphide ( $\text{H}_2\text{S}$ )  
Donnelly - December 2016



# Hourly Averages

External Temperature (ET) - °C

Donnelly - December 2016

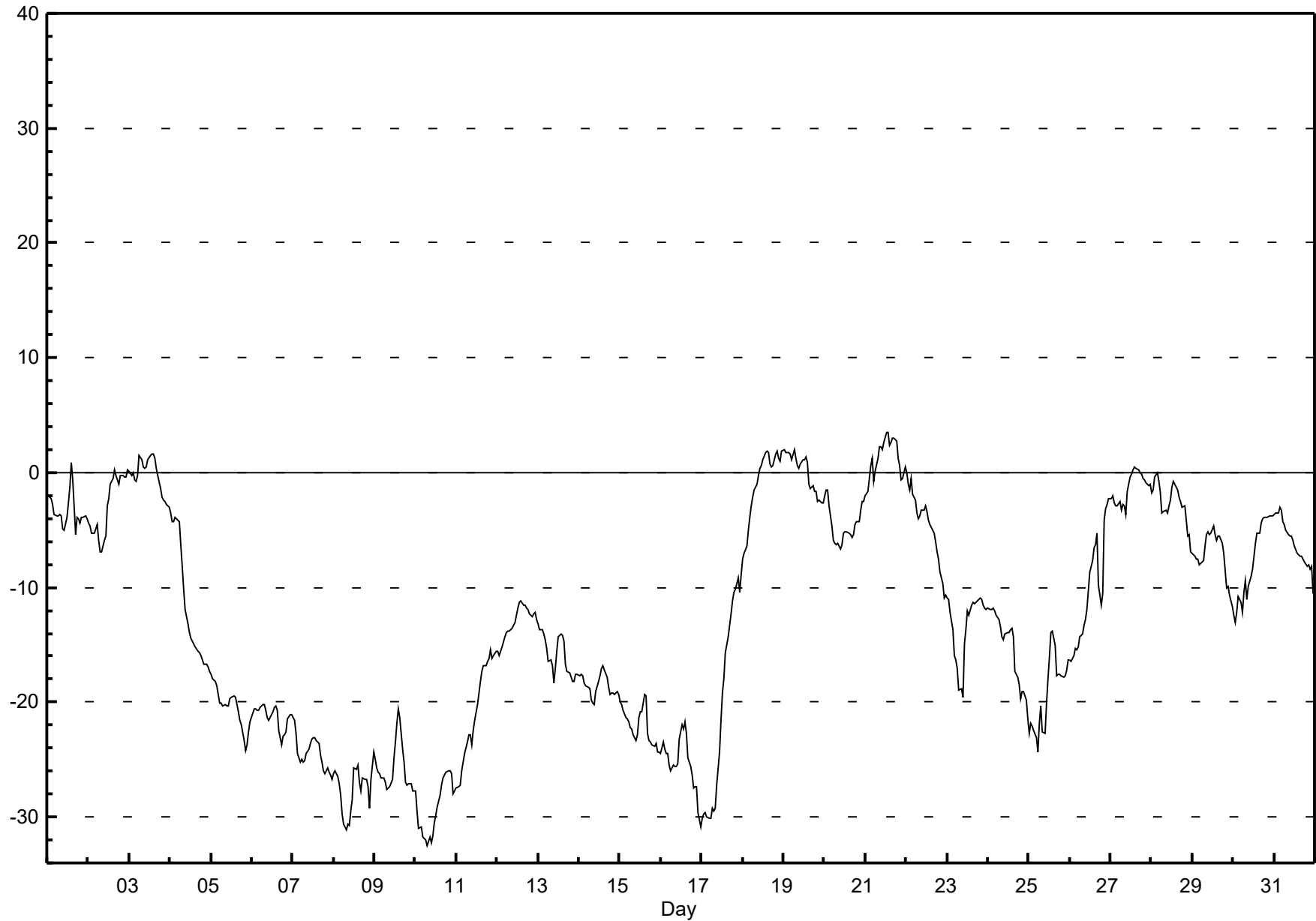
| Maximum Value: 3.5 °C on Dec 21 13:00        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 1.2 °C on Dec 21                                                                                                                              |     |     |     |                 |               |  |  |  |  | Hours in Service: 744    |  |
|----------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----------------|---------------|--|--|--|--|--------------------------|--|
| Minimum Value: -33 °C on Dec 10 08:00        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: -29.2 °C on Dec 10                                                                                                                            |     |     |     |                 |               |  |  |  |  | Hours of Data: 744       |  |
| Maximum Diurnal Average: -10.9 °C at hour 15 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: -14.1 °C at hour 10                                                                                                                         |     |     |     |                 |               |  |  |  |  | Hours of Missing Data: 0 |  |
| Monthly Average: -12.74 °C                   |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = -31.1 P <sub>10</sub> = -26.2 Q <sub>1</sub> = -21.1 Median = -12.4 Q <sub>3</sub> = -3.7 P <sub>90</sub> = -0.3 P <sub>99</sub> = 2.5 |     |     |     |                 |               |  |  |  |  | Hours of Calibration: 0  |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 100.0                                                                                                                                      |     |     |     |                 |               |  |  |  |  |                          |  |
| Day                                          | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     | Daily Average   | Daily Maximum |  |  |  |  |                          |  |
|                                              | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                   | 22  | 23  | 24  |                 |               |  |  |  |  |                          |  |
| 1-Dec                                        | -2                            | -2  | -2  | -3  | -4  | -4  | -4  | -4  | -4  | -5  | -5  | -4  | -3  | -1  | 1   | -1  | -5  | -4  | -4  | -4  | -4                                                                                                                                                                   | -4  | -4  | -4  | -3.3            | 0.8           |  |  |  |  |                          |  |
| 2-Dec                                        | -4                            | -5  | -5  | -5  | -5  | -4  | -6  | -7  | -7  | -6  | -6  | -3  | -2  | -1  | 0   | 0   | 0   | -1  | -1  | 0   | 0                                                                                                                                                                    | 0   | 0   | 0   | -2.9            | 0.2           |  |  |  |  |                          |  |
| 3-Dec                                        | 0                             | 0   | 0   | -1  | -1  | 0   | 1   | 1   | 1   | 0   | 1   | 1   | 1   | 2   | 2   | 1   | 0   | 0   | -1  | -2  | -2                                                                                                                                                                   | -3  | -3  | -3  | -0.2            | 1.7           |  |  |  |  |                          |  |
| 4-Dec                                        | -3                            | -4  | -4  | -4  | -4  | -4  | -6  | -8  | -10 | -12 | -13 | -14 | -14 | -15 | -15 | -15 | -16 | -16 | -16 | -16 | -17                                                                                                                                                                  | -17 | -17 | -17 | -11.6           | -3.5          |  |  |  |  |                          |  |
| 5-Dec                                        | -18                           | -18 | -18 | -19 | -19 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -19 | -20 | -20 | -21 | -22 | -22 | -23 | -24                                                                                                                                                                  | -24 | -23 | -22 | -20.5           | -17.5         |  |  |  |  |                          |  |
| 6-Dec                                        | -21                           | -21 | -21 | -21 | -21 | -20 | -20 | -20 | -21 | -21 | -22 | -21 | -21 | -20 | -20 | -21 | -22 | -24 | -23 | -23 | -23                                                                                                                                                                  | -21 | -21 | -21 | -21.2           | -20.2         |  |  |  |  |                          |  |
| 7-Dec                                        | -21                           | -22 | -23 | -24 | -25 | -25 | -25 | -25 | -25 | -24 | -24 | -23 | -23 | -23 | -23 | -24 | -25 | -25 | -26 | -26 | -26                                                                                                                                                                  | -26 | -26 | -27 | -24.4           | -21.3         |  |  |  |  |                          |  |
| 8-Dec                                        | -26                           | -26 | -26 | -27 | -28 | -30 | -31 | -31 | -31 | -31 | -30 | -29 | -26 | -26 | -25 | -27 | -28 | -27 | -27 | -27 | -29                                                                                                                                                                  | -29 | -27 | -24 | -27.7           | -24.3         |  |  |  |  |                          |  |
| 9-Dec                                        | -25                           | -26 | -26 | -26 | -27 | -27 | -27 | -28 | -27 | -27 | -27 | -25 | -23 | -22 | -21 | -21 | -24 | -25 | -27 | -27 | -27                                                                                                                                                                  | -27 | -28 | -28 | -25.7           | -20.5         |  |  |  |  |                          |  |
| 10-Dec                                       | -28                           | -30 | -31 | -31 | -32 | -32 | -32 | -33 | -32 | -32 | -32 | -30 | -30 | -29 | -28 | -27 | -27 | -26 | -26 | -26 | -26                                                                                                                                                                  | -26 | -28 | -28 | -29.2           | -25.9         |  |  |  |  |                          |  |
| 11-Dec                                       | -27                           | -27 | -27 | -26 | -25 | -24 | -24 | -23 | -23 | -24 | -22 | -22 | -20 | -19 | -18 | -17 | -17 | -17 | -16 | -16 | -15                                                                                                                                                                  | -16 | -16 | -16 | -20.8           | -15.4         |  |  |  |  |                          |  |
| 12-Dec                                       | -16                           | -16 | -16 | -15 | -14 | -14 | -14 | -14 | -14 | -14 | -13 | -12 | -12 | -11 | -11 | -12 | -12 | -12 | -12 | -12 | -13                                                                                                                                                                  | -12 | -12 | -13 | -13.1           | -11.2         |  |  |  |  |                          |  |
| 13-Dec                                       | -13                           | -14 | -14 | -14 | -15 | -15 | -16 | -16 | -17 | -18 | -17 | -16 | -14 | -14 | -14 | -15 | -17 | -17 | -17 | -18 | -18                                                                                                                                                                  | -18 | -18 | -18 | -16.0           | -13.1         |  |  |  |  |                          |  |
| 14-Dec                                       | -18                           | -18 | -18 | -18 | -19 | -19 | -19 | -20 | -20 | -20 | -19 | -18 | -18 | -17 | -17 | -17 | -18 | -19 | -19 | -19 | -19                                                                                                                                                                  | -19 | -19 | -19 | -18.6           | -16.8         |  |  |  |  |                          |  |
| 15-Dec                                       | -20                           | -20 | -21 | -21 | -21 | -22 | -22 | -22 | -23 | -23 | -23 | -21 | -21 | -21 | -19 | -19 | -23 | -23 | -23 | -24 | -24                                                                                                                                                                  | -24 | -24 | -24 | -22.1           | -19.4         |  |  |  |  |                          |  |
| 16-Dec                                       | -25                           | -23 | -24 | -25 | -25 | -25 | -26 | -26 | -26 | -26 | -25 | -23 | -22 | -22 | -22 | -23 | -25 | -26 | -26 | -28 | -27                                                                                                                                                                  | -27 | -30 | -31 | -25.2           | -21.7         |  |  |  |  |                          |  |
| 17-Dec                                       | -30                           | -30 | -30 | -30 | -30 | -30 | -29 | -29 | -29 | -27 | -24 | -22 | -19 | -18 | -16 | -14 | -13 | -12 | -11 | -10 | -10                                                                                                                                                                  | -9  | -10 | -9  | -20.6           | -8.9          |  |  |  |  |                          |  |
| 18-Dec                                       | -8                            | -7  | -6  | -5  | -4  | -3  | -2  | -1  | -1  | 0   | 0   | 1   | 1   | 2   | 2   | 2   | 1   | 1   | 1   | 2   | 2                                                                                                                                                                    | 1   | 1   | 2   | -0.9            | 1.9           |  |  |  |  |                          |  |
| 19-Dec                                       | 2                             | 2   | 2   | 2   | 2   | 1   | 2   | 1   | 1   | 0   | 1   | 1   | 1   | 1   | 1   | -1  | -1  | -1  | -2  | -2  | -2                                                                                                                                                                   | -2  | -3  | -3  | 0.1             | 2.0           |  |  |  |  |                          |  |
| 20-Dec                                       | -2                            | -1  | -1  | -3  | -5  | -6  | -6  | -6  | -6  | -7  | -6  | -5  | -5  | -5  | -5  | -5  | -6  | -5  | -5  | -4  | -4                                                                                                                                                                   | -3  | -3  | -2  | -4.6            | -1.5          |  |  |  |  |                          |  |
| 21-Dec                                       | -2                            | -2  | -1  | 1   | 1   | -1  | 0   | 1   | 2   | 2   | 2   | 3   | 4   | 3   | 2   | 3   | 3   | 3   | 3   | 1   | 1                                                                                                                                                                    | -1  | -1  | 0   | 1.2             | 3.5           |  |  |  |  |                          |  |
| 22-Dec                                       | 0                             | -1  | -1  | -1  | -2  | -2  | -3  | -4  | -4  | -3  | -3  | -3  | -3  | -4  | -4  | -5  | -5  | -6  | -7  | -8  | -9                                                                                                                                                                   | -10 | -11 | -11 | -4.6            | 0.0           |  |  |  |  |                          |  |
| 23-Dec                                       | -11                           | -11 | -12 | -14 | -16 | -16 | -17 | -19 | -19 | -20 | -15 | -14 | -12 | -12 | -12 | -11 | -11 | -11 | -11 | -11 | -11                                                                                                                                                                  | -12 | -12 | -12 | -13.4           | -10.9         |  |  |  |  |                          |  |
| 24-Dec                                       | -12                           | -12 | -12 | -12 | -12 | -12 | -13 | -13 | -14 | -15 | -14 | -14 | -14 | -14 | -14 | -14 | -17 | -18 | -18 | -20 | -19                                                                                                                                                                  | -19 | -20 | -21 | -15.1           | -11.8         |  |  |  |  |                          |  |
| 25-Dec                                       | -23                           | -22 | -22 | -23 | -23 | -24 | -22 | -20 | -23 | -23 | -20 | -18 | -16 | -14 | -14 | -15 | -18 | -18 | -18 | -18 | -18                                                                                                                                                                  | -18 | -17 | -16 | -19.2           | -13.9         |  |  |  |  |                          |  |
| 26-Dec                                       | -16                           | -16 | -16 | -15 | -15 | -15 | -14 | -14 | -13 | -13 | -12 | -10 | -9  | -8  | -7  | -6  | -5  | -10 | -12 | -11 | -4                                                                                                                                                                   | -3  | -3  | -2  | -10.4           | -2.3          |  |  |  |  |                          |  |
| 27-Dec                                       | -2                            | -2  | -3  | -3  | -3  | -3  | -3  | -3  | -3  | -4  | -2  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | -1  | -1                                                                                                                                                                   | -1  | -1  | -1  | -1.4            | 0.4           |  |  |  |  |                          |  |
| 28-Dec                                       | -2                            | -2  | 0   | 0   | -1  | -2  | -4  | -3  | -3  | -4  | -3  | -2  | -1  | -1  | -1  | -1  | -2  | -3  | -3  | -4  | -6                                                                                                                                                                   | -5  | -7  | -7  | -2.6            | 0.0           |  |  |  |  |                          |  |
| 29-Dec                                       | -7                            | -7  | -7  | -8  | -8  | -8  | -8  | -6  | -5  | -5  | -5  | -5  | -5  | -5  | -6  | -6  | -6  | -6  | -7  | -8  | -10                                                                                                                                                                  | -10 | -11 | -12 | -7.2            | -4.6          |  |  |  |  |                          |  |
| 30-Dec                                       | -12                           | -13 | -12 | -11 | -11 | -12 | -10 | -9  | -11 | -10 | -9  | -8  | -7  | -6  | -5  | -5  | -4  | -4  | -4  | -4  | -4                                                                                                                                                                   | -4  | -4  | -4  | -7.7            | -3.7          |  |  |  |  |                          |  |
| 31-Dec                                       | -4                            | -4  | -4  | -3  | -3  | -4  | -5  | -5  | -5  | -6  | -6  | -6  | -6  | -7  | -7  | -7  | -7  | -8  | -8  | -8  | -8                                                                                                                                                                   | -8  | -8  | -11 | -6.1            | -3.1          |  |  |  |  |                          |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     | Diurnal Average |               |  |  |  |  |                          |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     | Diurnal Maximum |               |  |  |  |  |                          |  |
|                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                      |     |     |     |                 |               |  |  |  |  |                          |  |



## Hourly Averages

External Temperature (ET) - °C

Donnelly - December 2016



## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Donnelly - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 20                            | 16  | 13  | 13  | 10  | 11  | 10  | 9   | 4   | 4   | 6   | 6   | 5   | 2   | 1   | 2   | 4   | 7   | 9   | 10  | 13  | 13  | 15  | 18  | 6.8           | 20.2          |
| Dir    | 164                           | 168 | 192 | 239 | 257 | 249 | 262 | 256 | 271 | 242 | 213 | 227 | 240 | 283 | 65  | 112 | 158 | 161 | 154 | 154 | 161 | 160 | 161 | 162 | 191           | 164           |
| 2 Spd  | 18                            | 16  | 19  | 19  | 18  | 12  | 7   | 8   | 9   | 9   | 7   | 15  | 22  | 18  | 20  | 21  | 22  | 16  | 9   | 13  | 12  | 18  | 18  | 19  | 14.3          | 22.0          |
| Dir    | 159                           | 155 | 162 | 160 | 157 | 141 | 110 | 110 | 105 | 109 | 65  | 151 | 161 | 144 | 149 | 155 | 160 | 150 | 146 | 154 | 157 | 172 | 175 | 173 | 152           | 160           |
| 3 Spd  | 20                            | 22  | 20  | 19  | 19  | 17  | 24  | 27  | 28  | 27  | 26  | 25  | 25  | 26  | 24  | 25  | 23  | 23  | 22  | 22  | 22  | 23  | 23  | 22  | 22.2          | 27.6          |
| Dir    | 174                           | 173 | 176 | 178 | 180 | 186 | 208 | 211 | 213 | 213 | 210 | 214 | 221 | 223 | 222 | 219 | 217 | 215 | 213 | 213 | 217 | 220 | 220 | 218 | 208           | 213           |
| 4 Spd  | 19                            | 17  | 17  | 17  | 25  | 21  | 15  | 17  | 16  | 17  | 15  | 14  | 16  | 16  | 17  | 16  | 18  | 20  | 20  | 18  | 16  | 15  | 16  | 15  | 13.9          | 24.6          |
| Dir    | 225                           | 226 | 226 | 232 | 250 | 254 | 346 | 347 | 330 | 334 | 329 | 326 | 313 | 307 | 304 | 293 | 286 | 286 | 287 | 287 | 294 | 287 | 290 | 290 | 288           | 250           |
| 5 Spd  | 20                            | 19  | 18  | 17  | 16  | 15  | 14  | 15  | 14  | 15  | 15  | 16  | 17  | 16  | 15  | 13  | 13  | 10  | 10  | 9   | 9   | 8   | 10  | 12  | 13.9          | 19.8          |
| Dir    | 277                           | 276 | 275 | 273 | 271 | 273 | 273 | 264 | 271 | 264 | 263 | 273 | 272 | 269 | 275 | 273 | 269 | 261 | 258 | 254 | 248 | 247 | 242 | 249 | 267           | 277           |
| 6 Spd  | 13                            | 12  | 12  | 10  | 10  | 11  | 12  | 12  | 12  | 10  | 5   | 10  | 14  | 12  | 9   | 7   | 8   | 6   | 8   | 7   | 8   | 9   | 11  | 10  | 9.8           | 14.1          |
| Dir    | 253                           | 261 | 269 | 262 | 270 | 272 | 274 | 273 | 266 | 263 | 271 | 264 | 262 | 271 | 282 | 276 | 257 | 243 | 236 | 240 | 243 | 260 | 266 | 271 | 264           | 262           |
| 7 Spd  | 8                             | 6   | 5   | 3   | 3   | 2   | 3   | 2   | 2   | 1   | 4   | 5   | 5   | 5   | 4   | 1   | 1   | 1   | N   | N   | N   | N   | N   | N   | 3.0           | 7.9           |
| Dir    | 274                           | 282 | 278 | 264 | 243 | 254 | 256 | 265 | 297 | 284 | 289 | 303 | 303 | 333 | 336 | 350 | 327 | 27  | N   | N   | N   | N   | N   | N   | 290           | 274           |
| 8 Spd  | N                             | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | 1   | 2   | 4   | 3   | 4   | 2   | 1   | 2   | 1   | 1   | 3   | --            | 3.8           |
| Dir    | N                             | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | 333 | 26  | 48  | 51  | 49  | 60  | 47  | 47  | 44  | 121 | 82  | --            | 49            |
| 9 Spd  | 4                             | 4   | 5   | 7   | 6   | 7   | 7   | 7   | 6   | 6   | 6   | 7   | 8   | 7   | 5   | 4   | 4   | 3   | 3   | 0   | 2   | 1   | 2   | 2   | 4.6           | 8.2           |
| Dir    | 84                            | 83  | 80  | 81  | 81  | 82  | 83  | 81  | 82  | 81  | 80  | 82  | 83  | 82  | 75  | 66  | 62  | 52  | 28  | 333 | 358 | 51  | 47  | 56  | 76            | 83            |
| 10 Spd | 2                             | 2   | 6   | 2   | 7   | 7   | 6   | 8   | 8   | 6   | 5   | 6   | 6   | 6   | 7   | 9   | 12  | 16  | 16  | 14  | 12  | 13  | 11  | 13  | 7.3           | 15.9          |
| Dir    | 60                            | 196 | 194 | 185 | 193 | 191 | 200 | 199 | 226 | 252 | 256 | 268 | 273 | 281 | 272 | 267 | 253 | 251 | 244 | 232 | 228 | 214 | 198 | 211 | 232           | 251           |
| 11 Spd | 14                            | 15  | 14  | 16  | 14  | 14  | 15  | 16  | 17  | 15  | 19  | 18  | 18  | 20  | 21  | 23  | 24  | 23  | 28  | 26  | 30  | 22  | 24  | 29  | 19.1          | 29.7          |
| Dir    | 214                           | 217 | 212 | 216 | 221 | 230 | 236 | 242 | 228 | 206 | 224 | 227 | 229 | 233 | 235 | 238 | 236 | 233 | 238 | 244 | 261 | 259 | 253 | 256 | 236           | 261           |
| 12 Spd | 25                            | 24  | 23  | 23  | 27  | 24  | 23  | 18  | 17  | 17  | 17  | 20  | 23  | 32  | 30  | 28  | 29  | 26  | 23  | 22  | 20  | 20  | 25  | 22  | 23.1          | 32.5          |
| Dir    | 259                           | 254 | 249 | 253 | 261 | 274 | 277 | 276 | 258 | 255 | 264 | 273 | 266 | 261 | 258 | 261 | 264 | 263 | 266 | 270 | 263 | 264 | 257 | 249 | 262           | 261           |
| 13 Spd | 20                            | 23  | 23  | 18  | 19  | 16  | 16  | 19  | 17  | 12  | 15  | 17  | 19  | 21  | 19  | 14  | 9   | 8   | 9   | 10  | 9   | 9   | 9   | 9   | 14.3          | 23.0          |
| Dir    | 239                           | 249 | 251 | 254 | 255 | 253 | 249 | 259 | 260 | 247 | 253 | 259 | 263 | 262 | 259 | 257 | 246 | 234 | 230 | 232 | 229 | 197 | 193 | 182 | 248           | 251           |
| 14 Spd | 9                             | 10  | 13  | 6   | 9   | 10  | 6   | 10  | 12  | 10  | 10  | 11  | 11  | 9   | 7   | 6   | 2   | 1   | 1   | 2   | 3   | 5   | 3   | 4   | 6.6           | 12.8          |
| Dir    | 180                           | 182 | 176 | 189 | 183 | 186 | 197 | 193 | 196 | 198 | 193 | 210 | 230 | 229 | 237 | 227 | 232 | 260 | 220 | 240 | 238 | 227 | 224 | 261 | 203           | 176           |
| 15 Spd | 3                             | 2   | 2   | 0   | 1   | 2   | 2   | 3   | 2   | 4   | 5   | 4   | 6   | 6   | 2   | 1   | 3   | 7   | 7   | 6   | 6   | 8   | 9   | 8   | 3.6           | 9.3           |
| Dir    | 239                           | 267 | 258 | 247 | 303 | 267 | 225 | 265 | 240 | 207 | 197 | 220 | 244 | 272 | 283 | 268 | 213 | 191 | 201 | 197 | 200 | 189 | 188 | 191 | 215           | 188           |
| 16 Spd | 6                             | 9   | 7   | 6   | 7   | 9   | 7   | 6   | 6   | 6   | 5   | 3   | 2   | 3   | 1   | 3   | 2   | 3   | 3   | N   | N   | N   | N   | N   | 4.5           | 9.0           |
| Dir    | 185                           | 185 | 184 | 194 | 208 | 200 | 188 | 191 | 194 | 186 | 185 | 161 | 209 | 162 | 250 | 228 | 108 | 125 | 133 | N   | N   | N   | N   | N   | 187           | 200           |
| 17 Spd | N                             | N   | 5   | 6   | 4   | 5   | 4   | N   | N   | N   | N   | 1   | 1   | 1   | 3   | 6   | 11  | 16  | 16  | 14  | 12  | 12  | 11  | 10  | 5.6           | 16.0          |
| Dir    | N                             | N   | 59  | 59  | 71  | 66  | 59  | N   | N   | N   | N   | 291 | 190 | 196 | 190 | 182 | 177 | 177 | 184 | 187 | 179 | 183 | 194 | 190 | 173           | 184           |
| 18 Spd | 12                            | 14  | 15  | 16  | 17  | 19  | 22  | 26  | 23  | 22  | 32  | 36  | 33  | 34  | 30  | 27  | 17  | 16  | 12  | 26  | 33  | 35  | 23  | 21  | 22.5          | 35.6          |
| Dir    | 187                           | 201 | 199 | 201 | 205 | 213 | 221 | 221 | 221 | 220 | 230 | 227 | 229 | 240 | 251 | 253 | 249 | 235 | 219 | 233 | 230 | 227 | 221 | 205 | 226           | 227           |
| 19 Spd | 23                            | 22  | 20  | 17  | 19  | 22  | 36  | 39  | 40  | 37  | 37  | 39  | 38  | 31  | 29  | 19  | 20  | 23  | 23  | 23  | 21  | 22  | 22  | 23  | 25.3          | 39.9          |
| Dir    | 202                           | 190 | 181 | 188 | 197 | 194 | 216 | 225 | 228 | 228 | 237 | 248 | 254 | 255 | 249 | 241 | 228 | 222 | 220 | 218 | 212 | 214 | 211 | 210 | 223           | 228           |
| 20 Spd | 25                            | 29  | 30  | 21  | 17  | 16  | 15  | 16  | 16  | 15  | 13  | 15  | 14  | 14  | 13  | 13  | 12  | 9   | 17  | 16  | 19  | 22  | 23  | 24  | 16.9          | 29.8          |
| Dir    | 215                           | 222 | 222 | 204 | 195 | 192 | 186 | 171 | 178 | 180 | 174 | 171 | 169 | 173 | 186 | 191 | 194 | 192 | 196 | 194 | 195 | 208 | 213 | 218 | 197           | 222           |
| 21 Spd | 24                            | 21  | 24  | 25  | 23  | 16  | 20  | 25  | 37  | 43  | 39  | 38  | 35  | 25  | 15  | 19  | 19  | 15  | 16  | 13  | 13  | 14  | 17  | 19  | 22.5          | 42.6          |
| Dir    | 224                           | 218 | 220 | 216 | 216 | 175 | 195 | 206 | 224 | 224 | 219 | 215 | 218 | 221 | 198 | 205 | 224 | 221 | 206 | 183 | 186 | 188 | 194 | 198 | 212           | 224           |
| 22 Spd | 20                            | 20  | 21  | 24  | 8   | 7   | 10  | 6   | 11  | 9   | 5   | 7   | 4   | 2   | 4   | 3   | 2   | 1   | 1   | 6   | 6   | 4   | 1   | 3   | 5.3           | 23.7          |
| Dir    | 195                           | 191 | 200 | 203 | 243 | 227 | 198 | 187 | 196 | 196 | 210 | 247 | 278 | 265 | 257 | 229 | 269 | 309 | 351 | 19  | 23  | 28  | 19  | 38  | 209           | 203           |

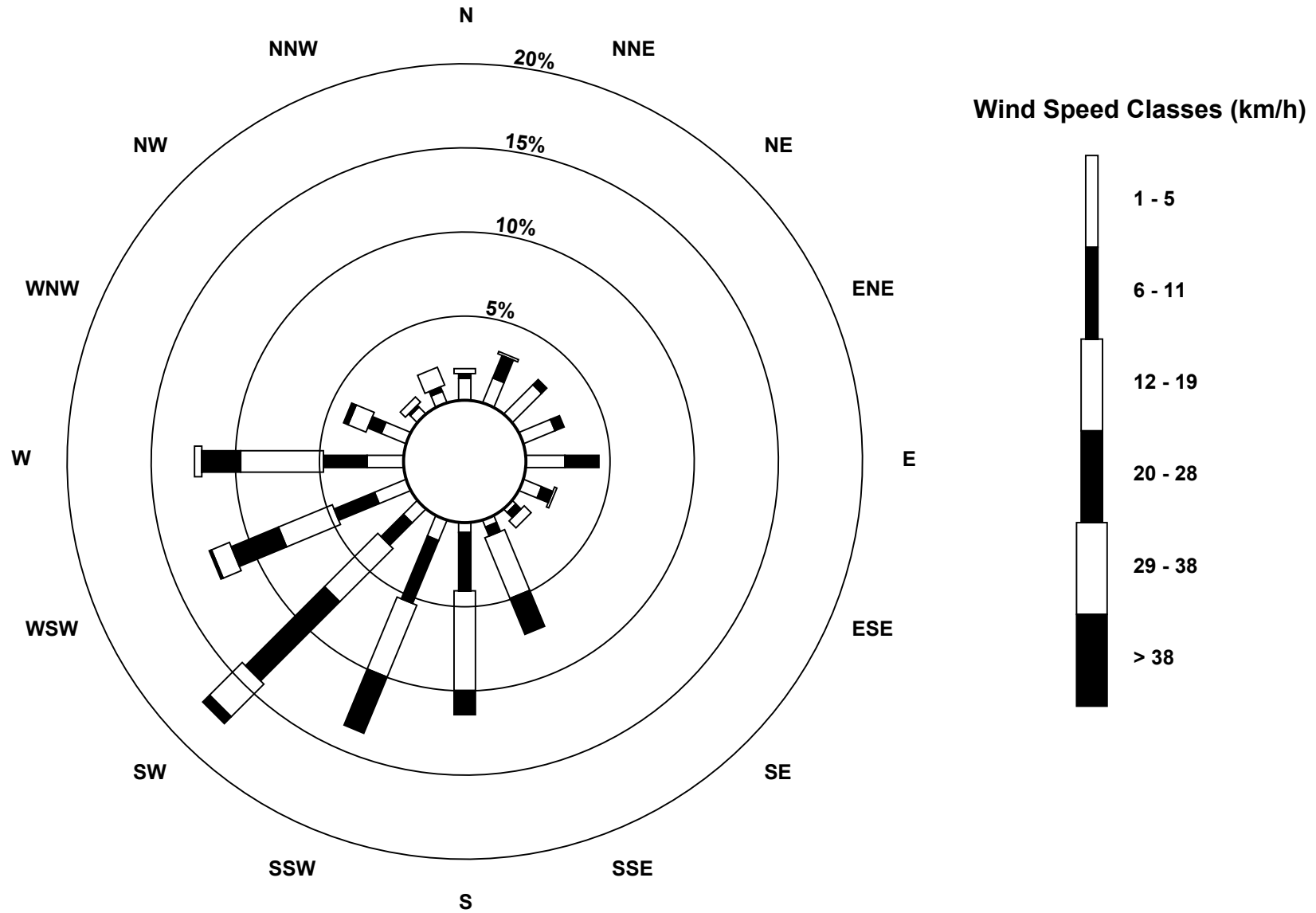
## Hourly Averages

Wind Speed (km/h)  
Wind Direction (deg)  
Donnelly - December 2016

| Day                                                                                                                                                                  | Hourly Period Ending At (MST) |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                | Daily Average   | Daily Maximum |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------|----------|----------|----------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------------------|-----------------|---------------|
|                                                                                                                                                                      | 1                             | 2       | 3        | 4        | 5        | 6    | 7     | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24                             |                 |               |
| 23 Spd                                                                                                                                                               | 3                             | 5       | 3        | 1        | 5        | 1    | 0     | 2    | 3    | 3    | 1    | 4    | 1    | 4    | 2    | 2    | 1    | 5    | 3    | 3    | 5    | 8    | 6    | 4                              | 2.4             | 7.9           |
| Dir                                                                                                                                                                  | 38                            | 9       | 11       | 123      | 250      | 316  | 54    | 46   | 38   | 55   | 29   | 25   | 27   | 294  | 340  | 334  | 279  | 29   | 28   | 52   | 47   | 41   | 25   | 1                              | 20              | 41            |
| 24 Spd                                                                                                                                                               | 9                             | 11      | 11       | 10       | 10       | 10   | 12    | 9    | 6    | 3    | 2    | 4    | 3    | 2    | 3    | 2    | N    | N    | N    | 1    | 1    | N    | N    | N                              | 5.6             | 12.0          |
| Dir                                                                                                                                                                  | 18                            | 21      | 26       | 28       | 23       | 15   | 25    | 34   | 33   | 22   | 6    | 355  | 10   | 328  | 305  | 285  | N    | N    | N    | 257  | 295  | N    | N    | N                              | 18              | 25            |
| 25 Spd                                                                                                                                                               | N                             | N       | N        | N        | N        | 3    | 4     | 5    | 2    | 2    | 2    | 2    | 2    | 3    | 5    | 3    | 4    | 8    | 12   | 7    | 7    | 5    | 4    | 9                              | 4.4             | 11.6          |
| Dir                                                                                                                                                                  | N                             | N       | N        | N        | N        | 70   | 112   | 121  | 107  | 90   | 93   | 86   | 85   | 87   | 108  | 101  | 98   | 103  | 106  | 95   | 88   | 83   | 81   | 125                            | 100             | 106           |
| 26 Spd                                                                                                                                                               | 21                            | 19      | 20       | 21       | 23       | 22   | 21    | 20   | 19   | 19   | 19   | 18   | 20   | 19   | 11   | 16   | 14   | 6    | 10   | 7    | 19   | 21   | 17   | 21                             | 16.5            | 23.3          |
| Dir                                                                                                                                                                  | 161                           | 162     | 162      | 160      | 163      | 161  | 163   | 160  | 157  | 159  | 156  | 157  | 161  | 159  | 139  | 143  | 145  | 73   | 50   | 71   | 156  | 162  | 156  | 163                            | 155             | 163           |
| 27 Spd                                                                                                                                                               | 21                            | 22      | 18       | 20       | 19       | 20   | 21    | 23   | 21   | 20   | 24   | 34   | 31   | 33   | 31   | 30   | 31   | 31   | 26   | 27   | 26   | 24   | 22   | 20                             | 22.9            | 33.8          |
| Dir                                                                                                                                                                  | 168                           | 174     | 172      | 174      | 170      | 172  | 178   | 198  | 201  | 196  | 211  | 221  | 228  | 229  | 227  | 229  | 228  | 227  | 225  | 224  | 228  | 227  | 224  | 223                            | 211             | 221           |
| 28 Spd                                                                                                                                                               | 15                            | 15      | 28       | 23       | 18       | 12   | 12    | 15   | 11   | 12   | 18   | 22   | 24   | 24   | 20   | 20   | 19   | 19   | 18   | 21   | 17   | 15   | 16   | 14                             | 17.1            | 28.4          |
| Dir                                                                                                                                                                  | 224                           | 246     | 254      | 261      | 263      | 243  | 216   | 221  | 218  | 210  | 216  | 224  | 228  | 228  | 227  | 219  | 223  | 220  | 217  | 220  | 210  | 206  | 210  | 190                            | 226             | 254           |
| 29 Spd                                                                                                                                                               | 14                            | 14      | 14       | 13       | 12       | 14   | 15    | 15   | 14   | 14   | 15   | 15   | 8    | 5    | 6    | 5    | 5    | 4    | 3    | 2    | 1    | 2    | 3    | 7                              | 7.4             | 15.3          |
| Dir                                                                                                                                                                  | 187                           | 189     | 185      | 188      | 187      | 181  | 171   | 161  | 157  | 157  | 160  | 164  | 151  | 87   | 88   | 99   | 61   | 64   | 70   | 91   | 34   | 61   | 206  | 232                            | 165             | 164           |
| 30 Spd                                                                                                                                                               | 8                             | 4       | 6        | 9        | 10       | 11   | 13    | 12   | 7    | 14   | 16   | 14   | 13   | 14   | 14   | 14   | 17   | 14   | 13   | 21   | 22   | 16   | 18   | 15                             | 11.8            | 22.0          |
| Dir                                                                                                                                                                  | 214                           | 202     | 189      | 190      | 202      | 194  | 214   | 213  | 184  | 176  | 185  | 190  | 193  | 201  | 208  | 201  | 208  | 223  | 232  | 247  | 249  | 250  | 253  | 261                            | 216             | 249           |
| 31 Spd                                                                                                                                                               | 18                            | 23      | 27       | 20       | 16       | 14   | 10    | 4    | 3    | 2    | 8    | 10   | 11   | 12   | 12   | 12   | 15   | 12   | 7    | 7    | 10   | 8    | 11   | 13                             | 9.1             | 27.2          |
| Dir                                                                                                                                                                  | 258                           | 254     | 253      | 258      | 278      | 281  | 294   | 298  | 273  | 322  | 347  | 6    | 351  | 349  | 346  | 340  | 347  | 353  | 347  | 294  | 310  | 300  | 297  | 262                            | 298             | 253           |
| Spd                                                                                                                                                                  | 11.0                          | 10.7    | 10.9     | 10.0     | 9.5      | 8.1  | 8.0   | 8.9  | 9.3  | 9.3  | 9.6  | 10.1 | 10.3 | 9.5  | 8.3  | 8.1  | 8.3  | 7.6  | 7.9  | 8.9  | 9.0  | 9.7  | 10.0 | 10.5                           | Diurnal Average |               |
| Dir                                                                                                                                                                  | 209                           | 212     | 213      | 213      | 219      | 214  | 217   | 218  | 219  | 214  | 221  | 226  | 232  | 238  | 239  | 231  | 229  | 226  | 223  | 225  | 224  | 219  | 220  | 216                            | Diurnal Maximum |               |
| Spd                                                                                                                                                                  | 25.4                          | 28.5    | 29.8     | 25.4     | 27.0     | 23.6 | 35.6  | 39.5 | 39.9 | 42.6 | 39.4 | 38.8 | 37.5 | 33.9 | 31.2 | 29.8 | 31.5 | 30.9 | 27.8 | 27.2 | 32.5 | 35.1 | 25.1 | 28.9                           | Diurnal Maximum |               |
| Dir                                                                                                                                                                  | 215                           | 222     | 222      | 216      | 261      | 274  | 216   | 225  | 228  | 224  | 219  | 248  | 254  | 240  | 227  | 229  | 228  | 227  | 238  | 224  | 230  | 227  | 257  | 256                            |                 |               |
| Maximum Speed Value: 43 km/h on Dec 21 10:00                                                                                                                         |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours in Service: 744          |                 |               |
| Maximum Daily Speed Average: 25.3 km/h on Dec 19                                                                                                                     |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours of Data: 703             |                 |               |
| Maximum Diurnal Speed Average: 11.0 km/h at hour 1                                                                                                                   |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Hours of Missing Data: 41      |                 |               |
| Minimum Speed Value: 0 km/h on Dec 15 04:00                                                                                                                          |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Minimum Daily Speed Average: 2.4 km/h on Dec 23                                                                                                                      |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Minimum Diurnal Speed Average: 7.6 km/h at hour 18                                                                                                                   |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Monthly Average Velocity: 9.20 km/h 221.5 deg                                                                                                                        |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Percent Operational Time: 94.5 |                 |               |
| Speed Percentiles: P <sub>1</sub> = 0.9 P <sub>10</sub> = 2.5 Q <sub>1</sub> = 6.0 Median = 12.7 Q <sub>3</sub> = 19.3 P <sub>90</sub> = 24.1 P <sub>99</sub> = 37.1 |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| All monthly, daily, and diurnal averages have been calculated using vector methods                                                                                   |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| N - Not Valid                                                                                                                                                        |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Frequency Distribution                                                                                                                                               |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Speed Range (km/h)                                                                                                                                                   |                               |         |          |          |          |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Direction                                                                                                                                                            | 0 to 5                        | 5 to 11 | 11 to 19 | 19 to 28 | 28 to 38 | > 38 | Total |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| North                                                                                                                                                                | 12                            | 6       | 9        | 0        | 0        | 0    | 27    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| NorthEast                                                                                                                                                            | 35                            | 15      | 1        | 0        | 0        | 0    | 51    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| East                                                                                                                                                                 | 23                            | 23      | 1        | 0        | 0        | 0    | 47    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| SouthEast                                                                                                                                                            | 4                             | 6       | 17       | 3        | 0        | 0    | 30    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| South                                                                                                                                                                | 10                            | 49      | 67       | 39       | 0        | 0    | 165   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| SouthWest                                                                                                                                                            | 19                            | 28      | 51       | 70       | 20       | 5    | 193   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| West                                                                                                                                                                 | 28                            | 28      | 56       | 34       | 11       | 1    | 158   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| NorthWest                                                                                                                                                            | 16                            | 7       | 9        | 0        | 0        | 0    | 32    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |
| Total                                                                                                                                                                | 147                           | 162     | 211      | 146      | 31       | 6    | 703   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                |                 |               |

## Wind Rose

Wind Speed (WS) (km/h)  
Donnelly - December 2016



# Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

Donnelly - December 2016

| Maximum Speed: 43 km/h on Dec 21 10:00                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Speed Average: 27.1 km/h on Dec 19                                                                                                               |    |    |    |    |                 |               |  |  |  | Hours in Service: 744          |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|--|--|--|--------------------------------|--|
| Minimum Speed: 0 km/h on Dec 15 04:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Speed Average: 3.4 km/h on Dec 23                                                                                                                |    |    |    |    |                 |               |  |  |  | Hours of Data: 703             |  |
| Maximum Diurnal Speed Average: 15.1 km/h at hour 3                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Speed Average: 11.9 km/h at hour 18                                                                                                            |    |    |    |    |                 |               |  |  |  | Hours of Missing Data: 41      |  |
| Monthly Average Speed: 13.38 km/h                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 1.0 P <sub>10</sub> = 2.7 Q <sub>1</sub> = 6.1 Median = 12.8 Q <sub>3</sub> = 19.4 P <sub>90</sub> = 24.1 P <sub>99</sub> = 37.1 |    |    |    |    |                 |               |  |  |  | Percent Operational Time: 94.5 |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |    | Daily Average   | Daily Maximum |  |  |  |                                |  |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                             | 21 | 22 | 23 | 24 |                 |               |  |  |  |                                |  |
| 1-Dec                                                                                                                   | 20                            | 16 | 13 | 13 | 10 | 12 | 10 | 9  | 5  | 5  | 6  | 7  | 6  | 2  | 1  | 2  | 4  | 7  | 9  | 10                                                                                                                                                             | 13 | 13 | 15 | 18 | 9.4             | 20.2          |  |  |  |                                |  |
| 2-Dec                                                                                                                   | 18                            | 16 | 19 | 19 | 18 | 13 | 7  | 9  | 9  | 9  | 8  | 15 | 22 | 18 | 20 | 21 | 22 | 16 | 10 | 13                                                                                                                                                             | 12 | 19 | 18 | 19 | 15.4            | 22.1          |  |  |  |                                |  |
| 3-Dec                                                                                                                   | 21                            | 22 | 20 | 20 | 19 | 17 | 25 | 27 | 28 | 27 | 26 | 25 | 25 | 26 | 24 | 25 | 23 | 24 | 22 | 22                                                                                                                                                             | 22 | 23 | 23 | 22 | 23.1            | 27.7          |  |  |  |                                |  |
| 4-Dec                                                                                                                   | 19                            | 17 | 17 | 17 | 25 | 21 | 16 | 17 | 17 | 17 | 15 | 14 | 16 | 17 | 17 | 16 | 18 | 20 | 20 | 18                                                                                                                                                             | 16 | 15 | 16 | 15 | 17.3            | 24.7          |  |  |  |                                |  |
| 5-Dec                                                                                                                   | 20                            | 19 | 18 | 17 | 16 | 15 | 14 | 15 | 14 | 15 | 15 | 16 | 17 | 16 | 15 | 13 | 13 | 10 | 10 | 9                                                                                                                                                              | 9  | 9  | 10 | 12 | 14.1            | 19.9          |  |  |  |                                |  |
| 6-Dec                                                                                                                   | 13                            | 12 | 12 | 10 | 10 | 11 | 12 | 12 | 12 | 10 | 5  | 10 | 14 | 12 | 9  | 7  | 8  | 6  | 8  | 7                                                                                                                                                              | 8  | 9  | 11 | 10 | 10.0            | 14.1          |  |  |  |                                |  |
| 7-Dec                                                                                                                   | 8                             | 6  | 5  | 4  | 3  | 3  | 3  | 3  | 2  | 2  | 4  | 5  | 5  | 5  | 4  | 2  | 1  | 2  | N  | N                                                                                                                                                              | N  | N  | N  | N  | 3.6             | 7.9           |  |  |  |                                |  |
| 8-Dec                                                                                                                   | N                             | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | 1  | 2  | 4  | 3  | 4  | 2  | 1                                                                                                                                                              | 2  | 1  | 2  | 3  | --              | 3.8           |  |  |  |                                |  |
| 9-Dec                                                                                                                   | 4                             | 4  | 5  | 7  | 6  | 7  | 7  | 7  | 6  | 6  | 6  | 7  | 8  | 7  | 5  | 4  | 4  | 3  | 3  | 1                                                                                                                                                              | 2  | 1  | 2  | 2  | 4.8             | 8.2           |  |  |  |                                |  |
| 10-Dec                                                                                                                  | 2                             | 2  | 6  | 2  | 7  | 7  | 6  | 8  | 8  | 6  | 5  | 6  | 7  | 6  | 7  | 9  | 12 | 16 | 16 | 14                                                                                                                                                             | 12 | 13 | 11 | 13 | 8.5             | 16.0          |  |  |  |                                |  |
| 11-Dec                                                                                                                  | 14                            | 15 | 14 | 16 | 14 | 14 | 15 | 16 | 18 | 15 | 19 | 18 | 18 | 20 | 21 | 23 | 24 | 23 | 28 | 27                                                                                                                                                             | 30 | 22 | 24 | 29 | 19.8            | 29.7          |  |  |  |                                |  |
| 12-Dec                                                                                                                  | 25                            | 24 | 23 | 24 | 27 | 24 | 23 | 18 | 17 | 17 | 17 | 20 | 23 | 32 | 30 | 29 | 30 | 26 | 23 | 22                                                                                                                                                             | 20 | 20 | 25 | 22 | 23.4            | 32.5          |  |  |  |                                |  |
| 13-Dec                                                                                                                  | 20                            | 23 | 23 | 18 | 19 | 16 | 16 | 19 | 17 | 12 | 15 | 17 | 19 | 22 | 19 | 14 | 9  | 8  | 9  | 10                                                                                                                                                             | 9  | 9  | 9  | 9  | 15.0            | 23.1          |  |  |  |                                |  |
| 14-Dec                                                                                                                  | 9                             | 10 | 13 | 7  | 9  | 10 | 7  | 10 | 12 | 10 | 10 | 11 | 11 | 9  | 7  | 6  | 2  | 1  | 2  | 2                                                                                                                                                              | 3  | 5  | 3  | 4  | 7.2             | 12.9          |  |  |  |                                |  |
| 15-Dec                                                                                                                  | 3                             | 2  | 2  | 0  | 1  | 2  | 2  | 3  | 3  | 4  | 6  | 4  | 6  | 6  | 2  | 1  | 3  | 7  | 7  | 6                                                                                                                                                              | 6  | 8  | 9  | 8  | 4.3             | 9.3           |  |  |  |                                |  |
| 16-Dec                                                                                                                  | 6                             | 9  | 7  | 6  | 7  | 9  | 7  | 6  | 6  | 6  | 5  | 3  | 2  | 4  | 2  | 3  | 2  | 3  | 3  | N                                                                                                                                                              | N  | N  | N  | N  | 5.1             | 9.0           |  |  |  |                                |  |
| 17-Dec                                                                                                                  | N                             | N  | 5  | 6  | 4  | 5  | 4  | N  | N  | N  | N  | 1  | 2  | 1  | 3  | 6  | 11 | 16 | 16 | 14                                                                                                                                                             | 12 | 12 | 11 | 11 | 7.7             | 16.1          |  |  |  |                                |  |
| 18-Dec                                                                                                                  | 12                            | 14 | 15 | 16 | 17 | 19 | 22 | 26 | 23 | 22 | 32 | 36 | 33 | 34 | 30 | 27 | 17 | 16 | 13 | 26                                                                                                                                                             | 33 | 35 | 23 | 21 | 23.4            | 35.7          |  |  |  |                                |  |
| 19-Dec                                                                                                                  | 23                            | 22 | 20 | 17 | 19 | 22 | 36 | 40 | 40 | 37 | 37 | 39 | 38 | 32 | 29 | 19 | 20 | 24 | 23 | 24                                                                                                                                                             | 21 | 22 | 22 | 23 | 27.1            | 40.0          |  |  |  |                                |  |
| 20-Dec                                                                                                                  | 26                            | 29 | 30 | 22 | 17 | 16 | 15 | 16 | 16 | 15 | 13 | 15 | 14 | 14 | 13 | 13 | 12 | 9  | 17 | 16                                                                                                                                                             | 19 | 22 | 23 | 25 | 17.8            | 29.8          |  |  |  |                                |  |
| 21-Dec                                                                                                                  | 24                            | 21 | 24 | 25 | 23 | 16 | 20 | 25 | 38 | 43 | 39 | 39 | 35 | 25 | 15 | 19 | 19 | 15 | 17 | 13                                                                                                                                                             | 13 | 14 | 17 | 19 | 23.2            | 42.6          |  |  |  |                                |  |
| 22-Dec                                                                                                                  | 20                            | 20 | 21 | 24 | 9  | 7  | 10 | 6  | 11 | 9  | 5  | 7  | 4  | 3  | 4  | 3  | 2  | 2  | 1  | 6                                                                                                                                                              | 6  | 5  | 1  | 3  | 7.9             | 23.9          |  |  |  |                                |  |
| 23-Dec                                                                                                                  | 3                             | 5  | 3  | 3  | 5  | 1  | 1  | 2  | 3  | 3  | 2  | 4  | 1  | 4  | 2  | 2  | 2  | 6  | 3  | 3                                                                                                                                                              | 5  | 8  | 6  | 5  | 3.4             | 7.9           |  |  |  |                                |  |
| 24-Dec                                                                                                                  | 9                             | 11 | 11 | 10 | 10 | 10 | 12 | 9  | 6  | 3  | 2  | 4  | 3  | 2  | 3  | 2  | N  | N  | N  | 1                                                                                                                                                              | 1  | N  | N  | N  | 6.2             | 12.0          |  |  |  |                                |  |
| 25-Dec                                                                                                                  | N                             | N  | N  | N  | N  | 3  | 4  | 5  | 2  | 2  | 2  | 2  | 2  | 3  | 5  | 3  | 4  | 8  | 12 | 7                                                                                                                                                              | 7  | 6  | 5  | 10 | 4.7             | 11.6          |  |  |  |                                |  |
| 26-Dec                                                                                                                  | 22                            | 19 | 20 | 21 | 23 | 22 | 21 | 20 | 19 | 19 | 19 | 18 | 20 | 19 | 11 | 16 | 14 | 6  | 10 | 7                                                                                                                                                              | 19 | 21 | 17 | 21 | 17.7            | 23.3          |  |  |  |                                |  |
| 27-Dec                                                                                                                  | 22                            | 22 | 18 | 20 | 19 | 20 | 21 | 23 | 21 | 20 | 24 | 34 | 32 | 33 | 31 | 30 | 32 | 31 | 26 | 27                                                                                                                                                             | 26 | 24 | 22 | 20 | 24.9            | 33.9          |  |  |  |                                |  |
| 28-Dec                                                                                                                  | 15                            | 15 | 29 | 23 | 18 | 12 | 12 | 15 | 12 | 12 | 18 | 22 | 24 | 24 | 20 | 20 | 19 | 19 | 18 | 21                                                                                                                                                             | 17 | 15 | 16 | 14 | 18.0            | 28.6          |  |  |  |                                |  |
| 29-Dec                                                                                                                  | 14                            | 14 | 14 | 14 | 12 | 15 | 15 | 15 | 14 | 14 | 15 | 15 | 9  | 5  | 6  | 5  | 7  | 5  | 3  | 2                                                                                                                                                              | 2  | 3  | 4  | 7  | 9.5             | 15.3          |  |  |  |                                |  |
| 30-Dec                                                                                                                  | 9                             | 4  | 6  | 9  | 10 | 11 | 13 | 12 | 7  | 14 | 16 | 14 | 13 | 14 | 14 | 15 | 17 | 14 | 13 | 21                                                                                                                                                             | 22 | 17 | 18 | 15 | 13.2            | 22.0          |  |  |  |                                |  |
| 31-Dec                                                                                                                  | 18                            | 23 | 27 | 20 | 16 | 14 | 10 | 5  | 3  | 2  | 8  | 10 | 11 | 12 | 12 | 12 | 15 | 12 | 8  | 7                                                                                                                                                              | 10 | 8  | 11 | 13 | 12.0            | 27.2          |  |  |  |                                |  |
| 14.9 14.8 15.1 14.0 13.6 12.4 12.9 13.7 13.3 13.0 13.6 14.6 14.7 13.8 12.4 12.0 12.3 11.9 12.1 12.3 13.0 13.4 13.3 14.1 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |    | Diurnal Average |               |  |  |  |                                |  |
| 25.6 28.6 29.8 25.5 27.1 23.7 35.9 39.5 40.0 42.6 39.5 38.9 37.6 33.9 31.3 29.9 31.5 30.9 27.8 27.3 32.6 35.2 25.2 28.9 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |    | Diurnal Maximum |               |  |  |  |                                |  |
| N - Not Valid                                                                                                           |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |    |                 |               |  |  |  |                                |  |
| All monthly, daily, and diurnal averages have been calculated using scalar methods                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                |    |    |    |    |                 |               |  |  |  |                                |  |

# Hourly Standard Deviations

Wind Direction (WD) - deg

Donnelly - December 2016

| Maximum Value: 90.5 deg on Dec 17 13:00                                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |    |    |    |    |    |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|----|----|----|----|----|---------------|
| Minimum Value: 1.1 deg on Dec 29 05:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 703             |    |    |    |    |    |               |
|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 41      |    |    |    |    |    |               |
| Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.8 Q <sub>1</sub> = 3.7 Median = 5.6 Q <sub>3</sub> = 10.7 P <sub>90</sub> = 19.8 P <sub>99</sub> = 61.8 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0        |    |    |    |    |    |               |
|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 94.5 |    |    |    |    |    |               |
| Day                                                                                                                                                           | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    | Daily Maximum |
|                                                                                                                                                               | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                             | 20 | 21 | 22 | 23 | 24 |               |
| 1-Dec                                                                                                                                                         | 3                             | 6  | 13 | 16 | 6  | 5  | 8  | 5  | 17 | 26 | 18 | 12 | 18 | 45 | 87 | 20 | 13 | 4  | 7                              | 7  | 3  | 5  | 3  | 3  | 87.1          |
| 2-Dec                                                                                                                                                         | 4                             | 5  | 4  | 3  | 4  | 16 | 12 | 11 | 10 | 7  | 21 | 30 | 8  | 9  | 6  | 5  | 6  | 8  | 42                             | 7  | 7  | 4  | 2  | 3  | 41.8          |
| 3-Dec                                                                                                                                                         | 3                             | 2  | 3  | 2  | 2  | 7  | 5  | 3  | 3  | 3  | 4  | 4  | 4  | 4  | 4  | 3  | 3  | 3  | 2                              | 2  | 2  | 3  | 3  | 4  | 7.2           |
| 4-Dec                                                                                                                                                         | 4                             | 3  | 2  | 7  | 5  | 10 | 17 | 7  | 7  | 7  | 6  | 7  | 6  | 5  | 7  | 4  | 5  | 4  | 4                              | 4  | 7  | 5  | 4  | 8  | 17.0          |
| 5-Dec                                                                                                                                                         | 4                             | 4  | 4  | 5  | 4  | 3  | 3  | 5  | 5  | 5  | 4  | 5  | 5  | 5  | 4  | 5  | 6  | 3  | 3                              | 3  | 4  | 3  | 3  | 4  | 5.6           |
| 6-Dec                                                                                                                                                         | 4                             | 5  | 6  | 3  | 5  | 4  | 4  | 5  | 4  | 5  | 9  | 6  | 5  | 6  | 7  | 7  | 12 | 4  | 2                              | 4  | 7  | 9  | 6  | 4  | 11.6          |
| 7-Dec                                                                                                                                                         | 5                             | 5  | 6  | 20 | 10 | 15 | 13 | 14 | 18 | 17 | 9  | 14 | 12 | 16 | 12 | 29 | 13 | 10 | N                              | N  | N  | N  | N  | N  | 28.9          |
| 8-Dec                                                                                                                                                         | N                             | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | 33 | 7  | 5  | 10 | 8  | 14                             | 22 | 16 | 6  | 64 | 13 | 64.2          |
| 9-Dec                                                                                                                                                         | 8                             | 8  | 6  | 5  | 5  | 5  | 5  | 5  | 6  | 6  | 6  | 6  | 6  | 11 | 12 | 9  | 6  | 13 | 33                             | 50 | 21 | 11 | 8  | 7  | 49.9          |
| 10-Dec                                                                                                                                                        | 9                             | 75 | 6  | 8  | 6  | 4  | 4  | 4  | 6  | 10 | 11 | 8  | 12 | 12 | 10 | 8  | 8  | 5  | 5                              | 4  | 4  | 6  | 3  | 7  | 75.1          |
| 11-Dec                                                                                                                                                        | 4                             | 3  | 4  | 5  | 5  | 3  | 9  | 5  | 10 | 10 | 3  | 6  | 7  | 5  | 4  | 8  | 3  | 4  | 3                              | 7  | 3  | 3  | 5  | 4  | 10.2          |
| 12-Dec                                                                                                                                                        | 2                             | 2  | 4  | 5  | 5  | 4  | 3  | 3  | 6  | 8  | 4  | 4  | 5  | 3  | 3  | 5  | 3  | 3  | 4                              | 6  | 3  | 4  | 4  | 8  | 8.0           |
| 13-Dec                                                                                                                                                        | 5                             | 3  | 4  | 3  | 4  | 6  | 2  | 4  | 4  | 6  | 5  | 4  | 4  | 3  | 4  | 3  | 2  | 9  | 5                              | 2  | 11 | 5  | 2  | 8  | 11.0          |
| 14-Dec                                                                                                                                                        | 2                             | 5  | 3  | 13 | 3  | 6  | 24 | 5  | 3  | 3  | 4  | 11 | 5  | 6  | 8  | 6  | 15 | 24 | 20                             | 26 | 11 | 8  | 18 | 9  | 26.1          |
| 15-Dec                                                                                                                                                        | 14                            | 21 | 19 | 14 | 20 | 18 | 14 | 16 | 28 | 20 | 12 | 7  | 23 | 14 | 17 | 44 | 15 | 8  | 13                             | 16 | 12 | 5  | 2  | 4  | 44.4          |
| 16-Dec                                                                                                                                                        | 5                             | 3  | 6  | 10 | 6  | 6  | 3  | 6  | 6  | 4  | 8  | 15 | 44 | 77 | 54 | 24 | 43 | 15 | 11                             | N  | N  | N  | N  | N  | 77.3          |
| 17-Dec                                                                                                                                                        | N                             | N  | 7  | 5  | 10 | 4  | 6  | N  | N  | N  | N  | 39 | 91 | 79 | 15 | 9  | 6  | 4  | 8                              | 6  | 6  | 9  | 5  | 6  | 90.5          |
| 18-Dec                                                                                                                                                        | 3                             | 5  | 2  | 4  | 3  | 5  | 3  | 3  | 3  | 3  | 5  | 3  | 5  | 3  | 6  | 3  | 4  | 5  | 13                             | 6  | 4  | 5  | 5  | 7  | 13.5          |
| 19-Dec                                                                                                                                                        | 3                             | 7  | 7  | 7  | 2  | 3  | 8  | 3  | 3  | 3  | 3  | 4  | 3  | 3  | 4  | 5  | 6  | 9  | 6                              | 5  | 3  | 3  | 2  | 4  | 8.7           |
| 20-Dec                                                                                                                                                        | 6                             | 3  | 3  | 9  | 4  | 4  | 7  | 2  | 6  | 5  | 7  | 4  | 3  | 4  | 4  | 3  | 4  | 5  | 4                              | 5  | 3  | 8  | 4  | 8  | 9.2           |
| 21-Dec                                                                                                                                                        | 3                             | 4  | 4  | 5  | 9  | 7  | 9  | 6  | 4  | 3  | 4  | 4  | 3  | 5  | 7  | 8  | 4  | 5  | 15                             | 4  | 4  | 3  | 2  | 4  | 15.0          |
| 22-Dec                                                                                                                                                        | 5                             | 3  | 6  | 9  | 20 | 21 | 6  | 8  | 7  | 13 | 13 | 11 | 13 | 34 | 16 | 30 | 30 | 19 | 34                             | 11 | 11 | 17 | 33 | 13 | 33.9          |
| 23-Dec                                                                                                                                                        | 24                            | 12 | 11 | 66 | 29 | 43 | 78 | 29 | 46 | 15 | 50 | 14 | 47 | 31 | 20 | 24 | 46 | 14 | 25                             | 23 | 10 | 6  | 12 | 14 | 78.1          |
| 24-Dec                                                                                                                                                        | 5                             | 4  | 4  | 5  | 5  | 6  | 5  | 7  | 9  | 25 | 66 | 13 | 21 | 13 | 12 | 25 | N  | N  | N                              | 34 | 16 | N  | N  | N  | 66.4          |
| 25-Dec                                                                                                                                                        | N                             | N  | N  | N  | N  | 15 | 18 | 8  | 28 | 30 | 14 | 11 | 10 | 17 | 14 | 11 | 6  | 7  | 3                              | 7  | 4  | 14 | 30 | 20 | 30.5          |
| 26-Dec                                                                                                                                                        | 4                             | 5  | 3  | 4  | 2  | 3  | 4  | 4  | 5  | 4  | 4  | 5  | 5  | 5  | 10 | 7  | 16 | 17 | 7                              | 17 | 13 | 4  | 5  | 4  | 17.1          |
| 27-Dec                                                                                                                                                        | 4                             | 3  | 2  | 2  | 3  | 3  | 5  | 5  | 3  | 3  | 6  | 3  | 3  | 3  | 3  | 2  | 2  | 2  | 3                              | 3  | 3  | 3  | 5  | 7  | 7.3           |
| 28-Dec                                                                                                                                                        | 12                            | 10 | 8  | 4  | 6  | 10 | 10 | 6  | 11 | 6  | 4  | 3  | 2  | 2  | 3  | 3  | 3  | 2  | 2                              | 3  | 7  | 7  | 6  | 3  | 12.2          |
| 29-Dec                                                                                                                                                        | 3                             | 4  | 3  | 2  | 1  | 4  | 8  | 3  | 3  | 3  | 4  | 3  | 43 | 13 | 6  | 31 | 49 | 23 | 26                             | 61 | 56 | 56 | 56 | 8  | 61.4          |
| 30-Dec                                                                                                                                                        | 13                            | 12 | 14 | 5  | 9  | 3  | 11 | 15 | 8  | 2  | 5  | 3  | 5  | 6  | 3  | 4  | 6  | 7  | 3                              | 7  | 3  | 10 | 6  | 6  | 14.9          |
| 31-Dec                                                                                                                                                        | 4                             | 4  | 3  | 8  | 5  | 8  | 4  | 9  | 25 | 18 | 13 | 7  | 9  | 5  | 5  | 7  | 10 | 8  | 14                             | 10 | 17 | 11 | 11 | 10 | 24.7          |
| 23.5 75.1 18.8 66.4 28.8 42.8 78.1 29.1 46.3 30.5 66.4 39.4 90.5 78.7 87.1 44.4 48.8 23.7 41.8 61.4 56.0 55.8 64.2 19.7                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |               |
| N - Not Valid                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |               |

PAZA

Portable – Rycroft Station

Monthly Summary Tables, Graphs and  
Roses

# Hourly Averages

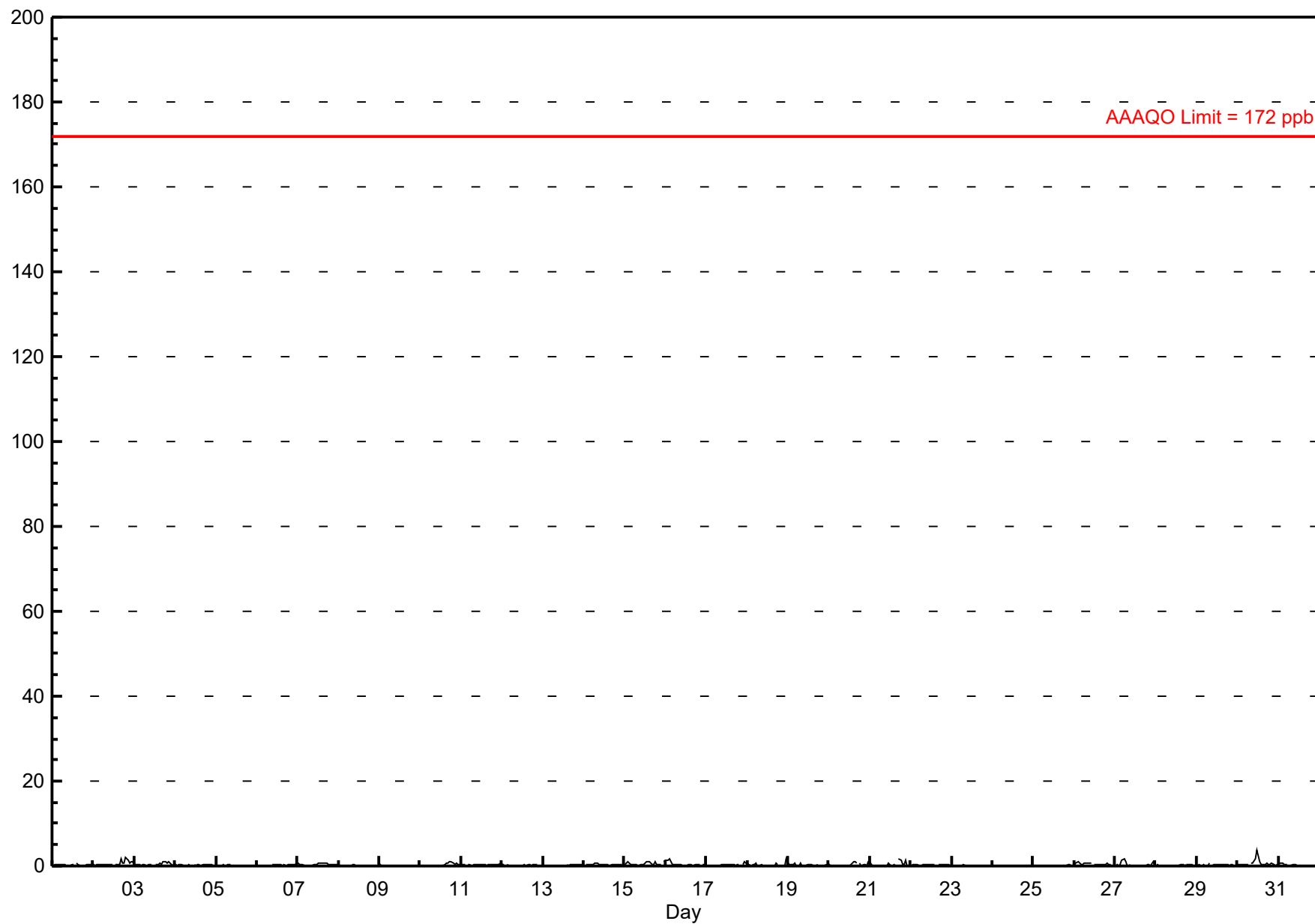
## Sulphur Dioxide (SO<sub>2</sub>) - ppb Portable Rycroft - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 3.7 ppb on Dec 30 12:00 Maximum Daily Average: 0.7 ppb on Dec 30 |                               |   |   |   |   |   |   |   |   |    |    |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 705<br>Hours of Missing Data: 39<br>Hours of Calibration: 34<br>Percent Operational Time: 99.3 |               |               |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 0 ppb on Dec 5 13:00<br>Maximum Diurnal Average: 0.4 ppb at hour 24<br>Monthly Average: 0.27 ppb                    |                               |   |   |   |   |   |   |   |   |    |    | Minimum Daily Average: 0.0 ppb on Dec 24<br>Minimum Diurnal Average: 0.2 ppb at hour 7<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.6 |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |
| Day                                                                                                                                | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |   |    |    |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        | Daily Average | Daily Maximum |
|                                                                                                                                    | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12                                                                                                                                                                                                                                                   | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                                                                                                                                     |               |               |
| 1-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | A  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.8           |
| 2-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | A  | 0  | 0  | 2  | 1  | 1  | 2  | 1  | 1  | 1  | 1                                                                                                                                      | 0.6           | 2.1           |
| 3-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 0                                                                                                                                      | 0.4           | 1.1           |
| 4-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.4           |
| 5-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.4           |
| 6-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                      | 0.2           | 0.6           |
| 7-Dec                                                                                                                              | 1                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0 | 0  | 1  | 0                                                                                                                                                                                                                                                    | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.4           | 0.7           |
| 8-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.3           |
| 9-Dec                                                                                                                              | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.2           |
| 10-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 0  | 0                                                                                                                                      | 0.3           | 1.1           |
| 11-Dec                                                                                                                             | 0                             | 0 | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1                                                                                                                                      | 0.3           | 0.7           |
| 12-Dec                                                                                                                             | 0                             | 0 | A | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | P  | P  | P                                                                                                                                      | 0.2           | 0.5           |
| 13-Dec                                                                                                                             | P                             | P | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | C                                                                                                                                                                                                                                                    | C  | C  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.5           |
| 14-Dec                                                                                                                             | A                             | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A                                                                                                                                      | 0.4           | 0.6           |
| 15-Dec                                                                                                                             | 0                             | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | A  | 1                                                                                                                                      | 0.5           | 1.2           |
| 16-Dec                                                                                                                             | 1                             | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0                                                                                                                                      | 0.4           | 1.7           |
| 17-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 1  | 1                                                                                                                                      | 0.2           | 0.9           |
| 18-Dec                                                                                                                             | 1                             | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 1  | 0  | A  | 0  | 0  | 0  | 2                                                                                                                                      | 0.3           | 1.6           |
| 19-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.8           |
| 20-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 1  | 1  | 1  | 1  | A  | 1  | 0  | 0  | 0  | 0  | 1                                                                                                                                      | 0.3           | 1.1           |
| 21-Dec                                                                                                                             | 1                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | A  | 2  | 1  | 0  | 0  | 1  | 0  | 0                                                                                                                                      | 0.3           | 1.6           |
| 22-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.3           | 0.5           |
| 23-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.2           |
| 24-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.0           | 0.1           |
| 25-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.4           |
| 26-Dec                                                                                                                             | 0                             | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1  | A  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0                                                                                                                                      | 0.5           | 0.9           |
| 27-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0  | A  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0                                                                                                                                      | 0.3           | 1.6           |
| 28-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.3           |
| 29-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 1 | A | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.2           | 0.7           |
| 30-Dec                                                                                                                             | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 1 | 1  | 2  | 4                                                                                                                                                                                                                                                    | 2  | 1  | 0  | 0  | 0  | 1  | 0  | 0  | 1  | 0  | 0  | 1                                                                                                                                      | 0.7           | 3.7           |
| 31-Dec                                                                                                                             | 0                             | 1 | 1 | 0 | 0 | 0 | A | 0 | 0 | 0  | 0  | 0                                                                                                                                                                                                                                                    | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0.1           | 0.7           |
| 0.3 0.3 0.3 0.2 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4                                    |                               |   |   |   |   |   |   |   |   |    |    |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                        |               |               |
| 1.4 1.2 1.7 0.9 1.4 1.6 1.0 0.8 0.6 0.8 1.6 3.7 2.3 1.2 1.1 1.0 1.7 1.6 1.2 2.1 1.2 1.2 1.0 1.6                                    |                               |   |   |   |   |   |   |   |   |    |    |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                        |               |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                    |                               |   |   |   |   |   |   |   |   |    |    |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb 30-day 11 ppb                                            |                               |   |   |   |   |   |   |   |   |    |    |                                                                                                                                                                                                                                                      |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |               |               |



## Hourly Averages

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Portable Rycroft - December 2016**



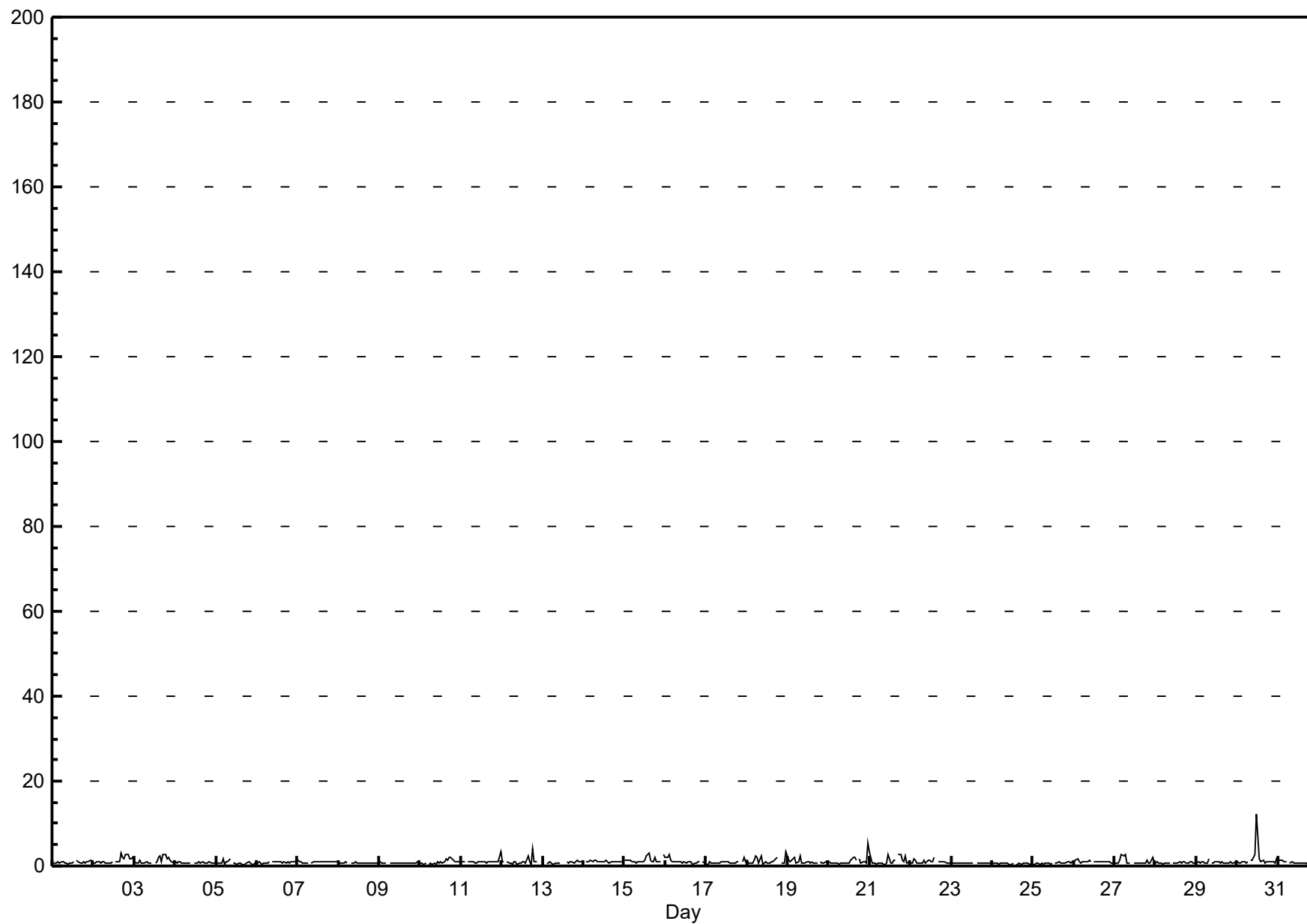
# Hourly Maximums

## Sulphur Dioxide (SO<sub>2</sub>) - ppb Portable Rycroft - December 2016

| Maximum Value: 12.2 ppb on Dec 30 12:00     |                               |                   |     |     |     |     |     |                               |     |     |     |     |      |     |     |     |     |     | Maximum Daily Average: 1.9 ppb on Dec 30                                                                                                                   |     |     |     |     |     |                 | Hours in Service: 744          |     |
|---------------------------------------------|-------------------------------|-------------------|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----------------|--------------------------------|-----|
| Minimum Value: 0 ppb on Dec 31 19:00        |                               |                   |     |     |     |     |     |                               |     |     |     |     |      |     |     |     |     |     | Minimum Daily Average: 0.6 ppb on Dec 24                                                                                                                   |     |     |     |     |     |                 | Hours of Data: 705             |     |
| Maximum Diurnal Average: 1.3 ppb at hour 12 |                               |                   |     |     |     |     |     |                               |     |     |     |     |      |     |     |     |     |     | Minimum Diurnal Average: 0.7 ppb at hour 10                                                                                                                |     |     |     |     |     |                 | Hours of Missing Data: 39      |     |
| Monthly Average: 0.96 ppb                   |                               |                   |     |     |     |     |     |                               |     |     |     |     |      |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.6 Median = 0.8 Q <sub>3</sub> = 1.0 P <sub>90</sub> = 1.4 P <sub>99</sub> = 3.3 |     |     |     |     |     |                 | Hours of Calibration: 34       |     |
|                                             |                               |                   |     |     |     |     |     |                               |     |     |     |     |      |     |     |     |     |     |                                                                                                                                                            |     |     |     |     |     |                 | Percent Operational Time: 99.3 |     |
| Day                                         | Hourly Period Ending At (MST) |                   |     |     |     |     |     |                               |     |     |     |     |      |     |     |     |     |     |                                                                                                                                                            |     |     |     |     |     | Daily Average   | Daily Maximum                  |     |
|                                             | 1                             | 2                 | 3   | 4   | 5   | 6   | 7   | 8                             | 9   | 10  | 11  | 12  | 13   | 14  | 15  | 16  | 17  | 18  | 19                                                                                                                                                         | 20  | 21  | 22  | 23  | 24  |                 |                                |     |
| 1-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | A   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.8             | 1.5                            |     |
| 2-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | A   | 1   | 1   | 1   | 3   | 2                                                                                                                                                          | 2   | 3   | 3   | 2   | 2   | 2               | 1.3                            | 3.0 |
| 3-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | A   | 1    | 1   | 2   | 2   | 1   | 3   | 3                                                                                                                                                          | 2   | 2   | 1   | 1   | 1   | 1.2             | 2.6                            |     |
| 4-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | A   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.8             | 1.1                            |     |
| 5-Dec                                       | 1                             | 1                 | 1   | 1   | 2   | 0   | 1   | 1                             | 2   | A   | 1   | 1   | 0    | 1   | 1   | 0   | 0   | 0   | 1                                                                                                                                                          | 1   | 1   | 0   | 0   | 1   | 0.7             | 1.8                            |     |
| 6-Dec                                       | 1                             | 1                 | 1   | 0   | 1   | 1   | 1   | 1                             | A   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.8             | 1.1                            |     |
| 7-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | A                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 1.0             | 1.2                            |     |
| 8-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | 1   | A   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.7             | 1.1                            |     |
| 9-Dec                                       | 1                             | 1                 | 1   | 1   | 1   | A   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.6             | 1.0                            |     |
| 10-Dec                                      | 1                             | 1                 | 0   | 1   | A   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 2   | 2   | 2   | 2                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.9             | 1.9                            |     |
| 11-Dec                                      | 1                             | 1                 | 1   | A   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 3   | 1.1             | 3.4                            |     |
| 12-Dec                                      | 1                             | 1                 | A   | 1   | 1   | 1   | 0   | 1                             | 1   | 0   | 1   | 1   | 1    | 1   | 1   | 2   | 1   | 0   | 4                                                                                                                                                          | 1   | 1   | P   | P   | P   | 1.0             | 3.9                            |     |
| 13-Dec                                      | P                             | P                 | 1   | 1   | 1   | 1   | 0   | 1                             | 1   | 1   | 1   | C   | C    | C   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.8             | 1.2                            |     |
| 14-Dec                                      | A                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | A   | 1.0             | 1.4                            |     |
| 15-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 2   | 3   | 1   | 1   | 1   | 2                                                                                                                                                          | 1   | 1   | 1   | A   | 3   | 1.3             | 2.9                            |     |
| 16-Dec                                      | 2                             | 2                 | 3   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 0   | 1   | 1                                                                                                                                                          | 1   | 1   | A   | 1   | 1   | 1.1             | 2.8                            |     |
| 17-Dec                                      | 1                             | 0                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | A   | 1   | 2   | 1   | 0.8             | 2.1                            |     |
| 18-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 2   | 2   | 1                             | 3   | 0   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 2   | 2                                                                                                                                                          | A   | 1   | 1   | 1   | 3   | 1.2             | 3.3                            |     |
| 19-Dec                                      | 1                             | 1                 | 1   | 2   | 2   | 1   | 1   | 2                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | A                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 1.0             | 2.4                            |     |
| 20-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 1   | 0   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 2   | 2   | 1   | A   | 2                                                                                                                                                          | 1   | 1   | 1   | 1   | 5   | 1.2             | 5.3                            |     |
| 21-Dec                                      | 3                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 0   | 0   | 1   | 3   | 1    | 1   | 1   | 1   | A   | 3   | 3                                                                                                                                                          | 1   | 1   | 2   | 1   | 1   | 1.2             | 3.3                            |     |
| 22-Dec                                      | 1                             | 1                 | 2   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 2   | A   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 1.0             | 1.9                            |     |
| 23-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | A   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.7             | 0.8                            |     |
| 24-Dec                                      | 1                             | 1                 | 1   | 1   | 0   | 1   | 1   | 1                             | 1   | 1   | 1   | 0   | 1    | A   | 0   | 0   | 1   | 0   | 1                                                                                                                                                          | 1   | 1   | 1   | 0   | 0   | 0.6             | 0.7                            |     |
| 25-Dec                                      | 0                             | 0                 | 1   | 1   | 0   | 1   | 0   | 1                             | 1   | 1   | 0   | 1   | A    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.7             | 1.1                            |     |
| 26-Dec                                      | 1                             | 1                 | 2   | 1   | 1   | 1   | 1   | 1                             | 1   | 2   | 1   | A   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 1.1             | 1.7                            |     |
| 27-Dec                                      | 1                             | 1                 | 1   | 1   | 3   | 3   | 3   | 1                             | 1   | 1   | A   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 2   | 1   | 1.1             | 2.7                            |     |
| 28-Dec                                      | 1                             | 1                 | 1   | 1   | 0   | 1   | 1   | 1                             | 1   | A   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.7             | 1.1                            |     |
| 29-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | 2                             | A   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 1   | 0.8             | 1.7                            |     |
| 30-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 1   | 1   | A                             | 1   | 1   | 3   | 12  | 7    | 2   | 1   | 1   | 1   | 1   | 1                                                                                                                                                          | 1   | 1   | 1   | 1   | 2   | 1.9             | 12.2                           |     |
| 31-Dec                                      | 1                             | 1                 | 1   | 1   | 1   | 1   | A   | 1                             | 1   | 1   | 1   | 1   | 1    | 1   | 1   | 1   | 1   | 1   | 0                                                                                                                                                          | 0   | 1   | 0   | 0   | 1   | 0.7             | 1.3                            |     |
|                                             |                               | 1.0               | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9                           | 0.9 | 0.7 | 0.9 | 1.3 | 1.0  | 1.0 | 1.0 | 1.0 | 0.9 | 1.0 | 1.2                                                                                                                                                        | 1.0 | 1.0 | 0.9 | 0.9 | 1.3 | Diurnal Average |                                |     |
|                                             |                               | 3.3               | 2.0 | 2.8 | 1.6 | 2.7 | 2.5 | 2.6                           | 2.4 | 2.5 | 1.5 | 2.7 | 12.2 | 7.1 | 2.2 | 2.9 | 2.4 | 3.0 | 2.7                                                                                                                                                        | 3.9 | 2.8 | 2.6 | 2.2 | 2.1 | 5.3             | Diurnal Maximum                |     |
| C - Calibration                             |                               | P - Power Failure |     |     |     |     |     | A - Automated Daily Zero Span |     |     |     |     |      |     |     |     |     |     |                                                                                                                                                            |     |     |     |     |     |                 |                                |     |

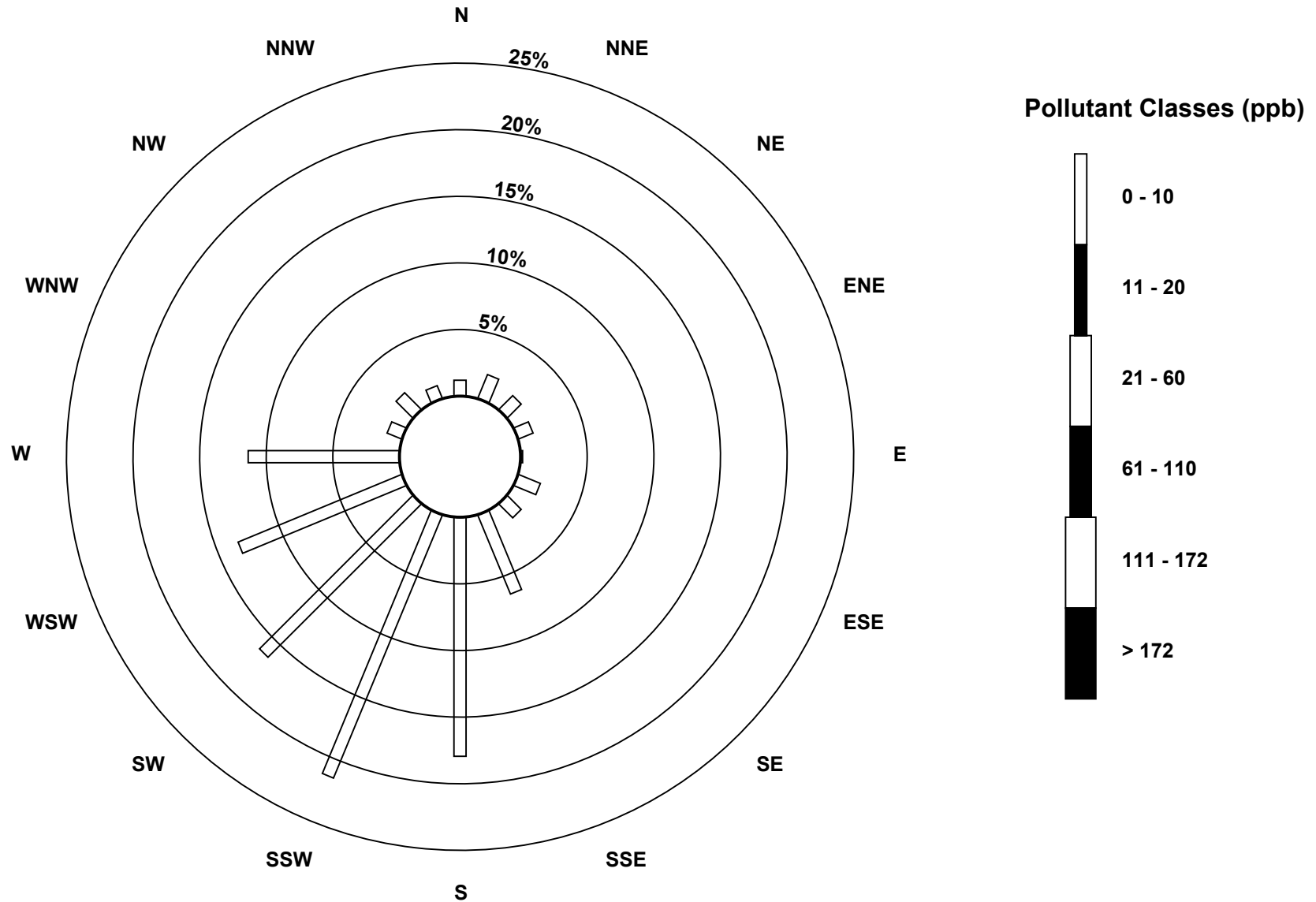
## Hourly Maximums

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Portable Rycroft - December 2016**



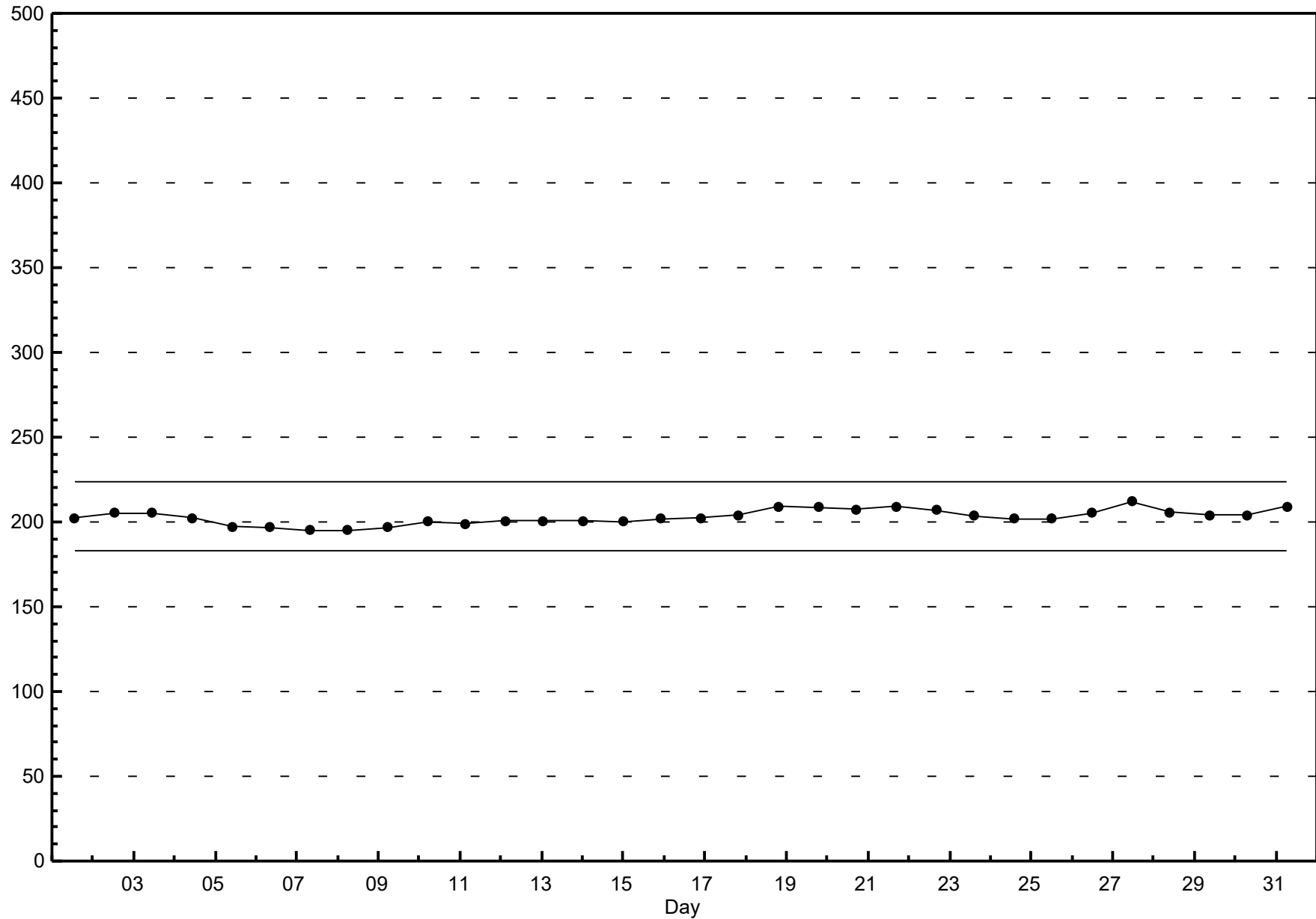
# Pollutant Rose

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Portable Rycroft - December 2016



## Span Responses

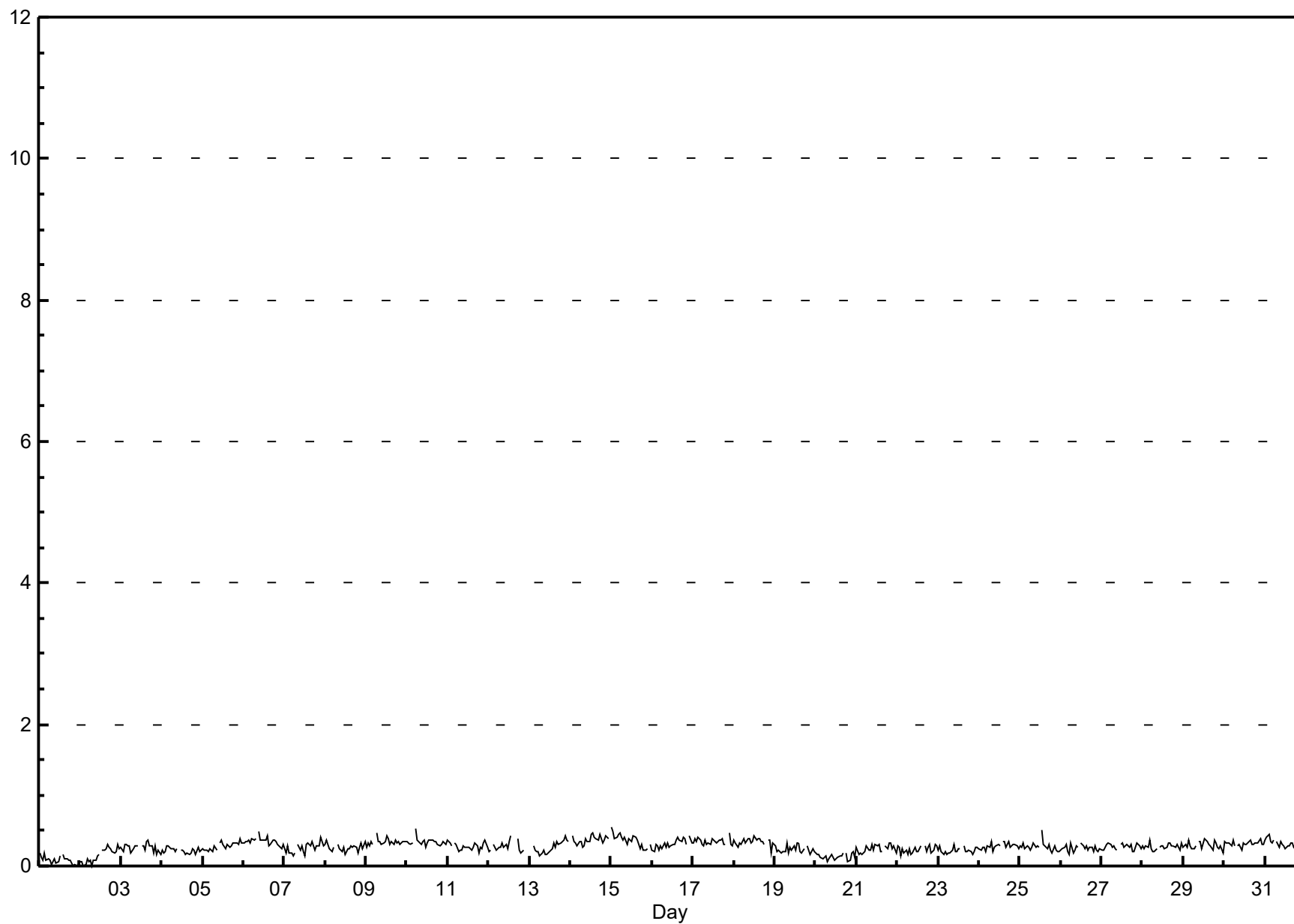
Sulphur Dioxide (SO<sub>2</sub>)  
Portable Rycroft - December 2016





## Hourly Averages

**Total Reduced Sulphur (TRS) - ppb**  
**Portable Rycroft - December 2016**

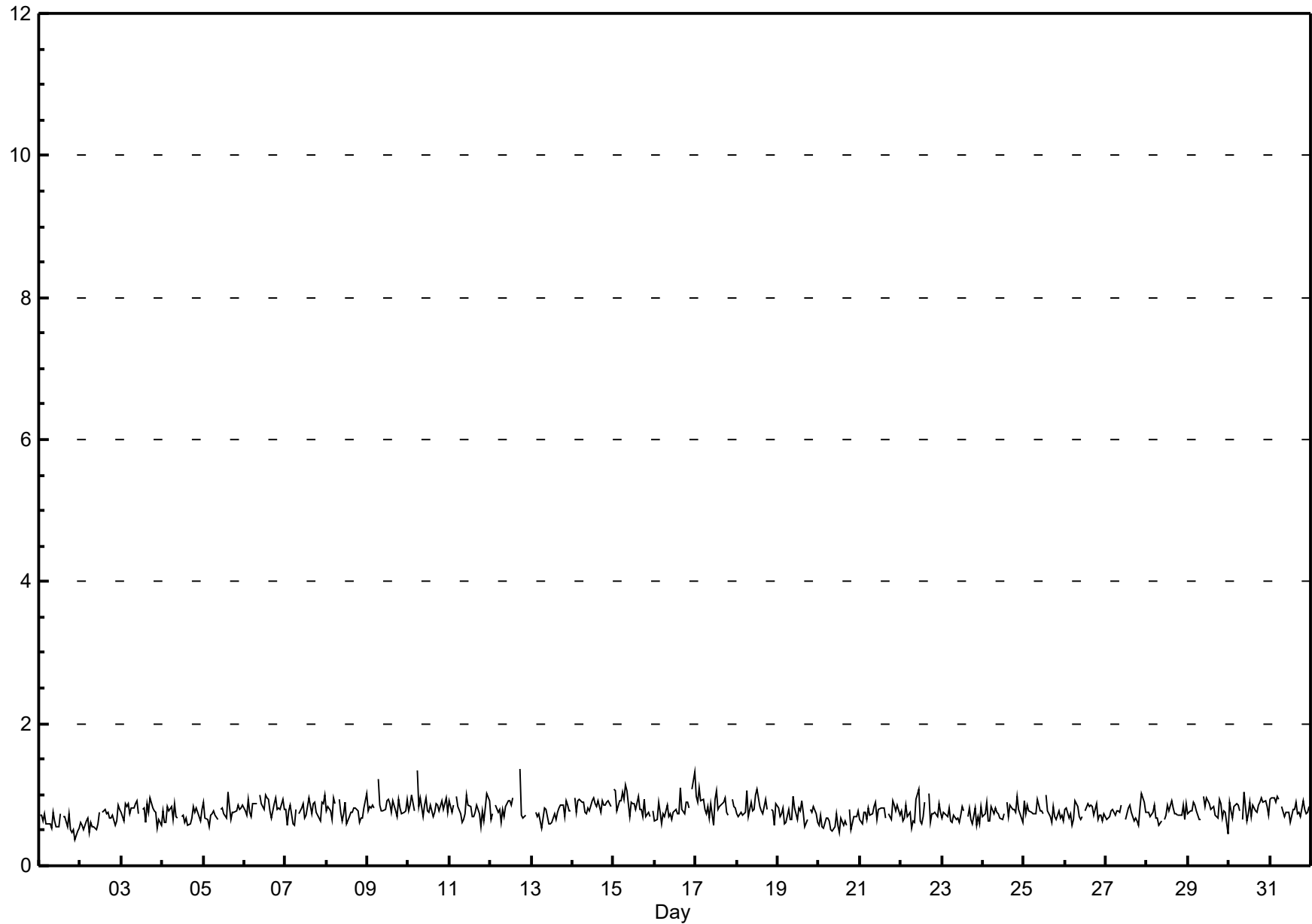


Page 240 of 401



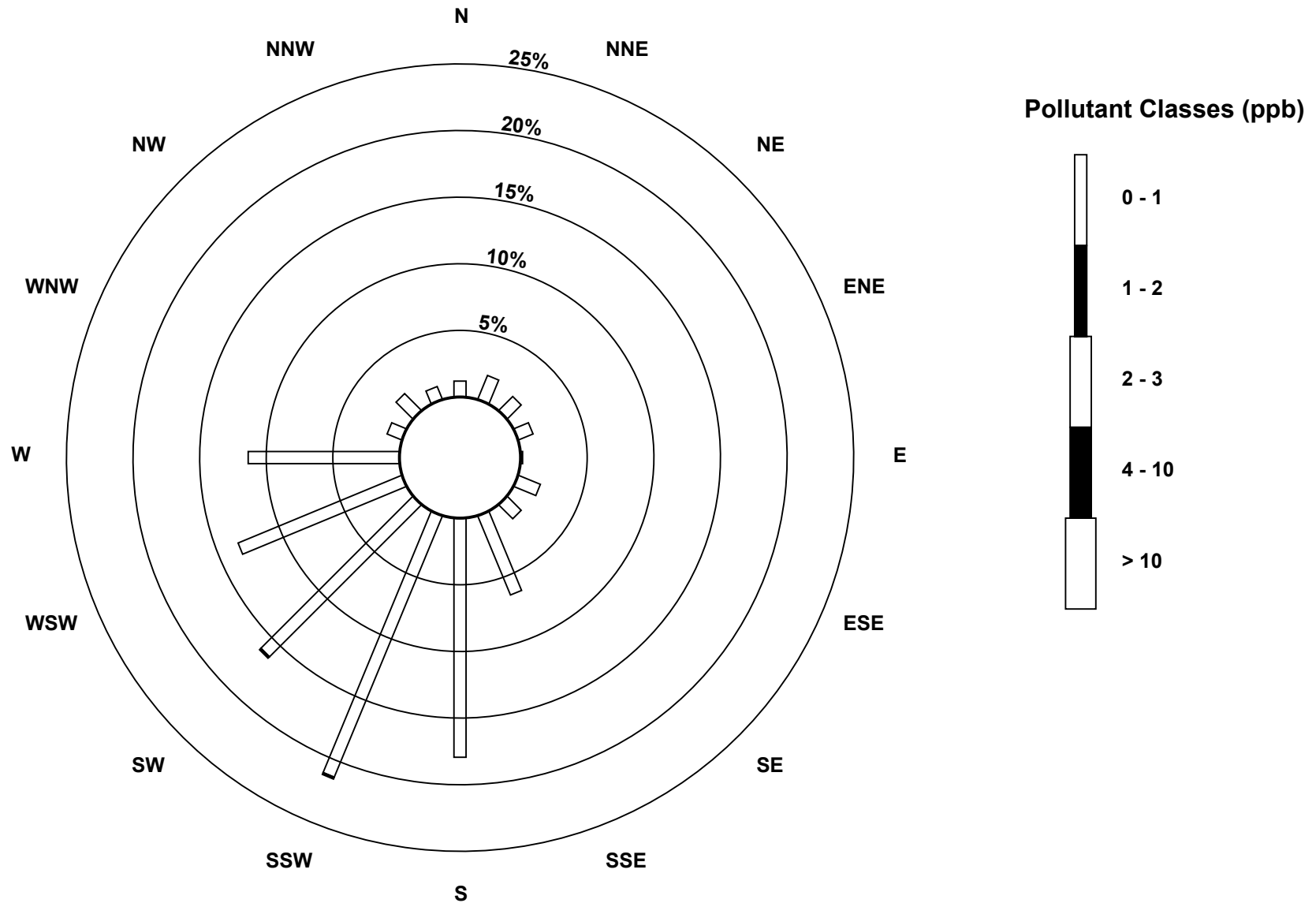
## Hourly Maximums

Total Reduced Sulphur (TRS) - ppb  
Portable Rycroft - December 2016



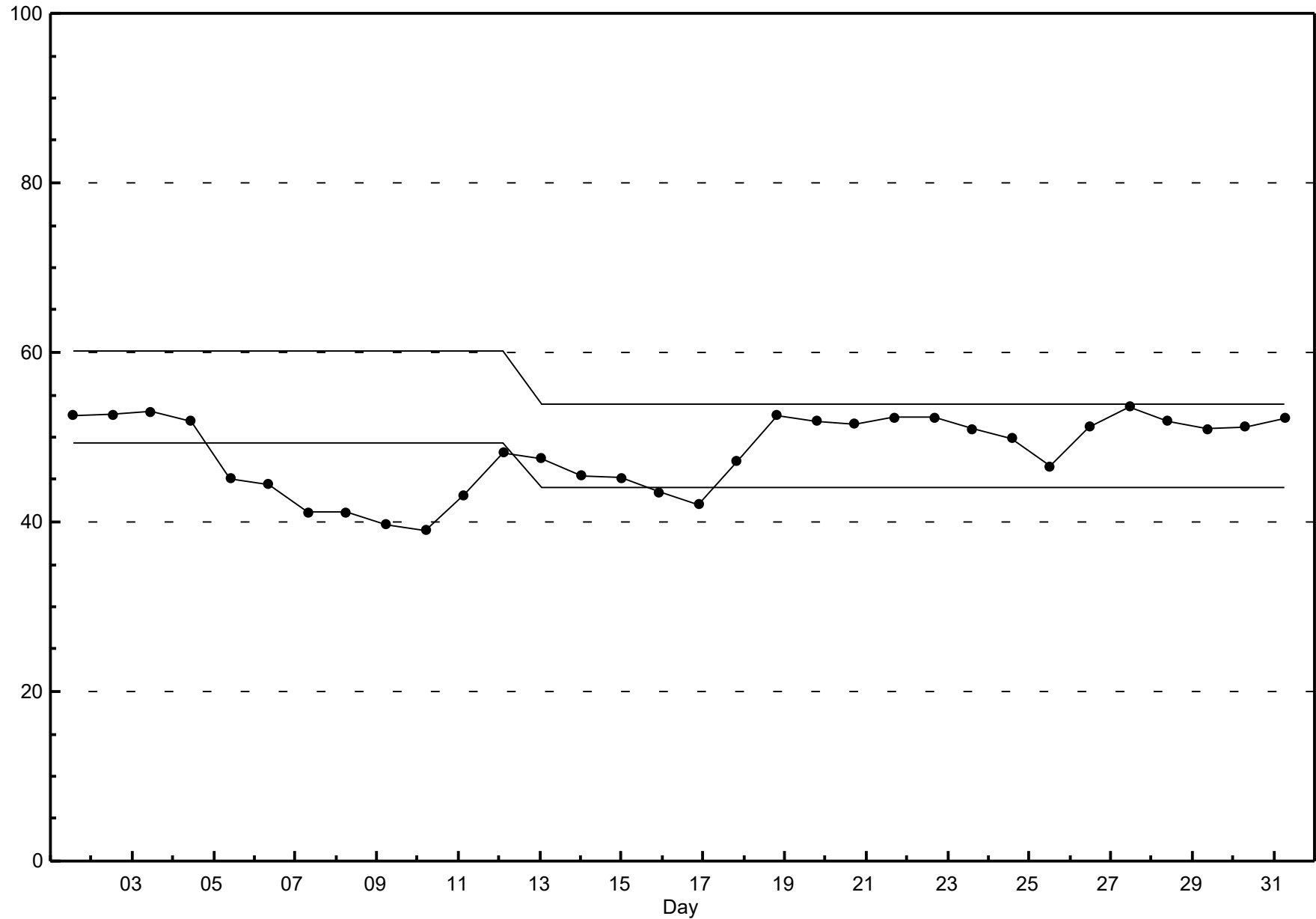
# Pollutant Rose

Total Reduced Sulphur (TRS) - ppb  
Portable Rycroft - December 2016



## Span Responses

**Total Reduced Sulphur (TRS)**  
**Portable Rycroft - December 2016**



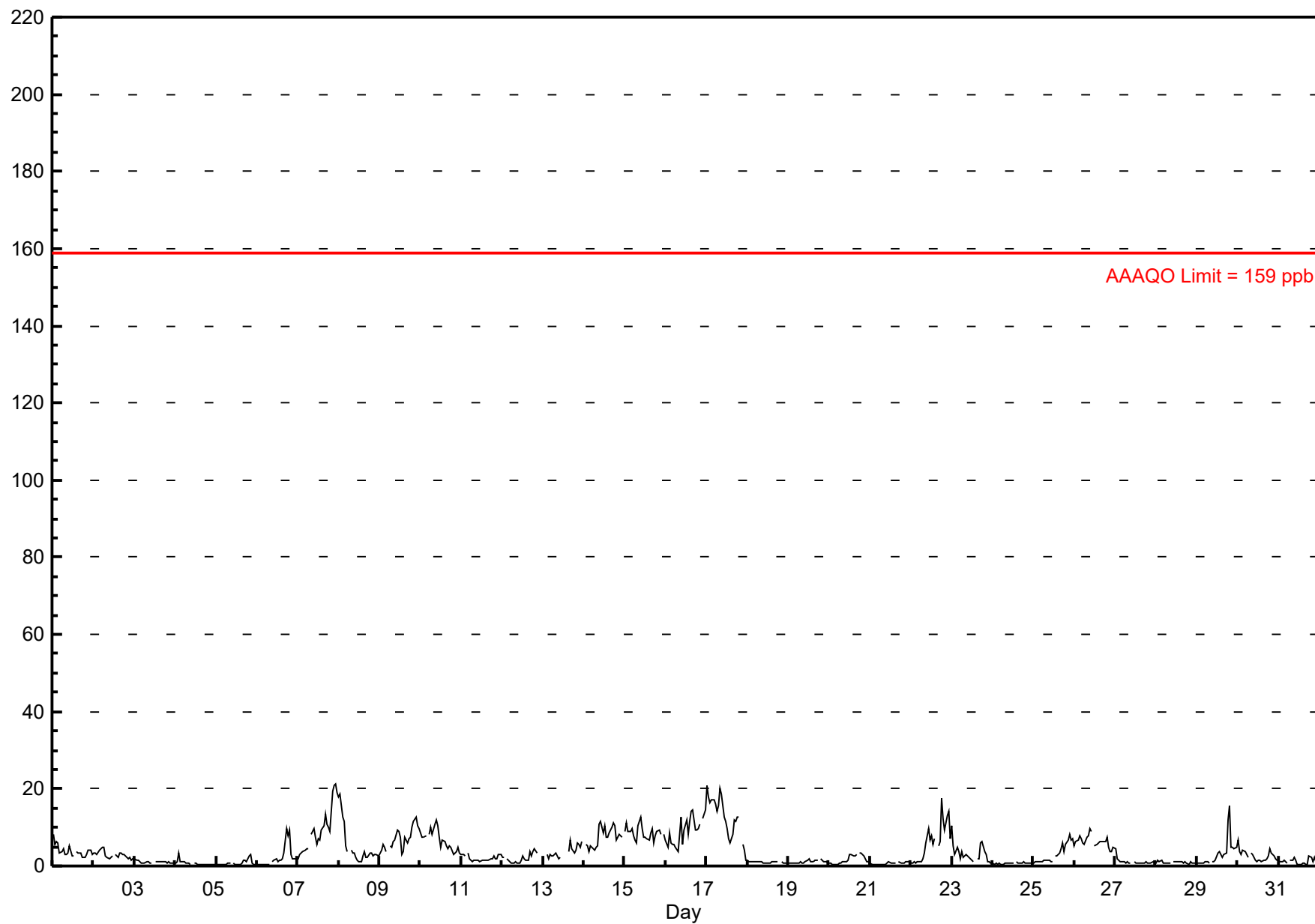
# Hourly Averages

## Nitrogen Dioxide (NO<sub>2</sub>) - ppb Portable Rycroft - December 2016

|                                                                                                                                                                                                                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|
| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 21.2 ppb on Dec 7 23:00 Maximum Daily Average: 12.6 ppb on Dec 17                                                                                                                                                                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 704<br>Hours of Missing Data: 40<br>Hours of Calibration: 35<br>Percent Operational Time: 99.3 |    |    |    |    |                 |               |
| Minimum Value: 0 ppb on Dec 5 04:00 Minimum Daily Average: 0.7 ppb on Dec 4<br>Maximum Diurnal Average: 5.1 ppb at hour 20 Minimum Diurnal Average: 2.9 ppb at hour 8<br>Monthly Average: 3.81 ppb Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 1.0 Median = 2.2 Q <sub>3</sub> = 5.5 P <sub>90</sub> = 9.5 P <sub>99</sub> = 18.7 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |
| Day                                                                                                                                                                                                                                                                                                                                                            | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    | Daily Average   | Daily Maximum |
|                                                                                                                                                                                                                                                                                                                                                                | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                     | 21 | 22 | 23 | 24 |                 |               |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                          | 8                             | 5  | 6  | 6  | 3  | 4  | 5  | 3  | 3  | 3  | 5  | 2  | 3  | A  | 4  | 3  | 3  | 2  | 2  | 2                                                                                                                                      | 3  | 4  | 4  | 3  | 3.8             | 8.3           |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                          | 3                             | 3  | 3  | 4  | 5  | 5  | 5  | 3  | 2  | 2  | 2  | 3  | A  | 3  | 2  | 3  | 3  | 3  | 3  | 2                                                                                                                                      | 2  | 2  | 2  | 2  | 3.0             | 4.7           |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                          | 2                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                      | 1  | 1  | 1  | 1  | 1.0             | 1.7           |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                          | 1                             | 1  | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                      | 0  | 0  | 0  | 0  | 0.7             | 3.5           |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | A  | 1  | 1  | 0  | 0  | 0  | 1  | 2  | 2  | 1  | 2                                                                                                                                      | 3  | 1  | 1  | 0  | 0.8             | 2.8           |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                          | 0                             | 0  | 0  | 0  | 0  | 0  | 1  | 1  | A  | 1  | 1  | 2  | 1  | 1  | 1  | 2  | 3  | 10 | 8  | 9                                                                                                                                      | 3  | 2  | 2  | 2  | 2.3             | 9.7           |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                          | 2                             | 3  | 3  | 4  | 4  | 5  | 4  | A  | 8  | 10 | 7  | 6  | 7  | 7  | 9  | 10 | 13 | 11 | 10 | 9                                                                                                                                      | 19 | 21 | 21 | 19 | 9.3             | 21.2          |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                          | 18                            | 19 | 13 | 12 | 5  | 4  | A  | 4  | 3  | 3  | 2  | 1  | 1  | 1  | 3  | 4  | 2  | 2  | 3  | 3                                                                                                                                      | 3  | 3  | 3  | 3  | 5.1             | 18.8          |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                          | 4                             | 4  | 6  | 5  | 4  | A  | 5  | 5  | 6  | 7  | 9  | 9  | 7  | 3  | 4  | 7  | 6  | 7  | 8  | 10                                                                                                                                     | 12 | 13 | 10 | 10 | 7.0             | 12.6          |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                         | 8                             | 8  | 7  | 8  | A  | 8  | 10 | 8  | 11 | 12 | 11 | 7  | 5  | 7  | 6  | 5  | 5  | 5  | 5  | 3                                                                                                                                      | 3  | 4  | 5  | 3  | 6.7             | 12.0          |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                         | 3                             | 3  | 2  | A  | 3  | 2  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 3                                                                                                                                      | 2  | 2  | 3  | 3  | 2.0             | 3.3           |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                         | 2                             | 2  | A  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 3  | 2  | 1  | 2  | 4  | 2  | 4  | 5                                                                                                                                      | 4  | P  | P  | P  | 2.0             | 4.6           |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                         | P                             | P  | 3  | 2  | 3  | 3  | 3  | 3  | 3  | 2  | 2  | C  | C  | C  | C  | 4  | 7  | 4  | 3  | 4                                                                                                                                      | 6  | 6  | 5  | 6  | 3.8             | 6.9           |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                         | A                             | 6  | 5  | 4  | 5  | 5  | 4  | 5  | 5  | 11 | 11 | 9  | 10 | 7  | 7  | 9  | 10 | 11 | 11 | 7                                                                                                                                      | 7  | 8  | 7  | A  | 7.5             | 11.4          |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                         | 9                             | 11 | 9  | 9  | 10 | 8  | 7  | 6  | 10 | 13 | 10 | 7  | 7  | 7  | 7  | 8  | 10 | 6  | 8  | 9                                                                                                                                      | 9  | 8  | A  | 8  | 8.5             | 12.7          |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                         | 7                             | 5  | 8  | 6  | 6  | 6  | 5  | 4  | 8  | 13 | 6  | 9  | 12 | 8  | 12 | 14 | 15 | 9  | 9  | 10                                                                                                                                     | 11 | A  | 12 | 14 | 9.0             | 14.7          |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                         | 21                            | 18 | 16 | 17 | 17 | 16 | 14 | 16 | 20 | 19 | 13 | 12 | 10 | 7  | 6  | 8  | 12 | 12 | 13 | 13                                                                                                                                     | A  | 6  | 4  | 1  | 12.6            | 20.8          |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                      | 1  | 1  | 1  | 1  | 1.0             | 1.4           |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 2  | A  | 2                                                                                                                                      | 1  | 1  | 1  | 1  | 1.1             | 1.8           |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 3  | 3  | 3  | 3  | 3  | A  | 3  | 3                                                                                                                                      | 3  | 2  | 1  | 1  | 1.6             | 3.3           |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1                                                                                                                                      | 1  | 1  | 1  | 1  | 0.7             | 1.2           |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 3  | 6  | 10 | 7  | 8  | 5  | 7  | A  | 5  | 6  | 18 | 12                                                                                                                                     | 9  | 13 | 14 | 7  | 6.1             | 17.7          |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                         | 11                            | 5  | 3  | 5  | 4  | 2  | 4  | 2  | 3  | 3  | 2  | 2  | 2  | 1  | A  | 2  | 2  | 6  | 6  | 4                                                                                                                                      | 3  | 1  | 1  | 1  | 3.2             | 10.6          |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                      | 1  | 1  | 1  | 1  | 0.7             | 1.0           |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 2  | 2  | 3  | 4  | 6  | 4  | 6                                                                                                                                      | 7  | 8  | 7  | 7  | 3.1             | 8.1           |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                         | 5                             | 6  | 7  | 8  | 7  | 6  | 6  | 8  | 8  | 10 | 9  | A  | 5  | 5  | 6  | 6  | 6  | 6  | 6  | 7                                                                                                                                      | 5  | 4  | 4  | 5  | 6.4             | 9.8           |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                         | 5                             | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                      | 1  | 1  | 1  | 1  | 1.1             | 4.6           |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                      | 1  | 1  | 1  | 1  | 0.9             | 1.5           |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 3  | 4  | 3  | 2  | 3  | 3  | 12 | 16                                                                                                                                     | 5  | 5  | 4  | 5  | 3.3             | 15.6          |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                         | 7                             | 4  | 3  | 4  | 4  | 3  | 2  | A  | 3  | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 3  | 4                                                                                                                                      | 3  | 2  | 2  | 2  | 2.6             | 6.9           |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                         | 1                             | 1  | 1  | 2  | 1  | 1  | A  | 1  | 1  | 2  | 1  | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 3  | 2                                                                                                                                      | 1  | 2  | 1  | 1  | 1.2             | 2.8           |
| 4.3 3.8 3.7 3.6 3.1 2.9 3.0 2.9 3.8 4.5 4.0 3.3 3.5 3.1 3.3 3.6 4.3 4.2 5.0 5.1 4.3 4.2 4.1 3.8                                                                                                                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    | Diurnal Average |               |
| 20.8 18.8 16.3 17.2 17.3 16.2 14.2 15.7 20.2 18.7 12.8 11.7 12.1 8.0 11.6 14.2 14.7 11.5 17.7 15.6 19.5 21.0 21.2 18.9                                                                                                                                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    | Diurnal Maximum |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                                                                                                                                                                                                                                                |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb 24-hr 106 ppb                                                                                                                                                                                                                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                        |    |    |    |    |                 |               |

## Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Portable Rycroft - December 2016



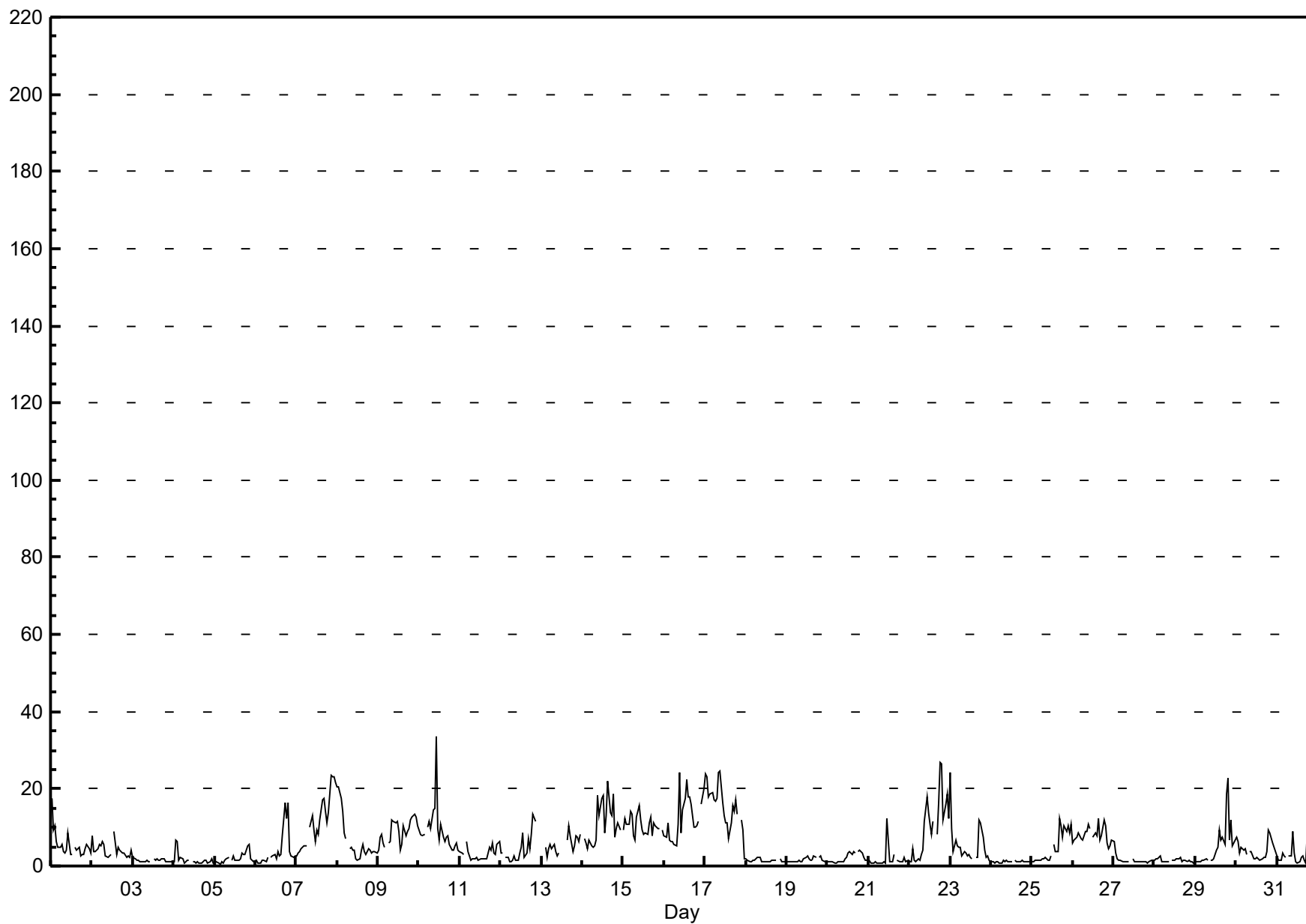
# Hourly Maximums

## Nitrogen Dioxide (NO<sub>2</sub>) - ppb Portable Rycroft - December 2016

|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                                |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|--------------------------------|---------------|
| Maximum Value: 33.4 ppb on Dec 10 11:00                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 15.5 ppb on Dec 17                                                                                                                    |    |    |    |    | Hours in Service: 744          |               |
| Minimum Value: 1 ppb on Dec 5 04:00                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 1.1 ppb on Dec 24                                                                                                                     |    |    |    |    | Hours of Data: 704             |               |
| Maximum Diurnal Average: 7.8 ppb at hour 20                                                                             |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 3.8 ppb at hour 7                                                                                                                   |    |    |    |    | Hours of Missing Data: 40      |               |
| Monthly Average: 5.45 ppb                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.8 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 1.5 Median = 3.4 Q <sub>3</sub> = 7.9 P <sub>90</sub> = 12.8 P <sub>99</sub> = 24.1 |    |    |    |    | Hours of Calibration: 35       |               |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Percent Operational Time: 99.3 |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Daily Average                  | Daily Maximum |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                           | 21 | 22 | 23 | 24 |                                |               |
| 1-Dec                                                                                                                   | 18                            | 9  | 10 | 6  | 5  | 5  | 6  | 4  | 3  | 4  | 9  | 3  | 3  | A  | 5  | 4  | 5  | 3  | 3  | 3                                                                                                                                                            | 4  | 5  | 4  | 4  | 5.4                            | 17.6          |
| 2-Dec                                                                                                                   | 8                             | 4  | 4  | 4  | 5  | 5  | 6  | 6  | 3  | 2  | 3  | 3  | A  | 9  | 3  | 5  | 4  | 4  | 4  | 3                                                                                                                                                            | 2  | 3  | 2  | 4  | 4.2                            | 8.9           |
| 3-Dec                                                                                                                   | 2                             | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 2  | 1  | 2  | 2  | 2  | 2  | 2  | 1                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.5                            | 2.3           |
| 4-Dec                                                                                                                   | 1                             | 7  | 6  | 2  | 2  | 2  | 1  | 1  | 2  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2                                                                                                                                                            | 1  | 1  | 2  | 1  | 1.7                            | 6.6           |
| 5-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | A  | 1  | 3  | 1  | 1  | 1  | 2  | 3  | 3  | 3  | 5                                                                                                                                                            | 6  | 2  | 2  | 1  | 2.0                            | 5.7           |
| 6-Dec                                                                                                                   | 2                             | 1  | 1  | 1  | 2  | 1  | 1  | 2  | A  | 2  | 3  | 3  | 2  | 4  | 3  | 3  | 8  | 17 | 12 | 16                                                                                                                                                           | 4  | 3  | 2  | 3  | 4.1                            | 16.5          |
| 7-Dec                                                                                                                   | 2                             | 3  | 4  | 5  | 5  | 5  | 5  | A  | 10 | 13 | 9  | 6  | 9  | 8  | 12 | 17 | 18 | 14 | 11 | 14                                                                                                                                                           | 23 | 23 | 23 | 22 | 11.5                           | 23.4          |
| 8-Dec                                                                                                                   | 21                            | 20 | 17 | 14 | 8  | 7  | A  | 5  | 5  | 4  | 4  | 2  | 2  | 2  | 4  | 5  | 4  | 3  | 5  | 4                                                                                                                                                            | 3  | 4  | 4  | 3  | 6.5                            | 20.6          |
| 9-Dec                                                                                                                   | 4                             | 7  | 8  | 6  | 5  | A  | 6  | 6  | 12 | 12 | 11 | 12 | 9  | 4  | 6  | 11 | 8  | 9  | 10 | 12                                                                                                                                                           | 13 | 13 | 13 | 11 | 9.0                            | 13.3          |
| 10-Dec                                                                                                                  | 9                             | 8  | 8  | 8  | A  | 10 | 11 | 10 | 14 | 15 | 33 | 10 | 7  | 11 | 7  | 6  | 7  | 8  | 6  | 4                                                                                                                                                            | 4  | 5  | 6  | 4  | 9.3                            | 33.4          |
| 11-Dec                                                                                                                  | 4                             | 3  | 3  | A  | 6  | 4  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 5  | 4  | 6                                                                                                                                                            | 3  | 3  | 6  | 6  | 3.2                            | 6.4           |
| 12-Dec                                                                                                                  | 3                             | 3  | A  | 2  | 2  | 1  | 1  | 1  | 3  | 1  | 2  | 3  | 5  | 9  | 2  | 3  | 7  | 4  | 8  | 14                                                                                                                                                           | 12 | P  | P  | P  | 4.4                            | 13.6          |
| 13-Dec                                                                                                                  | P                             | P  | 5  | 2  | 5  | 6  | 4  | 6  | 4  | 3  | 3  | C  | C  | C  | C  | 7  | 10 | 8  | 4  | 5                                                                                                                                                            | 8  | 8  | 6  | 8  | 5.6                            | 10.3          |
| 14-Dec                                                                                                                  | A                             | 7  | 6  | 5  | 7  | 5  | 5  | 5  | 7  | 18 | 13 | 17 | 18 | 9  | 13 | 22 | 14 | 13 | 18 | 7                                                                                                                                                            | 10 | 11 | 9  | A  | 10.9                           | 22.0          |
| 15-Dec                                                                                                                  | 9                             | 12 | 11 | 11 | 14 | 14 | 8  | 7  | 13 | 16 | 12 | 9  | 8  | 9  | 8  | 11 | 13 | 8  | 11 | 10                                                                                                                                                           | 10 | 10 | A  | 9  | 10.5                           | 15.5          |
| 16-Dec                                                                                                                  | 8                             | 7  | 11 | 7  | 6  | 6  | 6  | 5  | 11 | 24 | 9  | 15 | 17 | 22 | 18 | 18 | 16 | 10 | 10 | 10                                                                                                                                                           | 11 | A  | 16 | 20 | 12.4                           | 24.2          |
| 17-Dec                                                                                                                  | 24                            | 23 | 18 | 18 | 19 | 17 | 17 | 18 | 24 | 24 | 16 | 13 | 11 | 11 | 7  | 11 | 16 | 14 | 17 | 14                                                                                                                                                           | A  | 12 | 9  | 2  | 15.5                           | 24.5          |
| 18-Dec                                                                                                                  | 2                             | 2  | 1  | 1  | 2  | 1  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | A                                                                                                                                                            | 2  | 1  | 1  | 1  | 1.4                            | 2.2           |
| 19-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 3  | 2  | A  | 2                                                                                                                                                            | 3  | 1  | 1  | 1  | 1.6                            | 2.7           |
| 20-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 3  | 4  | 3  | 4  | 3  | A  | 4  | 4                                                                                                                                                            | 3  | 2  | 1  | 1  | 2.1                            | 4.2           |
| 21-Dec                                                                                                                  | 2                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 12 | 1  | 1  | 1  | 3  | A  | 1  | 1  | 1                                                                                                                                                            | 1  | 2  | 1  | 1  | 1.7                            | 12.1          |
| 22-Dec                                                                                                                  | 1                             | 1  | 5  | 2  | 1  | 2  | 1  | 3  | 4  | 11 | 18 | 14 | 11 | 8  | 11 | A  | 8  | 16 | 27 | 27                                                                                                                                                           | 12 | 16 | 19 | 12 | 10.0                           | 26.7          |
| 23-Dec                                                                                                                  | 24                            | 10 | 4  | 7  | 5  | 5  | 5  | 3  | 4  | 3  | 3  | 3  | 2  | 2  | A  | 2  | 2  | 12 | 11 | 8                                                                                                                                                            | 4  | 2  | 3  | 1  | 5.4                            | 24.3          |
| 24-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.1                            | 1.5           |
| 25-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 2  | 1  | 2  | A  | 5  | 4  | 4  | 12 | 10 | 7  | 11                                                                                                                                                           | 9  | 10 | 9  | 11 | 4.9                            | 12.3          |
| 26-Dec                                                                                                                  | 6                             | 7  | 7  | 9  | 8  | 7  | 7  | 9  | 9  | 11 | 10 | A  | 7  | 9  | 8  | 12 | 7  | 8  | 12 | 10                                                                                                                                                           | 6  | 4  | 5  | 7  | 8.0                            | 12.2          |
| 27-Dec                                                                                                                  | 6                             | 3  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | A  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 2  | 2  | 1.6                            | 6.3           |
| 28-Dec                                                                                                                  | 1                             | 2  | 2  | 3  | 1  | 1  | 1  | 1  | 1  | A  | 2  | 1  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 1  | 1.5                            | 2.5           |
| 29-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 2  | 1  | A  | 1  | 1  | 2  | 4  | 5  | 9  | 7  | 8  | 6  | 19 | 23                                                                                                                                                           | 7  | 12 | 5  | 7  | 5.4                            | 22.6          |
| 30-Dec                                                                                                                  | 7                             | 6  | 3  | 5  | 4  | 4  | 3  | A  | 4  | 4  | 2  | 2  | 2  | 2  | 1  | 2  | 2  | 2  | 4  | 9                                                                                                                                                            | 9  | 6  | 5  | 4  | 4.1                            | 9.2           |
| 31-Dec                                                                                                                  | 3                             | 2  | 2  | 3  | 2  | 2  | A  | 3  | 3  | 9  | 3  | 1  | 1  | 1  | 2  | 2  | 2  | 1  | 8  | 3                                                                                                                                                            | 3  | 7  | 2  | 3  | 2.9                            | 8.8           |
| 6.0 5.3 4.9 4.4 4.2 4.0 3.8 3.8 5.1 6.6 6.2 5.3 4.9 5.2 4.9 5.7 6.3 6.3 7.6 7.8 5.9 5.9 5.6 5.2                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Average                |               |
| 24.3 22.9 17.9 18.5 19.0 17.0 16.7 17.6 24.1 24.5 33.4 17.4 18.3 22.4 17.8 22.0 17.6 16.5 26.7 26.6 23.4 23.1 23.3 21.5 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Maximum                |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                                |               |

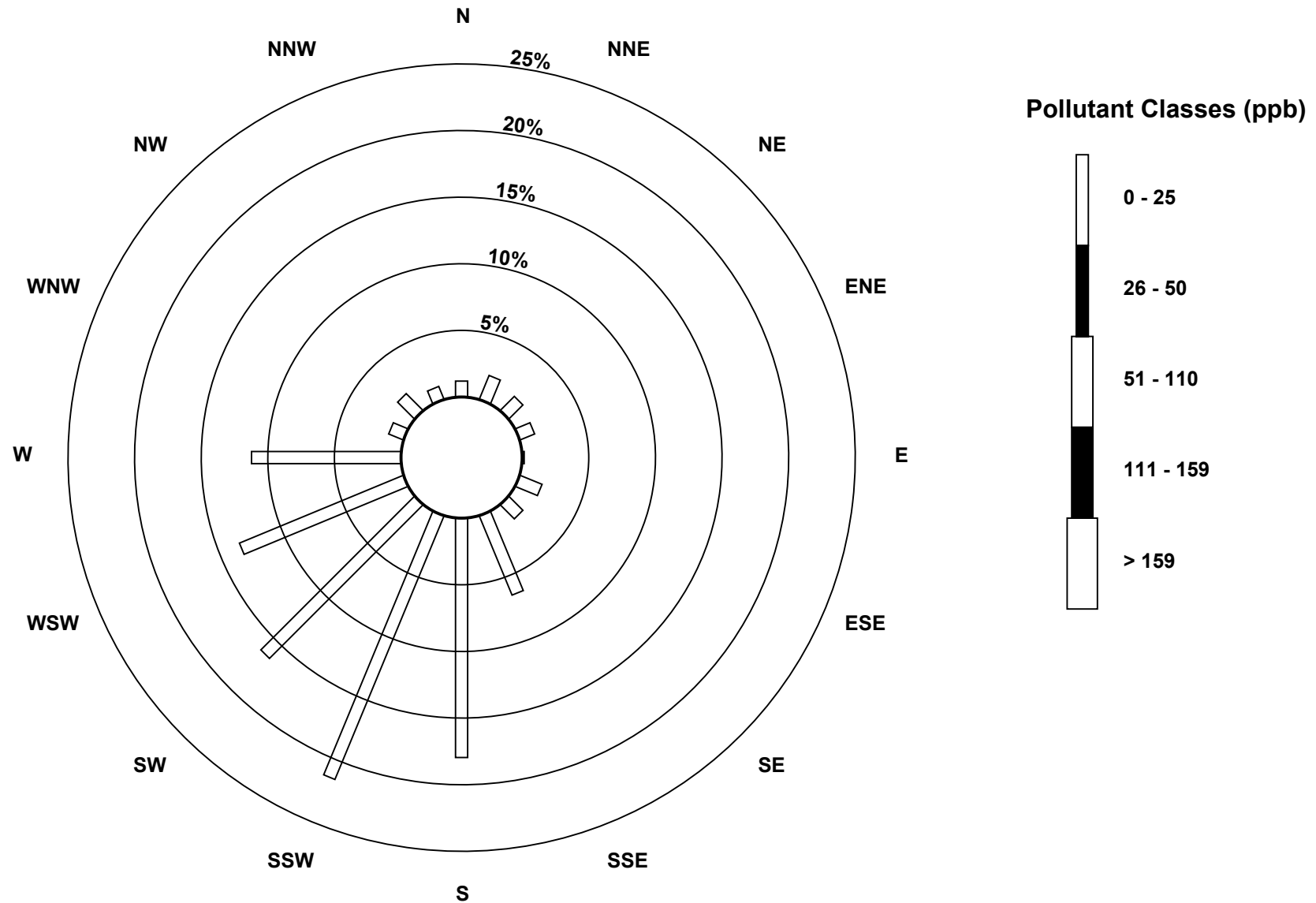
## Hourly Maximums

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Portable Rycroft - December 2016



# Pollutant Rose

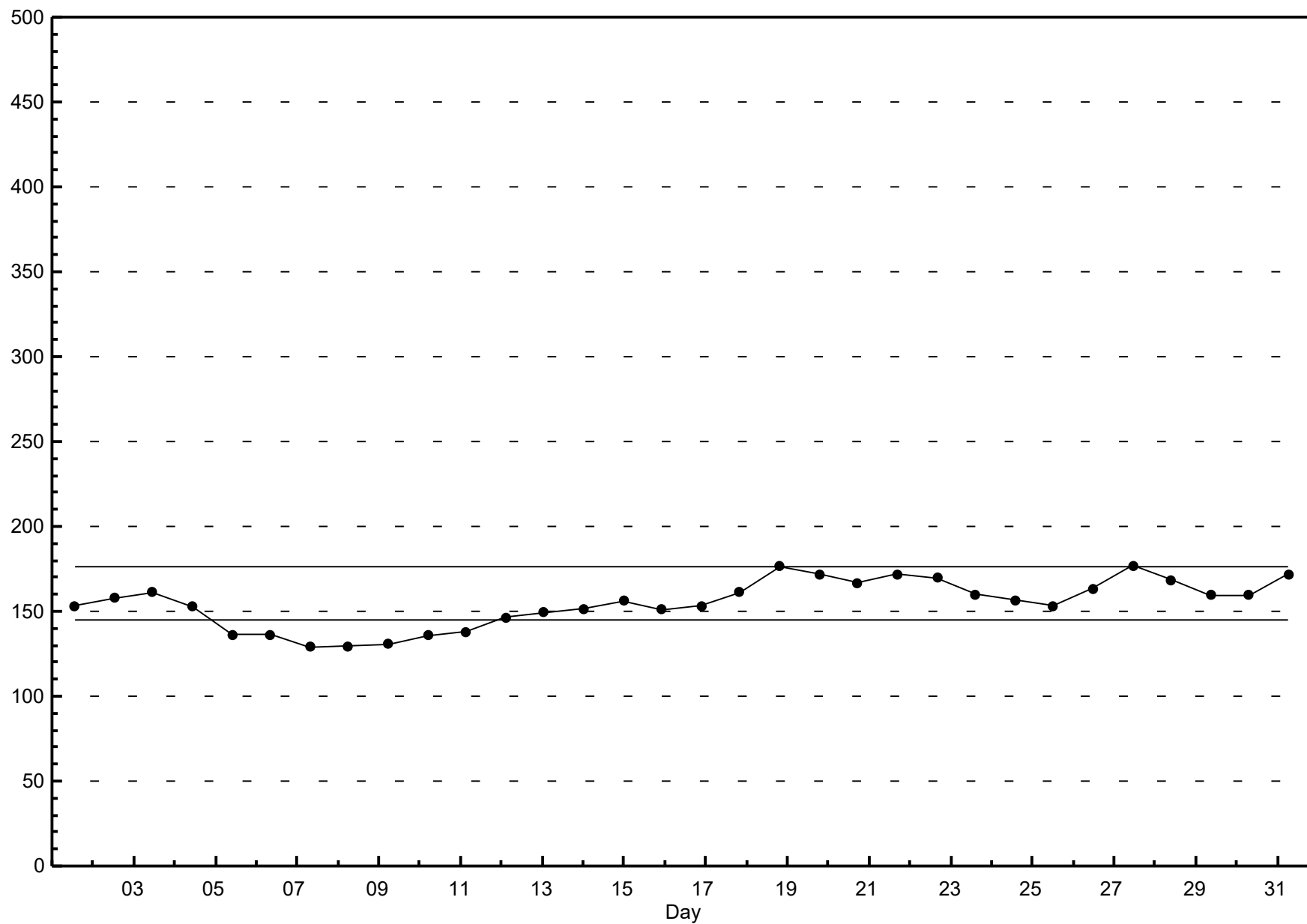
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Portable Rycroft - December 2016





## Span Responses

**Nitrogen Dioxide (NO<sub>2</sub>)**  
**Portable Rycroft - December 2016**



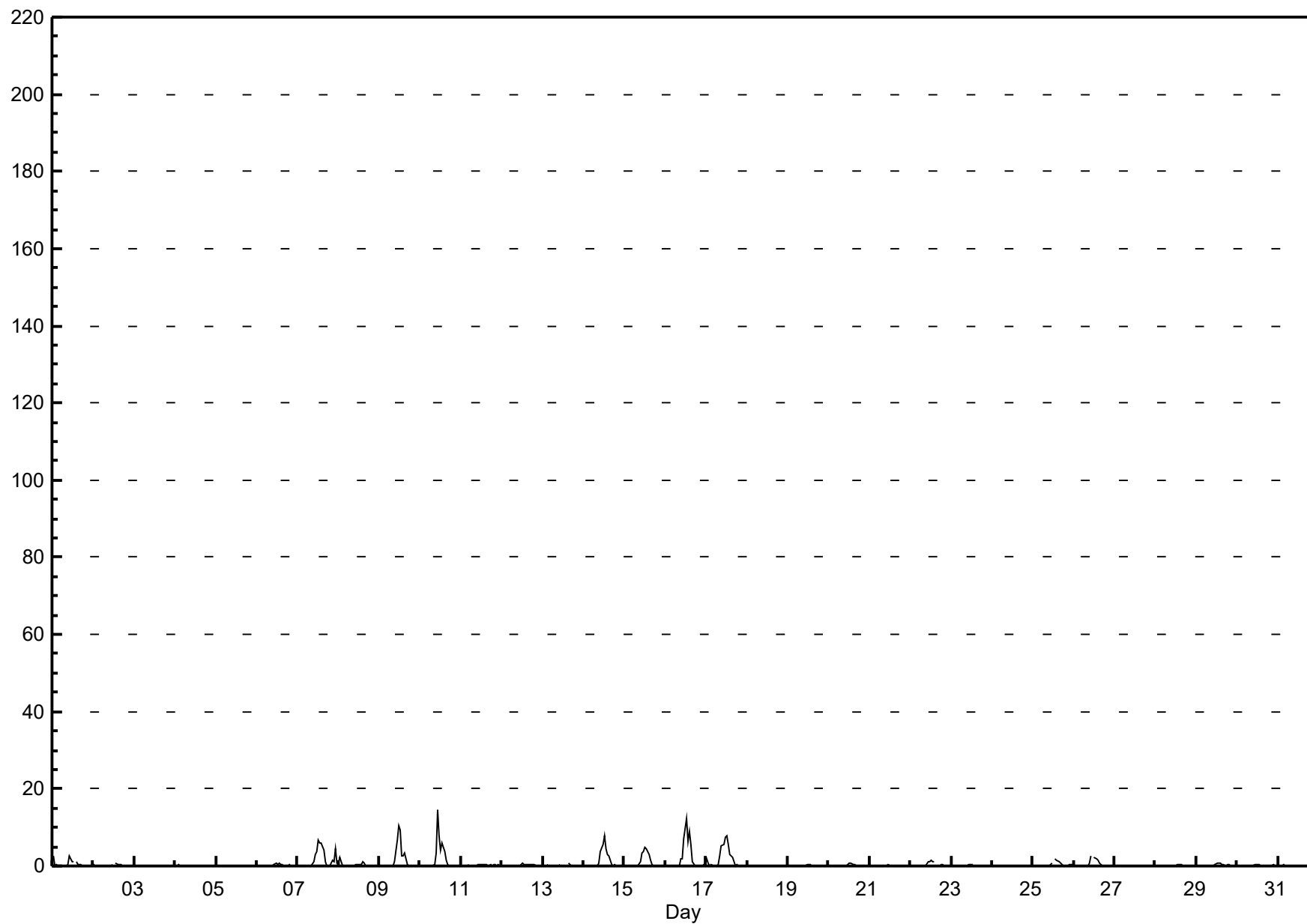
# Hourly Averages

## Nitrogen Oxide (NO) - ppb Portable Rycroft - December 2016

| Maximum Value: 14.5 ppb on Dec 10 11:00                                                            |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 2.0 ppb on Dec 16                                                                                                                   |    |    |    | Hours in Service: 744     |               |               |
|----------------------------------------------------------------------------------------------------|-------------------------------|---|---|-------------------|---|---|---|-------------------------------|---|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------------|---------------|---------------|
| Minimum Value: 0 ppb on Dec 2 05:00                                                                |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.0 ppb on Dec 27                                                                                                                   |    |    |    | Hours of Data: 704        |               |               |
| Maximum Diurnal Average: 2.3 ppb at hour 13                                                        |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 0.0 ppb at hour 7                                                                                                                 |    |    |    | Hours of Missing Data: 40 |               |               |
| Monthly Average: 0.50 ppb                                                                          |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 1.0 P <sub>99</sub> = 7.9 |    |    |    | Hours of Calibration: 35  |               |               |
|                                                                                                    |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.3                                                                                                                             |    |    |    |                           |               |               |
| Day                                                                                                | Hourly Period Ending At (MST) |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |                           | Daily Average | Daily Maximum |
|                                                                                                    | 1                             | 2 | 3 | 4                 | 5 | 6 | 7 | 8                             | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                         | 21 | 22 | 23 | 24                        |               |               |
| 1-Dec                                                                                              | 3                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 2  | 1  | 1  | A  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.4           | 2.6           |
| 2-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | A  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.8           |
| 3-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.2           |
| 4-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.3           |
| 5-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.2           |
| 6-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | A | 0  | 0  | 1  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.2           | 0.7           |
| 7-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | A                             | 0 | 1  | 3  | 4  | 7  | 6  | 6  | 4  | 1  | 0  | 0  | 0                                                                                                                                                          | 1  | 1  | 5  | 1                         | 1.8           | 6.6           |
| 8-Dec                                                                                              | 1                             | 2 | 0 | 0                 | 0 | 0 | A | 0                             | 0 | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.3           | 2.2           |
| 9-Dec                                                                                              | 0                             | 0 | 0 | 0                 | 0 | A | 0 | 0                             | 0 | 1  | 7  | 11 | 9  | 3  | 3  | 3  | 1  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 1.6           | 10.6          |
| 10-Dec                                                                                             | 0                             | 0 | 0 | 0                 | A | 0 | 0 | 0                             | 0 | 3  | 15 | 8  | 4  | 6  | 4  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 1.8           | 14.5          |
| 11-Dec                                                                                             | 0                             | 0 | 0 | A                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.2           | 0.5           |
| 12-Dec                                                                                             | 0                             | 0 | A | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 1  | 0  | 0  | 0                                                                                                                                                          | 0  | P  | P  | P                         | 0.2           | 0.7           |
| 13-Dec                                                                                             | P                             | P | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | C  | C  | C  | C  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.2           | 0.7           |
| 14-Dec                                                                                             | A                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 1  | 4  | 6  | 8  | 4  | 3  | 3  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | A                         | 1.3           | 7.9           |
| 15-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 1  | 3  | 4  | 5  | 4  | 3  | 2  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | A  | 0                         | 1.0           | 4.9           |
| 16-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 2  | 2  | 7  | 12 | 6  | 9  | 5  | 1  | 0  | 0  | 0                                                                                                                                                          | 0  | A  | 0  | 1                         | 2.0           | 12.3          |
| 17-Dec                                                                                             | 2                             | 1 | 0 | 0                 | 0 | 0 | 0 | 0                             | 3 | 5  | 6  | 7  | 8  | 5  | 3  | 2  | 1  | 0  | 0  | 0                                                                                                                                                          | A  | 0  | 0  | 0                         | 1.9           | 7.7           |
| 18-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.0           | 0.1           |
| 19-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.4           |
| 20-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 0  | A  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.7           |
| 21-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.3           |
| 22-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 1  | 1  | 2  | 1  | 1  | A  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.3           | 1.5           |
| 23-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.5           |
| 24-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.0           | 0.2           |
| 25-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | 0  | 1  | A  | 2  | 2  | 1  | 1  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.4           | 1.9           |
| 26-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 1  | 3  | A  | 2  | 2  | 1  | 1  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.5           | 2.8           |
| 27-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.0           | 0.1           |
| 28-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | 0 | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.3           |
| 29-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | 0                             | A | 0  | 0  | 0  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.2           | 0.8           |
| 30-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | 0 | A                             | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.5           |
| 31-Dec                                                                                             | 0                             | 0 | 0 | 0                 | 0 | 0 | A | 0                             | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                          | 0  | 0  | 0  | 0                         | 0.1           | 0.2           |
| 0.2 0.1 0.1 0.1 0.1 0.0 0.0 0.0 0.1 0.6 1.7 1.9 2.3 1.7 1.4 0.9 0.3 0.1 0.1 0.1 0.1 0.1 0.1 0.1    |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    | Diurnal Average           |               |               |
| 2.6 2.2 0.3 0.2 0.4 0.1 0.1 0.2 2.6 5.1 14.5 10.6 12.3 6.4 9.0 5.5 1.2 0.2 0.4 0.4 1.4 1.2 4.6 0.9 |                               |   |   |                   |   |   |   |                               |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    | Diurnal Maximum           |               |               |
| C - Calibration                                                                                    |                               |   |   | P - Power Failure |   |   |   | A - Automated Daily Zero Span |   |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                            |    |    |    |                           |               |               |

## Hourly Averages

Nitrogen Oxide (NO) - ppb  
Portable Rycroft - December 2016



# Hourly Maximums

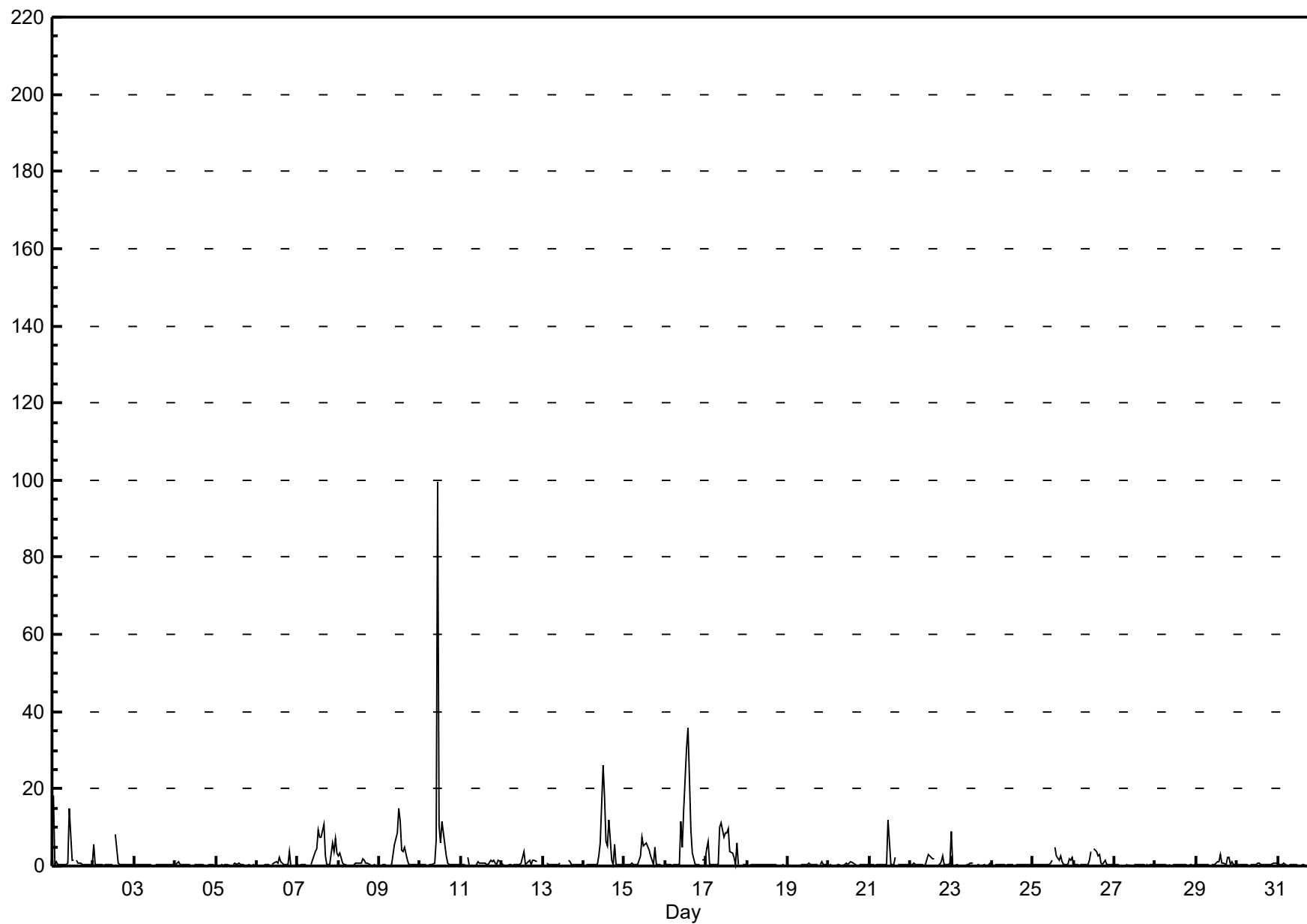
Nitrogen Oxide (NO) - ppb

Portable Rycroft - December 2016

| Maximum Value: 99.4 ppb on Dec 10 11:00                                                                  |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   | Maximum Daily Average: 6.4 ppb on Dec 10                                                                                                                    |   |   |   |   | Hours in Service: 744          |               |
|----------------------------------------------------------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|--------------------------------|---------------|
| Minimum Value: 0 ppb on Dec 19 05:00                                                                     |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   | Minimum Daily Average: 0.2 ppb on Dec 27                                                                                                                    |   |   |   |   | Hours of Data: 704             |               |
| Maximum Diurnal Average: 5.8 ppb at hour 11                                                              |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   | Minimum Diurnal Average: 0.2 ppb at hour 7                                                                                                                  |   |   |   |   | Hours of Missing Data: 40      |               |
| Monthly Average: 1.38 ppb                                                                                |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   | Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 3.0 P <sub>99</sub> = 17.9 |   |   |   |   | Hours of Calibration: 35       |               |
|                                                                                                          |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |                                                                                                                                                             |   |   |   |   | Percent Operational Time: 99.3 |               |
| Day                                                                                                      | Hourly Period Ending At (MST) |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |                                                                                                                                                             |   |   |   |   | Daily Average                  | Daily Maximum |
| 1-Dec                                                                                                    | 18                            | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0  | 1  | 15 | 1  | 1  | A  | 1  | 1  | 1 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 1.9                            | 18.4          |
| 2-Dec                                                                                                    | 6                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | A  | 8  | 1  | 1  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.9                            | 8.1           |
| 3-Dec                                                                                                    | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 0.4           |
| 4-Dec                                                                                                    | 0                             | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 1.1           |
| 5-Dec                                                                                                    | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 1  | 0  | 1  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 0.8           |
| 6-Dec                                                                                                    | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 1  | 1  | 1  | 2  | 1  | 1  | 0 | 0 | 0 | 4                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.6                            | 3.7           |
| 7-Dec                                                                                                    | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 2  | 4  | 5  | 9  | 7  | 8  | 11 | 2 | 0 | 0 | 1                                                                                                                                                           | 6 | 4 | 7 | 3 | 3.1                            | 10.6          |
| 8-Dec                                                                                                    | 2                             | 3 | 1 | 0 | 0 | 0 | A | 0 | 0  | 0  | 1  | 1  | 1  | 1  | 2  | 2  | 1 | 1 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.8                            | 3.5           |
| 9-Dec                                                                                                    | 0                             | 0 | 0 | 0 | 0 | A | 0 | 0 | 3  | 6  | 9  | 15 | 12 | 4  | 4  | 5  | 1 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 2.6                            | 14.7          |
| 10-Dec                                                                                                   | 0                             | 0 | 0 | 0 | A | 0 | 0 | 0 | 1  | 7  | 99 | 11 | 6  | 12 | 6  | 3  | 1 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 6.4                            | 99.4          |
| 11-Dec                                                                                                   | 0                             | 0 | 0 | A | 2 | 0 | 0 | 0 | 0  | 0  | 1  | 1  | 1  | 1  | 1  | 0  | 0 | 2 | 1 | 1                                                                                                                                                           | 1 | 0 | 1 | 1 | 0.7                            | 2.3           |
| 12-Dec                                                                                                   | 0                             | 0 | A | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 2  | 4  | 1  | 1  | 2 | 1 | 2 | 2                                                                                                                                                           | 1 | P | P | P | 0.9                            | 3.6           |
| 13-Dec                                                                                                   | P                             | P | 1 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | C  | C  | C  | C  | 2  | 1 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.5                            | 1.5           |
| 14-Dec                                                                                                   | A                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 2  | 6  | 26 | 18 | 6  | 5  | 12 | 1 | 0 | 6 | 0                                                                                                                                                           | 0 | 0 | 0 | A | 3.9                            | 26.1          |
| 15-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0  | 3  | 7  | 5  | 5  | 6  | 4  | 2  | 1 | 0 | 5 | 0                                                                                                                                                           | 0 | 0 | A | 0 | 1.9                            | 7.3           |
| 16-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 12 | 5  | 14 | 31 | 36 | 23 | 9  | 3 | 0 | 0 | 0                                                                                                                                                           | 0 | A | 1 | 2 | 6.1                            | 35.9          |
| 17-Dec                                                                                                   | 5                             | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 11 | 7  | 8  | 9  | 10 | 4  | 3  | 2 | 0 | 6 | 0                                                                                                                                                           | A | 0 | 0 | 0 | 3.7                            | 11.2          |
| 18-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | A                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 0.4           |
| 19-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 1  | 1  | 0  | 0  | 0 | 0 | A | 0                                                                                                                                                           | 1 | 0 | 0 | 0 | 0.3                            | 1.1           |
| 20-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 0  | 1  | 1  | 1  | 0  | 0 | A | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 0.9           |
| 21-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 12 | 0  | 0  | 0  | 2  | A | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.9                            | 12.1          |
| 22-Dec                                                                                                   | 0                             | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0  | 1  | 3  | 3  | 2  | 2  | 2  | A  | 0 | 0 | 1 | 3                                                                                                                                                           | 0 | 0 | 0 | 1 | 0.9                            | 3.1           |
| 23-Dec                                                                                                   | 9                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 1  | 1  | A  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 1 | 0.7                            | 9.1           |
| 24-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.2                            | 0.4           |
| 25-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 1  | 2  | A  | 5  | 3  | 2  | 3 | 1 | 0 | 0                                                                                                                                                           | 0 | 2 | 2 | 2 | 1.1                            | 5.0           |
| 26-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0  | 2  | 4  | A  | 4  | 4  | 3  | 3  | 1 | 0 | 2 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 1.1                            | 4.4           |
| 27-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.2                            | 0.3           |
| 28-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | A  | 0  | 0  | 0  | 0  | 1  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 0.5           |
| 29-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | A  | 0  | 0  | 0  | 1  | 1  | 3  | 1  | 1 | 0 | 2 | 2                                                                                                                                                           | 0 | 1 | 0 | 0 | 0.7                            | 3.0           |
| 30-Dec                                                                                                   | 0                             | 0 | 0 | 0 | 0 | 0 | 0 | A | 0  | 0  | 1  | 1  | 1  | 1  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 1 | 1 | 1 | 0.4                            | 0.9           |
| 31-Dec                                                                                                   | 0                             | 0 | 0 | 1 | 0 | 0 | A | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0                                                                                                                                                           | 0 | 0 | 0 | 0 | 0.3                            | 0.7           |
| 1.6 0.6 0.3 0.3 0.3 0.2 0.2 0.3 0.7 1.8 5.8 4.0 3.9 4.1 2.5 2.1 0.8 0.4 1.0 0.6 0.5 0.4 0.6 0.5          |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |                                                                                                                                                             |   |   |   |   | Diurnal Average                |               |
| 18.4 6.2 1.1 0.7 2.3 0.5 0.4 0.5 10.0 11.7 99.4 26.1 30.6 35.9 22.6 11.9 3.3 1.7 6.1 3.7 6.1 3.6 7.0 3.4 |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |                                                                                                                                                             |   |   |   |   | Diurnal Maximum                |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                          |                               |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |                                                                                                                                                             |   |   |   |   |                                |               |

## Hourly Maximums

Nitrogen Oxide (NO) - ppb  
Portable Rycroft - December 2016



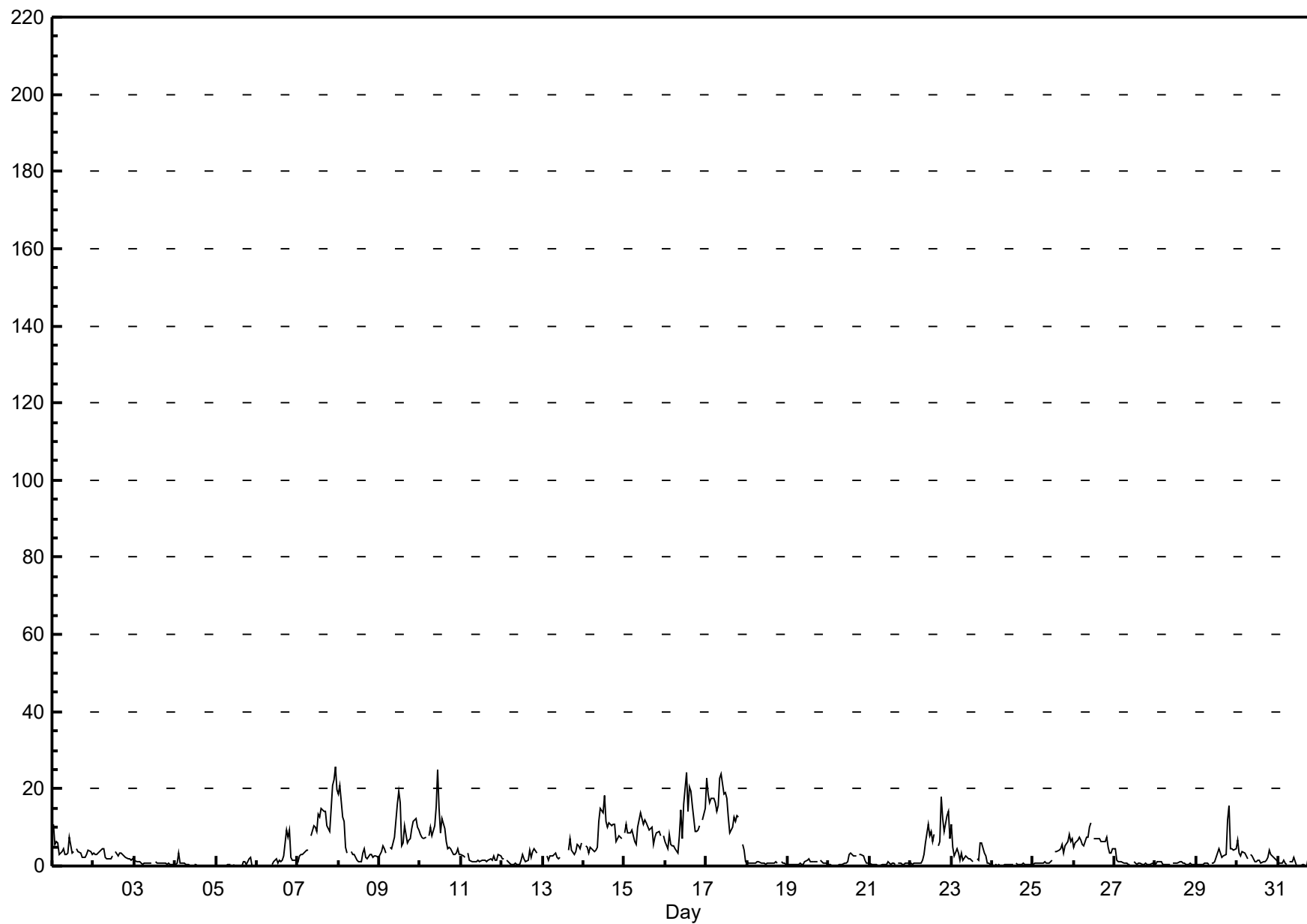
# Hourly Averages

## Oxides of Nitrogen (NO<sub>x</sub>) - ppb Portable Rycroft - December 2016

| Maximum Value: 25.8 ppb on Dec 7 23:00                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 14.5 ppb on Dec 17                                                                                                                    |    |    |    |    |                 |               |  |  |  | Hours in Service: 744     |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|--|--|--|---------------------------|--|
| Minimum Value: 0 ppb on Dec 4 15:00                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.3 ppb on Dec 24                                                                                                                     |    |    |    |    |                 |               |  |  |  | Hours of Data: 704        |  |
| Maximum Diurnal Average: 5.4 ppb at hour 13                                                                             |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 2.5 ppb at hour 8                                                                                                                   |    |    |    |    |                 |               |  |  |  | Hours of Missing Data: 40 |  |
| Monthly Average: 3.96 ppb                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.6 Median = 2.0 Q <sub>3</sub> = 5.5 P <sub>90</sub> = 10.7 P <sub>99</sub> = 21.9 |    |    |    |    |                 |               |  |  |  | Hours of Calibration: 35  |  |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.3                                                                                                                               |    |    |    |    |                 |               |  |  |  |                           |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Daily Average   | Daily Maximum |  |  |  |                           |  |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                           | 21 | 22 | 23 | 24 |                 |               |  |  |  |                           |  |
| 1-Dec                                                                                                                   | 11                            | 5  | 6  | 6  | 3  | 4  | 4  | 3  | 3  | 4  | 8  | 3  | 4  | A  | 5  | 4  | 3  | 2  | 2  | 2                                                                                                                                                            | 3  | 4  | 4  | 3  | 4.1             | 10.9          |  |  |  |                           |  |
| 2-Dec                                                                                                                   | 3                             | 3  | 3  | 4  | 4  | 4  | 4  | 2  | 2  | 2  | 2  | 3  | A  | 4  | 3  | 3  | 3  | 3  | 3  | 2                                                                                                                                                            | 2  | 2  | 1  | 2  | 2.8             | 4.5           |  |  |  |                           |  |
| 3-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0                                                                                                                                                            | 1  | 0  | 0  | 0  | 0.7             | 1.4           |  |  |  |                           |  |
| 4-Dec                                                                                                                   | 0                             | 1  | 3  | 1  | 1  | 1  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.4             | 3.4           |  |  |  |                           |  |
| 5-Dec                                                                                                                   | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 2                                                                                                                                                            | 2  | 0  | 0  | 0  | 0.4             | 2.3           |  |  |  |                           |  |
| 6-Dec                                                                                                                   | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 1  | 1  | 2  | 1  | 2  | 1  | 2  | 3  | 9  | 7  | 9                                                                                                                                                            | 2  | 1  | 1  | 1  | 1.9             | 9.4           |  |  |  |                           |  |
| 7-Dec                                                                                                                   | 1                             | 2  | 3  | 3  | 4  | 4  | 4  | A  | 8  | 11 | 10 | 9  | 13 | 13 | 15 | 14 | 14 | 10 | 10 | 9                                                                                                                                                            | 21 | 22 | 26 | 20 | 10.7            | 25.8          |  |  |  |                           |  |
| 8-Dec                                                                                                                   | 19                            | 21 | 13 | 12 | 5  | 4  | A  | 4  | 3  | 3  | 2  | 1  | 1  | 1  | 3  | 4  | 2  | 2  | 3  | 3                                                                                                                                                            | 2  | 3  | 3  | 2  | 5.1             | 20.9          |  |  |  |                           |  |
| 9-Dec                                                                                                                   | 3                             | 4  | 5  | 5  | 3  | A  | 5  | 4  | 6  | 7  | 16 | 19 | 16 | 5  | 6  | 10 | 6  | 7  | 7  | 10                                                                                                                                                           | 11 | 12 | 10 | 9  | 8.2             | 19.4          |  |  |  |                           |  |
| 10-Dec                                                                                                                  | 8                             | 7  | 7  | 7  | A  | 8  | 10 | 8  | 11 | 15 | 25 | 15 | 9  | 12 | 10 | 6  | 4  | 5  | 5  | 3                                                                                                                                                            | 3  | 4  | 5  | 3  | 8.2             | 24.8          |  |  |  |                           |  |
| 11-Dec                                                                                                                  | 3                             | 3  | 2  | A  | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 1  | 2  | 1  | 3                                                                                                                                                            | 2  | 2  | 3  | 3  | 1.8             | 3.3           |  |  |  |                           |  |
| 12-Dec                                                                                                                  | 2                             | 2  | A  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0  | 2  | 3  | 2  | 1  | 2  | 4  | 2  | 4  | 5                                                                                                                                                            | 3  | P  | P  | P  | 1.8             | 4.6           |  |  |  |                           |  |
| 13-Dec                                                                                                                  | P                             | P  | 3  | 2  | 3  | 2  | 2  | 3  | 2  | 2  | 2  | C  | C  | C  | C  | 4  | 7  | 4  | 3  | 4                                                                                                                                                            | 6  | 5  | 5  | 6  | 3.6             | 6.9           |  |  |  |                           |  |
| 14-Dec                                                                                                                  | A                             | 5  | 5  | 3  | 5  | 4  | 4  | 4  | 5  | 12 | 15 | 14 | 18 | 12 | 10 | 11 | 10 | 11 | 11 | 6                                                                                                                                                            | 7  | 8  | 7  | A  | 8.5             | 18.1          |  |  |  |                           |  |
| 15-Dec                                                                                                                  | 8                             | 11 | 9  | 9  | 9  | 8  | 6  | 6  | 10 | 14 | 12 | 11 | 12 | 11 | 9  | 10 | 10 | 6  | 8  | 9                                                                                                                                                            | 9  | 8  | A  | 8  | 9.2             | 13.6          |  |  |  |                           |  |
| 16-Dec                                                                                                                  | 6                             | 4  | 8  | 6  | 5  | 5  | 5  | 3  | 8  | 15 | 7  | 16 | 24 | 14 | 20 | 20 | 16 | 9  | 9  | 9                                                                                                                                                            | 10 | A  | 12 | 15 | 10.8            | 24.1          |  |  |  |                           |  |
| 17-Dec                                                                                                                  | 23                            | 19 | 16 | 17 | 17 | 16 | 14 | 16 | 23 | 24 | 18 | 19 | 17 | 12 | 9  | 10 | 13 | 11 | 13 | 13                                                                                                                                                           | A  | 6  | 4  | 1  | 14.5            | 23.8          |  |  |  |                           |  |
| 18-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                                            | 1  | 1  | 1  | 1  | 0.8             | 1.2           |  |  |  |                           |  |
| 19-Dec                                                                                                                  | 1                             | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | A  | 1                                                                                                                                                            | 1  | 1  | 1  | 0  | 0.8             | 1.9           |  |  |  |                           |  |
| 20-Dec                                                                                                                  | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 3  | 3  | 3  | 3  | 3  | A  | 3  | 3                                                                                                                                                            | 2  | 1  | 1  | 1  | 1.3             | 3.4           |  |  |  |                           |  |
| 21-Dec                                                                                                                  | 1                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 1  | 1  | 0  | A  | 1  | 1  | 0                                                                                                                                                            | 0  | 1  | 1  | 1  | 0.5             | 1.1           |  |  |  |                           |  |
| 22-Dec                                                                                                                  | 1                             | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 3  | 6  | 11 | 8  | 9  | 6  | 8  | A  | 5  | 6  | 18 | 12                                                                                                                                                           | 9  | 13 | 14 | 7  | 6.2             | 17.8          |  |  |  |                           |  |
| 23-Dec                                                                                                                  | 11                            | 5  | 3  | 4  | 3  | 2  | 3  | 2  | 3  | 2  | 2  | 2  | 2  | 1  | A  | 2  | 1  | 6  | 6  | 3                                                                                                                                                            | 3  | 1  | 1  | 0  | 2.9             | 10.8          |  |  |  |                           |  |
| 24-Dec                                                                                                                  | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | A  | 1  | 0  | 0  | 1  | 1  | 0                                                                                                                                                            | 0  | 0  | 0  | 0  | 0.3             | 0.7           |  |  |  |                           |  |
| 25-Dec                                                                                                                  | 0                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 4  | 4  | 4  | 5  | 6  | 3  | 5                                                                                                                                                            | 6  | 8  | 6  | 7  | 3.0             | 8.1           |  |  |  |                           |  |
| 26-Dec                                                                                                                  | 5                             | 6  | 7  | 8  | 7  | 6  | 5  | 7  | 8  | 10 | 11 | A  | 7  | 7  | 7  | 7  | 6  | 6  | 6  | 7                                                                                                                                                            | 5  | 3  | 3  | 5  | 6.5             | 11.3          |  |  |  |                           |  |
| 27-Dec                                                                                                                  | 4                             | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | A  | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 1  | 0                                                                                                                                                            | 0  | 0  | 1  | 1  | 0.8             | 4.3           |  |  |  |                           |  |
| 28-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 0  | 0  | 0  | 0  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0  | 0                                                                                                                                                            | 1  | 0  | 0  | 0  | 0.7             | 1.2           |  |  |  |                           |  |
| 29-Dec                                                                                                                  | 0                             | 0  | 0  | 0  | 1  | 1  | 1  | 0  | A  | 1  | 1  | 1  | 3  | 4  | 3  | 2  | 3  | 3  | 12 | 16                                                                                                                                                           | 4  | 5  | 4  | 4  | 3.0             | 15.7          |  |  |  |                           |  |
| 30-Dec                                                                                                                  | 7                             | 3  | 3  | 4  | 3  | 3  | 2  | A  | 3  | 3  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 4                                                                                                                                                            | 3  | 2  | 2  | 1  | 2.4             | 6.5           |  |  |  |                           |  |
| 31-Dec                                                                                                                  | 1                             | 1  | 1  | 1  | 1  | 0  | A  | 1  | 1  | 2  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 2  | 2                                                                                                                                                            | 1  | 2  | 1  | 0  | 0.9             | 2.4           |  |  |  |                           |  |
| 4.2 3.7 3.4 3.3 2.8 2.6 2.6 2.5 3.6 4.7 5.3 4.8 5.4 4.4 4.3 4.2 4.2 4.0 4.8 4.8 4.0 4.0 4.0 3.5                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Average |               |  |  |  |                           |  |
| 22.8 20.9 16.4 17.4 17.5 16.2 14.2 15.8 22.8 23.8 24.8 19.4 24.1 14.2 20.3 19.6 15.8 11.4 17.8 15.7 20.8 22.2 25.8 19.7 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    | Diurnal Maximum |               |  |  |  |                           |  |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |    |                 |               |  |  |  |                           |  |

## Hourly Averages

Oxides of Nitrogen (NO<sub>x</sub>) - ppb  
Portable Rycroft - December 2016



# Hourly Maximums

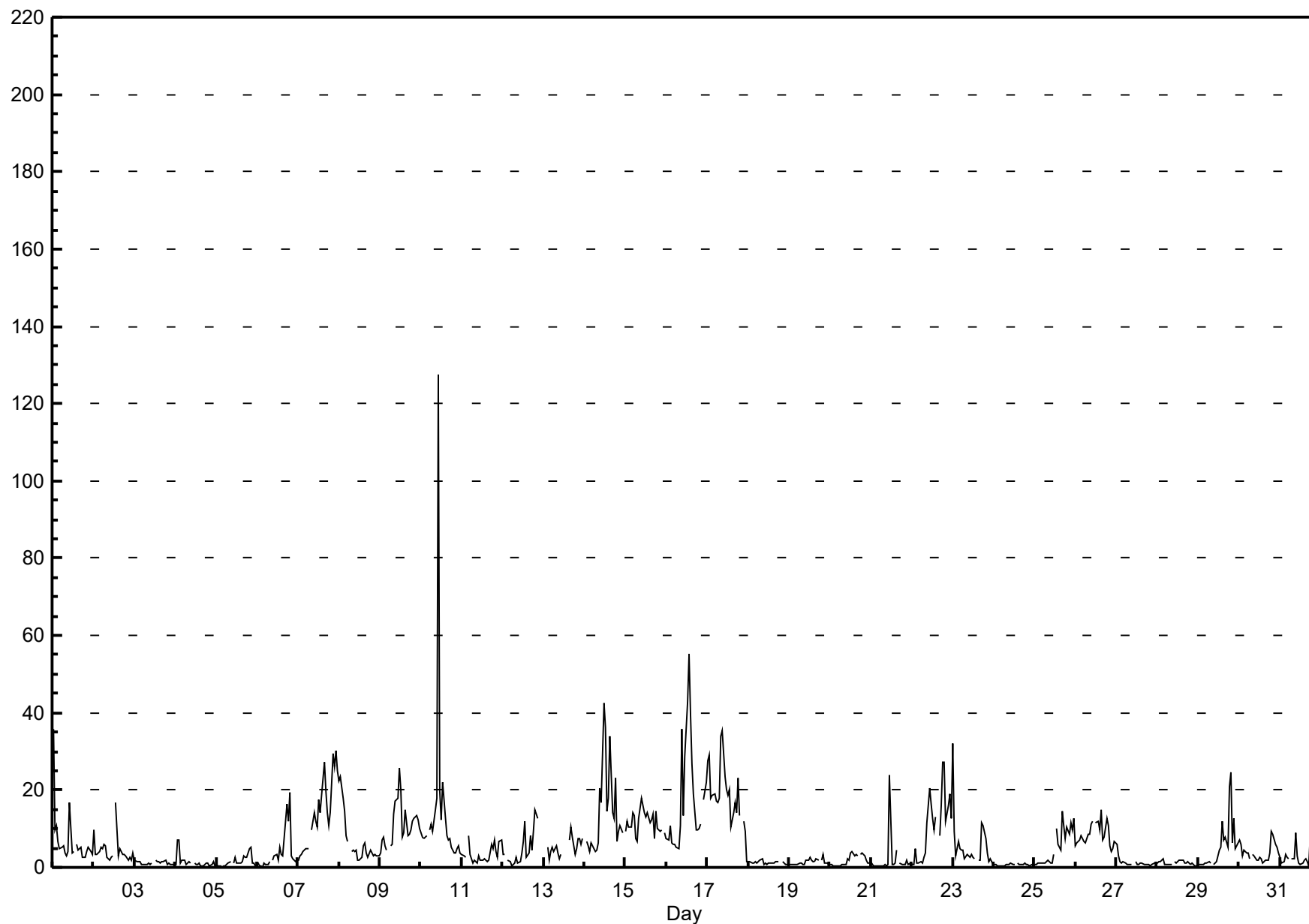
## Oxides of Nitrogen (NO<sub>x</sub>) - ppb Portable Rycroft - December 2016

| Maximum Value: 127.7 ppb on Dec 10 11:00                                                                                 |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    | Maximum Daily Average: 18.8 ppb on Dec 17                                                                                                                    |    |    |    |     | Hours in Service: 744     |               |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----|---------------------------|---------------|
| Minimum Value: 0 ppb on Dec 5 04:00                                                                                      |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    | Minimum Daily Average: 0.7 ppb on Dec 24                                                                                                                     |    |    |    |     | Hours of Data: 704        |               |
| Maximum Diurnal Average: 10.8 ppb at hour 11                                                                             |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 3.4 ppb at hour 7                                                                                                                   |    |    |    |     | Hours of Missing Data: 40 |               |
| Monthly Average: 6.23 ppb                                                                                                |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.1 Median = 3.2 Q <sub>3</sub> = 8.4 P <sub>90</sub> = 14.1 P <sub>99</sub> = 35.7 |    |    |    |     | Hours of Calibration: 35  |               |
|                                                                                                                          |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    | Percent Operational Time: 99.3                                                                                                                               |    |    |    |     |                           |               |
| Day                                                                                                                      | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |     | Daily Average             | Daily Maximum |
| 1-Dec                                                                                                                    | 36                            | 10 | 11 | 7  | 5  | 5  | 6  | 4  | 3  | 4  | 17  | 4  | A  | 6  | 5  | 5  | 3  | 3  | 3  | 4                                                                                                                                                            | 5  | 4  | 3  | 6.7 | 35.8                      |               |
| 2-Dec                                                                                                                    | 10                            | 3  | 3  | 4  | 5  | 5  | 6  | 6  | 3  | 2  | 2   | 3  | A  | 17 | 3  | 5  | 4  | 3  | 3  | 2                                                                                                                                                            | 2  | 2  | 4  | 4.4 | 16.8                      |               |
| 3-Dec                                                                                                                    | 2                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1   | A  | 2  | 1  | 2  | 1  | 1  | 2  | 2  | 1                                                                                                                                                            | 1  | 1  | 1  | 1.2 | 2.0                       |               |
| 4-Dec                                                                                                                    | 1                             | 7  | 7  | 1  | 2  | 2  | 1  | 1  | 2  | 1  | A   | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1  | 1                                                                                                                                                            | 0  | 1  | 2  | 0   | 1.5                       | 7.0           |
| 5-Dec                                                                                                                    | 1                             | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 2  | A  | 1   | 3  | 1  | 1  | 1  | 1  | 3  | 3  | 3  | 5                                                                                                                                                            | 5  | 1  | 1  | 0   | 1.5                       | 5.1           |
| 6-Dec                                                                                                                    | 1                             | 0  | 0  | 0  | 1  | 1  | 1  | 2  | A  | 2  | 3   | 4  | 2  | 5  | 3  | 3  | 7  | 17 | 12 | 19                                                                                                                                                           | 3  | 2  | 2  | 2   | 4.0                       | 19.3          |
| 7-Dec                                                                                                                    | 2                             | 3  | 3  | 4  | 5  | 5  | 5  | A  | 10 | 14 | 12  | 10 | 18 | 14 | 19 | 27 | 20 | 14 | 11 | 14                                                                                                                                                           | 29 | 26 | 30 | 25  | 13.9                      | 30.2          |
| 8-Dec                                                                                                                    | 22                            | 23 | 18 | 14 | 8  | 7  | A  | 4  | 4  | 4  | 4   | 2  | 2  | 2  | 5  | 6  | 4  | 3  | 4  | 4                                                                                                                                                            | 3  | 3  | 3  | 3   | 6.7                       | 23.4          |
| 9-Dec                                                                                                                    | 4                             | 7  | 8  | 6  | 4  | A  | 5  | 6  | 14 | 17 | 18  | 26 | 20 | 8  | 9  | 15 | 8  | 9  | 10 | 12                                                                                                                                                           | 13 | 13 | 12 | 10  | 11.0                      | 25.8          |
| 10-Dec                                                                                                                   | 9                             | 8  | 7  | 8  | A  | 10 | 11 | 9  | 15 | 18 | 128 | 20 | 12 | 22 | 13 | 8  | 7  | 8  | 5  | 4                                                                                                                                                            | 4  | 5  | 6  | 4   | 14.8                      | 127.7         |
| 11-Dec                                                                                                                   | 3                             | 3  | 3  | A  | 8  | 3  | 1  | 2  | 1  | 1  | 3   | 2  | 2  | 2  | 2  | 2  | 2  | 6  | 5  | 7                                                                                                                                                            | 4  | 3  | 7  | 7   | 3.4                       | 8.2           |
| 12-Dec                                                                                                                   | 3                             | 3  | A  | 2  | 2  | 1  | 1  | 1  | 2  | 1  | 2   | 4  | 7  | 12 | 2  | 4  | 8  | 4  | 9  | 15                                                                                                                                                           | 13 | P  | P  | P   | 4.8                       | 15.1          |
| 13-Dec                                                                                                                   | P                             | P  | 5  | 2  | 4  | 5  | 4  | 6  | 4  | 2  | 3   | C  | C  | C  | C  | 7  | 10 | 8  | 3  | 5                                                                                                                                                            | 8  | 7  | 6  | 8   | 5.4                       | 10.3          |
| 14-Dec                                                                                                                   | A                             | 7  | 6  | 4  | 6  | 5  | 4  | 5  | 7  | 20 | 17  | 43 | 36 | 15 | 18 | 34 | 14 | 13 | 23 | 7                                                                                                                                                            | 9  | 11 | 9  | A   | 14.2                      | 42.6          |
| 15-Dec                                                                                                                   | 9                             | 12 | 11 | 11 | 14 | 13 | 8  | 7  | 13 | 18 | 16  | 14 | 13 | 14 | 12 | 12 | 14 | 8  | 14 | 10                                                                                                                                                           | 9  | 10 | A  | 9   | 11.7                      | 17.8          |
| 16-Dec                                                                                                                   | 7                             | 7  | 11 | 6  | 6  | 6  | 5  | 5  | 11 | 36 | 13  | 29 | 43 | 55 | 40 | 27 | 19 | 10 | 10 | 10                                                                                                                                                           | 11 | A  | 18 | 22  | 17.7                      | 55.2          |
| 17-Dec                                                                                                                   | 28                            | 29 | 18 | 19 | 19 | 17 | 17 | 18 | 34 | 35 | 24  | 20 | 19 | 20 | 10 | 14 | 17 | 14 | 23 | 14                                                                                                                                                           | A  | 12 | 9  | 2   | 18.8                      | 35.4          |
| 18-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 1  | 1   | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A                                                                                                                                                            | 2  | 1  | 1  | 1   | 1.2                       | 2.2           |
| 19-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2   | 2  | 3  | 2  | 1  | 1  | 2  | 2  | A  | 2                                                                                                                                                            | 3  | 1  | 1  | 1   | 1.3                       | 3.4           |
| 20-Dec                                                                                                                   | 1                             | 1  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1  | 2   | 2  | 4  | 4  | 3  | 3  | 3  | A  | 3  | 4                                                                                                                                                            | 3  | 2  | 1  | 1   | 1.8                       | 4.1           |
| 21-Dec                                                                                                                   | 1                             | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 1  | 1  | 1   | 24 | 1  | 1  | 1  | 5  | A  | 1  | 1  | 1                                                                                                                                                            | 1  | 2  | 1  | 1   | 2.0                       | 24.0          |
| 22-Dec                                                                                                                   | 1                             | 1  | 5  | 1  | 1  | 2  | 1  | 3  | 4  | 12 | 21  | 16 | 13 | 10 | 13 | A  | 8  | 16 | 27 | 27                                                                                                                                                           | 12 | 16 | 19 | 13  | 10.5                      | 27.3          |
| 23-Dec                                                                                                                   | 32                            | 9  | 3  | 7  | 5  | 4  | 5  | 2  | 3  | 3  | 3   | 3  | 3  | 2  | A  | 2  | 2  | 12 | 11 | 7                                                                                                                                                            | 4  | 2  | 2  | 2   | 5.5                       | 32.2          |
| 24-Dec                                                                                                                   | 1                             | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 1   | 1  | 1  | A  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 1   | 0.7                       | 1.2           |
| 25-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1   | 3  | A  | 10 | 6  | 5  | 15 | 11 | 7  | 10                                                                                                                                                           | 8  | 12 | 10 | 13  | 5.3                       | 14.6          |
| 26-Dec                                                                                                                   | 6                             | 6  | 7  | 8  | 7  | 7  | 6  | 9  | 9  | 11 | 12  | A  | 12 | 12 | 10 | 15 | 7  | 8  | 13 | 11                                                                                                                                                           | 6  | 4  | 5  | 7   | 8.5                       | 15.1          |
| 27-Dec                                                                                                                   | 6                             | 3  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A   | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1                                                                                                                                                            | 1  | 1  | 1  | 1   | 1.3                       | 6.1           |
| 28-Dec                                                                                                                   | 1                             | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | A  | 1   | 1  | 2  | 2  | 2  | 2  | 1  | 1  | 2  | 1                                                                                                                                                            | 1  | 1  | 1  | 1   | 1.2                       | 2.2           |
| 29-Dec                                                                                                                   | 1                             | 1  | 1  | 1  | 1  | 1  | 1  | 1  | A  | 1  | 1   | 2  | 5  | 5  | 12 | 7  | 8  | 5  | 21 | 25                                                                                                                                                           | 6  | 13 | 5  | 6   | 5.6                       | 24.8          |
| 30-Dec                                                                                                                   | 7                             | 6  | 3  | 4  | 4  | 4  | 2  | A  | 3  | 3  | 2   | 2  | 2  | 2  | 1  | 2  | 2  | 2  | 4  | 9                                                                                                                                                            | 9  | 6  | 5  | 4   | 3.8                       | 9.2           |
| 31-Dec                                                                                                                   | 3                             | 1  | 1  | 4  | 3  | 2  | A  | 2  | 2  | 9  | 3   | 1  | 1  | 1  | 2  | 2  | 1  | 0  | 8  | 3                                                                                                                                                            | 2  | 6  | 2  | 2   | 2.7                       | 9.0           |
| 6.9 5.3 4.7 4.0 3.9 3.7 3.4 3.5 5.3 7.7 10.8 8.6 8.1 8.7 6.9 7.3 6.5 6.1 8.0 7.8 5.9 5.8 5.6 5.2                         |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |     | Diurnal Average           |               |
| 35.8 29.2 18.0 18.7 19.2 17.1 16.8 18.0 34.1 35.9 127.7 42.6 43.0 55.2 40.0 33.8 19.7 16.6 27.3 27.2 29.5 26.1 30.2 24.8 |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |     | Diurnal Maximum           |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                          |                               |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |                                                                                                                                                              |    |    |    |     |                           |               |



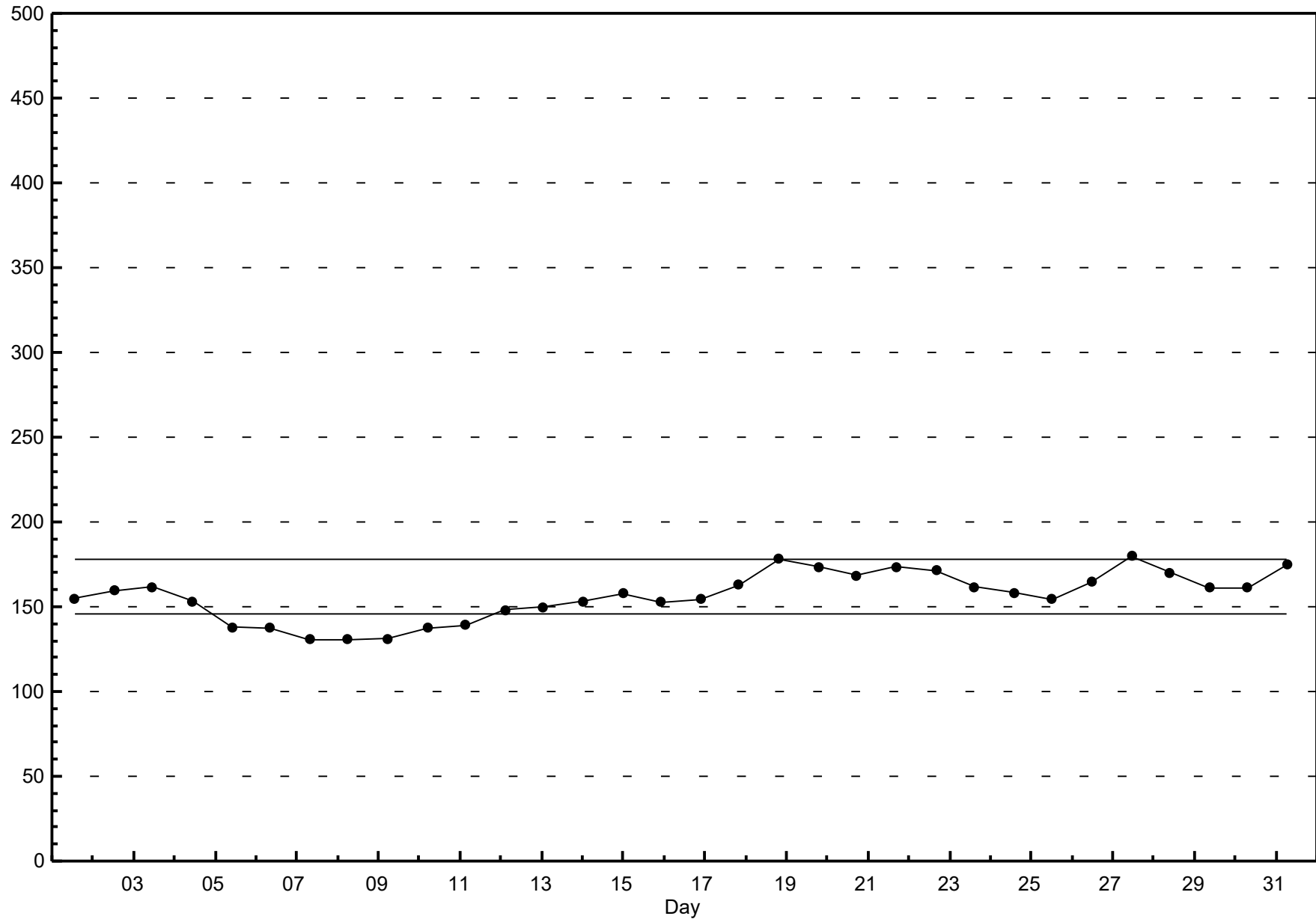
## Hourly Maximums

Oxides of Nitrogen (NO<sub>x</sub>) - ppb  
Portable Rycroft - December 2016



## Span Responses

Oxides of Nitrogen (NO<sub>x</sub>)  
Portable Rycroft - December 2016



# Hourly Averages

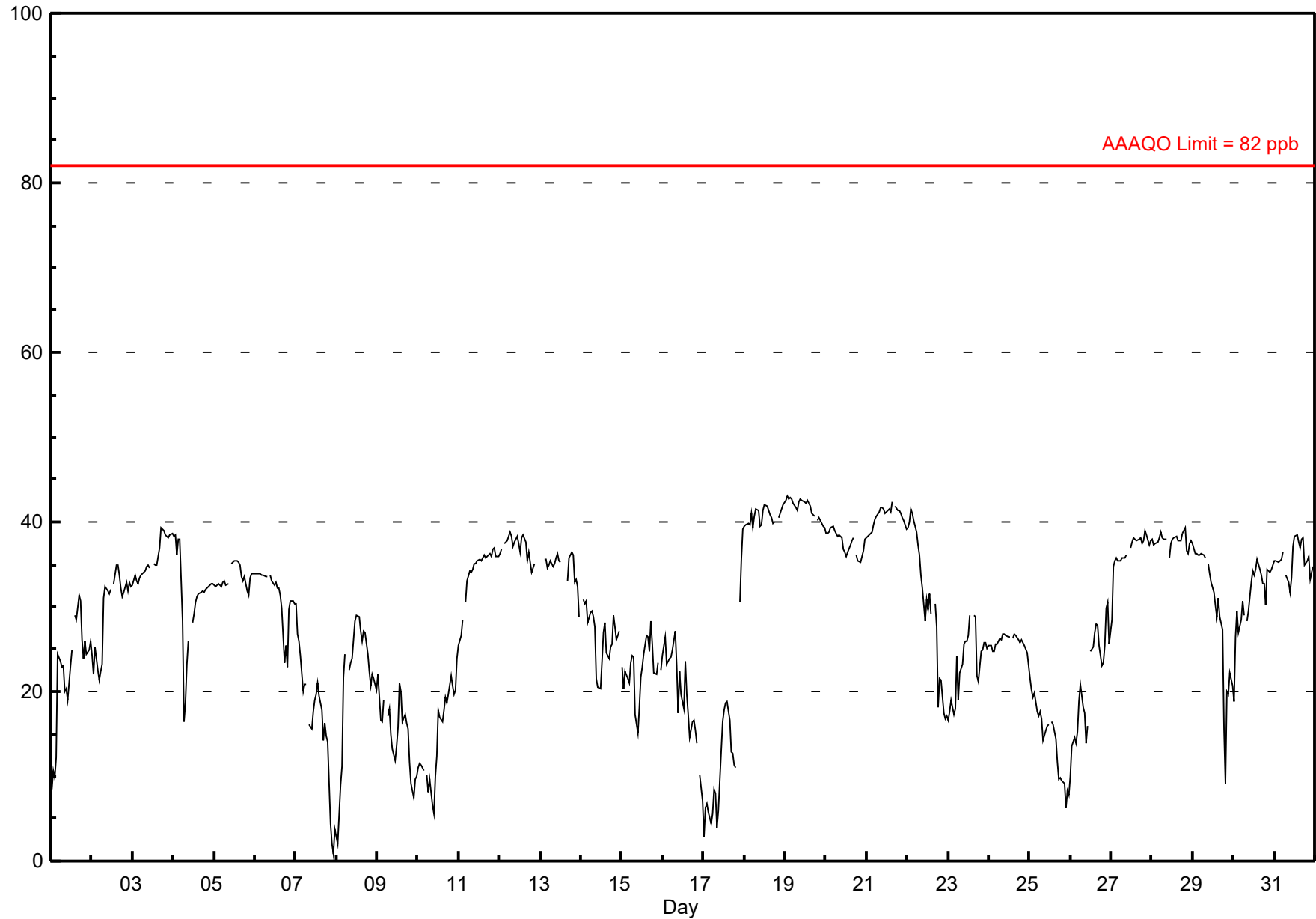
Ozone (O<sub>3</sub>) - ppb

Portable Rycroft - December 2016

| Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0<br>Maximum Value: 43.0 ppb on Dec 19 02:00<br>Maximum Daily Average: 41.7 ppb on Dec 19 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 705<br>Hours of Missing Data: 39<br>Hours of Calibration: 34<br>Percent Operational Time: 99.3                                                                                                                       |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|
| Minimum Value: 1 ppb on Dec 7 23:00<br>Maximum Diurnal Average: 30.9 ppb at hour 14<br>Monthly Average: 28.52 ppb                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 13.6 ppb on Dec 17<br>Minimum Diurnal Average: 26.8 ppb at hour 1<br>Percentiles: P <sub>1</sub> = 4.3 P <sub>10</sub> = 15.1 Q <sub>1</sub> = 21.9 Median = 30.7 Q <sub>3</sub> = 36.1 P <sub>90</sub> = 39.3 P <sub>99</sub> = 42.5 |               |               |
| Day                                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                              | Daily Average | Daily Maximum |
| 1-Dec                                                                                                                                   | 9                             | 11 | 10 | 12 | 24 | 24 | 23 | 23 | 20 | 20 | 19 | 23 | 25 | A  | 29 | 29 | 31 | 31 | 26 | 24 | 26 | 24 | 25 | 26                                                                                                                                                                                                                                                           | 22.3          | 31.4          |
| 2-Dec                                                                                                                                   | 24                            | 22 | 25 | 22 | 21 | 22 | 23 | 31 | 32 | 32 | 32 | A  | 33 | 35 | 35 | 34 | 32 | 31 | 32 | 33 | 32 | 33 | 33 | 32                                                                                                                                                                                                                                                           | 29.6          | 35.0          |
| 3-Dec                                                                                                                                   | 33                            | 34 | 33 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | A  | 35 | 35 | 36 | 37 | 39 | 39 | 39 | 39 | 38 | 38 | 39 | 39                                                                                                                                                                                                                                                           | 35.6          | 39.3          |
| 4-Dec                                                                                                                                   | 38                            | 38 | 36 | 38 | 38 | 28 | 17 | 19 | 23 | 26 | A  | 28 | 29 | 30 | 31 | 32 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33                                                                                                                                                                                                                                                           | 30.8          | 38.4          |
| 5-Dec                                                                                                                                   | 33                            | 32 | 33 | 33 | 32 | 33 | 33 | 33 | 33 | A  | 35 | 35 | 35 | 35 | 35 | 35 | 34 | 33 | 34 | 32 | 31 | 33 | 34 | 34                                                                                                                                                                                                                                                           | 33.5          | 35.5          |
| 6-Dec                                                                                                                                   | 34                            | 34 | 34 | 34 | 34 | 34 | 34 | 34 | A  | 34 | 33 | 33 | 33 | 32 | 32 | 31 | 30 | 23 | 25 | 23 | 30 | 31 | 31 | 30                                                                                                                                                                                                                                                           | 31.4          | 34.0          |
| 7-Dec                                                                                                                                   | 30                            | 27 | 26 | 24 | 20 | 21 | 21 | A  | 16 | 16 | 18 | 19 | 20 | 21 | 20 | 18 | 14 | 16 | 15 | 14 | 4  | 2  | 1  | 4                                                                                                                                                                                                                                                            | 16.8          | 30.3          |
| 8-Dec                                                                                                                                   | 3                             | 2  | 9  | 11 | 22 | 24 | A  | 23 | 23 | 24 | 26 | 28 | 29 | 29 | 27 | 26 | 27 | 27 | 24 | 22 | 21 | 22 | 22 | 20                                                                                                                                                                                                                                                           | 21.4          | 29.1          |
| 9-Dec                                                                                                                                   | 22                            | 19 | 17 | 16 | 19 | A  | 17 | 18 | 15 | 13 | 12 | 13 | 16 | 21 | 20 | 16 | 17 | 16 | 16 | 12 | 9  | 7  | 10 | 10                                                                                                                                                                                                                                                           | 15.3          | 22.0          |
| 10-Dec                                                                                                                                  | 11                            | 12 | 11 | 11 | A  | 10 | 8  | 10 | 7  | 6  | 10 | 12 | 18 | 17 | 16 | 18 | 19 | 19 | 20 | 22 | 21 | 20 | 20 | 24                                                                                                                                                                                                                                                           | 14.8          | 23.9          |
| 11-Dec                                                                                                                                  | 25                            | 27 | 28 | A  | 30 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 35 | 36 | 36 | 36 | 36 | 36 | 36 | 37 | 37 | 36 | 36                                                                                                                                                                                                                                                           | 34.1          | 36.9          |
| 12-Dec                                                                                                                                  | 36                            | 37 | A  | 37 | 38 | 38 | 39 | 38 | 37 | 38 | 38 | 38 | 37 | 38 | 38 | 38 | 35 | 36 | 35 | 34 | 35 | P  | P  | P                                                                                                                                                                                                                                                            | 37.1          | 38.8          |
| 13-Dec                                                                                                                                  | P                             | P  | 36 | 36 | 35 | 35 | 35 | 35 | 35 | 36 | 36 | 35 | 35 | C  | C  | C  | 33 | 36 | 36 | 36 | 33 | 33 | 32 | 29                                                                                                                                                                                                                                                           | 34.6          | 36.4          |
| 14-Dec                                                                                                                                  | A                             | 31 | 30 | 31 | 28 | 29 | 30 | 29 | 28 | 22 | 20 | 20 | 24 | 27 | 28 | 25 | 24 | 25 | 26 | 29 | 28 | 26 | 27 | A                                                                                                                                                                                                                                                            | 26.6          | 30.8          |
| 15-Dec                                                                                                                                  | 23                            | 20 | 22 | 22 | 21 | 23 | 24 | 24 | 17 | 15 | 18 | 22 | 23 | 24 | 27 | 26 | 25 | 28 | 26 | 22 | 22 | 23 | A  | 23                                                                                                                                                                                                                                                           | 22.7          | 28.3          |
| 16-Dec                                                                                                                                  | 24                            | 26 | 23 | 24 | 24 | 24 | 25 | 27 | 23 | 17 | 22 | 20 | 18 | 24 | 20 | 17 | 15 | 16 | 17 | 15 | 14 | A  | 10 | 7                                                                                                                                                                                                                                                            | 19.7          | 27.2          |
| 17-Dec                                                                                                                                  | 3                             | 6  | 7  | 6  | 4  | 6  | 8  | 8  | 4  | 6  | 13 | 17 | 18 | 19 | 19 | 17 | 13 | 13 | 11 | 11 | A  | 30 | 36 | 39                                                                                                                                                                                                                                                           | 13.6          | 39.1          |
| 18-Dec                                                                                                                                  | 39                            | 40 | 40 | 40 | 41 | 39 | 41 | 42 | 41 | 39 | 40 | 41 | 42 | 42 | 41 | 41 | 41 | 40 | 40 | A  | 41 | 41 | 42 | 42                                                                                                                                                                                                                                                           | 40.6          | 42.1          |
| 19-Dec                                                                                                                                  | 43                            | 43 | 43 | 43 | 43 | 42 | 42 | 41 | 42 | 43 | 43 | 42 | 42 | 43 | 42 | 42 | 41 | 41 | A  | 40 | 41 | 40 | 39 | 39                                                                                                                                                                                                                                                           | 41.7          | 43.0          |
| 20-Dec                                                                                                                                  | 39                            | 39 | 39 | 39 | 39 | 39 | 39 | 38 | 38 | 38 | 37 | 36 | 36 | 36 | 37 | 38 | 38 | A  | 36 | 35 | 35 | 36 | 37 | 38                                                                                                                                                                                                                                                           | 37.5          | 39.5          |
| 21-Dec                                                                                                                                  | 38                            | 38 | 39 | 39 | 40 | 40 | 41 | 41 | 42 | 42 | 42 | 41 | 41 | 42 | 41 | 42 | A  | 42 | 41 | 41 | 41 | 41 | 40 | 39                                                                                                                                                                                                                                                           | 40.6          | 42.4          |
| 22-Dec                                                                                                                                  | 39                            | 40 | 42 | 41 | 40 | 39 | 37 | 36 | 34 | 32 | 28 | 31 | 30 | 32 | 29 | A  | 30 | 28 | 18 | 22 | 21 | 17 | 17 | 17                                                                                                                                                                                                                                                           | 30.4          | 41.5          |
| 23-Dec                                                                                                                                  | 17                            | 18 | 19 | 17 | 18 | 24 | 19 | 22 | 23 | 26 | 26 | 26 | 27 | 29 | A  | 29 | 29 | 22 | 21 | 25 | 25 | 26 | 26 | 25                                                                                                                                                                                                                                                           | 23.4          | 29.0          |
| 24-Dec                                                                                                                                  | 25                            | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 26 | 26 | A  | 26 | 27 | 27 | 26 | 26 | 26 | 26 | 25 | 25 | 23                                                                                                                                                                                                                                                           | 25.8          | 26.9          |
| 25-Dec                                                                                                                                  | 22                            | 20 | 19 | 20 | 18 | 17 | 18 | 17 | 14 | 15 | 16 | 16 | A  | 16 | 16 | 14 | 12 | 10 | 10 | 9  | 9  | 6  | 8  | 8                                                                                                                                                                                                                                                            | 14.4          | 21.6          |
| 26-Dec                                                                                                                                  | 10                            | 13 | 15 | 14 | 15 | 19 | 21 | 18 | 17 | 14 | 16 | A  | 25 | 25 | 27 | 28 | 28 | 25 | 23 | 23 | 25 | 30 | 31 | 26                                                                                                                                                                                                                                                           | 21.2          | 30.5          |
| 27-Dec                                                                                                                                  | 29                            | 35 | 35 | 36 | 36 | 35 | 36 | 36 | 36 | 36 | A  | 37 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 39 | 38 | 37 | 38                                                                                                                                                                                                                                                           | 36.6          | 39.0          |
| 28-Dec                                                                                                                                  | 38                            | 37 | 37 | 38 | 38 | 39 | 38 | 38 | 38 | A  | 36 | 37 | 38 | 38 | 38 | 38 | 38 | 38 | 39 | 39 | 37 | 36 | 38 | 38                                                                                                                                                                                                                                                           | 37.8          | 39.4          |
| 29-Dec                                                                                                                                  | 37                            | 36 | 36 | 36 | 36 | 36 | 36 | 36 | A  | 35 | 34 | 33 | 32 | 30 | 29 | 31 | 29 | 27 | 16 | 9  | 20 | 20 | 22 | 21                                                                                                                                                                                                                                                           | 29.4          | 37.4          |
| 30-Dec                                                                                                                                  | 19                            | 26 | 29 | 27 | 28 | 31 | 29 | A  | 28 | 30 | 33 | 34 | 34 | 34 | 36 | 34 | 34 | 34 | 33 | 33 | 30 | 34 | 34 | 35                                                                                                                                                                                                                                                           | 31.3          | 35.6          |
| 31-Dec                                                                                                                                  | 35                            | 35 | 35 | 35 | 36 | 36 | A  | 34 | 33 | 32 | 33 | 37 | 38 | 38 | 38 | 37 | 38 | 38 | 35 | 35 | 36 | 33 | 34 | 35                                                                                                                                                                                                                                                           | 35.6          | 38.4          |
| 26.8 27.5 27.8 27.9 29.2 29.4 28.5 29.1 27.5 27.0 28.0 29.3 30.3 30.9 30.6 30.1 29.2 28.9 27.4 27.0 28.1 28.2 28.1 27.9                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Average                                                                                                                                                                                                                                              |               |               |
| 42.6 43.0 42.7 42.8 42.6 42.1 41.7 41.6 42.3 42.7 42.5 42.3 42.2 42.6 42.2 42.4 41.0 41.8 41.4 41.3 41.0 41.0 41.6 42.1                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Diurnal Maximum                                                                                                                                                                                                                                              |               |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |               |               |
| Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb 24-hr na                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                                                                                                              |               |               |

## Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Portable Rycroft - December 2016



# Hourly Maximums

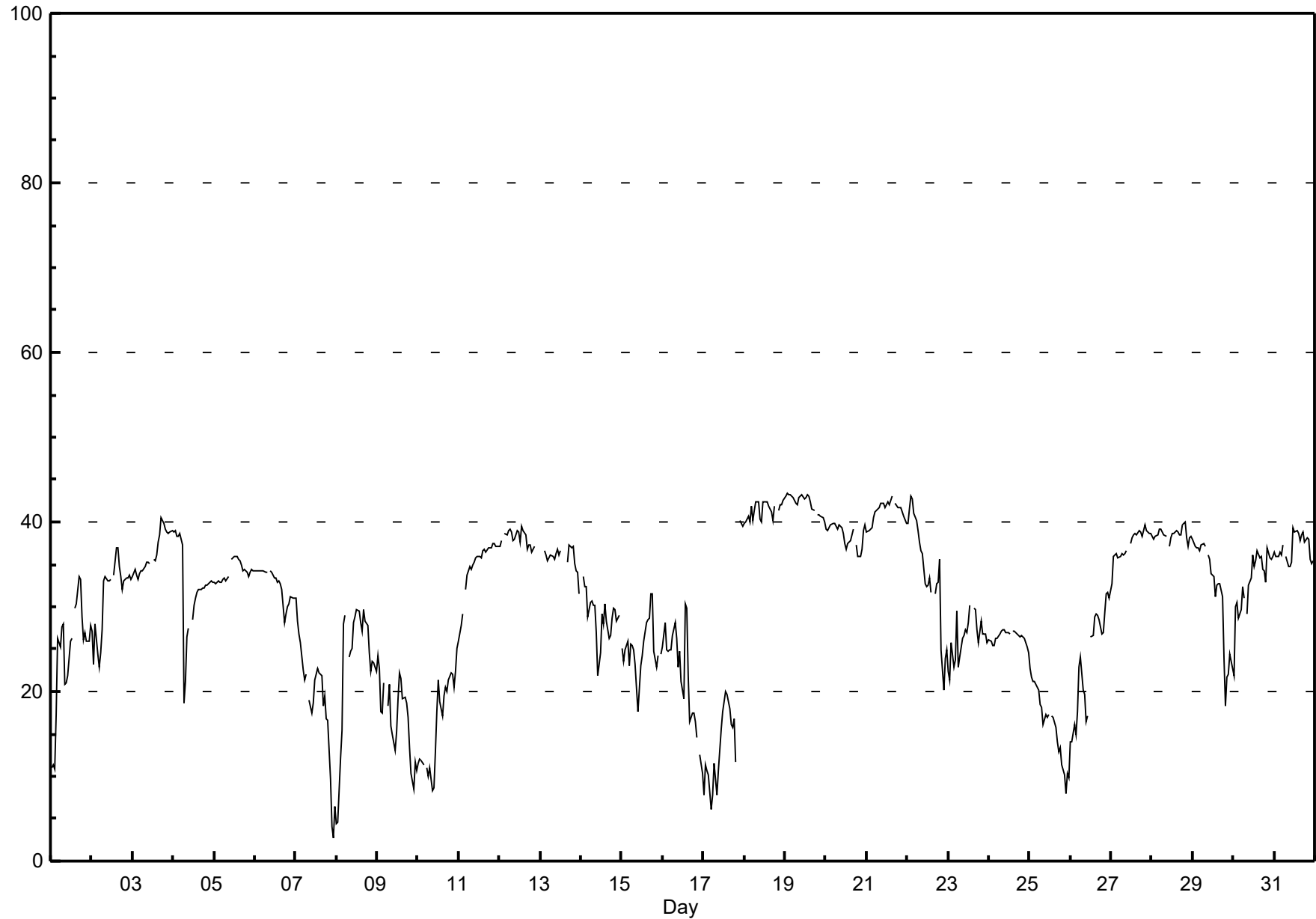
Ozone (O<sub>3</sub>) - ppb

Portable Rycroft - December 2016

| Maximum Value: 43.4 ppb on Dec 19 02:00                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Average: 42.3 ppb on Dec 19                                                                                                                        |    |    |    | Hours in Service: 744     |               |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---------------------------|---------------|---------------|
| Minimum Value: 3 ppb on Dec 7 23:00                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Average: 16.2 ppb on Dec 25                                                                                                                        |    |    |    | Hours of Data: 705        |               |               |
| Maximum Diurnal Average: 32.1 ppb at hour 15                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Average: 28.4 ppb at hour 1                                                                                                                      |    |    |    | Hours of Missing Data: 39 |               |               |
| Monthly Average: 30.13 ppb                                                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 7.7 P <sub>10</sub> = 17.1 Q <sub>1</sub> = 24.5 Median = 32.6 Q <sub>3</sub> = 37.3 P <sub>90</sub> = 39.9 P <sub>99</sub> = 43.1 |    |    |    | Hours of Calibration: 34  |               |               |
|                                                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.3                                                                                                                                   |    |    |    |                           |               |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                  |    |    |    |                           | Daily Average | Daily Maximum |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                               | 21 | 22 | 23 | 24                        |               |               |
| 1-Dec                                                                                                                   | 11                            | 11 | 11 | 17 | 26 | 25 | 28 | 28 | 21 | 21 | 22 | 26 | 26 | A  | 30 | 30 | 34 | 33 | 29 | 26                                                                                                                                                               | 27 | 26 | 26 | 28                        | 24.4          | 33.6          |
| 2-Dec                                                                                                                   | 27                            | 23 | 28 | 24 | 23 | 25 | 27 | 33 | 33 | 33 | 33 | 33 | A  | 34 | 37 | 37 | 35 | 34 | 32 | 33                                                                                                                                                               | 33 | 33 | 34 | 33                        | 31.2          | 37.0          |
| 3-Dec                                                                                                                   | 34                            | 34 | 34 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 35 | A  | 36 | 35 | 36 | 38 | 38 | 40 | 40 | 39                                                                                                                                                               | 39 | 39 | 39 | 39                        | 36.3          | 40.4          |
| 4-Dec                                                                                                                   | 39                            | 39 | 38 | 38 | 39 | 37 | 19 | 21 | 26 | 27 | A  | 29 | 30 | 31 | 32 | 32 | 32 | 32 | 32 | 33                                                                                                                                                               | 33 | 33 | 33 | 33                        | 32.1          | 39.0          |
| 5-Dec                                                                                                                   | 33                            | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 34 | A  | 36 | 36 | 36 | 36 | 36 | 35 | 35 | 34 | 34 | 34                                                                                                                                                               | 34 | 34 | 34 | 34                        | 34.2          | 35.9          |
| 6-Dec                                                                                                                   | 34                            | 34 | 34 | 34 | 34 | 34 | 34 | 34 | A  | 34 | 34 | 33 | 33 | 33 | 33 | 33 | 32 | 28 | 29 | 30                                                                                                                                                               | 30 | 31 | 31 | 31                        | 32.6          | 34.3          |
| 7-Dec                                                                                                                   | 31                            | 28 | 27 | 26 | 23 | 21 | 22 | A  | 19 | 17 | 19 | 21 | 22 | 23 | 22 | 22 | 18 | 19 | 17 | 17                                                                                                                                                               | 10 | 4  | 3  | 6                         | 19.0          | 31.0          |
| 8-Dec                                                                                                                   | 4                             | 5  | 12 | 15 | 28 | 29 | A  | 24 | 25 | 25 | 28 | 29 | 30 | 30 | 28 | 27 | 30 | 28 | 28 | 25                                                                                                                                                               | 22 | 24 | 23 | 22                        | 23.5          | 29.6          |
| 9-Dec                                                                                                                   | 24                            | 23 | 18 | 17 | 21 | A  | 18 | 21 | 16 | 15 | 13 | 15 | 19 | 22 | 21 | 19 | 19 | 19 | 17 | 13                                                                                                                                                               | 10 | 8  | 12 | 11                        | 17.1          | 24.2          |
| 10-Dec                                                                                                                  | 12                            | 12 | 12 | 11 | A  | 11 | 10 | 11 | 8  | 9  | 13 | 18 | 21 | 19 | 17 | 19 | 21 | 20 | 21 | 22                                                                                                                                                               | 22 | 20 | 22 | 25                        | 16.4          | 25.1          |
| 11-Dec                                                                                                                  | 26                            | 28 | 29 | A  | 32 | 34 | 35 | 34 | 35 | 35 | 36 | 36 | 36 | 36 | 37 | 37 | 36 | 37 | 37 | 37                                                                                                                                                               | 37 | 37 | 37 | 37                        | 34.8          | 37.5          |
| 12-Dec                                                                                                                  | 37                            | 38 | A  | 39 | 38 | 39 | 39 | 39 | 38 | 38 | 39 | 39 | 38 | 39 | 39 | 38 | 37 | 37 | 37 | 37                                                                                                                                                               | 37 | P  | P  | P                         | 38.1          | 39.4          |
| 13-Dec                                                                                                                  | P                             | P  | 37 | 36 | 35 | 36 | 36 | 36 | 36 | 36 | 37 | 36 | 37 | C  | C  | C  | 35 | 37 | 37 | 37                                                                                                                                                               | 35 | 34 | 34 | 31                        | 35.7          | 37.3          |
| 14-Dec                                                                                                                  | A                             | 34 | 32 | 32 | 29 | 31 | 31 | 30 | 30 | 27 | 22 | 25 | 29 | 28 | 30 | 28 | 26 | 27 | 29 | 30                                                                                                                                                               | 30 | 28 | 29 | A                         | 28.9          | 33.5          |
| 15-Dec                                                                                                                  | 25                            | 24 | 25 | 26 | 23 | 26 | 25 | 25 | 23 | 18 | 20 | 23 | 24 | 26 | 28 | 28 | 29 | 32 | 31 | 25                                                                                                                                                               | 23 | 24 | A  | 24                        | 25.1          | 31.5          |
| 16-Dec                                                                                                                  | 25                            | 28 | 25 | 25 | 25 | 25 | 27 | 28 | 26 | 23 | 25 | 21 | 19 | 30 | 30 | 22 | 16 | 18 | 17 | 16                                                                                                                                                               | 15 | A  | 13 | 10                        | 22.1          | 30.4          |
| 17-Dec                                                                                                                  | 8                             | 11 | 11 | 10 | 6  | 8  | 12 | 10 | 8  | 11 | 16 | 18 | 19 | 20 | 20 | 18 | 16 | 16 | 17 | 12                                                                                                                                                               | A  | 40 | 40 | 40                        | 16.7          | 40.2          |
| 18-Dec                                                                                                                  | 40                            | 40 | 41 | 40 | 42 | 40 | 41 | 42 | 42 | 40 | 40 | 42 | 42 | 42 | 42 | 42 | 41 | 40 | 42 | A                                                                                                                                                                | 41 | 42 | 42 | 43                        | 41.3          | 42.6          |
| 19-Dec                                                                                                                  | 43                            | 43 | 43 | 43 | 43 | 43 | 42 | 42 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 42 | 42 | 41 | A  | 41                                                                                                                                                               | 41 | 41 | 40 | 40                        | 42.3          | 43.4          |
| 20-Dec                                                                                                                  | 39                            | 39 | 39 | 40 | 40 | 40 | 40 | 39 | 40 | 39 | 39 | 38 | 37 | 37 | 38 | 39 | 39 | A  | 37 | 36                                                                                                                                                               | 36 | 37 | 39 | 40                        | 38.5          | 39.9          |
| 21-Dec                                                                                                                  | 39                            | 39 | 39 | 39 | 40 | 41 | 41 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 43 | 43 | A  | 42 | 42 | 42                                                                                                                                                               | 42 | 41 | 41 | 40                        | 41.2          | 43.1          |
| 22-Dec                                                                                                                  | 40                            | 41 | 43 | 43 | 41 | 40 | 39 | 38 | 37 | 36 | 33 | 32 | 33 | 33 | 32 | A  | 31 | 33 | 33 | 36                                                                                                                                                               | 25 | 20 | 24 | 25                        | 34.2          | 43.1          |
| 23-Dec                                                                                                                  | 22                            | 21 | 26 | 23 | 24 | 29 | 23 | 24 | 26 | 27 | 27 | 27 | 28 | 30 | A  | 30 | 30 | 27 | 26 | 28                                                                                                                                                               | 27 | 27 | 27 | 26                        | 26.3          | 30.2          |
| 24-Dec                                                                                                                  | 26                            | 26 | 25 | 25 | 26 | 26 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | A  | 27 | 27 | 27 | 27 | 26 | 27                                                                                                                                                               | 26 | 26 | 25 | 25                        | 26.4          | 27.3          |
| 25-Dec                                                                                                                  | 23                            | 22 | 21 | 21 | 20 | 20 | 18 | 18 | 16 | 17 | 17 | 17 | A  | 17 | 17 | 16 | 14 | 13 | 13 | 11                                                                                                                                                               | 10 | 8  | 10 | 10                        | 16.2          | 22.8          |
| 26-Dec                                                                                                                  | 14                            | 14 | 16 | 15 | 18 | 23 | 24 | 20 | 20 | 16 | 17 | A  | 26 | 27 | 29 | 29 | 29 | 29 | 27 | 27                                                                                                                                                               | 29 | 32 | 32 | 31                        | 23.6          | 31.8          |
| 27-Dec                                                                                                                  | 33                            | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 37 | A  | 37 | 38 | 39 | 39 | 38 | 39 | 39 | 38 | 39                                                                                                                                                               | 40 | 39 | 39 | 39                        | 37.4          | 39.6          |
| 28-Dec                                                                                                                  | 38                            | 38 | 38 | 38 | 39 | 39 | 39 | 38 | 38 | A  | 37 | 38 | 39 | 39 | 39 | 39 | 38 | 38 | 40 | 40                                                                                                                                                               | 38 | 37 | 38 | 38                        | 38.5          | 39.9          |
| 29-Dec                                                                                                                  | 38                            | 37 | 37 | 37 | 37 | 37 | 37 | 37 | A  | 36 | 36 | 34 | 33 | 31 | 33 | 33 | 33 | 31 | 24 | 18                                                                                                                                                               | 22 | 22 | 24 | 23                        | 31.7          | 38.0          |
| 30-Dec                                                                                                                  | 22                            | 30 | 30 | 29 | 30 | 32 | 31 | A  | 29 | 32 | 33 | 36 | 35 | 36 | 37 | 36 | 36 | 34 | 34 | 33                                                                                                                                                               | 37 | 36 | 36 | 36                        | 33.0          | 37.0          |
| 31-Dec                                                                                                                  | 36                            | 36 | 36 | 36 | 36 | 37 | A  | 36 | 35 | 35 | 35 | 39 | 39 | 39 | 39 | 38 | 39 | 39 | 38 | 38                                                                                                                                                               | 38 | 36 | 35 | 35                        | 36.9          | 39.3          |
| 28.4 28.9 29.2 29.5 30.7 31.1 30.0 30.4 29.1 28.7 29.4 30.7 31.6 32.0 32.1 31.6 30.9 30.8 30.2 29.3 29.6 29.7 29.7 29.5 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                  |    |    |    | Diurnal Average           |               |               |
| 43.0 43.4 43.2 43.2 43.1 42.8 42.3 42.4 42.9 43.1 43.2 42.8 42.9 43.2 43.0 43.1 41.6 42.3 41.9 41.7 41.7 42.0 42.0 42.6 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                  |    |    |    | Diurnal Maximum           |               |               |
| C - Calibration P - Power Failure A - Automated Daily Zero Span                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                                  |    |    |    |                           |               |               |

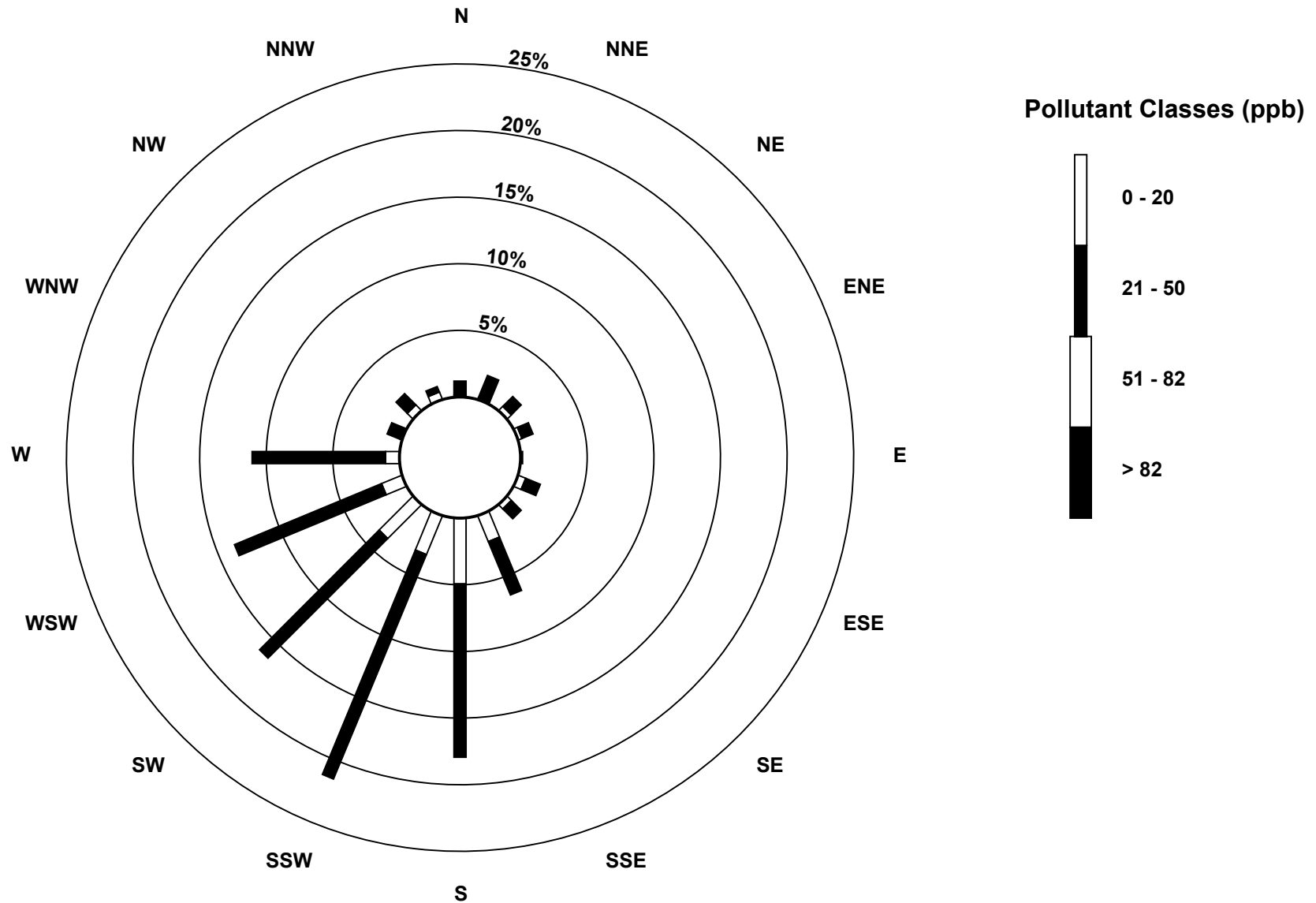
## Hourly Maximums

Ozone (O<sub>3</sub>) - ppb  
Portable Rycroft - December 2016



# Pollutant Rose

Ozone (O<sub>3</sub>) - ppb  
Portable Rycroft - December 2016



# Eight Hour Running Averages

Ozone (O<sub>3</sub>) - ppb

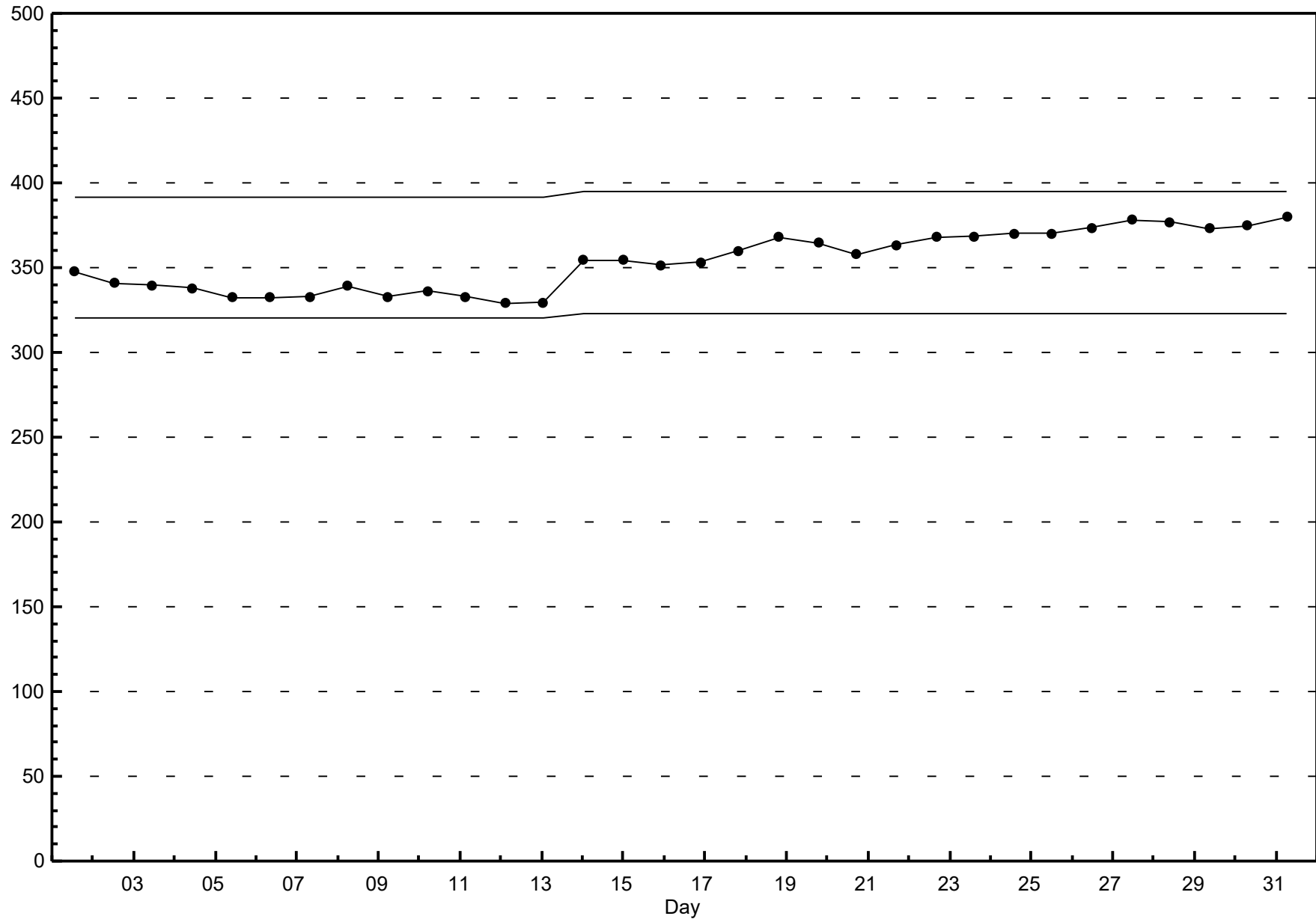
Portable Rycroft - December 2016

|                                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                           |    |      |               |      |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------|----|------|---------------|------|------|
| Maximum Value: 42.5 ppb on Dec 19 07:00                                                                                                                          |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service:         |    | 744  |               |      |      |
| Minimum Value: 4.5 ppb on Dec 8 04:00                                                                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data:            |    | 730  |               |      |      |
|                                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data:    |    | 14   |               |      |      |
| Percentiles: P <sub>1</sub> = 6.1 P <sub>10</sub> = 15.1 Q <sub>1</sub> = 22.0 Median = 29.6 Q <sub>3</sub> = 36.3 P <sub>90</sub> = 39.2 P <sub>99</sub> = 42.3 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration:     |    | 6    |               |      |      |
|                                                                                                                                                                  |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: |    | 98.9 |               |      |      |
| Day                                                                                                                                                              | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                           |    |      | Daily Maximum |      |      |
|                                                                                                                                                                  | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21                        | 22 | 23   | 24            |      |      |
| 1-Dec                                                                                                                                                            | 11                            | 12 | 12 | 12 | 13 | 14 | 16 | 17 | 18 | 20 | 21 | 22 | 22 | 22 | 23 | 24 | 25 | 27 | 28 | 28 | 28                        | 27 | 27   | 27            | 27   | 27.9 |
| 2-Dec                                                                                                                                                            | 26                            | 25 | 25 | 24 | 24 | 24 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 31 | 32 | 33 | 33 | 33 | 33 | 33 | 33                        | 33 | 33   | 33            | 32   | 33.1 |
| 3-Dec                                                                                                                                                            | 32                            | 32 | 33 | 33 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 35 | 36 | 37 | 37 | 37                        | 38 | 38   | 38            | 38   | 38.4 |
| 4-Dec                                                                                                                                                            | 39                            | 38 | 38 | 38 | 38 | 37 | 34 | 32 | 30 | 28 | 27 | 26 | 24 | 25 | 27 | 29 | 30 | 31 | 31 | 31 | 32                        | 32 | 32   | 32            | 32   | 38.6 |
| 5-Dec                                                                                                                                                            | 32                            | 32 | 32 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 34 | 34 | 35 | 35 | 35 | 35 | 35 | 35 | 34                        | 34 | 33   | 33            | 33   | 35.0 |
| 6-Dec                                                                                                                                                            | 33                            | 33 | 33 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 33 | 33 | 33 | 33 | 33 | 32 | 31 | 30 | 29 | 28                        | 28 | 28   | 28            | 28   | 33.9 |
| 7-Dec                                                                                                                                                            | 28                            | 28 | 28 | 29 | 27 | 26 | 25 | 24 | 22 | 21 | 19 | 19 | 19 | 19 | 18 | 18 | 18 | 18 | 18 | 17 | 15                        | 13 | 11   | 9             | 28.6 |      |
| 8-Dec                                                                                                                                                            | 7                             | 6  | 5  | 5  | 7  | 9  | 11 | 13 | 16 | 19 | 22 | 24 | 25 | 26 | 26 | 27 | 27 | 27 | 27 | 27 | 25                        | 25 | 24   | 23            | 27.5 |      |
| 9-Dec                                                                                                                                                            | 23                            | 22 | 21 | 20 | 20 | 19 | 19 | 18 | 17 | 16 | 16 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 16                        | 14 | 13   | 12            | 22.5 |      |
| 10-Dec                                                                                                                                                           | 11                            | 11 | 10 | 10 | 10 | 11 | 10 | 10 | 10 | 9  | 9  | 9  | 10 | 11 | 12 | 13 | 15 | 16 | 17 | 19 | 19                        | 19 | 20   | 20            | 20   | 20.5 |
| 11-Dec                                                                                                                                                           | 21                            | 22 | 23 | 24 | 25 | 27 | 29 | 30 | 32 | 33 | 34 | 34 | 35 | 35 | 35 | 35 | 36 | 36 | 36 | 36 | 36                        | 36 | 36   | 36            | 36   | 36.2 |
| 12-Dec                                                                                                                                                           | 36                            | 36 | 36 | 37 | 37 | 37 | 37 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 37 | 37 | 37 | 36 | 36                        | 36 | 36   | N             | 38.0 |      |
| 13-Dec                                                                                                                                                           | N                             | N  | N  | N  | N  | N  | N  | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | N  | N  | N  | N  | N  | N                         | 35 | 34   | 34            | 35.4 |      |
| 14-Dec                                                                                                                                                           | 34                            | 33 | 32 | 31 | 31 | 30 | 30 | 30 | 29 | 28 | 27 | 26 | 25 | 25 | 25 | 24 | 24 | 24 | 25 | 26 | 26                        | 26 | 26   | 26            | 26   | 33.6 |
| 15-Dec                                                                                                                                                           | 26                            | 25 | 25 | 24 | 23 | 23 | 22 | 22 | 22 | 21 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 24 | 25 | 25 | 25                        | 25 | 25   | 25            | 24   | 26.2 |
| 16-Dec                                                                                                                                                           | 24                            | 24 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 23 | 23 | 23 | 22 | 22 | 21 | 20 | 19 | 19 | 18 | 18 | 17                        | 16 | 15   | 13            | 24.7 |      |
| 17-Dec                                                                                                                                                           | 12                            | 10 | 9  | 8  | 6  | 6  | 6  | 6  | 6  | 6  | 7  | 8  | 10 | 12 | 13 | 14 | 15 | 16 | 16 | 15 | 15                        | 16 | 19   | 22            | 21.9 |      |
| 18-Dec                                                                                                                                                           | 26                            | 30 | 34 | 38 | 38 | 39 | 40 | 40 | 40 | 40 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41                        | 41 | 41   | 41            | 41   | 41.1 |
| 19-Dec                                                                                                                                                           | 41                            | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 41                        | 41 | 41   | 41            | 40   | 42.5 |
| 20-Dec                                                                                                                                                           | 40                            | 40 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 38 | 38 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37                        | 37 | 36   | 36            | 39.9 |      |
| 21-Dec                                                                                                                                                           | 36                            | 37 | 37 | 37 | 38 | 39 | 39 | 39 | 40 | 40 | 41 | 41 | 41 | 41 | 41 | 42 | 42 | 42 | 42 | 42 | 42                        | 41 | 41   | 41            | 41   | 41.6 |
| 22-Dec                                                                                                                                                           | 41                            | 40 | 40 | 40 | 40 | 40 | 40 | 39 | 39 | 38 | 36 | 35 | 33 | 32 | 31 | 31 | 30 | 30 | 28 | 27 | 26                        | 24 | 22   | 21            | 40.6 |      |
| 23-Dec                                                                                                                                                           | 20                            | 18 | 18 | 18 | 17 | 18 | 19 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 27 | 26 | 26 | 26                        | 25 | 25   | 25            | 25   | 27.3 |
| 24-Dec                                                                                                                                                           | 24                            | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 26 | 26 | 26 | 26                        | 26 | 26   | 25            | 26.6 |      |
| 25-Dec                                                                                                                                                           | 25                            | 24 | 23 | 23 | 21 | 20 | 20 | 19 | 18 | 17 | 17 | 16 | 16 | 16 | 16 | 16 | 15 | 14 | 13 | 13 | 12                        | 11 | 10   | 9             | 24.8 |      |
| 26-Dec                                                                                                                                                           | 9                             | 9  | 10 | 10 | 11 | 13 | 14 | 16 | 17 | 17 | 17 | 19 | 19 | 20 | 22 | 23 | 25 | 26 | 26 | 26 | 26                        | 26 | 27   | 26            | 26.7 |      |
| 27-Dec                                                                                                                                                           | 26                            | 28 | 29 | 31 | 32 | 33 | 33 | 35 | 36 | 36 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 38 | 38                        | 38 | 38   | 38            | 38   | 38.1 |
| 28-Dec                                                                                                                                                           | 38                            | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38                        | 38 | 38   | 38            | 38   | 38.2 |
| 29-Dec                                                                                                                                                           | 38                            | 37 | 37 | 37 | 37 | 37 | 37 | 36 | 36 | 36 | 36 | 35 | 35 | 34 | 33 | 32 | 32 | 31 | 28 | 25 | 24                        | 23 | 22   | 20            | 37.7 |      |
| 30-Dec                                                                                                                                                           | 19                            | 19 | 21 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 29 | 30 | 31 | 32 | 33 | 33 | 34 | 34 | 34 | 33 | 34                        | 33 | 33   | 33            | 33   | 33.9 |
| 31-Dec                                                                                                                                                           | 34                            | 34 | 34 | 35 | 35 | 35 | 35 | 35 | 35 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 37 | 37 | 37 | 37                        | 36 | 36   | 36            | 36   | 37.4 |
| Diurnal Maximums                                                                                                                                                 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                           |    |      |               |      |      |
| N - Not Valid                                                                                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                           |    |      |               |      |      |



## Span Responses

Ozone (O<sub>3</sub>)  
Portable Rycroft - December 2016



# Hourly Averages

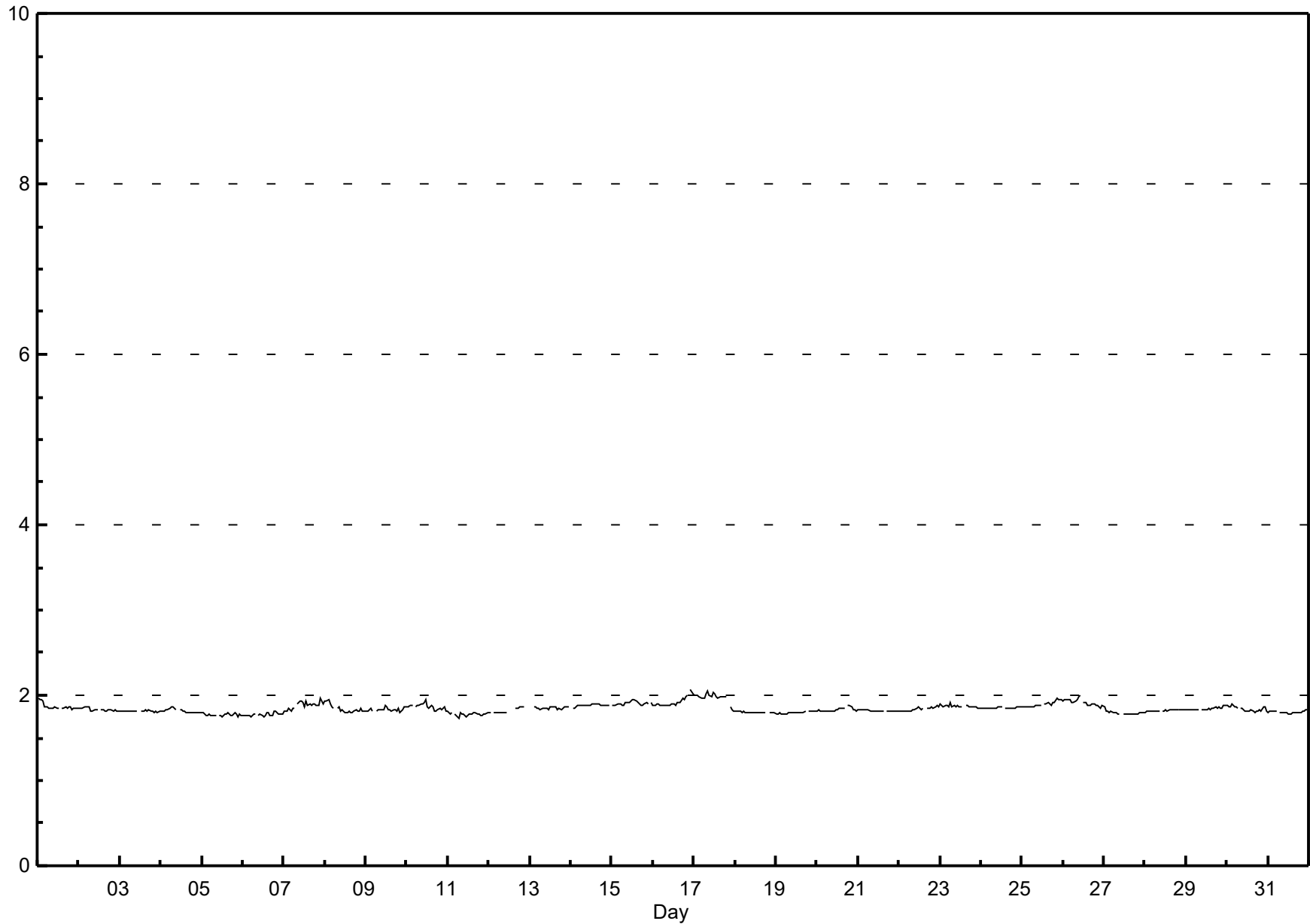
Total Hydrocarbons (THC) - ppm

Portable Rycroft - December 2016

| Maximum Value: 2.06 ppm on Dec 16 23:00                                         |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Maximum Daily Average: 1.97 ppm on Dec 17                                                                                                                         |      |      |      | Hours in Service: 744     |                 |                 |
|---------------------------------------------------------------------------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|---------------------------|-----------------|-----------------|
| Minimum Value: 1.7 ppm on Dec 11 07:00                                          |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Minimum Daily Average: 1.77 ppm on Dec 5                                                                                                                          |      |      |      | Hours of Data: 704        |                 |                 |
| Maximum Diurnal Average: 1.85 ppm at hour 4                                     |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Minimum Diurnal Average: 1.84 ppm at hour 6                                                                                                                       |      |      |      | Hours of Missing Data: 40 |                 |                 |
| Monthly Average: 1.843 ppm                                                      |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Percentiles: P <sub>1</sub> = 1.76 P <sub>10</sub> = 1.79 Q <sub>1</sub> = 1.81 Median = 1.83 Q <sub>3</sub> = 1.87 P <sub>90</sub> = 1.91 P <sub>99</sub> = 2.00 |      |      |      | Hours of Calibration: 34  |                 |                 |
|                                                                                 |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | Percent Operational Time: 99.2                                                                                                                                    |      |      |      |                           |                 |                 |
| Day                                                                             | Hourly Period Ending At (MST) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                                                                                                                                                   |      |      |      |                           | Daily Average   | Daily Maximum   |
|                                                                                 | 1                             | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20                                                                                                                                                                | 21   | 22   | 23   | 24                        |                 |                 |
| 1-Dec                                                                           | 2.0                           | 2.0  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.8  | 1.9  | 1.9  | 1.9  | 1.8  | 1.9  | A    | 1.9  | 1.9  | 1.9  | 1.8  | 1.9  | 1.9                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.87            | 1.96            |
| 2-Dec                                                                           | 1.8                           | 1.9  | 1.8  | 1.9  | 1.9  | 1.9  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.83            | 1.87            |
| 3-Dec                                                                           | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.81            | 1.82            |
| 4-Dec                                                                           | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.82            | 1.87            |
| 5-Dec                                                                           | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.77            | 1.80            |
| 6-Dec                                                                           | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.7  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.77            | 1.81            |
| 7-Dec                                                                           | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.8  | A    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 2.0  | 1.9  | 1.9                       | 1.88            | 1.96            |
| 8-Dec                                                                           | 1.9                           | 1.9  | 2.0  | 1.9  | 1.9  | 1.9  | A    | 1.8  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.84            | 1.95            |
| 9-Dec                                                                           | 1.8                           | 1.8  | 1.8  | 1.9  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.9  | 1.9                       | 1.83            | 1.87            |
| 10-Dec                                                                          | 1.9                           | 1.9  | 1.9  | 1.9  | A    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 2.0  | 1.9  | 1.8  | 1.9  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.9  | 1.8                       | 1.86            | 1.95            |
| 11-Dec                                                                          | 1.8                           | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.7  | 1.8  | 1.8  | 1.8  | 1.8  | 1.7  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.78            | 1.81            |
| 12-Dec                                                                          | 1.8                           | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | D    | C    | C    | C    | 1.8  | 1.8  | 1.8  | 1.9  | 1.9                                                                                                                                                               | 1.9  | P    | P    | P                         | --              | 1.87            |
| 13-Dec                                                                          | P                             | P    | 1.9  | 1.9  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.9  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.85            | 1.87            |
| 14-Dec                                                                          | A                             | 1.8  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | A                         | 1.88            | 1.90            |
| 15-Dec                                                                          | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 2.0  | 2.0  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | A    | 1.9                       | 1.91            | 1.96            |
| 16-Dec                                                                          | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 2.0  | 2.0  | 2.0                                                                                                                                                               | 2.0  | A    | 2.1  | 2.0                       | 1.92            | 2.06            |
| 17-Dec                                                                          | 2.0                           | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.1  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0                                                                                                                                                               | A    | 1.9  | 1.8  | 1.8                       | 1.97            | 2.05            |
| 18-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A                                                                                                                                                                 | 1.8  | 1.8  | 1.8  | 1.8                       | 1.80            | 1.81            |
| 19-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A                                                                                                                                                                 | 1.8  | 1.8  | 1.8  | 1.8                       | 1.80            | 1.82            |
| 20-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.8  | 1.8  | 1.8                       | 1.83            | 1.89            |
| 21-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.82            | 1.83            |
| 22-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.9                                                                                                                                                               | 1.8  | 1.9  | 1.9  | 1.9                       | 1.84            | 1.89            |
| 23-Dec                                                                          | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | A    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.87            | 1.92            |
| 24-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.8  | 1.9  | 1.9  | 1.9  | A    | 1.9  | 1.9  | 1.9  | 1.8  | 1.8  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.85            | 1.86            |
| 25-Dec                                                                          | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | A    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 2.0  | 2.0  | 1.9  | 1.9                       | 1.89            | 1.96            |
| 26-Dec                                                                          | 1.9                           | 2.0  | 1.9  | 2.0  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 2.0  | 2.0  | A    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.8  | 1.9                       | 1.91            | 1.99            |
| 27-Dec                                                                          | 1.9                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.79            | 1.87            |
| 28-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.82            | 1.83            |
| 29-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.84            | 1.88            |
| 30-Dec                                                                          | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.9  | 1.8                       | 1.84            | 1.89            |
| 31-Dec                                                                          | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.80            | 1.83            |
|                                                                                 |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                                                                                                                                                   |      |      |      |                           |                 |                 |
|                                                                                 |                               | 1.85 | 1.84 | 1.85 | 1.85 | 1.84 | 1.84 | 1.84 | 1.85 | 1.85 | 1.85 | 1.84 | 1.84 | 1.84 | 1.84 | 1.84 | 1.84 | 1.84 | 1.84 | 1.85                                                                                                                                                              | 1.84 | 1.84 | 1.85 | 1.84                      | Diurnal Average |                 |
|                                                                                 |                               | 1.99 | 1.99 | 2.00 | 1.98 | 1.97 | 1.96 | 1.96 | 2.02 | 2.05 | 2.00 | 1.99 | 2.03 | 2.02 | 1.99 | 1.96 | 1.98 | 1.99 | 1.98 | 1.99                                                                                                                                                              | 1.99 | 2.01 | 1.96 | 2.06                      | 2.03            | Diurnal Maximum |
| C - Calibration P - Power Failure D - DAS Failure A - Automated Daily Zero Span |                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                                                                                                                                                   |      |      |      |                           |                 |                 |

## Hourly Averages

Total Hydrocarbons (THC) - ppm  
Portable Rycroft - December 2016



# Hourly Maximums

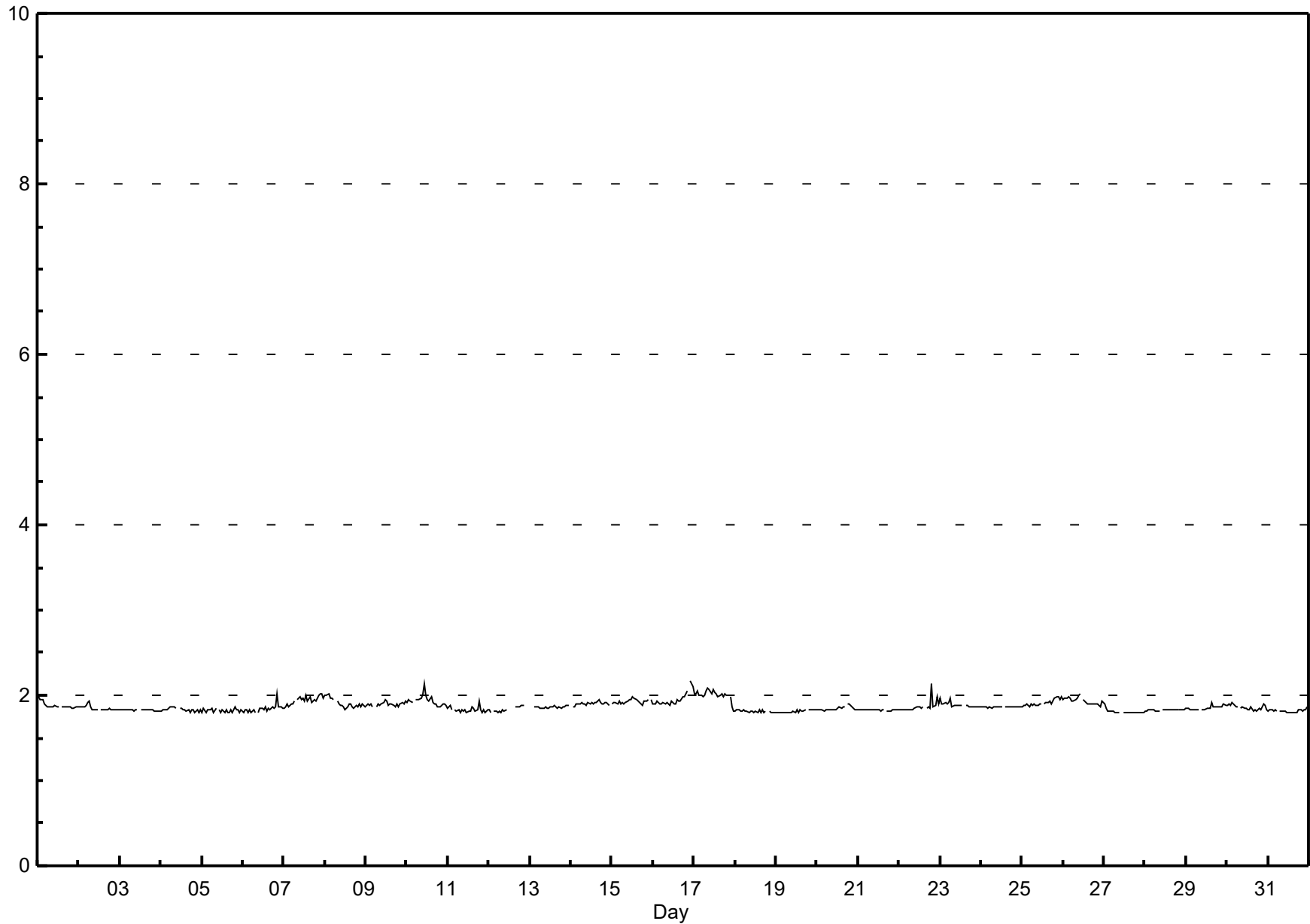
Total Hydrocarbons (THC) - ppm

Portable Rycroft - December 2016

| Maximum Value: 2.18 ppm on Dec 16 23:00      |                               |                   |      |      |      |      |      |                 |      |      |      |      |      |                               |      |      |      |      |      | Maximum Daily Average: 2.00 ppm on Dec 17                                                                                                                         |      |      |      | Hours in Service: 744     |               |                 |  |
|----------------------------------------------|-------------------------------|-------------------|------|------|------|------|------|-----------------|------|------|------|------|------|-------------------------------|------|------|------|------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|---------------------------|---------------|-----------------|--|
| Minimum Value: 1.8 ppm on Dec 31 14:00       |                               |                   |      |      |      |      |      |                 |      |      |      |      |      |                               |      |      |      |      |      | Minimum Daily Average: 1.80 ppm on Dec 27                                                                                                                         |      |      |      | Hours of Data: 704        |               |                 |  |
| Maximum Diurnal Average: 1.88 ppm at hour 20 |                               |                   |      |      |      |      |      |                 |      |      |      |      |      |                               |      |      |      |      |      | Minimum Diurnal Average: 1.86 ppm at hour 8                                                                                                                       |      |      |      | Hours of Missing Data: 40 |               |                 |  |
| Monthly Average: 1.870 ppm                   |                               |                   |      |      |      |      |      |                 |      |      |      |      |      |                               |      |      |      |      |      | Percentiles: P <sub>1</sub> = 1.79 P <sub>10</sub> = 1.81 Q <sub>1</sub> = 1.82 Median = 1.86 Q <sub>3</sub> = 1.90 P <sub>90</sub> = 1.95 P <sub>99</sub> = 2.05 |      |      |      | Hours of Calibration: 34  |               |                 |  |
|                                              |                               |                   |      |      |      |      |      |                 |      |      |      |      |      |                               |      |      |      |      |      | Percent Operational Time: 99.2                                                                                                                                    |      |      |      |                           |               |                 |  |
| Day                                          | Hourly Period Ending At (MST) |                   |      |      |      |      |      |                 |      |      |      |      |      |                               |      |      |      |      |      |                                                                                                                                                                   |      |      |      |                           | Daily Average | Daily Maximum   |  |
|                                              | 1                             | 2                 | 3    | 4    | 5    | 6    | 7    | 8               | 9    | 10   | 11   | 12   | 13   | 14                            | 15   | 16   | 17   | 18   | 19   | 20                                                                                                                                                                | 21   | 22   | 23   | 24                        |               |                 |  |
| 1-Dec                                        | 2.0                           | 2.0               | 2.0  | 2.0  | 1.9  | 1.9  | 1.9  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | A                             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.8  | 1.8  | 1.9  | 1.9                       | 1.88          | 1.98            |  |
| 2-Dec                                        | 1.9                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9             | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.85          | 1.93            |  |
| 3-Dec                                        | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | A    | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.82          | 1.83            |  |
| 4-Dec                                        | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.9  | 1.9  | 1.9             | 1.9  | 1.8  | A    | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.83          | 1.87            |  |
| 5-Dec                                        | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.82          | 1.86            |  |
| 6-Dec                                        | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.9                           | 1.8  | 1.8  | 1.8  | 1.9  | 1.8  | 1.9                                                                                                                                                               | 2.0  | 1.9  | 1.9  | 1.8                       | 1.84          | 2.02            |  |
| 7-Dec                                        | 1.8                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | A               | 2.0  | 2.0  | 2.0  | 2.0  | 1.9  | 2.0                           | 1.9  | 2.0  | 1.9  | 1.9  | 2.0  | 1.9                                                                                                                                                               | 2.0  | 2.0  | 2.0  | 2.0                       | 1.94          | 2.02            |  |
| 8-Dec                                        | 2.0                           | 2.0               | 2.0  | 2.0  | 2.0  | 2.0  | A    | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.8  | 1.9                           | 1.9  | 1.9  | 1.9  | 1.8  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.91          | 2.02            |  |
| 9-Dec                                        | 1.9                           | 1.9               | 1.9  | 1.9  | 1.9  | A    | 1.9  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.90          | 1.94            |  |
| 10-Dec                                       | 1.9                           | 2.0               | 1.9  | 1.9  | A    | 1.9  | 1.9  | 2.0             | 2.0  | 2.0  | 2.1  | 2.0  | 2.0  | 1.9                           | 2.0  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.94          | 2.13            |  |
| 11-Dec                                       | 1.8                           | 1.9               | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.9  | 1.8  | 1.8  | 1.8  | 1.9  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.83          | 1.93            |  |
| 12-Dec                                       | 1.8                           | 1.8               | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | D    | C    | C                             | C    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | P    | P    | P                         | --            | 1.88            |  |
| 13-Dec                                       | P                             | P                 | 1.9  | 1.9  | 1.9  | 1.9  | 1.8  | 1.8             | 1.8  | 1.9  | 1.8  | 1.8  | 1.9  | 1.9                           | 1.9  | 1.9  | 1.8  | 1.9  | 1.8  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.86          | 1.88            |  |
| 14-Dec                                       | A                             | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | A                         | 1.90          | 1.94            |  |
| 15-Dec                                       | 1.9                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9             | 1.9  | 1.9  | 2.0  | 2.0  | 2.0  | 2.0                           | 2.0  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | A    | 1.9                       | 1.93          | 1.98            |  |
| 16-Dec                                       | 1.9                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                           | 1.9  | 1.9  | 1.9  | 2.0  | 2.0  | 2.0                                                                                                                                                               | 2.1  | A    | 2.2  | 2.1                       | 1.95          | 2.18            |  |
| 17-Dec                                       | 2.0                           | 2.0               | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.1             | 2.1  | 2.1  | 2.0  | 2.1  | 2.0  | 2.0                           | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0                                                                                                                                                               | A    | 2.0  | 1.9  | 1.8                       | 2.00          | 2.09            |  |
| 18-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | A                                                                                                                                                                 | 1.8  | 1.8  | 1.8  | 1.8                       | 1.81          | 1.83            |  |
| 19-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.81          | 1.84            |  |
| 20-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.9                           | 1.8  | 1.9  | 1.9  | A    | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.8  | 1.8  | 1.8                       | 1.84          | 1.89            |  |
| 21-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.83          | 1.84            |  |
| 22-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | 1.9  | 1.9  | 1.9  | 1.8                           | 1.9  | A    | 1.8  | 1.9  | 1.8  | 2.1                                                                                                                                                               | 1.9  | 1.9  | 2.0  | 1.9                       | 1.87          | 2.14            |  |
| 23-Dec                                       | 2.0                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 2.0  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                           | A    | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.89          | 1.96            |  |
| 24-Dec                                       | 1.9                           | 1.9               | 1.9  | 1.9  | 1.8  | 1.9  | 1.8  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | A                             | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.86          | 1.87            |  |
| 25-Dec                                       | 1.9                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9             | 1.9  | 1.9  | 1.9  | 1.9  | A    | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 2.0                                                                                                                                                               | 2.0  | 2.0  | 2.0  | 2.0                       | 1.91          | 1.99            |  |
| 26-Dec                                       | 1.9                           | 2.0               | 2.0  | 2.0  | 2.0  | 1.9  | 1.9  | 2.0             | 2.0  | 2.0  | A    | 2.0  | 1.9  | 1.9                           | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.93          | 2.01            |  |
| 27-Dec                                       | 1.9                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | 1.8  | A    | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.80          | 1.89            |  |
| 28-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | 1.8  | A    | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.8                       | 1.83          | 1.84            |  |
| 29-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8             | A    | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.9  | 1.9  | 1.9  | 1.9  | 1.9                                                                                                                                                               | 1.9  | 1.9  | 1.9  | 1.9                       | 1.85          | 1.92            |  |
| 30-Dec                                       | 1.9                           | 1.9               | 1.9  | 1.9  | 1.9  | 1.9  | 1.9  | A               | 1.8  | 1.9  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.9  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.9  | 1.9  | 1.8                       | 1.86          | 1.92            |  |
| 31-Dec                                       | 1.8                           | 1.8               | 1.8  | 1.8  | 1.8  | 1.8  | A    | 1.8             | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                           | 1.8  | 1.8  | 1.8  | 1.8  | 1.8  | 1.8                                                                                                                                                               | 1.8  | 1.8  | 1.8  | 1.9                       | 1.82          | 1.86            |  |
|                                              |                               | 1.87              | 1.87 | 1.87 | 1.87 | 1.86 | 1.86 | 1.87            | 1.86 | 1.87 | 1.87 | 1.88 | 1.87 | 1.87                          | 1.86 | 1.87 | 1.87 | 1.86 | 1.86 | 1.87                                                                                                                                                              | 1.88 | 1.87 | 1.87 | 1.87                      | 1.87          | Diurnal Average |  |
|                                              |                               | 2.02              | 2.01 | 2.05 | 2.00 | 2.00 | 1.99 | 2.00            | 2.06 | 2.09 | 2.07 | 2.13 | 2.06 | 2.04                          | 2.02 | 1.98 | 2.00 | 2.02 | 1.99 | 2.02                                                                                                                                                              | 2.14 | 2.06 | 2.02 | 2.18                      | 2.11          | Diurnal Maximum |  |
| C - Calibration                              |                               | P - Power Failure |      |      |      |      |      | D - DAS Failure |      |      |      |      |      | A - Automated Daily Zero Span |      |      |      |      |      |                                                                                                                                                                   |      |      |      |                           |               |                 |  |

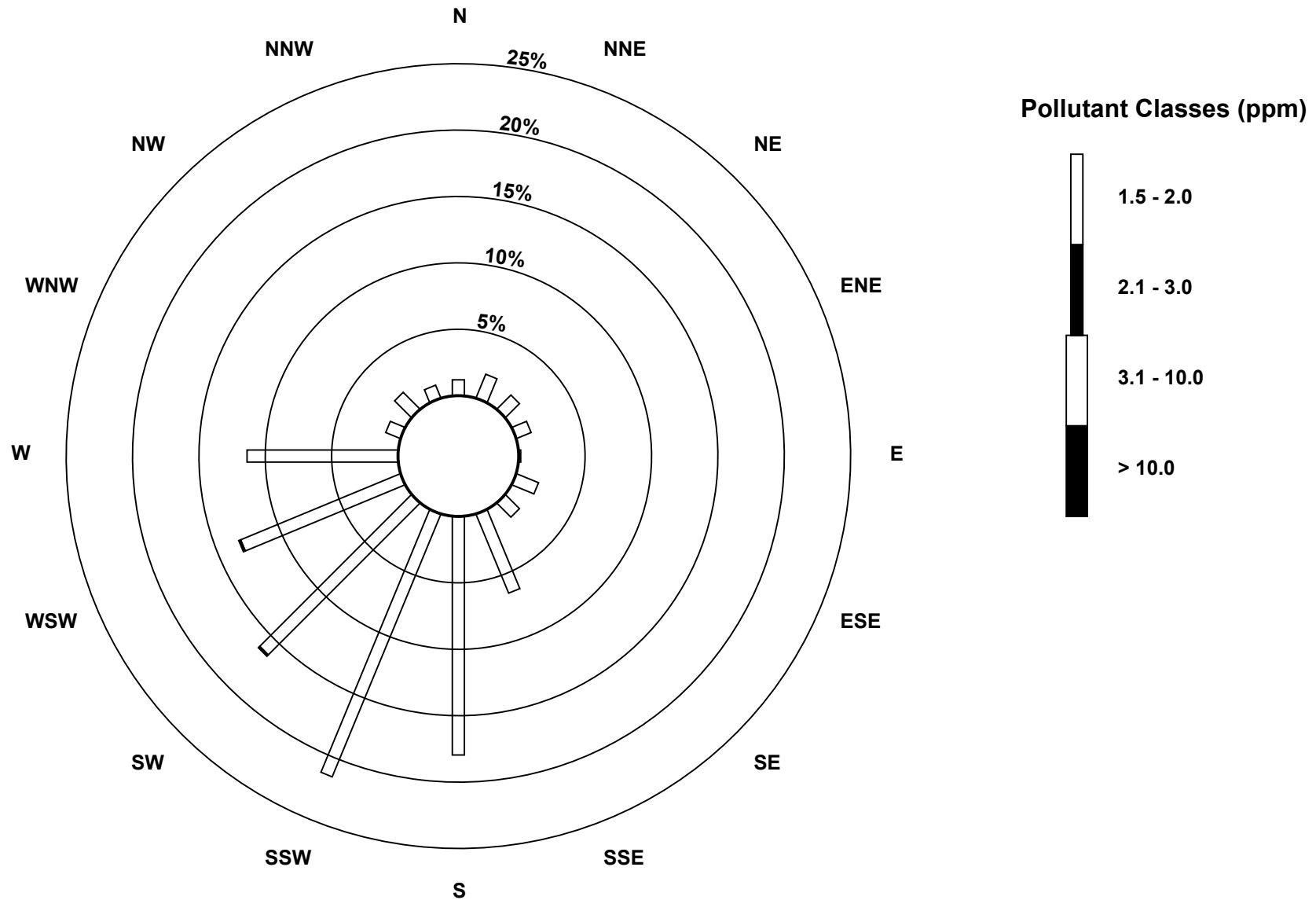
## Hourly Maximums

Total Hydrocarbons (THC) - ppm  
Portable Rycroft - December 2016



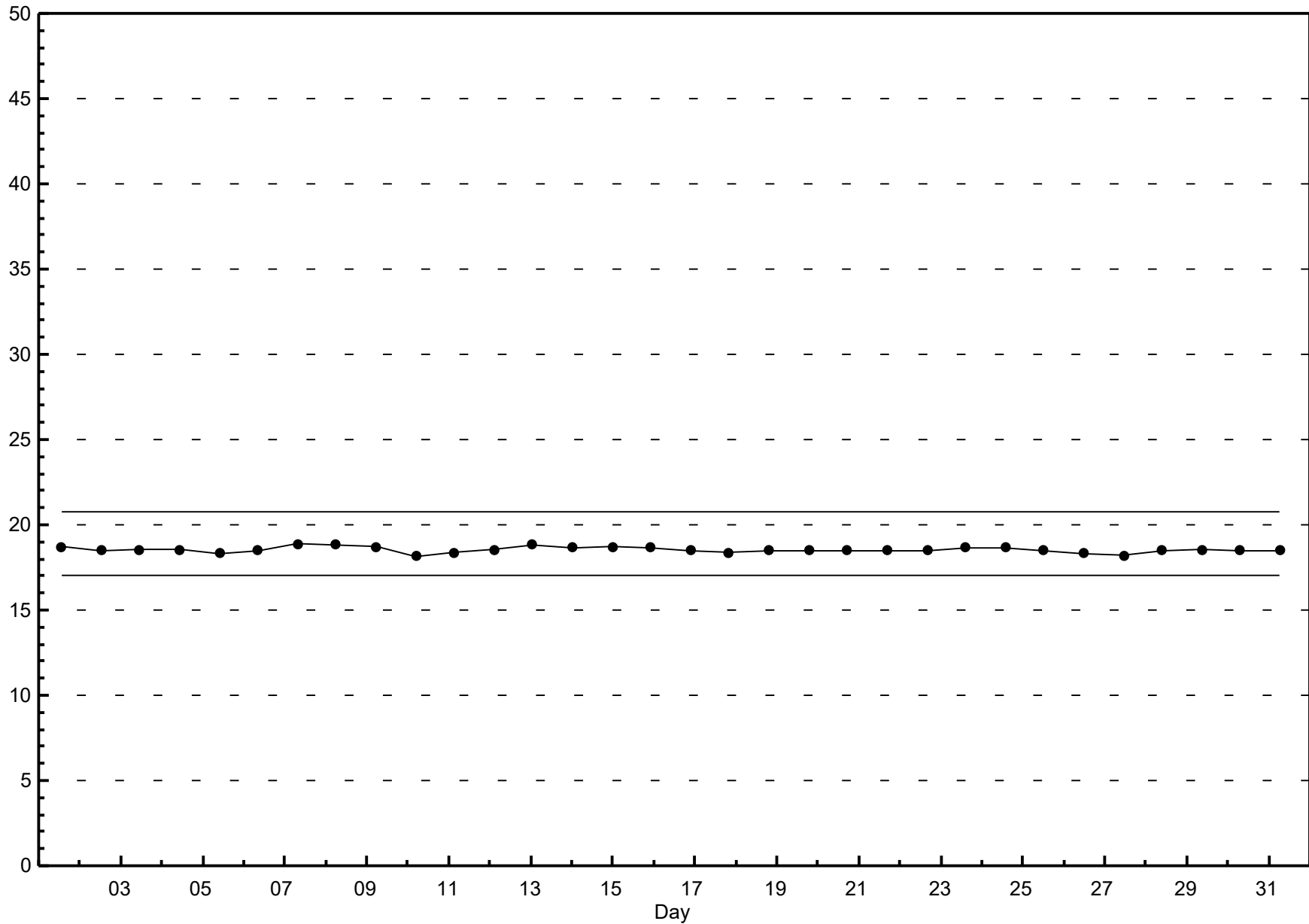
# Pollutant Rose

Total Hydrocarbons (THC) - ppm  
Portable Rycroft - December 2016



## Span Responses

Total Hydrocarbons (THC)  
Portable Rycroft - December 2016



# Hourly Averages

Methane (CH<sub>4</sub>) - ppm

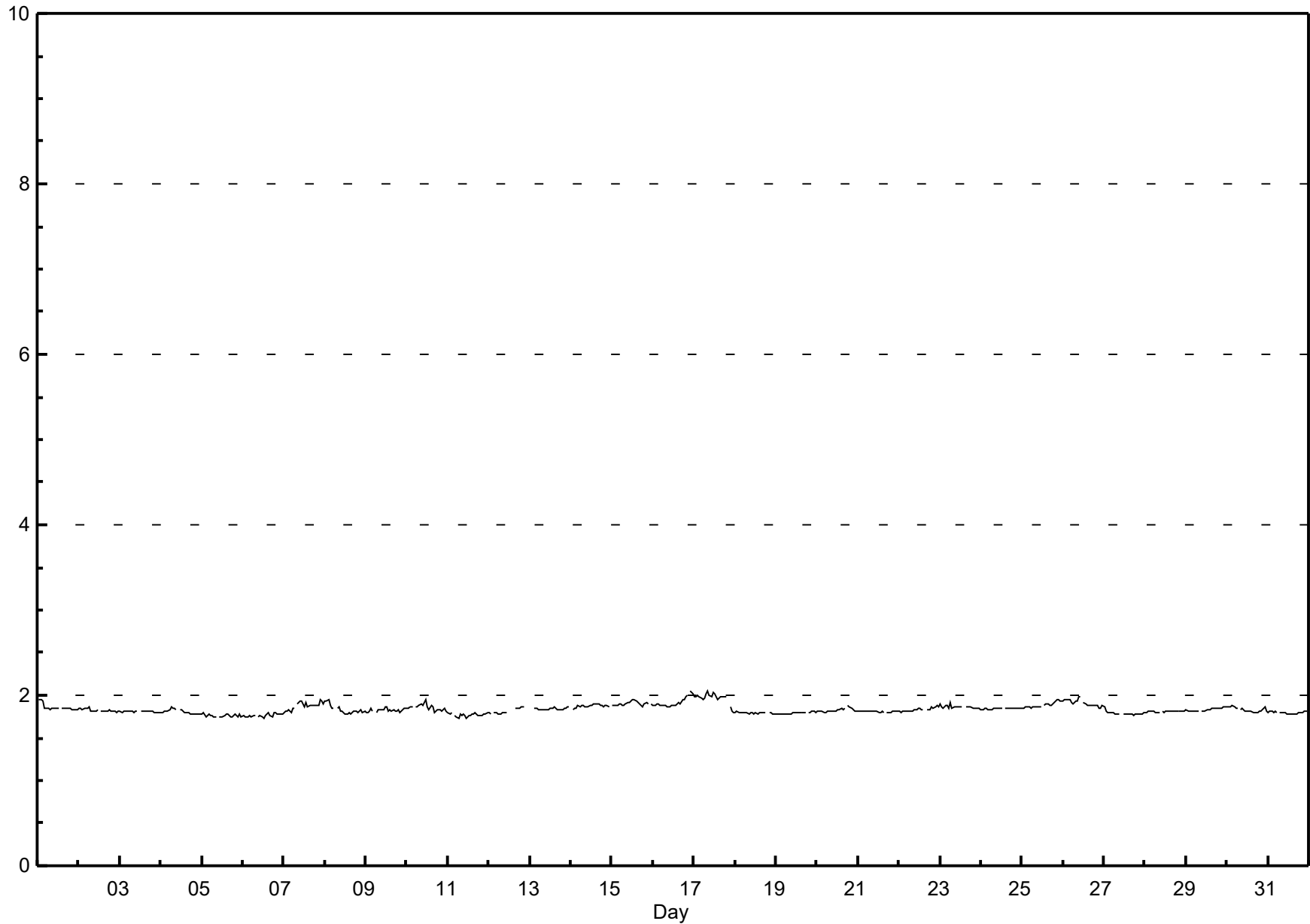
Portable Rycroft - December 2016

| Maximum Value: 2.06 ppm on Dec 16 23:00                                                                                                                           |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Hours in Service: 744          |               |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------------|---------------|---------------|
| Maximum Daily Average: 1.97 ppm on Dec 17                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Hours of Data: 704             |               |               |
| Minimum Value: 1.7 ppm on Dec 11 07:00                                                                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Hours of Missing Data: 40      |               |               |
| Maximum Diurnal Average: 1.84 ppm at hour 4                                                                                                                       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Hours of Calibration: 34       |               |               |
| Monthly Average: 1.836 ppm                                                                                                                                        |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percent Operational Time: 99.2 |               |               |
| Minimum Daily Average: 1.76 ppm on Dec 5                                                                                                                          |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                |               |               |
| Minimum Diurnal Average: 1.83 ppm at hour 6                                                                                                                       |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                |               |               |
| Percentiles: P <sub>1</sub> = 1.75 P <sub>10</sub> = 1.78 Q <sub>1</sub> = 1.80 Median = 1.82 Q <sub>3</sub> = 1.86 P <sub>90</sub> = 1.90 P <sub>99</sub> = 2.00 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                |               |               |
| Day                                                                                                                                                               | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                | Daily Average | Daily Maximum |
|                                                                                                                                                                   | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24                             |               |               |
| 1-Dec                                                                                                                                                             | 2.0                           | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.9 | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.86          | 1.95          |
| 2-Dec                                                                                                                                                             | 1.8                           | 1.8 | 1.8 | 1.9 | 1.8 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.83          | 1.86          |
| 3-Dec                                                                                                                                                             | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.81          | 1.81          |
| 4-Dec                                                                                                                                                             | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.81          | 1.86          |
| 5-Dec                                                                                                                                                             | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.7 | 1.8 | 1.7                            | 1.76          | 1.79          |
| 6-Dec                                                                                                                                                             | 1.8                           | 1.7 | 1.7 | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.77          | 1.80          |
| 7-Dec                                                                                                                                                             | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9                            | 1.88          | 1.95          |
| 8-Dec                                                                                                                                                             | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | A   | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.83          | 1.95          |
| 9-Dec                                                                                                                                                             | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9                            | 1.87          | 1.97          |
| 10-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8                            | 1.86          | 1.95          |
| 11-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.77          | 1.80          |
| 12-Dec                                                                                                                                                            | 1.8                           | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | D   | C   | C   | C   | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | P   | P   | P                              | --            | 1.86          |
| 13-Dec                                                                                                                                                            | P                             | P   | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9                            | 1.84          | 1.86          |
| 14-Dec                                                                                                                                                            | A                             | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A                              | 1.87          | 1.89          |
| 15-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9                            | 1.90          | 1.95          |
| 16-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 2.1 | 2.0                            | 1.91          | 2.06          |
| 17-Dec                                                                                                                                                            | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 1.9 | 1.8 | 1.8                            | 1.97          | 2.05          |
| 18-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8                            | 1.79          | 1.81          |
| 19-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8                            | 1.79          | 1.81          |
| 20-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8                            | 1.82          | 1.88          |
| 21-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.81          | 1.82          |
| 22-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9                            | 1.83          | 1.88          |
| 23-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.8 | 1.8                            | 1.86          | 1.91          |
| 24-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8                            | 1.84          | 1.85          |
| 25-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9                            | 1.89          | 1.95          |
| 26-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9                            | 1.91          | 1.99          |
| 27-Dec                                                                                                                                                            | 1.9                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.79          | 1.86          |
| 28-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.81          | 1.82          |
| 29-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8 | 1.9 | 1.9                            | 1.83          | 1.87          |
| 30-Dec                                                                                                                                                            | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.8                            | 1.83          | 1.89          |
| 31-Dec                                                                                                                                                            | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                            | 1.80          | 1.82          |
| 1.84 1.84 1.84 1.84 1.83 1.83 1.83 1.83 1.84 1.84 1.84 1.84 1.84 1.83 1.84 1.84 1.83 1.83 1.84 1.84 1.83 1.83 1.84 1.83                                           |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Diurnal Average                |               |               |
| 1.99 1.99 1.99 1.97 1.96 1.96 1.96 2.01 2.05 2.00 1.99 2.03 2.02 1.98 1.95 1.98 1.99 1.98 1.99 1.98 2.00 1.95 2.06 2.02                                           |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Diurnal Maximum                |               |               |
| C - Calibration P - Power Failure D - DAS Failure A - Automated Daily Zero Span                                                                                   |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                |               |               |



## Hourly Averages

Methane (CH<sub>4</sub>) - ppm  
Portable Rycroft - December 2016



# Hourly Maximums

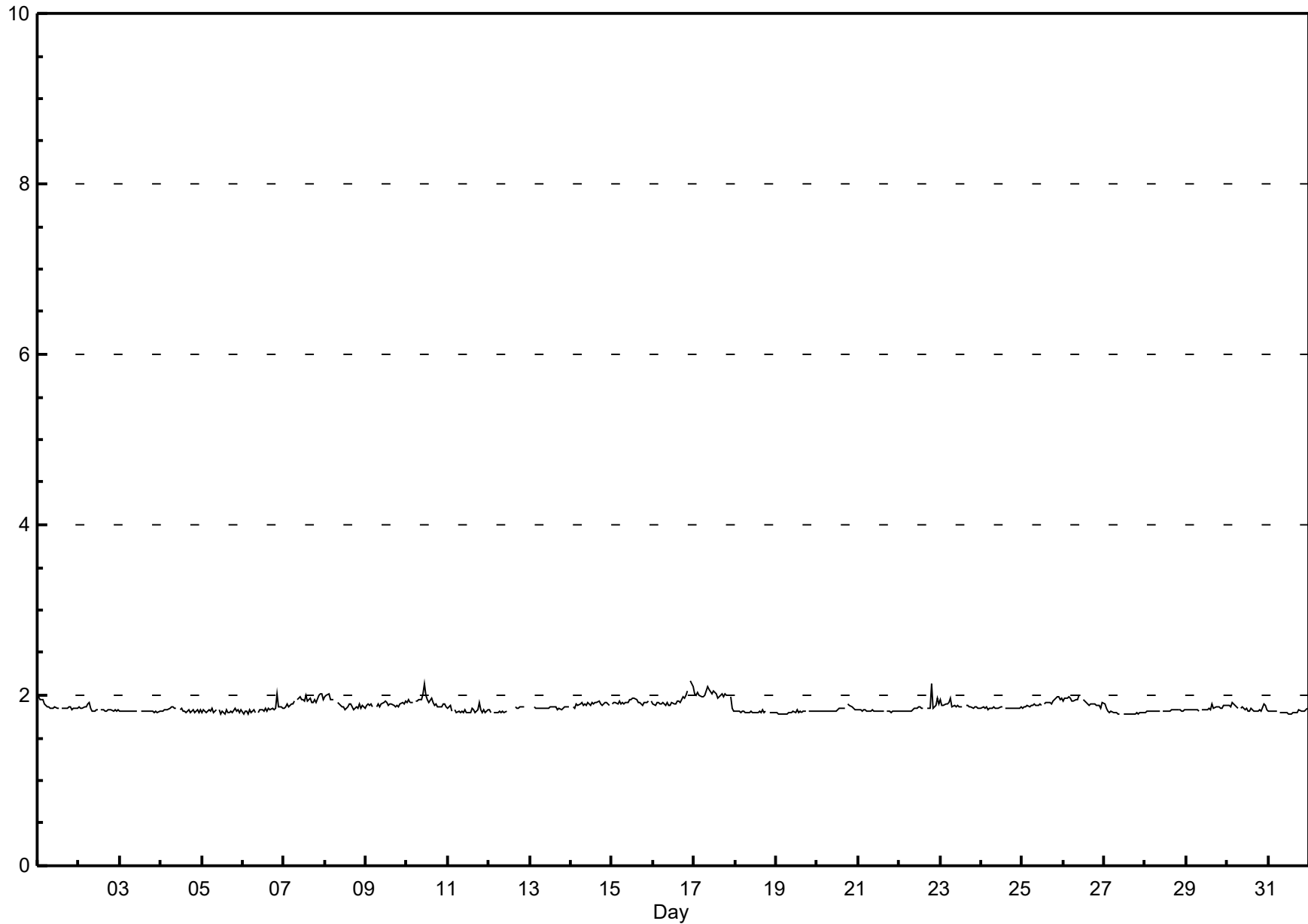
Methane (CH<sub>4</sub>) - ppm

Portable Rycroft - December 2016

|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                 |                                |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----------------|--------------------------------|--|
| Maximum Value: 2.16 ppm on Dec 16 23:00                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 2.00 ppm on Dec 17                                                                                                                         |     |     |     |                 | Hours in Service: 744          |  |
| Minimum Value: 1.8 ppm on Dec 27 13:00                                                                                  |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: 1.80 ppm on Dec 27                                                                                                                         |     |     |     |                 | Hours of Data: 704             |  |
| Maximum Diurnal Average: 1.87 ppm at hour 20                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 1.85 ppm at hour 8                                                                                                                       |     |     |     |                 | Hours of Missing Data: 40      |  |
| Monthly Average: 1.863 ppm                                                                                              |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 1.78 P <sub>10</sub> = 1.80 Q <sub>1</sub> = 1.82 Median = 1.85 Q <sub>3</sub> = 1.90 P <sub>90</sub> = 1.95 P <sub>99</sub> = 2.06 |     |     |     |                 | Hours of Calibration: 34       |  |
|                                                                                                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                 | Percent Operational Time: 99.2 |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Daily Average   | Daily Maximum                  |  |
|                                                                                                                         | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                | 22  | 23  | 24  |                 |                                |  |
| 1-Dec                                                                                                                   | 2.0                           | 2.0 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8                                                                                                                                                               | 1.8 | 1.9 | 1.8 | 1.87            | 1.98                           |  |
| 2-Dec                                                                                                                   | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.84            | 1.92                           |  |
| 3-Dec                                                                                                                   | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.82            | 1.82                           |  |
| 4-Dec                                                                                                                   | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.83            | 1.87                           |  |
| 5-Dec                                                                                                                   | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.81            | 1.85                           |  |
| 6-Dec                                                                                                                   | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.9 | 2.0                                                                                                                                                               | 1.9 | 1.9 | 1.8 | 1.83            | 2.02                           |  |
| 7-Dec                                                                                                                   | 1.8                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 2.0 | 1.9 | 2.0 | 1.9 | 2.0 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 2.0 | 1.9                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 1.94            | 2.02                           |  |
| 8-Dec                                                                                                                   | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.9 | 1.9 | 1.9 | 1.90            | 2.02                           |  |
| 9-Dec                                                                                                                   | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.9 | 1.9 | 1.9 | 1.89            | 1.94                           |  |
| 10-Dec                                                                                                                  | 1.9                           | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.9 | 1.9 | 1.9 | 1.93            | 2.13                           |  |
| 11-Dec                                                                                                                  | 1.8                           | 1.9 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.82            | 1.92                           |  |
| 12-Dec                                                                                                                  | 1.8                           | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | D   | C   | C   | C   | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9                                                                                                                                                               | P   | P   | P   | --              | 1.87                           |  |
| 13-Dec                                                                                                                  | P                             | P   | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.9 | 1.8 | 1.8 | 1.9                                                                                                                                                               | 1.9 | 1.9 | 1.9 | 1.86            | 1.87                           |  |
| 14-Dec                                                                                                                  | A                             | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.9 | 1.9 | A   | 1.90            | 1.93                           |  |
| 15-Dec                                                                                                                  | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.9 | A   | 1.9 | 1.92            | 1.97                           |  |
| 16-Dec                                                                                                                  | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.1                                                                                                                                                               | A   | 2.2 | 2.1 | 1.94            | 2.16                           |  |
| 17-Dec                                                                                                                  | 2.0                           | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | A                                                                                                                                                                 | 2.0 | 1.8 | 1.8 | 2.00            | 2.09                           |  |
| 18-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.81            | 1.83                           |  |
| 19-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.80            | 1.83                           |  |
| 20-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | A   | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.83            | 1.89                           |  |
| 21-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.82            | 1.83                           |  |
| 22-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.8 | 1.9 | A   | 1.8 | 1.8 | 1.8 | 2.1 | 1.9                                                                                                                                                               | 1.9 | 2.0 | 1.9 | 1.86            | 2.14                           |  |
| 23-Dec                                                                                                                  | 2.0                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.9 | 1.8 | 1.8 | 1.88            | 1.96                           |  |
| 24-Dec                                                                                                                  | 1.8                           | 1.9 | 1.8 | 1.9 | 1.8 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.9 | 1.9 | 1.9 | 1.85            | 1.87                           |  |
| 25-Dec                                                                                                                  | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0                                                                                                                                                               | 2.0 | 2.0 | 2.0 | 1.91            | 1.99                           |  |
| 26-Dec                                                                                                                  | 1.9                           | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | A   | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9                                                                                                                                                               | 1.8 | 1.9 | 1.9 | 1.93            | 2.01                           |  |
| 27-Dec                                                                                                                  | 1.9                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.80            | 1.89                           |  |
| 28-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.82            | 1.83                           |  |
| 29-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8                                                                                                                                                               | 1.9 | 1.9 | 1.9 | 1.84            | 1.90                           |  |
| 30-Dec                                                                                                                  | 1.9                           | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | A   | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.9 | 1.9 | 1.8 | 1.85            | 1.91                           |  |
| 31-Dec                                                                                                                  | 1.8                           | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | A   | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8                                                                                                                                                               | 1.8 | 1.8 | 1.8 | 1.81            | 1.85                           |  |
| 1.86 1.87 1.86 1.86 1.86 1.86 1.86 1.85 1.86 1.86 1.87 1.86 1.86 1.86 1.86 1.86 1.86 1.86 1.86 1.87 1.87 1.87 1.87 1.86 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Average |                                |  |
| 2.02 2.00 2.04 1.99 1.99 1.98 1.99 2.06 2.09 2.06 2.13 2.05 2.03 2.02 1.97 2.00 2.02 1.99 2.02 2.14 2.05 2.02 2.16 2.11 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     | Diurnal Maximum |                                |  |
| C - Calibration P - Power Failure D - DAS Failure A - Automated Daily Zero Span                                         |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |     |                 |                                |  |

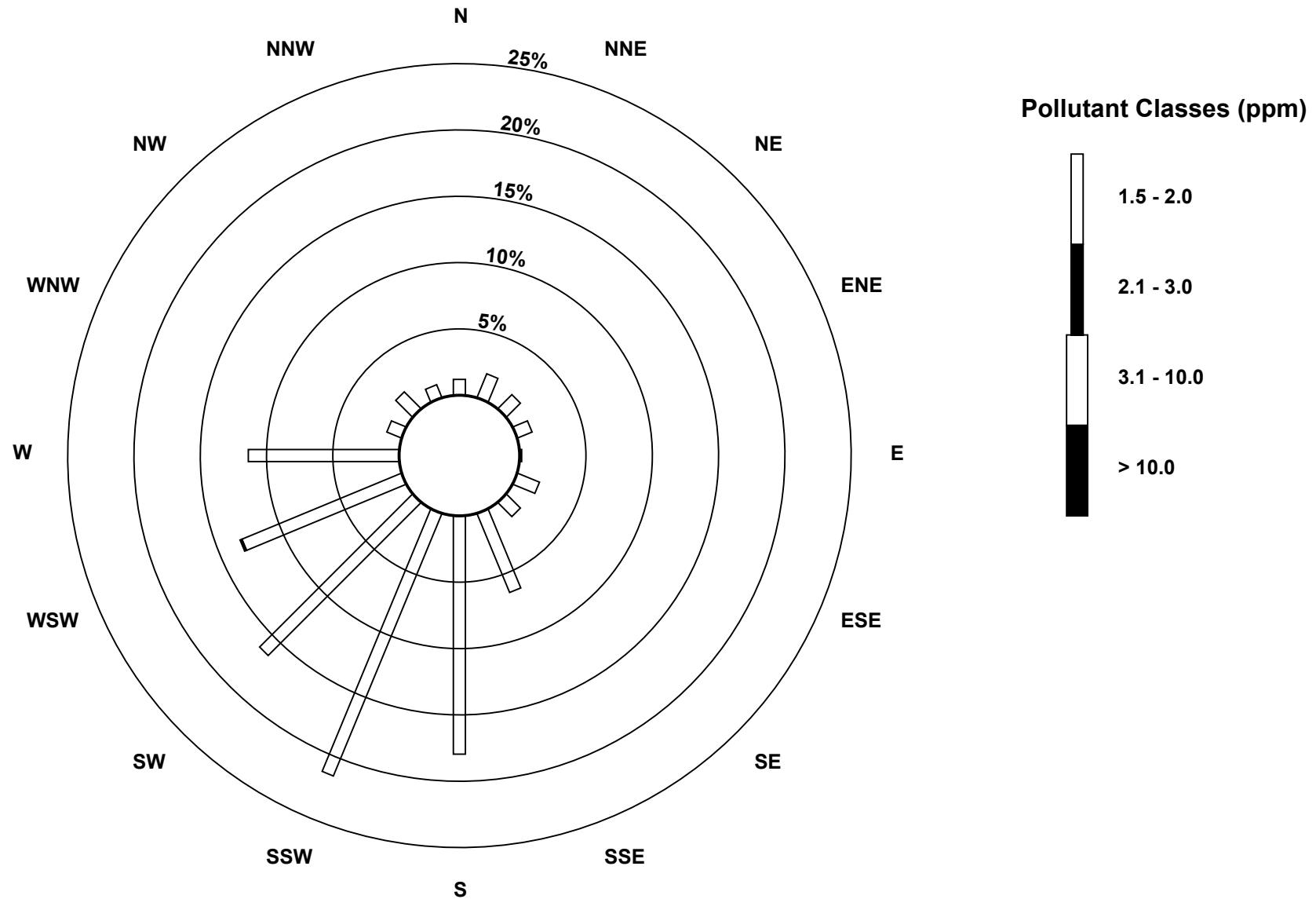
## Hourly Maximums

Methane (CH<sub>4</sub>) - ppm  
Portable Rycroft - December 2016



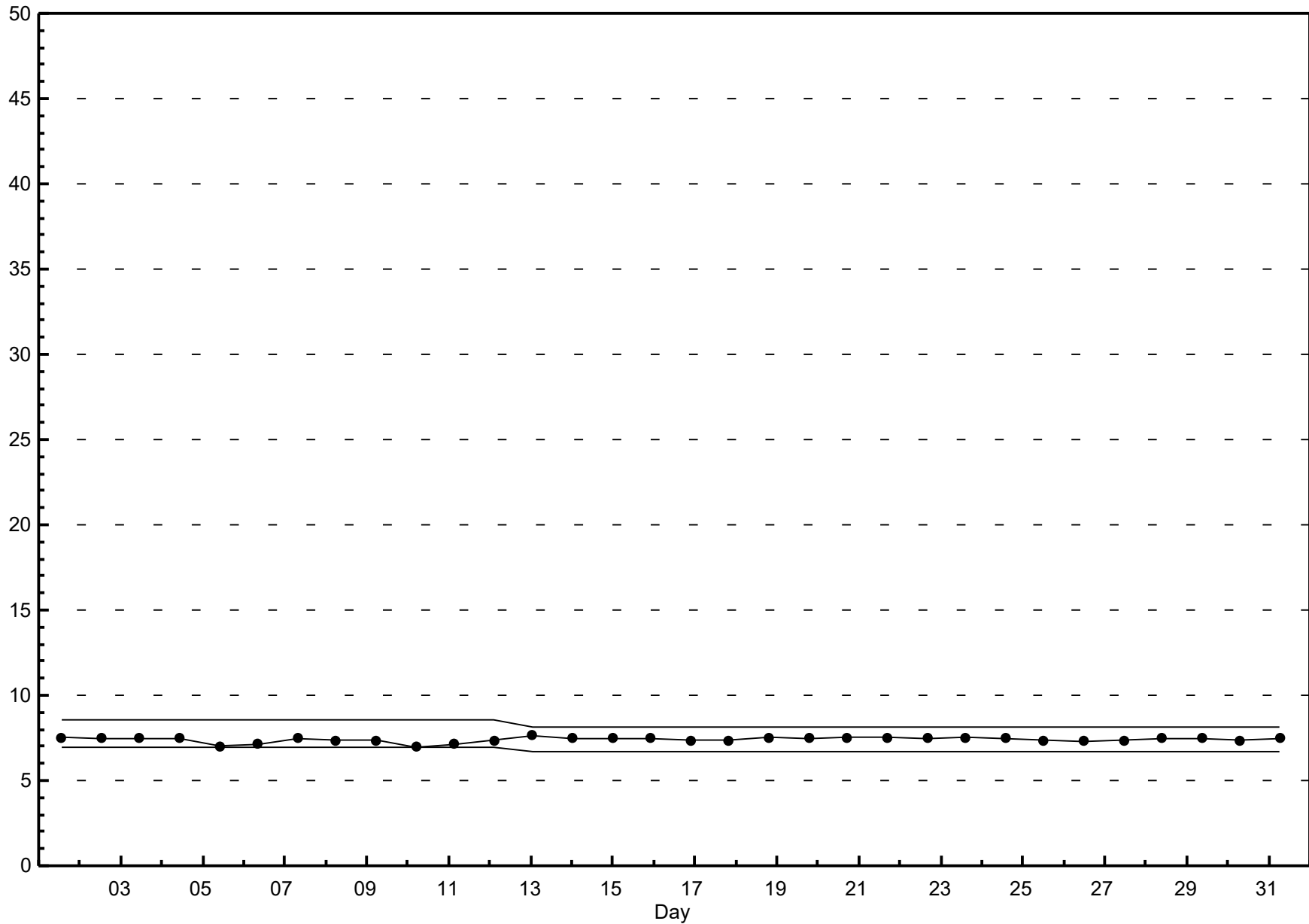
# Pollutant Rose

Methane (CH<sub>4</sub>) - ppm  
Portable Rycroft - December 2016



## Span Responses

**Methane (CH<sub>4</sub>)**  
**Portable Rycroft - December 2016**

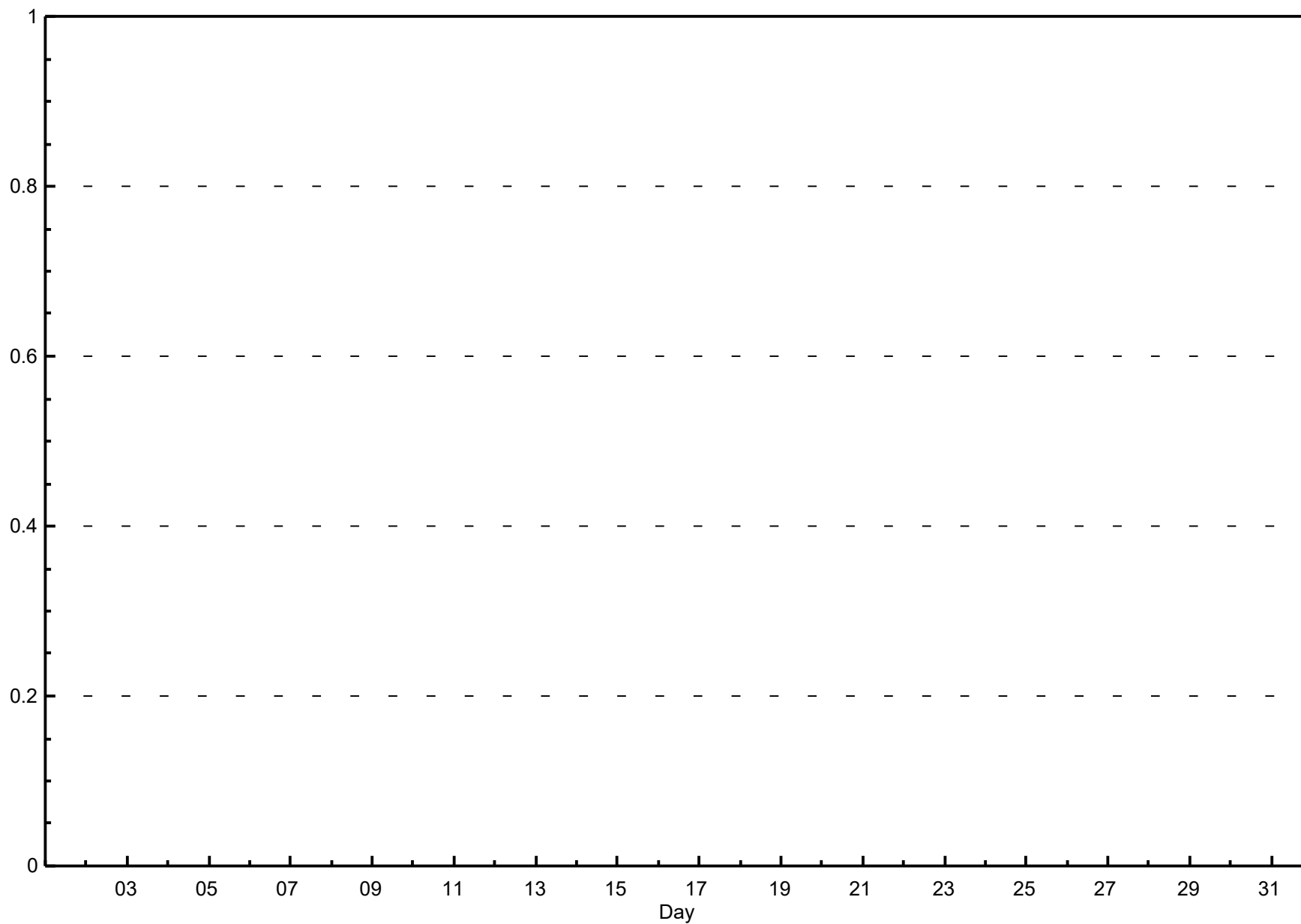


# Hourly Averages

Non Methane Hydrocarbon (NMHC) - ppm

Portable Rycroft - December 2016

| Maximum Value: 0.00 ppm on Dec 13 14:00                                                                                 |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.00 ppm on Dec 13                                                                                                                         |     |     |                 | Hours in Service: 744     |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-------------------|-----|-----|-----|-----------------|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------------------|---------------|
| Minimum Value: 0.0 ppm on Dec 1 01:00                                                                                   |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.00 ppm on Dec 1                                                                                                                          |     |     |                 | Hours of Data: 704        |               |
| Maximum Diurnal Average: 0.00 ppm at hour 14                                                                            |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.00 ppm at hour 24                                                                                                                      |     |     |                 | Hours of Missing Data: 40 |               |
| Monthly Average: 0.000 ppm                                                                                              |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.00 P <sub>10</sub> = 0.00 Q <sub>1</sub> = 0.00 Median = 0.00 Q <sub>3</sub> = 0.00 P <sub>90</sub> = 0.00 P <sub>99</sub> = 0.00 |     |     |                 | Hours of Calibration: 34  |               |
|                                                                                                                         |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Percent Operational Time: 99.2                                                                                                                                    |     |     |                 |                           |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |                 | Daily Average             | Daily Maximum |
|                                                                                                                         | 1                             | 2   | 3   | 4                 | 5   | 6   | 7   | 8               | 9   | 10  | 11  | 12                            | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                | 22  | 23  | 24              |                           |               |
| 1-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 2-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 3-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | A                             | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 4-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | A   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 5-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | A   | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 6-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | A   | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 7-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | A               | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 8-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | A   | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 9-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | A   | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 10-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | A   | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 11-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | A                 | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 12-Dec                                                                                                                  | 0.0                           | 0.0 | A   | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | D                             | C   | C   | C   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | P   | P   | P               | --                        | 0.00          |
| 13-Dec                                                                                                                  | P                             | P   | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 14-Dec                                                                                                                  | A                             | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | A               | 0.00                      | 0.00          |
| 15-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | A   | 0.0             | 0.00                      | 0.00          |
| 16-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | A   | 0.0 | 0.0             | 0.00                      | 0.00          |
| 17-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A                                                                                                                                                                 | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 18-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 19-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 20-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 21-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 22-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 23-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 24-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 25-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 26-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | A                             | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 27-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | A   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 28-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | A   | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 29-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | A   | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 30-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | A               | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 31-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | A   | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     | Diurnal Average |                           |               |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     | Diurnal Maximum |                           |               |
| C - Calibration                                                                                                         |                               |     |     | P - Power Failure |     |     |     | D - DAS Failure |     |     |     | A - Automated Daily Zero Span |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |                 |                           |               |



# Hourly Maximums

Non Methane Hydrocarbon (NMHC) - ppm

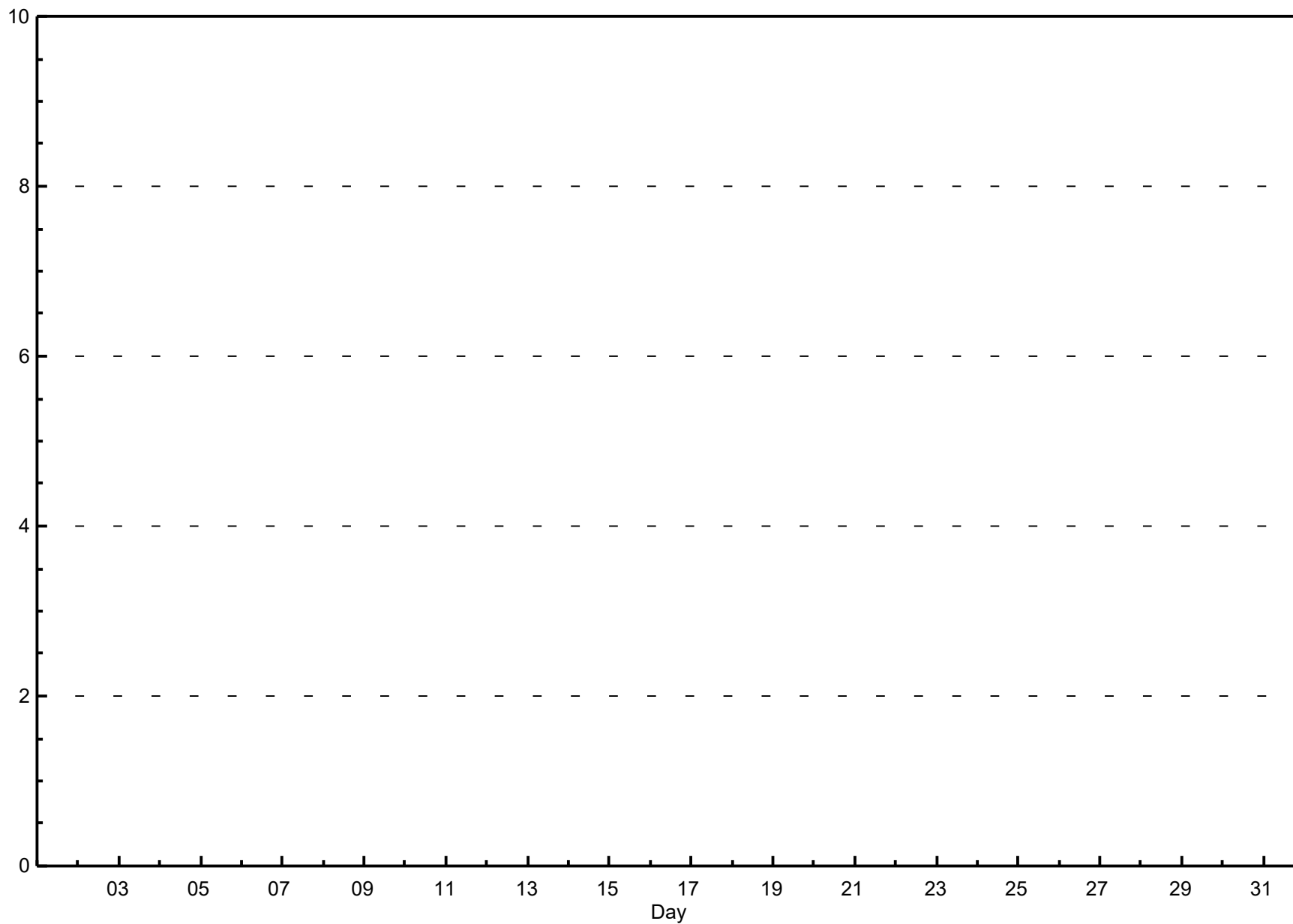
Portable Rycroft - December 2016

| Maximum Value: 0.00 ppm on Dec 19 12:00                                                                                 |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Maximum Daily Average: 0.00 ppm on Dec 13                                                                                                                         |     |     |                 | Hours in Service: 744     |               |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-------------------|-----|-----|-----|-----------------|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----------------|---------------------------|---------------|
| Minimum Value: 0.0 ppm on Dec 1 01:00                                                                                   |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Minimum Daily Average: 0.00 ppm on Dec 1                                                                                                                          |     |     |                 | Hours of Data: 704        |               |
| Maximum Diurnal Average: 0.00 ppm at hour 14                                                                            |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Minimum Diurnal Average: 0.00 ppm at hour 1                                                                                                                       |     |     |                 | Hours of Missing Data: 40 |               |
| Monthly Average: 0.000 ppm                                                                                              |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = 0.00 P <sub>10</sub> = 0.00 Q <sub>1</sub> = 0.00 Median = 0.00 Q <sub>3</sub> = 0.00 P <sub>90</sub> = 0.00 P <sub>99</sub> = 0.00 |     |     |                 | Hours of Calibration: 34  |               |
|                                                                                                                         |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     | Percent Operational Time: 99.2                                                                                                                                    |     |     |                 |                           |               |
| Day                                                                                                                     | Hourly Period Ending At (MST) |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |                 | Daily Average             | Daily Maximum |
|                                                                                                                         | 1                             | 2   | 3   | 4                 | 5   | 6   | 7   | 8               | 9   | 10  | 11  | 12                            | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21                                                                                                                                                                | 22  | 23  | 24              |                           |               |
| 1-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 2-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 3-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | A                             | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 4-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | A   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 5-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | A   | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 6-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | A   | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 7-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | A               | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 8-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | A   | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 9-Dec                                                                                                                   | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | A   | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 10-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | A   | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 11-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | A                 | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 12-Dec                                                                                                                  | 0.0                           | 0.0 | A   | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | D                             | C   | C   | C   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | P   | P   | P               | --                        | 0.00          |
| 13-Dec                                                                                                                  | P                             | P   | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 14-Dec                                                                                                                  | A                             | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | A               | 0.00                      | 0.00          |
| 15-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | A   | 0.0             | 0.00                      | 0.00          |
| 16-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | A   | 0.0 | 0.0             | 0.00                      | 0.00          |
| 17-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A                                                                                                                                                                 | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 18-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 19-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 20-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 21-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 22-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 23-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 24-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 25-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | A   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 26-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | 0.0 | A                             | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 27-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | 0.0 | A   | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 28-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | 0.0 | A   | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 29-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | 0.0             | A   | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 30-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | 0.0 | A               | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 31-Dec                                                                                                                  | 0.0                           | 0.0 | 0.0 | 0.0               | 0.0 | 0.0 | A   | 0.0             | 0.0 | 0.0 | 0.0 | 0.0                           | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0                                                                                                                                                               | 0.0 | 0.0 | 0.0             | 0.00                      | 0.00          |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     | Diurnal Average |                           |               |
| 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |                               |     |     |                   |     |     |     |                 |     |     |     |                               |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     | Diurnal Maximum |                           |               |
| C - Calibration                                                                                                         |                               |     |     | P - Power Failure |     |     |     | D - DAS Failure |     |     |     | A - Automated Daily Zero Span |     |     |     |     |     |     |     |     |                                                                                                                                                                   |     |     |                 |                           |               |



**Hourly Maximums**

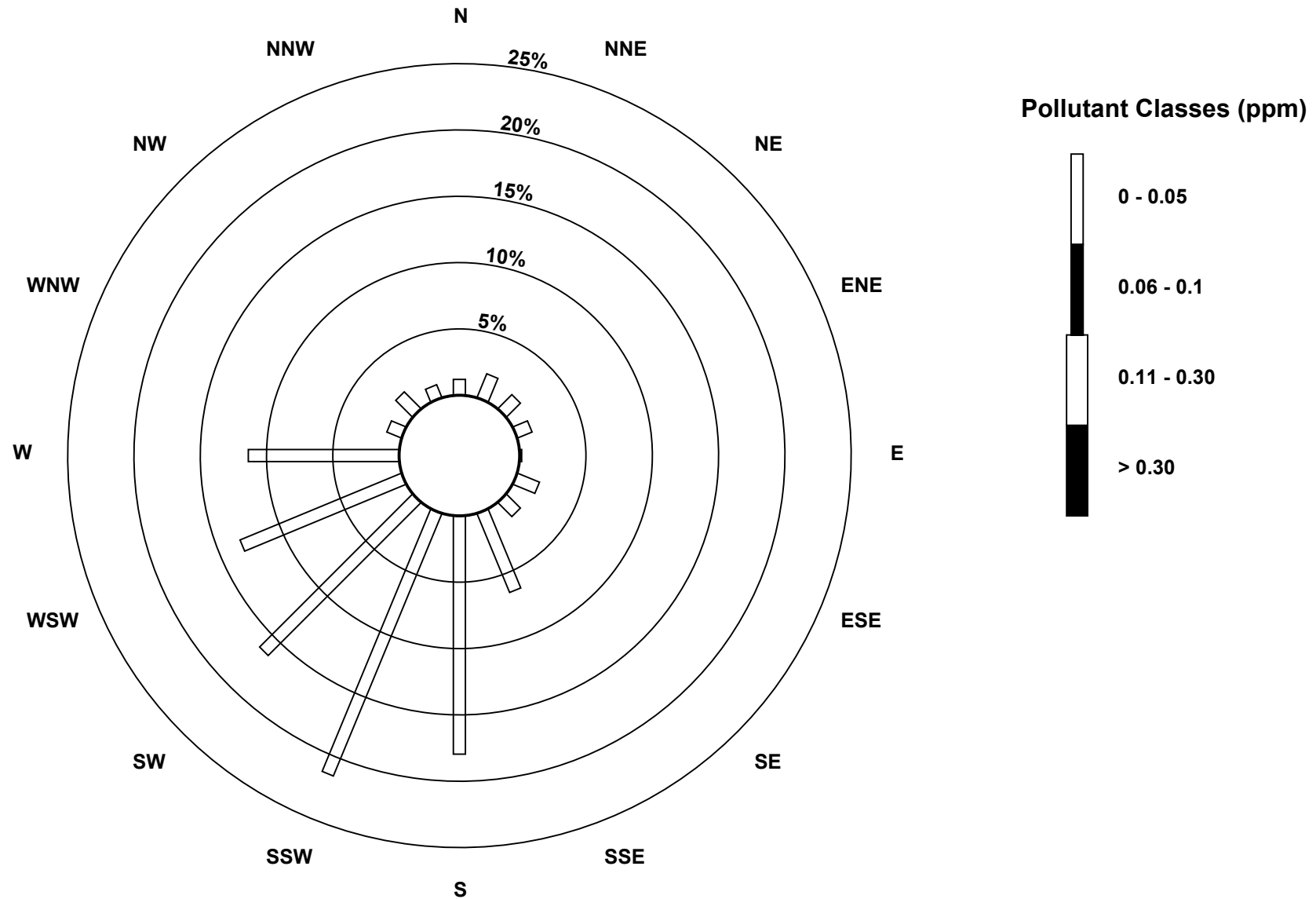
**Non Methane Hydrocarbon (NMHC) - ppm**  
**Portable Rycroft - December 2016**

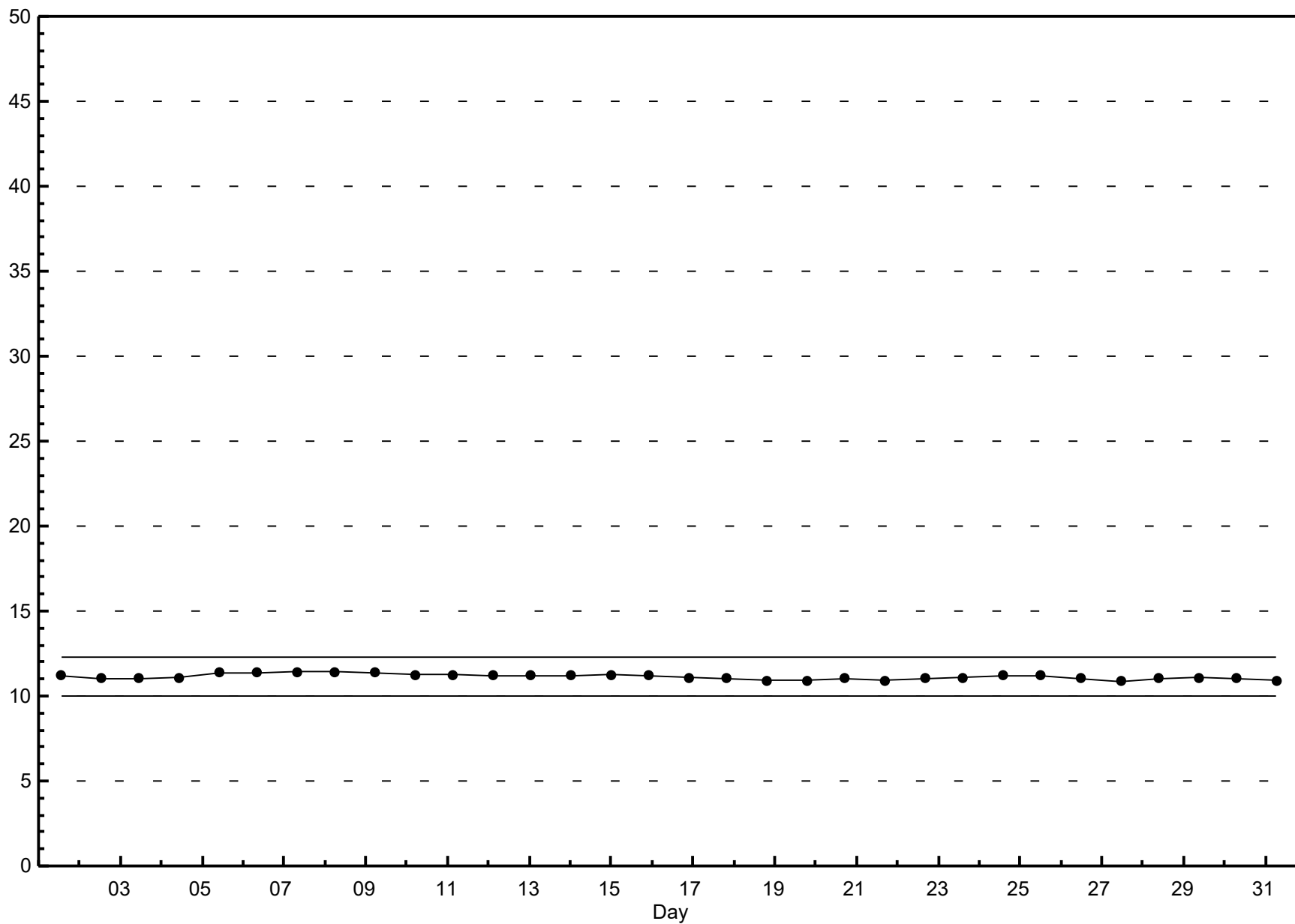


# Pollutant Rose

Non Methane Hydrocarbon (NMHC) - ppm

Portable Rycroft - December 2016





# Hourly Averages

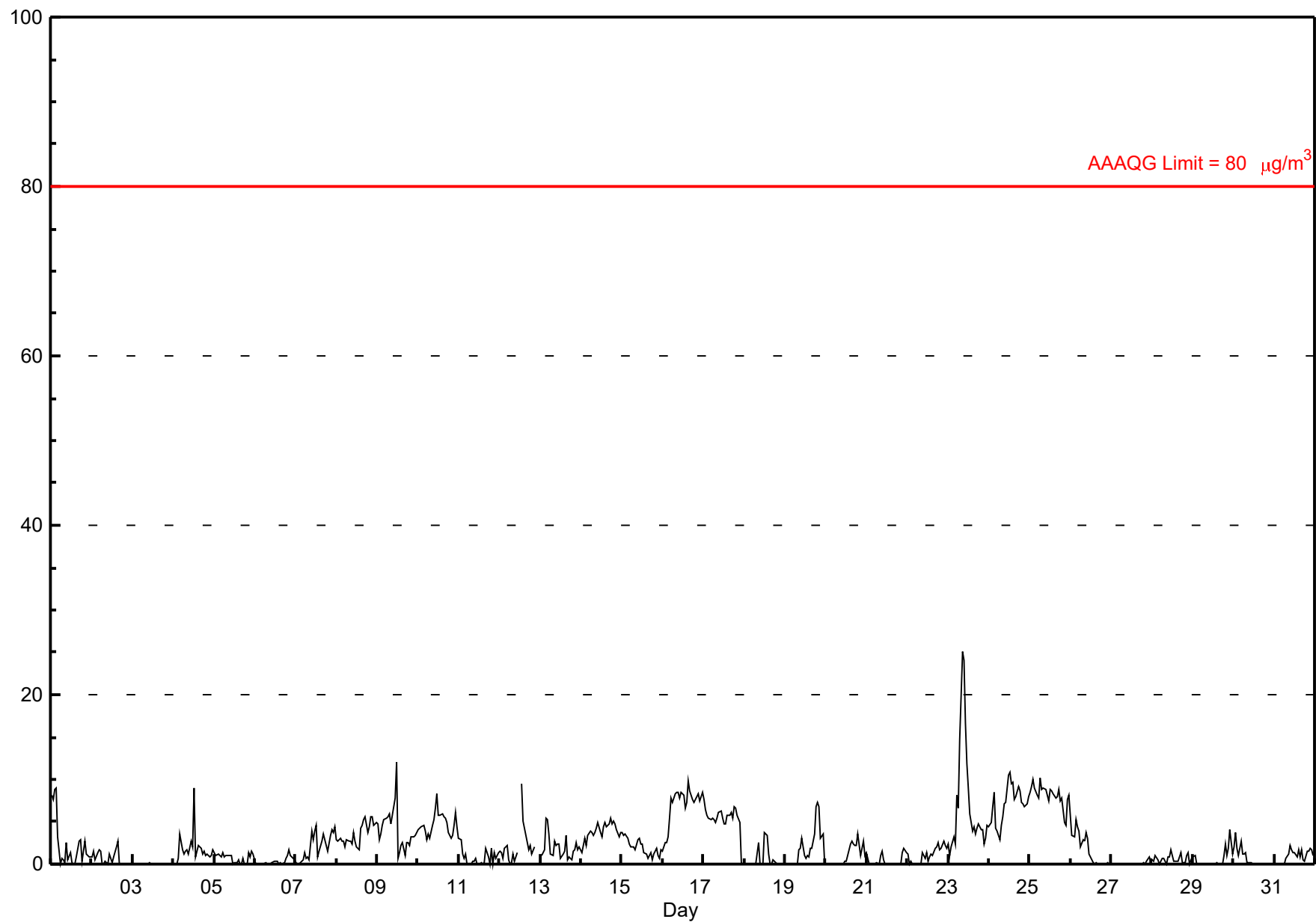
PM2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Portable Rycroft - December 2016

|                                                                                                                                                                                                                                                                                                                                                                                   |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                       |                 |     |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------------------------------------------------------------|-----------------|-----|------|
| Number of Exceedences: 1-hr: 0 24-hr: 0<br>Maximum Value: 25.1 µg/m³ on Dec 23 09:00<br>Maximum Daily Average: 8.2 µg/m³ on Dec 25                                                                                                                                                                                                                                                |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744<br>Hours of Data: 738                                           |                 |     |      |
| Minimum Value: 0 µg/m³ on Dec 1 06:00<br>Maximum Diurnal Average: 3.2 µg/m³ at hour 10<br>Monthly Average: 2.42 µg/m³<br>Minimum Daily Average: 0.0 µg/m³ on Dec 3<br>Minimum Diurnal Average: 1.9 µg/m³ at hour 7<br>Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 1.3 Q <sub>3</sub> = 3.7 P <sub>90</sub> = 6.8 P <sub>99</sub> = 10.1 |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 6<br>Hours of Calibration: 0<br>Percent Operational Time: 99.2 |                 |     |      |
| Day                                                                                                                                                                                                                                                                                                                                                                               | Hourly Period Ending At (MST) |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Daily Average                                                                         | Daily Maximum   |     |      |
|                                                                                                                                                                                                                                                                                                                                                                                   | 1                             | 2 | 3  | 4 | 5 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |                                                                                       |                 | 24  |      |
| 1-Dec                                                                                                                                                                                                                                                                                                                                                                             | 8                             | 8 | 9  | 9 | 3 | 0 | 1  | 0  | 0  | 3  | 0  | 1  | 0  | 0  | 0  | 1  | 3  | 3  | 0  | 1  | 3  | 1  | 1  | 1                                                                                     | 1               | 2.4 | 9.0  |
| 2-Dec                                                                                                                                                                                                                                                                                                                                                                             | 1                             | 2 | 0  | 1 | 2 | 1 | 0  | 0  | 0  | 0  | 1  | 1  | 0  | 1  | 2  | 3  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                     | 0               | 0.6 | 2.7  |
| 3-Dec                                                                                                                                                                                                                                                                                                                                                                             | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                     | 0.0             | 0.3 |      |
| 4-Dec                                                                                                                                                                                                                                                                                                                                                                             | 0                             | 0 | 0  | 1 | 4 | 2 | 1  | 2  | 2  | 1  | 3  | 2  | 9  | 1  | 1  | 2  | 2  | 1  | 2  | 1  | 1  | 1  | 1  | 1                                                                                     | 2               | 1.7 | 9.0  |
| 5-Dec                                                                                                                                                                                                                                                                                                                                                                             | 1                             | 1 | 1  | 1 | 1 | 1 | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 1  | 0  | 0  | 1  | 0  | 0  | 1  | 1  | 1  | 1                                                                                     | 1               | 0.7 | 1.5  |
| 6-Dec                                                                                                                                                                                                                                                                                                                                                                             | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 1  | 2  | 1  | 1  | 1                                                                                     | 1               | 0.3 | 1.7  |
| 7-Dec                                                                                                                                                                                                                                                                                                                                                                             | 0                             | 0 | 0  | 0 | 0 | 1 | 1  | 1  | 1  | 4  | 3  | 4  | 5  | 1  | 2  | 3  | 3  | 3  | 2  | 2  | 3  | 4  | 4  | 4                                                                                     | 4               | 2.1 | 4.6  |
| 8-Dec                                                                                                                                                                                                                                                                                                                                                                             | 3                             | 3 | 3  | 3 | 3 | 2 | 3  | 3  | 3  | 2  | 4  | 3  | 2  | 2  | 4  | 5  | 5  | 6  | 4  | 4  | 6  | 6  | 5  | 5                                                                                     | 5               | 3.6 | 5.7  |
| 9-Dec                                                                                                                                                                                                                                                                                                                                                                             | 5                             | 3 | 3  | 5 | 5 | 6 | 6  | 6  | 5  | 6  | 8  | 12 | 1  | 1  | 2  | 3  | 1  | 3  | 2  | 2  | 3  | 3  | 3  | 4                                                                                     | 4               | 4.0 | 12.1 |
| 10-Dec                                                                                                                                                                                                                                                                                                                                                                            | 4                             | 4 | 4  | 5 | 4 | 3 | 4  | 3  | 5  | 5  | 7  | 8  | 6  | 6  | 6  | 6  | 5  | 5  | 4  | 3  | 3  | 5  | 6  | 4                                                                                     | 4               | 4.8 | 8.2  |
| 11-Dec                                                                                                                                                                                                                                                                                                                                                                            | 3                             | 3 | 1  | 1 | 1 | 0 | 0  | 0  | 0  | 0  | 1  | 0  | 0  | 0  | 0  | 0  | 2  | 1  | 0  | 2  | 0  | 1  | 1  | 1                                                                                     | 1               | 0.8 | 3.0  |
| 12-Dec                                                                                                                                                                                                                                                                                                                                                                            | 2                             | 1 | 1  | 2 | 2 | 1 | 0  | 0  | 1  | 0  | 1  | D  | M  | 10 | 5  | 3  | 3  | 2  | 2  | 1  | 2  | P  | P  | P                                                                                     | 2               | 2.0 | 9.5  |
| 13-Dec                                                                                                                                                                                                                                                                                                                                                                            | P                             | 1 | 2  | 5 | 5 | 4 | 1  | 1  | 3  | 2  | 2  | 2  | 1  | 1  | 1  | 3  | 0  | 1  | 0  | 2  | 2  | 3  | 2  | 2                                                                                     | 2               | 2.0 | 5.4  |
| 14-Dec                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 2 | 3  | 2 | 3 | 4 | 4  | 3  | 4  | 4  | 5  | 4  | 3  | 4  | 5  | 4  | 5  | 5  | 5  | 5  | 5  | 4  | 3  | 4                                                                                     | 4               | 3.9 | 5.4  |
| 15-Dec                                                                                                                                                                                                                                                                                                                                                                            | 4                             | 3 | 4  | 3 | 2 | 2 | 2  | 2  | 2  | 3  | 3  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 1  | 1  | 2                                                                                     | 2               | 2.0 | 3.7  |
| 16-Dec                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 3 | 3  | 3 | 5 | 8 | 7  | 8  | 8  | 8  | 8  | 8  | 8  | 7  | 7  | 10 | 9  | 8  | 7  | 8  | 8  | 8  | 7  | 9                                                                                     | 9               | 7.0 | 9.8  |
| 17-Dec                                                                                                                                                                                                                                                                                                                                                                            | 8                             | 7 | 6  | 5 | 5 | 5 | 5  | 5  | 5  | 6  | 6  | 5  | 5  | 5  | 6  | 6  | 6  | 5  | 7  | 7  | 6  | 5  | 0  | 0                                                                                     | 0               | 5.3 | 7.6  |
| 18-Dec                                                                                                                                                                                                                                                                                                                                                                            | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 3  | 0  | 0  | 0  | 4  | 3  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                     | 0               | 0.5 | 3.7  |
| 19-Dec                                                                                                                                                                                                                                                                                                                                                                            | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 2  | 2  | 3  | 1  | 1  | 1  | 1  | 2  | 2  | 4  | 7  | 7  | 7  | 3  | 4  | 0                                                                                     | 0               | 1.9 | 7.3  |
| 20-Dec                                                                                                                                                                                                                                                                                                                                                                            | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 3  | 2  | 2  | 2  | 4  | 1  | 2  | 3  | 1                                                                                     | 1               | 1.0 | 3.6  |
| 21-Dec                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 1  | 2  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 1                                                                                     | 1               | 0.4 | 1.8  |
| 22-Dec                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 0  | 1  | 1  | 1  | 0  | 1  | 1  | 1  | 2  | 2  | 3  | 2  | 2  | 3  | 2  | 2                                                                                     | 2               | 1.0 | 2.7  |
| 23-Dec                                                                                                                                                                                                                                                                                                                                                                            | 2                             | 1 | 2  | 3 | 2 | 8 | 7  | 15 | 25 | 24 | 17 | 12 | 9  | 6  | 4  | 4  | 4  | 4  | 5  | 4  | 4  | 2  | 3  | 5                                                                                     | 5               | 7.2 | 25.1 |
| 24-Dec                                                                                                                                                                                                                                                                                                                                                                            | 4                             | 5 | 7  | 8 | 4 | 4 | 3  | 5  | 6  | 7  | 7  | 10 | 11 | 10 | 10 | 8  | 8  | 9  | 9  | 7  | 7  | 7  | 7  | 8                                                                                     | 8               | 7.1 | 10.9 |
| 25-Dec                                                                                                                                                                                                                                                                                                                                                                            | 9                             | 9 | 10 | 9 | 8 | 8 | 10 | 9  | 9  | 9  | 8  | 7  | 9  | 9  | 8  | 8  | 8  | 9  | 7  | 8  | 5  | 5  | 8  | 8                                                                                     | 8               | 8.2 | 10.1 |
| 26-Dec                                                                                                                                                                                                                                                                                                                                                                            | 6                             | 3 | 3  | 5 | 4 | 4 | 2  | 3  | 3  | 4  | 3  | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                     | 0               | 1.8 | 5.8  |
| 27-Dec                                                                                                                                                                                                                                                                                                                                                                            | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0                                                                                     | 0               | 0.1 | 0.9  |
| 28-Dec                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 0 | 1  | 0 | 0 | 0 | 1  | 1  | 0  | 1  | 1  | 2  | 1  | 0  | 0  | 0  | 1  | 1  | 0  | 0  | 1  | 1  | 0  | 0                                                                                     | 0               | 0.6 | 1.8  |
| 29-Dec                                                                                                                                                                                                                                                                                                                                                                            | 1                             | 1 | 0  | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 1  | 2  | 4  | 1                                                                                     | 1               | 0.6 | 4.1  |
| 30-Dec                                                                                                                                                                                                                                                                                                                                                                            | 2                             | 4 | 2  | 1 | 3 | 1 | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0                                                                                     | 0               | 0.7 | 3.7  |
| 31-Dec                                                                                                                                                                                                                                                                                                                                                                            | 0                             | 0 | 0  | 0 | 0 | 0 | 0  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 2  | 1  | 2  | 1  | 0  | 2  | 1  | 2  | 2  | 1                                                                                     | 1               | 0.9 | 2.1  |
| 2.3 2.0 2.1 2.4 2.2 2.1 1.9 2.2 2.8 3.2 3.1 3.0 2.6 2.3 2.4 2.4 2.4 2.5 2.3 2.4 2.5 2.4 2.4 2.2                                                                                                                                                                                                                                                                                   |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                       | Diurnal Average |     |      |
| 8.6 9.2 10.0 9.0 8.2 8.2 10.1 14.7 25.1 24.1 16.6 12.1 10.9 9.6 9.6 9.8 8.7 9.1 8.6 7.9 8.0 8.2 7.6 8.5                                                                                                                                                                                                                                                                           |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                       | Diurnal Maximum |     |      |
| P - Power Failure D - DAS Failure M - Maintenance                                                                                                                                                                                                                                                                                                                                 |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                       |                 |     |      |
| Alberta Ambient Air Quality Guideline (AAAQG): 1-hr 80 µg/m³ Alberta Ambient Air Quality Objective (AAAQO): 24-hr 30 µg/m³                                                                                                                                                                                                                                                        |                               |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                       |                 |     |      |

## Hourly Averages

PM<sub>2.5</sub> (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Portable Rycroft - December 2016



# Hourly Maximums

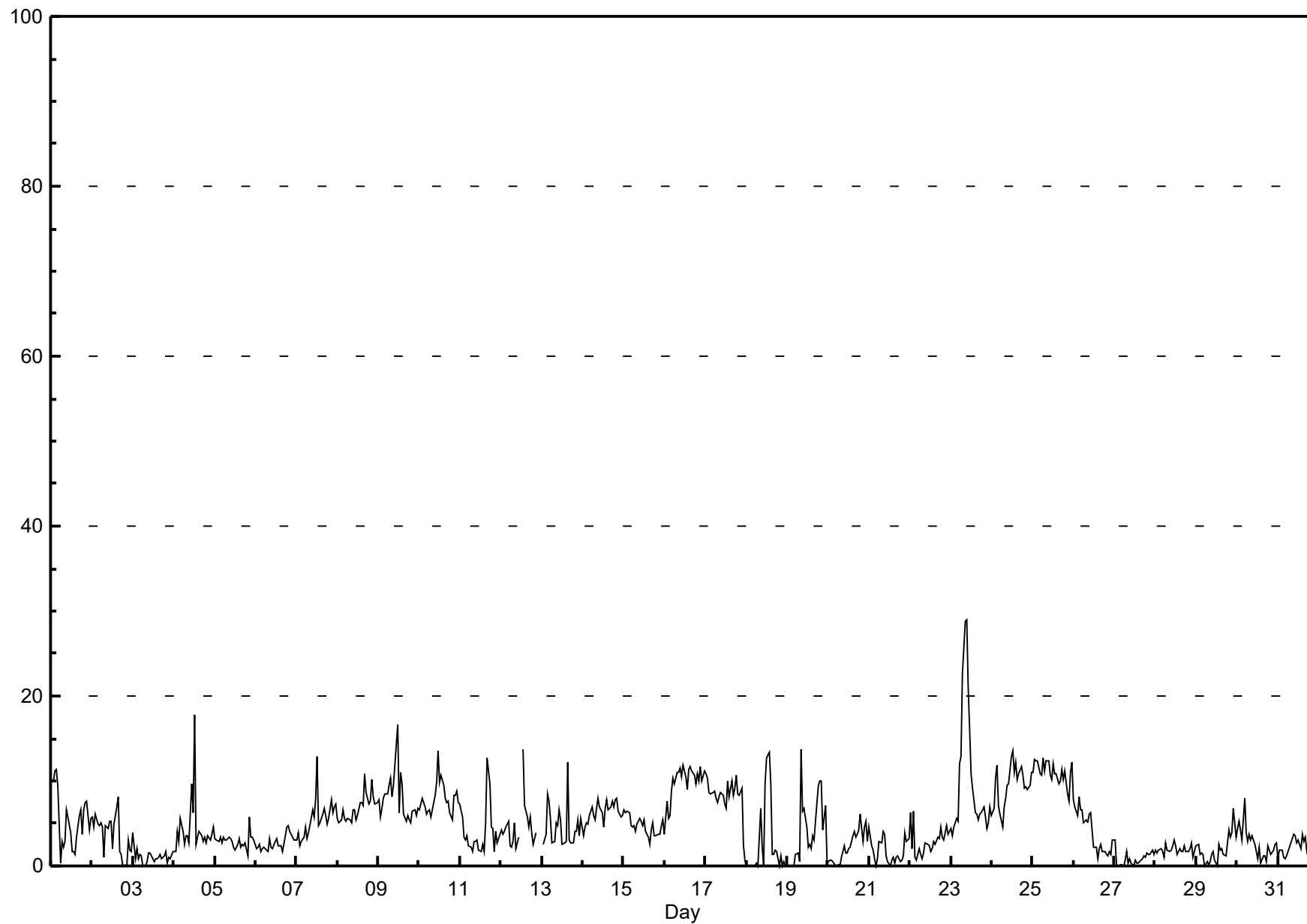
PM2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Portable Rycroft - December 2016

| Maximum Value: 29.0 µg/m <sup>3</sup> on Dec 23 10:00                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |                 |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|-----------------|---------------|
| Maximum Daily Average: 11.0 µg/m <sup>3</sup> on Dec 25                                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 738             |                 |               |
| Minimum Value: 0 µg/m <sup>3</sup> on Dec 2 20:00                                                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 6       |                 |               |
| Maximum Diurnal Average: 5.8 µg/m <sup>3</sup> at hour 10                                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0        |                 |               |
| Monthly Average: 4.81 µg/m <sup>3</sup>                                                                                                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 99.2 |                 |               |
| Minimum Daily Average: 0.8 µg/m <sup>3</sup> on Dec 27                                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |                 |               |
| Minimum Diurnal Average: 4.0 µg/m <sup>3</sup> at hour 7                                                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |                 |               |
| Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.9 Q <sub>1</sub> = 2.0 Median = 3.8 Q <sub>3</sub> = 6.8 P <sub>90</sub> = 10.1 P <sub>99</sub> = 15.6 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |                 |               |
| Day                                                                                                                                                          | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                | Daily Average   | Daily Maximum |
|                                                                                                                                                              | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24                             |                 |               |
| 1-Dec                                                                                                                                                        | 10                            | 10 | 11 | 11 | 9  | 0  | 3  | 2  | 3  | 7  | 6  | 4  | 2  | 2  | 1  | 3  | 6  | 7  | 4  | 7  | 8  | 8  | 4  | 6                              | 5.5             | 11.4          |
| 2-Dec                                                                                                                                                        | 6                             | 5  | 6  | 5  | 5  | 5  | 5  | 1  | 5  | 4  | 5  | 5  | 2  | 5  | 7  | 8  | 2  | 1  | 0  | 0  | 0  | 3  | 2  | 2                              | 3.7             | 8.2           |
| 3-Dec                                                                                                                                                        | 4                             | 1  | 2  | 1  | 1  | 1  | 0  | 0  | 1  | 2  | 1  | 1  | 0  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 0  | 1  | 1  | 2                              | 1.1             | 4.0           |
| 4-Dec                                                                                                                                                        | 2                             | 2  | 4  | 3  | 6  | 4  | 3  | 4  | 4  | 3  | 10 | 6  | 18 | 3  | 3  | 4  | 4  | 3  | 3  | 3  | 4  | 3  | 4  | 4                              | 4.3             | 17.8          |
| 5-Dec                                                                                                                                                        | 3                             | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 2  | 2  | 3  | 3  | 2  | 3  | 2  | 3  | 1  | 6  | 3  | 3  | 3                              | 2.9             | 5.8           |
| 6-Dec                                                                                                                                                        | 2                             | 2  | 3  | 2  | 2  | 2  | 2  | 2  | 3  | 2  | 2  | 3  | 3  | 2  | 2  | 2  | 2  | 4  | 5  | 5  | 4  | 4  | 3  | 3                              | 2.7             | 4.8           |
| 7-Dec                                                                                                                                                        | 3                             | 4  | 2  | 3  | 3  | 5  | 3  | 4  | 5  | 7  | 6  | 8  | 13 | 5  | 5  | 6  | 7  | 6  | 5  | 6  | 8  | 6  | 7  | 7                              | 5.5             | 12.9          |
| 8-Dec                                                                                                                                                        | 6                             | 5  | 5  | 7  | 6  | 5  | 6  | 5  | 5  | 7  | 7  | 5  | 6  | 8  | 7  | 7  | 11 | 9  | 7  | 8  | 10 | 8  | 7  | 7                              | 6.8             | 10.8          |
| 9-Dec                                                                                                                                                        | 8                             | 6  | 7  | 8  | 9  | 8  | 9  | 10 | 8  | 10 | 14 | 17 | 6  | 11 | 10 | 6  | 5  | 6  | 5  | 5  | 7  | 7  | 6  | 7                              | 8.1             | 16.6          |
| 10-Dec                                                                                                                                                       | 7                             | 7  | 8  | 7  | 6  | 6  | 7  | 6  | 7  | 8  | 10 | 14 | 10 | 11 | 10 | 8  | 8  | 8  | 6  | 5  | 8  | 8  | 9  | 7                              | 7.9             | 13.6          |
| 11-Dec                                                                                                                                                       | 7                             | 6  | 3  | 3  | 4  | 2  | 2  | 2  | 3  | 3  | 3  | 2  | 2  | 3  | 2  | 5  | 13 | 10 | 5  | 4  | 2  | 4  | 3  | 4                              | 3.9             | 12.8          |
| 12-Dec                                                                                                                                                       | 4                             | 4  | 4  | 5  | 5  | 2  | 2  | 3  | 5  | 2  | 3  | D  | M  | 14 | 7  | 6  | 5  | 6  | 4  | 3  | 4  | P  | P  | P                              | 4.6             | 13.8          |
| 13-Dec                                                                                                                                                       | P                             | 3  | 4  | 8  | 8  | 6  | 3  | 3  | 5  | 5  | 7  | 6  | 3  | 3  | 3  | 12 | 3  | 3  | 3  | 4  | 4  | 5  | 4  | 6                              | 4.7             | 12.2          |
| 14-Dec                                                                                                                                                       | 4                             | 5  | 5  | 5  | 6  | 7  | 6  | 6  | 7  | 8  | 7  | 6  | 5  | 7  | 8  | 7  | 7  | 8  | 7  | 8  | 8  | 6  | 6  | 6                              | 6.3             | 8.0           |
| 15-Dec                                                                                                                                                       | 7                             | 6  | 6  | 6  | 5  | 5  | 5  | 4  | 5  | 6  | 5  | 5  | 5  | 4  | 3  | 2  | 4  | 5  | 4  | 4  | 4  | 4  | 5  | 5                              | 4.7             | 6.5           |
| 16-Dec                                                                                                                                                       | 4                             | 8  | 6  | 6  | 9  | 10 | 10 | 11 | 11 | 12 | 11 | 12 | 10 | 9  | 11 | 12 | 11 | 11 | 10 | 11 | 10 | 12 | 10 | 11                             | 9.8             | 11.9          |
| 17-Dec                                                                                                                                                       | 11                            | 10 | 9  | 9  | 9  | 9  | 8  | 7  | 8  | 9  | 8  | 7  | 7  | 10 | 8  | 10 | 8  | 9  | 11 | 9  | 8  | 9  | 2  | 1                              | 8.1             | 10.8          |
| 18-Dec                                                                                                                                                       | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 7  | 2  | 0  | 10 | 13 | 13 | 9  | 1  | 1  | 2  | 2  | 0  | 1  | 0  | 0  | 0                              | 2.6             | 13.4          |
| 19-Dec                                                                                                                                                       | 0                             | 0  | 0  | 0  | 0  | 1  | 1  | 1  | 14 | 7  | 7  | 5  | 2  | 3  | 2  | 4  | 3  | 7  | 9  | 10 | 10 | 4  | 7  | 1                              | 4.1             | 13.8          |
| 20-Dec                                                                                                                                                       | 1                             | 1  | 1  | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 1  | 2  | 2  | 2  | 3  | 4  | 3  | 4  | 4  | 6  | 3  | 5  | 5  | 3                              | 2.2             | 6.1           |
| 21-Dec                                                                                                                                                       | 5                             | 2  | 2  | 1  | 0  | 1  | 3  | 3  | 4  | 4  | 1  | 1  | 0  | 1  | 1  | 0  | 1  | 1  | 0  | 1  | 1  | 4  | 3  | 3                              | 1.8             | 4.6           |
| 22-Dec                                                                                                                                                       | 6                             | 2  | 6  | 1  | 1  | 2  | 1  | 1  | 1  | 3  | 3  | 2  | 2  | 2  | 3  | 3  | 3  | 3  | 5  | 3  | 3  | 5  | 4  | 4                              | 2.9             | 6.4           |
| 23-Dec                                                                                                                                                       | 4                             | 4  | 4  | 6  | 5  | 12 | 13 | 23 | 29 | 29 | 21 | 16 | 11 | 9  | 6  | 6  | 6  | 6  | 6  | 7  | 6  | 4  | 5  | 7                              | 10.2            | 29.0          |
| 24-Dec                                                                                                                                                       | 6                             | 7  | 10 | 12 | 7  | 6  | 5  | 7  | 8  | 9  | 10 | 13 | 14 | 11 | 12 | 10 | 11 | 12 | 11 | 9  | 9  | 9  | 9  | 11                             | 9.5             | 13.6          |
| 25-Dec                                                                                                                                                       | 11                            | 12 | 12 | 12 | 11 | 11 | 13 | 11 | 12 | 12 | 11 | 10 | 12 | 11 | 11 | 10 | 10 | 11 | 10 | 11 | 8  | 8  | 11 | 12                             | 11.0            | 12.7          |
| 26-Dec                                                                                                                                                       | 8                             | 7  | 6  | 8  | 7  | 7  | 5  | 5  | 5  | 6  | 6  | 4  | 2  | 2  | 1  | 2  | 2  | 2  | 2  | 1  | 1  | 2  | 1  | 3                              | 4.0             | 8.2           |
| 27-Dec                                                                                                                                                       | 3                             | 0  | 0  | 0  | 0  | 0  | 1  | 2  | 0  | 1  | 0  | 0  | 1  | 0  | 0  | 0  | 1  | 1  | 1  | 2  | 1  | 1  | 2  | 1                              | 0.8             | 3.1           |
| 28-Dec                                                                                                                                                       | 2                             | 2  | 2  | 2  | 2  | 1  | 3  | 2  | 2  | 2  | 2  | 3  | 2  | 1  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 3  | 1  | 2                              | 1.9             | 3.1           |
| 29-Dec                                                                                                                                                       | 2                             | 3  | 1  | 2  | 1  | 0  | 1  | 0  | 1  | 1  | 2  | 1  | 0  | 3  | 2  | 2  | 1  | 1  | 3  | 4  | 3  | 4  | 7  | 3                              | 2.0             | 6.8           |
| 30-Dec                                                                                                                                                       | 4                             | 5  | 4  | 3  | 8  | 4  | 3  | 4  | 3  | 4  | 3  | 2  | 1  | 2  | 0  | 1  | 1  | 1  | 2  | 2  | 1  | 2  | 3  | 3                              | 2.7             | 8.0           |
| 31-Dec                                                                                                                                                       | 1                             | 2  | 2  | 1  | 1  | 1  | 2  | 2  | 3  | 4  | 4  | 3  | 3  | 2  | 4  | 3  | 3  | 2  | 3  | 4  | 4  | 4  | 4  | 3                              | 2.6             | 3.8           |
| 4.6 4.2 4.5 4.5 4.4 4.1 4.0 4.3 5.7 5.8 5.7 5.8 5.3 5.2 4.9 4.9 4.8 4.9 4.6 4.6 4.8 4.8 4.6 4.6                                                              |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                | Diurnal Average |               |
| 11.0 12.5 12.3 12.4 10.9 12.1 12.9 22.7 28.7 29.0 21.0 16.6 17.8 13.8 12.3 12.2 12.8 11.7 10.6 11.2 10.2 11.7 11.0 12.2                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                | Diurnal Maximum |               |
| P - Power Failure D - DAS Failure M - Maintenance                                                                                                            |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |                 |               |

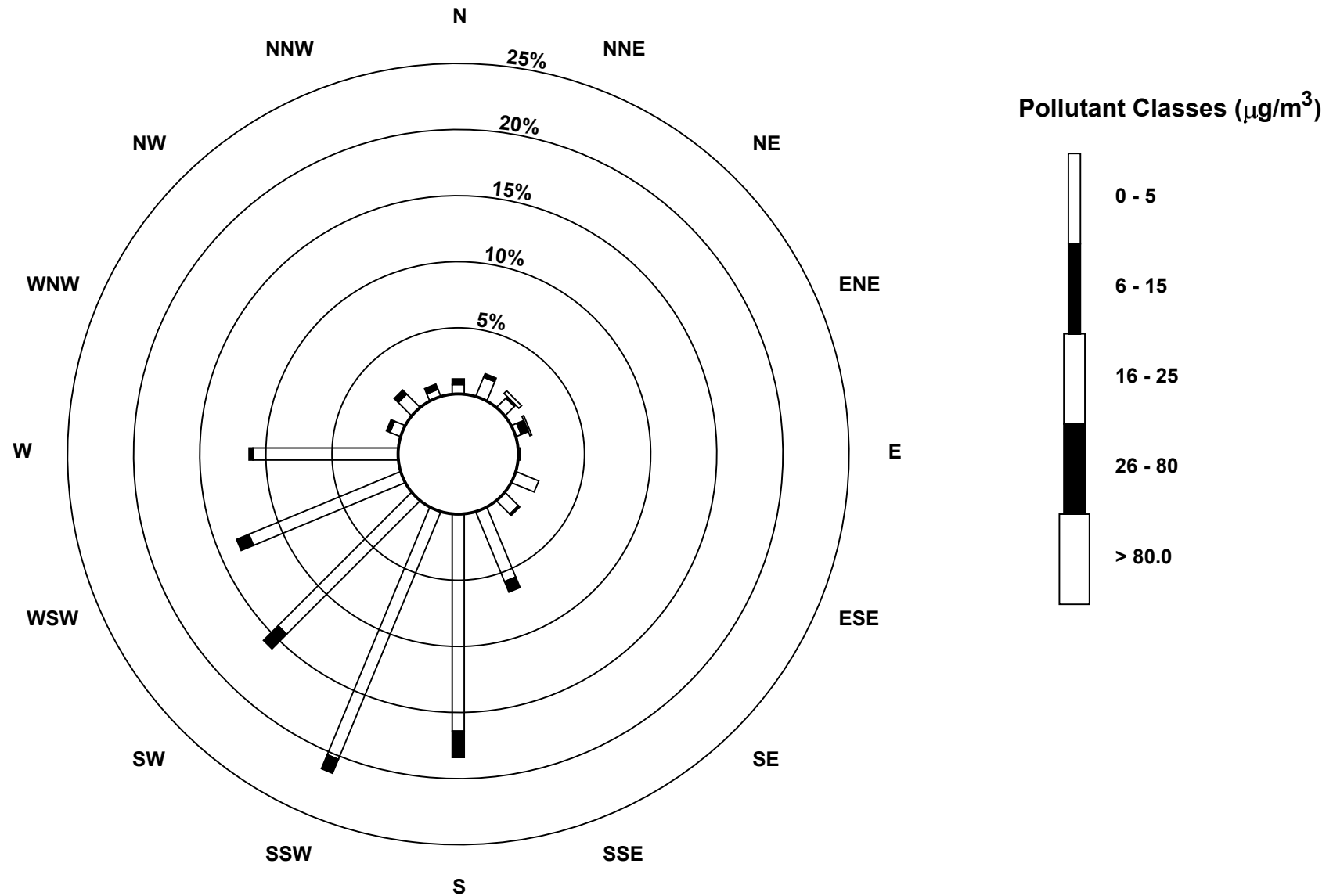
## Hourly Maximums

PM<sub>2.5</sub> (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Portable Rycroft - December 2016



# Pollutant Rose

PM<sub>2.5</sub> (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Portable Rycroft - December 2016





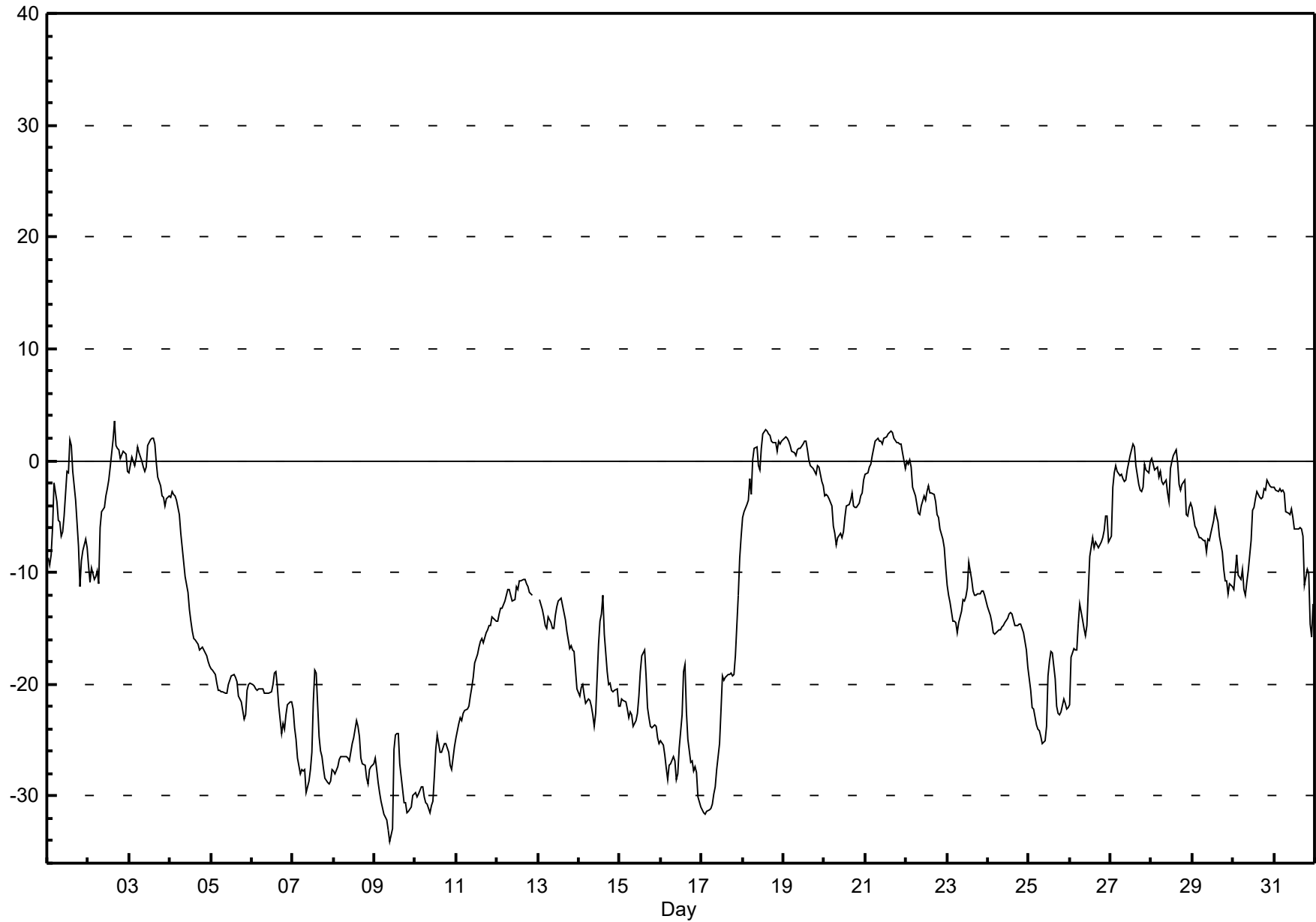
# Hourly Averages

External Temperature (ET) - °C  
Portable Rycroft - December 2016

| Maximum Value: 3.6 °C on Dec 2 16:00                                                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Maximum Daily Average: 1.2 °C on Dec 21                                                                                                                             |     |     |     |     | Hours in Service: 744          |               |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|--------------------------------|---------------|--|--|--|
| Minimum Value: -34 °C on Dec 9 10:00                                                                                                            |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Daily Average: -29.6 °C on Dec 9                                                                                                                            |     |     |     |     | Hours of Data: 740             |               |  |  |  |
| Maximum Diurnal Average: -10.0 °C at hour 14                                                                                                    |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Minimum Diurnal Average: -14.1 °C at hour 9                                                                                                                         |     |     |     |     | Hours of Missing Data: 4       |               |  |  |  |
| Monthly Average: -12.86 °C                                                                                                                      |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Percentiles: P <sub>1</sub> = -31.5 P <sub>10</sub> = -27.2 Q <sub>1</sub> = -21.6 Median = -12.6 Q <sub>3</sub> = -3.2 P <sub>90</sub> = 0.2 P <sub>99</sub> = 2.4 |     |     |     |     | Hours of Calibration: 0        |               |  |  |  |
|                                                                                                                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |     |     | Percent Operational Time: 99.5 |               |  |  |  |
| Day                                                                                                                                             | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |     |     | Daily Average                  | Daily Maximum |  |  |  |
|                                                                                                                                                 | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20                                                                                                                                                                  | 21  | 22  | 23  | 24  |                                |               |  |  |  |
| 1-Dec                                                                                                                                           | -9                            | -9  | -8  | -6  | -2  | -4  | -5  | -5  | -7  | -6  | -5  | -1  | -1  | 2   | 1   | -1  | -4  | -6  | -8  | -11                                                                                                                                                                 | -9  | -8  | -7  | -8  | -5.3                           | 1.9           |  |  |  |
| 2-Dec                                                                                                                                           | -9                            | -11 | -10 | -11 | -10 | -10 | -11 | -6  | -5  | -4  | -3  | -3  | -2  | -1  | 2   | 4   | 1   | 1   | 1   | 0                                                                                                                                                                   | 1   | 1   | 1   | -1  | -3.5                           | 3.6           |  |  |  |
| 3-Dec                                                                                                                                           | -1                            | 0   | 0   | 0   | 0   | 1   | 1   | 0   | -1  | -1  | -1  | 1   | 2   | 2   | 2   | 2   | 0   | -1  | -2  | -3                                                                                                                                                                  | -3  | -4  | -3  | -3  | -0.6                           | 2.0           |  |  |  |
| 4-Dec                                                                                                                                           | -3                            | -3  | -3  | -3  | -4  | -5  | -7  | -8  | -9  | -10 | -12 | -13 | -14 | -15 | -16 | -16 | -16 | -17 | -17 | -17                                                                                                                                                                 | -17 | -17 | -18 | -18 | -11.6                          | -2.8          |  |  |  |
| 5-Dec                                                                                                                                           | -19                           | -19 | -19 | -20 | -21 | -21 | -21 | -21 | -21 | -21 | -20 | -20 | -19 | -19 | -19 | -20 | -21 | -21 | -22 | -23                                                                                                                                                                 | -23 | -21 | -20 | -20 | -20.3                          | -18.6         |  |  |  |
| 6-Dec                                                                                                                                           | -20                           | -20 | -20 | -21 | -20 | -20 | -20 | -21 | -21 | -21 | -21 | -21 | -20 | -19 | -19 | -20 | -22 | -24 | -23 | -24                                                                                                                                                                 | -23 | -22 | -22 | -22 | -21.1                          | -18.9         |  |  |  |
| 7-Dec                                                                                                                                           | -22                           | -24 | -25 | -27 | -28 | -28 | -28 | -28 | -30 | -29 | -28 | -26 | -22 | -19 | -19 | -25 | -26 | -26 | -28 | -28                                                                                                                                                                 | -29 | -29 | -29 | -28 | -26.1                          | -18.7         |  |  |  |
| 8-Dec                                                                                                                                           | -28                           | -28 | -27 | -27 | -26 | -26 | -26 | -26 | -27 | -27 | -26 | -25 | -25 | -23 | -24 | -25 | -27 | -27 | -27 | -28                                                                                                                                                                 | -29 | -28 | -27 | -27 | -26.6                          | -23.3         |  |  |  |
| 9-Dec                                                                                                                                           | -27                           | -28 | -29 | -30 | -30 | -32 | -32 | -32 | -33 | -34 | -33 | -26 | -24 | -24 | -24 | -27 | -29 | -31 | -31 | -31                                                                                                                                                                 | -31 | -31 | -30 | -30 | -29.6                          | -24.4         |  |  |  |
| 10-Dec                                                                                                                                          | -30                           | -30 | -30 | -29 | -29 | -30 | -31 | -31 | -31 | -31 | -30 | -28 | -26 | -25 | -26 | -26 | -26 | -25 | -25 | -26                                                                                                                                                                 | -27 | -28 | -27 | -26 | -28.0                          | -24.6         |  |  |  |
| 11-Dec                                                                                                                                          | -25                           | -24 | -23 | -23 | -23 | -22 | -22 | -22 | -21 | -20 | -19 | -18 | -17 | -17 | -16 | -16 | -16 | -15 | -15 | -15                                                                                                                                                                 | -15 | -14 | -14 | -14 | -18.6                          | -13.9         |  |  |  |
| 12-Dec                                                                                                                                          | -14                           | -14 | -13 | -13 | -13 | -12 | -12 | -12 | -12 | -13 | -12 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -11 | -12                                                                                                                                                                 | -12 | P   | P   | P   | -11.9                          | -10.6         |  |  |  |
| 13-Dec                                                                                                                                          | P                             | -12 | -13 | -14 | -15 | -15 | -14 | -14 | -15 | -15 | -14 | -13 | -13 | -12 | -13 | -14 | -14 | -15 | -17 | -16                                                                                                                                                                 | -17 | -17 | -19 | -20 | -14.9                          | -12.4         |  |  |  |
| 14-Dec                                                                                                                                          | -21                           | -20 | -20 | -21 | -22 | -21 | -21 | -22 | -23 | -24 | -23 | -16 | -14 | -14 | -12 | -16 | -19 | -20 | -20 | -21                                                                                                                                                                 | -21 | -21 | -20 | -22 | -19.7                          | -12.0         |  |  |  |
| 15-Dec                                                                                                                                          | -22                           | -21 | -21 | -22 | -22 | -23 | -22 | -23 | -24 | -23 | -23 | -21 | -19 | -17 | -17 | -19 | -22 | -23 | -24 | -24                                                                                                                                                                 | -24 | -24 | -25 | -25 | -22.1                          | -17.0         |  |  |  |
| 16-Dec                                                                                                                                          | -25                           | -25 | -26 | -28 | -28 | -27 | -27 | -26 | -27 | -28 | -28 | -26 | -23 | -19 | -18 | -23 | -25 | -27 | -27 | -28                                                                                                                                                                 | -27 | -28 | -30 | -31 | -26.2                          | -18.3         |  |  |  |
| 17-Dec                                                                                                                                          | -31                           | -31 | -32 | -31 | -31 | -31 | -31 | -30 | -29 | -28 | -25 | -22 | -19 | -20 | -19 | -19 | -19 | -19 | -19 | -19                                                                                                                                                                 | -18 | -12 | -9  | -7  | -23.0                          | -6.8          |  |  |  |
| 18-Dec                                                                                                                                          | -5                            | -5  | -4  | -4  | -2  | -3  | 0   | 1   | 1   | 0   | -1  | 1   | 2   | 3   | 3   | 2   | 2   | 2   | 2   | 2                                                                                                                                                                   | 1   | 2   | 2   | 2   | 0.2                            | 2.8           |  |  |  |
| 19-Dec                                                                                                                                          | 2                             | 2   | 2   | 2   | 1   | 1   | 1   | 0   | 1   | 1   | 1   | 1   | 2   | 2   | 1   | 0   | -1  | -1  | -1  | -1                                                                                                                                                                  | 0   | -1  | -2  | -2  | 0.5                            | 2.2           |  |  |  |
| 20-Dec                                                                                                                                          | -3                            | -3  | -3  | -3  | -4  | -6  | -6  | -7  | -7  | -7  | -7  | -6  | -5  | -4  | -4  | -4  | -3  | -4  | -4  | -4                                                                                                                                                                  | -4  | -3  | -3  | -2  | -4.4                           | -1.8          |  |  |  |
| 21-Dec                                                                                                                                          | -1                            | -1  | -1  | 0   | 0   | 1   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 3   | 2   | 2   | 2   | 2                                                                                                                                                                   | 1   | 1   | 1   | -1  | 1.2                            | 2.6           |  |  |  |
| 22-Dec                                                                                                                                          | 0                             | 0   | 0   | -1  | -2  | -3  | -4  | -5  | -5  | -4  | -3  | -4  | -3  | -2  | -3  | -3  | -3  | -4  | -5  | -5                                                                                                                                                                  | -6  | -7  | -8  | -10 | -3.7                           | 0.1           |  |  |  |
| 23-Dec                                                                                                                                          | -11                           | -12 | -13 | -14 | -14 | -15 | -15 | -14 | -13 | -12 | -13 | -12 | -11 | -9  | -11 | -12 | -12 | -12 | -12 | -12                                                                                                                                                                 | -12 | -12 | -12 | -13 | -12.4                          | -9.1          |  |  |  |
| 24-Dec                                                                                                                                          | -13                           | -14 | -14 | -15 | -16 | -15 | -15 | -15 | -15 | -15 | -15 | -14 | -14 | -14 | -14 | -14 | -15 | -15 | -15 | -15                                                                                                                                                                 | -15 | -15 | -17 | -18 | -14.8                          | -13.1         |  |  |  |
| 25-Dec                                                                                                                                          | -19                           | -21 | -22 | -22 | -24 | -24 | -24 | -25 | -25 | -25 | -24 | -19 | -18 | -17 | -17 | -19 | -22 | -23 | -23 | -22                                                                                                                                                                 | -21 | -22 | -22 | -22 | -21.8                          | -17.0         |  |  |  |
| 26-Dec                                                                                                                                          | -22                           | -18 | -17 | -17 | -17 | -15 | -13 | -14 | -15 | -16 | -15 | -12 | -9  | -7  | -8  | -7  | -8  | -8  | -7  | -7                                                                                                                                                                  | -6  | -5  | -5  | -7  | -11.3                          | -4.9          |  |  |  |
| 27-Dec                                                                                                                                          | -7                            | -2  | -1  | 0   | -1  | -1  | -1  | -2  | -2  | -2  | -1  | 0   | 1   | 1   | 1   | 0   | -2  | -3  | -3  | -2                                                                                                                                                                  | 0   | -1  | -1  | 0   | -1.2                           | 1.4           |  |  |  |
| 28-Dec                                                                                                                                          | 0                             | 0   | -1  | -1  | -1  | -1  | -2  | -2  | -2  | -3  | -4  | -1  | 0   | 0   | 1   | 0   | -2  | -3  | -2  | -2                                                                                                                                                                  | -5  | -5  | -4  | -4  | -1.7                           | 1.0           |  |  |  |
| 29-Dec                                                                                                                                          | -4                            | -6  | -6  | -7  | -7  | -7  | -7  | -7  | -8  | -7  | -7  | -7  | -5  | -4  | -5  | -5  | -7  | -8  | -10 | -11                                                                                                                                                                 | -11 | -12 | -11 | -11 | -7.5                           | -4.2          |  |  |  |
| 30-Dec                                                                                                                                          | -11                           | -10 | -8  | -10 | -11 | -10 | -11 | -12 | -11 | -10 | -7  | -4  | -4  | -3  | -3  | -3  | -3  | -3  | -3  | -3                                                                                                                                                                  | -2  | -2  | -2  | -2  | -6.3                           | -1.8          |  |  |  |
| 31-Dec                                                                                                                                          | -2                            | -3  | -3  | -3  | -3  | -3  | -3  | -5  | -5  | -5  | -4  | -5  | -6  | -6  | -6  | -6  | -6  | -7  | -11 | -10                                                                                                                                                                 | -10 | -15 | -16 | -13 | -6.4                           | -2.4          |  |  |  |
| -13.4 -13.3 -13.3 -13.6 -13.7 -13.7 -13.9 -13.9 -14.1 -14.1 -13.5 -11.9 -10.8 -10.0 -10.0 -11.0 -12.1 -12.7 -13.1 -13.5 -13.3 -13.3 -13.3 -13.5 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |     |     | Diurnal Average                |               |  |  |  |
| 2.0 2.2 2.0 1.7 1.4 1.2 1.7 2.0 1.8 1.7 1.5 2.0 2.4 2.8 2.6 3.6 2.5 2.0 1.6 1.6 1.5 1.7 1.5 1.7                                                 |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |     |     | Diurnal Maximum                |               |  |  |  |
| P - Power Failure                                                                                                                               |                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |                                                                                                                                                                     |     |     |     |     |                                |               |  |  |  |

## Hourly Averages

External Temperature (ET) - °C  
Portable Rycroft - December 2016



## Hourly Averages

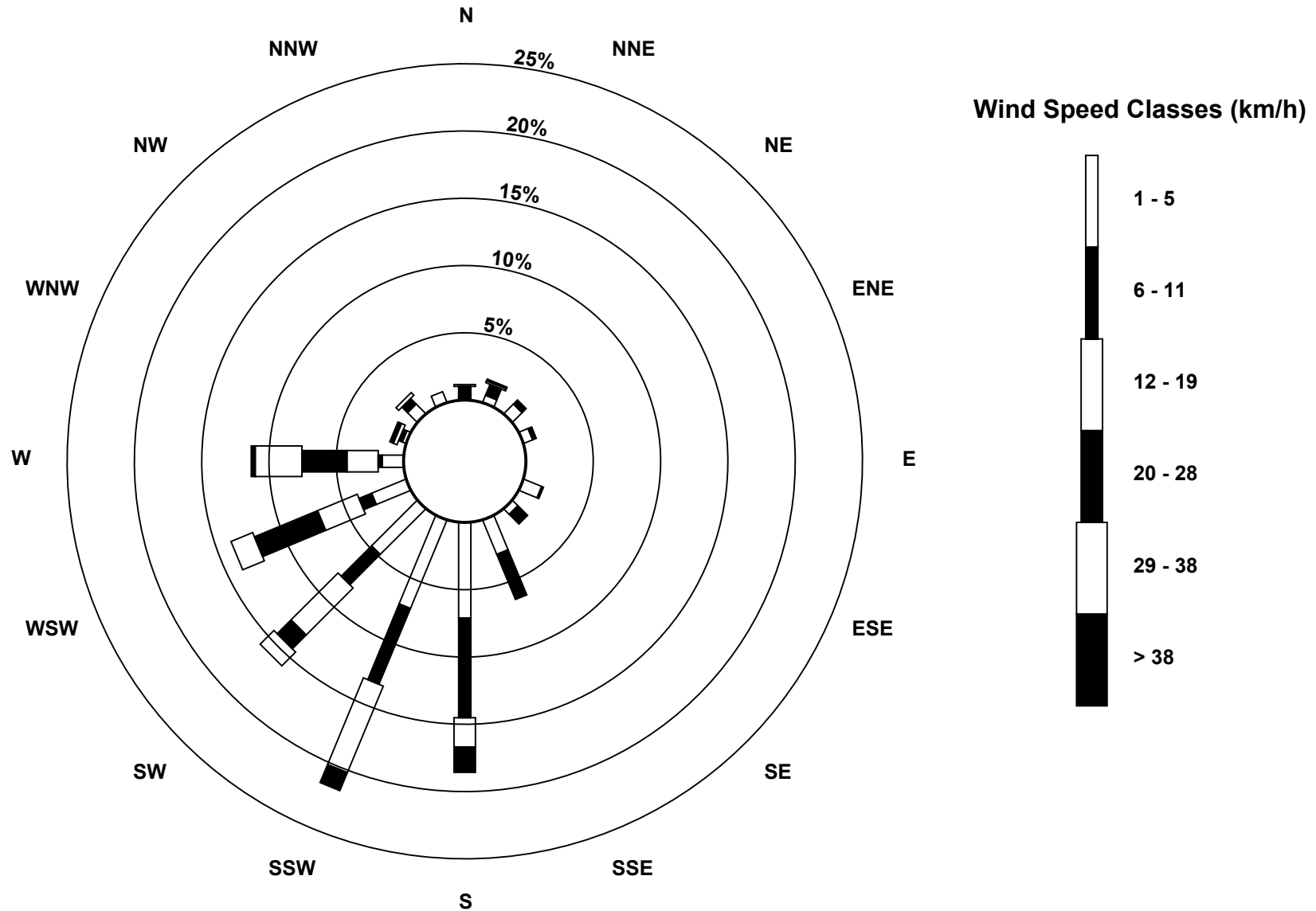
Wind Speed (km/h)  
Wind Direction (deg)  
Portable Rycroft - December 2016

| Day    | Hourly Period Ending At (MST) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Daily Average | Daily Maximum |
|--------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|---------------|
|        | 1                             | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |               |               |
| 1 Spd  | 4                             | 2   | 3   | 6   | 12  | 11  | 2   | 5   | 7   | 6   | 3   | 7   | 6   | 4   | 3   | 4   | 5   | 7   | 4   | 5   | 8   | 10  | 11  | 7   | 4.9           | 12.2          |
| Dir    | 247                           | 218 | 221 | 225 | 242 | 247 | 202 | 161 | 167 | 169 | 184 | 160 | 166 | 173 | 195 | 155 | 135 | 142 | 154 | 188 | 168 | 168 | 160 | 159 | 182.1         | 241.8         |
| 2 Spd  | 6                             | 7   | 6   | 6   | 4   | 3   | 3   | 8   | 11  | 4   | 5   | 7   | 5   | 5   | 6   | 6   | 13  | 14  | 16  | 13  | 14  | 15  | 12  | 7   | 7.2           | 15.7          |
| Dir    | 175                           | 188 | 164 | 181 | 156 | 206 | 272 | 141 | 145 | 117 | 116 | 78  | 120 | 145 | 147 | 171 | 177 | 192 | 187 | 187 | 185 | 180 | 191 | 205 | 171.9         | 187.2         |
| 3 Spd  | 9                             | 15  | 12  | 8   | 10  | 13  | 13  | 13  | 13  | 12  | 13  | 12  | 12  | 10  | 9   | 14  | 13  | 11  | 11  | 10  | 10  | 10  | 10  | 12  | 11.2          | 15.5          |
| Dir    | 180                           | 186 | 182 | 195 | 208 | 206 | 206 | 207 | 204 | 202 | 203 | 205 | 197 | 198 | 207 | 221 | 223 | 217 | 214 | 207 | 210 | 207 | 214 | 219 | 204.9         | 186.1         |
| 4 Spd  | 10                            | 12  | 19  | 19  | 24  | 24  | 31  | 29  | 28  | 24  | 34  | 38  | 36  | 38  | 38  | 35  | 33  | 30  | 29  | 31  | 33  | 36  | 39  | 40  | 29.0          | 40.1          |
| Dir    | 212                           | 228 | 248 | 239 | 248 | 268 | 272 | 277 | 278 | 283 | 275 | 274 | 273 | 271 | 268 | 267 | 266 | 264 | 266 | 266 | 265 | 265 | 266 | 267 | 266.3         | 266.7         |
| 5 Spd  | 34                            | 28  | 31  | 26  | 21  | 19  | 19  | 20  | 19  | 20  | 25  | 30  | 29  | 30  | 27  | 23  | 19  | 17  | 16  | 12  | 12  | 20  | 23  | 23  | 22.5          | 34.4          |
| Dir    | 270                           | 265 | 266 | 265 | 259 | 257 | 258 | 257 | 256 | 258 | 264 | 267 | 268 | 271 | 273 | 270 | 270 | 267 | 264 | 255 | 256 | 264 | 269 | 270 | 265.1         | 269.5         |
| 6 Spd  | 22                            | 21  | 22  | 22  | 22  | 22  | 24  | 23  | 22  | 22  | 22  | 20  | 19  | 16  | 14  | 12  | 14  | 15  | 14  | 8   | 5   | 7   | 7   | 6   | 16.4          | 23.5          |
| Dir    | 270                           | 264 | 266 | 266 | 266 | 266 | 270 | 270 | 264 | 265 | 259 | 259 | 260 | 262 | 262 | 259 | 263 | 259 | 253 | 244 | 213 | 228 | 233 | 229 | 261.3         | 269.9         |
| 7 Spd  | 6                             | 3   | 3   | 2   | 3   | 6   | 5   | 4   | 4   | 3   | 3   | 3   | 2   | 4   | 3   | 4   | 1   | 2   | 1   | 3   | 2   | 4   | 4   | 4   | 2.3           | 5.7           |
| Dir    | 229                           | 208 | 160 | 159 | 198 | 189 | 187 | 177 | 233 | 196 | 208 | 189 | 231 | 265 | 280 | 318 | 35  | 55  | 230 | 222 | 197 | 189 | 188 | 190 | 206.3         | 189.1         |
| 8 Spd  | 2                             | 2   | 4   | 4   | 3   | 3   | 4   | 3   | 4   | 3   | 3   | 2   | 3   | 4   | 3   | 1   | 3   | 4   | 4   | 0   | 1   | 1   | 0   | 0   | 1.4           | 4.4           |
| Dir    | 190                           | 212 | 191 | 185 | 186 | 213 | 195 | 185 | 198 | 191 | 211 | 215 | 237 | 271 | 269 | 228 | 40  | 61  | 61  | 338 | 161 | 196 | 112 | 221 | 199.6         | 60.8          |
| 9 Spd  | 1                             | 1   | 3   | 3   | 4   | 5   | 4   | 5   | 0   | 3   | 3   | 1   | 2   | 5   | 4   | 4   | 2   | 3   | 3   | 4   | 5   | 4   | 4   | 4   | 2.4           | 5.2           |
| Dir    | 240                           | 199 | 161 | 158 | 163 | 181 | 158 | 180 | 102 | 188 | 188 | 275 | 305 | 328 | 272 | 251 | 223 | 194 | 191 | 182 | 177 | 180 | 184 | 182 | 193.3         | 177.1         |
| 10 Spd | 3                             | 3   | 3   | 2   | 2   | 3   | 2   | 3   | 2   | 2   | 2   | 3   | 3   | 3   | 3   | 4   | 4   | 4   | 8   | 10  | 5   | 6   | 12  | 6   | 3.8           | 12.1          |
| Dir    | 185                           | 186 | 186 | 186 | 178 | 192 | 184 | 189 | 244 | 243 | 205 | 210 | 229 | 253 | 193 | 184 | 183 | 211 | 235 | 228 | 218 | 216 | 229 | 222 | 212.7         | 229.3         |
| 11 Spd | 9                             | 10  | 12  | 15  | 21  | 16  | 18  | 14  | 15  | 16  | 17  | 20  | 20  | 17  | 14  | 22  | 19  | 27  | 28  | 31  | 23  | 30  | 30  | 27  | 19.4          | 30.7          |
| Dir    | 229                           | 234 | 239 | 241 | 249 | 239 | 236 | 232 | 228 | 229 | 229 | 233 | 234 | 237 | 235 | 236 | 236 | 241 | 240 | 247 | 245 | 252 | 251 | 255 | 240.5         | 246.9         |
| 12 Spd | 27                            | 29  | 26  | 28  | 24  | 29  | 27  | 31  | 32  | 38  | 36  | 26  | 17  | 24  | 29  | 30  | 29  | 28  | 29  | 25  | 24  | P   | P   | P   | 27.5          | 37.9          |
| Dir    | 252                           | 252 | 251 | 256 | 274 | 275 | 273 | 271 | 269 | 270 | 270 | 255 | 239 | 255 | 257 | 255 | 248 | 245 | 252 | 251 | 242 | P   | P   | P   | 258.7         | 270.0         |
| 13 Spd | P                             | 26  | 27  | 29  | 21  | 22  | 29  | 24  | 23  | 23  | 27  | 24  | 23  | 21  | 14  | 17  | 16  | 5   | 5   | 6   | 4   | 5   | 5   | 5   | 16.7          | 29.1          |
| Dir    | P                             | 246 | 253 | 256 | 249 | 244 | 255 | 248 | 242 | 239 | 244 | 249 | 253 | 249 | 261 | 262 | 253 | 218 | 223 | 218 | 191 | 164 | 168 | 184 | 245.8         | 256.5         |
| 14 Spd | 8                             | 8   | 8   | 8   | 8   | 8   | 7   | 5   | 5   | 4   | 3   | 1   | 4   | 2   | 2   | 4   | 9   | 6   | 4   | 3   | 5   | 3   | 3   | 3   | 4.0           | 9.4           |
| Dir    | 180                           | 189 | 171 | 182 | 182 | 177 | 185 | 178 | 193 | 214 | 198 | 168 | 288 | 238 | 259 | 347 | 267 | 245 | 207 | 217 | 253 | 218 | 197 | 199 | 204.7         | 266.9         |
| 15 Spd | 4                             | 5   | 3   | 4   | 7   | 6   | 4   | 4   | 4   | 5   | 6   | 5   | 4   | 3   | 3   | 6   | 4   | 7   | 5   | 8   | 7   | 7   | 7   | 7   | 4.7           | 7.7           |
| Dir    | 231                           | 189 | 213 | 233 | 240 | 230 | 231 | 187 | 205 | 178 | 182 | 198 | 205 | 204 | 221 | 233 | 208 | 212 | 197 | 173 | 173 | 178 | 175 | 180 | 200.8         | 173.0         |
| 16 Spd | 8                             | 4   | 6   | 7   | 8   | 8   | 8   | 8   | 7   | 1   | 4   | 6   | 4   | 2   | 4   | 3   | 1   | 4   | 4   | 6   | 6   | 4   | 2   | 2   | 4.2           | 8.4           |
| Dir    | 167                           | 197 | 184 | 178 | 185 | 179 | 178 | 176 | 187 | 60  | 178 | 195 | 187 | 180 | 342 | 40  | 162 | 169 | 143 | 170 | 152 | 149 | 241 | 211 | 176.8         | 179.1         |
| 17 Spd | 3                             | 2   | 2   | 3   | 3   | 1   | 2   | 1   | 3   | 4   | 3   | 2   | 1   | 6   | 1   | 1   | 2   | 1   | 3   | 1   | 2   | 5   | 5   | 10  | 1.9           | 9.6           |
| Dir    | 237                           | 218 | 206 | 188 | 201 | 207 | 217 | 220 | 233 | 248 | 228 | 260 | 33  | 3   | 343 | 331 | 248 | 231 | 314 | 195 | 222 | 219 | 223 | 198 | 228.9         | 198.3         |
| 18 Spd | 10                            | 12  | 14  | 11  | 14  | 11  | 25  | 30  | 32  | 16  | 10  | 24  | 37  | 38  | 35  | 30  | 23  | 16  | 14  | 16  | 15  | 15  | 15  | 20  | 19.6          | 37.6          |
| Dir    | 217                           | 208 | 199 | 205 | 219 | 202 | 230 | 230 | 225 | 207 | 204 | 225 | 231 | 232 | 230 | 227 | 222 | 211 | 213 | 211 | 206 | 192 | 196 | 188 | 218.1         | 232.0         |
| 19 Spd | 25                            | 23  | 21  | 24  | 26  | 20  | 19  | 18  | 29  | 32  | 36  | 33  | 29  | 29  | 22  | 18  | 14  | 15  | 14  | 13  | 22  | 16  | 12  | 17  | 20.8          | 36.0          |
| Dir    | 187                           | 185 | 185 | 187 | 192 | 205 | 208 | 213 | 225 | 230 | 235 | 236 | 236 | 239 | 236 | 231 | 224 | 223 | 221 | 218 | 228 | 222 | 200 | 190 | 216.5         | 235.1         |
| 20 Spd | 14                            | 13  | 13  | 9   | 8   | 10  | 9   | 8   | 8   | 8   | 6   | 9   | 7   | 8   | 9   | 10  | 11  | 10  | 12  | 12  | 13  | 12  | 16  | 14  | 10.2          | 15.7          |
| Dir    | 196                           | 199 | 197 | 204 | 205 | 189 | 185 | 181 | 163 | 151 | 160 | 172 | 179 | 187 | 185 | 190 | 180 | 181 | 185 | 192 | 197 | 201 | 194 | 204 | 188.8         | 193.7         |
| 21 Spd | 15                            | 11  | 8   | 5   | 10  | 16  | 20  | 22  | 22  | 23  | 18  | 21  | 20  | 18  | 14  | 18  | 20  | 19  | 21  | 25  | 24  | 24  | 14  | 13  | 17.4          | 25.4          |
| Dir    | 210                           | 199 | 192 | 207 | 194 | 201 | 210 | 210 | 209 | 204 | 200 | 190 | 188 | 187 | 200 | 204 | 198 | 198 | 191 | 187 | 187 | 191 | 201 | 192 | 197.7         | 187.2         |
| 22 Spd | 16                            | 18  | 17  | 7   | 9   | 8   | 7   | 7   | 7   | 6   | 4   | 5   | 4   | 3   | 4   | 4   | 4   | 2   | 3   | 4   | 3   | 2   | 1   | 1   | 4.9           | 17.9          |
| Dir    | 186                           | 180 | 209 | 210 | 192 | 184 | 188 | 200 | 218 | 244 | 268 | 272 | 257 | 275 | 244 | 176 | 187 | 78  | 344 | 298 | 197 | 229 | 153 | 212 | 207.5         | 180.4         |



## Wind Rose

Wind Speed (WS) (km/h)  
Portable Rycroft - December 2016



# Hourly Averages - Wind Speed (Scalar)

Wind Speed (km/h)

Portable Rycroft - December 2016

| Maximum Speed: 40 km/h on Dec 5 00:00                                                                                   |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Maximum Daily Speed Average: 29.7 km/h on Dec 4                                                                                                               |    |    |    |    |                 |               |  |  |  | Hours in Service: 744          |  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|-----------------|---------------|--|--|--|--------------------------------|--|
| Minimum Speed: 1 km/h on Dec 8 23:00                                                                                    |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Daily Speed Average: 2.8 km/h on Dec 8                                                                                                                |    |    |    |    |                 |               |  |  |  | Hours of Data: 703             |  |
| Maximum Diurnal Speed Average: 13.4 km/h at hour 12                                                                     |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Minimum Diurnal Speed Average: 10.2 km/h at hour 18                                                                                                           |    |    |    |    |                 |               |  |  |  | Hours of Missing Data: 41      |  |
| Monthly Average Speed: 11.70 km/h                                                                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percentiles: P <sub>1</sub> = 1.3 P <sub>10</sub> = 2.8 Q <sub>1</sub> = 4.5 Median = 8.9 Q <sub>3</sub> = 16.8 P <sub>90</sub> = 24.8 P <sub>99</sub> = 37.5 |    |    |    |    |                 |               |  |  |  | Percent Operational Time: 94.5 |  |
| Day                                                                                                                     | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    | Daily Average   | Daily Maximum |  |  |  |                                |  |
|                                                                                                                         | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20                                                                                                                                                            | 21 | 22 | 23 | 24 |                 |               |  |  |  |                                |  |
| 1-Dec                                                                                                                   | 4                             | 3  | 3  | 6  | 12 | 11 | 4  | 5  | 7  | 6  | 4  | 7  | 6  | 4  | 3  | 4  | 5  | 7  | 4  | 5                                                                                                                                                             | 8  | 10 | 12 | 7  | 6.2             | 12.2          |  |  |  |                                |  |
| 2-Dec                                                                                                                   | 6                             | 8  | 7  | 6  | 5  | 3  | 4  | 9  | 11 | 4  | 5  | 8  | 5  | 6  | 6  | 7  | 13 | 14 | 16 | 13                                                                                                                                                            | 14 | 16 | 12 | 8  | 8.6             | 15.7          |  |  |  |                                |  |
| 3-Dec                                                                                                                   | 10                            | 16 | 12 | 8  | 10 | 13 | 13 | 13 | 13 | 12 | 13 | 12 | 12 | 10 | 9  | 14 | 13 | 11 | 11 | 10                                                                                                                                                            | 10 | 10 | 10 | 12 | 11.5            | 15.5          |  |  |  |                                |  |
| 4-Dec                                                                                                                   | 10                            | 12 | 19 | 19 | 24 | 25 | 31 | 29 | 29 | 24 | 34 | 38 | 36 | 39 | 38 | 35 | 33 | 30 | 29 | 31                                                                                                                                                            | 33 | 36 | 39 | 40 | 29.7            | 40.1          |  |  |  |                                |  |
| 5-Dec                                                                                                                   | 34                            | 28 | 31 | 26 | 21 | 19 | 19 | 20 | 19 | 20 | 25 | 30 | 29 | 30 | 27 | 23 | 19 | 17 | 16 | 12                                                                                                                                                            | 12 | 20 | 23 | 23 | 22.6            | 34.4          |  |  |  |                                |  |
| 6-Dec                                                                                                                   | 22                            | 21 | 22 | 22 | 22 | 22 | 24 | 23 | 22 | 22 | 22 | 21 | 19 | 16 | 14 | 12 | 14 | 15 | 14 | 8                                                                                                                                                             | 5  | 7  | 7  | 6  | 16.7            | 23.5          |  |  |  |                                |  |
| 7-Dec                                                                                                                   | 6                             | 3  | 7  | 3  | 3  | 6  | 5  | 4  | 4  | 3  | 4  | 4  | 2  | 4  | 3  | 4  | 1  | 2  | 1  | 2                                                                                                                                                             | 3  | 2  | 4  | 4  | 3.5             | 6.9           |  |  |  |                                |  |
| 8-Dec                                                                                                                   | 2                             | 2  | 4  | 4  | 3  | 3  | 4  | 3  | 4  | 3  | 3  | 2  | 3  | 4  | 3  | 2  | 4  | 4  | 5  | 1                                                                                                                                                             | 2  | 2  | 1  | 1  | 2.8             | 4.6           |  |  |  |                                |  |
| 9-Dec                                                                                                                   | 2                             | 1  | 3  | 4  | 5  | 5  | 4  | 5  | 1  | 3  | 3  | 1  | 2  | 5  | 4  | 4  | 2  | 3  | 3  | 4                                                                                                                                                             | 5  | 4  | 4  | 4  | 3.5             | 5.2           |  |  |  |                                |  |
| 10-Dec                                                                                                                  | 3                             | 3  | 3  | 3  | 2  | 3  | 2  | 3  | 2  | 2  | 2  | 3  | 3  | 3  | 3  | 4  | 4  | 4  | 8  | 10                                                                                                                                                            | 5  | 6  | 12 | 6  | 4.2             | 12.1          |  |  |  |                                |  |
| 11-Dec                                                                                                                  | 9                             | 11 | 12 | 15 | 21 | 17 | 18 | 14 | 15 | 16 | 17 | 20 | 20 | 17 | 14 | 22 | 19 | 27 | 28 | 31                                                                                                                                                            | 23 | 30 | 30 | 27 | 19.7            | 30.8          |  |  |  |                                |  |
| 12-Dec                                                                                                                  | 27                            | 29 | 26 | 28 | 25 | 29 | 27 | 31 | 32 | 38 | 36 | 26 | 17 | 24 | 29 | 30 | 29 | 28 | 29 | 25                                                                                                                                                            | 25 | P  | P  | P  | 17.5            | 29.1          |  |  |  |                                |  |
| 14-Dec                                                                                                                  | P                             | 26 | 27 | 29 | 21 | 22 | 29 | 24 | 23 | 23 | 27 | 24 | 23 | 21 | 14 | 17 | 16 | 6  | 5  | 6                                                                                                                                                             | 4  | 5  | 5  | 5  | 17.5            | 29.1          |  |  |  |                                |  |
| 15-Dec                                                                                                                  | 8                             | 8  | 8  | 8  | 8  | 9  | 7  | 5  | 5  | 4  | 4  | 2  | 6  | 3  | 3  | 4  | 10 | 6  | 4  | 4                                                                                                                                                             | 5  | 4  | 3  | 3  | 5.4             | 9.5           |  |  |  |                                |  |
| 16-Dec                                                                                                                  | 5                             | 5  | 3  | 4  | 7  | 6  | 5  | 4  | 4  | 5  | 6  | 5  | 4  | 3  | 3  | 6  | 4  | 7  | 5  | 8                                                                                                                                                             | 7  | 7  | 7  | 7  | 5.2             | 7.7           |  |  |  |                                |  |
| 17-Dec                                                                                                                  | 8                             | 7  | 6  | 8  | 8  | 8  | 8  | 8  | 7  | 1  | 4  | 6  | 4  | 2  | 5  | 3  | 2  | 4  | 4  | 6                                                                                                                                                             | 6  | 4  | 3  | 3  | 5.3             | 8.5           |  |  |  |                                |  |
| 18-Dec                                                                                                                  | 3                             | 2  | 3  | 4  | 3  | 1  | 2  | 1  | 3  | 4  | 3  | 2  | 2  | 7  | 2  | 3  | 3  | 3  | 6  | 2                                                                                                                                                             | 3  | 6  | 6  | 10 | 3.5             | 9.7           |  |  |  |                                |  |
| 19-Dec                                                                                                                  | 10                            | 12 | 14 | 11 | 14 | 11 | 25 | 31 | 32 | 16 | 11 | 24 | 37 | 38 | 35 | 30 | 23 | 16 | 14 | 16                                                                                                                                                            | 15 | 15 | 15 | 20 | 20.2            | 37.6          |  |  |  |                                |  |
| 20-Dec                                                                                                                  | 25                            | 23 | 21 | 24 | 27 | 20 | 19 | 18 | 29 | 32 | 36 | 33 | 29 | 29 | 22 | 18 | 14 | 15 | 14 | 13                                                                                                                                                            | 22 | 16 | 13 | 17 | 22.0            | 36.1          |  |  |  |                                |  |
| 21-Dec                                                                                                                  | 14                            | 13 | 13 | 9  | 8  | 10 | 9  | 8  | 8  | 8  | 6  | 9  | 7  | 8  | 9  | 10 | 11 | 10 | 12 | 12                                                                                                                                                            | 13 | 12 | 16 | 15 | 10.5            | 15.8          |  |  |  |                                |  |
| 22-Dec                                                                                                                  | 15                            | 12 | 8  | 5  | 10 | 16 | 20 | 22 | 22 | 23 | 18 | 21 | 20 | 18 | 14 | 18 | 20 | 19 | 21 | 25                                                                                                                                                            | 24 | 24 | 14 | 13 | 17.7            | 25.5          |  |  |  |                                |  |
| 23-Dec                                                                                                                  | 16                            | 18 | 20 | 8  | 9  | 8  | 7  | 7  | 7  | 6  | 5  | 5  | 4  | 4  | 4  | 5  | 4  | 4  | 3  | 5                                                                                                                                                             | 3  | 3  | 2  | 2  | 6.7             | 20.2          |  |  |  |                                |  |
| 24-Dec                                                                                                                  | 3                             | 3  | 4  | 3  | 3  | 3  | 3  | 4  | 6  | 8  | 7  | 5  | 4  | 3  | 1  | 2  | 1  | 2  | 2  | 2                                                                                                                                                             | 3  | 6  | 9  | 7  | 3.9             | 8.5           |  |  |  |                                |  |
| 25-Dec                                                                                                                  | 9                             | 9  | 9  | 10 | 7  | 6  | 6  | 10 | 12 | N  | N  | N  | 10 | 11 | 11 | N  | N  | N  | N  | N                                                                                                                                                             | N  | N  | N  | N  | --              | 12.3          |  |  |  |                                |  |
| 26-Dec                                                                                                                  | N                             | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N                                                                                                                                                             | N  | N  | N  | N  | --              | --            |  |  |  |                                |  |
| 27-Dec                                                                                                                  | N                             | 9  | 12 | 23 | 25 | 24 | 13 | 10 | 8  | 10 | 9  | 7  | 6  | 4  | 5  | 6  | 4  | 2  | 3  | 3                                                                                                                                                             | 7  | 12 | 9  | 4  | 9.3             | 25.0          |  |  |  |                                |  |
| 28-Dec                                                                                                                  | 9                             | 18 | 21 | 27 | 25 | 23 | 21 | 17 | 13 | 13 | 15 | 17 | 15 | 12 | 14 | 12 | 9  | 9  | 11 | 10                                                                                                                                                            | 16 | 12 | 10 | 16 | 15.2            | 27.3          |  |  |  |                                |  |
| 29-Dec                                                                                                                  | 17                            | 15 | 13 | 17 | 17 | 20 | 12 | 12 | 15 | 10 | 10 | 16 | 21 | 18 | 21 | 12 | 9  | 9  | 11 | 17                                                                                                                                                            | 10 | 8  | 11 | 11 | 13.8            | 21.3          |  |  |  |                                |  |
| 30-Dec                                                                                                                  | 10                            | 9  | 9  | 7  | 8  | 7  | 9  | 6  | 7  | 8  | 8  | 6  | 6  | 3  | 6  | 7  | 6  | 5  | 5  | 5                                                                                                                                                             | 3  | 5  | 4  | 7  | 6.5             | 9.8           |  |  |  |                                |  |
| 31-Dec                                                                                                                  | 9                             | 6  | 5  | 7  | 5  | 5  | 6  | 7  | 8  | 10 | 11 | 10 | 13 | 8  | 5  | 5  | 6  | 5  | 5  | 7                                                                                                                                                             | 13 | 16 | 17 | 18 | 8.5             | 18.4          |  |  |  |                                |  |
| 31-Dec                                                                                                                  | 24                            | 23 | 17 | 20 | 19 | 20 | 17 | 5  | 7  | 5  | 7  | 25 | 18 | 13 | 7  | 10 | 15 | 14 | 11 | 12                                                                                                                                                            | 13 | 15 | 14 | 14 | 14.5            | 24.5          |  |  |  |                                |  |
| 11.4 11.9 12.1 12.2 12.6 12.5 12.4 11.9 12.5 11.8 12.2 13.4 12.8 12.1 11.2 11.3 10.9 10.2 10.5 10.4 10.7 11.3 11.1 11.1 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    | Diurnal Average |               |  |  |  |                                |  |
| 34.4 28.8 30.6 29.1 26.5 29.2 31.1 30.6 32.1 37.9 36.1 38.0 37.3 38.5 37.8 35.1 33.5 30.0 28.8 30.8 33.2 35.8 39.1 40.1 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    | Diurnal Maximum |               |  |  |  |                                |  |
| P - Power Failure N - Not Valid                                                                                         |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    |                 |               |  |  |  |                                |  |
| All monthly, daily, and diurnal averages have been calculated using scalar methods                                      |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                                                                                                                                               |    |    |    |    |                 |               |  |  |  |                                |  |

# Hourly Standard Deviations

Wind Direction (WD) - deg  
Portable Rycroft - December 2016

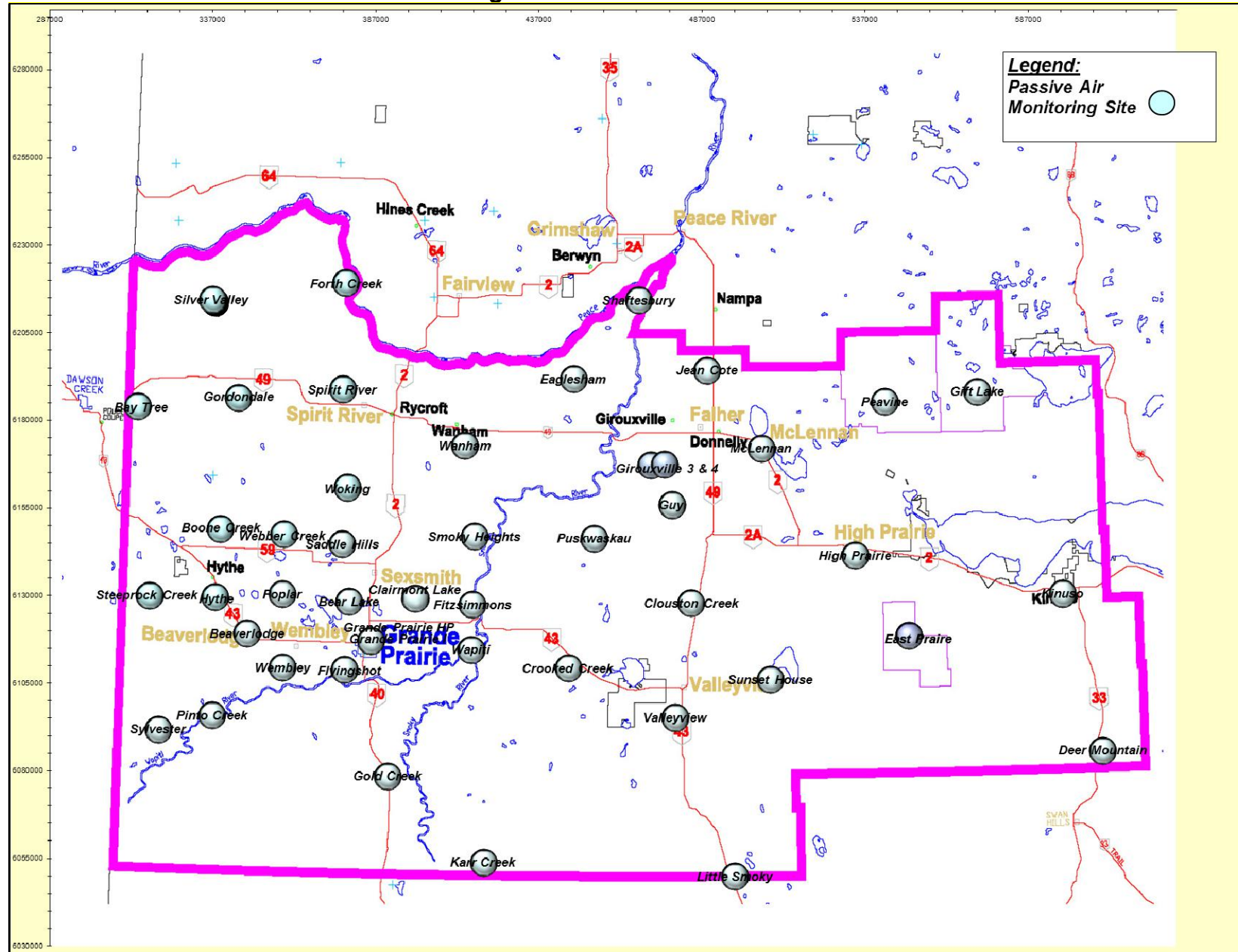
| Maximum Value: 94.6 deg on Dec 8 23:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours in Service: 744          |    |    |    |    |    |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------------------------------|----|----|----|----|----|------|---------------|
| Minimum Value: 1.2 deg on Dec 13 04:00                                                                                                                        |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Data: 703             |    |    |    |    |    |      |               |
| Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.9 Q <sub>1</sub> = 4.0 Median = 7.3 Q <sub>3</sub> = 15.7 P <sub>90</sub> = 33.6 P <sub>99</sub> = 80.2 |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Missing Data: 41      |    |    |    |    |    |      |               |
|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hours of Calibration: 0        |    |    |    |    |    |      |               |
|                                                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Percent Operational Time: 94.5 |    |    |    |    |    |      |               |
| Day                                                                                                                                                           | Hourly Period Ending At (MST) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |      | Daily Maximum |
|                                                                                                                                                               | 1                             | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18                             | 19 | 20 | 21 | 22 | 23 | 24   |               |
| 1-Dec                                                                                                                                                         | 29                            | 38 | 17 | 10 | 3  | 12 | 57 | 13 | 12 | 8  | 53 | 5  | 8  | 23 | 8  | 24 | 5  | 6                              | 26 | 16 | 14 | 8  | 7  | 13   | 57.3          |
| 2-Dec                                                                                                                                                         | 17                            | 13 | 20 | 12 | 30 | 43 | 32 | 34 | 5  | 26 | 16 | 16 | 20 | 50 | 55 | 20 | 4  | 4                              | 3  | 4  | 4  | 5  | 19 | 23   | 54.7          |
| 3-Dec                                                                                                                                                         | 11                            | 3  | 4  | 9  | 3  | 3  | 4  | 4  | 4  | 3  | 4  | 4  | 5  | 5  | 7  | 5  | 8  | 5                              | 3  | 4  | 2  | 3  | 4  | 4    | 11.4          |
| 4-Dec                                                                                                                                                         | 6                             | 10 | 3  | 3  | 5  | 12 | 4  | 3  | 8  | 8  | 3  | 3  | 4  | 3  | 2  | 2  | 2  | 2                              | 2  | 3  | 2  | 3  | 2  | 2    | 11.8          |
| 5-Dec                                                                                                                                                         | 3                             | 4  | 3  | 3  | 2  | 2  | 3  | 2  | 2  | 2  | 3  | 2  | 3  | 3  | 3  | 3  | 1  | 3                              | 1  | 4  | 7  | 2  | 2  | 3    | 7.1           |
| 6-Dec                                                                                                                                                         | 5                             | 2  | 2  | 2  | 2  | 3  | 2  | 3  | 2  | 3  | 3  | 3  | 2  | 2  | 3  | 3  | 4  | 5                              | 3  | 26 | 13 | 7  | 8  | 6    | 26.1          |
| 7-Dec                                                                                                                                                         | 9                             | 19 | 35 | 40 | 17 | 5  | 15 | 24 | 14 | 17 | 11 | 10 | 21 | 9  | 14 | 16 | 18 | 24                             | 67 | 49 | 7  | 15 | 8  | 27   | 67.2          |
| 8-Dec                                                                                                                                                         | 38                            | 16 | 12 | 14 | 19 | 9  | 11 | 15 | 9  | 14 | 13 | 13 | 11 | 12 | 55 | 46 | 20 | 14                             | 91 | 66 | 46 | 95 | 77 | 94.6 |               |
| 9-Dec                                                                                                                                                         | 27                            | 23 | 11 | 15 | 14 | 10 | 12 | 9  | 76 | 14 | 10 | 51 | 25 | 13 | 15 | 13 | 12 | 11                             | 5  | 8  | 5  | 5  | 12 | 8    | 76.2          |
| 10-Dec                                                                                                                                                        | 5                             | 7  | 6  | 13 | 60 | 11 | 19 | 20 | 53 | 34 | 7  | 16 | 24 | 18 | 11 | 9  | 11 | 10                             | 13 | 3  | 5  | 8  | 4  | 7    | 60.1          |
| 11-Dec                                                                                                                                                        | 4                             | 7  | 6  | 3  | 6  | 8  | 3  | 4  | 3  | 4  | 3  | 5  | 3  | 4  | 4  | 5  | 7  | 5                              | 4  | 6  | 5  | 4  | 2  | 3    | 8.0           |
| 12-Dec                                                                                                                                                        | 3                             | 2  | 2  | 2  | 6  | 2  | 3  | 3  | 3  | 2  | 2  | 4  | 8  | 7  | 3  | 4  | 2  | 2                              | 2  | 4  | 7  | P  | P  | P    | 8.0           |
| 13-Dec                                                                                                                                                        | P                             | 4  | 4  | 1  | 6  | 5  | 2  | 6  | 3  | 2  | 3  | 4  | 3  | 3  | 3  | 4  | 4  | 33                             | 7  | 14 | 12 | 9  | 14 | 10   | 32.8          |
| 14-Dec                                                                                                                                                        | 8                             | 5  | 6  | 8  | 7  | 5  | 8  | 16 | 6  | 14 | 8  | 48 | 49 | 59 | 48 | 33 | 8  | 13                             | 26 | 19 | 18 | 38 | 15 | 20   | 59.4          |
| 15-Dec                                                                                                                                                        | 19                            | 7  | 18 | 11 | 7  | 5  | 22 | 9  | 14 | 20 | 7  | 6  | 4  | 6  | 15 | 11 | 15 | 19                             | 13 | 4  | 6  | 7  | 6  | 12   | 21.8          |
| 16-Dec                                                                                                                                                        | 7                             | 55 | 28 | 8  | 8  | 4  | 4  | 5  | 15 | 56 | 28 | 7  | 11 | 56 | 35 | 34 | 55 | 26                             | 13 | 16 | 7  | 24 | 49 | 29   | 56.3          |
| 17-Dec                                                                                                                                                        | 19                            | 20 | 10 | 13 | 22 | 69 | 29 | 53 | 31 | 28 | 19 | 49 | 80 | 18 | 81 | 83 | 58 | 73                             | 80 | 58 | 60 | 16 | 22 | 9    | 83.1          |
| 18-Dec                                                                                                                                                        | 5                             | 4  | 3  | 4  | 9  | 6  | 5  | 4  | 7  | 3  | 5  | 14 | 3  | 3  | 3  | 3  | 4  | 3                              | 5  | 5  | 4  | 7  | 6  | 5    | 14.2          |
| 19-Dec                                                                                                                                                        | 3                             | 4  | 4  | 3  | 5  | 4  | 5  | 3  | 4  | 3  | 4  | 3  | 3  | 3  | 8  | 4  | 4  | 4                              | 4  | 4  | 3  | 4  | 11 | 3    | 11.2          |
| 20-Dec                                                                                                                                                        | 4                             | 4  | 4  | 3  | 4  | 11 | 4  | 6  | 15 | 15 | 18 | 5  | 7  | 5  | 4  | 8  | 5  | 4                              | 5  | 4  | 4  | 7  | 8  | 17   | 18.1          |
| 21-Dec                                                                                                                                                        | 3                             | 9  | 7  | 21 | 11 | 5  | 3  | 4  | 3  | 3  | 3  | 3  | 3  | 4  | 5  | 4  | 4  | 3                              | 4  | 2  | 4  | 4  | 5  | 4    | 21.1          |
| 22-Dec                                                                                                                                                        | 8                             | 7  | 35 | 8  | 4  | 7  | 6  | 10 | 7  | 20 | 41 | 28 | 11 | 23 | 24 | 16 | 5  | 59                             | 21 | 54 | 13 | 60 | 64 | 57   | 63.6          |
| 23-Dec                                                                                                                                                        | 44                            | 63 | 42 | 44 | 25 | 25 | 57 | 20 | 12 | 14 | 12 | 10 | 8  | 21 | 87 | 13 | 51 | 23                             | 18 | 46 | 22 | 14 | 4  | 11   | 87.3          |
| 24-Dec                                                                                                                                                        | 8                             | 10 | 6  | 10 | 9  | 13 | 80 | 41 | 9  | N  | N  | N  | 52 | 28 | 19 | N  | N  | N                              | N  | N  | N  | N  | N  | N    | 79.5          |
| 25-Dec                                                                                                                                                        | N                             | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N  | N                              | N  | N  | N  | N  | N  | N    | --            |
| 26-Dec                                                                                                                                                        | N                             | 35 | 26 | 56 | 4  | 25 | 5  | 6  | 54 | 10 | 16 | 10 | 8  | 14 | 12 | 8  | 21 | 79                             | 68 | 56 | 21 | 3  | 17 | 17   | 78.9          |
| 27-Dec                                                                                                                                                        | 29                            | 5  | 7  | 2  | 3  | 4  | 4  | 7  | 5  | 7  | 3  | 2  | 3  | 3  | 6  | 5  | 4  | 7                              | 5  | 9  | 5  | 4  | 5  | 5    | 29.3          |
| 28-Dec                                                                                                                                                        | 4                             | 3  | 5  | 7  | 5  | 3  | 4  | 4  | 4  | 9  | 8  | 5  | 4  | 4  | 4  | 7  | 5  | 3                              | 8  | 7  | 5  | 4  | 4  | 3    | 8.6           |
| 29-Dec                                                                                                                                                        | 4                             | 6  | 4  | 4  | 4  | 11 | 8  | 9  | 10 | 10 | 9  | 7  | 10 | 51 | 60 | 24 | 31 | 74                             | 15 | 62 | 74 | 18 | 19 | 9    | 74.0          |
| 30-Dec                                                                                                                                                        | 7                             | 8  | 6  | 12 | 25 | 11 | 6  | 6  | 12 | 10 | 6  | 10 | 6  | 10 | 14 | 9  | 10 | 12                             | 14 | 21 | 6  | 3  | 6  | 6    | 24.7          |
| 31-Dec                                                                                                                                                        | 3                             | 4  | 4  | 2  | 3  | 4  | 9  | 21 | 7  | 18 | 14 | 5  | 6  | 7  | 17 | 14 | 7  | 6                              | 11 | 16 | 13 | 3  | 3  | 5    | 21.2          |
| 43.8 63.4 42.0 55.5 60.1 69.5 79.5 53.4 76.2 56.3 52.9 51.1 80.2 59.4 87.3 83.1 57.7 78.9 80.3 91.0 74.0 60.2 94.6 77.4                                       |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |      |               |
| P - Power Failure N - Not Valid                                                                                                                               |                               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                                |    |    |    |    |    |      |               |

PAZA

## Monthly Passive Data Summary



# Location of PAZA Passive Monitoring Stations



## PAZA Passive Results for December 2016

| Station Number    | Station Name     | SO2<br>ppb | O3<br>ppb | NO2<br>ppb | H2S<br>ppb | Site<br>Legal    |
|-------------------|------------------|------------|-----------|------------|------------|------------------|
| <b>Duplicates</b> |                  |            |           |            |            |                  |
| 12a               | Hythe            | 0.3        | 29.8      | 1.8        |            |                  |
| 12b               | Hythe            | 0.4        | 30.9      | 1.4        |            |                  |
| 30a               | Fitzsimmons      | 0.3        | 28.0      | 1.6        |            |                  |
| 30b               | Fitzsimmons      | 0.3        | 38.3      | 1.6        |            |                  |
| 37a               | Crooked Creek    | 0.2        | 38.4      | 2.1        |            |                  |
| 37b               | Crooked Creek    | N/S        | 29.5      | 2.2        |            |                  |
| 43a               | High Prairie     | 0.1        | 35.7      | 1.3        |            |                  |
| 43b               | High Prairie     | 0.1        | 41.4      | 1.0        |            |                  |
| 63a               | Girouxville 3    |            |           |            | 0.4        |                  |
| 63b               | Girouxville 3    |            |           |            | N/S        |                  |
| 1                 | Silver Valley    | 0.3        | 35.3      | 1.6        |            | 08-27-081-11 W6M |
| 2                 | Bay Tree         | 0.2        | 25.8      | 1.5        |            | 13-16-078-13 W6M |
| 3                 | Fourth Creek     | 0.3        | 41.9      | 0.9        |            | 04-13-082-07 W6M |
| 4                 | Gordondale       | 0.2        | 29.9      | 2.0        |            | 04-34-078-10 W6M |
| 5                 | Boone Creek      | 0.3        | 33.7      | 1.3        |            | 16-36-074-11 W6M |
| 7                 | Steeprock Creek  | 0.3        | 33.2      | 1.6        |            | 09-35-072-13 W6M |
| 9                 | Spirit River     | 0.3        | 33.1      | 1.9        |            | 08-12-079-07 W6M |
| 10                | Woking           | 0.6        | 37.7      | 1.5        |            | 01-13-076-07 W6M |
| 11                | Webber Creek     | 0.4        | 28.5      | 3.1        |            | 09-36-074-09 W6M |
| 12                | Hythe            | 0.3        | 30.3      | 1.6        |            | 14-36-072-11 W6M |
| 14                | Sylvester        | 0.1        | 37.5      | 0.8        |            | 08-06-069-12 W6M |
| 16                | Beaverlodge      | 0.3        | 31.5      | 3.4        |            | 15-36-071-10 W6M |
| 17                | Poplar           | 0.3        | 31.9      | 2.0        |            | 13-06-073-08 W6M |
| 18                | Saddle Hills     | 0.3        | 29.2      | 1.1        |            | 04-25-074-07 W6M |
| 19                | Wanham           | 1.2        | 39.3      | 1.4        |            | 16-22-077-03 W6M |
| 20                | Shaftesbury      | 0.2        | 34.5      | 1.5        |            | 04-03-082-23 W5M |
| 21                | Eaglesham        | 0.1        | 34.0      | 1.6        |            | 16-21-079-25 W5M |
| 23                | Bear Lake        | 0.3        | 32.9      | 2.5        |            | 15-31-072-06 W6M |
| 24                | Wembley          | 0.2        | 32.3      | 2.2        |            | 12-31-070-08 W6M |
| 25                | Pinto Creek      | 0.2        | 36.0      | 1.3        |            | 04-24-069-11 W6M |
| 26                | Flyingshot       | 0.2        | 29.7      | 2.8        |            | 15-36-070-07 W6M |
| 27                | Grande Prairie I | 0.3        | 27.3      | 10.8       |            | 08-15-071-06 W6M |
| 28                | Clairmont Lake   | 0.4        | 34.7      | 1.9        |            | 09-06-073-04 W6M |

## PAZA Passive Results for December 2016 (Continued)

|    |                   |     |      |      |     |                  |
|----|-------------------|-----|------|------|-----|------------------|
| 29 | Smoky Heights     | 0.5 | 30.4 | 1.8  |     | 04-06-075-02 W6M |
| 30 | Fitzsimmons       | 0.3 | 33.2 | 1.6  |     | 15-36-072-03 W6M |
| 32 | Gold Creek        | 0.1 | 23.6 | 4.7  |     | 06-33-067-05 W6M |
| 33 | Wapiti            | 0.2 | 34.4 | 2.4  |     | 02-25-071-03 W6M |
| 34 | Puskaskau         | 0.1 | 26.4 | 1.0  |     | 15-35-074-25 W5M |
| 35 | Jean Cote         | 0.2 | 37.4 | 1.2  |     | 12-35-079-21 W5M |
| 36 | Guy               | 0.2 | 34.3 | 0.9  |     | 03-04-076-22 W5M |
| 37 | Crooked Creek     | 0.2 | 33.9 | 2.1  |     | 16-01-071-26 W5M |
| 38 | Karr Creek        | 0.1 | 25.3 | 1.2  |     | 10-16-065-02 W6M |
| 39 | Clouston Creek    | 0.2 | 33.8 | 1.2  |     | 12-01-073-22 W5M |
| 40 | McLennan          | 0.2 | 26.9 | 1.2  |     | 03-29-077-19 W5M |
| 41 | Valleyview        | 0.5 | 33.1 | 1.3  |     | 09-30-069-22 W5M |
| 42 | Sunset House      | 0.2 | 37.0 | 1.2  |     | 05-32-070-19 W5M |
| 43 | High Prairie      | 0.1 | 38.5 | 1.1  |     | 16-13-074-17 W5M |
| 44 | Peavine           | 0.1 | 33.0 | 0.7  |     | 03-05-079-15 W5M |
| 45 | Gift Lake         | 0.1 | 24.1 | 0.9  | 0.1 | 10-07-079-12 W5M |
| 46 | Little Smoky      | 0.2 | 25.9 | 3.9  |     | 12-01-065-21 W5M |
| 47 | Kinuso            | 0.1 | 35.6 | 0.8  |     | 12-10-073-10 W5M |
| 65 | Deer Mountain 2   | 0.1 | 32.6 | 0.5  |     | 15-22-068-09 W5M |
| 49 | Grande Prairie HP | 0.3 | 22.0 | 11.3 |     | 17-26-071-06 W6M |
| 50 | East Prairie      | 0.1 | 34.2 | 0.4  |     | 13-02-072-15 W5M |
| 63 | Girouxville 3     |     |      |      | 0.4 | 14-02-077-23 W5M |
| 64 | Girouxville 4     |     |      |      | 0.3 | 4-08-077-22 W5M  |

\*BDL = Below Detection Level

\*NS - No sample

## Passive Summary for December 2016

| Stats                                         | Sulphur Dioxide<br>SO <sub>2</sub> | Ozone<br>O <sub>3</sub> | Nitrogen Dioxide<br>NO <sub>2</sub> | Hydrogen Sulphide<br>H <sub>2</sub> S |
|-----------------------------------------------|------------------------------------|-------------------------|-------------------------------------|---------------------------------------|
|                                               | ppb                                | ppb                     | ppb                                 | ppb                                   |
| Passive Summary for December 2016 (PAZA Zone) |                                    |                         |                                     |                                       |
| Mean                                          | 0.3                                | 32.2                    | 2.1                                 | 0.3                                   |
| Standard Deviation                            | 0.2                                | 4.5                     | 2.2                                 | 0.2                                   |
| Minimum                                       | 0.1                                | 22.0                    | 0.4                                 | 0.1                                   |
| Minimum At                                    | Karr Creek (#38)                   | Grande Prairie HP       | East Prairie (#50)                  | Gift Lake (#45)                       |
| Maximum                                       | 1.2                                | 41.9                    | 11.3                                | 0.4                                   |
| Maximum At                                    | Wanham (#19)                       | Fourth Creek (#3)       | Grande Prairie HP                   | Girouxville 3 (#63)                   |

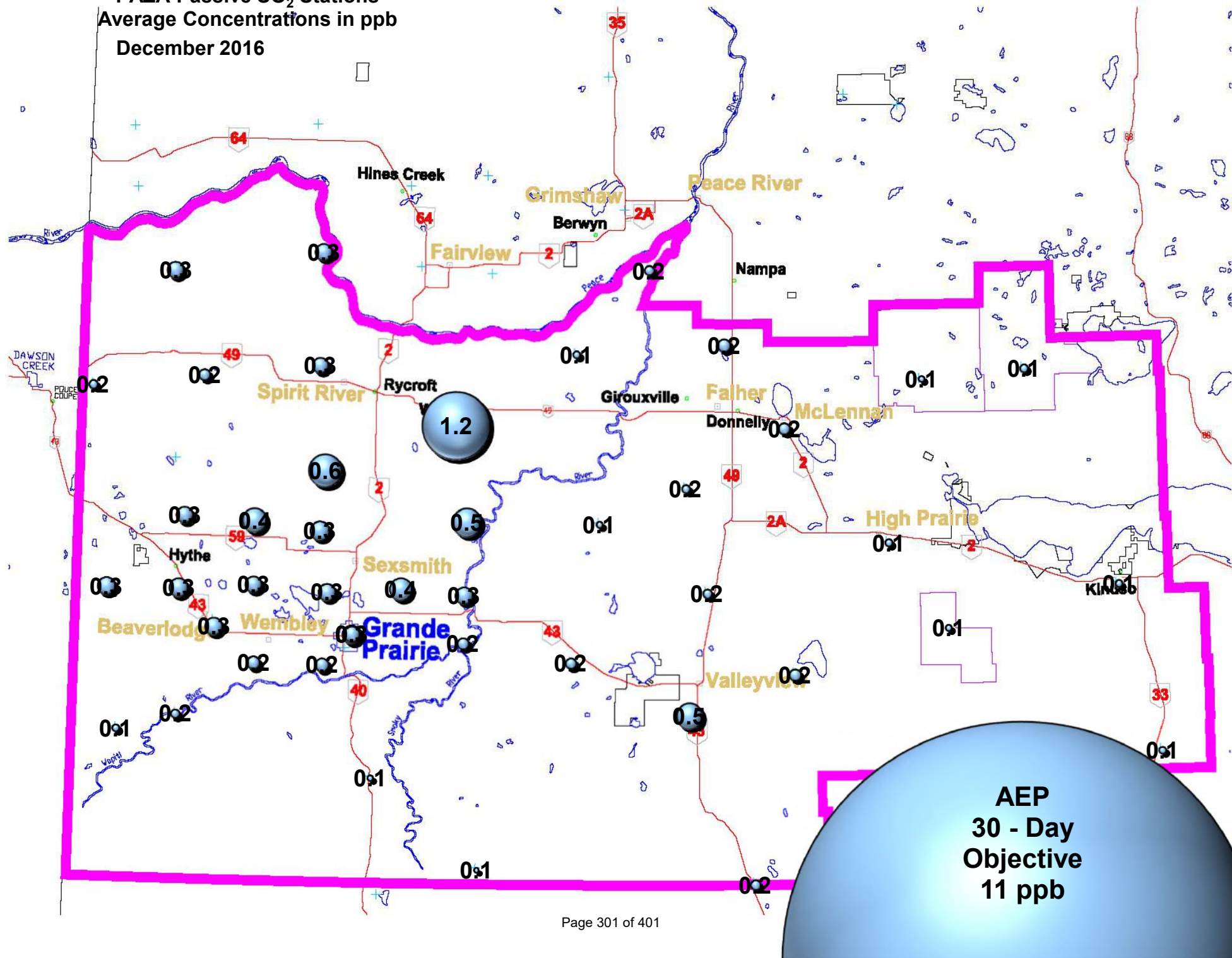
### Comparison between Continuous and Passive monitoring at Beaverlodge (passive #16 Beaverlodge)

|                          | SO <sub>2</sub> | O <sub>3</sub> | NO <sub>2</sub> |
|--------------------------|-----------------|----------------|-----------------|
| PAZA Beaverlodge station | 0.3             | 29.0           | 5.5             |
| PAZA Beaverlodge passive | 0.3             | 31.5           | 3.4             |

### Comparison between Continuous and Passive monitoring at Henry Pirker (passive #49 Grande Prairie HP)

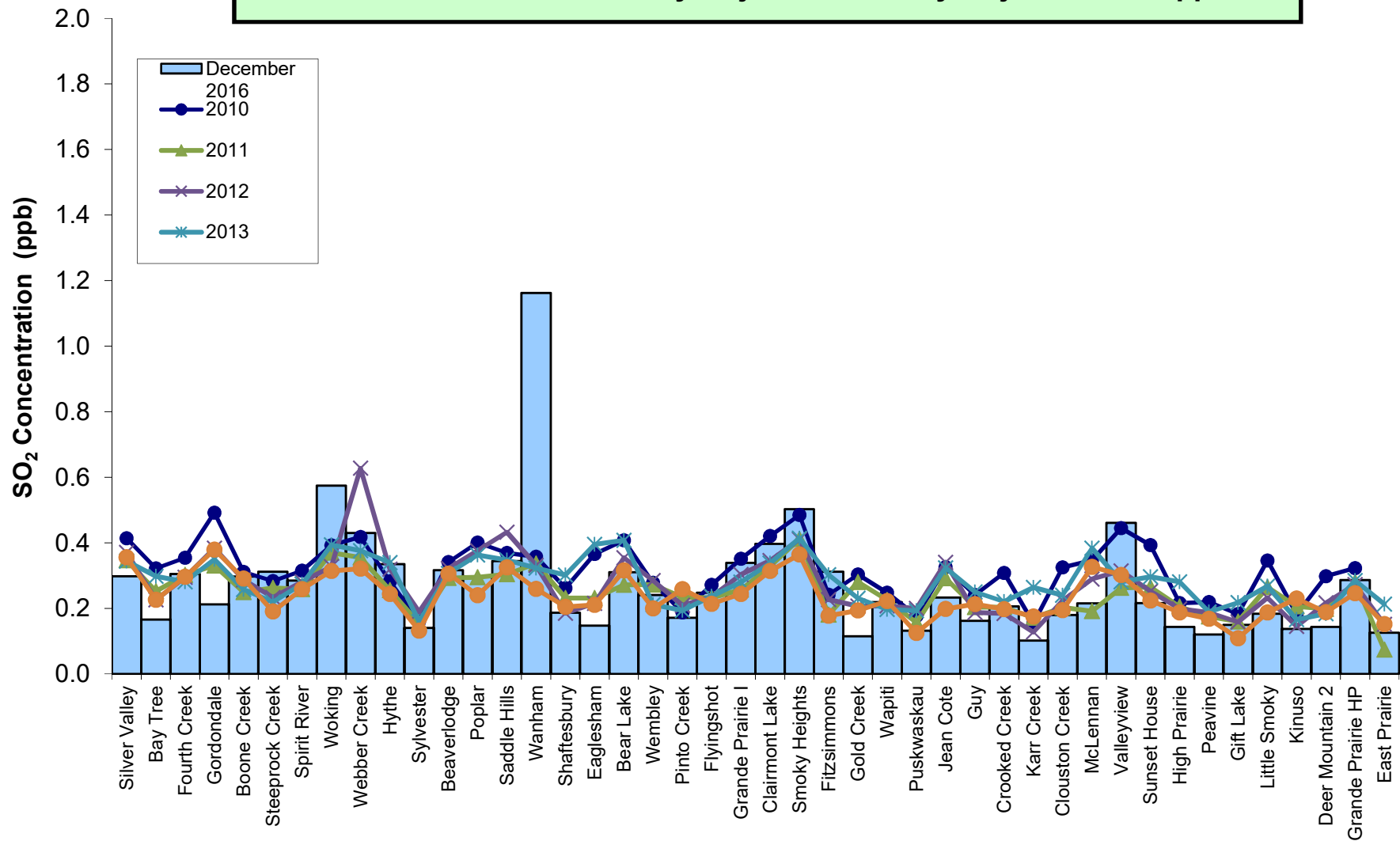
|                             | SO <sub>2</sub> | O <sub>3</sub> | NO <sub>2</sub> |
|-----------------------------|-----------------|----------------|-----------------|
| PAZA Henry Pirker station   | 0.3             | 20.3           | 14.5            |
| PAZA Grande Prairie passive | 0.3             | 22.0           | 11.3            |

PAZA Passive SO<sub>2</sub> Stations  
Average Concentrations in ppb  
December 2016



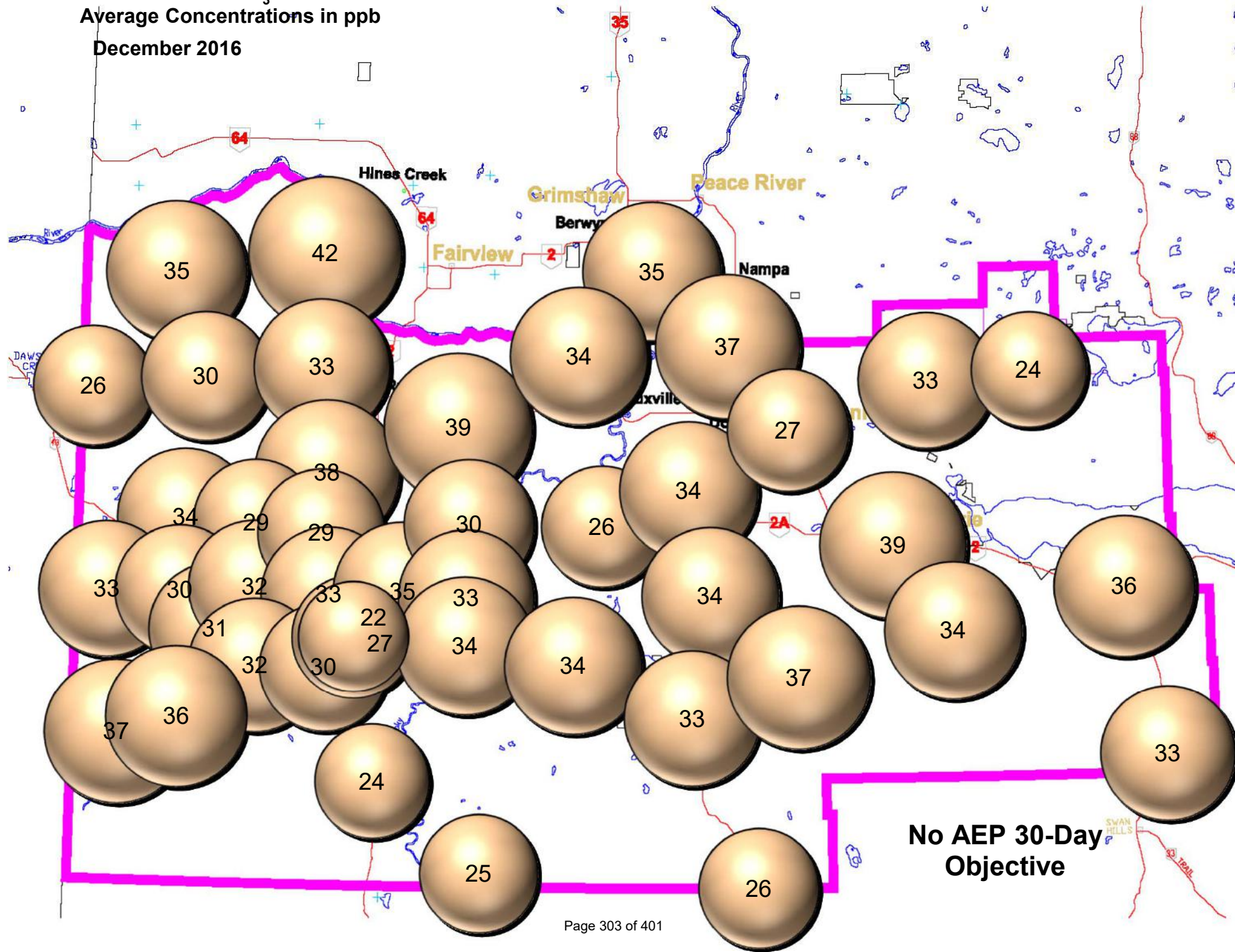
AEP  
30 - Day  
Objective  
11 ppb

**Alberta Ambient Air Quality Objective - 30-day Objective is 11 ppb**

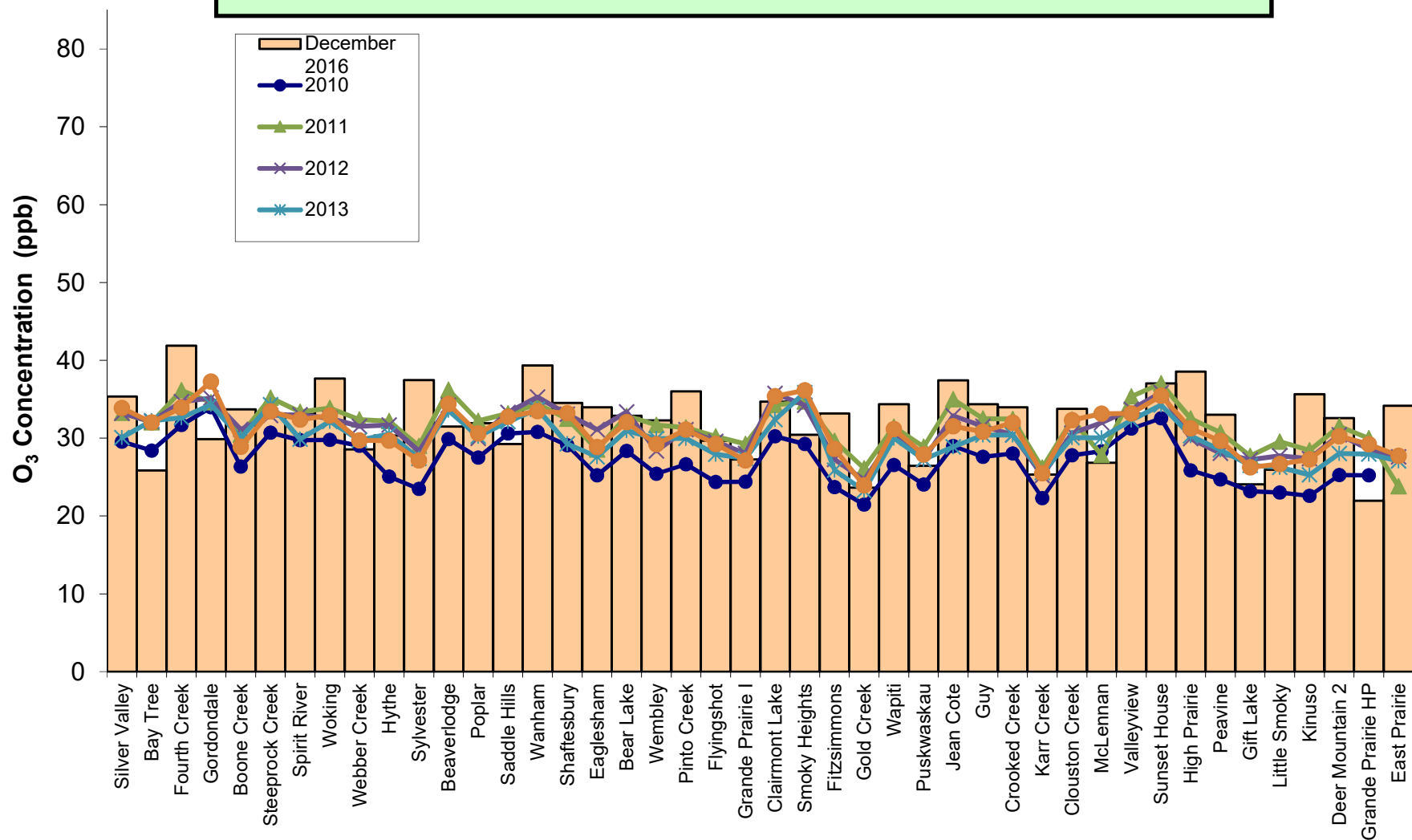




**PAZA Passive O<sub>3</sub> Stations**  
**Average Concentrations in ppb**  
**December 2016**

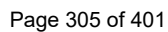


## Alberta Ambient Air Quality Objective - No Annual O<sub>3</sub> Objective



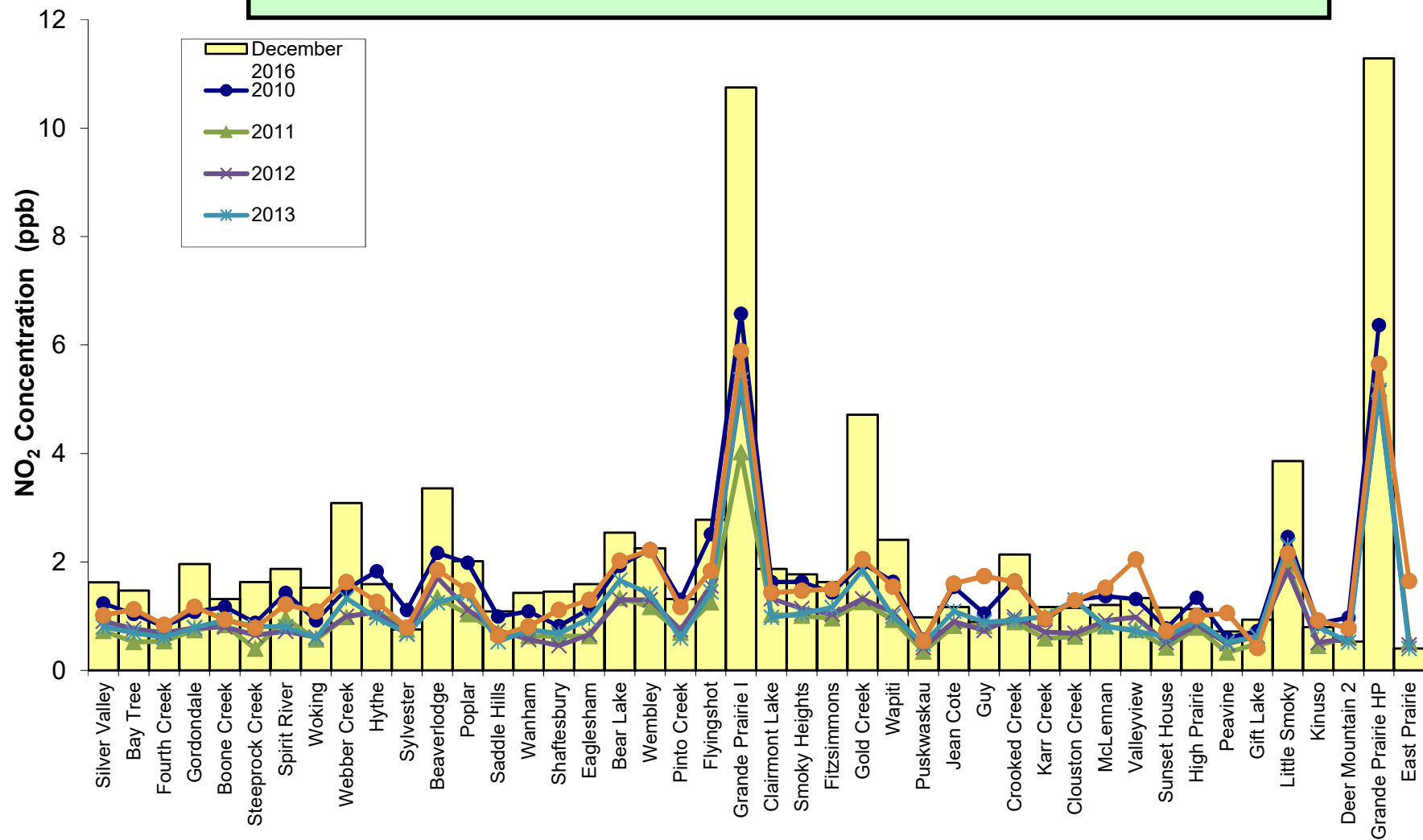


## December 2016

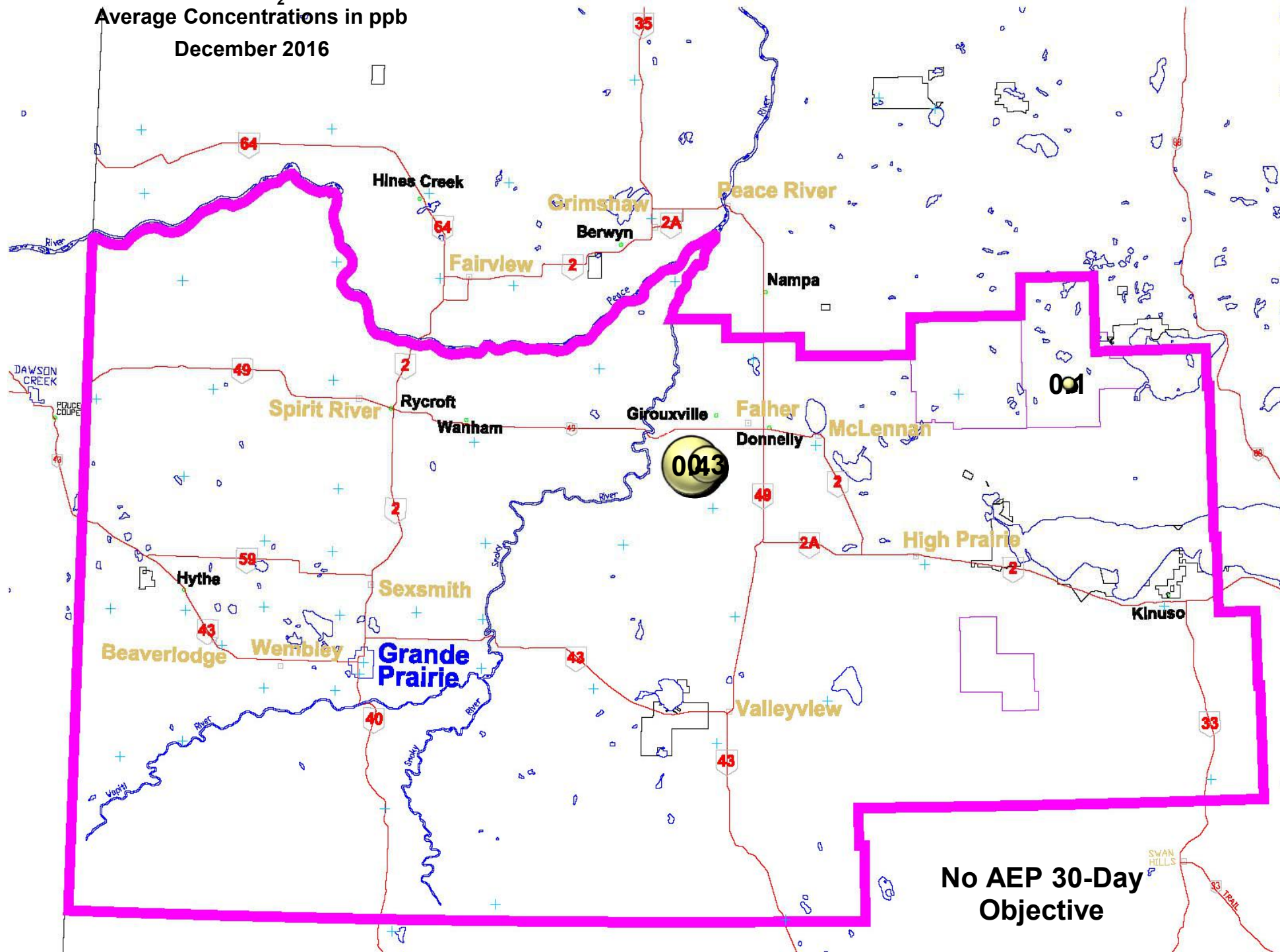


**AEP**  
**Annual**  
**Objective**  
**24 ppb**

**Alberta Ambient Air Quality Objective - Annual NO<sub>2</sub> Objective is 24 ppb**

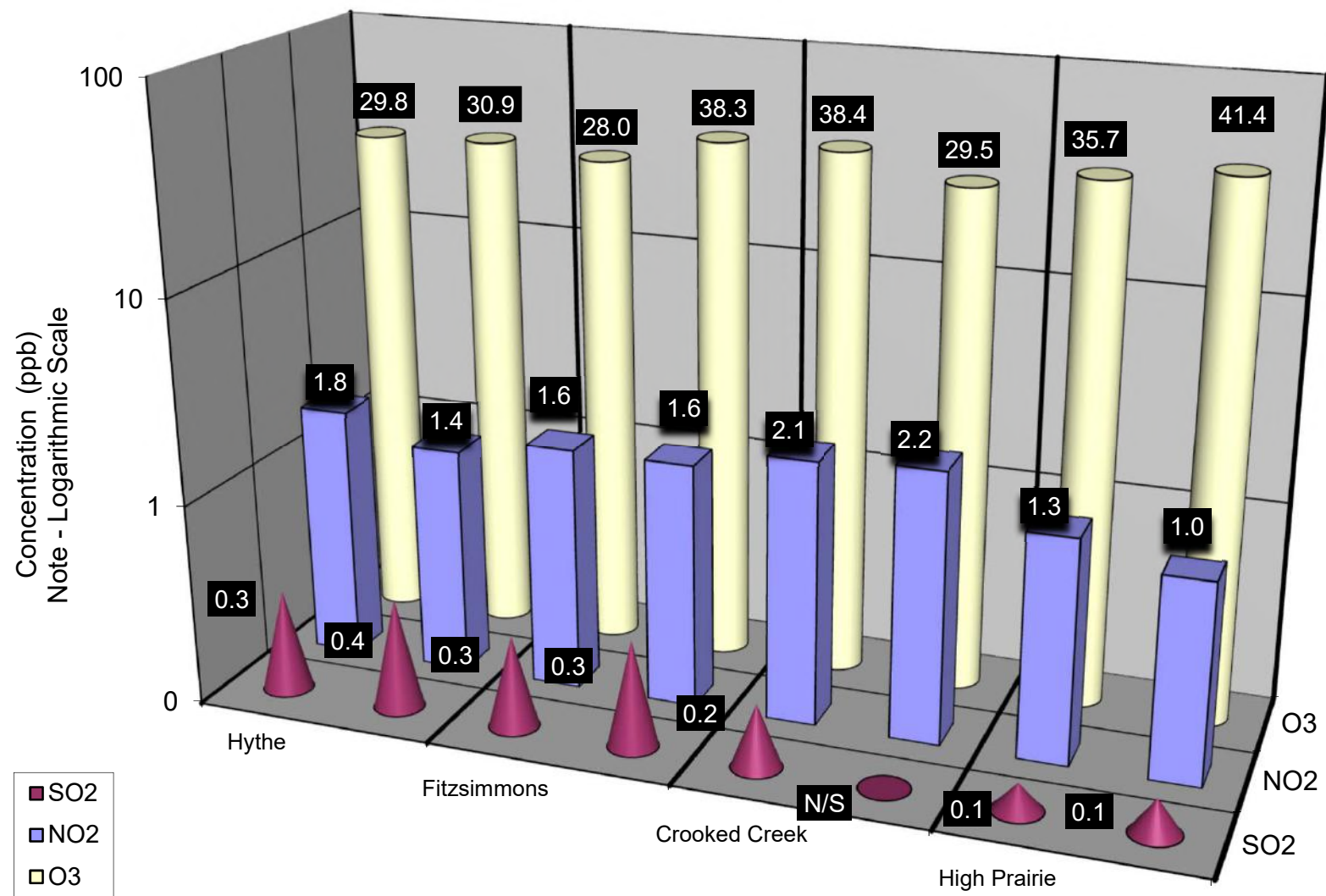


**PAZA Passive H<sub>2</sub>S Stations  
Average Concentrations in ppb  
December 2016**



**No AEP 30-Day  
Objective**





Duplicate Summary Chart

# **December 2016 Calibration Reports**

**PAZA - Henry Pirker Station with the following calibrations:  
SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, CO, THC, TRS and PM<sub>2.5</sub>**

**PAZA – Evergreen Park Station with the following calibrations:  
SO<sub>2</sub>, TRS and PM<sub>2.5</sub>**

**PAZA – Smoky Heights Station with the following calibrations:  
SO<sub>2</sub>, TRS and PM<sub>2.5</sub>**

**PAZA – Beaverlodge Station with the following calibrations:  
SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub> and PM<sub>2.5</sub>**

**PAZA – Valleyview Station with the following calibrations:  
SO<sub>2</sub> and H<sub>2</sub>S**

**PAZA – Donnelly Station with the following calibrations:  
SO<sub>2</sub> and H<sub>2</sub>S**

**PAZA – Rycroft Station with the following calibrations:  
SO<sub>2</sub>, NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, THC and TRS**

# Calibration Report

Parameter SO2

Air Monitoring Network PAZA



## Station Information

|                      |                                             |                                  |                                  |
|----------------------|---------------------------------------------|----------------------------------|----------------------------------|
| Calibration Date     | December 5, 2016                            | Previous Calibration             | November 7, 2016                 |
| Station Number       | 1                                           | Station Location                 | Henry Pirker                     |
| Reason:              | <input checked="" type="checkbox"/> Routine | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                      |                                             | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)     | 10:00                                       | End Time (MST)                   | 12:00                            |
| Barometric Pressure  | 721.000 mm                                  | Station Temperature              | 15.5 Deg C                       |
| Calibrator           | EnviroNics                                  | Serial Number                    | 6586                             |
| Cal Gas Conc         | 49.7 ppm                                    | Cal Gas Cert Date                | October 5, 2018                  |
|                      |                                             | Cal Gas Cylinder #               | LL103793                         |
| DACS make            | CR3000                                      | DACS serial No.                  | 5408                             |
| DACS voltage range   | 0 - 1 volt                                  | DACS channel #                   | 10                               |
|                      | Before                                      |                                  | After                            |
| Calculated slope     | 0.998782                                    | Calculated slope                 | 0.987360                         |
| Calculated intercept | 1.075131                                    | Calculated intercept             | 1.516513                         |
| Analyzer make        | TEI 43I-TLE                                 | Analyzer serial #                | 1507864682 (AMU 2006)            |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 500 | ppb   | 0 - 500 | ppb   |
| Background          | 1.43    |       | 1.43    |       |
| Coefficient         | 0.920   |       | 0.920   |       |
| Pressure            | 678.9   | mm Hg | 679.5   | mm Hg |
| Flow                | 0.441   | lpm   | 0.448   | lpm   |
| Lamp intensity      | 82      | Hz    | 82      | Hz    |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4996                            | 0.00                          | 0.0                                 | 0.1                                | N/A                       |
| 4998                            | 39.94                         | 394.0                               | 398.9                              | 0.9878                    |
| 4997                            | 19.99                         | 198.0                               | 196.6                              | 1.0075                    |
| 4999                            | 9.89                          | 98.1                                | 97.3                               | 1.0086                    |
|                                 |                               |                                     |                                    |                           |
|                                 |                               |                                     |                                    |                           |
| 4996                            | 0.00                          | 0.0                                 | 0.1                                | As Found Zero             |
| 4996                            | 39.93                         | 394.1                               | 398.9                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0013                    |

Calculated value of As Found Response: 399.3 ppb Percent Change of As Found: -1.3%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.1                | ppb | 0.1               | ppb |
| Auto span | 281.7              | ppb | 276.8             | ppb |

Notes: No adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



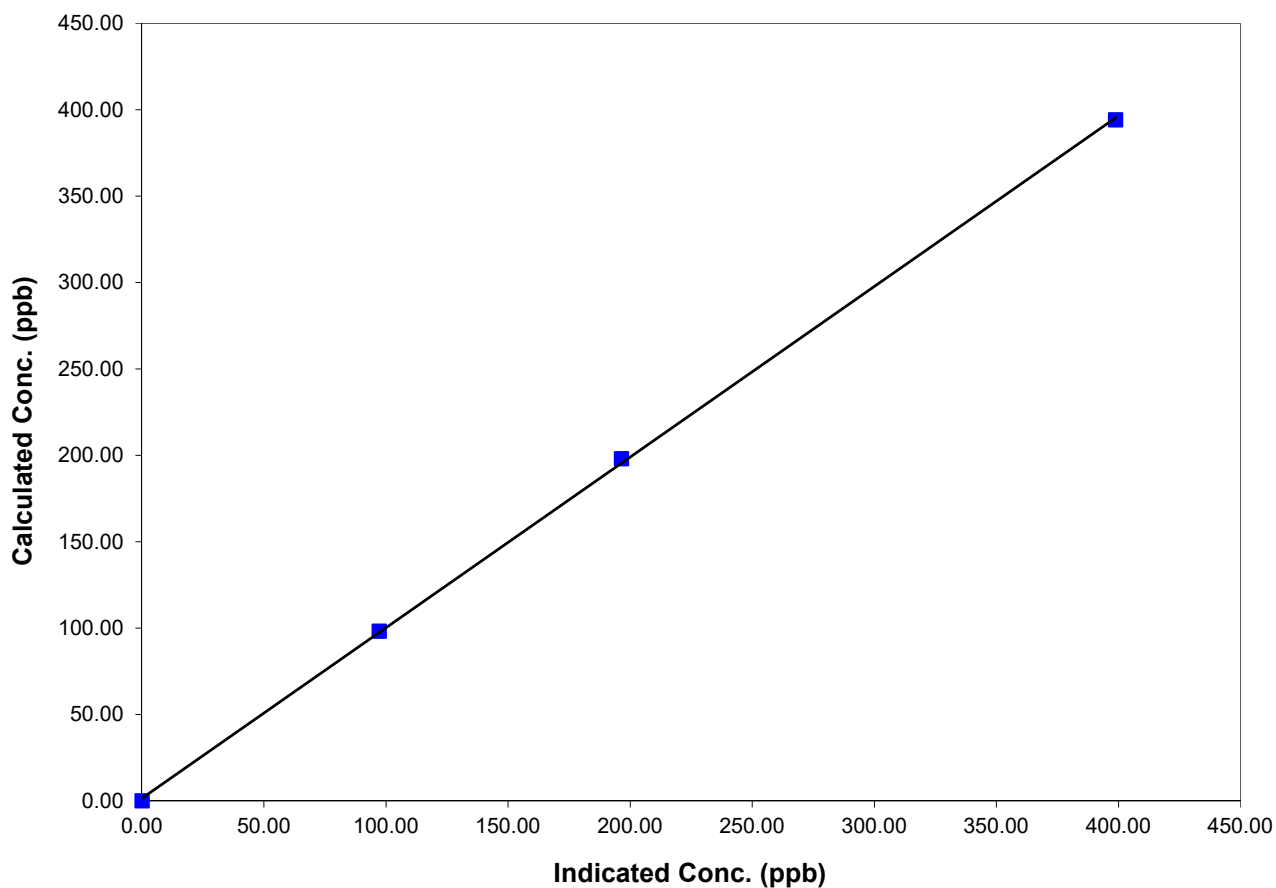
### Station Information

|                     |                  |                      |                       |
|---------------------|------------------|----------------------|-----------------------|
| Calibration Date    | December 5, 2016 | Previous Calibration | November 7, 2016      |
| Station Number      | 1                | Station Location     | Henry Pirker          |
| Start Time (MST)    | 10:00            | End Time (MST)       | 12:00                 |
| Analyzer make/model | TEI 43I-TLE      | Analyzer serial #    | 1507864682 (AMU 2006) |

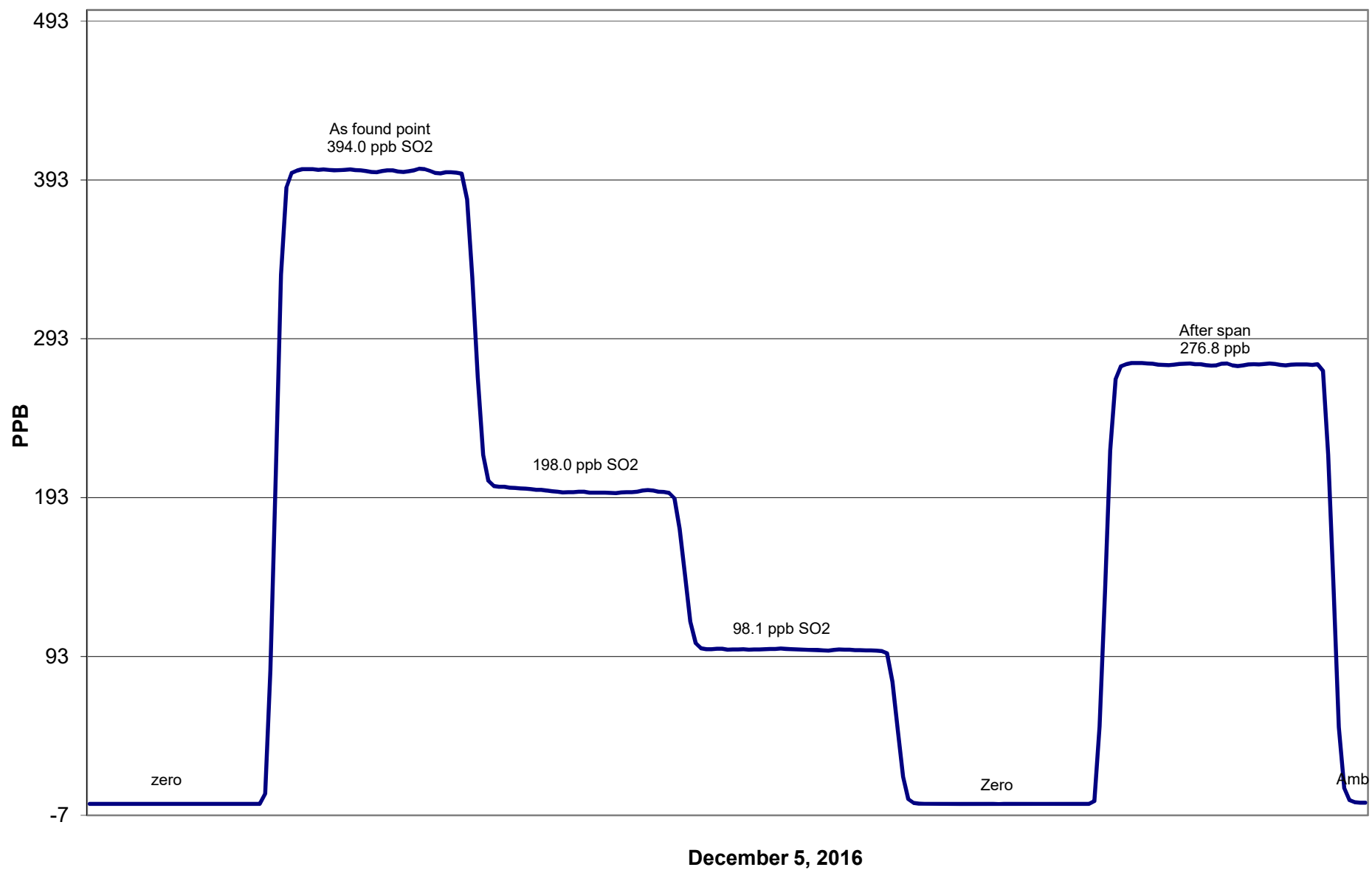
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                                 | 0.1                                | N/A                       | Correlation Coefficient | 0.999873 |
| 394.0                               | 398.9                              | 0.9878                    |                         |          |
| 198.0                               | 196.6                              | 1.0075                    |                         |          |
| 98.1                                | 97.3                               | 1.0086                    | Slope                   | 0.987360 |
|                                     |                                    |                           | Intercept               | 1.516513 |

### SO2 Calibration Curve



## SO2 Calibration





Parameter  
Air Monitoring Network

**NO<sub>x</sub>-NO-NO<sub>2</sub>**

PAZA



### Station Information

|                     |                                          |                                    |                               |                     |       |
|---------------------|------------------------------------------|------------------------------------|-------------------------------|---------------------|-------|
| Calibration Date    | December 5, 2016                         |                                    | Previous Calibration          | November 7, 2016    |       |
| Station Number      | 1                                        |                                    | Station Location              | Henry Pirker        |       |
| Reason:             | <input checked="" type="radio"/> Routine | <input type="radio"/> Installation | <input type="radio"/> Removal | Other:              |       |
| Start Time (MST)    | 10:00                                    |                                    | End Time (MST)                | 13:25:00 PM         |       |
| Barometric Pressure | 721.000                                  | mm                                 | Station Temperature           | 15.5                | Deg C |
| Calibrator          | Envionics                                |                                    | Serial Number                 | 906535067(AMU 197%) |       |
| NO Cal Gas Conc     | 50.9                                     | ppm                                | Cal Gas Expiry Date           | October 5, 2018     |       |
| NOx Cal Gas Conc    | 51.2                                     | ppm                                | Cal Gas Serial #              | LL103793            |       |

## DACS Information

|               |             |           |           |                 |  |      |  |
|---------------|-------------|-----------|-----------|-----------------|--|------|--|
| DACS make     |             | CR3000    |           | DACS serial No. |  | 5408 |  |
|               | Parameter   | NO2       | NOx       | NO              |  |      |  |
| Before        | Data Slope  | 1.001421  | 1.005243  | 0.999128        |  |      |  |
|               | Data Offset | -0.226681 | 0.586529  | 0.387205        |  |      |  |
| After         | Data Slope  | 0.999991  | 0.999402  | 0.993016        |  |      |  |
|               | Data Offset | -0.023323 | 0.886663  | 1.025477        |  |      |  |
| Channel #     |             | 8         | 6         | 7               |  |      |  |
| Voltage Range |             | 0 - 5 VDC | 0 - 5 VDC | 0 - 5 VDC       |  |      |  |

### Analyzer Information

|                     |         |                   |           |       |
|---------------------|---------|-------------------|-----------|-------|
| Analyzer make/model | 42i     | Analyzer serial # | 906535087 |       |
| Test Point          | before  |                   | after     |       |
| Concentration range | 0 - 500 | ppb               | 0 - 500   | ppb   |
| NO offset           | 5.9     | mV                | 5.9       | mV    |
| NOx bkgnd           | 6.3     | mV                | 6.3       | mV    |
| NO coefficient      | 0.928   |                   | 0.928     |       |
| NOx coefficient     | 1.000   |                   | 1.000     |       |
| NO2 conv temp       | 323.4   | Deg C             | 323.2     | Deg C |
| Cooler Temp         | -2.9    | Deg C             | -2.9      | Deg C |
| PMT Volt            | -845.1  | mV                | -845.0    | mV    |
| R Cell Press        | 171.9   | in Hg             | 171.9     | in Hg |
| Sample Flow         | 0.634   | LPM               | 0.640     | LPM   |

Notes: No adjustment made.

# Calibration Report

Parameter **NOX-NO-NO2**  
Air Monitoring Network **PAZA**



## Station Information

Calibration Date: December 5, 2016 Station Location: Henry Pirker

## Calibration Data

|                           | Dilution flow rate (ccm) | Source gas flow rate (ccm) | Calculated NOx conc (ppb) | Calculated NO conc (ppb) | Calculated NO2 conc (ppb) | Indicated NOx conc (ppb) | Indicated NO conc (ppb) | Indicated NO2 conc (ppb) | NOx Correction factor | NO Correction factor |
|---------------------------|--------------------------|----------------------------|---------------------------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|-----------------------|----------------------|
| zero                      | 4996                     | 0.00                       | 0.0                       | 0.0                      | 0.0                       | 0.6                      | 0.5                     | 0.1                      | N/A                   | N/A                  |
| 1                         | 4995                     | 39.91                      | 405.8                     | 403.5                    | 2.4                       | 406.0                    | 406.3                   | 0.0                      | 0.9997                | 0.9930               |
| 2                         | 4998                     | 19.95                      | 203.6                     | 202.4                    | 1.2                       | 201.8                    | 201.2                   | 0.3                      | 1.0085                | 1.0057               |
| 3                         | 4997                     | 9.94                       | 101.6                     | 101.0                    | 0.6                       | 99.5                     | 99.7                    | 0.1                      | 1.0211                | 1.0139               |
| AFZ                       | 4996                     | 0.00                       | 0.0                       | 0.0                      | 0.0                       | 0.6                      | 0.5                     | 0.1                      | 0.0000                | 0.0000               |
| AFS                       | 4996                     | 39.92                      | 405.9                     | 403.5                    | 0.8                       | 406.0                    | 406.3                   | 0.0                      | 0.9997                | 0.9931               |
| Average Correction Factor |                          |                            |                           |                          |                           |                          |                         |                          | 1.0098                | 1.0042               |

As Found Concentrations: NO<sub>x</sub>= 408.1 NO= 405.8 As Found Percent Change NO<sub>x</sub>= 0.6% NO= 0.6%

## GPT Calibration Data

Dilution Flow 4995 ccm Source Gas Flow 39.93 ccm

| O3 Setpoint (ppb)         | Indicated NO high point (ppb) | Indicated NO drop conc (ppb) | Calculated NO2 conc (ppb) | Indicated NOx conc (ppb) | Indicated NO conc (ppb) | Indicated NO2 conc (ppb) | NOx Correction factor | NO Correction factor | NO2 Correction factor | Converter Efficiency |
|---------------------------|-------------------------------|------------------------------|---------------------------|--------------------------|-------------------------|--------------------------|-----------------------|----------------------|-----------------------|----------------------|
| 0                         | 0.5                           | 0.5                          | 0.0                       | 0.6                      | 0.5                     | 0.1                      | N/A                   | N/A                  | N/A                   | N/A                  |
| NO point                  | 403.7                         | 403.7                        | 0.0                       | 403.7                    | 403.7                   | 0.0                      | 1.0000                | 1.0000               | N/A                   | N/A                  |
| 300                       | 403.7                         | 65.7                         | 338.0                     | 404.2                    | 65.7                    | 338.1                    | 0.9987                | 1.0000               | 0.9996                | 100.0%               |
| 200                       | 403.7                         | 177.5                        | 226.2                     | 404.6                    | 177.5                   | 226.2                    | 0.9978                | 1.0000               | 1.0002                | 100.0%               |
| 100                       | 403.7                         | 294.2                        | 109.5                     | 404.6                    | 294.2                   | 109.4                    | 0.9978                | 1.0000               | 1.0011                | 99.9%                |
| Average Correction Factor |                               |                              |                           |                          |                         |                          | 0.9981                | 1.0000               | 1.0003                | 100.0%               |

## AIC Data

|           | Previous calibration |       |     |     | Current calibration |       |     |     |
|-----------|----------------------|-------|-----|-----|---------------------|-------|-----|-----|
| Parameter | NOx                  | NO2   | NO  |     | NOx                 | NO2   | NO  |     |
| Auto zero | 0.4                  | 0.0   | 0.8 | ppb | 0.6                 | 0.0   | 0.8 | ppb |
| Auto span | 315.8                | 312.6 | 3.0 | ppb | 310.6               | 307.6 | 2.8 | ppb |

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter NO<sub>2</sub>

Air Monitoring Network PAZA



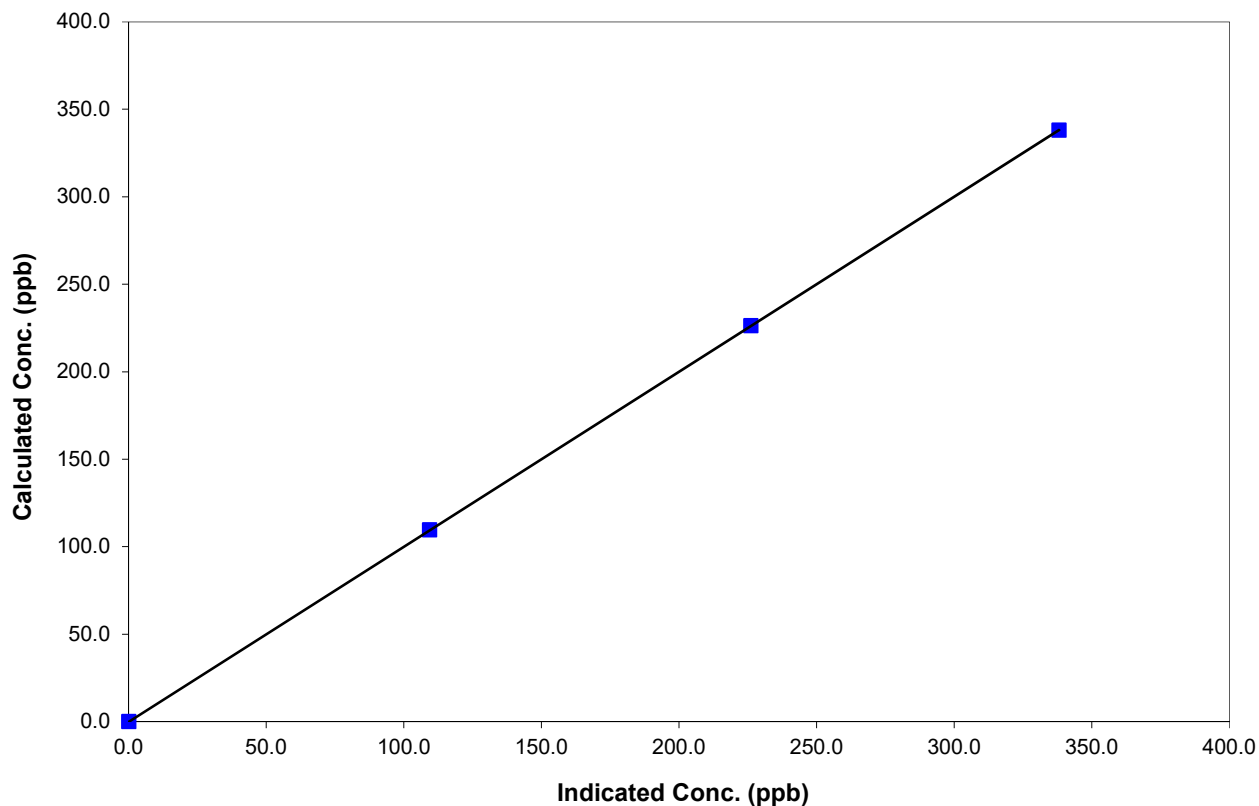
### Station Information

|                  |                  |                      |                  |
|------------------|------------------|----------------------|------------------|
| Calibration Date | December 5, 2016 | Previous Calibration | November 7, 2016 |
| Station Number   | 1                | Station Location     | Henry Pirker     |
| Start Time (MST) | 10:00            | End Time (MST)       | 13:25:00 PM      |
| Analyzer make    | 42i              | Analyzer serial #    | 906535087        |

### Calibration Data

| Calculated conc (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|----------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                        | 0.1                                | N/A                       | Correlation Coefficient | 0.999999  |
| 338.0                      | 338.1                              | 0.9996                    |                         |           |
| 226.2                      | 226.2                              | 1.0002                    |                         |           |
| 109.5                      | 109.4                              | 1.0011                    | Slope                   | 0.999991  |
|                            |                                    |                           |                         |           |
|                            |                                    |                           | Intercept               | -0.023323 |
|                            |                                    |                           |                         |           |

### NO<sub>2</sub> Calibration Curve



## Calibration Summary

Parameter NO<sub>x</sub>

Air Monitoring Network PAZA



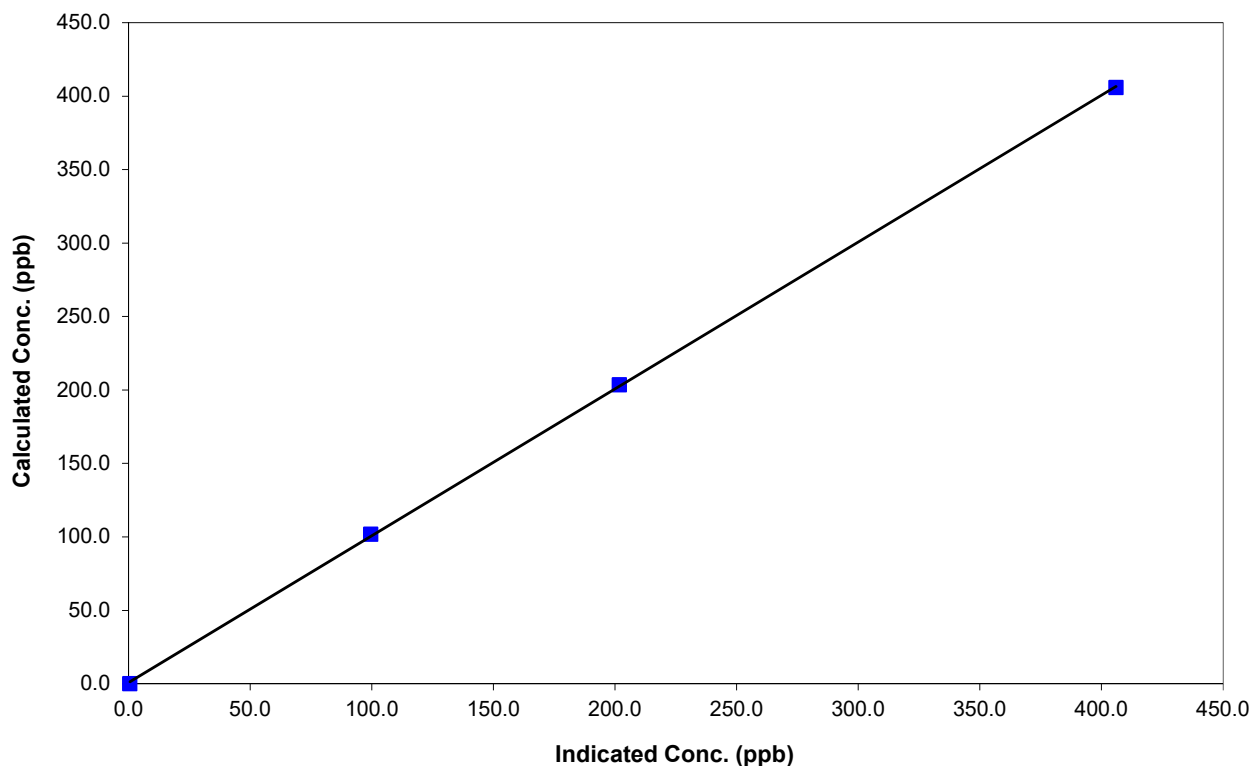
### Station Information

|                  |                  |                      |                  |
|------------------|------------------|----------------------|------------------|
| Calibration Date | December 5, 2016 | Previous Calibration | November 7, 2016 |
| Station Number   | 1                | Station Location     | Henry Pirker     |
| Start Time (MST) | 10:00            | End Time (MST)       | 13:25:00 PM      |
| Analyzer make    | 42i              | Analyzer serial #    | 906535087        |

### Calibration Data

| Calculated conc (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|----------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                        | 0.6                                | N/A                       | Correlation Coefficient | 0.999942 |
| 405.8                      | 406.0                              | 0.9997                    |                         |          |
| 203.6                      | 201.8                              | 1.0085                    |                         |          |
| 101.6                      | 99.5                               | 1.0211                    | Slope                   | 0.999402 |
|                            |                                    |                           | Intercept               | 0.886663 |

### NO<sub>x</sub> Calibration Curve



## Calibration Summary

Parameter NO

Air Monitoring Network PAZA



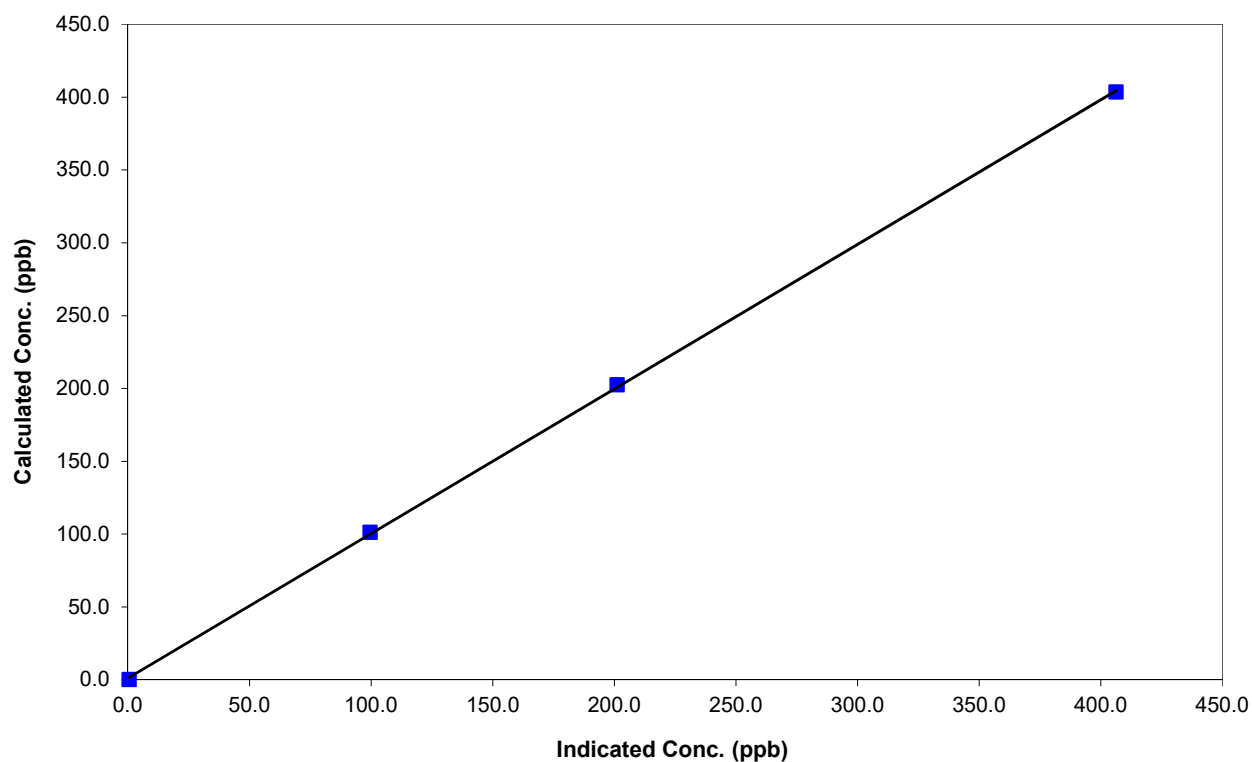
### Station Information

|                  |                  |                      |                  |
|------------------|------------------|----------------------|------------------|
| Calibration Date | December 5, 2016 | Previous Calibration | November 7, 2016 |
| Station Number   | 1                | Station Location     | Henry Pirker     |
| Start Time (MST) | 10:00            | End Time (MST)       | 13:25:00 PM      |
| Analyzer make    | 42i              | Analyzer serial #    | 906535087        |

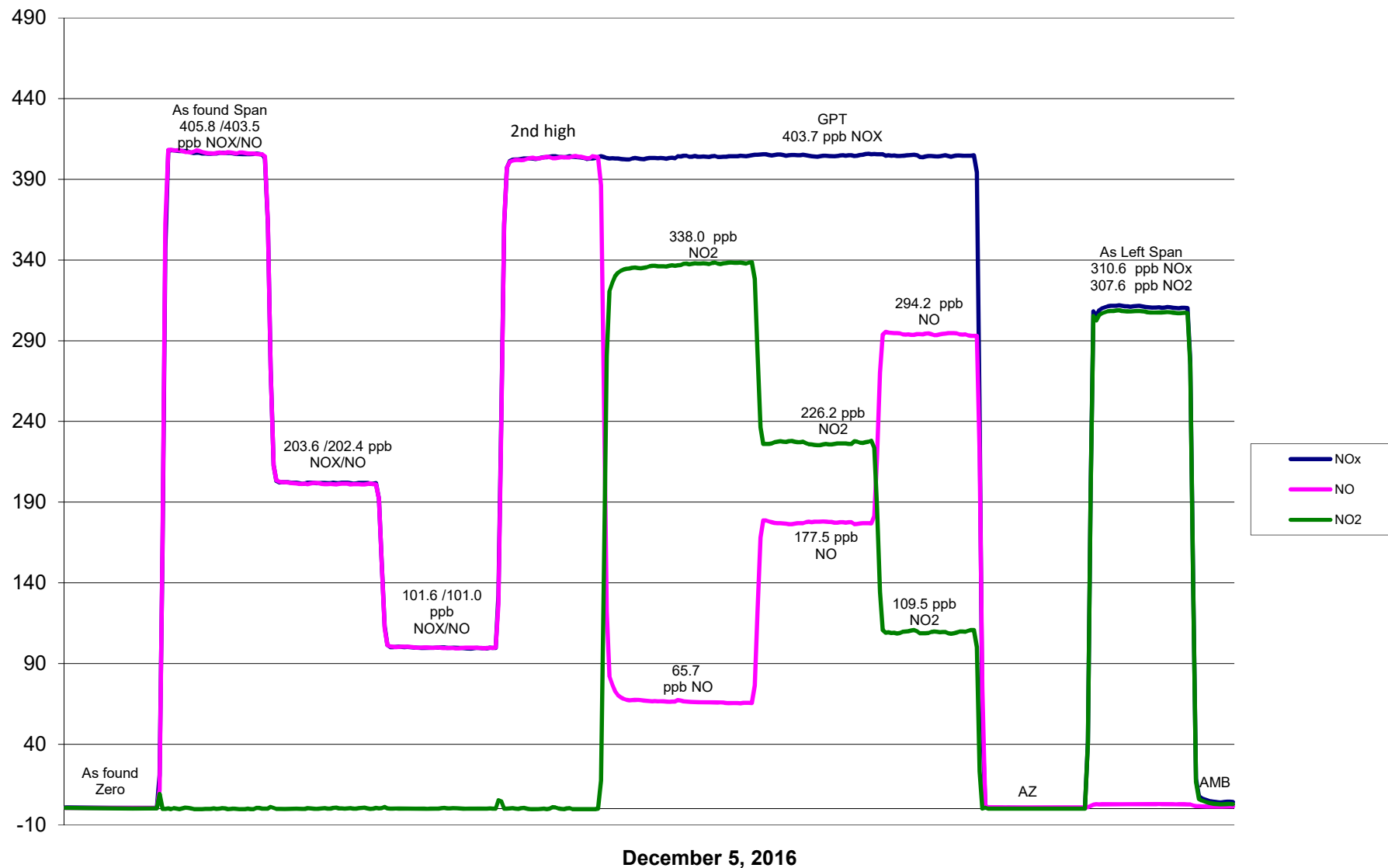
### Calibration Data

| Calculated conc (ppb)<br>(Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------|---------------------------------------|---------------------------|-------------------------|----------|
| 0.0                           | 0.5                                   | N/A                       | Correlation Coefficient | 0.999922 |
| 403.5                         | 406.3                                 | 0.9930                    |                         |          |
| 202.4                         | 201.2                                 | 1.0057                    |                         |          |
| 101.0                         | 99.7                                  | 1.0139                    | Slope                   | 0.993016 |
|                               |                                       |                           | Intercept               | 1.025477 |

### NO Calibration Curve



# NO<sub>x</sub> Calibration



# Calibration Report



AIR QUALITY MONITORING

Parameter 03

Air Monitoring Network PAZA

## Station Information

|                  |                  |                      |                  |
|------------------|------------------|----------------------|------------------|
| Calibration Date | December 5, 2016 | Previous Calibration | November 7, 2016 |
| Station Number   | 1                | Station Location     | Henry Pirker     |
| Reason:          | <b>Routine</b>   | Install              | Removal          |
|                  |                  | Other:               |                  |

|                       |            |                     |             |
|-----------------------|------------|---------------------|-------------|
| Start Time (MST)      | 12:40      | End Time (MST)      | 14:50:00 PM |
| Barometric Pressure   | 721.000 mm | Station Temperature | 15.5 Deg C  |
| Calibrator            | EnviroNics | Serial Number       | 6586        |
| Cal Gas Concentration | NA         | Cal Gas Expiry Date | NA          |

|                      |            |                      |           |
|----------------------|------------|----------------------|-----------|
| DACS make            | CR3000     | DACS serial No.      | 5237      |
| DACS voltage range   | 0 - 5 volt | DACS channel #       | 9         |
|                      | Before     |                      | After     |
| Calculated slope     | 1.009525   | Calculated slope     | 1.013428  |
| Calculated intercept | -0.617986  | Calculated intercept | -1.525955 |

|               |          |                   |                       |
|---------------|----------|-------------------|-----------------------|
| Analyzer make | Teco 49I | Analyzer serial # | 1507964699 (AMU:2015) |
|---------------|----------|-------------------|-----------------------|

|                     | before      |       | after       |       |
|---------------------|-------------|-------|-------------|-------|
| Concentration range | 0 - 500     | ppb   | 0 - 500     | ppb   |
| offset              | -1.10       | ppb   | -1.10       | ppb   |
| slope               | 1.017       |       | 1.017       |       |
| Lamp temp           | 53.5        | mV    | 53.6        | mV    |
| Lamp Intensity A/B  | 73055/80179 | mV    | 73106/80236 | mV    |
| Pressure            | 697.3       | mm Hg | 697.1       | mm Hg |
| Flow A              | 0.731       | ccm   | 0.732       | ccm   |
| Flow B              | 0.733       | ccm   | 0.733       | ccm   |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4997                            | 0.0                           | 0.0                                 | 0.7                                | N/A                       |
| 4999                            | 0.3                           | 338.0                               | 334.3                              | 1.0110                    |
| 4999                            | 0.2                           | 226.2                               | 225.3                              | 1.0040                    |
| 4998                            | 0.1                           | 109.5                               | 110.5                              | 0.9912                    |
|                                 |                               |                                     |                                    |                           |
| 4997                            | 0.0                           | 0.0                                 | 0.7                                | As found zero             |
| 4997                            | 0.3                           | 338.0                               | 334.3                              | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0021                    |

Calculated value of As Found Response: 336.2 ppm Percent Change of As Found: -0.5%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.2                | ppb | 1.1               | ppb |
| Auto span | 372.7              | ppb | 375.8             | ppb |

Notes: No adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter 03

Air Monitoring Network PAZA



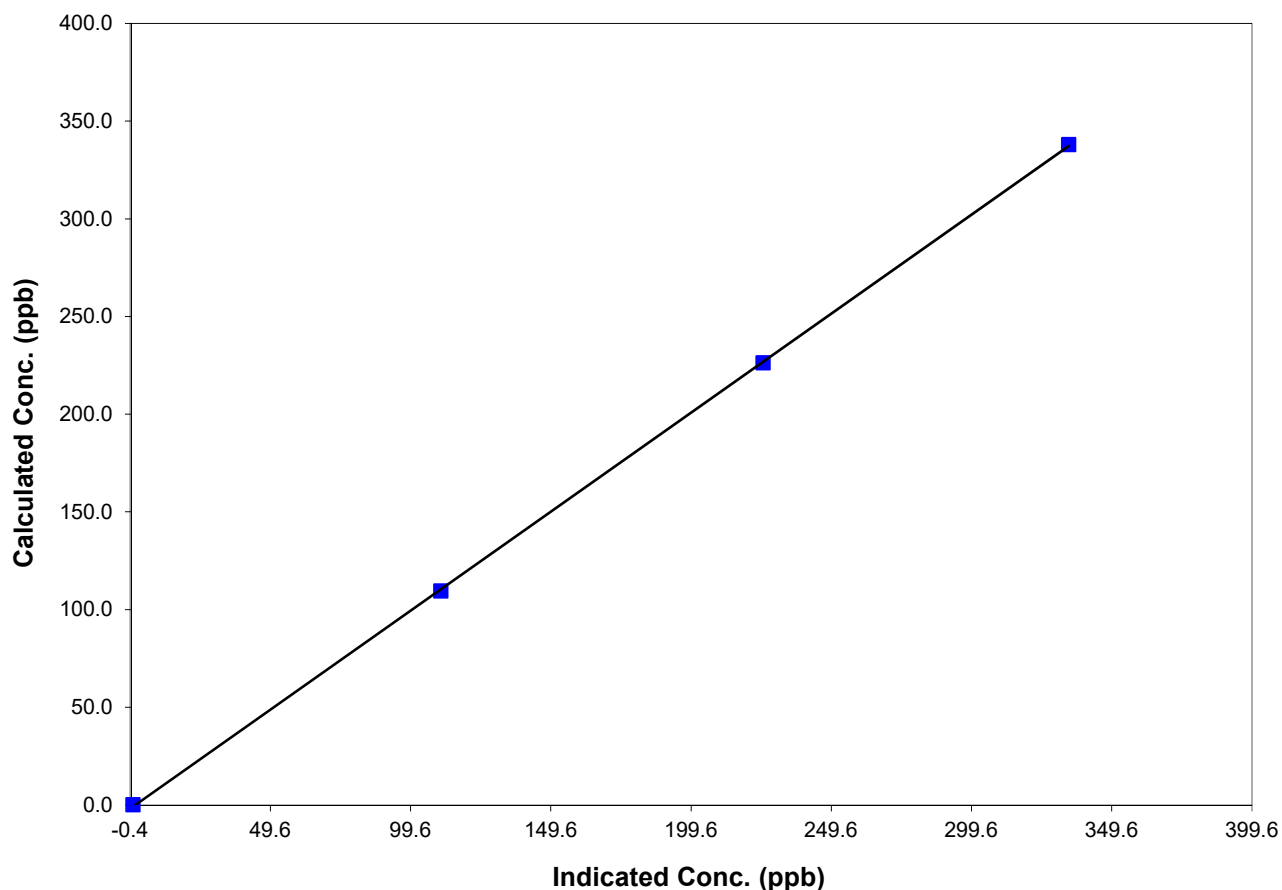
### Station Information

|                     |                  |                      |                       |
|---------------------|------------------|----------------------|-----------------------|
| Calibration Date    | December 5, 2016 | Previous Calibration | November 7, 2016      |
| Station Number      | 1                | Station Location     | Henry Pirker          |
| Start Time (MST)    | 12:40            | End Time (MST)       | 14:50:00 PM           |
| Analyzer make/model | Teco 49I         | Analyzer serial #    | 1507964699 (AMU:2015) |

### Calibration Data

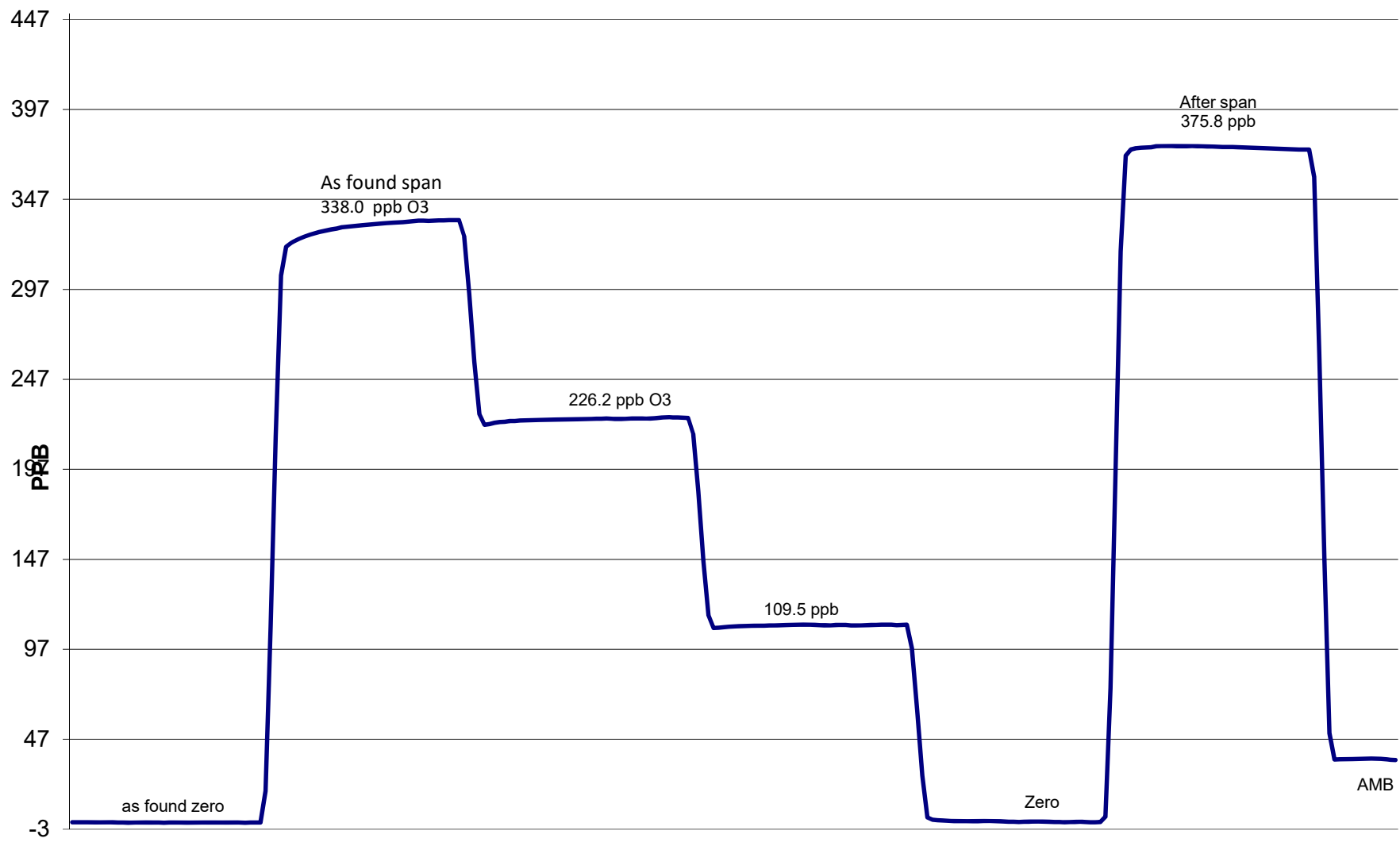
| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.7                                | NA                        | Correlation Coefficient | 0.999962  |
| 338.0                               | 334.3                              | 1.0110                    |                         |           |
| 226.2                               | 225.3                              | 1.0040                    |                         |           |
| 109.5                               | 110.5                              | 0.9912                    | Slope                   | 1.013428  |
|                                     |                                    |                           | Intercept               | -1.525955 |

### O3 Calibration Curve





O3 Calibration



December 5, 2016

# Calibration Report

Parameter CO

Air Monitoring Network PAZA



## Station Information

|                      |                  |                                  |                                  |
|----------------------|------------------|----------------------------------|----------------------------------|
| Calibration Date     | December 6, 2016 | Previous Calibration             | November 3, 2016                 |
| Station Number       | 1                | Station Location                 | Henry Pirker                     |
| Reason:              | <b>Routine</b>   | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                      |                  | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)     | 11:05            | End Time (MST)                   | 14:05:00 PM                      |
| Barometric Pressure  | 724.0 mm/hg      | Station Temperature              | 20.0 Deg C                       |
| Calibrator           | EnviroNics 6100  | Serial Number                    | 6586                             |
| Cal Gas Conc         | 2906 ppm         | Cal Gas Expiry Date              | 7/7/2023                         |
|                      |                  | Cal Gas Cylinder #               | LL109096                         |
| DACS make            | CR3000           | DACS serial No.                  | 5408                             |
| DACS voltage range   | 0 - 5 volt       | DACS channel #                   | 9                                |
|                      | <b>Before</b>    |                                  | <b>After</b>                     |
| Calculated slope     | 1.001023         | Calculated slope                 | 1.000146                         |
| Calculated intercept | -0.244924        | Calculated intercept             | -0.168927                        |
| Analyzer make        | Model 48I-TLE    | Analyzer serial #                | 1408761378                       |

|                     |        |       |        |       |
|---------------------|--------|-------|--------|-------|
|                     | before |       | after  |       |
| Concentration range | 0 - 50 | ppm   | 0 - 50 | ppm   |
| CO zero setting     | 6.472  |       | 6.828  |       |
| CO span setting     | 1.058  |       | 1.058  |       |
| Sample pressure     | 709.1  | mm Hg | 710.6  | mm Hg |
| Sample Flow         | 0.455  | LPM   | 0.456  | LPM   |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4995                            | 0.00                          | 0.00                                | 0.01                               | N/A                       |
| 4997                            | 69.91                         | 40.10                               | 40.16                              | 0.9983                    |
| 4998                            | 34.96                         | 20.19                               | 20.46                              | 0.9866                    |
| 4996                            | 17.93                         | 10.39                               | 10.71                              | 0.9704                    |
|                                 |                               |                                     |                                    |                           |
|                                 |                               |                                     |                                    |                           |
| 4995                            | 0.00                          | 0.00                                | 0.36                               | As Found Zero             |
| 4995                            | 69.91                         | 40.11                               | 41.12                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9851                    |

Calculated value of As Found Response: 40.561 ppm Percent Change of As Found: -1.1%

|           |                    |     |                   |     |
|-----------|--------------------|-----|-------------------|-----|
|           | before calibration |     | after calibration |     |
| Auto zero | 0.00               | ppm | 0.00              | ppm |
| Auto span | 20.58              | ppm | 20.51             | ppm |

Notes: Zero adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter CO

Air Monitoring Network PAZA



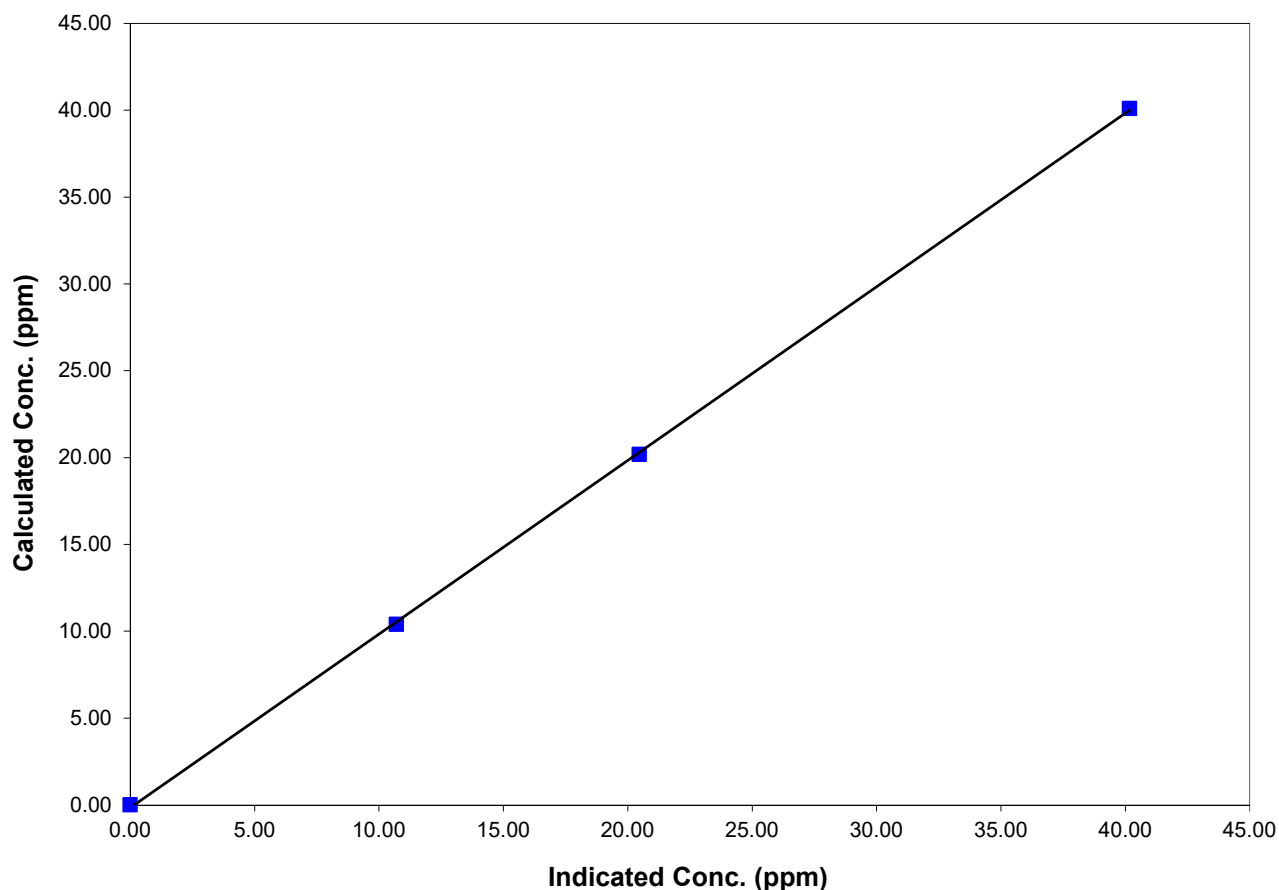
### Station Information

|                     |                  |                      |                  |
|---------------------|------------------|----------------------|------------------|
| Calibration Date    | December 6, 2016 | Previous Calibration | November 3, 2016 |
| Station Number      | 1                | Station Location     | Henry Pirker     |
| Start Time (MST)    | 11:05            | End Time (MST)       | 14:05:00 PM      |
| Analyzer make/model | Model 48I-TLE    | Analyzer serial #    | 1408761378       |

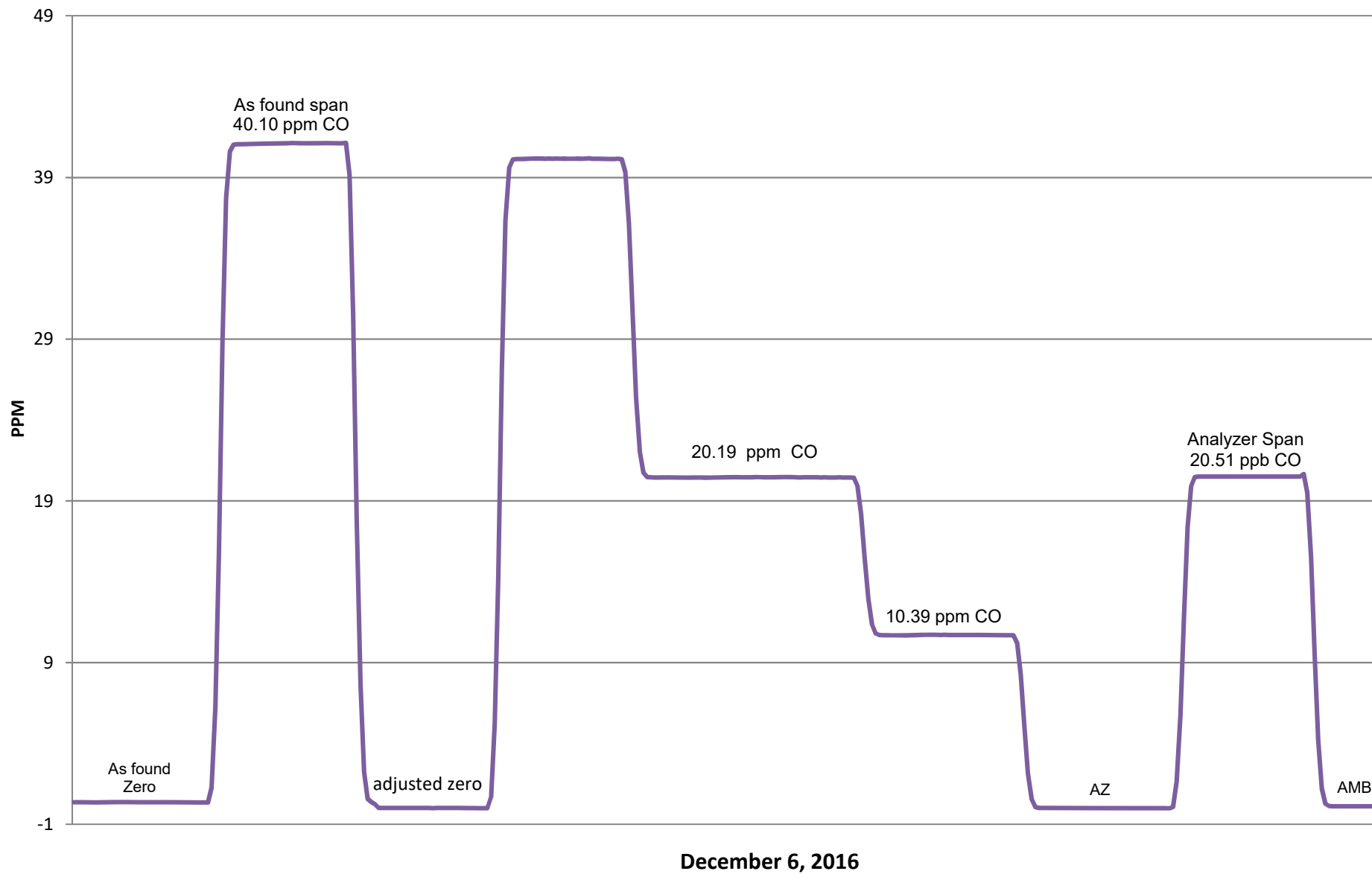
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.000                               | 0.007                              | N/A                       | Correlation Coefficient | 0.999921  |
| 40.095                              | 40.164                             | 0.9983                    |                         |           |
| 20.186                              | 20.459                             | 0.9866                    |                         |           |
| 10.392                              | 10.709                             | 0.9704                    | Slope                   | 1.000146  |
|                                     |                                    |                           | Intercept               | -0.168927 |

### CO Calibration Curve



## CO Calibration



# Calibration Report



Parameter CH4 / NMHC / THC

Air Monitoring Network PAZA

## Station Information

|                  |                  |                      |                  |
|------------------|------------------|----------------------|------------------|
| Calibration Date | December 6, 2016 | Previous Calibration | November 3, 2016 |
| Station Number   | 1                | Station Location     | Henry Pirker     |
| Reason:          | <b>Routine</b>   | Install              | Removal          |
|                  |                  |                      | Other:           |

|                     |                    |                     |             |
|---------------------|--------------------|---------------------|-------------|
| Start Time (MST)    | 13:05:00 PM        | End Time (MST)      | 15:45:00 PM |
| Barometric Pressure | 726.00 mm/hg       | Station Temperature | 20.0 Deg C  |
| Calibrator          | EnviroNics 6103    | Serial Number       | 6586        |
| Cal Gas CH4 Conc    | 386 ppm CH4        | Cal Gas Expiry Date | 3/28/2014   |
| Cal Gas C3H8 Conc   | 207 569.25 ppm CH4 | Cal Gas Cylinder #  | LL34318     |
| DACS make           | CR3000             | DACS serial No.     | 5408        |
| DACS voltage range  | 0 - 5 volt         | DACS channel #      | SE 11,12,13 |

Analyzer make TEI 55I Analyzer serial # 1134650658

|                     | before                       |     | after                        |                 |
|---------------------|------------------------------|-----|------------------------------|-----------------|
| Concentration range | 0-20 (CH4, NMHC); 0-40 (THC) | ppm | 0-20 (CH4, NMHC); 0-40 (THC) | ppm             |
| Air pressure        | 27.8                         | PSI | 27.8                         | PSI             |
| Fuel pressure       | 42.1                         | PSI | 42.1                         | PSI             |
| Carrier pressure    | 30.3                         | PSI | 30.3                         | PSI             |
| CH4 cal factor      | 6.01                         |     | 6.01                         | E <sup>-4</sup> |
| NMHC cal factor     | 2.45                         |     | 2.45                         | E <sup>-4</sup> |
| Rt                  | 12.31                        | Sec | 12.31                        | Sec             |
| Pk Index            | 23.43                        |     | 23.43                        |                 |

## CH4 Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.02                               | N/A                       |
| 1997                            | 68.96                         | 12.88                               | 12.92                              | 0.9975                    |
| 1998                            | 40.99                         | 7.76                                | 7.77                               | 0.9985                    |
| 1999                            | 15.97                         | 3.06                                | 3.05                               | 1.0040                    |
|                                 |                               |                                     |                                    |                           |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.02                               | As Found Zero             |
| 1995                            | 68.93                         | 12.89                               | 13.30                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0000                    |

Calculated value of As Found Response: 13.289 ppm Percent Change of As Found: -3.1%

|                      | Before   |                      | After     |
|----------------------|----------|----------------------|-----------|
| Calculated slope     | 1.000164 | Calculated slope     | 0.998226  |
| Calculated intercept | 0.002212 | Calculated intercept | -0.002254 |

## Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.03               | ppm | 0.03              | ppm |
| Auto span | 8.89               | ppm | 8.41              | ppm |

### NMHC Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.02                               | N/A                       |
| 1997                            | 68.96                         | 19.00                               | 19.03                              | 0.9984                    |
| 1998                            | 40.99                         | 11.44                               | 11.85                              | 0.9654                    |
| 1999                            | 15.97                         | 4.51                                | 4.86                               | 0.9280                    |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.02                               | As Found Zero             |
| 1995                            | 68.93                         | 19.01                               | 19.97                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9639                    |

Calculated value of As Found Response: 20.333 ppm      Percent Change of As Found: -7.0%

|                      | Before    |                      | After     |
|----------------------|-----------|----------------------|-----------|
| Calculated slope     | 1.028623  | Calculated slope     | 1.000443  |
| Calculated intercept | -0.189187 | Calculated intercept | -0.206455 |

#### Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.02               | ppm | 0.02              | ppm |
| Auto span | 12.27              | ppm | 11.81             | ppm |

### THC Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.03                               | N/A                       |
| 1997                            | 68.96                         | 31.89                               | 31.92                              | 0.9988                    |
| 1998                            | 40.99                         | 19.20                               | 19.61                              | 0.9792                    |
| 1999                            | 15.97                         | 7.57                                | 7.89                               | 0.9600                    |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.03                               | As Found Zero             |
| 1995                            | 68.93                         | 31.90                               | 33.29                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9793                    |

Calculated value of As Found Response: 33.666 ppm      Percent Change of As Found: -5.5%

|                      | Before    |                      | After     |
|----------------------|-----------|----------------------|-----------|
| Calculated slope     | 1.017866  | Calculated slope     | 1.000170  |
| Calculated intercept | -0.180586 | Calculated intercept | -0.201140 |

#### Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.02               | ppm | 0.02              | ppm |
| Auto span | 21.15              | ppm | 20.20             | ppm |

Notes: Span adjustment made

Calibration Performed By: Dmytro Doloti

# Calibration Summary

Parameter CH4

Air Monitoring Network PAZA



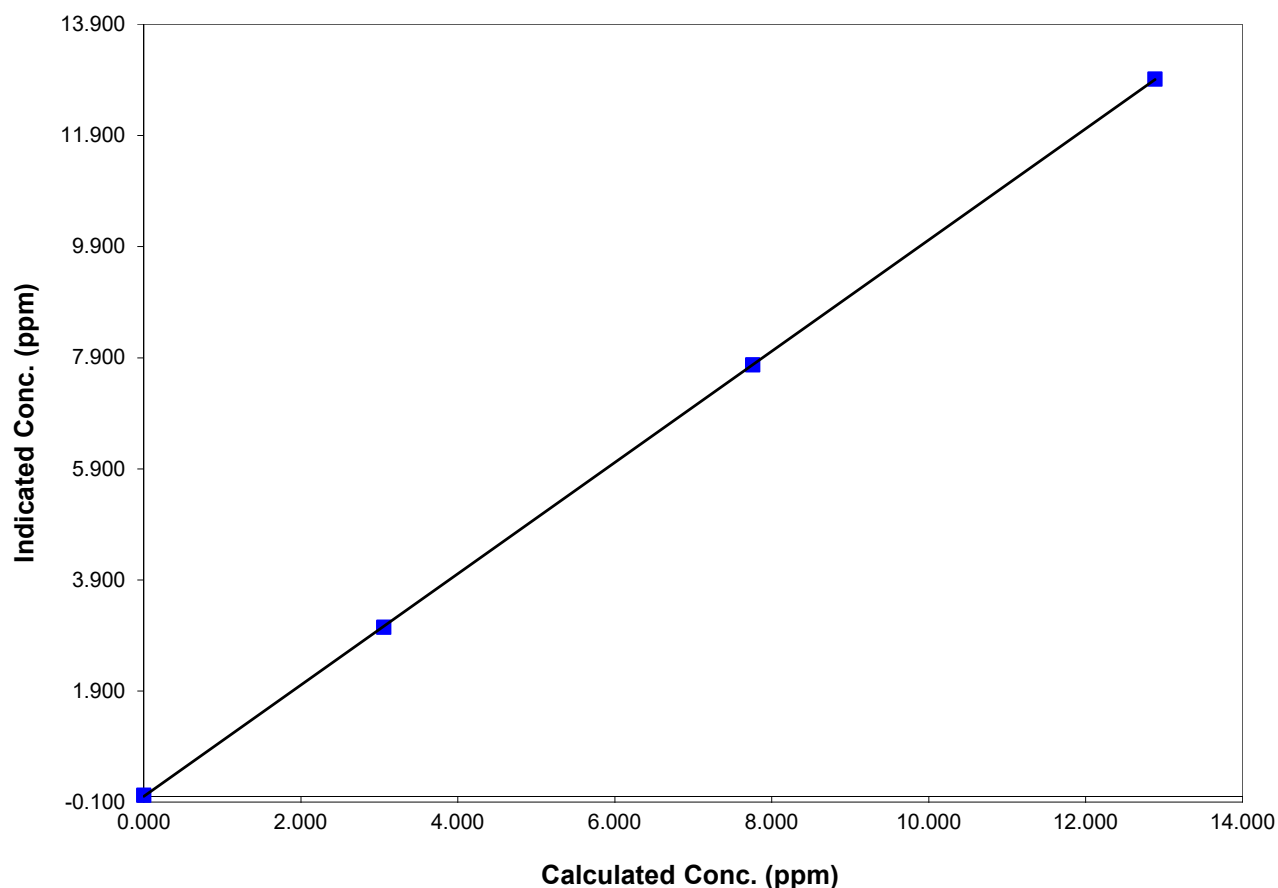
## Station Information

|                     |                  |                      |                  |
|---------------------|------------------|----------------------|------------------|
| Calibration Date    | December 6, 2016 | Previous Calibration | November 3, 2016 |
| Station Number      | 1                | Station Location     | Henry Pirker     |
| Start Time (MST)    | 13:05:00 PM      | End Time (MST)       | 15:45:00 PM      |
| Analyzer make/model | TEI 55I          | Analyzer serial #    | 1134650658       |

## Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.000                               | 0.019                              | N/A                       | Correlation Coefficient | 0.999992  |
| 12.884                              | 12.917                             | 0.9975                    |                         |           |
| 7.760                               | 7.772                              | 0.9985                    | Slope                   | 0.998226  |
| 3.059                               | 3.047                              | 1.0040                    |                         |           |
|                                     |                                    |                           | Intercept               | -0.002254 |
|                                     |                                    |                           |                         |           |

## CH4 Calibration Data



## Calibration Summary

Parameter NMHC

Air Monitoring Network PAZA



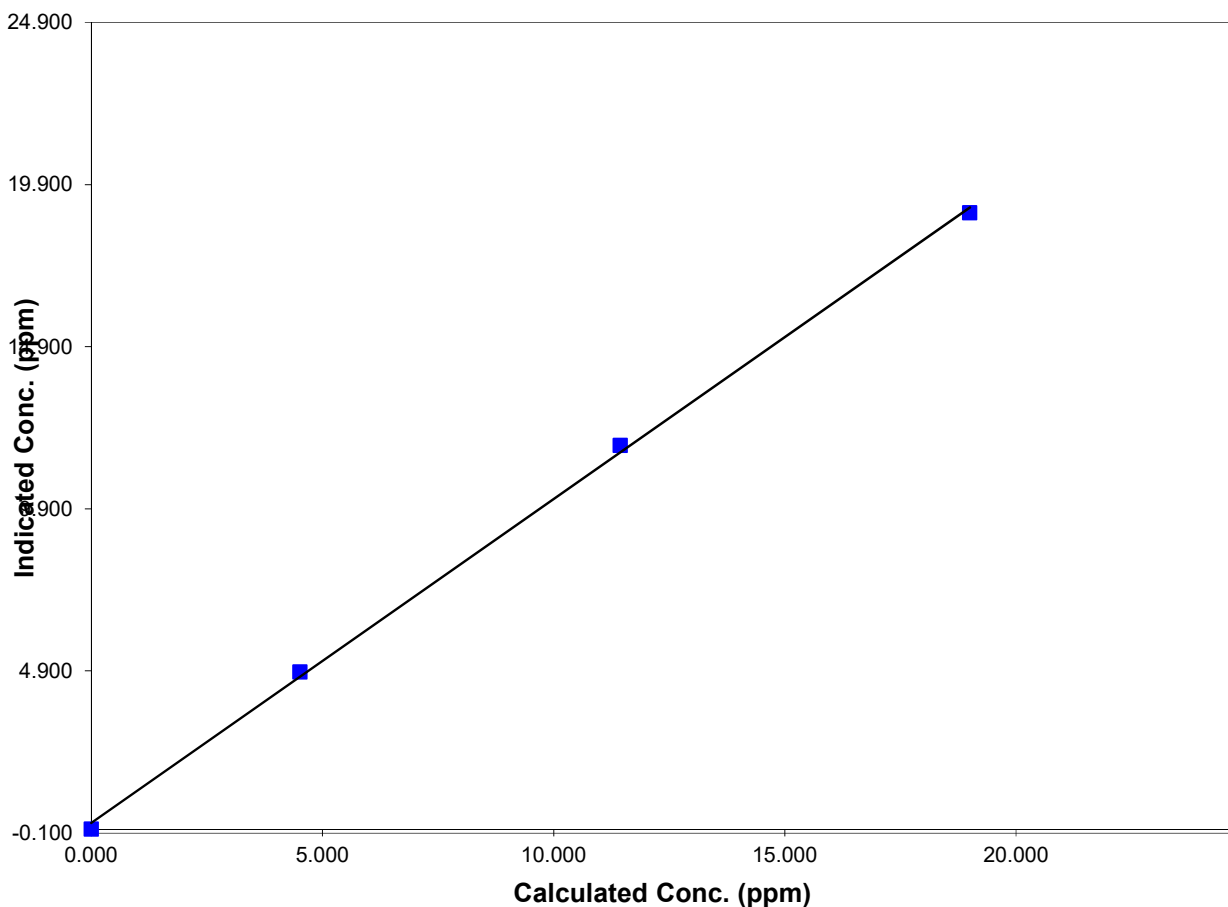
### Station Information

|                     |                  |                      |                  |
|---------------------|------------------|----------------------|------------------|
| Calibration Date    | December 6, 2016 | Previous Calibration | November 3, 2016 |
| Station Number      | 1                | Station Location     | Henry Pirker     |
| Start Time (MST)    | 13:05:00 PM      | End Time (MST)       | 15:45:00 PM      |
| Analyzer make/model | TEI 55I          | Analyzer serial #    | 1134650658       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.000                               | 0.019                              | N/A                       | Correlation Coefficient | 0.999383  |
| 19.001                              | 19.032                             | 0.9984                    |                         |           |
| 11.444                              | 11.853                             | 0.9654                    |                         |           |
| 4.512                               | 4.862                              | 0.9280                    | Slope                   | 1.000443  |
|                                     |                                    |                           | Intercept               | -0.206455 |

### NMHC Calibration Data





# Calibration Summary

Parameter THC

Air Monitoring Network PAZA



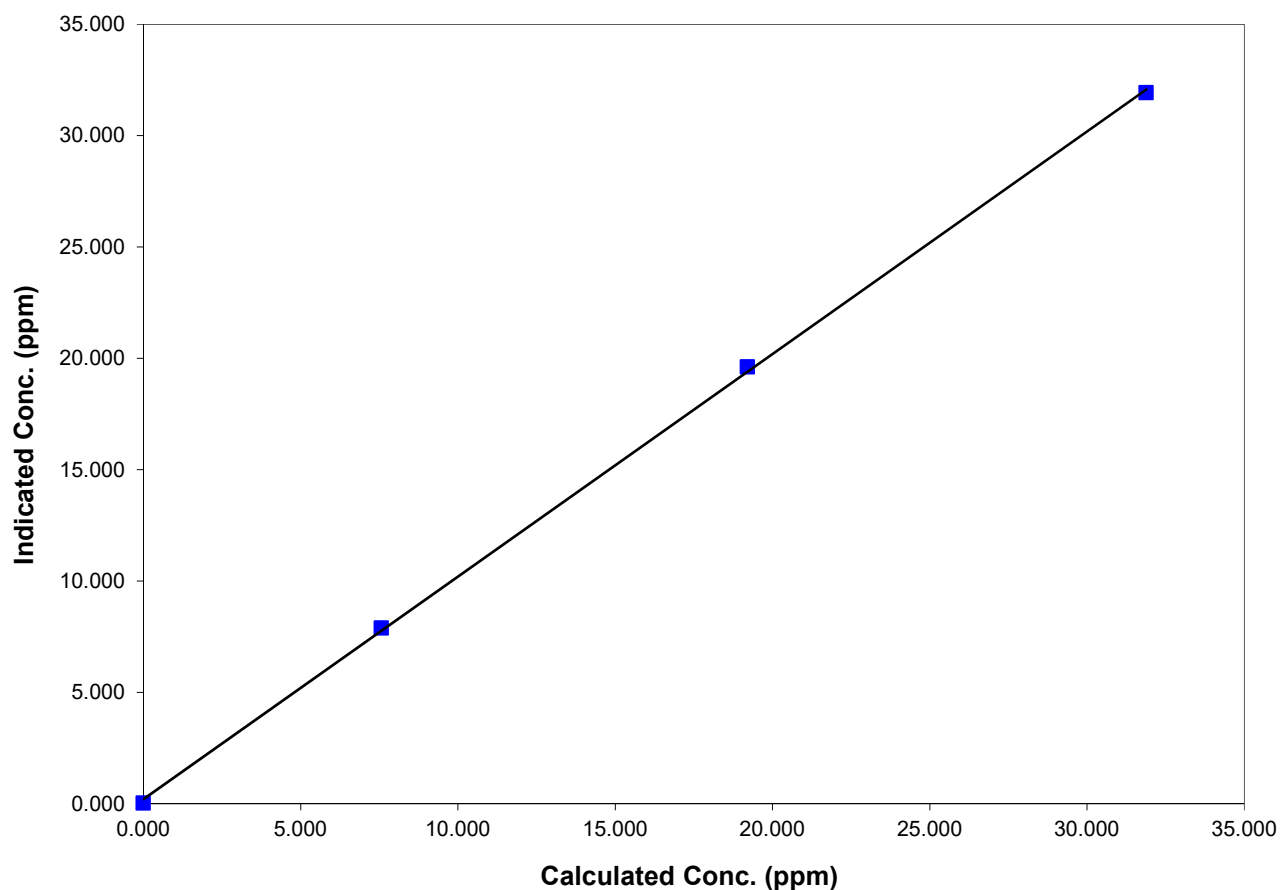
## Station Information

|                     |                  |                      |                  |
|---------------------|------------------|----------------------|------------------|
| Calibration Date    | December 6, 2016 | Previous Calibration | November 3, 2016 |
| Station Number      | 1                | Station Location     | Henry Pirker     |
| Start Time (MST)    | 13:05:00 PM      | End Time (MST)       | 15:45:00 PM      |
| Analyzer make/model | TEI 55I          | Analyzer serial #    | 1134650658       |

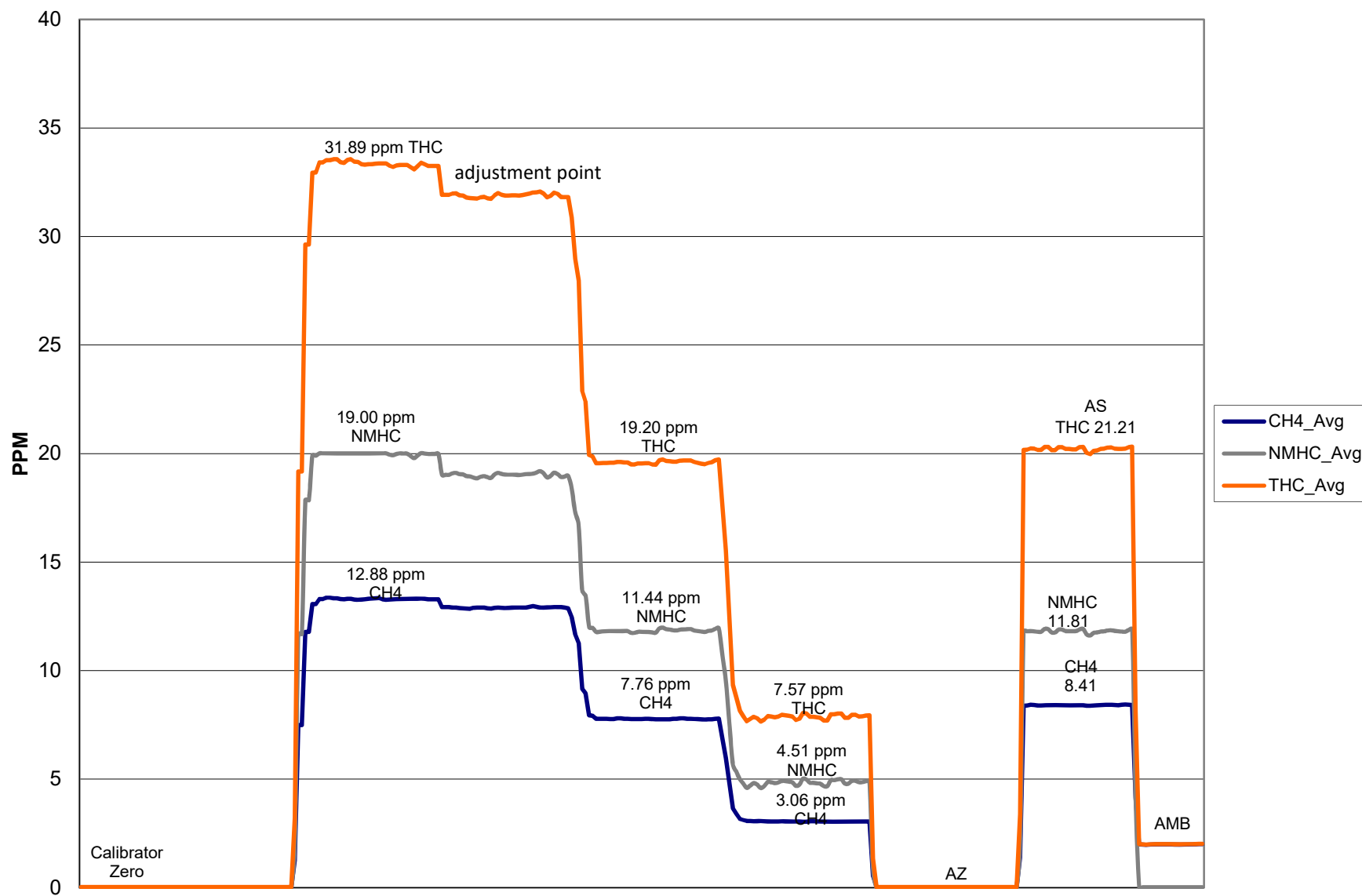
## Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.000                               | 0.033                              | N/A                       | Correlation Coefficient | 0.999811  |
| 31.885                              | 31.924                             | 0.9988                    |                         |           |
| 19.203                              | 19.611                             | 0.9792                    |                         |           |
| 7.571                               | 7.886                              | 0.9600                    | Slope                   | 1.000170  |
|                                     |                                    |                           | Intercept               | -0.201140 |

## THC Calibration Data



# THC/CH<sub>4</sub>/NMHC Calibration



# Calibration Report



Parameter CH4 / NMHC / THC

Air Monitoring Network PAZA

## Station Information

|                  |                                                        |                                                       |                                                       |
|------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| Calibration Date | December 20, 2016                                      | Previous Calibration                                  | December 6, 2016                                      |
| Station Number   | 1                                                      | Station Location                                      | Henry Pirker                                          |
| Reason:          | <span style="background-color: yellow;">Routine</span> | <span style="border: 1px solid black;">Install</span> | <span style="border: 1px solid black;">Removal</span> |
|                  |                                                        | <span style="border: 1px solid black;">Other:</span>  |                                                       |

|                     |                    |                     |             |
|---------------------|--------------------|---------------------|-------------|
| Start Time (MST)    | 9:40               | End Time (MST)      | 13:30:00 PM |
| Barometric Pressure | 713.00 mm/hg       | Station Temperature | 20.0 Deg C  |
| Calibrator          | EnviroNics 6103    | Serial Number       | 6586        |
| Cal Gas CH4 Conc    | 386 ppm CH4        | Cal Gas Expiry Date | 3/28/2014   |
| Cal Gas C3H8 Conc   | 207 569.25 ppm CH4 | Cal Gas Cylinder #  | LL34318     |
| DACS make           | CR3000             | DACS serial No.     | 5408        |
| DACS voltage range  | 0 - 5 volt         | DACS channel #      | SE 11,12,13 |

Analyzer make TEI 55I Analyzer serial # 1134650658

|                     | before                       |     | after                        |                 |
|---------------------|------------------------------|-----|------------------------------|-----------------|
| Concentration range | 0-20 (CH4, NMHC); 0-40 (THC) | ppm | 0-20 (CH4, NMHC); 0-40 (THC) | ppm             |
| Air pressure        | 27.8                         | PSI | 27.8                         | PSI             |
| Fuel pressure       | 42.1                         | PSI | 42.1                         | PSI             |
| Carrier pressure    | 30.3                         | PSI | 30.3                         | PSI             |
| CH4 cal factor      | 6.01                         |     | 6.01                         | E <sup>-4</sup> |
| NMHC cal factor     | 2.45                         |     | 2.45                         | E <sup>-4</sup> |
| Rt                  | 12.31                        | Sec | 12.31                        | Sec             |
| Pk Index            | 23.43                        |     | 23.43                        |                 |

## CH4 Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.02                               | N/A                       |
| 1997                            | 68.96                         | 12.88                               | 12.95                              | 0.9952                    |
| 1998                            | 40.99                         | 7.76                                | 7.78                               | 0.9978                    |
| 1999                            | 15.97                         | 3.06                                | 3.05                               | 1.0022                    |
|                                 |                               |                                     |                                    |                           |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.02                               | As Found Zero             |
| 1995                            | 68.93                         | 12.89                               | 12.82                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9984                    |

Calculated value of As Found Response: 12.772 ppm Percent Change of As Found: 0.9%

|                      | Before    |                      | After    |
|----------------------|-----------|----------------------|----------|
| Calculated slope     | 0.998226  | Calculated slope     | 0.996110 |
| Calculated intercept | -0.002254 | Calculated intercept | 0.000518 |

## Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.03               | ppm | 0.03              | ppm |
| Auto span | 8.41               | ppm | 8.58              | ppm |

### NMHC Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.02                               | N/A                       |
| 1997                            | 68.96                         | 19.00                               | 19.03                              | 0.9985                    |
| 1998                            | 40.99                         | 11.44                               | 11.81                              | 0.9694                    |
| 1999                            | 15.97                         | 4.51                                | 4.78                               | 0.9436                    |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.02                               | As Found Zero             |
| 1995                            | 68.93                         | 19.01                               | 19.87                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9705                    |

Calculated value of As Found Response: 19.657 ppm      Percent Change of As Found: -3.4%

|                      | Before    |                      | After     |
|----------------------|-----------|----------------------|-----------|
| Calculated slope     | 1.000443  | Calculated slope     | 0.999716  |
| Calculated intercept | -0.206455 | Calculated intercept | -0.167136 |

#### Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.02               | ppm | 0.02              | ppm |
| Auto span | 11.81              | ppm | 12.03             | ppm |

### THC Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.03                               | N/A                       |
| 1997                            | 68.96                         | 31.89                               | 31.95                              | 0.9980                    |
| 1998                            | 40.99                         | 19.20                               | 19.56                              | 0.9817                    |
| 1999                            | 15.97                         | 7.57                                | 7.82                               | 0.9684                    |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.03                               | As Found Zero             |
| 1995                            | 68.93                         | 31.90                               | 32.68                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9827                    |

Calculated value of As Found Response: 32.448 ppm      Percent Change of As Found: -1.7%

|                      | Before    |                      | After     |
|----------------------|-----------|----------------------|-----------|
| Calculated slope     | 1.000170  | Calculated slope     | 0.998997  |
| Calculated intercept | -0.201140 | Calculated intercept | -0.160066 |

#### Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.02               | ppm | 0.02              | ppm |
| Auto span | 20.20              | ppm | 20.59             | ppm |

Notes: Span adjustment made  
Hydrogen cylinder replaced

Calibration Performed By: Dmytro Doloti

## Calibration Summary

Parameter CH4

Air Monitoring Network PAZA



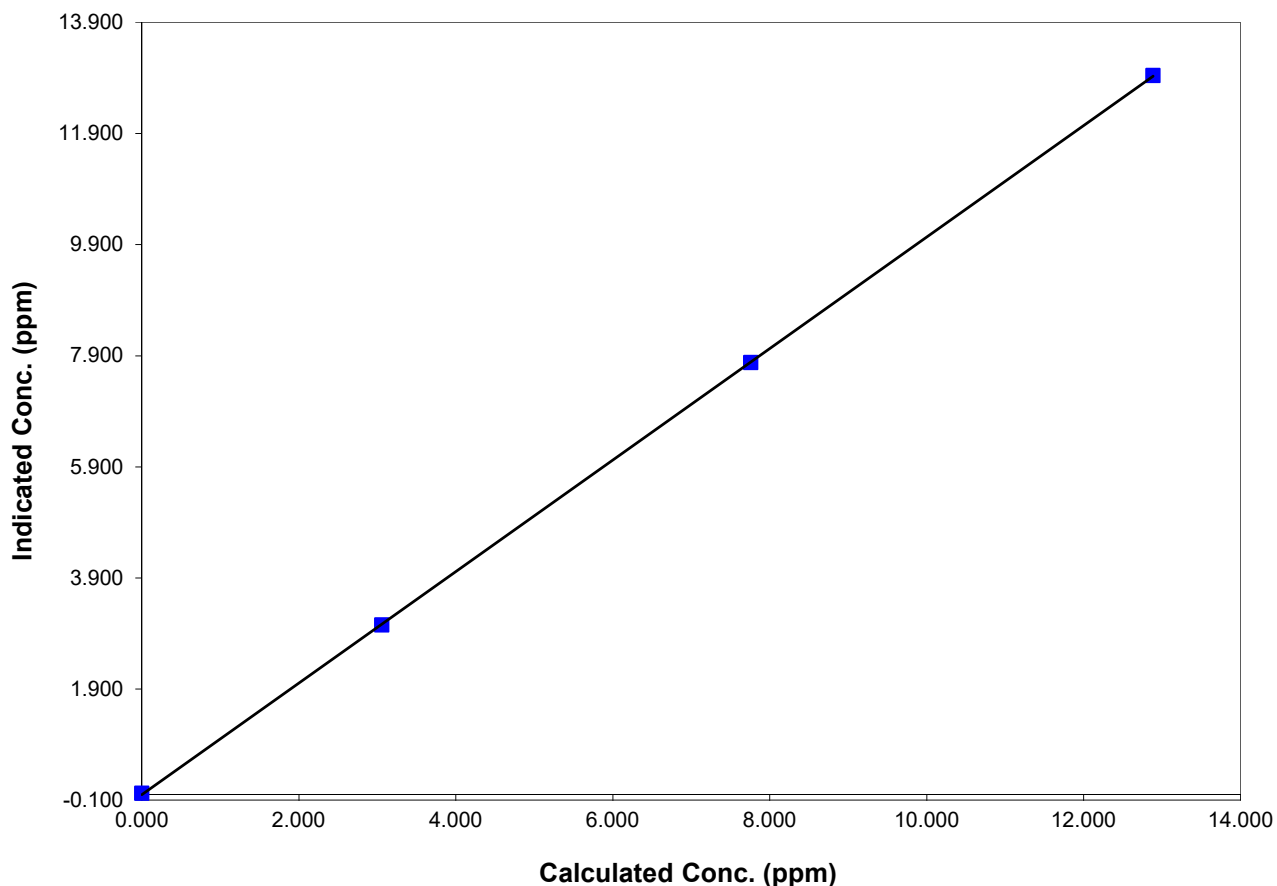
### Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 20, 2016 | Previous Calibration | December 6, 2016 |
| Station Number      | 1                 | Station Location     | Henry Pirker     |
| Start Time (MST)    | 9:40              | End Time (MST)       | 13:30:00 PM      |
| Analyzer make/model | TEI 55I           | Analyzer serial #    | 1134650658       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.000                               | 0.019                              | N/A                       | Correlation Coefficient | 0.999990 |
| 12.884                              | 12.946                             | 0.9952                    |                         |          |
| 7.760                               | 7.777                              | 0.9978                    | Slope                   | 0.996110 |
| 3.059                               | 3.053                              | 1.0022                    |                         |          |
|                                     |                                    |                           | Intercept               | 0.000518 |
|                                     |                                    |                           |                         |          |

### CH4 Calibration Data



## Calibration Summary

Parameter NMHC

Air Monitoring Network PAZA



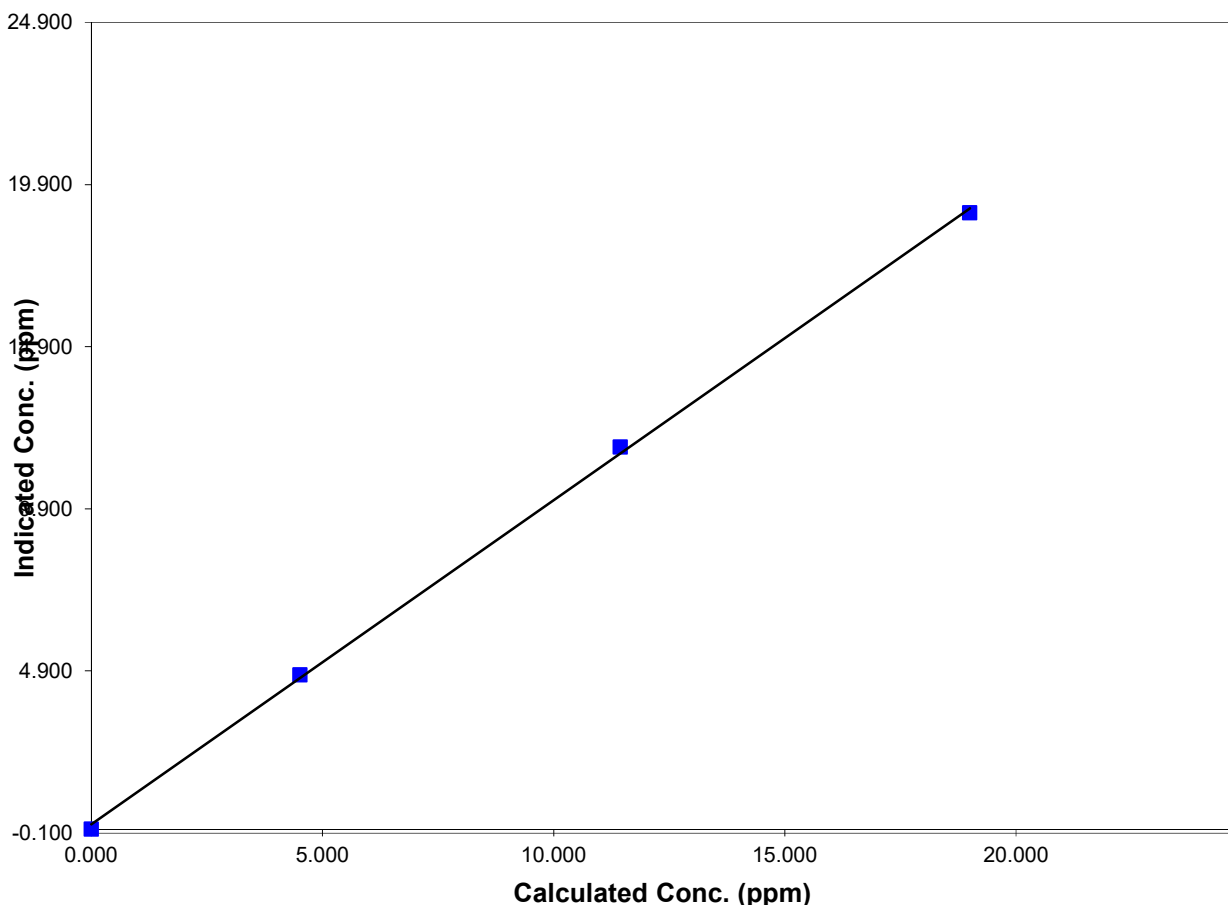
### Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 20, 2016 | Previous Calibration | December 6, 2016 |
| Station Number      | 1                 | Station Location     | Henry Pirker     |
| Start Time (MST)    | 9:40              | End Time (MST)       | 13:30:00 PM      |
| Analyzer make/model | TEI 55I           | Analyzer serial #    | 1134650658       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.000                               | 0.019                              | N/A                       | Correlation Coefficient | 0.999569  |
| 19.001                              | 19.030                             | 0.9985                    |                         |           |
| 11.444                              | 11.805                             | 0.9694                    |                         |           |
| 4.512                               | 4.781                              | 0.9436                    | Slope                   | 0.999716  |
|                                     |                                    |                           | Intercept               | -0.167136 |

### NMHC Calibration Data



## Calibration Summary

Parameter THC

Air Monitoring Network PAZA



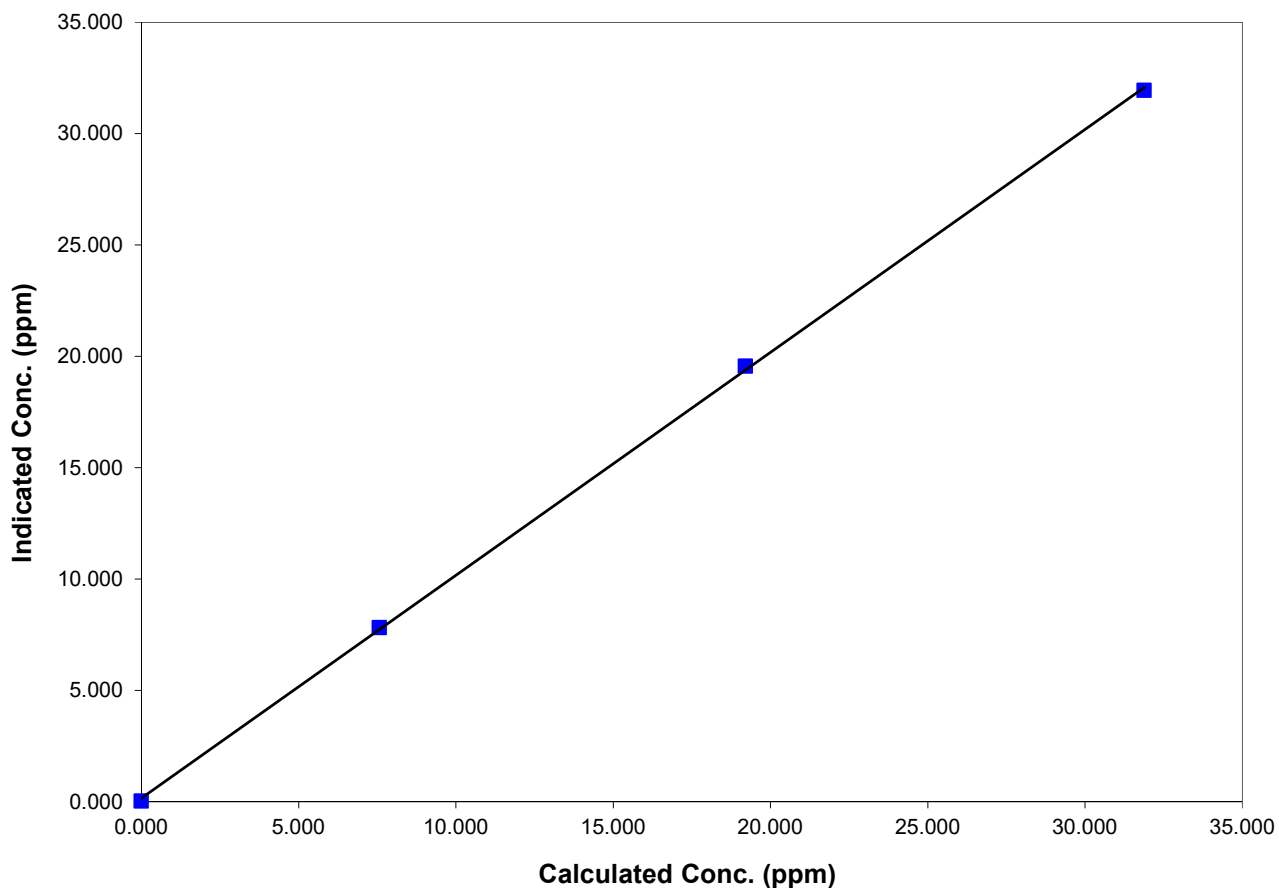
### Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 20, 2016 | Previous Calibration | December 6, 2016 |
| Station Number      | 1                 | Station Location     | Henry Pirker     |
| Start Time (MST)    | 9:40              | End Time (MST)       | 13:30:00 PM      |
| Analyzer make/model | TEI 55I           | Analyzer serial #    | 1134650658       |

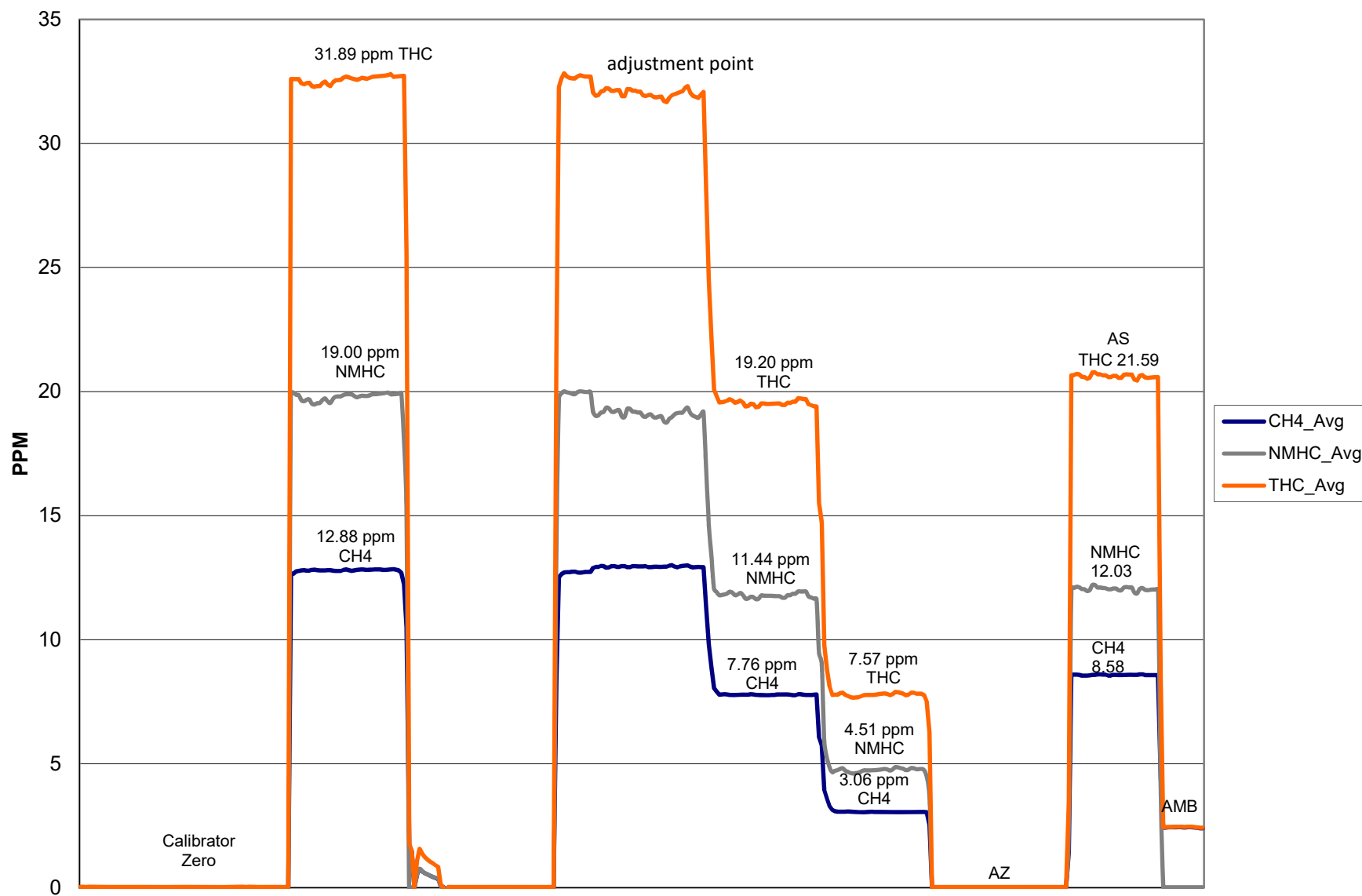
### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.000                               | 0.031                              | N/A                       | Correlation Coefficient | 0.999878  |
| 31.885                              | 31.949                             | 0.9980                    |                         |           |
| 19.203                              | 19.561                             | 0.9817                    |                         |           |
| 7.571                               | 7.818                              | 0.9684                    | Slope                   | 0.998997  |
|                                     |                                    |                           | Intercept               | -0.160066 |

### THC Calibration Data



# THC/CH<sub>4</sub>/NMHC Calibration





# Calibration Report

Parameter TRS

Air Monitoring Network PAZA



## Station Information

|                      |                                             |                                  |                                  |
|----------------------|---------------------------------------------|----------------------------------|----------------------------------|
| Calibration Date     | December 6, 2016                            | Previous Calibration             | November 3, 2016                 |
| Station Number       | 1                                           | Station Location                 | Henry Pirker                     |
| Reason:              | <input checked="" type="checkbox"/> Routine | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                      |                                             | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)     | 9:25                                        | End Time (MST)                   | 12:00                            |
| Barometric Pressure  | 721.00 mm/Hg                                | Station Temperature              | 20.0 Deg C                       |
| Calibrator           | EnviroNics 6103                             | Serial Number                    | 6586                             |
| Cal Gas Conc         | 10.2 ppb                                    | Cal Gas Expiry Date              | 02/23/2019                       |
|                      |                                             | Cal Gas Cylinder #               | EY0000380                        |
| DACS make            | CR3000                                      | DACS serial No.                  | 5408                             |
| DACS voltage range   | 0 - 1 volt                                  | DACS channel #                   | 9                                |
|                      | Before                                      |                                  | After                            |
| Calculated slope     | 1.017507                                    | Calculated slope                 | 1.018511                         |
| Calculated intercept | 0.038392                                    | Calculated intercept             | 0.667790                         |
| Analyzer make        | TEI 45C                                     | Analyzer serial #                | 630718528                        |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 100 | ppb   | 0 - 100 | ppb   |
| Coefficient         | 0.940   |       | 0.940   |       |
| Background          | 19.1    |       | 19.1    |       |
| Pressure            | 675.5   | mm Hg | 677.0   | mm Hg |
| Flow                | 0.448   | ccm   | 0.45    | ccm   |
| Lamp Voltage        | 909     | V     | 910     | V     |

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4997                            | 0.00                          | 0.00                                | 0.42                               | N/A                       |
| 4999                            | 39.97                         | 80.91                               | 79.38                              | 1.0193                    |
| 4999                            | 19.98                         | 40.61                               | 38.17                              | 1.0637                    |
| 6998                            | 10.01                         | 14.56                               | 13.01                              | 1.1193                    |
|                                 |                               |                                     |                                    |                           |
| 4997                            | 0.00                          | 0.00                                | 0.42                               | As Found Zero             |
| 4997                            | 39.93                         | 80.86                               | 79.38                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0674                    |

Calculated value of As Found Response: 80.4 ppb      Percent Change of As Found: 0.6%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.44               | ppb | 0.51              | ppb |
| Auto span | 28.67              | ppb | 26.70             | ppb |

Notes: No adjustment made  
Sox scrubber check performed

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter TRS

Air Monitoring Network PAZA



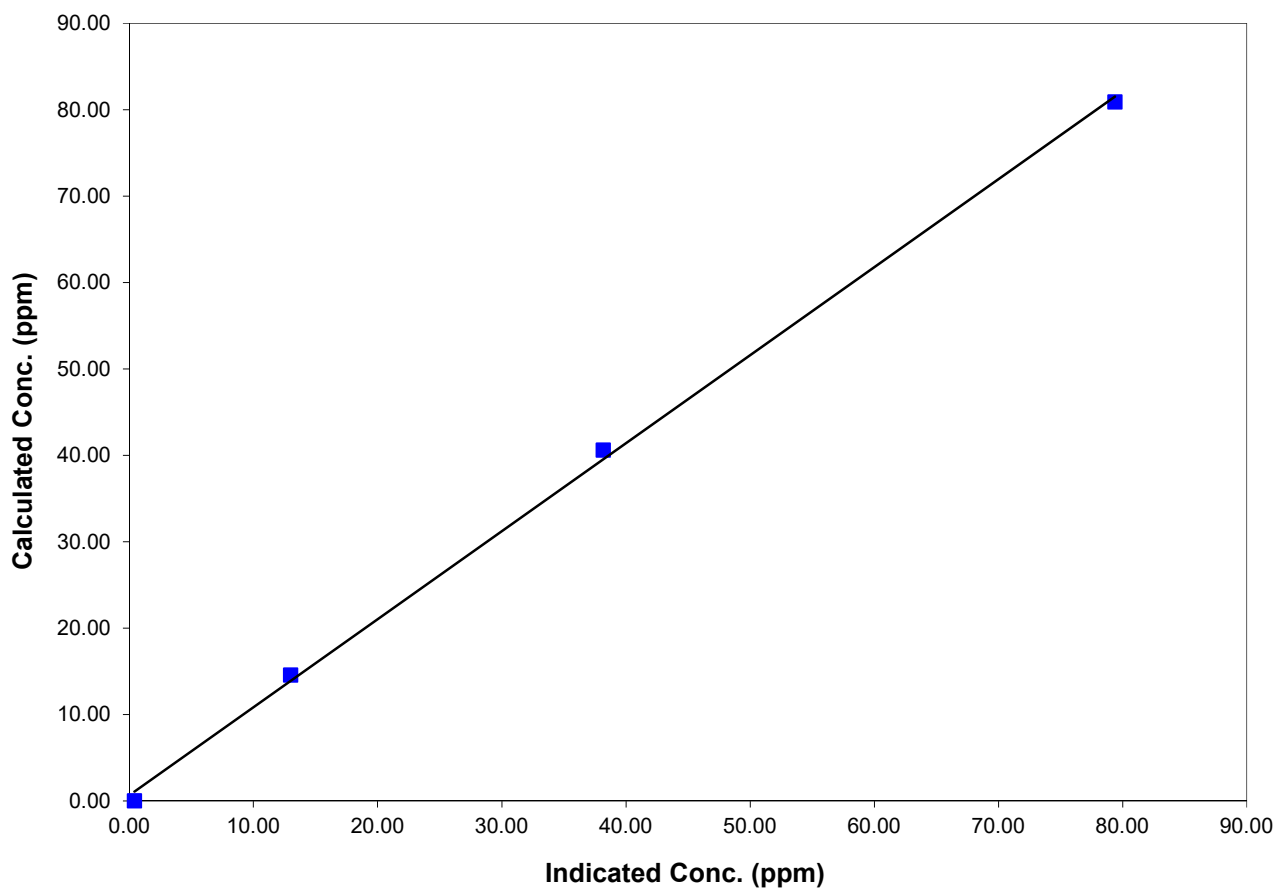
### Station Information

|                     |                  |                      |                  |
|---------------------|------------------|----------------------|------------------|
| Calibration Date    | December 6, 2016 | Previous Calibration | November 3, 2016 |
| Station Number      | 1                | Station Location     | Henry Pirker     |
| Start Time (MST)    | 9:25             | End Time (MST)       | 12:00            |
| Analyzer make/model | TEI 45C          | Analyzer serial #    | 630718528        |

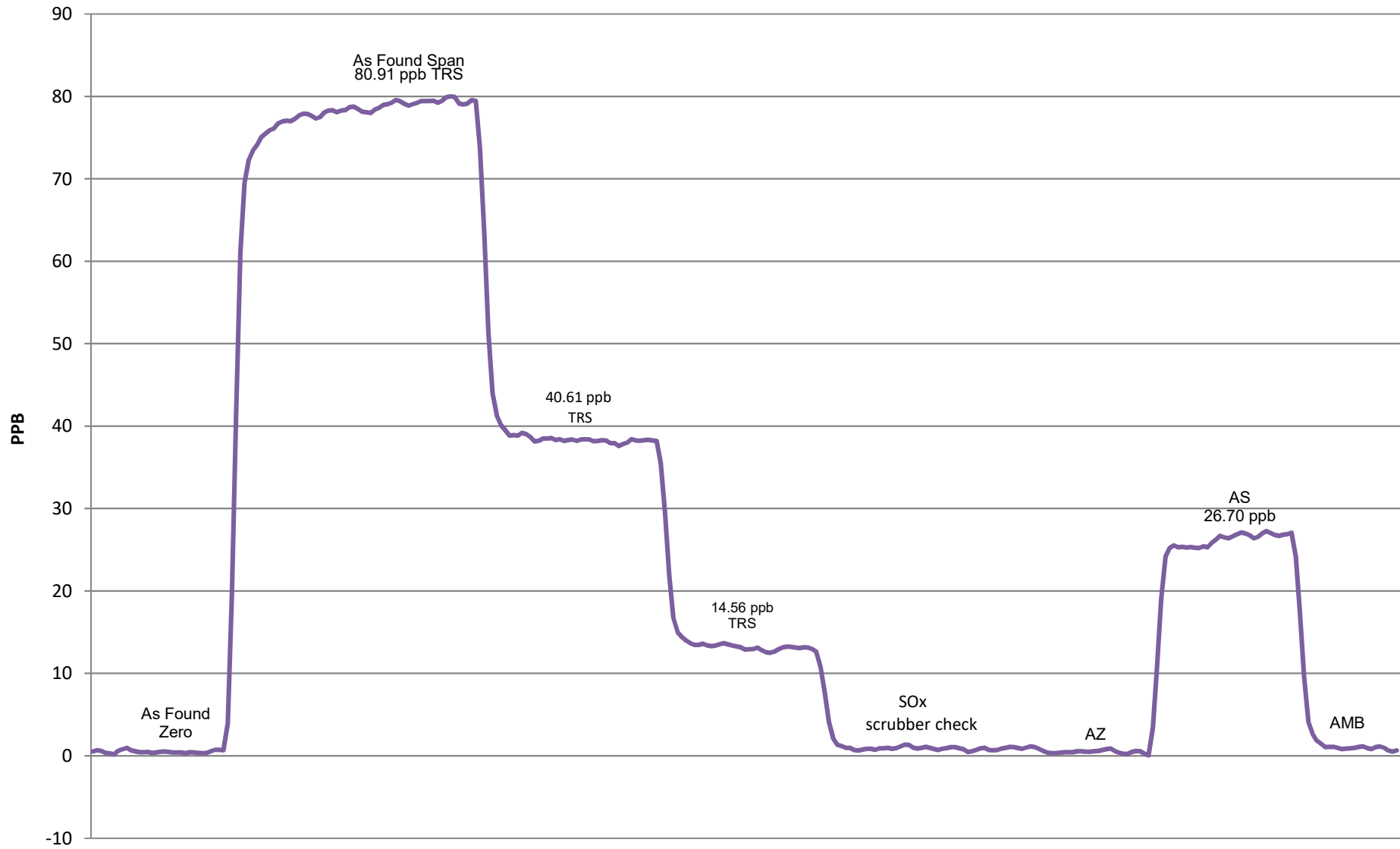
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.000                               | 0.418                              | N/A                       | Correlation Coefficient | 0.999178 |
| 80.908                              | 79.380                             | 1.0193                    |                         |          |
| 40.605                              | 38.172                             | 1.0637                    |                         |          |
| 14.562                              | 13.009                             | 1.1193                    | Slope                   | 1.018511 |
|                                     |                                    |                           | Intercept               | 0.667790 |

### TRS Calibration Curve



## TRS Calibration



December 6, 2016

# SHARP 5030 PM2.5 Calibration



STATION: Henry Pirker  
 LOCATION: Muskoseepi park  
 START TIME (MST): 10:55

OPERATOR: Dmytro Dolotii  
 DATE: December 20 2016  
 END TIME (MST): 15:45:00 PM

## MONITOR INFO / PARAMETER VALUES:

Make/Model SHARP 5030  
 Configuration PM 2.5  
 Serial Number AMU 1860

Audit Device Model Delta cal  
 Audit Device S/N AMU 1789  
 Certification Date 01-Oct-15

## AUDIT / CALIBRATION RESULTS:

|               |                      | Ambient Temp.<br>( <sup>o</sup> C) | Ambient Pres.<br>(mbar) | Leak Check<br>(L/min) | Flow Rate<br>(lpm) | Time settings<br>(hh:mm) |
|---------------|----------------------|------------------------------------|-------------------------|-----------------------|--------------------|--------------------------|
| As Found Data | Audit values (I)     | -3.1                               | 912                     | 16.70                 | 16.67              | 16:25 PM                 |
|               | MEASURED ( AF )      | -3.9                               | 914                     | 16.70                 | 16.80              | 16:24 PM                 |
|               | AF Difference (AF-I) | -0.8                               | 2                       | 0.00                  | 0.13               | 0:01                     |
| Adjusted Data | MEASURED ( M )       | -3.9                               | 914                     | 16.70                 | 16.80              | 16:24 PM                 |
|               | Adj Difference (M-I) | -0.8                               | 2                       | 0.00                  | 0.13               | 0:01                     |
|               | LIMITS               | ± 4.0 <sup>o</sup> C               | 6.7 mbar                | 1.0 L/min             | ± 1.0 L/min        | ±2 min                   |

Sample Head Inspect/Cleaning: Cleaned sample head

Status of sampling tape: 65% full

Nozzle Inspection / cleanliness: \_\_\_\_\_

COMMENTS: \_\_\_\_\_

Foil calibration Old value 6904 New value 7017

Nephelometer zero. Analog as found = 1.7 Aduusted value: 0.1

# Calibration Report



Parameter SO<sub>2</sub>

Air Monitoring Network PAZA

## Station Information

|                       |                 |                      |                 |
|-----------------------|-----------------|----------------------|-----------------|
| Calibration Date      | December 7 2016 | Previous Calibration | November 9 2016 |
| Station Number        | 2               | Station Location     | Evergreen Park  |
| Reason:               | <b>Routine</b>  | Install              | Removal         |
|                       |                 |                      | Other:          |
| Start Time (MST)      | 12:36           | End Time (MST)       | 14:15:00 PM     |
| Barometric Pressure   | 0.926 ATM       | Station Temperature  | 18.0 Deg C      |
| Calibrator            | EnviroNics      | Serial Number        | 6586            |
| Cal Gas Concentration | 49.7 ppm        | Cal Gas Expiry Date  | 10/5/2018       |
| Correction factor     | 0.031694        | Cal Gas Cylinder #   | LL103793        |
| DACS make             | CR3000          | DACS serial No.      | 5236            |
| DACS voltage range    | 0 - 5 volt      | DACS channel #       | 6               |
|                       | Before          |                      | After           |
| Calculated slope      | 0.992389        | Calculated slope     | 1.006556        |
| Calculated intercept  | 0.687464        | Calculated intercept | 0.489541        |
| Analyzer make         | Teco 43i        | Analyzer serial #    | 701120008       |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 500 | ppb   | 0 - 500 | ppb   |
| Background          | 11.4    |       | 11.4    |       |
| coefficient         | 1.224   |       | 1.224   |       |
| Lamp Voltage        | 834     | volts | 834     | volts |
| Chamber Temp        | 45      | Deg C | 45      | Deg C |
| Perm Gas Temp       | 45      | Deg C | 45      | Deg C |
| Pressure            | 686.8   | mm Hg | 685.2   | mm Hg |
| Sample Flow         | 0.453   | ccm   | 0.465   | ccm   |
| Lamp Intensity      | 89      | %     | 89      | %     |

| Dilution air flow rate (cc/min) | Corrected gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4996                            | 0.0                              | 0.00                                | 0.8                                | N/A                       |
| 4998                            | 39.95                            | 394.1                               | 391.5                              | 1.0066                    |
| 4998                            | 19.96                            | 197.7                               | 195.7                              | 1.0101                    |
| 4997                            | 9.99                             | 99.2                                | 96.5                               | 1.0273                    |
|                                 |                                  |                                     |                                    |                           |
| 4996                            | 0.0                              | 0.0                                 | 0.8                                | As Found Zero             |
| 4996                            | 39.93                            | 394.1                               | 391.5                              | As Found Span             |
| Average Correction Factor       |                                  |                                     |                                    | 1.0147                    |

Calculated value of As Found Response: 388.493 ppm Percent Change of As Found: 1.4%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.6                | ppm | 0.8               | ppm |
| Auto span | 257.7              | ppm | 247.9             | ppm |

Notes: No adjustments made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



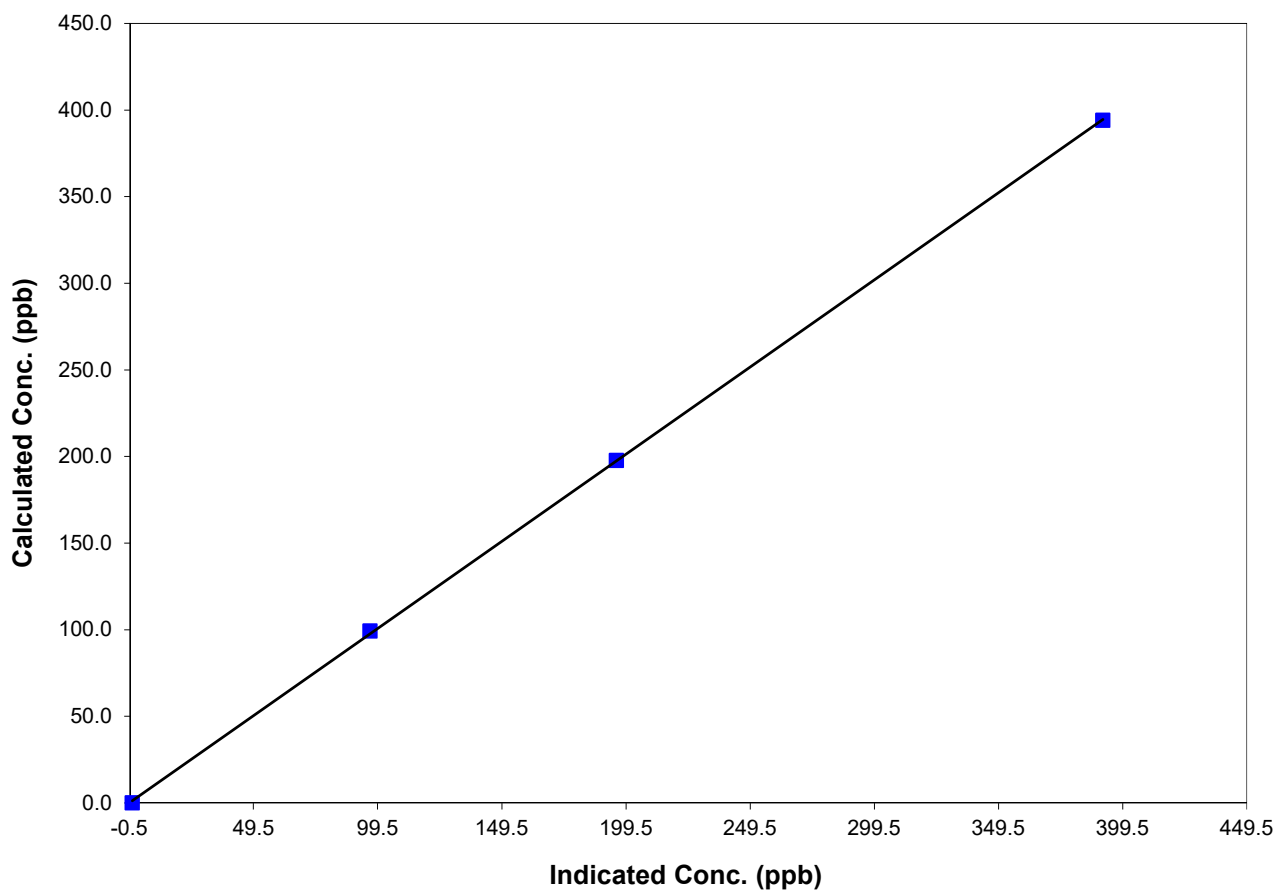
### Station Information

|                     |                 |                      |                 |
|---------------------|-----------------|----------------------|-----------------|
| Calibration Date    | December 7 2016 | Previous Calibration | November 9 2016 |
| Station Number      | 2               | Station Location     | Evergreen Park  |
| Start Time (MST)    | 12:36           | End Time (MST)       | 14:15:00 PM     |
| Analyzer make/model | Teco 43i        | Analyzer serial #    | 701120008       |

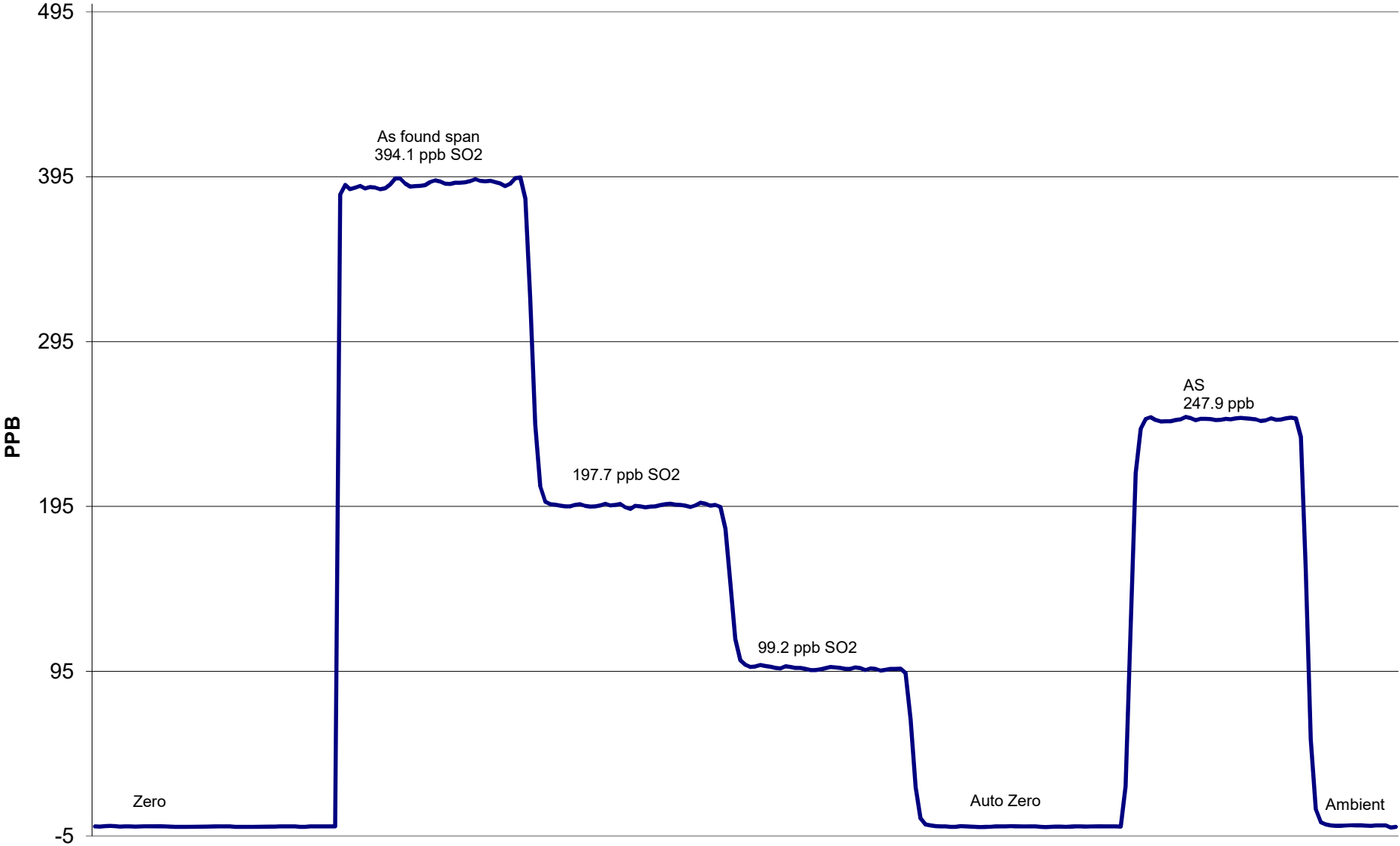
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                                 | 0.8                                | N/A                       | Correlation Coefficient | 0.999952 |
| 394.1                               | 391.5                              | 1.0066                    |                         |          |
| 197.7                               | 195.7                              | 1.0101                    |                         |          |
| 99.2                                | 96.5                               | 1.0273                    | Slope                   | 1.006556 |
|                                     |                                    |                           | Intercept               | 0.489541 |

### SO2 Calibration Curve



SO2 Calibration



December 7 2016

# Calibration Report



Parameter TRS

Air Monitoring Network PAZA

## Station Information

|                      |                 |                      |                 |
|----------------------|-----------------|----------------------|-----------------|
| Calibration Date     | December 7 2016 | Previous Calibration | November 9 2016 |
| Station Number       | 2               | Station Location     | Evergreen Park  |
| Reason:              | <b>Routine</b>  | Install              | Removal         |
|                      |                 |                      | Other:          |
| Start Time (MST)     | 10:45           | End Time (MST)       | 13:45:00 PM     |
| Barometric Pressure  | 0.926 ATM       | Station Temperature  | 18.0 Deg C      |
| Calibrator           | Envionics       | Serial Number        | 6586            |
| Cal Gas Conc         | 10.2 ppm        | Cal Gas Expiry Date  | 7/8/2016        |
| Correction factor    | 0.031694        | Cal Gas Cylinder #   | LL110781        |
| DACS make            | CR3000          | DACS serial No.      | 5236            |
| DACS voltage range   | 0 - 5 volt      | DACS channel #       | 5               |
|                      | Before          |                      | After           |
| Calculated slope     | 0.992602        | Calculated slope     | 1.000849        |
| Calculated intercept | 0.301230        | Calculated intercept | 0.412529        |

Analyzer make TEI Model 43C Analyzer serial # 3.199E+13

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 100 | ppb   | 0 - 100 | ppb   |
| Background          | 15.9    | ppb   | 15.2    | ppb   |
| coefficient         | 0.986   |       | 0.940   |       |
| Lamp Voltage        | 1018    | volts | 1018    | volts |
| Chamber Temp        | 44.1    | Deg C | 44.1    | Deg C |
| Perm Gas Temp       | 44.99   | Deg C | 45      | Deg C |
| Pressure            | 670.5   | mm Hg | 670.4   | mm Hg |
| Sample Flow         | 0.513   | ccm   | 0.523   | ccm   |
| Lamp Intensity      | 36,714  | mv    | 36,826  | mv    |

| Dilution air flow rate (cc/min) | Corrected gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4996                            | 0.00                             | 0.00                                | -0.2                               | N/A                       |
| 4993                            | 39.97                            | 81.00                               | 80.7                               | 1.0040                    |
| 4995                            | 19.97                            | 40.62                               | 39.9                               | 1.0187                    |
| 6997                            | 9.88                             | 14.38                               | 13.9                               | 1.0330                    |
| 4999                            | 9.98                             |                                     | 3.3                                | Sox Test                  |
| 4996                            | 0.00                             | 0.00                                | -0.2                               | As Found Zero             |
| 4996                            | 39.93                            | 80.88                               | 84.7                               | As Found Span             |
| Average Correction Factor       |                                  |                                     |                                    | 1.0186                    |

Calculated value of As Found Response: 84.64 ppm Percent Change of As Found: **-4.7%**

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | -0.3               | ppm | -0.2              | ppm |
| Auto span | 78.5               | ppm | 76.1              | ppm |

Notes: Span adjustment made  
Sox scrubber check performed

Calibration Performed By: Dmytro Dolotii



## Calibration Summary

Parameter TRS

Air Monitoring Network PAZA



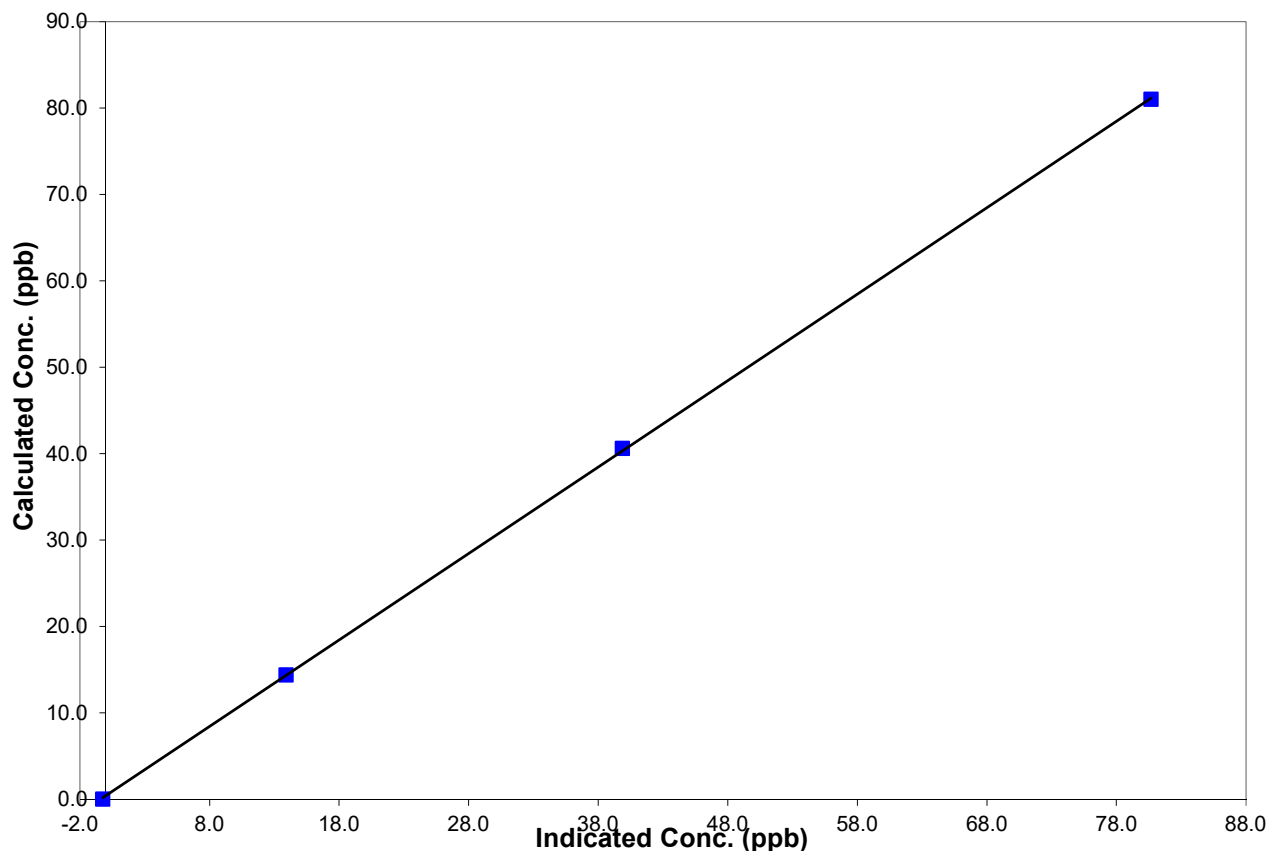
### Station Information

|                     |                 |                      |                 |
|---------------------|-----------------|----------------------|-----------------|
| Calibration Date    | December 7 2016 | Previous Calibration | November 9 2016 |
| Station Number      | 2               | Station Location     | Evergreen Park  |
| Start Time (MST)    | 10:45           | End Time (MST)       | 13:45:00 PM     |
| Analyzer make/model | TEI Model 43C   | Analyzer serial #    | 31990000000491  |

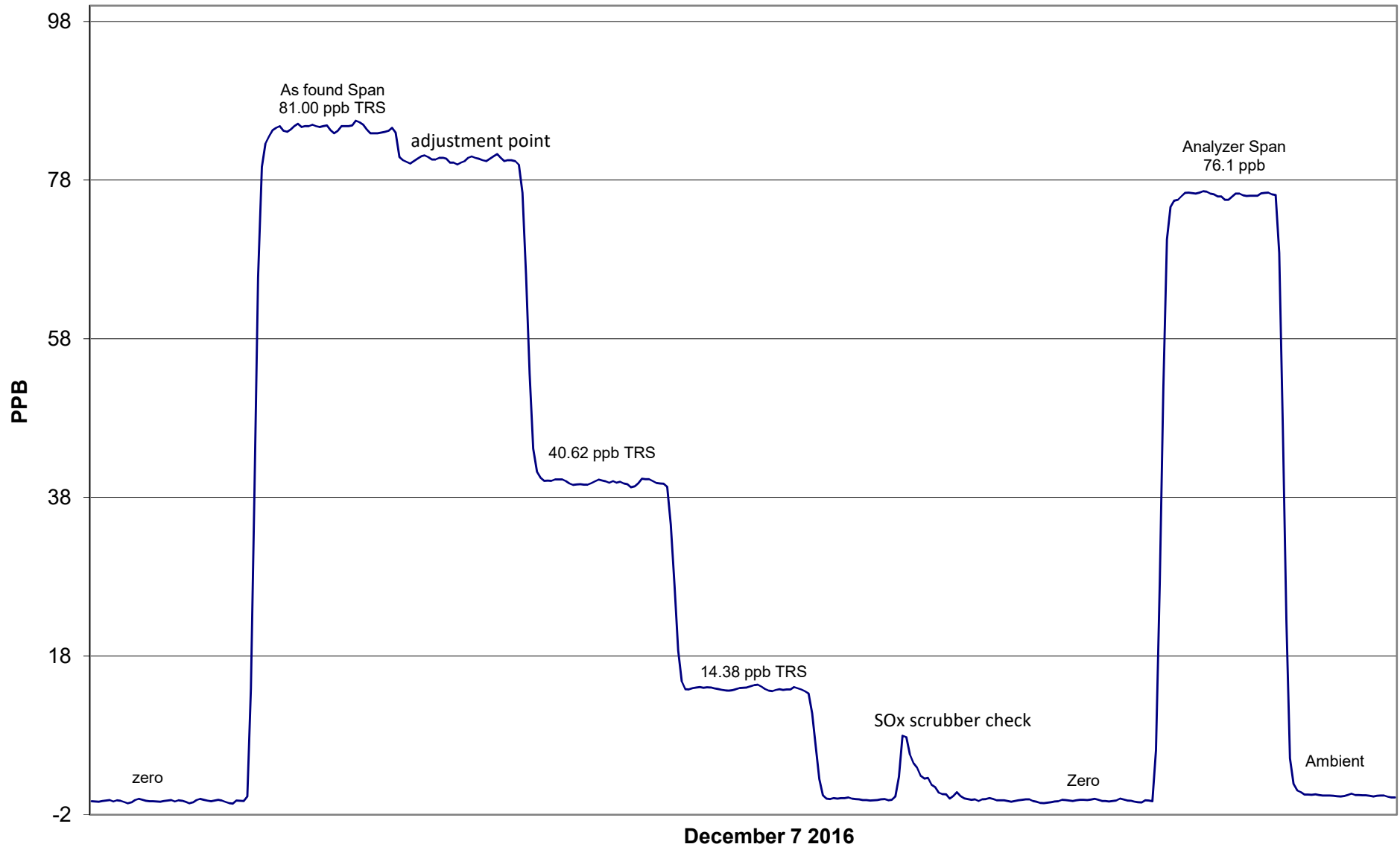
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                                 | -0.2                               | N/A                       | Correlation Coefficient | 0.999961 |
| 81.0                                | 80.7                               | 1.0040                    |                         |          |
| 40.6                                | 39.9                               | 1.0187                    |                         |          |
| 14.4                                | 13.9                               | 1.0330                    | Slope                   | 1.000849 |
|                                     |                                    |                           | Intercept               | 0.412529 |

### TRS Calibration Curve



## TRS Calibration



# AB TEOM PM2.5 Calibration



STATION: Evergreen Park  
 LOCATION: PAZA - Grande Prairie

OPERATOR: Grover Christiansen/Dmytro  
 DATE: 7-Dec-16

## MONITOR INFO / PARAMETER VALUES:

|                                  |             |
|----------------------------------|-------------|
| Make/Model                       | TEOM AB     |
| Configuration                    | PM2.5       |
| Serial Number                    | 24634       |
| Site Number                      | 2           |
| Inlet Type                       | PM 10 / SCC |
| FAdj. Main Setting               | 1.000       |
| FAdj. Aux. Setting               | 1.000       |
| T-Case Indicated / Set Point     | 40/40       |
| T-Air Indicated / Set Point      | 40/40       |
| T-Cap Indicated / Set Point      | 40/40       |
| Splitter Assembly Alignment (cm) | 15.5        |

( vs. specified depth of 15.5 cm from top of flow tube to top of concentric 1/2 in. tube )

## RECENT CALIBRATION AND AUDIT HISTORY

|                      |     |
|----------------------|-----|
| Previous Audit       |     |
| Previous Calibration | N/A |

|                       |      |
|-----------------------|------|
| PUMP CAPACITY CHECK * | PASS |
|-----------------------|------|

\* capacity test or pump on timed test utilized to verify pump integrity  
 "FAIL" indicates that pump requires service.

| LEAK CHECK    | Indicated Flow (lpm) |                 |
|---------------|----------------------|-----------------|
|               | Main                 | Auxiliary       |
| PUMP ON       | 0.003                | 0.050           |
| PUMP OFF      | 0.000                | 0.010           |
| NET           | 0.003                | 0.040           |
| <b>LIMITS</b> | <b>&lt;0.15</b>      | <b>&lt;0.60</b> |

|                  | Ambient Temp.<br>( <sup>o</sup> C ) | Ambient Pres.<br>(atm) | Ko *             | Bypass flow<br>(lpm) | Sample flow<br>(lpm) |
|------------------|-------------------------------------|------------------------|------------------|----------------------|----------------------|
| SET POINT ( S )  | na                                  | na                     | 16147            | 13.67                | 3.000                |
| INDICATED ( I )  | 18.5                                | 0.929                  | <del>16147</del> | 13.69                | 3.000                |
| MEASURED ( AF )  | 19.2                                | 0.927                  | <del>16147</del> | 13.66                | 2.970                |
| MEASURED ( M )   | 19.2                                | 0.927                  | 16250            | 13.66                | 2.970                |
| DIFFERENCE (M-I) | 0.7                                 | -0.002                 | 0.6%             | -0.01                | -0.03                |
| <b>LIMITS</b>    | <b>± 2<sup>o</sup> C</b>            | <b>± 0.005 atm</b>     | <b>± 2.5 %</b>   | <b>± 1.0 L/min</b>   | <b>± 0.2 L/min</b>   |

As Found Data  
 Adjusted Data

Ko Audit Filter data      Weight: 0.11014      Serial #: CVK 2123

COMMENTS:    Pass.  
Control unit replaced  
   
   
 

Sample Head Inspection/Cleaning:      Large In Line Filter Inspection & Or Cleaning:

# Calibration Report



Parameter SO<sub>2</sub>

Air Monitoring Network PAZA

## Station Information

|                       |                                             |                                  |                                  |
|-----------------------|---------------------------------------------|----------------------------------|----------------------------------|
| Calibration Date      | December 15, 2016                           | Previous Calibration             | November 18, 2016                |
| Station Number        | 3                                           | Station Location                 | Smokey Heights                   |
| Reason:               | <input checked="" type="checkbox"/> Routine | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                       |                                             | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)      | 11:00                                       | End Time (MST)                   | 13:45:00 PM                      |
| Barometric Pressure   | 0.930 ATM                                   | Station Temperature              | 20.0 Deg C                       |
| Calibrator            | EnviroNics                                  | Serial Number                    | 3474                             |
| Cal Gas Concentration | 49.7 ppm                                    | Cal Gas Cert Date                | 11/5/2018                        |
| Correction factor     | 0.031613                                    | Cal Gas Cylinder #               | LL103793                         |
| DACS make             | CR3000                                      | DACS serial No.                  | 5238                             |
| DACS voltage range    | 0 - 5 volt                                  | DACS channel #                   | 6                                |
|                       | Before                                      |                                  | After                            |
| Calculated slope      | 0.986998                                    | Calculated slope                 | 1.016099                         |
| Calculated intercept  | -0.095355                                   | Calculated intercept             | -0.030757                        |
| Analyzer make         | Teco 43i                                    | Analyzer serial #                | 701120009                        |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 500 | ppb   | 0 - 500 | ppb   |
| Background          | 12.7    |       | 12.7    |       |
| coefficient         | 0.939   |       | 0.939   |       |
| Lamp Voltage        | 950     | volts | 949     | volts |
| Chamber Temp        | 45      | Deg C | 45      | Deg C |
| Perm Gas Temp       | 44.9    | Deg C | 45      | Deg C |
| Pressure            | 66.2    | mm Hg | 679.5   | mm Hg |
| Sample Flow         | 0.447   | lpm   | 0.451   | lpm   |
| Lamp Intensity      | 87      | %     | 88      | %     |

| Dilution air flow rate (cc/min) | Corrected gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4996                            | 0.0                              | 0.00                                | 1.2                                | N/A                       |
| 4998                            | 39.92                            | 393.82                              | 388.1                              | 1.0147                    |
| 4996                            | 19.95                            | 197.67                              | 194.2                              | 1.0180                    |
| 4991                            | 9.98                             | 99.18                               | 96.3                               | 1.0298                    |
|                                 |                                  |                                     |                                    |                           |
| 4996                            | 0.0                              | 0.00                                | 1.2                                | As Found Zero             |
| 4998                            | 39.92                            | 393.82                              | 388.1                              | As Found Span             |
| Average Correction Factor       |                                  |                                     |                                    | 1.0208                    |

Calculated value of As Found Response: 381.777 ppm Percent Change of As Found: 3.1%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 1.0                | ppb | 1.2               | ppb |
| Auto span | 207.7              | ppb | 202.9             | ppb |

Notes: No adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



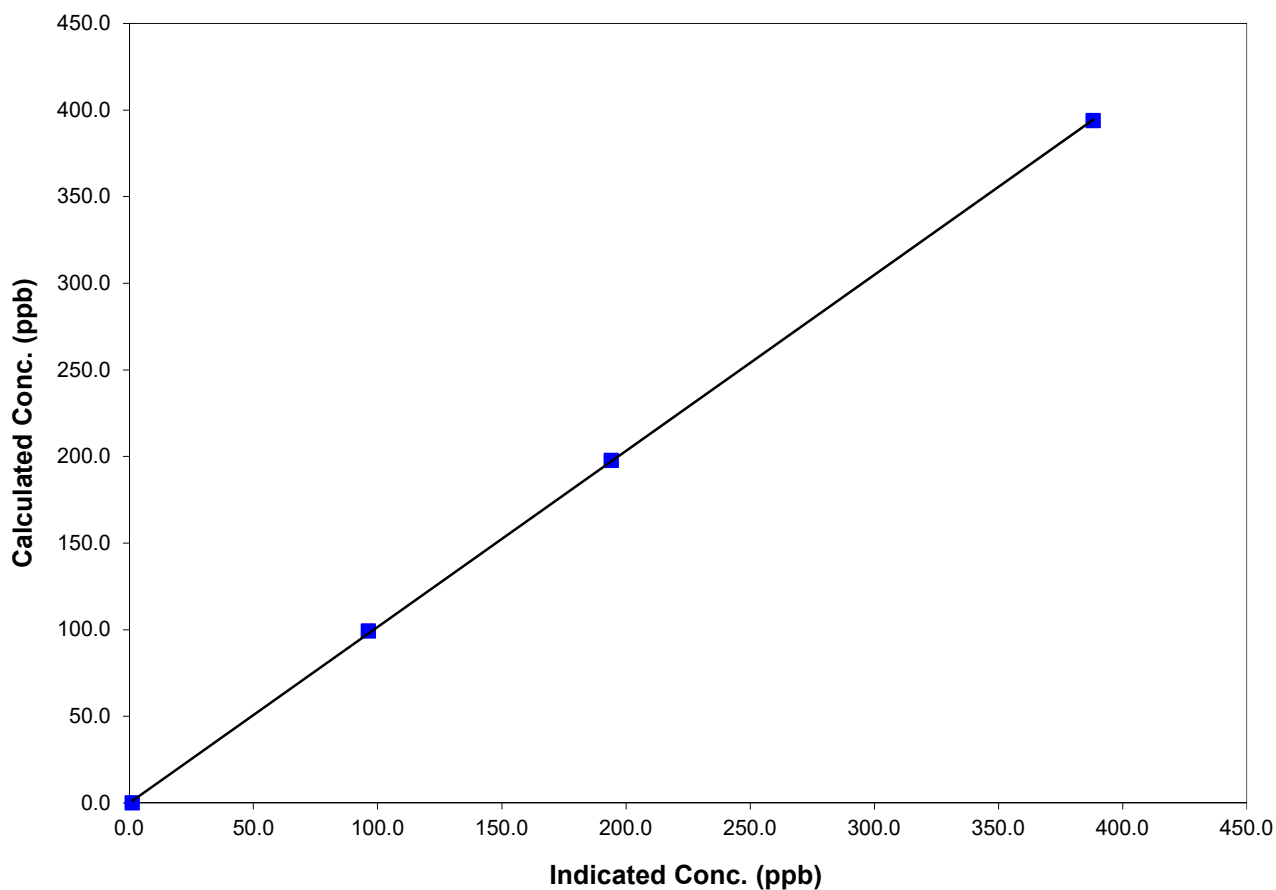
### Station Information

|                     |                   |                      |                   |
|---------------------|-------------------|----------------------|-------------------|
| Calibration Date    | December 15, 2016 | Previous Calibration | November 18, 2016 |
| Station Number      | 3                 | Station Location     | Smokey Heights    |
| Start Time (MST)    | 11:00             | End Time (MST)       | 13:45:00 PM       |
| Analyzer make/model | Teco 43i          | Analyzer serial #    | 701120009         |

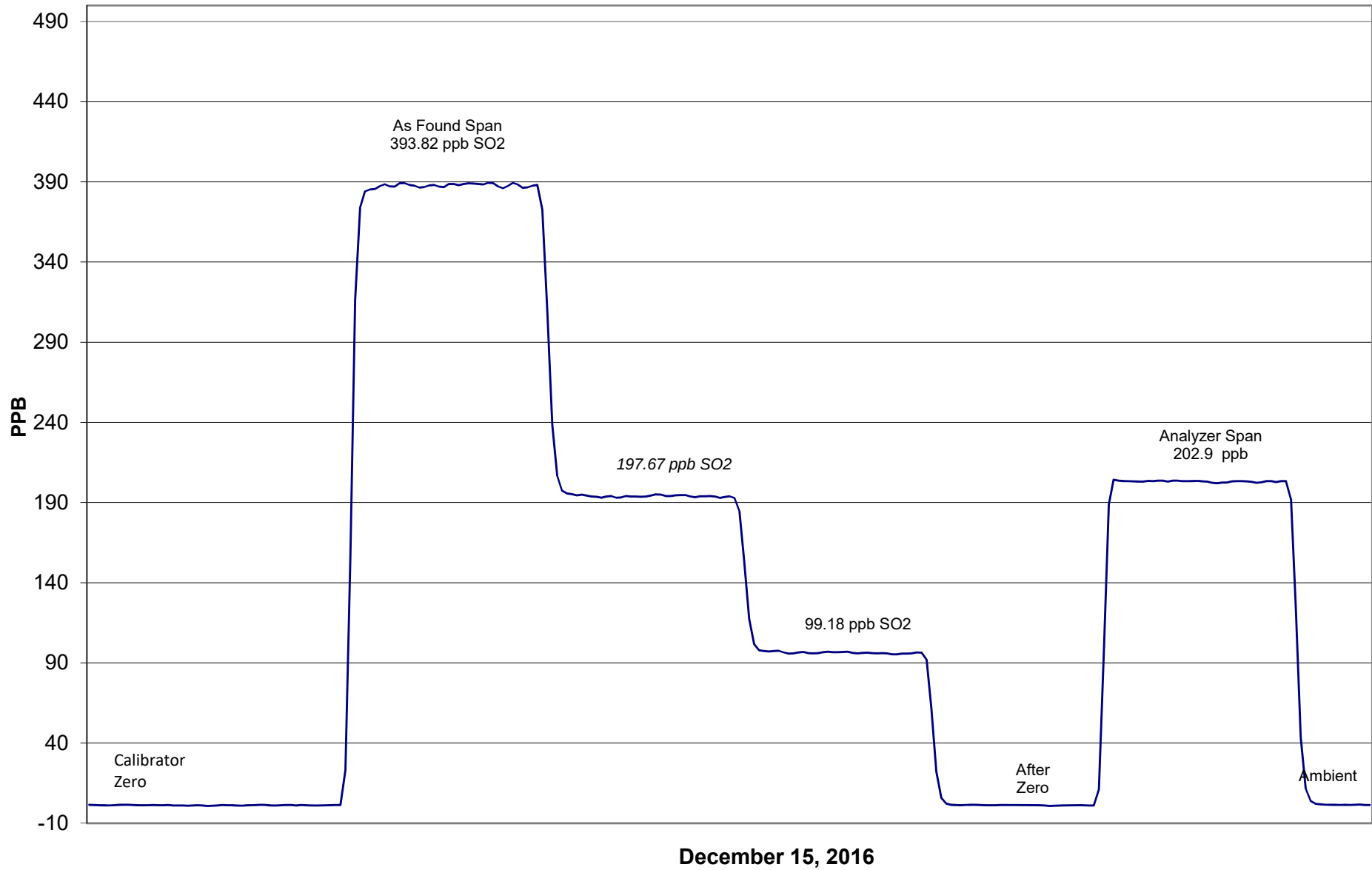
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 1.2                                | N/A                       | Correlation Coefficient | 0.999956  |
| 393.8                               | 388.1                              | 1.0147                    |                         |           |
| 197.7                               | 194.2                              | 1.0180                    |                         |           |
| 99.2                                | 96.3                               | 1.0298                    | Slope                   | 1.016099  |
|                                     |                                    |                           | Intercept               | -0.030757 |

### SO2 Calibration Curve



## Smokey Heights SO<sub>2</sub> Calibration



# Calibration Report



Parameter TRS

Air Monitoring Network PAZA

## Station Information

|                      |                   |         |                      |                   |       |
|----------------------|-------------------|---------|----------------------|-------------------|-------|
| Calibration Date     | December 15, 2016 |         | Previous Calibration | November 18, 2016 |       |
| Station Number       | 3                 |         | Station Location     | Smokey Heights    |       |
| Reason:              | <b>Routine</b>    | Install | Removal              | Other:            |       |
| Start Time (MST)     | 10:20             |         | End Time (MST)       | 12:50             |       |
| Barometric Pressure  | 0.921             | ATM     | Station Temperature  | 20.0              | Deg C |
| Calibrator           | Envionics         |         | Serial Number        | 3474              |       |
| Cal Gas Conc         | 10.2              | ppm     | Cal Gas Expiry Date  | 7/8/2016          |       |
| Correction factor    | 0.031307          |         | Cal Gas Cylinder #   | BLM00586          |       |
| DACS make            | CR3000            |         | DACS serial No.      | 5238              |       |
| DACS voltage range   | 0 - 5 volt        |         | DACS channel #       | 5                 |       |
|                      | <u>Before</u>     |         |                      | <u>After</u>      |       |
| Calculated slope     | 0.976317          |         | Calculated slope     | 0.993791          |       |
| Calculated intercept | 0.601467          |         | Calculated intercept | -0.108640         |       |

Analyzer make TEI Model 43I APSAA Analyzer serial # 1153630151

|                     | before |       | after |       |
|---------------------|--------|-------|-------|-------|
| Concentration range | 100    | ppb   | 100   | ppb   |
| Background          | 14.3   | ppb   | 14.4  | ppb   |
| coefficient         | 0.949  |       | 0.949 |       |
| Lamp Voltage        | 807    | volts | 809   | volts |
| Chamber Temp        | 45.3   | Deg C | 45    | Deg C |
| Perm Gas Temp       | 44.9   | Deg C | 45    | Deg C |
| Pressure            | 681.1  | mm Hg | 681.1 | mm Hg |
| Sample Flow         | 0.427  | lpm   | 0.427 | lpm   |
| Lamp Intensity      | 91     | mv    | 90    | mv    |

| Dilution air flow rate (cc/min) | Corrected gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4990                            | 0.0                              | 0.00                                | 0.4                                | N/A                       |
| 4987                            | 39.85                            | 80.86                               | 81.7                               | 0.9900                    |
| 4988                            | 19.91                            | 40.55                               | 40.6                               | 0.9993                    |
| 6991                            | 9.92                             | 14.45                               | 14.5                               | 0.9997                    |
| 4990                            | 9.92                             |                                     | 2.6                                | Sox test                  |
| 4990                            | 0.0                              | 0.00                                | 0.4                                | As Found Zero             |
| 4987                            | 39.85                            | 80.86                               | 81.7                               | As Found Span             |
| Average Correction Factor       |                                  |                                     |                                    | 0.9963                    |

Calculated value of As Found Response: 79.91 ppm Percent Change of As Found: 1.2%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | -0.1               | ppm | 0.7               | ppm |
| Auto span | 67.3               | ppm | 67.8              | ppm |

Notes: No adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter TRS

Air Monitoring Network PAZA



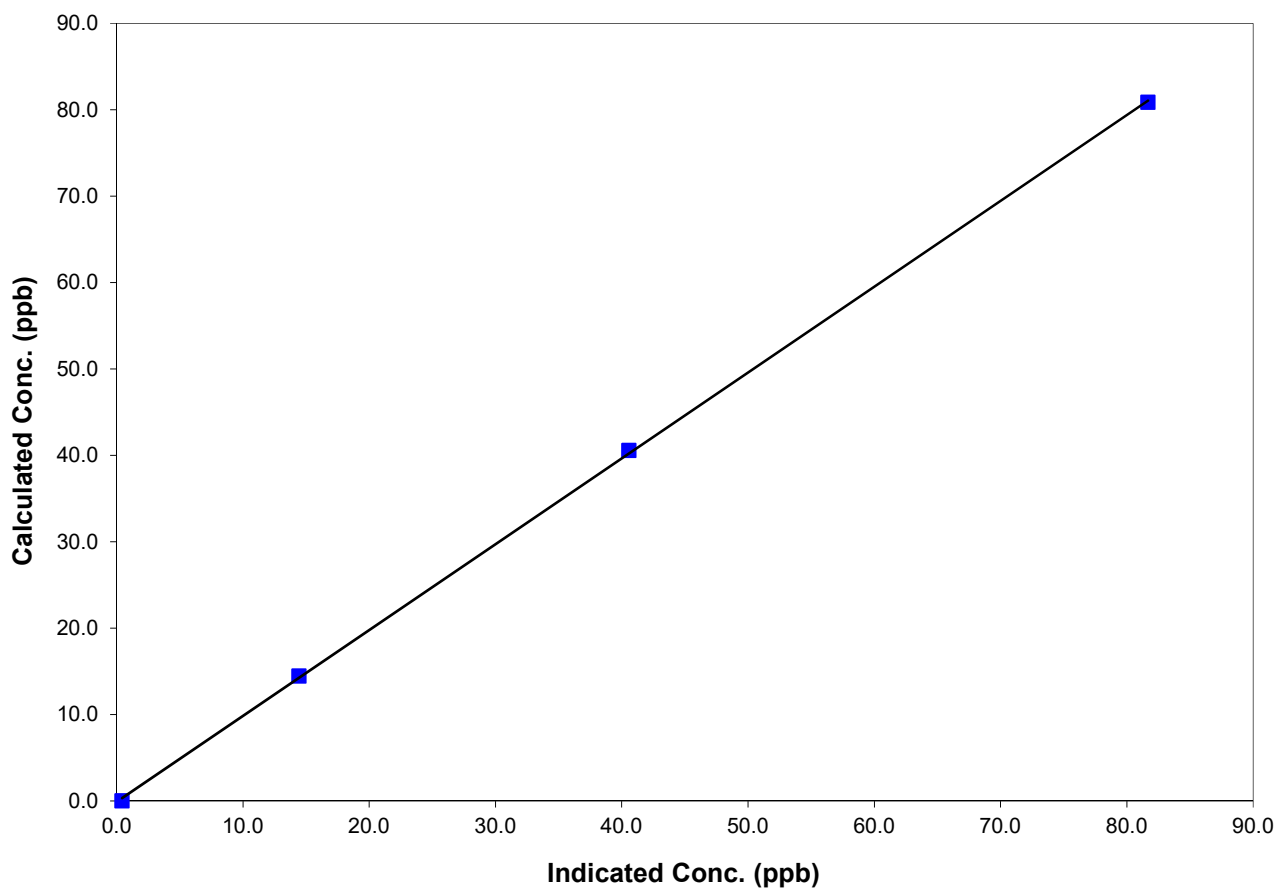
### Station Information

|                     |                     |                      |                   |
|---------------------|---------------------|----------------------|-------------------|
| Calibration Date    | December 15, 2016   | Previous Calibration | November 18, 2016 |
| Station Number      | 3                   | Station Location     | Smokey Heights    |
| Start Time (MST)    | 10:20               | End Time (MST)       | 12:50             |
| Analyzer make/model | TEI Model 43I APSAA | Analyzer serial #    | 1153630151        |

### Calibration Data

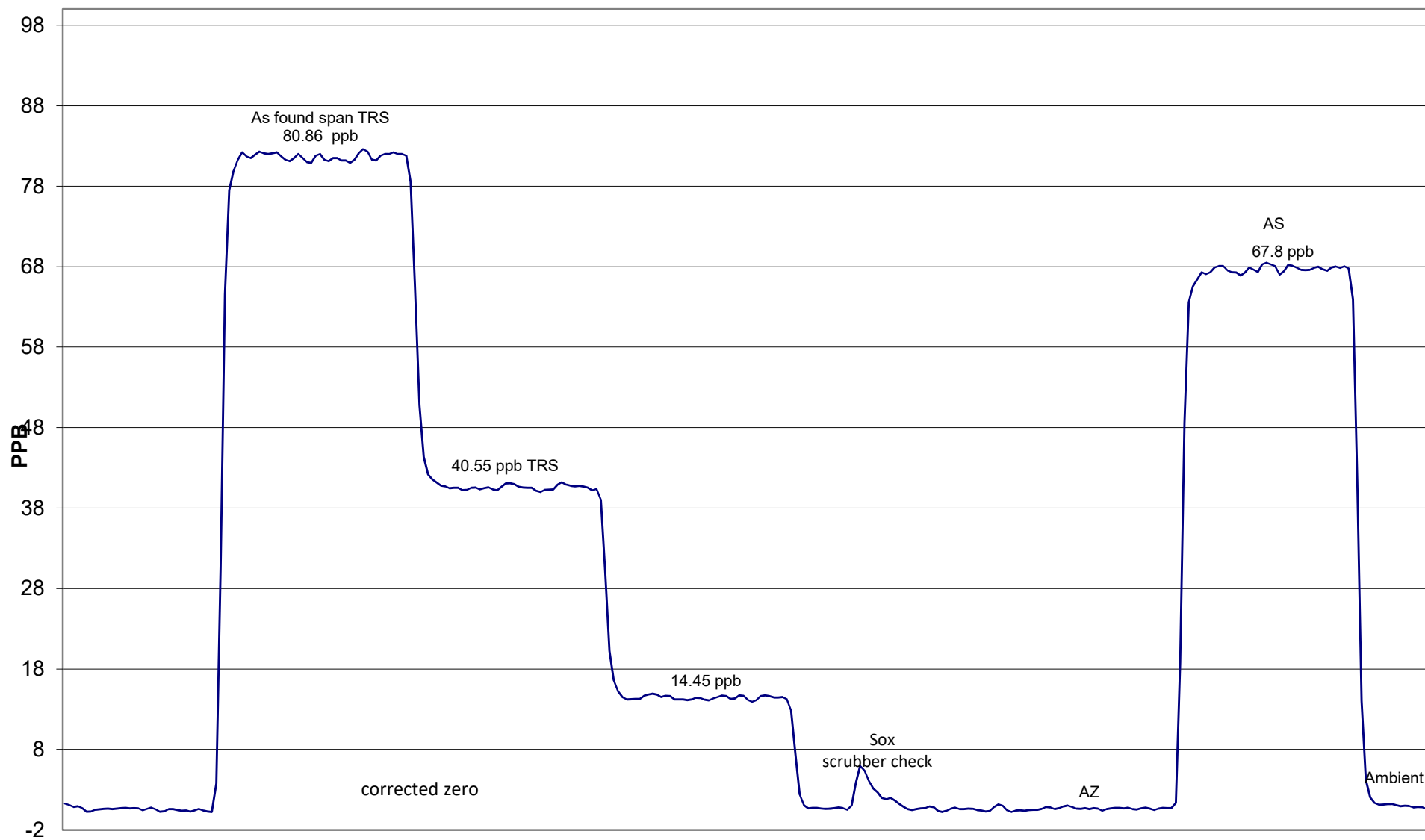
| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.4                                | N/A                       | Correlation Coefficient | 0.999922  |
| 80.9                                | 81.7                               | 0.9900                    |                         |           |
| 40.6                                | 40.6                               | 0.9993                    |                         |           |
| 14.5                                | 14.5                               | 0.9997                    | Slope                   | 0.993791  |
|                                     |                                    |                           | Intercept               | -0.108640 |

### TRS Calibration Curve





## Smokey Heights TRS Calibration



December 15, 2016

# SHARP 5030 PM2.5 Calibration



STATION: Smokey Heights  
LOCATION: Smokey Heights  
START TIME (MST): 10:20

OPERATOR: Grover Christiansen  
DATE: December 15 2016  
END TIME (MST): 15:25:PM

## MONITOR INFO / PARAMETER VALUES:

Make/Model SHARP 5030  
Configuration PM 2.5  
Serial Number CM-0271

Audit Device Model Delta cal  
Audit Device S/N AMU 2024  
Certification Date 16-May-15

## AUDIT / CALIBRATION RESULTS:

|               |                      | Ambient Temp.<br>( <sup>o</sup> C) | Ambient Pres.<br>(mm/HG) | Leak Check<br>(L/min) | Flow Rate<br>(lpm) | Time settings<br>(hh:mm) |
|---------------|----------------------|------------------------------------|--------------------------|-----------------------|--------------------|--------------------------|
| As Found Data | Audit values (I)     | -16.6                              | 914                      | 16.67                 | 16.67              | 13:01:00 PM              |
|               | MEASURED ( AF )      | -15.9                              | 912                      | 16.66                 | 16.80              | 13:00:00 PM              |
|               | AF Difference (AF-I) | 0.7                                | -2                       | 0.01                  | 0.13               |                          |
| Adjusted Data | MEASURED ( M )       | -16.6                              | 912                      | 16.66                 | 16.80              | 13:00:00 PM              |
|               | Adj Difference (M-I) | 0.0                                | -2                       | -0.01                 | 0.13               | 0:01                     |
|               | LIMITS               | ± 4.0 <sup>o</sup> C               | 6.7 mbar                 | 1.0 L/min             | ± 1.0 L/min        | ±2 min                   |

Sample Head Inspect/Cleaning: Cleaned sample head

Status of sampling tape: 90% full

Nozzle Inspection / cleanliness: Good

COMMENTS:

Foil calibration Old value 7079 New value 7006

Nephelometer zero. Analog as found = 1.2 After adjustment=-0.1

# Calibration Report

Parameter SO2  
Air Monitoring Network

PAZA



## Station Information

|                       |                   |                      |                   |
|-----------------------|-------------------|----------------------|-------------------|
| Calibration Date      | December 14, 2016 | Previous Calibration | November 16, 2016 |
| Station Number        | 4                 | Station Location     | Beaverlodge       |
| Reason:               | <b>Routine</b>    | Install              | Removal           |
| Start Time (MST)      | 14:11:00 PM       | End Time (MST)       | 16:10:00 PM       |
| Barometric Pressure   | 0.928 atm         | Station Temperature  | 20.0 Deg C        |
| Calibrator            | Envionics         | Serial Number        | 3474              |
| Cal Gas Concentration | 10.5 ppm          | Cal Gas Expiry Date  | 1/12/2019         |
| Gas Cert Reference    | FF16108           |                      |                   |
| DACS make             | CR3000            | DACS serial No.      | 5237              |
| DACS voltage range    | 0 - 5 volt        | DACS channel #       | 5                 |
|                       | <u>Before</u>     |                      | <u>After</u>      |
| DACS Scale High       | 100               | DACS slope           | 100               |
| DACS Scale Low        | 0                 | DACS intercept       | 0                 |
| Calculated slope      | 0.993732          | Calculated slope     | 1.008263          |
| Calculated intercept  | -0.439349         | Calculated intercept | -0.320337         |
| Analyzer make         | TEI Model 43i-TLE | Analyzer serial #    | 713021137         |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 100 | ppb   | 0 - 100 | ppb   |
| Background          | 2.54    |       | 2.54    |       |
| Coefficient         | 0.969   |       | 0.969   |       |
| PMT                 | -767.8  | V     | -767.6  | V     |
| UV Lamp Voltage     | 1126    | V     | 1127    | V     |
| Chamber Temp        | 45.1    | Deg C | 45.2    | Deg C |
| Pressure            | 667.9   | mm Hg | 668.2   | mm Hg |
| Sample Flow         | 0.454   | LPM   | 0.462   | LPM   |
| Lamp Intensity      | 96      | %     | 96      | %     |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4989                            | 0.00                          | 0.0                                 | 0.3                                | N/A                       |
| 4989                            | 39.84                         | 83.2                                | 82.9                               | 1.0040                    |
| 4989                            | 19.92                         | 41.8                                | 41.7                               | 1.0025                    |
| 4989                            | 9.91                          | 20.8                                | 21.0                               | 0.9916                    |
| 4989                            | 0.00                          | 0.0                                 | 0.3                                | As found zero             |
| 4989                            | 39.84                         | 83.2                                | 82.9                               | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 0.9994                    |

Calculated value of As Found Response: 81.561 ppm Percent Change of As Found: 2.0%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | -0.2               | ppb | 0.0               | ppb |
| Auto span | 58.9               | ppb | 58.5              | ppb |

Notes: No adjustment made

## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



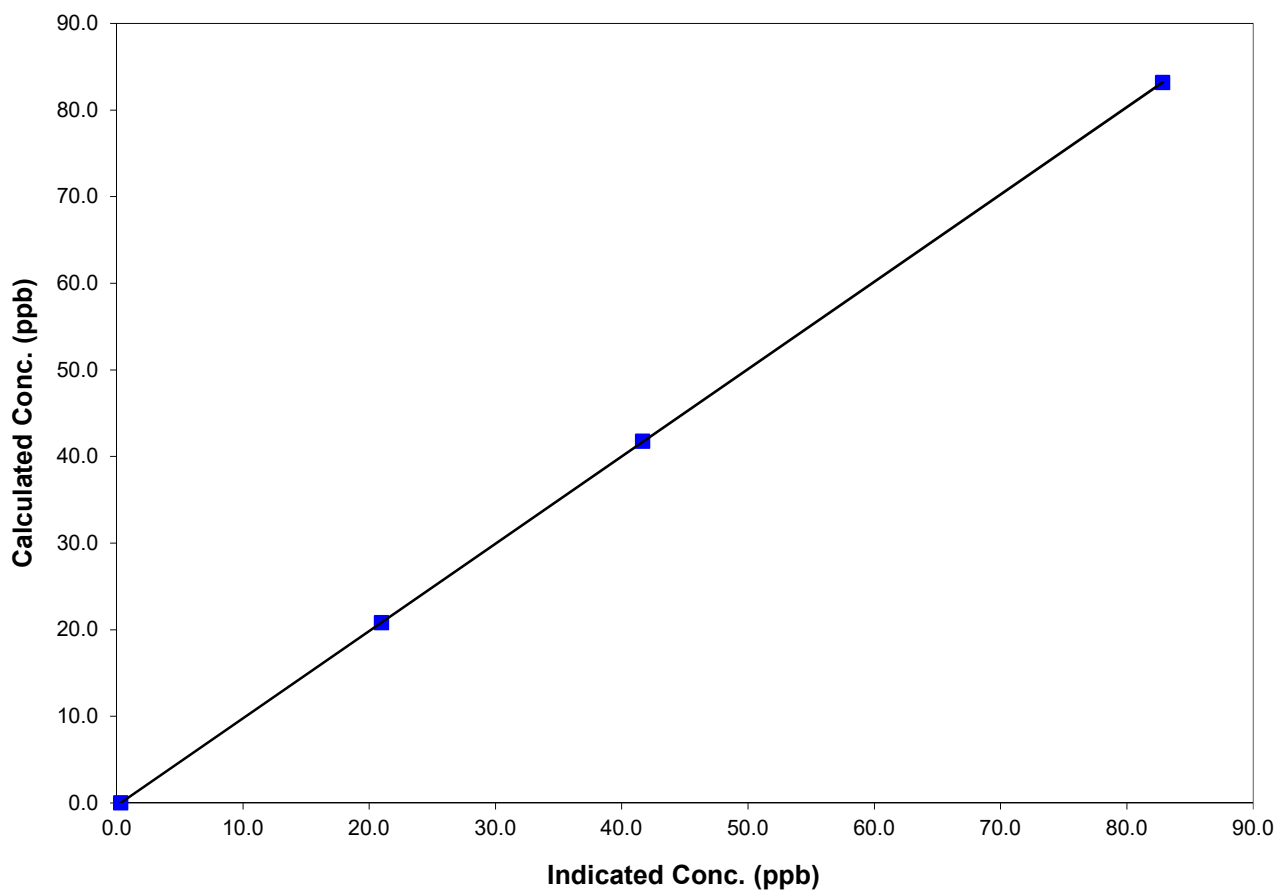
### Station Information

|                     |                   |                      |                   |
|---------------------|-------------------|----------------------|-------------------|
| Calibration Date    | December 14, 2016 | Previous Calibration | November 16, 2016 |
| Station Number      | 4                 | Station Location     | Beaverlodge       |
| Start Time (MST)    | 14:11:00 PM       | End Time (MST)       | 16:10:00 PM       |
| Analyzer make/model | TEI Model 43i-TLE | Analyzer serial #    | 713021137         |

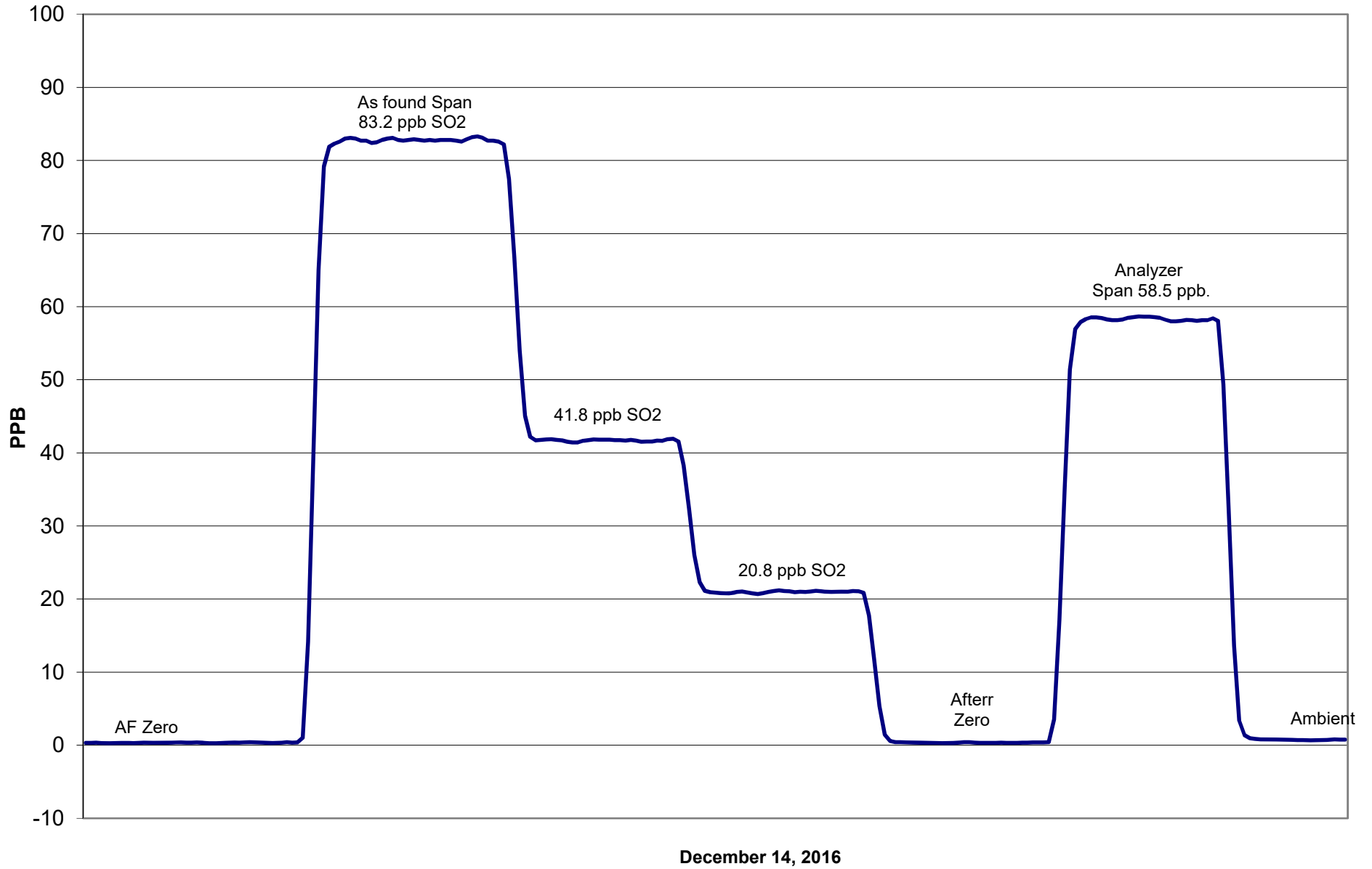
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.3                                | N/A                       | Correlation Coefficient | 0.999998  |
| 83.2                                | 82.9                               | 1.0040                    |                         |           |
| 41.8                                | 41.7                               | 1.0025                    |                         |           |
| 20.8                                | 21.0                               | 0.9916                    | Slope                   | 1.008263  |
|                                     |                                    |                           | Intercept               | -0.320337 |

### SO2 Calibration Curve



## SO2 Calibration



# Calibration Report

Parameter

NO<sub>x</sub>-NO-NO<sub>2</sub>

Air Monitoring Network

PAZA



## Station Information

|                     |                   |              |                      |                   |       |
|---------------------|-------------------|--------------|----------------------|-------------------|-------|
| Calibration Date    | December 14, 2016 |              | Previous Calibration | November 16, 2016 |       |
| Station Number      | 4                 |              | Station Location     | Beaverlodge       |       |
| Reason:             | <b>Routine</b>    | Installation | Removal              | Other:            |       |
| Start Time (MST)    | 10:00             |              | End Time (MST)       | 13:43:00 PM       |       |
| Barometric Pressure | 0.928             | Atm          | Station Temperature  | 20.0              | Deg C |
| Calibrator          | EnviroNics        |              | Serial Number        | 3474              |       |
| NO Cal Gas Conc     | 50.9              | ppm          | Cal Gas Expiry Date  | November 5, 2018  |       |
| NOx Cal Gas Conc    | 51.2              | ppm          | Cal Gas Serial #     | LL103793          |       |

## DACS Information

|           |               |           |                 |           |  |
|-----------|---------------|-----------|-----------------|-----------|--|
| DACS make | CR3000        |           | DACS serial No. | 5237      |  |
|           | Parameter     | NO2       | NOx             | NO        |  |
| Before    | Data Slope    | 0.997798  | 1.008470        | 1.004524  |  |
|           | Data Offset   | -0.536914 | 0.690699        | 1.026034  |  |
| After     | Data Slope    | 1.000980  | 1.006672        | 1.001463  |  |
|           | Data Offset   | -0.012409 | 0.597120        | 1.206290  |  |
|           | Channel #     | 8         | 6               | 7         |  |
|           | Voltage Range | 0 - 5 VDC | 0 - 5 VDC       | 0 - 5 VDC |  |

## Analyzer Information

|                     |         |       |                   |           |  |
|---------------------|---------|-------|-------------------|-----------|--|
| Analyzer make/model | TEI 42i |       | Analyzer serial # | 906535068 |  |
| Test Point          | before  |       | after             |           |  |
| Concentration range | 0-500   | ppb   | 0-500             | ppb       |  |
| NO offset           | 2.8     | mV    | 2.8               | mV        |  |
| NOx bkgnd           | 3.3     | mV    | 3.3               | mV        |  |
| NO coefficient      | 1.168   |       | 1.183             |           |  |
| NOx coefficient     | 0.999   |       | 0.999             |           |  |
| NO2 conv temp       | 324.2   | Deg C | 325.1             | Deg C     |  |
| PMT Temp            | -3.0    | Deg C | -3.0              | Deg C     |  |
| PMT Volt            | -729.6  | mV    | -730.0            | mV        |  |
| R Cell Press        | 184.9   | in Hg | 185.6             | in Hg     |  |
| Sample Flow         | 0.660   | LPM   | 0.659             | LPM       |  |

Notes: Span adjustment made

# Calibration Report

Parameter **NOX-NO-NO2**  
Air Monitoring Network **PAZA**



## Station Information

Calibration Date: December 14, 2016 Station Location: Beaverlodge

## Calibration Data

|                           | Dilution flow rate (ccm) | Source gas flow rate (ccm) | Calculated NOx conc (ppb) | Calculated NO conc (ppb) | Calculated NO2 conc (ppb) | Indicated NOx conc (ppb) | Indicated NO conc (ppb) | Indicated NO2 conc (ppb) | NOx Correction factor | NO Correction factor |
|---------------------------|--------------------------|----------------------------|---------------------------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|-----------------------|----------------------|
| zero                      | 4990                     | 0.00                       | 0.0                       | 0.0                      | 0.0                       | 0.0                      | -0.2                    | 0.0                      | N/A                   | N/A                  |
| 1                         | 4990                     | 39.87                      | 405.8                     | 403.5                    | 2.4                       | 402.8                    | 402.3                   | -0.3                     | 1.0077                | 1.0030               |
| 2                         | 4990                     | 19.92                      | 203.6                     | 202.4                    | 1.2                       | 201.6                    | 200.0                   | 0.7                      | 1.0098                | 1.0117               |
| 3                         | 4990                     | 9.92                       | 101.6                     | 101.0                    | 0.6                       | 99.6                     | 98.9                    | 0.6                      | 1.0201                | 1.0214               |
| AFZ                       | 4990                     | 0.00                       | 0.0                       | 0.0                      | 0.0                       | 0.0                      | -0.2                    | 0.0                      | 0.0000                | 0.0000               |
| AFS                       | 4990                     | 39.92                      | 406.3                     | 404.0                    | 0.8                       | 399.3                    | 398.5                   | 0.1                      | 1.0177                | 1.0138               |
| Average Correction Factor |                          |                            |                           |                          |                           |                          |                         |                          | 1.0125                | 1.0120               |

As Found Concentrations: NO<sub>x</sub>= 403.4 NO= 401.5 As Found Percent Change NO<sub>x</sub>= -0.7% NO= -0.6%

## GPT Calibration Data

Dilution Flow 4995 ccm Source Gas Flow 39.93 ccm

| O3 Setpoint (ppb)         | Indicated NOx high point (ppb) | Indicated NO drop conc (ppb) | Calculated NO2 conc (ppb) | Indicated NOx conc (ppb) | Indicated NO conc (ppb) | Indicated NO2 conc (ppb) | NOx Correction factor | NO Correction factor | NO2 Correction factor | Converter Efficiency |
|---------------------------|--------------------------------|------------------------------|---------------------------|--------------------------|-------------------------|--------------------------|-----------------------|----------------------|-----------------------|----------------------|
| 0                         | -0.2                           | -0.2                         | 0.0                       | 0.0                      | -0.2                    | 0.0                      | N/A                   | N/A                  | N/A                   | N/A                  |
| NO point                  | 401.8                          | 401.8                        | 0.0                       | 401.9                    | 401.8                   | -0.6                     | 0.9998                | 1.0000               | N/A                   | N/A                  |
| 300                       | 401.8                          | 62.5                         | 339.4                     | 402.4                    | 62.5                    | 339.0                    | 0.9985                | 1.0000               | 1.0012                | 99.9%                |
| 200                       | 401.8                          | 173.0                        | 228.8                     | 402.6                    | 173.0                   | 228.7                    | 0.9980                | 1.0000               | 1.0003                | 100.0%               |
| 100                       | 401.8                          | 290.7                        | 111.1                     | 402.4                    | 290.7                   | 111.0                    | 0.9987                | 1.0000               | 1.0010                | 99.9%                |
| Average Correction Factor |                                |                              |                           |                          |                         |                          | 0.9984                | 1.0000               | 1.0009                | 99.9%                |

## AIC Data

|           | Previous calibration |       |      |     | Current calibration |       |      |     |
|-----------|----------------------|-------|------|-----|---------------------|-------|------|-----|
| Parameter | NOx                  | NO2   | NO   |     | NOx                 | NO2   | NO   |     |
| Auto zero | -0.1                 | -0.1  | -0.2 | ppb | 0.1                 | 0.1   | -0.1 | ppb |
| Auto span | 292.0                | 288.9 | 2.1  | ppb | 312.9               | 310.3 | 1.9  | ppb |

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter NO<sub>2</sub>

Air Monitoring Network PAZA



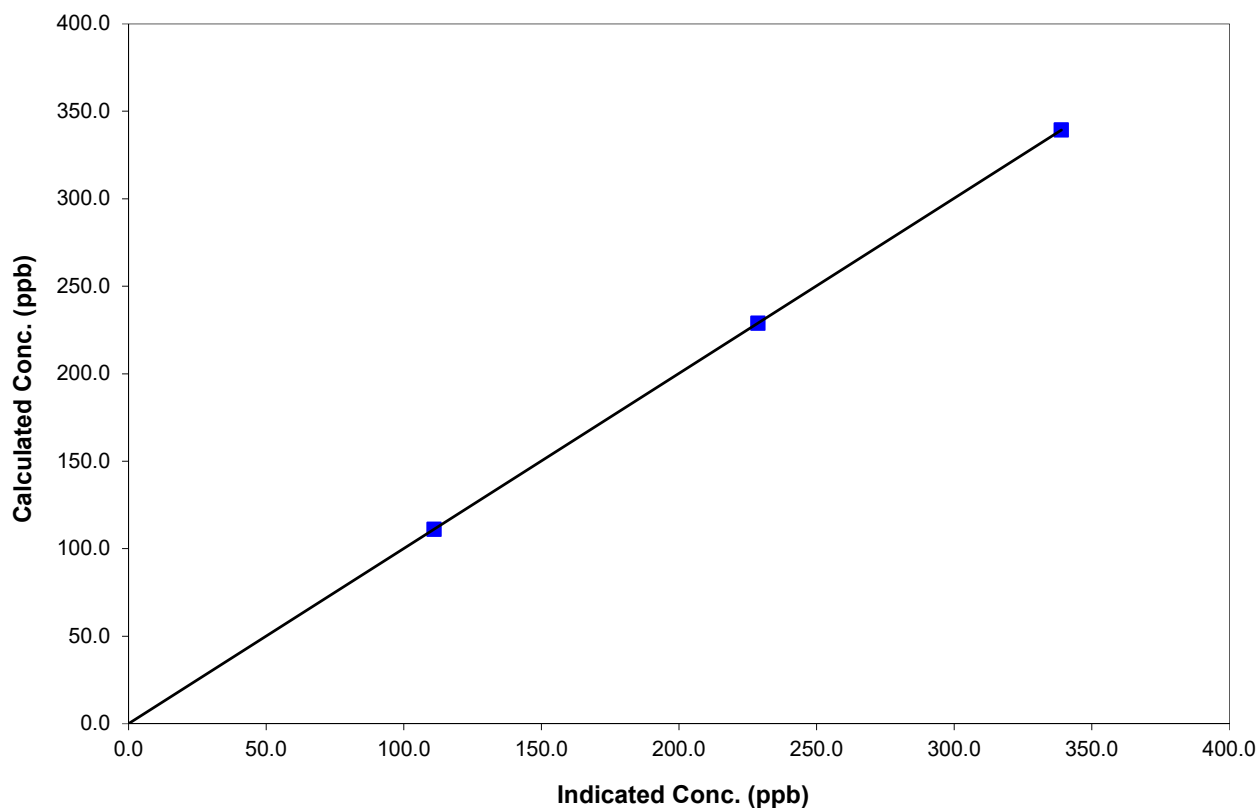
### Station Information

|                  |                   |                      |                   |
|------------------|-------------------|----------------------|-------------------|
| Calibration Date | December 14, 2016 | Previous Calibration | November 16, 2016 |
| Station Number   | 4                 | Station Location     | Beaverlodge       |
| Start Time (MST) | 10:00             | End Time (MST)       | 13:43:00 PM       |
| Analyzer make    | TEI 42i           | Analyzer serial #    | 906535068         |

### Calibration Data

| Calculated conc (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|----------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                        | 0.0                                | N/A                       | Correlation Coefficient | 1.000000  |
| 339.4                      | 339.0                              | 1.0012                    |                         |           |
| 228.8                      | 228.7                              | 1.0003                    |                         |           |
| 111.1                      | 111.0                              | 1.0010                    | Slope                   | 1.000980  |
|                            |                                    |                           |                         |           |
|                            |                                    |                           | Intercept               | -0.012409 |
|                            |                                    |                           |                         |           |

### NO<sub>2</sub> Calibration Curve





## Calibration Summary

Parameter NO<sub>x</sub>

Air Monitoring Network PAZA



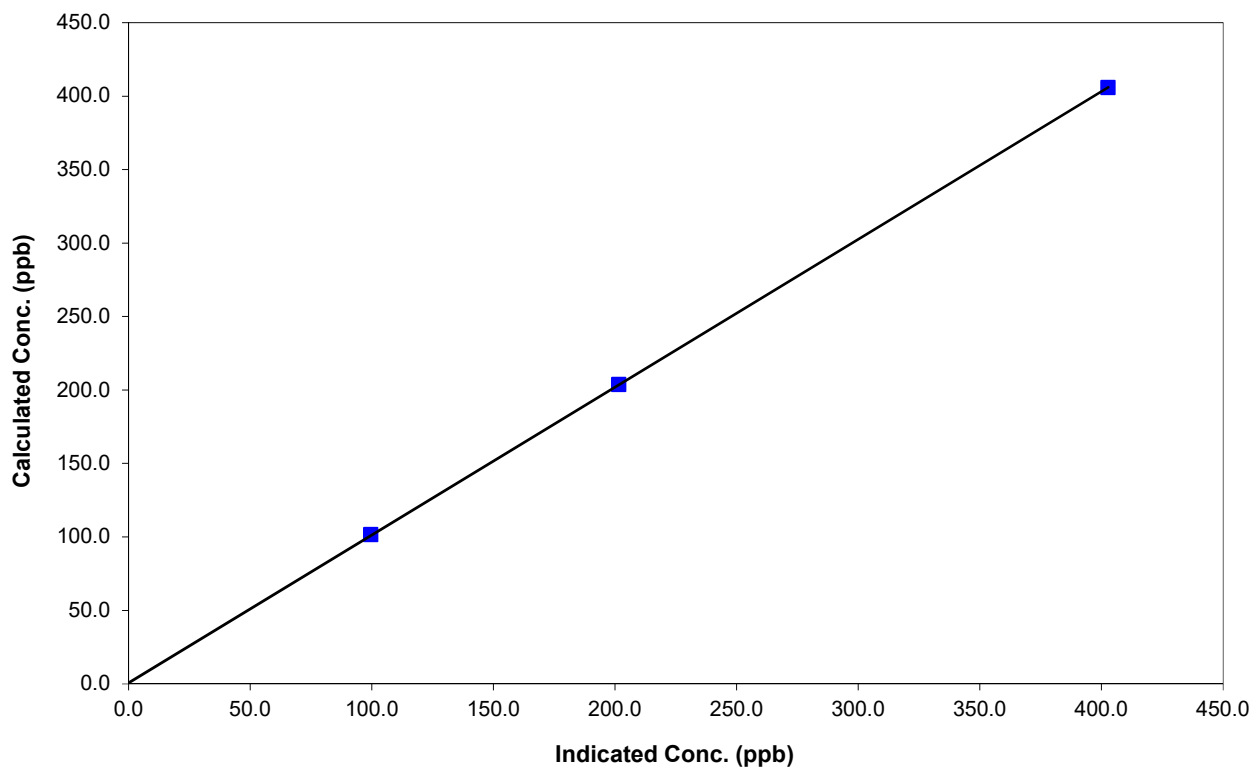
### Station Information

|                  |                   |                      |                   |
|------------------|-------------------|----------------------|-------------------|
| Calibration Date | December 14, 2016 | Previous Calibration | November 16, 2016 |
| Station Number   | 4                 | Station Location     | Beaverlodge       |
| Start Time (MST) | 10:00             | End Time (MST)       | 13:43:00 PM       |
| Analyzer make    | TEI 42i           | Analyzer serial #    | 906535068         |

### Calibration Data

| Calculated conc (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|----------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                        | 0.0                                | N/A                       | Correlation Coefficient | 0.999990 |
| 405.8                      | 402.8                              | 1.0077                    |                         |          |
| 203.6                      | 201.6                              | 1.0098                    |                         |          |
| 101.6                      | 99.6                               | 1.0201                    | Slope                   | 1.006672 |
|                            |                                    |                           | Intercept               | 0.597120 |

### NO<sub>x</sub> Calibration Curve



## Calibration Summary

Parameter NO

Air Monitoring Network PAZA



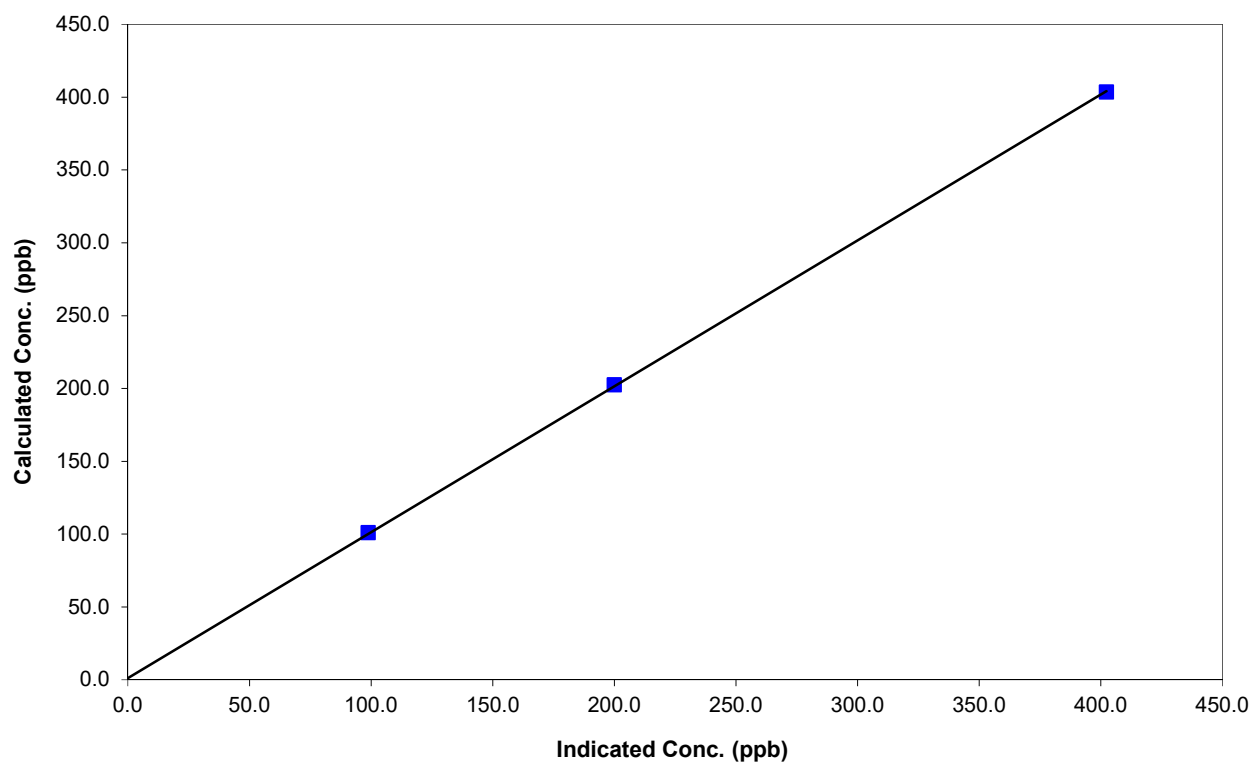
### Station Information

|                  |                   |                      |                   |
|------------------|-------------------|----------------------|-------------------|
| Calibration Date | December 14, 2016 | Previous Calibration | November 16, 2016 |
| Station Number   | 4                 | Station Location     | Beaverlodge       |
| Start Time (MST) | 10:00             | End Time (MST)       | 13:43:00 PM       |
| Analyzer make    | TEI 42i           | Analyzer serial #    | 906535068         |

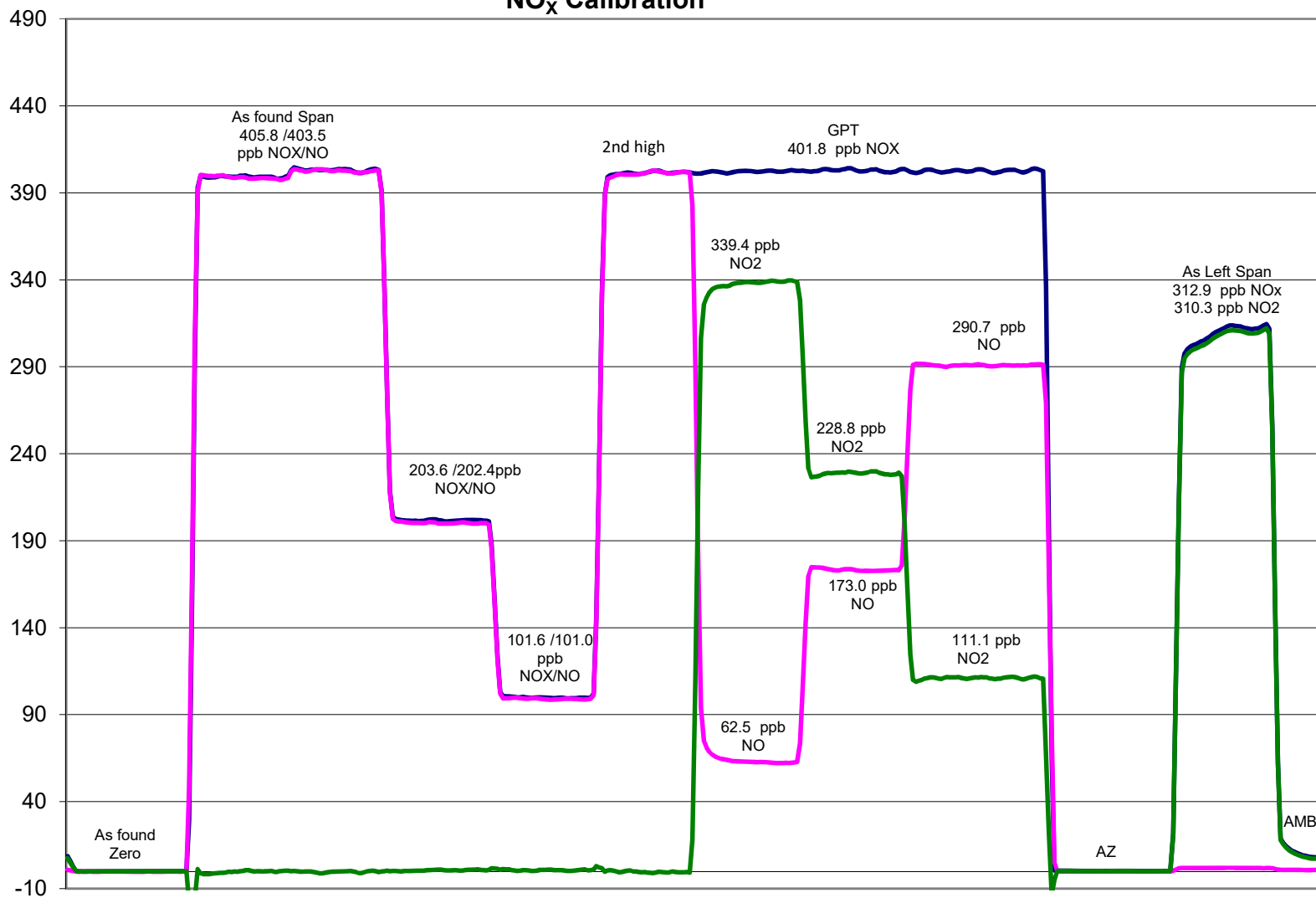
### Calibration Data

| Calculated conc (ppb)<br>(Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------|---------------------------------------|---------------------------|-------------------------|----------|
| 0.0                           | -0.2                                  | N/A                       | Correlation Coefficient | 0.999970 |
| 403.5                         | 402.3                                 | 1.0030                    |                         |          |
| 202.4                         | 200.0                                 | 1.0117                    |                         |          |
| 101.0                         | 98.9                                  | 1.0214                    | Slope                   | 1.001463 |
|                               |                                       |                           | Intercept               | 1.206290 |

### NO Calibration Curve



# NO<sub>x</sub> Calibration



December 14, 2016

# Calibration Report



Parameter 03

Air Monitoring Network PAZA

## Station Information

|                  |                   |                      |                   |
|------------------|-------------------|----------------------|-------------------|
| Calibration Date | December 14, 2016 | Previous Calibration | November 16, 2016 |
| Station Number   | 4                 | Station Location     | Beaverlodge       |
| Reason:          | <b>Routine</b>    | Install              | Removal           |
|                  |                   | Other:               |                   |

|                       |           |                     |             |
|-----------------------|-----------|---------------------|-------------|
| Start Time (MST)      | 12:45     | End Time (MST)      | 15:15:00 PM |
| Barometric Pressure   | 0.928 atm | Station Temperature | 20.0 Deg C  |
| Calibrator            | Envionics | Serial Number       | 3474        |
| Cal Gas Concentration | NA        | Cal Gas Expiry Date | NA          |

|                      |            |                      |           |
|----------------------|------------|----------------------|-----------|
| DACS make            | CR3000     | DACS serial No.      | 5237      |
| DACS voltage range   | 0 - 5 volt | DACS channel #       | 9         |
|                      | Before     |                      | After     |
| Calculated slope     | 1.015308   | Calculated slope     | 1.010175  |
| Calculated intercept | -0.337858  | Calculated intercept | -0.567631 |

|               |          |                   |                     |
|---------------|----------|-------------------|---------------------|
| Analyzer make | Teco 49i | Analyzer serial # | 1136451236,AMU 1879 |
|---------------|----------|-------------------|---------------------|

|                     | before      |       | after       |       |
|---------------------|-------------|-------|-------------|-------|
| Concentration range | 0 - 500     | ppb   | 0 - 500     | ppb   |
| offset              | -0.20       | ppb   | -0.30       | ppb   |
| slope               | 1.016       |       | 1.080       |       |
| Lamp temp           | 53.8        | mV    | 53.9        | mV    |
| Lamp Intensity A/B  | 44635/50384 | mV    | 60002/67651 | mV    |
| Pressure            | 683.9       | mm Hg | 686.3       | mm Hg |
| Flow A              | 0.787       | LPM   | 0.797       | LPM   |
| Flow B              | 0.745       | LPM   | 0.749       | LPM   |

## Calibration Data

| Dilution air flow rate (cc/min) | Calibrator Setting | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|--------------------|-------------------------------------|------------------------------------|---------------------------|
| 5028                            | 0.00               | 0.0                                 | 0.5                                | N/A                       |
| 5028                            | 0.30               | 339.4                               | 337.2                              | 1.0065                    |
| 5028                            | 0.20               | 228.8                               | 225.7                              | 1.0139                    |
| 5028                            | 0.10               | 111.1                               | 111.4                              | 0.9975                    |
|                                 |                    |                                     |                                    |                           |
| 5028                            | 0.00               | 0.0                                 | 0.5                                | As found zero             |
| 5028                            | 0.30               | 339.4                               | 319.1                              | As found span             |
| Average Correction Factor       |                    |                                     |                                    | 1.0060                    |

Calculated value of As Found Response: 323.2 ppm Percent Change of As Found: -4.8%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.4                | ppb | 0.5               | ppb |
| Auto span | 261.1              | ppb | 274.2             | ppb |

Notes: Span adjustment made

Calibration Performed By: Dmytro Dolotii

# Calibration Summary

Parameter 03

Air Monitoring Network PAZA



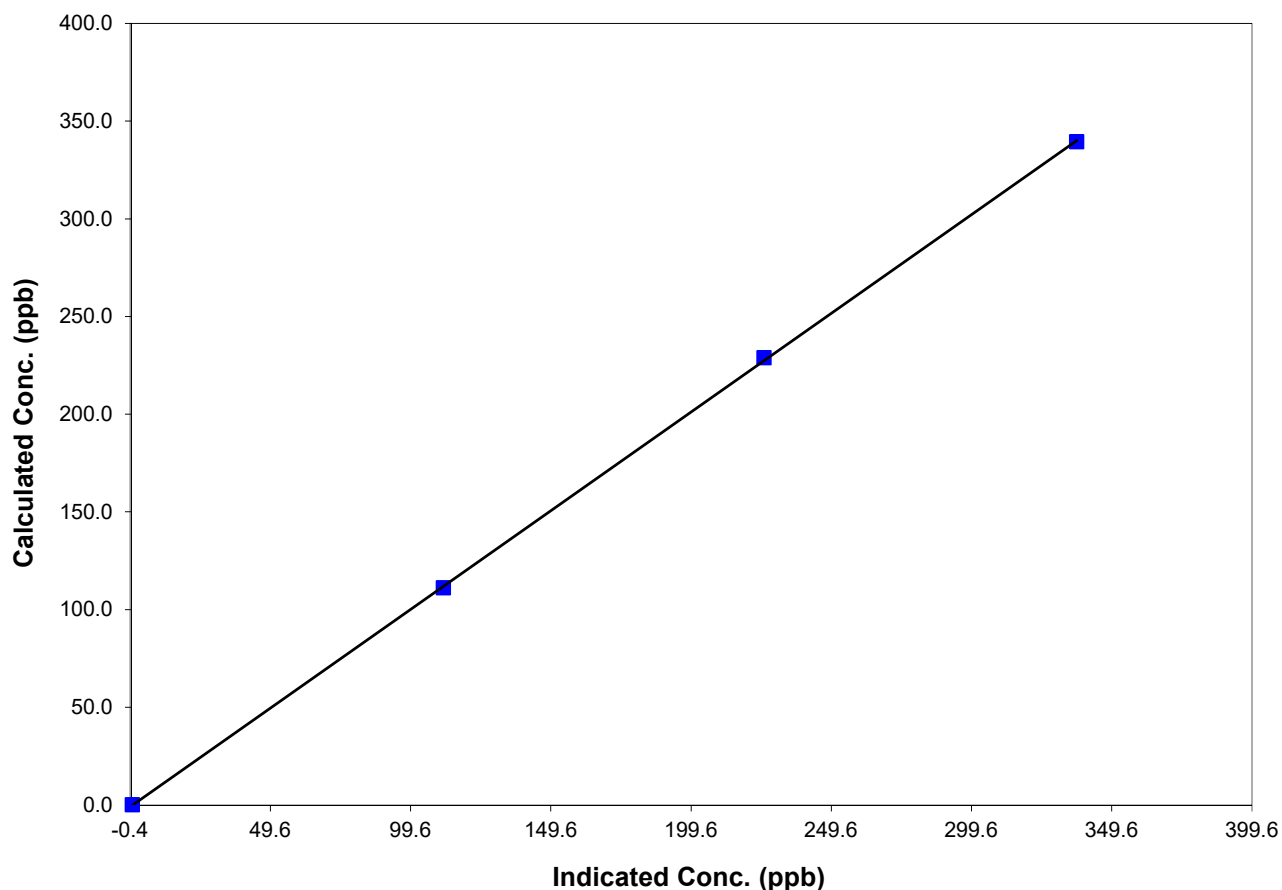
## Station Information

|                     |                   |                      |                     |
|---------------------|-------------------|----------------------|---------------------|
| Calibration Date    | December 14, 2016 | Previous Calibration | November 16, 2016   |
| Station Number      | 4                 | Station Location     | Beaverlodge         |
| Start Time (MST)    | 12:45             | End Time (MST)       | 15:15:00 PM         |
| Analyzer make/model | Teco 49i          | Analyzer serial #    | 1136451236,AMU 1879 |

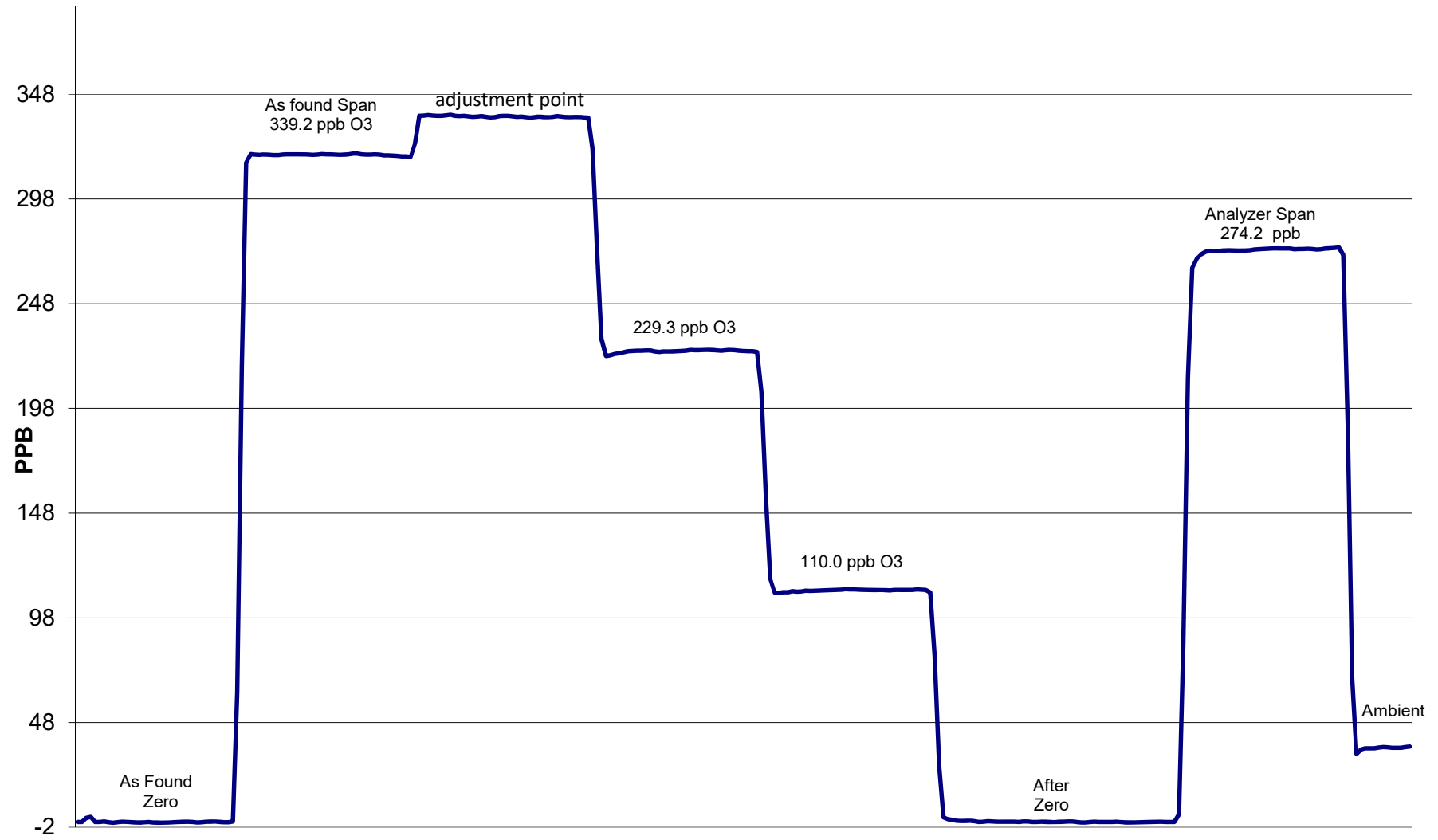
## Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.5                                | NA                        | Correlation Coefficient | 0.999951  |
| 339.4                               | 337.2                              | 1.0065                    |                         |           |
| 228.8                               | 225.7                              | 1.0139                    |                         |           |
| 111.1                               | 111.4                              | 0.9975                    | Slope                   | 1.010175  |
|                                     |                                    |                           | Intercept               | -0.567631 |

## O3 Calibration Curve



O3 Calibration



December 14, 2016

# SHARP 5030 PM2.5 Calibration



STATION: Beaverlodge  
 LOCATION: Beaverlodge agriculture centre  
 START TIME (MST): 8:20

OPERATOR: Grover Christiansen/Dmytro Dc  
 DATE: December 21 2016  
 END TIME (MST): 15:10:00 PM

## MONITOR INFO / PARAMETER VALUES:

Make/Model SHARP 5030  
 Configuration PM 2.5  
 Serial Number AMU 1969

Audit Device Model Delta cal  
 Audit Device S/N AMU 1789  
 Certification Date 01-Oct-15

## AUDIT / CALIBRATION RESULTS:

|                      |                      | Ambient Temp.<br>( <sup>o</sup> C) | Ambient Pres.<br>(mbar) | Leak Check<br>(L/min) | Flow Rate<br>(lpm) | Time settings<br>(hh:mm) |
|----------------------|----------------------|------------------------------------|-------------------------|-----------------------|--------------------|--------------------------|
| <i>As Found Data</i> | Audit values (I)     | 5.0                                | 914                     | 16.67                 | 16.67              | 14:55:00 PM              |
|                      | MEASURED ( AF )      | 2.7                                | 901                     | 16.40                 | 16.10              | 15:02:00 PM              |
|                      | AF Difference (AF-I) | -2.3                               | -13                     | 0.27                  | -0.57              | 0:01                     |
| <i>Adjusted Data</i> | MEASURED ( M )       | 3.0                                | 901                     | 16.40                 | 16.10              | 14:55:00 PM              |
|                      | Adj Difference (M-I) | -2.0                               | -13                     | -0.27                 | -0.57              | 0:01                     |
|                      | <i>LIMITS</i>        | ± 4.0 <sup>o</sup> C               | 6.7 mbar                | 1.0 L/min             | ± 1.0 L/min        | ±2 min                   |

Sample Head Inspect/Cleaning: Cleaned sample head

Status of sampling tape: 70% full

Nozzle Inspection / cleanliness: \_\_\_\_\_

COMMENTS: \_\_\_\_\_

Foil calibration Old value 7056 New value 7181

Nephelometer zero. Analog as found = 1.2 adsuted conc = -0.0

# Calibration Report

Parameter SO2  
Air Monitoring Network

PAZA



## Station Information

|                       |                  |                      |                  |
|-----------------------|------------------|----------------------|------------------|
| Calibration Date      | December 16 2016 | Previous Calibration | November 25 2016 |
| Station Number        | 6                | Station Location     | Valleyview       |
| Reason:               | <b>Routine</b>   | Install              | Removal          |
|                       |                  |                      | Other:           |
| Start Time (MST)      | 13:10:00 PM      | End Time (MST)       | 15:10:00 PM      |
| Barometric Pressure   | 0.921 atm        | Station Temperature  | 20.0 Deg C       |
| Calibrator            | Envionics        | Serial Number        | 3016             |
| Cal Gas Concentration | 49.7 ppm         | Cal Gas Exp Date     | November 5, 2018 |
| Gas Cylinder Num.     | LL103793         |                      |                  |
| DACS make             | CR3000           | DACS serial No.      | 5409             |
| DACS voltage range    | 0 - 5 volt       | DACS channel #       | 4                |
|                       | <u>Before</u>    |                      | <u>After</u>     |
| DACS Scale High       | 500              | DACS slope           | 500              |
| DACS Scale Low        | 0                | DACS intercept       | 0                |
| Calculated slope      | 0.999462         | Calculated slope     | 1.004772         |
| Calculated intercept  | 1.356958         | Calculated intercept | 1.398353         |
| Analyzer make         | TEI 43C          | Analyzer serial #    | 609716239        |

|                     | before |       | after |       |
|---------------------|--------|-------|-------|-------|
| Concentration range | 0-500  | ppb   | 0-500 | ppb   |
| Background          | 16.4   |       | 16.4  |       |
| Coefficient         | 1.011  |       | 1.011 |       |
| UV Lamp Voltage     | 738    | LPM   | 738   | LPM   |
| Chamber Temp        | 43     | V     | 43    | V     |
| Perm Gas Temp       | 45     | C     | 45    | C     |
| Pressure            | 677.3  | in Hg | 678.1 | in Hg |
| Sample Flow         | 0.490  | LPM   | 0.490 | LPM   |
| Lamp Intensity      | 47578  | Hz    | 48967 | Hz    |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4995                            | 0.00                          | 0.0                                 | 0.1                                | N/A                       |
| 4997                            | 39.93                         | 394.0                               | 391.6                              | 1.0062                    |
| 4999                            | 19.99                         | 197.9                               | 194.5                              | 1.0177                    |
| 4995                            | 9.95                          | 98.8                                | 95.8                               | 1.0319                    |
| 4995                            | 0.00                          | 0.0                                 | 0.1                                | As found zero             |
| 4995                            | 39.93                         | 394.2                               | 391.6                              | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0186                    |

Calculated value of As Found Response: 392.7 ppm Percent Change of As Found: 0.4%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.2                | ppm | -0.1              | ppm |
| Auto span | 281.4              | ppm | 275.0             | ppm |

Notes: No adjustments made



## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



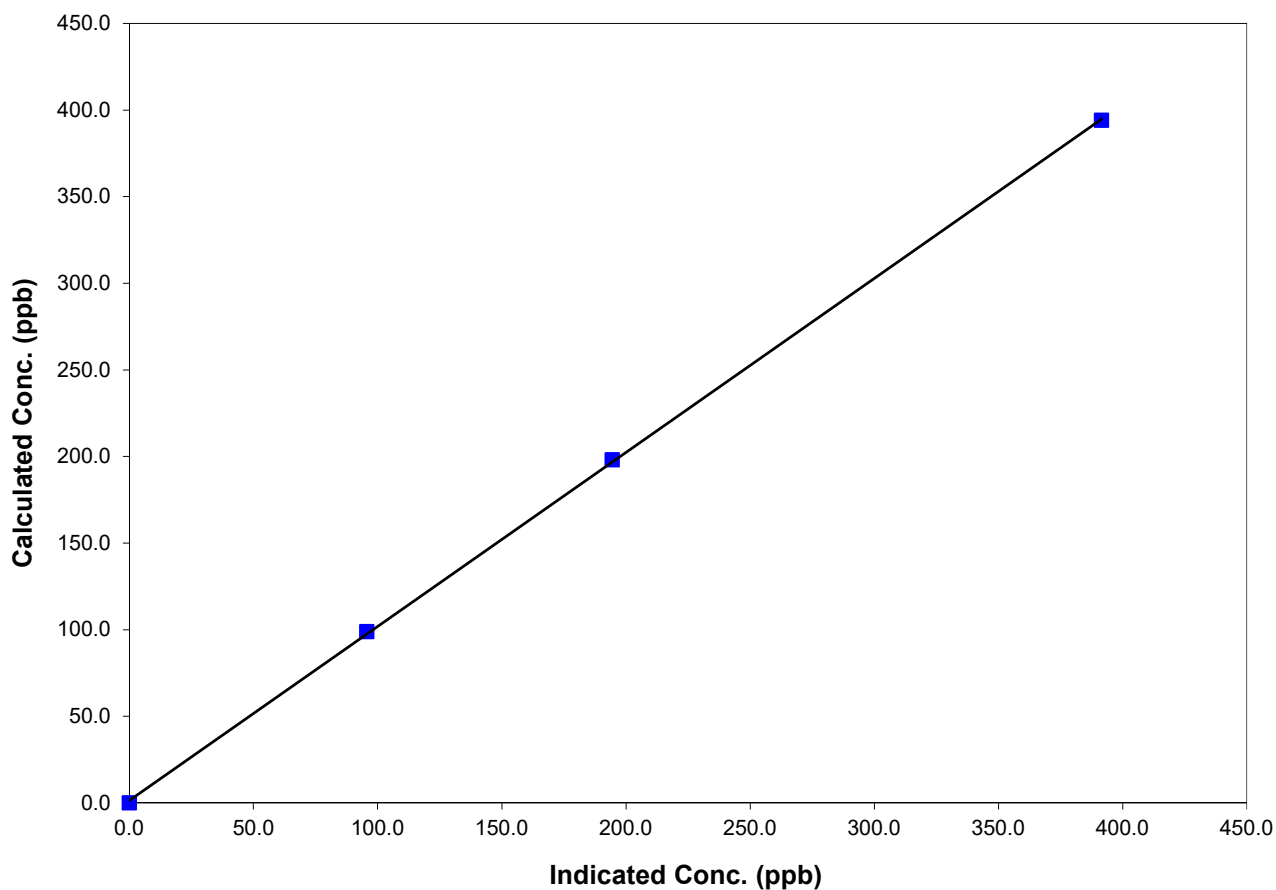
### Station Information

|                     |                  |                      |                  |
|---------------------|------------------|----------------------|------------------|
| Calibration Date    | December 16 2016 | Previous Calibration | November 25 2016 |
| Station Number      | 6                | Station Location     | Valleyview       |
| Start Time (MST)    | 13:10:00 PM      | End Time (MST)       | 15:10:00 PM      |
| Analyzer make/model | TEI 43C          | Analyzer serial #    | 609716239        |

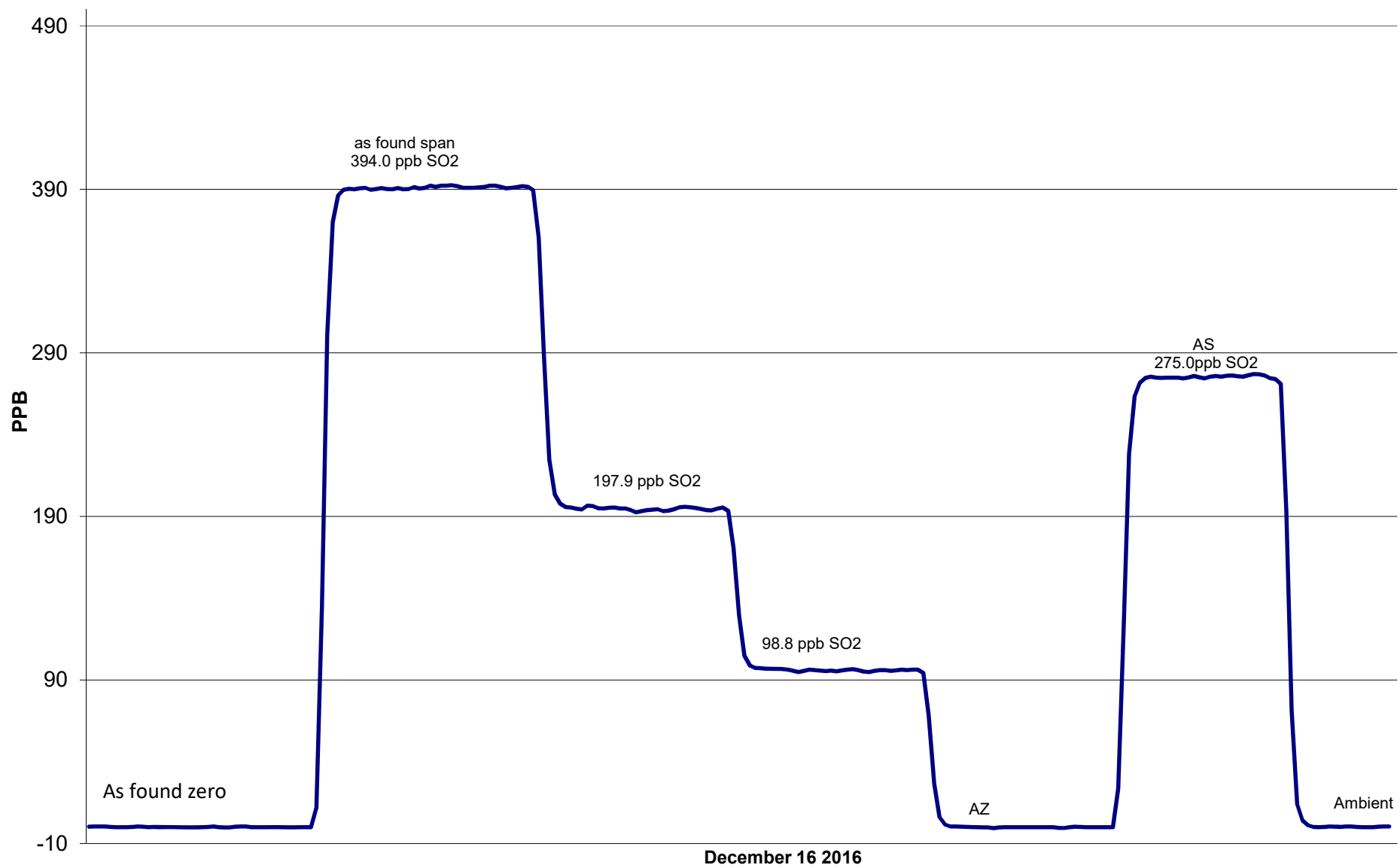
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                                 | 0.1                                | N/A                       | Correlation Coefficient | 0.999935 |
| 394.0                               | 391.6                              | 1.0062                    |                         |          |
| 197.9                               | 194.5                              | 1.0177                    |                         |          |
| 98.8                                | 95.8                               | 1.0319                    | Slope                   | 1.004772 |
|                                     |                                    |                           | Intercept               | 1.398353 |

### SO2 Calibration Curve



## SO2 Calibration



# Calibration Report



Parameter H2S

Air Monitoring Network PAZA

## Station Information

|                       |                       |                      |                  |
|-----------------------|-----------------------|----------------------|------------------|
| Calibration Date      | December 16 2016      | Previous Calibration | November 30 2016 |
| Station Number        | 6                     | Station Location     | Valleyview       |
| Reason:               | <b>Routine</b>        | Install              | Removal          |
| Start Time (MST)      | 11:35                 | End Time (MST)       | 14:15:00 PM      |
| Barometric Pressure   | 0.921 atm             | Station Temperature  | 20.0 Deg C       |
| Calibrator            | Envionics             | Serial Number        | 6586             |
| Cal Gas Concentration | 10.2 ppm              | Cal Gas Expiry Date  | July 03 2016     |
| Gas Cert Reference    | LL110781              |                      |                  |
| DACS make             | CR3000                | DACS serial No.      | 5409             |
| DACS voltage range    | 0 - 5 volt            | DACS channel #       | 9                |
|                       | <u>Before</u>         |                      | <u>After</u>     |
| DACS Scale High       | 100                   | DACS slope           | 100              |
| DACS Scale Low        | 0                     | DACS intercept       | 0                |
| Calculated slope      | 0.974214              | Calculated slope     | 0.991382         |
| Calculated intercept  | 0.798248              | Calculated intercept | 0.651700         |
| Analyzer make         | TEI Model 43i - APSCB | Analyzer serial #    | 701120010        |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 100 | ppb   | 0 - 100 | ppb   |
| Back Ground         | 9.8     | ppb   | 9.4     | ppb   |
| Coefficient         | 0.885   |       | 0.861   |       |
| Lamp Voltage        | 799     | V     | 797     | V     |
| Chamber Temp        | 45      | c     | 45      | c     |
| Perm Oven Temp      | 44.98   | c     | 45      | c     |
| Pressure            | 527.80  | mm Hg | 528.70  | mm Hg |
| Sample Flow         | 0.364   | ccm   | 0.364   | lpm   |
| Lamp Intensity      | 91      | %     | 91      | %     |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4996                            | 0.00                          | 0.0                                 | -0.1                               | N/A                       |
| 4998                            | 39.98                         | 80.9                                | 81.3                               | 0.9959                    |
| 4998                            | 19.96                         | 40.6                                | 39.8                               | 1.0187                    |
| 6999                            | 10.09                         | 14.7                                | 13.7                               | 1.0701                    |
| 4997                            | 9.97                          |                                     | 2.8                                | Sox Test                  |
| 4997                            | 0.00                          | 0.0                                 | -0.1                               | As found zero             |
| 4997                            | 39.93                         | 80.9                                | 83.3                               | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0282                    |

Calculated value of As Found Response: 82.02 ppm Percent Change of As Found: -1.4%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | -0.9               | ppm | -0.1              | ppm |
| Auto span | 70.0               | ppm | 67.0              | ppm |

Notes: Span adjustments made  
Sox scrubber replaced

## Calibration Summary

Parameter H2S

Air Monitoring Network PAZA



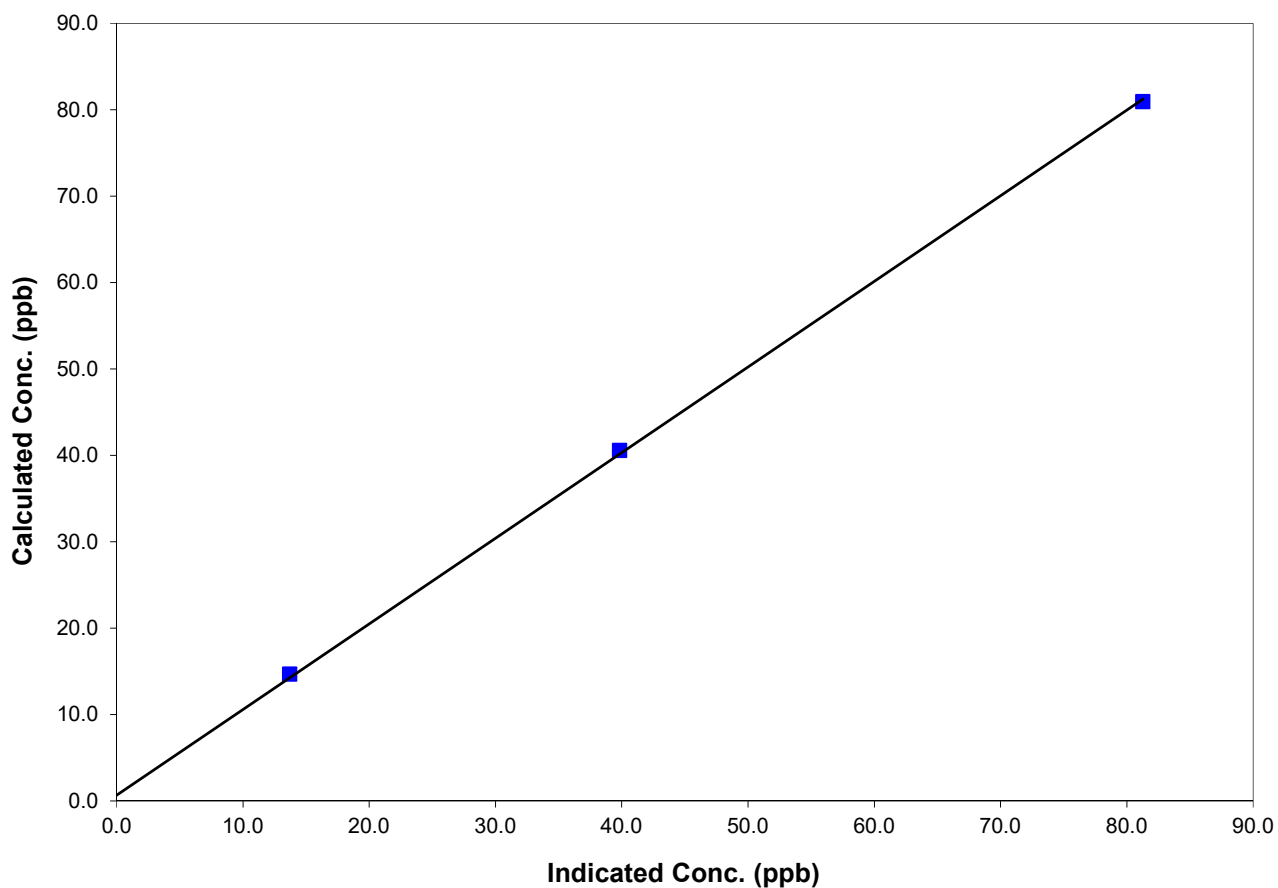
### Station Information

|                     |                       |                      |                  |
|---------------------|-----------------------|----------------------|------------------|
| Calibration Date    | December 16 2016      | Previous Calibration | November 30 2016 |
| Station Number      | 6                     | Station Location     | Valleyview       |
| Start Time (MST)    | 11:35                 | End Time (MST)       | 14:15:00 PM      |
| Analyzer make/model | TEI Model 43i - APSCB | Analyzer serial #    | 701120010        |

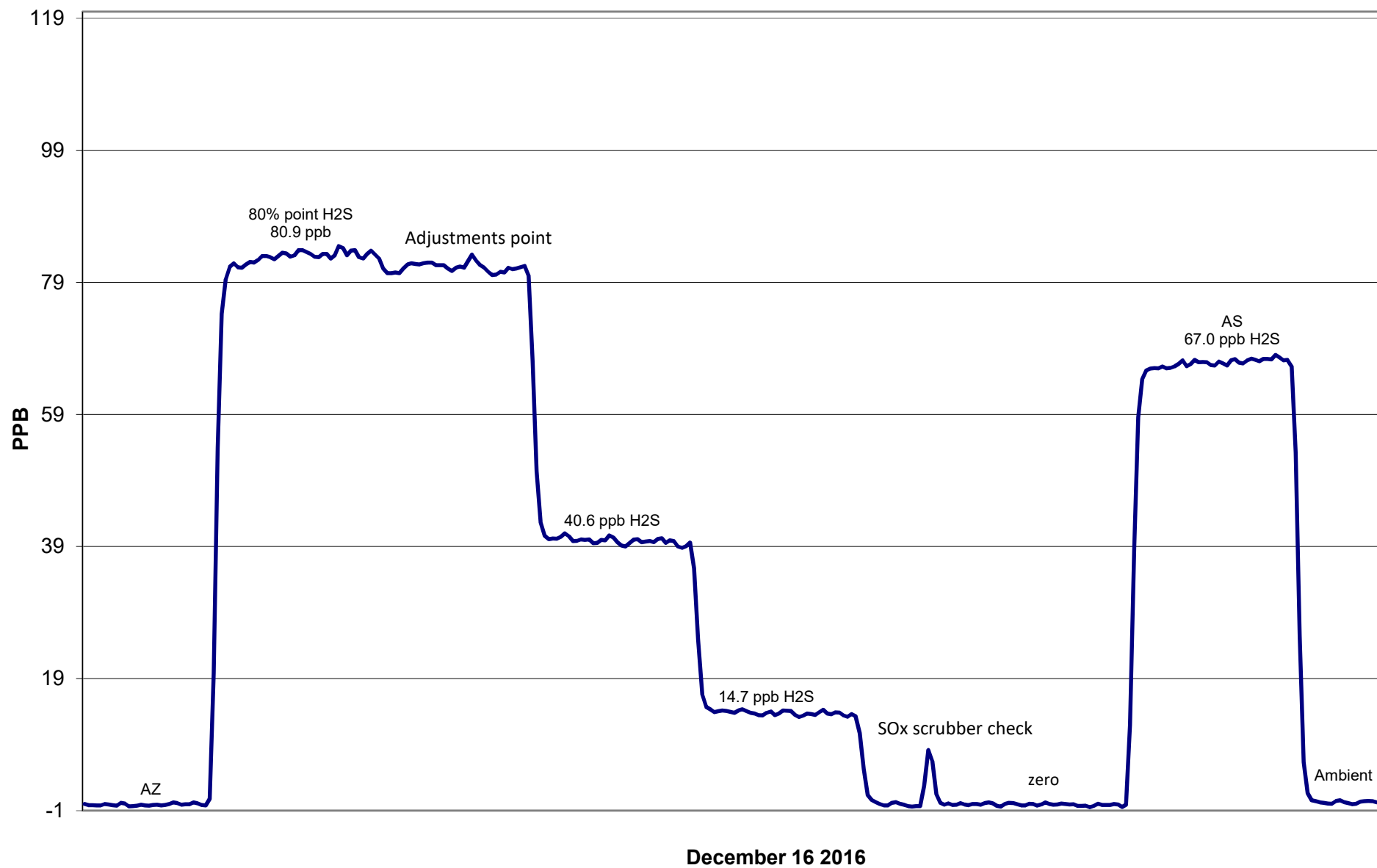
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                                 | -0.1                               | N/A                       | Correlation Coefficient | 0.999790 |
| 80.9                                | 81.3                               | 0.9959                    |                         |          |
| 40.6                                | 39.8                               | 1.0187                    |                         |          |
| 14.7                                | 13.7                               | 1.0701                    | Slope                   | 0.991382 |
|                                     |                                    |                           | Intercept               | 0.651700 |

### H2S Calibration Curve



## H2S Calibration



# Calibration Report

Parameter SO<sub>2</sub>

Air Monitoring Network PAZA



## Station Information

|                       |                                             |                                  |                                  |
|-----------------------|---------------------------------------------|----------------------------------|----------------------------------|
| Calibration Date      | December 9, 2016                            | Previous Calibration             | November 22, 2016                |
| Station Number        | 1                                           | Station Location                 | Donnelly                         |
| Reason:               | <input checked="" type="checkbox"/> Routine | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                       |                                             | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)      | 13:24:00 PM                                 | End Time (MST)                   | 15:45:00 PM                      |
| Barometric Pressure   | 0.925 mm                                    | Station Temperature              | 12.5 Deg C                       |
| Calibrator            | EnviroNics                                  | Serial Number                    | 6586                             |
| Cal Gas Concentration | 49.7 ppm                                    | Cal Gas Expiry Date              | 11/5/2018                        |
| Correction factor     | 0.032269                                    | Cal Gas Cylinder #               | LL103793                         |
| DACS make             | CR1000                                      | DACS serial No.                  | 3980                             |
| DACS voltage range    | 0 - 5 volt                                  | DACS channel #                   | 6                                |
|                       | Before                                      |                                  | After                            |
| Calculated slope      | 0.981175                                    | Calculated slope                 | 1.004346                         |
| Calculated intercept  | -0.149097                                   | Calculated intercept             | -0.468887                        |
| Analyzer make         | Teco 43i                                    | Analyzer serial #                | 1207452008                       |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 500 | ppb   | 0 - 500 | ppb   |
| Background          | 6.6     |       | 6.3     |       |
| coefficient         | 0.929   |       | 0.908   |       |
| Lamp Voltage        | 870     | volts | 868     | volts |
| Chamber Temp        | 44.9    | Deg C | 44.9    | Deg C |
| Perm Gas Temp       | 45      | Deg C | 45      | Deg C |
| Pressure            | 689.5   | mm Hg | 691.6   | mm Hg |
| Sample Flow         | 0.408   | ccm   | 0.41    | ccm   |
| Lamp Intensity      | 97      | %     | 97      | %     |

| Dilution air flow rate (cc/min) | Corrected gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4995                            | 0.0                              | 0.00                                | 1.2                                | N/A                       |
| 4995                            | 39.93                            | 394.2                               | 393.4                              | 1.0020                    |
| 4995                            | 19.96                            | 197.8                               | 196.8                              | 1.0052                    |
| 4995                            | 9.97                             | 99.0                                | 98.5                               | 1.0055                    |
|                                 |                                  |                                     |                                    |                           |
| 4995                            | 0.0                              | 0.0                                 | 1.2                                | As Found Zero             |
| 4995                            | 39.93                            | 394.2                               | 402.0                              | As Found Span             |
| Average Correction Factor       |                                  |                                     |                                    | 1.0042                    |

Calculated value of As Found Response: 393.064 ppm Percent Change of As Found: 0.3%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 1.1                | ppm | 1.4               | ppm |
| Auto span | 264.6              | ppm | 258.1             | ppm |

Notes: Span adjustment

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



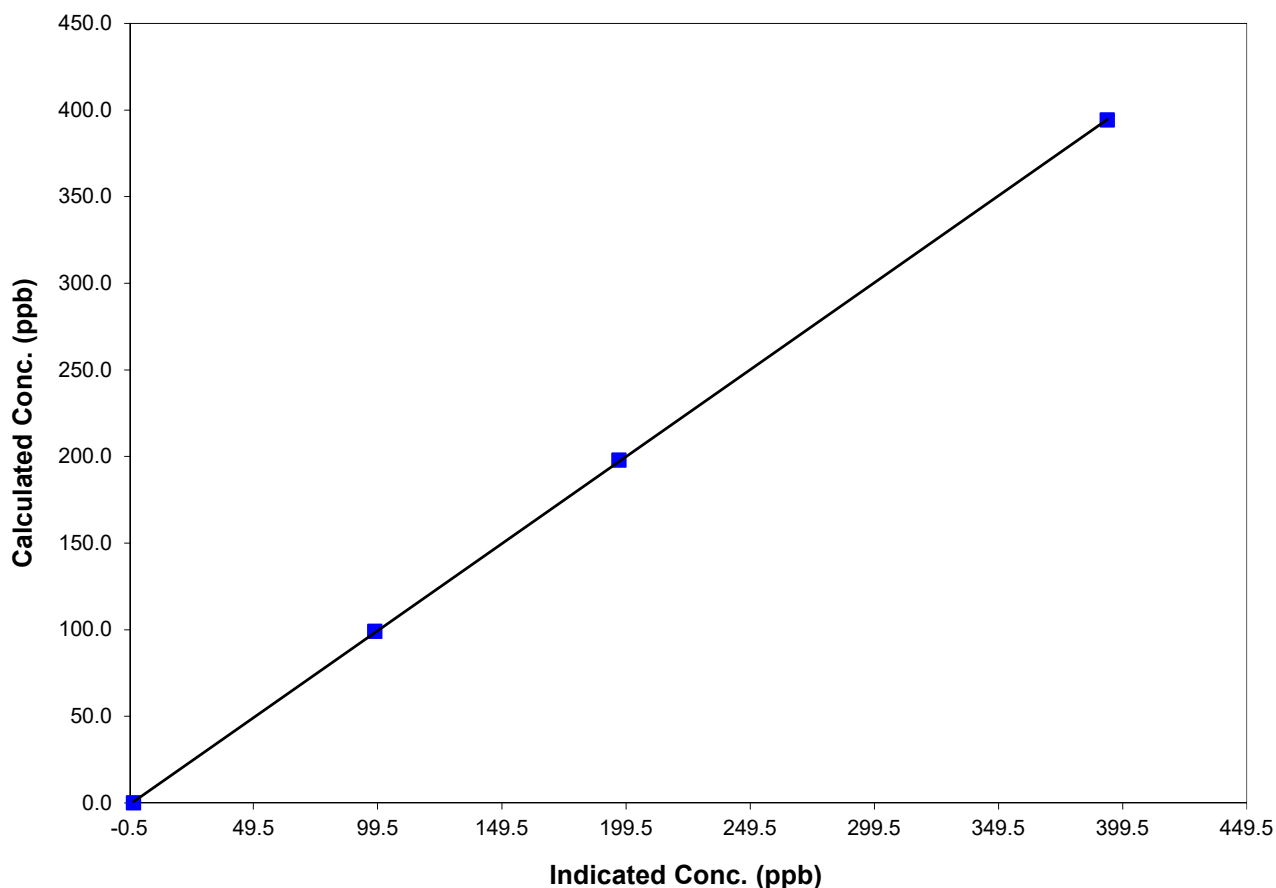
### Station Information

|                     |                  |                      |                   |
|---------------------|------------------|----------------------|-------------------|
| Calibration Date    | December 9, 2016 | Previous Calibration | November 22, 2016 |
| Station Number      | 1                | Station Location     | Donnely           |
| Start Time (MST)    | 13:24:00 PM      | End Time (MST)       | 15:45:00 PM       |
| Analyzer make/model | Teco 43i         | Analyzer serial #    | 1207452008        |

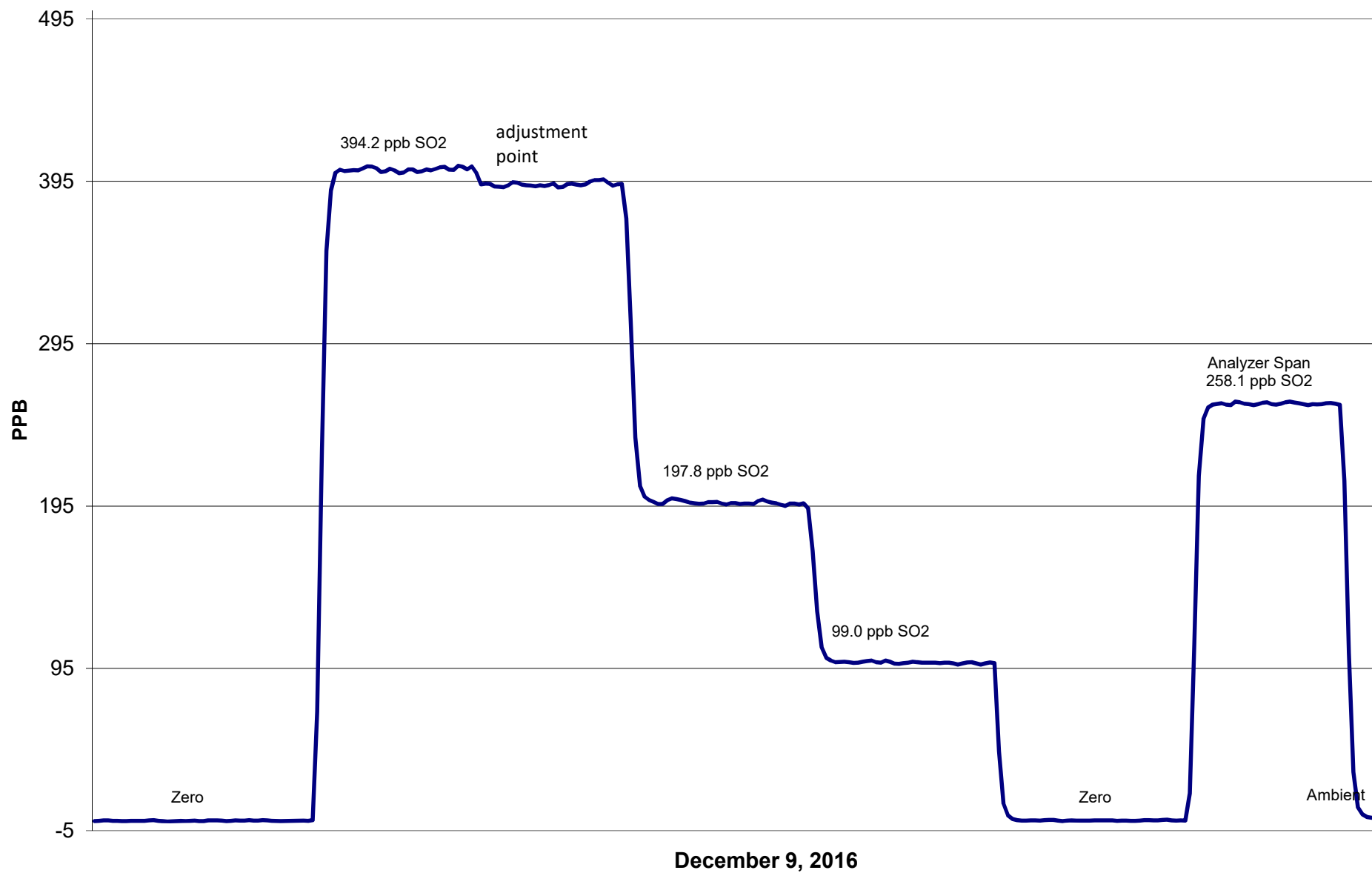
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 1.2                                | N/A                       | Correlation Coefficient | 0.999982  |
| 394.2                               | 393.4                              | 1.0020                    |                         |           |
| 197.8                               | 196.8                              | 1.0052                    |                         |           |
| 99.0                                | 98.5                               | 1.0055                    | Slope                   | 1.004346  |
|                                     |                                    |                           | Intercept               | -0.468887 |

### SO2 Calibration Curve



## SO2 Calibration





# Calibration Report



Parameter H2S

Air Monitoring Network PAZA

## Station Information

|                      |                  |                                  |                                  |
|----------------------|------------------|----------------------------------|----------------------------------|
| Calibration Date     | December 9, 2016 | Previous Calibration             | November 22, 2016                |
| Station Number       | 1                | Station Location                 | Donnelly                         |
| Reason:              | <b>Routine</b>   | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                      |                  | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)     | 12:00            | End Time (MST)                   | 14:35:00 PM                      |
| Barometric Pressure  | 0.925 mm         | Station Temperature              | 12.5 Deg C                       |
| Calibrator           | EnviroNics       | Serial Number                    | 6586                             |
| Cal Gas Conc         | 10.2 ppm         | Cal Gas Expiry Date              | 7/8/2016                         |
| Correction factor    | 0.032269         | Cal Gas Cylinder #               | LL103793                         |
| DACS make            | CR1000           | DACS serial No.                  | 3980                             |
| DACS voltage range   | 0 - 5 volt       | DACS channel #                   | 5                                |
|                      | <u>Before</u>    |                                  | <u>After</u>                     |
| Calculated slope     | 0.998979         | Calculated slope                 | 1.013180                         |
| Calculated intercept | -0.630997        | Calculated intercept             | -0.467762                        |
| Analyzer make        | Thermo 450i      | Analyzer serial #                | 1207452006                       |

|                     | before  |       | after   |       |
|---------------------|---------|-------|---------|-------|
| Concentration range | 0 - 100 | ppb   | 0 - 100 | ppb   |
| Background          | 15.1    | ppb   | 14.8    | ppb   |
| coefficient         | 1.031   |       | 1.031   |       |
| Lamp Voltage        | 807     | volts | 807     | volts |
| Chamber Temp        | 44.9    | Deg C | 45      | Deg C |
| Perm Gas Temp       | 44.9    | Deg C | 45      | Deg C |
| Pressure            | 490.5   | mm Hg | 493.5   | mm Hg |
| Sample Flow         | 0.779   | lpm   | 0.767   | lpm   |
| Lamp Intensity      | 90      | mv    | 90      | mv    |

## Calibration Data

| Dilution air flow rate (cc/min) | Corrected gas flow rate (cc/min) | Calculated concentration (ppb) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4995                            | 0.00                             | 0.00                                | 0.9                                | N/A                       |
| 4995                            | 39.93                            | 80.89                               | 80.7                               | 1.0021                    |
| 4995                            | 19.96                            | 40.60                               | 39.7                               | 1.0234                    |
| 6994                            | 9.97                             | 14.52                               | 14.8                               | 0.9817                    |
|                                 |                                  |                                     |                                    |                           |
|                                 |                                  |                                     |                                    |                           |
| 4995                            | 0.00                             | 0.00                                | 0.9                                | As Found Zero             |
| 4995                            | 39.93                            | 80.89                               | 80.7                               | As Found Span             |
| Average Correction Factor       |                                  |                                     |                                    | 1.0024                    |

Calculated value of As Found Response: 79.10 ppm Percent Change of As Found: **2.2%**

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.7                | ppm | 0.9               | ppm |
| Auto span | 63.2               | ppm | 62.1              | ppm |

Notes: No adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter H2S

Air Monitoring Network PAZA



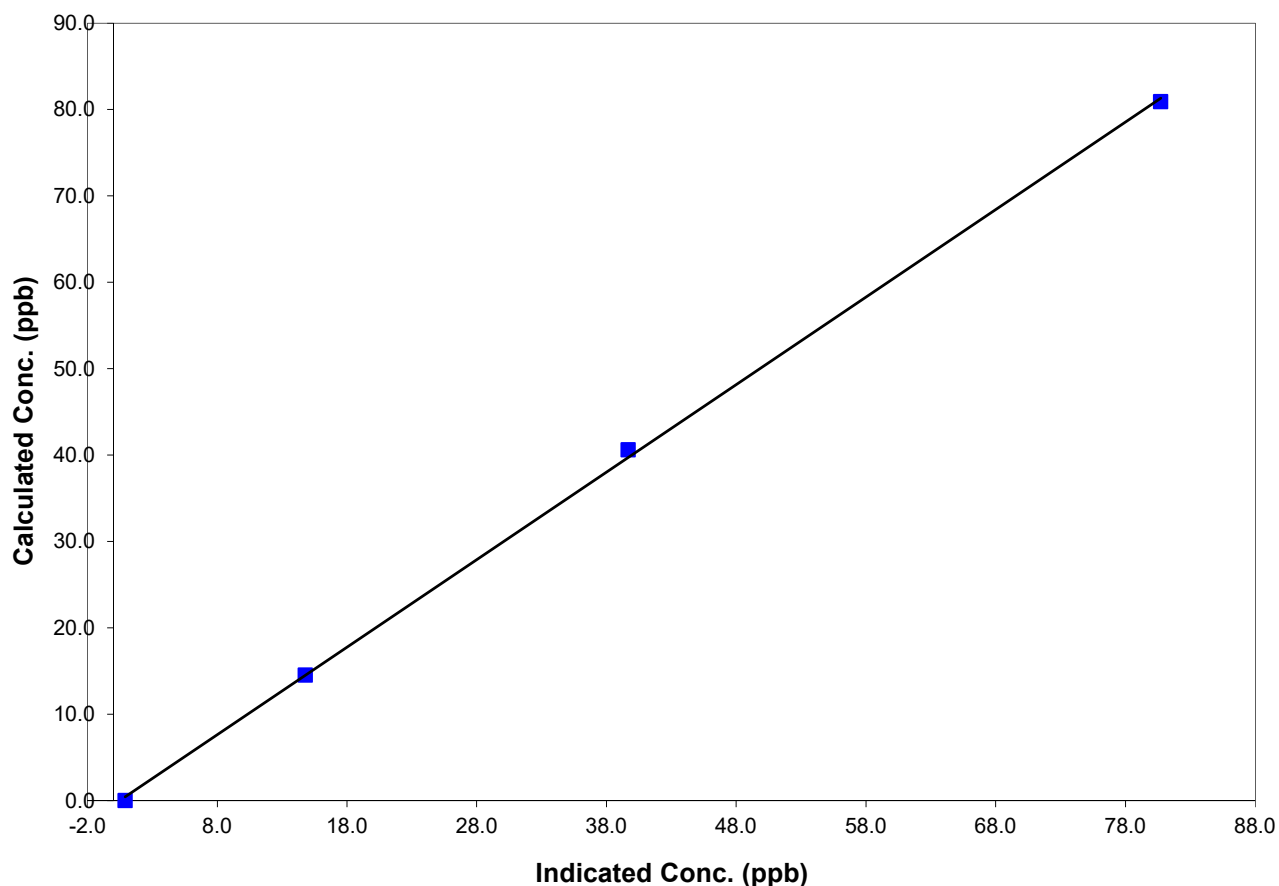
### Station Information

|                     |                  |                      |                   |
|---------------------|------------------|----------------------|-------------------|
| Calibration Date    | December 9, 2016 | Previous Calibration | November 22, 2016 |
| Station Number      | 1                | Station Location     | Donnely           |
| Start Time (MST)    | 12:00            | End Time (MST)       | 14:35:00 PM       |
| Analyzer make/model | Thermo 450i      | Analyzer serial #    | 1207452006        |

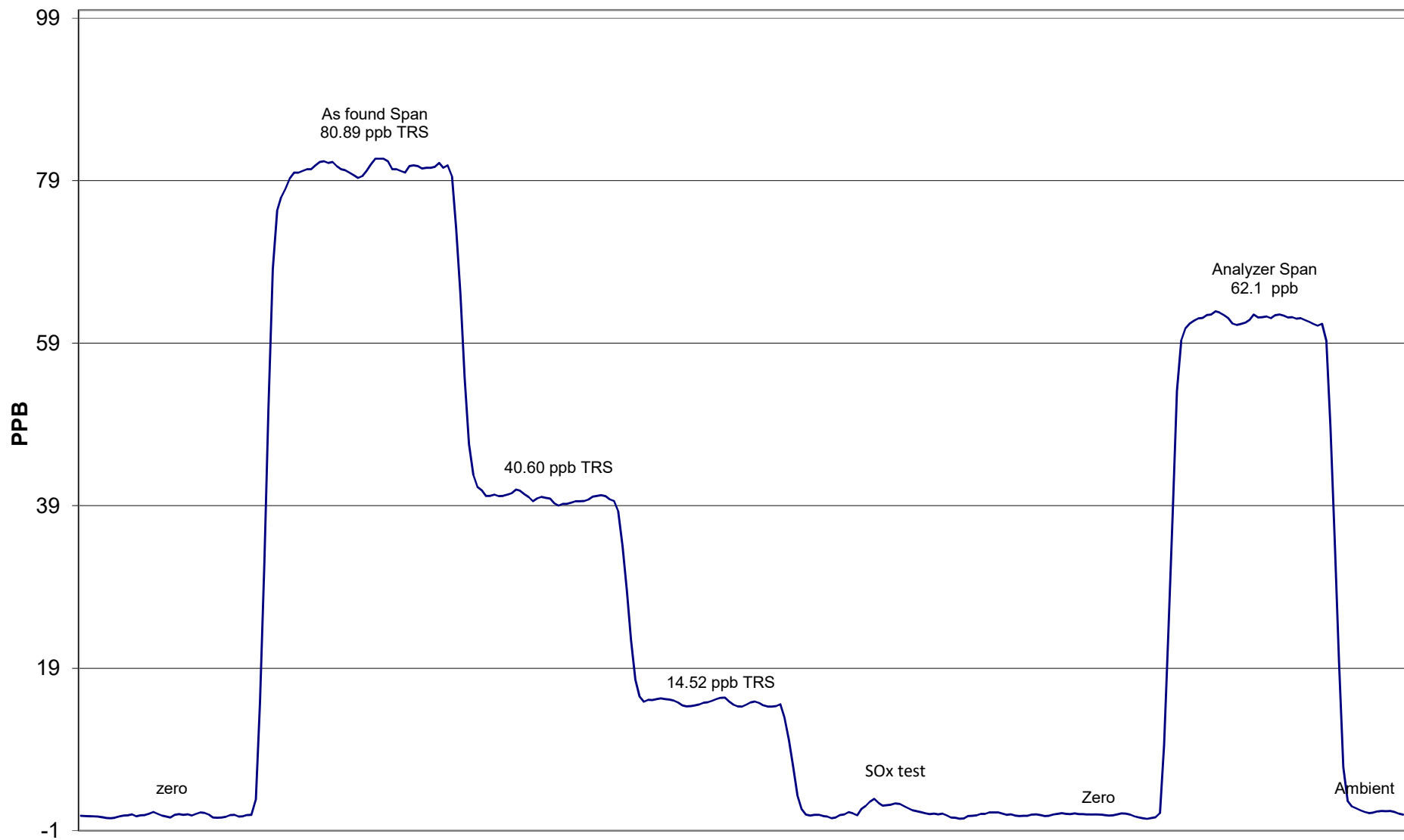
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.9                                | N/A                       | Correlation Coefficient | 0.999697  |
| 80.9                                | 80.7                               | 1.0021                    |                         |           |
| 40.6                                | 39.7                               | 1.0234                    |                         |           |
| 14.5                                | 14.8                               | 0.9817                    | Slope                   | 1.013180  |
|                                     |                                    |                           | Intercept               | -0.467762 |

### TRS Calibration Curve



## H2S Calibration



December 9, 2016

# Calibration Report

Parameter SO2  
Air Monitoring Network PAZA



## Station Information

|                       |                                             |                                  |                                  |
|-----------------------|---------------------------------------------|----------------------------------|----------------------------------|
| Calibration Date      | December 13, 2016                           | Previous Calibration             | November 1, 2016                 |
| Station Number        | 10                                          | Station Location                 | Rycroft                          |
| Reason:               | <input checked="" type="checkbox"/> Routine | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                       |                                             | <input type="checkbox"/> Other:  |                                  |
| Start Time (MST)      | 11:00                                       | End Time (MST)                   | 13:30:00 PM                      |
| Barometric Pressure   | 0.929 Atm                                   | Station Temperature              | 20.0 Deg C                       |
| Calibrator            | EnviroNics 6103                             | Serial Number                    | 6586                             |
| Cal Gas Concentration | 49.8 ppm                                    | Cal Gas Expiry Date              | 3/10/2017                        |
| Gas Cert Reference    | LL119493                                    |                                  |                                  |
| DACS make             | CR3000                                      | DACS serial No.                  | 5407                             |
| DACS voltage range    | 0 - 5 Volt                                  | DACS channel #                   | 2                                |
|                       | Before                                      |                                  | After                            |
| DACS Scale High       | 500                                         | DACS slope                       | 500                              |
| DACS Scale Low        | 0                                           | DACS intercept                   | 0                                |
| Calculated slope      | 1.000552                                    | Calculated slope                 | 0.998748                         |
| Calculated intercept  | 0.887183                                    | Calculated intercept             | 1.385964                         |
| Analyzer make         | TEI 43C                                     | Analyzer serial #                | 436610005                        |

|                     | before |       | after |       |
|---------------------|--------|-------|-------|-------|
| Concentration range | 0-500  | ppb   | 0-500 | ppb   |
| Background          | 23.2   |       | 23.3  |       |
| Coefficient         | 1.056  |       | 1.056 |       |
| UV Lamp Voltage     | 896    | V     | 896   | V     |
| Chamber Temp        | 44.7   | C     | 44.8  | C     |
| Perm Gas Temp       | 45     | C     | 45    | C     |
| Pressure            | 682.9  | mm Hg | 682.7 | mm Hg |
| Sample Flow         | 0.469  | LPM   | 0.47  | LPM   |
| Lamp Intensity      | 30308  | Hz    | 30789 | Hz    |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4998                            | 0.00                          | 0.0                                 | 0.0                                | N/A                       |
| 4996                            | 39.95                         | 395.1                               | 395.0                              | 1.0002                    |
| 4997                            | 19.98                         | 198.3                               | 196.1                              | 1.0112                    |
| 4999                            | 9.94                          | 98.8                                | 96.4                               | 1.0251                    |
| 4998                            | 0.00                          | 0.0                                 | 0.0                                | As found zero             |
| 4999                            | 39.93                         | 394.6                               | 395.0                              | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0122                    |

Calculated value of As Found Response: 396.063 ppm Percent Change of As Found: -0.4%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.3                | ppm | 0.3               | ppm |
| Auto span | 203.5              | ppm | 200.6             | ppm |

Notes: No adjustment made

## Calibration Summary

Parameter SO2

Air Monitoring Network PAZA



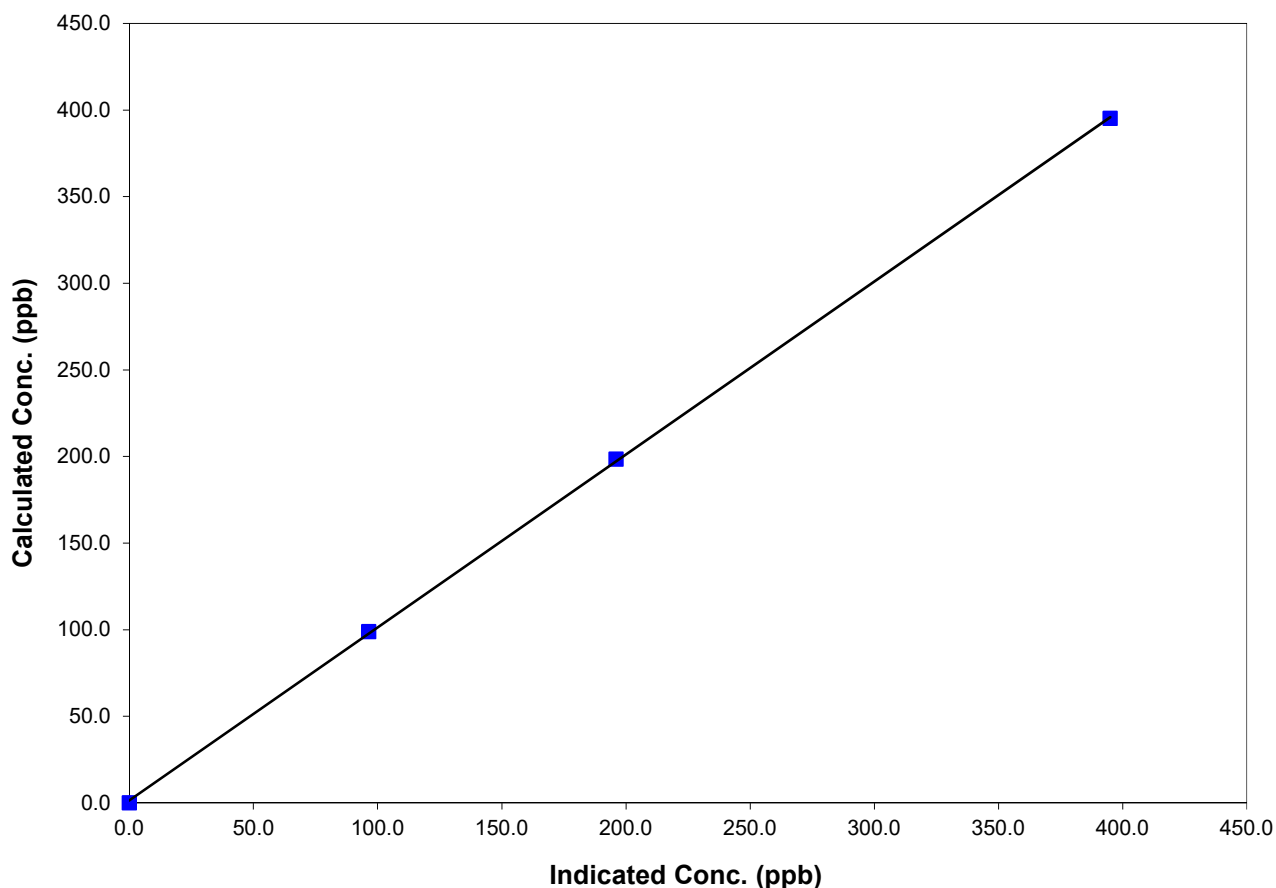
### Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 13, 2016 | Previous Calibration | November 1, 2016 |
| Station Number      | 10                | Station Location     | Rycroft          |
| Start Time (MST)    | 11:00             | End Time (MST)       | 13:30:00 PM      |
| Analyzer make/model | TEI 43C           | Analyzer serial #    | 436610005        |

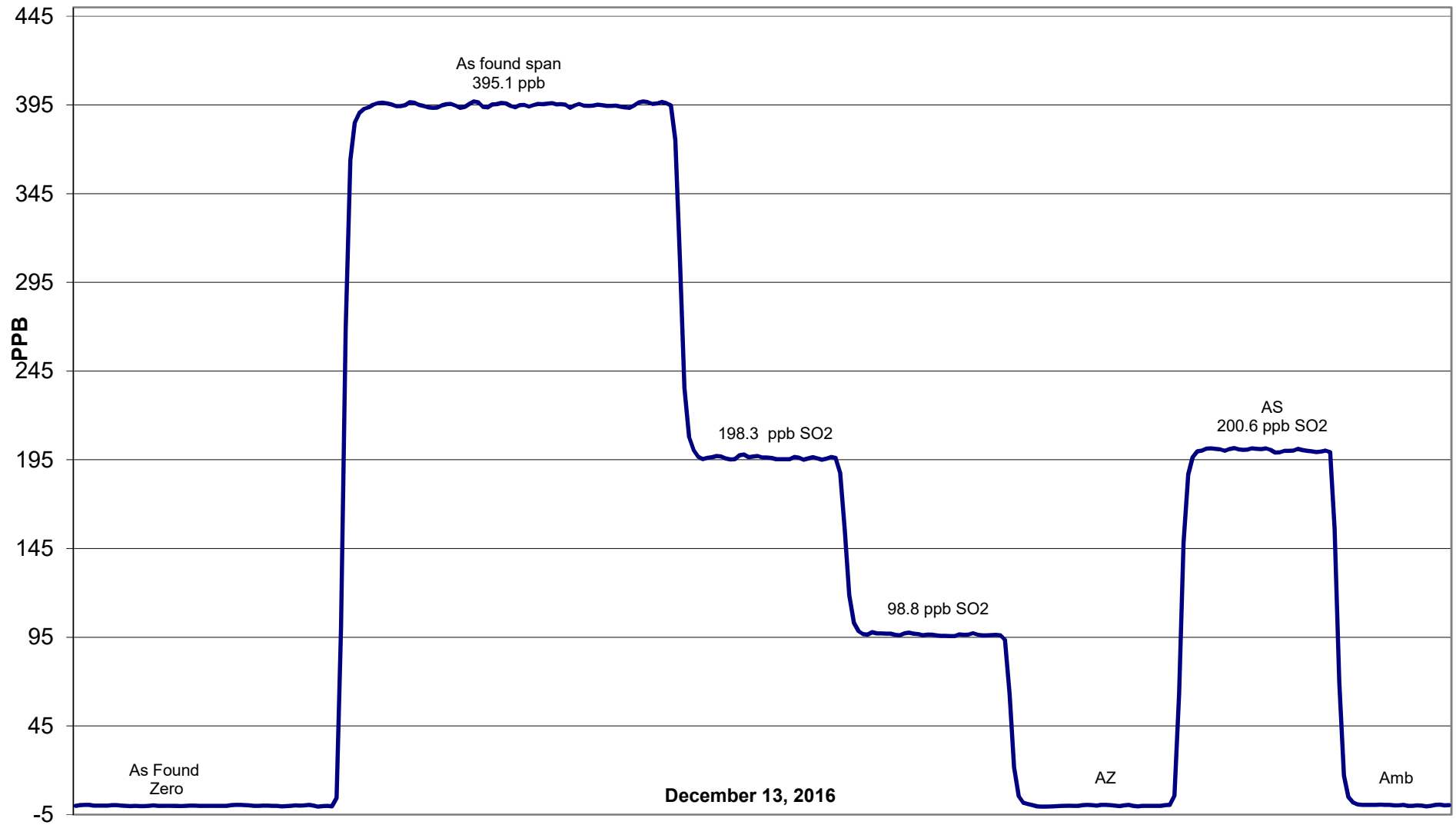
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.0                                 | 0.0                                | N/A                       | Correlation Coefficient | 0.999940 |
| 395.1                               | 395.0                              | 1.0002                    |                         |          |
| 198.3                               | 196.1                              | 1.0112                    |                         |          |
| 98.8                                | 96.4                               | 1.0251                    | Slope                   | 0.998748 |
|                                     |                                    |                           | Intercept               | 1.385964 |
|                                     |                                    |                           |                         |          |

### SO2 Calibration Curve



## SO2 Calibration



# Calibration Report

Parameter

NO<sub>x</sub>-NO-NO<sub>2</sub>

Air Monitoring Network

PAZA



## Station Information

|                              |                   |              |                      |                  |       |
|------------------------------|-------------------|--------------|----------------------|------------------|-------|
| Calibration Date             | December 13, 2016 |              | Previous Calibration | November 1, 2016 |       |
| Station Number               | 10                |              | Station Location     | Rycroft          |       |
| Reason:                      | <b>Routine</b>    | Installation | Removal              | Other:           |       |
| Start Time (MST)             | 11:10             |              | End Time (MST)       | 14:45:00 PM      |       |
| Barometric Pressure          | 0.929             | Atm          | Station Temperature  | 17.0             | Deg C |
| Calibrator                   | EnviroNics        |              | Serial Number        | 6586             |       |
| NO Cal Gas Conc              | 50.9              | ppm          | Cal Gas Expiry Date  | March 10, 2017   |       |
| NO <sub>x</sub> Cal Gas Conc | 51.2              | ppm          | Cal Gas Serial #     | LL103793         |       |

## DACS Information

|           |               |                 |                 |           |  |
|-----------|---------------|-----------------|-----------------|-----------|--|
| DACS make | CR3000        |                 | DACS serial No. | 5407      |  |
|           | Parameter     | NO <sub>2</sub> | NO <sub>x</sub> | NO        |  |
| Before    | Data Slope    | 1.000056        | 1.002085        | 1.000491  |  |
|           | Data Offset   | -0.603488       | 0.296170        | 0.134042  |  |
| After     | Data Slope    | 1.002167        | 1.002506        | 0.995367  |  |
|           | Data Offset   | -0.856063       | 0.322499        | 0.236681  |  |
|           | Channel #     | 8               | 6               | 7         |  |
|           | Voltage Range | 0 - 5 VDC       | 0 - 5 VDC       | 0 - 5 VDC |  |

## Analyzer Information

|                             |         |       |                   |            |  |
|-----------------------------|---------|-------|-------------------|------------|--|
| Analyzer make/model         | TEI 42i |       | Analyzer serial # | 0701120011 |  |
| Test Point                  | before  |       | after             |            |  |
| Concentration range         | 0-500   | ppb   | 0-500             | ppb        |  |
| NO offset                   | 7.7     | mV    | 8.4               | mV         |  |
| NO <sub>x</sub> bkgnd       | 7.9     | mV    | 8.6               | mV         |  |
| NO coefficient              | 1.499   |       | 1.617             |            |  |
| NO <sub>x</sub> coefficient | 0.999   |       | 0.999             |            |  |
| NO <sub>2</sub> conv temp   | 323.4   | Deg C | 323.4             | Deg C      |  |
| PMT Temp                    | -3.0    | Deg C | -3.0              | Deg C      |  |
| PMT Volt                    | 834.7   | mV    | -835.2            | mV         |  |
| R Cell Press                | 246.4   | in Hg | 244.0             | in Hg      |  |
| Sample Flow                 | 0.599   | LPM   | 0.609             | LPM        |  |

Notes: Span adjustment made

# Calibration Report

Parameter **NOX-NO-NO2**  
Air Monitoring Network **PAZA**



## Station Information

Calibration Date: December 13, 2016 Station Location: Rycroft

## Calibration Data

|                           | Dilution flow rate (ccm) | Source gas flow rate (ccm) | Calculated NOx conc (ppb) | Calculated NO conc (ppb) | Calculated NO2 conc (ppb) | Indicated NOx conc (ppb) | Indicated NO conc (ppb) | Indicated NO2 conc (ppb) | NOx Correction factor | NO Correction factor |
|---------------------------|--------------------------|----------------------------|---------------------------|--------------------------|---------------------------|--------------------------|-------------------------|--------------------------|-----------------------|----------------------|
| zero                      | 4994                     | 0.00                       | 0.0                       | 0.0                      | 0.0                       | 0.0                      | 0.0                     | 0.0                      | N/A                   | N/A                  |
| 1                         | 4995                     | 39.92                      | 405.9                     | 403.6                    | 2.4                       | 404.6                    | 405.3                   | -2.3                     | 1.0032                | 0.9958               |
| 2                         | 4994                     | 19.96                      | 203.8                     | 202.6                    | 1.2                       | 203.2                    | 203.5                   | -1.1                     | 1.0032                | 0.9960               |
| 3                         | 4998                     | 9.98                       | 102.0                     | 101.4                    | 0.6                       | 101.0                    | 101.2                   | -0.1                     | 1.0105                | 1.0020               |
| AFZ                       | 4994                     | 0.00                       | 0.0                       | 0.0                      | 0.0                       | 0.0                      | 0.0                     | 0.0                      | 0.0000                | 0.0000               |
| AFS                       | 4999                     | 39.92                      | 405.6                     | 403.2                    | 0.8                       | 373.4                    | 373.8                   | -1.9                     | 1.0863                | 1.0789               |
| Average Correction Factor |                          |                            |                           |                          |                           |                          |                         |                          | 1.0057                | 0.9979               |

As Found Concentrations: NO<sub>x</sub>= 374.5 NO= 374.0 As Found Percent Change NO<sub>x</sub>= -7.7% NO= -7.2%

## GPT Calibration Data

Dilution Flow 4995 ccm Source Gas Flow 39.93 ccm

| O3 Setpoint (ppb)         | Indicated NOx high point (ppb) | Indicated NO drop conc (ppb) | Calculated NO2 conc (ppb) | Indicated NOx conc (ppb) | Indicated NO conc (ppb) | Indicated NO2 conc (ppb) | NOx Correction factor | NO Correction factor | NO2 Correction factor | Converter Efficiency |
|---------------------------|--------------------------------|------------------------------|---------------------------|--------------------------|-------------------------|--------------------------|-----------------------|----------------------|-----------------------|----------------------|
| 0                         | 0.0                            | 0.0                          | 0.0                       | 0.0                      | 0.0                     | 0.0                      | N/A                   | N/A                  | N/A                   | N/A                  |
| NO point                  | 408.8                          | 408.8                        | 0.0                       | 408.8                    | 408.8                   | -1.8                     | 1.0000                | 1.0000               | N/A                   | N/A                  |
| 300                       | 408.8                          | 65.9                         | 342.9                     | 409.8                    | 65.9                    | 342.3                    | 0.9976                | 1.0000               | 1.0018                | 99.8%                |
| 200                       | 408.8                          | 178.6                        | 230.2                     | 411.9                    | 178.6                   | 231.1                    | 0.9926                | 1.0000               | 0.9958                | 100.4%               |
| 100                       | 408.8                          | 299.0                        | 109.8                     | 412.4                    | 299.0                   | 111.4                    | 0.9912                | 1.0000               | 0.9861                | 101.4%               |
| Average Correction Factor |                                |                              |                           |                          |                         |                          | 0.9938                | 1.0000               | 0.9946                | 100.6%               |

## AIC Data

|           | Previous calibration |       |     |     | Current calibration |       |     |     |
|-----------|----------------------|-------|-----|-----|---------------------|-------|-----|-----|
| Parameter | NOx                  | NO2   | NO  |     | NOx                 | NO2   | NO  |     |
| Auto zero | 0.0                  | 0.1   | 0.0 | ppb | 0.1                 | 0.0   | 0.2 | ppb |
| Auto span | 169.3                | 167.4 | 1.2 | ppb | 162.5               | 160.8 | 1.1 | ppb |

Calibration Performed By: Dmytro Dolotii



## Calibration Summary

Parameter NO<sub>2</sub>

Air Monitoring Network PAZA



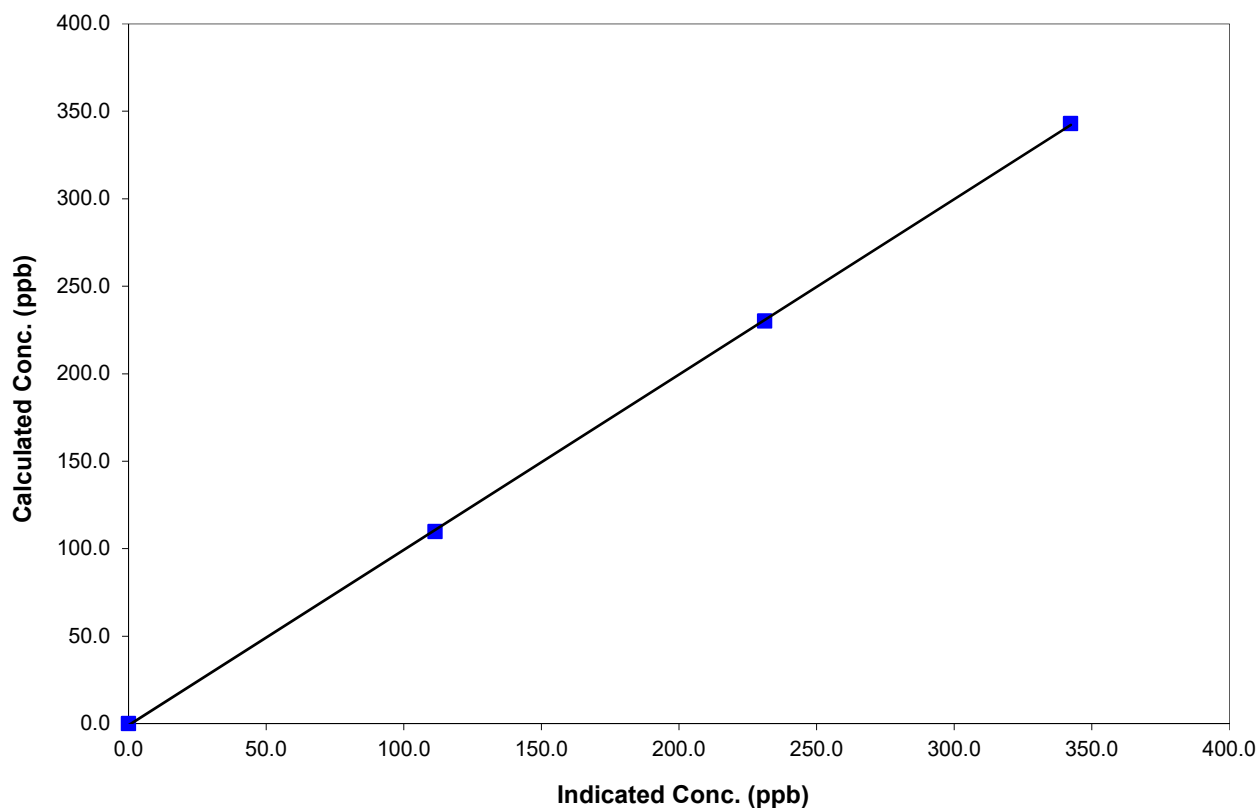
### Station Information

|                  |                   |                      |                  |
|------------------|-------------------|----------------------|------------------|
| Calibration Date | December 13, 2016 | Previous Calibration | November 1, 2016 |
| Station Number   | 10                | Station Location     | Rycroft          |
| Start Time (MST) | 11:10             | End Time (MST)       | 14:45:00 PM      |
| Analyzer make    | TEI 42i           | Analyzer serial #    | 0701120011       |

### Calibration Data

| Calculated conc (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|----------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                        | 0.0                                | N/A                       | Correlation Coefficient | 0.999963  |
| 342.9                      | 342.3                              | 1.0018                    |                         |           |
| 230.2                      | 231.1                              | 0.9958                    |                         |           |
| 109.8                      | 111.4                              | 0.9861                    | Slope                   | 1.002167  |
|                            |                                    |                           |                         |           |
|                            |                                    |                           | Intercept               | -0.856063 |
|                            |                                    |                           |                         |           |

### NO<sub>2</sub> Calibration Curve



## Calibration Summary

Parameter NO<sub>x</sub>

Air Monitoring Network PAZA



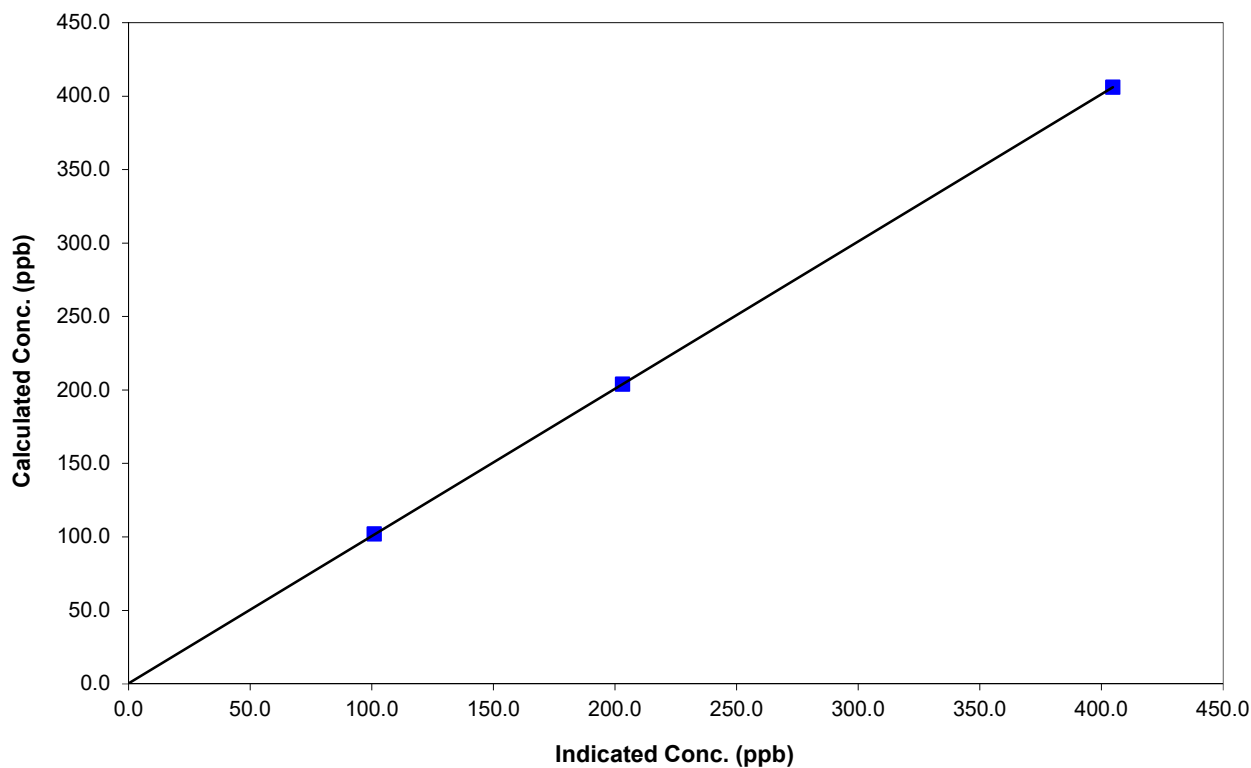
### Station Information

|                  |                   |                      |                  |
|------------------|-------------------|----------------------|------------------|
| Calibration Date | December 13, 2016 | Previous Calibration | November 1, 2016 |
| Station Number   | 10                | Station Location     | Rycroft          |
| Start Time (MST) | 11:10             | End Time (MST)       | 14:45:00 PM      |
| Analyzer make    | TEI 42i           | Analyzer serial #    | 0701120011       |

### Calibration Data

| Calculated conc (ppb)<br>(Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------|---------------------------------------|---------------------------|-------------------------|----------|
| 0.0                           | 0.0                                   | N/A                       | Correlation Coefficient | 0.999996 |
| 405.9                         | 404.6                                 | 1.0032                    |                         |          |
| 203.8                         | 203.2                                 | 1.0032                    |                         |          |
| 102.0                         | 101.0                                 | 1.0105                    | Slope                   | 1.002506 |
|                               |                                       |                           |                         |          |
|                               |                                       |                           | Intercept               | 0.322499 |
|                               |                                       |                           |                         |          |

### NO<sub>x</sub> Calibration Curve



# Calibration Summary

Parameter NO

Air Monitoring Network PAZA



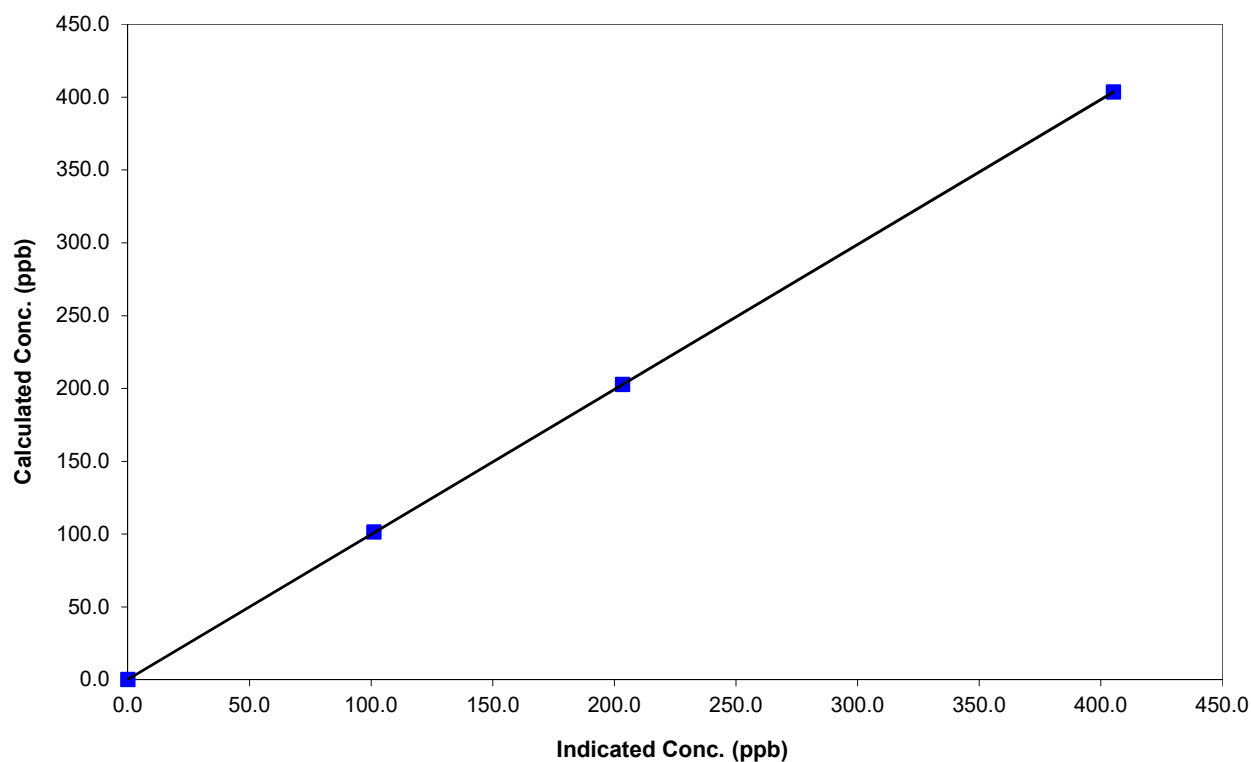
## Station Information

|                  |                   |                      |                  |
|------------------|-------------------|----------------------|------------------|
| Calibration Date | December 13, 2016 | Previous Calibration | November 1, 2016 |
| Station Number   | 10                | Station Location     | Rycroft          |
| Start Time (MST) | 11:10             | End Time (MST)       | 14:45:00 PM      |
| Analyzer make    | TEI 42i           | Analyzer serial #    | 0701120011       |

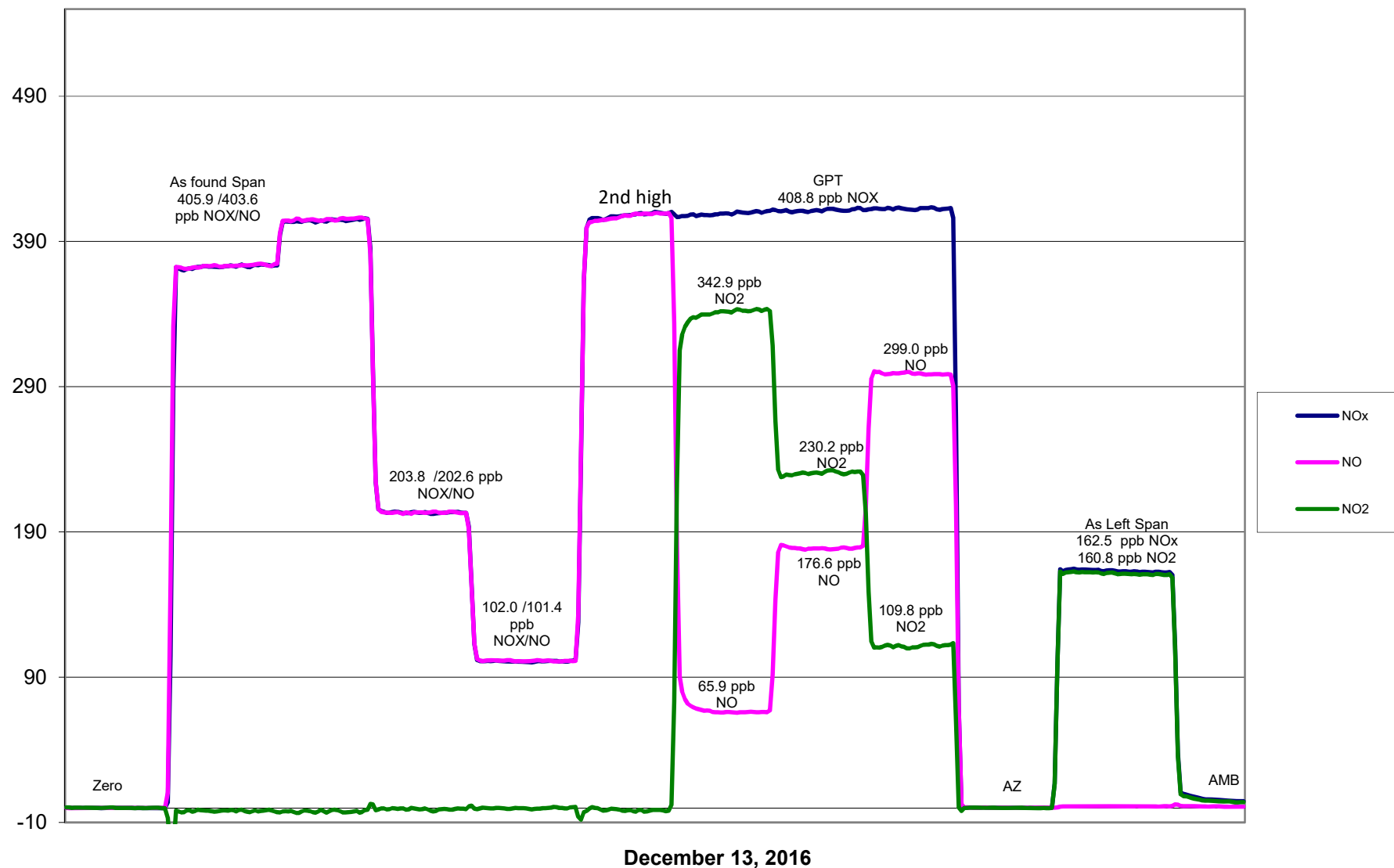
## Calibration Data

| Calculated conc (ppb)<br>(Cc) | Indicated concentration<br>(ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------|---------------------------------------|---------------------------|-------------------------|----------|
| 0.0                           | 0.0                                   | N/A                       | Correlation Coefficient | 0.999997 |
| 403.6                         | 405.3                                 | 0.9958                    |                         |          |
| 202.6                         | 203.5                                 | 0.9960                    |                         |          |
| 101.4                         | 101.2                                 | 1.0020                    | Slope                   | 0.995367 |
|                               |                                       |                           |                         |          |
|                               |                                       |                           | Intercept               | 0.236681 |
|                               |                                       |                           |                         |          |

## NO Calibration Curve



# NO<sub>x</sub> Calibration



# Calibration Report



AIR QUALITY MONITORING

Parameter 03

Air Monitoring Network PAZA

## Station Information

|                      |                 |                      |                 |
|----------------------|-----------------|----------------------|-----------------|
| Calibration Date     | November 1 2016 | Previous Calibration | November 1 2016 |
| Station Number       | 10              | Station Location     | Rycroft         |
| Reason:              | <b>Routine</b>  | Install              | Removal         |
| Start Time (MST)     | 13:43:00 PM     | End Time (MST)       | 16:00:00 PM     |
| Barometric Pressure  | 0.929 atm       | Station Temperature  | 20.0 Deg C      |
| Calibrator           | EnviroNics 6103 | Serial Number        | 6586            |
| DACS make            | CR3000          | DACS serial No.      | 5407            |
| DACS voltage range   | 0 - 5 Volts     | DACS channel #       | 6               |
|                      | Before          |                      | After           |
| Calculated slope     | 1.019209        | Calculated slope     | 1.021685        |
| Calculated intercept | -0.815905       | Calculated intercept | -2.135616       |
| Analyzer make        | Model 49-I      | Analyzer serial #    | 1153630156      |

|                     | before |       | after  |       |
|---------------------|--------|-------|--------|-------|
| Concentration range | 0-500  | ppb   | 0-500  | ppb   |
| Offset              | -0.5   | ppb   | -0.6   | ppb   |
| Span                | 1.012  |       | 1.088  |       |
| Cell A intensity    | 87800  | Hz    | 87918  | Hz    |
| Cell B intensity    | 110374 | Hz    | 110697 | Hz    |
| Pressure            | 710.50 | in Hg | 705.00 | in Hg |
| Cell A Flow         | 0.702  | ccm   | 0.698  | ccm   |
| Cell B Flow         | 0.701  | cmm   | 0.696  | cmm   |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 5015                            | 0.00                          | 0.0                                 | 0.6                                | N/A                       |
| 5020                            | 0.30                          | 342.9                               | 337.5                              | 1.0160                    |
| 5025                            | 0.20                          | 230.2                               | 226.4                              | 1.0170                    |
| 5020                            | 0.10                          | 109.8                               | 112.3                              | 0.9775                    |
| 5015                            | 0.00                          | 0.0                                 | 0.6                                | As found zero             |
| 5020                            | 0.30                          | 342.9                               | 317.2                              | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0035                    |

Calculated value of As Found Response: 321.8 ppm Percent Change of As Found: -6.1%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.5                | ppb | 0.6               | ppb |
| Auto span | 358.8              | ppb | 353.9             | ppb |

Notes: Span adjustment made

Calibration Performed By: Dmytro Dolotii

## Calibration Summary

Parameter           O3          

Air Monitoring Network                                   PAZA                                  



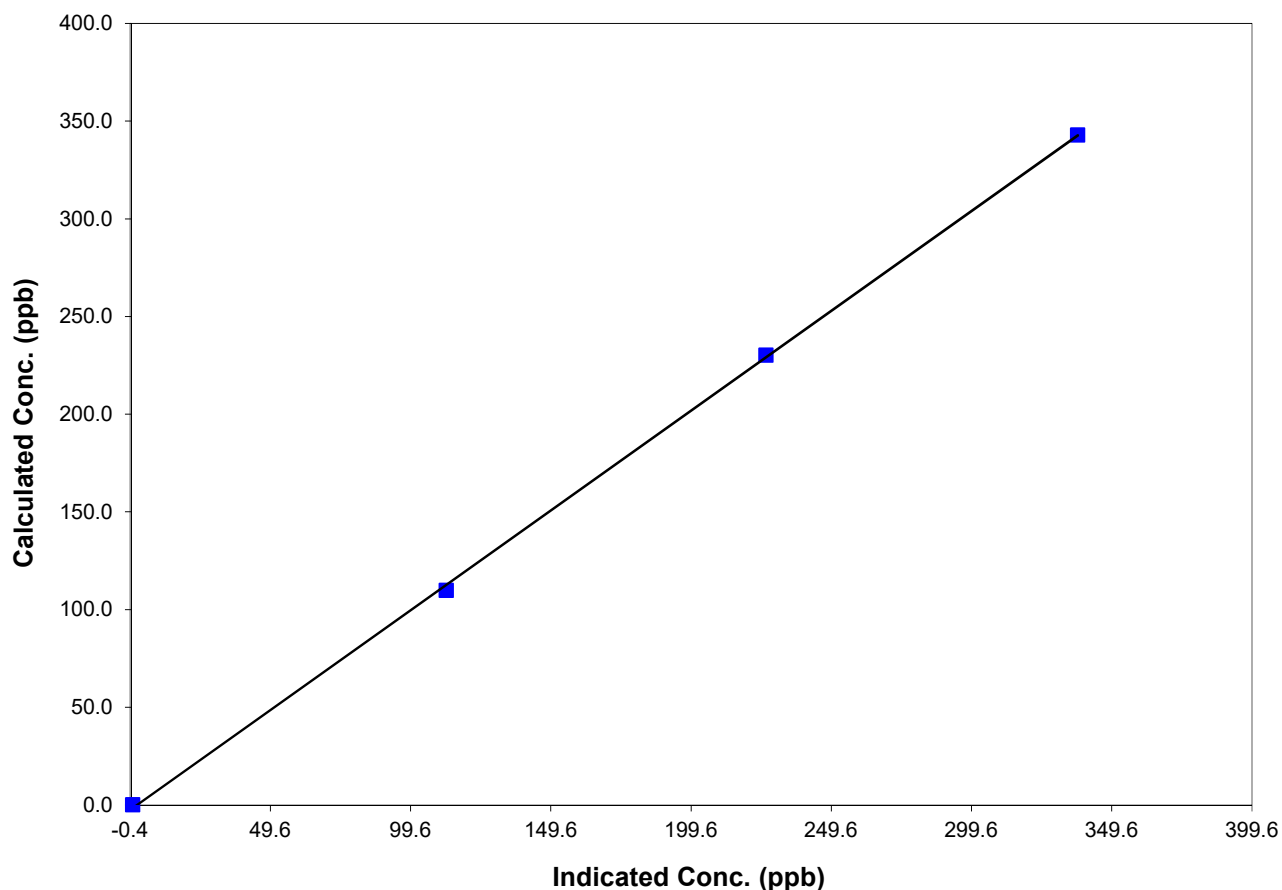
### Station Information

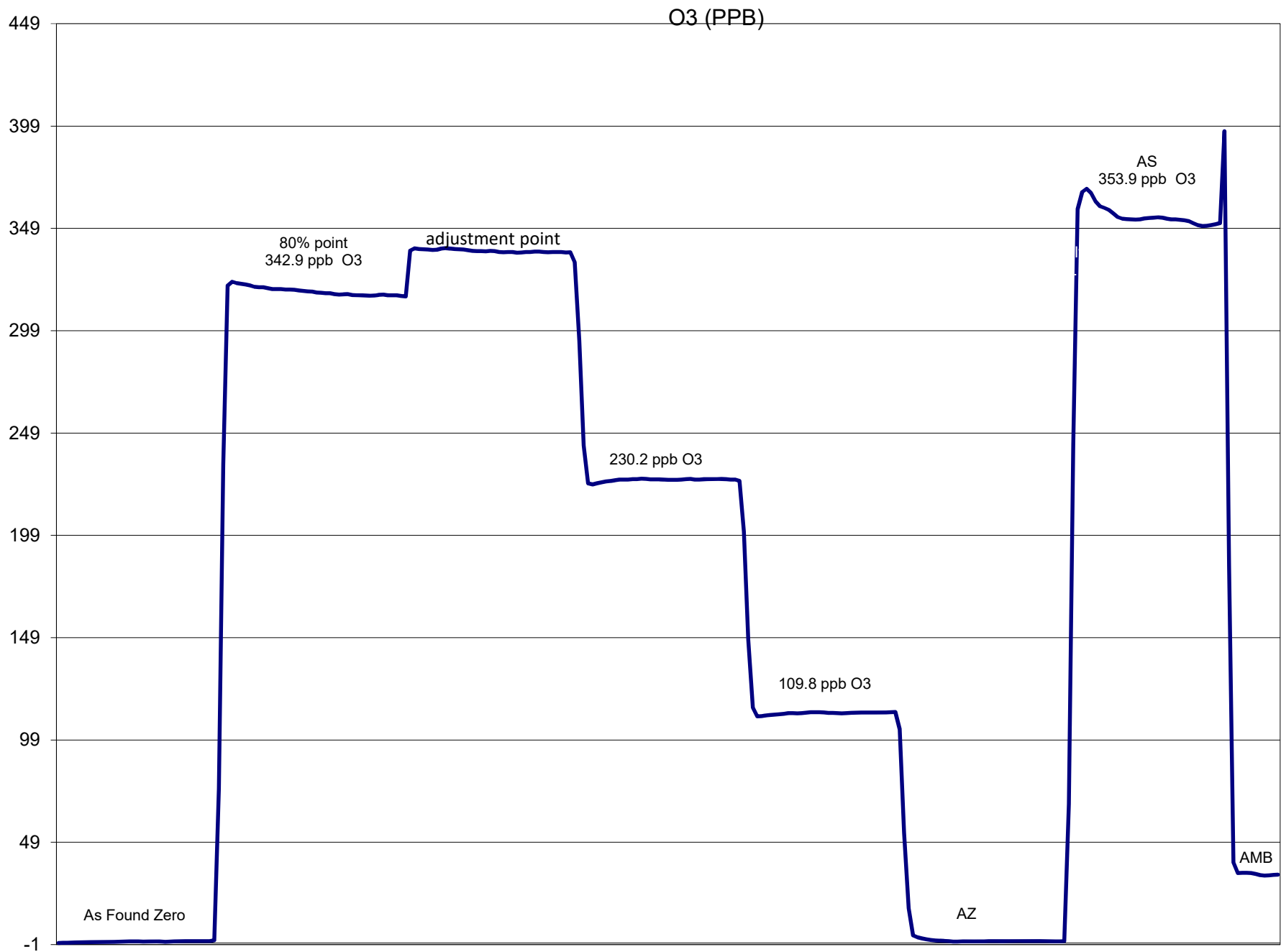
|                     |                 |                      |                 |
|---------------------|-----------------|----------------------|-----------------|
| Calibration Date    | November 1 2016 | Previous Calibration | November 1 2016 |
| Station Number      | 10              | Station Location     | Rycroft         |
| Start Time (MST)    | 13:43:00 PM     | End Time (MST)       | 16:00:00 PM     |
| Analyzer make/model | Model 49-I      | Analyzer serial #    | 1153630156      |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.6                                | NA                        | Correlation Coefficient | 0.999825  |
| 342.9                               | 337.5                              | 1.0160                    |                         |           |
| 230.2                               | 226.4                              | 1.0170                    |                         |           |
| 109.8                               | 112.3                              | 0.9775                    | Slope                   | 1.021685  |
|                                     |                                    |                           | Intercept               | -2.135616 |

### O3 Calibration Curve





November 1 2016

# Calibration Report



Parameter CH4 / NMHC / THC

Air Monitoring Network PAZA

## Station Information

|                  |                                             |                                  |                                  |
|------------------|---------------------------------------------|----------------------------------|----------------------------------|
| Calibration Date | December 12, 2016                           | Previous Calibration             | November 2, 2016                 |
| Station Number   | 1                                           | Station Location                 | Rycroft                          |
| Reason:          | <input checked="" type="checkbox"/> Routine | <input type="checkbox"/> Install | <input type="checkbox"/> Removal |
|                  |                                             |                                  | <input type="checkbox"/> Other:  |

|                     |                    |                     |             |
|---------------------|--------------------|---------------------|-------------|
| Start Time (MST)    | 11:30              | End Time (MST)      | 15:00:00 PM |
| Barometric Pressure | 729.00 mm/hg       | Station Temperature | 18.0 Deg C  |
| Calibrator          | EnviroNics 6103    | Serial Number       | 6586        |
| Cal Gas CH4 Conc    | 386 ppm CH4        | Cal Gas Expiry Date | 3/28/2014   |
| Cal Gas C3H8 Conc   | 207 569.25 ppm CH4 | Cal Gas Cylinder #  | LL34318     |
| DACS make           | CR3000             | DACS serial No.     | 5408        |
| DACS voltage range  | 0 - 5 volt         | DACS channel #      | SE 12,13,14 |

Analyzer make TEI 55I-A3PHAA Analyzer serial # 1151980005

|                     | before                       |     | after                        |                 |
|---------------------|------------------------------|-----|------------------------------|-----------------|
| Concentration range | 0-20 (CH4, NMHC); 0-40 (THC) | ppm | 0-20 (CH4, NMHC); 0-40 (THC) | ppm             |
| Air pressure        | 34.7                         | PSI | 34.7                         | PSI             |
| Fuel pressure       | 49.4                         | PSI | 49.4                         | PSI             |
| Carrier pressure    | 40.1                         | PSI | 40.1                         | PSI             |
| CH4 cal factor      |                              |     |                              | E <sup>-4</sup> |
| NMHC cal factor     |                              |     |                              | E <sup>-4</sup> |
| Rt                  |                              | Sec |                              | Sec             |
| Pk Index            |                              |     |                              |                 |

## CH4 Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.00                               | N/A                       |
| 1997                            | 68.96                         | 12.88                               | 12.65                              | 1.0186                    |
| 1998                            | 40.99                         | 7.76                                | 7.61                               | 1.0194                    |
| 1999                            | 15.97                         | 3.06                                | 2.99                               | 1.0223                    |
|                                 |                               |                                     |                                    |                           |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.00                               | As Found Zero             |
| 1995                            | 68.93                         | 12.89                               | 12.36                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0201                    |

Calculated value of As Found Response: 12.390 ppm Percent Change of As Found: 3.9%

|                      | Before   |                      | After    |
|----------------------|----------|----------------------|----------|
| Calculated slope     | 0.999392 | Calculated slope     | 1.018425 |
| Calculated intercept | 0.045763 | Calculated intercept | 0.004996 |

## Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.00               | ppm | 0.00              | ppm |
| Auto span | 7.58               | ppm | 7.59              | ppm |



### NMHC Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.00                               | N/A                       |
| 1997                            | 68.96                         | 19.00                               | 19.02                              | 0.9990                    |
| 1998                            | 40.99                         | 11.44                               | 11.39                              | 1.0052                    |
| 1999                            | 15.97                         | 4.51                                | 4.34                               | 1.0387                    |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.00                               | As Found Zero             |
| 1995                            | 68.93                         | 19.01                               | 19.13                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0143                    |

Calculated value of As Found Response: 19.170 ppm      Percent Change of As Found: -0.8%

|                      | Before   |                      | After    |
|----------------------|----------|----------------------|----------|
| Calculated slope     | 0.997390 | Calculated slope     | 0.996385 |
| Calculated intercept | 0.087304 | Calculated intercept | 0.083287 |

#### Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.00               | ppm | 0.00              | ppm |
| Auto span | 11.07              | ppm | 11.17             | ppm |

### THC Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 1995                            | 0.00                          | 0.00                                | 0.00                               | N/A                       |
| 1997                            | 68.96                         | 31.89                               | 31.70                              | 1.0057                    |
| 1998                            | 40.99                         | 19.20                               | 19.00                              | 1.0110                    |
| 1999                            | 15.97                         | 7.57                                | 7.36                               | 1.0282                    |
|                                 |                               |                                     |                                    |                           |
| 1995                            | 0.00                          | 0.00                                | 0.00                               | As Found Zero             |
| 1995                            | 68.93                         | 31.90                               | 31.53                              | As Found Span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0150                    |

Calculated value of As Found Response: 31.568 ppm      Percent Change of As Found: 1.0%

|                      | Before   |                      | After    |
|----------------------|----------|----------------------|----------|
| Calculated slope     | 0.997211 | Calculated slope     | 1.004430 |
| Calculated intercept | 0.131674 | Calculated intercept | 0.085042 |

#### Final Zero/Span Data

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.00               | ppm | 0.00              | ppm |
| Auto span | 18.61              | ppm | 18.76             | ppm |

Notes: Hydrogen & nitrogen cylinders replaced.  
No adjustment made

Calibration Performed By: Dmytro Dolotii

# Calibration Summary

Parameter CH4

Air Monitoring Network PAZA



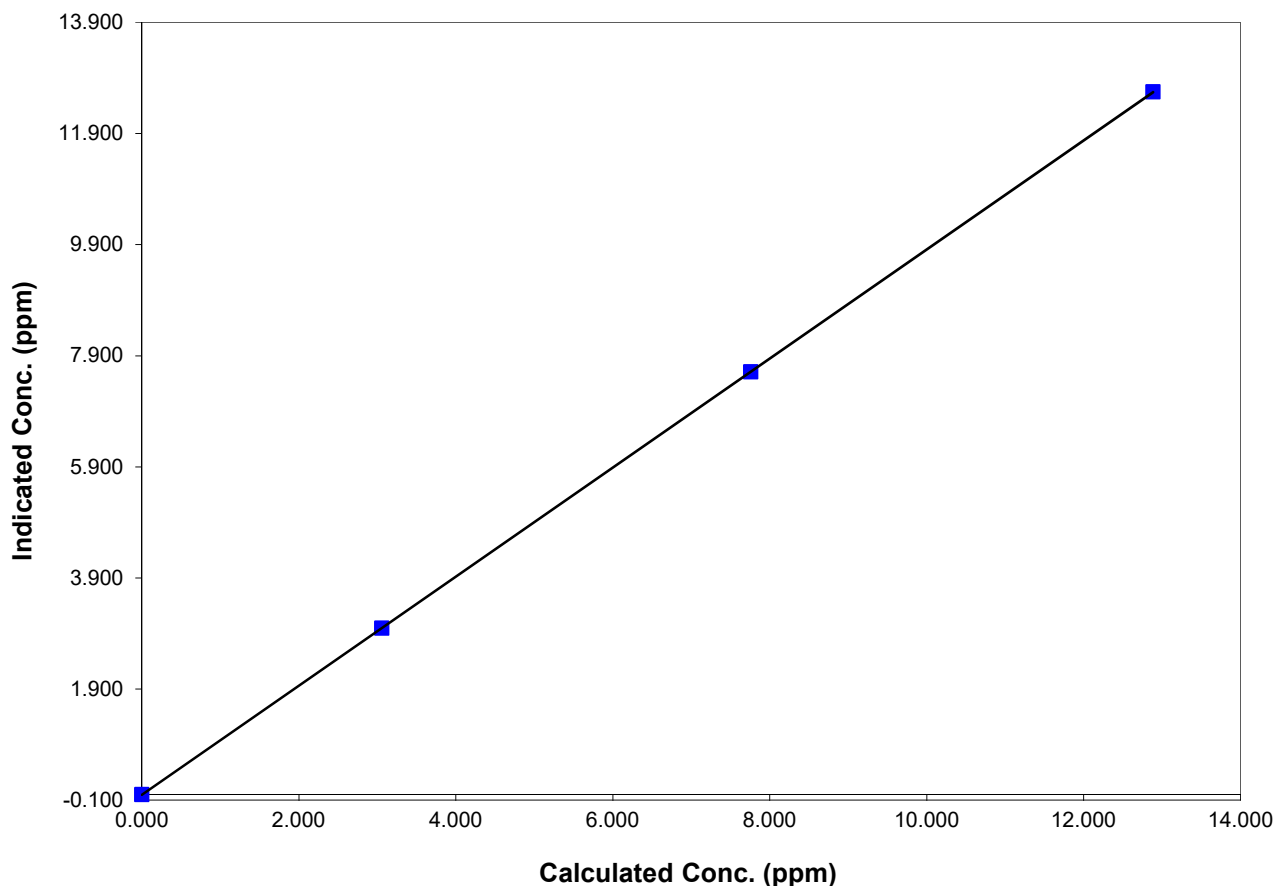
## Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 12, 2016 | Previous Calibration | November 2, 2016 |
| Station Number      | 1                 | Station Location     | Rycroft          |
| Start Time (MST)    | 11:30             | End Time (MST)       | 15:00:00 PM      |
| Analyzer make/model | TEI 55I-A3PHAA    | Analyzer serial #    | 1151980005       |

## Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.000                               | 0.001                              | N/A                       | Correlation Coefficient | 0.999999 |
| 12.884                              | 12.649                             | 1.0186                    |                         |          |
| 7.760                               | 7.612                              | 1.0194                    |                         |          |
| 3.059                               | 2.993                              | 1.0223                    | Slope                   | 1.018425 |
|                                     |                                    |                           | Intercept               | 0.004996 |

## CH4 Calibration Data



## Calibration Summary

Parameter NMHC

Air Monitoring Network PAZA



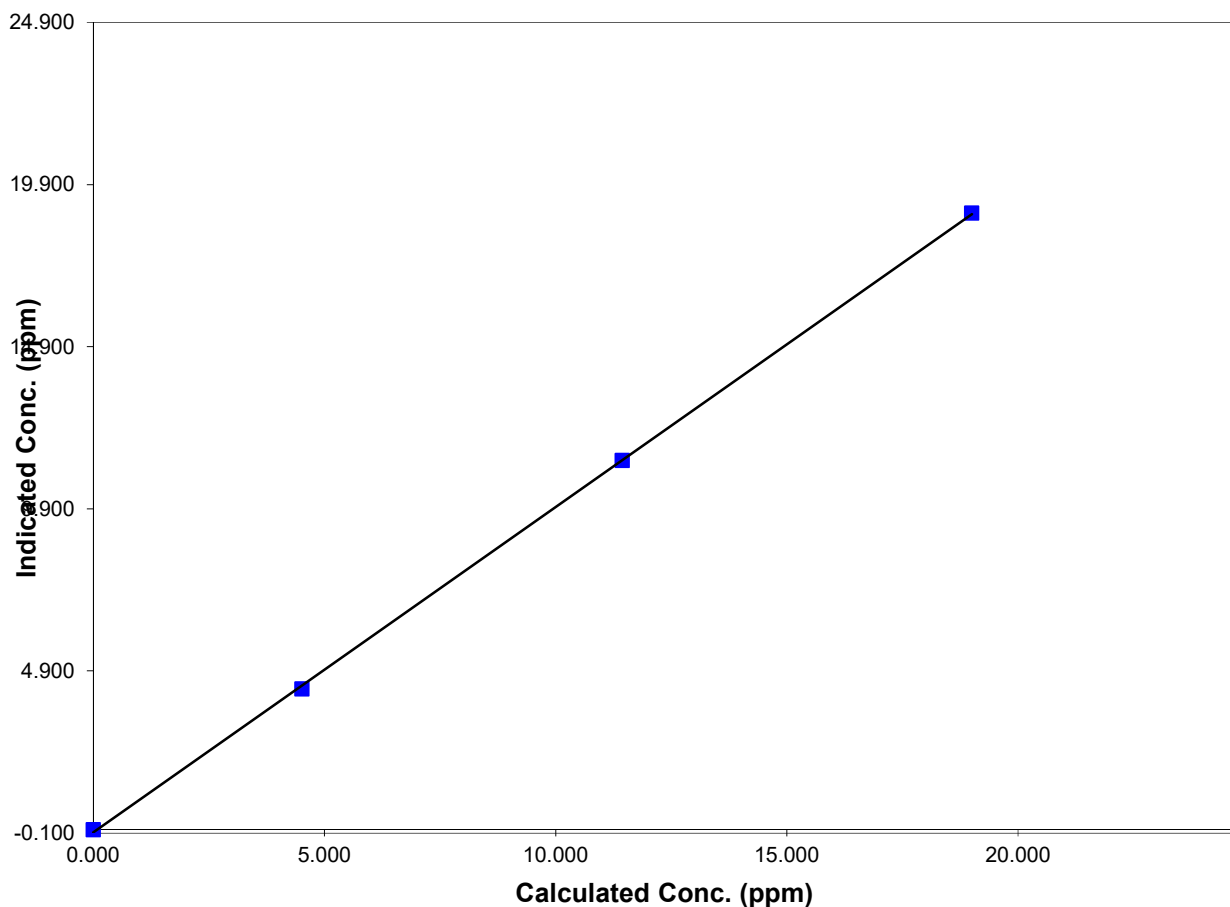
### Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 12, 2016 | Previous Calibration | November 2, 2016 |
| Station Number      | 1                 | Station Location     | Rycroft          |
| Start Time (MST)    | 11:30             | End Time (MST)       | 15:00:00 PM      |
| Analyzer make/model | TEI 55I-A3PHAA    | Analyzer serial #    | 1151980005       |

### Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.000                               | 0.001                              | N/A                       | Correlation Coefficient | 0.999910 |
| 19.001                              | 19.019                             | 0.9990                    |                         |          |
| 11.444                              | 11.385                             | 1.0052                    |                         |          |
| 4.512                               | 4.344                              | 1.0387                    | Slope                   | 0.996385 |
|                                     |                                    |                           | Intercept               | 0.083287 |

### NMHC Calibration Data



# Calibration Summary

Parameter THC

Air Monitoring Network PAZA



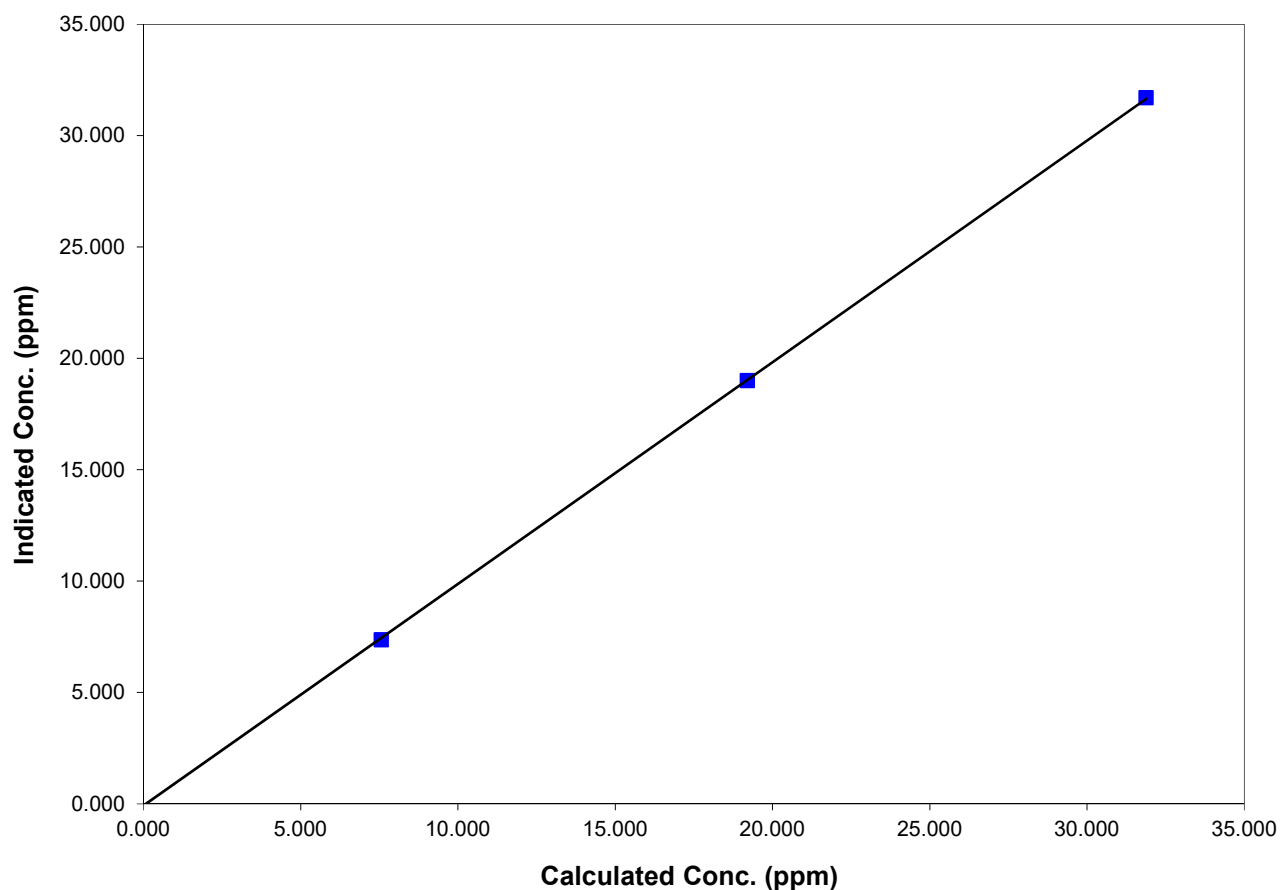
## Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 12, 2016 | Previous Calibration | November 2, 2016 |
| Station Number      | 1                 | Station Location     | Rycroft          |
| Start Time (MST)    | 11:30             | End Time (MST)       | 15:00:00 PM      |
| Analyzer make/model | TEI 55I-A3PHAA    | Analyzer serial #    | 1151980005       |

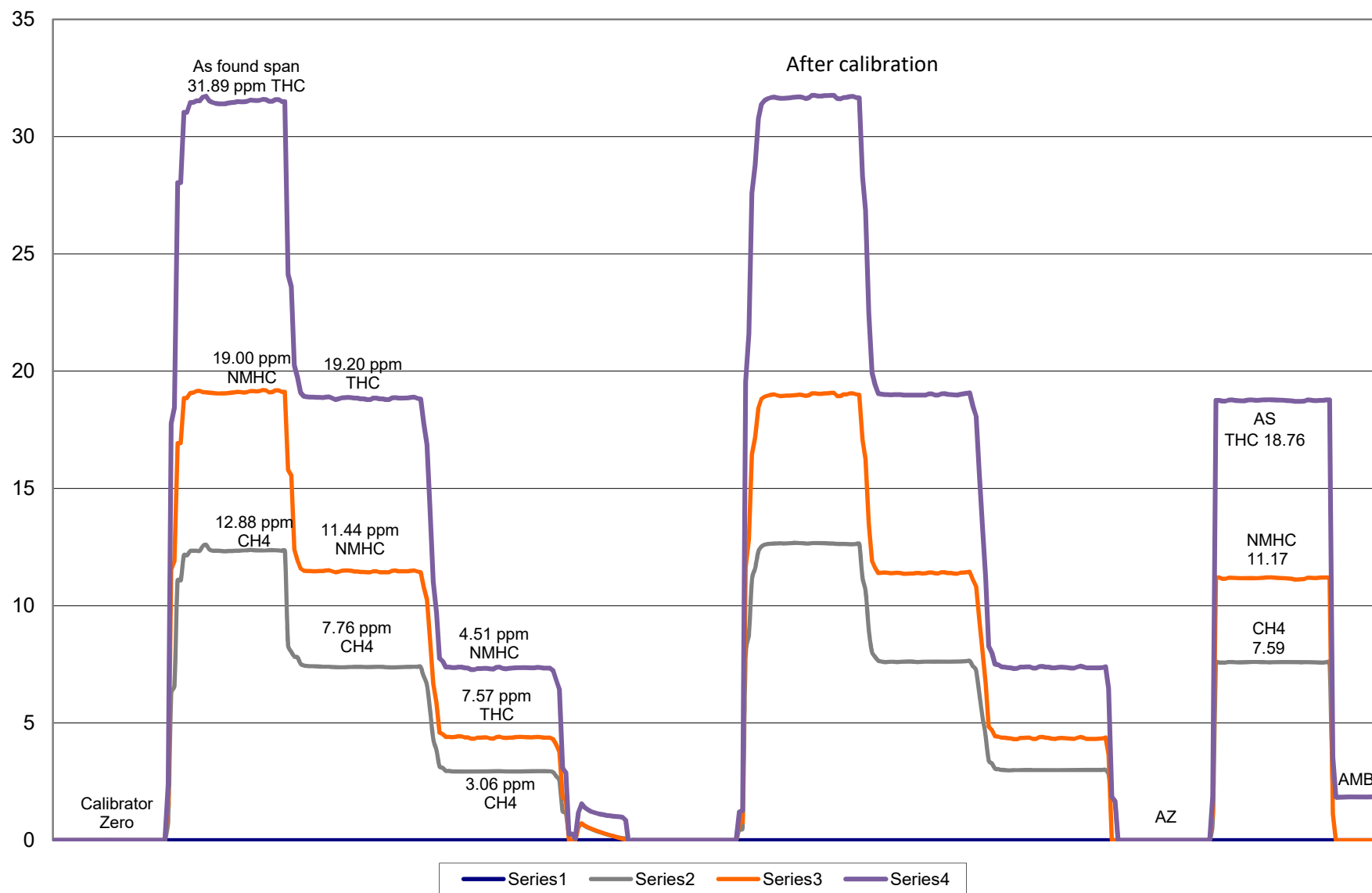
## Calibration Data

| Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |          |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|----------|
| 0.000                               | 0.000                              | N/A                       | Correlation Coefficient | 0.999968 |
| 31.885                              | 31.704                             | 1.0057                    |                         |          |
| 19.203                              | 18.995                             | 1.0110                    |                         |          |
| 7.571                               | 7.363                              | 1.0282                    | Slope                   | 1.004430 |
|                                     |                                    |                           | Intercept               | 0.085042 |

## THC Calibration Data



## THC/CH<sub>4</sub>/NMHC Calibration



# Calibration Report

Parameter TRS

Air Monitoring Network PAZA



## Station Information

|                       |                   |                      |                  |
|-----------------------|-------------------|----------------------|------------------|
| Calibration Date      | December 12, 2016 | Previous Calibration | November 2, 2016 |
| Station Name          | PAZA Rover        | Station Location     | Rycroft          |
| Reason:               | <b>Routine</b>    | Install              | Removal          |
|                       |                   |                      | Other:           |
| Start Time (MST)      | 14:00:00 PM       | End Time (MST)       | 17:12:00 PM      |
| Barometric Pressure   | 0.925 Atm         | Station Temperature  | 18.0 Deg C       |
| Calibrator            | EnviroNics        | Serial Number        | 6586             |
| Cal Gas Concentration | 10.2 ppm          | Cal Gas Expiry Date  | 02/23/2019       |
| Gas Cert Reference    | EY0000380         |                      |                  |
| DACS make             | CR3000            | DACS serial No.      | 5407             |
| DACS voltage range    | 0 - 5 Volt        | DACS channel #       | 1                |
|                       | Before            |                      | After            |
| DACS Scale High       | 100               | DACS slope           | 100              |
| DACS Scale Low        | 0                 | DACS intercept       | 0                |
| Calculated slope      | 1.018495          | Calculated slope     | 1.023975         |
| Calculated intercept  | -0.436377         | Calculated intercept | -0.551352        |
| Analyzer make         | TEI 43C           | Analyzer serial #    | 609716238        |

|                     | before  |      | after   |      |
|---------------------|---------|------|---------|------|
| Concentration range | 0 - 100 | ppb  | 0 - 100 | ppb  |
| Background          | 26.6    | ppb  | 26.6    | ppb  |
| Coefficient         | 0.934   |      | 0.937   |      |
| Lamp Voltage        | 797     | V    | 798     | V    |
| Chamber Temp        | 43.8    | C    | 45      | C    |
| Perm gas Temp       | 45      | C    | 45      | C    |
| Pressure            | 668.6   | mmHg | 668.1   | mmHg |
| Sample Flow         | 0.452   | lpm  | 0.451   | lpm  |
| Lamp Intensity      | 43219   | Hz   | 43239   | Hz   |

## Calibration Data

| Dilution air flow rate (cc/min) | Source gas flow rate (cc/min) | Calculated concentration (ppm) (Cc) | Indicated concentration (ppm) (Ic) | Correction factor (Cc/Ic) |
|---------------------------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|
| 4996                            | 0.0                           | 0.0                                 | 0.7                                | N/A                       |
| 4995                            | 39.94                         | 80.9                                | 79.8                               | 1.0139                    |
| 4997                            | 19.91                         | 40.5                                | 39.5                               | 1.0245                    |
| 6998                            | 9.97                          | 14.5                                | 14.8                               | 0.9778                    |
| 4996                            | 9.97                          |                                     | 2.0                                | Sox Test                  |
| 4995                            | 0.00                          | 0.0                                 | 0.7                                | As found zero             |
| 4995                            | 39.93                         | 80.9                                | 81.6                               | As found span             |
| Average Correction Factor       |                               |                                     |                                    | 1.0054                    |

Calculated value of As Found Response: 81.92 ppm Percent Change of As Found: -1.3%

|           | before calibration |     | after calibration |     |
|-----------|--------------------|-----|-------------------|-----|
| Auto zero | 0.8                | ppm | 14.9              | ppm |
| Auto span | 55.6               | ppm | 51.1              | ppm |

Notes: Span adjustment made  
Sox scrubber check performed

## Calibration Summary

Parameter TRS

Air Monitoring Network PAZA



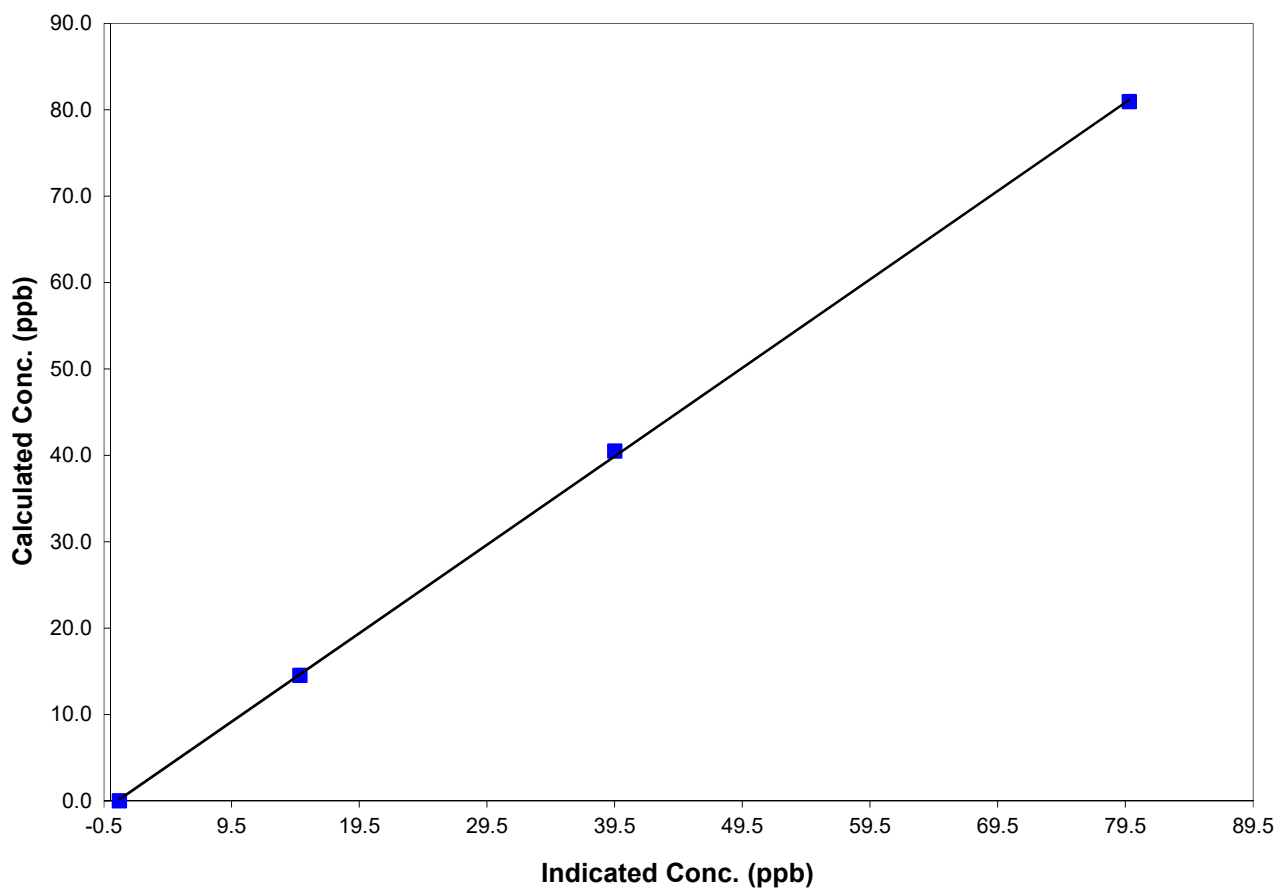
### Station Information

|                     |                   |                      |                  |
|---------------------|-------------------|----------------------|------------------|
| Calibration Date    | December 12, 2016 | Previous Calibration | November 2, 2016 |
| Station Number      | PAZA Rover        | Station Location     | Rycroft          |
| Start Time (MST)    | 14:00:00 PM       | End Time (MST)       | 17:12:00 PM      |
| Analyzer make/model | TEI 43C           | Analyzer serial #    | 609716238        |

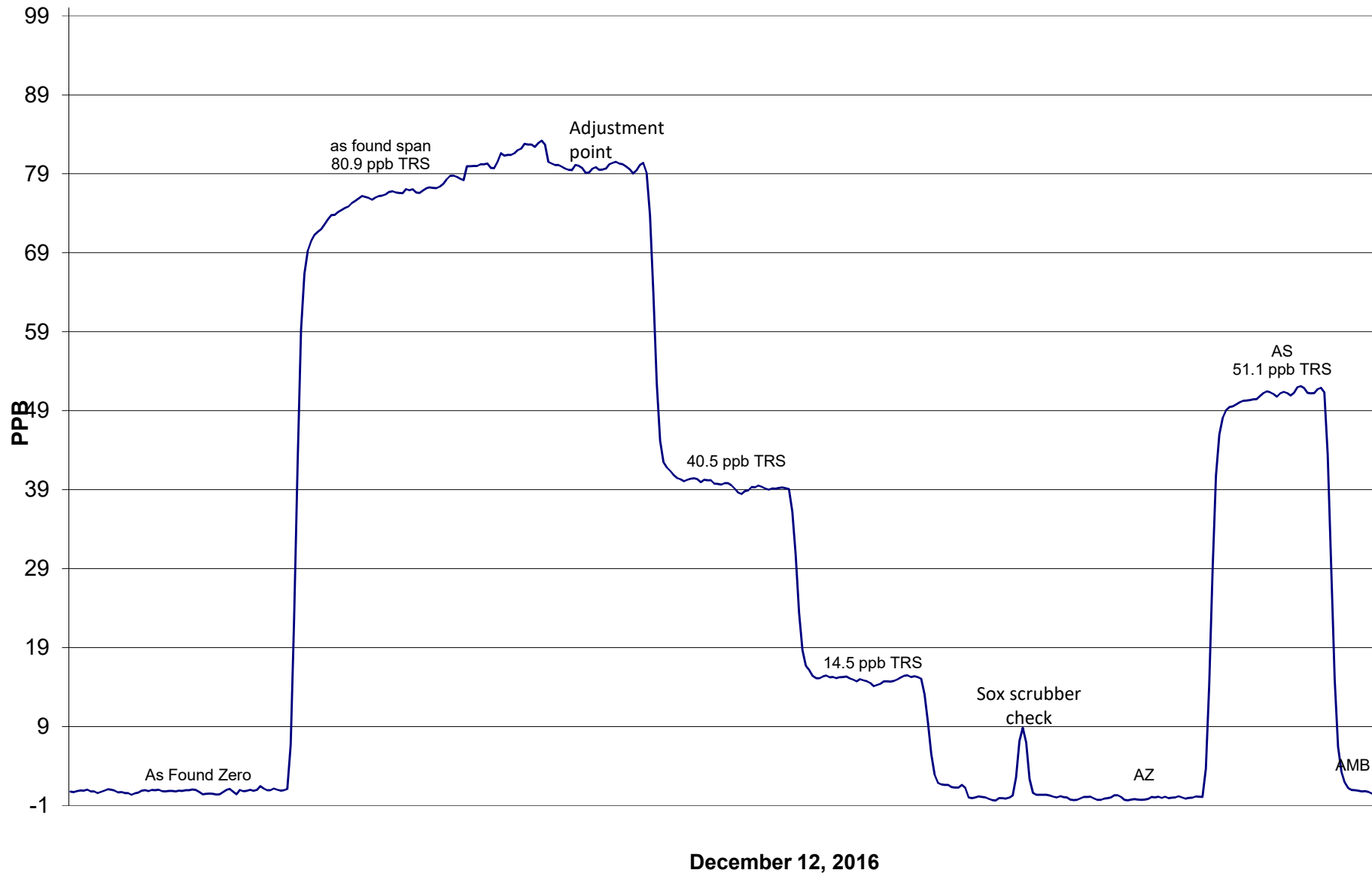
### Calibration Data

| Calculated concentration (ppb) (Cc) | Indicated concentration (ppb) (Ic) | Correction factor (Cc/Ic) | Statistical Evaluation  |           |
|-------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|
| 0.0                                 | 0.7                                | N/A                       | Correlation Coefficient | 0.999883  |
| 80.9                                | 79.8                               | 1.0139                    |                         |           |
| 40.5                                | 39.5                               | 1.0245                    |                         |           |
| 14.5                                | 14.8                               | 0.9778                    | Slope                   | 1.023975  |
|                                     |                                    |                           | Intercept               | -0.551352 |

### TRS Calibration Curve



## TRS Calibration





## *Air Monitoring Directive Exceedence Report*

**Alberta Environment and Parks**  
 Environmental Service Response Centre  
 111 Twin Atria Building  
 4999 – 98<sup>th</sup> Avenue  
 Edmonton, Alberta T6B 2X3  
 Phone: (780) 422-4505  
 Fax: (780) 427-1044  
[erc.environment@gov.ab.ca](mailto:erc.environment@gov.ab.ca)

|                                                                                                                                                                                                                                                                                                                                                        |                        |                                         |                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------------|---------------------|
| <b>Reference Number:</b>                                                                                                                                                                                                                                                                                                                               | 319081                 | <b>Reported To (AESRD Contact):</b>     | Raymond             |
| <b>Date &amp; Time Incident Reported to AESRD:</b>                                                                                                                                                                                                                                                                                                     | December 9, 2016 17:40 |                                         |                     |
| <b>Reported on Behalf of:</b>                                                                                                                                                                                                                                                                                                                          | PASA                   | <b>Reported By:</b>                     | Grover Christiansen |
|                                                                                                                                                                                                                                                                                                                                                        |                        | <b>Approval Number (if applicable):</b> |                     |
| <b>Location(s) of Incident:</b> Valley View                                                                                                                                                                                                                                                                                                            |                        |                                         |                     |
| <b>Start Date &amp; Time of Incident:</b>                                                                                                                                                                                                                                                                                                              |                        | <b>End Date &amp; Time of Incident:</b> |                     |
| December 9, 2016 17:00                                                                                                                                                                                                                                                                                                                                 |                        | December 9, 2016 18:00                  |                     |
| <b>Reason or Nature of Incident:</b>                                                                                                                                                                                                                                                                                                                   |                        |                                         |                     |
| The Valley View site located approximately 18 km southeast of Valley View has exceeded 1-hour AAAQ Objective of 10.0 ppb for H <sub>2</sub> S, details as follows:<br>17:00 MST: H <sub>2</sub> S 38.5 ppb WS: 1.0 km/hr WD: 19.4 degrees Temp: -20.6 Deg C.<br>18:00 MST: H <sub>2</sub> S 20.2 ppb WS: 0.6 km/hr WD: 34.6 Degrees Temp: -22.1 Deg C. |                        |                                         |                     |
| <b>Immediate Actions Taken:</b>                                                                                                                                                                                                                                                                                                                        |                        |                                         |                     |
| Confirm data and instrumentation. Call in Exceedence to AEP. Call CNRL control room.                                                                                                                                                                                                                                                                   |                        |                                         |                     |
| <b>Investigation Details:</b>                                                                                                                                                                                                                                                                                                                          |                        |                                         |                     |
| Plant upset do to cold temperatures.                                                                                                                                                                                                                                                                                                                   |                        |                                         |                     |
| <b>Actions Taken to Prevent Reoccurrence (if any):</b>                                                                                                                                                                                                                                                                                                 |                        |                                         |                     |
| N/A                                                                                                                                                                                                                                                                                                                                                    |                        |                                         |                     |
| <b>Additional Actions Required (if any):</b>                                                                                                                                                                                                                                                                                                           |                        |                                         |                     |
| N/A                                                                                                                                                                                                                                                                                                                                                    |                        |                                         |                     |
| <b>Report Completed By:</b>                                                                                                                                                                                                                                                                                                                            | Grover Christiansen    | <b>Date Report Submitted:</b>           | 2016/12/9           |
| <b>7-Day Letter Due Date:</b>                                                                                                                                                                                                                                                                                                                          | 2016/12/16             |                                         |                     |

WSP AQM Group: Exceedence Report  
 Revision #3  
 January 01, 2015