Peace Airshed Zone Association

Ambient Air Monitoring Network Summary

Ambient Air Quality Monitoring Program

Monthly Report

February 2020

March 30, 2020

Alberta Environment and Parks
11th Floor, Oxbridge Place
9820-106 Street
Edmonton Alberta T5K 2J6

Subject: **Peace Airshed Zone Association (PAZA)**
February 2020 Ambient Air Quality Monitoring Report

Please find enclosed the PAZA Ambient Air Quality Monitoring Network Report for the month of February 2020.

The representative of the Person Responsible for this monitoring program is:

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This report was prepared by Matrix Solutions Inc. and reviewed by Mandeep Dhaliwal.

PAZA has retained the services of WSP Canada Inc. to conduct continuous ambient monitoring and Matrix Solutions Inc. to provide data validation and reporting.

This report is submitted by PAZA on behalf of the industrial member companies to satisfy the requirements of the facility Operating Approvals listed in Table A

The monthly summary report includes the operational summaries and hourly continuous monitoring and monthly passive results

Continuous Monitoring: Seven (7) Stations including Henry Pirker (Grande Prairie), Evergreen Park, Smoky Heights, Beaverlodge, Valleyview, Donnelly and Wembley-Portable. Detailed Summaries are included in the report

Calibration and Data Submission:
Monthly report, hourly data and calibration reports for February 2020 were submitted to the ETS data system.

Table A. PAZA members with Facility Operating Approvals

Company	Facility	LSD	EPEA Approval No.
Advantage Oil & Gas Ltd.	Glacier	05-02-076-13-W6	262479-00-00
Alberta Power (2000) Ltd. (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	02-26-068-25-W5	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
	Teepee Creek	SE-2-074-04-W6	00001635-02-00
	Sturgeon/Valleyview	02-02-069-22-W5	1633-02-00
Canfor Forest Products	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
Inception Exploration Ltd.	Gold Creek	03-26-069-05-W6	00335317-00-02
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
	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

Concentrations in excess of the Clean Air (Maximum Levels) Regulation:

There was one exceedance of the hourly AAAQG in February 2020 at the Smoky heights Station for $PM_{2.5}$.

Date	$PM_{2.5}$	Wind Conditions	Reference Number
Feb 2, 2020 19:00 MST	127.1 µg/m³	WS: 9.8 km/hr WD: 6.8 degrees (North)	#363464

Operational times less than 90 percent:

There were power issues at Valleyview resulting in operational times less than 90% in February 2020.

Air Incidents

None were reported to PAZA

Deviations from Authorized Monitoring Methods

Trees nearby to Valleyview air monitoring station exceed the height allowed under section 2.3 of the siting criteria in Chapter 3 of the AMD. This variance was authorized in writing by the director on February 4, 2019.

Passive Monitoring

33 Stations throughout the PAZA zone
The passive sample analyses were performed by Bureau Veritas Laboratories (formally Maxxam Analytics Inc.)

There were eight duplicate sites sampled in the month of February with RPD from 0 to 36%:

For sulphur dioxide duplicates at station Woking, Grande Prairie, and Jean Cote
For ozone duplicate at station Bay Tree
For nitrogen dioxide duplicates at stations Eaglesham, Gold Creek, and Clouston Creek
For hydrogen sulphide duplicate at station Girouxville 3

There were no exceedances of the AAAQOs for all monitored parameters at any of the passive monitoring stations during this month.

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements.

Mandeep Dhaliwal, B.Sc., P.Chem.
Program Manager

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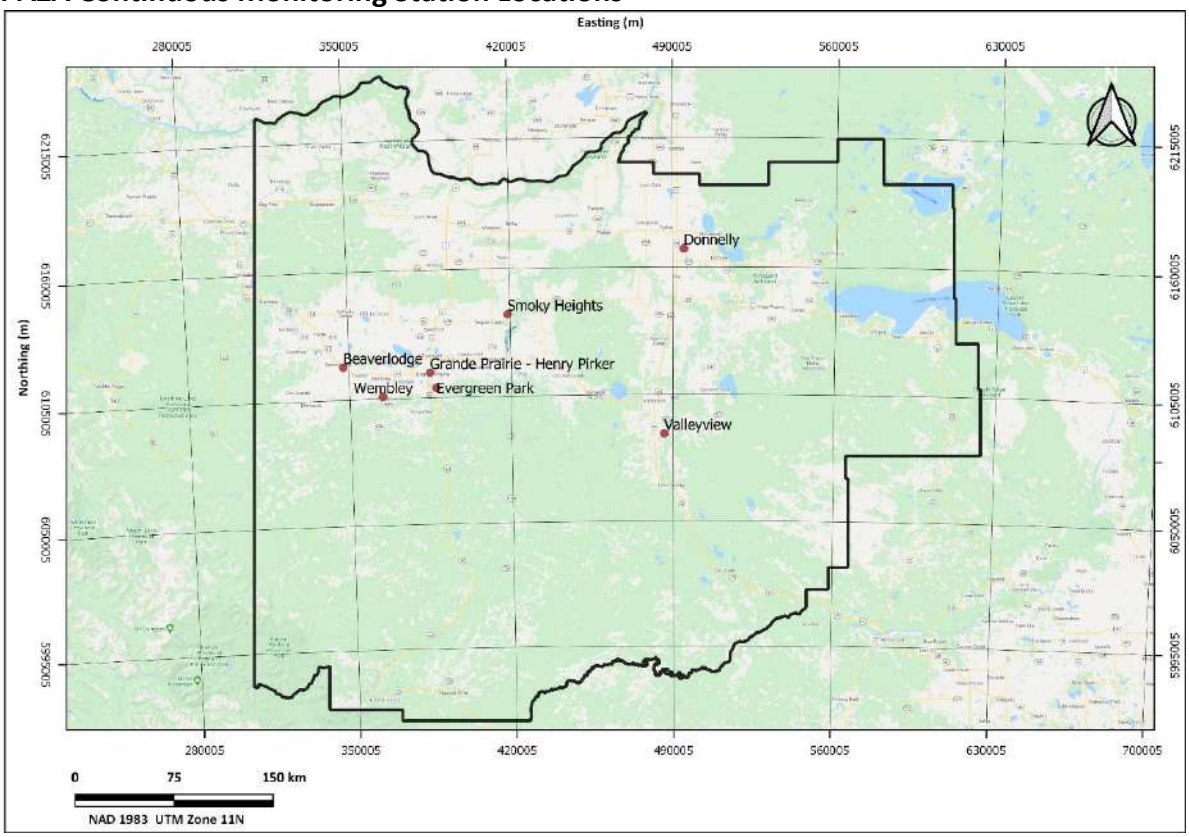
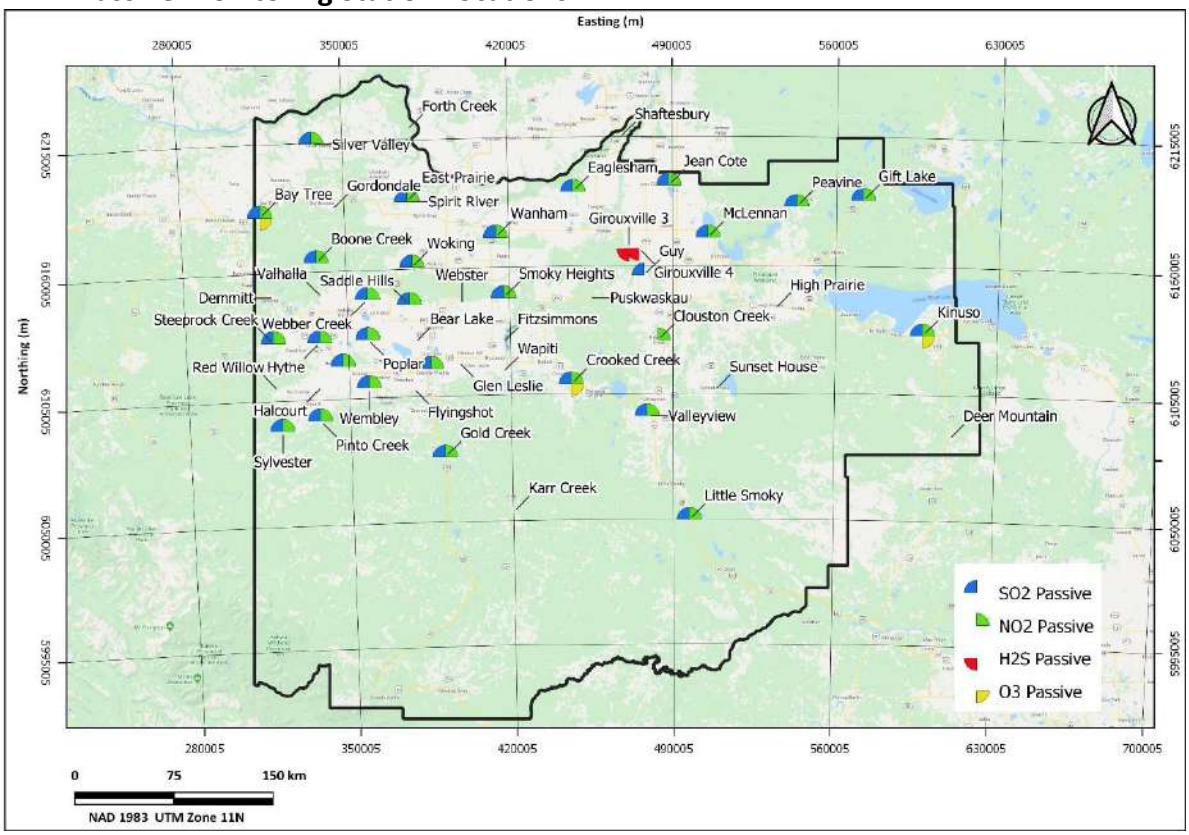
PAZA Continuous Monitoring Station Locations



PAZA Passive Monitoring Station Locations



1 Monthly Station Summaries

The following summaries are for the equipment and data results from the continuous ambient monitoring network

1.1 Beaverlodge Air Monitoring Station

PAZA - February 2020 Beaverlodge Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	24-hour Max	24-hour Objective	24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
NO (ppb)	1.2	0.0	95%	100%	24.4	-	Feb-03 12:00	4.6	-	Feb-18	-	-	-	-	Feb 11, 2020
NO_2 (ppb)	5.6	0.5	95%	100%	34.4	159	Feb-18 20:00	14.3	-	Feb-18	0	-	-	-	Feb 11, 2020
NO_X (ppb)	6.9	0.5	95%	100%	43.5	-	Feb-24 09:00	19.1	-	Feb-18	-	-	-	-	Feb 11, 2020
O_3 (ppb)	33.8	1.7	95%	100%	48.3	76	Feb-21 07:00	44.1	-	Feb-21	0	-	-	-	Feb 11, 2020
$PM_{2.5}$ (µg/m³)	2.8	0.0	99%	99%	22.0	80	Feb-15 18:00	9.1	29	Feb-15	0	-	0	-	Feb 13, 2020
SO_2 (ppb)	0.7	0.0	93%	100%	20.7	172	Feb-12 02:00	4.4	48	Feb-18	0	-	0	0	Feb 13, 2020

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-5.4	-21.8	100%	100%	5.8
RH (%)	67.4	34.2	100%	100%	100.0
WS (km/hr)	13.7	0.1	100%	100%	54.6
WD (deg)	267	1.0	100%	100%	359.3

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	267	W

Update Summary:

Parameter	Make	Model	Equipment summary
$NO/NO_2/NO_X$	TECO	42I	No Operational issues noted during the month
O_3	TECO	49I	No Operational issues noted during the month
$PM_{2.5}$	Sharp	5030	No Operational issues noted during the month
SO_2	TECO	43I	Low flow issues resulted in rem cals and install cals to fix flow issue
Met Equip	MetOne	50.5	No Operational issues noted during the month

1.2 Evergreen Park Air Monitoring Station

PAZA - February 2020 Evergreen Park Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	24-hour Max	24-hour Objective	24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
$PM_{2.5}$ (µg/m³)	2.7	0.0	99%	100%	18.8	80	Feb-19 10:00	10.1	29	Feb-19	0	-	0	-	Feb-25-2020
SO_2 (ppb)	0.3	0.0	95%	100%	16.2	172	Feb-06 15:00	1.3	48	Feb-18	0	-	0	0	Feb-25-2020
TRS (ppb)	0.6	0.1	95%	100%	3.6	-	Feb-20 04:00	1.7	-	Feb-19	-	-	-	-	Feb-25-2020

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-6.3	-24.2	100%	100%	8.1
RH (%)	66.9	31.2	100%	100%	97.2
WS (km/hr)	4.6	0.1	100%	100%	20.0
WD (deg)	253	0.9	100%	100%	359.4

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	253	WSW

Update Summary:

Parameter	Make	Model	Equipment summary
$PM_{2.5}$	Thermo	TEOM AB	No Operational issues noted during the month
SO_2	TECO	43I	No Operational issues noted during the month
TRS	TECO	43C	No Operational issues noted during the month
Met Equip	Gil/RMYoung	MetPak/RMY86004	No Operational issues noted during the month

1.3 Grande Prairie - Henry Pirker Air Monitoring Station

PAZA - February 2020 Henry Pirker Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	8-hour / 24-hour Max	8-hour / 24-hour Objective	8-hour / 24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
NO (ppb)	9.2	0.0	90%	98%	160.3	-	Feb-05 12:00	47.8	-	Feb-04	-	-	-	-	**Feb 06, 2020**
NO_2 (ppb)	15.5	1.5	90%	98%	52.4	159	Feb-02 08:00	32.7	-	Feb-19	0	-	-	-	**Feb 06, 2020**
NO_X (ppb)	24.9	1.5	90%	98%	209.9	-	Feb-05 12:00	79.8	-	Feb-04	-	-	-	-	**Feb 06, 2020**
O_3 (ppb)	24.5	0.5	95%	100%	45.1	76	Feb-28 02:00	36.9	-	Feb-09	0	-	-	-	**Feb 07, 2020**
$PM_{2.5}$ (µg/m³)	4.3	0.5	99%	100%	23.7	80	Feb-19 13:00	15.0	29	Feb-19	0	-	0	-	**Feb 07, 2020**
SO_2 (ppb)	0.5	0.0	94%	99%	9.4	172	Feb-18 17:00	1.6	48	Feb-18	0	-	0	0	**Feb 06, 2020**
H2S (ppb)	0.3	0.0	95%	100%	2.2	10	Feb-10 12:00	0.9	3	Feb-04	0	-	0	-	**Feb 07, 2020**
CH4 (ppm)	2.0	1.7	94%	99%	3.2	-	Feb-19 09:00	2.5	-	Feb-19	-	-	-	-	**Feb 04, 2020**
THC (ppm)	2.0	1.7	94%	99%	4.0	-	Feb-19 09:00	2.9	-	Feb-19	-	-	-	-	**Feb 04, 2020**
NMHC (ppm)	0.0	0.0	94%	99%	0.8	-	Feb-19 09:00	0.4	-	Feb-19	-	-	-	-	**Feb 04, 2020**
CO (ppm)	0.2	0.1	94%	99%	1.4	13	Feb-04 10:00	**0.4**	**5**	**Feb-04**	**0**	**0**	**-**	**-**	**Feb 04, 2020**

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-6.3	-25.7	100%	100%	8.3
RH (%)	62.6	34.4	100%	100%	87.8
SR (W/m²)	50.7	0.0	100%	100%	348.5
WS (km/hr)	8.0	0.1	99.6%	99.6%	31.5
WD (deg)	266	0.2	99.6%	99.6%	359.8

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	266	W

Update Summary:

Parameter	Make	Model	Equipment summary
$NO/NO_2/NO_X$	Thermo	42i	Feb1, pump replaced for service, Feb3 Cal check with rebuild pump, Feb6, pump replaced back
O_3	TECO	49I	No Operational issues noted during the month
$PM_{2.5}$	Sharp	5030	No Operational issues noted during the month
SO_2	TEI	43I-TLE	No Operational issues noted during the month
H2S	TEI	450i	No Operational issues noted during the month
THC/CH4/NMHC	TEI	55i	Feb3 replaced hydrogen & nitrogen cylinders
CO	TEI	48I-TLE	Feb4 Calibration, Feb5 check due to span
Met Equip	MetOne	50.5	Excessive wind speeds >180km/hr were removed resulting in 3 hrs lost

1.4 Smoky Heights Air Monitoring Station

PAZA - February 2020 Smoky Heights Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	24-hour Max	24-hour Objective	24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
$PM_{2.5}$ (µg/m³)	2.8	0.0	100%	100%	127.1	80	Feb-02 19:00	8.2	29	Feb-02	1	-	0	-	Feb 14, 2020
SO_2 (ppb)	0.7	0.0	95%	100%	7.3	172	Feb-18 18:00	2.7	48	Feb-19	0	-	0	0	Feb 14, 2020
TRS (ppb)	0.2	0.0	95%	100%	1.1	-	Feb-07 09:00	0.4	-	Feb-05	-	-	-	-	Feb 14, 2020

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-7.6	-25.5	100%	100%	5.6
WS (km/hr)	14.5	0.3	100%	100%	47.1
WD (deg)	259	1.4	100%	100%	359.8

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	259	W

Update Summary:

Parameter	Make	Model	Equipment summary
$PM_{2.5}$	Sharp	5030	No Operational issues noted during the month
SO_2	TECO	43i	No Operational issues noted during the month
TRS	TEI	43I APSAA	Pump replacement, rem Cal and install Cal perfromed
Met Equip	MetOne	0	No Operational issues noted during the month

1.5 Valleyview Air Monitoring Station

PAZA - February 2020 Valleyview Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	24-hour Max	24-hour Objective	24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
SO_2 (ppb)	0.2	0.0	84%	89%	3.0	172	Feb-18 19:00	0.5	48	Feb-13	0	-	0	0	Feb 18, 2020
H2S (ppb)	0.1	0.0	85%	89%	0.9	10	Feb-08 01:00	0.3	3	Feb-01	0	-	0	-	Feb 18, 2020

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-5.1	-29.8	89%	89%	9.8
RH (%)	72.6	31.5	89%	89%	100.2
WS (km/hr)	4.3	0.1	89%	89%	24.9
WD (deg)	269	0.0	89%	89%	360.0

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	269	W

Update Summary:

Parameter	Make	Model	Equipment summary
SO_2	TEI	43i-APSCB	No Operational issues noted during the month
H2S	TEI	450i-APHAA	No Operational issues noted during the month
Met Equip	RMYoung	RMY86004	No Operational issues noted during the month

1.6 Donnelly Air Monitoring Station

PAZA - February 2020 Donnelly Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	24-hour Max	24-hour Objective	24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
SO_2 (ppb)	0.3	0.0	95%	100%	1.1	172	Feb-19 07:00	0.5	48	Feb-15	0	-	0	0	Feb 27, 2020
H2S (ppb)	0.0	0.0	95%	100%	1.0	10	Feb-11 22:00	0.1	3	Feb-08	0	-	0	-	Feb 27, 2020

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-7.2	-28.4	100%	100%	5.8
WS (km/hr)	13.4	0.0	100%	100%	44.8
WD (deg)	236	0.0	100%	100%	359.9

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	236	WSW

Update Summary:

Parameter	Make	Model	Equipment summary
SO_2	Teco	43i	No Operational issues noted during the month
H2S	Thermo	45C	No Operational issues noted during the month
Met Equip	RMYoung	5103	No Operational issues noted during the month

1.7 Wembley Air Monitoring Station

PAZA - February 2020 Wembley Station Report

Parameter	February Average	Minimum	Valid	Operational	1-hour Max	1-hour Objective	1-hour Max Day and Time	24-hour Max	24-hour Objective	24-hour Max Day	Exceedance 1hr	Exceedance 8hr	Exceedance 24hr	Exceedance 30d	Calibration Date
NO (ppb)	0.9	0.0	95%	100%	17.3	-	Feb-19 20:00	6.0	-	Feb-19	-	-	-	-	Feb 03, 2020
NO_2 (ppb)	5.1	0.3	95%	100%	47.4	159	Feb-19 20:00	22.3	-	Feb-19	0	-	-	-	Feb 03, 2020
NO_X (ppb)	6.0	0.4	95%	100%	65.2	-	Feb-19 20:00	28.7	-	Feb-19	-	-	-	-	Feb 03, 2020
O_3 (ppb)	34.2	0.6	95%	100%	50.3	76	Feb-21 04:00	46.3	-	Feb-21	0	-	-	-	Feb 03, 2020
$PM_{2.5}$ (µg/m³)	1.4	0.0	100%	100%	10.8	80	Feb-19 20:00	4.8	29	Feb-18	0	-	0	-	Feb 05, 2020
SO_2 (ppb)	0.6	0.0	95%	100%	41.3	172	Feb-11 10:00	3.4	48	Feb-18	0	-	0	0	Feb 03, 2020
TRS (ppb)	0.3	0.0	93%	100%	2.1	-	Feb-10 11:00	0.5	-	Feb-19	-	-	-	-	Feb 12, 2020
CH4 (ppm)	2.1	1.8	95%	100%	3.7	-	Feb-24 06:00	2.5	-	Feb-24	-	-	-	-	Feb 05, 2020
THC (ppm)	2.1	1.8	95%	100%	3.7	-	Feb-24 06:00	2.6	-	Feb-24	-	-	-	-	Feb 05, 2020
NMHC (ppm)	0.0	0.0	95%	100%	0.0	-	Feb-27 12:00	0.0	-	Feb-23	-	-	-	-	Feb 05, 2020

	Average	Minimum	Valid	Operational	Maximum
Temp (°C)	-5.9	-25.5	100%	100%	8.3
WS (km/hr)	10.0	0.3	100%	100%	32.9
WD (deg)	289	1.4	100%	100%	359.1

Note: Valid hours must be greater than 75%
Operational hours must be greater than 90%

Average Wind Direction	289	WNW

Update Summary:

Parameter	Make	Model	Equipment summary
$NO/NO_2/NO_X$	TEI	42i	No Operational issues noted during the month
O_3	TEI	49I	No Operational issues noted during the month
$PM_{2.5}$	Thermo	TEOM AB	No Operational issues noted during the month
SO_2	TEI	43I	No Operational issues noted during the month
TRS	TEI	43I	Replaced thermocouple, glass tube & scrubber material in the oxidizer.
THC/CH4/NMHC	TEI	55I-A3PHAA	Replaced Hydrogen & Nitrogen cylinders
Met Equip	MetOne	50.5	A few minutes of wind gusts in excess of 180 km/hr removed

2 Beaverlodge Charts

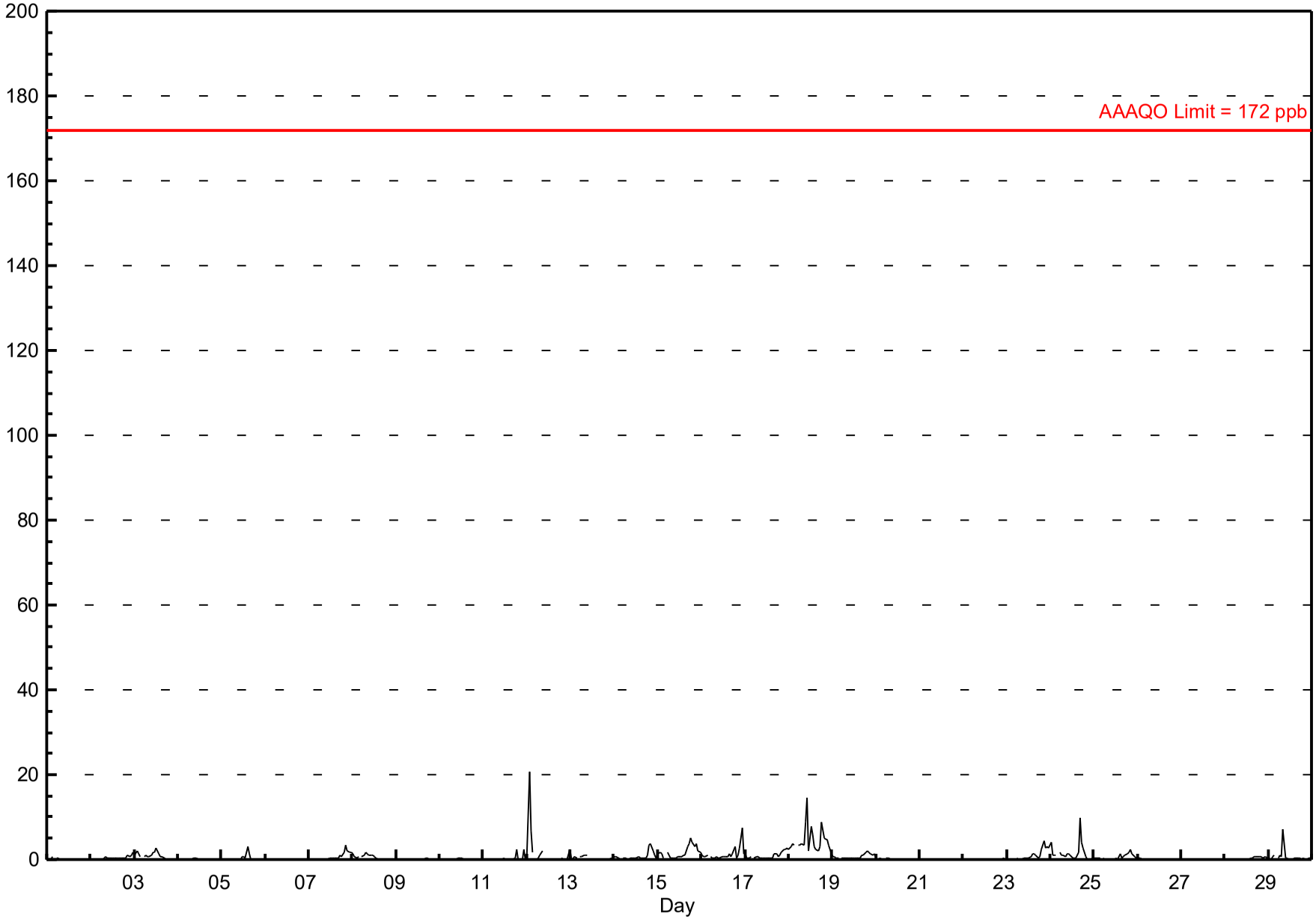
The following pages include the charts and histograms for Beaverlodge Station

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Beaverlodge - February 2020

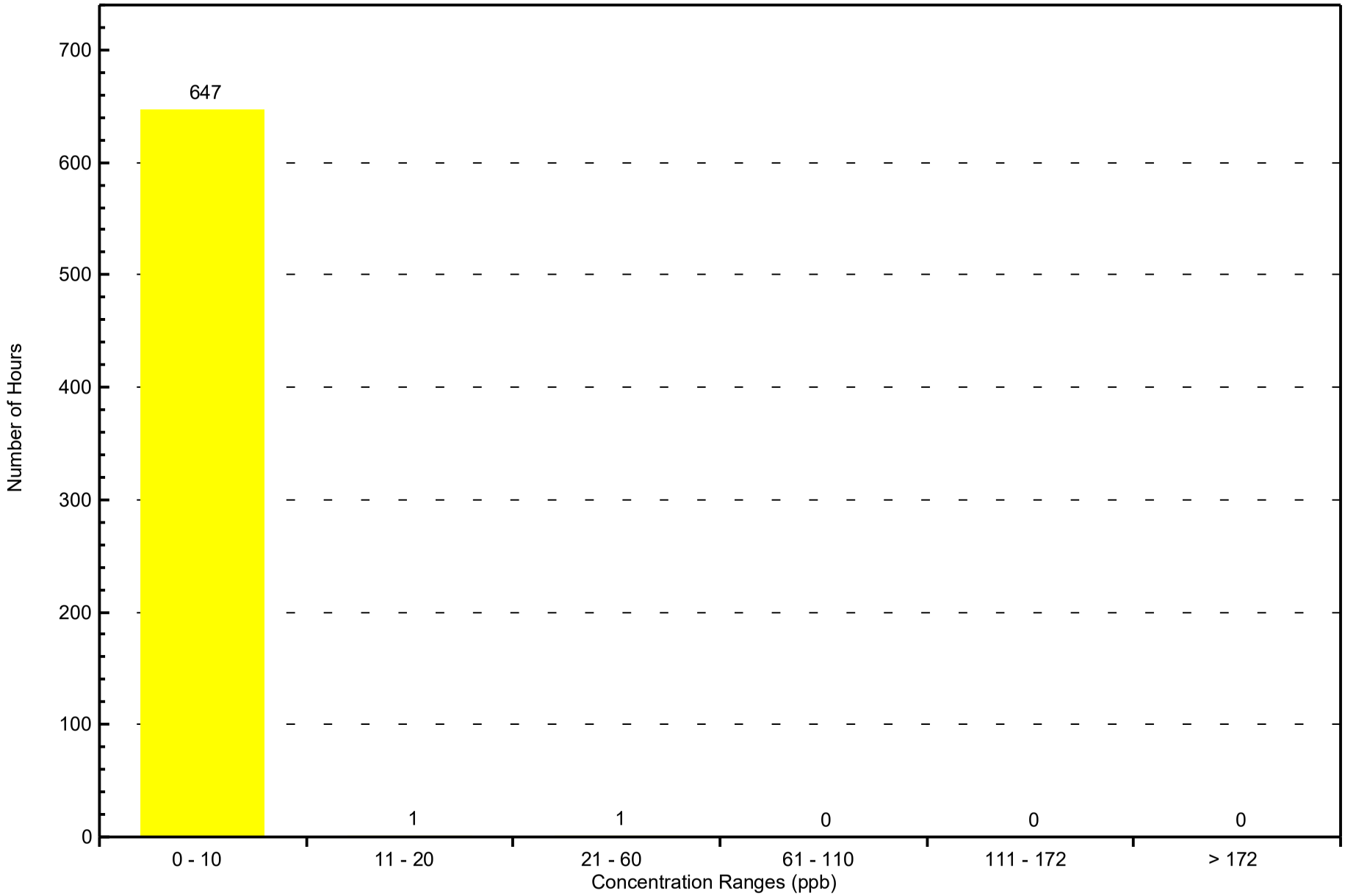


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Beaverlodge - February 2020

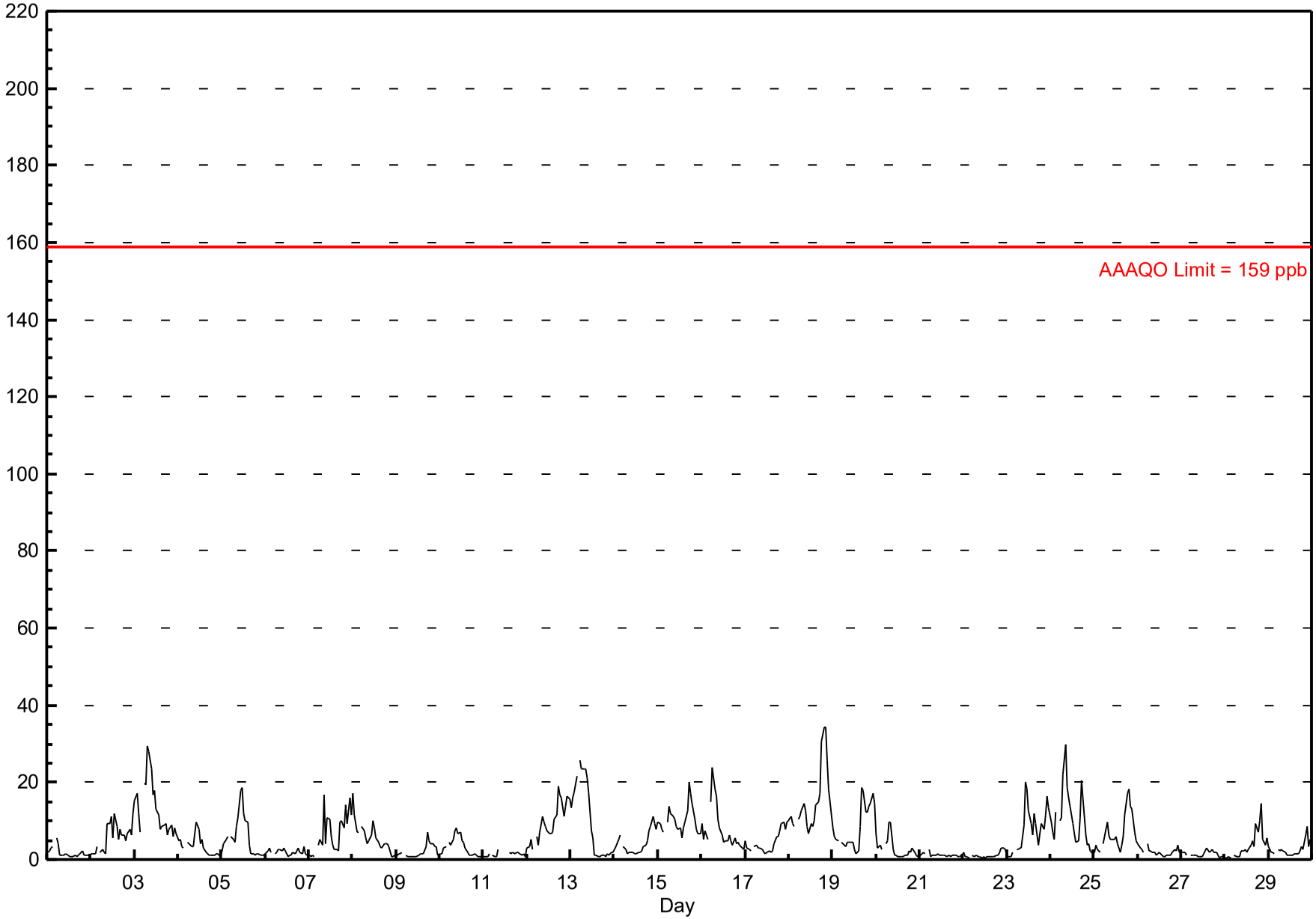


Peace Airshed Zone Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Beaverlodge - February 2020

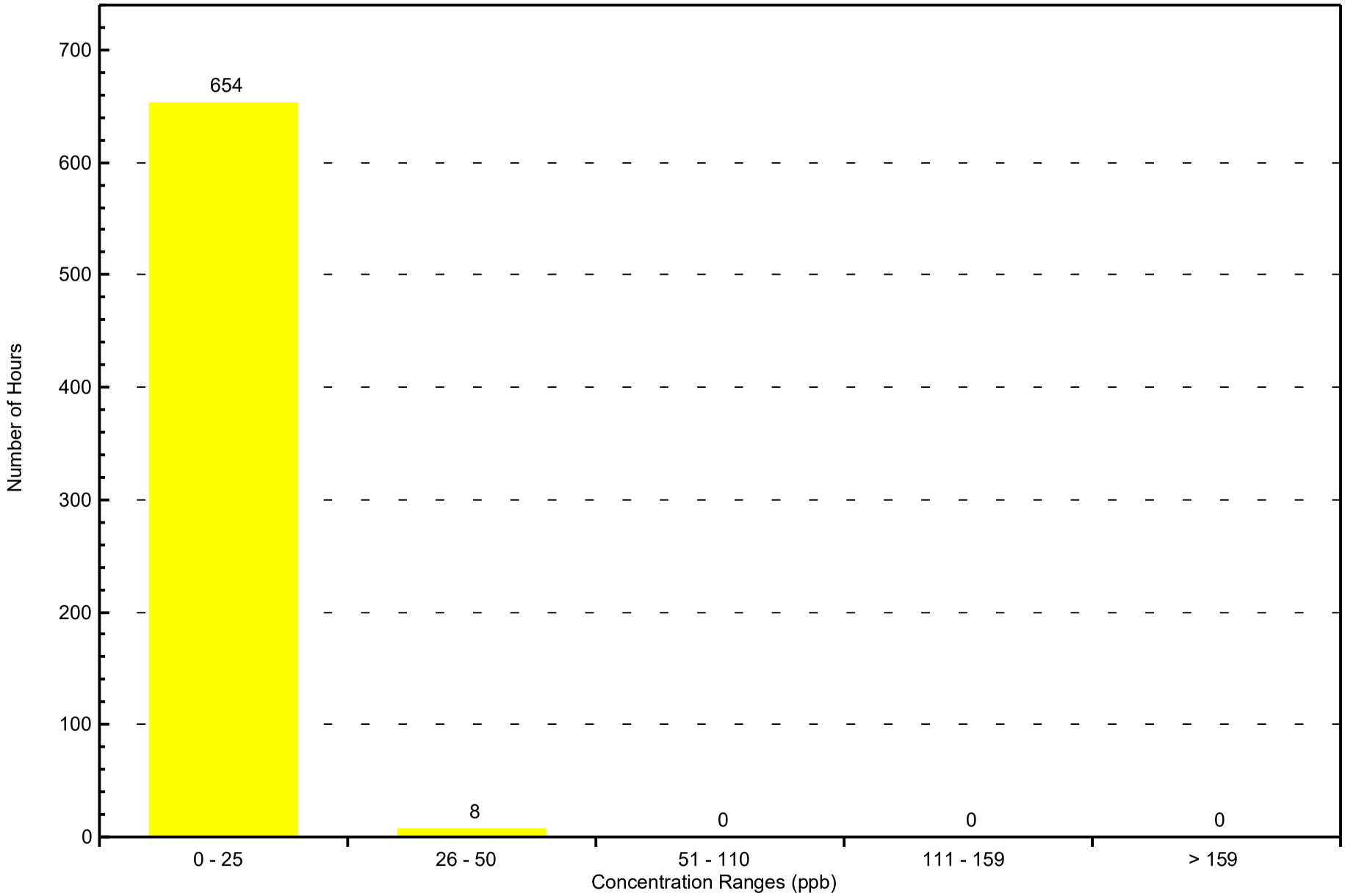


Peace Airshed Zone Association

Histogram of Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Beaverlodge - February 2020

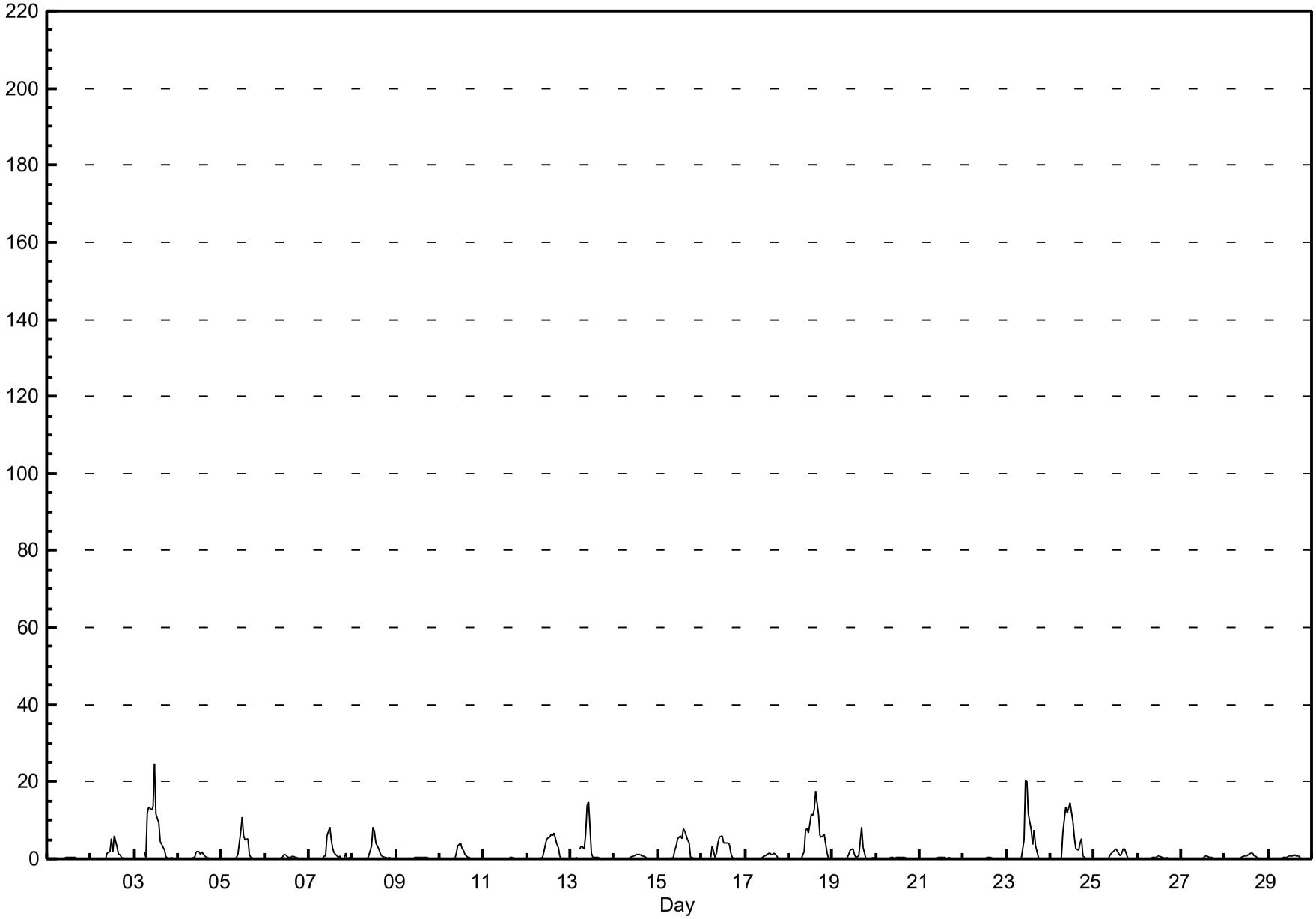


Peace Airshed Zone Association

Hourly Averages

Nitrogen Oxide (NO) - ppb

Beaverlodge - February 2020

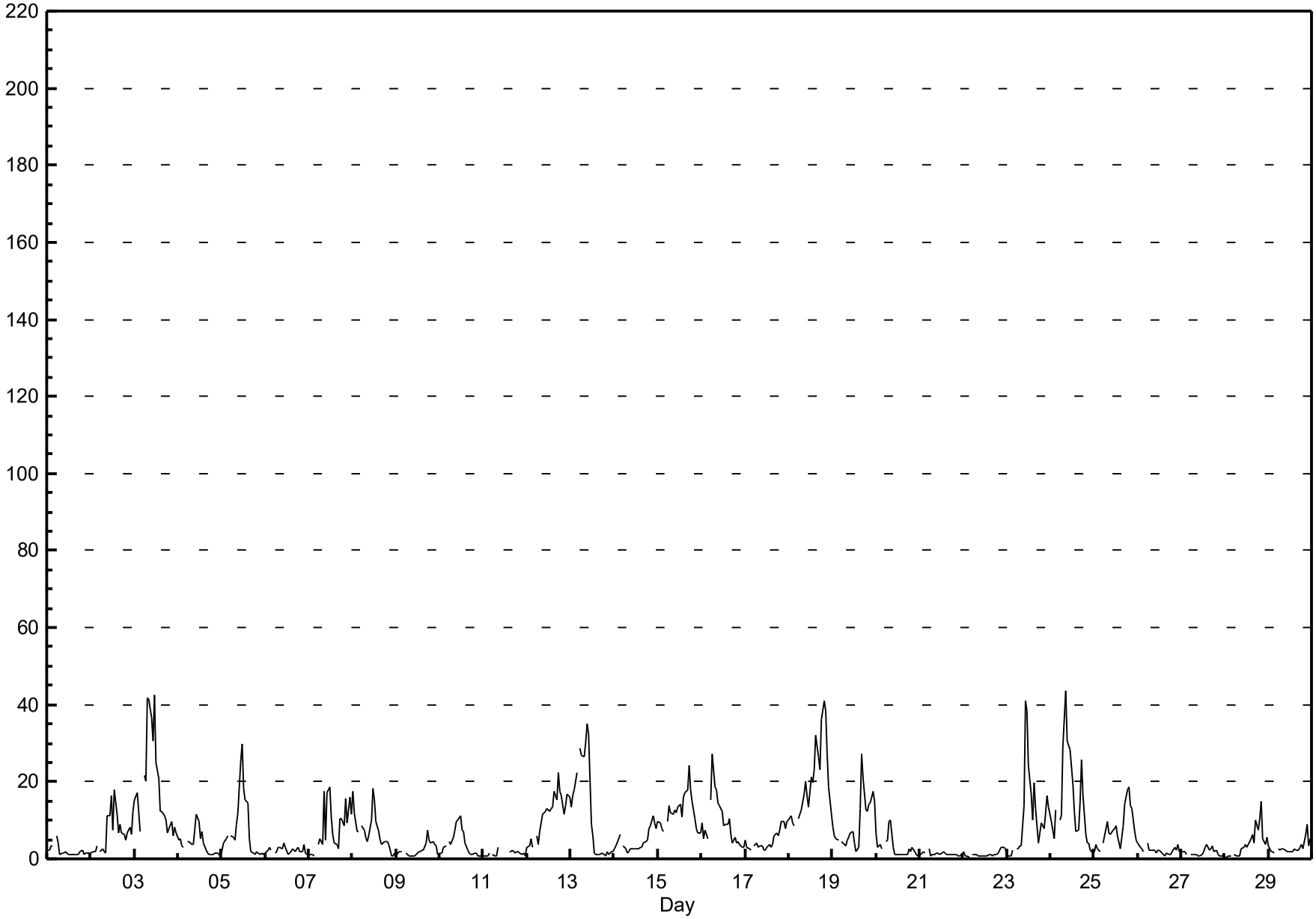


Peace Airshed Zone Association

Hourly Averages

Oxides of Nitrogen (NO_X) - ppb

Beaverlodge - February 2020

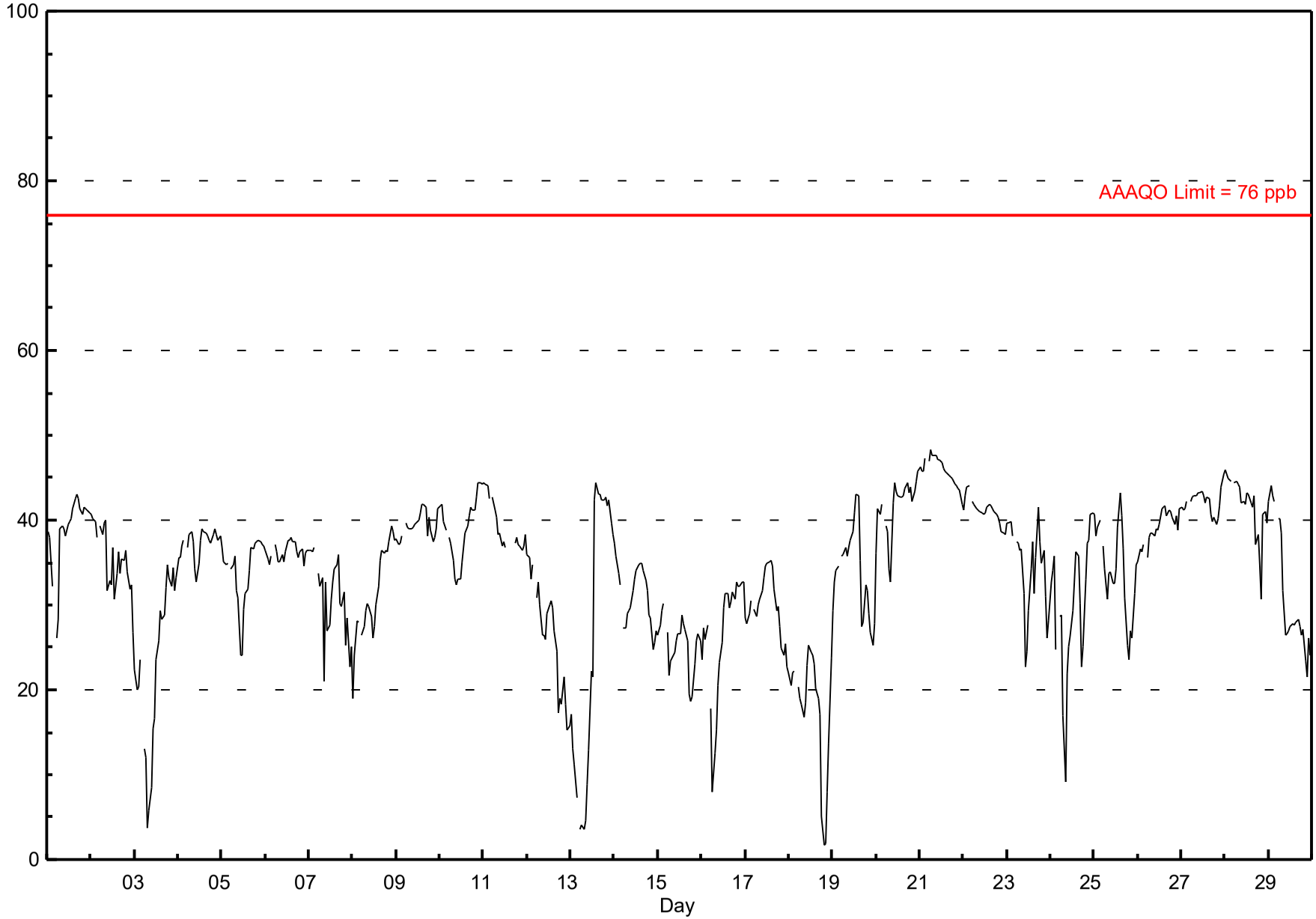


Peace Airshed Zone Association

Hourly Averages

Ozone (O_3) - ppb

Beaverlodge - February 2020

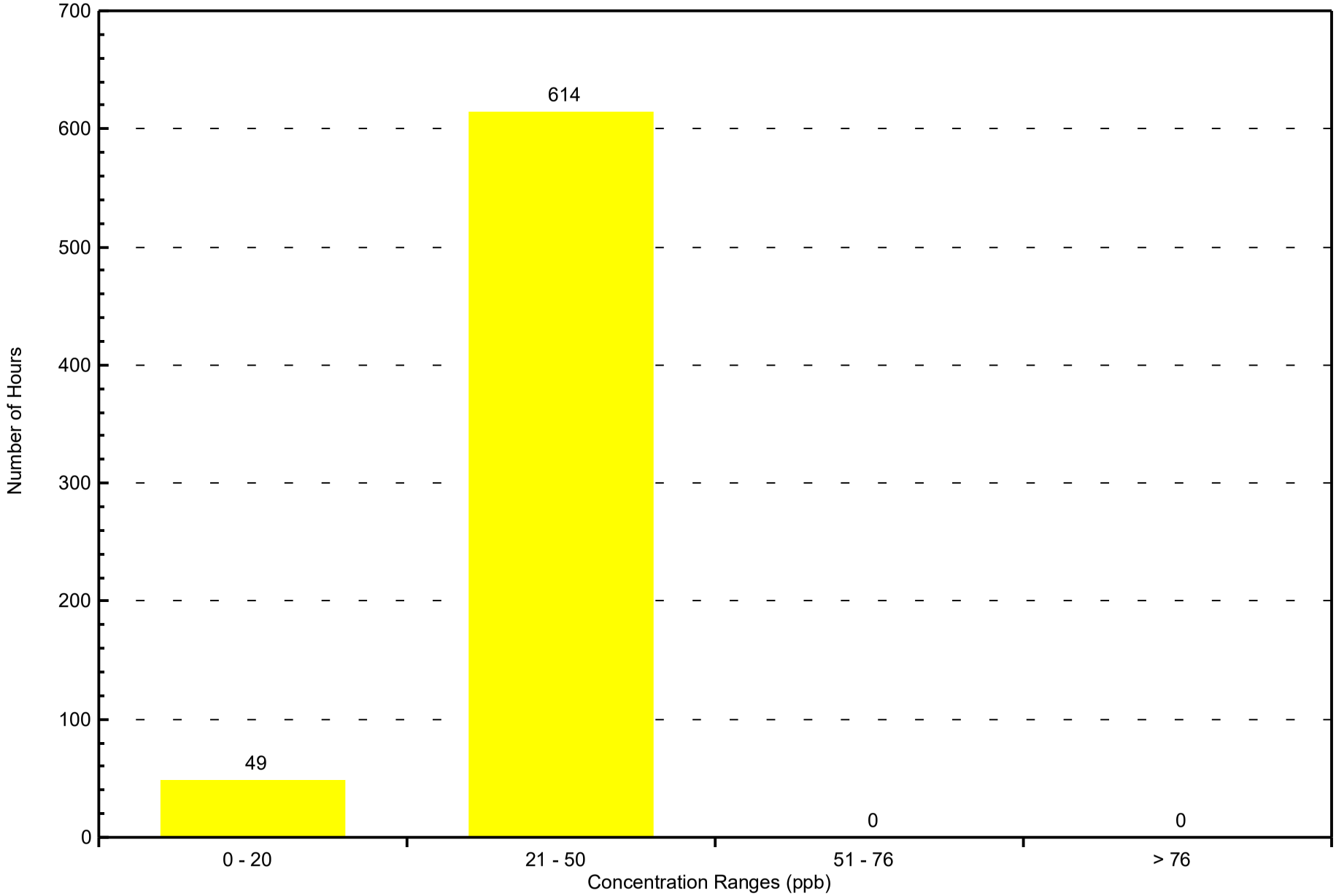


Peace Airshed Zone Association

Histogram of Hourly Averages

Ozone (O_3) - ppb

Beaverlodge - February 2020

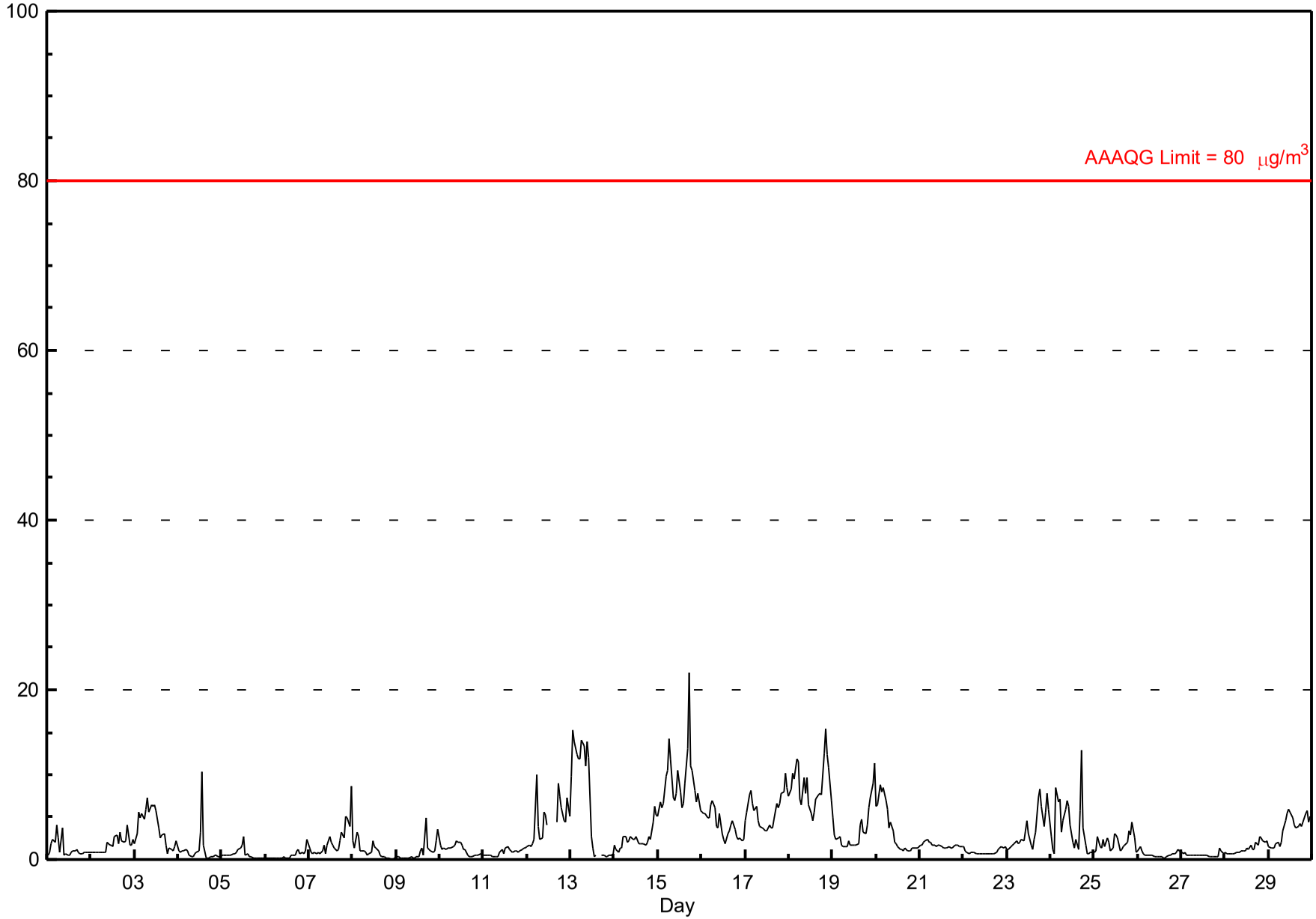


Peace Airshed Zone Association

Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Beaverlodge - February 2020

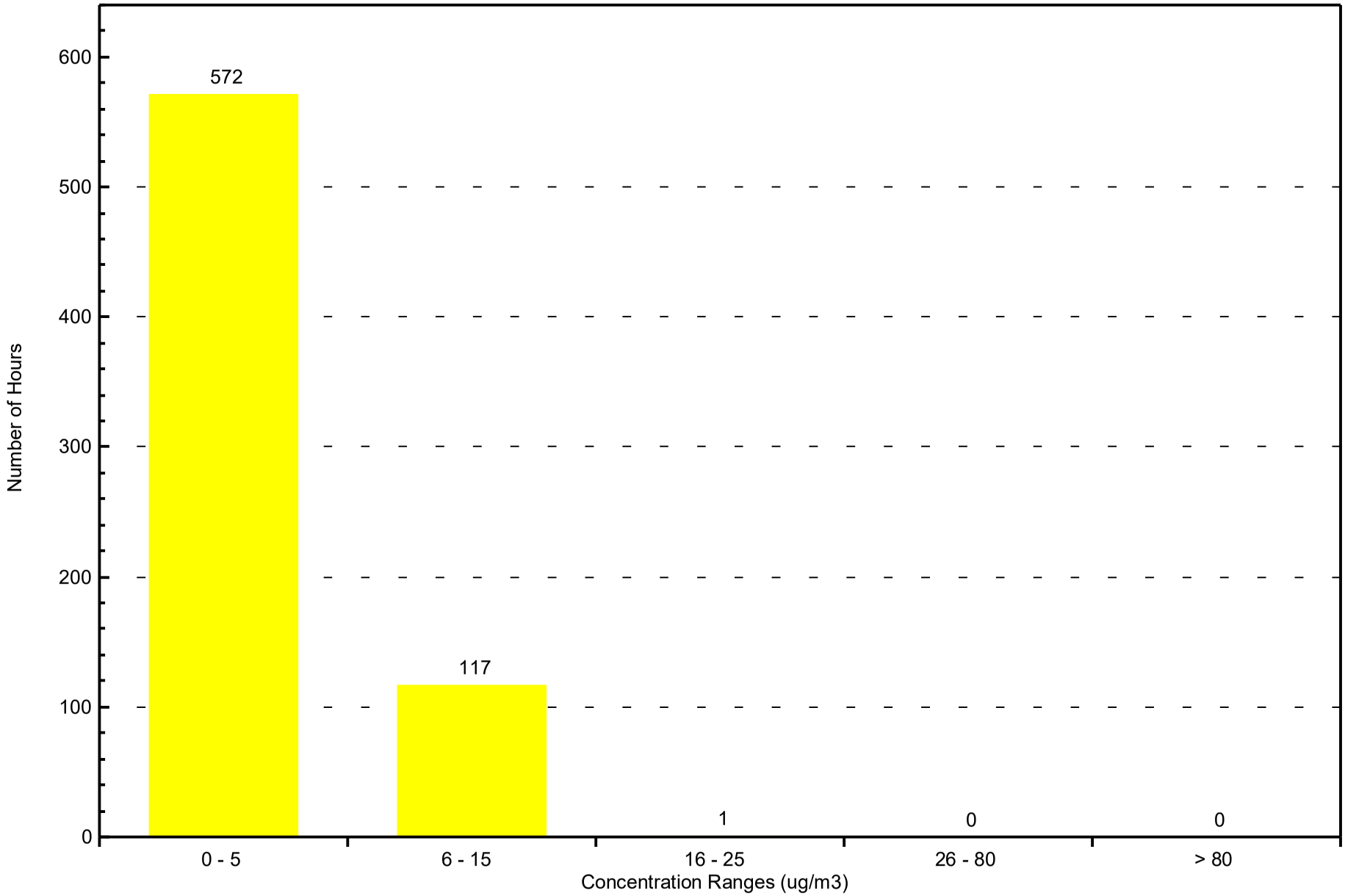


Peace Airshed Zone Association

Histogram of Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Beaverlodge - February 2020

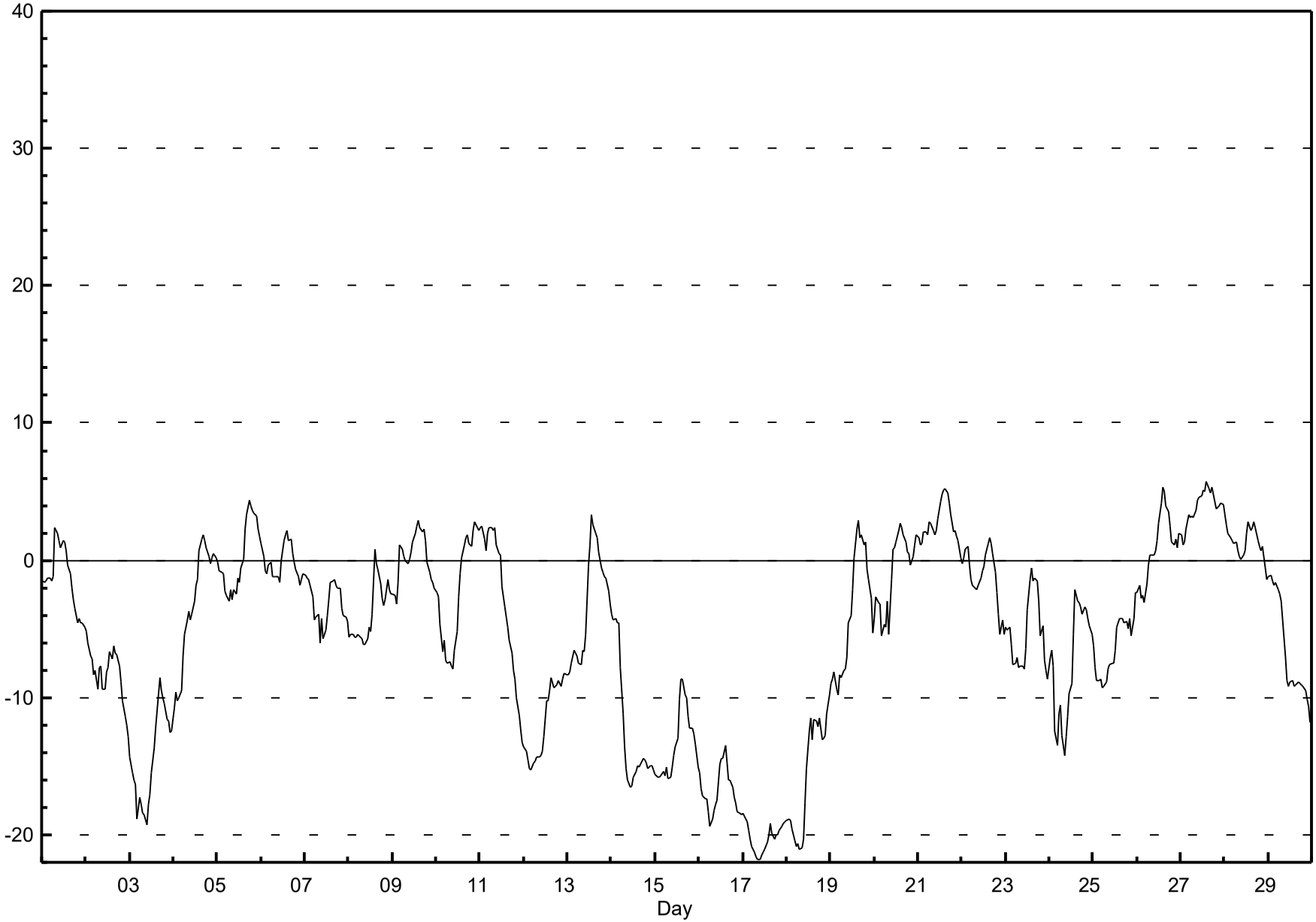


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C

Beaverlodge - February 2020

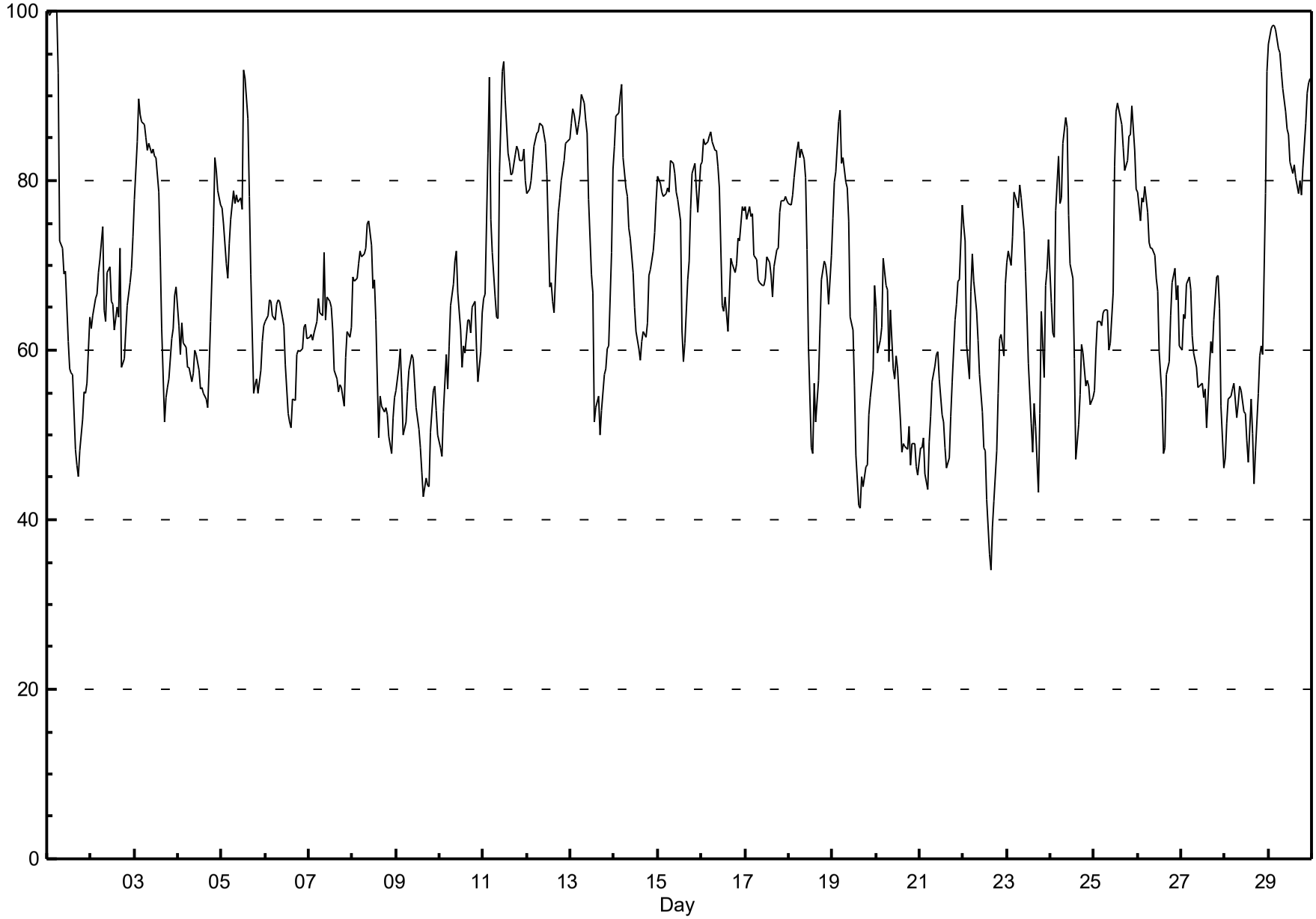


Peace Airshed Zone Association

Hourly Averages

Relative Humidity (RH) - %

Beaverlodge - February 2020

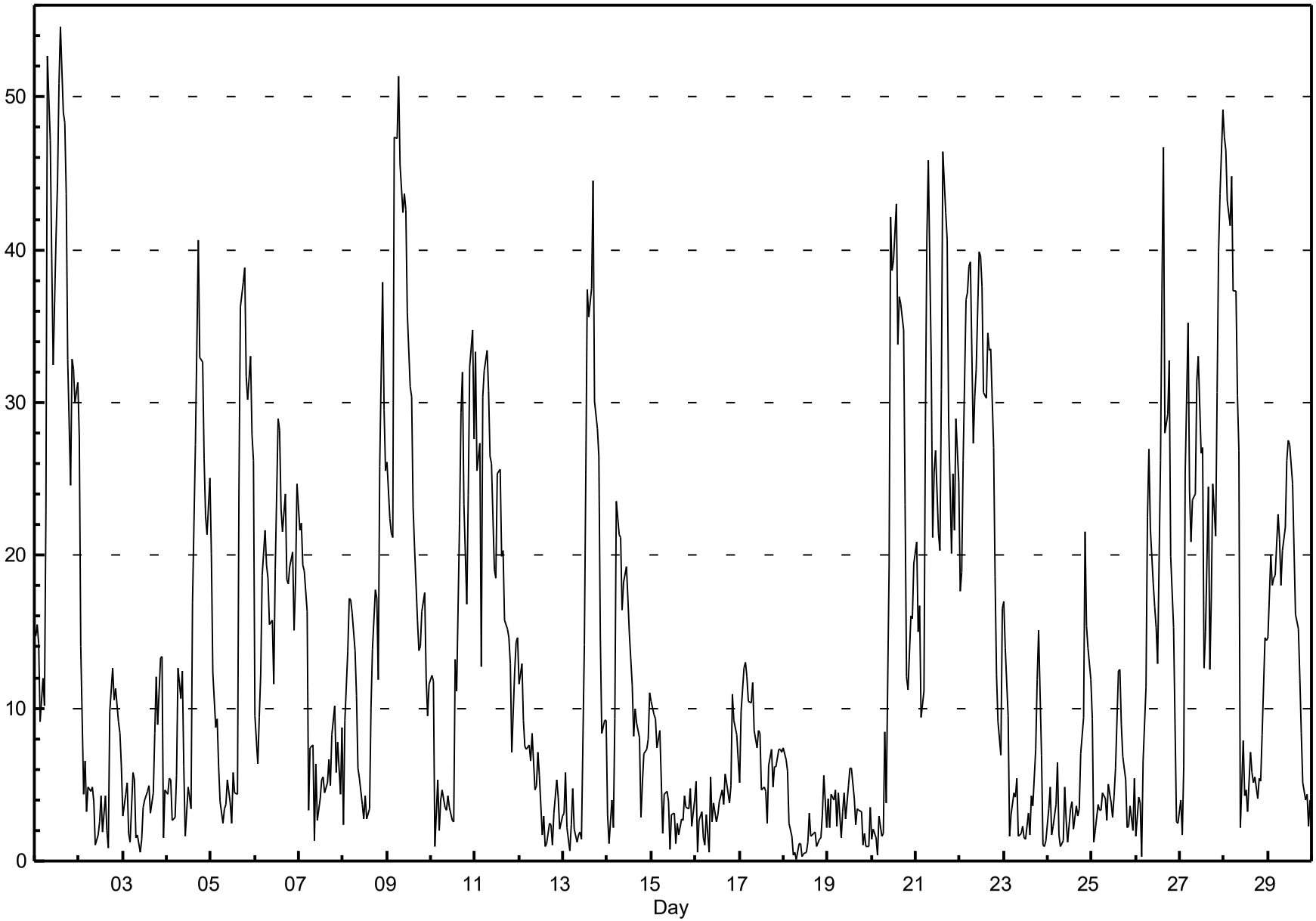


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Beaverlodge - February 2020

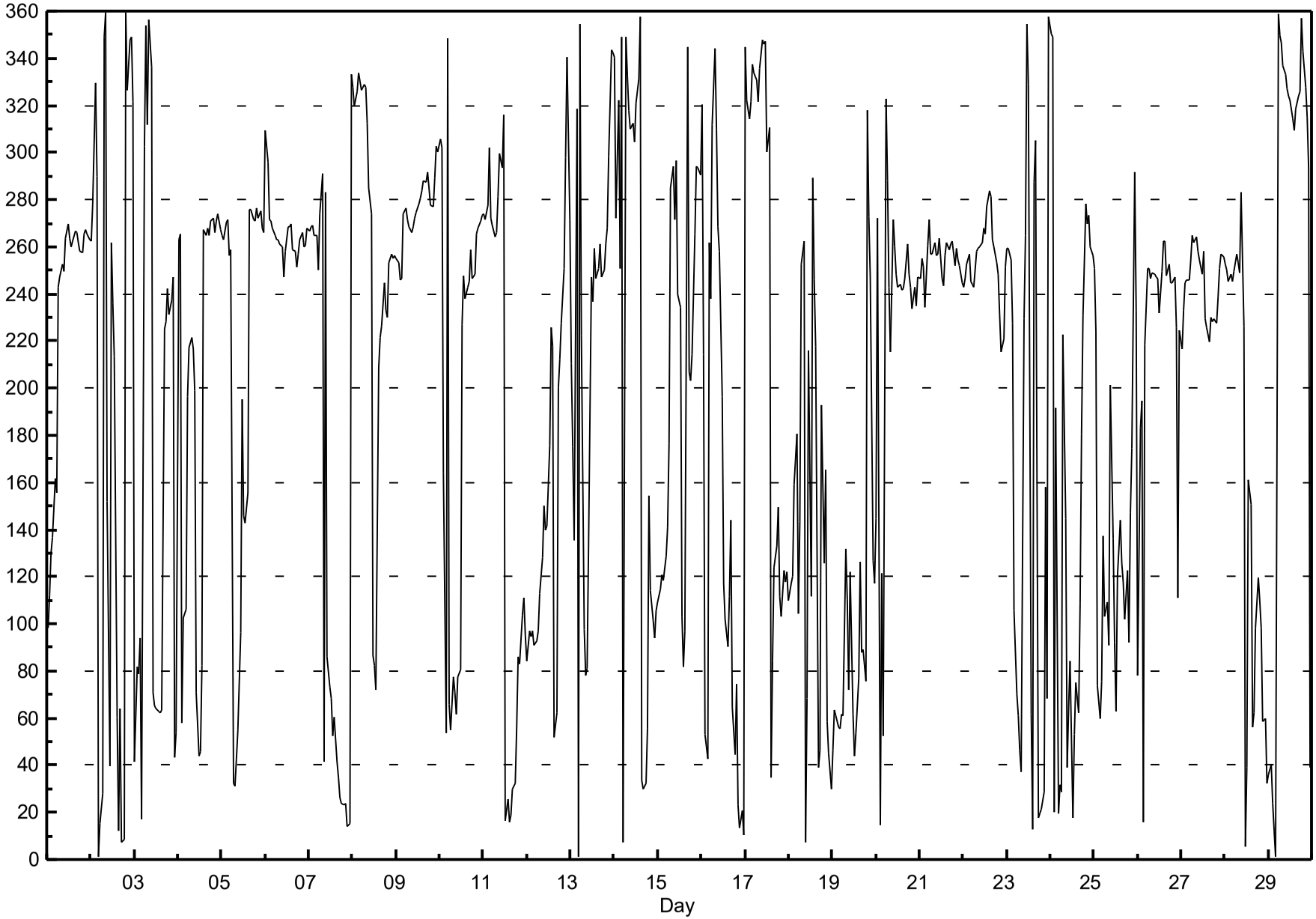


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Beaverlodge - February 2020

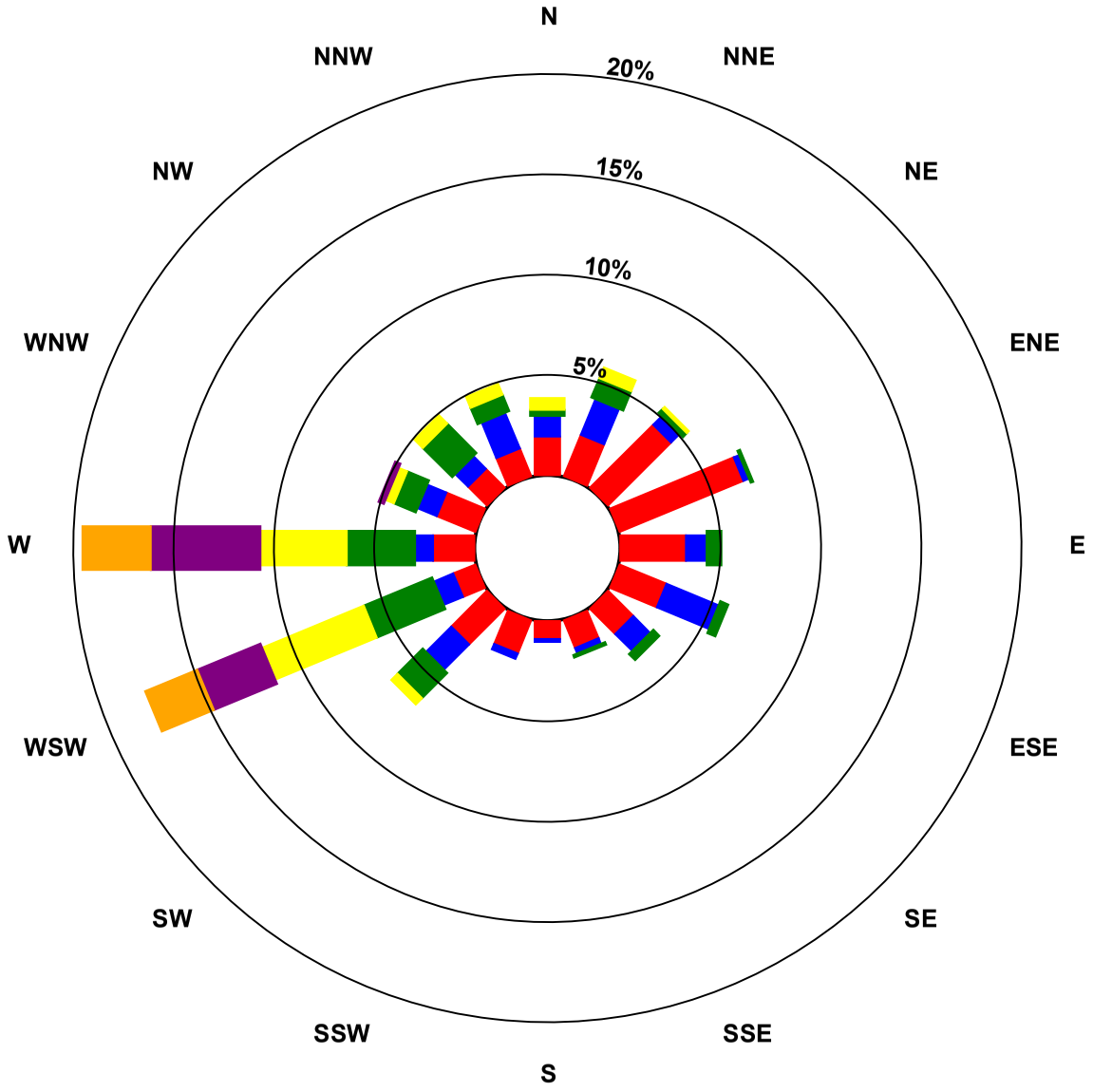


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

Beaverlodge - February 2020



Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

3 Evergreen Park Charts

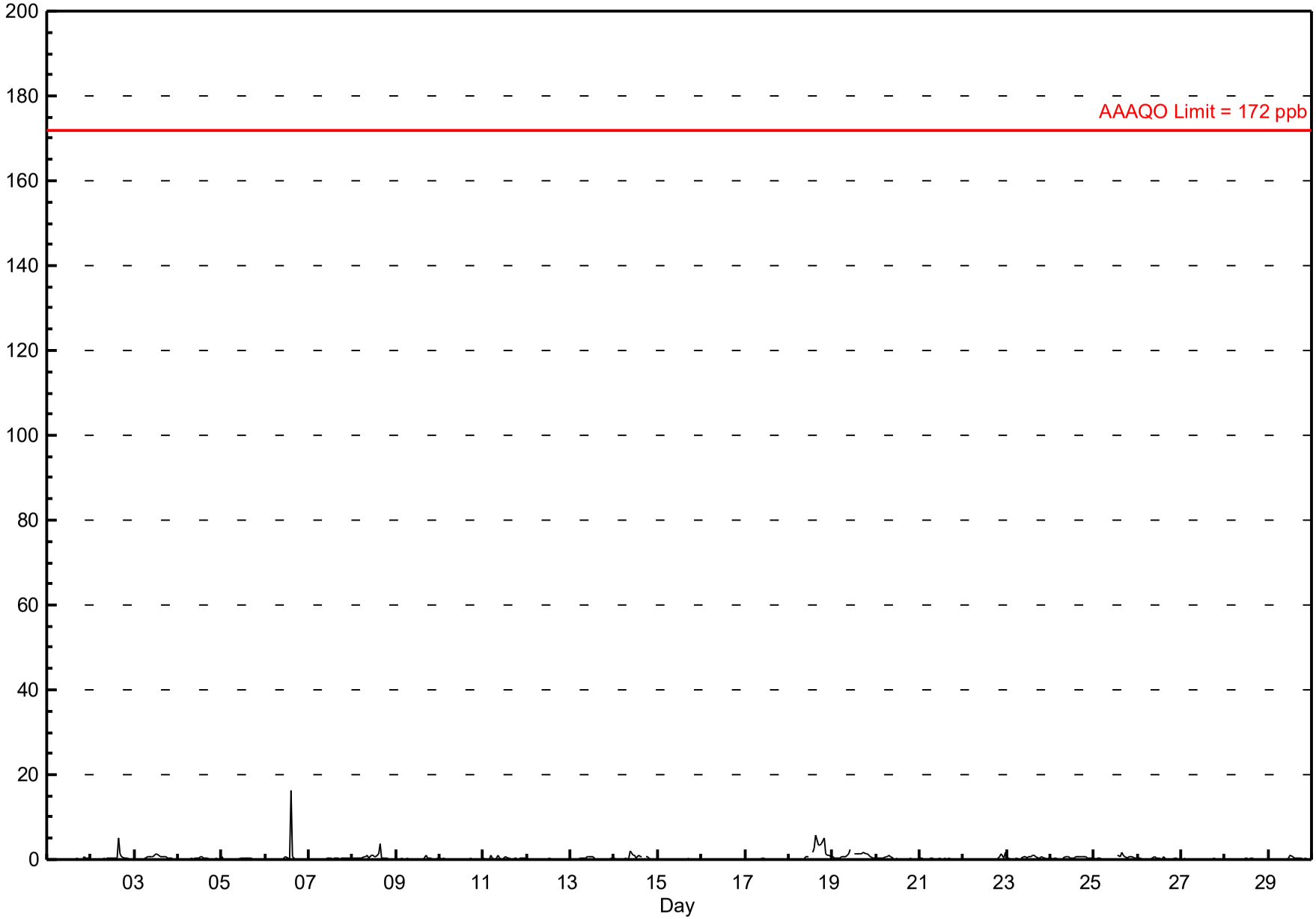
The following pages include the charts and histograms for Evergreen Park Station

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Evergreen Park - February 2020

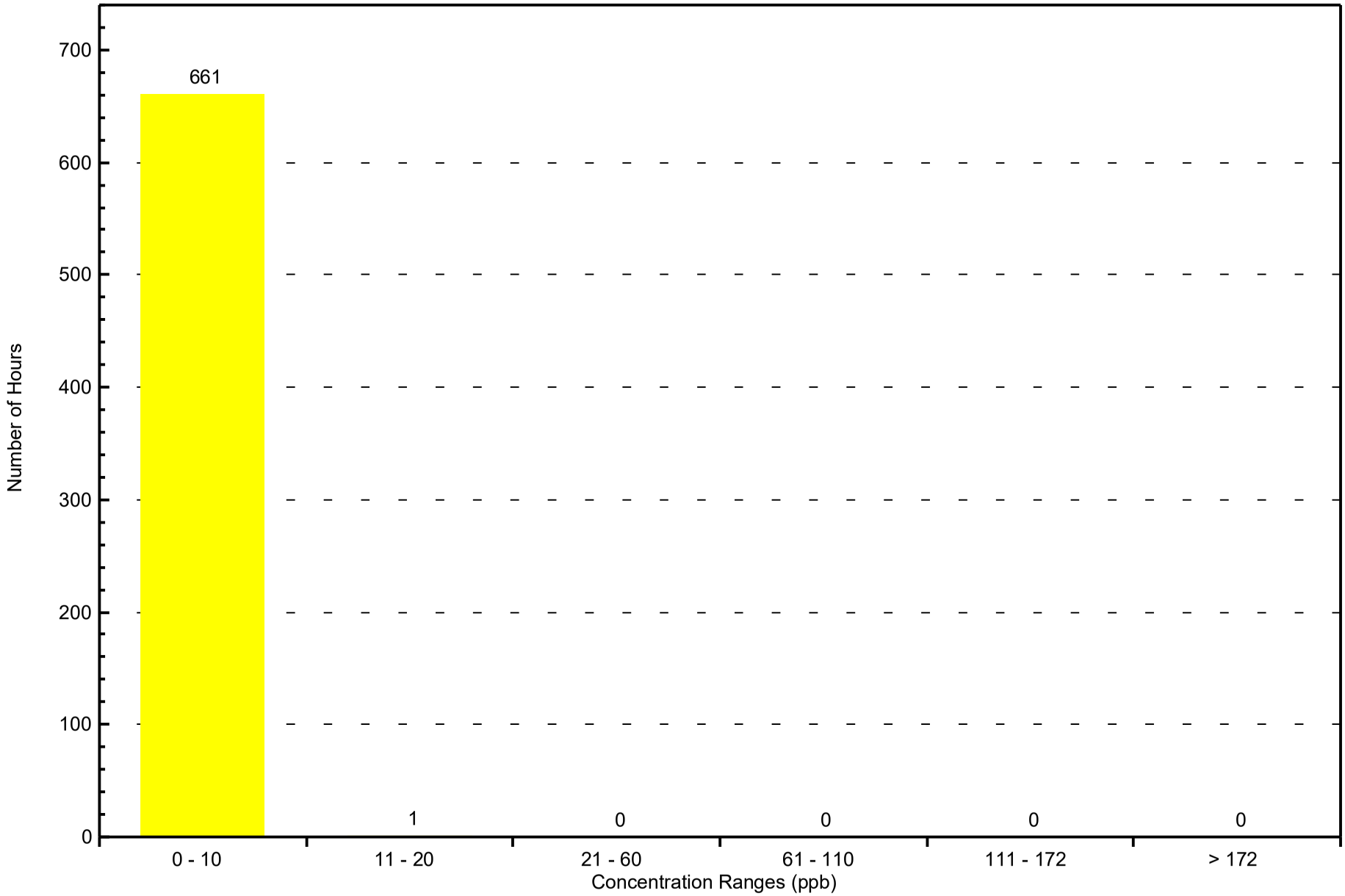


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Evergreen Park - February 2020

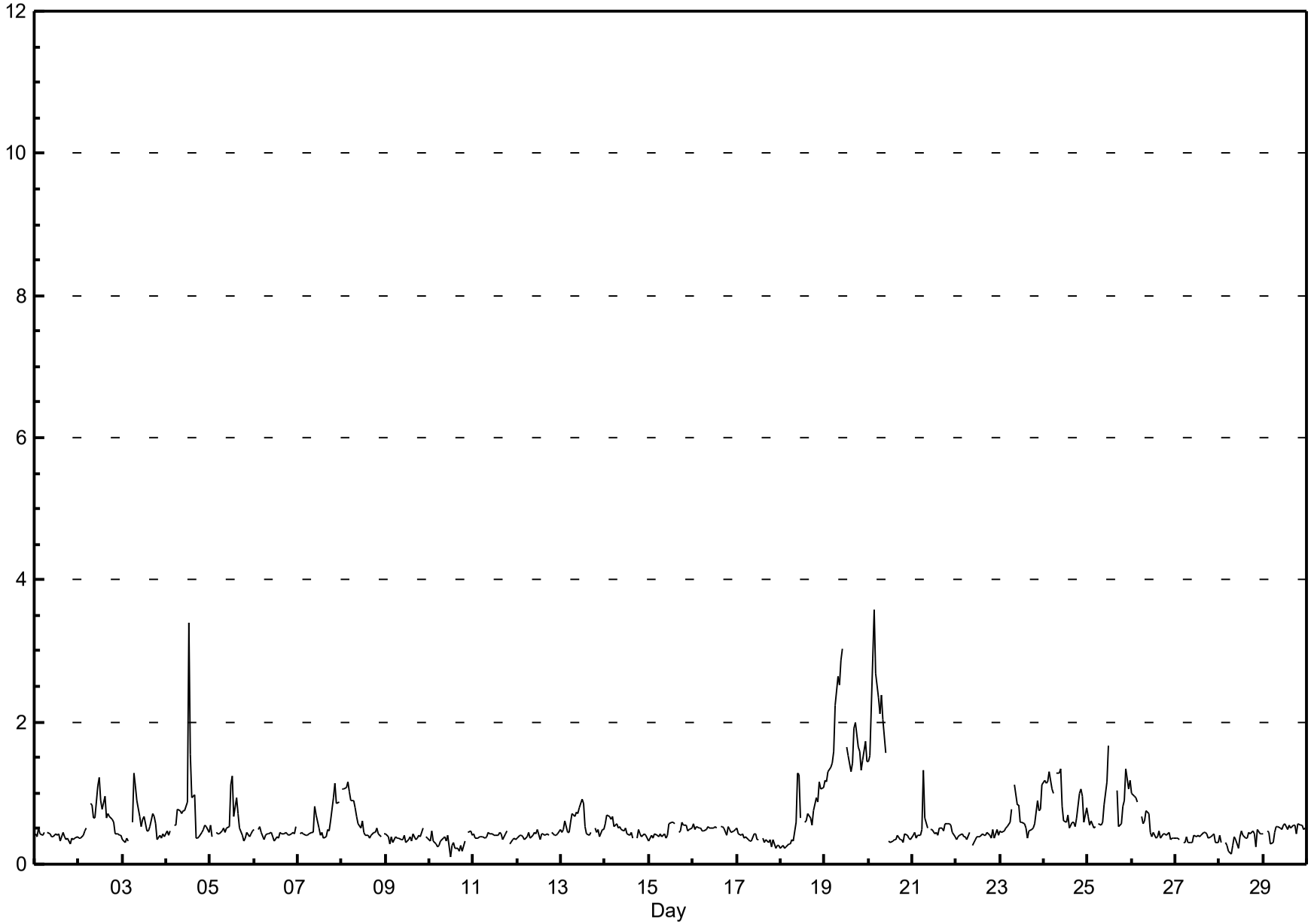


Peace Airshed Zone Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Evergreen Park - February 2020

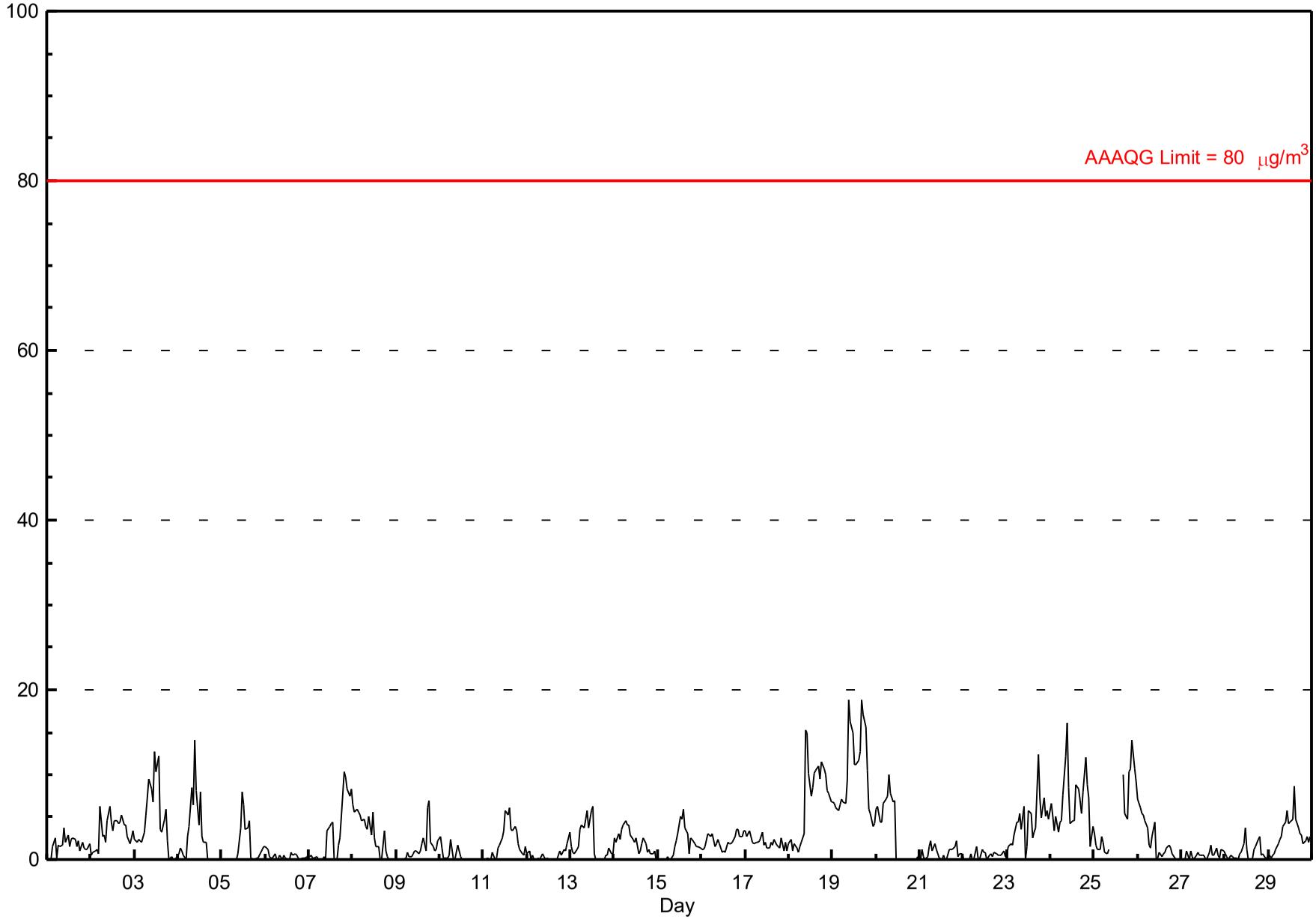


Peace Airshed Zone Association

Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Evergreen Park - February 2020

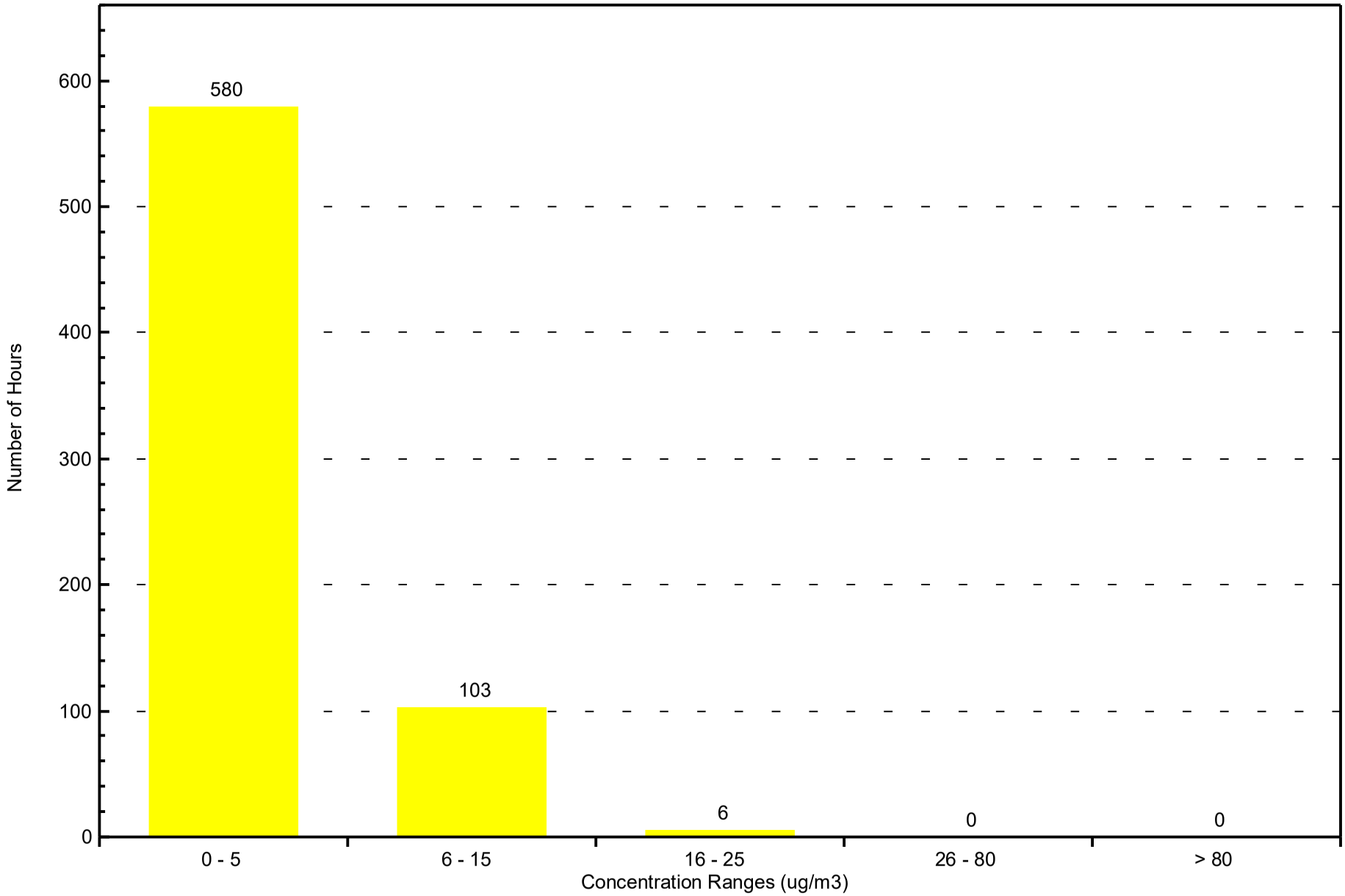


Peace Airshed Zone Association

Histogram of Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Evergreen Park - February 2020

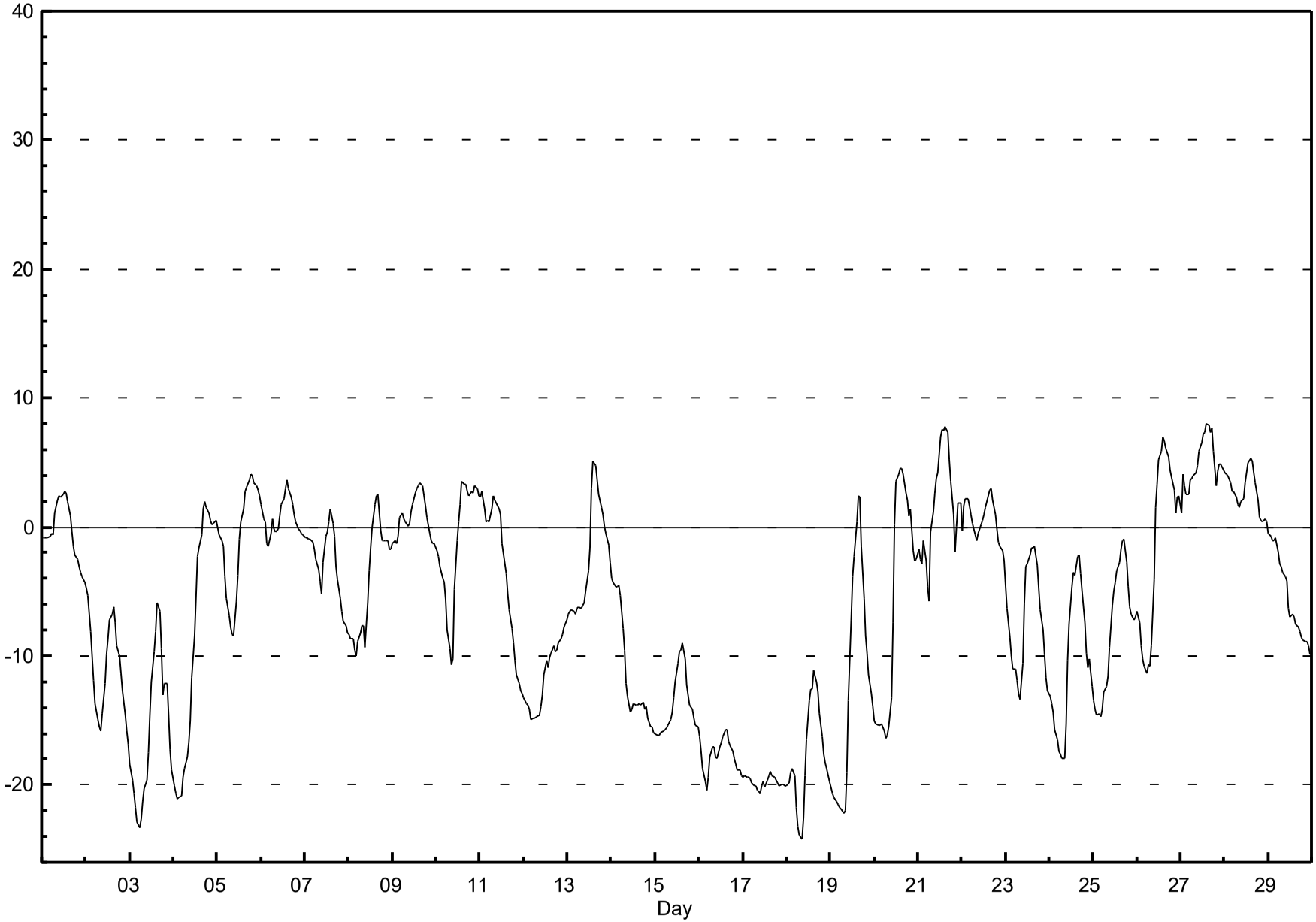


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C

Evergreen Park - February 2020

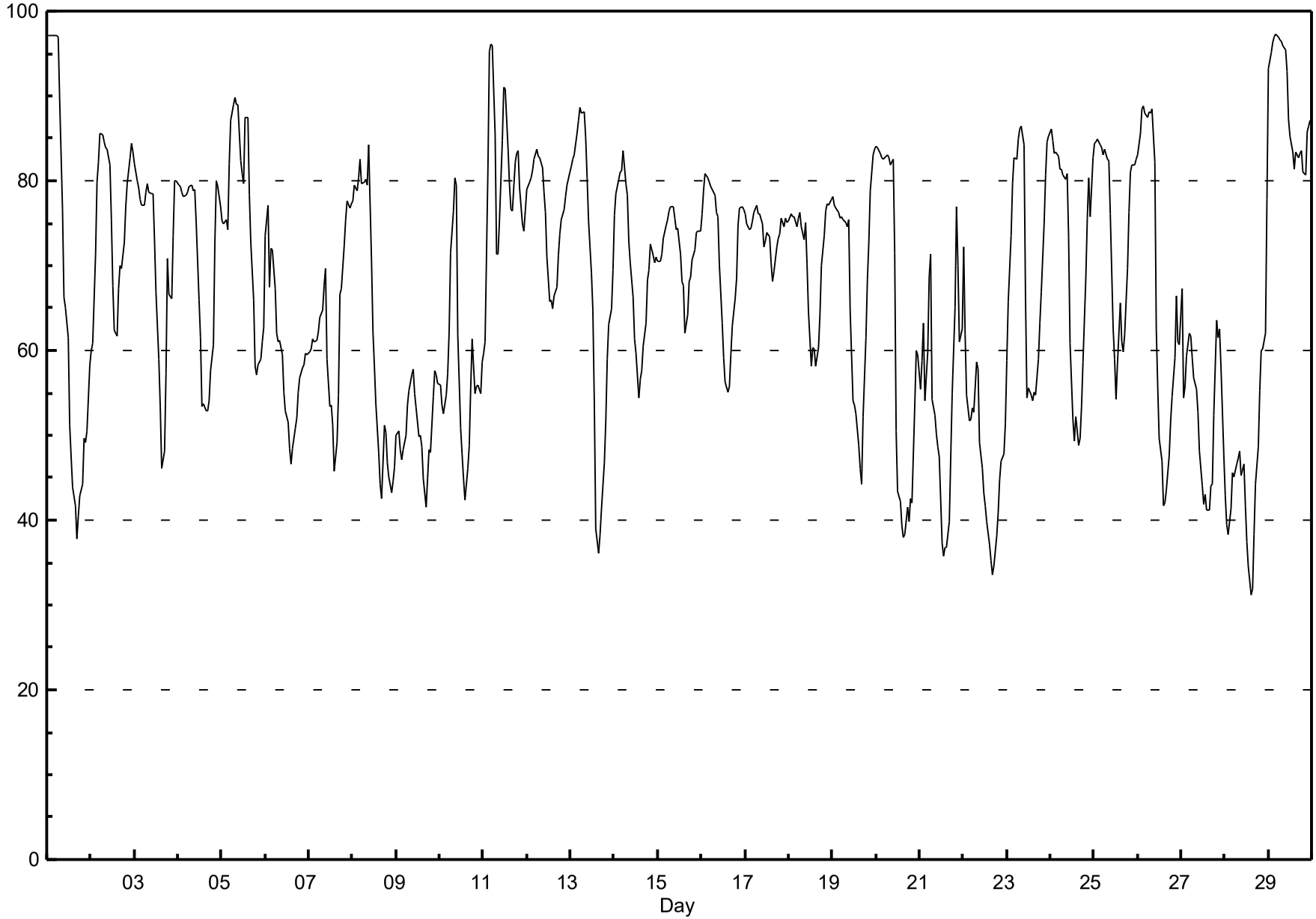


Peace Airshed Zone Association

Hourly Averages

Relative Humidity (RH) - %

Evergreen Park - February 2020

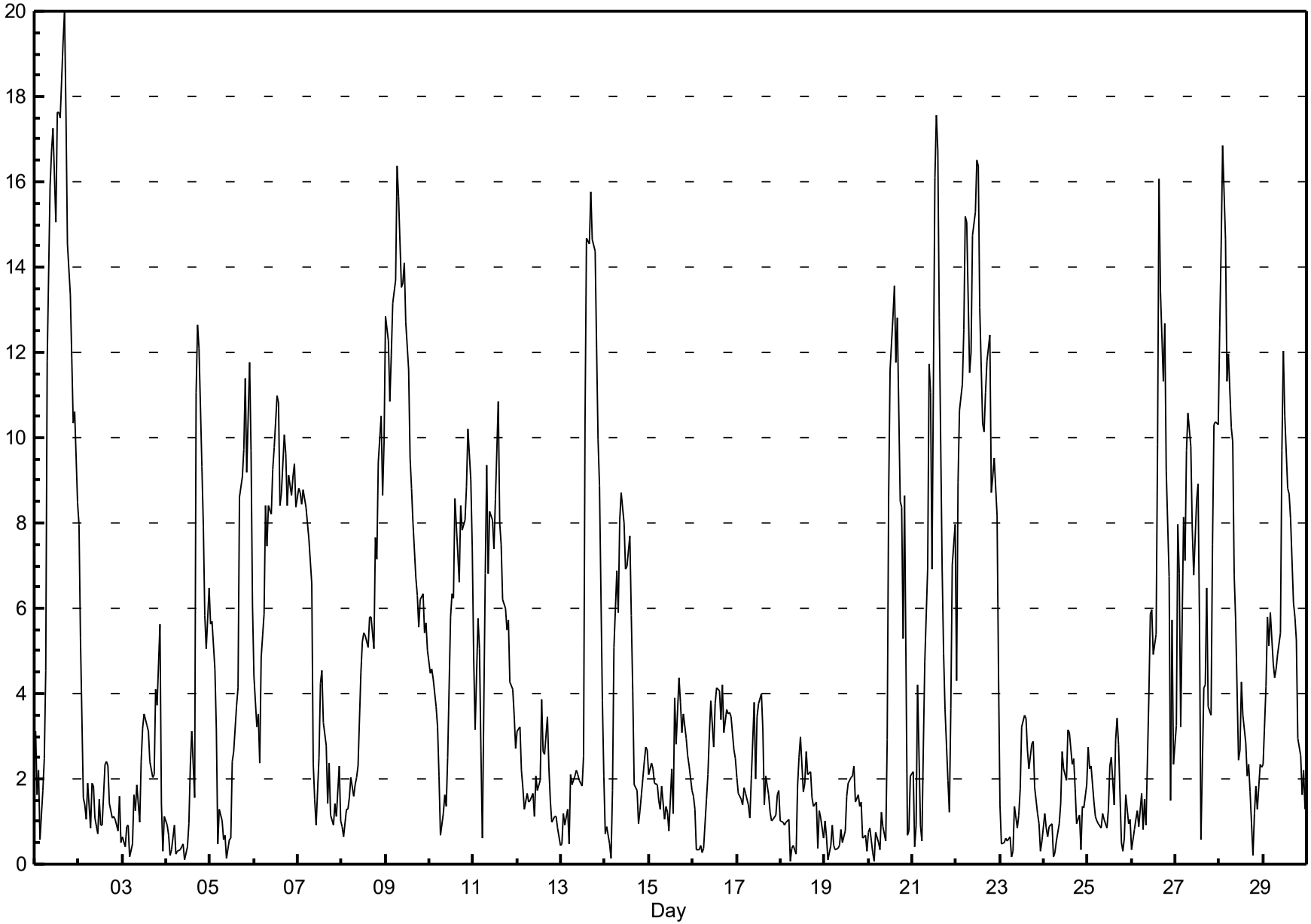


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Evergreen Park - February 2020

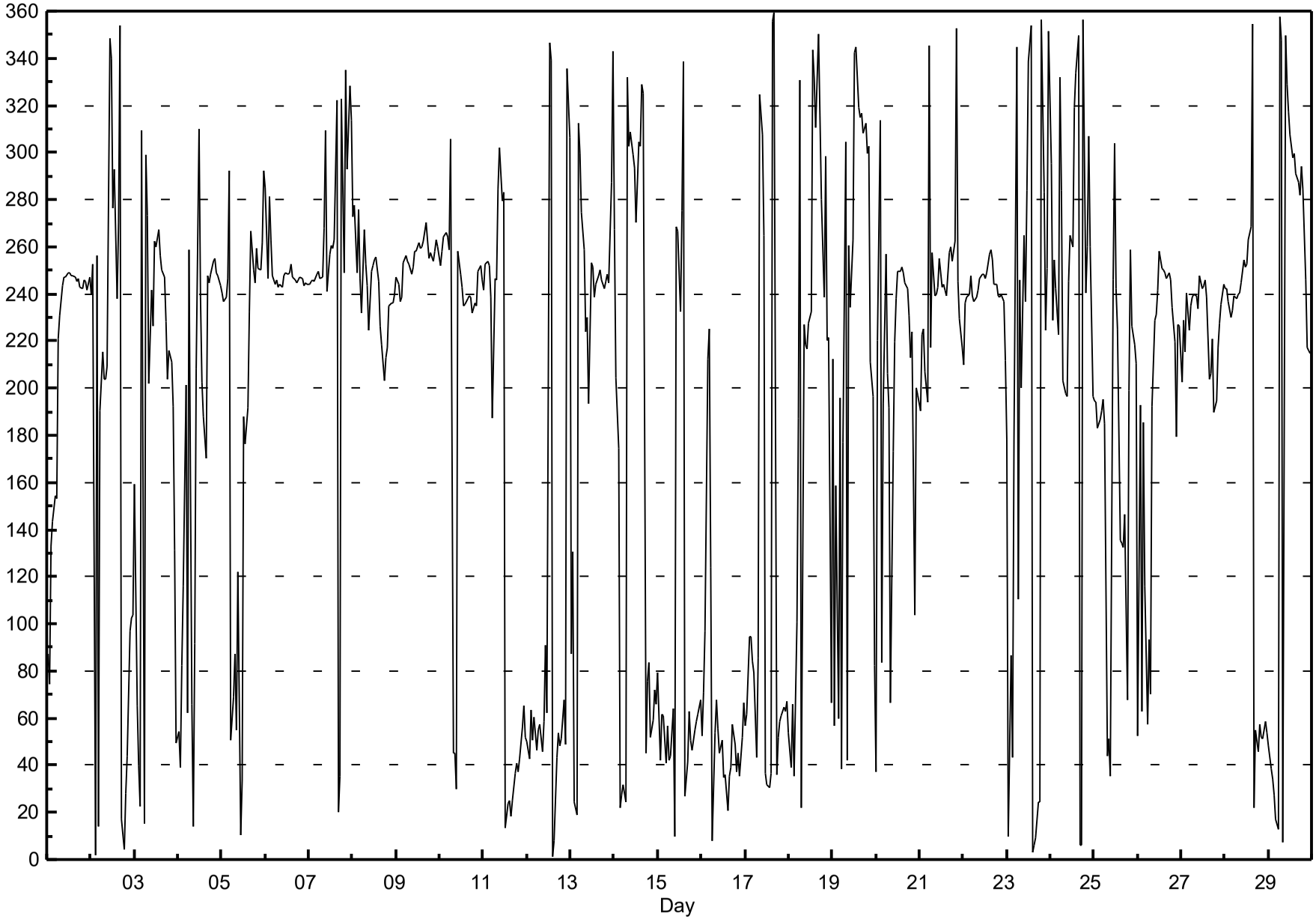


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Evergreen Park - February 2020

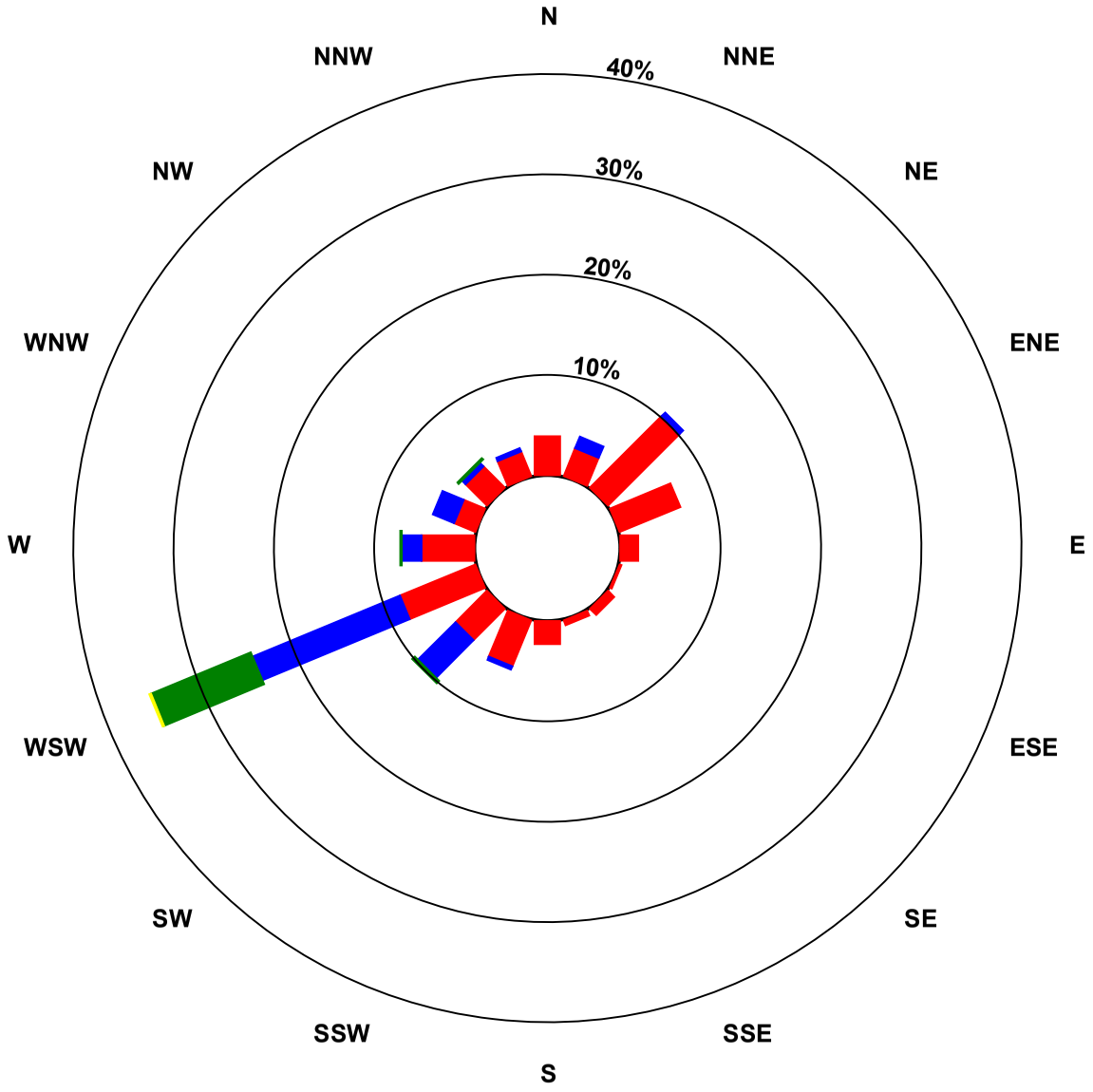


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

Evergreen Park - February 2020



Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

4 Grande Prairie - Henry Pirker Charts

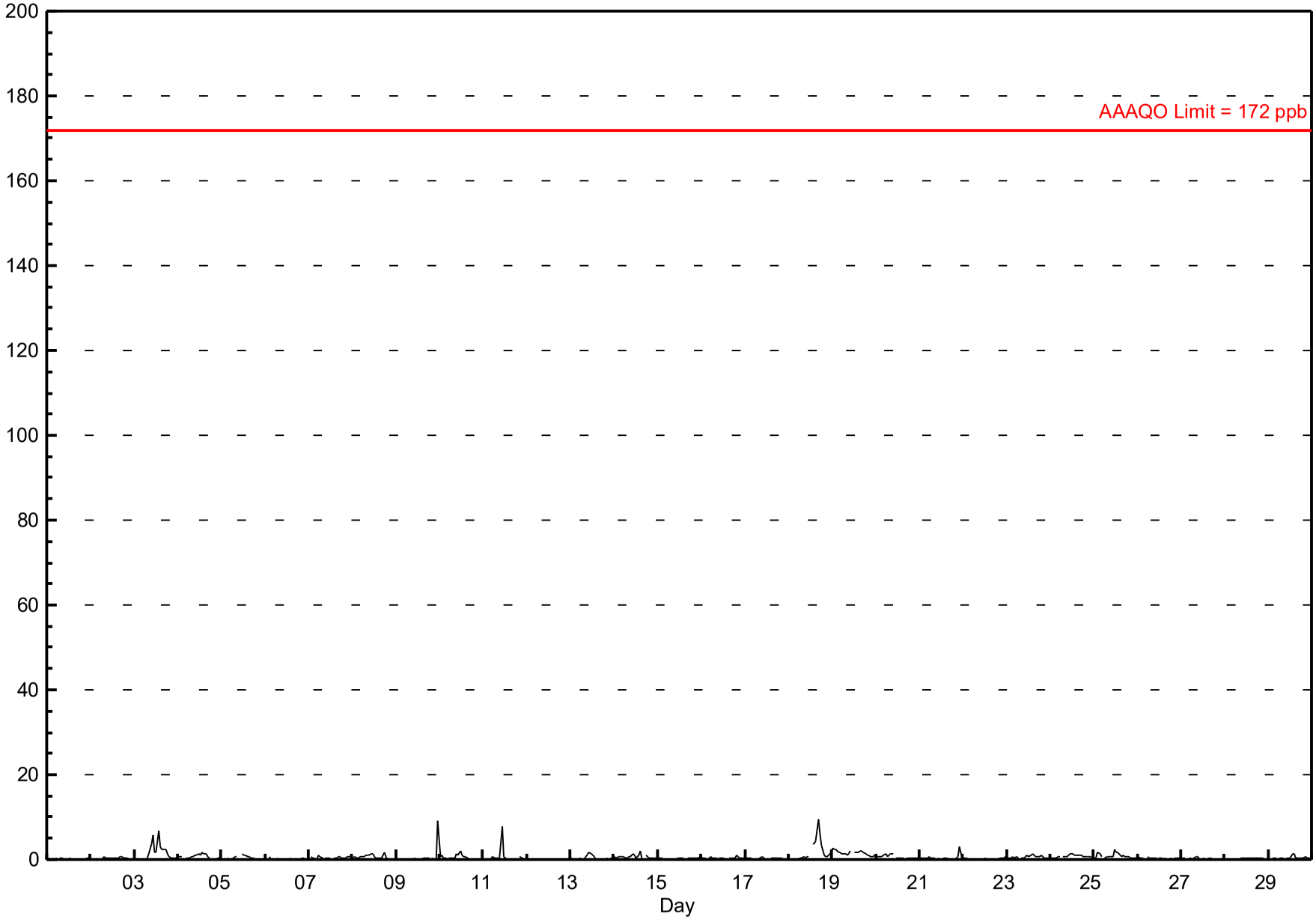
The following pages include the charts and histograms for Henry Pirker Station in Grande Prairie

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Henry Pirker - February 2020

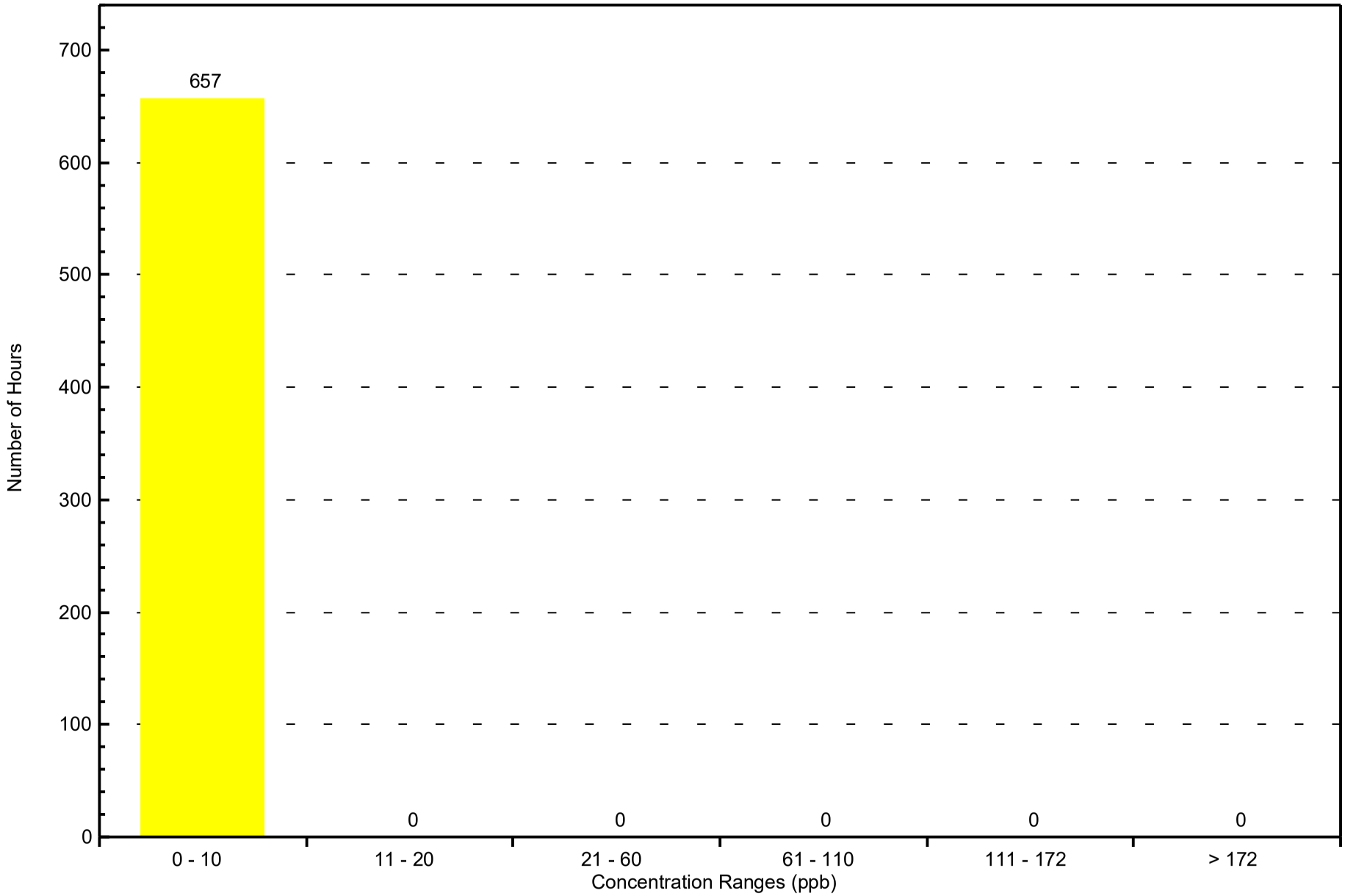


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Henry Pirker - February 2020

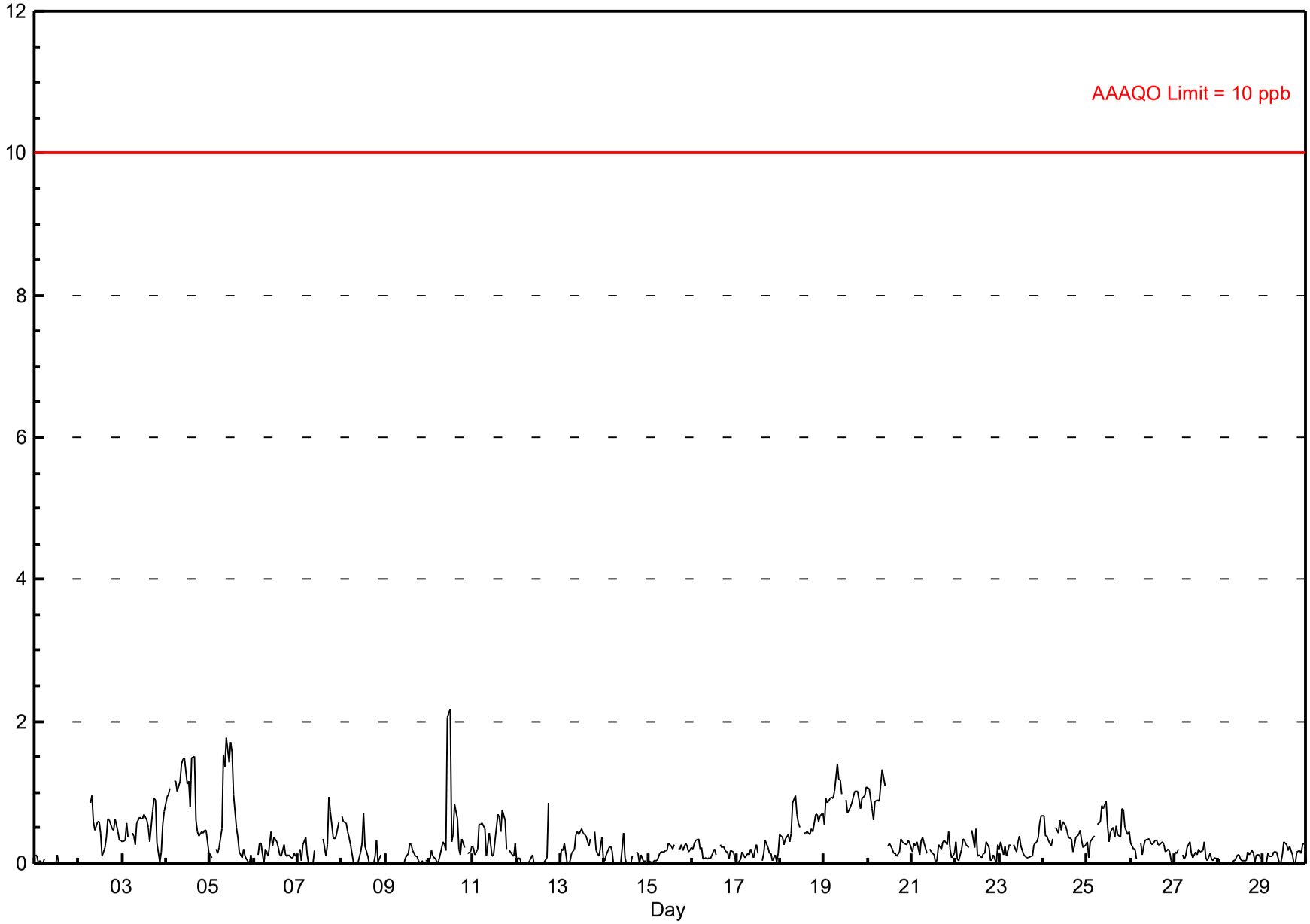


Peace Airshed Zone Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Henry Pirker - February 2020

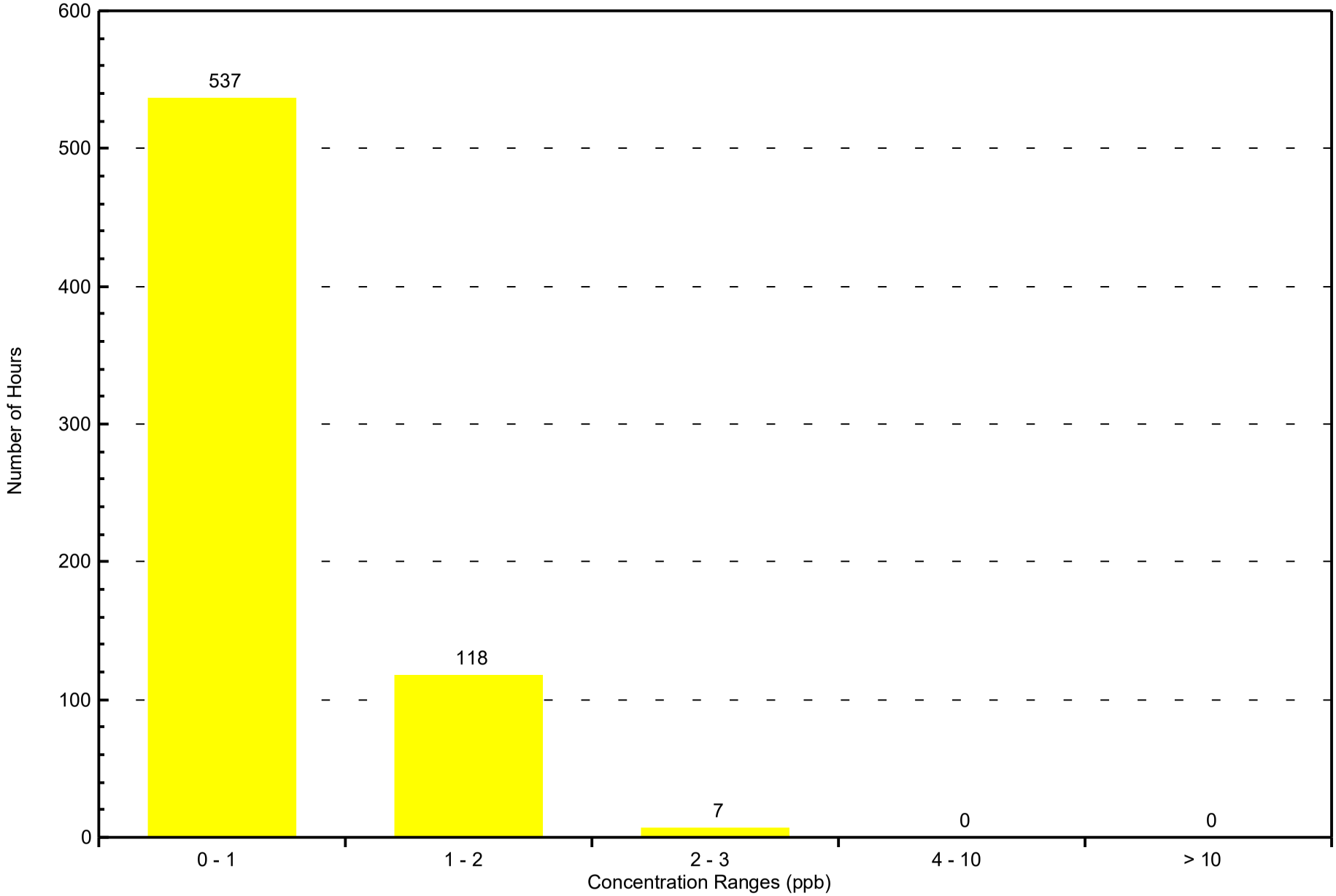


Peace Airshed Zone Association

Histogram of Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Henry Pirker - February 2020

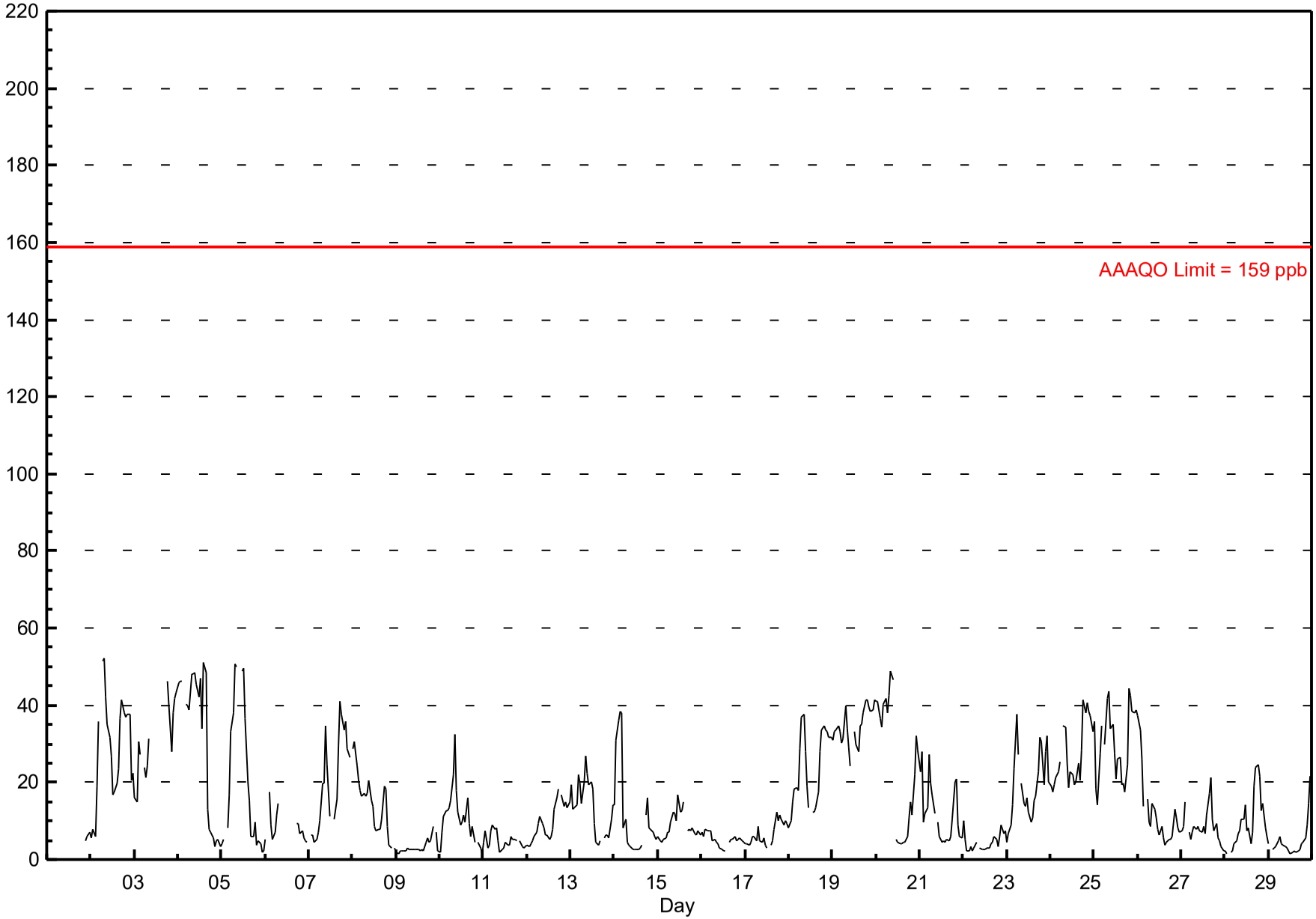


Peace Airshed Zone Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Henry Pirker - February 2020

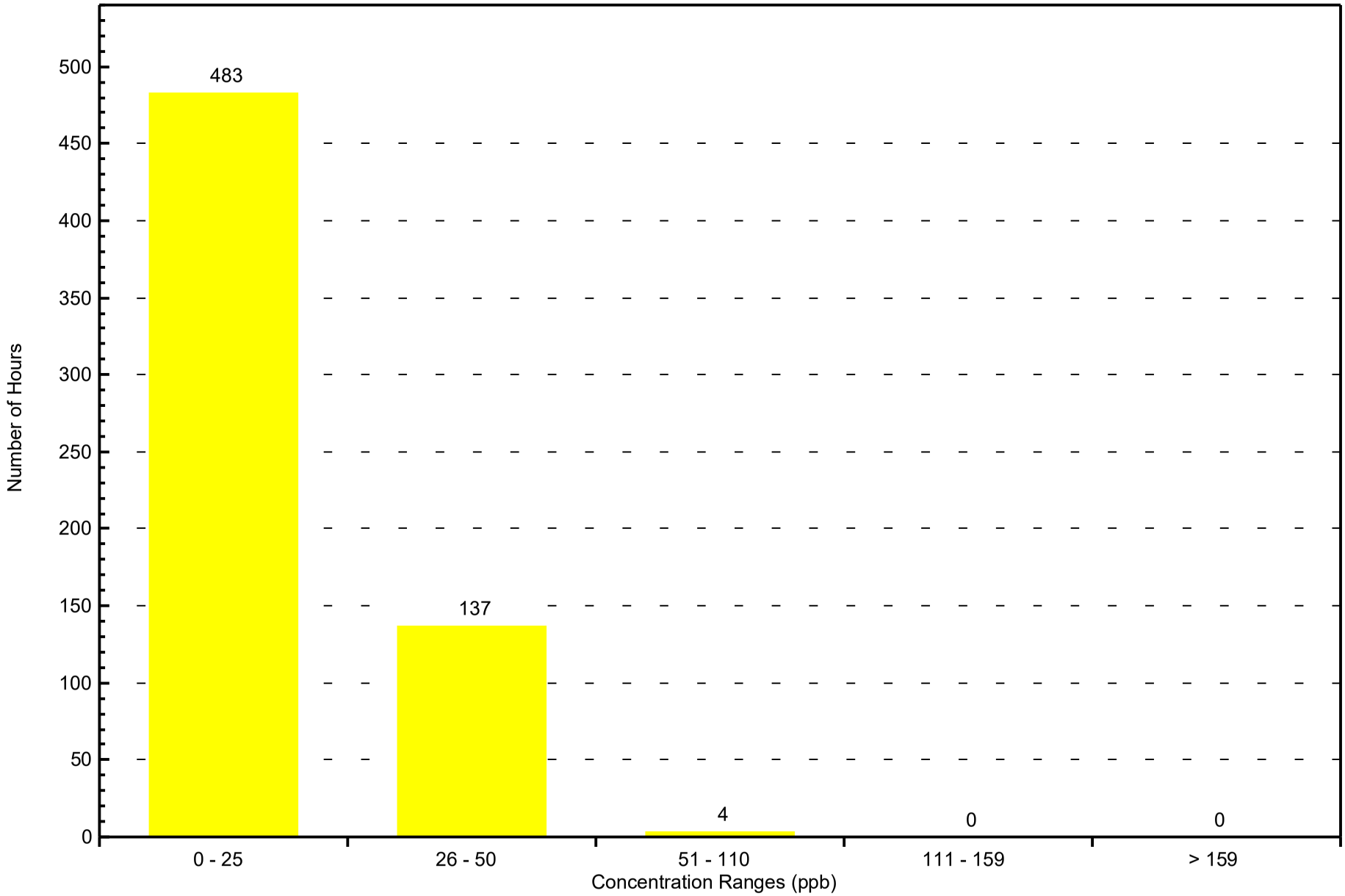


Peace Airshed Zone Association

Histogram of Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Henry Pirker - February 2020

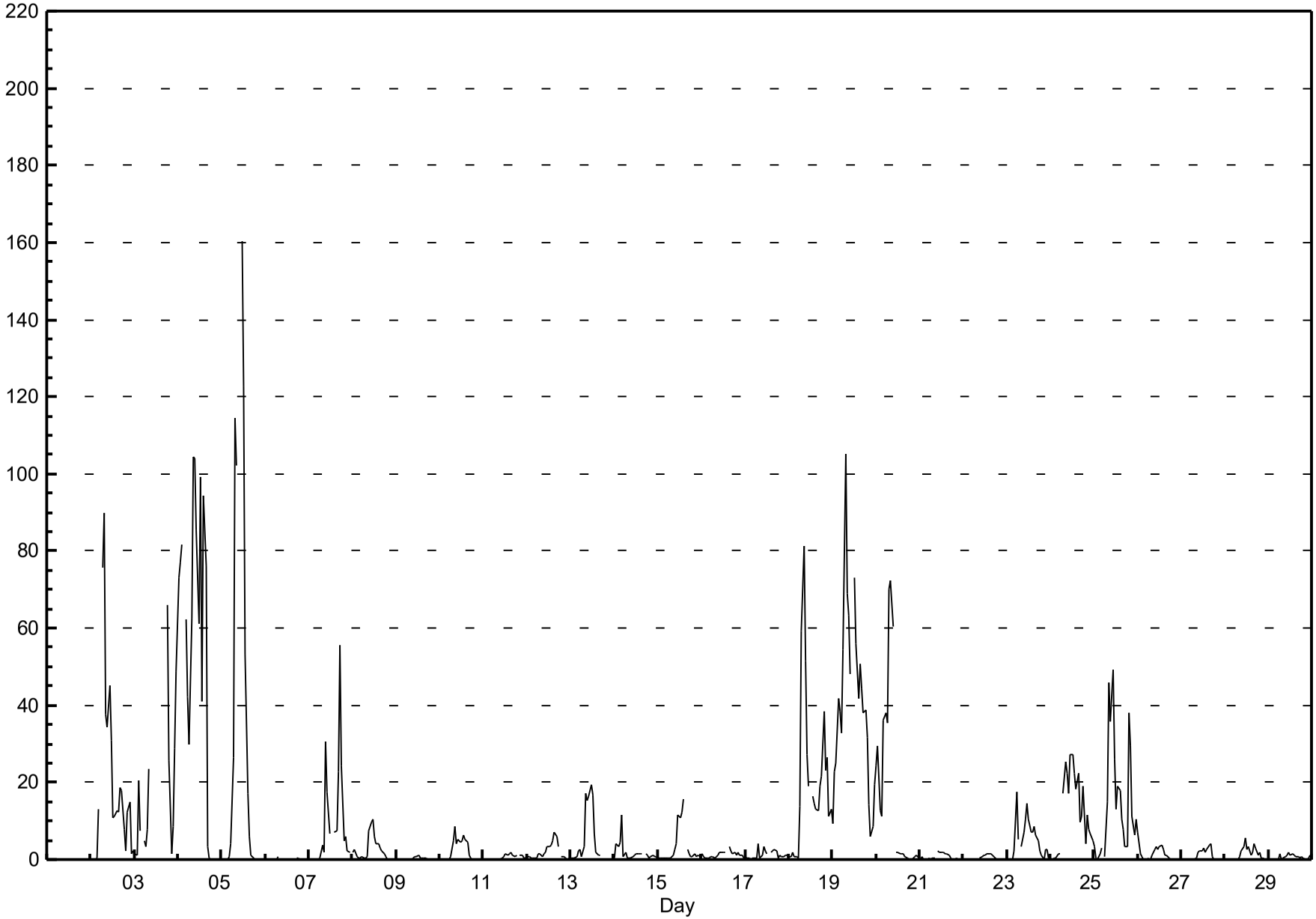


Peace Airshed Zone Association

Hourly Averages

Nitrogen Oxide (NO) - ppb

Henry Pirker - February 2020

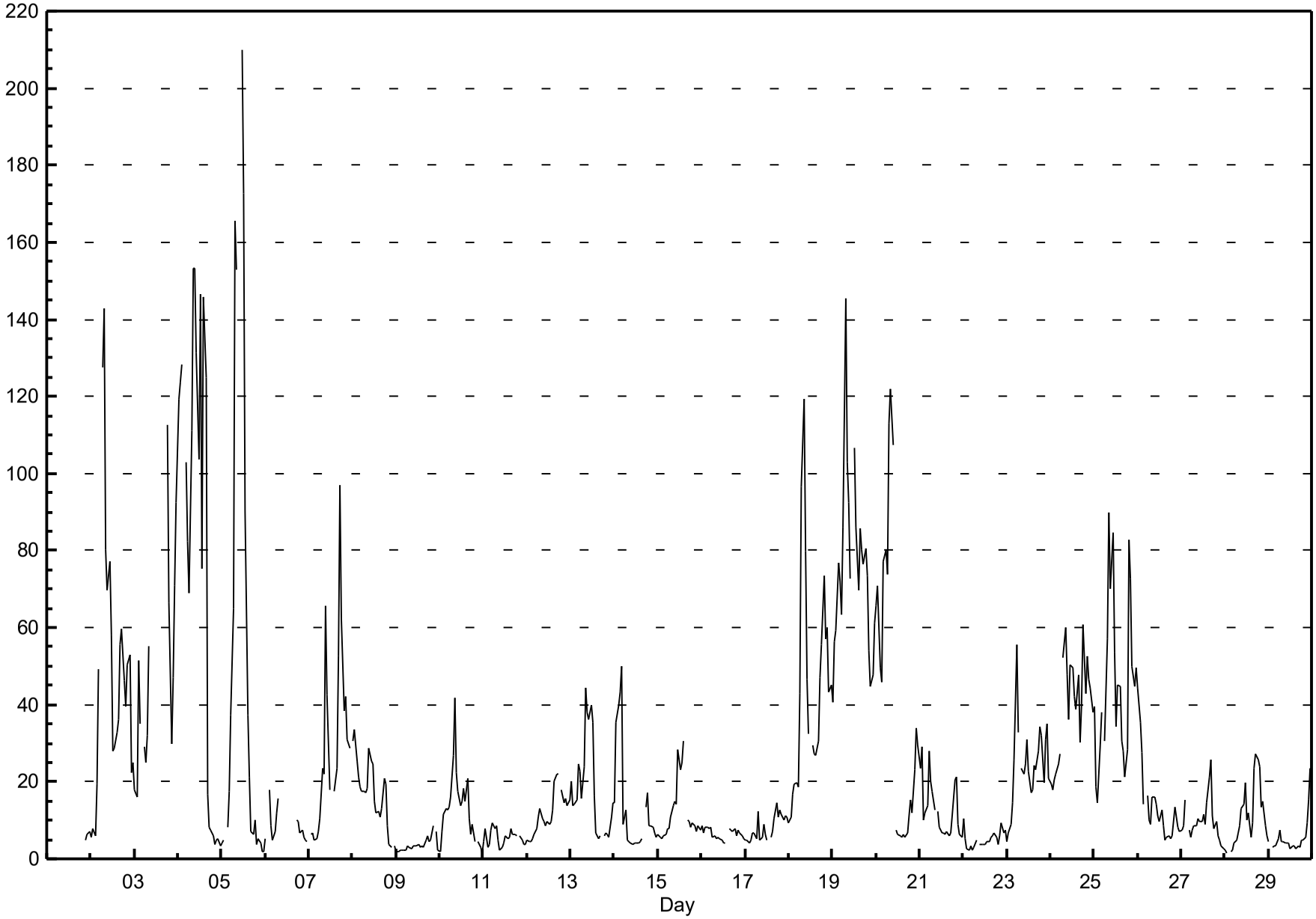


Peace Airshed Zone Association

Hourly Averages

Oxides of Nitrogen (NO_X) - ppb

Henry Pirker - February 2020

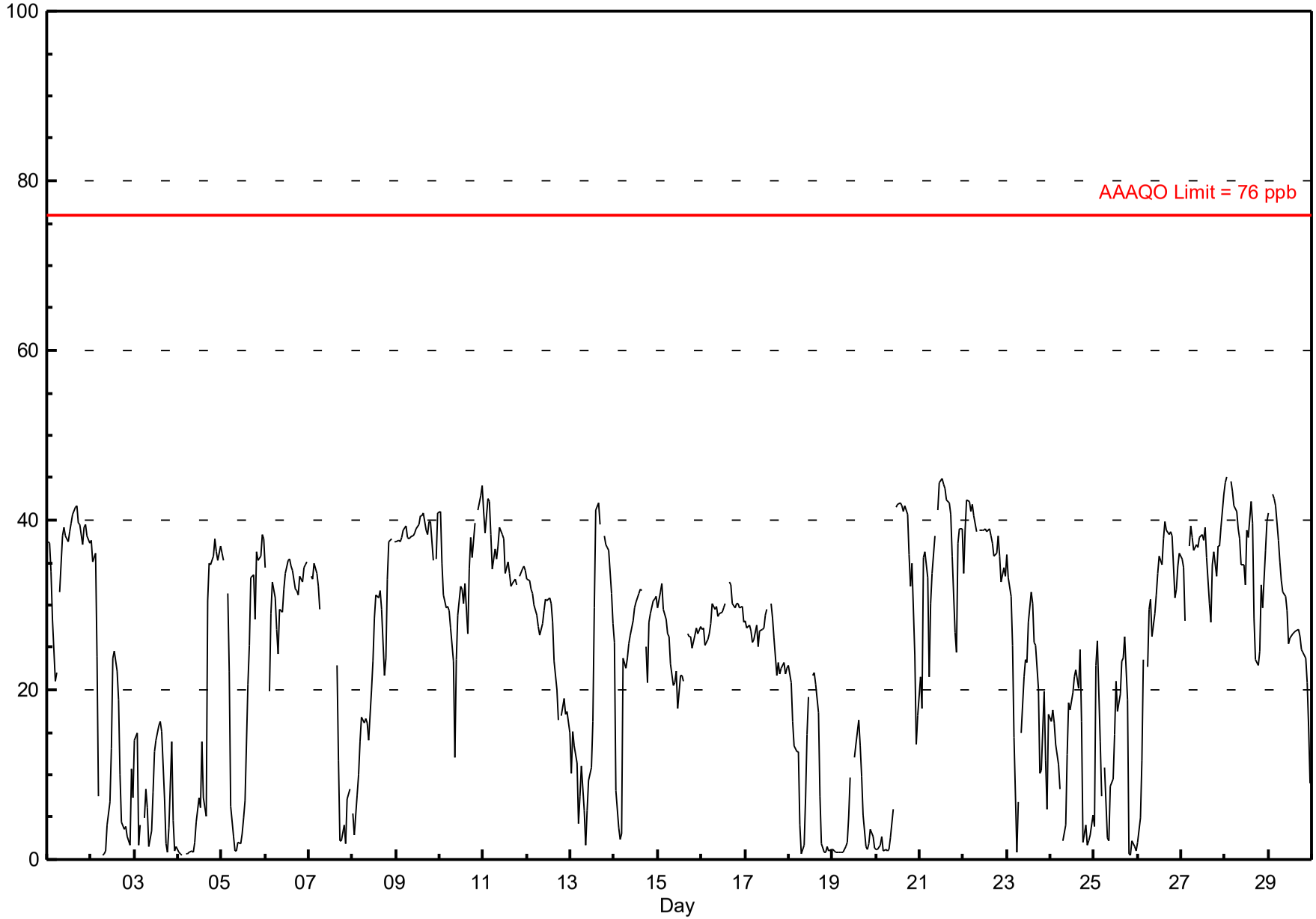


Peace Airshed Zone Association

Hourly Averages

Ozone (O_3) - ppb

Henry Pirker - February 2020

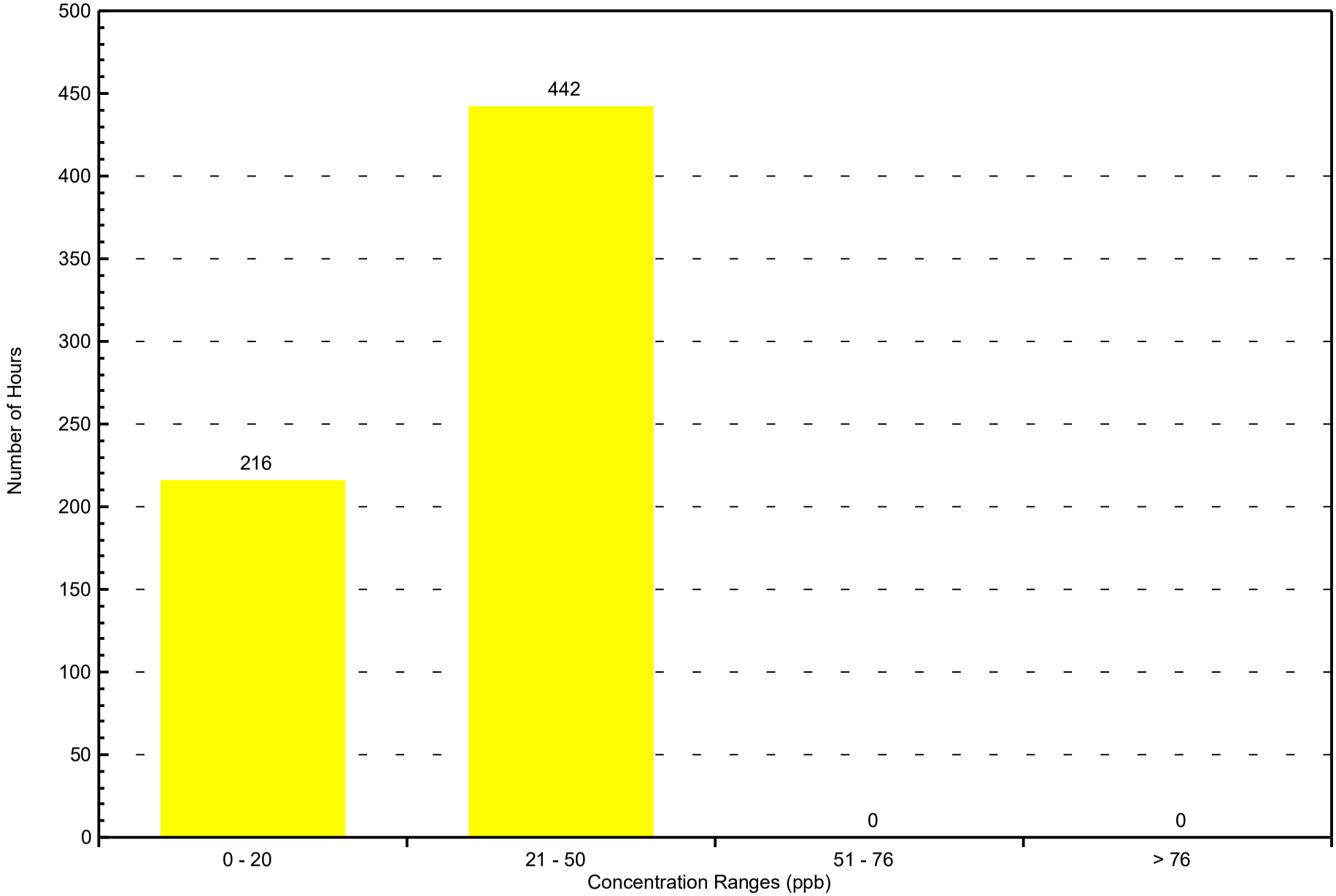


Peace Airshed Zone Association

Histogram of Hourly Averages

Ozone (O_3) - ppb

Henry Pirker - February 2020

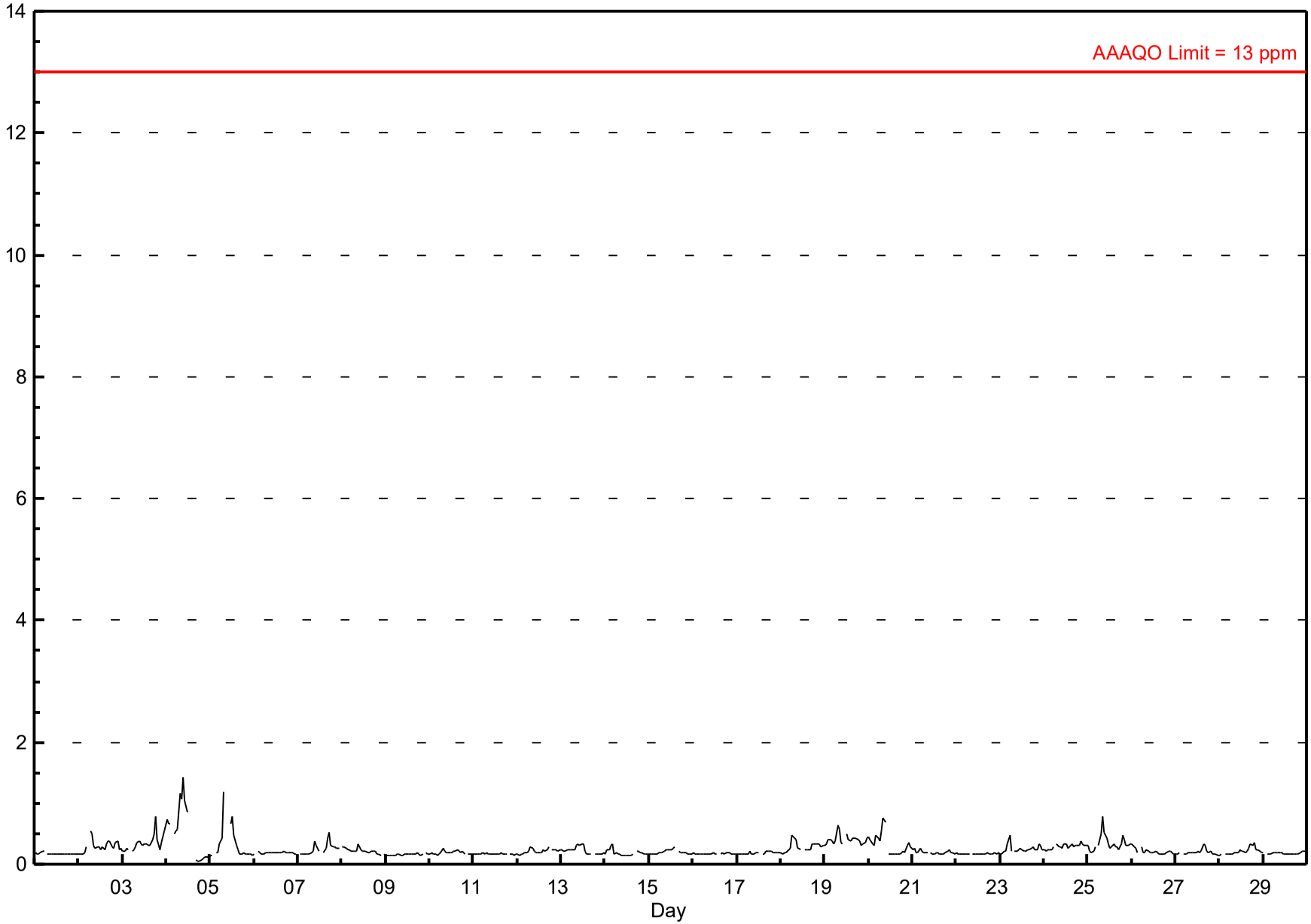


Peace Airshed Zone Association

Hourly Averages

Carbon Monoxide (CO) - ppm

Henry Pirker - February 2020

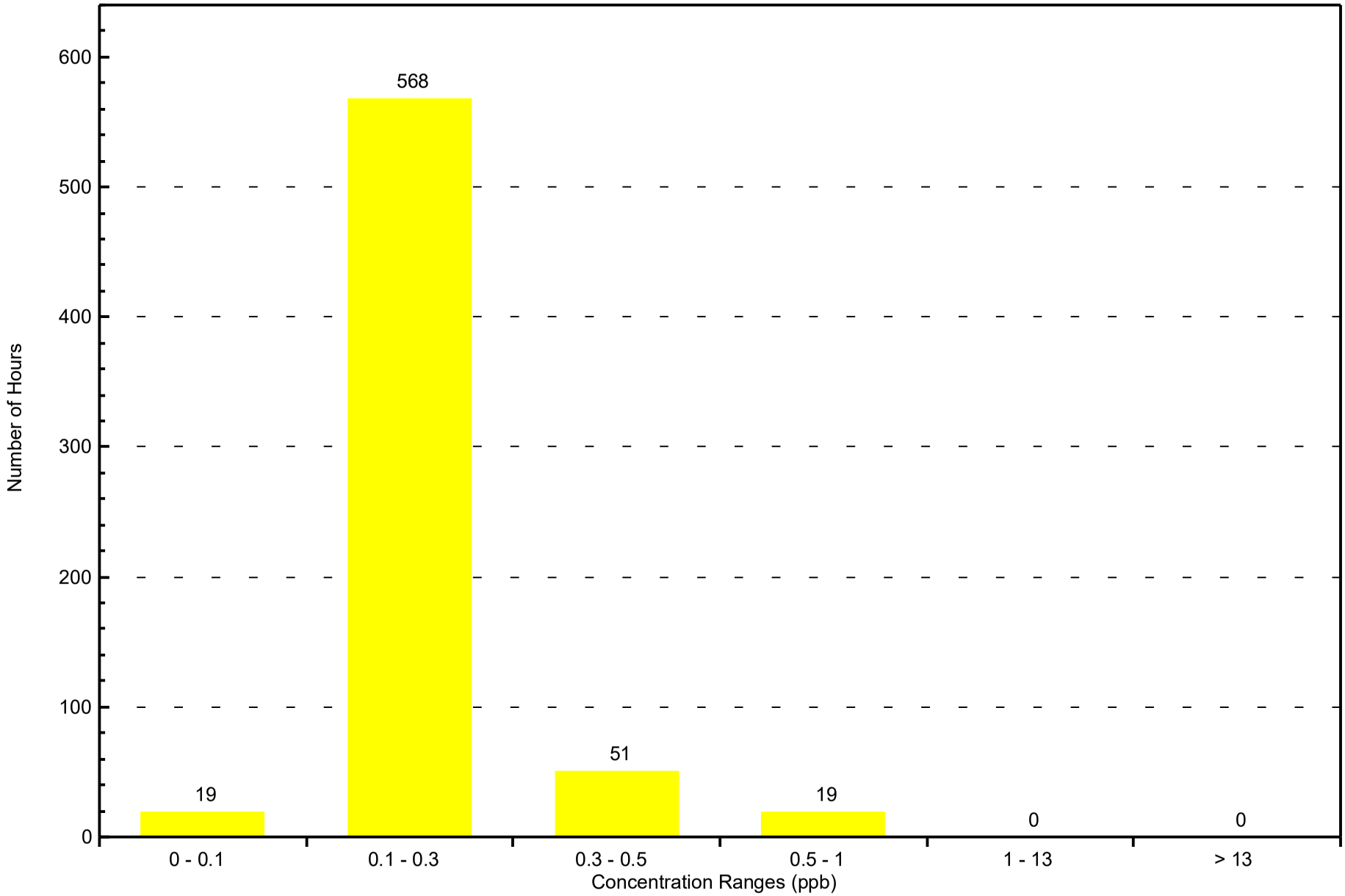


Peace Airshed Zone Association

Histogram of Hourly Averages

Carbon Monoxide (CO) - ppm

Henry Pirker - February 2020

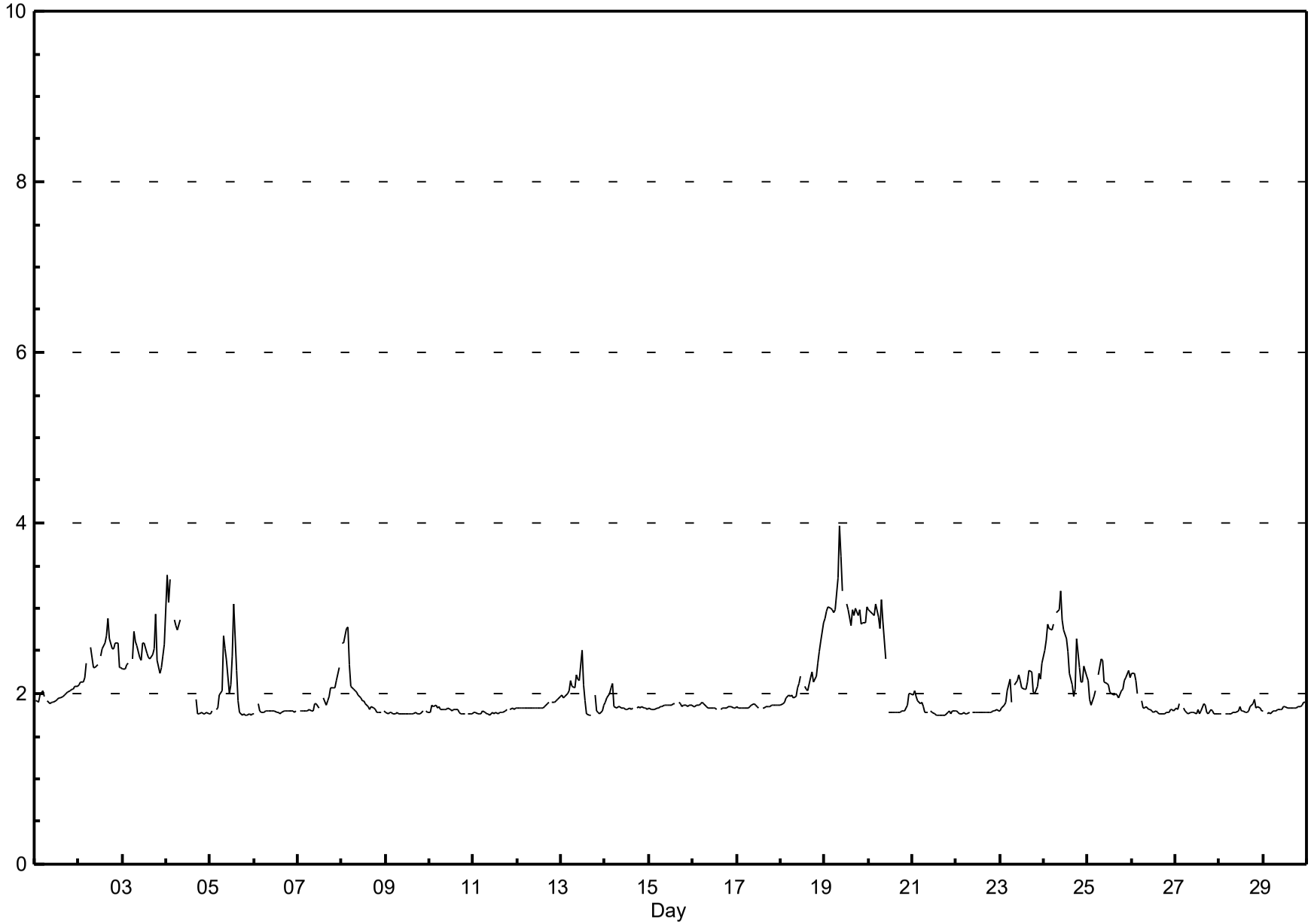


Peace Airshed Zone Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Henry Pirker - February 2020

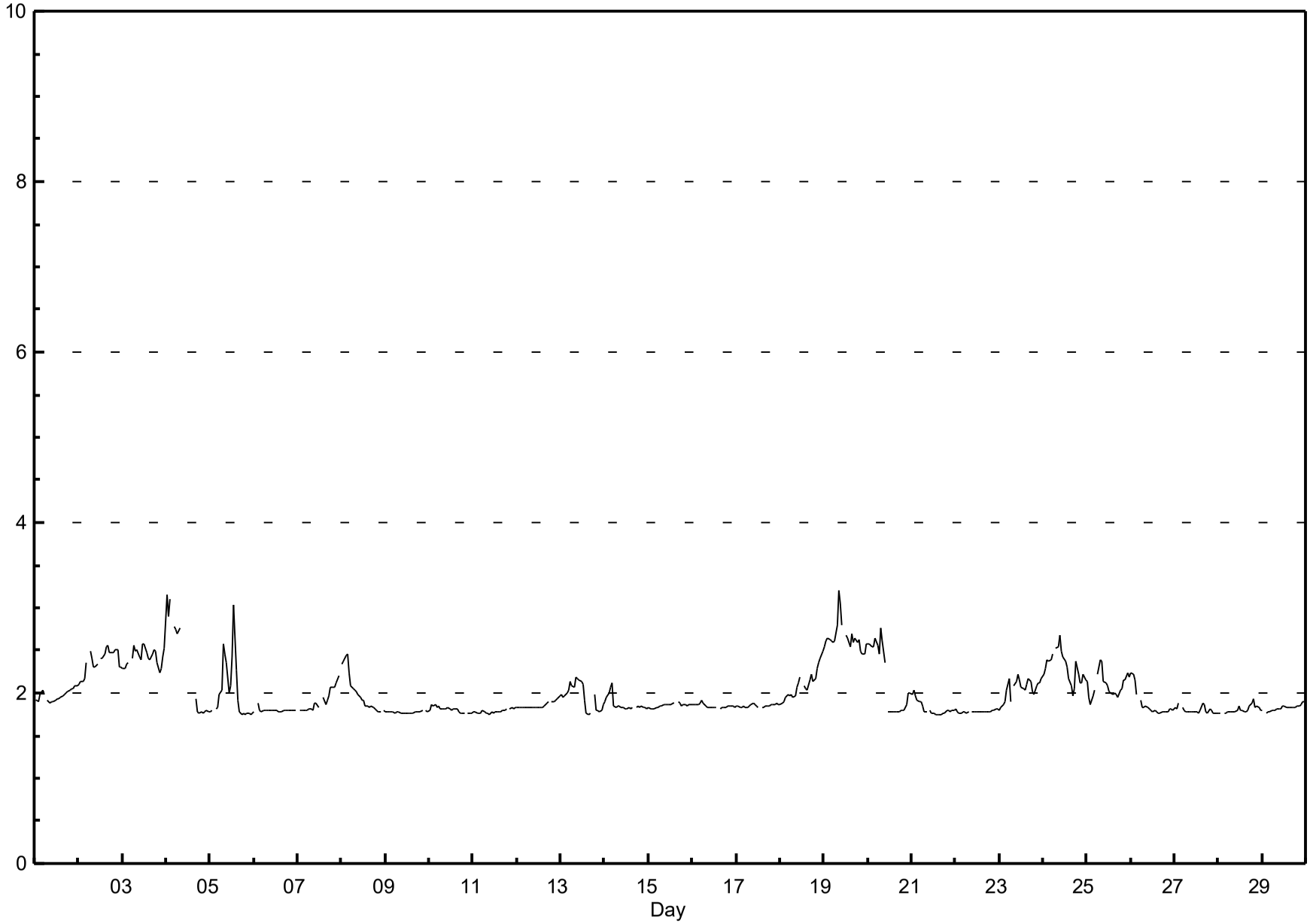


Peace Airshed Zone Association

Hourly Averages

Methane (CH_4) - ppm

Henry Pirker - February 2020

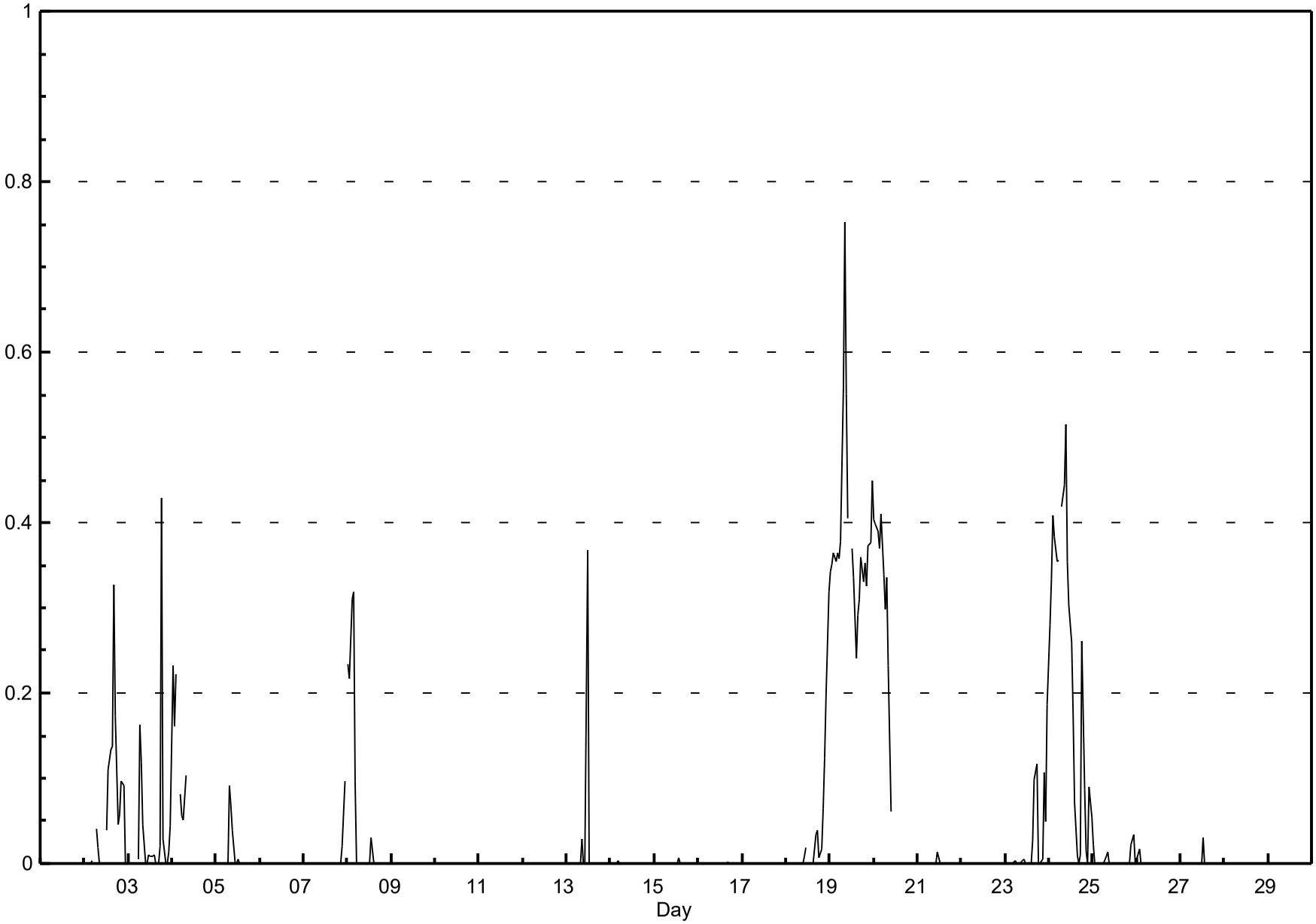


Peace Airshed Zone Association

Hourly Averages

Non Methane Hydrocarbon (NMHC) - ppm

Henry Pirker - February 2020

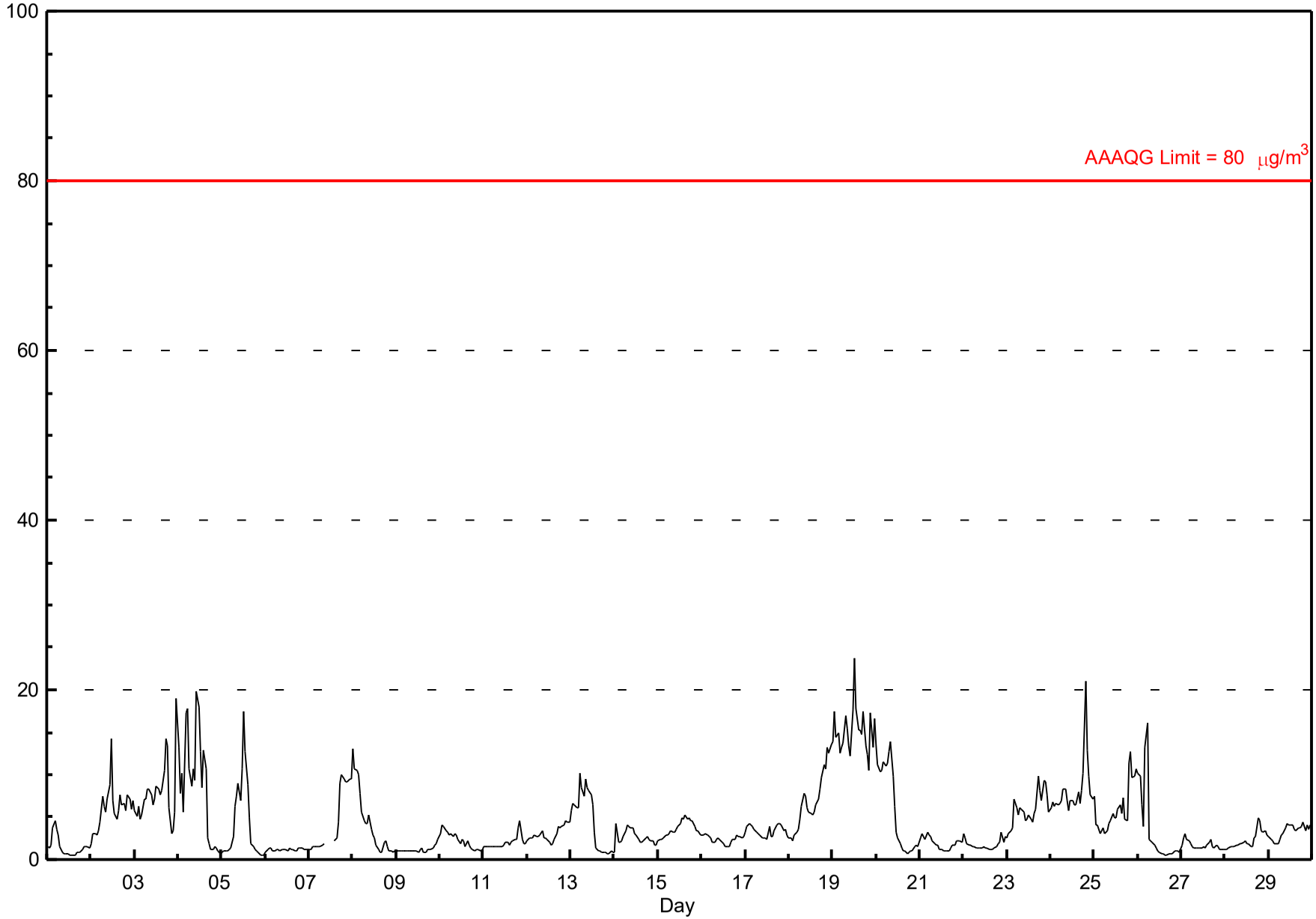


Peace Airshed Zone Association

Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Henry Pirker - February 2020

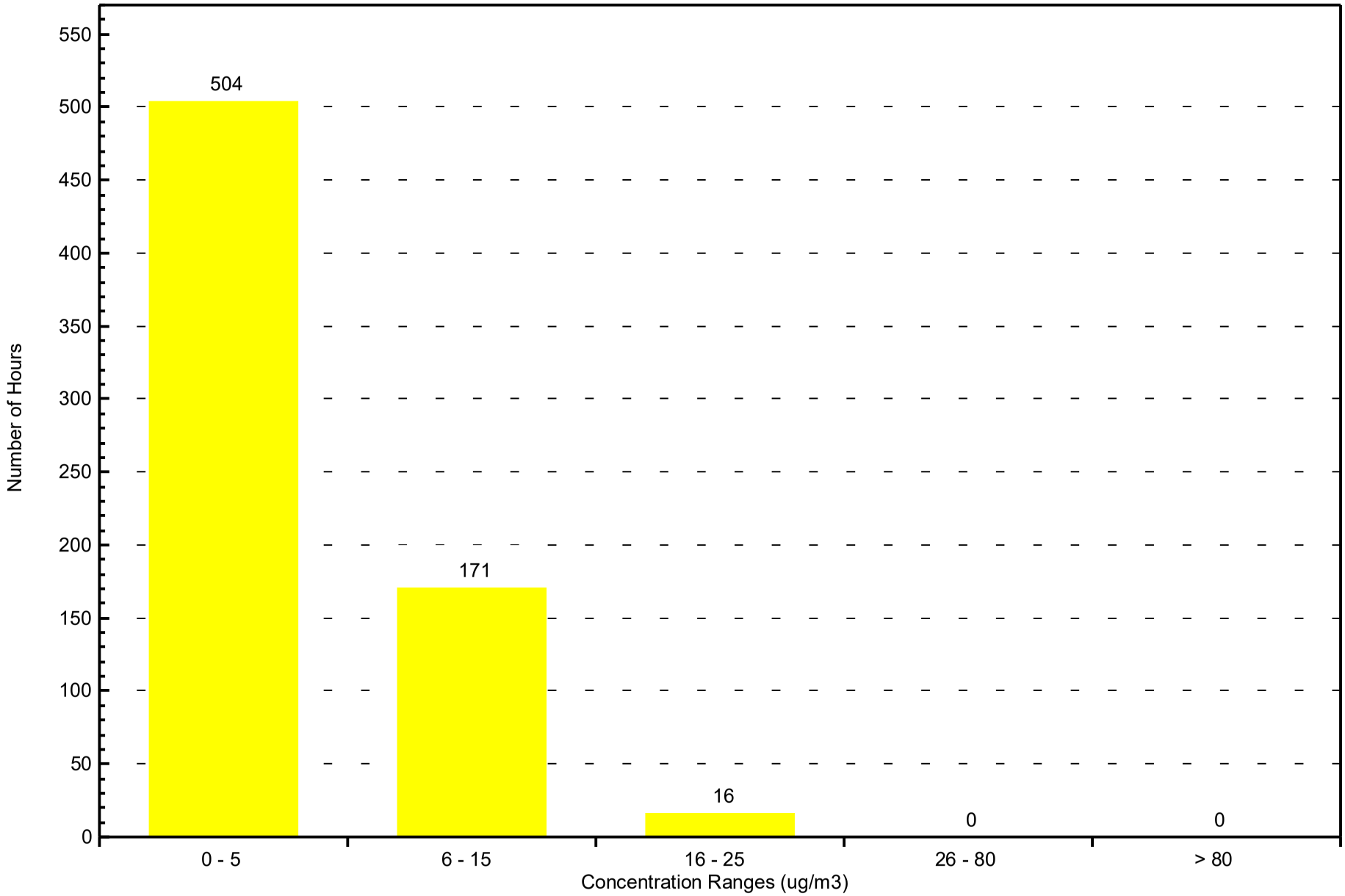


Peace Airshed Zone Association

Histogram of Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Henry Pirker - February 2020

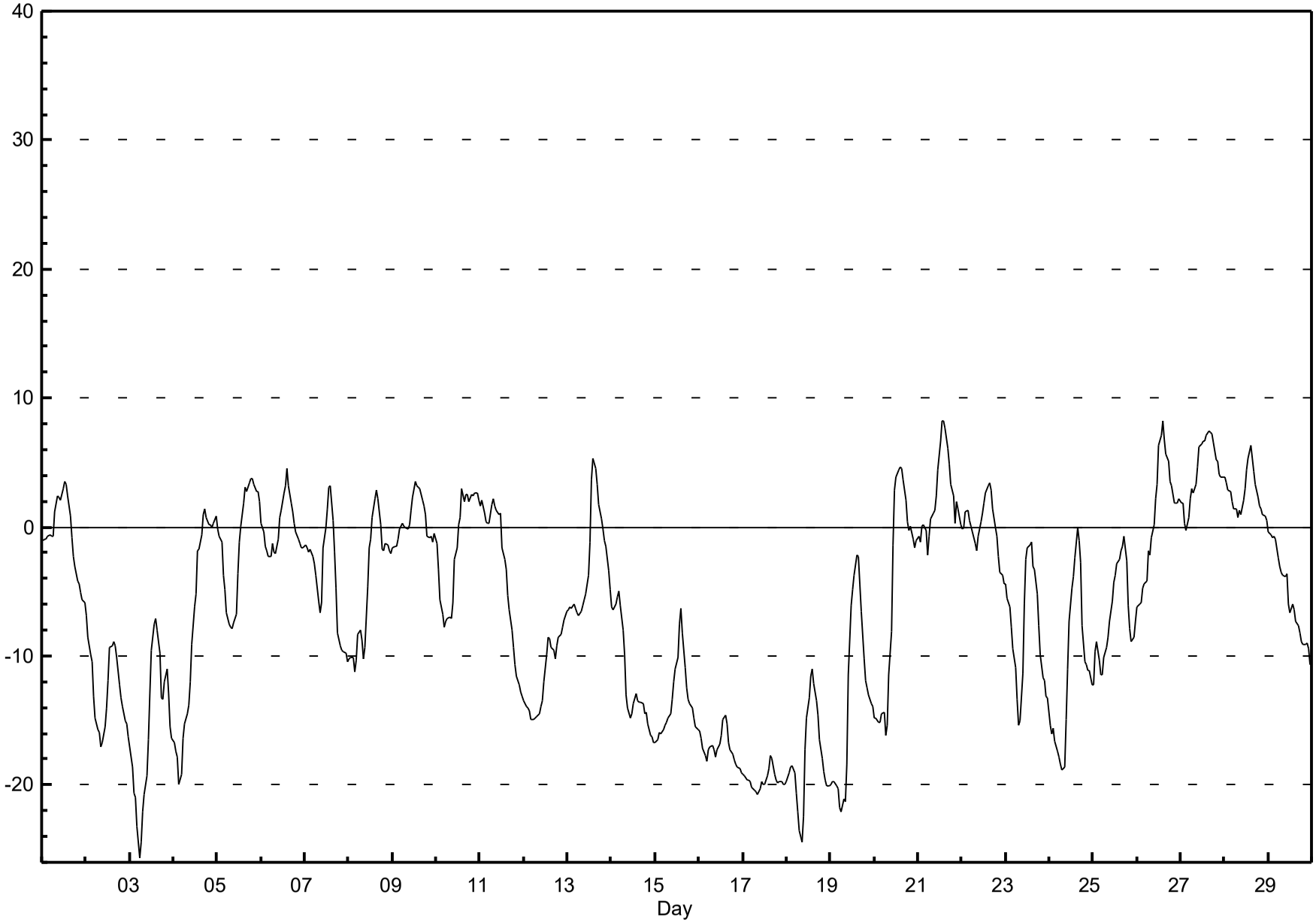


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - ^{o}C

Henry Pirker - February 2020

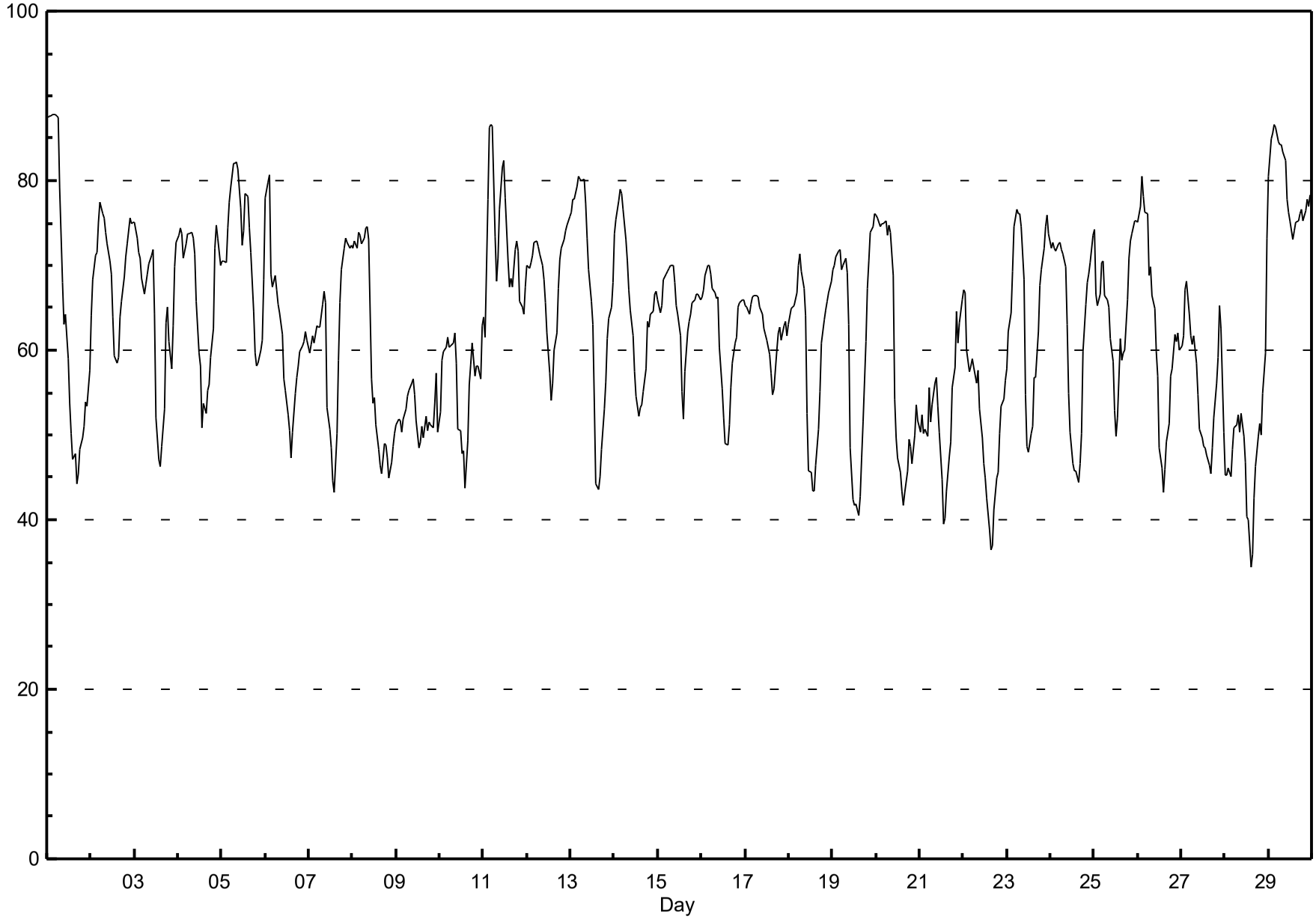


Peace Airshed Zone Association

Hourly Averages

Relative Humidity (RH) - %

Henry Pirker - February 2020

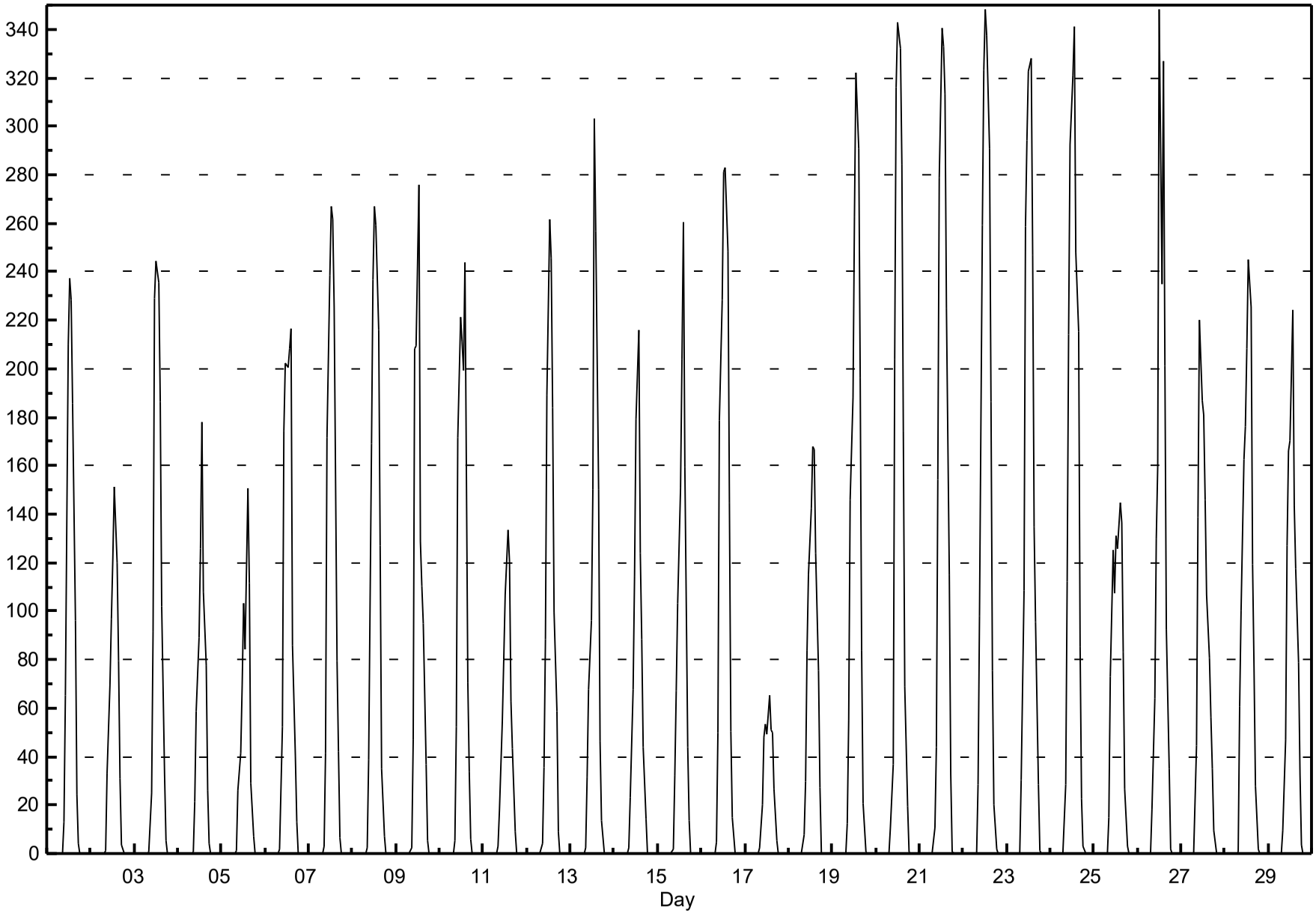


Peace Airshed Zone Association

Hourly Averages

Solar Radiation (SR) - W/m^2

Henry Pirker - February 2020

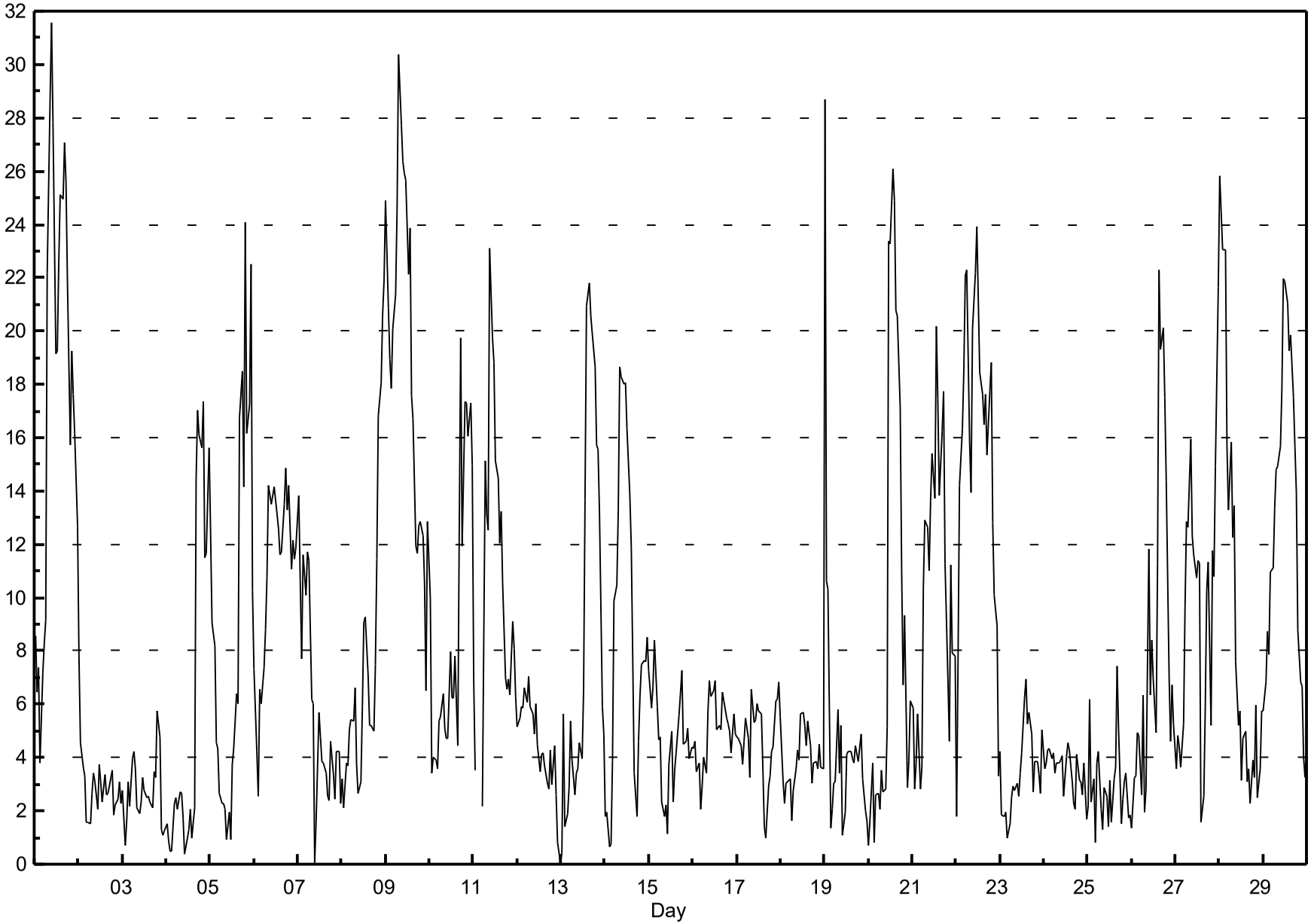


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Henry Pirker - February 2020

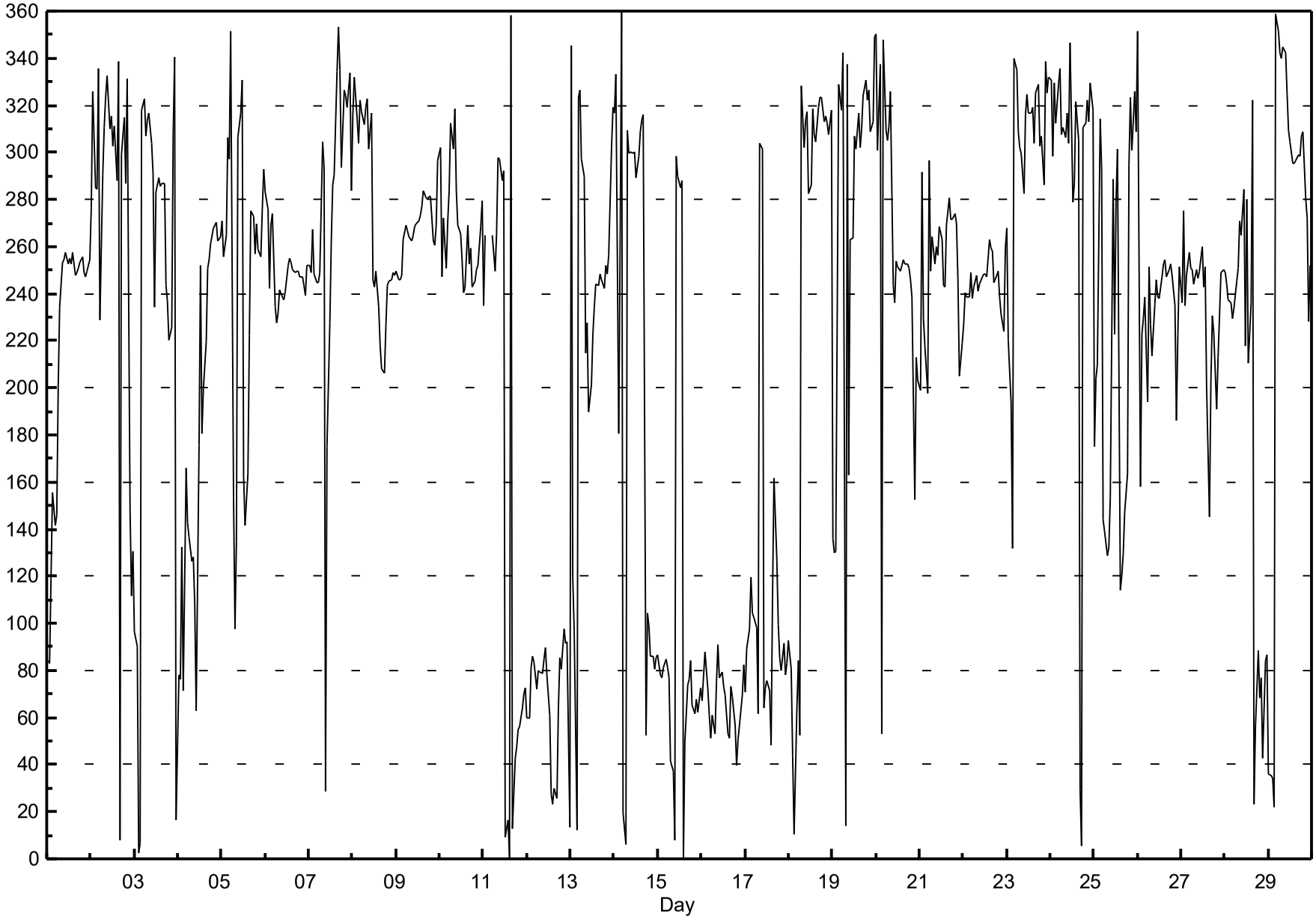


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Henry Pirker - February 2020

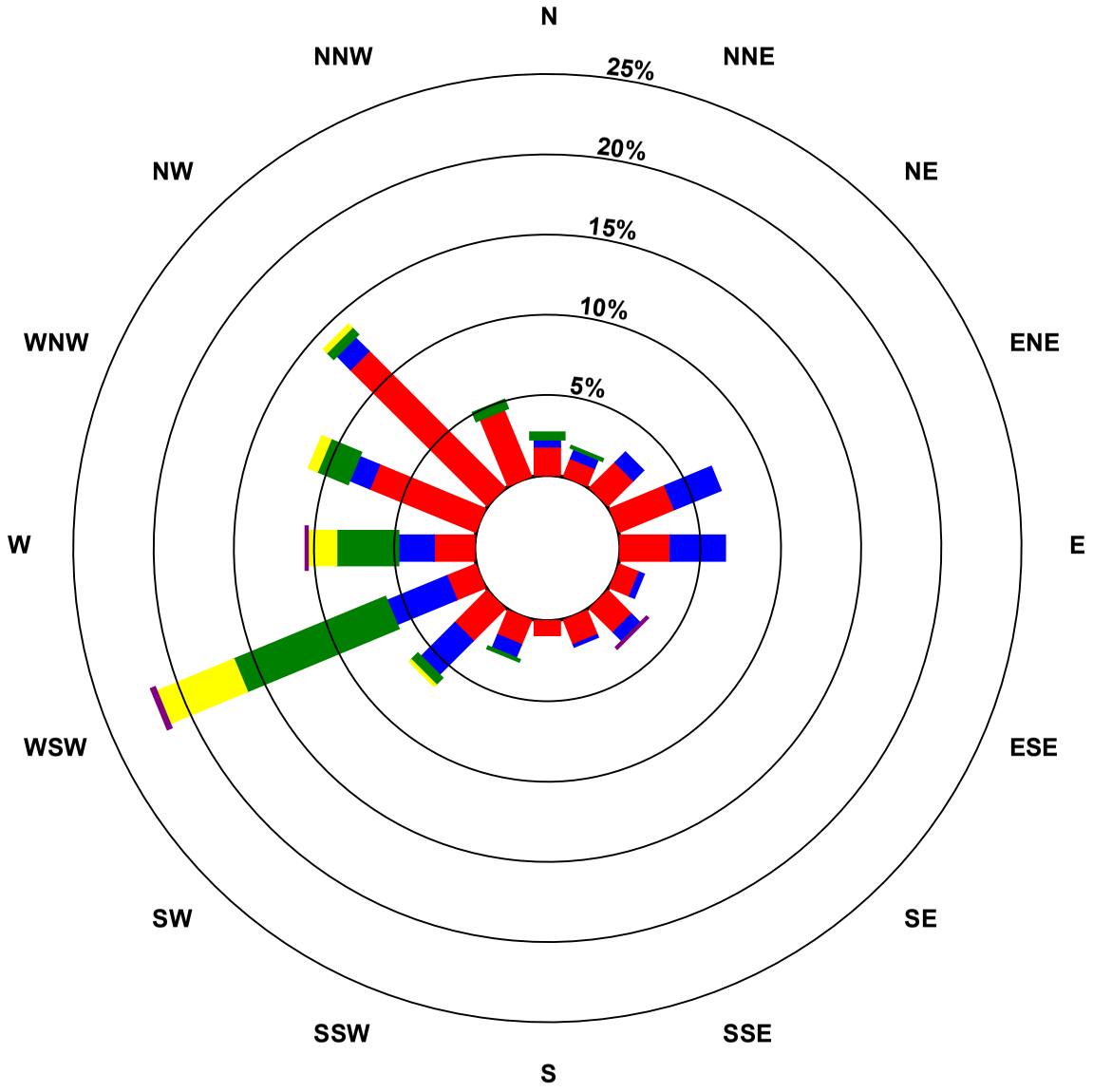


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

Henry Pirker - February 2020



Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

5 Smoky Heights Charts

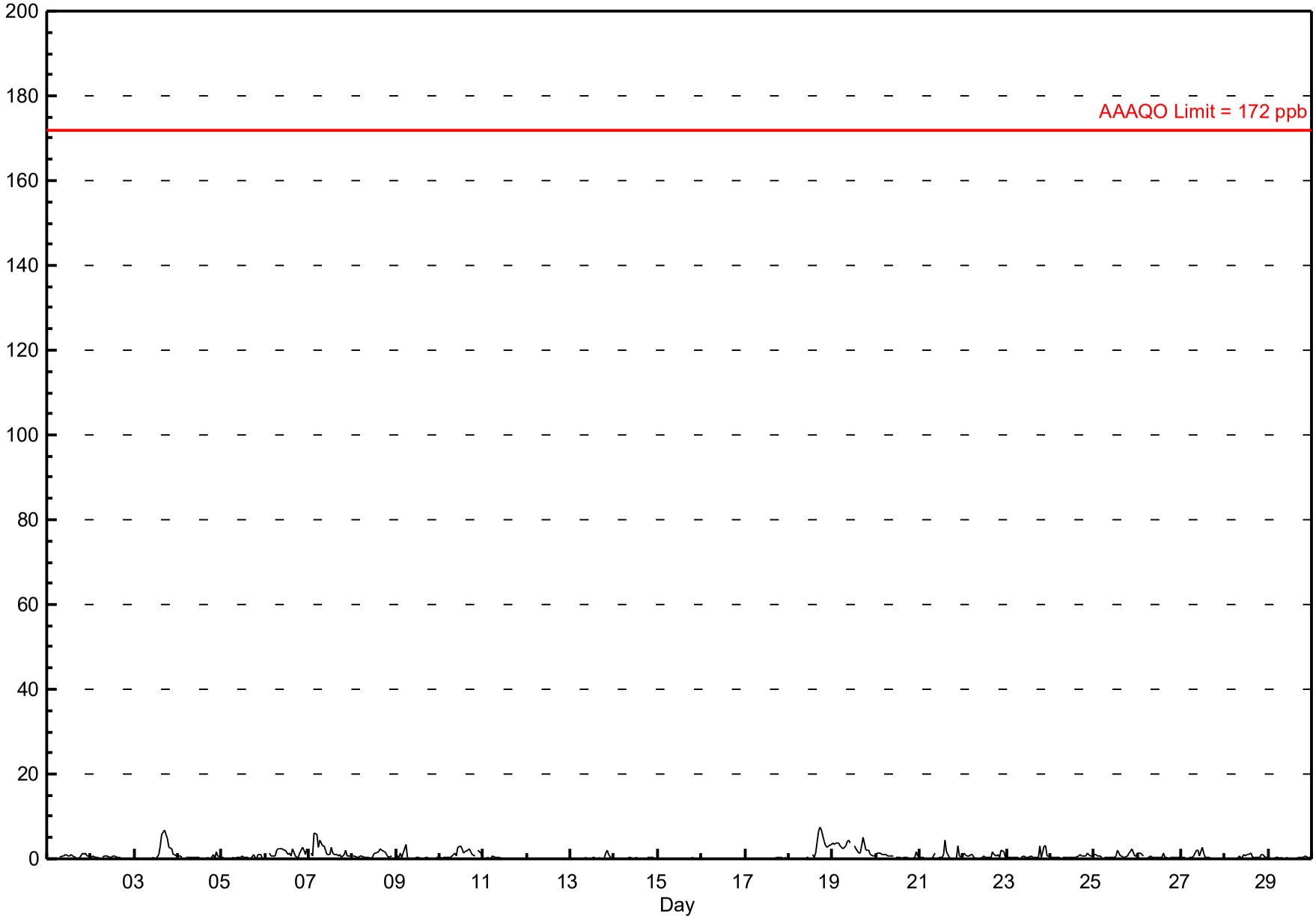
The following pages include the charts and histograms for Smoky Heights Station

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Smoky Heights - February 2020

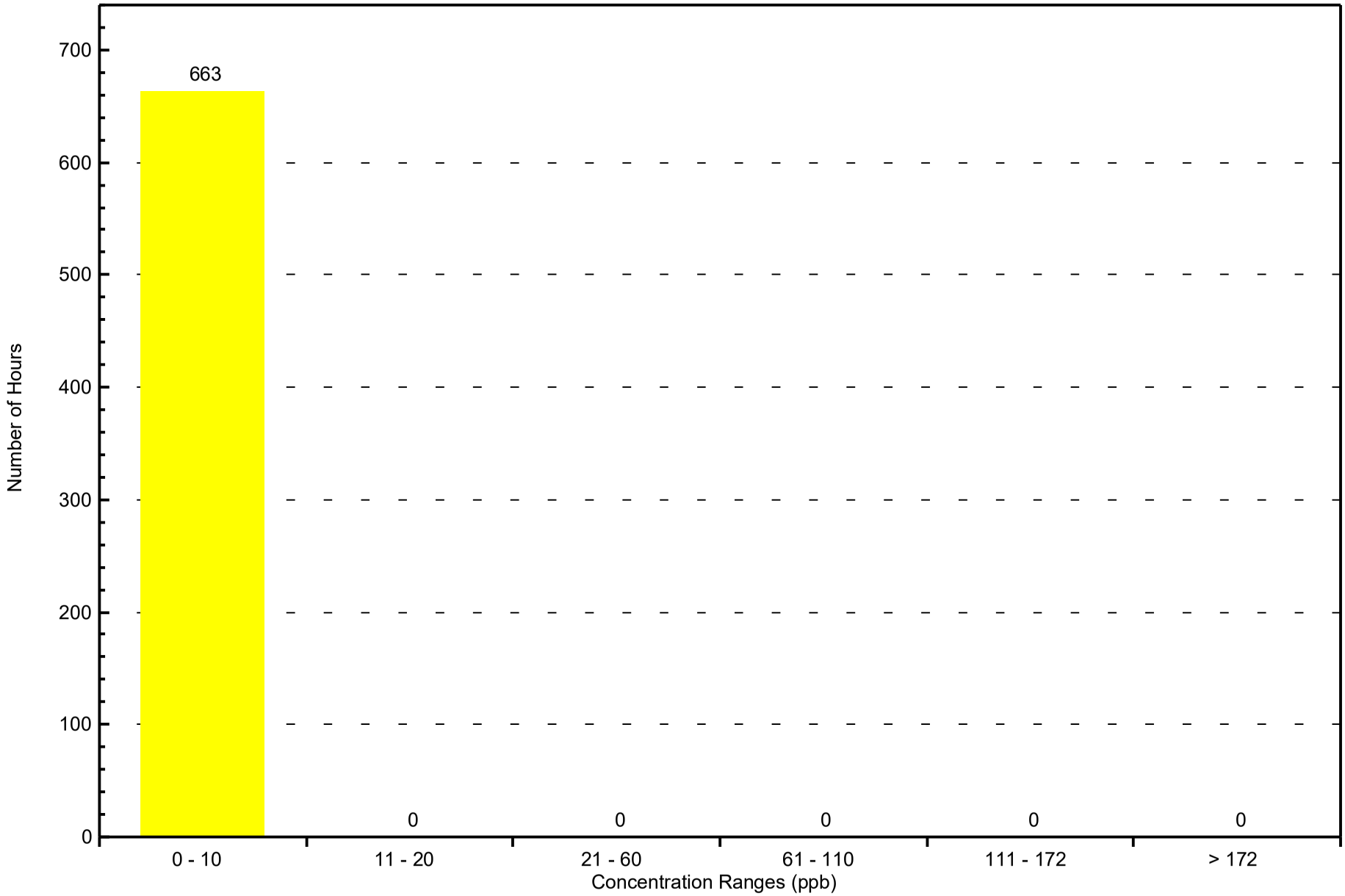


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Smoky Heights - February 2020

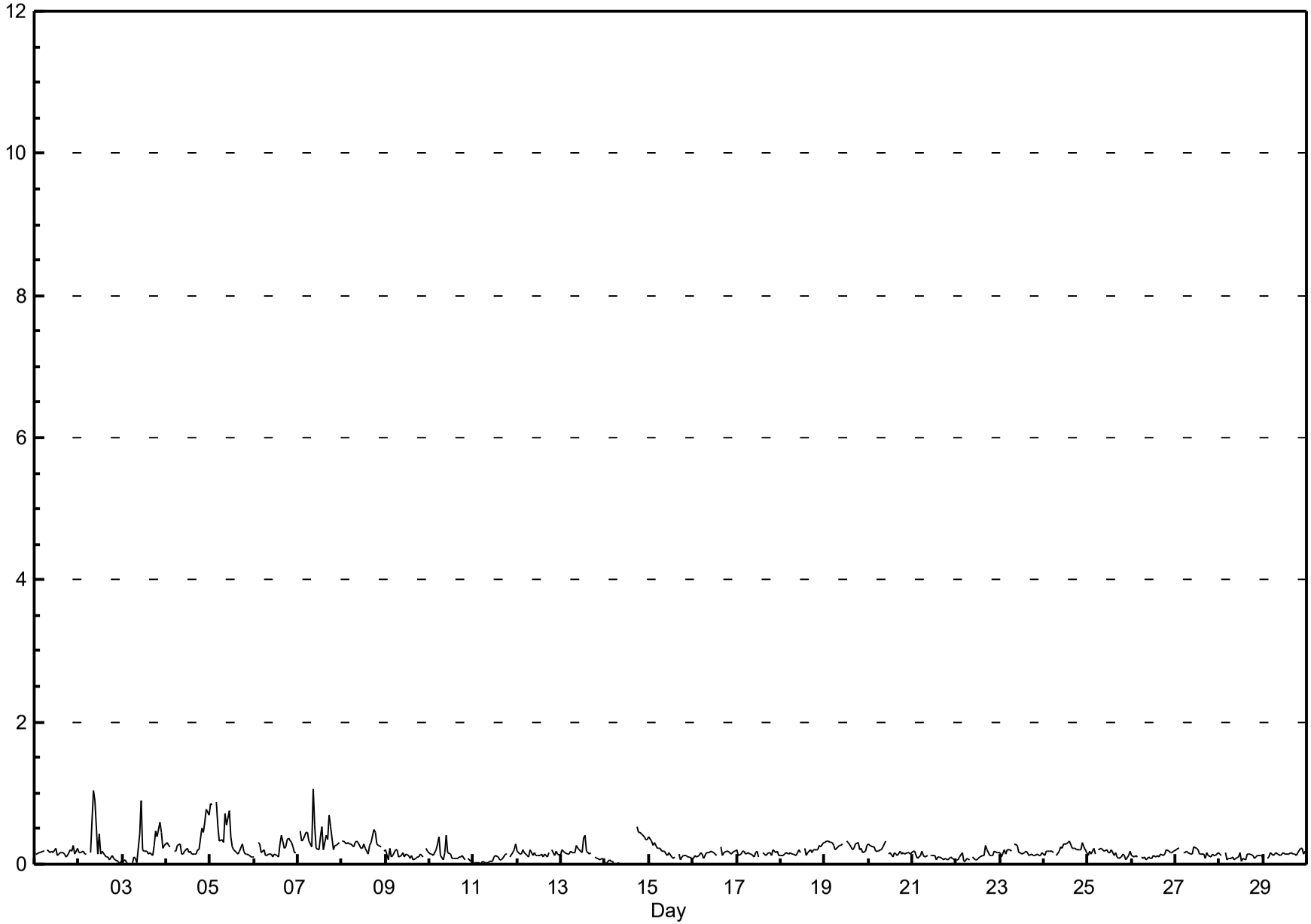


Peace Airshed Zone Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Smoky Heights - February 2020

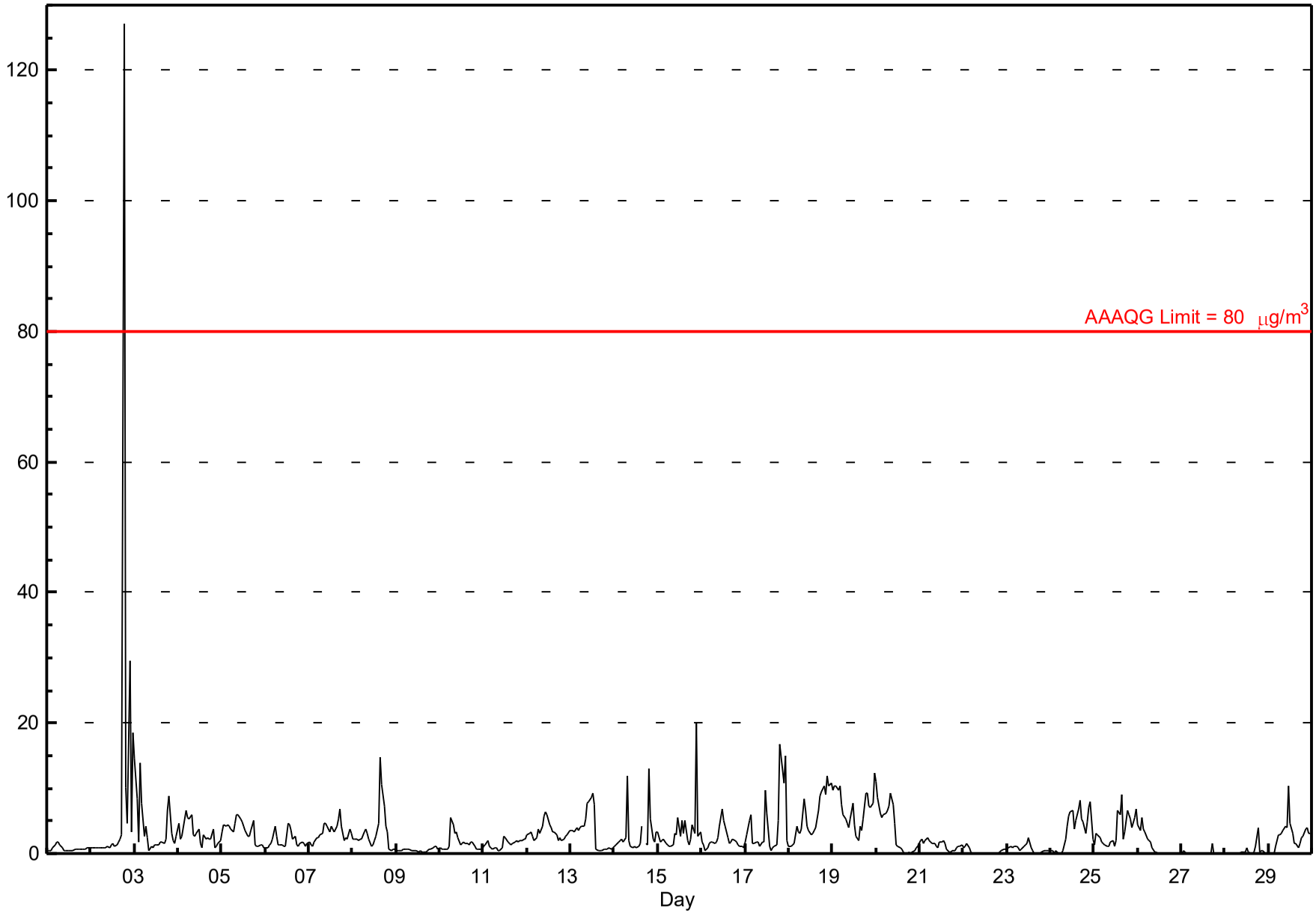


Peace Airshed Zone Association

Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Smoky Heights - February 2020

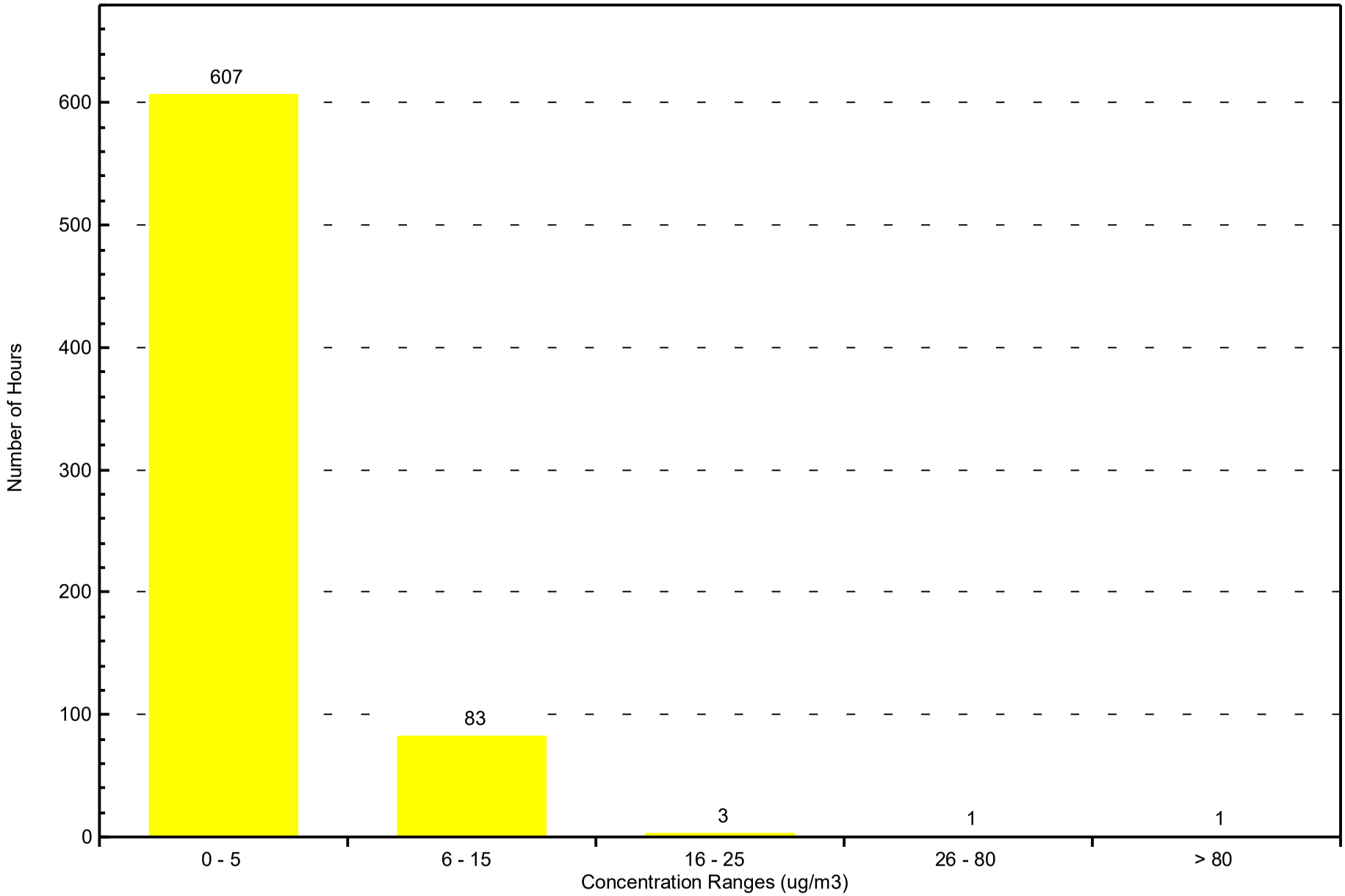


Peace Airshed Zone Association

Histogram of Hourly Averages

Particulate Matter 2.5 ($PM_{2.5}$) - $\mu g/m^3$

Smoky Heights - February 2020

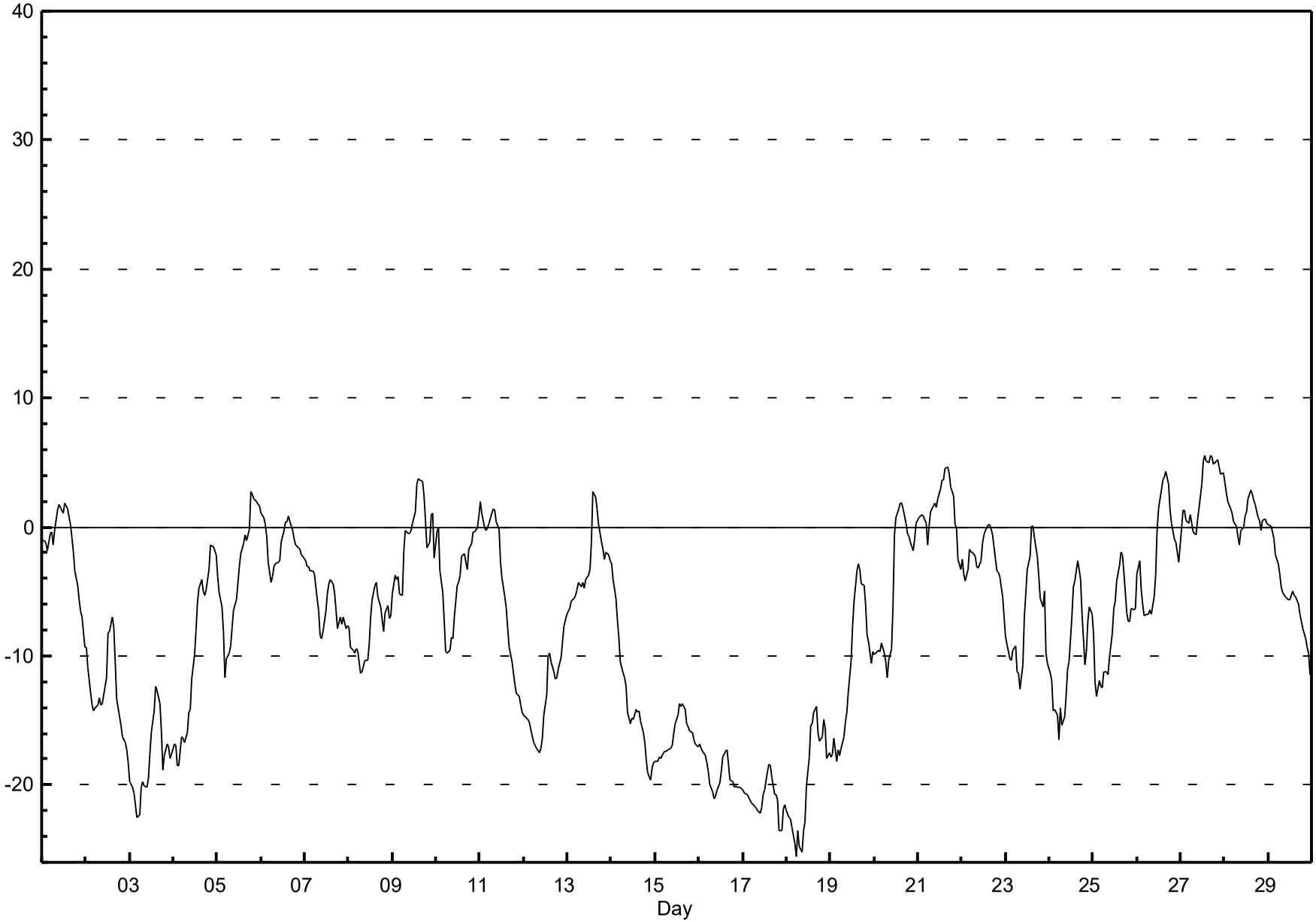


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - ^{o}C

Smoky Heights - February 2020

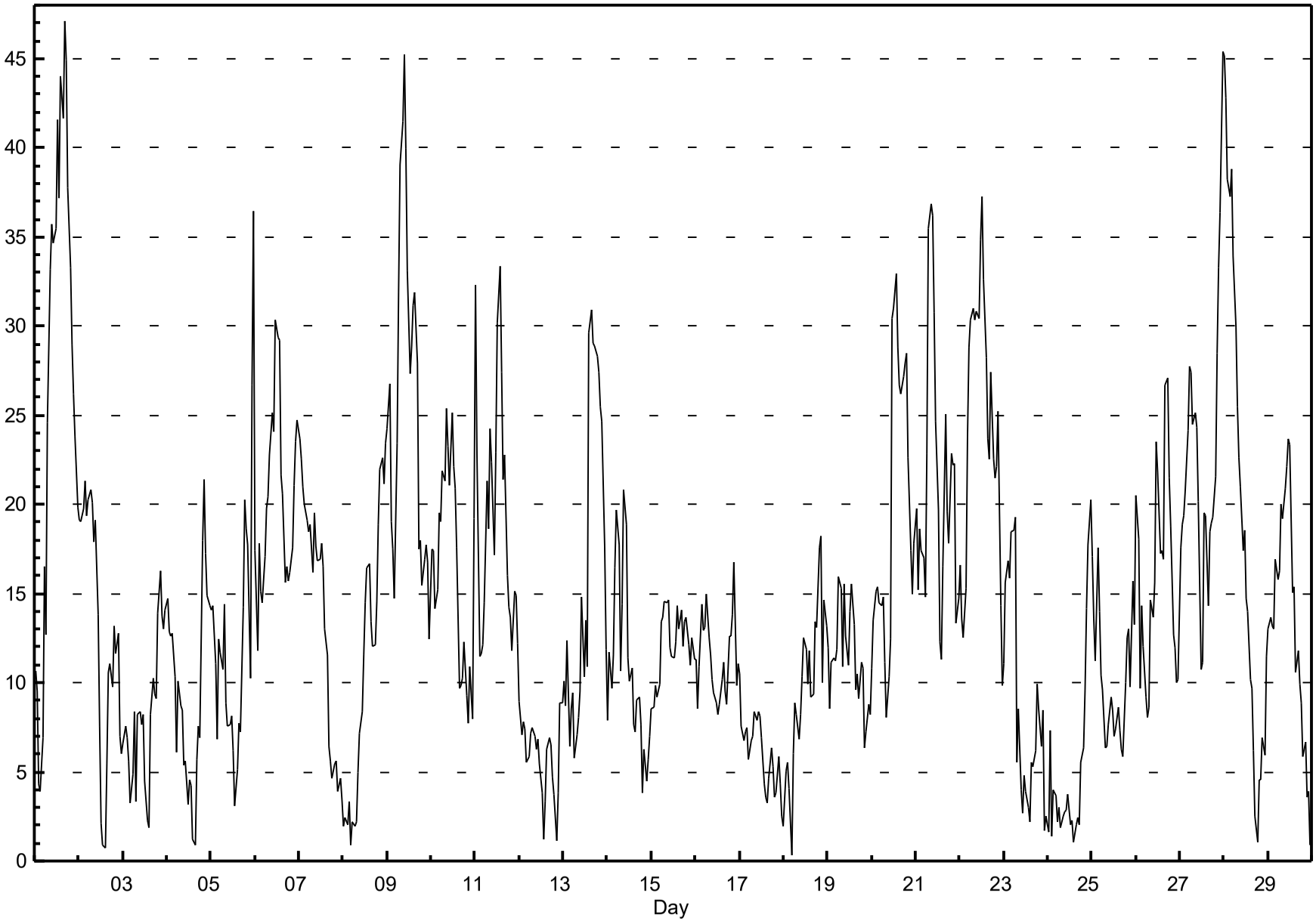


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Smoky Heights - February 2020

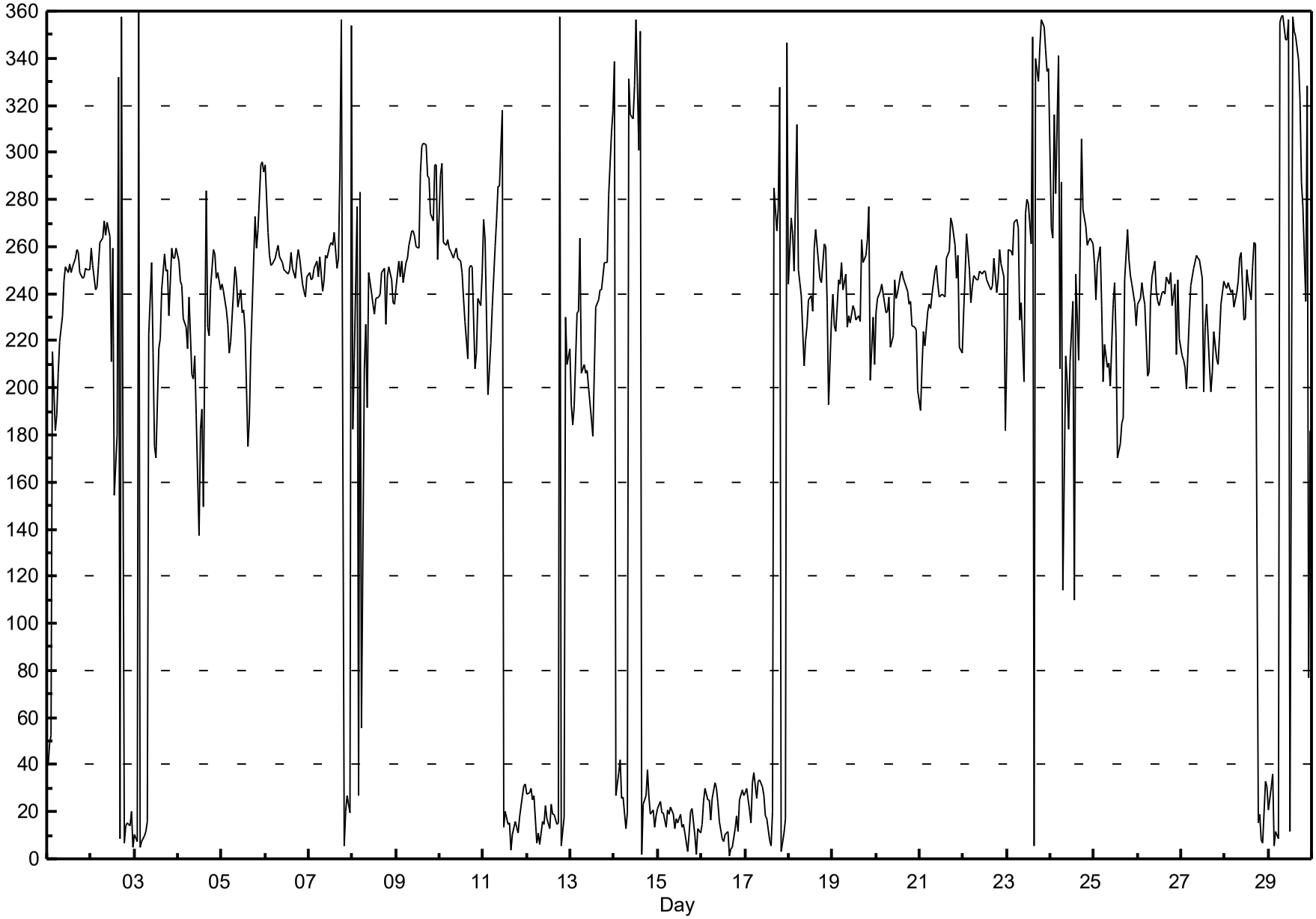


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Smoky Heights - February 2020

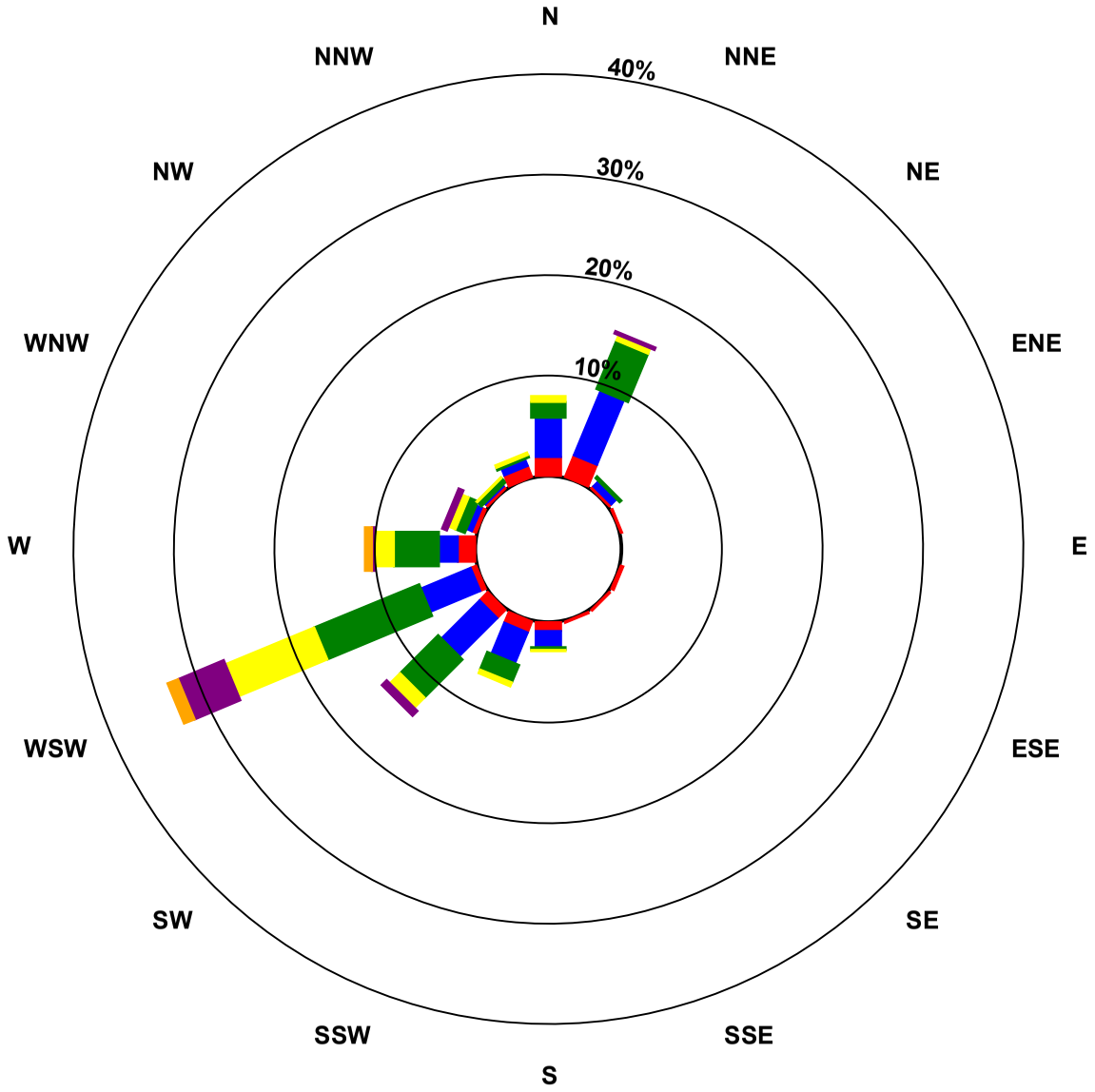


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

Smoky Heights - February 2020



Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

6 Valleyview Charts

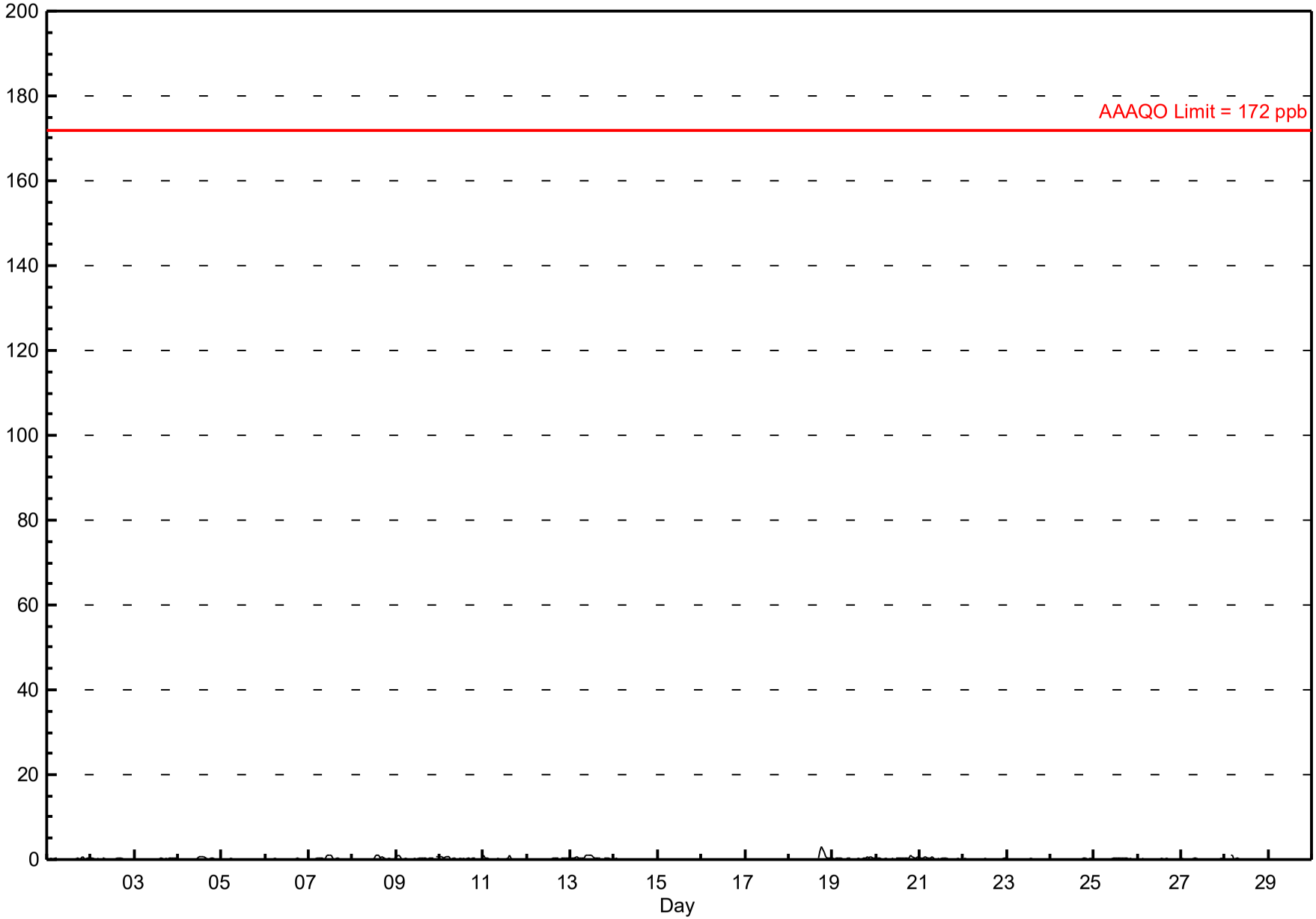
The following pages include the charts and histograms for Valleyview Station

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Valleyview - February 2020

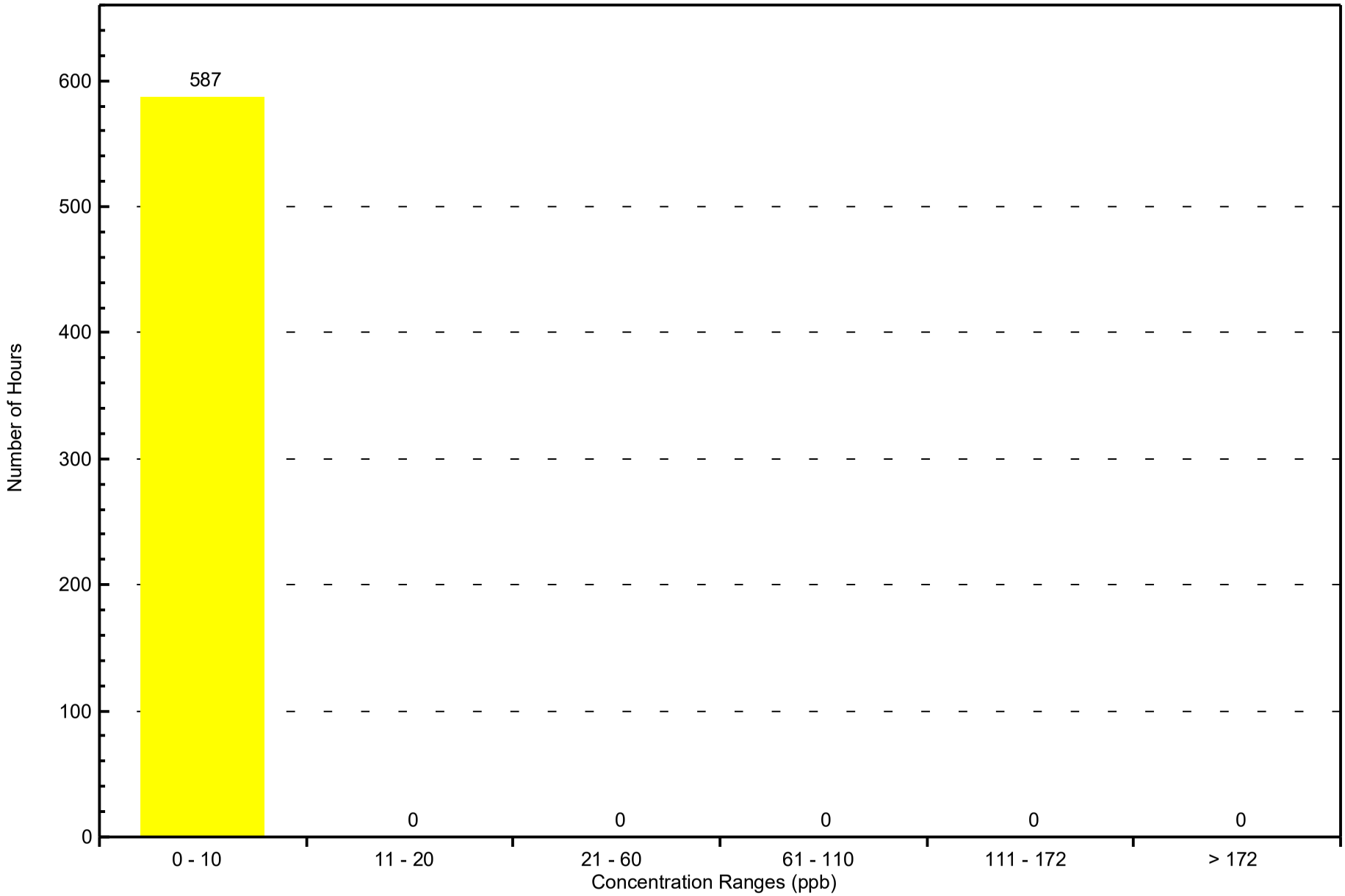


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Valleyview - February 2020

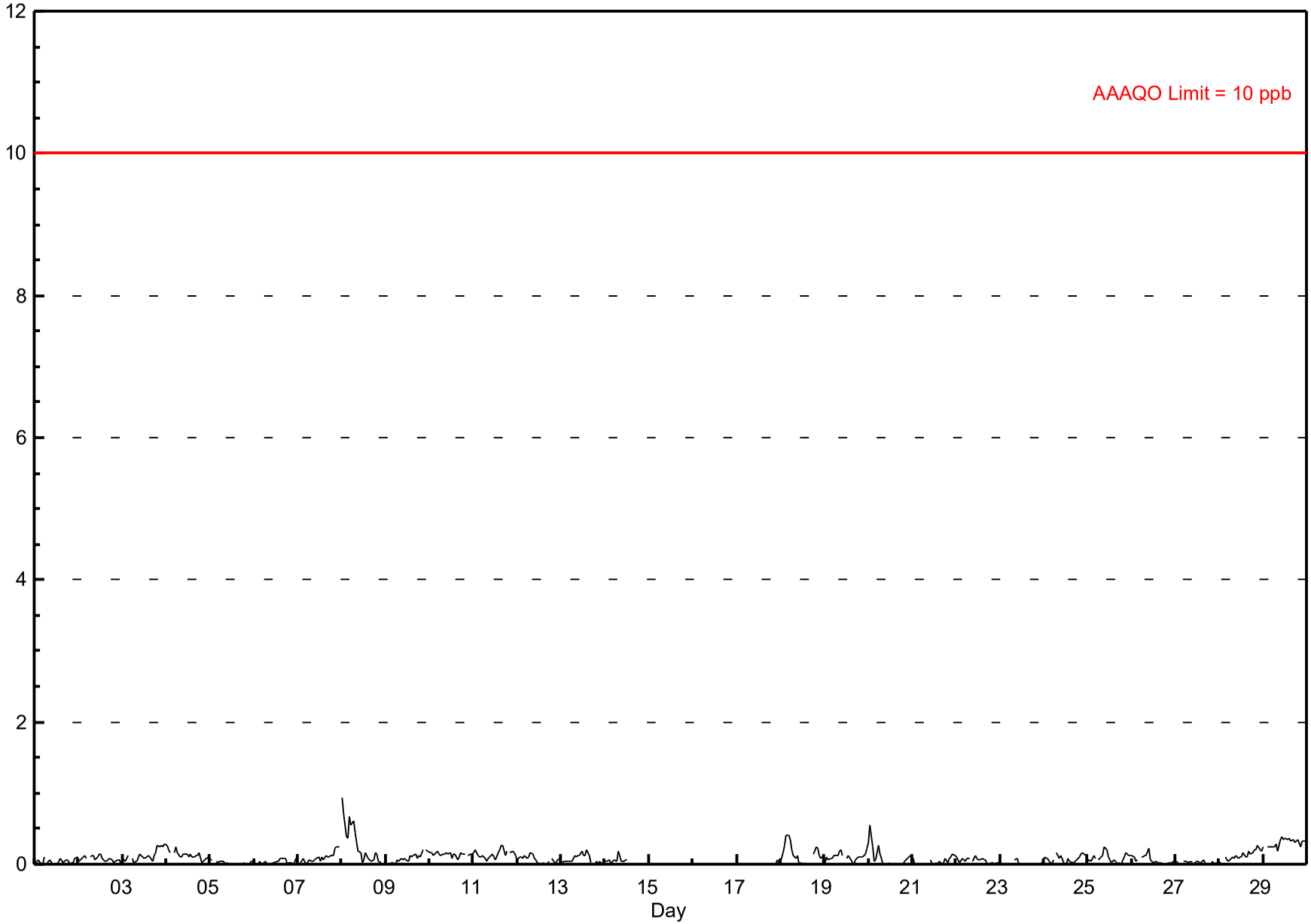


Peace Airshed Zone Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Valleyview - February 2020

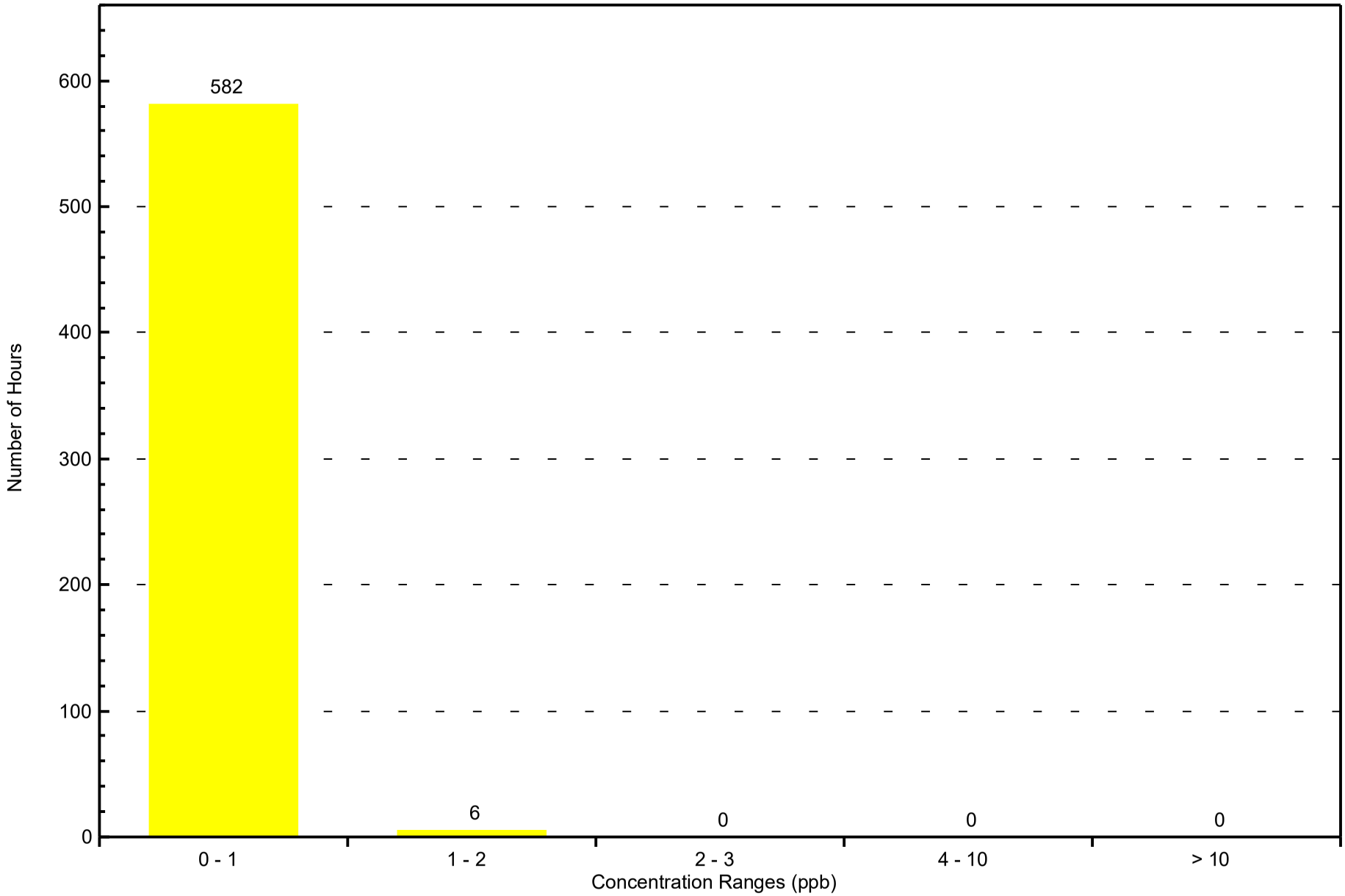


Peace Airshed Zone Association

Histogram of Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Valleyview - February 2020

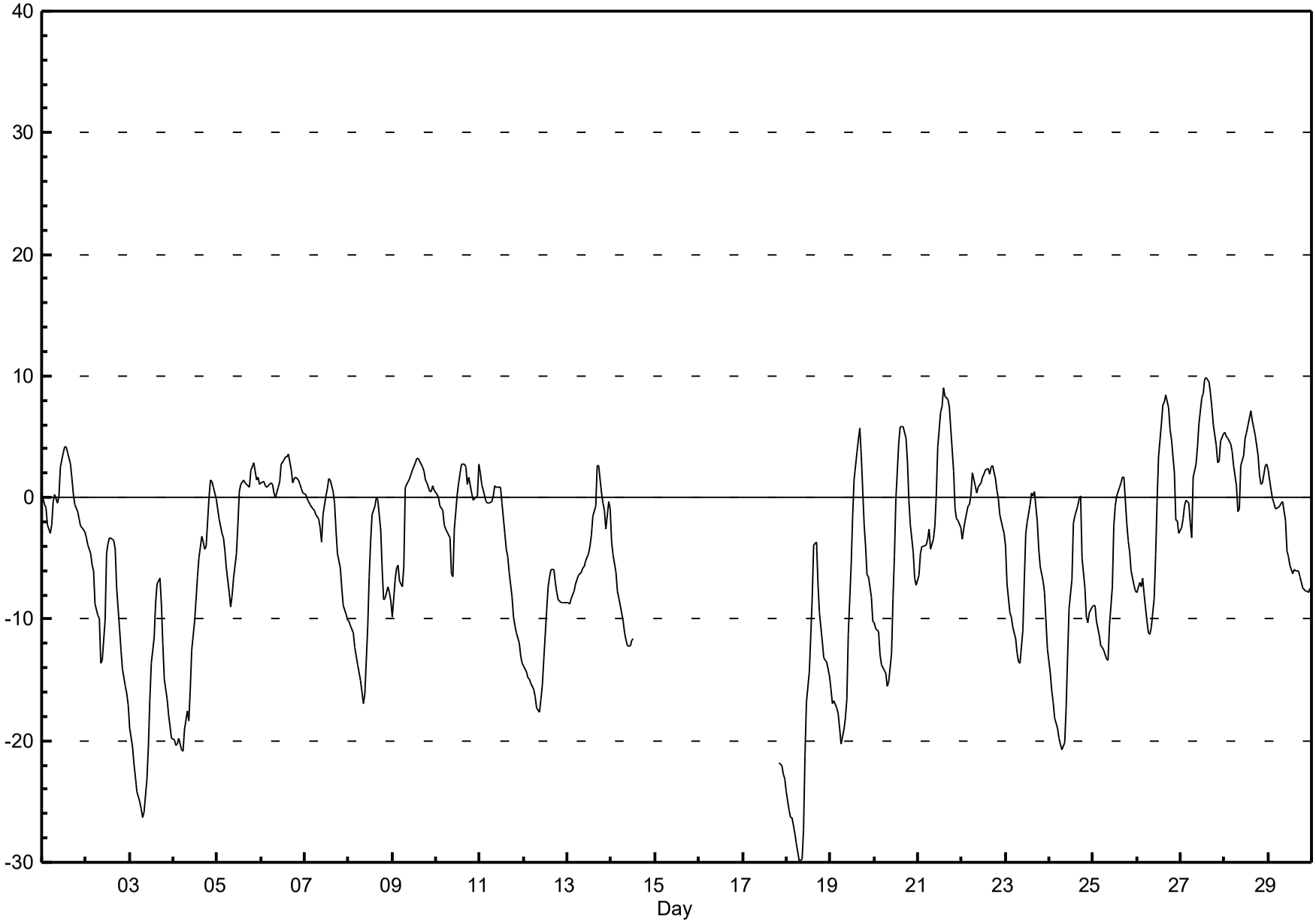


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - ^{o}C

Valleyview - February 2020

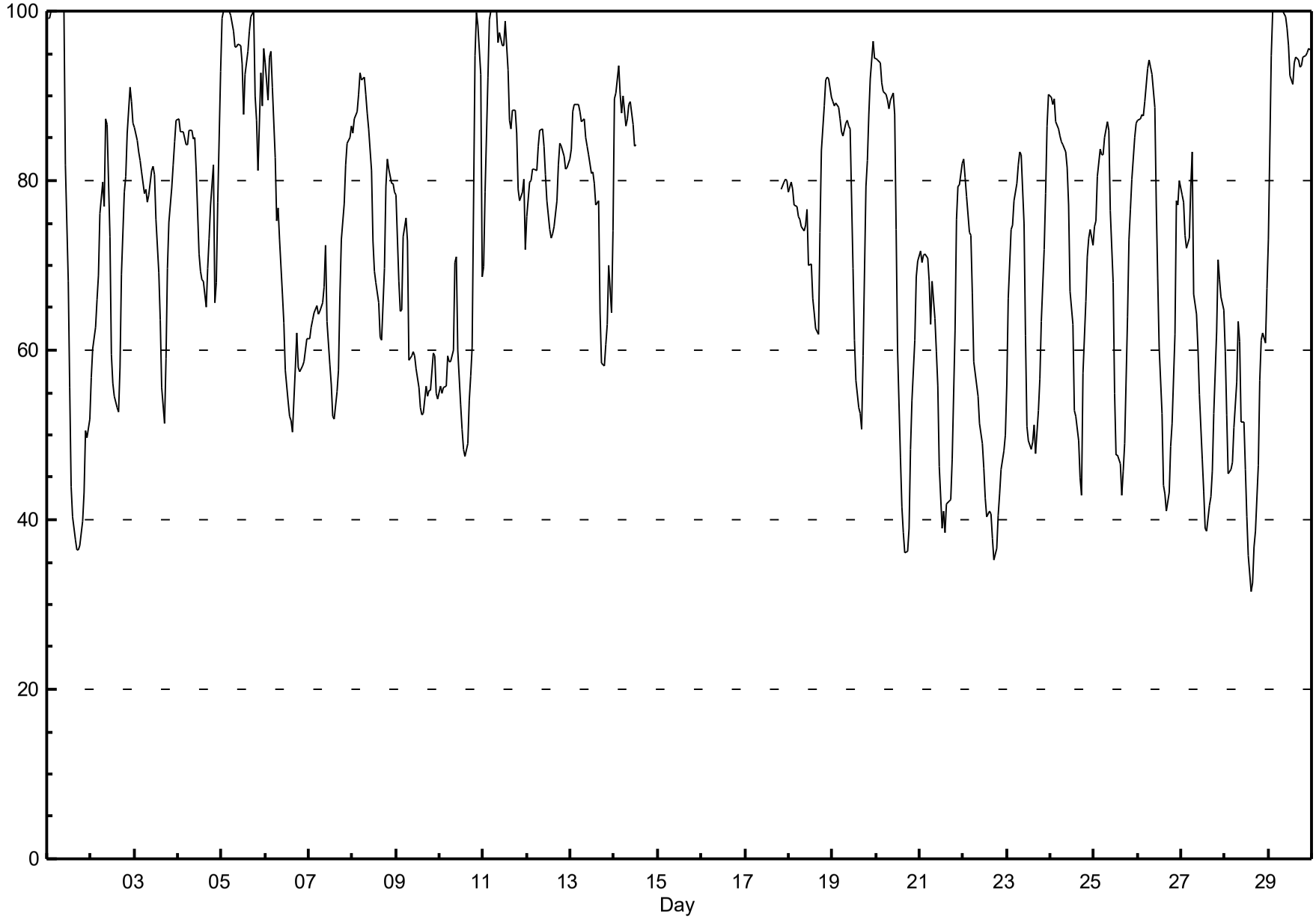


Peace Airshed Zone Association

Hourly Averages

Relative Humidity (RH) - %

Valleyview - February 2020

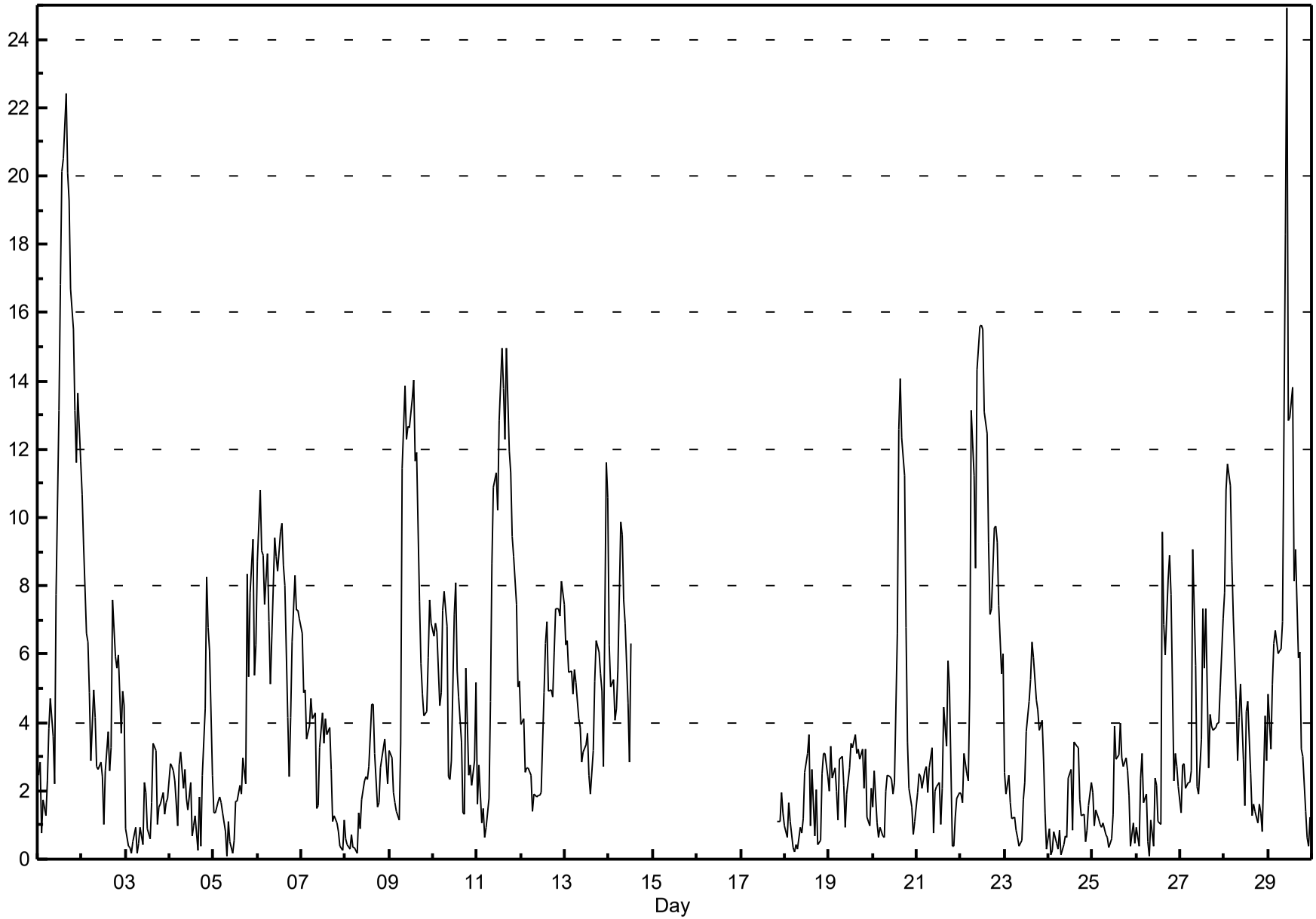


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Valleyview - February 2020

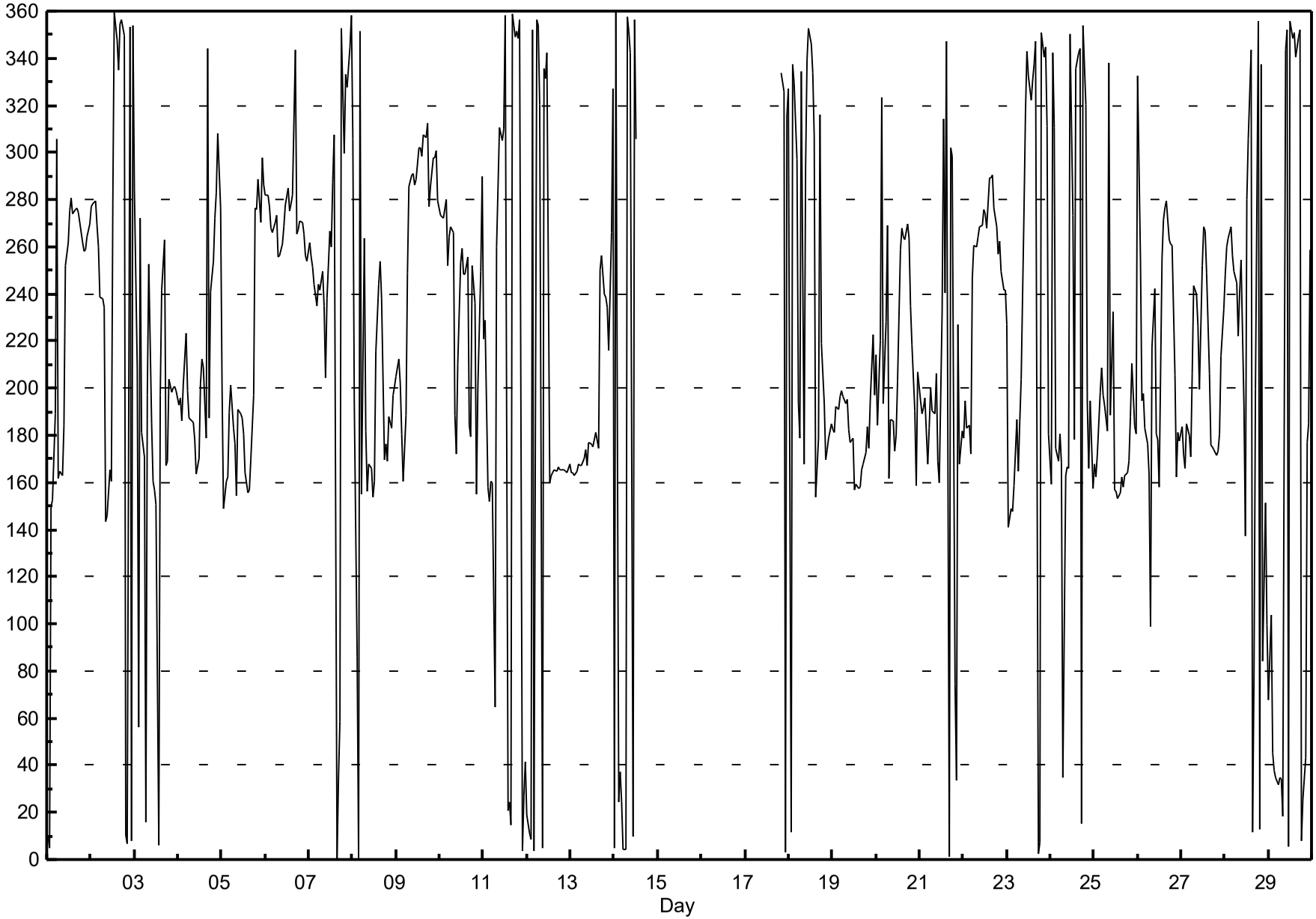


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Valleyview - February 2020

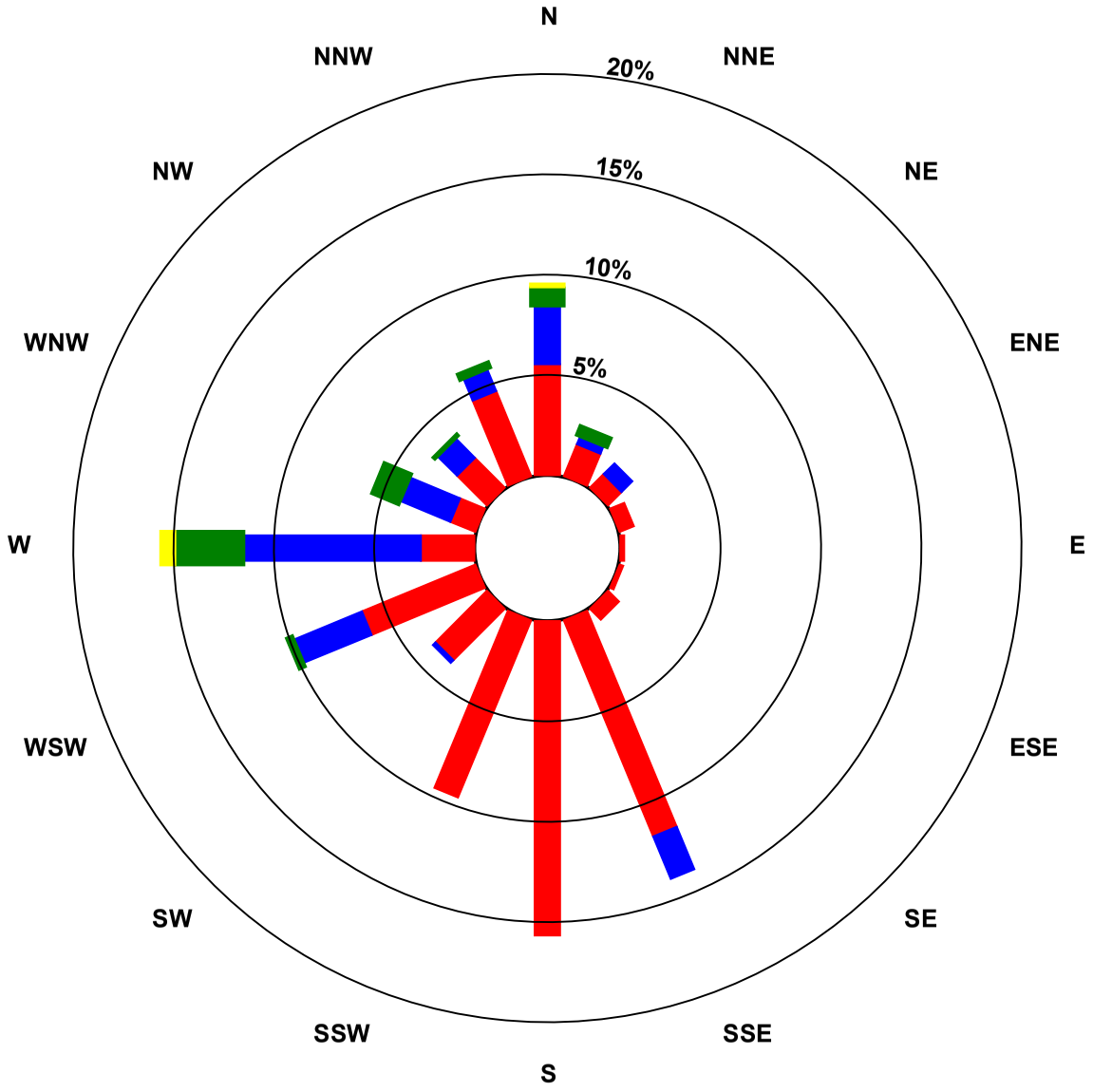


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

Valleyview - February 2020



Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

7 Donnelly Charts

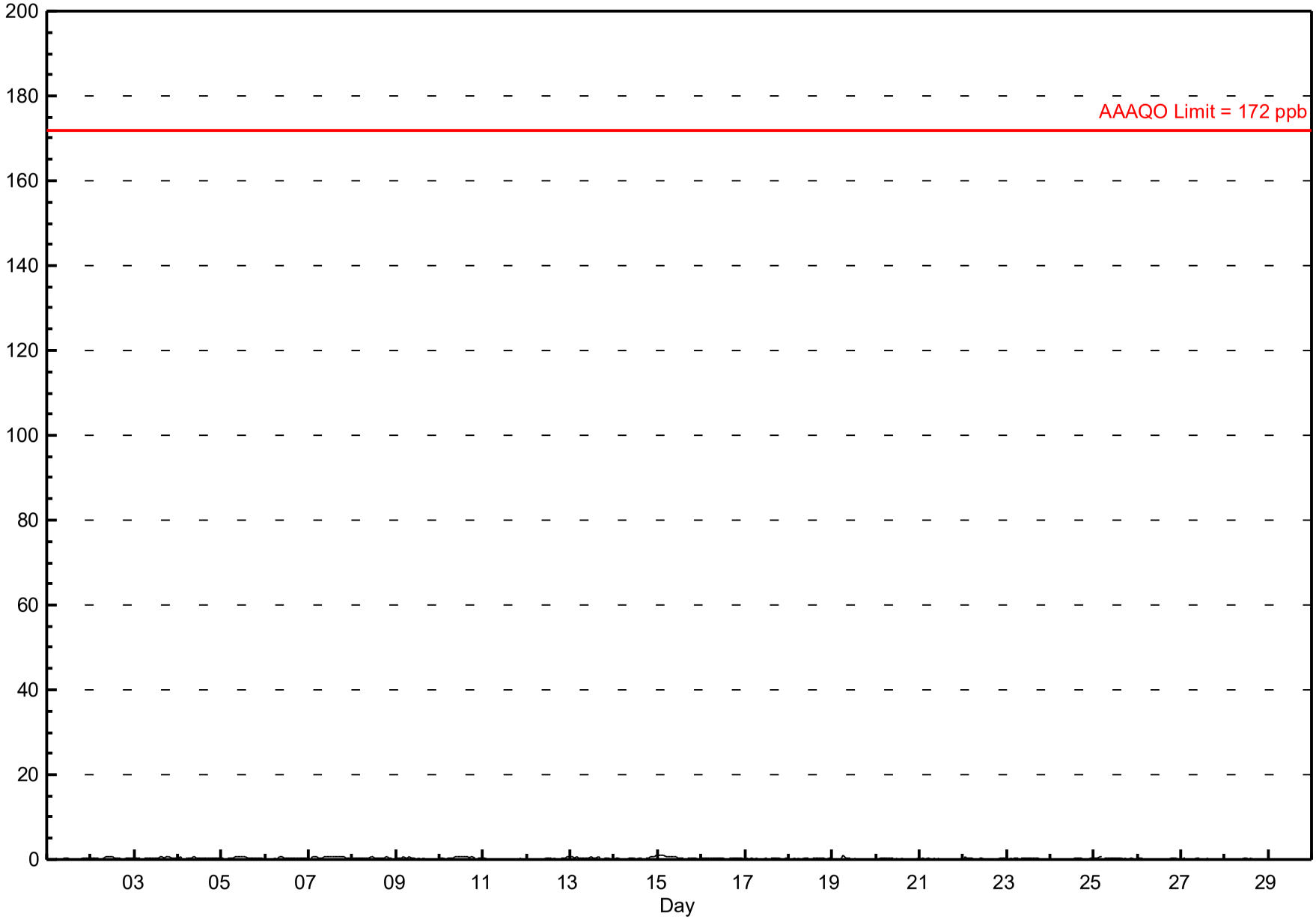
The following pages include the charts and histograms for Donnelly Station

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Donnelly - February 2020

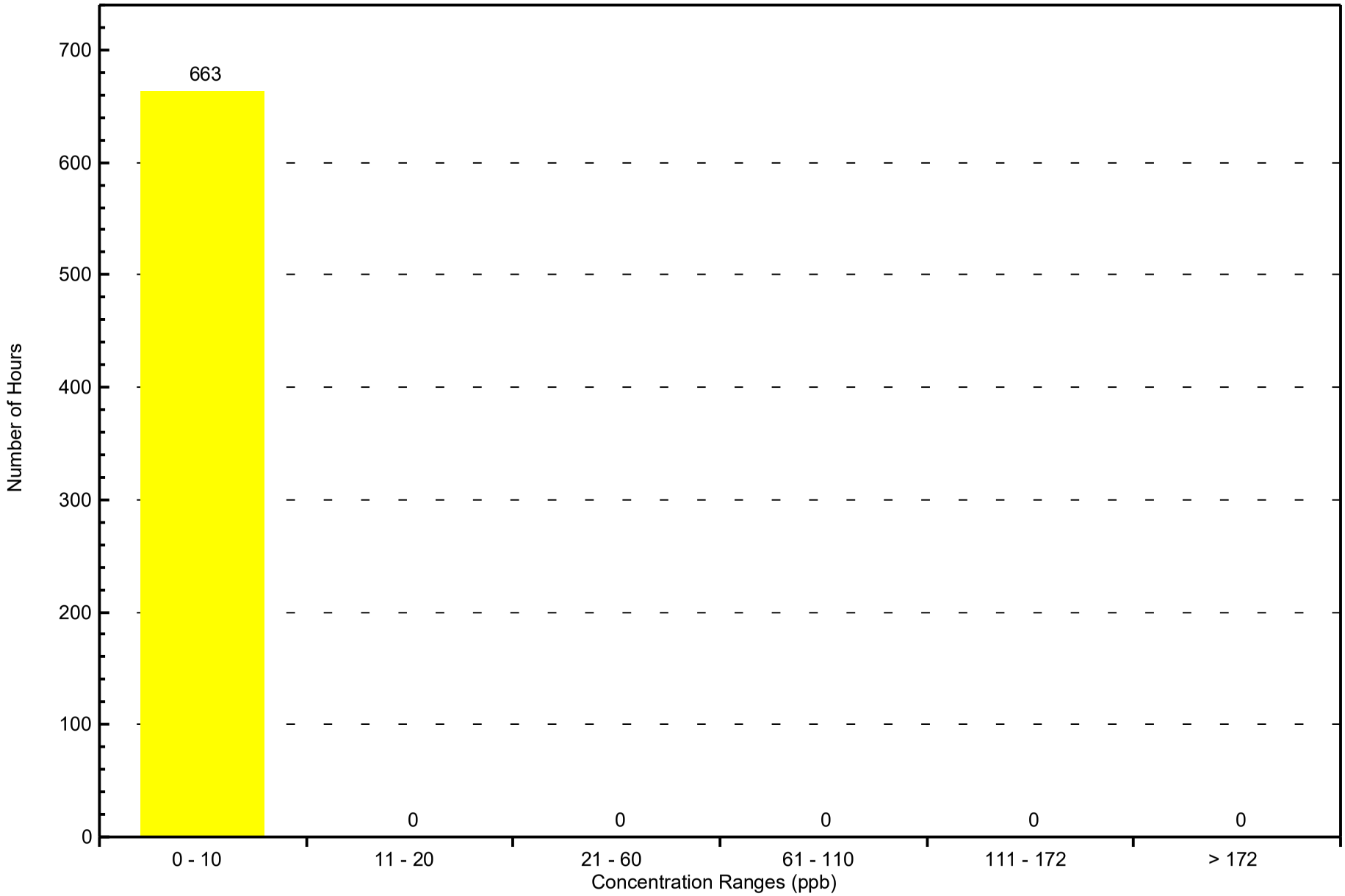


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Donnelly - February 2020

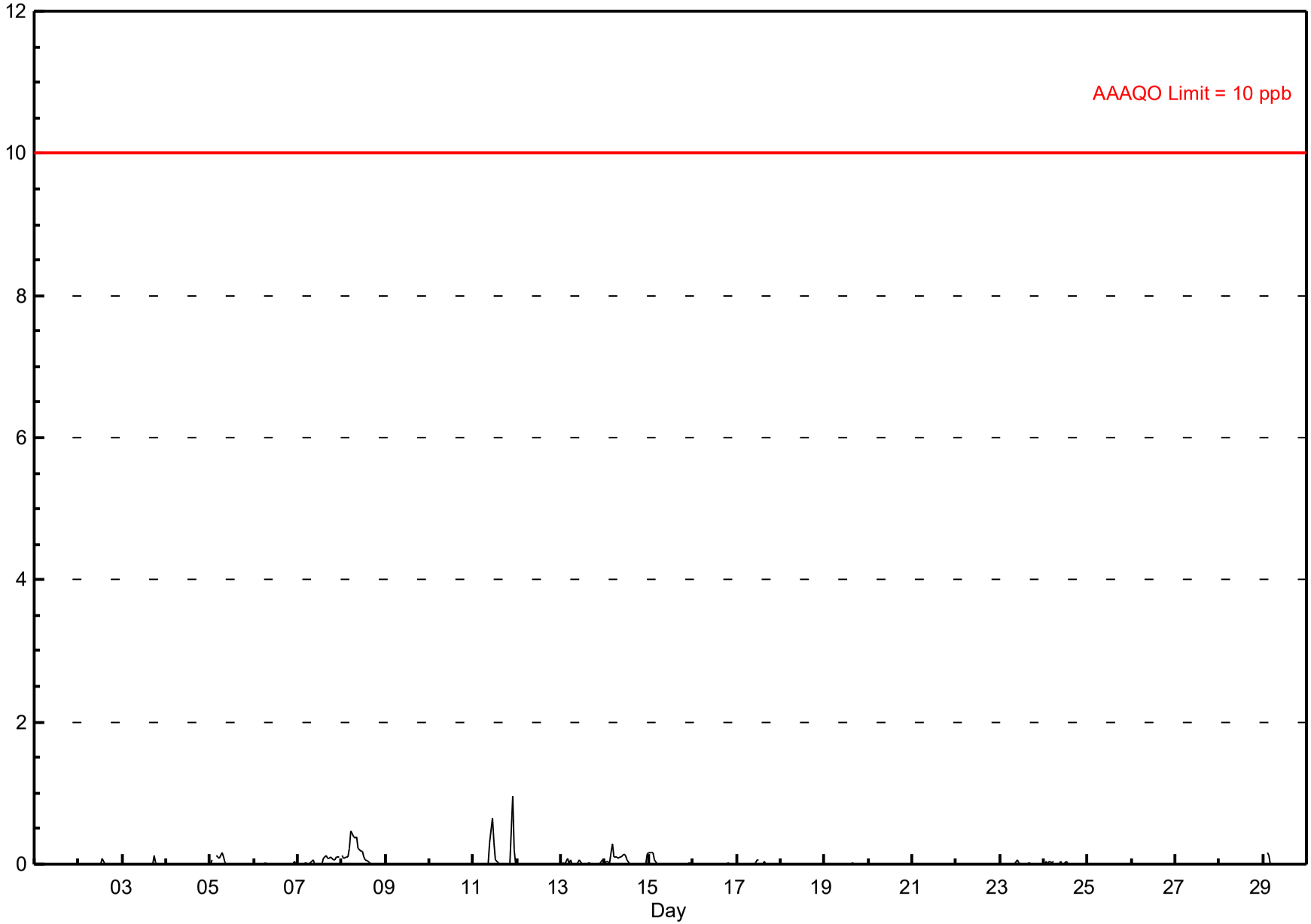


Peace Airshed Zone Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Donnelly - February 2020

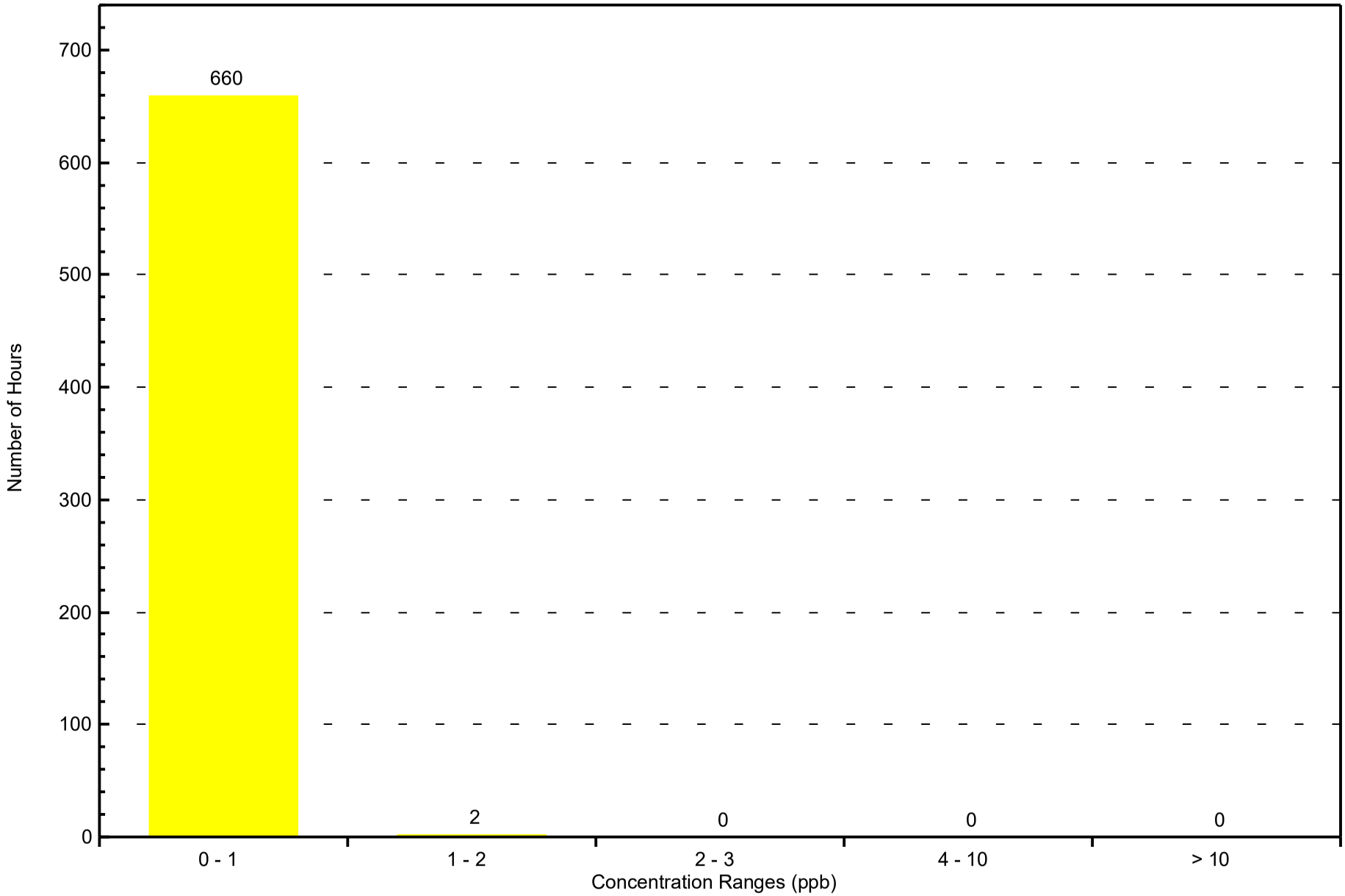


Peace Airshed Zone Association

Histogram of Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Donnelly - February 2020

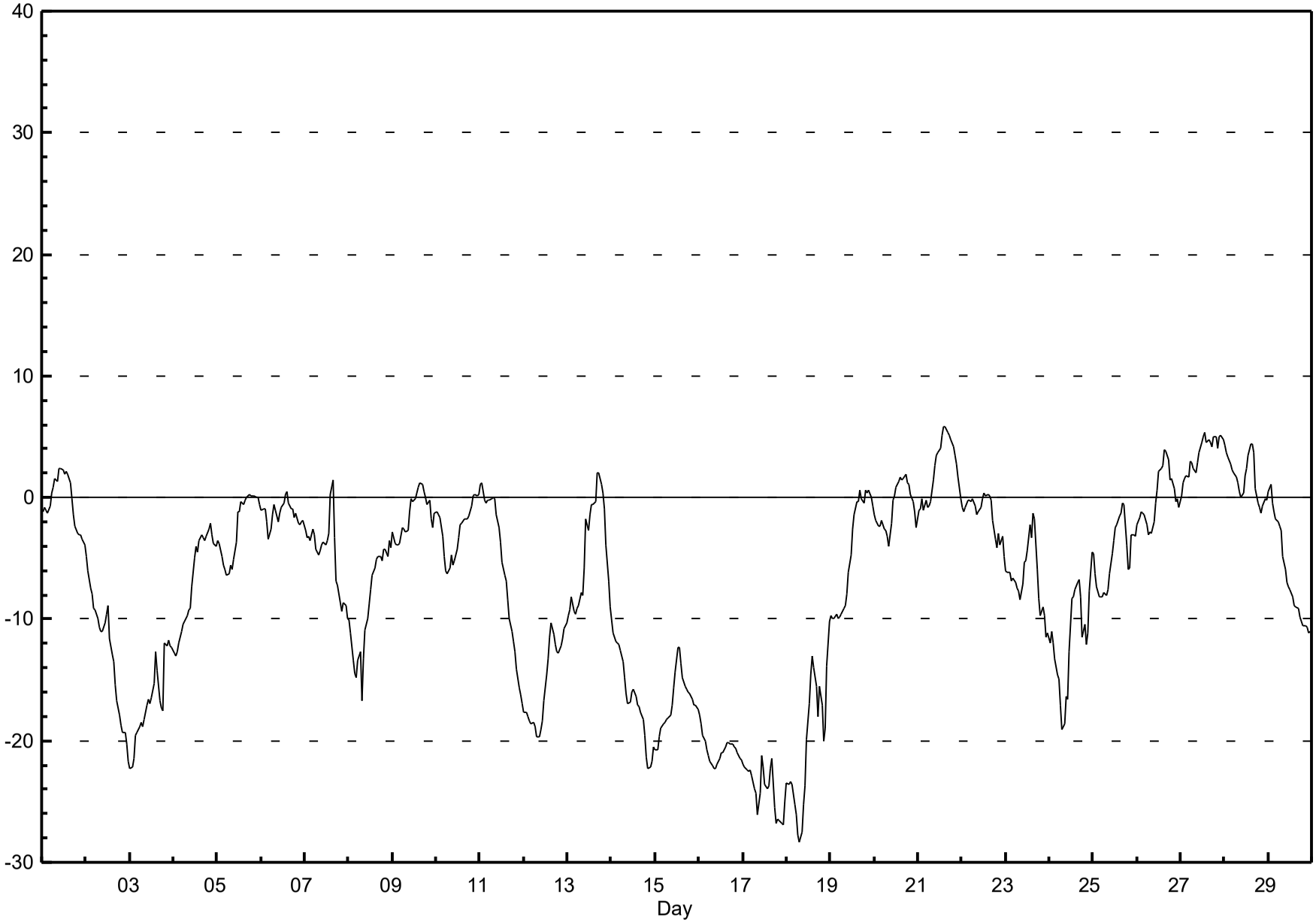


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - ^{o}C

Donnelly - February 2020

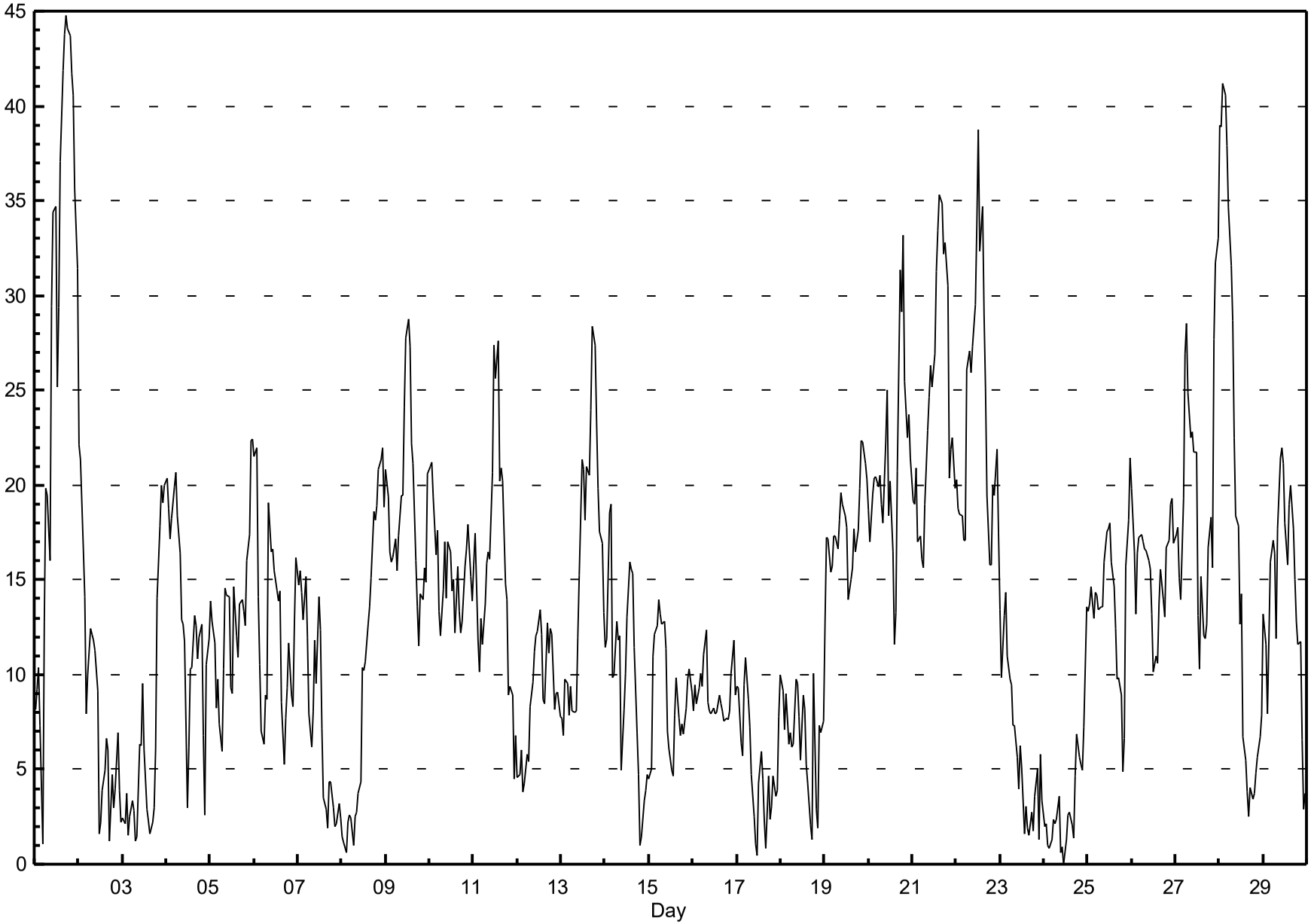


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Donnelly - February 2020

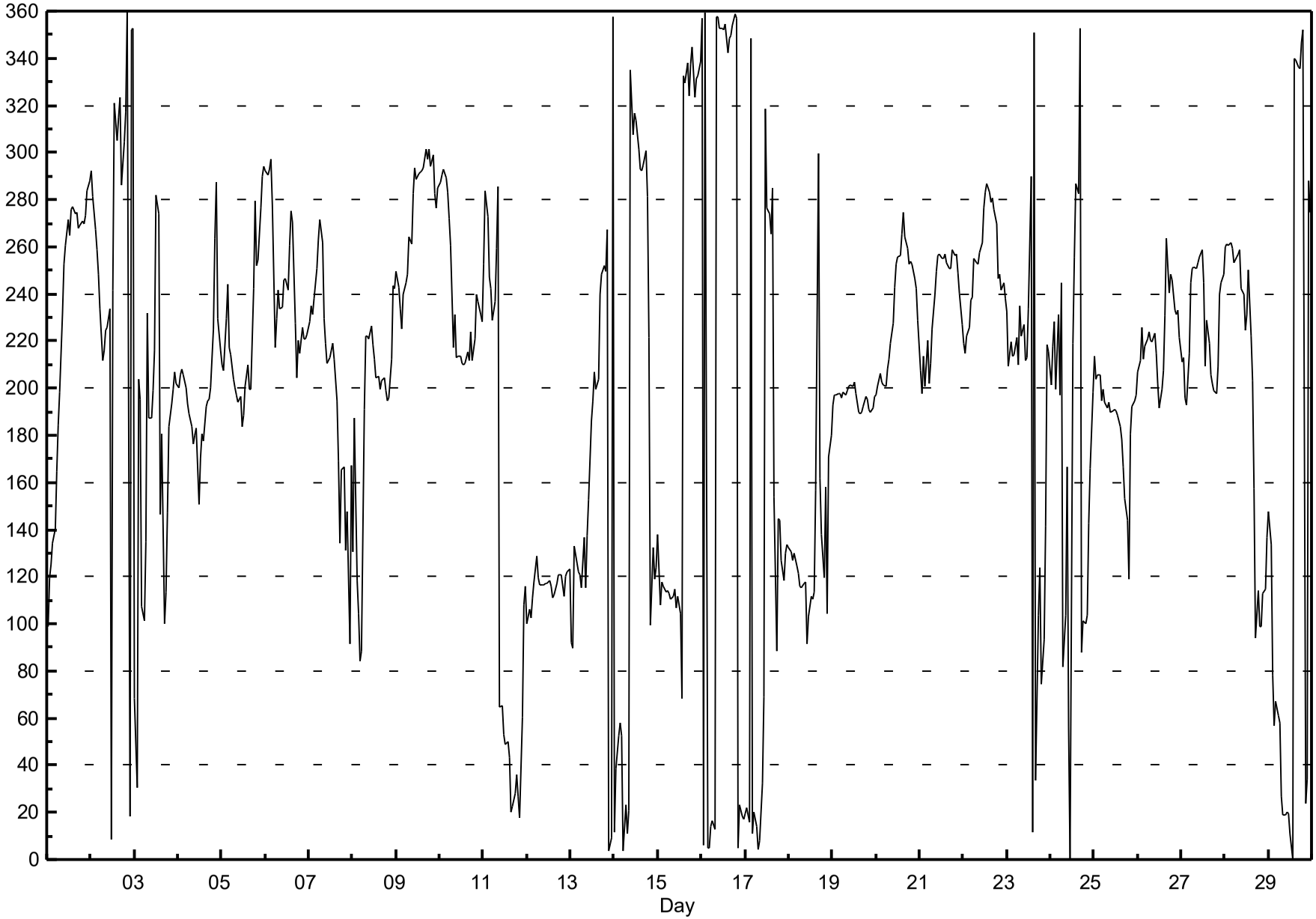


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Donnelly - February 2020

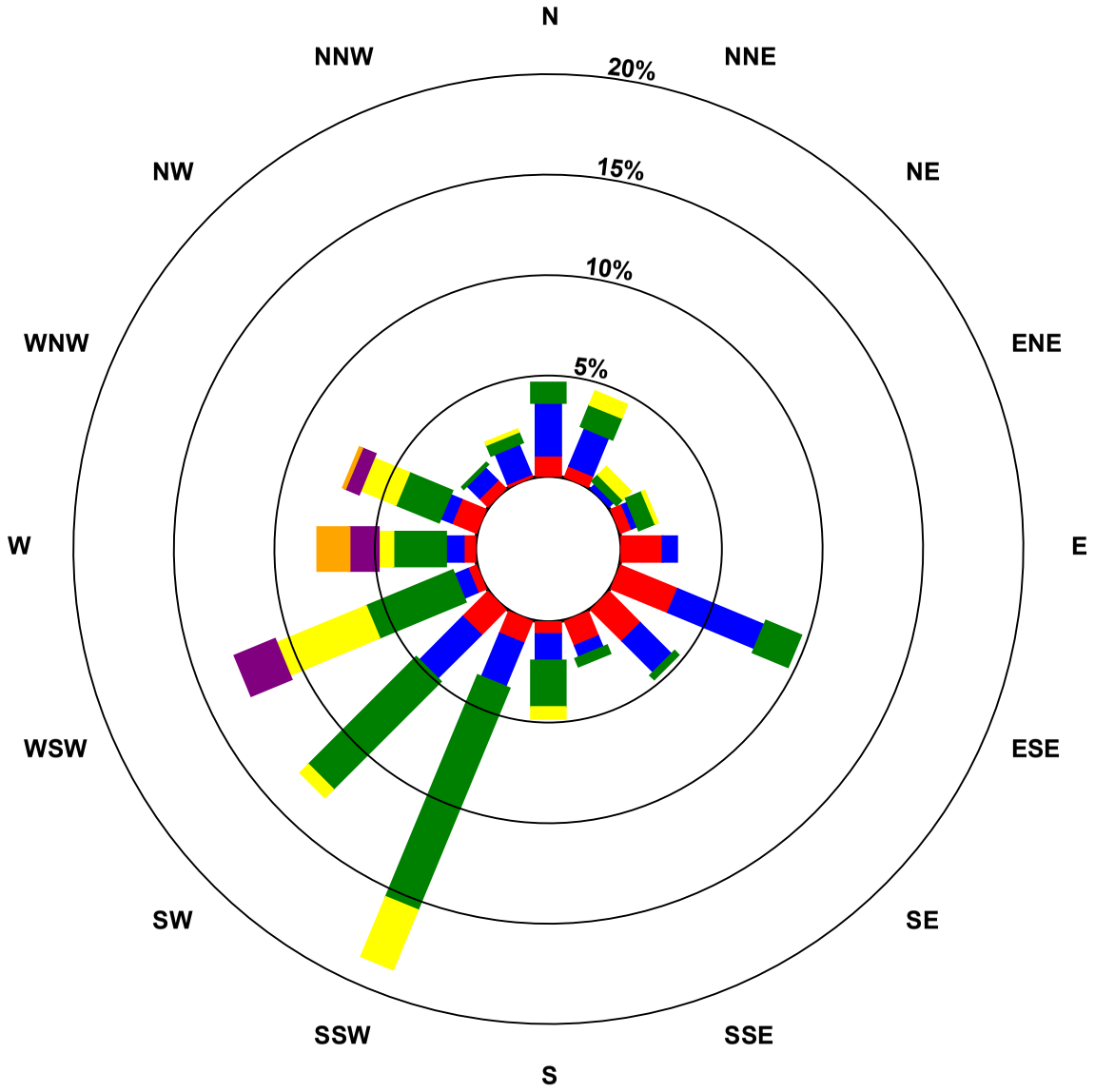


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

Donnelly - February 2020



Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

8 Wembley (Portable) Charts

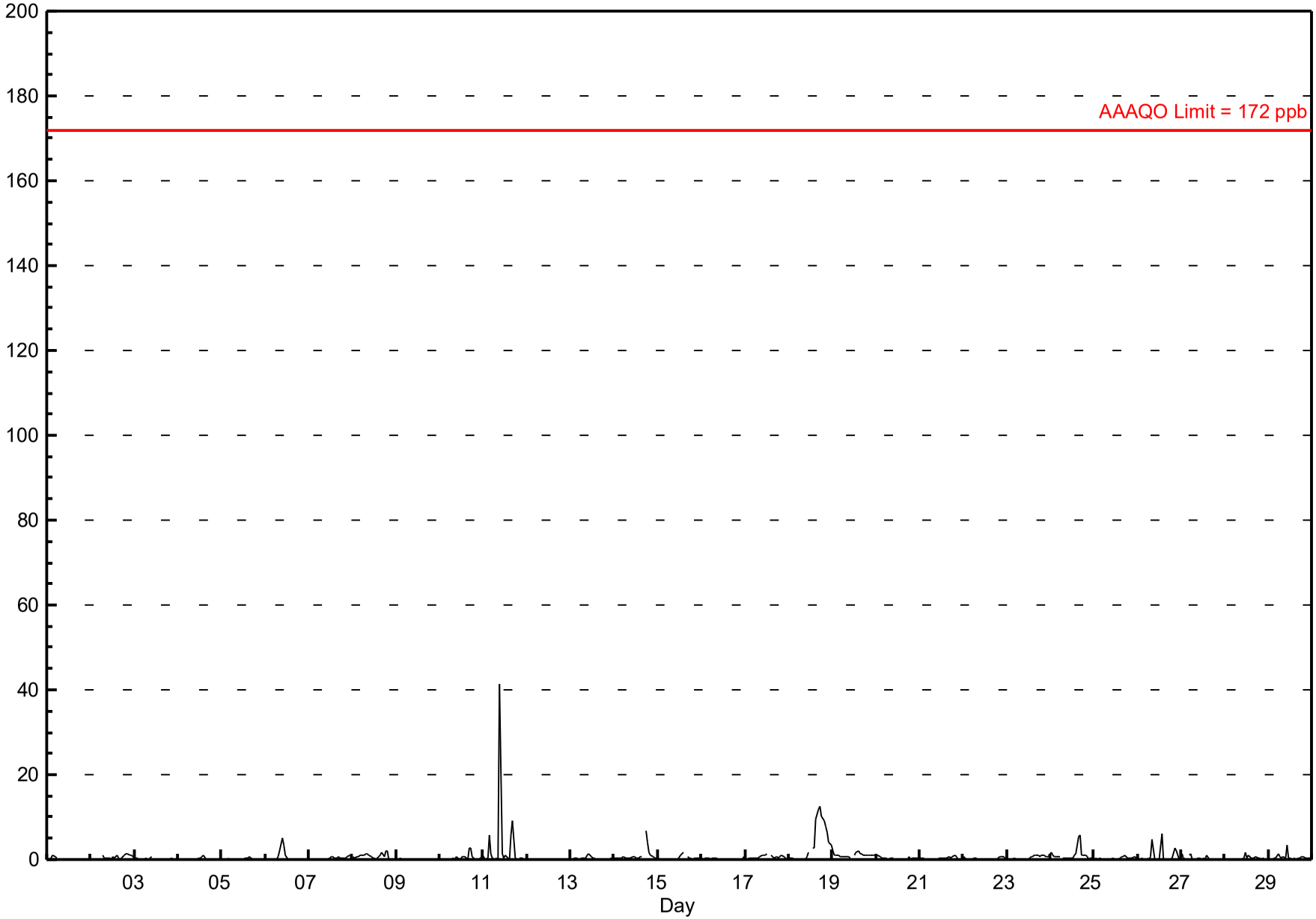
The following pages include the charts and histograms for Wembley Portable Station

Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Wembley - February 2020

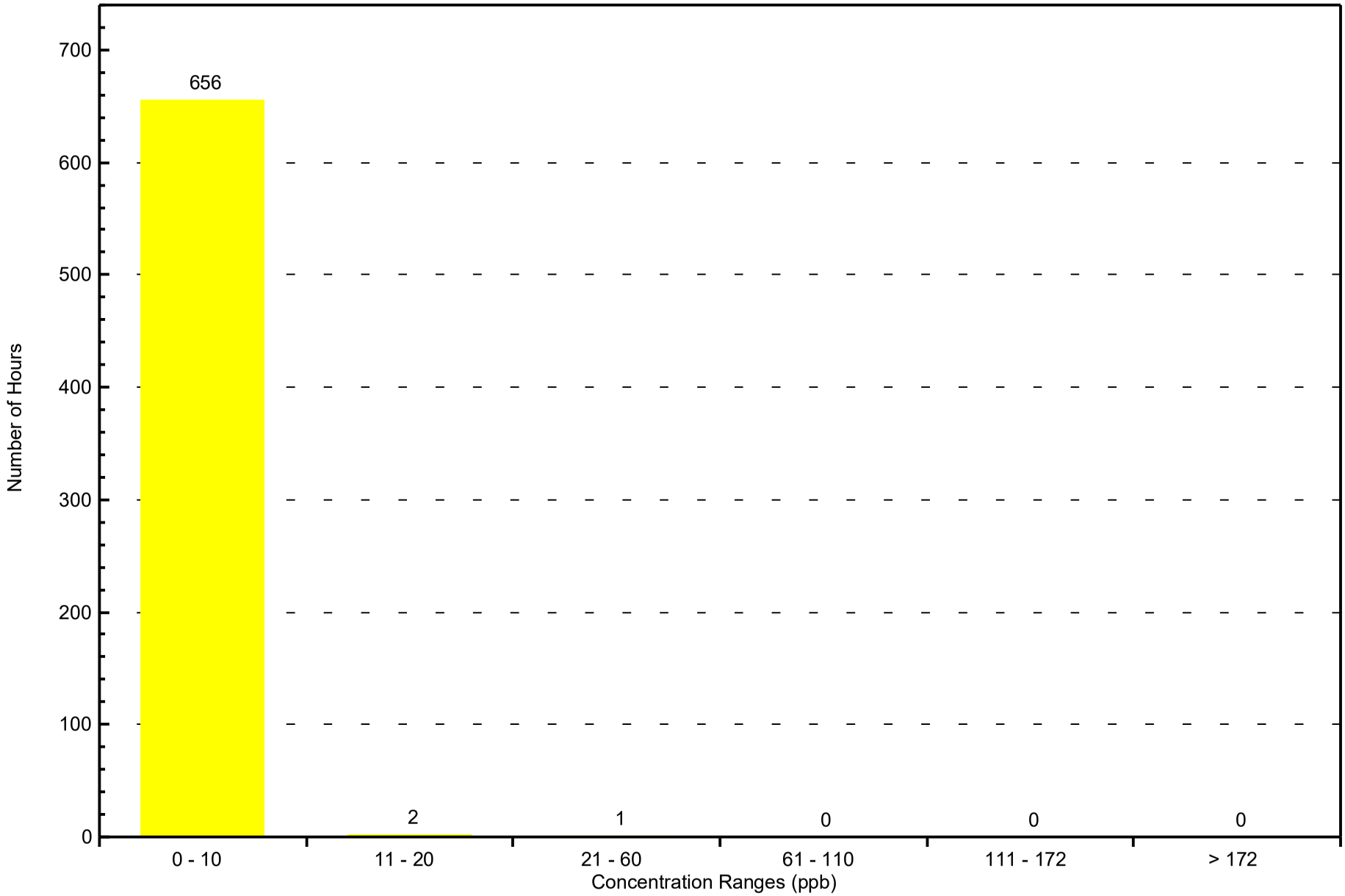


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Wembley - February 2020

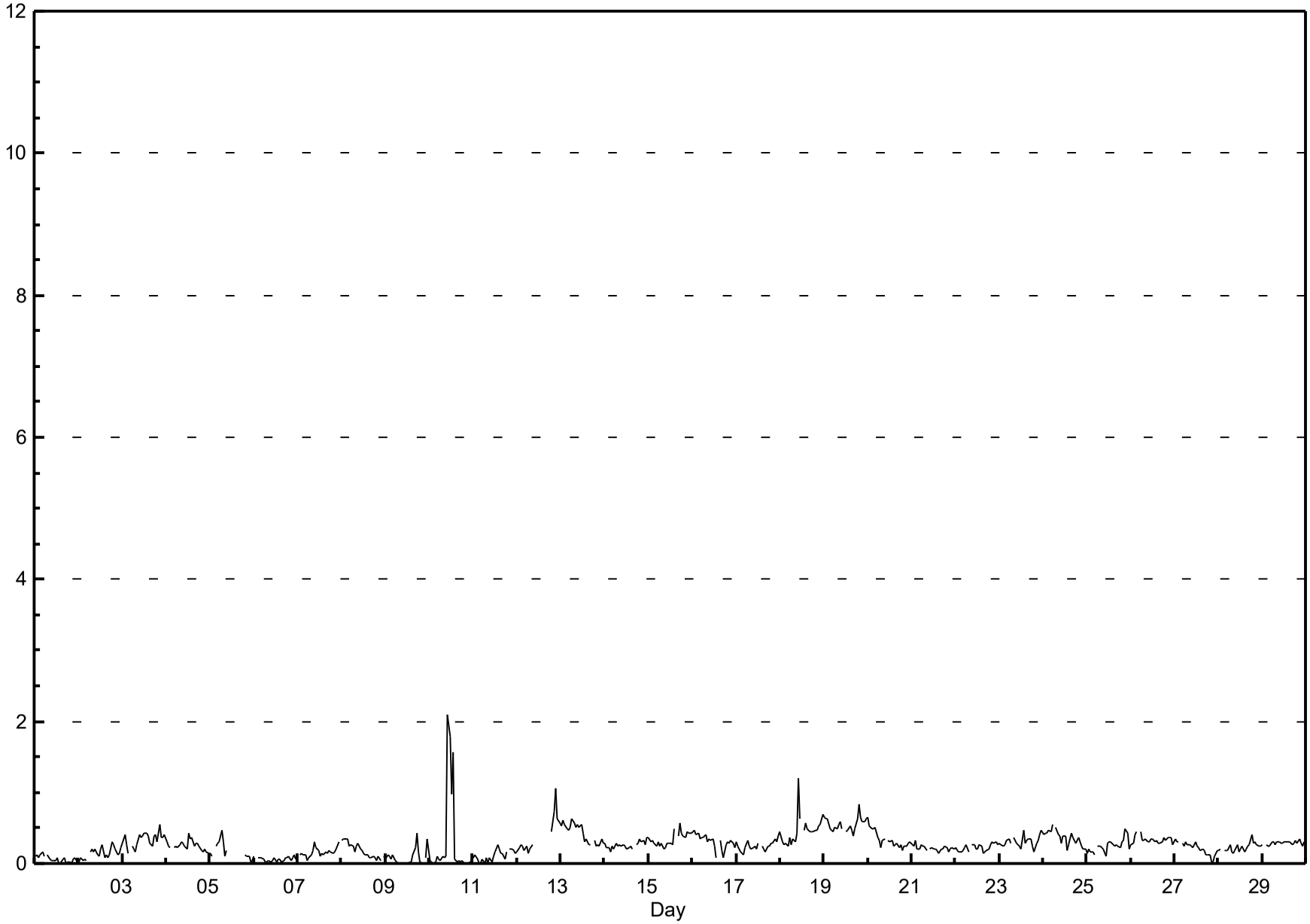


Peace Airshed Zone Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Wembley - February 2020

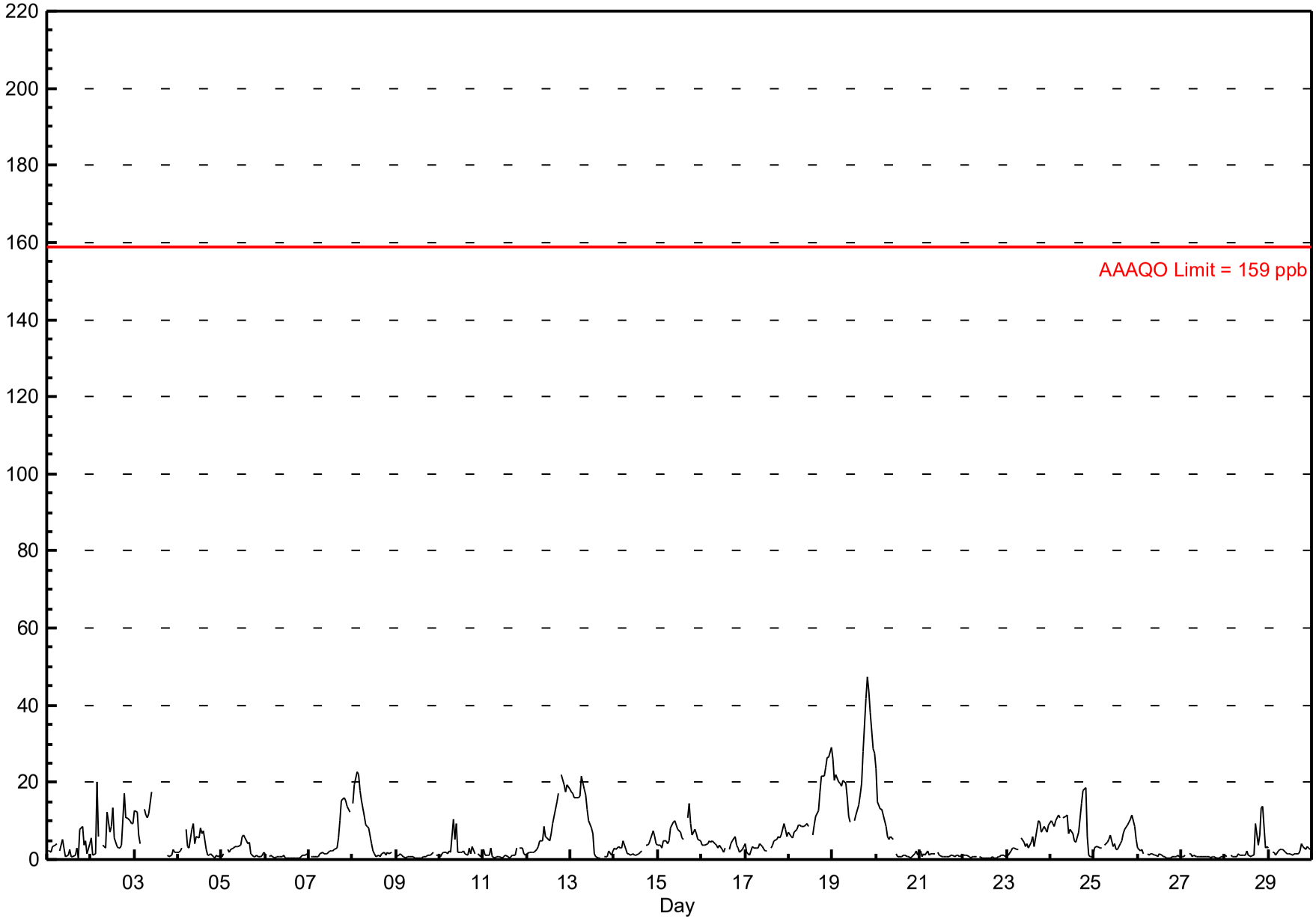


Peace Airshed Zone Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wembley - February 2020

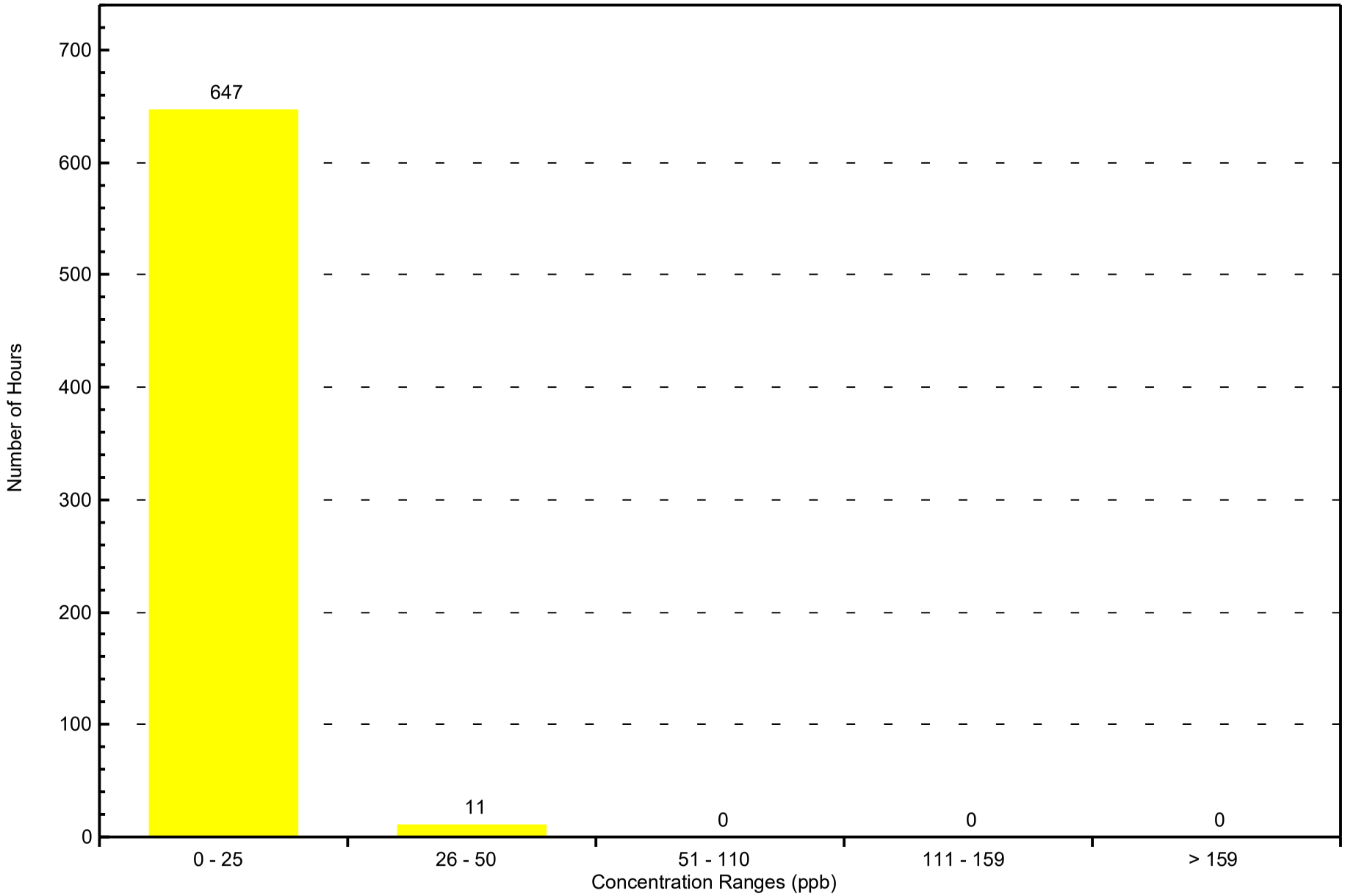


Peace Airshed Zone Association

Histogram of Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wembley - February 2020

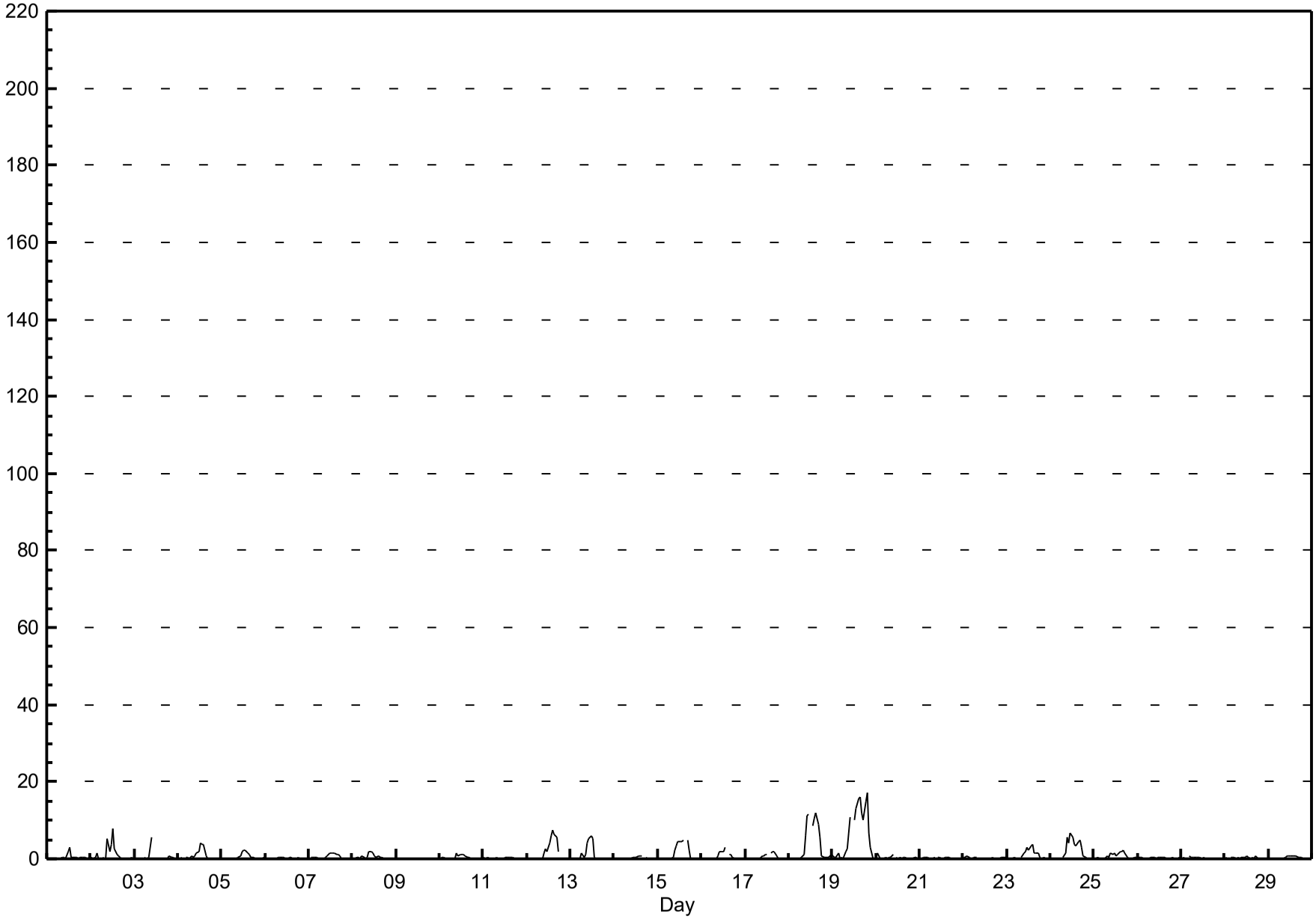


Peace Airshed Zone Association

Hourly Averages

Nitrogen Oxide (NO) - ppb

Wembley - February 2020

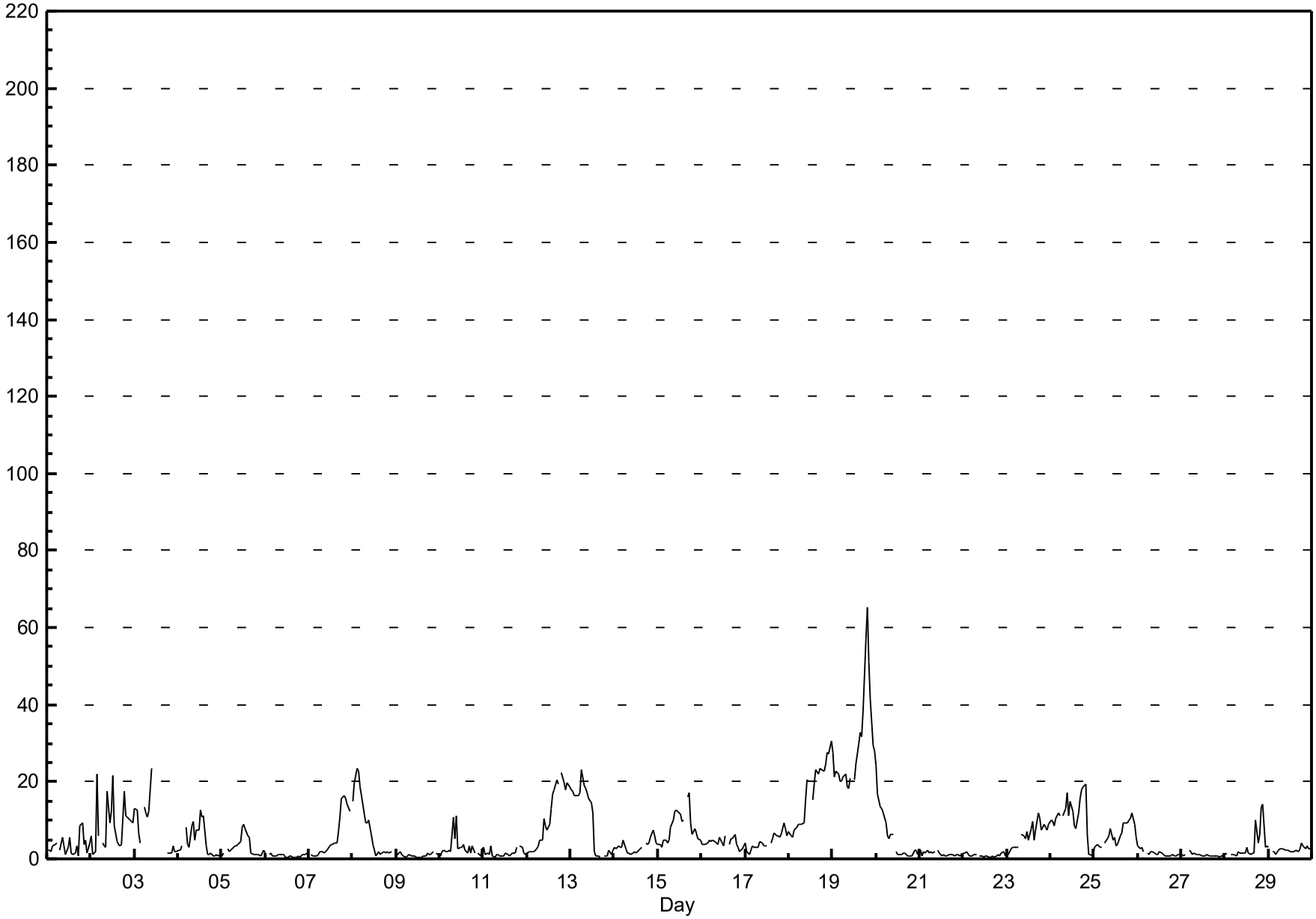


Peace Airshed Zone Association

Hourly Averages

Oxides of Nitrogen (NO_X) - ppb

Wembley - February 2020

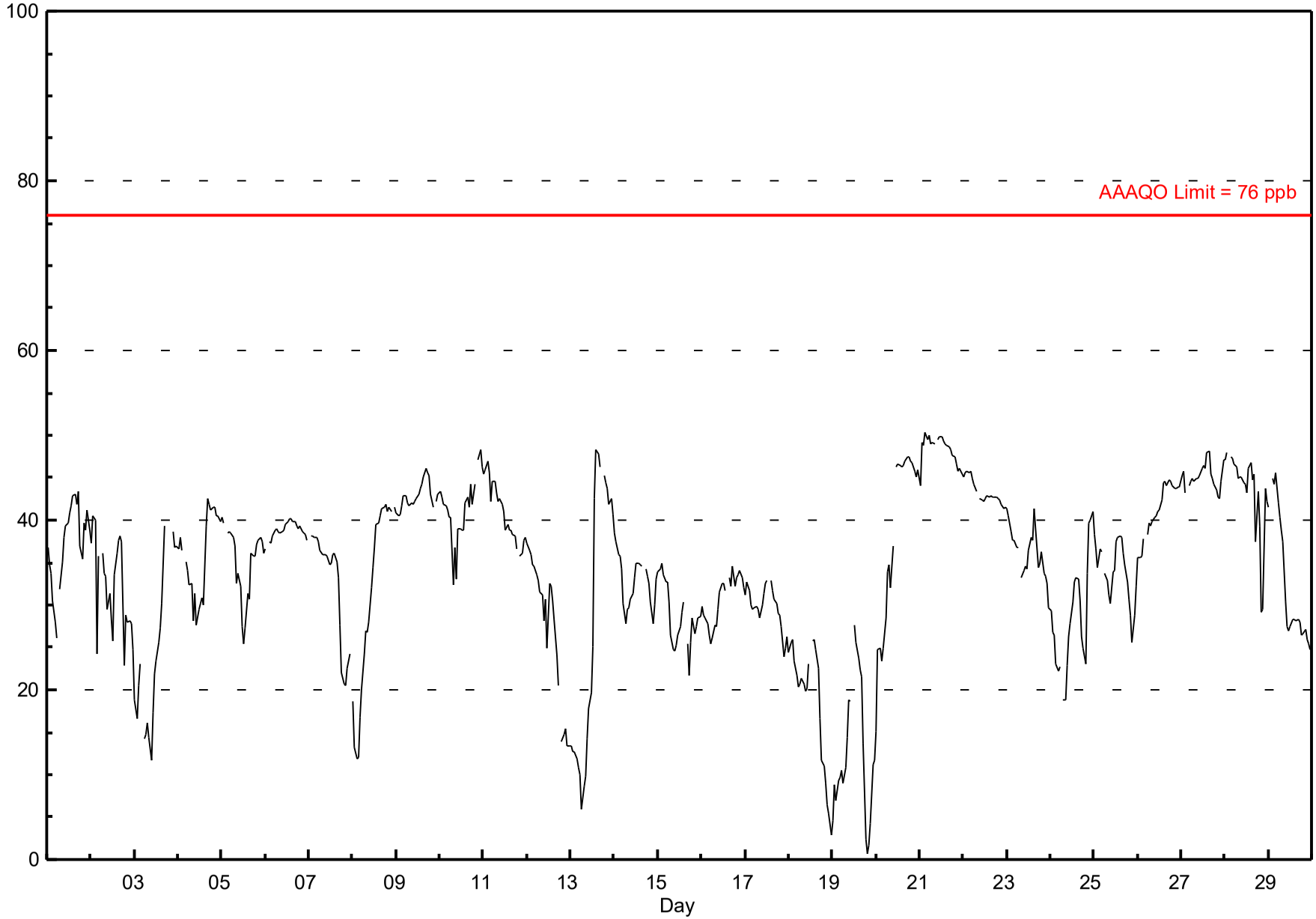


Peace Airshed Zone Association

Hourly Averages

Ozone (O_3) - ppb

Wembley - February 2020

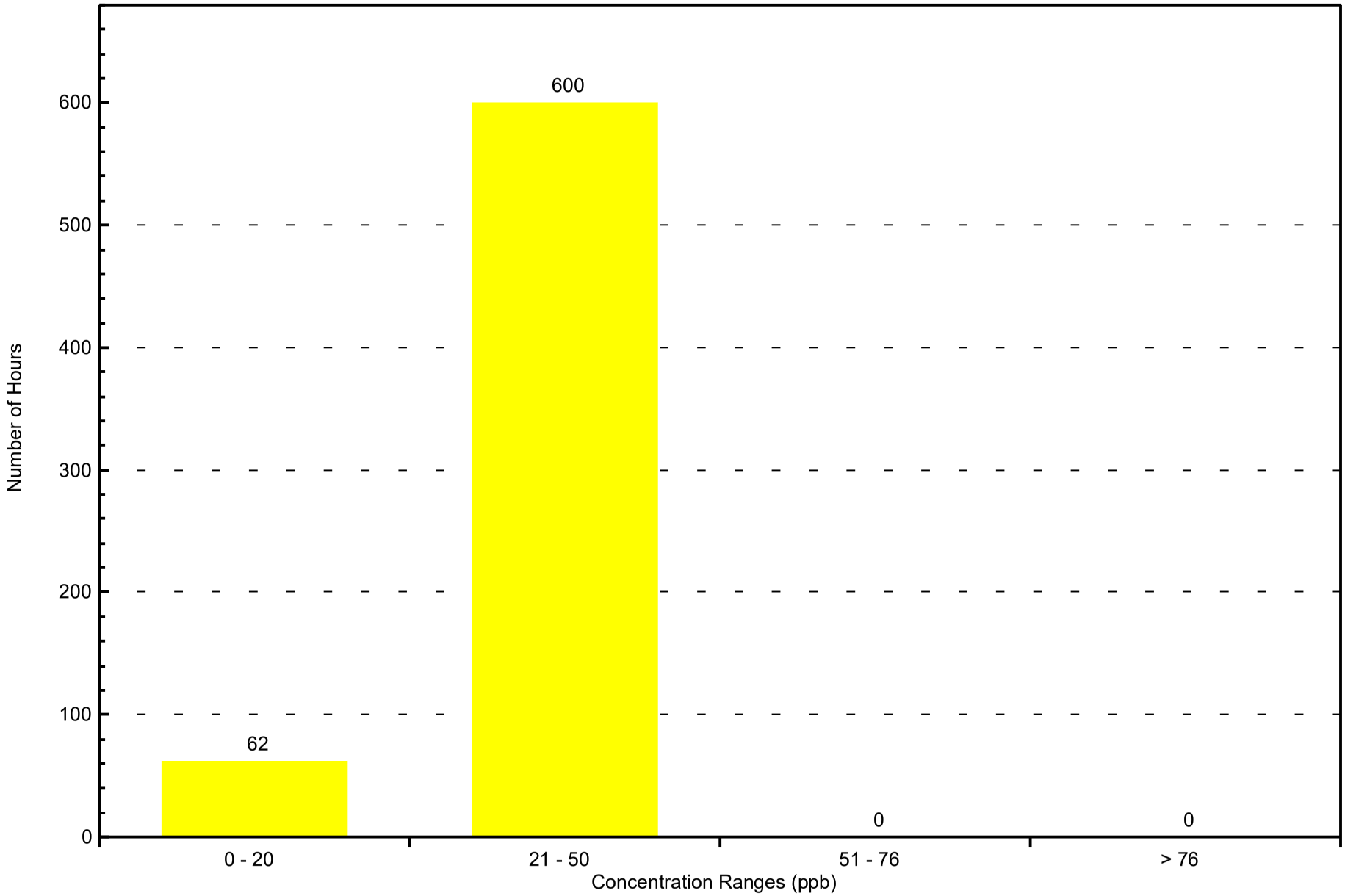


Peace Airshed Zone Association

Histogram of Hourly Averages

Ozone (O_3) - ppb

Wembley - February 2020

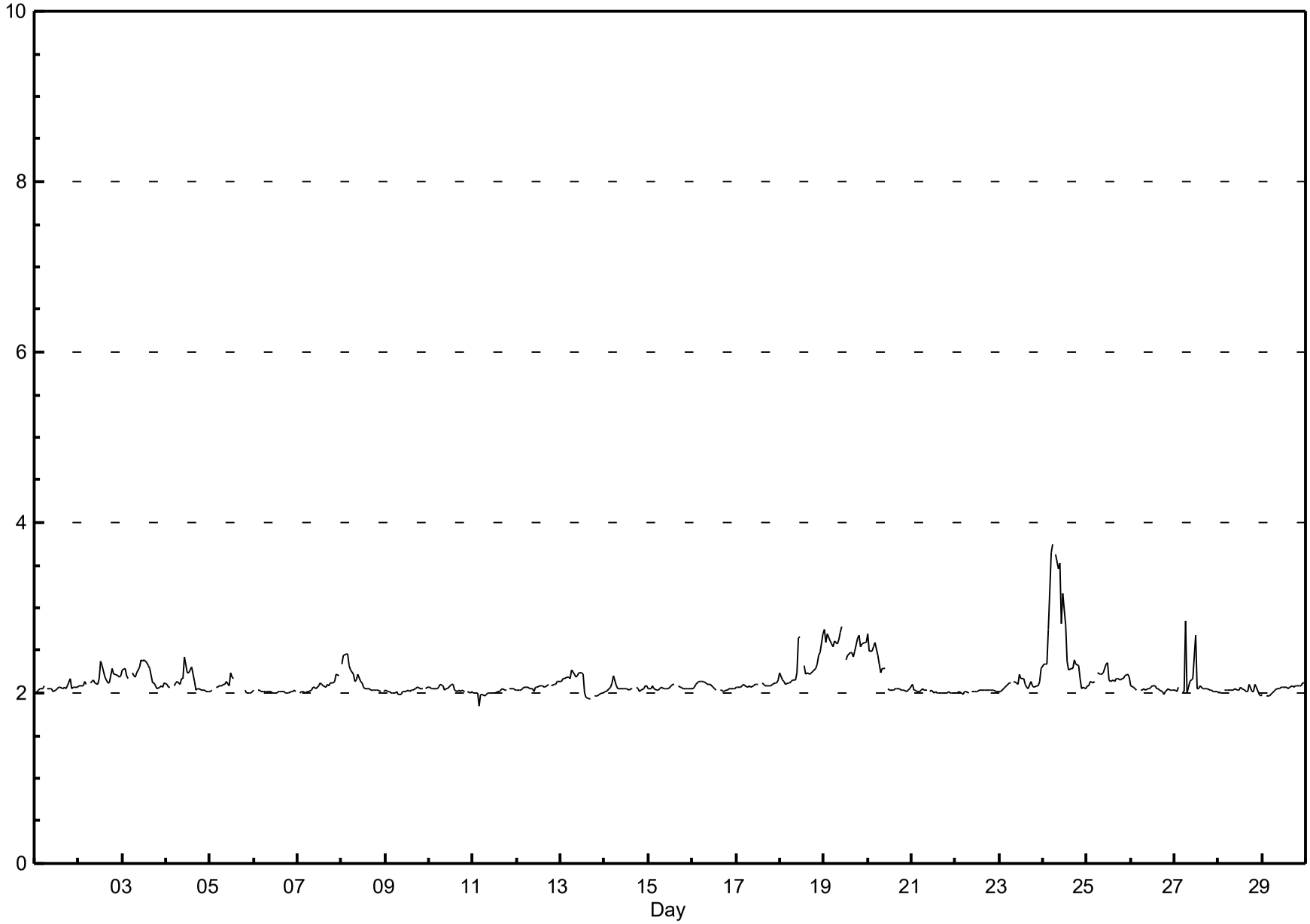


Peace Airshed Zone Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Wembley - February 2020

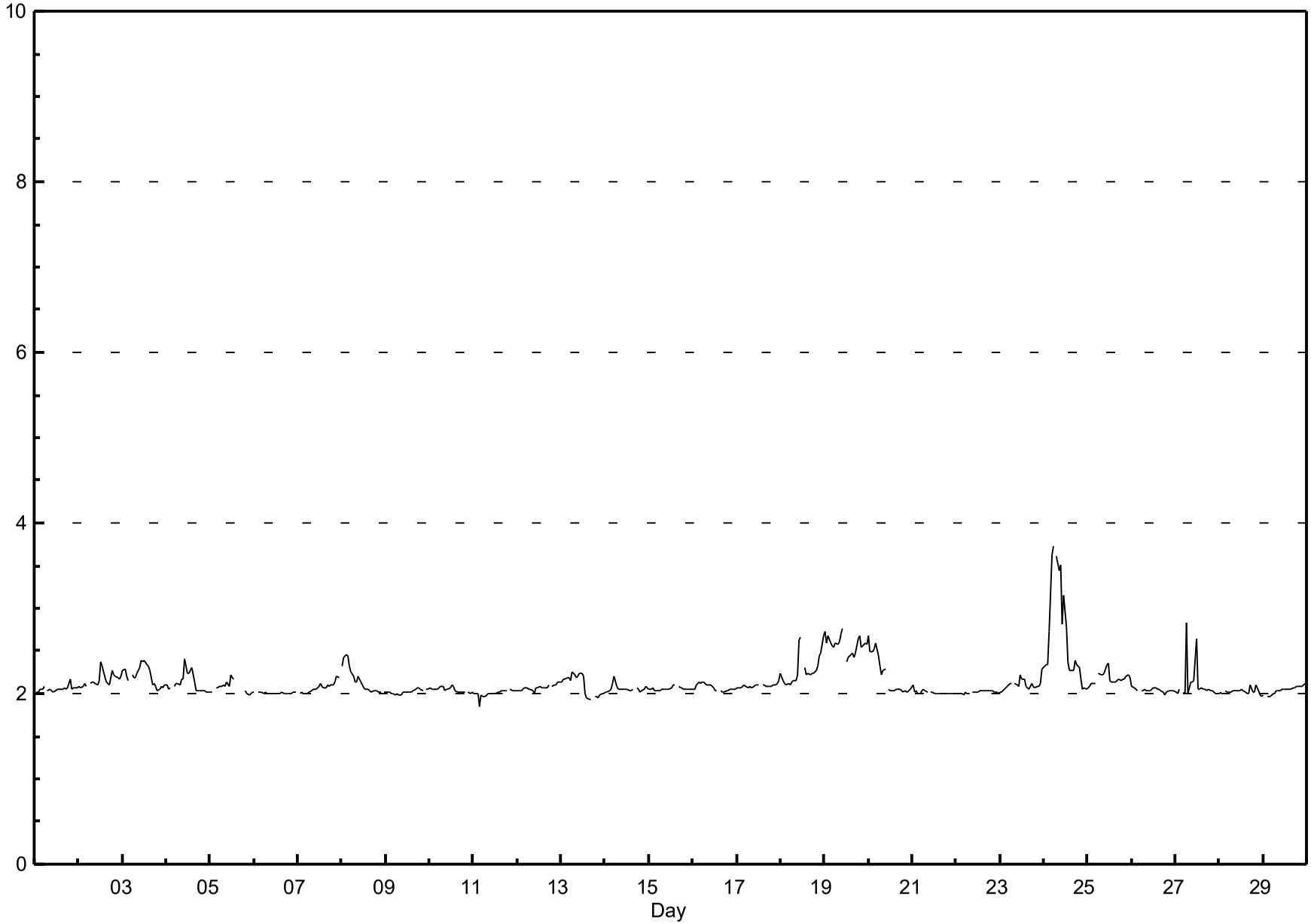


Peace Airshed Zone Association

Hourly Averages

Methane (CH_4) - ppm

Wembley - February 2020

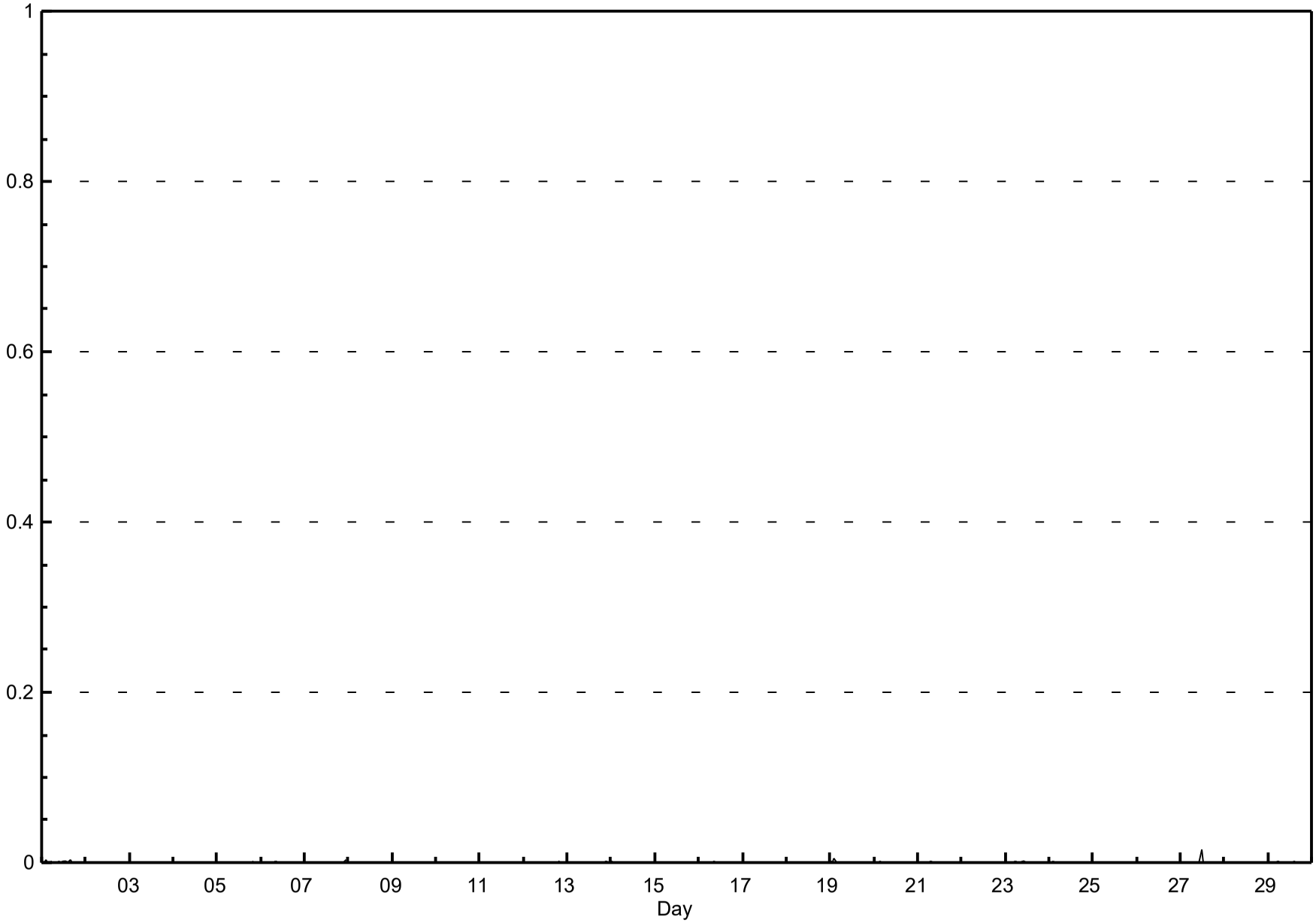


Peace Airshed Zone Association

Hourly Averages

Non Methane Hydrocarbon (NMHC) - ppm

Wembley - February 2020

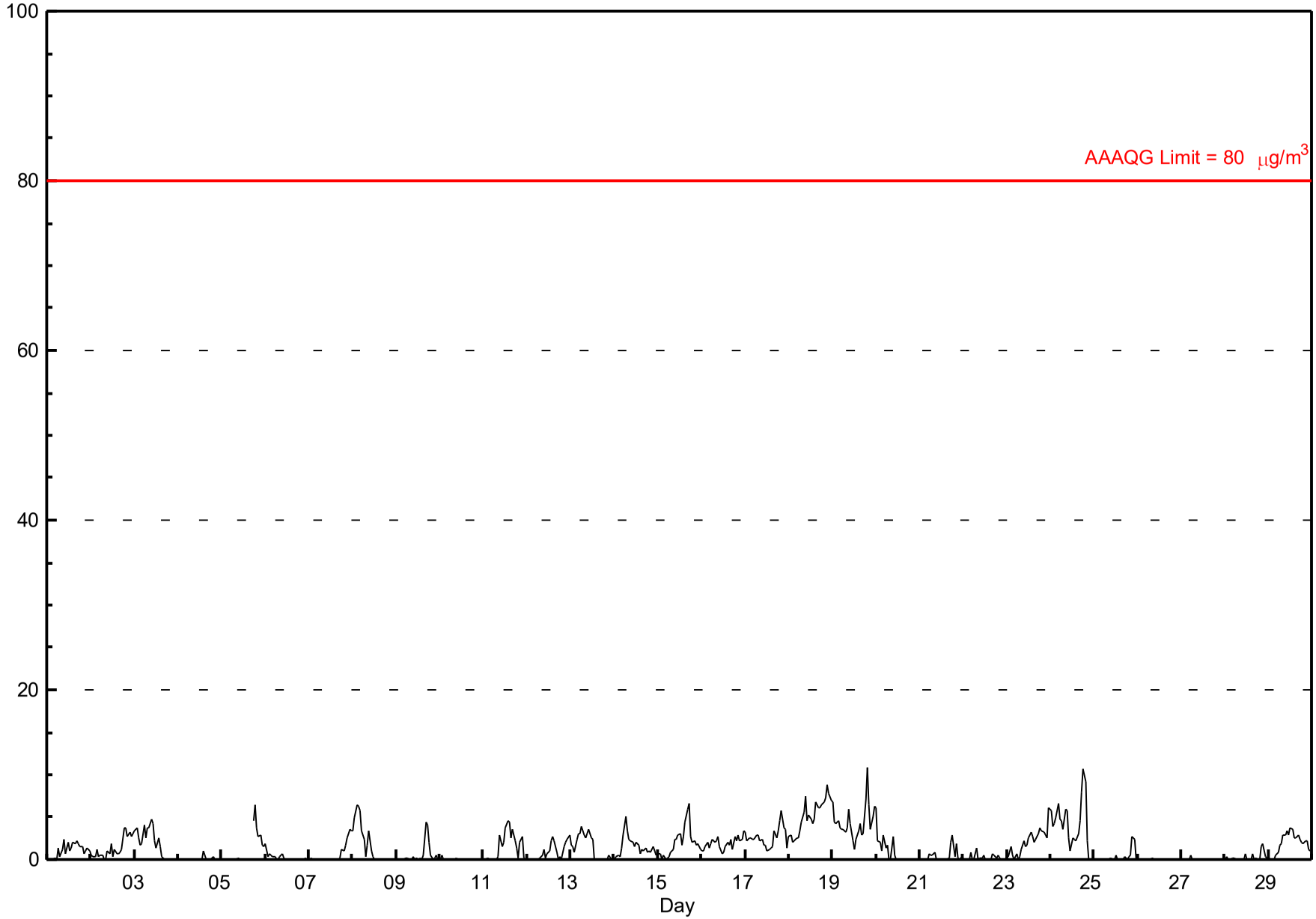


Peace Airshed Zone Association

Hourly Averages

PM2.5 ($PM_{2.5}$) - $\mu g/m^3$

Wembley - February 2020

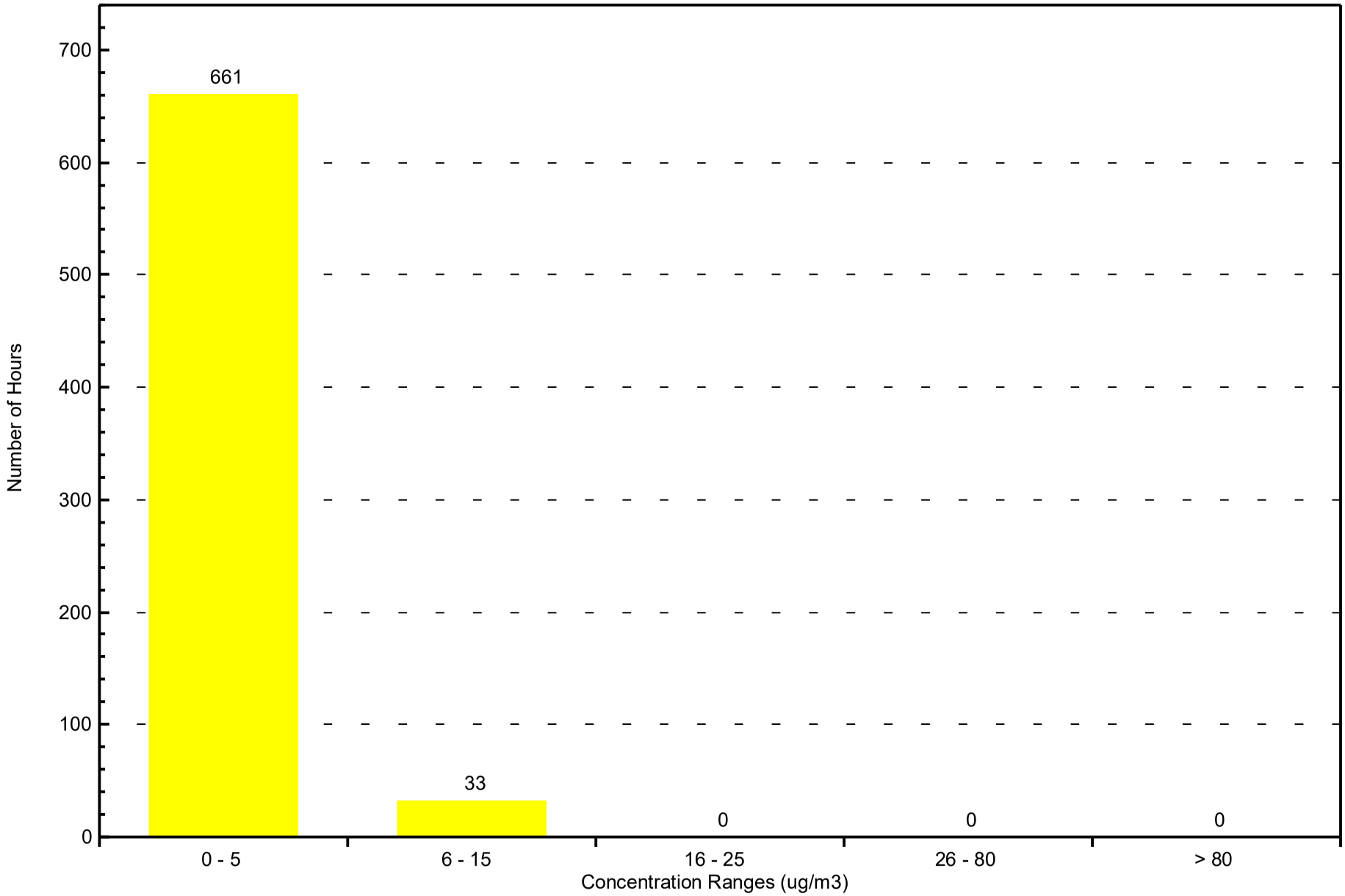


Peace Airshed Zone Association

Histogram of Hourly Averages

PM2.5 ($PM_{2.5}$) - $\mu g/m^3$

Wembley - February 2020

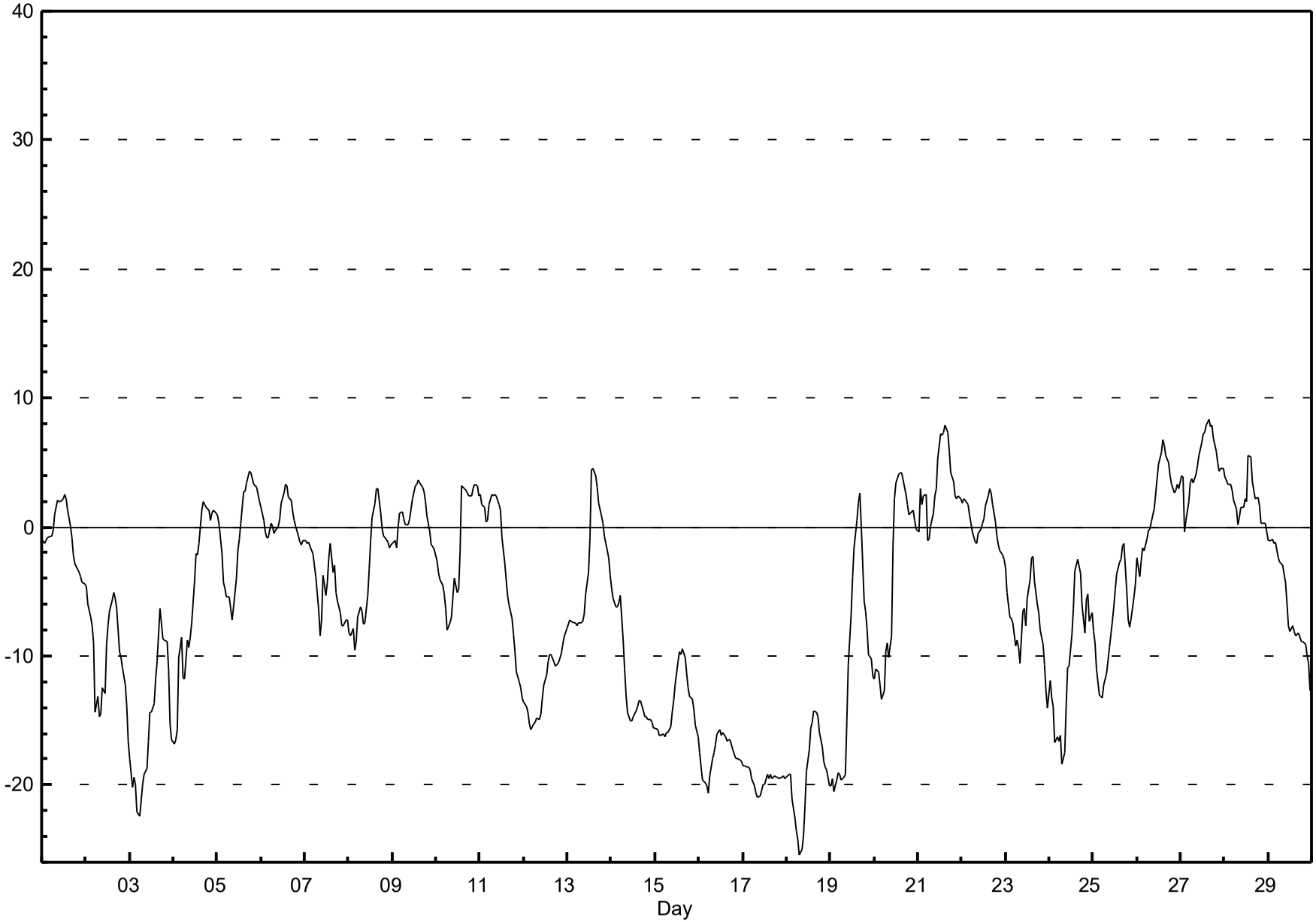


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - ^{o}C

Wembley - February 2020

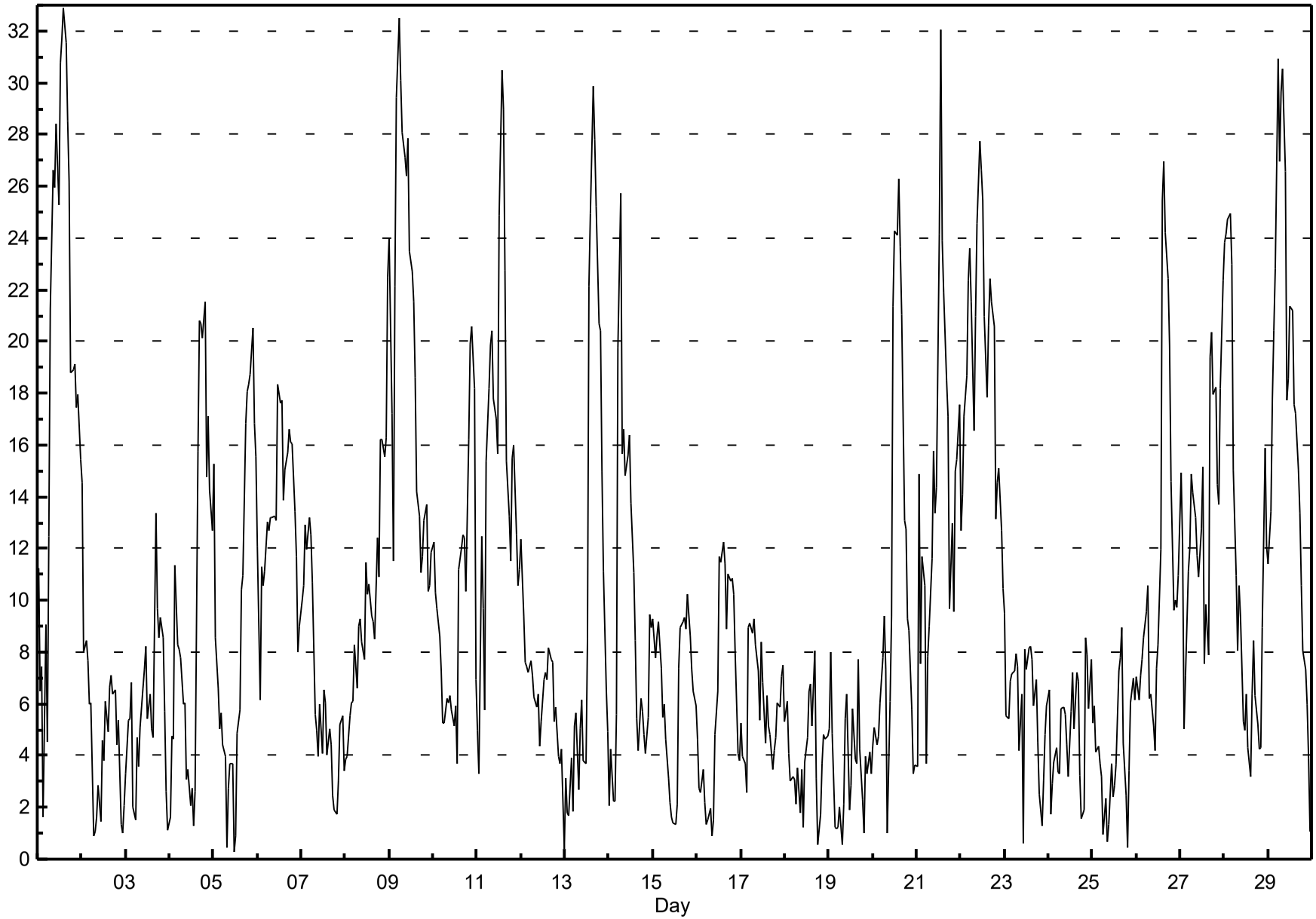


Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h

Wembley - February 2020

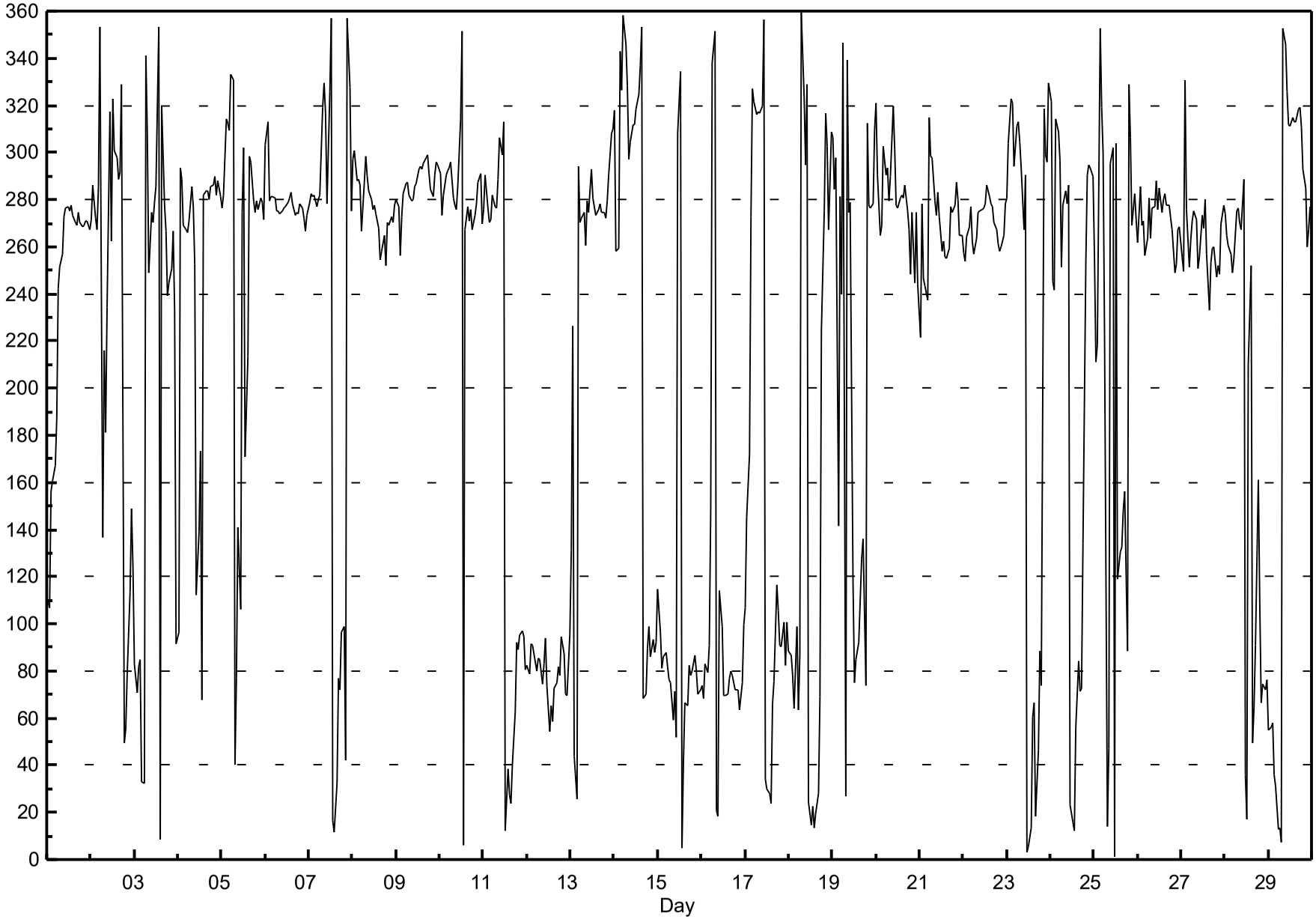


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Wembley - February 2020

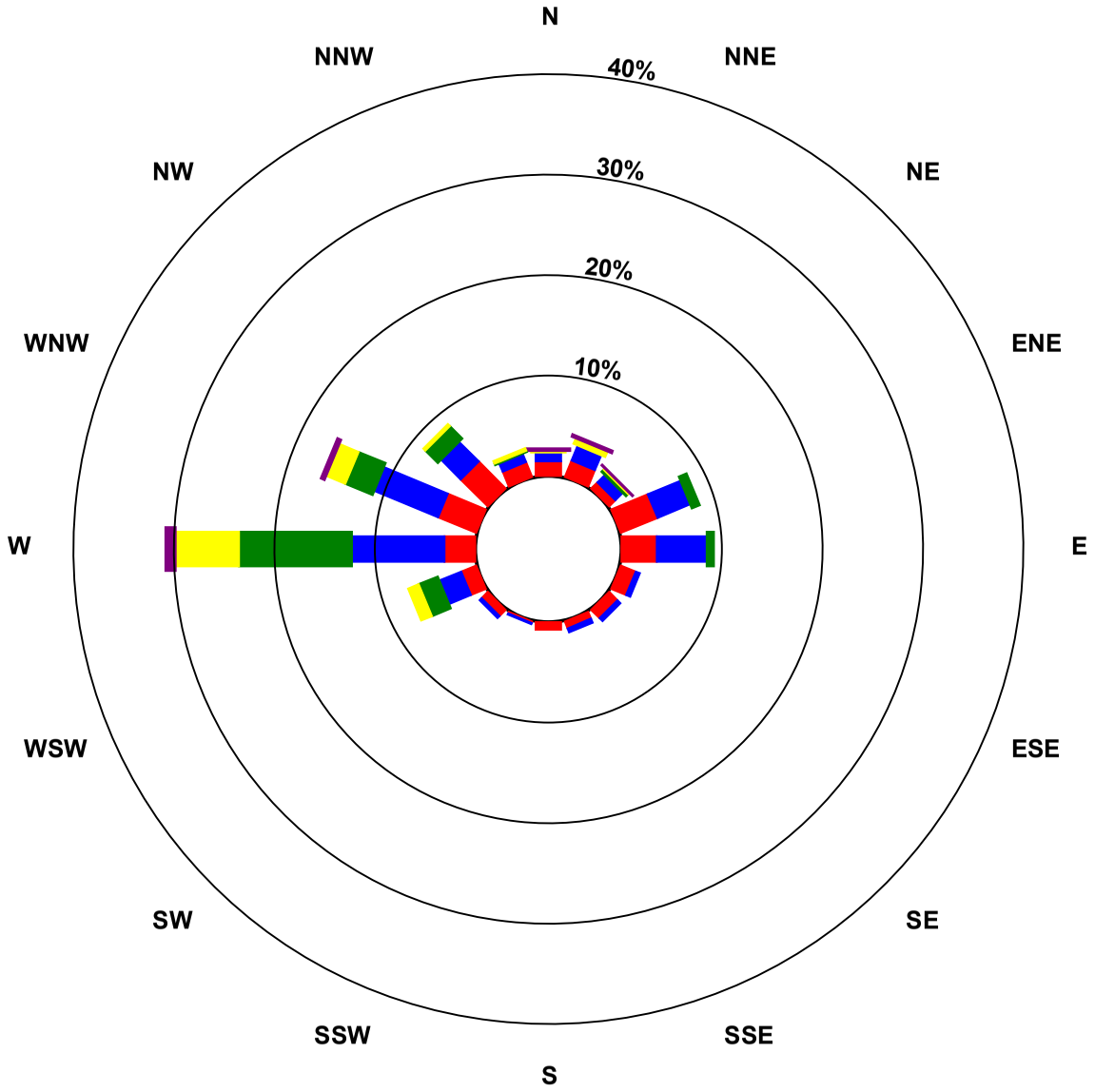


Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)

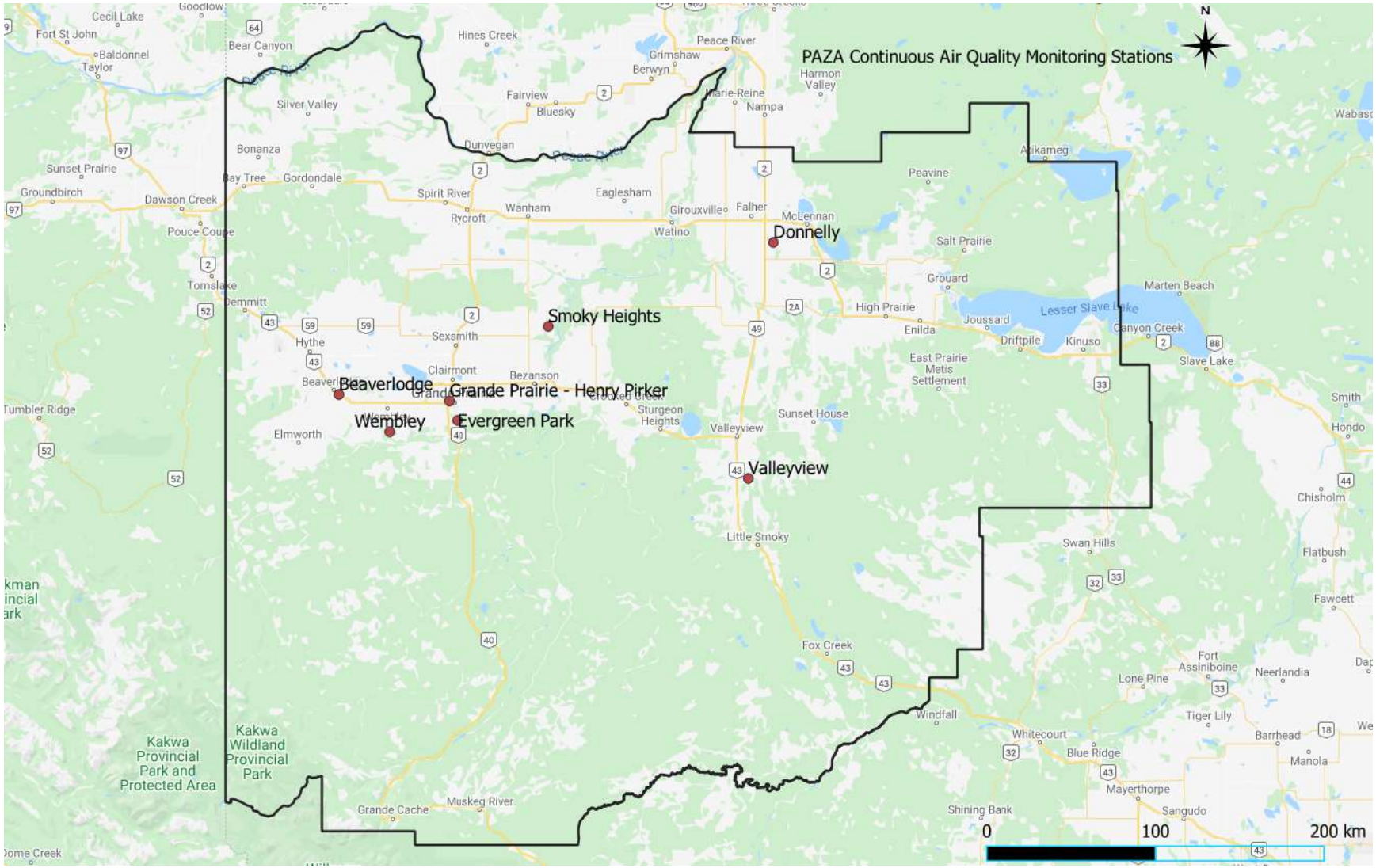
Wembley - February 2020



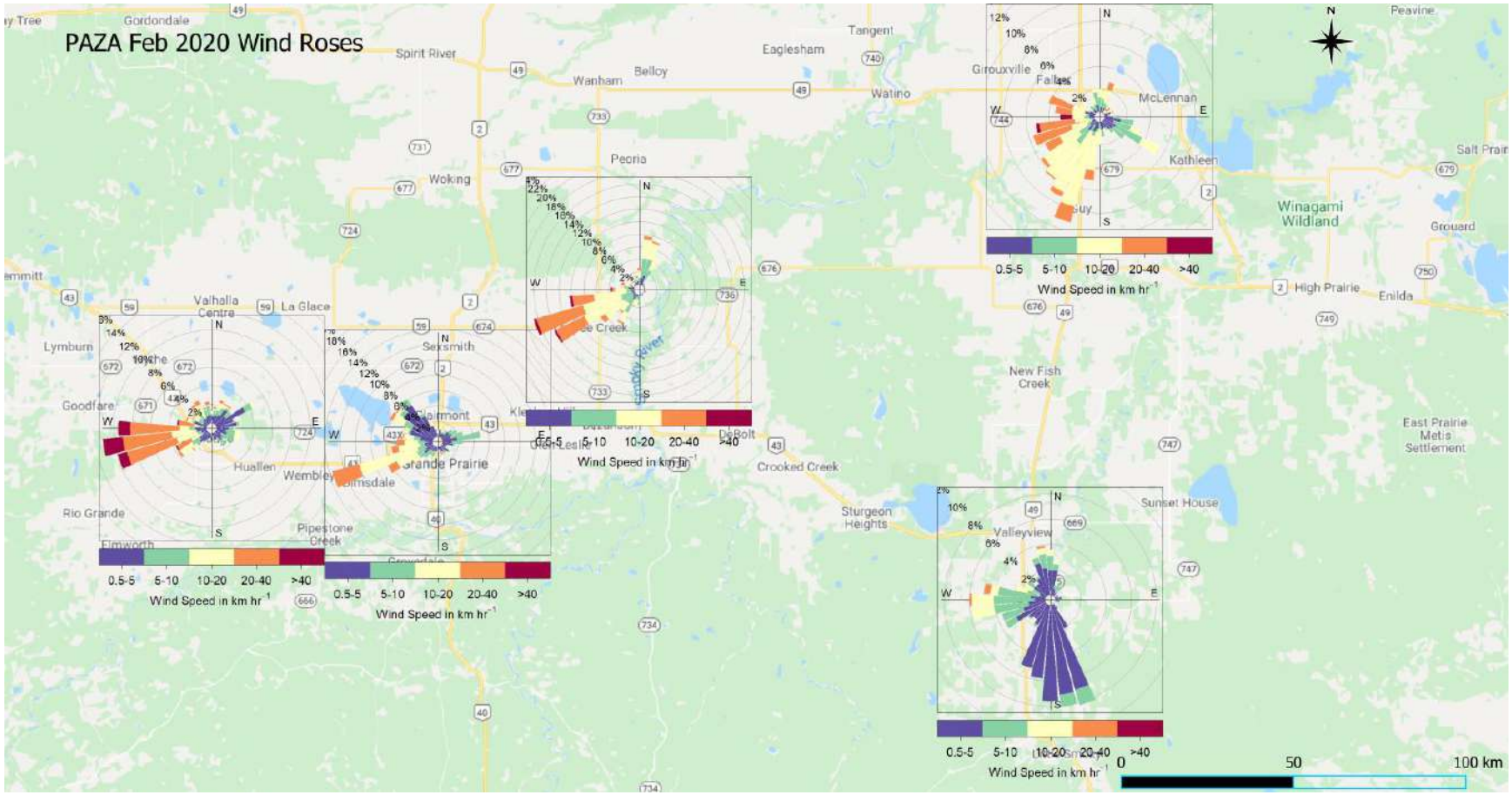
Wind Speed Classes (km/h)

- 1 - 5
- 6 - 11
- 12 - 19
- 20 - 28
- 29 - 38
- > 38

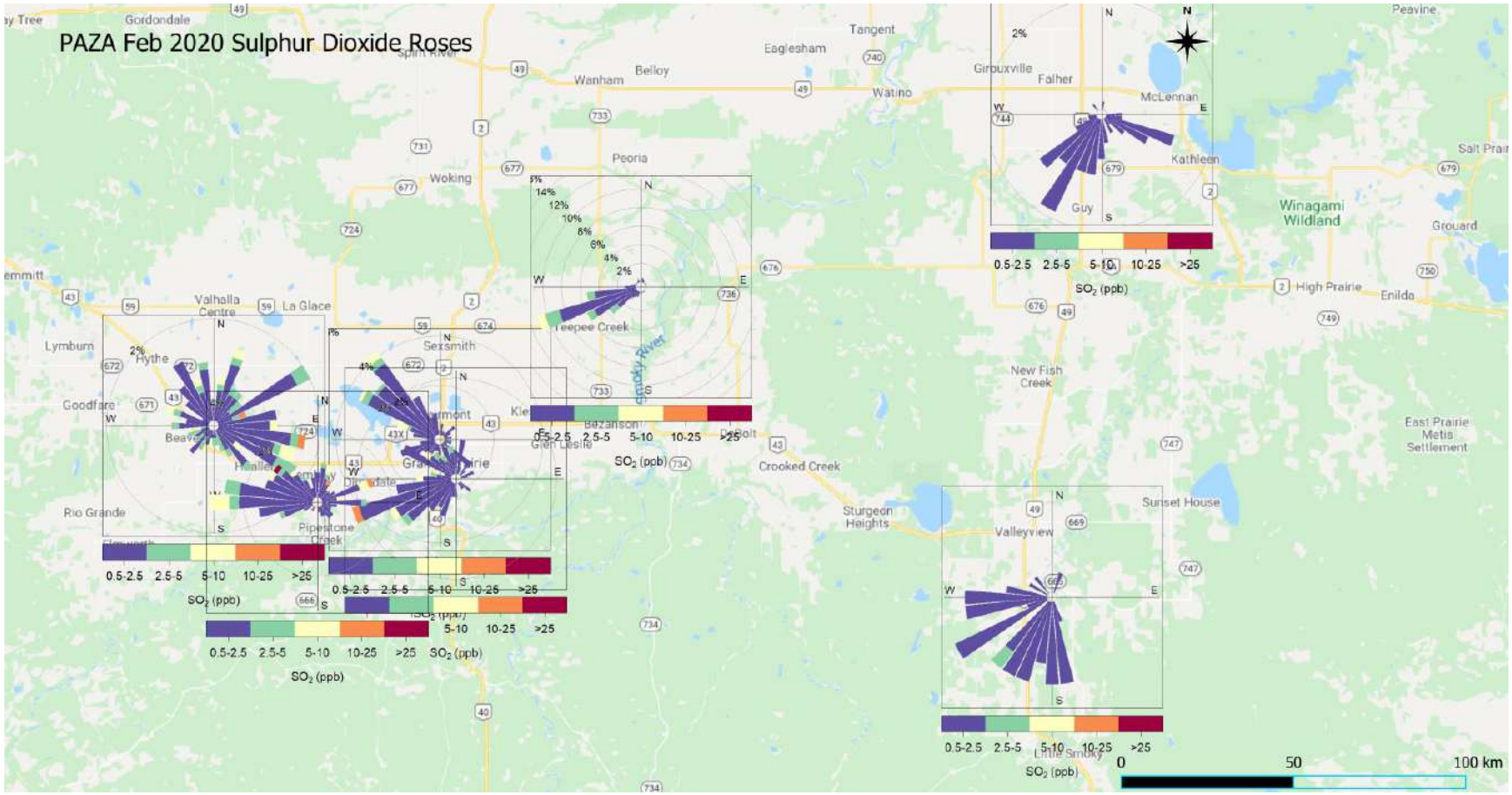
9 Concentration Roses for PAZA

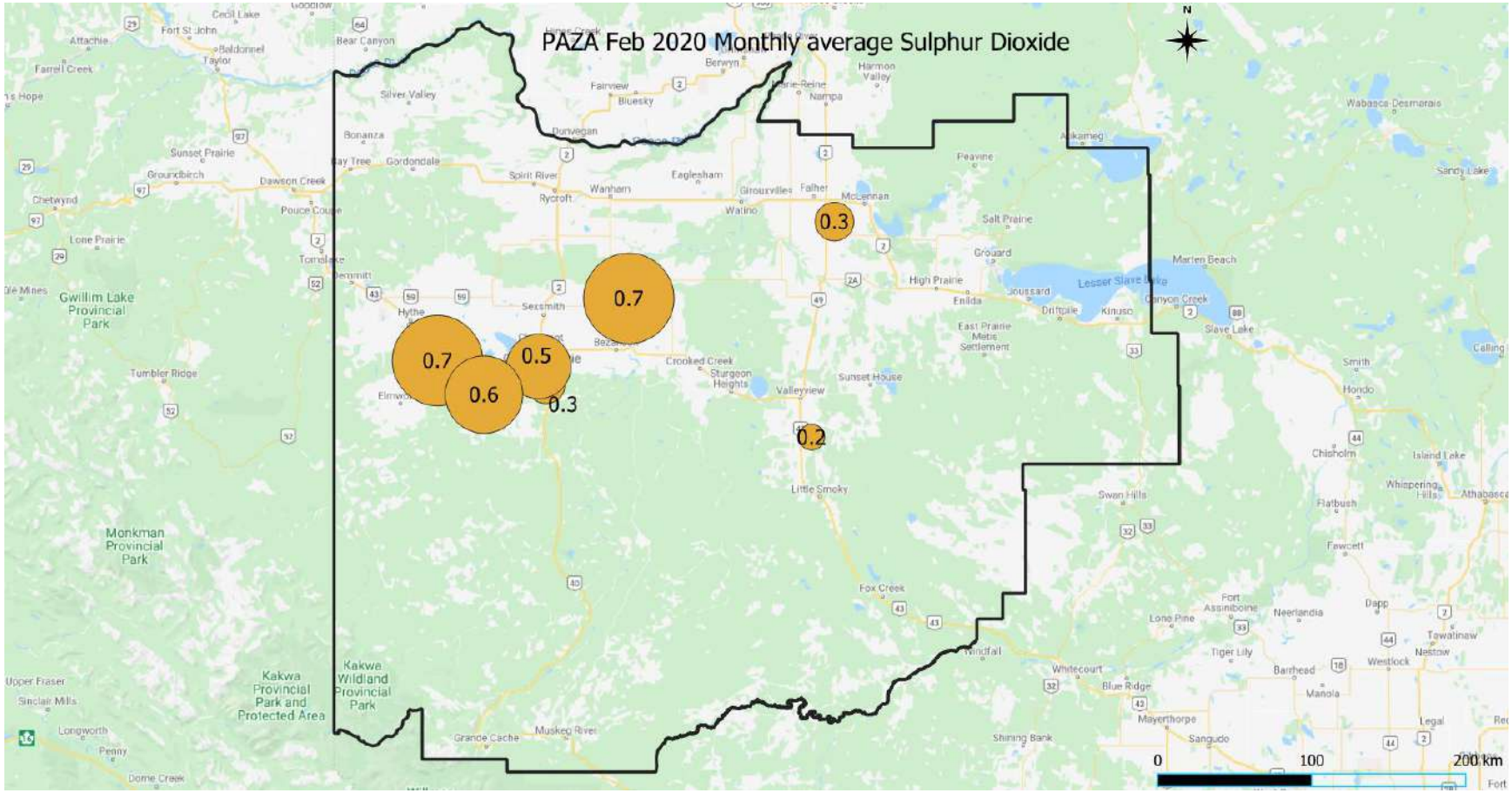


9.1 Wind Roses

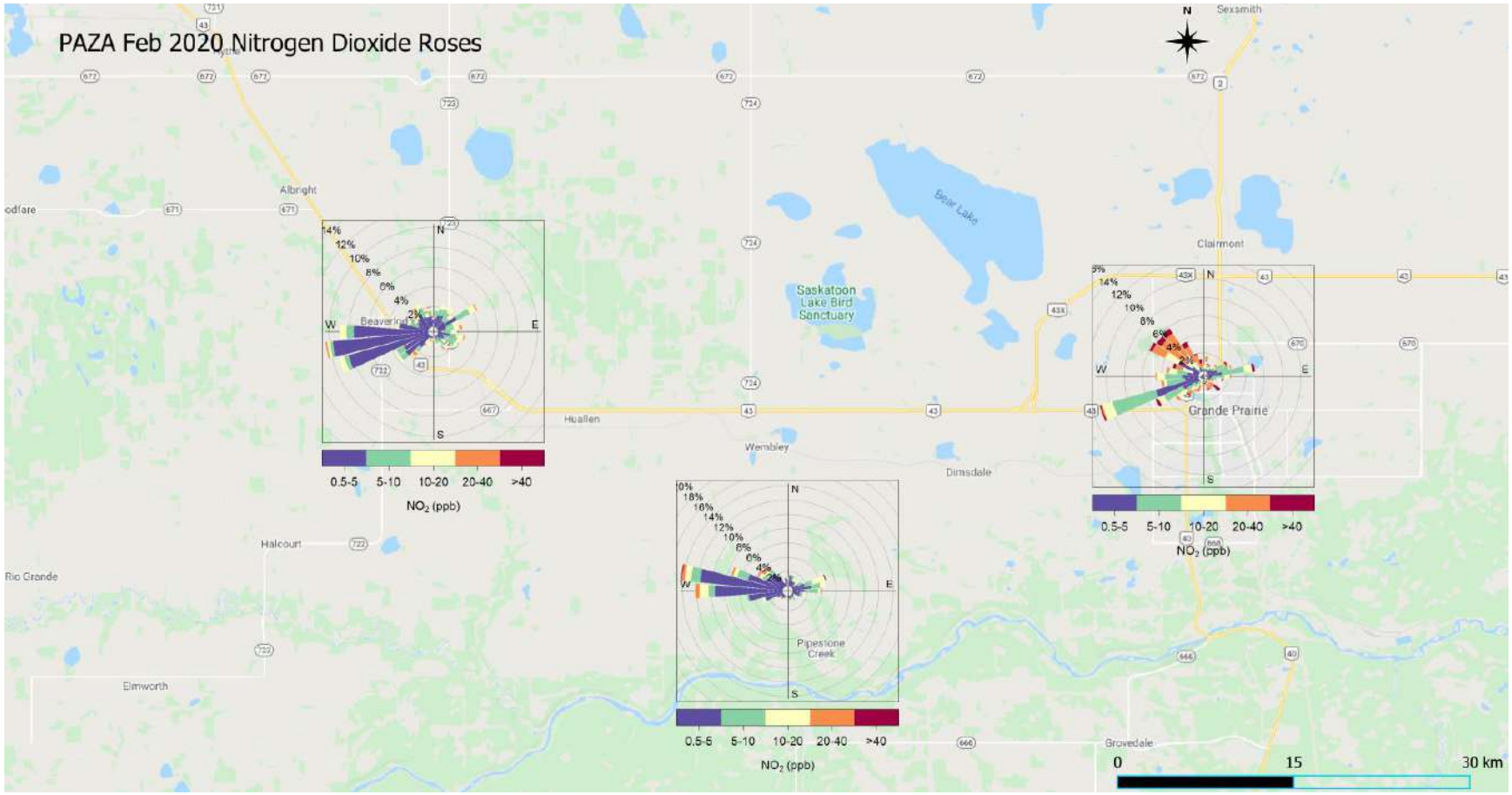


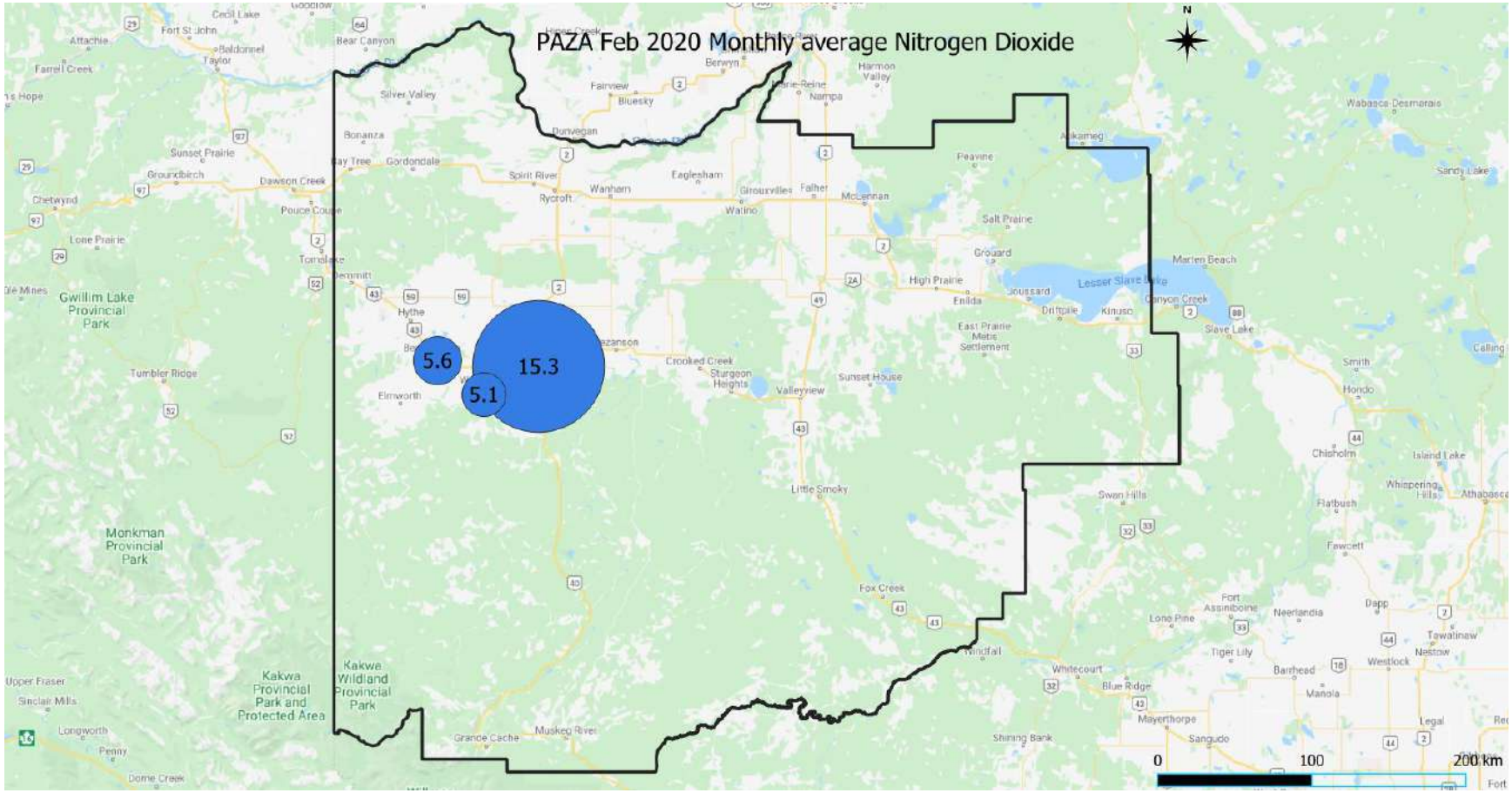
9.2 Sulphur Dioxide Plots



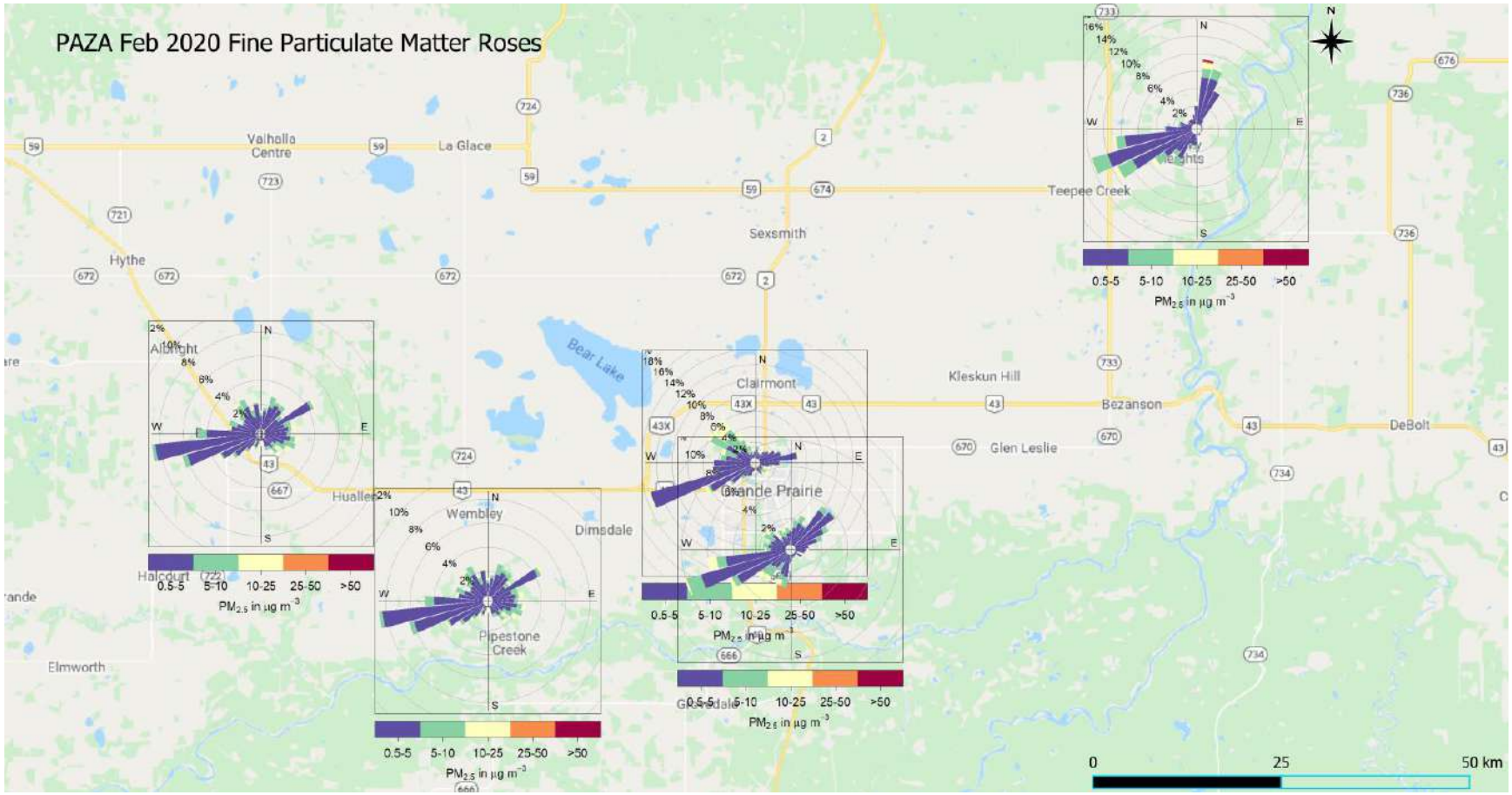

PAZA Feb 2020 Monthly average Sulphur Dioxide
N
0.3
0.7
0.7
0.5
0.6
0.3
0.2
0
100
200 km
Gwillim Lake Provincial Park
Monkman Provincial Park
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park
Lesser Slave Lake

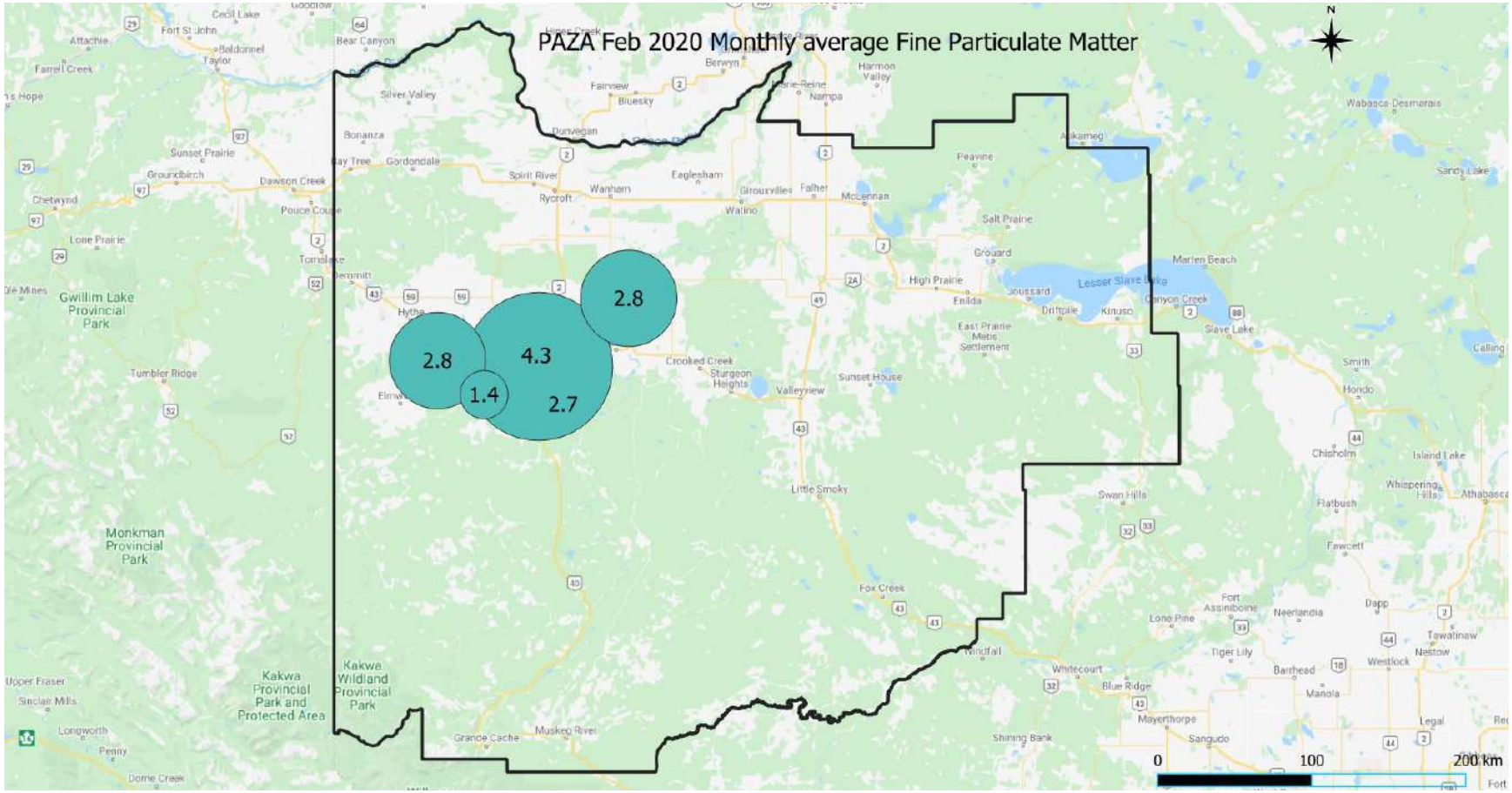
9.3 Nitrogen Dioxide Plots




PAZA Feb 2020 Monthly average Nitrogen Dioxide
N
5.6
15.3
5.1
0
100
200 km
Gwillim Lake Provincial Park
Monkman Provincial Park
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park
Lesser Slave Lake
Fort St John
Dawson Creek
Chetwynd
Tumbler Ridge
Grande Cache
Fox Creek
Whitecourt
Slave Lake
Peace River
Grande Prairie
Valleyview
Sexsmith
Hythe
Elmworth
Bonanza
Gordondale
Spirit River
Rycroft
Wanham
Eaglesham
Girouxville
Falher
McLennan
Watino
Fairview
Bluesky
Berwyn
Nampa
Dunvegan
Peavine
Salt Prairie
Grouard
High Prairie
Enilda
Joussard
Driftpile
Kinuso
East Prairie Metis Settlement
Sturgeon Heights
Crooked Creek
Sunset House
Little Smoky
Swan Hills
Fort Assiniboine
Neerlandia
Lone Pine
Tiger Lily
Barrhead
Manola
Mayerthorpe
Sangudo
Shining Bank
Blue Ridge
Windfall
Musketo River
Sinclair Mills
Upper Fraser
Longworth
Penny
Dome Creek
Sandy Lake
Wabasca-Desmarais
Marten Beach
Canyon Creek
Smith
Hondo
Chisholm
Island Lake
Whispering Hills
Athabasca
Flatbush
Fawcett
Dapp
Tawatinaw
Nestow
Westlock
Legal
Sangudo
Cecil Lake
Attachie
Farrell Creek
Sunset Prairie
Groundbirch
Lone Prairie
Tomslake
Bear Canyon
Silver Valley
Harmon Valley
Bay Tree
Pouce Coupe
Hythe
Bezanson
Elmworth
Calling

9.4 Fine Particulate Matter ($PM_{2.5}$) Plots




PAZA Feb 2020 Monthly average Fine Particulate Matter
N
2.8
2.8
4.3
1.4
2.7
0
100
200 km
Gwillim Lake Provincial Park
Monkman Provincial Park
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park
Lesser Slave Lake

10 Passive Monitoring Data

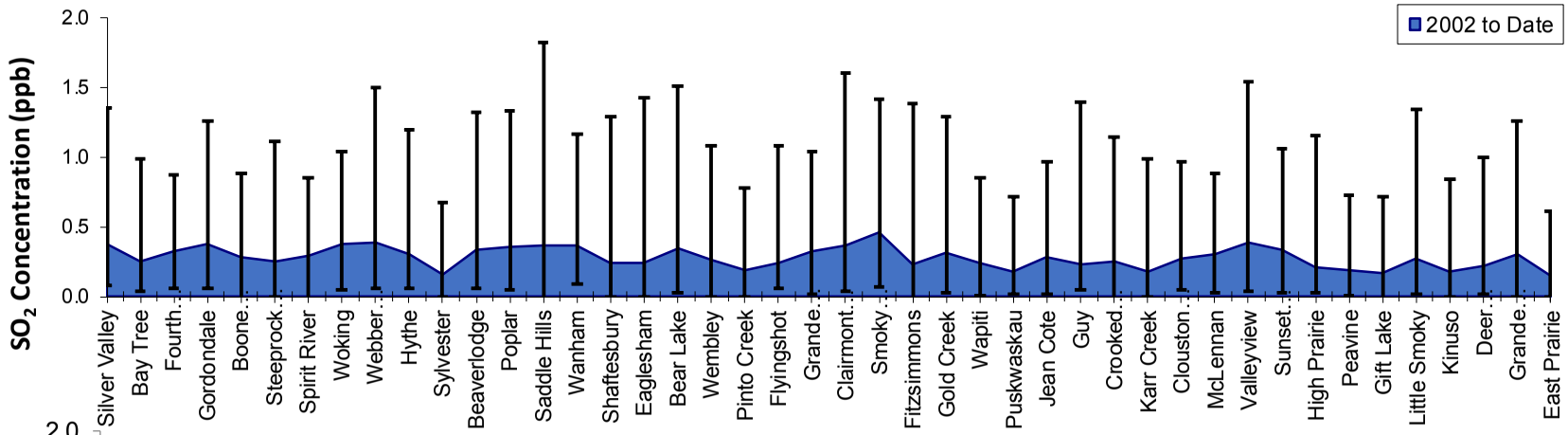
Peace Airshed Zone Association - PAZA Passive Stations for February 2020

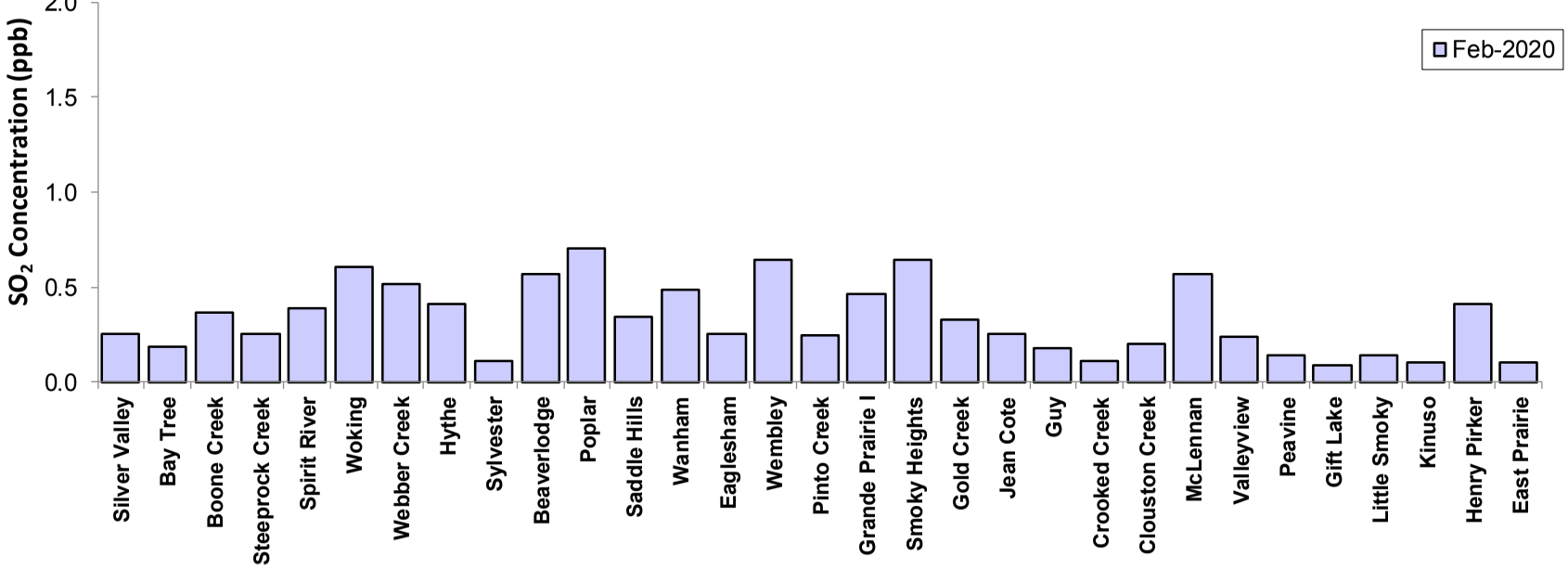
Station Number	Station Name	SO2 ppb	O3 ppb	NO2 ppb	H2S ppb	LSD
Duplicates						
2a	Bay Tree		43.8			
2b	Bay Tree		41.9			
10a	Woking	0.6				
10b	Woking	0.6				
21a	Eaglesham			0.3		
21b	Eaglesham			0.2		
27a	Grande Prairie I	0.4				
27b	Grande Prairie I	0.5				
32a	Gold Creek			3.3		
32b	Gold Creek			3.4		
35a	Jean Cote	0.3				
35b	Jean Cote	0.2				
39a	Clouston Creek			0.5		
39b	Clouston Creek			0.5		
63a	Girouxville 3				0.6	
63b	Girouxville 3				0.5	
1	Silver Valley	0.3	-	0.7	-	08-27-081-11 W6M
2	Bay Tree	0.2	42.8	0.3	-	13-16-078-13 W6M
5	Boone Creek	0.4	-	0.5	-	01-23-076-11 W6M
7	Steeprock Creek	0.3	-	0.1	-	09-35-072-13 W6M
9	Spirit River	0.4	-	0.6	-	08-12-079-07 W6M
10	Woking	0.6	-	0.5	-	01-13-076-07 W6M
11	Webber Creek	0.5	-	3.5	-	09-36-074-09 W6M
12	Hythe	0.4	-	1.1	-	14-36-072-11 W6M
14	Sylvester	0.1	-	0.2	-	08-06-069-12 W6M
16	Beaverlodge	0.6	-	1.9	-	15-36-071-10 W6M
17	Poplar	0.7	-	1.8	-	13-06-073-08 W6M
18	Saddle Hills	0.3	-	0.5	-	04-25-074-07 W6M
19	Wanham	0.5	-	0.2	-	16-22-077-03 W6M
21	Eaglesham	0.3	-	0.3	-	16-21-079-25 W5M
24	Wembley	0.6	-	2.6	-	12-31-070-08 W6M
25	Pinto Creek	0.2	-	0.4	-	04-24-069-11 W6M
27	Grande Prairie I	0.5	-	9.9	-	08-15-071-06 W6M
29	Smoky Heights	0.6	-	1.7	-	04-06-075-02 W6M
32	Gold Creek	0.3	-	3.3	-	06-33-067-05 W6M
35	Jean Cote	0.3	-	0.3	-	12-35-079-21 W5M
36	Guy	0.2	-	0.2	0.1	03-04-076-22 W5M
37	Crooked Creek	0.1	42.2	1.1	-	16-01-071-26 W5M
39	Clouston Creek	0.2	-	0.5	-	12-01-073-22 W5M
40	McLennan	0.6	-	0.2	-	03-29-077-19 W5M
41	Valleyview	0.2	-	0.7	-	09-30-069-22 W5M
44	Peavine	0.1	-	0.3	-	03-05-079-15 W5M
45	Gift Lake	0.1	-	0.3	-	10-07-079-12 W5M
46	Little Smoky	0.1	-	1.9	-	12-01-065-21 W5M
47	Kinuso	0.1	46.9	0.9	-	12-10-073-10 W5M
49	Henry Pirker	0.4	-	9.0	-	17-26-071-06 W6M
50	East Prairie	0.1	-	1.1	-	11-13-079-08 W6M
63	Girouxville 3	-	-	-	0.6	14-02-077-23 W5M
64	Girouxville 4	-	-	-	0.4	04-08-077-22 W5M

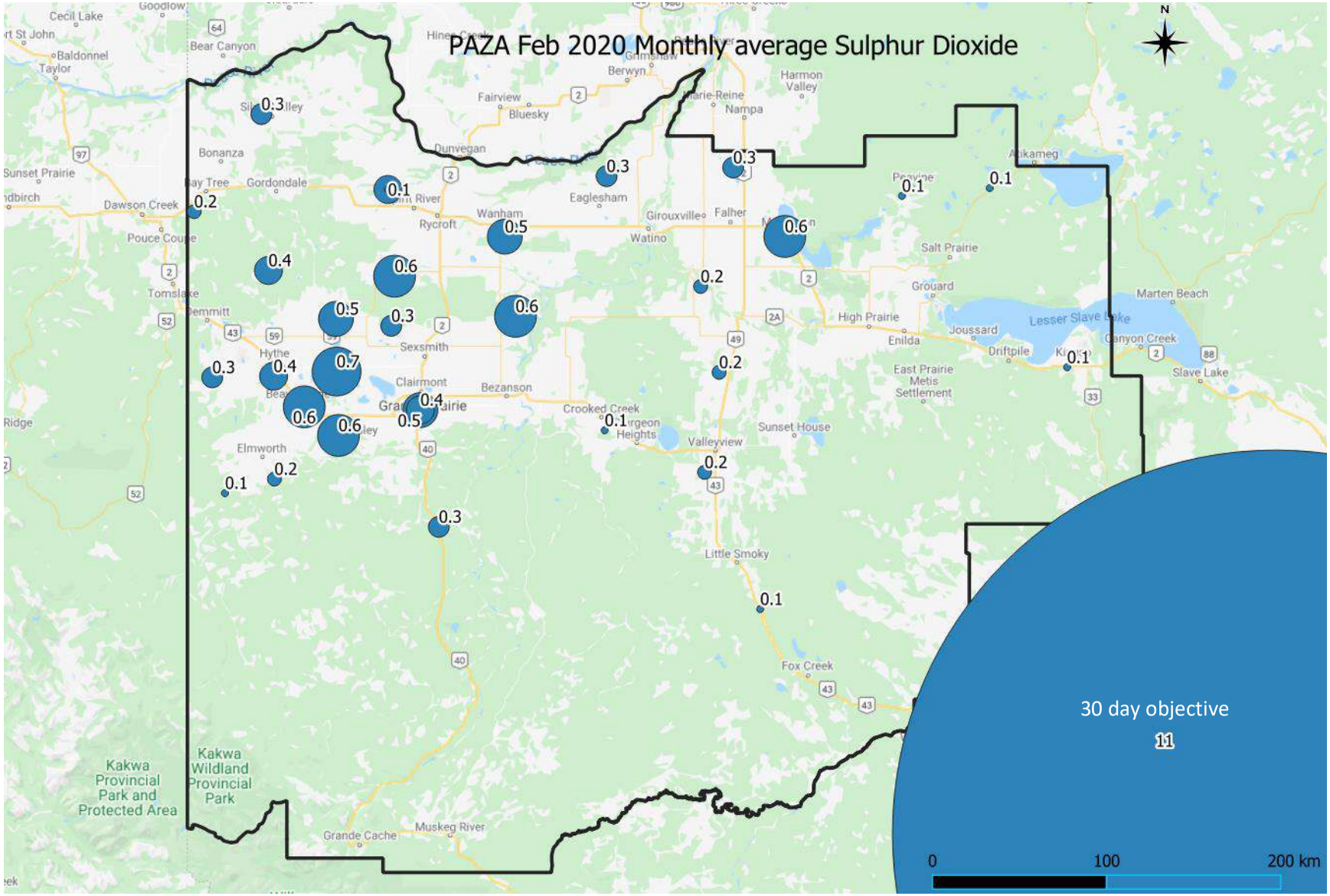
Passive Summary for February 2020

Stats	Sulphur Dioxide SO_2	Ozone O_3	Nitrogen Dioxide NO_2	Hydrogen Sulphide H_2S
	ppb	ppb	ppb	ppb
	Passive Summary for Feb 2020 (PAZA)			
Mean	0.3	44.0	1.5	0.3
Standard Deviation	0.2	2.5	2.3	0.2
Minimum	0.1 Gift Lake (#45)	42.2 Crooked Creek (#37)	0.1 Steeprock Creek (#7)	0.1 Guy (#36)
Maximum	0.7 Poplar (#17)	46.9 Kinuso (#47)	9.9 Grande Prairie I (#27)	0.6 Girouxville 3 (#63)
	Continuous and Passive Monitoring Comparision			
PAZA Beaverlodge Station	**0.7**	**33.8**	**5.6**	**-**
Beaverlodge Passive (#16)	**0.6**	**-**	**1.9**	**-**
PAZA Henry Pirker Station	**0.5**	**24.5**	**15.3**	**0.3**
Henry Pirker passive (#49)	**0.4**	**-**	**9.0**	**-**

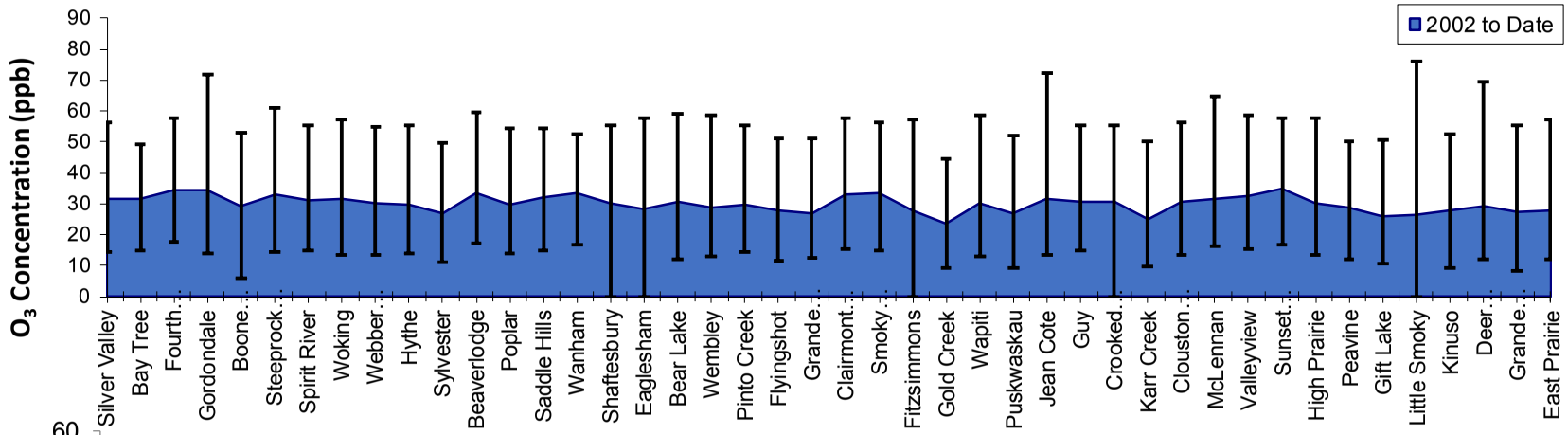
Alberta Ambient Air Quality Objective - 30-day SO_2 Objective is 11 ppb

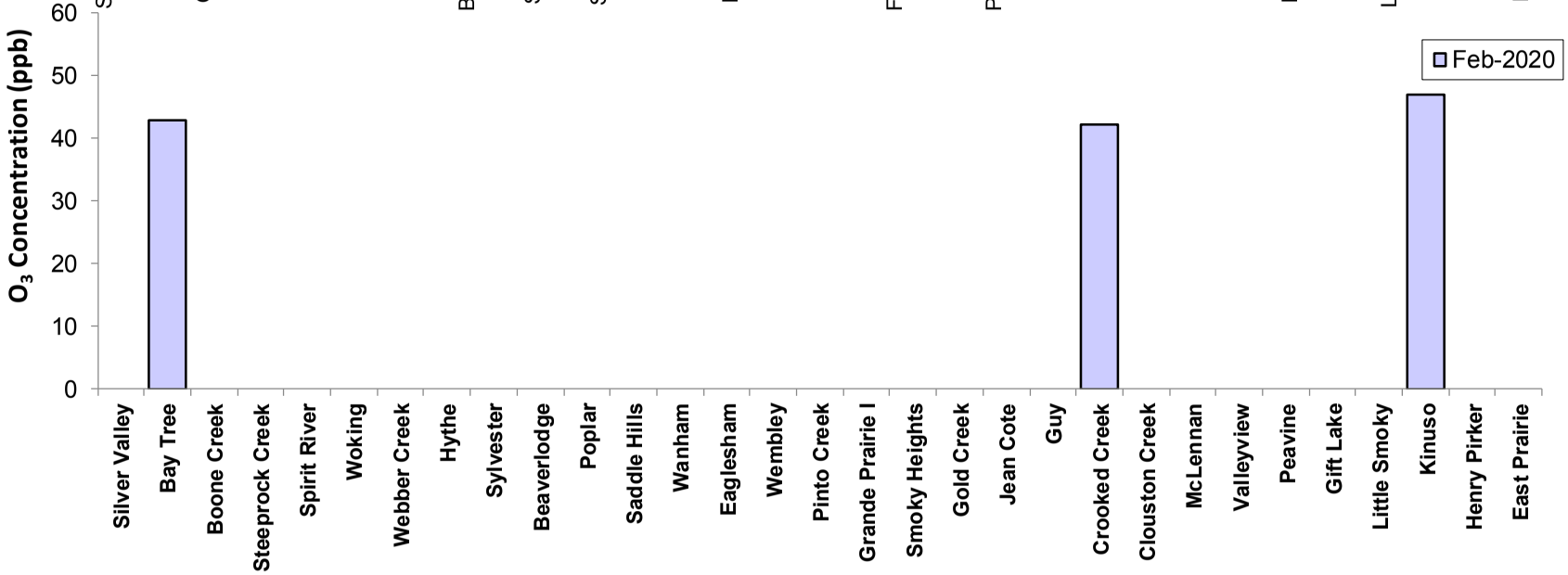


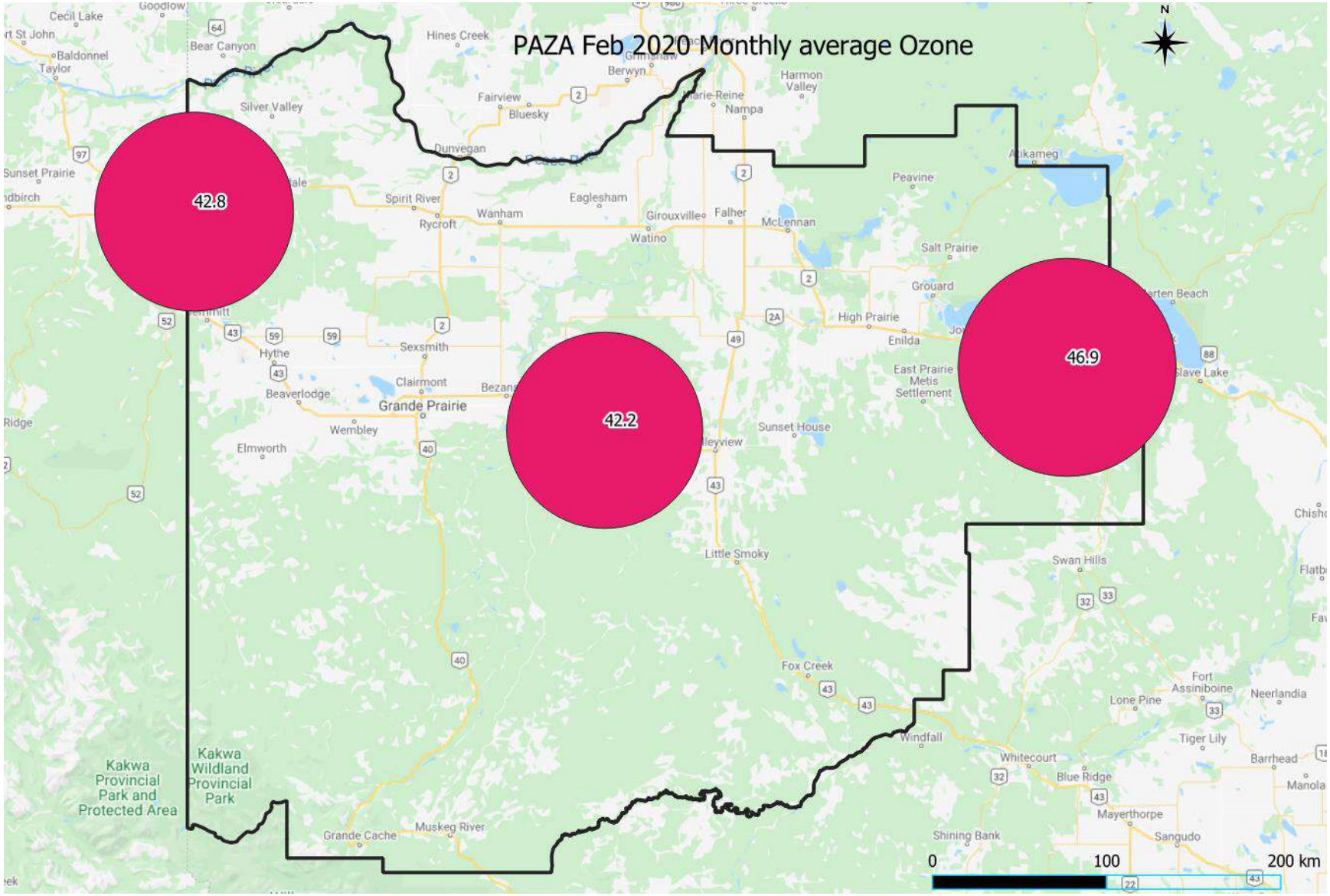



PAZA Feb 2020 Monthly average Sulphur Dioxide
N
30 day objective
11
0
100
200 km
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park
Bear Canyon
Bonanza
Gordondale
Dawson Creek
Pouce Coupe
Tomslake
Demmitt
Hythe
Sexsmith
Clairmont
Bezanson
Elmworth
Wanham
Rycroft
Dunvegan
Fairview
Bluesky
Eaglesham
Watino
Girouxville
Falher
Berwyn
Nampa
Harmon Valley
Salt Prairie
Grouard
High Prairie
Enilda
Joussard
Driftpile
East Prairie Metis Settlement
Lesser Slave Lake
Marten Beach
Canyon Creek
Slave Lake
Crooked Creek
Valleyview
Sunset House
Little Smoky
Fox Creek
Grande Cache
Muskeg River
0.1
0.2
0.3
0.4
0.5
0.6
0.7

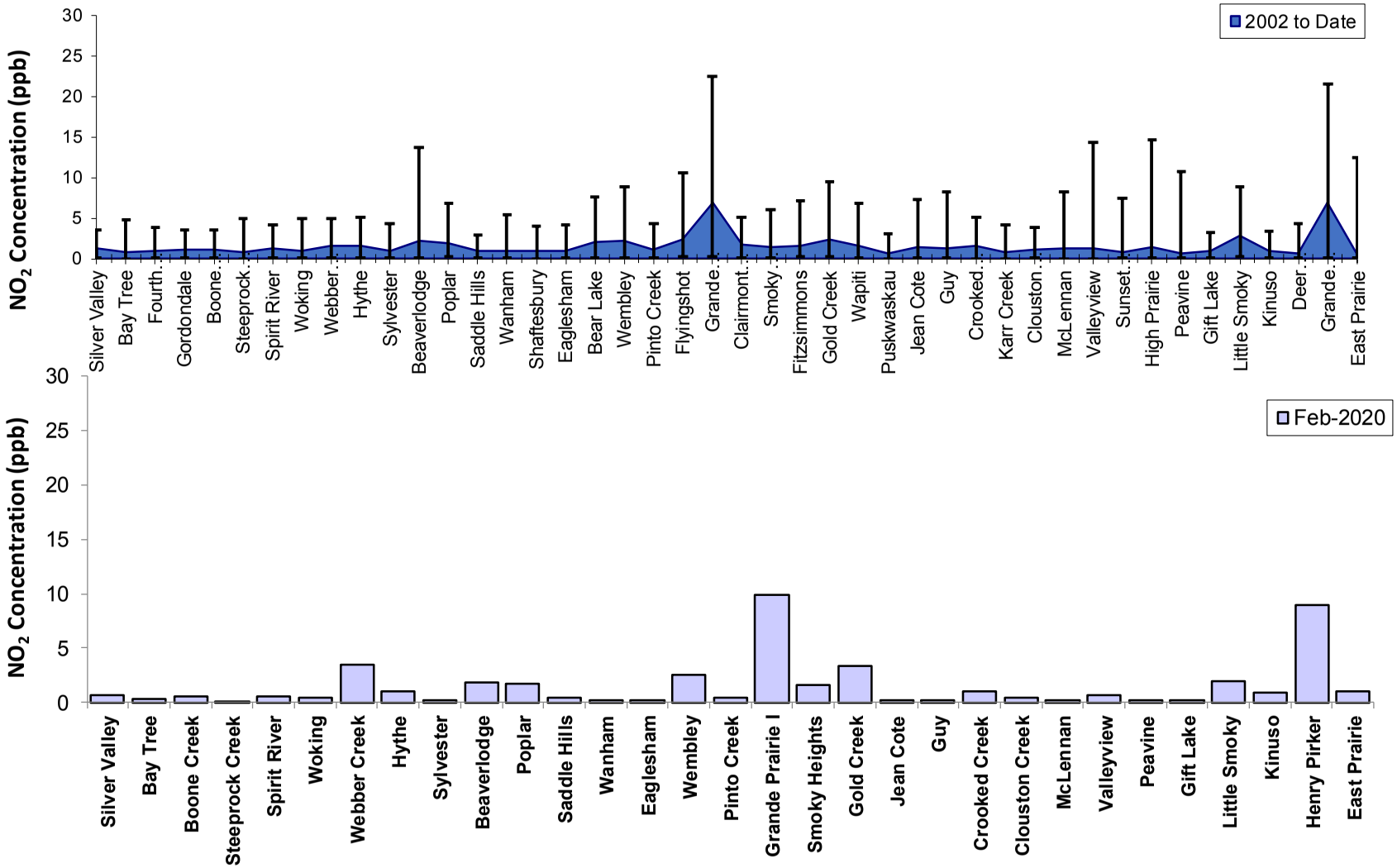
No Monthly or Annual Alberta Ambient Air Quality Objective for O_3

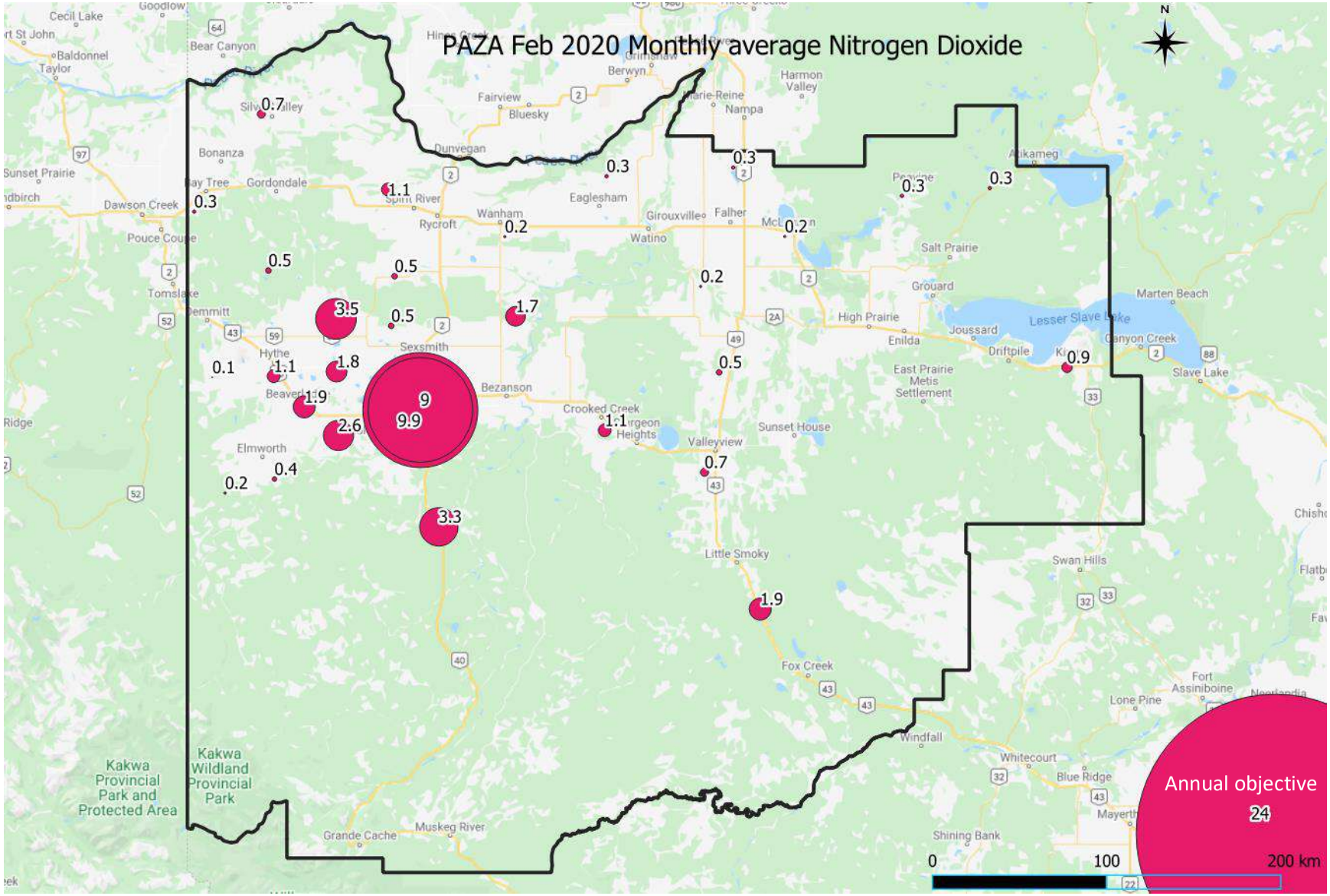




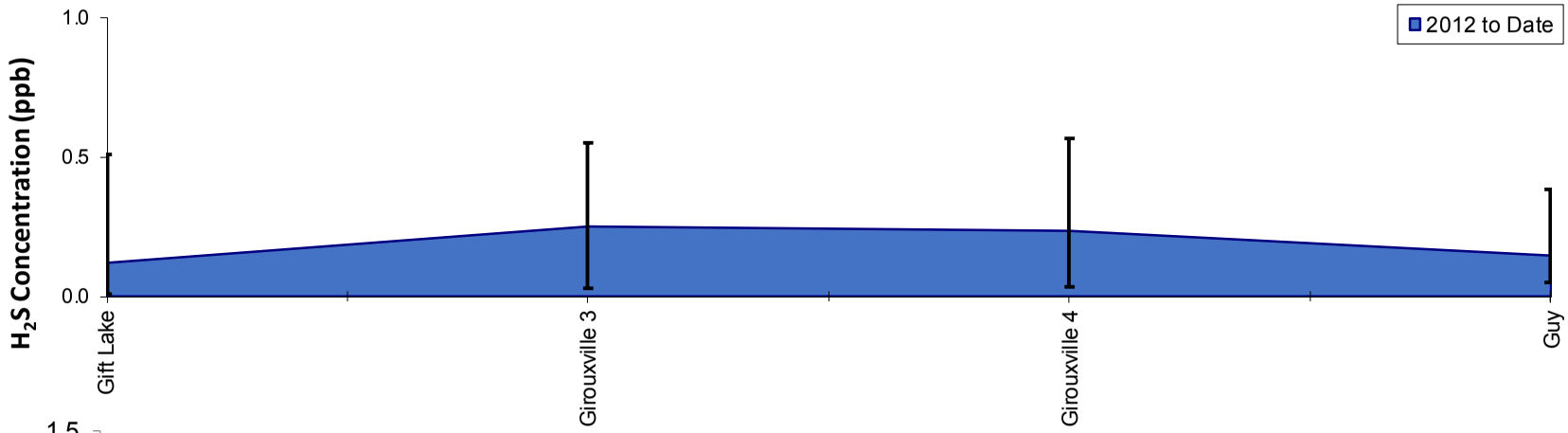

PAZA Feb 2020 Monthly average Ozone
N
42.8
42.2
46.9
0
100
200 km
Cecil Lake
Baldonnel
Taylor
Bear Canyon
Hines Creek
Berwyn
Harmon Valley
Fairview
Bluesky
Nampa
Silver Valley
Dunvegan
Sunset Prairie
Spirit River
Rycroft
Wanham
Eaglesham
Girouxville
Falher
McLennan
Watino
Peavine
Salt Prairie
Grouard
High Prairie
Enilda
East Prairie Metis Settlement
Sexsmith
Hythe
Clairmont
Beaverlodge
Grande Prairie
Wembley
Elmworth
Sunset House
Little Smoky
Swan Hills
Fox Creek
Windfall
Whitecourt
Blue Ridge
Mayerthorpe
Sangudo
Shining Bank
Lone Pine
Fort Assiniboine
Neerlandia
Tiger Lily
Barrhead
Manola
Slave Lake
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park
Grande Cache
Muskeg River

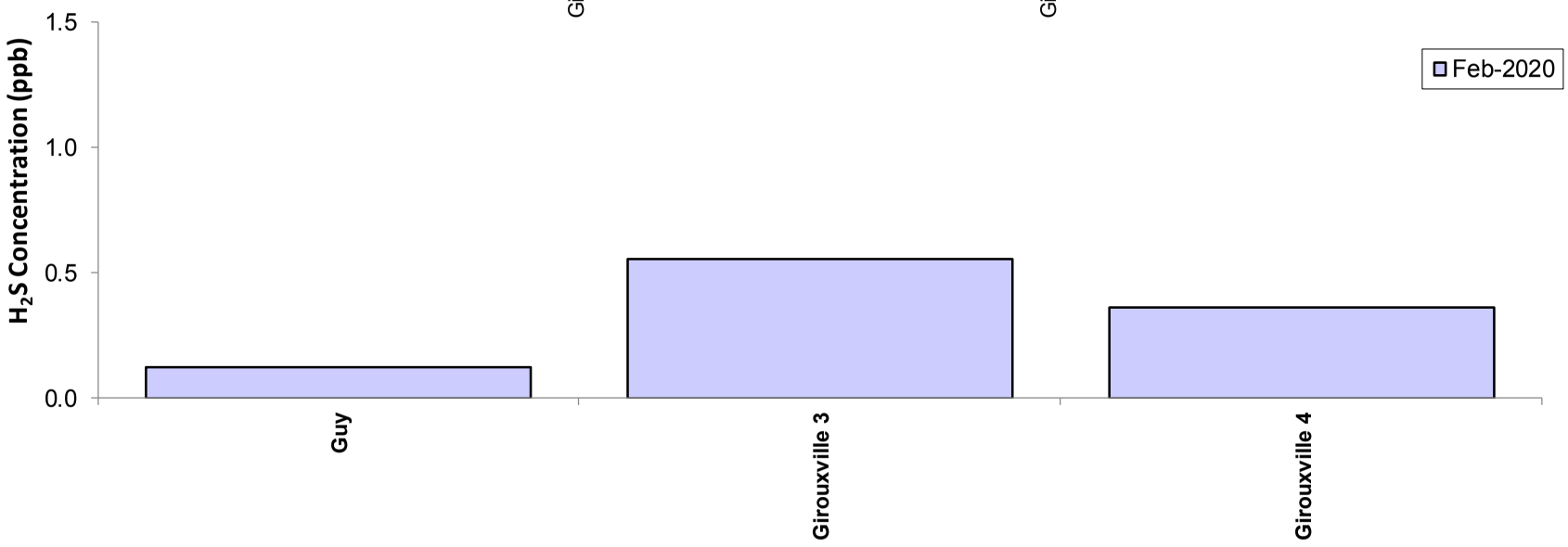
Alberta Ambient Air Quality Objective - Annual NO_2 Objective is 24 ppb

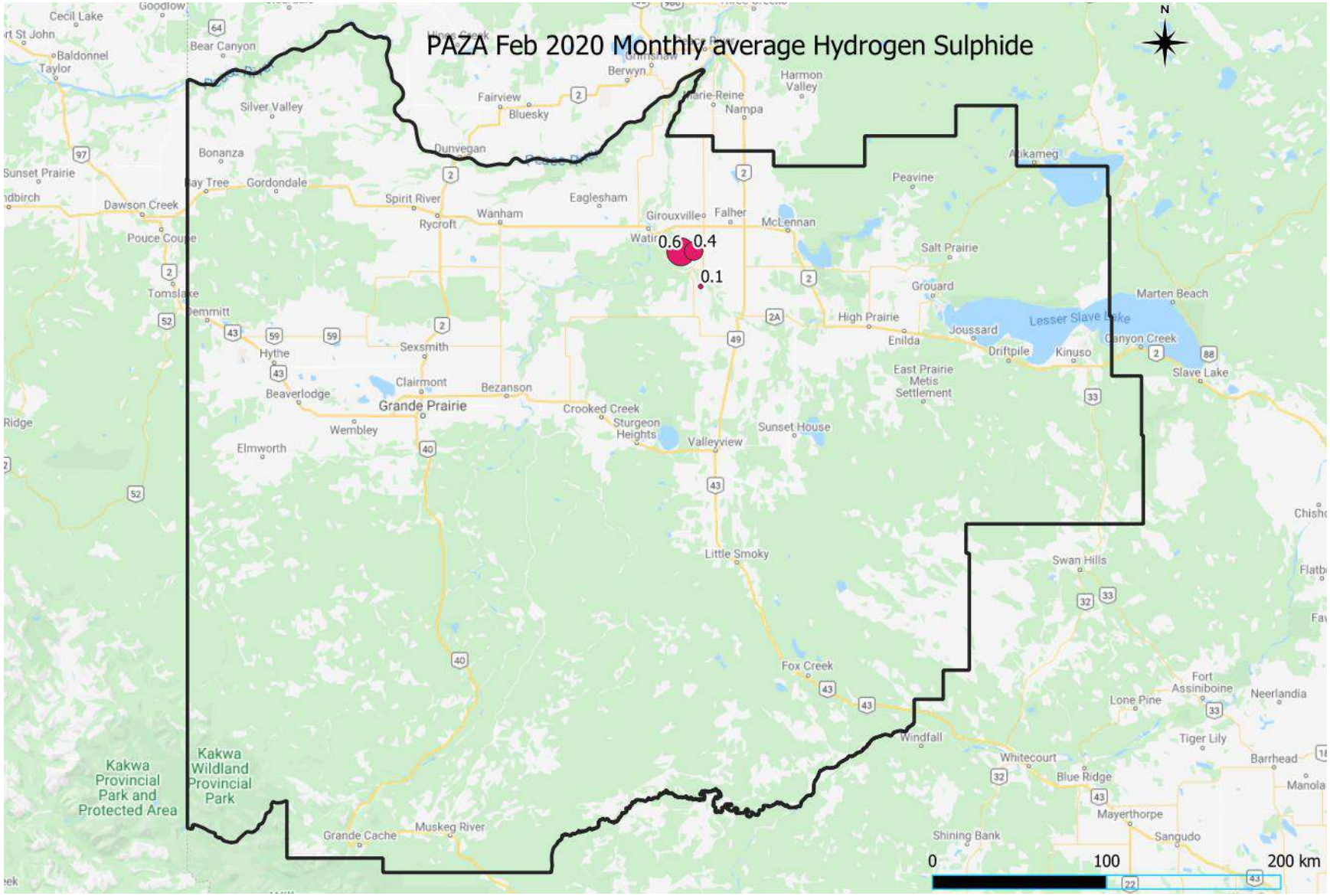



PAZA Feb 2020 Monthly average Nitrogen Dioxide
N
Annual objective
24
0
100
200 km
0.7
0.3
1.1
0.3
0.3
0.3
0.3
0.2
0.2
0.5
0.5
0.2
3.5
0.5
1.7
0.1
1.1
1.8
9
9.9
1.9
2.6
0.5
1.1
0.9
0.4
0.2
0.7
3.3
1.9
Cecil Lake
Baldonnel
Taylor
Bear Canyon
Berwyn
Harmon Valley
Fairview
Bluesky
Nampa
Dunvegan
Bonanza
Sunset Prairie
Gordondale
Dawson Creek
Pouce Coupe
Eaglesham
Wanham
Rycroft
Girouxville
Watino
Falher
Salt Prairie
Grouard
Marten Beach
Lesser Slave Lake
High Prairie
Enilda
Joussard
Driftpile
Canyon Creek
Slave Lake
East Prairie Metis Settlement
Tomslake
Demmitt
Hythe
Sexsmith
Bezanson
Crooked Creek
Sunset House
Valleyview
Elmworth
Little Smoky
Swan Hills
Fox Creek
Fort Assiniboine
Lone Pine
Windfall
Whitecourt
Blue Ridge
Mayerthorpe
Shining Bank
Grande Cache
Muskeg River
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park

No Monthly or Annual Alberta Ambient Air Quality Objective for H_2S






PAZA Feb 2020 Monthly average Hydrogen Sulphide
N
0.6
0.4
0.1
0
100
200 km
Grande Prairie
Kakwa Provincial Park and Protected Area
Kakwa Wildland Provincial Park
Lesser Slave Lake
Girouxville
Falher
McLennan
Sexsmith
Hythe
Beaverlodge
Clairmont
Bezanson
Wembley
Elmworth
Crooked Creek
Sturgeon Heights
Valleyview
Sunset House
Little Smoky
Fox Creek
Swan Hills
Whitecourt
Blue Ridge
Mayerthorpe
Sangudo
Shining Bank
Windfall
Grande Cache
Muskeg River
Dawson Creek
Tomslake
Pouce Coupe
Dunvegan
Bonanza
Silver Valley
Fairview
Bluesky
Berwyn
Nampa
Harmon Valley
Peavine
Salt Prairie
Grouard
High Prairie
Enilda
Joussard
Driftpile
Kinuso
East Prairie Metis Settlement
Marten Beach
Canyon Creek
Slave Lake
Spirit River
Rycroft
Wanham
Eaglesham
Gordondale
Bay Tree
Cecil Lake
Baldonnel
Taylor
Bear Canyon
Sunset Prairie
Goodlow
Fort Assiniboine
Lone Pine
Neerlandia
Tiger Lily
Barrhead
Manola

11 End of Report

End of Report

Peace Airshed Zone Association

Ambient Air Monitoring Report

February 2020