



Peace Airshed Zone Association

Ambient Air Monitoring Network Summary

Ambient Air Quality Monitoring Program

Monthly Report

March 2020

April 25, 2020

Alberta Environment and Parks

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

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

Please find enclosed the PAZA Ambient Air Quality Monitoring Network Report for the month of March 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 March 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 were no exceedances of the AAAQO in March 2020

Operational times less than 90 percent:

There were no operational times less than 90% in March 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 seven duplicate sites sampled in the month of March with RPD from 0 to 14%:

For sulphur dioxide duplicates at Webber Creek, Crooked Creek and Peavine stations

For ozone duplicate at Crooked Creek station

For nitrogen dioxide duplicates at Boone Creek, Spirit River, and East Prairie stations

For hydrogen sulphide duplicate at Guy station

Two samples could not be collected at Girouxville 3 and 4 due to accessibility

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.

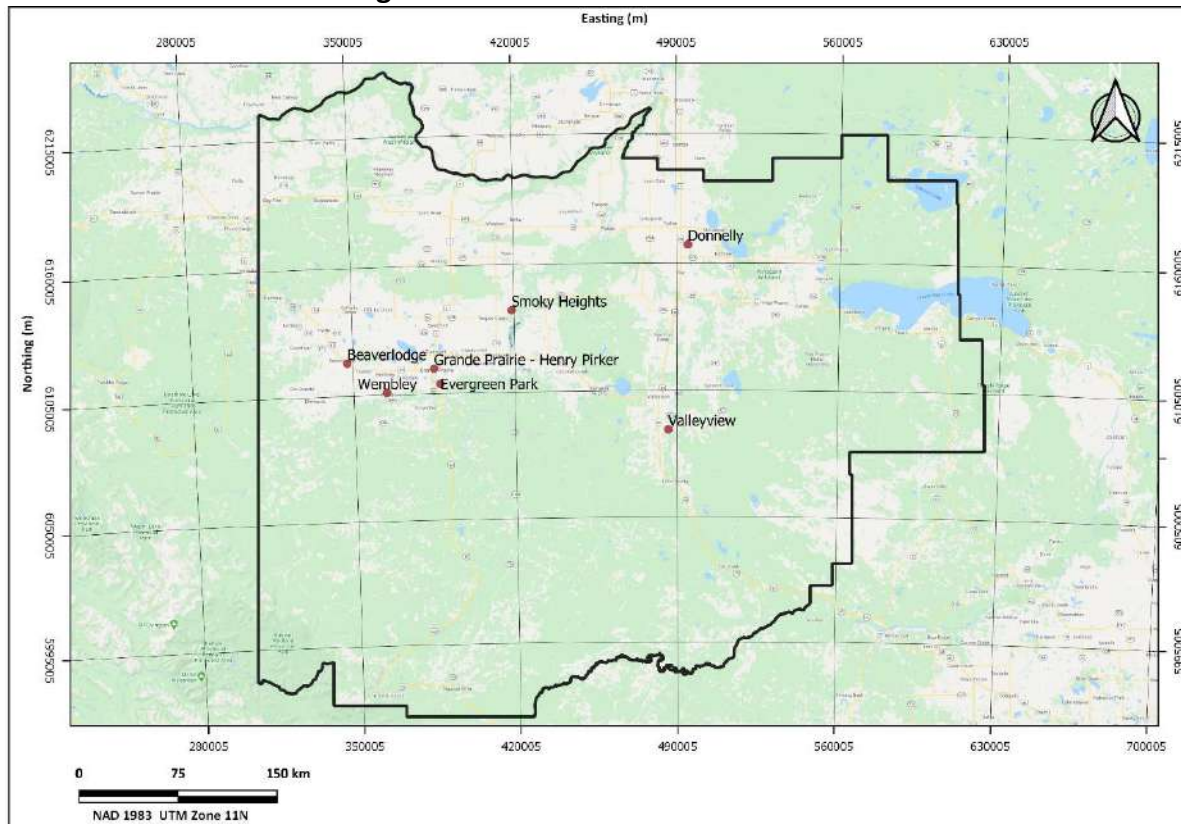


Mandeep Dhaliwal, B.Sc., P.Chem.
Program Manager

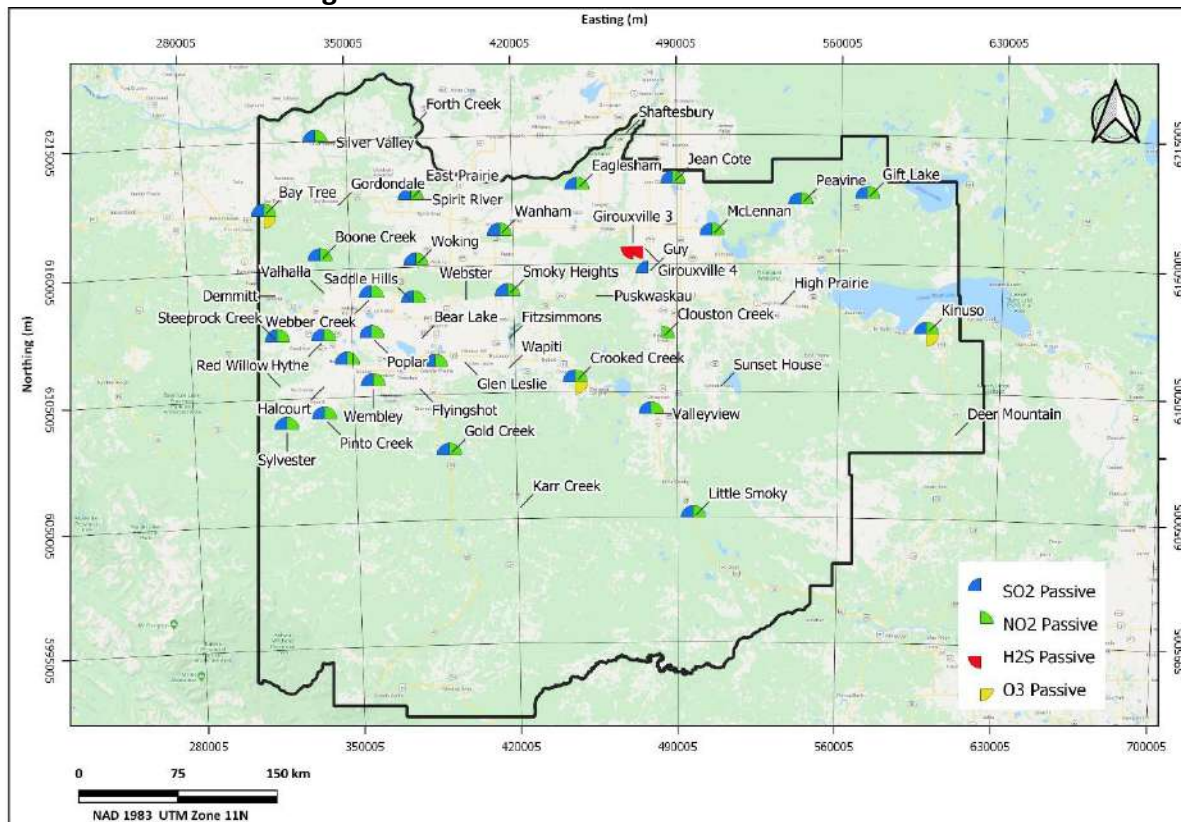
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PAZA Continuous Monitoring Station Locations



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 - March 2020 Beaverlodge Station Report

Parameter	March			Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum	Valid			Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
NO (ppb)	1.1	0.0	95.0%	100.0%	33.1	-	Mar-14 10:00	5.6	-	Mar-14	-	-	-	-	Mar 19, 2020
NO ₂ (ppb)	4.0	0.0	95.0%	100.0%	27.6	159	Mar-14 09:00	10.8	-	Mar-14	0	-	-	-	Mar 19, 2020
NO _x (ppb)	5.1	0.4	95.0%	100.0%	56.5	-	Mar-14 09:00	16.5	-	Mar-14	-	-	-	-	Mar 19, 2020
O ₃ (ppb)	37.0	11.9	95.3%	100.0%	52.6	76	Mar-26 04:00	47.5	-	Mar-26	0	-	-	-	Mar 19, 2020
PM _{2.5} (µg/m ³)	3.6	0.2	99.5%	100.0%	18.2	80	Mar-20 05:00	9.8	29	Mar-19	0	-	0	-	Mar 17, 2020
SO ₂ (ppb)	0.6	0.0	95.3%	100.0%	13.8	172	Mar-16 17:00	1.4	48	Mar-30	0	-	0	0	Mar 17, 2020
Average															
Temp (°C)	-7.6	-29.1	100.0%	100.0%	5.4										
RH (%)	67.2	34.9	100.0%	100.0%	100.0										
WS (km/hr)	12.5	0.2	100.0%	100.0%	52.3										
WD (deg)	297	0.2	100.0%	100.0%	359.7										

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

Average Wind Direction 297 WNW

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	No Operational issues noted during the month
Met Equip	MetOne	50.5	No Operational issues noted during the month

1.2 Evergreen Park Air Monitoring Station

PAZA - March 2020 Evergreen Park Station Report

Parameter	March			Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum	Valid			Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
PM _{2.5} (µg/m ³)	3.1	0.0	99.6%	100.0%	23.0	80	Mar-16 09:00	8.0	29	Mar-16	0	-	0	-	Mar-10-2020
SO ₂ (ppb)	0.4	0.0	94.9%	100.0%	15.7	172	Mar-25 12:00	1.9	48	Mar-25	0	-	0	0	Mar-10-2020
TRS (ppb)	0.5	0.0	95.2%	100.0%	3.8	-	Mar-08 07:00	0.9	-	Mar-16	-	-	-	-	Mar-10-2020
Average															
Temp (°C)	-8.0	-31.4	100.0%	100.0%	7.2										
RH (%)	66.5	27.5	100.0%	100.0%	95.9										
WS (km/hr)	4.5	0.1	100.0%	100.0%	18.1										
WD (deg)	281	2.0	100.0%	100.0%	359.8										

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

Average Wind Direction 281 W

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	GI/Young	MetPak/RMY86004	No Operational issues noted during the month

1.3 Grande Prairie - Henry Pirker Air Monitoring Station

PAZA - March 2020 Henry Pirker Station Report

Parameter	March				Operational	1-hour			8-hour / 24-hour			Exceedance				Calibration Date
	Average	Minimum	Valid			Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	
NO (ppb)	2.7	0.0	88.2%	94.6%	69.4	-	-	Mar-01 11:00	12.7	-	Mar-01	-	-	-	-	Mar 14, 2020
NO ₂ (ppb)	10.0	1.2	88.2%	94.6%	46.9	159	-	Mar-09 21:00	25.8	-	Mar-16	0	-	-	-	Mar 14, 2020
NO _x (ppb)	12.8	1.3	88.2%	94.6%	101.8	-	-	Mar-01 11:00	35.7	-	Mar-16	-	-	-	-	Mar 14, 2020
O ₃ (ppb)	29.5	0.1	95.2%	100.0%	48.4	76	-	Mar-26 14:00	39.8	-	Mar-26	0	-	-	-	Mar 03, 2020
PM _{2.5} (µg/m ³)	4.0	0.4	99.9%	100.0%	30.2	80	-	Mar-01 08:00	10.9	29	Mar-20	0	-	0	-	Mar 04, 2020
SO ₂ (ppb)	0.4	0.0	95.0%	100.0%	9.6	172	-	Mar-11 15:00	1.4	48	Mar-15	0	-	0	0	Mar 03, 2020
H ₂ S (ppb)	0.2	0.0	95.0%	99.7%	1.6	10	-	Mar-09 08:00	0.6	3	Mar-20	0	-	0	-	Mar 04, 2020
CH ₄ (ppm)	1.8	1.6	95.0%	100.0%	2.5	-	-	Mar-16 08:00	2.0	-	Mar-16	-	-	-	-	Mar 02, 2020
THC (ppm)	1.8	1.6	95.0%	100.0%	3.1	-	-	Mar-16 07:00	2.3	-	Mar-16	-	-	-	-	Mar 02, 2020
NMHC (ppm)	0.0	0.0	95.0%	100.0%	0.6	-	-	Mar-16 04:00	0.2	-	Mar-16	-	-	-	-	Mar 02, 2020
CO (ppm)	0.2	0.1	95.0%	100.0%	1.1	13	-	Mar-09 08:00	0.4	5	Mar-09	0	0	-	-	Mar 02, 2020
	Average	Minimum	Valid	Operational	Maximum											
Temp (°C)	-7.7	-32.2	100.0%	100.0%	8.7	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%										
RH (%)	60.7	30.0	100.0%	100.0%	86.4											
SR (W/m ²)	98.0	0.0	100.0%	100.0%	575.8											
WS (km/hr)	8.0	0.1	97.3%	97.3%	29.4											
WD (deg)	294	0.0	97.3%	97.3%	359.6											
										Average Wind Direction 294 WNW						

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	Thermo	42i	March 8 failure resulted in second and third calibration on March 9 and 14, time flagged for work
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
H ₂ S	TEI	450i	No Operational issues noted during the month
THC/CH ₄ /NMHC	TEI	55i	Replaced hydrogen & nitrogen cylinders
CO	TEI	48i-TLE	No Operational issues noted during the month
Met Equip	MetOne	50.5	Several hours removed due to shifting signal

1.4 Smoky Heights Air Monitoring Station

PAZA - March 2020 Smoky Heights Station Report

March					1-hour			24-hour			Exceedance				Calibration
Parameter	Average	Minimum	Valid	Operational	Max	Objective	Max Day and Time	Max	Objective	Max Day	1hr	8hr	24hr	30d	Date
PM _{2.5} (µg/m³)	2.8	0.0	99.6%	100.0%	27.0	80	Mar-20 23:00	10.2	29	Mar-20	0	-	0	-	Mar 20, 2020
SO ₂ (ppb)	0.6	0.0	95.0%	100.0%	24.6	172	Mar-15 11:00	4.4	48	Mar-15	0	-	0	0	Mar 20, 2020
TRS (ppb)	0.1	0.0	94.9%	100.0%	0.5	-	Mar-16 13:00	0.2	-	Mar-16	-	-	-	-	Mar 20, 2020
	Average	Minimum	Valid	Operational	Maximum										
Temp (°C)	-8.6	-30.7	99.9%	99.9%	4.8	Note: Valid hours must be greater than 75% Operational hours must be greater than 90%									
WS (km/hr)	13.6	0.3	100.0%	100.0%	59.2										
WD (deg)	285	0.0	100.0%	100.0%	360.0										
										Average Wind Direction285WNW					

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	No Operational issues noted during the month
Met Equip	MetOne	50.5	No Operational issues noted during the month

1.5 Valleyview Air Monitoring Station

PAZA - March 2020 Valleyview Station Report

Parameter	March			Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum	Valid			Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
SO ₂ (ppb)	0.2	0.0	95.2%	100.0%	2.4	172	Mar-30 09:00	0.6	48	Mar-19	0	-	0	0	Mar 12, 2020
H ₂ S (ppb)	0.3	0.2	95.2%	100.0%	1.3	10	Mar-18 00:00	0.4	3	Mar-18	0	-	0	-	Mar 12, 2020
	Average	Minimum	Valid	Operational	Maximum	Note: Valid hours must be greater than 75% Operational hours must be greater than 90% Average Wind Direction 321 NW									
Temp (°C)	-7.7	-36.0	100.0%	100.0%	8.5										
RH (%)	72.2	25.4	100.0%	100.0%	100.1										
WS (km/hr)	5.2	0.1	100.0%	100.0%	18.4										
WD (deg)	321	0.0	100.0%	100.0%	359.9										

Update Summary:

Parameter	Make	Model	Equipment summary
SO ₂	TEI	43I-APSCB	No Operational issues noted during the month
H ₂ S	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 - March 2020 Donnelly Station Report

Parameter	March			Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum	Valid			Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
SO ₂ (ppb)	0.3	0.0	95.2%	100.0%	5.8	172	Mar-15 22:00	1.8	48	Mar-15	0	-	0	0	Mar 18, 2020
H ₂ S (ppb)	0.2	0.0	95.0%	100.0%	0.5	10	Mar-07 10:00	0.3	3	Mar-07	0	-	0	-	Mar 18, 2020
	Average	Minimum	Valid	Operational	Maximum	Note: Valid hours must be greater than 75% Operational hours must be greater than 90% Average Wind Direction 258 WSW									
Temp (°C)	-8.3	-29.9	100.0%	100.0%	5.3										
WS (km/hr)	12.3	0.2	100.0%	100.0%	49.1										
WD (deg)	258	0.2	100.0%	100.0%	359.9										

Update Summary:

Parameter	Make	Model	Equipment summary
SO ₂	Teco	43I	No Operational issues noted during the month
H ₂ S	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 - March 2020 Wembley Station Report

Parameter	March			Operational	Max	1-hour		24-hour		Max Day	Exceedance				Calibration Date
	Average	Minimum	Valid			Objective	Max Day and Time	Max	Objective		1hr	8hr	24hr	30d	
NO (ppb)	0.7	0.0	94.4%	100.0%	13.4	-	Mar-20 11:00	2.4	-	Mar-08	-	-	-	-	Mar 13, 2020
NO ₂ (ppb)	3.3	0.3	94.4%	100.0%	23.0	159	Mar-08 20:00	9.6	-	Mar-08	0	-	-	-	Mar 13, 2020
NO _x (ppb)	4.0	0.3	94.4%	100.0%	23.9	-	Mar-08 20:00	12.2	-	Mar-08	-	-	-	-	Mar 13, 2020
O ₃ (ppb)	37.3	10.9	95.0%	100.0%	52.0	76	Mar-26 09:00	48.0	-	Mar-26	0	-	-	-	Mar 13, 2020
PM _{2.5} (µg/m³)	1.9	0.0	98.8%	99.2%	77.1	80	Mar-25 11:00	8.0	29	Mar-25	0	-	0	-	Mar 05, 2020
SO ₂ (ppb)	0.7	0.0	95.0%	100.0%	44.4	172	Mar-24 13:00	5.0	48	Mar-24	0	-	0	0	Mar 13, 2020
TRS (ppb)	0.2	0.0	94.9%	100.0%	1.0	-	Mar-16 12:00	0.3	-	Mar-08	-	-	-	-	Mar 05, 2020
CH ₄ (ppm)	2.0	1.8	94.2%	99.5%	2.8	-	Mar-01 07:00	2.1	-	Mar-01	-	-	-	-	Mar 05, 2020
THC (ppm)	2.0	1.8	94.2%	99.5%	2.8	-	Mar-01 07:00	2.1	-	Mar-01	-	-	-	-	Mar 05, 2020
NMHC (ppm)	0.0	0.0	94.2%	99.5%	0.0	-	Mar-12 00:00	0.0	-	Mar-28	-	-	-	-	Mar 05, 2020
	Average	Minimum	Valid	Operational	Maximum	Note: Valid hours must be greater than 75% Operational hours must be greater than 90% Average Wind Direction 330 NNW									
Temp (°C)	-8.0	-32.9	100.0%	100.0%	7.4										
WS (km/hr)	10.5	0.4	100.0%	100.0%	34.2										
WD (deg)	330	0.4	100.0%	100.0%	359.4										

Update Summary:

Parameter	Make	Model	Equipment summary
NO/NO ₂ /NO _x	TEI	42I	Sample pump replaced + changed carbon between pump and instrument
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	No Operational issues noted during the month
THC/CH ₄ /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 noted

2 Beaverlodge Charts

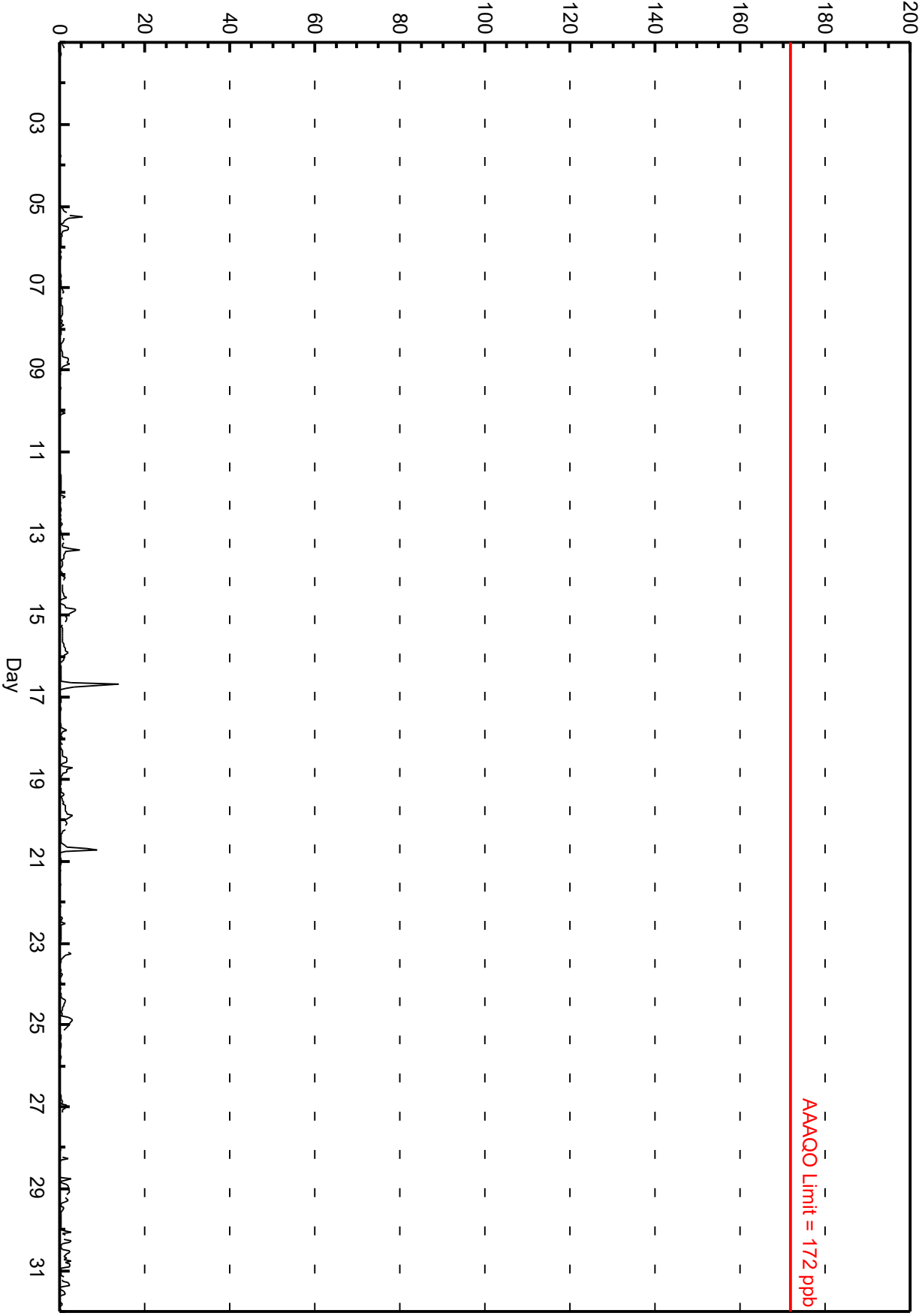
The following pages include the charts and histograms for Beaverlodge Station



Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Beaverlodge - March 2020

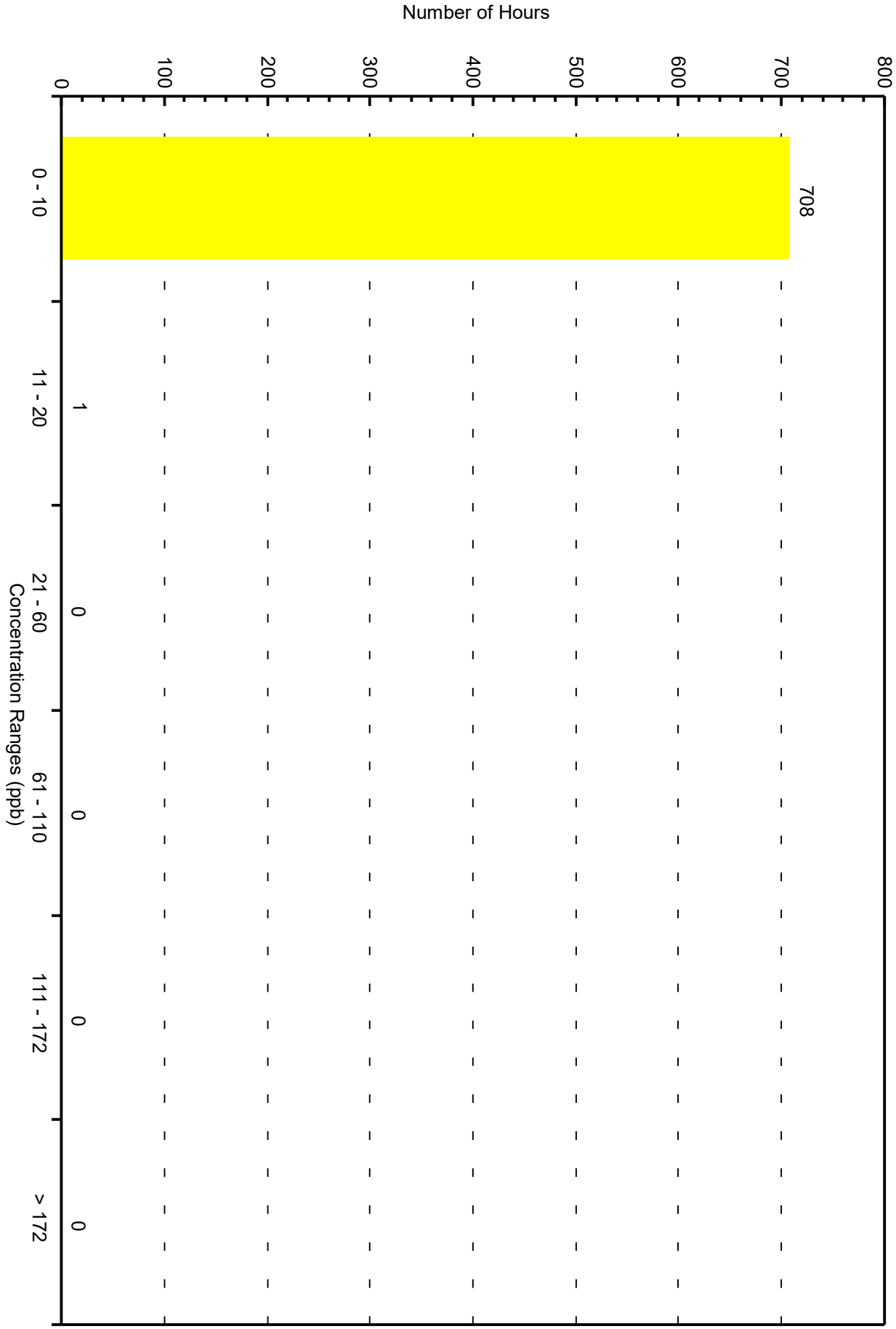




Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Beaverlodge - March 2020

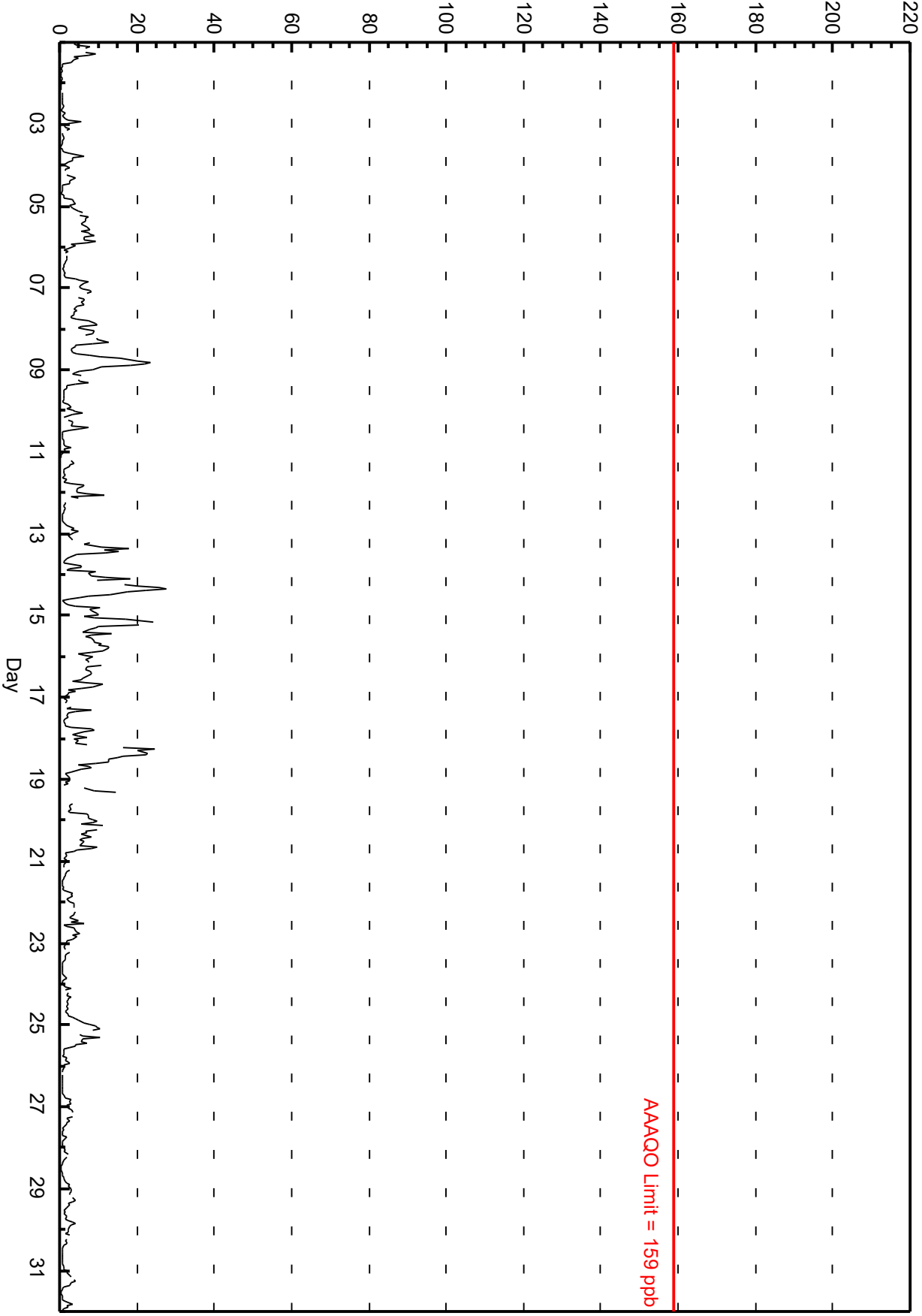




Peace Airshed Zone Association

Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Beaverlodge - March 2020

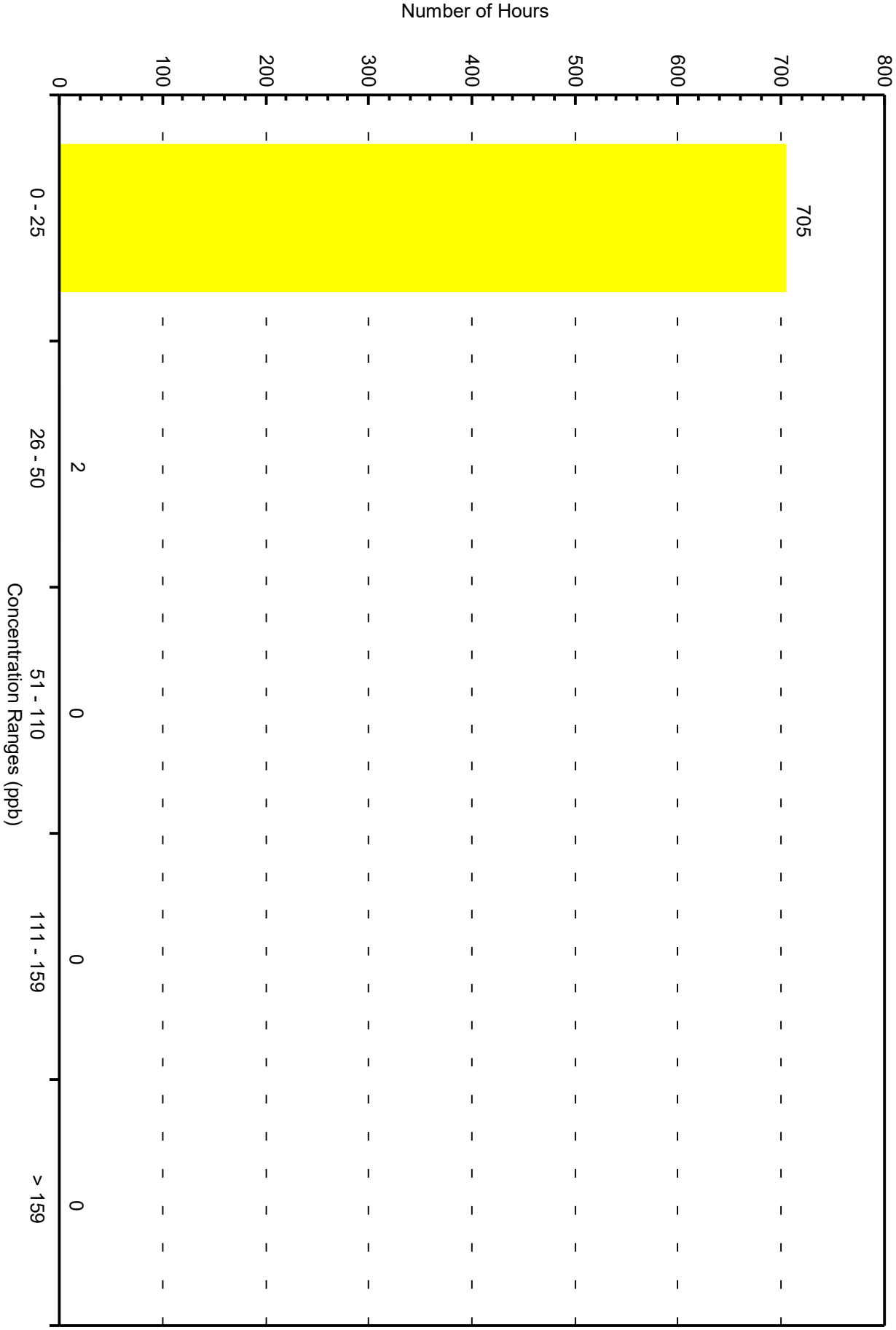




Peace Airshed Zone Association

Histogram of Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Beaverlodge - March 2020

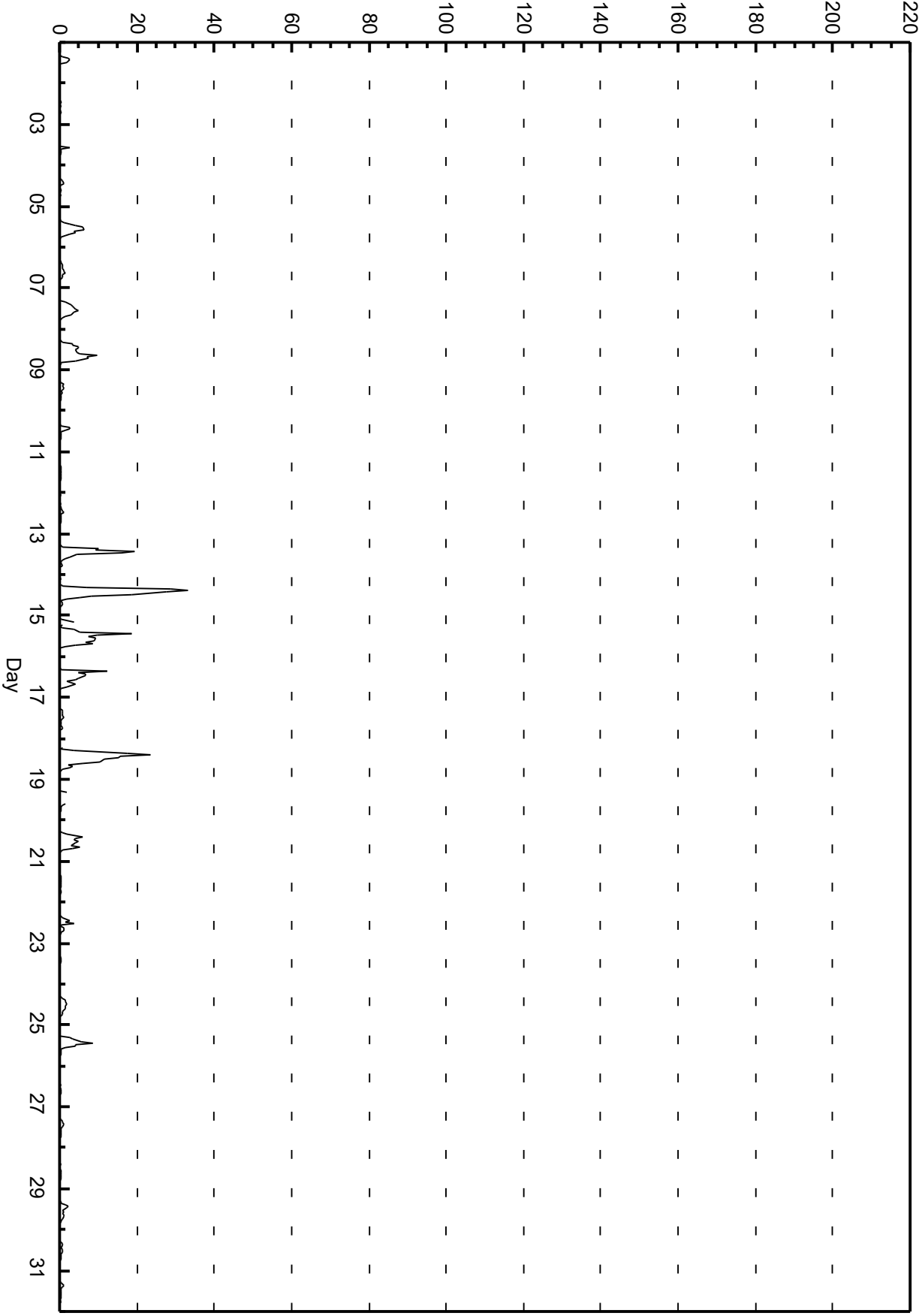




Peace Airshed Zone Association

Hourly Averages

Nitrogen Oxide (NO) - ppb
Beaverlodge - March 2020

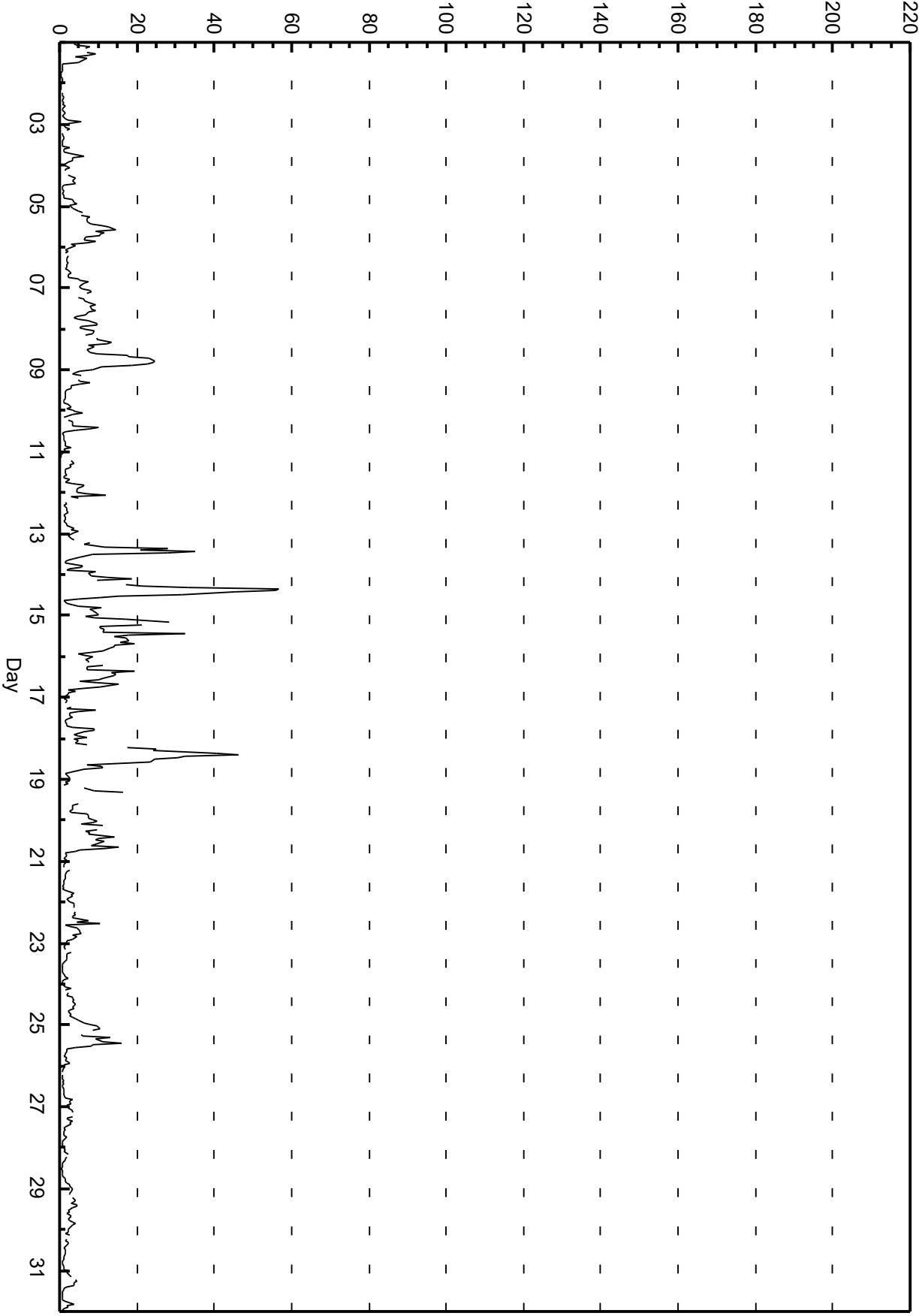




Peace Airshed Zone Association

Hourly Averages

Oxides of Nitrogen (NO_x) - ppb
Beaverlodge - March 2020

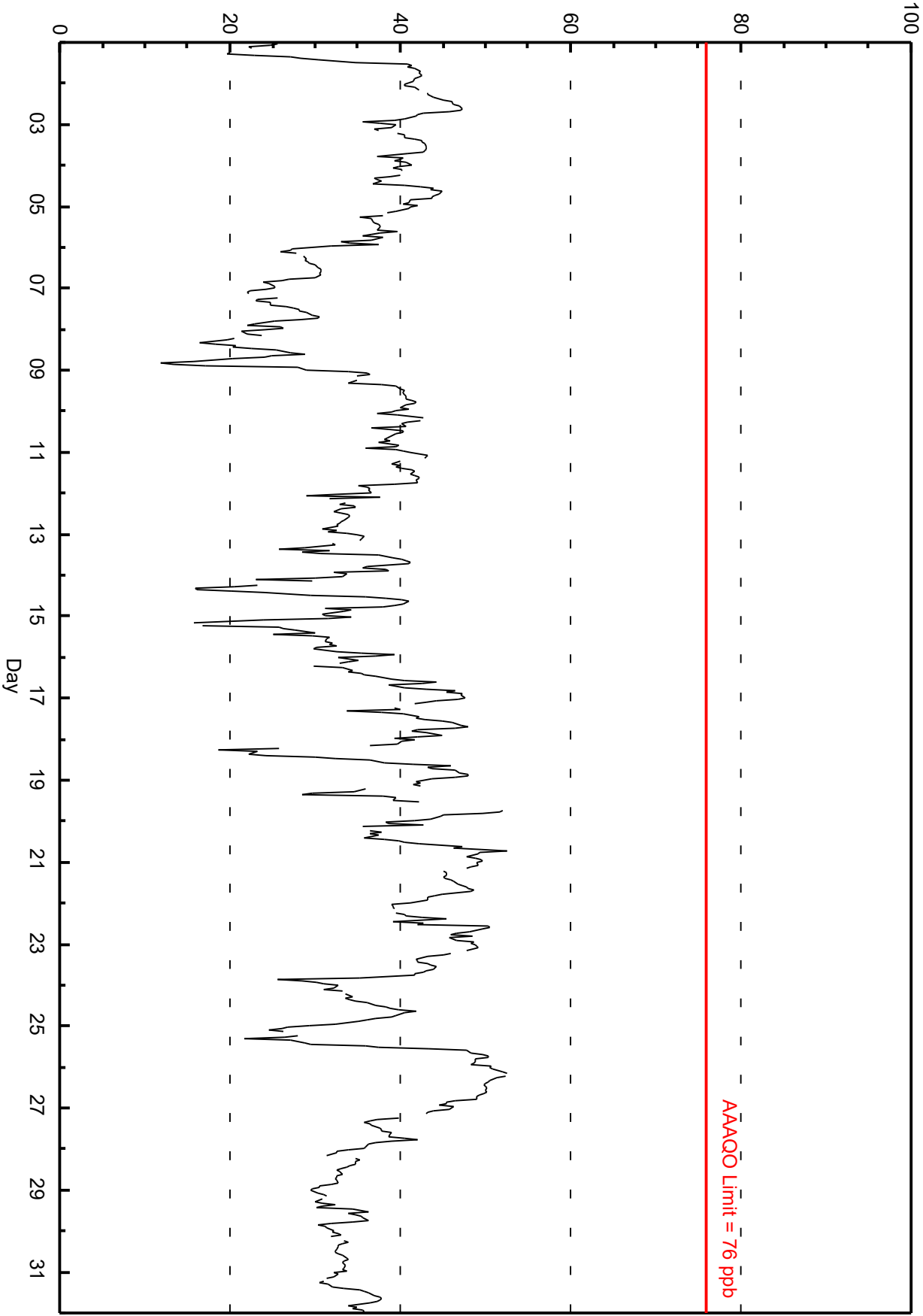




Peace Airshed Zone Association

Hourly Averages

Ozone (O_3) - ppb
Beaverlodge - March 2020

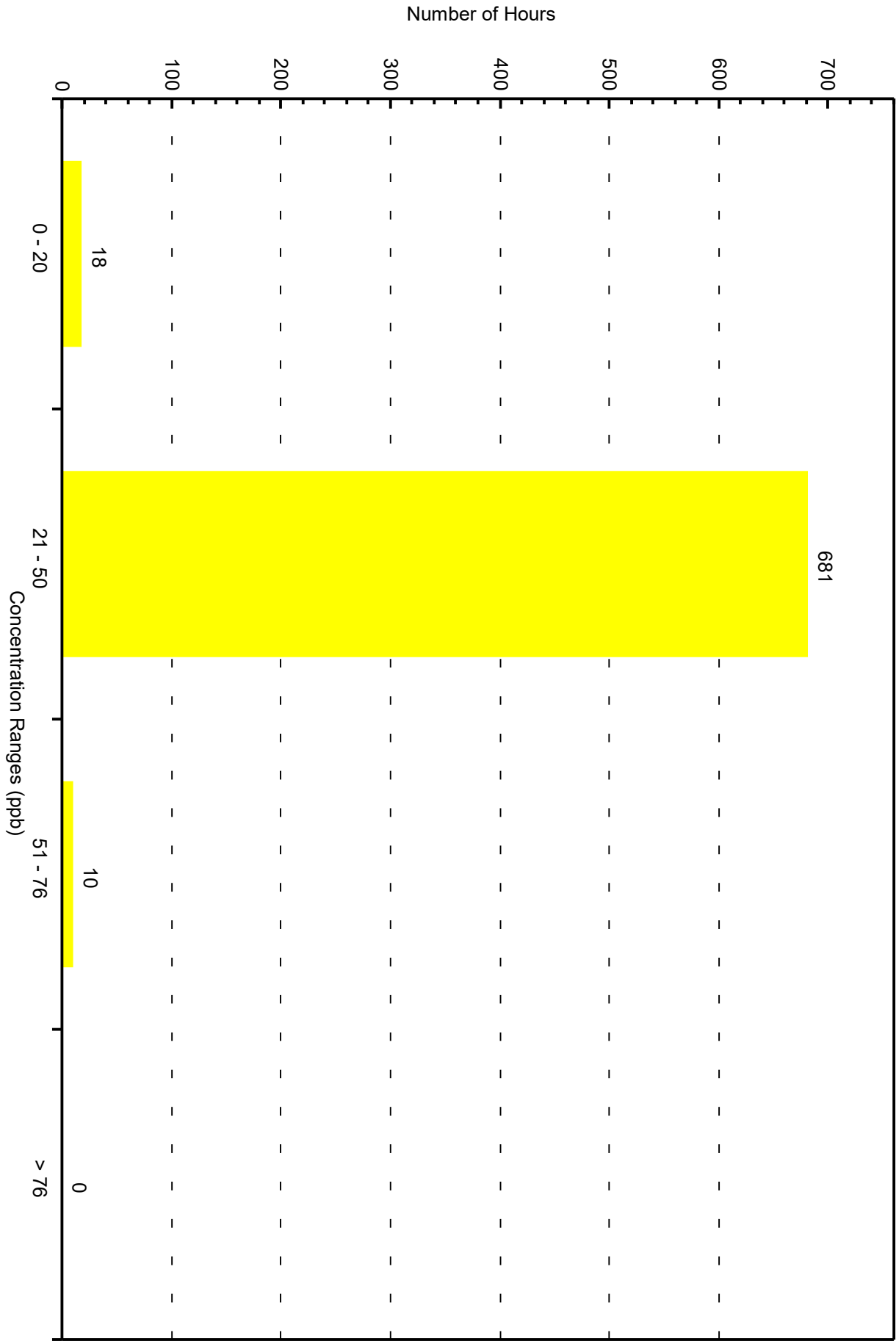




Peace Airshed Zone Association

Histogram of Hourly Averages

Ozone (O₃) - ppb
Beaverlodge - March 2020



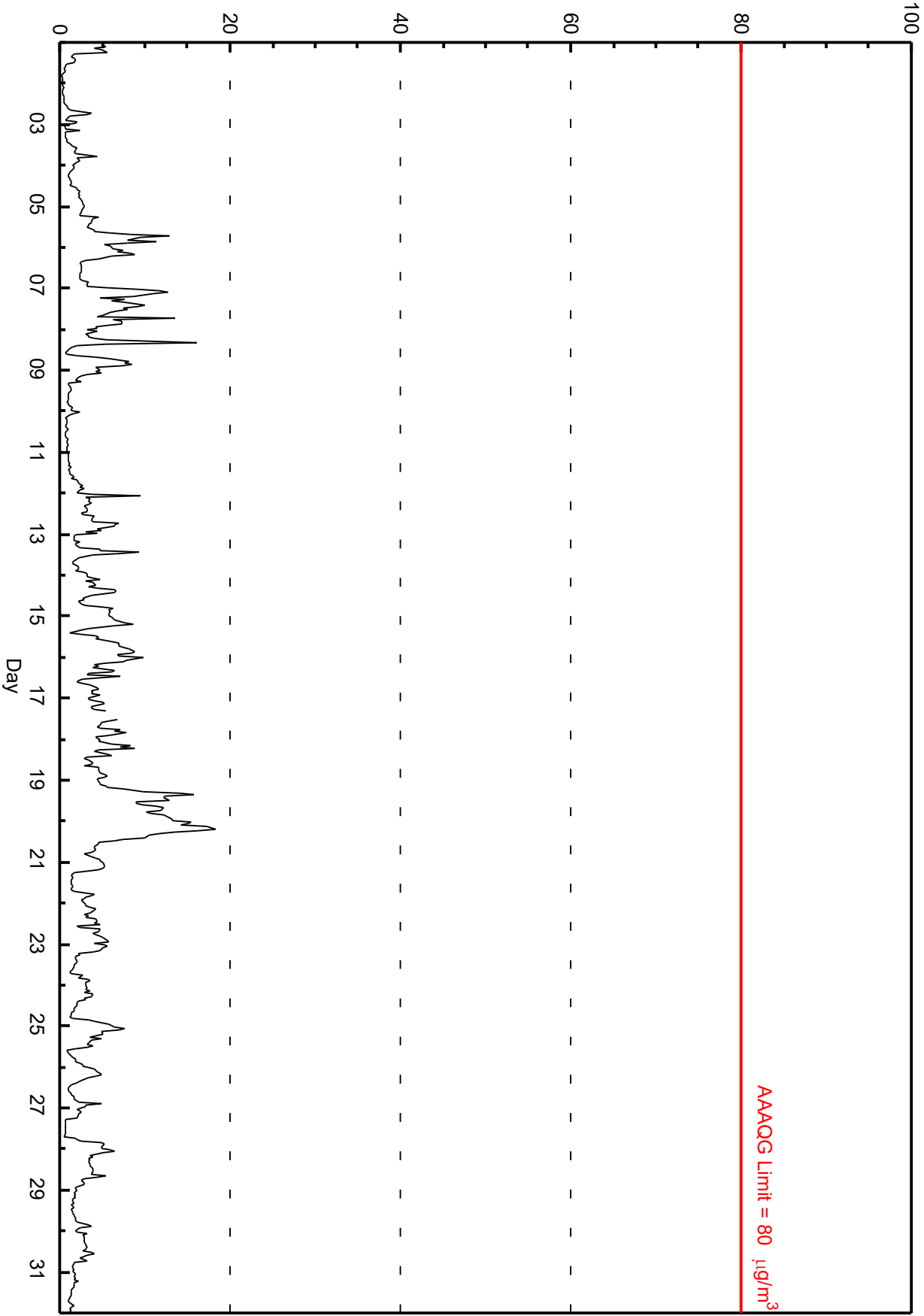


Peace Airshed Zone Association

Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Beaverlodge - March 2020



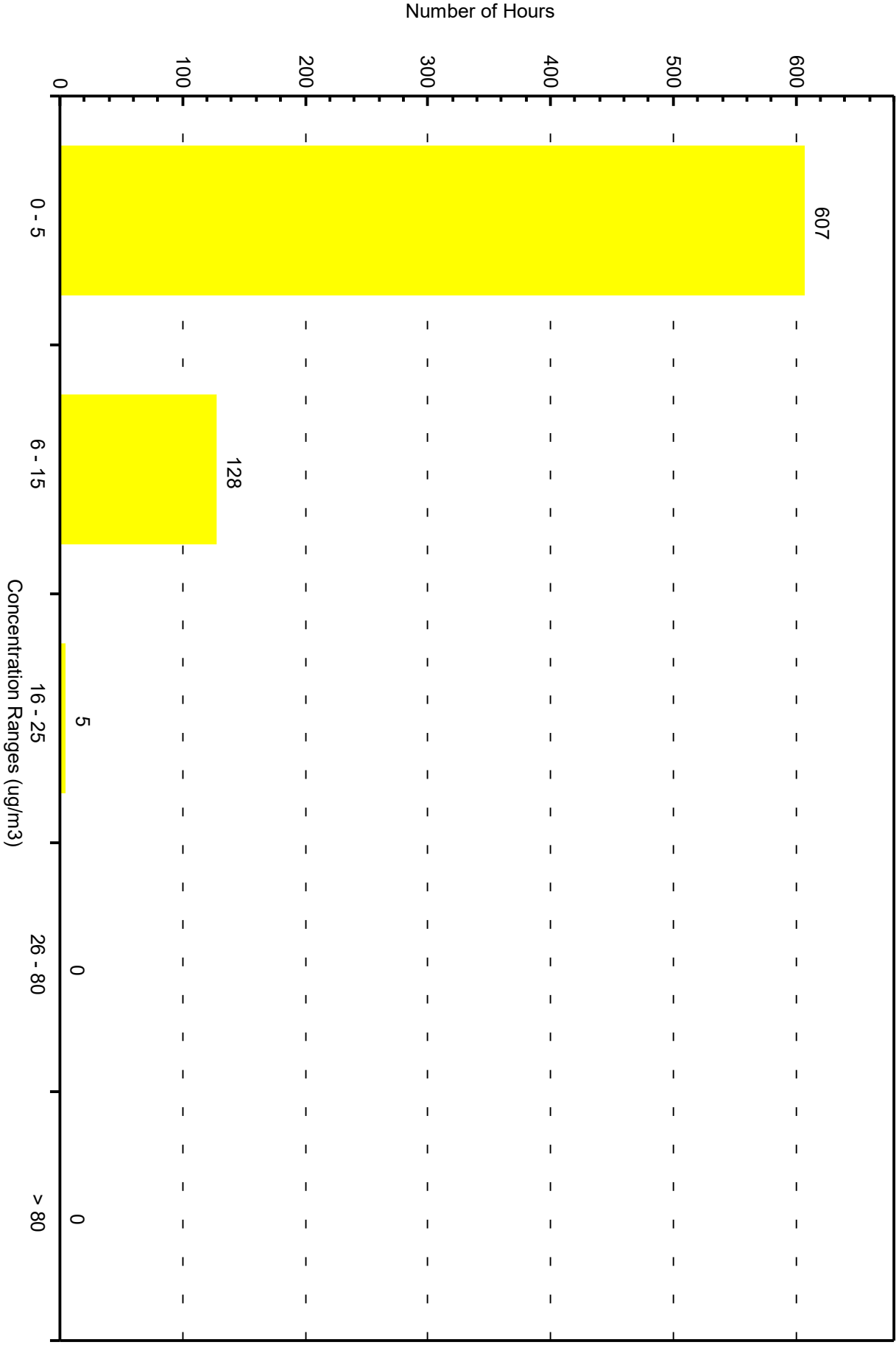


Peace Airshed Zone Association

Histogram of Hourly Averages

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

Beaverlodge - March 2020

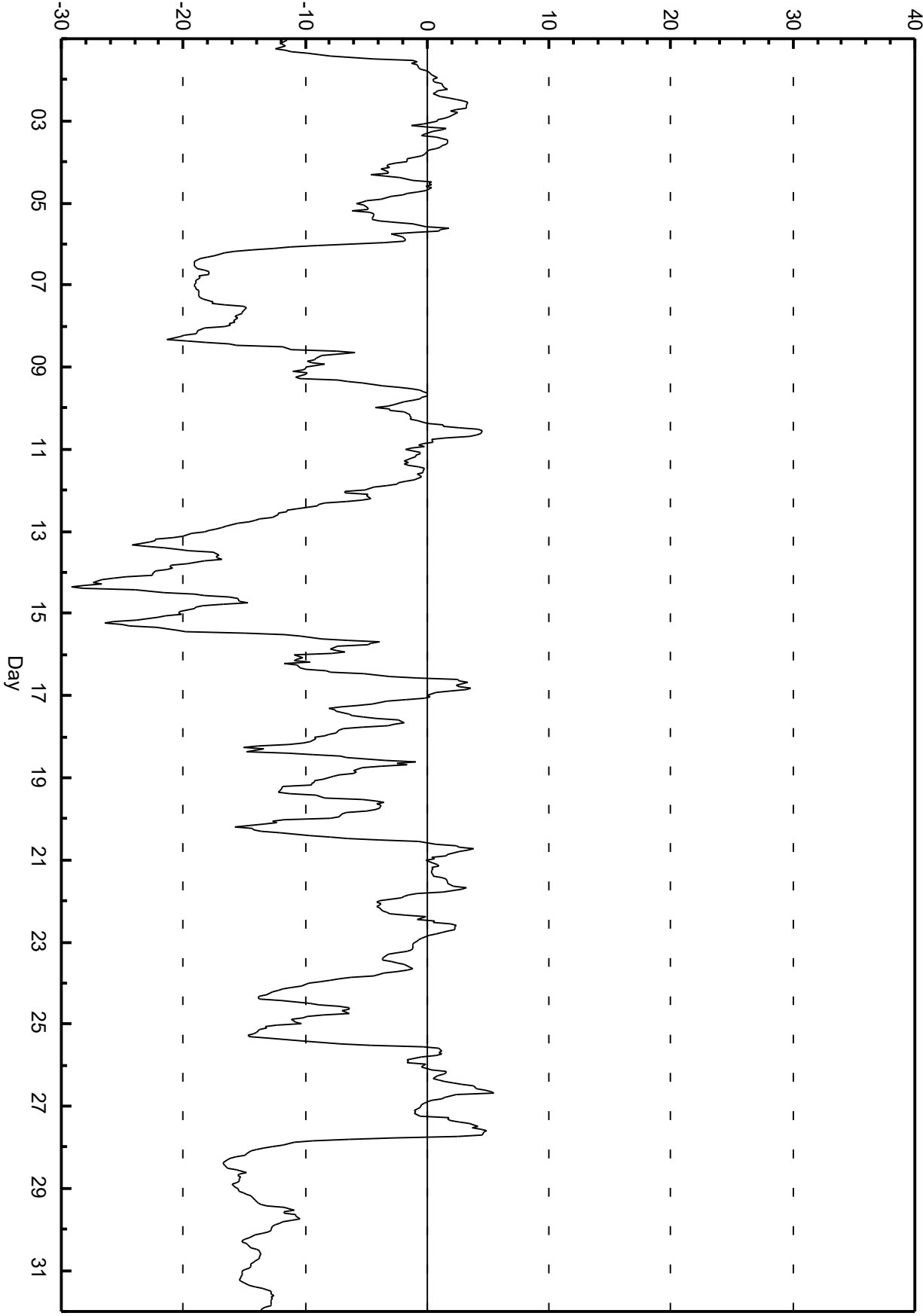




Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C
Beaverlodge - March 2020

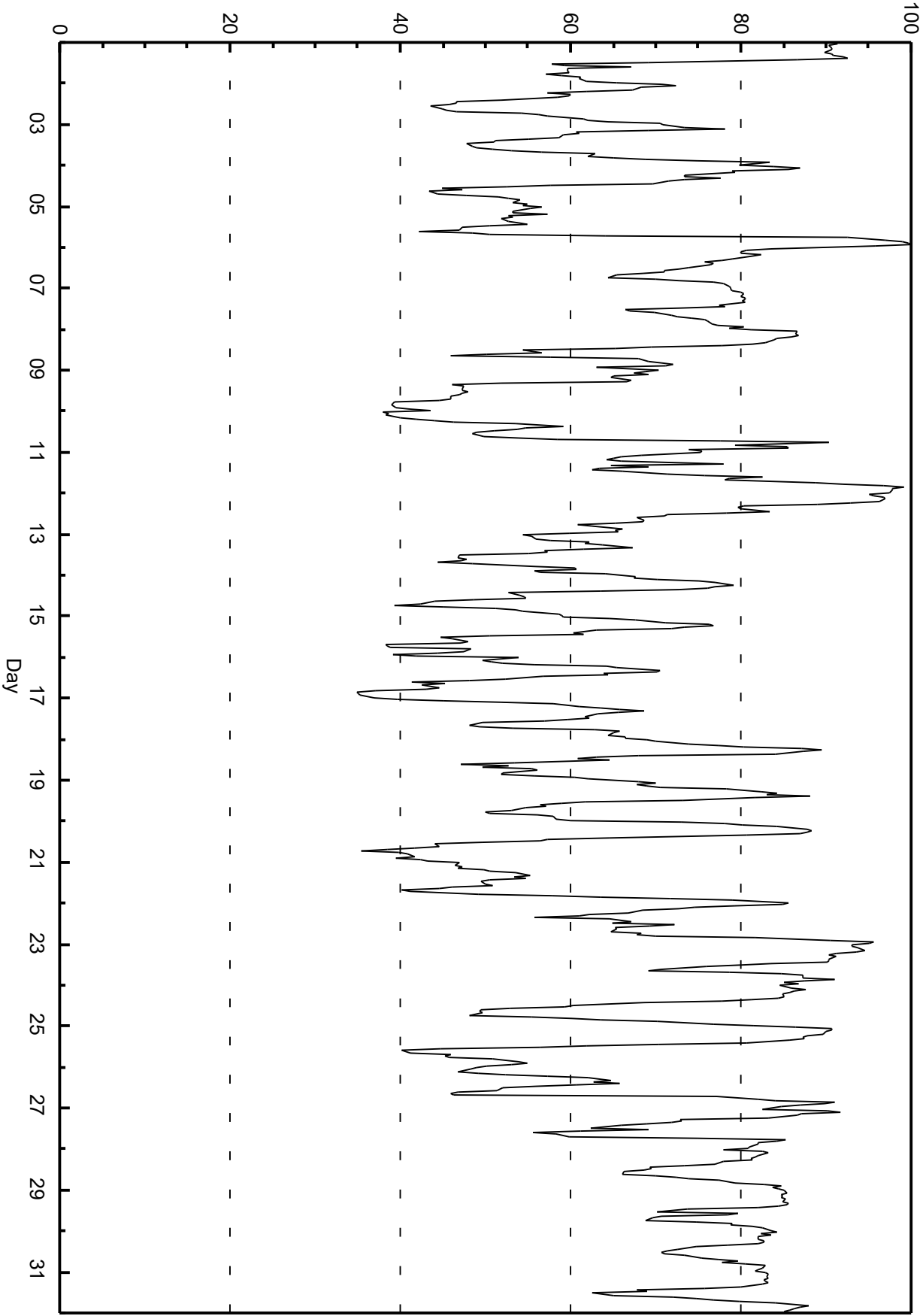




Peace Airshed Zone Association

Hourly Averages

**Relative Humidity (RH) - %
Beaverlodge - March 2020**

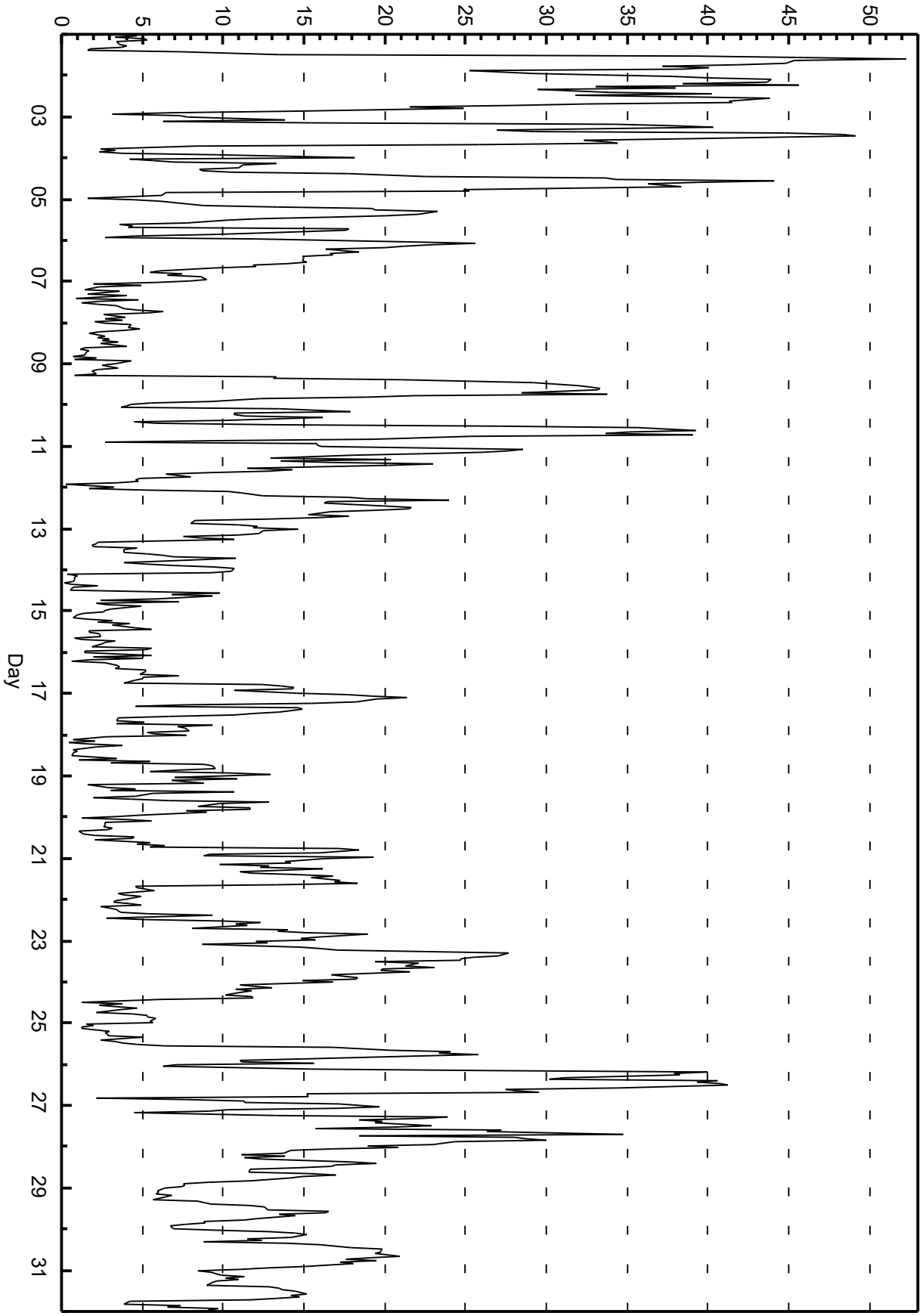




Peace Airshed Zone Association

Hourly Averages

**Wind Speed (WS) - km/h
Beaverlodge - March 2020**

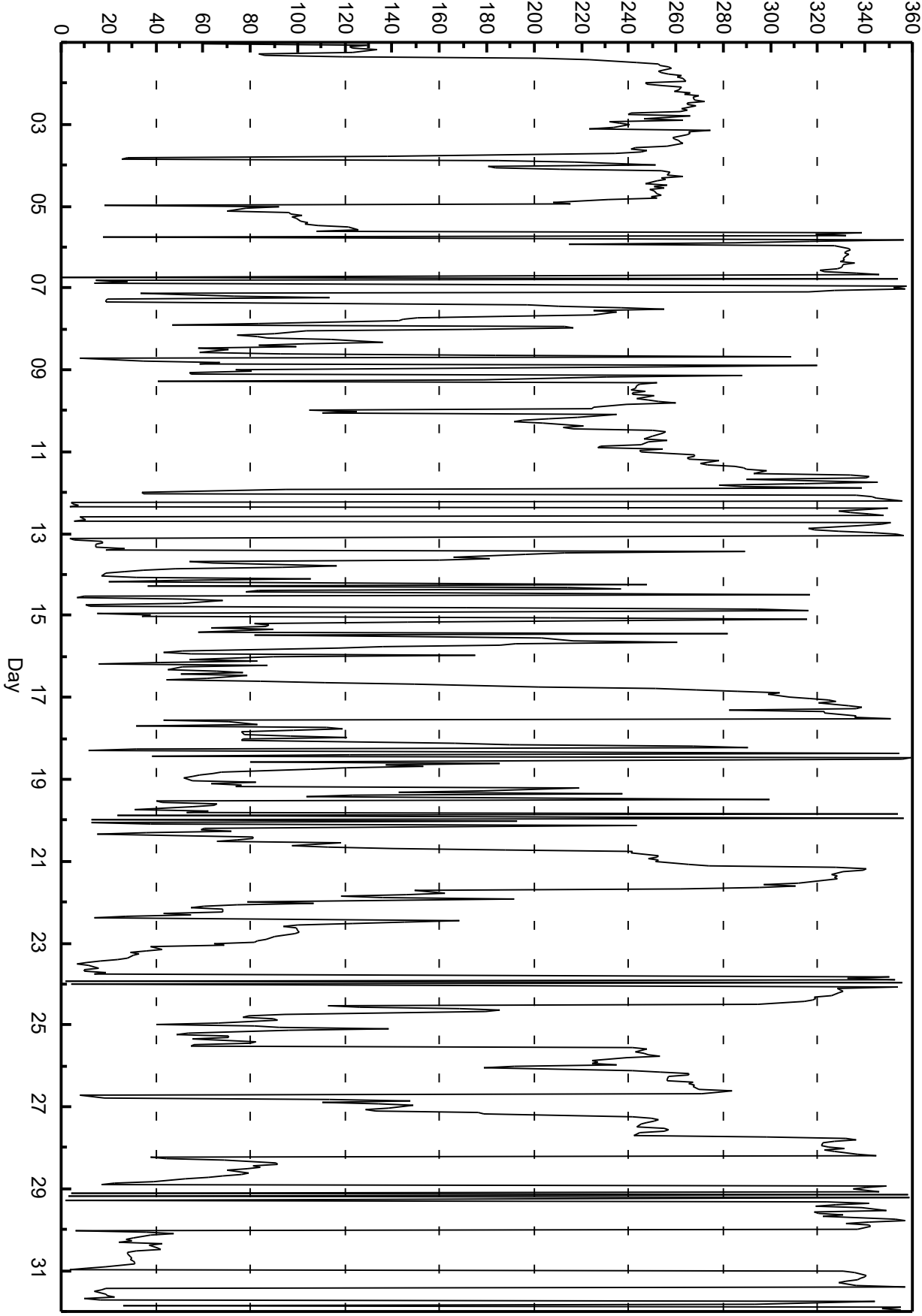




Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg
Beaverlodge - March 2020

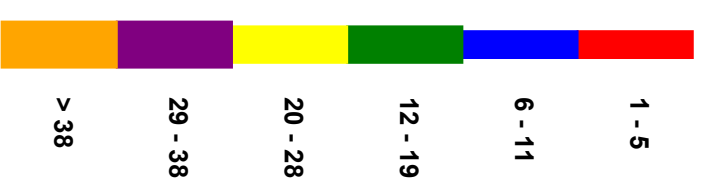
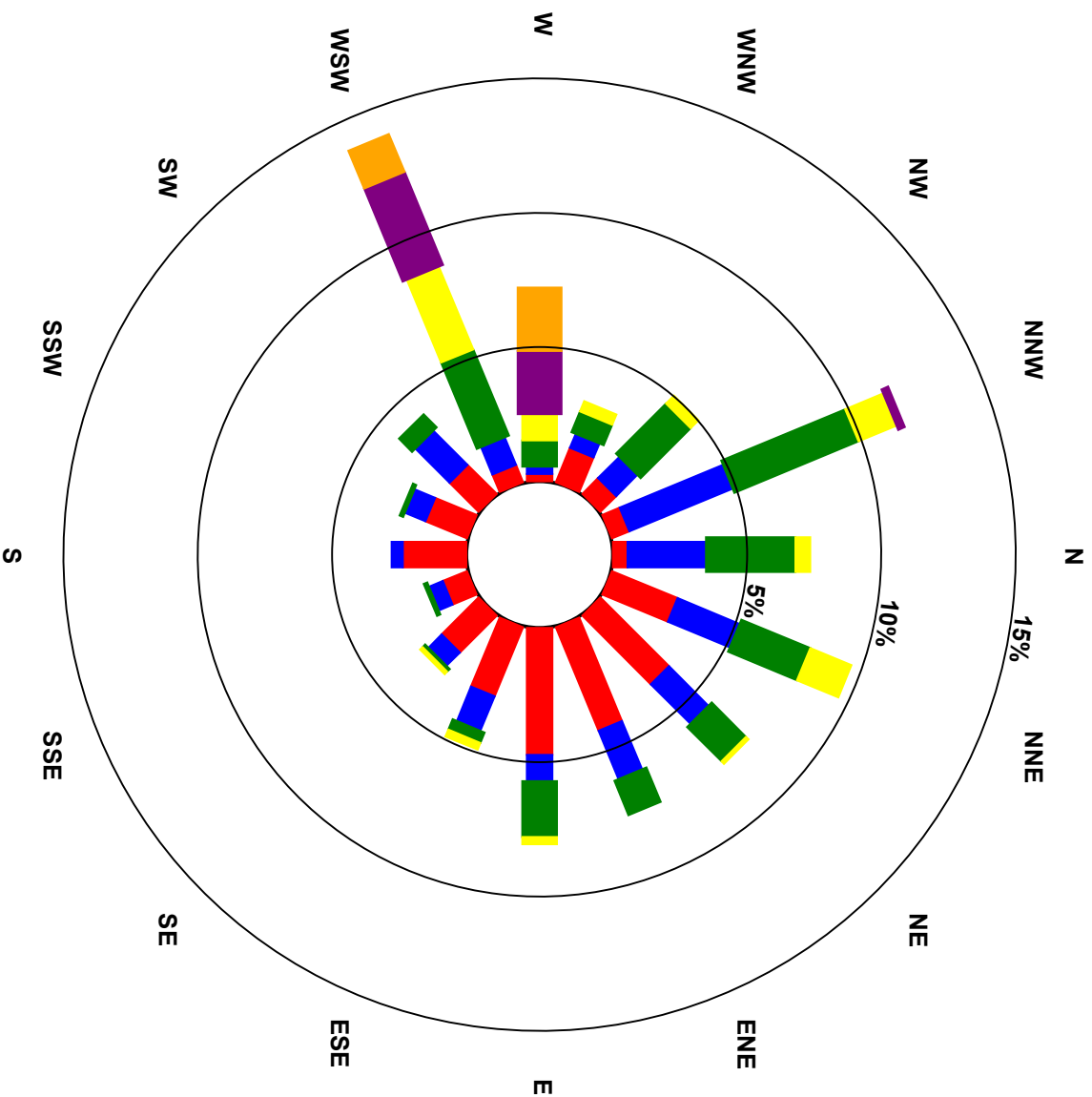




Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)
Beaverlodge - March 2020



3 **Evergreen Park Charts**

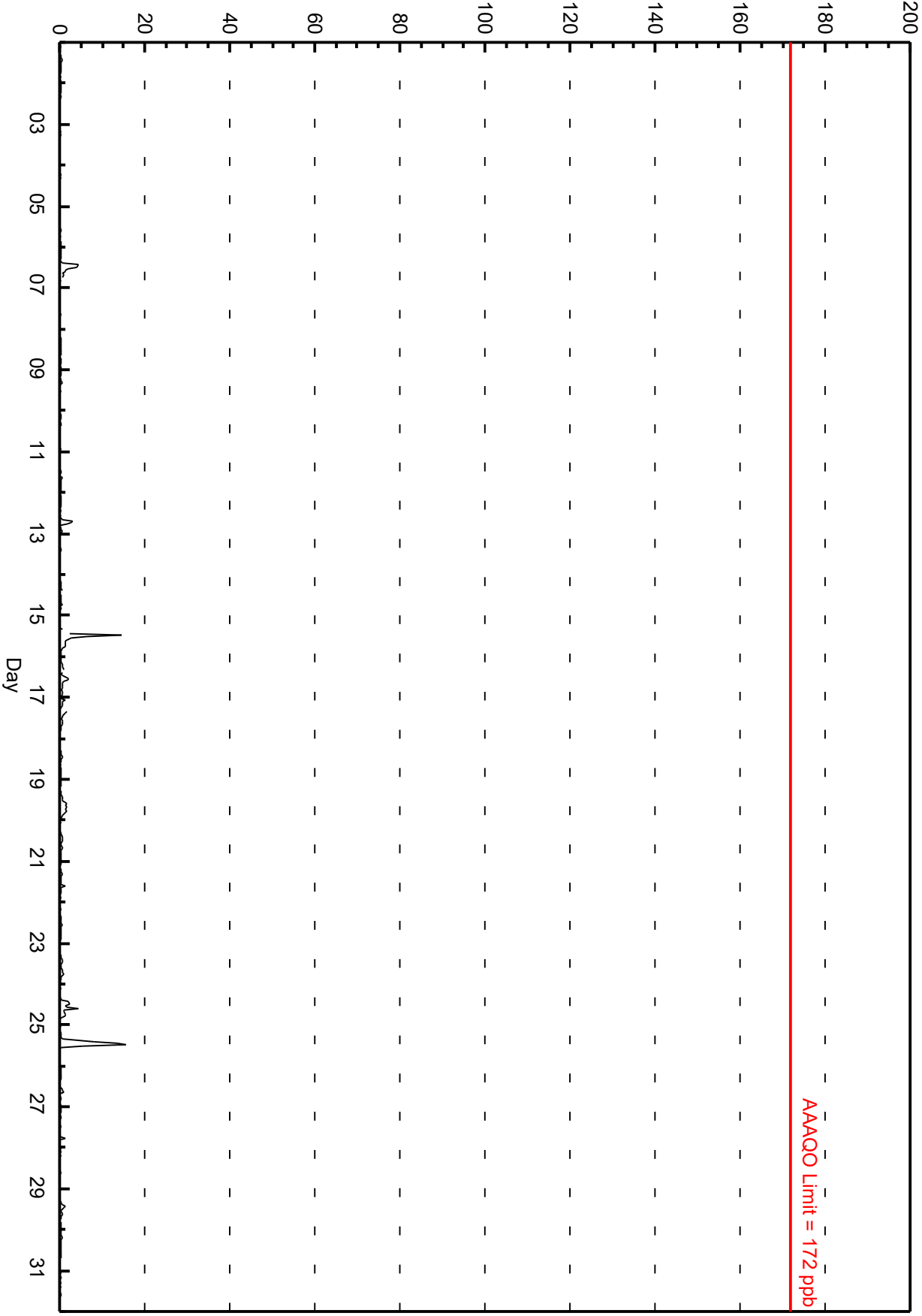
The following pages include the charts and histograms for Evergreen Park Station



Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Evergreen Park - March 2020

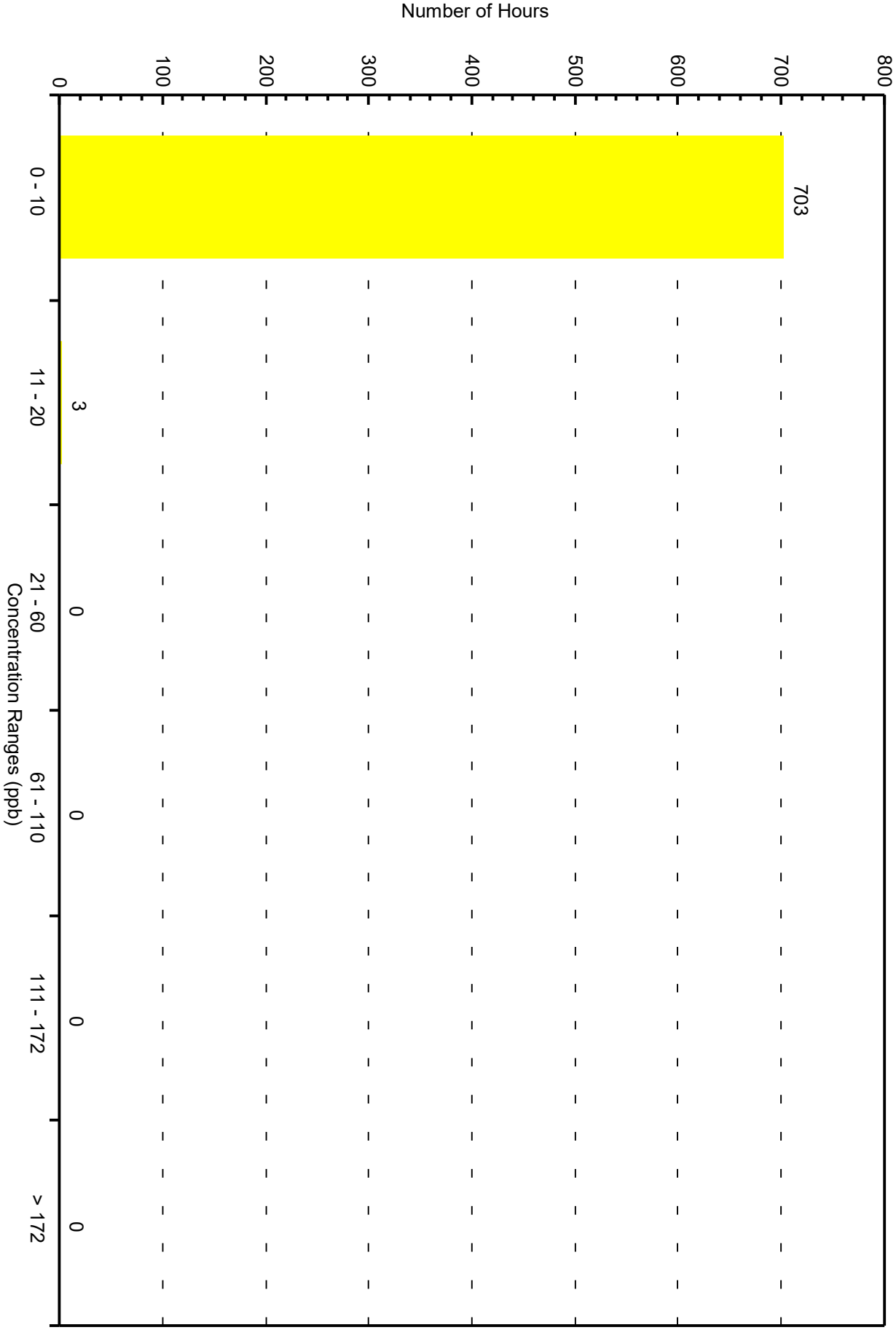




Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Evergreen Park - March 2020

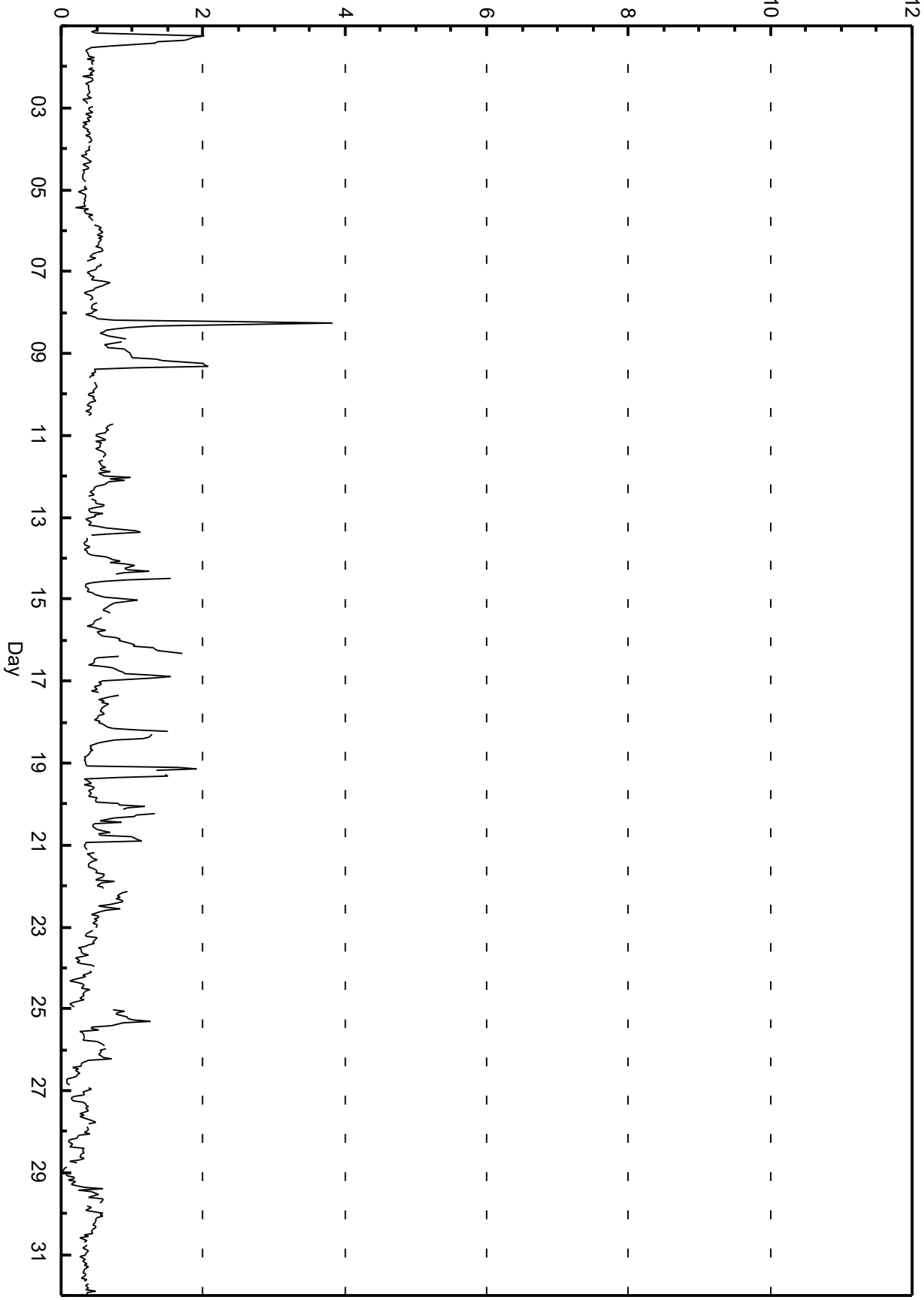




Peace Airshed Zone Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Evergreen Park - March 2020



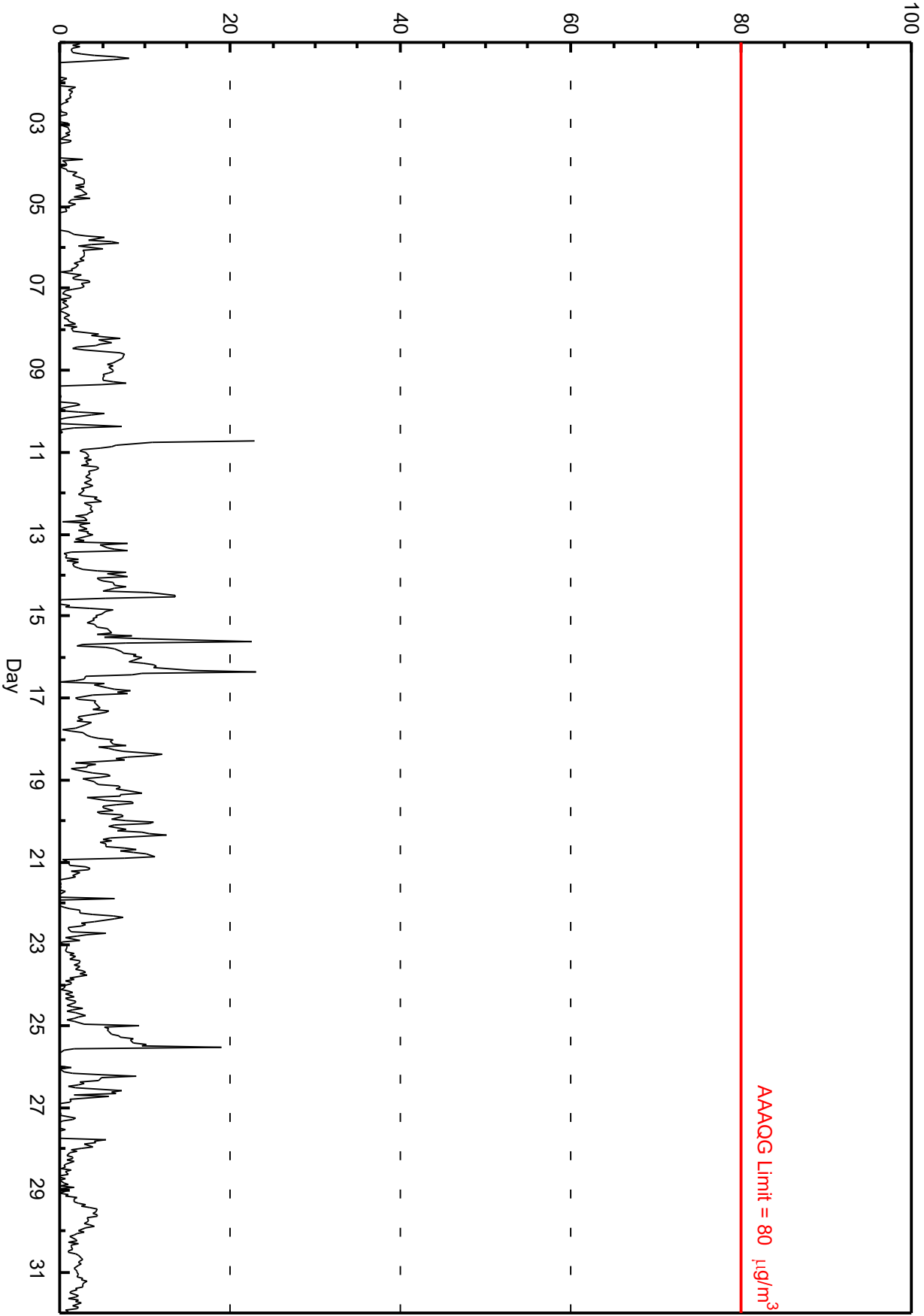


Peace Airshed Zone Association

Hourly Averages

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

Evergreen Park - March 2020



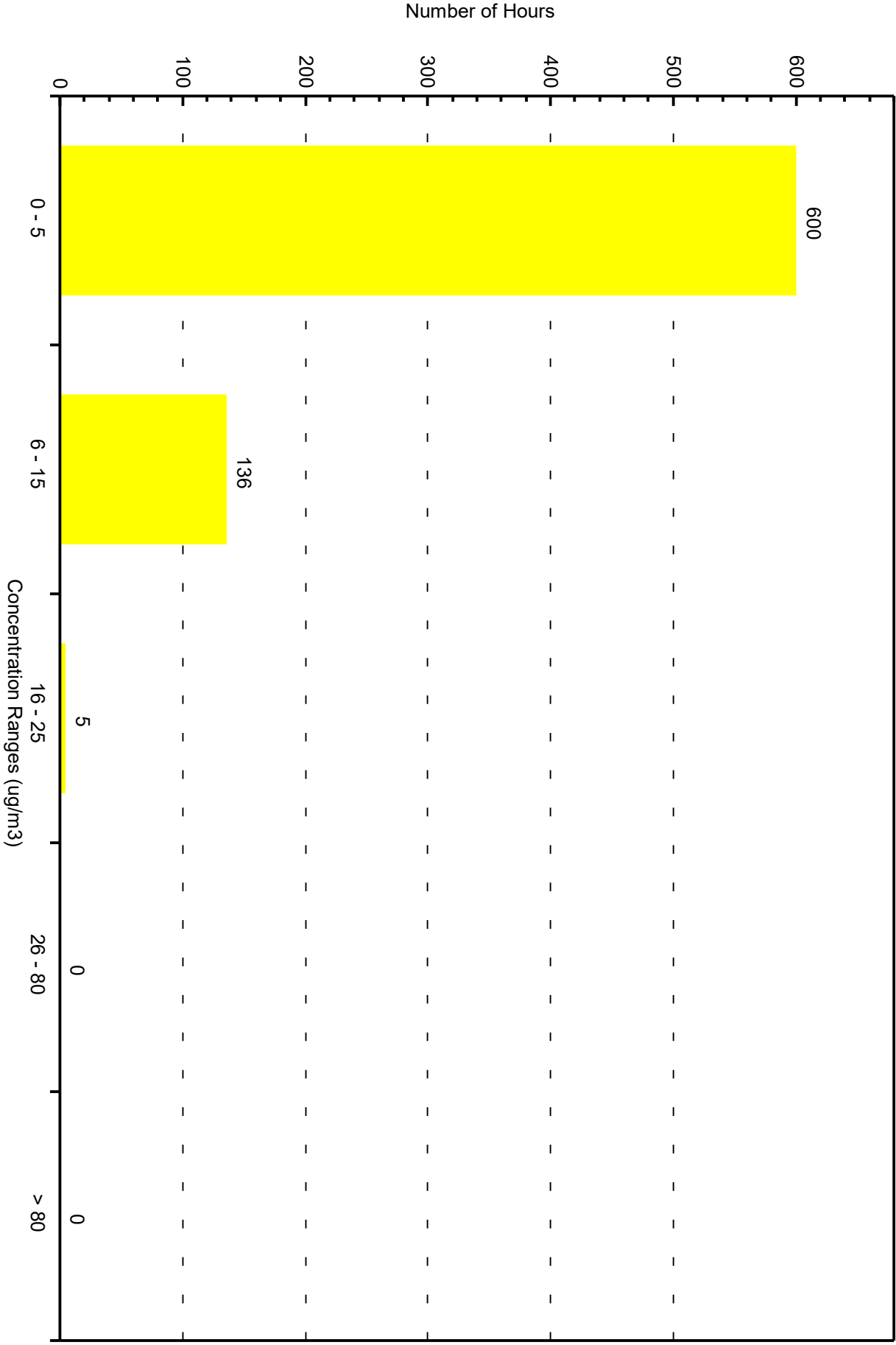


Peace Airshed Zone Association

Histogram of Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Evergreen Park - March 2020

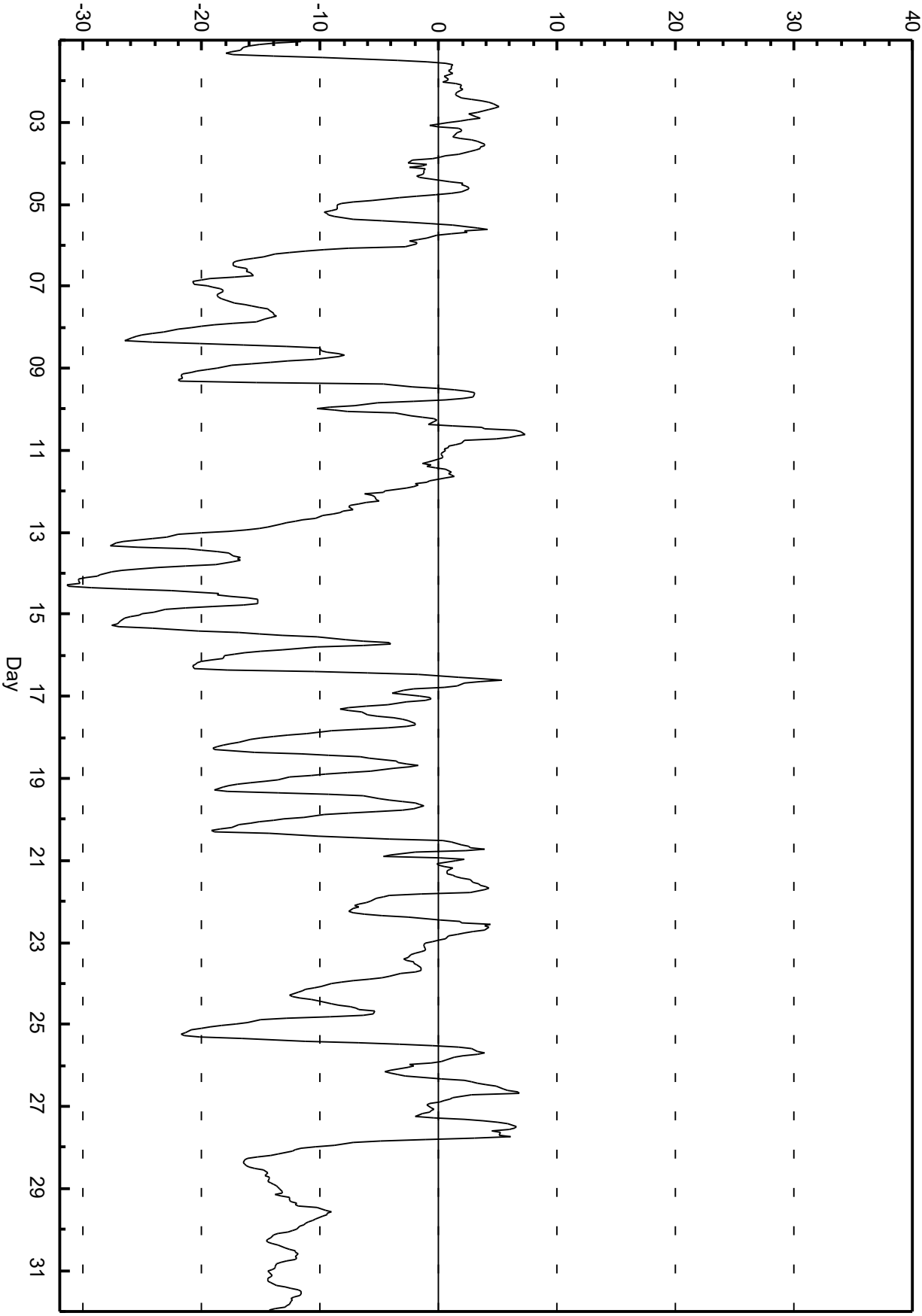




Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C
Evergreen Park - March 2020

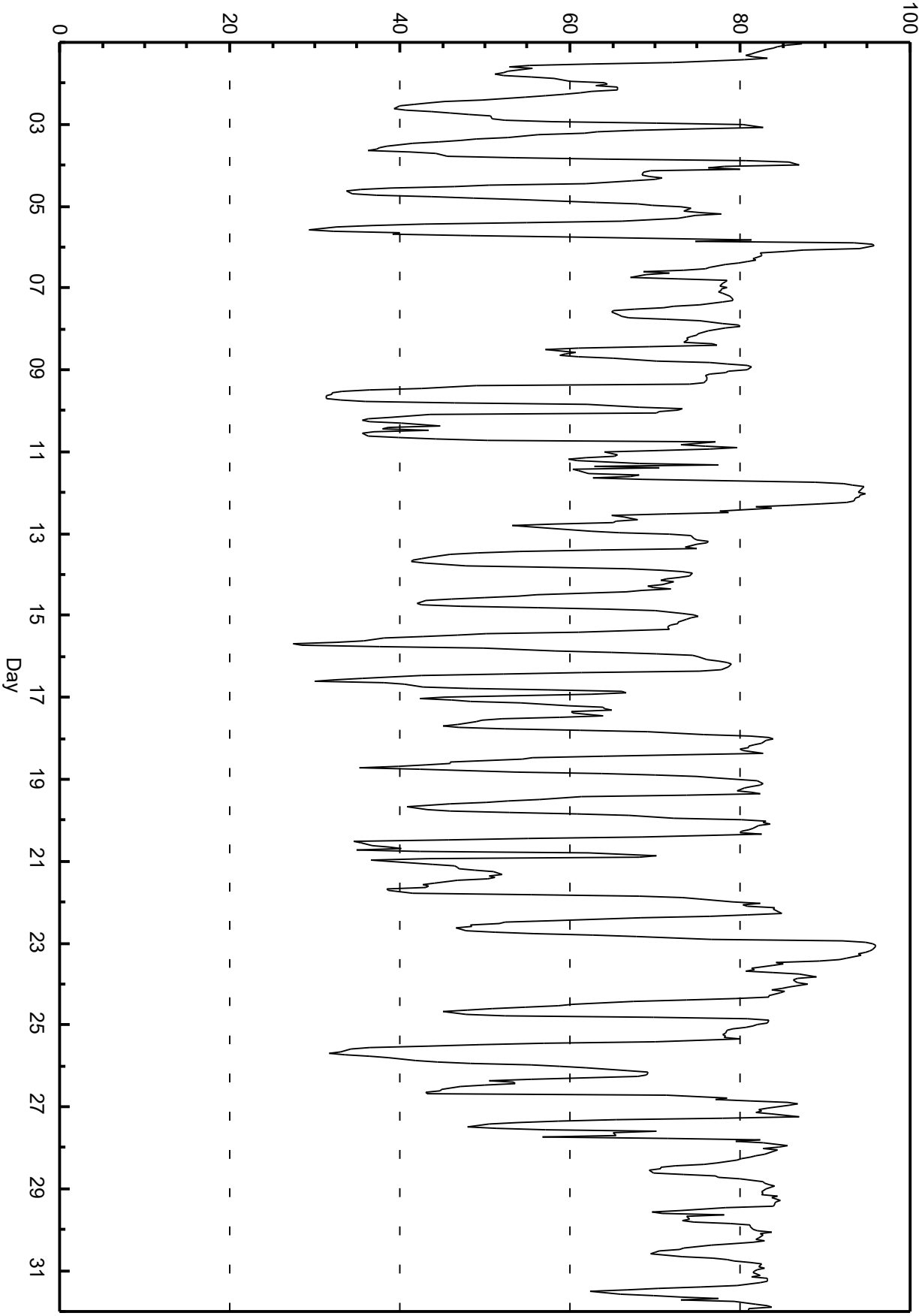




Peace Airshed Zone Association

Hourly Averages

Relative Humidity (RH) - %
Evergreen Park - March 2020

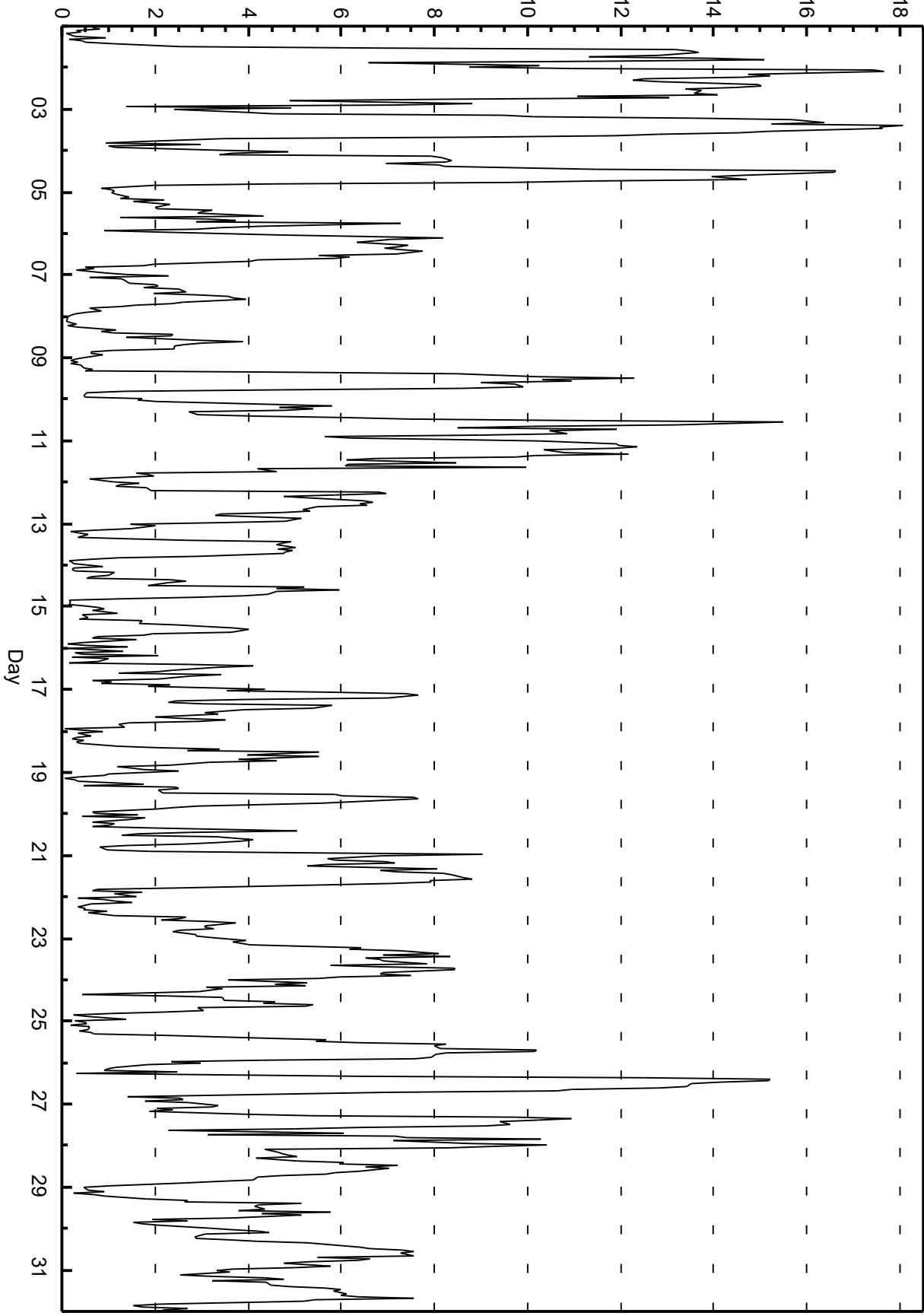




Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h
Evergreen Park - March 2020

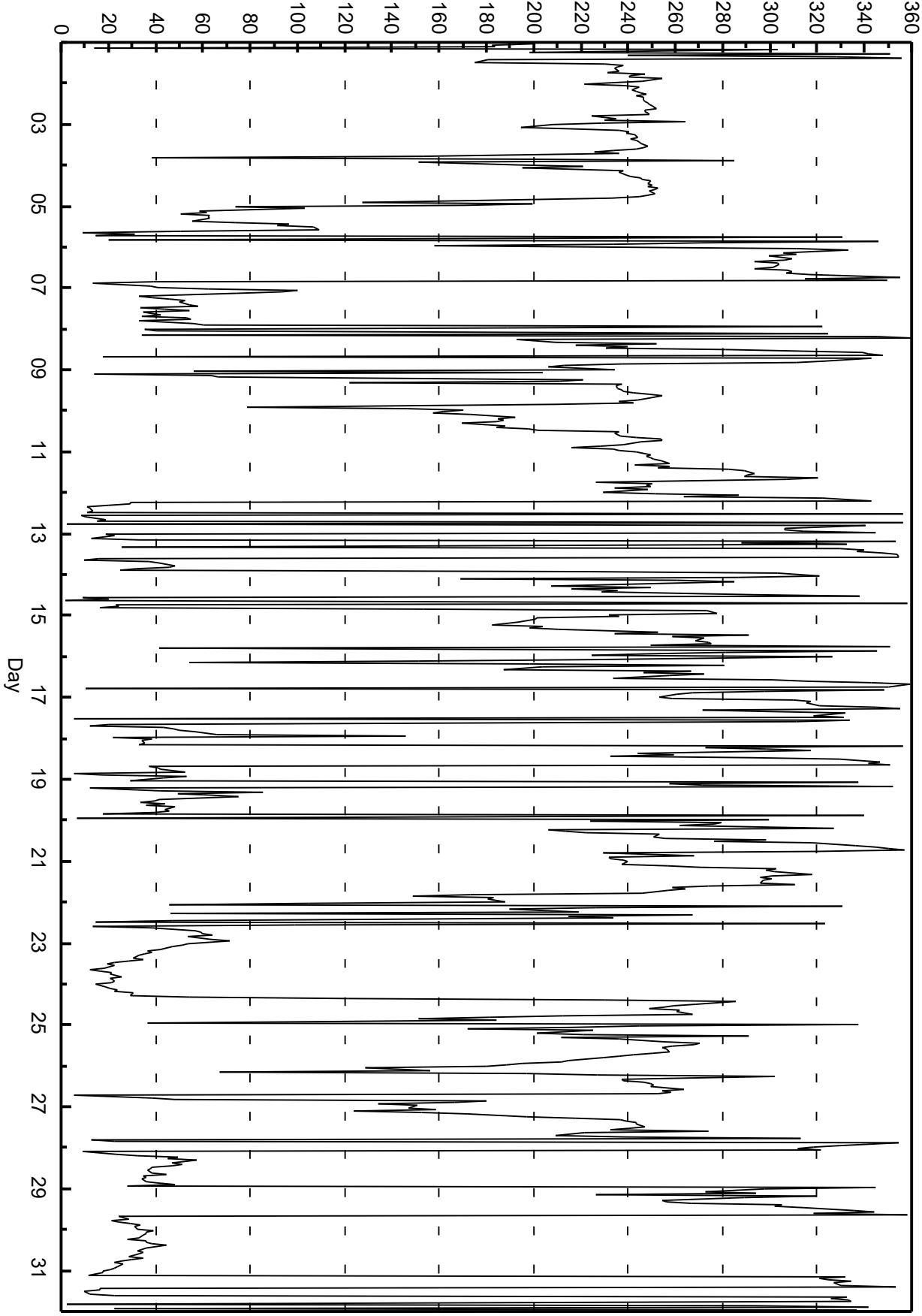




Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg
Evergreen Park - March 2020

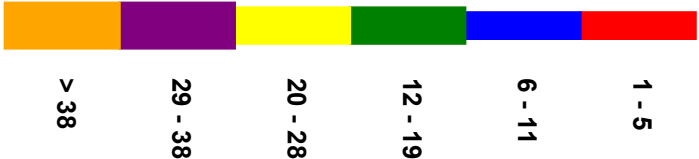
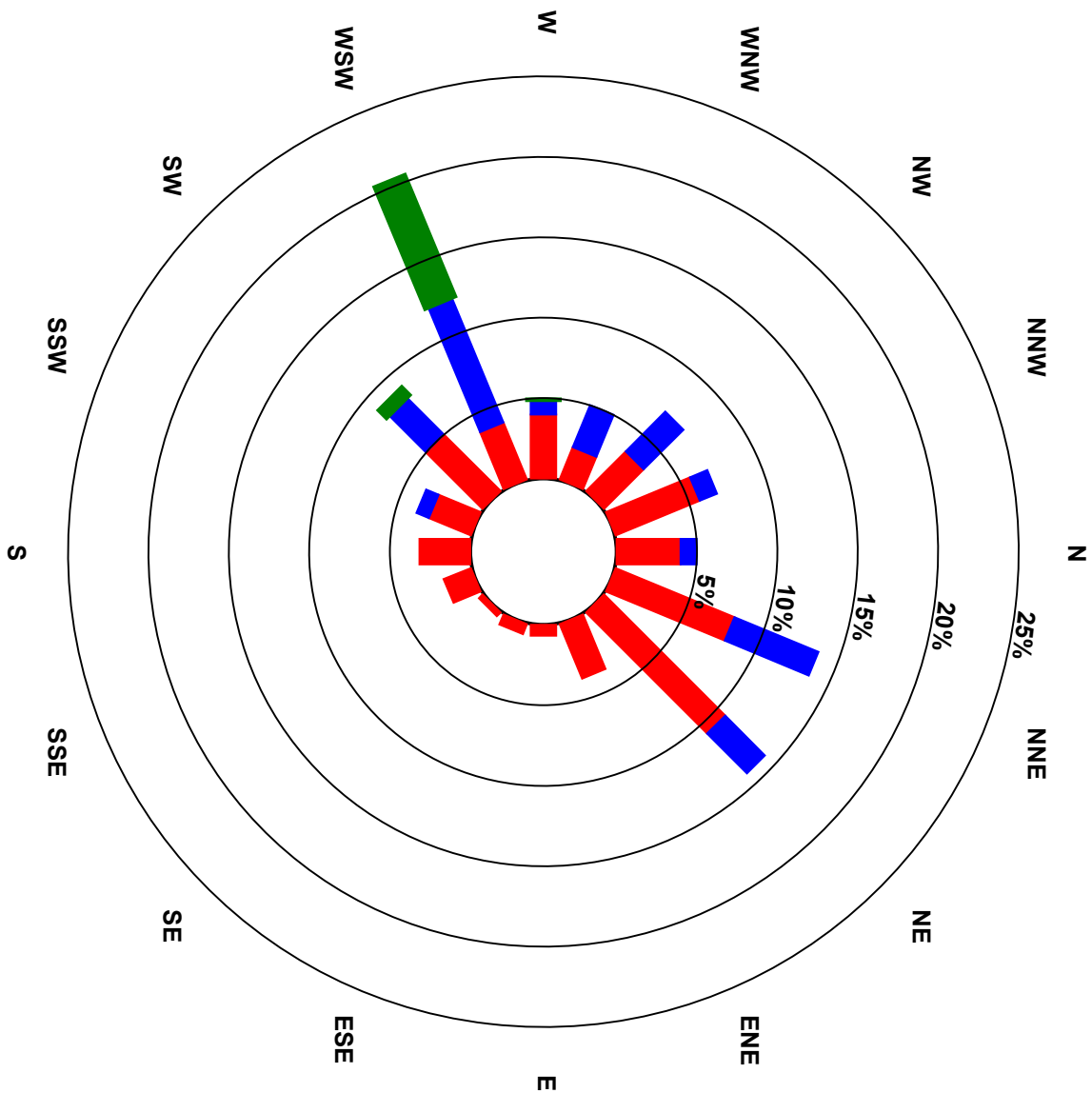




Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)
Evergreen Park - March 2020



4 Grande Prairie - Henry Pirker Charts

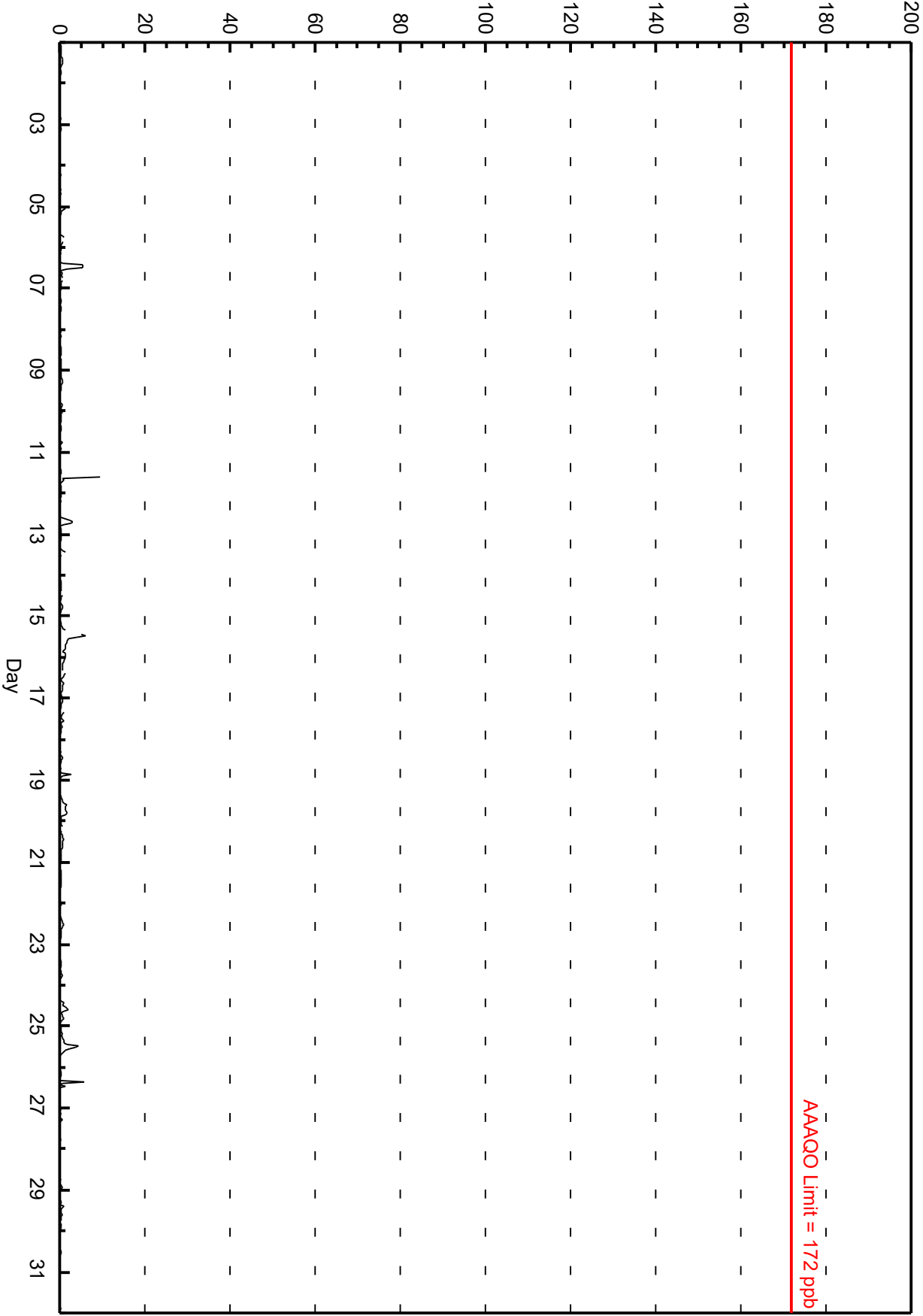
The following pages include the charts and histograms for Henry Pirker Station in Grande Prairie



Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Henry Pirkner - March 2020

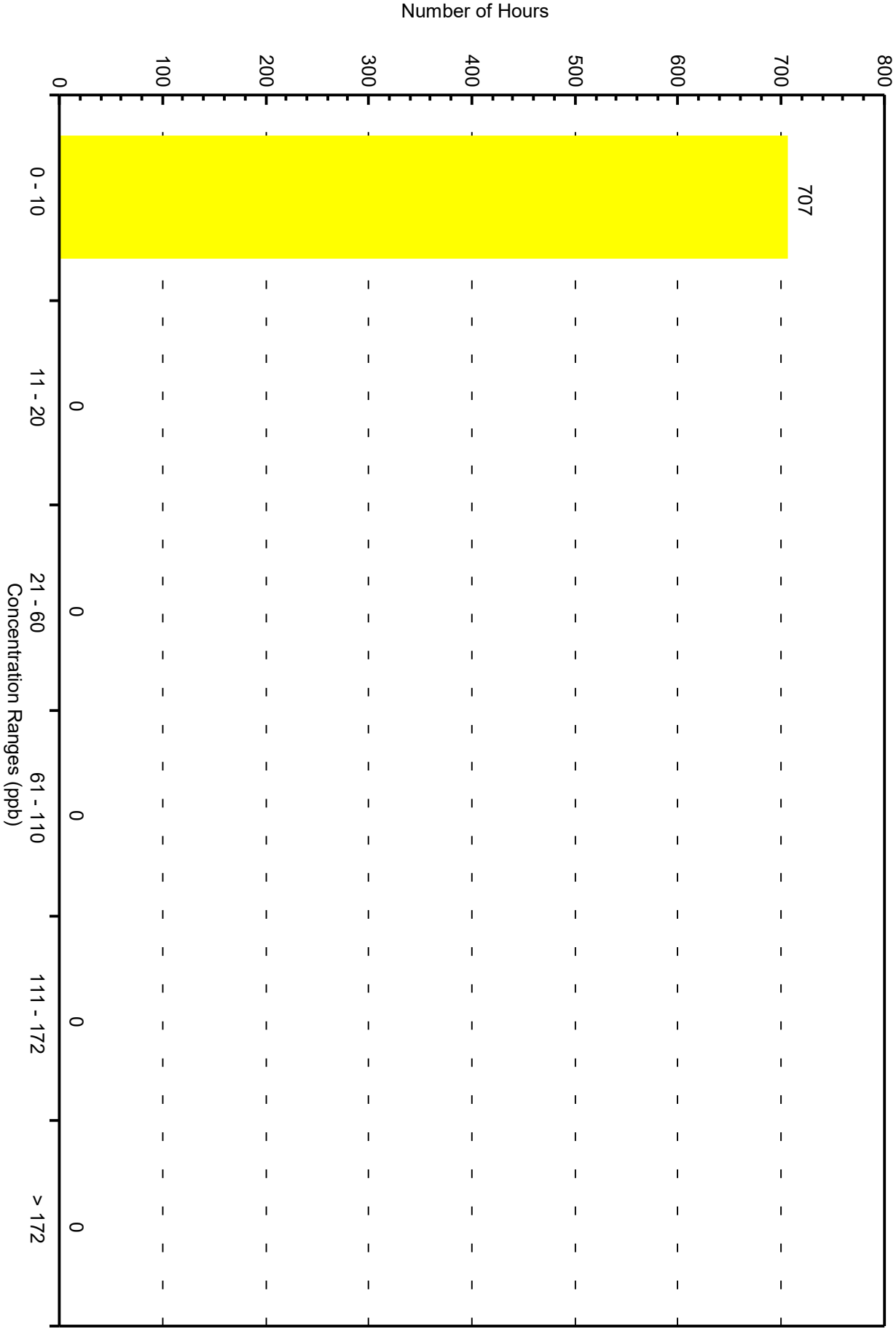




Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Henry Pirkner - March 2020



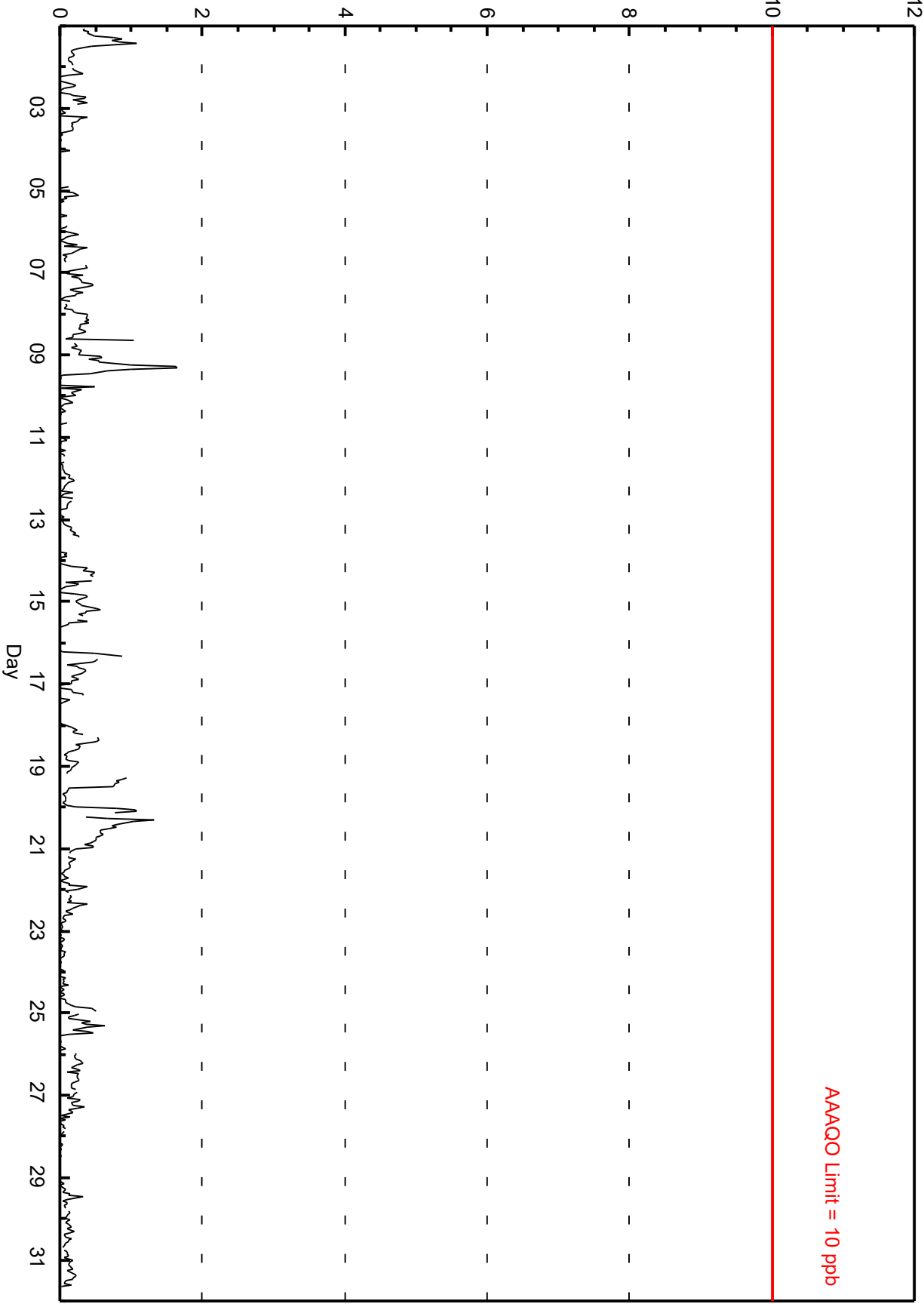


Peace Airshed Zone Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

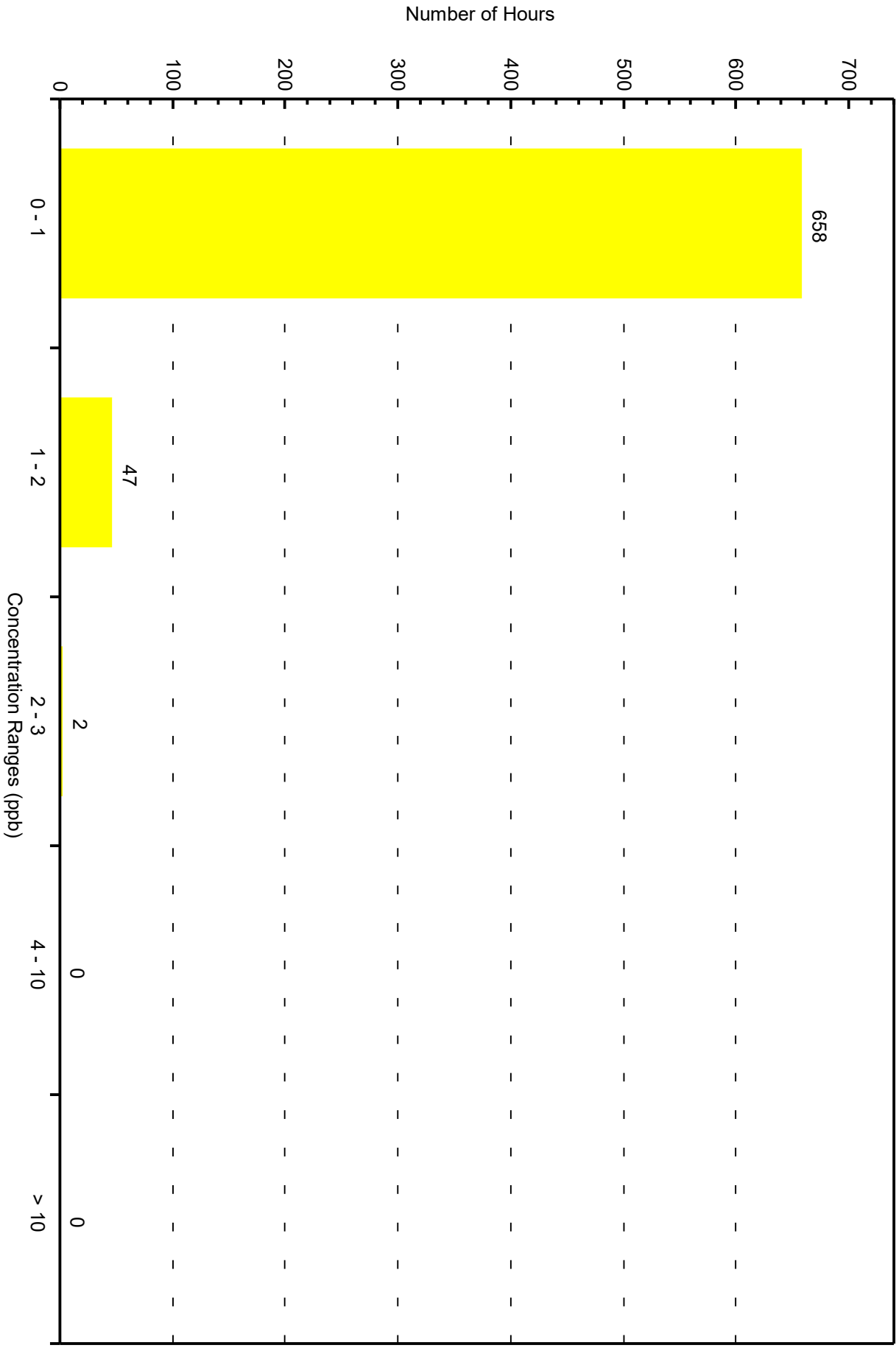
Henry Pirkker - March 2020



Histogram of Hourly Averages

Hydrogen Sulphide (H₂S) - ppb

Henry Pirkner - March 2020

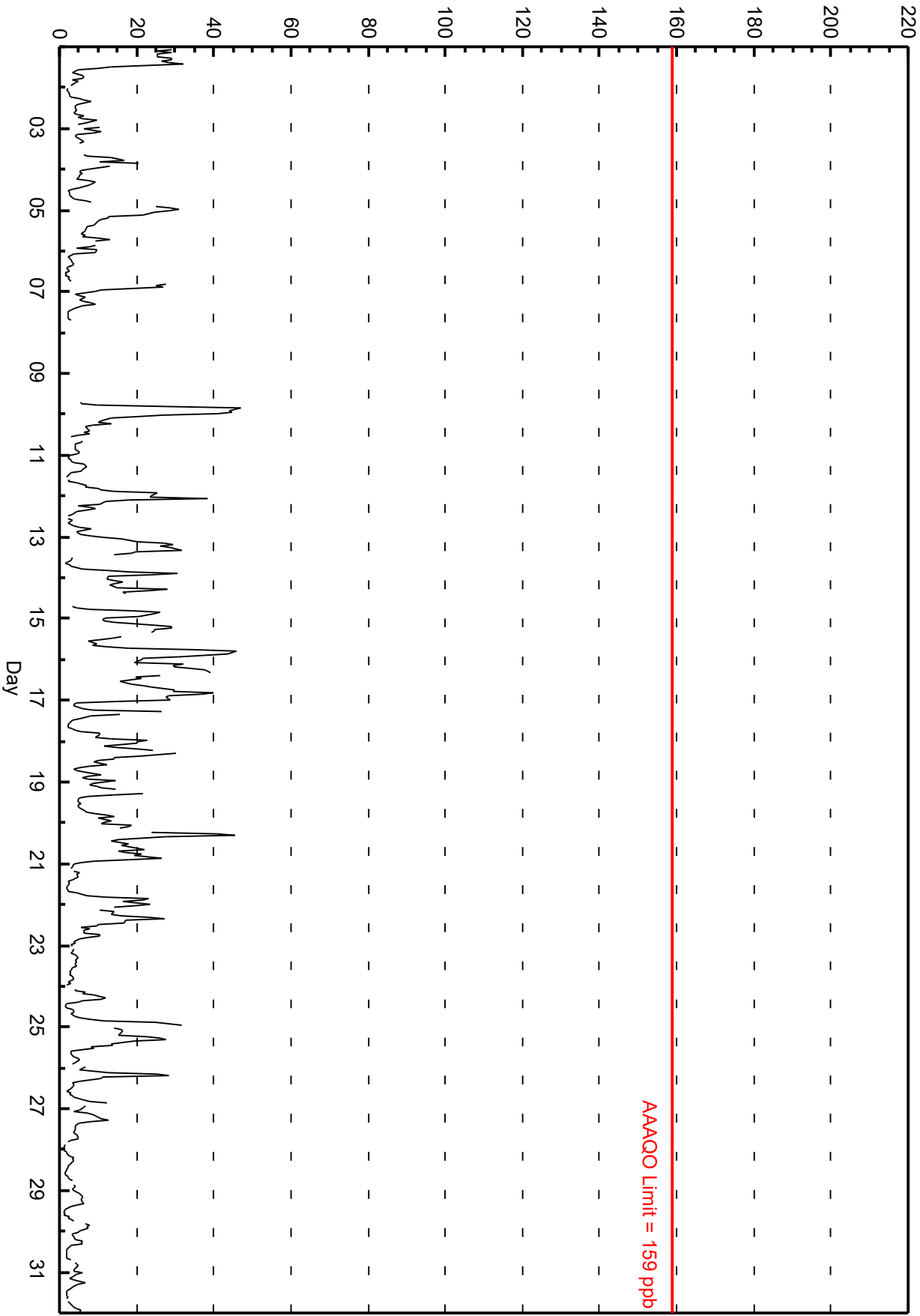




Peace Airshed Zone Association

Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Henry Pirkner - March 2020



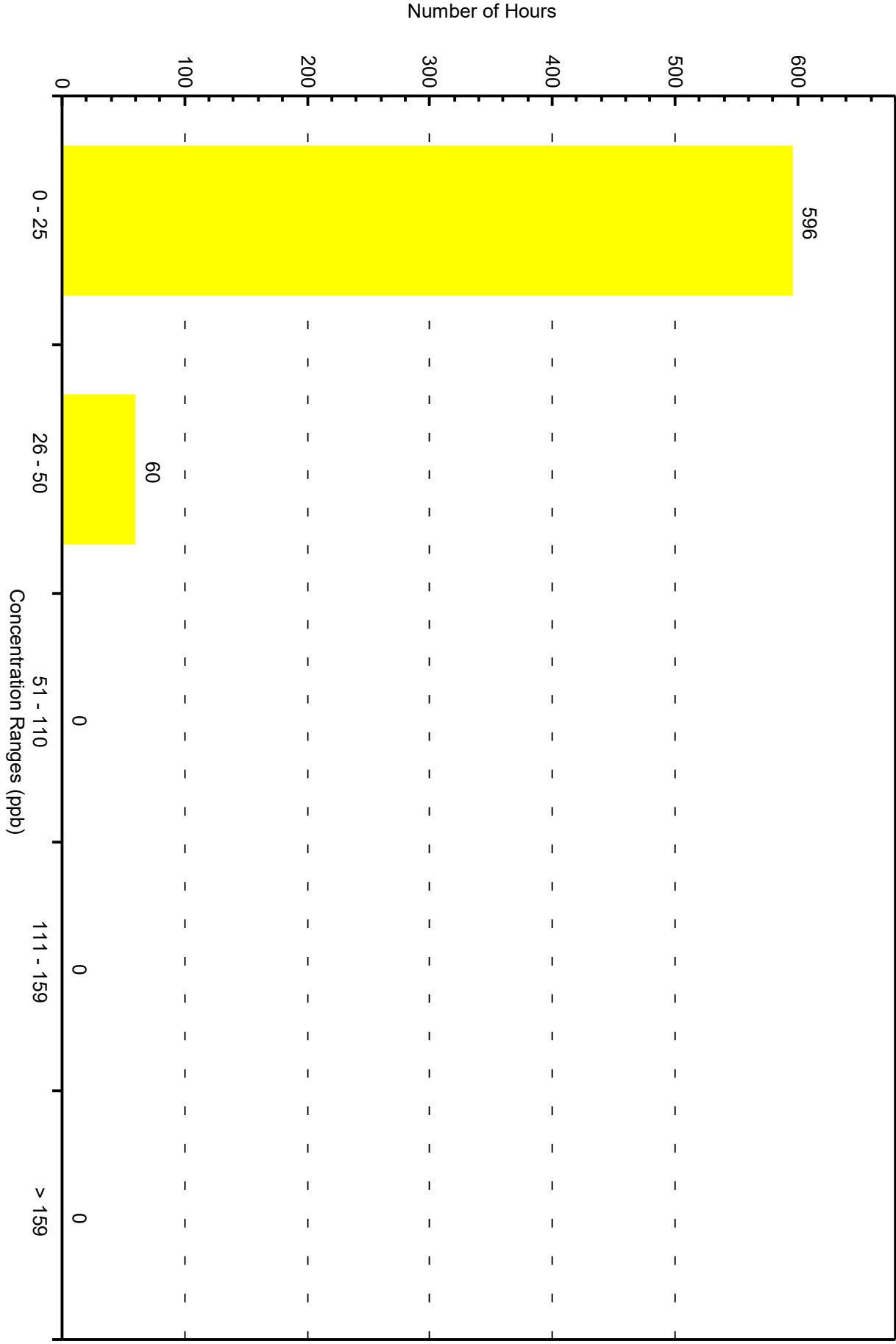


Peace Airshed Zone Association

Histogram of Hourly Averages

Nitrogen Dioxide (NO₂) - ppb

Henry Pirkner - March 2020

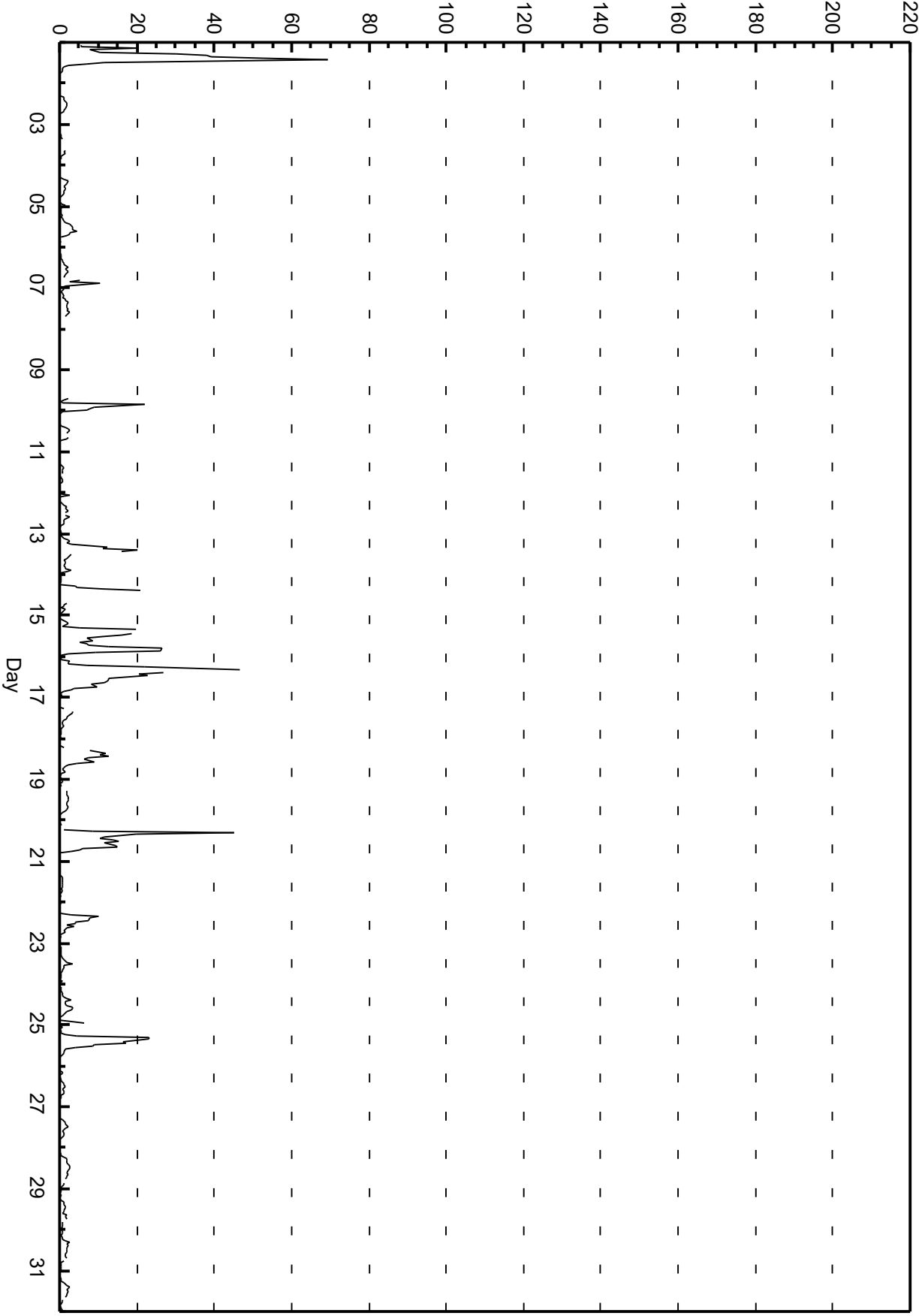




Peace Airshed Zone Association

Hourly Averages

Nitrogen Oxide (NO) - ppb
Henry Pirkner - March 2020



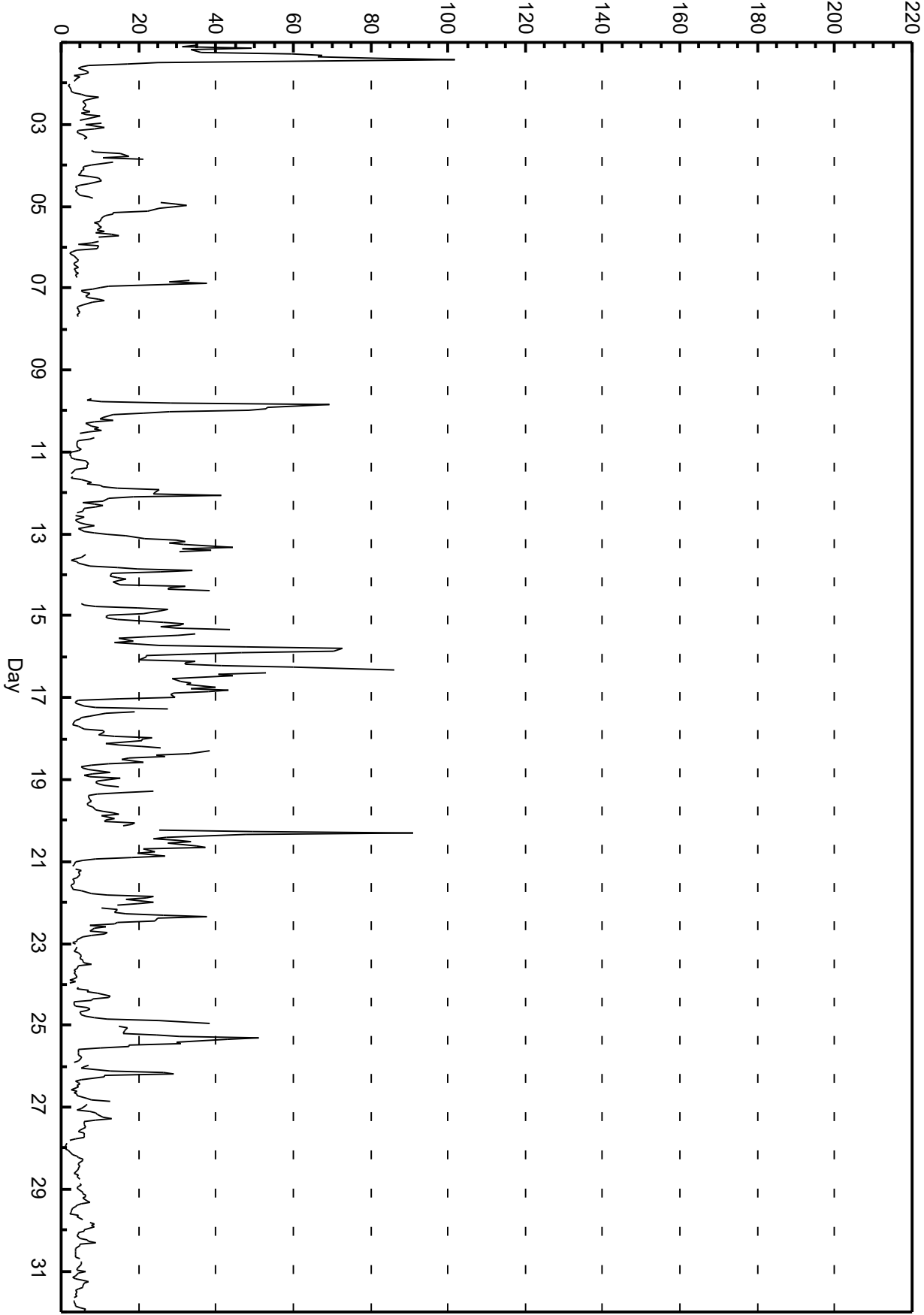


Peace Airshed Zone Association

Hourly Averages

Oxides of Nitrogen (NO_x) - ppb

Henry Pirkner - March 2020



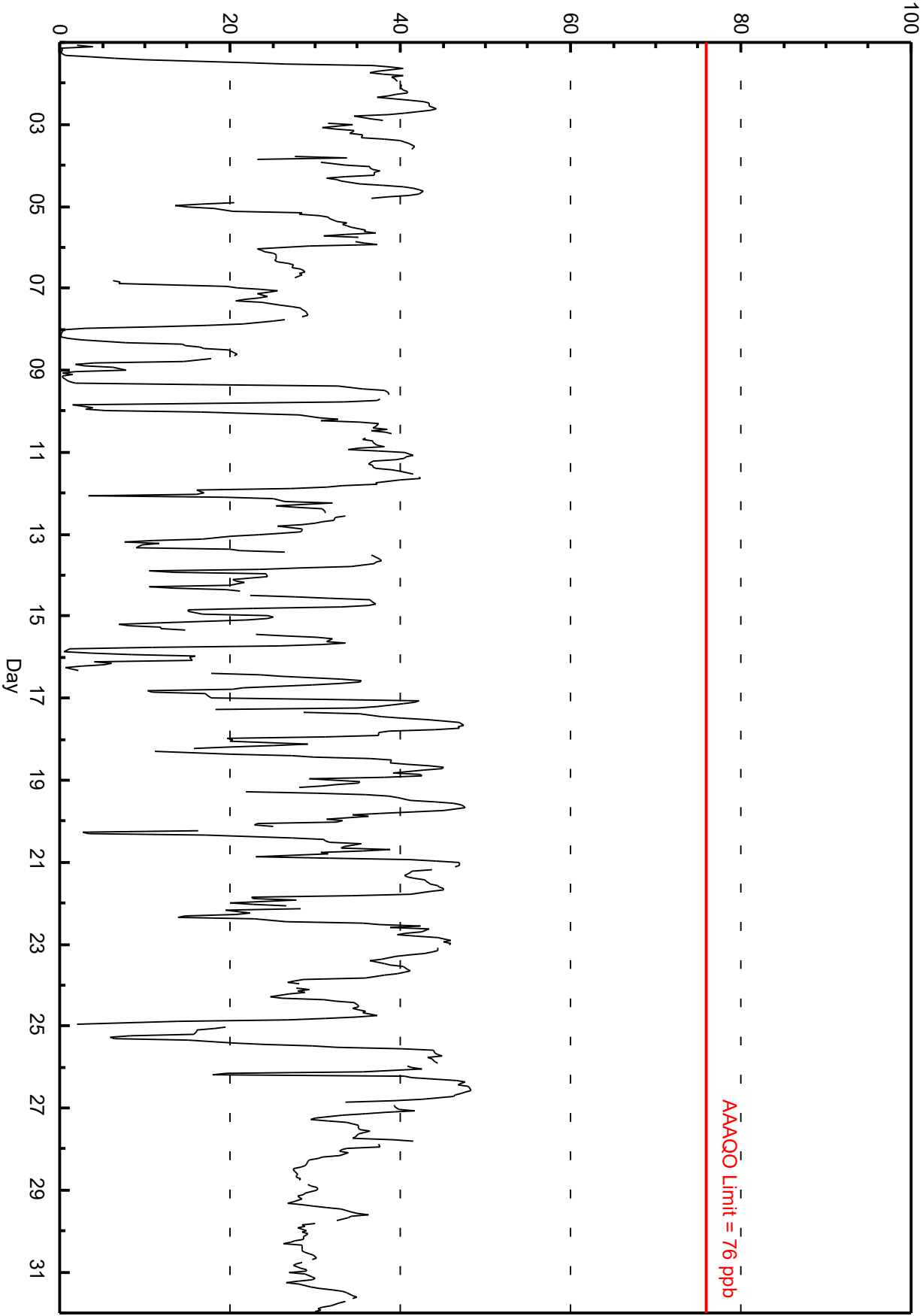


Peace Airshed Zone Association

Hourly Averages

Ozone (O_3) - ppb

Henry Pirkner - March 2020



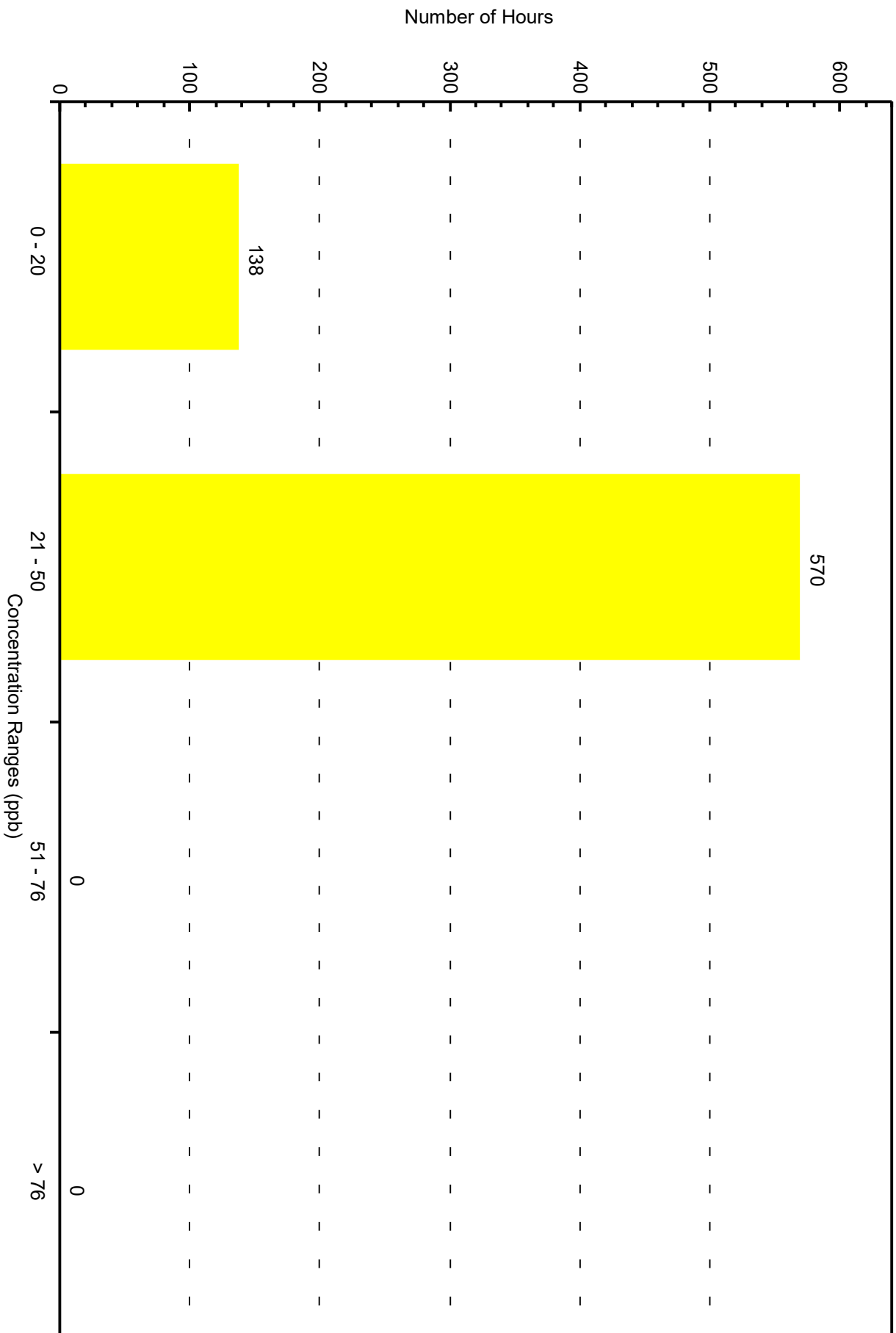


Peace Airshed Zone Association

Histogram of Hourly Averages

Ozone (O_3) - ppb

Henry Pirkner - March 2020

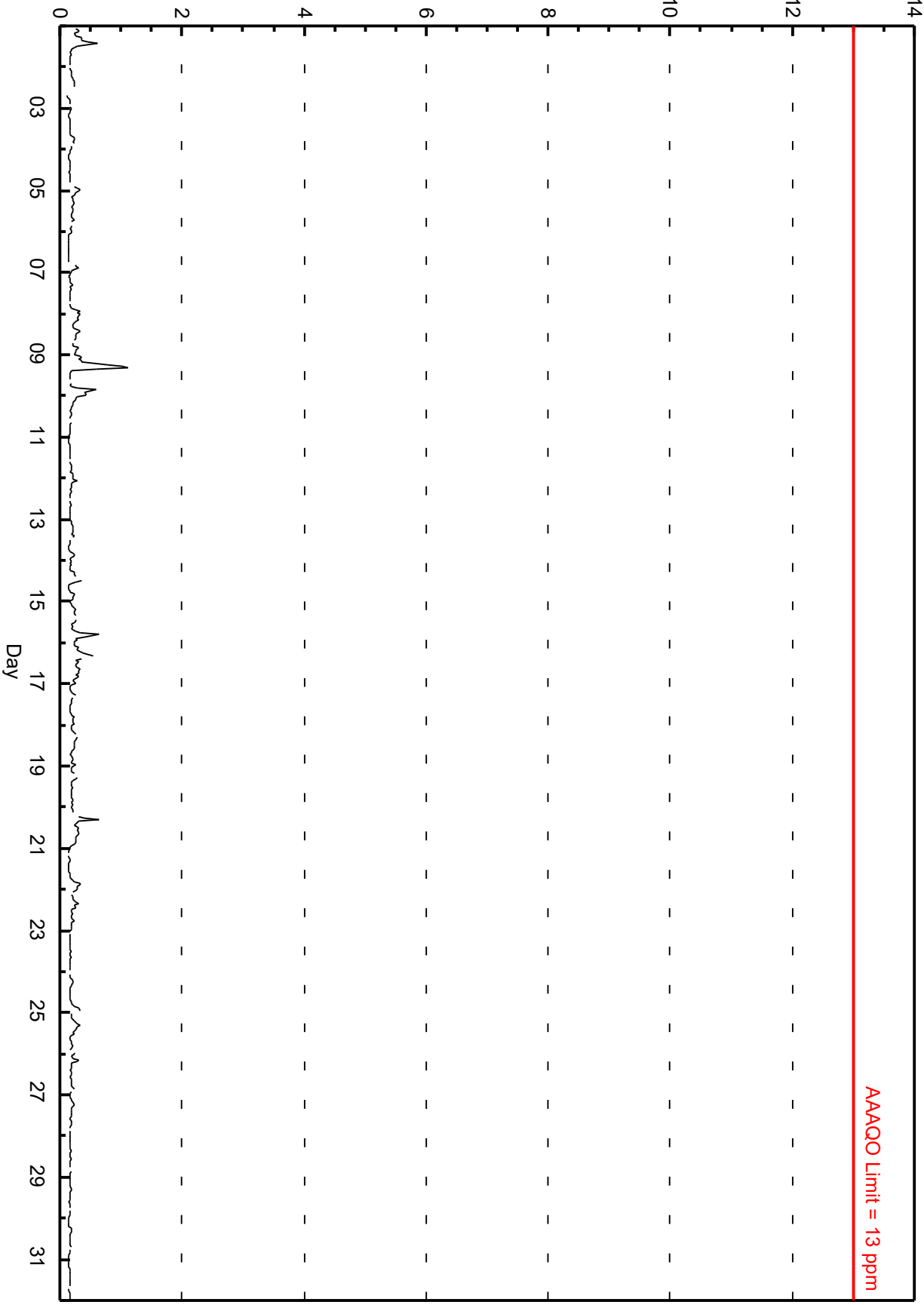




Peace Airshed Zone Association

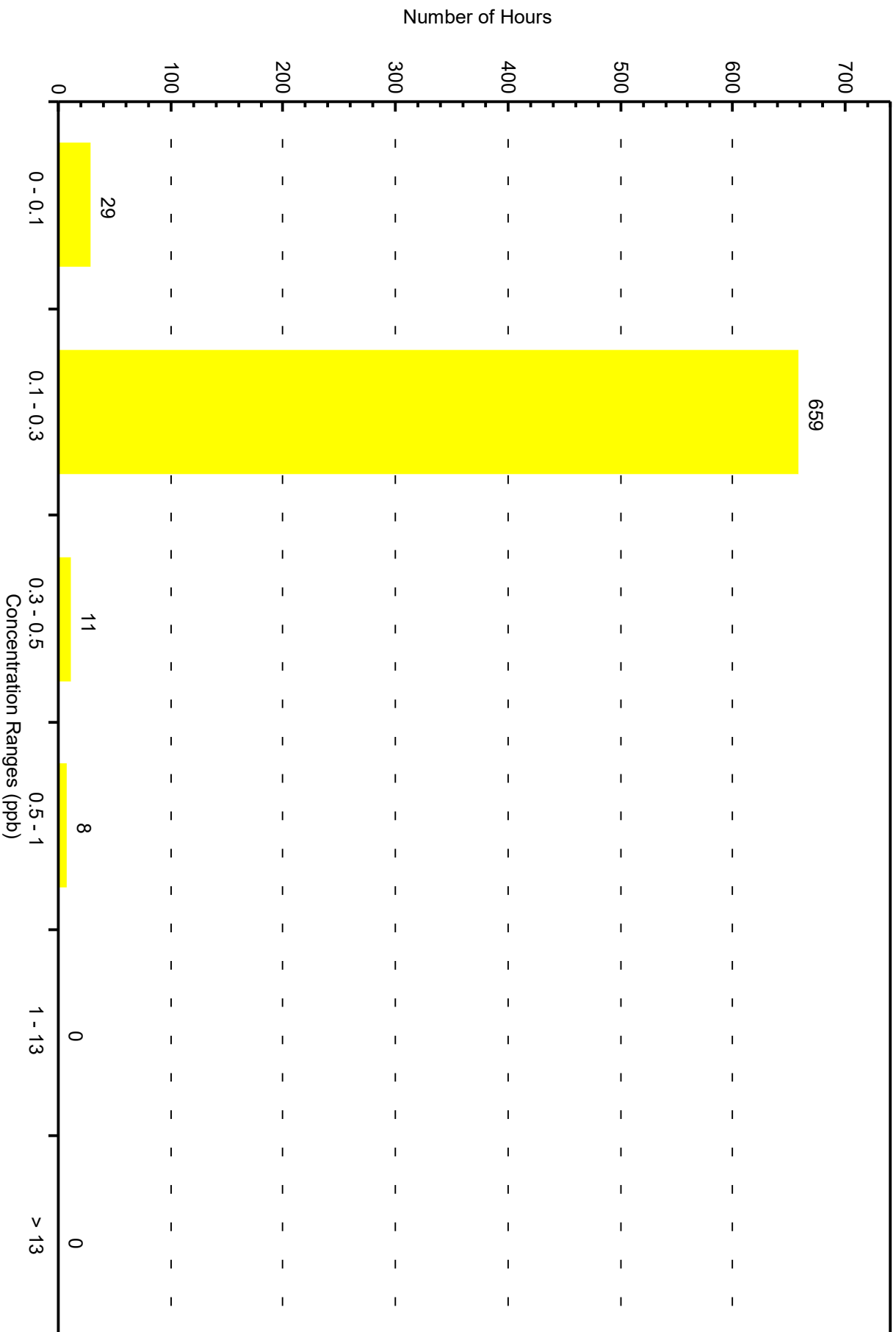
Hourly Averages

Carbon Monoxide (CO) - ppm
Henry Pirkner - March 2020



Histogram of Hourly Averages

Carbon Monoxide (CO) - ppm
Henry Pirkner - March 2020



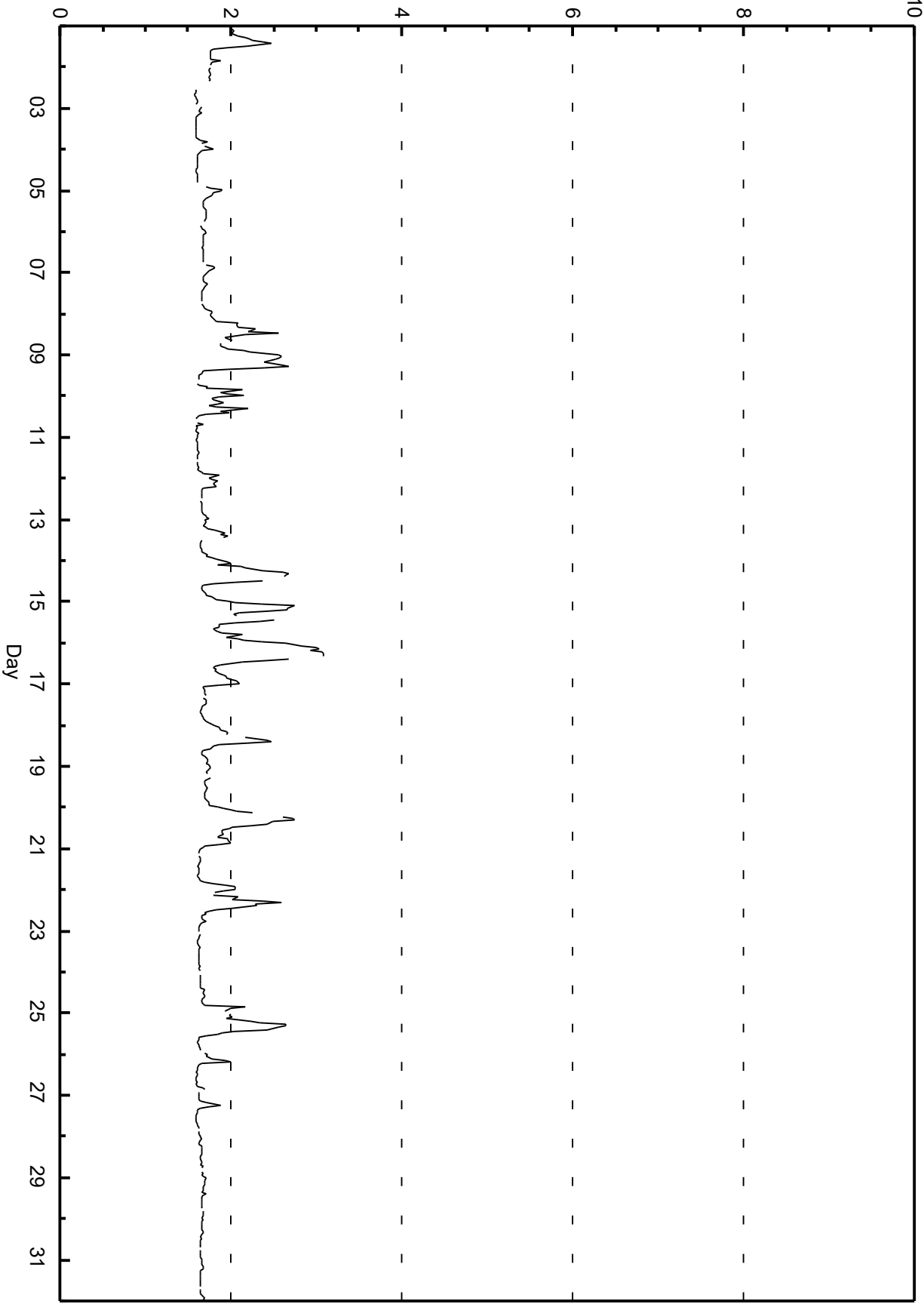


Peace Airshed Zone Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Henry Pirkner - March 2020



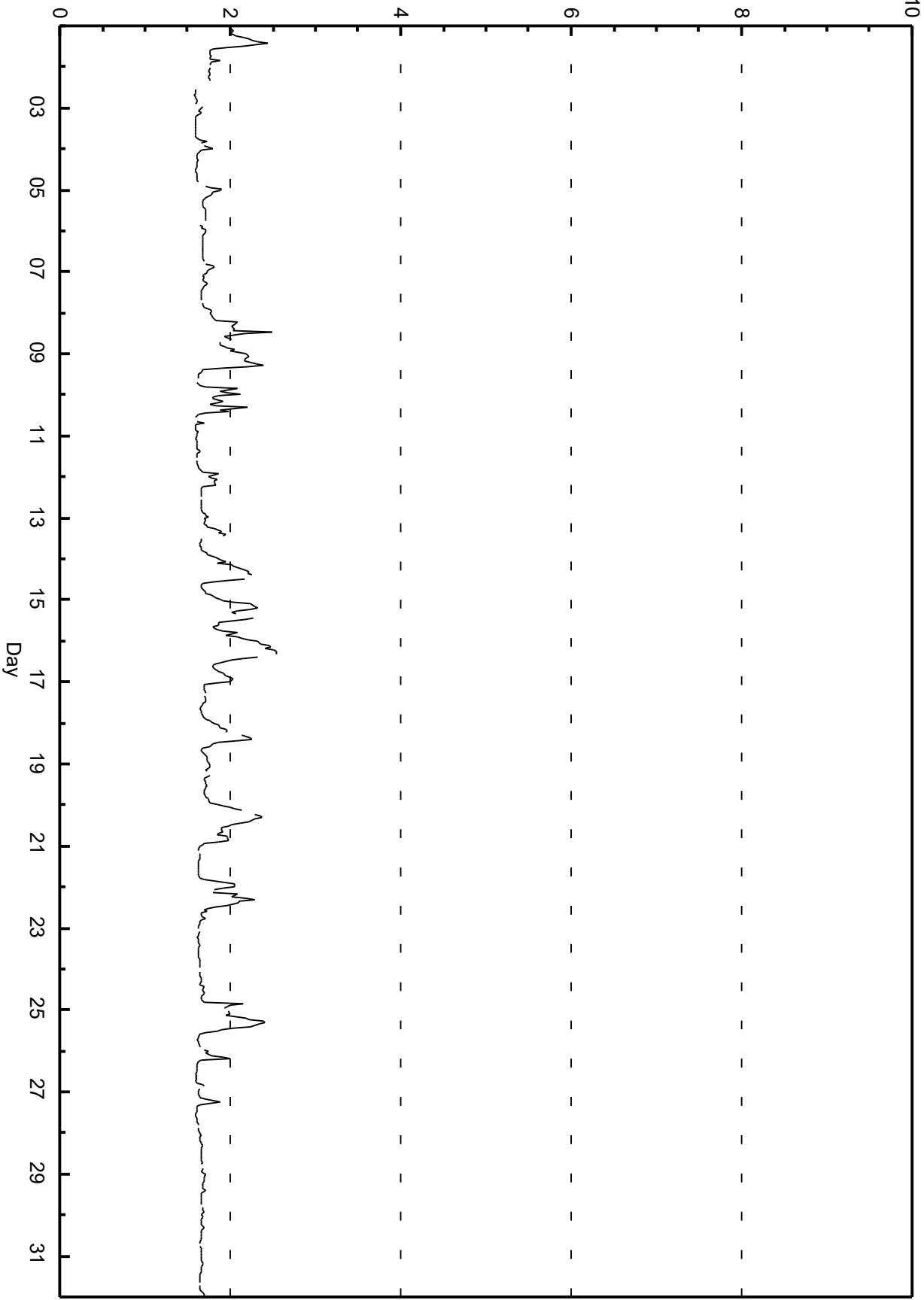


Peace Airshed Zone Association

Hourly Averages

Methane (CH_4) - ppm

Henry Pirkner - March 2020



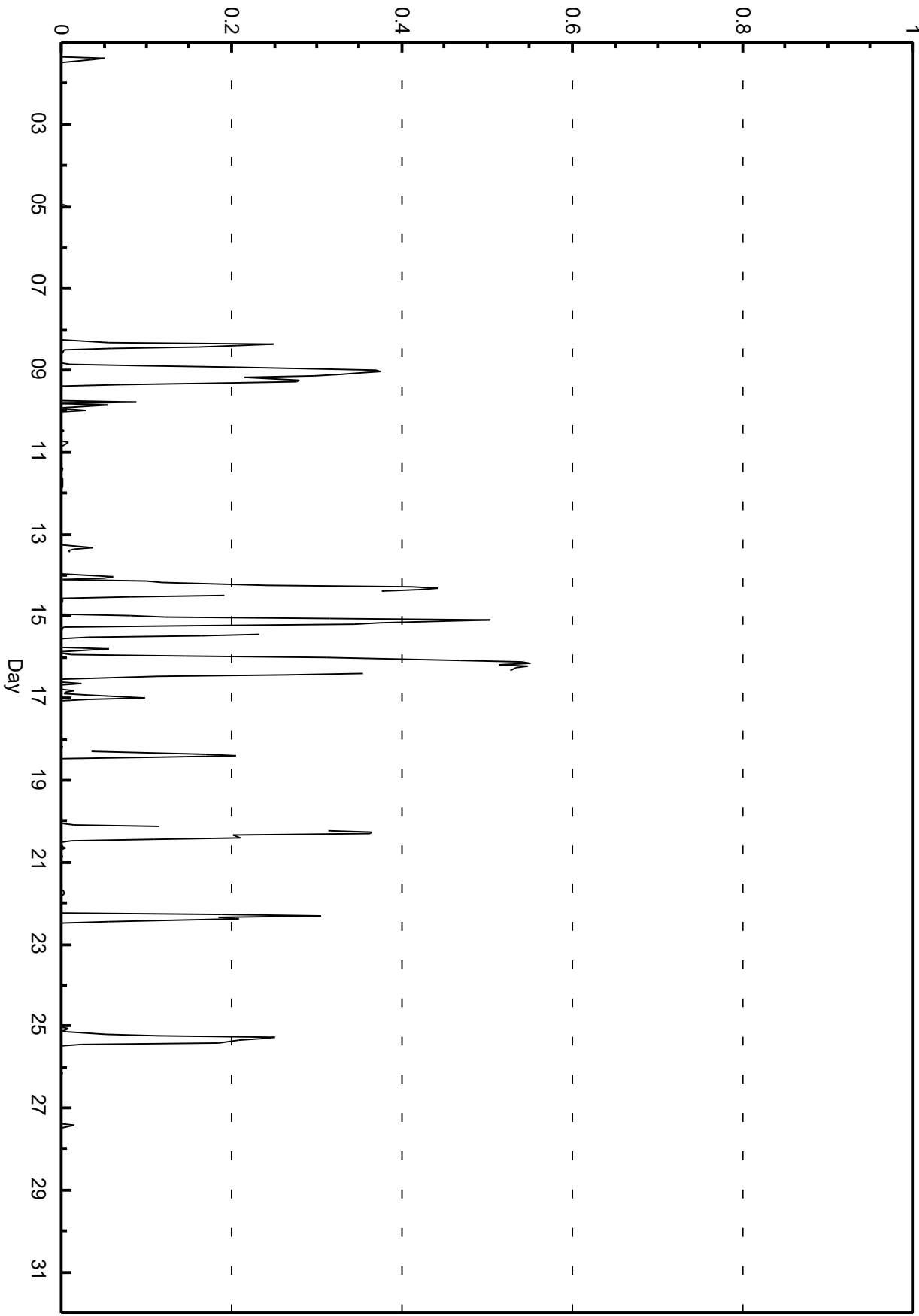


Peace Airshed Zone Association

Hourly Averages

Non Methane Hydrocarbon (NMHC) - ppm

Henry Pirker - March 2020



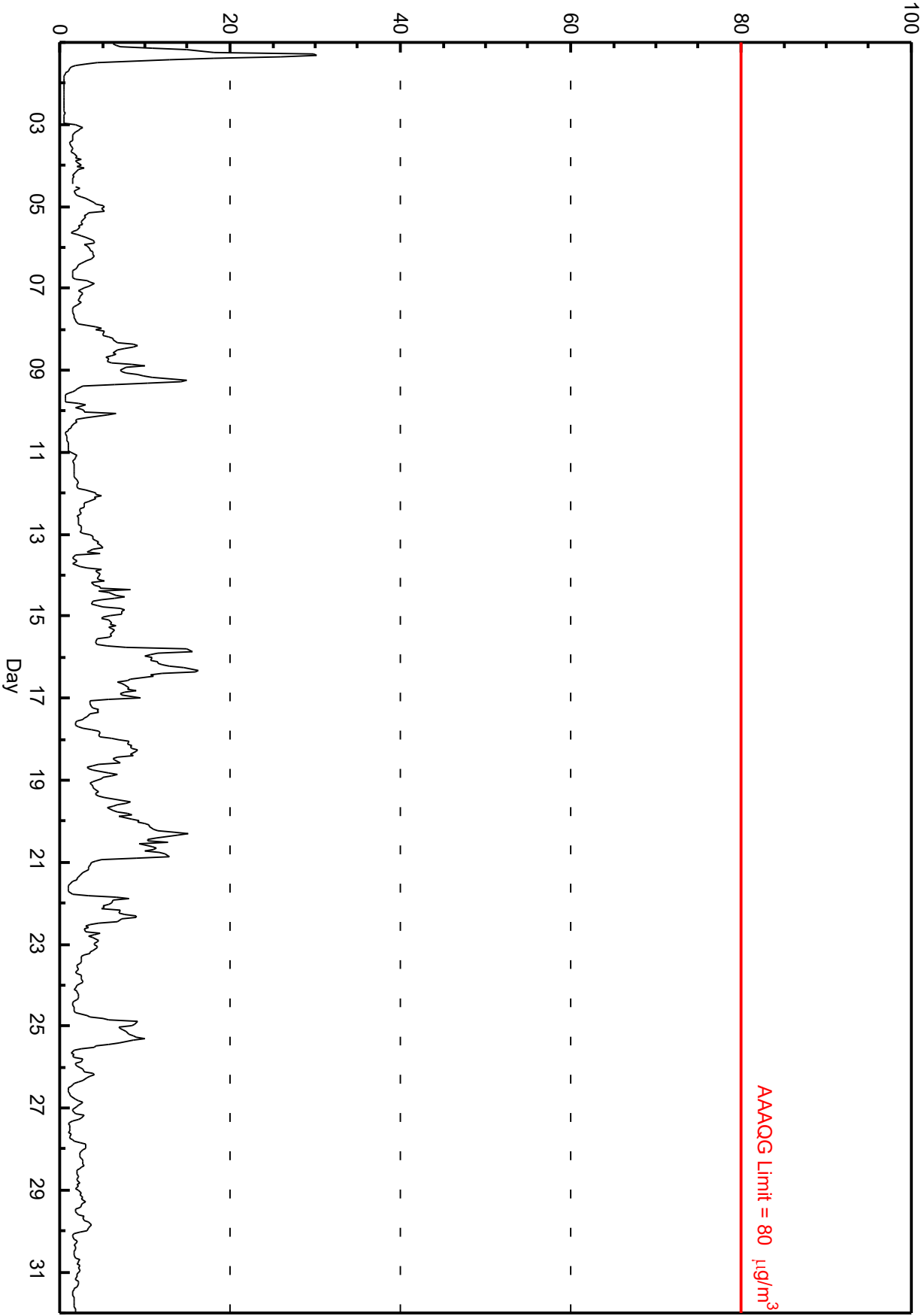


Peace Airshed Zone Association

Hourly Averages

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

Henry Pirkner - March 2020



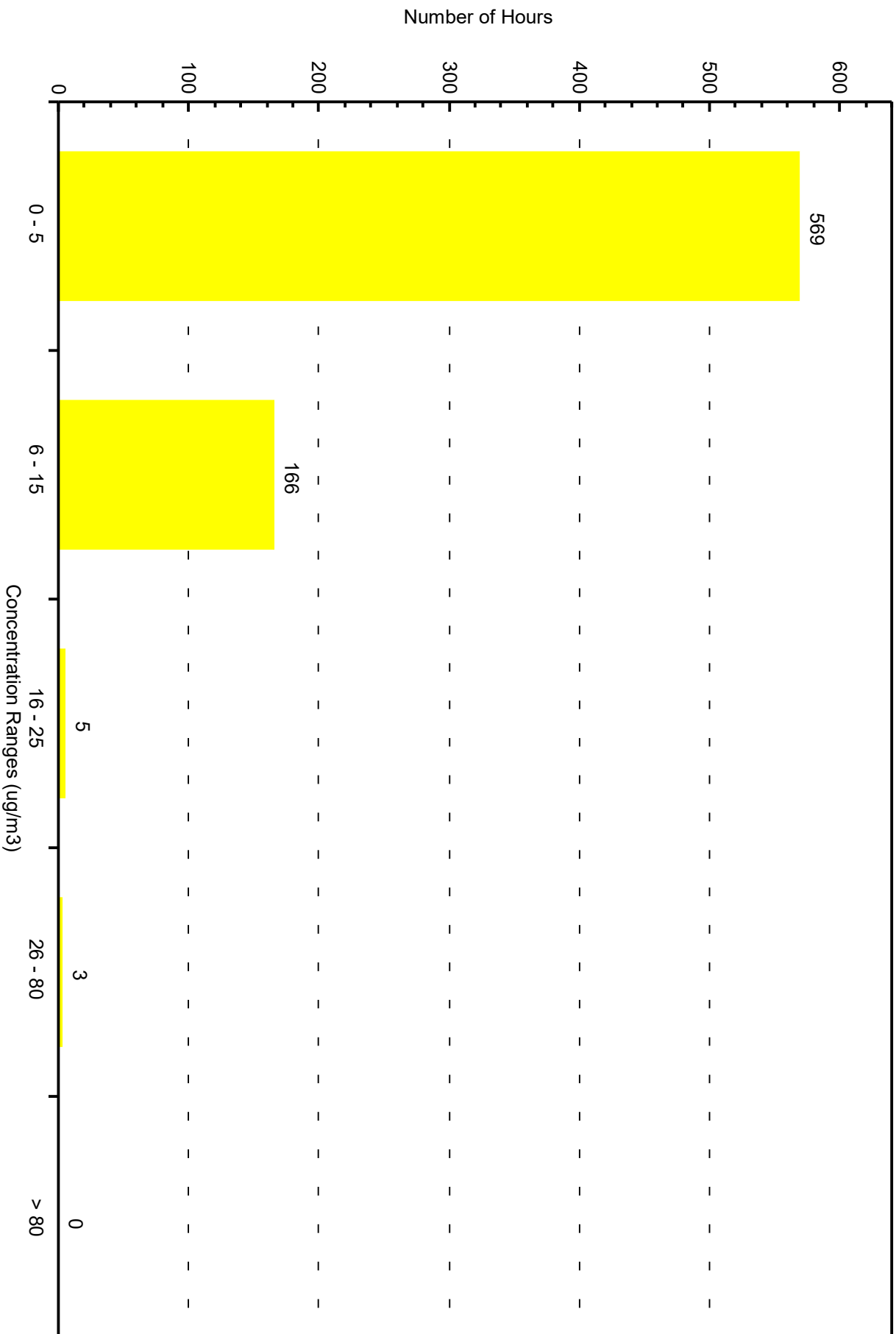


Peace Airshed Zone Association

Histogram of Hourly Averages

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

Henry Pirker - March 2020



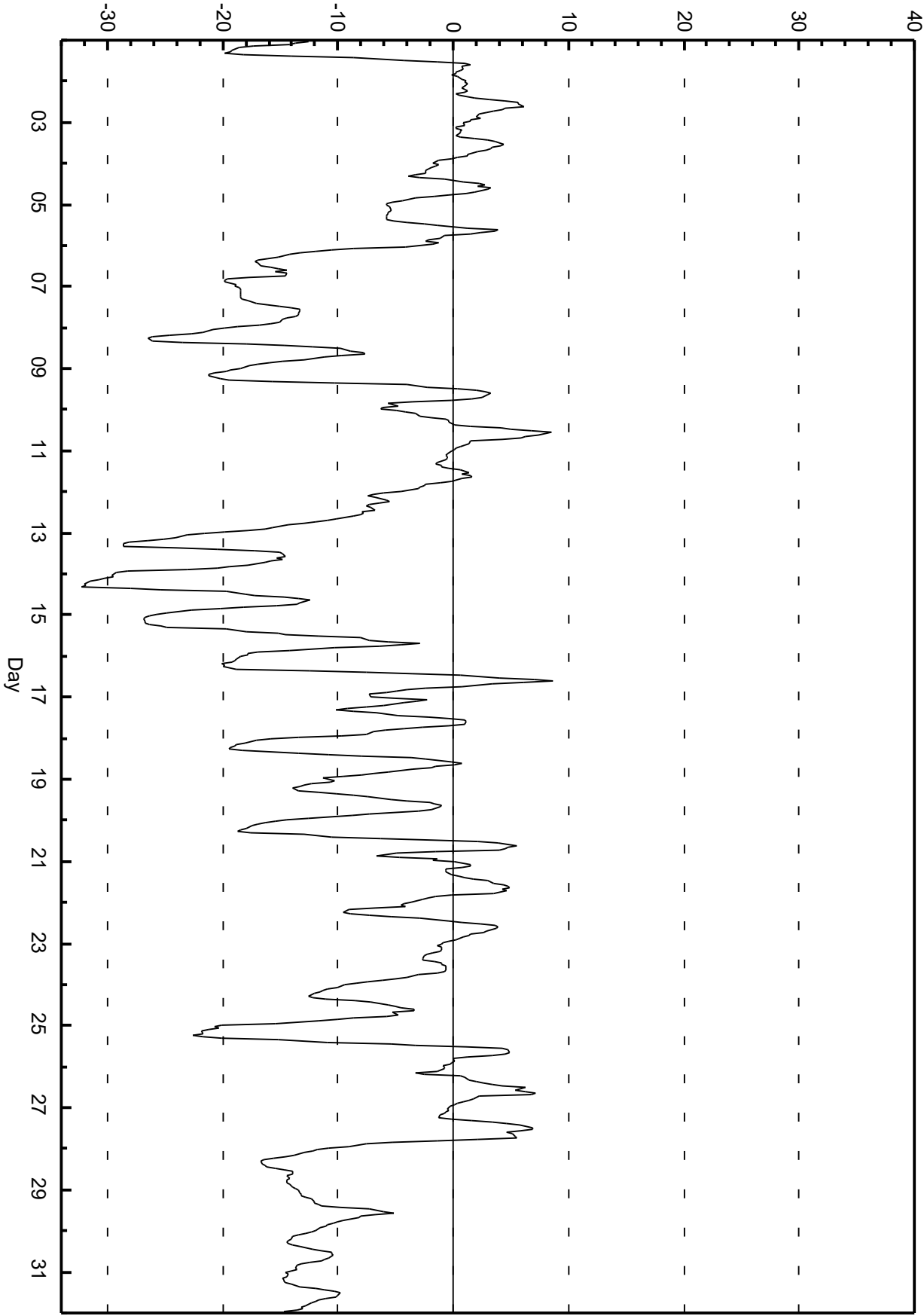


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C

Henry Pirkner - March 2020

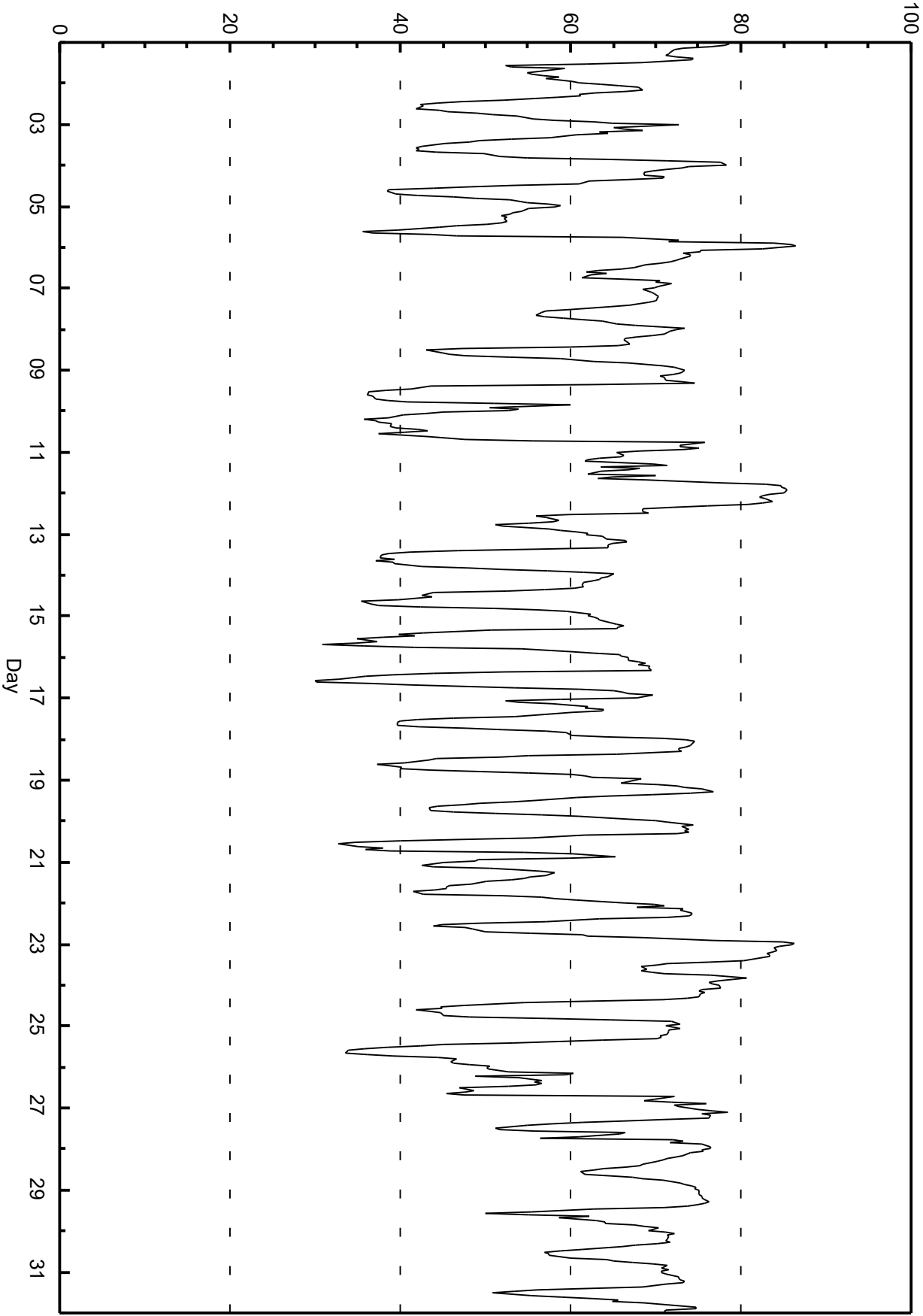




Peace Airshed Zone Association

Hourly Averages

Relative Humidity (RH) - %
Henry Pirkner - March 2020



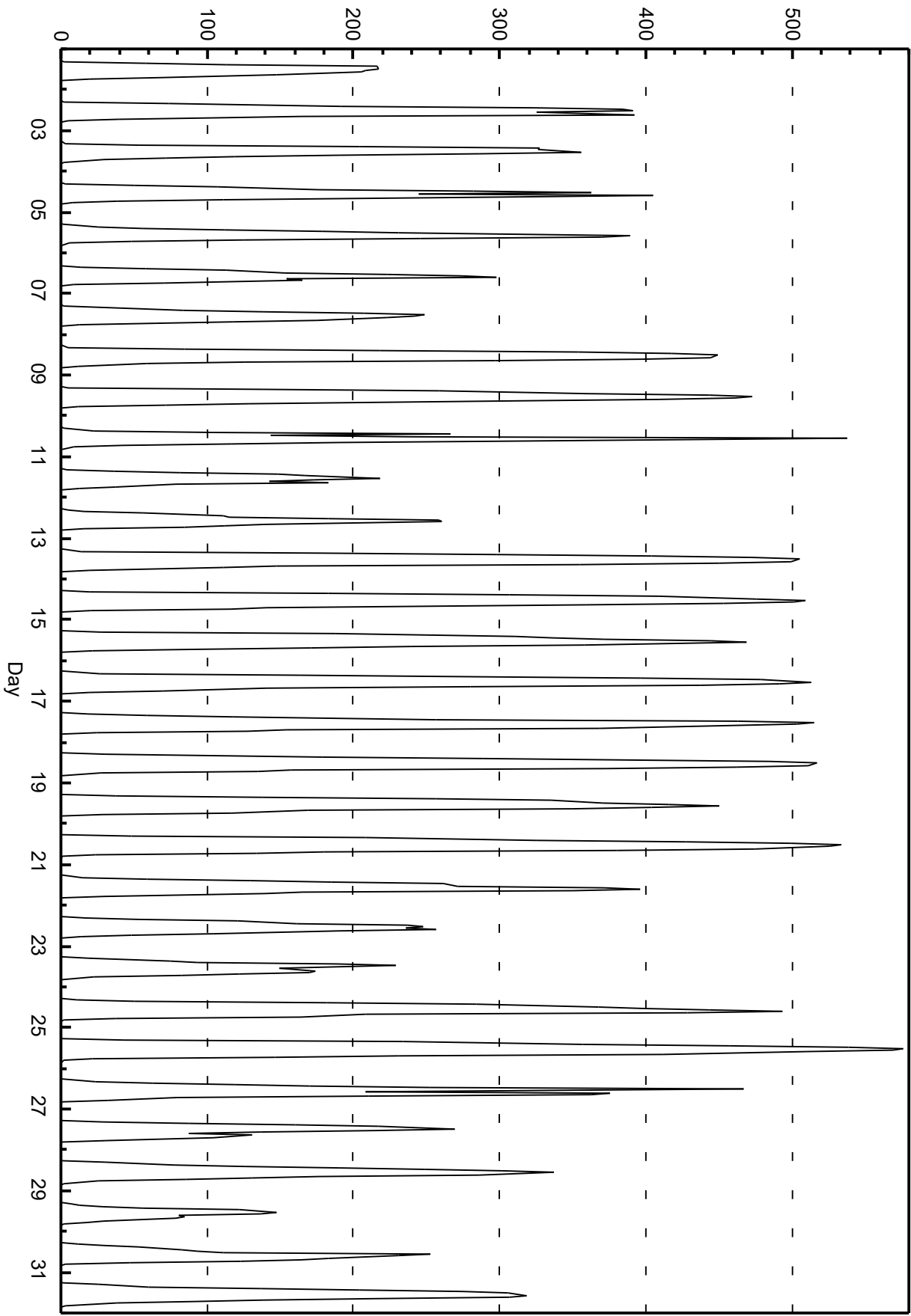


Peace Airshed Zone Association

Hourly Averages

Solar Radiation (SR) - W/m²

Henry Pirkner - March 2020

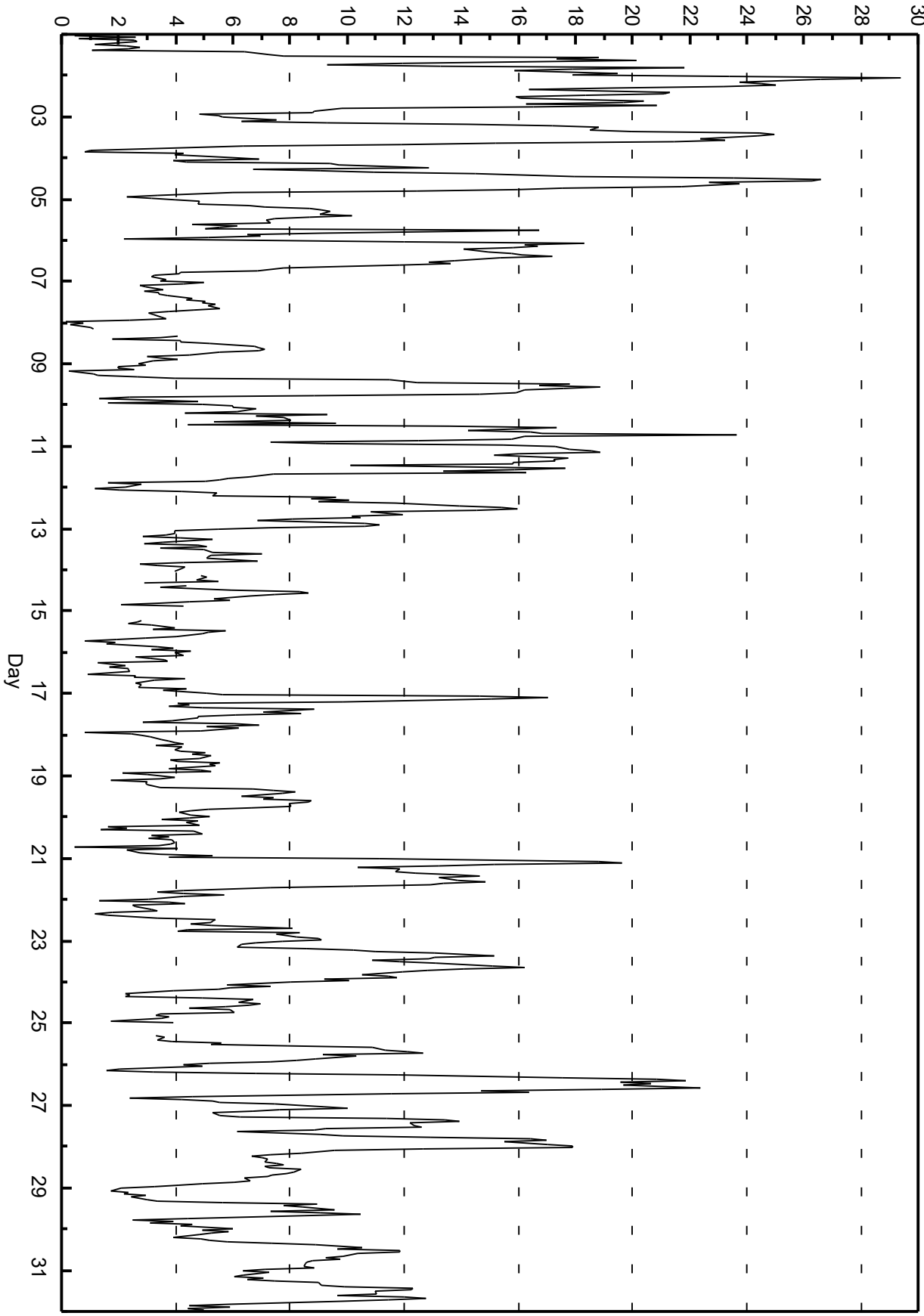




Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h
Henry Pirkner - March 2020

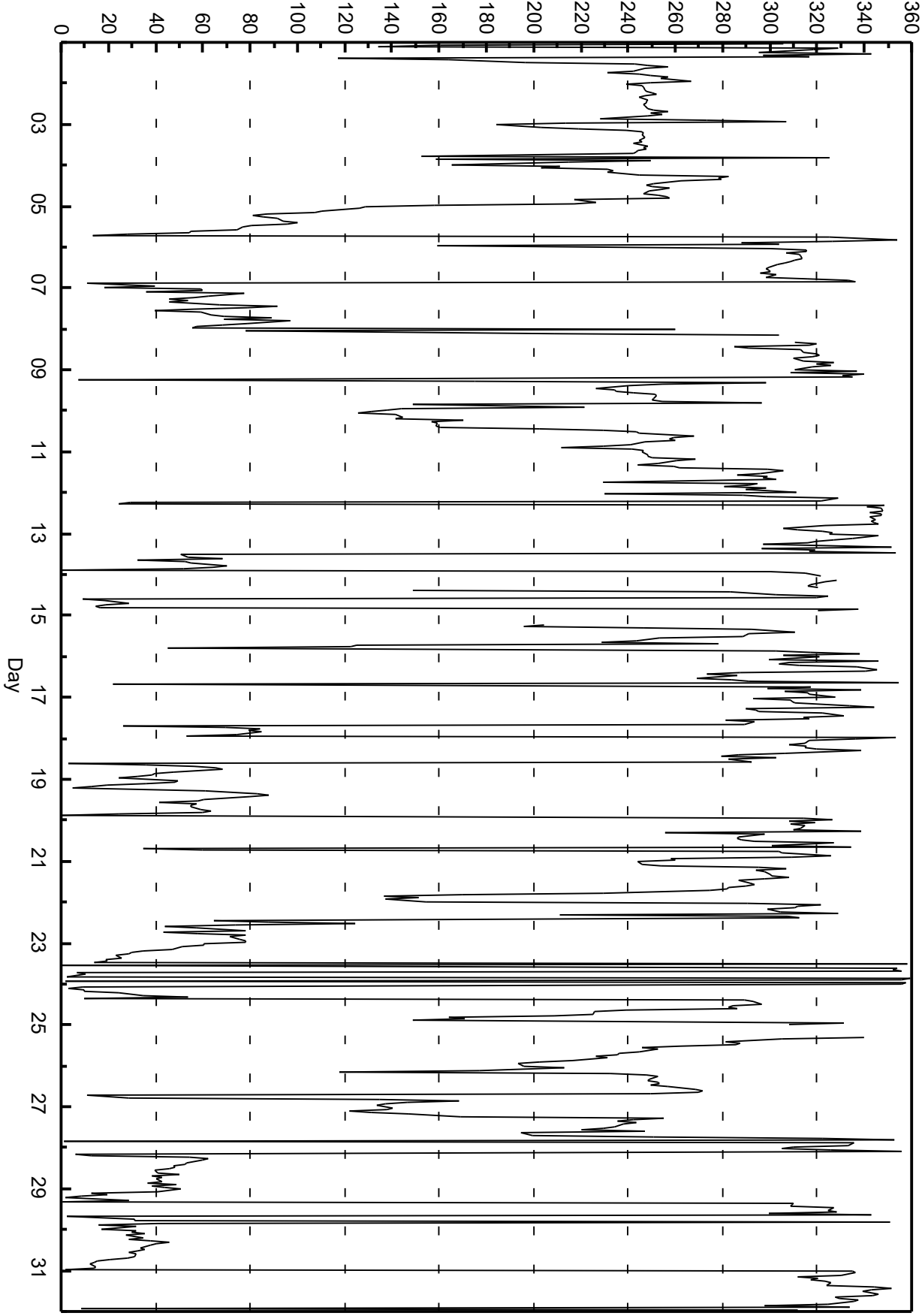




Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg
Henry Pirkner - March 2020

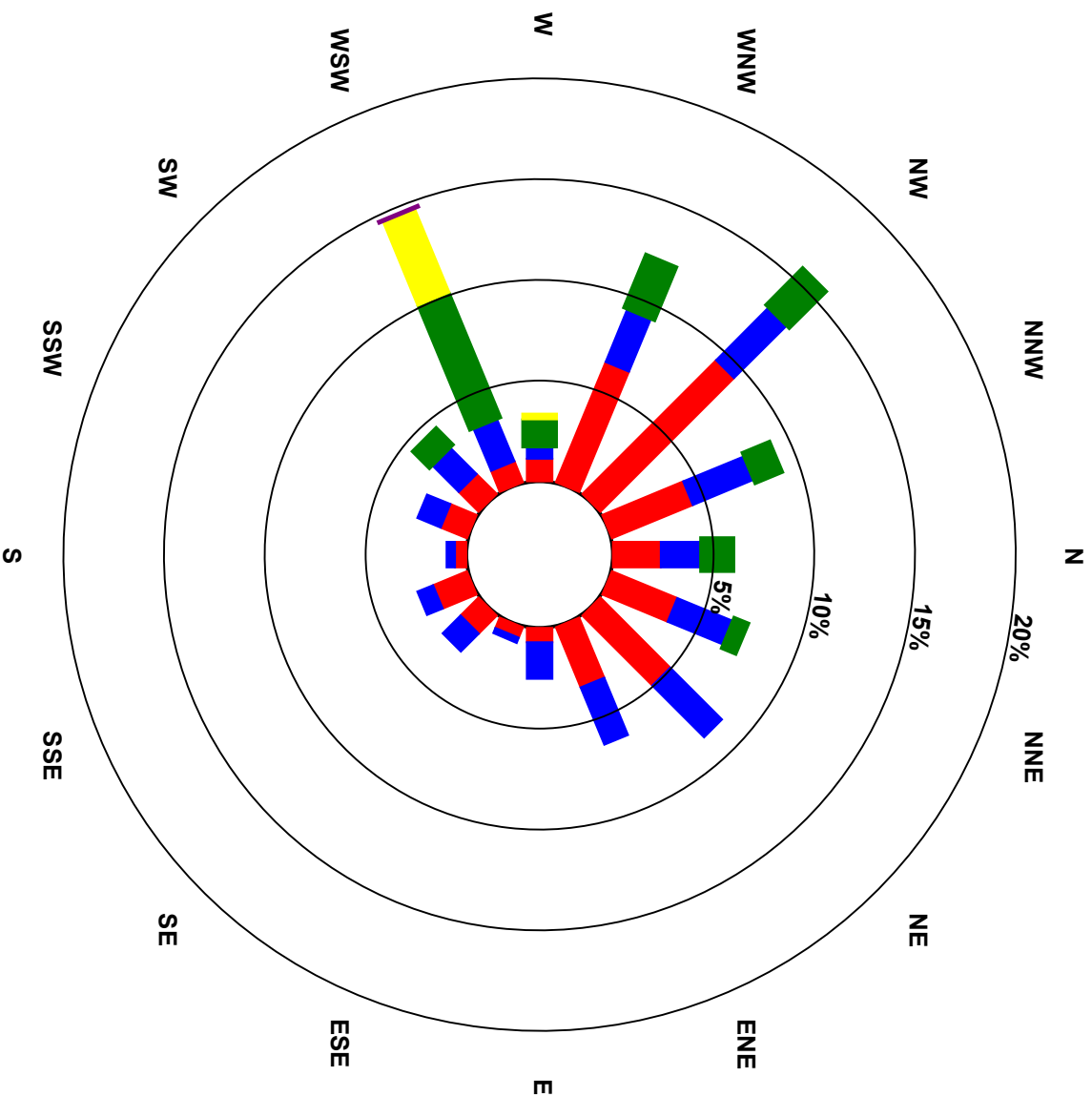




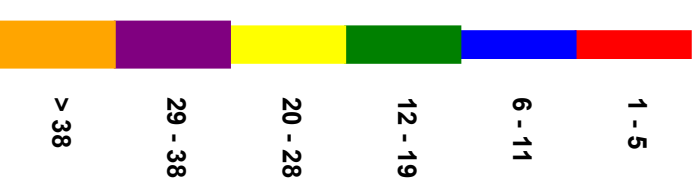
Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)
Henry Pirker - March 2020



Wind Speed Classes (km/h)



5 Smoky Heights Charts

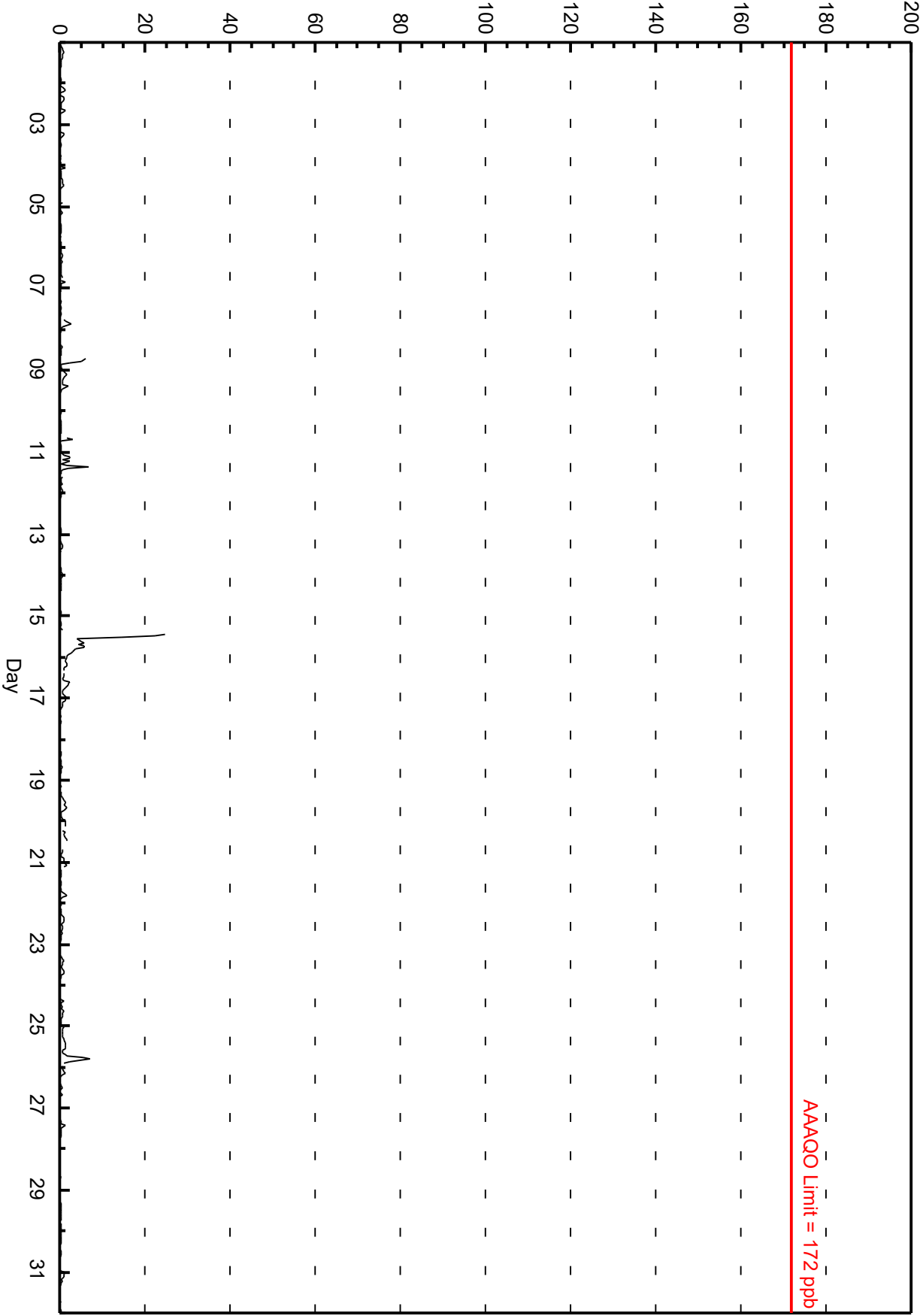
The following pages include the charts and histograms for Smoky Heights Station



Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Smoky Heights - March 2020

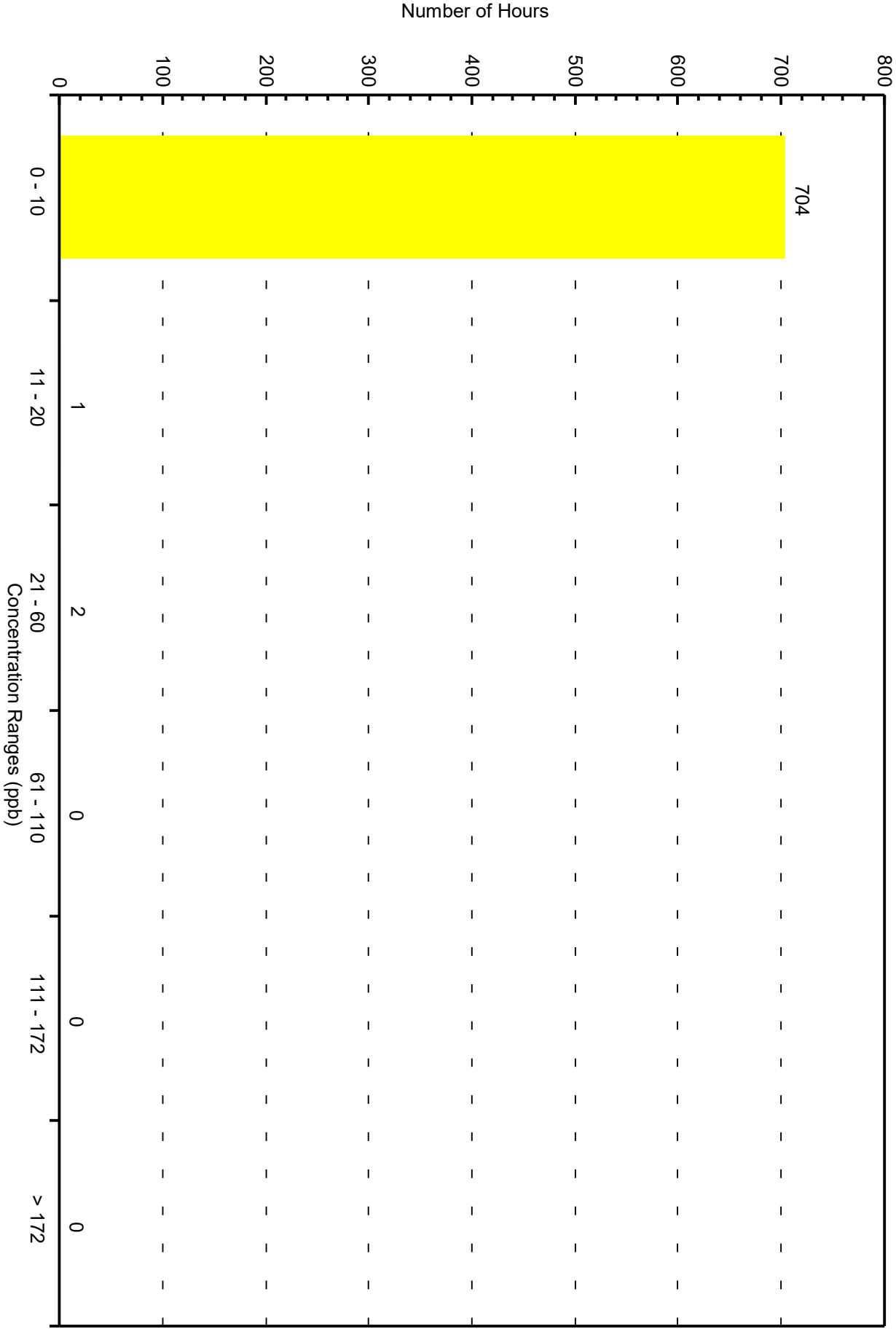




Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Smoky Heights - March 2020

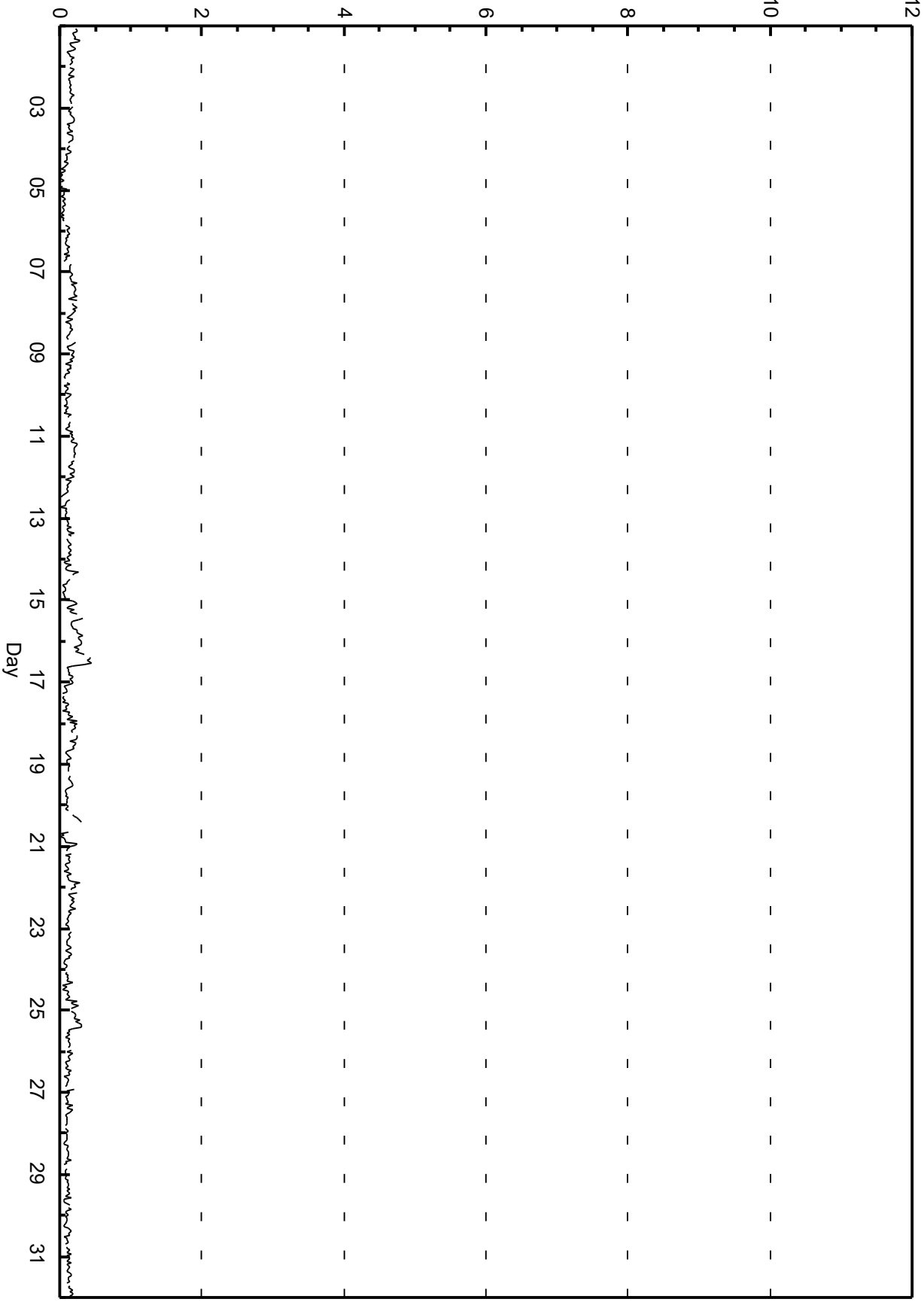




Peace Airshed Zone Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Smoky Heights - March 2020



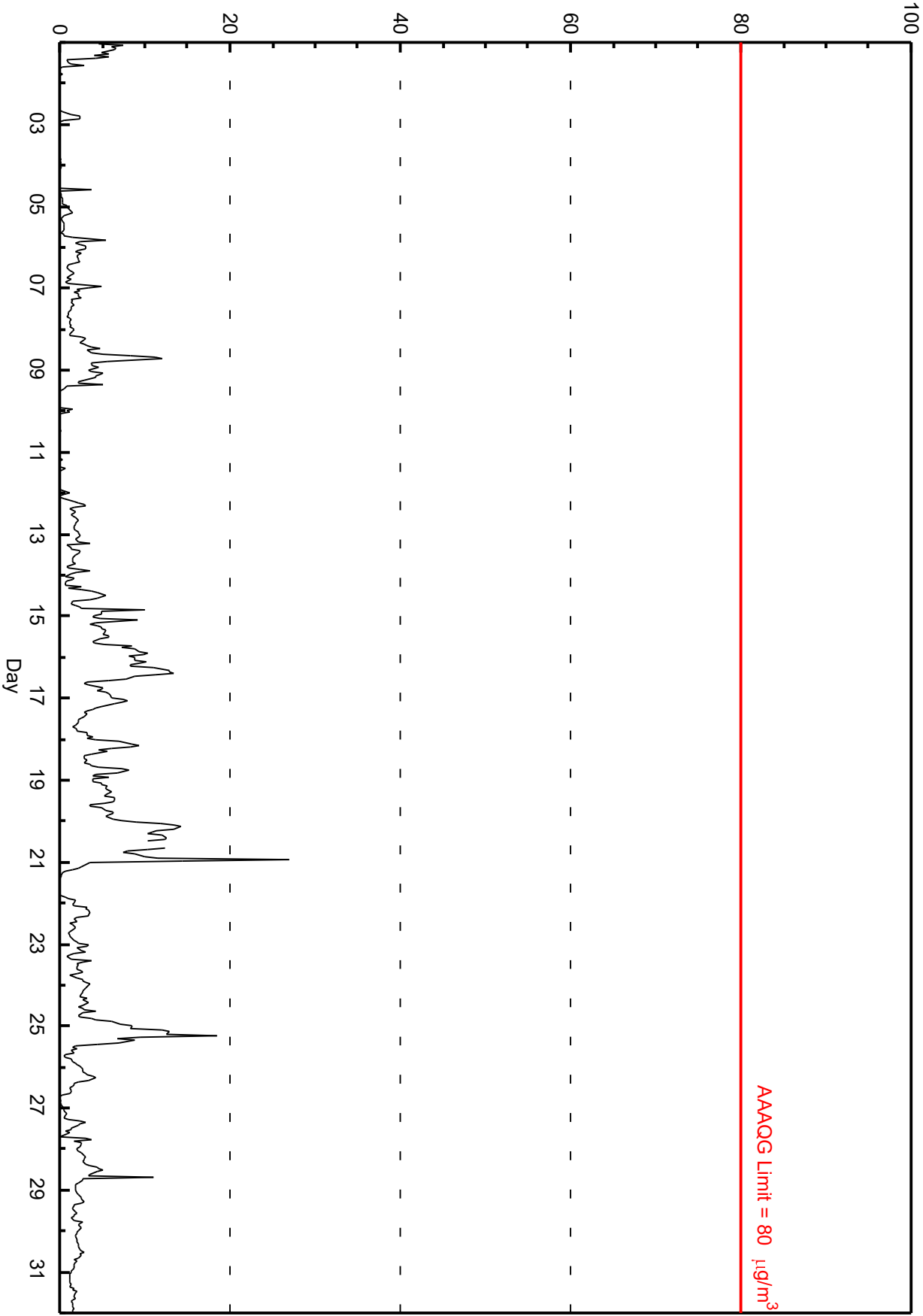


Peace Airshed Zone Association

Hourly Averages

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

Smoky Heights - March 2020



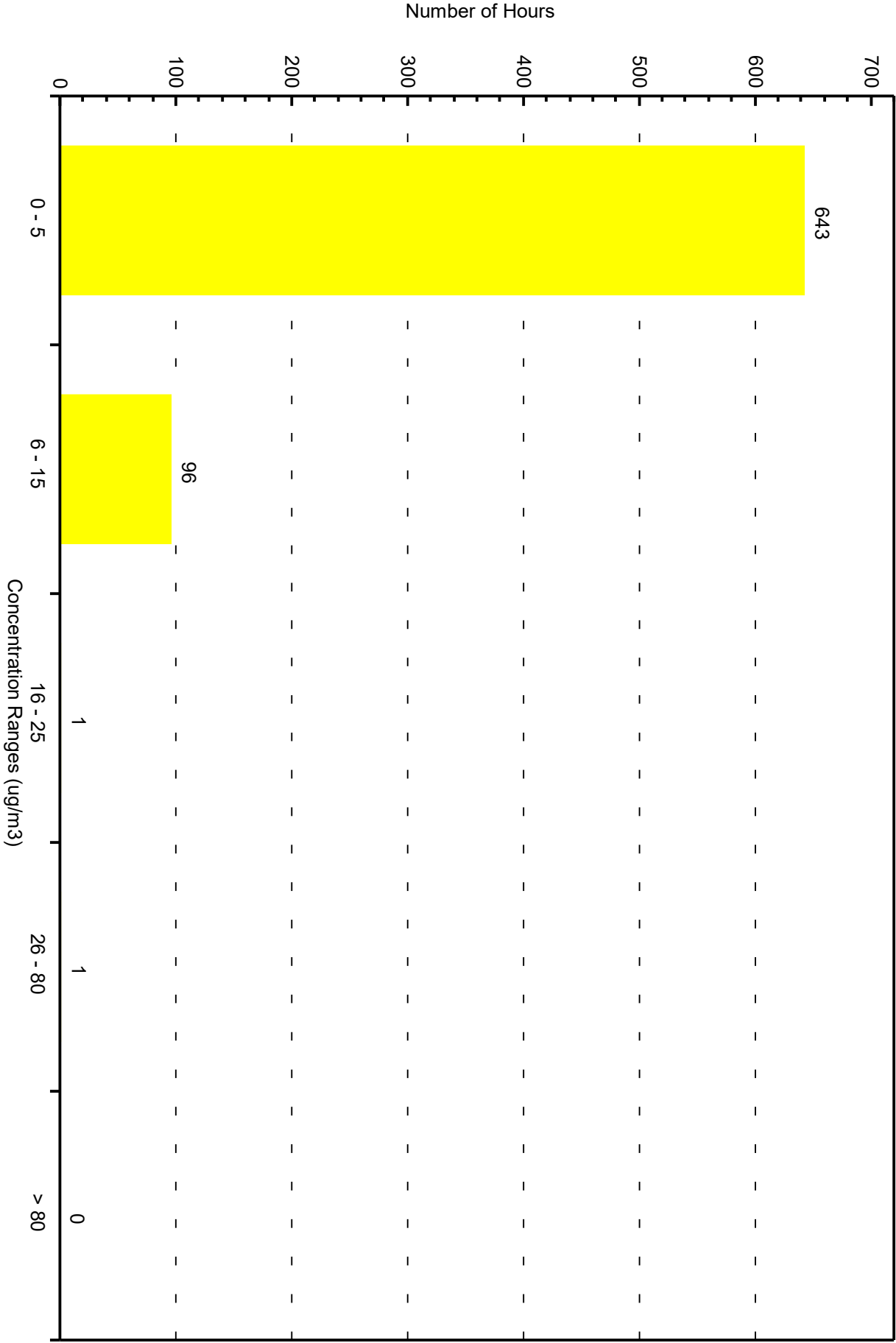


Peace Airshed Zone Association

Histogram of Hourly Averages

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

Smoky Heights - March 2020

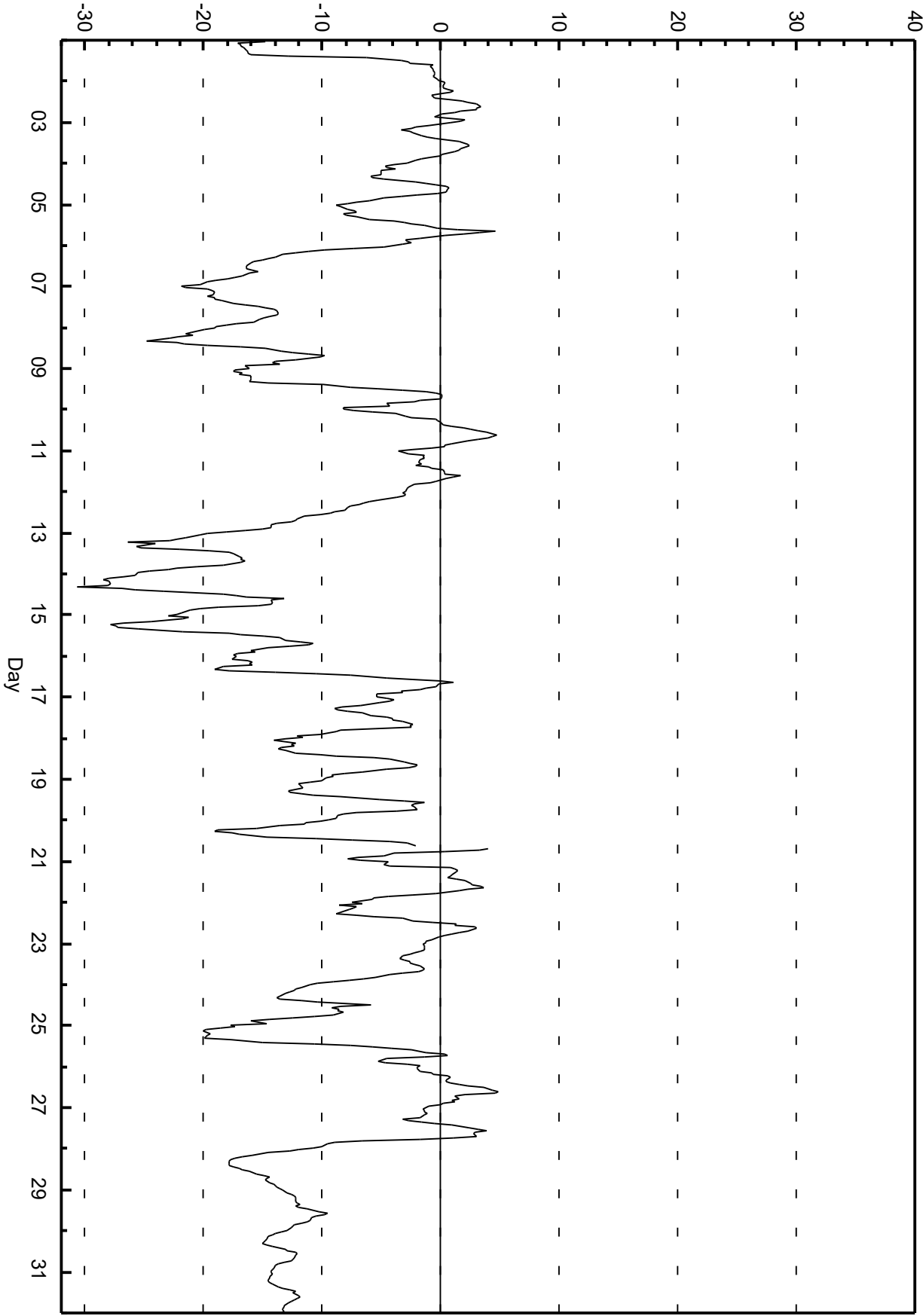




Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C
Smoky Heights - March 2020

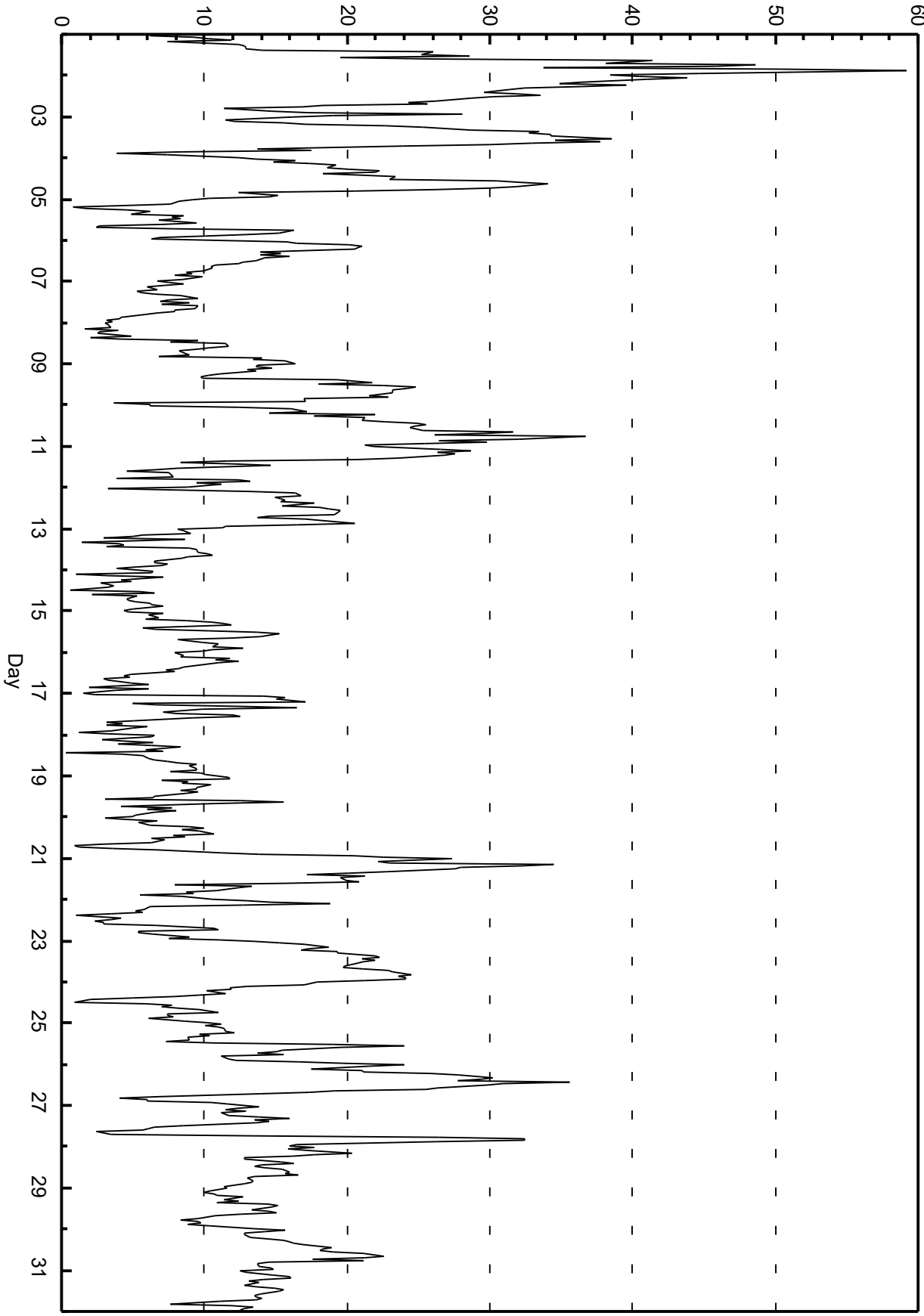




Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h
Smoky Heights - March 2020

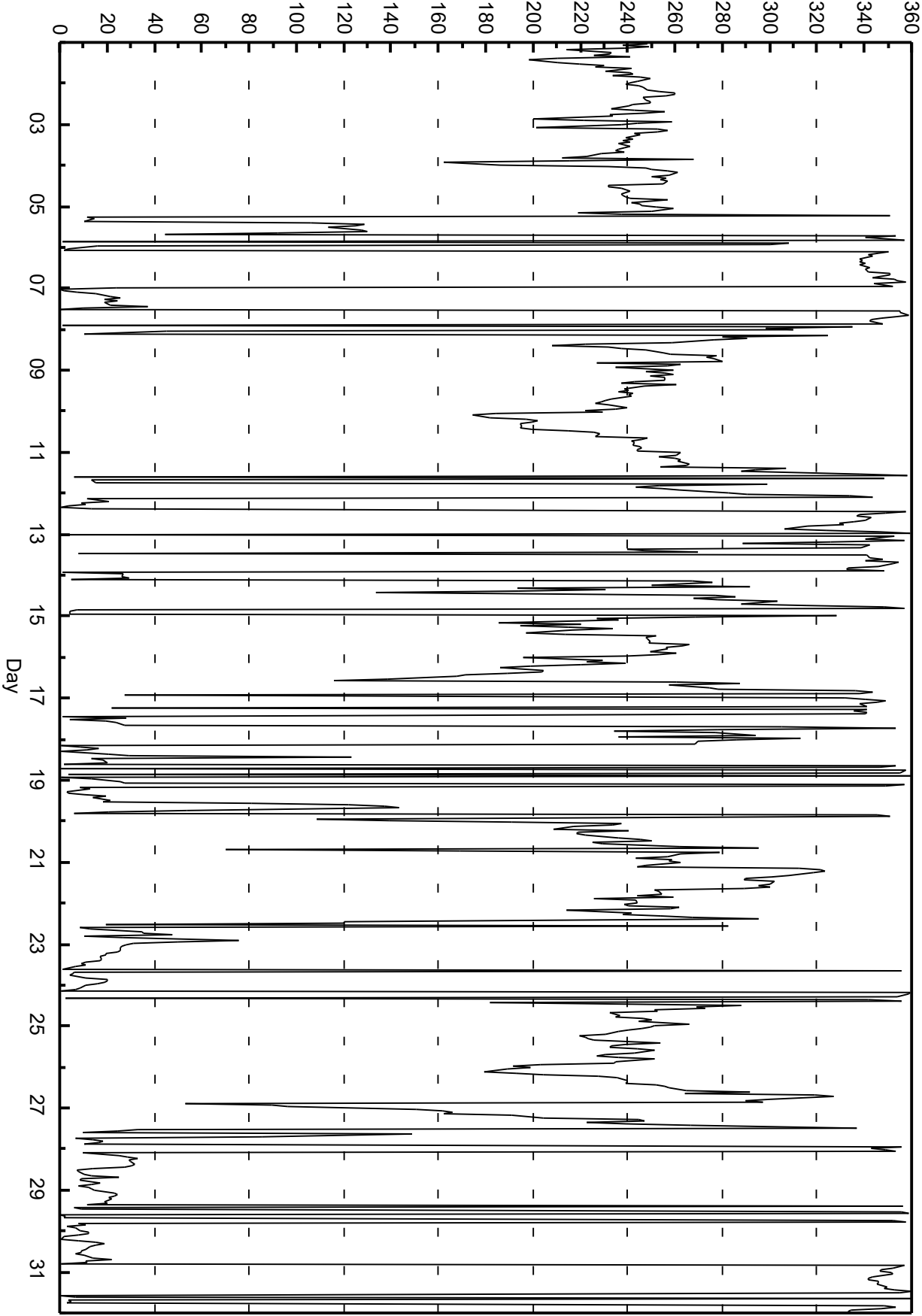




Peace Airshed Zone Association

Hourly Averages

**Wind Direction (WD) - deg
Smoky Heights - March 2020**

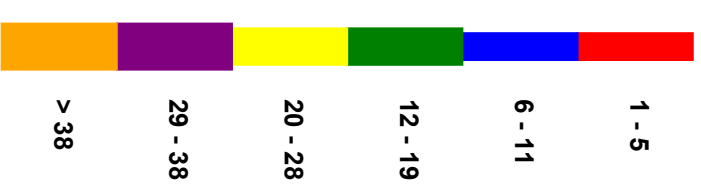
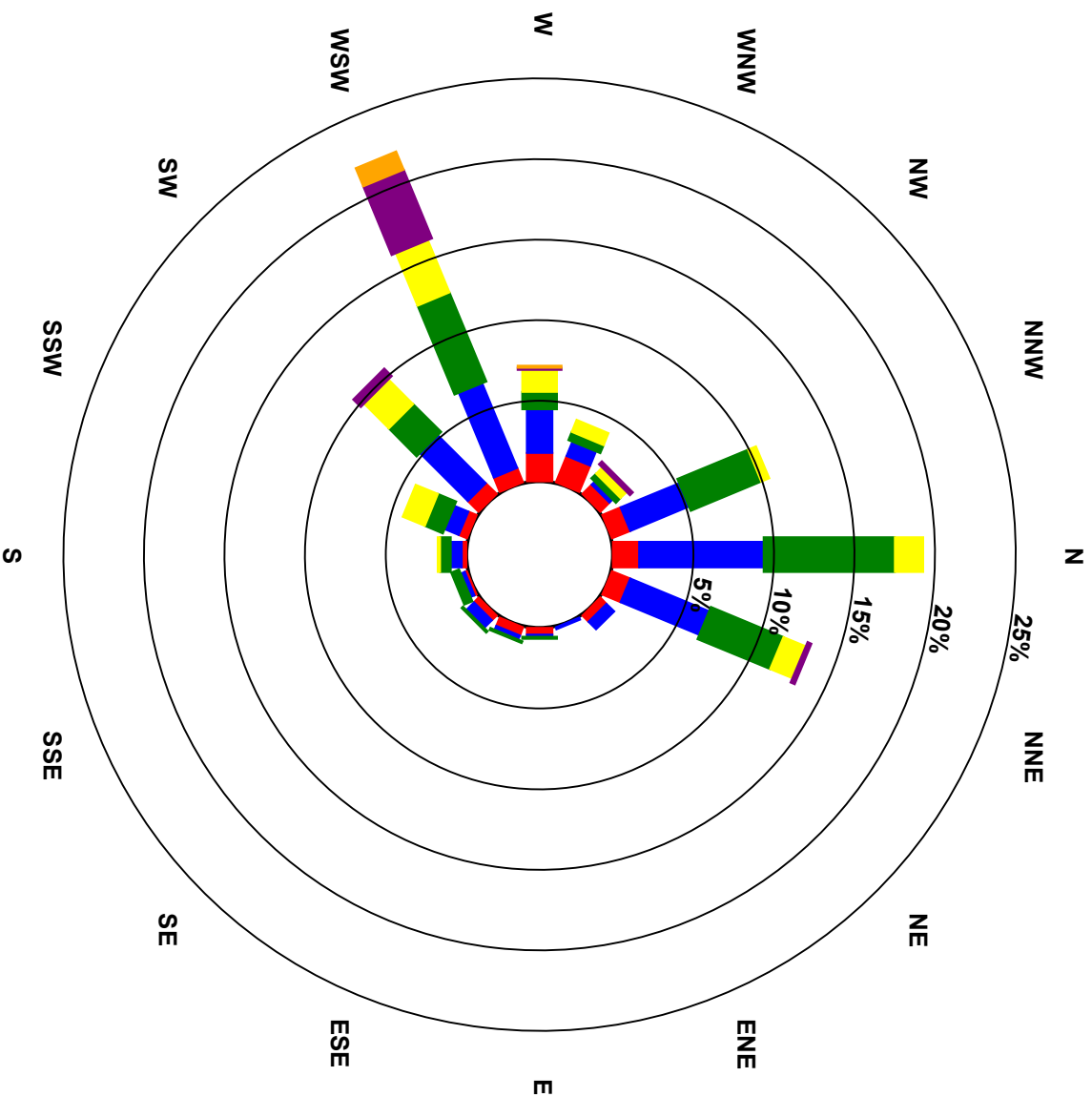




Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)
Smoky Heights - March 2020



6 Valleyview Charts

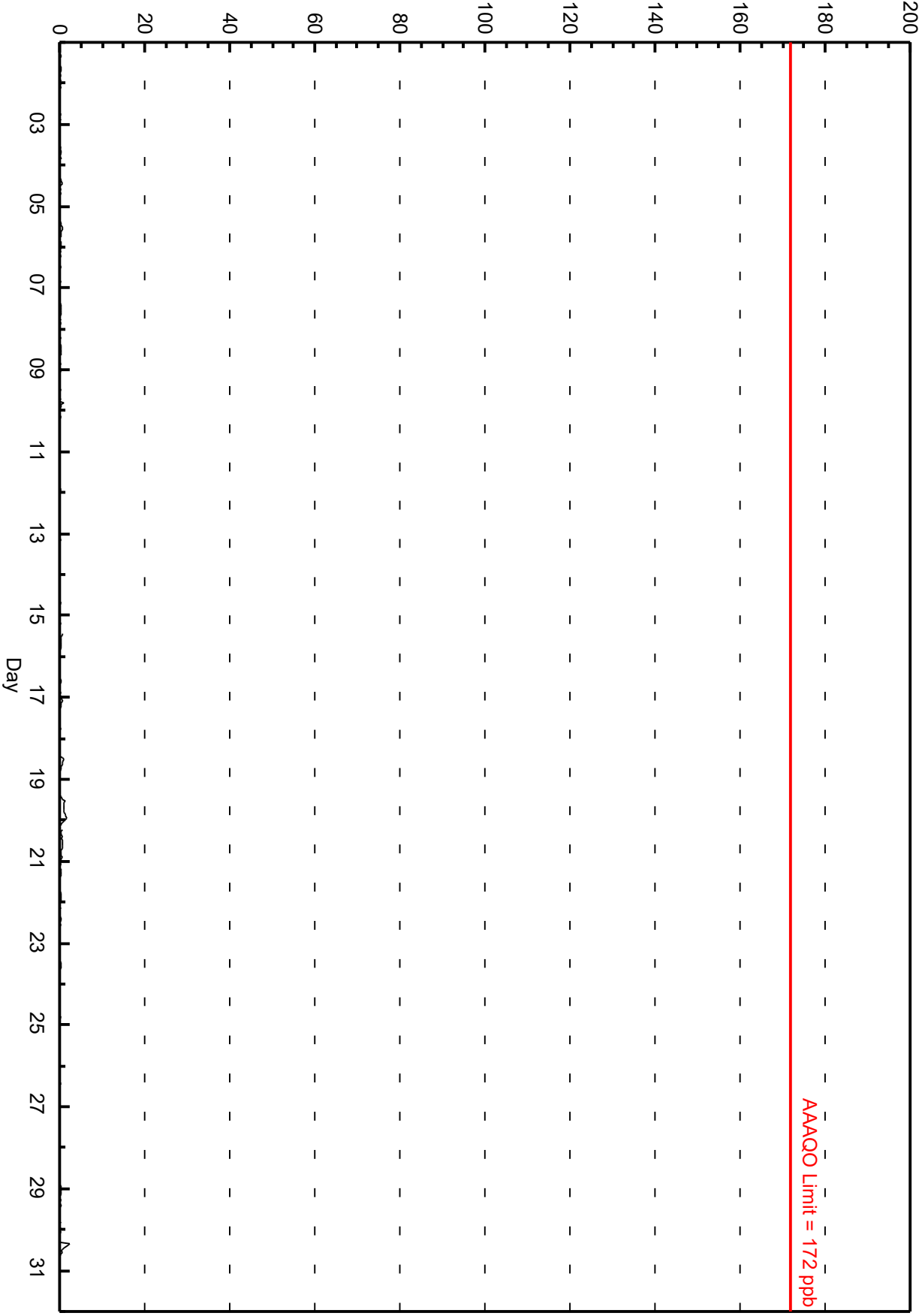
The following pages include the charts and histograms for Valleyview Station



Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Valleyview - March 2020

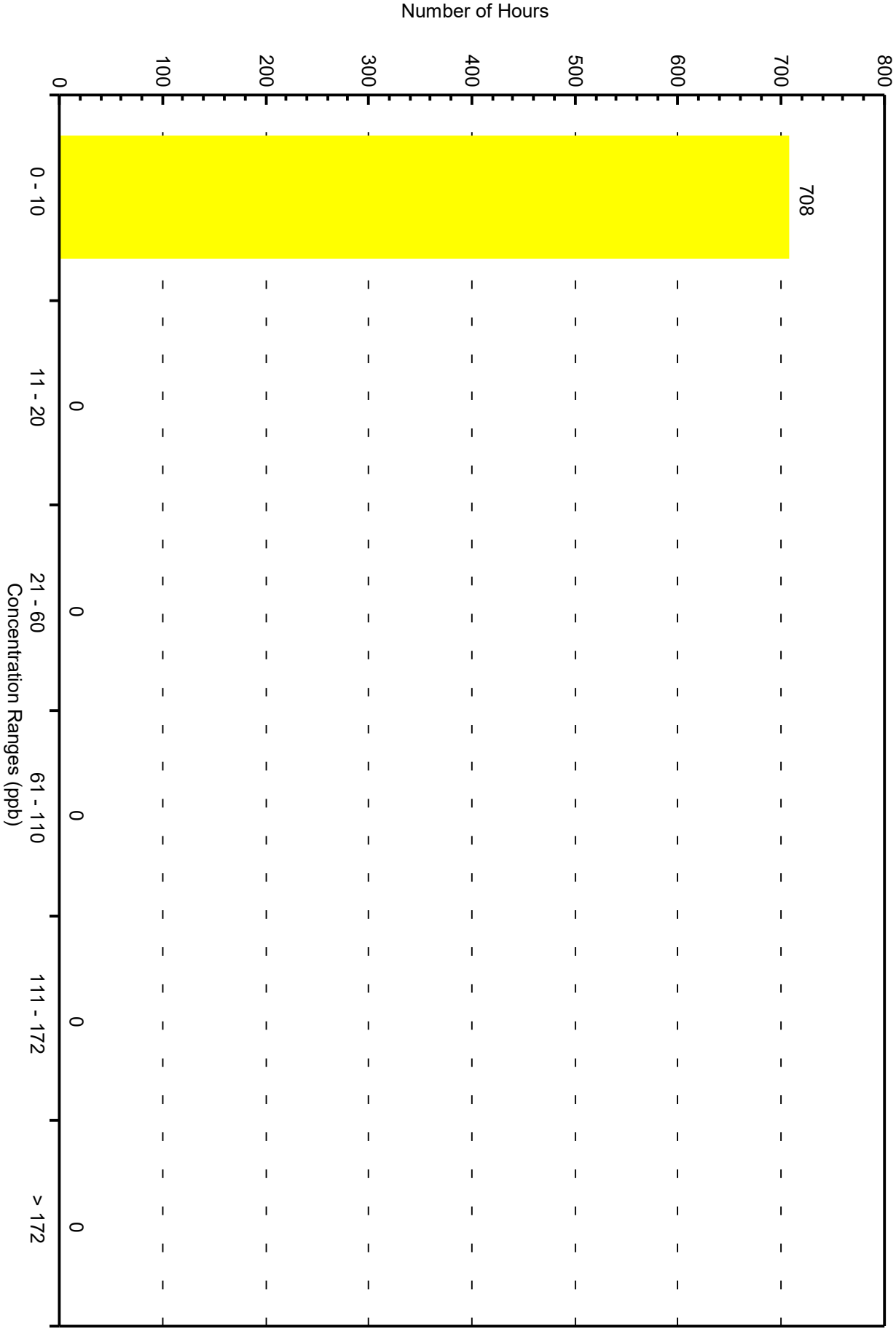




Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO_2) - ppb
Valleyview - March 2020

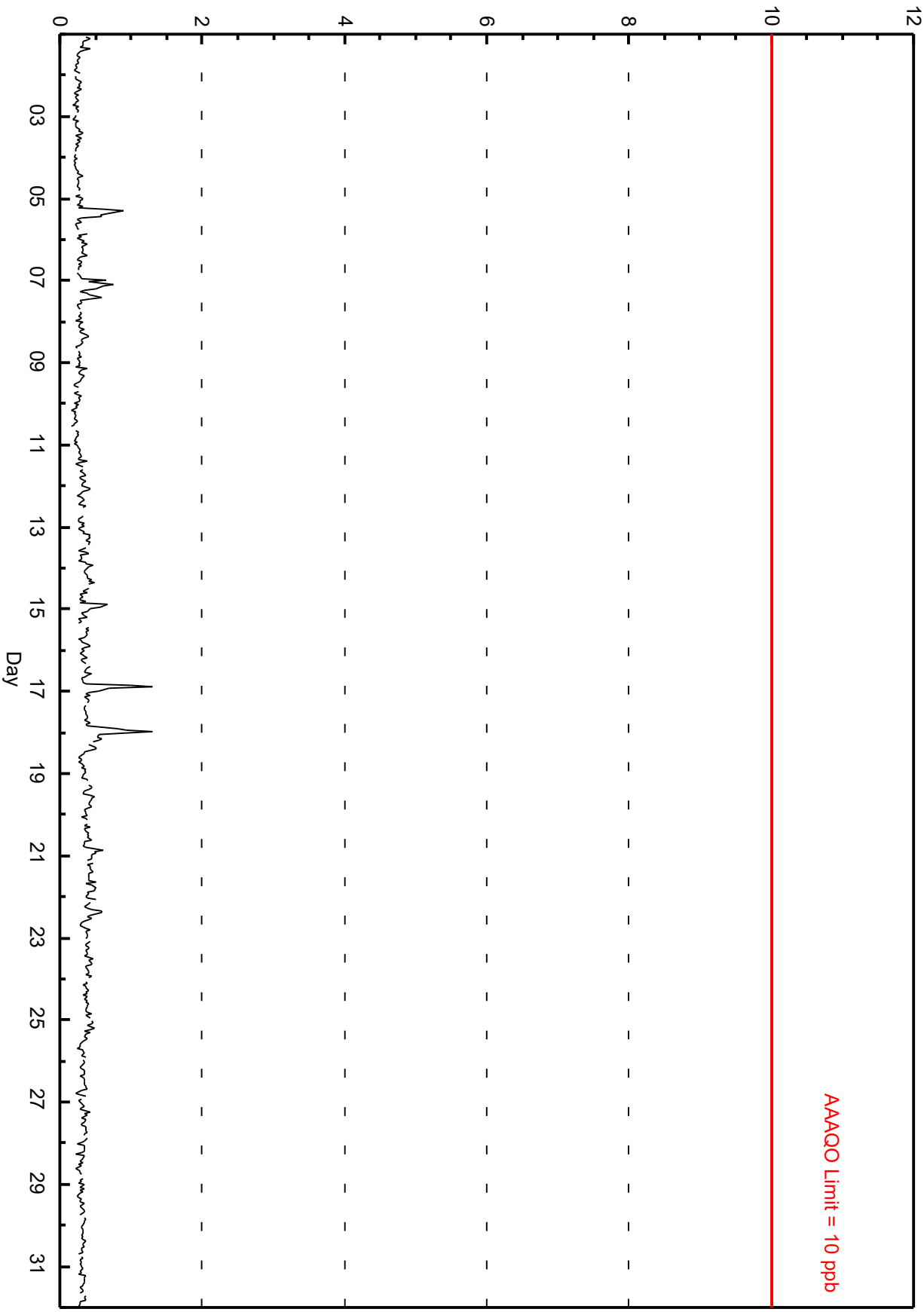




Peace Airshed Zone Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb
Valleyview - March 2020



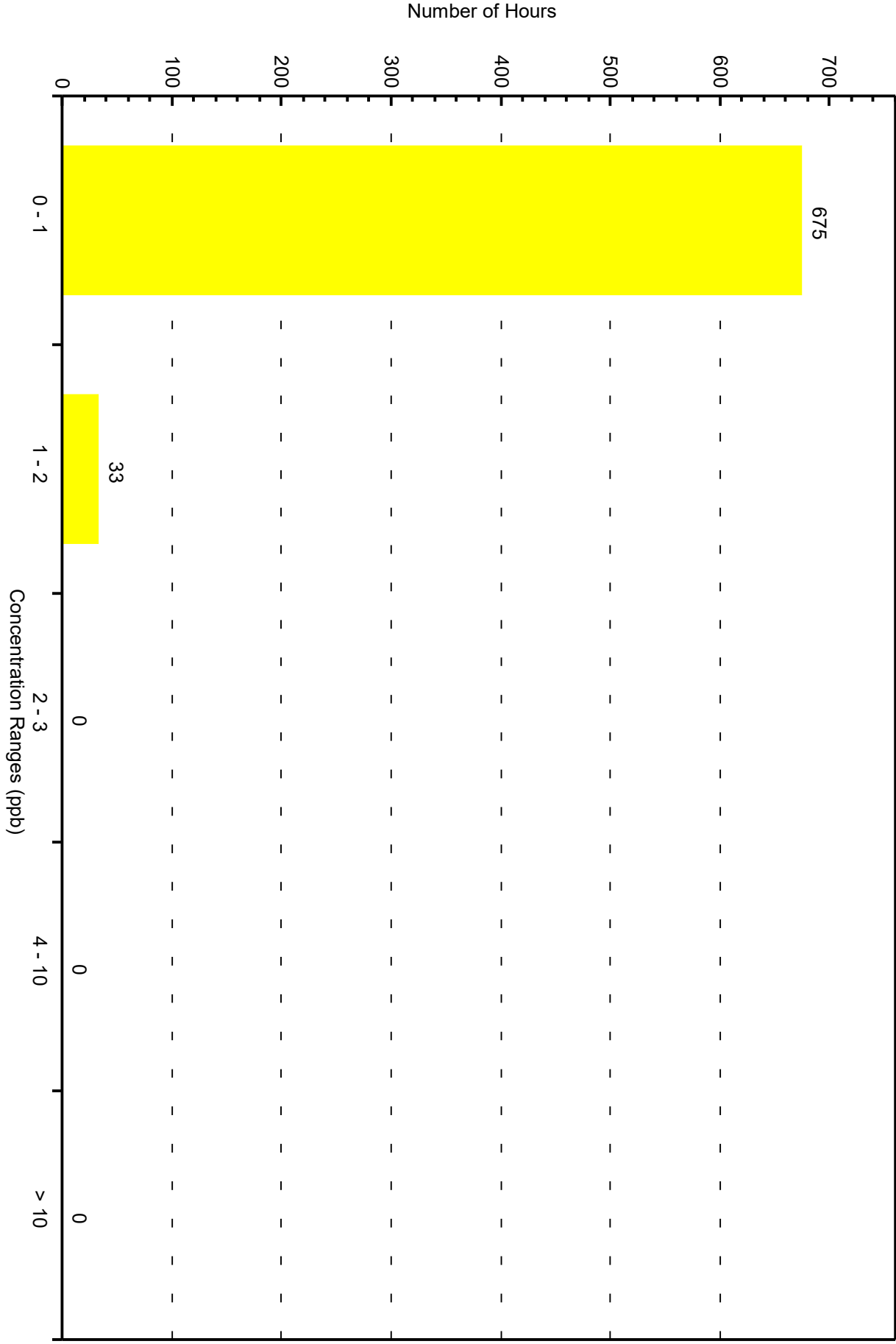


Peace Airshed Zone Association

Histogram of Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Valleyview - March 2020



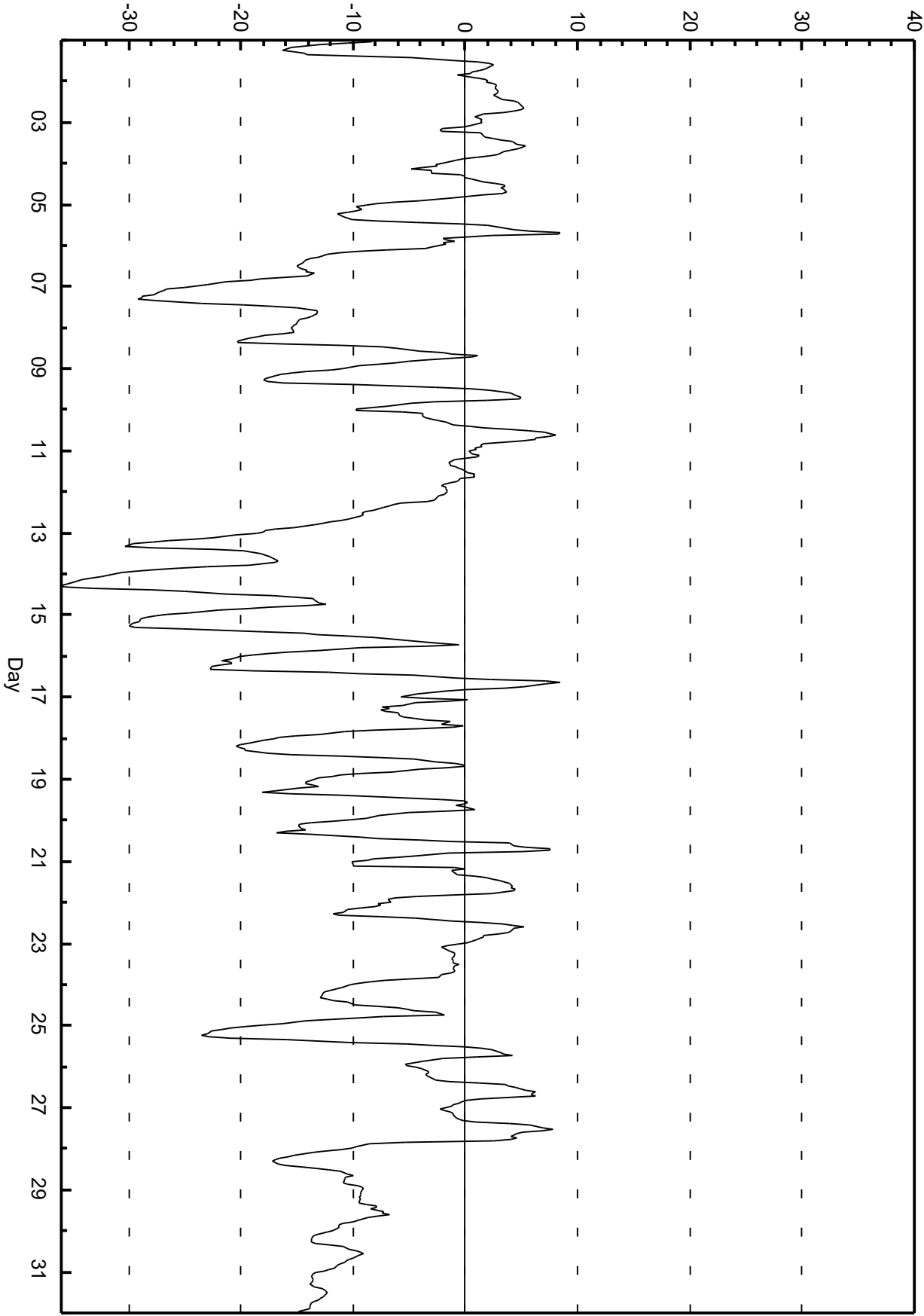


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C

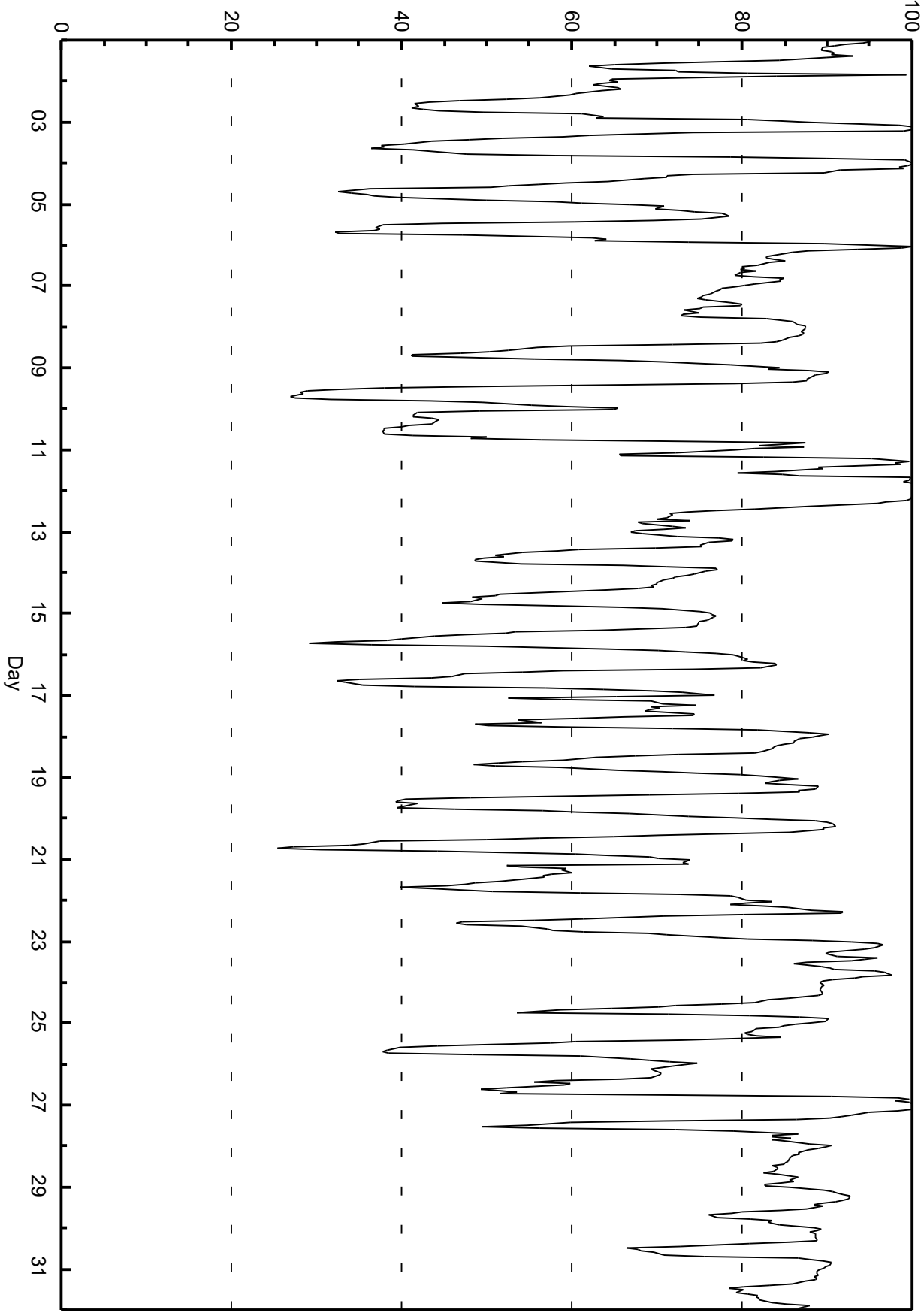
Valleyview - March 2020





Hourly Averages

Relative Humidity (RH) - %
Valleyview - March 2020

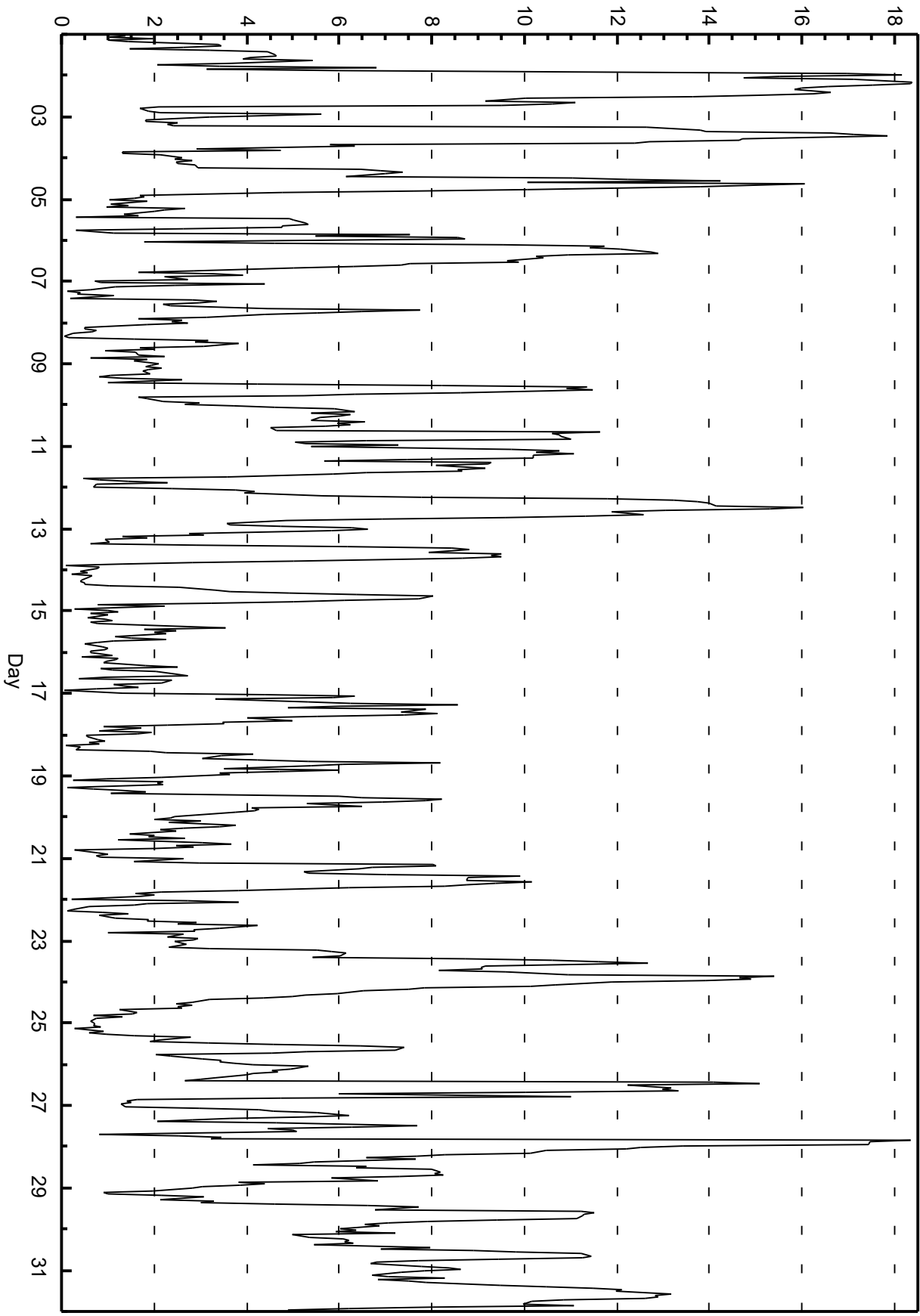




Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h
Valleyview - March 2020

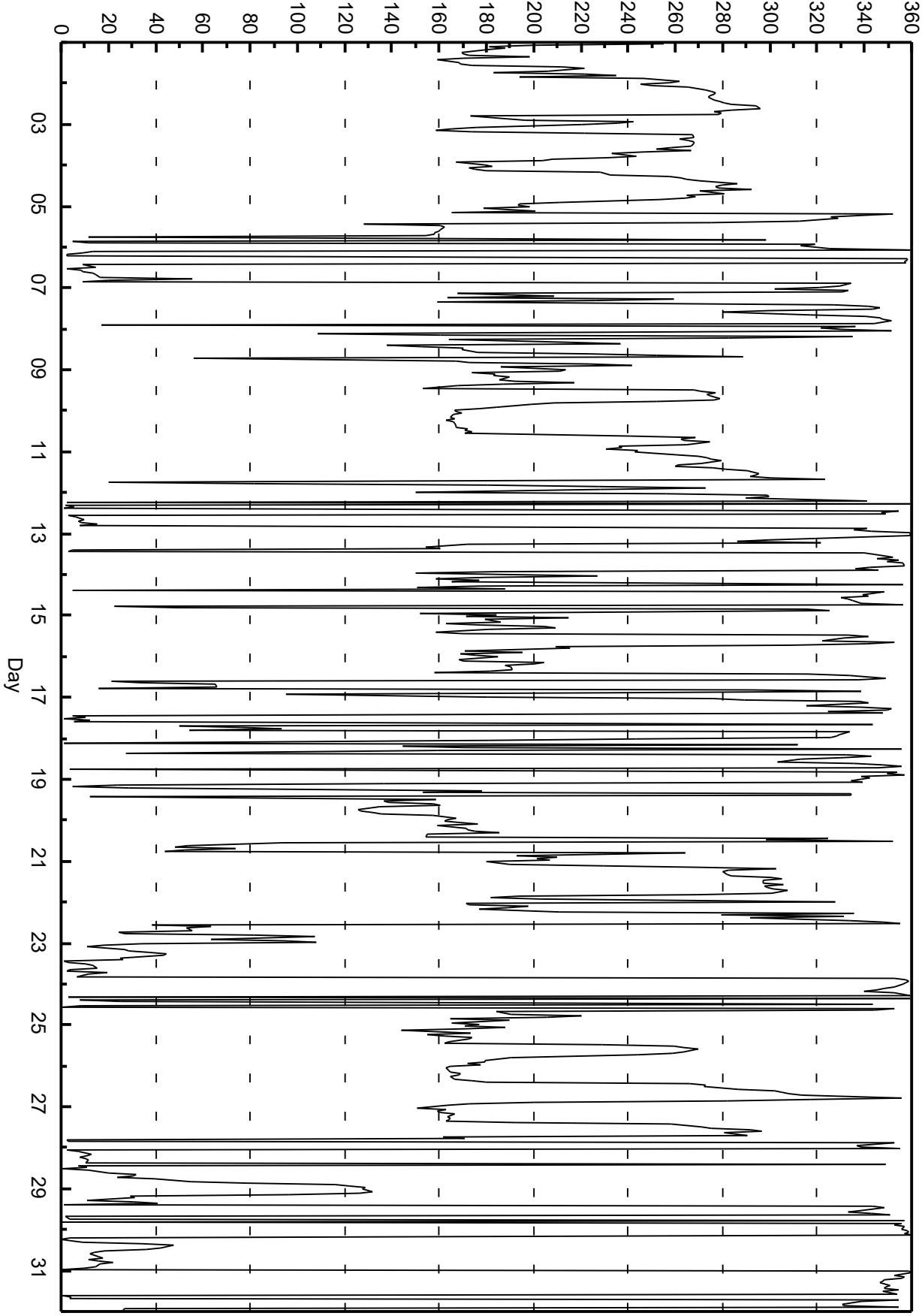




Peace Airshed Zone Association

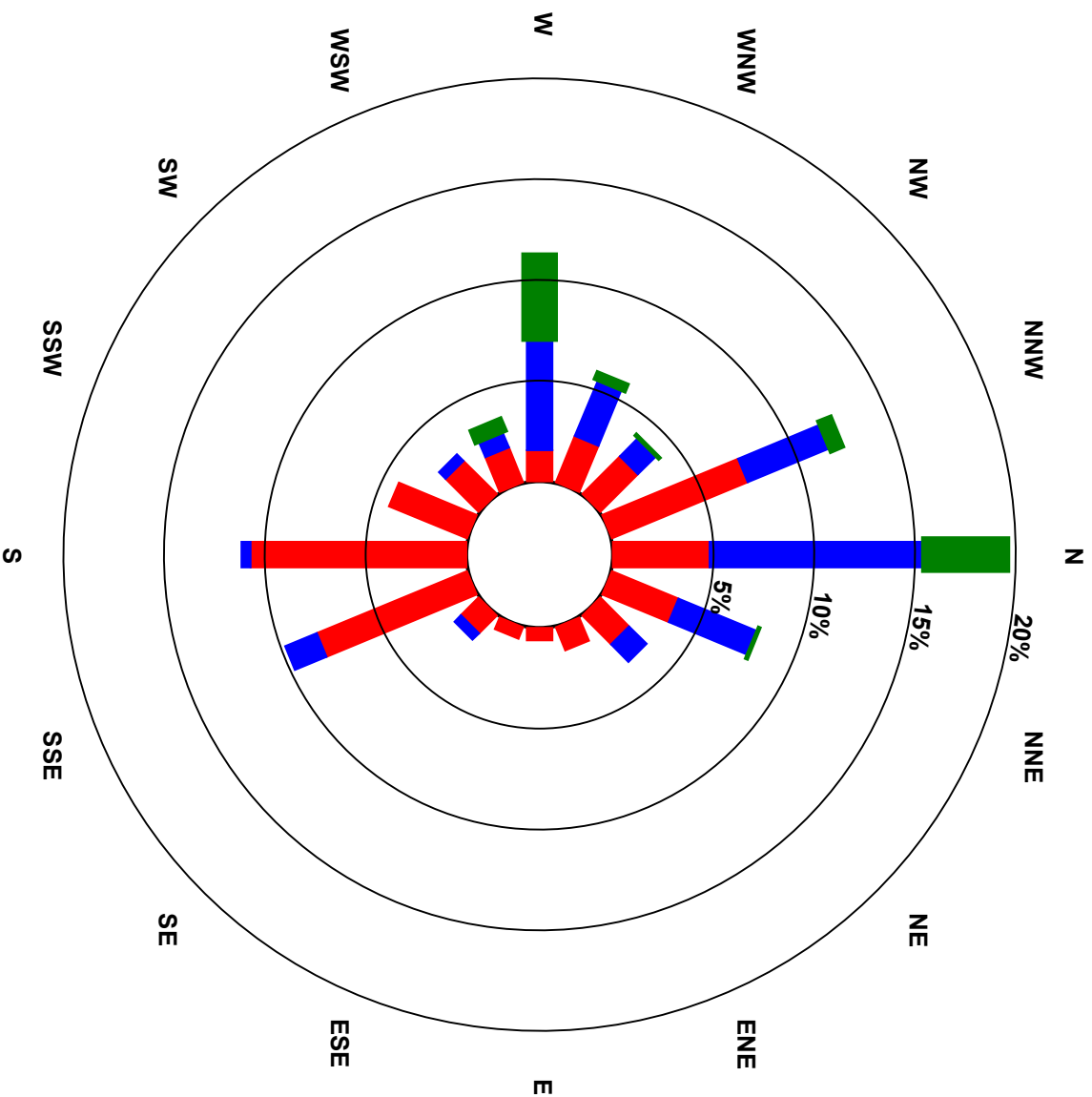
Hourly Averages

Wind Direction (WD) - deg
Valleyview - March 2020

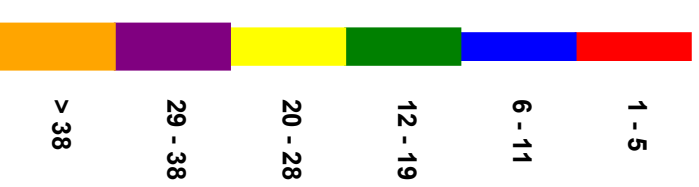


Wind Rose

Wind Speed (WS) (km/h)
Valleyview - March 2020



Wind Speed Classes (km/h)



7 Donnelly Charts

The following pages include the charts and histograms for Donnelly Station

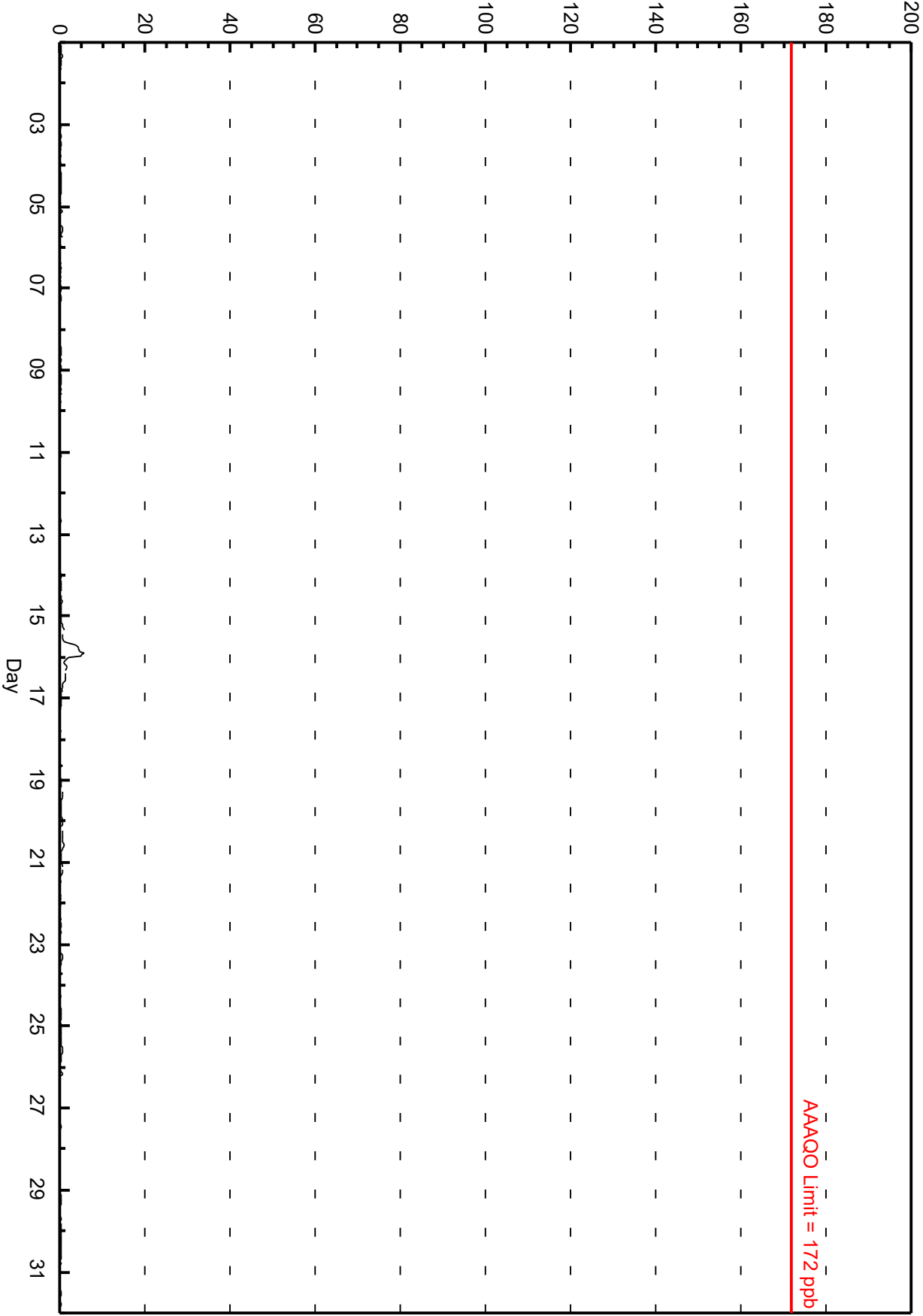


Peace Airshed Zone Association

Hourly Averages

Sulphur Dioxide (SO₂) - ppb

Donnelly - March 2020



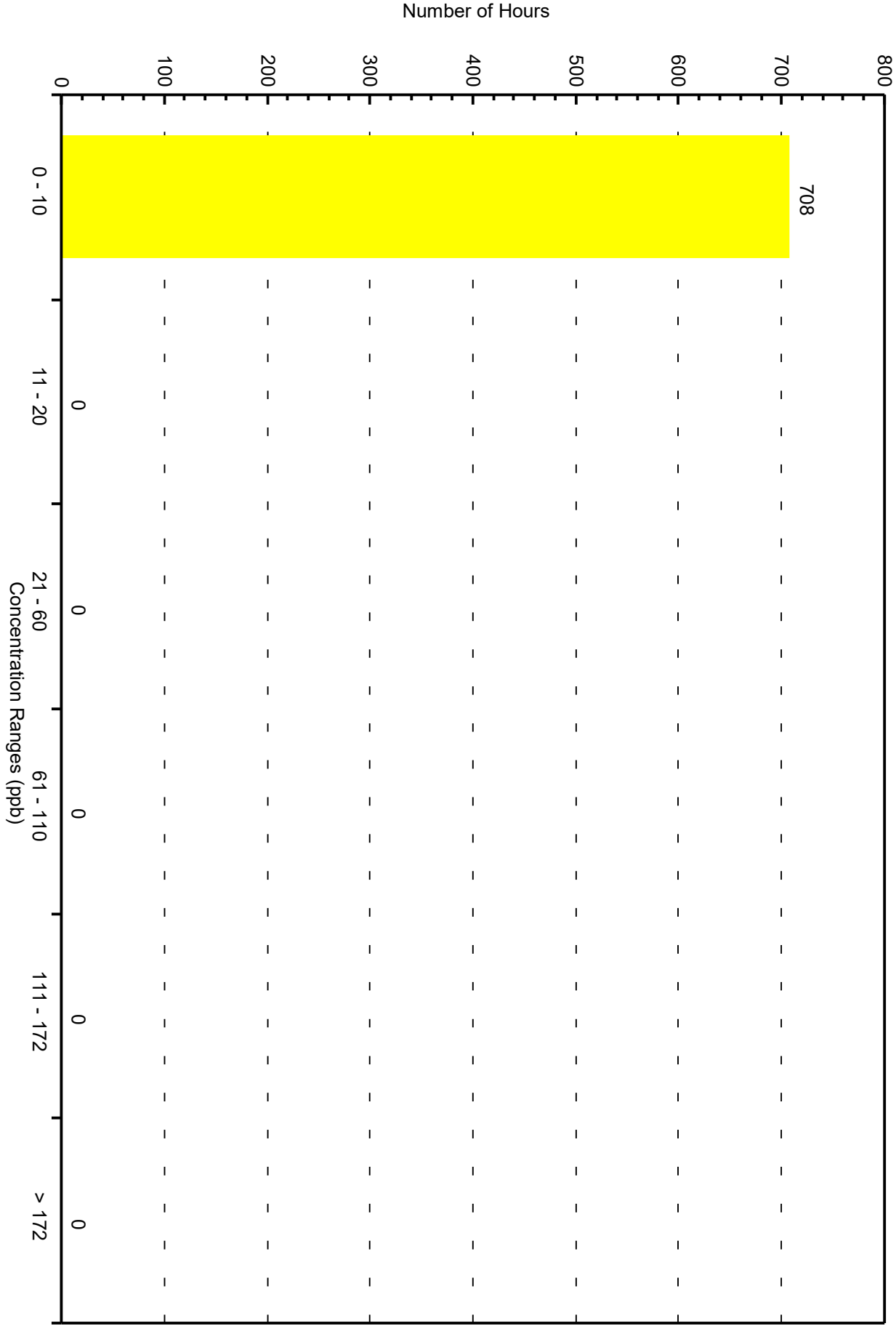


Peace Airshed Zone Association

Histogram of Hourly Averages

Sulphur Dioxide (SO₂) - ppb

Donnelly - March 2020



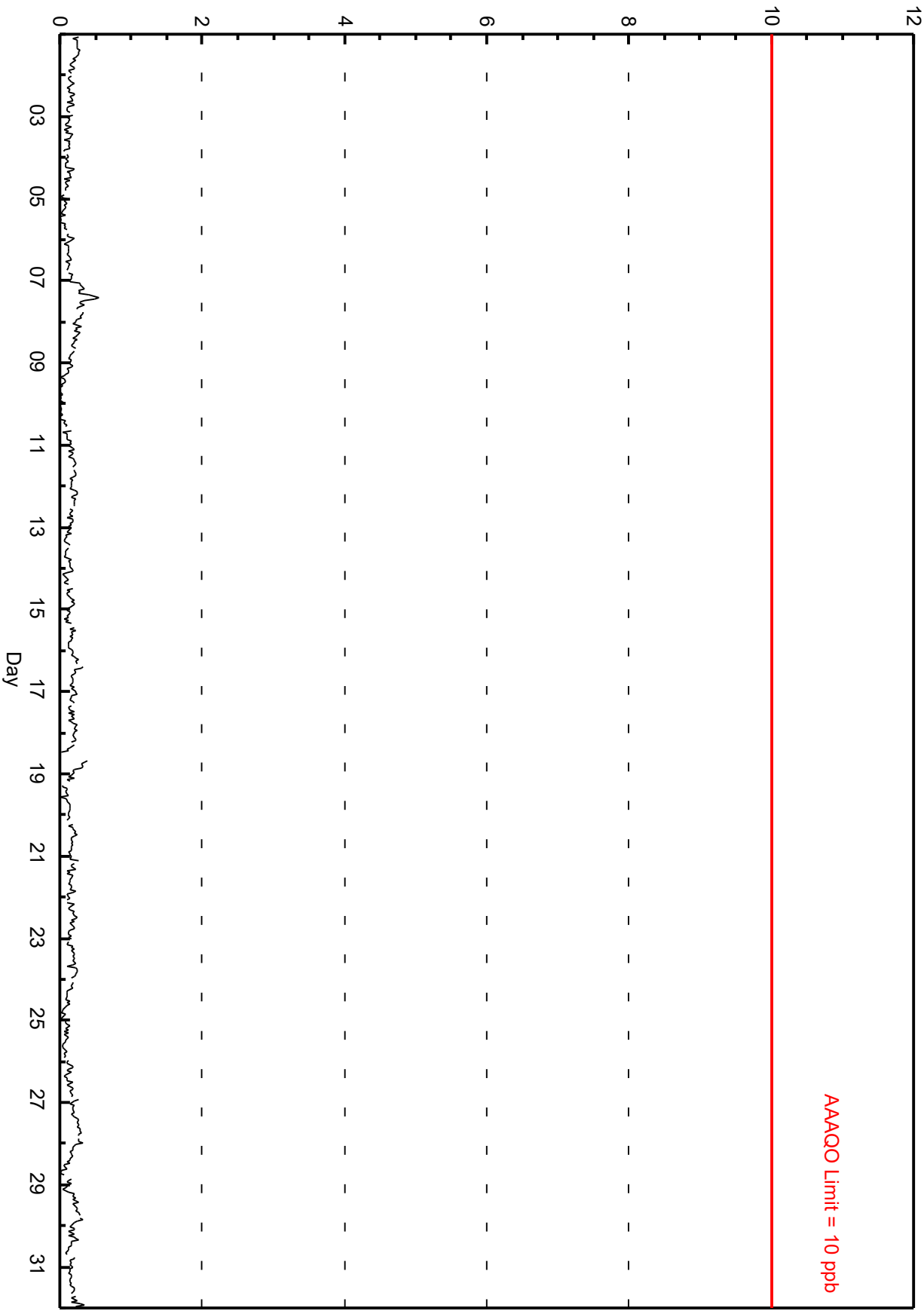


Peace Airshed Zone Association

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Donnelly - March 2020



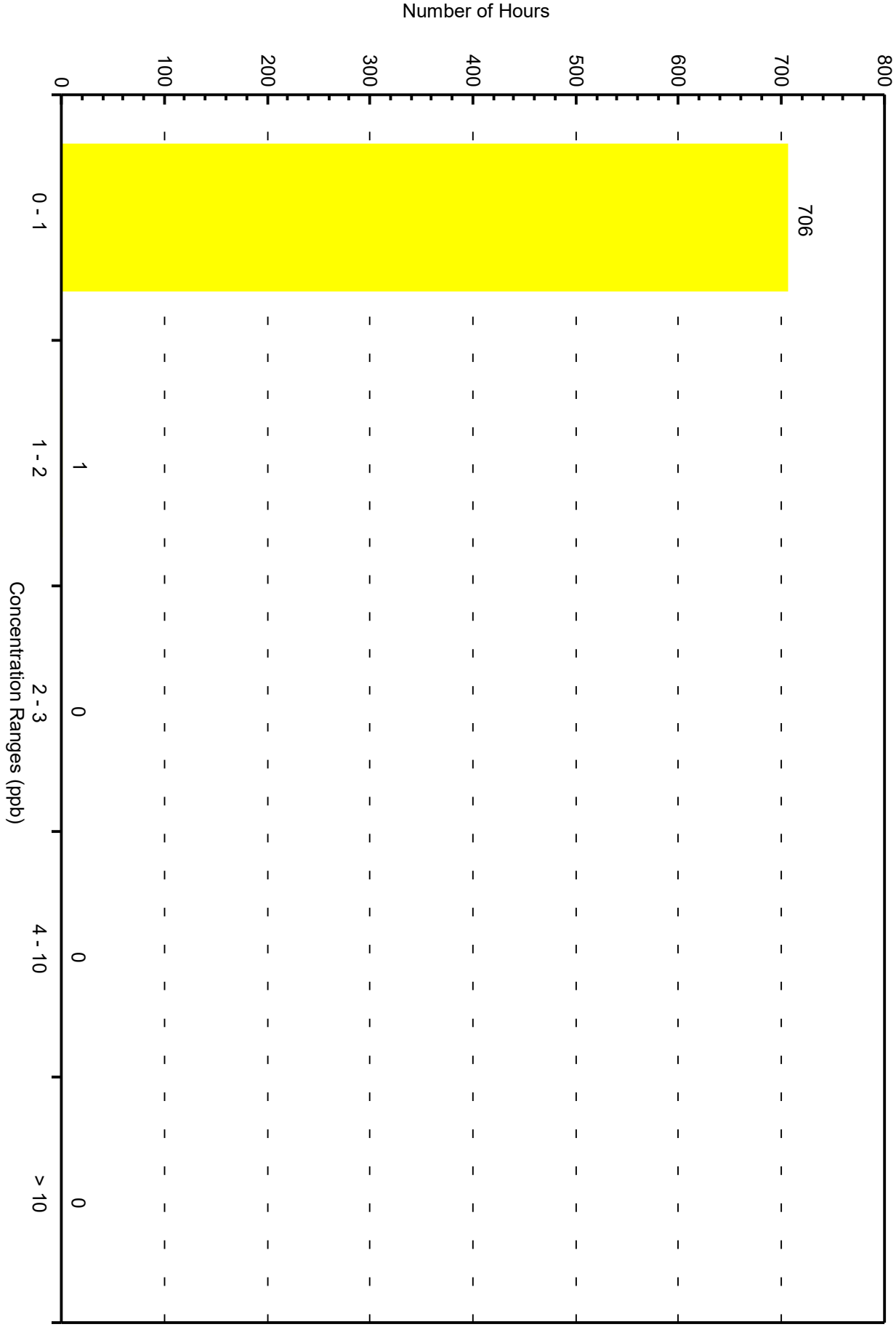


Peace Airshed Zone Association

Histogram of Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Donnelly - March 2020



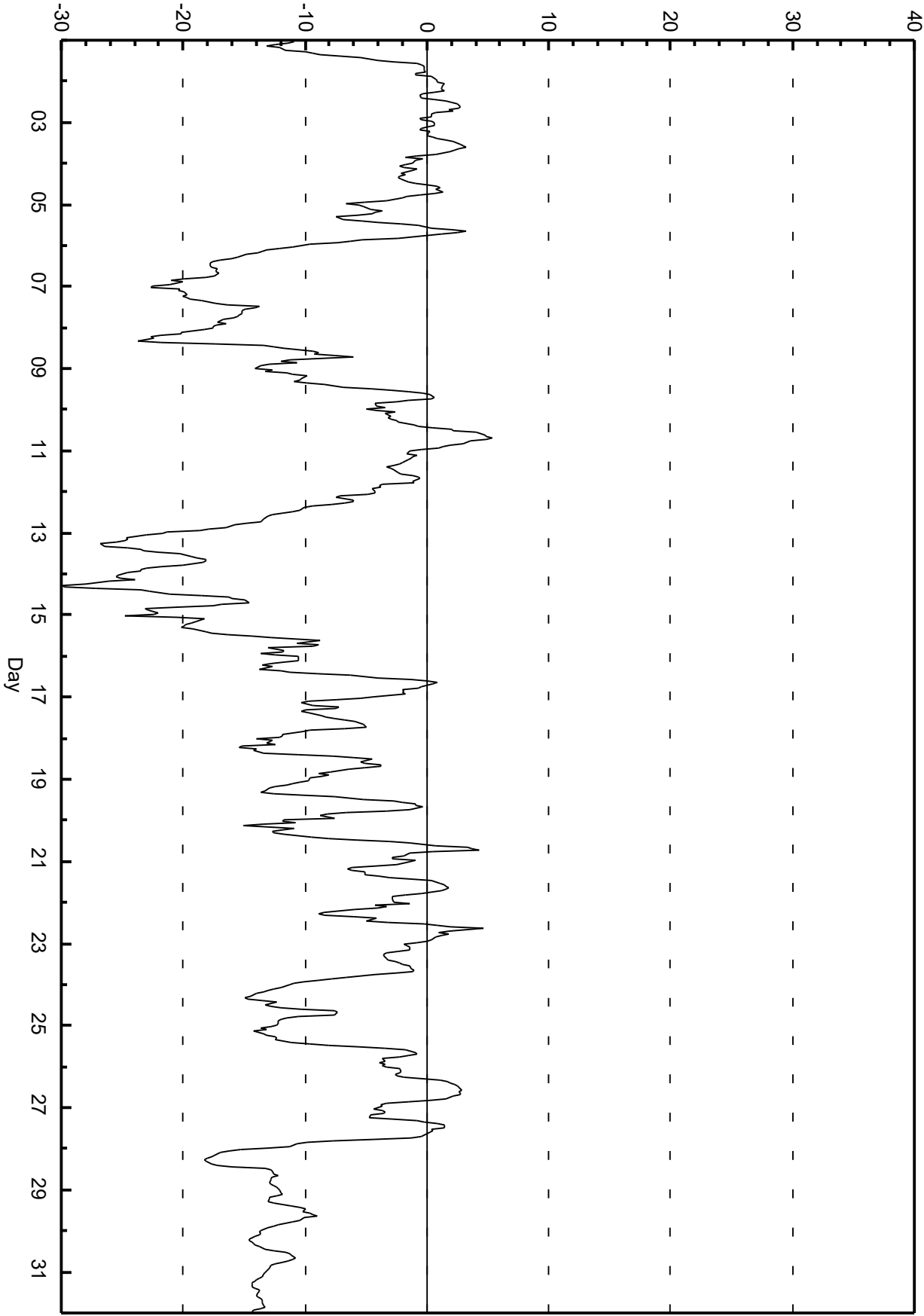


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C

Donnelly - March 2020

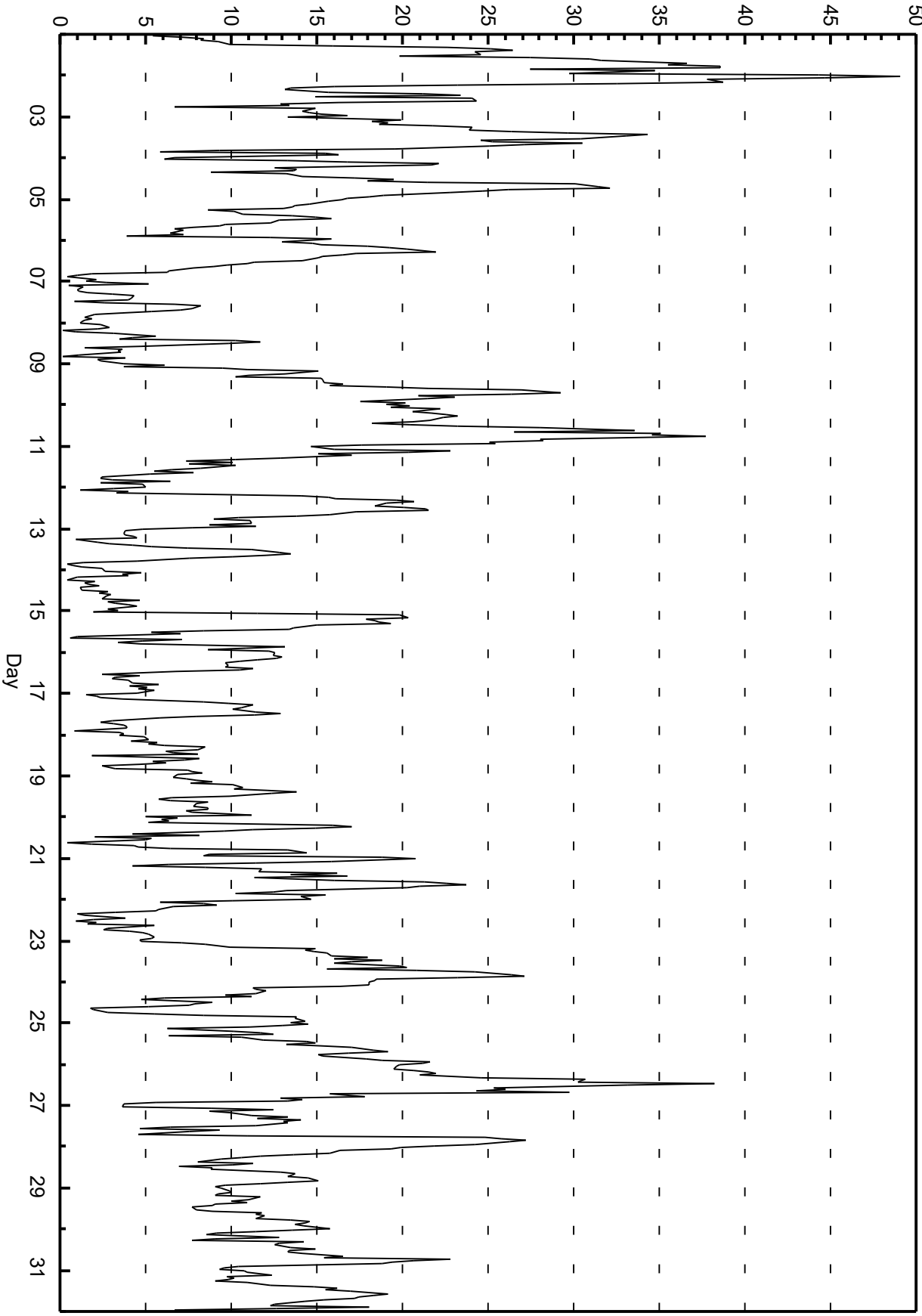




Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h
Donnelly - March 2020



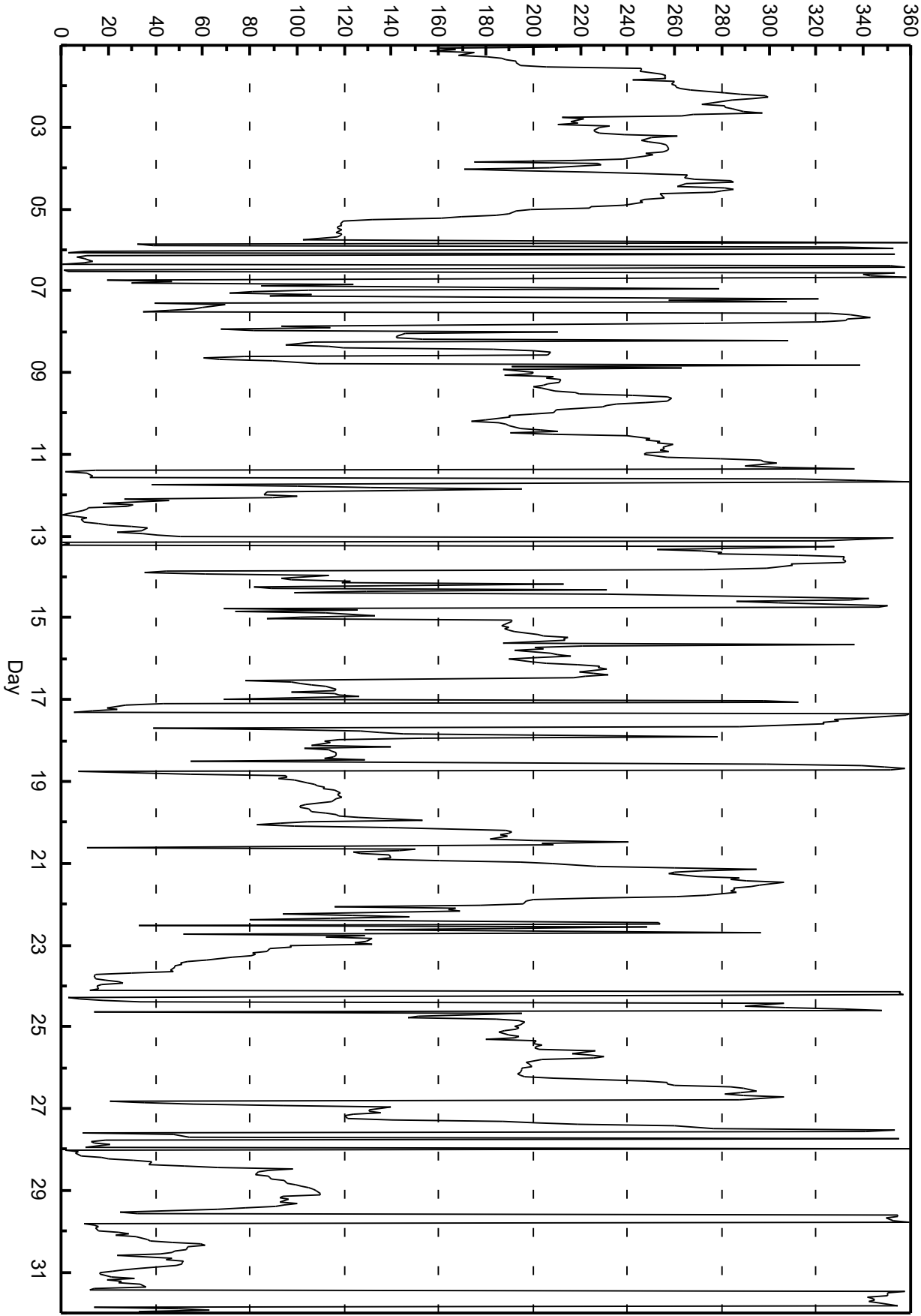


Peace Airshed Zone Association

Hourly Averages

Wind Direction (WD) - deg

Donnelly - March 2020

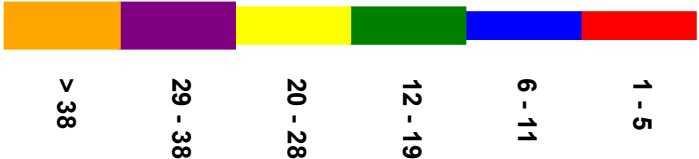
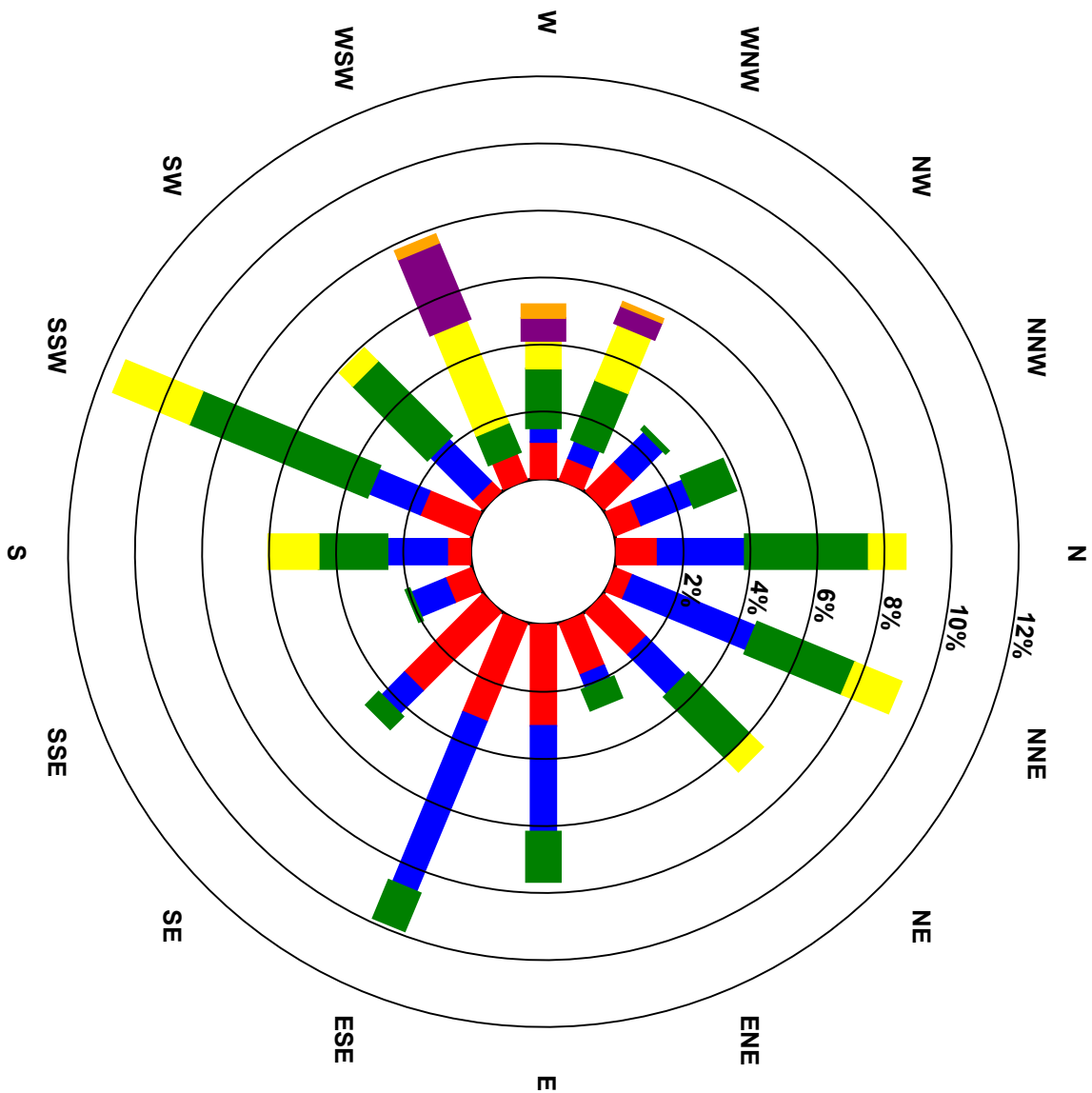




Peace Airshed Zone Association

Wind Rose

Wind Speed (WS) (km/h)
Donnelly - March 2020



8 Wembley (Portable) Charts

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

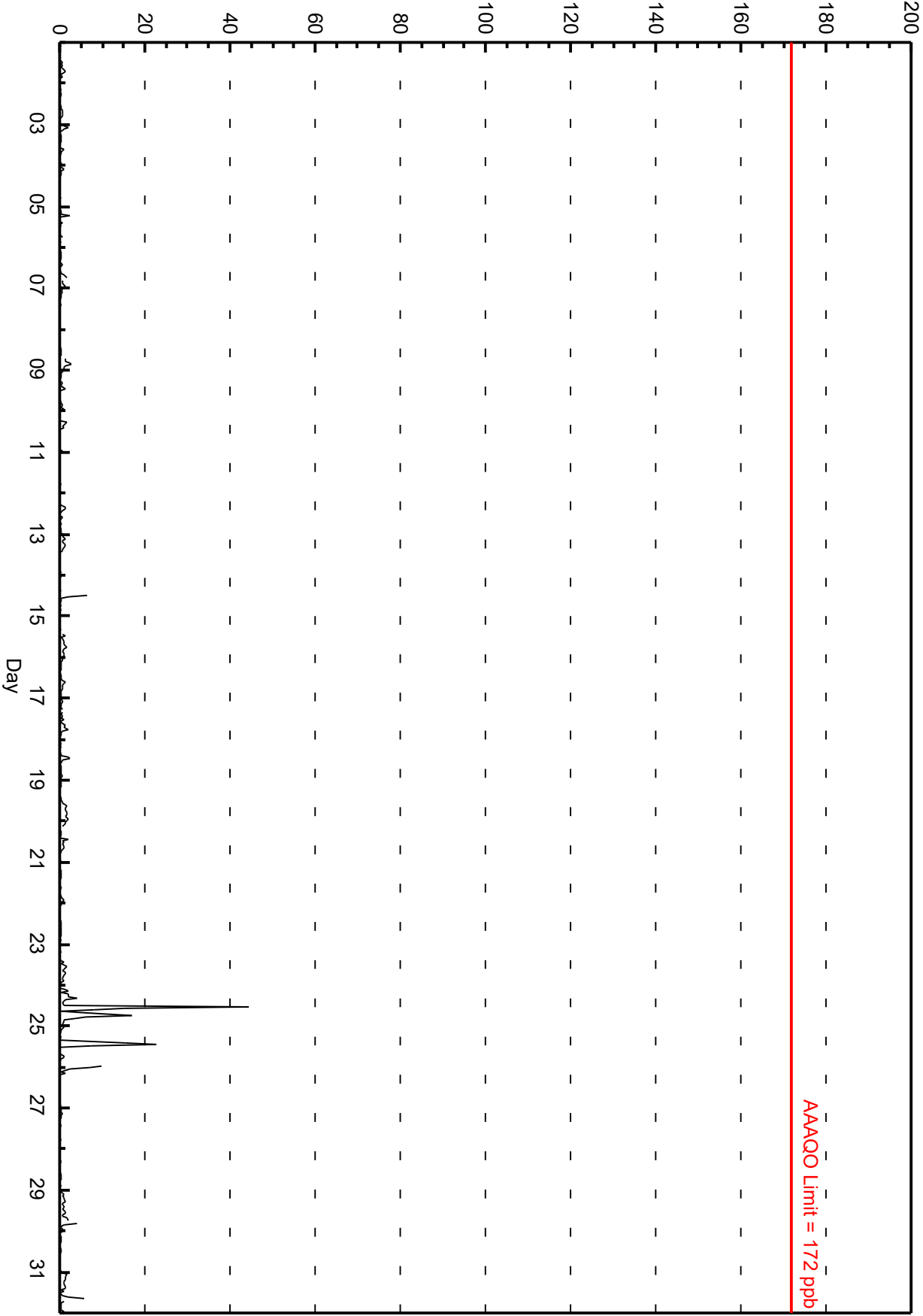


Peace Airshed Zone Association

Hourly Averages

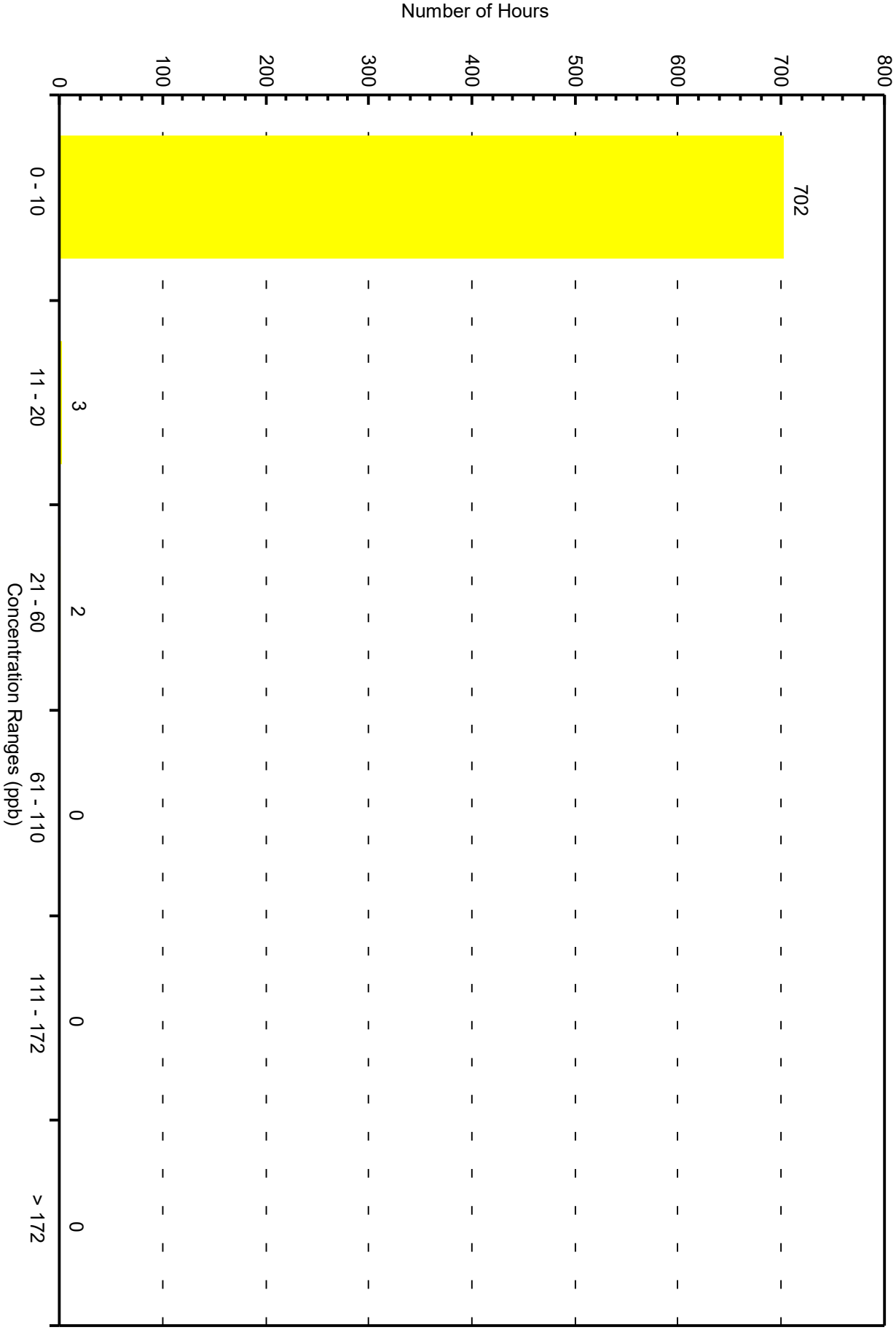
Sulphur Dioxide (SO₂) - ppb

Wembley - March 2020



Histogram of Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Wembley - March 2020



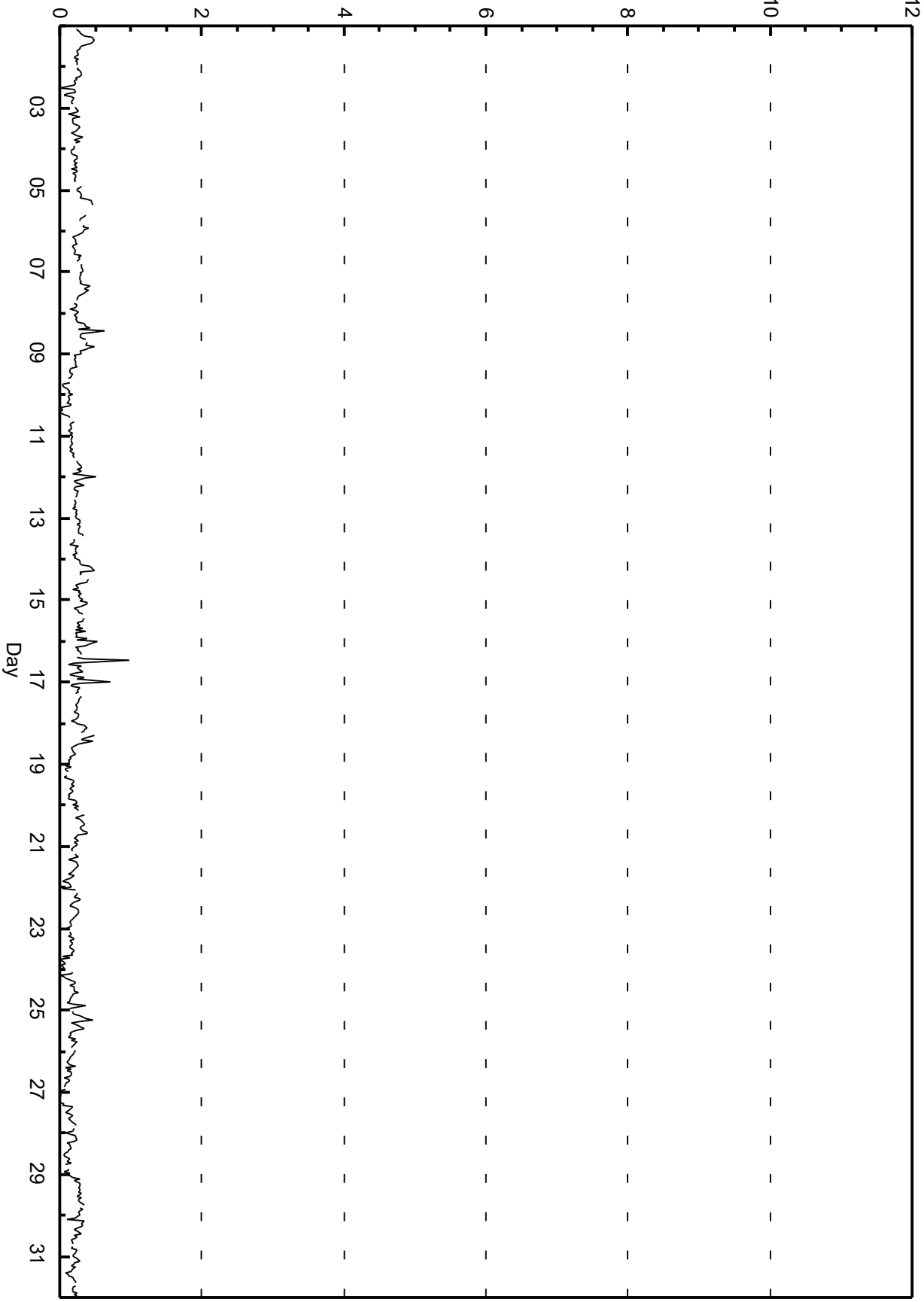


Peace Airshed Zone Association

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Wembley - March 2020



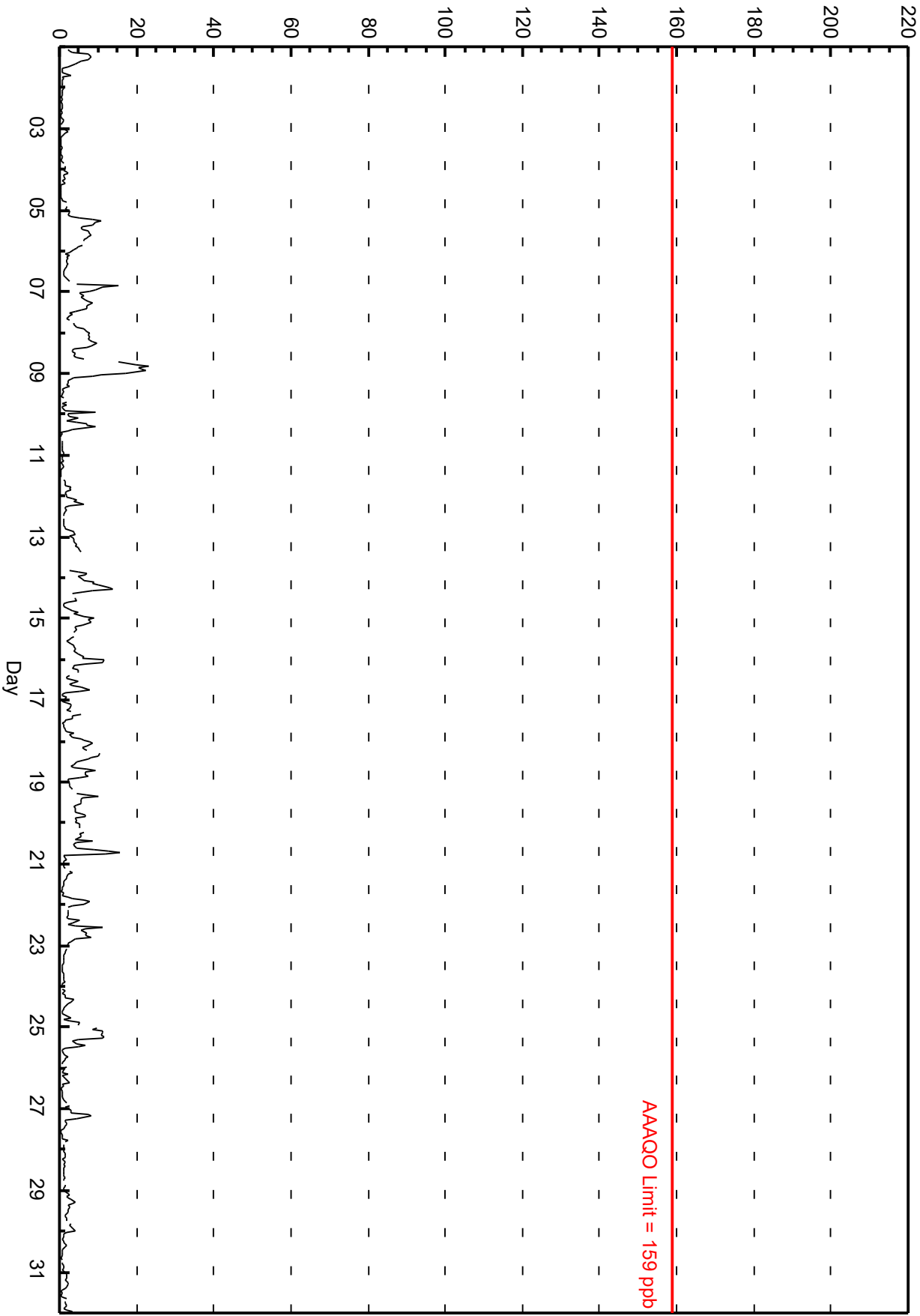


Peace Airshed Zone Association

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wembley - March 2020



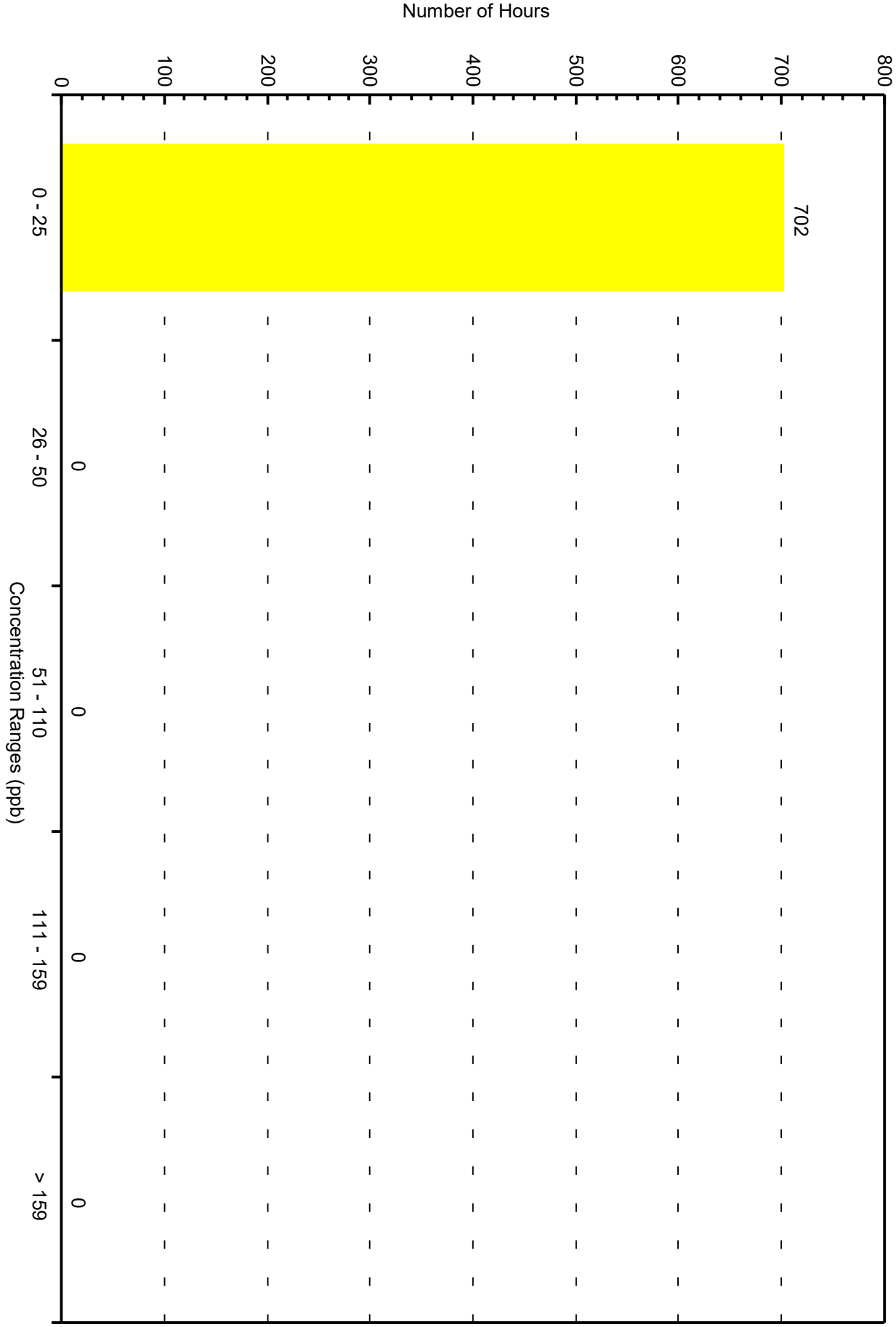


Peace Airshed Zone Association

Histogram of Hourly Averages

Nitrogen Dioxide (NO₂) - ppb

Wembley - March 2020

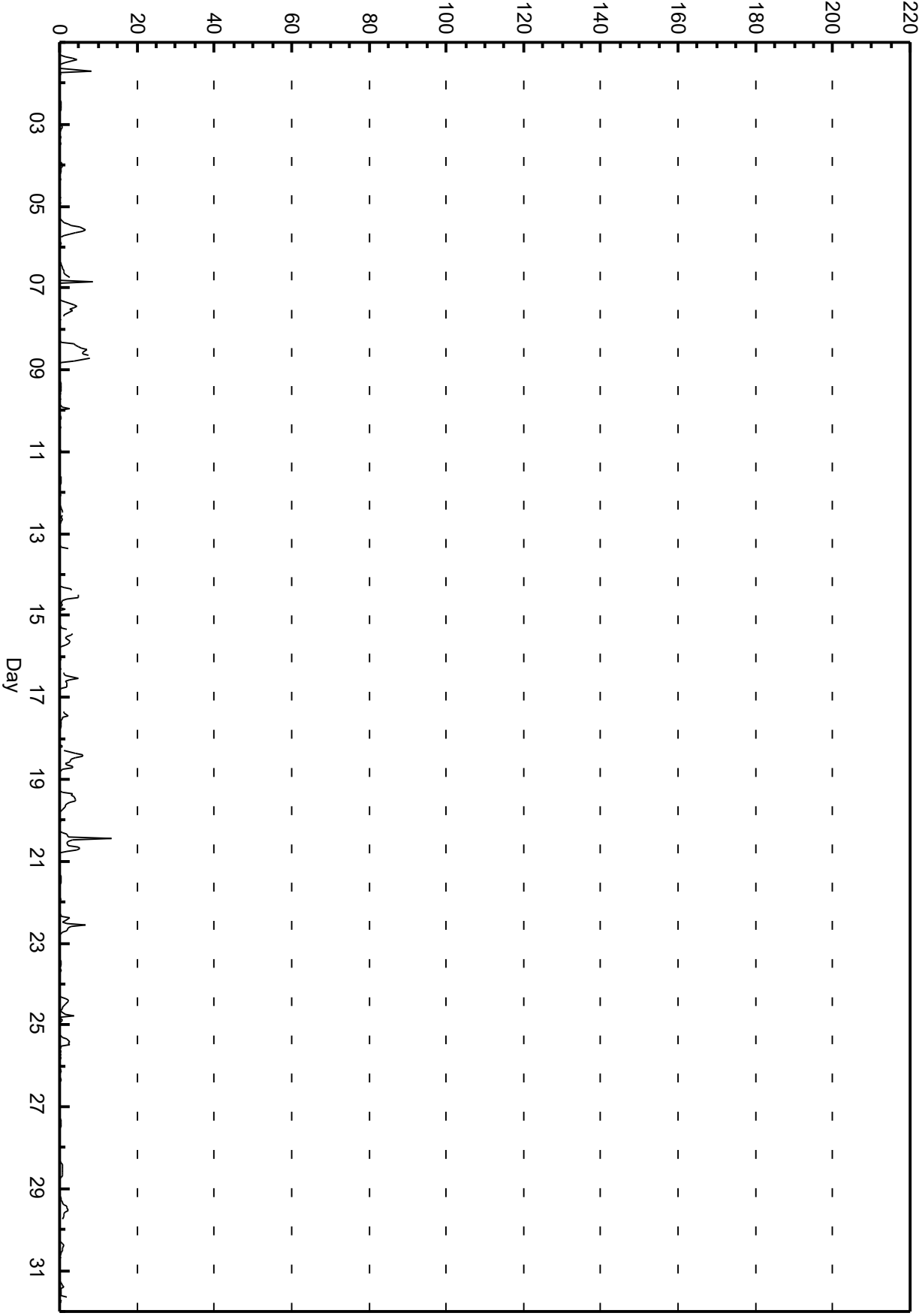




Peace Airshed Zone Association

Hourly Averages

Nitrogen Oxide (NO) - ppb
Wembley - March 2020



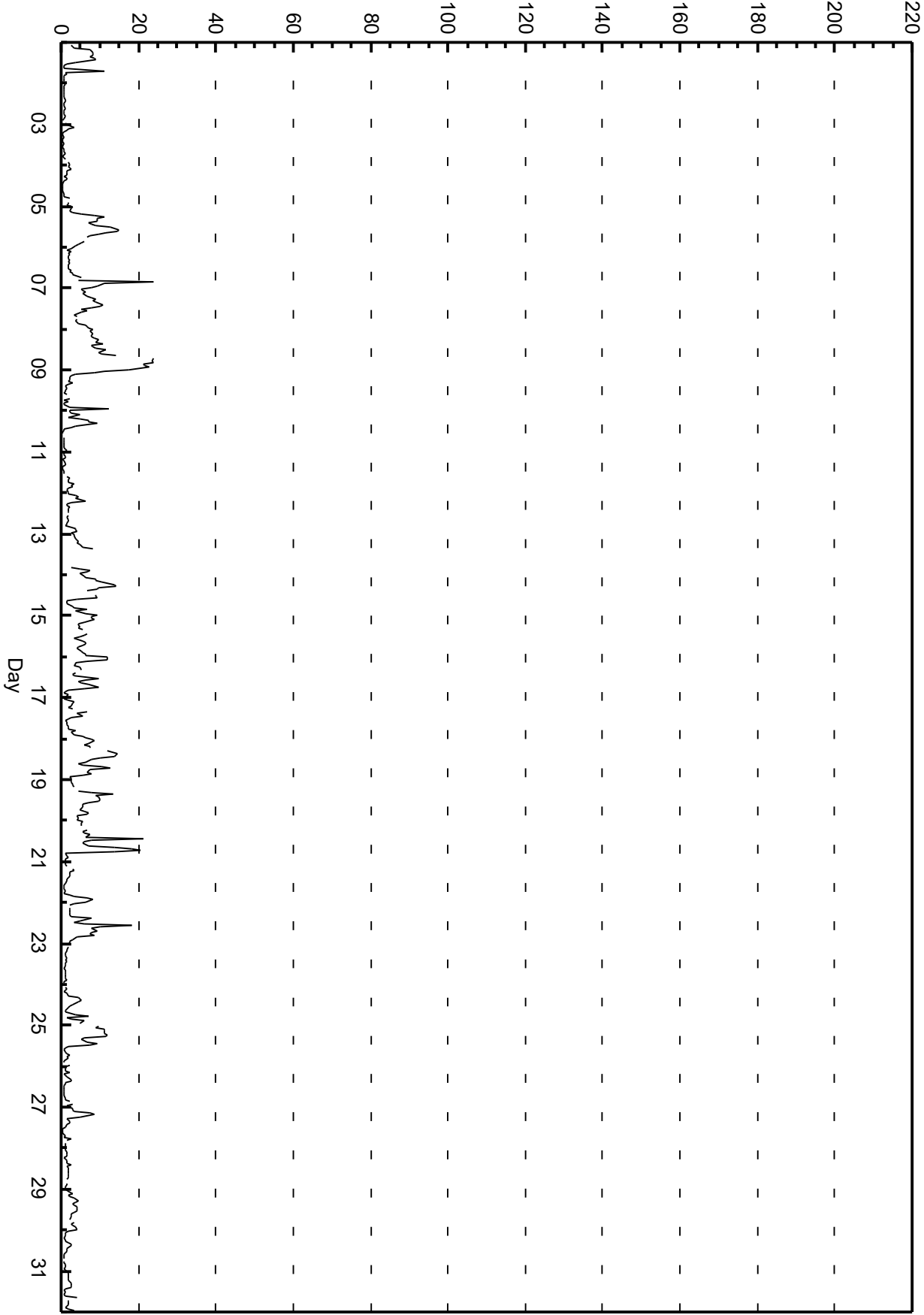


Peace Airshed Zone Association

Hourly Averages

Oxides of Nitrogen (NO_x) - ppb

Wembley - March 2020

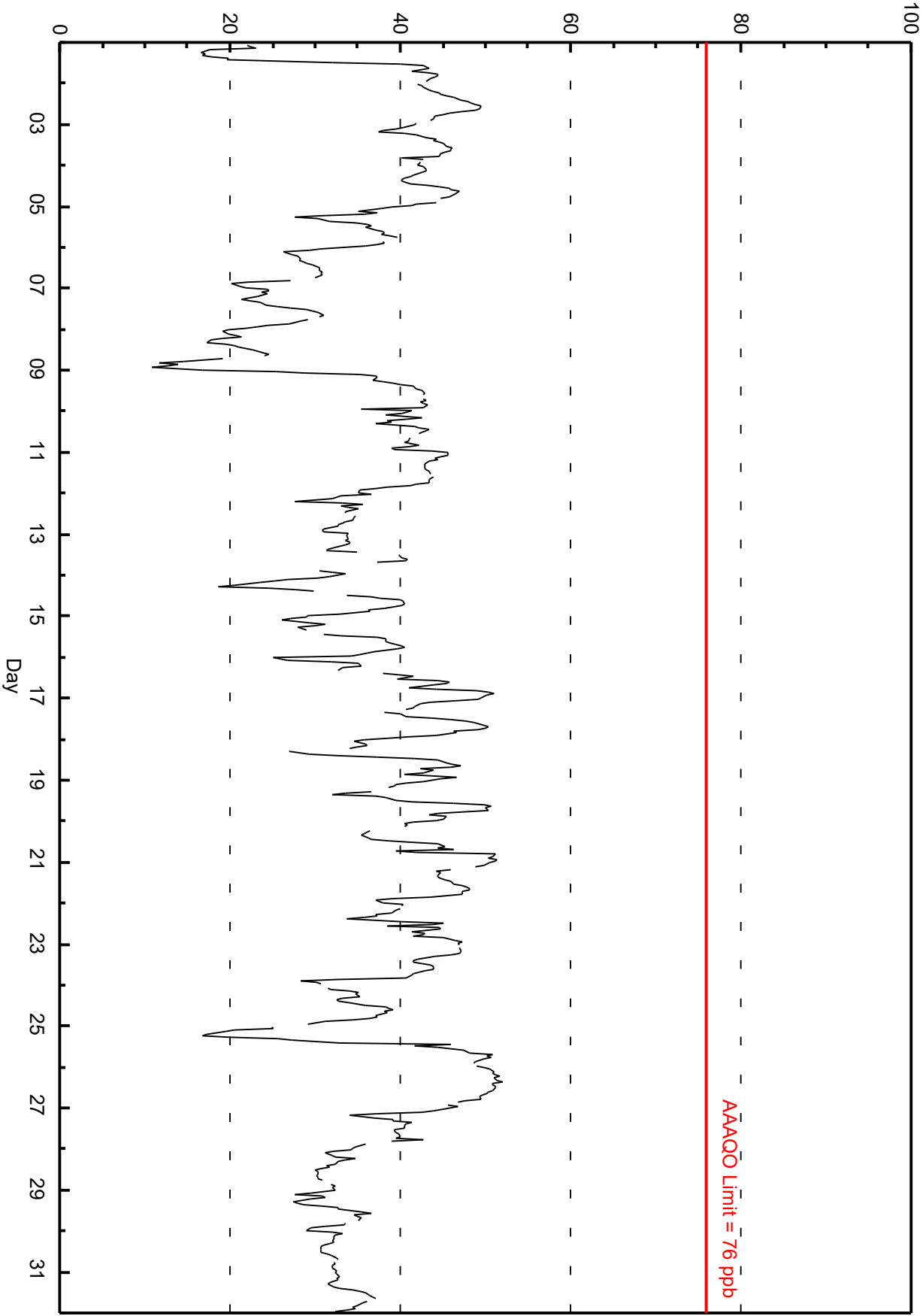




Peace Airshed Zone Association

Hourly Averages

Ozone (O₃) - ppb
Wembley - March 2020

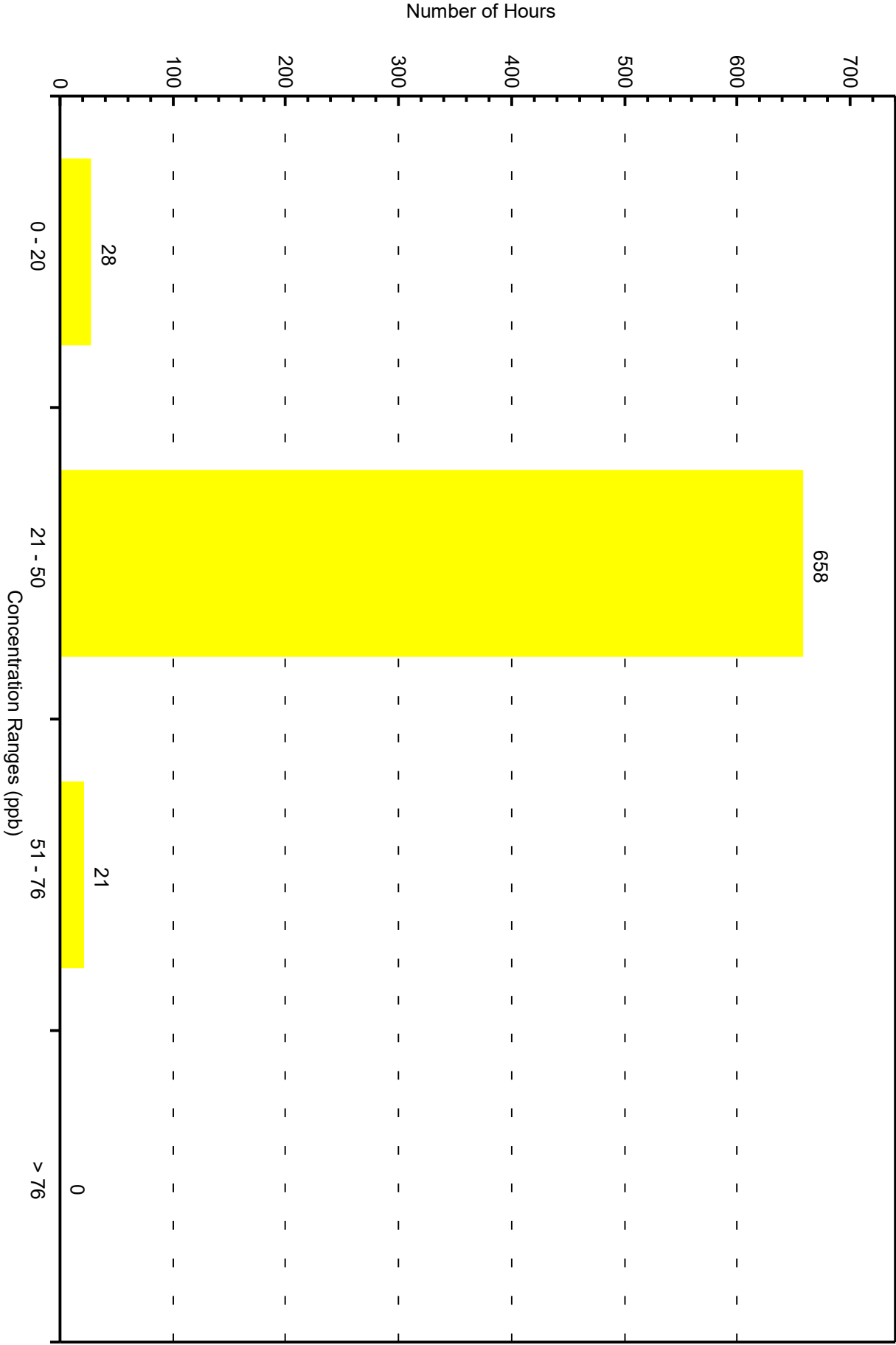




Peace Airshed Zone Association

Histogram of Hourly Averages

Ozone (O₃) - ppb
Wembley - March 2020



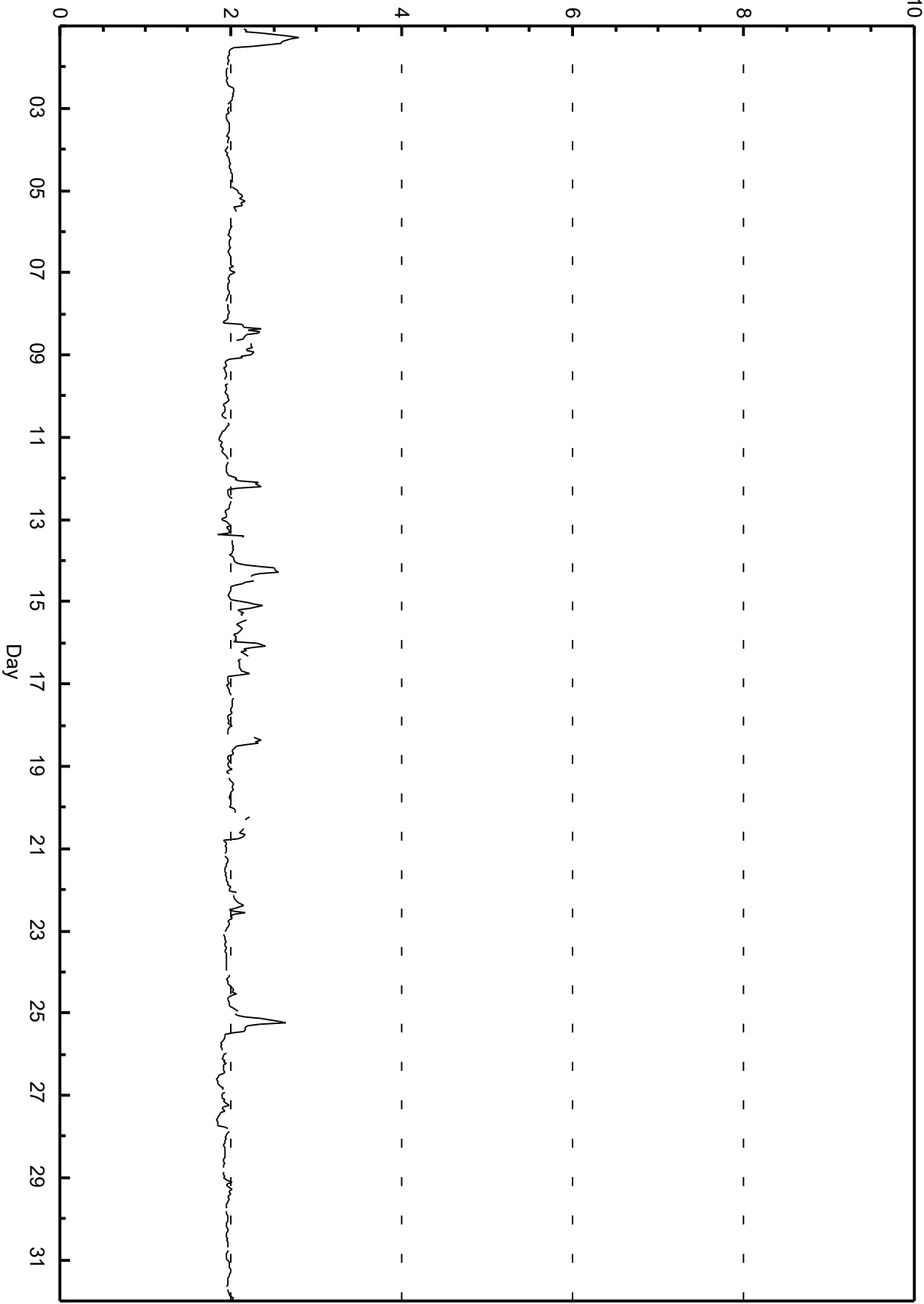


Peace Airshed Zone Association

Hourly Averages

Total Hydrocarbons (THC) - ppm

Wembley - March 2020

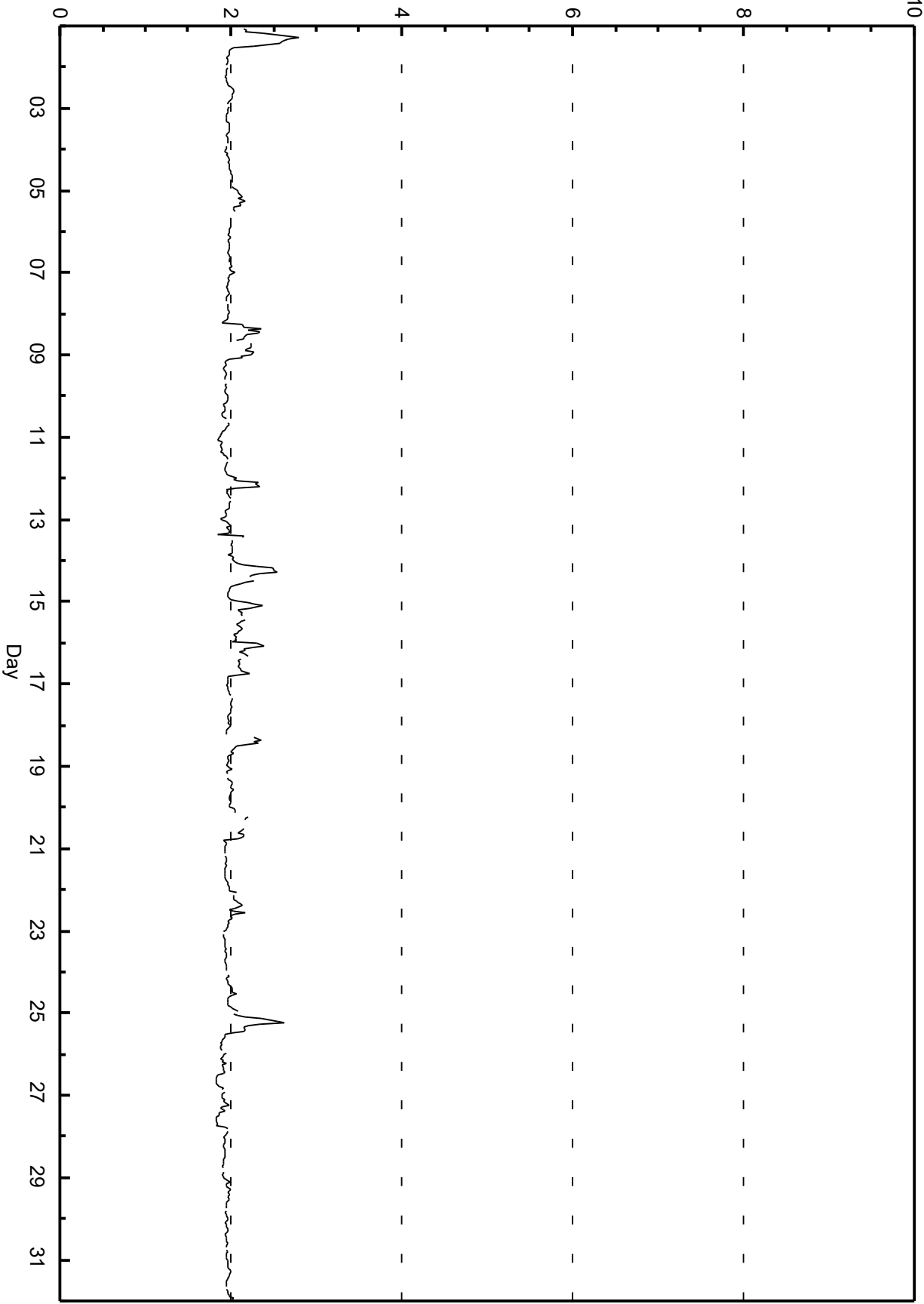




Peace Airshed Zone Association

Hourly Averages

Methane (CH₄) - ppm
Wembley - March 2020



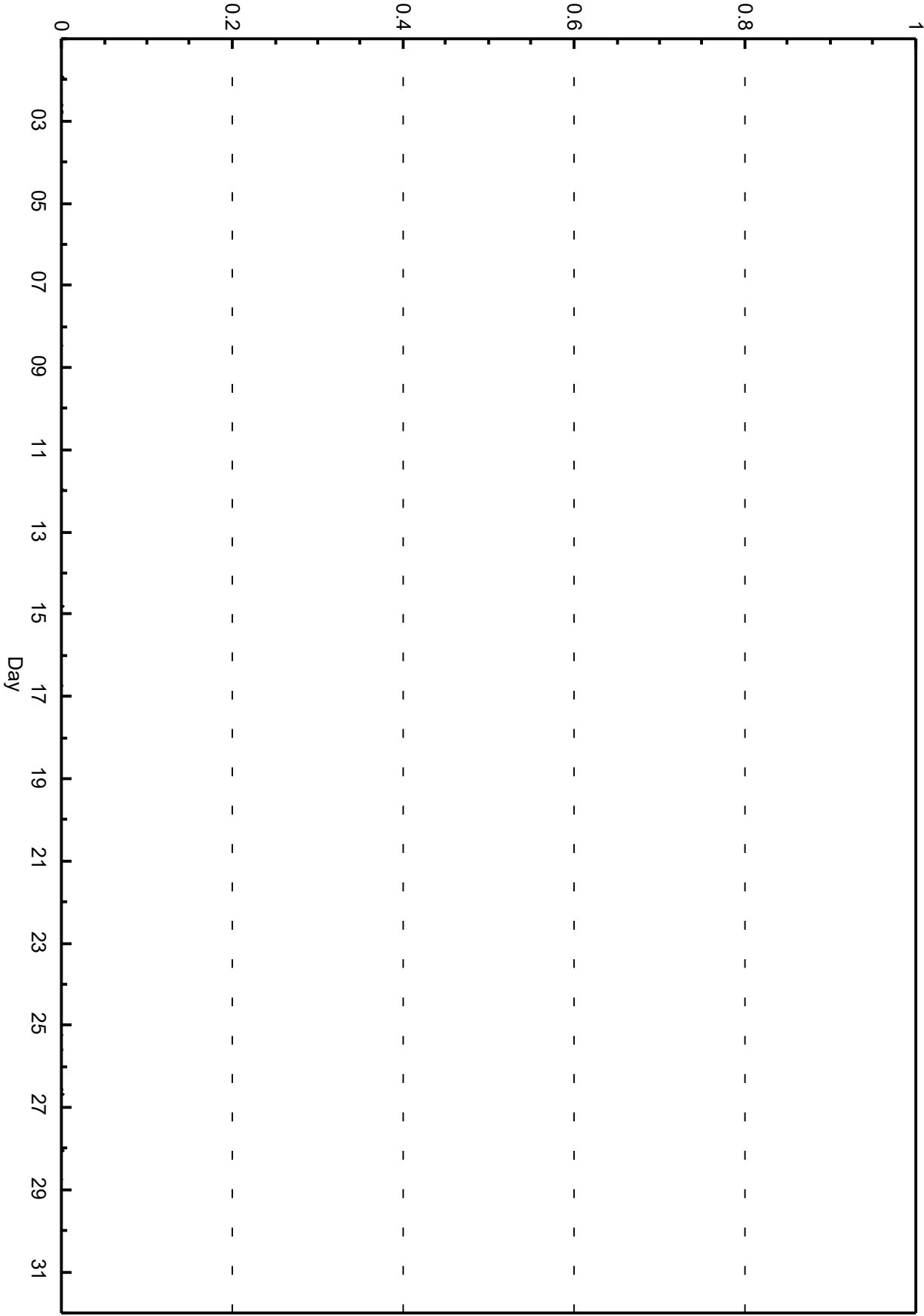


Peace Airshed Zone Association

Hourly Averages

Non Methane Hydrocarbon (NMHC) - ppm

Wembley - March 2020



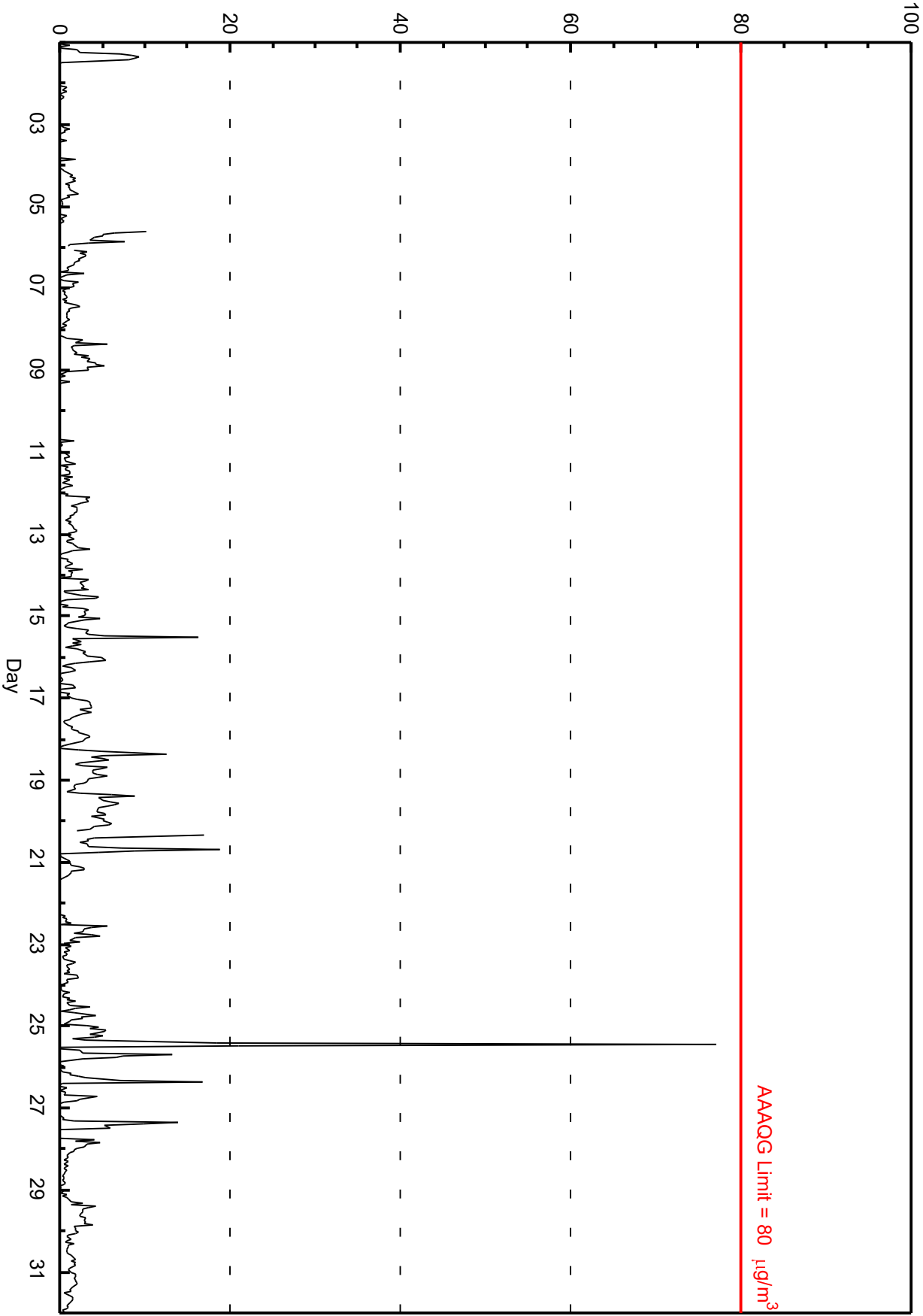


Peace Airshed Zone Association

Hourly Averages

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

Wembley - March 2020

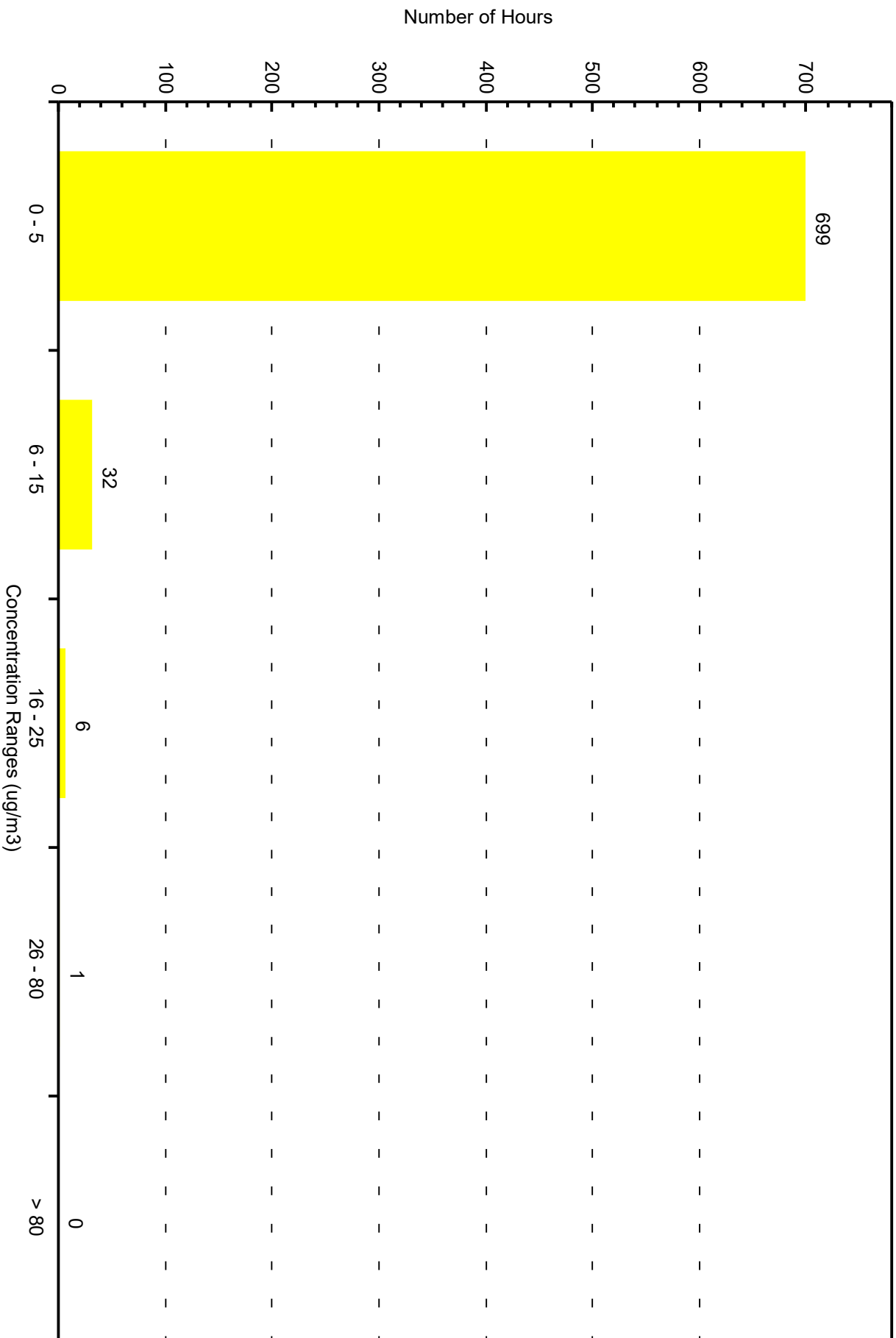




Peace Airshed Zone Association

Histogram of Hourly Averages

PM_{2.5} (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wembley - March 2020



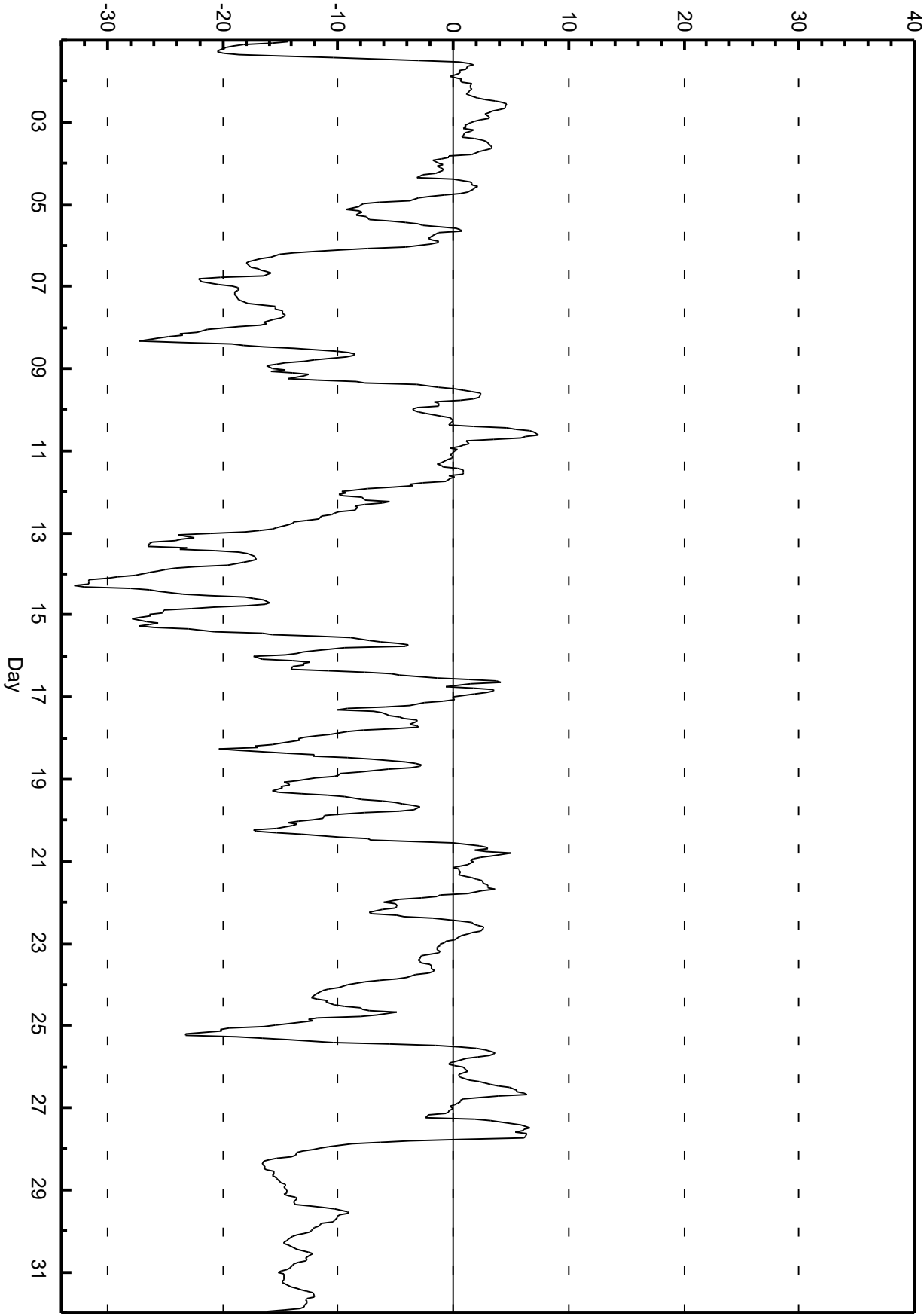


Peace Airshed Zone Association

Hourly Averages

External Temperature (ET) - °C

Wembley - March 2020

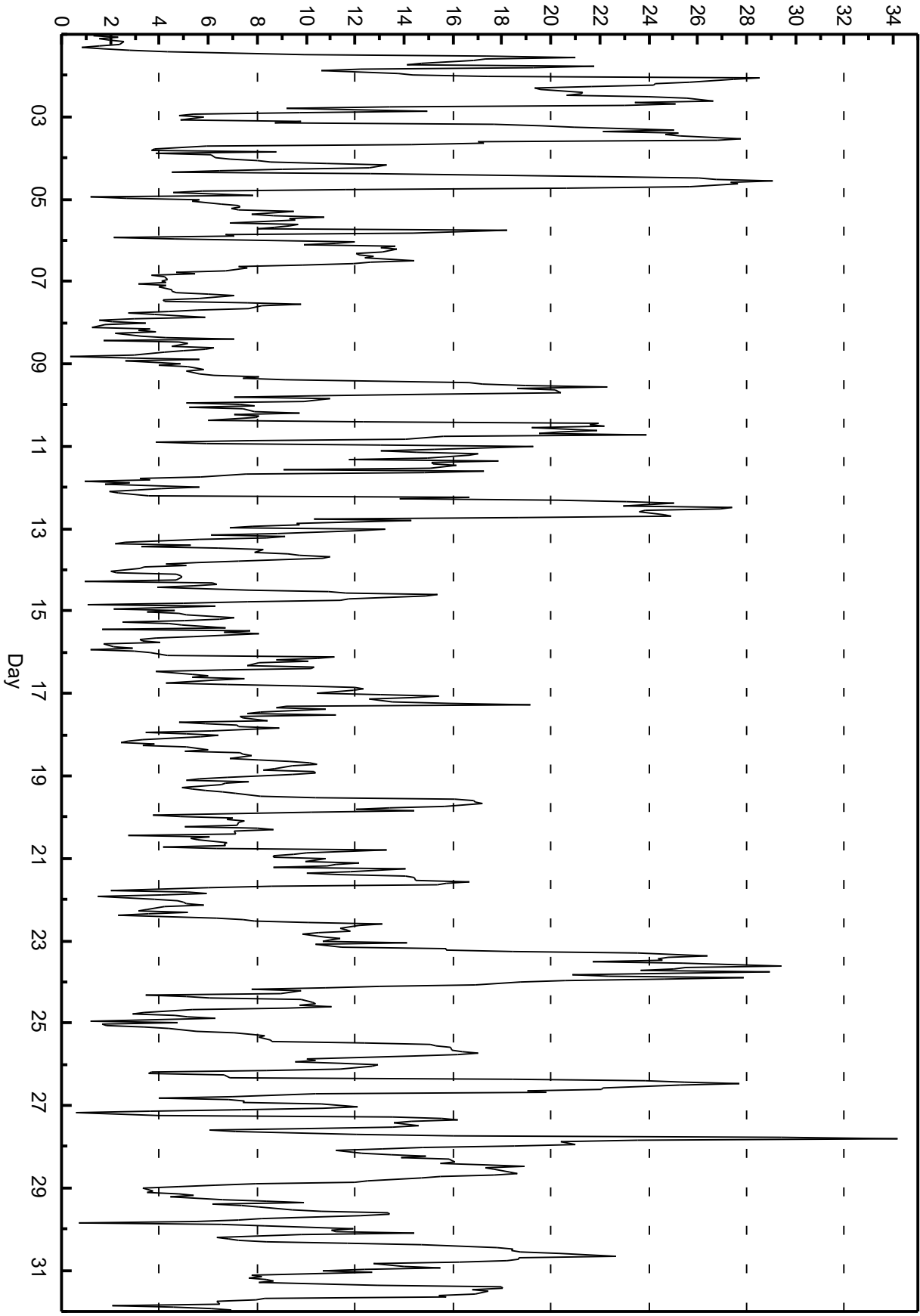




Peace Airshed Zone Association

Hourly Averages

Wind Speed (WS) - km/h
Wembley - March 2020

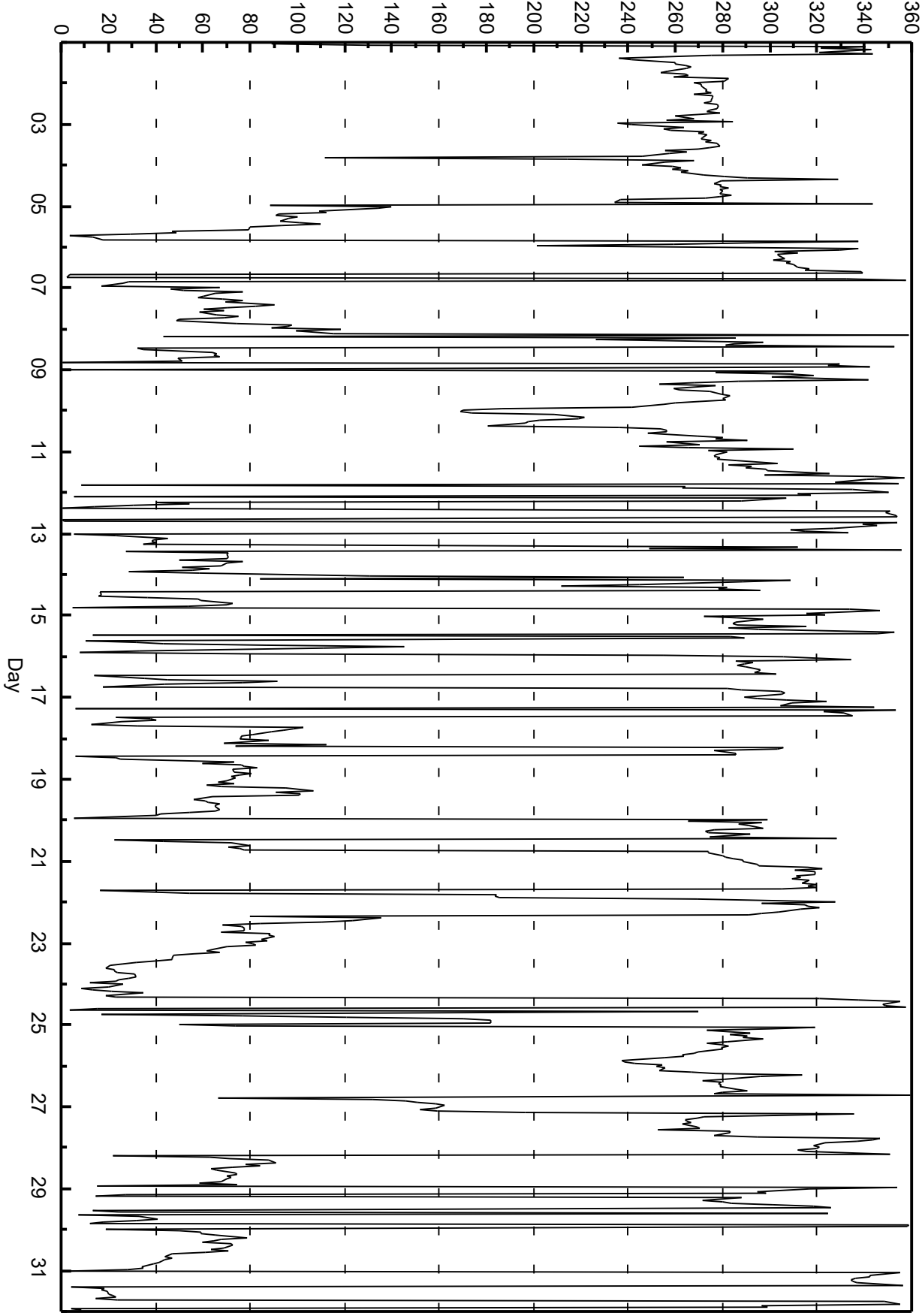




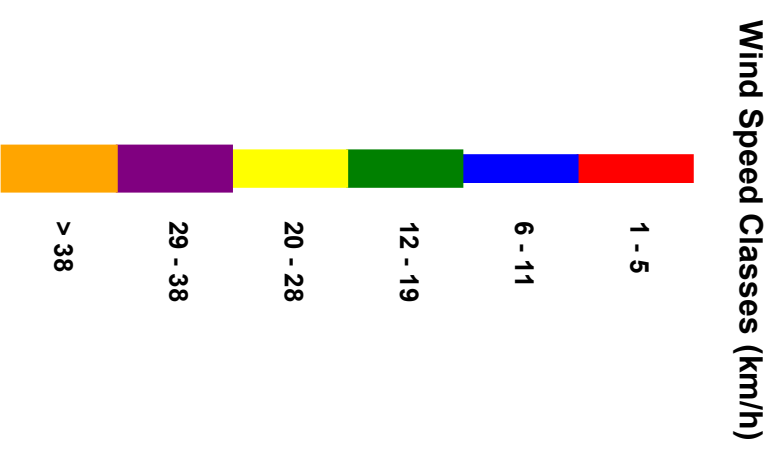
Peace Airshed Zone Association

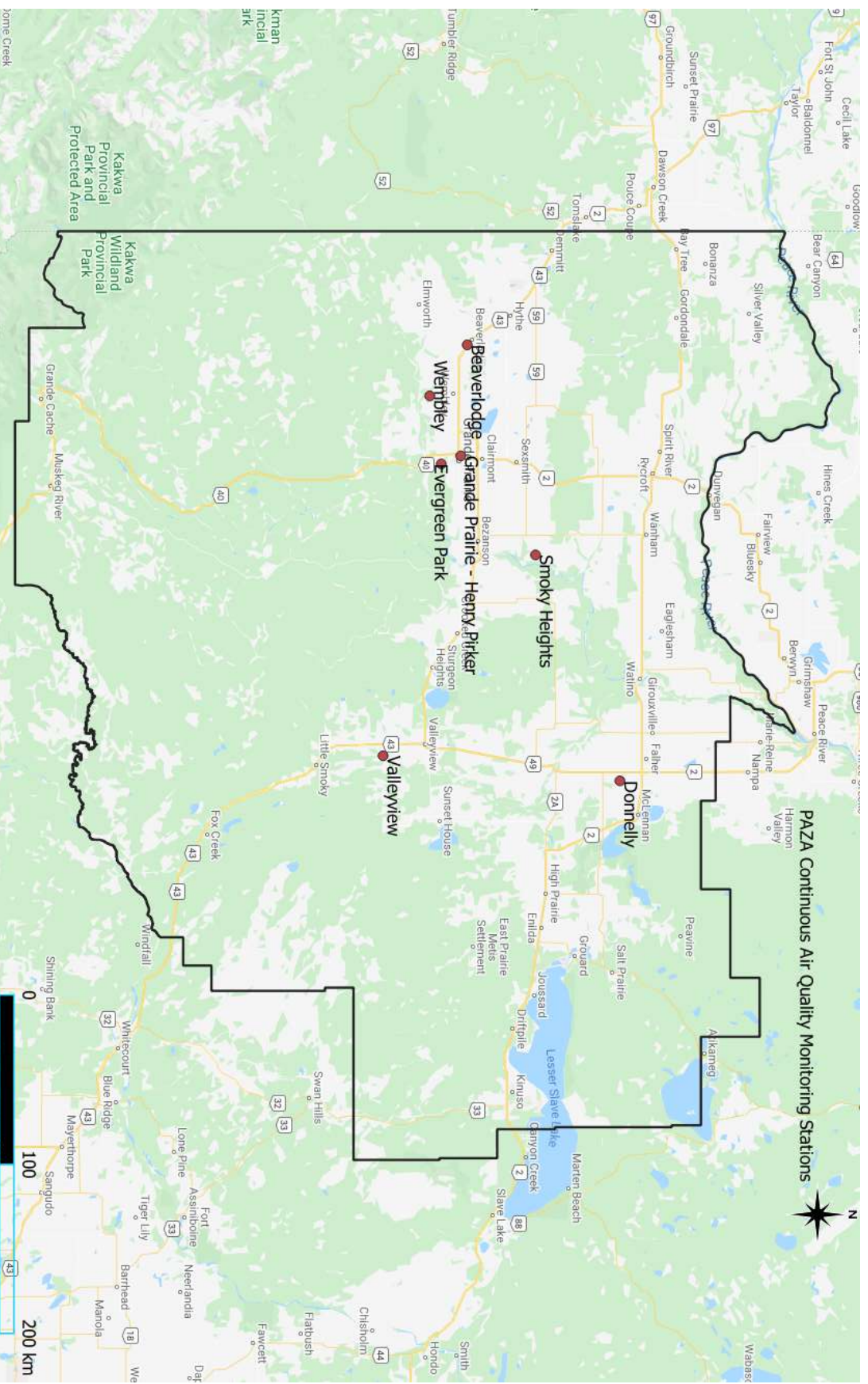
Hourly Averages

Wind Direction (WD) - deg
Wembley - March 2020

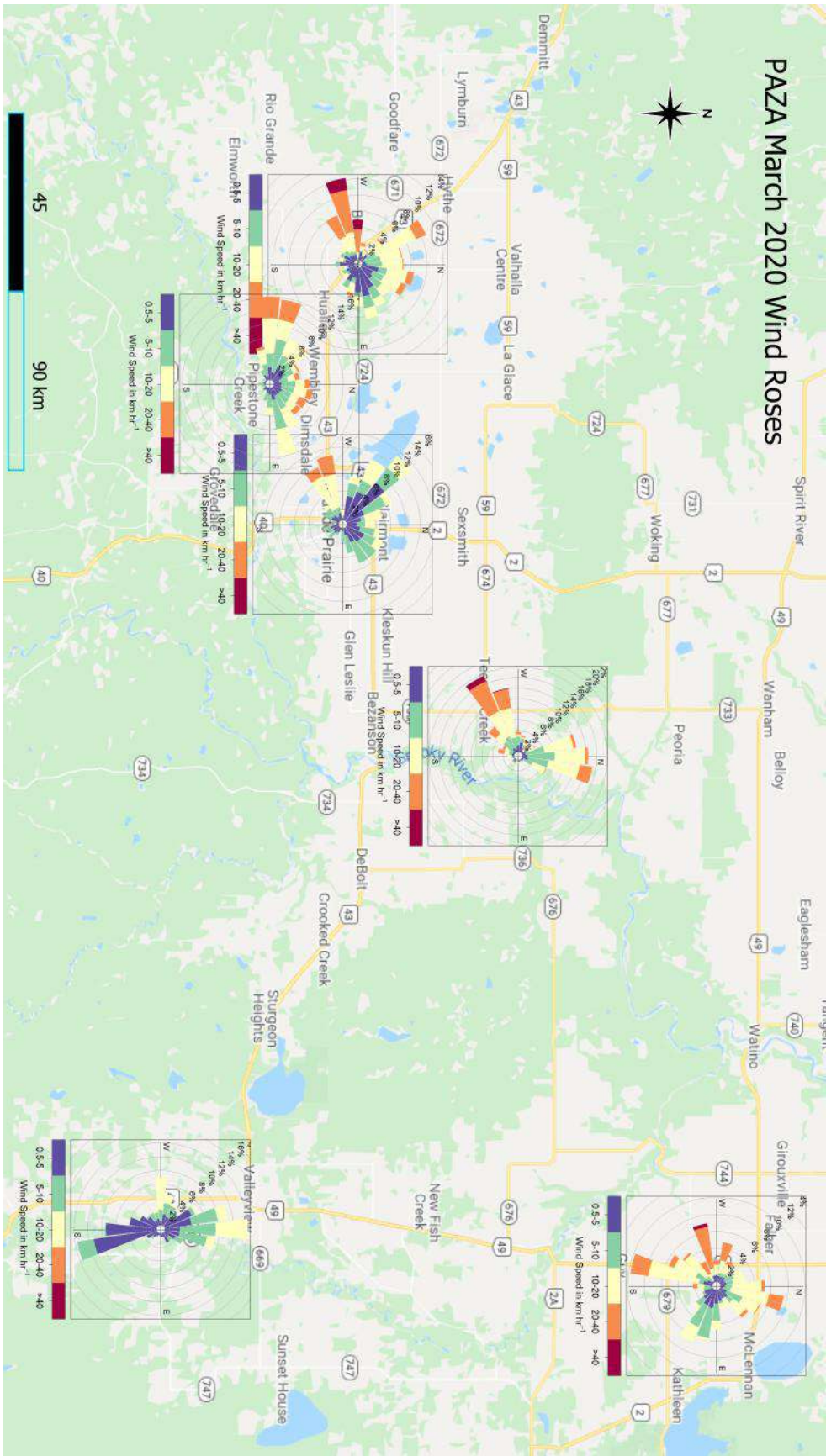


Wind Speed (WS) (km/h)
Wembley - March 2020

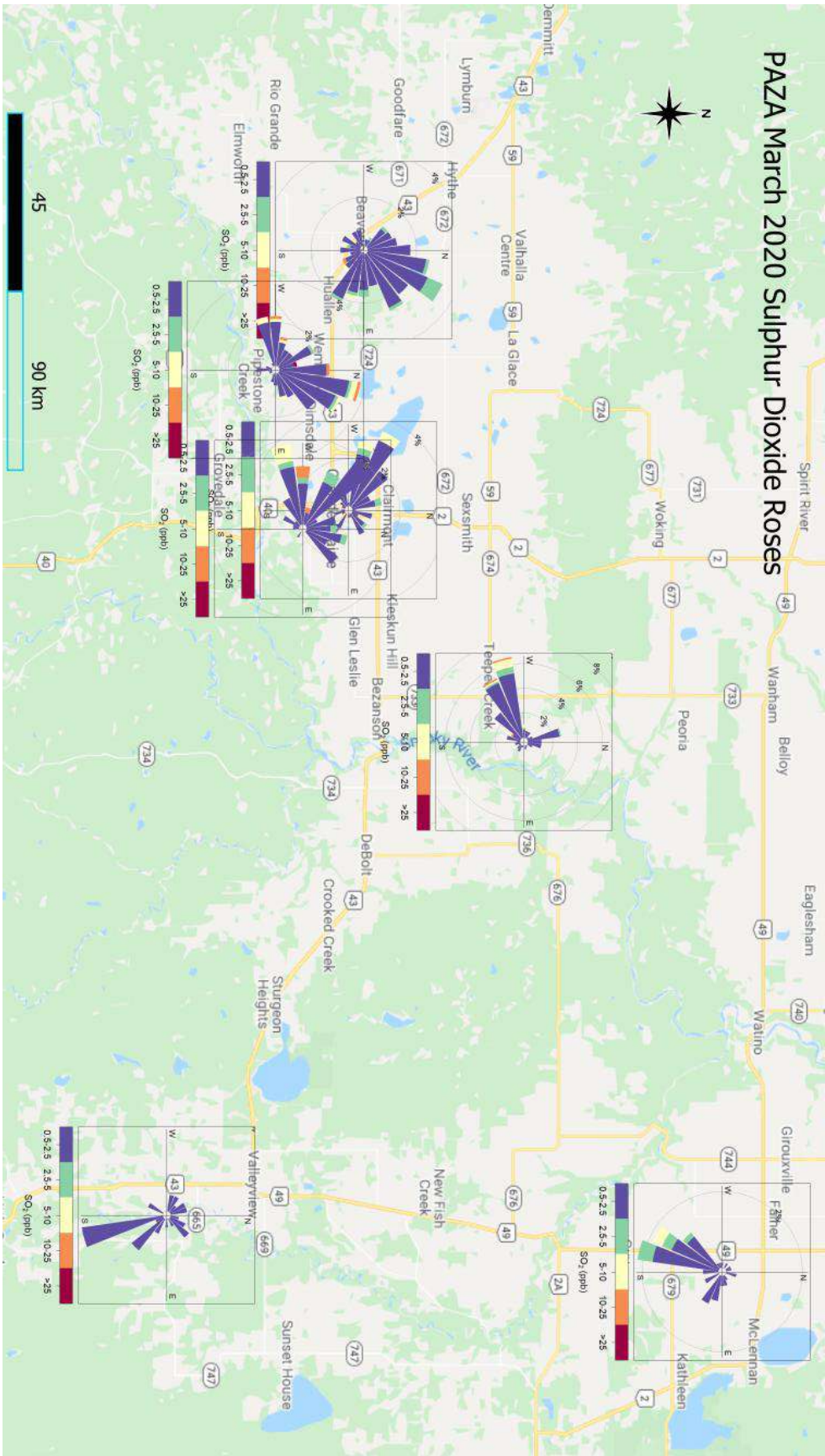


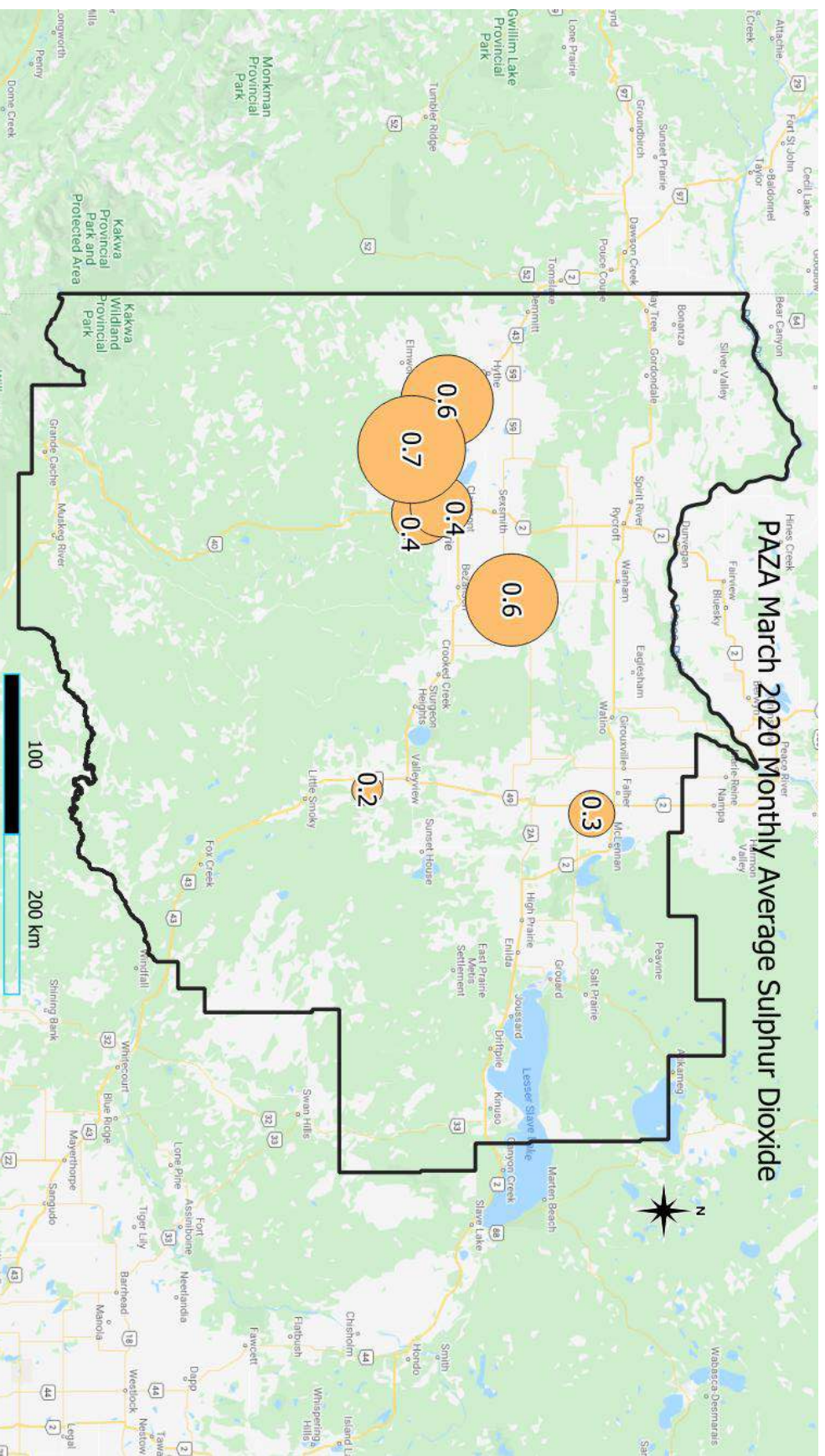


9.1 Wind Roses

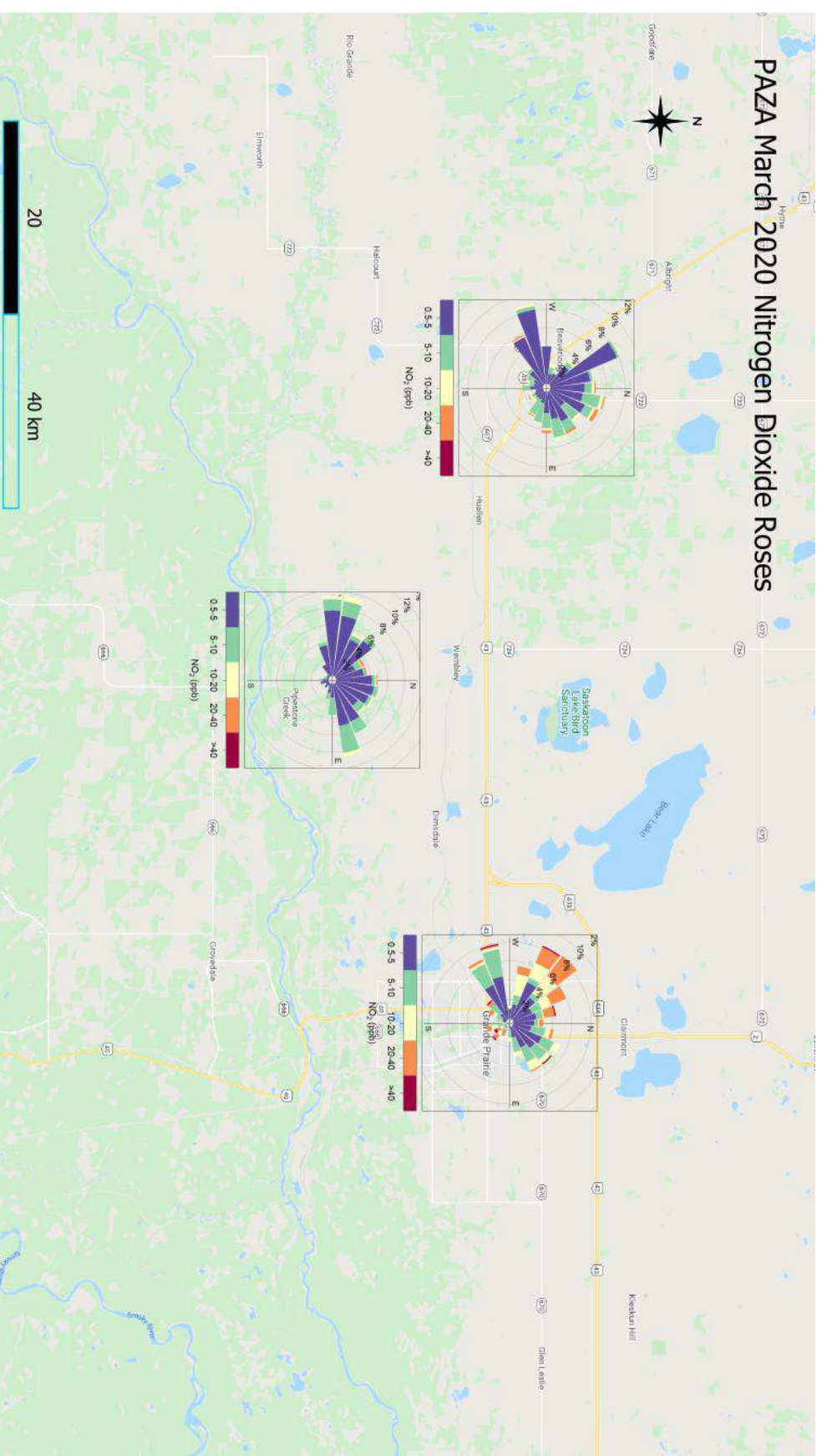


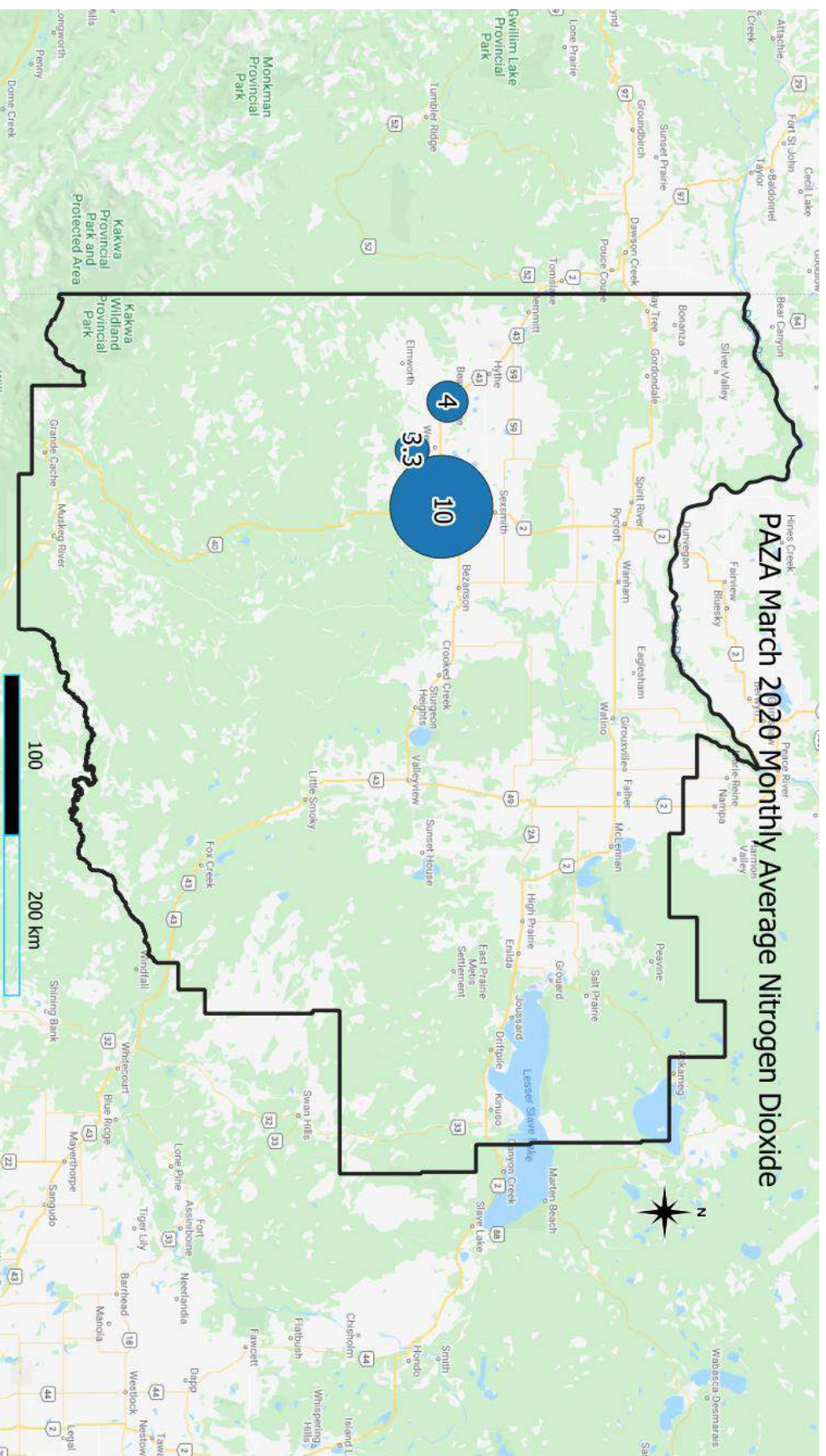
9.2 Sulphur Dioxide Plots



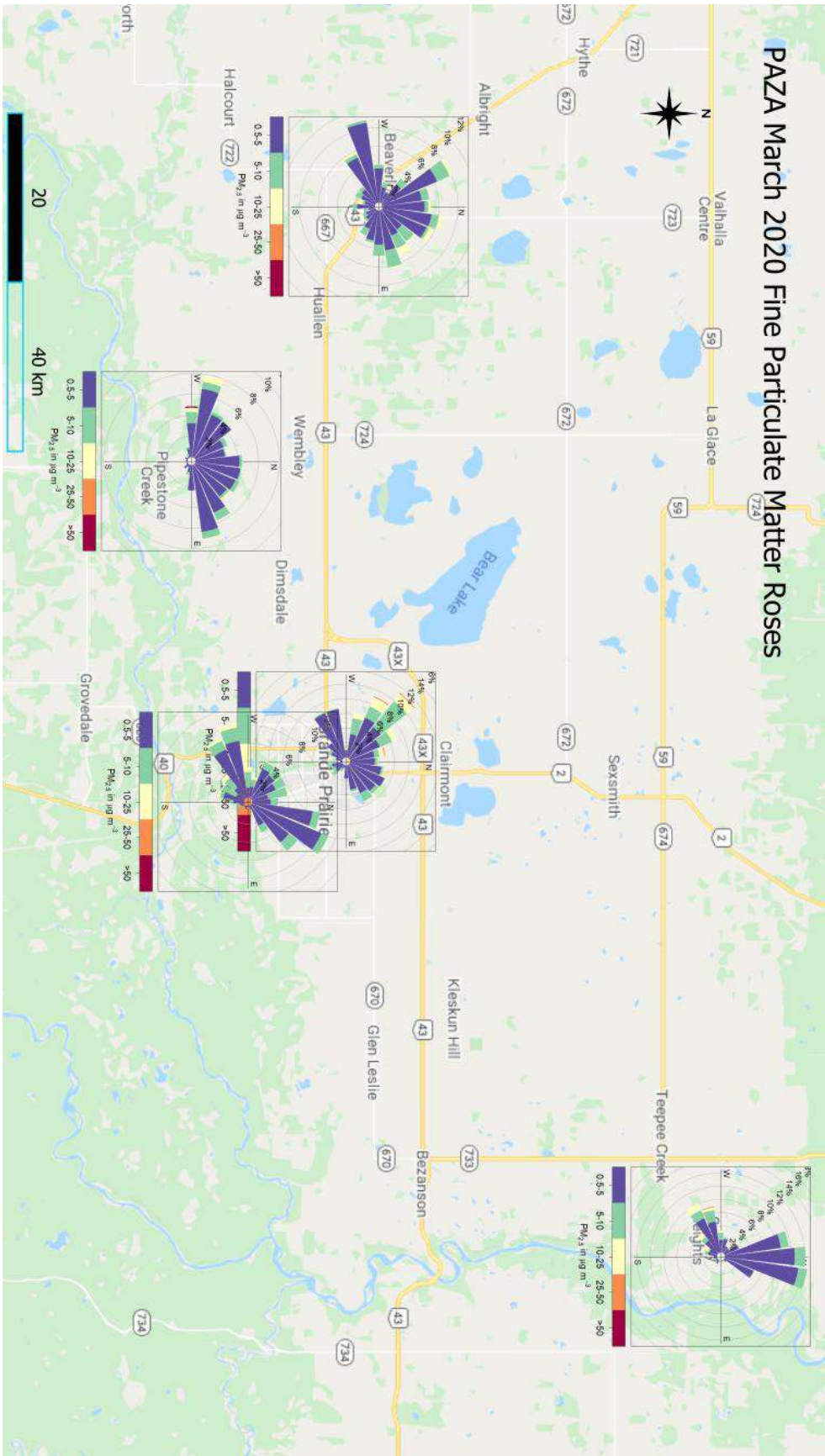


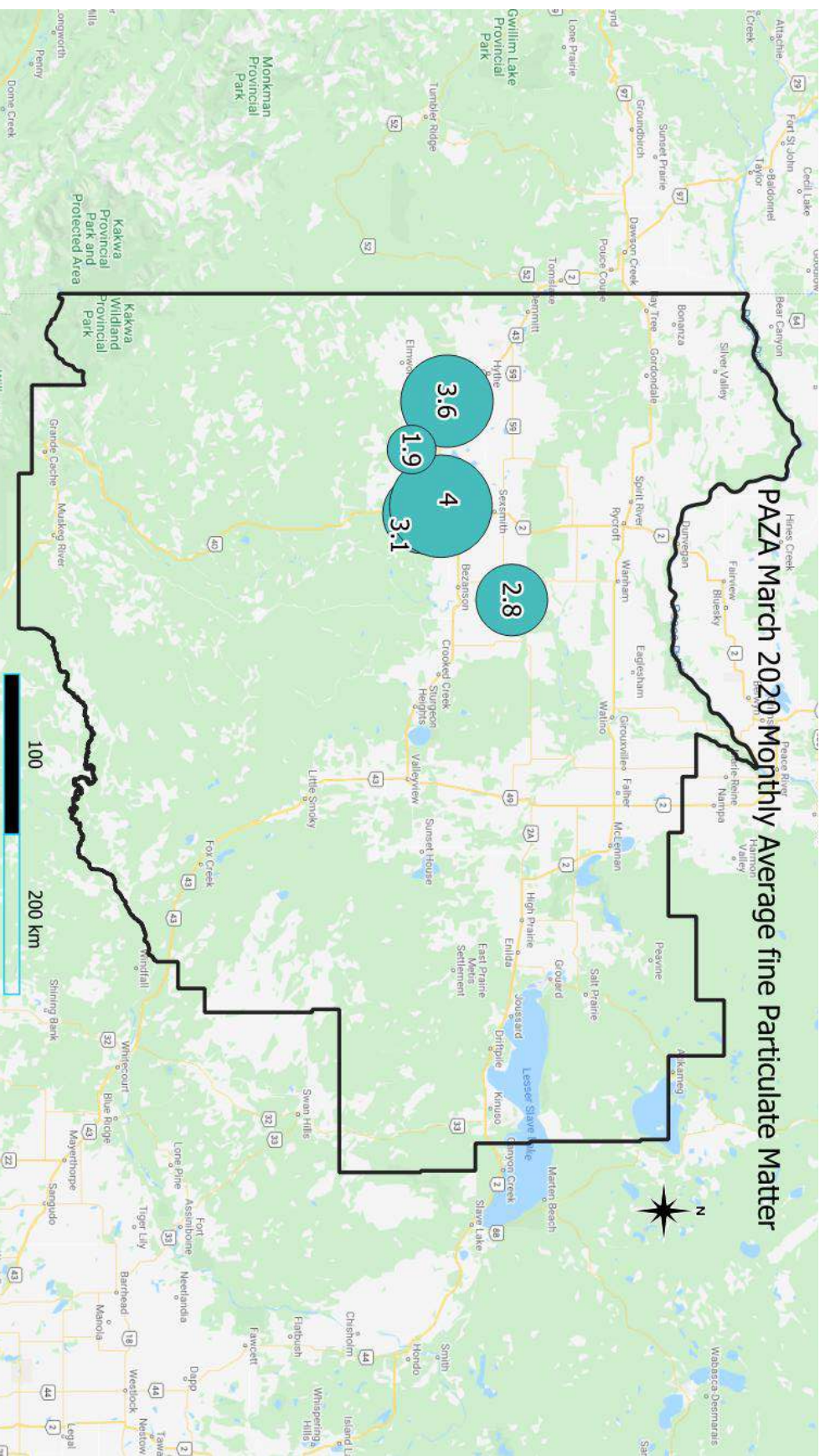
9.3 Nitrogen Dioxide Plots





9.4 Fine Particulate Matter (PM_{2.5}) Plots





10 Passive Monitoring Data

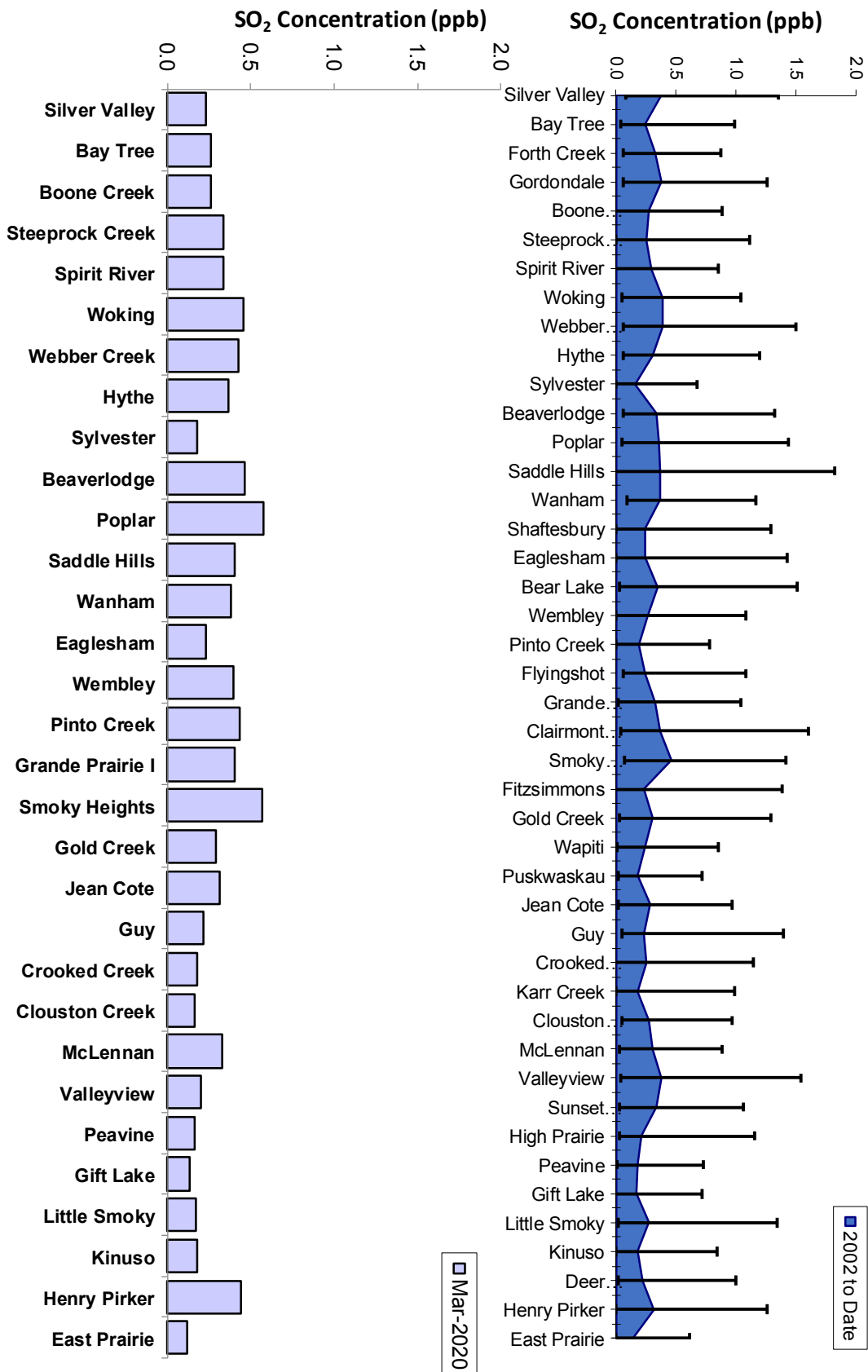
Peace Airshed Zone Association - PAZA Passive Stations for March 2020

Station Number	Station Name	SO2 ppb	O3 ppb	NO2 ppb	H2S ppb	LSD
Duplicates						
5a	Boone Creek			0.0		
5b	Boone Creek			0.0		
9a	Spirit River			0.0		
9b	Spirit River			0.0		
11a	Webber Creek	0.4				
11b	Webber Creek	0.4				
36a	Guy				0.1	
36b	Guy				0.1	
37a	Crooked Creek	0.2	49.4			
37b	Crooked Creek	0.2	58.7			
44a	Peavine	0.2				
44b	Peavine	0.2				
50a	East Prairie			0.0		
50b	East Prairie			0.0		

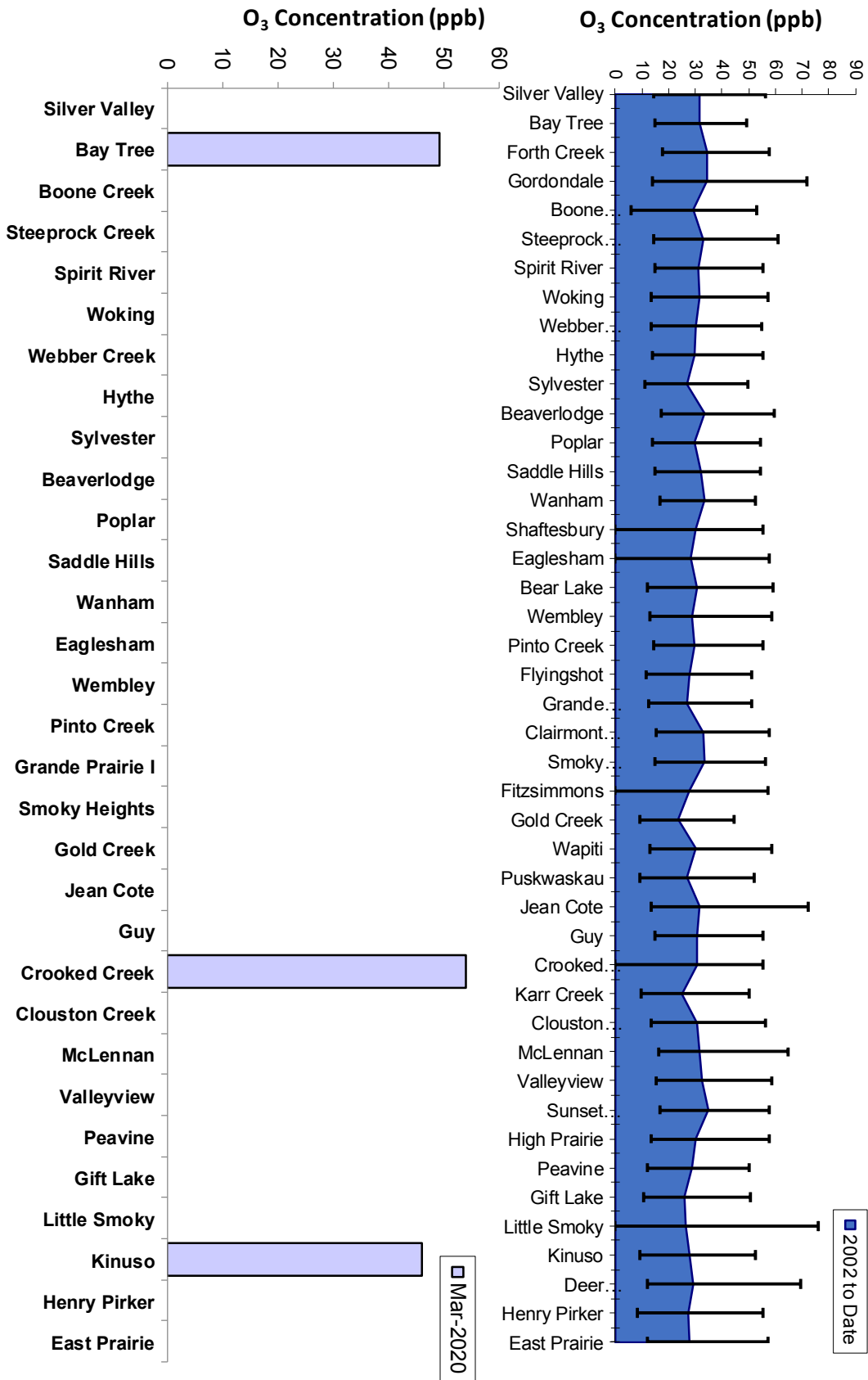
1	Silver Valley	0.2	-	0.1	-	08-27-081-11 W6M
2	Bay Tree	0.3	49.1	0.0	-	13-16-078-13 W6M
5	Boone Creek	0.3	-	0.0	-	01-23-076-11 W6M
7	Steepprock Creek	0.3	-	0.0	-	09-35-072-13 W6M
9	Spirit River	0.3	-	0.0	-	08-12-079-07 W6M
10	Woking	0.5	-	0.0	-	01-13-076-07 W6M
11	Webber Creek	0.4	-	0.7	-	09-36-074-09 W6M
12	Hythe	0.4	-	0.1	-	14-36-072-11 W6M
14	Sylvester	0.2	-	0.0	-	08-06-069-12 W6M
16	Beaverlodge	0.5	-	0.5	-	15-36-071-10 W6M
17	Poplar	0.6	-	0.2	-	13-06-073-08 W6M
18	Saddle Hills	0.4	-	0.0	-	04-25-074-07 W6M
19	Wanham	0.4	-	0.0	-	16-22-077-03 W6M
21	Eaglesham	0.2	-	0.0	-	16-21-079-25 W5M
24	Wembley	0.4	-	0.6	-	12-31-070-08 W6M
25	Pinto Creek	0.4	-	0.0	-	04-24-069-11 W6M
27	Grande Prairie I	0.4	-	3.9	-	08-15-071-06 W6M
29	Smoky Heights	0.6	-	0.0	-	04-06-075-02 W6M
32	Gold Creek	0.3	-	1.0	-	06-33-067-05 W6M
35	Jean Cote	0.3	-	0.0	-	12-35-079-21 W5M
36	Guy	0.2	-	0.0	0.1	03-04-076-22 W5M
37	Crooked Creek	0.2	54.1	0.3	-	16-01-071-26 W5M
39	Clouston Creek	0.2	-	0.0	-	12-01-073-22 W5M
40	McLennan	0.3	-	0.0	-	03-29-077-19 W5M
41	Valleyview	0.2	-	0.0	-	09-30-069-22 W5M
44	Peavine	0.2	-	0.0	-	03-05-079-15 W5M
45	Gift Lake	0.1	-	0.0	-	10-07-079-12 W5M
46	Little Smoky	0.2	-	0.4	-	12-01-065-21 W5M
47	Kinuso	0.2	46.1	0.0	-	12-10-073-10 W5M
49	Henry Pirker	0.4	-	3.3	-	17-26-071-06 W6M
50	East Prairie	0.1	-	0.0	-	11-13-079-08 W6M
63	Girouxville 3	-	-	-	-	14-02-077-23 W5M
64	Girouxville 4	-	-	-	-	04-08-077-22 W5M

Passive Summary for March 2020

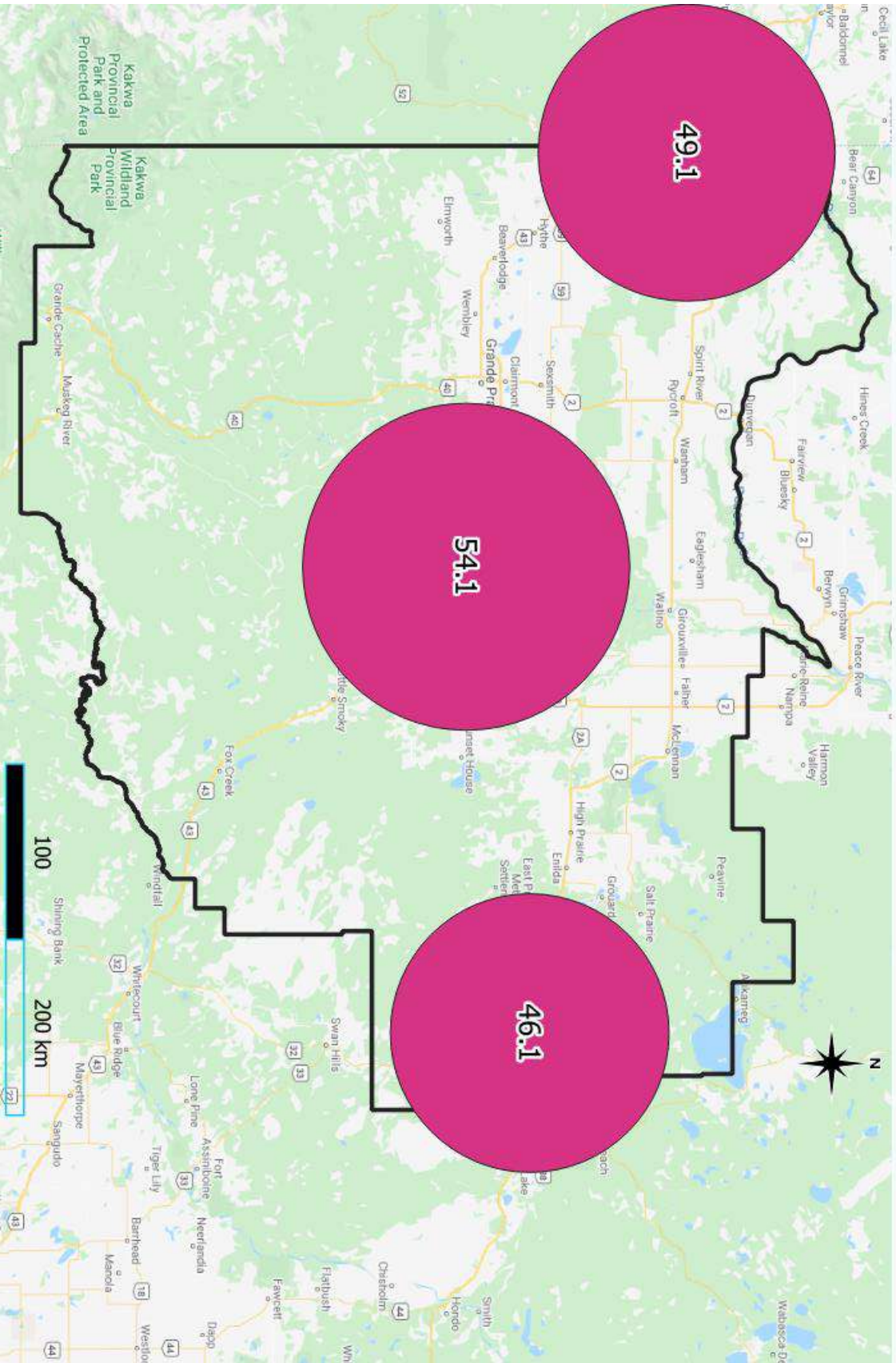
Stats	Sulphur Dioxide	Ozone	Nitrogen Dioxide	Hydrogen Sulphide
	SO ₂	O ₃	NO ₂	H ₂ S
	ppb	ppb	ppb	ppb
Passive Summary for March 2020 (PAZA)				
Mean	0.3	49.8	0.4	0.1
Standard Deviation	0.1	4.0	0.9	-
Minimum	0.1	46.1	0.0	0.1
	East Prairie (#50)	Kinuso (#47)	Bay Tree (#2)	Guy (#36)
Maximum	0.6	54.1	3.9	0.1
	Poplar (#17)	Crooked Creek (#37)	Grande Prairie I (#27)	Guy (#36)
Continuous and Passive Monitoring Comparision				
PAZA Beaverlodge Station	0.6	37.0	4.0	-
Beaverlodge Passive (#16)	0.5	-	0.5	-
PAZA Henry Pirker Station	0.4	29.5	10.0	0.2
Henry Pirker passive (#49)	0.4	-	3.3	-

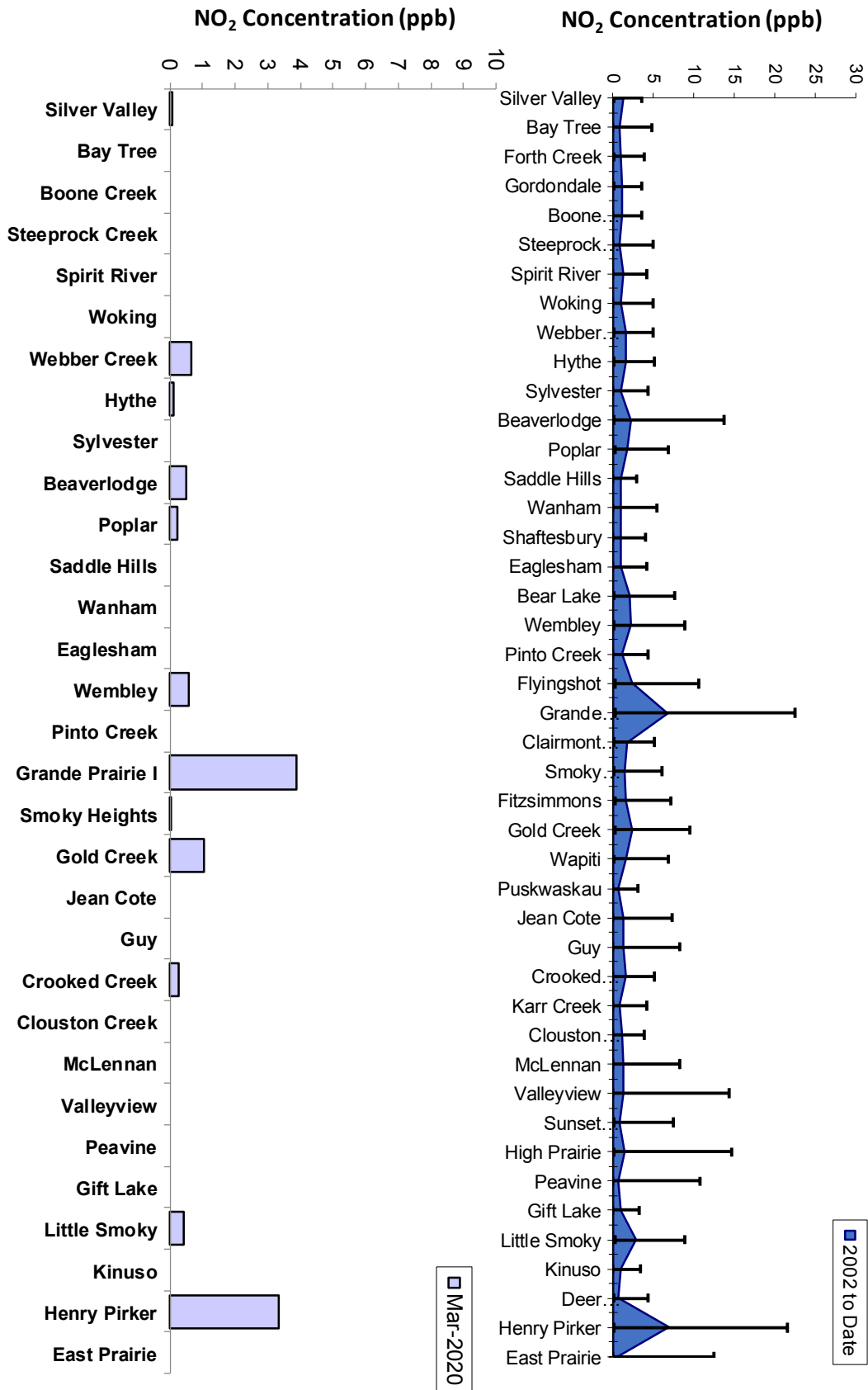


[illegible]

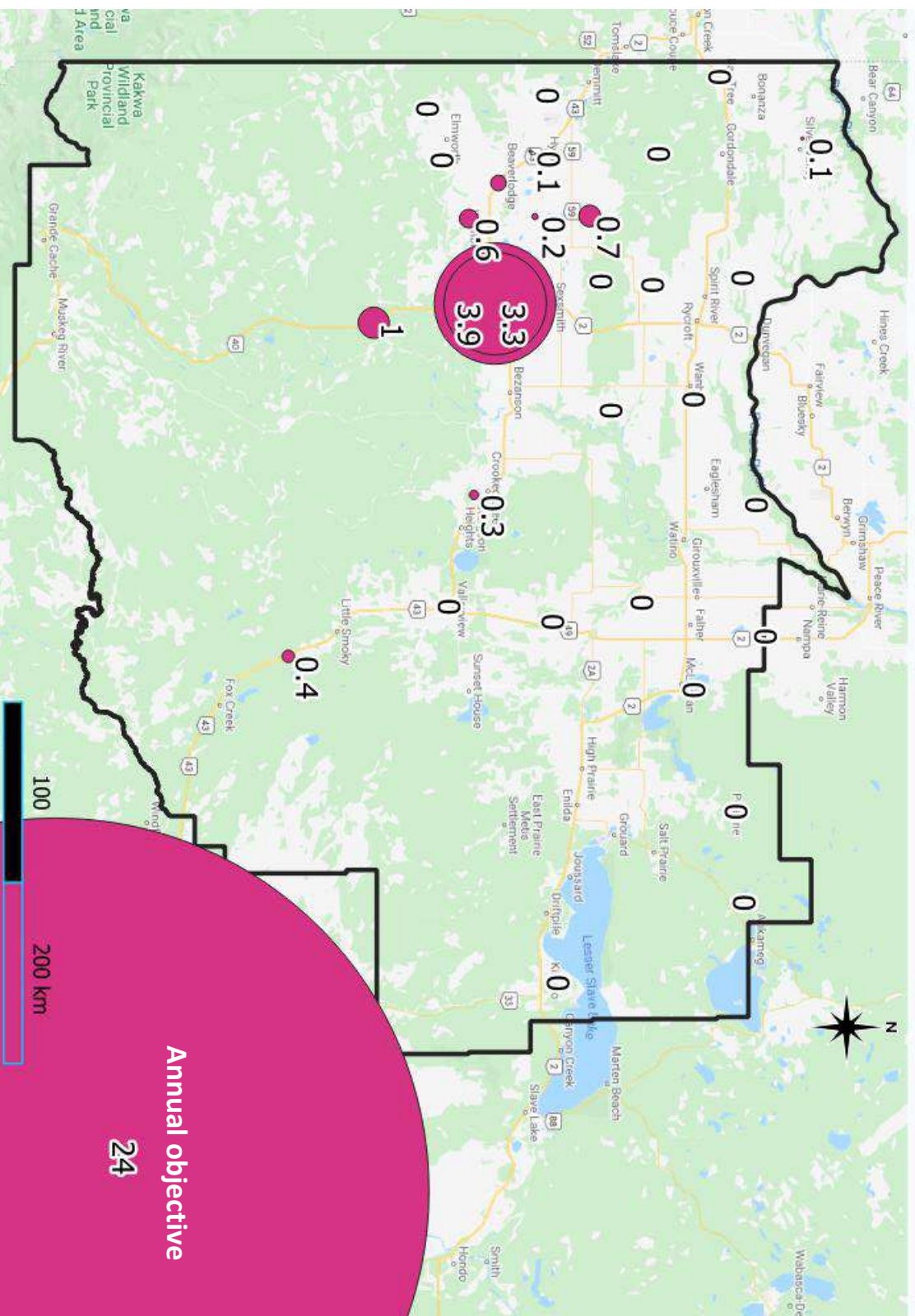


PAZA March 2020 Monthly average Ozone Passives

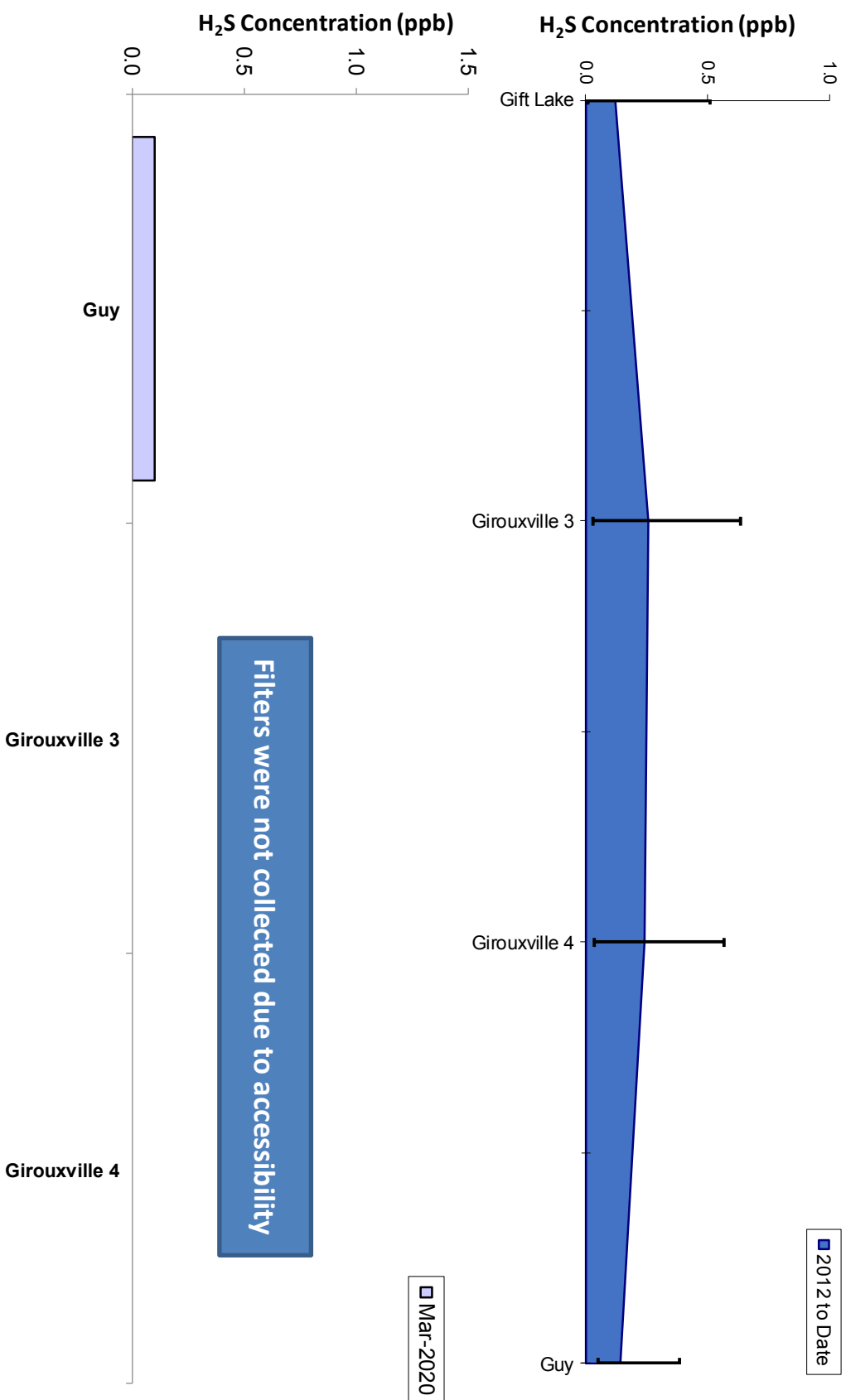




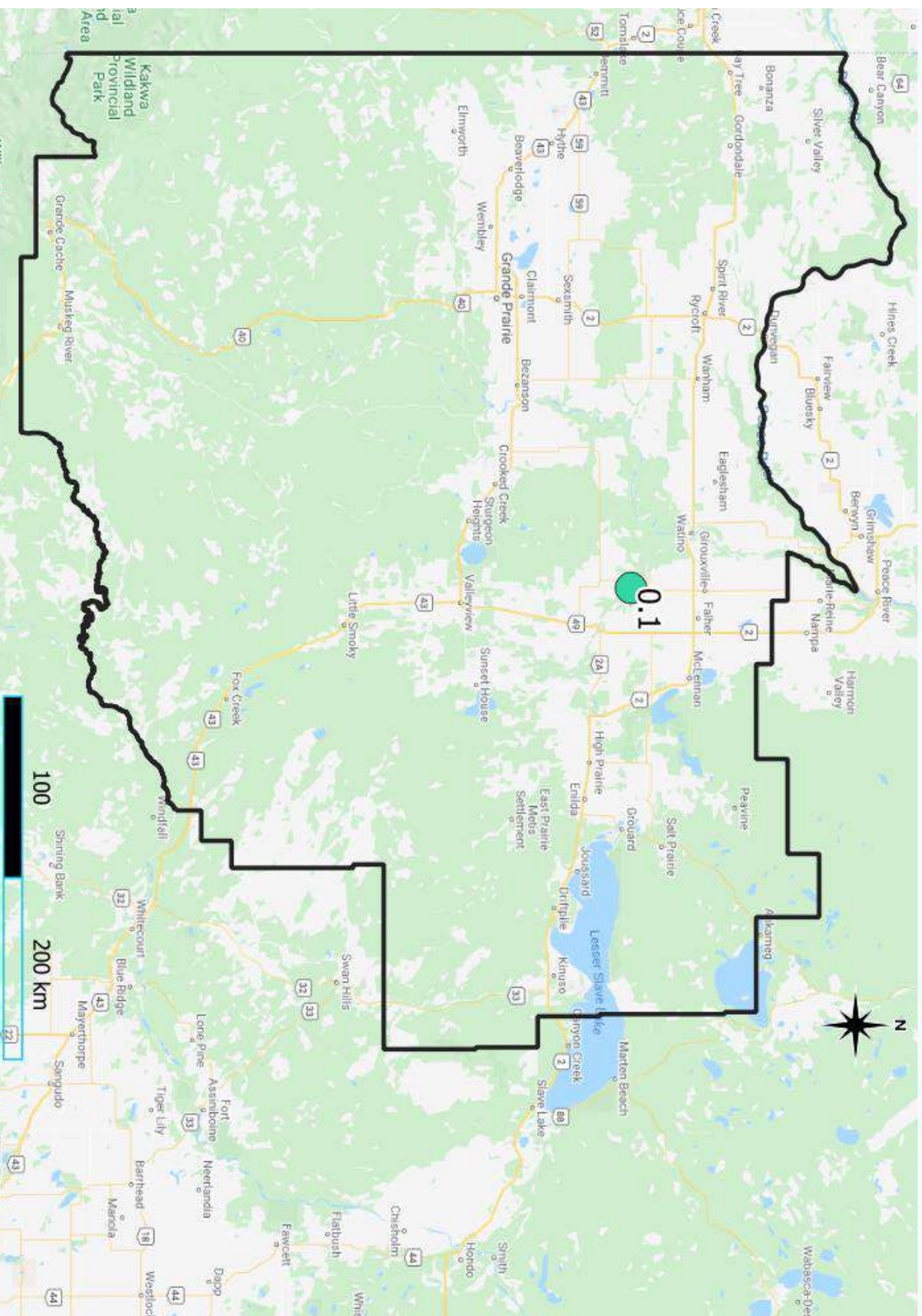
PAZA March 2020 Monthly average Nitrogen Dioxide Passives



No Monthly or Annual Alberta Ambient Air Quality Objective for H₂S



PAZA March 2020 Monthly average Hydrogen Sulphide Passives



End of Report



Peace Airshed Zone Association

Ambient Air Monitoring Report

March 2020