



Wood Buffalo Environmental Association

APRIL 2017

MONTHLY REPORT

CONTINUOUS MONITORING
INTEGRATED MONITORING
May 29, 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta



Table of Contents

Continuous Monitoring Summaries

Summary Letter	1
Network Summary	11
Bertha Ganter	1-1
Station Summaries	1-2
Station Percentiles	1-3
Station Downtime	1-4
Data Summaries	1-5
Calibrations	1-106
Mildred Lake	2-1
Station Summaries	2-2
Station Percentiles	2-3
Station Downtime	2-4
Data Summaries	2-5
Calibrations	2-40
Lower Camp Meteorology	3-1
Station Summaries	3-2
Station Percentiles	3-3
Station Downtime	3-4
Data Summaries	3-5
Buffalo Viewpoint	4-1
Station Summaries	4-2
Station Percentiles	4-3
Station Downtime	4-4
Data Summaries	4-5
Calibrations	4-40
Mannix	5-1
Station Summaries	5-2
Station Percentiles	5-3
Station Downtime	5-4
Data Summaries	5-5
Calibrations	5-99
Patricia McInnes	6-1
Station Summaries	6-2
Station Percentiles	6-3
Station Downtime	6-4
Data Summaries	6-5



Calibrations	6-94
Athabasca Valley	7-1
Station Summaries	7-2
Station Percentiles	7-3
Station Downtime	7-4
Data Summaries	7-5
Calibrations	7-96
Fort Chipewyan	8-1
Station Summaries	8-2
Station Percentiles	8-3
Station Downtime	8-4
Data Summaries	8-5
Calibrations	8-69
Barge Landing	9-1
Station Summaries	9-2
Station Percentiles	9-3
Station Downtime	9-4
Data Summaries	9-5
Calibrations	9-33
Lower Camp	11-1
Station Summaries	11-2
Station Percentiles	11-3
Station Downtime	11-4
Data Summaries	11-5
Calibrations	11-40
Fort McKay South	13-1
Station Summaries	13-2
Station Percentiles	13-3
Station Downtime	13-4
Data Summaries	13-5
Calibrations	13-73
Anzac	14-1
Station Summaries	14-2
Station Percentiles	14-3
Station Downtime	14-4
Data Summaries	14-5
Calibrations	14-96
Horizon	15-1
Station Summaries	15-2
Station Percentiles	15-3



Station Downtime	15-4
Data Summaries	15-5
Calibrations	15-71
Muskeg River	16-1
Station Summaries	16-2
Station Percentiles	16-3
Station Downtime	16-4
Data Summaries	16-5
Calibrations	16-62
Wapasu	17-1
Station Summaries	17-2
Station Percentiles	17-3
Station Downtime	17-4
Data Summaries	17-5
Calibrations	17-76
Stony Mountain	18-1
Station Summaries	18-2
Station Percentiles	18-3
Station Downtime	18-4
Data Summaries	18-5
Calibrations	18-96
Firebag	19-1
Station Summaries	19-2
Station Percentiles	19-3
Station Downtime	19-4
Data Summaries	19-5
Calibrations	19-62
Mackay River	20-1
Station Summaries	20-2
Station Percentiles	20-3
Station Downtime	20-4
Data Summaries	20-5
Calibrations	20-65
Conklin	21-1
Station Summaries	21-2
Station Percentiles	21-3
Station Downtime	21-4
Data Summaries	21-5
Calibrations	21-90



Janvier	22-1
Station Summaries.....	22-2
Station Percentiles.....	22-3
Station Downtime.....	22-4
Data Summaries.....	22-5
Calibrations.....	22-87

Christina Lake	500-1
Station Summaries.....	500-2
Station Percentiles.....	500-3
Station Downtime.....	500-4
Data Summaries.....	500-5
Calibrations.....	500-55

Surmont	502-1
Station Summaries.....	502-2
Station Percentiles.....	502-3
Station Downtime.....	502-4
Data Summaries.....	502-5
Calibrations.....	502-55

Integrated Monitoring Summaries

Passive Measurements	Pass-1
Metadata.....	Pass-2
Remote Summary.....	Pass-3
Local Summary.....	Pass-4

Volatile Organic Compounds	VOC-1
Metadata.....	VOC-2
Lab Results.....	VOC-3
Monthly Data Summary.....	VOC-23
Monthly Data Statistics.....	VOC-30

Particulate Matter – PM 2.5 Ions	PM2.5 Ions-1
Metadata.....	PM2.5 Ions-2
Lab Results.....	PM2.5 Ions-3
Monthly Data Summary.....	PM2.5 Ions-12
Monthly Data Statistics.....	PM2.5 Ions-16

Particulate Matter – PM 10 Ions	PM10 Ions-1
Metadata.....	PM10 Ions-2
Lab Results.....	PM10 Ions-3
Monthly Data Summary.....	PM10 Ions-23
Monthly Data Statistics.....	PM10 Ions-30

Particulate Matter – PM 2.5 Metals	PM2.5 Metals-1
---	-----------------------



Metadata.....	PM2.5 Metals-2
Lab Results	PM2.5 Metals-3
Monthly Data Summary	PM2.5 Metals-13
Monthly Data Statistics	PM2.5 Metals-17
Particulate Matter – PM 10 Metals	PM10 Metals-1
Metadata.....	PM10 Metals-2
Lab Results	PM10 Metals-3
Monthly Data Summary	PM10 Metals-23
Monthly Data Statistics	PM10 Metals-30
Polycyclic Aromatic Hydrocarbons	PAH-1
Metadata.....	PAH-2
Lab Results	PAH-3
Monthly Data Summary	PAH-13
Monthly Data Statistics	PAH-17
Precipitation Chemistry	Precip-1
Metadata.....	Precip-2
Lab Results	Precip-3



May 29, 2017

Director, Environmental Monitoring and Evaluation Branch
Alberta Environment and Parks
11th Floor, Oxbridge Place
9820 106 Street
Edmonton, Alberta T5K 2J6

#100 – 330 Thickwood Blvd.
Fort McMurray, AB, T9K 1Y1

Tel: (780) 799-4420
Fax: (780) 715-2016
Email: info@wbea.org

www.wbea.org

**RE: Monthly Ambient Air Quality Monitoring Report April 2017
Wood Buffalo Environmental Association**

Enclosed is the April 2017 Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Wood Buffalo Environmental Association regional air quality monitoring network.

The continuous ambient air quality monitoring network stations are:

AMS 1 - Fort McKay – Bertha Ganter
AMS 2 - Mildred Lake
AMS 3 - Lower Camp B (meteorology)
AMS 4 - Buffalo Viewpoint
AMS 5 - Mannix
AMS 6 - Patricia McInnes
AMS 7 - Athabasca Valley
AMS 8 - Fort Chipewyan
AMS 9 - Barge Landing
AMS 11 - Lower Camp (air quality)
AMS 13 - Fort McKay South
AMS 14 - Anzac
AMS 15 - Horizon
AMS 16 - Muskeg River
AMS 17 - Wapasu
AMS 18 - Stony Mountain
AMS 19 - Firebag
AMS 20 - MacKay River
AMS 21 - Conklin
AMS 22 - Janvier
AMS 500 - Christina Lake
AMS 502 - Surmont

This report is submitted by WBEA on behalf its members and for some members to satisfy the requirements contained in their EPEA Approvals (as amended):



Member	EPEA Approval No.
Athabasca Oil Corporation	289664-00-00; 241311-00-00
Brion Energy	254465-00-00
Canadian Natural Resources Ltd.	149968-01-00
Cenovus Energy	48522-01-00
Connacher Oil and Gas Ltd.	240008-00-00
ConocoPhillips Canada	48263-01-00
Devon Canada Corporation	224816-00-00
Finning Canada Ltd.	Not Applicable
Hammerstone Corporation	189942-00-00
Husky Oil Operations Ltd.	206355-01-00
Imperial Oil Ltd.	00046586-00-00
Inter Pipeline Offgas Ltd.	73203-02-00
MEG Energy Corporation	00216466-01-00
Nexen Energy ULC.	137467-01-00; 236394-00-00
Shell Canada Energy	20809-01-00
Suncor Energy Inc.	094-02-00
Sunshine Oilsands Ltd.	305529-00-00
Syncrude Canada Ltd.	026-02-00
Teck Resources Ltd.	EIA Application
Total E&P Canada Ltd.	228044-00-00

Government and Non-Industrial Organizations

Alberta Energy Regulator
Alberta Environment & Parks
Alberta Health Services
Alberta Health & Wellness
Environment Canada
Health Canada
Parks Canada
Pembina Institute for Appropriate Development
Regional Municipality of Wood Buffalo
Saskatchewan Environment

Aboriginal Communities

Chipewyan Prairie Dene First Nation	Fort McKay Métis Local 63
Christina River Dene Nation Council	Fort McMurray First Nation 468
Fort McKay First Nation	Fort McMurray Métis Local 1935

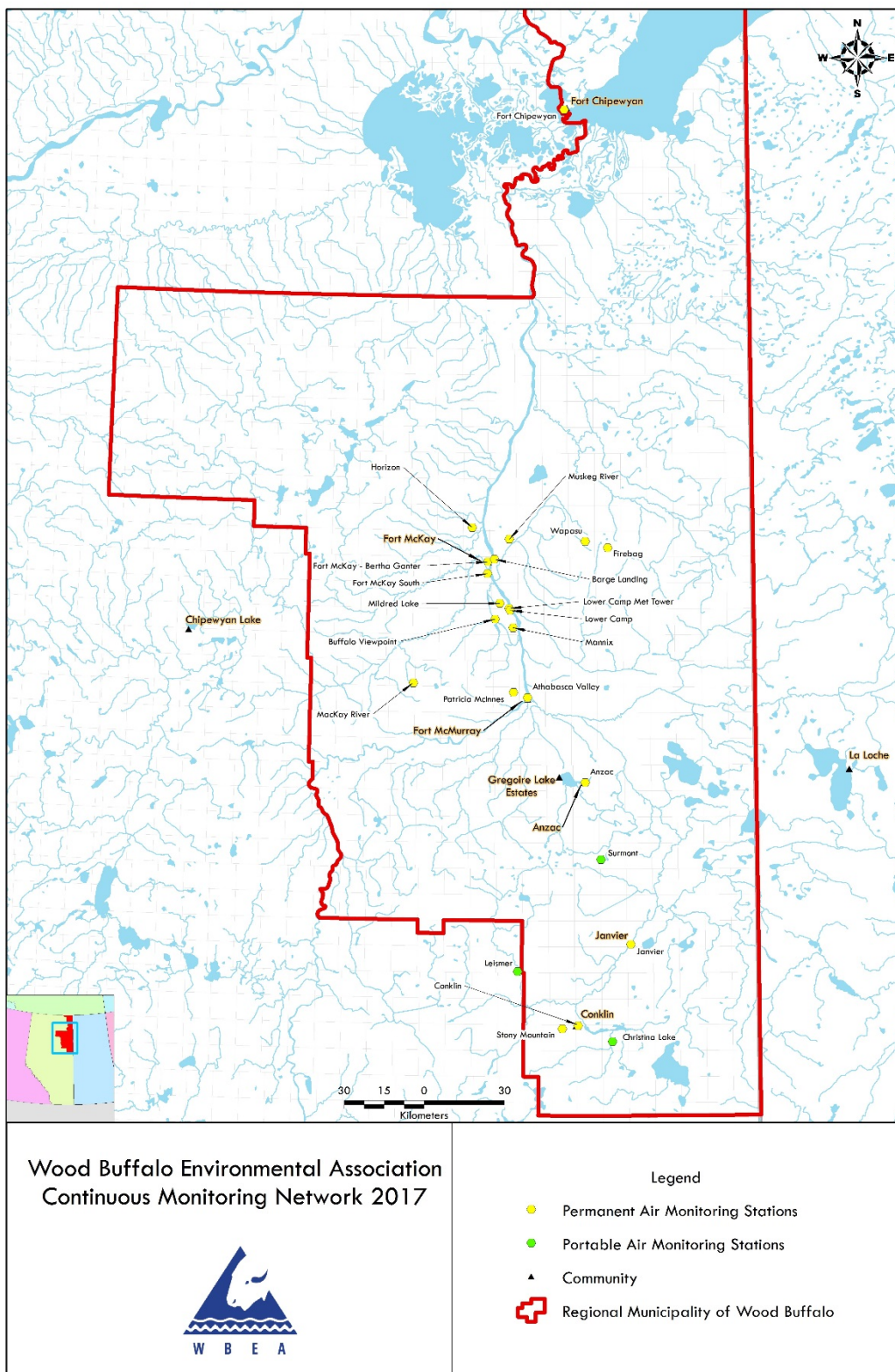


Figure 1: Map of WBEA Continuous Monitoring Network.

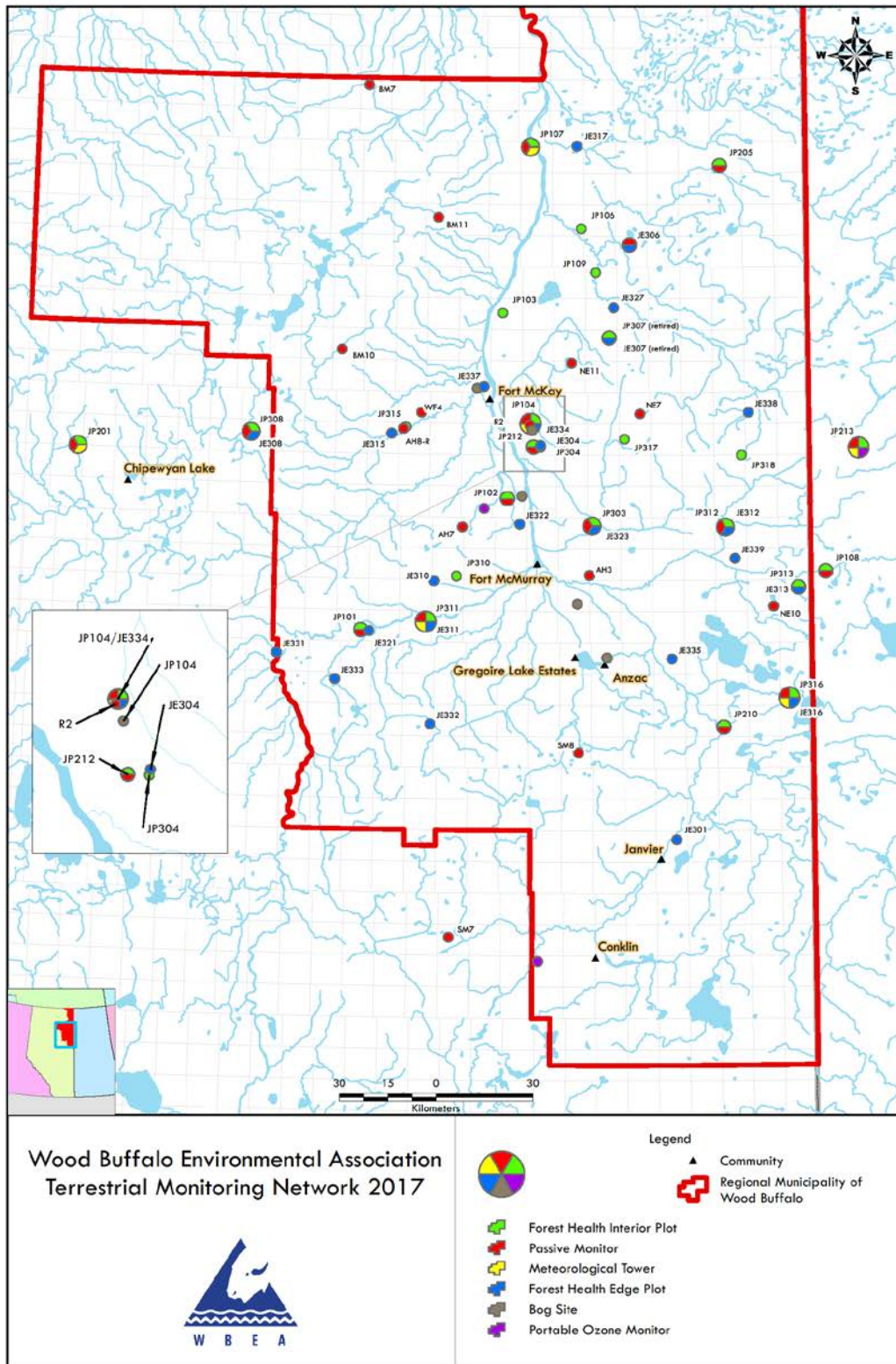


Figure 2: Map of WBEA Terrestrial Monitoring Network.

The following operational notes are provided as per the Air Monitoring Directive requirements.

1.0 Concentrations in Excess of Alberta Ambient Air Quality Objectives

There were no ambient concentrations in excess of the air quality objectives as indicated in the Air Monitoring Directive Section III.A.3 (a & b) for CO, NH₃, NO₂, PM_{2.5}, O₃, and SO₂.

There were 8 ambient ground level concentrations in excess of the 1-hour and 24-hour H₂S air quality objective reported to the Energy and Environmental Response Centre in real time. After data processing to account for analyzer drift with baseline correction, there were 7 concentrations in excess of the 1-hour H₂S air quality objective and 1 concentration in excess of the 24-hour H₂S air quality objective.

The following table provides the status of the incidents and final data averages.

Site	Parameter	Date / Time	Reference	Period	Concentration ppb or ug/m ³		Status
					Reported	Final	
AMS 5 Mannix	H ₂ S	28Apr17, 22:00	323651	1hr	86	86	exc
AMS 5 Mannix	H ₂ S	28Apr17, 23:00	323651	1hr	38	37	exc
AMS 5 Mannix	H ₂ S	28Apr17, 24:00	323651	1hr	66	66	exc
AMS 5 Mannix	H ₂ S	28Apr17, 24:00	323651	24hr	9	9.5	exc
AMS 5 Mannix	H ₂ S	29Apr17, 10:00	323658	1hr	11	11	exc
AMS 5 Mannix	H ₂ S	30Apr17, 23:00	323685	1 hr	19	18	exc
AMS 11 Lower Camp	H ₂ S	19Apr17, 21:00	323318	1hr	13	13	exc
AMS 11 Lower Camp	H ₂ S	29Apr17, 21:00	323665	1hr	21	21	exc

*status legend:

- late exceedance, raw values were not found to be in exceedance in real time, and/or were not reported, but final values were found to be an exceedance after data processing.
- exc exceedance, raw values reported in real time were confirmed to be in exceedance after data processing.
- nae not an exceedance, raw values reported in real time were found not in exceedance after data processing.
- ret retracted, reported exceedance was found to be not an exceedance after investigation of measurement system status and/or validation of raw data in conjunction with all associated measurement parameters.

1.1 Data Processing and Validation

Concentrations reported in near real-time were raw values. The final values were determined after processing of data for reporting. For all parameters except PM_{2.5}, the final 5-minute data values were determined by subtracting from the raw 5-minute data values, the daily zero responses interpolated to the time of each raw 5-minute value. The final 5-minute data values were then rounded to one decimal place greater than the reporting precision indicated in the Air Monitoring Directive (AMD). The final 1-hour data values were calculated from final 5-minute data values and then rounded to reporting precision. The final 24-hour data values were calculated from final 1-hour values.

After data processing and validation, NO₂ concentrations were re-calculated from baseline-corrected NO_x and NO concentrations. Specifically, the NO concentration was subtracted from the NO_x concentration to determine the NO₂ concentration. In cases where the NO_x and/or NO values exceeded the operating range of the analyzer, values reported for NO₂ were determined as the largest of either the difference between baseline-corrected NO_x and NO values, or the NO₂ value reported by the data acquisition system with baseline correction applied.

1.2 Revisions to AEP Airdata Warehouse

- i. As a result of the Alberta Environment and Parks (AEP) audit, data for Mildred Lake (AMS 2) was re-submitted to reflect adjustment to SO₂ data effective August 2015 - October 2016. Adjusted data has been flagged "V" (Valid data – data is valid after review).
- ii. As a result of the AEP audit, data for Mannix (AMS 5) was re-submitted to reflect invalidation of H₂S data effective February 2015 - September 2016.
- iii. As a result of the AEP audit, data for Athabasca Valley (AMS 7) was re-submitted to reflect adjustment to NO₂ data effective March 2015 - September 2016. Adjusted data has been flagged "V" (Valid data – data is valid after review).
- iv. As a result of the AEP audit, data for Anzac (AMS 14) was re-submitted to reflect adjustment to SO₂ data effective June 2016 - September 2016. Adjusted data has been flagged "V" (Valid data – data is valid after review).
- v. As a result of the AEP audit, data for Horizon (AMS 15) was re-submitted to reflect invalidation of PM_{2.5} data effective June 2016 - September 2016.
- vi. As a result of the AEP audit, data for Wapasu (AMS 17) was re-submitted to reflect adjustment to wind direction data effective August 2016 - September 2016.
- vii. Barometric pressure data has been revised and resubmitted to the AEP Airdata Warehouse for Athabasca Valley air monitoring station (AMS 7) from November 2012 – September 2016 as well as Muskeg River air monitoring station (AMS 16) from May 2011 – February 2017. This data was revised to standardize barometric pressure units from inches of mercury to millibars.

2.0 Operational Status

Continuous Monitoring

The Wood Buffalo Environmental Association received an Audit Closure Letter, from Alberta Environment and Parks, dated May 19, 2017 for File No(s). 2016-206A/297A. All data corrections have been resubmitted to the AEP airdata warehouse as of May 29, 2017. A summary of corrective actions can be found below.

Station	Audit Findings	Cause	Corrective Actions
Mildred Lake (AMS 2)	SO ₂ analyzer response was 11% below the calculated audit gas concentration.	Calibration gas concentration not as indicated.	Data was reviewed and corrected from August 19, 2015 to October 4, 2016.
Buffalo Viewpoint (AMS 4)	H ₂ S analyzer did not meet audit criteria for linearity.	Analyzer SOx scrubber required replacement.	SOx scrubber was replaced. Previous calibrations and data were reviewed; data was invalidated from September 27-28, 2017 from the last valid daily zero span until repairs and recalibration was conducted.
Mannix (AMS 5)	H ₂ S analyzer response was 32% above the calculated audit gas concentration.	Calibration gas may have become contaminated.	Data has been invalidated for the time the calibration cylinder was used at the station: February 6, 2015 to September 28, 2016.
Athabasca Valley (AMS 7)	NO _x analyzer response was 12% below the calculated audit gas concentration.	Calibration gas concentration not as indicated.	Data was reviewed and corrected from October 14, 2014 to September 26, 2016.
Athabasca Valley (AMS 7)	TRS analyzer was 12% below the calculated audit gas concentration	Analyzer had a leak in the ambient sample stream.	Analyzer was repaired, recalibrated, and re-audited. Data was invalidated from the installation of this analyzer on July 30 to September 26, 2016, following repairs and re-audit.
Anzac (AMS 14)	SO ₂ analyzer response was 12% below the calculated audit gas concentration.	Calibration gas concentration not as indicated.	Data was reviewed and corrected from March 17, 2015 to September 27, 2016.
Horizon (AMS 15)	PM _{2.5} analyzer span response was 34% above the target sensitivity factor.	Previous foil calibration was beyond audit criteria.	The analyzer was re-calibrated and data was invalidated from June 21 to September 23, 2016.

Station	Audit Findings	Cause	Corrective Actions
Wapasu (AMS 17)	Wind direction was out of alignment by 16 degrees.	The wind direction sensor was aligned to magnetic north rather than true north.	The wind direction sensor alignment was corrected and verified by WBEA and AEP on September 21, 2016. Data was assessed by a third party and has been corrected from August 17 to September 21, 2016.
Firebag (AMS 19)	THC analyzer response was 11% above the calculated audit gas concentration.	A component failure was identified as the cause of the out of criteria analyzer response.	Analyzer was repaired and recalibrated. Data was invalidated from September 15-21, 2016 based on a review of diagnostics.

In April 2017, there were one instance of a compliance monitoring instruments operating less than 90% of the time.

The Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), and Nitrogen Dioxide (NO₂) analyzers at Surmont AMS operated less than 90% of the time in April 2017, which is a contravention of the Air Monitoring Directive (1989, as amended), Chapter 6, Clause DQ 4-C.

The glass sample manifold assembly was discovered to be broken during routine calibrations on April 26, 2017, preventing the analyzers from sampling ambient air. The manifold assembly was replaced on April 27, 2017. Review of sample manifold pressure diagnostics indicate that the break occurred on April 16, 2017.

The Wood Buffalo Environmental Association (WBEA) has installed manifold pressure sensors at all air monitoring stations for monitoring manifold blower motors. An alarm has now been set to notify the WBEA when changes in manifold pressure occur, indicating a potentially broken manifold. This should prevent less than 90% operational time due to broken manifolds in the future.

During the data validation process, SO₂, NO₂, and H₂S at Surmont AMS were invalidated for 271 (SO₂ & NO₂) and 273 (H₂S) hours, resulting in a monthly operational time of 62% for the month of April 2017. This incident was reported to Alberta Environment and Parks on May 4, 2017 (AEP Reference #323840).

In April 2017, there were no instances of a non-compliance monitoring instrument operating less than 90% of the time.

Intermittent Monitoring

Results for integrated monitoring of precipitation, PAH, VOC, PM_{2.5} and PM₁₀ samples for March 2017 are included with this report. The results for passive samples for February - March 2017 are included with this report.

3.0 Monitoring Notes

General Network Notes

The Ammonia (NH₃) analyzer currently operates on a 0 to 1000 ppb operating range with a detection level of 5 ppb in the WBEA network. In data processing, values less than 5 ppb have been considered below detection levels and are reported as zero.

Monitoring notes for the continuous monitoring stations are provided on a station by station basis.

Station 1, Fort McKay - Bertha Ganter

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. Additional time for stabilization after exposure to high concentrations of NH₃ gas is an inherent behavior in the NH₃ analyzer operations resulting from the properties of the NH₃ gas. Data for 1-2 hours following the daily spans have been reported as invalid for a total of 36 hours this month.

Maintenance and cleaning of the sample manifold on April 26 interrupted the normal operations of the NH₃, NO_x, THC, SO₂ and TRS analyzers for 1 hour.

Power outages at the station on April 13 and 14 affected the normal operations of all air quality analyzers for 3 to 6 hours.

Five instances of unstable operation due to baseline drift affected the normal operation of the PM_{2.5} analyzer for 29 hours this month.

The temperature sensors at 2 and 10 m are independent sensors and are not an integrated delta-t system. Although reported values are representative of ambient temperatures, they may not be suitable as measurements of vertical temperature gradients.

Station 2, Mildred Lake

A power outage at the station followed by stabilization time on April 13 affected the normal operation of all analyzers for 5 hours.

Station 3, Lower Camp - Meteorology

Flat lines in the output signals of the sonic wind sensors at the 100 m elevation resulted in 6 hours of downtime.

Station 4, Buffalo Viewpoint

Maintenance and cleaning of the sample manifold on April 25 interrupted the normal operation of the H₂S analyzer for 1 hour.

Station 5, Mannix

Maintenance to the sample manifold on April 26 interrupted the normal operations of all analyzers for 1 hour.

The data acquisition system on the meteorological tower failed to record data on April 26 resulting in the absence of data for 9 hours for all meteorological parameters.

Flat lines in output signals of the temperature and relative humidity sensors at the 90 m elevation resulted in 2 hours of invalid data this reporting period.

Flat lines in output signals of the sonic wind sensors at 20, 45, and 75 m elevations resulted in 6, 9, and 5 hours of downtime for each respective sensor.

Station 6, Patricia McInnes

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily span and routine monthly multipoint calibration periods. Additional time for stabilization after exposure to high concentrations of the NH₃ gas is an inherent behavior in the NH₃ analyzer operations resulting from the properties of the NH₃ gas. Data for 1 to 2 hours following each daily span has been reported as invalid for a total of 31 hours this month.

Maintenance to replace the converter core on April 3 interrupted the normal operation of the NH₃ analyzer for 30 hours.

Maintenance and cleaning of the sample manifold on April 4 interrupted the normal operations of the THC, O₃, and SO₂ analyzers for 1 hour.

Flat-lines in the output signal of the wind sensor resulted in 10 hours of invalid data this reporting period.

Station 7, Athabasca Valley

Maintenance and cleaning of the sample manifold on April 3 interrupted the normal operations of the TRS, O₃, and CO analyzers for 1 hour.

Three instances of unstable operation due to baseline drift affected the normal operation of the PM_{2.5} analyzer for 6 hours this month.

Flat-lines in the output signal of the wind sensor resulted in 1 hours of invalid data this reporting period.

Station 8, Fort Chipewyan

A power interruption at the station followed by stabilization time on April 11 affected the normal operation of the NO₂ analyzer for 1 hour.

Station 9, Barge Landing

A power outage at the station on April 13 affected the normal operation of the TRS and THC analyzers for 6 hours.

Flat-lines in the output signal of the wind sensor resulted in 1 hour of invalid data this reporting period.

Station 11, Lower Camp

No operational issues to report this month.

Station 13, Fort McKay South

A power outage at the station followed by stabilization time on April 13 affected the normal operations of all analyzers for 4 hours.

Intermittent unstable operation on April 22 interrupted the normal operation of the O₃ analyzer for 4 hours.

Replacement of the UV lamp and a follow-up calibration on April 26 affected the normal operation of the O₃ analyzer for 5 hours.

Confirmation of reference points for O₃ calibrations on April 10 and 26 interrupted the normal operation of the NO₂ analyzer for 5 hours.

Station 14, Anzac

An internal WBEA audit on April 11 and 13 interrupted the normal operations of all air quality analyzers for 1 to 4 hours.

Flat-lines in the output signal of the wind sensor resulted in 6 hours of invalid data this reporting period.

Station 15, Horizon

Unstable operation due to baseline drift on April 17 affected the normal operation of the PM_{2.5} analyzer for 3 hours.

Flat-lines in the output signal of the wind sensor resulted in 2 hours of invalid data this reporting period.

Station 16, Muskeg River

No operational issues to report this month.

Station 17, Wapasu

Unstable operation due to baseline drift on April 17 affected the normal operation of the PM_{2.5} analyzer for 3 hours.

Flat-lines in the output signal of the wind sensor resulted in 4 hours of invalid data this reporting period.

Station 18, Stony Mountain

Flat-lines in the output signal of the wind sensor resulted in 68 hours of invalid data this reporting period.

Station 19, Firebag

Maintenance to replace the sample manifold blower on April 27 interrupted the normal operations of all air quality analyzers for 1 hour.

Maintenance to the data acquisition system on April 20 interrupted the routine operations of all air quality analyzers for 1 hour.

Station 20, MacKay River

Four instances of intermittent unstable operation due to baseline drift affected the normal operation of the H₂S analyzer for a total of 5 hours this reporting period.

Maintenance to reinitiate the daily zero/span check on April 12 interrupted the routine operation of the H₂S analyzer for 1 hour.

Maintenance and cleaning of the sample manifold on April 20 interrupted the normal operation of the H₂S analyzer for 1 hour.

Maintenance to the data acquisition system on April 21 interrupted the routine operations of all air quality analyzers for 1 hour.

Flat-lines in the output signal of the wind sensor resulted in 12 hours of invalid data this reporting period.

Station 21, Conklin

Flat-lines in the output signal of the PM_{2.5} analyzer resulted in 22 hours of invalid data this reporting period.

Maintenance and cleaning of the sample manifold on April 13 interrupted the normal operations of the TRS and O₃ analyzers for 1 hour.

Flat-lines in the output signal of the wind sensor resulted in 2 hours of invalid data this reporting period.

Station 22, Janvier

Maintenance on the in-situ calibrator on April 20 interrupted the normal operations of the SO₂, THC, NO_x, and O₃ analyzers for 2 hours.

Flat-lines in the output signal of the PM_{2.5} analyzer resulted in 23 hours of invalid data this reporting period.

Replacement of the carrier gas cylinder at the station on April 10 affected the normal operation of the THC analyzer for 2 hours.

Station operator activities on April 19 affected the normal operation of the PM_{2.5} analyzer for 1 hour.

Station 500, Christina Lake

Maintenance and cleaning of the sample manifold on April 12 interrupted the normal operation of the H₂S analyzer for 1 hour.

Station 502, Surmont

A broken sample manifold prevented the SO₂, H₂S, and NO_x analyzers from sampling ambient air. Manifold pressure diagnostics and review of analyzer baseline responses indicated that the break occurred on April 16, 2017; the manifold was replaced on April 27, 2017, resulting in 271 to 273 hours of invalid data for all air quality analyzers.

Flat-lines in the output signal of the wind sensor resulted in 22 hours of invalid data this reporting period.

If additional information is required, please contact either Mike Martineau at (780) 715 1770 ext. 222 or the Wood Buffalo Environmental Association at (780) 799 4420.

Yours sincerely,

Wood Buffalo Environmental Association

Mike Martineau
Data Lead

Sanjay Prasad
Air Quality Scientist

R00_1704

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY
for AMD SECTION III.B.1(c)

APRIL 2017

page 1 of 2

Prepared: May 29 2017 10:22

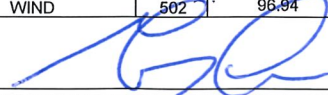
APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	4	2017					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
254465-00-00							
149968-01-00							
48522-01-00							
240008-00-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
48263-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
224816-00-00	SO2(ppm)	1	99.44	0.045	0	0.009	0
189942-00-00	SO2(ppm)	2	99.31	0.030	0	0.007	0
206355-00-00	SO2(ppm)	4	100.00	0.080	0	0.006	0
46586-00-00	SO2(ppm)	5	99.86	0.123	0	0.020	0
73203-02-00	SO2(ppm)	6	99.86	0.020	0	0.004	0
216466-01-00	SO2(ppm)	7	100.00	0.010	0	0.002	0
137467-01-00	SO2(ppm)	8	100.00	0.004	0	0.001	0
236394-00-00	SO2(ppm)	11	100.00	0.145	0	0.019	0
20809-01-00	SO2(ppm)	13	99.44	0.061	0	0.010	0
094-02-00	SO2(ppm)	14	99.72	0.006	0	0.002	0
305529-00-00	SO2(ppm)	15	100.00	0.042	0	0.010	0
026-02-00	SO2(ppm)	16	100.00	0.049	0	0.006	0
228044-00-00	SO2(ppm)	17	100.00	0.044	0	0.005	0
	SO2(ppm)	18	100.00	0.002	0	0.001	0
	SO2(ppm)	19	99.72	0.025	0	0.004	0
	SO2(ppm)	20	99.86	0.033	0	0.006	0
	SO2(ppm)	21	100.00	0.003	0	0.001	0
	SO2(ppm)	22	99.72	0.003	0	0.001	0
	SO2(ppm)	500	100.00	0.010	0	0.002	0
	SO2(ppm)	502	62.36	0.006	0	0.001	0
	H2S(ppm)	2	99.31	0.005	0	0.001	0
	H2S(ppm)	4	99.86	0.005	0	0.000	0
	H2S(ppm)	5	99.86	0.086	5	0.009	1
	H2S(ppm)	11	100.00	0.021	2	0.003	0
	H2S(ppm)	17	100.00	0.001	0	0.000	0
	H2S(ppm)	19	99.86	0.001	0	0.000	0
	H2S(ppm)	20	98.89	0.001	0	0.000	0
	H2S(ppm)	500	99.86	0.002	0	0.000	0
	H2S(ppm)	502	62.08	0.003	0	0.001	0
	TRS(ppm)	1	99.44	0.002	0	0.001	0
	TRS(ppm)	6	99.86	0.001	0	0.000	0
	TRS(ppm)	7	99.86	0.002	0	0.001	0
	TRS(ppm)	9	99.17	0.001	0	0.001	0
	TRS(ppm)	13	99.44	0.003	0	0.001	0
	TRS(ppm)	14	99.58	0.001	0	0.000	0
	TRS(ppm)	15	100.00	0.004	0	0.000	0
	TRS(ppm)	18	100.00	0.000	0	0.000	0
	TRS(ppm)	21	99.86	0.000	0	0.000	0
	TRS(ppm)	22	100.00	0.000	0	0.000	0
	THC(ppm)	1	99.31	3.2	-	2.4	-
	THC(ppm)	2	99.31	4.6	-	2.7	-
	THC(ppm)	4	100.00	4.8	-	2.7	-
	THC(ppm)	5	99.86	4.5	-	2.5	-
	THC(ppm)	6	99.86	2.5	-	2.0	-
	THC(ppm)	7	100.00	2.9	-	2.2	-
	THC(ppm)	9	99.17	4.3	-	2.4	-
	THC(ppm)	11	100.00	6.0	-	2.8	-
	THC(ppm)	13	99.44	4.9	-	2.7	-
	THC(ppm)	14	99.86	2.5	-	2.0	-
	THC(ppm)	15	100.00	6.6	-	2.8	-
	THC(ppm)	16	100.00	5.2	-	2.8	-
	THC(ppm)	17	100.00	2.5	-	2.2	-
	THC(ppm)	18	100.00	2.1	-	2.0	-
	THC(ppm)	19	99.72	2.6	-	2.3	-
	THC(ppm)	20	99.86	2.6	-	2.3	-
	THC(ppm)	21	100.00	2.4	-	2.0	-
	THC(ppm)	22	99.44	2.1	-	2.0	-
	O3(ppm)	1	99.44	0.057	0	0.042	-
	O3(ppm)	6	99.86	0.057	0	0.044	-
	O3(ppm)	7	99.86	0.057	0	0.044	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
 MONTHLY AIR MONITORING SUMMARY
 for AMD SECTION III.B.1(c)

APRIL 2017

page 2 of 2

Prepared: May 29 2017 10:22

APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	4	2017					
254465-00-00	CONTINUOUS AMBIENT MONITORING						
149968-00-01			ONE-HOUR AVERAGE		24-HOUR AVERAGE		
48522-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
240008-00-03	O3(ppm)	8	100.00	0.052	0	0.047	-
48263-00-00	O3(ppm)	13	98.19	0.057	0	0.040	-
224816-00-03	O3(ppm)	14	99.72	0.055	0	0.046	-
189942-00-02	O3(ppm)	17	100.00	0.054	0	0.045	-
206355-00-00	O3(ppm)	18	100.00	0.060	0	0.053	-
46586-00-00	O3(ppm)	21	99.86	0.057	0	0.046	-
216466-00-04	O3(ppm)	22	99.72	0.062	0	0.052	-
137467-00-00	NO2(ppm)	1	99.31	0.042	0	0.010	-
20809-01-00	NO2(ppm)	6	100.00	0.029	0	0.009	-
241311-00-02	NO2(ppm)	7	100.00	0.032	0	0.011	-
094-02-00	NO2(ppm)	8	99.86	0.008	0	0.003	-
305529-00-00	NO2(ppm)	13	98.75	0.036	0	0.009	-
026-02-00	NO2(ppm)	14	99.44	0.013	0	0.005	-
228044-00-00	NO2(ppm)	15	100.00	0.045	0	0.014	-
73203-01-00	NO2(ppm)	16	100.00	0.046	0	0.019	-
236394-00-00	NO2(ppm)	17	100.00	0.019	0	0.004	-
	NO2(ppm)	18	100.00	0.003	0	0.001	-
	NO2(ppm)	19	99.72	0.016	0	0.004	-
	NO2(ppm)	20	99.86	0.023	0	0.006	-
	NO2(ppm)	21	100.00	0.021	0	0.004	-
	NO2(ppm)	22	99.72	0.006	0	0.002	-
	NO2(ppm)	500	100.00	0.012	0	0.004	-
	NO2(ppm)	502	62.36	0.012	0	0.004	-
	CO(ppm)	7	99.86	0.3	0	0.1	-
	NH3(ppm)	1	94.03	0.000	0	0.000	-
	NH3(ppm)	6	92.92	0.000	0	0.000	-
	PM2.5(ug/m3)	1	95.97	78.9	-	9.8	0
	PM2.5(ug/m3)	6	100.00	32.0	-	7.5	0
	PM2.5(ug/m3)	7	99.17	25.5	-	8.1	0
	PM2.5(ug/m3)	8	100.00	21.7	-	7.6	0
	PM2.5(ug/m3)	13	99.44	15.2	-	7.2	0
	PM2.5(ug/m3)	14	100.00	34.5	-	5.7	0
	PM2.5(ug/m3)	15	99.58	34.0	-	12.9	0
	PM2.5(ug/m3)	16	100.00	45.1	-	9.3	0
	PM2.5(ug/m3)	17	99.58	11.0	-	5.6	0
	PM2.5(ug/m3)	18	100.00	11.7	-	4.9	0
	PM2.5(ug/m3)	21	96.94	24.1	-	6.3	0
	PM2.5(ug/m3)	22	96.67	37.2	-	5.8	0
	WIND	1	100.00	-	-	-	-
	WIND	2	100.00	-	-	-	-
	WIND	4	100.00	-	-	-	-
	WIND	5	97.92	-	-	-	-
	WIND	6	98.61	-	-	-	-
	WIND	7	99.86	-	-	-	-
	WIND	8	100.00	-	-	-	-
	WIND	9	99.86	-	-	-	-
	WIND	11	100.00	-	-	-	-
	WIND	13	100.00	-	-	-	-
	WIND	14	99.17	-	-	-	-
	WIND	15	99.72	-	-	-	-
	WIND	16	100.00	-	-	-	-
	WIND	17	99.44	-	-	-	-
	WIND	18	90.56	-	-	-	-
	WIND	19	100.00	-	-	-	-
	WIND	20	98.33	-	-	-	-
	WIND	21	99.72	-	-	-	-
	WIND	22	100.00	-	-	-	-
	WIND	500	100.00	-	-	-	-
	WIND	502	96.94	-	-	-	-
							
	SIGNATURE OF ASSOCIATION REPRESENTATIVE				FOR ALBERTA ENVIRONMENT USE ONLY		



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 1
BERTHA GANTER FORT MCKAY
APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY - BERTHA GANTER (AMS 1)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	681	35	39	99.44	45	0	9	0
TRS(ppb) Average	682	34	38	99.44	2	0	1	0
THC(ppm) Average	680	35	40	99.31	3.2	-	2.4	-
NMHC(ppm) Average	680	35	40	99.31	0.469	-	0.166	-
CH4(ppm) Average	680	35	40	99.31	2.8	-	2.2	-
O3 (ppb) Average	682	34	38	99.44	57	0	42	-
NO2 (ppb) Average	679	36	41	99.31	42	0	10	-
NO (ppb) Average	679	36	41	99.31	42	-	6	-
NOX (ppb) Average	679	36	41	99.31	81	-	16	-
NH3 (ppb) Average	634	43	86	94.03	0	0	0	-
PM2.5 (ug/m3) Average	688	3	32	95.97	78.9	-	9.8	0
Wind Speed 10 m (km/h) Average	720	0	0	100	27	-	17	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-
Temperature 2 m (C) Average	720	0	0	100	18.3	-	9.6	-
Temperature 10 m (C) Average	720	0	0	100	18	-	10.6	-
Relative Humidity (%) Average	720	0	0	100	98	-	81	-
Precipitation (mm) Total	720	0	0	100	0.9	-	3.5	-
Leaf Wetness (% of range) Average	720	0	0	100	28	-	6	-
Global Solar Radiation (W/m2) Average	720	0	0	100	758	-	251	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT McKAY (AMS 1)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	681	1.5	4	-	0	0	0	0	1	3	45
TRS (ppb) Average	682	0.5	0	-	0	0	0	0	0	1	2
THC (ppm) Average	680	2.04	0.2	-	1.9	1.9	2	2	2	2.2	3.2
NMHC(ppm) Average	680	0.024	0.061	-	0	0	0	0	0	0.1	0.469
CH4(ppm) Average	680	2.01	0.1	-	1.9	1.9	2	2	2	2.1	2.8
O3 (ppb) Average	682	30.9	12	-	1	16	23	32	40	44	57
NO2 (ppb) Average	679	5.7	5	-	0	1	2	4	8	13	42
NO (ppb) Average	679	1.4	4	-	0	0	0	0	1	3	42
NOX (ppb) Average	679	7.1	8	-	0	1	3	5	9	14	81
NH3 (ppb) Average	634	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	688	5.05	6.1	-	0	1.2	2.1	3.3	5.9	10.4	78.9
Wind Speed 10 m (km/h) Average	720	9	5	-	0	3	5	8	13	17	27
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	720	2.26	6.2	-	-14.4	-5.3	-2.6	1.9	6.1	11.2	18.3
Temperature 10 m (C) Average	720	2.52	6	-	-12.3	-5.1	-2.5	2.3	6.6	11	18
Relative Humidity (%) Average	720	58.3	18	-	15	34	45	58	71	84	98
Precipitation (mm) Total	720	-	-	7.24	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	-0.1	2	-	-1	-1	-1	0	0	0	28
Global Solar Radiation (W/m2) Average	720	169.6	217	-	0	0	0	47	312	536	758

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER Fort McKAY (AMS 1)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	13 Apr 2017 21:00	13 Apr 2017 21:00	1	Station power failure
AIR QUALITY ANALYZERS	26 Apr 2017 12:00	26 Apr 2017 12:00	1	Maintenance - sample manifold cleaned
SO2, TRS	14 Apr 2017 16:00	14 Apr 2017 17:00	2	Station power failure
THC, O3, NOX	14 Apr 2017 15:00	14 Apr 2017 17:00	3	Station power failure
NH3	01 Apr 2017 05:00	30 Apr 2017 11:00	36	Stabilization after daily span
NH3	13 Apr 2017 18:00	13 Apr 2017 18:00	1	Station power failure
NH3	14 Apr 2017 15:00	14 Apr 2017 18:00	4	Station power failure
PM2.5	01 Apr 2017 03:00	01 Apr 2017 17:00	15	Unstable operation - excessive baseline drift
PM2.5	01 Apr 2017 23:00	02 Apr 2017 01:00	3	Unstable operation - excessive baseline drift
PM2.5	02 Apr 2017 22:00	03 Apr 2017 05:00	8	Unstable operation - excessive baseline drift
PM2.5	14 Apr 2017 16:00	14 Apr 2017 17:00	2	Station power failure
PM2.5	17 Apr 2017 02:00	17 Apr 2017 02:00	1	Unstable operation - excessive baseline drift



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 45 ppb on Apr 30 10:00	Maximum Daily Average: 8.9 ppb on Apr 9		Hours of Data:	681
Minimum Value: 0 ppb on Apr 1 05:00	Minimum Daily Average: 0.0 ppb on Apr 12		Hours of Missing Data:	39
Maximum Diurnal Average: 3.8 ppb at hour 12	Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Calibration:	35
Monthly Average: 1.5 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 22		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
3-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0.3	1
4-Apr	0	0	0	Z	0	0	0	0	0	0	1	0	17	20	19	6	3	9	8	3	3	1	0	0	4.0	20
5-Apr	0	0	0	0	Z	0	1	3	2	1	4	13	6	2	2	7	3	0	1	2	1	0	0	0	2.2	13
6-Apr	0	1	1	1	1	Z	1	1	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0.5	2
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	Z	0	0	1	3	10	13	31	22	25	18	19	18	13	15	8	2	1	1	1	1	2	8.9	31
10-Apr	3	3	2	Z	2	2	2	2	2	2	9	34	12	2	6	6	5	4	3	2	1	1	1	0	4.6	34
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16-Apr	1	4	1	Z	1	0	1	2	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	4
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	Z	0	0	0	0	0	0	0	0	0	0	1	17	13	5	2	2	1	9	2	1	1	0	0	2.4	17
20-Apr	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9	7	0	0	0	0	0.8	9
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.2	1
24-Apr	0	0	0	0	0	Z	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	Z	0	0	0	0	0	0	2	7	8	3	2	4	9	4	5	4	9	1	0	0	0	0	0	2.5	9
26-Apr	1	Z	3	3	1	1	1	2	1	1	0	M	2	1	8	4	6	8	4	2	0	1	1	1	2.3	8
27-Apr	1	1	Z	1	1	1	1	1	1	4	17	17	3	5	9	18	11	18	19	11	2	1	1	1	6.3	19
28-Apr	0	0	0	Z	0	0	0	0	1	1	1	2	3	3	3	2	2	2	1	1	1	1	1	1	1.1	3
29-Apr	1	1	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	7	14	2	0	0	1	0	0	1.3	14
30-Apr	0	0	0	0	0	Z	0	0	25	45	11	23	17	8	3	1	1	1	1	2	2	2	1	0	6.3	45

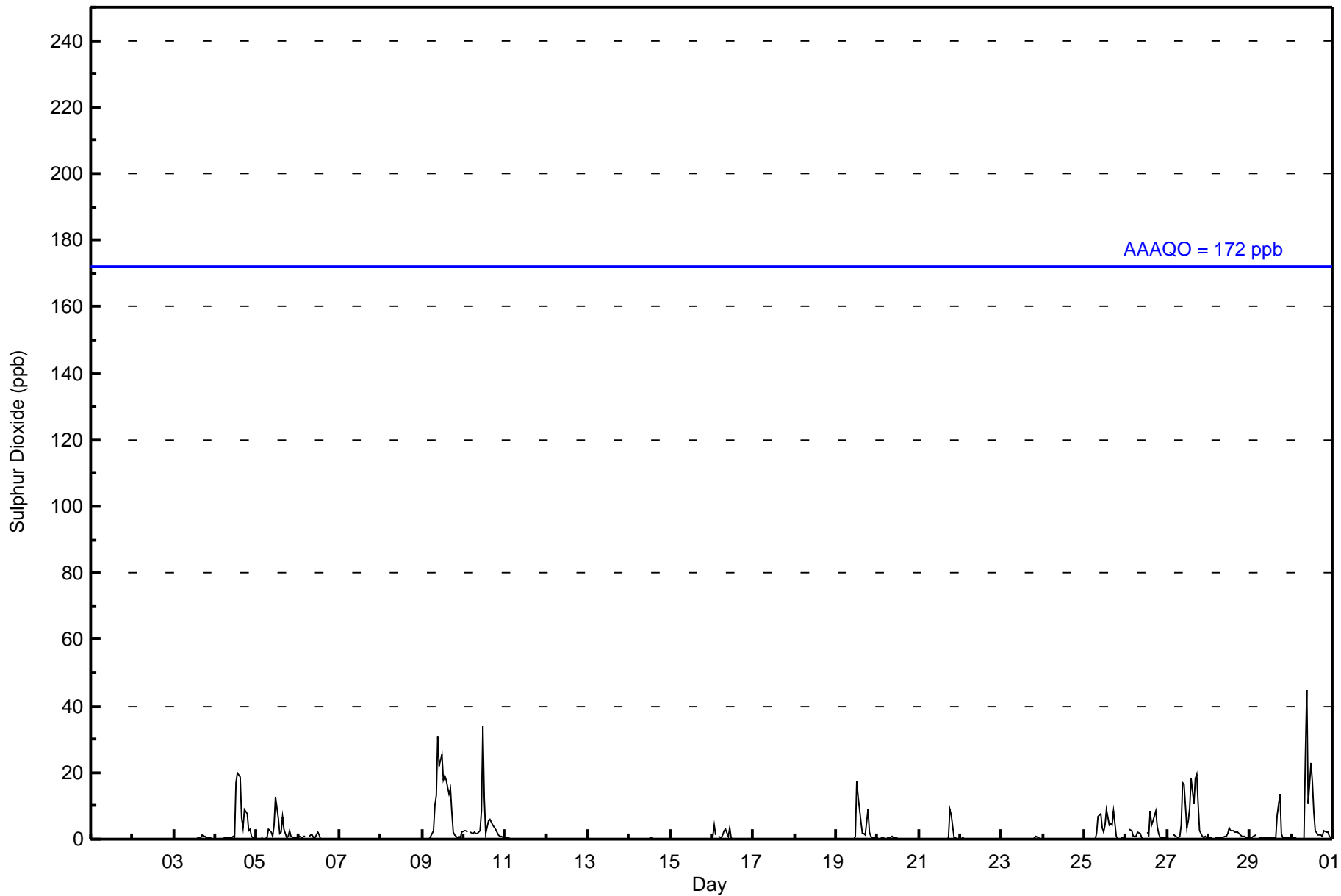
0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.9	2.0	3.7	2.5	3.8	3.6	3.0	2.9	2.0	2.4	2.6	1.7	0.9	0.5	0.3	0.2	0.2	Diurnal Average	
3	4	3	3	2	2	3	10	25	45	22	34	18	20	19	13	18	19	11	7	3	2	1	2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	651	95.59	95.59
11 - 20	23	3.38	98.97
21 - 60	7	1.03	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	168	50	26	11	16	11	16	94	82	24	23	12	19	15	30	54	651
11 - 20	0	0	0	0	0	0	6	11	4	0	1	0	0	0	1	0	23
21 - 60	0	0	0	0	0	0	4	2	1	0	0	0	0	0	0	0	7
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	168	50	26	11	16	11	26	107	87	24	24	12	19	15	31	54	681

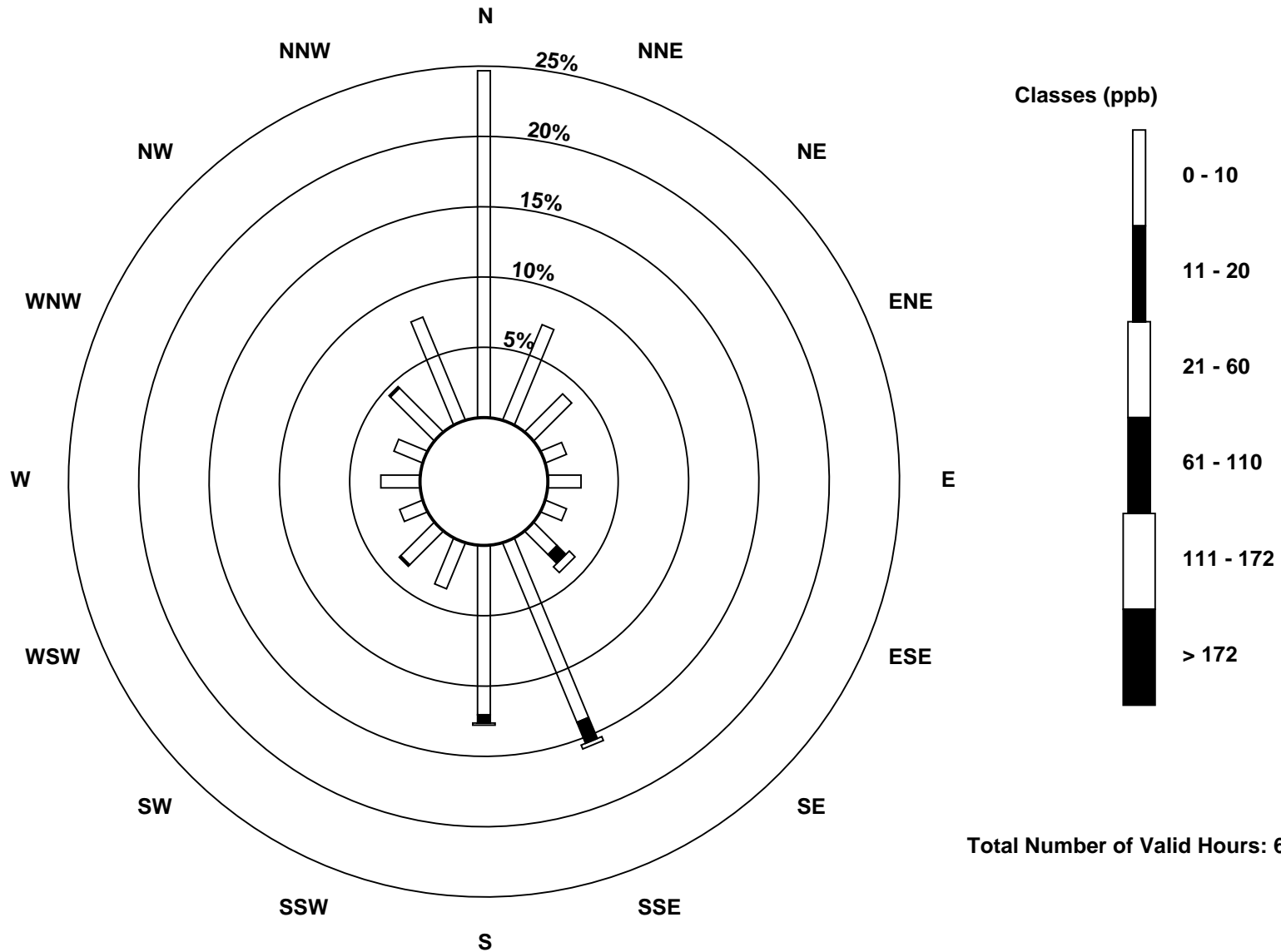
Total Number of Valid Hours: 681

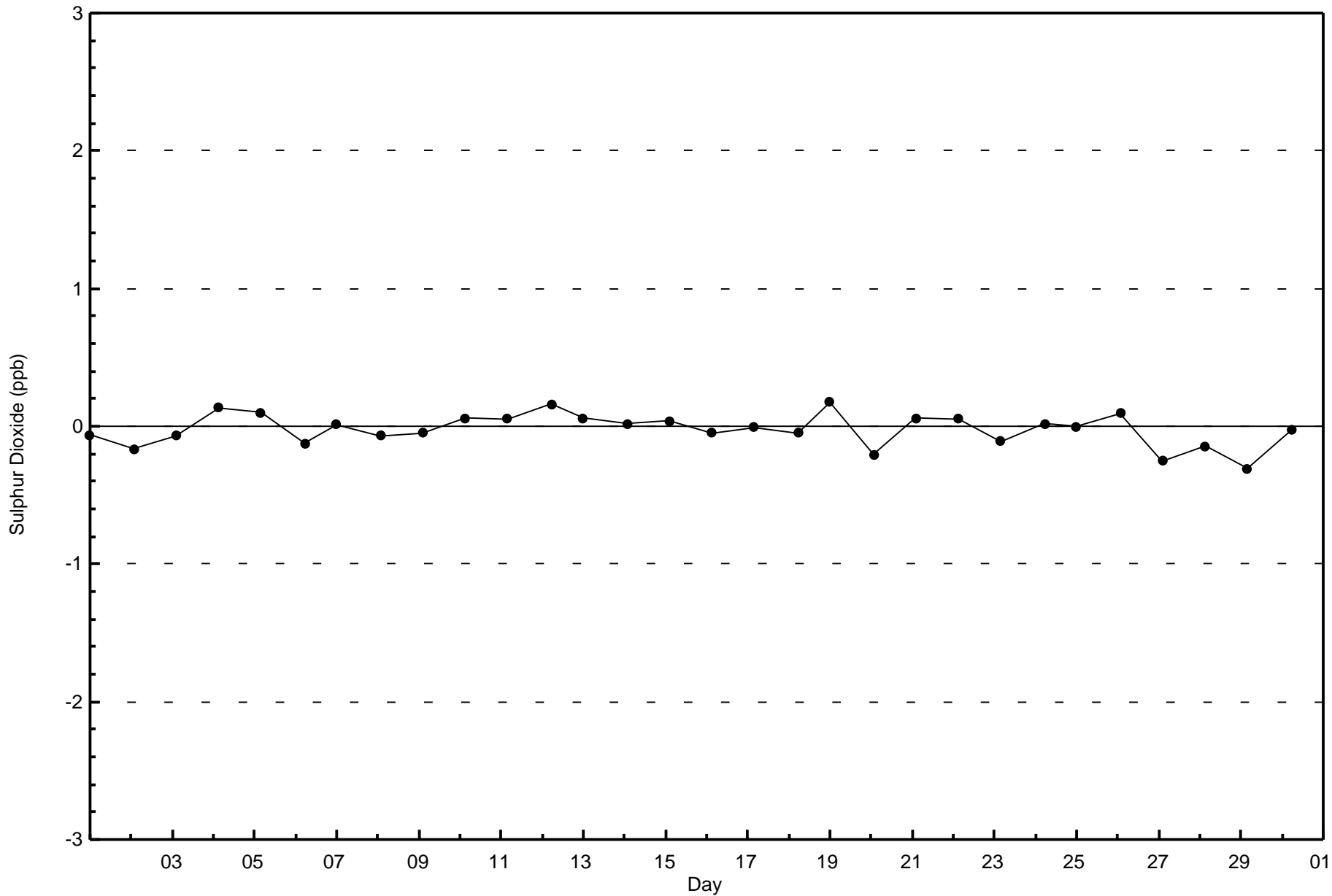
Total Number of Hours: 720

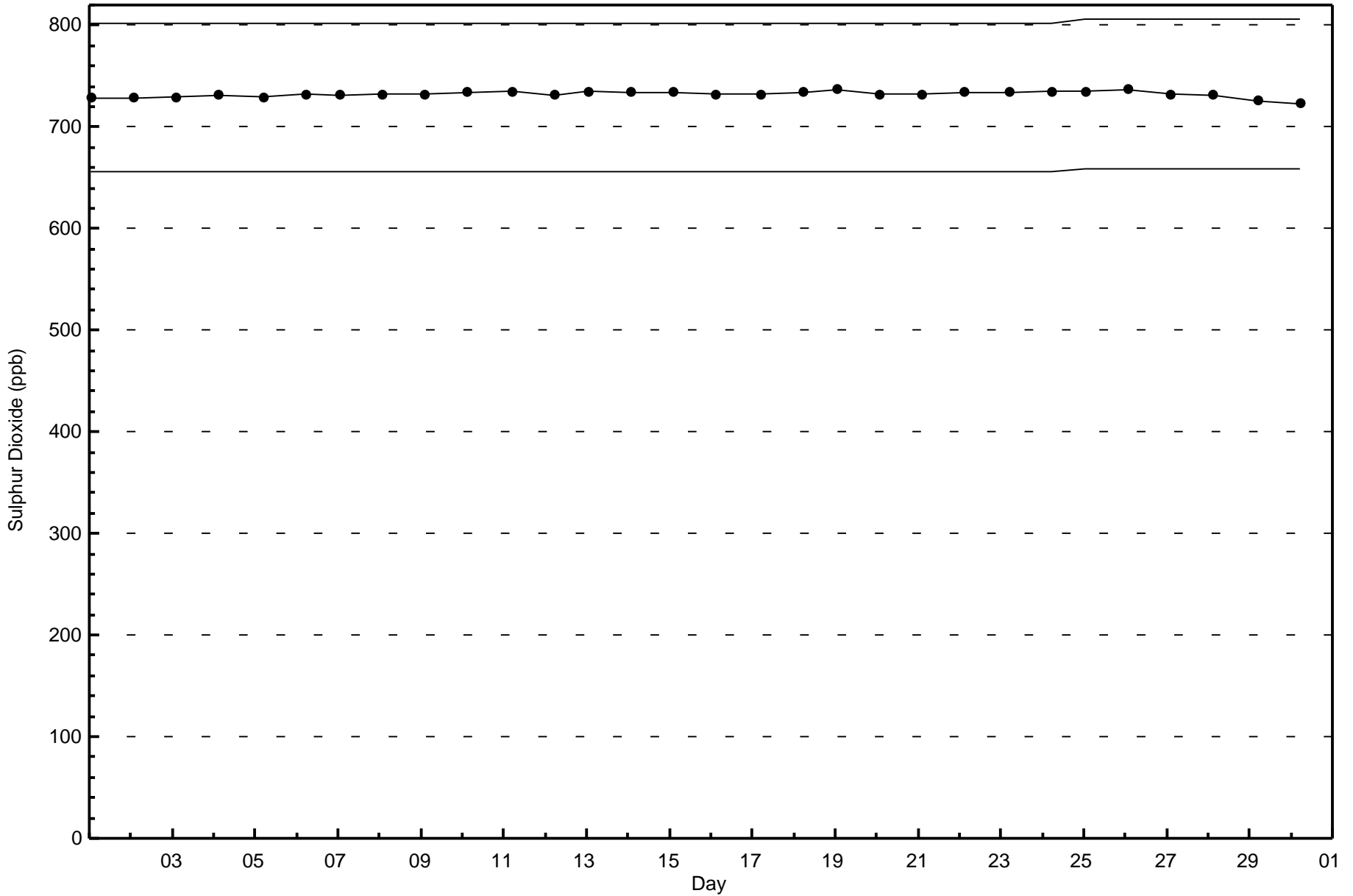


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2 ppb on Apr 6 06:00	Maximum Daily Average: 0.8 ppb on Apr 10		Hours of Data:	682
Minimum Value: 0 ppb on Apr 15 21:00	Minimum Daily Average: 0.4 ppb on Apr 15		Hours of Missing Data:	38
Maximum Diurnal Average: 0.6 ppb at hour 9	Minimum Diurnal Average: 0.4 ppb at hour 17		Hours of Calibration:	34
Monthly Average: 0.5 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 1		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
2-Apr	0	0	0	Z	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0.5	1
3-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
4-Apr	0	0	0	1	1	Z	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
5-Apr	0	0	0	1	1	1	Z	1	1	C	C	C	C	1	0	1	0	0	1	1	1	1	1	0.7	1	
6-Apr	1	2	1	1	1	2	2	Z	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0.8	2
7-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0.4	1
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
9-Apr	0	0	0	0	Z	0	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	1	0	1	0.5	1
10-Apr	1	1	1	1	1	Z	2	1	1	1	1	1	1	0	1	1	0	0	1	1	0	0	0	0	0.8	2
11-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
12-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
13-Apr	0	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
14-Apr	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
16-Apr	1	1	1	1	1	Z	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
18-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.4	1
19-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	1
20-Apr	0	0	0	Z	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
21-Apr	0	0	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0.5	1
22-Apr	1	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.5	1
23-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.4	1
24-Apr	0	0	0	0	0	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
25-Apr	0	0	Z	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	0.5	1
26-Apr	1	1	1	Z	1	0	0	1	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
27-Apr	0	0	1	1	Z	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
28-Apr	0	0	0	0	0	Z	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0.5	1
29-Apr	0	0	0	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
30-Apr	0	0	0	0	1	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1

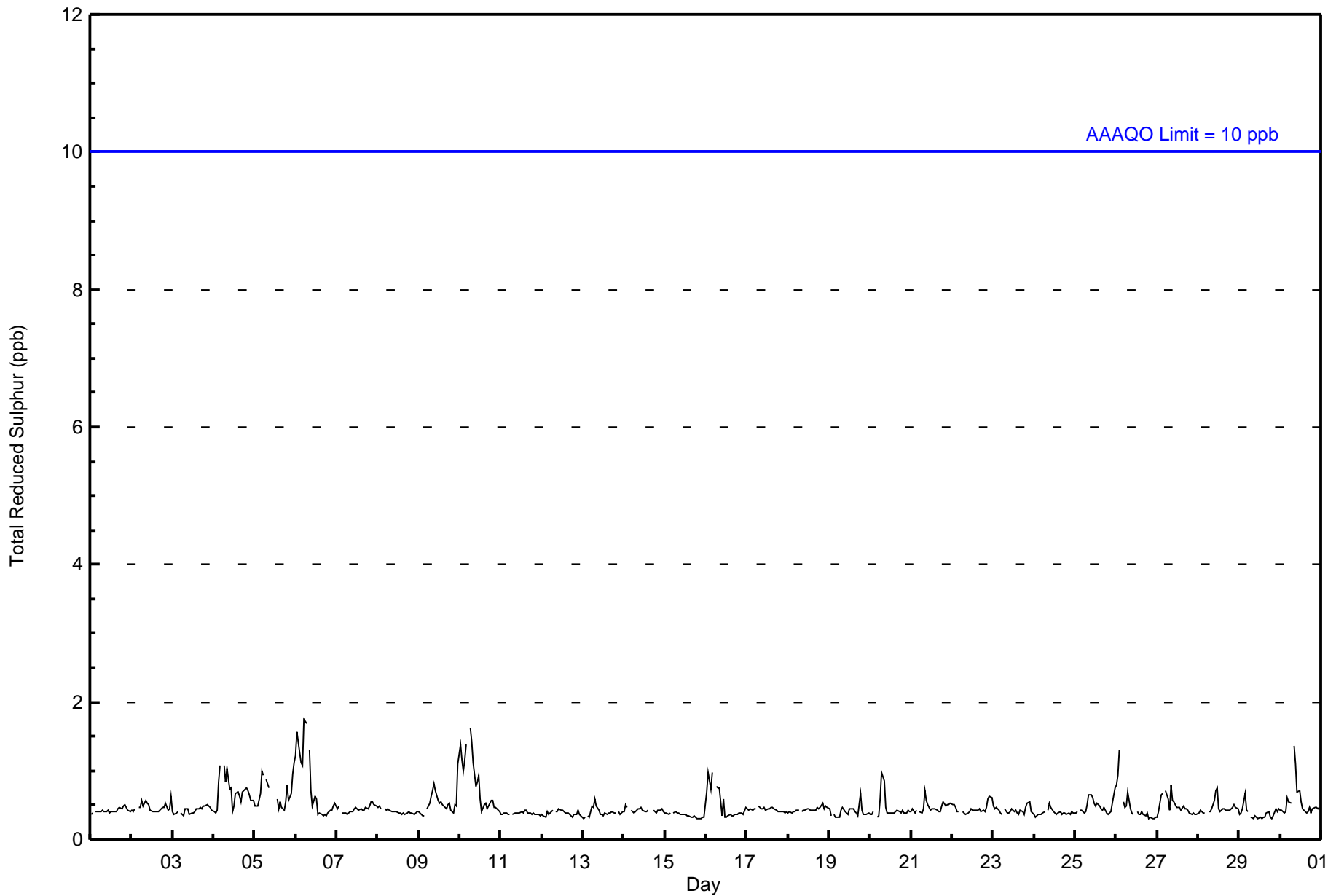
0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	Diurnal Average		
1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Diurnal Maximum	

Z - zeronspan C - Calibration M - Maintenance PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	682	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	167	49	28	12	17	11	25	101	86	27	24	12	20	16	30	57	682
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	167	49	28	12	17	11	25	101	86	27	24	12	20	16	30	57	682

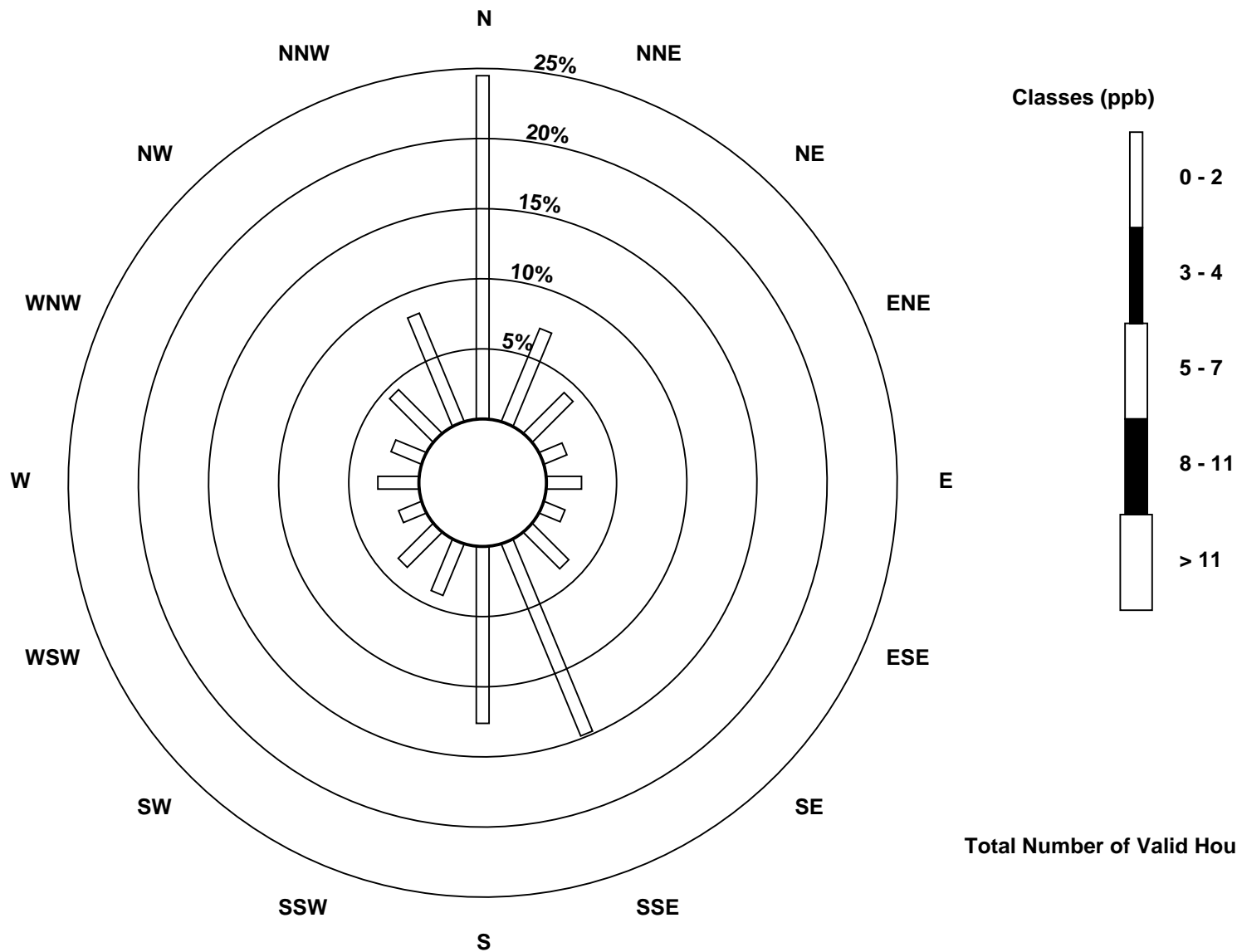
Total Number of Valid Hours: 682

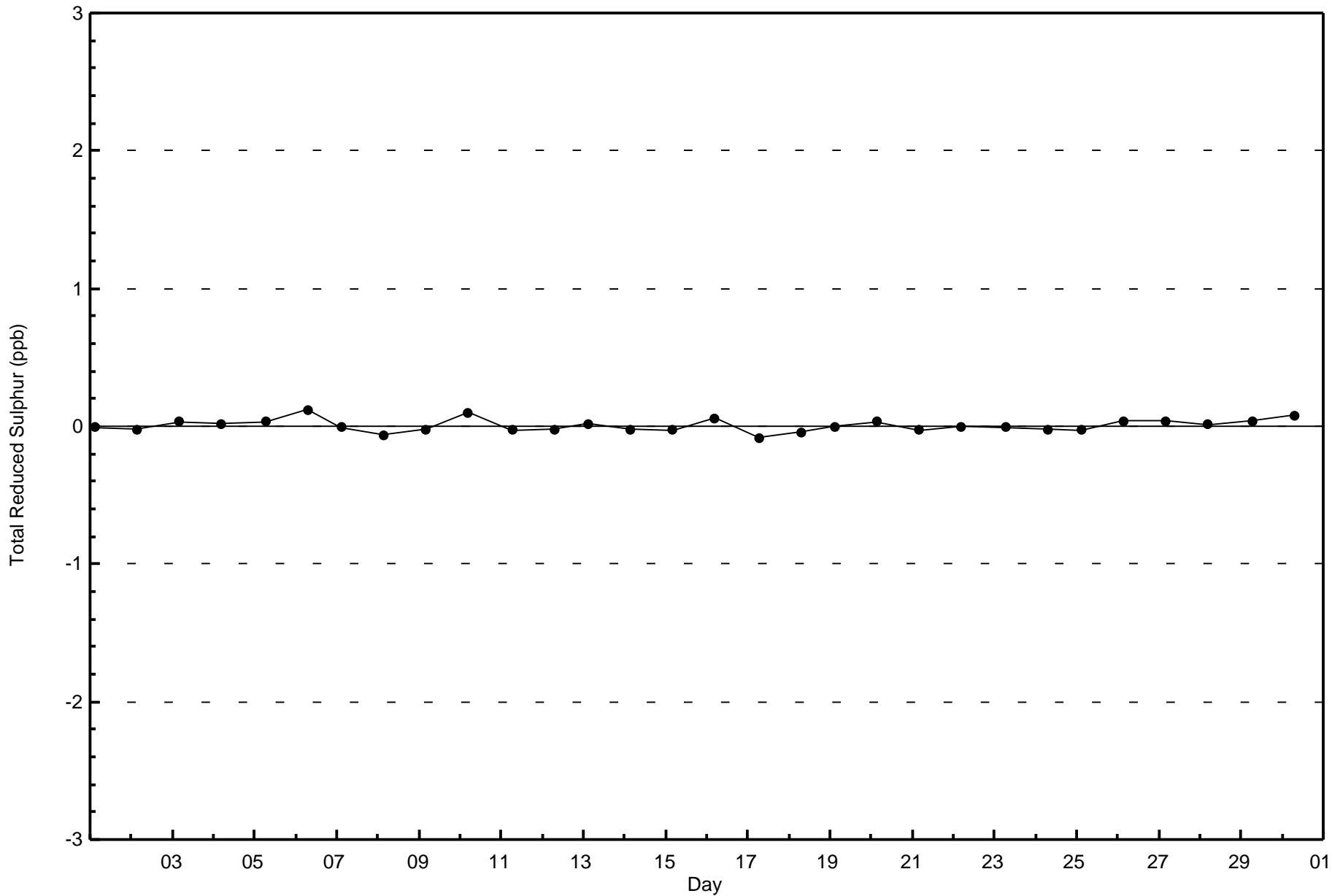
Total Number of Hours: 720

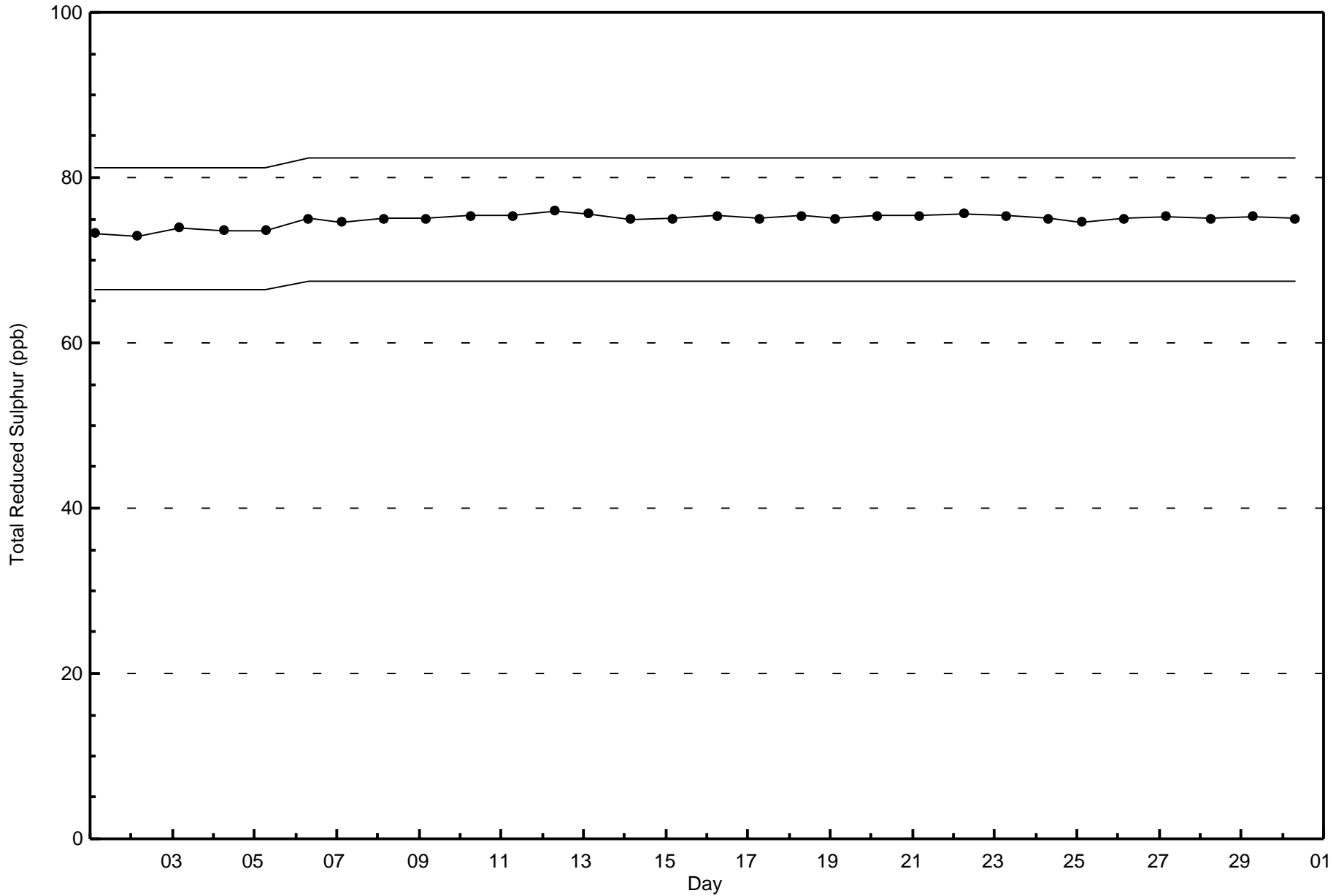


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association

Summary of Hour Averages

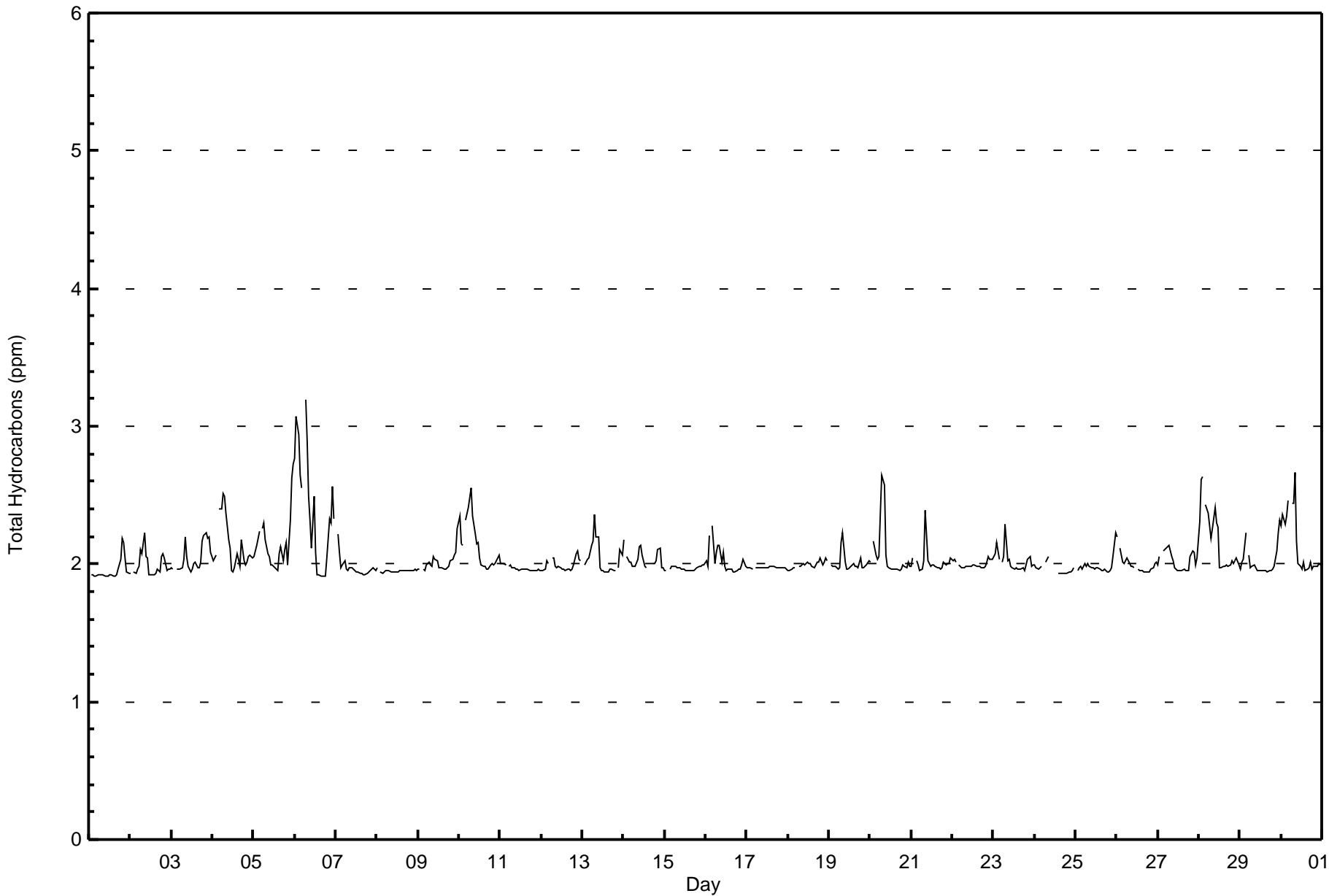
Total Hydrocarbons (THC) - ppm Fort McKay - Bertha Ganter - April 2017

Maximum Value: 3.2 ppm on Apr 6 07:00		Maximum Daily Average: 2.4 ppm on Apr 6		Hours in Service:	720																								
Minimum Value: 1.9 ppm on Apr 1 11:00		Minimum Daily Average: 1.9 ppm on Apr 8		Hours of Data:	680																								
Maximum Diurnal Average: 2.1 ppm at hour 8		Minimum Diurnal Average: 2.0 ppm at hour 15		Hours of Missing Data:	40																								
Monthly Average: 2.04 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.2 P ₉₉ = 2.6		Hours of Calibration:	35																								
				Percent Operational Time:	99.3																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Apr	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.2	2.0	1.9	1.9	2.0	2.2			
2-Apr	1.9	Z	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.1	2.1	2.0	1.9	2.0	2.0	2.0	2.0	2.2		
3-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2		
4-Apr	2.0	2.0	2.1	Z	2.4	2.4	2.5	2.5	2.4	2.2	2.1	2.0	1.9	2.0	2.1	2.0	2.0	2.2	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.5		
5-Apr	2.1	2.1	2.1	2.2	Z	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.2	2.0	2.3	2.6	2.7	2.1	2.7	2.1		
6-Apr	2.8	3.1	2.9	2.6	2.5	Z	3.2	2.9	2.5	2.3	2.1	2.5	2.1	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3	2.3	2.6	2.3	2.4	3.2	2.4		
7-Apr	Z	2.2	2.1	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.2		
8-Apr	2.0	Z	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0		
9-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.0	2.3	2.0		
10-Apr	2.3	2.1	2.1	Z	2.3	2.4	2.5	2.6	2.3	2.2	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.6	2.1		
11-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0		
12-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1		
13-Apr	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.2	2.2	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	PF	2.0	2.1	2.1	2.0	2.4	2.0		
14-Apr	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	PF	PF	PF	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.0		
15-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
16-Apr	2.0	2.0	2.2	Z	2.3	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3		
17-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
18-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
19-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2		
20-Apr	2.0	Z	2.2	2.1	2.0	2.1	2.4	2.6	2.6	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6		
21-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4		
22-Apr	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1		
23-Apr	2.1	2.1	2.2	2.0	Z	2.0	2.1	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.3	2.0		
24-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1		
25-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.2	2.0	2.2		
26-Apr	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2		
27-Apr	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1		
28-Apr	2.3	2.6	2.6	Z	2.4	2.4	2.3	2.2	2.3	2.4	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6		
29-Apr	2.0	2.0	2.0	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.0	2.3	2.0		
30-Apr	2.3	2.4	2.3	2.3	2.5	Z	2.4	2.4	2.7	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.7		
																								Diurnal Average	2.1				
																								Diurnal Maximum	2.8				
Z - zerospan																								C - Calibration		M - Maintenance		PF - Power Failure	



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	522	76.76	76.76
2.1 - 3.0	156	22.94	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	153	40	24	11	14	9	15	71	51	14	18	11	15	11	24	41	522
2.1 - 3.0	15	10	1	0	2	2	11	36	35	10	6	1	3	4	7	13	156
3.1 - 10.0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	168	50	25	11	16	11	26	107	87	24	24	12	19	15	31	54	680

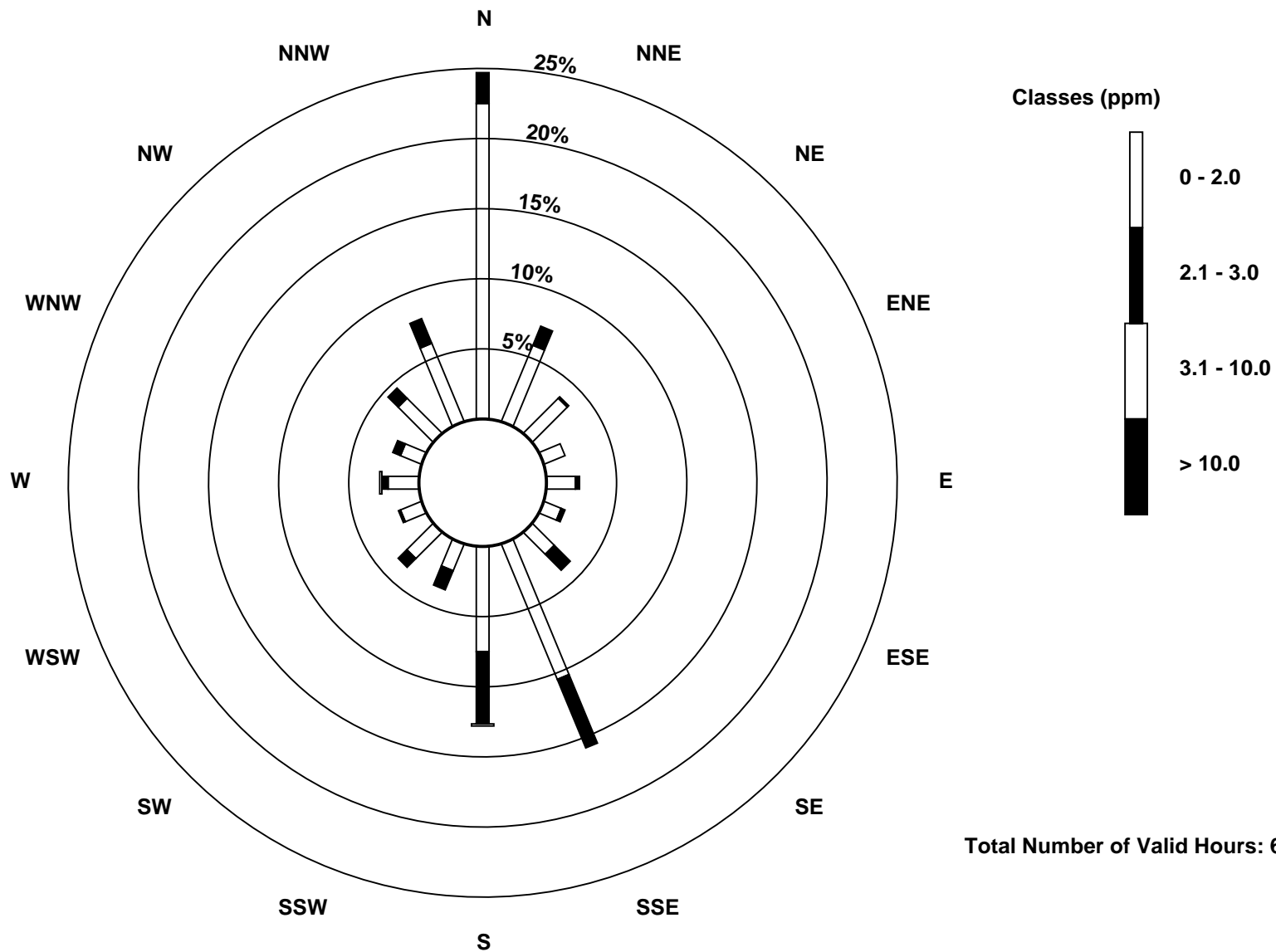
Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter (AMS 1)



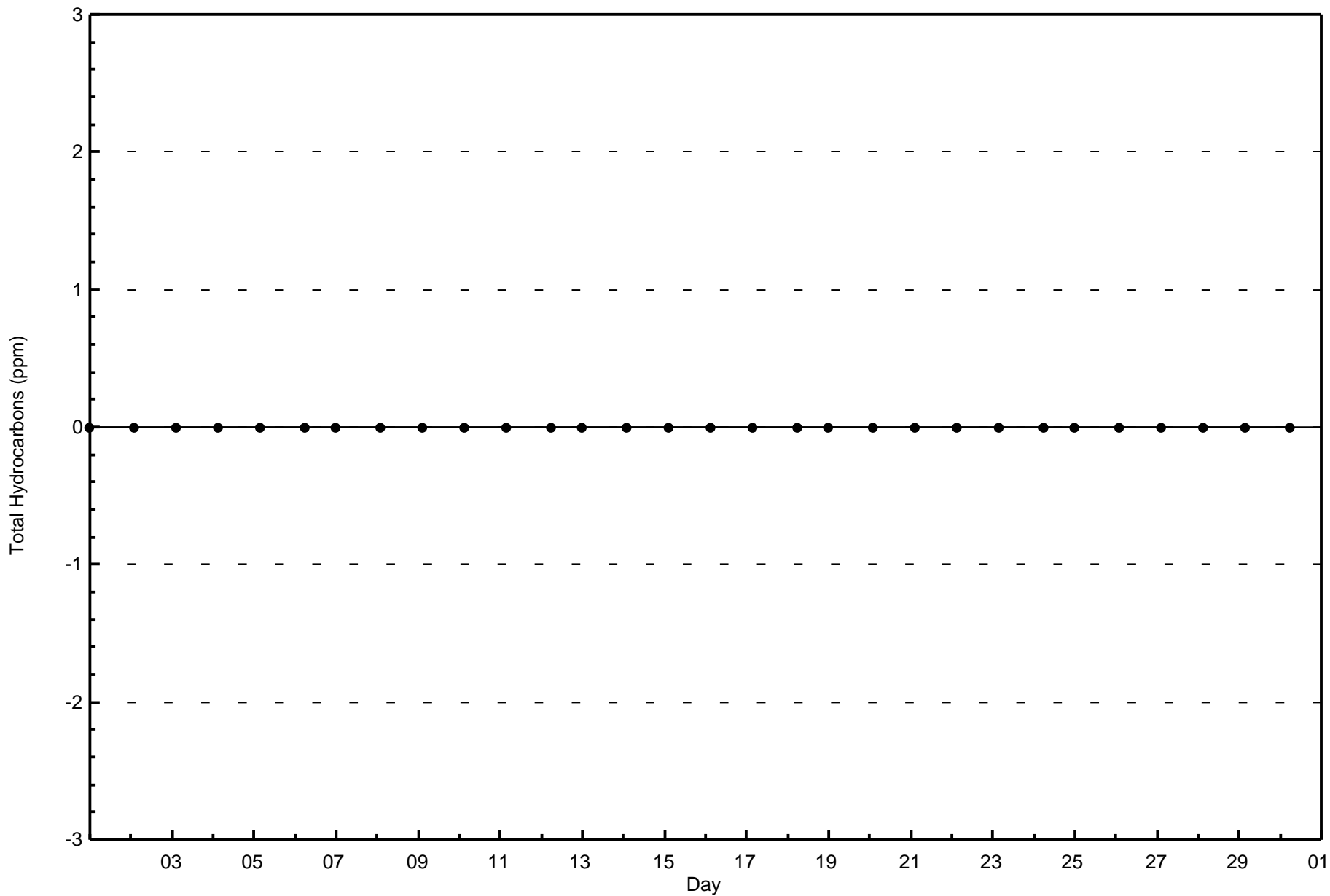


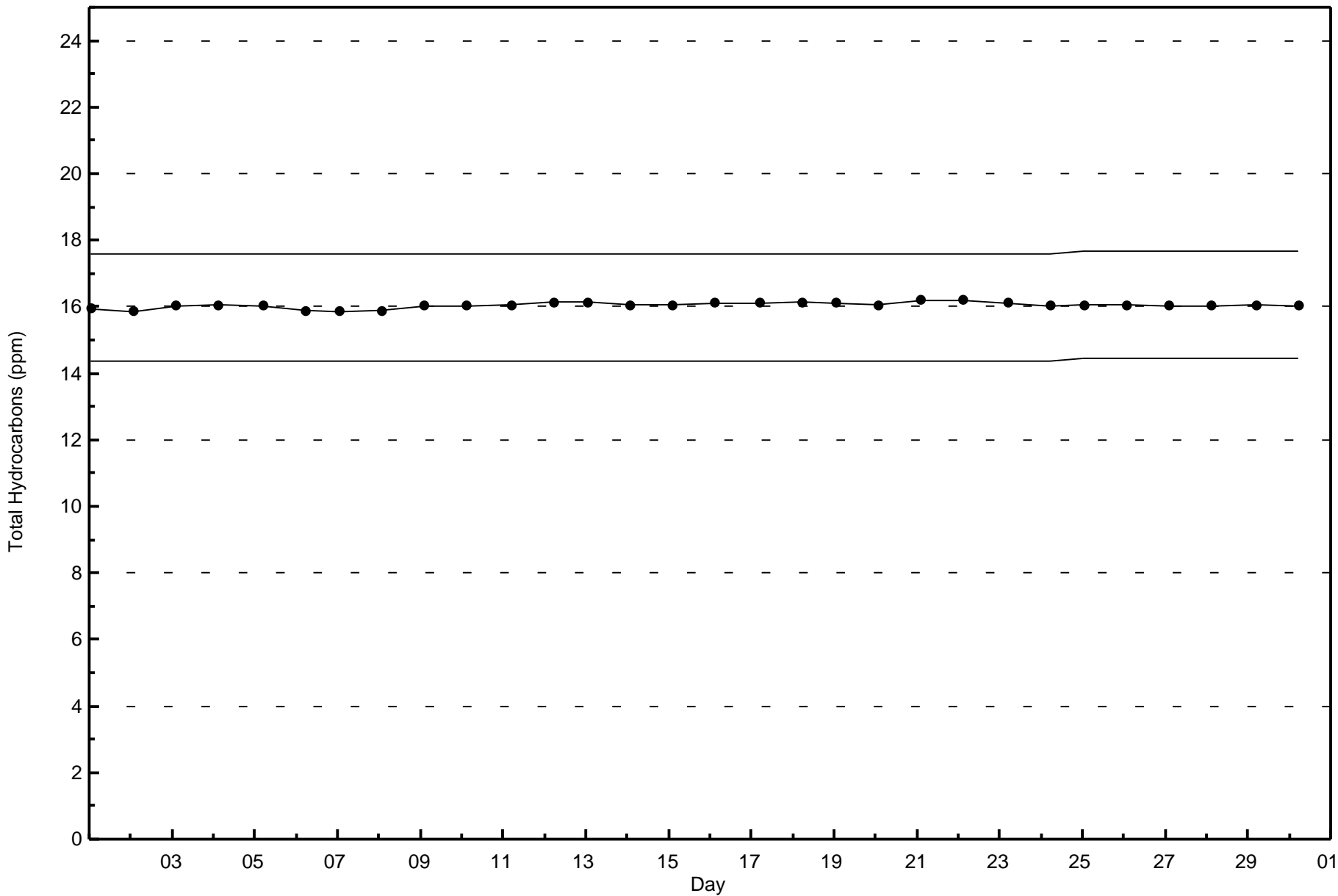
Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - April 2017







Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

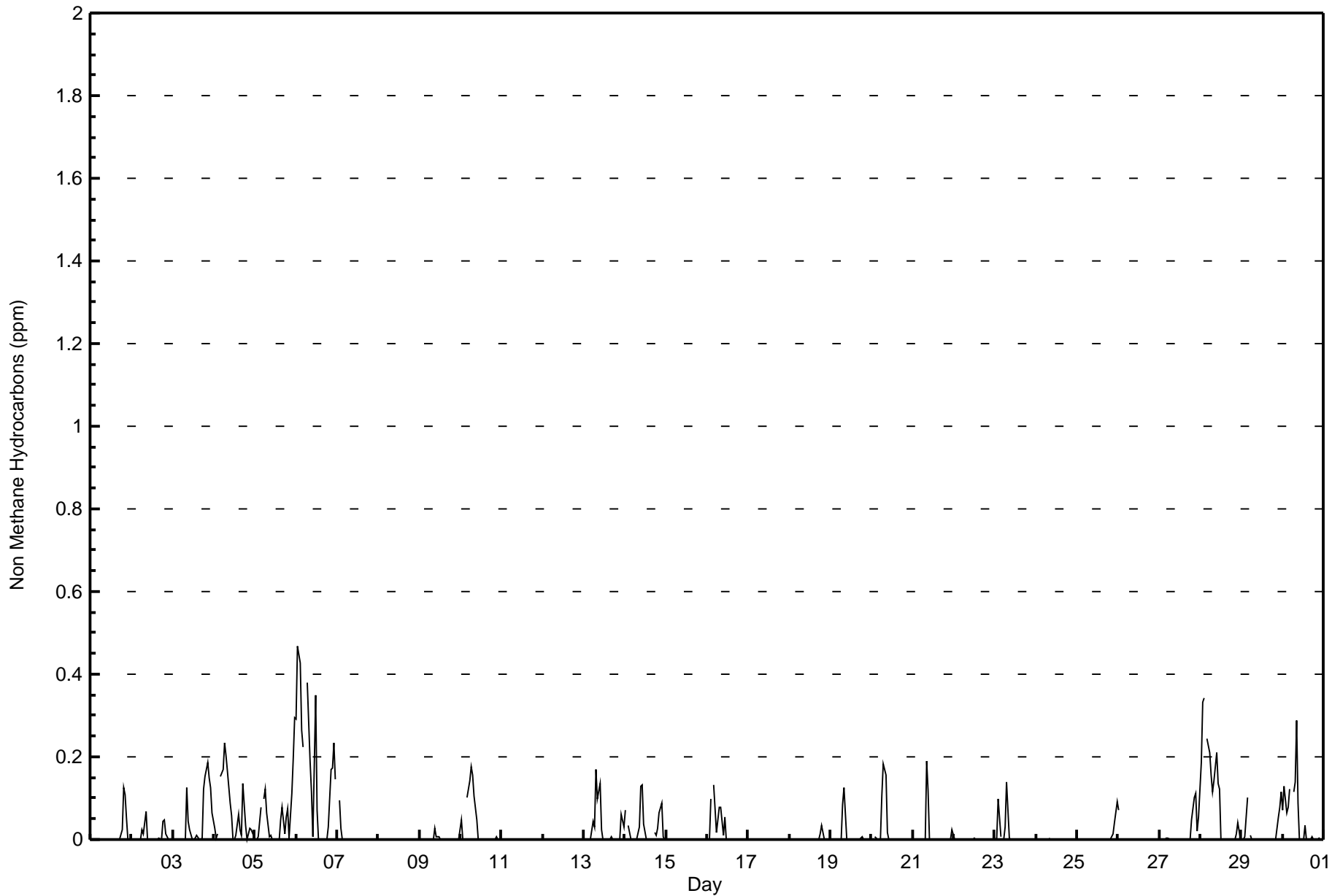
Fort McKay - Bertha Ganter - April 2017

Maximum Value: 0.469 ppm on Apr 6 02:00		Maximum Daily Average: 0.166 ppm on Apr 6		Hours in Service: 720																																											
Minimum Value: 0.000 ppm on Apr 1 02:00		Minimum Daily Average: 0.000 ppm on Apr 11		Hours of Data: 680																																											
Maximum Diurnal Average: 0.059 ppm at hour 9		Minimum Diurnal Average: 0.002 ppm at hour 14		Hours of Missing Data: 40																																											
Monthly Average: 0.024 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.3		Hours of Calibration: 35																																											
				Percent Operational Time: 99.3																																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.127	0.109	0.052	0.000	0.000	0.014	0.127																				
2-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.022	0.012	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.045	0.046	0.014	0.000	0.000	0.000	0.009	0.069																					
3-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.126	0.043	0.022	0.000	0.000	0.003	0.011	0.000	0.000	0.005	0.122	0.152	0.188	0.148	0.124	0.066	0.044	0.188																					
4-Apr	0.026	0.002	0.012	Z	0.153	0.171	0.235	0.203	0.166	0.089	0.059	0.000	0.000	0.011	0.061	0.025	0.011	0.135	0.033	0.000	0.013	0.026	0.023	0.006	0.063	0.235																					
5-Apr	0.000	0.001	0.006	0.078	Z	0.099	0.124	0.063	0.008	0.010	0.000	0.000	0.000	0.000	0.000	0.049	0.079	0.013	0.056	0.074	0.002	0.114	0.195	0.295	0.055	0.295																					
6-Apr	0.293	0.469	0.426	0.266	0.223	Z	0.380	0.285	0.189	0.116	0.006	0.349	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.169	0.174	0.235	0.145	0.166	0.469																					
7-Apr	Z	0.094	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.094																					
8-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																					
9-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.007	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.026																					
10-Apr	0.048	0.000	0.000	Z	0.101	0.143	0.177	0.156	0.106	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.001	0.000	0.034	0.177																					
11-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																					
12-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																					
13-Apr	Z	0.000	0.000	0.000	0.000	0.043	0.029	0.170	0.100	0.136	0.025	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.061	0.031	0.027	0.170	0.170																					
14-Apr	0.070	Z	0.033	0.000	0.000	0.000	0.000	0.000	0.031	0.128	0.131	0.038	0.000	0.000	PF	PF	PF	0.017	0.011	0.027	0.065	0.087	0.008	0.001	0.032	0.131																					
15-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																					
16-Apr	0.000	0.000	0.097	Z	0.133	0.018	0.049	0.078	0.077	0.009	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.133																					
17-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																					
18-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.035	0.000	0.000	0.000	0.000	0.002	0.035																					
19-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.085	0.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.009	0.125																					
20-Apr	0.000	Z	0.007	0.001	0.000	0.000	0.105	0.184	0.155	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.184																					
21-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.190	0.119	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.015	0.190																					
22-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002																					
23-Apr	0.000	0.002	0.099	0.008	Z	0.000	0.030	0.140	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.140																						
24-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.002	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002																					
25-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.015	0.040	0.093	0.007	0.093																					
26-Apr	0.071	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.071																						
27-Apr	0.000	0.000	Z	0.001	0.002	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.047	0.101	0.111	0.021	0.055	0.015	0.111																					
28-Apr	0.185	0.332	0.343	Z	0.245	0.211	0.155	0.117	0.143	0.211	0.136	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.039	0.000	0.098	0.343																					
29-Apr	0.000	0.000	0.006	0.102	Z	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.079	0.114	0.016	0.114																					
30-Apr	0.072	0.129	0.066	0.079	0.123	Z	0.116	0.139	0.289	0.089	0.000	0.000	0.001	0.033	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.005	0.000	0.001	0.050	0.289																					
																								Diurnal Average																							
																								Diurnal Maximum																							
0.031		0.041		0.045		0.021		0.039		0.028		0.047		0.054		0.059		0.036		0.015		0.018		0.002		0.002		0.003		0.003		0.004		0.006		0.010		0.018		0.023		0.027		0.028		0.028	
0.293		0.469		0.426		0.266		0.245		0.211		0.380		0.285		0.289		0.211		0.136		0.349		0.070		0.033		0.061		0.049		0.079		0.135		0.122		0.152		0.188		0.174		0.235		0.295	
Z - zerospan			C - Calibration			M - Maintenance			PF - Power Failure																																						



Wood Buffalo Environmental Association
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	511	75.15	75.15
0.006 - 0.05	68	10.00	85.15
0.06 - 0.1	66	9.71	94.85
> 0.1	35	5.15	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	155	35	22	10	14	9	17	70	52	12	17	11	14	11	22	40	511
0.006 - 0.05	6	8	2	1	0	1	2	13	15	4	2	0	1	0	7	6	68
0.06 - 0.1	3	6	1	0	2	1	5	14	13	7	3	0	2	2	1	6	66
> 0.1	4	1	0	0	0	0	2	10	7	1	2	1	2	2	1	2	35
Totals	168	50	25	11	16	11	26	107	87	24	24	12	19	15	31	54	680

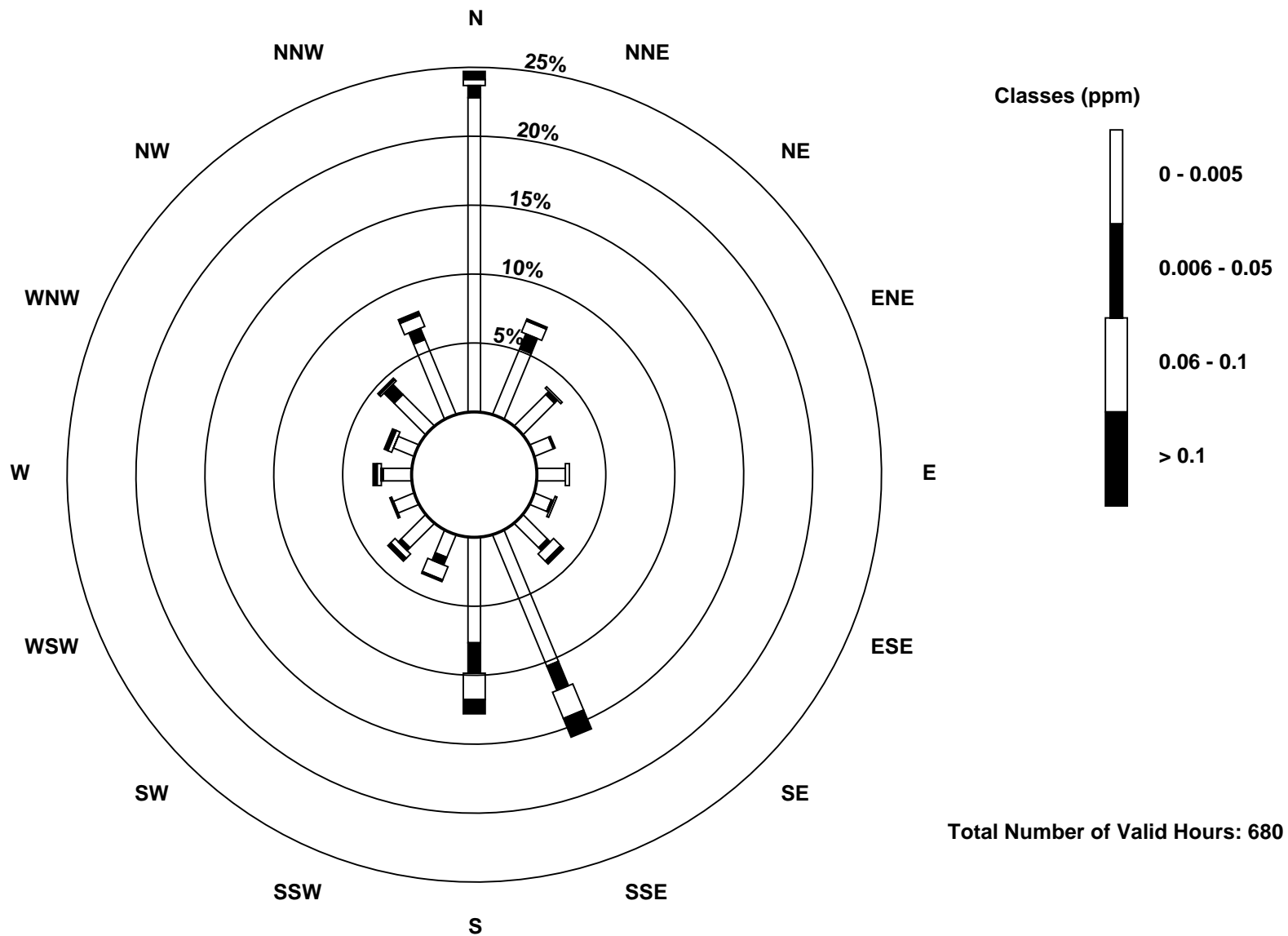
Total Number of Valid Hours: 680

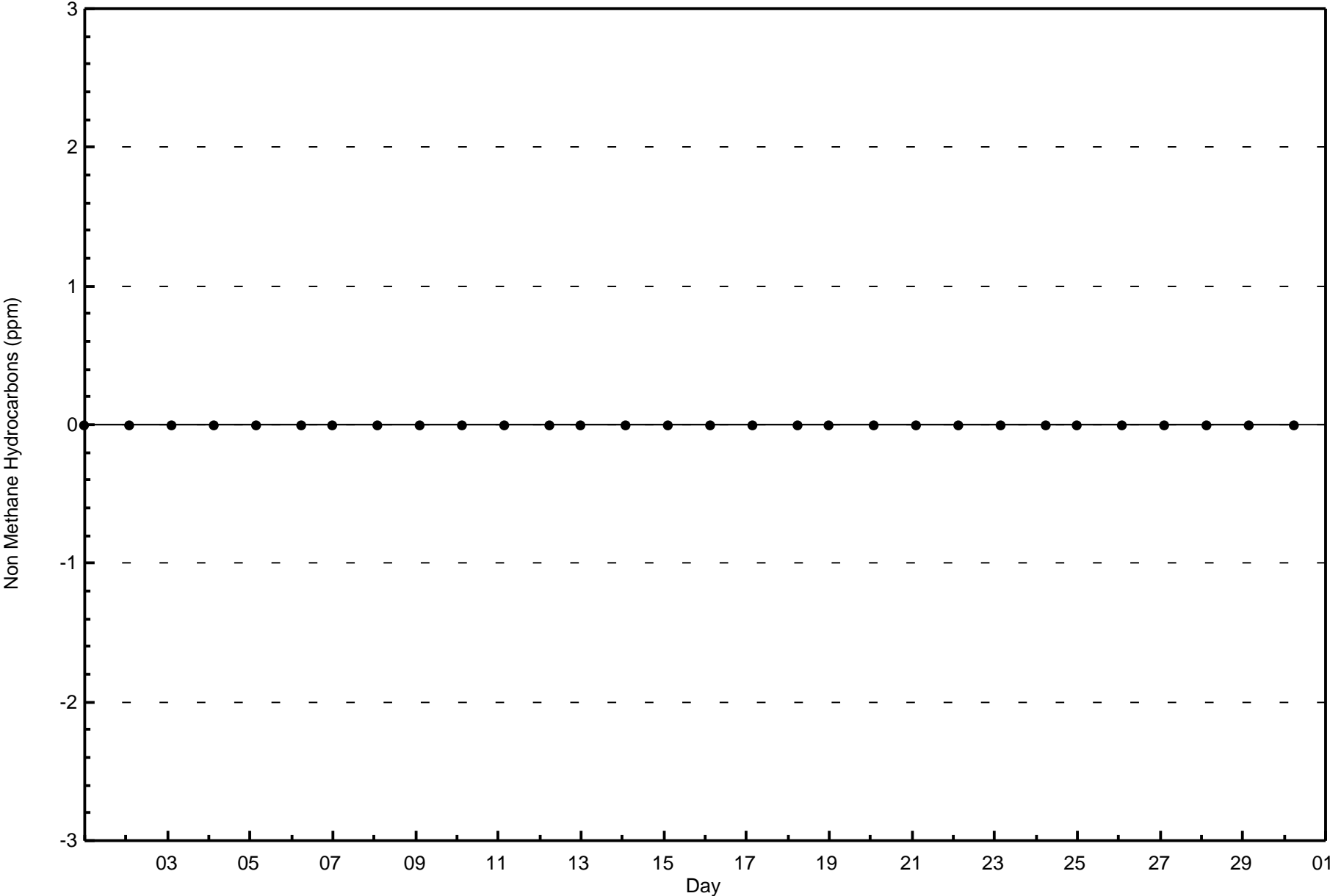
Total Number of Hours: 720

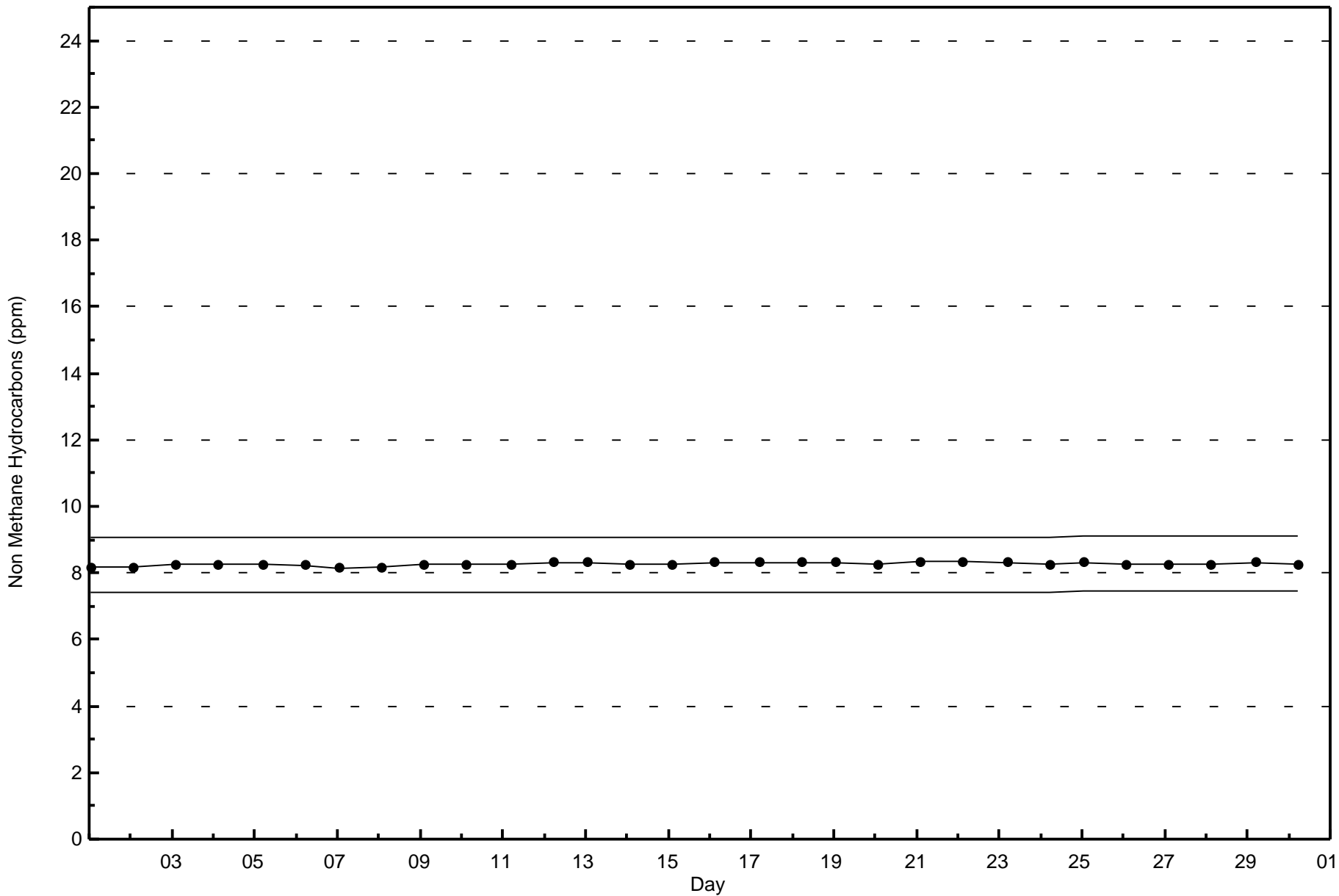


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter (AMS 1)

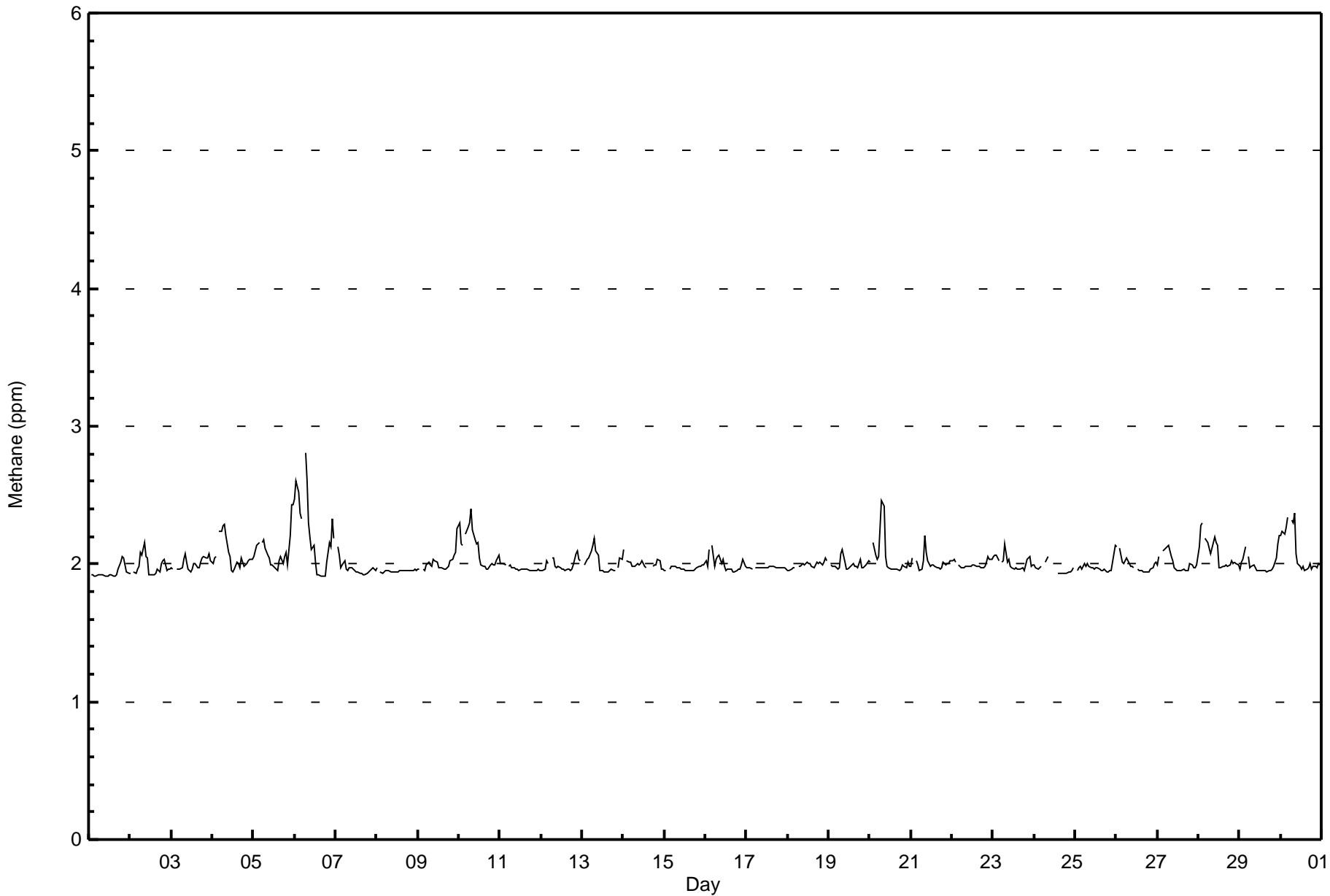








Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 720																		
Maximum Value: 2.8 ppm on Apr 6 07:00										Maximum Daily Average: 2.2 ppm on Apr 6										Hours of Data: 680								
Minimum Value: 1.9 ppm on Apr 1 11:00										Minimum Daily Average: 1.9 ppm on Apr 1										Hours of Missing Data: 40								
Maximum Diurnal Average: 2.1 ppm at hour 8										Minimum Diurnal Average: 2.0 ppm at hour 17										Hours of Calibration: 35								
Monthly Average: 2.01 ppm										Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.1 P ₉₉ = 2.4										Percent Operational Time: 99.3								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.1	
2-Apr	1.9	Z	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0
3-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0
4-Apr	2.0	2.0	2.1	Z	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Apr	2.1	2.1	2.1	2.2	Z	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	2.4	2.4	2.1	2.4	2.1
6-Apr	2.5	2.6	2.5	2.4	2.3	Z	2.8	2.6	2.3	2.2	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.1	2.3	2.2	2.2	2.2	2.8	2.2
7-Apr	Z	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-Apr	2.0	Z	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0
9-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.0	2.0	2.0	2.3
10-Apr	2.3	2.1	2.1	Z	2.2	2.3	2.3	2.4	2.2	2.2	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	2.1
11-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
12-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1
13-Apr	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	PF	2.0	2.0	2.0	2.0	2.0	2.0	2.2
14-Apr	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
15-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
16-Apr	2.0	2.0	2.1	Z	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
17-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
18-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
19-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
20-Apr	2.0	Z	2.2	2.1	2.0	2.1	2.3	2.5	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5
21-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
22-Apr	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1
23-Apr	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2
24-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0
25-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.1
26-Apr	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1
27-Apr	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
28-Apr	2.1	2.3	2.3	Z	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
29-Apr	2.0	2.0	2.0	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.2	2.0
30-Apr	2.2	2.2	2.2	2.3	2.3	Z	2.3	2.3	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerspan C - Calibration M - Maintenance PF - Power Failure																												





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	557	81.91	81.91
2.1 - 3.0	123	18.09	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	157	47	25	11	14	10	16	75	57	17	19	11	17	11	25	45	557
2.1 - 3.0	11	3	0	0	2	1	10	32	30	7	5	1	2	4	6	9	123
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	168	50	25	11	16	11	26	107	87	24	24	12	19	15	31	54	680

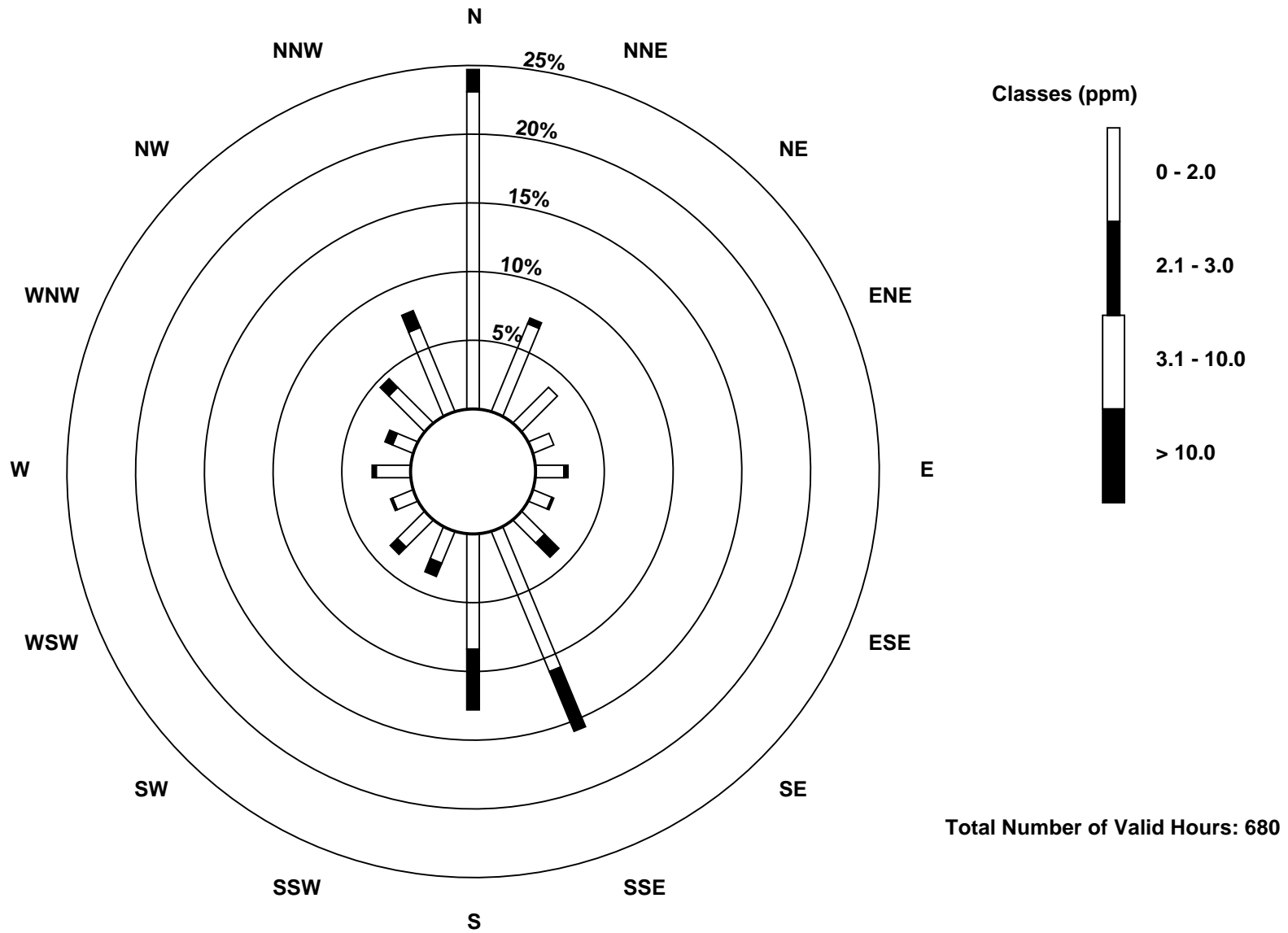
Total Number of Valid Hours: 680

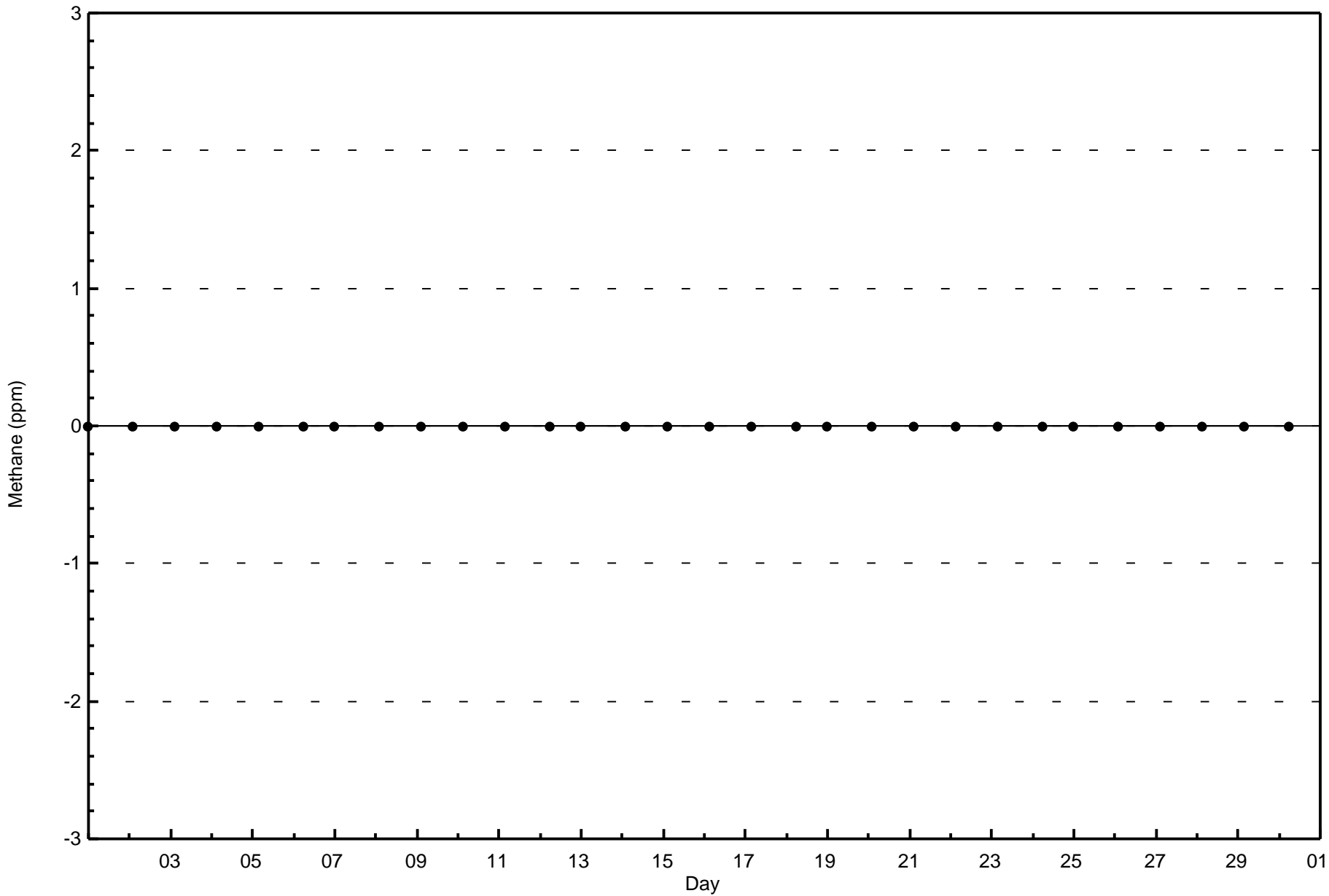
Total Number of Hours: 720

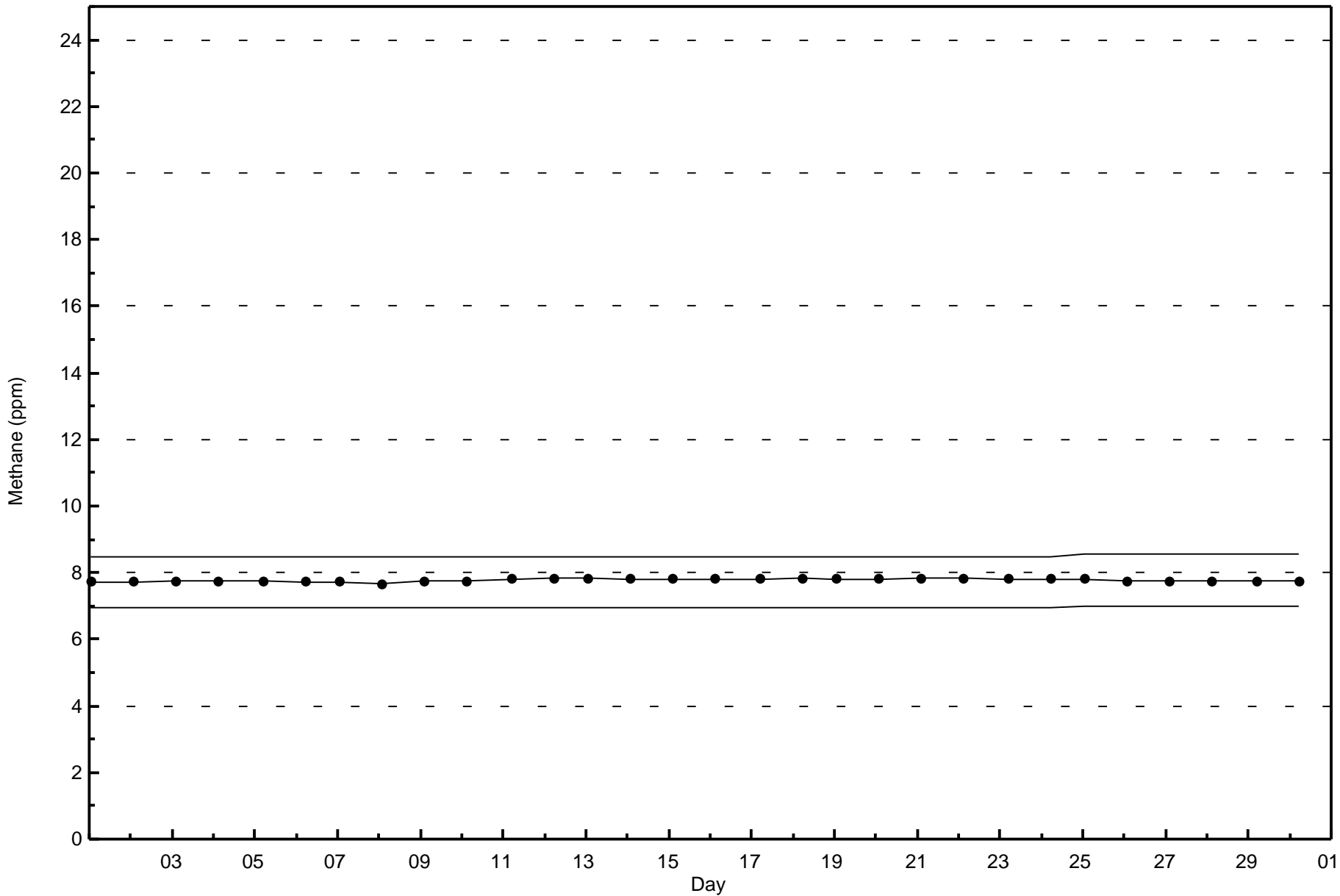


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter (AMS 1)









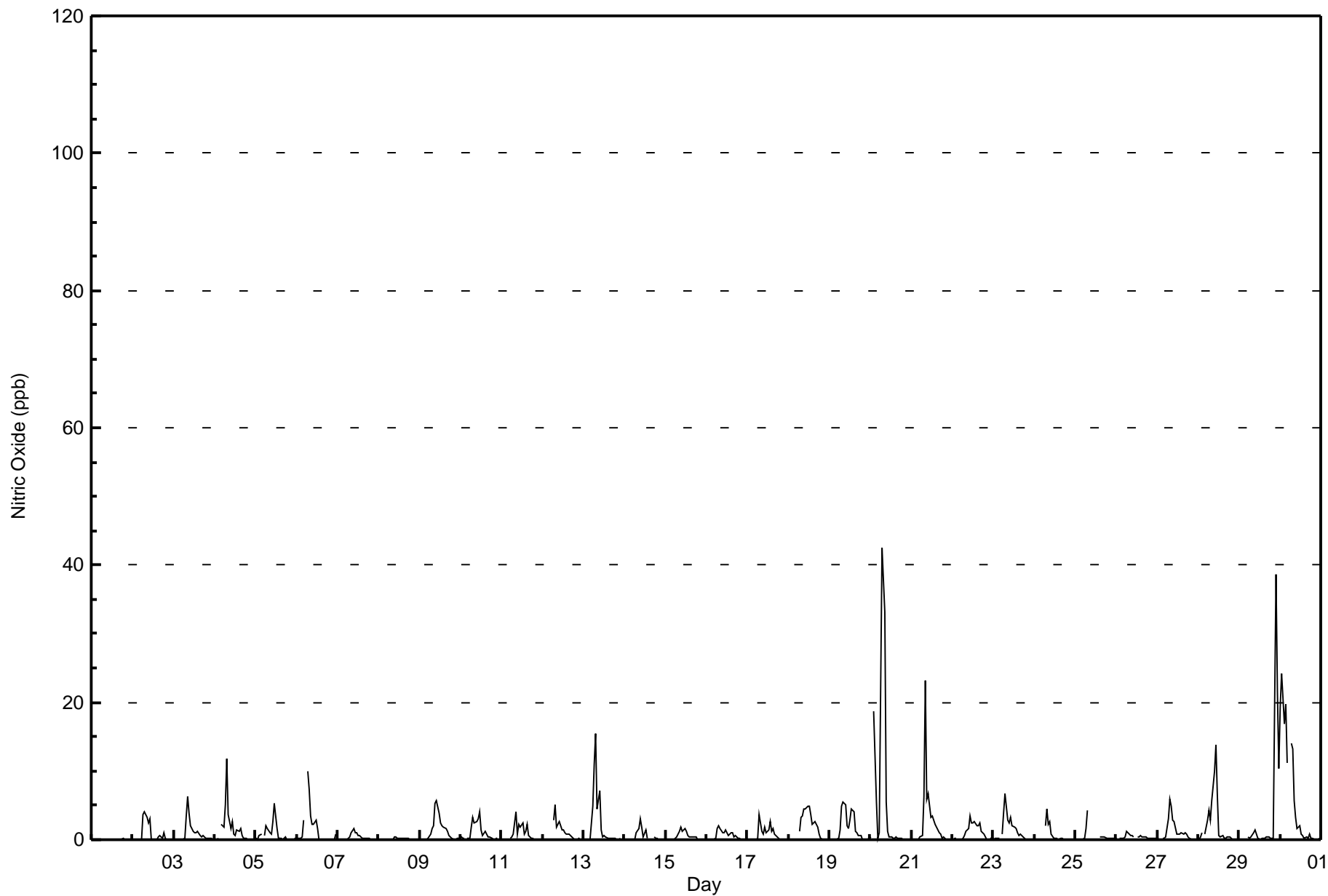
Maximum Value: 42 ppb on Apr 20 08:00																		Maximum Daily Average: 5.8 ppb on Apr 30																		Hours in Service: 720	
Minimum Value: 0 ppb on Apr 1 11:00																		Minimum Daily Average: 0.0 ppb on Apr 1																		Hours of Data: 679	
Maximum Diurnal Average: 5.3 ppb at hour 8																		Minimum Diurnal Average: 0.1 ppb at hour 21																		Hours of Missing Data: 41	
Monthly Average: 1.4 ppb																		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 22																		Hours of Calibration: 36	
																																				Percent Operational Time: 99.3	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0										
2-Apr	0	Z	0	0	0	0	4	4	3	2	3	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0.8	4										
3-Apr	0	0	Z	0	0	0	0	3	6	4	2	1	1	1	1	1	0	1	0	0	0	0	0	0	1.0	6											
4-Apr	0	0	0	Z	2	2	5	12	4	2	3	1	1	1	1	2	1	0	0	0	0	0	0	0	1.6	12											
5-Apr	0	0	1	1	Z	1	2	2	1	1	3	5	2	0	0	0	0	0	0	0	0	0	0	0	0.8	5											
6-Apr	0	0	0	0	3	Z	10	7	3	2	2	3	2	0	0	0	0	0	0	0	0	0	0	0	1.5	10											
7-Apr	Z	0	0	0	0	0	0	0	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	2											
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0											
9-Apr	0	0	Z	0	0	0	1	2	2	5	6	4	2	2	2	2	1	1	0	0	0	0	0	0	1.3	6											
10-Apr	0	0	0	Z	0	0	2	3	2	3	3	4	2	1	1	1	0	0	0	0	0	0	0	0	1.0	4											
11-Apr	0	0	0	0	Z	0	0	1	4	1	2	2	2	1	1	2	1	0	0	0	0	0	0	0	0.8	4											
12-Apr	0	0	0	0	0	Z	3	5	2	2	3	1	1	1	1	1	1	0	0	0	0	0	0	0	1.0	5											
13-Apr	Z	0	0	0	0	5	11	15	4	7	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2.1	15											
14-Apr	0	Z	0	0	0	0	0	1	2	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	3											
15-Apr	0	0	Z	0	0	0	0	1	1	2	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0.5	2											
16-Apr	0	0	0	Z	0	0	2	2	2	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0.6	2											
17-Apr	0	0	0	0	Z	0	0	4	1	1	2	1	2	3	1	2	1	0	0	0	0	0	0	0	0.8	4											
18-Apr	0	0	0	0	0	Z	1	3	3	4	5	5	5	4	2	3	2	2	1	0	0	0	0	0	1.8	5											
19-Apr	Z	0	0	0	0	0	1	5	5	5	2	2	3	4	4	1	1	1	1	0	0	0	0	0	1.6	5											
20-Apr	0	Z	19	5	0	1	22	42	33	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5.7	42											
21-Apr	0	0	Z	0	0	0	1	6	23	6	7	3	3	3	2	1	1	1	0	0	0	0	0	0	2.6	23											
22-Apr	0	0	0	Z	0	0	0	1	1	2	3	2	2	3	2	2	2	1	1	0	0	0	0	0	1.1	3											
23-Apr	0	0	0	0	Z	1	4	7	3	2	3	2	2	2	1	1	1	0	0	0	0	0	0	0	1.3	7											
24-Apr	0	0	0	0	0	Z	2	4	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	4											
25-Apr	Z	0	0	0	0	0	2	4	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	4											
26-Apr	0	Z	0	0	0	0	1	1	1	1	0	M	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1											
27-Apr	0	0	Z	0	0	0	3	6	5	3	3	1	1	1	1	1	1	1	0	0	0	0	0	0	1.2	6											
28-Apr	0	0	1	Z	1	3	4	3	6	10	14	7	1	0	1	0	0	0	0	0	0	0	0	0	2.2	14											
29-Apr	0	0	0	0	Z	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	39	22	10	3.4	39										
30-Apr	19	24	17	20	11	Z	14	13	6	3	2	2	1	1	0	0	0	1	0	0	0	0	0	0	5.8	24											
																		Diurnal Average		Diurnal Maximum																	
																		0.9		19																	
																		1.1		24																	
																		1.5		19																	
																		1.1		20																	
																		0.7		11																	
																		0.6		5																	
																		3.2		22																	
																		5.3		42																	
																		4.4		33																	
																		2.9		10																	
																		2.6		14																	
																		1.9		7																	
																		1.3		5																	
																		1.1		4																	
																		0.9		4																	
																		0.8		3																	
																		0.6		2																	
																		0.5		2																	
																		0.3		1																	
																		0.1		0																	
																		0.1		0																	
																		1.4		39																	
																		0.8		22																	
																		0.4		10																	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	672	98.97	98.97
21 - 40	6	0.88	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	167	50	27	12	17	11	25	103	84	22	24	12	19	15	31	53	672
21 - 40	1	0	0	0	0	0	1	0	1	2	0	0	0	0	0	1	6
11 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	169	50	27	12	17	11	26	103	85	24	24	12	19	15	31	54	679

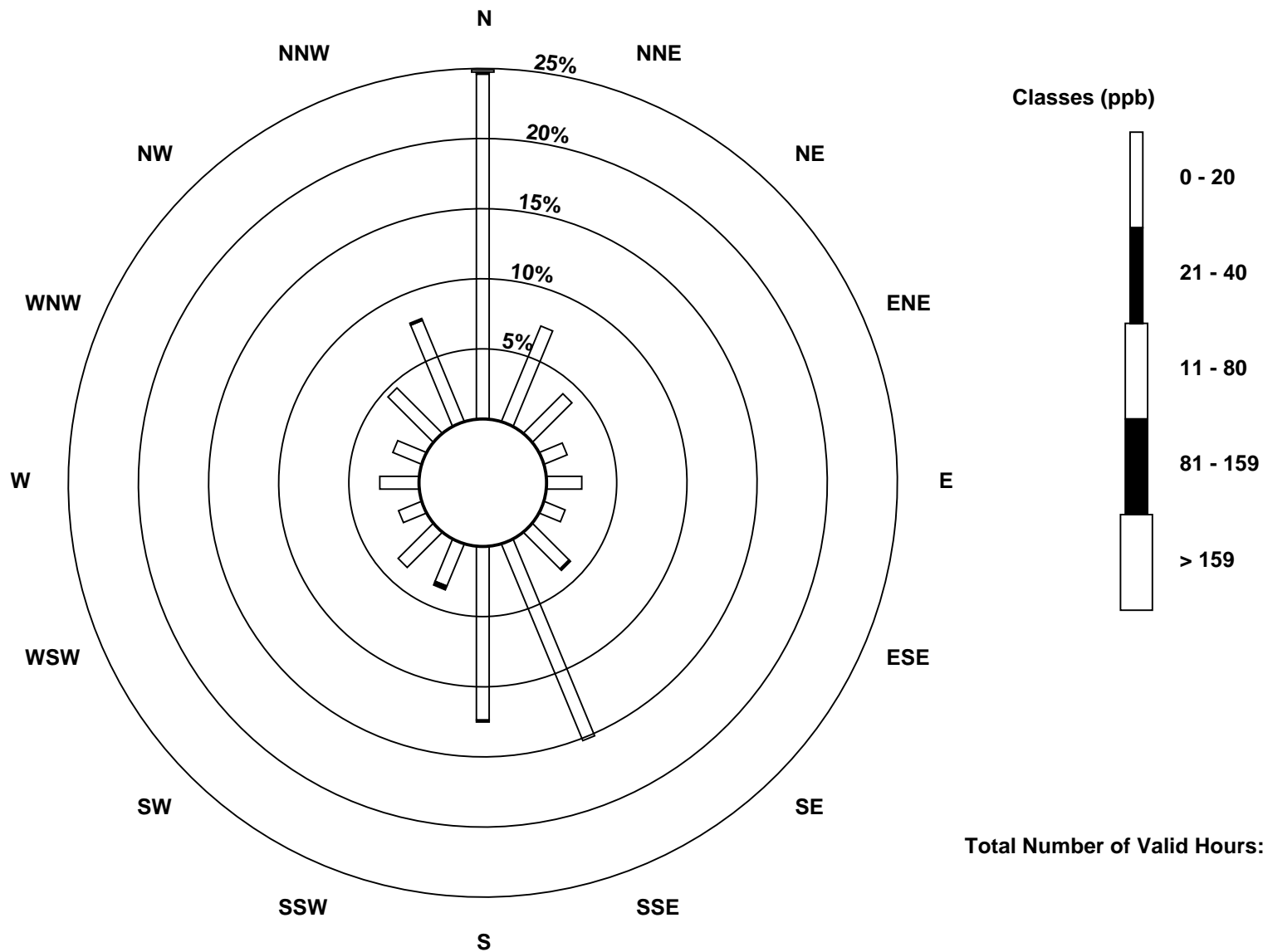
Total Number of Valid Hours: 679

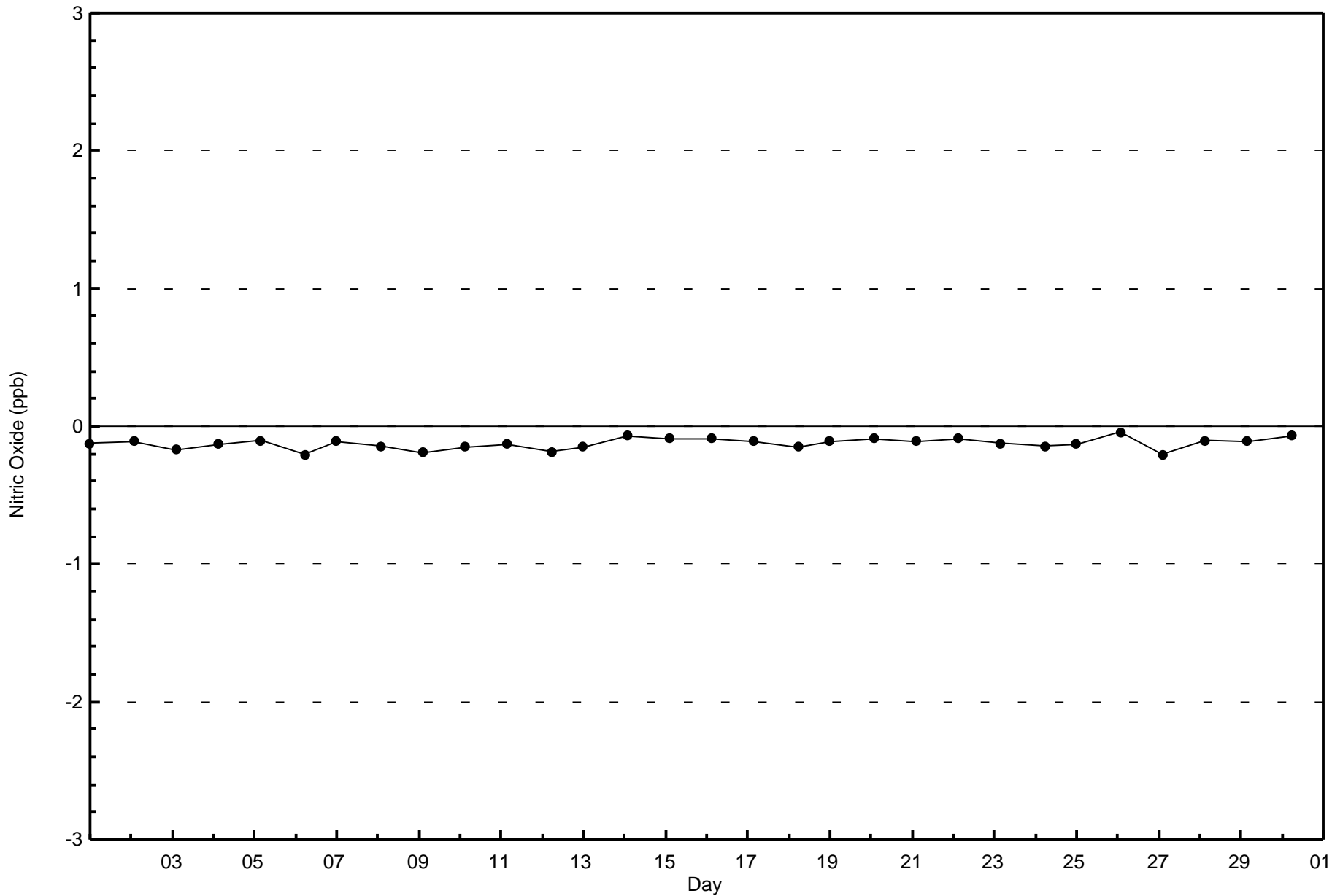
Total Number of Hours: 720

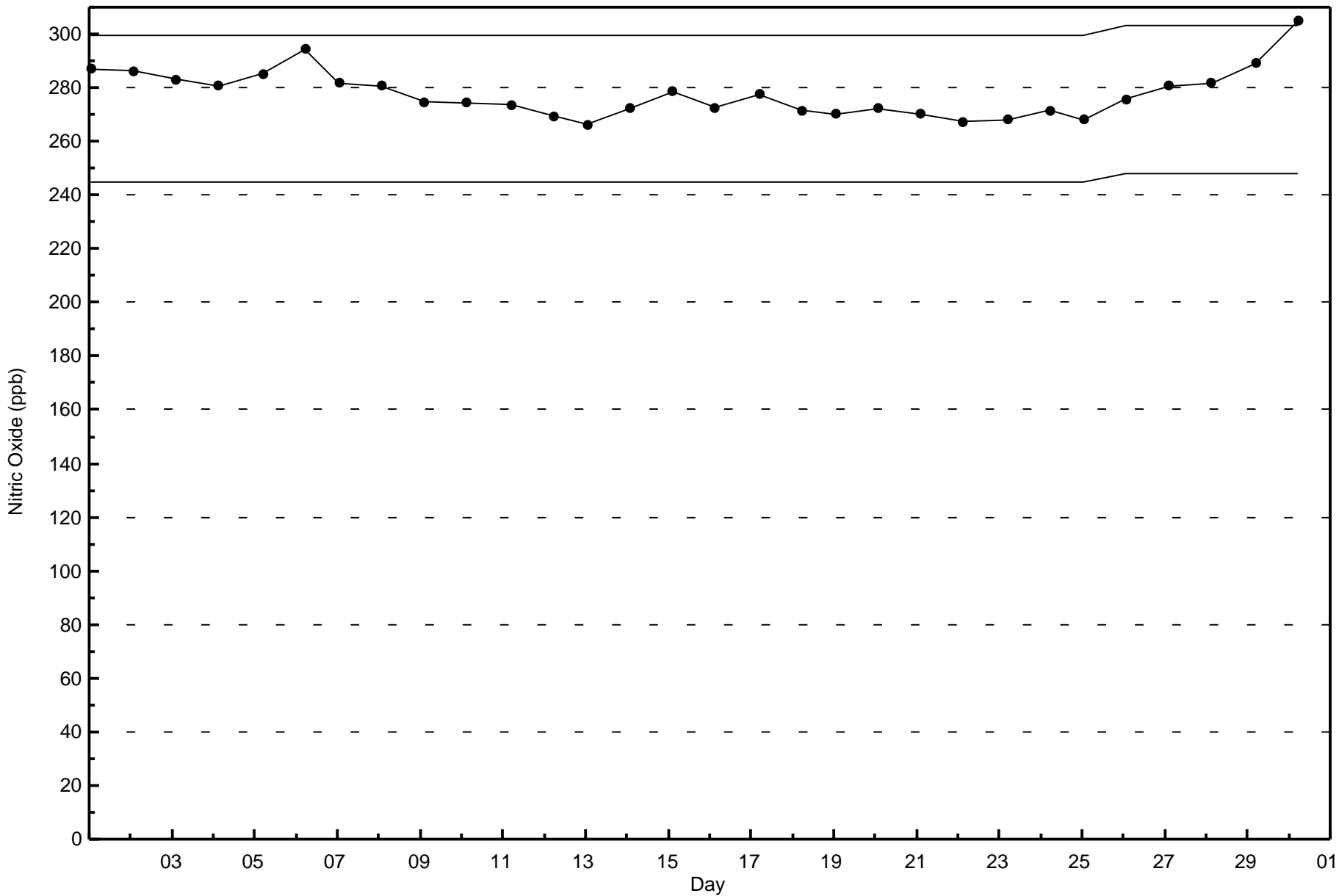


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 42 ppb on Apr 29 22:00	Maximum Daily Average: 10.1 ppb on Apr 28		Hours of Data:	679
Minimum Value: 0 ppb on Apr 1 16:00	Minimum Daily Average: 1.3 ppb on Apr 1		Hours of Missing Data:	41
Maximum Diurnal Average: 8.8 ppb at hour 3	Minimum Diurnal Average: 2.3 ppb at hour 14		Hours of Calibration:	36
Monthly Average: 5.7 ppb	Percentiles: P ₁ = 0 P ₁₀ = 1 O ₁ = 2 Median = 4 O ₃ = 8 P ₉₀ = 13 P ₉₉ = 25		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	4	8	6	4	0	0	1.3	8
2-Apr	0	Z	1	1	4	6	16	10	10	5	6	0	0	0	3	3	2	16	14	7	2	1	1	4.7	16	
3-Apr	0	1	Z	1	1	3	2	9	13	10	5	3	3	4	5	3	3	5	10	10	11	10	8	6	5.3	13
4-Apr	5	5	9	Z	19	17	15	13	7	5	6	3	2	5	6	9	4	3	4	6	11	12	10	10	8.1	19
5-Apr	9	9	14	17	Z	10	11	9	6	5	7	10	4	2	2	2	8	4	6	3	4	4	3	6.5	17	
6-Apr	4	6	10	23	30	Z	19	15	10	7	6	6	4	0	0	0	0	0	5	14	12	20	26	9.4	30	
7-Apr	Z	18	13	4	7	11	7	5	7	5	4	4	3	2	1	2	2	2	4	3	4	7	7	6	5.4	18
8-Apr	6	Z	2	1	1	2	2	1	1	2	2	1	1	1	1	1	1	2	1	1	1	1	3	3	1.5	6
9-Apr	5	2	Z	2	2	7	12	11	9	12	8	6	4	4	4	4	4	3	4	5	5	9	15	15	6.5	15
10-Apr	13	11	13	Z	9	6	10	10	7	6	6	8	4	2	4	4	4	5	5	6	5	8	5	10	6.9	13
11-Apr	5	6	6	6	Z	4	5	3	5	3	5	3	4	2	4	5	2	1	1	1	1	1	3	2	3.3	6
12-Apr	0	1	2	10	8	Z	15	15	6	5	6	4	3	3	2	3	3	3	4	2	15	22	14	12	6.8	22
13-Apr	Z	8	12	13	13	25	24	22	10	8	2	1	2	1	1	1	1	1	3	1	PF	3	2	4	7.1	25
14-Apr	4	Z	15	13	13	6	4	4	7	8	6	4	4	1	PF	PF	PF	3	7	7	6	5	1	3	6.0	15
15-Apr	4	3	Z	4	7	5	5	4	3	3	2	2	2	1	1	1	1	2	4	3	2	4	7	6	3.3	7
16-Apr	6	7	4	Z	3	4	9	6	4	2	2	3	2	2	3	3	2	5	4	8	4	2	3	4	3.9	9
17-Apr	3	3	3	2	Z	3	3	3	2	2	3	2	2	3	2	3	3	2	2	2	2	2	2	2	2.4	3
18-Apr	1	1	3	4	4	Z	6	4	5	6	6	5	6	5	4	5	6	8	8	9	12	13	14	15	6.5	15
19-Apr	Z	9	8	7	5	4	7	13	13	12	5	3	4	6	7	4	5	4	7	2	3	3	5	11	6.4	13
20-Apr	13	Z	18	13	7	7	13	18	20	9	4	2	2	2	2	3	3	3	4	3	3	1	6	4	6.8	20
21-Apr	5	9	Z	10	6	4	3	10	19	6	8	5	5	5	4	3	3	3	3	7	8	9	10	9	6.7	19
22-Apr	8	13	9	Z	4	3	3	2	2	2	3	2	2	2	1	2	3	2	3	5	7	13	13	17	5.1	17
23-Apr	12	12	13	9	Z	5	4	7	3	3	3	3	3	3	2	2	3	3	2	3	6	6	3	1	4.8	13
24-Apr	3	6	5	6	7	Z	11	12	8	9	3	1	1	0	0	1	1	0	0	0	0	1	1	1	3.2	12
25-Apr	Z	0	0	1	2	2	8	9	C	C	C	C	C	C	C	2	2	2	2	2	2	2	2	2	--	9
26-Apr	2	Z	3	5	8	9	10	6	2	2	1	M	2	2	2	2	2	3	2	3	6	8	7	7	4.2	10
27-Apr	8	10	Z	6	7	7	12	13	12	6	5	3	3	3	4	4	4	5	4	5	4	3	3	6	5.9	13
28-Apr	13	22	24	Z	15	12	9	9	11	16	18	12	3	3	4	4	4	4	6	9	10	11	9	6	10.1	24
29-Apr	3	3	9	13	Z	8	2	2	3	4	3	1	1	1	2	1	3	3	5	10	23	42	40	35	9.3	42
30-Apr	32	29	26	21	17	Z	11	13	11	8	5	6	3	3	1	2	3	10	3	5	3	4	4	8	9.9	32

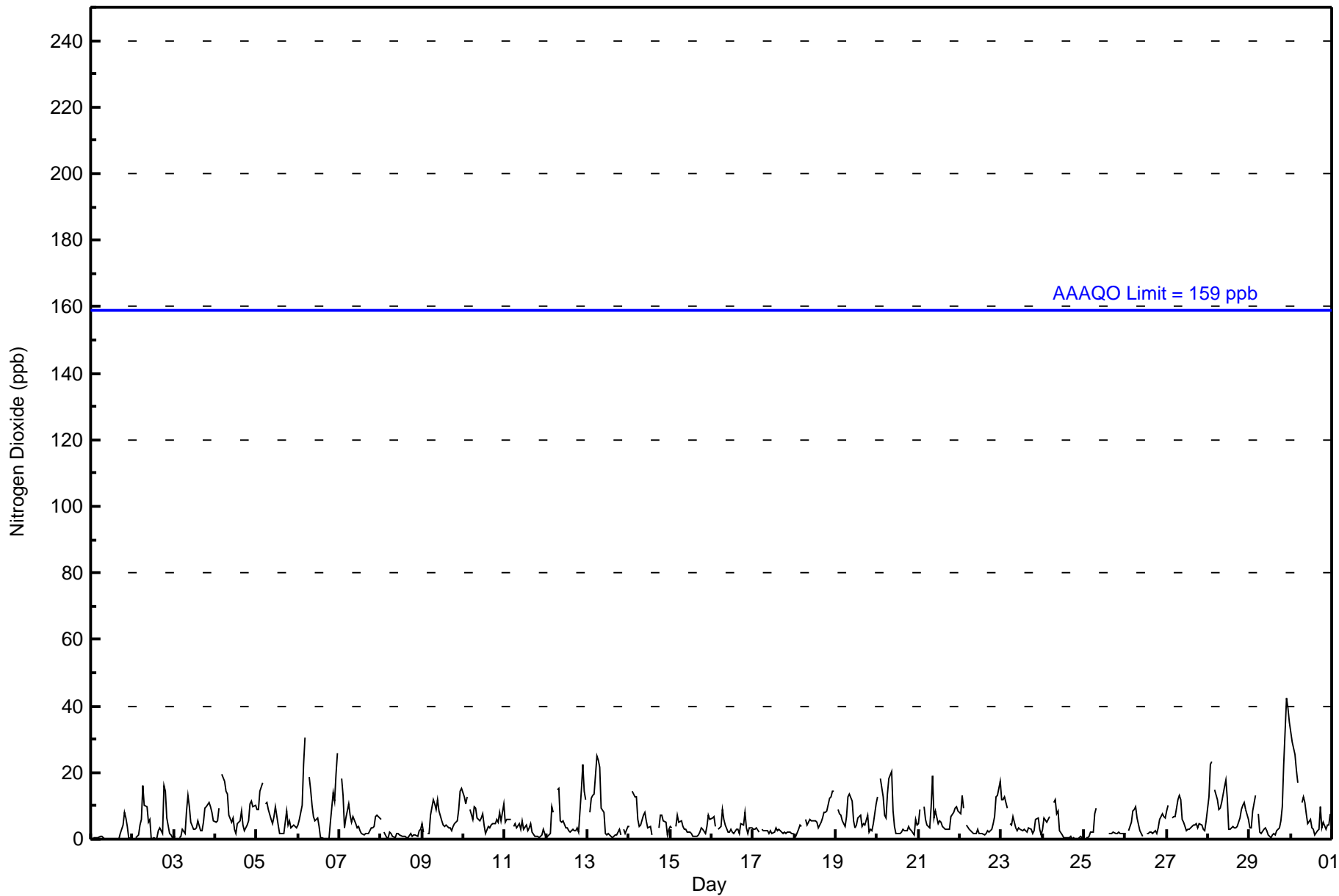
6.6	7.8	8.8	7.6	8.0	6.8	8.5	8.6	7.4	5.7	4.7	3.6	2.7	2.3	2.4	2.6	2.5	3.2	4.1	4.9	6.3	7.4	7.3	7.7	Diurnal Average	
32	29	26	23	30	25	24	22	20	16	18	12	6	6	7	9	6	10	16	14	23	42	40	35	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	662	97.50	97.50
21 - 40	16	2.36	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	167	50	27	12	17	11	26	103	80	21	23	11	18	13	31	52	662
21 - 40	2	0	0	0	0	0	0	0	5	2	1	1	1	2	0	2	16
11 - 80	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	169	50	27	12	17	11	26	103	85	24	24	12	19	15	31	54	679

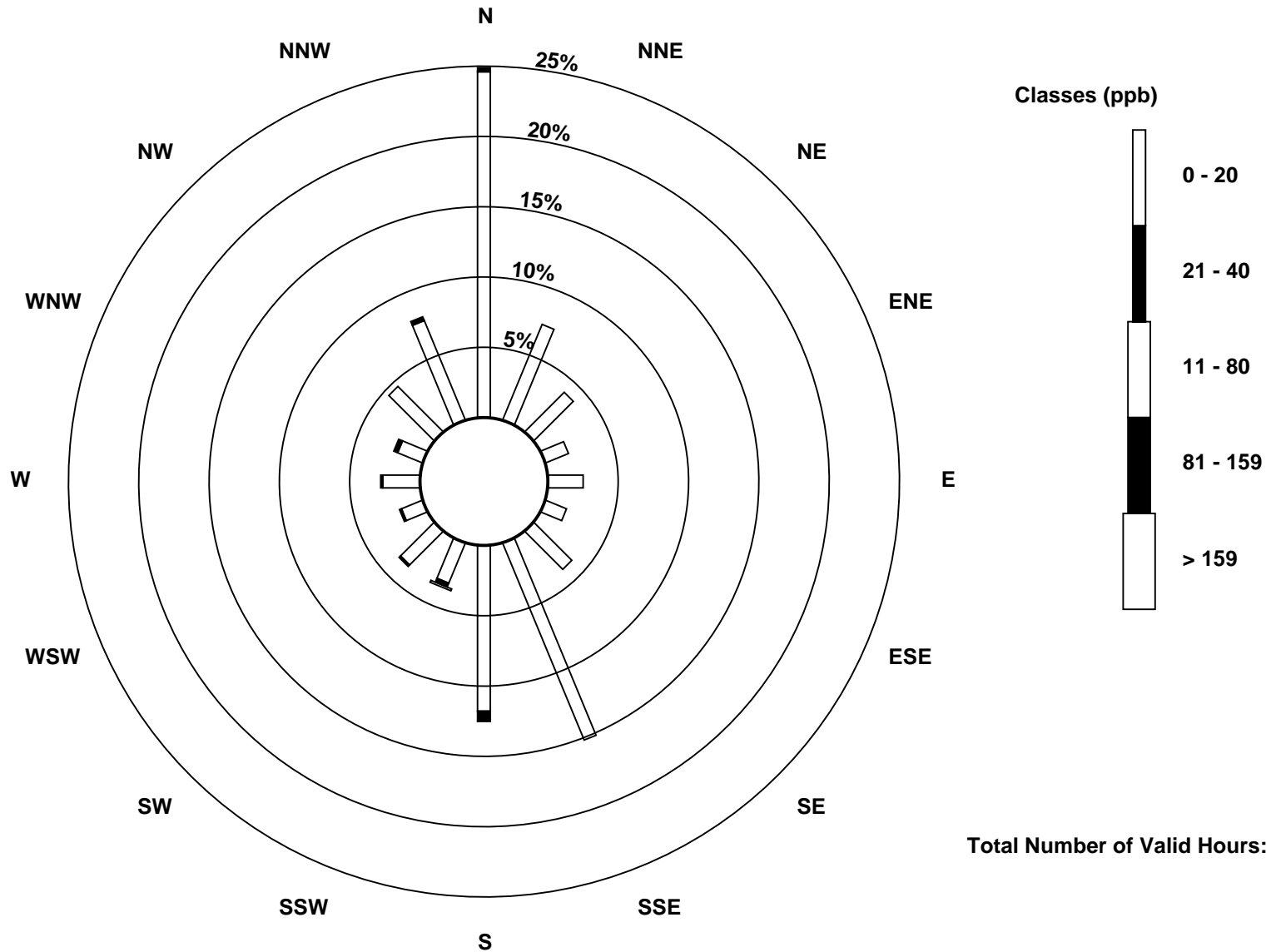
Total Number of Valid Hours: 679

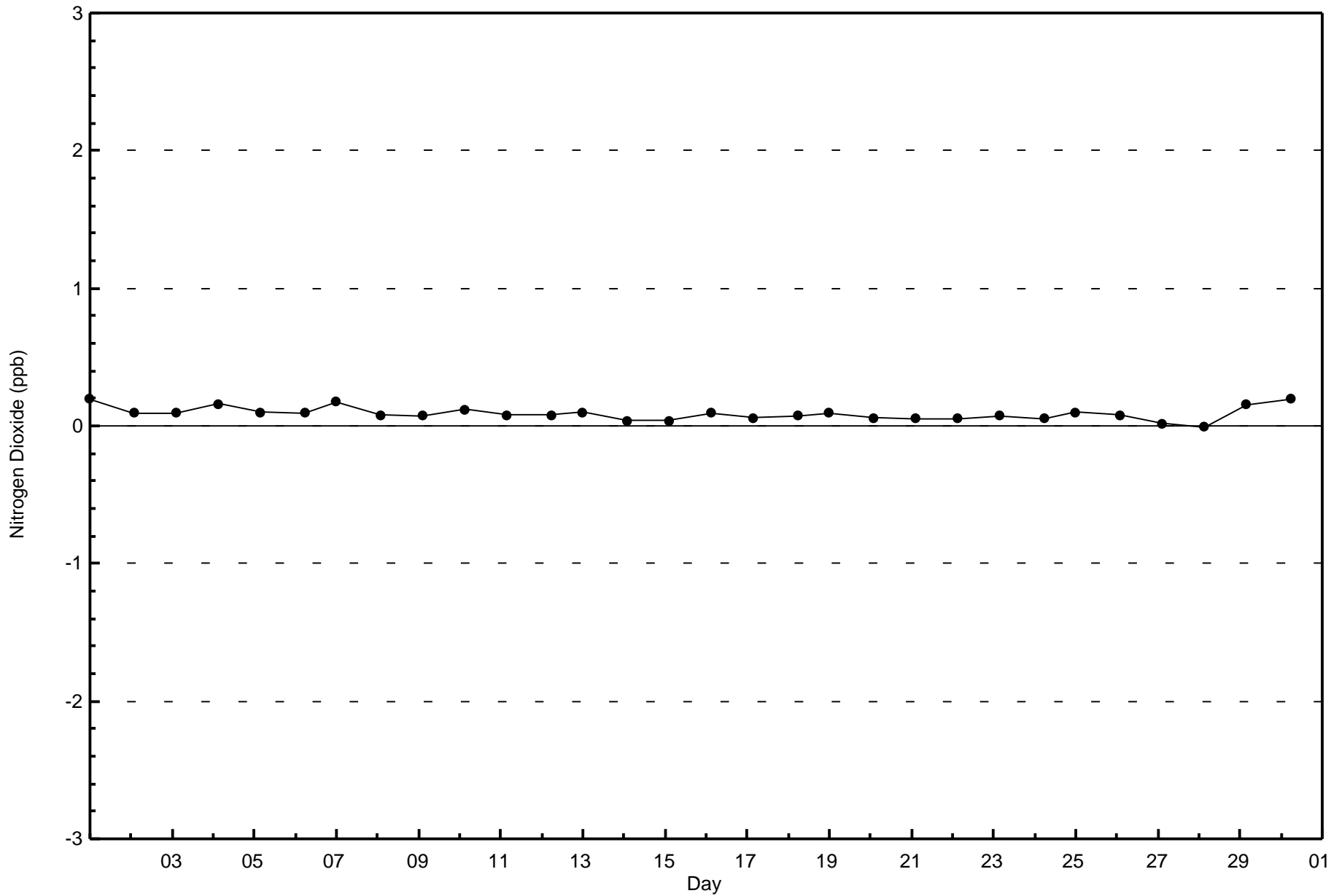
Total Number of Hours: 720

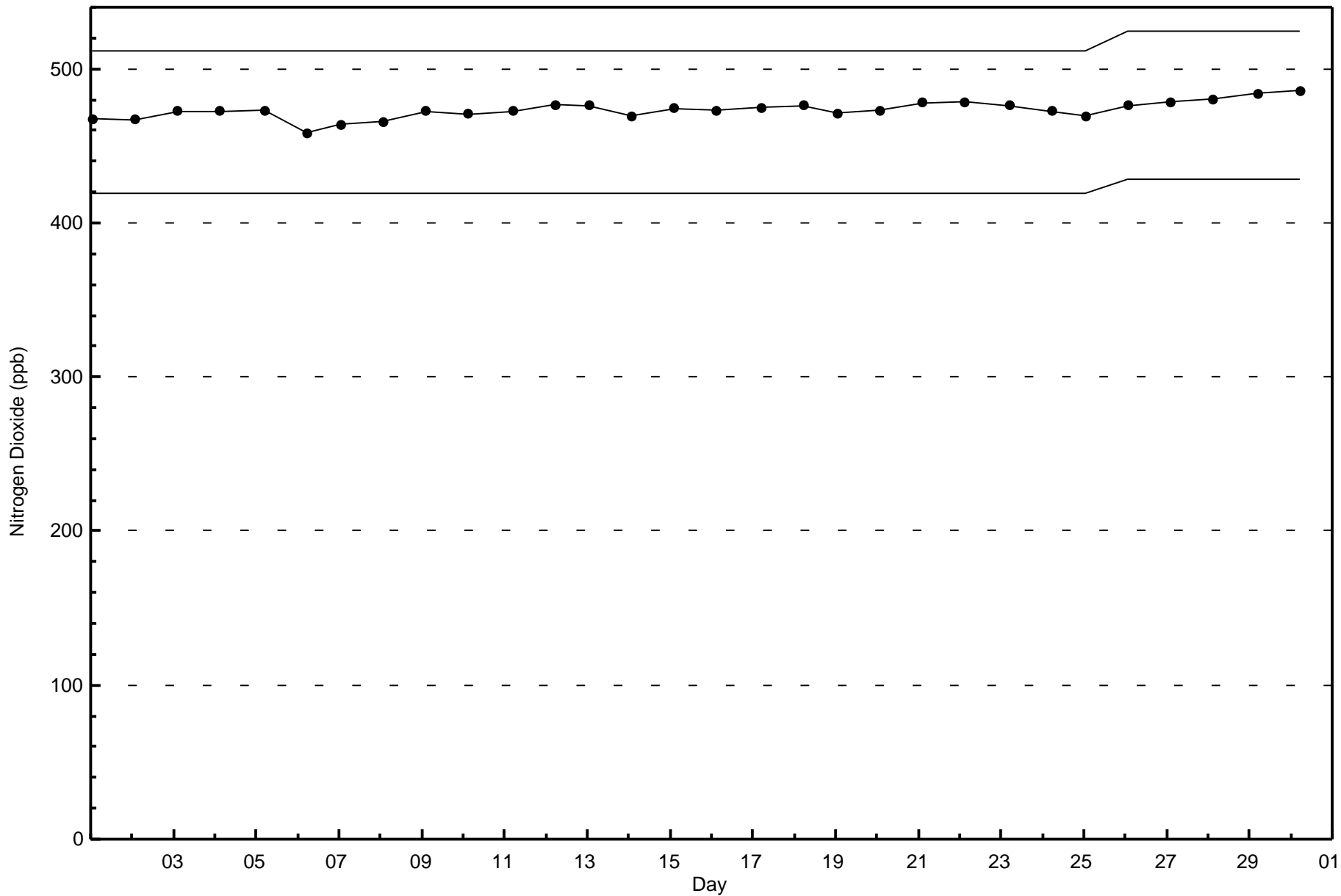


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

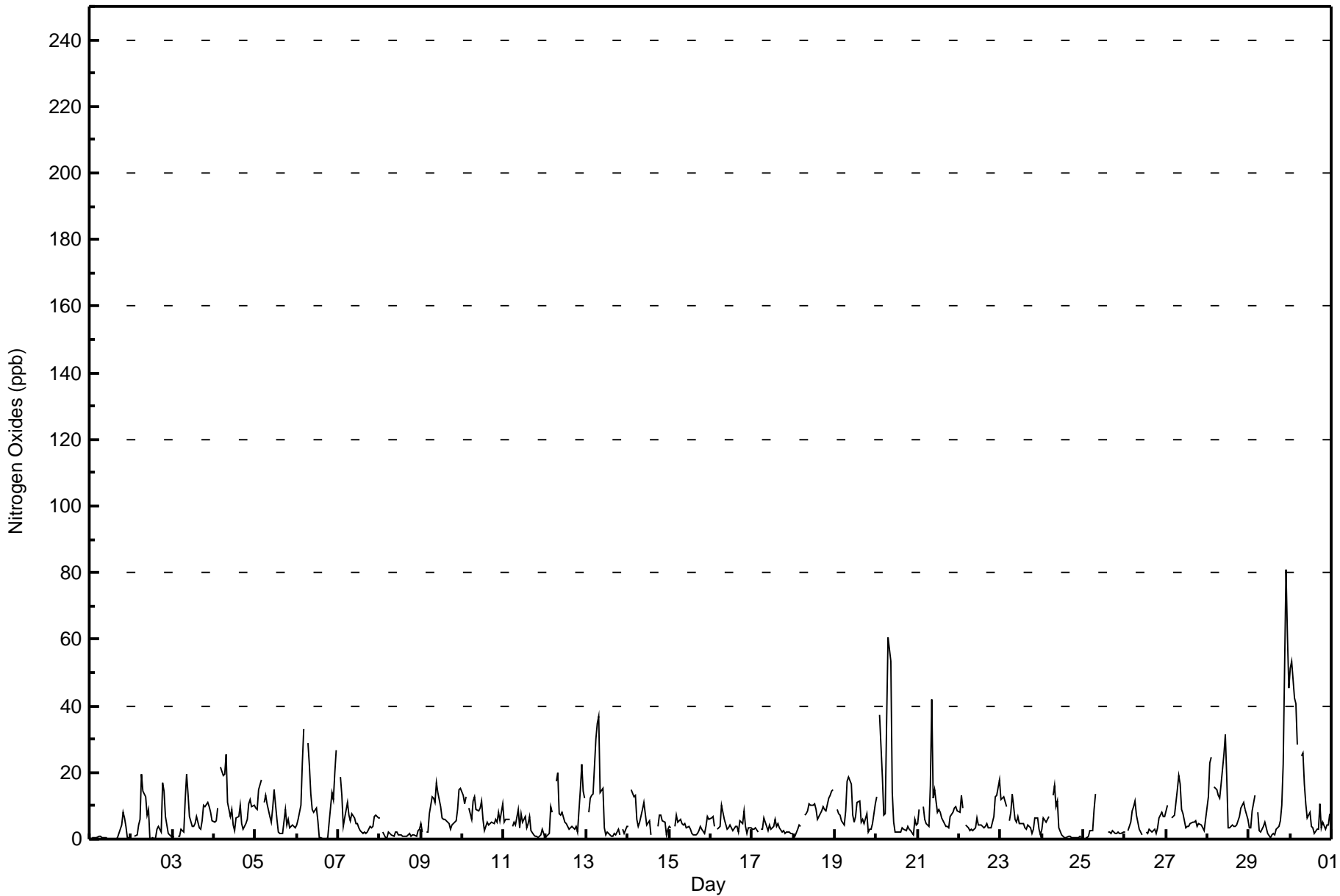
Fort McKay - Bertha Ganter - April 2017

Maximum Value: 81 ppb on Apr 29 22:00														Maximum Daily Average: 15.7 ppb on Apr 30														Hours in Service: 720			
Minimum Value: 0 ppb on Apr 1 16:00														Minimum Daily Average: 1.3 ppb on Apr 1														Hours of Data: 679			
Maximum Diurnal Average: 13.9 ppb at hour 8														Minimum Diurnal Average: 3.1 ppb at hour 17														Hours of Missing Data: 41			
Monthly Average: 7.1 ppb														Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 5 Q ₃ = 9 P ₉₀ = 14 P ₉₉ = 44														Hours of Calibration: 36			
																												Percent Operational Time: 99.3			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24							
1-Apr	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	4	8	6	4	0	0	1.3	8					
2-Apr	0	Z	1	1	4	6	20	14	13	7	9	0	0	0	3	4	2	17	14	7	2	1	1	5.5	20						
3-Apr	0	1	Z	1	1	3	2	12	19	14	7	4	4	5	7	3	3	5	10	10	11	10	8	6	6.3	19					
4-Apr	5	5	9	Z	21	19	20	25	11	7	9	4	3	6	7	10	5	3	4	6	11	12	10	10	9.7	25					
5-Apr	9	9	15	18	Z	11	13	11	7	5	9	15	6	2	2	2	9	4	6	3	4	4	3	7.4	18						
6-Apr	4	6	10	23	33	Z	29	22	14	9	8	9	5	0	0	0	0	0	0	5	14	12	20	27	10.9	33					
7-Apr	Z	18	13	4	7	11	7	5	8	6	5	5	3	3	2	2	2	2	4	3	4	7	7	6	5.8	18					
8-Apr	6	Z	2	1	1	2	2	1	1	2	2	1	1	1	1	1	1	2	1	1	1	1	3	3	1.6	6					
9-Apr	5	2	Z	2	2	8	13	12	11	17	14	10	6	6	6	5	5	3	4	5	5	9	15	15	7.8	17					
10-Apr	13	11	13	Z	9	6	11	13	9	8	9	12	6	2	5	4	5	5	5	6	5	8	5	11	7.9	13					
11-Apr	5	6	6	6	Z	4	5	4	9	4	8	5	7	3	5	7	3	1	1	1	1	1	3	1	4.1	9					
12-Apr	0	1	2	10	8	Z	17	20	7	7	8	5	5	4	3	4	3	3	4	2	15	22	14	12	7.7	22					
13-Apr	Z	8	12	13	13	30	35	37	14	15	3	1	2	1	1	2	1	3	1	PF	3	2	4	9.3	37						
14-Apr	4	Z	15	13	13	6	4	5	9	11	8	4	5	1	PF	PF	PF	4	7	7	6	5	1	3	6.6	15					
15-Apr	4	3	Z	4	7	5	6	5	4	5	3	4	3	2	1	1	2	3	4	3	2	4	7	6	3.7	7					
16-Apr	6	7	4	Z	3	4	10	8	6	3	3	4	3	2	4	4	2	6	5	8	4	2	3	4	4.6	10					
17-Apr	3	3	3	2	Z	3	3	6	4	3	4	3	4	6	4	4	3	2	2	2	2	2	2	2	3.1	6					
18-Apr	1	1	3	4	4	Z	7	7	9	11	10	10	11	9	6	8	9	10	9	9	12	13	14	15	8.3	15					
19-Apr	Z	9	8	7	5	4	8	17	19	17	7	5	7	11	11	5	6	5	8	2	3	3	5	11	7.9	19					
20-Apr	13	Z	37	18	7	8	35	60	53	14	5	2	2	2	2	3	3	3	4	3	3	1	6	4	12.6	60					
21-Apr	5	9	Z	10	6	5	4	16	42	12	15	8	9	8	6	5	4	4	3	7	8	9	10	9	9.2	42					
22-Apr	8	13	9	Z	4	3	3	3	3	3	6	4	4	4	3	4	5	3	3	5	7	13	13	18	6.2	18					
23-Apr	12	12	13	10	Z	6	8	13	6	5	7	5	4	4	4	3	4	3	2	3	6	6	3	1	6.1	13					
24-Apr	3	6	5	6	7	Z	13	16	10	11	3	1	1	0	1	1	1	0	0	0	0	1	1	1	3.9	16					
25-Apr	Z	0	1	1	2	2	9	13	C	C	C	C	C	C	2	2	2	3	2	2	2	2	2	2	--	13					
26-Apr	2	Z	3	5	9	10	11	7	3	2	1	M	2	2	3	3	2	3	2	3	6	8	7	7	4.6	11					
27-Apr	8	10	Z	6	7	7	15	19	17	9	8	3	4	4	5	5	5	5	4	5	4	3	3	6	7.0	19					
28-Apr	13	23	24	Z	16	15	13	12	17	26	31	19	3	3	4	4	4	4	4	7	9	10	11	9	6	12.3	31				
29-Apr	3	3	9	13	Z	8	2	2	4	5	3	2	1	1	2	1	3	4	6	10	23	81	61	46	12.7	81					
30-Apr	51	54	42	41	28	Z	25	26	17	11	6	8	4	3	2	3	3	10	4	5	3	4	4	8	15.7	54					
																												Diurnal Average			
																												Diurnal Maximum			
Z - zerospan														C - Calibration														M - Maintenance		PF - Power Failure	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	648	95.43	95.43
21 - 40	21	3.09	98.53
41 - 80	9	1.33	99.85
81 - 159	0	0.00	99.85
> 159	0	0.00	99.85

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	165	50	27	12	17	11	23	99	78	20	23	11	18	13	30	51	648
21 - 40	2	0	0	0	0	0	2	4	4	1	0	1	1	2	1	3	21
11 - 80	2	0	0	0	0	0	1	0	3	2	1	0	0	0	0	0	9
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	169	50	27	12	17	11	26	103	85	23	24	12	19	15	31	54	678

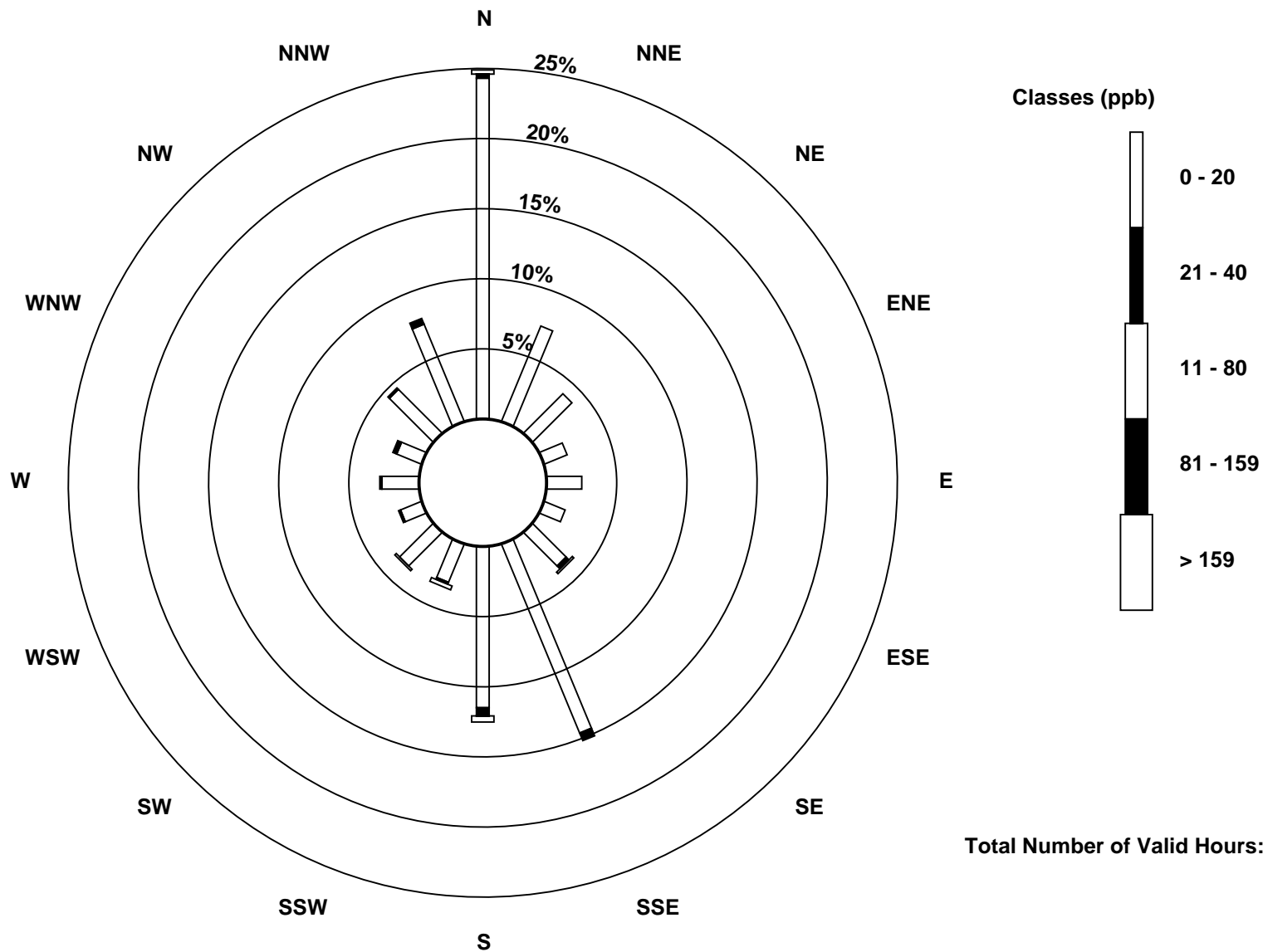
Total Number of Valid Hours: 679

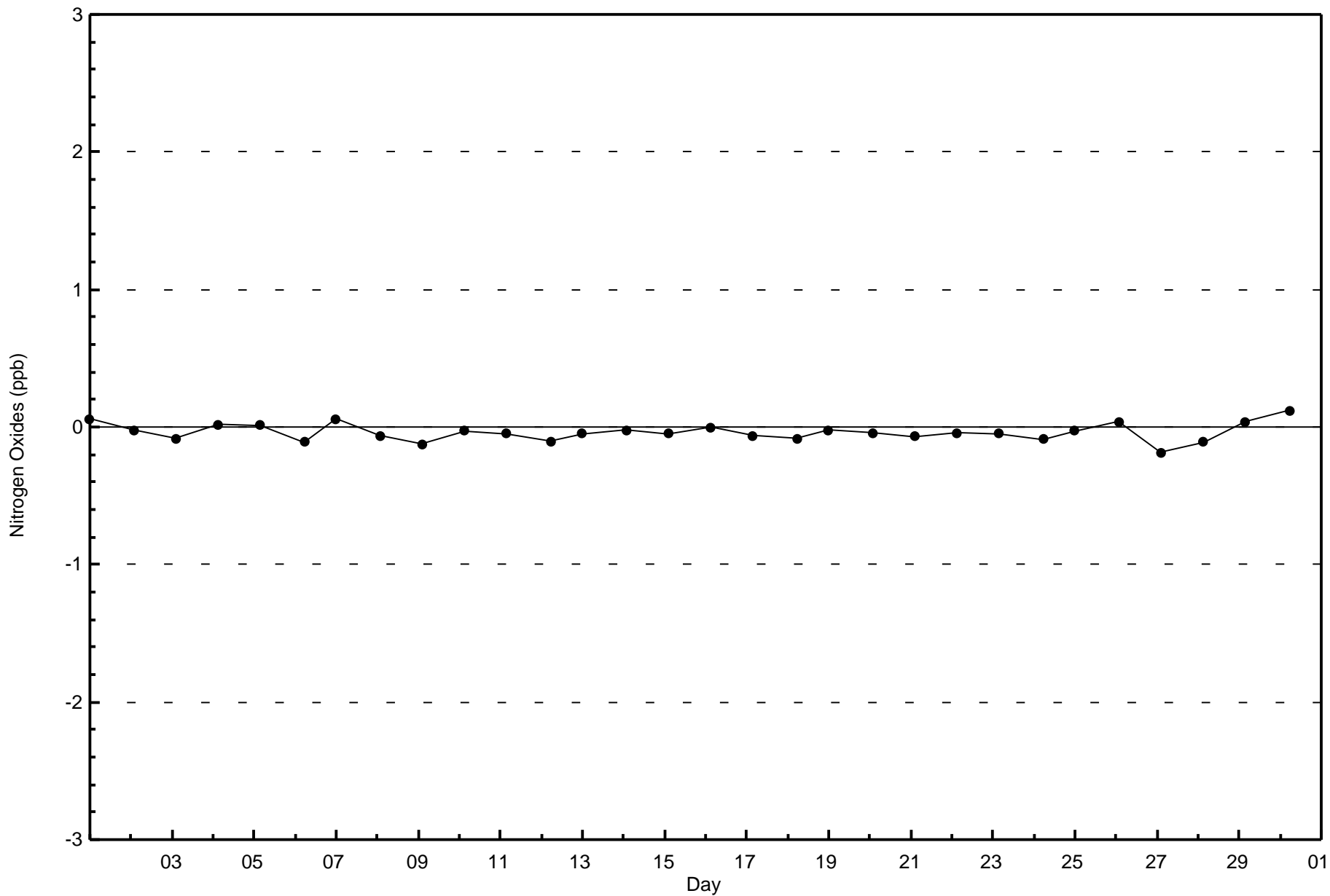
Total Number of Hours: 720

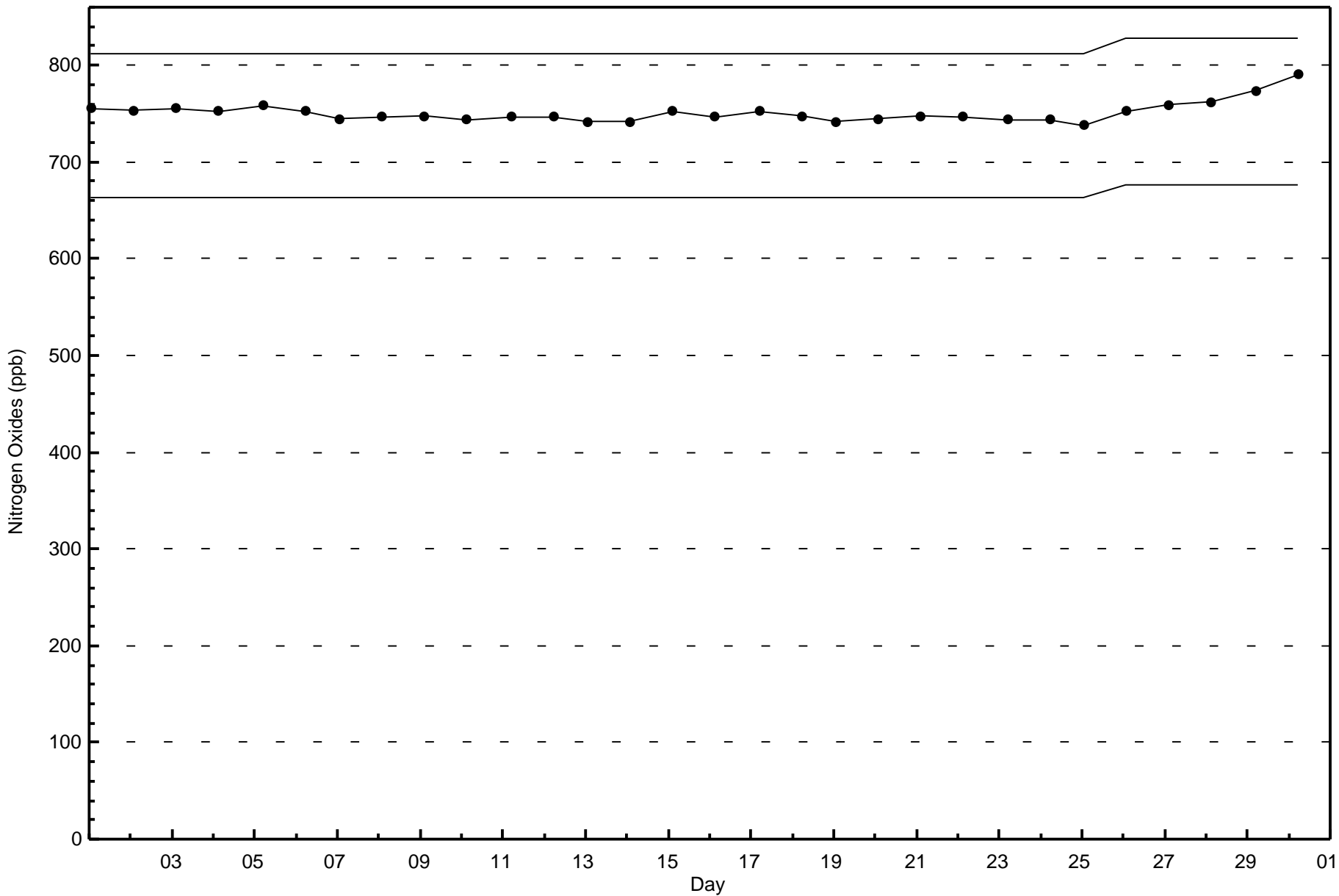


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

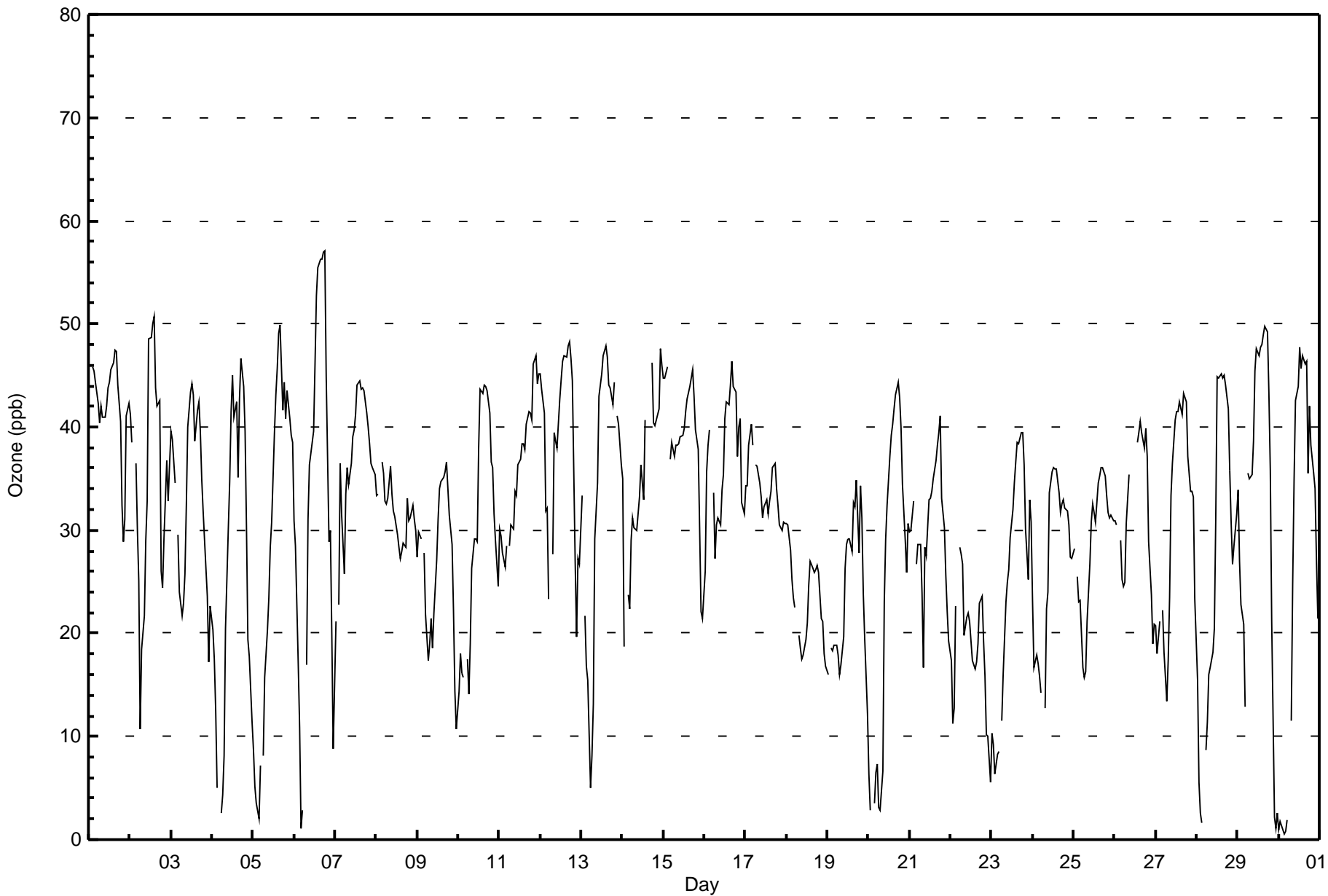
Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 57 ppb on Apr 6 19:00	Maximum Daily Average: 42.0 ppb on Apr 1		Hours of Data:	682
Minimum Value: 1 ppb on Apr 30 04:00	Minimum Daily Average: 18.6 ppb on Apr 22		Hours of Missing Data:	38
Maximum Diurnal Average: 40.7 ppb at hour 17	Minimum Diurnal Average: 20.6 ppb at hour 6		Hours of Calibration:	34
Monthly Average: 30.9 ppb	Percentiles: P ₁ = 2 P ₁₀ = 16 Q ₁ = 23 Median = 32 Q ₃ = 40 P ₉₀ = 44 P ₉₉ = 50		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	46	Z	46	45	44	42	40	42	41	41	42	44	44	46	46	47	47	44	40	32	29	31	41	42	42.0	47
2-Apr	41	39	Z	36	30	25	11	18	22	29	33	49	49	50	51	44	42	43	26	24	29	37	33	36	34.6	51
3-Apr	40	39	35	Z	30	24	22	23	26	32	40	43	44	43	39	42	42	40	35	32	26	24	17	23	33.0	44
4-Apr	20	17	12	5	Z	3	4	8	20	30	35	42	45	41	42	35	43	47	44	40	30	19	18	11	26.6	47
5-Apr	9	5	4	2	7	Z	8	16	20	23	28	31	40	43	46	49	50	42	44	41	44	41	39	39	29.1	50
6-Apr	31	28	17	11	1	3	Z	17	31	36	37	40	46	53	55	56	56	57	57	45	29	30	20	9	33.3	57
7-Apr	21	Z	23	36	32	26	33	36	34	36	39	40	41	44	45	44	44	44	41	40	38	37	36	35	36.8	45
8-Apr	33	33	Z	37	35	33	33	33	36	33	32	31	30	28	27	28	29	28	33	31	31	32	31	30	31.7	37
9-Apr	27	30	29	Z	28	22	17	19	21	19	22	27	31	34	35	35	36	37	34	31	29	22	14	11	26.5	37
10-Apr	14	18	16	16	Z	18	14	19	26	29	29	29	38	44	43	44	44	44	41	37	36	32	29	25	29.8	44
11-Apr	30	29	28	26	29	Z	29	30	30	34	33	36	37	38	38	38	40	42	41	41	46	47	44	45	36.2	47
12-Apr	45	44	41	32	32	23	Z	28	39	39	38	43	45	46	47	47	48	48	47	44	27	20	27	27	38.1	48
13-Apr	33	Z	22	17	15	5	8	13	29	35	43	44	45	47	48	47	44	44	42	44	PF	41	40	36	33.8	48
14-Apr	35	19	Z	24	22	29	31	30	30	32	33	36	33	41	PF	PF	PF	46	40	40	41	42	48	46	34.9	48
15-Apr	45	45	46	Z	37	38	37	38	38	38	39	39	40	41	43	44	45	45	43	40	38	30	22	21	38.8	46
16-Apr	26	36	38	40	Z	34	27	30	31	30	34	35	41	42	42	44	46	44	43	37	40	41	33	32	36.8	46
17-Apr	34	34	38	40	38	Z	36	36	35	33	31	32	33	32	33	34	36	37	34	32	30	30	31	31	34.0	40
18-Apr	31	31	28	25	23	23	Z	20	19	17	18	19	21	25	27	26	26	26	27	26	21	21	18	17	23.2	31
19-Apr	16	Z	19	18	19	19	18	16	17	20	26	29	29	29	28	33	32	35	28	34	31	24	20	12	23.9	35
20-Apr	6	3	Z	4	6	7	3	3	7	23	29	32	37	39	40	42	43	44	43	40	34	29	26	31	24.9	44
21-Apr	30	30	33	Z	27	29	29	24	17	28	27	33	33	34	35	37	38	39	41	33	30	26	22	19	30.2	41
22-Apr	17	11	13	23	Z	28	28	27	20	22	22	21	19	17	16	17	19	23	24	19	16	10	10	6	18.6	28
23-Apr	10	9	6	8	8	Z	11	16	23	25	26	29	32	35	37	39	38	39	39	36	30	25	33	31	25.6	39
24-Apr	23	17	18	17	16	14	Z	13	22	24	34	36	36	36	36	34	32	32	33	32	32	30	27	27	27.0	36
25-Apr	28	Z	26	23	23	17	16	16	21	27	31	33	32	31	35	35	36	36	35	33	32	31	31	31	28.6	36
26-Apr	31	31	Z	29	25	25	25	31	35	C	C	C	C	38	39	41	39	38	40	37	29	24	19	21	31.4	41
27-Apr	21	18	21	Z	22	18	13	17	23	33	36	41	42	41	42	41	43	43	42	37	34	34	33	23	31.4	43
28-Apr	16	6	3	2	Z	9	11	16	17	18	20	31	45	45	45	45	45	44	42	36	31	27	29	32	26.6	45
29-Apr	34	27	23	21	13	Z	36	35	35	39	45	48	47	48	48	49	50	49	43	36	21	2	1	3	32.7	50
30-Apr	1	2	1	1	1	2	Z	12	25	35	43	44	48	46	47	46	46	46	42	38	36	34	27	21	27.5	48

26.5	24.0	23.4	21.5	22.6	20.6	21.6	22.8	26.4	29.7	32.7	35.7	38.0	39.2	39.8	40.0	40.7	40.5	38.9	35.7	31.7	29.1	27.3	25.7	Diurnal Average		
46	45	46	45	44	42	40	42	41	41	45	49	49	53	55	56	56	57	57	57	45	46	47	48	46	Diurnal Maximum	

Z - zerspan C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAO): 1-hr 82 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	132	19.35	19.35
21 - 50	543	79.62	98.97
51 - 82	7	1.03	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	17	1	6	0	0	1	6	17	23	9	9	2	4	6	9	22	132
21 - 50	149	49	21	12	17	10	20	87	64	15	12	8	14	9	21	35	543
51 - 82	0	0	0	0	0	0	0	0	0	0	2	2	2	0	1	0	7
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	166	50	27	12	17	11	26	104	87	24	23	12	20	15	31	57	682

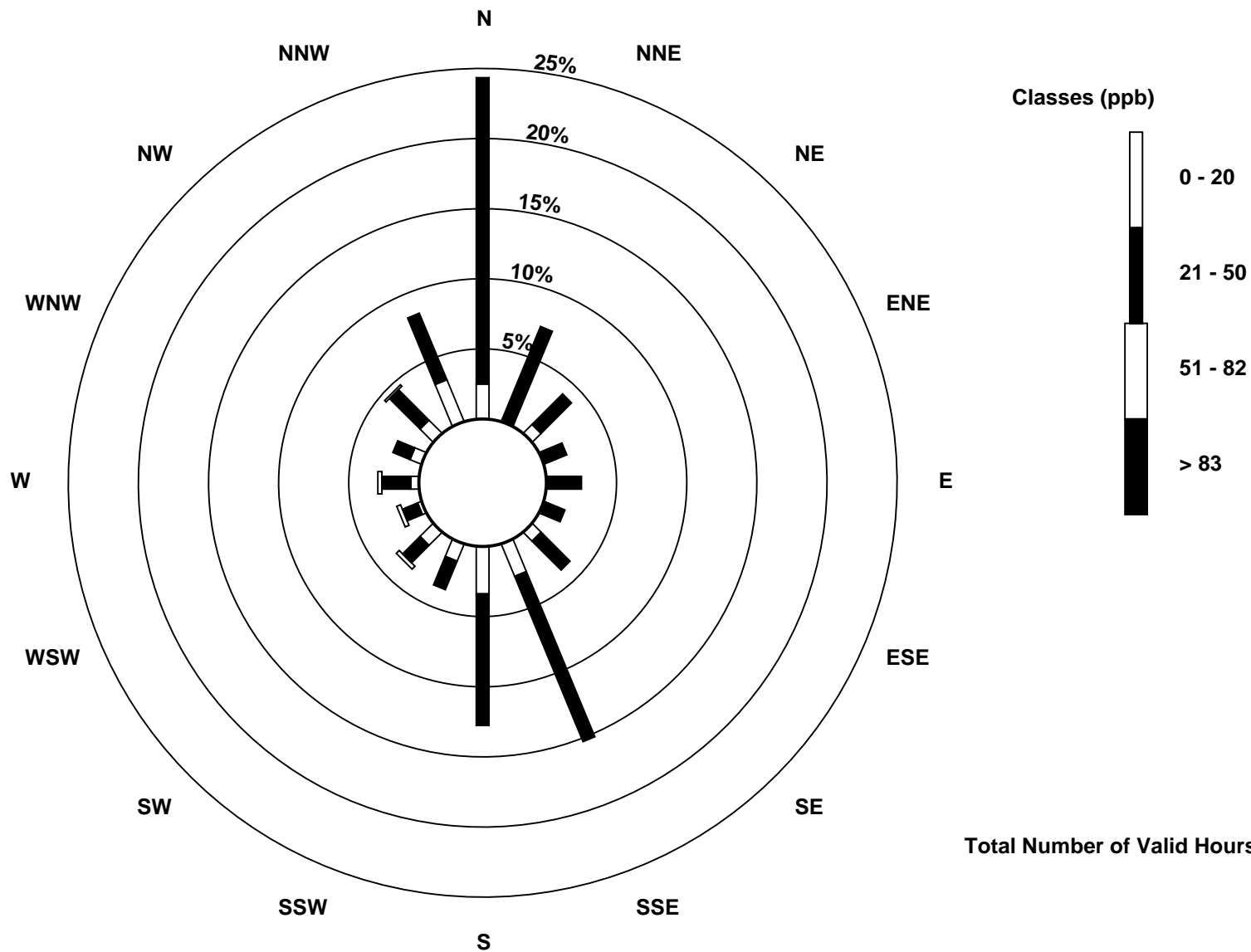
Total Number of Valid Hours: 682

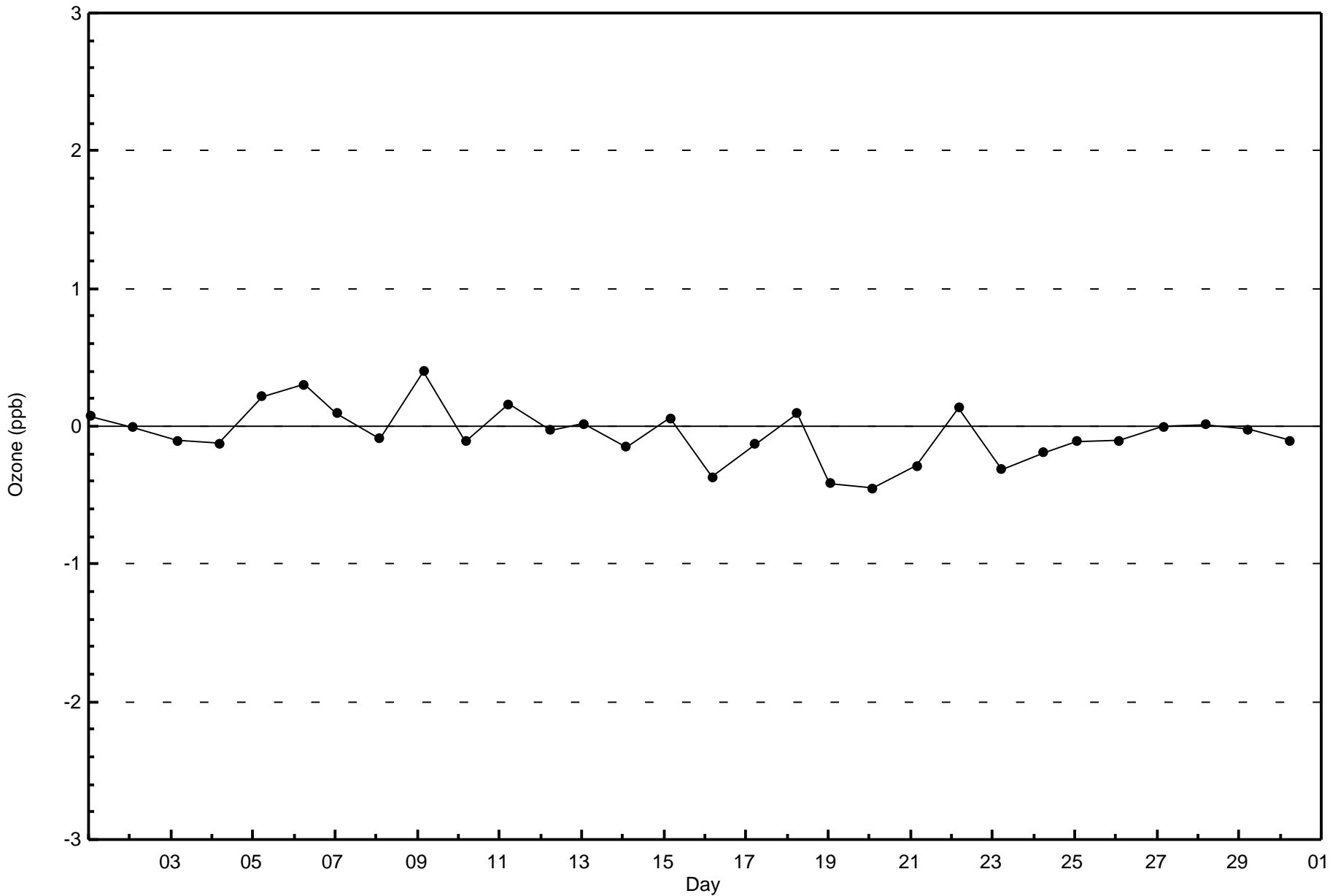
Total Number of Hours: 720

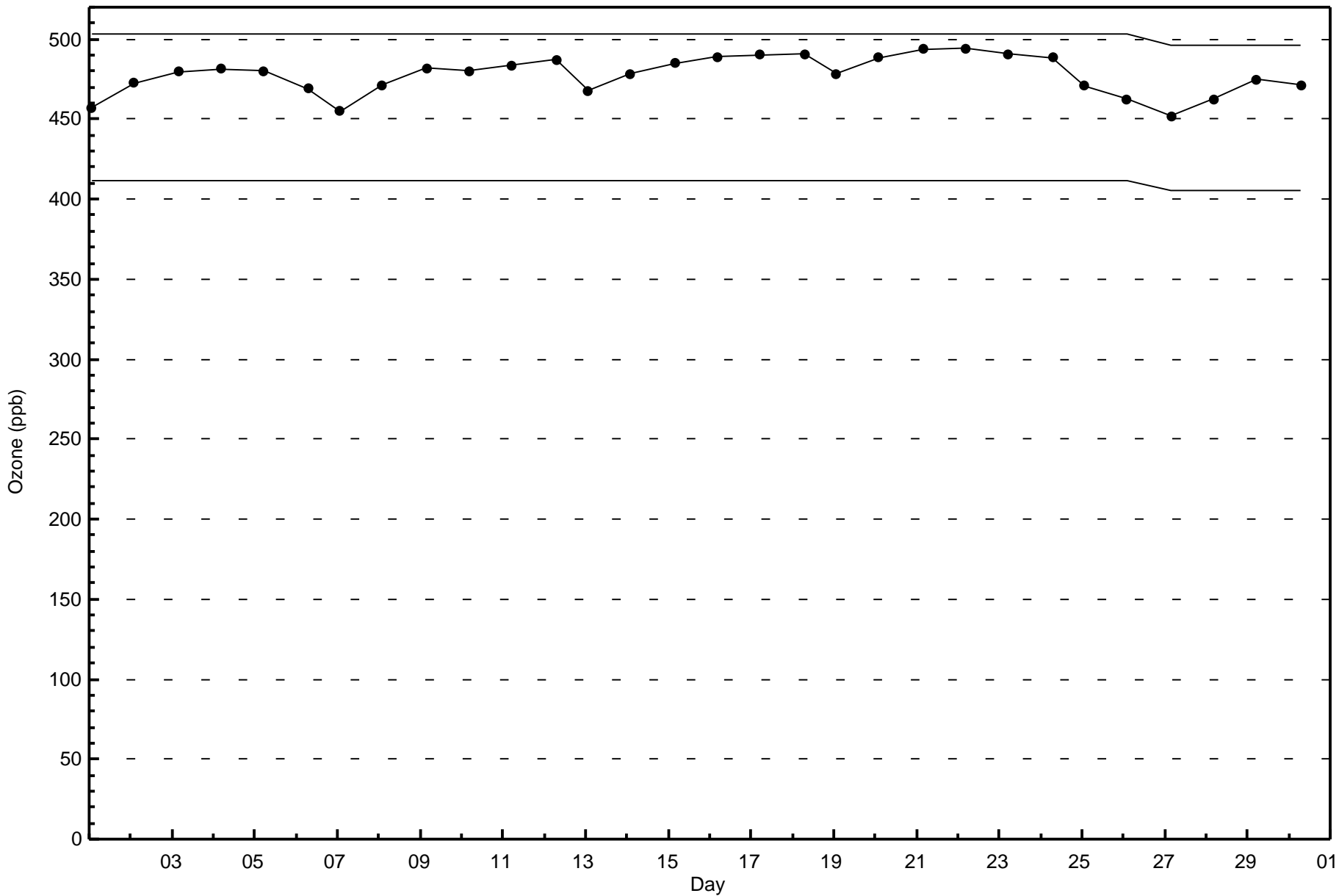


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAQO): 24-hr: 0	Hours in Service: 720
Maximum Value: 78.9 µg/m ³ on Apr 22 00:00	Maximum Daily Average: 9.8 µg/m ³ on Apr 30
Minimum Value: 0.0 µg/m ³ on Apr 2 04:00	Hours of Data: 688
Maximum Diurnal Average: 10.1 µg/m ³ at hour 24	Hours of Missing Data: 32
Monthly Average: 5.05 µg/m ³	Hours of Calibration: 3
Minimum Daily Average: 1.6 µg/m ³ on Apr 17	Percent Operational Time: 96.0
Minimum Diurnal Average: 2.7 µg/m ³ at hour 15	
Percentiles: P ₁ = 0.2 P ₁₀ = 1.2 Q ₁ = 2.1 Median = 3.3 Q ₃ = 5.9 P ₉₀ = 10.4 P ₉₉ = 30.1	

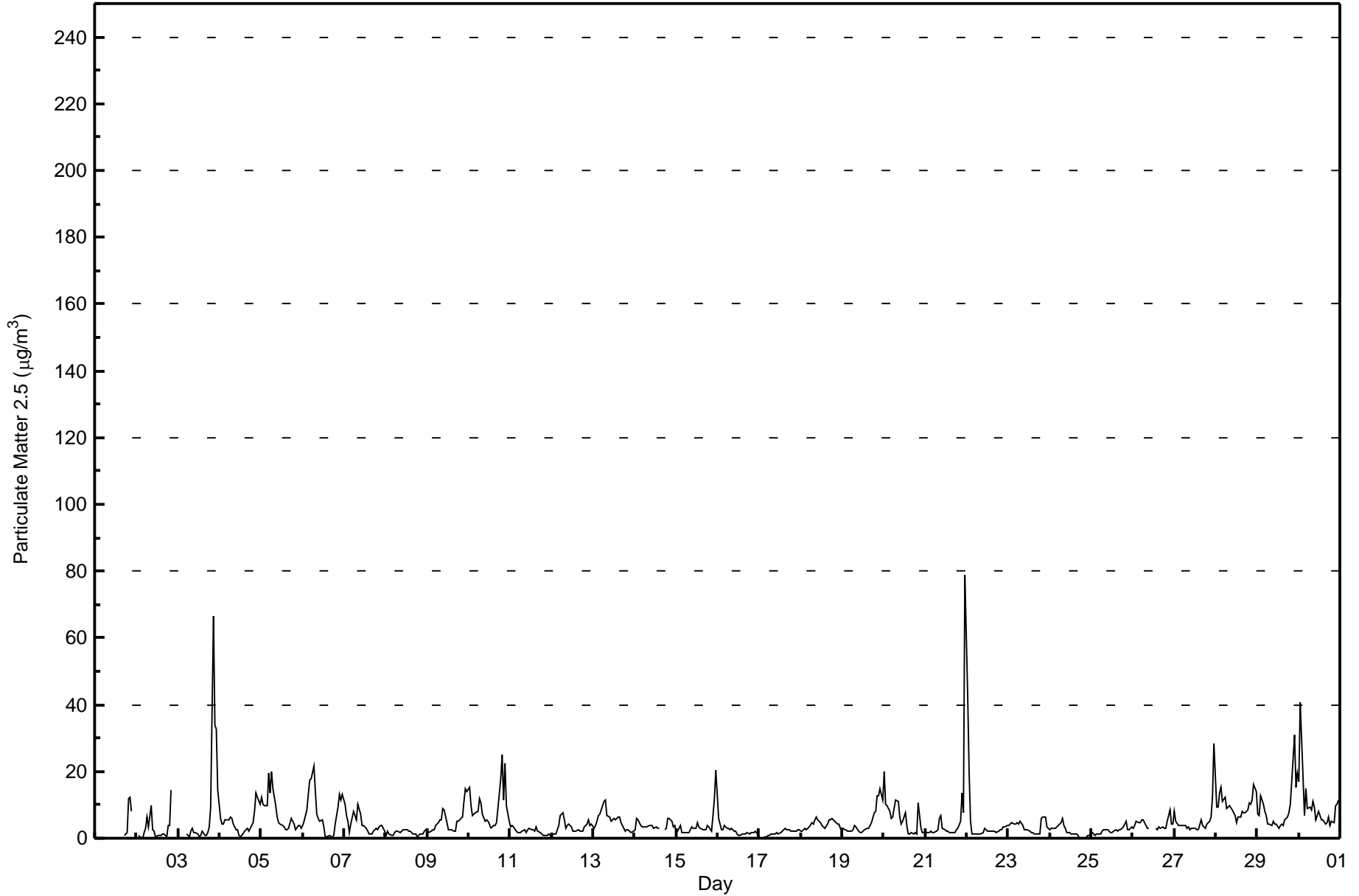
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0.2	0.3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.6	1.7	12.0	12.5	8.2	UO	UO	--	12.5
2-Apr	UO	0.8	0.6	0.0	1.7	3.0	6.4	3.5	9.9	2.7	2.2	0.5	0.7	0.6	1.0	1.2	1.3	0.5	4.0	3.8	14.4	UO	UO	UO	2.9	14.4
3-Apr	UO	UO	UO	UO	UO	1.2	0.4	2.0	2.8	1.9	1.6	1.2	0.6	0.9	2.1	0.9	0.9	1.5	3.5	9.4	66.5	33.7	32.6	14.5	9.4	66.5
4-Apr	5.9	4.3	4.3	5.4	5.3	5.6	6.3	5.9	4.3	2.6	2.6	0.9	0.5	1.0	2.3	2.6	2.8	2.1	3.9	4.6	8.0	13.6	12.5	10.4	4.9	13.6
5-Apr	12.2	10.3	9.8	9.6	19.4	13.4	19.7	14.9	9.7	6.1	4.8	4.1	3.7	3.2	2.7	2.4	2.9	5.8	5.2	4.4	2.5	3.7	3.7	3.0	7.4	19.7
6-Apr	3.7	5.2	8.6	13.0	17.4	17.6	21.5	13.8	7.3	6.1	5.1	5.4	3.6	0.5	0.4	0.7	0.4	0.2	0.8	4.1	9.5	13.2	11.5	13.1	7.6	21.5
7-Apr	10.2	6.6	5.1	1.6	4.3	7.9	6.6	5.7	10.1	7.1	3.9	3.6	3.2	3.1	1.3	1.3	1.3	2.1	2.9	2.4	3.4	4.0	3.7	2.2	4.3	10.2
8-Apr	1.0	2.0	1.2	0.7	0.9	1.8	2.1	2.0	1.8	2.0	2.3	2.6	2.5	2.2	2.2	1.9	1.2	1.2	0.5	1.0	1.5	1.2	1.9	2.4	1.7	2.6
9-Apr	2.7	1.6	2.2	2.7	2.6	3.8	4.8	5.6	5.6	8.9	8.3	4.5	2.7	2.7	2.5	2.1	2.3	5.2	5.3	5.6	6.5	11.1	14.9	13.8	5.3	14.9
10-Apr	15.2	9.6	6.8	7.3	7.6	7.9	11.8	10.7	7.0	5.2	5.7	5.3	4.4	3.1	3.7	3.8	4.6	8.8	17.6	24.9	11.6	22.4	9.6	4.9	9.2	24.9
11-Apr	3.4	4.0	3.5	2.3	1.7	1.7	1.9	2.2	2.5	1.9	2.7	3.0	2.5	2.7	2.3	3.3	2.2	1.7	1.4	1.0	0.8	0.6	1.2	1.0	2.1	4.0
12-Apr	0.9	1.1	1.2	2.7	3.7	6.7	7.6	5.3	2.9	3.9	4.2	3.2	2.2	2.3	2.0	2.6	2.1	2.0	2.0	3.3	4.1	5.7	4.0	4.4	3.3	7.6
13-Apr	2.9	3.8	4.9	6.6	7.4	9.9	11.2	11.3	6.9	6.5	5.3	5.3	5.9	5.5	6.6	6.3	4.5	3.8	2.1	2.4	2.5	2.0	1.5	2.2	5.3	11.3
14-Apr	2.6	5.8	5.5	3.9	3.5	3.4	3.3	3.3	3.8	3.7	3.7	3.0	3.4	3.0	3.0	UO	UO	2.6	3.1	6.1	6.0	5.2	3.5	3.9	3.9	6.1
15-Apr	1.9	2.0	3.7	1.7	1.6	1.5	1.6	1.8	2.4	3.2	3.0	3.2	4.7	3.5	2.9	2.6	2.4	2.7	4.0	3.5	1.9	6.6	11.8	20.4	3.9	20.4
16-Apr	6.1	4.1	2.3	2.5	3.6	3.2	3.0	2.4	2.9	2.0	2.2	1.3	0.8	0.8	1.1	1.4	1.2	1.7	1.4	1.5	1.5	1.6	2.0	0.7	2.2	6.1
17-Apr	0.0	UO	0.0	0.3	0.5	0.9	0.9	1.2	1.2	1.4	1.5	1.5	1.7	2.0	2.6	3.1	2.7	2.4	2.0	2.0	2.2	2.2	2.4	2.5	1.6	3.1
18-Apr	2.3	2.1	2.8	2.4	2.8	3.2	4.5	4.2	5.3	6.2	5.4	4.9	3.9	3.6	3.0	4.1	5.6	5.4	6.0	5.7	4.7	4.1	4.1	3.1	4.1	6.2
19-Apr	2.8	2.5	2.4	2.3	2.2	2.2	2.7	3.8	3.4	2.2	1.7	1.7	2.2	2.6	3.1	3.1	4.0	4.6	7.7	8.0	12.8	12.5	14.9	11.4	4.9	14.9
20-Apr	19.9	10.3	10.0	7.9	5.9	6.2	9.1	11.5	10.9	6.2	4.4	5.3	7.7	3.9	1.3	1.4	1.5	1.3	1.5	1.4	10.4	3.0	1.8	1.6	6.0	19.9
21-Apr	1.5	1.7	1.7	2.1	1.9	1.7	2.1	2.7	5.9	6.7	3.0	2.7	2.3	2.0	1.9	1.6	1.6	1.7	2.6	3.1	5.3	13.5	7.7	78.9	6.5	78.9
22-Apr	42.9	20.1	4.9	1.5	1.3	1.2	1.2	1.1	1.4	1.5	2.8	2.6	2.3	2.2	2.3	2.2	2.1	1.9	2.0	2.4	2.7	3.3	3.5	3.8	4.7	42.9
23-Apr	3.6	4.4	4.6	4.2	4.2	4.8	4.4	5.2	3.8	2.7	2.7	2.6	2.1	1.8	1.5	1.3	1.3	1.2	1.4	5.8	6.5	6.5	3.3	3.1	3.5	6.5
24-Apr	2.5	3.0	3.0	3.2	3.2	3.7	4.5	6.0	3.9	3.1	1.9	1.6	1.3	1.3	1.4	1.3	0.9	0.2	0.0	0.0	0.0	0.2	0.7	1.0	2.0	6.0
25-Apr	1.6	1.1	1.0	1.1	1.3	1.3	2.2	2.5	2.6	2.7	2.3	1.7	1.9	2.2	2.4	2.1	2.4	2.6	3.2	4.2	5.1	2.6	2.7	3.2	2.3	5.1
26-Apr	3.1	3.8	5.0	4.5	4.6	5.5	5.7	4.8	3.1	2.8	C	C	C	3.2	2.8	3.3	3.1	3.2	3.0	3.2	5.2	8.6	4.4	4.3	4.2	8.6
27-Apr	7.8	5.2	3.9	3.7	3.9	4.0	4.0	2.9	3.3	2.5	3.0	2.9	2.9	2.6	2.7	5.7	3.6	3.3	2.9	4.3	5.1	6.3	12.1	28.2	5.3	28.2
28-Apr	9.1	9.5	13.5	15.3	10.9	12.3	8.7	9.3	9.7	8.4	7.7	6.9	4.7	6.4	6.5	8.2	7.5	7.8	8.5	10.5	10.0	11.6	15.9	14.2	9.7	15.9
29-Apr	7.4	6.7	12.5	10.1	8.1	6.7	4.1	4.1	3.8	4.9	4.4	4.3	3.1	3.9	4.1	3.9	5.6	6.5	7.8	10.0	16.8	30.8	15.4	19.5	8.5	30.8
30-Apr	16.8	40.5	18.0	6.8	15.0	9.0	9.3	8.4	11.1	9.2	5.5	8.2	6.6	5.4	5.6	4.3	4.6	6.3	4.0	5.0	4.7	9.9	10.4	11.3	9.8	40.5
																								Diurnal Average		
																								Diurnal Maximum		

C - Calibration	UO - Unstable Operation	PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³		



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	448	65.12	65.12
6 - 15	167	24.27	89.39
16 - 25	16	2.33	91.72
26 - 80	8	1.16	92.88
> 81.0	0	0.00	92.88

Total Number of Valid Hours: 688

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	137	42	24	8	11	5	14	71	51	8	2	1	5	6	19	44	448
6 - 15	20	8	5	3	2	2	12	34	30	9	7	4	7	5	4	15	167
16 - 25	0	0	0	0	0	0	0	2	6	4	2	1	1	0	0	0	16
26 - 80	0	0	0	0	0	0	0	0	0	3	4	1	0	0	0	0	8
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	157	50	29	11	13	7	26	107	87	24	15	7	13	11	23	59	639

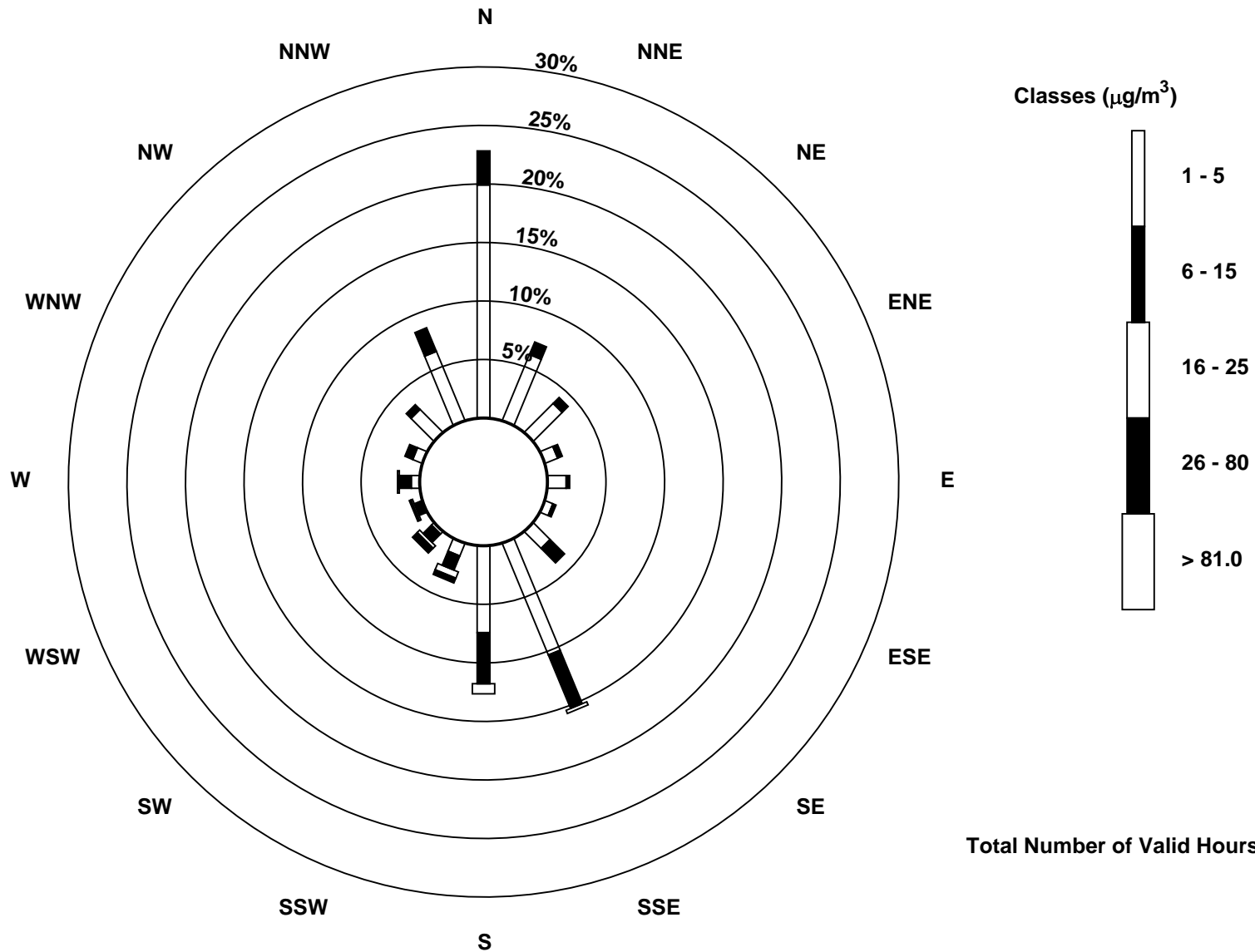
Total Number of Valid Hours: 688

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter (AMS 1)





Number of Exceedences (AAAQO): 1-hr: 0	Hours in Service: 720
Maximum Value: 0 ppb on Apr 1 01:00	Maximum Daily Average: 0.0 ppb on Apr 1
Minimum Value: 0 ppb on Apr 1 01:00	Hours of Data: 634
Maximum Diurnal Average: 0.0 ppb at hour 1	Hours of Missing Data: 86
Monthly Average: 0.0 ppb	Hours of Calibration: 43
Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0	Percent Operational Time: 94.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
2-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
3-Apr	0	0	0	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
4-Apr	0	0	0	0	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
5-Apr	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
6-Apr	0	0	0	0	0	0	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
7-Apr	0	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
8-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
10-Apr	0	0	0	0	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
11-Apr	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
12-Apr	0	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
13-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
14-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
15-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16-Apr	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
17-Apr	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
18-Apr	0	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
20-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
21-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
22-Apr	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
23-Apr	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	0	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	0	0	0	Z	RE	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	--	0
26-Apr	0	0	0	0	Z	RE	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27-Apr	0	0	0	0	0	Z	RE	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	--	0
28-Apr	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
29-Apr	0	0	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
30-Apr	0	0	0	0	0	0	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0

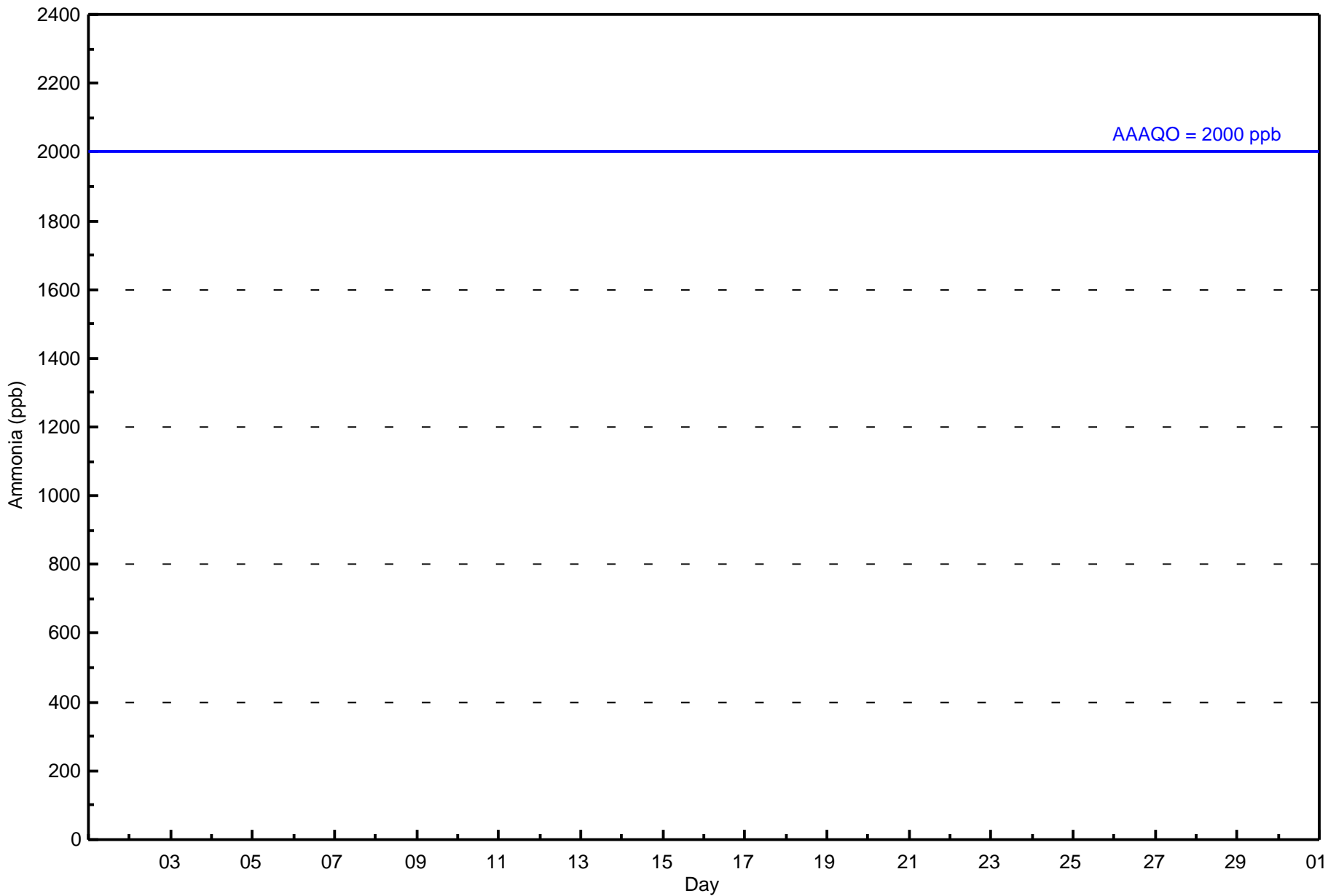
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance PF - Power Failure RE - Recovery
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	634	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 634

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	157	46	25	12	17	10	21	85	83	26	24	10	18	14	31	55	634
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	157	46	25	12	17	10	21	85	83	26	24	10	18	14	31	55	634

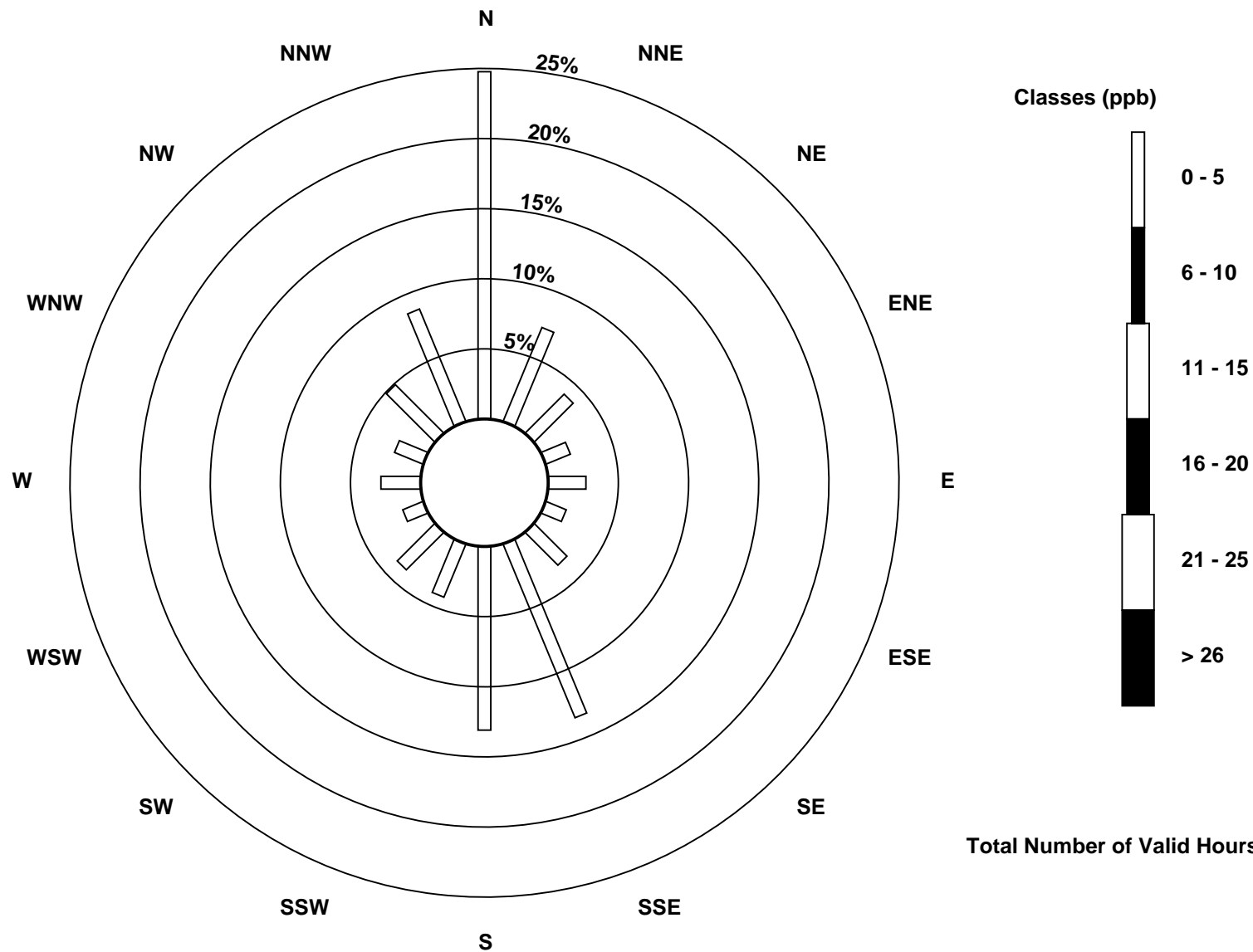
Total Number of Valid Hours: 634

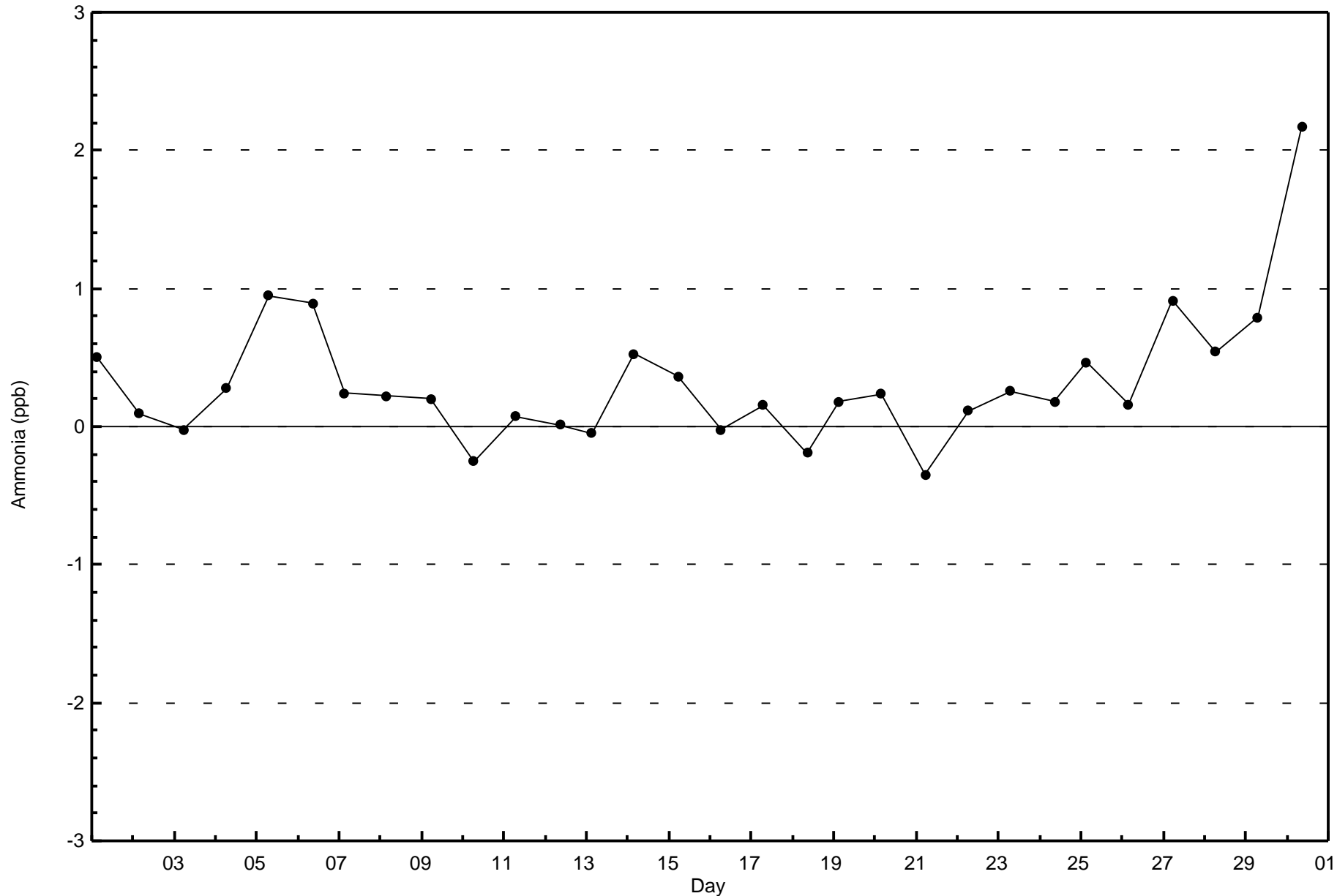
Total Number of Hours: 720

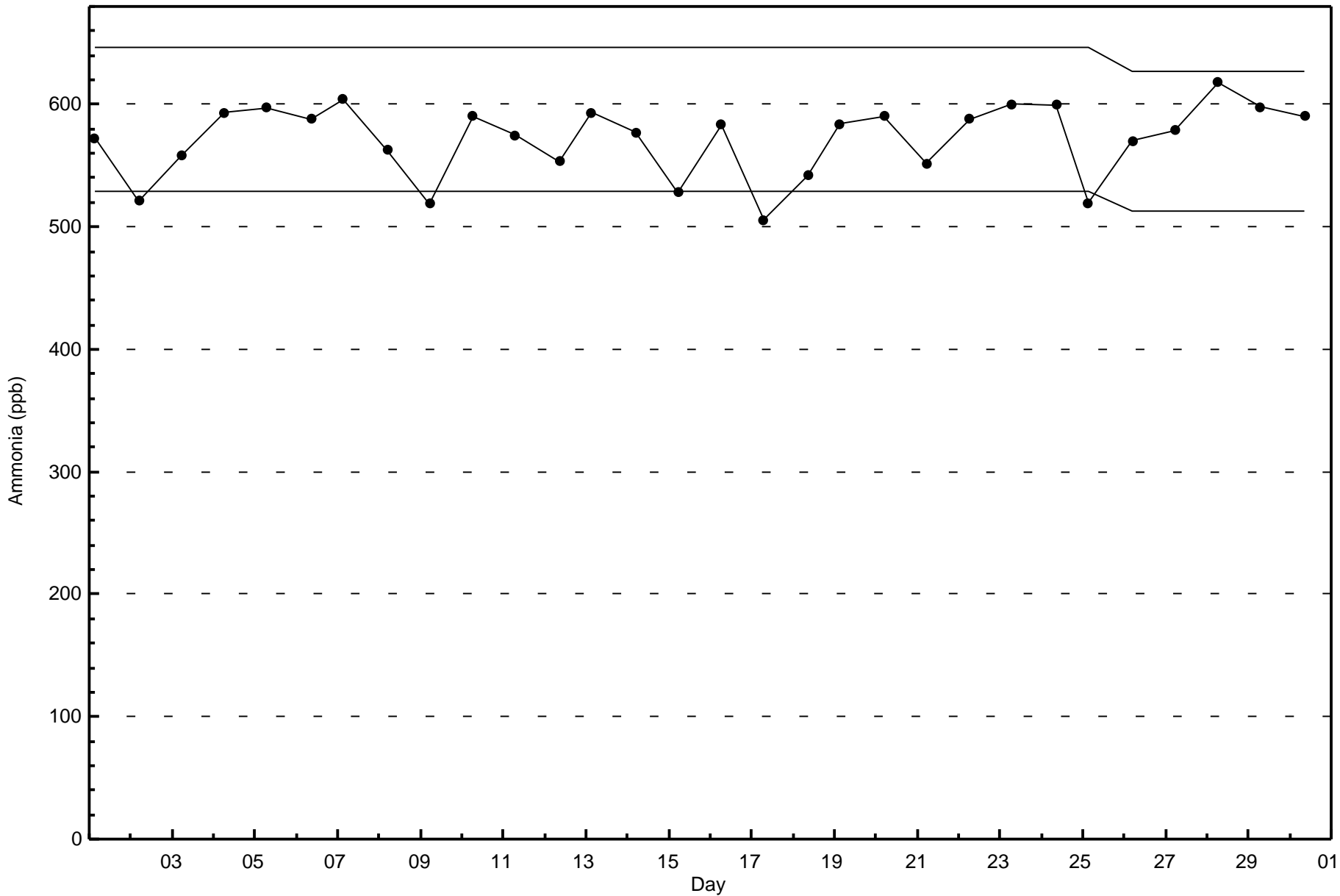


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter (AMS 1)









Wood Buffalo Environmental Association
Summary of Hour Averages

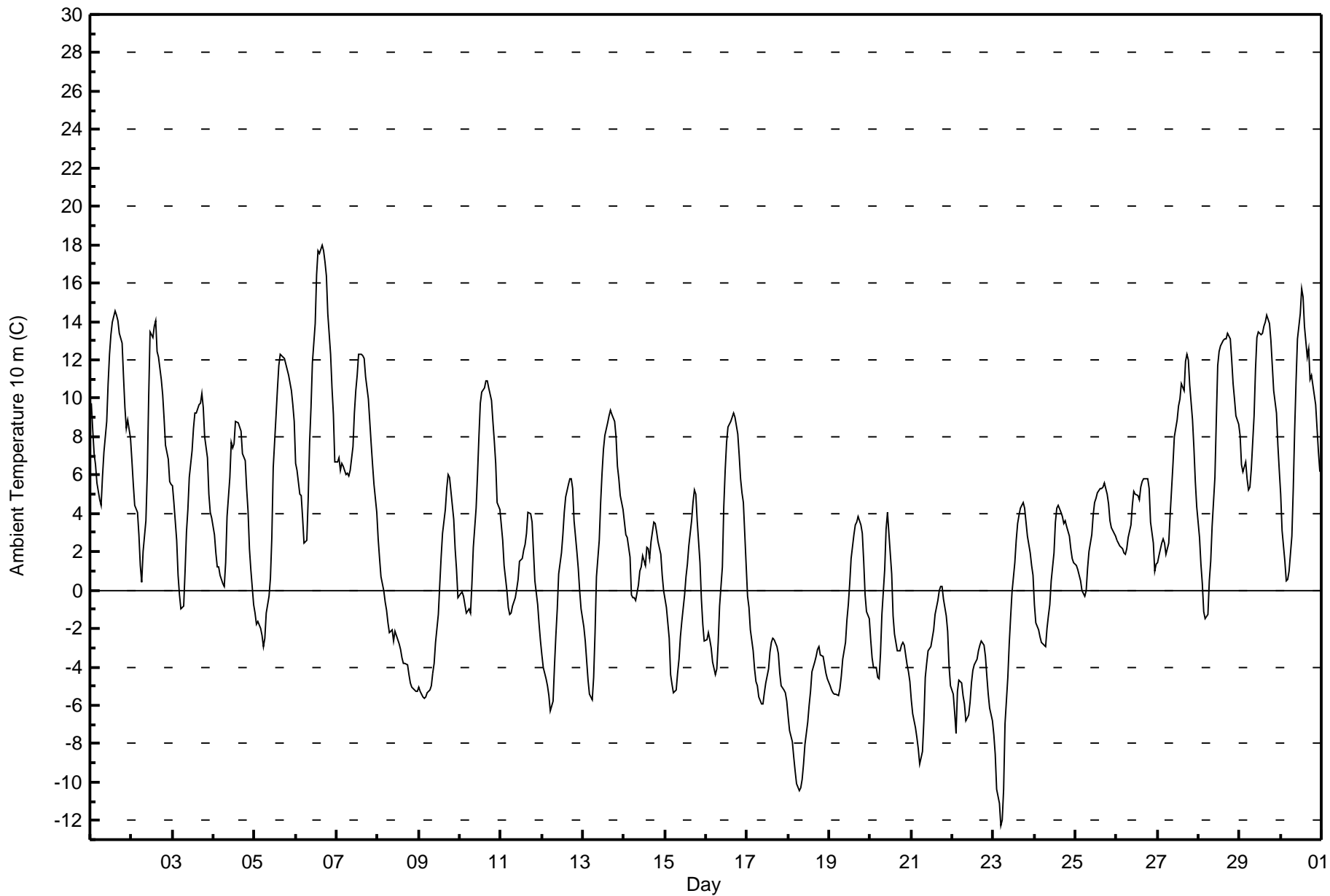
Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - April 2017

Maximum Value: 18.0 C on Apr 6 16:00		Maximum Daily Average: 10.6 C on Apr 6		Hours in Service: 720																							
Minimum Value: -12.3 C on Apr 23 05:00		Minimum Daily Average: -6.4 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 6.6 C at hour 17		Minimum Diurnal Average: -2.2 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 2.52 C		Percentiles: P ₁ = -10.2 P ₁₀ = -5.1 Q ₁ = -2.5 Median = 2.3 Q ₃ = 6.6 P ₉₀ = 11.0 P ₉₉ = 16.3		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	9.7	8.4	7.1	6.5	5.6	4.7	4.4	6.0	7.2	8.8	10.8	12.3	13.3	14.0	14.6	14.3	14.0	13.4	12.8	11.1	9.5	8.4	8.9	8.0	9.7	14.6	
2-Apr	6.8	5.5	4.4	4.0	2.9	1.3	0.4	2.0	3.6	6.1	10.1	13.4	13.2	13.8	14.0	12.5	12.1	11.0	10.2	8.9	7.6	6.8	5.6	5.5	7.6	14.0	
3-Apr	5.4	4.6	2.6	0.8	-0.2	-1.0	-0.8	1.0	3.1	4.2	5.9	7.3	8.5	9.2	9.3	9.7	9.8	10.3	9.6	8.0	6.9	5.0	4.0	3.7	5.3	10.3	
4-Apr	2.9	1.9	1.2	1.2	0.7	0.3	0.2	1.5	3.9	5.9	7.7	7.4	7.6	8.8	8.7	8.5	8.3	7.1	6.8	5.3	4.1	2.2	1.0	-0.7	4.3	8.8	
5-Apr	-1.2	-1.8	-1.6	-2.0	-2.3	-3.0	-2.5	-1.2	-0.3	0.6	2.7	6.4	9.1	10.5	11.7	12.3	12.2	12.1	11.8	11.5	11.2	10.4	9.7	8.8	5.2	12.3	
6-Apr	6.6	6.3	5.0	4.9	3.8	2.5	2.6	4.8	7.7	9.5	11.9	13.9	16.5	17.7	17.5	18.0	17.7	17.1	16.4	14.4	12.3	10.6	9.2	6.7	10.6	18.0	
7-Apr	6.6	6.9	6.3	6.6	6.5	6.0	6.1	6.0	6.2	7.5	9.2	10.4	11.2	12.3	12.3	12.2	12.1	11.1	10.0	8.8	7.6	6.6	5.5	4.0	8.2	12.3	
8-Apr	2.7	1.7	0.7	0.0	-0.6	-1.1	-1.7	-2.2	-2.1	-2.7	-2.2	-2.3	-2.8	-3.1	-3.5	-3.8	-3.8	-3.9	-4.4	-4.8	-5.0	-5.2	-5.3	-5.3	-2.5	2.7	
9-Apr	-5.1	-5.3	-5.6	-5.6	-5.5	-5.4	-5.2	-5.0	-4.3	-3.8	-2.7	-1.3	0.3	1.7	3.0	4.2	5.3	6.0	5.9	5.2	3.7	2.2	1.1	-0.4	-0.7	6.0	
10-Apr	-0.2	-0.1	-0.3	-0.8	-1.2	-1.0	-1.2	0.4	2.2	4.3	6.0	8.0	9.8	10.3	10.5	10.9	10.9	10.6	9.9	8.8	7.7	6.6	4.6	4.2	5.0	10.9	
11-Apr	3.4	2.6	1.3	-0.1	-0.9	-1.2	-1.2	-0.9	-0.4	0.0	0.5	1.5	1.7	2.1	2.4	2.9	4.0	4.0	3.5	2.0	0.5	-0.8	-1.8	-2.6	0.9	4.0	
12-Apr	-3.4	-4.0	-4.6	-5.0	-5.5	-6.3	-5.8	-3.9	-2.4	-0.9	0.9	2.0	2.9	4.0	4.8	5.5	5.8	5.8	5.3	3.6	2.0	1.2	0.0	-1.0	0.0	5.8	
13-Apr	-1.9	-2.7	-3.7	-4.7	-5.5	-5.7	-4.6	-2.2	0.7	2.6	4.6	6.1	7.3	8.0	8.7	9.1	9.4	9.2	8.8	8.0	6.5	5.8	4.9	4.2	3.0	9.4	
14-Apr	3.6	2.9	2.7	1.7	-0.3	-0.4	-0.4	-0.5	0.3	1.0	1.2	1.8	1.3	2.2	2.2	1.6	2.5	3.5	3.5	3.0	2.5	1.8	0.8	0.0	1.6	3.6	
15-Apr	-0.5	-0.9	-2.5	-4.4	-4.9	-5.3	-5.2	-4.3	-3.6	-2.4	-1.6	-0.2	0.7	1.4	2.3	3.6	4.5	5.2	5.0	3.6	1.4	-0.4	-1.8	-2.7	-0.5	5.2	
16-Apr	-2.6	-2.2	-2.6	-3.0	-3.7	-4.4	-4.1	-2.7	-0.8	1.2	4.3	6.2	7.7	8.5	8.8	9.0	9.2	9.0	8.2	7.0	5.8	5.1	4.6	1.3	2.9	9.2	
17-Apr	-0.3	-0.9	-2.0	-3.2	-4.1	-4.7	-5.0	-5.6	-5.9	-5.9	-5.3	-4.8	-4.1	-3.3	-2.7	-2.5	-2.6	-2.9	-3.3	-4.3	-5.0	-5.2	-5.4	-5.8	-4.0	-0.3	
18-Apr	-6.6	-7.3	-7.9	-8.7	-9.4	-10.1	-10.4	-10.3	-9.8	-9.1	-8.1	-6.9	-6.0	-5.3	-4.3	-3.7	-3.4	-3.1	-2.9	-3.3	-3.5	-3.9	-4.3	-4.7	-6.4	-2.9	
19-Apr	-5.0	-5.2	-5.3	-5.4	-5.4	-5.5	-5.2	-4.5	-3.6	-2.7	-1.5	-0.8	0.3	1.7	2.9	3.4	3.6	3.8	3.4	2.9	1.5	-0.3	-1.1	-1.5	-1.2	3.8	
20-Apr	-2.6	-3.5	-4.0	-4.1	-4.5	-4.6	-3.3	-1.3	1.0	3.2	4.1	3.0	0.8	-1.3	-2.3	-2.7	-3.2	-3.2	-2.9	-2.7	-2.9	-3.9	-4.2	-4.7	-2.1	4.1	
21-Apr	-5.7	-6.5	-7.2	-7.7	-8.2	-9.1	-8.4	-6.8	-4.6	-3.8	-3.2	-3.0	-2.5	-2.1	-1.3	-0.5	0.0	0.2	0.2	-0.5	-1.3	-2.2	-3.9	-5.0	-3.9	0.2	
22-Apr	-5.4	-6.4	-7.5	-5.3	-4.7	-4.8	-5.5	-6.0	-6.8	-6.5	-5.9	-4.9	-4.2	-3.9	-3.6	-3.2	-2.9	-2.7	-2.9	-3.4	-4.4	-5.4	-6.2	-6.8	-5.0	-2.7	
23-Apr	-7.5	-8.5	-10.4	-11.1	-12.3	-11.9	-10.4	-6.9	-4.6	-2.8	-1.4	-0.1	1.5	2.6	3.4	3.9	4.3	4.6	4.3	3.5	2.8	1.9	1.3	0.8	-2.2	4.6	
24-Apr	-0.8	-1.7	-2.1	-2.5	-2.8	-2.8	-3.0	-2.0	-1.3	-0.7	0.5	1.9	3.5	4.3	4.4	4.0	3.8	3.5	3.7	3.3	2.8	2.2	1.7	1.4	0.9	4.4	
25-Apr	1.3	1.0	0.8	0.5	0.0	-0.3	0.0	1.2	2.0	2.9	3.9	4.6	4.8	5.1	5.3	5.3	5.4	5.6	5.0	4.5	3.6	3.2	3.1	2.8	3.0	5.6	
26-Apr	2.6	2.4	2.3	2.1	2.0	1.9	2.1	2.7	3.4	4.4	5.1	5.0	4.9	4.7	5.4	5.6	5.8	5.8	5.8	5.3	3.6	2.4	1.0	1.3	3.7	5.8	
27-Apr	1.4	1.8	2.5	2.7	2.5	1.9	2.4	3.9	5.2	6.5	8.0	8.8	9.6	10.0	10.7	10.4	11.9	12.3	12.0	10.7	8.9	7.4	5.7	4.3	6.7	12.3	
28-Apr	2.7	1.4	0.3	-1.1	-1.5	-1.3	0.4	1.5	3.3	5.9	8.9	11.7	12.5	12.7	13.0	13.1	13.1	13.4	13.1	12.0	10.8	9.9	9.1	8.7	7.2	13.4	
29-Apr	8.1	6.5	6.2	6.7	5.8	5.2	5.4	6.3	9.1	11.5	13.2	13.5	13.3	13.4	13.7	13.9	14.3	13.9	13.0	11.7	10.4	9.2	7.5	6.2	9.9	14.3	
30-Apr	5.0	3.1	1.5	0.5	0.5	1.0	2.8	5.3	8.3	10.9	13.1	14.4	15.7	15.3	13.8	12.1	12.6	11.0	11.2	10.7	9.6	8.4	7.2	6.1	8.3	15.7	
		0.7	0.0	-0.7	-1.2	-1.8	-2.2	-1.9	-0.8	0.6	1.9	3.4	4.5	5.3	5.8	6.2	6.3	6.6	6.5	6.1	5.2	4.0	3.0	2.1	1.2	Diurnal Average	
		9.7	8.4	7.1	6.7	6.5	6.0	6.1	6.3	9.1	11.5	13.2	14.4	16.5	17.7	17.5	18.0	17.7	17.1	16.4	14.4	12.3	10.6	9.7	8.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	267	37.08	37.08
0 - 10	361	50.14	87.22
10 - 20	92	12.78	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

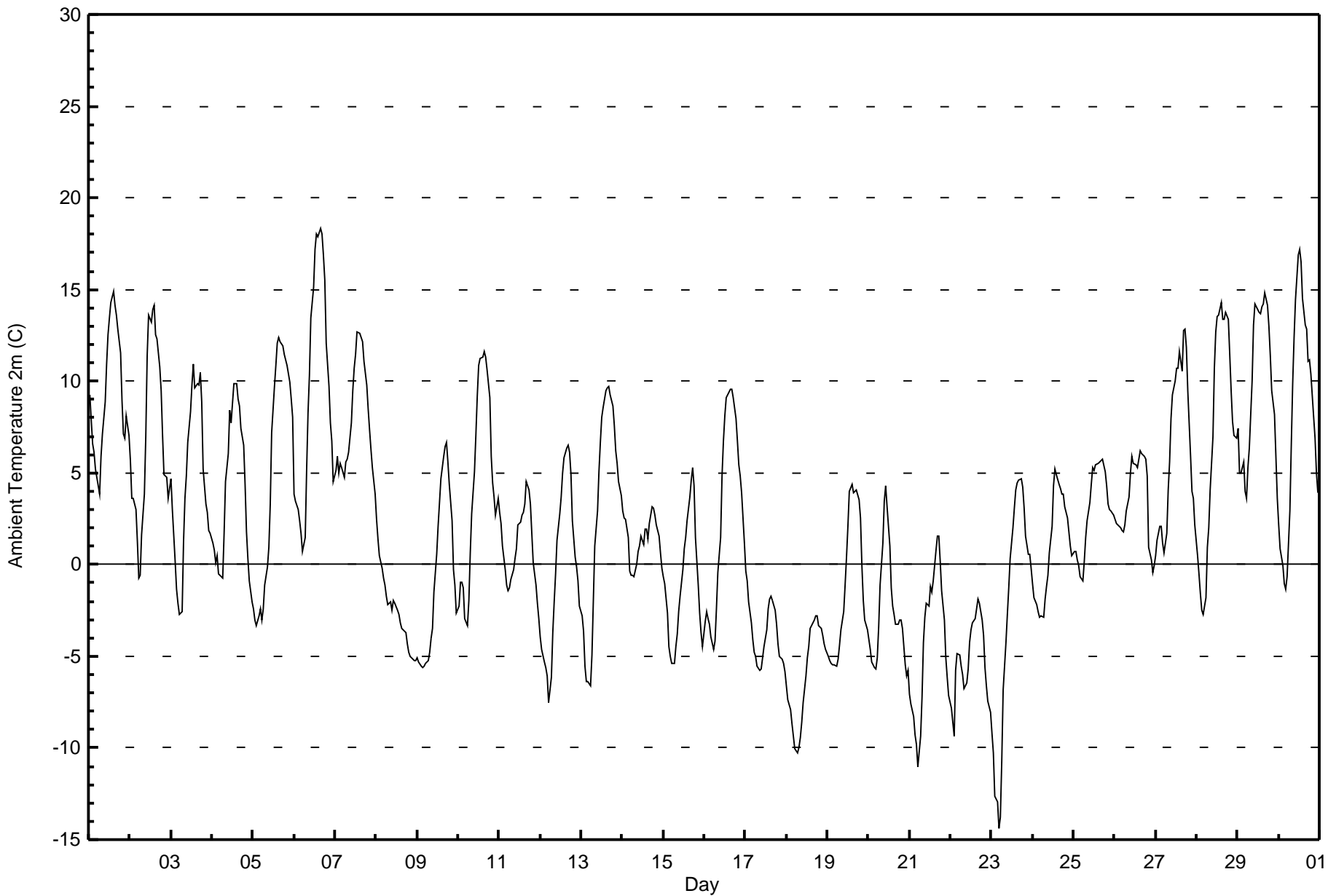
Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - April 2017

Maximum Value: 18.3 C on Apr 6 16:00		Maximum Daily Average: 9.6 C on Apr 6		Hours in Service: 720																						
Minimum Value: -14.4 C on Apr 23 05:00		Minimum Daily Average: -6.1 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 6.9 C at hour 17		Minimum Diurnal Average: -3.0 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 2.26 C		Percentiles: P ₁ = -10.3 P ₁₀ = -5.3 Q ₁ = -2.6 Median = 1.9 Q ₃ = 6.1 P ₉₀ = 11.2 P ₉₉ = 16.6		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	9.3	7.9	6.6	6.1	5.2	4.3	3.8	5.9	7.1	8.9	10.9	12.5	13.5	14.3	14.9	14.2	13.6	12.8	11.6	8.9	7.1	6.9	8.1	7.1	9.2	14.9
2-Apr	5.7	3.6	3.6	3.0	1.2	-0.7	-0.6	1.6	3.8	7.0	11.4	13.6	13.2	13.9	14.1	12.5	12.3	10.8	9.5	7.0	4.9	4.8	3.6	4.1	6.8	14.1
3-Apr	4.7	3.0	0.2	-1.4	-2.1	-2.7	-2.6	1.3	3.6	4.8	6.6	8.3	9.8	10.9	9.6	9.9	9.8	10.5	8.9	5.2	3.3	2.8	1.9	1.7	4.5	10.9
4-Apr	1.2	0.8	0.1	0.5	-0.5	-0.6	-0.7	1.7	4.5	6.1	8.4	7.7	8.8	9.8	9.8	9.1	8.7	7.4	6.5	4.4	1.8	0.4	-0.9	-2.1	3.9	9.8
5-Apr	-2.4	-3.0	-3.3	-2.8	-2.4	-3.0	-2.4	-1.1	-0.1	1.0	3.3	7.2	9.7	10.9	12.1	12.3	12.1	11.9	11.5	11.2	10.9	9.9	9.1	8.1	5.0	12.3
6-Apr	3.9	3.4	3.0	2.4	1.7	0.7	1.5	5.1	8.2	10.3	13.4	15.1	17.2	18.0	17.9	18.3	18.0	16.8	15.5	12.1	9.7	7.7	6.7	4.5	9.6	18.3
7-Apr	5.1	5.9	5.0	5.5	5.3	4.8	5.6	5.7	6.1	7.7	9.5	10.7	11.5	12.7	12.6	12.4	12.2	11.1	9.8	8.5	7.4	6.3	5.3	3.8	7.9	12.7
8-Apr	2.4	1.4	0.5	-0.2	-0.7	-1.1	-1.7	-2.2	-2.0	-2.5	-1.9	-2.1	-2.5	-2.7	-3.2	-3.5	-3.5	-3.7	-4.3	-4.8	-5.0	-5.2	-5.2	-5.2	-2.5	2.4
9-Apr	-5.1	-5.3	-5.5	-5.6	-5.5	-5.4	-5.2	-4.8	-4.0	-3.5	-1.5	0.5	2.1	3.4	4.7	5.9	6.5	6.7	5.6	4.4	2.4	-0.2	-1.1	-2.6	-0.6	6.7
10-Apr	-2.3	-1.0	-1.0	-1.3	-3.0	-3.3	-1.9	0.6	2.7	5.0	7.0	9.2	10.9	11.3	11.3	11.6	11.3	10.6	9.1	5.9	4.5	3.6	2.7	3.6	4.5	11.6
11-Apr	2.8	2.2	1.0	-0.3	-1.1	-1.4	-1.3	-0.8	-0.3	0.3	0.9	2.2	2.4	2.7	2.8	3.3	4.5	4.0	3.3	1.7	0.1	-1.1	-2.1	-3.0	0.9	4.5
12-Apr	-3.9	-4.6	-5.3	-5.6	-6.1	-7.5	-6.2	-3.7	-2.0	-0.5	1.4	2.7	3.7	5.0	5.8	6.4	6.5	6.1	4.9	2.4	0.4	-0.1	-0.9	-2.2	-0.1	6.5
13-Apr	-2.8	-3.6	-5.5	-6.4	-6.4	-6.6	-4.9	-2.0	1.0	2.9	5.0	6.7	8.1	8.6	9.5	9.6	9.7	9.2	8.6	7.6	6.2	5.5	4.5	3.8	2.8	9.7
14-Apr	2.9	2.5	2.5	1.5	-0.4	-0.6	-0.6	-0.7	0.0	0.7	1.0	1.6	1.1	2.0	2.0	1.4	2.2	3.2	3.1	2.7	2.2	1.6	0.6	-0.2	1.3	3.2
15-Apr	-0.7	-1.0	-2.6	-4.5	-5.0	-5.4	-5.4	-4.5	-3.8	-2.6	-1.7	-0.3	0.8	1.5	2.4	3.7	4.6	5.3	4.3	1.5	-1.1	-2.7	-3.7	-4.5	-1.1	5.3
16-Apr	-3.1	-2.6	-2.9	-3.3	-3.9	-4.6	-4.2	-2.4	-0.4	1.4	4.8	6.7	8.1	9.1	9.4	9.5	9.5	9.1	8.0	6.7	5.4	4.8	3.9	1.2	2.9	9.5
17-Apr	-0.4	-0.9	-2.0	-3.2	-4.1	-4.8	-5.0	-5.5	-5.8	-5.7	-5.1	-4.5	-3.6	-2.4	-1.8	-1.7	-1.9	-2.5	-3.3	-4.3	-5.0	-5.2	-5.4	-5.8	-3.8	-0.4
18-Apr	-6.6	-7.4	-7.9	-8.7	-9.4	-10.0	-10.3	-10.0	-9.4	-8.6	-7.5	-6.0	-5.1	-4.4	-3.5	-3.2	-3.0	-2.8	-2.8	-3.3	-3.5	-3.8	-4.3	-4.7	-6.1	-2.8
19-Apr	-5.0	-5.3	-5.4	-5.4	-5.5	-5.6	-5.2	-4.4	-3.5	-2.6	-1.1	0.4	2.1	4.0	4.4	3.9	4.0	4.0	3.5	2.5	-0.1	-1.9	-3.0	-3.6	-1.2	4.4
20-Apr	-4.1	-4.7	-5.3	-5.6	-5.7	-5.1	-3.4	-1.1	1.2	3.5	4.3	3.2	1.0	-1.3	-2.2	-2.7	-3.2	-3.3	-3.0	-3.0	-3.4	-5.4	-6.0	-5.8	-2.6	4.3
21-Apr	-7.1	-7.6	-8.3	-9.3	-9.8	-11.0	-9.3	-7.2	-4.3	-2.9	-2.1	-2.3	-1.2	-1.5	-0.9	0.8	1.5	1.6	0.2	-1.4	-3.0	-5.1	-6.2	-7.1	-4.3	1.6
22-Apr	-7.9	-8.6	-9.3	-5.8	-4.9	-4.9	-5.5	-6.0	-6.8	-6.4	-5.7	-4.2	-3.6	-3.2	-2.9	-2.4	-1.9	-2.1	-3.0	-3.9	-5.6	-6.6	-7.4	-8.1	-5.3	-1.9
23-Apr	-9.2	-10.3	-12.7	-12.9	-14.4	-13.7	-10.8	-6.8	-4.3	-2.7	-1.2	0.3	2.0	3.1	4.1	4.5	4.6	4.7	4.2	3.1	1.6	0.6	0.6	-0.2	-2.7	4.7
24-Apr	-1.0	-1.8	-2.2	-2.6	-2.9	-2.8	-2.9	-1.9	-1.2	-0.6	0.6	2.1	4.3	5.2	4.9	4.4	4.1	3.9	3.8	3.2	2.5	1.8	1.0	0.5	0.9	5.2
25-Apr	0.7	0.7	0.3	0.0	-0.7	-0.9	0.2	1.5	2.4	3.4	4.4	5.3	5.1	5.4	5.5	5.6	5.7	5.8	5.0	4.3	3.3	3.0	2.9	2.7	3.0	5.8
26-Apr	2.5	2.3	2.1	2.0	1.8	1.8	2.1	2.9	3.7	5.0	5.9	5.5	5.4	5.3	5.7	6.2	6.0	5.9	5.8	4.8	1.0	0.2	-0.5	-0.1	3.5	6.2
27-Apr	0.5	1.3	2.1	2.1	1.2	0.6	1.7	4.0	5.6	7.9	9.3	10.0	10.7	10.7	11.6	10.6	12.8	12.8	11.9	9.5	5.9	4.0	3.6	2.2	6.4	12.8
28-Apr	0.4	-0.5	-1.6	-2.5	-2.8	-1.8	0.9	2.0	4.1	6.9	10.7	12.7	13.5	13.6	14.3	13.4	13.4	13.7	13.4	11.4	9.5	7.8	7.0	6.9	6.9	14.3
29-Apr	7.4	5.0	5.0	5.6	4.0	3.6	5.3	6.4	10.0	13.1	14.2	14.0	13.7	13.7	14.1	14.2	14.8	14.1	13.0	11.4	9.5	8.2	5.9	3.6	9.6	14.8
30-Apr	2.2	0.8	-0.1	-1.1	-1.4	-0.7	3.0	6.5	9.9	12.3	14.4	16.8	17.2	16.5	14.5	13.1	12.9	11.1	11.2	10.4	8.0	6.9	5.0	3.9	8.1	17.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	284	39.44	39.44
0 - 10	345	47.92	87.36
10 - 20	91	12.64	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



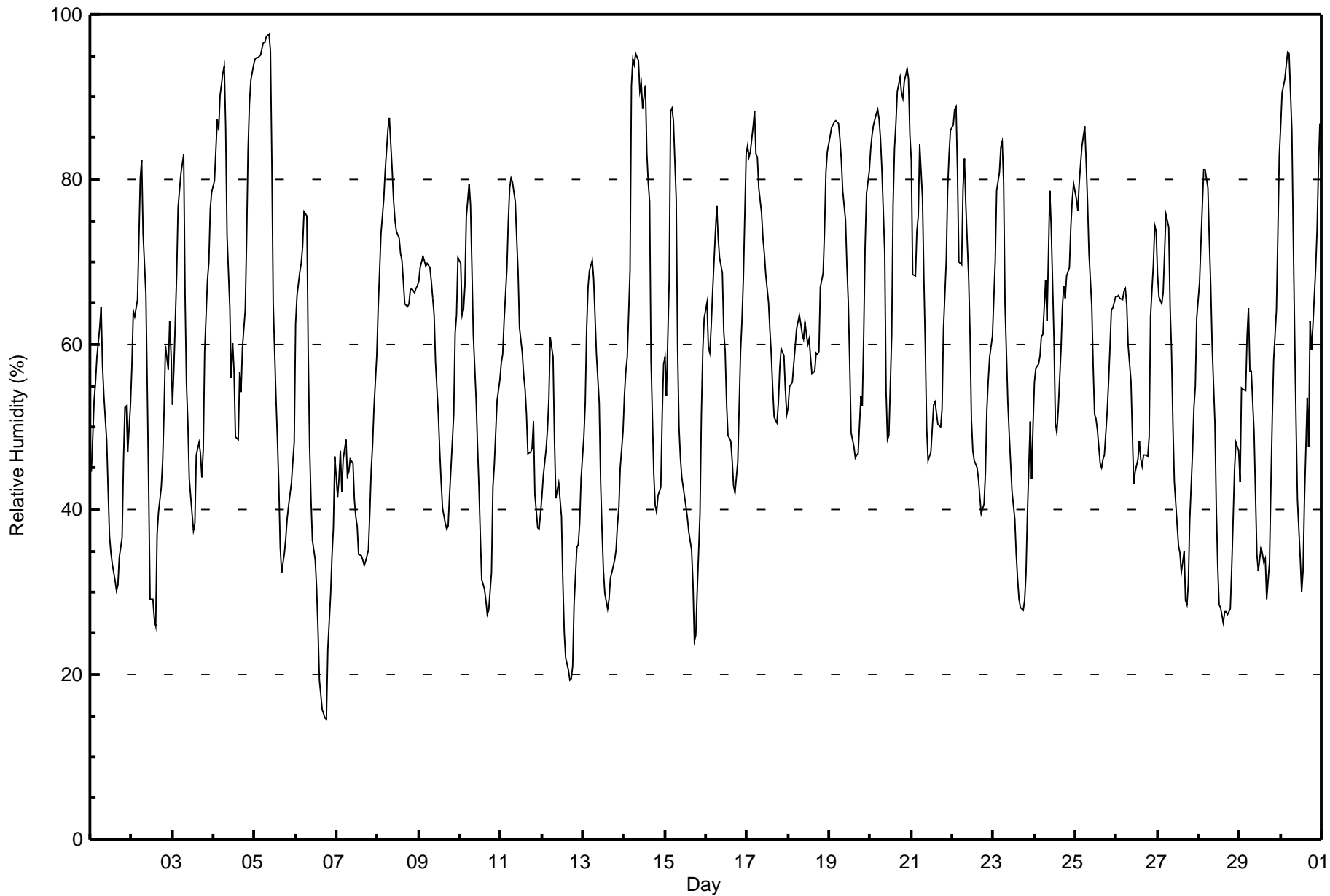
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - April 2017

Maximum Value: 98 % on Apr 5 09:00																	Maximum Daily Average: 81.0 % on Apr 20																	Hours in Service: 720	
Minimum Value: 15 % on Apr 6 19:00																	Minimum Daily Average: 37.9 % on Apr 12																	Hours of Data: 720	
Maximum Diurnal Average: 77.4 % at hour 6																	Minimum Diurnal Average: 42.3 % at hour 17																	Hours of Missing Data: 0	
Monthly Average: 58.3 %																	Percentiles: P ₁ = 20 P ₁₀ = 34 Q ₁ = 45 Median = 58 Q ₃ = 71 P ₉₀ = 84 P ₉₉ = 95																	Hours of Calibration: 0	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	45	49	53	55	58	62	65	57	54	48	42	37	35	33	31	30	31	34	37	46	52	53	47	53	46.1	65									
2-Apr	58	64	63	65	73	80	82	73	66	55	42	29	29	27	26	37	40	43	46	52	60	57	63	59	53.7	82									
3-Apr	53	57	68	77	79	81	83	66	55	51	44	40	37	38	47	48	47	44	47	59	68	70	76	79	58.9	83									
4-Apr	80	84	87	86	90	93	94	86	73	64	56	60	57	49	48	57	54	60	64	73	84	89	92	94	73.9	94									
5-Apr	95	95	95	95	96	97	97	97	98	96	82	65	53	48	43	35	32	35	37	39	40	43	46	48	66.9	98									
6-Apr	63	66	69	70	72	76	76	59	48	41	36	34	31	25	19	16	15	15	15	23	30	34	38	46	42.3	76									
7-Apr	41	44	47	42	46	48	44	44	46	46	41	39	38	35	34	34	33	34	35	40	45	48	52	59	42.3	59									
8-Apr	64	69	73	78	81	83	86	87	81	77	75	74	73	71	70	68	65	65	65	67	67	66	67	67	72.5	87									
9-Apr	68	69	71	70	70	70	69	68	66	64	58	52	47	43	40	38	38	38	42	45	52	61	64	71	57.1	71									
10-Apr	70	64	64	67	75	79	77	69	61	53	48	43	37	32	30	29	27	28	32	43	45	49	53	56	51.4	79									
11-Apr	58	59	63	69	75	79	80	80	77	73	69	62	59	56	55	52	47	47	47	51	42	38	38	39	58.9	80									
12-Apr	42	44	47	50	53	61	58	48	41	42	43	39	31	25	22	21	19	19	21	28	35	36	38	44	37.9	61									
13-Apr	49	53	62	67	69	70	68	63	59	53	43	37	33	30	28	29	32	32	34	35	38	40	45	50	46.6	70									
14-Apr	54	57	58	69	91	95	94	95	94	91	92	89	91	83	80	77	58	44	40	40	42	43	52	58	70.3	95									
15-Apr	59	54	68	88	89	87	78	60	50	46	44	42	40	39	37	35	31	24	25	30	39	52	59	63	51.6	89									
16-Apr	65	60	59	62	66	74	77	73	70	69	62	59	53	49	48	46	43	42	46	53	59	63	68	83	60.3	83									
17-Apr	84	83	83	86	88	83	83	79	76	73	71	69	65	62	59	54	51	51	53	57	60	59	55	51	68.1	88									
18-Apr	52	55	55	58	60	62	64	62	61	61	63	60	61	58	56	57	59	59	59	67	69	74	81	83	62.3	83									
19-Apr	85	86	87	87	87	87	85	82	79	75	69	65	58	49	48	46	47	47	54	53	61	72	78	81	69.5	87									
20-Apr	84	85	87	88	88	87	85	81	71	54	48	49	61	77	84	87	91	92	90	90	92	93	92	85	81.0	93									
21-Apr	82	68	68	74	76	84	78	68	60	50	46	47	50	53	53	50	50	50	52	62	70	79	83	86	64.1	86									
22-Apr	87	88	89	81	70	70	79	83	77	68	61	51	47	46	45	44	41	39	41	44	52	56	58	61	61.6	89									
23-Apr	66	70	79	81	84	85	80	65	53	49	46	42	39	35	32	29	28	28	29	32	40	51	44	50	51.4	85									
24-Apr	55	57	58	59	61	61	68	63	70	79	74	61	50	49	52	59	65	67	66	68	69	74	77	79	64.3	79									
25-Apr	78	76	79	82	84	86	82	77	71	65	57	51	51	50	46	45	46	47	52	55	60	64	64	66	64.0	86									
26-Apr	66	66	66	65	66	67	65	60	56	49	43	45	46	48	46	45	47	47	46	49	63	70	74	74	57.0	74									
27-Apr	68	66	65	66	71	76	74	64	59	50	43	38	36	35	32	35	29	28	31	39	47	52	55	63	51.0	76									
28-Apr	67	72	77	81	81	79	73	67	60	51	40	33	28	28	26	28	28	27	28	33	39	45	48	47	49.4	81									
29-Apr	43	55	55	54	61	64	57	57	49	42	35	33	35	35	34	34	29	34	43	51	58	64	73	83	49.1	83									
30-Apr	86	91	92	94	95	95	86	73	61	51	41	34	30	33	41	54	48	63	59	62	69	74	81	87	66.7	95									
65.5																	66.8																	Diurnal Average	
95																	95																	Diurnal Maximum	



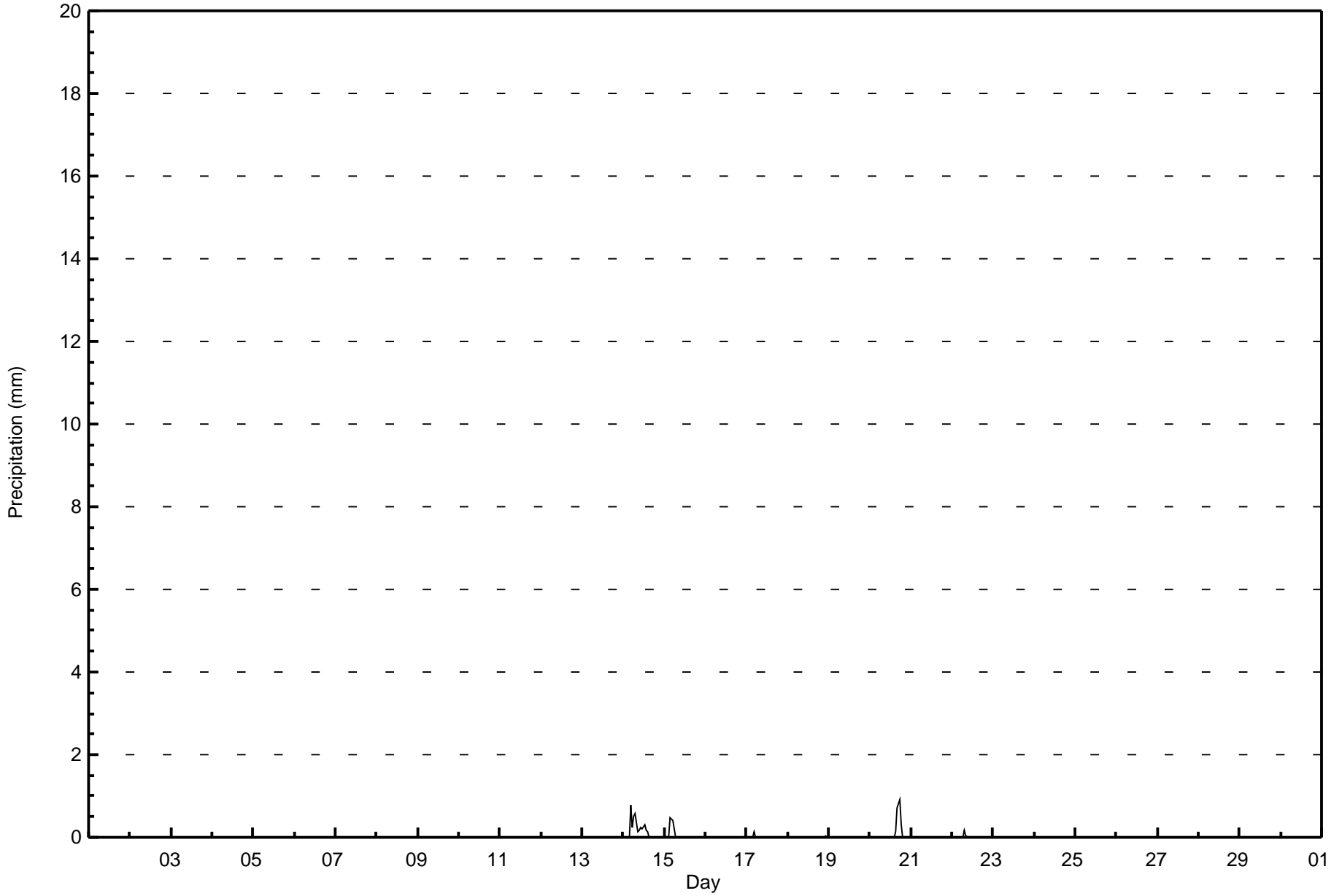


Maximum Value: 0.9 mm on Apr 20 18:00 Maximum Daily Total: 3.5 mm on Apr 14 Minimum Value: 0.0 mm on Apr 1 01:00 Minimum Daily Total: 0.0 mm on Apr 1 Maximum Diurnal Total: 1.4 mm at hour 5 Minimum Diurnal Total: 0.0 mm at hour 1 Monthly Total: 7.24 mm Percentiles: $P_1 = 0.0$ $P_{10} = 0.0$ $Q_1 = 0.0$ Median = 0.0 $Q_3 = 0.0$ $P_{90} = 0.0$ $P_{99} = 0.4$																							Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
2-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
3-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
4-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
5-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
6-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
7-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
8-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
9-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
10-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
11-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
12-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
13-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
14-Apr	0.0	0.0	0.0	0.0	0.8	0.2	0.5	0.6	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
15-Apr	0.0	0.0	0.0	0.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
16-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
17-Apr	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
18-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0																		
19-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
20-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
21-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
22-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
23-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
24-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
25-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
26-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
27-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
28-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
29-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
30-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
																							0.0	0.0	0.0	0.5	1.4	0.6	0.5	0.8	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.7	0.9	0.3	0.0	0.0	0.0	0.1	0.0	Diurnal Average	
																							0.0	0.0	0.0	0.5	0.8	0.4	0.5	0.6	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.7	0.9	0.3	0.0	0.0	0.0	0.1	0.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	712	98.89	98.89
0.4 - 0.5	4	0.56	99.44
0.6 - 0.7	2	0.28	99.72
0.8 - 1.4	2	0.28	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

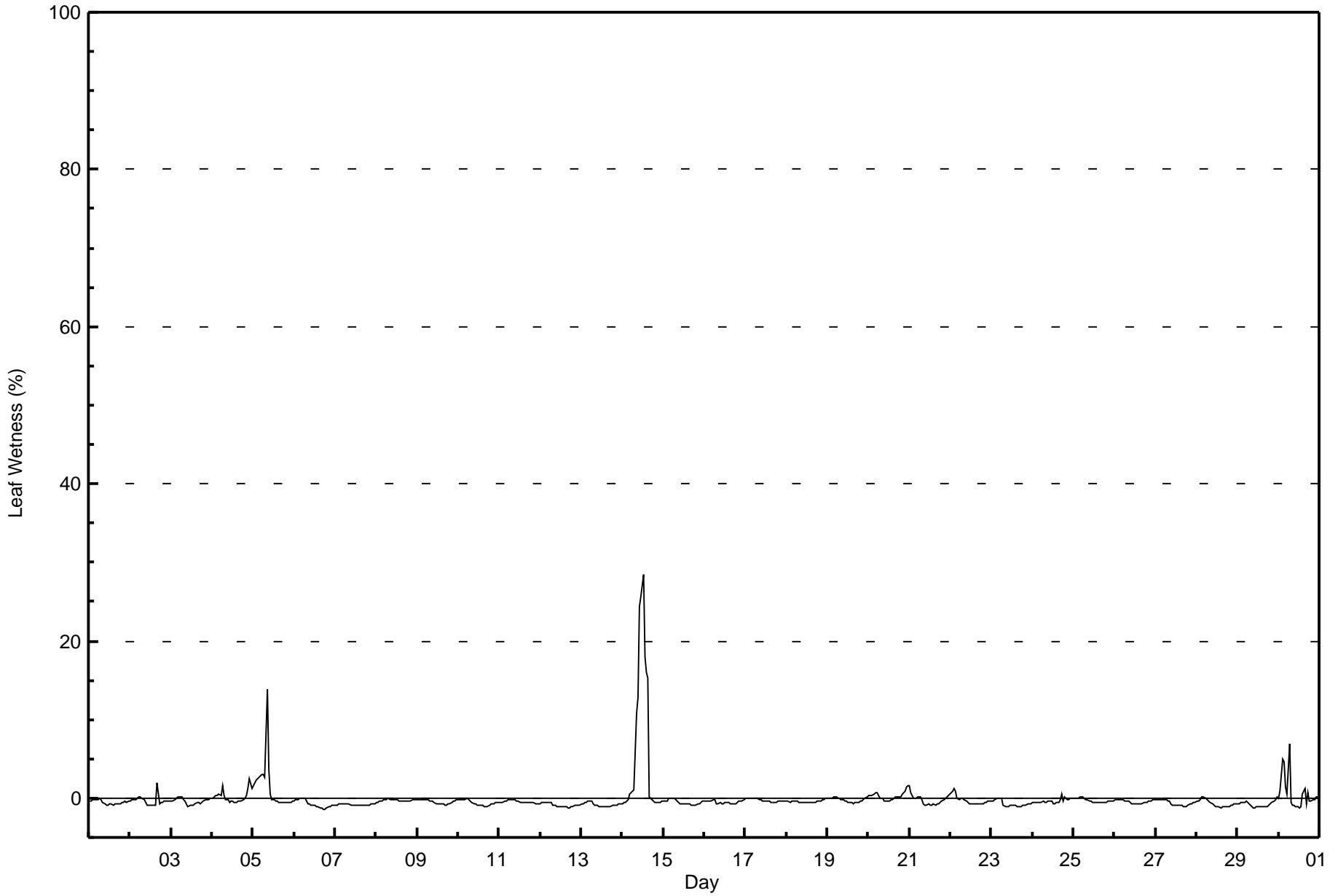
Fort McKay - Bertha Ganter - April 2017

Maximum Value: 28 % on Apr 14 13:00																	Maximum Daily Average: 6.2 % on Apr 14																	Hours in Service: 720			
Minimum Value: -1 % on Apr 6 18:00																	Minimum Daily Average: -0.9 % on Apr 12																	Hours of Data: 720			
Maximum Diurnal Average: 0.4 % at hour 9																	Minimum Diurnal Average: -0.7 % at hour 19																	Hours of Missing Data: 0			
Monthly Average: -0.1 %																	Percentiles: P ₁ = -1 P ₁₀ = -1 Q ₁ = -1 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 13																	Hours of Calibration: 0			
																																		Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	-0.5	0											
2-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	2	-1	-1	-1	0	0	0	0	-0.3	2											
3-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	-0.4	0												
4-Apr	0	0	0	0	0	0	2	0	0	0	-1	0	0	-1	-1	0	0	0	0	0	0	1	2	1	0.2	2											
5-Apr	2	2	2	3	3	3	3	3	14	4	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	0	0	1.3	14											
6-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.8	0											
7-Apr	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.8	-1											
8-Apr	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.3	0											
9-Apr	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	-0.5	0											
10-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.6	0											
11-Apr	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.4	0											
12-Apr	-1	-1	-1	-1	-1	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.9	0											
13-Apr	-1	-1	-1	-1	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.8	0											
14-Apr	-1	-1	-1	0	0	1	1	1	11	13	24	26	28	18	16	15	0	0	0	0	-1	-1	0	0	6.2	28											
15-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	-0.5	0											
16-Apr	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	-0.5	0											
17-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	0	0	0	0	0	-0.3	0											
18-Apr	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	0	0	-0.4	0											
19-Apr	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0	0	0	0	0	-0.2	0											
20-Apr	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.3	2											
21-Apr	2	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	0	-0.3	2											
22-Apr	1	1	1	1	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	-0.2	1											
23-Apr	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.7	0											
24-Apr	-1	-1	-1	-1	0	0	0	0	0	0	0	-1	-1	-1	-1	0	1	0	0	0	0	0	0	0	-0.4	1											
25-Apr	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	0	-0.3	0											
26-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	-0.5	0											
27-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.6	0											
28-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.7	0											
29-Apr	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	-0.8	0											
30-Apr	0	1	5	5	1	1	7	0	-1	-1	-1	-1	-1	-1	0	1	-1	1	0	0	0	0	0	0	0.6	7											
																																		Diurnal Average			
																																		Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Fort McKay - Bertha Ganter - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Fort McKay - Bertha Ganter - April 2017

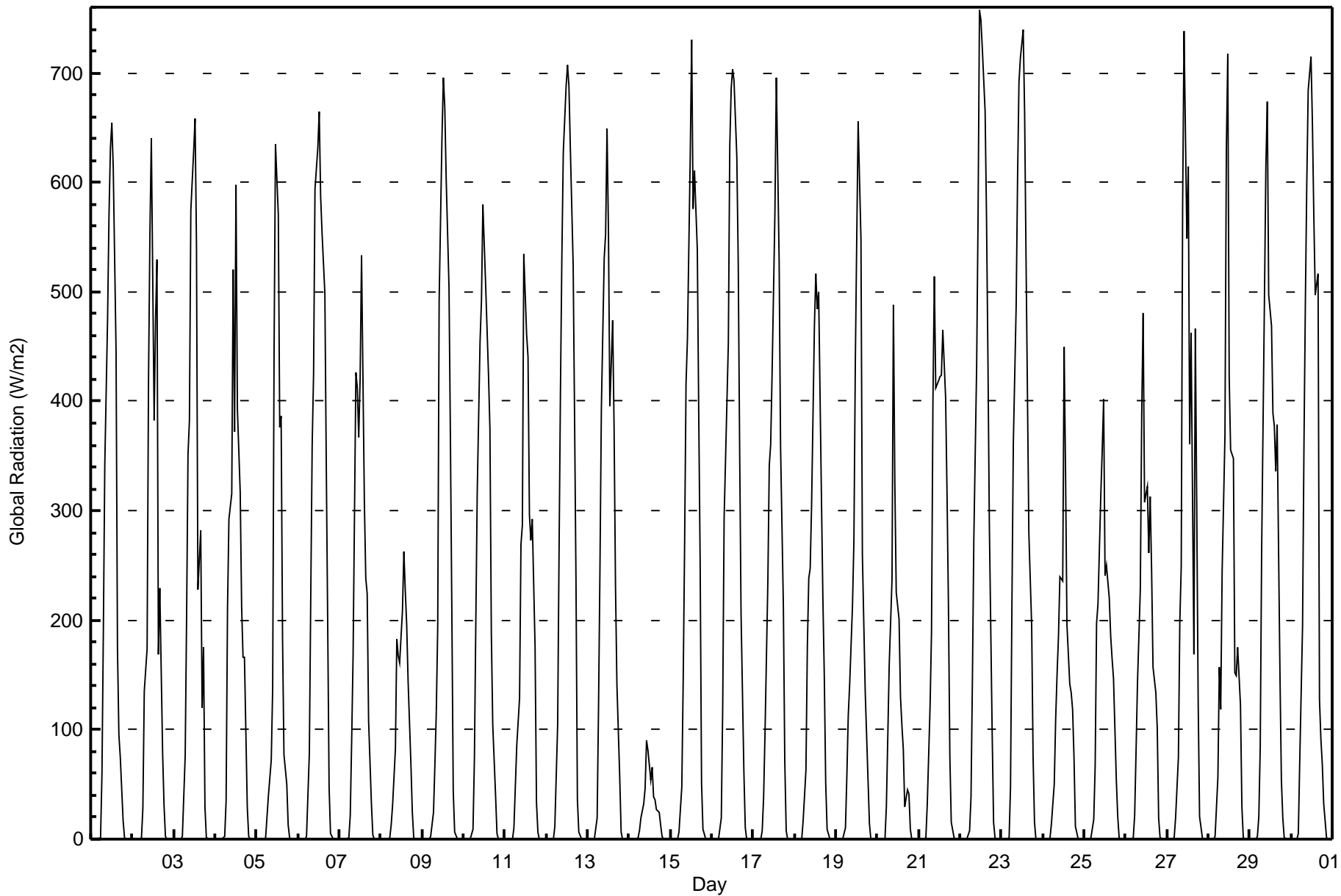
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	46	44.66	44.66
0.4 - 0.5	11	10.68	55.34
0.6 - 0.7	7	6.80	62.14
0.8 - 1.4	13	12.62	74.76
1.5 - 10	17	16.50	91.26
> 10	9	8.74	100.00

Total Number of Valid Hours: 103

Total Number of Hours: 720



Maximum Value: 758 W/m2 on Apr 22 12:00		Maximum Daily Average: 251.1 W/m2 on Apr 23		Hours in Service: 720																						
Minimum Value: 0 W/m2 on Apr 1 01:00		Minimum Daily Average: 22.6 W/m2 on Apr 14		Hours of Data: 720																						
Maximum Diurnal Average: 517.7 W/m2 at hour 13		Minimum Diurnal Average: 0.0 W/m2 at hour 4		Hours of Missing Data: 0																						
Monthly Average: 169.6 W/m2		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 47 Q ₃ = 312 P ₉₀ = 536 P ₉₉ = 714		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	0	0	0	1	60	190	341	476	570	631	655	613	446	174	96	74	17	1	0	0	0	0	181.0	655
2-Apr	0	0	0	0	0	2	28	136	174	419	554	640	383	476	529	169	230	78	31	2	0	0	0	0	160.4	640
3-Apr	0	0	0	0	0	3	76	204	352	382	575	628	658	542	228	282	119	175	30	2	0	0	0	0	177.3	658
4-Apr	0	0	0	0	0	2	35	211	293	315	521	372	598	393	317	212	166	167	29	2	0	0	0	0	151.4	598
5-Apr	0	0	0	0	0	2	20	40	72	138	445	635	571	377	387	184	78	51	13	1	0	0	0	0	125.6	635
6-Apr	0	0	0	0	0	3	79	222	359	424	594	632	665	587	554	499	342	198	48	5	0	0	0	0	217.1	665
7-Apr	0	0	0	0	0	1	21	91	167	426	412	367	421	533	308	238	224	108	32	4	0	0	0	0	139.7	533
8-Apr	0	0	0	0	0	2	12	32	82	183	168	161	209	263	227	195	144	68	25	2	0	0	0	0	73.9	263
9-Apr	0	0	0	0	0	3	25	68	117	195	492	640	696	668	602	504	365	209	43	6	0	0	0	0	193.1	696
10-Apr	0	0	0	0	0	9	74	198	316	454	492	579	543	505	424	374	188	104	40	5	0	0	0	0	179.5	579
11-Apr	0	0	0	0	0	10	48	85	129	269	287	535	461	440	296	273	292	175	34	6	0	0	0	0	139.2	535
12-Apr	0	0	0	0	0	12	105	263	411	534	628	688	707	687	631	525	385	236	36	7	0	0	0	0	244.0	707
13-Apr	0	0	0	0	0	19	122	248	394	531	552	649	556	396	474	376	232	141	57	6	0	0	0	0	198.1	649
14-Apr	0	0	0	0	0	1	7	20	33	46	90	81	54	66	39	36	28	25	13	2	0	0	0	0	22.6	90
15-Apr	0	0	0	0	0	7	47	145	270	416	457	627	731	575	611	538	389	254	52	9	0	0	0	0	213.7	731
16-Apr	0	0	0	0	0	19	122	294	347	453	633	686	703	693	623	527	356	206	62	11	0	0	0	0	238.9	703
17-Apr	0	0	0	0	0	8	39	97	235	342	361	425	572	695	615	528	359	213	71	8	0	0	0	0	190.3	695
18-Apr	0	0	0	0	0	17	63	177	239	248	305	469	516	484	500	310	221	150	51	9	0	0	0	0	156.6	516
19-Apr	0	0	0	0	0	10	57	113	142	213	273	436	549	655	548	261	197	135	54	14	0	0	0	0	152.5	655
20-Apr	0	0	0	0	1	29	93	159	237	489	326	226	201	130	104	82	30	44	41	9	0	0	0	0	91.7	489
21-Apr	0	0	0	0	1	33	123	189	398	514	412	419	423	423	465	403	316	214	76	15	1	0	0	0	184.4	514
22-Apr	0	0	0	0	0	7	38	147	274	433	569	758	748	723	664	567	438	288	97	16	1	0	0	0	240.4	758
23-Apr	0	0	0	0	1	48	215	362	486	604	691	714	740	663	531	407	280	195	75	15	0	0	0	0	251.1	740
24-Apr	0	0	0	0	1	14	51	109	150	186	240	236	449	336	195	142	134	119	74	11	0	0	0	0	102.0	449
25-Apr	0	0	0	0	1	18	67	197	215	314	355	402	241	249	220	185	164	147	53	21	1	0	0	0	118.8	402
26-Apr	0	0	0	0	1	22	81	144	228	387	481	308	322	262	313	247	158	134	102	19	1	0	0	0	133.7	481
27-Apr	0	0	0	0	1	20	75	198	248	580	738	548	615	360	462	169	466	304	127	21	1	0	0	0	205.6	738
28-Apr	0	0	0	0	3	57	157	119	245	368	631	718	422	356	347	151	150	175	122	30	1	0	0	0	168.8	718
29-Apr	0	0	0	0	2	20	84	263	495	615	673	497	469	389	378	336	379	149	54	20	2	0	0	0	201.0	673
30-Apr	0	0	0	0	5	71	194	360	490	599	684	715	653	569	498	516	128	91	69	33	1	0	0	0	236.5	715
		0.0	0.0	0.0	0.0	0.6	15.6	73.9	169.3	264.7	385.1	473.6	513.9	517.7	470.3	418.0	313.6	235.1	154.2	54.3	10.3	0.4	0.0	0.0	0.0	Diurnal Average
		0	0	0	0	5	71	215	362	495	615	738	758	748	723	664	567	466	304	127	33	2	0	0	0	Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Fort McKay - Bertha Ganter - April 2017

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	327	45.42	45.42
21 - 100	82	11.39	56.81
101 - 300	126	17.50	74.31
301 - 600	137	19.03	93.33
601 - 900	48	6.67	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

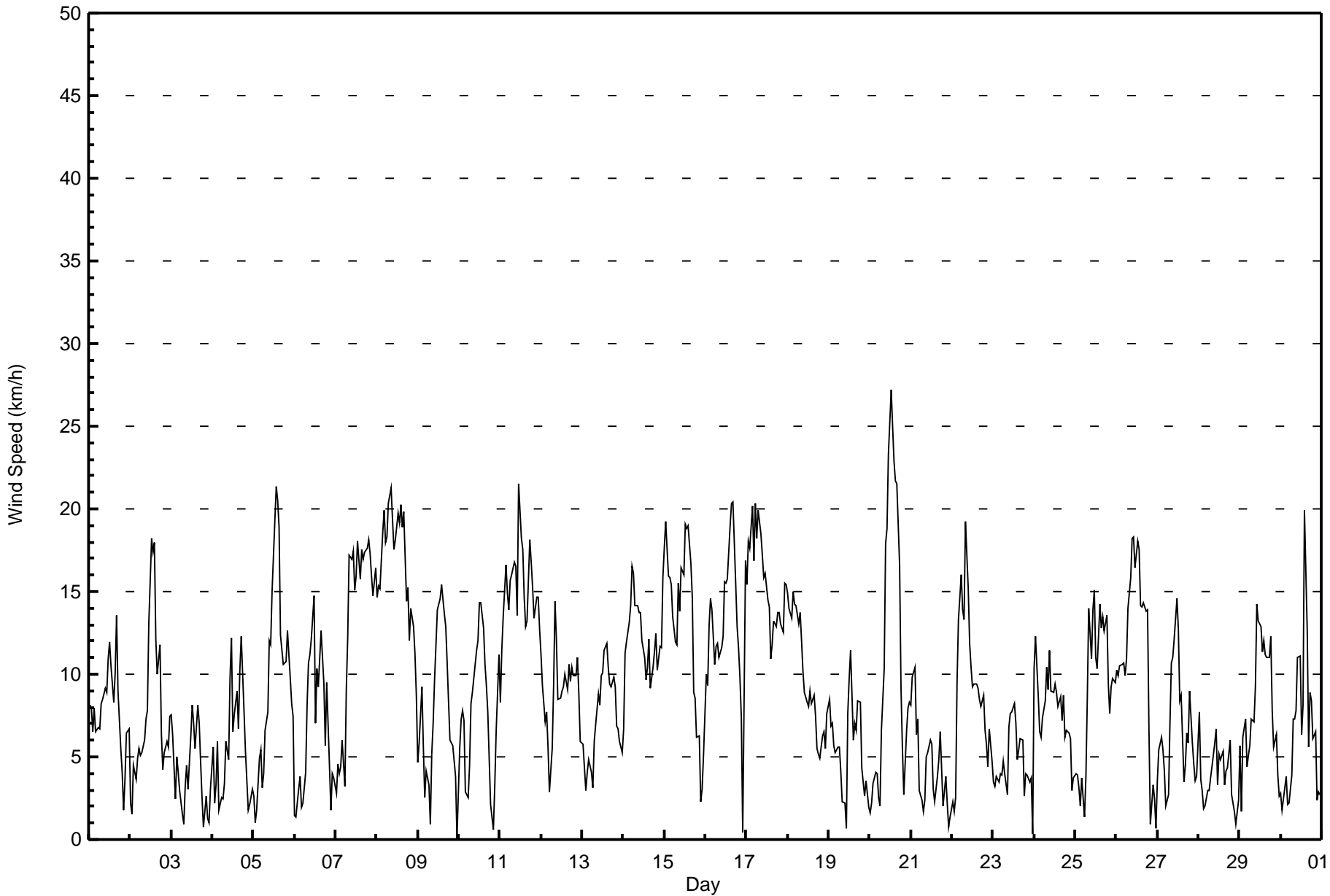
Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - April 2017

Maximum Speed: 27 km/h on Apr 20 13:00	Maximum Daily Speed Average: 16.7 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 10 00:00	Minimum Daily Speed Average: 1.1 km/h on Apr 21	Hours of Data: 720
Maximum Diurnal Speed Average: 3.6 km/h at hour 2	Minimum Diurnal Speed Average: 1.7 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 2.2 km/h 18.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 8 Q ₃ = 13 P ₉₀ = 17 P ₉₉ = 22	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	SSW8	SW8	SW7	WSW8	WSW7	SSW7	SW7	SW8	WSW8	SW9	SW9	SW11	W12	W10	NW8	WNW10	NW14	NW9	NW6	WNW4	W2	W4	W6	W7	WSW6.4	NW14																						
2-Apr	W2	S2	SW5	S4	S5	S6	S5	S5	SSE6	SE7	SE8	NW13	NW18	WNW17	NW18	NNE12	NNE10	N12	N6	NW4	NNW5	NW6	WNW6	NW7	NW3.2	NW18																						
3-Apr	NNW8	NNW6	NW2	WNW5	NW4	W3	WNW2	SSE1	ESE3	ESE4	SE3	E6	E8	E7	NW6	NW8	N7	NE5	NE3	N1	SW3	SSW1	SW1	W3	N1.5	NW8																						
4-Apr	S6	SSW2	S3	SSE6	S2	S3	SW2	SSE3	SSE6	S5	S10	SSW12	SSE7	SSE8	SE9	ENE7	SSE10	SSE12	SSE8	SSE5	S4	SSE2	S2	SSW3	SSE5.0	SSE12																						
5-Apr	S3	SSW1	SW2	S5	S5	SSE3	SSE4	S7	SSE8	SSE12	SSE15	SSE19	SSE21	SSE21	S19	S12	S11	S11	S11	S13	S10	S8	S7	S9.8	SSE21																							
6-Apr	NW1	W1	S3	S4	WSW2	SSW2	S4	SSE8	SSE11	SE11	SE12	SSE15	SSW7	W10	WSW9	SW13	SW11	W9	W6	NW9	NNW4	NNE2	NNW4	WNW4	SSW3.5	SSE15																						
7-Apr	NNW3	N5	NNW4	N4	NNW6	NNW3	N9	N12	N17	N17	N17	N15	N16	N18	N16	N18	N17	N17	N18	N18	N17	N16	N15	N16	N13.0	N18																						
8-Apr	N15	N15	N15	N19	N20	N18	N18	N20	N21	N19	N18	N18	N20	N19	N20	N19	N20	N14	N15	N12	N14	N13	N11	N9	N16.7	N21																						
9-Apr	N5	NW6	NNW9	NNW6	NNE3	NNE4	NNW3	ESE1	S5	S7	SSE10	SE14	SSE14	SSE15	SSE15	SSE14	SSE13	SSE11	SSE8	SSE6	SSE6	SSE5	SSE4	SW0	SSE4.7	SSE15																						
10-Apr	S6	S7	S8	S7	SSW3	SSE3	SSE5	SSE8	SSE9	SSE11	SSE11	SSE12	SSE14	SSE14	SSE13	SSE11	SSE9	SSE8	S2	S1	WNW1	SSW3	NNW7	N11	SSE6.0	SSE14																						
11-Apr	N8	N11	N13	N17	N15	N14	N16	N16	N17	N17	N14	N22	N18	N18	NNE15	NNE13	NNE13	N18	N17	N15	N13	N15	N15	N13	N15.0	N22																						
12-Apr	NNW11	N9	NNW7	NNW8	N6	NNW3	N6	N9	N14	N12	NNE8	NE9	NNE9	NNE9	NNE10	N9	N11	N10	N10	N10	N10	N11	N9	NNW6	N8.7	N14																						
13-Apr	NNW6	NNW4	NW3	N4	N5	NNW4	N3	N6	NNE7	NNE9	NE8	NE10	NE10	NE11	ENE12	NE10	NE9	NE9	ENE10	ENE9	NE7	NE7	NNE6	NNE5	NE6.4	ENE12																						
14-Apr	N7	N11	N12	N13	N14	N17	N16	N14	N14	N14	NNE14	NNE12	N11	NNE10	NE10	NE12	NE9	NNE10	NNE11	NNE12	NNE10	NNE12	NNE12	NNE16	NNE11.8	N17																						
15-Apr	N18	N19	N16	N16	N15	N13	NNE12	NNE12	N16	N14	N16	N16	NNW19	NNW19	NNW19	NNW17	NNW15	N9	N9	NNW6	NW6	WSW2	SSW3	SSE5	N11.8	N19																						
16-Apr	SSE10	S9	SSE13	SSE15	S14	S11	S12	SSE12	SSE11	S12	S12	S16	S16	S16	S19	S20	S20	S18	S13	S12	S10	S7	WSW0	N17	S11.6	S20																						
17-Apr	N15	N18	N18	N20	N17	N20	N18	N20	N18	N17	N16	N16	NNE14	NNE14	NE11	NE12	NNE13	NNE13	N14	N14	N13	N13	N16	N15	N15.4	N20																						
18-Apr	N15	N14	N13	N15	N14	N14	N13	N14	N12	N10	N9	NE8	NE8	NNE9	NNE8	N9	NNE7	NNE6	N5	NNE5	N6	N7	N5	NNW8	N9.5	N15																						
19-Apr	NNW8	NNW7	NNW7	NNW6	NW5	NW6	NW6	NNW4	NNW2	W2	N1	SE8	SE10	SE11	SSE6	S7	S7	S8	SSE8	SW4	SW4	WSW3	S4	SW2	SSW1.2	SE11																						
20-Apr	SW2	NW2	NW3	NW4	NNW4	NW3	NNW2	N7	N10	N18	N19	N23	N27	N25	N23	N22	N22	N17	N9	NNW6	W3	WNW7	NNW8	NNW8	N10.7	N27																						
21-Apr	N8	NNW10	NNW10	NNW6	NNW7	W3	NW2	NNW2	SE2	E5	E5	ENE6	E6	S3	NW2	ESE4	SE5	SSE7	S4	E2	SSE4	SSW2	WSW1	SW1	NE1.1	NNW10																						
22-Apr	WSW2	W2	WNW3	NNW9	N13	N16	N14	N13	N19	N15	NNE12	NE10	NE9	NE9	NNE9	NE9	NE8	NNE8	N9	N7	N6	N4	NNW7	NNW5	NNE8.3	N19																						
23-Apr	N3	NW3	NW4	WNW4	NW4	NNW5	NNW4	NE3	NNE7	N8	NNE8	N8	N7	NNE5	NNE5	N6	N6	SSE3	S4	SSE4	SE3	SSE4	SW0	N2.8	N8																							
24-Apr	N10	N12	NNW9	NNW7	NNW6	NNW7	NNW8	NNW10	NNE9	N11	NE9	NE9	ENE9	E9	E8	E9	E7	ESE9	E6	ESE7	ESE6	ESE6	E3	ENE4	NE5.1	N12																						
25-Apr	E4	E4	E3	E2	ESE4	NE1	SE4	SSE9	SSE14	SSE11	SSE14	SSE15	S11	S10	SSE14	SSE13	SSE13	SSE13	SSE14	SSE9	SSE8	SSE9	SSE10	SSE10	SSE8.6	SSE15																						
26-Apr	SSE10	SSE10	SSE11	SSE11	SSE11	SSE10	SSE11	SSE14	SSE16	SSE18	SSE18	SSE16	SSE18	SSE18	S14	SSE14	S14	S14	SSE14	SSW7	SSE1	W3	WNW2	ENE1	SSE11.0	SSE18																						
27-Apr	S4	S5	S6	S5	S4	SE2	SSE3	S7	SSE11	SE11	SSE12	SSE15	SSE13	S8	S9	SE3	S4	SW6	NW6	NNW9	NNW6	NNW5	NNW4	SW4	S4.1	SSE15																						
28-Apr	WNW8	WNW4	W3	SW2	SSW2	SSE3	SSE3	SSE4	SE4	SSE6	SE7	E3	ESE5	SE5	SE5	NE3	NE4	ENE4	ENE6	NE3	N2	NNE2	SSW1	S2	ESE1.5	WNW8																						
29-Apr	S6	ESE2	S6	S7	SSW4	SSW5	S6	SSW7	SSE7	SE9	SSE14	S13	SSW13	SSW11	SSW12	SSW11	S11	S11	S12	S8	S6	SSW6	S4	SSW3	S7.7	SSE14																						
30-Apr	SW3	SSW2	S3	S4	SSW2	W2	SSE4	SE7	SE7	SE8	SSE11	SE11	SE6	NW8	N20	ENE13	ENE6	SSE9	S8	W6	WNW7	SSE2	SSE3	WSW3	SE2.1	N20																						
NNW3.0NNW3.6NNW2.7NNW2.8																								N3.3	N3.1	N2.8	NNE2.4	NE2.7	NE3.0	E3.0	ENE3.0	ENE2.7	NE2.2	NE2.4	NE3.0	NE2.3	ENE1.9	NE1.7	N2.0	N1.9	N1.8	N2.5	NNW3.4	Diurnal Average				
N18																								N19	N18	N20	N20	N20	N18	N20	N21	N19	N19	N23	N27	N25	N23	N22	N22	N18	N18	N18	N17	N16	N16	N17	Diurnal Maximum	

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	209	29.03	29.03
6 - 11	287	39.86	68.89
12 - 19	203	28.19	97.08
20 - 28	21	2.92	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	8	7	3	9	7	10	23	33	16	15	7	13	10	15	21	209
6 - 11	41	23	22	7	9	4	14	47	37	8	9	5	6	5	14	36	287
12 - 19	105	19	2	2	0	0	2	39	19	3	1	0	1	1	4	5	203
20 - 28	17	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	21
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	175	50	31	12	18	11	26	111	91	27	25	12	20	16	33	62	720

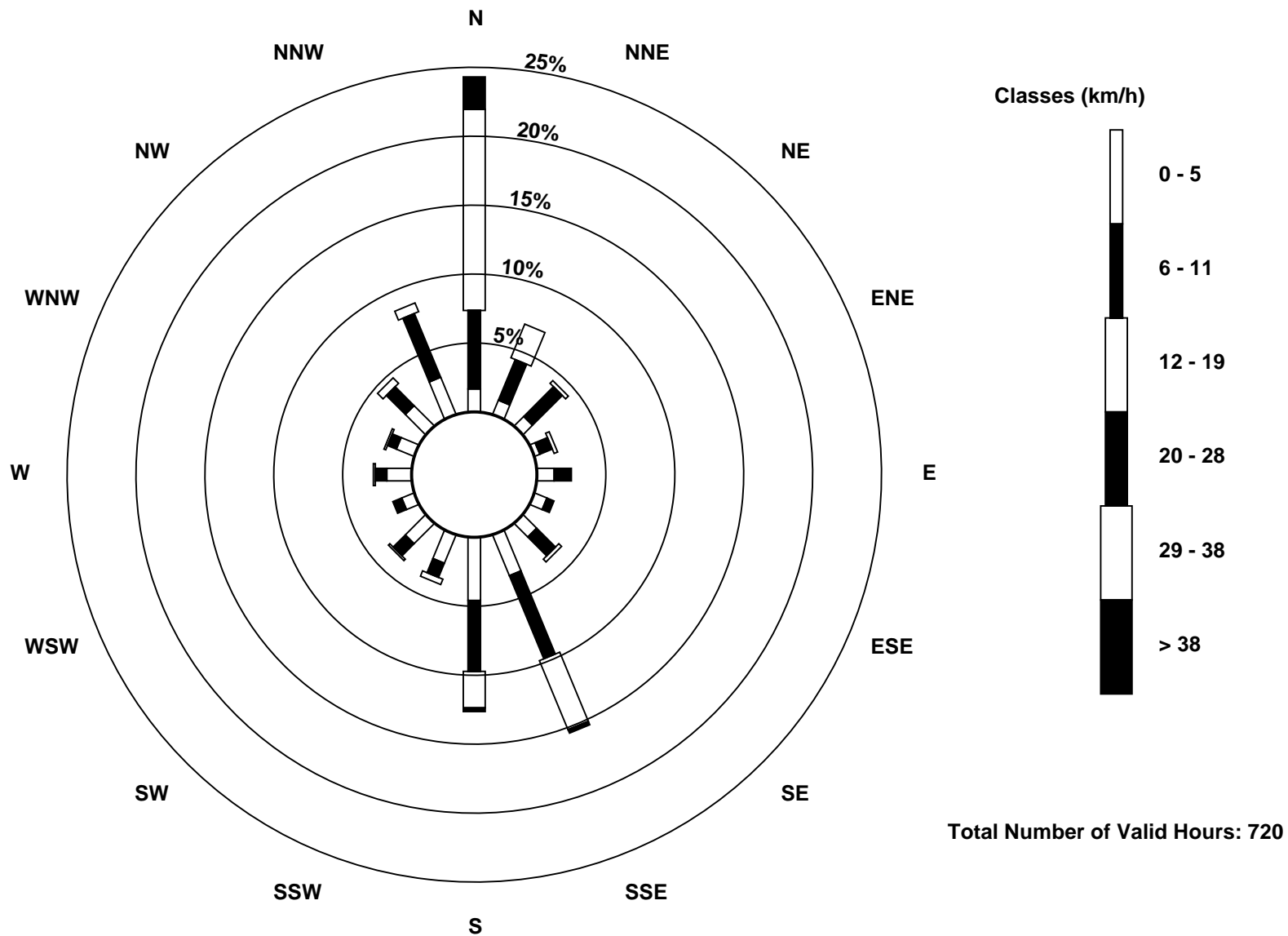
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter (AMS 1)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Apr 30 15:00 Minimum Value: 0 km/h on Apr 27 00:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6														Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0											
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	3	2	3	3	2	3	3	4	4	4	5	5	4	5	4	3	3	2	1	1	2	2	2	5
2-Apr	3	1	2	1	1	1	1	1	1	1	3	5	5	6	6	4	5	3	2	1	4	1	1	1	6
3-Apr	1	1	2	1	1	2	2	1	1	1	2	3	2	2	3	3	4	2	1	1	1	1	1	4	
4-Apr	2	2	2	1	1	2	1	2	1	1	4	4	3	3	3	2	5	3	2	2	1	1	2	5	
5-Apr	1	1	1	1	1	1	2	2	2	2	3	4	4	5	5	5	4	4	3	2	3	2	1	5	
6-Apr	1	1	2	1	1	2	2	2	2	2	2	2	5	5	4	6	5	4	3	1	2	1	1	6	
7-Apr	1	1	3	3	2	3	3	4	4	4	4	5	5	6	6	5	5	5	5	4	4	4	4	6	
8-Apr	3	3	3	4	4	5	6	7	6	6	5	6	6	5	6	6	5	4	5	4	3	3	2	7	
9-Apr	2	2	3	2	1	1	1	1	2	2	3	3	3	3	3	2	2	2	2	1	1	1	1	3	
10-Apr	1	1	1	1	2	1	2	1	2	2	2	2	2	3	3	3	2	2	2	1	1	1	5	5	
11-Apr	2	3	3	3	3	3	3	4	4	5	4	6	6	5	5	4	5	4	4	3	3	3	3	6	
12-Apr	2	2	2	1	1	1	2	3	3	4	3	3	4	3	4	4	4	3	3	1	1	1	2	4	
13-Apr	2	1	1	1	1	1	1	1	2	3	3	4	4	4	5	4	4	4	4	4	3	3	2	5	
14-Apr	2	2	2	2	3	3	2	2	3	4	4	5	3	4	5	6	5	4	4	4	4	4	5	6	
15-Apr	5	6	5	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	2	1	2	2	1	6	
16-Apr	3	3	3	3	4	2	3	3	3	3	3	4	5	5	5	5	5	5	3	3	2	1	3	5	
17-Apr	4	5	5	5	4	5	4	4	6	5	5	5	5	5	4	5	5	5	4	3	3	3	3	6	
18-Apr	3	3	4	3	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	1	1	1	4	
19-Apr	1	1	1	1	1	1	1	2	1	1	1	2	2	3	3	2	3	2	2	1	1	2	1	3	
20-Apr	1	1	1	2	1	1	1	3	3	5	6	6	7	7	6	6	5	5	3	2	1	2	2	7	
21-Apr	1	1	1	2	2	1	1	1	1	2	2	2	2	1	1	2	2	1	1	1	1	1	1	2	
22-Apr	2	1	2	3	4	5	3	4	4	4	5	4	4	4	4	4	4	4	3	2	2	1	1	5	
23-Apr	1	1	1	1	1	1	1	1	2	2	3	3	3	4	2	3	3	3	3	2	1	1	1	4	
24-Apr	2	2	2	1	2	2	2	2	3	3	4	4	4	3	3	3	3	3	2	3	2	2	1	4	
25-Apr	1	1	1	1	1	1	1	2	3	3	3	3	4	4	3	3	3	3	3	2	1	2	2	4	
26-Apr	2	2	2	2	2	2	2	3	3	4	4	4	4	4	4	3	4	4	3	4	1	1	1	4	
27-Apr	1	1	1	1	1	1	1	3	2	2	4	3	4	3	3	3	3	3	2	2	1	1	2	4	
28-Apr	2	2	2	1	1	1	1	1	1	1	2	2	2	2	3	1	1	1	2	1	1	1	2	3	
29-Apr	2	2	2	3	1	2	1	3	2	3	5	5	5	5	5	4	4	3	4	3	1	1	1	5	
30-Apr	1	1	2	2	1	1	2	1	2	2	2	3	3	8	10	6	5	3	4	2	2	3	2	10	
														Diurnal Maximum											



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay - Bertha Ganter - April 2017

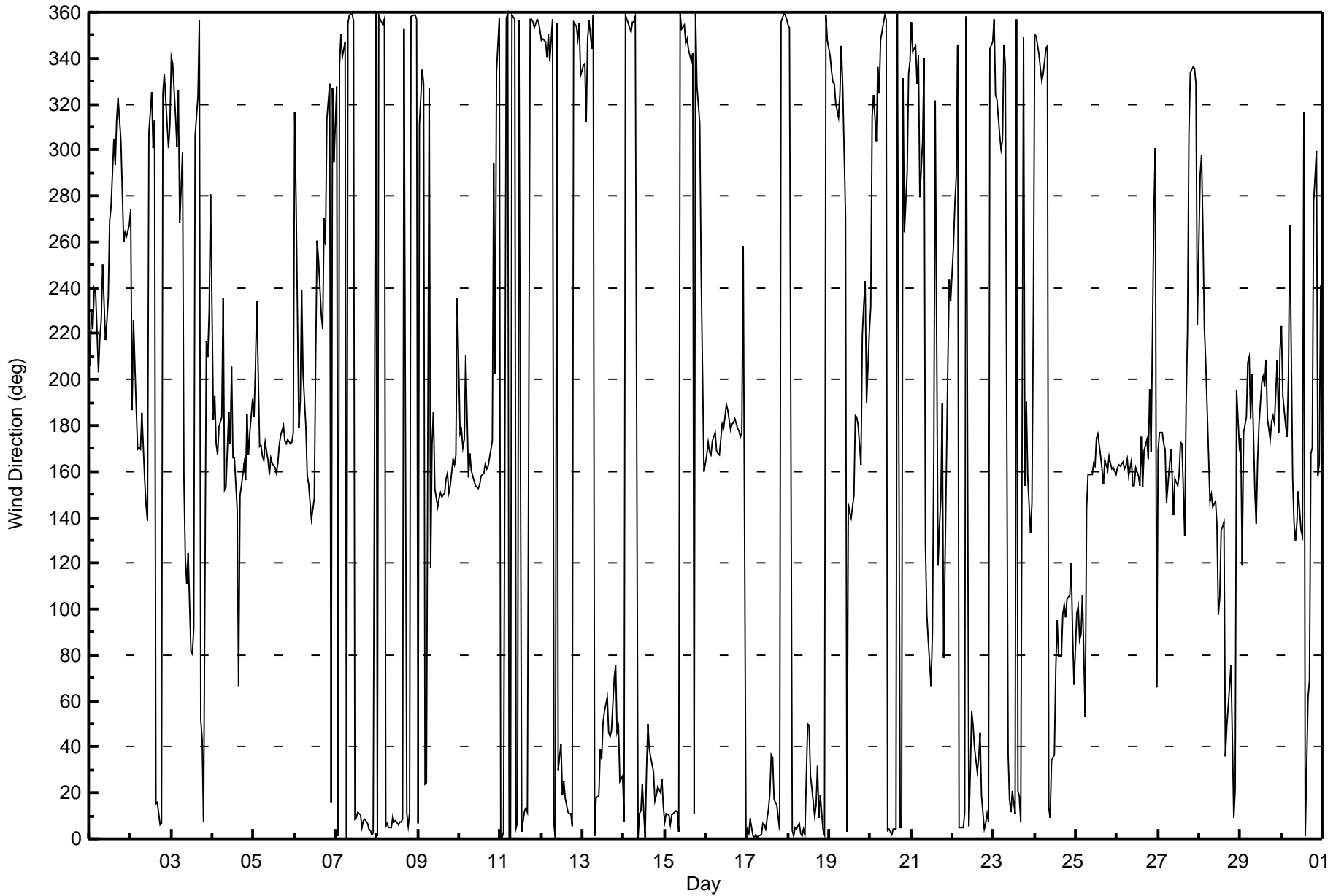
Direction of Maximum Speed: 2 deg on Apr 20 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 3.4 deg on Apr 8	Hours of Data: 720
Direction of Minimum Speed: 235 deg on Apr 10 00:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.1 deg on Apr 21	Percent Operational Time: 100.0
Monthly Average Direction: 294.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	206	231	222	240	238	203	219	226	250	217	225	236	269	275	305	294	313	323	305	282	260	264	262	267	256.3
2-Apr	274	187	226	187	170	170	170	185	156	145	138	308	325	301	313	15	16	6	7	325	333	311	301	311	317.4
3-Apr	341	337	315	302	326	268	299	157	122	111	124	82	81	92	306	323	357	52	43	7	217	210	229	281	5.0
4-Apr	183	193	172	167	179	184	235	152	153	186	172	205	166	166	143	66	150	154	164	156	185	167	177	192	166.5
5-Apr	184	205	234	171	172	167	165	173	165	159	166	164	161	159	163	172	176	180	174	172	174	172	173	177	168.8
6-Apr	317	278	179	191	239	203	179	158	155	146	139	148	210	261	253	228	222	270	259	314	329	16	327	295	211.5
7-Apr	328	1	337	350	340	347	0	355	359	359	357	8	9	11	11	5	8	8	6	4	4	2	2	360	2.6
8-Apr	1	359	357	355	357	5	6	5	5	10	7	8	6	7	7	9	352	11	5	11	358	359	359	357	3.4
9-Apr	7	311	335	329	24	24	327	118	172	186	153	145	148	151	149	151	157	160	150	154	165	163	167	235	152.5
10-Apr	177	178	170	174	211	158	168	161	158	154	153	152	154	158	159	163	161	162	170	173	294	202	334	357	161.9
11-Apr	1	0	3	358	359	1	1	359	357	5	8	356	3	8	12	14	12	357	357	356	353	357	355	352	0.8
12-Apr	348	349	347	340	350	339	357	6	0	355	30	41	19	25	18	11	11	11	6	356	354	349	355	333	2.3
13-Apr	337	337	312	349	356	344	359	1	17	19	39	35	51	55	62	47	44	47	70	75	46	49	25	27	35.2
14-Apr	7	359	357	353	351	356	356	358	0	11	12	24	1	29	50	39	35	29	16	19	22	20	26	14	12.0
15-Apr	7	11	10	6	10	11	12	12	3	360	352	354	347	348	344	338	342	11	359	328	312	246	203	160	357.1
16-Apr	167	173	168	167	174	177	169	168	167	181	179	184	189	187	178	181	181	183	179	178	175	177	258	0	177.1
17-Apr	4	3	9	1	0	2	0	1	2	6	6	4	13	19	37	35	17	15	9	4	356	359	359	357	6.3
18-Apr	355	353	4	1	5	4	7	3	1	4	2	50	49	27	22	10	15	32	9	19	4	2	359	348	7.9
19-Apr	341	334	330	329	320	314	325	345	328	271	3	146	142	140	149	185	184	180	163	220	233	243	190	221	210.5
20-Apr	232	315	324	304	336	324	348	352	359	357	4	4	2	4	4	4	359	5	5	331	264	290	333	339	355.3
21-Apr	356	343	345	329	341	280	304	340	128	98	87	67	90	170	321	119	136	147	190	79	163	207	243	234	34.8
22-Apr	258	276	289	346	5	5	5	11	358	5	29	55	49	39	29	35	46	19	4	7	11	8	344	347	12.8
23-Apr	357	324	322	306	300	304	346	337	37	17	11	21	11	357	20	19	7	349	154	190	158	133	147	228	1.5
24-Apr	350	350	342	335	330	333	344	345	14	9	34	37	74	95	79	98	102	97	105	106	120	89	89	67	37.2
25-Apr	98	101	87	89	106	53	144	159	158	159	163	162	174	176	167	161	154	165	160	167	164	161	162	158	157.9
26-Apr	162	163	162	164	161	162	165	158	165	154	154	162	158	154	175	153	169	174	165	196	168	273	301	66	163.3
27-Apr	169	177	177	172	170	146	162	169	159	141	157	154	159	173	172	132	189	221	307	333	336	336	329	224	171.2
28-Apr	289	298	265	223	207	167	147	150	145	147	137	98	105	134	138	36	49	57	76	44	9	21	195	171	120.8
29-Apr	175	119	177	184	207	210	183	203	152	138	165	181	199	201	197	209	183	174	182	184	181	209	177	213	184.5
30-Apr	223	193	180	175	202	267	157	137	130	138	152	134	132	317	1	62	69	168	170	278	300	158	164	241	140.2

347.7 347.6 344.7 340.9 349.4 352.2 1.0 15.5 34.0 50.7 79.2 77.4 59.6 51.4 42.2 46.3 44.8 57.3 51.3 2.2 355.6 352.9 350.3 346.5

Diurnal Average

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay - Bertha Ganter - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																			Hours in Service: 720																								
Maximum Value: 97 deg on Apr 10 00:00																			Hours of Data: 720																								
Minimum Value: 9 deg on Apr 10 02:00																			Hours of Missing Data: 0																								
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 16 Median = 21 Q ₃ = 40 P ₉₀ = 56 P ₉₉ = 90																			Hours of Calibration: 0																								
Percent Operational Time: 100.0																																											
Day	Hourly Period Ending At (MST)																								Daily Maximum																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																			
1-Apr	28	40	36	45	45	28	37	46	49	47	47	46	44	43	53	23	17	11	21	18	65	55	36	33	65																		
2-Apr	97	79	54	35	18	10	26	34	17	14	49	36	20	20	31	26	40	18	18	21	26	21	22	17	97																		
3-Apr	9	9	51	18	23	47	88	87	50	38	76	50	30	51	84	26	38	49	45	82	44	68	63	30	88																		
4-Apr	30	80	40	15	49	71	51	53	21	31	33	29	49	36	25	44	35	11	14	17	34	71	69	25	80																		
5-Apr	42	75	57	16	17	24	31	23	17	14	15	15	16	13	14	14	15	34	17	11	12	12	11	14	75																		
6-Apr	77	67	24	16	76	72	20	19	12	14	12	12	67	48	48	43	40	35	41	10	33	51	33	70	77																		
7-Apr	70	18	62	45	25	91	21	14	16	17	17	22	22	23	24	19	20	18	17	17	16	17	17	16	91																		
8-Apr	16	14	15	15	13	18	19	18	18	19	20	19	21	20	19	22	17	23	20	23	14	14	15	15	23																		
9-Apr	35	20	20	27	59	31	47	89	34	34	29	19	16	18	14	14	16	13	11	10	9	11	14	97	97																		
10-Apr	11	9	10	13	38	43	16	13	15	19	16	17	15	14	15	18	14	12	79	49	79	51	63	14	79																		
11-Apr	13	15	16	15	15	15	14	16	15	19	21	19	22	23	26	25	27	16	16	15	14	14	14	14	27																		
12-Apr	12	10	13	10	17	39	14	20	17	24	41	43	45	40	37	42	30	24	17	12	11	11	18	18	45																		
13-Apr	39	23	31	20	18	20	30	16	29	30	39	39	43	41	46	47	51	56	40	42	61	56	38	49	61																		
14-Apr	21	13	12	13	12	14	14	13	16	16	18	32	27	43	49	43	47	41	31	26	32	26	47	24	49																		
15-Apr	18	19	23	17	18	17	21	20	16	17	15	17	16	17	17	16	15	26	18	18	17	67	31	19	67																		
16-Apr	12	13	13	12	15	14	14	14	22	19	24	19	23	25	19	17	16	17	13	13	11	11	91	16	91																		
17-Apr	18	17	19	16	16	17	17	17	18	19	23	19	26	33	43	41	36	32	20	16	15	15	15	15	43																		
18-Apr	15	15	17	16	17	17	18	20	22	27	41	43	38	39	38	35	32	41	31	30	15	15	14	12	43																		
19-Apr	11	11	13	13	17	11	19	23	43	71	96	22	18	17	67	36	43	21	23	24	21	58	23	53	96																		
20-Apr	46	45	17	26	17	42	44	38	15	17	20	18	18	18	17	18	17	18	19	30	27	13	20	9	46																		
21-Apr	12	13	10	30	12	45	31	58	60	50	42	43	36	58	70	54	34	20	18	54	30	37	75	68	75																		
22-Apr	68	52	58	18	15	15	17	19	14	19	37	40	46	48	43	44	44	43	23	19	17	21	14	21	68																		
23-Apr	36	29	26	25	14	14	20	27	76	32	39	42	43	60	73	64	41	40	88	19	17	20	19	93	93																		
24-Apr	10	12	14	13	19	12	13	11	20	18	41	43	38	38	36	27	45	22	27	21	18	14	34	23	45																		
25-Apr	35	21	29	34	19	56	19	17	15	19	16	15	22	28	17	14	16	14	12	13	11	11	11	11	56																		
26-Apr	11	11	11	11	11	12	12	12	14	16	16	15	15	14	25	14	19	16	17	20	70	20	42	76	76																		
27-Apr	14	12	11	15	10	26	21	15	13	16	23	20	21	38	36	75	71	46	26	11	13	46	46	46	75																		
28-Apr	18	53	56	43	35	32	21	15	16	19	18	74	58	53	54	68	39	42	23	57	44	60	80	87	87																		
29-Apr	19	76	12	19	34	17	18	30	38	29	31	35	34	36	34	30	32	17	16	20	13	15	15	32	76																		
30-Apr	40	58	25	14	48	38	29	15	18	22	19	14	50	90	44	44	70	28	34	30	15	80	67	39	90																		
																			97	80	62	45	76	91	88	89	76	71	96	74	67	90	84	75	71	56	88	82	79	80	91	97	
Diurnal Maximum																																											



Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name: Fort McKay - Bertha Ganter Station number: AMS 01
Calibration Date: April 24, 2017 Last Cal Date: March 13, 2017
Start time (MST): 9:45 End time (MST): 13:10
Reason: Routine

Calibration Standards

Cal Gas Concentration 49.3 ppm Cal Gas Exp Date November 4, 2019
Cal Gas Cylinder # EY0000683
Calibrator Make/Model Sabio 4010 Serial Number 1730512
ZAG Make/Model API 701H Serial Number 587

Analyzer Information

Analyzer make: Thermo 43i

Analyzer serial #: JC1501301448

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-614	-614
Calculated slope	0.998796	0.997599	Lamp voltage	820	820
Calculated intercept	0.990078	1.097180	Pressure	686.9	687.1
Analyzer Background	14.9	14.8	Flow	0.505	0.507
Analyzer Coefficient	0.948	0.943	Intensity	92	91

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	6000	0.0	0.0	0.0	----
as found span	5417	83.0	744.0	747.3	0.996
calibrator zero	6000	0.0	0.0	0.4	----
high point	5417	83.0	744.0	745.4	0.998
second point	5452	46.5	416.9	416.5	1.001
third point	5475	23.3	208.9	206.5	1.012
as left zero	6000	0.0	0.0	0.2	----
as left span	5417	83.0	744.0	742.3	1.002
Average Correction Factor					1.004
Corrected As found	747.35	Previous response	743.89	% change	-0.5%

* => +/-5% change initiates investigation

Notes:

Span adjusted.

Calibration Performed By:

Devin Russell



Wood Buffalo Environmental Association

SO₂ Calibration Summary

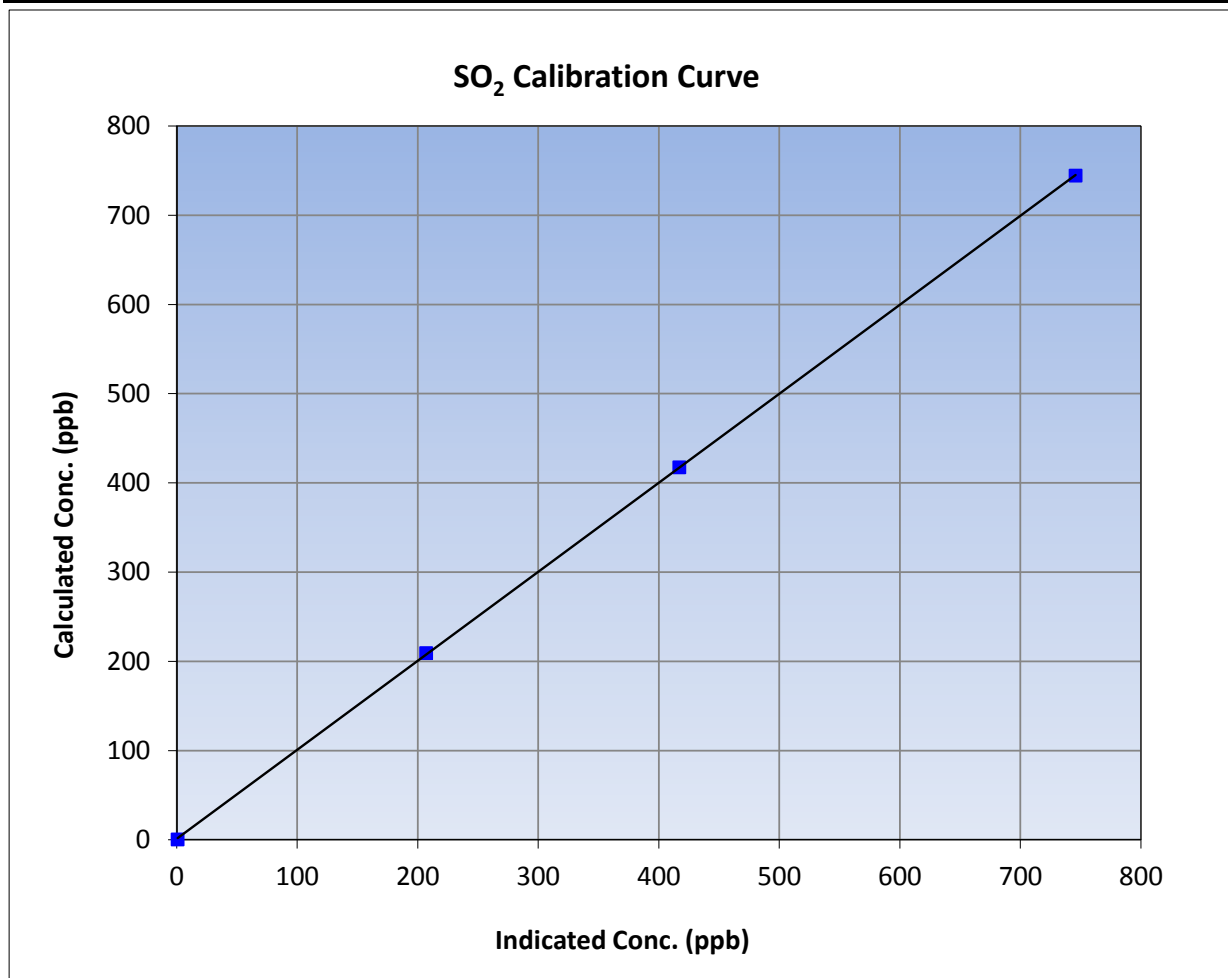
Version-03-2017

Station Information

Calibration Date	April 24, 2017	Previous Calibration	March 13, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	9:45	End Time (MST)	13:10
Analyzer make	Thermo 43i	Analyzer serial #	JC1501301448

Calibration Data

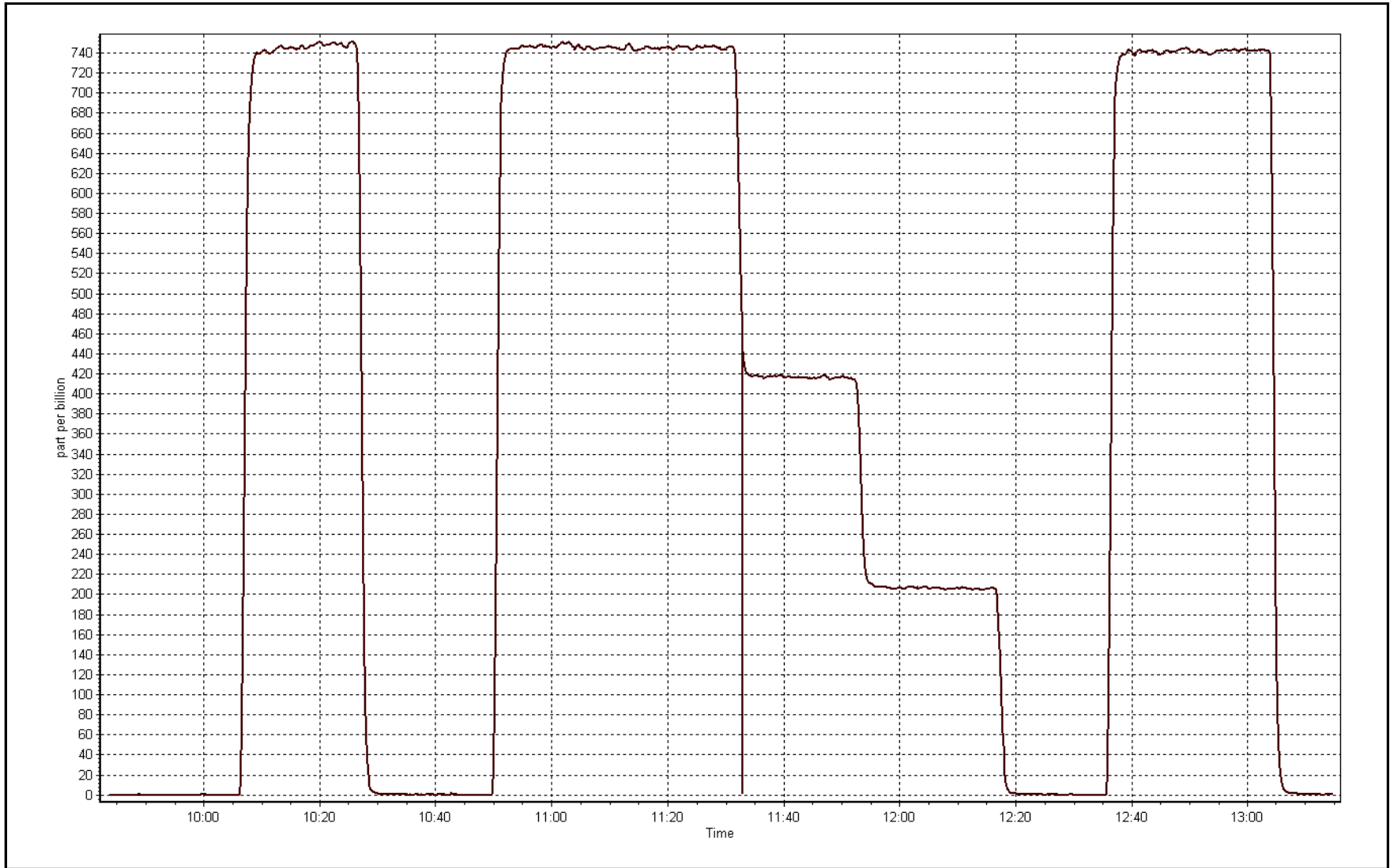
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.4	----	Correlation Coefficient	0.999980	≥0.995
744.0	745.4	0.9981			
416.9	416.5	1.0010	Slope	0.997599	0.90 - 1.10
208.9	206.5	1.0118			
			Intercept	1.097180	+/-30



SO2 Calibration Plot

Date: April 24, 2017

Location: Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association

TRS Calibration Report

Version-03-2017

Station Information

Station Name: Fort McKay - Bertha Ganter Station number: AMS 01
 Calibration Date: April 5, 2017 Last Cal Date: March 10, 2017
 Start time (MST): 8:55 End time (MST): 12:30
 Reason: Routine

Calibration Standards

Cal Gas Concentration 4.94 ppm Cal Gas Exp Date February 12, 2019
 Calibrator Make/Model Sabio 4010 Serial Number 1730512
 ZAG Make/Model API 701H Serial Number 587

Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1218153461

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	-860	-860
Calculated slope	0.997469	0.994144	Lamp voltage	1155	1155
Calculated intercept	-0.174736	-0.132778	Pressure	668.4	671.5
Analyzer Background	1.68	1.75	Flow	0.438	0.440
Analyzer Coefficient	0.925	0.944	Intensity	80	80

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	6000	0.0	0.0	0.0	----
as found span	5909	91.1	75.0	73.6	1.019
calibrator zero	6000	0.0	0.0	0.1	----
high point	5909	91.1	75.0	75.5	0.993
second point	5951	48.6	40.0	40.5	0.987
third point	5978	24.3	20.0	20.2	0.988
as left zero	6000	0.0	0.0	0.1	----
as left span	5909	91.1	75.0	76.3	0.983
Average Correction Factor					0.990

Corrected As found	73.57	Previous response	75.37	% change	2.4%
--------------------	-------	-------------------	-------	----------	------

** = > +/-5% change initiates investigation*

Notes:

Scrubber check completed after as founds. Span adjusted.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

TRS Calibration Summary

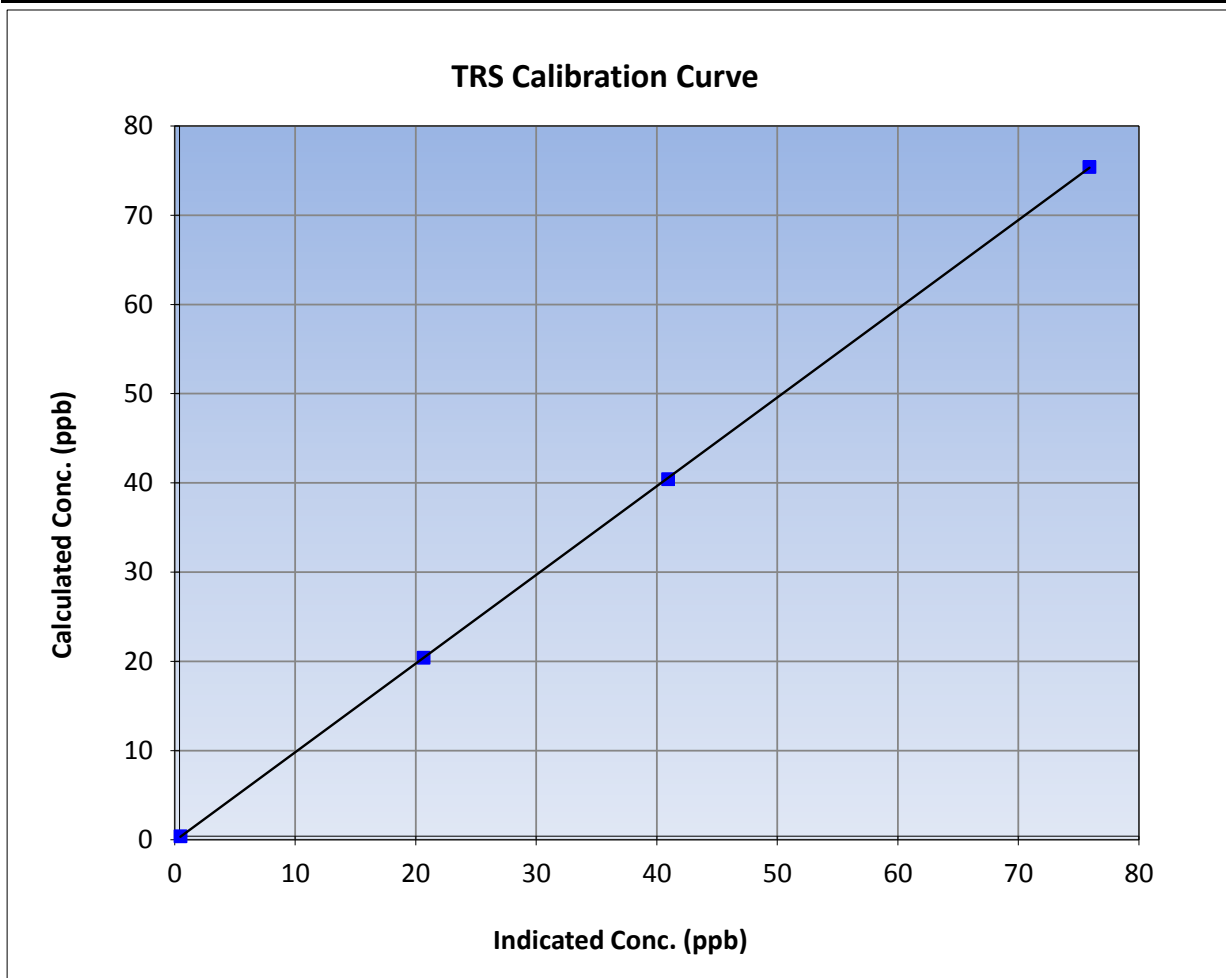
Version-03-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 10, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:55	End Time (MST)	12:30
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1218153461

Calibration Data

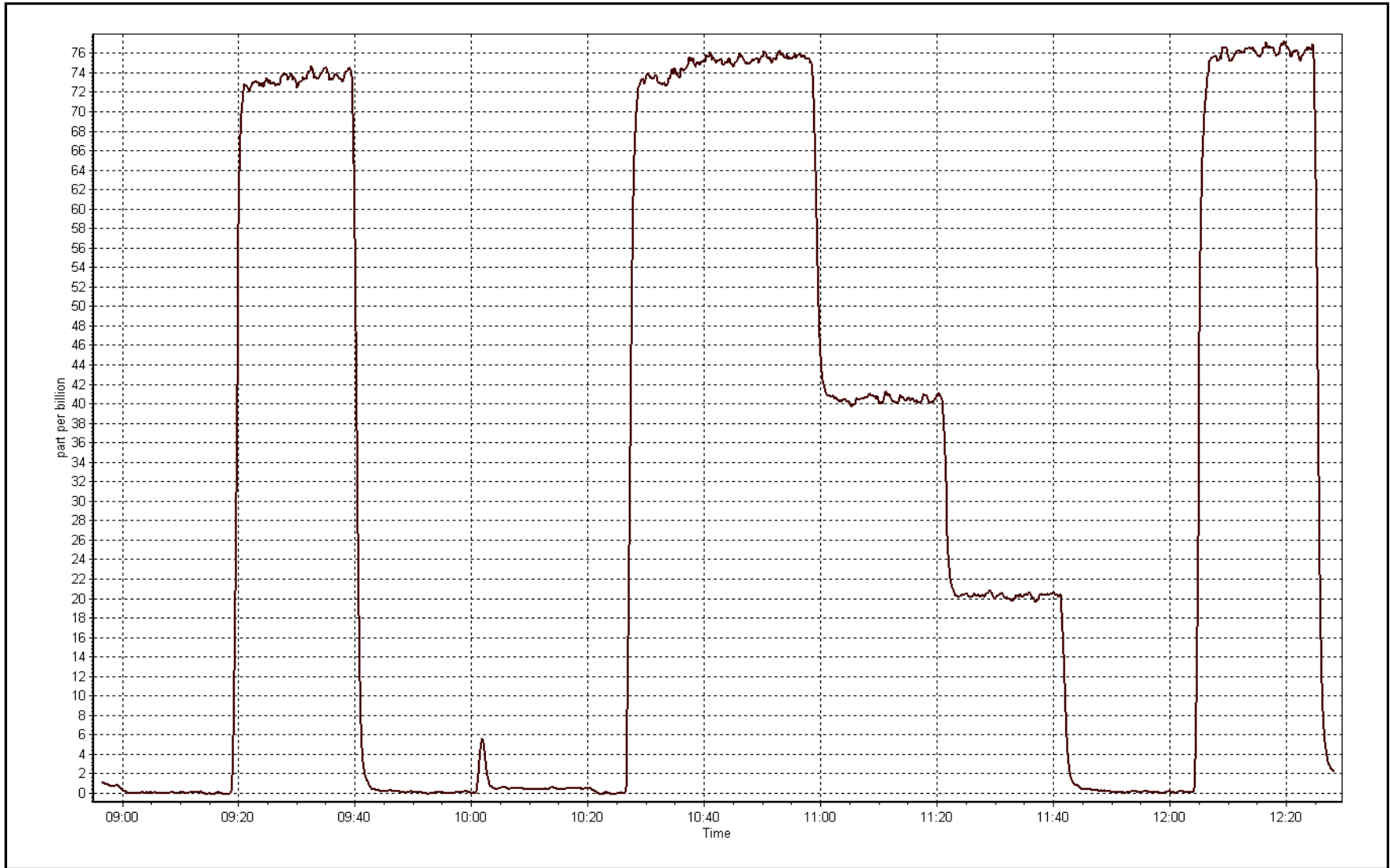
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.1	----	Correlation Coefficient	≥0.995
75.0	75.5	0.9934		
40.0	40.5	0.9871	Slope	0.90 - 1.10
20.0	20.2	0.9881		
			Intercept	+/-3



TRS Calibration Plot

Date: April 5, 2017

Location: Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
Calibration Date:	April 24, 2017	Last Cal Date:	March 13, 2017
Start time (MST):	9:45	End time (MST):	13:10
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000683	Cal Gas Expiry Date	November-04-19
CH4 Cal Gas Conc.	<u>515.0</u> ppm	CH4 Equiv Conc.	1062.3 ppm
C3H8 Cal Gas Conc.	<u>199.0</u> ppm	Station temp.	21 Deg C
Calibrator Model	Sabio 4010	Serial Number	1730512
ZAG make/model	API 701H	Serial Number	587

Analyzer Information

Analyzer make: Thermo 55i

Analyzer serial #: 1152430012

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.1	75.3
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	175.0	175.0
CH4 SP Ratio	0.000172	1.72E-04	Flame Temp	405.0	405.0
CH4 Retention time	12.0	12.0	Carrier Pressure	36.7	36.7
NMHC SP Ratio	4.03E-05	4.03E-05	Fuel Pressure	47.7	47.7
NMHC Peak Area	204961	204961	Air Pressure	39.0	39.0

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	0.998833	0.999456
THC Cal Offset	0.053869	0.060250
CH4 Cal Slope	NA	0.999629
CH4 Cal Offset	NA	0.043687
NMHC Cal Slope	0.999264	0.999046
NMHC Cal Offset	0.016189	0.015009

Notes:

Span adjusted slightly.

Calibration Performed By:

Devin Russell



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	6000	0.0	0.00	0.00	----
as found span	5417	83.0	16.03	16.05	0.999
calibrator zero	6000	0.0	0.00	0.00	----
high point	5417	83.0	16.03	16.02	1.001
second point	5452	46.5	8.98	8.88	1.012
third point	5475	23.3	4.50	4.39	1.025
as left zero	6000	0.0	0.00	0.00	----
as left span	5417	83.0	16.03	16.00	1.002
Average Correction Factor					1.013
Corrected As found	16.05	Prev response	16.00	*% change	-0.3%

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	6000	0	0.00	0.00	----
as found span	5417	83	8.26	8.28	0.997
calibrator zero	6000	0	0.00	0.00	----
high point	5417	83	8.26	8.26	1.000
second point	5452	46.5	4.63	4.61	1.004
third point	5475	23.3	2.32	2.29	1.013
as left zero	6000	0	0.00	0.00	----
as left span	5417	83	8.26	8.25	1.001
Average Correction Factor					1.005
Corrected As found	8.28	Prev response	8.25	*% change	-0.4%

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	6000	0.0	0.00	0.00	----
as found span	5417	83.0	7.77	7.78	0.999
calibrator zero	6000	0.0	0.00	0.00	----
high point	5417	83.0	7.77	7.76	1.002
second point	5452	46.5	4.36	4.28	1.018
third point	5475	23.3	2.18	2.10	1.039
as left zero	6000	0.0	0.00	0.00	----
as left span	5417	83.0	7.77	7.75	1.003
Average Correction Factor					1.019
Corrected As found	7.78	Prev response	NA	*% change	NA

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

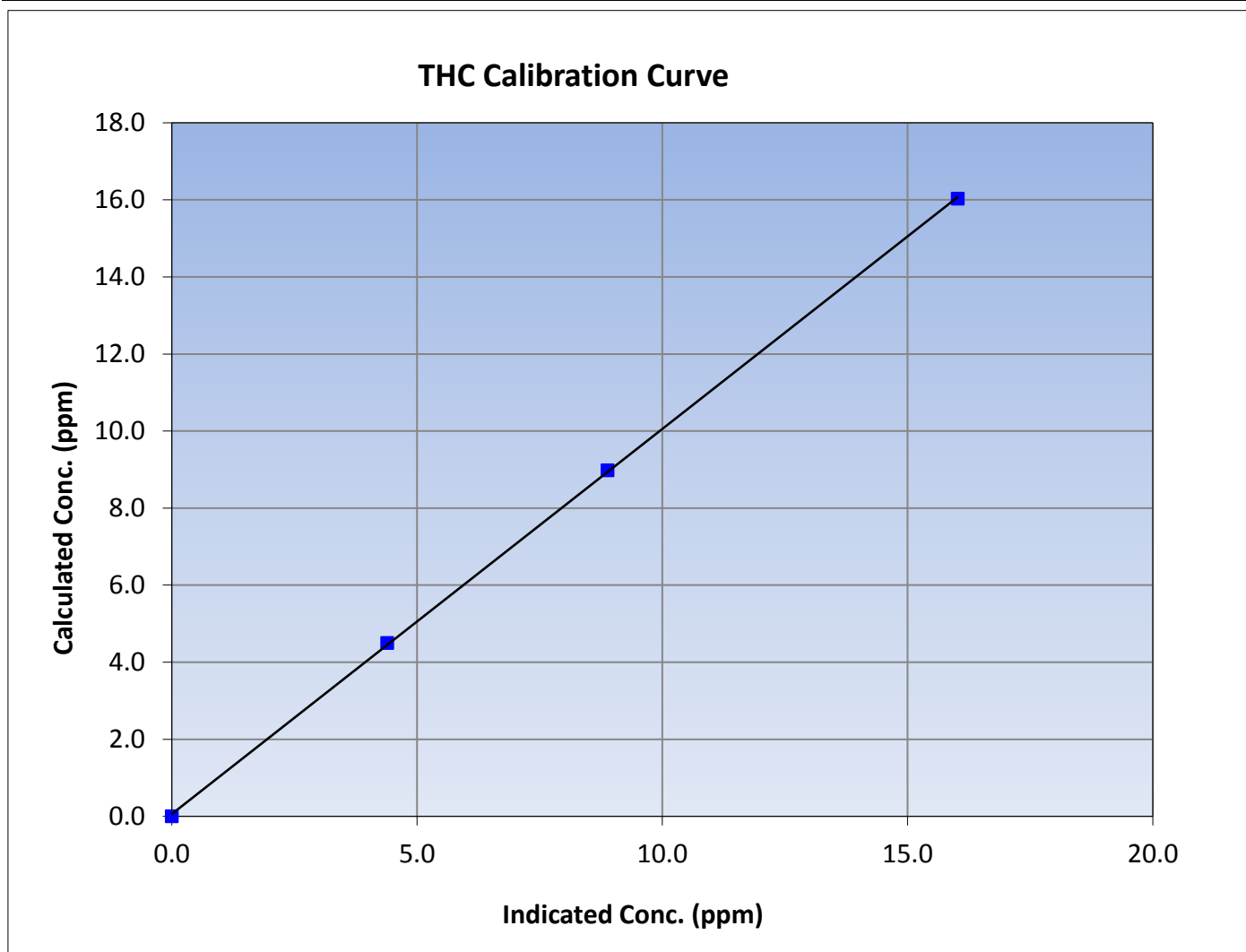
Version-02-2017

Station Information

Calibration Date	April 24, 2017	Previous Calibration	AMS 01
Station Name	Fort McKay - Bertha Ganter	Station Number	42807
Start Time (MST)	9:45	End Time (MST)	13:10
Analyzer make	Thermo 55i	Analyzer serial #	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999925	≥ 0.995			
16.03	16.02	1.0006						
8.98	8.88	1.0116				Slope	0.999456	0.90 - 1.10
4.50	4.39	1.0254						
			Intercept	0.060250	± 0.5			





Wood Buffalo Environmental Association

CH₄ Calibration Summary

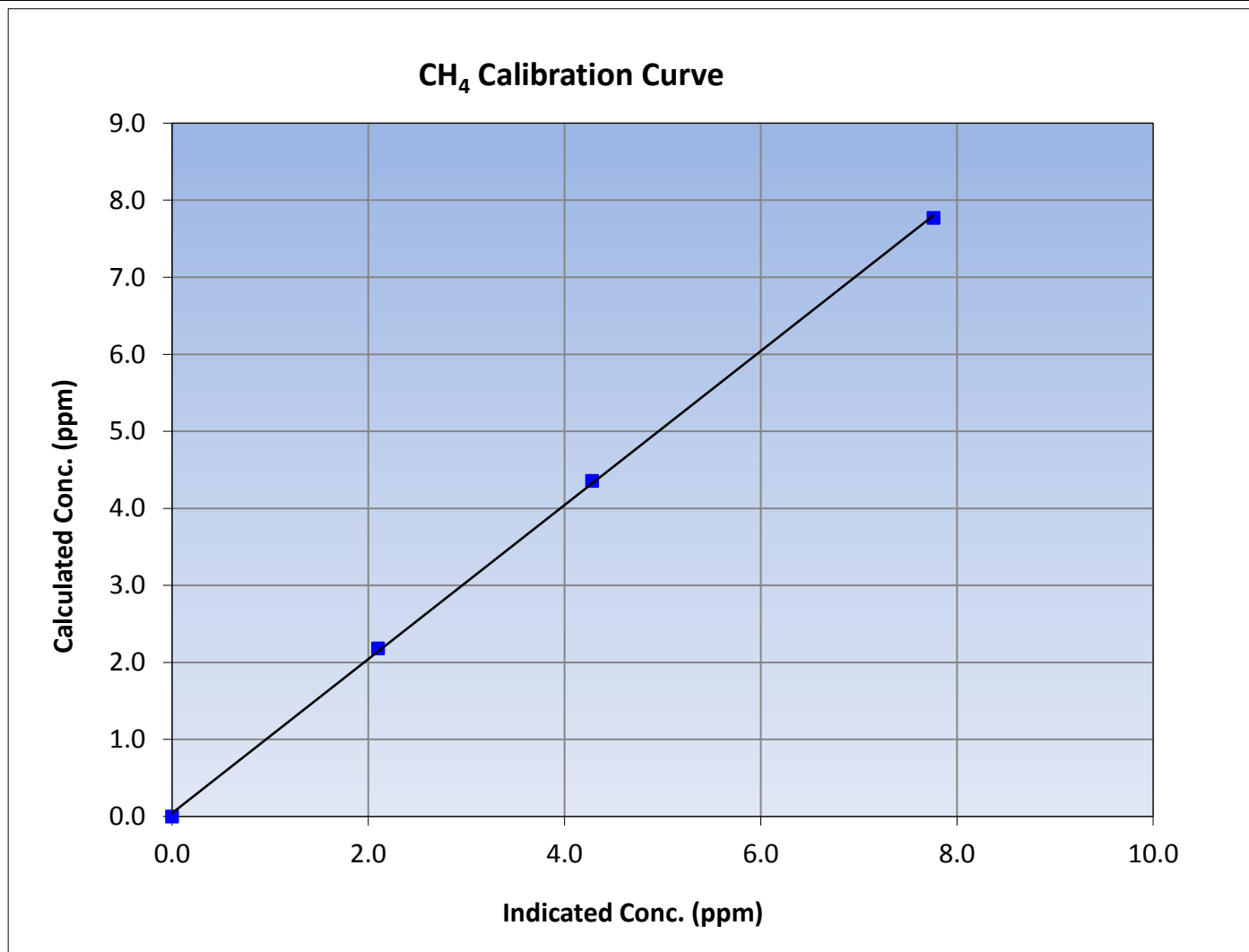
Version-02-2017

Station Information

Calibration Date	April 24, 2017	Previous Calibration	AMS 01
Station Name	Fort McKay - Bertha Ganter	Station Number	42807
Start Time (MST)	9:45	End Time (MST)	13:10
Analyzer make	Thermo 55i	Analyzer serial #	1152430012

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999836	≥ 0.995			
7.77	7.76	1.0015						
4.36	4.28	1.0176				Slope	0.999629	0.90 - 1.10
2.18	2.10	1.0392						
			Intercept	0.043687	± 0.5			





Wood Buffalo Environmental Association

NMHC Calibration Summary

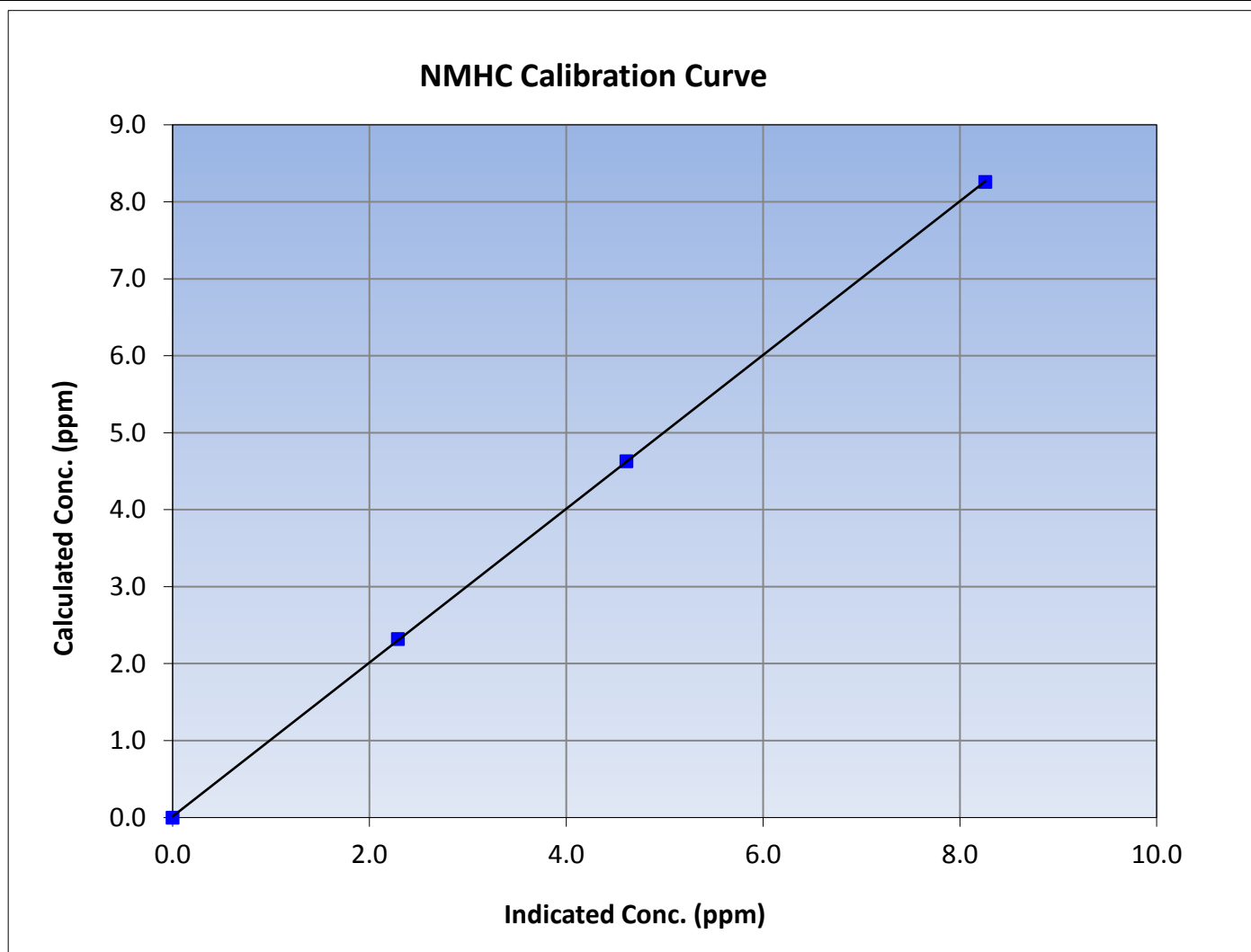
Version-02-2017

Station Information

Calibration Date	April 24, 2017	Previous Calibration	AMS 01
Station Name	Fort McKay - Bertha Ganter	Station Number	42807
Start Time (MST)	9:45	End Time (MST)	13:10
Analyzer make	Thermo 55i	Analyzer serial #	1152430012

Calibration Data

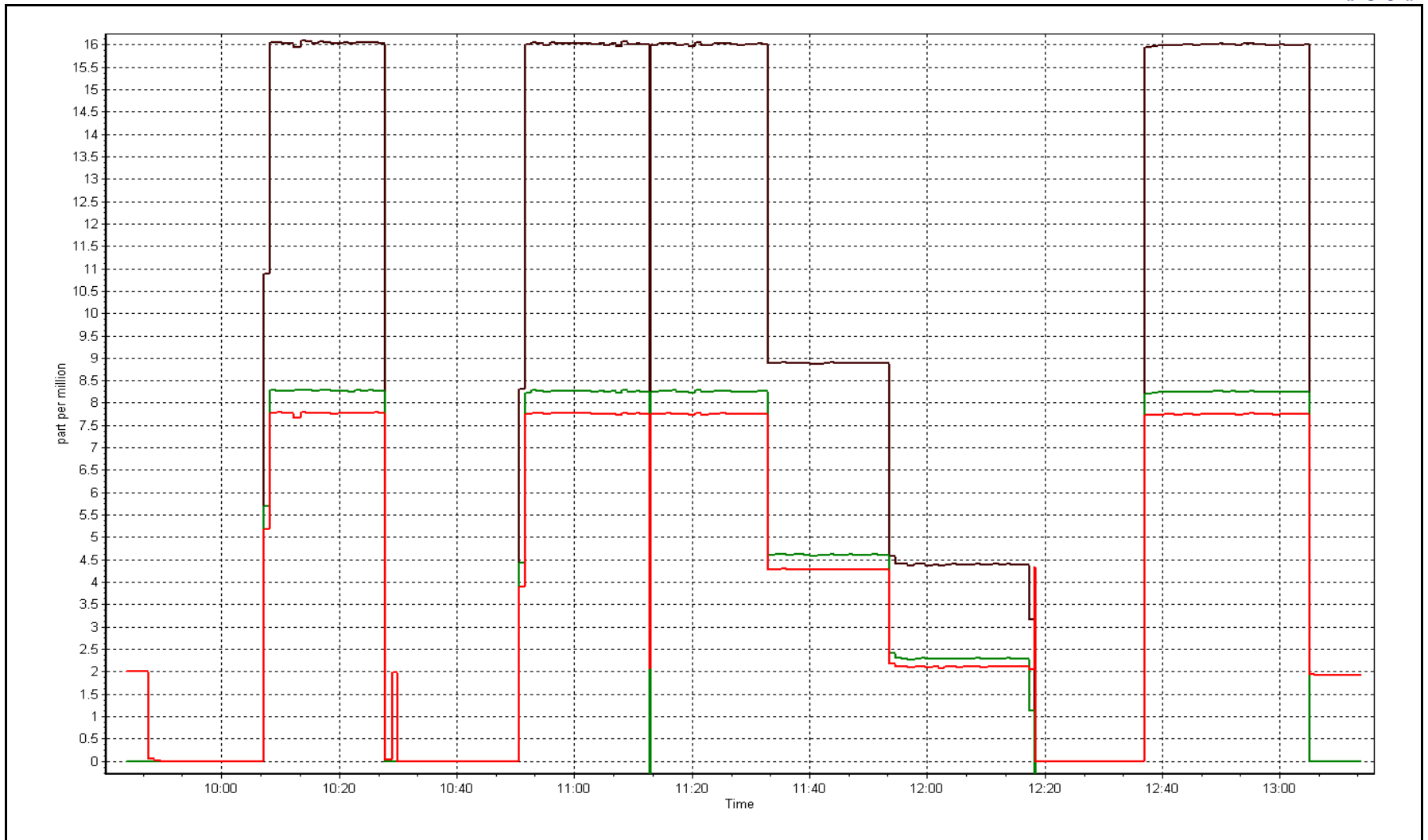
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999983	≥ 0.995			
8.26	8.26	0.9998						
4.63	4.61	1.0039				Slope	0.999046	0.90 - 1.10
2.32	2.29	1.0127						
			Intercept	0.015009	± 0.5			



NMHC Calibration Plot

Date: April 24, 2017

Location: Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association

O₃ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
Calibration Date:	April 26, 2017	Last Cal Date:	March 17, 2017
Start time (MST):	9:05	End time (MST):	12:30
Reason:	Routine		

Calibration Standards

O3 generation mode:	Photometer	O3 reference Date:	April 25, 2017
Calibrator Make/Model:	Sabio 4010	Serial Number:	1730512
ZAG Make/Model:	API 701H	Serial Number:	587

Analyzer Information

Analyzer make: API T400

Analyzer serial #: 1107

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 500 ppb		Pressure	27	27
Calculated slope	0.997657	0.998278	Flow cell A	767.0	770.0
Calculated intercept	-1.503586	-1.418850	Flow cell B	769.0	772.0
Analyzer Background	0.4		O3 Measurement	4125.6	4058.1
Analyzer Coefficient	1.060		O3 Reference	4125.6	4058.3

O₃ Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5996	0.00	0.0	0.0	----
as found span	5000	0.88	439.0	447.7	0.981
calibrator zero	5996	0.00	0.0	0.1	----
high point	5000	0.88	439.0	440.0	0.998
second point	5001	0.56	259.7	262.9	0.988
third point	4999	0.34	133.3	136.2	0.979
as left zero	5996	0.0	0.0	0.0	----
as left span	5000	0.9	439.0	452.9	0.969
Average Correction Factor					0.988

Corrected As found	447.66	Previous response	441.53	*% change	-1.4%
--------------------	--------	-------------------	--------	-----------	-------

* = > +/-8% change initiates investigation

Notes:

Span adjusted.

Calibration Performed By:

Devin Russell



Wood Buffalo Environmental Association

O₃ Calibration Summary

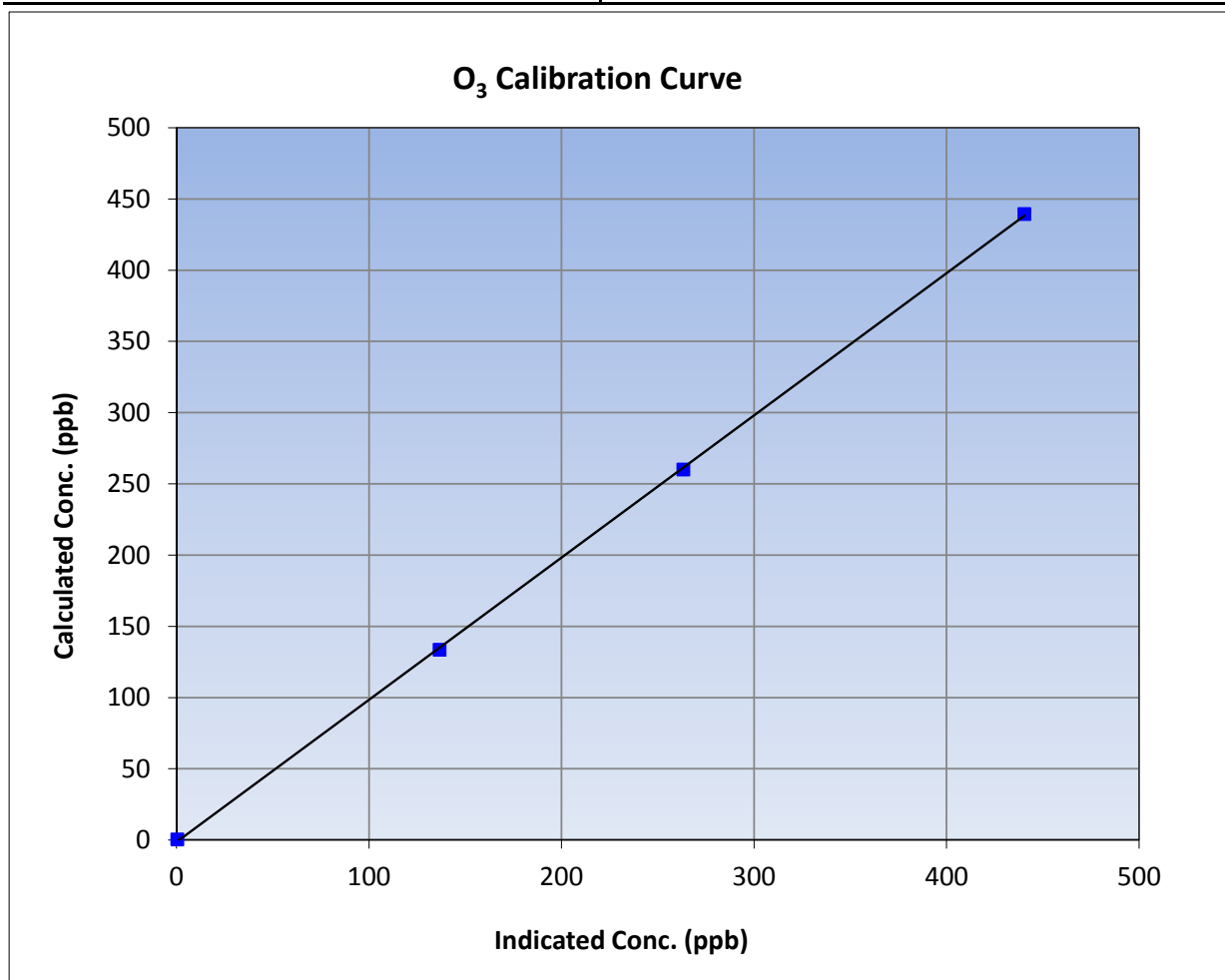
Version-03-2017

Station Information

Calibration Date	April 26, 2017	Previous Calibration	March 17, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	9:05	End Time (MST)	12:30
Analyzer make	API T400	Analyzer serial #	1107

Calibration Data

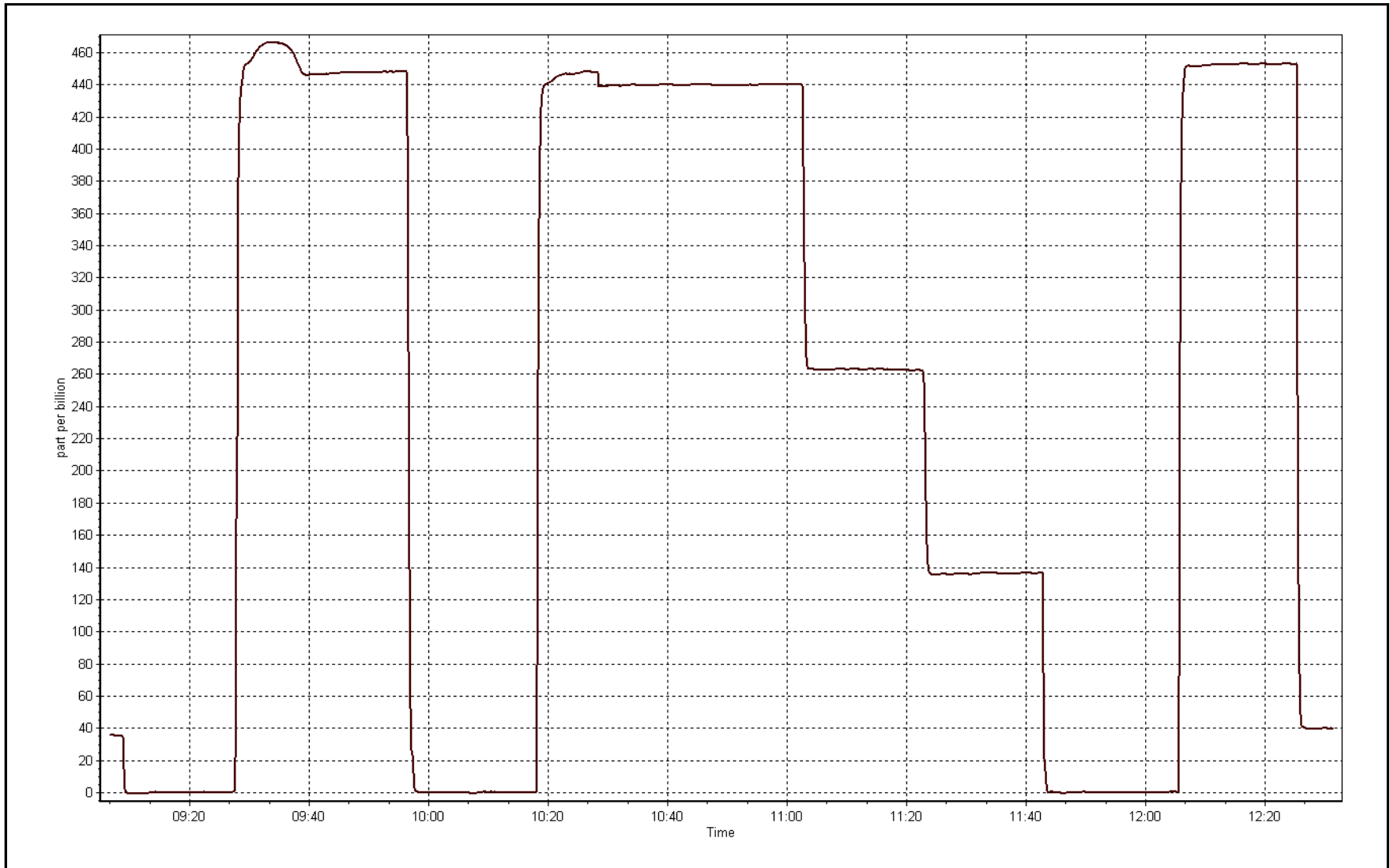
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999939	≥0.995
439.0	440.0	0.9977	Slope	0.998278	0.90 - 1.10
259.7	262.9	0.9880	Intercept	-1.418850	+/- 10
133.3	136.2	0.9788			



O₃ Calibration Plot

Date: April 26, 2017

Location: Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association

TN - NO_x - NH₃ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
NOX Cal Date:	April 25, 2017	Last Cal Date:	March 21, 2017
Start time (MST):	8:10	End time (MST):	13:30
NH3 Cal Date:	April 27, 2017	Last Cal Date:	March 21, 2017
Start time (MST):	8:25	End time (MST):	12:50
Reason:	Routine		

Calibration Standards

NOX Cal Gas Conc.	<u>49.7</u>	ppm	NO Gas Cylinder #	EY0000683
NO Cal Gas Conc.	<u>49.7</u>	ppm	NO Cal Gas Expiry	November-04-19
NH3 Cal Gas Conc.	<u>95.5</u>	ppm	NH3 Gas Cylinder #	LL23123
			NH3 Cal Gas Expiry	May-24-17
Calibrator Model	Sabio 4010		Serial Number	1730512
ZAG make/model	API 701H		Serial Number	587

Analyzer Information

Analyzer make:	API T201	Analyzer serial #:	152		
	<u>Start</u>	<u>Finish</u>			
NO coefficient	1.116	1.116	NH3 Range (ppb)	<u>Start</u>	<u>Finish</u>
NOX coefficient	1.261	1.267	NOX Range (ppb)	0 - 1000 ppb	
NO2 coefficient	1.000	1.000	PMT Temperature	7.0	7.0
NH3 coefficient	0.857	0.873	Reaction cell Press	6.6	6.6
TN coefficient	1.264	1.265	Sample Flow	519	524
NO bkgrnd	-0.2	-0.2	PMT Voltage	645.0	645.0
NOX bkgrnd	-0.2	-0.2	Moly Temperature	314.9	316.5
TN bkgrnd	-0.1	-0.1	NH3 Conv Temp	825	825

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	1.000799	0.996358
NO _x Cal Offset	1.318973	-0.522148
NO Cal Slope	0.998532	1.000397
NO Cal Offset	1.283365	1.377838
NO ₂ Cal Slope	1.005055	0.991125
NO ₂ Cal Offset	-0.616990	-2.546061
NH3 Cal Slope	1.003516	1.001038
NH3 Cal Offset	-1.270000	0.195856
TN Cal Slope	0.989405	0.986973
TN Cal Offset	-2.430000	-1.299809



Wood Buffalo Environmental Association

TN - NOX - NH₃ Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated TN concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated TN concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	TN Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NH3 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5997	0.0	0.0	0.0	0.0	2.5	1.6	0.9	----	----
as found NO	5415	83.0	750.3	750.3	----	741.7	746.0	-4.3	1.012	----
calibrator zero	5997	0.0	0.0	0.0	0.0	1.2	1.1	0.1	----	----
high NO point	5415	83.0	750.3	750.3	----	750.2	753.3	-3.0	1.000	----
NO/O3 point	5415	83.0	750.3	750.3	----	751.3	756.4	-5.7	0.999	----
as found NH3	4958	41.9	800.3	NA	800.3	820.9	----	808.0	0.975	0.990
first NH3	4958	41.9	800.3	NA	800.3	812.7	----	800.2	0.985	1.000
second NH3	4979	20.9	399.2	NA	399.2	404.0	----	396.2	0.988	1.008
third NH3	4992	10.5	200.4	NA	200.4	205.8	----	201.4	0.974	0.996
Average Correction Factor									0.9994	1.0011

Corrected As found TN = 739.2 ppb NO_x = 744.4 ppb NH3 = 807.2 ppb

Previous Response TN = 760.8 ppb NO_x = 748.4 ppb NH3 = 798.8 ppb

NH3 Previous Converter Efficiency = 85.7 %

NH3 Current Converter Efficiency = 87.3 %

*Percent Change TN = 2.9%

*Percent Change NO_x = 0.5%

*Percent Change NH3 = -1.0%

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NO _x concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated TN concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated TN concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5997	0.0	0.0	0.0	0.0	1.4	0.9	1.2	----	----
as found span	5415	83.0	750.3	750.3	750.3	749.3	747.8	748.4	1.0013	1.0034
calibrator zero	5997	0.0	0.0	0.0	0.0	1.1	0.4	1.2	----	----
high point	5415	83.0	750.3	750.3	750.3	753.3	749.1	750.2	0.9960	1.0015
second point	5451	46.4	419.5	419.5	419.5	422.8	418.3	421.3	0.9921	1.0028
third point	5474	23.3	210.7	210.7	210.7	210.3	206.6	210.3	1.0015	1.0198
Average Correction Factor									0.9965	1.0081

Corrected As found	TN = 747.2 ppb	NO _x = 747.9 ppb	NO = 746.9 ppb	*Percent Change	TN = 1.8%
Previous Response	TN = 760.8 ppb	NO _x = 748.4 ppb	NO = 750.1 ppb	*Percent Change	NO _x = 0.1%
				*Percent Change	NO = 0.4%

* = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO ₂ concentration (ppb) (Cc)	Indicated NO _x concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO ₂ concentration (ppb) (Ic)	NO _x Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO ₂ Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point	----	0.0	756.4	748.2	9.0	0.9919	1.0028	----	----
1st NO ₂ (400 ppb O ₃)	316.1	432.2	753.6	316.1	437.5	0.9957	----	0.9877	101.2%
2nd NO ₂ (200 ppb O ₃)	489.9	258.3	754.1	489.9	264.2	0.9949	----	0.9776	102.3%
3rd NO ₂ (100 ppb O ₃)	614.0	134.2	753.4	614.0	139.4	0.9959	----	0.9627	103.9%
2nd NO ref point	----	0.0	757.3	746.3	11.0	0.9907	1.0053	----	----
Average Correction Factor						0.9943	1.0041	0.9760	102.5%

Notes:

NO_x/NO span adjusted. NH₃ span adjusted.

Calibration Performed By:

Devin Russell



Wood Buffalo Environmental Association

TN Calibration Summary

Version-03-2017

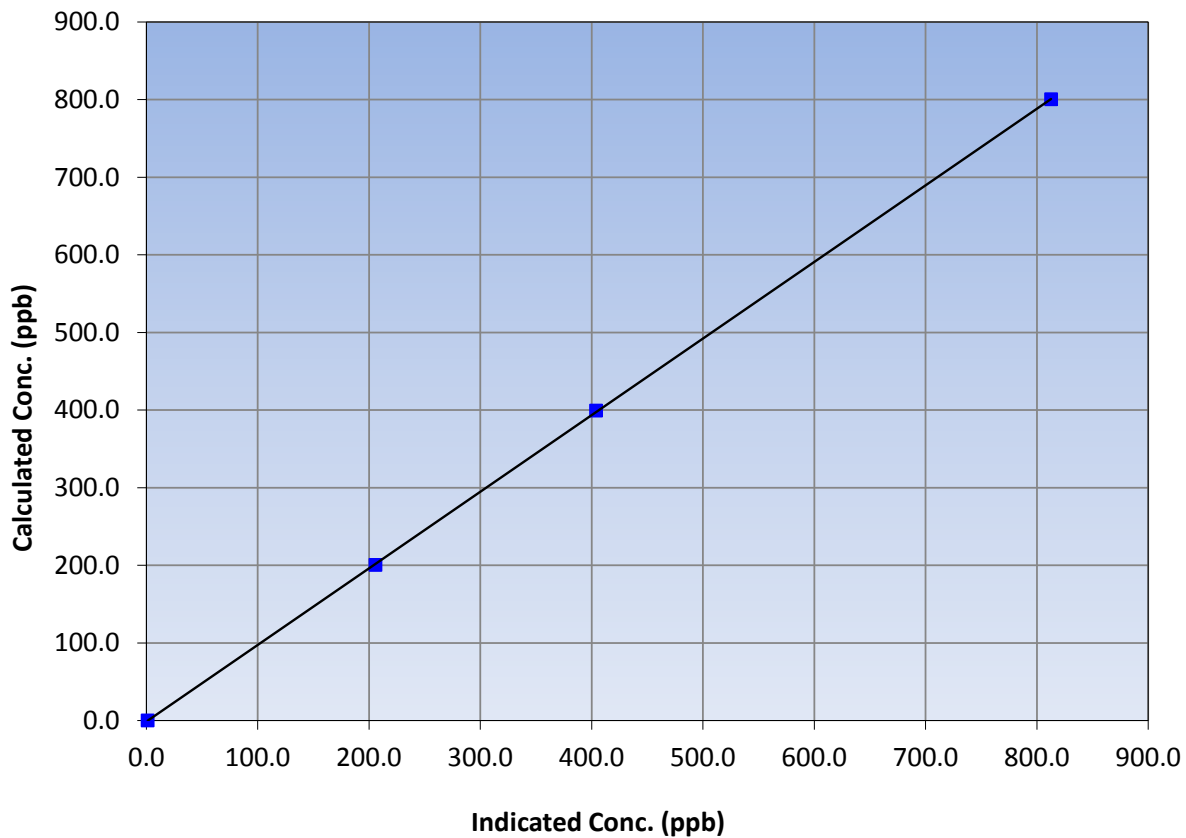
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	13:30
Analyzer make	API T201	Analyzer serial #	152

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	1.2	----	Correlation Coefficient	≥0.995	
800.3	812.7	0.9847			
399.2	404.0	0.9880			
200.4	205.8	0.9741			
			Slope	0.986973	0.90 - 1.10
			Intercept	-1.299809	+/-20

TN Calibration Curve





Wood Buffalo Environmental Association

NH₃ Calibration Summary

Version-03-2017

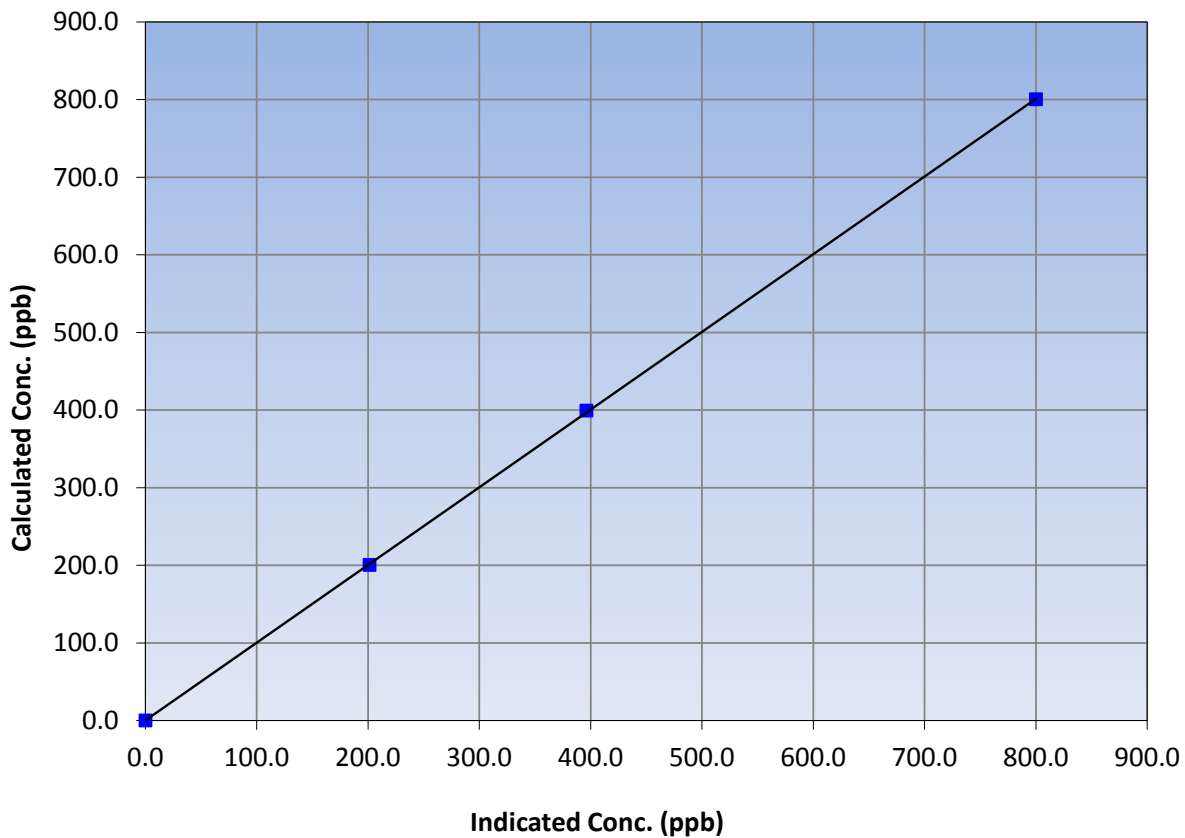
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	13:30
Analyzer make	API T201	Analyzer serial #	152

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
800.3	800.2	1.0002			
399.2	396.2	1.0077			
200.4	201.4	0.9955			
			Slope	1.001038	0.90 - 1.10
			Intercept	0.195856	+/-20

NH₃ Calibration Curve





Wood Buffalo Environmental Association

NO_x Calibration Summary

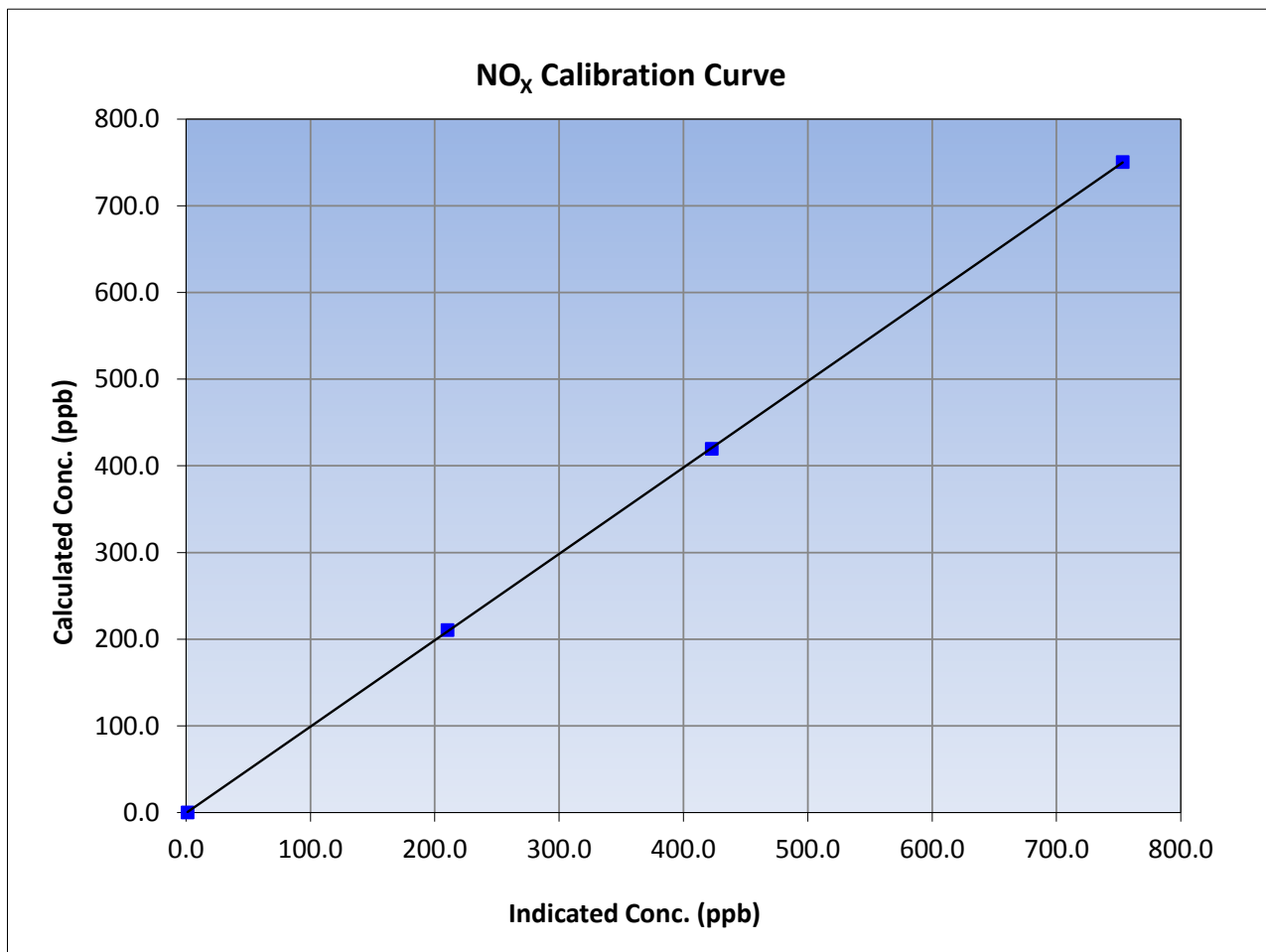
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	13:30
Analyzer make	API T201	Analyzer serial #	152

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	1.1	----	Correlation Coefficient	≥0.995	
750.3	753.3	0.9960			
419.5	422.8	0.9921			
210.7	210.3	1.0015			
			Slope	0.996358	0.90 - 1.10
			Intercept	-0.522148	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

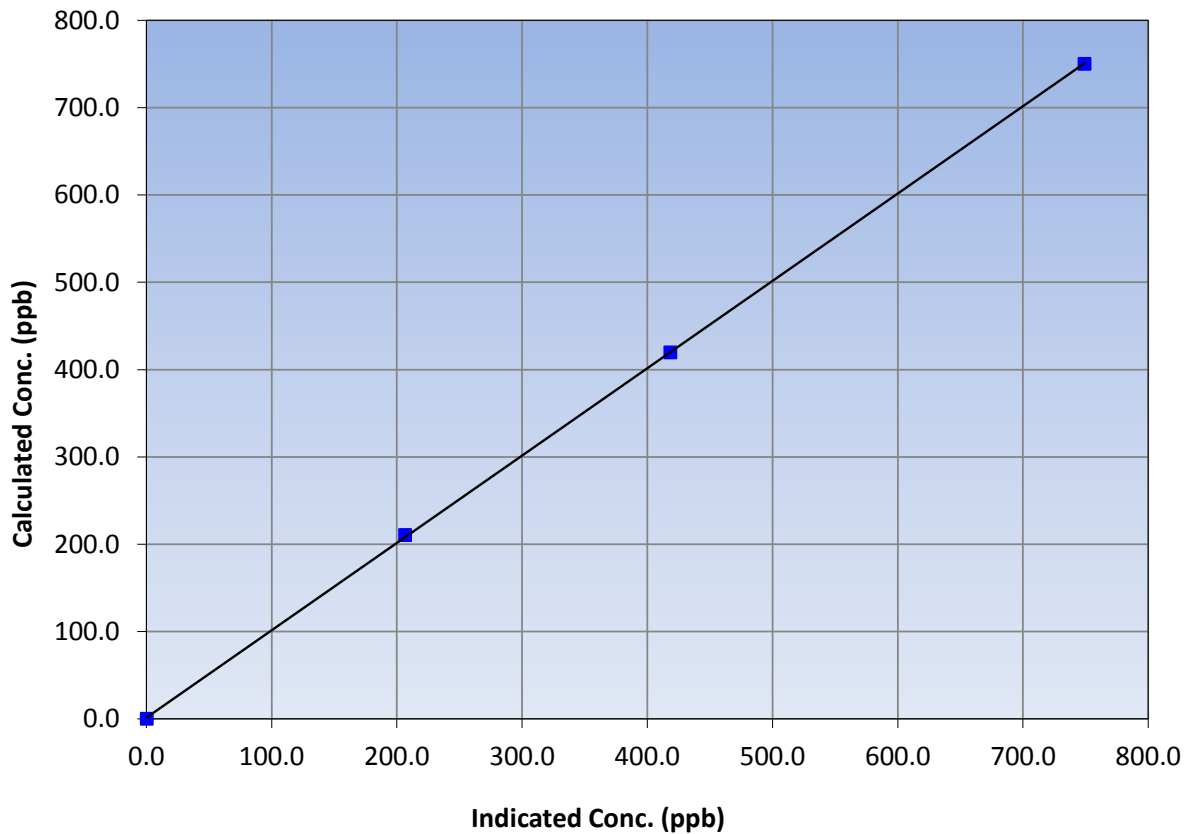
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	13:30
Analyzer make	API T201	Analyzer serial #	152

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.4	----	Correlation Coefficient	≥0.995
750.3	749.1	1.0015		
419.5	418.3	1.0028		
210.7	206.6	1.0198		
			Slope	0.90 - 1.10
			Intercept	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

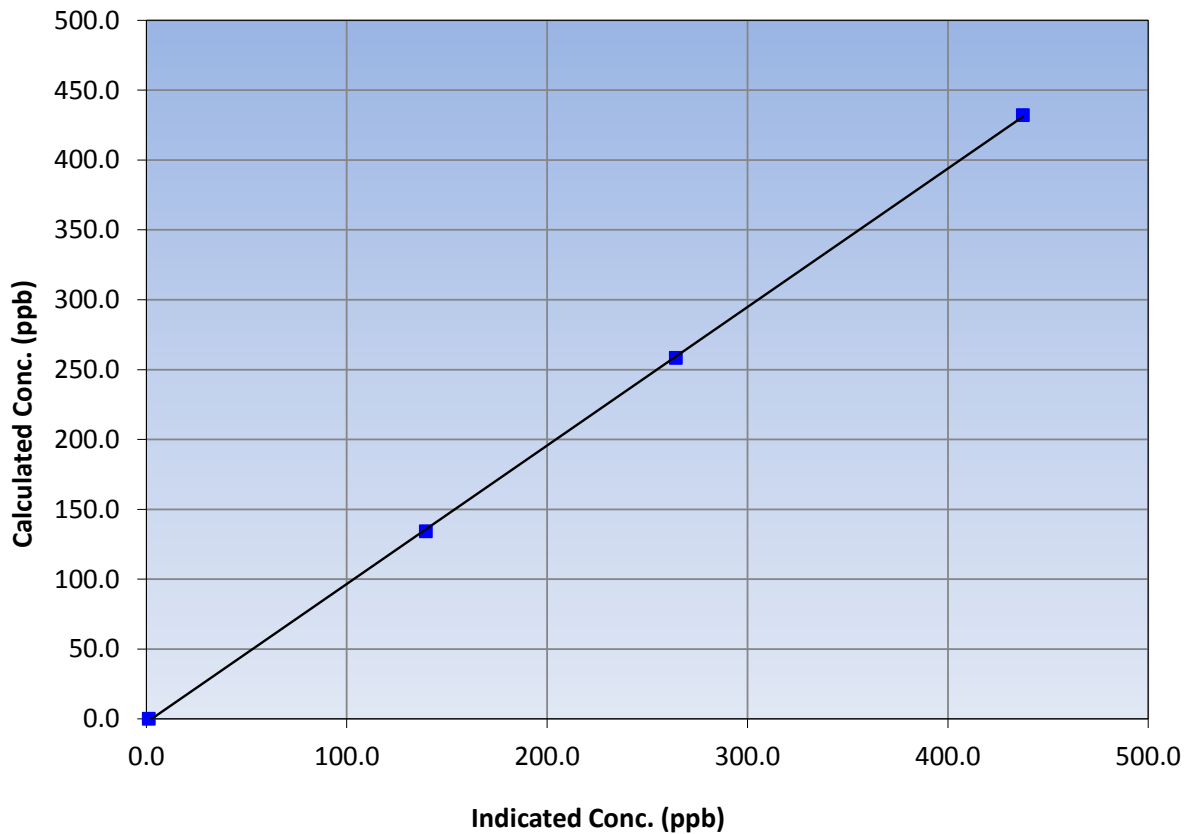
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	13:30
Analyzer make	API T201	Analyzer serial #	152

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	1.2	----	Correlation Coefficient	≥0.995	
432.2	437.5	0.9877			
258.3	264.2	0.9776			
134.2	139.4	0.9627			
			Slope	0.991125	0.90 - 1.10
			Intercept	-2.546061	+/-20

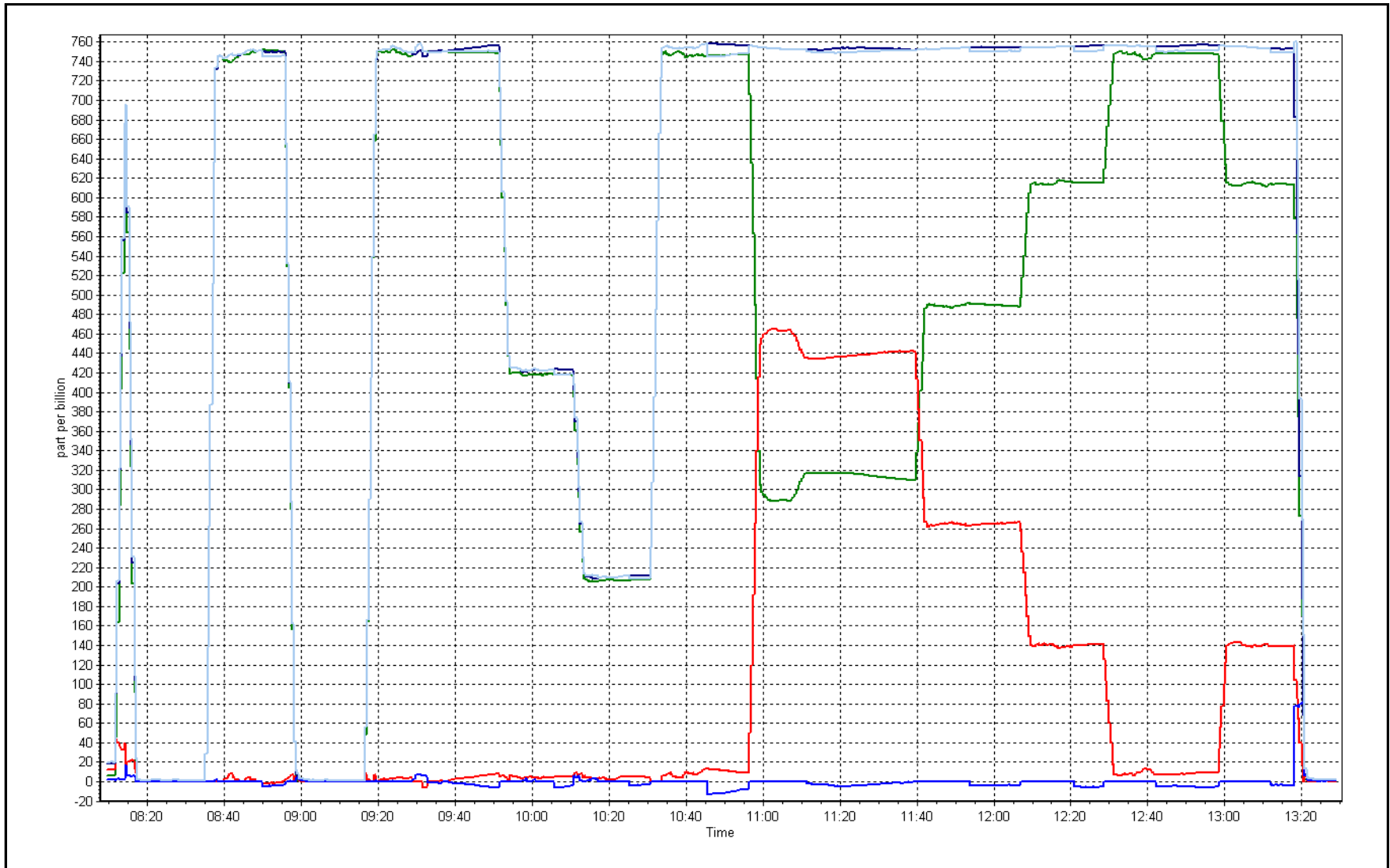
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 25, 2017

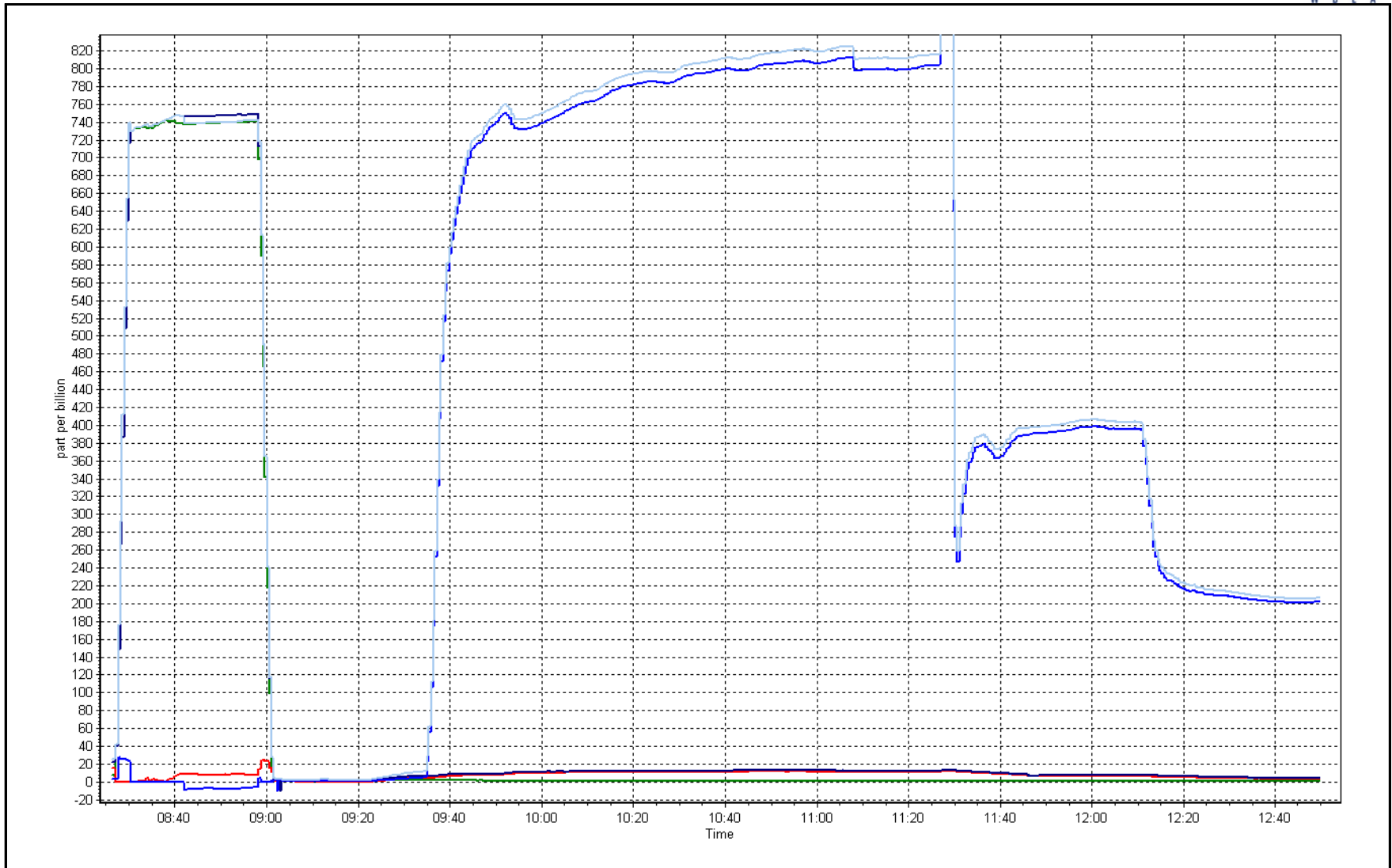
Location: Fort McKay - Bertha Ganter



NH₃ Calibration Plot

Date: April 27, 2017

Location: Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
Calibration Date:	April 25, 2017	Last Cal Date:	March 21, 2017
Start time (MST):	8:10	End time (MST):	14:00
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	EY0000683	Cal Gas Expiry Date	November-04-19
NOX Cal Gas Conc.	<u>49.7</u> ppm	NO Cal Gas Conc.	<u>49.7</u> ppb
Calibrator Model	Sabio 4010	Serial Number	1730512
ZAG make/model	API &01H	Serial Number	587

Analyzer Information

Analyzer make: Thermo 42i			Analyzer serial #: 1218153357		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	1.149	1.172	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	1.000	1.000	hamber Temperature	50.2	50.5
NO2 coefficient	1.000	1.000	Reaction cell Press	172.3	172.9
NO bkgrnd	5.8	5.9	Sample Flow	0.594	0.599
NOX bkgrnd	5.9	6.0	PMT Voltage	-791.8	-791.4

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.999580	1.000366
NO _x Cal Offset	1.792295	0.985820
NO Cal Slope	0.999374	1.000845
NO Cal Offset	1.915413	0.956296
NO ₂ Cal Slope	0.998818	1.001750
NO ₂ Cal Offset	-0.422058	-0.416659



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5997	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	----	----
as found span	5415	83.0	750.3	750.3	0.0	736.1	734.4	1.7	1.0193	1.0216
calibrator zero	5997	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	----	----
high point	5415	83.0	750.3	750.3	0.0	749.0	748.6	0.4	1.0018	1.0023
second point	5451	46.4	419.5	419.5	0.0	419.5	419.4	0.1	1.0000	1.0002
third point	5474	23.3	210.7	210.7	0.0	207.6	207.5	0.1	1.0146	1.0152
as left zero	5997	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	----	----
as left span	5415	83.0	750.3	310.5	439.8	750.5	297.6	452.9	0.9998	1.0434
Average Correction Factor									1.0055	1.0059

Corrected As found	NO _x = 736.1 ppb	NO = 734.5 ppb		*Percent Change	NO _x = 1.7%
Previous Response	NO _x = 748.8 ppb	NO = 748.8 ppb		*Percent Change	NO = 2.0%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	749.8	749.5	0.3	1.0007	1.0011	----	----
1st NO2 (400 ppb O3)	310.5	439.0	748.7	310.5	438.2	1.0021	----	1.0018	99.8%
2nd NO2 (200 ppb O3)	489.8	259.7	750.0	489.8	260.2	1.0004	----	0.9980	100.2%
3rd NO2 (100 ppb O3)	616.2	133.3	750.0	616.2	133.8	1.0004	----	0.9965	100.4%
2nd NO ref point	----	0.0	749.2	749.1	0.1	1.0014	1.0016	----	----
Average Correction Factor						1.0011	1.0013	0.9987	100.1%

Notes:

Span adjusted.

Calibration Performed By:

Devin Russell



Wood Buffalo Environmental Association

NO_x Calibration Summary

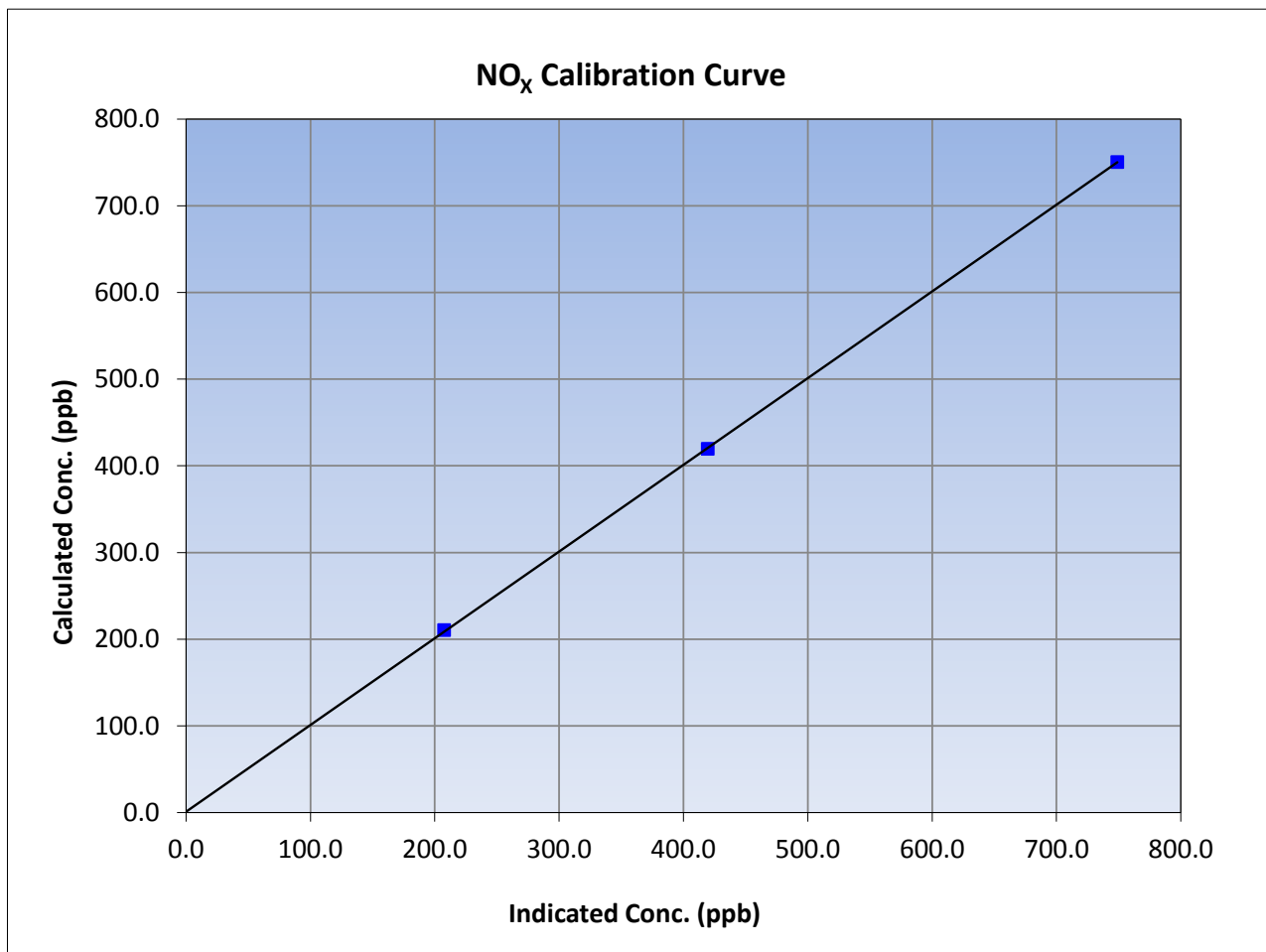
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	14:00
Analyzer make	Thermo 42i	Analyzer serial #	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
750.3	749.0	1.0018			
419.5	419.5	1.0000			
210.7	207.6	1.0146			
			Slope	1.000366	0.90 - 1.10
			Intercept	0.985820	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

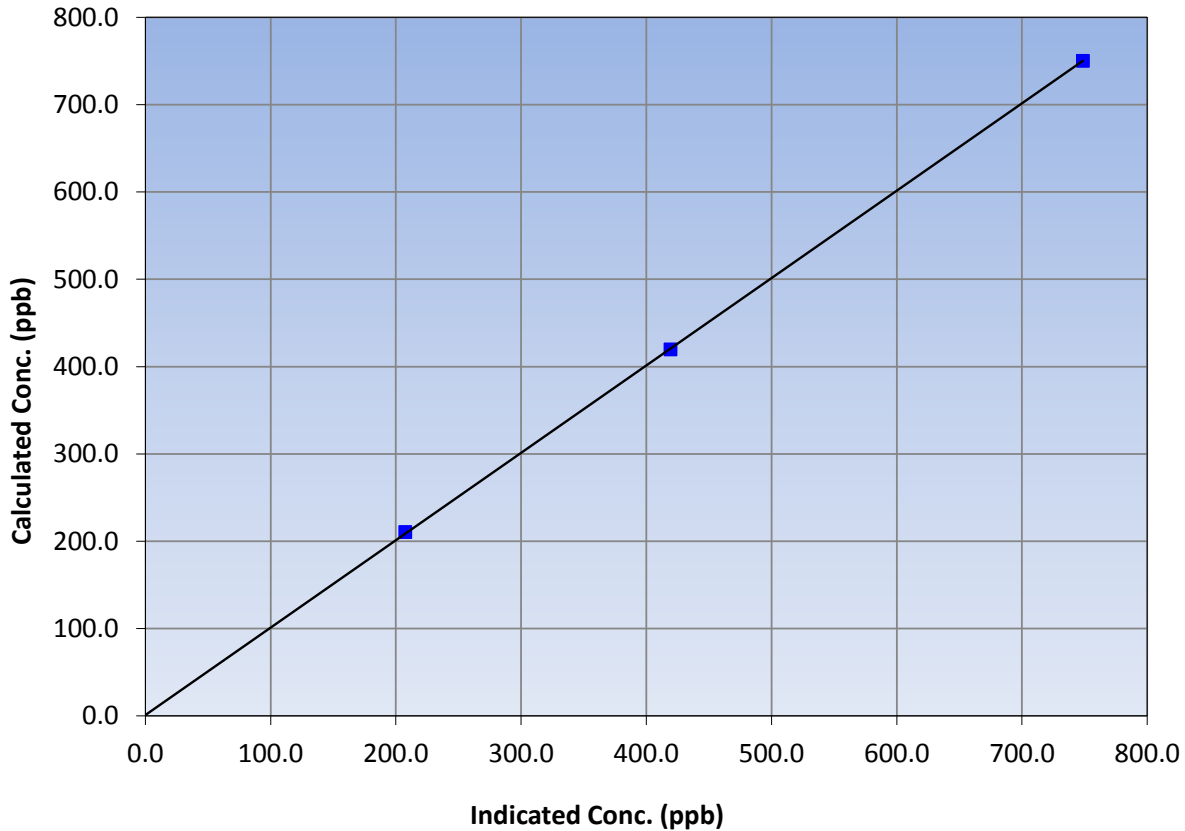
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	14:00
Analyzer make	Thermo 42i	Analyzer serial #	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	≥0.995	
750.3	748.6	1.0023			
419.5	419.4	1.0002			
210.7	207.5	1.0152			
			Slope	1.000845	0.90 - 1.10
			Intercept	0.956296	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

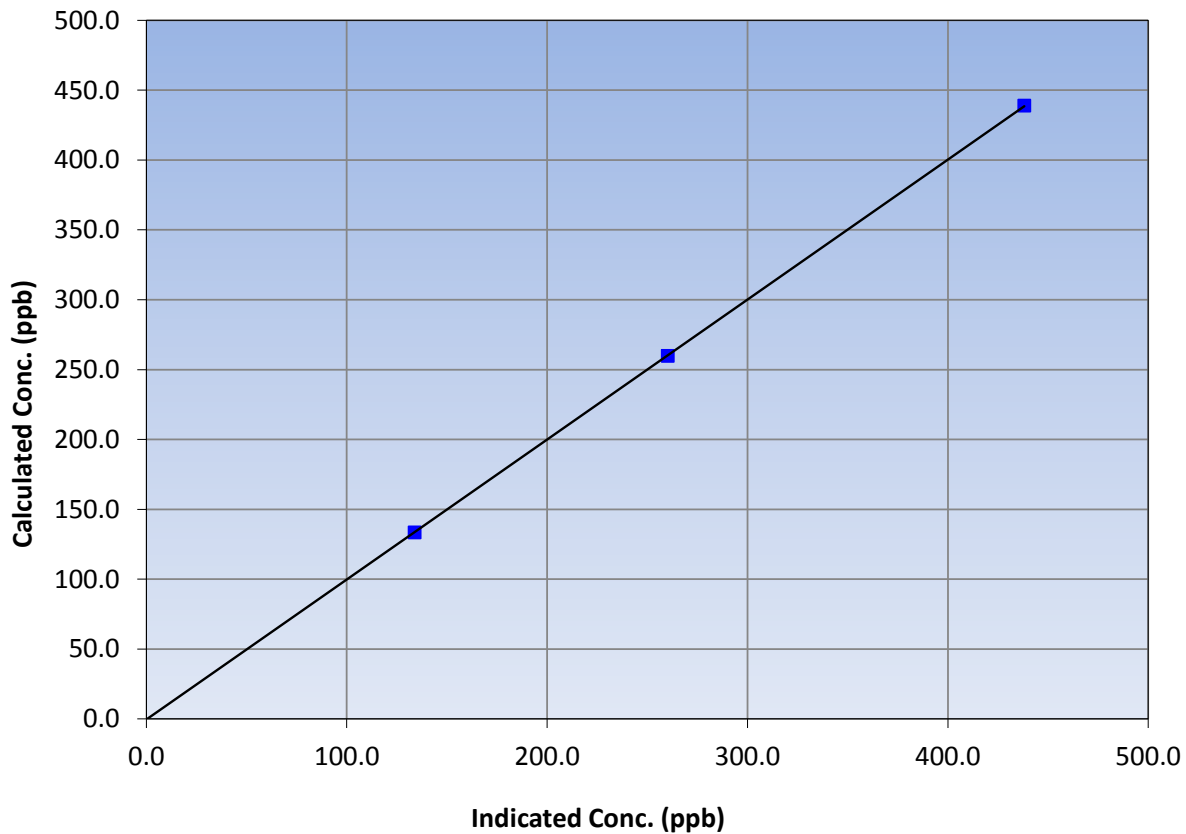
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 21, 2017
Station Name	Fort McKay - Bertha Ganter	Station Number	AMS 01
Start Time (MST)	8:10	End Time (MST)	14:00
Analyzer make	Thermo 42i	Analyzer serial #	1218153357

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
439.0	438.2	1.0018			
259.7	260.2	0.9980			
133.3	133.8	0.9965			
			Slope	1.001750	0.90 - 1.10
			Intercept	-0.416659	+/-20

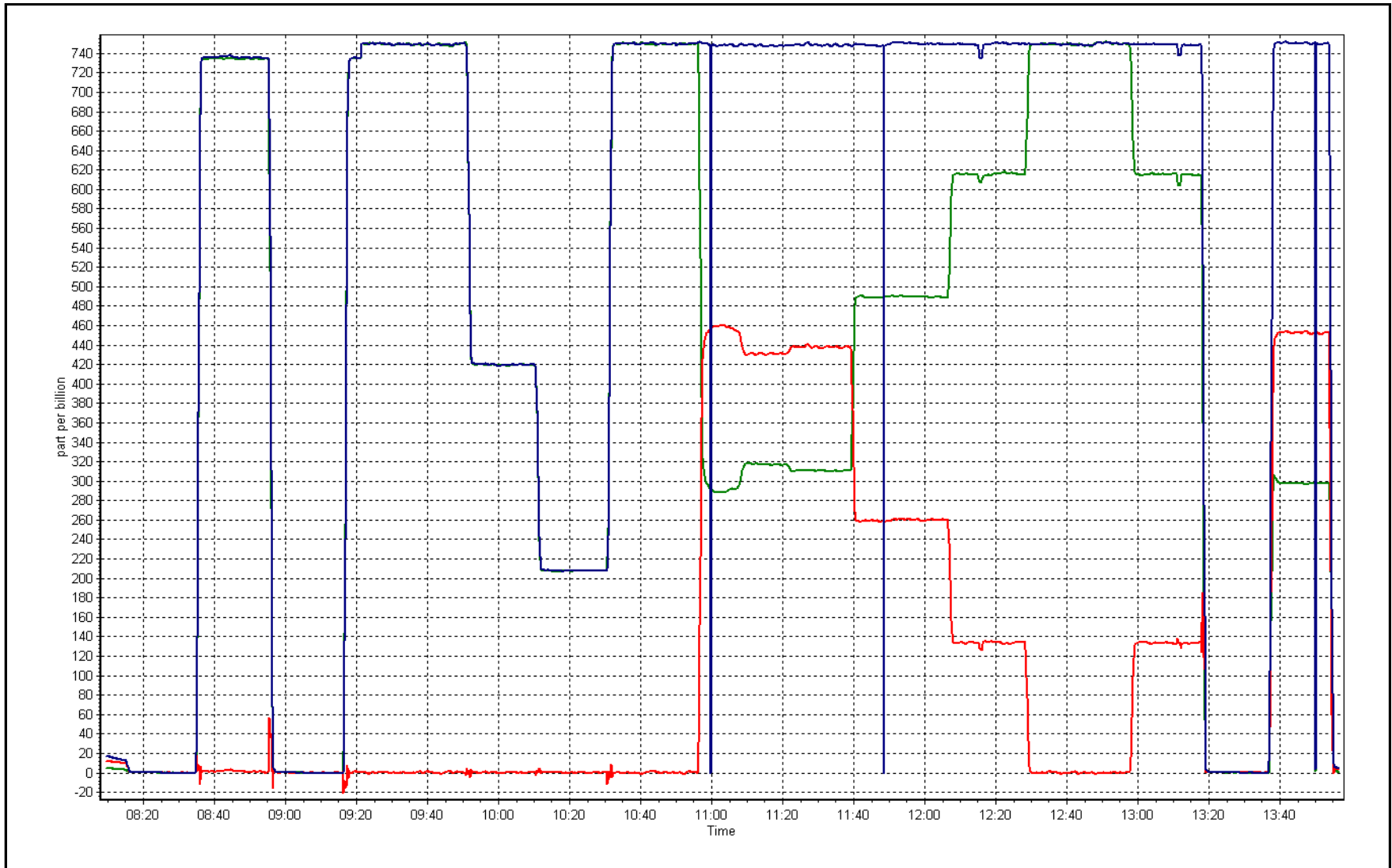
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 25, 2017

Location: Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Fort McKay - Bertha Ganter	Station number:	AMS 01
Calibration Date:	April 26, 2017	Last Cal Date:	March 21, 2017
Start time (MST):	10:20	End time (MST):	12:37
Sharp Model:	Thermo 5030 SHARP	S/N:	E-1486
Particulate Fraction:	PM2.5	C14 Source S/N:	5691
Flow Meter Make/Model:	Delta-Cal	S/N:	1451
Temp/RH standard:	Delta-Cal	S/N:	1451

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	5	5.3	5	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	978	977.92	987	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	992.4	1000	<input type="checkbox"/>	+/- 50 LPH
Nephelometer zero	-0.7	-----	0	<input checked="" type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: April 26, 2017 Last Cal Date: January 13, 2017
 Flow w/o adaptor: 16.54 Flow w/ adaptor: 16.53

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>2582</u>	Foil S/N: <u>2582</u>	
Foil Calibration	Foil Mass: <u>1186</u>	Foil Mass: <u>1186</u>	
	Calibration Date: <u>April 26, 2017</u>	Calibration Date: <u>November 17, 2016</u>	
(Limit) +/- 5% of previous	Correction Factor: <u>7124</u>	Correction Factor: <u>7017</u>	1.52%

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Cyclone head replaced with clean head. No adjustments made to T1, P3, or Flow. Nephelometer adjusted. Foil Calibration completed; did not adjust.

Calibration by: Devin Russell



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

AMS 2 MILDRED LAKE APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	681	34	39	99.31	30	0	7	0
H2S (ppb) Average	682	33	38	99.31	5	0	1	0
THC (ppm) Average	681	34	39	99.31	4.6	-	2.7	-
Temperature (C) Average	720	0	0	100	17.5	-	10.5	-
Relative Humidity (%) Average	720	0	0	100	99	-	82	-
Wind Speed 10 m (km/h) Average	720	0	0	100	26	-	17	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	681	1.6	4	-	0	0	0	0	1	5	30
H2S (ppb) Average	682	0.4	1	-	0	0	0	0	0	1	5
THC (ppm) Average	681	2.4	0.3	-	2.1	2.2	2.2	2.3	2.5	2.7	4.6
Temperature 2 m (C) Average	720	2.36	6	-	-11.7	-5.4	-2.5	2.2	6.2	10.7	17.5
Relative Humidity (%) Average	720	59.3	19	-	18	34	45	58	73	86	99
Wind Speed 10 m (km/h) Average	720	10.1	5	-	0	4	6	10	13	17	26
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	13 Apr 2017 18:00	13 Apr 2017 21:00	4	Station power failure
AIR QUALITY ANALYZERS	13 Apr 2017 22:00	13 Apr 2017 22:00	1	Stabilization after power failure



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Mildred Lake - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 30 ppb on Apr 9 21:00	Maximum Daily Average: 7.0 ppb on Apr 28		Hours of Data:	681
Minimum Value: 0 ppb on Apr 1 03:00	Minimum Daily Average: 0.0 ppb on Apr 18		Hours of Missing Data:	39
Maximum Diurnal Average: 2.7 ppb at hour 3	Minimum Diurnal Average: 0.7 ppb at hour 8		Hours of Calibration:	34
Monthly Average: 1.6 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 5 P ₉₉ = 22		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	3	9	2	0	1	10	21	0	4	7	0	0	0	0	4	9	6	3.3	21
2-Apr	4	1	Z	1	0	0	0	0	0	0	1	9	3	0	0	0	0	0	0	0	0	0	0	0	0.9	9
3-Apr	0	0	0	Z	0	0	0	0	0	1	4	19	12	4	0	0	0	1	1	0	0	0	0	0	1.9	19
4-Apr	0	0	21	4	2	Z	6	1	8	19	14	1	1	1	1	0	0	2	3	1	1	0	1	2	3.9	21
5-Apr	4	6	3	0	3	Z	0	0	0	C	C	C	C	1	0	0	0	1	1	0	0	0	0	0	1.1	6
6-Apr	Z	12	22	23	5	1	1	1	1	1	2	12	15	7	10	2	0	0	0	0	0	0	0	0	5.1	23
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	0	Z	1	0	1	1	3	1	0	0	0	0	0	0	0	1	3	19	30	21	10	5	4.2	30
10-Apr	3	16	14	16	Z	3	1	1	1	7	8	1	1	0	0	1	1	0	5	8	6	12	26	4	5.7	26
11-Apr	1	0	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	RE	0	0.0	0
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0.4	3
16-Apr	4	3	0	0	Z	0	0	0	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	6
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	4	22	8	6	5	4	3	2	1	1	0	0	0	0	2.5	22
20-Apr	3	6	Z	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	6
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1	1	3	1	0	1	0.4	3
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
23-Apr	0	0	0	0	0	Z	0	4	14	2	1	3	2	1	7	3	3	1	0	2	2	2	0	1	2.1	14
24-Apr	Z	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
25-Apr	5	Z	1	2	5	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	5
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	7	9	0.9	9
27-Apr	1	0	0	Z	1	8	11	3	1	2	2	1	1	2	0	1	1	1	10	7	3	2	2	1	2.6	11
28-Apr	1	1	0	0	Z	0	0	0	3	2	27	19	7	7	27	19	17	11	8	4	2	1	2	1	7.0	27
29-Apr	7	7	4	5	2	Z	0	1	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	7
30-Apr	Z	0	0	0	0	0	0	1	1	1	1	0	1	11	7	1	4	5	1	1	1	0	2	2	1.7	11

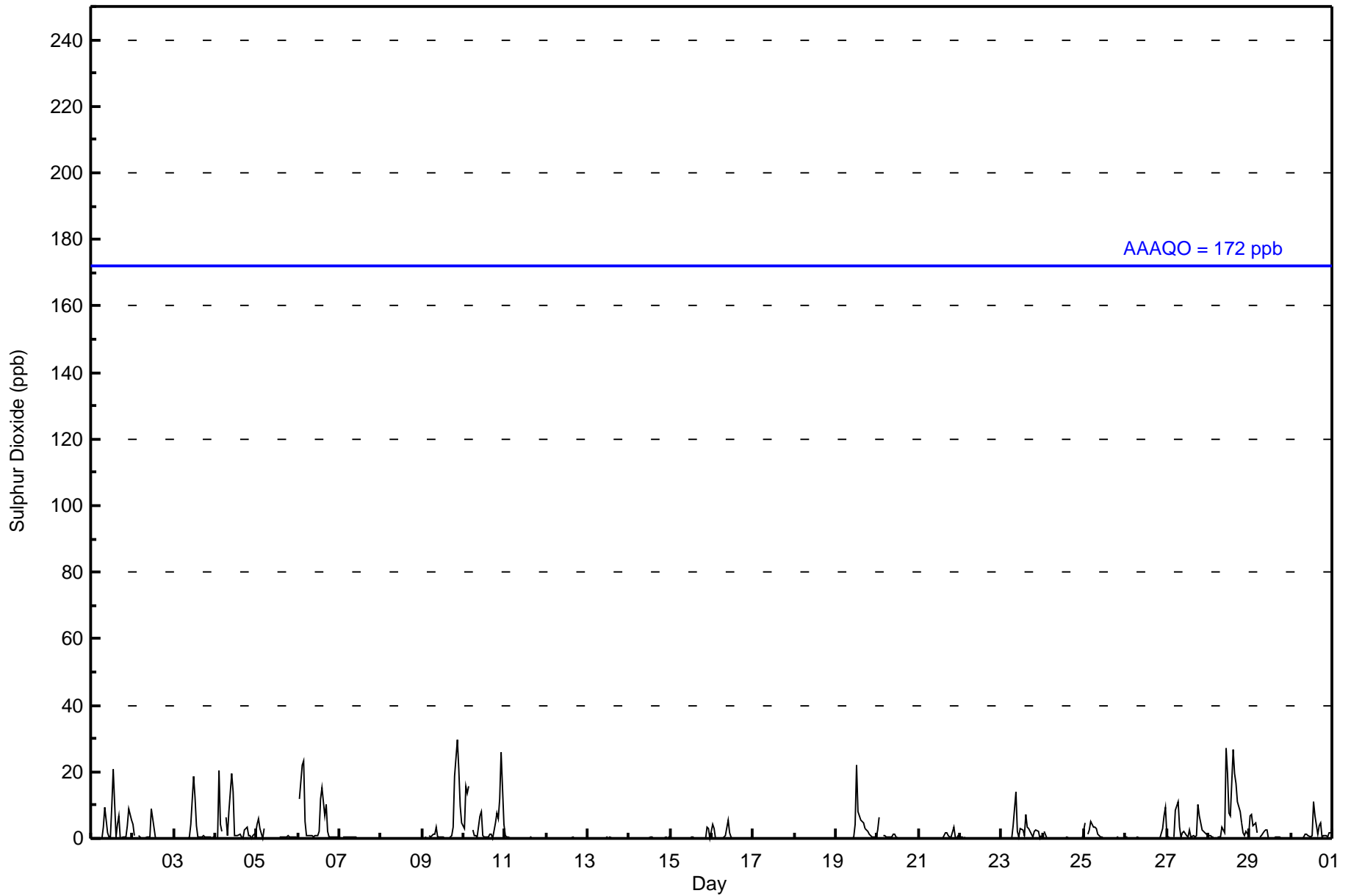
1.4	2.3	2.7	2.1	0.8	0.7	0.9	0.7	1.6	1.6	2.3	2.1	2.2	2.3	2.2	1.5	1.7	1.0	1.2	1.6	1.7	1.8	2.1	1.1	Diurnal Average	
7	16	22	23	5	8	11	4	14	19	27	19	22	21	27	19	17	11	10	19	30	21	26	9	Diurnal Maximum	

Z - zeronspan C - Calibration PF - Power Failure RE - Recovery
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mildred Lake - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mildred Lake - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	652	95.74	95.74
11 - 20	19	2.79	98.53
21 - 60	10	1.47	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mildred Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	67	165	52	17	14	24	25	76	71	48	31	29	12	4	8	9	652
11 - 20	1	0	0	0	1	1	2	5	1	3	2	0	1	2	0	0	19
21 - 60	0	0	0	0	0	0	2	3	1	2	0	0	0	1	1	0	10
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	165	52	17	15	25	29	84	73	53	33	29	13	7	9	9	681

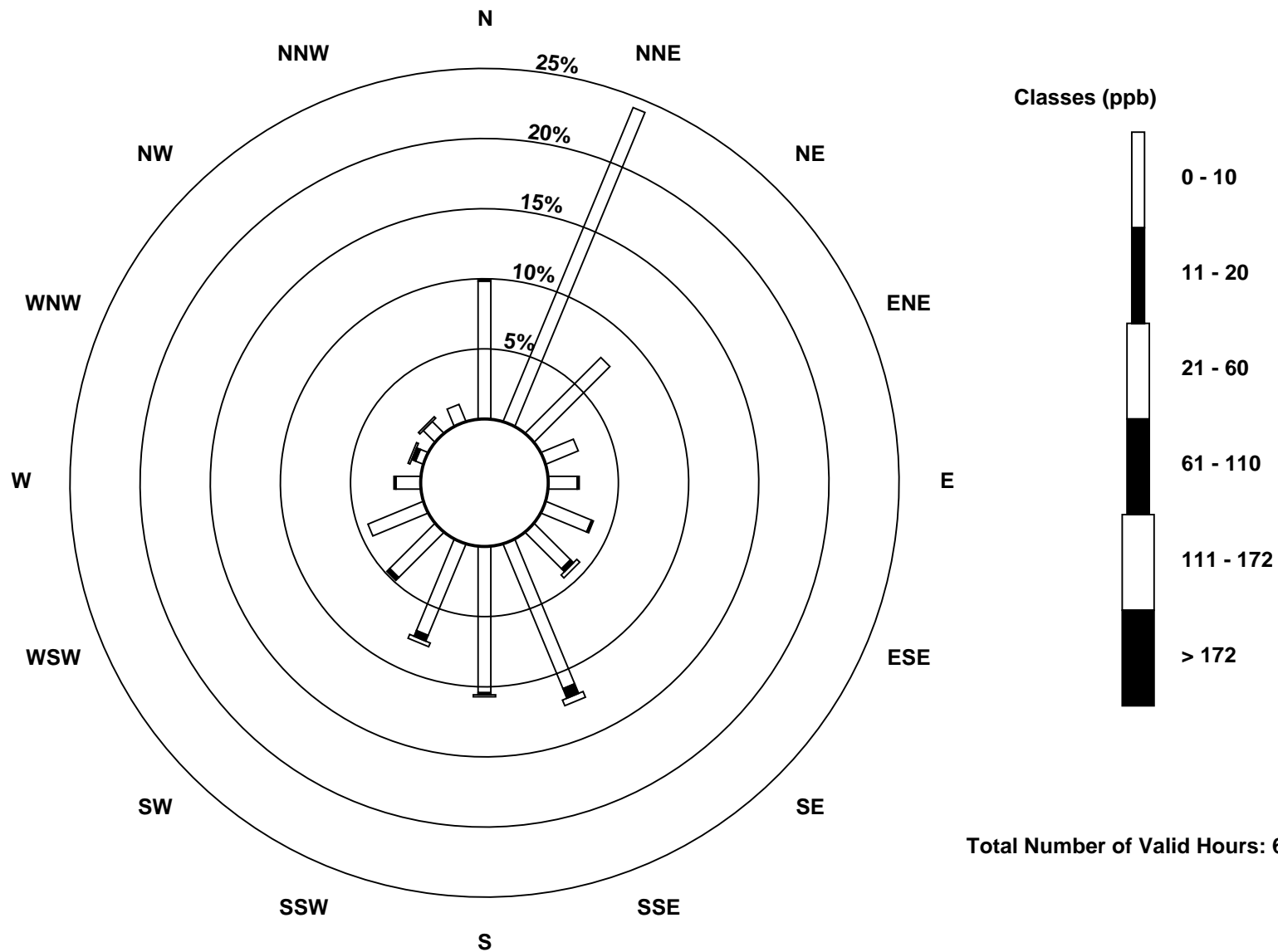
Total Number of Valid Hours: 681

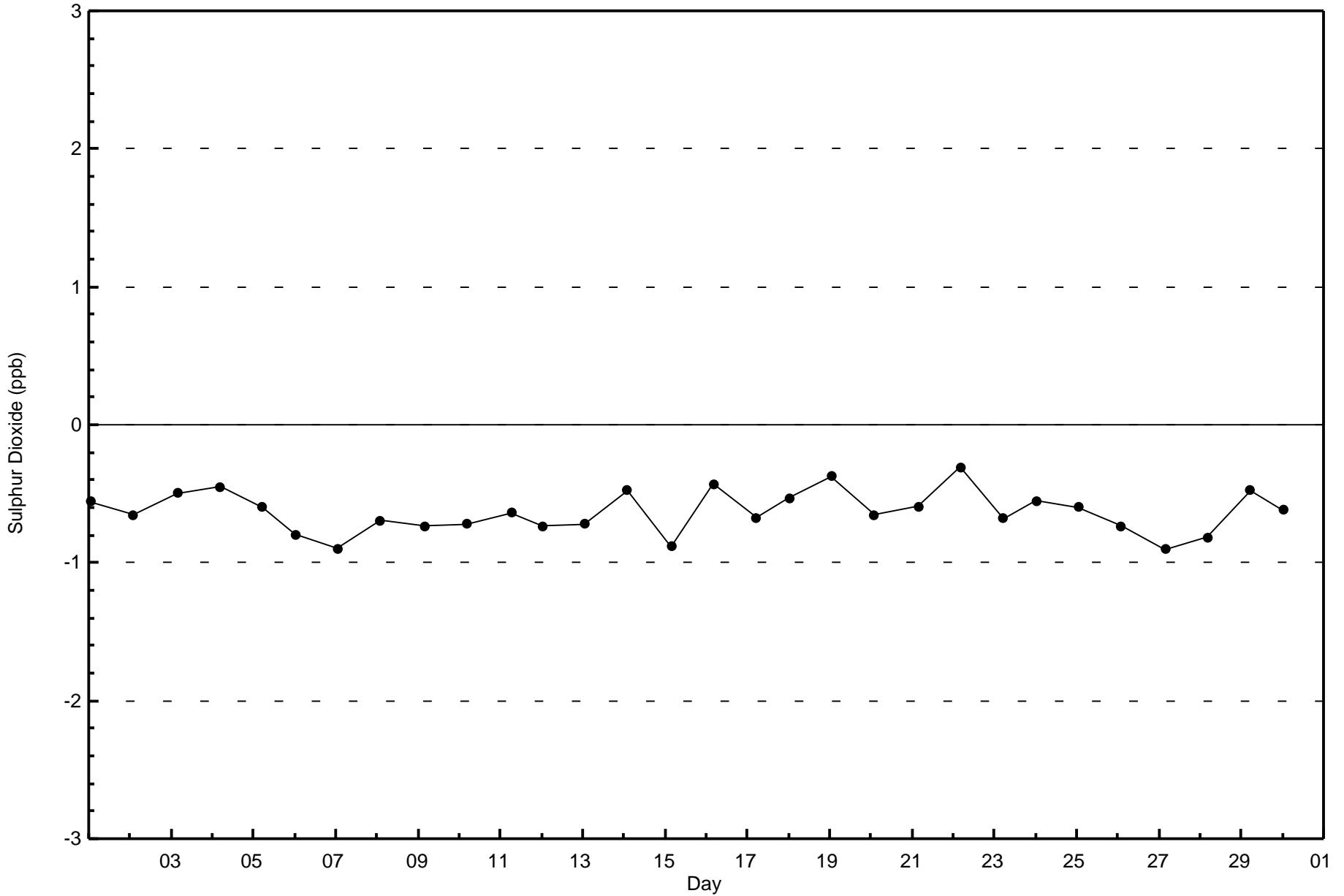
Total Number of Hours: 720

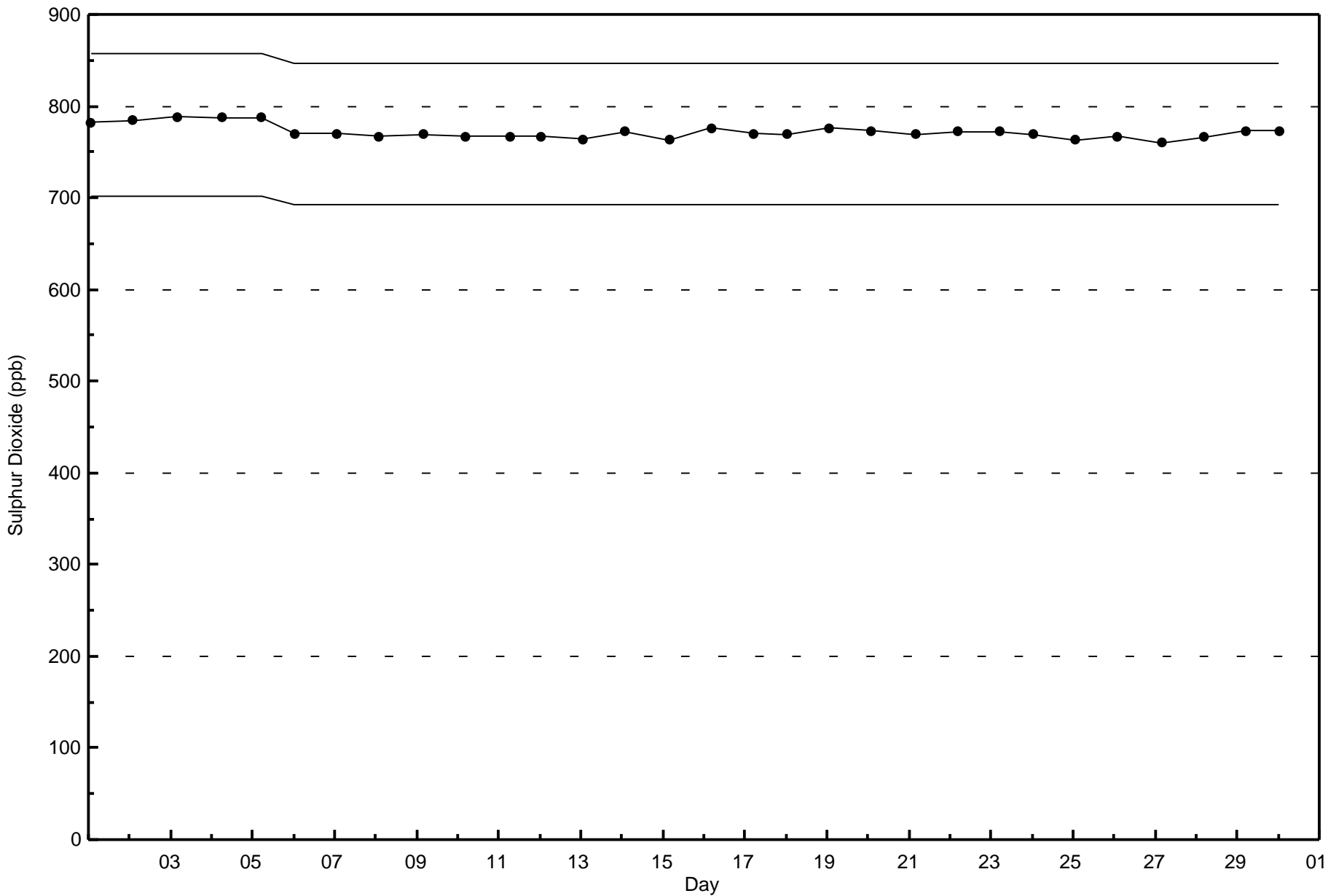


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Mildred Lake (AMS 2)







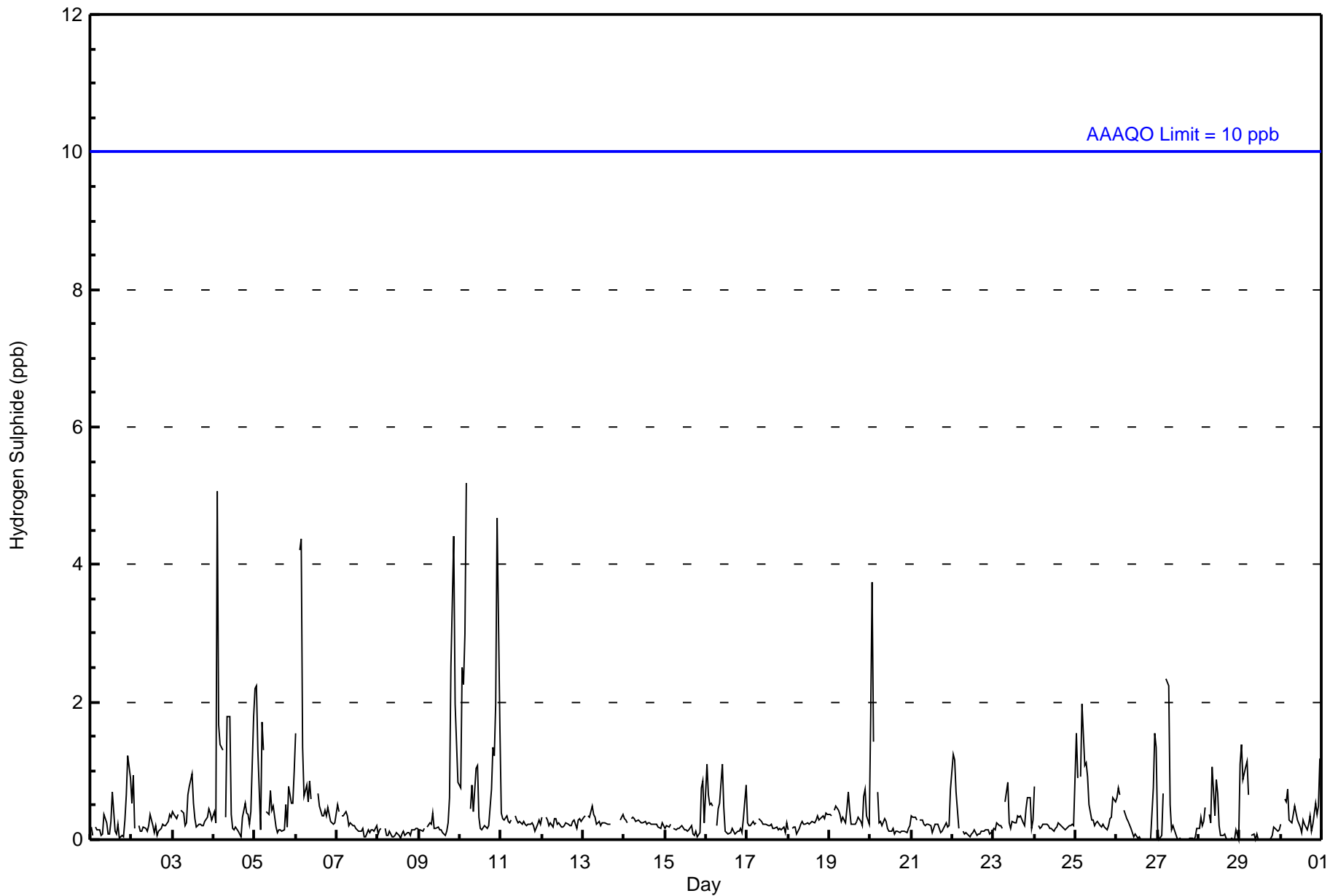


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 5 ppb on Apr 10 05:00	Maximum Daily Average: 1.3 ppb on Apr 10		Hours of Data:	682
Minimum Value: 0 ppb on Apr 26 15:00	Minimum Daily Average: 0.1 ppb on Apr 8		Hours of Missing Data:	38
Maximum Diurnal Average: 0.8 ppb at hour 3	Minimum Diurnal Average: 0.2 ppb at hour 17		Hours of Calibration:	33
Monthly Average: 0.4 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 4		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0.3	1
2-Apr	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
3-Apr	0	0	0	0	Z	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Apr	0	0	5	2	1	1	Z	0	2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0.8	5
5-Apr	2	2	1	0	2	1	Z	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0.7	2
6-Apr	2	Z	4	4	1	1	1	1	1	1	C	C	C	1	0	0	0	0	0	0	0	0	0	0	0.9	4
7-Apr	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	2	1	1	0.6	4
10-Apr	1	3	2	3	5	Z	0	1	0	1	1	0	0	0	0	0	0	0	1	1	1	2	5	2	1.3	5
11-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
12-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	RE	0	0.3	0
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.2	1
16-Apr	1	1	1	1	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
19-Apr	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0.4	1
20-Apr	2	4	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	4
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
22-Apr	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
23-Apr	0	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.3	1
24-Apr	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
25-Apr	2	1	Z	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.6	2
26-Apr	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0.3	2
27-Apr	0	0	0	1	Z	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
28-Apr	0	0	0	0	0	Z	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
29-Apr	1	1	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Apr	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.4	1

0.6	0.7	0.8	0.7	0.8	0.5	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.5	Diurnal Average		
2	4	5	4	5	2	2	1	2	2	1	1	1	1	1	0	0	0	0	0	1	3	4	2	5	2	Diurnal Maximum	

Z - zerspan C - Calibration PF - Power Failure RE - Recovery
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	672	98.53	98.53
3 - 4	7	1.03	99.56
5 - 7	3	0.44	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	68	163	54	19	14	22	29	82	69	52	33	28	14	7	9	9	672
3 - 4	0	0	0	0	0	1	1	5	0	0	0	0	0	0	0	0	7
5 - 7	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	163	54	19	14	23	30	89	70	52	33	28	14	7	9	9	682

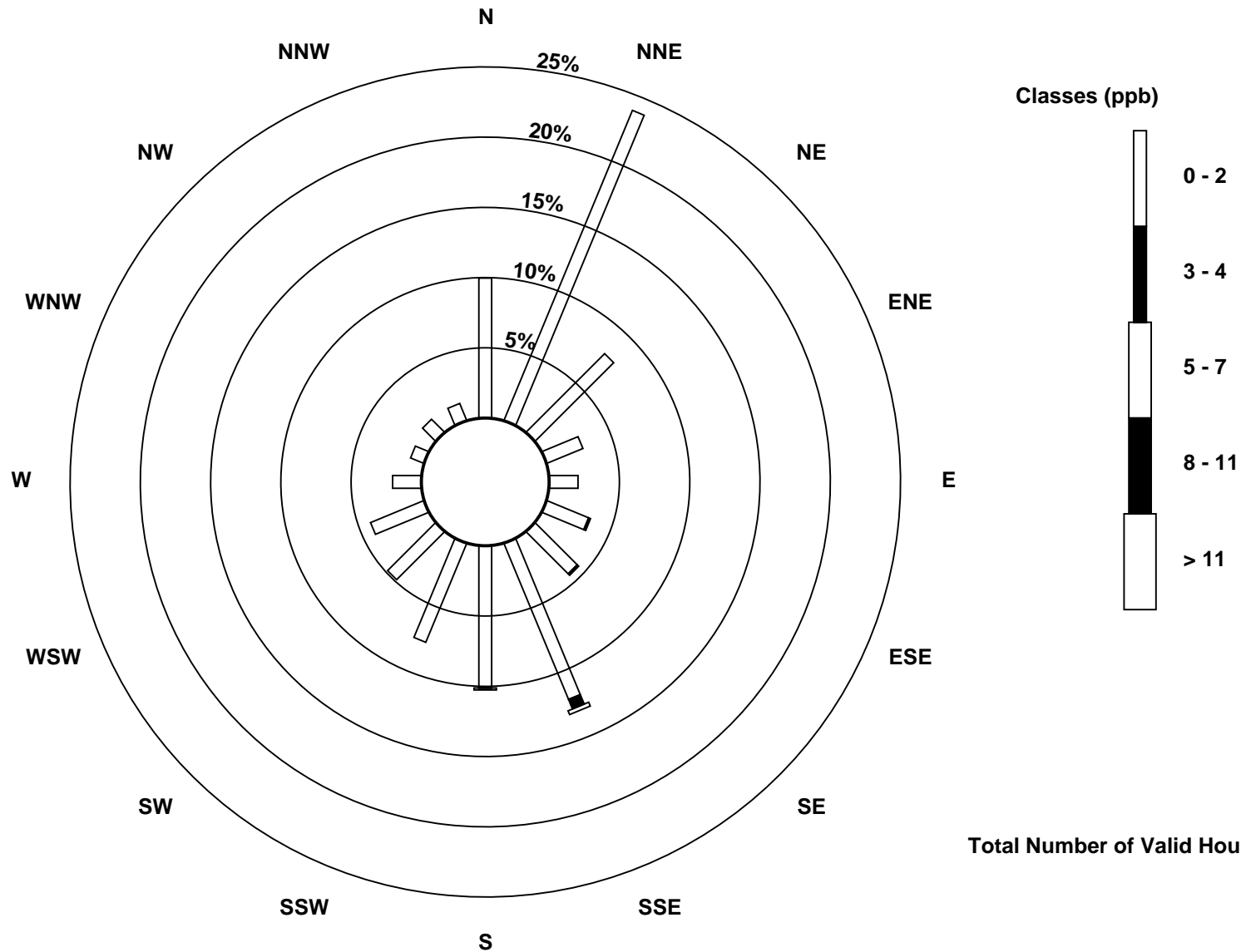
Total Number of Valid Hours: 682

Total Number of Hours: 720

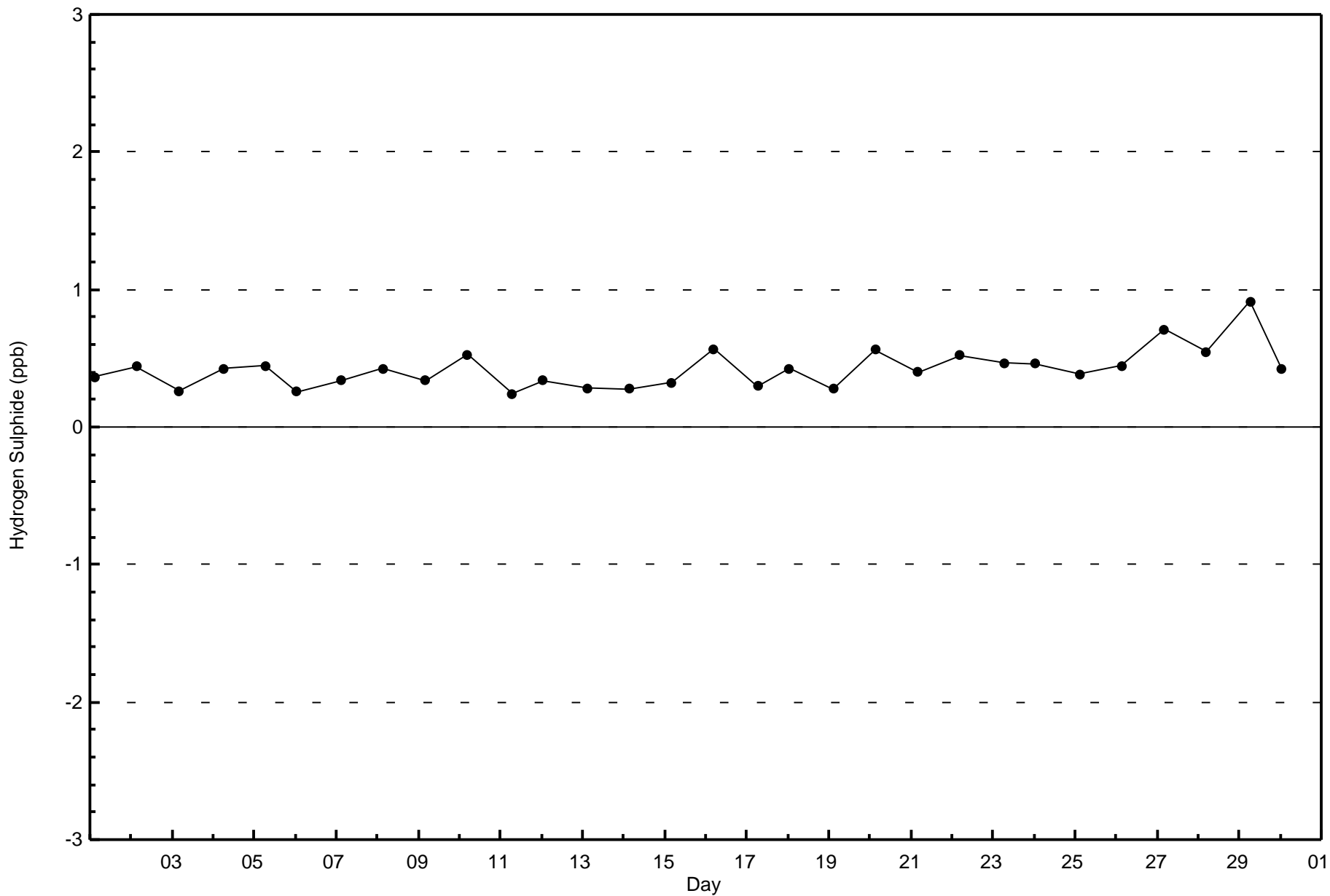


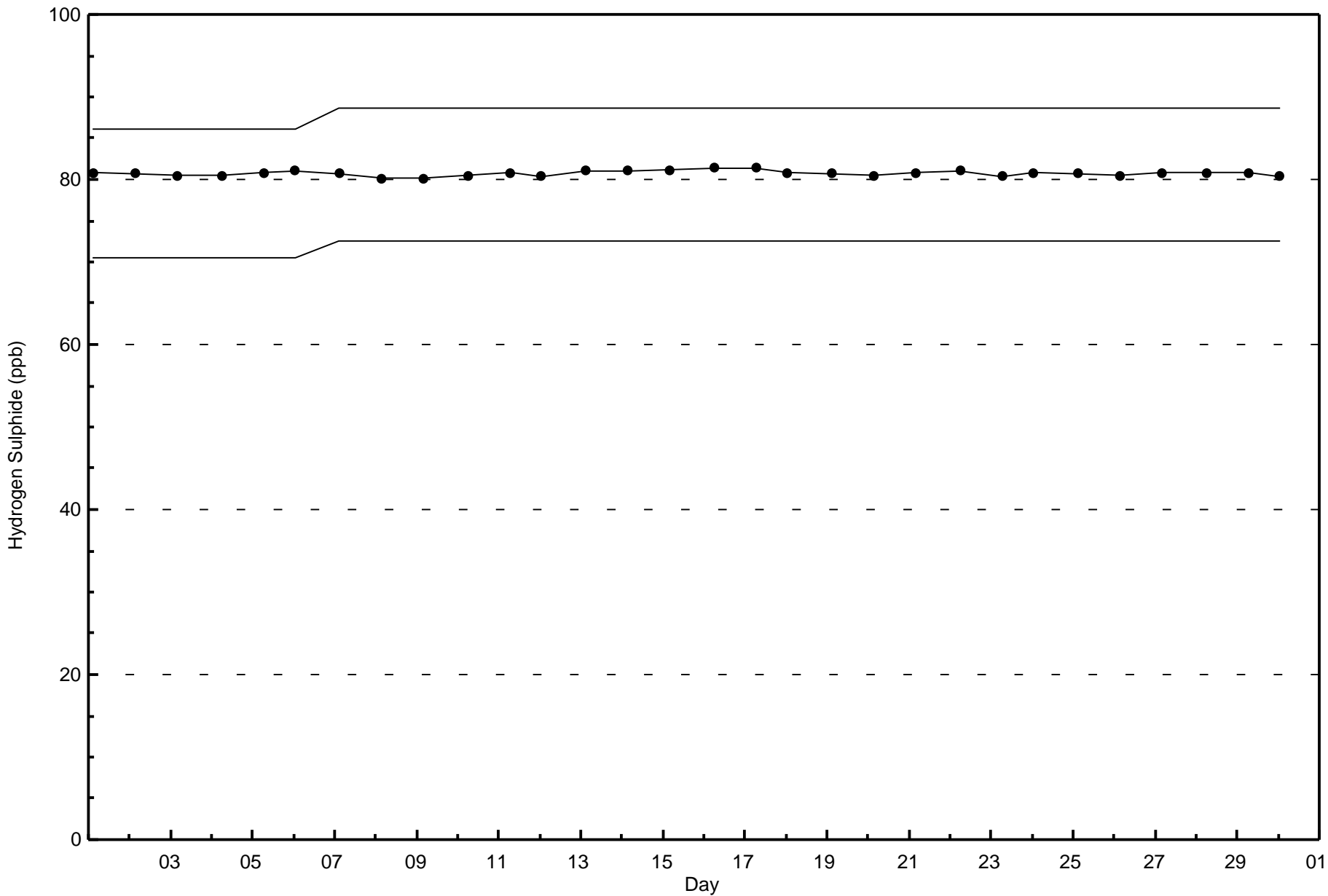
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake (AMS 2)



Total Number of Valid Hours: 682







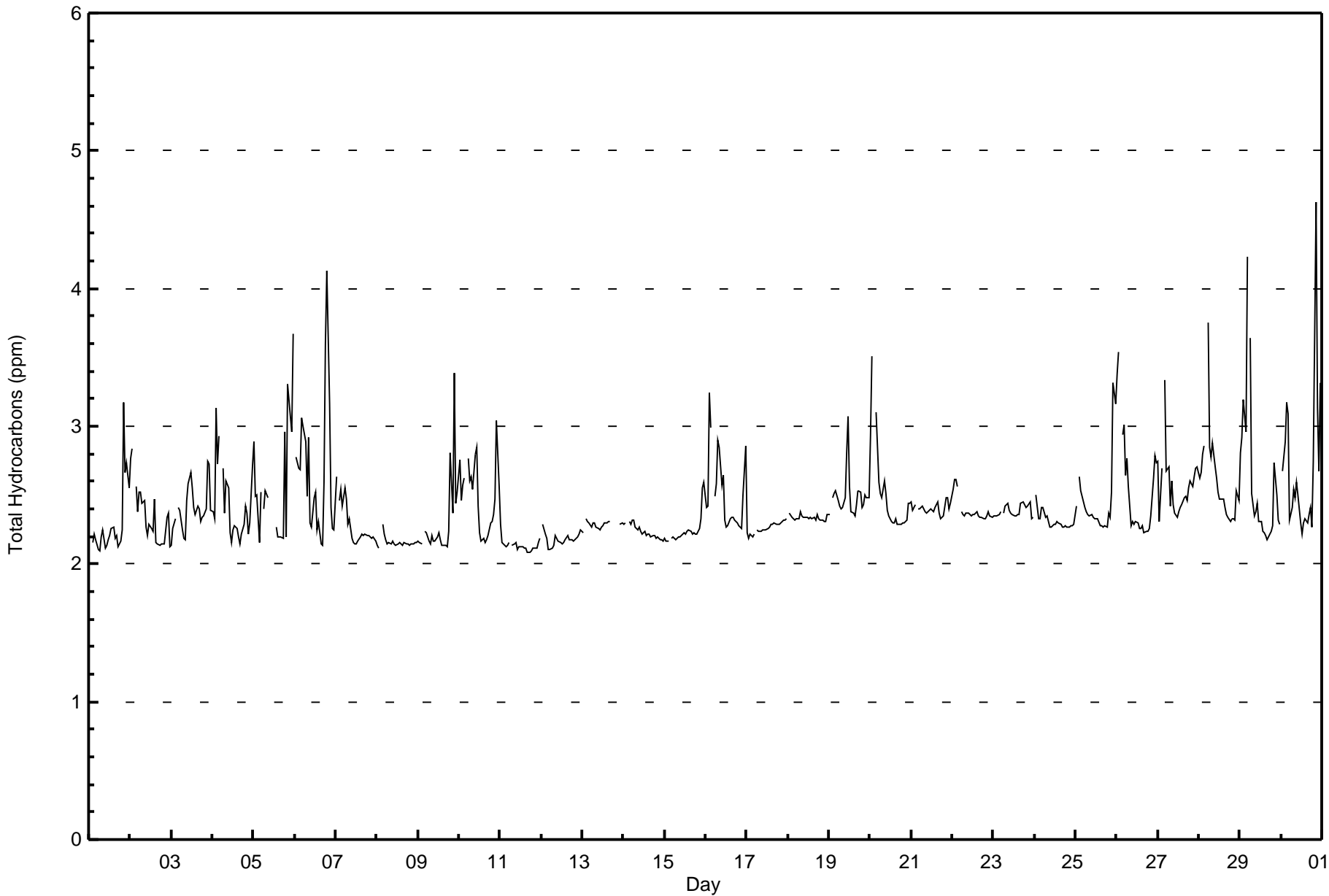
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - April 2017

Maximum Value: 4.6 ppm on Apr 30 21:00																				Maximum Daily Average: 2.7 ppm on Apr 30					Hours in Service: 720	
Minimum Value: 2.1 ppm on Apr 11 17:00																				Minimum Daily Average: 2.1 ppm on Apr 11					Hours of Data: 681	
Maximum Diurnal Average: 2.6 ppm at hour 5																				Minimum Diurnal Average: 2.3 ppm at hour 17					Hours of Missing Data: 39	
Monthly Average: 2.40 ppm																				Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.5 P ₉₀ = 2.7 P ₉₉ = 3.6					Hours of Calibration: 34	
																									Percent Operational Time: 99.3	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.2	2.3	3.2	2.7	2.7	2.6	2.3	3.2
2-Apr	2.8	2.8	Z	2.6	2.4	2.5	2.5	2.4	2.5	2.3	2.2	2.3	2.3	2.2	2.5	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.1	2.3	2.8
3-Apr	2.1	2.3	2.3	Z	2.4	2.4	2.3	2.2	2.2	2.5	2.6	2.7	2.6	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.7	2.7	2.4	2.4	2.7
4-Apr	2.4	2.3	3.1	2.7	2.9	Z	2.7	2.4	2.6	2.6	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.2	2.3	2.4	2.4	2.2	2.3	2.7	2.4	3.1
5-Apr	2.9	2.5	2.5	2.2	2.5	Z	2.4	2.5	2.5	C	C	C	C	2.3	2.2	2.2	2.2	2.2	3.0	2.2	3.3	3.1	3.0	3.7	2.6	3.7
6-Apr	Z	2.8	2.7	2.7	3.1	3.0	2.9	2.5	2.9	2.3	2.3	2.5	2.5	2.2	2.3	2.1	2.1	2.6	3.6	4.1	3.2	2.4	2.3	2.3	2.7	4.1
7-Apr	2.6	Z	2.5	2.5	2.4	2.6	2.5	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6
8-Apr	2.1	2.1	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3
9-Apr	2.2	2.2	2.1	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.8	2.4	3.4	2.4	2.5	2.3	3.4
10-Apr	2.8	2.5	2.6	2.6	Z	2.8	2.6	2.6	2.5	2.8	2.8	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	3.0	2.6	2.5	3.0
11-Apr	2.3	2.2	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.3
12-Apr	Z	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
13-Apr	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	PF	PF	PF	PF	RE	2.3	2.3
14-Apr	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
15-Apr	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.6	2.2	2.6
16-Apr	2.4	2.4	3.2	3.0	Z	2.5	2.6	2.9	2.9	2.6	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.9	3.2
17-Apr	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
18-Apr	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4
19-Apr	2.4	Z	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.8	3.1	2.6	2.4	2.4	2.3	2.4	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.5	3.1
20-Apr	2.9	3.5	Z	3.1	2.9	2.6	2.5	2.5	2.6	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	3.5
21-Apr	2.5	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.5	2.5	2.4	2.4	2.4	2.5
22-Apr	2.5	2.6	2.6	2.6	Z	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.6
23-Apr	2.3	2.4	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5	2.3	2.3	2.4	2.5
24-Apr	Z	2.5	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
25-Apr	2.4	Z	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.5	3.3	3.2	2.5	3.3
26-Apr	3.4	3.5	Z	2.9	3.0	2.6	2.8	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.6	2.8	2.7	2.5	3.5
27-Apr	2.7	2.3	2.7	Z	3.3	2.7	2.7	2.4	2.6	2.4	2.4	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.7	2.6	3.3
28-Apr	2.6	2.7	2.8	2.9	Z	3.8	2.8	2.8	2.9	2.7	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.6	3.8
29-Apr	2.8	2.9	3.2	3.0	4.2	Z	3.6	2.5	2.3	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.7	2.5	2.3	2.3	2.6	4.2
30-Apr	Z	2.7	2.9	3.2	3.1	2.3	2.4	2.5	2.5	2.6	2.5	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.3	2.7	4.6	3.1	2.7	3.3	2.7	4.6
																								Diurnal Average		
																								Diurnal Maximum		
																								Z - zerospan		
																								C - Calibration		
																								PF - Power Failure		
																								RE - Recovery		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mildred Lake - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	653	95.89	95.89
3.1 - 10.0	28	4.11	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mildred Lake - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	66	164	52	17	15	23	28	78	66	49	32	27	13	7	8	8	653
3.1 - 10.0	2	1	0	0	0	2	1	6	7	4	1	2	0	0	1	1	28
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	165	52	17	15	25	29	84	73	53	33	29	13	7	9	9	681

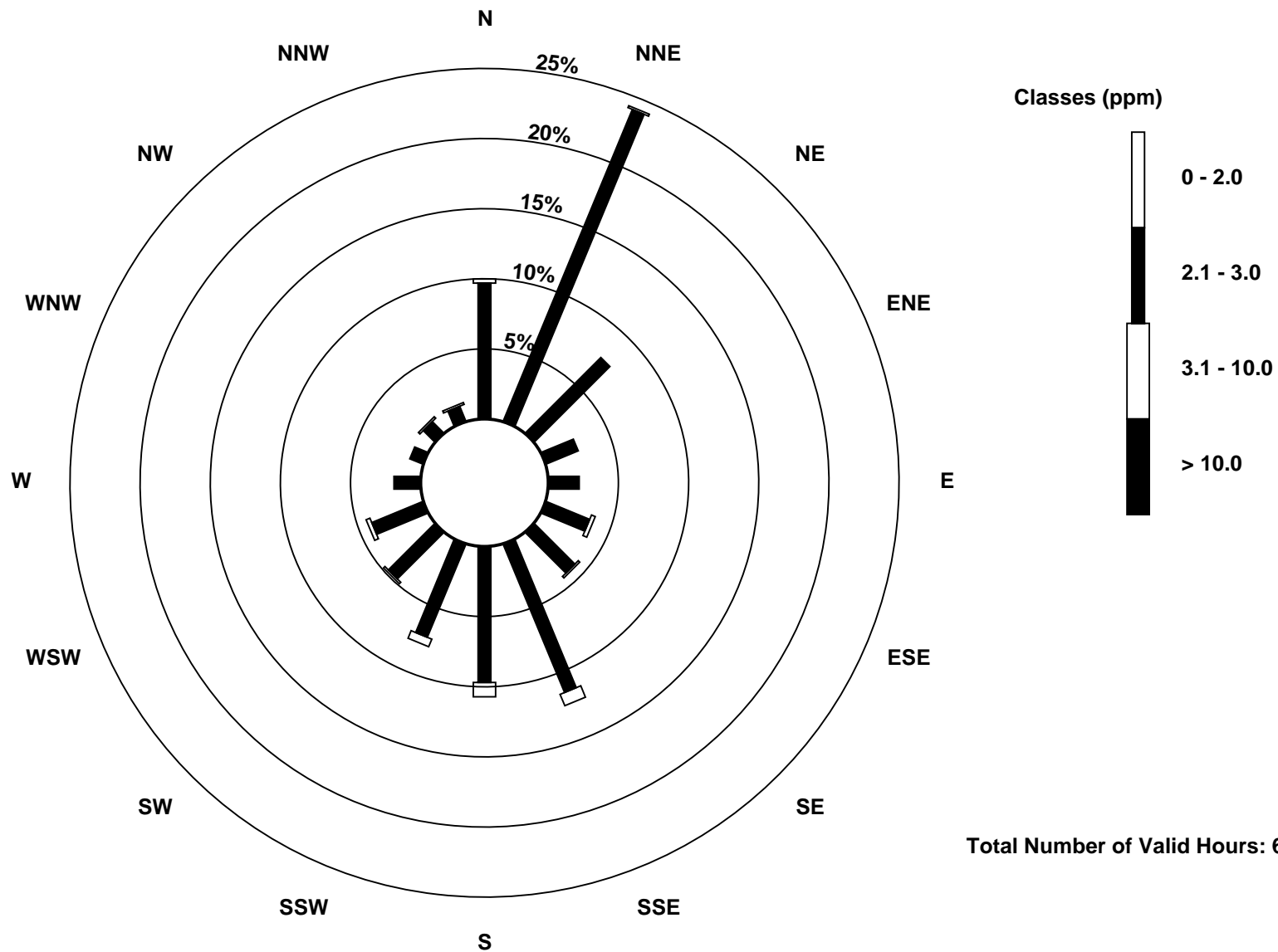
Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Mildred Lake (AMS 2)



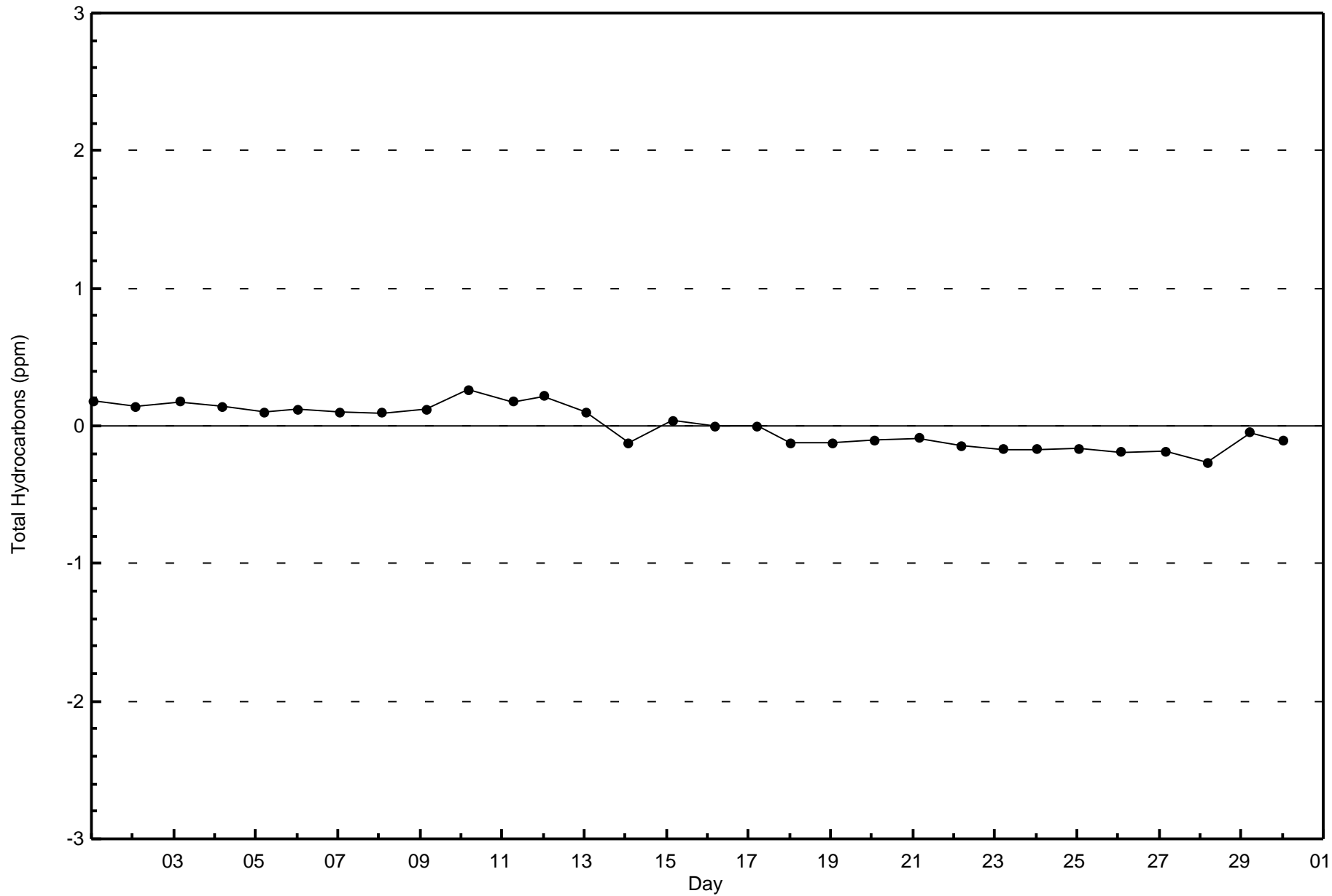


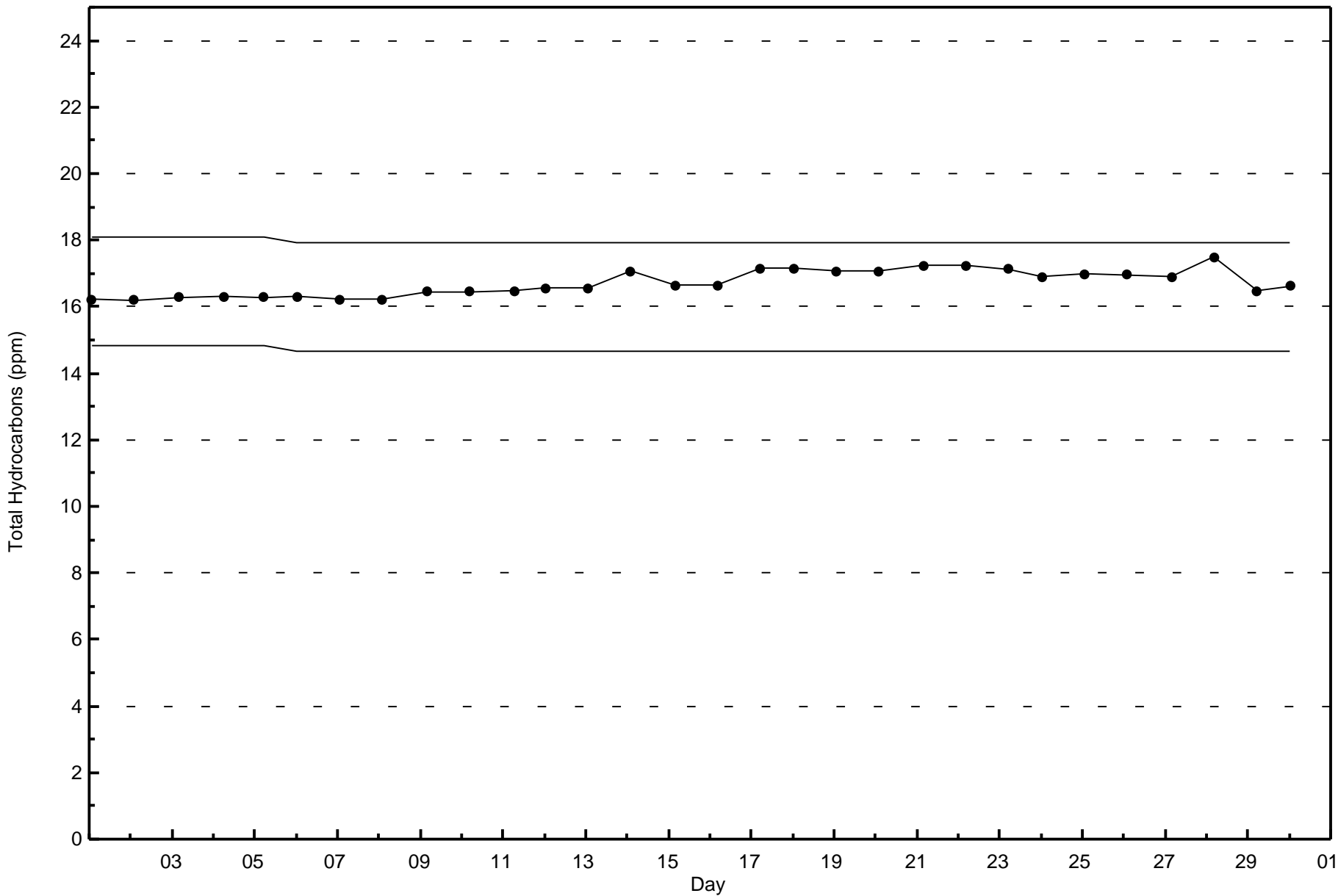
Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - April 2017







Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

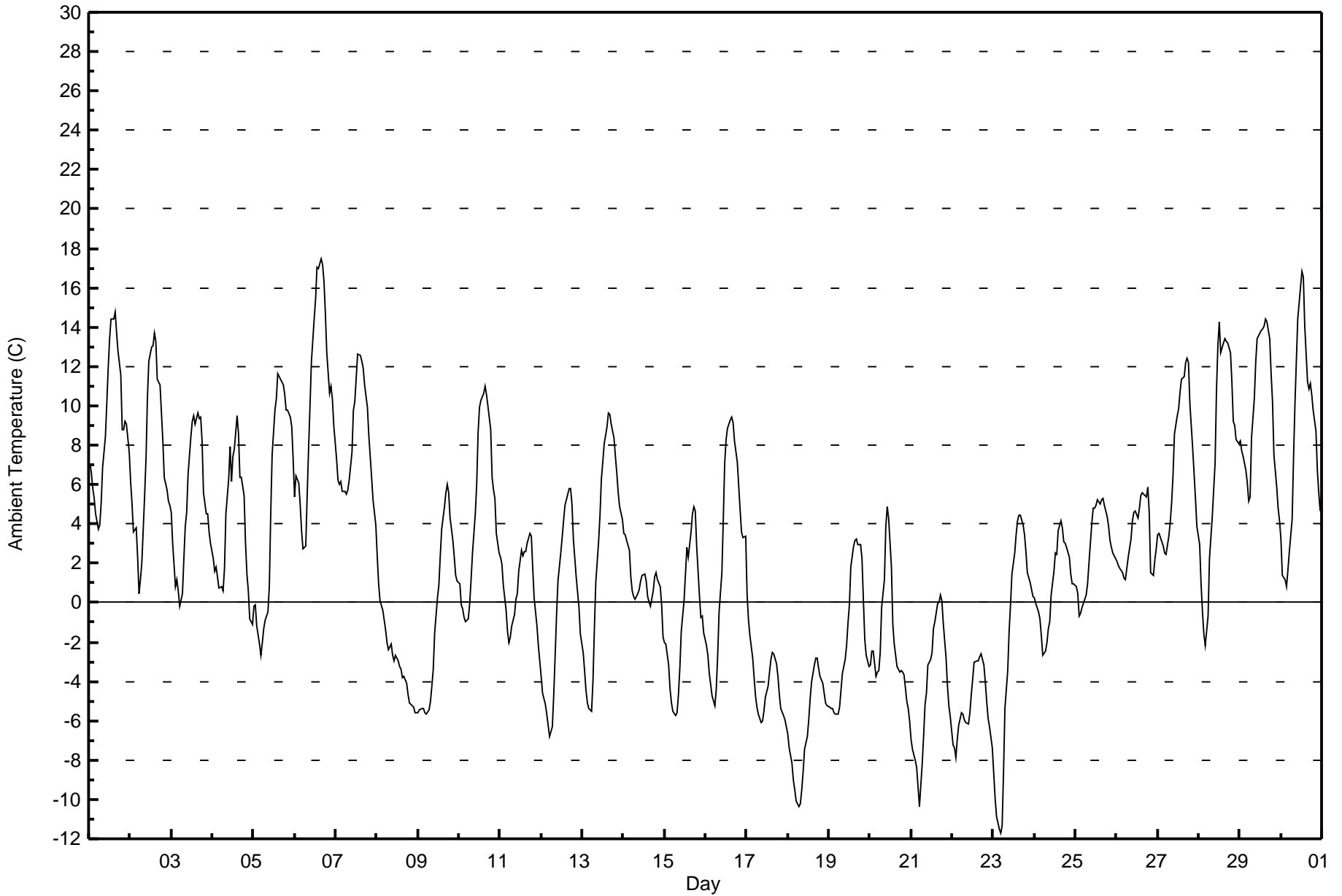
Mildred Lake - April 2017

Maximum Value: 17.5 C on Apr 6 16:00		Maximum Daily Average: 10.5 C on Apr 6		Hours in Service: 720																							
Minimum Value: -11.7 C on Apr 23 05:00		Minimum Daily Average: -6.4 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 6.4 C at hour 16		Minimum Diurnal Average: -2.1 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 2.36 C		Percentiles: P ₁ = -10.2 P ₁₀ = -5.4 Q ₁ = -2.5 Median = 2.2 Q ₃ = 6.2 P ₉₀ = 10.7 P ₉₉ = 16.2		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	7.0	6.6	5.8	5.3	4.5	3.7	3.9	5.1	6.9	8.4	10.1	11.9	13.4	14.4	14.4	14.8	13.7	12.7	11.5	8.8	8.8	9.2	9.1	7.7	9.1	14.8	
2-Apr	6.1	5.0	3.6	3.8	2.3	0.5	1.2	2.0	5.4	7.3	10.4	12.3	13.0	13.1	13.7	13.3	11.3	11.1	9.6	8.2	6.4	5.7	5.2	5.0	7.3	13.7	
3-Apr	4.6	3.0	0.8	1.2	0.6	-0.2	0.5	2.2	3.9	4.6	6.5	8.5	9.2	9.5	9.1	9.6	9.3	9.4	8.2	5.6	4.5	4.5	3.6	3.1	5.1	9.6	
4-Apr	2.2	1.6	1.8	1.3	0.7	0.8	0.6	1.8	4.5	6.3	7.9	6.2	7.4	7.8	9.5	8.6	6.4	6.4	5.5	3.0	1.4	0.6	-0.8	-1.1	3.8	9.5	
5-Apr	-0.1	-0.1	-1.2	-2.1	-2.7	-2.0	-1.3	-0.9	-0.5	0.8	4.5	7.5	9.8	10.4	11.6	11.5	11.3	11.0	10.6	9.8	9.8	9.4	9.0	7.3	5.1	11.6	
6-Apr	5.3	6.5	6.0	5.0	3.7	2.8	2.9	5.5	7.8	9.9	12.2	14.4	15.4	17.1	16.9	17.5	17.2	16.4	14.7	12.7	10.7	11.0	10.3	9.0	10.5	17.5	
7-Apr	7.3	6.2	6.0	6.1	5.7	5.7	5.5	5.7	6.2	7.7	9.8	10.2	11.4	12.6	12.6	12.3	11.9	11.1	9.9	8.5	7.5	6.4	5.2	3.9	8.2	12.6	
8-Apr	2.4	1.0	0.1	-0.4	-0.9	-1.4	-2.0	-2.4	-2.1	-2.7	-3.0	-2.7	-2.9	-3.3	-3.4	-3.8	-3.7	-4.1	-4.7	-5.1	-5.2	-5.3	-5.6	-5.6	-2.8	2.4	
9-Apr	-5.6	-5.5	-5.4	-5.4	-5.6	-5.6	-5.4	-5.0	-4.3	-3.4	-1.5	0.3	0.9	2.4	3.8	4.8	5.6	6.0	5.6	4.3	3.2	2.3	1.4	1.1	-0.5	6.0	
10-Apr	1.0	-0.1	-0.4	-0.8	-1.0	-0.8	-0.1	1.2	2.6	4.5	6.0	8.6	9.9	10.3	10.6	11.0	10.6	10.0	8.8	6.4	5.8	5.3	3.5	2.6	4.8	11.0	
11-Apr	2.3	1.9	0.9	-0.4	-1.5	-2.1	-1.8	-1.2	-0.6	0.1	0.5	1.6	2.7	2.4	2.6	2.6	3.0	3.5	3.4	1.8	0.2	-1.2	-2.2	-2.9	0.7	3.5	
12-Apr	-3.7	-4.6	-5.2	-5.7	-6.2	-6.8	-6.3	-4.7	-2.7	-0.6	1.1	2.5	3.3	4.2	5.0	5.5	5.8	5.8	5.0	3.2	1.3	0.5	-0.2	-1.6	-0.2	5.8	
13-Apr	-2.5	-3.5	-4.5	-5.1	-5.4	-5.5	-3.9	-1.3	1.1	3.1	4.4	6.3	7.1	8.1	9.0	9.6	9.6	9.1	8.4	7.5	6.6	5.6	4.8	4.2	3.0	9.6	
14-Apr	3.5	3.5	3.2	2.7	1.3	0.6	0.3	0.2	0.4	0.7	1.1	1.4	1.5	1.1	0.3	0.0	-0.2	0.6	1.3	1.5	1.2	0.8	-0.1	-1.8	1.0	3.5	
15-Apr	-2.0	-2.1	-3.1	-4.4	-5.1	-5.5	-5.8	-5.6	-4.7	-3.3	-1.5	0.1	1.5	2.8	2.3	3.6	4.5	4.9	4.6	2.8	0.3	-0.7	-0.7	-1.5	-0.8	4.9	
16-Apr	-2.1	-2.7	-3.6	-4.2	-4.7	-5.2	-4.4	-2.6	-0.5	1.5	4.2	7.1	8.3	8.8	9.2	9.4	9.1	8.2	7.2	5.9	4.7	3.6	3.3	3.4	2.7	9.4	
17-Apr	0.4	-0.9	-1.7	-2.8	-3.8	-4.8	-5.3	-5.7	-6.1	-6.0	-5.5	-4.8	-4.3	-3.6	-2.9	-2.5	-2.6	-3.1	-3.7	-4.6	-5.4	-5.8	-5.9	-6.3	-4.1	0.4	
18-Apr	-6.6	-7.3	-8.2	-9.0	-9.5	-10.1	-10.4	-10.2	-9.5	-8.6	-7.5	-6.8	-6.0	-4.9	-4.0	-3.2	-2.8	-2.8	-3.3	-3.7	-4.1	-4.6	-5.1	-5.3	-6.4	-2.8	
19-Apr	-5.3	-5.4	-5.4	-5.6	-5.6	-5.6	-5.3	-4.5	-3.6	-2.9	-2.2	-1.0	-0.1	1.8	2.8	3.2	3.3	3.0	2.9	2.2	0.1	-1.9	-2.7	-3.2	-1.7	3.3	
20-Apr	-3.2	-2.5	-2.5	-3.7	-3.5	-3.5	-2.6	-0.3	1.2	3.9	4.8	4.3	1.8	-1.1	-2.1	-2.7	-3.2	-3.5	-3.5	-3.5	-3.7	-5.0	-5.4	-6.0	-1.9	4.8	
21-Apr	-7.0	-7.5	-8.0	-8.4	-9.3	-10.4	-8.2	-6.8	-5.2	-4.6	-3.2	-2.9	-2.5	-1.3	-1.0	0.0	0.0	0.4	0.1	-1.0	-2.8	-4.2	-5.3	-5.8	-4.4	0.4	
22-Apr	-7.2	-7.4	-7.9	-6.9	-6.2	-5.6	-5.7	-6.0	-6.1	-6.1	-5.6	-4.7	-3.9	-3.0	-3.0	-2.9	-2.7	-2.6	-3.1	-4.0	-5.0	-5.9	-6.3	-7.4	-5.2	-2.6	
23-Apr	-8.7	-9.9	-10.9	-11.5	-11.7	-11.4	-8.7	-5.4	-3.5	-1.5	-0.1	1.5	2.6	3.4	4.1	4.4	4.5	3.9	3.4	2.6	1.5	1.0	0.7	0.3	-2.0	4.5	
24-Apr	0.2	0.0	-0.5	-0.8	-1.7	-2.7	-2.4	-2.0	-1.3	-1.0	0.4	1.6	2.5	2.5	3.7	4.1	3.8	3.1	3.1	2.8	2.3	1.4	1.0	0.9	0.9	4.1	
25-Apr	0.8	0.5	-0.7	-0.5	-0.3	0.1	0.4	1.0	2.0	4.0	4.8	4.8	5.0	5.2	5.0	5.2	5.3	5.0	4.4	3.9	3.2	2.8	2.5	2.2	2.8	5.3	
26-Apr	2.1	1.9	1.7	1.5	1.3	1.2	1.8	2.3	3.3	4.2	4.6	4.7	4.3	4.8	5.5	5.6	5.5	5.4	5.9	4.6	1.5	1.4	2.2	2.7	3.3	5.9	
27-Apr	3.5	3.5	3.1	2.8	2.5	2.5	3.4	4.1	5.1	6.5	8.6	9.5	9.9	10.7	11.3	11.5	12.2	12.4	12.2	10.2	7.9	6.6	5.3	3.9	7.0	12.4	
28-Apr	2.9	1.0	-0.5	-1.6	-2.2	-0.7	2.2	3.3	4.3	7.1	10.7	13.1	14.3	12.7	13.2	13.4	13.3	13.2	12.7	11.2	9.2	9.0	8.3	8.1	7.4	14.3	
29-Apr	8.2	7.7	7.4	6.7	6.1	5.1	5.4	8.4	10.4	12.2	13.4	13.6	13.8	13.9	14.1	14.4	14.2	13.4	11.7	10.2	7.5	5.9	4.8	4.1	9.7	14.4	
30-Apr	3.2	1.4	1.2	0.8	1.7	2.6	4.2	7.3	10.1	12.3	14.4	16.1	16.8	16.6	14.1	11.2	10.8	11.1	10.6	9.8	8.7	6.8	5.6	4.6	8.4	16.8	
		0.3	-0.3	-0.9	-1.4	-1.9	-2.1	-1.6	-0.5	0.8	2.2	3.7	4.8	5.5	6.0	6.3	6.4	6.2	6.0	5.4	4.2	2.9	2.2	1.5	0.9	Diurnal Average	
		8.2	7.7	7.4	6.7	6.1	5.7	5.5	8.4	10.4	12.3	14.4	16.1	16.8	17.1	16.9	17.5	17.2	16.4	14.7	12.7	10.7	11.0	10.3	9.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Mildred Lake - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mildred Lake - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	259	35.97	35.97
0 - 10	374	51.94	87.92
10 - 20	87	12.08	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

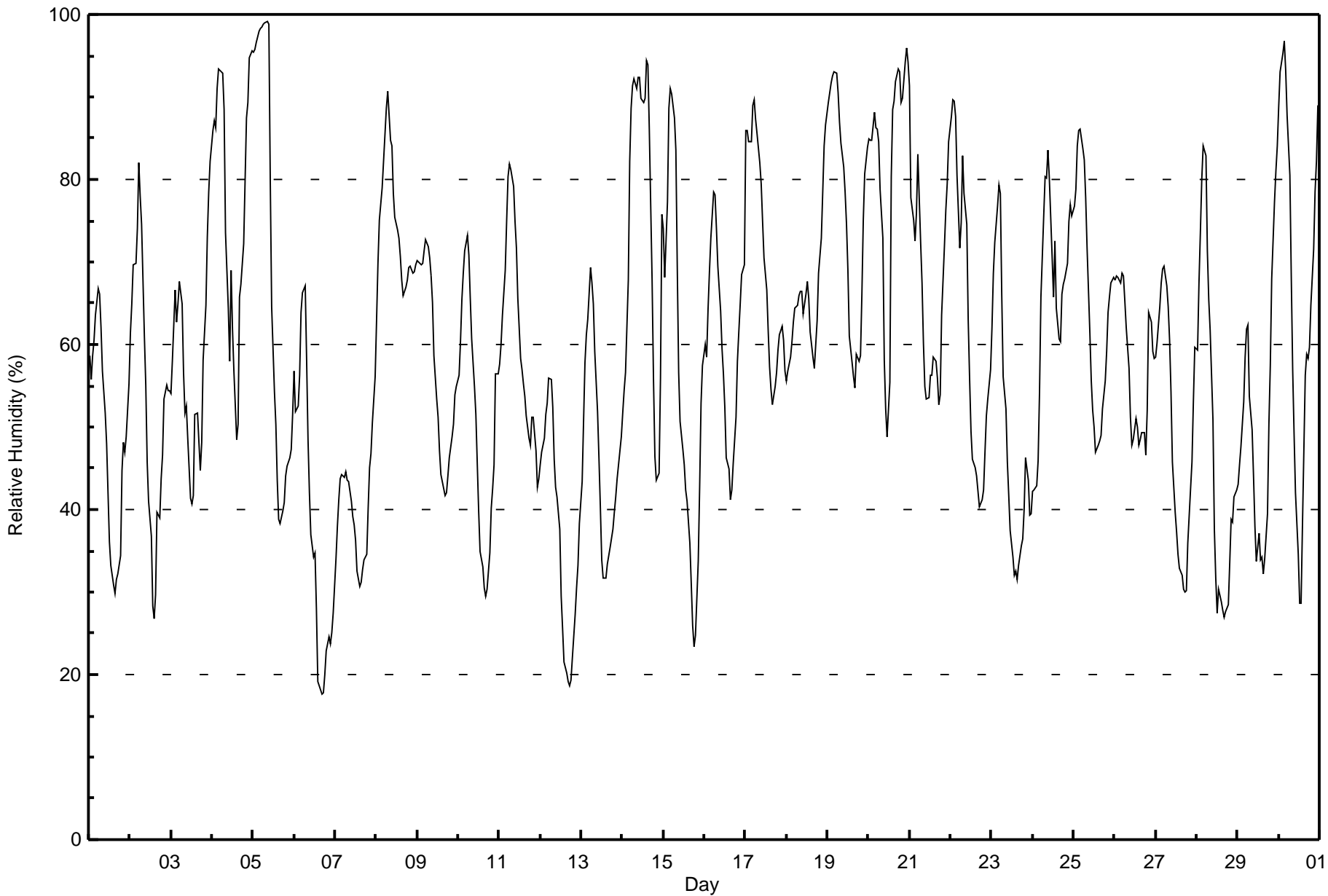
Mildred Lake - April 2017

Maximum Value: 99 % on Apr 5 09:00 Maximum Daily Average: 81.9 % on Apr 20																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Minimum Value: 18 % on Apr 6 17:00 Minimum Daily Average: 36.8 % on Apr 12 Maximum Diurnal Average: 76.6 % at hour 6 Minimum Diurnal Average: 45.6 % at hour 16 Monthly Average: 59.3 % Percentiles: P ₁ = 20 P ₁₀ = 34 Q ₁ = 45 Median = 58 Q ₃ = 73 P ₉₀ = 86 P ₉₉ = 98																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	59	56	59	60	64	67	66	62	57	52	48	42	36	33	31	30	32	32	34	45	48	47	49	55	48.4	67
2-Apr	61	65	70	70	74	82	78	75	61	55	46	41	37	28	27	30	40	39	44	47	53	55	54	54	53.5	82
3-Apr	54	58	67	63	65	68	65	57	52	52	49	41	41	42	52	52	48	45	48	58	65	73	79	82	57.2	82
4-Apr	86	87	86	91	93	93	93	88	74	64	58	69	62	57	49	50	66	67	72	80	87	89	95	96	77.2	96
5-Apr	95	96	97	98	98	98	99	99	99	99	80	65	54	50	44	39	38	40	41	44	45	46	47	51	69.3	99
6-Apr	57	52	53	56	64	66	67	58	48	42	37	34	35	28	19	18	18	18	20	23	25	24	25	27	38.1	67
7-Apr	34	38	41	44	44	44	45	43	43	41	39	38	36	33	31	31	33	34	35	40	45	47	50	56	40.2	56
8-Apr	63	70	75	79	82	85	89	91	85	84	78	75	74	73	71	68	66	67	68	69	70	69	69	70	74.5	91
9-Apr	70	70	70	70	71	73	72	71	68	65	59	53	51	47	44	43	42	42	44	46	49	50	54	55	57.4	73
10-Apr	56	60	65	69	71	73	71	66	61	55	52	46	40	35	33	31	29	30	35	40	43	45	57	56	50.8	73
11-Apr	58	60	64	69	75	80	82	81	79	75	72	66	58	57	55	54	51	49	48	51	51	47	43	44	61.2	82
12-Apr	45	47	49	51	53	56	56	52	46	43	42	38	30	26	22	20	19	19	19	22	27	31	33	38	36.8	56
13-Apr	43	51	58	61	63	69	67	65	59	52	46	40	34	32	32	33	34	35	38	40	42	44	45	49	47.2	69
14-Apr	52	54	57	68	82	89	91	92	91	92	92	90	89	90	94	94	86	68	56	46	43	44	56	76	74.7	94
15-Apr	74	68	77	89	91	90	87	84	69	57	51	47	45	42	41	36	31	26	23	25	34	43	53	57	55.9	91
16-Apr	60	59	64	69	73	79	78	74	70	64	59	56	52	46	45	41	42	46	51	58	62	65	68	70	60.5	79
17-Apr	86	86	85	85	89	90	87	86	82	79	75	71	67	62	57	55	53	55	57	59	61	62	61	57	71.0	90
18-Apr	56	57	58	60	63	64	65	66	66	66	64	66	68	66	62	58	57	60	63	69	73	79	84	87	65.6	87
19-Apr	89	91	92	93	93	93	90	87	84	82	78	75	69	61	58	56	55	59	58	59	66	75	81	84	76.1	93
20-Apr	85	85	85	88	86	86	85	79	73	58	52	49	55	80	88	89	92	93	93	89	90	94	96	94	81.9	96
21-Apr	91	78	75	73	76	83	72	67	60	55	53	54	56	56	59	58	56	53	54	64	72	76	79	85	66.9	91
22-Apr	88	90	89	88	81	72	75	83	78	75	63	56	50	46	45	44	42	40	41	42	47	51	53	57	62.3	90
23-Apr	62	69	72	77	79	78	66	56	52	46	42	37	34	32	33	32	33	36	36	40	46	44	39	40	49.2	79
24-Apr	42	42	43	46	54	66	76	80	80	83	80	71	66	73	64	61	60	66	67	68	70	75	77	76	66.1	83
25-Apr	77	79	84	86	86	84	82	78	72	61	56	52	50	47	48	48	49	52	56	59	64	66	68	68	65.4	86
26-Apr	68	68	68	67	69	68	65	62	57	51	48	49	51	50	48	48	49	49	47	52	64	63	59	58	57.5	69
27-Apr	59	60	65	67	69	70	67	65	60	54	46	40	37	35	33	32	30	30	30	36	43	46	53	60	49.4	70
28-Apr	59	67	73	80	84	83	71	65	62	51	38	32	28	30	29	28	27	28	28	34	39	38	42	42	48.3	84
29-Apr	43	45	48	53	58	62	62	54	50	44	38	34	37	34	34	32	34	39	50	58	68	77	81	84	50.8	84
30-Apr	89	93	95	97	93	88	81	68	57	49	42	35	29	29	38	56	59	58	60	65	72	78	82	89	66.7	97
65.4 66.7 69.4 72.2 74.8 76.6 75.0 71.8 66.6 61.6 56.0 52.0 49.0 47.3 46.1 45.6 45.7 45.8 47.2 50.9 55.4 58.1 61.1 63.9																								Diurnal Average		
95 96 97 98 98 98 99 99 99 99 92 90 89 90 94 94 92 93 93 89 90 94 96 96																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mildred Lake - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Mildred Lake - April 2017

Maximum Speed: 26 km/h on Apr 20 13:00	Maximum Daily Speed Average: 17.1 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 28 17:00	Minimum Daily Speed Average: 1.3 km/h on Apr 19	Hours of Data: 720
Maximum Diurnal Speed Average: 3.6 km/h at hour 5	Minimum Diurnal Speed Average: 1.3 km/h at hour 17	Hours of Missing Data: 0
Monthly Average Velocity: 2.5 km/h 58.2 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 10 Q ₃ = 13 P ₉₀ = 17 P ₉₉ = 21	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SW10	W11	WSW12	WSW13	WSW13	WSW12	WSW13	WSW13	W12	WSW15	WSW14	WSW15	W14	WNW12	NW13	NW9	NNW8	N8	N5	W2	WSW7	W9	WNW12	W8	W9.5	WSW15	
2-Apr	WSW5	WSW6	WSW6	WSW4	WSW5	SSW4	SW8	SSW6	SW8	SSW7	S6	SW5	SW7	NNW16	NW14	NNE17	NE12	NE11	NNE9	NNE6	N4	N9	N9	N10	NW2.7	NNE17	
3-Apr	N10	N5	N7	N11	NNE10	N9	NNE5	N5	W3	SW6	SW7	SW7	SSW3	SW5	NW12	WNW9	NW6	N9	ENE4	ESE2	SSW4	W4	SSE4	WSW1	NNW2.7	NW12	
4-Apr	WSW3	S3	SE5	S6	SE6	S7	S6	S6	SE8	S8	SSW9	WSW10	S8	SSE11	S9	S12	SSW15	SE8	SSE6	SE5	SW4	SSW1	SE4	SSE5	S6.0	SSW15	
5-Apr	SSE7	SSE8	SSE6	S7	S4	S6	S12	SSE13	S12	SSE14	SSE15	SSE17	S21	SSE23	S19	S15	S14	SSW13	S12	S9	SSE13	SSE13	SSE14	SSE9	S12.1	SSE23	
6-Apr	SE6	SE8	SSE7	SSE6	SSW6	S4	SSW4	SSW7	S10	SSW8	S6	S10	SSE13	WNW10	W14	W11	W12	WNW8	NW10	NNW7	N6	NE8	ENE7	NNE8	SW2.6	W14	
7-Apr	N10	N8	N9	N9	N11	N11	NNE11	NNE11	N15	NNE17	N18	N18	NNE21	NNE21	NE18	NE17	NNE17	NNE18	NNE17	NNE15	NNE15	NNE17	NNE17	NNE16	NNE14.7	NNE21	
8-Apr	NNE16	NNE18	NNE18	NNE19	NNE18	NNE18	NNE17	NNE19	NNE21	NNE22	NNE21	NNE21	NNE20	NNE20	NNE20	NNE19	NNE18	NNE16	NNE15	NNE14	NNE12	NNE11	NNE10	NNE8	NNE17.1	NNE22	
9-Apr	N8	N9	NNE6	NE6	N7	NNE5	NE5	SE2	SW7	SW7	SSW8	S10	SSE12	SSE13	S12	S11	SSE11	SSE11	SSE11	SSE11	SE10	SE10	SSE9	SSE9	SSE4.8	SSE13	
10-Apr	SSE12	SSE9	SSE11	SSE10	SSE10	SSE10	SSE11	SSE13	SSE13	SSE11	SSE12	SSE11	SSE13	S12	S9	S8	S8	SSE7	SE6	ESE5	SE6	SSE6	S3	NNE9	SSE8.5	SSE13	
11-Apr	NNE8	NNE10	NNE12	NNE17	NNE15	NNE11	NNE13	NNE16	NNE17	NNE17	NNE17	N17	NNE20	NNE18	NNE18	NNE17	NNE14	NNE14	NNE15	NNE14	NNE15	NNE13	NNE15	NNE14	NNE14.8	NNE20	
12-Apr	N12	NNE10	NNE8	NNE8	NNE8	NNE8	NNE11	NNE11	NNE13	N12	N10	NNE11	NE11	NE10	NNE12	NNE11	NNE11	NNE12	NNE12	NNE9	N11	NNE11	NNE9	N7	NNE10.1	NNE13	
13-Apr	N8	N9	N5	N7	N8	NNE7	N7	ENE6	ENE8	SE3	SE14	SE11	ESE14	E16	E16	ESE14	E14	ESE17	E15	ESE14	E12	ENE10	ENE11	ENE10	E8.4	ESE17	
14-Apr	NE8	ENE8	NE7	E10	NE9	NNE8	NNE10	NNE11	NNE11	NE11	NE12	ENE14	NE13	ENE16	NE15	NE15	NE13	ENE10	NE10	ENE12	ENE13	ENE12	NE17	NNE17	NE11.5	NE17	
15-Apr	NE16	NE15	NE16	NNE15	NNE16	NNE16	NNE16	NNE16	NNE14	NE14	NE13	NNE13	NNE13	NNE13	N14	N20	N17	N15	N12	NNE9	NNE8	NNE6	ESE6	S8	SSE12	NNE11.0	N20
16-Apr	SSE16	SSE15	S11	SSE11	SSE13	S10	S11	SSE12	SSE10	SSE13	SSE13	SW10	SW12	WSW14	WSW14	SW14	SW14	SW14	SSW11	SSW10	SSW8	S8	S6	WSW2	SSW9.8	SSE16	
17-Apr	N17	NNE17	NNE19	NNE20	NNE19	NNE18	NNE17	NNE19	NNE19	NNE18	NNE18	NNE18	NE17	NE17	NNE18	NE16	NE16	NE16	NE15	NE12	NNE12	NE11	NE10	NE9	NNE16.0	NNE20	
18-Apr	NNE9	NNE11	NNE13	NNE14	NNE14	NNE14	NE13	NNE14	NNE14	NNE12	N12	N13	NNE12	NNE12	NNE11	NNE11	NNE10	NE10	NE10	NNE9	NNE8	NNE9	NNE9	N9	NNE11.2	NNE14	
19-Apr	N9	NNE8	N8	N9	N7	N6	N7	N5	NNW5	W5	WSW4	WSW4	SSW6	SW10	SSW10	SSW9	S10	SSE11	S9	SW6	NW4	SW2	SSE2	S3	W1.3	SSE11	
20-Apr	SE4	ESE4	ENE4	NNE5	NNE6	N9	NNE6	NNE5	N12	NNE15	NNE15	NNE20	NNE26	NNE24	NNE22	NNE21	NNE20	NNE19	NNE13	NNE8	N5	NW4	NNW7	N7	NNE11.0	NNE26	
21-Apr	N7	N9	NNE8	NE9	NNE4	N1	N4	NNE4	NE3	NE7	NNE5	NNW7	E4	W7	WSW6	SW6	SW5	SW4	SW4	E2	NE4	E2	SSE4	SW3	NNE1.8	NE9	
22-Apr	SE2	SE2	NNW2	N9	NNE12	NNE15	NNE15	NNE15	NNE17	NNE17	NNE17	NNE15	NE13	NNE13	NNE14	NNE14	N13	NE10	NE10	NE9	NE8	NE8	NE8	NE6	NNE10.6	NNE17	
23-Apr	NNE6	NNE7	N7	N5	N6	NNE6	NE5	SE4	ESE7	ESE8	SE7	S11	SSE10	S6	SSW9	SSW8	SSW7	S8	SSE8	SSE5	SSE4	SE6	ESE10	SE7	SE3.4	S11	
24-Apr	SE7	ESE7	E8	E7	NNE5	N8	ENE5	NE7	NE11	ENE10	E11	ENE9	ESE9	ESE5	SSE11	SE12	ESE13	ESE13	ESE12	E9	E7	E7	ESE6	ESE7	E7.1	ESE13	
25-Apr	SSE9	SE8	ESE7	SE7	SSE9	SSE14	SSE14	SSE14	SSE14	SSE12	SSE16	SSE15	S12	SSE15	S13	S13	S13	S14	S13	S11	S13	S12	S14	S13	SSE11.9	SSE16	
26-Apr	S13	S14	SSE14	SSE12	SSE12	SSE12	SSE13	S14	S16	S16	S17	SSE17	SSE18	S16	S13	S14	SSW14	S13	S12	SSW5	S3	SE5	SE6	SE6	S11.9	SSE18	
27-Apr	S10	S9	S8	SSE8	SSE6	ESE7	SE8	SSE10	SSE10	SSE9	SSE11	SSE13	SSE10	SSE7	SSW6	WSW3	WSW4	WSW5	WNW4	NNW5	N8	NNE6	ESE2	NE3	SSE4.5	SSE13	
28-Apr	NNW6	NE4	N3	SSW3	ENE1	SSW4	SSW4	SSW3	SSW5	SW4	SSW5	SW7	SSW7	NNE5	NW3	SSW1	N0	E7	ESE6	E5	ESE5	SE6	ESE6	SE5	SSE1.6	E7	
29-Apr	SE8	SSE6	SSE6	SSE7	S8	S6	SSW5	S6	SSW8	S8	SSW6	SSW15	WSW12	SW12	SW12	SSW15	SSW13	SSW12	SW13	SW4	SSW5	SSW5	SSW3	SSW3	SSW7.6	SSW15	
30-Apr	SSW5	S1	SSW2	S5	SSW6	SSW5	SW5	S7	SSW5	S6	S7	SSW7	WSW4	WNW7	N17	N15	WSW2	ENE3	ESE6	W4	N4	ESE3	SSE2	SW4	SSW1.4	N17	

NE2.3 NE2.9 NE2.9 NE3.3 NE3.6 NE3.0 NE2.7 ENE2.5 ENE2.5 E2.7 E2.5 ESE1.6 E2.5 NE2.0 N2.4 NE2.2 NE1.3 ENE3.2 ENE3.1 ENE2.8 NE2.8 ENE2.8 ENE3.1 NE2.5	Diurnal Average
NNE17 NNE18 NNE19 NNE20 NNE19 NNE18 NNE17 NNE19 NNE21 NNE22 NNE21 NNE21 NNE26 NNE24 NNE22 NNE21 NNE20 NNE19 NNE17 NNE15 NNE15 NNE17 NE17 NNE17	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

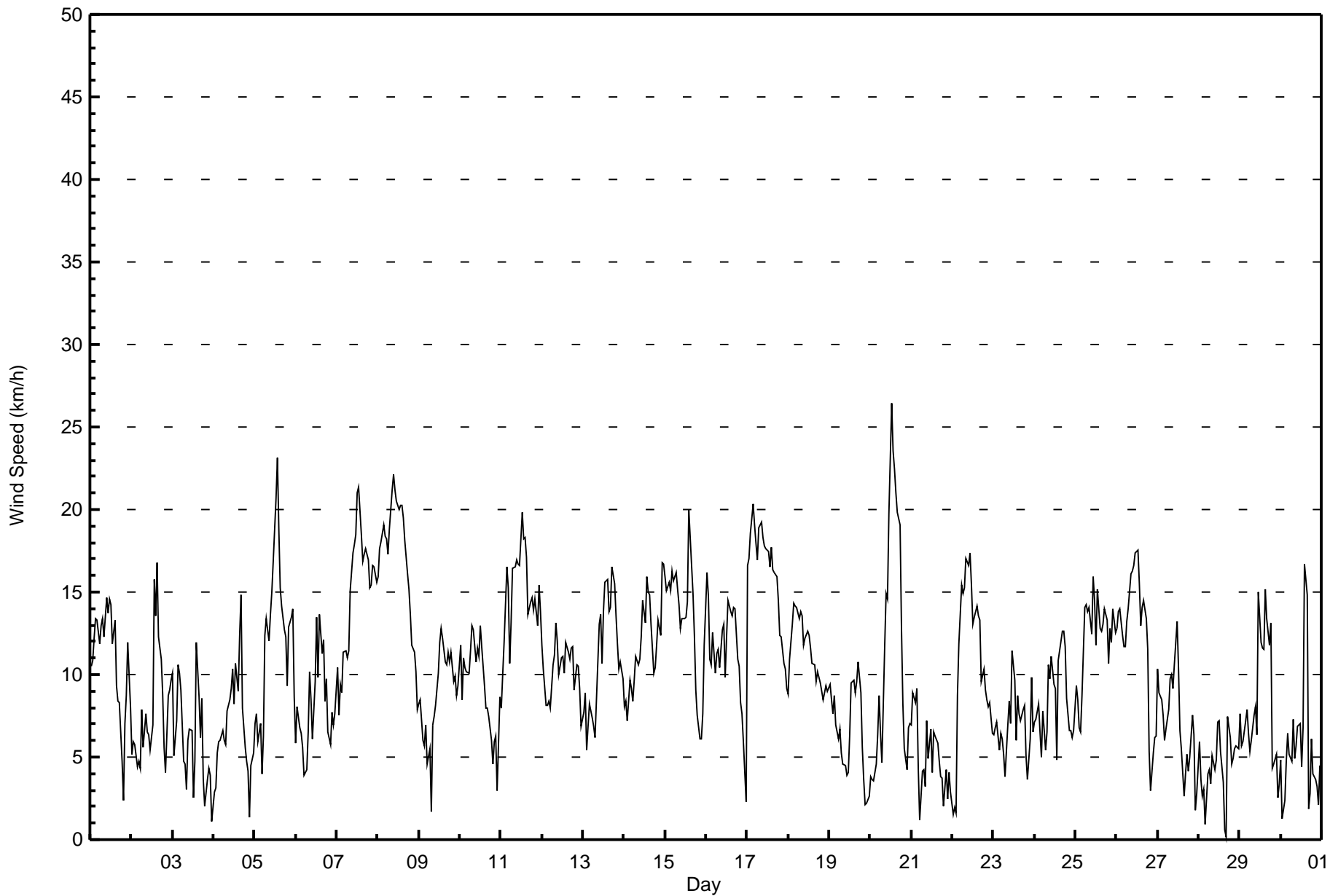
Wind Speed (WS) - km/h
Mildred Lake - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Apr 8 11:00 Minimum Value: 1 km/h on Apr 21 20:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	3	4	5	4	4	4	4	4	4	4	4	5	4	3	4	3	1	2	3	3	3	3	5	
2-Apr	2	2	2	2	2	2	2	2	2	1	2	2	3	4	6	5	4	4	2	1	1	3	1	1	6
3-Apr	2	3	2	2	1	2	1	1	2	1	2	2	2	2	4	3	3	3	1	1	1	2	2	1	4
4-Apr	1	2	1	1	2	2	2	1	2	2	3	4	3	2	3	3	4	2	2	1	1	2	1	1	4
5-Apr	1	1	2	2	1	4	4	3	3	3	3	3	4	6	5	4	4	3	4	2	2	2	2	5	6
6-Apr	2	1	1	1	2	2	1	2	2	2	2	2	4	4	4	5	4	3	2	2	1	2	1	2	5
7-Apr	2	2	2	2	2	2	2	2	3	4	4	4	5	6	5	5	5	5	5	4	4	4	4	4	6
8-Apr	3	3	4	4	5	5	4	5	6	6	7	6	5	5	6	6	4	4	4	4	3	3	2	2	7
9-Apr	1	2	2	2	2	1	1	1	2	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3
10-Apr	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	1	1	1	1	1	2	4	4
11-Apr	2	2	3	4	4	3	4	4	4	4	4	4	5	5	5	5	4	4	4	3	3	4	3	3	5
12-Apr	2	2	2	2	2	2	2	3	3	3	4	5	4	4	4	4	3	3	3	2	2	2	2	2	5
13-Apr	2	1	1	1	2	2	1	2	3	4	4	4	4	4	5	4	4	4	4	3	3	2	2	2	5
14-Apr	2	3	2	3	3	2	2	3	3	3	3	4	4	5	4	4	4	4	5	5	6	5	5	5	6
15-Apr	5	5	4	4	4	4	4	4	3	3	4	4	4	4	5	4	3	3	2	1	1	2	2	3	5
16-Apr	3	2	3	3	2	2	3	2	2	3	2	3	4	4	4	4	4	4	3	3	2	2	1	4	4
17-Apr	4	4	4	6	5	5	5	5	5	5	4	5	5	5	5	5	4	5	4	3	3	3	4	3	6
18-Apr	3	3	3	4	3	4	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	4
19-Apr	1	2	1	2	2	1	1	1	1	2	1	1	2	3	3	2	3	2	2	2	1	1	1	1	3
20-Apr	1	1	1	2	2	2	1	1	4	4	4	5	7	6	6	5	5	5	4	3	2	1	1	1	7
21-Apr	1	2	2	2	2	1	1	1	2	3	3	3	2	3	2	2	1	1	1	1	1	1	1	1	3
22-Apr	1	2	2	4	2	4	3	6	5	4	4	4	4	5	4	4	4	3	3	2	2	2	2	1	6
23-Apr	2	2	1	1	1	1	2	2	2	4	3	3	3	3	2	2	2	2	2	1	1	2	2	1	4
24-Apr	2	2	2	3	2	2	2	2	3	2	4	3	3	3	4	3	3	3	3	2	2	2	1	1	4
25-Apr	3	2	2	2	4	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	4
26-Apr	2	2	2	3	2	3	2	3	4	4	3	4	4	4	3	3	4	3	4	2	1	1	1	2	4
27-Apr	2	2	2	1	1	2	2	2	2	2	4	4	3	4	3	3	2	2	1	1	1	1	2	1	4
28-Apr	1	2	1	1	1	1	1	1	1	1	2	2	2	3	2	2	1	3	2	1	1	1	1	1	3
29-Apr	1	1	2	1	1	1	1	1	2	2	3	4	4	4	4	4	4	4	4	1	1	1	2	1	4
30-Apr	1	1	1	1	1	2	1	2	2	2	3	3	2	3	7	4	3	4	3	3	2	1	2	1	7
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Mildred Lake - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Mildred Lake - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	128	17.78	17.78
6 - 11	316	43.89	61.67
12 - 19	256	35.56	97.22
20 - 28	20	2.78	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Mildred Lake - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	13	9	6	5	4	7	8	9	8	22	12	13	5	1	3	3	128
6 - 11	43	52	27	10	8	13	20	44	38	25	14	5	5	4	3	5	316
12 - 19	15	95	22	5	5	7	3	38	30	7	7	12	4	2	3	1	256
20 - 28	1	17	0	0	0	0	0	2	0	0	0	0	0	0	0	0	20
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	173	55	20	17	27	31	93	76	54	33	30	14	7	9	9	720

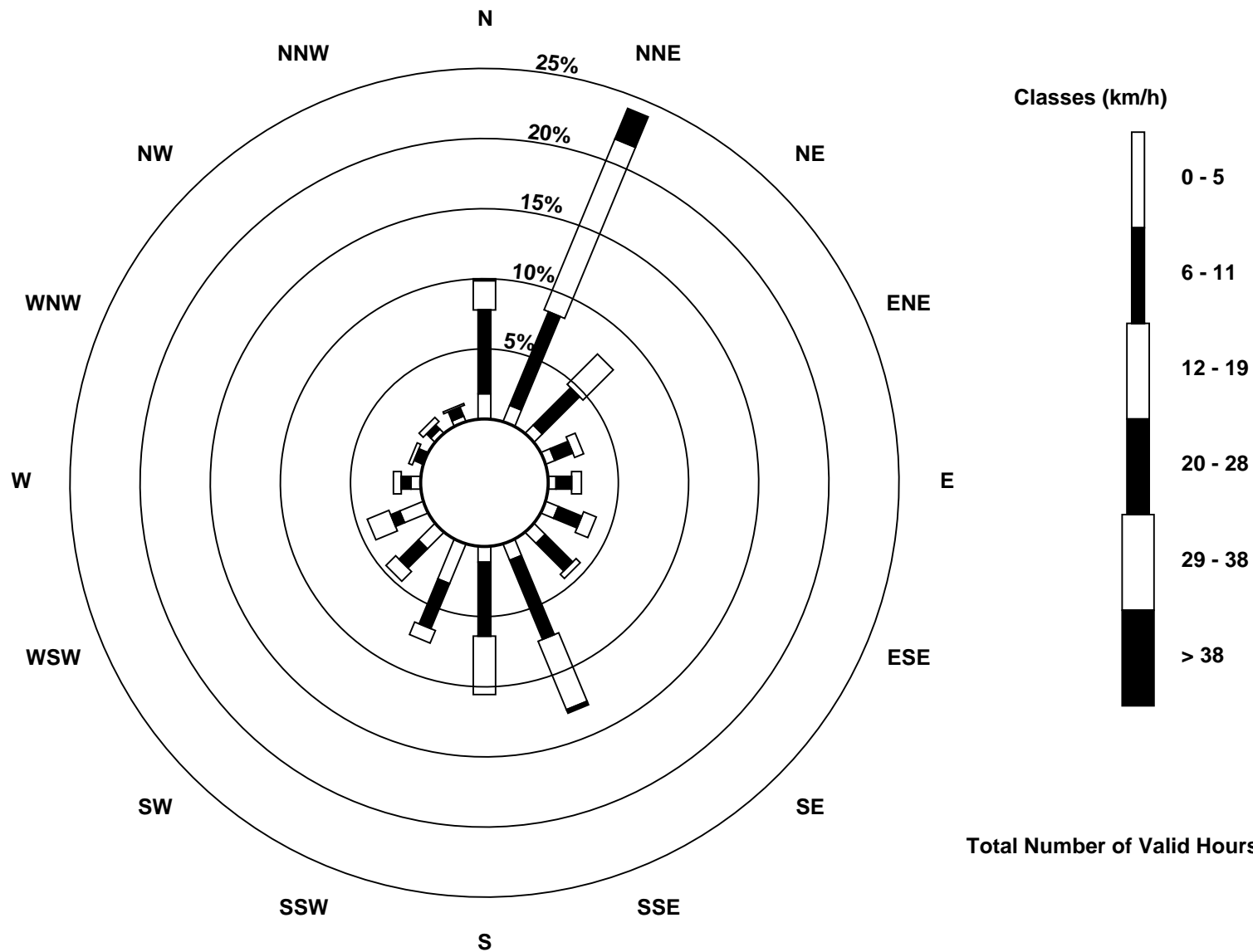
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Mildred Lake (AMS 2)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mildred Lake - April 2017

Direction of Maximum Speed: 19 deg on Apr 20 13:00 Direction of Maximum Daily Speed Average: 21.6 deg on Apr 8	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 9 deg on Apr 28 17:00 Direction of Minimum Daily Speed Average: 1.3 deg on Apr 19	Percent Operational Time: 100.0
Monthly Average Direction: 194.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	227	260	256	255	251	251	245	247	264	253	246	246	265	285	313	305	329	353	6	269	242	276	284	266	266.2
2-Apr	237	253	239	252	241	212	219	208	216	198	191	221	226	335	321	14	41	38	20	19	3	357	3	359	321.0
3-Apr	11	359	359	9	12	10	21	2	279	221	219	218	193	225	318	295	308	7	67	108	197	265	157	247	332.9
4-Apr	254	181	146	178	134	172	188	181	140	174	204	240	177	163	188	181	211	142	148	125	218	206	146	149	177.7
5-Apr	157	158	167	191	171	189	169	168	170	160	167	159	169	168	181	190	188	196	171	174	166	165	165	164	171.7
6-Apr	141	146	154	155	203	188	193	199	174	200	184	169	158	284	264	268	262	297	323	331	4	42	68	19	215.0
7-Apr	4	4	6	0	2	10	16	14	10	14	4	9	22	29	36	37	32	33	24	19	18	21	16	13	18.2
8-Apr	12	12	13	15	20	24	29	20	18	17	33	33	25	21	27	33	13	30	17	18	18	20	23	18	21.6
9-Apr	3	8	13	35	11	15	44	127	222	222	209	185	164	167	174	172	166	156	157	154	143	143	154	155	157.4
10-Apr	160	147	157	154	156	164	164	167	162	151	153	156	162	172	180	180	173	165	140	118	135	150	175	12	158.4
11-Apr	21	24	22	19	16	16	16	21	21	19	17	8	14	20	22	24	33	20	15	14	15	16	15	19	18.4
12-Apr	10	14	19	28	29	31	19	21	13	11	357	23	46	46	16	30	25	22	23	18	7	20	21	6	20.5
13-Apr	10	360	355	1	8	13	7	59	66	131	129	134	104	87	98	111	97	114	100	104	79	73	66	68	83.6
14-Apr	44	63	50	79	40	27	27	27	34	43	47	57	46	58	42	42	49	59	50	65	64	60	47	33	48.1
15-Apr	35	49	45	24	21	20	24	21	31	36	30	19	17	7	351	355	358	6	16	12	26	119	172	167	23.1
16-Apr	161	167	172	163	163	187	172	167	168	151	162	222	231	243	239	230	225	216	212	210	196	189	177	245	193.2
17-Apr	11	26	21	23	23	18	21	23	28	25	27	29	34	34	27	41	46	49	40	37	30	35	37	38	29.2
18-Apr	27	25	24	18	24	33	37	29	21	19	7	3	16	27	24	19	14	38	38	25	15	12	13	11	21.8
19-Apr	10	13	6	6	11	9	1	354	334	277	242	250	204	223	206	197	185	164	191	234	306	226	153	175	259.2
20-Apr	135	112	71	30	14	9	17	22	359	21	21	25	19	20	20	19	16	22	31	19	354	323	340	356	18.7
21-Apr	359	10	25	36	20	355	10	26	39	55	18	347	81	278	240	217	214	227	214	79	53	89	160	228	13.5
22-Apr	138	137	333	4	15	21	30	26	24	24	26	29	34	16	17	22	3	43	53	42	36	37	51	49	27.3
23-Apr	20	21	7	5	8	21	42	125	116	117	143	174	164	182	193	195	204	181	167	158	161	139	120	126	138.7
24-Apr	140	112	92	85	26	0	71	34	47	57	90	77	113	120	147	126	117	104	113	98	98	99	110	105	95.5
25-Apr	152	146	122	144	151	164	163	159	155	163	159	163	178	165	186	176	178	180	188	182	184	182	171	171	167.9
26-Apr	171	169	166	161	159	158	162	172	183	175	169	166	168	184	179	176	199	190	187	195	188	138	124	139	171.8
27-Apr	172	181	175	165	149	118	141	154	166	153	163	164	165	156	196	252	252	243	286	334	4	22	111	40	164.7
28-Apr	348	38	5	199	58	193	210	196	196	214	211	219	211	27	319	213	9	99	109	88	111	125	119	133	151.4
29-Apr	145	155	167	163	172	187	198	189	195	185	198	210	241	215	227	198	198	202	214	217	201	207	194	210	198.8
30-Apr	211	180	202	187	192	207	222	180	209	174	177	195	242	283	10	10	258	69	107	280	3	121	166	234	208.6

52.7	55.6	47.1	41.9	34.3	34.4	52.6	63.2	59.7	79.5	95.4	103.5	95.2	44.3	7.0	43.4	50.0	75.4	75.6	56.6	51.0	65.4	74.5	54.6
Diurnal Average																							

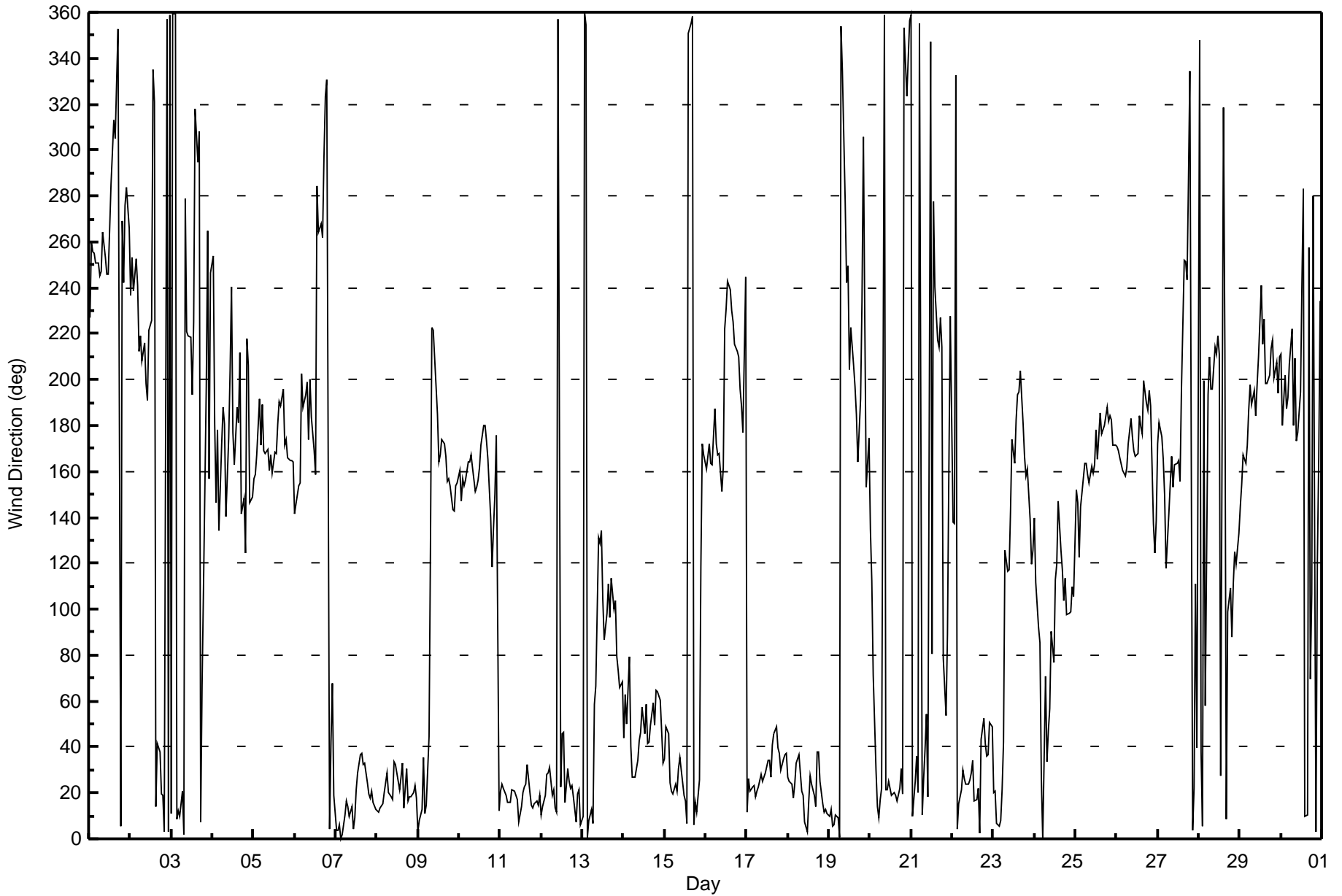
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Mildred Lake - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Apr 28 17:00 Minimum Value: 5 deg on Apr 20 23:00 Percentiles: P ₁ = 10 P ₁₀ = 12 Q ₁ = 15 Median = 19 Q ₃ = 25 P ₉₀ = 38 P ₉₉ = 77																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	28	19	21	21	22	23	23	23	23	22	24	24	24	26	20	30	29	13	11	47	22	32	18	21	47
2-Apr	32	38	25	47	48	31	19	23	18	16	24	36	43	21	31	26	20	21	16	13	10	14	10	12	48
3-Apr	12	30	9	10	11	11	20	19	65	28	23	32	96	46	21	31	30	17	28	37	27	35	40	93	96
4-Apr	38	48	22	27	18	37	22	29	22	25	28	25	35	18	25	23	17	36	21	15	40	82	33	19	82
5-Apr	14	16	34	17	33	49	14	12	14	14	18	17	14	13	17	15	16	20	14	13	10	10	11	19	49
6-Apr	20	13	11	12	18	23	22	19	15	16	36	20	18	55	23	33	24	24	12	10	16	16	14	21	55
7-Apr	14	14	11	15	13	14	13	14	14	17	16	18	19	20	20	19	20	19	18	16	16	16	16	14	20
8-Apr	14	14	14	14	17	17	19	17	19	18	20	20	21	20	21	21	18	21	19	17	18	17	16	19	21
9-Apr	13	12	15	23	18	14	18	72	27	24	31	27	24	20	20	20	20	16	14	14	14	12	12	11	72
10-Apr	12	14	11	12	12	10	12	11	14	20	18	19	19	16	20	25	18	12	17	11	14	16	52	47	52
11-Apr	13	15	16	16	15	16	16	17	20	18	19	18	19	21	22	22	21	19	17	14	15	14	13	15	22
12-Apr	13	14	15	15	16	14	14	18	18	21	43	36	36	37	31	27	27	21	16	14	11	16	15	20	43
13-Apr	14	11	10	10	10	13	15	22	32	31	24	37	25	22	20	25	17	17	12	12	16	17	15	15	37
14-Apr	14	19	28	24	24	17	14	16	17	17	18	19	19	19	18	19	19	21	22	20	23	21	19	18	28
15-Apr	19	20	19	17	16	16	17	17	18	19	24	25	23	27	18	19	17	18	17	10	25	44	26	12	44
16-Apr	12	10	12	13	11	15	14	13	16	16	15	34	24	23	25	24	22	17	17	15	16	15	22	62	62
17-Apr	17	17	17	18	17	17	18	18	20	19	20	23	22	24	22	23	23	21	18	19	17	19	20	18	24
18-Apr	18	17	17	15	16	17	19	21	21	24	22	20	24	32	31	28	28	26	19	19	16	13	13	12	32
19-Apr	11	12	13	11	12	12	13	19	26	43	41	44	26	26	23	26	26	15	17	40	36	50	40	37	50
20-Apr	28	25	31	22	12	10	13	25	15	20	21	19	18	17	17	18	16	18	18	24	19	17	5	11	31
21-Apr	12	13	15	19	32	65	17	29	69	32	66	33	60	43	30	39	26	28	22	53	11	23	22	36	69
22-Apr	69	64	75	36	16	16	17	20	21	19	20	27	34	26	28	29	24	32	23	15	15	13	15	13	75
23-Apr	15	13	10	10	11	12	24	61	38	47	66	26	33	64	30	28	25	18	13	18	31	20	11	18	66
24-Apr	20	21	12	16	40	13	35	19	16	18	24	36	33	70	33	24	20	16	16	14	22	11	15	15	70
25-Apr	19	16	20	20	18	12	13	15	16	22	20	20	23	16	18	19	19	18	15	15	15	15	14	14	23
26-Apr	14	13	12	13	13	14	13	16	17	17	15	18	15	19	23	20	17	16	22	17	17	21	12	20	23
27-Apr	15	16	15	13	15	12	20	15	15	26	30	23	25	55	79	83	68	33	32	17	10	13	71	43	83
28-Apr	14	59	66	21	73	15	20	25	23	41	36	39	37	69	69	97	101	32	16	14	21	16	7	32	101
29-Apr	17	23	19	16	10	7	24	25	23	29	46	20	28	28	25	21	18	20	16	15	11	14	58	31	58
30-Apr	10	68	32	13	16	26	19	27	52	41	42	43	66	49	28	20	79	78	22	58	58	33	76	17	79
	69	68	75	47	73	65	35	72	69	47	66	44	96	70	79	97	101	78	32	58	58	82	76	93	
Diurnal Maximum																									





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	April 5, 2017	Last Cal Date:	March 3, 2017
Start time (MST):	9:22	End time (MST):	12:22
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	51.2	ppm	Cal Gas Exp Date	2/19/18
Calibrator Make/Model	API T700		Serial Number	1185
ZAG Make/Model	APT T701		Serial Number	4767

Analyzer Information

Analyzer make:	Thermo 43i	Analyzer serial #:	JC1404901075		
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 1000 ppb		PMT voltage	-653.4	-653
Calculated slope	0.997532	1.000581	Lamp voltage	810	809
Calculated intercept	1.418434	1.542958	Pressure	696.5	690.2
Analyzer Background	21.4	21.0	Flow	0.496	0.490
Analyzer Coefficient	0.977	0.956	Intensity	90	90

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.0	-0.6	----
as found span	4931	76.4	781.2	796.6	0.981
calibrator zero	5000	0.0	0.0	-0.6	----
high point	4931	76.4	781.2	779.8	1.002
second point	4969	38.3	391.6	389.0	1.007
third point	4986	19.2	196.4	194.1	1.012
as left zero	5003	0.0	0.0	-0.6	----
as left span	4932	76.4	781.0	778.0	1.004
Average Correction Factor					1.007

Corrected As found	797.18	Previous response	781.69	% change	-1.9%
--------------------	--------	-------------------	--------	----------	-------

* = > +/-5% change initiates investigation

Notes:

Adjusted span.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

SO₂ Calibration Summary

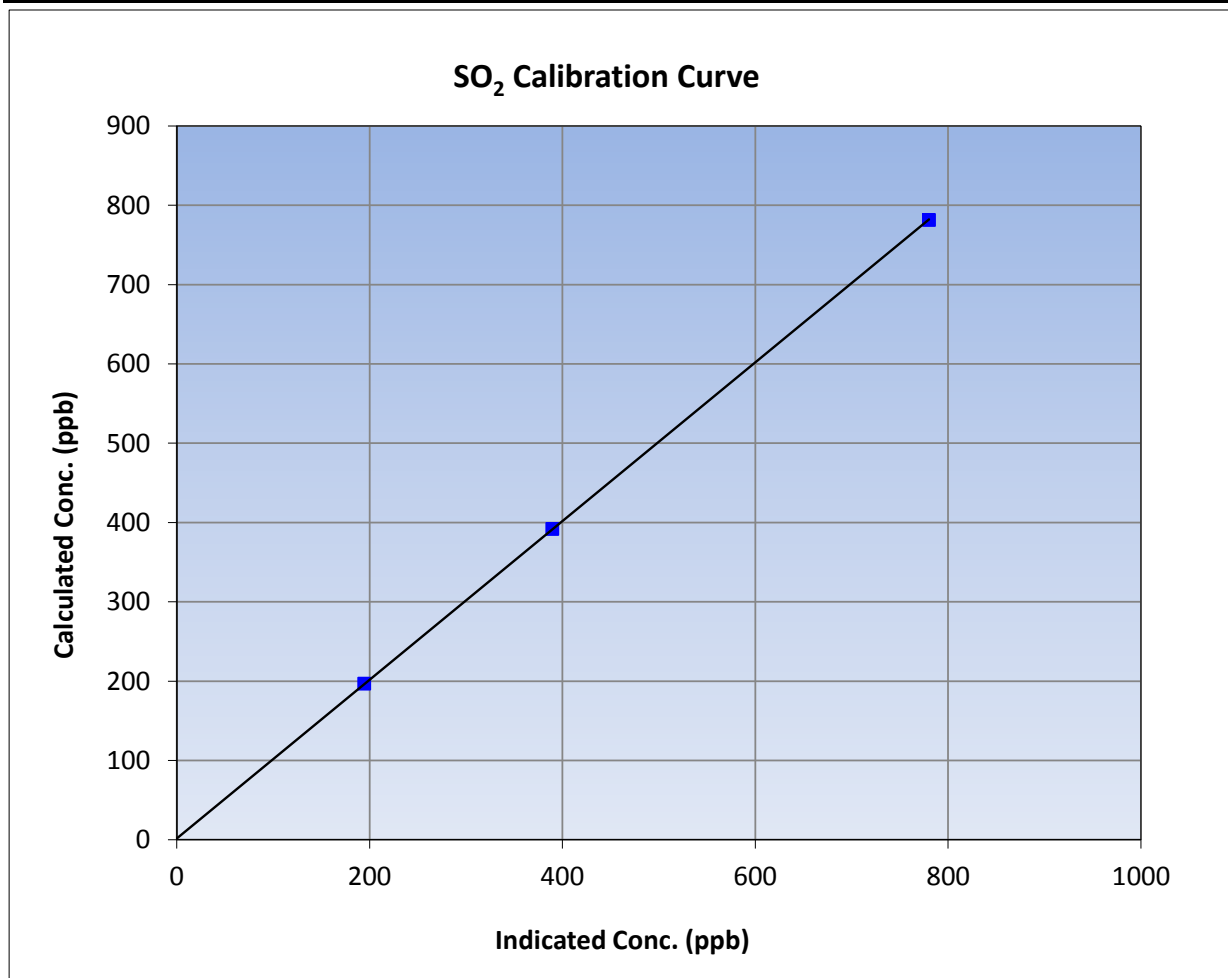
Version-03-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 3, 2017
Station Name	Mildred Lake	Station Number	AMS 02
Start Time (MST)	9:22	End Time (MST)	12:22
Analyzer make	Thermo 43i	Analyzer serial #	JC1404901075

Calibration Data

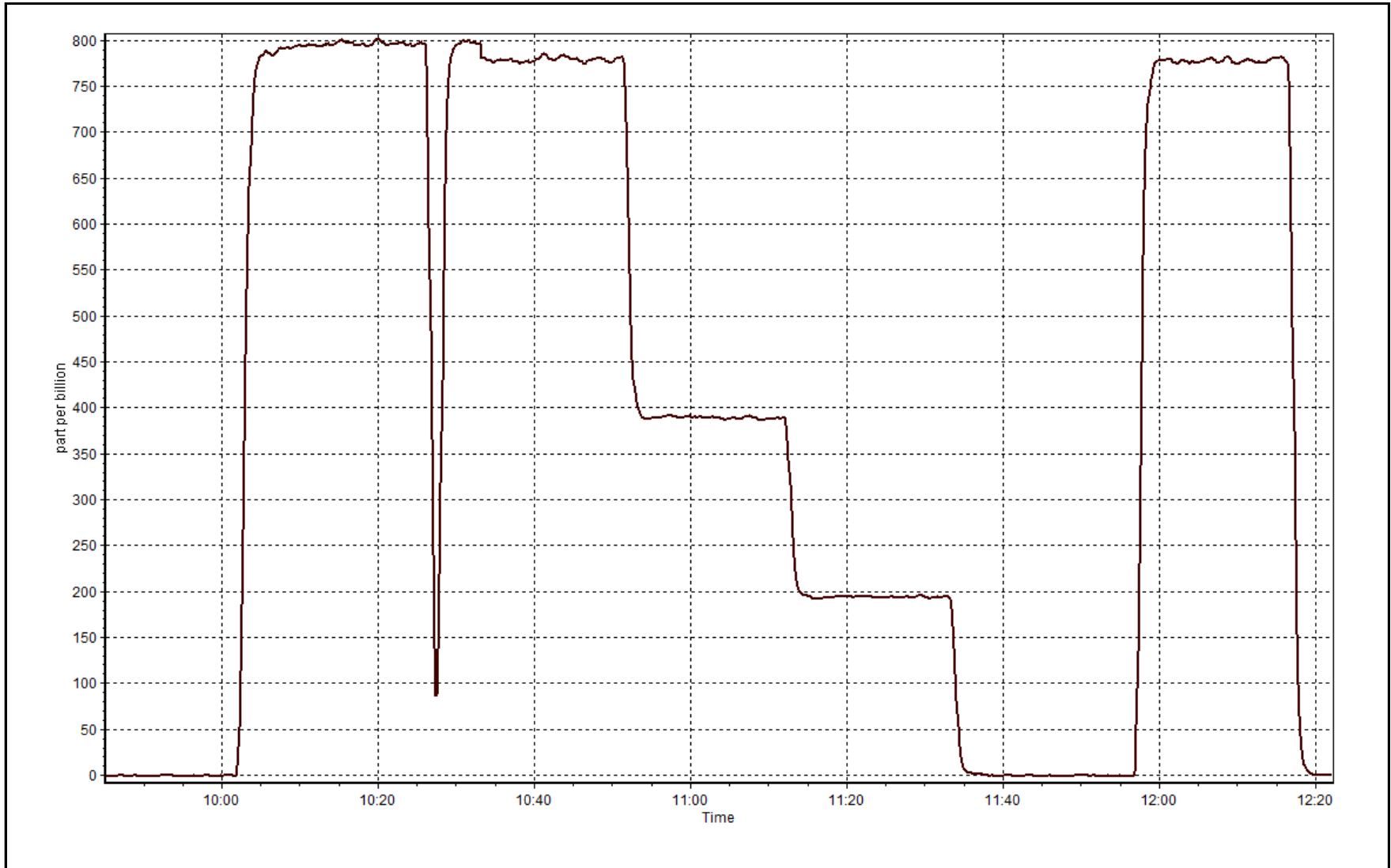
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.6	----	Correlation Coefficient	0.999992	≥0.995
781.2	779.8	1.0018			
391.6	389.0	1.0068	Slope	1.000581	0.90 - 1.10
196.4	194.1	1.0121			
			Intercept	1.542958	+/-30



SO2 Calibration Plot

Date: April 5, 2017

Location: Mildred Lake





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	April 6, 2017	Last Cal Date:	March 1, 2017
Start time (MST):	10:09	End time (MST):	12:20
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.04</u>	ppm	Cal Gas Exp Date	September 9, 2017
Calibrator Make/Model	API T700		Serial Number	1185
ZAG Make/Model	API T701		Serial Number	825

Analyzer Information

Analyzer make: TEI 450i

Analyzer serial #: 815129107

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	-601	-601
Calculated slope	1.003006	0.995911	Lamp voltage	791	788
Calculated intercept	0.089905	0.111458	Pressure	554.8	553.3
Analyzer Background	17.0	17.1	Flow	0.951	0.951
Analyzer Coefficient	0.976	0.976	Intensity	87	88

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.4	----
as found span	4927	80.1	80.6	81.1	0.994
calibrator zero	5000	0.0	0.0	0.4	----
high point	4927	80.1	80.6	81.1	0.994
second point	4968	40.1	40.4	40.1	1.007
third point	4986	20.1	20.2	19.8	1.023
as left zero	5002	0.0	0.0	0.3	----
as left span	3944	64.1	80.6	81.7	0.986
Average Correction Factor					1.008

Corrected As found	80.73	Previous response	80.29	*% change	-0.5%
--------------------	-------	-------------------	-------	-----------	-------

* = > +/-5% change initiates investigation

Notes:

No adjustments made.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

H₂S Calibration Summary

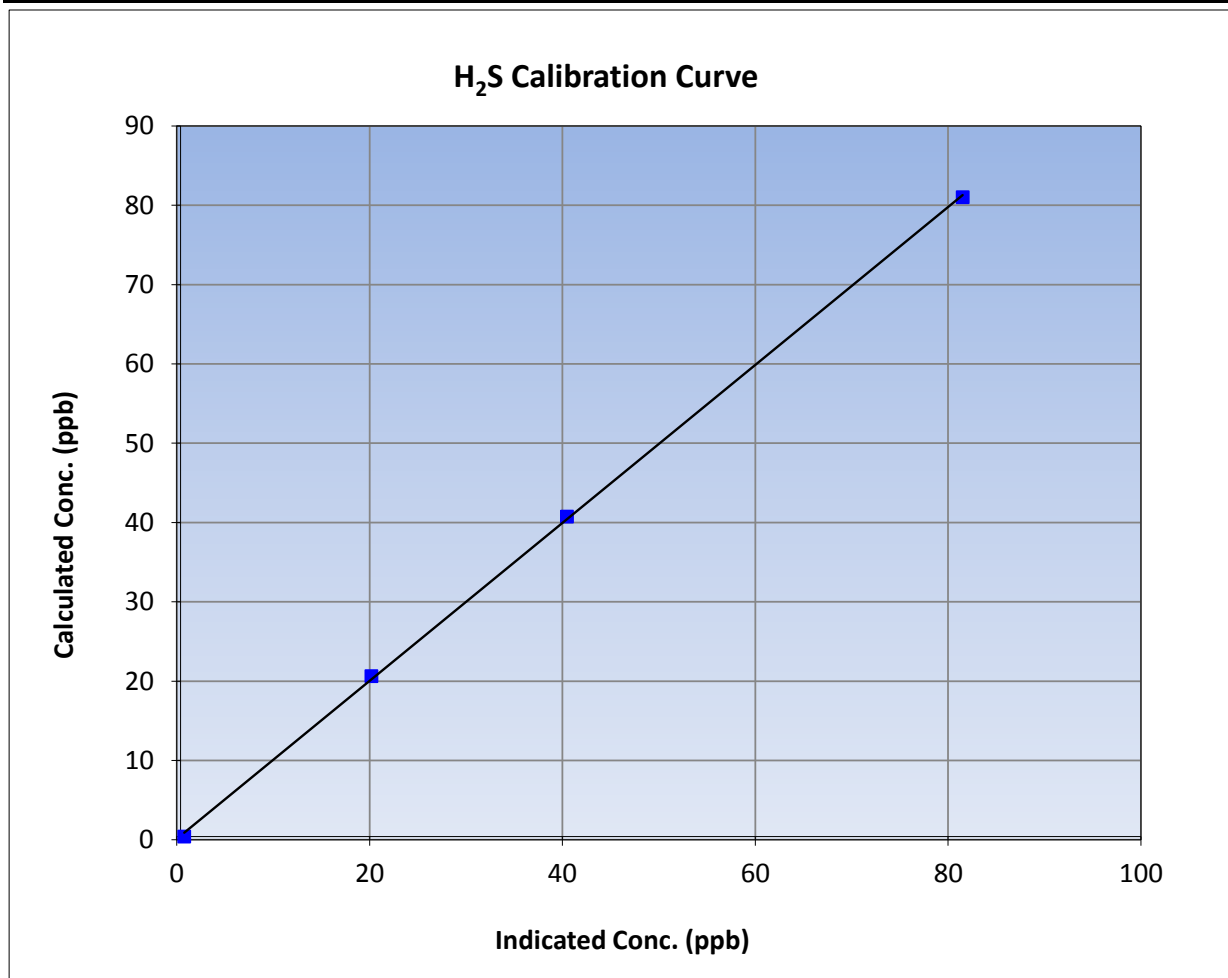
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 1, 2017
Station Name	Mildred Lake	Station Number	AMS 02
Start Time (MST)	10:09	End Time (MST)	12:20
Analyzer make	TEI 450i	Analyzer serial #	815129107

Calibration Data

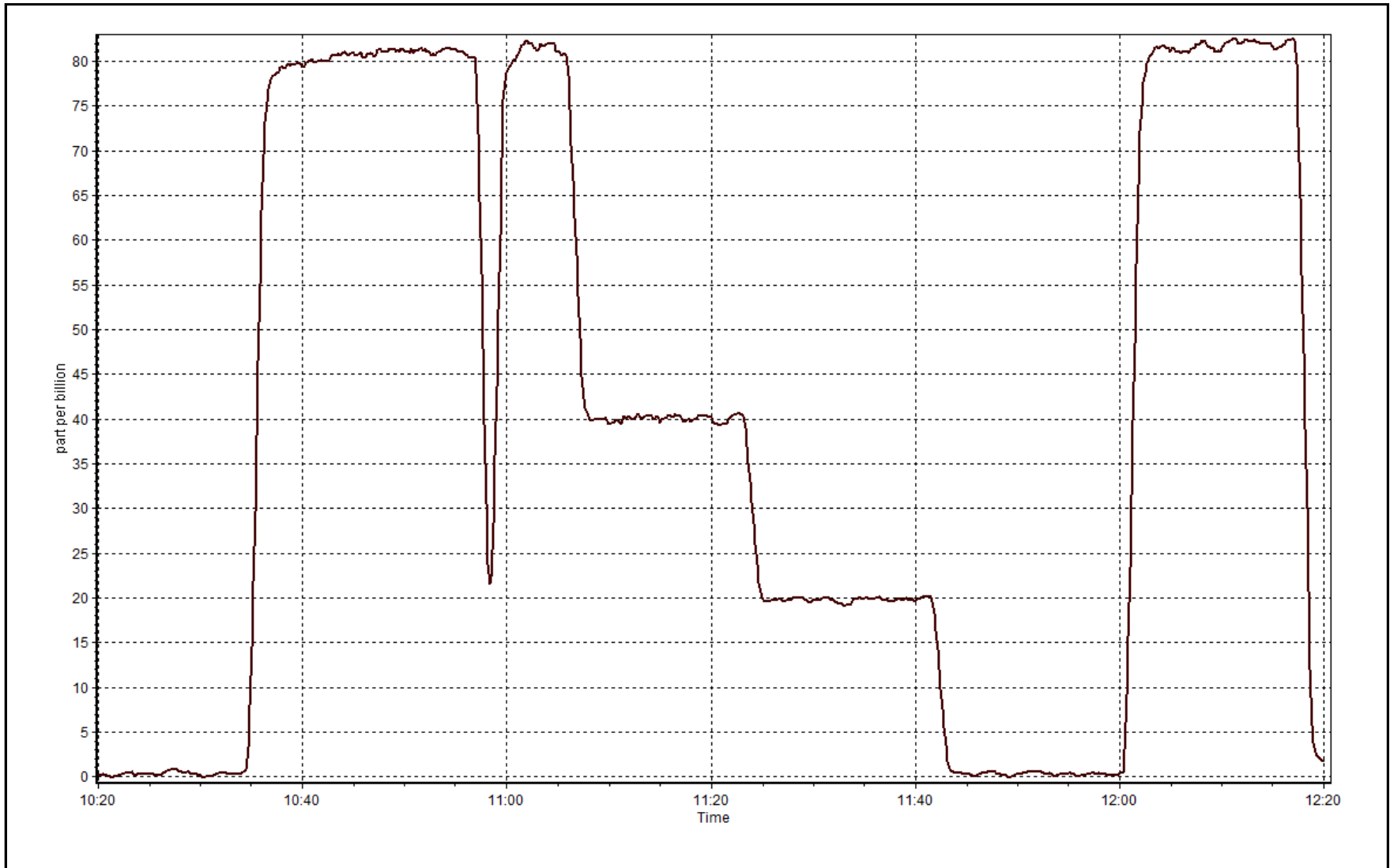
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.4	----	Correlation Coefficient	0.999832	≥0.995
80.6	81.1	0.9940			
40.4	40.1	1.0069	Slope	0.995911	0.90 - 1.10
20.2	19.8	1.0231			
			Intercept	0.111458	+/-3



H₂S Calibration Plot

Date: April 6, 2017

Location: Mildred Lake





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Mildred Lake	Station number:	AMS 02
Calibration Date:	April 5, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	9:22	End time (MST):	12:23
Reason:	Routine		

Calibration Standards

Gas Cert Reference	LL107930	Cal Gas Expiry Date	2/9/18
CH4 Cal Gas Conc.	509 ppm	CH4 Equiv Conc.	1081.0 ppm
C3H8 Cal Gas Conc.	208 ppm	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	1185
ZAG Make/Model	Teledyne API 701	Serial Number	4767

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1300156231
	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 25 ppm	Bias voltage supply	-301.0 -302
Calculated slope	1.001053	Sample pressure	8.2 8.2
Calculated intercept	-0.018380	Fuel pressure	21.8 21.8
Analyzer Background	0.560	Air pressure	33.1 33.1
Analyzer Coefficient	3.776	Flame temperature	144.0 144.2

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.00	0.09	----
as found span	4931	76.4	16.49	16.31	1.011
calibrator zero	5002	0.0	0.00	0.09	----
high point	4931	76.4	16.49	16.51	0.999
second point	4969	38.3	8.27	8.30	0.996
third point	4987	19.2	4.15	4.23	0.980
as left zero	5003	0.0	0.00	0.13	----
as left span	4932	76.4	16.49	16.38	1.007
Average Correction Factor					0.992
Corrected As found	16.22	Previous response	16.49	*% change	1.7%

* = > +/-5% change initiates investigation

Notes:

Adjusted span.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

THC Calibration Summary

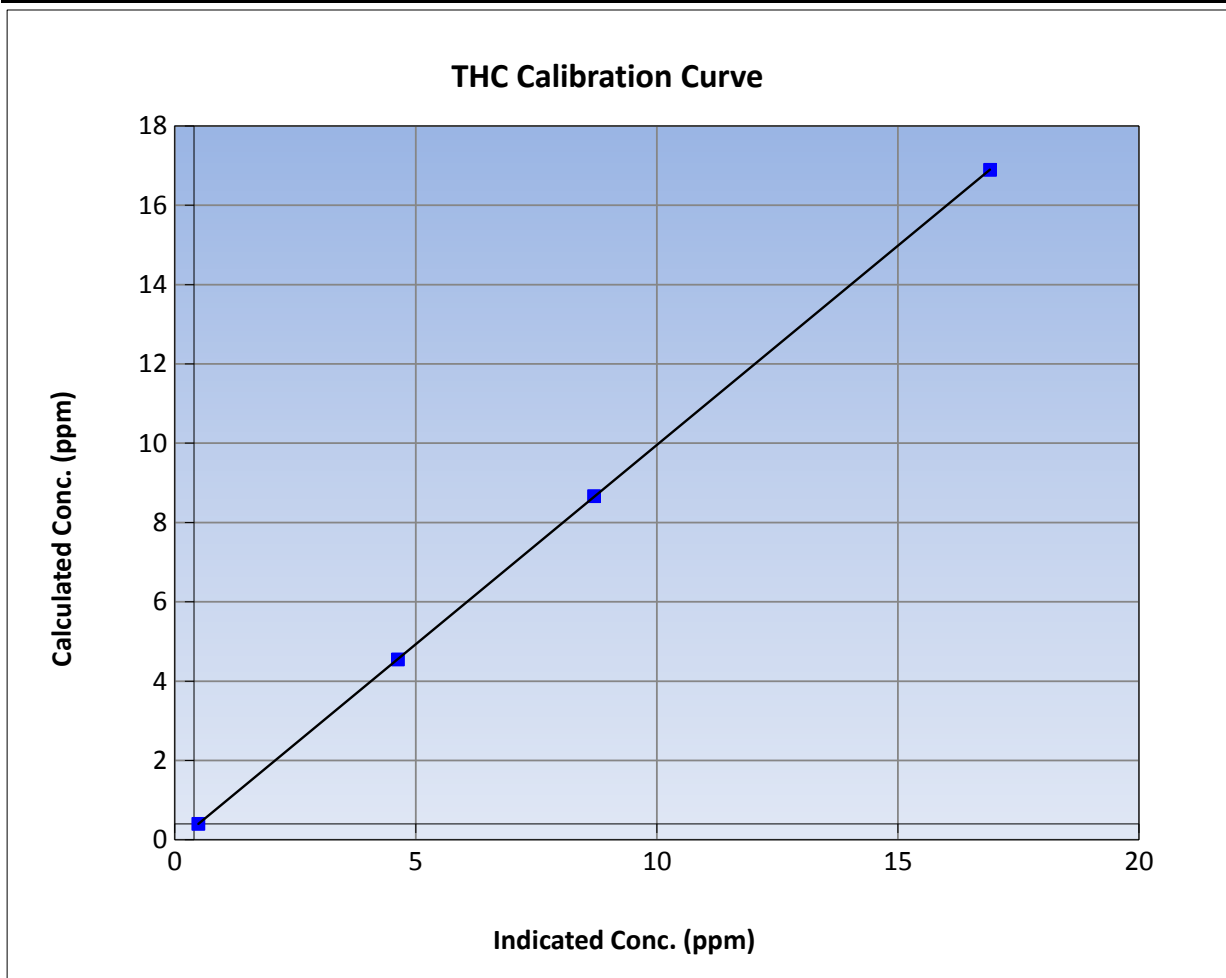
Version-03-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 8, 2017
Station Name	Mildred Lake	Station Number	AMS 02
Start Time (MST)	9:22	End Time (MST)	12:23
Analyzer make	Thermo 51i-LT	Analyzer serial #	1300156231

Calibration Data

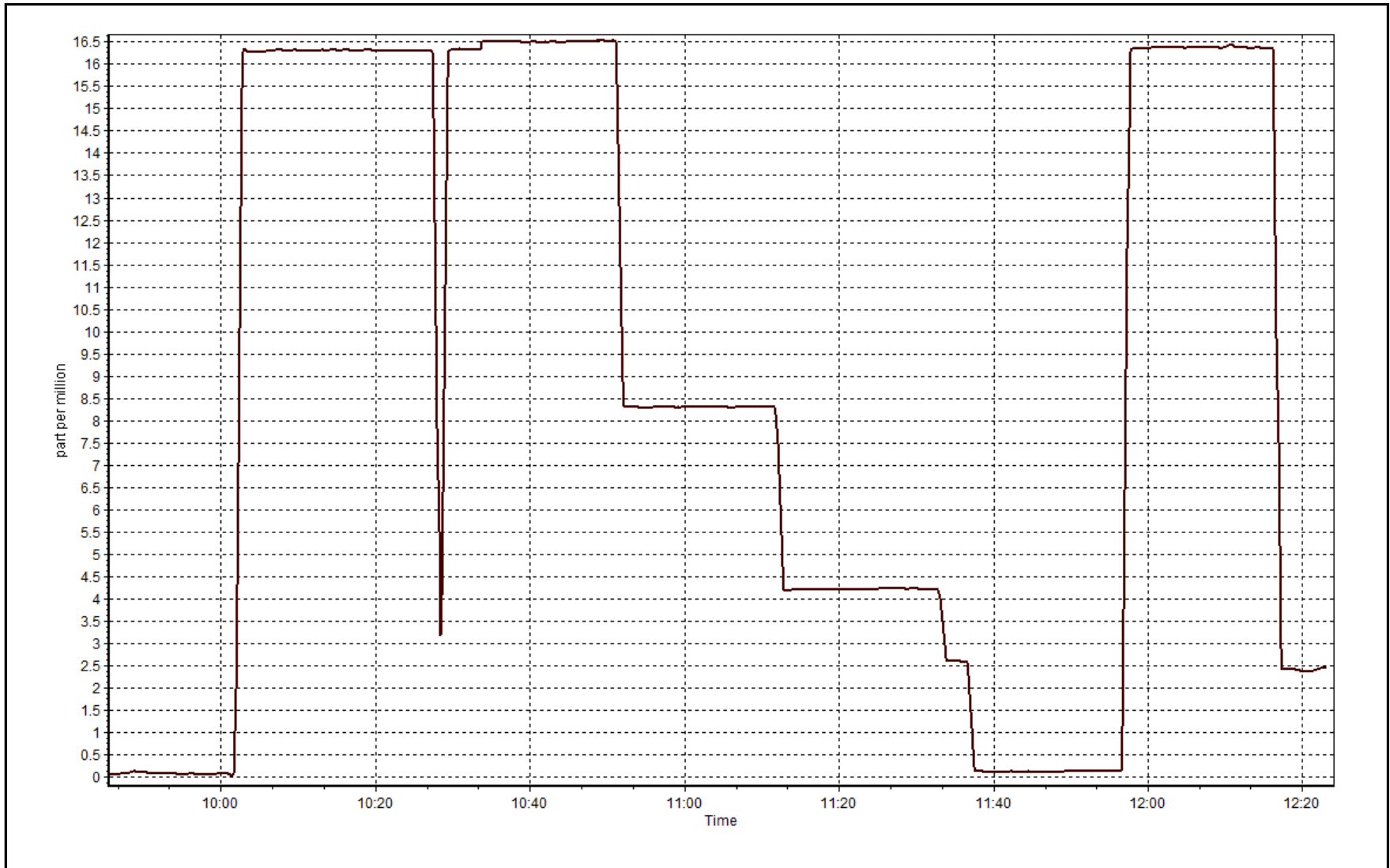
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999996	≥0.995
16.5	16.5	0.9990			
8.3	8.3	0.9962	Slope	1.004873	0.90 - 1.10
4.1	4.2	0.9801			
			Intercept	-0.091100	+/-1.5



THC Calibration Plot

Date: April 5, 2017

Location: Mildred Lake





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 3 LOWER CAMP METEOROLOGY APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
Temperature 20 m (C) Average	720	0	0	100	16.8	-	10.3	-
Temperature 45 m (C) Average	720	0	0	100	16.4	-	10.5	-
Temperature 100 m (C) Average	720	0	0	100	16.1	-	11.0	-
Temperature 167 m (C) Average	720	0	0	100	15.5	-	11.1	-
Relative Humidity 20 m (%) Average	720	0	0	100	98	-	82.0	-
Relative Humidity 45 m (%) Average	720	0	0	100	98	-	81.0	-
Relative Humidity 100 m (%) Average	720	0	0	100	98	-	78.0	-
Relative Humidity 167 m (%) Average	720	0	0	100	98	-	77.0	-
Wind Speed 20 m (km/h) Average	720	0	0	100	25	-	14.0	-
Wind Speed 45 m (km/h) Average	720	0	0	100	28	-	19.0	-
Wind Speed 100 m (km/h) Average	714	0	6	99.17	38	-	25.0	-
Wind Speed 167 m (km/h) Average	720	0	0	100	44	-	28.0	-
Wind Direction 20 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 45 m (deg) Average	720	0	0	100	-	-	-	-
Wind Direction 100 m (deg) Average	714	0	6	99.17	-	-	-	-
Wind Direction 167 m (deg) Average	720	0	0	100	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	0	0	100	0.5	-	0.1	-
Vertical Wind Speed 45 m (km/h) Average	720	0	0	100	1.2	-	0.6	-
Vertical Wind Speed 100 m (km/h) Average	714	0	6	99.17	3.6	-	1.0	-
Vertical Wind Speed 167 m (km/h) Average	720	0	0	100	4.5	-	1.4	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
Temperature 20 m (C) Average	720	2.76	5.8	-	-11.4	-4.7	-1.9	2.8	6.6	11.2	16.8
Temperature 45 m (C) Average	720	2.74	5.8	-	-11.1	-4.9	-2	2.9	6.7	11.1	16.4
Temperature 100 m (C) Average	720	2.58	5.9	-	-10.7	-5.4	-2.1	2.5	7	10.9	16.1
Temperature 167 m (C) Average	720	2.32	5.8	-	-11.3	-5.8	-2.3	2.3	6.8	10.4	15.5
Relative Humidity 20 m (%) Average	720	58.1	18	-	19	33	45	58	71	84	98
Relative Humidity 45 m (%) Average	720	56.9	18	-	18	32	44	57	70	83	98
Relative Humidity 100 m (%) Average	720	56.3	18	-	15	33	43	56	69	83	98
Relative Humidity 167 m (%) Average	720	56.4	18	-	13	33	42	56	70	84	98
Wind Speed 20 m (km/h) Average	720	8.2	5	-	0	2	4	8	12	15	25
Wind Speed 45 m (km/h) Average	720	11.1	6	-	0	3	6	11	16	19	28
Wind Speed 100 m (km/h) Average	714	15.2	7	-	1	5	9	15	20	25	38
Wind Speed 167 m (km/h) Average	720	17.4	8	-	1	7	11	17	23	29	44
Wind Direction 20 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-
Wind Direction 167 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	720	-0.07	0.2	-	-0.9	-0.3	-0.2	0	0	0.1	0.5
Vertical Wind Speed 45 m (km/h) Average	720	0.09	0.4	-	-1.2	-0.3	-0.2	0	0.4	0.6	1.2
Vertical Wind Speed 100 m (km/h) Average	714	0.33	0.6	-	-1.5	-0.2	0	0.2	0.5	0.9	3.6
Vertical Wind Speed 167 m (km/h) Average	720	0.55	0.7	-	-1.6	-0.1	0.1	0.4	0.8	1.5	4.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed 100 m	14 Apr 2017 15:00	14 Apr 2017 20:00	6	Flat line in sensor output signal

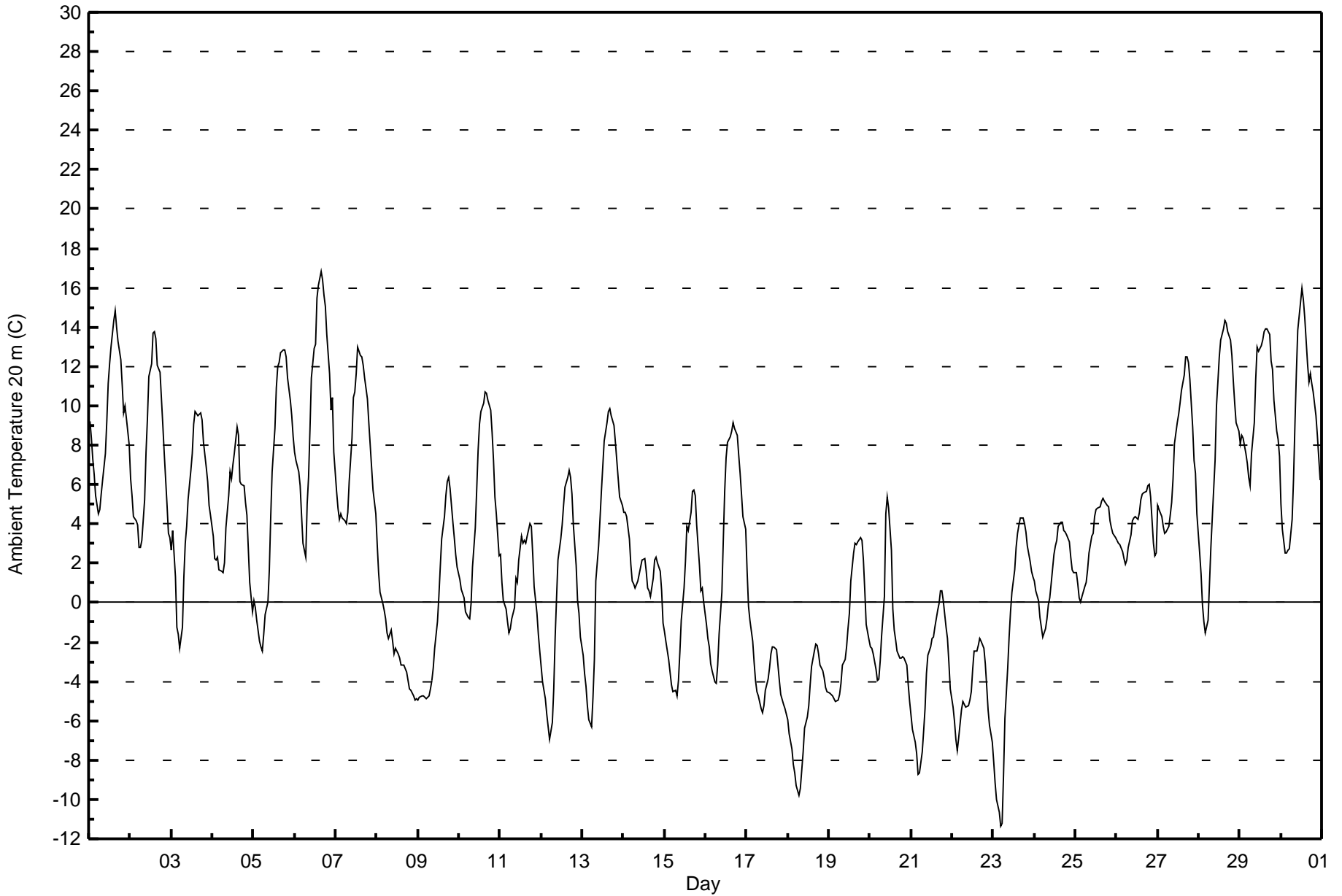


Maximum Value: 16.8 C on Apr 6 16:00		Maximum Daily Average: 10.3 C on Apr 29		Hours in Service: 720																							
Minimum Value: -11.4 C on Apr 23 05:00		Minimum Daily Average: -5.6 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 6.6 C at hour 16		Minimum Diurnal Average: -1.7 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 2.76 C		Percentiles: P ₁ = -9.2 P ₁₀ = -4.7 Q ₁ = -1.9 Median = 2.8 Q ₃ = 6.6 P ₉₀ = 11.2 P ₉₉ = 15.4		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	9.2	8.3	7.3	6.5	5.4	4.5	4.7	5.5	6.2	7.6	9.2	11.2	12.1	13.0	14.3	14.8	14.0	13.2	12.3	11.1	9.7	10.0	9.4	8.0	9.5	14.8	
2-Apr	6.3	5.4	4.4	4.1	3.9	2.8	2.8	3.1	5.2	7.7	9.4	11.5	12.1	13.7	13.7	13.4	12.1	11.7	10.4	9.0	7.5	4.9	3.5	3.3	7.6	13.7	
3-Apr	2.7	3.7	1.3	-1.3	-1.6	-2.3	-1.3	1.3	3.0	3.8	5.3	6.7	7.6	9.1	9.7	9.5	9.6	9.7	9.3	8.2	6.8	6.2	4.9	4.4	4.8	9.7	
4-Apr	3.4	2.3	2.2	2.3	1.6	1.6	1.6	2.0	3.8	5.4	6.6	6.3	7.0	7.6	9.0	8.5	6.2	6.0	5.9	5.1	4.5	2.7	1.0	-0.5	4.3	9.0	
5-Apr	0.1	-0.2	-0.9	-1.9	-2.2	-2.4	-1.6	-0.6	0.0	1.7	4.4	6.6	8.9	10.9	12.0	12.2	12.7	12.9	12.8	12.5	11.4	10.3	9.5	8.5	5.7	12.9	
6-Apr	7.7	7.2	6.6	5.9	4.4	3.0	2.3	5.0	6.4	8.8	11.4	12.9	13.1	15.4	16.1	16.8	16.4	15.6	15.1	13.6	11.6	9.8	10.4	7.7	10.1	16.8	
7-Apr	5.6	4.8	4.2	4.5	4.3	4.2	4.0	4.6	6.2	8.4	10.4	10.7	11.6	13.0	12.6	12.5	12.1	11.4	10.3	9.1	8.0	6.8	5.7	4.5	7.9	13.0	
8-Apr	3.0	1.5	0.5	0.0	-0.4	-0.8	-1.5	-1.8	-1.4	-1.9	-2.6	-2.4	-2.6	-2.8	-3.2	-3.2	-3.2	-3.5	-4.0	-4.4	-4.5	-4.7	-5.0	-4.9	-2.2	3.0	
9-Apr	-5.0	-4.8	-4.7	-4.7	-4.8	-4.9	-4.7	-4.4	-4.0	-3.3	-2.3	-1.0	0.3	1.8	3.3	4.4	5.5	6.1	6.4	5.8	4.1	3.3	2.5	1.8	-0.1	6.4	
10-Apr	1.2	0.7	0.5	0.2	-0.5	-0.7	-0.8	-0.1	1.8	3.8	5.7	7.7	9.1	9.7	10.2	10.7	10.6	10.3	9.8	8.6	7.2	5.4	4.5	2.4	4.9	10.7	
11-Apr	2.4	1.0	0.1	-0.3	-1.0	-1.5	-1.3	-0.8	-0.3	1.2	1.0	2.1	3.4	3.1	3.2	3.0	3.4	4.0	3.9	2.4	0.8	-0.6	-1.6	-2.4	1.1	4.0	
12-Apr	-3.3	-4.0	-4.9	-5.6	-6.3	-6.9	-6.1	-4.4	-1.8	0.3	2.2	3.2	3.9	4.9	5.9	6.4	6.7	6.3	5.5	4.0	1.9	0.1	-0.5	-1.8	0.2	6.7	
13-Apr	-2.7	-3.6	-4.2	-5.2	-5.9	-6.3	-4.8	-2.9	1.1	2.9	4.2	5.6	6.9	8.2	9.2	9.7	9.8	9.5	9.0	8.1	7.2	6.3	5.4	4.9	3.0	9.8	
14-Apr	4.6	4.6	4.4	3.3	1.9	1.1	0.9	0.7	1.1	1.4	1.8	2.2	2.2	1.6	0.7	0.6	0.3	1.2	2.2	2.3	2.0	1.6	0.6	-1.1	1.8	4.6	
15-Apr	-1.4	-1.9	-2.9	-3.5	-4.2	-4.5	-4.5	-4.7	-3.9	-2.5	-0.9	0.8	2.1	3.8	3.7	4.6	5.7	5.7	5.4	4.0	1.9	0.6	0.7	0.1	0.2	5.7	
16-Apr	-1.1	-1.8	-2.3	-3.1	-3.4	-4.0	-4.1	-3.2	-1.6	0.5	3.2	5.7	7.4	8.1	8.4	8.7	9.1	8.9	8.5	7.5	6.6	5.5	4.4	3.7	3.0	9.1	
17-Apr	1.6	-0.2	-0.9	-2.0	-3.0	-3.9	-4.5	-4.8	-5.4	-5.6	-5.2	-4.4	-3.9	-3.3	-2.6	-2.2	-2.2	-2.4	-3.2	-3.9	-4.7	-5.2	-5.3	-5.6	-3.5	1.6	
18-Apr	-6.0	-6.6	-7.4	-8.2	-8.6	-9.3	-9.8	-9.4	-8.5	-7.6	-6.4	-5.8	-5.2	-4.2	-3.2	-2.4	-2.1	-2.2	-2.6	-3.1	-3.5	-3.8	-4.3	-4.5	-5.6	-2.1	
19-Apr	-4.6	-4.7	-4.7	-4.9	-5.0	-5.0	-4.7	-4.1	-3.2	-2.9	-2.2	-1.3	-0.5	1.1	2.5	3.0	3.0	3.1	3.3	3.2	2.1	0.6	-1.1	-1.9	-1.2	3.3	
20-Apr	-2.2	-2.3	-2.6	-3.4	-4.0	-3.9	-2.9	-1.6	0.3	4.5	5.4	4.8	2.6	-0.3	-1.4	-1.9	-2.4	-2.8	-2.8	-2.8	-2.8	-3.2	-4.2	-5.0	-1.5	5.4	
21-Apr	-5.7	-6.4	-7.1	-7.7	-8.7	-8.7	-7.6	-6.6	-5.4	-3.6	-2.7	-2.3	-1.8	-1.7	-1.3	-0.4	0.0	0.6	0.6	0.1	-1.2	-1.8	-3.0	-4.4	-3.6	0.6	
22-Apr	-5.3	-6.0	-7.0	-7.5	-6.8	-5.5	-5.0	-5.1	-5.3	-5.3	-5.0	-4.5	-3.4	-2.5	-2.4	-2.2	-1.8	-2.0	-2.3	-3.1	-4.2	-5.5	-6.2	-7.1	-4.6	-1.8	
23-Apr	-8.1	-9.1	-10.0	-10.7	-11.4	-11.2	-8.8	-5.9	-3.3	-1.7	-0.4	0.6	1.7	2.8	3.5	4.0	4.3	4.3	4.0	3.6	2.9	2.1	1.6	1.3	-1.8	4.3	
24-Apr	1.1	0.6	0.1	-0.7	-1.2	-1.7	-1.3	-0.8	-0.1	0.3	1.0	2.4	2.9	3.2	3.8	4.1	4.1	3.7	3.6	3.4	3.1	2.3	1.6	1.5	1.5	4.1	
25-Apr	1.5	1.0	0.3	0.0	0.3	0.8	1.0	1.7	2.5	3.3	3.5	4.3	4.7	4.8	4.9	5.2	5.3	5.2	5.0	4.8	4.2	3.8	3.5	3.3	3.1	5.3	
26-Apr	3.2	3.0	2.9	2.6	2.2	2.0	2.2	2.8	3.5	4.2	4.3	4.3	4.2	4.6	5.2	5.5	5.6	5.6	6.0	6.0	5.4	3.0	2.4	2.6	3.9	6.0	
27-Apr	4.9	4.7	4.4	3.9	3.5	3.6	3.9	4.5	5.1	6.3	8.1	9.1	9.6	10.1	10.8	11.5	12.5	12.5	12.2	11.3	9.0	7.2	6.6	4.5	7.5	12.5	
28-Apr	2.5	1.4	-0.1	-1.0	-1.5	-0.9	1.0	2.8	4.3	7.2	10.0	11.2	12.5	13.4	13.9	14.3	14.2	13.8	13.4	12.6	11.3	10.1	9.1	8.7	7.7	14.3	
29-Apr	8.1	8.5	8.4	7.6	7.1	6.4	5.9	7.6	9.1	11.4	13.0	12.8	13.0	13.4	13.7	13.9	13.9	13.6	12.3	11.8	10.3	8.7	8.3	7.4	10.3	13.9	
30-Apr	5.0	3.8	2.6	2.5	2.7	2.8	4.2	6.3	9.1	11.6	13.9	15.2	15.9	15.4	14.5	12.1	11.2	11.7	11.1	10.7	9.5	8.5	7.3	6.2	8.9	15.9	
		1.0	0.4	-0.3	-0.9	-1.4	-1.7	-1.4	-0.4	0.8	2.3	3.5	4.5	5.2	5.9	6.4	6.6	6.5	6.5	6.1	5.4	4.3	3.2	2.4	1.5	Diurnal Average	
		9.2	8.5	8.4	7.6	7.1	6.4	5.9	7.6	9.1	11.6	13.9	15.2	15.9	15.4	16.1	16.8	16.4	15.6	15.1	13.6	11.6	10.3	10.4	8.7	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - April 2017**

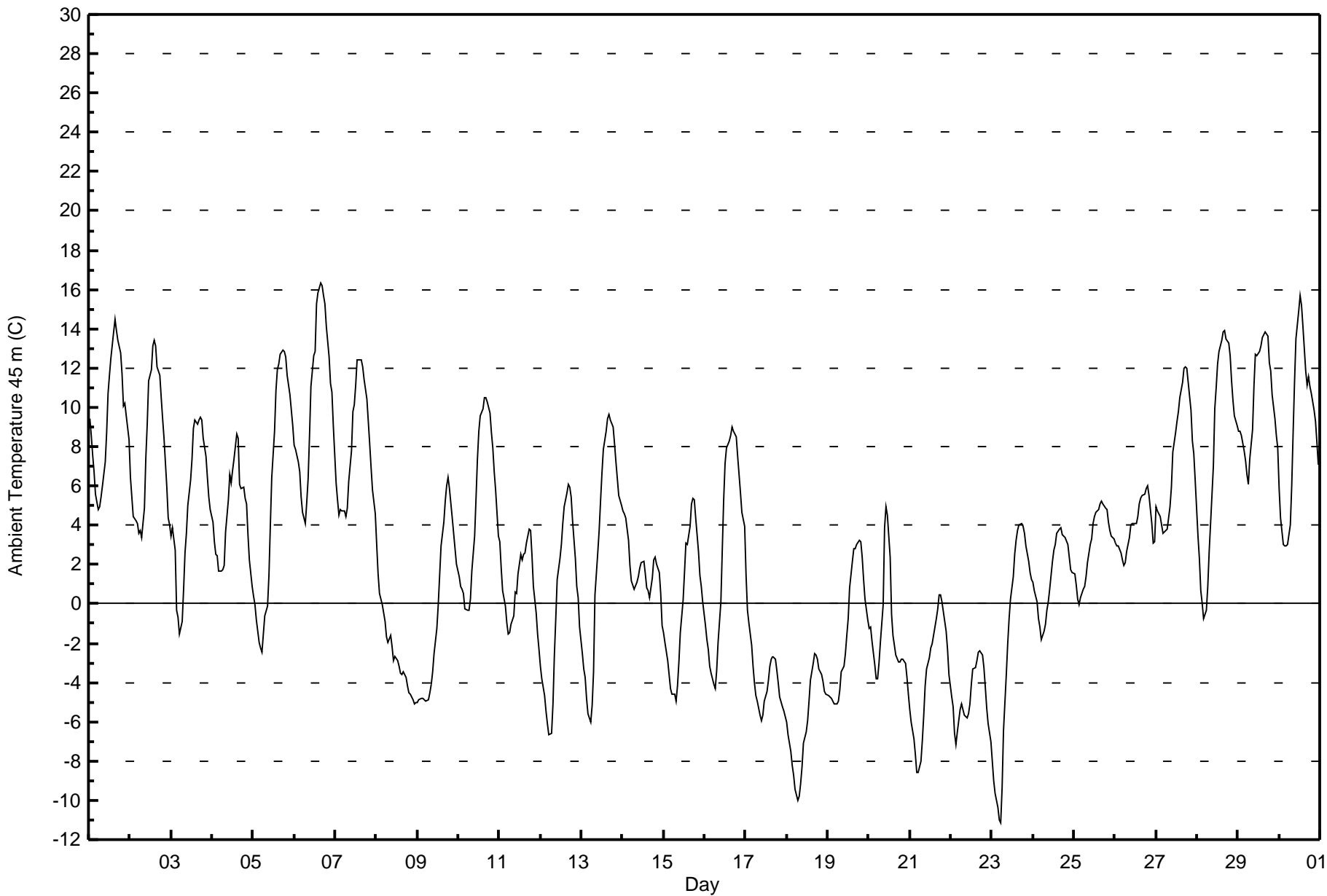
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	245	34.03	34.03
0 - 10	382	53.06	87.08
10 - 20	93	12.92	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 16.4 C on Apr 6 16:00		Maximum Daily Average: 10.5 C on Apr 6		Hours in Service: 720																						
Minimum Value: -11.1 C on Apr 23 06:00		Minimum Daily Average: -6.0 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 6.3 C at hour 17		Minimum Diurnal Average: -1.5 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 2.74 C		Percentiles: P ₁ = -9.5 P ₁₀ = -4.9 Q ₁ = -2.0 Median = 2.9 Q ₃ = 6.7 P ₉₀ = 11.1 P ₉₉ = 15.2		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	9.4	8.6	7.6	6.7	5.6	4.8	4.9	5.4	6.0	7.2	8.7	10.7	11.7	12.5	13.8	14.5	13.9	13.4	12.7	11.7	10.0	10.2	9.6	8.4	9.5	14.5
2-Apr	6.4	5.4	4.5	4.3	4.1	3.6	3.7	3.4	4.9	7.4	9.2	11.4	11.9	13.2	13.4	13.1	12.0	11.7	10.5	9.4	8.5	5.9	4.4	4.0	7.8	13.4
3-Apr	3.4	3.9	2.8	-0.3	-0.7	-1.5	-0.9	0.8	2.6	3.6	5.0	6.3	7.3	8.9	9.3	9.1	9.3	9.5	9.3	8.4	7.5	6.4	5.4	4.8	5.0	9.5
4-Apr	4.1	3.1	2.5	2.4	1.7	1.7	1.8	2.0	3.6	5.3	6.6	6.1	6.8	7.4	8.6	8.5	6.1	5.8	6.0	5.4	5.1	3.5	2.2	0.9	4.5	8.6
5-Apr	0.4	0.0	-0.8	-2.0	-2.2	-2.5	-1.6	-0.6	-0.1	1.4	4.0	6.4	8.8	10.9	11.9	12.2	12.7	12.9	12.9	12.5	11.6	10.6	9.9	9.1	5.8	12.9
6-Apr	8.1	7.9	7.2	6.7	5.5	4.6	4.1	5.1	6.4	8.6	11.1	12.6	12.9	15.2	15.8	16.4	16.2	15.7	15.2	14.1	12.5	11.2	10.8	9.1	10.5	16.4
7-Apr	6.1	5.3	4.5	4.8	4.7	4.7	4.4	4.9	6.2	7.8	9.8	10.2	11.1	12.4	12.4	12.4	12.0	11.4	10.4	9.3	8.1	6.9	5.8	4.6	7.9	12.4
8-Apr	3.0	1.5	0.5	0.0	-0.4	-0.9	-1.7	-2.0	-1.6	-2.2	-2.9	-2.6	-2.9	-3.2	-3.5	-3.6	-3.5	-3.8	-4.2	-4.5	-4.6	-4.9	-5.1	-5.0	-2.4	3.0
9-Apr	-5.0	-4.9	-4.8	-4.8	-4.9	-5.0	-4.9	-4.5	-4.1	-3.5	-2.5	-1.3	0.0	1.5	3.0	4.2	5.3	6.0	6.4	5.9	4.4	3.6	2.8	2.0	-0.2	6.4
10-Apr	1.4	0.9	0.7	0.6	-0.3	-0.3	-0.4	0.3	1.6	3.4	5.3	7.4	8.8	9.6	9.9	10.5	10.5	10.3	9.7	8.7	8.0	6.7	5.8	3.4	5.1	10.5
11-Apr	3.2	1.8	0.7	-0.1	-0.9	-1.5	-1.4	-1.0	-0.6	0.6	0.6	1.6	2.5	2.2	2.5	2.6	3.1	3.8	3.8	2.5	0.9	-0.5	-1.5	-2.3	0.9	3.8
12-Apr	-3.1	-3.8	-4.7	-5.5	-6.1	-6.7	-6.6	-5.1	-2.6	-0.7	1.2	2.3	3.0	4.1	4.9	5.6	6.1	6.0	5.4	4.2	2.3	0.9	0.3	-1.2	0.0	6.1
13-Apr	-2.5	-3.3	-3.7	-4.8	-5.6	-6.1	-5.2	-3.4	0.5	2.6	3.7	5.3	6.6	7.8	8.8	9.4	9.7	9.4	9.0	8.2	7.2	6.4	5.5	5.0	2.9	9.7
14-Apr	4.7	4.6	4.4	3.2	1.9	1.2	1.0	0.7	1.1	1.4	1.8	2.1	2.2	1.5	0.8	0.6	0.3	1.3	2.3	2.4	2.0	1.6	0.5	-1.1	1.8	4.7
15-Apr	-1.5	-2.0	-2.9	-3.6	-4.3	-4.6	-4.6	-5.0	-4.2	-2.9	-1.5	0.2	1.6	3.1	3.0	3.9	5.1	5.4	5.3	4.4	2.7	1.4	0.9	0.1	0.0	5.4
16-Apr	-1.1	-1.8	-2.3	-3.2	-3.5	-4.1	-4.3	-3.4	-2.0	0.1	2.7	5.3	7.2	7.9	8.3	8.6	9.0	8.8	8.5	7.5	6.6	5.6	4.6	3.9	2.9	9.0
17-Apr	1.5	-0.3	-1.0	-2.1	-3.2	-4.0	-4.6	-5.0	-5.7	-5.9	-5.7	-5.0	-4.4	-3.9	-3.2	-2.8	-2.7	-2.8	-3.4	-4.0	-4.7	-5.2	-5.4	-5.7	-3.7	1.5
18-Apr	-6.0	-6.7	-7.5	-8.3	-8.7	-9.5	-10.0	-9.8	-9.1	-8.3	-7.1	-6.5	-5.9	-4.9	-3.9	-3.1	-2.6	-2.6	-2.8	-3.3	-3.6	-3.9	-4.4	-4.6	-6.0	-2.6
19-Apr	-4.7	-4.7	-4.8	-5.0	-5.1	-5.1	-4.9	-4.4	-3.5	-3.2	-2.5	-1.6	-0.8	0.8	2.2	2.8	2.8	3.0	3.2	3.1	2.4	1.2	0.2	-0.8	-1.2	3.2
20-Apr	-1.2	-1.1	-1.9	-3.1	-3.8	-3.8	-3.1	-1.9	0.0	3.9	5.0	4.5	2.4	-0.5	-1.6	-2.1	-2.6	-3.0	-3.0	-2.8	-2.8	-3.0	-3.7	-4.6	-1.4	5.0
21-Apr	-5.3	-6.0	-6.9	-7.6	-8.6	-8.6	-8.0	-7.0	-5.6	-4.2	-3.3	-2.7	-2.3	-2.0	-1.6	-0.7	-0.2	0.4	0.5	0.1	-0.9	-1.4	-2.3	-3.6	-3.7	0.5
22-Apr	-4.7	-5.2	-6.6	-7.2	-6.5	-5.4	-5.1	-5.4	-5.7	-5.8	-5.6	-5.1	-4.1	-3.3	-3.2	-2.9	-2.5	-2.4	-2.6	-3.2	-4.3	-5.3	-6.1	-7.0	-4.8	-2.4
23-Apr	-8.0	-9.0	-9.6	-10.4	-11.0	-11.1	-9.4	-6.5	-3.6	-2.0	-0.8	0.3	1.4	2.5	3.2	3.7	4.0	4.1	4.0	3.6	2.9	2.2	1.6	1.3	-1.9	4.1
24-Apr	1.1	0.6	0.1	-0.7	-1.2	-1.8	-1.4	-1.0	-0.3	0.1	0.8	2.2	2.7	3.0	3.6	3.8	3.9	3.5	3.5	3.4	3.0	2.4	1.7	1.6	1.4	3.9
25-Apr	1.5	0.9	0.2	0.0	0.3	0.8	0.9	1.4	2.1	3.0	3.3	4.1	4.4	4.6	4.8	5.1	5.2	5.1	4.9	4.8	4.1	3.8	3.4	3.3	3.0	5.2
26-Apr	3.1	2.9	2.9	2.6	2.2	2.0	2.1	2.7	3.3	4.0	4.1	4.1	4.1	4.5	5.1	5.4	5.5	5.6	5.9	6.0	5.5	4.1	3.1	3.2	3.9	6.0
27-Apr	5.0	4.7	4.5	4.0	3.6	3.6	3.8	4.3	4.9	6.0	7.7	8.7	9.3	9.8	10.5	11.2	12.0	12.1	12.0	11.3	9.9	8.3	7.7	6.3	7.6	12.1
28-Apr	3.4	2.3	0.7	0.0	-0.8	-0.3	0.9	2.7	4.1	7.0	9.9	11.0	12.2	12.9	13.4	13.9	13.9	13.5	13.2	12.7	11.4	10.4	9.6	9.1	7.8	13.9
29-Apr	8.8	8.8	8.6	7.8	7.3	6.6	6.1	7.3	8.9	11.1	12.7	12.7	12.8	13.2	13.5	13.7	13.8	13.6	12.2	11.8	10.6	9.5	8.6	7.9	10.3	13.8
30-Apr	5.9	4.4	3.0	2.9	3.0	3.0	4.0	6.0	8.7	11.3	13.5	14.9	15.7	15.2	14.1	11.8	11.1	11.6	11.0	10.7	9.8	9.3	8.2	7.1	9.0	15.7
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 45 m (AT45m) - C
Lower Camp Met Tower - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	244	33.89	33.89
0 - 10	384	53.33	87.22
10 - 20	92	12.78	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

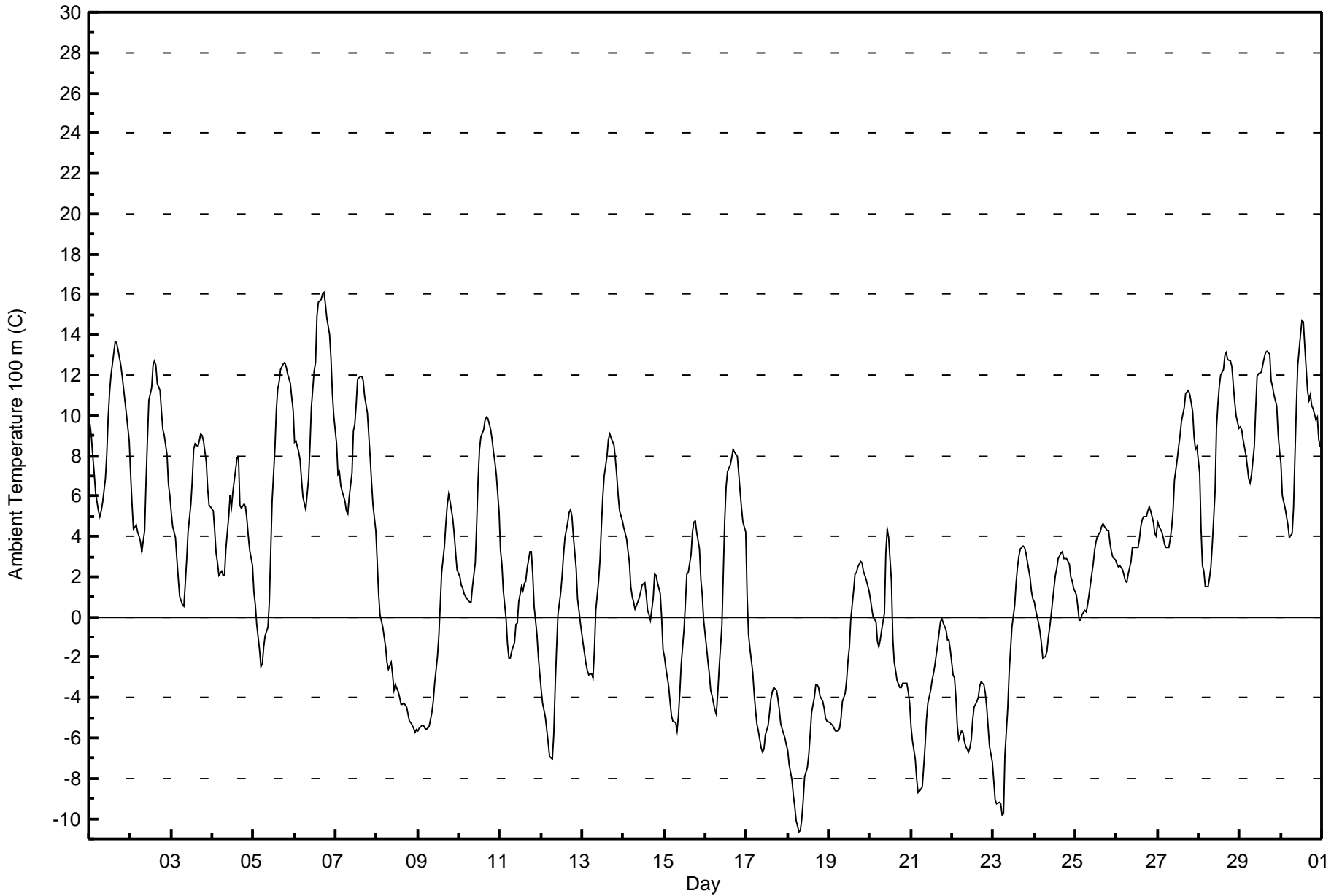


Maximum Value: 16.1 C on Apr 6 18:00		Maximum Daily Average: 11.0 C on Apr 6		Hours in Service: 720																							
Minimum Value: -10.7 C on Apr 18 07:00		Minimum Daily Average: -6.7 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 5.8 C at hour 18		Minimum Diurnal Average: -1.3 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 2.58 C		Percentiles: P ₁ = -9.3 P ₁₀ = -5.4 Q ₁ = -2.1 Median = 2.5 Q ₃ = 7.0 P ₉₀ = 10.9 P ₉₉ = 14.8		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	9.6	9.0	8.0	7.2	6.1	5.2	5.0	5.3	5.7	6.9	8.1	10.0	11.1	12.0	13.1	13.7	13.6	13.2	12.5	12.0	11.3	10.7	10.0	8.7	9.5	13.7	
2-Apr	7.1	5.6	4.4	4.6	4.2	4.0	3.7	3.2	4.3	6.7	8.8	10.8	11.4	12.5	12.7	12.5	11.6	11.2	10.2	9.3	9.0	8.0	6.6	6.0	7.8	12.7	
3-Apr	5.2	4.5	3.9	2.9	1.9	1.1	0.6	0.5	1.7	2.8	4.2	5.6	6.8	8.3	8.6	8.5	8.8	9.1	9.0	8.8	7.7	6.4	5.6	5.5	5.3	9.1	
4-Apr	5.3	4.3	3.2	2.7	2.0	2.3	2.1	2.1	3.4	5.0	6.0	5.5	6.2	6.8	7.9	7.9	5.5	5.4	5.6	5.4	4.9	4.0	3.3	2.5	4.5	7.9	
5-Apr	1.2	0.6	-0.4	-1.6	-2.5	-2.3	-1.5	-0.9	-0.5	0.8	3.3	5.8	8.4	10.3	11.3	11.7	12.3	12.6	12.6	12.4	12.1	11.6	10.9	10.3	5.8	12.6	
6-Apr	8.7	8.7	8.2	7.8	6.8	6.0	5.4	6.1	6.9	8.4	10.4	12.2	12.6	14.9	15.6	15.8	16.0	16.1	15.5	14.9	14.1	12.8	11.1	10.0	11.0	16.1	
7-Apr	8.6	7.0	7.2	6.5	6.2	5.7	5.3	5.1	5.9	7.1	9.2	9.6	10.5	11.8	11.9	11.9	11.7	11.0	10.1	9.0	7.9	6.7	5.5	4.3	8.2	11.9	
8-Apr	2.7	1.1	0.1	-0.5	-1.0	-1.5	-2.3	-2.6	-2.2	-2.9	-3.6	-3.4	-3.7	-4.0	-4.3	-4.4	-4.2	-4.5	-4.8	-5.2	-5.2	-5.5	-5.7	-5.6	-3.0	2.7	
9-Apr	-5.7	-5.5	-5.4	-5.4	-5.5	-5.6	-5.5	-5.1	-4.7	-4.2	-3.3	-2.0	-0.9	0.6	2.2	3.5	4.7	5.6	6.1	5.8	4.8	4.1	3.1	2.4	-0.7	6.1	
10-Apr	2.0	1.6	1.4	1.2	1.0	0.8	0.7	0.7	1.5	2.7	4.7	6.8	8.3	8.9	9.3	9.8	9.9	9.9	9.3	8.8	8.2	7.7	7.1	5.2	5.3	9.9	
11-Apr	3.3	2.6	1.3	-0.1	-1.4	-2.0	-2.0	-1.7	-1.3	-0.4	-0.3	0.7	1.5	1.3	1.7	1.8	2.4	3.3	3.3	2.1	0.5	-0.9	-1.9	-2.8	0.5	3.3	
12-Apr	-3.6	-4.3	-5.0	-5.6	-6.2	-6.9	-7.1	-5.9	-3.5	-1.6	0.1	1.3	2.1	3.1	3.9	4.7	5.2	5.3	5.0	4.0	2.4	0.9	0.3	-0.3	-0.5	5.3	
13-Apr	-1.3	-1.9	-2.3	-2.6	-2.9	-2.8	-3.0	-1.7	0.3	1.8	2.8	4.5	5.9	7.0	8.0	8.8	9.1	8.9	8.5	7.8	7.0	6.0	5.2	4.8	3.3	9.1	
14-Apr	4.5	4.2	3.9	2.7	1.5	1.0	0.7	0.4	0.7	0.9	1.2	1.6	1.7	1.1	0.3	0.1	-0.2	1.0	2.1	2.1	1.7	1.2	0.0	-1.6	1.4	4.5	
15-Apr	-2.0	-2.5	-3.4	-4.2	-4.9	-5.2	-5.2	-5.6	-4.9	-3.7	-2.3	-0.6	0.8	2.2	2.2	3.1	4.2	4.7	4.7	4.2	3.4	1.9	1.1	-0.2	-0.5	4.7	
16-Apr	-1.5	-2.2	-2.8	-3.6	-3.9	-4.6	-4.8	-3.8	-2.6	-0.4	2.1	4.7	6.4	7.2	7.6	7.9	8.3	8.2	8.0	7.1	6.2	5.4	4.7	4.2	2.4	8.3	
17-Apr	1.1	-0.8	-1.6	-2.7	-3.8	-4.6	-5.3	-5.7	-6.5	-6.7	-6.5	-5.9	-5.4	-4.8	-4.1	-3.7	-3.5	-3.6	-4.1	-4.6	-5.3	-5.8	-6.0	-6.3	-4.4	1.1	
18-Apr	-6.6	-7.3	-8.1	-8.8	-9.4	-10.1	-10.7	-10.6	-10.0	-9.1	-8.0	-7.5	-6.8	-5.8	-4.7	-4.0	-3.3	-3.4	-3.5	-3.9	-4.2	-4.6	-5.0	-5.2	-6.7	-3.3	
19-Apr	-5.2	-5.3	-5.4	-5.5	-5.6	-5.7	-5.5	-5.0	-4.2	-3.7	-3.1	-2.2	-1.5	-0.1	1.3	2.1	2.2	2.4	2.7	2.7	2.3	2.1	1.8	1.3	-1.5	2.7	
20-Apr	0.9	0.4	0.0	-0.3	-1.2	-1.4	-1.1	-0.6	0.2	3.2	4.4	3.9	1.8	-1.1	-2.2	-2.7	-3.2	-3.5	-3.5	-3.3	-3.3	-3.3	-3.7	-4.2	-1.0	4.4	
21-Apr	-5.4	-6.1	-7.0	-8.0	-8.7	-8.7	-8.5	-7.5	-6.4	-5.1	-4.3	-3.6	-3.1	-2.8	-2.4	-1.3	-0.8	-0.2	-0.1	-0.3	-0.7	-1.1	-1.2	-1.6	-4.0	-0.1	
22-Apr	-2.9	-3.0	-4.0	-5.4	-6.0	-5.7	-5.7	-6.1	-6.4	-6.7	-6.5	-6.0	-5.1	-4.5	-4.2	-4.0	-3.4	-3.2	-3.4	-3.8	-4.5	-5.5	-6.4	-7.2	-5.0	-2.9	
23-Apr	-8.1	-9.0	-9.3	-9.2	-9.3	-9.8	-9.7	-6.8	-4.5	-2.8	-1.6	-0.5	0.6	1.7	2.5	3.0	3.4	3.5	3.5	3.2	2.8	1.9	1.2	0.9	-2.2	3.5	
24-Apr	0.8	0.3	-0.3	-0.7	-1.2	-2.1	-2.0	-1.7	-1.0	-0.5	0.1	1.4	2.1	2.4	2.9	3.2	3.3	2.9	2.9	2.9	2.6	2.0	1.8	1.4	1.0	3.3	
25-Apr	1.1	0.5	-0.2	-0.2	0.1	0.3	0.2	0.6	1.1	2.1	2.6	3.3	3.7	4.0	4.2	4.5	4.6	4.5	4.3	4.3	3.7	3.3	3.0	2.8	2.4	4.6	
26-Apr	2.6	2.5	2.5	2.4	2.1	1.8	1.7	2.1	2.7	3.4	3.4	3.5	3.4	3.8	4.5	4.8	5.0	5.0	5.3	5.5	5.2	4.7	4.1	4.0	3.6	5.5	
27-Apr	4.7	4.5	4.2	3.9	3.6	3.4	3.5	3.9	4.4	5.2	6.8	7.8	8.5	9.0	9.7	10.4	11.1	11.2	11.3	11.0	10.2	9.0	8.3	8.5	7.3	11.3	
28-Apr	7.2	4.3	2.6	2.3	1.5	1.5	1.9	2.5	3.6	6.2	9.4	10.5	11.5	12.0	12.3	13.0	13.1	12.8	12.7	12.4	11.5	10.7	10.0	9.3	8.1	13.1	
29-Apr	9.4	9.3	8.8	8.0	7.5	6.9	6.7	7.1	8.4	10.3	11.9	12.0	12.2	12.5	12.9	13.1	13.2	13.1	11.7	11.4	11.0	10.5	9.1	8.3	10.2	13.2	
30-Apr	7.6	6.0	5.4	5.0	4.6	3.9	4.2	5.4	8.0	10.4	12.5	14.0	14.7	14.6	13.5	11.3	10.7	11.1	10.5	10.3	9.8	9.9	8.8	8.5	9.2	14.7	
		1.7	1.0	0.3	-0.2	-0.8	-1.2	-1.3	-0.9	0.0	1.2	2.4	3.5	4.2	4.8	5.3	5.6	5.7	5.8	5.6	5.2	4.6	3.8	3.1	2.5	Diurnal Average	
		9.6	9.3	8.8	8.0	7.5	6.9	6.7	7.1	8.4	10.4	12.5	14.0	14.7	14.9	15.6	15.8	16.0	16.1	15.5	14.9	14.1	12.8	11.1	10.3	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 100 m (AT100m) - C
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 100 m (AT100m) - C
Lower Camp Met Tower - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	245	34.03	34.03
0 - 10	384	53.33	87.36
10 - 20	91	12.64	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

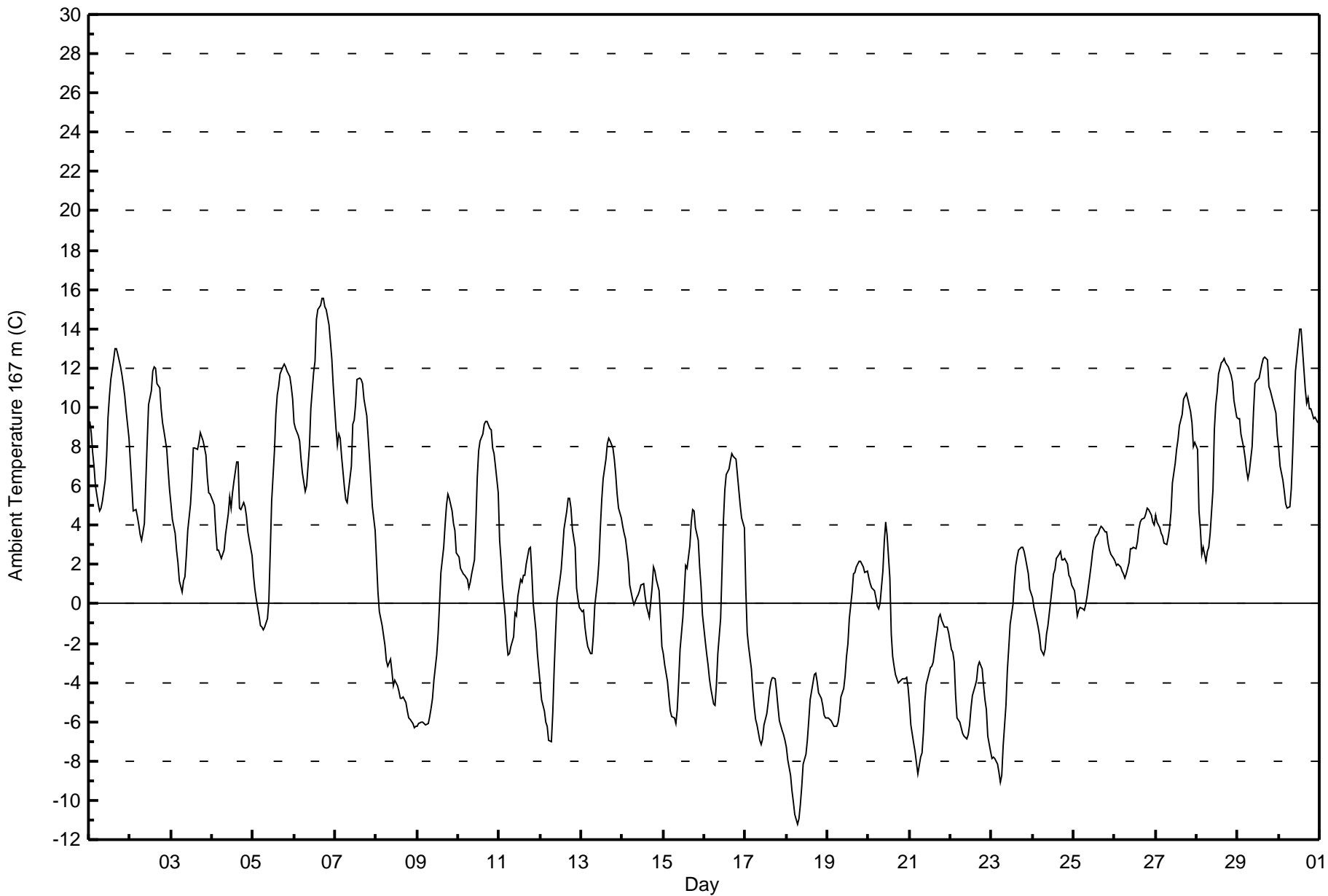


Maximum Value: 15.5 C on Apr 6 18:00		Maximum Daily Average: 11.1 C on Apr 6		Hours in Service: 720																																												
Minimum Value: -11.3 C on Apr 18 07:00		Minimum Daily Average: -7.1 C on Apr 18		Hours of Data: 720																																												
Maximum Diurnal Average: 5.3 C at hour 18		Minimum Diurnal Average: -1.4 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: 2.32 C		Percentiles: P ₁ = -9.1 P ₁₀ = -5.8 Q ₁ = -2.3 Median = 2.3 Q ₃ = 6.8 P ₉₀ = 10.4 P ₉₉ = 14.2		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	9.3	8.7	7.7	7.0	6.0	5.1	4.7	4.9	5.2	6.3	7.5	9.5	10.6	11.4	12.4	13.0	13.0	12.7	12.1	11.6	11.1	10.6	9.8	8.4	9.1	13.0																						
2-Apr	7.2	6.0	4.7	4.8	4.4	4.0	3.5	3.2	4.1	6.1	8.2	10.1	10.9	11.8	12.1	12.0	11.2	11.0	9.9	9.2	8.8	7.8	6.8	5.8	7.7	12.1																						
3-Apr	5.1	4.3	3.6	2.7	2.1	1.2	0.6	1.2	1.4	2.4	3.7	5.1	6.3	7.9	7.9	7.8	8.2	8.7	8.5	8.3	7.6	6.4	5.7	5.6	5.1	8.7																						
4-Apr	5.3	5.0	3.7	2.7	2.8	2.3	2.5	2.7	3.5	4.6	5.4	4.9	5.7	6.2	7.3	7.2	4.9	4.8	5.2	5.0	4.5	3.6	3.2	2.5	4.4	7.3																						
5-Apr	1.5	0.7	0.2	-0.6	-1.1	-1.2	-1.3	-1.2	-0.7	0.2	2.7	5.2	7.8	9.6	10.7	11.1	11.7	12.1	12.2	12.1	11.8	11.6	11.1	10.4	5.7	12.2																						
6-Apr	9.2	8.9	8.5	8.3	7.4	6.6	5.8	6.0	7.0	8.0	9.9	11.8	12.3	14.5	15.0	15.2	15.5	15.5	15.1	15.0	14.2	13.4	12.5	11.1	11.1	15.5																						
7-Apr	8.9	8.1	8.6	8.4	7.5	5.9	5.3	5.1	5.8	7.0	9.1	9.4	10.2	11.4	11.5	11.4	11.2	10.4	9.6	8.5	7.4	6.1	5.0	3.8	8.1	11.5																						
8-Apr	2.2	0.6	-0.4	-1.1	-1.6	-2.1	-2.9	-3.2	-2.8	-3.5	-4.2	-3.9	-4.2	-4.5	-4.8	-4.8	-4.8	-5.1	-5.5	-5.8	-5.9	-6.1	-6.3	-6.2	-3.6	2.2																						
9-Apr	-6.2	-6.1	-6.0	-6.0	-6.1	-6.2	-6.1	-5.7	-5.3	-4.8	-3.9	-2.6	-1.5	0.0	1.6	2.9	4.0	5.0	5.6	5.4	4.8	4.1	3.7	2.6	-1.1	5.6																						
10-Apr	2.4	1.8	1.6	1.5	1.4	1.3	0.8	1.1	1.5	2.2	4.2	6.4	7.8	8.3	8.7	9.1	9.3	9.3	8.9	8.8	8.0	7.6	7.0	5.7	5.2	9.3																						
11-Apr	3.2	2.2	1.0	-0.6	-1.9	-2.6	-2.5	-2.2	-1.7	-0.5	-0.6	0.4	1.2	1.1	1.4	1.4	2.0	2.8	2.8	1.6	0.0	-1.4	-2.5	-3.3	0.1	3.2																						
12-Apr	-4.1	-4.9	-5.5	-6.0	-6.2	-7.0	-7.0	-5.5	-3.3	-1.5	0.2	1.1	1.8	2.7	3.8	4.7	5.4	5.4	4.9	3.8	2.9	0.8	0.2	-0.2	-0.6	5.4																						
13-Apr	-0.4	-0.3	-1.2	-1.8	-2.2	-2.5	-2.5	-1.6	-0.1	1.2	2.2	3.9	5.3	6.4	7.4	8.1	8.5	8.3	8.0	7.4	6.6	5.6	4.9	4.4	3.1	8.5																						
14-Apr	4.0	3.6	3.3	2.1	1.0	0.6	0.3	-0.1	0.3	0.5	0.7	1.0	1.0	0.4	-0.1	-0.4	-0.7	0.8	1.9	1.7	1.2	0.7	-0.6	-2.2	0.9	4.0																						
15-Apr	-2.5	-3.1	-4.0	-4.7	-5.5	-5.8	-5.8	-6.1	-5.4	-3.9	-2.4	-0.7	0.6	1.9	1.8	2.9	4.2	4.8	4.8	3.9	3.2	1.9	0.9	-0.5	-0.8	4.8																						
16-Apr	-1.9	-2.5	-3.1	-3.8	-4.3	-5.1	-5.2	-4.1	-2.5	-0.7	1.8	4.2	5.8	6.6	6.9	7.3	7.7	7.5	7.4	6.6	5.8	5.0	4.4	3.9	2.0	7.7																						
17-Apr	0.7	-1.4	-2.2	-3.3	-4.4	-5.2	-5.9	-6.2	-7.0	-7.1	-6.9	-6.1	-5.6	-5.0	-4.4	-4.0	-3.7	-3.8	-4.4	-5.2	-5.9	-6.5	-6.7	-7.0	-4.9	0.7																						
18-Apr	-7.3	-7.9	-8.7	-9.5	-10.1	-10.8	-11.3	-11.0	-10.2	-9.3	-8.2	-7.6	-6.9	-5.9	-4.9	-4.0	-3.6	-3.5	-4.0	-4.5	-4.8	-5.2	-5.6	-5.8	-7.1	-3.5																						
19-Apr	-5.8	-5.9	-6.0	-6.1	-6.2	-6.2	-6.0	-5.5	-4.7	-4.3	-3.7	-2.7	-2.1	-0.7	0.6	1.5	1.6	1.9	2.1	2.1	2.1	1.9	1.6	1.7	-2.0	2.1																						
20-Apr	1.3	1.0	0.8	0.7	0.3	-0.1	-0.3	0.0	1.7	3.2	4.1	3.5	1.3	-1.5	-2.7	-3.2	-3.6	-4.0	-4.0	-3.9	-3.8	-3.8	-3.7	-4.2	-0.9	4.1																						
21-Apr	-5.1	-6.2	-7.1	-7.5	-8.1	-8.7	-7.8	-7.6	-6.6	-4.9	-4.1	-3.5	-3.2	-3.1	-3.0	-1.8	-1.3	-0.7	-0.6	-0.8	-1.1	-1.2	-1.2	-1.4	-4.0	-0.6																						
22-Apr	-2.3	-2.5	-3.0	-4.7	-5.8	-6.1	-6.3	-6.6	-6.7	-6.9	-6.7	-6.2	-5.3	-4.7	-4.2	-3.9	-3.2	-3.0	-3.3	-4.2	-4.9	-5.4	-6.7	-7.5	-5.0	-2.3																						
23-Apr	-7.9	-7.8	-7.9	-8.2	-8.6	-9.1	-8.8	-7.2	-5.2	-3.4	-2.2	-1.1	0.0	1.1	1.9	2.4	2.8	2.9	2.9	2.7	2.3	1.5	0.8	0.5	-2.3	2.9																						
24-Apr	0.3	-0.2	-0.8	-1.2	-1.6	-2.3	-2.6	-2.3	-1.6	-1.1	-0.5	0.8	1.5	1.8	2.3	2.6	2.6	2.3	2.3	2.3	2.0	1.5	1.3	0.9	0.4	2.6																						
25-Apr	0.7	0.1	-0.6	-0.3	-0.2	-0.2	-0.3	-0.1	0.4	1.4	2.0	2.7	3.1	3.4	3.6	3.8	3.9	3.9	3.7	3.7	3.1	2.7	2.5	2.3	1.9	3.9																						
26-Apr	2.1	2.0	2.0	1.9	1.7	1.5	1.3	1.5	2.1	2.8	2.8	2.8	2.8	3.2	3.8	4.2	4.3	4.4	4.6	4.9	4.8	4.5	4.1	4.0	3.1	4.9																						
27-Apr	4.5	4.2	3.9	3.6	3.5	3.1	3.0	3.4	3.9	4.7	6.1	7.2	7.8	8.4	9.1	9.7	10.4	10.6	10.7	10.4	9.8	9.2	8.0	8.2	6.8	10.7																						
28-Apr	7.8	4.8	3.8	2.5	2.9	2.1	2.7	2.9	3.6	5.8	8.9	10.2	10.8	11.7	12.3	12.4	12.5	12.3	12.1	11.9	11.6	11.3	10.3	9.5	8.2	12.5																						
29-Apr	9.4	9.5	8.6	7.9	7.4	6.8	6.3	6.7	8.0	9.8	11.2	11.4	11.5	11.8	12.2	12.5	12.6	12.4	11.1	10.9	10.6	10.0	9.7	8.6	9.9	12.6																						
30-Apr	7.9	7.0	6.3	5.7	5.1	4.9	5.0	5.8	7.7	9.9	11.9	13.3	14.0	14.0	13.0	10.9	10.2	10.5	9.9	9.9	9.4	9.5	9.4	9.2	9.2	14.0																						
																								1.7	1.0	0.4	-0.2	-0.7	-1.2	-1.4	-1.0	-0.3	0.8	2.0	3.0	3.7	4.3	4.8	5.1	5.2	5.3	5.1	4.8	4.2	3.6	3.0	2.4	Diurnal Average
																								9.4	9.5	8.6	8.4	7.5	6.8	6.3	6.7	8.0	9.9	11.9	13.3	14.0	14.5	15.0	15.2	15.5	15.5	15.1	15.0	14.2	13.4	12.5	11.1	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 167 m (AT167m) - C
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 167 m (AT167m) - C
Lower Camp Met Tower - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	253	35.14	35.14
0 - 10	385	53.47	88.61
10 - 20	82	11.39	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

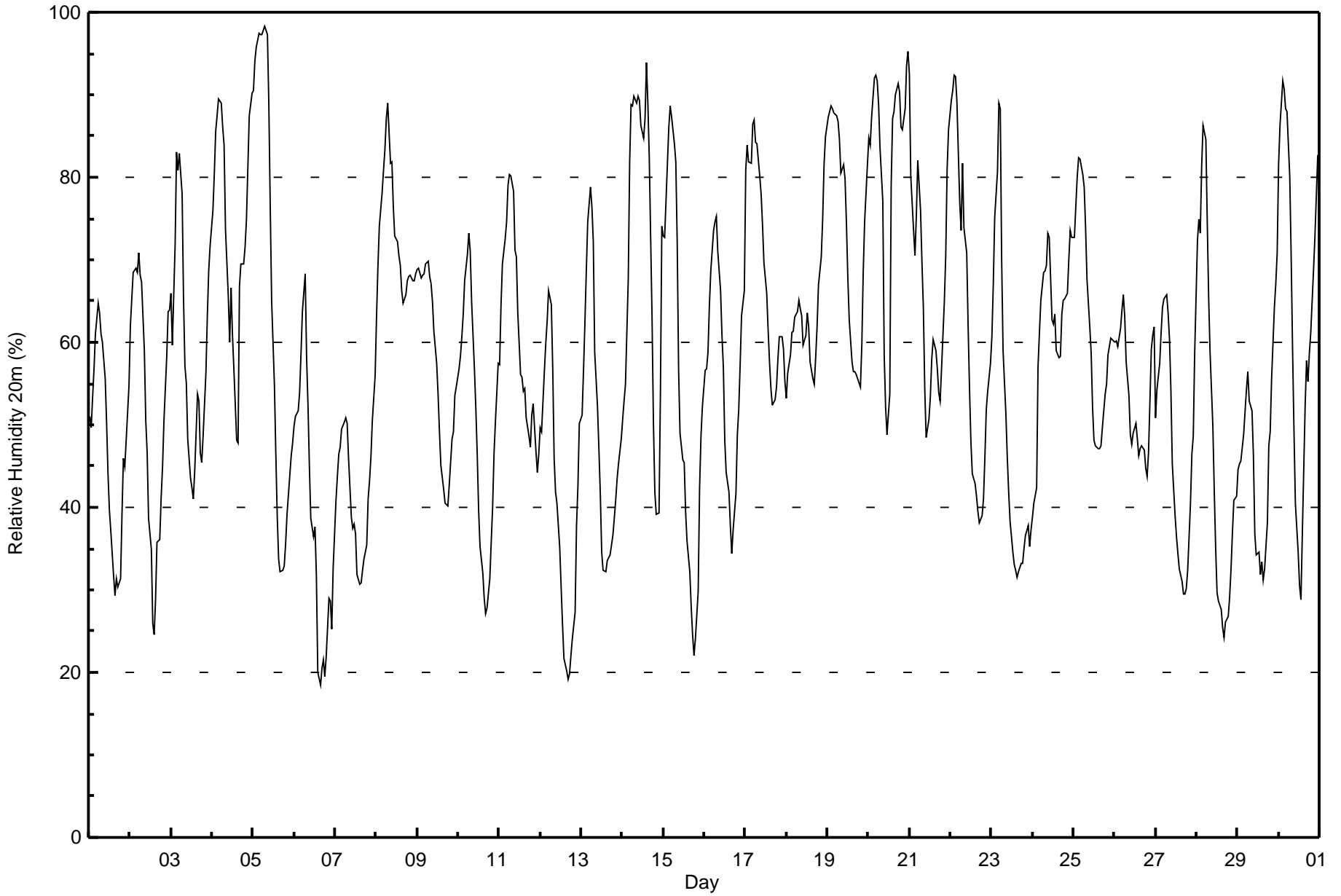
Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - April 2017

Maximum Value: 98 % on Apr 5 08:00																		Maximum Daily Average: 82.1 % on Apr 20						Hours in Service: 720		
Minimum Value: 19 % on Apr 6 16:00																		Minimum Daily Average: 38.9 % on Apr 6						Hours of Data: 720		
Maximum Diurnal Average: 76.5 % at hour 6																		Minimum Diurnal Average: 44.2 % at hour 18						Hours of Missing Data: 0		
Monthly Average: 58.1 %																		Percentiles: P ₁ = 21 P ₁₀ = 33 Q ₁ = 45 Median = 58 Q ₃ = 71 P ₉₀ = 84 P ₉₉ = 95						Hours of Calibration: 0		
																		Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	51	50	53	57	61	65	64	61	60	56	50	44	40	37	32	29	31	30	31	39	46	45	48	55	47.3	65
2-Apr	62	65	69	69	68	71	68	67	59	50	47	39	35	26	25	29	36	36	41	45	51	58	64	64	51.8	71
3-Apr	66	60	72	83	81	83	78	65	57	55	48	44	42	41	44	54	53	47	45	49	56	63	69	72	59.4	83
4-Apr	76	80	86	87	89	89	86	84	74	66	60	67	61	57	48	48	67	70	69	72	75	81	87	90	73.7	90
5-Apr	91	94	96	98	97	97	98	98	97	89	76	65	55	46	39	34	32	32	33	36	39	44	46	48	65.9	98
6-Apr	50	51	52	54	59	64	68	58	52	45	39	36	38	32	20	19	21	21	19	22	29	29	25	33	38.9	68
7-Apr	41	44	46	47	50	50	51	50	46	39	37	38	37	32	31	31	32	34	35	41	43	46	50	56	42.0	56
8-Apr	63	69	74	78	81	83	87	89	82	82	76	73	72	70	69	66	65	66	67	68	68	67	68	68	73.1	89
9-Apr	69	69	68	68	68	69	70	68	67	65	61	57	54	49	45	42	40	40	40	43	48	49	54	55	56.6	70
10-Apr	57	58	61	63	67	71	73	71	65	57	52	46	40	35	32	29	27	28	31	36	40	46	50	57	49.7	73
11-Apr	57	64	70	73	75	79	80	80	78	71	70	64	56	56	54	54	51	49	47	51	53	47	44	46	61.2	80
12-Apr	50	49	56	60	62	66	65	57	46	42	40	35	30	26	22	20	19	20	22	24	27	38	43	50	40.4	66
13-Apr	51	57	62	69	75	79	76	72	59	52	47	42	35	32	32	34	34	34	37	39	41	43	45	48	49.8	79
14-Apr	51	53	55	68	82	89	89	90	89	90	89	86	85	87	94	89	83	63	50	42	39	39	54	74	72.0	94
15-Apr	73	73	82	86	89	87	84	82	72	57	49	46	45	39	36	32	28	25	22	24	30	42	49	52	54.3	89
16-Apr	57	57	59	64	69	74	75	75	71	66	61	57	48	44	42	38	34	37	42	49	52	57	63	66	56.5	75
17-Apr	81	84	82	82	87	87	84	84	80	78	74	70	66	62	58	54	52	53	55	58	61	61	59	55	69.4	87
18-Apr	53	56	59	61	61	63	64	65	64	63	60	61	64	62	58	56	55	58	62	67	70	75	82	85	63.4	85
19-Apr	87	88	89	88	88	88	87	85	80	82	80	74	68	63	58	56	56	56	55	55	60	68	75	81	73.6	89
20-Apr	85	84	87	92	92	92	89	84	77	58	52	49	54	79	87	88	90	91	90	86	86	88	94	95	82.1	95
21-Apr	92	80	74	71	75	82	76	70	64	54	48	51	53	58	60	59	57	54	53	57	65	70	81	86	66.3	92
22-Apr	89	91	92	92	89	77	74	82	74	71	62	54	48	44	43	41	39	38	39	41	46	52	54	57	62.1	92
23-Apr	61	67	75	81	89	88	70	59	51	46	42	38	35	33	32	32	33	33	33	35	37	38	35	37	49.1	89
24-Apr	39	41	42	57	61	65	68	69	69	73	73	63	62	63	59	58	58	63	65	65	66	70	74	73	62.4	74
25-Apr	73	76	80	82	82	80	79	74	68	62	59	52	48	47	47	47	48	50	54	55	58	59	60	60	62.6	82
26-Apr	60	60	59	62	64	66	63	58	54	49	48	49	50	48	46	47	48	47	45	44	47	59	61	62	53.9	66
27-Apr	51	54	58	61	64	65	66	64	60	54	45	39	36	34	33	31	30	29	30	32	40	46	49	59	47.1	66
28-Apr	72	75	73	81	86	85	75	65	59	50	42	35	30	29	28	25	24	26	27	29	32	37	41	41	48.7	86
29-Apr	45	45	46	49	51	54	56	53	52	46	37	34	35	32	33	31	33	38	47	49	56	64	67	71	46.8	71
30-Apr	81	86	92	91	88	88	80	70	59	49	41	35	30	29	37	52	58	55	59	61	69	73	78	83	64.3	92
	64.4	66.0	68.9	72.4	75.1	76.5	74.7	71.6	66.2	60.6	55.6	51.4	48.3	46.5	44.8	44.2	44.4	44.2	44.9	47.1	51.0	55.3	58.9	62.7	Diurnal Average	
	92	94	96	98	97	97	98	98	97	90	89	86	85	87	94	89	90	91	90	86	86	88	94	95	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	5	0.69	0.69
20 - 40	130	18.06	18.75
40 - 60	260	36.11	54.86
60 - 80	206	28.61	83.47
80 - 100	119	16.53	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 45m (RH45m) - %

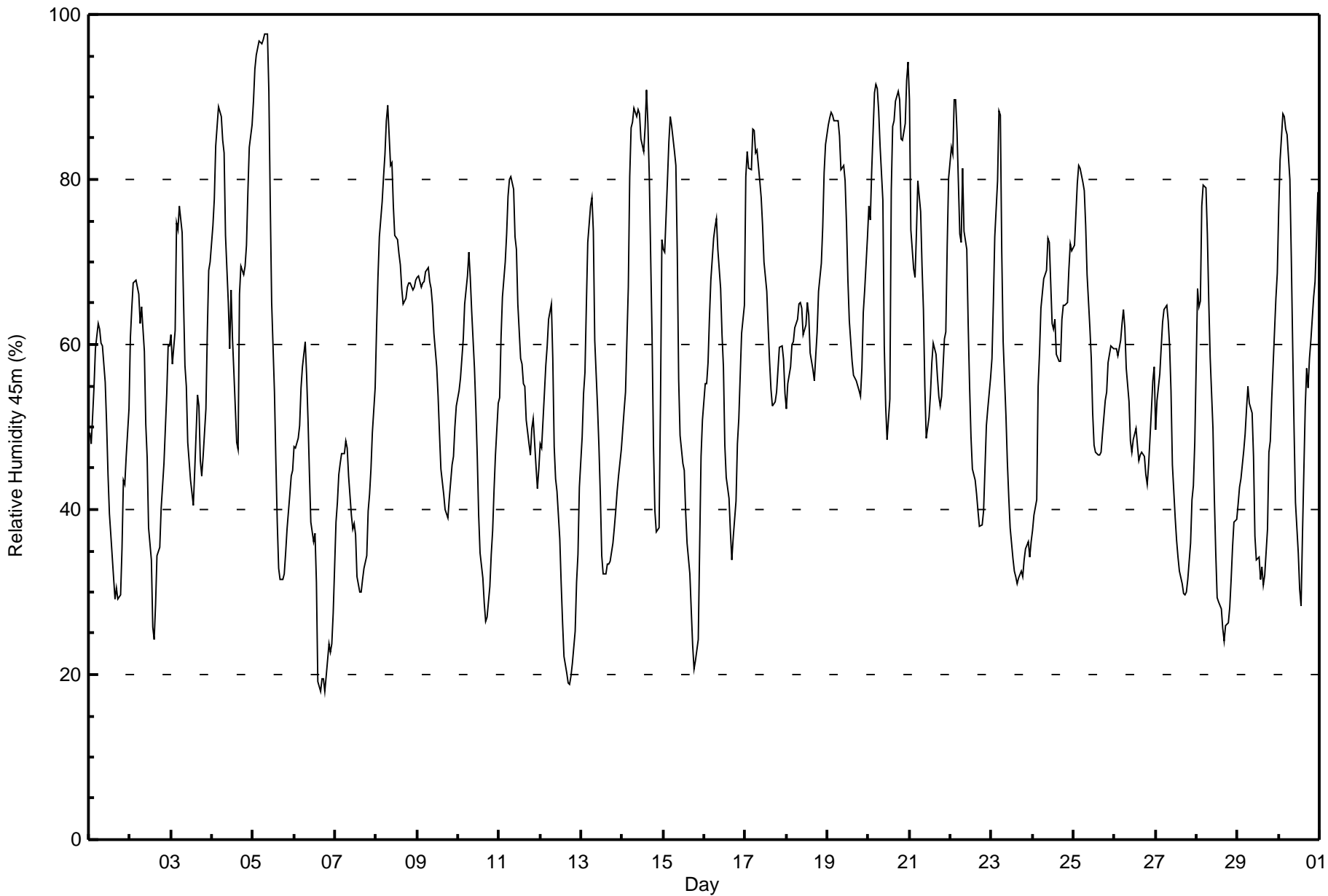
Lower Camp Met Tower - April 2017

Maximum Value: 98 % on Apr 5 08:00 Maximum Daily Average: 80.6 % on Apr 20																		Hours in Service: 720 Hours of Data: 720								
Minimum Value: 18 % on Apr 6 19:00 Minimum Daily Average: 36.3 % on Apr 6 Maximum Diurnal Average: 74.5 % at hour 6 Minimum Diurnal Average: 43.5 % at hour 18 Monthly Average: 56.9 % Percentiles: P ₁ = 20 P ₁₀ = 32 Q ₁ = 44 Median = 57 Q ₃ = 70 P ₉₀ = 83 P ₉₉ = 94																		Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	49	48	51	55	60	63	62	60	60	56	50	44	39	37	32	29	30	29	30	35	43	43	47	52	46.0	63
2-Apr	61	64	67	68	67	66	63	65	59	50	46	38	34	26	24	28	34	35	40	43	46	54	60	60	50.0	68
3-Apr	61	58	62	75	74	77	74	65	58	55	48	44	42	41	45	54	53	46	44	46	52	62	69	70	57.2	77
4-Apr	74	78	84	86	89	88	85	83	73	65	60	67	61	57	48	47	66	70	69	69	72	79	84	87	72.5	89
5-Apr	90	93	95	97	97	96	97	98	98	91	77	65	54	46	38	33	32	32	32	35	38	42	44	45	65.1	98
6-Apr	48	48	49	50	55	57	60	56	51	44	39	36	37	31	19	18	20	19	18	20	24	23	24	27	36.3	60
7-Apr	38	41	44	46	47	47	48	47	44	39	38	38	37	32	30	30	32	33	34	40	42	45	49	55	40.7	55
8-Apr	62	68	73	77	80	83	87	89	82	82	77	73	73	71	70	67	65	66	67	67	67	67	67	68	72.8	89
9-Apr	68	68	67	67	68	69	69	68	67	65	61	57	54	49	45	42	40	40	39	41	45	46	50	53	55.8	69
10-Apr	54	56	58	61	65	68	71	68	64	57	52	46	39	35	32	29	26	27	31	35	37	42	47	53	48.1	71
11-Apr	54	61	66	70	73	78	80	80	79	73	72	65	58	58	55	55	51	48	47	50	51	45	43	45	60.6	80
12-Apr	48	47	54	58	60	63	65	58	48	44	42	36	31	26	22	20	19	19	20	21	25	31	35	43	39.0	65
13-Apr	49	54	57	65	72	77	78	74	61	52	48	42	34	32	32	33	33	34	36	38	40	42	44	47	48.9	78
14-Apr	50	52	54	67	80	86	87	89	88	89	88	85	83	86	91	87	80	61	48	40	37	38	53	73	70.4	91
15-Apr	72	71	80	85	88	86	83	82	71	56	49	46	45	40	36	32	28	24	21	22	24	35	46	51	53.0	88
16-Apr	55	55	58	63	68	73	74	75	71	67	61	57	48	44	41	37	34	37	41	48	51	56	61	65	55.9	75
17-Apr	80	83	81	81	86	86	83	84	80	78	74	70	66	62	58	55	53	53	54	57	60	60	58	54	69.0	86
18-Apr	52	55	57	60	60	62	63	65	65	64	61	62	65	64	59	57	56	59	62	66	70	74	81	84	63.5	84
19-Apr	87	87	88	88	87	87	87	85	81	82	80	75	68	63	58	56	56	56	54	54	57	64	67	73	72.5	88
20-Apr	77	75	81	91	91	91	88	84	78	60	53	48	53	79	87	87	89	91	90	85	85	87	92	94	80.6	94
21-Apr	90	74	69	68	73	80	76	70	64	55	49	51	54	58	60	59	56	54	53	54	61	62	72	80	64.2	90
22-Apr	84	83	90	90	86	73	72	81	74	71	62	55	49	45	44	42	40	38	38	40	45	50	52	56	60.8	90
23-Apr	58	65	73	80	88	88	71	60	51	46	42	38	34	33	32	31	32	33	32	34	35	36	34	36	48.4	88
24-Apr	37	39	41	55	59	64	68	68	69	73	72	63	62	63	59	58	58	63	65	65	65	69	72	71	61.6	73
25-Apr	72	76	79	82	81	80	79	74	68	62	58	52	48	47	47	47	49	53	54	58	59	60	60	60	62.1	82
26-Apr	59	59	59	61	63	64	62	57	53	48	47	49	50	48	46	47	47	46	44	43	45	52	56	57	52.6	64
27-Apr	50	53	56	60	63	64	65	63	60	54	45	39	36	34	33	31	30	30	30	32	36	41	43	48	45.6	65
28-Apr	67	65	65	77	79	79	73	65	59	50	41	35	29	29	28	26	24	26	26	28	32	35	38	39	46.5	79
29-Apr	41	43	44	47	49	52	55	53	52	47	37	34	34	32	33	31	32	38	47	48	53	62	66	69	45.7	69
30-Apr	76	82	88	88	86	85	80	71	60	50	41	35	30	28	37	52	57	55	58	60	66	68	73	78	62.7	88
	62.1	63.4	66.4	70.5	73.1	74.5	73.5	71.3	66.2	60.8	55.7	51.5	48.3	46.4	44.6	44.0	44.0	43.5	44.0	45.7	48.7	52.3	56.2	59.7	Diurnal Average	
	90	93	95	97	97	96	97	98	98	91	88	85	83	86	91	87	89	91	90	85	85	87	92	94	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	9	1.25	1.25
20 - 40	140	19.44	20.69
40 - 60	264	36.67	57.36
60 - 80	209	29.03	86.39
80 - 100	98	13.61	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 100m (RH100m) - %

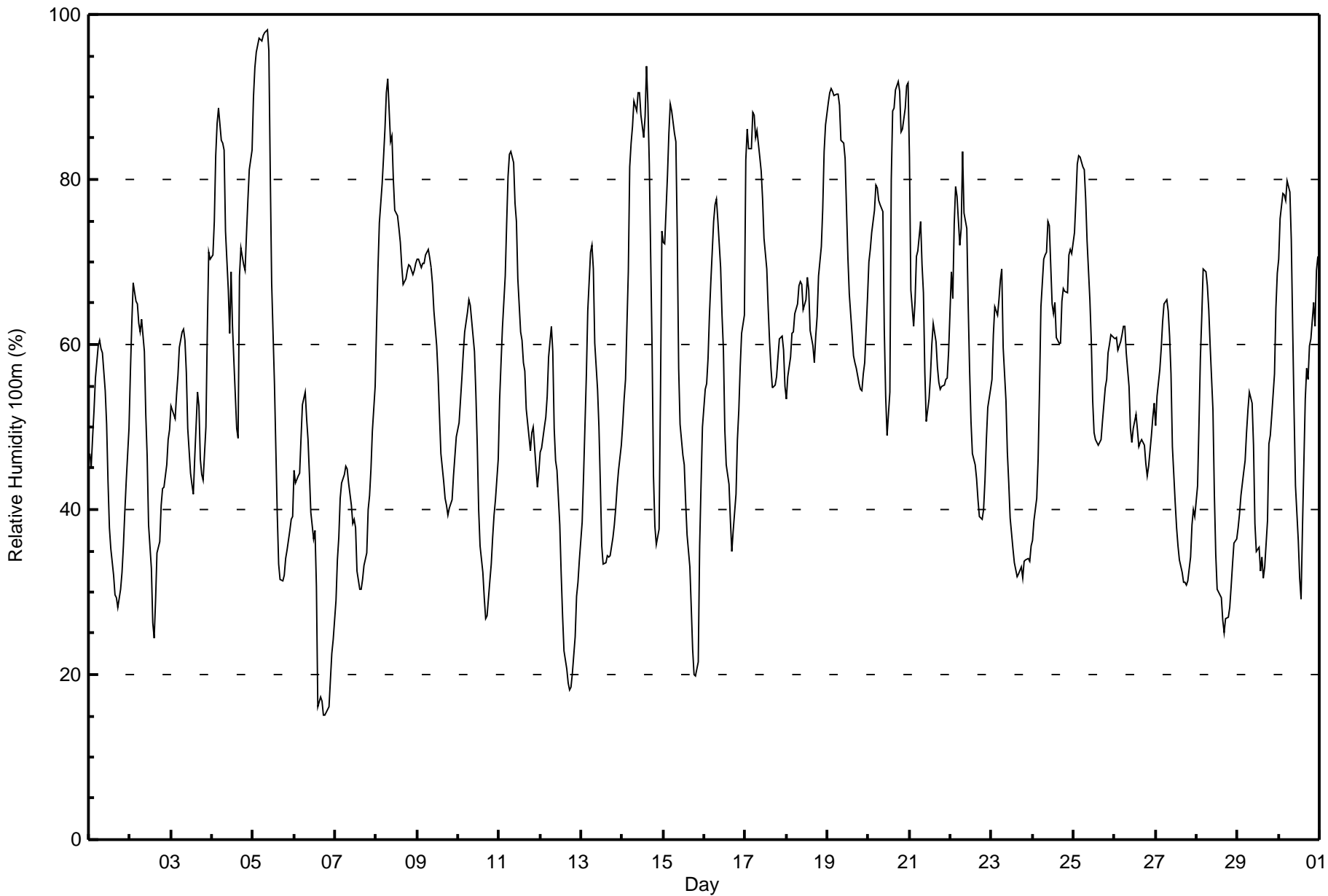
Lower Camp Met Tower - April 2017

Maximum Value: 98 % on Apr 5 09:00																		Maximum Daily Average: 78.1 % on Apr 20																		Hours in Service: 720	
Minimum Value: 15 % on Apr 6 18:00																		Minimum Daily Average: 33.2 % on Apr 6																		Hours of Data: 720	
Maximum Diurnal Average: 72.4 % at hour 7																		Minimum Diurnal Average: 44.2 % at hour 18																		Hours of Missing Data: 0	
Monthly Average: 56.3 %																		Percentiles: P ₁ = 18 P ₁₀ = 33 Q ₁ = 43 Median = 56 Q ₃ = 69 P ₉₀ = 83 P ₉₉ = 95																		Hours of Calibration: 0	
																																				Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	47	45	49	52	56	60	60	59	59	54	50	43	38	35	32	30	29	28	30	32	36	40	43	50	44.1	60											
2-Apr	57	63	67	65	65	63	61	63	59	52	46	38	33	26	24	29	35	36	41	43	43	45	49	50	48.0	67											
3-Apr	53	52	51	54	56	60	62	62	61	57	50	44	43	42	46	54	52	46	44	44	50	62	71	70	53.5	71											
4-Apr	71	75	83	87	89	85	84	84	74	67	61	69	62	58	50	49	68	72	70	69	73	77	81	84	72.5	89											
5-Apr	90	94	95	97	97	97	97	98	98	96	81	67	55	47	39	33	32	31	32	34	35	37	39	39	65.1	98											
6-Apr	45	43	44	44	49	53	54	51	48	44	40	37	37	31	16	17	17	15	15	15	16	19	23	24	33.2	54											
7-Apr	29	34	37	41	43	44	45	45	43	40	38	39	38	32	30	30	32	33	35	40	42	45	49	55	39.2	55											
8-Apr	62	69	75	79	83	86	90	92	85	85	80	76	76	74	72	70	67	68	69	70	69	69	69	70	75.2	92											
9-Apr	70	70	69	70	70	71	72	70	69	67	64	60	56	51	47	43	41	41	39	40	41	44	46	49	56.8	72											
10-Apr	50	53	56	59	62	64	65	65	63	59	54	48	40	36	32	29	27	27	31	33	37	39	41	46	46.5	65											
11-Apr	53	58	62	68	75	80	83	83	82	77	75	68	62	60	58	57	52	49	47	49	50	45	43	45	61.7	83											
12-Apr	47	47	50	51	54	58	62	59	50	46	45	38	32	27	23	21	19	18	18	20	25	30	31	34	37.7	62											
13-Apr	39	44	50	56	64	71	72	69	60	54	50	43	36	33	34	34	34	34	37	38	40	43	45	48	47.0	72											
14-Apr	50	53	56	69	81	84	87	89	88	90	90	88	85	88	94	89	82	59	44	38	36	38	54	74	71.1	94											
15-Apr	72	72	81	86	89	88	86	85	73	57	50	47	45	41	37	33	28	23	20	20	21	36	43	50	53.5	89											
16-Apr	55	55	58	64	68	75	77	78	75	69	64	59	50	45	43	39	35	37	42	48	52	57	61	64	57.1	78											
17-Apr	82	86	84	84	88	88	85	86	83	81	78	73	69	64	60	57	55	55	56	58	61	61	59	55	71.2	88											
18-Apr	53	56	58	61	62	64	65	67	68	67	64	65	68	67	62	60	58	61	63	68	72	76	83	87	65.7	87											
19-Apr	89	90	91	91	90	90	90	89	85	84	82	76	71	66	61	59	58	57	55	55	54	56	58	66	73.5	91											
20-Apr	70	71	74	76	79	79	78	77	76	62	54	49	54	80	88	89	91	92	91	86	86	89	91	92	78.1	92											
21-Apr	83	67	62	65	71	71	75	70	66	57	51	53	56	60	63	60	57	55	55	55	55	56	56	59	61.6	83											
22-Apr	69	66	75	79	78	72	74	83	76	74	65	57	51	47	45	44	41	39	39	40	44	48	52	55	58.8	83											
23-Apr	56	61	65	64	65	68	69	60	53	47	43	39	35	34	33	32	32	33	32	34	34	34	34	36	45.4	69											
24-Apr	36	39	41	46	55	65	70	71	71	75	74	65	64	65	61	60	60	65	67	66	66	71	71	71	62.4	75											
25-Apr	74	77	82	83	83	82	81	78	72	65	60	53	49	49	48	48	49	51	55	56	59	60	61	61	64.0	83											
26-Apr	61	61	59	60	61	62	62	59	55	50	48	50	52	50	48	48	48	48	46	44	45	49	51	53	52.9	62											
27-Apr	50	54	57	60	63	65	65	64	61	57	48	41	38	36	34	32	31	31	31	31	34	38	40	39	45.8	65											
28-Apr	43	50	58	63	69	69	67	64	60	52	42	35	30	30	29	27	25	27	27	28	31	33	36	36	43.0	69											
29-Apr	38	40	42	45	46	49	52	54	53	48	38	35	35	33	34	32	33	39	48	49	51	56	64	69	45.1	69											
30-Apr	70	75	78	78	77	80	78	73	62	52	43	36	32	29	38	53	57	56	60	61	65	62	69	71	60.7	80											
58.8 60.7 63.6 66.6 69.5 71.4 72.4 71.6 67.6 62.9 57.6 53.1 49.7 47.9 46.1 45.3 44.9 44.2 44.6 45.5 47.4 50.6 53.9 56.6																								Diurnal Average													
90 94 95 97 97 97 97 98 98 96 90 88 85 88 94 89 91 92 91 86 86 89 91 92																								Diurnal Maximum													



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	13	1.81	1.81
20 - 40	143	19.86	21.67
40 - 60	259	35.97	57.64
60 - 80	216	30.00	87.64
80 - 100	89	12.36	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 167m (RH167m) - %

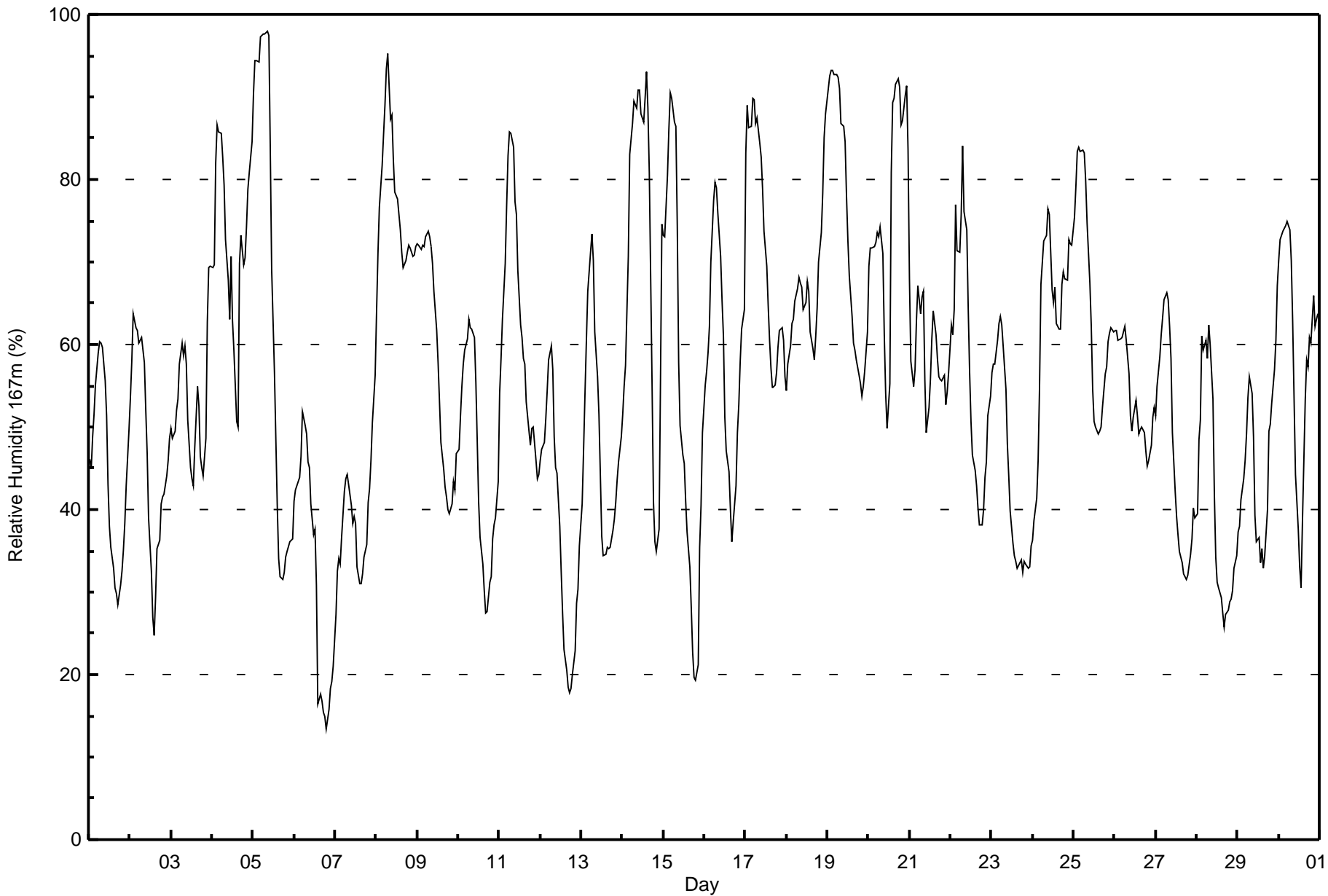
Lower Camp Met Tower - April 2017

Maximum Value: 98 % on Apr 5 09:00																		Maximum Daily Average: 77.4 % on Apr 8																		Hours in Service: 720													
Minimum Value: 13 % on Apr 6 20:00																		Minimum Daily Average: 32.2 % on Apr 6																		Hours of Data: 720													
Maximum Diurnal Average: 71.6 % at hour 7																		Minimum Diurnal Average: 44.8 % at hour 18																		Hours of Missing Data: 0													
Monthly Average: 56.4 %																		Percentiles: P ₁ = 18 P ₁₀ = 33 Q ₁ = 42 Median = 56 Q ₃ = 70 P ₉₀ = 84 P ₉₉ = 94																		Hours of Calibration: 0													
																																				Percent Operational Time: 100.0													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	46	45	49	52	55	59	60	60	60	56	51	43	38	35	33	30	30	28	31	33	35	38	43	50	44.2	60																							
2-Apr	54	58	64	62	62	60	60	61	58	52	47	39	33	27	25	29	35	36	41	42	42	44	46	49	46.8	64																							
3-Apr	50	49	50	52	53	58	60	59	60	58	51	45	44	43	47	55	52	46	45	44	49	63	69	69	52.9	69																							
4-Apr	69	70	82	87	86	86	83	79	73	68	63	71	63	59	51	50	70	73	70	71	74	79	81	85	72.5	87																							
5-Apr	90	94	94	94	97	98	98	98	98	97	84	69	57	48	41	34	32	32	32	34	35	36	36	36	65.2	98																							
6-Apr	41	42	43	44	47	52	50	49	46	45	41	37	38	31	16	18	17	15	15	13	16	18	19	21	32.2	52																							
7-Apr	27	33	34	33	37	42	44	44	43	41	38	39	38	33	31	31	32	34	36	41	42	46	51	56	38.6	56																							
8-Apr	64	71	77	82	85	89	93	95	87	88	82	78	78	76	74	71	69	70	71	72	72	71	71	72	77.4	95																							
9-Apr	72	72	72	72	72	73	74	73	72	70	66	62	58	53	48	45	43	42	40	39	41	43	42	47	57.9	74																							
10-Apr	47	51	55	58	59	61	63	62	62	61	55	48	41	37	33	30	27	28	31	32	36	38	39	43	45.8	63																							
11-Apr	54	58	63	70	77	83	86	86	84	77	76	69	62	61	58	58	53	50	48	50	50	46	44	44	62.7	86																							
12-Apr	46	47	48	51	54	58	60	57	49	45	44	38	33	27	23	20	19	18	18	20	23	29	30	36	37.2	60																							
13-Apr	41	47	54	60	66	71	73	70	62	56	52	44	37	34	35	35	35	35	37	39	41	44	46	49	48.5	73																							
14-Apr	52	55	57	71	83	85	87	90	89	91	91	88	87	90	93	89	81	55	41	36	35	38	56	75	71.3	93																							
15-Apr	73	73	81	86	91	90	87	86	74	58	50	47	46	41	37	33	28	23	20	19	21	35	40	49	53.7	91																							
16-Apr	55	57	59	62	70	78	80	79	76	71	65	61	51	47	45	40	36	38	43	49	53	58	62	64	58.3	80																							
17-Apr	83	89	86	86	90	90	87	87	84	83	79	74	70	65	61	57	55	55	57	60	62	62	61	56	72.4	90																							
18-Apr	54	58	60	63	63	65	67	68	68	67	64	65	68	66	62	60	58	61	64	70	74	78	85	88	66.5	88																							
19-Apr	91	93	93	93	93	93	92	91	87	86	85	78	73	68	63	60	59	58	56	55	54	55	57	61	74.8	93																							
20-Apr	70	72	72	72	72	74	73	74	71	61	54	50	55	81	89	90	92	92	91	87	87	90	91	84	76.8	92																							
21-Apr	68	58	55	57	63	67	64	66	66	56	49	52	56	61	64	61	58	56	56	56	56	53	54	57	58.7	68																							
22-Apr	62	61	64	77	71	71	76	84	76	74	65	57	51	47	45	43	40	38	38	40	44	46	51	54	57.3	84																							
23-Apr	57	58	58	61	63	63	62	60	55	48	44	40	36	34	34	33	33	34	32	34	33	33	33	36	44.7	63																							
24-Apr	36	39	41	46	55	67	73	73	73	76	76	67	65	67	63	62	62	67	69	68	68	73	72	72	63.7	76																							
25-Apr	75	79	83	84	83	83	83	80	75	68	62	55	51	50	49	50	50	52	56	57	60	61	62	61	65.5	84																							
26-Apr	62	62	60	61	61	61	62	61	56	51	49	51	53	51	49	50	50	49	47	45	46	48	51	52	53.8	62																							
27-Apr	51	55	58	61	63	65	66	65	62	58	49	42	39	37	35	34	32	32	31	32	35	37	40	39	46.7	66																							
28-Apr	39	48	51	61	59	60	58	62	60	53	42	34	31	30	29	27	26	27	28	29	29	30	33	34	41.0	62																							
29-Apr	37	38	41	44	46	49	54	56	54	49	39	36	37	34	35	33	34	40	50	50	53	57	60	67	45.5	67																							
30-Apr	70	73	74	74	74	75	74	70	63	53	44	38	33	31	39	53	58	57	61	60	66	62	63	64	59.6	75																							
																								57.9	60.1	62.6	65.8	68.4	70.9	71.6	71.5	68.0	63.9	58.7	53.9	50.6	48.8	46.9	46.0	45.6	44.8	45.2	45.9	47.7	50.3	53.0	55.7	Diurnal Average	
																								91	94	94	94	97	98	98	98	98	97	91	88	87	90	93	90	92	92	91	87	87	90	91	88	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 167m (RH167m) - %
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 167m (RH167m) - %
Lower Camp Met Tower - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	14	1.94	1.94
20 - 40	141	19.58	21.53
40 - 60	259	35.97	57.50
60 - 80	217	30.14	87.64
80 - 100	89	12.36	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - April 2017

Maximum Speed: 25 km/h on Apr 5 14:00	Maximum Daily Speed Average: 13.4 km/h on Apr 26	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 29 00:00	Minimum Daily Speed Average: 0.4 km/h on Apr 28	Hours of Data: 720
Maximum Diurnal Speed Average: 2.3 km/h at hour 11	Minimum Diurnal Speed Average: 0.4 km/h at hour 16	Hours of Missing Data: 0
Monthly Average Velocity: 1.0 km/h 99.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 8 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 19	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW14	WSW13	WSW15	W14	W12	W5	WSW9	WSW15	W18	WSW18	W14	W12	W17	W14	W9	W10	WNW7	NNW4	NNW2	SW3	W5	W9	W12	W12	W10.6	WSW18
2-Apr	WNW4	NW1	WNW1	SSW3	SW1	SW3	SW6	SSW3	WSW6	S2	SSE5	SW5	WSW11	NNW10	NW15	NNE11	NNE9	NNE8	N6	NW3	WNW2	NNW4	NNW3	NNW2	NW2.3	NW15
3-Apr	NW2	WNW3	NNW3	NNW2	NNW3	N4	NW2	WNW1	N1	WSW6	WSW6	WSW9	WSW5	SSW2	WNW6	WNW8	W7	NNW3	ENE2	WNW1	SSW2	WSW2	SSE3	SSE1	W2.4	WSW9
4-Apr	NW4	SE4	SSE7	SSE7	SE6	S5	SSE7	SE4	SSE9	SSE10	S9	WSW16	S8	SSE9	SSE10	S13	SSW12	SSE8	SSE6	SSE2	SSE2	W2	SSE3	SE3	S5.6	WSW16
5-Apr	ESE4	SE5	SSE7	SE6	ESE2	ESE2	SSE6	S11	S12	SSE12	SE13	SSE17	SSE24	S25	S22	S19	S15	S14	S16	S12	SSE16	SSE16	SSE17	SSE14	SSE12.3	S25
6-Apr	SSE2	SSE9	ESE2	SE5	N2	NNW1	NNE1	SSE5	SSE11	SE8	SSE6	SSE10	SSE16	SW7	W18	WSW11	W13	W12	WNW6	W2	WNW2	NW3	ENE2	N5	SSW2.8	W18
7-Apr	NNW4	N4	NNW3	NNW3	N5	N5	N3	N3	N6	N11	N13	N14	NNE16	NNE16	NNE15	NNE15	NNE13	NNE17	NNE13	NNE12	NNE11	NNE12	N11	N11	NNE9.6	NNE17
8-Apr	N12	N12	N11	N12	N11	NNE12	N15	N14	N15	N16	NNE16	NNE16	NNE16	NNE15	N17	N15	N13	NNE12	NNE11	NNE9	N9	N10	NNE7	N6	N12.5	N17
9-Apr	NNW6	N6	NNE3	NNE4	NNE5	N5	N4	W2	SW6	SSW5	S7	S9	S9	SSE10	S9	S9	SSE10	SSE12	SSE13	SSE13	SSE10	SSE13	SSE10	SE3	SSE4.6	SSE13
10-Apr	SSE6	SE9	SSE13	SSE15	SSE15	SSE18	SSE16	SSE15	SSE12	SSE10	SSE10	SSE10	SSE12	S10	SSE10	SSE7	SSE9	SSE9	S6	S2	SE3	SSE1	ESE1	NNW3	SSE8.9	SSE18
11-Apr	NNW4	N4	N7	N8	N9	N8	N8	N12	N13	NNE11	N12	N13	N14	NNE13	NNE13	NNE11	N10	N10	N13	N11	N9	N8	N9	N7	N9.8	N14
12-Apr	NNW5	N5	N4	N3	N3	NNW2	N3	N5	N7	NNW8	N7	N9	N11	N9	N9	N8	N8	N10	NNE9	NNE6	NNW4	NNW3	N3	N6	N6.1	N11
13-Apr	NNW4	NNW3	N2	NW3	NW4	NNW4	NNW3	N6	ENE3	SE13	SE10	SSE12	SE13	SE12	ESE11	SE12	ESE11	ESE14	ESE12	ESE11	ENE9	ENE6	NE5	ENE5	ESE5.3	ESE14
14-Apr	ENE4	E7	E6	ENE4	N5	N6	NNE6	NNE7	NE7	NE8	NE8	ENE11	NE10	ENE12	NE12	ENE9	ENE6	ENE6	ENE8	ENE10	ENE11	NE14	NNE12	NE8.0	NE14	
15-Apr	NE12	NE11	NE8	NNE9	NNE11	NNE10	NNE10	N11	NNE9	N9	N10	N10	NNE8	N9	NNE13	N10	N10	NNE8	NNE7	N4	NNE2	SSE4	SSE10	SSE15	NNE6.6	SSE15
16-Apr	SSE17	SSE15	SSE15	SSE12	SSE15	SSE10	SSE15	SSE13	SSE11	SSE13	SSE14	SSE12	SW15	SW17	SW18	SW16	SW18	SW16	SSW12	SSW9	SSE9	SSE13	SSE8	SSE2	S11.2	SW18
17-Apr	N12	N12	N13	NNE14	N13	N14	NNE12	N12	NNE15	NNE14	NNE13	NNE12	NNE13	NNE12	NNE11	NE12	NNE13	NNE11	NNE12	NNE9	NNE8	NNE8	NNE7	NNE8	NNE11.5	NNE15
18-Apr	NNE7	NNE8	NNE8	N9	N10	N10	NNE11	NNE9	N10	N9	NNW8	N9	N10	N10	N9	N9	N8	NNE9	NNE7	N8	N6	N7	N7	N5	N8.3	NNE11
19-Apr	NNW5	N6	NNW4	N7	N6	N5	N4	N4	N3	WSW6	WSW6	WSW6	WSW6	W6	WSW4	SSW3	S10	S9	S8	SW5	WSW2	SE1	SE1	SSE1	W1.4	S10
20-Apr	NW0	NNW2	NNW3	NNW3	NW3	NNW4	N3	N4	N7	N10	N10	N15	N19	N19	N16	N14	N15	N14	N11	N5	NNW5	WNW4	NW2	NW3	N7.8	N19
21-Apr	NNW4	NNW6	N8	NNE5	NNW2	N1	NNW2	NW2	WSW3	NNW4	NNE5	N3	N3	WSW4	W6	WSW7	WSW6	W3	WSW3	NNW2	N2	WNW1	SSW1	N2	NW2.3	N8
22-Apr	NNW2	NNW2	NNW3	NNW3	NNW5	N9	NNE10	NNE9	NNE13	NNE12	NNE12	NNE11	NNE10	N10	N11	N10	NNE9	NNE9	NNE8	NNE7	NNE7	NNW3	NNW3	N2	NNE7.3	NNE13
23-Apr	NNE4	NNE3	NNW3	NNW4	NNW3	NNW4	N4	NNW3	SE5	SSE10	SSE8	S9	S9	SSE9	S7	S9	SSE8	SSE6	SSE7	SE7	ESE6	SE6	SE8	SSE5	ESE3.8	SSE10
24-Apr	SE5	ESE3	E1	N3	N5	N4	ESE6	ENE4	NE6	E6	ESE10	ESE10	SSE11	SSE9	SSE12	ESE11	ESE12	ESE10	ESE8	E6	ESE7	ESE5	ENE3	ENE1	ESE5.3	ESE12
25-Apr	SSE7	S4	SSE3	SSW2	SE3	SSE11	SSE12	SSE14	SSE13	SSE13	SSE12	SSE15	SSE15	SSE14	S13	S12	S12	S16	S14	S13	S15	S16	S20	S19	SSE11.6	S20
26-Apr	SSE20	SSE20	S20	SSE16	SSE14	SSE14	SSE14	S17	S16	S15	SSE18	SSE18	S17	S16	S15	S14	S11	S13	S13	S11	SSE8	E1	SSE2	SSE3	S13.4	SSE20
27-Apr	SSE15	SSE12	SSE12	SSE12	SSE9	SE10	SSE9	SSE9	SSE10	SSE10	SSE11	SSE11	SSE11	SSE10	SSE8	SE4	WNW5	W6	W6	NW3	N3	WNW1	SE1	NNW3	SSE6.1	SSE15
28-Apr	NW2	N2	SSE1	NNE0	S0	SE2	SE4	SSE3	SSE4	SE2	SSW3	WSW4	SW5	NNW2	NNE4	W4	SW4	NE5	E3	E4	E1	S1	N1	NNE0	SSE0.4	NE5
29-Apr	SE3	SE8	SE7	SSE8	SSE12	SSE12	SSE12	SSE7	SSE7	SSE7	S8	SW13	SW16	SSW11	SW12	S14	S14	SSW12	SW13	SSW5	SW4	SSW3	ESE3	E3	S7.4	SW16
30-Apr	SSE2	SE1	SE1	SSE3	SE5	E1	SSE4	SSE6	SSE7	SSE7	SSE9	SSE5	S5	SSE12	NE4	N11	WNW6	ENE4	E4	WNW4	ESE3	SSW1	ENE0	SSE1	SE2.3	SSE12

ENE0.5	E1.2	E1.0	ENE0.9	NE1.2	NE1.3	E1.6	E1.3	ESE1.3	ESE1.7	ESE2.3	SE1.5	SSE1.6	SE1.3	NNW0.6	E0.4	SW0.4	E1.3	E1.5	E1.2	E1.5	E0.9	ESE1.4	ENE0.9	Diurnal Average
SSE20	SSE20	SSE20	SSE16	SSE15	SSE18	SSE16	S17	W18	WSW18	SSE18	SSE18	SSE24	S25	S22	S19	SW18	NNE17	S16	SSE13	SSE16	S16	S20	S19	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

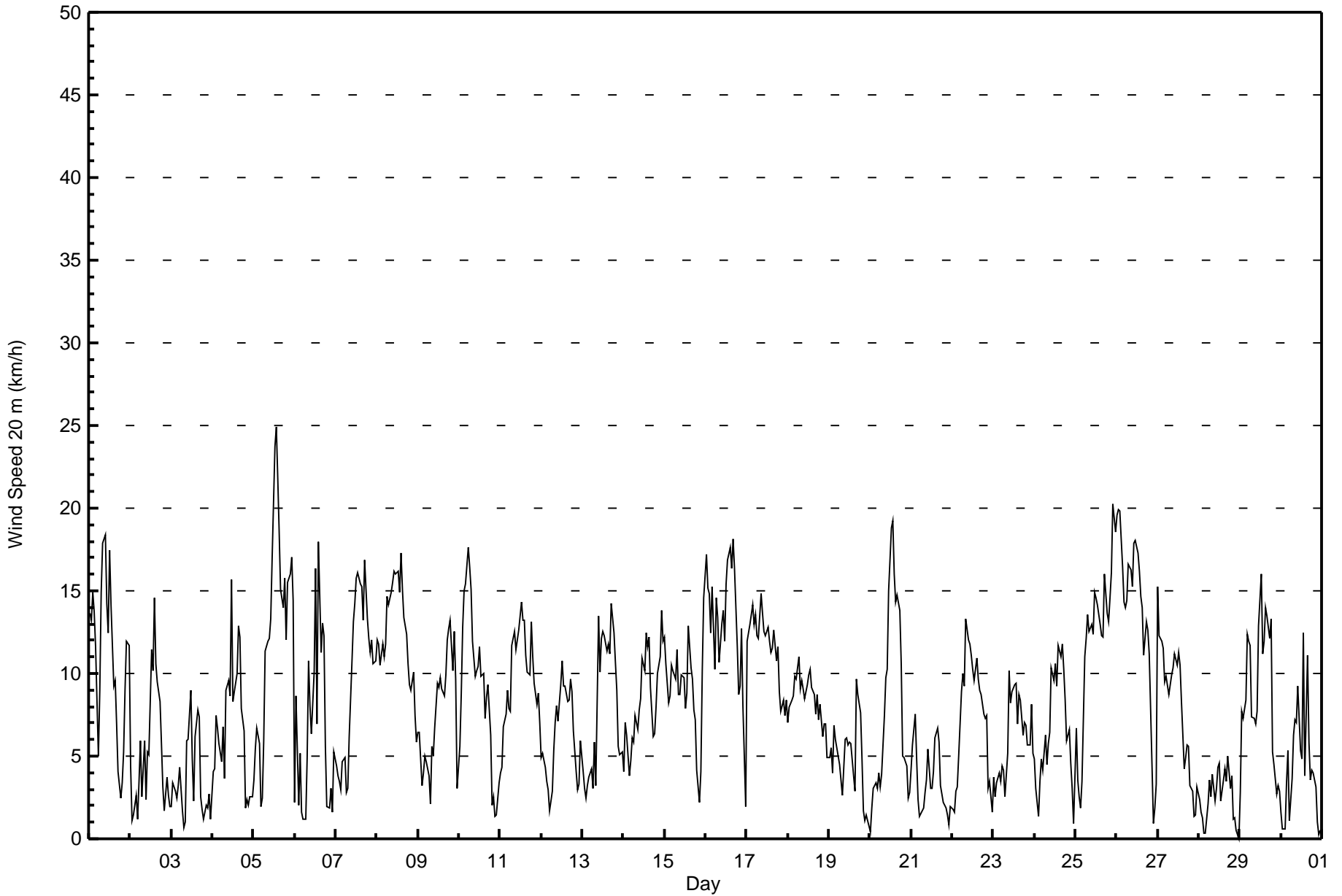
Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Apr 5 13:00 Minimum Value: 1 km/h on Apr 28 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	5	4	4	4	4	3	3	6	5	6	6	5	6	5	5	4	4	2	1	3	4	5	4	3	6
2-Apr	4	1	1	2	1	2	3	2	3	2	2	6	4	5	6	5	4	4	2	1	1	1	1	1	6
3-Apr	1	1	1	1	1	1	1	1	1	2	3	3	2	4	3	3	2	1	1	2	1	3	3	4	
4-Apr	2	2	2	3	2	3	3	2	2	3	3	5	3	3	4	4	5	2	3	1	1	3	1	2	5
5-Apr	1	2	2	2	2	2	5	3	3	5	5	6	7	7	4	5	4	4	4	3	3	2	2	4	7
6-Apr	2	2	2	2	1	1	1	2	3	3	3	3	4	5	6	4	4	3	2	2	1	1	2	2	6
7-Apr	2	2	2	2	2	2	1	1	3	4	5	5	7	7	6	6	6	7	5	5	4	5	4	4	7
8-Apr	4	4	4	4	4	5	6	5	6	6	7	6	7	7	6	6	5	5	4	4	4	4	3	2	7
9-Apr	2	2	2	2	2	2	2	2	3	3	3	4	3	4	4	3	3	4	3	2	2	2	3	2	4
10-Apr	3	4	2	3	3	3	3	3	3	3	3	3	3	4	4	3	3	3	3	1	2	1	2	3	4
11-Apr	1	1	2	3	4	3	3	4	5	5	5	5	5	5	5	5	4	4	4	4	4	3	3	3	5
12-Apr	2	2	2	1	1	1	2	2	3	3	3	4	4	4	4	4	4	4	4	2	1	1	2	2	4
13-Apr	2	1	1	1	1	2	1	2	4	4	5	4	5	6	6	5	5	5	5	4	3	2	2	3	6
14-Apr	3	4	3	3	2	2	2	3	3	3	4	5	5	5	6	5	5	4	3	4	6	6	6	5	6
15-Apr	5	5	4	4	4	4	4	4	4	3	4	4	4	4	5	4	4	3	3	2	2	3	2	4	5
16-Apr	5	5	4	3	4	5	4	4	3	4	4	4	6	6	6	5	5	4	3	3	2	2	3	2	6
17-Apr	5	5	5	6	5	5	5	5	6	6	6	5	6	5	5	5	5	5	5	4	3	3	3	4	6
18-Apr	3	4	3	4	4	4	4	4	4	4	3	4	4	4	3	4	3	3	3	3	3	3	3	2	4
19-Apr	2	2	2	3	2	2	2	2	1	2	2	2	2	3	3	2	4	2	3	2	1	1	1	1	4
20-Apr	1	1	1	2	2	1	2	2	2	4	4	6	6	6	6	5	5	5	4	2	2	1	1	1	6
21-Apr	1	2	3	3	1	1	1	1	1	2	3	2	2	3	3	2	2	2	1	1	1	1	1	2	3
22-Apr	1	1	1	2	1	4	4	4	6	5	5	5	4	4	5	5	4	3	3	3	3	2	2	1	6
23-Apr	1	1	1	1	1	1	2	2	3	3	3	4	3	3	3	3	3	2	2	2	2	3	2	4	
24-Apr	3	2	2	1	2	2	3	2	3	4	4	5	5	4	5	4	4	4	3	3	3	2	1	2	5
25-Apr	3	2	2	1	4	4	4	5	5	5	4	5	5	5	4	4	4	4	3	3	3	4	4	4	5
26-Apr	4	4	4	3	3	3	3	4	5	5	6	6	5	5	5	5	4	4	4	3	3	1	2	2	6
27-Apr	4	3	2	2	2	2	2	3	3	3	5	5	5	5	5	3	4	3	2	2	1	1	3	1	5
28-Apr	2	1	1	1	1	1	1	1	1	2	2	1	2	3	3	3	3	2	1	2	1	1	1	2	3
29-Apr	2	3	2	3	2	2	2	3	2	2	5	6	6	5	5	5	4	5	6	2	2	2	1	1	6
30-Apr	1	1	1	3	2	2	2	2	3	3	3	3	3	4	5	5	4	3	2	2	2	1	2	1	5
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	249	34.58	34.58
6 - 11	273	37.92	72.50
12 - 19	191	26.53	99.03
20 - 28	7	0.97	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

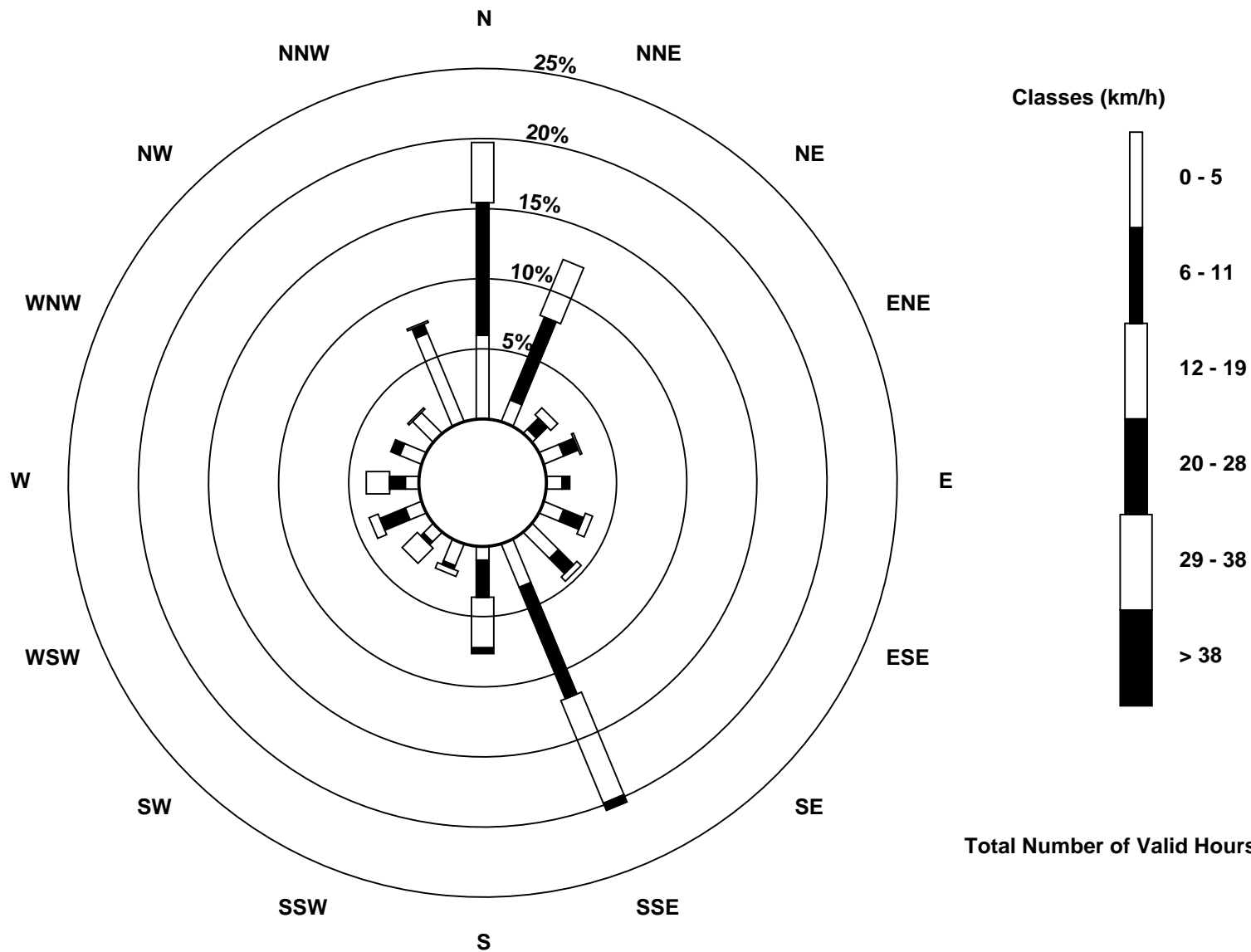
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower (AMS 3)



Total Number of Valid Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - April 2017

Maximum Speed: 28 km/h on Apr 5 13:00	Maximum Daily Speed Average: 18.4 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 28 03:00	Minimum Daily Speed Average: 0.8 km/h on Apr 28	Hours of Data: 720
Maximum Diurnal Speed Average: 3.3 km/h at hour 11	Minimum Diurnal Speed Average: 0.6 km/h at hour 17	Hours of Missing Data: 0
Monthly Average Velocity: 1.9 km/h 63.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 11 Q ₃ = 16 P ₉₀ = 19 P ₉₉ = 26	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW18	WSW20	WSW22	WSW21	WSW17	WSW8	WSW15	WSW23	WSW25	WSW27	WSW20	W16	WSW24	WSW19	W12	W11	WNW9	NNW7	NNW5	SW4	WSW9	WSW13	W17	WSW18	WSW15.0	WSW27
2-Apr	W9	W2	W2	SW5	SW3	SW9	SW10	SW4	WSW8	S3	SE5	SW6	WSW15	NW13	WNW18	N16	NNE15	NNE13	N9	NNW5	NW3	NNW5	NNW5	NNW4	WNW3.7	WNW18
3-Apr	N5	WNW4	NNW6	N7	NNW7	NNW7	NW3	WNW2	N1	WSW6	WSW7	WSW10	WSW6	SSW2	WNW8	W10	WSW9	NNW4	NE4	N1	S3	SW2	SE3	SE3	WNW2.8	WSW10
4-Apr	WNW5	SE7	SE10	SE10	SE8	SSE7	SSE8	SE5	SE12	SSE11	S10	SW19	S10	SE11	SE12	S16	SSW17	SE10	SE8	SE3	SE4	WSW3	SE5	SE6	SSE7.4	SW19
5-Apr	SE6	SE8	SE8	SE7	ESE3	ESE4	SSE8	SSE13	SE16	SE17	SE21	SSE28	SSE27	S23	S20	S17	S16	SSE17	S13	SSE18	SE19	SE20	SE19	SSE14.6	SSE28	
6-Apr	SE5	SE12	SE5	SE8	NW1	N1	NNE1	SE8	SE15	SE10	SE7	SE12	SE20	SSW9	W23	WSW16	WSW18	WSW17	WNW7	W4	NW3	NNW4	NE3	N7	SSW3.6	W23
7-Apr	NNW8	NNW7	NNW7	NNW6	NNW8	NNW7	NNW4	NNW5	NNW9	NNW15	N18	N20	NNE24	NNE25	NNE24	NNE24	NNE21	NNE26	NNE21	NNE19	NNE18	NNE20	N16	N16	N14.9	NNE26
8-Apr	N17	N17	NNW15	N16	N16	N18	N22	N20	N21	N23	NNE25	NNE24	N25	NNE23	N26	N21	N19	N18	N16	NNE15	N13	N15	N11	N8	N18.4	N26
9-Apr	NNW8	N9	NNE5	N6	N7	N7	N5	WSW2	SW7	SSW6	SSE8	SSE11	SSE10	SSE11	S10	S10	SSE11	SSE14	SSE15	SE16	SE13	SE17	SE14	SE6	SE5.4	SE17
10-Apr	SE9	SE12	SE16	SE19	SE20	SSE22	SE20	SE19	SE16	SE12	SE13	SE12	SE15	SSE11	SE12	SE9	SE10	SSE11	SSE7	S2	SE5	SSE4	SE4	N5	SE11.4	SSE22
11-Apr	NNW6	N8	N11	N12	N13	N11	N11	N17	N19	N17	N18	N18	N20	N19	N19	N17	N15	N15	N19	N16	N14	NNW12	NNW13	N11	N14.5	N20
12-Apr	NNW7	NNW7	N7	N5	N5	NNW3	N4	N7	NNW9	NNW10	N9	N12	N15	N12	N12	N11	N11	N14	NNE15	NNE12	NNW7	NNW6	NNW6	N9	N8.9	NNE15
13-Apr	NNW6	NNW5	NNW4	NNW5	NNW5	NNW7	NNW4	N7	ENE4	SE17	ESE13	SE14	ESE16	ESE16	ESE15	ESE15	ESE16	ESE20	E17	E15	ENE14	ENE8	NE8	ENE8	E7.5	ESE20
14-Apr	ENE6	E10	ENE9	NE5	N7	N9	NNE9	NNE12	NE10	NE12	NE12	NE16	NE15	NE18	NNE17	NE18	NE14	ENE9	NE10	NE12	NE15	NE16	NE21	NNE18	NE11.8	NE21
15-Apr	NNE18	NE15	NNE12	NNE13	N16	N15	NNE14	N15	NNE13	N13	N14	N13	N11	N11	NNW17	NNW14	N13	N12	N11	N8	NNE4	SSE5	SSE13	SSE16	NNE9.9	NNE18
16-Apr	SE22	SE21	SSE17	SE16	SSE19	SSE12	SE18	SE17	SE13	SE16	SE18	SSE15	SW18	SW20	SW21	SSW19	SW22	SW19	SSW14	S11	SSE10	SSE15	SSE11	SSE4	S13.7	SE22
17-Apr	N17	N18	N20	N21	N19	N19	N19	N18	N22	NNE21	NNE19	N18	N18	NNE17	NNE16	NNE17	NNE18	NNE16	NNE18	NNE14	NNE12	NNE13	NNE11	NNE13	NNE17.2	N22
18-Apr	NNE11	NNE12	NNE13	N13	N14	N14	NNE17	NNE13	N13	N12	NNW11	N12	N13	N13	N12	N11	N10	N12	N10	N12	N9	N10	N9	N7	N11.6	NNE17
19-Apr	NNW7	N8	NNW6	N10	N8	N7	N6	N4	N3	WSW8	WSW8	WSW6	WSW6	WSW7	WSW4	SSW3	SSE10	SSE9	SSE8	SSW6	WSW2	S1	SSE3	SE3	W1.7	SSE10
20-Apr	S1	NNW2	NNW5	NNW6	NNW4	NNW6	NNW5	NNW5	N10	NNW14	N15	N23	N28	N27	N24	N21	N20	N19	N15	N7	NNW7	WNW5	NNW3	NNW5	N11.3	N28
21-Apr	NNW7	NNW8	N11	NNE8	N4	NNW2	NNW2	NNW2	WSW3	NNW5	NNE7	N4	NNW3	WSW5	WSW7	WSW8	WSW6	WSW3	WSW3	NNW3	NNE3	NW2	SSW1	NNW1	NW3.1	N11
22-Apr	NNW3	NNW2	NNW4	NNW5	NNW8	N13	N15	N13	NNE20	N17	NNE17	NNE15	N13	N13	N14	N13	N13	N12	NNE11	N11	NNE12	N5	NNW5	N3	N10.5	NNE20
23-Apr	NNE5	NNE4	NNW5	NNW6	NNW6	NNW6	N5	NNW2	SE6	SSE11	SSE10	SSE10	SSE10	SSE10	SSE8	SSE10	SSE10	SE8	SE9	SE10	ESE9	ESE9	SE11	SE7	SE4.6	SSE11
24-Apr	SE7	ESE5	E3	N5	N7	N6	ESE8	ENE6	NE8	E9	ESE13	E13	SE13	SE11	SE14	ESE15	ESE16	ESE14	ESE12	E8	ESE10	ESE7	ENE6	E3	ESE7.6	ESE16
25-Apr	SE9	SE5	SSE3	SSE2	SE6	SE16	SE17	SE18	SE16	SE16	SSE15	SE19	SE18	SSE16	SSE15	SE14	S14	S17	SSE15	S14	S16	SSE17	SSE21	SSE20	SSE13.6	SSE21
26-Apr	SSE20	SSE21	SSE22	SSE18	SSE16	SSE15	SSE17	SSE18	S18	SSE18	SE22	SSE22	SSE19	S18	SSE16	S16	S13	S15	S14	SSE13	SSE10	ESE4	SE6	SE7	SSE15.4	SE22
27-Apr	SSE17	SSE13	SSE13	SSE13	SE12	SE13	SE11	SE12	SE13	SE13	SE13	SE13	SE12	SSE9	SE5	WNW6	W7	W7	NW5	N6	NNW4	SE2	NNW4	SSE6.9	SSE17	
28-Apr	NNW4	N2	SSE0	WNW1	WSW1	SSE5	SE5	SE3	SE4	SE2	SSW3	SW5	SW5	NNW3	N4	W5	SW4	NE7	ENE5	ENE7	E3	SSE3	ESE2	SE2	ESE0.8	NE7
29-Apr	ESE6	SE11	SE9	SE11	SSE15	SSE15	SE15	SE9	SE8	SE7	S10	SW16	SW19	SSW14	SW15	S16	S15	SSW15	SSW17	SSW7	SSW7	SSW6	ESE4	ESE4	S9.2	SW19
30-Apr	SE3	SE3	SE3	SE7	SE8	ESE3	SE4	SE8	SE8	SE8	SE10	SSE6	S5	SE15	NE7	N16	WNW7	ENE6	E6	W5	E3	SE2	ESE1	SW1	SE3.3	N16

NE1.4	ENE2.0	ENE1.6	NE1.9	NNE2.4	NE2.3	ENE2.5	ENE2.0	ENE2.2	E2.4	E3.3	E2.0	ESE1.4	E1.5	N1.6	NE1.7	NNE0.6	ENE2.5	ENE2.9	NE2.4	ENE2.6	ENE1.8	E2.4	ENE1.8	Diurnal Average
SE22	SSE21	SSE22	N21	SE20	SSE22	N22	WSW23	WSW25	WSW27	NNE25	NNE24	SSE28	N27	N26	NNE24	SW22	NNE26	NNE21	NNE19	SSE18	NNE20	SSE21	SSE20	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

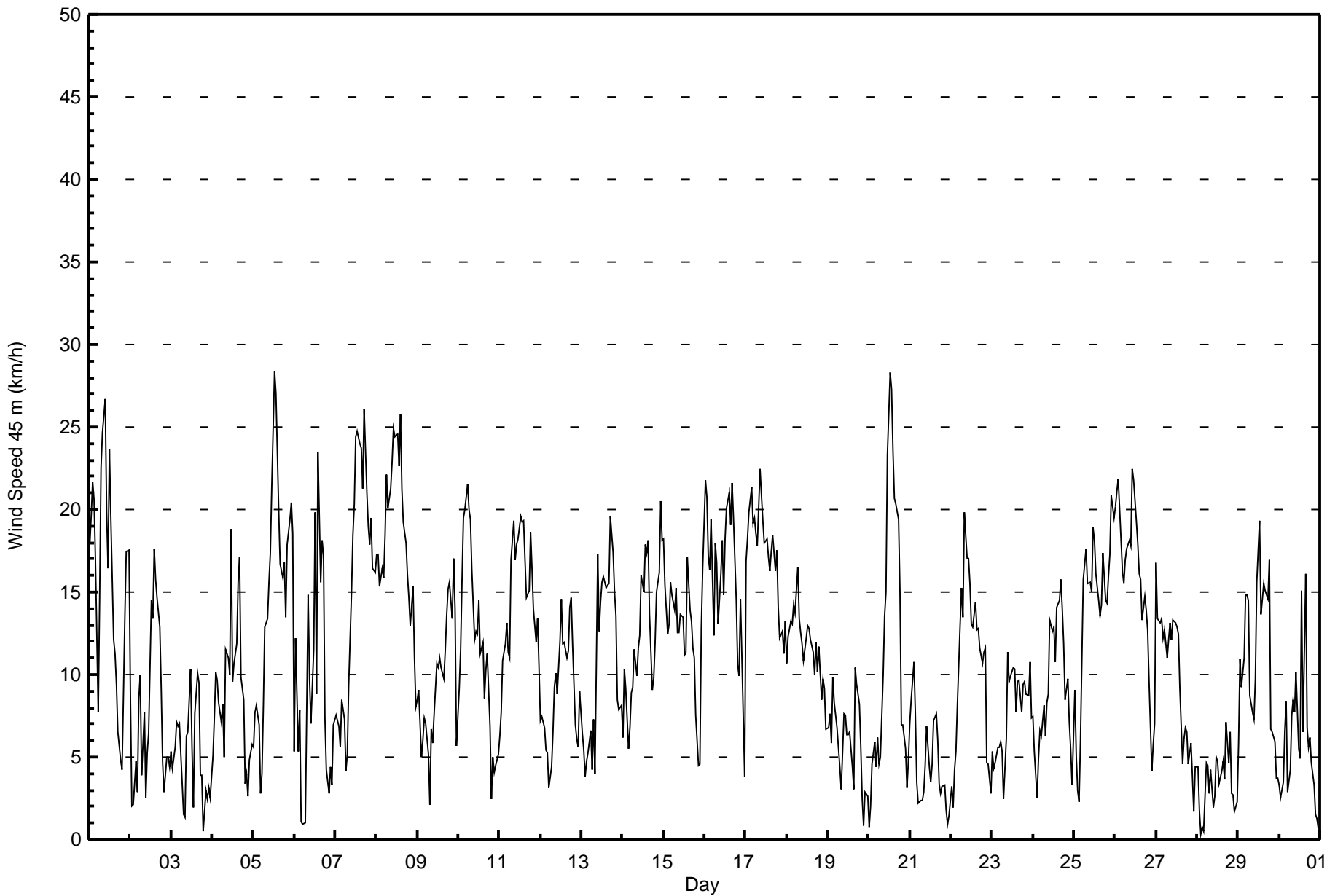
Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0														Hours in Service: 720											
Maximum Value: 8 km/h on Apr 14 21:00														Hours of Data: 720											
Minimum Value: 1 km/h on Apr 21 22:00														Hours of Missing Data: 0											
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 5 P ₉₀ = 6 P ₉₉ = 7														Hours of Calibration: 0											
														Percent Operational Time: 100.0											
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	4	3	4	4	4	3	6	4	4	6	5	5	4	5	4	4	3	2	3	4	5	4	3	6
2-Apr	6	2	2	3	2	4	2	3	3	2	2	7	4	5	5	5	5	5	3	2	1	2	1	2	7
3-Apr	1	2	1	1	2	2	2	1	1	1	3	2	3	2	4	3	3	2	1	1	2	1	4	3	4
4-Apr	2	2	2	3	2	4	3	3	2	3	3	4	3	4	5	4	7	2	3	2	2	3	2	3	7
5-Apr	2	2	2	2	2	2	5	3	3	6	5	6	8	7	6	5	4	4	4	3	3	2	2	4	8
6-Apr	3	2	4	1	2	1	1	2	3	3	3	3	3	5	5	3	4	3	2	2	2	2	2	3	5
7-Apr	3	2	2	3	2	2	2	1	3	4	5	6	7	7	7	6	6	7	6	5	5	5	5	5	7
8-Apr	4	4	4	4	4	6	6	6	6	7	7	7	7	7	7	6	6	6	5	5	4	4	3	2	7
9-Apr	2	2	2	2	2	2	2	2	3	3	4	4	3	4	4	3	3	3	3	2	2	3	3	2	4
10-Apr	3	4	2	2	2	2	1	2	3	3	3	3	3	4	4	3	3	3	3	1	3	2	2	5	5
11-Apr	2	1	2	3	4	3	4	5	5	6	6	6	6	6	5	5	5	4	5	4	4	3	3	3	6
12-Apr	3	3	2	2	2	1	2	2	3	3	3	5	4	5	4	4	4	4	4	3	1	2	2	2	5
13-Apr	3	2	1	2	2	2	2	2	5	4	5	5	6	6	7	5	5	6	5	4	3	3	2	4	7
14-Apr	4	4	3	4	3	2	3	3	3	3	4	5	5	6	6	6	6	5	4	4	8	7	6	5	8
15-Apr	6	7	4	4	5	5	5	4	4	4	4	4	4	5	5	5	4	4	3	2	2	3	2	4	7
16-Apr	5	5	4	4	5	5	4	4	4	3	4	5	5	6	6	5	5	4	4	3	2	2	3	3	6
17-Apr	6	6	6	6	6	5	6	5	6	6	6	5	6	6	6	6	6	6	5	4	4	4	4	4	6
18-Apr	3	4	4	4	4	4	4	5	4	4	3	4	3	4	4	4	3	3	3	3	3	3	3	2	5
19-Apr	2	2	2	3	2	2	1	2	1	2	1	2	2	3	3	2	3	2	3	2	2	1	2	1	3
20-Apr	1	1	2	2	3	2	2	2	3	5	4	7	7	7	6	6	5	5	5	3	2	1	1	2	7
21-Apr	2	2	3	3	1	1	1	1	1	3	3	3	2	3	2	2	2	2	1	1	2	1	1	2	3
22-Apr	2	1	1	2	2	5	5	5	6	6	6	5	4	5	5	6	5	4	4	3	3	3	2	1	6
23-Apr	2	1	2	1	2	1	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	3	3	3	3
24-Apr	3	4	3	1	3	3	3	3	3	5	5	6	5	4	5	4	4	4	4	3	3	2	2	3	6
25-Apr	3	3	2	1	6	5	5	5	5	5	5	6	5	5	4	4	3	4	3	3	3	4	5	4	6
26-Apr	4	4	4	3	3	3	3	4	4	5	6	7	5	5	4	5	4	4	3	4	3	2	3	2	7
27-Apr	4	3	3	2	2	2	2	3	3	3	5	5	5	5	5	3	4	3	2	2	1	2	3	2	5
28-Apr	3	2	1	1	1	1	1	1	1	2	2	1	2	3	3	3	3	3	1	2	2	1	2	3	3
29-Apr	3	2	2	3	2	2	2	3	2	2	6	6	6	5	6	5	4	6	7	2	2	3	1	1	7
30-Apr	2	2	1	3	2	3	2	3	3	3	3	3	3	4	7	7	5	4	2	3	2	1	1	1	7
														Diurnal Maximum											



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - April 2017

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	161	22.36	22.36
6 - 11	226	31.39	53.75
12 - 19	269	37.36	91.11
20 - 28	64	8.89	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

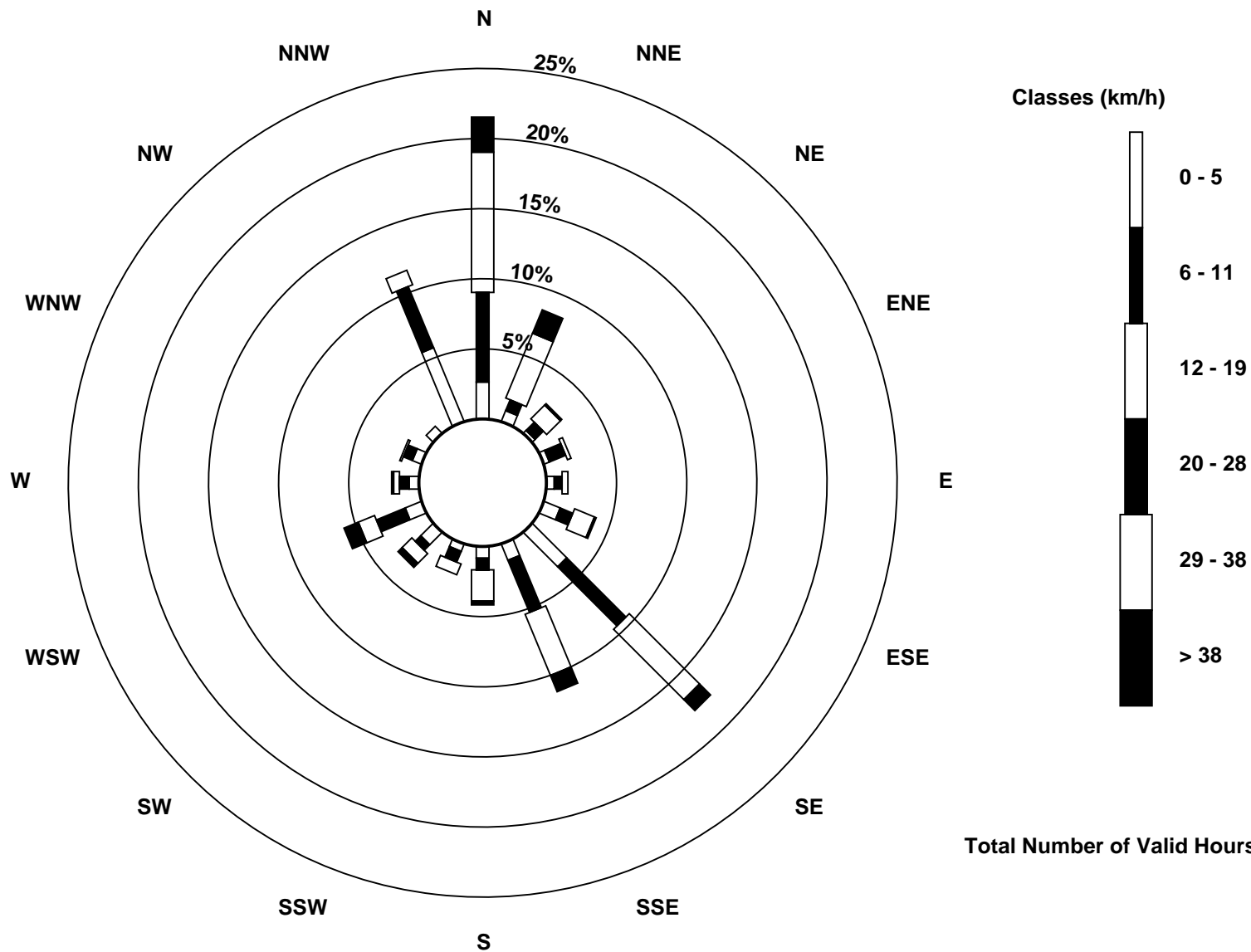
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower (AMS 3)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - April 2017

Maximum Speed: 38 km/h on Apr 20 13:00	Maximum Daily Speed Average: 25.2 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 28 03:00	Minimum Daily Speed Average: 1.8 km/h on Apr 19	Hours of Data: 714
Maximum Diurnal Speed Average: 4.9 km/h at hour 21	Minimum Diurnal Speed Average: 1.6 km/h at hour 17	Hours of Missing Data: 6
Monthly Average Velocity: 3.2 km/h 67.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 9 Median = 15 Q ₃ = 20 P ₉₀ = 25 P ₉₉ = 33	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW27WSW29WSW31WSW31WSW29WSW18WSW24WSW28WSW31WSW30WSW24WSW23WSW30WSW23	W14	W13WNW13	NNW12	N8	W2WSW17WSW21	W25WSW23	WSW20.6	WSW31																	
2-Apr	WSW20WSW13	WSW8WSW15WSW13	SW18	SW15	SW10	SW10	SSW4	S4	WSW8WSW15	NW18WNW23	N21	NNE20	NNE18	NNE14	NNE9	NNE7	NNW13	N14	NNW18	WNW6.7	WNW23					
3-Apr	N14	N11	N12	N16	N16	N14	N10	NNW3	W3	WSW5	WSW6	WSW9	WSW4	NNE1	WNW9WNW11	W10	N6	ENE7	E6	SE6	WSW6	SSE2	SSE5	NNW4.3	N16	
4-Apr	W7	SE9	SE20	SSE13	SE19	SSE15	SSE12	SSE8	SE13	SSE9	S10	SW20	S10	SSE12	SE14	S17	SSW22	SE11	SE10	SE7	SSE5	S3	SE9	SE12	SSE10.4	SSW22
5-Apr	SSE13	SE16	SE15	SSE9	SE7	SSE10	SSE15	SSE17	SSE17	SE23	SE25	SE29	SSE37	SSE31	S25	S23	S20	S19	S21	S20	SSE23	SSE22	SSE22	SSE22	SSE19.6	SSE37
6-Apr	SE14	SE20	SE16	SE17	SSE8	SE11	SSE8	SSE11	SSE14	SSE7	SE8	SE10	SE19	SW12	W30WSW18WSW23WSW22	NW14	NW12	NNW9	NE12	ENE10	NE8	S5.1	W30			
7-Apr	NNW14	N11	NNW14	NNW17	NNW19	NNW16	N13	NNW11	NNW15	N20	N24	N27	NNE32	NNE33	NNE32	NNE31	NNE29	NNE34	NNE28	NNE27	NNE25	NNE29	NNE26	NNE25	N22.3	NNE34
8-Apr	N24	N25	N22	N25	N23	N25	N30	N28	N30	N32	NNE32	NNE31	N32	NNE31	N34	N28	N27	NNE24	N23	NNE20	N17	N20	N14	N11	N25.2	N34
9-Apr	NNW12	N11	NNE7	N8	NNE9	NNE9	NNE7	WSW2	SW7	S6	SSE9	SSE12	SSE13	SSE13	S12	S11	SSE12	SSE15	SSE19	SE22	SE24	SE27	SE21	SE15	SE7.6	SE27
10-Apr	SE16	SSE16	SSE22	SSE22	SSE23	SSE25	SSE23	SSE20	SSE16	SE16	SE14	SE13	SSE15	SSE13	SE15	SE11	SE12	SE14	SE10	ESE9	SE9	SE9	SSE10	NNE9	SSE14.3	SSE25
11-Apr	N11	N12	N17	N21	N21	N18	N16	N24	N26	N24	N24	N24	N26	N26	N25	NNE24	N20	N21	N26	N24	N22	N19	N19	N17	N21.1	N26
12-Apr	N14	N13	N12	N12	N12	N9	N9	N9	NNW11	NNW12	N11	N15	N18	N14	N15	N14	N15	N19	NNE21	NNE19	NNE15	N11	NNE8	NE7	N12.8	NNE21
13-Apr	N9	NNE8	NNW4	NNE5	NE5	ENE8	E5	ESE8	E10	SE22	ESE17	SE18	ESE20	ESE22	ESE21	ESE21	ESE21	ESE26	E25	ESE24	E23	ENE15	ENE15	E16	E13.4	ESE26
14-Apr	E14	E16	E14	ENE8	NNE10	NNE11	NE14	NE17	NE16	ENE18	NE18	ENE22	NE21	NE25	AF	AF	AF	AF	AF	ENE22	ENE23	NE27	NNE25	NE17.0	NE27	
15-Apr	NNE25	NE22	NE19	NNE19	NNE23	NNE21	NNE20	NNE17	N16	N18	N17	NNE16	N14	NNW22	NNW18	N18	N16	NNE15	N12	NE7	SE13	SSE18	SSE21	NNE13.6	NNE25	
16-Apr	SSE31	SE30	SSE23	SSE23	SSE26	SSE18	SSE21	SE18	SE16	SE18	SE20	SSE16	SW20	SW23	SW23	SSW22	SW25	SW24	SSW19	SSW15	S12	S13	S11	S7	S16.9	SSE31
17-Apr	N22	N25	N28	N29	N27	N27	N25	N30	NNE27	NNE26	NNE24	NNE25	NNE22	NNE21	NNE23	NNE23	NNE22	NNE23	NNE19	NNE18	NNE17	NNE16	NNE18	NNE23.3	N30	
18-Apr	NNE14	NNE17	NNE18	N18	N19	N18	NNE20	NNE18	N16	N14	N13	N15	N16	N15	N14	N14	N12	NNE14	NNE14	N15	N11	N13	N12	N10	N15.0	NNE20
19-Apr	N11	N11	N9	N13	N10	N8	NNW6	NNW5	NNW3	W6	W6	WSW4	WSW6	WSW6	WSW5	SSW4	SSE10	SSE9	S8	SW7	W5	W3	SE4	SE10	WNW1.8	N13
20-Apr	SE11	SE8	ESE6	ESE6	ENE6	NE7	NE7	NNE4	NNW11	N17	N19	N32	N38	N37	N33	N30	N28	N27	N21	N11	N11	NNW6	NNW8	NNW13	N14.1	N38
21-Apr	N11	N14	N18	NNE14	N6	NNW5	N4	N3	W3	N6	NNE8	N5	N4	W4	W7	WSW6	W5	W3	W2	NW3	NE8	E4	SE6	SE7	N3.7	N18
22-Apr	WSW1	SW2	WNW4	NNW15	N16	N20	NNE22	N19	NNE25	N23	NNE22	NNE20	NNE16	N17	N18	N17	N17	NNE15	NNE15	NNE15	NNE21	NE14	NNE6	NE5	N14.5	NNE25
23-Apr	ENE8	NE7	NE3	NNE1	NE3	ENE5	NNE6	SE1	SE9	SE12	SE11	SSE11	SSE12	SE11	SSE8	SSE11	SSE11	SE10	SE14	SE16	SE17	SE18	SE17	SE14	SE8.5	ESE18
24-Apr	SE14	ESE11	ESE8	ENE5	NNE5	NNE9	ESE11	ENE9	ENE12	E13	ESE18	ESE17	SE17	SE14	SE17	ESE18	ESE20	ESE19	ESE16	E13	ESE15	ESE14	ESE12	ESE11	ESE12.2	ESE20
25-Apr	SE18	SE12	SE7	SE11	SE16	SE24	SE24	SE23	SE21	SE20	SE19	SE25	SE22	SSE19	SE16	SE14	S15	S18	S15	S17	S20	SSE21	SSE23	SSE22	SSE17.8	SE25
26-Apr	SSE22	SSE23	SSE27	SSE24	SSE22	SSE20	SSE19	S19	SSE19	SE28	SSE26	SSE22	S19	SSE17	S17	S14	S16	SSE16	SSE15	SSE12	SE10	SE14	SSE14	SSE18.8	SE28	
27-Apr	SSE20	S17	S16	SSE17	SSE15	SE18	SE16	SE16	SE14	SE17	SE17	SE15	SE15	SSE11	SE6	WNW7	W8	W7	NW6	N10	NNE9	ENE3	ENE3	SSE8.6	SSE20	
28-Apr	N9	N2	ESE1	S4	SSE2	S4	S2	ESE5	SE7	ESE2	S1	SW4	SW4	N5	N5	WSW5	SW3	NE9	E6	E11	ESE13	ESE10	SE11	SE12	ESE2.8	ESE13
29-Apr	SE14	SE14	SSE10	SSE13	SSE12	SSE12	SSE8	SE8	ESE7	SE6	S11	SW18	SW21	SSW15	SW16	S17	S16	SSW16	SSW21	SSW9	SSW11	SSW14	S9	SSE6	S11.1	SW21
30-Apr	SSE8	SSE13	SSE13	SSE14	SSE14	SSE9	SE7	SE11	SE10	SE8	SE12	SSE6	S4	SE16	NE9	N24	WNW5	E9	E8	W4	NNE4	E5	SE5	SSE3	SE5.6	N24
E2.6 E3.6 E2.9 ENE2.4 NE2.9 ENE3.3 ENE3.6 ENE2.9 ENE3.2 ENE3.7 E4.7 ENE3.3 E2.5 ENE2.8 N2.4 NNE2.8 NNE1.6 NE3.9 ENE4.5 ENE4.2 ENE4.9 ENE4.1 E4.3 E4.0																								Diurnal Average		
SSE31 SE30 WSW31 WSW31 WSW29 N27 N30 WSW28 WSW31 N32 NNE32 N32 N38 N37 N34 NNE31 NNE29 NNE34 NNE28 NNE27 NNE25 NNE29 NE27 NNE25																								Diurnal Maximum		

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

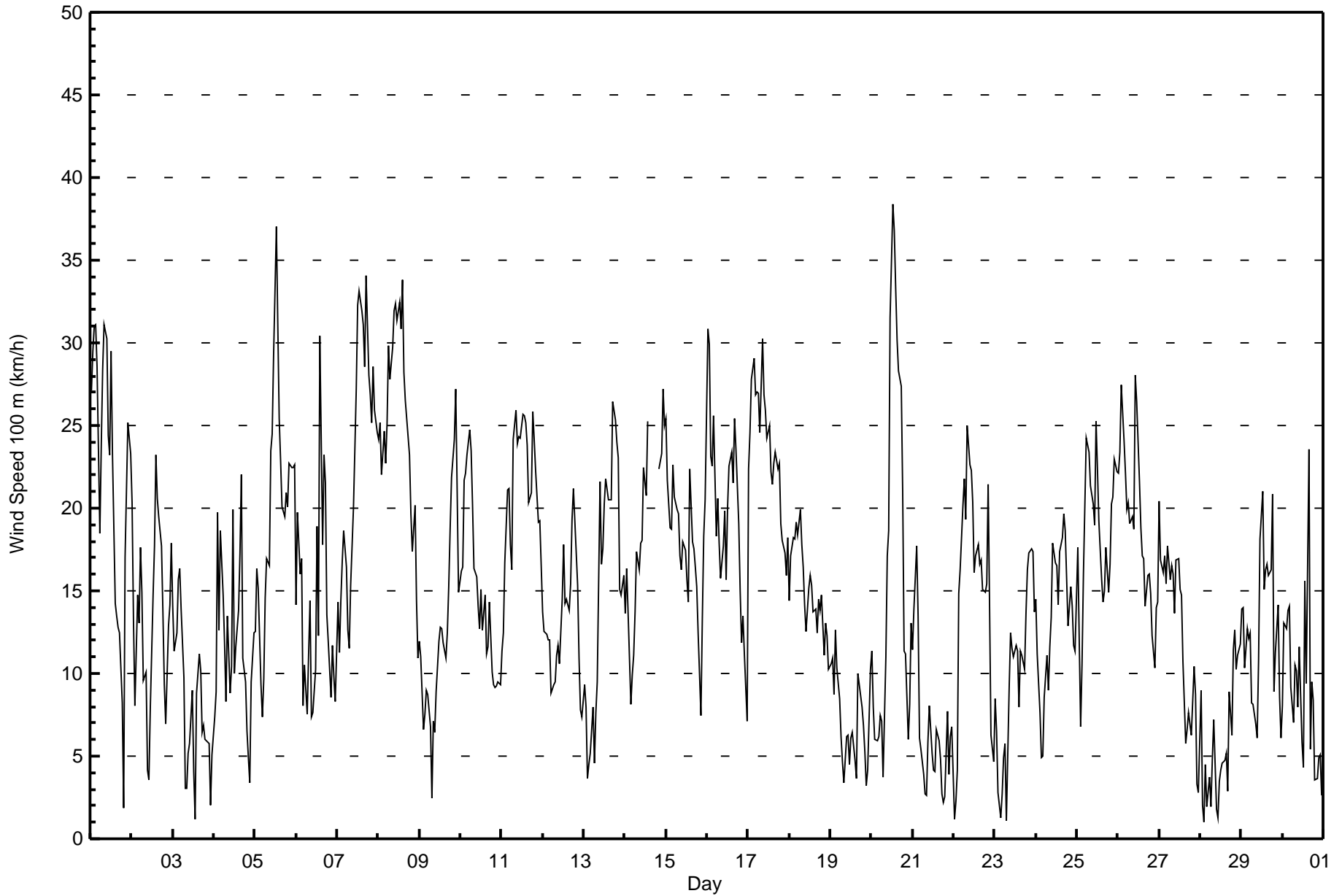
Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Apr 4 17:00	Hours in Service: 720 Hours of Data: 714 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2
Minimum Value: 1 km/h on Apr 28 09:00	
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	5	3	3	3	4	3	2	4	2	2	3	4	3	4	5	4	4	5	2	3	3	4	3	2	5
2-Apr	5	4	4	5	3	2	2	2	2	2	2	7	5	6	5	6	5	6	3	2	2	5	2	1	7
3-Apr	1	1	2	1	1	2	2	1	1	1	2	2	3	2	4	3	3	2	1	1	2	3	3	5	5
4-Apr	3	5	2	4	4	6	4	3	2	2	3	3	3	2	5	4	9	2	3	3	2	2	2	3	9
5-Apr	3	3	4	3	3	2	5	4	4	6	4	4	7	8	6	5	5	4	4	3	5	5	4	6	8
6-Apr	3	2	2	2	4	3	3	3	2	3	3	3	2	7	5	5	3	2	3	3	1	3	4	3	7
7-Apr	3	3	3	3	2	2	1	1	2	3	4	3	5	5	5	5	6	6	6	5	4	5	5	4	6
8-Apr	3	4	3	3	3	4	4	5	4	5	5	6	5	5	5	5	4	4	4	4	3	3	2	2	6
9-Apr	2	2	2	1	1	1	2	2	2	3	4	4	4	4	4	3	4	3	3	3	2	2	3	2	4
10-Apr	3	5	3	3	3	3	3	4	2	2	1	2	3	4	4	3	3	2	3	3	4	2	2	5	5
11-Apr	2	2	2	3	3	3	3	4	3	3	3	4	4	4	4	4	4	3	3	4	4	3	2	2	4
12-Apr	3	2	2	1	2	2	1	2	2	2	3	4	4	4	4	4	4	4	3	2	3	2	3	2	4
13-Apr	3	2	2	2	2	1	2	2	7	4	5	5	5	5	6	5	5	5	4	3	4	4	4	5	7
14-Apr	5	5	4	4	4	2	4	4	3	4	4	6	6	6	AF	AF	AF	AF	AF	AF	3	4	4	5	8
15-Apr	5	7	5	4	4	4	4	3	3	3	3	3	4	5	4	4	4	3	2	2	5	4	5	7	
16-Apr	6	4	4	2	3	5	3	2	2	2	3	4	5	6	6	5	4	4	5	4	3	3	2	2	6
17-Apr	7	4	5	5	5	4	4	4	4	4	3	4	4	5	4	4	4	4	4	4	3	3	3	3	7
18-Apr	3	3	3	3	3	4	3	3	2	3	3	2	3	4	3	3	3	2	2	2	2	2	2	2	4
19-Apr	2	2	2	2	2	1	1	1	1	2	1	1	2	2	2	3	3	2	3	2	3	2	2	2	3
20-Apr	1	1	3	2	1	1	1	1	3	5	3	5	5	4	4	4	4	4	4	4	3	1	1	1	5
21-Apr	1	2	2	4	1	1	1	1	1	3	3	3	2	3	3	2	2	2	1	1	2	1	1	2	4
22-Apr	1	1	1	5	2	4	4	3	4	3	4	4	5	4	5	5	4	3	3	2	2	5	3	2	5
23-Apr	2	2	1	1	1	2	2	2	4	3	3	4	3	4	2	3	3	2	2	2	1	2	3	2	4
24-Apr	4	5	4	2	3	2	3	3	3	5	4	6	5	4	4	4	3	4	4	3	3	2	2	4	6
25-Apr	3	5	4	4	8	2	3	3	4	4	5	4	5	6	4	4	4	4	3	3	4	4	5	5	8
26-Apr	4	5	4	4	4	4	4	5	4	6	6	7	6	4	5	4	4	4	3	4	3	2	2	3	7
27-Apr	5	3	3	3	2	2	3	2	3	2	5	5	4	5	5	4	3	2	2	1	1	3	2	1	5
28-Apr	3	2	2	2	2	2	1	1	1	2	2	1	1	4	2	3	2	3	2	2	3	3	2	3	4
29-Apr	4	3	3	3	2	3	3	2	1	2	6	6	6	5	5	5	5	7	7	3	2	3	3	2	7
30-Apr	3	2	2	2	3	2	1	2	2	2	3	4	3	4	8	7	6	4	2	4	2	1	2	1	8
	7	7	5	5	8	6	5	5	7	6	6	7	7	8	8	7	9	7	7	5	8	8	6	6	

Diurnal Maximum

AF - Analyzer Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	73	10.22	10.22
6 - 11	176	24.65	34.87
12 - 19	262	36.69	71.57
20 - 28	168	23.53	95.10
29 - 38	35	4.90	100.00
> 38	0	0.00	100.00

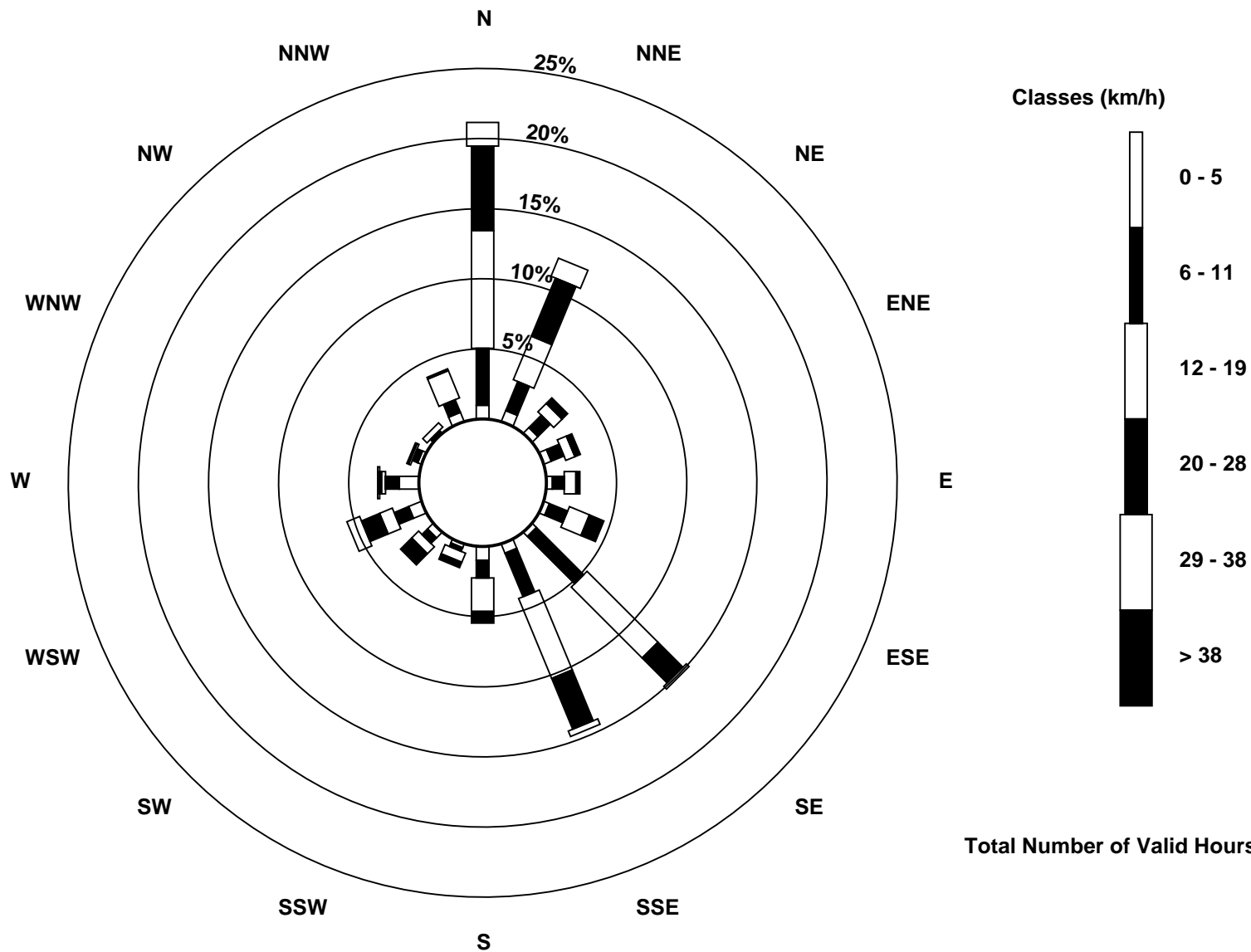
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower (AMS 3)





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower - April 2017

Maximum Speed: 44 km/h on Apr 1 04:00	Maximum Daily Speed Average: 26.9 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 30 20:00	Minimum Daily Speed Average: 2.4 km/h on Apr 19	Hours of Data: 720
Maximum Diurnal Speed Average: 6.3 km/h at hour 21	Minimum Diurnal Speed Average: 2.2 km/h at hour 17	Hours of Missing Data: 0
Monthly Average Velocity: 3.7 km/h 75.8 deg	Percentiles: P ₁ = 2 P ₁₀ = 7 Q ₁ = 11 Median = 17 Q ₃ = 23 P ₉₀ = 29 P ₉₉ = 37	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW36	WSW40	WSW42	WSW44	WSW41	WSW30	WSW35	WSW38	WSW38	WSW35	WSW29	WSW27	WSW34	WSW26	W16	W15	WNW15	NNW16	N12	NNW3	WSW20	W25	W28	WSW31	WSW26.2	WSW44
2-Apr	W31	W25	WSW21	WSW25	WSW24	WSW18	WSW17	WSW10	SW12	SW8	SW7	WSW10	WSW16	NW20	WNW26	N23	NNE21	NNE19	NNE17	NNE18	NE12	N16	N21	N21	WNW9.6	W31
3-Apr	N21	NNE19	N16	NNE22	NNE23	NNE19	NNE13	NNE3	WNW4	W4	W5	WSW8	W4	N4	WNW9	WNW12	WNW10	N8	ENE7	E7	SE9	W10	SW3	SSE5	N6.0	NNE23
4-Apr	W6	SSW6	SSE18	SSE12	SSE15	SSE16	S13	S8	SE9	SSE7	S11	SW21	S11	SSE11	SE14	S20	SSW25	SSE10	SSE9	SSE7	S8	SSW5	SSE10	SSE12	S10.4	SSW25
5-Apr	SSE15	SSE16	SSE14	S13	SSE16	SSE14	SSE16	SSE18	SSE19	SE26	SE30	SSE38	SSE35	S30	S27	S24	S25	S31	S30	S31	S32	S32	S32	S30	SSE23.8	SSE38
6-Apr	SSE15	SSE15	SSE16	SSE18	SSE12	SSE13	S14	S13	S12	SSW8	SSE7	SSE8	SSE15	WSW15	W31	WSW20	WSW27	W23	NW18	NW19	N14	NE22	ENE25	ENE21	SSW5.0	W31
7-Apr	NE10	NE5	NNE12	NNE15	N18	N20	NNE18	NNE13	N17	N21	N23	N27	NNE33	NNE34	NNE34	NNE33	NNE30	NNE38	NNE34	NNE33	NNE31	NNE35	NNE33	NNE30	NNE24.6	NNE38
8-Apr	NNE28	NNE30	NNE26	N28	N25	NNE27	N31	N29	N31	N33	NNE34	NNE33	N33	NNE32	N34	N29	N28	NNE26	NNE24	NNE21	NNE18	NNE20	NNE15	NNE11	NNE26.9	NNE34
9-Apr	N12	NNE10	NNE7	N8	NNE9	NNE9	NE7	WSW3	SW8	SSW7	S9	SSE13	SSE13	SSE12	S13	S12	SSE13	SSE15	SSE19	SSE25	SE27	SSE25	SSE26	SSE17	SSE8.4	SE27
10-Apr	SSE23	S21	S24	S21	S18	S20	S21	S17	S12	SSE15	SSE13	SSE11	SSE14	SSE14	SE15	SE10	SE12	SE14	SE14	SE17	SE13	SSE11	S10	NNE9	SSE14.1	S24
11-Apr	NE19	NNE18	NNE22	NNE26	N24	N22	N19	N25	N26	NNE24	N25	N25	N26	NNE26	NNE25	NNE25	NNE20	N22	N27	N27	N27	N23	N22	N21	N23.4	N27
12-Apr	N19	N16	N16	NNE16	NNE18	NNE17	NNE14	N13	N12	N12	N11	N15	N18	N14	N15	N14	NNE15	NNE20	NNE23	NNE26	NE29	NE18	NE13	E12	NNE15.4	NE29
13-Apr	ESE9	ESE11	SE10	SE11	ESE11	ESE14	SE16	ESE17	ESE14	ESE22	ESE17	ESE17	ESE21	ESE22	ESE21	ESE21	ESE22	ESE29	ESE30	ESE29	E30	E21	E22	E23	ESE18.7	E30
14-Apr	E19	E20	E16	ENE9	NE13	NE14	NE18	NE24	ENE23	ENE24	ENE23	ENE27	NE26	ENE31	NE31	NE32	ENE25	ENE25	NE23	ENE25	ENE28	ENE29	NE31	NNE30	ENE22.8	NE32
15-Apr	NE31	NE26	NE23	NNE23	NNE26	NNE24	NNE23	NNE19	NNE19	NNE15	N18	NNE18	NNE15	N15	NNW24	N19	N18	NNE17	NNE16	NNE15	NE12	SE21	SSE21	SSE23	NNE14.8	NNE31
16-Apr	SSE32	SSE29	SSE24	SSE23	SSE27	SSE20	SSE17	SSE13	SSE12	SSE14	SSE17	S15	SW22	SW24	SW25	SW24	SW26	SW25	SSW24	SSW21	SSW15	SSW16	SSW12	SW9	S18.1	SSE32
17-Apr	N21	NNE25	NNE30	NNE30	N29	N29	NNE29	N25	NNE31	NNE27	NNE26	NNE25	NNE25	NNE22	NNE23	NNE24	NNE23	NNE24	NNE22	NNE22	NNE21	NNE18	NNE21	NNE24.5	NNE31	
18-Apr	NNE16	NNE19	NNE21	NNE21	NNE21	NNE19	NNE20	NNE18	N16	N14	N13	N15	N16	N15	N14	N14	NNE13	NNE15	NNE14	N14	N12	N14	N13	N12	N15.7	NNE21
19-Apr	N13	N12	N10	N13	N11	NNE9	N6	NNW5	NW4	WNW5	WNW6	W4	WSW6	WSW6	WSW6	SW4	S10	S9	S8	WSW9	W10	WNW5	SE4	SSE9	WNW2.4	N13
20-Apr	SSE9	SE11	SE10	SE15	ESE14	ESE11	ESE10	E10	NNE7	N18	NNE18	NNE31	N39	N38	NNE35	NNE32	N31	NNE30	NNE24	NNE14	N14	NNW8	NNW14	NNE18	NNE14.2	N39
21-Apr	NNE21	NNE22	NNE28	NE26	NE12	N6	NNE9	NNE4	NNW3	N7	NNE8	N5	N4	W4	WNW6	W5	W4	W2	W2	WNW3	NE8	ESE7	SSE7	S7	NNE5.9	NNE28
22-Apr	SSW3	SSW4	W7	NNW19	NNE24	N24	NNE23	NNE21	NNE26	NNE23	NNE22	NNE20	NNE16	N17	N18	N18	NNE17	NNE15	NNE15	NNE17	NE24	NE24	ENE14	ENE9	NNE15.8	NNE26
23-Apr	ESE8	SE8	ESE14	ESE10	ESE9	ESE13	ESE12	SE7	SE11	SE11	SE11	SSE11	SSE12	SE11	SSE7	SSE11	SSE11	SE11	SE14	SE18	SE20	SE22	SE22	SE17	SE12.2	SE22
24-Apr	SE19	ESE15	ESE13	ESE10	ESE7	E9	ESE12	ENE10	ENE13	E16	ESE20	ESE18	SE17	SE14	SE17	ESE19	ESE20	ESE20	ESE17	ESE15	SE18	ESE16	SE16	SE16	ESE14.6	ESE20
25-Apr	SE21	SE17	SE13	SE18	SE23	SE25	SE25	SE24	SE22	SE20	SSE19	SE26	SE22	SSE21	SSE17	S15	S18	S21	S19	S21	S26	S28	S30	S29	SSE20.8	S30
26-Apr	S28	S28	S27	SSE25	SSE23	SSE22	SSE21	S22	S23	S19	SSE28	SSE27	SSE23	S22	S19	S20	S17	S19	S19	S17	SSE14	SE15	SSE17	SSE19	SSE21.1	S28
27-Apr	S26	S21	S20	S17	S16	SSE20	SE20	SSE16	SSE14	SE13	SE17	SE17	SE15	SE15	SSE11	SE6	W7	W7	W6	NW6	N14	NNE17	ENE6	E6	SSE8.8	S26
28-Apr	NE6	N6	NNW3	WSW4	WNW4	W2	SW4	SSW3	S4	S1	SSW1	SSW2	WSW4	NNW5	NNE5	WSW5	SW3	NE9	E7	E13	ESE18	ESE20	ESE20	SE20	ESE3.1	ESE20
29-Apr	SSE14	S13	S13	S11	SSW9	SSW9	SSW7	SSE5	SE6	SSE5	S11	SW20	SW22	SSW17	SW18	S18	S18	SSW18	SSW24	SSW12	SW13	SSW15	SSW14	S12	SSW12.7	SSW24
30-Apr	S12	S9	S14	S17	S18	S13	S10	S11	S8	SSE7	SSE12	S6	SSW3	SE13	NNE12	NNE27	NW4	E11	E10	S1	NNW5	ENE4	ESE7	SE4	SSE5.2	NNE27

ESE3.4 ESE3.2 ESE3.3 ENE2.7 ENE3.0 ENE3.9 E4.0 ENE2.9 ENE2.9 ENE3.6 E4.6 E3.2 ENE2.6 ENE3.1 NNE3.2 NE3.9 NE2.2 ENE4.9 ENE5.4 ENE5.7 ENE6.3 E5.9 ESE5.9 ESE5.5	Diurnal Average
SW36 WSW40 WSW42 WSW44 WSW41 WSW30 WSW35 WSW38 WSW38 WSW35 NNE34 NNE33 N39 N38 NNE35 NNE33 N31 NNE38 NNE34 NNE33 S31 NNE35 NNE33 WSW31	Diurnal Maximum

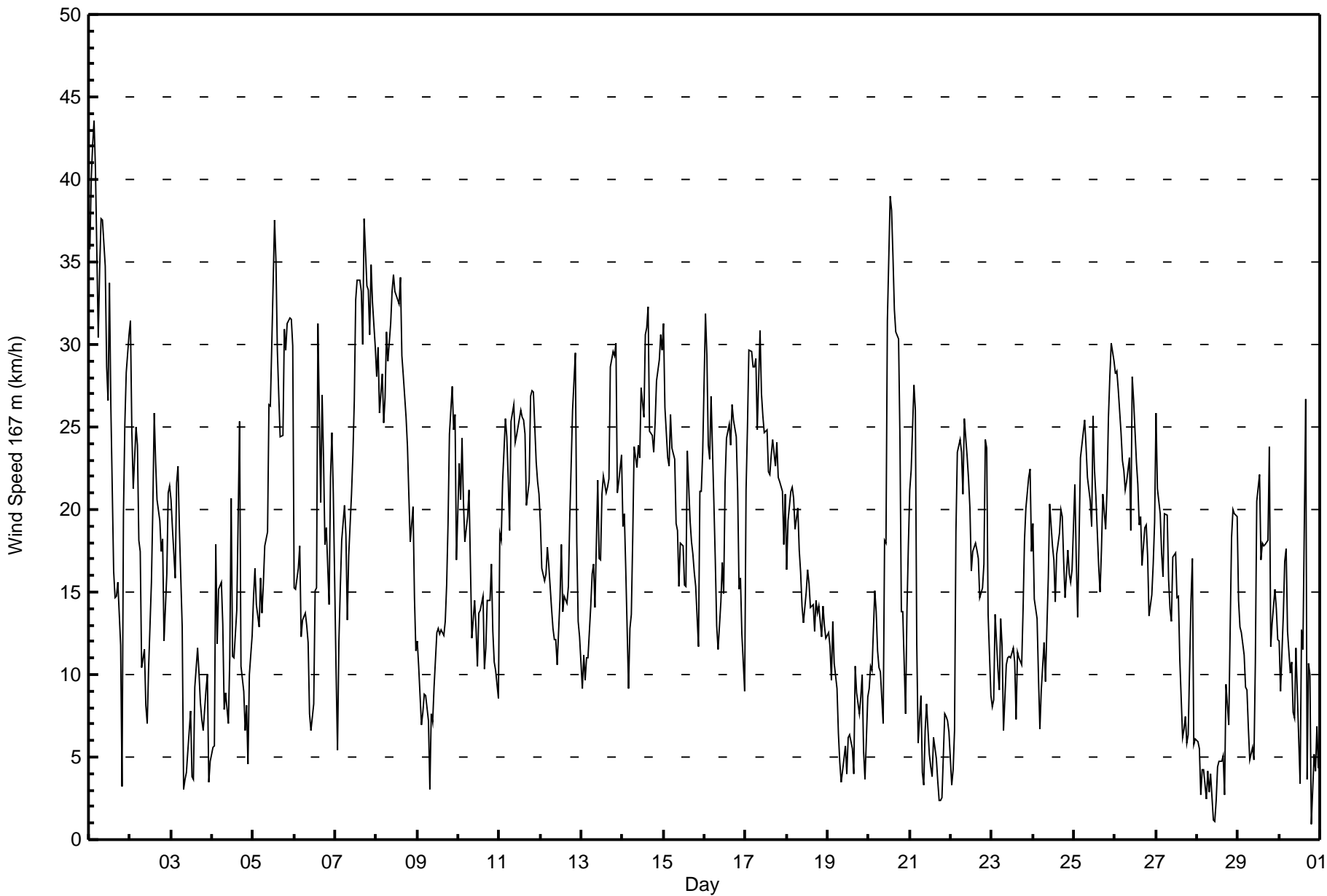
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 167 m (WS167m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 24 km/h on Apr 20 18:00 Minimum Value: 1 km/h on Apr 30 22:00 Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	2	3	3	4	3	3	4	2	1	3	4	2	4	6	4	4	5	2	3	7	5	3	3	7
2-Apr	4	3	5	3	2	4	4	2	1	2	2	7	5	6	5	6	5	6	3	2	3	7	2	2	7
3-Apr	2	2	2	1	1	2	3	2	1	2	2	2	3	3	4	2	3	2	1	1	3	4	2	4	4
4-Apr	3	3	4	4	3	3	2	2	3	4	3	3	3	3	5	4	10	3	2	3	3	2	3	3	10
5-Apr	2	3	3	3	3	2	3	3	4	6	3	4	6	6	6	5	4	3	3	2	3	3	3	4	6
6-Apr	3	2	2	2	2	3	3	4	2	2	3	2	3	7	4	5	4	2	4	2	1	5	4	5	7
7-Apr	4	2	3	2	4	2	4	1	2	2	4	4	5	5	5	6	6	6	6	6	5	5	5	5	6
8-Apr	4	4	4	3	4	5	4	4	4	4	5	6	5	5	5	4	4	4	4	4	2	3	2	2	6
9-Apr	2	2	2	1	1	1	2	3	2	3	4	4	3	3	4	3	3	3	3	4	3	2	3	3	4
10-Apr	4	4	2	3	2	4	2	4	2	2	2	2	3	4	3	3	3	2	2	1	3	2	2	5	5
11-Apr	3	3	3	3	3	3	3	4	3	3	3	3	4	4	3	4	4	3	3	4	5	3	3	2	5
12-Apr	3	2	1	1	1	2	2	1	2	2	3	4	4	4	4	4	4	4	3	3	3	5	5	2	5
13-Apr	3	2	3	3	2	2	3	2	6	3	5	5	4	5	6	5	5	4	4	3	3	5	4	5	6
14-Apr	6	5	5	4	5	3	4	4	4	4	5	6	6	7	7	6	7	7	5	5	8	8	7	5	8
15-Apr	6	7	4	4	5	5	5	3	4	3	3	4	4	4	4	4	4	3	2	2	2	4	4	5	7
16-Apr	6	4	4	4	4	5	3	2	2	3	3	4	4	5	5	4	3	4	5	4	2	2	3	2	6
17-Apr	6	5	5	5	5	4	4	4	4	5	4	4	4	5	4	4	4	4	3	4	3	4	4	3	6
18-Apr	3	4	3	4	4	3	3	3	3	3	3	2	3	4	3	3	3	2	2	2	2	2	1	2	4
19-Apr	1	1	2	2	2	1	1	1	1	2	1	2	2	2	2	3	4	2	2	3	3	2	2	2	4
20-Apr	2	2	1	3	2	2	1	2	2	3	4	5	5	4	5	5	15	24	16	4	3	1	2	2	24
21-Apr	3	3	2	2	6	1	1	2	2	3	2	3	2	3	2	2	1	2	1	1	2	1	2	1	6
22-Apr	2	1	1	6	3	3	5	3	4	3	4	4	5	4	4	4	4	3	2	2	1	3	4	3	6
23-Apr	3	4	2	2	2	4	3	3	4	3	3	3	3	4	2	3	3	2	2	2	1	2	3	2	4
24-Apr	4	4	4	3	3	3	3	4	3	5	5	6	5	3	4	3	2	3	4	2	3	2	2	3	6
25-Apr	3	4	5	5	5	2	3	3	3	4	5	4	5	6	3	4	3	3	3	3	3	2	3	2	6
26-Apr	2	2	2	2	2	2	3	4	4	4	7	7	5	4	4	4	4	3	3	3	3	2	2	5	7
27-Apr	3	1	2	2	2	3	2	3	3	2	4	5	4	4	5	3	3	3	2	1	2	2	3	1	5
28-Apr	3	3	1	2	1	1	1	2	1	1	2	1	2	4	2	3	2	3	2	2	1	1	3	2	4
29-Apr	3	3	2	2	1	1	2	2	1	2	6	6	5	6	5	5	5	7	6	3	1	2	1	3	7
30-Apr	2	1	2	3	4	3	1	2	2	2	3	3	3	4	9	8	6	3	3	2	3	1	1	1	9
																		Diurnal Maximum							





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 167 m (WS167m) - km/h
Lower Camp Met Tower - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	54	7.50	7.50
6 - 11	130	18.06	25.56
12 - 19	254	35.28	60.83
20 - 28	205	28.47	89.31
29 - 38	72	10.00	99.31
> 38	5	0.69	100.00

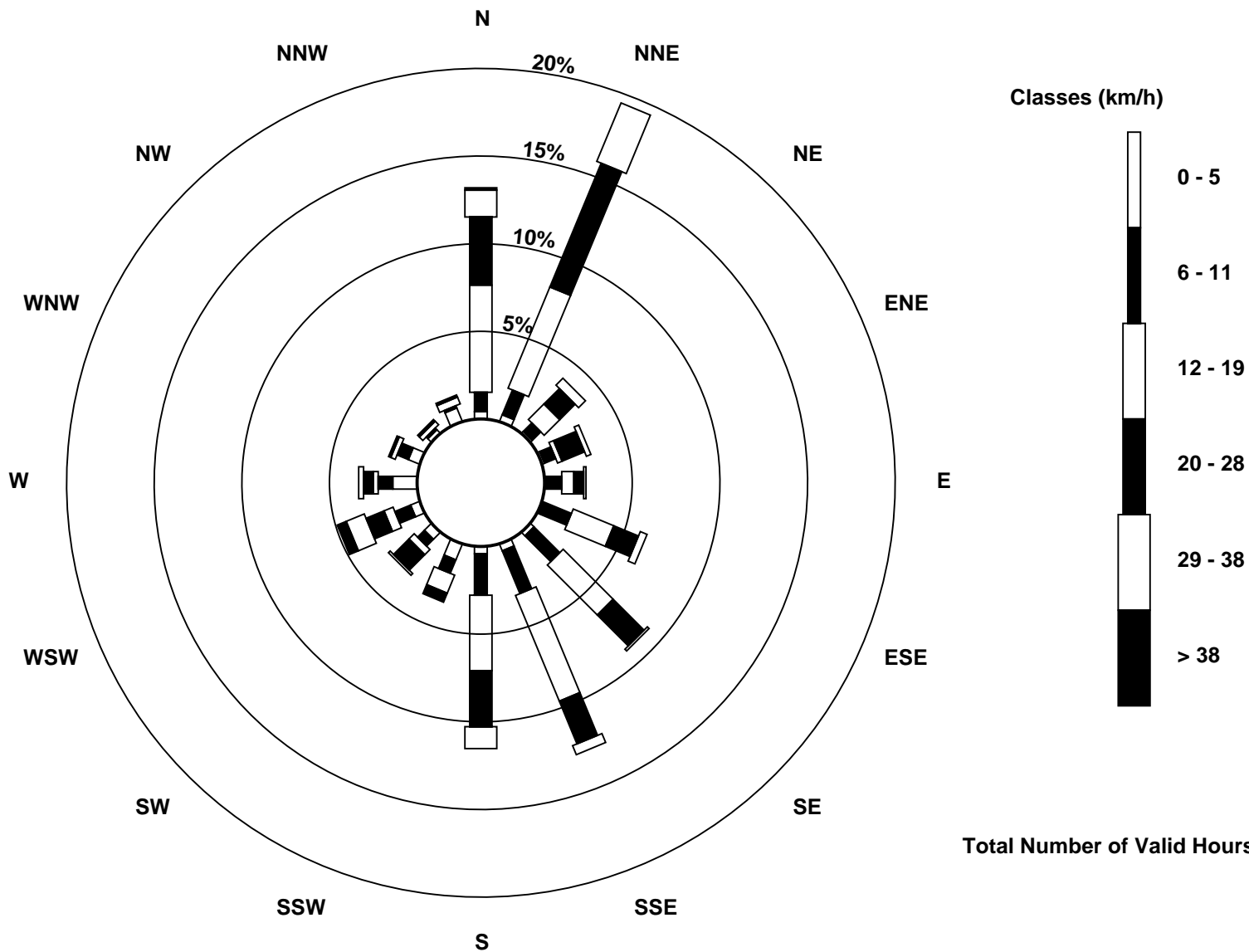
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 167 m (WS167m) - km/h
Lower Camp Met Tower (AMS 3)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Lower Camp Met Tower - April 2017

Direction of Maximum Speed: 172 deg on Apr 5 14:00 Direction of Maximum Daily Speed Average: 169.5 deg on Apr 26	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 25 deg on Apr 29 00:00 Direction of Minimum Daily Speed Average: 0.4 deg on Apr 28	Percent Operational Time: 100.0
Monthly Average Direction: 285.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	228	254	253	260	270	270	254	256	259	256	260	270	261	259	269	277	297	341	337	231	262	268	278	266	262.5
2-Apr	283	317	293	213	236	217	223	196	252	190	148	228	247	335	304	17	27	26	1	322	287	345	329	327	306.1
3-Apr	313	286	348	341	335	353	313	291	354	243	254	256	242	205	295	284	263	343	58	303	207	245	147	163	278.0
4-Apr	324	145	154	148	145	172	154	124	154	165	184	240	184	152	149	188	209	152	152	155	149	270	163	134	171.7
5-Apr	121	140	155	143	102	118	164	171	173	149	146	156	162	172	178	181	187	185	173	178	162	156	156	154	164.8
6-Apr	152	152	112	132	358	336	16	158	149	146	150	152	152	217	269	258	262	267	286	271	299	319	57	357	207.2
7-Apr	344	352	335	328	349	1	359	357	357	353	2	4	21	19	23	26	27	30	30	26	21	21	11	9	14.0
8-Apr	2	359	354	357	5	16	9	3	4	5	23	27	14	19	10	11	7	14	14	23	6	11	16	4	10.2
9-Apr	344	10	33	13	13	11	8	259	236	208	174	175	169	159	180	183	164	165	162	154	151	153	153	144	161.7
10-Apr	147	144	147	152	151	157	154	155	153	151	153	148	153	177	157	149	157	162	175	190	131	160	113	340	154.2
11-Apr	336	7	359	2	357	355	358	4	9	14	11	1	1	12	12	17	11	9	1	3	356	349	353	358	3.8
12-Apr	346	350	358	2	6	336	3	3	351	347	358	360	2	4	358	9	4	8	15	16	343	334	352	9	0.2
13-Apr	339	334	353	320	321	331	342	5	60	136	132	148	132	124	109	129	110	117	102	103	78	63	47	66	103.6
14-Apr	73	93	82	64	8	355	12	31	40	47	50	59	52	57	39	50	57	73	42	60	64	60	43	31	49.6
15-Apr	34	45	40	21	12	12	16	360	18	10	3	6	17	355	348	353	1	13	15	360	32	155	157	167	17.2
16-Apr	157	153	164	158	162	166	156	152	148	154	150	161	231	223	225	218	225	224	209	200	168	160	155	161	181.0
17-Apr	353	6	11	12	8	7	12	9	12	22	22	16	15	20	29	39	32	25	29	25	19	25	21	23	17.4
18-Apr	23	21	19	11	4	7	25	22	356	355	344	355	1	359	1	360	4	13	15	6	357	358	354	350	5.5
19-Apr	348	354	343	359	3	358	3	359	0	258	255	245	256	261	256	196	173	172	169	219	258	146	142	162	268.1
20-Apr	324	339	344	340	323	342	355	2	6	356	7	9	7	2	7	8	0	2	10	358	340	293	314	322	359.2
21-Apr	335	339	358	21	346	358	327	315	251	347	19	353	352	244	263	252	255	261	257	336	356	300	203	353	316.2
22-Apr	341	340	345	336	344	357	13	12	24	16	22	26	16	10	6	9	16	20	17	16	32	348	335	9	11.9
23-Apr	29	18	342	336	339	336	352	340	140	162	165	174	170	166	174	169	161	153	147	139	121	135	144	153	152.9
24-Apr	136	108	85	356	358	9	111	68	54	89	115	109	152	152	150	118	114	111	112	93	118	103	63	65	110.0
25-Apr	157	169	162	193	130	149	148	149	150	156	160	153	155	164	173	177	185	178	174	180	181	175	169	169	165.5
26-Apr	168	167	169	165	162	161	160	172	180	174	155	158	169	178	177	180	191	182	180	172	158	96	152	147	169.5
27-Apr	167	168	167	159	153	142	148	151	155	152	150	155	156	147	166	136	298	280	273	316	6	298	141	343	160.7
28-Apr	326	356	150	21	178	137	143	147	152	144	201	240	236	346	16	268	226	51	79	79	80	178	356	25	156.3
29-Apr	124	138	140	154	156	160	154	150	156	150	187	224	235	211	226	185	189	208	217	207	223	213	109	100	184.8
30-Apr	164	145	143	152	139	100	154	147	147	153	152	166	189	159	41	2	290	76	101	283	117	205	70	161	144.7

67.6 91.5 94.1 70.7 39.4 46.5 90.1 89.2 102.0 119.8 115.2 138.0 164.2 145.6 301.3 88.5 214.0 96.2 97.3 84.1 90.4 98.3 102.8 66.6

Diurnal Average

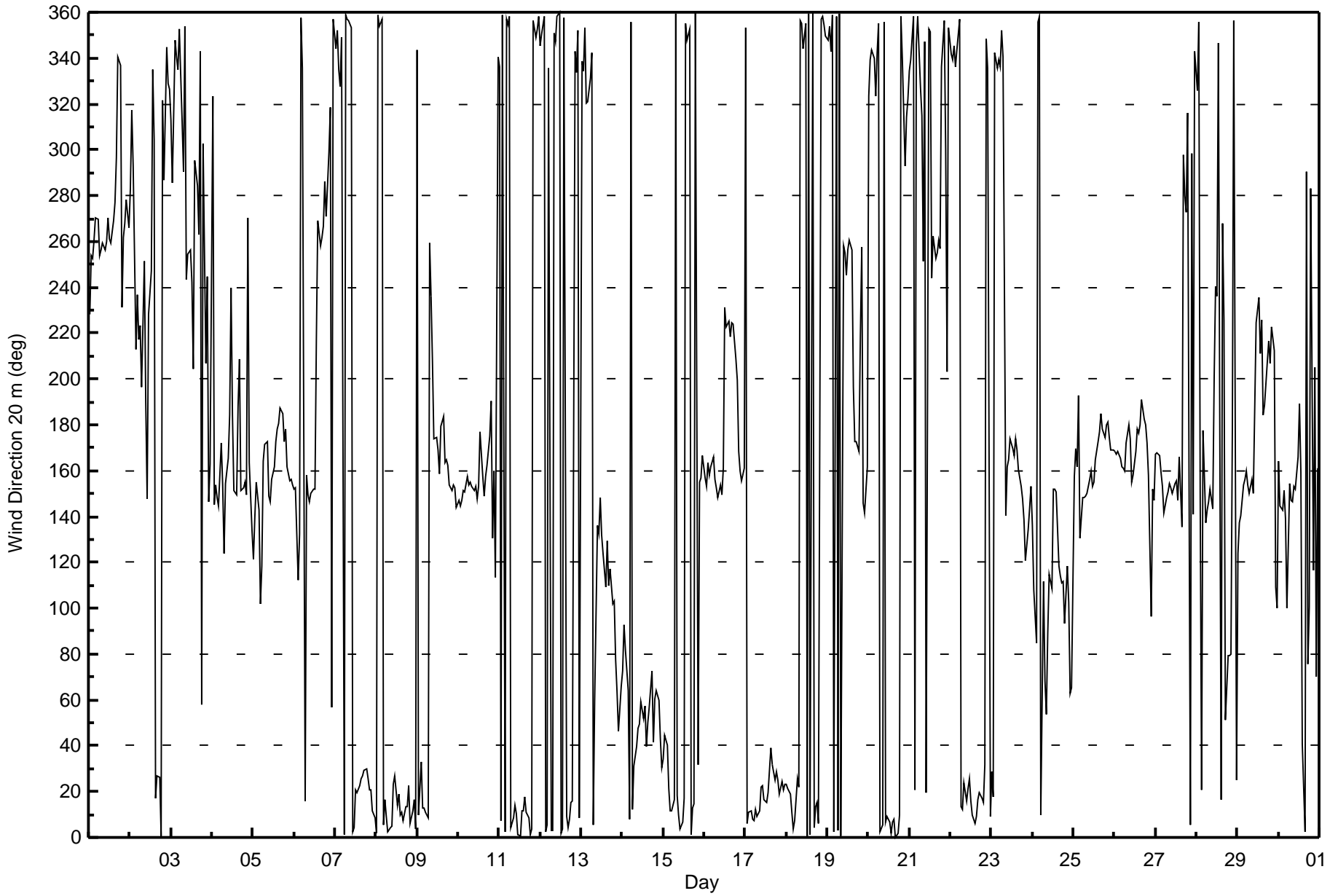
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Apr 25 00:00		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																							
Minimum Value: 5 deg on Apr 5 23:00																									
Percentiles: P ₁ = 7 P ₁₀ = 13 Q ₁ = 18 Median = 23 Q ₃ = 32 P ₉₀ = 60 P ₉₉ = 93																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	22	13	12	15	17	42	16	16	14	15	22	23	16	17	30	27	41	29	38	20	37	33	16	12	42
2-Apr	66	94	80	66	74	27	19	39	23	54	17	53	20	36	22	34	26	23	19	17	38	21	24	62	94
3-Apr	34	28	21	24	26	19	67	74	73	17	25	17	35	67	47	31	27	53	57	60	47	58	75	93	93
4-Apr	43	26	11	25	24	54	29	33	13	16	22	17	35	20	24	18	17	17	19	75	59	86	26	78	86
5-Apr	27	20	16	24	71	54	52	13	17	19	20	15	16	11	14	12	11	13	9	10	9	6	5	10	71
6-Apr	78	10	68	16	70	94	65	21	13	15	29	15	11	61	14	19	15	13	17	59	47	31	82	26	94
7-Apr	36	31	31	46	26	15	23	21	18	18	19	19	23	23	22	21	23	20	19	19	22	20	24	20	46
8-Apr	15	17	15	16	19	22	21	18	22	20	25	23	23	23	21	24	23	23	23	23	21	20	22	24	25
9-Apr	17	23	31	25	20	23	33	77	33	60	35	25	28	25	29	21	22	14	16	7	11	8	11	34	77
10-Apr	24	19	8	8	8	6	7	9	13	16	14	16	17	24	20	24	16	12	14	29	54	39	84	77	84
11-Apr	25	14	13	16	20	18	21	20	21	23	23	23	21	23	22	24	23	22	18	17	17	17	16	17	25
12-Apr	25	18	17	18	22	40	29	22	25	22	30	27	28	32	31	31	26	21	20	17	19	28	37	17	40
13-Apr	33	31	40	36	33	26	31	15	64	20	30	21	20	24	32	24	24	19	19	19	21	33	21	29	64
14-Apr	53	27	32	61	39	18	22	23	23	22	22	23	22	23	21	23	27	35	28	21	25	30	23	21	61
15-Apr	20	25	24	23	22	21	24	18	26	22	23	24	32	32	21	22	23	25	22	18	49	73	9	10	73
16-Apr	15	14	10	14	12	27	13	13	17	13	16	30	17	15	17	14	11	10	10	14	9	7	14	77	77
17-Apr	23	20	21	23	19	20	22	21	23	23	24	25	26	27	30	28	25	29	22	22	23	21	24	22	30
18-Apr	21	22	21	22	21	21	23	27	22	23	23	26	22	21	25	26	27	25	24	21	21	20	19	22	27
19-Apr	19	19	22	20	18	18	21	27	54	20	18	19	27	34	54	57	18	15	12	34	82	86	69	87	87
20-Apr	93	37	25	28	28	22	29	24	18	19	20	21	17	17	20	20	19	19	22	32	22	17	25	20	93
21-Apr	21	17	14	51	47	37	49	60	48	62	37	89	60	73	34	23	20	43	34	34	56	59	63	68	89
22-Apr	47	50	27	32	14	19	22	24	23	26	28	30	29	29	28	30	31	28	25	21	16	46	46	61	61
23-Apr	24	31	16	24	19	17	25	50	49	19	27	20	18	18	25	15	16	17	15	17	15	19	18	26	50
24-Apr	36	55	83	35	30	46	29	36	32	42	24	35	25	26	21	26	21	23	23	21	28	22	36	100	100
25-Apr	22	28	59	39	71	17	17	18	20	20	17	20	18	20	18	18	17	13	11	11	11	11	7	7	71
26-Apr	7	6	7	9	10	9	11	12	14	20	16	15	18	16	15	16	20	15	14	15	13	79	59	36	79
27-Apr	7	9	10	9	9	11	12	13	16	17	24	29	28	26	40	57	61	49	27	27	40	63	98	29	98
28-Apr	71	77	51	97	78	24	16	24	20	57	34	25	28	90	69	62	65	35	28	20	78	67	97	92	97
29-Apr	69	14	11	13	8	7	10	18	14	19	47	18	17	34	33	19	19	19	9	15	14	53	34	44	69
30-Apr	57	83	79	37	25	95	36	18	21	17	20	66	54	16	82	28	61	65	34	42	44	93	93	82	95
	93	94	83	97	78	95	67	77	73	62	47	89	60	90	82	62	65	65	57	75	82	93	98	100	
	Diurnal Maximum																								





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg
Lower Camp Met Tower - April 2017

Direction of Maximum Speed: 150 deg on Apr 5 13:00 Direction of Maximum Daily Speed Average: 5.3 deg on Apr 8	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 168 deg on Apr 28 03:00 Direction of Minimum Daily Speed Average: 0.8 deg on Apr 28	Percent Operational Time: 100.0
Monthly Average Direction: 325.6 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	220	243	242	248	257	252	243	247	251	248	252	260	253	251	261	272	289	336	342	227	250	256	269	257	253.1
2-Apr	263	272	265	227	225	226	220	219	242	187	139	230	241	326	296	11	21	19	357	335	308	331	341	337	300.1
3-Apr	349	296	334	349	345	348	326	299	352	243	249	250	237	194	291	278	256	341	56	8	182	221	135	140	290.0
4-Apr	301	137	143	140	137	158	148	125	141	154	174	233	176	142	140	177	199	140	139	144	146	249	143	130	160.6
5-Apr	124	136	142	132	111	116	151	159	162	138	135	142	150	163	169	172	177	175	165	169	154	146	145	145	153.8
6-Apr	135	141	128	130	321	8	20	143	138	139	140	141	142	212	261	249	252	257	287	277	309	340	55	354	195.6
7-Apr	341	348	346	329	346	346	339	338	345	348	358	359	16	15	17	19	19	23	22	19	15	15	11	5	8.1
8-Apr	358	355	348	351	1	11	5	358	360	1	18	19	8	14	5	5	4	10	9	16	3	6	10	358	5.3
9-Apr	338	4	27	7	8	9	3	250	228	196	167	165	157	149	169	174	155	155	152	144	136	140	138	135	146.0
10-Apr	137	134	138	142	141	148	146	146	141	138	141	139	145	165	144	139	146	150	165	174	130	150	137	349	143.6
11-Apr	338	355	351	357	352	349	355	359	5	7	6	356	355	5	6	11	7	3	357	360	352	344	346	350	358.3
12-Apr	344	345	350	354	354	343	351	357	346	343	353	355	355	359	352	3	358	4	12	12	347	333	342	3	355.3
13-Apr	345	340	337	332	343	342	346	351	59	125	121	137	122	115	102	119	103	110	97	98	75	59	50	65	92.3
14-Apr	74	88	76	53	8	349	13	27	34	44	45	55	46	51	33	45	49	66	37	54	56	54	36	22	43.9
15-Apr	27	37	31	16	8	7	12	356	12	6	358	0	9	352	341	347	353	7	11	356	19	150	148	157	11.4
16-Apr	145	141	152	144	150	154	146	142	136	143	141	152	221	214	215	209	217	216	199	190	164	154	149	155	170.1
17-Apr	350	2	5	7	4	2	8	5	7	16	14	11	11	14	23	30	25	21	23	18	13	17	15	17	12.1
18-Apr	18	14	12	5	0	3	18	16	353	351	340	351	357	355	356	353	360	7	9	2	351	355	349	350	1.0
19-Apr	344	349	341	355	357	353	353	355	351	251	249	242	251	257	252	194	163	164	162	213	240	189	154	146	274.0
20-Apr	180	345	340	346	339	343	345	348	353	348	2	5	1	357	3	3	355	358	6	357	338	294	328	339	355.5
21-Apr	335	335	351	13	350	342	334	327	256	347	12	352	347	245	258	248	250	257	254	330	12	317	207	332	320.9
22-Apr	344	333	339	345	341	353	10	7	16	10	16	19	11	3	2	4	9	11	12	10	24	4	338	4	7.0
23-Apr	26	15	343	345	344	342	353	338	129	151	151	163	159	153	163	157	150	141	136	130	115	123	132	136	134.2
24-Apr	127	106	92	357	356	5	104	67	50	82	107	100	140	141	140	111	107	104	105	89	109	103	78	96	101.6
25-Apr	140	144	154	163	127	140	138	138	138	142	147	140	144	153	162	167	174	169	167	171	173	167	163	163	154.2
26-Apr	162	161	161	158	153	154	149	165	171	164	143	147	158	169	168	170	181	172	170	163	150	111	130	134	159.4
27-Apr	161	162	161	153	142	133	138	140	142	142	139	143	144	136	155	127	288	275	267	310	351	345	146	334	149.9
28-Apr	340	357	168	289	254	150	132	130	138	132	193	235	230	344	6	260	220	44	75	77	93	153	114	134	119.9
29-Apr	123	128	132	143	149	151	145	138	142	138	179	214	226	202	217	176	178	198	209	198	207	193	118	108	175.1
30-Apr	143	138	137	141	136	116	139	136	137	144	144	155	183	146	34	1	283	73	91	269	95	139	121	232	128.1

44.7 68.6 57.0 42.0 29.8 34.9 67.4 64.6 69.2 85.0 87.4 91.6 113.9 86.7 351.9 35.3 26.5 60.6 63.9 55.7 66.8 72.0 85.4 57.7

Diurnal Average

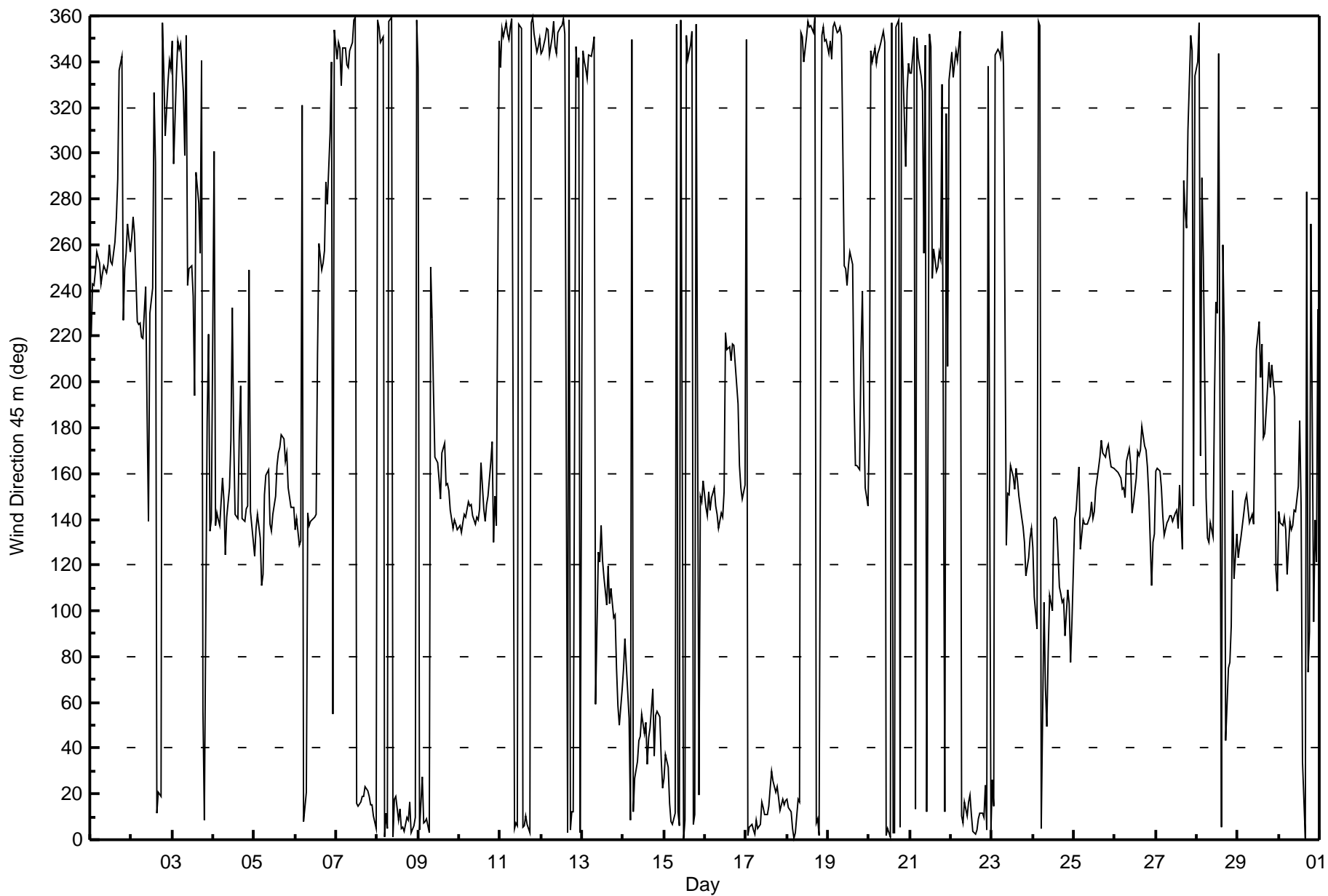
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 45 m (WD45m) - deg
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Apr 29 00:00 Minimum Value: 3 deg on Apr 5 23:00 Percentiles: P ₁ = 5 P ₁₀ = 9 Q ₁ = 13 Median = 17 Q ₃ = 25 P ₉₀ = 50 P ₉₉ = 89		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	22	7	6	8	11	24	9	7	7	7	15	14	9	10	25	22	40	23	13	36	19	24	11	7	40
2-Apr	43	96	80	45	36	15	9	37	17	59	16	51	15	31	19	32	21	18	15	13	23	18	21	29	96
3-Apr	19	28	14	10	11	13	39	51	72	13	22	12	37	76	46	26	23	44	31	83	38	52	80	90	90
4-Apr	31	9	8	13	15	43	20	54	7	14	19	13	34	17	20	13	17	12	16	60	38	92	15	15	92
5-Apr	15	13	11	20	74	38	44	11	14	15	14	12	13	9	11	9	8	10	7	7	10	4	3	6	74
6-Apr	69	5	29	5	86	75	64	13	7	12	25	12	6	60	8	13	8	8	16	29	50	23	56	25	86
7-Apr	18	13	12	29	12	11	26	14	13	12	13	14	17	16	16	14	17	13	14	13	14	13	16	15	29
8-Apr	11	13	12	12	15	15	14	14	16	16	18	17	16	17	14	19	18	18	15	16	15	13	15	19	19
9-Apr	13	20	23	20	14	17	27	85	30	50	38	22	25	22	25	18	19	13	14	6	8	6	7	19	85
10-Apr	13	13	5	4	4	4	4	6	8	13	10	11	13	21	17	19	12	10	11	28	29	17	71	77	77
11-Apr	16	10	8	13	15	13	17	15	14	17	17	18	16	17	16	18	17	16	13	14	14	13	12	13	18
12-Apr	18	14	11	13	14	22	19	20	18	18	27	22	21	25	25	26	19	16	14	9	16	12	18	8	27
13-Apr	23	21	22	26	23	13	22	10	62	15	25	19	17	21	26	19	19	14	12	12	15	29	17	22	62
14-Apr	38	19	25	50	33	15	15	16	18	16	17	18	16	18	16	18	22	28	22	17	21	26	18	15	50
15-Apr	15	20	18	17	16	16	18	14	20	18	16	18	25	29	17	18	18	20	16	14	34	76	8	10	76
16-Apr	13	10	10	11	10	20	10	10	12	9	10	29	15	14	17	14	10	9	11	13	10	6	10	50	50
17-Apr	24	15	15	16	15	16	16	15	15	17	17	19	19	22	23	21	18	23	16	16	15	15	16	15	24
18-Apr	15	15	14	18	16	17	17	20	18	18	17	18	17	18	19	21	22	20	19	16	15	17	14	17	22
19-Apr	14	15	18	15	13	15	13	20	44	14	10	17	21	26	49	56	16	13	10	33	79	69	18	38	79
20-Apr	76	60	14	10	20	14	18	20	11	14	16	15	12	13	14	15	14	14	17	30	19	12	21	14	76
21-Apr	13	13	11	39	38	16	35	52	46	58	32	56	54	79	27	17	19	40	32	30	49	34	78	94	94
22-Apr	38	43	21	17	12	14	16	18	17	21	20	24	26	22	24	25	26	24	19	17	11	40	29	36	43
23-Apr	18	15	13	15	11	11	18	58	42	14	21	16	15	16	25	13	13	14	11	11	9	11	12	18	58
24-Apr	27	44	83	31	33	37	22	28	27	32	18	28	21	21	20	20	14	17	15	14	23	14	19	85	85
25-Apr	17	27	42	61	58	11	11	12	15	17	15	16	15	19	16	16	12	9	8	7	7	8	7	6	61
26-Apr	6	6	6	8	9	9	11	9	10	17	14	14	16	13	12	12	17	10	9	13	10	33	20	14	33
27-Apr	7	8	8	9	7	7	8	9	11	15	21	24	25	22	37	57	49	38	21	25	12	23	81	27	81
28-Apr	54	83	99	84	79	10	12	21	16	70	46	21	28	90	57	56	65	30	21	12	53	40	86	100	100
29-Apr	68	9	9	9	5	5	6	13	12	16	44	16	14	33	32	17	16	19	10	15	13	17	41	23	68
30-Apr	47	30	26	16	16	57	16	15	18	15	16	66	54	12	76	25	63	56	25	52	53	49	86	66	86
	76	96	99	84	86	75	64	85	72	70	46	66	54	90	76	57	65	56	32	83	79	92	86	100	
	Diurnal Maximum																								





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - April 2017

Direction of Maximum Speed: 4 deg on Apr 20 13:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 7.9 deg on Apr 8		Hours of Data:	714
Direction of Minimum Speed: 115 deg on Apr 28 03:00		Hours of Missing Data:	6
Direction of Minimum Daily Speed Average: 1.8 deg on Apr 19		Percent Operational Time:	99.2
Monthly Average Direction: 192.4 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	228	240	240	243	246	239	240	243	250	247	246	252	251	252	265	273	293	337	7	266	238	255	267	254	250.8
2-Apr	256	255	237	246	242	235	228	231	225	209	173	244	247	322	296	11	24	23	12	18	17	347	350	343	298.3
3-Apr	354	356	350	356	360	360	3	336	280	247	258	246	240	25	296	286	266	358	64	82	143	242	166	155	332.8
4-Apr	259	143	142	151	142	156	161	150	134	150	177	230	178	147	140	177	205	139	141	145	159	171	141	142	161.1
5-Apr	153	144	145	152	135	148	150	154	160	137	135	141	149	163	171	174	179	181	169	172	163	163	162	160	157.6
6-Apr	136	140	141	143	153	143	155	157	151	163	143	136	145	226	260	250	252	257	309	308	348	35	75	37	183.3
7-Apr	348	359	347	344	345	346	354	346	348	355	2	4	20	17	20	22	22	25	26	23	21	23	21	16	11.0
8-Apr	10	6	1	358	5	11	7	0	3	2	17	20	8	13	5	6	5	12	10	19	6	7	10	3	7.9
9-Apr	346	7	32	8	13	19	21	249	222	190	166	163	152	151	170	174	158	158	153	144	139	142	146	135	143.2
10-Apr	144	148	153	155	157	158	158	160	152	138	141	145	154	163	140	136	143	145	145	119	145	151	152	23	148.4
11-Apr	11	5	2	2	359	359	2	3	7	9	6	358	356	8	8	15	9	5	1	6	2	355	355	357	3.4
12-Apr	353	351	350	355	5	4	354	353	348	347	354	354	360	4	356	5	6	10	15	20	24	359	17	42	3.0
13-Apr	7	17	339	17	40	66	82	107	98	125	116	129	119	114	105	119	106	111	101	104	85	76	77	84	99.1
14-Apr	95	96	86	68	33	19	39	43	51	57	56	61	51	54	AF	AF	AF	AF	AF	AF	63	58	39	27	54.2
15-Apr	30	38	36	21	12	13	17	3	17	10	4	5	13	359	341	347	353	10	16	5	53	137	151	157	18.1
16-Apr	147	145	151	149	152	152	150	146	141	145	145	163	220	216	215	213	218	217	205	201	179	175	172	182	174.1
17-Apr	354	6	8	9	7	5	9	6	9	16	16	12	14	18	23	30	28	22	26	19	13	16	15	19	13.6
18-Apr	15	13	13	10	7	9	20	16	358	355	349	355	360	1	2	358	5	14	12	6	358	359	355	359	5.4
19-Apr	358	359	352	357	359	1	348	339	343	262	262	247	251	255	249	209	166	165	172	226	261	267	134	143	296.6
20-Apr	141	132	114	121	63	51	54	16	336	352	8	9	4	2	6	8	1	3	11	9	351	332	331	343	8.5
21-Apr	356	354	4	25	5	329	0	2	281	2	14	3	355	261	272	249	259	267	269	325	49	89	140	139	355.3
22-Apr	254	222	286	334	351	359	12	10	16	10	19	19	14	6	4	5	10	14	14	12	31	35	26	48	10.6
23-Apr	64	48	54	17	54	69	23	133	127	145	144	157	153	143	158	152	148	138	137	135	127	124	126	130	129.7
24-Apr	131	116	107	74	33	32	109	71	60	90	106	102	133	136	136	113	110	108	109	98	120	117	119	117	108.4
25-Apr	136	134	135	129	138	141	139	136	137	138	144	139	141	152	162	168	174	169	169	171	174	168	164	165	151.0
26-Apr	164	163	160	159	158	158	154	166	171	165	143	147	158	169	167	170	181	171	168	164	156	134	136	148	159.6
27-Apr	166	171	169	162	152	139	138	143	144	138	138	142	144	136	149	125	287	275	268	313	2	13	76	66	148.7
28-Apr	1	7	115	188	164	191	175	118	128	110	184	223	233	352	9	250	225	49	79	86	103	117	130	133	111.1
29-Apr	141	144	155	153	164	161	166	128	123	136	180	218	223	202	216	179	178	202	211	198	213	209	185	164	184.0
30-Apr	167	147	156	153	159	156	143	133	145	146	146	162	176	142	34	9	301	85	92	261	18	81	130	165	133.0

80.2	87.2	87.1	56.3	48.1	58.1	67.5	70.7	65.4	70.3	80.5	77.6	80.5	61.4	356.2	29.8	16.3	51.3	59.8	62.8	71.9	78.7	95.4	89.5
Diurnal Average																							

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



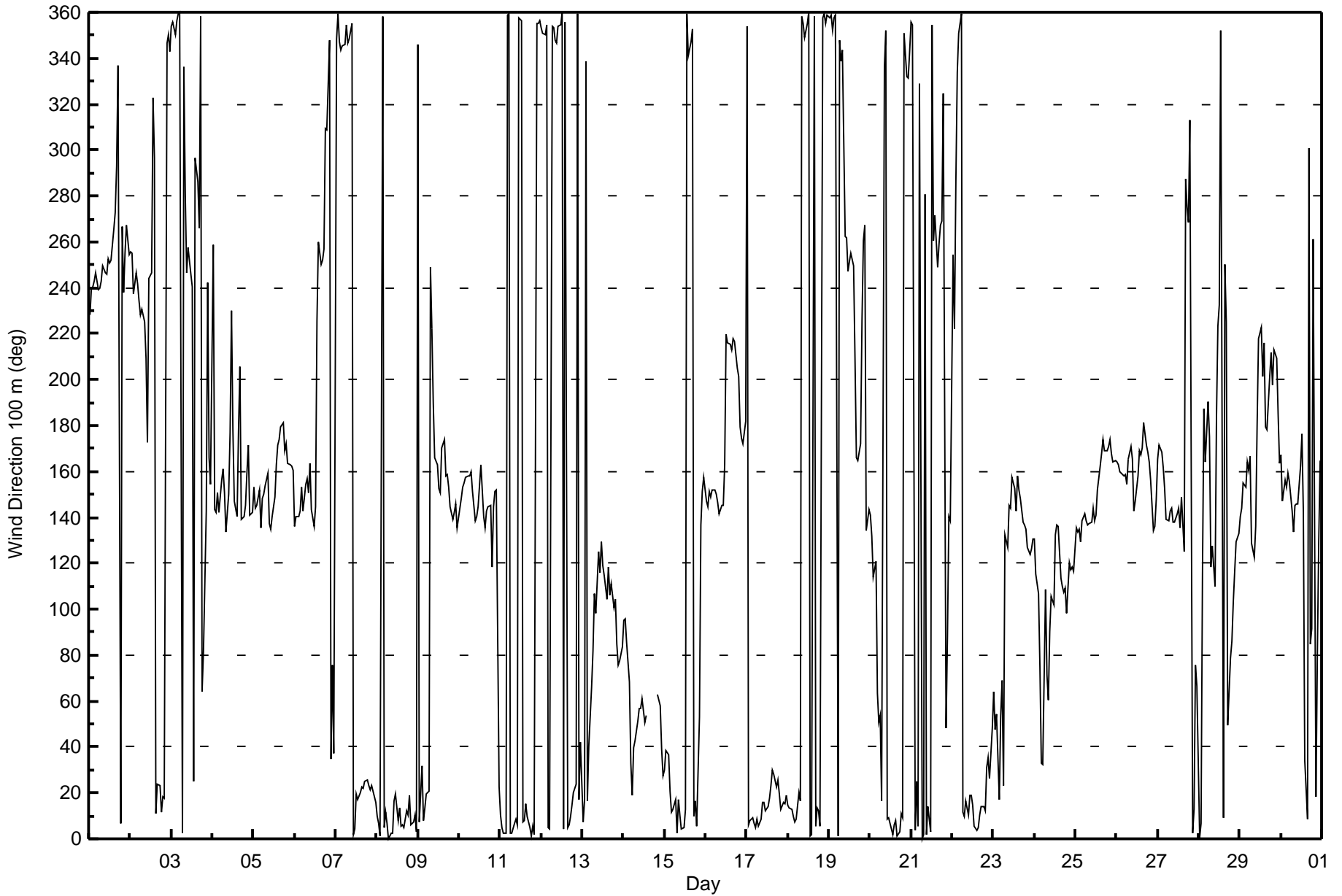
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 106 deg on Apr 3 14:00	Hours of Data: 714
Minimum Value: 3 deg on Apr 25 06:00	Hours of Missing Data: 6
Percentiles: P ₁ = 4 P ₁₀ = 6 Q ₁ = 8 Median = 11 Q ₃ = 18 P ₉₀ = 32 P ₉₉ = 87	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	15	4	3	4	4	8	5	5	4	3	7	7	5	9	25	20	36	14	8	69	8	13	9	4	69
2-Apr	10	14	26	14	8	3	6	10	9	28	31	38	16	28	14	30	15	14	9	9	17	9	8	4	38
3-Apr	4	6	6	5	4	8	11	23	31	16	29	13	75	106	62	20	22	34	25	10	28	35	81	44	106
4-Apr	14	33	4	13	4	29	15	23	4	24	17	8	31	17	19	13	13	13	15	16	37	51	14	8	51
5-Apr	7	8	8	17	23	16	9	9	11	7	6	6	10	8	11	9	10	10	6	6	6	6	6	7	23
6-Apr	8	3	4	4	19	6	12	11	7	20	31	9	7	55	4	13	6	8	10	6	12	23	21	31	55
7-Apr	14	21	10	5	4	4	7	7	8	8	8	10	10	11	9	9	12	8	9	9	9	8	10	9	21
8-Apr	7	7	7	7	8	9	8	8	11	9	13	11	11	12	7	13	11	13	8	11	9	7	9	11	13
9-Apr	8	13	21	10	8	11	22	88	23	41	31	22	19	19	21	16	15	10	11	5	4	3	6	5	88
10-Apr	9	11	7	6	4	4	4	5	8	6	7	11	10	19	13	10	9	8	13	13	18	12	9	61	61
11-Apr	15	10	5	7	7	6	10	8	7	9	9	11	11	11	11	11	12	10	7	7	6	8	7	6	15
12-Apr	9	8	6	6	7	10	9	12	11	12	19	15	18	20	17	21	15	10	8	6	10	12	22	18	22
13-Apr	21	23	49	42	25	13	36	16	40	10	18	16	11	14	17	12	14	8	8	7	9	18	11	12	49
14-Apr	16	13	17	35	25	21	13	13	13	11	12	13	13	13	AF	AF	AF	AF	AF	AF	17	24	15	12	35
15-Apr	10	14	12	12	8	11	11	8	14	12	12	14	23	25	13	15	15	13	11	9	42	20	9	8	42
16-Apr	7	4	7	6	5	10	8	5	5	6	7	28	10	10	13	9	7	7	9	12	11	8	10	25	28
17-Apr	32	8	8	8	9	8	8	7	9	10	9	12	12	16	16	14	14	15	10	11	8	9	9	8	32
18-Apr	9	8	8	10	9	12	10	12	11	12	12	11	12	13	17	15	16	14	12	9	12	10	7	9	17
19-Apr	9	8	12	7	7	8	11	18	27	26	13	17	17	22	37	47	18	11	12	34	39	39	24	5	47
20-Apr	6	6	21	15	15	20	8	32	8	10	10	8	6	6	8	7	8	8	11	23	11	5	4	9	32
21-Apr	9	12	10	23	32	12	22	30	49	45	24	44	36	75	32	23	23	50	49	36	26	10	15	11	75
22-Apr	48	46	36	7	9	9	9	10	12	14	13	18	19	15	17	20	17	15	10	9	6	14	29	30	48
23-Apr	12	19	38	71	50	28	19	98	24	15	17	14	11	17	22	9	10	9	5	5	5	5	7	7	98
24-Apr	7	17	29	34	52	30	14	22	17	23	12	19	14	15	15	13	8	12	10	8	13	6	7	16	52
25-Apr	6	14	20	9	10	3	4	5	7	9	12	8	10	15	15	16	12	8	8	7	6	7	6	6	20
26-Apr	5	5	3	5	5	6	8	9	9	16	11	13	16	11	11	12	17	9	8	11	11	9	6	13	17
27-Apr	7	6	7	5	9	5	6	6	9	9	14	18	20	18	29	44	42	23	16	22	15	8	43	43	44
28-Apr	14	85	78	42	54	41	30	9	4	91	83	35	33	89	38	55	88	19	18	9	8	13	8	13	91
29-Apr	9	14	14	11	8	8	17	13	10	15	41	12	11	30	26	20	17	19	7	15	7	5	13	24	41
30-Apr	14	7	7	6	7	15	11	7	11	14	14	54	56	9	71	18	81	19	23	89	56	30	20	33	89
	48	85	78	71	54	41	36	98	49	91	83	54	75	106	71	55	88	50	49	89	56	51	81	61	
	Diurnal Maximum																								

AF - Analyzer Failure





Maximum Value: 0.5 km/h on Apr 5 19:00		Maximum Daily Average: 0.1 km/h on Apr 5		Hours in Service: 720																						
Minimum Value: -0.9 km/h on Apr 6 15:00		Minimum Daily Average: -0.2 km/h on Apr 1		Hours of Data: 720																						
Maximum Diurnal Average: 0.0 km/h at hour 23		Minimum Diurnal Average: -0.2 km/h at hour 15		Hours of Missing Data: 0																						
Monthly Average: -0.07 km/h		Percentiles: P ₁ = -0.5 P ₁₀ = -0.3 Q ₁ = -0.2 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.3		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0.0	-0.2	-0.2	-0.2	-0.4	-0.2	0.0	-0.2	-0.6	-0.4	-0.4	-0.5	-0.6	-0.4	-0.2	-0.5	-0.2	0.1	0.0	0.0	-0.2	-0.1	-0.3	-0.3	-0.2	0.1
2-Apr	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	-0.1	-0.3	-0.3	-0.6	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	0.2
3-Apr	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.4	-0.2	-0.1	-0.4	-0.1	0.2	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4
4-Apr	-0.1	0.1	0.0	-0.1	0.0	-0.2	0.0	0.0	0.0	0.0	0.2	-0.3	-0.1	-0.1	0.0	0.0	0.2	-0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.2
5-Apr	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.1	0.3	0.1	0.2	-0.1	-0.1	0.3	0.2	0.4	0.2	0.2	0.5	0.2	0.2	0.0	-0.1	0.1	0.1	0.5
6-Apr	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	-0.2	0.0	0.2	0.2	-0.2	-0.4	-0.9	-0.2	-0.5	-0.5	-0.2	0.0	0.0	0.0	0.0	-0.2	-0.1	0.2
7-Apr	-0.1	-0.1	0.0	0.0	-0.1	-0.2	-0.1	0.0	0.0	-0.4	-0.5	-0.4	0.0	-0.2	-0.2	-0.1	0.0	-0.4	-0.2	-0.2	-0.2	-0.1	0.0	-0.1	-0.2	0.0
8-Apr	-0.3	0.0	-0.1	-0.3	-0.2	0.0	-0.3	-0.4	-0.4	-0.3	-0.2	-0.3	-0.1	-0.3	-0.5	-0.3	-0.3	-0.1	0.0	0.0	-0.1	-0.2	0.0	-0.1	-0.2	0.0
9-Apr	0.0	-0.1	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	0.0	0.3	0.1	0.1	0.2	0.2	0.1	-0.1	0.2	0.3	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.3
10-Apr	0.1	-0.1	0.0	0.0	-0.3	-0.1	-0.3	-0.2	-0.2	0.1	0.1	0.0	0.0	0.3	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	-0.1	0.0	0.3
11-Apr	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.3	0.0	0.2	0.1	-0.3	-0.2	-0.3	-0.2	0.1	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.1	0.0	-0.1	0.2
12-Apr	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.4	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.1	-0.2	0.0	0.1	0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	0.1
13-Apr	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.5	-0.2	-0.3	0.0	0.1	-0.3	-0.1	-0.3	-0.1	-0.3	-0.5	-0.4	-0.3	-0.2	-0.1	-0.1	-0.2	-0.2	0.1
14-Apr	0.0	-0.1	0.0	0.0	-0.2	-0.2	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4	-0.3	-0.1	-0.1	-0.2	-0.1	-0.3	-0.3	-0.3	-0.1	-0.2	0.0
15-Apr	-0.2	-0.2	-0.2	-0.1	0.0	-0.3	-0.1	-0.5	-0.1	0.0	-0.3	-0.3	0.2	-0.1	-0.3	-0.2	-0.2	0.2	0.0	-0.1	0.0	0.1	0.0	0.3	-0.1	0.3
16-Apr	0.1	0.0	0.1	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	-0.3	-0.3	-0.3	-0.4	-0.3	-0.3	-0.2	-0.1	0.3	0.2	0.3	0.1	-0.1	0.3
17-Apr	-0.1	-0.1	0.1	-0.1	-0.1	-0.2	0.0	-0.2	-0.2	-0.2	0.0	-0.1	0.0	-0.1	0.0	0.1	-0.2	0.1	-0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.1
18-Apr	0.0	-0.1	-0.1	-0.1	0.0	-0.2	-0.1	0.0	-0.1	-0.3	0.0	-0.2	-0.3	-0.6	-0.4	-0.1	-0.3	-0.3	-0.1	-0.3	-0.2	-0.2	-0.3	0.0	-0.2	0.0
19-Apr	0.0	-0.1	0.1	-0.1	-0.2	-0.2	-0.3	0.1	0.0	0.0	-0.1	0.0	-0.3	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.2
20-Apr	0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.5	-0.3	-0.3	0.0	-0.3	-0.6	-0.2	-0.2	-0.4	-0.3	-0.4	0.0	0.0	-0.1	0.0	-0.1	-0.2	0.1
21-Apr	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	-0.2	-0.5	0.1	-0.2	-0.1	0.0	0.1	0.0	0.0	0.0	0.1
22-Apr	0.0	0.0	-0.1	-0.1	-0.1	-0.2	0.1	0.0	-0.1	-0.2	0.1	-0.3	-0.5	-0.2	-0.4	-0.1	-0.1	-0.3	0.2	0.1	0.1	0.0	-0.2	0.0	-0.1	0.2
23-Apr	-0.2	-0.1	-0.1	-0.2	-0.1	-0.3	-0.2	0.1	0.0	-0.1	0.0	-0.2	-0.2	0.0	0.0	0.1	0.0	0.2	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.2
24-Apr	-0.1	0.0	-0.1	-0.2	-0.4	-0.1	-0.1	0.1	0.0	0.0	-0.4	-0.2	0.1	-0.2	-0.2	-0.4	-0.4	-0.2	-0.1	-0.2	0.0	-0.1	-0.1	0.0	-0.1	0.1
25-Apr	0.2	0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	-0.1	-0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.4
26-Apr	0.3	0.3	0.4	0.2	0.1	-0.1	-0.2	0.1	0.0	0.0	-0.1	-0.1	-0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.2	0.1	0.0	0.1	0.1	0.4
27-Apr	0.4	0.3	0.3	0.1	-0.1	-0.2	-0.1	-0.1	0.1	0.0	0.0	0.2	-0.2	-0.2	-0.3	-0.2	0.0	0.0	0.0	-0.2	-0.1	0.0	0.1	0.0	0.0	0.4
28-Apr	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.0	-0.1	-0.3	-0.1	0.4	0.0	-0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4
29-Apr	0.0	0.0	0.0	0.0	0.0	0.2	-0.1	0.2	0.1	-0.1	-0.2	-0.5	-0.4	-0.4	-0.2	0.0	0.2	0.0	-0.2	0.0	0.1	0.2	0.1	0.0	0.0	0.2
30-Apr	0.1	0.1	0.1	0.1	-0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.2	0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	0.1	0.1	0.1	0.1	0.0	0.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 20 m (VW20m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.1 km/h on Apr 20 13:00 Minimum Value: 0.1 km/h on Apr 28 05:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.9 Median = 1.6 Q ₃ = 2.3 P ₉₀ = 2.9 P ₉₉ = 3.9																								Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	1.7	1.8	1.9	2.1	2.0	1.0	1.5	2.5	2.7	3.0	2.7	2.7	3.0	2.5	2.1	2.0	1.6	0.8	0.3	0.3	1.0	1.7	1.8	1.5	3.0
2-Apr	1.4	0.9	0.9	0.9	0.7	0.7	0.7	0.6	1.5	1.1	1.4	1.5	1.8	2.4	2.6	2.7	2.3	2.0	1.2	0.4	0.3	0.4	0.3	0.4	2.7
3-Apr	0.4	0.4	0.4	0.5	0.6	0.6	0.4	0.4	1.0	1.2	1.6	1.8	1.2	1.2	1.7	1.6	1.4	0.8	0.4	0.2	0.4	0.5	0.3	0.6	1.8
4-Apr	0.4	0.4	0.8	1.1	1.1	1.1	0.8	0.8	1.5	1.5	1.3	2.0	1.7	1.7	2.1	1.7	1.9	1.5	0.9	0.4	0.5	0.5	0.2	0.3	2.1
5-Apr	0.5	0.8	0.9	0.9	1.0	0.9	1.2	1.5	1.7	2.6	2.9	3.2	3.6	2.9	2.4	1.9	1.7	1.5	1.6	1.4	1.5	1.2	1.2	1.4	3.6
6-Apr	0.7	0.8	0.6	0.4	0.3	0.2	0.2	0.8	1.9	1.6	1.7	1.8	2.3	2.3	2.8	2.1	2.1	1.7	0.9	0.4	0.2	0.4	0.9	0.8	2.8
7-Apr	0.8	0.6	0.7	0.6	0.8	0.8	0.6	0.6	1.3	2.2	2.8	3.1	3.9	4.0	3.8	3.6	3.4	4.0	3.1	2.8	2.7	2.9	2.7	2.5	4.0
8-Apr	2.3	2.5	2.1	2.4	2.5	2.9	3.5	3.0	3.5	3.5	3.9	4.0	4.0	3.8	3.8	3.6	3.1	3.0	2.6	2.4	2.0	2.4	1.8	1.4	4.0
9-Apr	1.3	1.4	0.9	1.0	1.2	1.3	1.0	0.9	1.2	1.3	1.7	2.0	2.0	2.1	1.8	1.6	1.6	1.5	1.6	1.2	1.0	1.4	1.1	0.7	2.1
10-Apr	1.0	1.0	1.1	1.6	1.6	1.5	1.6	1.8	2.0	2.1	2.1	2.1	2.1	1.8	1.9	1.7	1.3	1.2	0.8	0.4	0.5	0.2	0.3	0.8	2.1
11-Apr	0.6	0.6	1.0	1.4	1.9	1.7	1.8	2.7	3.1	3.2	3.0	3.0	3.3	3.3	3.4	3.0	2.7	2.3	2.6	2.3	1.9	1.7	1.8	1.5	3.4
12-Apr	1.1	1.1	0.8	0.6	0.6	0.5	0.7	1.3	1.9	2.0	2.2	2.4	2.8	2.6	2.4	2.4	2.3	2.3	2.1	1.4	0.6	0.5	0.5	0.9	2.8
13-Apr	0.8	0.6	0.3	0.4	0.5	0.6	0.6	1.1	1.7	2.7	2.5	2.5	2.6	2.9	2.9	2.6	2.5	2.9	2.5	2.1	2.0	1.3	1.1	1.4	2.9
14-Apr	1.3	1.8	1.8	1.5	1.2	1.1	1.3	1.8	1.7	1.9	2.1	2.8	2.4	2.8	2.9	3.0	2.4	1.7	1.5	1.9	2.5	2.7	3.2	2.8	3.2
15-Apr	2.9	2.7	2.1	2.3	2.6	2.5	2.5	2.4	2.3	2.1	2.2	2.2	2.3	2.4	2.7	2.5	2.4	2.0	1.8	0.8	0.3	0.6	1.1	1.8	2.9
16-Apr	3.0	2.8	2.0	2.3	2.6	2.1	2.3	2.3	2.3	2.4	2.9	2.5	2.0	2.1	2.0	1.9	1.9	1.7	1.6	1.2	0.9	1.1	1.0	0.5	3.0
17-Apr	2.6	2.8	3.2	3.5	3.0	3.2	3.0	3.0	3.7	3.4	3.3	3.2	3.4	3.1	3.1	3.2	3.2	2.9	2.8	2.2	2.0	2.2	2.0	2.1	3.7
18-Apr	1.7	2.0	2.1	2.1	2.3	2.4	2.7	2.5	2.3	2.4	2.1	2.4	2.5	2.3	2.3	2.3	1.9	2.1	1.7	1.8	1.4	1.6	1.4	1.1	2.7
19-Apr	1.1	1.2	1.0	1.5	1.3	1.1	1.0	1.2	1.1	1.3	1.3	1.4	1.5	1.8	1.8	1.4	1.5	1.2	0.9	0.6	0.4	0.2	0.2	0.2	1.8
20-Apr	0.2	0.2	0.3	0.5	0.6	0.6	0.8	1.0	1.7	2.2	2.5	3.5	4.1	3.9	3.6	3.4	3.1	2.9	2.5	1.3	1.0	0.2	0.2	0.3	4.1
21-Apr	0.6	0.8	1.2	1.2	0.5	0.2	0.6	1.1	1.1	1.7	1.9	1.6	1.6	1.7	1.8	1.5	1.2	1.1	0.7	0.2	0.3	0.2	0.2	0.3	1.9
22-Apr	0.2	0.1	0.3	0.5	0.8	2.0	2.6	2.5	3.4	3.2	3.2	2.9	2.8	2.7	2.8	2.7	2.5	2.2	2.0	1.8	1.6	1.0	0.8	0.6	3.4
23-Apr	0.6	0.5	0.4	0.5	0.5	1.0	1.1	1.7	1.9	2.0	1.9	1.9	1.9	1.6	1.5	1.5	1.3	1.3	1.2	1.0	1.1	1.4	1.1	2.0	
24-Apr	1.2	0.8	0.7	0.7	1.1	1.2	1.5	1.4	1.7	2.0	2.5	2.4	2.0	1.8	2.1	2.4	2.5	2.2	2.0	1.3	1.4	1.0	0.6	1.0	2.5
25-Apr	1.4	1.0	0.7	0.7	1.4	2.2	2.7	2.9	2.8	2.6	2.2	3.0	2.7	2.3	1.7	1.7	1.7	1.7	1.6	1.5	1.7	1.8	2.0	1.8	3.0
26-Apr	1.8	1.8	1.9	1.8	1.5	1.6	2.0	1.9	2.0	2.1	3.2	2.9	2.4	2.2	1.9	1.8	1.6	1.6	1.6	1.4	1.0	0.4	0.4	0.6	3.2
27-Apr	1.5	1.4	1.2	1.1	1.1	1.2	1.2	1.6	1.9	2.0	2.5	2.5	2.1	2.3	1.9	1.7	1.9	1.7	1.2	0.5	0.4	0.2	0.5	0.3	2.5
28-Apr	0.4	0.3	0.2	0.2	0.1	0.2	0.8	0.9	1.1	1.3	1.4	1.1	1.4	1.7	1.9	1.8	1.5	1.5	0.8	0.7	0.4	0.4	0.4	0.6	1.9
29-Apr	0.6	1.0	0.8	1.0	1.2	1.2	1.4	1.6	1.5	1.9	2.2	1.7	2.1	2.1	2.0	2.0	1.8	1.6	1.6	0.7	0.6	0.7	0.4	0.5	2.2
30-Apr	0.5	0.3	0.4	0.6	1.0	0.5	0.8	1.6	2.0	1.8	2.2	1.8	1.9	2.0	2.7	3.0	1.5	1.3	1.0	0.6	0.4	0.2	0.2	0.2	3.0
Diurnal Maximum																									
3.0 2.8 3.2 3.5 3.0 3.2 3.5 3.0 3.7 3.5 3.9 4.0 4.1 4.0 3.8 3.6 3.4 4.0 3.1 2.8 2.7 2.9 3.2 2.8																									



Maximum Value: 1.2 km/h on Apr 6 00:00		Maximum Daily Average: 0.6 km/h on Apr 10		Hours in Service: 720																						
Minimum Value: -1.2 km/h on Apr 6 15:00		Minimum Daily Average: -0.4 km/h on Apr 1		Hours of Data: 720																						
Maximum Diurnal Average: 0.2 km/h at hour 11		Minimum Diurnal Average: -0.1 km/h at hour 15		Hours of Missing Data: 0																						
Monthly Average: 0.09 km/h		Percentiles: P ₁ = -0.7 P ₁₀ = -0.3 Q ₁ = -0.2 Median = 0.0 Q ₃ = 0.4 P ₉₀ = 0.6 P ₉₉ = 1.0		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	-0.1	-0.2	-0.2	-0.4	-0.6	-0.4	0.0	-0.2	-0.7	-0.5	-0.6	-0.7	-0.9	-0.6	-0.4	-0.6	-0.3	-0.1	-0.1	0.0	-0.2	0.0	-0.9	-0.4	-0.4	0.0
2-Apr	0.0	-0.2	-0.3	-0.1	-0.1	0.0	0.1	0.1	0.1	0.0	0.4	-0.2	-0.3	-0.4	-1.1	0.1	0.2	0.1	-0.2	-0.2	0.0	-0.2	-0.2	-0.1	-0.1	0.4
3-Apr	-0.1	-0.2	-0.2	-0.1	-0.2	-0.3	-0.1	-0.1	0.5	0.0	-0.2	-0.6	-0.1	0.4	-0.1	-0.2	-0.1	0.0	0.1	0.1	0.0	0.0	0.3	0.2	0.0	0.5
4-Apr	-0.3	0.5	0.5	0.5	0.2	0.0	0.5	0.3	0.7	0.5	0.3	-0.1	0.1	0.4	0.6	-0.1	-0.4	0.4	0.6	0.2	0.2	-0.1	0.3	0.4	0.3	0.7
5-Apr	0.2	0.3	0.4	0.2	0.1	0.1	0.4	0.6	0.6	0.7	1.1	1.0	1.2	0.9	0.1	0.3	-0.2	-0.1	0.6	0.2	0.9	1.0	1.0	1.2	0.5	1.2
6-Apr	0.5	0.9	0.4	0.6	0.0	0.0	0.1	0.4	0.6	0.4	0.6	0.7	1.0	-0.1	-1.2	-0.5	-0.6	-0.7	-0.3	-0.1	-0.1	-0.1	0.0	-0.4	0.1	1.0
7-Apr	-0.3	-0.3	0.0	-0.3	-0.2	-0.2	-0.1	0.0	-0.1	-0.4	-0.5	-0.4	0.0	-0.1	-0.1	0.0	0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	0.1
8-Apr	-0.2	-0.3	-0.3	-0.4	-0.3	-0.3	-0.7	-0.6	-0.4	-0.3	0.1	-0.2	-0.3	-0.3	-0.5	-0.4	-0.3	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.0	-0.3	0.1
9-Apr	-0.2	-0.1	0.2	0.1	-0.1	0.0	0.0	0.0	0.1	0.2	0.5	0.3	0.6	0.5	0.2	0.0	0.2	0.7	0.7	0.6	0.5	0.7	0.7	0.4	0.3	0.7
10-Apr	0.6	0.5	0.9	1.1	0.8	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.1	0.1	0.3	0.3	0.4	-0.3	0.6	1.1
11-Apr	-0.5	-0.2	-0.3	-0.4	-0.2	-0.2	-0.3	-0.4	-0.3	0.3	-0.2	-0.3	-0.3	-0.1	-0.3	0.0	-0.1	-0.3	-0.3	-0.3	-0.4	-0.3	-0.2	-0.1	-0.2	0.3
12-Apr	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1	-0.3	-0.3	-0.3	-0.1	-0.2	0.0	0.0	0.1	0.0	-0.3	-0.4	-0.3	-0.4	-0.2	0.1
13-Apr	-0.3	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	-0.5	0.1	0.7	0.8	0.8	0.7	0.8	0.6	0.6	0.5	0.6	0.6	0.7	0.4	0.2	0.1	0.1	0.3	0.8
14-Apr	0.4	0.3	0.2	0.1	-0.2	-0.3	-0.1	-0.1	0.0	0.1	0.3	0.3	0.1	0.2	-0.1	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.0	0.0	0.1	0.4
15-Apr	0.1	0.1	0.1	0.0	-0.2	-0.2	0.1	-0.3	0.0	-0.2	-0.1	-0.3	0.3	0.1	-0.5	-0.3	-0.2	0.2	0.0	-0.2	0.0	0.2	0.4	0.8	0.0	0.8
16-Apr	1.1	1.0	0.9	0.7	0.7	0.4	0.7	0.7	0.7	0.6	0.7	0.7	-0.1	-0.4	-0.4	-0.7	-0.4	-0.2	-0.6	-0.2	0.4	0.8	1.0	0.2	0.3	1.1
17-Apr	-0.4	-0.2	-0.4	-0.3	-0.4	-0.4	-0.2	-0.2	-0.3	0.0	0.0	0.0	-0.1	-0.1	0.2	0.5	0.1	0.3	0.0	0.1	0.2	0.0	0.2	-0.1	-0.1	0.5
18-Apr	0.0	0.1	0.0	-0.3	0.0	-0.2	-0.2	0.1	-0.1	-0.3	-0.3	-0.3	-0.4	-0.6	-0.6	-0.3	-0.2	-0.3	0.1	-0.3	-0.2	-0.3	-0.3	-0.1	-0.2	0.1
19-Apr	0.1	-0.1	0.2	-0.2	-0.2	-0.2	-0.2	0.1	0.1	-0.1	-0.2	0.0	-0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.1	0.0	0.1	0.2	0.1	0.0	0.3
20-Apr	0.1	0.0	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.4	-0.4	-0.4	-0.1	-0.4	-0.6	-0.3	-0.2	-0.5	-0.4	-0.4	0.0	-0.1	-0.2	-0.1	-0.1	-0.2	0.1
21-Apr	-0.3	-0.3	-0.2	0.0	-0.2	0.0	0.1	0.1	0.1	0.1	-0.1	0.2	0.0	0.0	0.0	-0.2	-0.6	0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1	0.2
22-Apr	-0.1	0.0	-0.1	-0.1	-0.3	-0.3	0.0	0.2	-0.1	0.0	0.2	-0.1	-0.3	-0.2	-0.3	0.2	0.2	-0.1	0.2	0.0	0.3	0.1	-0.2	0.0	0.0	0.3
23-Apr	-0.2	0.0	-0.3	-0.4	-0.2	-0.4	-0.1	0.3	0.5	0.5	0.5	0.0	0.1	0.4	0.2	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.2	0.5
24-Apr	0.4	0.3	0.1	-0.3	-0.5	-0.1	0.3	0.2	0.3	0.4	0.3	0.5	0.8	0.3	0.6	0.4	0.4	0.5	0.5	0.4	0.5	0.3	0.0	0.2	0.3	0.8
25-Apr	0.7	0.4	0.0	-0.1	0.3	0.8	0.8	1.0	1.0	0.9	0.8	1.0	0.9	0.6	0.2	0.5	0.0	0.1	0.4	0.1	0.0	0.4	0.6	0.4	0.5	1.0
26-Apr	0.5	0.6	0.8	0.9	1.0	0.9	0.7	0.3	0.1	0.4	0.9	0.9	0.5	0.1	0.2	-0.1	0.1	0.3	0.1	0.3	0.6	0.4	0.3	0.6	0.5	1.0
27-Apr	0.6	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.8	0.6	0.8	0.7	0.5	0.4	0.1	-0.1	-0.1	0.0	0.1	-0.2	-0.2	0.0	0.2	0.0	0.3	0.8
28-Apr	-0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.3	-0.3	-0.4	-0.2	0.4	0.0	-0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.7
29-Apr	0.4	0.8	0.5	0.6	0.9	0.9	1.0	0.6	0.5	0.2	-0.1	-0.5	-0.2	-0.4	-0.3	-0.1	0.2	-0.1	-0.4	-0.1	0.0	0.3	0.3	0.1	0.2	1.0
30-Apr	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.4	0.6	0.4	0.6	0.3	0.2	0.5	0.2	0.1	-0.3	0.2	0.3	-0.3	0.2	0.1	0.2	0.1	0.2	0.6
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 45 m (VW45m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Apr 20 13:00		Hours in Service: 720 Hours of Data: 720																								
Minimum Value: 0.2 km/h on Apr 21 23:00		Hours of Missing Data: 0 Hours of Calibration: 0																								
Percentiles: P ₁ = 0.2 P ₁₀ = 0.6 Q ₁ = 1.0 Median = 1.7 Q ₃ = 2.3 P ₉₀ = 2.9 P ₉₉ = 3.8		Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	2.0	1.7	1.7	2.1	2.2	1.4	1.6	2.0	2.3	2.4	2.5	2.8	2.7	2.3	2.1	2.2	1.6	1.1	0.3	0.3	1.0	1.9	1.7	1.0	2.8	
2-Apr	1.5	1.2	1.1	1.1	1.0	0.8	0.8	0.7	1.5	1.1	1.4	1.7	1.6	2.7	2.8	2.9	2.3	2.0	1.2	0.5	0.4	0.5	0.4	0.6	2.9	
3-Apr	0.5	0.6	0.5	0.5	0.8	0.6	0.6	0.5	1.1	1.3	1.7	1.8	1.3	1.4	1.8	1.7	1.4	0.8	0.4	0.2	0.5	0.7	0.6	0.8	1.8	
4-Apr	0.5	0.5	0.8	1.2	1.3	1.2	0.8	0.8	1.2	1.3	1.6	2.0	1.8	1.6	2.2	2.0	2.0	1.3	0.8	0.5	0.8	0.7	0.4	0.4	2.2	
5-Apr	0.5	0.9	0.9	0.9	1.1	1.0	1.2	1.6	1.8	2.7	2.8	3.0	3.6	3.3	2.9	2.6	2.2	1.9	1.9	1.6	1.7	1.2	1.1	1.2	3.6	
6-Apr	0.8	0.7	0.6	0.3	0.4	0.3	0.3	1.0	1.4	1.4	1.7	1.7	1.6	2.4	2.7	1.9	1.9	1.3	1.0	0.5	0.3	0.7	1.2	0.8	2.7	
7-Apr	0.9	0.6	0.9	0.8	0.8	0.7	0.6	0.6	1.4	2.2	2.7	3.1	3.9	4.1	3.8	3.7	3.5	4.0	3.1	2.9	2.8	3.0	2.9	2.6	4.1	
8-Apr	2.3	2.6	2.3	2.5	2.6	3.1	3.3	3.0	3.6	3.7	3.9	3.7	3.9	3.8	3.8	3.5	3.3	3.0	2.8	2.4	2.0	2.3	1.8	1.4	3.9	
9-Apr	1.4	1.4	1.0	1.0	1.1	1.3	1.2	1.1	1.3	1.6	1.8	2.2	2.3	2.3	2.1	1.9	1.7	1.5	1.4	1.1	1.0	1.2	1.0	0.8	2.3	
10-Apr	1.0	1.1	1.0	1.1	1.0	1.1	1.0	1.4	1.8	2.0	1.8	1.6	1.9	2.0	1.8	1.6	1.1	1.1	0.9	0.5	0.6	0.4	0.5	0.8	2.0	
11-Apr	0.8	0.5	0.8	1.5	2.1	1.8	1.9	2.7	3.1	3.1	3.0	3.0	3.4	3.3	3.3	2.9	2.5	2.4	2.7	2.3	2.1	1.9	2.0	1.5	3.4	
12-Apr	1.2	1.3	0.9	0.7	0.8	0.6	0.9	1.5	1.9	2.2	2.4	2.4	2.9	2.6	2.5	2.5	2.3	2.5	2.3	1.3	0.8	0.7	0.6	0.7	2.9	
13-Apr	0.7	0.7	0.4	0.5	0.7	0.7	0.7	0.8	1.8	2.5	2.5	2.4	2.5	2.9	2.7	2.5	2.5	2.7	2.6	2.1	2.1	1.5	1.3	1.6	2.9	
14-Apr	1.6	1.9	1.8	1.6	1.3	1.1	1.4	2.0	1.8	2.0	2.2	2.9	2.5	2.9	2.9	3.1	2.5	2.0	1.7	2.1	2.6	2.8	3.4	2.8	3.4	
15-Apr	3.1	2.8	2.2	2.2	2.7	2.6	2.6	2.5	2.2	2.3	2.4	2.4	2.5	2.6	2.9	2.6	2.5	2.2	1.8	0.8	0.5	0.9	1.2	2.0	3.1	
16-Apr	2.8	2.6	2.0	2.3	2.5	2.1	2.0	1.9	2.1	2.0	2.4	2.3	2.4	2.5	2.5	2.3	2.4	2.2	1.8	1.5	1.0	1.0	1.0	0.7	2.8	
17-Apr	2.7	2.9	3.2	3.5	3.0	3.2	3.1	3.0	3.7	3.3	3.3	3.2	3.3	3.3	3.1	3.2	3.1	3.1	2.8	2.2	2.1	2.2	2.1	2.1	3.7	
18-Apr	1.8	2.0	2.1	2.2	2.5	2.5	2.6	2.5	2.5	2.3	2.2	2.4	2.4	2.4	2.2	2.4	1.9	2.0	1.8	1.7	1.4	1.5	1.4	1.2	2.6	
19-Apr	1.3	1.4	1.2	1.5	1.3	1.1	1.0	1.2	1.2	1.1	1.1	1.3	1.8	2.1	2.1	1.6	1.6	1.2	0.9	0.8	0.4	0.3	0.2	0.2	2.1	
20-Apr	0.3	0.2	0.3	0.5	0.7	0.7	0.8	0.9	1.4	2.1	2.4	3.7	4.2	3.9	3.8	3.5	3.1	3.0	2.3	1.4	1.2	0.2	0.2	0.5	4.2	
21-Apr	0.7	1.0	1.3	1.3	0.6	0.3	0.7	1.1	1.3	1.9	1.9	1.9	1.7	1.8	2.0	1.7	1.2	1.2	0.8	0.2	0.5	0.2	0.2	0.3	2.0	
22-Apr	0.2	0.2	0.4	0.6	1.0	2.1	2.7	2.6	3.2	3.0	3.2	2.9	2.9	2.8	3.0	2.9	2.6	2.3	2.0	1.8	1.5	1.2	1.0	0.7	3.2	
23-Apr	0.7	0.7	0.5	0.6	0.6	0.7	1.1	1.2	1.8	1.9	2.0	1.9	1.9	2.0	1.6	1.6	1.4	1.2	1.2	1.2	1.0	1.1	1.4	1.1	2.0	
24-Apr	1.2	0.9	0.8	0.8	1.0	1.3	1.5	1.5	1.8	2.0	2.4	2.2	2.0	1.8	2.0	2.2	2.2	2.2	1.9	1.3	1.5	1.0	0.6	1.1	2.4	
25-Apr	1.6	1.2	0.9	0.8	1.5	2.0	2.4	2.6	2.7	2.6	2.2	2.8	2.4	2.3	1.9	2.0	2.1	2.0	1.8	1.6	1.9	2.0	2.0	1.7	2.8	
26-Apr	1.8	1.8	1.9	1.8	1.6	1.6	1.9	2.1	2.3	2.2	3.1	2.9	2.6	2.5	2.1	2.1	1.9	1.9	1.8	1.6	1.1	0.7	0.6	0.8	3.1	
27-Apr	1.5	1.4	1.3	1.2	1.0	1.0	1.0	1.4	1.8	1.9	2.3	2.6	2.2	2.3	1.9	1.8	2.4	1.8	1.3	0.5	0.3	0.2	0.6	0.2	2.6	
28-Apr	0.5	0.3	0.2	0.2	0.2	0.3	0.7	0.9	1.1	1.3	1.6	1.1	1.3	1.8	2.1	2.0	1.7	1.3	0.7	0.7	0.6	0.6	0.5	0.8	2.1	
29-Apr	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.4	1.5	1.8	2.4	1.9	2.4	2.5	2.4	2.3	2.3	1.9	1.8	0.8	0.6	0.9	0.6	0.8	2.5	
30-Apr	0.7	0.4	0.6	0.8	1.1	0.7	0.8	1.5	1.9	1.8	2.2	2.1	2.1	1.9	2.6	3.2	1.7	1.4	1.0	0.8	0.6	0.2	0.3	0.2	3.2	
		3.1	2.9	3.2	3.5	3.0	3.2	3.3	3.0	3.7	3.7	3.9	3.7	4.2	4.1	3.8	3.7	3.5	4.0	3.1	2.9	2.8	3.0	3.4	2.8	
		Diurnal Maximum																								



Maximum Value: 3.6 km/h on Apr 16 05:00 Maximum Daily Average: 1.0 km/h on Apr 16																				Hours in Service: 720 Hours of Data: 714						
Minimum Value: -1.5 km/h on Apr 2 15:00 Minimum Daily Average: 0.0 km/h on Apr 12 Maximum Diurnal Average: 0.5 km/h at hour 1 Minimum Diurnal Average: 0.1 km/h at hour 17 Monthly Average: 0.33 km/h Percentiles: P ₁ = -0.6 P ₁₀ = -0.2 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 0.9 P ₉₉ = 2.3																				Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0.6	0.4	0.4	0.6	0.5	0.0	0.9	0.7	0.1	0.4	0.0	0.0	0.2	0.0	0.2	-0.2	-0.1	-0.1	0.0	0.2	0.9	1.2	-0.3	0.5	0.3	1.2
2-Apr	2.5	0.5	0.3	0.7	0.1	0.6	0.2	0.5	0.4	0.0	0.0	-0.7	0.0	-0.2	-1.5	0.0	0.2	0.0	0.2	0.0	0.1	-0.1	0.0	-0.1	0.2	2.5
3-Apr	0.1	-0.1	-0.2	0.1	0.0	0.0	-0.1	0.0	0.3	0.3	-0.1	-0.4	-0.4	0.8	0.5	0.1	0.4	0.4	0.2	0.2	0.1	-0.1	0.1	0.3	0.1	0.8
4-Apr	0.1	0.7	1.2	0.8	0.9	0.4	0.1	0.3	0.3	0.1	0.4	0.8	0.1	0.4	0.6	-0.4	-0.5	0.7	0.6	0.4	0.1	0.0	0.4	0.7	0.4	1.2
5-Apr	0.4	0.5	0.4	0.1	0.5	0.8	0.9	1.5	0.8	2.3	2.1	2.5	3.0	0.4	-0.2	-0.3	-0.6	-0.5	-0.2	-0.3	0.4	0.6	0.7	1.0	0.7	3.0
6-Apr	1.1	1.4	1.1	0.9	0.5	0.5	0.3	0.4	0.9	0.2	0.6	0.2	0.3	0.2	-0.3	-0.3	0.0	0.0	-0.3	-0.1	0.0	-0.2	-0.3	-0.4	0.3	1.4
7-Apr	-0.3	-0.1	0.0	-0.2	-0.1	-0.1	0.0	0.0	0.1	-0.1	-0.1	0.0	0.3	0.2	0.2	-0.1	1.0	-0.2	0.4	0.4	0.4	0.2	0.5	0.5	0.1	1.0
8-Apr	0.3	0.4	0.3	0.0	0.5	0.3	-0.2	0.1	0.3	0.1	0.3	0.1	0.2	0.1	-0.3	-0.2	-0.2	0.2	0.3	0.0	0.0	0.1	-0.1	0.2	0.1	0.5
9-Apr	0.0	0.0	0.2	0.2	-0.2	0.1	0.2	0.1	0.6	0.8	0.4	0.6	0.9	0.5	0.3	-0.4	-0.2	0.5	0.7	0.2	1.4	1.4	1.7	1.5	0.5	1.7
10-Apr	1.5	0.2	0.4	0.4	0.4	0.5	0.9	0.4	1.1	1.0	0.7	0.3	0.5	0.4	0.8	0.5	0.5	0.8	0.6	1.1	0.4	0.4	0.5	0.1	0.6	1.5
11-Apr	-0.2	-0.2	-0.1	0.2	0.5	0.4	0.2	0.2	-0.1	0.8	0.2	0.0	0.1	0.2	0.2	0.6	0.1	0.0	0.0	0.3	0.2	0.0	0.1	0.3	0.2	0.8
12-Apr	0.1	0.1	-0.1	-0.1	-0.2	-0.1	0.0	-0.3	-0.1	0.0	0.1	-0.1	-0.2	-0.3	0.0	0.1	0.3	0.2	0.1	0.3	0.5	0.1	-0.3	-0.3	0.0	0.5
13-Apr	-0.1	0.1	0.1	0.2	-0.1	0.0	0.1	0.2	0.3	0.5	1.0	1.6	0.7	1.8	1.1	1.2	0.6	0.7	0.4	0.7	0.3	0.2	0.1	0.3	0.5	1.8
14-Apr	0.5	0.4	0.1	0.4	0.4	0.1	0.2	0.3	0.1	0.0	0.0	-0.1	0.1	0.2	AF	AF	AF	AF	AF	AF	-0.1	0.0	-0.2	-0.2	0.1	0.5
15-Apr	0.2	0.6	0.2	0.1	0.2	0.5	0.9	0.3	0.4	0.4	0.2	0.3	0.7	-0.1	-0.5	-0.4	0.2	0.4	0.6	0.1	0.2	0.7	0.8	1.8	0.4	1.8
16-Apr	2.9	2.4	2.4	2.7	3.6	1.8	1.2	0.8	1.1	0.8	1.0	1.1	0.6	0.1	0.1	0.0	0.6	0.7	-0.3	-0.1	-0.1	-0.1	0.3	0.1	1.0	3.6
17-Apr	0.2	0.5	0.1	0.2	0.2	-0.2	0.3	0.4	0.1	-0.2	0.2	0.6	0.5	0.1	0.6	0.6	0.4	0.9	-0.1	0.3	0.1	0.0	0.2	-0.2	0.3	0.9
18-Apr	0.0	0.2	0.0	0.2	0.7	0.5	-0.3	0.5	0.1	0.0	-0.3	-0.2	-0.6	-0.4	-0.8	-0.4	0.1	-0.2	0.9	0.2	0.3	0.1	0.1	0.4	0.0	0.9
19-Apr	0.4	0.1	0.3	0.1	-0.1	0.2	-0.3	0.3	0.5	0.1	-0.1	0.1	-0.5	0.5	-0.1	0.4	0.2	0.1	-0.2	-0.1	0.1	0.0	0.2	0.8	0.1	0.8
20-Apr	0.7	0.4	0.2	0.2	0.1	-0.1	0.0	0.0	-0.4	-0.2	0.2	0.3	0.3	0.2	0.4	0.5	0.0	-0.1	0.1	0.1	-0.1	-0.1	-0.1	-0.1	0.1	0.7
21-Apr	0.0	-0.3	-0.3	-0.1	-0.1	-0.2	0.0	0.5	0.1	0.1	-0.3	0.4	-0.5	1.2	0.4	-0.1	-0.5	0.8	0.5	-0.1	0.0	0.1	0.3	0.4	0.1	1.2
22-Apr	0.0	0.1	-0.1	-0.4	-0.3	0.1	0.4	0.6	-0.4	0.3	0.6	0.3	-0.2	-0.3	-0.2	0.3	0.3	0.2	0.4	0.5	0.3	0.6	-0.2	0.1	0.1	0.6
23-Apr	-0.1	0.1	0.1	-0.1	0.1	0.0	0.0	0.4	1.0	0.5	0.2	-0.2	-0.1	0.2	0.1	0.3	0.1	0.7	0.7	0.9	0.7	0.8	0.4	1.2	0.3	1.2
24-Apr	1.1	0.6	0.0	0.2	-0.1	0.7	0.0	0.8	0.7	1.5	0.8	0.7	1.2	0.3	1.1	0.4	-0.1	0.5	0.5	0.4	0.7	0.7	0.5	0.8	0.6	1.5
25-Apr	2.1	1.7	0.5	1.4	1.2	1.6	1.5	1.7	2.3	2.2	1.6	2.4	1.8	1.0	0.7	0.7	-0.5	-0.1	-0.1	-0.1	-0.3	0.0	-0.2	-0.3	1.0	2.4
26-Apr	-0.1	-0.1	0.0	1.1	1.6	1.9	2.1	0.0	-0.4	0.9	1.7	1.9	0.5	-0.5	-0.3	-0.4	0.1	-0.3	-0.7	-0.4	0.5	0.6	0.9	1.0	0.5	2.1
27-Apr	0.2	0.4	0.2	0.4	0.9	0.6	0.3	0.9	1.4	0.3	1.0	1.0	1.2	0.8	0.2	0.2	-0.3	0.1	0.3	-0.2	0.0	0.1	0.0	-0.1	0.4	1.4
28-Apr	0.2	0.1	0.1	0.2	0.2	0.4	0.1	0.2	0.3	1.5	0.7	-0.7	-0.2	-0.3	-0.3	0.6	-0.6	-0.2	0.1	0.2	0.5	0.5	0.7	0.6	0.2	1.5
29-Apr	0.6	0.9	0.2	0.7	0.5	0.4	0.3	0.3	0.1	0.0	0.2	0.1	0.6	0.1	0.4	-0.2	0.1	0.5	0.3	0.0	0.1	0.5	0.0	-0.5	0.3	0.9
30-Apr	0.1	0.8	0.6	0.7	0.1	0.6	0.4	0.7	1.0	0.0	0.2	0.1	0.3	0.6	0.6	0.8	-0.1	0.9	0.2	-0.1	0.1	0.1	0.1	0.1	0.4	1.0
																								Diurnal Average		
																								Diurnal Maximum		
AF - Analyzer Failure																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 100 m (VW100m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Apr 8 11:00 Minimum Value: 0.2 km/h on Apr 21 20:00 Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.1 Median = 1.8 Q ₃ = 2.5 P ₉₀ = 3.1 P ₉₉ = 3.9		Hours in Service: 720 Hours of Data: 714 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2.2	1.7	1.7	1.9	1.6	1.9	1.8	2.1	1.5	1.2	1.5	1.8	1.9	1.7	2.6	2.3	1.4	1.2	0.5	0.5	1.3	2.6	1.4	1.0	2.6
2-Apr	1.4	1.6	1.6	1.5	1.3	1.0	1.3	1.0	1.2	1.1	0.9	1.9	1.9	3.8	2.8	3.2	2.8	2.3	1.4	1.0	0.9	0.7	0.4	0.4	3.8
3-Apr	0.3	0.7	0.7	0.6	0.7	0.7	1.0	0.5	0.8	1.2	1.9	1.7	1.2	2.0	2.2	1.7	2.0	1.1	0.6	0.3	0.8	1.2	0.6	1.1	2.2
4-Apr	0.7	0.8	1.2	1.2	1.6	1.6	1.0	0.9	0.7	1.2	2.1	2.2	1.7	1.7	2.5	2.1	2.2	1.4	0.9	1.0	1.3	1.3	0.8	0.7	2.5
5-Apr	0.8	1.1	1.4	1.0	1.2	1.2	1.5	1.9	1.9	2.5	2.5	2.7	4.0	3.5	3.1	2.6	2.2	1.9	1.7	1.5	2.0	2.1	1.9	1.9	4.0
6-Apr	1.2	1.0	1.0	0.9	0.9	0.6	0.8	1.1	1.0	1.3	1.6	1.2	1.7	2.0	1.2	1.5	1.3	1.0	1.2	0.7	0.4	1.4	2.2	1.7	2.2
7-Apr	1.4	0.6	0.4	0.5	0.6	0.6	0.6	0.5	1.3	1.9	2.2	2.5	3.9	4.0	3.7	3.9	3.8	4.0	3.9	3.5	3.3	3.4	3.4	2.9	4.0
8-Apr	2.2	2.2	2.1	2.1	2.5	3.1	2.6	2.7	3.3	3.1	4.2	3.9	3.5	3.9	3.0	3.3	2.9	3.2	2.6	2.3	1.8	1.9	1.7	1.3	4.2
9-Apr	1.4	1.3	1.2	1.2	0.9	1.1	1.2	1.6	1.8	2.0	2.2	2.5	2.7	2.8	2.6	2.4	1.9	1.7	1.8	1.4	1.1	1.4	1.5	1.1	2.8
10-Apr	1.7	1.8	1.9	1.7	1.5	1.4	1.2	1.4	1.4	1.5	1.4	1.4	2.2	2.4	2.0	1.8	1.5	1.3	1.0	1.0	1.1	0.9	1.0	1.1	2.4
11-Apr	1.5	1.0	0.8	1.6	1.8	1.4	2.0	2.5	2.4	2.7	2.5	2.7	3.1	3.1	2.7	3.0	2.6	2.1	2.0	2.1	1.8	1.8	1.5	1.2	3.1
12-Apr	1.3	1.3	0.8	0.8	0.7	0.9	0.9	1.4	2.0	2.5	2.9	2.6	3.0	2.8	3.0	2.8	2.4	2.5	2.2	1.3	1.3	1.2	1.4	1.1	3.0
13-Apr	1.1	0.8	1.1	1.1	1.0	0.7	1.1	0.9	2.2	2.6	3.1	2.8	2.9	3.2	3.6	2.9	2.9	2.9	2.1	2.1	1.9	2.0	2.3	3.6	3.6
14-Apr	2.5	2.8	2.6	2.2	2.1	1.3	1.9	2.5	2.4	2.6	2.9	3.5	3.5	3.9	AF	AF	AF	AF	AF	AF	3.3	3.5	3.7	3.4	3.9
15-Apr	3.6	3.5	2.4	2.6	2.7	2.7	2.8	2.1	2.6	2.2	2.2	2.5	2.9	3.1	3.1	2.7	2.9	2.1	1.8	0.8	0.6	1.4	1.7	2.6	3.6
16-Apr	2.9	2.1	1.9	2.0	2.3	2.7	1.9	1.5	1.3	1.6	2.1	2.6	3.2	3.5	3.3	3.0	3.0	2.6	2.1	1.7	1.2	1.2	1.2	0.8	3.5
17-Apr	2.1	2.6	2.8	3.0	2.7	2.7	3.1	2.6	3.1	3.4	3.5	3.3	3.6	3.6	3.9	3.8	3.6	3.6	3.1	2.3	2.1	2.2	2.2	2.3	3.9
18-Apr	2.0	2.1	2.3	2.1	2.8	2.8	2.7	2.8	2.3	2.2	2.5	2.4	2.2	2.5	2.4	2.5	1.9	2.2	2.0	1.5	1.5	1.5	1.2	1.2	2.8
19-Apr	1.1	1.1	1.1	1.3	1.1	1.1	0.9	1.3	1.4	1.2	1.1	1.2	1.6	2.7	2.5	1.9	1.8	1.5	1.0	1.3	0.5	0.3	0.3	0.5	2.7
20-Apr	0.5	0.3	0.4	0.3	0.6	0.3	0.3	0.3	0.8	2.0	2.1	3.0	3.2	3.0	3.3	3.2	2.8	2.5	2.6	1.9	0.9	0.2	0.2	0.6	3.3
21-Apr	1.0	1.4	1.2	1.4	0.8	0.3	0.8	1.4	1.3	1.9	2.1	2.2	2.0	2.2	2.3	1.8	1.3	1.8	1.3	0.2	0.5	0.3	0.4	0.5	2.3
22-Apr	0.2	0.2	0.4	0.6	1.1	1.6	2.8	2.6	3.1	3.0	3.6	3.2	3.1	2.9	3.4	3.3	2.9	2.9	2.2	1.7	1.1	1.8	1.9	1.6	3.6
23-Apr	0.8	1.1	0.7	0.5	0.8	0.9	1.1	1.4	2.3	1.9	2.4	2.2	2.3	2.2	1.5	1.9	1.6	1.3	1.1	1.1	0.7	1.1	1.7	1.1	2.4
24-Apr	1.1	1.1	1.3	1.2	1.2	1.7	1.8	1.8	2.3	2.7	2.8	2.8	2.3	2.3	2.6	2.6	2.2	2.3	2.0	1.3	1.7	1.0	0.9	1.5	2.8
25-Apr	1.5	1.5	1.6	1.6	1.9	1.1	1.7	2.3	2.4	2.6	2.4	2.5	2.6	2.7	2.5	2.6	2.4	2.0	1.8	1.6	1.7	1.8	1.8	1.7	2.7
26-Apr	1.6	1.6	1.4	1.8	1.8	1.9	2.2	2.3	2.5	2.8	2.8	3.1	3.1	2.9	2.7	2.5	2.3	2.1	2.1	1.8	1.6	1.0	0.9	1.5	3.1
27-Apr	1.5	1.2	1.3	1.2	1.3	1.1	1.3	1.5	1.9	2.0	2.7	3.0	2.7	2.5	2.3	2.2	2.8	2.2	1.4	0.3	0.5	0.5	1.0	0.6	3.0
28-Apr	0.5	0.8	0.4	0.5	0.3	0.5	0.3	0.3	0.4	1.6	1.9	0.7	1.4	2.3	2.2	2.7	2.1	1.6	0.9	0.6	0.7	1.0	0.9	1.4	2.7
29-Apr	1.5	1.2	1.2	1.3	1.0	1.0	1.0	1.0	0.8	1.2	3.1	3.0	3.3	3.4	3.5	3.0	2.9	2.4	2.2	1.1	0.9	0.9	1.1	1.4	3.5
30-Apr	1.1	0.6	0.9	1.0	1.2	1.1	0.7	1.0	1.4	1.3	2.1	2.5	2.3	2.4	2.8	2.9	1.9	2.0	1.2	0.8	0.9	0.4	0.5	0.4	2.9
	3.6	3.5	2.8	3.0	2.8	3.1	3.1	2.8	3.3	3.4	4.2	3.9	4.0	4.0	3.9	3.9	3.8	4.0	3.9	3.5	3.3	3.5	3.7	3.4	
	Diurnal Maximum																								
AF - Analyzer Failure																									



Maximum Value: 4.5 km/h on Apr 2 01:00		Maximum Daily Average: 1.4 km/h on Apr 16		Hours in Service: 720																						
Minimum Value: -1.6 km/h on Apr 2 15:00		Minimum Daily Average: 0.1 km/h on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 0.8 km/h at hour 1		Minimum Diurnal Average: 0.3 km/h at hour 15		Hours of Missing Data: 0																						
Monthly Average: 0.55 km/h		Percentiles: P ₁ = -0.7 P ₁₀ = -0.1 Q ₁ = 0.1 Median = 0.4 Q ₃ = 0.8 P ₉₀ = 1.5 P ₉₉ = 3.0		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	1.9	1.5	1.5	1.7	1.6	1.1	2.1	1.8	0.7	1.1	0.7	0.7	0.6	0.3	0.9	0.2	0.0	0.0	0.2	0.3	1.4	1.7	0.3	1.2	1.0	2.1
2-Apr	4.5	2.2	2.4	2.1	0.9	1.0	0.2	0.6	0.8	0.5	0.3	-0.6	0.2	0.3	-1.6	0.1	0.2	0.1	0.4	0.2	0.1	0.2	0.2	0.2	0.6	4.5
3-Apr	0.2	0.2	0.1	0.3	0.3	0.3	0.1	-0.1	0.1	0.5	0.0	-0.3	-0.6	0.7	1.0	0.2	0.6	0.4	0.4	0.4	0.7	0.0	0.1	0.4	0.3	1.0
4-Apr	0.1	0.6	1.1	0.8	0.7	0.4	0.3	0.7	0.3	0.4	0.7	1.4	0.3	0.1	0.5	0.1	1.8	0.9	0.6	0.4	0.9	-0.1	0.4	0.4	0.6	1.8
5-Apr	0.7	0.6	0.4	0.3	1.4	1.3	0.9	1.8	1.5	3.1	2.4	3.1	3.0	0.0	0.1	-0.3	0.1	0.5	-0.6	-0.7	0.3	0.5	0.7	0.8	0.9	3.1
6-Apr	0.9	0.7	1.0	0.7	0.7	0.8	0.5	0.4	0.5	0.5	0.5	0.1	0.0	0.6	0.2	0.3	0.4	0.5	0.1	0.1	0.2	0.2	-0.3	-0.5	0.4	1.0
7-Apr	0.1	0.2	0.3	0.2	0.1	0.2	0.3	0.0	0.4	0.0	0.1	0.4	0.1	0.4	0.1	0.1	1.6	0.0	0.5	0.6	0.9	0.6	1.0	0.8	0.4	1.6
8-Apr	0.6	0.7	0.5	0.3	0.5	0.4	-0.3	0.3	0.5	0.1	0.0	0.2	0.5	0.3	-0.4	0.2	-0.4	0.0	0.4	0.1	0.1	0.1	-0.1	0.2	0.2	0.7
9-Apr	0.2	0.3	0.3	0.3	-0.1	0.2	0.2	0.4	0.9	1.2	0.8	1.0	0.8	0.7	0.7	0.0	0.1	0.4	0.7	0.5	1.7	1.5	2.0	1.6	0.7	2.0
10-Apr	1.2	-0.4	-0.7	-0.1	-0.1	0.3	1.0	0.4	0.6	1.0	0.6	0.3	0.3	0.8	1.0	0.6	0.7	1.0	1.5	2.6	0.9	0.3	0.0	0.3	0.6	2.6
11-Apr	0.3	0.0	0.2	0.5	0.7	0.4	0.5	0.2	-0.2	1.1	0.2	-0.2	0.3	0.5	0.6	0.9	0.3	0.2	0.0	0.4	0.7	0.2	0.2	0.4	0.4	1.1
12-Apr	0.3	0.3	-0.1	0.0	0.0	0.2	0.1	-0.1	0.0	0.0	-0.2	-0.1	0.4	0.0	-0.4	0.0	0.9	0.5	0.4	0.9	1.9	1.0	-0.4	0.2	0.2	1.9
13-Apr	0.5	0.4	0.5	0.7	0.5	0.7	1.0	1.0	1.2	0.6	1.3	1.4	0.7	2.3	2.0	1.4	0.9	1.0	1.1	1.3	1.2	0.8	0.7	1.2	1.0	2.3
14-Apr	1.2	1.0	0.7	0.6	0.6	0.3	0.8	1.0	0.8	0.7	0.3	0.4	0.4	0.6	0.3	0.2	0.4	0.3	0.1	0.5	0.2	0.2	0.5	0.1	0.5	1.2
15-Apr	0.0	0.6	0.4	0.5	0.2	0.5	1.1	0.5	0.4	0.6	0.5	0.6	1.1	-0.4	-0.6	-0.3	0.4	0.8	0.7	0.3	0.7	1.7	0.9	1.6	0.5	1.7
16-Apr	3.1	2.7	2.4	2.2	3.3	1.6	0.7	0.4	0.7	0.4	0.6	0.9	1.1	1.0	1.2	1.3	1.9	1.7	1.8	1.8	1.0	1.2	1.1	0.7	1.4	3.3
17-Apr	0.5	0.3	0.2	0.5	0.2	-0.1	0.2	0.4	0.0	-0.4	0.3	0.9	0.7	0.2	0.8	0.6	0.1	0.8	0.2	0.3	0.2	0.1	0.2	-0.1	0.3	0.9
18-Apr	0.0	0.4	0.3	0.7	0.5	0.5	-0.3	0.8	0.1	-0.2	-0.4	-0.4	-0.7	-0.5	-1.0	-0.3	0.0	-0.2	0.9	0.4	0.4	0.1	0.4	0.4	0.1	0.9
19-Apr	0.5	0.4	0.3	0.2	0.0	0.1	-0.1	0.2	0.5	0.4	0.1	0.3	-0.5	0.3	-0.6	0.6	0.4	0.2	0.2	0.1	0.4	0.1	0.3	0.6	0.2	0.6
20-Apr	0.4	0.6	0.7	0.8	0.8	0.5	0.5	0.4	0.0	-0.3	0.4	0.1	0.6	0.2	0.1	0.6	0.2	-0.1	-0.2	0.1	0.1	0.0	-0.1	0.2	0.3	0.8
21-Apr	0.3	-0.2	0.0	0.3	0.6	0.1	0.0	0.8	0.4	0.6	-0.6	0.1	-0.9	1.8	0.7	-0.3	-0.4	0.7	0.7	0.0	0.1	0.5	0.4	0.3	0.2	1.8
22-Apr	0.4	0.4	0.1	-0.1	-0.1	0.2	0.5	0.6	-0.7	0.5	0.6	0.8	-0.4	-0.4	-0.4	0.2	0.3	0.1	0.4	0.4	0.6	1.8	-0.1	0.3	0.3	1.8
23-Apr	0.4	0.6	1.1	0.8	0.6	0.7	0.6	0.6	1.0	-0.1	-0.3	-0.6	-0.5	0.1	0.0	-0.1	-0.2	0.6	0.6	1.2	1.2	1.6	1.2	1.9	0.5	1.9
24-Apr	2.0	1.5	0.6	0.6	0.4	1.3	-0.2	1.0	1.0	2.1	0.8	1.1	1.1	0.2	1.0	0.3	0.1	0.7	0.7	1.2	1.0	0.9	1.8	0.9	2.1	
25-Apr	3.2	3.3	1.8	2.9	1.9	1.6	1.5	2.0	2.6	2.5	2.1	2.9	2.0	1.2	0.9	1.0	-0.2	-0.4	-0.1	-0.2	-0.5	-0.1	0.0	-0.2	1.3	3.3
26-Apr	-0.1	0.0	0.2	1.1	1.3	1.6	1.7	0.0	-0.4	1.2	1.9	2.3	0.6	-0.6	-0.3	-0.1	0.6	-0.3	-0.6	-0.3	0.7	0.6	1.1	1.2	0.6	2.3
27-Apr	0.0	0.1	0.1	0.2	0.7	0.8	0.2	1.3	1.0	-0.1	1.1	1.0	1.3	0.8	0.4	0.3	-0.1	0.2	0.6	-0.1	0.4	0.5	0.1	0.0	0.5	1.3
28-Apr	0.3	0.1	0.1	0.1	0.0	0.1	0.3	0.2	0.2	1.0	0.4	-0.6	0.1	-0.5	-0.8	0.9	-0.4	-0.5	0.4	0.7	1.6	1.7	1.4	1.5	0.3	1.7
29-Apr	0.6	0.7	0.3	0.5	0.8	0.5	0.6	0.4	0.0	-0.1	1.1	0.8	1.1	0.8	1.6	0.8	0.5	1.6	2.0	1.1	1.3	2.2	1.0	-0.3	0.8	2.2
30-Apr	0.4	0.3	0.6	0.7	0.0	0.4	0.2	0.7	0.7	-0.2	-0.1	0.1	0.5	0.1	0.9	1.8	0.4	1.1	0.4	0.3	0.4	0.2	0.4	0.3	0.4	1.8
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 167 m (VW167m) - km/h
Lower Camp Met Tower - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.6 km/h on Apr 17 15:00 Minimum Value: 0.2 km/h on Apr 28 06:00 Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.0 Median = 1.7 Q ₃ = 2.6 P ₉₀ = 3.3 P ₉₉ = 4.3																								Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2.1	1.4	1.6	1.7	1.3	1.7	1.7	2.0	1.2	0.9	1.0	1.3	1.3	1.6	3.1	2.4	1.5	1.0	0.4	0.5	1.3	3.1	1.8	1.3	3.1
2-Apr	1.1	1.3	1.6	1.2	1.2	0.9	1.1	0.9	1.0	1.2	1.1	2.4	1.9	4.5	2.7	3.1	2.7	2.5	1.7	1.0	1.0	0.8	0.6	0.6	4.5
3-Apr	0.7	0.8	0.6	0.6	0.4	0.9	1.2	0.6	0.9	1.4	1.9	1.6	1.3	2.1	2.6	1.9	2.2	1.4	0.7	0.4	0.8	1.1	0.7	0.9	2.6
4-Apr	0.6	0.8	1.0	1.1	1.1	1.6	0.9	0.9	0.7	1.2	1.8	2.1	1.6	1.8	2.8	1.5	1.5	1.4	1.0	1.2	1.5	1.3	0.8	0.9	2.8
5-Apr	0.8	1.0	0.9	0.9	1.4	0.9	1.5	1.8	1.8	2.7	2.5	3.0	4.3	2.9	2.3	2.0	1.8	1.4	1.2	1.0	1.1	1.2	1.2	1.1	4.3
6-Apr	1.6	1.2	1.2	1.2	0.7	0.7	0.9	0.8	0.8	1.1	1.6	1.2	1.6	2.2	1.3	1.5	1.4	1.2	1.3	0.4	0.5	1.1	1.8	1.9	2.2
7-Apr	1.9	1.0	0.5	0.6	0.7	0.6	0.8	0.6	0.8	1.8	2.4	2.7	3.9	4.5	3.7	3.6	4.1	3.8	3.7	3.5	3.4	3.3	3.3	3.4	4.5
8-Apr	2.4	2.5	2.6	2.2	2.9	3.2	2.8	2.9	3.4	3.6	4.4	4.1	4.0	4.2	3.6	3.7	3.0	3.4	3.0	2.5	2.0	2.0	1.8	1.5	4.4
9-Apr	1.4	1.6	1.2	1.3	0.9	0.9	1.3	1.6	1.6	1.9	2.1	2.6	2.7	2.6	2.3	1.7	1.8	1.7	1.7	1.5	1.7	1.6	1.2	1.9	2.7
10-Apr	1.8	1.6	1.2	1.2	0.8	0.8	0.8	0.7	0.8	1.5	1.4	1.2	2.0	2.2	2.2	2.0	1.7	1.5	1.2	0.7	1.8	1.0	0.8	1.3	2.2
11-Apr	1.8	1.3	1.2	2.0	1.9	1.7	2.4	2.6	2.6	3.0	2.9	2.9	3.6	3.6	3.3	3.9	2.9	2.5	2.3	2.3	2.0	1.7	2.0	1.6	3.9
12-Apr	1.4	1.4	0.8	0.8	0.6	1.2	1.0	1.0	1.8	2.1	3.2	3.2	3.4	3.3	3.5	3.1	3.1	3.0	2.2	1.0	1.0	1.9	1.9	1.1	3.5
13-Apr	1.1	0.9	1.1	1.4	1.1	1.0	1.1	1.0	2.6	2.8	4.0	3.1	3.2	3.7	4.4	3.2	3.3	2.8	2.5	2.0	1.9	1.9	2.1	2.6	4.4
14-Apr	3.0	3.1	3.0	2.7	2.2	1.7	2.2	2.6	2.8	2.6	2.9	3.6	3.5	3.8	3.4	4.1	3.6	3.0	2.3	2.7	3.3	3.3	3.6	3.0	4.1
15-Apr	3.5	3.4	2.3	2.6	2.8	2.8	3.1	2.1	2.6	2.5	2.7	3.0	3.2	3.4	2.9	3.2	3.3	2.6	2.0	0.8	0.7	1.4	1.6	2.1	3.5
16-Apr	2.8	2.2	1.8	1.9	2.1	2.8	1.6	1.2	1.2	1.5	1.7	2.4	3.3	3.7	3.3	3.3	3.2	2.5	1.8	1.5	1.1	1.1	1.0	0.9	3.7
17-Apr	2.2	2.8	3.3	3.3	3.2	2.9	3.4	2.8	3.4	3.4	3.9	3.8	3.9	3.9	4.6	4.3	3.8	3.9	3.0	2.3	2.0	2.2	2.2	2.1	4.6
18-Apr	2.1	2.0	2.2	2.0	3.1	2.9	2.9	3.2	2.3	2.3	2.6	2.6	2.4	2.6	2.6	2.6	2.2	2.2	2.2	1.7	1.6	1.5	1.2	1.2	3.2
19-Apr	1.1	1.1	0.9	1.1	1.0	1.0	0.8	1.2	1.4	1.3	1.4	1.3	1.6	2.6	2.4	1.9	1.6	1.1	0.8	1.3	0.6	0.3	0.3	0.6	2.6
20-Apr	0.6	0.5	0.4	0.5	0.8	0.5	0.3	0.3	0.5	2.0	2.5	3.3	3.7	3.3	3.4	3.7	3.0	3.0	3.0	2.0	1.0	0.2	0.3	0.8	3.7
21-Apr	1.0	1.4	0.8	0.8	0.8	0.3	0.6	1.2	1.7	2.2	2.0	2.3	1.9	2.4	2.6	1.8	1.3	2.0	1.6	0.3	0.7	0.4	0.4	0.4	2.6
22-Apr	0.4	0.3	0.4	0.6	1.4	1.6	2.8	3.0	3.2	3.4	3.9	3.9	3.6	3.5	3.7	3.9	3.2	3.1	2.4	1.7	0.4	1.3	2.3	2.0	3.9
23-Apr	0.8	1.1	0.9	1.0	1.3	1.3	1.1	1.6	2.4	2.0	2.6	2.1	2.4	2.4	1.6	2.0	1.7	1.6	1.2	0.9	0.5	1.0	1.6	1.2	2.6
24-Apr	1.3	1.1	1.6	1.7	1.4	1.8	1.8	2.0	2.5	3.1	2.9	3.0	2.6	2.7	3.0	2.9	2.6	2.4	1.9	1.3	2.0	0.9	1.1	1.7	3.1
25-Apr	1.3	1.4	2.1	1.9	1.9	1.3	1.6	2.4	2.3	3.1	2.9	2.9	2.8	3.1	2.4	2.6	1.7	1.4	1.3	1.0	1.0	1.0	0.9	1.0	3.1
26-Apr	1.1	0.9	0.9	1.3	1.0	1.0	1.8	1.8	1.7	2.9	2.7	3.3	3.2	2.5	2.3	2.5	2.1	1.6	1.7	1.5	1.6	1.4	1.3	1.7	3.3
27-Apr	0.9	0.8	0.8	0.6	0.8	1.3	1.3	1.6	2.0	2.5	2.9	3.3	2.8	3.3	2.9	2.9	3.2	2.2	1.4	0.4	0.5	0.5	1.2	0.9	3.3
28-Apr	0.5	0.9	0.2	0.4	0.2	0.2	0.3	0.2	0.3	1.7	1.8	0.8	1.7	2.8	2.0	3.0	2.2	1.8	1.1	0.7	0.3	0.8	0.9	1.3	3.0
29-Apr	1.5	1.1	1.0	1.0	0.7	0.7	0.9	1.1	0.9	1.0	3.0	3.4	3.4	3.0	3.3	2.9	2.3	2.3	2.0	0.9	1.0	0.7	0.8	1.1	3.4
30-Apr	0.9	0.5	0.6	0.7	1.0	1.0	0.7	0.8	1.1	1.2	2.2	3.1	2.4	2.9	2.9	3.1	2.3	2.2	1.1	0.8	1.0	0.4	0.4	0.3	3.1
Diurnal Maximum																									
3.5 3.4 3.3 3.3 3.2 3.2 3.4 3.2 3.4 3.6 4.4 4.1 4.3 4.5 4.6 4.3 4.1 3.9 3.7 3.5 3.4 3.3 3.6 3.4																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 4 BUFFALO VIEWPOINT APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	688	32	32	100	60	0	6	0
H2S (ppb) Average	686	33	34	99.86	5	0	0	0
THC (ppm) Average	688	32	32	100	4.8	-	2.7	-
Temperature (C) Average	720	0	0	100	17.3	-	10.2	-
Relative Humidity (%) Average	720	0	0	100	99	-	83	-
Wind Speed 10 m (km/h) Average	720	0	0	100	34	-	24	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	688	1	3	-	0	0	0	0	0	2	60
H2S (ppb) Average	686	0.2	0	-	0	0	0	0	0	0	5
THC (ppm) Average	688	2.31	0.2	-	2.1	2.2	2.2	2.2	2.3	2.5	4.8
Temperature 2 m (C) Average	720	2.38	6	-	-10.9	-5.3	-2	1.9	6.4	10.9	17.3
Relative Humidity (%) Average	720	61	19	-	18	35	47	60	75	89	99
Wind Speed 10 m (km/h) Average	720	11.6	6	-	0	5	7	10	15	21	34
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	25 Apr 2017 08:00	25 Apr 2017 08:00	1	Maintenance - sample manifold cleaning



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Buffalo Viewpoint - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 60 ppb on Apr 3 13:00	Maximum Daily Average: 5.6 ppb on Apr 3		Hours of Data:	688
Minimum Value: 0 ppb on Apr 12 05:00	Minimum Daily Average: 0.1 ppb on Apr 8		Hours of Missing Data:	32
Maximum Diurnal Average: 3.1 ppb at hour 13	Minimum Diurnal Average: 0.3 ppb at hour 2		Hours of Calibration:	32
Monthly Average: 1.0 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 2 P ₉₉ = 15		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	1
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	1	3	9	0	0	0	0	0	0	0	0	0	0	0.7	9
3-Apr	0	0	Z	0	0	0	0	0	0	1	2	16	60	23	9	1	6	5	1	1	1	1	1	0	5.6	60
4-Apr	0	0	0	Z	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.2	1
6-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	18	1.7	18
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Apr	0	0	Z	0	1	1	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	6
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.3	1
11-Apr	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0.2	4
13-Apr	Z	0	0	0	0	1	2	2	6	1	0	2	2	4	8	0	0	0	0	0	16	14	11	20	4.0	20
14-Apr	4	Z	11	4	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	1	0	0	1.2	11
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	3	2	5	1	0	0	1	0	0	0	0.7	5
16-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	Z	0	0	0	0	0	0	0	0	0	0	7	17	10	6	6	5	2	1	1	1	1	1	0	2.6	17
20-Apr	1	Z	1	14	5	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1.2	14
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	6	8	7	8	8	13	6	2	2.7	13	
22-Apr	2	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
23-Apr	0	1	1	2	Z	1	2	5	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0.8	5
24-Apr	0	0	0	0	0	Z	1	3	0	1	11	8	0	0	0	0	0	0	0	0	0	0	0	0	1.1	11
25-Apr	Z	0	0	0	0	0	0	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	8	0.7	8
28-Apr	2	1	0	Z	0	0	0	0	0	1	3	12	6	6	7	7	5	7	8	6	2	1	2	1	3.4	12
29-Apr	0	0	0	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	3	1	6	4	3	2	1	9	2	1	1.5	9

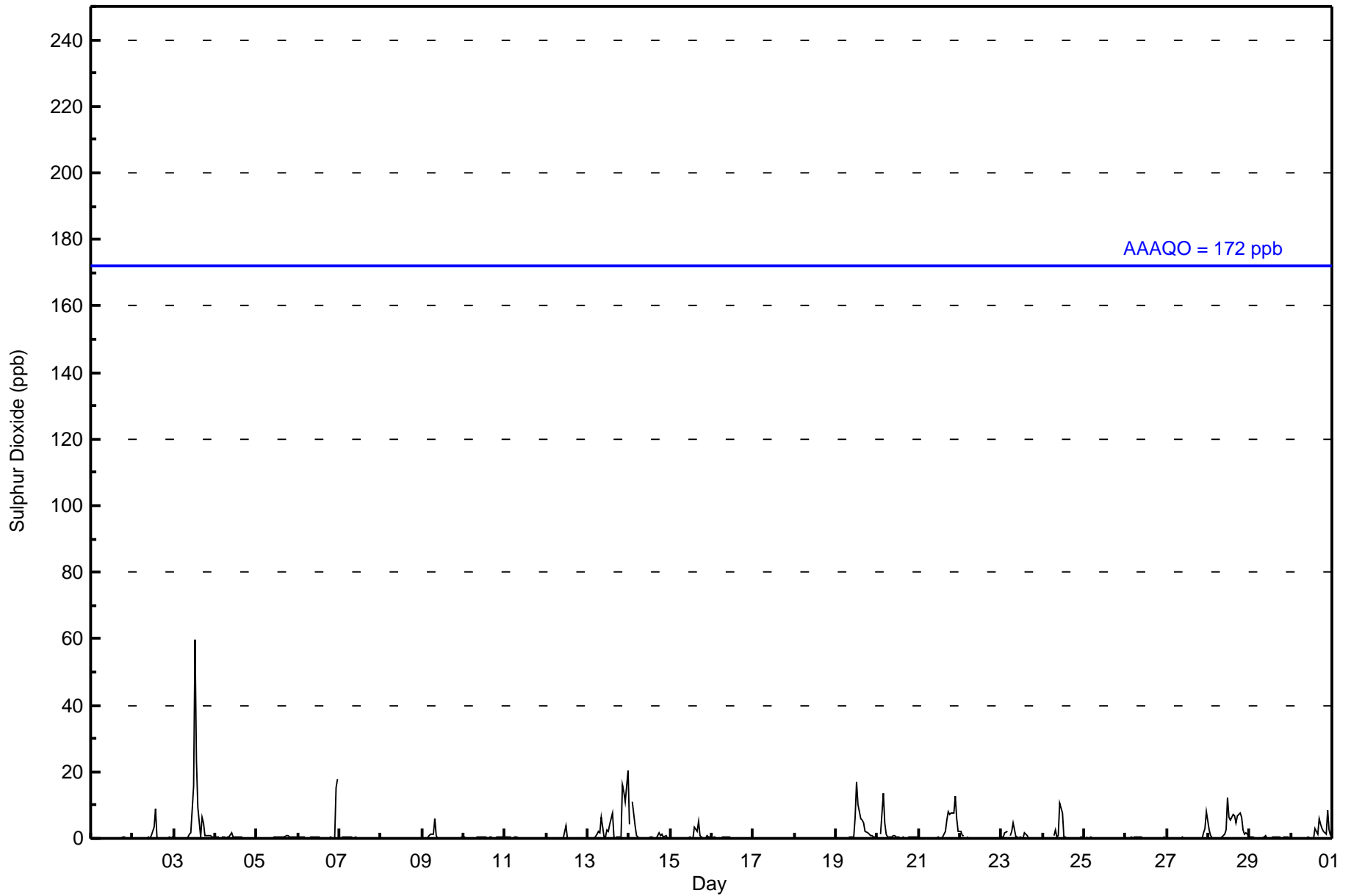
0.5	0.3	0.7	0.9	0.4	0.3	0.4	0.7	0.4	0.4	0.7	1.8	3.1	1.9	1.4	0.8	1.2	1.1	0.9	0.8	1.1	1.5	1.5	1.9	Diurnal Average
4	1	11	14	5	1	2	6	6	2	11	16	60	23	9	7	6	8	8	8	16	14	15	20	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	673	97.82	97.82
11 - 20	13	1.89	99.71
21 - 60	2	0.29	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	150	99	25	4	12	30	69	112	36	30	16	19	14	9	16	32	673
11 - 20	2	1	0	5	4	0	0	0	0	0	0	1	0	0	0	0	13
21 - 60	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	152	101	26	9	16	30	69	112	36	30	16	20	14	9	16	32	688

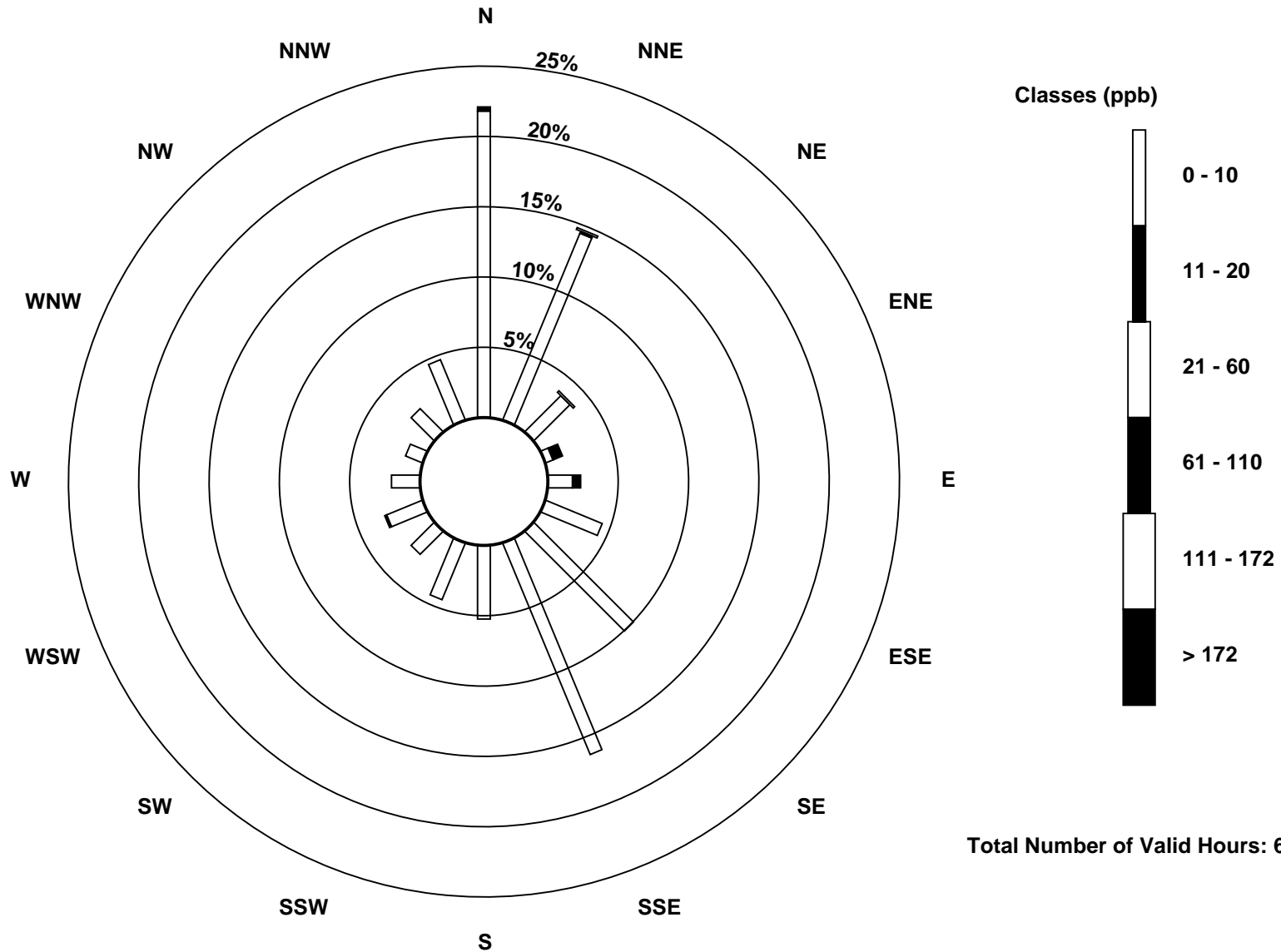
Total Number of Valid Hours: 688

Total Number of Hours: 720

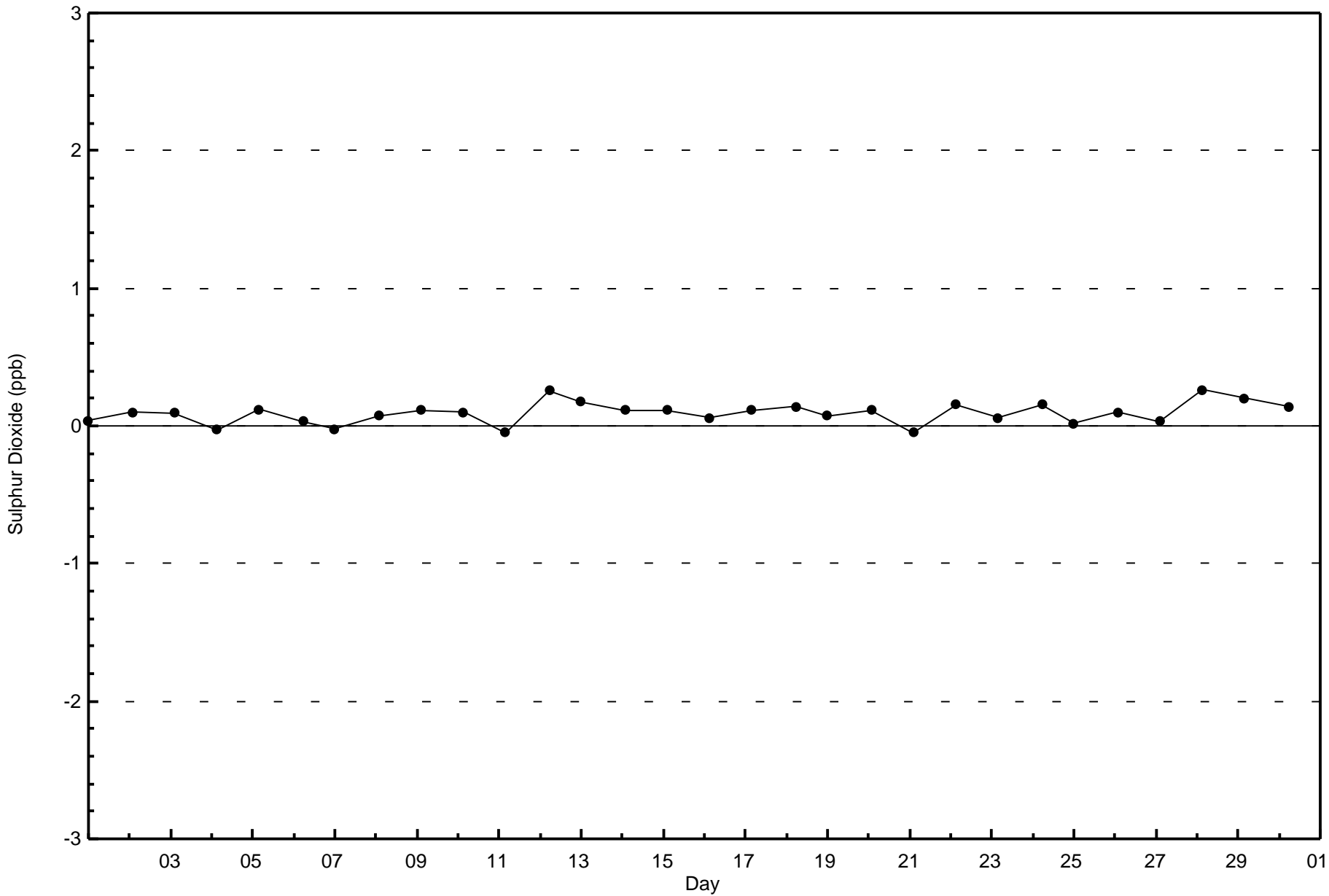


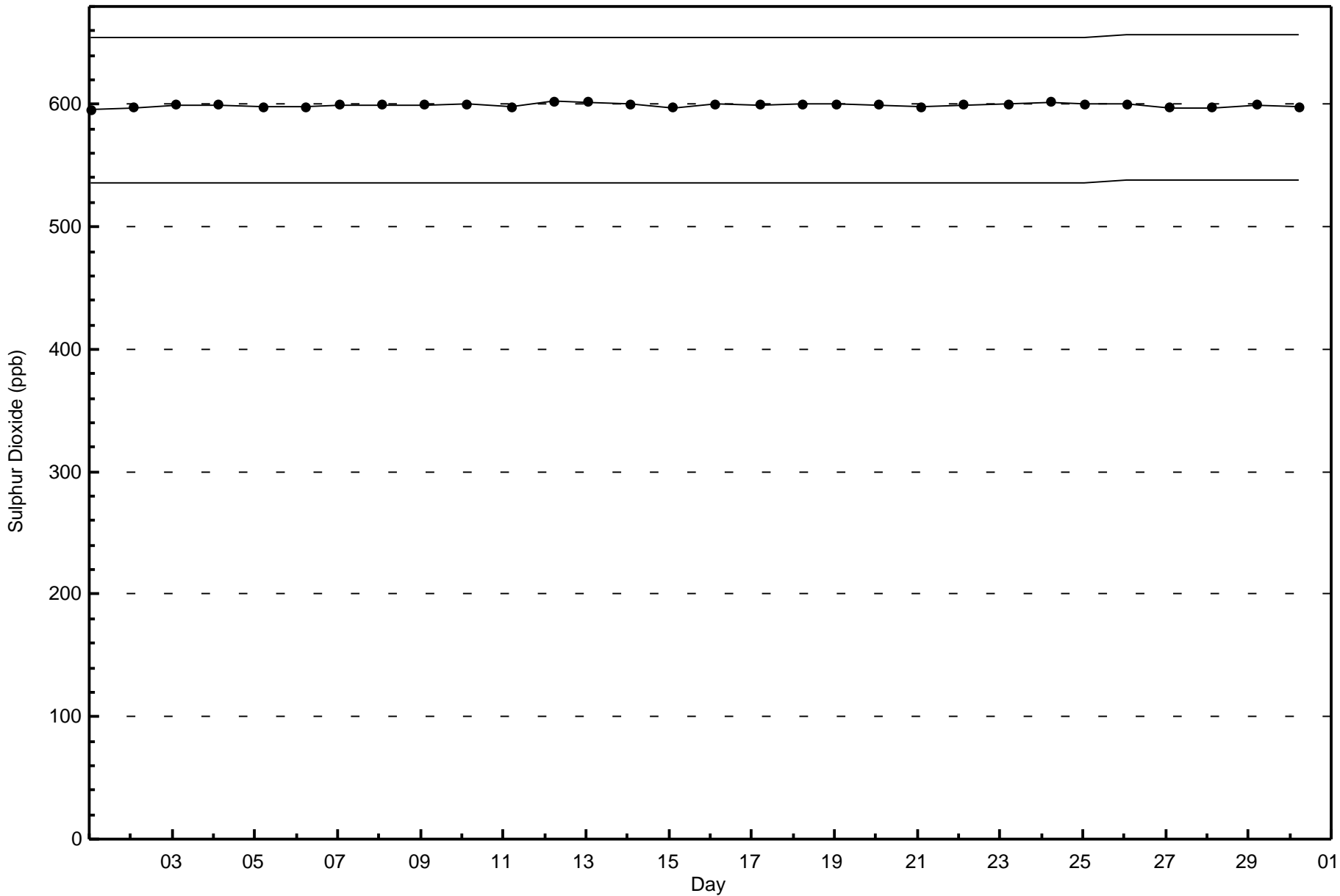
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint (AMS 4)



Total Number of Valid Hours: 688







Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 5 ppb on Apr 20 04:00	Maximum Daily Average: 0.5 ppb on Apr 20
Minimum Value: 0 ppb on Apr 6 17:00	Hours of Data: 686
Maximum Diurnal Average: 0.4 ppb at hour 4	Hours of Missing Data: 34
Monthly Average: 0.2 ppb	Hours of Calibration: 33
Minimum Daily Average: 0.0 ppb on Apr 18	Percent Operational Time: 99.9
Minimum Diurnal Average: 0.1 ppb at hour 17	
Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1	

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.2	1
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.2	1
3-Apr	0	0	0	Z	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0.3	3
7-Apr	1	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	0	Z	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0.4	1
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
20-Apr	0	0	Z	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	5
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0.4	2
22-Apr	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
23-Apr	0	0	0	1	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
25-Apr	0	Z	0	0	0	0	0	M	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.2	1
28-Apr	1	0	1	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	0	0.5	1
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0.3	2

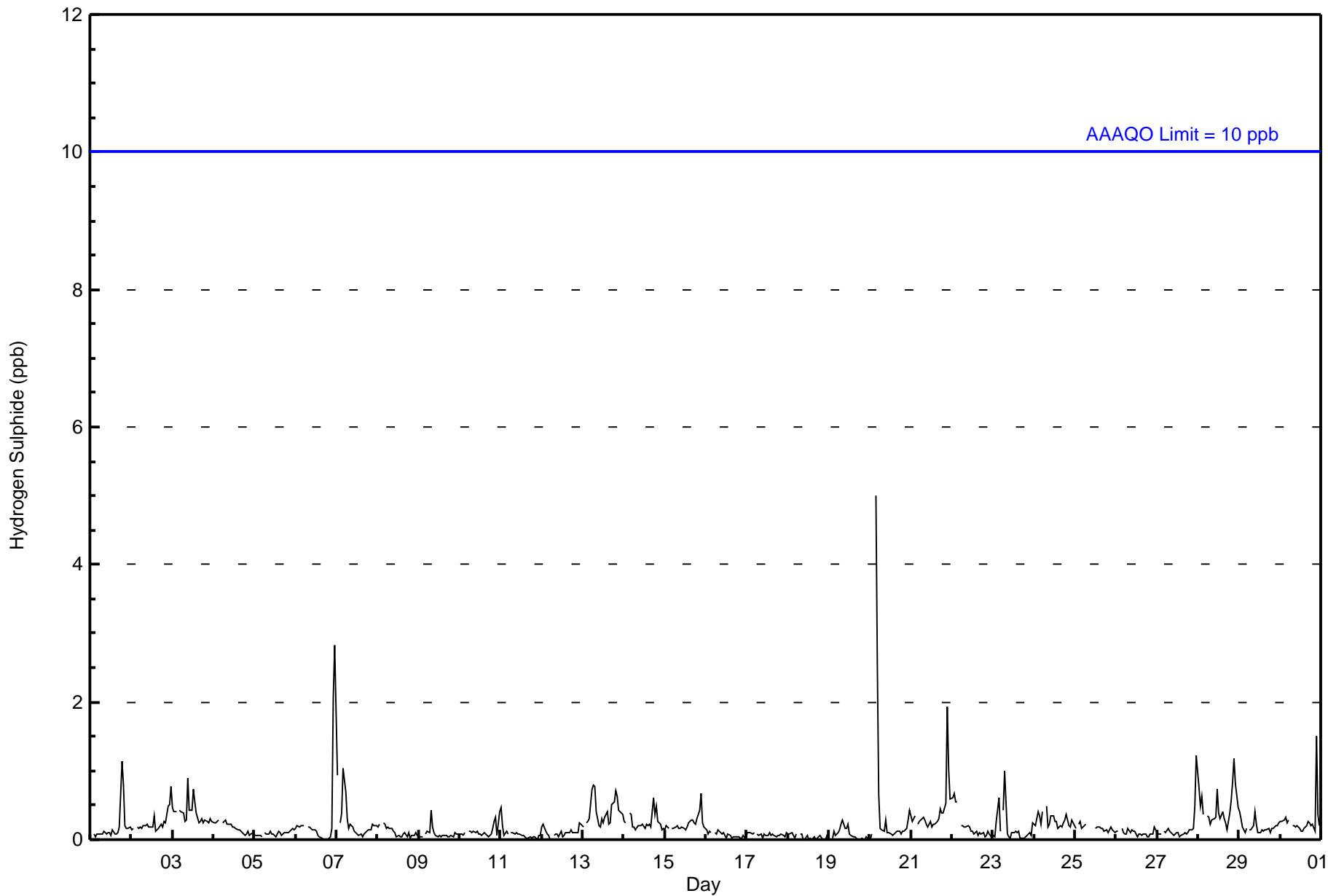
0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	Diurnal Average
1	1	1	5	3	1	1	1	1	0	1	0	1	1	1	0	0	0	1	1	1	1	2	2	3	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	683	99.56	99.56
3 - 4	2	0.29	99.85
5 - 7	1	0.15	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	149	102	23	7	17	31	69	111	34	31	16	19	15	9	16	34	683
3 - 4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5 - 7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	150	102	24	8	17	31	69	111	34	31	16	19	15	9	16	34	686

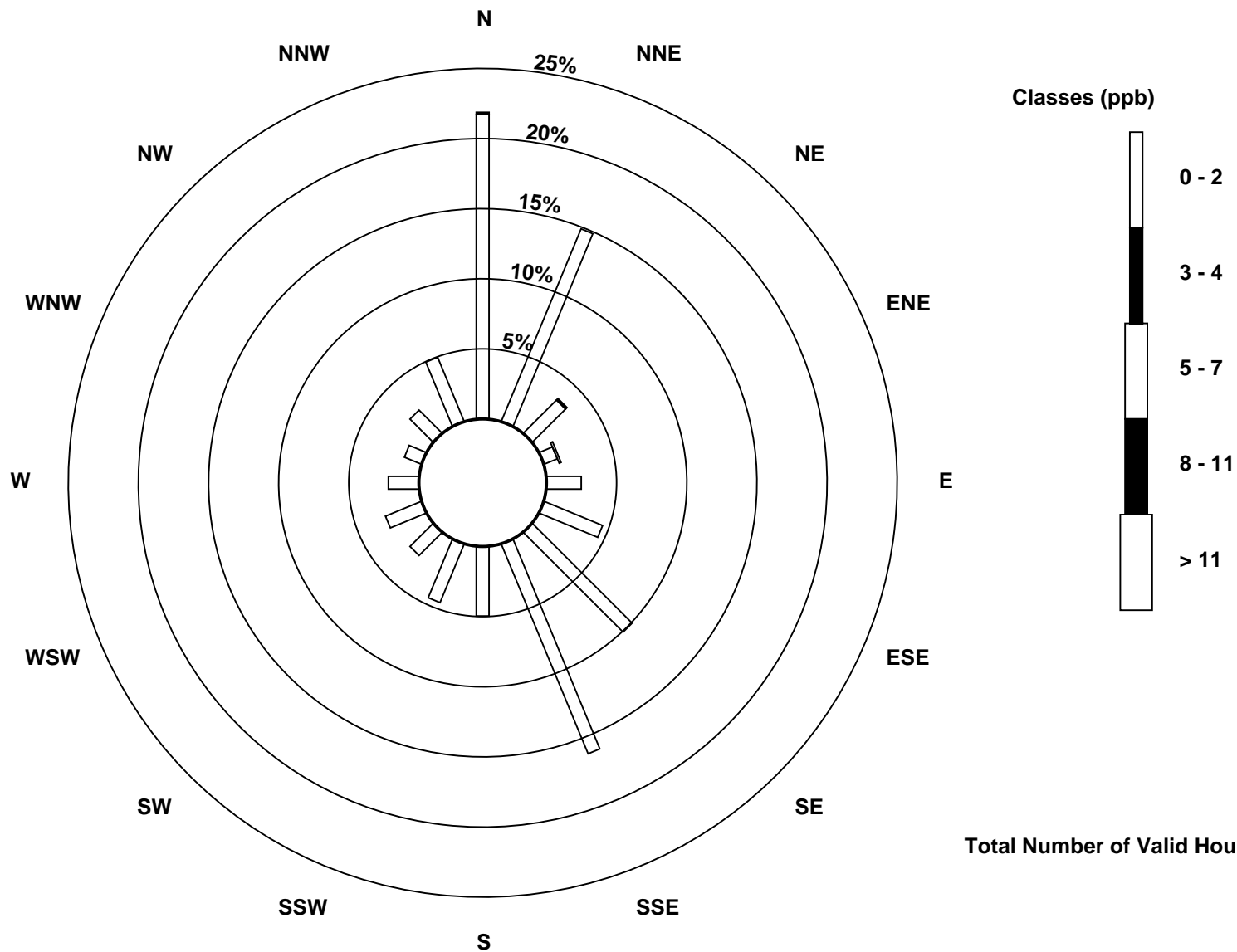
Total Number of Valid Hours: 686

Total Number of Hours: 720

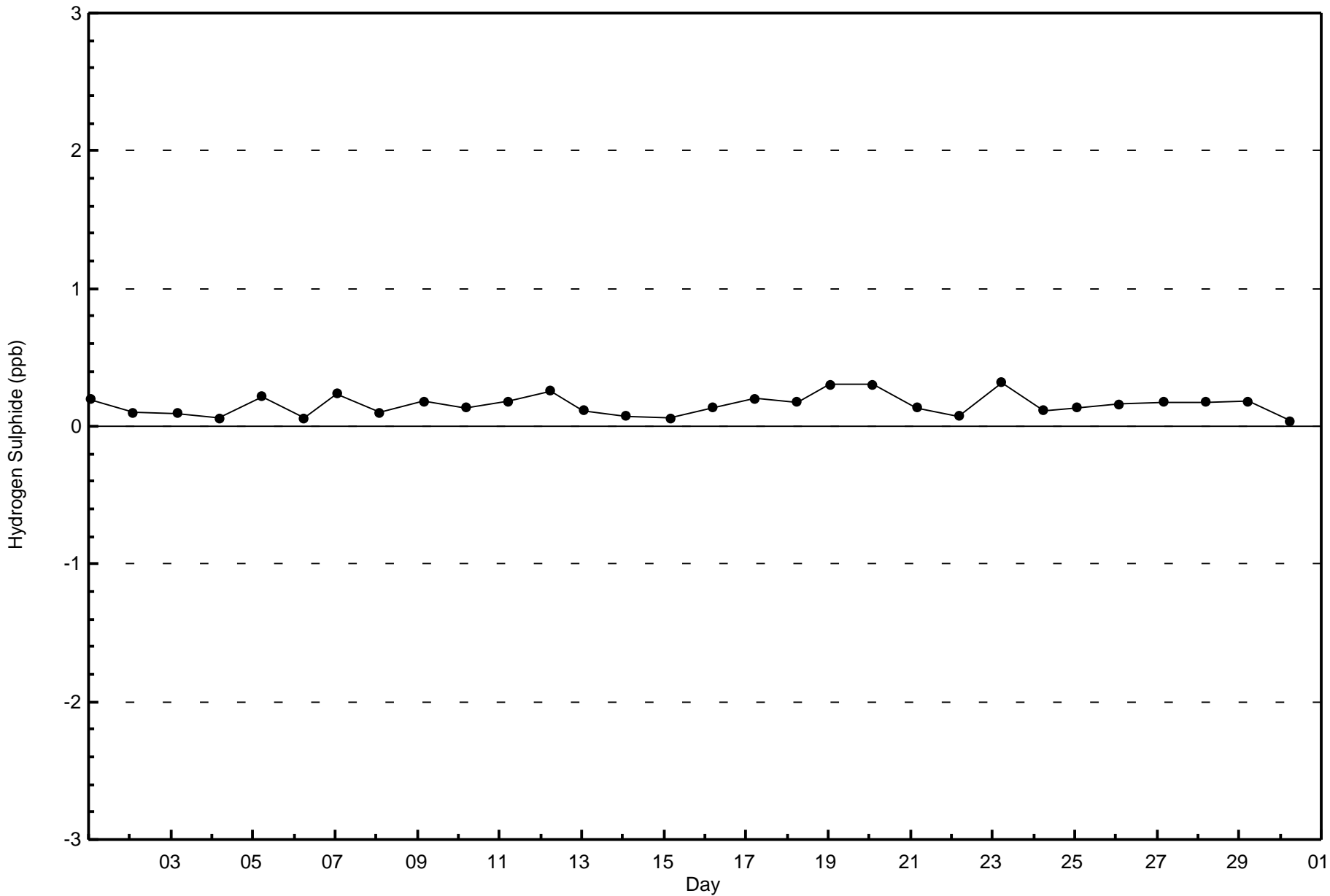


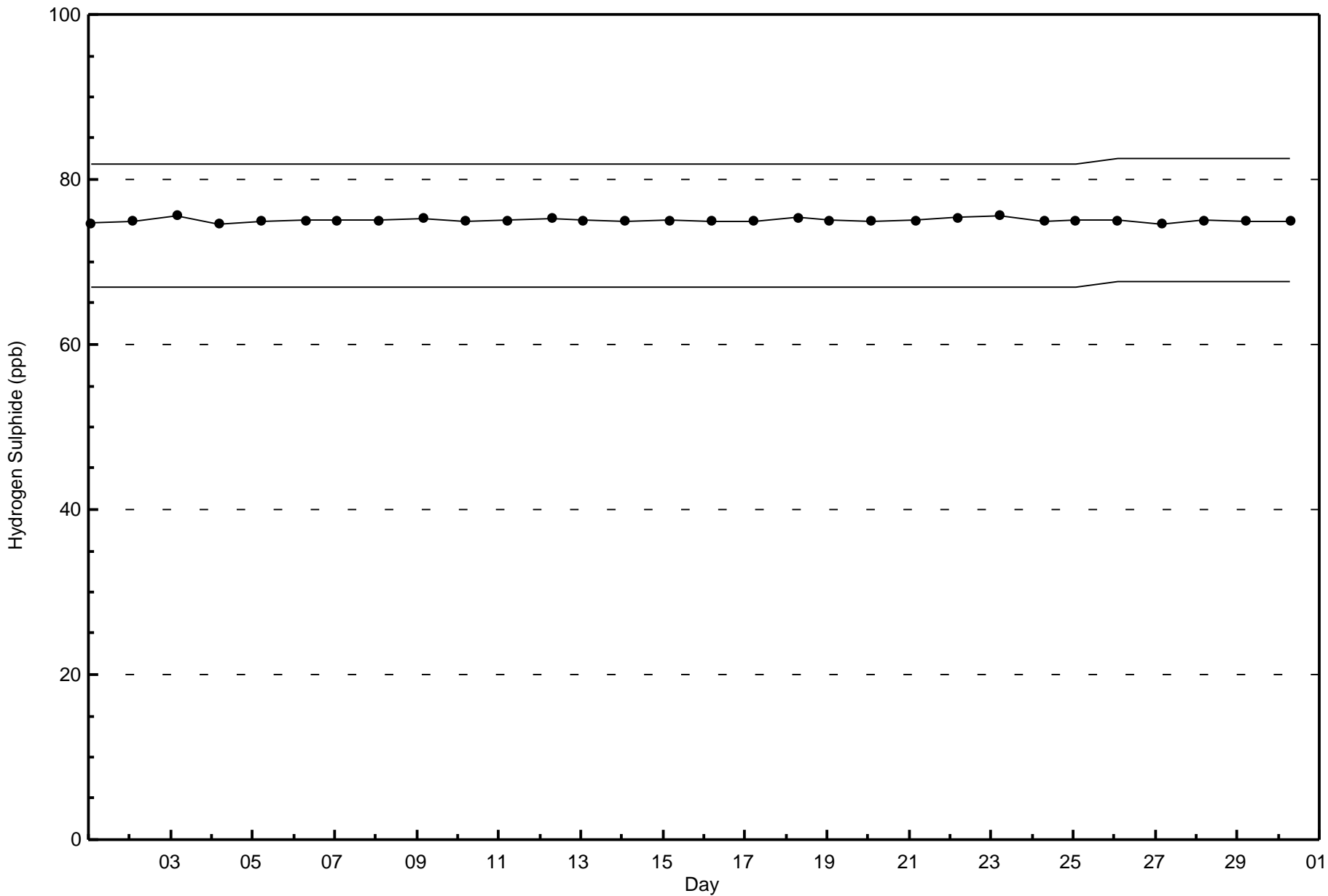
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint (AMS 4)



Total Number of Valid Hours: 686







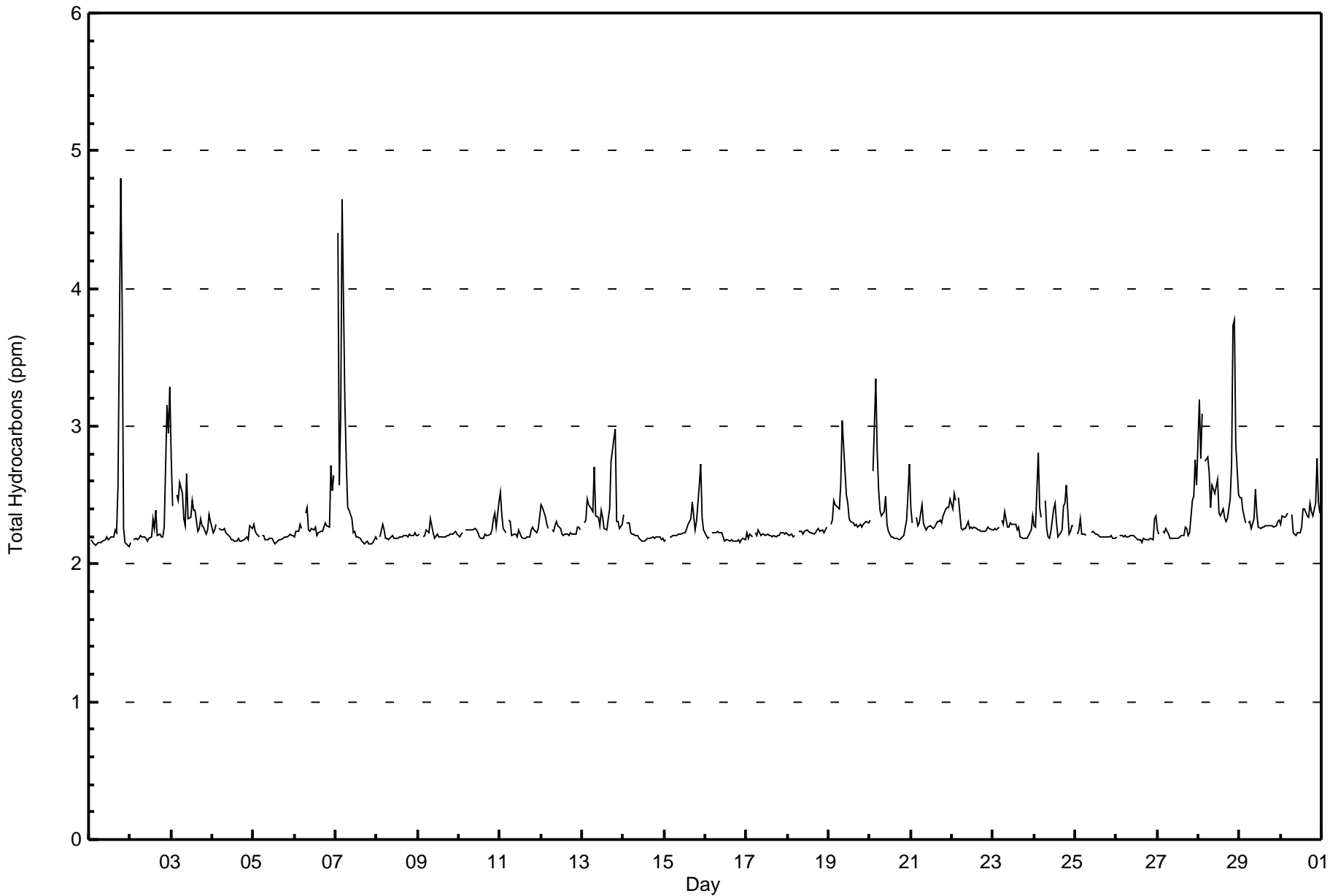
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - April 2017

Maximum Value: 4.8 ppm on Apr 1 19:00																	Maximum Daily Average: 2.7 ppm on Apr 28																	Hours in Service: 720	
Minimum Value: 2.1 ppm on Apr 2 00:00																	Minimum Daily Average: 2.2 ppm on Apr 16																	Hours of Data: 688	
Maximum Diurnal Average: 2.4 ppm at hour 5																	Minimum Diurnal Average: 2.2 ppm at hour 15																	Hours of Missing Data: 32	
Monthly Average: 2.31 ppm																	Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.5 P ₉₉ = 3.2																	Hours of Calibration: 32	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	4.8	3.9	2.3	2.2	2.1	2.1	2.4	4.8									
2-Apr	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.3	3.1	2.9	3.3	2.3	3.3									
3-Apr	2.8	2.4	Z	2.5	2.5	2.6	2.5	2.3	2.3	2.7	2.3	2.3	2.5	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.4	2.3	2.4	2.8									
4-Apr	2.2	2.3	2.3	Z	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3									
5-Apr	2.3	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3									
6-Apr	2.2	2.2	2.2	2.3	2.3	Z	2.4	2.4	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.7	2.5	2.6	2.3	2.7									
7-Apr	Z	4.4	2.6	3.1	4.6	3.2	2.7	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.5	4.6									
8-Apr	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3								
9-Apr	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3								
10-Apr	2.2	2.2	2.2	Z	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.5	2.2	2.5									
11-Apr	2.5	2.4	2.3	2.2	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.5									
12-Apr	2.4	2.4	2.4	2.3	2.3	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4									
13-Apr	Z	2.3	2.3	2.5	2.4	2.4	2.4	2.7	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.3	2.4	2.7	2.9	3.0	2.3	2.3	2.3	2.3	2.4	3.0									
14-Apr	2.4	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4									
15-Apr	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.6	2.7	2.3	2.2	2.7									
16-Apr	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2									
17-Apr	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2									
18-Apr	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2									
19-Apr	Z	2.3	2.3	2.5	2.4	2.4	2.4	2.6	3.0	2.7	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	3.0									
20-Apr	2.3	Z	2.7	3.3	2.8	2.5	2.4	2.3	2.4	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.7	2.4	3.3									
21-Apr	2.4	2.3	Z	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.3	2.5									
22-Apr	2.4	2.5	2.5	Z	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.5									
23-Apr	2.2	2.3	2.3	2.3	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4									
24-Apr	2.3	2.3	2.8	2.4	2.3	Z	2.5	2.3	2.2	2.2	2.2	2.4	2.4	2.3	2.2	2.2	2.2	2.4	2.4	2.6	2.2	2.2	2.3	2.3	2.3	2.8									
25-Apr	Z	2.2	2.2	2.3	2.2	2.2	2.2	C	C	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3									
26-Apr	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3									
27-Apr	2.2	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.5	2.5	2.8	2.6	2.3	2.8									
28-Apr	3.2	2.8	3.1	Z	2.7	2.8	2.7	2.4	2.6	2.5	2.6	2.6	2.4	2.4	2.4	2.3	2.3	2.3	2.5	2.7	3.7	3.8	2.9	2.5	2.7	3.8									
29-Apr	2.5	2.5	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5									
30-Apr	2.3	2.4	2.3	2.4	2.4	Z	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.8	2.5	2.4	2.4	2.8									
																								Diurnal Average											
																								Diurnal Maximum											
Z - zerospan C - Calibration																																			





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint - April 2017**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	675	98.11	98.11
3.1 - 10.0	13	1.89	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	149	101	26	8	16	28	69	112	36	30	15	20	14	8	14	29	675
3.1 - 10.0	3	0	0	1	0	2	0	0	0	0	1	0	0	1	2	3	13
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	152	101	26	9	16	30	69	112	36	30	16	20	14	9	16	32	688

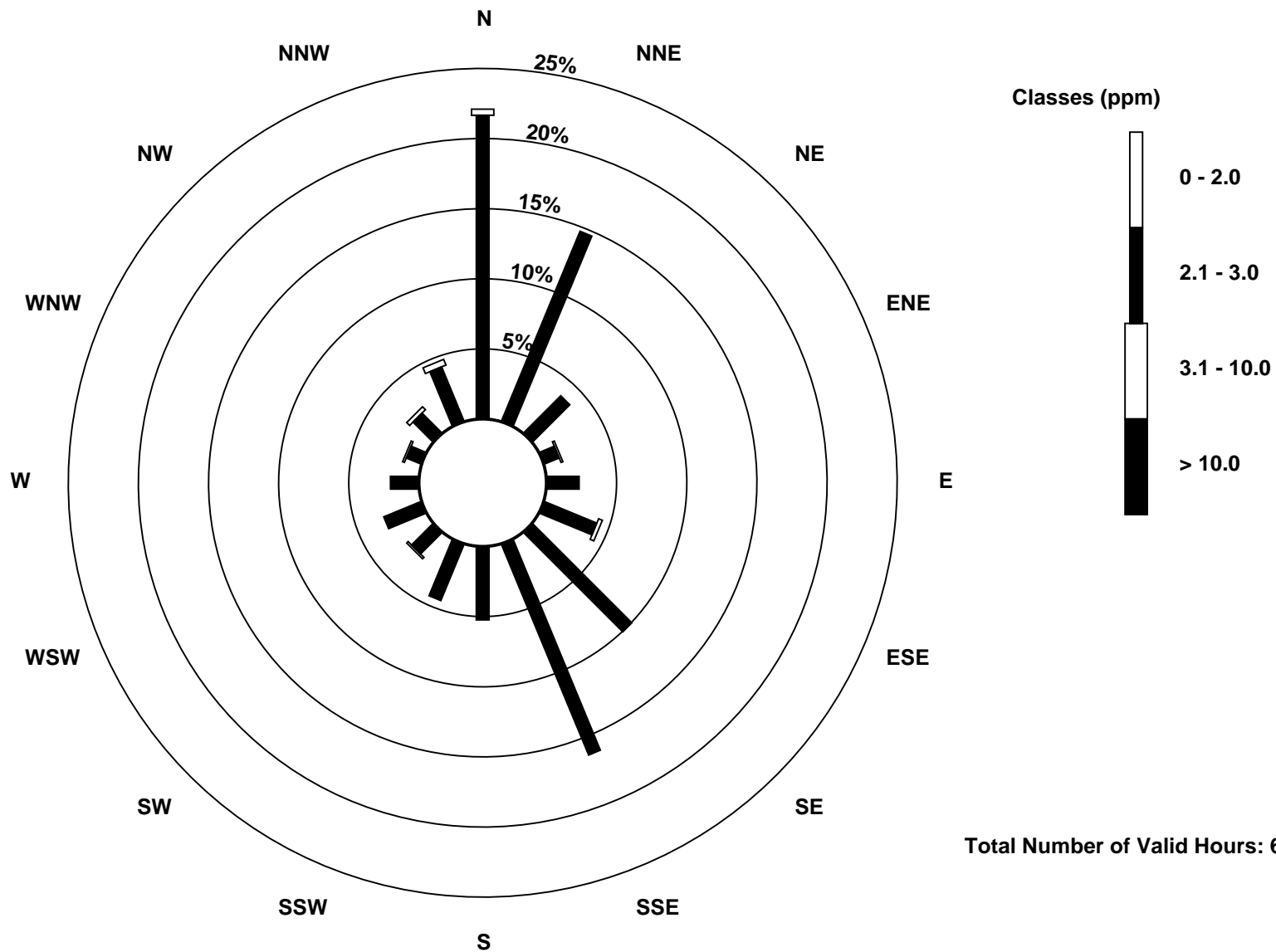
Total Number of Valid Hours: 688

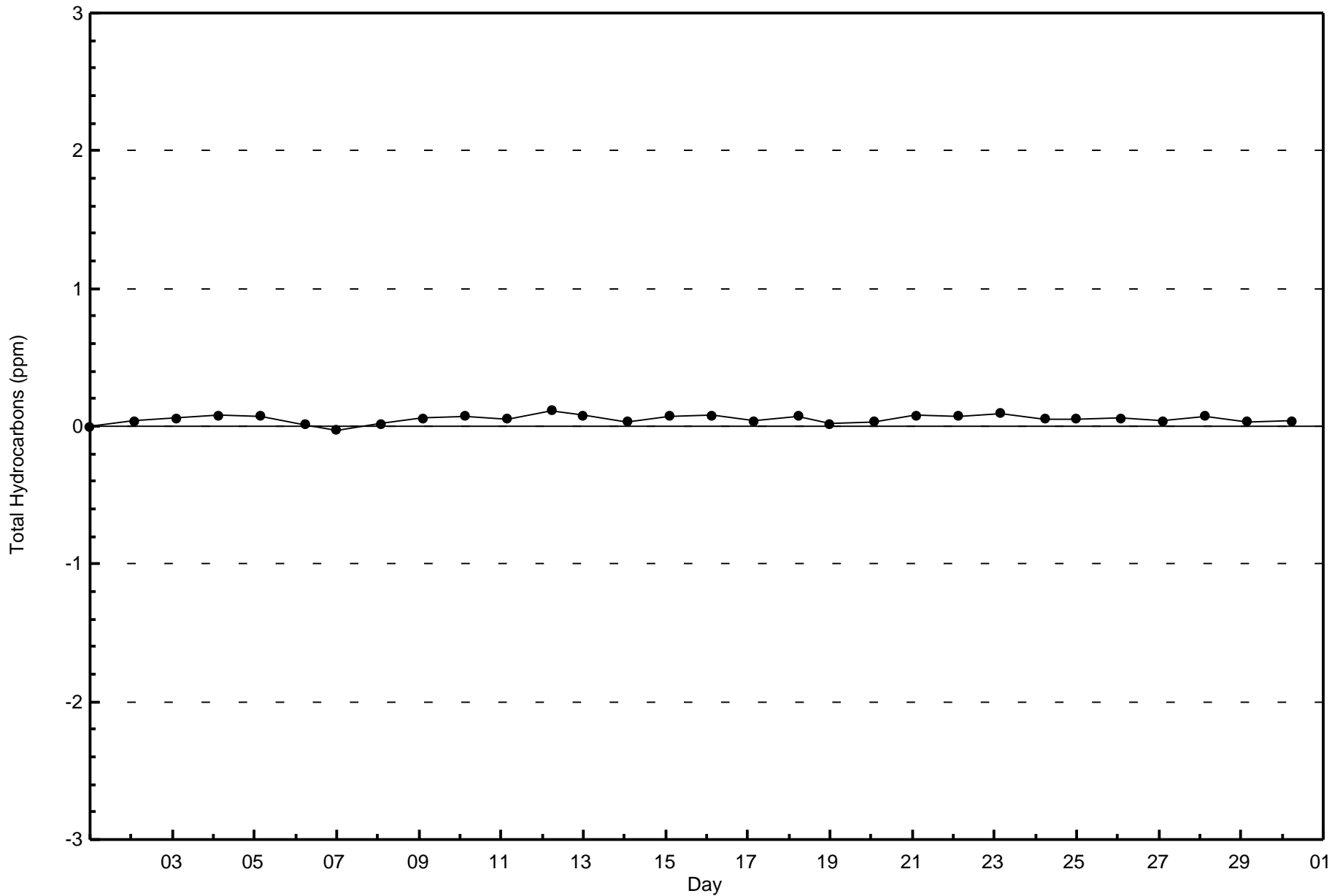
Total Number of Hours: 720

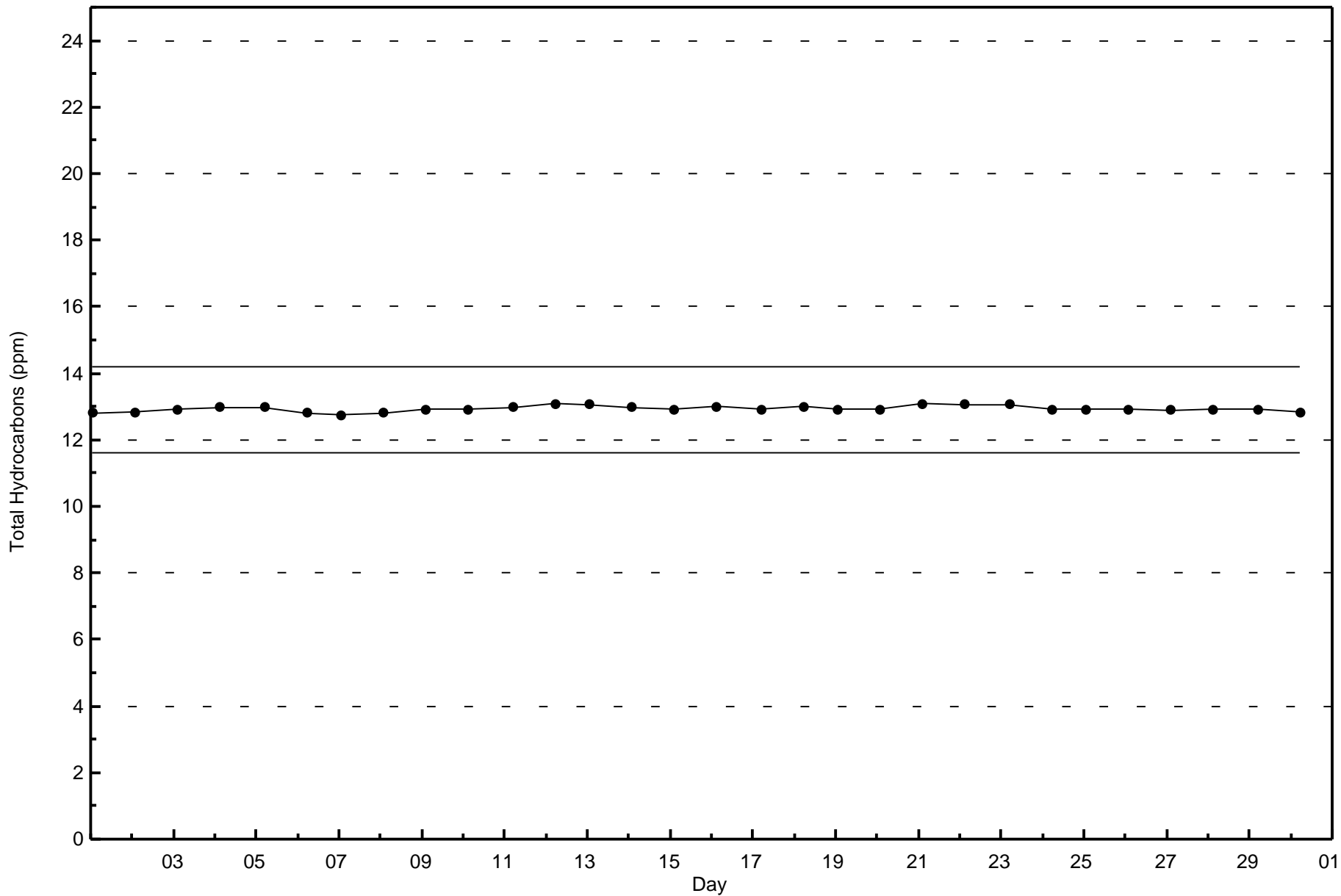


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint (AMS 4)









Wood Buffalo Environmental Association
Summary of Hour Averages

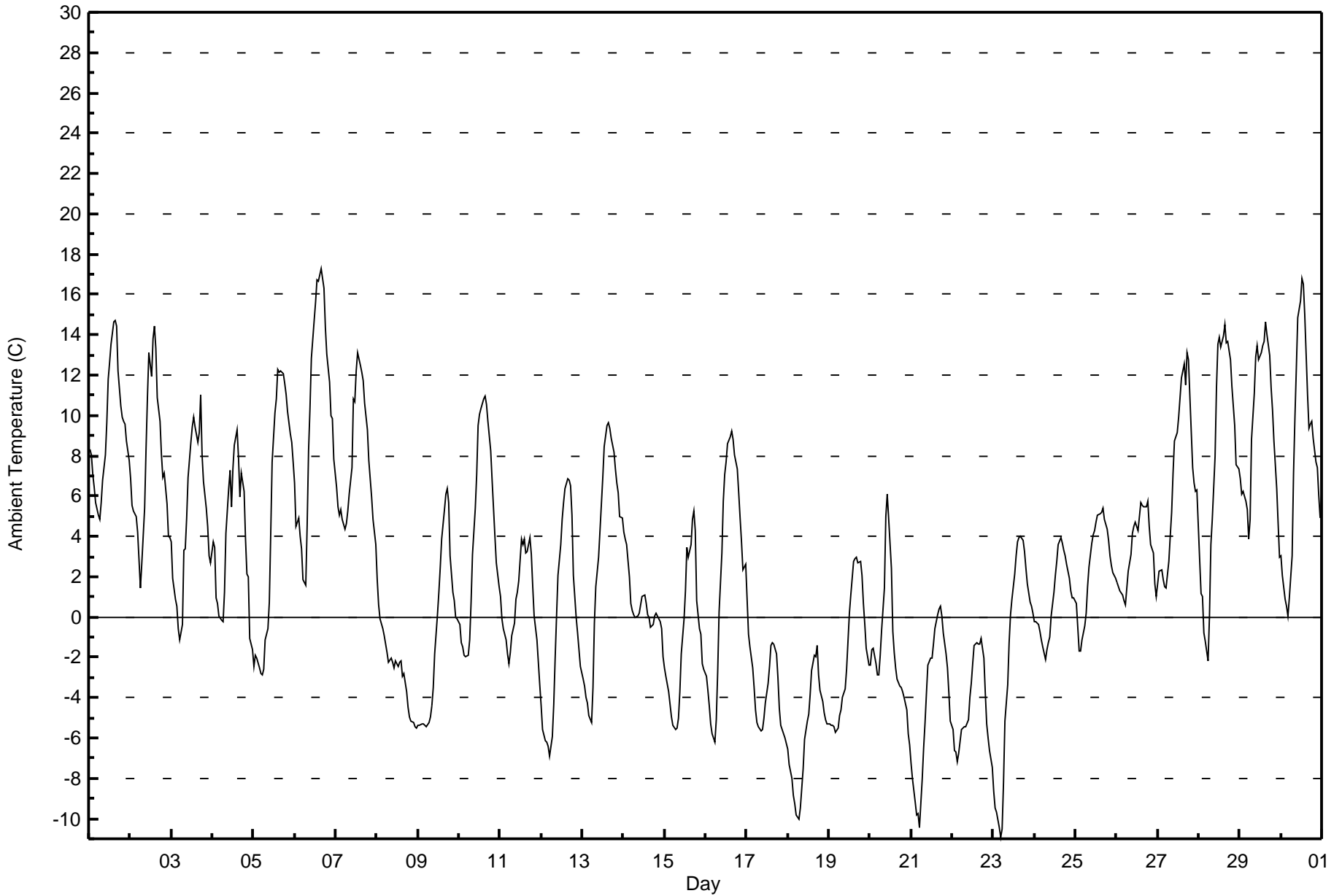
Ambient Temperature (AT) - C
Buffalo Viewpoint - April 2017

Maximum Value: 17.3 C on Apr 6 16:00		Maximum Daily Average: 10.2 C on Apr 6		Hours in Service: 720																							
Minimum Value: -10.9 C on Apr 23 05:00		Minimum Daily Average: -5.8 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 6.7 C at hour 15		Minimum Diurnal Average: -2.4 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 2.38 C		Percentiles: P ₁ = -9.7 P ₁₀ = -5.3 Q ₁ = -2.0 Median = 1.9 Q ₃ = 6.4 P ₉₀ = 10.9 P ₉₉ = 16.1		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	8.3	8.0	7.0	6.4	5.7	5.0	4.8	5.7	6.8	8.0	9.7	11.8	12.6	13.6	14.6	14.7	14.4	12.2	10.5	9.9	9.7	9.6	8.7	7.7	9.4	14.7	
2-Apr	6.9	5.6	5.3	5.0	4.2	2.9	1.4	2.7	5.4	8.3	10.9	13.1	11.9	13.8	14.5	13.3	10.9	9.7	8.0	6.9	7.2	5.6	4.0	3.9	7.5	14.5	
3-Apr	3.7	1.9	0.9	0.6	-0.6	-1.1	-0.4	3.3	3.4	4.9	6.9	8.7	9.4	9.9	9.4	8.6	9.2	11.0	8.0	6.7	5.4	4.5	3.0	2.7	5.0	11.0	
4-Apr	3.7	3.4	0.9	0.7	0.0	-0.1	-0.2	1.2	4.1	6.3	7.2	5.5	7.4	8.5	9.3	7.9	6.0	7.1	6.2	3.9	2.1	2.0	-1.1	-1.6	3.8	9.3	
5-Apr	-2.5	-1.9	-2.0	-2.5	-2.8	-2.9	-2.6	-1.2	-0.6	0.7	4.2	7.7	10.2	10.8	12.3	12.1	12.2	12.0	11.6	11.1	10.2	9.1	8.6	7.7	5.1	12.3	
6-Apr	6.6	4.5	4.9	4.0	3.4	1.8	1.6	4.6	8.3	10.3	12.8	14.7	15.6	16.7	16.7	17.3	16.8	16.3	14.4	13.1	11.7	10.0	9.9	7.8	10.2	17.3	
7-Apr	6.5	5.5	5.1	5.3	4.9	4.4	4.6	5.3	6.1	7.4	10.8	10.7	12.2	13.1	12.5	12.1	11.7	10.6	9.3	7.8	6.8	5.9	4.8	3.6	7.8	13.1	
8-Apr	1.9	0.6	-0.1	-0.6	-0.9	-1.4	-1.8	-2.3	-2.0	-2.3	-2.5	-2.2	-2.4	-2.3	-2.2	-2.9	-2.8	-3.7	-4.5	-5.0	-5.1	-5.2	-5.5	-5.5	-2.5	1.9	
9-Apr	-5.4	-5.4	-5.3	-5.3	-5.3	-5.4	-5.2	-5.0	-4.4	-3.5	-1.9	0.1	1.2	2.5	3.9	5.3	6.1	6.4	5.7	3.1	1.2	0.8	0.0	-0.1	-0.7	6.4	
10-Apr	-0.4	-1.2	-1.5	-1.9	-2.0	-1.9	-1.1	0.8	3.1	5.4	7.1	9.5	10.1	10.3	10.8	11.0	10.6	9.7	8.3	6.8	5.4	4.0	2.7	1.5	4.5	11.0	
11-Apr	1.0	-0.1	-0.6	-1.1	-1.8	-2.3	-1.8	-0.9	-0.3	0.9	1.2	1.8	3.9	3.6	3.9	3.2	3.2	3.9	3.1	1.5	0.1	-1.2	-2.2	-3.3	0.7	3.9	
12-Apr	-4.4	-5.6	-6.1	-6.2	-6.4	-6.9	-6.0	-4.4	-2.1	0.0	2.1	3.6	4.8	5.7	6.4	6.9	6.8	6.5	5.1	2.1	0.0	-0.8	-1.6	-2.5	-0.1	6.9	
13-Apr	-3.1	-3.4	-4.0	-4.3	-4.9	-5.2	-3.5	-0.3	1.5	3.0	4.3	5.6	6.9	8.5	9.5	9.6	9.3	8.9	8.2	7.4	6.6	6.1	5.0	4.9	3.2	9.6	
14-Apr	4.2	3.9	3.6	2.0	0.7	0.3	0.1	0.0	0.2	0.6	1.0	1.1	0.7	0.1	0.0	-0.5	-0.4	0.0	0.2	0.0	-0.2	-0.6	-2.0	-0.6	0.6	4.2	
15-Apr	-2.5	-3.0	-3.7	-4.3	-4.9	-5.4	-5.6	-5.5	-5.0	-3.7	-1.8	-0.1	1.3	3.5	2.9	3.6	4.9	5.3	4.3	0.8	-0.6	-0.9	-2.3	-2.6	-1.1	5.3	
16-Apr	-3.0	-3.6	-4.4	-5.3	-5.8	-6.2	-5.1	-2.7	0.2	3.2	5.7	7.1	7.7	8.6	9.0	9.2	8.8	8.0	7.4	6.1	4.9	3.7	2.3	2.6	2.4	9.2	
17-Apr	0.9	-0.8	-1.5	-2.5	-3.5	-4.6	-5.2	-5.5	-5.6	-5.6	-5.0	-4.2	-3.3	-2.5	-1.4	-1.3	-1.4	-1.8	-3.0	-4.5	-5.3	-5.8	-6.0	-6.3	-3.6	0.9	
18-Apr	-6.6	-7.3	-8.0	-8.8	-9.3	-9.8	-10.0	-9.5	-8.5	-7.5	-6.1	-5.2	-4.8	-3.8	-2.7	-1.9	-1.9	-1.4	-2.9	-3.6	-4.2	-4.7	-5.1	-5.3	-5.8	-1.4	
19-Apr	-5.3	-5.4	-5.4	-5.4	-5.7	-5.5	-4.9	-4.6	-4.0	-3.5	-2.6	-1.2	0.2	1.1	2.7	2.9	3.0	2.7	2.8	2.1	0.7	-0.4	-1.6	-2.3	-1.7	3.0	
20-Apr	-2.4	-1.6	-1.5	-2.3	-2.9	-2.9	-1.9	-0.6	1.4	5.0	6.1	4.9	2.4	-0.7	-1.8	-2.6	-3.1	-3.4	-3.5	-3.7	-4.0	-4.6	-5.8	-6.3	-1.5	6.1	
21-Apr	-7.2	-8.0	-9.2	-9.8	-9.7	-10.5	-8.0	-6.5	-5.2	-3.8	-2.4	-2.0	-2.0	-1.3	-0.6	0.1	0.4	0.6	0.0	-0.8	-1.8	-2.5	-3.8	-5.1	-4.1	0.6	
22-Apr	-5.5	-6.6	-6.7	-7.2	-6.8	-5.6	-5.5	-5.4	-5.4	-5.1	-4.0	-3.3	-2.3	-1.4	-1.3	-1.3	-1.3	-1.1	-2.0	-3.8	-5.3	-6.0	-6.6	-7.5	-4.5	-1.1	
23-Apr	-8.7	-9.5	-9.7	-10.4	-10.9	-10.5	-8.2	-5.2	-3.4	-1.3	0.1	0.9	2.2	3.0	3.7	3.9	4.0	3.8	3.3	2.4	1.7	0.7	0.6	0.2	-2.0	4.0	
24-Apr	-0.3	-0.2	-0.4	-0.7	-1.1	-1.5	-2.1	-1.6	-1.2	-1.0	0.1	1.2	2.1	2.8	3.6	3.9	3.7	3.3	3.0	2.6	1.9	1.3	0.9	1.0	0.9	3.9	
25-Apr	0.6	-0.5	-1.7	-1.7	-1.1	-0.5	0.2	1.5	2.5	3.7	4.0	4.3	4.7	5.1	5.1	5.2	5.4	4.8	4.4	3.8	3.1	2.5	2.2	1.9	2.5	5.4	
26-Apr	1.7	1.5	1.3	1.1	0.8	0.6	1.5	2.3	3.1	4.2	4.5	4.7	4.3	5.0	5.7	5.5	5.4	5.5	5.7	4.5	3.6	3.2	1.6	1.0	3.3	5.7	
27-Apr	1.6	2.2	2.3	1.8	1.5	1.4	2.8	4.0	5.2	7.1	8.7	9.2	9.9	10.9	11.9	12.5	11.5	13.1	12.8	11.0	7.4	6.7	6.3	6.3	7.0	13.1	
28-Apr	2.8	1.1	1.0	-0.8	-1.2	-2.2	0.0	3.6	4.9	8.0	11.4	13.5	13.9	13.4	13.9	14.5	13.6	13.7	12.7	11.5	10.5	9.5	7.5	7.3	7.7	14.5	
29-Apr	6.8	6.1	6.3	5.8	5.3	3.8	4.8	8.8	11.1	12.9	13.4	12.8	13.1	13.5	13.6	14.6	14.0	13.0	11.4	10.3	8.7	6.3	4.6	3.0	9.3	14.6	
30-Apr	3.1	2.1	0.9	0.5	0.1	1.0	3.0	7.1	9.9	12.4	14.8	15.7	16.8	16.5	15.0	11.0	9.3	9.6	9.7	8.9	7.7	7.4	6.0	4.9	8.1	16.8	
		0.1	-0.6	-1.1	-1.6	-2.0	-2.4	-1.8	-0.3	1.0	2.5	4.0	5.0	5.7	6.3	6.7	6.6	6.3	6.2	5.3	4.1	3.0	2.2	1.2	0.6	Diurnal Average	
		8.3	8.0	7.0	6.4	5.7	5.0	4.8	8.8	11.1	12.9	14.8	15.7	16.8	16.7	16.7	17.3	16.8	16.3	14.4	13.1	11.7	10.0	9.9	7.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Buffalo Viewpoint - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Buffalo Viewpoint - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	272	37.78	37.78
0 - 10	361	50.14	87.92
10 - 20	87	12.08	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

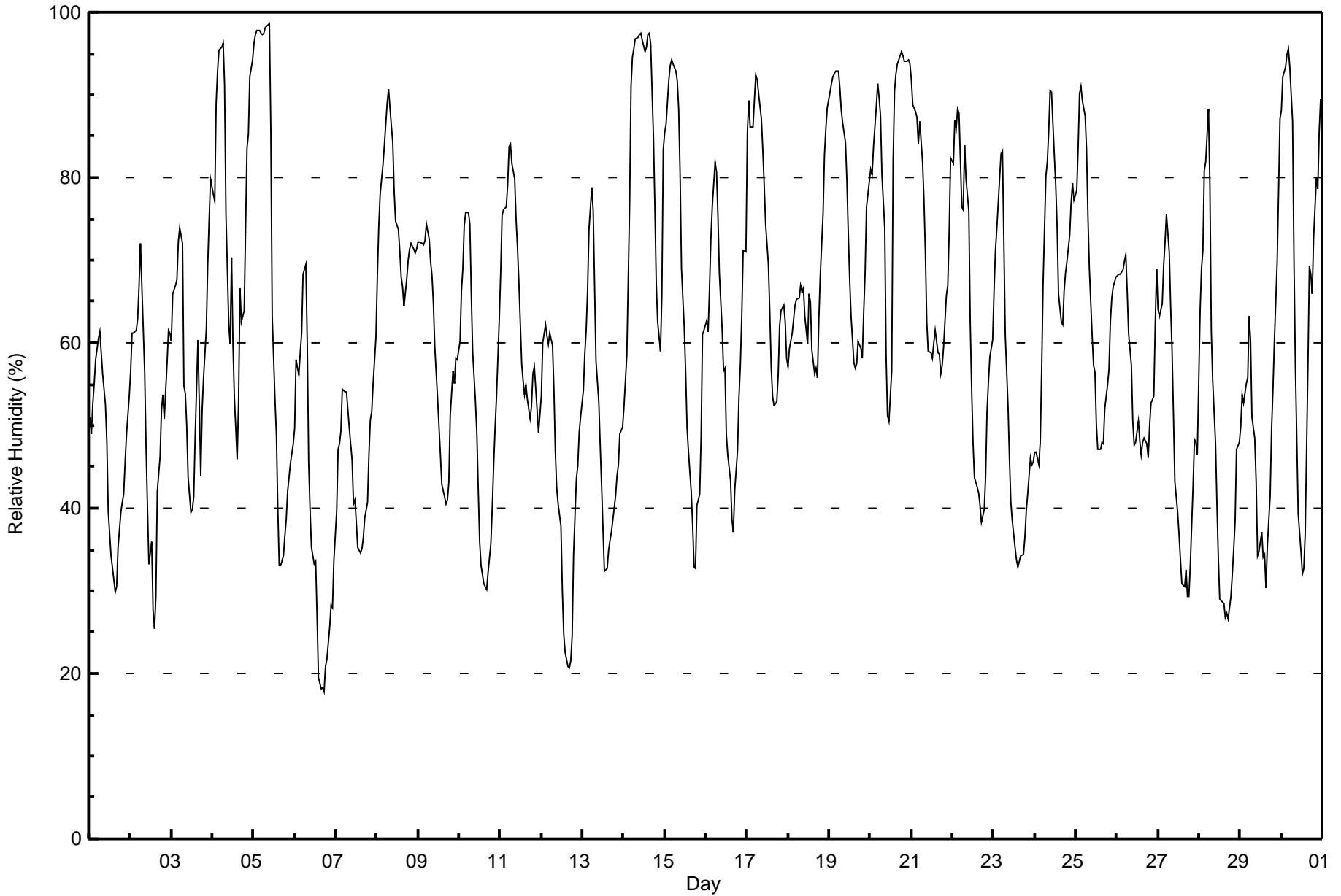
**Relative Humidity (RH) - %
Buffalo Viewpoint - April 2017**

Maximum Value: 99 % on Apr 5 10:00																		Maximum Daily Average: 83.0 % on Apr 20																		Hours in Service: 720													
Minimum Value: 18 % on Apr 6 18:00																		Minimum Daily Average: 38.7 % on Apr 6																		Hours of Data: 720													
Maximum Diurnal Average: 79.3 % at hour 6																		Minimum Diurnal Average: 45.8 % at hour 15																		Hours of Missing Data: 0													
Monthly Average: 61.0 %																		Percentiles: P ₁ = 21 P ₁₀ = 35 Q ₁ = 47 Median = 60 Q ₃ = 75 P ₉₀ = 89 P ₉₉ = 97																		Hours of Calibration: 0													
																																				Percent Operational Time: 100.0													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	51	49	53	55	58	61	61	59	56	53	48	40	37	34	31	30	31	35	39	41	42	45	49	54	46.3	61																							
2-Apr	57	61	61	62	63	67	72	67	56	47	40	33	36	28	25	29	42	46	52	54	51	58	62	61	51.2	72																							
3-Apr	60	66	67	68	72	74	72	55	54	50	44	39	40	41	49	60	52	44	52	56	62	70	75	80	58.3	80																							
4-Apr	78	77	89	93	95	96	96	91	76	62	60	70	60	53	46	53	67	63	64	74	84	85	92	94	75.7	96																							
5-Apr	96	97	98	98	97	97	97	98	99	99	86	63	53	49	40	33	33	34	37	39	42	45	47	48	67.7	99																							
6-Apr	50	58	56	59	61	68	70	60	46	40	35	33	33	27	19	18	18	18	21	22	26	28	28	34	38.7	70																							
7-Apr	40	47	48	49	54	54	54	52	50	46	40	41	38	35	35	35	36	39	41	46	51	52	55	61	45.8	61																							
8-Apr	68	74	78	81	84	86	89	91	86	84	78	75	74	71	68	67	64	68	70	71	72	71	71	71	75.6	91																							
9-Apr	72	72	72	72	72	74	72	70	68	65	60	53	50	46	43	41	41	41	43	51	57	55	58	58	58.6	74																							
10-Apr	60	66	69	74	76	76	74	66	59	53	49	42	36	33	31	30	30	32	36	40	45	50	53	63	51.8	76																							
11-Apr	68	75	76	76	79	84	84	82	80	75	72	67	57	56	54	55	53	51	52	56	57	52	49	51	65.1	84																							
12-Apr	54	60	62	61	60	61	60	54	47	42	40	38	30	25	23	21	21	22	24	34	43	45	49	51	42.8	62																							
13-Apr	54	59	61	66	74	79	76	67	58	53	48	43	37	32	33	35	36	37	40	41	44	45	49	50	50.7	79																							
14-Apr	52	55	59	77	91	95	96	97	97	98	97	98	97	95	96	97	96	85	77	67	63	59	66	83	82.9	98																							
15-Apr	85	86	92	94	94	94	93	92	88	81	69	62	56	50	47	42	38	33	33	40	42	49	61	62	65.8	94																							
16-Apr	63	61	67	73	77	82	81	75	68	62	57	57	49	46	43	39	37	42	47	53	57	63	71	71	60.1	82																							
17-Apr	85	89	86	86	89	92	92	90	87	83	79	74	70	64	57	54	52	53	56	62	64	65	63	58	73.0	92																							
18-Apr	57	59	61	63	65	65	65	67	66	67	63	60	66	65	59	56	57	56	63	68	76	83	86	88	65.9	88																							
19-Apr	90	91	92	92	93	93	91	88	87	84	80	73	68	63	58	57	57	60	59	58	64	68	76	79	76.0	93																							
20-Apr	81	80	84	89	91	90	87	80	74	58	51	51	57	82	90	92	94	95	95	95	94	94	94	94	83.0	95																							
21-Apr	92	89	88	87	84	87	82	77	71	63	59	59	58	60	61	59	59	56	57	60	66	67	73	82	70.7	92																							
22-Apr	82	87	86	88	88	76	76	84	80	76	62	55	48	44	43	42	40	38	40	44	52	55	58	60	62.7	88																							
23-Apr	66	71	74	80	83	83	72	61	52	46	41	38	35	34	33	34	34	34	36	40	42	46	45	46	51.1	83																							
24-Apr	47	47	45	48	57	67	80	82	86	90	90	83	79	74	66	63	62	66	68	70	73	77	79	77	69.9	90																							
25-Apr	78	83	90	91	89	87	83	75	69	61	57	56	50	47	47	48	48	52	55	57	63	65	67	68	66.2	91																							
26-Apr	68	68	68	69	70	71	66	61	57	51	48	48	50	48	47	48	48	48	46	50	53	54	62	69	57.0	71																							
27-Apr	64	63	65	69	72	76	71	64	59	51	43	40	37	34	31	30	33	29	29	33	43	48	48	46	49.1	76																							
28-Apr	64	69	71	81	82	88	79	62	55	48	41	34	29	29	28	27	27	27	29	32	35	38	47	48	48.8	88																							
29-Apr	50	54	53	55	56	63	60	51	49	43	34	35	37	34	34	30	35	42	49	54	60	70	78	87	50.6	87																							
30-Apr	88	92	93	95	96	93	87	70	57	48	39	35	32	33	37	58	69	68	66	73	80	79	86	89	69.3	96																							
																								67.4	70.3	72.1	75.0	77.4	79.3	78.0	72.9	67.9	62.6	57.0	53.1	49.9	47.8	45.8	46.1	47.1	47.1	49.3	52.7	56.6	59.4	63.3	66.2	Diurnal Average	
																								96	97	98	98	97	97	97	98	99	99	98	97	95	96	97	97	96	95	95	95	94	94	94	94	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Buffalo Viewpoint - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Buffalo Viewpoint - April 2017

Maximum Speed: 34 km/h on Apr 20 14:00	Maximum Daily Speed Average: 23.7 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 27 16:00	Minimum Daily Speed Average: 1.0 km/h on Apr 28	Hours of Data: 720
Maximum Diurnal Speed Average: 5.0 km/h at hour 15	Minimum Diurnal Speed Average: 2.8 km/h at hour 1	Hours of Missing Data: 0
Monthly Average Velocity: 3.8 km/h 31.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 15 P ₉₀ = 21 P ₉₉ = 29	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW14	SW16	SW15	SW17	WSW15	SW15	WSW16	WSW19	WSW19	WSW19	WSW17	WSW18	WSW20	W15	W10	WNW10	W11	NW12	NNW7	SW5	SW10	WSW10	WSW9	WSW12	WSW12.6	WSW20
2-Apr	WSW15	W11	WSW13	W12	WSW9	SW5	S7	S3	SW7	WSW9	W4	NNW6	SSW3	NNW17	NW17	NNW17	NNE18	NNE11	NNE12	N5	NNW3	NNW9	NNW7	NW8	WNW5.5	NNE18
3-Apr	NNW7	N9	N10	N12	NNW9	NNW10	NNE7	NNE3	N4	N5	N6	NNE6	NE6	NNE8	NW9	W9	WNW5	N7	NNE6	SSW3	S5	SW3	SE8	SSW2	N4.3	N12
4-Apr	WSW5	SSW5	SSE8	SE9	SE10	SSE8	SSE7	SE7	SE7	SSE8	S11	SSW9	SE11	SE10	ESE10	S9	SSW12	S7	S6	SE6	SSW4	SW3	SSE6	SSE7	SSE6.8	SSW12
5-Apr	SSE8	SSE9	SSE10	SSE7	SE8	SSE7	SSE6	SSE9	SSE11	SE13	SE12	SE15	SE18	SSE22	SSE17	S16	S14	S12	SSE13	SSE11	SSE13	SSE13	SSE13	SSE12	SSE11.8	SSE22
6-Apr	SE6	SE6	ESE3	SSE6	S5	SSE5	SSE7	SSE7	SSE9	SW4	SSE6	SE7	SSE8	W16	W16	W14	WSW16	W12	WNW9	W6	NW4	NNE7	ENE9	N6	SW2.8	W16
7-Apr	NNW7	N7	N7	NNW8	N9	N11	N10	N11	N14	N16	N21	N24	NNE26	NNE28	NNE26	NNE26	NNE26	NNE27	NNE25	NNE22	NNE23	NNE25	NNE25	NNE23	N18.4	NNE28
8-Apr	N22	N23	N24	N21	N22	N24	N24	N29	N30	N30	NNE31	NNE27	NNE27	N28	NNE28	NNE29	N23	NNE22	N22	N21	N18	N18	NNE15	NNE13	N23.7	NNE31
9-Apr	N12	N10	N7	N5	N4	N6	NNE4	SSW4	S6	S6	S8	SSE10	SSE9	SSE11	SSE12	SSE9	SE11	SE10	SE10	SE8	SE8	SSE10	SSE10	SSE10	SE4.4	SSE12
10-Apr	SSE11	SE11	SE11	SE11	SE10	SE7	SE7	SSE9	SE10	SE9	SE10	SSE10	SSE12	SSE10	SSE9	SE8	ESE9	SE8	ESE7	ESE7	SE8	SSE6	SSE7	NE6	SE8.5	SSE12
11-Apr	NNE11	NNE11	N15	N17	N18	N16	N15	N21	N23	N21	N23	N22	N25	N25	N23	N23	N19	N18	N21	N22	NNE22	NNE20	N19	NNW12	N19.2	N25
12-Apr	N14	N12	N12	N12	NNE14	N13	N14	N12	N13	N11	N9	NNW10	N14	N13	N14	N15	N15	N16	N16	NNE13	NNE11	NNE12	NNE9	N7	N12.4	N16
13-Apr	N7	NNE8	NNE5	NNE5	NNE7	NNE7	NE5	E8	E12	ESE11	ESE12	ESE12	ESE13	E15	E13	ESE12	ESE14	E15	E14	E15	E15	E16	ENE14	E18	E10.0	E18
14-Apr	E14	E13	E15	ENE12	NE12	NNE11	NNE16	NNE18	NNE15	NNE15	NNE16	NE17	NE18	NE21	NNE20	NE20	NE18	NE13	NE12	NE15	NE16	NE19	NNE23	NNE24	NE15.5	NNE24
15-Apr	NNE25	NNE19	NNE20	N21	N22	N21	N21	N20	NNE18	NNE15	N15	N16	N17	N16	NNW23	NNW19	NNW16	NNW16	N13	N10	NNW7	E5	S8	SSE12	N14.1	NNE25
16-Apr	SSE14	SSE12	SSE11	SSE10	SSE11	SSE13	SSE11	SSE10	SSE8	SSE9	S9	SSW13	SW15	SSW15	SW15	SW15	SW16	SSW13	SSW12	S9	SSE7	S8	SE7	SE5	S10.0	SW16
17-Apr	N17	NNE23	N24	N25	N25	N25	N25	N28	N27	NNE22	NNE20	NNE21	NNE20	NNE19	NNE19	NNE19	NNE18	NNE19	NNE18	NNE20	NNE19	NNE17	NNE17	NNE18	NNE20.9	N28
18-Apr	NNE15	NNE18	NNE19	N21	NNE20	NNE21	NNE19	N17	N16	N13	N12	N15	N15	N13	N11	N10	N7	N11	NNE12	NNE12	N12	N13	N13	N13	N14.3	NNE21
19-Apr	N11	N11	NNW9	N10	NNW8	NNW7	NNW6	NW6	WNW6	WNW6	WNW5	NW3	WSW3	SSW4	NW2	SE5	SE9	SE8	SE5	W6	WSW2	SSE5	SSE6	SSE6	NNW1.5	N11
20-Apr	SSE6	ESE5	NE3	ENE4	NE8	NNE9	NE8	NNE6	N9	N14	N17	N26	N34	N34	N32	N29	N29	N28	N19	N12	N10	NW4	NW7	NNW9	N13.8	N34
21-Apr	N13	N13	N9	N6	NW2	NNW7	N7	N5	NNE4	N5	N6	N5	NNE5	NNE4	N7	N7	N6	NNW4	N4	NNE3	NE6	ENE5	SSE4	S5	N5.0	N13
22-Apr	SSW5	SSE4	SW2	NNW8	N14	N21	N21	N20	N23	N22	N20	NNE15	NNE13	N13	N19	N18	N16	N11	NNE12	NNE14	NNE12	NNE12	NE11	NE9	N12.7	N23
23-Apr	NE9	NE8	NE7	NNE5	NNE5	NE7	NNE7	NNE3	SE8	SE10	ESE11	SE11	SE10	SE8	SSE9	SE8	SE8	SE9	SE7	S6	SE4	SE7	SE7	SE5	ESE5.3	ESE11
24-Apr	ESE6	ESE6	E8	ESE8	ESE7	E5	ENE6	NE9	NNE11	NE10	ENE11	E10	ESE9	ESE9	SE11	ESE12	SE11	ESE11	ESE10	ESE8	SE8	ESE7	ESE5	ESE7	E7.5	ESE12
25-Apr	SE9	SE6	SE6	SSE7	SSE8	SE9	SE12	SE13	SE12	SSE11	SSE11	S9	S11	S12	SE11	S11	S11	SSE13	SSE11	SSE11	SSE11	SSE11	SSE12	SSE12	SSE10.2	SSE13
26-Apr	SSE11	SSE11	SSE11	SSE10	SSE10	SSE10	SSE10	SSE12	SSE14	SSE16	SSE15	SSE16	SSE16	S15	SSE11	SSE13	S12	S12	S9	SSW4	SE5	ESE6	SE7	SSE7	SSE10.5	SSE16
27-Apr	SSE9	SSE9	SSE9	SE7	SSE6	SE7	SE7	SSE8	SSE9	SE7	SE12	SSE10	SE9	SSE9	SSW7	WSW0	NNW7	NNW6	NW6	WNW5	NNW7	ENE4	ESE4	NE5	SE4.0	SE12
28-Apr	NW2	S4	WNW2	SSW3	S3	SSE7	SE6	SSW2	SSW4	NW1	N7	N9	N9	NNW7	N7	NNE7	NNW5	N6	ENE3	ESE5	ESE5	ESE6	SSE6	SSE6	NE1.0	N9
29-Apr	SE7	SSE8	SSE8	SE8	SSE6	SE5	SE6	SE4	N7	NNE8	SSW11	SSW13	SSW13	SSW12	SSW14	S14	S12	SSW13	SSW11	SSW6	SSW5	S7	SSE8	SSE9	S6.9	SSW14
30-Apr	SSE8	SSE5	S7	SSE8	SSE9	SSE9	SSE8	SSE8	S6	SSE8	SSE8	SSW7	NW5	NNW8	NNE13	N16	W8	WNW6	NNW2	W6	NW3	E4	SSW4	SSW7	S1.9	N16
NE2.8 NE3.4 NE3.3 NNE3.5 NNE3.7 NNE4.4 NNE4.5 NNE4.2 NNE4.2 NNE3.8 NE3.8 NE3.5 NE4.1 NNE4.2 N5.0 NNE4.8 NNE3.6 NNE4.4 NE4.6 NE3.5 NE3.8 NE4.2 ENE3.7 ENE3.0																								Diurnal Average		
NNE25 NNE23 N24 N25 N25 N25 N25 N29 N30 N30 NNE31 NNE27 N34 N34 N32 NNE29 N29 N28 NNE25 NNE22 NNE23 NNE25 NNE25 NNE24																								Diurnal Maximum		

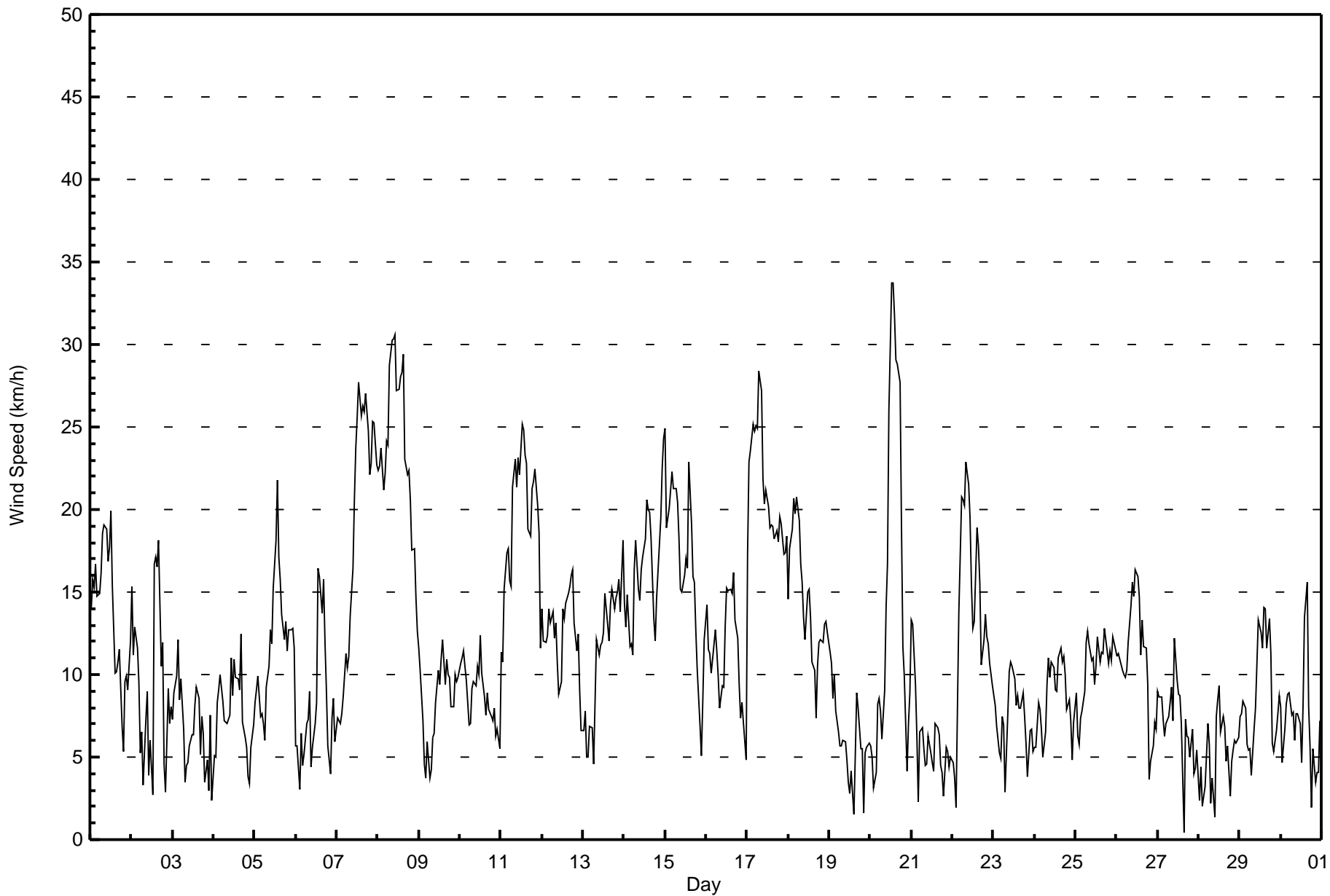
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Buffalo Viewpoint - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Apr 30 15:00 Minimum Value: 0 km/h on Apr 21 23:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	3	3	4	3	3	4	5	5	4	4	5	5	4	4	3	3	2	2	2	3	3	3	3	5
2-Apr	3	3	3	4	3	2	1	2	2	3	3	5	4	6	6	5	4	4	4	2	1	4	2	1	6
3-Apr	1	1	2	2	1	1	3	2	1	1	2	2	3	2	4	3	2	2	3	2	1	1	3	2	4
4-Apr	3	1	2	1	1	2	1	1	1	2	4	3	4	3	3	4	4	2	2	1	1	1	1	1	4
5-Apr	1	1	2	2	2	2	1	3	3	4	3	5	5	6	5	5	4	3	3	2	2	2	2	6	
6-Apr	1	3	1	1	1	2	1	2	2	2	2	3	4	4	4	4	4	4	2	1	2	1	1	1	4
7-Apr	2	2	2	1	2	2	1	2	3	3	5	4	5	6	6	5	5	6	5	4	4	5	4	4	6
8-Apr	4	3	4	4	4	5	5	5	6	6	6	6	6	6	6	6	5	5	4	4	3	4	3	3	6
9-Apr	2	2	2	2	2	2	2	2	2	2	3	3	3	3	4	3	3	3	2	1	1	2	2	2	4
10-Apr	2	2	2	2	2	1	2	3	2	2	2	3	4	3	3	2	2	2	1	1	1	1	1	2	4
11-Apr	2	2	2	2	3	3	4	4	4	4	4	5	5	4	5	4	4	4	3	4	5	4	4	3	5
12-Apr	2	2	2	2	2	2	2	2	2	2	3	3	4	3	3	4	3	3	3	2	2	2	2	1	4
13-Apr	1	1	1	1	1	1	1	4	4	3	4	4	4	5	5	4	4	4	4	4	5	5	5	5	5
14-Apr	4	3	5	4	4	3	3	4	3	3	3	4	4	5	5	5	5	4	5	5	6	7	7	6	7
15-Apr	6	5	4	4	4	4	4	4	4	3	3	3	3	4	4	4	3	3	2	1	1	1	2	2	6
16-Apr	3	2	3	2	2	3	3	3	2	3	3	4	3	4	4	3	4	4	4	3	2	2	1	1	4
17-Apr	8	4	5	5	4	5	5	5	5	5	4	4	5	5	5	4	5	5	4	4	4	4	4	4	8
18-Apr	3	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	2	3	3	2	2	2	2	2	4
19-Apr	2	2	1	2	1	1	1	1	1	1	1	2	2	2	2	2	3	2	2	2	1	1	1	1	3
20-Apr	1	1	1	2	1	1	1	2	3	3	3	5	6	6	6	5	5	5	5	5	2	2	1	3	6
21-Apr	2	4	3	2	2	1	1	1	1	1	2	2	2	2	2	2	2	1	1	0	2	1	0	1	4
22-Apr	1	2	1	4	4	4	4	5	5	4	4	4	4	4	4	4	4	3	3	3	3	2	2	2	5
23-Apr	1	1	1	1	1	1	2	2	2	3	4	4	4	3	3	3	3	2	2	1	1	1	2	1	4
24-Apr	2	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	1	3	3
25-Apr	2	2	1	1	2	2	3	4	3	3	4	4	3	4	4	3	3	4	3	3	2	3	2	4	4
26-Apr	2	2	2	2	2	2	3	3	4	4	4	5	5	5	4	4	3	4	3	2	1	1	1	1	5
27-Apr	2	1	2	1	1	1	2	2	2	3	4	4	3	3	3	3	2	2	1	1	1	2	2	1	4
28-Apr	2	2	2	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2
29-Apr	1	1	2	2	1	1	2	1	2	2	5	4	4	4	4	5	3	4	5	1	1	1	1	1	5
30-Apr	1	1	1	1	1	1	2	2	2	2	3	3	3	3	10	5	4	2	2	2	2	2	1	1	10
																		Diurnal Maximum							





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Buffalo Viewpoint - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	97	13.47	13.47
6 - 11	324	45.00	58.47
12 - 19	208	28.89	87.36
20 - 28	81	11.25	98.61
29 - 38	10	1.39	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Buffalo Viewpoint - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	9	11	3	4	3	6	8	5	6	14	6	4	1	4	9	4	97
6 - 11	41	22	12	3	3	19	59	90	21	7	2	4	8	5	5	23	324
12 - 19	58	38	9	2	12	6	8	22	9	10	9	11	6	0	2	6	208
20 - 28	45	31	2	0	0	0	0	1	0	0	0	1	0	0	0	1	81
29 - 38	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	161	104	26	9	18	31	75	118	36	31	17	20	15	9	16	34	720

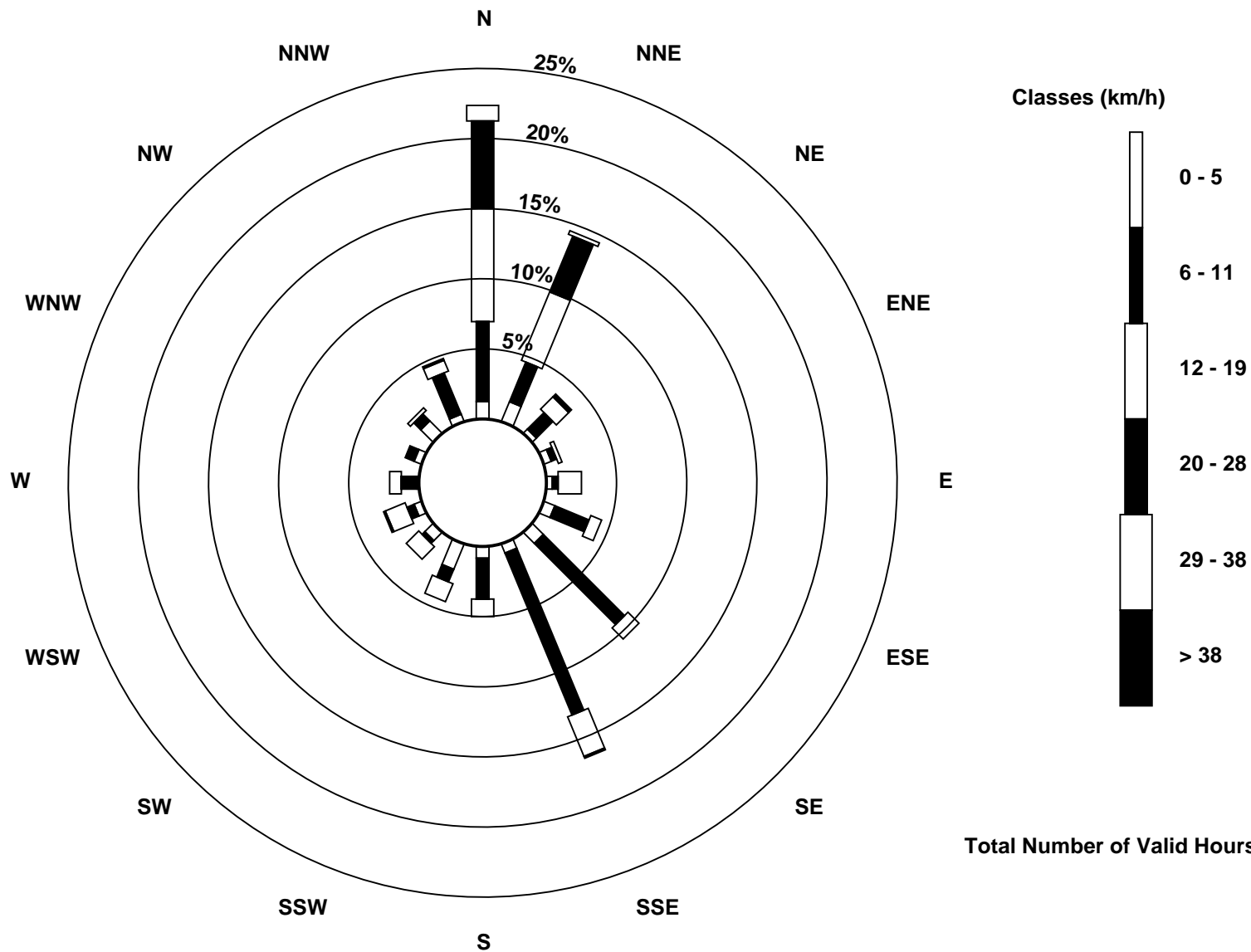
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Buffalo Viewpoint (AMS 4)



Total Number of Valid Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Buffalo Viewpoint - April 2017

Direction of Maximum Speed: 0 deg on Apr 20 14:00 Direction of Maximum Daily Speed Average: 8.9 deg on Apr 8	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 241 deg on Apr 27 16:00 Direction of Minimum Daily Speed Average: 1.0 deg on Apr 28	Percent Operational Time: 100.0
Monthly Average Direction: 215.8 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	226	231	234	235	239	235	239	244	250	249	251	239	257	262	274	294	281	319	343	215	229	244	255	250	249.7
2-Apr	254	272	250	261	238	216	183	169	231	246	269	330	195	331	310	333	20	25	12	355	335	338	333	321	303.1
3-Apr	338	4	357	358	344	343	12	14	358	359	11	14	36	24	308	276	298	8	24	192	173	236	141	212	353.3
4-Apr	242	205	148	142	141	156	161	136	130	155	190	206	129	132	123	173	194	177	175	146	194	227	160	152	161.6
5-Apr	148	150	156	154	142	162	167	159	157	145	137	138	145	153	165	173	172	171	157	161	155	152	150	156	155.2
6-Apr	137	140	113	150	179	151	156	161	155	222	152	134	151	263	279	268	255	260	284	280	317	17	62	8	222.8
7-Apr	337	2	9	346	351	4	7	6	2	356	2	8	14	12	14	15	15	16	14	12	12	14	16	15	9.8
8-Apr	7	5	7	3	4	7	8	7	4	4	14	13	12	10	17	17	8	12	6	7	7	8	12	13	8.9
9-Apr	1	355	357	11	355	349	14	200	190	175	184	155	160	156	162	157	146	135	139	136	137	148	155	154	145.3
10-Apr	148	138	140	137	140	143	143	148	145	134	128	147	152	149	147	126	123	126	123	122	130	148	165	53	138.0
11-Apr	18	12	2	359	357	356	357	2	1	359	356	354	357	1	3	8	8	4	0	6	12	15	8	342	2.4
12-Apr	353	355	3	9	12	9	8	1	358	360	359	339	3	2	359	357	1	4	10	15	19	19	26	9	4.6
13-Apr	10	25	22	24	27	19	39	91	92	115	105	112	109	92	88	109	103	101	98	96	82	86	77	82	86.0
14-Apr	87	83	83	78	39	20	30	27	26	29	31	41	38	37	29	35	38	55	46	51	51	53	32	18	41.8
15-Apr	20	32	25	10	6	6	6	5	13	15	9	356	356	349	343	341	337	346	350	352	331	94	170	157	4.5
16-Apr	153	158	161	154	156	160	154	152	162	151	172	210	219	209	216	218	218	198	193	183	166	176	138	134	180.6
17-Apr	359	13	3	4	1	1	6	5	10	18	12	14	14	20	18	28	24	30	26	19	15	18	19	19	13.2
18-Apr	17	14	12	11	15	21	13	6	360	355	349	351	0	2	1	355	359	2	13	12	4	357	2	1	5.8
19-Apr	0	359	348	349	345	341	344	307	299	292	295	316	247	193	324	133	140	134	129	260	247	168	152	150	332.4
20-Apr	151	111	56	62	36	29	34	26	3	357	360	5	4	0	4	4	1	3	9	9	356	306	315	344	5.8
21-Apr	4	9	351	357	323	343	11	8	18	2	4	11	12	26	6	6	1	342	4	15	49	59	166	174	8.3
22-Apr	210	150	234	334	357	6	10	10	10	0	6	25	21	6	355	359	351	10	25	18	20	32	37	44	9.8
23-Apr	45	40	45	31	21	41	33	22	126	135	103	136	125	130	149	138	137	131	139	175	143	129	129	132	109.9
24-Apr	123	113	91	118	108	91	74	49	32	39	73	100	105	119	132	123	124	104	103	109	128	122	113	122	100.7
25-Apr	144	142	133	149	158	146	142	140	142	153	153	174	171	175	165	170	173	162	160	160	159	156	155	154	156.4
26-Apr	155	153	150	151	148	148	152	159	161	153	157	153	155	182	168	162	183	175	188	203	138	119	128	148	158.5
27-Apr	157	153	152	144	147	136	140	149	153	140	139	148	146	161	201	241	347	345	323	300	344	70	117	36	142.5
28-Apr	304	186	290	209	182	147	146	209	205	313	4	8	356	332	360	28	327	6	73	115	107	117	153	162	53.0
29-Apr	138	157	162	141	153	146	132	136	356	30	209	201	212	200	198	177	174	195	198	200	198	169	148	148	177.2
30-Apr	150	153	169	150	157	149	156	154	170	154	162	192	325	331	13	357	275	294	330	274	311	99	195	205	174.8

37.5	43.0	36.6	30.1	24.1	25.5	33.7	30.2	25.5	26.4	34.4	34.8	34.5	16.2	6.9	14.9	13.3	29.3	33.8	33.8	40.6	55.8	69.4	61.5
Diurnal Average																							

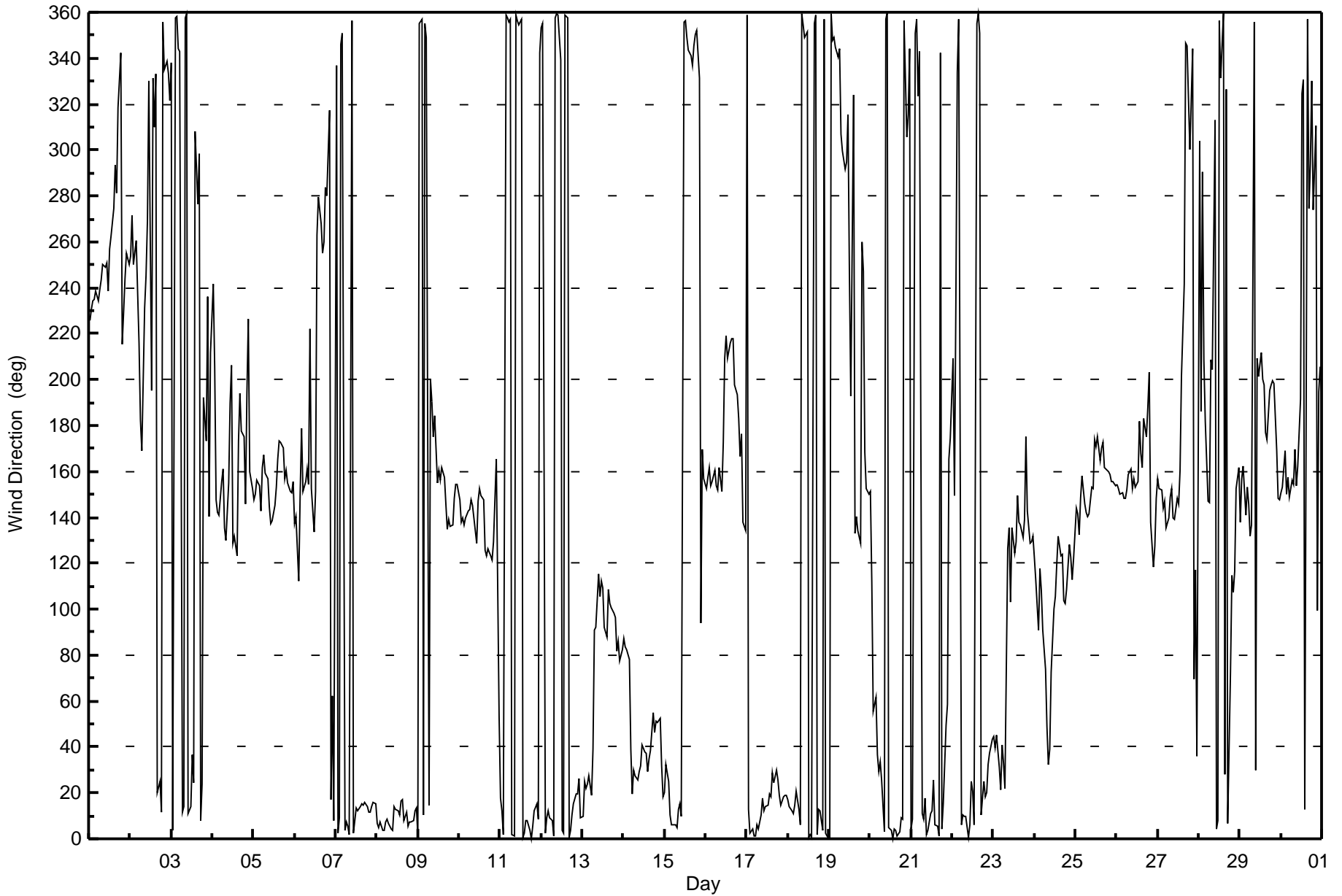
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Buffalo Viewpoint - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Apr 27 16:00 Minimum Value: 4 deg on Apr 13 03:00 Percentiles: P ₁ = 6 P ₁₀ = 13 Q ₁ = 17 Median = 21 Q ₃ = 26 P ₉₀ = 39 P ₉₉ = 78																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	21	13	15	14	15	15	16	17	16	16	16	21	14	20	29	22	20	18	28	42	18	30	26	13	42
2-Apr	13	18	16	20	17	19	23	60	21	22	78	64	83	35	25	36	16	18	23	26	41	35	19	12	83
3-Apr	18	28	23	25	17	14	57	38	26	42	30	33	45	24	35	19	28	31	17	52	22	48	23	63	63
4-Apr	33	49	11	11	8	34	15	13	18	28	34	23	24	28	25	30	21	32	20	26	45	41	20	13	49
5-Apr	13	13	13	18	17	22	19	20	19	20	25	22	22	21	24	22	22	23	17	16	15	15	15	15	25
6-Apr	18	15	56	21	41	27	18	15	22	52	49	39	55	21	21	23	19	15	12	10	48	26	11	35	56
7-Apr	24	31	15	26	24	25	20	20	24	25	24	20	18	18	17	16	16	16	16	16	16	16	15	14	31
8-Apr	19	21	23	24	24	21	22	23	23	25	19	18	20	21	19	17	24	22	21	19	19	19	17	17	25
9-Apr	22	22	24	25	40	24	29	63	33	44	40	32	35	32	27	33	25	20	15	11	11	13	14	13	63
10-Apr	14	10	9	9	10	14	19	22	20	24	20	29	24	30	30	33	21	16	11	6	7	13	15	59	59
11-Apr	17	23	23	23	25	22	23	23	24	24	25	25	25	27	25	22	23	24	25	22	18	17	20	20	27
12-Apr	22	25	24	15	14	15	18	23	24	25	30	31	24	25	25	25	23	23	17	11	10	10	9	26	31
13-Apr	10	6	4	10	8	18	27	28	24	24	32	26	23	28	27	25	19	19	18	17	18	18	22	18	32
14-Apr	18	19	20	22	19	17	15	16	15	15	15	17	17	16	17	16	20	19	19	19	19	25	22	17	25
15-Apr	18	17	17	19	19	20	19	19	17	18	18	21	21	23	20	19	19	22	25	27	25	57	15	15	57
16-Apr	16	16	16	16	16	16	17	19	26	25	35	21	18	23	19	19	18	18	18	20	19	17	14	31	35
17-Apr	41	19	22	22	24	24	19	19	19	16	20	17	18	20	20	20	20	18	17	18	17	17	16	16	41
18-Apr	18	18	19	20	16	16	18	24	27	27	25	26	27	27	28	28	30	30	24	21	25	28	25	26	30
19-Apr	26	26	22	23	20	18	22	19	18	19	28	61	79	63	92	45	27	19	38	22	68	30	11	7	92
20-Apr	10	30	48	55	9	14	14	26	20	19	21	21	24	26	21	18	19	18	16	21	13	25	6	26	55
21-Apr	11	13	17	41	78	10	14	16	28	36	38	42	42	69	27	27	23	30	22	18	15	18	24	16	78
22-Apr	28	57	63	30	18	18	17	18	18	18	20	24	24	25	24	26	25	29	21	18	17	13	15	12	63
23-Apr	6	7	6	13	12	7	16	56	26	27	34	27	38	42	28	31	29	18	17	14	17	13	18	21	56
24-Apr	14	15	22	18	20	30	26	22	20	20	23	24	26	28	22	22	21	19	19	19	18	16	14	21	30
25-Apr	17	16	13	16	15	19	18	21	24	25	27	32	28	24	27	27	26	21	19	18	17	17	18	16	32
26-Apr	17	16	16	17	15	16	19	21	21	21	21	23	24	25	35	24	24	23	19	20	9	7	9	17	35
27-Apr	15	13	14	12	11	12	18	22	23	42	26	31	35	47	49	96	24	39	22	10	32	64	45	41	96
28-Apr	80	54	59	60	46	13	12	53	29	85	36	27	28	39	29	39	59	32	43	10	22	9	13	20	85
29-Apr	16	10	21	14	10	13	16	55	38	33	64	23	23	31	25	26	28	21	18	21	32	10	14	7	64
30-Apr	9	26	9	9	17	8	13	22	35	32	39	56	68	36	41	47	28	18	74	18	64	28	28	12	74
Diurnal Maximum																									





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	April 25, 2017	Last Cal Date:	March 23, 2017
Start time (MST):	7:10	End time (MST):	9:12
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>49.7</u>	ppm	Cal Gas Exp Date	September 8, 2019
Cal Gas Cylinder #	<u>LL107929</u>			
Calibrator Make/Model	Sabio 4010		Serial Number	11551008
ZAG Make/Model	API 701		Serial Number	4297

Analyzer Information

Analyzer make: Thermo 43i

Analyzer serial #: JC1327300932

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-592.7	-592.7
Calculated slope	0.992837	1.000461	Lamp voltage	838	838
Calculated intercept	1.895956	0.042826	Pressure	697.6	697.6
Analyzer Background	11.7	11.7	Flow	0.501	0.501
Analyzer Coefficient	0.827	0.827	Intensity	84	84

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.0	----
as found span	4941	60.3	599.2	598.6	1.001
calibrator zero	5000	0.0	0.0	0.0	----
high point	4941	60.3	599.2	598.6	1.001
second point	4966	30.1	299.4	300.2	0.997
third point	4985	15.0	149.1	148.3	1.005
as left zero	5000	0.0	0.0	0.1	----
as left span	4941	60.3	599.2	603.0	0.994
Average Correction Factor					1.001
Corrected As found	598.60	Previous response	601.65	*% change	0.5%

* = > +/-5% change initiates investigation

Notes:

No maintenance or adjustments done

Calibration Performed By:

Melissa Lemay



Wood Buffalo Environmental Association

SO₂ Calibration Summary

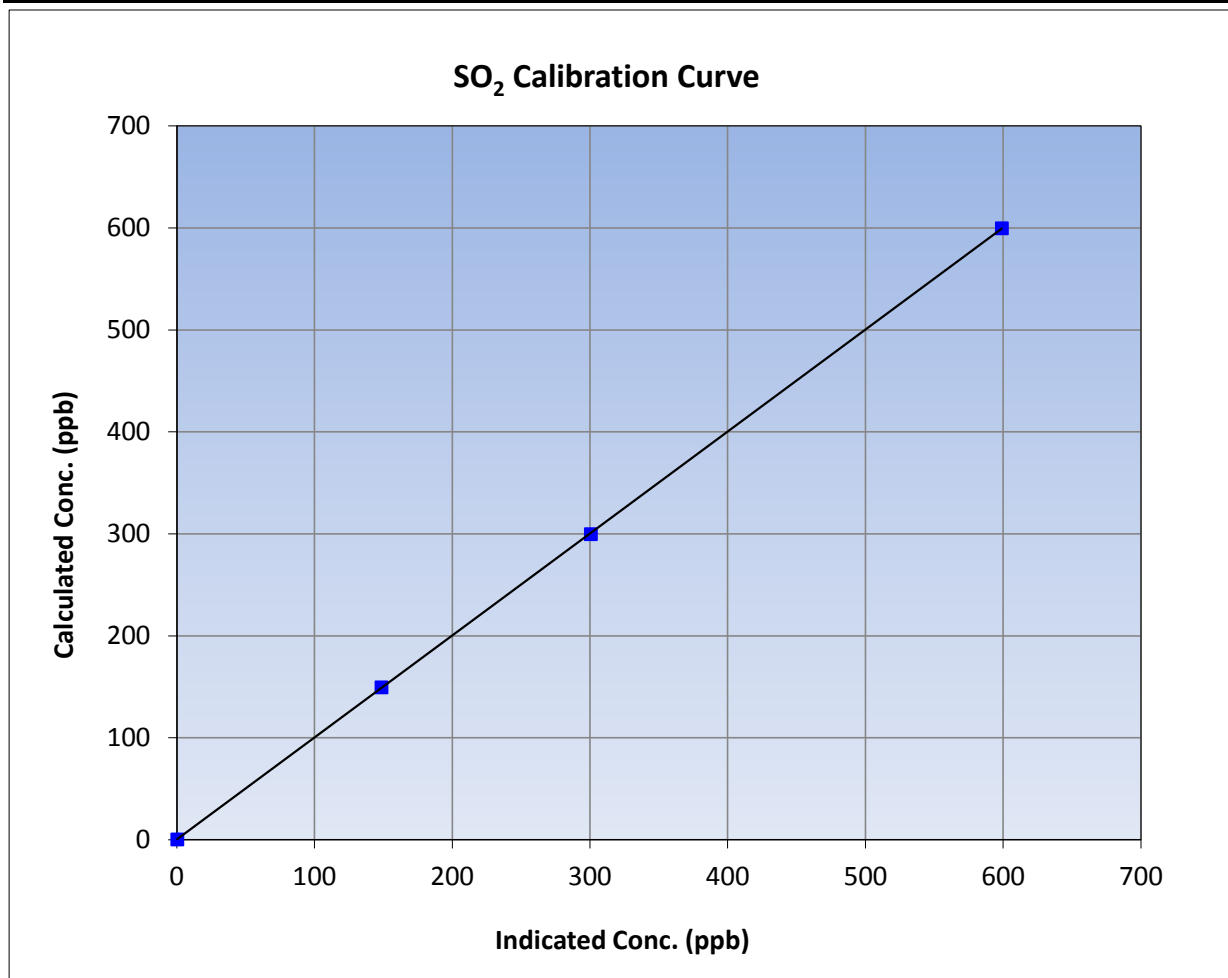
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 23, 2017
Station Name	Buffalo Viewpoint	Station Number	AMS 04
Start Time (MST)	7:10	End Time (MST)	9:12
Analyzer make	Thermo 43i	Analyzer serial #	JC1327300932

Calibration Data

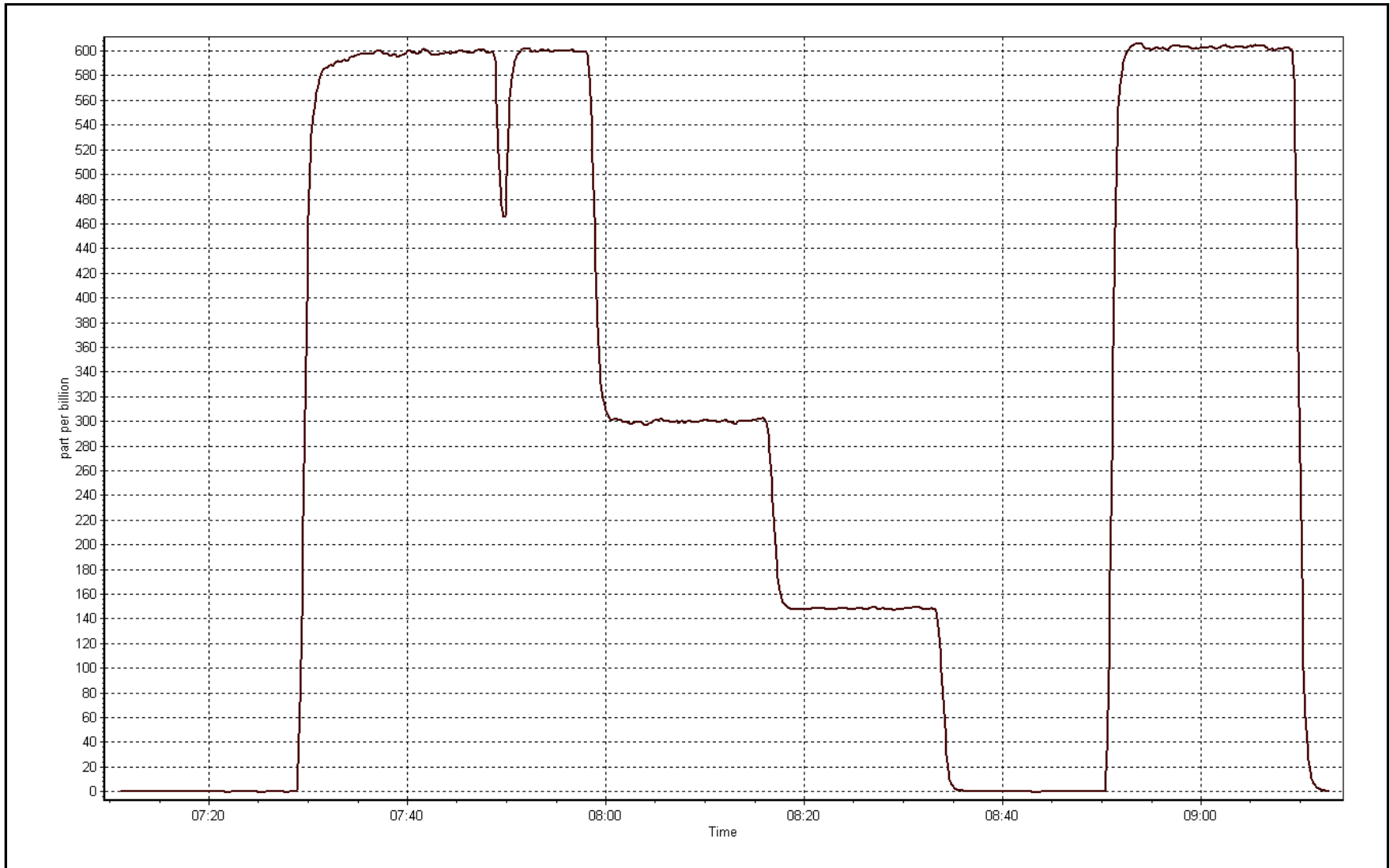
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999992	≥0.995
599.2	598.6	1.0010			
299.4	300.2	0.9974	Slope	1.000461	0.90 - 1.10
149.1	148.3	1.0054			
			Intercept	0.042826	+/-30



SO2 Calibration Plot

Date: April 25, 2017

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	April 25, 2017	Last Cal Date:	March 23, 2017
Start time (MST):	7:10	End time (MST):	9:10
Reason:	Routine		

Calibration Standards

Gas Cert Reference	LL107929	Cal Gas Expiry Date	September-08-18
CH4 Cal Gas Conc.	<u>514.0</u> ppm	CH4 Equiv Conc.	1061.3 ppm
C3H8 Cal Gas Conc.	<u>199.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11551008
ZAG Make/Model	API 701	Serial Number	4297

Analyzer Information

Analyzer make: Thermo 51i-LT		Analyzer serial #: 1201650671	
	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 25 ppm	Bias voltage supply	-291.7
Calculated slope	1.002524	Sample pressure	8.5
Calculated intercept	-0.027984	Fuel pressure	19.9
Analyzer Background	0.750	Air pressure	30.4
Analyzer Coefficient	4.285	Flame temperature	135.2

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.00	0.07	----
as found span	4941	60.3	12.80	12.84	0.997
calibrator zero	5000	0.0	0.00	0.07	----
high point	4941	60.3	12.80	12.84	0.997
second point	4966	30.1	6.39	6.47	0.988
third point	4982	15.0	3.19	3.25	0.980
as left zero	5000	0.0	0.00	0.07	----
as left span	4941	60.3	12.80	12.92	0.990
Average Correction Factor					0.988
Corrected As found	12.77	Previous response	12.79	*% change	0.2%

* = > +/-5% change initiates investigation

Notes: No adjustments or maintenance done

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

THC Calibration Summary

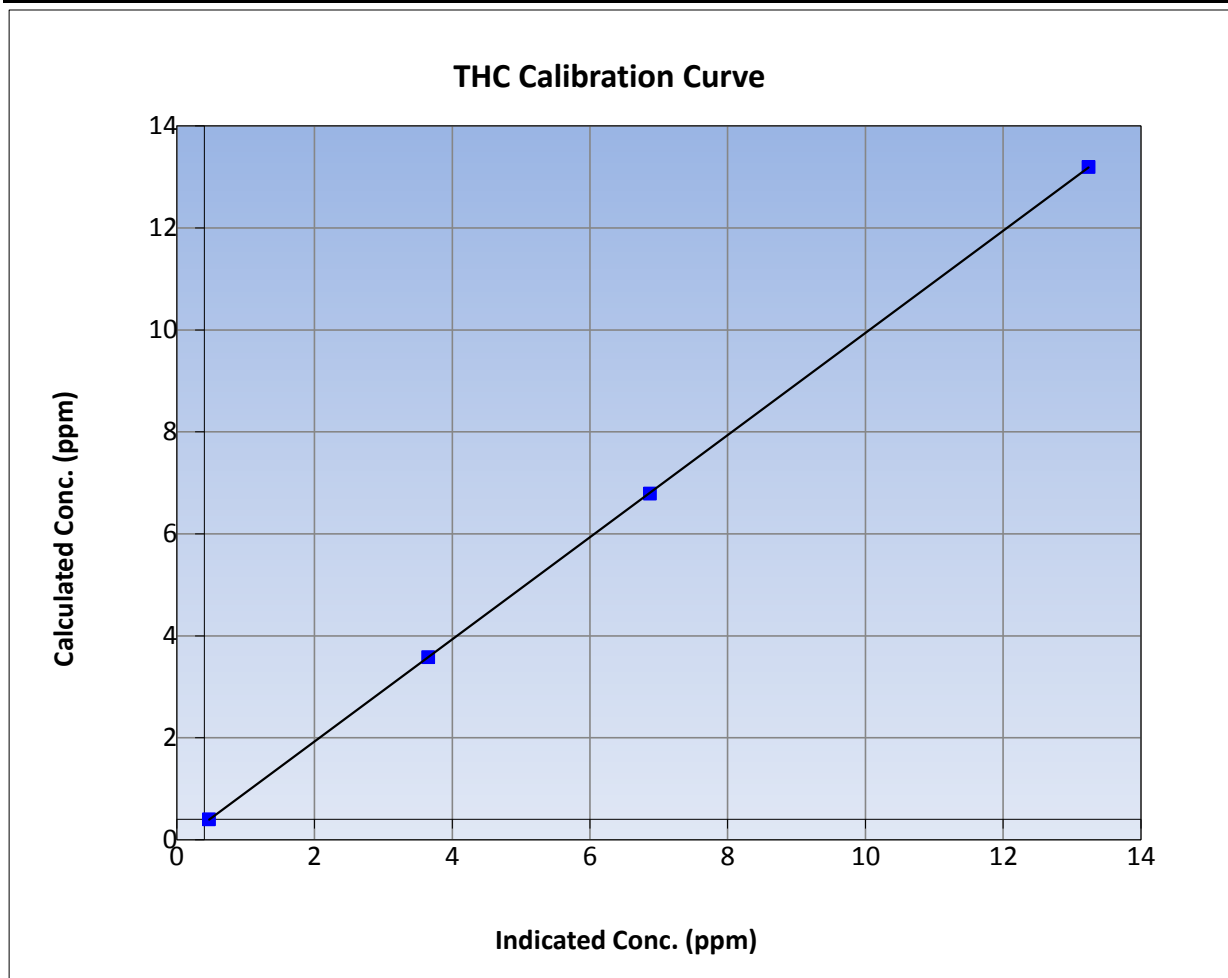
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 23, 2017
Station Name	Buffalo Viewpoint	Station Number	AMS 04
Start Time (MST)	7:10	End Time (MST)	9:10
Analyzer make	Thermo 51i-LT	Analyzer serial #	1201650671

Calibration Data

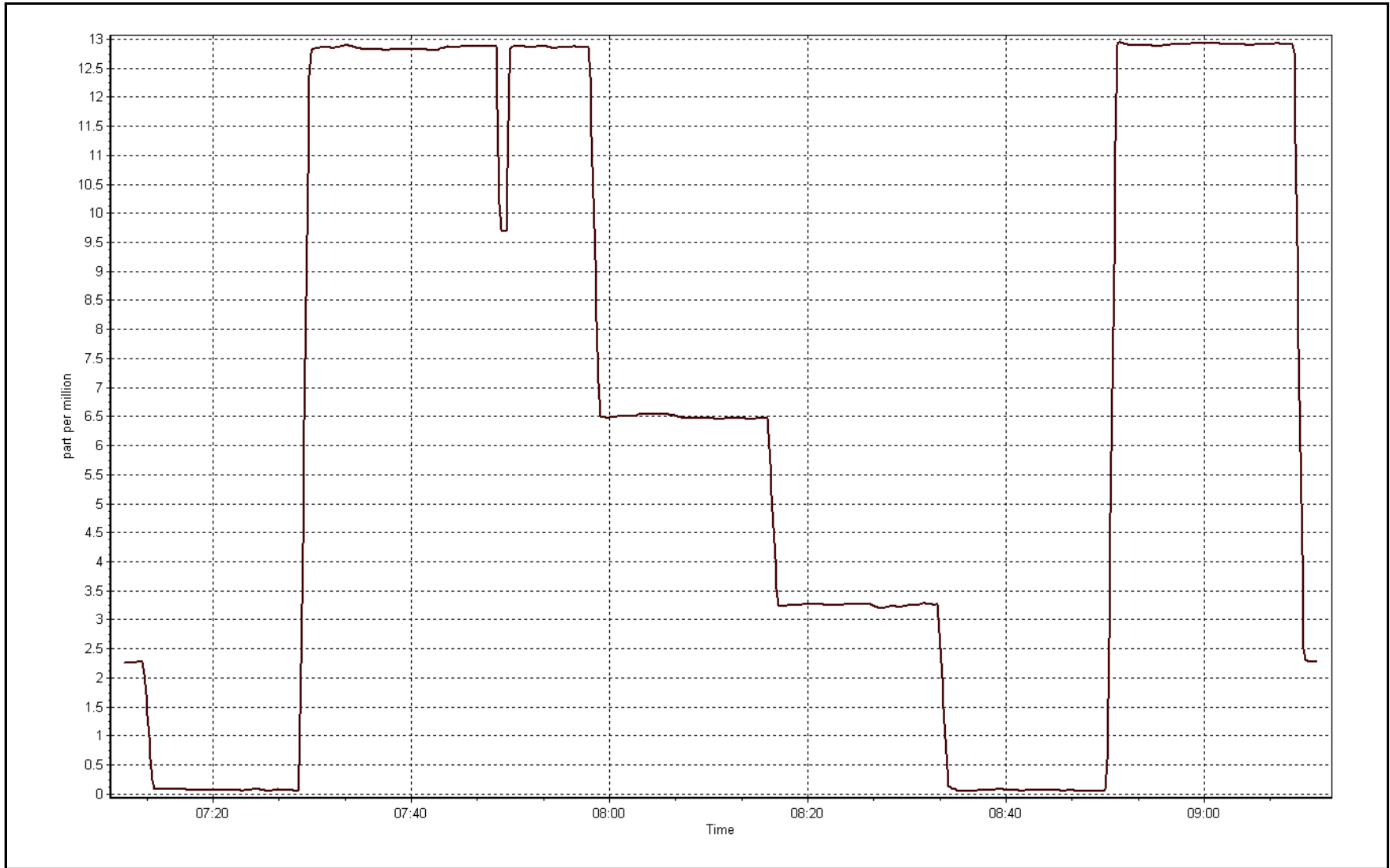
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999997	≥0.995
12.8	12.8	0.9965			
6.4	6.5	0.9882	Slope	1.001830	0.90 - 1.10
3.2	3.3	0.9802			
			Intercept	-0.074171	+/-1.5



THC Calibration Plot

Date: April 25, 2017

Location: Buffalo Viewpoint





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Buffalo Viewpoint	Station number:	AMS 04
Calibration Date:	April 25, 2017	Last Cal Date:	March 23, 2017
Start time (MST):	9:10	End time (MST):	11:27
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.11</u>	ppm	Cal Gas Exp Date	December 2, 2019
Cal Gas Cylinder #	<u>LL55546</u>			
Calibrator Make/Model	Sabio 4010		Serial Number	11551008
ZAG Make/Model	API 701		Serial Number	4297

Analyzer Information

Analyzer make:	Thermo 450i	Analyzer serial #:	1336160094		
	<u>Start</u>	<u>Finish</u>	<u>Start</u>		
Analyzer Range	0 - 100 ppb		<u>Finish</u>		
Calculated slope	0.997633	1.003061	PMT voltage	-617.2	-617.2
Calculated intercept	-0.068754	-0.225781	Lamp voltage	881	881
Analyzer Background	13.6	13.6	Pressure	549.3	549.3
Analyzer Coefficient	0.806	0.806	Flow	1.039	1.039
			Intensity	94	94

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	6000	0.0	0.0	0.2	----
as found span	5909	88.0	75.0	75.0	1.000
calibrator zero	6000	0.0	0.0	0.2	----
high point	5909	88.0	75.0	75.0	1.000
second point	5949	49.3	42.0	42.0	1.000
third point	5968	29.4	25.0	25.3	0.990
as left zero	5000	0.0	0.0	0.3	----
as left span	5909	88.0	75.0	75.4	0.994
Average Correction Factor					0.997
Corrected As found	74.80	Previous response	75.23	*% change	0.6%

* = > +/-5% change initiates investigation

Notes:

No adjustments or maintenance done

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

H₂S Calibration Summary

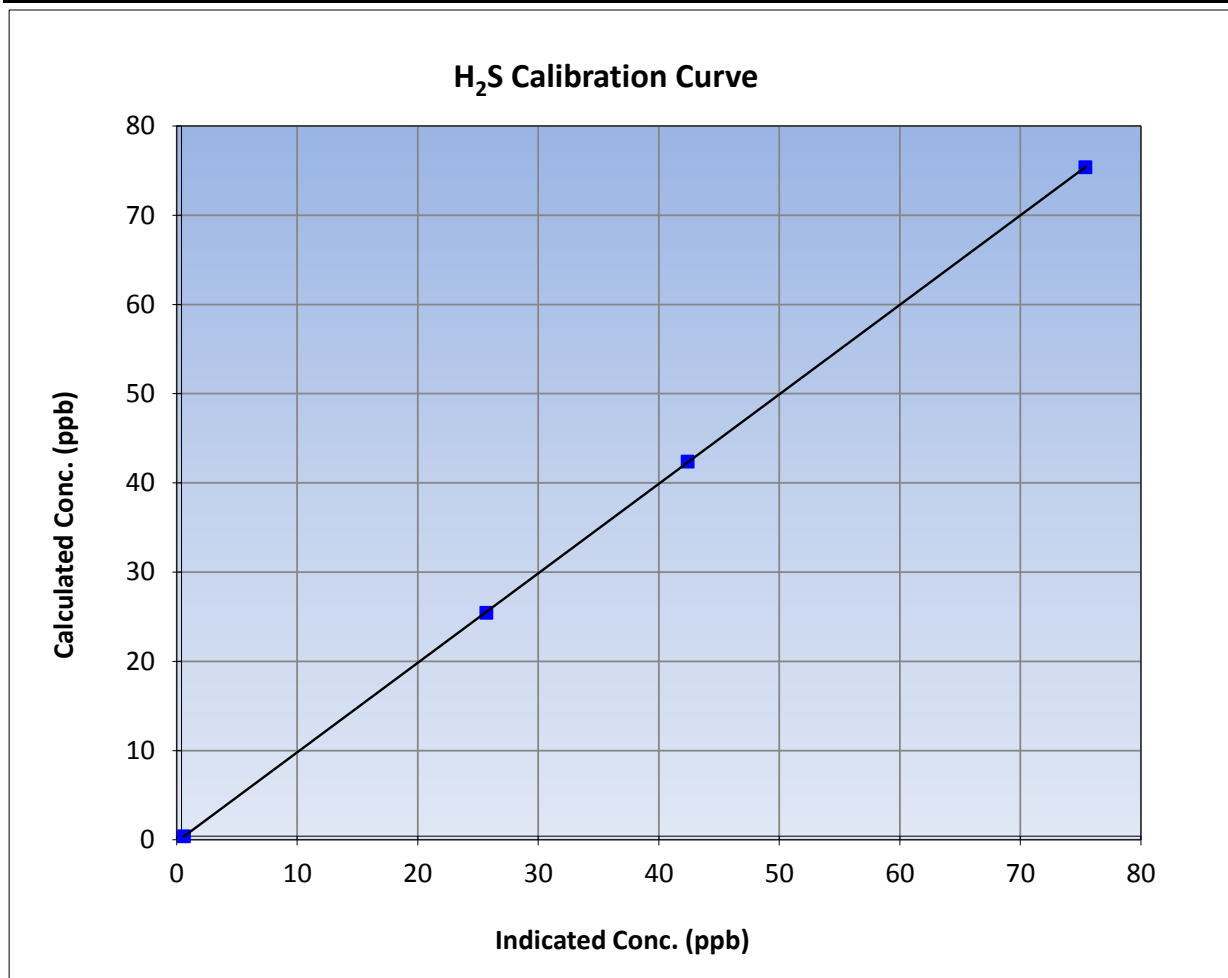
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 23, 2017
Station Name	Buffalo Viewpoint	Station Number	AMS 04
Start Time (MST)	9:10	End Time (MST)	11:27
Analyzer make	Thermo 450i	Analyzer serial #	1336160094

Calibration Data

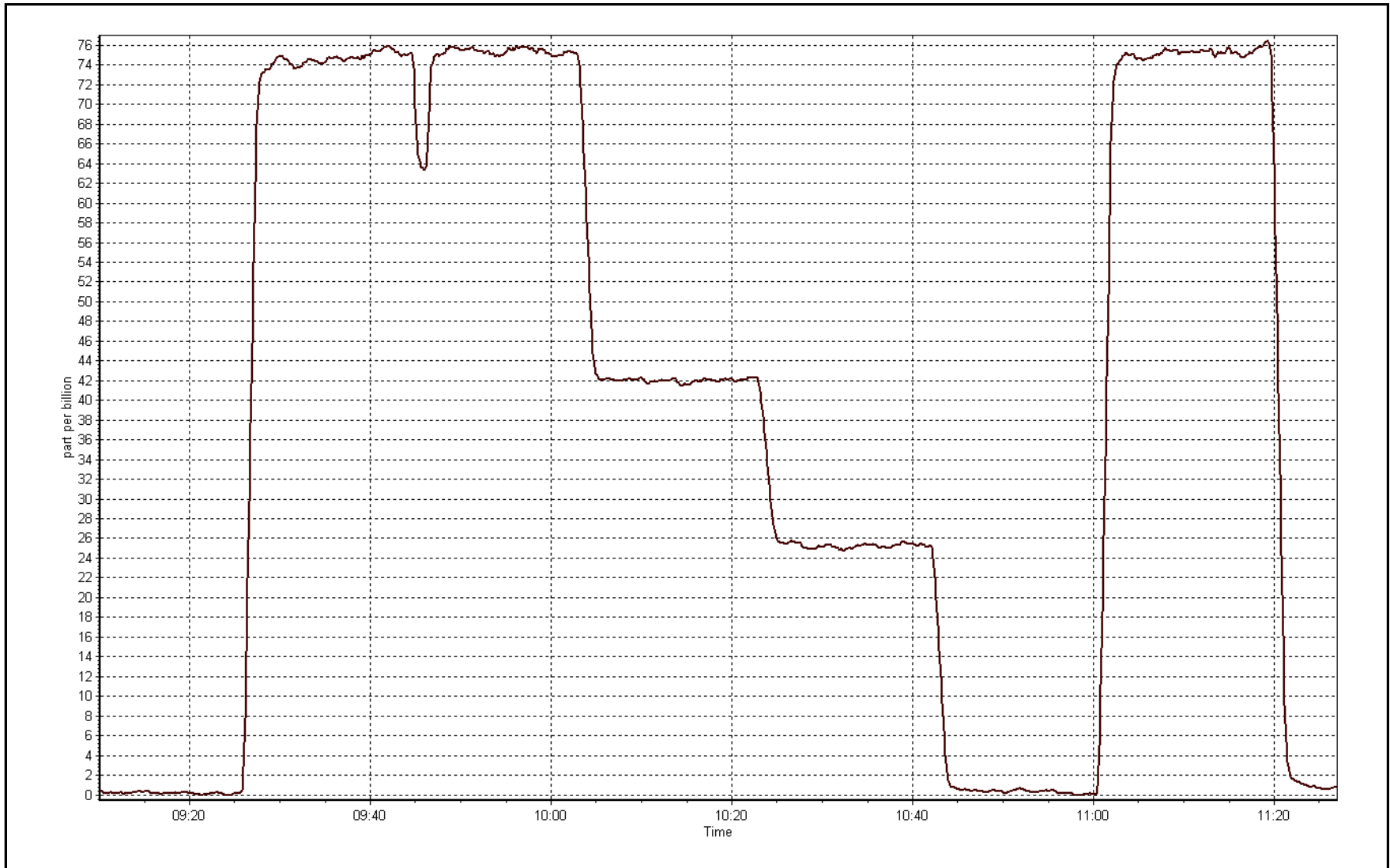
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.2	----	Correlation Coefficient	≥0.995
75.0	75.0	0.9998		
42.0	42.0	1.0000	Slope	0.90 - 1.10
25.0	25.3	0.9901		
			Intercept	+/-3



H₂S Calibration Plot

Date: April 25, 2017

Location: Buffalo Viewpoint





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

**AMS 5
MANNIX
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)

APRIL 2017

MONTHLY SUMMARY for
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	34	35	99.86	123	0	20	0
H2S (ppb) Average	686	33	34	99.86	86	5	9	1
THC (ppm) Average	685	34	35	99.86	4.5	-	2.5	-
Temperature 2 m (C) Average	711	0	9	98.75	17.6	-	10.6	-
Temperature 20 m (C) Average	711	0	9	98.75	16.3	-	10.9	-
Temperature 45 m (C) Average	711	0	9	98.75	15.9	-	10.9	-
Temperature 75 m (C) Average	711	0	9	98.75	15.6	-	10.8	-
Temperature 90 m (C) Average	709	0	11	98.47	15.5	-	10.8	-
Relative Humidity 2 m (%) Average	711	0	9	98.75	98	-	79	-
Relative Humidity 20 m (%) Average	711	0	9	98.75	98	-	77	-
Relative Humidity 45 m (%) Average	711	0	9	98.75	98	-	77	-
Relative Humidity 75 m (%) Average	711	0	9	98.75	98	-	78	-
Relative Humidity 90 m (%) Average	709	0	11	98.47	98	-	78	-
Wind Speed 20 m (km/h) Average	705	0	15	97.92	29	-	20	-
Wind Speed 45 m (km/h) Average	700	0	20	97.22	38	-	26	-
Wind Speed 75 m (km/h) Average	706	0	14	98.06	42	-	29	-
Wind Speed 90 m (km/h) Average	707	0	13	98.19	43	-	30	-
Wind Direction 20 m (deg) Average	705	0	15	97.92	-	-	-	-
Wind Direction 45 m (deg) Average	700	0	20	97.22	-	-	-	-
Wind Direction 75 m (deg) Average	706	0	14	98.06	-	-	-	-
Wind Direction 90 m (deg) Average	707	0	13	98.19	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	705	0	15	97.92	1.4	-	0.9	-
Vertical Wind Speed 45 m (km/h) Average	700	0	20	97.22	2.2	-	1.3	-
Vertical Wind Speed 75 m (km/h) Average	706	0	14	98.06	1.8	-	0.6	-
Vertical Wind Speed 90 m (km/h) Average	707	0	13	98.19	2	-	1	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	3.3	9	-	0	0	0	0	2	8	123
H2S (ppb) Average	686	0.9	4	-	0	0	0	0	1	1	86
THC (ppm) Average	685	2.34	0.2	-	2.1	2.2	2.2	2.3	2.4	2.6	4.5
Temperature 2 m (C) Average	711	2.65	5.8	-	-9.9	-4.9	-1.8	2.3	6.5	11.2	17.6
Temperature 20 m (C) Average	711	2.58	5.8	-	-10.4	-5.1	-1.9	2.4	6.9	11	16.3
Temperature 45 m (C) Average	711	2.41	5.8	-	-10.8	-5.4	-2.2	2.2	6.8	10.7	15.9
Temperature 75 m (C) Average	711	2.2	5.8	-	-11.1	-5.7	-2.5	2	6.7	10.5	15.6
Temperature 90 m (C) Average	709	2.1	5.9	-	-11.3	-5.9	-2.6	1.9	6.6	10.4	15.5
Relative Humidity 2 m (%) Average	711	58.4	18	-	18	34	45	59	71	85	98
Relative Humidity 20 m (%) Average	711	57	18	-	16	34	43	57	69	83	98
Relative Humidity 45 m (%) Average	711	57.1	18	-	15	34	43	57	70	84	98
Relative Humidity 75 m (%) Average	711	57.3	19	-	15	34	42	57	71	85	98
Relative Humidity 90 m (%) Average	709	57.6	19	-	14	34	42	57	72	85	98
Wind Speed 20 m (km/h) Average	705	11.8	6	-	0	5	7	11	16	20	29
Wind Speed 45 m (km/h) Average	700	15.2	7	-	1	6	10	14	21	25	38
Wind Speed 75 m (km/h) Average	706	17	9	-	1	6	10	17	23	28	42
Wind Speed 90 m (km/h) Average	707	18.1	9	-	1	6	11	17	24	30	43
Wind Direction 20 m (deg) Average	705	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	700	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	706	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	707	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	705	0.25	0.4	-	-0.8	-0.2	-0.1	0.2	0.6	0.8	1.4
Vertical Wind Speed 45 m (km/h) Average	700	0.14	0.8	-	-2.3	-0.9	-0.5	0.1	0.7	1.2	2.2
Vertical Wind Speed 75 m (km/h) Average	706	0.14	0.5	-	-1.8	-0.4	-0.1	0.1	0.4	0.7	1.8
Vertical Wind Speed 90 m (km/h) Average	707	0.38	0.4	-	-1.4	-0.1	0.1	0.4	0.6	0.9	2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
 APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	26 Apr 2017 10:00	26 Apr 2017 10:00	1	Maintenance - sample manifold blower replaced
ALL METEOROLOGICAL PARAMETERS	26 Apr 2017 13:00	26 Apr 2017 21:00	9	DAS collection error - data not recorded
Temperature, Relative Humidity 90 m	27 Apr 2017 13:00	27 Apr 2017 14:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 20 m	05 Apr 2017 07:00	05 Apr 2017 10:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 20 m	14 Apr 2017 14:00	14 Apr 2017 15:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 45 m	05 Apr 2017 07:00	05 Apr 2017 10:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 45 m	14 Apr 2017 10:00	14 Apr 2017 10:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 45 m	14 Apr 2017 14:00	14 Apr 2017 17:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 75 m	05 Apr 2017 07:00	05 Apr 2017 10:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed 75 m	14 Apr 2017 14:00	14 Apr 2017 14:00	1	Flat line in sensor output signal



Summary of Hour Averages

Mannix - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 123 ppb on Apr 12 08:00	Maximum Daily Average: 20.3 ppb on Apr 12		Hours of Data:	685
Minimum Value: 0 ppb on Apr 6 17:00	Minimum Daily Average: 0.1 ppb on Apr 24		Hours of Missing Data:	35
Maximum Diurnal Average: 6.0 ppb at hour 8	Minimum Diurnal Average: 0.7 ppb at hour 20		Hours of Calibration:	34
Monthly Average: 3.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 2 P ₉₀ = 8 P ₉₉ = 55		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0.3	2
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	2	5	2	2	2	5	1	0	0	0	2	16	6	1.9	16
3-Apr	28	14	8	Z	33	22	4	0	8	12	11	20	8	13	17	3	21	5	1	1	1	0	0	0	10.1	33
4-Apr	0	0	0	0	Z	0	0	0	0	2	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0.6	7
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.1	1
6-Apr	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	0	0	0	0	1	2	3	3	0	0	0.6	3
7-Apr	0	Z	16	12	4	14	21	19	23	4	24	11	1	1	0	0	0	0	0	0	0	0	0	6	6.9	24
8-Apr	18	58	Z	7	26	5	2	4	6	6	6	1	3	4	2	2	2	0	0	0	0	0	0	0	6.7	58
9-Apr	0	4	2	Z	3	5	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	5
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2	2
11-Apr	1	0	0	20	12	Z	6	8	5	7	5	5	6	6	3	1	1	5	8	5	36	55	45	86	14.3	86
12-Apr	Z	33	63	56	36	13	75	123	13	7	9	2	10	7	5	4	5	3	1	0	0	0	0	0	20.3	123
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.2	1
15-Apr	0	0	0	Z	0	3	0	0	0	0	2	3	0	0	1	6	2	7	2	0	0	0	0	0	1.2	7
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	1	2	4	8	6	Z	9	3	4	1	3	0	3	1	3	1	0	0	0	0	0	0	0	0	2.2	9
18-Apr	Z	0	0	0	8	2	1	1	4	9	7	4	5	12	12	18	3	0	0	0	1	4	9	3	4.6	18
19-Apr	2	Z	1	5	2	2	2	5	1	3	4	18	24	7	6	7	4	1	1	1	2	1	1	1	4.3	24
20-Apr	0	1	Z	0	0	0	0	0	0	6	3	20	25	19	32	21	36	43	9	1	7	3	1	4	10.0	43
21-Apr	1	13	9	Z	0	3	4	3	1	0	8	3	10	11	9	7	2	1	1	1	2	1	1	1	3.9	13
22-Apr	1	1	1	1	Z	26	2	1	0	5	2	1	4	7	7	6	4	6	2	1	0	0	0	0	3.3	26
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
24-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	5	3	2	0.7	5
28-Apr	1	1	1	0	1	1	Z	0	0	0	1	3	3	8	9	16	10	4	4	2	1	1	0	0	3.0	16
29-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	1	1	0	0	0.5	4

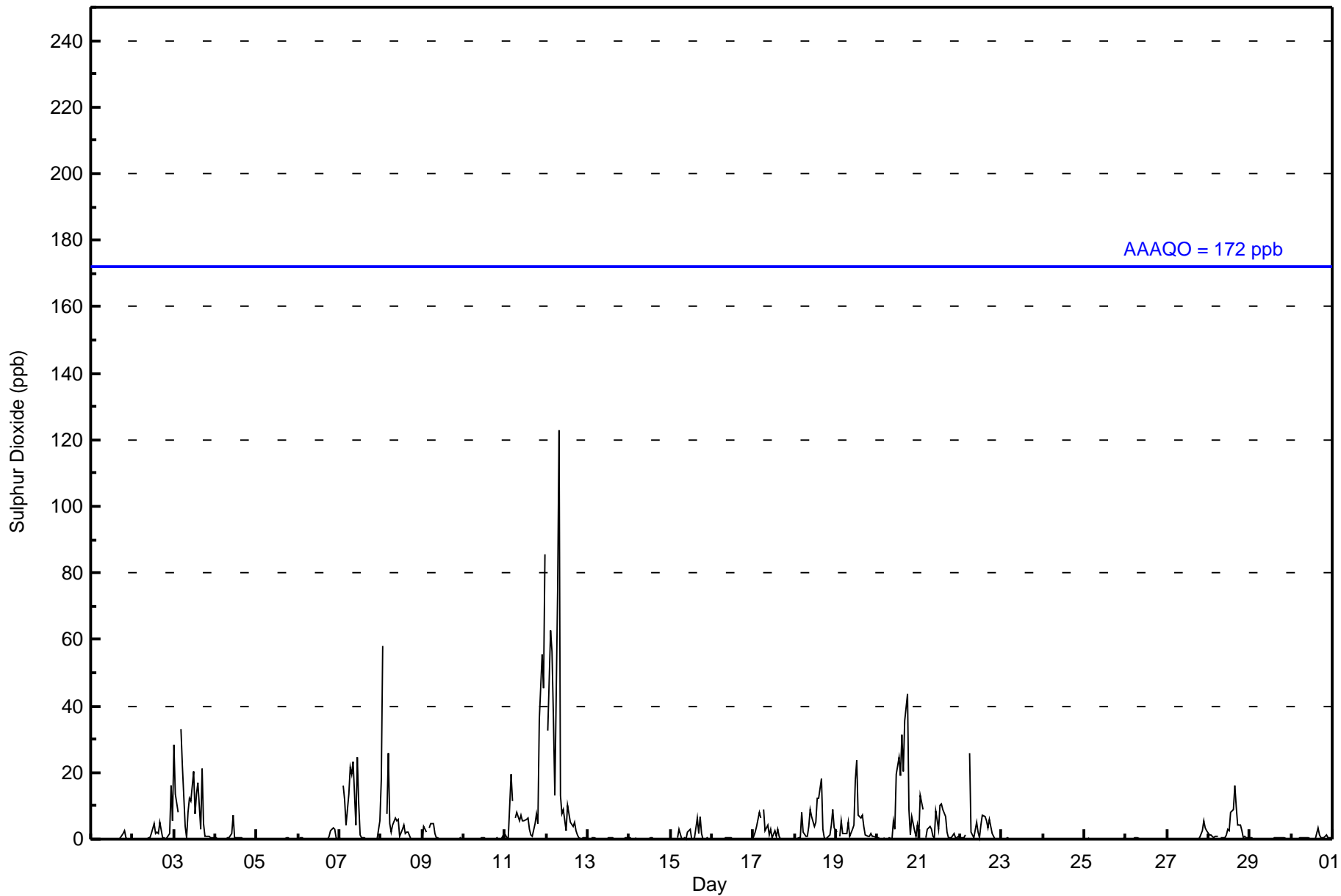
2.3	5.1	4.3	4.5	5.2	3.7	4.6	6.0	2.3	2.3	3.3	3.3	3.8	3.5	3.7	3.3	3.2	2.6	1.1	0.7	2.0	2.6	2.7	3.8	Diurnal Average	
28	58	63	56	36	26	75	123	23	12	24	20	25	19	32	21	36	43	9	5	36	55	45	86	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mannix - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mannix - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	633	92.41	92.41
11 - 20	26	3.80	96.20
21 - 60	22	3.21	99.42
61 - 110	3	0.44	99.85
111 - 172	1	0.15	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mannix - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	80	80	34	24	38	36	100	87	21	23	19	12	20	11	14	19	618
11 - 20	16	1	1	0	0	0	0	0	0	0	0	1	3	1	1	2	26
21 - 60	19	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	22
61 - 110	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
111 - 172	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	81	35	24	38	36	100	87	21	23	19	13	24	13	15	22	670

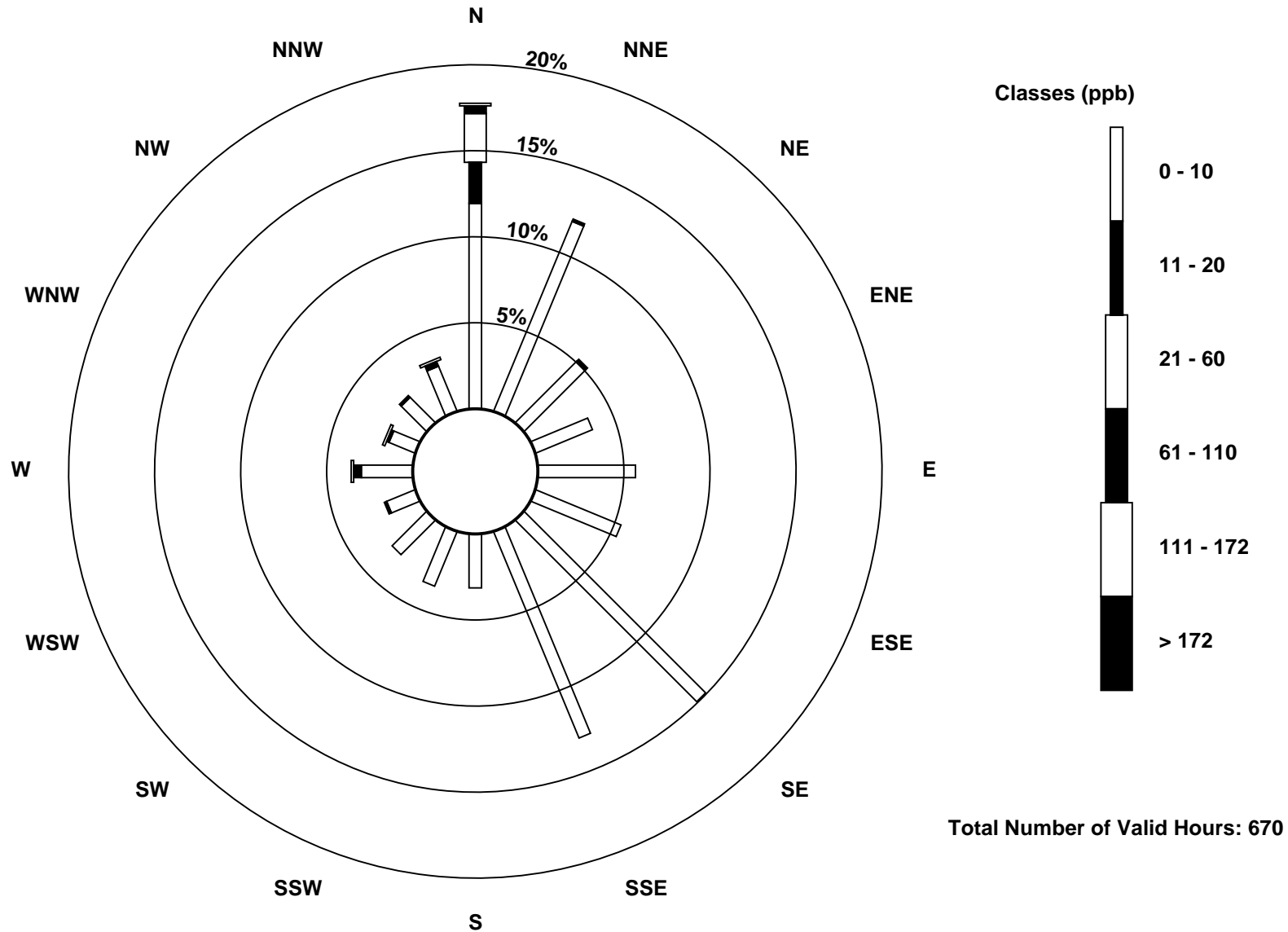
Total Number of Valid Hours: 670

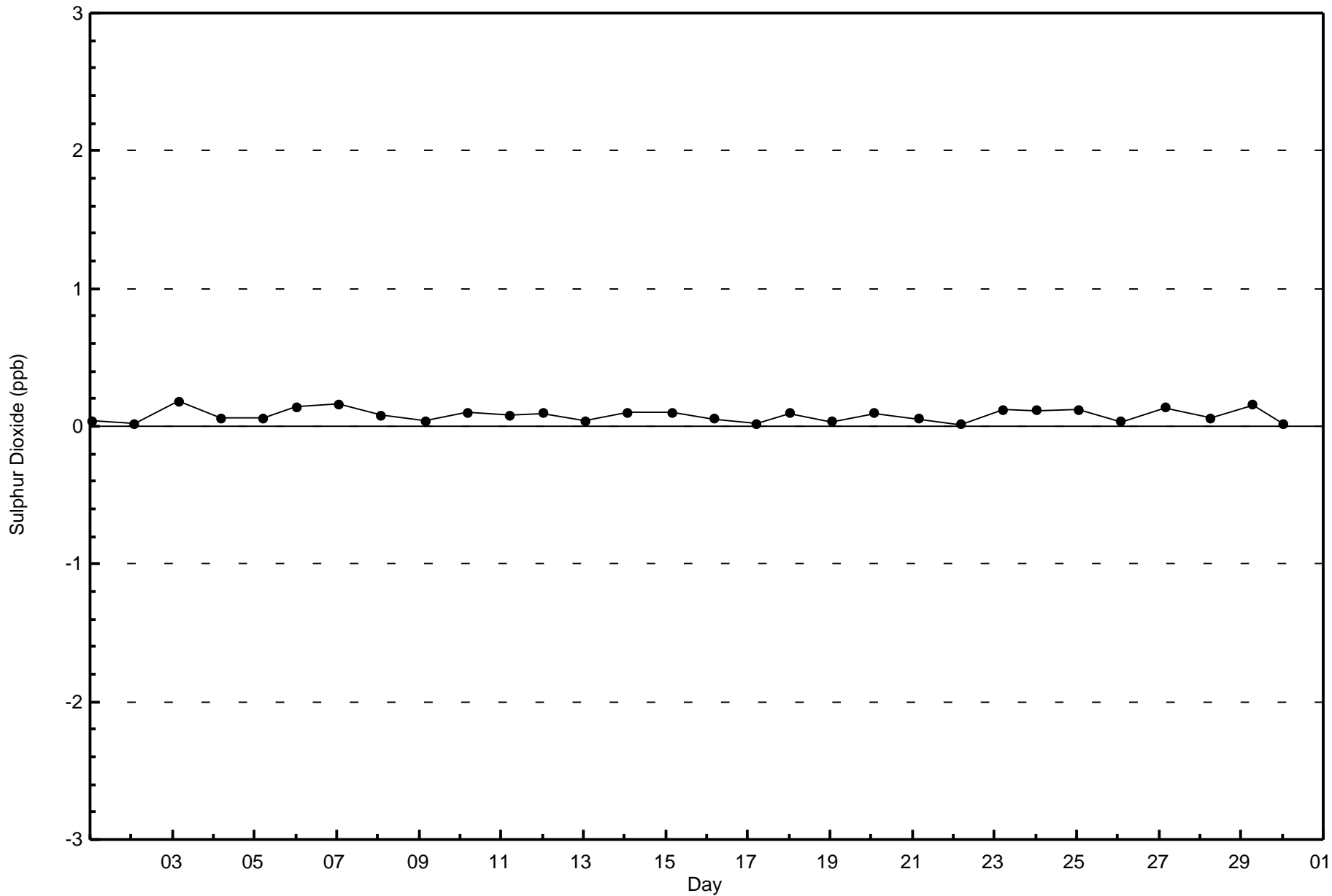
Total Number of Hours: 720

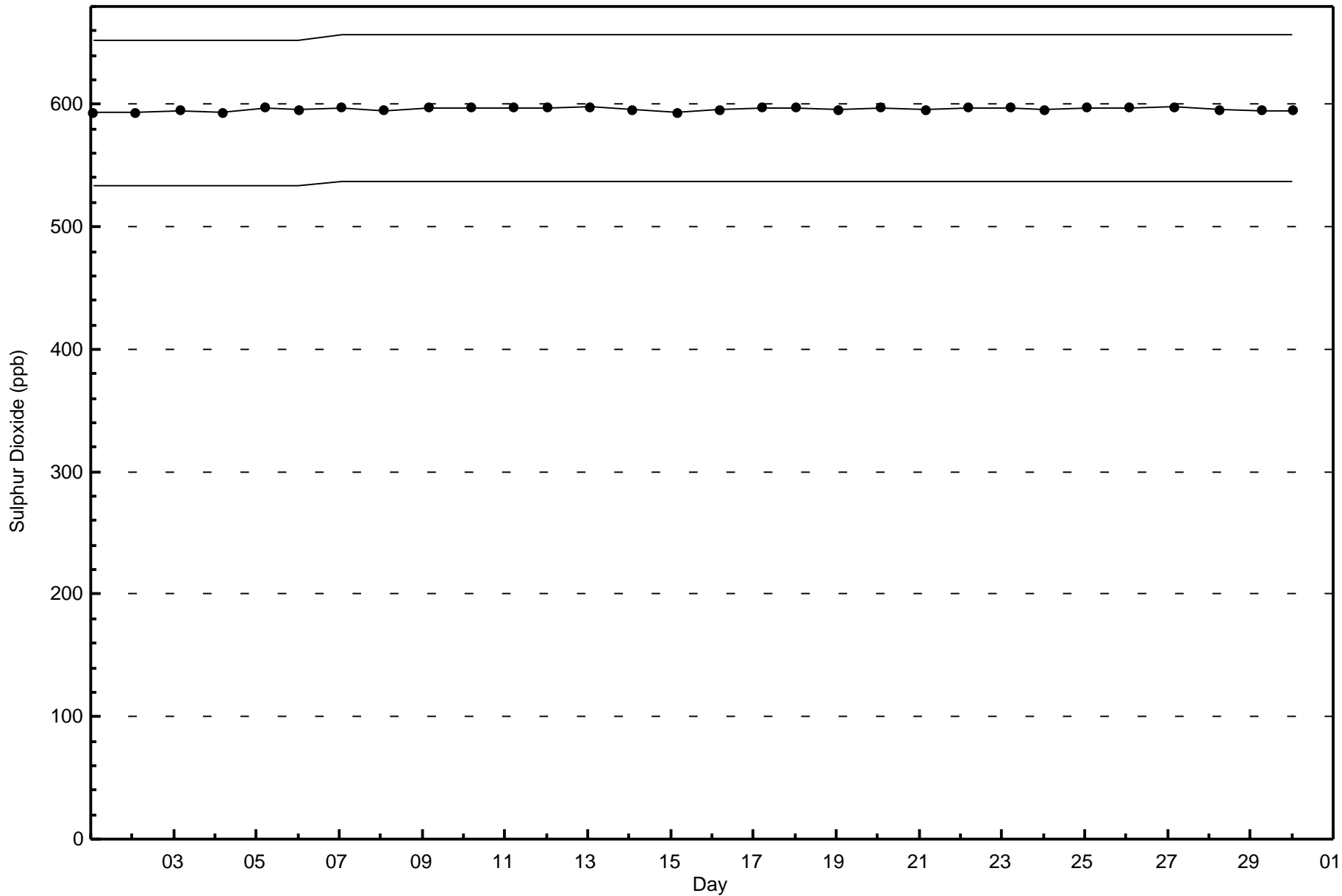


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Mannix (AMS 5)







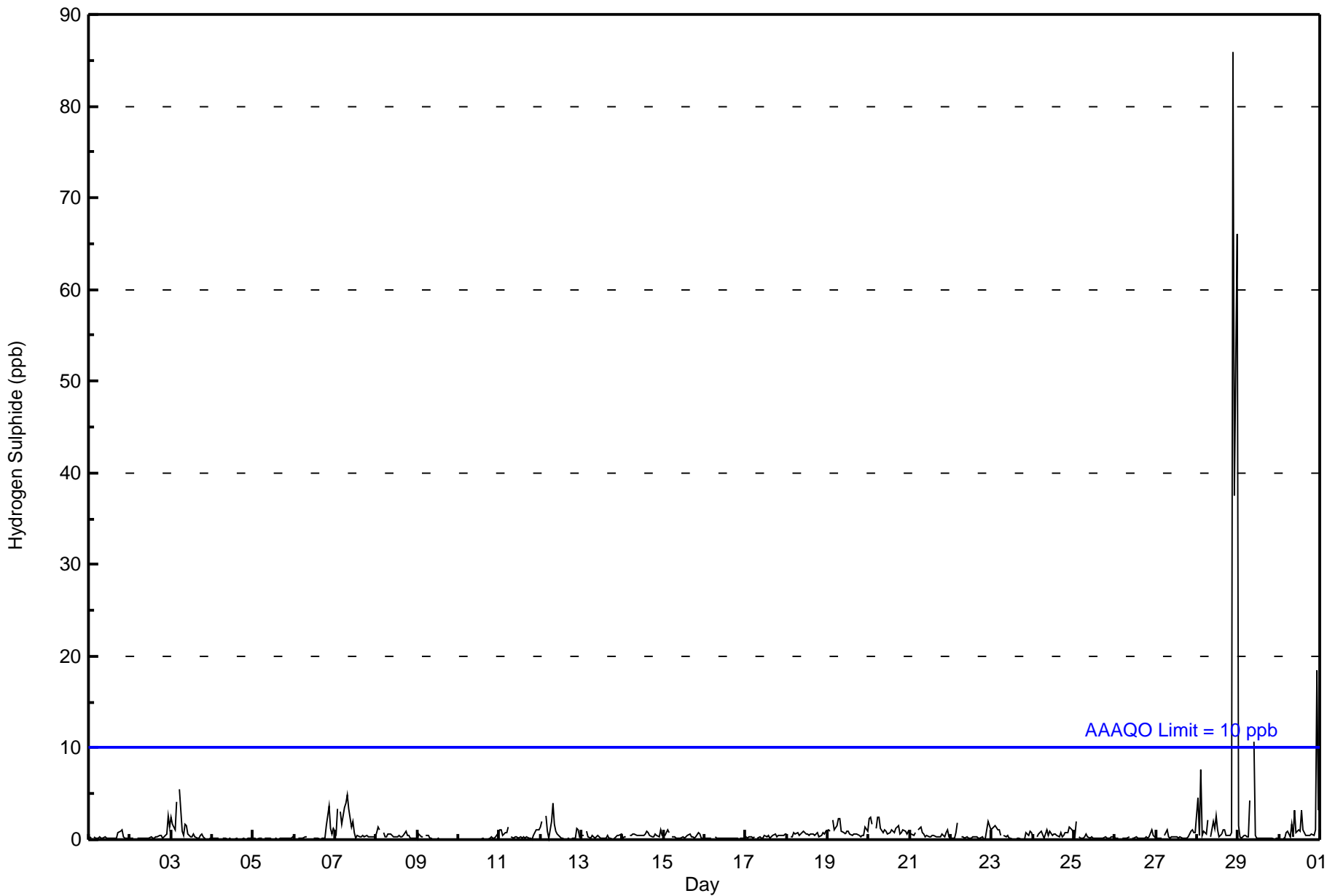


Number of Exceedences (AAAQO):	1-hr: 5	24-hr: 1	Hours in Service:	720
Maximum Value: 86 ppb on Apr 28 22:00	Maximum Daily Average: 9.5 ppb on Apr 28		Hours of Data:	686
Minimum Value: 0 ppb on Apr 4 12:00	Minimum Daily Average: 0.1 ppb on Apr 4		Hours of Missing Data:	34
Maximum Diurnal Average: 3.4 ppb at hour 22	Minimum Diurnal Average: 0.3 ppb at hour 16		Hours of Calibration:	33
Monthly Average: 0.9 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 1 P ₉₉ = 5		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0.3	1	
2-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0.4	3	
3-Apr	2	2	1	4	Z	6	1	0	2	2	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1.0	6	
4-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
5-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
6-Apr	0	Z	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	2	4	1	1	1	0.5	4	
7-Apr	1	3	Z	3	2	4	4	5	3	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0	1.4	5	
8-Apr	1	1	1	Z	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0.5	1	
9-Apr	0	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	
10-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	1	
11-Apr	1	1	0	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.5	1	
12-Apr	1	2	Z	3	1	0	2	4	2	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0.9	4	
13-Apr	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0.3	1	
14-Apr	0	0	0	Z	0	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	0	1	0	1	0.5	1	
15-Apr	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0.4	1	
16-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0.3	1	
18-Apr	1	Z	0	0	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	1	1	0.6	1	
19-Apr	1	1	Z	2	1	2	2	2	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	1	1.0	2	
20-Apr	2	2	2	Z	1	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1.2	2	
21-Apr	1	1	0	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0.6	1	
22-Apr	0	0	0	1	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0.4	2	
23-Apr	1	1	1	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.5	1	
24-Apr	0	Z	0	1	1	1	0	1	1	1	1	0	1	1	0	0	1	0	0	1	1	1	1	1	0.7	1	
25-Apr	0	2	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2	
26-Apr	0	0	0	Z	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.3	1	
27-Apr	0	0	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1	
28-Apr	5	1	8	0	1	1	2	Z	0	2	1	3	1	0	1	1	1	0	0	0	1	86	37	66	9.5	86	
29-Apr	1	0	0	0	0	0	0	4	Z	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	11	
30-Apr	0	Z	0	0	1	1	0	2	0	3	1	1	1	3	1	0	1	1	1	1	1	0	1	18	3	1.8	18

0.7	0.8	0.7	0.8	0.6	0.9	0.8	0.9	0.6	1.0	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	3.4	2.5	2.8	Diurnal Average
5	3	8	4	2	6	4	5	3	11	2	3	1	3	1	1	1	1	2	1	2	4	86	37	66	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mannix - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	662	96.50	96.50
3 - 4	15	2.19	98.69
5 - 7	3	0.44	99.13
8 - 11	1	0.15	99.27
> 11	5	0.73	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mannix - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	110	82	35	23	37	30	97	88	21	23	20	12	23	13	14	20	648
3 - 4	8	0	0	0	1	2	1	0	0	0	0	1	0	0	1	1	15
5 - 7	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3
8 - 11	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	5
Totals	119	82	35	23	39	34	102	88	21	23	20	13	23	13	15	22	672

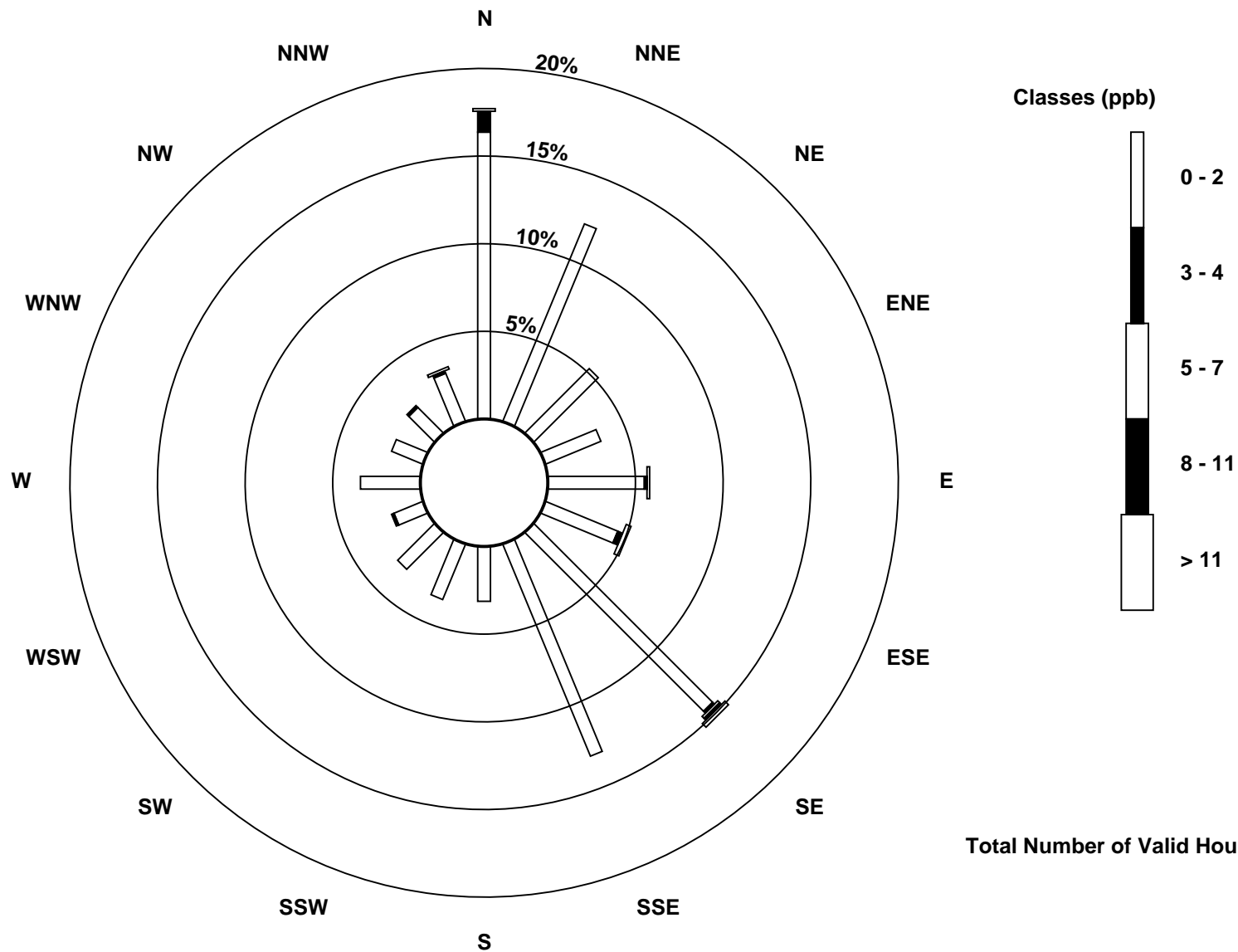
Total Number of Valid Hours: 672

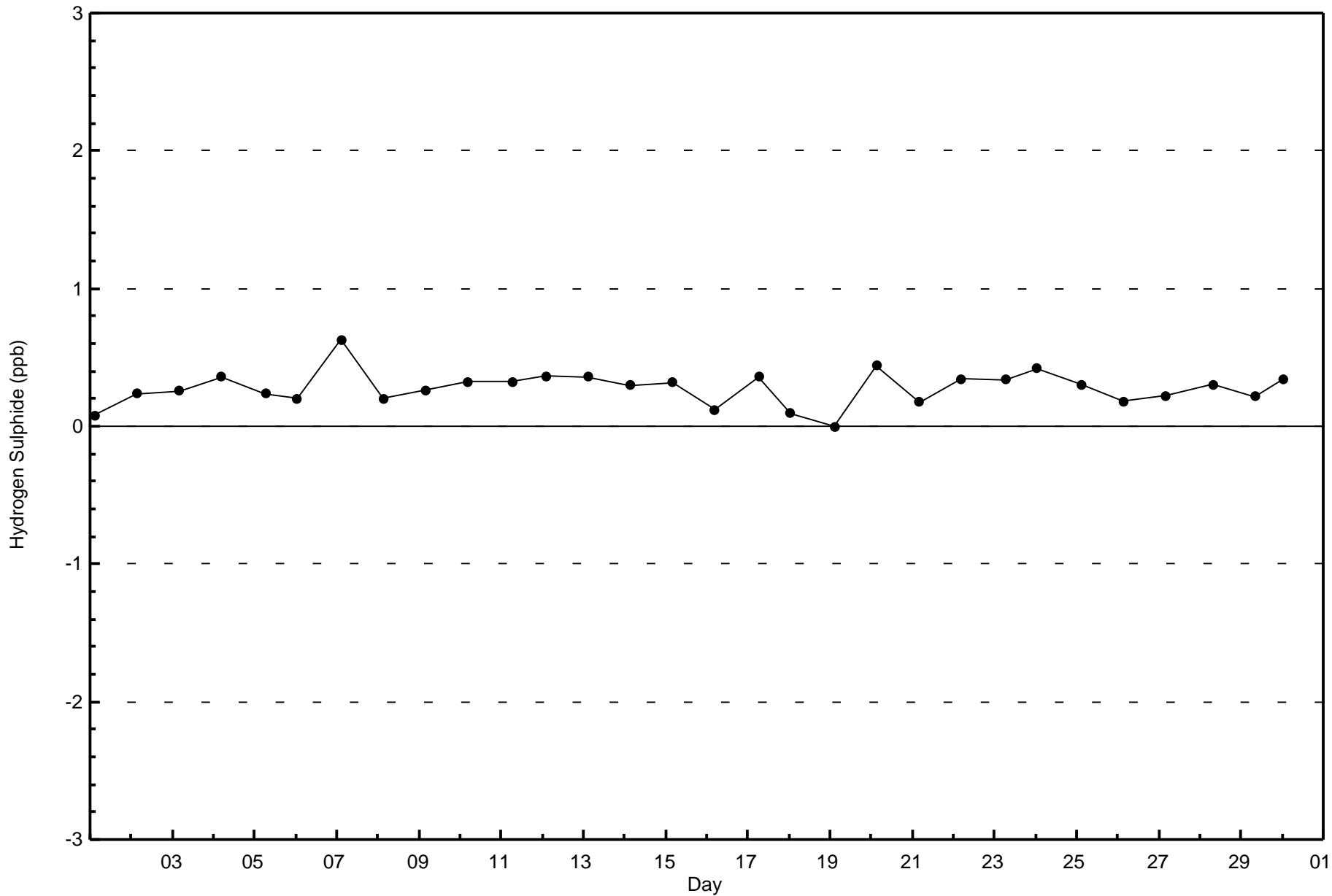
Total Number of Hours: 720

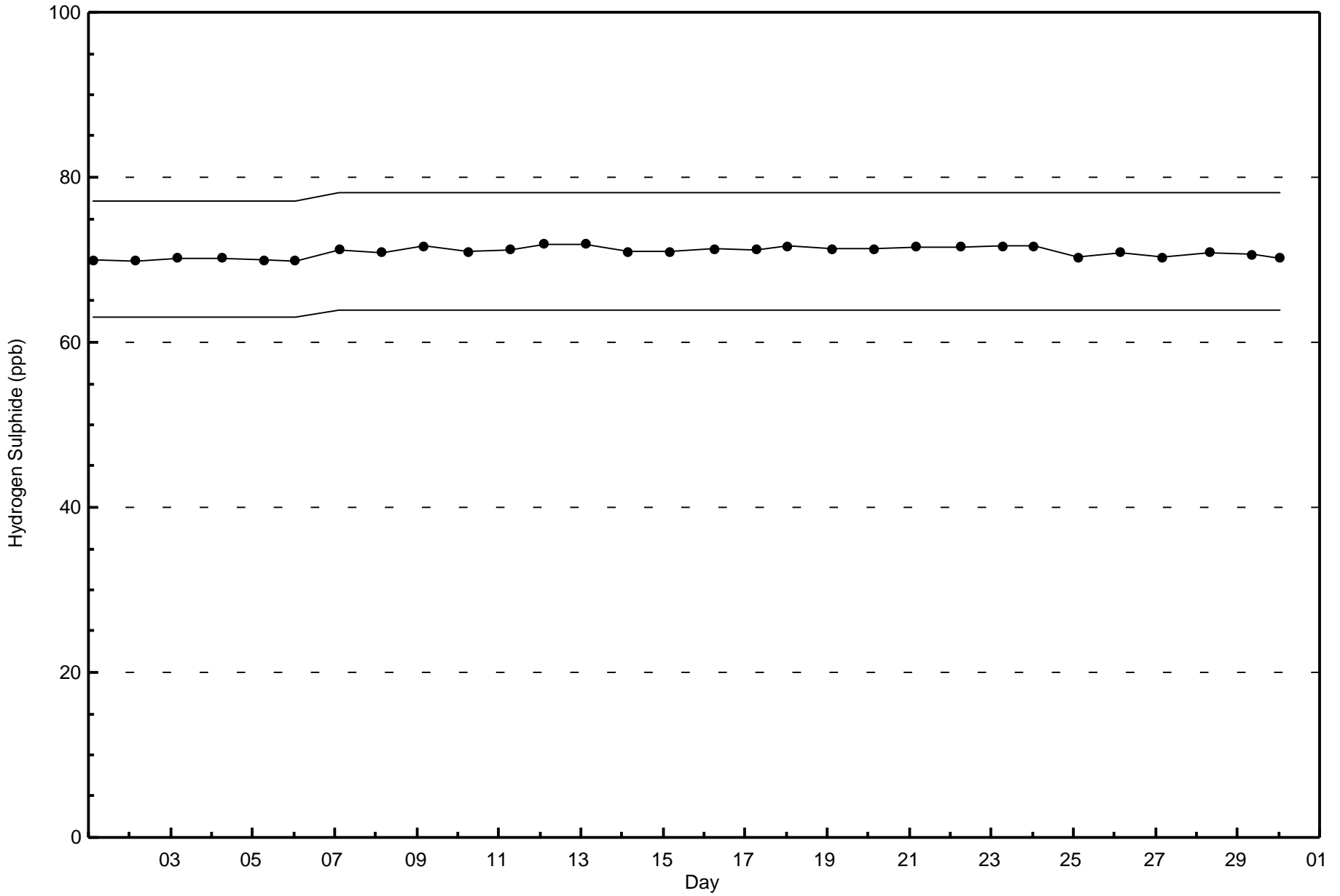


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Mannix (AMS 5)









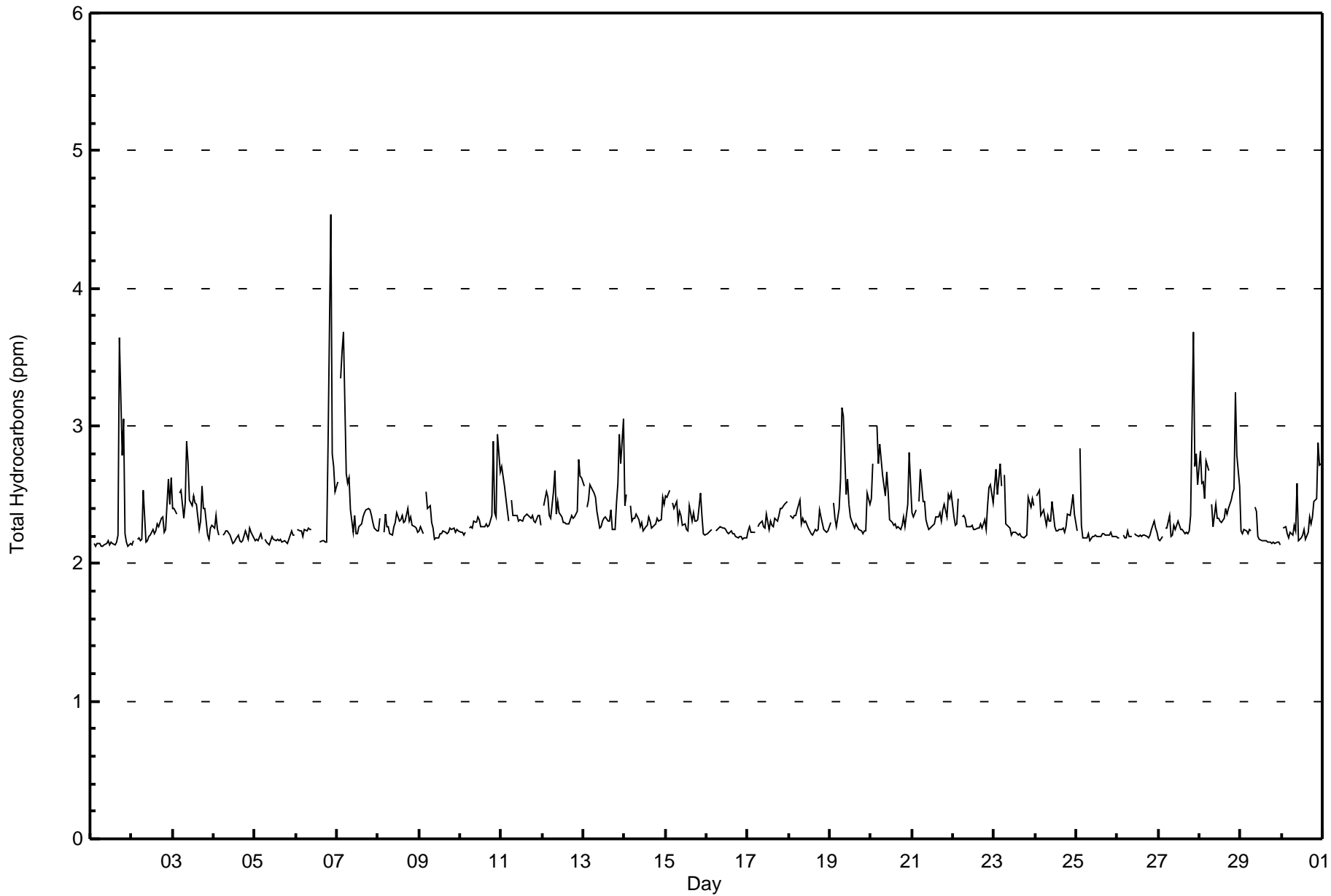
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - April 2017

Maximum Value: 4.5 ppm on Apr 6 21:00																	Maximum Daily Average: 2.5 ppm on Apr 7																	Hours in Service: 720	
Minimum Value: 2.1 ppm on Apr 1 04:00																	Minimum Daily Average: 2.2 ppm on Apr 5																	Hours of Data: 685	
Maximum Diurnal Average: 2.4 ppm at hour 23																	Minimum Diurnal Average: 2.3 ppm at hour 13																	Hours of Missing Data: 35	
Monthly Average: 2.34 ppm																	Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 3.2																	Hours of Calibration: 34	
																																		Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.2	3.6	2.8	3.1	2.2	2.2	2.1	2.1	2.3	3.6									
2-Apr	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.6	2.4	2.6	2.3	2.6									
3-Apr	2.4	2.4	2.4	Z	2.5	2.5	2.3	2.4	2.9	2.7	2.5	2.4	2.5	2.4	2.4	2.2	2.3	2.6	2.4	2.4	2.2	2.2	2.3	2.3	2.4	2.9									
4-Apr	2.3	2.3	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3									
5-Apr	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2									
6-Apr	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.9	4.5	2.8	2.7	2.5	2.4	4.5									
7-Apr	2.6	Z	3.3	3.5	3.7	2.7	2.6	2.6	2.4	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.5	3.7									
8-Apr	2.2	2.3	Z	2.2	2.4	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4									
9-Apr	2.2	2.3	2.2	Z	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.2	2.5									
10-Apr	2.2	2.2	2.2	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.9	2.4	2.3	2.9	2.7	2.4	2.9									
11-Apr	2.7	2.6	2.6	2.4	2.3	Z	2.5	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.7									
12-Apr	Z	2.4	2.5	2.5	2.3	2.3	2.5	2.7	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.8	2.6	2.6	2.4	2.8									
13-Apr	2.6	Z	2.4	2.5	2.6	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.6	2.9	2.7	3.0	2.5	3.0									
14-Apr	2.4	2.5	Z	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.4	2.3	2.5									
15-Apr	2.5	2.5	2.5	Z	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.4	2.3	2.4	2.3	2.3	2.3	2.5	2.4	2.2	2.2	2.4	2.5									
16-Apr	2.2	2.2	2.2	2.3	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3									
17-Apr	2.2	2.3	2.2	2.2	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.3	2.5								
18-Apr	Z	2.3	2.3	2.3	2.3	2.4	2.5	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.2	2.2	2.3	2.5									
19-Apr	2.3	Z	2.4	2.3	2.3	2.4	2.6	3.1	3.1	2.5	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.5	2.4	2.4	3.1									
20-Apr	2.5	2.7	Z	3.0	2.7	2.9	2.8	2.6	2.5	2.7	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.8	2.6	2.5	3.0									
21-Apr	2.4	2.3	2.4	Z	2.5	2.7	2.5	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.3	2.5	2.5	2.5	2.4	2.7									
22-Apr	2.3	2.3	2.3	2.5	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.6	2.6	2.4	2.3	2.6									
23-Apr	2.6	2.7	2.5	2.7	2.6	Z	2.6	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.4	2.5	2.4	2.4	2.7									
24-Apr	Z	2.5	2.5	2.3	2.4	2.4	2.3	2.4	2.3	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.4	2.4	2.5	2.4	2.3	2.5								
25-Apr	2.2	Z	2.8	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.8								
26-Apr	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	M	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3									
27-Apr	2.2	2.2	2.2	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	3.7	2.7	2.8	2.6	2.4	3.7								
28-Apr	2.8	2.6	2.6	2.5	2.7	2.7	Z	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	3.2	2.8	2.6	2.5	3.2								
29-Apr	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Z	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.4								
30-Apr	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.9	2.7	2.7	2.3	2.9									
																								Diurnal Average											
																								Diurnal Maximum											
																								Z - zerospan C - Calibration M - Maintenance											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	675	98.54	98.54
3.1 - 10.0	10	1.46	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	118	81	35	24	38	35	100	87	21	23	18	13	23	11	14	19	660
3.1 - 10.0	1	0	0	0	0	1	0	0	0	0	1	0	1	2	1	3	10
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	81	35	24	38	36	100	87	21	23	19	13	24	13	15	22	670

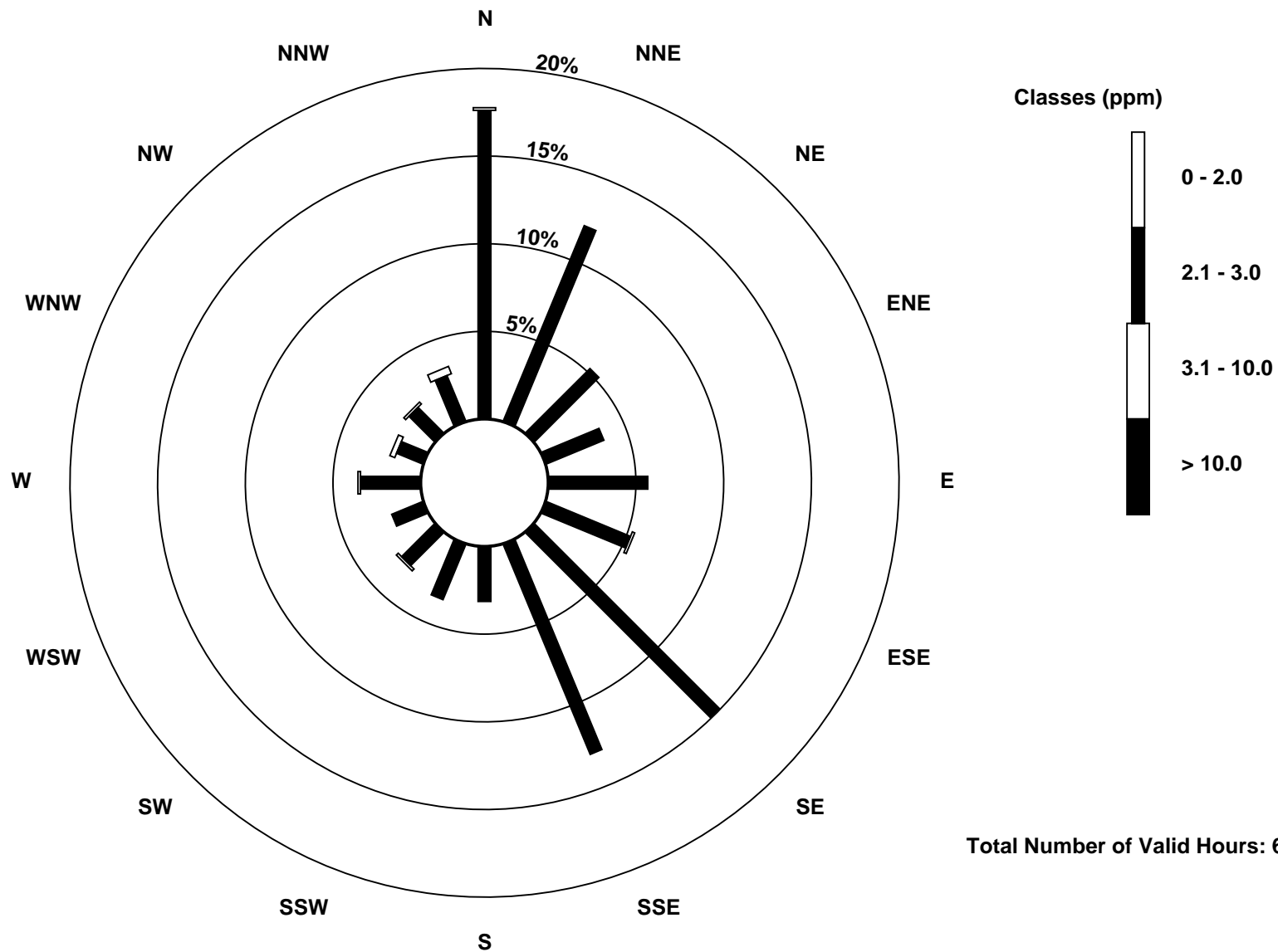
Total Number of Valid Hours: 670

Total Number of Hours: 720

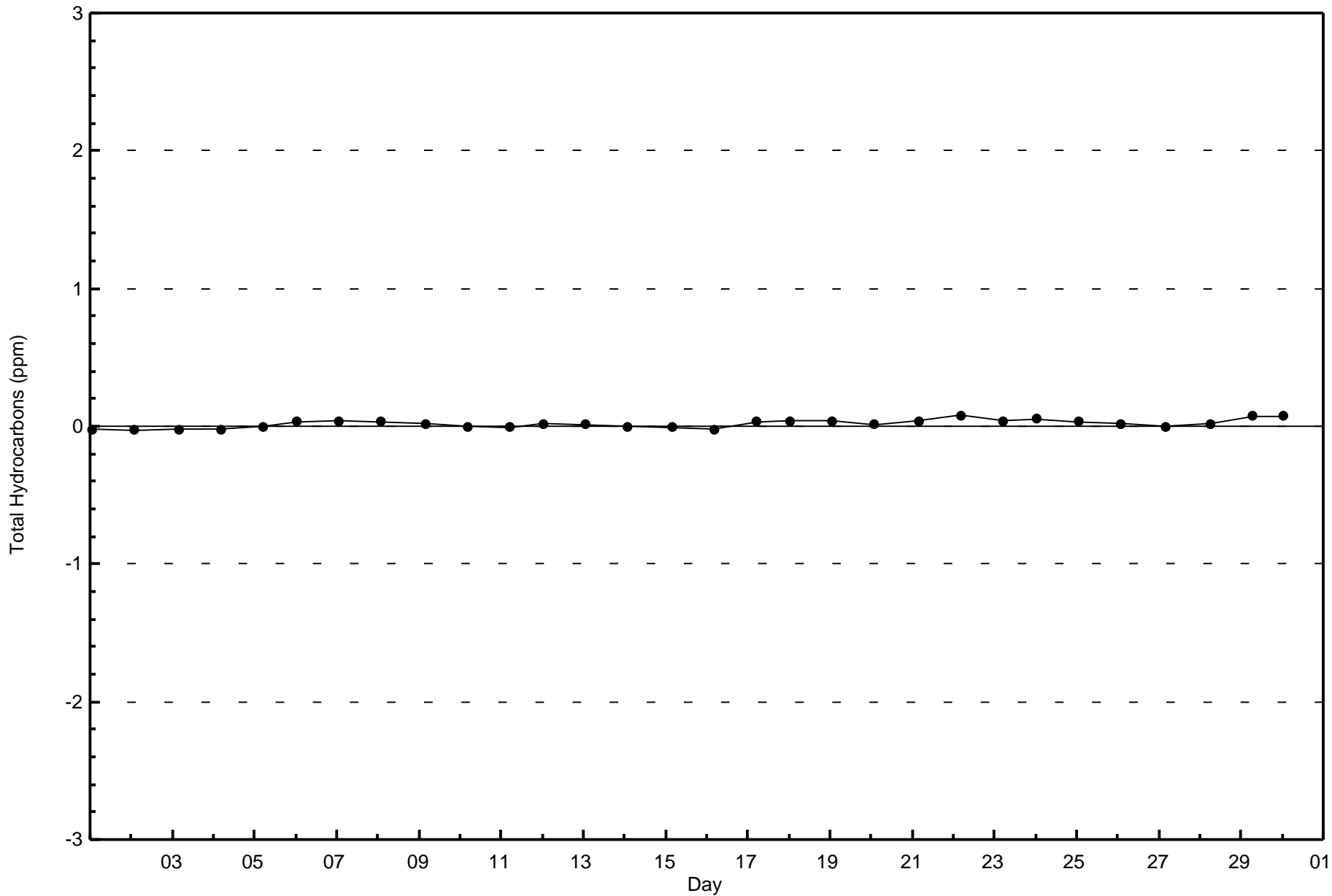


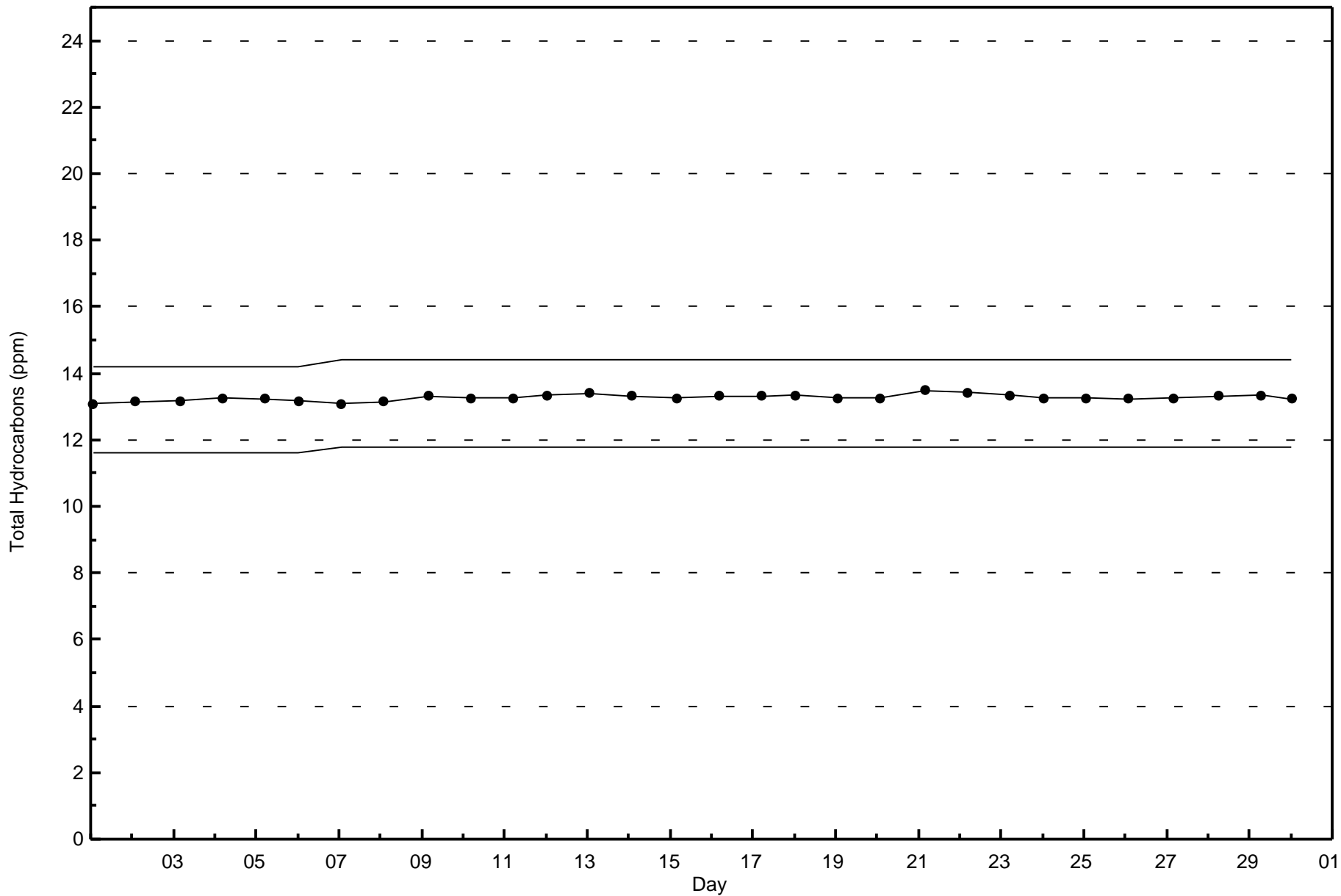
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Mannix (AMS 5)



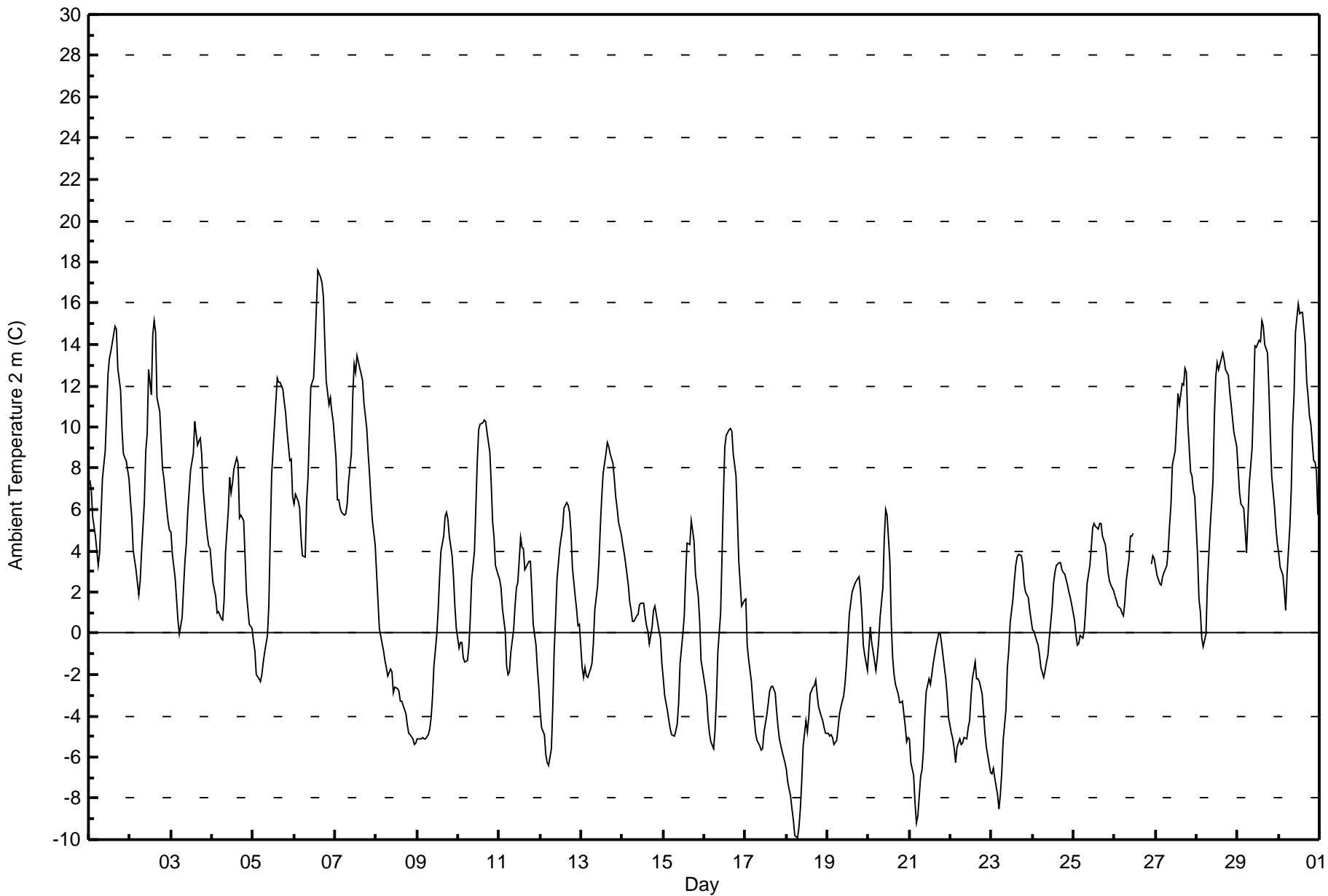
Total Number of Valid Hours: 670







Maximum Value: 17.6 C on Apr 6 15:00		Maximum Daily Average: 10.6 C on Apr 6		Hours in Service: 720																						
Minimum Value: -9.9 C on Apr 18 07:00		Minimum Daily Average: -5.7 C on Apr 18		Hours of Data: 711																						
Maximum Diurnal Average: 6.7 C at hour 15		Minimum Diurnal Average: -1.6 C at hour 6		Hours of Missing Data: 9																						
Monthly Average: 2.65 C		Percentiles: P ₁ = -8.5 P ₁₀ = -4.9 Q ₁ = -1.8 Median = 2.3 Q ₃ = 6.5 P ₉₀ = 11.2 P ₉₉ = 15.4		Hours of Calibration: 0																						
				Percent Operational Time: 98.8																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	7.4	7.0	5.7	5.2	4.7	3.3	3.9	5.7	7.5	8.9	10.6	12.5	13.3	13.6	14.5	14.9	14.7	12.9	11.8	9.9	8.7	8.5	8.4	7.5	9.2	14.9
2-Apr	6.4	5.6	4.0	3.1	2.4	1.9	2.5	3.9	6.4	8.9	9.7	12.8	11.6	14.5	15.1	14.6	11.4	10.8	9.3	8.0	7.5	6.0	5.4	5.0	7.8	15.1
3-Apr	4.9	3.8	2.7	1.6	0.7	0.0	0.8	2.2	3.5	4.4	5.9	7.9	8.3	8.7	10.2	9.1	9.3	9.4	8.6	7.0	5.4	4.7	4.2	4.1	5.3	10.2
4-Apr	2.5	2.1	1.8	1.0	1.0	0.7	0.6	1.6	3.9	6.0	7.6	6.8	7.3	8.0	8.5	8.3	5.6	5.7	5.4	3.7	1.9	1.2	0.4	0.2	3.8	8.5
5-Apr	-0.4	-0.8	-2.0	-2.2	-2.3	-2.0	-1.4	-0.9	-0.1	1.4	4.7	7.7	10.1	11.2	12.3	12.2	12.2	11.8	11.2	10.7	9.8	8.4	8.5	6.6	5.3	12.3
6-Apr	6.3	6.7	6.4	6.1	4.6	3.7	3.7	6.4	7.6	9.8	12.0	12.4	13.9	15.8	17.6	17.3	17.0	16.3	14.2	12.2	11.1	11.4	10.7	10.2	10.6	17.6
7-Apr	8.5	6.5	6.5	6.1	5.9	5.7	5.8	6.3	7.4	8.7	11.6	13.1	12.7	13.4	12.9	12.6	12.2	11.2	9.9	8.7	7.7	6.5	5.4	4.3	8.7	13.4
8-Apr	2.9	1.6	0.2	-0.5	-0.9	-1.3	-1.7	-2.1	-1.7	-1.9	-2.9	-2.6	-2.7	-2.8	-3.3	-3.3	-3.5	-3.9	-4.5	-4.8	-4.9	-5.1	-5.4	-5.3	-2.5	2.9
9-Apr	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-4.9	-4.7	-4.1	-3.1	-1.6	-0.1	1.1	2.6	4.0	4.7	5.6	5.9	5.5	4.7	3.8	2.7	1.4	0.2	-0.3	5.9
10-Apr	-0.7	-0.4	-0.5	-1.2	-1.4	-1.3	-0.6	0.7	2.6	4.0	6.1	8.3	9.9	10.1	10.2	10.4	10.3	9.7	8.8	7.2	5.4	4.6	3.3	2.8	4.5	10.4
11-Apr	2.6	2.2	1.2	0.1	-1.6	-2.0	-1.9	-0.9	0.2	1.3	2.2	2.4	4.7	4.1	4.1	3.1	3.2	3.5	3.5	2.1	0.4	-0.6	-1.7	-2.6	1.2	4.7
12-Apr	-3.9	-4.5	-4.9	-5.8	-6.2	-6.4	-5.6	-3.6	-0.8	0.8	2.6	4.2	4.6	5.1	6.0	6.3	6.2	5.9	4.9	3.3	1.8	1.2	0.4	0.4	0.5	6.3
13-Apr	-1.6	-2.1	-1.6	-2.1	-2.1	-1.7	-1.5	-0.5	1.1	2.3	3.5	5.2	6.6	7.8	8.7	9.3	9.1	8.7	8.2	7.5	6.6	6.1	5.4	4.8	3.6	9.3
14-Apr	4.3	3.9	3.5	2.3	1.5	1.1	0.5	0.9	0.9	1.4	1.5	1.5	0.9	0.4	0.1	-0.5	0.3	1.1	1.3	0.9	0.1	-0.2	-1.5	1.1	4.3	
15-Apr	-2.2	-3.0	-3.8	-4.2	-4.7	-4.9	-5.0	-4.7	-4.4	-3.4	-1.4	0.0	0.8	2.8	4.4	4.3	5.4	5.0	4.4	2.9	1.8	0.7	-1.3	-1.7	-0.5	5.4
16-Apr	-2.6	-3.1	-4.2	-4.8	-5.3	-5.6	-4.7	-3.1	-0.9	1.0	3.8	6.7	9.1	9.6	9.9	9.9	9.8	8.7	7.6	5.6	3.5	2.4	1.3	1.6	2.3	9.9
17-Apr	1.7	-0.5	-1.3	-2.3	-3.3	-4.1	-4.8	-5.2	-5.5	-5.7	-5.6	-4.8	-3.9	-3.4	-2.8	-2.6	-2.6	-2.9	-3.7	-4.5	-5.1	-5.7	-6.0	-6.3	-3.8	1.7
18-Apr	-6.6	-7.2	-7.9	-8.5	-9.0	-9.8	-9.9	-9.4	-8.5	-7.1	-5.5	-4.2	-4.8	-4.1	-3.0	-2.6	-2.5	-2.3	-2.9	-3.5	-4.0	-4.3	-4.5	-4.8	-5.7	-2.3
19-Apr	-4.8	-5.0	-4.9	-5.1	-5.4	-5.2	-4.6	-3.9	-3.5	-3.0	-2.4	-1.4	-0.3	0.9	2.0	2.2	2.4	2.6	2.7	2.0	1.0	-0.6	-1.0	-1.8	-1.5	2.7
20-Apr	-0.7	0.3	-0.4	-1.3	-1.8	-1.2	-0.4	0.8	2.2	4.6	6.0	5.7	3.5	0.5	-1.2	-2.0	-2.4	-2.9	-3.3	-3.3	-3.3	-4.5	-5.3	-5.1	-0.7	6.0
21-Apr	-5.1	-6.3	-6.9	-8.3	-9.2	-8.8	-6.9	-6.6	-5.6	-4.0	-2.8	-2.2	-2.5	-2.0	-1.5	-0.6	-0.3	0.1	0.0	-0.5	-1.6	-2.2	-3.0	-4.1	-3.8	0.1
22-Apr	-4.8	-5.1	-5.6	-6.3	-5.5	-5.1	-5.4	-5.3	-5.1	-5.1	-4.6	-4.2	-3.1	-2.2	-1.4	-2.2	-2.2	-2.3	-2.9	-3.9	-4.8	-5.5	-5.9	-6.7	-4.4	-1.4
23-Apr	-6.8	-6.5	-7.0	-7.8	-8.5	-7.8	-6.8	-5.2	-3.7	-1.6	-0.9	0.5	1.7	2.6	3.3	3.7	3.9	3.8	3.3	2.4	2.0	1.7	1.1	0.7	-1.3	3.9
24-Apr	0.2	0.1	-0.3	-0.6	-1.0	-1.7	-2.1	-1.8	-1.4	-1.0	-0.3	1.2	2.4	2.9	3.3	3.4	3.4	3.1	3.0	2.9	2.3	2.0	1.7	1.4	1.0	3.4
25-Apr	0.7	0.0	-0.5	-0.5	-0.1	-0.2	0.2	1.2	2.4	3.3	4.2	5.1	5.3	5.2	5.1	5.3	5.3	4.7	4.3	3.7	2.9	2.5	2.3	2.1	2.7	5.3
26-Apr	1.8	1.6	1.3	1.2	1.0	0.9	1.5	2.5	3.6	4.7	4.7	4.9	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	4.9
27-Apr	3.2	2.8	2.4	2.4	2.7	3.0	3.3	4.0	5.2	6.3	8.2	8.9	10.1	11.6	11.1	12.1	12.0	12.8	12.7	10.2	7.8	7.6	7.0	6.6	7.2	12.8
28-Apr	3.8	1.6	1.1	-0.3	-0.6	0.0	2.3	3.8	5.1	7.3	10.5	12.4	13.2	12.8	13.3	13.6	13.2	12.8	12.5	11.7	11.1	10.4	9.7	9.0	7.9	13.6
29-Apr	8.0	6.8	6.2	6.1	5.1	3.9	5.6	7.3	9.0	11.3	13.9	13.9	14.2	14.1	15.1	14.9	14.0	13.6	11.9	9.7	7.6	6.1	5.1	4.4	9.5	15.1
30-Apr	3.9	3.3	2.8	2.1	1.1	2.9	5.2	7.0	10.1	11.6	14.6	16.0	15.5	15.6	15.6	14.0	12.2	11.5	10.6	10.1	8.4	8.3	7.8	5.7	9.0	16.0
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2 m (AT2m) - C
Mannix - April 2017**

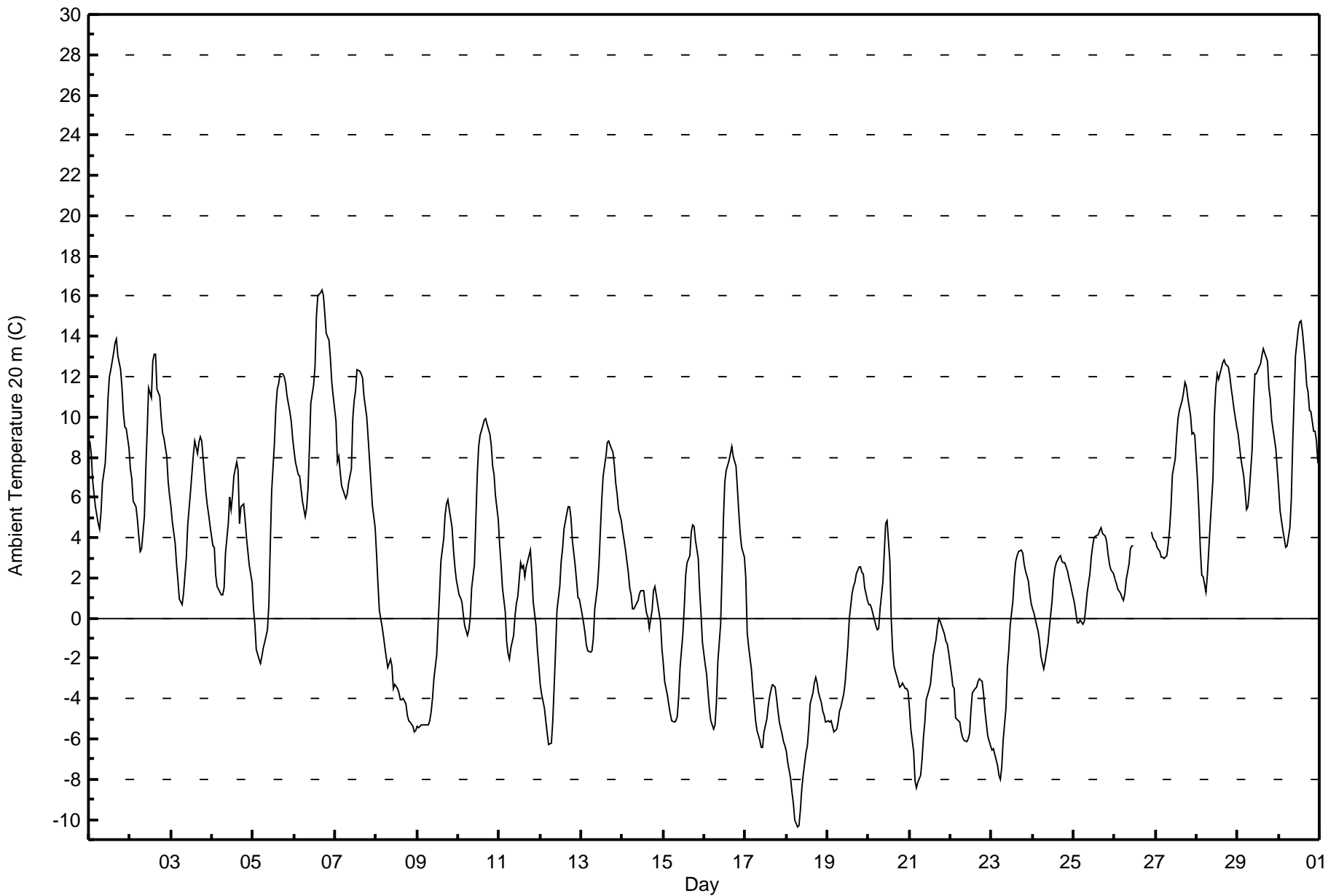
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	254	35.72	35.72
0 - 10	364	51.20	86.92
10 - 20	93	13.08	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Maximum Value: 16.3 C on Apr 6 17:00		Maximum Daily Average: 10.9 C on Apr 6		Hours in Service: 720																							
Minimum Value: -10.4 C on Apr 18 07:00		Minimum Daily Average: -6.4 C on Apr 18		Hours of Data: 711																							
Maximum Diurnal Average: 5.8 C at hour 17		Minimum Diurnal Average: -1.2 C at hour 7		Hours of Missing Data: 9																							
Monthly Average: 2.58 C		Percentiles: P ₁ = -8.5 P ₁₀ = -5.1 Q ₁ = -1.9 Median = 2.4 Q ₃ = 6.9 P ₉₀ = 11.0 P ₉₉ = 14.7		Hours of Calibration: 0																							
				Percent Operational Time: 98.8																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	8.8	8.2	6.9	6.1	5.6	4.7	4.5	5.3	6.7	7.7	9.1	11.0	12.0	12.4	13.2	13.6	13.9	13.1	12.4	11.4	10.2	9.5	9.4	8.5	9.3	13.9	
2-Apr	7.4	7.0	5.8	5.5	4.9	4.1	3.3	3.4	5.0	7.4	9.3	11.5	10.9	12.7	13.1	13.1	11.4	11.0	10.0	9.2	8.9	8.0	6.8	6.1	8.2	13.1	
3-Apr	5.5	4.8	3.7	2.7	1.8	1.0	0.7	1.2	2.1	3.0	4.6	6.3	7.2	8.1	8.8	8.2	8.7	9.0	8.8	8.0	6.2	5.6	5.1	4.6	5.2	9.0	
4-Apr	3.6	3.5	2.2	1.6	1.4	1.2	1.1	1.5	3.3	4.7	6.1	5.4	6.1	7.1	7.8	7.3	4.7	5.6	5.7	4.9	4.0	3.3	2.6	1.8	4.0	7.8	
5-Apr	0.5	-0.3	-1.6	-2.1	-2.2	-1.9	-1.5	-1.2	-0.6	0.7	3.6	6.3	8.8	10.4	11.4	11.7	12.1	12.1	12.0	11.6	11.0	10.3	9.8	9.0	5.4	12.1	
6-Apr	8.3	7.8	7.1	7.0	6.4	5.8	5.1	5.5	6.5	8.5	10.6	11.6	12.5	15.0	16.1	16.2	16.3	16.1	15.1	14.1	13.8	12.9	11.7	11.1	10.9	16.3	
7-Apr	9.8	7.7	8.0	7.3	6.6	6.1	6.0	6.1	6.7	7.4	9.9	10.8	11.3	12.3	12.3	12.1	11.9	11.0	10.0	8.9	7.8	6.7	5.6	4.5	8.6	12.3	
8-Apr	3.2	1.7	0.4	-0.4	-0.9	-1.5	-2.0	-2.4	-2.0	-2.4	-3.5	-3.3	-3.5	-3.7	-4.0	-4.1	-4.0	-4.3	-4.8	-5.1	-5.1	-5.3	-5.6	-5.6	-2.8	3.2	
9-Apr	-5.4	-5.4	-5.3	-5.3	-5.3	-5.3	-5.3	-5.1	-4.7	-4.0	-3.0	-1.8	-0.3	1.2	2.8	3.9	5.1	5.7	5.9	5.4	4.5	3.4	2.6	1.9	-0.6	5.9	
10-Apr	1.2	1.0	0.8	0.2	-0.4	-0.9	-0.6	0.1	1.5	2.7	4.9	7.1	8.5	9.1	9.6	9.9	9.9	9.6	9.2	8.6	7.5	7.1	6.1	4.9	4.9	9.9	
11-Apr	3.7	2.7	1.5	0.4	-1.1	-1.8	-2.0	-1.5	-0.9	0.1	0.7	1.1	2.8	2.5	2.6	2.1	2.5	3.1	3.4	2.2	0.8	-0.4	-1.5	-2.4	0.9	3.7	
12-Apr	-3.3	-3.8	-4.4	-5.1	-5.7	-6.3	-6.2	-5.1	-3.4	-1.5	0.4	1.5	2.8	3.5	4.4	5.2	5.5	5.5	5.0	3.9	2.6	1.9	1.0	0.9	0.0	5.5	
13-Apr	0.2	-0.2	-0.7	-1.4	-1.6	-1.7	-1.6	-1.0	0.5	1.5	2.7	4.3	5.9	7.1	8.1	8.7	8.8	8.6	8.2	7.6	6.7	6.1	5.4	4.8	3.6	8.8	
14-Apr	4.3	3.8	3.4	2.3	1.5	1.2	0.5	0.5	0.8	0.8	1.2	1.3	1.4	0.8	0.3	0.0	-0.5	0.4	1.3	1.6	1.2	0.2	-0.1	-1.5	1.1	4.3	
15-Apr	-2.2	-3.1	-3.8	-4.3	-4.8	-5.1	-5.2	-5.1	-4.9	-3.9	-2.4	-0.8	0.5	2.1	2.8	3.1	4.3	4.7	4.6	3.8	2.9	1.4	0.2	-1.2	-0.7	4.7	
16-Apr	-2.3	-2.8	-3.7	-4.6	-5.1	-5.5	-5.3	-4.2	-2.2	-0.3	2.2	4.9	6.8	7.3	7.8	8.2	8.5	8.0	7.6	6.4	5.3	4.2	3.5	3.0	2.0	8.5	
17-Apr	2.0	-0.7	-1.4	-2.5	-3.5	-4.3	-5.1	-5.6	-6.0	-6.4	-6.4	-5.7	-5.0	-4.4	-3.9	-3.5	-3.3	-3.4	-4.0	-4.6	-5.1	-5.8	-6.1	-6.4	-4.2	2.0	
18-Apr	-6.7	-7.2	-7.9	-8.6	-9.2	-10.0	-10.4	-10.3	-9.5	-8.5	-7.8	-6.7	-6.4	-5.5	-4.3	-3.7	-3.2	-2.9	-3.2	-3.7	-4.2	-4.6	-4.8	-5.1	-6.4	-2.9	
19-Apr	-5.1	-5.2	-5.1	-5.4	-5.6	-5.5	-5.1	-4.6	-4.4	-3.8	-3.2	-2.3	-1.3	0.0	1.3	1.6	1.8	2.2	2.6	2.6	2.3	2.2	1.5	0.9	-1.6	2.6	
20-Apr	0.7	0.7	0.5	-0.1	-0.4	-0.6	-0.5	0.5	1.8	3.2	4.7	4.8	2.8	-0.1	-1.7	-2.4	-2.7	-3.2	-3.5	-3.4	-3.2	-3.5	-3.5	-3.6	-0.5	4.8	
21-Apr	-4.4	-5.5	-6.6	-8.1	-8.4	-8.1	-7.8	-7.0	-5.9	-5.1	-4.1	-3.5	-3.3	-2.6	-1.9	-1.0	-0.4	0.0	-0.1	-0.4	-0.8	-1.2	-1.3	-1.7	-3.7	0.0	
22-Apr	-2.7	-3.4	-3.5	-4.9	-5.0	-5.2	-5.7	-5.9	-6.0	-6.1	-6.0	-5.7	-4.5	-3.7	-3.5	-3.4	-3.1	-3.0	-3.1	-3.7	-4.6	-5.2	-5.8	-6.3	-4.6	-2.7	
23-Apr	-6.6	-6.5	-6.8	-7.3	-7.8	-8.0	-7.4	-6.1	-4.4	-2.5	-1.6	-0.4	0.9	2.1	2.8	3.1	3.3	3.4	3.2	2.7	2.4	1.9	1.2	0.7	-1.6	3.4	
24-Apr	0.4	0.3	-0.4	-0.7	-1.2	-1.9	-2.5	-2.2	-1.7	-1.3	-0.5	0.9	1.9	2.5	2.8	3.1	3.1	2.8	2.8	2.8	2.4	2.0	1.7	1.4	0.8	3.1	
25-Apr	0.8	0.3	-0.3	-0.2	-0.1	-0.3	-0.2	0.5	1.2	2.2	3.0	3.6	4.0	4.1	4.1	4.4	4.5	4.2	4.1	3.8	3.2	2.7	2.4	2.2	2.3	4.5	
26-Apr	1.9	1.7	1.5	1.2	1.0	0.9	1.2	1.9	2.7	3.5	3.6	3.6	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	4.3	4.0	3.9	--	4.3
27-Apr	3.8	3.6	3.3	3.1	3.0	3.0	3.1	3.6	4.5	5.5	7.1	7.9	9.0	9.9	10.3	10.8	11.2	11.7	11.5	10.9	10.0	9.2	9.2	9.1	7.3	11.7	
28-Apr	6.8	5.3	3.4	2.2	2.1	1.3	2.1	3.4	4.6	6.9	10.1	11.5	12.2	11.9	12.4	12.7	12.8	12.6	12.5	12.1	11.4	11.0	10.4	9.5	8.4	12.8	
29-Apr	9.2	8.5	7.9	7.1	6.3	5.4	5.5	6.3	8.4	10.6	12.1	12.2	12.5	12.7	13.1	13.4	13.2	12.8	11.5	10.9	9.8	8.9	8.4	7.4	9.7	13.4	
30-Apr	6.4	5.3	4.4	3.9	3.5	3.6	4.5	5.9	8.7	10.9	13.0	14.4	14.7	14.8	14.2	12.7	11.6	11.2	10.3	10.2	9.3	9.3	8.8	7.7	9.1	14.8	
																								Diurnal Average			
																								Diurnal Maximum			
DF - DAS Failure																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 20 m (AT20m) - C
Mannix - April 2017**

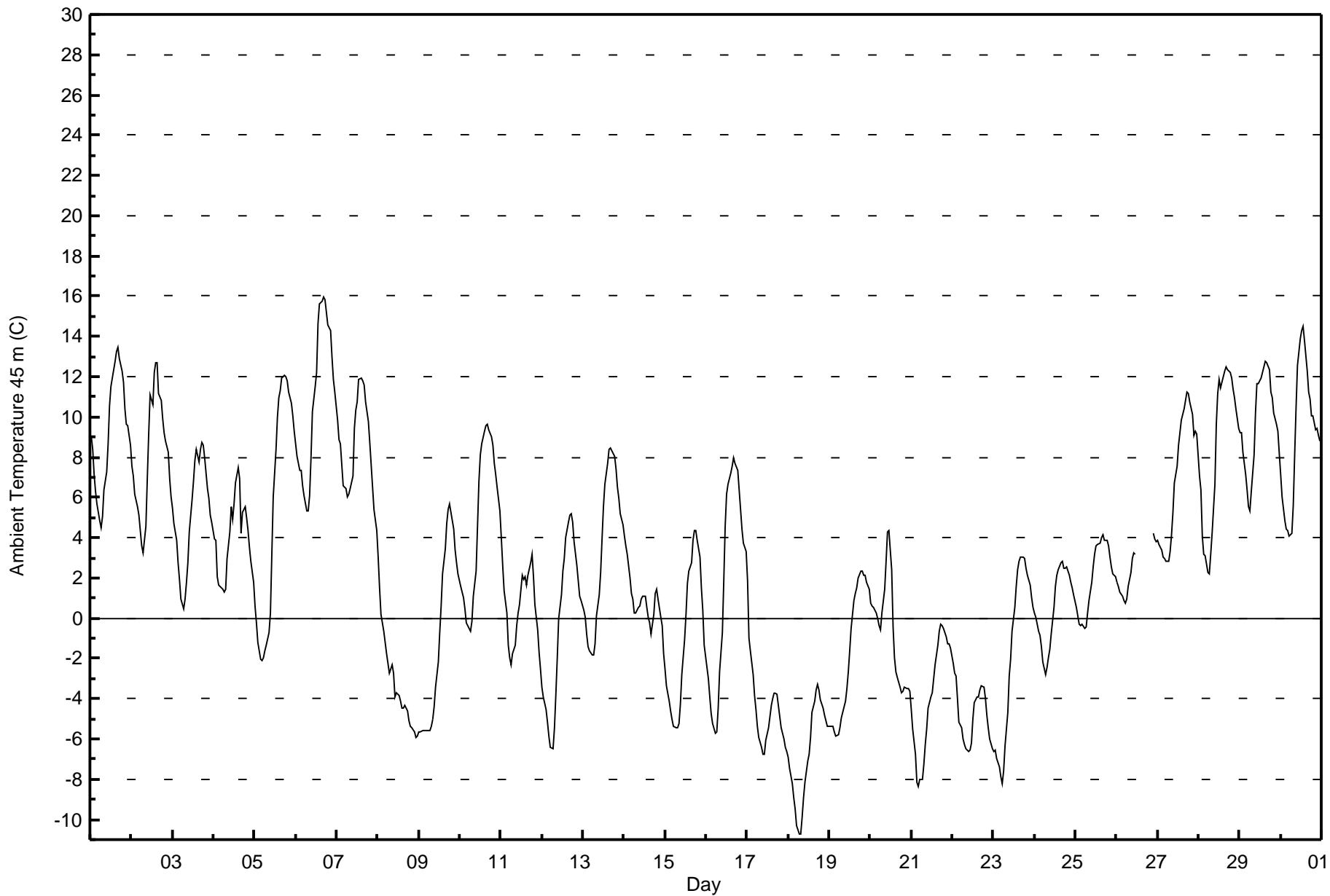
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	246	34.60	34.60
0 - 10	375	52.74	87.34
10 - 20	90	12.66	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Maximum Value: 15.9 C on Apr 6 17:00		Maximum Daily Average: 10.9 C on Apr 6		Hours in Service: 720																						
Minimum Value: -10.8 C on Apr 18 07:00		Minimum Daily Average: -6.8 C on Apr 18		Hours of Data: 711																						
Maximum Diurnal Average: 5.5 C at hour 18		Minimum Diurnal Average: -1.4 C at hour 7		Hours of Missing Data: 9																						
Monthly Average: 2.41 C		Percentiles: P ₁ = -8.4 P ₁₀ = -5.4 Q ₁ = -2.2 Median = 2.2 Q ₃ = 6.8 P ₉₀ = 10.7 P ₉₉ = 14.5		Hours of Calibration: 0																						
				Percent Operational Time: 98.8																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	9.0	8.4	7.1	6.3	5.7	4.9	4.5	5.1	6.4	7.3	8.6	10.5	11.5	11.9	12.7	13.2	13.5	12.9	12.3	11.7	10.4	9.6	9.6	8.6	9.2	13.5
2-Apr	7.6	7.1	6.2	5.5	5.1	4.4	3.6	3.2	4.5	7.0	9.1	11.1	10.6	12.2	12.7	12.7	11.2	10.8	9.9	9.2	8.8	8.3	6.9	6.1	8.1	12.7
3-Apr	5.5	4.7	3.9	2.8	1.9	1.0	0.5	0.9	1.8	2.7	4.3	5.9	6.8	7.8	8.4	7.7	8.4	8.7	8.6	8.0	6.4	5.9	5.1	4.8	5.1	8.7
4-Apr	4.0	3.8	2.1	1.7	1.5	1.4	1.3	1.4	3.0	4.3	5.5	4.9	5.7	6.7	7.5	6.9	4.2	5.3	5.5	4.9	4.4	3.5	2.9	1.8	3.9	7.5
5-Apr	0.6	-0.2	-1.2	-2.0	-2.1	-1.9	-1.7	-1.4	-0.7	0.3	3.2	6.1	8.4	10.0	11.0	11.3	11.9	12.0	12.0	11.8	11.3	10.7	10.0	9.3	5.4	12.0
6-Apr	8.7	8.0	7.4	7.3	6.6	6.1	5.3	5.3	6.1	8.0	10.3	11.5	12.2	14.6	15.6	15.7	15.9	15.8	15.2	14.6	14.3	13.0	11.9	11.2	10.9	15.9
7-Apr	9.9	8.8	8.7	7.6	6.6	6.5	6.0	6.1	6.5	7.0	9.5	10.4	10.7	11.9	11.9	11.8	11.6	10.7	9.8	8.7	7.7	6.5	5.4	4.4	8.5	11.9
8-Apr	3.0	1.5	0.2	-0.6	-1.2	-1.7	-2.3	-2.7	-2.3	-2.7	-3.9	-3.7	-3.9	-4.1	-4.4	-4.5	-4.3	-4.6	-5.1	-5.4	-5.4	-5.6	-5.9	-5.8	-3.1	3.0
9-Apr	-5.6	-5.7	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4	-5.0	-4.4	-3.4	-2.2	-0.7	0.6	2.2	3.4	4.7	5.4	5.7	5.3	4.4	3.4	2.7	2.2	-0.8	5.7
10-Apr	1.6	1.3	1.0	0.4	-0.3	-0.5	-0.6	-0.2	1.1	2.4	4.5	6.8	8.1	8.7	9.3	9.6	9.7	9.4	9.0	8.6	7.7	7.2	6.5	5.3	4.9	9.7
11-Apr	4.0	2.6	1.3	0.2	-1.3	-2.0	-2.3	-1.8	-1.3	-0.4	0.3	0.7	2.2	1.9	2.1	1.6	2.2	2.8	3.2	2.1	0.6	-0.6	-1.7	-2.5	0.6	4.0
12-Apr	-3.4	-3.9	-4.6	-5.1	-5.9	-6.4	-6.5	-5.4	-3.7	-1.9	-0.1	1.2	2.3	3.0	4.0	4.7	5.1	5.2	4.7	3.8	2.6	1.9	1.1	0.9	-0.3	5.2
13-Apr	0.4	0.0	-0.8	-1.4	-1.6	-1.8	-1.8	-1.3	0.1	1.2	2.3	4.0	5.5	6.6	7.7	8.4	8.5	8.3	8.0	7.4	6.5	5.9	5.2	4.6	3.4	8.5
14-Apr	4.1	3.6	3.2	2.0	1.2	1.0	0.3	0.2	0.5	0.6	0.9	1.1	1.1	0.5	0.1	-0.2	-0.8	0.2	1.2	1.4	1.0	0.0	-0.4	-1.8	0.9	4.1
15-Apr	-2.5	-3.4	-4.1	-4.6	-5.1	-5.3	-5.5	-5.4	-5.2	-4.3	-2.8	-1.1	0.2	1.7	2.3	2.7	3.9	4.3	4.4	3.9	3.1	1.5	0.4	-1.4	-0.9	4.4
16-Apr	-2.5	-3.0	-3.9	-4.7	-5.2	-5.7	-5.6	-4.5	-2.6	-0.7	1.8	4.6	6.2	6.7	7.2	7.6	8.0	7.7	7.4	6.4	5.4	4.4	3.7	3.3	1.7	8.0
17-Apr	1.9	-1.0	-1.7	-2.8	-3.8	-4.6	-5.4	-5.9	-6.4	-6.8	-6.8	-6.1	-5.5	-4.9	-4.3	-4.0	-3.7	-3.8	-4.3	-4.9	-5.4	-6.0	-6.4	-6.6	-4.5	1.9
18-Apr	-6.9	-7.5	-8.2	-8.9	-9.5	-10.3	-10.8	-10.7	-9.9	-8.9	-8.2	-7.1	-6.8	-5.9	-4.7	-4.1	-3.6	-3.3	-3.6	-4.0	-4.5	-4.8	-5.1	-5.4	-6.8	-3.3
19-Apr	-5.3	-5.4	-5.3	-5.6	-5.9	-5.8	-5.4	-5.0	-4.7	-4.1	-3.5	-2.7	-1.6	-0.5	0.9	1.2	1.5	2.0	2.3	2.4	2.1	2.1	1.8	1.4	-1.8	2.4
20-Apr	0.7	0.6	0.6	0.3	0.0	-0.4	-0.6	0.2	1.5	2.8	4.3	4.4	2.4	-0.4	-2.0	-2.7	-2.9	-3.4	-3.7	-3.6	-3.4	-3.5	-3.5	-3.7	-0.7	4.4
21-Apr	-4.5	-5.5	-6.8	-8.2	-8.4	-8.0	-8.0	-7.3	-6.2	-5.5	-4.5	-3.9	-3.7	-3.0	-2.3	-1.4	-0.6	-0.3	-0.4	-0.5	-0.9	-1.2	-1.3	-1.5	-3.9	-0.3
22-Apr	-2.3	-2.7	-2.9	-4.0	-5.2	-5.4	-6.0	-6.3	-6.5	-6.6	-6.5	-6.2	-5.0	-4.2	-3.9	-3.9	-3.6	-3.3	-3.5	-4.0	-4.8	-5.4	-6.0	-6.5	-4.8	-2.3
23-Apr	-6.6	-6.6	-7.0	-7.4	-7.9	-8.2	-7.6	-6.3	-4.7	-2.9	-2.0	-0.6	0.5	1.6	2.4	2.8	3.0	3.1	3.0	2.5	2.2	1.7	1.0	0.5	-1.8	3.1
24-Apr	0.2	0.1	-0.6	-0.9	-1.4	-2.2	-2.8	-2.5	-2.0	-1.6	-0.8	0.6	1.6	2.1	2.4	2.7	2.8	2.5	2.5	2.1	1.8	1.5	1.1	0.5	2.8	2.8
25-Apr	0.5	0.1	-0.3	-0.4	-0.3	-0.5	-0.4	0.2	0.9	1.8	2.6	3.2	3.6	3.6	3.7	4.0	4.1	3.9	3.8	3.6	3.0	2.5	2.2	2.0	2.0	4.1
26-Apr	1.8	1.6	1.3	1.1	0.9	0.7	1.0	1.6	2.3	3.0	3.2	3.2	DF	DF	DF	DF	DF	DF	DF	DF	DF	4.2	3.9	3.8	--	4.2
27-Apr	3.8	3.7	3.4	3.0	3.0	2.8	2.9	3.3	4.2	5.3	6.7	7.6	8.6	9.2	9.8	10.4	10.8	11.2	11.2	10.7	10.1	9.1	9.3	9.1	7.0	11.2
28-Apr	7.1	6.3	4.1	3.2	3.1	2.3	2.2	3.2	4.2	6.7	9.7	11.2	11.9	11.5	12.0	12.3	12.5	12.3	12.2	11.9	11.4	11.0	10.4	9.4	8.4	12.5
29-Apr	9.2	9.2	8.3	7.2	6.4	5.6	5.4	6.3	8.1	10.2	11.7	11.7	11.9	12.2	12.5	12.7	12.7	12.4	11.2	11.0	10.2	9.7	9.3	8.2	9.7	12.7
30-Apr	7.1	6.0	4.8	4.5	4.4	4.1	4.2	5.6	8.1	10.5	12.6	13.9	14.3	14.5	13.8	12.2	11.2	10.9	10.1	10.0	9.4	9.5	9.1	8.8	9.1	14.5
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 45 m (AT45m) - C
Mannix - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	248	34.88	34.88
0 - 10	374	52.60	87.48
10 - 20	89	12.52	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Summary of Hour Averages

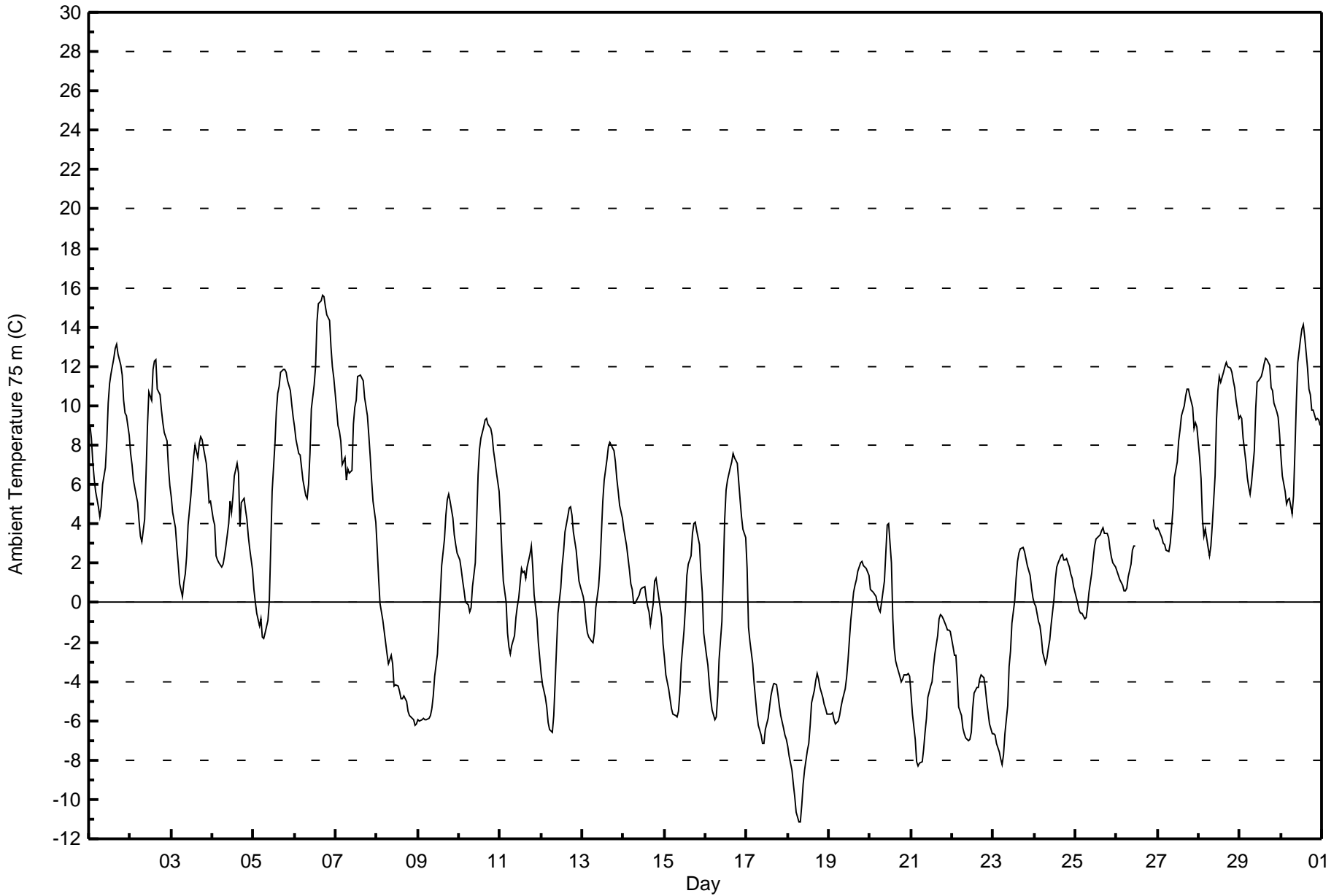
Mannix - April 2017

Maximum Value: 15.6 C on Apr 6 17:00		Maximum Daily Average: 10.8 C on Apr 6		Hours in Service: 720																							
Minimum Value: -11.1 C on Apr 18 07:00		Minimum Daily Average: -7.1 C on Apr 18		Hours of Data: 711																							
Maximum Diurnal Average: 5.2 C at hour 18		Minimum Diurnal Average: -1.5 C at hour 7		Hours of Missing Data: 9																							
Monthly Average: 2.20 C		Percentiles: P ₁ = -8.5 P ₁₀ = -5.7 Q ₁ = -2.5 Median = 2.0 Q ₃ = 6.7 P ₉₀ = 10.5 P ₉₉ = 14.2		Hours of Calibration: 0																							
				Percent Operational Time: 98.8																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	9.0	8.3	7.1	6.3	5.7	4.8	4.4	4.9	6.0	6.9	8.2	10.1	11.2	11.6	12.4	12.9	13.1	12.7	12.1	11.6	10.3	9.6	9.5	8.5	9.0	13.1	
2-Apr	7.5	7.0	6.2	5.4	5.1	4.2	3.4	3.1	4.3	6.5	8.9	10.7	10.3	11.8	12.3	12.4	10.9	10.5	9.8	9.1	8.6	8.2	6.8	6.0	7.9	12.4	
3-Apr	5.3	4.6	3.8	2.8	2.0	1.0	0.3	1.0	1.5	2.4	3.9	5.5	6.5	7.4	8.0	7.4	8.1	8.4	8.3	7.9	7.1	6.2	5.1	5.2	5.0	8.4	
4-Apr	4.2	4.0	2.3	2.2	2.0	1.8	2.0	2.3	2.8	4.0	5.1	4.6	5.4	6.4	7.1	6.6	3.9	5.1	5.3	4.7	4.2	3.4	2.7	1.7	3.9	7.1	
5-Apr	0.7	0.1	-0.6	-1.2	-0.8	-1.8	-1.8	-1.6	-0.9	0.1	2.8	5.6	8.1	9.7	10.7	11.0	11.7	11.9	11.9	11.7	11.3	10.7	10.1	9.4	5.4	11.9	
6-Apr	8.9	8.3	7.6	7.5	6.8	6.3	5.4	5.3	6.0	7.6	9.9	11.0	12.0	14.3	15.2	15.4	15.6	15.6	15.0	14.7	14.4	13.0	12.0	11.4	10.8	15.6	
7-Apr	9.8	9.0	8.7	8.2	7.0	7.4	6.2	6.8	6.6	6.7	9.1	9.9	10.3	11.5	11.6	11.4	11.3	10.4	9.5	8.5	7.4	6.2	5.1	4.1	8.4	11.6	
8-Apr	2.7	1.2	0.0	-0.9	-1.4	-2.1	-2.6	-3.1	-2.7	-3.1	-4.3	-4.1	-4.3	-4.6	-4.8	-4.9	-4.8	-5.0	-5.5	-5.8	-5.8	-6.0	-6.2	-6.2	-3.5	2.7	
9-Apr	-5.9	-6.0	-5.9	-5.9	-5.9	-5.9	-5.9	-5.9	-5.7	-5.4	-4.7	-3.8	-2.6	-1.1	0.3	1.9	3.2	4.5	5.2	5.5	5.1	4.3	3.5	3.0	2.5	-1.1	5.5
10-Apr	2.2	1.7	1.1	0.6	0.1	-0.1	-0.5	-0.2	0.8	2.1	4.2	6.5	7.8	8.4	8.9	9.3	9.3	9.1	8.8	8.5	7.7	7.2	6.6	5.6	4.8	9.3	
11-Apr	4.3	2.5	1.1	0.0	-1.6	-2.2	-2.6	-2.1	-1.7	-0.8	-0.2	0.2	1.7	1.5	1.6	1.2	1.8	2.4	2.8	1.8	0.4	-0.9	-2.0	-2.8	0.3	4.3	
12-Apr	-3.6	-4.2	-4.8	-5.3	-6.1	-6.5	-6.6	-5.7	-4.1	-2.3	-0.5	0.8	1.9	2.6	3.6	4.4	4.8	4.8	4.4	3.6	2.6	1.9	1.1	0.8	-0.5	4.8	
13-Apr	0.3	-0.1	-1.0	-1.5	-1.8	-1.9	-2.0	-1.6	-0.2	0.8	1.9	3.5	5.1	6.2	7.3	8.0	8.1	8.0	7.7	7.1	6.3	5.7	4.9	4.3	3.1	8.1	
14-Apr	3.8	3.3	2.9	1.7	0.9	0.7	0.0	0.3	0.4	0.6	0.7	0.8	0.3	-0.2	-0.5	-1.1	0.0	1.1	1.3	0.7	-0.2	-0.7	-2.1	0.6	3.8		
15-Apr	-2.8	-3.7	-4.4	-4.9	-5.4	-5.7	-5.8	-5.8	-5.5	-4.6	-3.1	-1.4	-0.2	1.4	2.0	2.4	3.5	4.0	4.1	3.7	3.0	1.6	0.5	-1.6	-1.2	4.1	
16-Apr	-2.7	-3.2	-4.1	-4.9	-5.4	-6.0	-5.8	-4.7	-2.9	-0.9	1.5	4.2	5.8	6.2	6.8	7.2	7.6	7.3	7.1	6.2	5.3	4.4	3.7	3.3	1.5	7.6	
17-Apr	1.7	-1.3	-2.0	-3.1	-4.1	-4.9	-5.7	-6.2	-6.8	-7.2	-7.2	-6.5	-5.9	-5.3	-4.7	-4.4	-4.1	-4.2	-4.7	-5.2	-5.8	-6.4	-6.7	-7.0	-4.9	1.7	
18-Apr	-7.3	-7.8	-8.5	-9.3	-9.8	-10.6	-11.1	-11.1	-10.3	-9.2	-8.5	-7.5	-7.2	-6.2	-5.1	-4.4	-3.9	-3.6	-3.9	-4.3	-4.8	-5.1	-5.4	-5.7	-7.1	-3.6	
19-Apr	-5.6	-5.7	-5.6	-5.9	-6.1	-6.1	-5.7	-5.3	-4.9	-4.4	-3.8	-3.0	-1.9	-0.9	0.5	0.9	1.2	1.6	2.0	2.1	1.9	1.8	1.7	1.4	-2.1	2.1	
20-Apr	0.7	0.6	0.5	0.3	0.0	-0.3	-0.5	0.0	1.1	2.5	3.9	4.0	2.0	-0.8	-2.3	-3.0	-3.2	-3.7	-4.0	-3.9	-3.7	-3.6	-3.6	-3.8	-0.9	4.0	
21-Apr	-4.7	-5.6	-7.0	-8.1	-8.3	-8.1	-8.1	-7.4	-6.6	-5.9	-4.8	-4.3	-4.0	-3.3	-2.6	-1.7	-0.8	-0.6	-0.7	-0.8	-1.2	-1.4	-1.4	-1.5	-4.1	-0.6	
22-Apr	-2.3	-2.7	-2.7	-3.8	-5.3	-5.7	-6.3	-6.7	-6.8	-7.0	-7.0	-6.6	-5.4	-4.6	-4.3	-4.3	-3.9	-3.7	-3.8	-4.3	-5.0	-5.6	-6.2	-6.6	-5.0	-2.3	
23-Apr	-6.7	-6.7	-7.2	-7.6	-8.0	-8.3	-7.7	-6.7	-5.2	-3.3	-2.4	-1.1	0.1	1.2	2.1	2.5	2.7	2.8	2.6	2.2	1.9	1.4	0.7	0.3	-2.1	2.8	
24-Apr	0.0	-0.2	-0.9	-1.2	-1.8	-2.5	-3.1	-2.8	-2.3	-1.9	-1.1	0.2	1.2	1.8	2.0	2.4	2.5	2.2	2.2	2.2	1.8	1.5	1.2	0.8	0.2	2.5	
25-Apr	0.3	-0.1	-0.4	-0.6	-0.5	-0.8	-0.8	-0.2	0.5	1.5	2.2	2.9	3.2	3.3	3.4	3.7	3.8	3.5	3.5	3.3	2.7	2.3	2.0	1.8	1.7	3.8	
26-Apr	1.6	1.4	1.2	0.9	0.6	0.6	0.7	1.3	2.0	2.6	2.9	2.8	DF	DF	DF	DF	DF	DF	DF	DF	DF	4.2	3.8	3.7	--	4.2	
27-Apr	3.8	3.7	3.3	3.0	3.0	2.7	2.6	3.0	3.9	4.8	6.3	7.2	8.2	8.8	9.5	10.0	10.5	10.8	10.9	10.5	9.9	8.9	9.1	9.0	6.8	10.9	
28-Apr	7.4	6.3	4.2	3.4	3.7	2.8	2.4	2.9	4.0	6.4	9.3	10.8	11.5	11.2	11.7	12.0	12.2	12.0	11.9	11.7	11.2	10.9	10.3	9.3	8.3	12.2	
29-Apr	9.5	9.3	8.4	7.2	6.4	5.8	5.5	6.1	7.7	9.9	11.2	11.3	11.5	11.8	12.1	12.4	12.4	12.0	10.9	10.8	10.1	9.7	9.4	8.6	9.6	12.4	
30-Apr	7.5	6.4	5.6	5.0	5.2	5.3	4.5	5.5	7.7	10.2	12.2	13.4	13.9	14.1	13.5	11.9	10.9	10.6	9.8	9.8	9.3	9.4	9.3	9.0	9.2	14.1	
																								Diurnal Average			
																								Diurnal Maximum			
DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 75 m (AT75m) - C
Mannix - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 75 m (AT75m) - C
Mannix - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	260	36.57	36.57
0 - 10	370	52.04	88.61
10 - 20	81	11.39	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 711

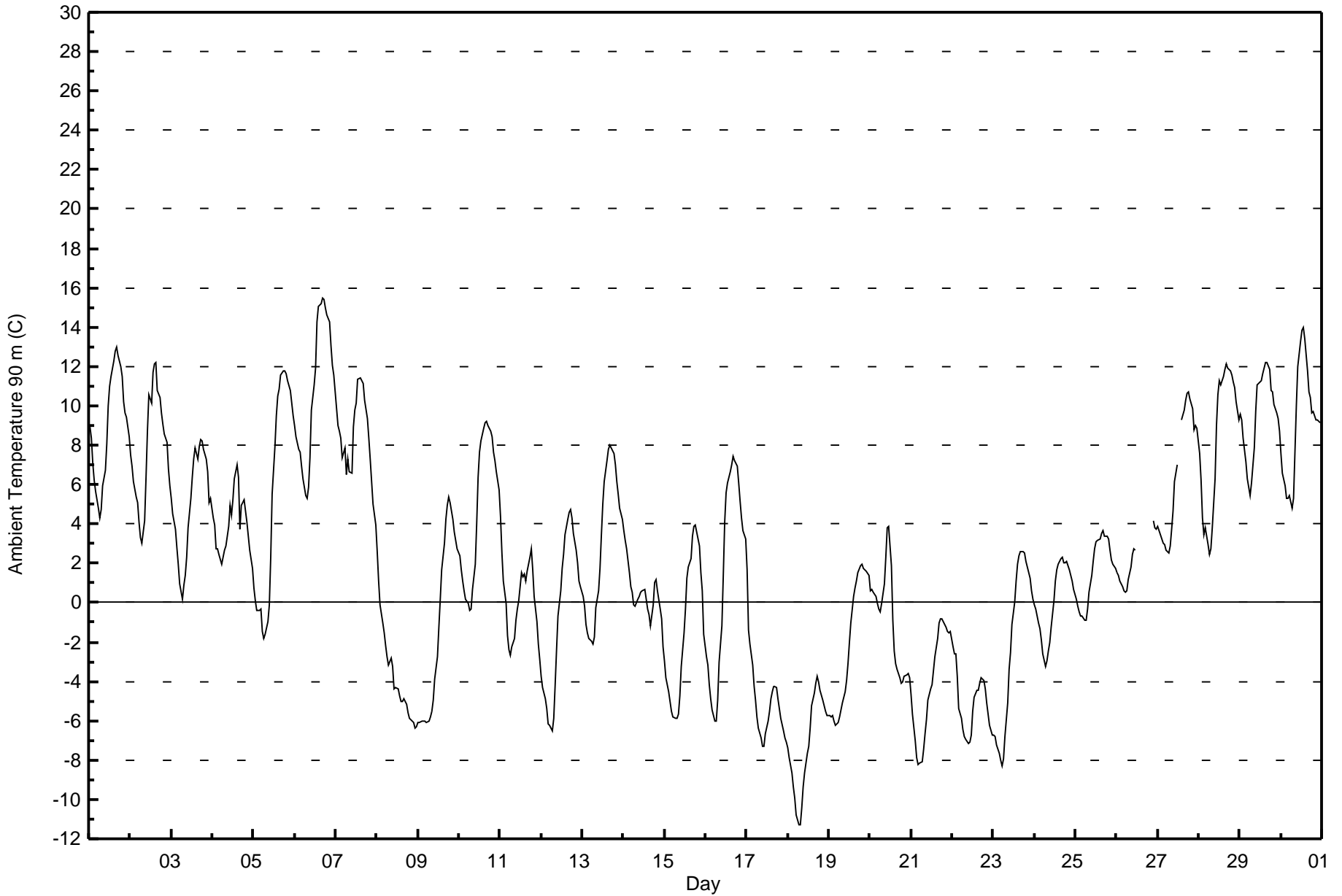
Total Number of Hours: 720



Summary of Hour Averages

Mannix - April 2017

Maximum Value: 15.5 C on Apr 6 17:00		Maximum Daily Average: 10.8 C on Apr 6		Hours in Service: 720																						
Minimum Value: -11.3 C on Apr 18 07:00		Minimum Daily Average: -7.2 C on Apr 18		Hours of Data: 709																						
Maximum Diurnal Average: 5.0 C at hour 18		Minimum Diurnal Average: -1.5 C at hour 7		Hours of Missing Data: 11																						
Monthly Average: 2.10 C		Percentiles: P ₁ = -8.7 P ₁₀ = -5.9 Q ₁ = -2.6 Median = 1.9 Q ₃ = 6.6 P ₉₀ = 10.4 P ₉₉ = 14.1		Hours of Calibration: 0																						
				Percent Operational Time: 98.5																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	9.0	8.3	7.1	6.2	5.7	4.8	4.3	4.8	5.9	6.7	8.1	10.0	11.0	11.5	12.3	12.8	13.0	12.6	12.0	11.5	10.2	9.6	9.4	8.4	9.0	13.0
2-Apr	7.5	7.0	6.2	5.4	5.1	4.1	3.3	3.1	4.2	6.3	8.7	10.5	10.2	11.7	12.1	12.2	10.8	10.4	9.7	9.1	8.6	8.1	6.8	5.9	7.8	12.2
3-Apr	5.3	4.5	3.8	2.8	2.0	1.0	0.2	0.9	1.4	2.3	3.8	5.3	6.3	7.3	7.9	7.3	7.9	8.3	8.2	7.8	7.3	6.6	5.1	5.3	4.9	8.3
4-Apr	4.3	3.9	2.7	2.7	2.5	2.0	2.3	2.6	2.9	3.8	5.0	4.4	5.2	6.3	7.0	6.4	3.8	4.9	5.2	4.6	4.1	3.3	2.7	1.7	3.9	7.0
5-Apr	0.7	0.1	-0.4	-0.4	-0.3	-1.5	-1.8	-1.6	-1.0	-0.1	2.3	5.5	7.9	9.5	10.5	10.9	11.6	11.8	11.8	11.6	11.3	10.8	10.1	9.5	5.4	11.8
6-Apr	9.0	8.4	7.8	7.6	6.9	6.3	5.4	5.3	5.9	7.4	9.7	11.1	11.9	14.2	15.1	15.2	15.5	15.4	15.0	14.6	14.3	13.0	12.0	11.5	10.8	15.5
7-Apr	9.8	9.0	8.7	8.4	7.4	7.8	6.5	7.3	6.7	6.6	8.9	9.8	10.2	11.3	11.4	11.3	11.1	10.3	9.4	8.4	7.3	6.1	5.0	3.9	8.4	11.4
8-Apr	2.6	1.1	-0.1	-1.0	-1.5	-2.2	-2.7	-3.2	-2.8	-3.2	-4.4	-4.3	-4.4	-4.7	-5.0	-5.0	-4.9	-5.2	-5.6	-5.9	-5.9	-6.1	-6.4	-6.3	-3.6	2.6
9-Apr	-6.1	-6.1	-6.0	-6.0	-6.1	-6.1	-6.0	-5.8	-5.5	-4.9	-3.9	-2.7	-1.2	0.2	1.7	3.0	4.3	5.0	5.4	5.1	4.2	3.6	3.1	2.8	-1.2	5.4
10-Apr	2.4	1.7	1.1	0.6	0.2	0.0	-0.4	-0.3	0.6	1.9	4.0	6.4	7.7	8.2	8.8	9.2	9.2	9.0	8.7	8.4	7.7	7.2	6.7	5.7	4.8	9.2
11-Apr	4.4	2.5	1.1	0.0	-1.7	-2.4	-2.7	-2.3	-1.8	-0.9	-0.3	0.1	1.5	1.3	1.5	1.1	1.6	2.3	2.7	1.7	0.3	-1.0	-2.1	-2.9	0.2	4.4
12-Apr	-3.7	-4.3	-4.9	-5.3	-6.2	-6.2	-6.5	-5.9	-4.2	-2.4	-0.7	0.6	1.7	2.5	3.4	4.2	4.6	4.7	4.3	3.5	2.7	2.0	1.1	0.8	-0.6	4.7
13-Apr	0.3	-0.2	-1.1	-1.6	-1.8	-2.0	-2.1	-1.7	-0.3	0.6	1.8	3.4	5.0	6.1	7.2	7.8	8.0	7.9	7.6	7.0	6.2	5.5	4.8	4.2	3.0	8.0
14-Apr	3.6	3.2	2.7	1.5	0.8	0.5	-0.1	-0.2	0.2	0.3	0.5	0.6	0.7	0.1	-0.3	-0.6	-1.2	-0.1	1.0	1.1	0.6	-0.3	-0.8	-2.2	0.5	3.6
15-Apr	-2.9	-3.8	-4.5	-5.0	-5.5	-5.8	-5.9	-5.9	-5.7	-4.7	-3.3	-1.5	-0.3	1.3	1.8	2.2	3.4	3.9	4.0	3.6	2.9	1.6	0.6	-1.6	-1.3	4.0
16-Apr	-2.8	-3.2	-4.2	-4.9	-5.5	-6.0	-6.0	-5.0	-3.0	-1.1	1.4	4.1	5.6	6.1	6.7	7.0	7.4	7.2	7.0	6.1	5.2	4.3	3.7	3.3	1.4	7.4
17-Apr	1.7	-1.4	-2.1	-3.2	-4.3	-5.0	-5.8	-6.4	-6.9	-7.3	-7.3	-6.6	-6.0	-5.5	-4.9	-4.5	-4.3	-4.3	-4.9	-5.4	-5.9	-6.5	-6.9	-7.1	-5.0	1.7
18-Apr	-7.4	-7.9	-8.7	-9.4	-10.0	-10.8	-11.3	-11.3	-10.4	-9.4	-8.6	-7.6	-7.3	-6.4	-5.2	-4.6	-4.1	-3.7	-4.1	-4.5	-4.9	-5.2	-5.5	-5.8	-7.2	-3.7
19-Apr	-5.8	-5.8	-5.7	-6.0	-6.2	-6.1	-5.8	-5.4	-5.1	-4.5	-3.9	-3.1	-2.0	-1.1	0.3	0.8	1.1	1.5	1.9	2.0	1.8	1.7	1.6	1.4	-2.2	2.0
20-Apr	0.6	0.6	0.5	0.3	0.0	-0.3	-0.5	0.0	1.0	2.3	3.8	3.8	1.9	-0.9	-2.5	-3.1	-3.4	-3.8	-4.1	-4.0	-3.8	-3.7	-3.6	-3.8	-0.9	3.8
21-Apr	-4.7	-5.7	-7.0	-7.9	-8.2	-8.2	-8.1	-7.5	-6.6	-6.0	-4.9	-4.4	-4.2	-3.4	-2.7	-1.8	-1.0	-0.8	-0.8	-1.0	-1.3	-1.5	-1.5	-1.5	-4.2	-0.8
22-Apr	-2.2	-2.6	-2.6	-3.8	-5.4	-5.9	-6.5	-6.8	-7.0	-7.2	-7.1	-6.8	-5.5	-4.8	-4.4	-4.5	-4.1	-3.8	-3.9	-4.4	-5.1	-5.6	-6.2	-6.7	-5.1	-2.2
23-Apr	-6.8	-6.8	-7.2	-7.7	-8.0	-8.3	-7.9	-6.8	-5.1	-3.4	-2.5	-1.1	0.0	1.1	1.9	2.4	2.6	2.6	2.5	2.1	1.8	1.3	0.6	0.2	-2.2	2.6
24-Apr	-0.1	-0.3	-1.1	-1.3	-1.9	-2.6	-3.2	-3.0	-2.5	-2.0	-1.2	0.1	1.1	1.7	1.9	2.2	2.3	2.1	2.0	2.1	1.7	1.4	1.1	0.7	0.0	2.3
25-Apr	0.2	-0.1	-0.5	-0.7	-0.6	-0.9	-0.9	-0.3	0.5	1.4	2.1	2.7	3.1	3.2	3.3	3.5	3.6	3.4	3.4	3.2	2.6	2.2	1.9	1.7	1.6	3.6
26-Apr	1.5	1.4	1.1	0.8	0.6	0.5	0.6	1.1	1.8	2.5	2.7	2.7	DF	DF	DF	DF	DF	DF	DF	DF	DF	4.1	3.8	3.7	--	4.1
27-Apr	3.8	3.6	3.2	3.1	2.9	2.7	2.5	2.9	3.7	4.7	6.2	7.0	AF	AF	9.3	9.8	10.3	10.7	10.7	10.4	9.8	8.8	9.0	8.9	6.6	10.7
28-Apr	7.6	6.2	4.3	3.4	3.8	3.0	2.4	2.7	3.8	6.3	9.0	10.6	11.3	11.0	11.5	11.8	12.1	11.9	11.8	11.6	11.2	10.9	10.2	9.3	8.2	12.1
29-Apr	9.5	9.3	8.4	7.1	6.3	5.9	5.4	6.1	7.9	9.7	11.0	11.1	11.3	11.6	11.9	12.2	12.2	11.9	10.8	10.7	10.1	9.7	9.4	8.7	9.5	12.2
30-Apr	7.6	6.6	5.9	5.3	5.3	5.4	4.8	5.3	7.6	10.0	12.0	13.2	13.9	14.0	13.4	11.8	10.7	10.4	9.7	9.7	9.3	9.3	9.2	9.1	9.2	14.0
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure AF - Analyzer Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 90 m (AT90m) - C
Mannix - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	263	37.09	37.09
0 - 10	367	51.76	88.86
10 - 20	79	11.14	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

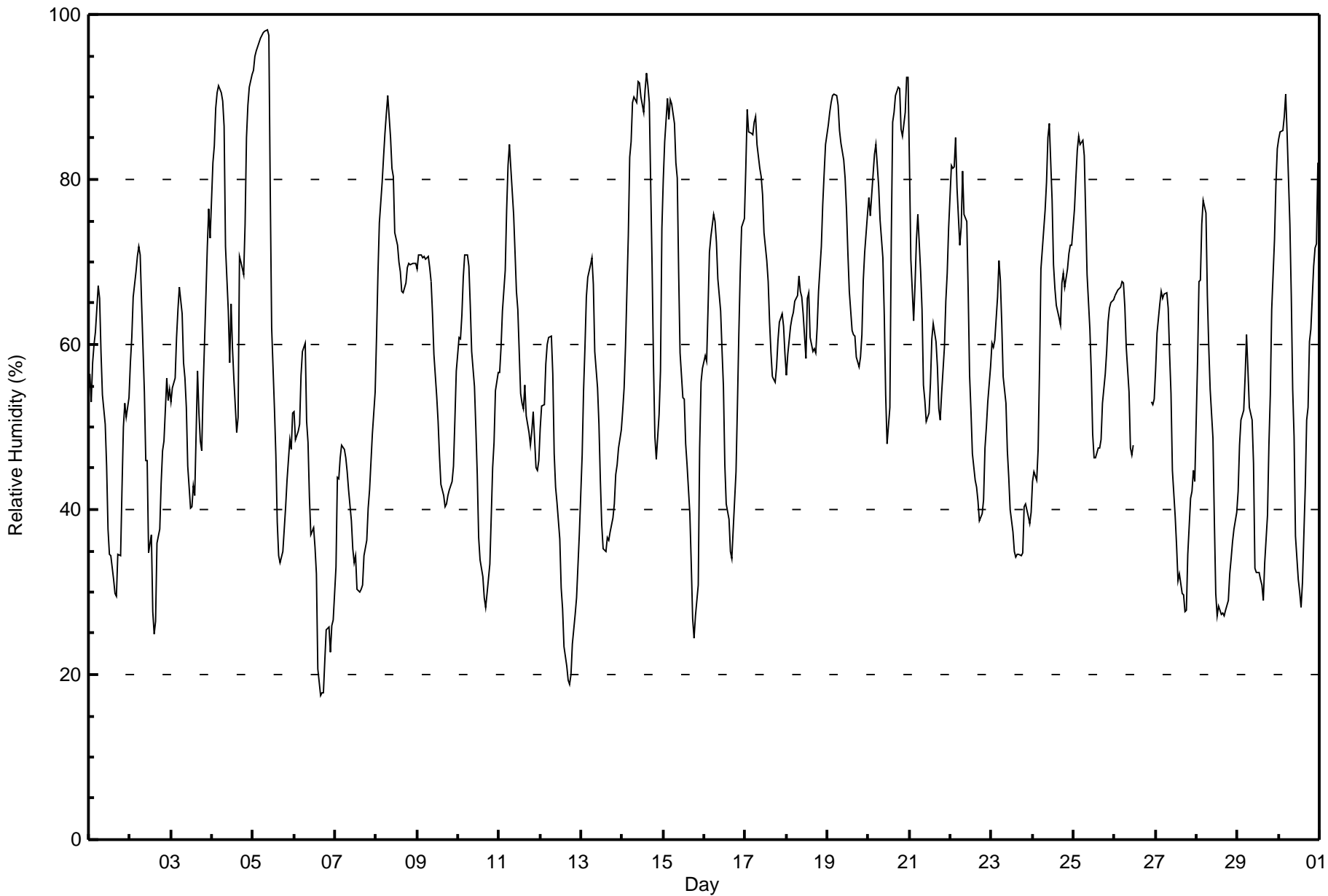
Mannix - April 2017

Maximum Value: 98 % on Apr 5 09:00																		Maximum Daily Average: 78.7 % on Apr 20																		Hours in Service: 720														
Minimum Value: 18 % on Apr 6 16:00																		Minimum Daily Average: 36.7 % on Apr 6																		Hours of Data: 711														
Maximum Diurnal Average: 74.6 % at hour 6																		Minimum Diurnal Average: 45.1 % at hour 16																		Hours of Missing Data: 9														
Monthly Average: 58.4 %																		Percentiles: P ₁ = 21 P ₁₀ = 34 Q ₁ = 45 Median = 59 Q ₃ = 71 P ₉₀ = 85 P ₉₉ = 96																		Hours of Calibration: 0														
																																				Percent Operational Time: 98.8														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	57	53	58	60	62	67	66	59	54	50	45	38	35	34	32	30	30	35	34	43	50	53	51	54	47.8	67																								
2-Apr	58	61	66	69	71	72	71	65	54	46	46	35	37	28	25	26	36	38	43	47	48	56	53	55	50.2	72																								
3-Apr	53	55	56	61	64	67	64	58	56	52	45	40	40	43	42	57	52	48	47	55	66	72	76	73	55.9	76																								
4-Apr	82	84	89	91	91	91	90	86	72	64	58	65	59	56	49	51	71	70	69	75	85	89	91	93	75.8	93																								
5-Apr	93	95	96	97	97	97	98	98	98	97	79	62	52	47	38	34	34	35	38	40	43	48	47	52	67.3	98																								
6-Apr	52	49	50	50	56	59	60	51	48	42	37	38	35	32	21	18	18	18	22	25	26	23	26	27	36.7	60																								
7-Apr	33	44	44	46	48	47	46	45	42	39	35	34	34	30	30	30	31	34	36	40	42	46	49	54	40.0	54																								
8-Apr	61	69	75	80	83	86	88	90	85	81	80	74	72	70	69	66	66	67	69	70	70	70	70	70	74.2	90																								
9-Apr	69	71	71	71	71	70	71	69	68	64	59	54	51	46	43	42	40	41	42	42	43	45	51	57	56.2	71																								
10-Apr	61	61	64	68	71	71	69	65	59	55	50	44	37	34	32	29	28	30	33	39	45	48	54	57	50.2	71																								
11-Apr	57	60	64	69	76	82	84	81	76	71	66	64	54	53	52	55	51	49	48	50	52	45	45	46	60.4	84																								
12-Apr	50	53	53	58	60	61	61	56	47	43	41	37	30	28	23	21	19	19	20	24	27	29	33	37	38.7	61																								
13-Apr	47	54	60	66	68	70	71	67	59	55	50	44	38	35	35	37	36	37	39	41	44	45	47	50	49.8	71																								
14-Apr	52	55	60	73	83	85	89	90	89	92	92	90	88	91	93	91	89	69	58	49	46	51	57	74	75.3	93																								
15-Apr	80	85	90	87	90	89	87	82	80	69	59	54	53	48	45	40	33	27	24	27	31	47	55	57	60.0	90																								
16-Apr	59	58	64	71	73	76	75	72	68	64	59	55	45	41	39	35	34	38	45	52	61	69	74	75	58.4	76																								
17-Apr	81	88	86	86	85	87	88	84	81	80	78	74	70	68	63	59	56	55	57	60	63	64	62	59	72.3	88																								
18-Apr	56	59	62	63	64	65	66	68	66	66	64	58	66	66	61	59	59	59	62	66	72	77	81	84	65.4	84																								
19-Apr	87	88	89	90	90	90	89	86	84	82	80	76	71	66	62	61	61	59	57	59	61	68	71	76	75.2	90																								
20-Apr	78	76	78	83	84	82	79	75	70	64	54	48	52	72	87	88	90	91	91	86	85	88	92	92	78.7	92																								
21-Apr	82	70	63	67	73	76	69	64	55	53	51	52	55	61	63	60	57	52	51	54	60	65	69	74	62.3	82																								
22-Apr	82	81	81	85	79	72	74	81	76	75	66	56	52	47	44	43	41	39	39	41	48	50	53	57	60.9	85																								
23-Apr	60	60	60	66	70	68	63	56	53	47	44	40	37	35	34	35	35	34	35	40	41	39	38	40	47.1	70																								
24-Apr	43	45	44	47	57	69	74	76	80	85	87	77	70	67	65	63	62	68	69	67	69	71	72	72	66.6	87																								
25-Apr	77	80	84	85	84	85	83	76	68	62	57	49	46	46	47	48	48	53	56	59	63	64	65	65	64.6	85																								
26-Apr	66	66	67	67	68	67	65	60	54	48	47	48	DF	DF	DF	DF	DF	DF	DF	DF	DF	53	53	53	--	68																								
27-Apr	57	61	65	66	66	66	66	64	59	54	45	39	36	31	32	30	30	28	28	35	41	42	45	43	47.0	66																								
28-Apr	58	68	68	75	77	76	66	60	55	49	39	30	27	28	27	27	27	28	29	32	34	36	38	40	45.5	77																								
29-Apr	42	48	51	52	56	61	57	52	51	46	33	32	32	32	31	29	34	39	48	54	64	73	79	84	49.1	84																								
30-Apr	85	86	86	88	90	86	75	66	55	49	37	32	30	28	31	43	51	52	60	62	70	72	72	82	61.9	90																								
																								63.9	66.0	68.0	71.2	73.6	74.6	73.4	70.1	65.4	61.4	56.1	51.2	48.5	47.0	45.3	45.1	45.5	45.2	46.5	49.5	53.5	56.6	59.0	61.7	Diurnal Average		
																								93	95	96	97	97	97	98	98	98	97	92	90	88	91	93	91	90	91	91	91	86	85	89	92	93	Diurnal Maximum	
DF - DAS Failure																																																		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mannix - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Mannix - April 2017

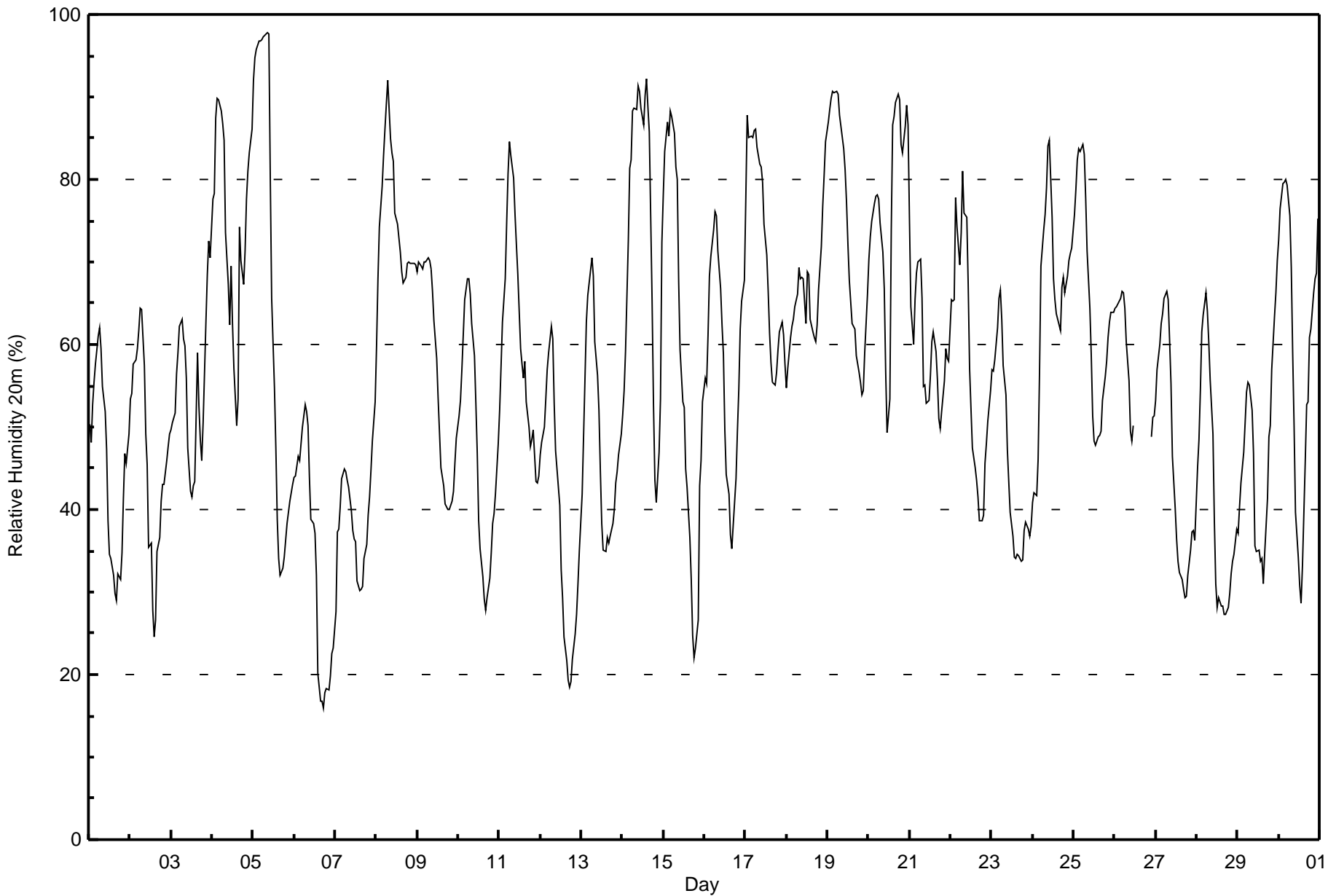
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	5	0.70	0.70
20 - 40	126	17.72	18.42
40 - 60	250	35.16	53.59
60 - 80	218	30.66	84.25
80 - 100	112	15.75	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Maximum Value: 98 % on Apr 5 09:00																		Maximum Daily Average: 77.0 % on Apr 20																		Hours in Service: 720													
Minimum Value: 16 % on Apr 6 18:00																		Minimum Daily Average: 33.9 % on Apr 6																		Hours of Data: 711													
Maximum Diurnal Average: 72.5 % at hour 7																		Minimum Diurnal Average: 44.8 % at hour 18																		Hours of Missing Data: 9													
Monthly Average: 57.0 %																		Percentiles: P ₁ = 19 P ₁₀ = 34 Q ₁ = 43 Median = 57 Q ₃ = 69 P ₉₀ = 83 P ₉₉ = 97																		Hours of Calibration: 0													
																																				Percent Operational Time: 98.8													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	50	48	53	55	58	61	62	59	55	52	47	39	35	34	32	30	29	32	31	35	41	47	46	49	45.0	62																							
2-Apr	53	54	58	58	59	62	64	64	57	49	45	35	36	28	25	27	35	37	41	43	43	46	48	49	46.5	64																							
3-Apr	50	50	52	56	59	62	63	61	60	56	48	42	42	43	43	59	52	49	46	51	63	68	73	71	54.9	73																							
4-Apr	78	78	87	90	90	88	87	85	74	67	62	69	63	57	50	53	74	70	67	71	78	81	83	86	74.6	90																							
5-Apr	92	95	96	97	97	97	97	97	98	98	80	66	55	47	39	34	32	33	34	36	38	41	42	43	66.0	98																							
6-Apr	44	44	46	46	48	50	53	52	50	44	39	38	37	32	20	17	17	16	18	18	18	20	23	23	33.9	53																							
7-Apr	28	37	38	40	44	45	45	44	43	40	37	36	36	31	30	30	31	34	36	39	42	45	48	53	38.8	53																							
8-Apr	60	68	74	79	83	86	89	92	85	83	82	76	75	73	71	69	68	68	70	70	70	70	70	70	75.0	92																							
9-Apr	69	70	70	69	70	70	70	70	69	66	63	58	54	49	45	43	41	40	40	40	41	42	46	49	56.0	70																							
10-Apr	51	53	57	61	66	68	68	66	63	59	53	47	39	35	32	29	28	29	32	35	38	40	42	48	47.4	68																							
11-Apr	52	57	63	68	75	81	85	83	80	76	72	68	59	58	56	58	53	50	48	48	50	43	43	44	61.2	85																							
12-Apr	47	48	50	53	57	59	62	61	53	47	45	40	33	29	25	22	19	19	19	22	25	27	31	35	38.6	62																							
13-Apr	42	49	56	63	66	69	71	68	60	56	52	45	38	35	35	37	36	37	38	40	43	45	47	49	49.0	71																							
14-Apr	52	54	59	73	81	82	88	89	88	91	91	89	87	90	92	89	86	65	53	44	41	47	53	72	73.2	92																							
15-Apr	78	83	87	85	88	88	86	82	80	68	59	53	52	45	43	37	32	25	22	23	27	43	46	53	57.6	88																							
16-Apr	56	55	61	68	71	74	76	76	71	67	62	59	50	44	42	37	35	38	44	50	55	62	65	68	57.7	76																							
17-Apr	78	88	85	85	85	86	86	84	82	82	80	75	71	67	61	58	55	55	57	59	62	63	61	58	71.7	88																							
18-Apr	55	57	61	62	63	65	66	69	68	68	68	63	69	68	63	61	61	60	62	67	72	77	80	85	66.3	85																							
19-Apr	87	89	90	91	90	91	90	88	86	84	81	77	72	68	63	62	62	59	57	56	54	54	59	66	74.0	91																							
20-Apr	70	73	75	77	78	78	78	75	71	67	57	49	53	74	87	88	89	90	90	84	83	86	89	87	77.0	90																							
21-Apr	75	65	60	65	69	70	70	66	55	55	53	53	56	60	61	59	56	51	50	52	56	60	58	58	59.7	75																							
22-Apr	65	65	65	78	74	70	74	81	76	75	67	57	52	47	45	44	41	39	39	39	46	48	51	54	58.0	81																							
23-Apr	57	57	58	62	66	67	63	57	54	47	43	40	37	34	34	35	34	34	34	38	38	38	37	38	45.9	67																							
24-Apr	41	42	42	46	57	69	74	76	79	84	85	75	68	65	64	62	62	67	68	66	68	70	71	72	65.6	85																							
25-Apr	76	79	82	84	83	84	83	78	71	64	59	51	48	48	49	49	49	53	56	58	61	63	64	64	64.9	84																							
26-Apr	64	65	65	66	66	66	64	60	56	50	48	50	DF	DF	DF	DF	DF	DF	DF	DF	DF	49	51	51	--	66																							
27-Apr	53	57	60	62	64	66	66	65	61	55	46	40	36	34	32	32	30	29	29	32	35	37	37	36	45.7	66																							
28-Apr	45	48	54	61	64	66	64	60	56	49	39	31	28	29	28	28	27	27	28	30	32	34	35	38	41.8	66																							
29-Apr	37	40	43	47	51	54	55	55	52	47	36	35	35	34	34	31	35	41	49	50	57	63	66	70	46.6	70																							
30-Apr	73	77	79	80	80	79	76	69	59	50	40	34	31	29	33	46	53	53	61	62	66	68	69	75	60.0	80																							
																								59.3	61.5	64.2	67.6	70.0	71.8	72.5	71.1	67.1	63.2	58.0	53.1	49.8	47.9	46.0	45.6	45.6	44.8	45.4	46.8	49.7	52.5	54.4	57.1	Diurnal Average	
																								92	95	96	97	97	97	97	97	98	98	91	89	87	90	92	89	89	90	90	84	83	86	89	87	Diurnal Maximum	
DF - DAS Failure																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 20m (RH20m) - %
Mannix - April 2017

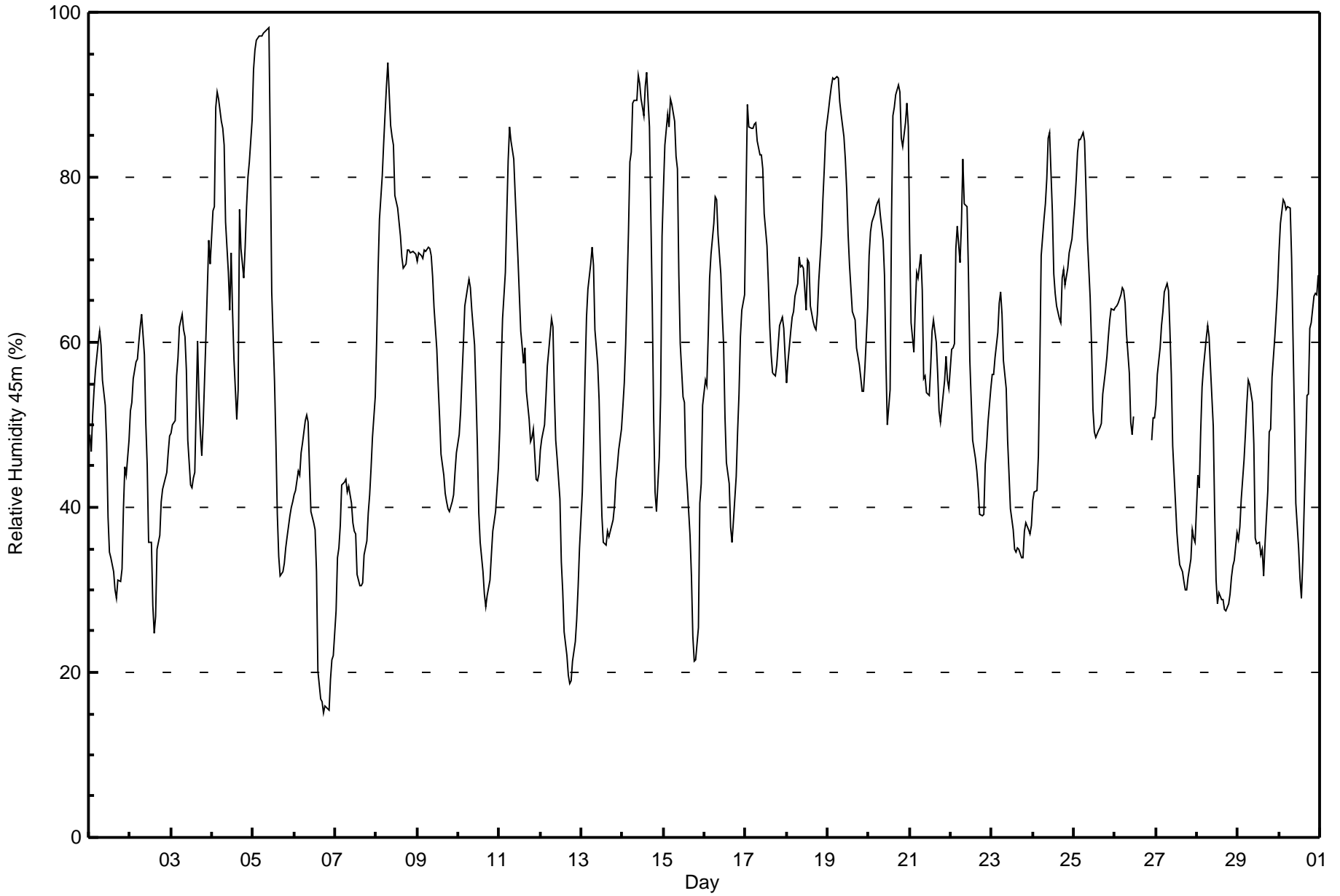
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	10	1.41	1.41
20 - 40	137	19.27	20.68
40 - 60	250	35.16	55.84
60 - 80	223	31.36	87.20
80 - 100	91	12.80	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Maximum Value: 98 % on Apr 5 10:00																		Maximum Daily Average: 77.3 % on Apr 20																		Hours in Service: 720													
Minimum Value: 15 % on Apr 6 18:00																		Minimum Daily Average: 32.8 % on Apr 6																		Hours of Data: 711													
Maximum Diurnal Average: 72.8 % at hour 7																		Minimum Diurnal Average: 45.2 % at hour 18																		Hours of Missing Data: 9													
Monthly Average: 57.1 %																		Percentiles: P ₁ = 19 P ₁₀ = 34 Q ₁ = 43 Median = 57 Q ₃ = 70 P ₉₀ = 84 P ₉₉ = 97																		Hours of Calibration: 0													
																																				Percent Operational Time: 98.8													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	49	47	51	54	57	60	61	60	55	52	48	39	35	34	32	30	29	31	31	33	40	45	44	48	44.3	61																							
2-Apr	52	53	56	58	58	60	62	63	58	50	45	36	36	28	25	27	35	37	41	42	43	44	47	49	45.9	63																							
3-Apr	49	50	50	56	58	62	63	62	61	57	48	43	42	44	44	60	53	49	46	50	61	67	72	70	54.9	72																							
4-Apr	76	77	88	90	90	87	86	84	75	68	64	71	64	58	51	54	76	71	68	71	76	80	82	87	74.7	90																							
5-Apr	93	95	97	97	97	97	97	98	98	98	83	66	55	48	39	34	32	32	33	35	37	39	40	41	65.9	98																							
6-Apr	41	42	44	44	47	48	50	51	50	45	40	38	37	32	20	17	16	15	16	16	15	19	22	22	32.8	51																							
7-Apr	27	34	35	38	43	43	43	42	43	41	38	37	37	32	30	31	31	34	36	39	42	45	48	53	38.4	53																							
8-Apr	60	69	75	80	84	88	91	94	86	85	84	78	76	75	73	70	69	70	71	71	71	71	71	71	76.3	94																							
9-Apr	70	71	70	70	71	71	72	71	70	68	64	59	55	51	46	44	42	41	40	39	41	41	44	47	56.6	72																							
10-Apr	49	51	56	60	64	67	68	67	64	60	54	47	39	36	32	29	28	29	31	34	37	38	40	45	46.9	68																							
11-Apr	50	57	63	68	75	82	86	84	82	78	74	70	61	59	58	59	54	51	48	49	50	43	43	44	62.1	86																							
12-Apr	47	48	50	53	57	59	63	62	54	48	46	41	33	30	25	22	20	19	19	21	24	26	30	35	38.9	63																							
13-Apr	42	48	56	63	66	69	71	69	62	57	53	45	39	36	35	37	36	37	38	40	43	45	47	50	49.5	71																							
14-Apr	52	55	60	73	82	83	89	89	89	92	91	90	87	91	93	89	86	65	51	42	40	46	53	73	73.4	93																							
15-Apr	79	84	88	86	89	89	87	83	81	68	60	53	53	45	43	37	32	24	21	22	25	41	43	52	57.6	89																							
16-Apr	55	55	61	68	71	74	78	77	73	68	63	60	51	45	43	38	36	38	44	49	54	61	64	66	58.0	78																							
17-Apr	78	89	86	86	86	87	87	84	83	83	81	76	72	67	62	58	56	56	57	60	62	63	62	58	72.4	89																							
18-Apr	55	58	61	63	64	66	67	70	69	69	69	64	70	70	64	63	62	61	63	68	73	78	81	85	67.2	85																							
19-Apr	88	90	91	92	92	92	92	89	88	85	82	79	73	69	64	63	63	59	57	56	54	54	57	64	74.7	92																							
20-Apr	71	73	75	76	77	77	77	75	72	68	58	50	54	75	88	88	90	91	90	85	84	87	89	86	77.3	91																							
21-Apr	72	62	59	64	69	68	71	66	56	56	54	54	57	61	63	60	56	52	50	52	55	58	55	54	59.4	72																							
22-Apr	59	59	60	71	74	70	74	82	77	76	68	58	53	48	46	44	42	39	39	39	45	48	50	54	57.4	82																							
23-Apr	56	56	58	61	65	66	63	58	54	48	44	40	37	35	35	35	35	34	34	37	38	37	37	38	45.9	66																							
24-Apr	41	42	42	46	58	71	75	77	80	85	85	76	68	66	64	63	62	68	69	67	69	71	72	73	66.2	85																							
25-Apr	77	80	83	85	85	85	84	79	73	65	60	52	49	48	49	50	50	54	57	58	61	63	64	64	65.6	85																							
26-Apr	64	64	65	66	67	66	65	61	56	50	49	51	DF	DF	DF	DF	DF	DF	DF	DF	DF	48	51	51	--	67																							
27-Apr	52	56	59	62	64	66	67	66	61	56	47	41	37	35	33	32	31	30	30	32	34	37	36	36	45.9	67																							
28-Apr	44	42	49	55	57	61	62	61	57	50	40	31	28	30	29	29	28	27	28	30	32	33	34	37	40.5	62																							
29-Apr	36	38	41	46	49	53	55	55	53	48	36	36	36	34	35	32	36	42	49	49	56	61	64	67	46.0	67																							
30-Apr	71	74	77	77	76	76	76	70	60	51	40	35	31	29	34	47	54	54	62	62	66	66	66	68	59.3	77																							
																								58.5	60.6	63.6	67.0	69.6	71.4	72.8	71.7	68.0	64.2	59.0	53.8	50.6	48.6	46.7	46.3	46.2	45.2	45.5	46.5	49.1	51.8	53.6	56.2	Diurnal Average	
																								93	95	97	97	97	97	97	98	98	98	91	90	87	91	93	89	90	91	90	85	84	87	89	87	Diurnal Maximum	
DF - DAS Failure																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 45m (RH45m) - %
Mannix - April 2017

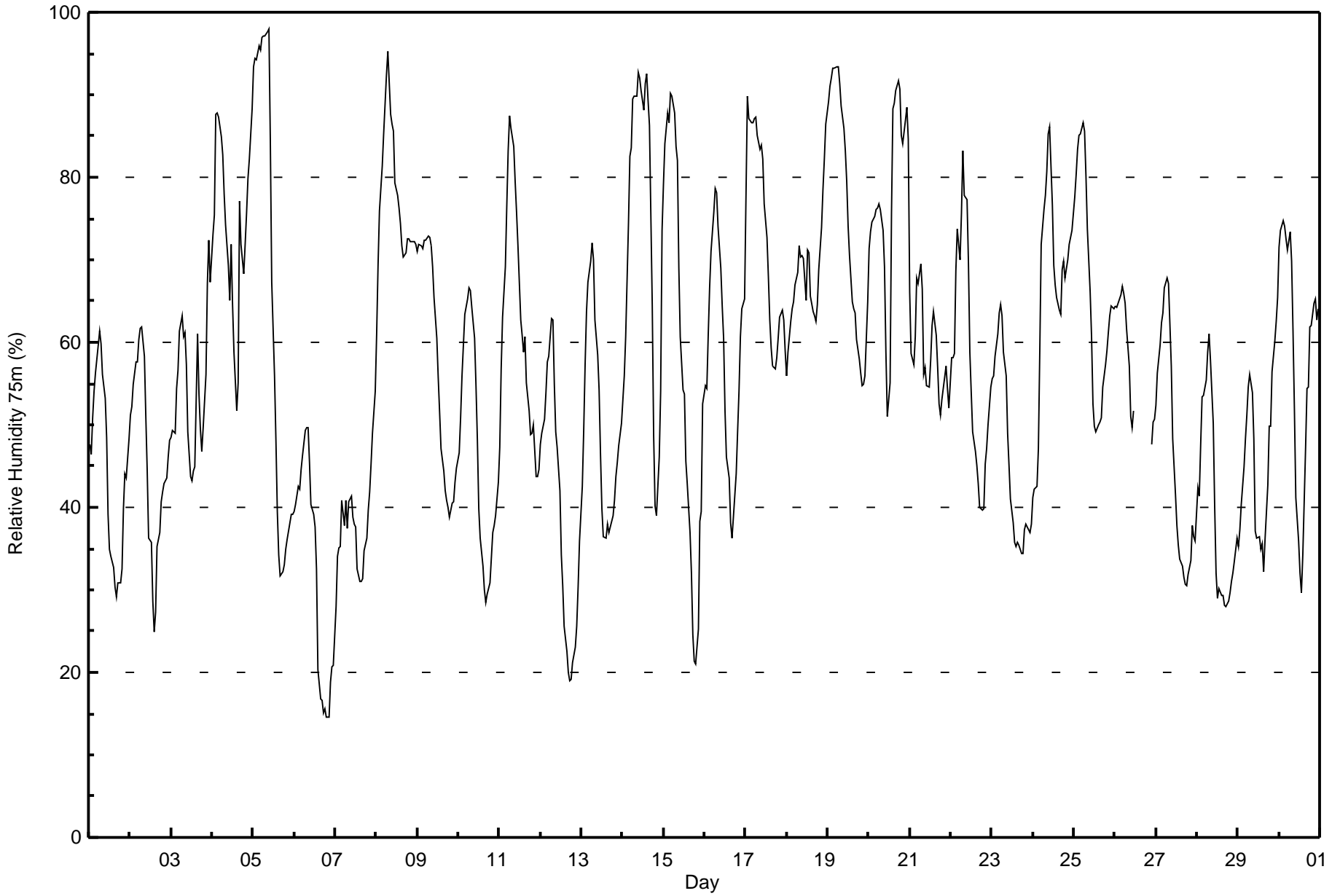
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	10	1.41	1.41
20 - 40	140	19.69	21.10
40 - 60	249	35.02	56.12
60 - 80	219	30.80	86.92
80 - 100	93	13.08	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Maximum Value: 98 % on Apr 5 10:00																		Maximum Daily Average: 77.6 % on Apr 8																		Hours in Service: 720													
Minimum Value: 15 % on Apr 6 20:00																		Minimum Daily Average: 32.2 % on Apr 6																		Hours of Data: 711													
Maximum Diurnal Average: 72.7 % at hour 7																		Minimum Diurnal Average: 45.7 % at hour 18																		Hours of Missing Data: 9													
Monthly Average: 57.3 %																		Percentiles: P ₁ = 19 P ₁₀ = 34 Q ₁ = 42 Median = 57 Q ₃ = 71 P ₉₀ = 85 P ₉₉ = 95																		Hours of Calibration: 0													
																																				Percent Operational Time: 98.8													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	48	46	51	54	56	60	61	60	56	53	48	39	35	34	33	30	29	31	31	33	40	44	44	48	44.3	61																							
2-Apr	51	52	55	58	58	60	62	62	58	51	44	36	36	29	25	27	35	37	41	42	43	44	46	48	45.8	62																							
3-Apr	48	49	49	54	57	61	63	61	61	57	49	44	43	44	45	61	54	50	47	50	56	67	72	67	54.6	72																							
4-Apr	73	75	88	88	87	85	83	78	74	69	65	72	65	59	52	55	77	72	68	72	76	80	82	88	74.3	88																							
5-Apr	93	94	94	96	95	97	97	97	98	98	84	67	56	48	40	34	32	32	33	35	36	38	39	39	65.6	98																							
6-Apr	39	40	42	42	45	46	49	50	50	46	40	39	38	33	20	17	17	15	16	15	15	19	21	21	32.2	50																							
7-Apr	28	34	35	35	41	38	41	37	41	41	39	38	38	32	31	31	31	35	36	40	42	45	49	54	38.0	54																							
8-Apr	61	69	76	81	85	89	92	95	88	86	86	79	78	76	74	72	70	71	73	73	72	72	72	72	77.6	95																							
9-Apr	71	72	72	71	72	72	73	73	72	69	65	61	56	52	47	44	42	41	40	39	40	41	43	45	57.2	73																							
10-Apr	47	51	56	60	63	65	67	66	64	61	55	48	40	36	33	30	28	30	31	34	37	38	39	43	46.7	67																							
11-Apr	47	57	63	69	77	83	87	86	84	79	76	72	63	61	59	61	55	52	49	49	50	44	44	45	62.9	87																							
12-Apr	48	49	51	54	58	58	63	63	55	49	47	42	34	31	26	23	20	19	19	21	23	26	30	36	39.3	63																							
13-Apr	43	49	57	64	67	70	72	70	63	59	54	46	40	37	36	38	37	38	39	41	44	45	48	50	50.2	72																							
14-Apr	53	56	61	74	82	84	89	90	90	93	92	91	88	91	93	89	86	64	49	40	39	46	54	73	73.7	93																							
15-Apr	79	84	88	87	90	90	88	84	82	69	61	54	54	46	43	37	32	25	21	21	25	38	40	53	57.9	90																							
16-Apr	55	54	61	67	71	76	79	78	74	69	64	60	52	46	44	38	36	39	44	49	54	61	64	65	58.3	79																							
17-Apr	78	90	87	87	87	87	87	85	83	84	82	77	73	68	63	59	57	57	58	61	63	64	63	59	73.2	90																							
18-Apr	56	59	63	64	65	67	69	72	70	71	70	65	71	71	66	64	63	63	65	69	74	78	82	86	68.4	86																							
19-Apr	89	91	92	93	93	93	93	91	89	86	83	80	74	71	65	64	64	60	58	56	55	55	56	65	75.7	93																							
20-Apr	71	73	75	75	76	76	77	76	74	69	59	51	55	76	88	89	91	92	91	85	84	87	89	85	77.6	92																							
21-Apr	66	59	57	61	68	67	69	66	56	57	55	55	58	62	64	61	57	53	51	53	56	57	54	52	58.9	69																							
22-Apr	58	58	59	69	74	70	76	83	78	77	70	59	54	49	47	45	43	40	40	40	45	47	50	55	57.7	83																							
23-Apr	56	56	58	61	64	65	63	59	56	49	45	41	38	36	35	36	35	34	34	37	38	37	37	38	46.2	65																							
24-Apr	41	42	43	47	59	72	76	78	81	85	86	77	69	67	65	64	63	69	70	68	70	72	73	74	67.1	86																							
25-Apr	78	80	83	85	85	87	86	80	74	66	61	53	50	49	50	50	51	55	57	59	61	63	64	64	66.3	87																							
26-Apr	64	64	65	66	67	66	65	62	57	51	50	52	DF	DF	DF	DF	DF	DF	DF	DF	DF	48	50	51	--	67																							
27-Apr	52	56	60	62	64	67	68	67	62	57	48	41	38	35	34	33	32	31	31	32	34	38	36	36	46.4	68																							
28-Apr	42	41	48	53	54	55	59	61	58	50	40	32	29	30	29	29	28	28	29	30	31	32	33	36	40.0	61																							
29-Apr	35	37	40	45	48	51	55	56	54	48	37	36	36	35	36	32	36	43	50	50	56	60	62	65	46.1	65																							
30-Apr	71	74	75	74	73	71	73	70	61	52	41	36	32	30	34	47	54	55	62	62	65	65	63	64	58.5	75																							
																								58.1	60.5	63.4	66.5	69.3	70.9	72.7	71.9	68.7	65.1	59.9	54.7	51.4	49.4	47.4	46.9	46.8	45.7	45.9	46.6	49.1	51.7	53.3	55.9	Diurnal Average	
																								93	94	94	96	95	97	97	97	98	98	92	91	88	91	93	89	91	92	91	85	84	87	89	88	Diurnal Maximum	
DF - DAS Failure																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 75m (RH75m) - %
Mannix - April 2017

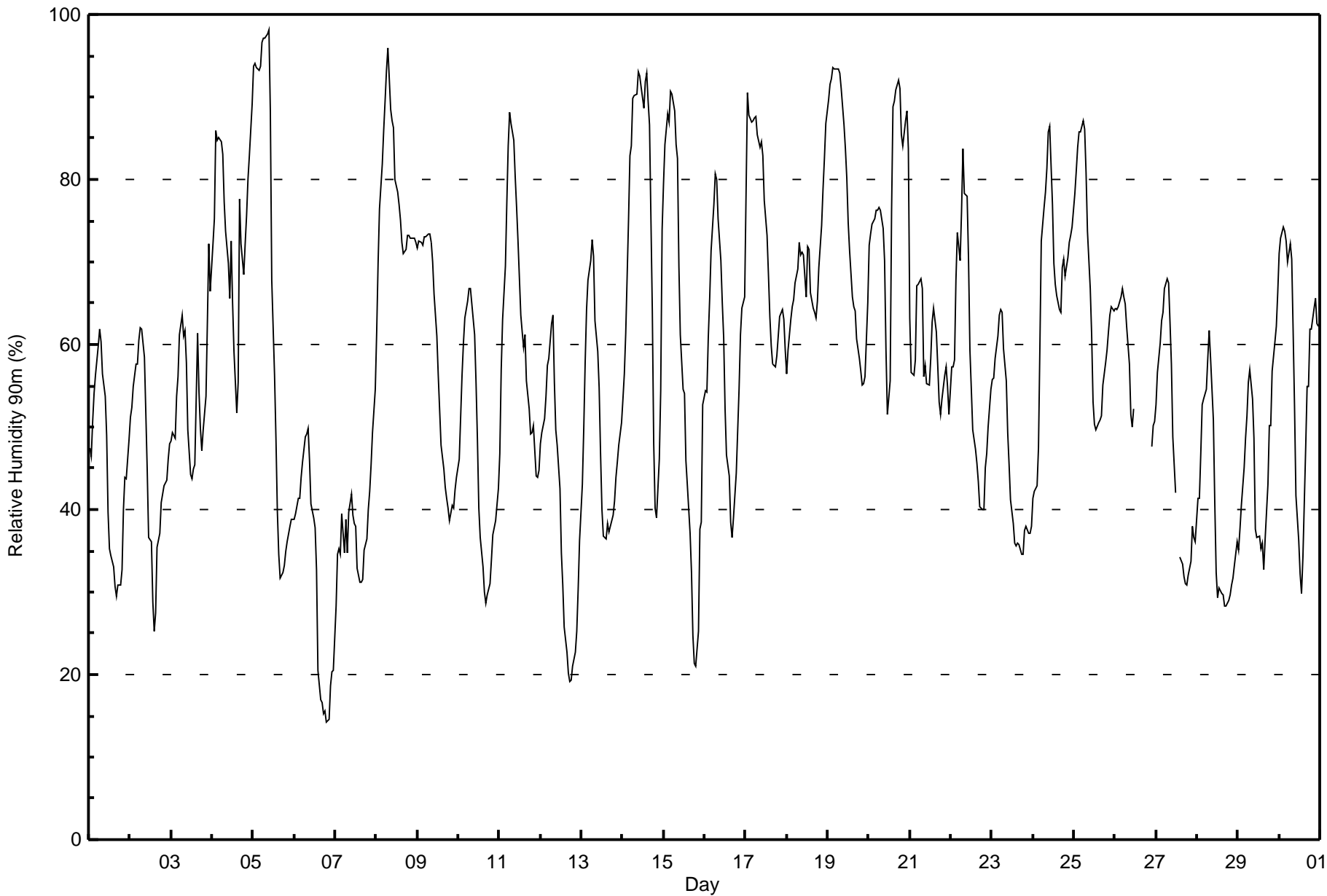
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	9	1.27	1.27
20 - 40	145	20.39	21.66
40 - 60	239	33.61	55.27
60 - 80	223	31.36	86.64
80 - 100	95	13.36	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



Maximum Value: 98 % on Apr 5 10:00																			Maximum Daily Average: 78.3 % on Apr 8						Hours in Service: 720																									
Minimum Value: 14 % on Apr 6 20:00																			Minimum Daily Average: 32.0 % on Apr 6						Hours of Data: 709																									
Maximum Diurnal Average: 72.9 % at hour 7																			Minimum Diurnal Average: 46.0 % at hour 18						Hours of Missing Data: 11																									
Monthly Average: 57.6 %																			Percentiles: P ₁ = 19 P ₁₀ = 34 Q ₁ = 42 Median = 57 Q ₃ = 72 P ₉₀ = 85 P ₉₉ = 93						Hours of Calibration: 0																									
																									Percent Operational Time: 98.5																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	48	46	51	54	56	60	62	60	56	54	49	40	35	34	33	31	29	31	31	33	40	44	44	48	44.5	62																								
2-Apr	51	52	55	58	58	60	62	62	58	52	45	37	36	29	25	27	35	37	41	42	43	44	46	48	45.9	62																								
3-Apr	48	49	49	54	56	61	64	61	62	58	50	44	44	45	45	61	54	50	47	50	54	63	72	66	54.4	72																								
4-Apr	72	75	86	85	85	83	77	74	70	66	73	65	59	52	55	78	72	69	72	76	80	83	89	89	74.1	89																								
5-Apr	94	94	94	93	94	97	97	97	98	98	88	68	56	49	40	35	32	32	33	35	36	38	39	39	65.6	98																								
6-Apr	39	39	41	41	44	46	49	49	50	46	41	39	38	33	20	17	17	15	16	14	15	19	20	20	32.0	50																								
7-Apr	28	35	35	35	39	35	39	35	40	42	39	38	38	33	31	31	32	35	36	40	42	45	49	54	37.8	54																								
8-Apr	61	70	76	82	86	90	93	96	89	87	86	80	79	77	75	72	71	72	73	73	73	73	73	72	78.3	96																								
9-Apr	72	72	72	72	73	73	73	73	72	70	66	61	56	52	48	45	43	41	40	39	40	40	42	44	57.6	73																								
10-Apr	46	51	56	60	63	65	67	67	65	61	56	48	40	37	33	30	29	30	31	34	37	38	39	42	46.9	67																								
11-Apr	47	57	63	70	77	84	88	87	85	80	77	72	64	62	60	61	56	52	49	49	50	44	44	45	63.4	88																								
12-Apr	48	49	51	54	58	58	63	63	55	50	48	43	35	31	26	23	20	19	19	21	23	25	30	36	39.5	63																								
13-Apr	43	50	58	64	68	70	73	71	63	59	55	47	40	37	37	38	37	38	39	41	44	46	48	51	50.6	73																								
14-Apr	53	56	61	75	83	84	90	90	90	93	93	91	89	92	93	90	87	64	48	40	39	46	54	74	74.0	93																								
15-Apr	80	84	88	87	91	90	88	84	83	70	61	55	54	46	43	37	32	25	21	21	25	38	38	53	58.1	91																								
16-Apr	54	54	61	66	71	77	81	80	75	70	65	61	52	47	44	38	37	39	44	49	55	61	64	66	58.8	81																								
17-Apr	78	90	88	87	87	87	88	85	84	85	83	77	73	69	63	60	58	57	59	61	63	64	63	59	73.7	90																								
18-Apr	56	59	63	65	65	67	69	72	71	71	71	66	72	71	66	64	64	63	65	69	74	79	83	87	68.9	87																								
19-Apr	90	92	92	94	93	93	93	93	91	87	84	80	75	71	66	65	64	61	58	57	55	55	56	65	76.2	94																								
20-Apr	72	73	75	75	76	76	77	76	74	70	59	51	56	76	89	89	91	92	91	85	84	87	88	84	77.8	92																								
21-Apr	63	57	56	58	67	67	68	67	56	58	55	55	58	63	64	61	58	53	51	53	56	57	55	52	58.7	68																								
22-Apr	57	57	58	68	74	70	76	84	78	78	70	59	55	50	47	46	43	40	40	40	45	47	50	55	57.8	84																								
23-Apr	56	56	58	61	63	64	64	59	56	49	45	41	38	36	36	36	36	35	34	37	38	37	37	38	46.3	64																								
24-Apr	41	42	43	47	60	73	77	78	81	86	86	77	70	67	66	64	64	69	70	68	70	72	73	74	67.5	86																								
25-Apr	78	81	84	86	86	87	86	81	74	67	61	53	50	50	50	51	51	55	58	59	62	64	65	64	66.8	87																								
26-Apr	64	64	65	66	67	66	65	62	58	52	50	52	DF	DF	DF	DF	DF	DF	DF	DF	DF	48	50	51	--	67																								
27-Apr	53	57	60	63	64	67	68	67	63	58	49	42	AF	AF	34	33	32	31	31	32	34	38	37	36	47.6	68																								
28-Apr	41	41	47	53	53	55	58	62	58	51	41	32	29	31	30	30	28	28	29	30	31	32	33	36	40.0	62																								
29-Apr	35	38	41	45	49	51	55	57	53	49	38	37	37	35	36	33	36	43	50	50	57	60	62	66	46.4	66																								
30-Apr	71	73	74	74	73	70	72	70	62	53	42	36	32	30	34	48	55	55	62	62	64	66	63	62	58.4	74																								
																								58.0	60.5	63.4	66.3	69.3	71.0	72.9	72.3	69.1	65.7	60.6	55.2	52.3	50.3	47.8	47.3	47.2	46.0	46.1	46.8	49.1	51.6	53.4	55.9	Diurnal Average		
																								94	94	94	94	94	97	97	97	97	98	98	93	91	89	92	93	90	91	92	91	85	84	87	88	89	Diurnal Maximum	
DF - DAS Failure																								AF - Analyzer Failure																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 90m (RH90m) - %
Mannix - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	9	1.27	1.27
20 - 40	142	20.03	21.30
40 - 60	238	33.57	54.87
60 - 80	220	31.03	85.90
80 - 100	100	14.10	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 720



Maximum Speed: 29 km/h on Apr 20 15:00	Maximum Daily Speed Average: 19.9 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 19 21:00	Minimum Daily Speed Average: 0.8 km/h on Apr 19	Hours of Data: 705
Maximum Diurnal Speed Average: 5.8 km/h at hour 19	Minimum Diurnal Speed Average: 2.2 km/h at hour 15	Hours of Missing Data: 15
Monthly Average Velocity: 3.6 km/h 56.0 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 11 Q ₃ = 16 P ₉₀ = 20 P ₉₉ = 27	Percent Operational Time: 97.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SW17	SW16	SW15	SW17	WSW16	SW10	SW9	SW14	WSW17	WSW19	SW17	SW21	W23	W23	W15	WNW13	WNW13	WNW9	N7	SW7	SW10	WSW10	W13	WSW13	WSW12.9	W23	
2-Apr	WSW11	SW5	SW7	SW6	SW7	SSW8	SSW7	S4	SSW5	S4	E1	NW4	W6	NW10	WNW19	NNW16	N16	NNE12	N11	N10	NNW7	NNW6	N11	NNW12	NW4.1	WNW19	
3-Apr	N12	N9	N9	N7	N9	NNW4	NNE5	NNE4	WSW7	W6	WSW6	W7	W4	NNE4	WNW10	W14	W9	NW5	NE6	SSW4	SW5	WSW8	SSE5	SSE7	NW3.6	W14	
4-Apr	W6	ESE6	SE9	SSE7	SE11	SSE9	SSE8	SE6	SE6	SSE9	S10	SSW14	SSE10	SE10	SE11	S16	SSW14	SE9	SE6	SSE7	SSW8	SSW4	SE8	SE8	SSW7.6	S16	
5-Apr	SSE9	SE10	SSE8	SSE8	SE9	SSE12	AF	AF	AF	AF	SE15	SE19	SE27	SSE26	SSE24	S20	SSE17	S14	SSE16	SSE16	SSE17	SSE12	SSE14	SE10	SSE14.8	SE27	
6-Apr	SE9	SE9	SE8	SE10	SSE8	SE9	SSE8	SSE7	SSE12	SSE8	SSE7	SE8	SE13	SW5	W20	W18	W20	W17	WNW10	WNW9	NW8	N10	ENE11	ENE10	S2.7	W20	
7-Apr	NNE6	N7	N6	NNW8	NNW9	N11	N13	N14	N13	N14	N14	N19	N23	NNE24	NNE24	NNE25	NNE22	NNE26	NNE26	NNE24	NNE22	NNE20	N18	N17	N16.6	NNE26	
8-Apr	N23	N23	N20	N20	N27	N21	N20	N20	N18	N23	N26	NNE26	N23	N23	N23	NNE21	NNE19	NNE18	NNE18	NNE16	NNE15	N15	N13	N11	N19.9	N27	
9-Apr	N8	NNW6	NW5	NW3	W6	WSW5	W6	S5	SSE6	S8	SSE10	SSE13	SSE11	SSE12	SSE12	SSE12	SSE12	SSE14	SE12	SE12	SE13	SE13	SE11	SE12	SSE6.5	SSE14	
10-Apr	SSE12	SSE14	SSE17	SSE15	SSE11	SE12	SE11	SE14	SE11	SE11	SE10	SE9	SSE13	SSE10	SE10	SE9	SE9	SE11	SE9	SE6	SE7	SE6	SSE5	NNE5	SE9.7	SSE17	
11-Apr	NNE10	NNE12	NNE18	N18	N15	N16	NNE20	N16	N17	NNE17	N17	N16	N19	N21	N19	NNE21	NNE17	N15	N19	N26	N22	N27	N26	N20	N18.5	N27	
12-Apr	N9	N10	N11	N9	N10	N15	N11	N8	NW9	WNW11	NW8	NW11	N11	N13	N12	N12	N15	N16	N17	N16	N14	NNE14	NE10	ENE9	N10.7	N17	
13-Apr	ENE1	E3	ESE6	ESE6	E7	E14	ESE12	E11	E14	ESE13	ESE11	E12	E14	ENE18	E18	E15	E18	E20	E19	E19	ENE17	ENE16	ENE15	ENE17	E12.8	E20	
14-Apr	E15	E14	E12	ENE10	NE13	NE13	NE16	NE18	NE16	NE15	NE17	NE19	NE20	AF	AF	NE23	NE22	NE22	NE16	NE19	NE21	ENE21	NE22	NNE21	NE17.0	NE23	
15-Apr	NNE18	NNE18	NNE18	NNE18	NNE19	NNE19	NNE17	N18	NNE16	NNE14	N10	NNE9	ENE7	NE12	NW14	NNW15	NNW11	N15	N14	N12	NE9	SE13	SSE12	SSE16	NNE10.8	NNE19	
16-Apr	SE17	SE17	SSE14	SSE13	SSE16	SSE15	SE13	SE10	SE9	SE11	SE13	SSE13	SSW16	SSW19	SSW18	SSW18	SSW16	SSW15	SSW14	S12	S11	SSE11	SSE10	SSE8	SSE12.3	SSW19	
17-Apr	NNW8	N25	N24	N25	N26	N24	N21	N23	NNE24	N20	N20	NNE18	N19	NNE17	N18	NNE19	NNE18	NNE18	NNE18	NNE18	NNE16	NNE15	NNE15	NNE15	NNE19.3	N26	
18-Apr	NNE13	N16	N17	NNE19	N19	NNE18	NNE17	N13	NNE12	N10	NW12	NNW13	N13	N11	N10	N9	NNE9	NNE9	NNE12	NNE12	N11	NNW10	N10	N8	N12.3	N19	
19-Apr	N7	N8	N6	NNW8	NNW7	NNW5	NW3	WNW5	W6	W7	W6	W4	WNW3	SSW4	S3	SE7	SE9	SE7	SE4	WSW2	NE0	SSE5	SE3	SE7	WNW0.8	SE9	
20-Apr	ESE5	ESE5	ENE5	ENE6	NE7	NE7	NE7	NE5	NE5	NW6	N10	N20	N29	N27	N29	N27	N23	N19	N21	NNE13	N9	NW5	NNW8	NNW10	N11.4	N29	
21-Apr	NNE13	N14	NNE21	NNE14	NW1	NW5	N5	NNE3	ENE4	NNE6	NE5	NNE8	N5	NE4	NE4	NE2	NE2	ESE2	E3	SE2	NNE3	ENE4	SE3	S6	NNE4.5	NNE21	
22-Apr	SSW3	W3	W5	NW7	N16	N21	NNE19	NNE16	NNE21	NNE17	N17	NNE18	NNE12	N13	N14	NNE15	NNE14	N13	NNE13	N14	NNE15	NNE12	NE10	NE8	N12.3	NNE21	
23-Apr	ENE8	E7	ESE7	E5	E4	E6	E4	SE9	ESE8	ESE10	E11	ESE8	E8	E6	SE5	SE7	SE8	SSE11	SE10	SE8	SE7	SE8	SE8	ESE8	ESE7.0	SSE11	
24-Apr	SE7	E7	E9	ESE8	ESE8	ESE9	E12	ENE12	ENE13	ENE11	ENE13	E12	ESE12	ESE10	ESE12	E12	E13	E12	ESE9	ESE9	ESE8	ESE9	ESE9	ESE9	E9.7	ENE13	
25-Apr	SE10	ESE6	ESE6	SE11	SE10	SE11	SE13	SE15	SE14	SE14	SSE12	SE19	SSE15	SSE15	SSE15	SSE15	SSE15	SSE17	SSE19	SSE16	SSE15	SSE16	SSE17	SSE17	SSE15	SSE13.6	SSE19
26-Apr	SSE14	SSE14	SE12	SE12	SE10	SE11	SE14	SSE16	SSE18	SSE17	SSE19	SE20	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	SE8	SE10	SE13	----	SE20
27-Apr	SSE13	SSE13	SSE10	SSE10	SE9	SE9	SE6	SE7	SE9	ESE8	SE9	ESE12	SE10	SSE10	SE7	SW6	SW4	WSW5	WNW5	WNW6	NNW7	E1	NNE6	NNE6	SE4.8	SSE13	
28-Apr	SE2	SW6	SE4	SW3	SSW1	S4	SSE5	SE3	SSE4	ESE4	ESE3	E3	ESE2	N6	W2	NNW3	E4	ENE8	ENE7	E6	E8	ESE6	SE9	SE7	ESE2.8	SE9	
29-Apr	SE7	SSE9	SSE11	SSE8	SSE8	SSE9	SSE9	SE7	ESE7	ESE9	SSW13	SSW13	SSW15	SW11	SSW17	S16	S16	S15	SSW13	S9	S9	S9	S9	SSE9	S9.5	SSW17	
30-Apr	SSE8	SSE10	SE9	SE9	SSE12	SSE7	SSE8	SE9	SSE7	ESE7	SE11	S6	E7	ESE10	SE18	N15	NE11	ENE13	NE8	WNW1	NNW3	ENE7	E5	WSW6	ESE5.2	SE18	

ENE2.5	ENE3.4	ENE3.4	NE3.1	NE3.4	ENE3.9	NE4.4	ENE4.1	ENE3.6	ENE3.1	ENE2.9	ENE3.0	ENE3.5	NE3.4	NNE2.2	NNE3.7	NE3.6	NE4.7	NE5.8	NE4.4	NE4.0	ENE3.9	ENE4.5	ENE3.9	Diurnal Average
N23	N25	N24	N25	N27	N24	N21	N23	NNE24	N23	N26	NNE26	N29	N27	N29	N27	N23	NNE26	NNE26	N26	N22	N27	N26	NNE21	Diurnal Maximum

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

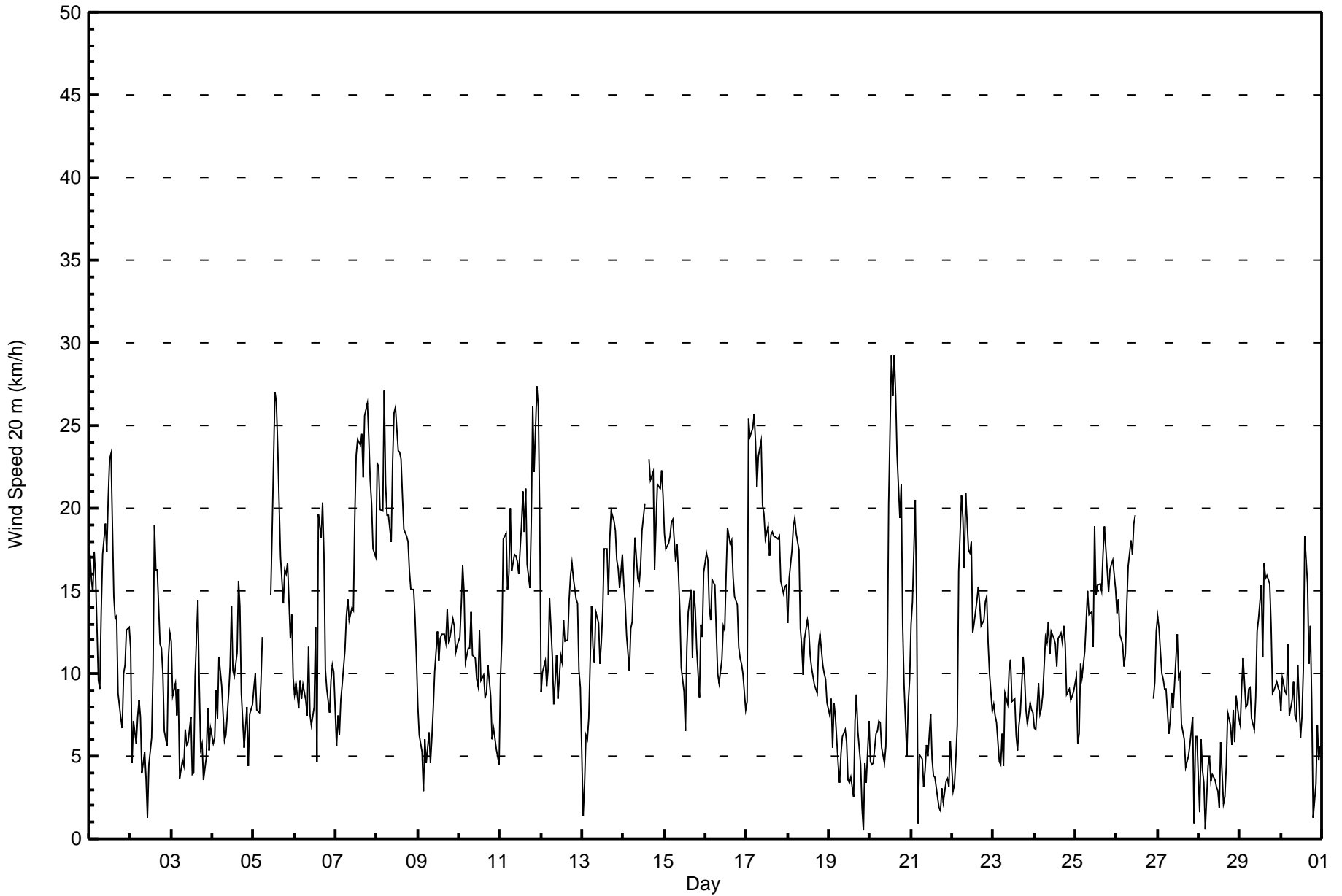
Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 10 km/h on Apr 14 22:00	Hours of Data: 705
Minimum Value: 1 km/h on Apr 22 00:00	Hours of Missing Data: 15
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 5 P ₉₀ = 6 P ₉₉ = 7	Hours of Calibration: 0
	Percent Operational Time: 97.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	3	3	3	3	3	3	3	5	5	4	5	5	4	5	3	3	3	4	3	4	4	3	2	5
2-Apr	2	3	4	3	2	1	3	2	2	2	2	6	6	6	5	5	5	5	3	3	2	2	3	4	6
3-Apr	4	3	2	2	3	3	2	2	2	2	2	2	3	4	3	2	3	2	3	2	1	1	4	4	
4-Apr	4	2	2	2	3	3	2	2	2	3	4	4	4	4	4	7	8	3	2	4	2	2	2	3	8
5-Apr	2	2	2	3	2	3	AF	AF	AF	AF	5	6	7	6	7	7	5	5	3	3	3	2	3	2	7
6-Apr	2	3	3	3	2	1	2	2	3	3	3	3	7	5	6	5	5	5	2	1	2	3	2	2	7
7-Apr	3	2	2	2	3	3	4	4	4	4	5	5	7	6	6	6	6	7	6	6	5	5	5	4	7
8-Apr	6	7	5	5	7	6	7	7	7	7	7	7	6	6	6	6	5	5	5	5	4	4	4	2	7
9-Apr	2	2	2	1	2	2	2	2	3	4	5	5	4	4	5	5	3	3	3	3	3	3	2	2	5
10-Apr	2	3	3	2	2	2	3	3	3	3	3	3	4	4	4	4	3	2	2	2	2	1	2	4	4
11-Apr	3	3	5	6	4	7	5	5	5	5	5	5	6	5	6	5	4	4	5	6	7	7	6	7	7
12-Apr	3	3	4	3	3	3	3	3	3	3	3	4	4	4	4	5	4	4	4	3	3	3	3	4	5
13-Apr	2	2	2	3	3	4	3	3	5	4	4	4	5	5	5	5	5	6	5	5	4	4	4	4	6
14-Apr	4	4	5	4	4	4	4	4	4	3	3	4	5	AF	AF	6	6	7	6	5	7	10	7	6	10
15-Apr	5	5	4	4	5	5	4	4	4	4	3	3	3	3	4	6	5	4	4	3	2	3	2	4	6
16-Apr	4	3	3	3	3	3	3	2	2	3	3	4	6	6	6	6	6	5	5	4	3	2	2	1	6
17-Apr	9	5	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	9
18-Apr	3	4	5	5	5	5	4	3	3	3	3	4	3	4	3	3	3	3	3	3	3	3	3	2	5
19-Apr	2	2	2	2	2	2	1	2	1	1	1	2	2	3	2	3	2	2	2	2	1	1	2	2	3
20-Apr	2	1	1	1	1	2	1	1	2	3	4	6	8	8	8	7	7	7	6	6	3	2	2	2	8
21-Apr	3	6	4	5	2	1	1	1	3	3	3	4	3	3	2	2	1	2	1	1	2	1	2	1	6
22-Apr	1	1	2	4	7	5	5	5	5	4	5	5	4	5	5	5	4	4	3	3	3	3	2	2	7
23-Apr	2	2	3	1	2	3	2	3	3	5	4	4	4	4	3	3	4	3	3	2	2	3	3	2	5
24-Apr	2	3	3	2	2	3	3	2	3	3	4	4	4	4	4	4	4	4	4	3	3	3	3	3	4
25-Apr	3	2	2	3	3	3	4	5	5	4	4	6	6	6	4	4	4	4	4	3	3	3	4	3	6
26-Apr	3	3	3	3	2	3	3	4	5	5	6	5	DF	DF	DF	DF	DF	DF	DF	DF	DF	2	3	4	6
27-Apr	2	2	1	2	2	2	2	2	3	2	4	4	5	5	4	4	3	2	2	1	2	2	2	2	5
28-Apr	1	2	3	2	1	1	1	1	1	2	2	2	3	4	2	2	3	2	2	1	2	1	2	2	4
29-Apr	2	2	2	2	1	2	2	2	2	3	6	5	6	5	6	7	6	6	5	3	2	2	1	1	7
30-Apr	1	2	2	2	3	2	3	3	3	2	4	3	4	4	7	7	5	4	3	2	3	2	2	2	7

9	7	6	6	7	7	7	7	7	7	7	7	7	8	8	8	7	8	7	6	6	7	10	7	7	
Diurnal Maximum																									

DF - DAS Failure AF - Analyzer Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Mannix - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	89	12.62	12.62
6 - 11	280	39.72	52.34
12 - 19	264	37.45	89.79
20 - 28	70	9.93	99.72
29 - 38	2	0.28	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Mannix - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	6	8	4	10	6	8	5	5	6	5	3	5	4	8	4	89
6 - 11	36	9	10	11	12	26	73	39	9	3	10	6	10	6	7	13	280
12 - 19	53	51	11	9	18	5	24	49	6	14	6	4	5	3	1	5	264
20 - 28	34	18	6	1	1	0	2	2	1	0	1	0	4	0	0	0	70
29 - 38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	127	84	35	25	41	37	107	95	21	23	22	13	24	13	16	22	705

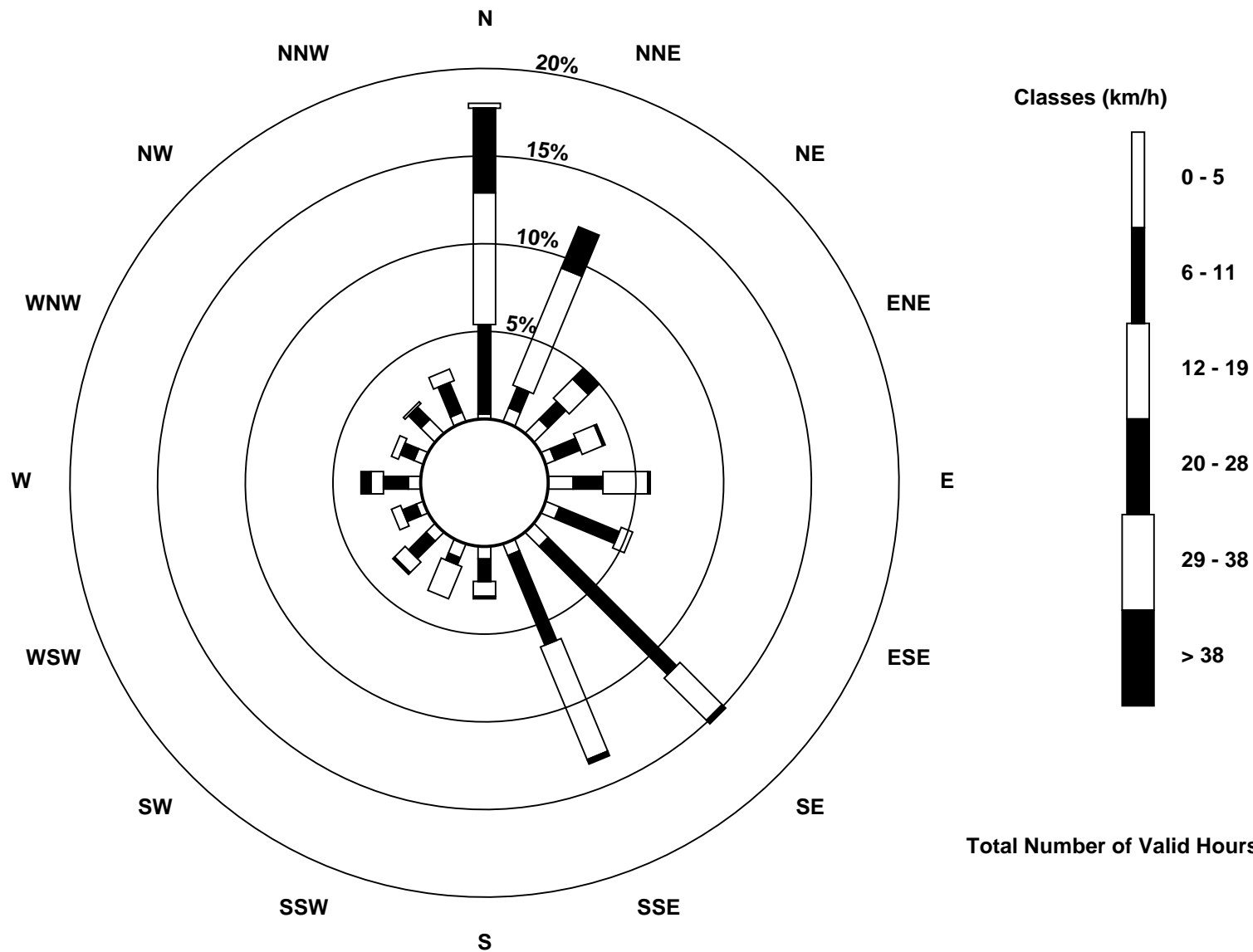
Total Number of Valid Hours: 705

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 20 m (WS20m) - km/h
Mannix (AMS 5)





Maximum Speed: 38 km/h on Apr 20 13:00	Maximum Daily Speed Average: 25.7 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 2 11:00	Minimum Daily Speed Average: 1.0 km/h on Apr 19	Hours of Data: 700
Maximum Diurnal Speed Average: 7.0 km/h at hour 19	Minimum Diurnal Speed Average: 2.7 km/h at hour 15	Hours of Missing Data: 20
Monthly Average Velocity: 4.3 km/h 50.4 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 10 Median = 14 Q ₃ = 21 P ₉₀ = 25 P ₉₉ = 34	Percent Operational Time: 97.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SW25	SW24	SW23	SW25	SW23	SW17	SW15	SW18	WSW21	SW23	SW21	SW24	WSW26	W26	W17	WNW15	W16	WNW12	N10	SW8	SW15	SW15	WSW17	WSW19	WSW17.2	WSW26	
2-Apr	WSW17	WSW8	SW13	SW9	SW11	SSW11	SSW12	S6	SSW7	S5	SE1	NW6	W8	NW13	WNW22	NNW20	N22	NNE15	N17	N14	N9	NNW9	N16	NNW18	NW6.0	N22	
3-Apr	N18	N14	N15	N13	N15	NNW8	N7	NNE5	WSW7	W5	WSW6	WSW8	W5	N4	WNW12	W16	W10	NW7	NNE7	SSW4	SW9	WSW10	S5	SE11	NW5.0	N18	
4-Apr	W8	ESE6	SE13	SSE12	SE17	SSE15	SSE13	SE9	SE7	SSE10	S14	SSW18	SSE12	SE11	SE12	S23	S21	SE10	SE6	SSE10	S14	S8	SE11	SE13	SSE10.8	S23	
5-Apr	SE15	SE15	SE12	SSE11	AF	AF	AF	AF	AF	AF	AF	ESE16	SE21	SE32	SSE31	SSE31	SSE27	SSE24	SSE22	SSE22	SSE23	SSE24	SE19	SE20	SE16	SSE20.7	SE32
6-Apr	SE15	SE15	ESE12	ESE14	SE13	SE13	SE13	SSE10	SE13	SSE9	SSE8	ESE9	SE14	SW6	W22	W20	W23	W20	W15	WNW14	NW12	N14	NE15	NE14	S3.5	W23	
7-Apr	NNE8	N11	NNE9	NNW13	NNW15	N19	N20	N21	N18	NNW18	N16	NNW24	N30	N29	N29	NNE30	NNE28	N33	NNE33	N31	N28	N27	N23	N22	N21.9	NNE33	
8-Apr	N31	N31	N28	N27	N36	N30	N26	N26	N24	N29	N32	N33	N29	N30	N29	N26	NNE23	NNE23	N23	NNE20	N19	N19	N17	N14	N25.7	N36	
9-Apr	N10	NNW7	NW6	NW3	W7	WSW5	W7	S6	SSE7	S10	SSE12	SE14	SE13	SSE15	SSE16	SE14	SSE14	SE16	SE15	SE17	SE18	SE19	SE17	SE18	SSE8.4	SE19	
10-Apr	SSE19	SSE22	SSE24	SSE22	SSE17	SE19	SE17	SE17	SE13	SE12	SE11	SE10	SE15	SE11	ESE11	ESE9	ESE10	SE13	SE11	ESE9	SE12	SE10	SSE10	NE5	SE13.2	SSE24	
11-Apr	NNE15	NNE17	N25	N26	N20	N22	N25	N21	N21	N21	N21	N19	N24	N25	N23	N26	N20	N19	N25	N35	N30	N36	N34	N28	N24.0	N36	
12-Apr	NNW13	N14	N15	N14	N14	N20	N15	NNW10	NW11	NNW13	NW10	NW13	N13	N16	N14	N15	N17	N20	N22	N22	N21	NNE19	NE13	ENE11	N14.0	N22	
13-Apr	E3	E6	ESE8	ESE7	E9	E17	E14	E12	E16	E14	E12	E14	ENE16	ENE20	ENE20	E17	ENE22	E24	E24	E23	ENE21	ENE20	ENE18	ENE21	E15.4	E24	
14-Apr	E18	ENE16	ENE15	ENE13	NE16	NE17	NNE21	NNE24	NE20	AF	NE20	NE23	NE25	AF	AF	AF	AF	NE28	NE21	NE24	NE27	NE26	NNE28	N26	NE20.7	NNE28	
15-Apr	NNE23	NNE22	NNE23	NNE23	N24	N24	N21	N22	N20	N16	N13	NNE11	NE7	NNE13	NW18	NNW18	NNW13	N19	N18	N17	NE12	SE19	SE18	SE21	NNE13.4	N24	
16-Apr	SE22	SE22	SE18	SE17	SE21	SSE20	SE15	SE12	SE11	SE12	SE15	SSE14	S21	S26	SSW24	SSW24	SSW22	SSW21	S22	S20	SSE17	S17	SSE15	SSE12	SSE16.8	S26	
17-Apr	NNW10	N33	N32	N33	N34	N32	N28	N30	N30	N25	N25	N22	N23	NNE21	N22	N23	N22	NNE22	N23	N23	N19	N19	N19	NNE18	N24.3	N34	
18-Apr	NNE17	N20	N22	N24	N24	N23	N21	N16	N14	N11	NW14	NW16	N15	N13	N12	N11	NNE10	N11	NNE14	N15	N14	NNW13	N13	NNW11	N15.1	N24	
19-Apr	N10	N11	NNW8	NNW11	NNW10	NNW7	NNW4	WNW6	W6	W7	W6	W4	W4	SSW4	S4	SE8	SE10	ESE7	SE5	WSW3	WNW1	SSE4	SE5	SE13	NW1.0	SE13	
20-Apr	SE7	ESE6	E6	E8	ENE7	NE9	NE10	NE7	NNE5	NW7	NNW12	N27	N38	N36	N38	N36	N30	N26	N28	NNE17	NNW13	NNW7	NW12	NNW14	N14.8	N38	
21-Apr	N18	N20	N27	NNE20	NE2	NW7	NNW6	N3	NE4	NNE7	NNE6	NNE8	N6	NNE4	NNE4	NNE3	NE2	E2	E3	SE3	NNE4	ENE5	ESE5	SSE9	NNE5.9	N27	
22-Apr	SSE6	SSE4	SW5	NW12	N22	N28	N25	N21	N26	N21	N22	N21	N14	N15	N17	N18	N17	N15	N16	N18	N19	NNE17	NE14	NE10	N15.2	N28	
23-Apr	ENE10	E9	ESE8	ESE5	E6	E8	ENE5	ESE10	E9	E12	E12	ESE9	E9	E7	SE6	SE7	SE9	SE12	SE10	SE10	ESE8	ESE10	ESE9	ESE9	ESE8.2	SE12	
24-Apr	SE9	E8	E11	E9	E9	ESE10	ENE14	NE13	NE15	NE13	ENE14	E14	ESE13	ESE12	E14	E14	E14	E15	ENE14	ESE10	ESE10	ESE10	ESE10	ESE10	E11.2	E15	
25-Apr	ESE12	ESE8	ESE9	SE15	SE13	SE15	SE15	ESE16	SE15	SE16	SSE14	SE22	SSE18	SSE19	SSE18	SSE18	SSE20	SSE23	SSE19	SSE18	SSE22	SSE21	SE22	SE20	SE16.8	SSE23	
26-Apr	SE18	SE19	SE17	SE16	SE14	SE16	SE18	SSE20	SSE22	SSE22	SE22	SE23	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	SE13	SE14	SE17	----	SE23
27-Apr	SSE20	SSE19	SSE15	SE14	SE13	SE13	ESE9	SE8	SE10	ESE8	ESE10	ESE14	ESE11	SSE13	SE7	SW6	SW5	WSW5	WNW6	WNW7	NNW10	ENE2	NE8	NNE8	SE6.5	SSE20	
28-Apr	E3	S8	SE5	SSW4	WNW5	SSW5	S6	SE3	SSE4	ESE3	ESE3	E3	ESE2	N7	W2	NNW3	ENE5	NE8	ENE8	ENE7	E10	E9	ESE10	SE10	ESE3.0	E10	
29-Apr	SE11	SSE14	SSE16	SSE12	SSE13	SSE14	SSE12	ESE7	E7	E9	SSW16	SSW18	SSW21	SSW13	SSW22	S22	SSE21	S22	S19	S15	S16	S18	SSE17	SSE15	S14.1	SSW22	
30-Apr	SSE13	SSE15	SE16	SE16	SSE20	SSE14	SSE11	SE11	SSE9	ESE7	SE12	S7	E8	ESE11	SE21	N19	NNE13	NE15	NE9	W1	NNW5	NE9	E9	SSE3	ESE7.1	SE21	
E3.4 ENE4.4 ENE4.4 NE3.9 NE4.3 NE5.2 NE5.2 NE4.9 NE4.3 NE3.1 ENE3.3 NE3.4 NE4.1 NE4.0 NNE2.7 N3.7 NE3.5 NE5.6 NE7.0 NE5.6 NE4.8 ENE5.0 ENE5.9 E5.4																								Diurnal Average			
N31 N33 N32 N33 N36 N32 N28 N30 N30 N29 N32 N33 N38 N36 N38 N36 N30 N33 NNE33 N35 N30 N36 N34 N28																								Diurnal Maximum			

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 45 m (WS45m) - km/h

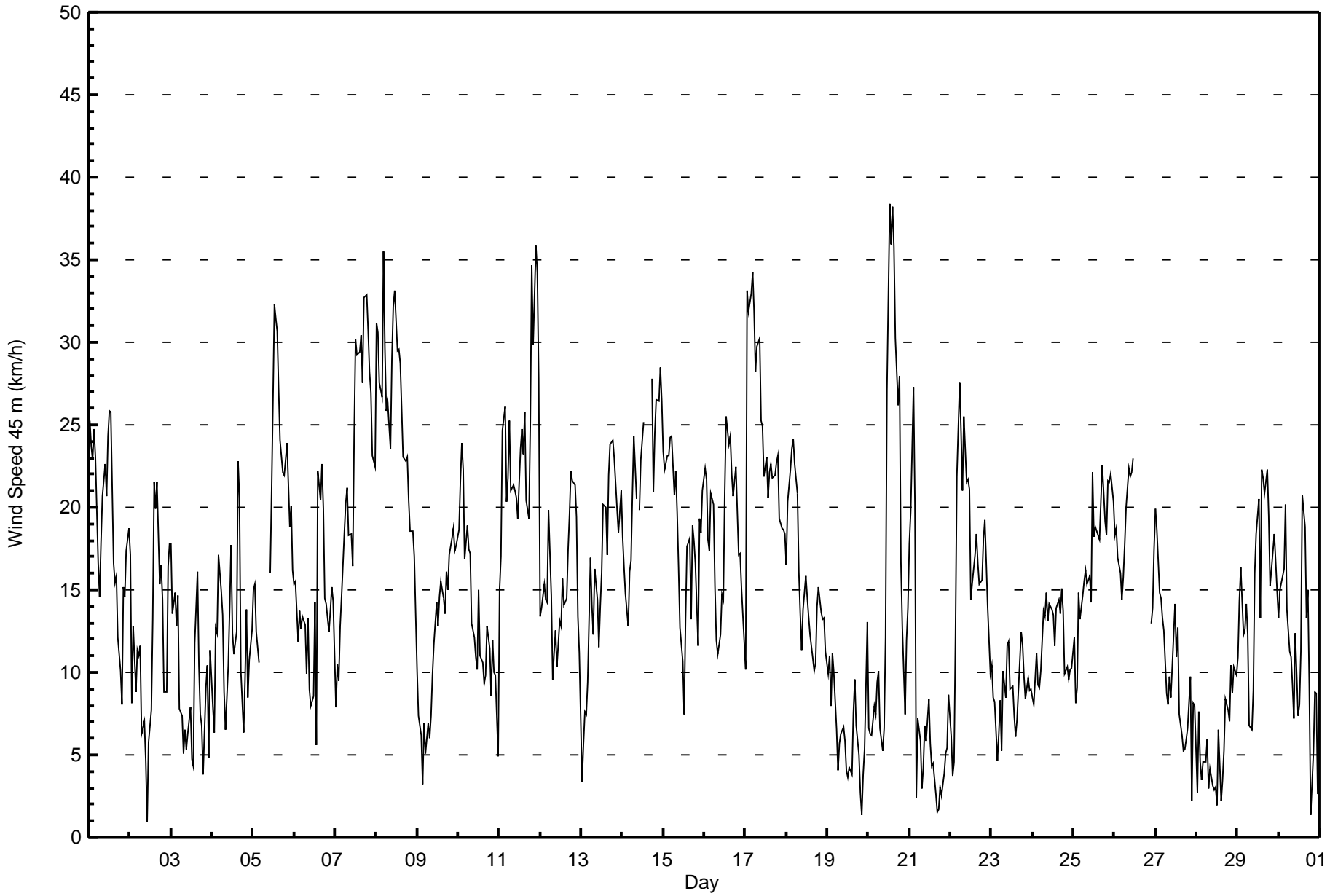
Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 10 km/h on Apr 14 22:00	Hours of Data: 700
Minimum Value: 1 km/h on Apr 3 22:00	Hours of Missing Data: 20
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8	Hours of Calibration: 0
	Percent Operational Time: 97.2

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	4	3	3	3	3	3	3	4	4	4	4	5	6	4	5	3	3	3	4	5	5	5	3	2	6	
2-Apr	2	5	4	4	2	1	2	2	2	2	2	8	6	7	4	5	5	6	4	4	2	3	3	4	8	
3-Apr	4	4	3	3	3	3	3	2	2	2	2	2	2	2	3	3	2	3	2	4	1	1	2	5	5	
4-Apr	3	4	2	2	2	3	2	3	2	4	4	3	3	4	4	9	9	3	2	5	1	2	2	3	9	
5-Apr	2	2	2	4	AF	AF	AF	AF	AF	AF	4	7	7	6	5	6	5	5	3	3	3	2	3	2	7	
6-Apr	2	2	3	4	3	2	2	2	3	3	2	2	3	8	5	6	5	4	2	2	2	4	2	2	8	
7-Apr	4	3	4	2	3	3	3	3	3	4	5	5	5	6	7	5	6	7	6	5	4	5	4	4	7	
8-Apr	5	7	5	4	6	6	6	7	7	7	7	6	6	6	6	6	5	5	5	5	3	4	3	2	7	
9-Apr	2	1	2	1	2	2	2	2	3	4	5	4	5	4	5	4	3	3	3	3	3	3	2	3	5	
10-Apr	3	3	2	2	2	2	3	3	3	3	3	2	3	4	4	3	3	2	2	3	3	1	1	5	5	
11-Apr	2	3	5	6	4	8	5	4	5	4	5	4	5	4	5	4	4	3	4	4	8	6	4	7	8	
12-Apr	3	3	3	4	3	3	3	2	2	2	3	4	4	4	4	4	4	3	3	3	3	3	3	5	5	
13-Apr	2	3	2	3	3	4	3	3	4	4	4	4	5	5	6	5	5	5	6	5	5	4	4	4	6	
14-Apr	5	5	5	5	4	4	4	4	4	4	AF	3	4	5	AF	AF	AF	AF	7	6	6	8	10	8	6	10
15-Apr	5	5	5	4	4	4	4	4	3	3	3	3	4	5	7	4	4	3	3	2	3	4	2	4	7	
16-Apr	4	3	3	2	3	2	3	2	2	2	3	4	5	5	6	5	5	4	4	5	3	2	1	2	6	
17-Apr	10	4	5	5	5	5	5	5	5	5	4	5	5	5	4	5	5	5	4	4	4	5	4	4	10	
18-Apr	3	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2	2	3	2	3	2	3	2	4	
19-Apr	2	2	2	2	2	2	1	1	1	1	1	1	2	3	3	3	2	2	2	3	1	1	3	2	3	
20-Apr	3	1	1	1	1	2	1	2	2	3	3	6	7	8	7	6	7	7	6	6	3	2	2	2	8	
21-Apr	2	6	3	6	2	1	1	1	3	3	3	4	3	3	2	2	1	2	1	1	3	1	1	1	6	
22-Apr	2	2	2	5	7	5	5	5	4	3	4	4	4	4	5	4	4	4	3	2	3	3	2	2	7	
23-Apr	1	2	2	2	2	3	2	3	3	5	5	4	4	4	3	3	4	3	3	3	3	4	3	3	5	
24-Apr	3	3	3	3	3	3	3	2	3	3	4	4	4	4	4	5	4	4	3	3	3	3	3	3	5	
25-Apr	3	2	3	3	3	3	4	4	5	4	5	6	5	4	3	4	4	4	3	3	3	3	3	3	6	
26-Apr	2	2	3	3	3	3	3	4	4	4	5	5	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	2	3	4	5
27-Apr	2	2	1	1	2	2	3	2	2	2	4	5	5	5	5	4	3	2	2	1	2	2	2	2	5	
28-Apr	1	3	3	3	2	1	1	1	2	2	2	3	3	5	2	3	3	2	2	2	2	2	2	3	5	
29-Apr	2	2	1	3	2	2	3	2	2	3	6	5	5	5	6	6	5	6	5	2	2	1	1	1	6	
30-Apr	1	1	2	2	3	3	2	2	3	2	4	3	4	4	7	7	5	4	3	2	3	2	2	1	7	

10	7	5	6	7	8	6	7	7	7	7	7	8	7	8	7	9	9	7	6	6	8	10	8	7	
Diurnal Maximum																									

DF - DAS Failure AF - Analyzer Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - April 2017

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	60	8.57	8.57
6 - 11	178	25.43	34.00
12 - 19	260	37.14	71.14
20 - 28	166	23.71	94.86
29 - 38	36	5.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - April 2017

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	6	4	4	5	5	6	4	3	4	2	3	6	2	1	3	60
6 - 11	12	9	9	5	19	34	27	12	6	3	6	5	8	3	7	13	178
12 - 19	55	11	11	9	15	8	66	36	7	5	6	3	4	5	8	11	260
20 - 28	67	17	9	7	2	0	12	20	8	6	8	3	4	1	0	2	166
29 - 38	30	3	0	0	0	0	1	2	0	0	0	0	0	0	0	0	36
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	166	46	33	25	41	47	112	74	24	18	22	14	22	11	16	29	700

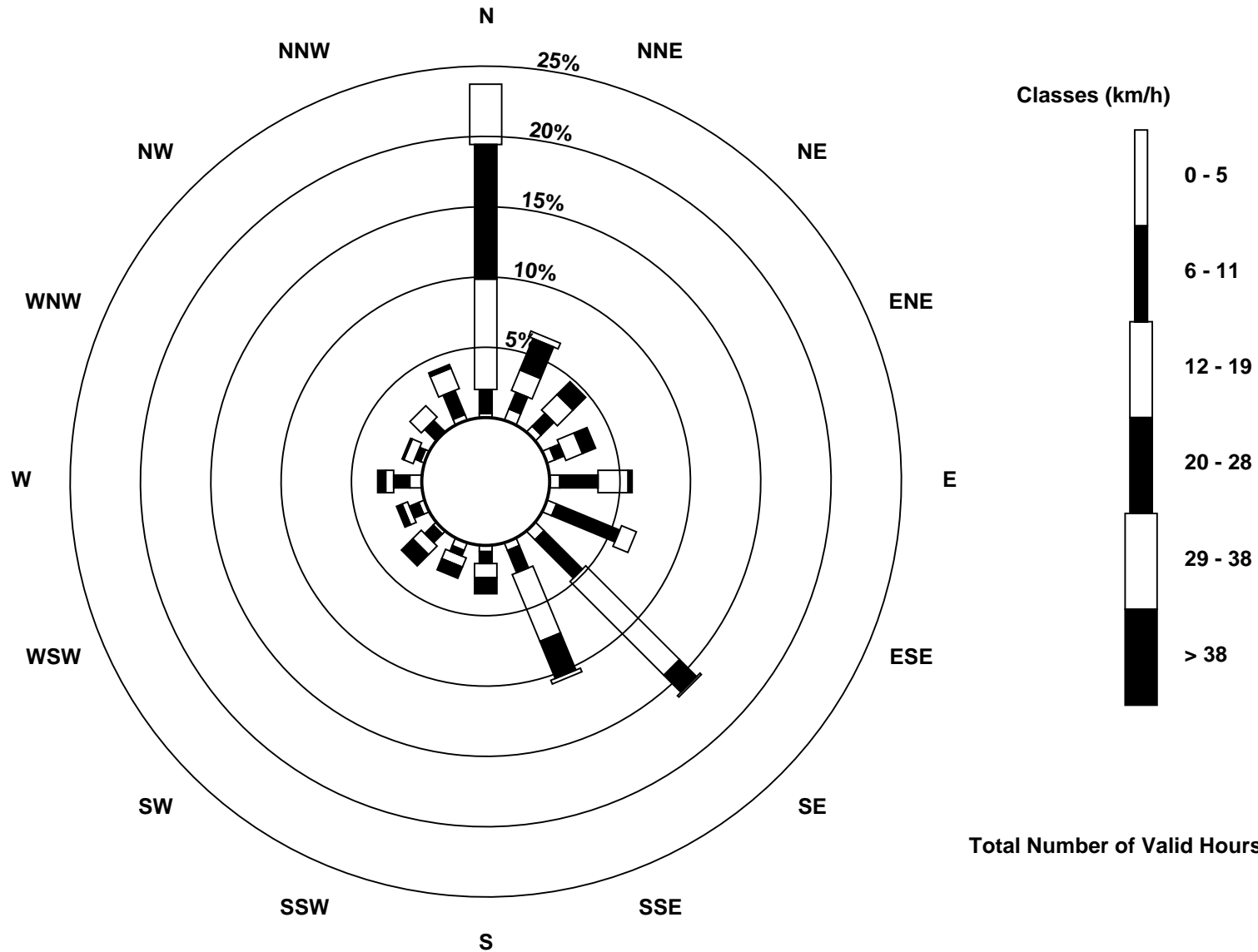
Total Number of Valid Hours: 700

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 45 m (WS45m) - km/h
Mannix (AMS 5)





Maximum Speed: 42 km/h on Apr 20 13:00	Maximum Daily Speed Average: 28.8 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 30 20:00	Minimum Daily Speed Average: 1.3 km/h on Apr 19	Hours of Data: 706
Maximum Diurnal Speed Average: 8.1 km/h at hour 19	Minimum Diurnal Speed Average: 3.6 km/h at hour 11	Hours of Missing Data: 14
Monthly Average Velocity: 5.0 km/h 53.8 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 10 Median = 17 Q ₃ = 23 P ₉₀ = 28 P ₉₉ = 38	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW30	SW29	SW28	SW30	WSW28	SW22	SW18	SW21	WSW23	SW25	SW22	SW26	WSW27	W27	W17	WNW16	W16	WNW13	N12	SW6	SW19	WSW17	WSW20	WSW23	WSW19.6	SW30
2-Apr	WSW21	WSW11	WSW16	SW12	WSW12	SW11	SW12	SW6	SSW7	SSW5	SW1	NW7	WNW9	NW14	WNW22	NNW21	N25	NNE18	N20	N18	N11	N11	N20	NNW22	NW7.4	N25
3-Apr	N22	N18	N19	N18	N20	N12	N11	NNE7	WSW5	W4	WSW6	W7	WNW4	N5	WNW12	W16	WNW10	NW8	NE8	SSW2	WSW11	WSW14	SSW5	SE11	NNW6.1	N22
4-Apr	SW8	ESE5	SE17	SSE16	SE23	SSE19	SSE20	SSE13	SE6	SSE10	S15	SSW19	SSE13	SE10	SE11	S25	S22	SE10	SE6	SSE10	S15	S11	SE13	SE16	SSE12.7	S25
5-Apr	SE20	SE19	SE19	SE18	SE22	SE20	AF	AF	AF	AF	ESE12	SE20	SE35	SE34	SSE33	SSE30	SSE28	SSE26	SSE26	SSE28	SSE29	SSE25	SE26	SSE22	SSE24.2	SE35
6-Apr	SE21	SE20	SE14	SE15	SE17	SE15	SE14	SSE13	SSE14	S9	SSE8	ESE7	SE14	SW6	W23	W22	W23	W21	W16	WNW17	NW14	NNE17	NE20	NE19	S3.7	W23
7-Apr	NE10	NE10	NE11	N12	NNW18	N21	N24	NNE24	N20	N20	N17	N26	N33	NNE32	NNE33	NNE34	NNE31	NNE37	NNE38	NNE36	NNE33	N31	N27	N25	N24.7	NNE38
8-Apr	N35	N35	N31	N30	N39	N34	N30	N29	N26	N32	N35	N37	N33	N33	N32	N29	NNE26	NNE26	NNE26	NNE23	N20	N20	N18	N14	N28.8	N39
9-Apr	N11	N7	NW6	NW3	W7	WSW5	W6	S7	SSE8	SSE10	SSE12	SE14	SE13	SSE15	SSE17	SE15	SSE14	SE17	SE17	SE19	SE21	SE26	SE24	SE24	SSE9.8	SE26
10-Apr	SSE26	SSE28	SSE29	SSE27	SSE23	SSE24	SE23	SE21	SE14	SE12	SE11	SE10	SE16	SE11	ESE9	ESE9	ESE9	SE13	SE10	ESE8	SE16	SE13	SSE13	NE4	SE15.2	SSE29
11-Apr	NNE18	NNE22	N31	N31	N23	N25	N28	N23	N24	N23	N23	N21	N25	N27	N25	N28	N22	N22	N28	N38	N34	N39	N38	N32	N26.9	N39
12-Apr	N17	N16	N17	N18	N17	N24	N18	N10	NNW11	NW12	NW10	NW14	N13	N17	N15	N15	N18	N21	N25	N26	NNE27	NNE25	ENE16	E12	N15.9	NNE27
13-Apr	ESE5	E7	SE8	ESE6	E9	E15	E11	E12	E15	E11	E10	E14	ENE16	ENE21	ENE20	E16	ENE23	E23	E22	E24	ENE26	ENE23	ENE22	ENE24	E15.6	ENE26
14-Apr	E19	ENE17	ENE16	ENE14	NE19	NE21	NE25	NE29	NE25	NE24	NE23	NE26	NE29	AF	NNE28	NE33	NE32	NE31	NE25	NE29	NE30	NE30	NNE33	NNE30	NE24.9	NE33
15-Apr	NNE27	NNE27	NNE28	NNE27	NNE28	N27	NNE23	N24	N21	NNE18	N14	NE12	NE8	NNE15	NNW19	NNW19	NNW14	N20	N19	N19	NE13	SE24	SE24	SE26	NNE15.1	NNE28
16-Apr	SE27	SE27	SE22	SE21	SSE26	SSE24	SSE18	SSE14	SE12	SE13	SE15	SSE15	S22	S27	SSW25	SSW26	SSW24	SSW23	S25	S24	S20	S21	SSE18	S12	SSE19.3	SE27
17-Apr	NNW11	N36	N35	N36	N38	N36	N32	N33	N33	N28	N28	NNE25	N25	NNE24	N24	N24	NNE24	NNE24	N25	NNE27	N22	NNE22	NNE22	NNE21	N27.1	N38
18-Apr	NNE19	N22	N24	N25	N27	N25	NNE23	N18	N15	N12	NW14	NNW16	N15	N14	N13	N12	NNE11	NNE11	NNE15	N16	N15	NNW14	N15	N13	N16.3	N27
19-Apr	N11	N12	N9	NNW12	N11	N7	NNW4	NW5	WNW6	W6	W5	W4	W3	SSW5	S4	SE7	SE9	ESE6	SE5	WSW3	WNW2	SSE3	SE5	SE15	NNW1.3	SE15
20-Apr	SE9	ESE5	E6	E7	E7	ENE9	ENE11	ENE8	NE6	NW6	N13	N29	N42	N41	N42	N40	N34	N30	N32	NNE20	N16	NNW9	NNW14	N17	N16.3	N42
21-Apr	NNE22	N24	N32	NNE28	ENE6	NNW6	NNW6	N3	NE5	NNE7	NNE6	NNE9	N6	NNE4	NNE5	NNE3	ENE1	E2	ENE3	SE2	NNE4	ENE6	ESE5	SE10	NNE7.2	N32
22-Apr	SSE8	S5	SSW6	NW13	N26	N31	N28	N23	N27	N23	N23	N23	NNE15	N17	N18	N20	N18	N17	NNE17	N19	NNE23	NNE22	NE17	ENE12	N16.7	N31
23-Apr	ENE11	E7	ESE7	ESE5	E4	E8	E6	SE9	E7	E11	E11	ESE9	E9	E8	SE6	ESE6	SE9	SE12	SE12	SE12	ESE7	ESE9	ESE7	ESE7	ESE7.8	SE12
24-Apr	SE10	E8	E11	E8	E8	E8	ENE14	NE15	NE17	ENE15	ENE15	E14	ESE11	ESE10	E12	E13	E12	E13	ENE14	ESE9	ESE8	ESE7	ESE8	ESE9	E10.6	NE17
25-Apr	SE12	ESE7	ESE9	SE17	SE15	SE17	SE15	ESE13	SE14	SE16	SSE15	SE22	SSE19	SSE20	SE19	SSE19	SSE21	SSE24	SSE21	SSE20	SSE25	SSE25	SE26	SSE25	SE17.8	SE26
26-Apr	SE23	SE23	SE22	SE20	SE19	SE21	SE21	SSE21	SSE24	SSE23	SE23	SE23	DF	DF	DF	DF	DF	DF	DF	DF	DF	SE14	SE18	SE22	----	SSE24
27-Apr	SSE26	SSE23	SSE19	SSE19	SE17	SE15	SE12	SE9	SE9	ESE7	ESE9	ESE12	SE10	SSE14	SE8	SW6	SW5	WSW5	WNW6	WNW6	N10	NE4	NE10	NE9	SE7.7	SSE26
28-Apr	NE4	S8	ESE3	SW3	WNW6	WSW6	SSW6	SSE3	S4	SE3	SE3	ENE3	E2	N7	W1	NNW4	ENE6	ENE9	ENE8	ENE9	E12	E8	ESE8	SE9	E2.6	E12
29-Apr	SSE15	S16	SSE20	SSE16	SSE15	SSE15	SSE13	ESE5	ESE5	ESE7	SSW17	SSW20	SSW22	SSW15	S24	S23	SSE22	S24	S21	S18	S19	S20	SSE17	SSE20	S16.0	S24
30-Apr	SSE17	SSE13	SSE21	SSE23	SSE26	SSE21	SSE16	SSE13	SSE10	ESE7	SE12	SSE8	E8	ESE9	SE19	N20	NE15	NE17	NE10	WSW1	NNW7	NE8	E10	E3	SE8.0	SSE26

E4.5	ENE4.7	ENE4.9	ENE4.2	ENE4.8	ENE5.5	NE5.9	NE5.4	NE4.9	NE4.2	ENE3.6	NE4.0	NE4.8	NE4.7	NNE4.2	NNE5.2	NE5.1	NE6.5	NE8.1	NE6.7	NE5.9	ENE6.1	ENE6.9	E6.5	Diurnal Average	
N35	N36	N35	N36	N39	N36	N32	N33	N33	N33	N32	N35	N37	N42	N41	N42	N40	N34	NNE37	NNE38	N38	N34	N39	N38	N32	Diurnal Maximum

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 75 m (WS75m) - km/h

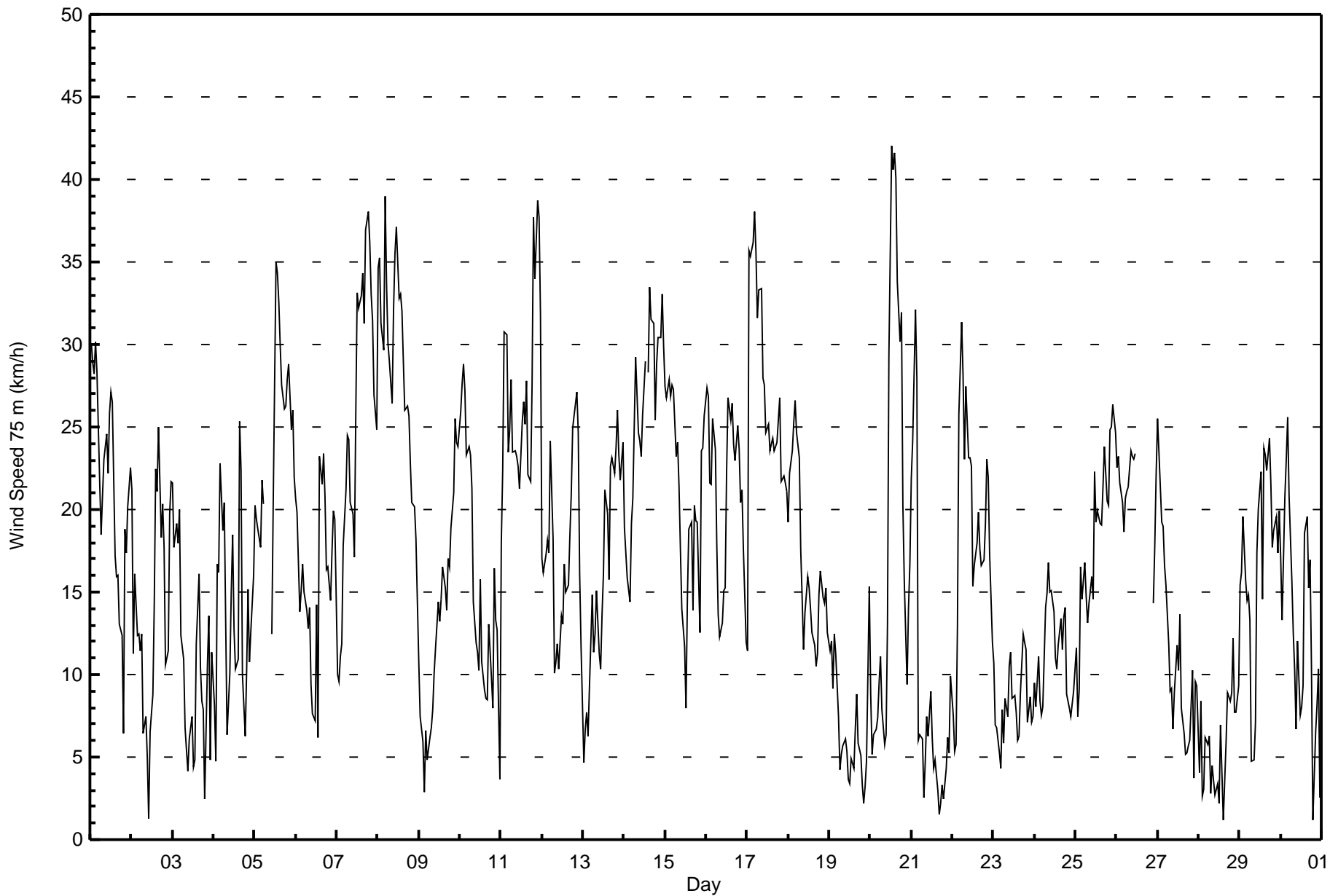
Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 11 km/h on Apr 14 22:00	Hours of Data: 706
Minimum Value: 1 km/h on Apr 28 06:00	Hours of Missing Data: 14
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 6 P ₉₉ = 8	Hours of Calibration: 0
	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	3	3	3	3	3	3	3	4	4	4	4	5	4	5	3	3	3	5	5	6	5	3	2	6
2-Apr	2	6	4	4	2	1	2	2	2	2	2	8	7	7	4	5	5	6	4	5	3	4	3	4	8
3-Apr	4	3	3	3	3	4	4	3	2	2	2	2	2	3	3	2	3	1	4	3	1	2	4	4	
4-Apr	3	4	2	3	3	3	1	2	2	5	3	3	4	4	10	9	3	3	4	1	2	2	3	10	
5-Apr	2	2	1	3	2	2	AF	AF	AF	AF	5	9	7	6	5	6	6	5	3	3	2	2	2	9	
6-Apr	2	1	4	4	3	3	3	2	3	3	3	3	8	5	6	5	4	2	3	2	4	3	3	8	
7-Apr	6	3	4	3	3	1	2	3	2	4	4	5	5	6	6	5	6	7	6	5	4	4	4	7	
8-Apr	5	6	4	4	5	5	6	7	8	6	6	5	6	5	6	5	5	4	4	3	3	2	2	8	
9-Apr	2	2	2	1	1	2	2	2	3	4	5	4	5	5	5	4	3	3	4	4	4	3	2	5	
10-Apr	2	2	2	2	2	1	2	3	3	3	3	3	4	4	4	4	4	3	3	4	3	1	1	5	
11-Apr	2	3	5	6	4	8	5	4	5	4	4	4	5	4	5	3	4	3	3	3	8	6	3	6	
12-Apr	3	3	3	3	3	2	4	2	2	2	3	4	4	4	4	4	4	3	3	3	2	3	3	6	
13-Apr	2	3	3	3	3	5	3	4	4	4	4	4	6	6	7	6	7	7	6	5	4	5	5	7	
14-Apr	6	5	6	5	4	4	4	4	3	3	3	4	6	AF	5	6	5	7	5	6	8	11	8	11	
15-Apr	5	5	4	4	4	4	4	3	3	3	3	3	4	5	7	5	4	3	3	1	5	6	2	7	
16-Apr	4	3	4	2	3	2	3	2	2	2	3	4	4	4	5	5	6	4	4	4	3	2	2	6	
17-Apr	10	3	4	4	4	5	5	6	4	4	4	4	4	5	4	4	4	4	4	3	4	4	3	10	
18-Apr	3	4	4	4	4	4	4	3	2	3	3	3	3	3	3	3	2	2	2	2	3	2	3	4	
19-Apr	2	2	2	2	2	2	1	1	1	1	1	1	2	2	3	3	3	2	2	2	2	1	3	3	
20-Apr	3	2	2	2	1	2	1	2	2	3	4	6	6	7	6	5	7	7	6	7	4	2	2	7	
21-Apr	2	6	3	6	5	1	2	1	2	3	3	4	3	2	2	2	2	1	1	1	3	2	2	6	
22-Apr	2	2	1	7	7	4	5	5	4	3	3	4	4	4	5	4	4	4	3	2	2	2	3	7	
23-Apr	3	3	2	3	2	3	2	3	3	5	5	4	4	3	3	3	4	3	4	3	3	4	3	5	
24-Apr	3	3	4	3	3	3	3	2	2	3	4	5	4	4	5	4	4	4	4	3	3	3	3	5	
25-Apr	4	2	5	3	4	3	5	5	6	4	5	6	5	4	3	4	3	3	3	3	3	3	2	6	
26-Apr	2	2	3	2	2	3	3	4	3	4	6	6	DF	DF	DF	DF	DF	DF	DF	DF	DF	3	3	6	
27-Apr	2	2	2	1	1	2	3	3	3	2	4	5	5	5	4	3	2	2	1	3	2	2	2	5	
28-Apr	2	2	2	2	1	1	1	1	2	2	2	2	4	5	3	2	4	2	2	3	3	2	3	5	
29-Apr	2	2	2	2	1	1	3	2	2	3	6	4	5	5	6	6	5	7	5	3	2	2	1	7	
30-Apr	2	3	1	2	3	2	4	2	3	3	4	4	4	4	7	7	6	4	3	2	2	1	2	7	

10	6	6	7	7	8	6	7	8	6	6	9	7	8	7	10	9	7	7	7	8	11	8	6	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 75 m (WS75m) - km/h
Mannix - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	58	8.22	8.22
6 - 11	162	22.95	31.16
12 - 19	205	29.04	60.20
20 - 28	212	30.03	90.23
29 - 38	63	8.92	99.15
> 38	6	0.85	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 75 m (WS75m) - km/h
Mannix - April 2017

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	4	4	3	4	8	5	2	3	4	3	5	5	2	2	2	58
6 - 11	13	6	10	10	24	30	23	8	4	4	5	4	4	6	5	6	162
12 - 19	43	10	8	10	13	3	45	33	6	3	4	4	4	4	6	9	205
20 - 28	57	32	8	7	3	0	31	36	11	7	6	6	5	1	0	2	212
29 - 38	36	10	8	0	0	0	2	4	0	0	3	0	0	0	0	0	63
> 38	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Totals	157	62	38	30	44	41	106	83	24	18	21	19	18	13	13	19	706

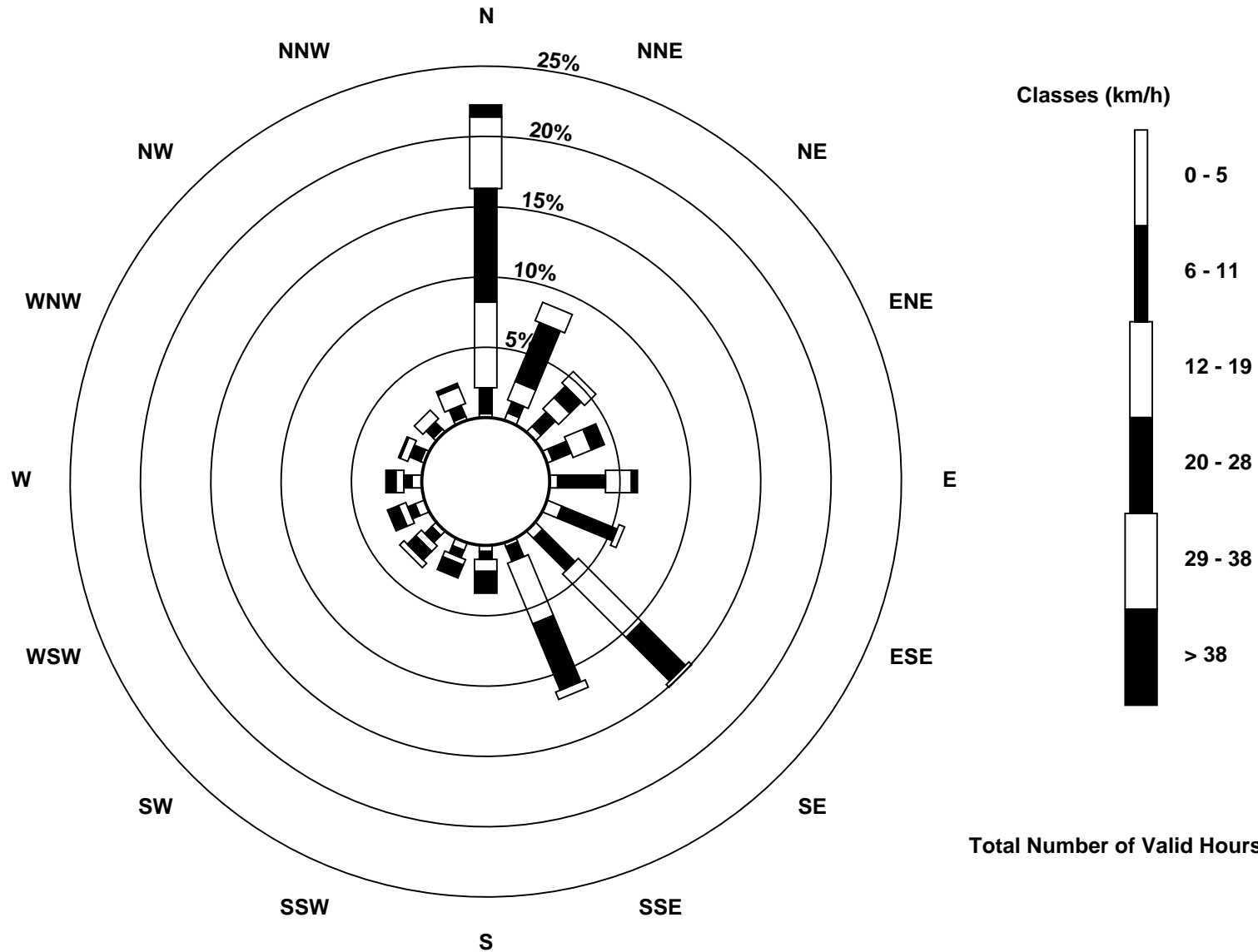
Total Number of Valid Hours: 706

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 75 m (WS75m) - km/h
Mannix (AMS 5)





Maximum Speed: 43 km/h on Apr 20 13:00	Maximum Daily Speed Average: 29.8 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 30 20:00	Minimum Daily Speed Average: 1.1 km/h on Apr 19	Hours of Data: 707
Maximum Diurnal Speed Average: 8.2 km/h at hour 19	Minimum Diurnal Speed Average: 3.7 km/h at hour 11	Hours of Missing Data: 13
Monthly Average Velocity: 5.2 km/h 58.4 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 11 Median = 17 Q ₃ = 24 P ₉₀ = 30 P ₉₉ = 40	Percent Operational Time: 98.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW32	SW31	SW31	SW33	WSW31	SW24	SW20	WSW22	WSW24	WSW25	SW23	SW27	WSW28	W28	W18	WNW17	W17	WNW14	N13	SW6	SW20	WSW19	W22	WSW24	WSW21.0	SW33
2-Apr	WSW23	WSW13	WSW18	WSW14	WSW13	SW12	SW13	SW7	SW8	SSW5	SW3	NW7	WNW10	NW15	WNW24	NNW22	N26	NNE19	NNE21	NNE19	NNE12	N12	N21	N23	NW8.3	N26
3-Apr	N23	N19	N21	N20	N22	N15	NNE13	NNE7	WSW5	W4	WSW6	W8	WNW4	N5	NW12	W17	WNW11	NW9	NE8	S2	WSW10	WSW14	SSW6	SE12	NNW6.6	N23
4-Apr	SW8	ESE6	SE15	SSE17	SSE23	SSE19	SSE21	SSE13	SE7	SSE10	S15	SSW19	SSE13	SE11	SE13	S25	S23	SE11	SE7	SSE11	S15	S12	SE14	SE17	SSE13.2	S25
5-Apr	SSE22	SE20	SSE21	SE23	SE23	AF	AF	AF	AF	ESE16	SE23	SE36	SSE35	SSE33	SSE30	SSE28	S27	SSE28	SSE30	SSE31	SSE27	SSE28	SSE24	SSE25.8	SE36	
6-Apr	SSE22	SE21	SE18	SE18	SE18	SE17	SSE15	SSE14	SSE15	S10	SSE8	SE8	SE14	SW7	W24	W23	W24	W22	W18	WNW18	NW15	NNE19	NE22	NE21	S4.3	W24
7-Apr	NE11	NE10	NE11	N11	N18	N21	N26	NNE24	N21	N20	N17	N26	N34	NNE33	NNE34	NNE35	NNE32	NNE38	NNE40	NNE38	NNE35	NNE33	NNE28	N26	NNE25.5	NNE40
8-Apr	N35	N38	N33	N31	N40	N35	N31	N30	N28	N33	N37	N38	N34	N34	N33	N30	NNE27	NNE27	NNE26	NNE23	NNE21	N21	N19	N15	N29.8	N40
9-Apr	NNE11	N7	NNW6	NW3	W7	WSW5	W6	S7	SSE8	S11	SSE12	SE15	SSE14	SSE15	SSE17	SSE16	SSE14	SE17	SE18	SE21	SE23	SE28	SSE27	SSE27	SSE10.6	SE28
10-Apr	SSE28	SSE28	SSE29	S28	SSE25	SSE24	SSE24	SSE22	SSE15	SE13	SE12	SE11	SSE16	SE12	ESE11	ESE10	SE10	SE14	SE10	ESE11	SE18	SSE14	SSE14	ENE3	SSE16.0	SSE29
11-Apr	NNE18	NNE24	N33	N32	N25	N26	N29	N24	N24	N24	N23	N22	N26	N27	N26	N28	N23	N22	N28	N38	N35	N40	N39	N33	N27.8	N40
12-Apr	N19	N17	N18	N19	N19	N25	N20	N10	NNW11	NW12	NW11	NW14	N13	N17	N15	N16	N19	N21	N26	N27	NNE29	NNE27	ENE17	E14	N16.5	NNE29
13-Apr	ESE6	ESE9	SE10	ESE10	E12	E21	ESE19	E14	E18	ESE16	ESE12	E15	E17	ENE22	E22	E20	E25	E28	E28	E27	ENE28	ENE25	ENE23	ENE25	E18.4	E28
14-Apr	E21	E19	E18	ENE15	NE20	NE22	NE26	NE30	NE26	NE25	NE24	NE26	NE30	NE35	NNE35	NE35	NE33	NE32	NE27	NE30	NE31	NE31	NNE34	NNE31	NE26.6	NE35
15-Apr	NNE29	NNE28	NNE29	NNE28	NNE28	N28	NNE24	N24	N22	NNE18	N14	NNE12	NE8	NNE15	NNW20	NNW14	N20	N19	N20	NE13	SE25	SSE25	SSE28	NNE15.4	NNE29	
16-Apr	SE30	SE29	SE23	SSE23	SSE28	SSE25	SSE19	SSE14	SSE13	SE14	SE16	SSE16	SSW23	SSW27	SSW26	SSW27	SSW24	SSW24	S26	S25	S21	S22	S18	S12	S20.1	SE30
17-Apr	NNW12	N36	N36	N37	N40	N37	N33	N35	N34	N29	N28	NNE25	N26	NNE24	N24	NNE25	NNE24	NNE24	NNE26	NNE28	NNE23	NNE23	NNE22	NNE22	N27.9	N40
18-Apr	NNE20	N23	N24	N26	N27	N25	NNE24	N18	NNE15	N12	NNW14	NNW16	N15	N14	N13	N12	NNE10	NNE11	NNE15	N16	N15	N15	N16	N13	N16.7	N27
19-Apr	N12	N12	N10	NNW13	N12	N8	N4	NW5	WNW6	WNW6	W5	W4	W3	SSW5	SSW5	SE7	SE10	SE7	SE6	WSW4	W3	S3	SE5	SSE16	NNW1.1	SSE16
20-Apr	SE10	ESE9	ESE9	ESE10	E10	E11	ENE11	E9	NE6	NW6	N13	N30	N43	N43	N43	N42	N36	N32	N33	NNE22	N17	NNW10	NNW15	N18	NNE16.6	N43
21-Apr	NNE23	N26	N34	NNE31	ENE8	NNW6	N6	NNW2	NE5	NNE8	NNE6	NNE9	NNE6	NNE4	NNE5	NNE3	E2	E3	E3	SE3	NNE4	ENE7	ESE6	SE10	NNE7.5	N34
22-Apr	SSE9	S7	SSW7	NW13	N28	N33	N29	N24	NNE28	N23	N24	N23	NNE15	N17	N18	N20	NNE18	N17	NNE17	N19	NNE24	NNE24	NE18	ENE13	NNE17.0	N33
23-Apr	E12	ESE9	ESE11	SE7	ESE6	E11	E7	SE10	E9	E12	E12	ESE9	E10	E8	SE7	SE8	SE10	SE13	SE13	SE13	ESE10	ESE12	ESE10	ESE11	ESE9.7	SE13
24-Apr	SE11	E10	E13	E12	E11	ESE11	ENE14	NE15	NE17	ENE16	ENE16	E15	ESE15	ESE13	E16	E16	E16	E16	E16	ESE12	ESE11	ESE11	ESE13	ESE12	E13.0	NE17
25-Apr	SE14	ESE10	ESE13	SE19	SE17	SE19	SE17	ESE17	SE16	SE17	SSE15	SE23	SSE19	SSE20	SSE19	SSE19	SSE22	SSE24	SSE21	SSE21	SSE26	SSE27	SSE28	SSE26	SE19.1	SSE28
26-Apr	SSE24	SSE25	SSE24	SE22	SE21	SE23	SSE23	SSE22	SSE24	SSE23	SSE24	SE24	DF	DF	DF	DF	DF	DF	DF	DF	DF	SE17	SE20	SE24	----	SSE25
27-Apr	SSE28	SSE25	SSE21	SSE20	SE17	SE17	SE14	SE10	SE10	ESE9	ESE11	ESE15	SE12	SSE14	SE9	SSW7	SW5	WSW5	WNW6	WNW6	N10	ENE5	NE10	NE10	SE8.7	SSE28
28-Apr	NE4	SSW9	ESE2	WSW3	WNW6	WSW6	SSW6	S3	S5	SSE3	SE3	E4	E2	N6	WSW2	NNW4	E6	ENE9	ENE8	ENE9	E15	ESE14	ESE14	SE14	ESE3.3	E15
29-Apr	SSE17	S16	S20	SSE16	SSE14	SSE13	SSE12	SE5	ESE6	ESE9	SSW18	SSW20	SSW23	SSW15	SSW24	S23	S22	S25	S22	S18	SSW19	S19	S17	SSE21	S16.2	S25
30-Apr	S17	S11	SSE18	SSE23	SSE25	S21	SSE17	SSE14	SSE11	SE8	SE13	SSE8	E9	ESE12	SE20	N20	NE16	NE18	NE11	SW1	NW7	NE8	E11	ESE3	SE8.0	SSE25

ESE4.7	E4.7	ENE5.0	ENE4.2	ENE4.8	ENE5.6	ENE5.9	NE5.3	NE4.9	NE4.2	ENE3.7	NE4.1	NE4.8	NE5.7	NNE4.4	NNE5.3	NE5.2	NE6.6	NE8.2	NE6.9	NE6.1	ENE6.6	E7.4	E7.1	Diurnal Average	
N35	N38	N36	N37	N40	N37	N33	N35	N34	N33	N37	NNE38	N43	N43	N43	N42	N36	NNE38	NNE40	N38	N35	N40	N39	N33	Diurnal Maximum	

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 90 m (WS90m) - km/h

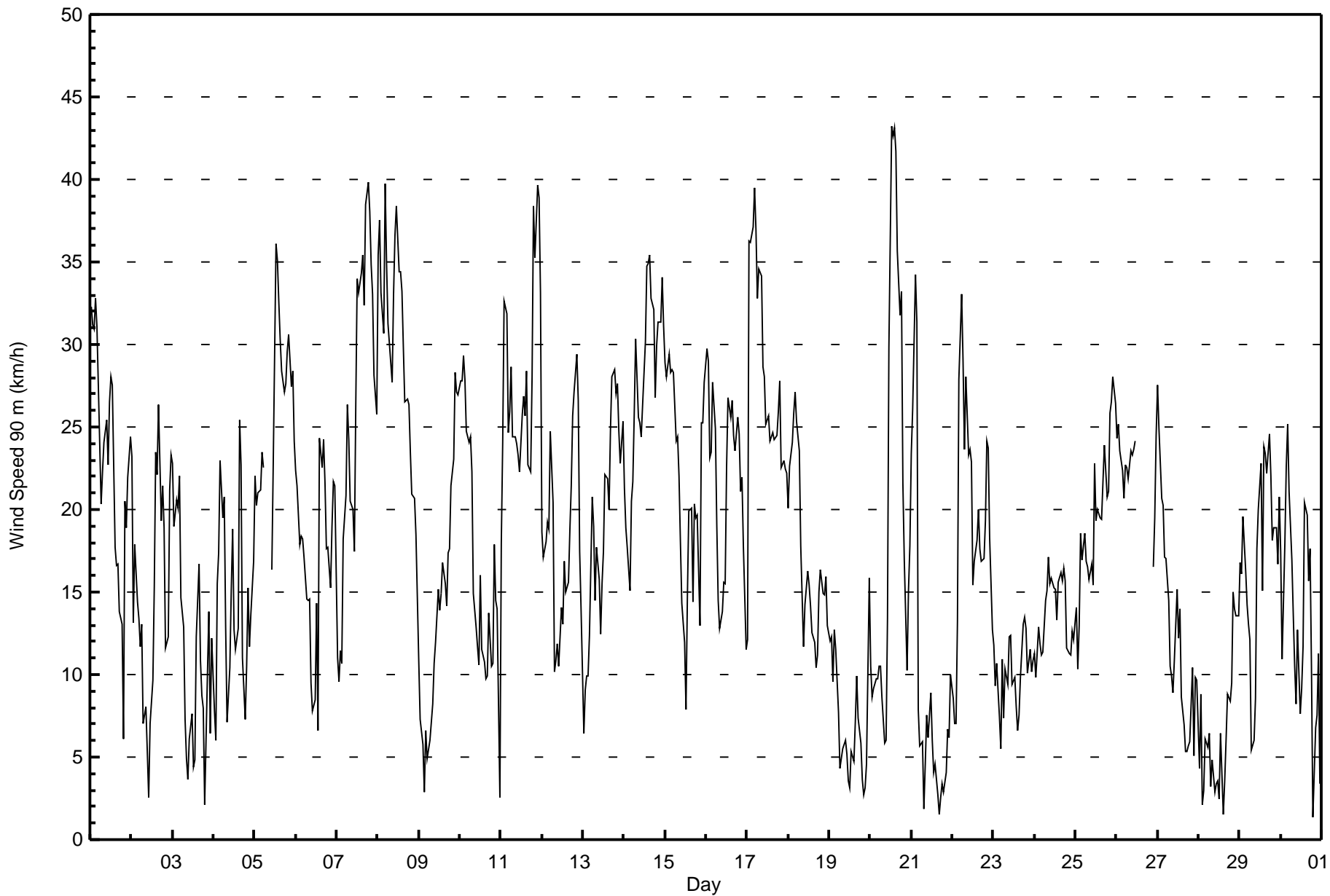
Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 10 km/h on Apr 14 22:00	Hours of Data: 707
Minimum Value: 1 km/h on Apr 22 03:00	Hours of Missing Data: 13
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8	Hours of Calibration: 0
	Percent Operational Time: 98.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	3	3	4	3	3	3	3	4	3	3	4	5	4	5	3	4	3	5	5	6	6	3	2	6
2-Apr	2	6	3	4	2	1	2	3	2	2	2	8	7	8	5	6	5	6	4	6	3	5	3	3	8
3-Apr	4	3	2	3	2	4	4	3	2	2	2	2	3	3	4	2	3	1	3	4	2	2	4	4	
4-Apr	3	3	2	2	4	3	1	3	2	4	3	3	3	3	4	10	9	3	3	1	2	2	3	10	
5-Apr	3	2	1	2	1	2	AF	AF	AF	AF	4	8	6	6	4	5	6	5	3	3	2	2	2	8	
6-Apr	2	1	3	3	3	2	3	2	3	3	3	2	3	8	5	7	5	4	2	3	1	4	3	3	8
7-Apr	6	3	4	3	3	1	3	4	3	3	5	5	4	6	6	5	6	7	6	4	4	4	4	4	7
8-Apr	4	5	4	4	5	5	6	7	8	6	6	5	5	5	5	5	5	5	4	4	3	3	2	2	8
9-Apr	2	2	2	1	1	2	3	2	3	3	4	4	4	4	4	4	3	3	4	3	3	2	1	2	4
10-Apr	2	1	2	2	1	1	1	3	3	2	3	2	4	4	3	3	3	3	2	4	3	1	2	4	4
11-Apr	3	3	5	5	4	8	5	4	4	4	4	4	5	4	5	3	4	3	3	3	7	5	3	6	8
12-Apr	3	3	2	3	3	2	3	3	2	2	3	5	4	4	4	4	4	3	3	3	2	3	4	6	6
13-Apr	3	3	3	3	4	4	3	3	4	4	4	4	5	5	5	6	5	5	5	6	5	4	4	5	6
14-Apr	5	5	6	5	4	4	4	4	3	2	4	3	5	6	5	5	5	7	5	6	8	10	8	5	10
15-Apr	5	5	4	3	4	3	4	3	3	3	3	3	4	5	7	5	4	3	2	1	4	5	2	3	7
16-Apr	3	3	4	2	3	2	3	2	2	2	2	4	4	4	5	4	5	4	4	4	3	2	2	2	5
17-Apr	10	3	4	4	4	4	6	6	4	4	4	4	4	5	4	4	4	4	4	3	4	4	3	4	10
18-Apr	3	3	4	4	4	4	4	3	2	3	2	4	3	3	3	3	2	2	2	2	3	2	3	2	4
19-Apr	2	2	1	2	1	3	1	1	1	1	1	1	2	2	3	2	2	2	2	2	2	1	3	1	3
20-Apr	2	2	2	1	1	1	1	3	2	3	4	6	6	7	6	5	7	7	6	7	4	2	3	3	7
21-Apr	2	6	3	6	6	2	2	1	3	3	3	4	3	2	2	2	1	1	1	1	3	1	1	1	6
22-Apr	2	1	1	8	7	4	5	5	3	3	3	4	4	4	5	4	4	3	3	2	1	2	3	2	8
23-Apr	2	3	3	3	2	4	2	3	3	4	5	4	4	4	3	4	4	3	3	2	3	4	3	3	5
24-Apr	3	3	3	3	2	3	3	2	3	3	4	4	4	4	4	4	4	3	3	3	3	3	3	3	4
25-Apr	3	2	4	3	3	2	4	4	5	4	4	6	5	4	3	4	3	3	3	3	3	3	2	2	6
26-Apr	2	2	2	2	2	2	3	4	3	3	5	5	DF	DF	DF	DF	DF	DF	DF	DF	DF	3	2	3	5
27-Apr	2	1	1	1	1	1	2	3	3	2	4	4	5	4	4	4	3	2	2	1	3	2	1	2	5
28-Apr	2	2	2	2	1	1	1	1	2	2	2	2	4	5	3	2	4	2	2	3	2	2	3	3	5
29-Apr	2	2	1	2	1	2	2	2	2	3	6	4	5	5	6	5	5	7	5	3	2	2	1	1	7
30-Apr	3	3	2	2	4	2	3	2	3	3	4	3	4	3	6	7	6	4	3	2	2	1	2	2	7

10	6	6	8	7	8	6	7	8	6	6	8	7	8	7	10	9	7	6	7	8	10	8	6	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 90 m (WS90m) - km/h
Mannix - April 2017

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	48	6.79	6.79
6 - 11	140	19.80	26.59
12 - 19	216	30.55	57.14
20 - 28	220	31.12	88.26
29 - 38	74	10.47	98.73
> 38	9	1.27	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 90 m (WS90m) - km/h
Mannix - April 2017

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	4	2	2	5	2	4	1	4	3	3	6	5	1	2	2	48
6 - 11	8	8	10	7	11	28	24	7	5	5	5	3	3	7	4	5	140
12 - 19	41	14	6	6	20	16	36	36	10	4	2	6	4	3	6	6	216
20 - 28	53	34	10	5	8	0	17	49	12	11	5	6	6	1	0	3	220
29 - 38	35	16	9	0	0	0	3	6	0	0	4	1	0	0	0	0	74
> 38	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Totals	147	77	37	20	44	46	84	99	31	23	19	22	18	12	12	16	707

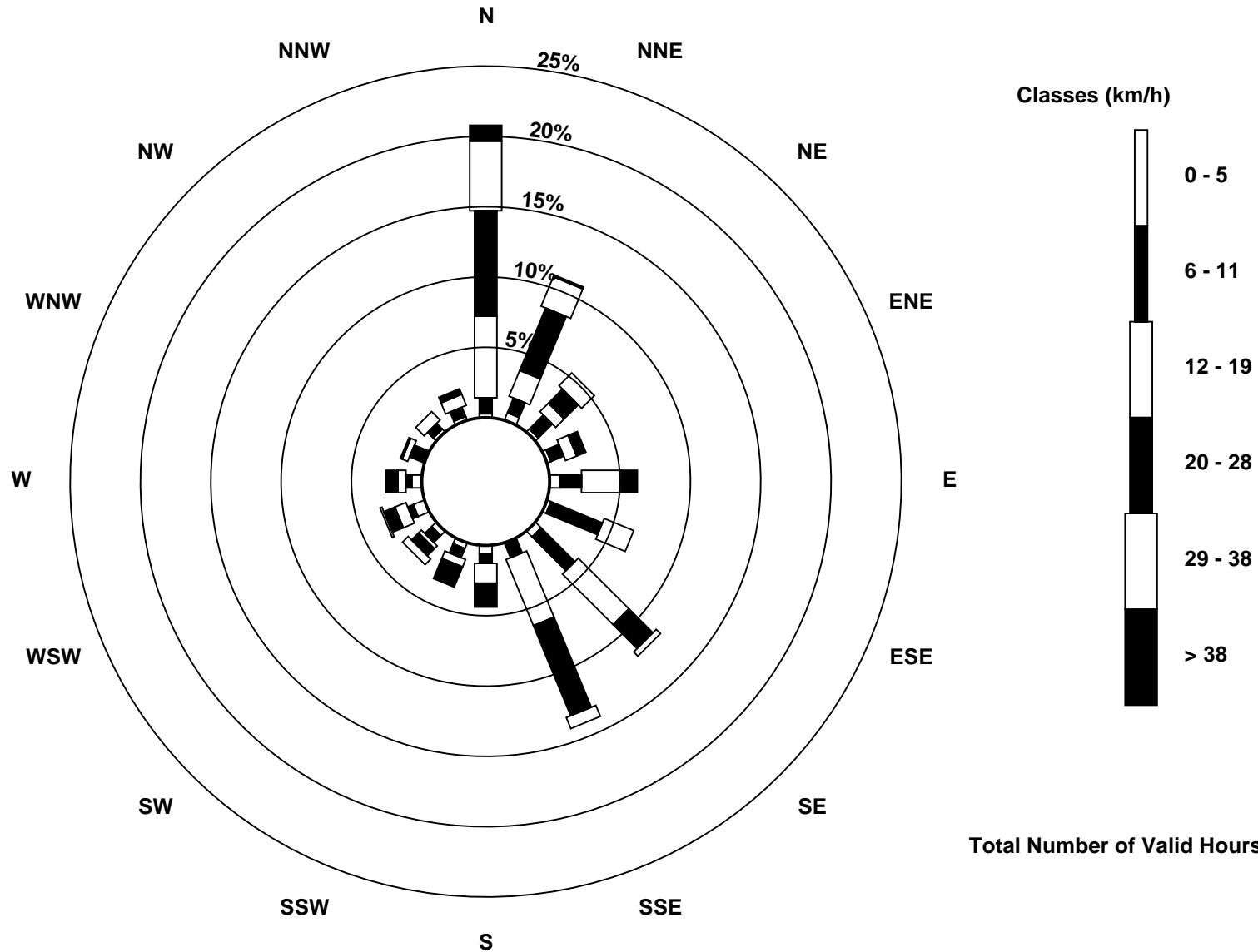
Total Number of Valid Hours: 707

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed 90 m (WS90m) - km/h
Mannix (AMS 5)



Total Number of Valid Hours: 707



Direction of Maximum Speed: 5 deg on Apr 20 15:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 9.2 deg on Apr 8		Hours of Data:	705
Direction of Minimum Speed: 42 deg on Apr 19 21:00		Hours of Missing Data:	15
Direction of Minimum Daily Speed Average: 0.8 deg on Apr 19		Percent Operational Time:	97.9
Monthly Average Direction: 172.3 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	219	225	230	235	239	221	219	234	245	238	229	233	259	267	267	290	283	301	2	222	224	238	260	245	245.9
2-Apr	245	227	220	215	220	201	204	171	200	190	86	325	273	322	295	337	9	16	10	5	348	334	357	347	314.2
3-Apr	353	353	3	355	353	348	16	15	254	266	250	262	275	20	301	278	281	319	40	213	220	237	155	148	308.4
4-Apr	274	122	138	153	140	151	159	145	133	160	191	213	159	133	134	184	192	135	132	158	196	208	145	139	161.5
5-Apr	147	141	160	149	141	159	AF	AF	AF	AF	127	136	144	152	167	170	168	173	160	161	155	148	147	145	153.4
6-Apr	134	126	124	127	150	143	152	162	147	168	153	128	138	217	273	265	268	269	283	283	316	11	58	60	191.2
7-Apr	24	1	359	330	332	358	5	5	357	349	0	352	7	16	15	18	19	16	18	17	13	12	11	7	8.2
8-Apr	2	0	355	357	11	9	6	2	2	8	10	16	8	8	11	12	23	27	17	22	12	9	10	8	9.2
9-Apr	7	345	318	320	270	245	275	189	166	175	155	148	147	156	165	150	157	147	139	132	134	142	144	145	153.4
10-Apr	151	152	156	157	148	142	142	146	141	132	137	138	150	147	125	127	129	136	135	131	140	130	152	25	141.6
11-Apr	17	23	18	8	352	1	13	5	10	13	6	1	4	10	9	14	14	10	10	9	4	6	8	4	8.5
12-Apr	350	358	7	7	6	10	4	354	323	300	321	309	3	6	360	3	10	8	7	10	9	20	47	70	2.3
13-Apr	75	94	122	109	81	92	107	85	92	107	104	94	86	75	83	99	83	91	95	87	67	74	68	75	87.7
14-Apr	86	81	84	64	50	44	39	40	42	44	50	46	43	AF	AF	39	45	56	47	46	54	60	34	18	48.9
15-Apr	20	21	25	21	17	14	17	10	13	14	10	30	66	36	326	342	331	8	10	8	41	139	152	148	19.7
16-Apr	142	144	151	149	150	156	145	141	137	135	137	162	199	196	203	207	204	200	194	184	171	168	154	155	168.5
17-Apr	335	10	8	8	7	7	8	11	12	9	8	19	9	21	11	15	18	19	13	17	16	15	17	18	11.7
18-Apr	18	10	10	12	10	15	19	4	14	1	323	330	2	5	360	3	21	17	17	12	2	341	352	349	4.9
19-Apr	355	3	349	339	339	337	324	288	272	268	269	277	282	211	190	138	135	129	139	257	42	162	128	142	296.0
20-Apr	121	110	75	64	49	47	43	53	42	306	353	3	5	359	5	6	3	3	10	21	350	316	329	347	8.9
21-Apr	12	4	13	21	305	317	2	33	68	25	35	26	7	36	37	49	56	115	91	136	26	76	134	172	25.6
22-Apr	206	269	262	312	3	8	13	12	13	13	8	13	18	11	356	13	15	10	16	9	15	29	43	49	10.6
23-Apr	61	80	114	97	97	80	80	127	108	102	90	111	99	95	134	131	140	151	135	143	129	129	125	122	113.4
24-Apr	137	86	84	103	105	110	85	57	59	62	78	88	114	113	105	96	101	92	84	111	121	112	107	120	95.0
25-Apr	130	120	115	134	133	137	133	126	135	146	151	146	155	152	151	159	154	158	150	156	161	154	150	150	146.7
26-Apr	149	150	145	144	142	142	145	160	161	164	149	144	DF	DF	DF	DF	DF	DF	DF	DF	DF	130	131	145	--
27-Apr	158	158	151	148	140	127	126	138	139	113	125	120	128	167	134	234	216	254	301	287	347	82	32	29	141.1
28-Apr	133	217	142	229	208	181	152	132	159	104	112	96	120	8	268	337	86	64	65	81	92	107	127	127	113.2
29-Apr	138	151	163	149	148	150	150	130	106	105	211	201	212	216	200	174	171	190	198	177	186	184	170	163	175.2
30-Apr	152	149	145	144	160	156	160	141	158	111	143	176	99	118	133	356	34	57	53	299	339	60	96	239	121.5
	75.3	65.6	64.9	55.0	48.6	59.9	55.9	58.0	60.5	57.8	71.7	69.0	58.7	47.9	20.9	18.4	42.0	52.0	46.1	46.1	47.0	67.5	71.7	78.1	

Diurnal Average

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

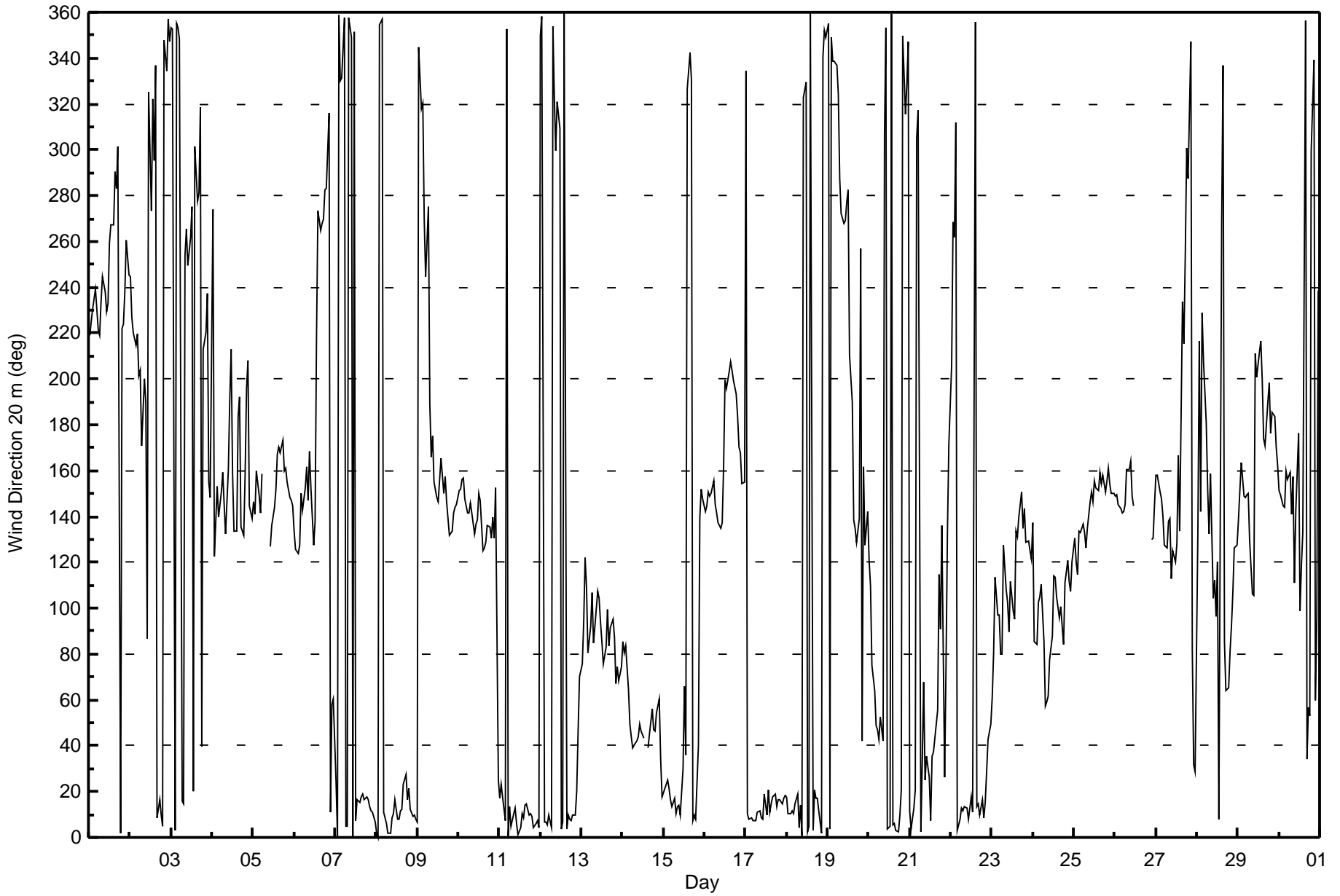
Wind Direction 20 m (WD20m) - deg
Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 98 deg on Apr 2 11:00	Hours of Data: 705
Minimum Value: 5 deg on Apr 30 00:00	Hours of Missing Data: 15
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 11 Median = 14 Q ₃ = 21 P ₉₀ = 35 P ₉₉ = 81	Hours of Calibration: 0
	Percent Operational Time: 97.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	17	10	9	9	9	14	14	12	14	12	13	14	14	12	24	19	14	17	29	19	21	21	16	8	29
2-Apr	7	71	24	33	11	9	14	18	24	46	98	75	62	44	23	28	19	17	16	22	20	27	13	12	98
3-Apr	16	16	10	13	12	44	35	23	33	22	25	30	65	60	25	13	17	43	20	48	13	13	28	51	65
4-Apr	52	28	9	12	8	34	16	17	15	27	24	14	24	19	17	18	21	16	14	13	38	11	11	52	
5-Apr	10	8	16	14	11	8	AF	AF	AF	AF	10	12	11	12	17	13	13	14	8	8	6	6	7	6	17
6-Apr	9	7	9	10	13	7	11	18	8	23	29	11	9	68	15	17	11	11	11	7	27	14	11	13	68
7-Apr	35	15	26	9	17	12	10	10	12	15	16	17	13	14	12	11	13	11	10	9	9	10	11	12	35
8-Apr	11	13	12	12	10	12	14	15	17	13	11	13	17	15	13	14	14	14	15	15	12	11	12	11	17
9-Apr	13	18	23	29	21	34	27	43	32	31	29	22	26	26	21	21	14	9	11	8	8	8	7	6	43
10-Apr	6	7	6	6	8	8	9	8	12	11	12	13	19	25	22	22	15	9	8	11	13	10	18	55	55
11-Apr	10	10	11	13	12	16	10	14	14	14	17	20	18	14	18	13	14	12	10	9	12	11	9	17	20
12-Apr	15	13	15	17	13	10	13	20	19	17	39	28	25	19	20	20	16	12	11	9	8	11	21	19	39
13-Apr	85	44	18	14	22	13	8	17	16	15	19	21	19	17	18	19	14	12	11	11	11	13	14	12	85
14-Apr	13	15	20	26	14	13	11	11	11	10	10	10	12	AF	AF	13	12	14	11	13	12	17	16	12	26
15-Apr	11	12	11	11	10	10	11	10	12	12	18	33	32	27	42	22	28	12	10	8	30	13	9	8	42
16-Apr	9	8	8	8	8	8	10	10	10	10	10	34	24	18	23	16	19	17	15	15	9	11	6	9	34
17-Apr	69	9	10	10	10	11	12	12	11	12	13	13	15	16	14	14	14	15	11	11	11	12	10	11	69
18-Apr	12	11	11	10	12	12	12	14	15	25	19	20	22	19	21	26	17	19	13	11	15	13	15	12	26
19-Apr	15	11	19	12	13	20	23	21	19	11	15	37	49	61	82	26	13	13	18	76	81	11	12	8	82
20-Apr	18	10	26	14	9	13	11	18	27	57	39	12	11	14	11	11	14	15	12	14	15	20	11	15	57
21-Apr	10	11	10	14	84	15	18	22	30	37	48	34	55	61	52	72	73	76	31	34	63	18	17	14	84
22-Apr	42	23	21	30	13	11	12	14	13	13	16	15	28	29	24	18	18	18	14	9	8	11	10	11	42
23-Apr	16	16	12	13	16	35	41	16	20	24	22	27	36	52	47	24	22	13	10	11	13	11	12	16	52
24-Apr	16	27	19	14	13	17	11	13	11	14	14	18	19	21	17	19	15	13	16	22	16	14	11	15	27
25-Apr	8	11	10	8	10	9	9	11	14	15	22	13	19	16	15	16	14	11	8	10	8	8	8	8	22
26-Apr	8	7	8	9	9	9	9	11	13	14	14	14	DF	DF	DF	DF	DF	DF	DF	DF	DF	9	9	12	14
27-Apr	7	6	7	7	8	7	11	12	16	14	19	20	39	34	53	63	58	42	25	14	23	79	21	16	79
28-Apr	65	21	71	55	74	11	16	22	26	40	57	63	81	56	78	83	73	23	16	12	11	9	17	17	83
29-Apr	10	9	7	10	7	6	11	16	18	18	26	21	24	31	20	21	18	18	15	12	7	8	7	5	31
30-Apr	8	8	9	9	7	13	14	12	24	21	22	46	45	21	12	28	54	13	17	77	50	27	15	43	77

85	71	71	55	84	44	41	43	33	57	98	75	81	68	82	83	73	76	31	77	81	79	28	55	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - April 2017

Direction of Maximum Speed: 359 deg on Apr 20 13:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 3.1 deg on Apr 8		Hours of Data:	700
Direction of Minimum Speed: 131 deg on Apr 2 11:00		Hours of Missing Data:	20
Direction of Minimum Daily Speed Average: 1.0 deg on Apr 19		Percent Operational Time:	97.2
Monthly Average Direction: 114.0 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	215	223	226	231	235	223	221	231	239	235	224	228	253	260	261	284	277	297	353	215	219	235	255	239	239.9
2-Apr	242	239	229	226	228	211	213	183	196	189	131	318	275	319	291	333	3	12	5	3	351	347	351	342	307.0
3-Apr	350	350	359	350	352	346	5	12	251	260	248	257	276	5	298	273	277	312	32	205	222	247	172	133	313.5
4-Apr	259	118	136	152	139	147	154	145	128	157	186	207	158	129	126	177	185	132	128	153	182	186	138	138	158.1
5-Apr	144	134	145	147	AF	AF	AF	AF	AF	AF	118	131	138	147	162	164	162	167	156	157	151	145	144	145	149.0
6-Apr	134	127	121	123	138	131	146	161	146	168	152	123	133	217	267	259	262	262	276	282	311	9	48	48	177.8
7-Apr	28	11	17	332	332	354	357	359	353	345	354	348	2	9	9	12	13	10	12	11	8	7	6	1	3.2
8-Apr	356	356	351	352	5	3	0	356	356	2	4	9	3	2	5	5	16	19	10	15	7	4	4	3	3.1
9-Apr	4	343	315	317	268	246	273	182	163	169	150	145	145	151	164	146	152	142	133	126	128	138	142	144	147.9
10-Apr	148	149	152	153	147	140	136	140	140	128	135	135	146	142	116	120	123	129	126	121	139	134	156	37	138.8
11-Apr	12	14	9	1	349	356	8	360	4	5	359	355	358	4	3	7	7	3	4	3	359	1	0	358	2.2
12-Apr	347	354	0	4	2	3	359	348	319	299	316	309	358	1	357	359	3	3	2	4	6	16	46	73	358.5
13-Apr	97	93	120	108	85	89	100	79	84	100	96	83	77	67	77	91	75	84	88	79	59	68	62	68	80.9
14-Apr	79	75	76	57	43	38	33	33	34	AF	42	38	36	AF	AF	AF	AF	48	38	39	46	51	27	11	42.2
15-Apr	14	15	17	14	10	7	10	5	7	9	4	20	49	26	321	337	328	1	3	1	35	136	145	143	13.9
16-Apr	138	139	144	143	145	151	144	143	136	132	133	160	191	190	196	200	197	194	187	179	168	170	155	159	165.6
17-Apr	327	4	2	2	1	0	1	5	5	2	3	11	3	14	5	8	11	12	8	10	9	9	11	12	5.3
18-Apr	12	4	3	5	4	8	11	0	8	354	320	324	355	359	352	355	13	11	13	5	356	340	351	348	359.1
19-Apr	351	358	347	335	339	342	328	290	274	268	267	272	274	207	189	136	129	121	134	248	298	164	127	142	311.2
20-Apr	125	105	83	79	68	55	45	54	32	304	348	358	359	354	359	360	358	357	4	14	347	328	325	346	4.6
21-Apr	7	0	6	15	37	324	346	6	52	18	21	19	2	14	25	25	53	100	79	131	21	69	119	150	18.2
22-Apr	163	164	234	316	358	2	6	5	7	6	2	7	11	3	350	7	7	3	9	3	10	21	35	51	6.0
23-Apr	64	81	107	105	88	80	78	123	100	95	81	106	91	90	131	124	135	142	128	134	120	122	117	115	107.6
24-Apr	129	83	79	96	97	103	75	49	50	54	71	81	106	105	98	89	93	86	77	104	113	105	102	114	88.0
25-Apr	123	115	112	127	128	131	126	120	129	141	147	140	151	148	147	154	148	153	147	150	155	149	145	146	141.3
26-Apr	144	145	141	139	138	139	142	154	155	159	144	139	DF	DF	DF	DF	DF	DF	DF	DF	DF	126	129	140	--
27-Apr	151	152	147	145	135	125	123	134	134	109	118	114	121	164	132	221	214	246	294	282	345	62	38	31	136.0
28-Apr	81	191	129	193	289	209	170	140	163	106	120	88	104	359	267	332	74	55	58	71	83	98	113	124	104.5
29-Apr	140	160	158	151	151	147	147	120	100	101	203	194	204	209	192	169	167	184	189	173	183	178	166	159	171.4
30-Apr	156	149	142	143	158	159	161	142	159	113	138	171	91	111	126	352	30	49	41	275	334	48	82	153	121.7

80.6	67.6	63.7	52.0	40.6	48.7	48.9	46.6	47.7	47.6	60.2	55.6	47.9	37.4	11.9	6.8	35.3	43.8	38.7	40.4	43.1	65.5	70.1	80.3
Diurnal Average																							

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods

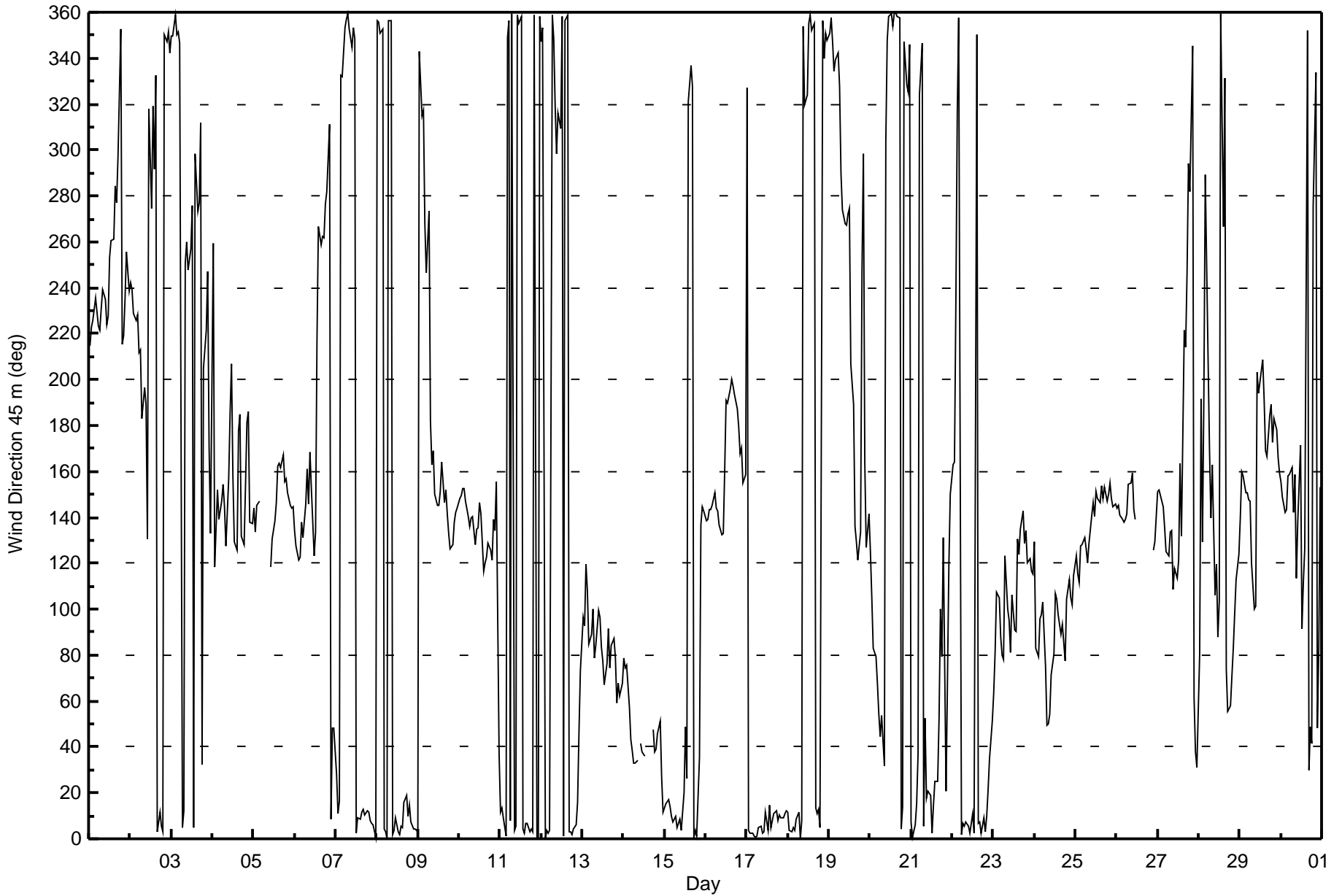


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 98 deg on Apr 2 11:00			Hours of Data:	700
Minimum Value: 3 deg on Apr 29 21:00			Hours of Missing Data:	20
			Hours of Calibration:	0
			Percent Operational Time:	97.2
Percentiles: P ₁ = 4 P ₁₀ = 6 Q ₁ = 8 Median = 11 Q ₃ = 18 P ₉₀ = 31 P ₉₉ = 73				

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	16	6	6	6	6	9	10	10	11	10	11	12	13	11	21	18	11	17	23	57	13	18	14	5	57
2-Apr	4	57	11	21	5	8	8	13	19	39	98	71	58	36	22	26	15	14	12	19	20	15	9	9	98
3-Apr	11	11	7	8	8	21	20	18	33	30	22	24	46	54	20	10	15	36	17	66	8	10	43	23	66
4-Apr	30	43	7	7	6	27	13	14	13	27	20	10	21	20	19	11	11	21	16	16	7	22	11	9	43
5-Apr	7	5	9	11	AF	AF	AF	AF	AF	AF	9	12	10	10	14	8	9	9	5	5	4	4	5	4	14
6-Apr	6	4	6	6	8	4	6	13	7	20	25	9	8	66	13	15	9	9	11	6	20	12	8	10	66
7-Apr	25	8	21	8	12	5	5	4	6	11	12	14	9	11	9	9	10	8	8	7	7	7	8	8	25
8-Apr	6	9	8	8	6	8	11	11	13	11	9	9	15	12	10	12	12	11	12	11	9	8	8	7	15
9-Apr	10	16	23	30	18	30	27	33	30	27	25	20	24	23	18	19	13	7	10	5	6	6	5	4	33
10-Apr	4	5	4	4	5	5	6	6	10	9	10	11	17	23	19	20	14	7	5	12	9	5	8	63	63
11-Apr	9	7	8	8	9	11	7	10	11	10	13	17	15	11	15	9	10	9	6	5	8	7	6	9	17
12-Apr	12	9	7	9	8	6	8	15	16	15	31	24	20	14	15	16	12	9	7	6	5	8	22	14	31
13-Apr	55	32	16	12	19	12	8	15	13	14	19	19	18	15	17	17	13	11	10	9	9	11	12	11	55
14-Apr	12	15	18	23	13	12	8	8	8	AF	8	8	10	AF	AF	AF	AF	11	9	11	10	15	14	10	23
15-Apr	9	9	8	8	7	7	9	7	8	10	15	31	32	25	33	19	28	9	6	4	34	11	5	6	34
16-Apr	7	6	6	6	6	5	8	9	9	8	8	32	20	12	19	11	16	13	9	9	5	8	5	12	32
17-Apr	66	5	6	5	6	8	7	8	8	9	9	11	12	13	11	11	11	12	8	7	8	9	8	8	66
18-Apr	9	8	7	7	9	9	9	9	11	20	16	16	19	12	17	21	14	14	10	9	11	10	12	9	21
19-Apr	10	8	14	7	9	12	20	15	15	10	11	21	36	45	66	25	11	12	16	58	85	15	42	5	85
20-Apr	11	10	21	14	15	18	8	16	22	36	36	6	7	10	7	7	9	11	8	11	13	17	7	14	36
21-Apr	7	8	6	9	51	9	10	18	31	28	40	27	49	54	39	67	72	75	30	31	62	19	19	10	75
22-Apr	12	10	32	17	10	7	9	11	9	10	12	12	23	24	20	13	14	15	10	6	7	9	7	9	32
23-Apr	12	16	11	17	11	30	35	14	19	22	22	27	34	43	39	27	19	11	8	9	11	11	12	13	43
24-Apr	14	27	17	13	10	16	10	11	10	11	13	18	17	19	15	18	14	12	16	22	14	13	10	13	27
25-Apr	6	9	10	5	7	7	8	10	13	14	20	11	16	13	12	13	11	8	7	8	5	5	5	5	20
26-Apr	6	5	6	6	7	7	7	9	10	11	13	12	DF	DF	DF	DF	DF	DF	DF	DF	DF	5	5	10	13
27-Apr	4	3	5	5	5	4	10	10	14	14	19	19	39	28	51	60	47	33	23	14	23	56	20	15	60
28-Apr	46	18	42	62	23	20	17	21	25	46	56	58	76	60	79	74	63	19	12	11	10	8	13	17	79
29-Apr	9	7	6	8	5	3	7	14	16	17	21	16	21	29	15	16	13	13	10	9	3	5	3	4	29
30-Apr	5	8	6	7	4	7	10	10	20	21	18	40	43	18	10	24	49	11	14	84	40	22	10	36	84

66	57	42	62	51	30	35	33	33	46	98	71	76	66	79	74	72	75	30	84	85	56	43	63	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - April 2017

Direction of Maximum Speed: 2 deg on Apr 20 13:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 6.0 deg on Apr 8		Hours of Data:	706
Direction of Minimum Speed: 241 deg on Apr 30 20:00		Hours of Missing Data:	14
Direction of Minimum Daily Speed Average: 1.3 deg on Apr 19		Percent Operational Time:	98.1
Monthly Average Direction: 158.2 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	219	226	228	232	237	227	227	233	240	236	225	229	254	261	262	284	278	300	355	217	220	238	257	239	241.1
2-Apr	245	247	237	236	240	221	223	214	209	194	224	319	282	322	293	337	6	17	10	10	6	356	354	347	311.9
3-Apr	356	356	4	357	359	355	11	24	254	261	253	262	287	10	303	277	283	316	35	200	238	248	198	129	328.2
4-Apr	235	117	140	160	145	149	156	155	130	156	187	207	158	131	126	176	184	136	131	156	176	175	138	140	159.3
5-Apr	144	134	141	146	138	144	AF	AF	AF	AF	120	132	139	146	162	163	162	167	157	158	152	148	146	147	148.9
6-Apr	141	133	129	128	134	129	145	159	151	173	155	123	135	225	268	259	263	262	278	288	315	17	49	48	171.2
7-Apr	46	38	39	349	347	2	3	12	359	349	355	352	6	12	12	14	15	14	16	14	12	11	10	5	9.1
8-Apr	0	359	356	357	6	6	3	358	360	3	6	11	6	4	8	7	19	21	12	18	11	8	8	9	6.0
9-Apr	11	351	325	320	273	251	275	176	159	168	149	144	146	151	161	146	151	142	135	128	131	140	144	146	146.3
10-Apr	155	158	160	161	156	149	140	144	145	133	140	139	146	142	114	121	123	129	125	120	141	141	161	49	145.2
11-Apr	18	16	11	4	355	0	10	2	7	7	1	357	1	6	6	9	10	7	7	6	2	3	2	1	5.1
12-Apr	354	358	2	7	5	7	4	353	327	307	320	315	2	4	1	4	6	6	6	9	15	24	59	84	4.4
13-Apr	112	98	125	110	92	93	99	81	84	98	96	82	77	67	77	90	76	85	88	80	63	71	66	71	81.4
14-Apr	80	76	77	61	49	44	39	38	40	41	47	43	40	AF	29	36	43	50	40	42	48	52	30	16	43.6
15-Apr	17	18	20	17	12	10	13	10	10	13	8	23	44	27	328	342	332	5	7	6	36	139	145	144	18.5
16-Apr	139	139	143	144	147	152	148	148	143	138	136	163	190	190	195	200	197	194	187	180	172	175	166	174	167.1
17-Apr	328	7	5	4	4	3	5	8	8	6	6	14	7	16	9	11	15	15	11	13	11	12	14	16	8.2
18-Apr	14	7	6	7	7	11	14	5	10	358	325	328	359	2	357	359	17	15	17	8	360	348	356	356	3.1
19-Apr	358	2	355	342	349	356	345	304	287	281	277	273	273	207	187	139	130	121	135	245	285	167	129	144	338.6
20-Apr	130	114	97	92	86	71	65	68	38	312	353	2	2	358	2	2	0	1	7	19	353	341	333	356	8.6
21-Apr	16	5	9	20	58	343	348	356	49	22	21	23	11	21	24	28	61	79	78	124	26	69	117	142	23.8
22-Apr	154	171	213	320	2	5	9	9	11	9	6	10	13	5	353	9	11	7	13	6	14	26	42	62	10.5
23-Apr	78	94	111	119	95	86	87	124	97	95	83	108	91	91	127	121	135	140	128	132	115	120	113	114	109.3
24-Apr	127	86	81	96	96	99	74	52	53	57	73	80	104	103	96	90	92	87	77	102	112	105	103	118	86.5
25-Apr	125	119	121	128	129	131	127	122	128	141	147	139	151	147	146	153	149	153	148	150	155	149	146	147	142.3
26-Apr	146	146	142	141	140	141	144	154	155	158	144	139	DF	DF	DF	DF	DF	DF	DF	DF	DF	128	132	141	--
27-Apr	152	153	150	149	138	130	129	135	134	110	119	115	125	164	133	214	217	242	296	286	356	53	46	43	137.9
28-Apr	43	187	115	232	293	242	198	166	169	131	127	75	90	6	267	339	78	57	60	71	82	97	106	129	97.6
29-Apr	149	173	164	160	161	156	154	119	106	104	202	193	203	207	191	169	167	184	188	173	186	180	165	162	174.4
30-Apr	162	157	152	151	161	166	163	153	161	121	138	166	92	111	127	359	34	53	46	241	330	50	79	100	128.8
93.2 73.6 72.1 62.0 57.4 60.2 53.5 49.7 46.9 43.1 56.5 51.4 47.4 36.7 18.4 17.8 38.3 45.1 39.9 43.4 46.5 69.0 73.2 85.6																									
Diurnal Average																									

DF - DAS Failure AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Summary of Hour Standard Deviations

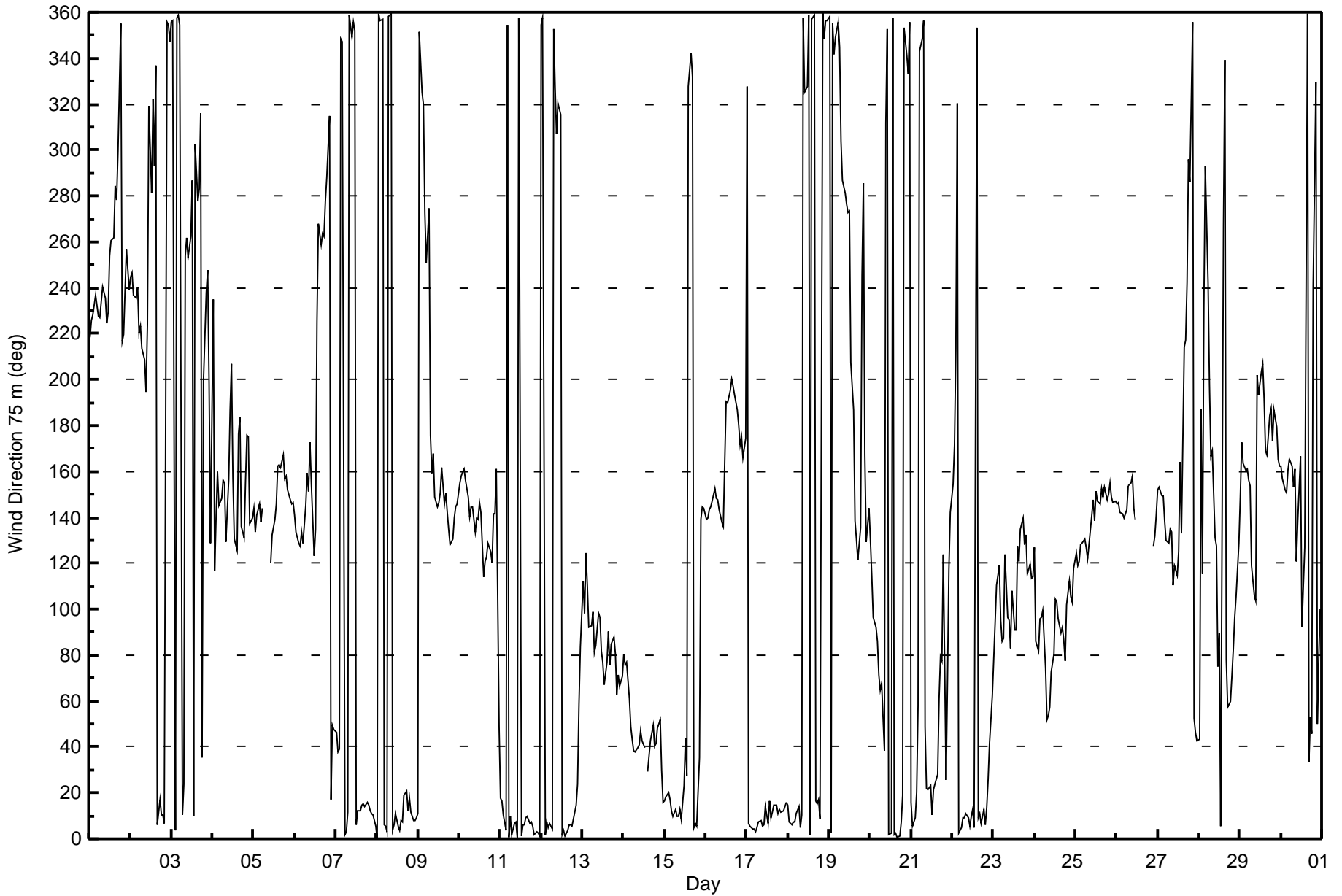
Mannix - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 98 deg on Apr 2 11:00			Hours of Data:	706
Minimum Value: 3 deg on Apr 30 06:00			Hours of Missing Data:	14
Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 17 P ₉₀ = 29 P ₉₉ = 71			Hours of Calibration:	0
			Percent Operational Time:	98.1

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	15	5	5	6	4	7	8	8	9	8	10	10	13	10	20	16	10	17	21	69	11	17	14	4	69	
2-Apr	4	23	6	16	6	9	6	14	18	34	98	71	56	26	21	26	13	10	10	17	19	16	8	8	98	
3-Apr	8	8	5	5	5	13	17	19	38	45	22	28	47	50	21	9	15	33	16	71	7	8	49	10	71	
4-Apr	33	59	7	5	5	19	8	10	13	28	20	9	19	20	20	10	12	19	17	14	5	18	10	7	59	
5-Apr	6	3	7	4	4	5	AF	AF	AF	AF	12	12	8	9	13	7	8	8	5	5	3	3	3	3	13	
6-Apr	5	3	8	7	6	5	8	8	7	19	25	13	8	65	13	15	9	9	11	7	20	12	6	7	65	
7-Apr	19	11	18	6	8	5	5	8	8	8	12	13	7	10	8	8	8	7	6	5	6	5	7	7	19	
8-Apr	4	7	7	7	5	7	9	10	13	9	8	7	13	11	9	11	10	9	10	10	8	7	7	6	13	
9-Apr	10	17	22	39	18	26	31	31	27	24	23	19	23	22	15	15	13	7	10	6	6	4	3	3	39	
10-Apr	5	3	4	3	4	4	4	5	9	11	10	12	15	23	19	18	14	8	8	16	6	7	3	71	71	
11-Apr	6	5	5	6	8	9	6	9	9	8	12	16	14	10	13	7	9	7	5	3	6	5	4	6	16	
12-Apr	9	7	5	5	6	4	7	14	14	16	31	24	22	12	13	14	10	8	5	5	4	7	19	16	31	
13-Apr	27	22	16	16	16	14	13	14	13	15	19	17	17	14	17	18	11	11	11	9	7	9	10	9	27	
14-Apr	12	13	16	19	11	11	7	6	6	5	8	6	8	AF	9	11	7	11	7	10	9	14	12	10	19	
15-Apr	7	7	6	7	6	6	8	6	7	10	12	30	29	21	31	18	27	7	5	3	39	10	3	5	39	
16-Apr	6	4	5	4	5	4	7	8	9	8	8	31	18	11	18	10	15	12	8	7	5	6	4	15	31	
17-Apr	60	4	5	4	5	6	6	7	6	7	7	9	10	11	9	9	10	10	7	5	7	7	6	7	60	
18-Apr	7	6	6	6	7	7	8	8	9	19	16	15	18	10	15	19	14	13	8	7	9	11	8	7	19	
19-Apr	7	6	10	6	6	9	16	15	12	13	14	24	39	40	63	28	12	13	19	52	75	18	61	5	75	
20-Apr	7	16	20	17	12	17	7	14	19	35	33	5	5	8	6	6	9	8	6	10	13	14	8	15	35	
21-Apr	6	6	5	6	37	7	13	25	32	22	34	22	40	66	34	61	85	62	23	29	57	19	20	10	85	
22-Apr	8	9	29	29	7	5	8	9	7	8	9	10	20	21	19	11	12	12	9	5	4	6	7	8	29	
23-Apr	12	18	16	17	16	21	25	16	19	21	20	24	31	35	34	30	16	11	9	8	16	15	16	16	35	
24-Apr	15	24	17	15	14	18	10	10	8	9	12	18	18	20	17	18	15	14	14	22	16	16	15	15	24	
25-Apr	9	12	13	7	8	6	9	12	12	13	18	10	14	12	10	11	9	6	6	8	5	4	4	4	18	
26-Apr	4	4	5	5	5	5	6	8	8	9	12	11	DF	DF	DF	DF	DF	DF	DF	DF	DF	7	5	8	12	
27-Apr	3	3	4	3	6	5	8	10	13	17	20	20	38	25	41	59	48	38	26	16	38	25	42	17	16	59
28-Apr	41	14	38	63	8	28	12	24	24	44	57	54	72	61	94	61	50	18	10	8	10	15	16	20	94	
29-Apr	12	7	7	6	4	5	8	19	17	19	19	15	21	29	14	16	12	13	11	9	4	6	3	4	29	
30-Apr	5	10	4	4	4	3	8	10	17	21	17	37	39	19	11	25	46	9	13	84	38	20	10	20	84	

60	59	38	63	37	28	31	31	38	45	98	71	72	66	94	61	85	62	26	84	75	42	61	71	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure



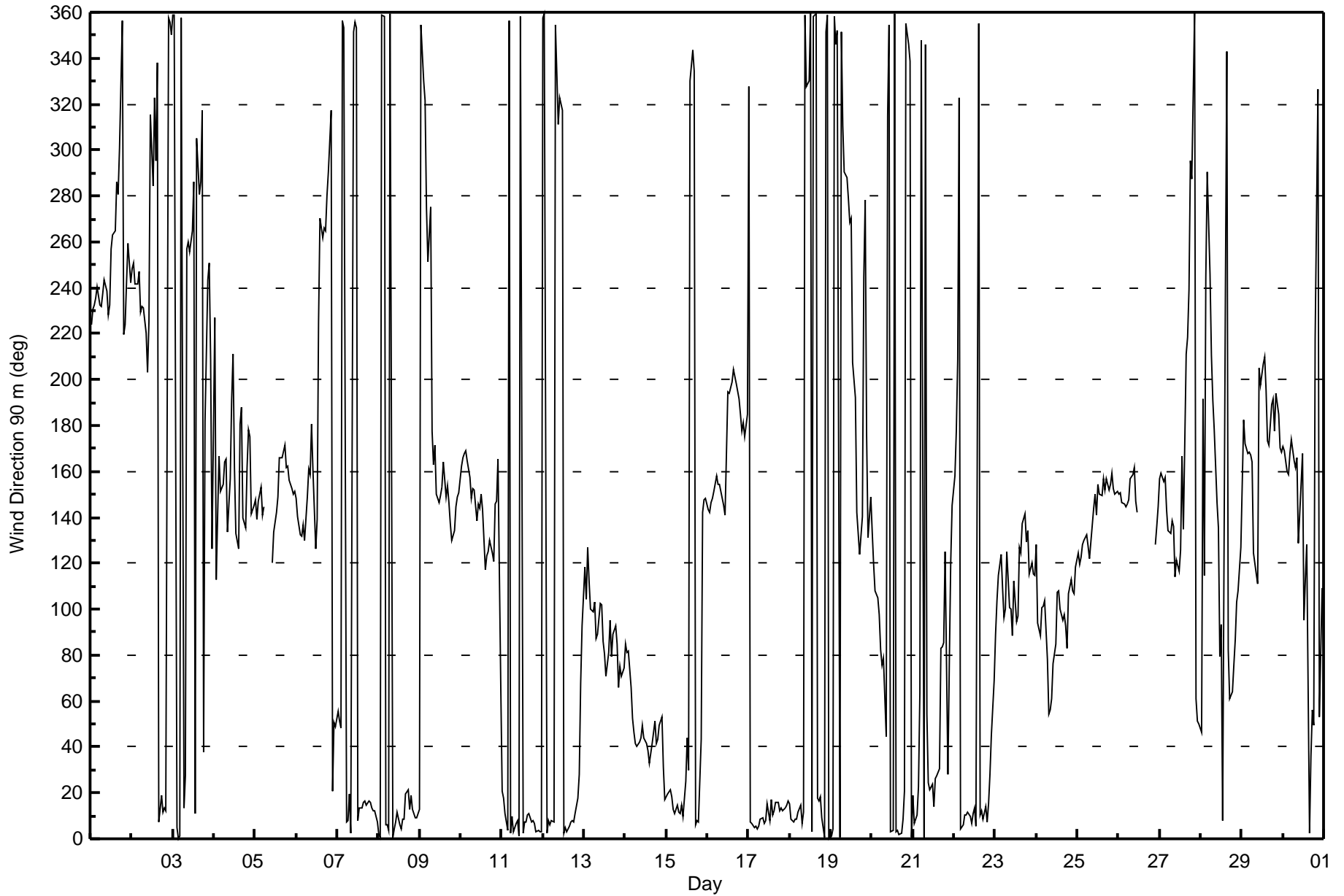


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 91 deg on Apr 28 15:00			Hours of Data:	707
Minimum Value: 2 deg on Apr 30 06:00			Hours of Missing Data:	13
Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 6 Median = 10 Q ₃ = 16 P ₉₀ = 29 P ₉₉ = 71			Hours of Calibration:	0
			Percent Operational Time:	98.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	13	5	5	5	4	6	7	8	9	7	9	9	12	10	19	15	9	17	20	72	9	16	14	4	72
2-Apr	4	16	5	12	5	10	5	12	17	28	69	64	55	26	19	26	12	9	9	14	18	16	8	7	69
3-Apr	7	7	4	4	4	9	16	18	40	61	24	28	50	50	20	8	14	31	17	69	9	5	44	9	69
4-Apr	36	54	9	11	7	16	5	10	13	29	19	8	20	19	18	10	13	18	17	14	5	17	11	7	54
5-Apr	6	3	7	3	3	7	AF	AF	AF	AF	8	12	8	9	13	7	8	8	5	5	3	3	3	2	13
6-Apr	5	2	6	5	4	2	9	6	8	19	24	11	8	66	13	14	8	9	10	7	20	13	6	7	66
7-Apr	17	12	16	8	6	5	5	10	11	8	11	13	7	9	8	8	8	6	6	5	5	5	6	7	17
8-Apr	4	7	6	6	5	6	9	10	12	9	7	7	12	10	8	11	10	8	10	10	7	6	6	6	12
9-Apr	10	20	23	41	17	26	38	30	24	24	22	19	22	21	14	13	13	7	9	4	5	3	2	2	41
10-Apr	6	3	4	4	4	4	5	5	9	11	12	12	15	22	15	15	11	7	6	12	5	7	3	75	75
11-Apr	6	5	4	5	7	8	6	8	8	8	11	15	14	9	13	7	8	7	5	3	5	5	3	5	15
12-Apr	8	6	5	4	5	4	7	14	14	15	30	23	24	12	12	13	10	7	5	5	3	7	19	14	30
13-Apr	18	18	13	10	13	9	7	13	12	11	17	17	14	17	15	11	9	8	8	6	9	11	9	9	18
14-Apr	11	12	16	20	10	10	7	6	6	5	8	7	8	8	7	8	7	11	7	10	9	16	12	10	20
15-Apr	7	6	6	6	6	5	7	6	7	10	11	31	33	20	30	17	27	7	5	3	41	9	2	5	41
16-Apr	5	3	5	4	4	4	7	8	10	8	8	30	17	11	17	9	15	11	8	7	5	6	5	16	30
17-Apr	58	4	4	4	4	6	6	6	6	7	7	8	10	10	9	9	9	9	6	4	6	7	5	7	58
18-Apr	7	6	6	6	6	7	7	8	8	18	15	15	17	9	15	17	14	12	7	7	9	11	7	6	18
19-Apr	6	5	8	6	6	8	16	15	12	13	15	26	43	34	57	26	11	10	19	48	64	23	64	5	64
20-Apr	6	7	13	10	6	15	7	12	19	40	32	4	5	7	5	5	8	8	6	10	13	14	8	15	40
21-Apr	6	5	5	6	30	9	20	42	33	22	41	23	40	54	40	64	82	46	22	28	57	21	15	10	82
22-Apr	8	6	21	32	6	5	7	9	6	8	8	10	19	21	19	11	11	12	8	4	4	6	8	9	32
23-Apr	11	13	11	11	11	16	19	13	16	19	19	22	29	37	31	29	15	11	6	7	10	10	11	10	37
24-Apr	12	20	15	10	8	13	10	10	9	9	12	17	14	16	13	16	10	11	13	17	11	10	9	10	20
25-Apr	6	6	7	4	6	5	7	9	11	13	18	10	14	12	10	11	10	6	6	8	5	4	4	3	18
26-Apr	4	4	4	4	4	4	5	7	8	9	12	11	DF	DF	DF	DF	DF	DF	DF	DF	DF	5	4	7	12
27-Apr	2	3	5	3	6	3	6	8	12	13	18	17	37	25	40	54	46	37	26	19	26	39	16	18	54
28-Apr	42	12	48	66	13	26	9	21	17	40	50	54	73	78	91	64	45	19	10	8	6	5	9	18	91
29-Apr	14	7	6	5	4	8	11	15	14	16	19	14	20	28	14	16	12	13	10	9	5	7	3	2	28
30-Apr	5	16	4	3	5	2	7	9	17	20	16	37	38	15	9	27	45	8	16	75	39	21	6	29	75

58	54	48	66	30	26	38	42	40	61	69	64	73	78	91	64	82	46	26	75	64	39	64	75	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure





Summary of Hour Averages

Mannix - April 2017

Maximum Value: 1.4 km/h on Apr 13 14:00		Maximum Daily Average: 0.9 km/h on Apr 13		Hours in Service: 720																						
Minimum Value: -0.8 km/h on Apr 1 12:00		Minimum Daily Average: -0.4 km/h on Apr 1		Hours of Data: 705																						
Maximum Diurnal Average: 0.3 km/h at hour 23		Minimum Diurnal Average: 0.1 km/h at hour 15		Hours of Missing Data: 15																						
Monthly Average: 0.25 km/h		Percentiles: P ₁ = -0.5 P ₁₀ = -0.2 Q ₁ = -0.1 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 0.8 P ₉₉ = 1.2		Hours of Calibration: 0																						
				Percent Operational Time: 97.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	-0.5	-0.5	-0.4	-0.6	-0.6	-0.2	-0.2	-0.5	-0.5	-0.7	-0.7	-0.8	-0.5	-0.5	-0.4	-0.4	-0.1	-0.1	0.0	-0.1	-0.3	-0.4	-0.4	-0.6	-0.4	0.0
2-Apr	-0.5	-0.1	-0.2	-0.1	-0.2	-0.3	-0.2	0.1	-0.1	0.2	0.4	0.1	0.0	0.1	-0.4	-0.3	0.0	0.1	0.0	-0.1	-0.1	0.0	-0.2	-0.3	-0.1	0.4
3-Apr	-0.2	0.0	-0.1	-0.2	-0.3	-0.1	0.1	0.0	-0.1	0.0	-0.1	0.1	0.1	0.4	-0.1	-0.1	-0.2	0.2	0.2	0.0	0.0	-0.2	0.2	0.5	0.0	0.5
4-Apr	0.0	0.5	0.6	0.4	0.7	0.5	0.3	0.4	0.4	0.5	0.0	-0.4	0.4	0.6	0.5	-0.1	-0.2	0.6	0.4	0.3	-0.2	0.0	0.4	0.5	0.3	0.7
5-Apr	0.6	0.6	0.2	0.4	0.6	0.6	AF	AF	AF	AF	0.9	0.9	1.3	1.2	0.5	0.1	0.5	0.2	0.8	0.7	1.0	0.8	0.7	0.6	0.7	1.3
6-Apr	0.7	0.7	0.7	0.8	0.4	0.4	0.5	0.3	0.7	0.3	0.2	0.4	0.7	0.2	-0.2	-0.3	-0.5	-0.4	-0.2	-0.2	-0.2	-0.1	0.5	0.7	0.2	0.8
7-Apr	0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.3	0.1	-0.4	-0.1	0.0	-0.1	0.1	0.2	0.1	0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.2
8-Apr	-0.3	-0.2	-0.4	-0.5	-0.1	0.1	0.0	-0.1	0.0	-0.1	-0.3	0.0	0.0	0.0	-0.2	0.3	0.6	0.6	0.1	0.3	-0.2	-0.1	0.1	-0.1	0.0	0.6
9-Apr	0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.2	0.2	0.1	0.4	0.6	0.7	0.4	0.4	0.3	0.4	0.7	0.8	0.8	0.9	0.7	0.6	0.6	0.3	0.9
10-Apr	0.7	0.9	0.9	0.7	0.6	0.8	0.9	0.7	0.7	0.6	0.6	0.3	0.8	0.6	0.7	0.6	0.6	0.6	0.5	0.6	0.4	0.6	0.3	0.1	0.6	0.9
11-Apr	0.0	0.3	0.3	0.1	-0.2	-0.1	-0.1	0.0	0.1	0.0	0.3	0.0	0.3	-0.1	0.2	-0.3	-0.1	-0.2	-0.3	-0.2	-0.2	-0.5	-0.3	0.0	0.0	0.3
12-Apr	-0.1	-0.2	0.0	0.2	-0.1	-0.1	0.1	0.0	0.0	-0.1	0.1	0.0	0.2	-0.3	-0.1	0.0	-0.2	-0.2	-0.2	-0.1	-0.2	0.1	0.5	0.6	0.0	0.6
13-Apr	0.2	0.4	0.4	0.6	0.7	1.0	0.7	0.7	1.0	0.7	0.7	1.1	1.4	0.8	1.2	1.1	1.2	1.4	1.2	1.1	1.0	1.0	1.0	0.9	1.4	
14-Apr	0.9	0.9	0.6	0.8	0.5	0.6	0.5	0.8	0.4	0.6	0.4	0.4	0.7	AF	AF	0.7	0.8	1.0	0.5	0.7	0.8	1.2	0.7	0.3	0.7	1.2
15-Apr	0.4	0.3	0.5	0.1	0.1	0.0	0.1	-0.1	0.1	0.0	0.2	0.1	0.5	0.5	0.0	-0.3	-0.2	0.0	-0.1	-0.1	0.3	0.8	0.7	0.9	0.2	0.9
16-Apr	0.8	0.9	0.7	0.8	0.9	0.9	0.8	0.7	0.6	0.5	0.8	0.3	-0.3	-0.4	-0.2	-0.6	-0.3	-0.3	-0.1	0.0	0.1	0.3	0.6	0.4	0.3	0.9
17-Apr	-0.2	-0.2	-0.4	-0.2	-0.4	-0.4	-0.2	0.1	-0.2	-0.1	-0.2	0.3	-0.1	0.6	-0.1	0.1	0.3	0.3	0.1	0.1	0.2	0.1	0.0	0.2	0.0	0.6
18-Apr	0.4	0.0	0.0	-0.2	-0.1	0.0	0.2	0.1	0.1	-0.3	-0.5	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.1	0.2	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.4
19-Apr	0.0	0.0	0.0	-0.1	-0.1	0.1	0.1	0.1	-0.1	-0.1	-0.2	0.1	-0.2	0.0	0.2	0.7	0.6	0.4	0.4	0.1	0.1	0.1	0.2	0.4	0.1	0.7
20-Apr	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.3	0.3	0.3	0.1	-0.3	-0.4	-0.4	-0.5	-0.4	-0.4	-0.3	-0.3	0.2	-0.1	0.0	-0.2	-0.2	0.0	0.5
21-Apr	-0.2	-0.2	-0.2	0.1	0.0	-0.1	0.1	0.0	0.1	0.1	0.4	0.4	0.1	0.2	0.0	0.3	0.1	0.1	0.4	0.3	0.1	0.3	0.2	0.1	0.1	0.4
22-Apr	0.0	-0.1	0.0	-0.1	-0.4	-0.2	-0.1	0.1	-0.2	-0.1	0.0	-0.2	0.2	0.3	-0.2	0.0	-0.1	0.0	0.2	-0.1	-0.1	0.3	0.5	0.3	0.0	0.5
23-Apr	0.5	0.7	0.5	0.5	0.4	0.5	0.3	0.6	0.4	0.9	0.4	0.6	0.4	0.4	0.3	0.5	0.5	0.7	0.5	0.5	0.6	0.4	0.6	0.6	0.5	0.9
24-Apr	0.5	0.5	0.5	0.6	0.6	0.8	0.7	0.7	0.9	0.9	0.7	1.0	0.8	0.8	0.9	1.0	0.8	1.0	0.8	0.7	0.8	0.6	0.7	0.8	0.7	1.0
25-Apr	0.6	0.5	0.5	0.7	0.5	0.7	0.7	0.8	0.9	0.6	0.8	0.9	0.6	0.7	0.7	0.4	0.7	0.9	0.9	0.7	0.7	0.8	0.9	0.9	0.7	0.9
26-Apr	0.7	0.7	0.6	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.9	1.2	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.6	0.6	0.7	--	1.2
27-Apr	0.8	0.7	0.6	0.6	0.5	0.4	0.6	0.6	0.6	0.6	0.5	0.8	0.7	0.3	0.4	-0.2	0.2	0.3	0.0	0.1	-0.1	0.1	0.1	0.1	0.4	0.8
28-Apr	0.1	-0.2	0.3	-0.1	0.0	-0.1	0.2	0.3	0.3	0.5	0.6	0.1	0.4	0.2	0.0	0.4	0.5	0.6	0.3	0.6	0.5	0.5	0.6	0.4	0.3	0.6
29-Apr	0.6	0.6	0.4	0.6	0.4	0.6	0.5	0.3	0.4	0.3	-0.2	-0.2	-0.1	-0.2	-0.5	0.3	0.3	-0.2	-0.2	0.1	-0.1	-0.1	0.2	0.4	0.2	0.6
30-Apr	0.4	0.4	0.6	0.5	0.6	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.9	0.9	-0.1	0.4	0.9	0.5	0.2	0.0	0.4	0.4	-0.3	0.4	0.9
																								Diurnal Average		
																								Diurnal Maximum		
																								DF - DAS Failure AF - Analyzer Failure		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 20 m (VW20m) - km/h

Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 4.1 km/h on Apr 20 13:00	Hours of Data: 705
Minimum Value: 0.1 km/h on Apr 22 02:00	Hours of Missing Data: 15
	Hours of Calibration: 0
	Percent Operational Time: 97.9
Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.0 Median = 1.6 Q ₃ = 2.2 P ₉₀ = 2.7 P ₉₉ = 3.4	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2.1	1.7	1.7	1.8	1.8	1.4	1.3	1.8	2.2	2.3	2.2	2.5	2.6	2.1	2.0	1.7	1.6	1.0	1.0	0.5	1.2	1.0	1.1	1.2	2.6
2-Apr	1.0	0.7	0.9	0.7	0.6	0.5	0.8	0.6	1.3	1.4	1.3	2.0	1.9	2.3	2.4	2.6	2.5	1.7	1.5	1.2	0.7	0.7	1.3	1.6	2.6
3-Apr	1.8	1.3	1.0	1.2	1.4	0.9	1.0	1.1	1.2	1.4	1.5	1.8	1.5	1.5	1.9	1.5	1.2	1.2	0.8	0.5	0.4	0.3	0.5	1.1	1.9
4-Apr	0.4	0.6	0.9	0.7	1.2	1.1	0.8	0.8	1.1	1.5	1.9	1.9	1.8	1.7	1.8	2.4	2.3	1.4	0.7	0.6	0.6	0.3	0.5	0.7	2.4
5-Apr	0.9	1.0	0.7	0.8	1.0	1.1	AF	AF	AF	AF	2.1	2.4	3.1	2.8	2.8	2.5	2.3	2.2	1.4	1.4	1.2	0.9	1.2	0.8	3.1
6-Apr	1.0	1.0	1.0	1.0	0.6	0.6	0.6	1.0	1.3	1.7	1.6	1.3	1.6	1.8	2.2	2.1	1.7	1.5	0.8	0.5	0.5	1.0	1.1	1.2	2.2
7-Apr	0.8	0.8	0.7	0.8	1.2	1.7	1.7	1.8	2.1	2.2	2.5	2.9	3.3	3.2	3.0	3.2	3.0	3.3	3.1	3.0	2.6	2.5	2.4	2.3	3.3
8-Apr	3.1	3.5	2.8	2.8	3.3	3.1	3.0	2.9	3.0	3.2	3.3	3.3	3.4	3.2	3.2	3.0	2.7	2.6	2.5	2.4	1.9	1.9	1.8	1.3	3.5
9-Apr	1.1	0.8	0.9	0.7	0.9	0.7	1.0	1.3	1.4	1.7	1.9	2.1	2.2	2.1	2.1	1.9	1.6	1.3	1.2	1.4	1.4	1.6	1.1	1.0	2.2
10-Apr	0.8	1.1	1.3	1.1	1.1	1.3	1.4	1.4	1.5	1.4	1.6	1.6	2.0	1.7	1.8	1.5	1.5	1.2	0.9	0.8	0.6	0.6	0.4	0.7	2.0
11-Apr	0.8	1.4	2.5	2.8	2.1	2.5	2.5	2.4	2.7	2.6	2.9	2.6	3.0	2.9	3.1	2.8	2.3	2.1	2.3	3.1	3.1	3.4	3.2	2.9	3.4
12-Apr	1.5	1.4	1.4	1.5	1.4	1.8	1.6	1.6	1.6	1.7	2.0	2.4	2.4	2.4	2.2	2.2	2.2	2.0	2.2	1.8	1.5	1.6	1.2	1.3	2.4
13-Apr	0.6	0.8	0.8	1.0	1.3	1.8	1.6	1.6	2.0	2.1	2.1	2.2	2.3	2.4	2.4	2.4	2.4	2.6	2.7	2.4	2.2	2.3	2.1	2.5	2.7
14-Apr	2.3	2.2	2.3	2.1	1.9	2.0	2.2	2.6	2.2	2.1	2.0	2.2	2.7	AF	AF	3.0	2.7	3.0	2.2	2.5	2.9	2.9	3.0	2.6	3.0
15-Apr	2.5	2.4	2.4	2.3	2.4	2.4	2.1	2.2	2.1	1.8	1.8	1.7	1.6	2.1	2.4	2.4	1.9	2.1	1.7	1.1	1.1	1.4	1.0	1.7	2.5
16-Apr	2.1	1.9	1.3	1.3	1.6	1.4	1.4	1.3	1.4	1.5	1.7	2.1	2.6	2.9	2.8	2.5	2.5	2.1	2.1	1.8	1.0	1.0	0.6	0.5	2.9
17-Apr	1.9	3.0	3.1	3.1	3.4	3.1	2.9	3.2	3.0	2.7	2.6	2.7	2.8	2.7	2.5	2.7	2.6	2.6	2.4	2.3	2.1	2.0	1.9	2.0	3.4
18-Apr	1.8	1.9	2.3	2.4	2.6	2.5	2.2	2.1	1.9	1.8	1.8	2.2	2.2	1.9	2.0	1.8	1.7	1.6	1.7	1.5	1.5	1.4	1.5	1.2	2.6
19-Apr	1.1	1.0	0.8	1.1	1.0	0.9	0.8	0.9	1.0	1.0	1.1	1.3	1.3	1.5	1.6	1.3	1.3	1.1	0.7	0.4	0.3	0.2	0.4	0.5	1.6
20-Apr	0.5	0.6	0.5	0.5	0.5	0.8	0.9	0.8	1.1	1.5	1.9	3.0	4.1	4.0	3.9	3.7	3.4	2.9	2.8	1.9	1.4	0.5	0.7	1.1	4.1
21-Apr	1.4	1.7	2.4	2.0	0.4	0.4	0.8	0.9	1.1	1.5	1.7	1.7	1.5	1.6	1.6	1.7	1.3	1.2	0.9	0.6	0.4	0.5	0.3	0.3	2.4
22-Apr	0.2	0.1	0.2	0.9	2.4	2.8	2.7	2.4	2.5	2.4	2.7	2.5	2.5	2.7	2.4	2.6	2.2	2.0	1.8	1.6	1.7	1.6	1.4	0.9	2.8
23-Apr	0.9	0.8	1.1	0.6	0.7	1.0	1.1	1.6	1.6	2.0	2.0	2.0	2.1	2.0	1.8	1.5	1.5	1.3	1.3	1.0	1.1	1.2	1.3	1.2	2.1
24-Apr	0.9	1.0	1.4	1.3	1.3	1.4	1.4	1.5	1.7	1.6	1.7	2.0	2.0	1.8	1.9	1.9	1.8	1.8	1.6	1.4	1.4	1.3	1.4	1.5	2.0
25-Apr	1.3	1.0	0.9	1.4	1.4	1.5	1.7	2.1	1.9	1.8	1.9	2.3	2.1	2.0	1.8	1.9	1.9	1.9	1.5	1.5	1.5	1.6	1.7	1.6	2.3
26-Apr	1.4	1.3	1.4	1.5	1.4	1.3	1.6	1.8	2.1	2.3	2.1	2.3	DF	DF	DF	DF	DF	DF	DF	DF	DF	1.1	1.1	1.4	2.3
27-Apr	1.1	0.9	0.7	0.9	0.9	1.0	1.1	1.2	1.3	1.6	1.9	2.1	2.2	2.3	2.1	2.1	1.6	1.4	1.1	0.5	0.5	0.5	0.5	0.5	2.3
28-Apr	0.4	0.3	0.3	0.6	0.2	0.3	0.6	0.9	1.1	1.4	1.6	2.0	1.9	1.8	1.5	1.4	1.5	1.3	0.9	0.7	0.9	0.7	1.0	1.0	2.0
29-Apr	0.8	0.5	0.7	0.7	0.7	0.6	0.9	1.0	1.5	1.7	2.1	2.2	2.6	2.0	2.7	2.6	2.2	2.4	1.8	1.2	0.7	0.7	0.6	0.4	2.7
30-Apr	0.4	0.7	0.9	0.8	0.8	0.7	1.1	1.3	1.7	1.7	2.0	2.1	2.1	2.0	2.4	2.4	2.3	1.9	1.1	0.5	0.3	0.7	0.6	0.3	2.4

3.1	3.5	3.1	3.1	3.4	3.1	3.0	3.2	3.0	3.2	3.2	3.3	3.3	4.1	4.0	3.9	3.7	3.4	3.3	3.1	3.1	3.1	3.4	3.2	2.9	
Diurnal Maximum																									

DF - DAS Failure AF - Analyzer Failure



Maximum Value: 2.2 km/h on Apr 5 13:00																				Maximum Daily Average: 1.3 km/h on Apr 5					Hours in Service: 720				
Minimum Value: -2.3 km/h on Apr 20 15:00																				Minimum Daily Average: -0.9 km/h on Apr 17					Hours of Data: 700				
Maximum Diurnal Average: 0.3 km/h at hour 24																				Minimum Diurnal Average: 0.0 km/h at hour 19					Hours of Missing Data: 20				
Monthly Average: 0.14 km/h																				Percentiles: P ₁ = -1.7 P ₁₀ = -0.9 Q ₁ = -0.5 Median = 0.1 Q ₃ = 0.7 P ₉₀ = 1.2 P ₉₉ = 1.6					Hours of Calibration: 0				
																				Percent Operational Time: 97.2									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Apr	-0.3	-0.2	-0.3	-0.4	-0.5	0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.7	-0.3	-0.7	-0.4	-0.6	-0.3	-0.4	-0.5	0.1	-0.1	-0.4	-0.4	-0.5	-0.3	0.1			
2-Apr	-0.5	0.0	0.0	-0.1	-0.1	-0.2	-0.1	0.2	0.0	0.3	0.4	-0.1	-0.1	-0.1	-0.5	-1.0	-0.8	-0.2	-0.6	-0.6	-0.5	-0.1	-1.0	-1.1	-0.3	0.4			
3-Apr	-1.0	-0.7	-0.6	-0.6	-0.6	-0.5	-0.2	-0.2	0.2	-0.1	0.0	0.6	0.4	0.6	-0.2	-0.2	-0.2	0.1	-0.1	0.1	0.0	-0.1	0.3	1.0	-0.1	1.0			
4-Apr	-0.1	0.5	1.1	0.9	1.3	1.1	0.8	0.6	0.5	0.9	0.5	0.2	1.0	0.8	0.6	0.7	0.6	0.6	0.4	0.6	0.3	0.2	0.8	0.9	0.7	1.3			
5-Apr	1.0	1.2	0.7	0.7	AF	AF	AF	AF	AF	AF	0.6	1.1	2.2	2.1	1.4	1.1	1.3	1.0	1.5	1.5	1.7	1.4	1.5	1.1	1.3	2.2			
6-Apr	1.2	1.3	1.0	1.1	0.8	0.8	0.8	0.6	1.0	0.6	0.2	0.1	0.8	0.1	-0.1	-0.2	-0.5	-0.5	-0.4	-0.5	-0.6	-0.6	0.1	0.2	0.3	1.3			
7-Apr	-0.1	-0.3	-0.1	-0.4	-0.6	-0.8	-1.0	-1.1	-0.8	-1.0	-0.5	-1.1	-1.3	-1.0	-0.9	-1.1	-0.6	-1.0	-0.9	-1.1	-1.0	-0.9	-1.0	-0.9	-0.8	-0.1			
8-Apr	-1.7	-0.9	-1.3	-1.0	-1.1	-0.6	-0.4	-0.9	-0.5	-0.8	-1.5	-1.0	-1.0	-1.0	-1.0	-0.4	-0.4	-0.2	-0.8	-0.6	-0.9	-0.7	-0.6	-0.7	-0.8	-0.2			
9-Apr	-0.2	-0.4	-0.2	-0.4	-0.1	0.1	0.1	-0.3	0.5	0.3	0.7	1.2	1.5	0.9	1.2	0.8	1.1	1.0	1.0	1.2	1.3	1.3	1.1	1.2	0.6	1.5			
10-Apr	1.3	1.6	1.6	1.5	1.4	1.5	1.6	1.2	1.1	0.7	0.7	0.3	1.3	0.8	0.9	0.8	0.7	0.7	0.7	1.0	0.9	1.0	0.6	0.0	1.0	1.6			
11-Apr	-0.6	-0.4	-0.7	-0.6	-0.9	-0.8	-1.3	-0.6	-0.7	-0.7	-0.5	-0.3	-0.5	-0.7	-0.4	-1.4	-1.0	-1.0	-1.1	-1.9	-1.1	-1.9	-1.6	-0.9	-0.9	-0.3			
12-Apr	-0.6	-0.7	-0.5	-0.1	-0.5	-0.9	-0.5	-0.3	0.0	-0.3	0.1	0.1	0.1	-1.3	-0.8	-0.3	-1.1	-0.7	-0.9	-0.9	-0.9	-0.4	0.2	0.4	-0.4	0.4			
13-Apr	0.2	0.4	0.6	0.6	0.6	0.9	0.4	0.5	0.6	0.5	0.8	0.6	1.0	1.0	0.4	1.3	0.5	0.8	1.1	0.8	0.5	0.7	0.6	0.6	0.7	1.3			
14-Apr	0.7	0.7	0.6	0.5	0.0	0.3	-0.1	-0.1	-0.1	-0.1	AF	-0.2	-0.1	-0.1	AF	AF	AF	AF	0.0	-0.1	0.0	0.5	-0.4	-0.6	0.1	0.7			
15-Apr	-0.2	-0.5	-0.3	-0.5	-0.8	-0.9	-0.7	-1.0	-0.7	-0.4	-0.3	-0.4	0.2	0.1	-0.1	-0.8	-0.5	-0.9	-0.7	-0.7	-0.1	1.2	1.2	1.3	-0.3	1.3			
16-Apr	1.4	1.5	1.2	1.4	1.8	1.5	1.4	0.8	0.8	0.7	0.9	0.7	0.5	-0.1	0.8	0.1	0.5	0.5	0.5	0.5	0.7	0.7	1.0	0.7	0.8	1.8			
17-Apr	-0.7	-1.6	-1.4	-1.6	-1.7	-1.6	-1.3	-1.3	-1.7	-1.0	-1.2	-0.6	-0.9	-0.2	-0.9	-0.7	-0.1	-0.4	-0.7	-0.7	-0.6	-0.6	-0.6	-0.2	-0.9	-0.1			
18-Apr	-0.4	-0.7	-0.7	-1.1	-0.8	-1.0	-0.2	-0.6	-0.6	-0.6	-0.8	0.0	-0.5	-1.0	-0.6	-0.3	-0.2	-0.4	0.0	-0.6	-0.5	-0.3	-0.2	-0.5	-0.5	0.0			
19-Apr	-0.3	-0.3	-0.3	-0.5	-0.4	-0.1	-0.1	0.2	-0.1	-0.1	-0.5	0.1	-0.2	0.3	0.2	1.1	0.8	0.3	0.7	0.1	0.0	0.1	0.4	0.9	0.1	1.1			
20-Apr	0.4	0.2	0.3	0.3	0.2	0.3	0.1	0.0	0.1	0.4	0.1	-1.3	-2.0	-1.7	-2.3	-1.6	-1.3	-1.0	-1.4	-0.3	-0.4	-0.2	-0.5	-0.7	-0.5	0.4			
21-Apr	-0.7	-0.8	-1.1	-0.5	0.0	-0.2	-0.3	0.1	-0.2	-0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.1	-0.1	0.3	0.6	0.0	0.1	0.4	0.5	-0.1	0.6			
22-Apr	0.3	0.2	0.1	-0.5	-1.1	-1.3	-0.9	-0.5	-1.2	-1.0	-0.8	-1.1	-0.1	-0.1	-0.7	-0.7	-0.7	-0.6	-0.6	-0.9	-0.7	-0.3	-0.1	0.1	-0.5	0.3			
23-Apr	0.5	0.5	0.6	0.4	0.2	0.4	0.2	0.7	0.4	0.9	0.1	0.5	0.2	0.5	0.5	0.6	0.6	1.1	0.7	0.7	0.7	0.8	0.9	0.5	0.6	1.1			
24-Apr	0.6	0.4	0.2	0.4	0.4	0.7	0.3	0.3	0.4	0.4	0.3	0.9	0.7	1.0	0.7	0.9	0.6	0.7	0.4	0.7	1.0	0.6	0.6	0.8	0.6	1.0			
25-Apr	0.6	0.5	0.5	1.1	0.9	0.9	0.8	1.1	1.5	1.0	1.6	1.4	1.2	1.3	1.3	1.3	1.3	1.5	1.2	1.5	1.3	1.6	1.6	1.5	1.2	1.6			
26-Apr	1.3	1.4	1.3	1.2	1.0	1.3	1.3	1.3	1.5	1.5	1.9	1.8	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.9	1.0	1.3	--	1.9		
27-Apr	1.5	1.4	1.2	1.1	0.9	0.8	0.6	1.0	1.0	0.6	0.3	1.0	1.2	0.9	0.4	0.2	0.2	0.9	-0.1	0.1	-0.3	0.0	-0.1	-0.1	0.6	1.5			
28-Apr	0.2	0.1	0.3	0.3	-0.1	0.0	0.2	0.3	0.3	0.4	1.1	0.0	0.5	0.0	0.1	0.4	0.4	0.3	0.0	0.5	0.4	0.4	0.7	0.5	0.3	1.1			
29-Apr	0.9	0.9	1.0	0.9	0.8	1.0	0.8	0.4	0.4	0.4	0.2	0.3	1.0	0.1	0.0	1.2	1.0	0.5	0.5	0.6	0.4	0.6	0.8	1.0	0.7	1.2			
30-Apr	0.8	0.9	1.1	1.2	1.3	0.8	0.8	0.7	1.0	0.4	0.4	1.0	0.0	1.2	1.1	-0.5	0.3	0.6	0.1	0.1	-0.1	0.2	0.3	0.1	0.6	1.3			
																								Diurnal Average					
																								Diurnal Maximum					
0.2 0.2 0.2 0.2 0.1 0.1 0.1 0.1 0.2 0.1 0.2 0.2 0.2 0.2 0.1 0.0 0.0 0.1 0.1 0.0 0.1 0.0 0.2 0.3 0.3																													
1.5 1.6 1.6 1.5 1.8 1.5 1.6 1.3 1.5 1.5 1.9 1.8 2.2 2.1 1.4 1.3 1.3 1.5 1.5 1.5 1.5 1.7 1.6 1.6 1.5																													
DF - DAS Failure AF - Analyzer Failure																													



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 4.0 km/h on Apr 20 14:00	Hours of Data: 700
Minimum Value: 0.2 km/h on Apr 22 03:00	Hours of Missing Data: 20
Percentiles: P ₁ = 0.3 P ₁₀ = 0.7 Q ₁ = 1.1 Median = 1.8 Q ₃ = 2.5 P ₉₀ = 2.9 P ₉₉ = 3.3	Hours of Calibration: 0
	Percent Operational Time: 97.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2.2	1.7	1.5	1.9	1.7	1.6	1.4	1.9	2.4	2.6	2.4	2.6	2.9	2.3	2.5	1.9	1.8	1.1	1.2	0.5	1.0	1.2	1.1	1.0	2.9
2-Apr	0.8	0.7	0.7	1.0	0.5	0.4	0.4	0.5	1.4	1.7	1.4	2.3	2.4	2.9	2.9	3.3	2.6	2.0	1.5	1.3	1.1	1.0	1.2	1.7	3.3
3-Apr	1.9	1.4	1.0	1.1	1.4	1.1	1.3	1.0	1.6	1.6	2.0	2.4	2.0	2.1	2.4	1.7	1.6	1.5	0.8	0.6	0.4	0.2	0.6	1.1	2.4
4-Apr	0.5	0.8	1.0	0.5	1.0	1.0	0.8	0.8	1.1	1.7	2.2	2.2	2.1	2.2	2.1	2.2	2.1	1.6	0.9	0.6	0.3	0.3	0.4	0.6	2.2
5-Apr	0.9	0.9	0.7	0.8	AF	AF	AF	AF	AF	AF	2.6	2.9	3.8	3.4	2.7	2.3	2.3	2.0	1.7	1.5	1.2	1.1	1.4	0.9	3.8
6-Apr	0.8	0.6	1.0	0.8	0.6	0.6	0.4	0.9	1.3	1.9	1.6	1.9	2.0	2.4	2.4	1.9	1.5	0.8	0.5	0.5	1.1	1.2	1.4	2.4	
7-Apr	1.0	0.6	0.8	0.7	1.2	1.2	1.3	1.4	1.7	2.3	2.9	2.9	3.1	3.3	3.1	3.1	3.1	3.3	3.3	3.0	2.6	2.6	2.3	2.4	3.3
8-Apr	2.7	3.8	2.7	2.7	3.0	2.9	3.0	3.0	3.2	3.2	3.1	3.4	3.5	3.3	3.1	3.1	2.8	2.8	2.5	2.4	2.0	1.8	1.8	1.3	3.8
9-Apr	1.3	1.1	1.2	1.0	1.0	0.9	1.2	1.6	1.9	2.1	2.3	2.8	2.8	2.6	2.7	2.5	2.2	1.7	1.2	1.3	1.5	1.7	1.1	0.9	2.8
10-Apr	1.1	1.3	1.4	1.1	1.2	1.1	1.6	1.6	1.7	1.6	2.0	1.9	2.4	2.4	2.3	2.0	1.8	1.3	0.9	1.2	0.6	0.5	0.3	0.9	2.4
11-Apr	0.9	1.6	2.7	2.7	2.4	2.6	2.5	2.6	2.9	2.8	3.3	3.0	3.6	3.3	3.3	2.6	2.5	2.0	2.1	2.2	2.8	3.0	2.7	2.5	3.6
12-Apr	1.9	1.6	1.4	1.5	1.4	1.5	1.5	1.8	2.0	2.0	2.8	2.9	3.1	2.7	2.7	2.8	2.2	2.3	2.1	1.6	1.4	1.8	1.3	1.4	3.1
13-Apr	0.9	1.2	1.1	1.2	1.6	2.0	1.8	1.8	2.3	2.4	2.5	2.6	2.9	2.7	2.8	2.9	2.4	2.7	2.8	2.5	2.3	2.5	2.3	2.7	2.9
14-Apr	2.7	2.7	2.9	2.6	2.1	2.2	2.2	2.5	2.0	AF	1.9	2.1	2.5	AF	AF	AF	AF	3.2	2.3	2.8	2.8	3.2	3.2	2.9	3.2
15-Apr	2.9	2.7	2.7	2.7	2.5	2.3	2.2	2.0	2.1	2.0	2.1	1.9	2.5	3.0	2.7	2.4	1.9	1.4	0.9	1.2	1.3	1.0	1.9	3.0	
16-Apr	2.3	2.1	1.4	1.5	1.8	1.5	1.6	1.6	1.6	1.7	2.0	2.4	2.9	2.7	3.1	2.8	2.6	2.2	2.0	1.7	1.0	0.9	0.7	0.8	3.1
17-Apr	1.6	2.2	2.7	2.5	2.9	3.0	2.8	2.8	2.6	2.8	2.5	2.9	3.0	3.2	2.8	2.8	3.1	2.8	2.4	2.3	2.2	2.1	2.1	2.4	3.2
18-Apr	2.1	1.9	2.4	2.1	2.7	2.5	2.6	2.1	2.1	2.1	2.2	2.8	2.7	2.3	2.2	2.3	2.0	1.9	1.9	1.5	1.6	1.5	1.7	1.1	2.8
19-Apr	1.1	0.9	0.7	1.1	1.0	0.9	0.8	1.1	1.2	1.1	1.2	1.6	1.8	2.0	2.0	1.6	1.7	1.4	1.1	0.6	0.5	0.3	0.5	0.4	2.0
20-Apr	0.5	0.7	0.6	0.4	0.4	0.6	0.6	0.8	1.3	1.9	2.5	2.5	3.4	4.0	3.3	3.3	3.3	2.9	2.7	2.3	1.7	0.7	0.9	1.2	4.0
21-Apr	1.4	1.8	2.2	2.0	0.6	0.3	0.7	1.0	1.2	1.8	2.1	2.2	2.0	2.2	1.9	2.0	1.7	1.5	1.1	0.7	0.5	0.6	0.5	0.3	2.2
22-Apr	0.4	0.2	0.2	1.1	2.6	2.7	2.6	2.3	2.5	2.3	2.8	2.7	3.3	3.2	3.0	2.8	2.5	2.3	1.9	1.3	1.6	1.7	1.1	0.8	3.3
23-Apr	0.8	1.0	1.3	0.8	0.8	1.0	1.2	2.1	2.1	2.6	2.3	2.6	2.6	2.5	2.4	1.9	1.9	1.8	1.4	1.2	1.3	1.6	1.6	1.4	2.6
24-Apr	1.2	1.0	1.6	1.6	1.4	1.6	1.5	1.6	1.9	1.7	2.0	2.3	2.3	2.1	2.2	2.2	1.9	1.9	1.8	1.7	1.6	1.5	1.6	1.8	2.3
25-Apr	1.4	1.2	1.0	1.4	1.4	1.6	1.8	2.5	2.3	2.3	2.4	2.8	2.5	2.4	2.1	2.4	2.4	1.8	1.7	1.6	1.5	1.7	1.8	1.7	2.8
26-Apr	1.4	1.4	1.5	1.6	1.5	1.6	1.9	2.1	2.2	2.4	2.7	3.0	DF	DF	DF	DF	DF	DF	DF	DF	DF	1.0	1.1	1.6	3.0
27-Apr	1.1	0.7	0.8	0.8	0.9	0.8	1.2	1.5	1.7	2.0	2.3	2.7	2.8	2.9	2.6	2.6	2.2	1.8	1.4	0.6	0.6	0.7	0.6	0.6	2.9
28-Apr	0.5	0.5	0.4	0.7	0.2	0.2	0.5	0.9	1.2	1.5	2.0	2.3	2.2	2.2	2.0	1.8	1.8	1.5	1.0	0.9	1.0	0.8	1.3	1.2	2.3
29-Apr	0.9	0.7	0.6	0.9	0.7	0.7	0.9	1.1	1.4	2.1	2.7	2.6	3.1	2.5	3.0	3.1	2.4	2.4	2.0	1.0	0.5	0.3	0.3	0.3	3.1
30-Apr	0.4	0.7	0.8	0.7	0.5	0.5	1.1	1.4	2.2	1.9	2.7	2.6	2.5	2.5	2.9	2.9	2.6	2.1	1.2	0.5	0.4	0.7	0.6	0.3	2.9

2.9	3.8	2.9	2.7	3.0	3.0	3.0	3.0	3.0	3.2	3.2	3.3	3.4	3.8	4.0	3.3	3.3	3.3	3.3	3.3	3.3	3.0	2.8	3.2	3.2	2.9
Diurnal Maximum																									

DF - DAS Failure AF - Analyzer Failure



Maximum Value: 1.8 km/h on Apr 14 15:00 Maximum Daily Average: 0.6 km/h on Apr 5		Hours in Service: 720 Hours of Data: 706 Hours of Missing Data: 14 Hours of Calibration: 0 Percent Operational Time: 98.1																								
Minimum Value: -1.8 km/h on Apr 14 16:00 Maximum Diurnal Average: 0.3 km/h at hour 13 Monthly Average: 0.14 km/h		Minimum Daily Average: -0.5 km/h on Apr 17 Minimum Diurnal Average: 0.0 km/h at hour 19 Percentiles: P ₁ = -1.1 P ₁₀ = -0.4 Q ₁ = -0.1 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.3																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	-0.1	0.1	0.0	0.0	-0.1	0.3	0.1	0.2	0.3	0.2	-0.1	-0.3	0.9	0.0	0.3	0.1	0.3	0.1	-0.3	0.3	0.0	-0.3	0.1	-0.2	0.1	0.9
2-Apr	-0.1	0.1	0.2	0.0	0.1	-0.1	-0.1	0.1	0.0	0.1	0.4	0.3	0.2	0.2	0.3	-0.1	-0.4	0.1	-0.2	-0.3	-0.3	0.4	-0.6	-0.6	0.0	0.4
3-Apr	-0.4	-0.3	-0.2	-0.1	0.0	-0.1	-0.1	-0.1	0.5	-0.2	0.3	0.7	0.8	0.8	0.3	0.4	0.3	0.5	-0.1	0.3	0.2	0.1	0.2	0.2	0.2	0.8
4-Apr	0.2	0.1	0.7	0.8	0.7	0.4	0.8	0.7	0.3	0.6	0.3	0.2	0.9	0.6	0.0	0.4	0.2	0.2	0.1	0.4	0.3	0.2	0.2	0.3	0.4	0.9
5-Apr	0.5	0.3	0.3	0.5	0.3	0.5	AF	AF	AF	AF	-0.3	-0.1	0.5	0.8	0.7	0.8	0.9	0.8	1.1	1.1	1.2	0.9	0.8	0.8	0.6	1.2
6-Apr	0.4	0.2	0.2	0.1	0.0	-0.1	0.4	0.5	0.5	0.5	0.0	-0.5	-0.2	-0.2	0.7	0.2	0.0	0.2	0.2	0.2	0.1	-0.3	0.1	0.2	0.1	0.7
7-Apr	0.0	0.0	0.0	0.1	0.0	-0.2	-0.6	-0.6	-0.3	-0.7	0.1	-0.4	-0.8	-0.4	-0.2	-0.4	0.1	-0.2	-0.4	-0.4	-0.3	-0.4	-0.4	-0.2	-0.3	0.1
8-Apr	-0.8	-0.5	-0.3	0.1	0.0	0.4	0.6	0.3	0.4	0.2	-0.6	-0.5	-0.3	0.1	0.0	0.2	-0.1	0.2	-0.2	-0.2	-0.4	-0.1	-0.1	-0.4	-0.1	0.6
9-Apr	0.1	-0.2	0.0	-0.4	0.0	0.3	0.3	-0.5	0.2	-0.1	0.2	0.8	1.5	0.5	1.0	0.5	0.8	0.3	0.1	0.0	0.1	0.3	0.5	0.7	0.3	1.5
10-Apr	1.0	1.3	1.2	1.1	1.1	1.1	0.6	0.6	0.5	0.0	0.3	0.0	0.8	0.4	0.4	0.2	0.1	-0.1	-0.4	0.8	0.5	0.5	0.5	0.1	0.5	1.3
11-Apr	-0.2	-0.1	-0.2	0.4	-0.1	0.1	-0.9	0.1	-0.2	-0.1	0.0	0.4	0.2	-0.3	0.3	-0.9	-0.7	-0.7	-0.4	-1.3	-0.2	-1.0	-0.8	-0.3	-0.3	0.4
12-Apr	-0.2	-0.3	-0.2	0.4	0.0	-0.4	-0.2	0.0	0.5	0.4	0.6	0.9	0.3	-1.3	-0.8	0.3	-0.9	-0.4	-0.4	-0.4	-0.4	-0.1	0.1	0.0	-0.1	0.9
13-Apr	0.0	0.0	0.1	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.7	0.4	1.0	0.5	-0.3	0.8	-0.1	-0.1	0.4	0.1	0.3	0.5	0.5	0.3	0.3	1.0
14-Apr	0.3	0.6	0.4	0.5	0.0	0.5	-0.1	0.1	0.2	0.2	-0.1	-0.2	0.0	AF	1.8	-1.8	-0.6	-0.2	0.0	0.0	0.1	0.3	0.1	-0.2	0.1	1.8
15-Apr	-0.1	-0.3	0.1	-0.2	-0.4	-0.3	-0.3	-0.4	-0.4	0.0	-0.1	-0.3	0.3	0.4	0.8	-0.1	-0.1	-0.6	-0.4	-0.3	0.2	0.3	0.7	0.7	0.0	0.8
16-Apr	0.3	0.4	0.6	0.8	1.3	1.1	0.8	0.4	0.4	0.2	0.1	0.5	0.1	-0.7	0.9	-0.2	0.5	0.2	0.2	0.3	0.5	0.4	0.6	0.4	0.4	1.3
17-Apr	-0.2	-1.1	-0.8	-1.2	-1.0	-1.0	-0.8	-0.7	-1.1	-0.4	-0.8	-0.1	-0.3	0.0	-0.6	-0.4	0.1	0.0	-0.3	-0.4	-0.2	-0.3	-0.4	0.0	-0.5	0.1
18-Apr	-0.2	-0.1	-0.1	-0.4	-0.2	-0.5	0.1	-0.3	-0.5	-0.3	-0.5	1.0	0.2	-0.7	-0.3	-0.2	-0.1	-0.5	0.2	-0.2	0.0	0.4	0.2	0.0	-0.1	1.0
19-Apr	0.1	-0.1	0.0	-0.1	-0.2	0.2	0.0	0.4	0.2	0.0	-0.3	0.0	-0.2	0.5	0.1	0.7	0.4	0.0	0.3	0.2	0.0	0.1	0.1	0.6	0.1	0.7
20-Apr	0.1	0.1	0.1	0.2	-0.1	0.2	0.2	0.0	0.1	0.5	0.4	-0.8	-1.1	-0.7	-1.1	-1.0	-0.5	-0.2	-0.8	-0.1	0.0	0.0	-0.1	-0.3	-0.2	0.5
21-Apr	-0.3	-0.3	-0.5	-0.1	0.1	0.1	-0.3	0.2	-0.1	0.0	0.2	0.1	0.0	0.0	0.3	-0.1	-0.1	-0.4	0.3	0.8	0.1	0.1	0.2	0.2	0.0	0.8
22-Apr	0.4	0.1	0.2	0.0	-0.4	-0.5	-0.5	-0.1	-0.8	-0.7	-0.5	-0.9	0.3	0.5	-0.1	-0.5	-0.6	-0.4	-0.4	-0.6	-0.3	-0.1	0.0	0.2	-0.2	0.5
23-Apr	0.5	0.4	0.4	0.2	0.3	0.3	0.1	0.2	0.0	0.7	-0.2	0.2	-0.1	0.3	0.2	0.5	0.2	0.6	0.1	0.1	0.3	0.2	0.6	0.2	0.3	0.7
24-Apr	0.0	0.2	0.0	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.1	0.7	0.3	0.6	0.1	0.6	0.4	0.1	0.2	0.3	0.7	0.4	0.3	0.2	0.3	0.7
25-Apr	-0.3	-0.2	0.0	0.0	0.0	0.0	-0.1	0.2	0.7	0.3	1.5	0.5	0.9	0.6	0.7	0.9	0.7	1.0	0.4	1.0	1.1	1.0	0.9	0.9	0.5	1.5
26-Apr	0.7	0.8	0.5	0.5	0.4	0.4	0.5	0.7	0.9	1.0	1.2	0.7	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.0	0.1	0.6	--	1.2
27-Apr	1.1	1.1	0.8	0.9	0.2	0.1	0.1	0.7	0.5	0.3	-0.2	0.3	1.3	0.8	-0.1	0.6	0.3	1.4	0.3	0.3	-0.1	0.2	-0.1	-0.1	0.5	1.4
28-Apr	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.2	0.1	0.5	1.1	-0.3	0.5	0.0	0.4	0.7	0.2	0.2	-0.1	0.3	0.1	0.7	0.3	0.1	0.2	1.1
29-Apr	0.6	0.5	0.7	0.7	0.5	0.7	0.5	0.2	0.6	0.2	0.0	0.1	1.0	0.0	-0.2	0.8	0.3	0.2	0.3	0.4	0.1	0.4	0.6	0.8	0.4	1.0
30-Apr	0.6	0.4	0.9	1.1	1.1	0.7	0.6	0.5	0.8	0.2	-0.3	0.9	-0.3	1.1	-0.1	-0.2	0.6	0.6	0.3	0.2	0.1	0.1	0.0	0.2	0.4	1.1
																								Diurnal Average		
																								Diurnal Maximum		
																								DF - DAS Failure AF - Analyzer Failure		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 75 m (VW75m) - km/h

Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 4.0 km/h on Apr 5 13:00	Hours of Data: 706
Minimum Value: 0.1 km/h on Apr 22 02:00	Hours of Missing Data: 14
Percentiles: P ₁ = 0.3 P ₁₀ = 0.6 Q ₁ = 1.2 Median = 1.9 Q ₃ = 2.5 P ₉₀ = 3.0 P ₉₉ = 3.6	Hours of Calibration: 0
	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2.2	1.7	1.6	2.1	1.7	1.5	1.7	2.1	2.3	2.5	2.4	2.8	3.1	2.5	2.9	2.2	1.9	1.0	1.3	0.7	1.1	1.3	1.3	1.0	3.1
2-Apr	0.9	1.1	0.8	1.1	0.5	0.5	0.4	0.5	1.3	1.7	1.6	2.3	2.4	3.1	3.0	3.8	2.8	2.0	1.2	1.3	1.4	1.1	1.4	1.6	3.8
3-Apr	2.0	1.3	0.8	1.0	1.2	1.1	1.1	0.9	1.6	1.4	2.1	2.6	2.3	2.2	2.8	1.6	1.8	1.6	0.8	0.9	0.4	0.3	0.4	1.3	2.8
4-Apr	0.5	1.0	0.8	0.4	0.6	0.6	0.5	0.8	1.0	1.8	2.2	2.3	2.2	2.4	2.4	2.0	2.0	1.7	0.9	0.6	0.4	0.3	0.4	0.4	2.4
5-Apr	0.8	0.5	0.5	0.5	0.7	1.1	AF	AF	AF	AF	2.7	3.0	4.0	3.4	3.0	2.3	2.4	2.1	1.7	1.6	0.9	0.9	1.2	0.7	4.0
6-Apr	0.5	0.5	1.2	1.3	0.6	1.0	0.4	0.7	1.0	1.8	1.9	1.6	1.8	2.3	2.7	2.5	2.1	1.6	0.8	0.4	0.5	1.0	1.4	1.6	2.7
7-Apr	1.4	0.8	0.9	0.6	0.8	0.8	1.1	1.1	1.2	1.9	3.0	2.9	2.8	3.3	2.9	2.9	2.8	3.0	3.1	2.7	2.4	2.3	2.3	2.4	3.3
8-Apr	2.2	3.6	2.7	2.7	2.6	2.5	2.8	3.0	3.3	3.4	3.1	3.1	3.3	3.2	3.1	3.1	2.7	2.7	2.3	2.2	2.0	2.0	1.7	1.3	3.6
9-Apr	1.5	1.2	1.4	1.3	1.2	1.0	1.4	1.6	2.0	2.2	2.4	3.1	3.4	3.1	3.2	2.7	2.5	1.7	1.2	1.6	1.5	1.2	0.8	0.7	3.4
10-Apr	1.0	1.0	1.1	0.9	0.9	0.6	0.9	1.2	1.5	1.6	1.9	1.9	2.7	2.8	2.8	2.2	2.1	1.4	1.2	1.6	0.4	0.4	0.2	0.7	2.8
11-Apr	0.6	1.1	2.1	2.3	2.5	2.8	2.3	2.5	2.7	2.6	3.1	2.9	3.7	3.2	3.2	2.4	2.3	1.9	2.0	1.5	2.6	2.9	2.2	2.1	3.7
12-Apr	2.0	1.4	1.2	1.2	1.3	1.1	1.3	1.7	2.2	2.2	3.1	3.5	3.4	2.8	3.0	3.1	2.3	2.3	1.7	1.4	1.2	1.5	1.8	2.0	3.5
13-Apr	1.4	1.9	1.4	1.7	2.3	3.3	3.1	2.3	3.0	3.2	3.2	3.4	3.6	3.3	3.5	3.7	2.9	3.4	3.9	3.1	2.3	2.9	2.5	3.1	3.9
14-Apr	3.2	3.2	3.6	2.9	2.3	2.2	1.9	2.0	1.8	1.6	2.1	2.0	2.2	AF	3.7	3.1	2.3	3.4	2.3	2.7	2.7	3.2	3.1	2.7	3.7
15-Apr	2.6	2.5	2.4	2.5	2.0	2.2	2.2	1.8	1.9	2.1	2.0	2.2	2.1	3.0	3.1	2.7	2.4	1.8	1.3	0.7	1.4	1.2	0.7	1.7	3.1
16-Apr	1.9	1.7	1.1	1.2	1.5	1.2	1.5	1.4	1.4	1.4	1.8	2.4	2.9	2.6	3.5	2.8	2.6	2.0	1.9	1.7	1.1	1.0	0.7	0.8	3.5
17-Apr	1.5	1.8	2.2	2.1	2.4	2.7	2.5	2.7	2.4	2.8	2.1	2.9	2.8	2.9	2.9	2.7	3.0	2.7	2.3	1.9	2.1	1.9	1.8	2.1	3.0
18-Apr	1.9	1.7	2.4	2.2	2.6	2.4	2.6	1.9	1.9	2.4	2.4	3.0	3.1	2.6	2.4	2.5	2.1	2.1	1.8	1.4	1.7	1.6	1.4	1.1	3.1
19-Apr	1.0	0.8	0.6	0.8	0.7	0.8	0.7	1.1	1.3	0.9	1.1	1.4	1.6	2.3	2.3	1.9	1.8	1.6	1.1	0.7	0.6	0.4	0.6	0.4	2.3
20-Apr	0.7	1.3	1.2	1.3	1.2	1.1	0.4	0.9	1.3	2.0	2.5	1.9	3.0	3.3	3.1	2.9	3.3	2.8	2.4	2.3	1.6	0.9	1.1	1.2	3.3
21-Apr	1.2	1.7	1.8	1.2	0.6	0.3	0.7	0.9	1.3	2.1	2.3	2.5	2.2	2.6	2.3	2.2	2.0	1.7	1.3	0.8	0.5	0.7	0.8	0.4	2.6
22-Apr	0.4	0.1	0.2	0.9	2.4	2.3	2.5	2.1	2.2	2.1	2.5	2.7	3.9	3.5	3.4	3.0	2.5	2.2	2.0	1.1	1.1	1.2	0.9	1.0	3.9
23-Apr	1.2	1.6	1.9	1.2	1.2	1.7	1.3	2.3	2.4	3.0	2.7	3.0	2.9	3.0	2.6	2.2	2.2	2.0	1.5	1.3	1.8	1.9	2.0	1.9	3.0
24-Apr	1.4	1.4	2.0	2.2	2.0	2.2	1.7	1.7	1.9	1.7	2.3	2.9	3.1	2.8	2.9	2.9	2.7	2.6	2.1	2.0	2.1	2.1	2.3	2.2	3.1
25-Apr	1.6	1.4	1.6	1.5	1.6	1.6	1.9	2.9	2.7	2.6	2.6	3.2	2.8	2.7	2.3	2.6	2.5	1.8	1.6	1.7	1.3	1.5	1.6	1.4	3.2
26-Apr	1.2	1.2	1.2	1.3	1.3	1.2	1.7	2.2	2.4	2.6	3.0	3.2	DF	DF	DF	DF	DF	DF	DF	DF	DF	1.3	1.1	1.4	3.2
27-Apr	0.9	0.5	0.6	0.5	0.5	0.9	1.3	1.6	1.8	2.3	2.7	3.2	3.3	3.1	3.0	3.0	2.5	1.9	1.6	0.8	0.6	1.0	0.8	0.8	3.3
28-Apr	0.7	0.5	0.4	0.3	0.2	0.2	0.4	0.8	1.2	1.5	2.3	2.7	2.6	2.4	2.4	2.1	2.1	1.6	1.0	0.9	1.5	1.9	2.1	1.7	2.7
29-Apr	0.8	0.8	0.7	0.7	0.6	0.7	0.8	1.2	1.6	2.5	2.8	2.7	3.2	2.5	3.3	3.5	2.7	2.4	1.9	0.9	0.5	0.3	0.3	0.3	3.5
30-Apr	0.4	0.7	0.4	0.5	0.4	0.4	1.1	1.2	2.2	2.0	2.6	3.0	3.0	3.1	3.0	3.1	2.8	2.0	1.1	0.6	0.5	0.5	0.7	0.5	3.1

3.2	3.6	3.6	2.9	2.6	3.3	3.1	3.0	3.3	3.4	3.2	3.5	4.0	3.5	3.7	3.8	3.3	3.4	3.9	3.1	2.7	3.2	3.1	3.1	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure



Summary of Hour Averages

Mannix - April 2017

Maximum Value: 2.0 km/h on Apr 8 07:00		Maximum Daily Average: 1.0 km/h on Apr 8		Hours in Service: 720																						
Minimum Value: -1.4 km/h on Apr 16 14:00		Minimum Daily Average: -0.1 km/h on Apr 1		Hours of Data: 707																						
Maximum Diurnal Average: 0.6 km/h at hour 13		Minimum Diurnal Average: 0.3 km/h at hour 2		Hours of Missing Data: 13																						
Monthly Average: 0.38 km/h		Percentiles: P ₁ = -0.6 P ₁₀ = -0.1 Q ₁ = 0.1 Median = 0.4 Q ₃ = 0.6 P ₉₀ = 0.9 P ₉₉ = 1.5		Hours of Calibration: 0																						
				Percent Operational Time: 98.2																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	-0.6	-0.4	-0.4	-0.5	-0.5	0.1	-0.1	-0.1	0.1	-0.2	-0.4	-0.8	0.8	-0.2	0.2	0.2	0.3	0.3	0.2	0.2	-0.3	-0.5	-0.1	-0.5	-0.1	0.8
2-Apr	-0.3	0.0	0.1	0.0	0.0	-0.2	-0.2	0.0	0.0	0.0	0.4	0.5	0.3	0.5	0.5	0.5	0.6	0.8	0.7	0.4	0.1	0.9	0.1	0.2	0.2	0.9
3-Apr	0.5	0.4	0.6	0.8	0.9	0.5	0.4	0.2	0.6	-0.3	0.3	0.7	1.0	1.1	0.5	0.3	0.4	0.8	0.1	0.3	0.1	0.0	0.2	0.5	0.4	1.1
4-Apr	0.1	0.2	0.8	0.3	0.4	0.4	0.2	0.4	0.4	0.4	-0.1	-0.2	0.8	0.6	-0.1	0.0	-0.3	0.2	0.1	0.1	0.0	0.1	0.4	0.4	0.2	0.8
5-Apr	0.6	0.9	0.3	0.4	0.7	0.7	AF	AF	AF	AF	-0.6	-0.2	0.4	0.4	-0.2	0.0	0.2	0.1	0.3	0.2	0.4	0.4	0.5	0.4	0.3	0.9
6-Apr	0.5	0.7	0.5	0.6	0.4	0.2	0.3	0.2	0.2	0.3	-0.1	-0.6	-0.3	-0.3	0.6	0.0	-0.3	0.0	0.2	0.3	0.3	0.3	0.6	0.6	0.2	0.7
7-Apr	0.3	0.4	0.3	0.5	0.7	0.6	0.3	0.4	0.4	-0.1	0.7	0.6	0.4	1.0	1.1	1.1	1.5	1.2	1.1	1.0	0.9	0.9	0.7	0.7	0.7	1.5
8-Apr	0.4	0.7	1.0	1.4	1.6	1.8	2.0	1.4	1.5	1.6	0.7	0.9	0.9	1.4	1.2	1.2	0.8	1.3	0.7	0.6	0.3	0.6	0.5	0.1	1.0	2.0
9-Apr	0.4	0.1	0.1	-0.5	0.0	0.3	0.3	-0.7	0.0	-0.4	0.2	0.6	1.6	0.4	0.5	0.4	0.7	0.1	0.3	0.3	0.6	0.5	0.3	0.3	0.3	1.6
10-Apr	0.1	0.2	0.1	0.1	0.4	0.5	0.7	0.4	0.4	0.1	0.2	-0.1	0.7	0.3	0.5	0.2	0.0	0.0	-0.6	1.0	0.4	0.5	0.1	0.3	0.3	1.0
11-Apr	0.4	0.8	1.1	1.8	0.8	1.0	0.1	1.2	0.8	0.9	0.9	1.2	1.2	0.6	1.1	0.1	0.1	0.0	0.6	-0.2	1.1	0.3	0.4	0.9	0.7	1.8
12-Apr	0.4	0.4	0.4	1.2	0.7	0.6	0.7	0.4	0.7	0.6	0.9	1.3	0.7	-0.8	-0.3	0.8	-0.2	0.4	0.5	0.6	0.8	0.8	0.5	0.1	0.5	1.3
13-Apr	0.1	-0.1	0.1	0.3	0.6	0.3	-0.1	0.5	0.4	0.1	0.7	0.6	1.4	1.1	0.0	0.9	0.4	0.2	0.7	0.6	0.9	0.9	0.9	0.6	0.5	1.4
14-Apr	0.7	0.8	0.5	0.8	0.5	1.0	0.7	1.0	0.8	0.7	0.6	0.8	1.0	1.0	1.1	1.0	0.8	0.8	0.8	1.0	1.2	1.3	0.9	0.9	0.9	1.3
15-Apr	1.0	0.8	1.1	0.9	0.7	0.7	0.6	0.5	0.5	0.7	0.5	0.2	0.5	1.1	1.3	0.6	0.3	0.1	0.3	0.4	0.5	0.3	0.5	0.4	0.6	1.3
16-Apr	0.5	0.5	0.5	0.6	0.9	0.5	0.5	0.2	0.3	0.2	0.1	0.3	-0.5	-1.4	0.5	-0.8	0.1	-0.3	-0.4	-0.2	0.1	-0.1	0.1	0.0	0.1	0.9
17-Apr	0.1	0.0	0.3	-0.1	0.3	0.1	0.3	0.3	0.0	0.5	0.2	0.8	0.7	0.9	0.2	0.4	1.0	0.9	0.6	0.5	0.6	0.4	0.4	0.6	0.4	1.0
18-Apr	0.5	0.6	0.7	0.6	1.0	0.4	0.8	0.3	0.0	0.0	-0.2	1.4	0.7	-0.3	0.0	0.2	0.3	-0.3	0.7	0.5	0.6	1.1	0.8	0.5	0.5	1.4
19-Apr	0.5	0.4	0.3	0.3	0.2	0.4	0.1	0.4	0.3	0.0	-0.3	-0.1	-0.3	0.4	0.0	0.7	0.4	-0.1	0.4	0.2	-0.1	0.0	0.2	0.4	0.2	0.7
20-Apr	0.2	-0.1	0.1	0.1	0.1	0.4	0.3	0.2	0.3	0.7	0.9	0.2	0.3	0.8	0.3	0.3	0.5	0.8	0.3	0.7	0.6	0.3	0.4	0.4	0.4	0.9
21-Apr	0.5	0.6	0.6	1.1	0.3	0.3	0.0	0.3	0.1	0.2	0.3	0.4	0.1	0.0	0.5	-0.1	-0.1	-0.4	0.4	0.8	0.3	0.2	0.1	0.2	0.3	1.1
22-Apr	0.2	0.0	0.1	0.3	0.6	0.5	0.4	0.6	0.1	0.2	0.2	-0.2	0.8	1.2	0.4	0.3	0.0	0.3	0.2	0.1	0.6	0.7	0.3	0.4	0.4	1.2
23-Apr	0.6	0.3	0.3	0.3	0.4	0.5	0.2	0.2	0.0	0.8	0.1	0.2	0.0	0.3	0.3	0.5	0.2	0.5	0.1	0.2	0.2	0.2	0.5	0.0	0.3	0.8
24-Apr	0.1	0.2	0.1	0.3	0.1	0.5	0.3	0.6	0.5	0.4	0.4	1.0	0.2	0.6	0.1	0.6	0.3	0.4	0.6	0.3	0.6	0.4	0.2	0.1	0.4	1.0
25-Apr	-0.4	-0.4	0.0	0.1	0.2	0.3	0.0	0.1	0.7	0.2	1.5	0.5	0.7	0.3	0.4	0.6	0.3	0.4	0.1	0.6	0.5	0.6	0.5	0.5	0.3	1.5
26-Apr	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.2	0.3	0.6	1.1	0.6	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.0	0.5	0.8	--	1.1
27-Apr	0.6	0.5	0.5	0.5	0.4	0.7	0.4	0.7	0.5	0.2	-0.3	0.3	1.4	0.6	-0.1	0.6	0.4	1.6	0.3	0.4	0.3	0.4	0.1	0.1	0.5	1.6
28-Apr	0.3	0.0	0.2	0.1	0.3	0.1	-0.1	0.1	0.1	0.5	1.0	-0.2	0.7	0.2	0.4	0.9	0.2	0.5	0.1	0.6	0.5	0.3	0.2	0.1	0.3	1.0
29-Apr	0.5	0.1	0.1	0.2	0.0	0.1	0.1	0.2	0.5	0.2	-0.4	-0.3	0.5	-0.3	-0.7	0.3	-0.2	-0.4	-0.3	-0.1	-0.3	-0.1	0.1	0.1	0.0	0.5
30-Apr	0.0	0.1	0.3	0.6	0.3	0.2	0.2	0.3	0.5	0.2	-0.4	0.8	-0.1	0.9	0.0	0.7	1.2	1.0	0.6	0.2	0.4	0.2	0.3	0.1	0.4	1.2
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure AF - Analyzer Failure																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 90 m (VW90m) - km/h

Mannix - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 4.2 km/h on Apr 5 13:00	Hours of Data: 707
Minimum Value: 0.1 km/h on Apr 22 02:00	Hours of Missing Data: 13
Percentiles: P ₁ = 0.2 P ₁₀ = 0.6 Q ₁ = 1.1 Median = 1.8 Q ₃ = 2.6 P ₉₀ = 3.1 P ₉₉ = 3.7	Hours of Calibration: 0
	Percent Operational Time: 98.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2.5	1.7	1.8	2.2	1.7	1.7	1.8	2.2	2.5	2.7	2.5	3.1	3.3	2.7	3.0	2.4	2.0	1.0	1.3	0.8	1.1	1.4	1.4	1.1	3.3
2-Apr	1.0	1.3	0.9	1.3	0.6	0.5	0.4	0.5	1.3	1.6	1.7	2.4	2.4	3.1	3.0	4.0	2.9	2.0	1.2	1.4	1.5	1.2	1.5	1.7	4.0
3-Apr	2.1	1.3	0.8	0.9	1.2	1.2	1.1	0.8	1.6	1.2	2.1	2.7	2.3	2.4	2.9	1.7	1.8	1.7	0.8	1.1	0.4	0.3	0.4	0.9	2.9
4-Apr	0.5	0.8	0.8	0.4	0.5	0.7	0.5	0.7	0.9	1.8	2.4	2.4	2.4	2.5	2.4	2.1	2.0	1.5	1.0	0.6	0.4	0.3	0.4	0.3	2.5
5-Apr	0.7	0.5	0.4	0.4	0.7	1.2	AF	AF	AF	AF	2.5	3.2	4.2	3.7	3.3	2.3	2.3	2.2	1.9	1.6	0.9	0.9	1.0	0.7	4.2
6-Apr	0.5	0.4	0.7	0.7	0.5	0.4	0.3	0.6	1.1	1.9	2.0	1.4	1.9	2.4	2.9	2.6	2.1	1.7	0.9	0.4	0.5	1.1	1.4	1.7	2.9
7-Apr	1.5	0.9	1.0	0.7	0.7	0.8	1.1	1.1	1.2	1.9	3.1	3.1	2.9	3.4	2.8	3.0	2.9	2.9	3.1	2.7	2.3	2.4	2.4	2.6	3.4
8-Apr	2.3	3.7	3.1	2.6	3.0	2.5	2.8	3.1	3.4	3.8	3.1	3.3	3.3	3.3	3.1	3.2	2.7	2.8	2.5	2.2	2.0	2.1	1.7	1.3	3.8
9-Apr	1.6	1.3	1.5	1.3	1.2	1.1	1.5	1.6	2.0	2.4	2.6	3.4	3.6	3.3	3.4	2.9	2.7	1.8	0.9	1.2	1.4	1.0	0.7	0.7	3.6
10-Apr	0.9	0.9	1.1	1.0	0.9	0.7	0.8	1.0	1.6	1.5	1.8	2.1	2.9	3.0	2.8	2.2	2.2	1.3	1.1	1.5	0.3	0.3	0.2	0.8	3.0
11-Apr	0.6	1.0	1.9	2.3	2.5	2.9	2.6	2.6	2.8	2.6	3.3	2.8	3.8	3.2	3.1	2.4	2.3	2.0	2.2	1.7	2.9	3.2	2.1	2.0	3.8
12-Apr	2.1	1.5	1.2	1.2	1.2	1.0	1.2	1.8	2.2	2.4	3.2	3.7	3.4	3.0	3.2	3.2	2.5	2.4	1.7	1.3	1.1	1.5	1.7	1.7	3.7
13-Apr	1.4	1.8	1.4	1.5	2.0	2.5	1.7	2.2	2.5	2.7	3.0	3.1	3.6	3.3	3.2	3.2	2.5	2.5	2.9	2.5	2.1	2.7	2.4	3.0	3.6
14-Apr	3.0	3.1	3.4	3.0	2.5	2.3	1.9	2.1	1.8	1.6	2.1	2.1	2.4	2.9	2.7	2.8	2.5	3.5	2.3	2.6	2.8	3.5	3.2	2.7	3.5
15-Apr	2.7	2.5	2.3	2.4	2.1	2.2	2.4	1.9	1.9	2.2	2.1	2.3	2.1	3.1	3.3	2.9	2.4	1.8	1.3	0.8	1.2	1.0	0.6	1.6	3.3
16-Apr	2.0	1.4	1.0	1.1	1.5	1.1	1.5	1.5	1.4	1.4	1.9	2.6	3.1	2.8	3.6	3.0	2.8	2.0	2.0	1.7	1.2	1.0	0.8	0.9	3.6
17-Apr	1.6	1.8	2.2	2.1	2.5	2.7	2.7	2.7	2.4	2.9	2.1	3.1	3.0	3.0	3.0	2.8	3.1	2.9	2.3	1.7	2.1	1.8	1.7	2.0	3.1
18-Apr	1.9	1.7	2.4	2.3	2.8	2.5	2.6	1.9	1.9	2.5	2.6	3.0	3.1	2.6	2.5	2.6	2.2	2.1	1.7	1.4	1.7	1.7	1.4	1.2	3.1
19-Apr	1.0	0.9	0.6	0.7	0.7	0.8	0.6	1.0	1.4	0.7	1.1	1.4	1.5	2.4	2.4	1.9	1.9	1.6	1.1	0.8	0.7	0.5	0.5	0.3	2.4
20-Apr	0.4	0.9	0.9	0.9	0.4	0.6	0.4	0.6	1.2	2.0	2.7	1.9	3.1	3.4	3.3	2.9	3.3	2.8	2.5	2.3	1.7	1.0	1.3	1.4	3.4
21-Apr	1.1	1.6	1.6	1.0	0.6	0.4	0.7	0.8	1.3	2.3	2.3	2.6	2.2	2.7	2.5	2.1	2.2	1.8	1.4	0.9	0.4	0.4	0.4	0.2	2.7
22-Apr	0.3	0.1	0.2	0.8	2.5	2.3	2.4	2.3	2.4	2.3	2.7	2.8	4.0	3.7	3.6	3.1	2.6	2.4	2.0	1.2	0.9	1.1	1.0	1.0	4.0
23-Apr	0.9	1.4	1.4	1.2	1.0	1.0	1.3	2.3	2.2	3.0	2.6	3.0	3.0	3.1	2.8	2.2	2.3	2.1	1.3	1.2	1.7	1.8	1.8	1.6	3.1
24-Apr	1.3	1.3	1.8	1.7	1.4	1.8	1.7	1.8	2.0	1.7	2.2	2.8	2.5	2.8	2.4	2.6	2.0	2.1	1.9	1.8	2.0	1.8	1.9	2.1	2.8
25-Apr	1.2	1.1	1.3	1.1	1.3	1.4	1.8	2.9	2.8	2.8	2.8	3.6	3.0	2.9	2.5	2.8	2.7	1.9	1.8	1.8	1.5	1.5	1.5	1.3	3.6
26-Apr	1.2	1.2	1.1	1.2	1.1	1.1	1.7	2.4	2.7	2.9	3.3	3.2	DF	DF	DF	DF	DF	DF	DF	DF	DF	1.1	1.1	1.4	3.3
27-Apr	0.8	0.5	0.5	0.4	0.4	0.5	1.1	1.5	1.8	2.2	2.7	3.0	3.3	3.4	3.2	3.2	2.7	1.9	1.6	0.8	0.6	1.0	0.9	0.9	3.4
28-Apr	0.7	0.6	0.4	0.3	0.2	0.2	0.3	0.6	1.1	1.5	2.5	2.7	2.7	2.6	2.6	2.3	2.2	1.6	1.1	0.9	0.9	0.8	1.4	1.2	2.7
29-Apr	0.9	1.0	0.7	0.6	0.5	0.9	0.8	1.0	1.5	2.4	3.0	2.9	3.4	2.6	3.5	3.7	3.0	2.5	1.9	1.0	0.4	0.3	0.3	0.3	3.7
30-Apr	0.4	0.7	0.4	0.4	0.3	0.3	1.0	1.3	2.3	2.1	2.9	3.2	3.0	3.1	3.0	3.2	2.8	1.9	1.1	0.7	0.5	0.5	0.4	0.2	3.2

3.0	3.7	3.4	3.0	3.0	2.9	2.8	3.1	3.4	3.8	3.3	3.7	4.2	3.7	3.6	4.0	3.3	3.5	3.1	2.7	2.9	3.5	3.2	3.0	
Diurnal Maximum																								

DF - DAS Failure AF - Analyzer Failure



Wood Buffalo Environmental Association

SO₂ Calibration Summary

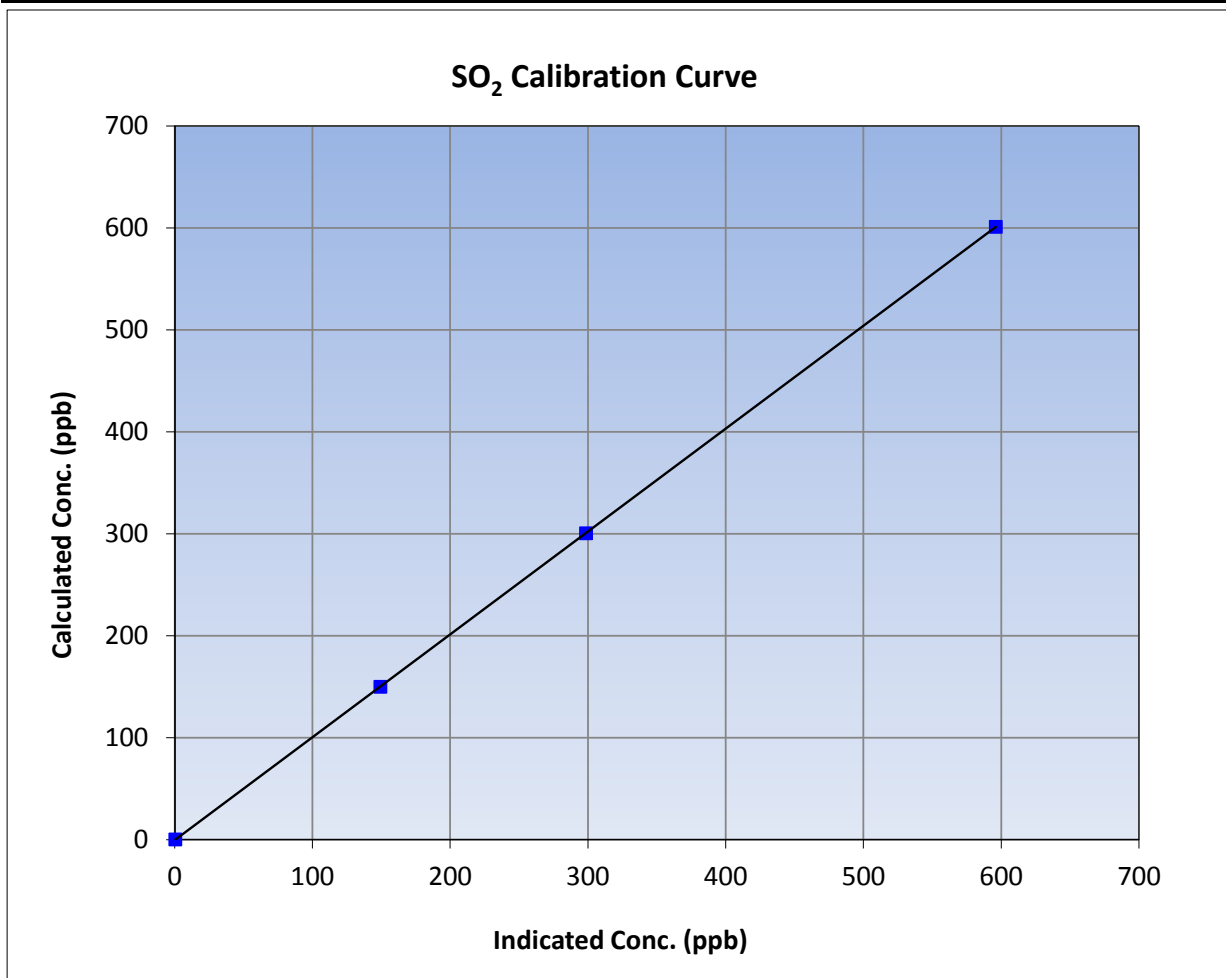
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 15, 2017
Station Name	Mannix	Station Number	AMS 05
Start Time (MST)	10:35	End Time (MST)	13:22
Analyzer make	Thermo 43i	Analyzer serial #	1008841399

Calibration Data

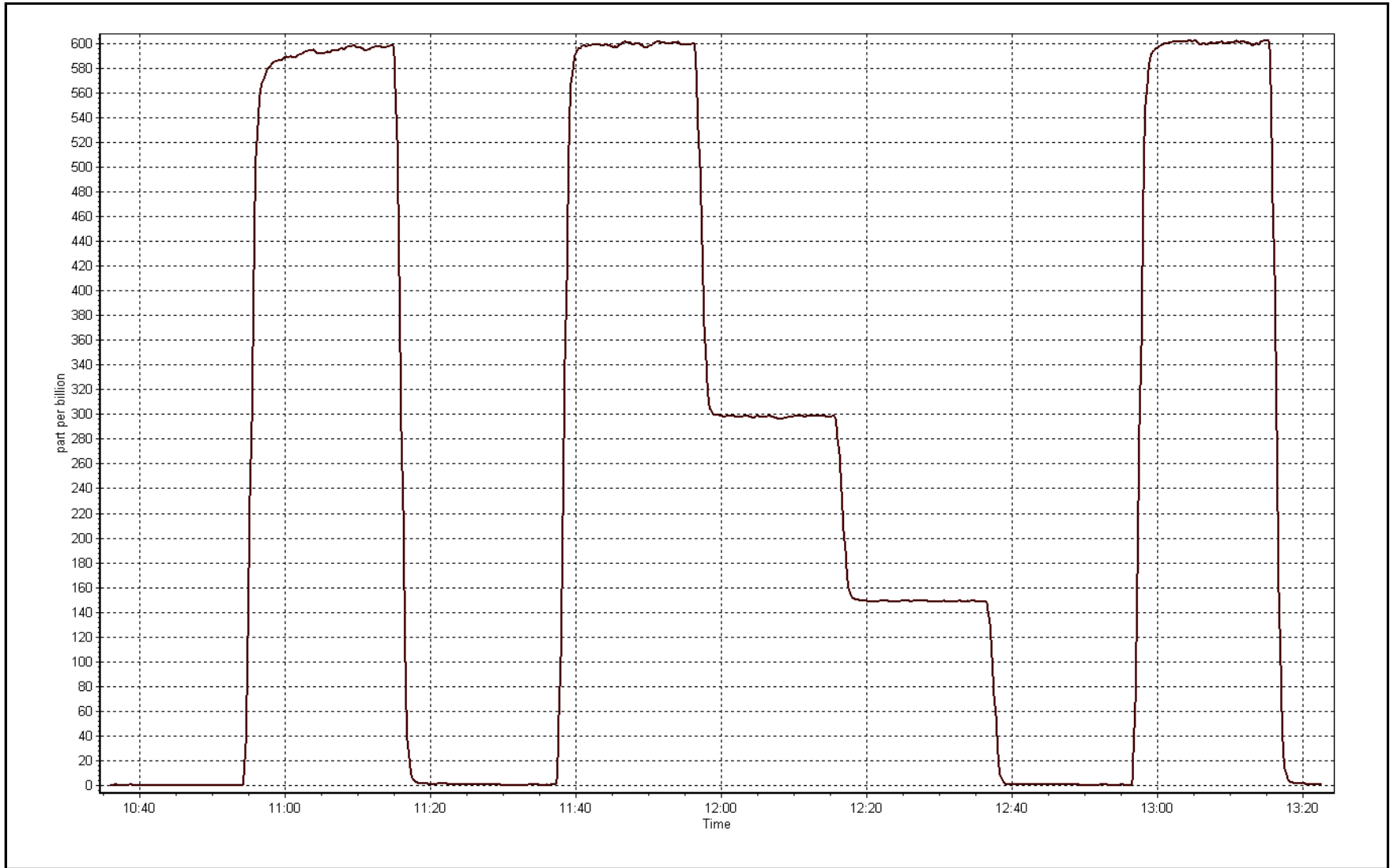
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999999	≥0.995
600.8	595.7	1.0086			
300.3	298.3	1.0069	Slope	1.008908	0.90 - 1.10
149.7	149.0	1.0049			
			Intercept	-0.364497	+/-30



SO2 Calibration Plot

Date: April 6, 2017

Location: Mannix





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	April 6, 2017	Last Cal Date:	March 2, 2017
Start time (MST):	8:12	End time (MST):	10:47
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.03</u>	ppm	Cal Gas Exp Date	December 2, 2019
Calibrator Make/Model	Sabio 4010		Serial Number	14300410
ZAG Make/Model	API 701		Serial Number	138

Analyzer Information

Analyzer make:	Thermo 450i	Analyzer serial #:	815129108	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb	PMT voltage	-644	-644
Calculated slope	1.012680	Lamp voltage	798	800
Calculated intercept	-0.426332	Pressure	523.5	523.5
Analyzer Background	15.6	Flow	1.006	1.004
Analyzer Coefficient	0.957	Intensity	97	97

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5997	0.0	0.0	0.1	----
as found span	5910	85.2	71.5	70.5	1.015
calibrator zero	5997	0.0	0.0	0.1	----
high point	5910	85.2	71.5	71.3	1.003
second point	5952	45.5	38.2	38.3	0.996
third point	5966	28.4	23.8	23.9	0.999
as left zero	5997	0.0	0.0	0.4	----
as left span	5910	85.2	71.5	71.4	1.002
Average Correction Factor					1.000

Corrected As found	70.37	Previous response	71.01	*% change	0.9%
--------------------	-------	-------------------	-------	-----------	------

* = > +/-5% change initiates investigation

Notes:

Changed inlet filter after asfound. Slightly adjusted the span.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

H₂S Calibration Summary

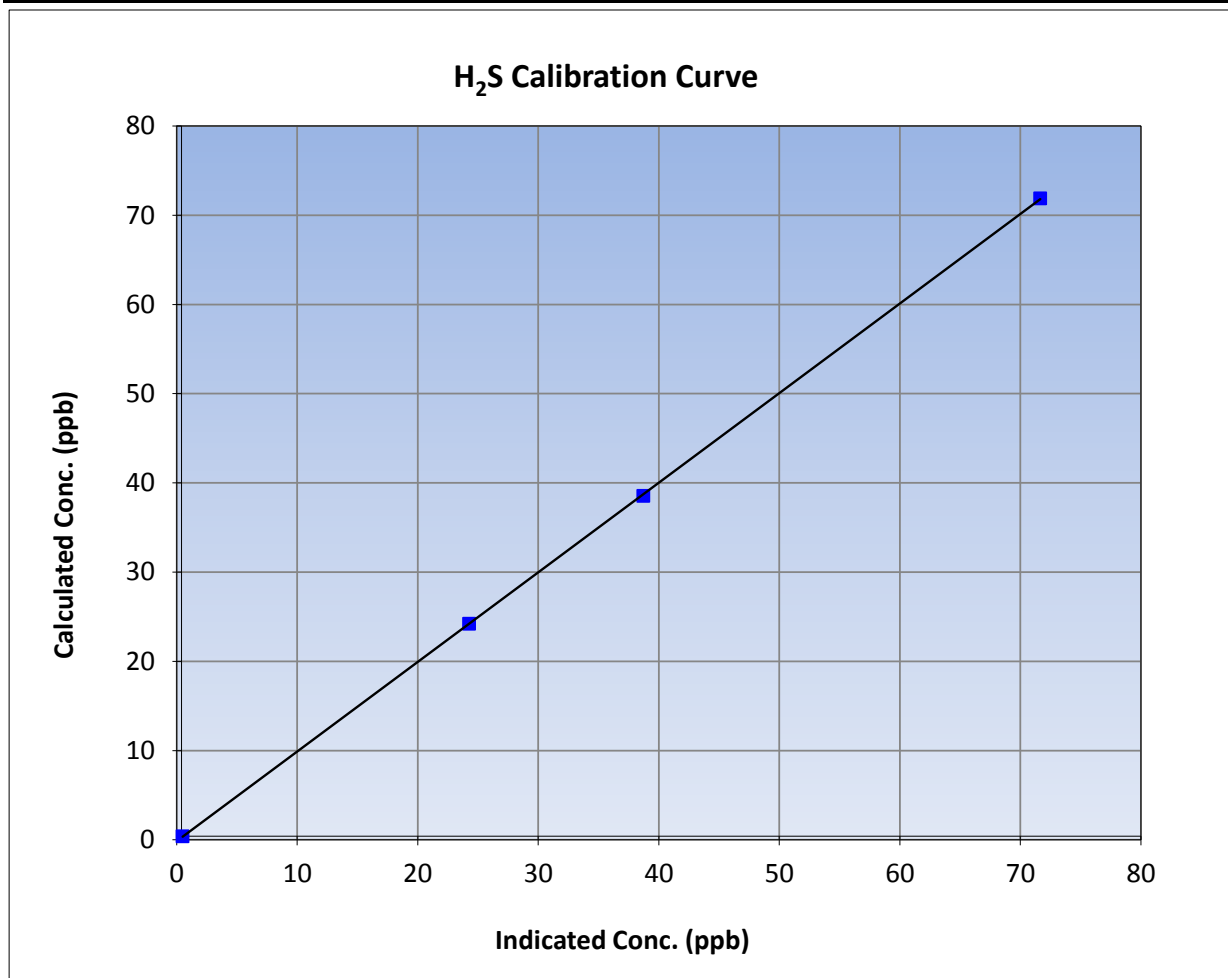
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 2, 2017
Station Name	Mannix	Station Number	AMS 05
Start Time (MST)	8:12	End Time (MST)	10:47
Analyzer make	Thermo 450i	Analyzer serial #	815129108

Calibration Data

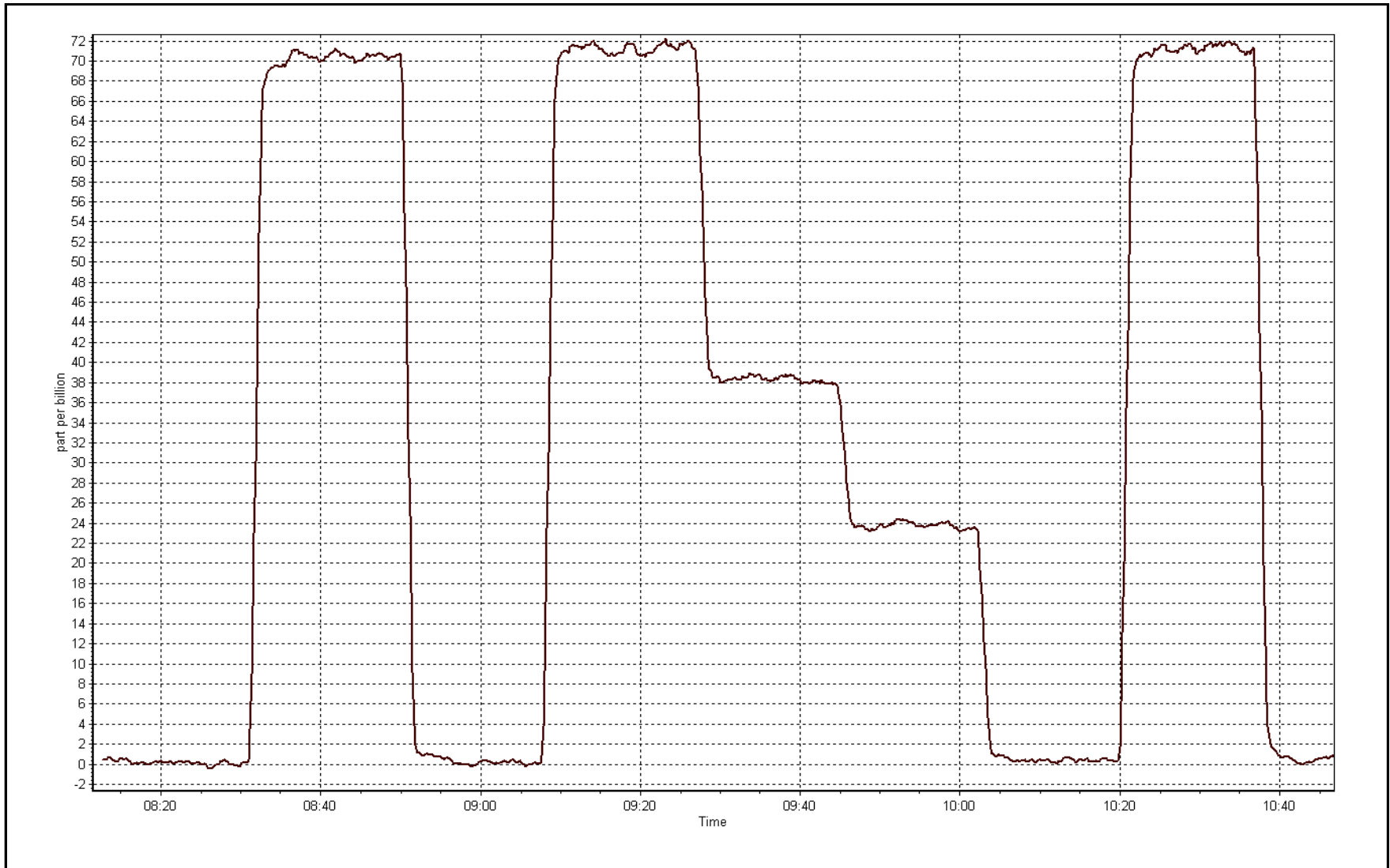
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999986	≥0.995
71.5	71.3	1.0033	Slope	1.004241	0.90 - 1.10
38.2	38.3	0.9961	Intercept	-0.147992	+/-3
23.8	23.9	0.9992			



H₂S Calibration Plot

Date: April 6, 2017

Location: Mannix





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Mannix	Station number:	AMS 05
Calibration Date:	April 6, 2017	Last Cal Date:	March 15, 2017
Start time (MST):	10:35	End time (MST):	13:18
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000646	Cal Gas Expiry Date	November-04-19
CH4 Cal Gas Conc.	<u>514.0</u> ppm	CH4 Equiv Conc.	1064.0 ppm
C3H8 Cal Gas Conc.	<u>200.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4080	Serial Number	14300410
ZAG Make/Model	Teledyne API 701	Serial Number	138

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1317958295
	<u>Start</u>	<u>Finish</u>	<u>Start</u>
Analyzer Range	0 - 25 ppm	Bias voltage supply	-396
Calculated slope	1.002488	Sample pressure	9.4
Calculated intercept	-0.020196	Fuel pressure	20.2
Analyzer Background	3.330	Air pressure	42.3
Analyzer Coefficient	3.621	Flame temperature	162.1
			<u>Finish</u>

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	4997	0.0	0.00	0.06	----
as found span	4934	61.0	12.99	13.01	0.999
calibrator zero	4997	0.0	0.00	0.06	----
high point	4934	61.0	12.99	13.01	0.999
second point	4966	30.5	6.49	6.49	1.001
third point	4981	15.2	3.24	3.29	0.984
as left zero	4997	0.0	0.00	0.07	----
as left span	4934	61.0	12.99	13.14	0.989
Average Correction Factor					0.994
Corrected As found	12.95	Previous response	12.98	*% change	0.2%

* = > +/-5% change initiates investigation

Notes: Changed inlet filter after as founds. No adjustments made.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

THC Calibration Summary

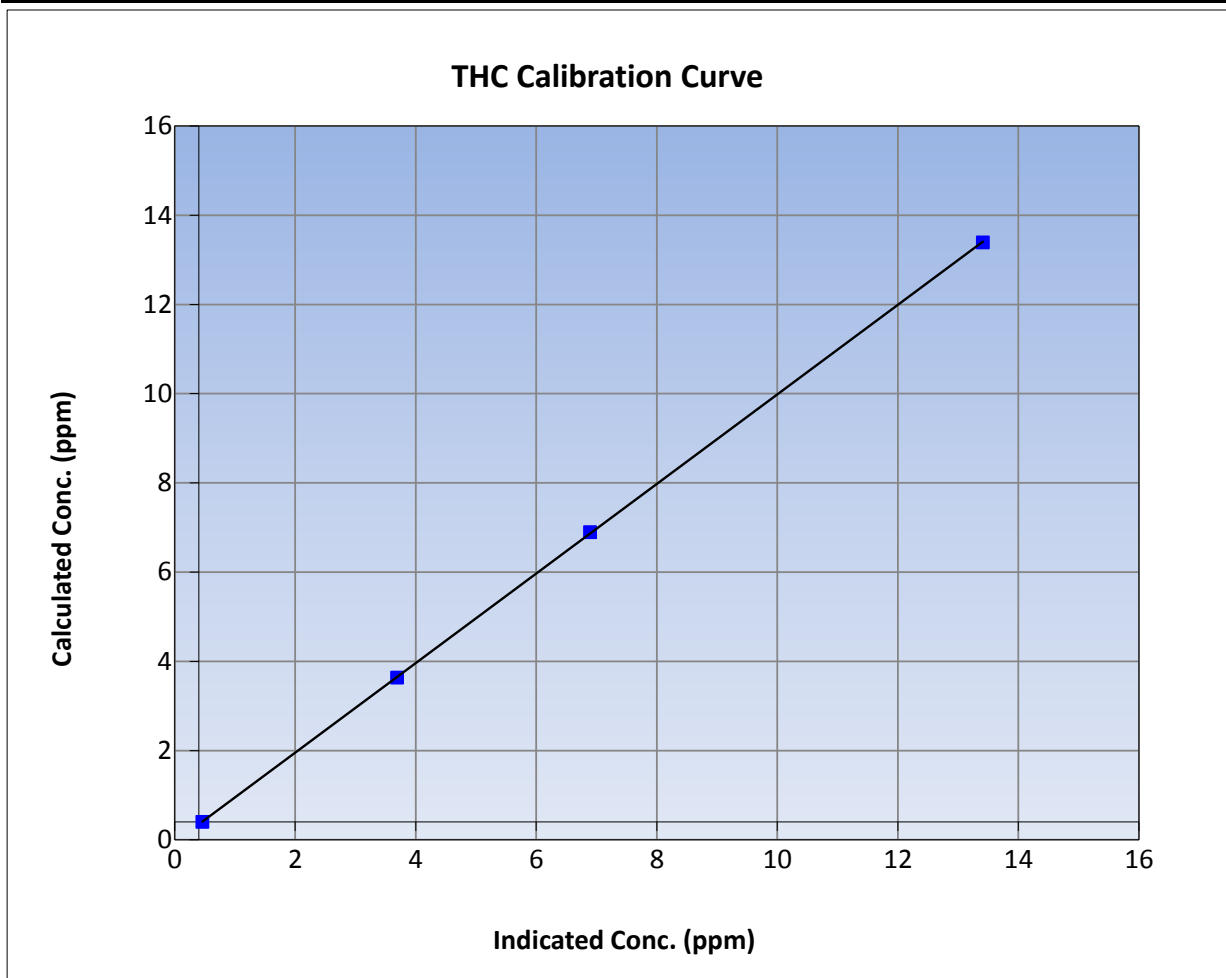
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 15, 2017
Station Name	Mannix	Station Number	AMS 05
Start Time (MST)	10:35	End Time (MST)	13:18
Analyzer make	Thermo 51i-LT	Analyzer serial #	1317958295

Calibration Data

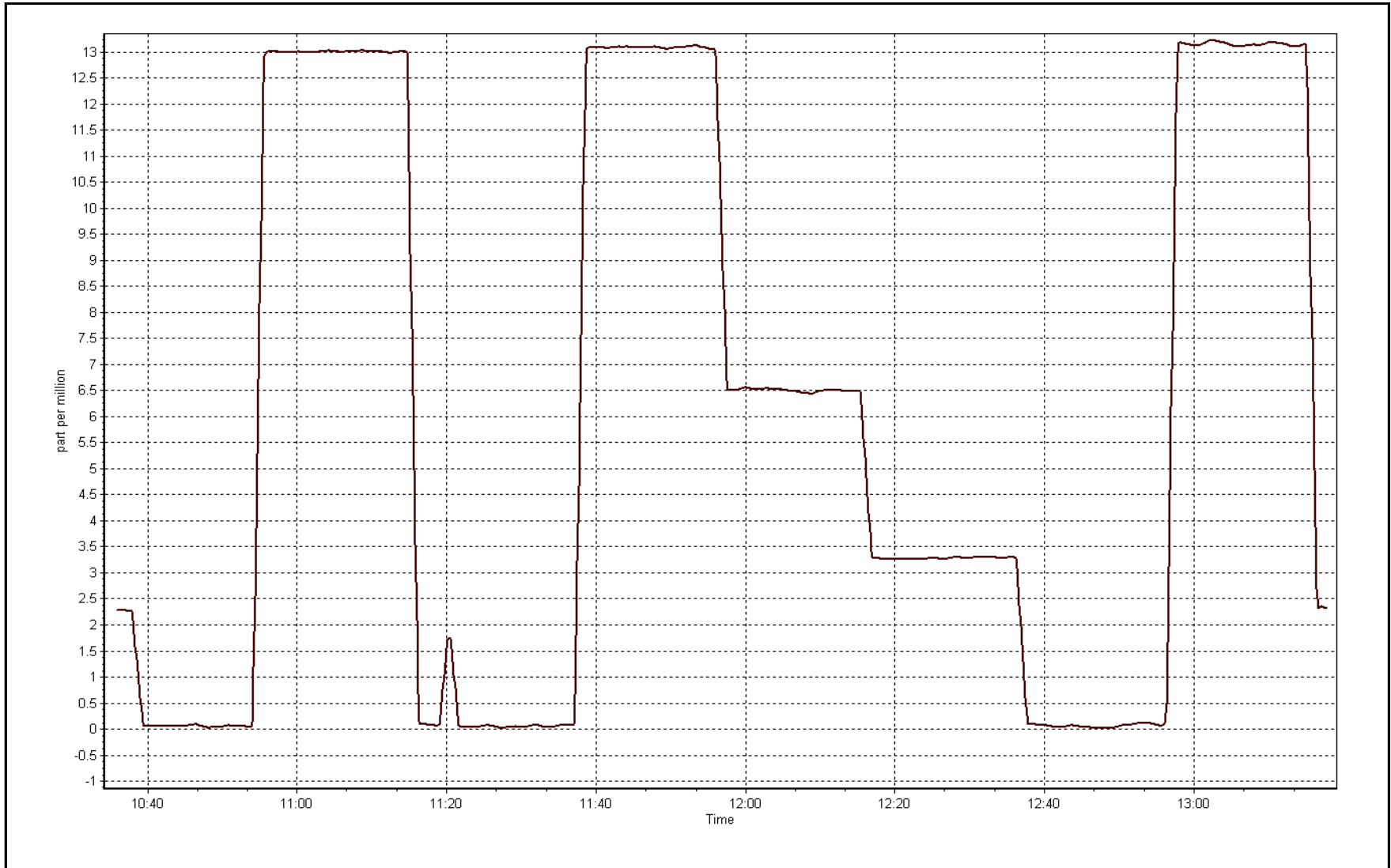
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999984	
13.0	13.0	0.9988			≥0.995
6.5	6.5	1.0008	Slope	1.003851	
3.2	3.3	0.9839			0.90 - 1.10
			Intercept	-0.053060	+/-1.5



THC Calibration Plot

Date: April 6, 2017

Location: Mannix





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 6
PATRICIA MCINNES
APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	682	37	38	99.86	20	0	4	0
TRS (ppb) Average	683	36	37	99.86	1	0	0	0
THC (ppm) Average	682	37	38	99.86	2.5	-	2	-
NMHC(ppm) Average	682	37	38	99.86	0.082	-	0.005	-
CH4(ppm) Average	682	37	38	99.86	2.4	-	2	-
O3 (ppb) Average	685	34	35	99.86	57	0	44	-
NO2 (ppb) Average	685	35	35	100	29	0	9	-
NO (ppb) Average	685	35	35	100	28	-	3	-
NOX (ppb) Average	685	35	35	100	57	-	10	-
NH3 (ppb) Average	628	41	92	92.92	0	0	0	-
PM2.5 (ug/m3) Average	718	2	2	100	32	-	7.5	0
Temperature 2 m (C) Average	720	0	0	100	16.9	-	8.9	-
Relative Humidity (%) Average	720	0	0	100	99	-	89	-
Wind Speed 10 m (km/h) Average	710	0	10	98.61	31	-	20	-
Wind Direction 10 m (deg) Average	710	0	10	98.61	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	682	0.7	2	-	0	0	0	0	0	2	20
TRS (ppb) Average	683	0.2	0	-	0	0	0	0	0	0	1
THC (ppm) Average	682	1.96	0.1	-	1.9	1.9	1.9	1.9	2	2	2.5
NMHC(ppm) Average	682	0	0.005	-	0	0	0	0	0	0	0.082
CH4(ppm) Average	682	1.96	0.1	-	1.9	1.9	1.9	1.9	2	2	2.4
O3 (ppb) Average	685	34.9	10	-	7	22	28	36	42	47	57
NO2 (ppb) Average	685	4.6	5	-	0	1	1	3	6	11	29
NO (ppb) Average	685	1.1	2	-	0	0	0	1	1	2	28
NOX (ppb) Average	685	5.8	6	-	0	1	2	4	7	13	57
NH3 (ppb) Average	628	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	718	4.09	3	-	0.6	1.6	2.2	3.4	4.9	7.2	32
Temperature 2 m (C) Average	720	2.28	5.7	-	-10.1	-4.9	-2.2	2	6.2	10.7	16.9
Relative Humidity (%) Average	720	61.6	19	-	19	36	46	62	76	89	99
Wind Speed 10 m (km/h) Average	710	11.1	6	-	0	4	7	10	15	19	31
Wind Direction 10 m (deg) Average	710	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NMHC, CH4, THC, O3, SO2	04 Apr 2017 09:00	04 Apr 2017 09:00	1	Maintenance - sample manifold cleaned
NH3	01 Apr 2017 03:00	30 Apr 2017 02:00	31	Stabilization after daily span
NH3	03 Apr 2017 13:00	04 Apr 2017 08:00	30	Maintenance - replaced convertor core
Wind Speed, Wind Direction	05 Apr 2017 00:00	05 Apr 2017 09:00	10	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

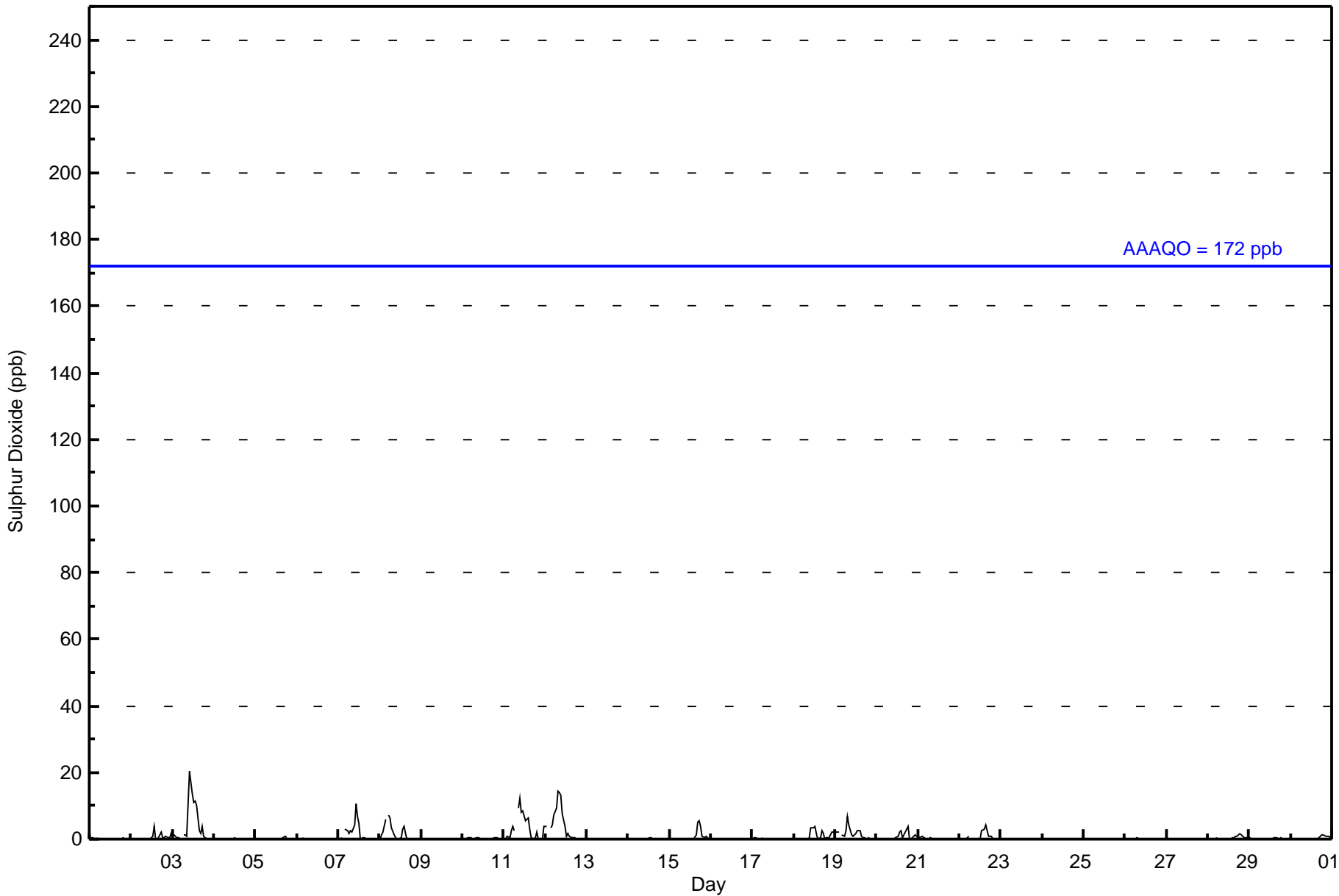
Patricia McInnes - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 20 ppb on Apr 3 11:00 Maximum Daily Average: 4.1 ppb on Apr 3		Hours in Service: 720 Hours of Data: 682																								
Minimum Value: 0 ppb on Apr 7 18:00 Maximum Diurnal Average: 1.8 ppb at hour 11 Monthly Average: 0.7 ppb		Hours of Missing Data: 38 Hours of Calibration: 37 Percent Operational Time: 99.9																								
Minimum Daily Average: 0.0 ppb on Apr 24 Minimum Diurnal Average: 0.2 ppb at hour 21 Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 2 P ₉₉ = 11																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
2-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	1	4	0	0	0	2	1	1	1	0	0	1	0.5	4
3-Apr	1	1	1	1	0	Z	1	1	1	11	20	14	11	11	10	2	2	4	1	0	0	0	0	0	4.1	20
4-Apr	0	0	0	0	0	0	Z	1	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.2	1
6-Apr	0	0	Z	0	0	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	0
7-Apr	0	0	0	Z	3	2	2	3	2	4	11	7	5	0	0	0	0	0	0	0	0	0	0	0	1.7	11
8-Apr	0	1	2	6	Z	7	6	3	1	0	0	0	1	3	4	2	0	0	0	0	0	0	0	0	1.6	7
9-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
10-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	1	0	2	4	2	Z	9	12	8	8	5	6	6	3	0	0	0	2	0	0	0	4	3.3	12
12-Apr	4	4	Z	3	4	7	10	14	14	13	8	4	1	2	1	0	1	0	0	0	0	0	0	0	4.0	14
13-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
14-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	5	6	4	1	0	1	0	0	0.8	6
16-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
17-Apr	0	0	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
18-Apr	0	0	Z	0	0	0	0	0	0	1	3	4	4	2	0	1	2	2	0	0	0	1	2	2	1.0	4
19-Apr	2	2	2	Z	1	1	3	7	4	1	1	1	2	3	3	1	0	0	0	0	0	0	0	0	1.5	7
20-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	1	2	2	0	1	3	4	0	0	1	1	1	0.8	4
21-Apr	1	0	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Apr	0	0	0	0	0	1	Z	0	0	0	0	0	0	2	3	4	2	1	1	0	0	0	0	0	0.7	4
23-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
26-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	2	1	1	0	0	0	0.4	2
29-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
30-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0.3	1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	672	98.53	98.53
11 - 20	10	1.47	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	129	64	35	17	37	59	43	52	49	42	26	20	13	20	13	44	663
11 - 20	6	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	10
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	37	59	43	52	49	42	26	20	13	20	14	46	673

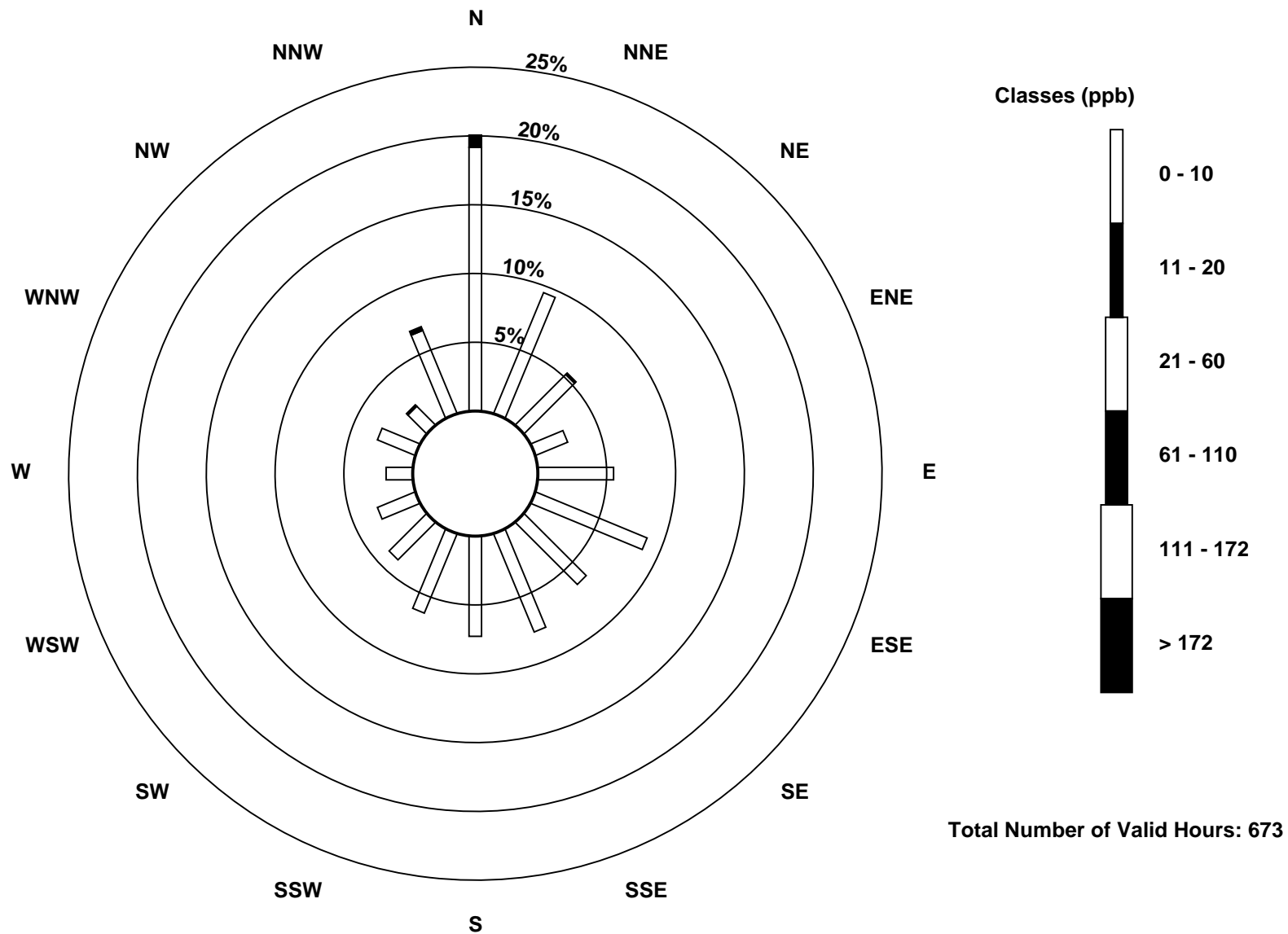
Total Number of Valid Hours: 673

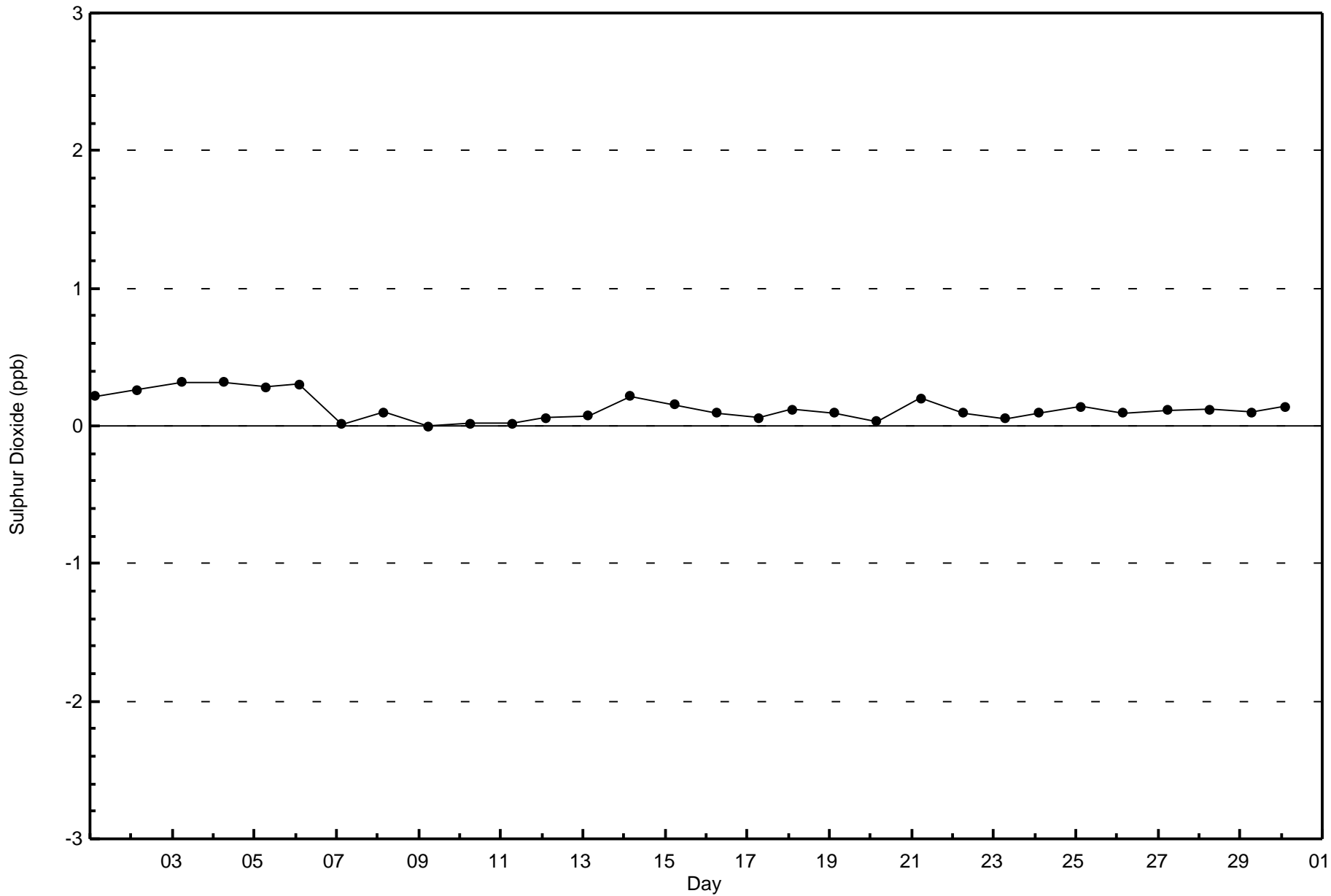
Total Number of Hours: 720

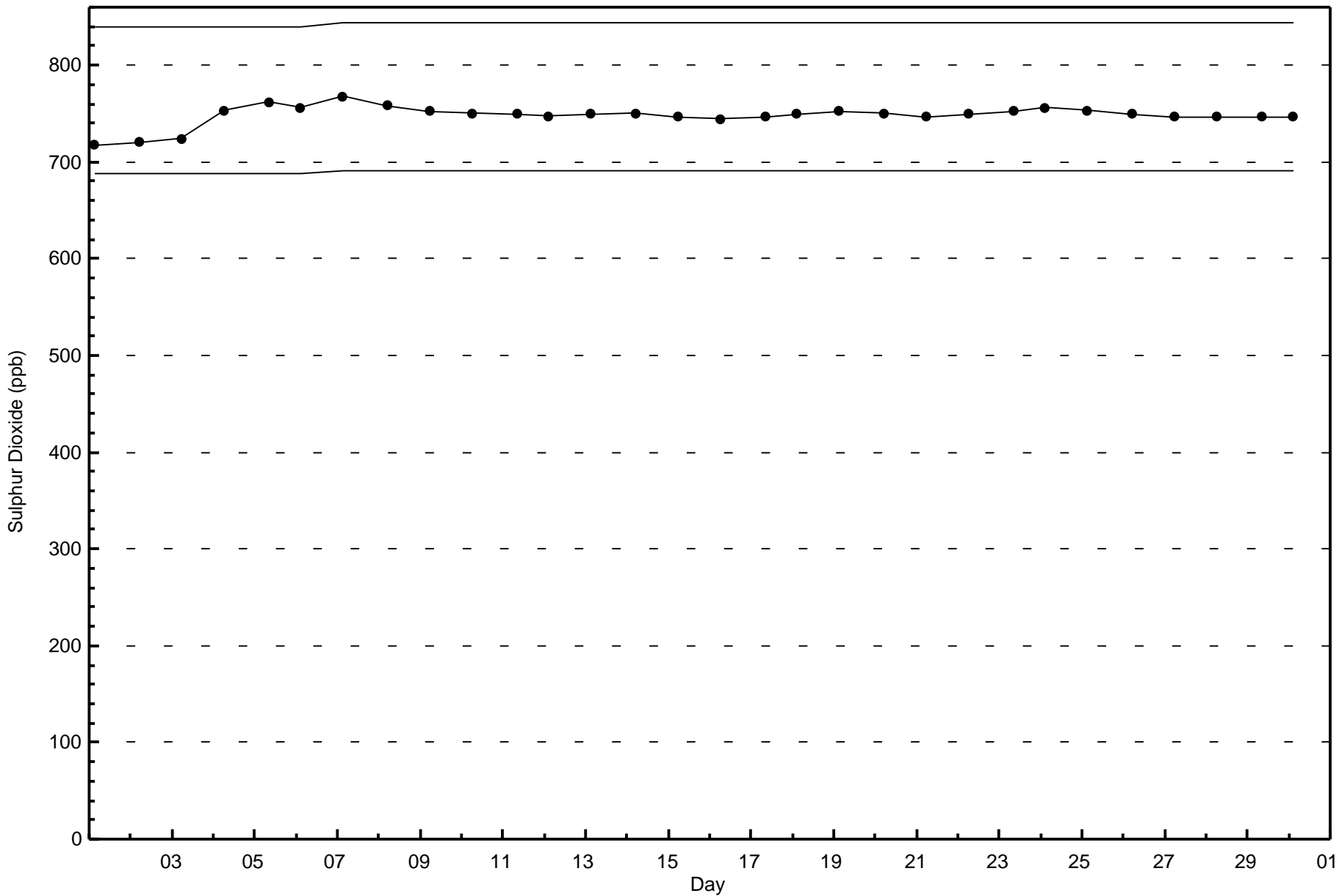


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes (AMS 6)







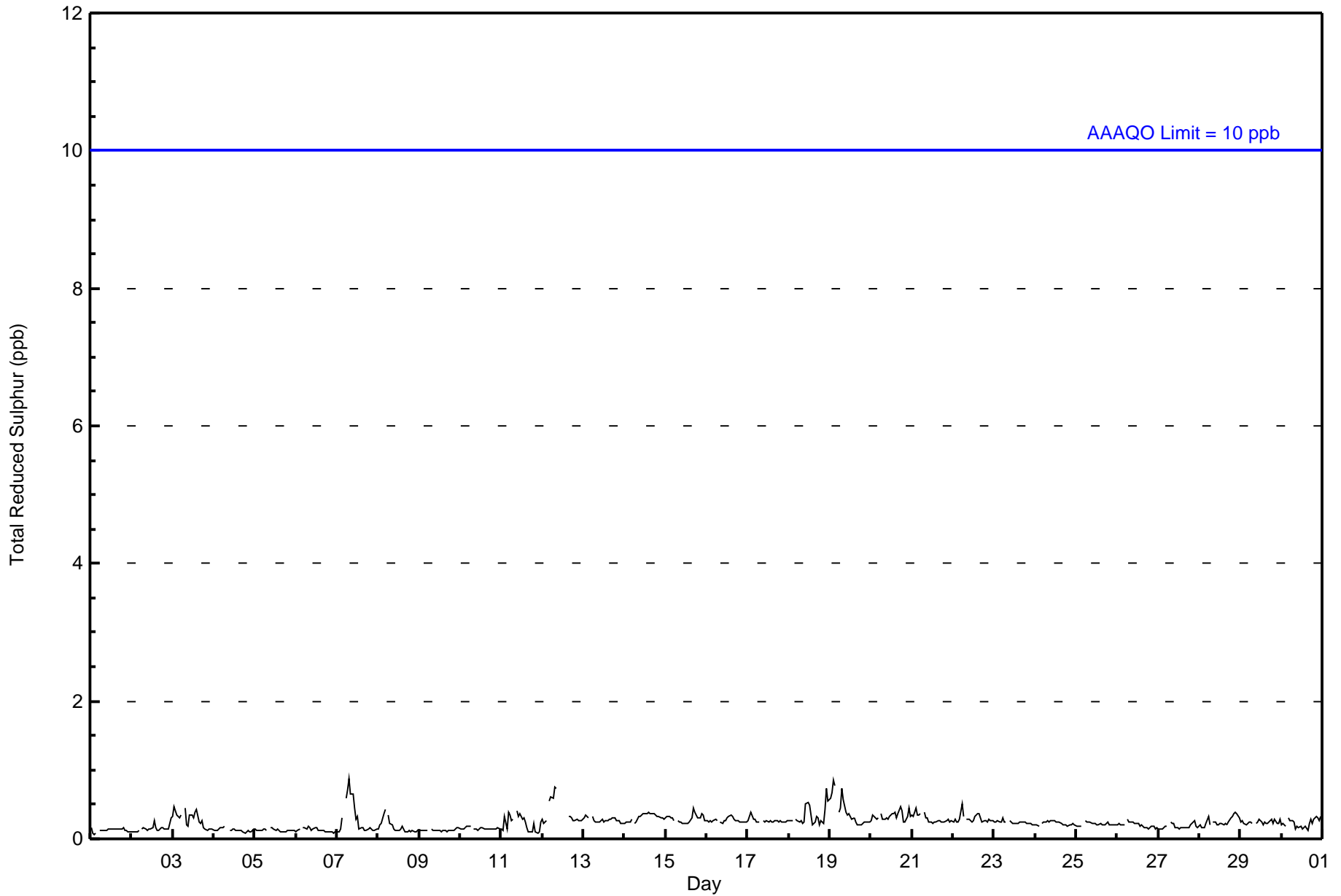


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1 ppb on Apr 7 08:00	Maximum Daily Average: 0.4 ppb on Apr 19		Hours of Data:	683
Minimum Value: 0 ppb on Apr 1 03:00	Minimum Daily Average: 0.1 ppb on Apr 1		Hours of Missing Data:	37
Maximum Diurnal Average: 0.3 ppb at hour 8	Minimum Diurnal Average: 0.2 ppb at hour 21		Hours of Calibration:	36
Monthly Average: 0.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
2-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
4-Apr	0	0	0	0	0	0	0	Z	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Apr	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
7-Apr	0	0	0	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
8-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
10-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	0	0	Z	1	1	1	1	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	1
13-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
14-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
15-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
16-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
17-Apr	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Apr	0	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
19-Apr	1	1	1	1	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
21-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
22-Apr	0	0	0	0	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
23-Apr	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
24-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Apr	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Apr	0	0	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	683	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	132	62	37	17	35	59	42	55	51	43	26	21	14	21	14	45	674
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	62	37	17	35	59	42	55	51	43	26	21	14	21	14	45	674

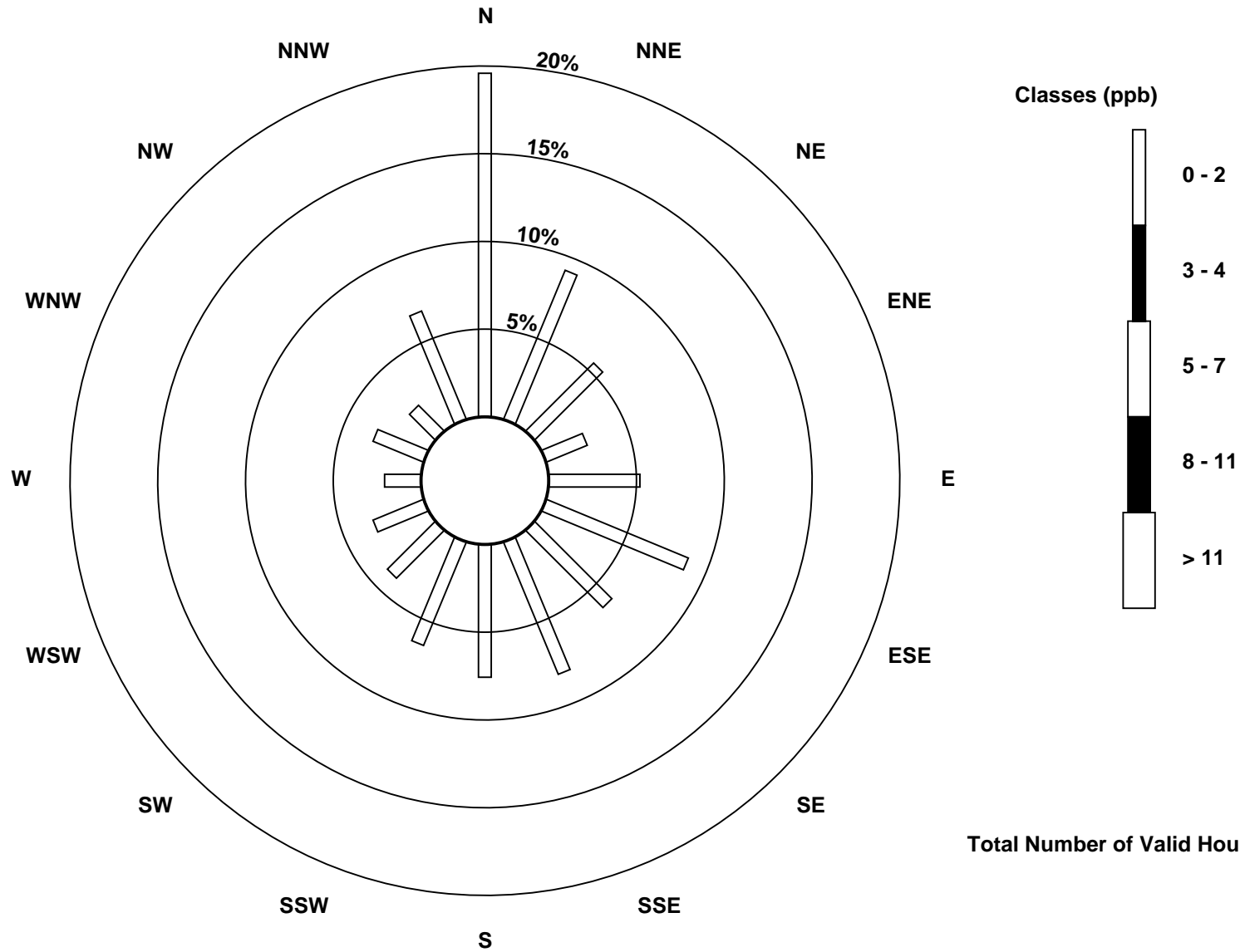
Total Number of Valid Hours: 674

Total Number of Hours: 720

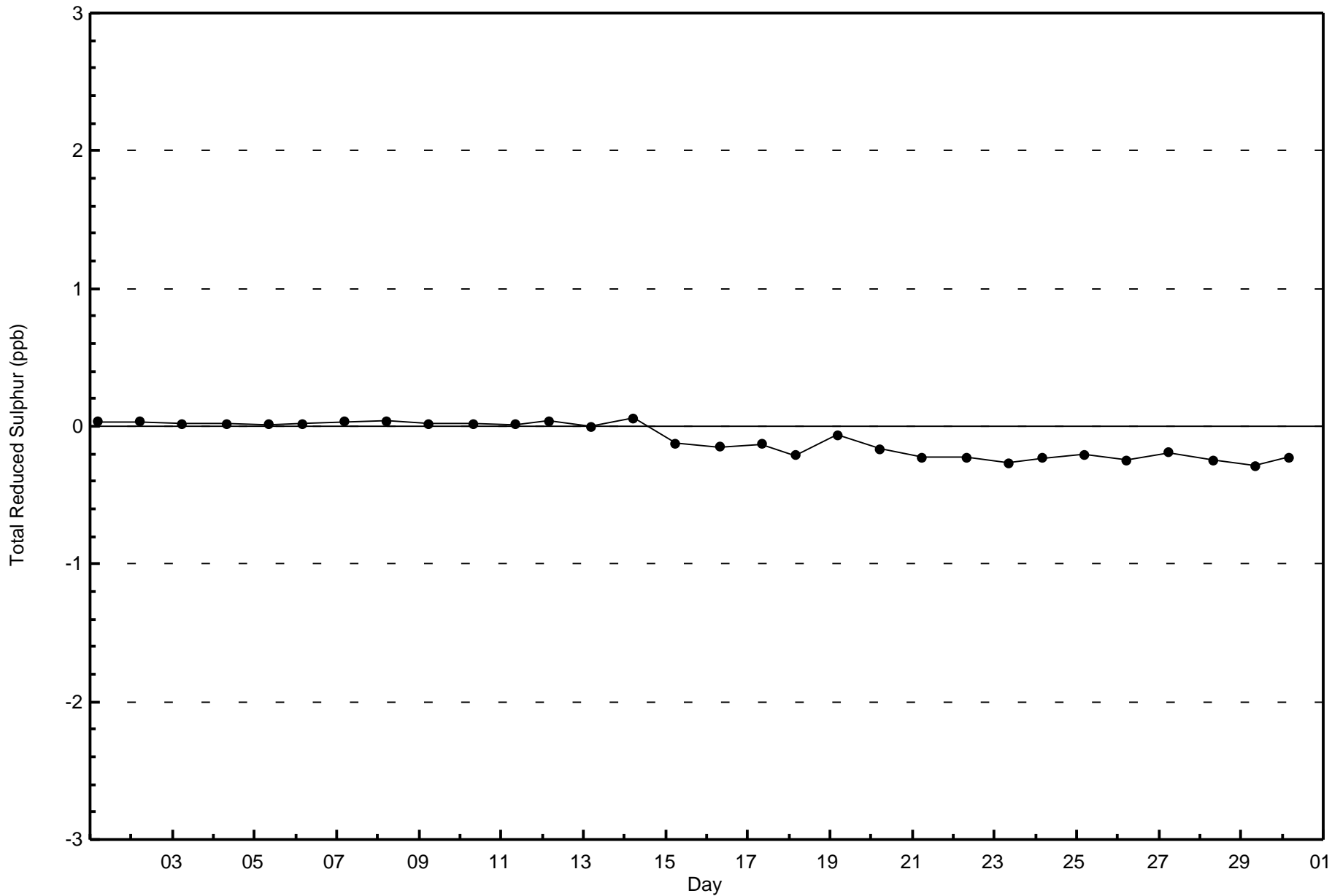


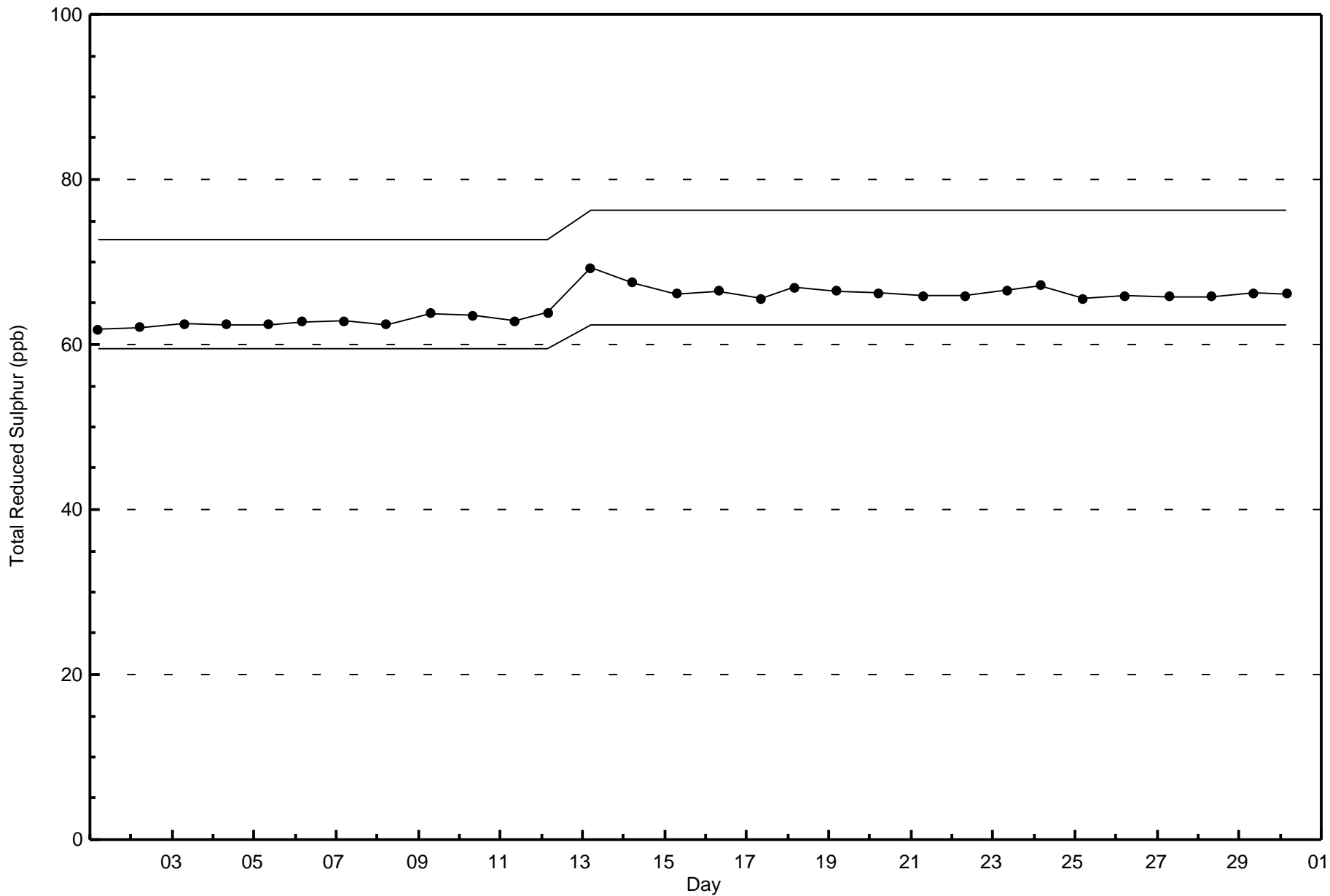
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes (AMS 6)



Total Number of Valid Hours: 674

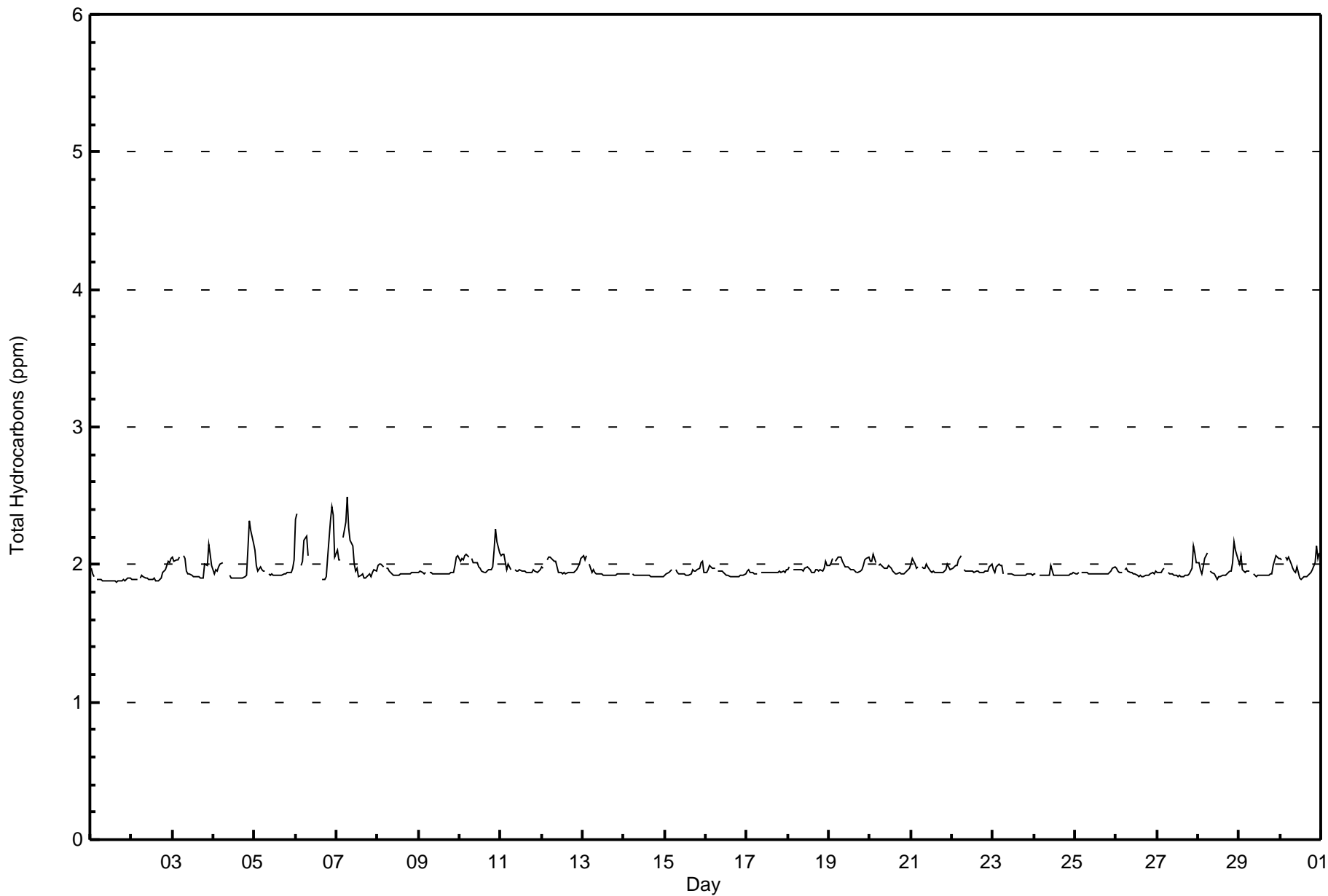






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Patricia McInnes - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Patricia McInnes - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	621	91.06	91.06
2.1 - 3.0	61	8.94	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Patricia McInnes - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	130	62	35	16	37	57	41	45	44	38	23	18	12	16	9	31	614
2.1 - 3.0	5	2	1	1	0	2	2	7	5	4	3	2	1	4	5	15	59
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	37	59	43	52	49	42	26	20	13	20	14	46	673

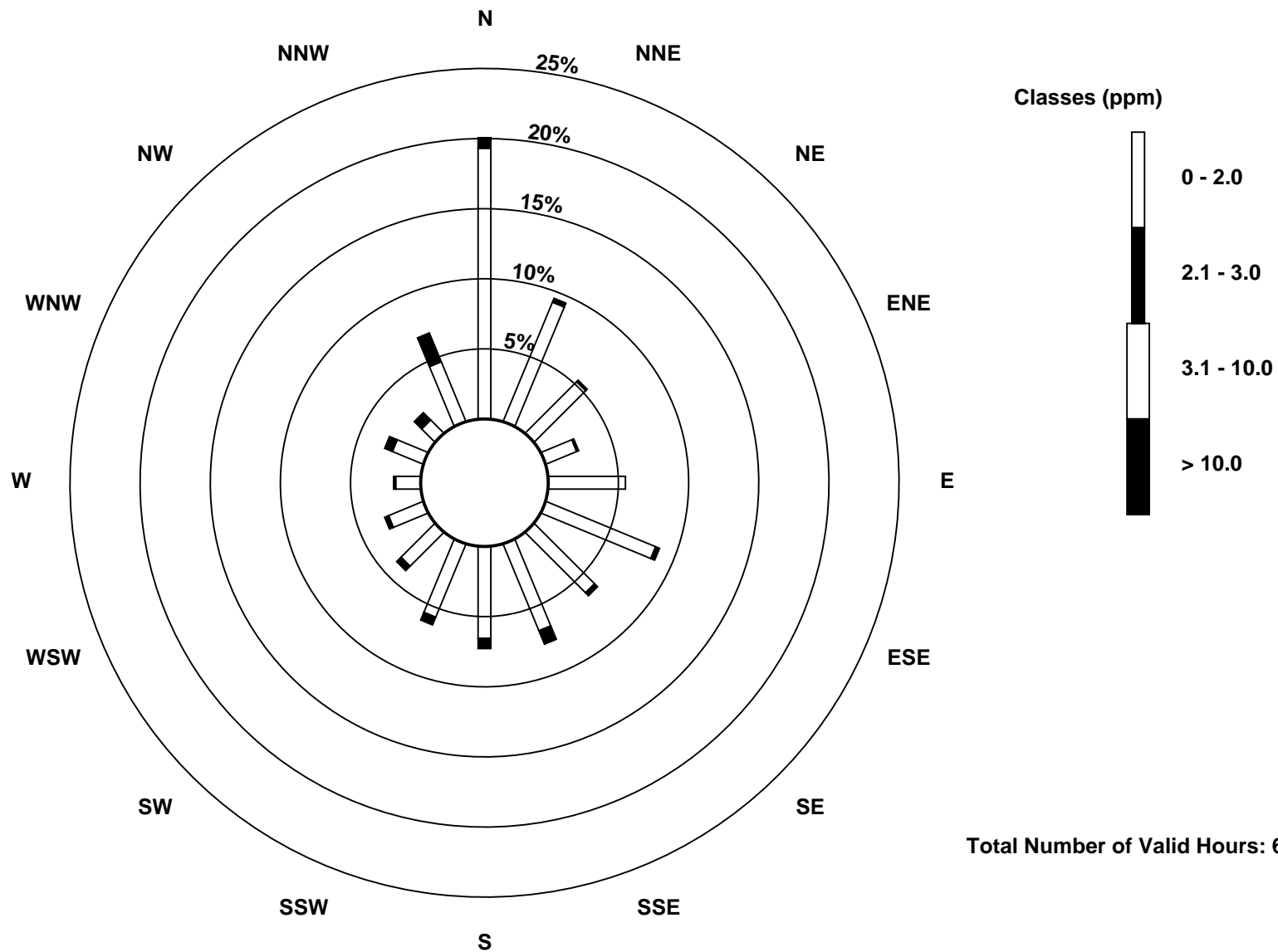
Total Number of Valid Hours: 673

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Patricia McInnes (AMS 6)



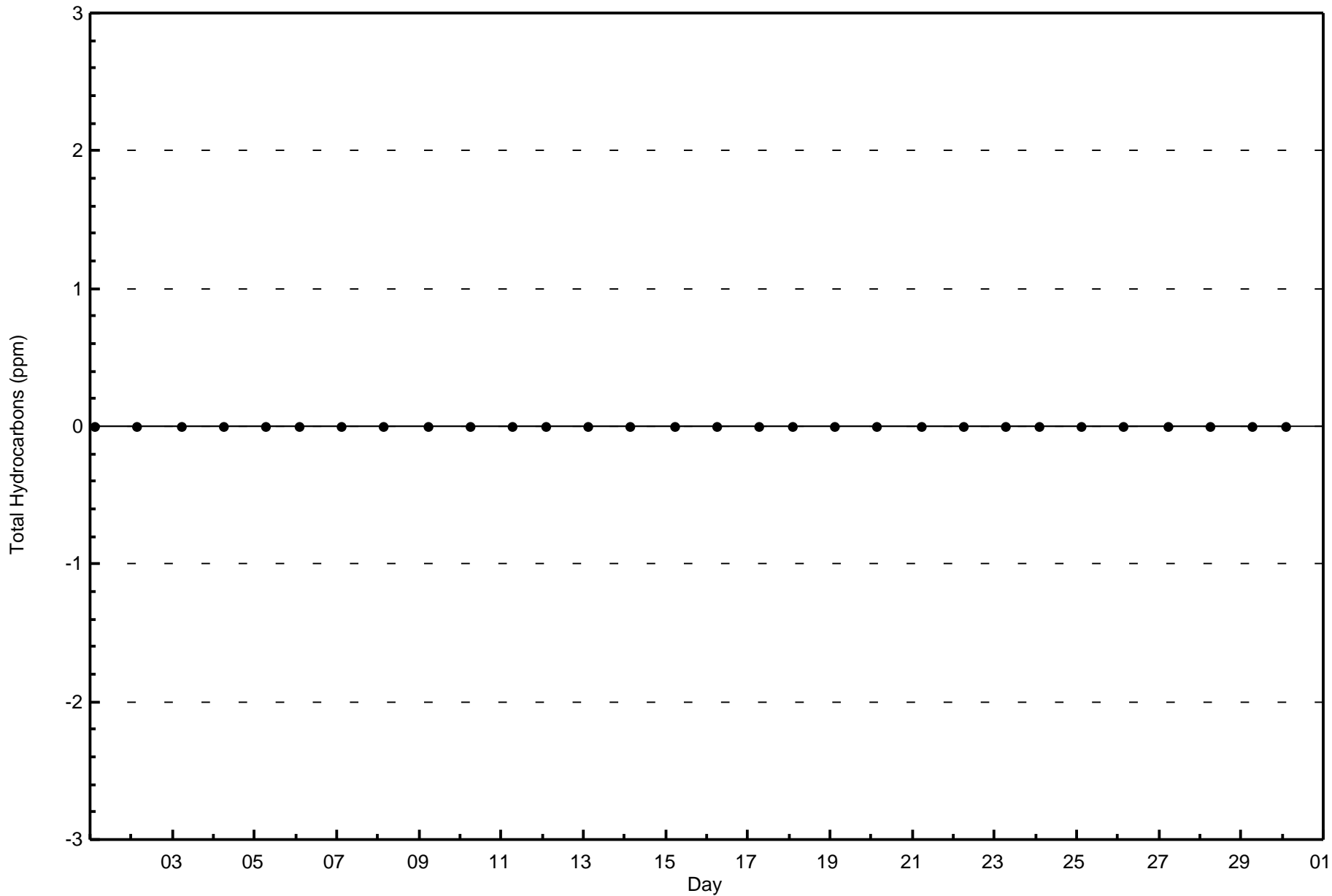


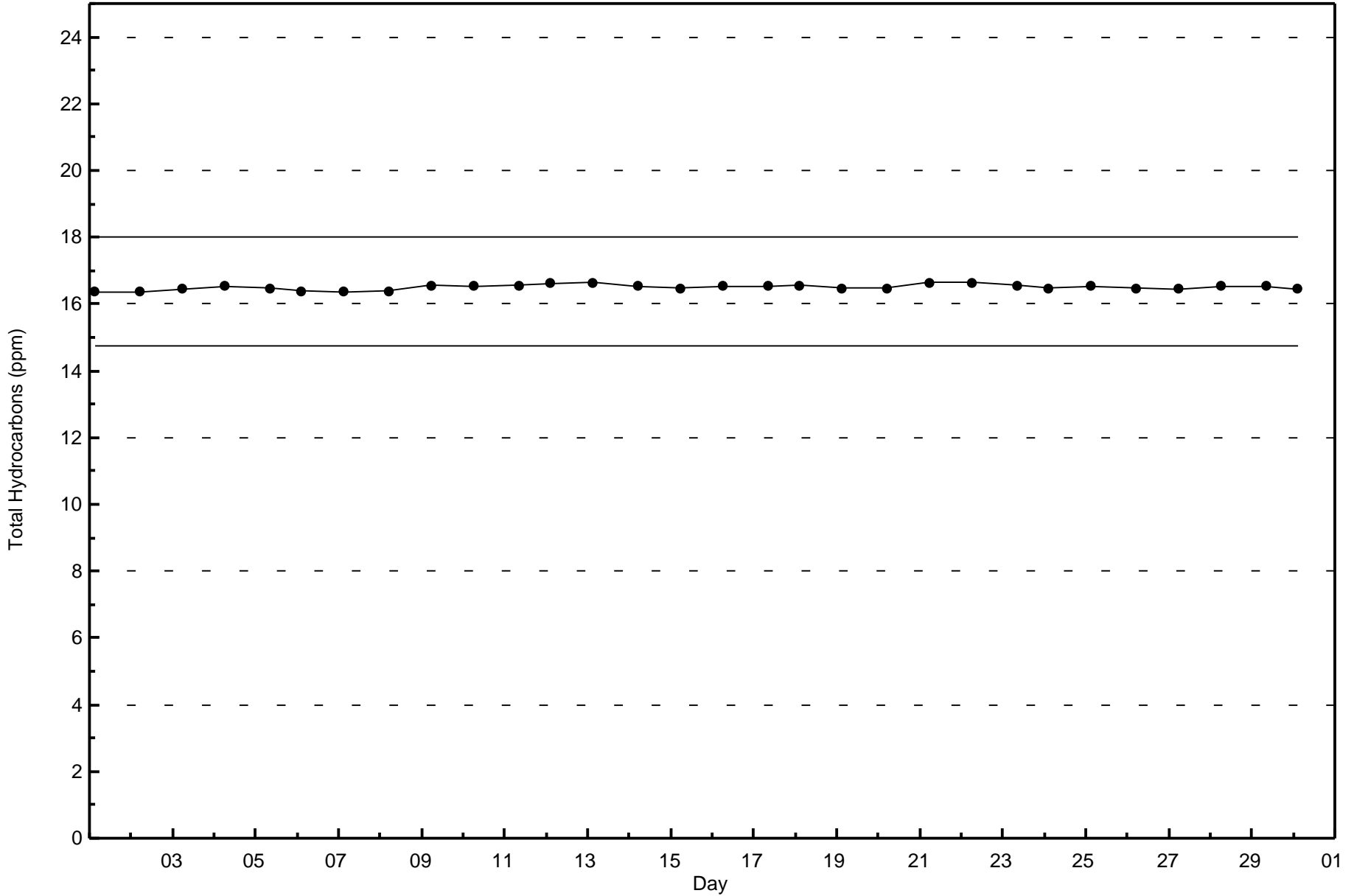
Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

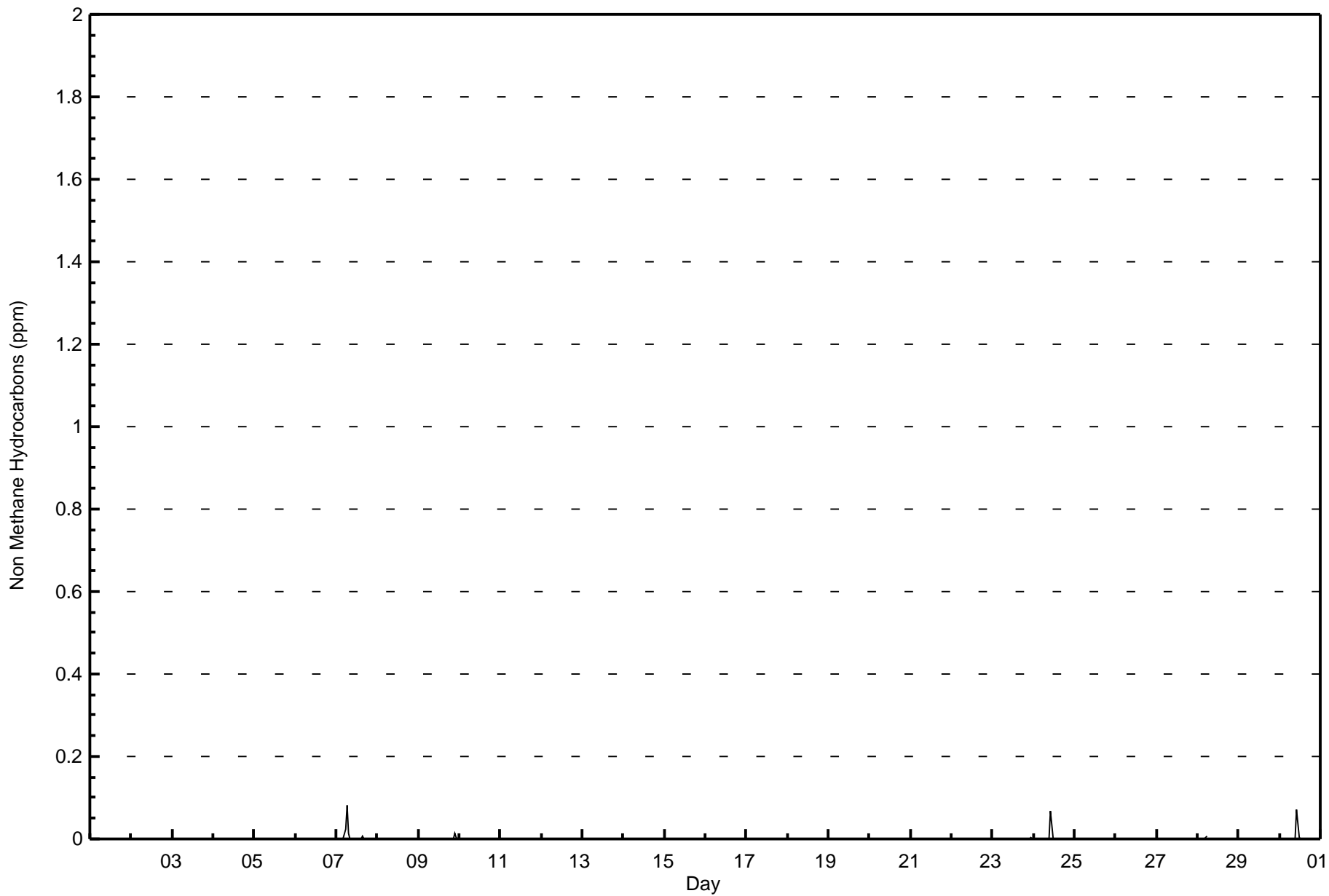
Patricia McInnes - April 2017







Maximum Value: 0.082 ppm on Apr 7 07:00 Maximum Daily Average: 0.005 ppm on Apr 7																							Hours in Service:	720				
Minimum Value: 0.000 ppm on Apr 1 01:00 Minimum Daily Average: 0.000 ppm on Apr 1																							Hours of Data:	682				
Maximum Diurnal Average: 0.005 ppm at hour 11 Minimum Diurnal Average: 0.000 ppm at hour 1																							Hours of Missing Data:	38				
Monthly Average: 0.000 ppm Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0																							Hours of Calibration:	37				
																							Percent Operational Time:	99.9				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001
3-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-Apr	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	
5-Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000
7-Apr	0.000	0.000	0.000	Z	0.000	0.023	0.082	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.082
8-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.005	0.000	0.001	0.013
10-Apr	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11-Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
14-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16-Apr	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17-Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001
19-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22-Apr	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23-Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
24-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.069
25-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Apr	0.000	0.000	0.000	0.000	0.000	0.006	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
29-Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.071	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.071
																							Diurnal Average					
																							Diurnal Maximum					
Z - zerospan C - Calibration M - Maintenance																												





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	674	98.83	98.83
0.006 - 0.05	5	0.73	99.56
0.06 - 0.1	3	0.44	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	134	64	35	16	37	59	42	51	48	42	26	20	13	20	14	44	665
0.006 - 0.05	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	1	5
0.06 - 0.1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	3
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	37	59	43	52	49	42	26	20	13	20	14	46	673

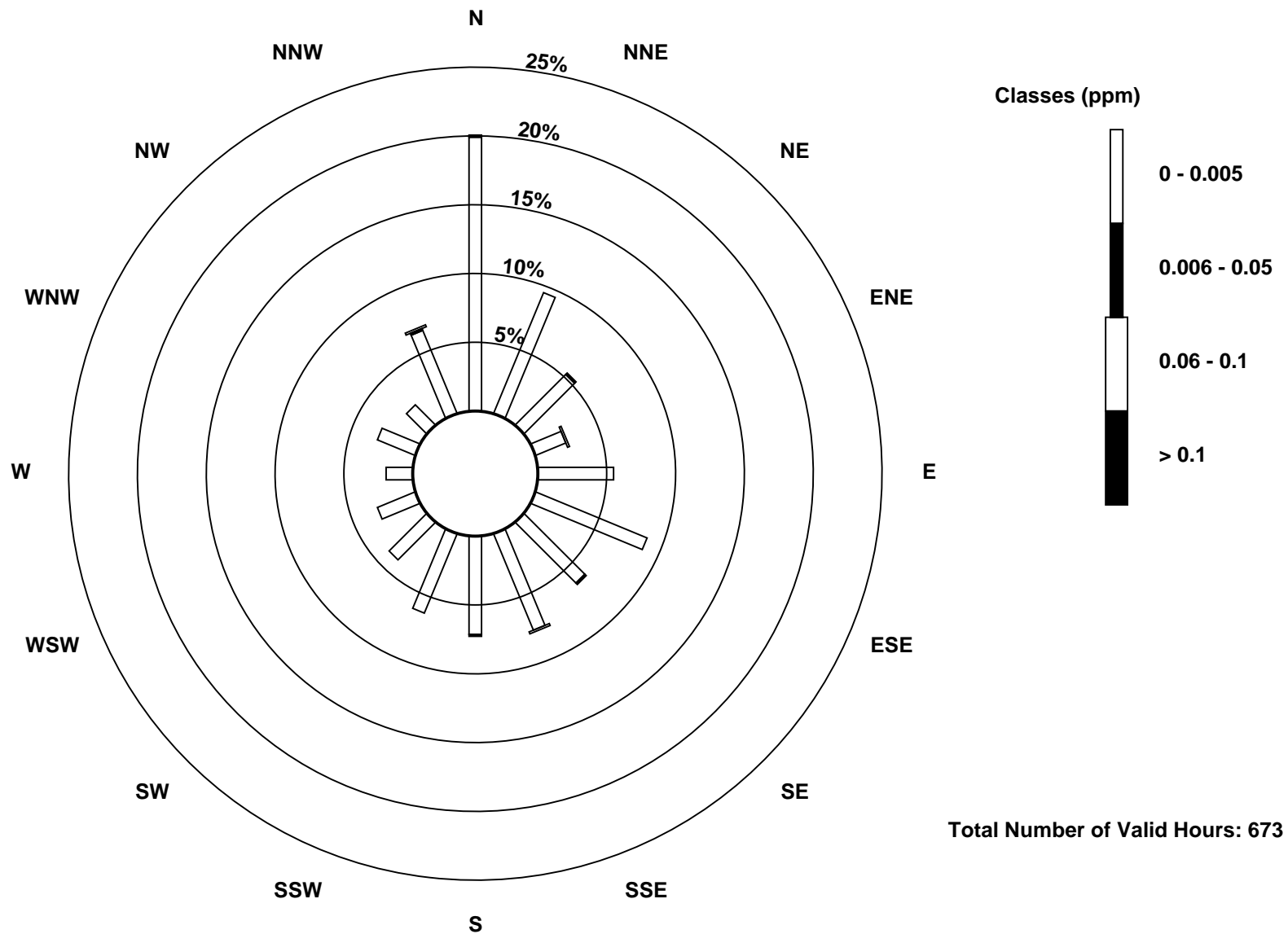
Total Number of Valid Hours: 673

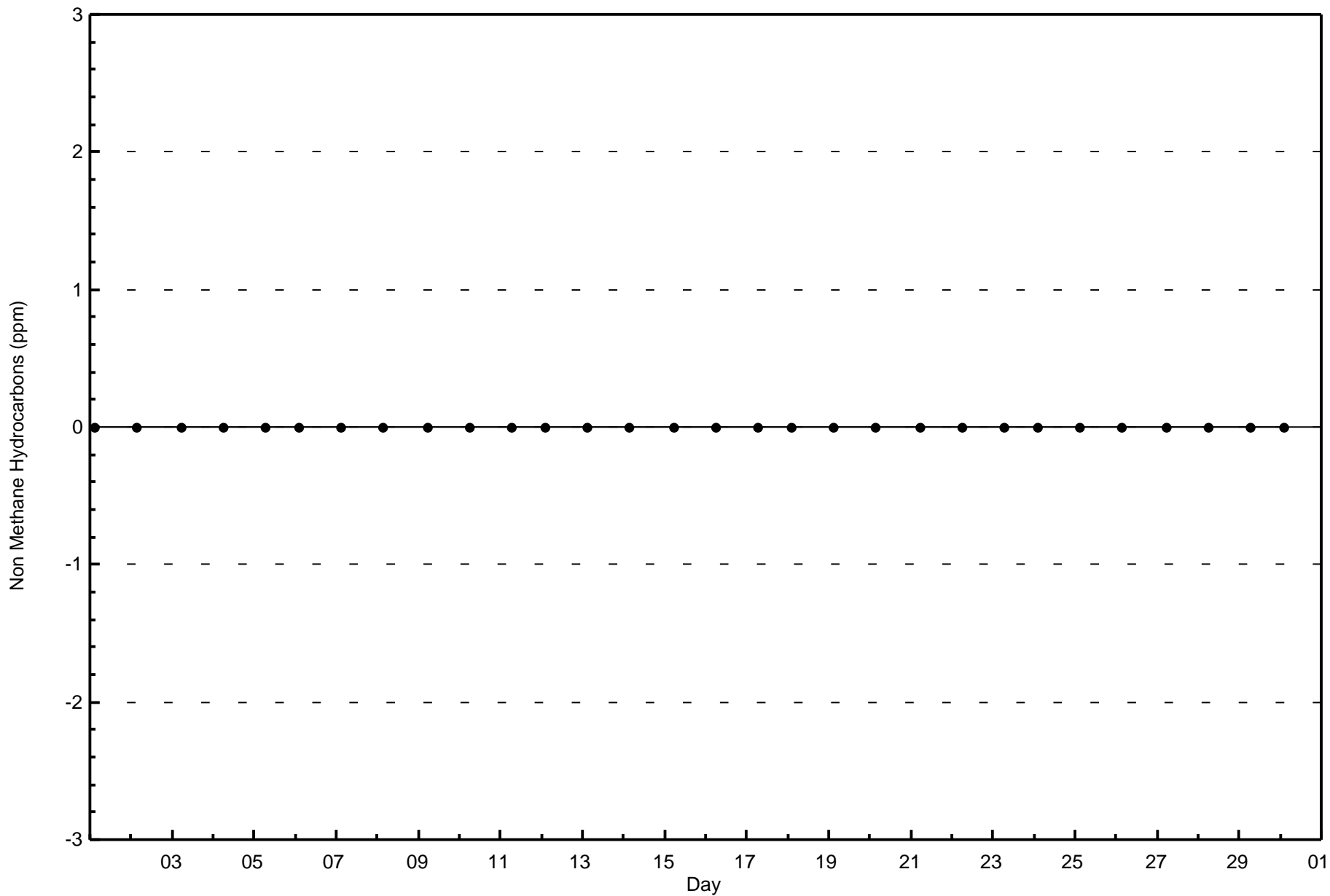
Total Number of Hours: 720

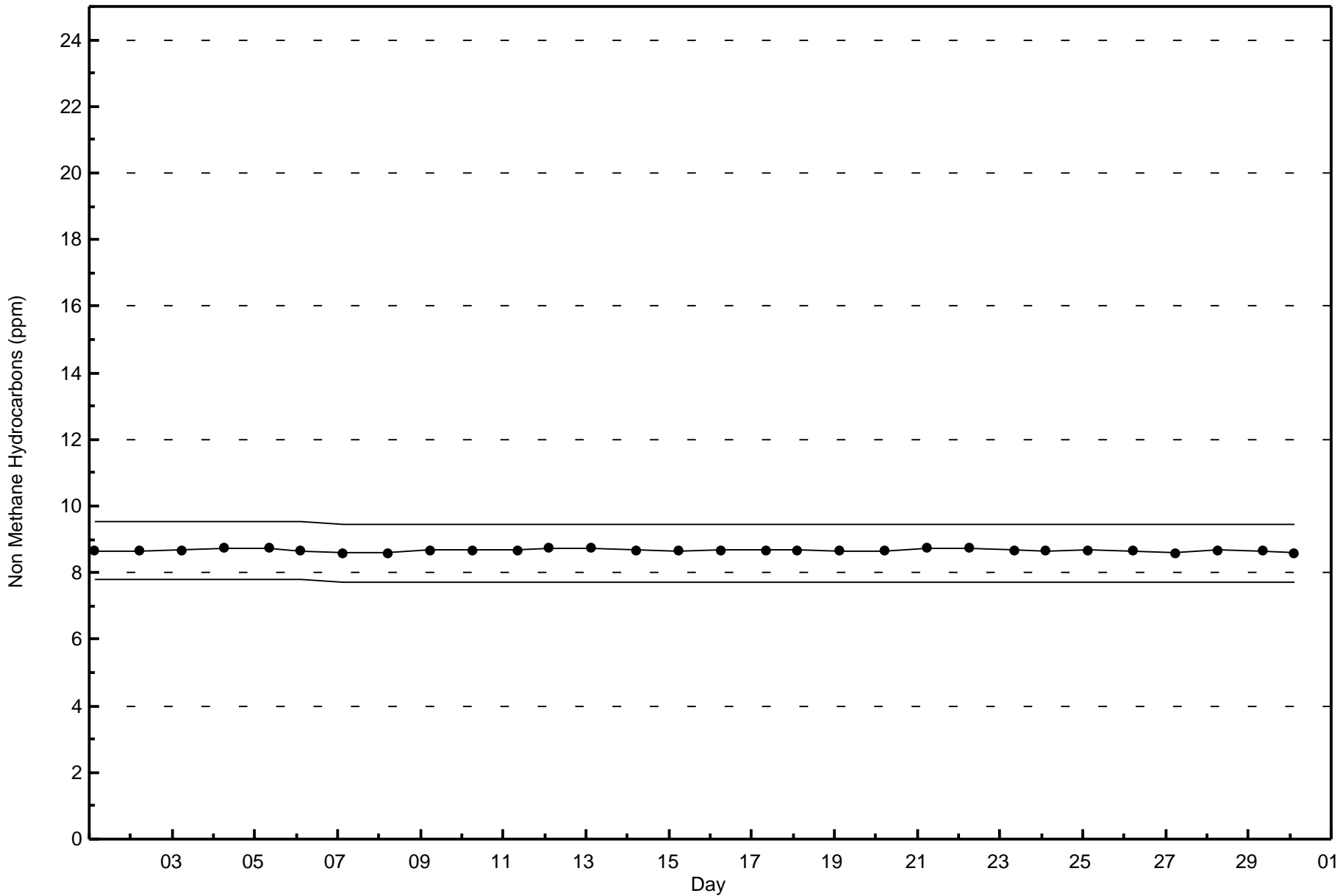


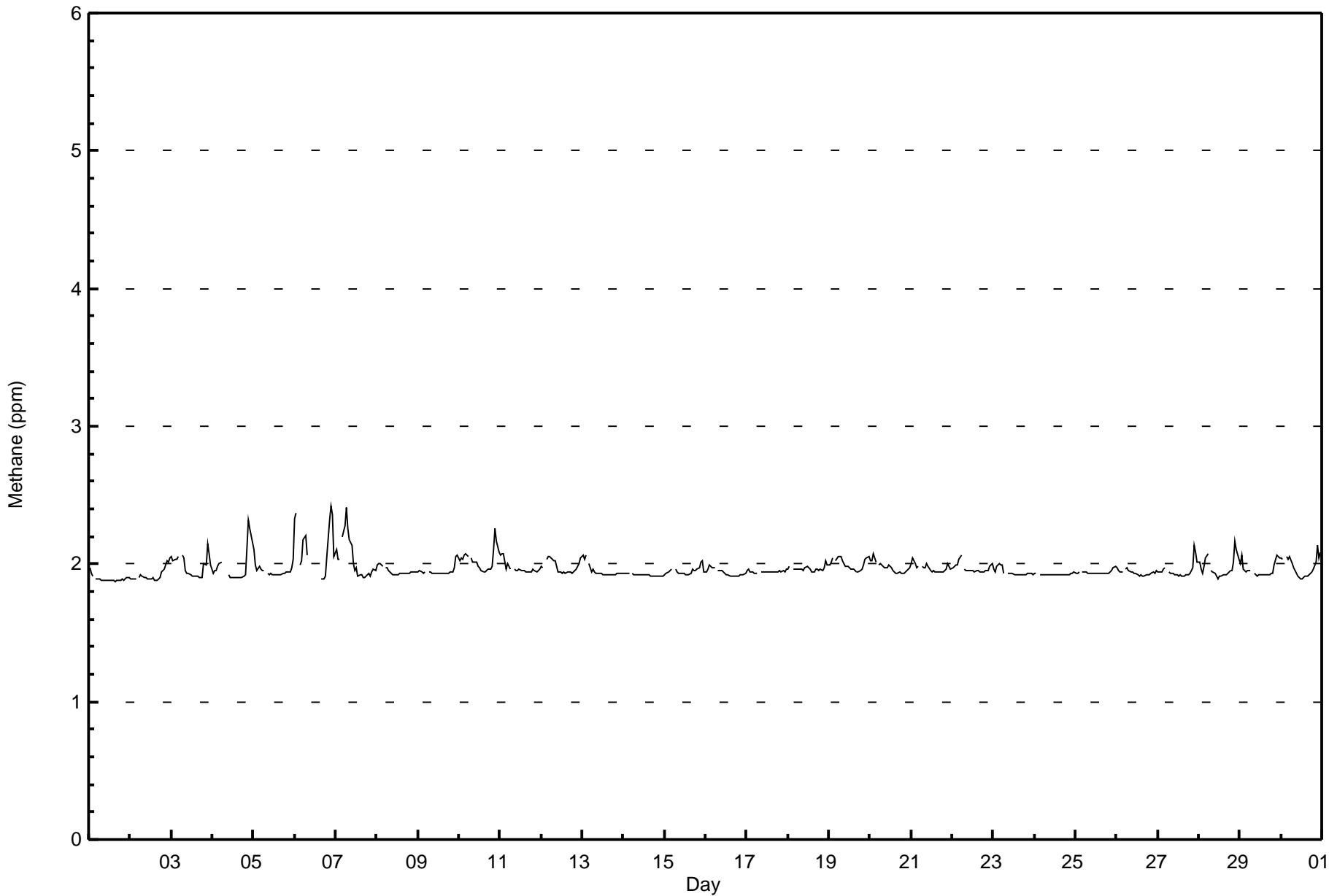
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes (AMS 6)











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	621	91.06	91.06
2.1 - 3.0	61	8.94	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Patricia McInnes - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	130	62	35	16	37	57	41	45	44	38	23	18	12	16	9	31	614
2.1 - 3.0	5	2	1	1	0	2	2	7	5	4	3	2	1	4	5	15	59
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	37	59	43	52	49	42	26	20	13	20	14	46	673

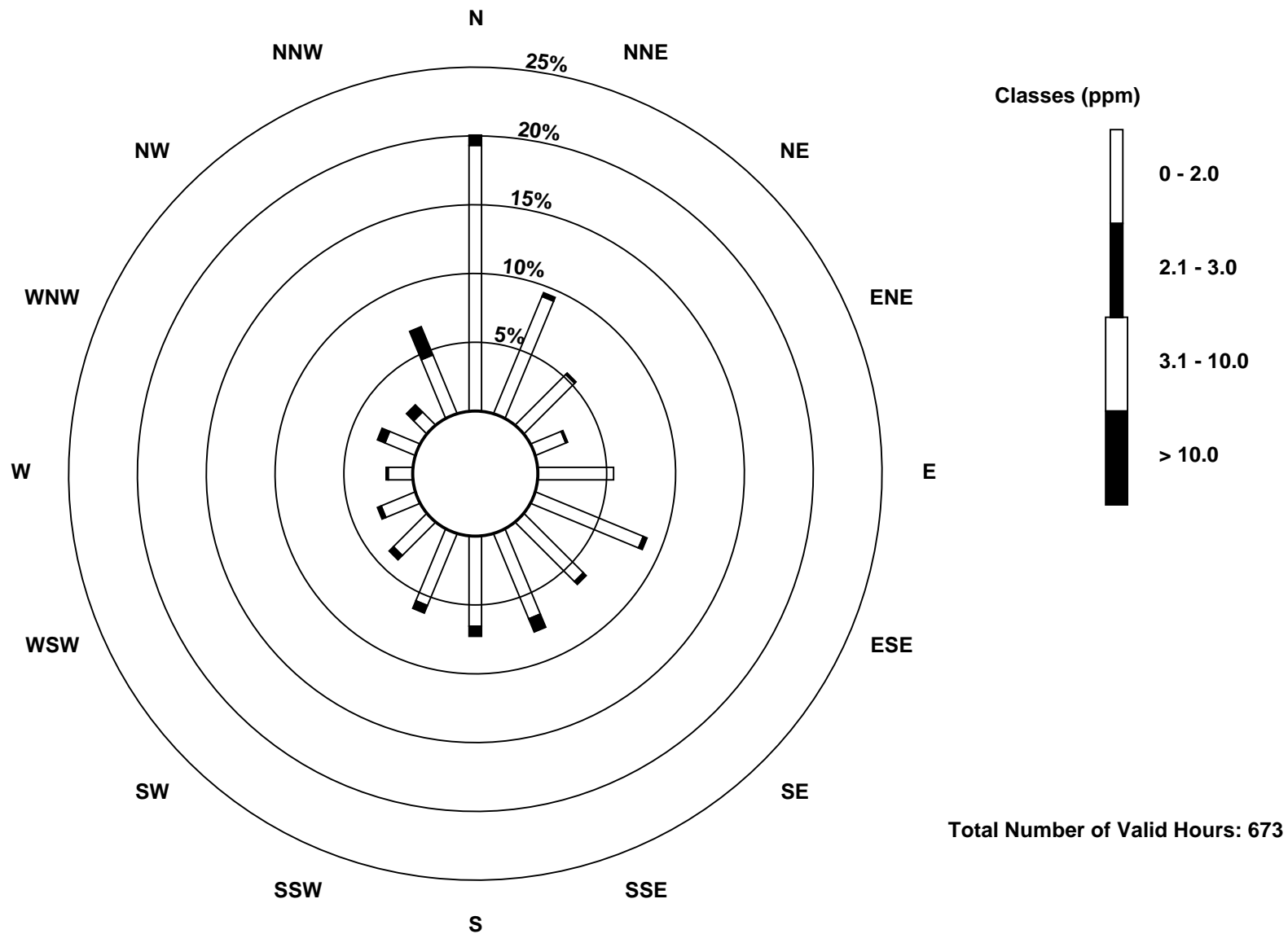
Total Number of Valid Hours: 673

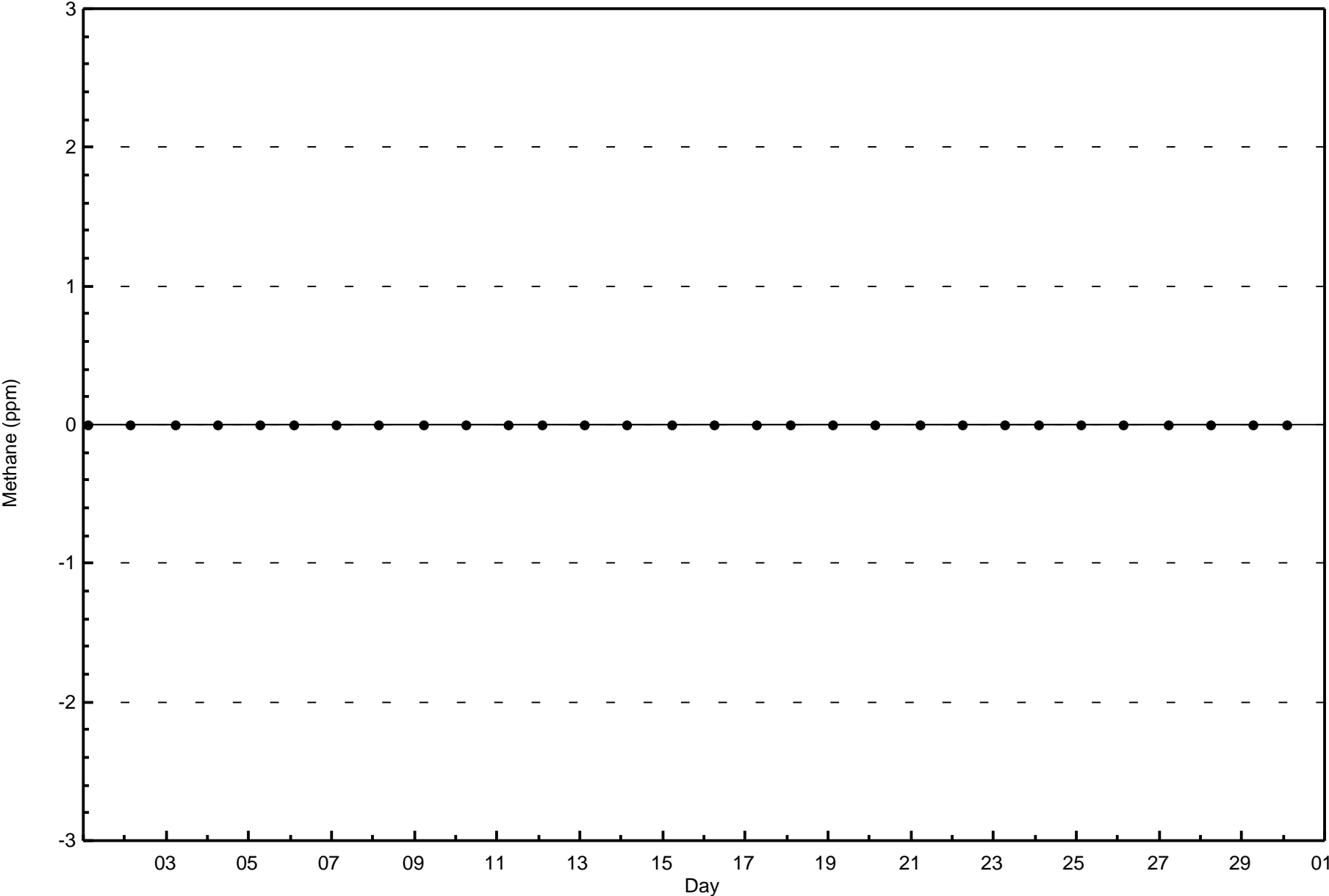
Total Number of Hours: 720

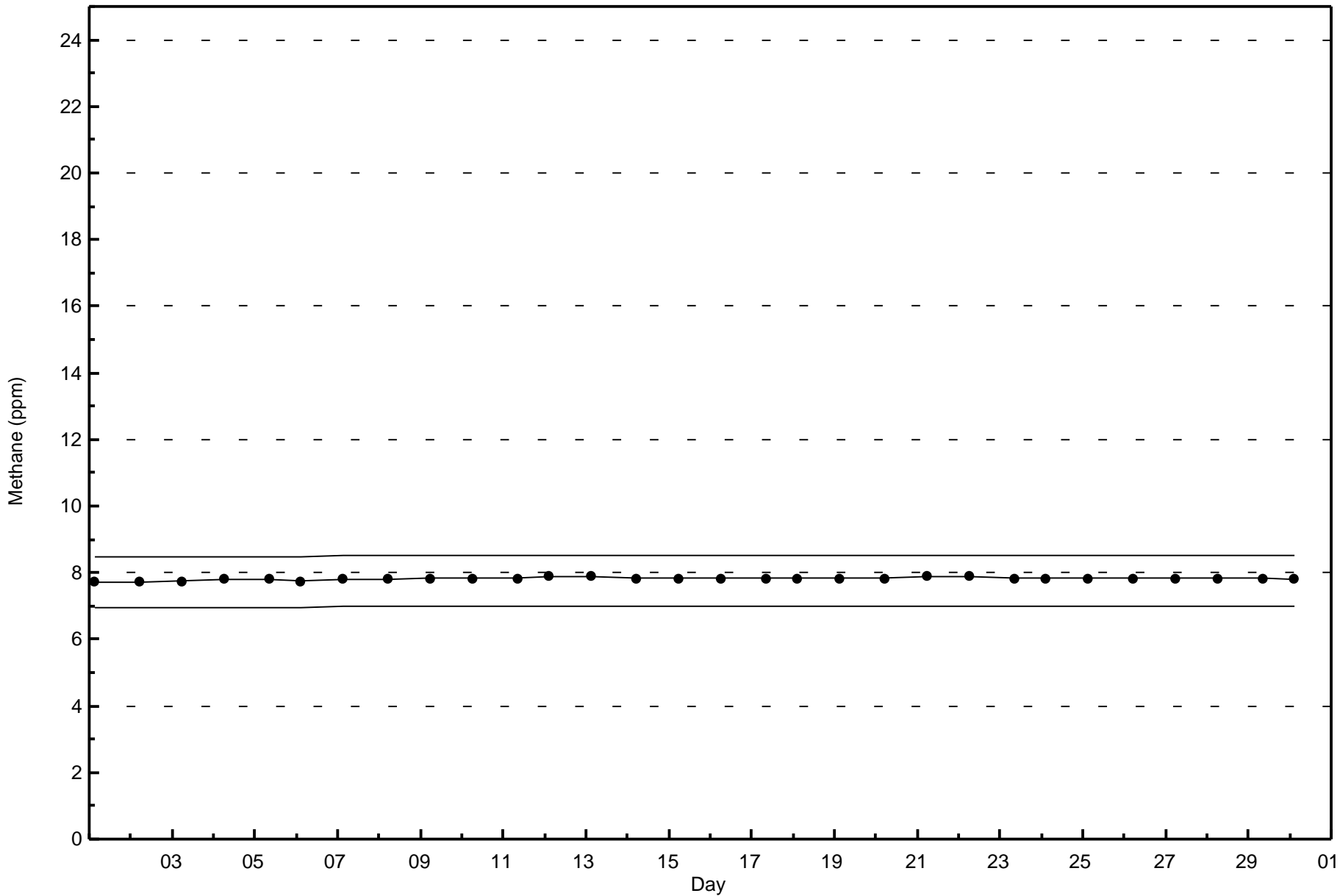


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Methane (CH₄) - ppm
Patricia McInnes (AMS 6)









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Patricia McInnes - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 57 ppb on Apr 6 15:00	Maximum Daily Average: 44.4 ppb on Apr 1		Hours of Data:	685
Minimum Value: 7 ppb on Apr 5 01:00	Minimum Daily Average: 24.5 ppb on Apr 22		Hours of Missing Data:	35
Maximum Diurnal Average: 42.8 ppb at hour 16	Minimum Diurnal Average: 25.0 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 34.9 ppb	Percentiles: P ₁ = 11 P ₁₀ = 22 O ₁ = 28 Median = 36 O ₃ = 42 P ₉₀ = 47 P ₉₉ = 52		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	38	43	Z	43	42	41	41	41	42	43	44	45	46	47	47	48	48	49	48	47	48	46	41	43	44.4	49
2-Apr	44	44	42	Z	40	37	34	36	38	40	43	47	48	46	49	50	50	45	40	41	41	36	37	32	41.7	50
3-Apr	28	27	27	31	Z	24	26	31	41	41	38	43	46	44	44	43	44	43	39	40	39	22	26	24	35.3	46
4-Apr	27	20	21	15	8	Z	9	21	M	34	44	47	48	49	48	49	48	45	36	25	18	15	9	31.2	49	
5-Apr	7	20	22	16	18	23	Z	25	28	32	38	40	43	46	50	52	52	50	50	47	43	44	43	37	35.9	52
6-Apr	32	Z	30	36	30	17	20	19	34	41	41	42	41	51	57	56	56	56	55	49	43	37	33	37	39.7	57
7-Apr	34	37	Z	26	23	19	13	20	28	32	36	39	41	45	46	46	47	46	42	41	40	36	36	37	35.2	47
8-Apr	40	39	35	Z	30	30	29	30	32	36	36	35	34	31	30	30	30	29	28	27	27	27	28	29	31.5	40
9-Apr	29	29	30	32	Z	29	30	31	32	35	36	35	36	37	37	37	37	36	35	33	30	28	21	17	31.8	37
10-Apr	22	17	19	11	11	Z	17	23	29	C	C	C	C	42	45	46	44	43	39	36	27	23	18	19	28.0	46
11-Apr	23	25	23	33	28	27	Z	27	27	28	31	33	36	37	38	40	39	40	39	39	41	41	44	41	33.8	44
12-Apr	40	Z	35	32	30	30	31	30	33	37	41	43	45	47	49	49	49	49	49	46	42	37	32	27	39.4	49
13-Apr	24	24	Z	19	22	23	27	34	40	41	42	42	45	45	44	43	43	43	42	43	41	41	42	41	37.0	45
14-Apr	42	41	40	Z	36	37	37	39	39	40	40	41	41	41	42	42	46	45	47	49	49	50	50	49	42.7	50
15-Apr	48	45	43	43	Z	41	40	42	45	44	45	45	48	51	53	50	43	43	42	37	31	20	20	40	41.8	53
16-Apr	42	37	29	28	27	Z	33	36	37	38	40	43	46	47	49	51	52	51	49	46	48	47	45	44	42.1	52
17-Apr	41	38	34	35	38	38	Z	38	39	39	37	36	37	36	35	36	36	35	33	32	31	30	31	27	35.3	41
18-Apr	25	Z	29	26	25	23	23	22	23	24	24	25	26	27	28	28	28	27	27	27	27	26	23	27	25.7	29
19-Apr	29	28	Z	26	23	17	16	19	21	24	25	25	25	28	29	33	36	36	34	31	22	22	18	13	25.2	36
20-Apr	17	12	13	Z	18	13	13	20	25	25	29	27	30	34	36	38	37	38	40	44	43	42	40	37	29.1	44
21-Apr	30	28	32	33	Z	26	30	32	34	33	35	38	39	39	41	41	42	41	40	39	34	24	21	23	33.7	42
22-Apr	23	18	14	11	12	Z	27	30	32	33	31	29	32	33	29	26	25	25	27	26	27	24	16	11	24.5	33
23-Apr	19	23	14	9	12	9	Z	27	31	33	34	36	37	38	39	40	40	41	40	38	35	35	38	40	30.8	41
24-Apr	39	Z	38	38	35	27	29	30	31	32	32	33	34	33	33	32	32	33	32	31	31	29	28	28	32.3	39
25-Apr	31	30	Z	26	25	24	25	27	29	30	32	34	35	35	36	37	36	36	36	35	34	33	32	32	31.8	37
26-Apr	32	31	33	Z	28	27	31	37	39	41	41	40	43	43	42	42	42	42	40	38	32	32	36	36	36.8	43
27-Apr	35	35	33	25	Z	26	30	32	34	37	42	45	45	46	46	46	45	44	43	38	32	26	26	23	36.2	46
28-Apr	20	30	37	25	11	Z	30	35	37	41	46	47	47	49	49	50	48	46	39	30	24	26	21	28	35.5	50
29-Apr	33	23	38	39	36	36	Z	42	44	47	49	50	52	52	52	52	52	50	50	47	37	37	26	25	42.2	52
30-Apr	21	Z	19	14	17	13	24	32	36	44	48	49	50	49	49	50	47	44	42	33	26	25	30	24	34.2	50

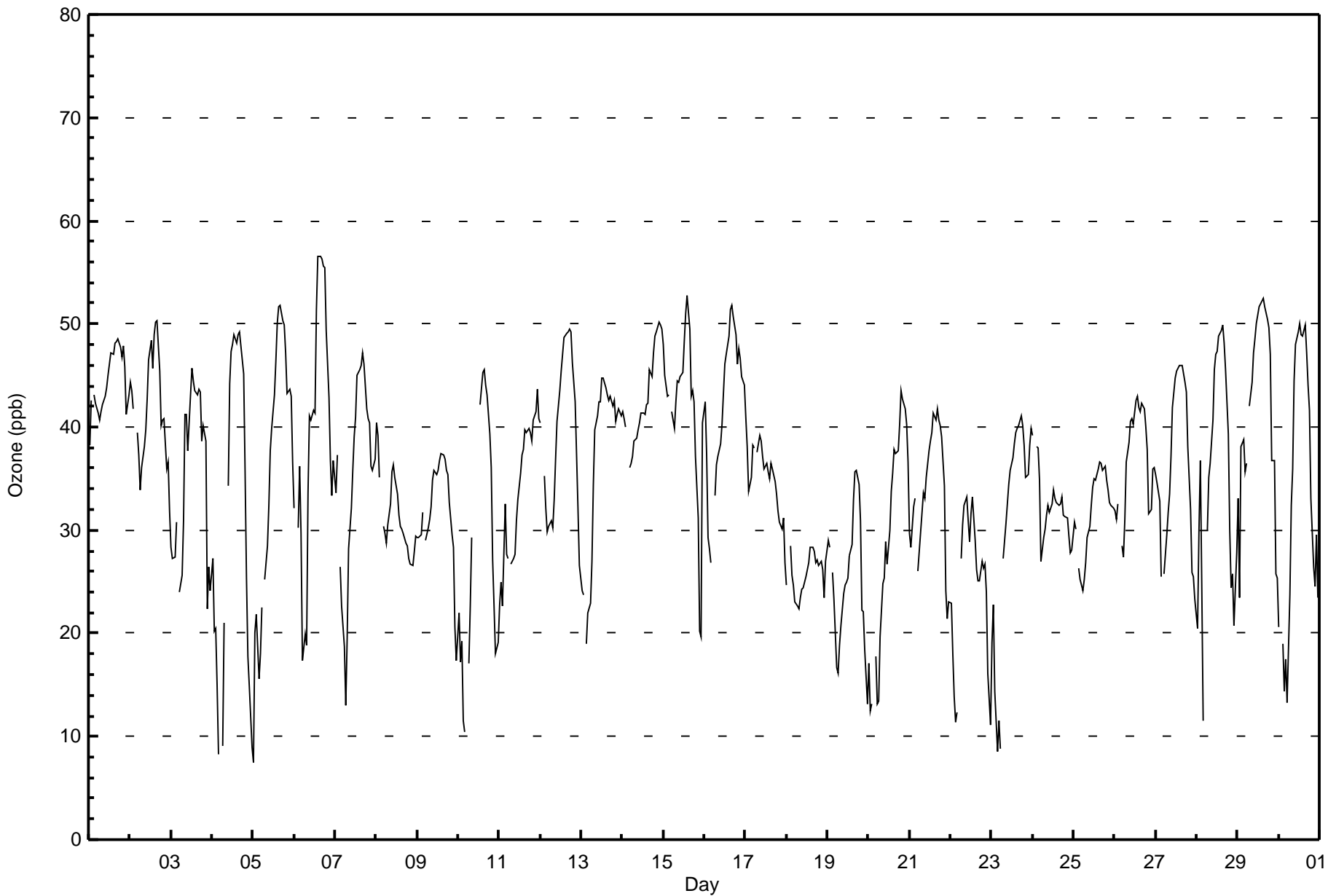
30.6	29.8	29.2	26.9	25.0	26.3	26.6	30.3	33.8	36.1	37.9	39.1	40.5	41.6	42.4	42.8	42.5	41.8	40.5	38.2	35.0	32.1	30.6	30.0	Diurnal Average	
48	45	43	43	42	41	41	42	45	47	49	50	52	52	57	56	56	56	55	49	49	50	50	49	Diurnal Maximum	

Z - zeronspan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Patricia McInnes - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	57	8.32	8.32
21 - 50	610	89.05	97.37
51 - 82	18	2.63	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	2	3	2	1	4	1	12	4	4	2	1	3	1	1	4	52
21 - 50	127	62	33	14	36	54	40	41	42	35	21	21	10	15	13	42	606
51 - 82	0	1	1	0	0	0	0	0	4	5	1	0	1	5	0	0	18
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	134	65	37	16	37	58	41	53	50	44	24	22	14	21	14	46	676

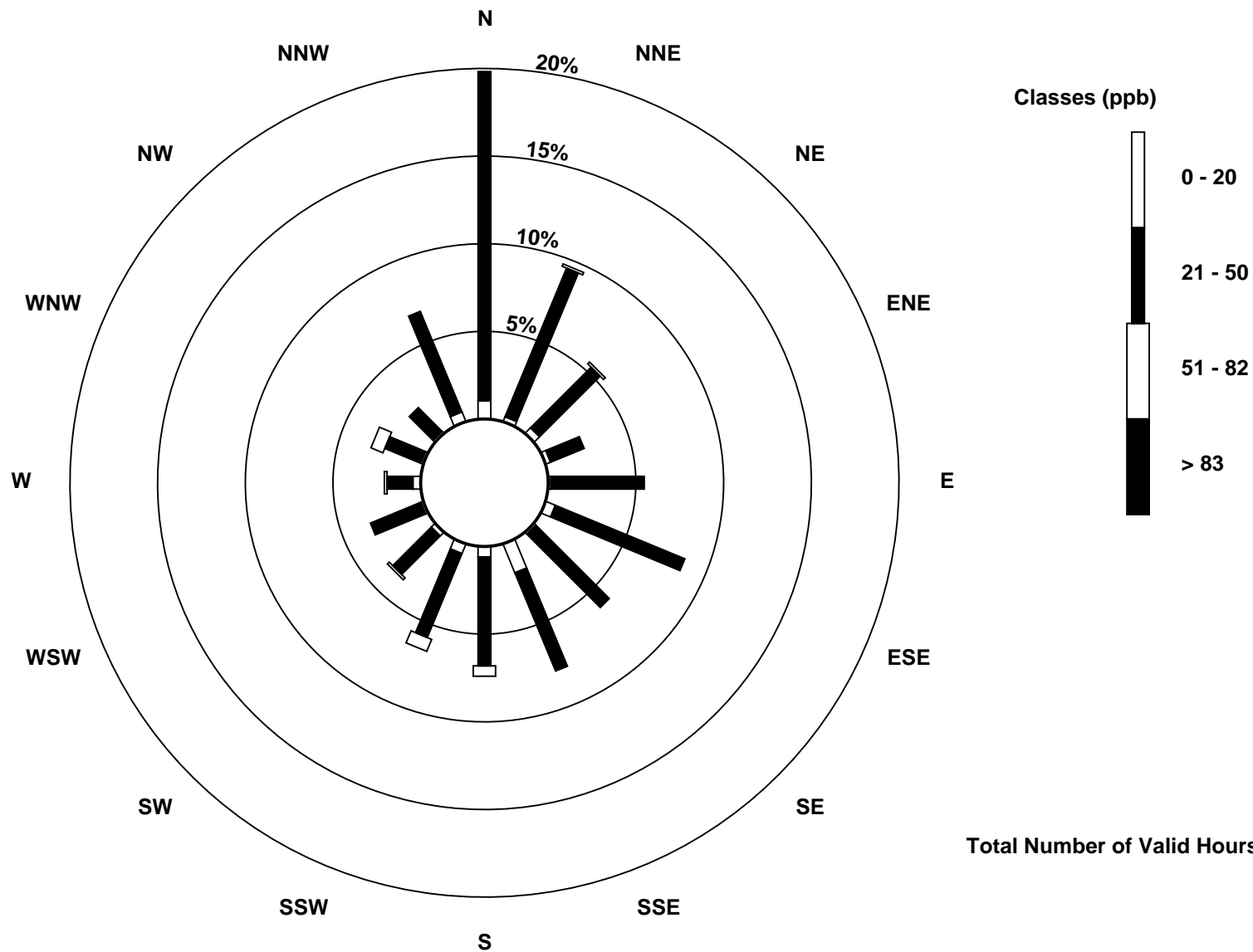
Total Number of Valid Hours: 676

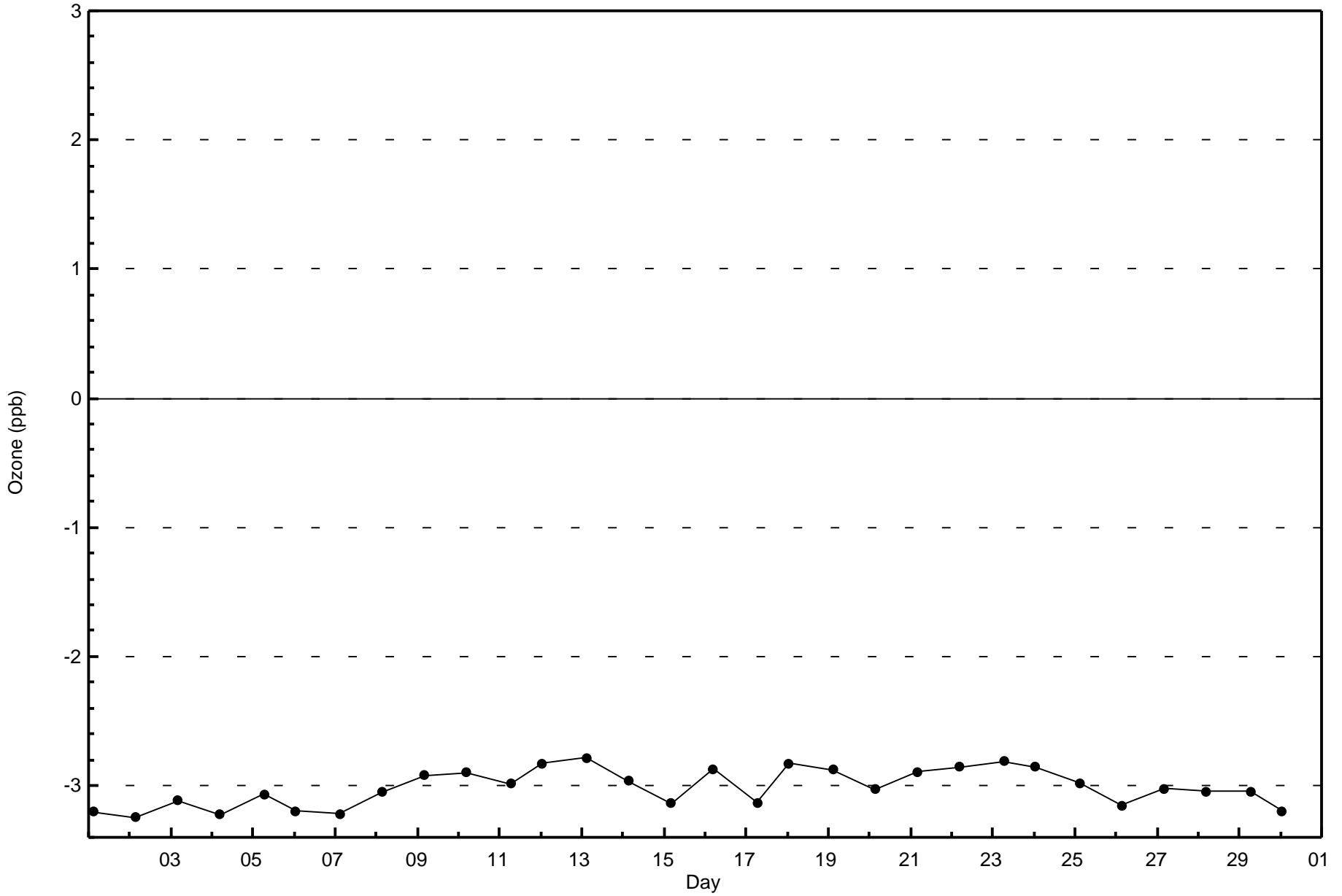
Total Number of Hours: 720

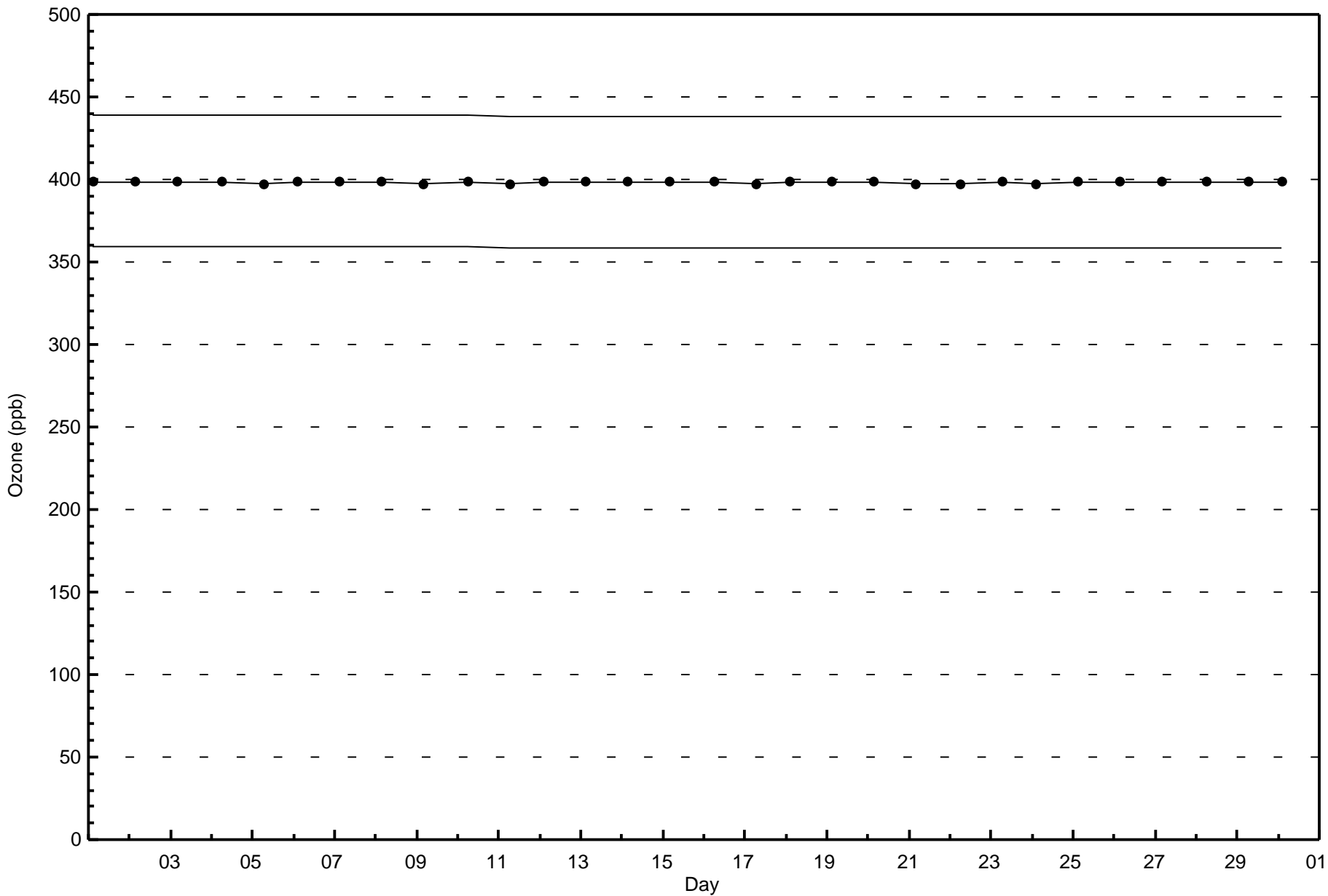


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Patricia McInnes (AMS 6)









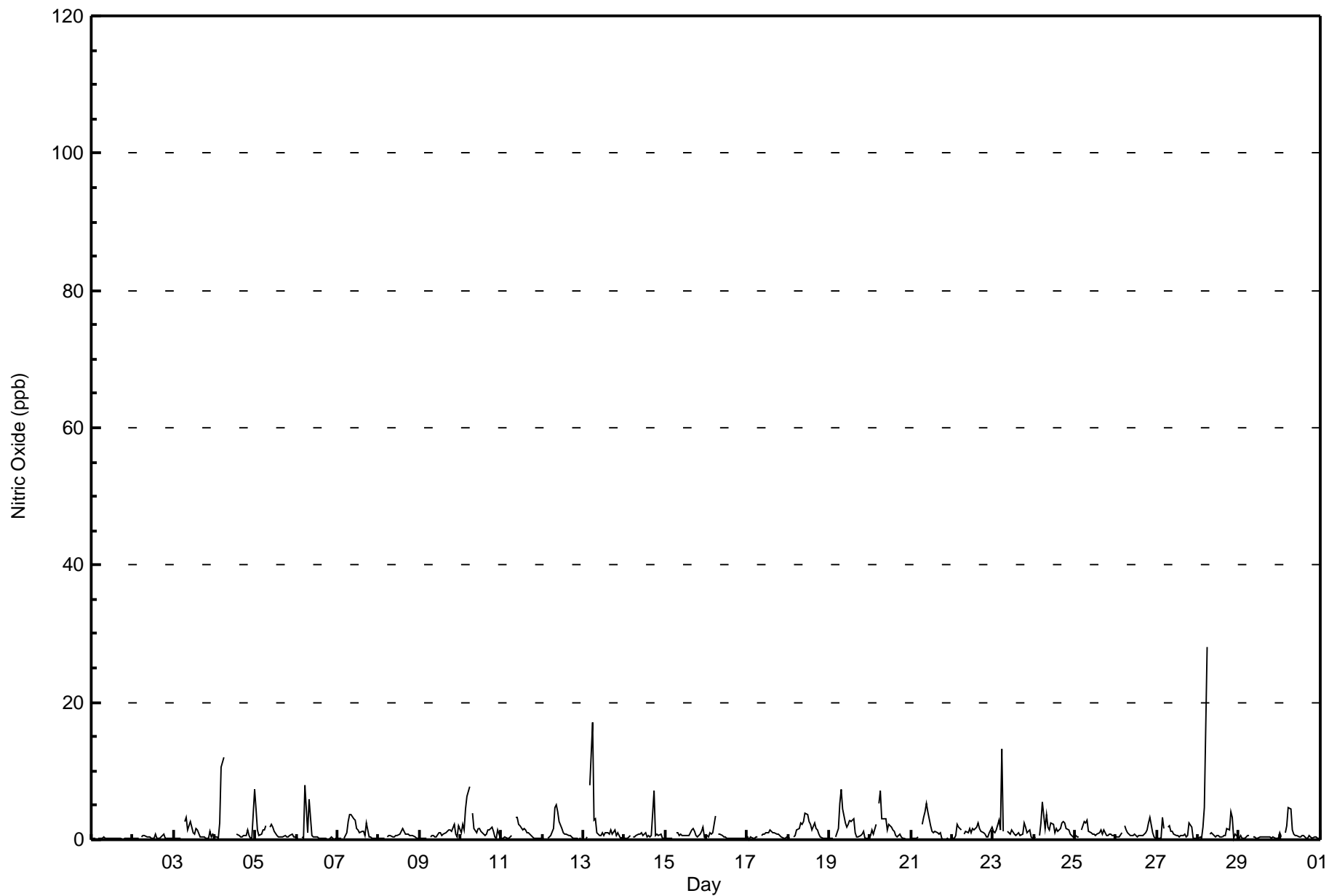
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Patricia McInnes - April 2017

Maximum Value: 28 ppb on Apr 28 06:00																	Maximum Daily Average: 2.5 ppb on Apr 4																	Hours in Service: 720															
Minimum Value: 0 ppb on Apr 21 21:00																	Minimum Daily Average: 0.2 ppb on Apr 1																	Hours of Data: 685															
Maximum Diurnal Average: 4.8 ppb at hour 6																	Minimum Diurnal Average: 0.4 ppb at hour 23																	Hours of Missing Data: 35															
Monthly Average: 1.1 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 8																	Hours of Calibration: 35															
																																		Percent Operational Time: 100.0															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																							
2-Apr	0	0	0	0	Z	0	1	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0.3	1																							
3-Apr	0	0	0	0	0	Z	3	3	1	2	3	1	1	2	1	0	0	0	0	0	1	0	1	0	0.9	3																							
4-Apr	0	0	0	2	10	12	Z	7	C	C	C	C	C	1	1	0	0	1	1	1	1	0	0	7	2.5	12																							
5-Apr	5	1	1	1	1	1	2	Z	2	2	2	1	1	0	0	0	0	1	0	0	1	1	0	0	1.1	5																							
6-Apr	0	0	Z	0	0	8	1	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	8																							
7-Apr	0	0	0	Z	0	1	3	4	4	3	3	2	1	1	1	1	1	2	0	0	0	0	0	0	1.2	4																							
8-Apr	0	0	0	0	Z	0	1	1	0	0	1	1	1	1	2	1	1	1	1	1	1	0	0	0	0.6	2																							
9-Apr	0	0	0	0	0	Z	0	1	1	0	0	1	1	1	1	1	1	1	1	1	2	1	0	2	0.8	2																							
10-Apr	1	2	1	4	6	8	Z	4	2	1	2	2	1	1	1	1	1	1	2	1	0	0	1	0	1.9	8																							
11-Apr	0	0	0	0	0	0	1	Z	3	3	2	2	1	2	2	1	1	1	0	0	0	0	0	0	0.9	3																							
12-Apr	0	0	Z	0	0	1	2	5	5	4	3	2	1	1	1	1	1	0	0	0	0	0	0	0	1.1	5																							
13-Apr	0	0	0	Z	8	17	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1.9	17																							
14-Apr	0	0	0	1	Z	0	0	1	1	1	1	1	1	0	1	0	1	7	1	1	1	1	0	0	0.8	7																							
15-Apr	0	0	0	0	0	Z	1	1	1	1	1	1	1	1	1	2	2	1	1	0	1	1	2	0	0.8	2																							
16-Apr	1	0	1	1	1	3	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	3																							
17-Apr	0	0	0	0	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.6	1																							
18-Apr	0	0	Z	0	1	1	2	2	2	3	4	4	3	2	2	2	2	2	1	1	0	0	0	0	1.4	4																							
19-Apr	0	0	0	Z	0	2	5	7	5	2	2	2	3	3	3	1	0	0	1	1	1	0	0	0	1.7	7																							
20-Apr	1	1	1	2	Z	5	7	3	3	3	1	2	2	1	1	1	1	1	0	0	0	0	0	0	1.6	7																							
21-Apr	0	0	0	0	0	Z	2	3	4	5	4	2	1	1	1	1	1	1	0	0	0	0	0	0	1.3	5																							
22-Apr	0	0	1	2	2	1	Z	1	1	1	2	1	2	2	2	2	2	2	1	1	1	0	1	2	1.2	2																							
23-Apr	1	1	1	3	1	13	1	Z	1	1	1	1	1	1	1	1	1	1	2	2	1	1	0	0	1.7	13																							
24-Apr	0	0	Z	1	2	6	2	4	2	1	2	2	1	2	1	2	2	3	2	2	2	1	1	0	1.7	6																							
25-Apr	1	0	0	Z	1	3	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	3																							
26-Apr	0	0	0	1	Z	2	1	1	1	1	1	0	1	1	1	1	1	1	1	2	3	1	0	0	1.0	3																							
27-Apr	0	0	0	3	2	Z	2	2	1	1	1	1	1	0	1	1	1	0	1	2	2	0	0	0	1.0	3																							
28-Apr	0	0	0	2	5	28	Z	1	1	1	0	1	1	0	0	1	1	2	1	4	3	0	1	0	2.3	28																							
29-Apr	0	1	0	0	0	1	1	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1																							
30-Apr	1	0	Z	1	2	5	5	1	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0	1.0	5																							
																								0.5	0.4	0.4	1.1	1.9	4.8	1.9	2.6	1.7	1.5	1.4	1.1	0.9	0.9	0.9	0.9	0.8	1.1	0.8	0.8	0.8	0.4	0.4	0.6	Diurnal Average	
																								5	2	1	4	10	28	7	7	5	5	4	4	3	3	3	2	2	7	2	4	3	1	2	7	Diurnal Maximum	
Z - zerospan																								C - Calibration																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	135	64	36	17	36	59	43	52	50	44	25	19	14	21	14	46	675
21 - 40	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	36	59	43	52	51	44	25	19	14	21	14	46	676

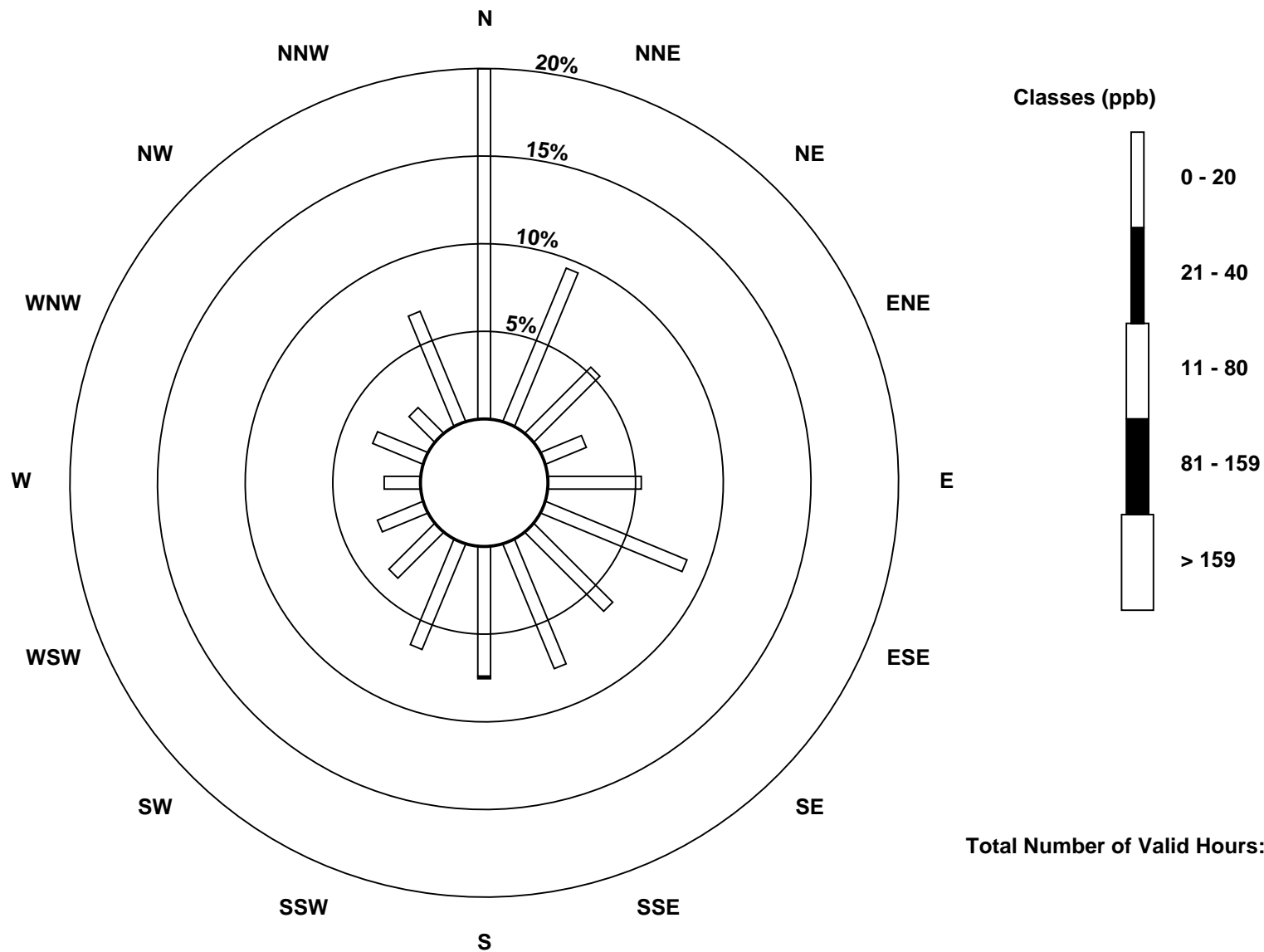
Total Number of Valid Hours: 676

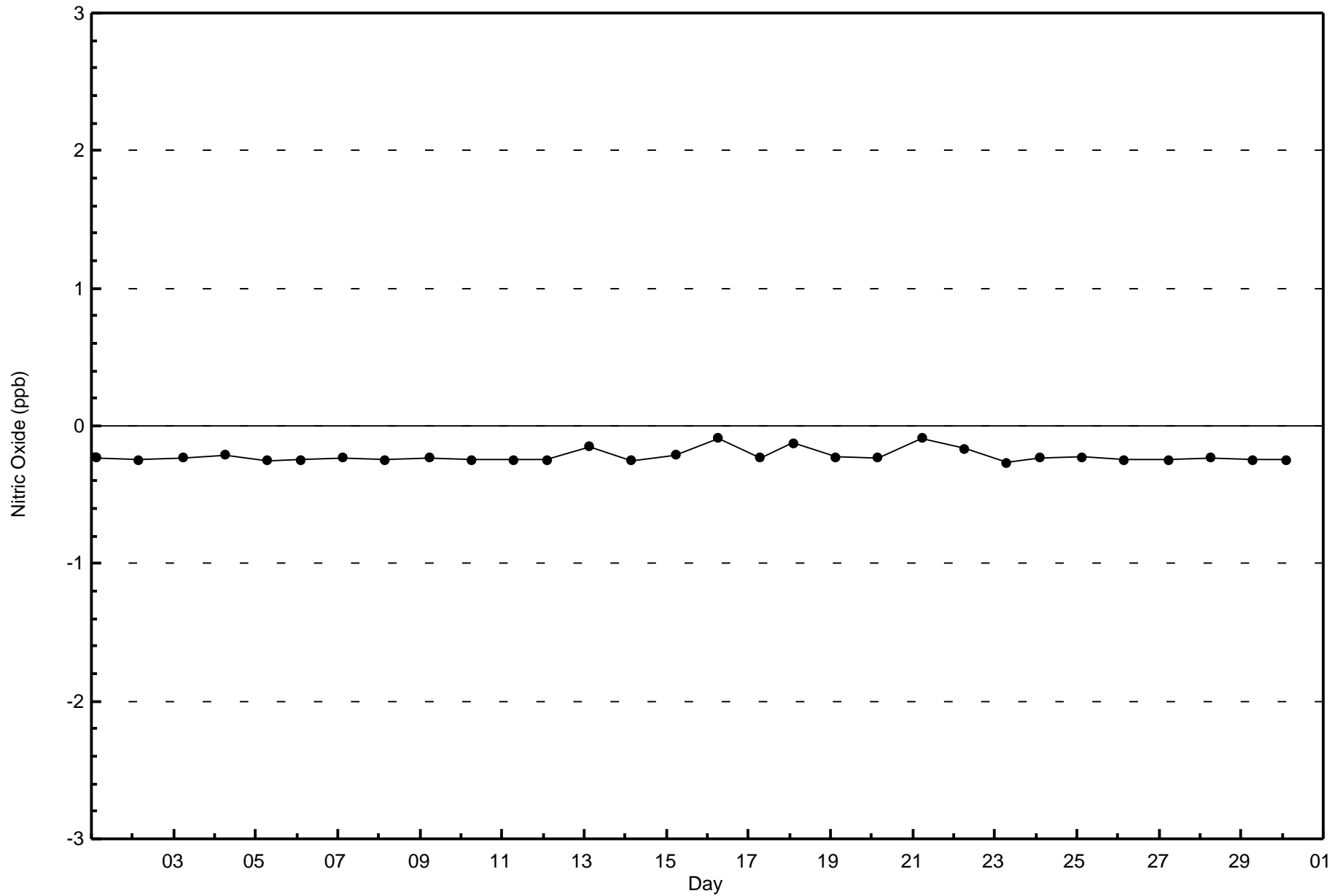
Total Number of Hours: 720

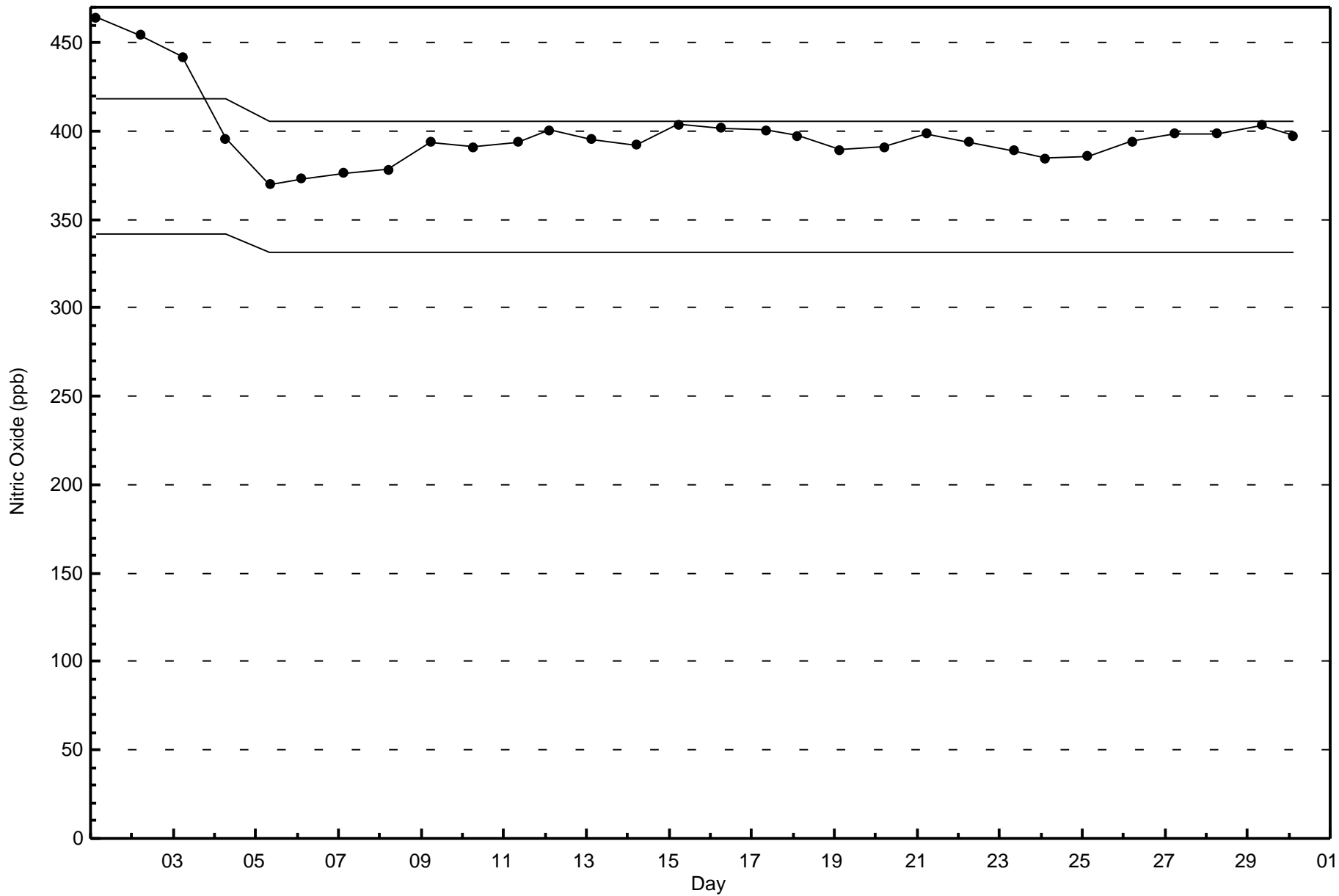


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Patricia McInnes (AMS 6)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Patricia McInnes - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 29 ppb on Apr 28 06:00	Maximum Daily Average: 9.2 ppb on Apr 7		Hours of Data:	685
Minimum Value: 0 ppb on Apr 1 13:00	Minimum Daily Average: 0.9 ppb on Apr 1		Hours of Missing Data:	35
Maximum Diurnal Average: 12.0 ppb at hour 6	Minimum Diurnal Average: 1.7 ppb at hour 16		Hours of Calibration:	35
Monthly Average: 4.6 ppb	Percentiles: P ₁ = 0 P ₁₀ = 1 O ₁ = 1 Median = 3 O ₃ = 6 P ₉₀ = 11 P ₉₉ = 24		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	3	2	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	2	0.9	3
2-Apr	1	0	1	1	Z	4	5	2	1	1	1	0	1	3	0	0	1	4	7	3	1	1	2	8	2.1	8
3-Apr	12	13	11	9	11	Z	16	13	4	5	9	4	2	4	5	1	1	2	4	1	1	11	7	9	6.8	16
4-Apr	3	7	5	13	22	23	Z	12	C	C	C	C	C	1	2	1	1	2	3	11	9	2	4	11	7.4	23
5-Apr	18	7	6	9	9	7	Z	4	4	3	2	1	1	1	1	1	2	2	2	4	6	4	5	9	5.0	18
6-Apr	6	5	Z	7	8	13	6	11	7	1	1	1	0	0	0	0	0	0	1	1	2	0	7	3.4	13	
7-Apr	6	4	6	Z	20	23	28	24	16	13	10	6	4	3	4	4	2	4	5	5	4	8	8	6	9.2	28
8-Apr	2	3	5	8	Z	7	7	4	2	2	2	2	2	3	3	3	2	3	3	4	3	4	4	3	3.4	8
9-Apr	3	3	3	1	2	Z	3	3	2	1	1	1	1	1	1	1	1	3	4	6	9	9	12	16	3.7	16
10-Apr	12	18	17	26	26	24	Z	9	3	2	2	2	2	2	1	2	2	4	6	8	10	5	4	3	8.2	26
11-Apr	3	3	11	2	5	5	5	Z	7	8	5	5	4	4	4	3	3	3	3	3	2	3	3	5	4.2	11
12-Apr	4	6	Z	10	12	11	11	13	11	8	5	4	2	2	2	2	2	2	2	4	6	10	11	6	6.4	13
13-Apr	4	4	5	Z	16	22	14	7	3	1	1	2	1	1	1	1	2	2	4	2	5	2	1	1	4.4	22
14-Apr	1	1	1	2	Z	2	3	3	4	3	3	2	2	2	2	3	7	3	3	2	1	2	2	2	2.3	7
15-Apr	3	5	6	6	4	Z	6	3	1	1	1	1	1	1	1	3	3	4	4	7	13	24	21	4	5.3	24
16-Apr	3	7	13	12	13	15	Z	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	3.5	15
17-Apr	4	4	2	2	2	3	2	Z	1	1	2	2	2	2	2	2	3	3	4	4	5	5	4	7	2.9	7
18-Apr	8	6	Z	6	6	7	6	6	4	3	4	4	4	3	3	4	4	5	4	5	4	5	8	6	4.9	8
19-Apr	5	5	5	Z	7	13	14	12	9	6	5	5	5	5	5	3	2	2	3	6	12	3	2	3	5.9	14
20-Apr	9	16	13	12	Z	14	13	6	4	5	3	6	5	3	4	2	4	6	5	3	4	4	4	6	6.5	16
21-Apr	12	15	8	7	10	Z	7	7	6	7	6	4	3	3	3	3	3	4	4	4	6	7	2	2	5.8	15
22-Apr	3	3	5	10	13	14	Z	4	3	2	2	1	2	2	2	3	2	2	3	4	4	5	10	16	5.0	16
23-Apr	10	6	8	11	5	14	2	Z	1	1	1	1	1	1	2	1	2	3	5	8	7	4	3	4.1	14	
24-Apr	3	3	Z	2	4	11	5	5	3	3	4	3	1	2	2	2	3	2	4	3	3	4	6	5	3.6	11
25-Apr	3	3	5	Z	5	6	4	3	2	2	1	1	1	1	1	2	2	2	2	3	3	4	3	4	2.7	6
26-Apr	4	5	4	6	Z	11	7	3	2	1	1	1	1	1	1	1	1	2	3	4	10	8	3	3	3.6	11
27-Apr	3	3	4	12	13	Z	7	5	3	2	1	1	1	1	1	1	1	1	1	6	12	4	1	2	3.7	13
28-Apr	2	4	1	13	24	29	Z	1	2	1	1	1	1	1	1	2	3	6	10	19	21	7	14	8	7.5	29
29-Apr	7	13	4	3	6	5	3	Z	1	1	1	1	1	1	1	1	1	1	2	2	7	1	3	4	2.9	13
30-Apr	9	6	Z	9	9	15	11	3	1	1	1	1	1	1	2	0	1	5	4	6	5	4	4	3	4.4	15

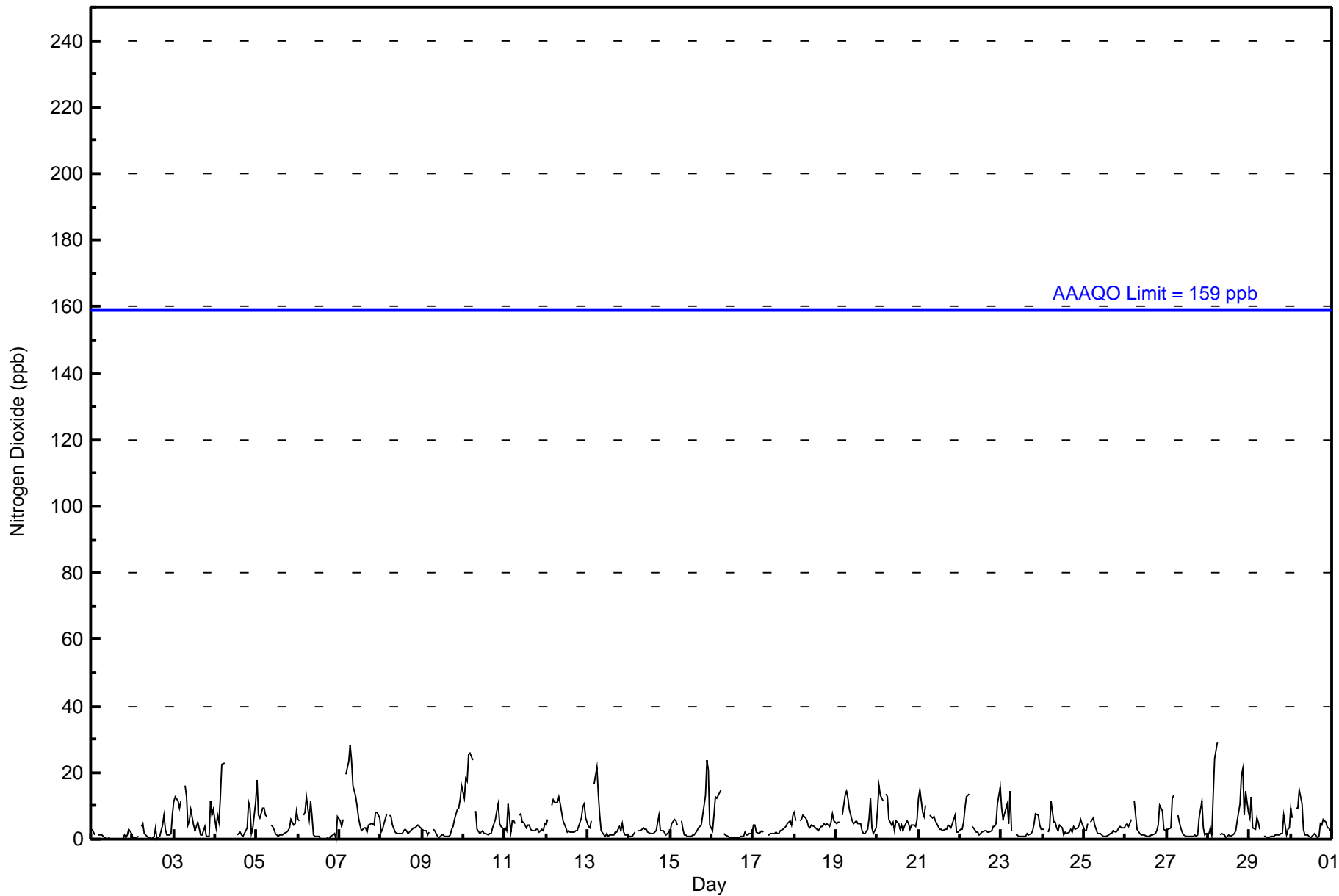
5.4	5.9	6.0	7.9	10.2	12.0	7.7	6.4	3.7	3.0	2.6	2.2	1.8	1.8	1.9	1.7	1.9	2.8	3.4	4.6	6.0	5.2	5.2	5.4	Diurnal Average	
18	18	17	26	26	29	28	24	16	13	10	6	5	5	5	4	4	7	10	19	21	24	21	16	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	671	97.96	97.96
21 - 40	14	2.04	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	134	64	36	16	36	58	43	46	48	44	25	19	14	21	14	44	662
21 - 40	1	0	0	1	0	1	0	6	3	0	0	0	0	0	0	2	14
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	36	59	43	52	51	44	25	19	14	21	14	46	676

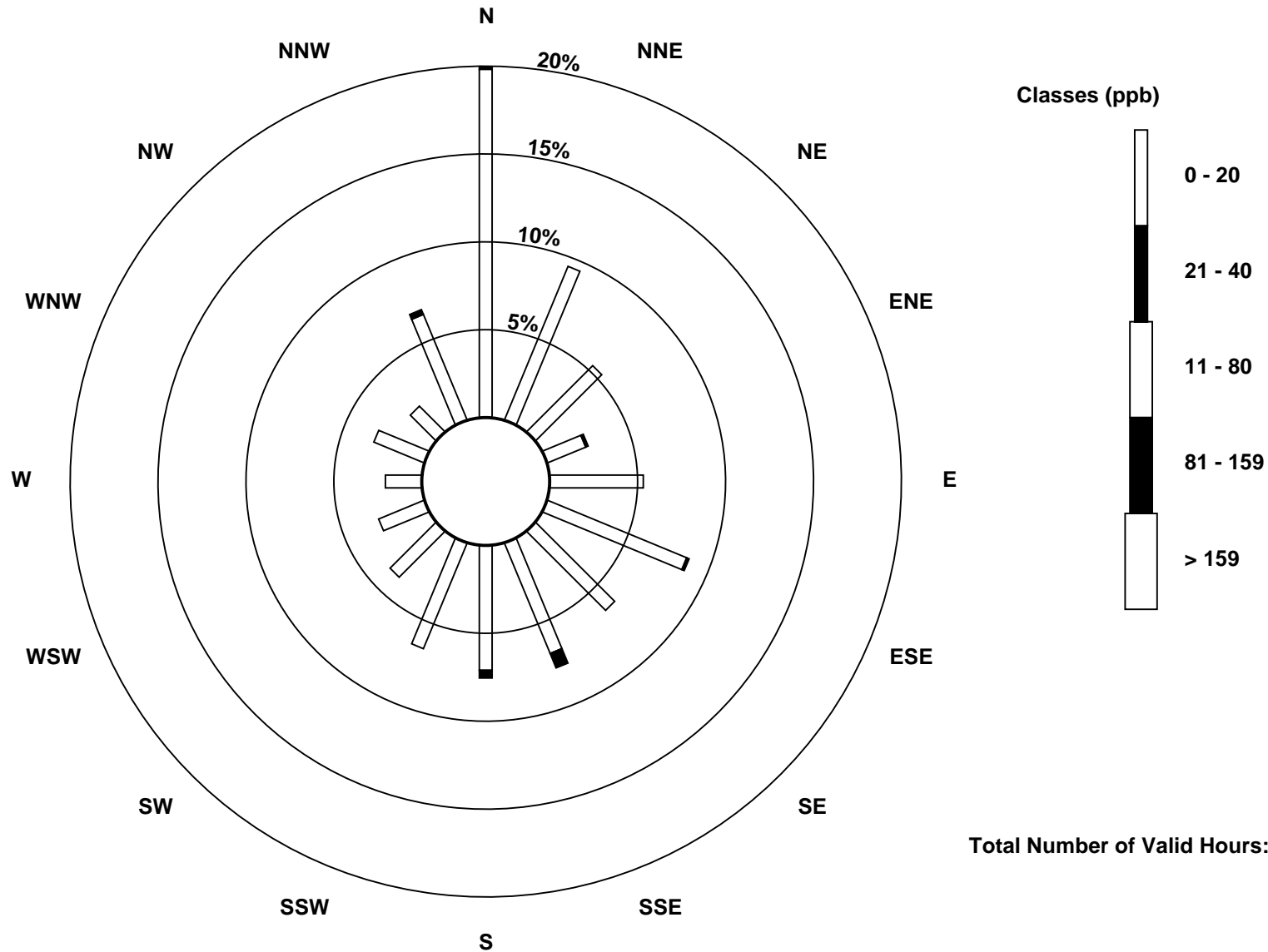
Total Number of Valid Hours: 676

Total Number of Hours: 720

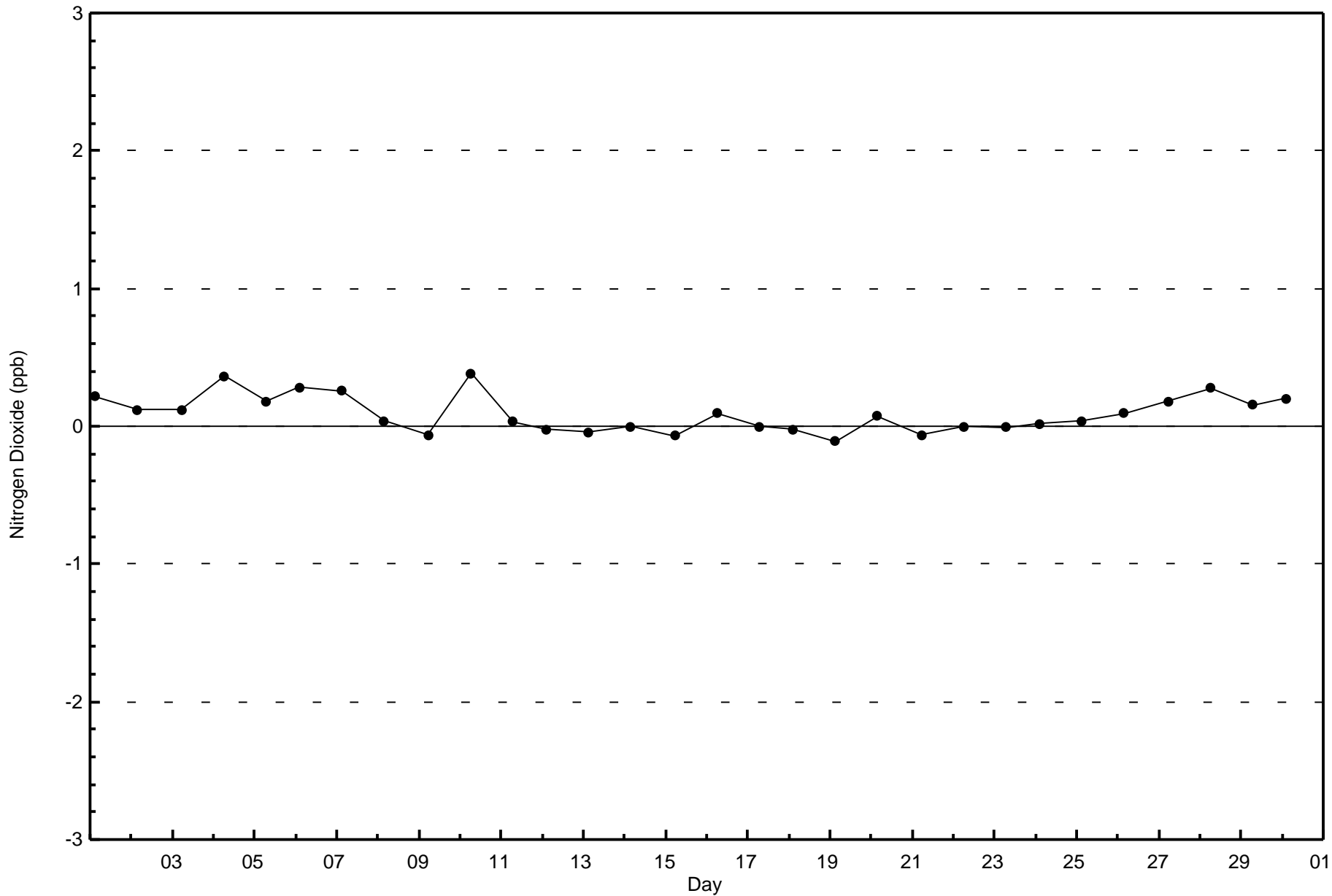


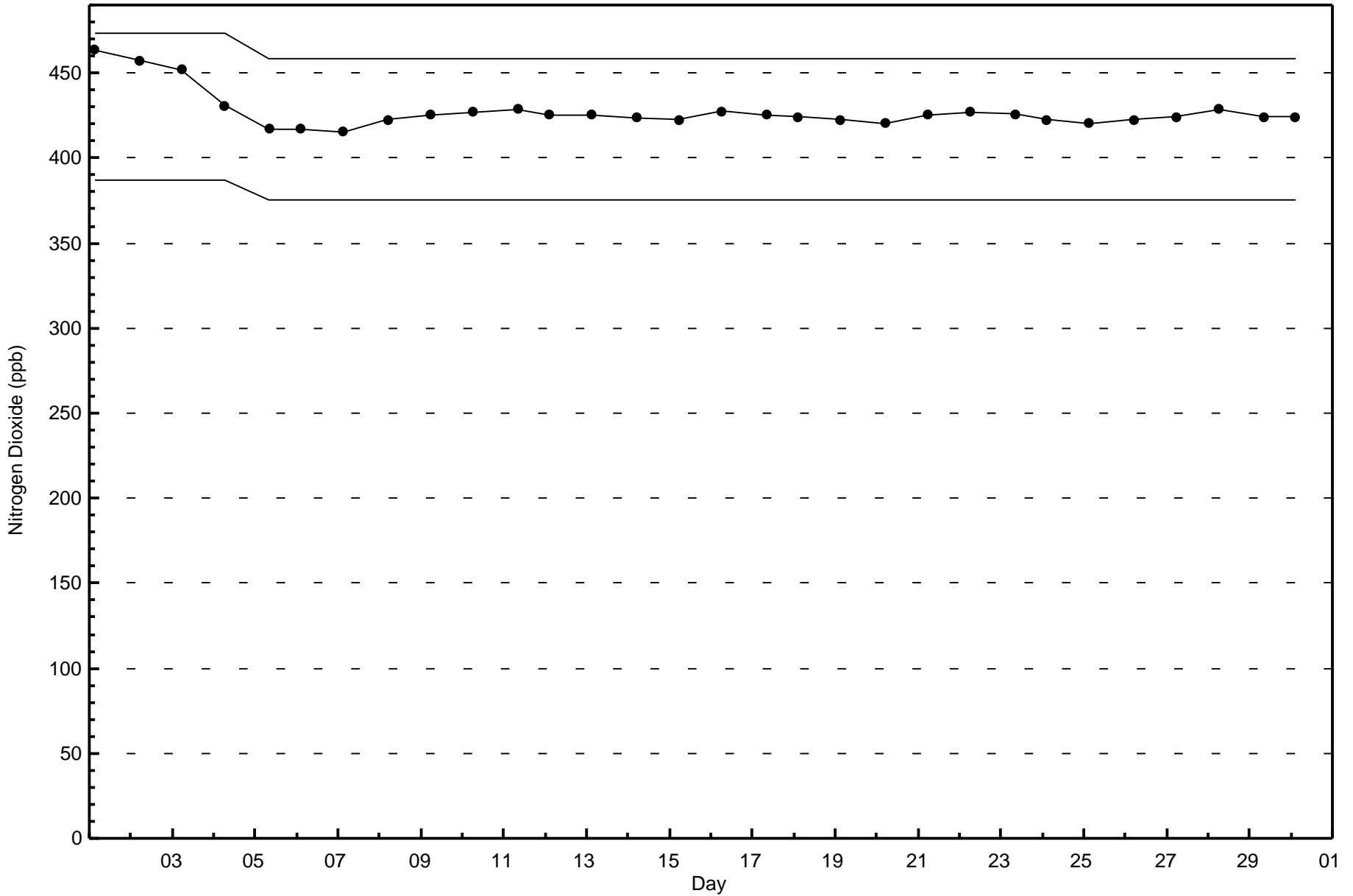
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes (AMS 6)



Total Number of Valid Hours: 676







Wood Buffalo Environmental Association
Summary of Hour Averages

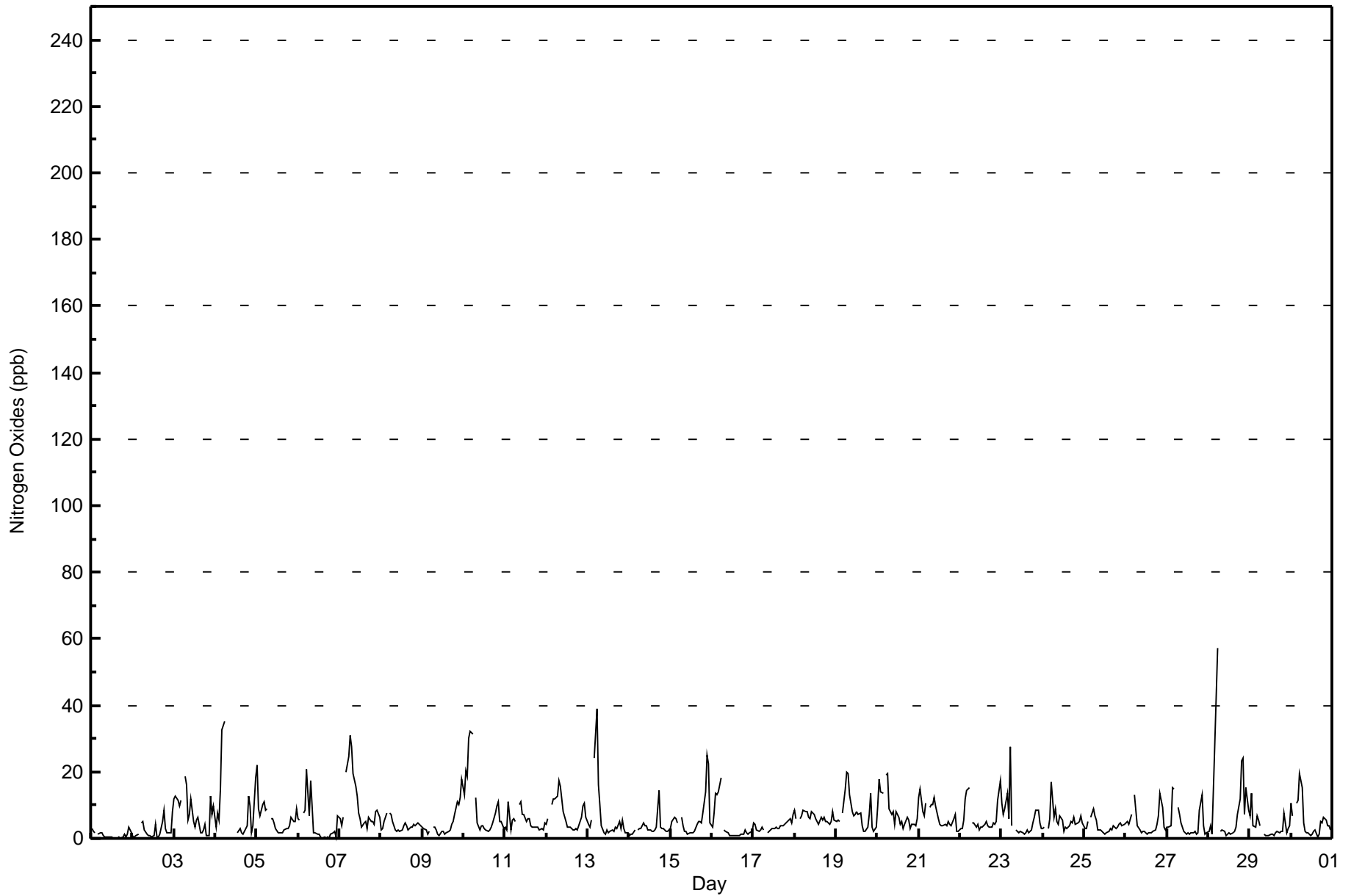
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - April 2017

Maximum Value: 57 ppb on Apr 28 06:00																	Maximum Daily Average: 10.4 ppb on Apr 7							Hours in Service: 720																									
Minimum Value: 0 ppb on Apr 6 17:00																	Minimum Daily Average: 1.0 ppb on Apr 1							Hours of Data: 685																									
Maximum Diurnal Average: 16.8 ppb at hour 6																	Minimum Diurnal Average: 2.6 ppb at hour 16							Hours of Missing Data: 35																									
Monthly Average: 5.8 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 4 Q ₃ = 7 P ₉₀ = 13 P ₉₉ = 31							Hours of Calibration: 35																									
																	Percent Operational Time: 100.0																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	3	2	2	Z	1	2	2	1	1	0	1	0	0	0	0	0	0	0	0	1	0	1	3	2	1.0	3																							
2-Apr	1	1	1	1	Z	4	5	3	1	1	1	0	1	4	0	0	1	5	8	3	2	2	2	8	2.4	8																							
3-Apr	12	13	11	10	12	Z	19	16	6	7	12	5	3	5	6	2	2	3	4	1	1	13	7	10	7.7	19																							
4-Apr	4	8	5	15	33	35	Z	19	C	C	C	C	C	2	3	2	1	2	4	13	10	2	4	18	9.9	35																							
5-Apr	22	9	7	10	11	8	9	Z	6	6	5	3	2	2	2	2	2	2	3	4	6	5	5	9	6.1	22																							
6-Apr	6	6	Z	8	8	21	7	17	10	2	1	1	1	0	0	0	0	0	0	1	1	2	0	7	4.4	21																							
7-Apr	6	4	6	Z	20	24	31	28	20	16	13	8	6	4	5	5	3	6	5	5	4	8	8	6	10.4	31																							
8-Apr	2	3	5	8	Z	7	7	5	3	2	2	2	2	4	4	4	3	3	3	4	4	4	4	4	4.0	8																							
9-Apr	3	3	3	1	2	Z	3	3	2	1	1	2	2	1	2	2	2	4	5	7	11	10	12	18	4.5	18																							
10-Apr	13	20	19	30	32	32	Z	12	4	2	4	4	3	3	2	2	3	5	8	10	11	5	5	3	10.1	32																							
11-Apr	3	3	11	2	6	6	5	Z	10	11	7	7	5	6	6	4	4	3	3	3	3	3	3	5	5.2	11																							
12-Apr	4	6	Z	10	12	12	13	18	16	12	8	5	3	3	3	3	3	3	3	4	6	10	11	6	7.5	18																							
13-Apr	4	4	6	Z	24	39	16	10	4	2	1	2	2	2	2	2	4	3	5	3	6	3	2	2	6.4	39																							
14-Apr	1	1	1	3	Z	3	3	3	5	4	4	3	3	2	2	3	3	2	2	3	3	2	2	2	3.2	14																							
15-Apr	3	5	6	6	5	Z	6	4	2	2	1	2	1	2	2	4	5	5	8	14	25	23	5	6.1	25																								
16-Apr	3	8	14	13	14	18	Z	2	2	2	1	1	1	1	1	1	1	1	1	2	2	1	2	2	4.0	18																							
17-Apr	5	4	3	2	2	3	3	Z	2	2	2	3	3	4	3	3	4	4	4	4	4	5	6	5	7	3.6	7																						
18-Apr	8	6	Z	6	7	9	8	8	6	6	8	7	6	5	4	6	5	6	5	5	4	5	8	6	6.3	9																							
19-Apr	5	5	5	Z	8	15	20	19	13	8	7	7	8	7	8	4	2	2	4	7	13	3	2	3	7.6	20																							
20-Apr	10	18	14	14	Z	19	20	9	7	8	4	8	7	4	5	3	4	6	5	3	4	4	4	6	8.1	20																							
21-Apr	12	15	8	7	11	Z	9	10	10	12	10	6	4	4	4	4	4	5	4	4	6	7	2	2	7.0	15																							
22-Apr	3	3	6	12	15	15	Z	5	5	3	4	2	3	4	4	5	4	3	4	5	4	5	12	17	6.2	17																							
23-Apr	11	7	9	14	6	28	4	Z	2	2	2	2	1	2	3	2	3	5	7	9	8	5	3	5.8	28																								
24-Apr	3	3	Z	3	6	17	6	9	5	4	7	6	2	4	3	4	5	5	6	4	5	5	7	5	5.4	17																							
25-Apr	3	3	5	Z	6	9	7	6	3	3	2	2	1	2	2	3	3	4	3	3	4	5	4	4	3.7	9																							
26-Apr	5	5	4	7	Z	13	9	4	3	2	2	2	1	2	2	2	2	3	4	7	14	9	3	3	4.6	14																							
27-Apr	3	3	4	15	15	Z	9	7	5	3	2	1	2	1	2	2	2	1	2	9	13	4	1	2	4.7	15																							
28-Apr	2	4	1	15	29	57	Z	2	2	2	1	1	2	1	2	2	3	7	12	23	24	7	15	8	9.8	57																							
29-Apr	7	14	4	3	7	5	4	Z	1	1	1	1	1	1	1	2	2	2	2	2	8	2	3	4	3.3	14																							
30-Apr	10	7	Z	11	11	19	15	4	2	2	2	1	1	2	3	1	1	5	4	6	5	4	4	3	5.4	19																							
																								5.9	6.4	6.4	9.0	12.1	16.8	9.5	8.9	5.4	4.5	4.0	3.3	2.7	2.8	2.8	2.6	2.7	3.9	4.2	5.4	6.8	5.7	5.6	6.0	Diurnal Average	
																								22	20	19	30	33	57	31	28	20	16	13	8	8	7	8	6	5	14	12	23	24	25	23	18	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	666	97.23	97.23
21 - 40	18	2.63	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	134	64	35	16	34	58	43	45	48	44	25	19	14	21	14	44	658
21 - 40	1	0	1	1	2	1	0	7	2	0	0	0	0	0	0	2	17
11 - 80	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	135	64	36	17	36	59	43	52	51	44	25	19	14	21	14	46	676

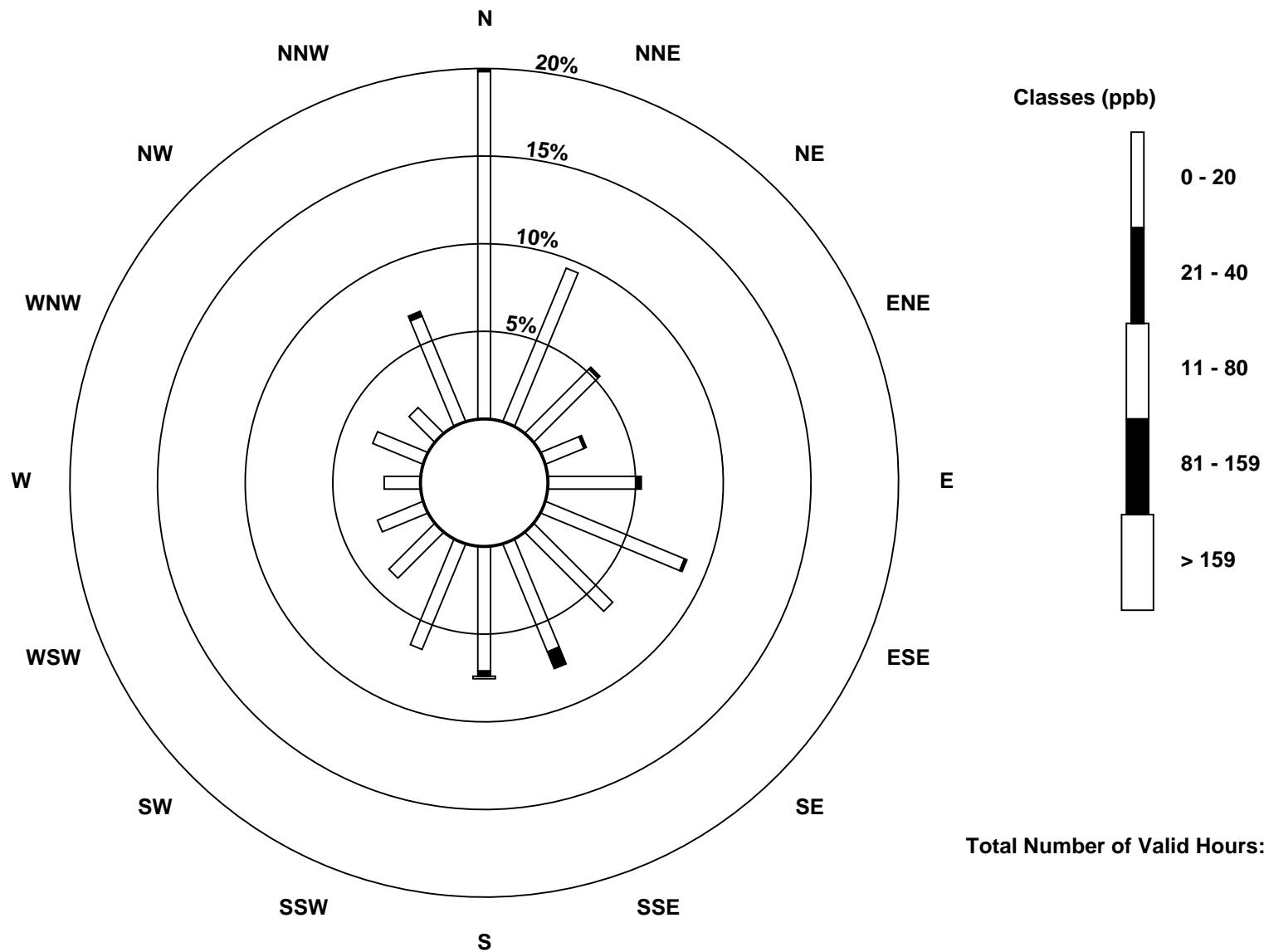
Total Number of Valid Hours: 676

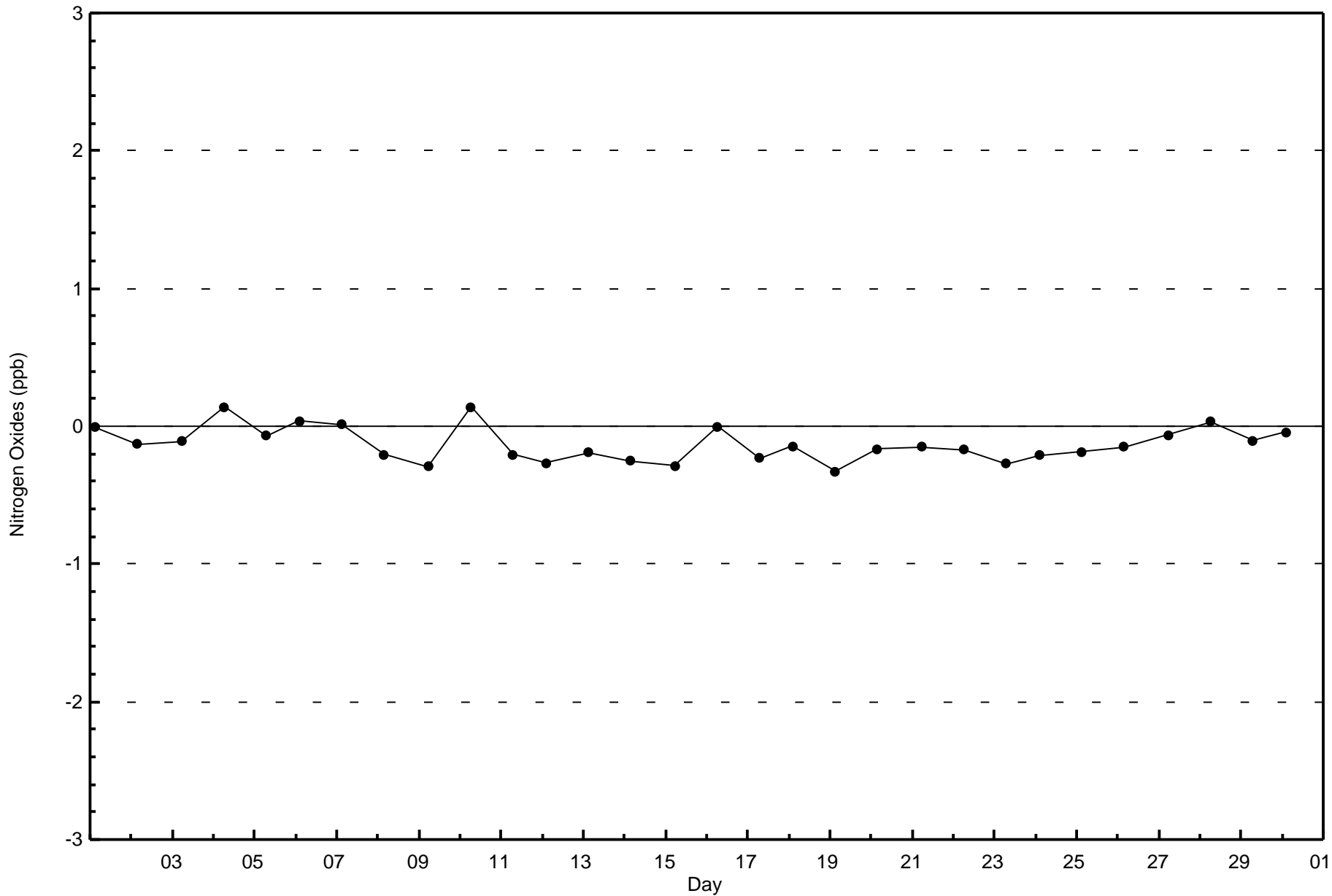
Total Number of Hours: 720

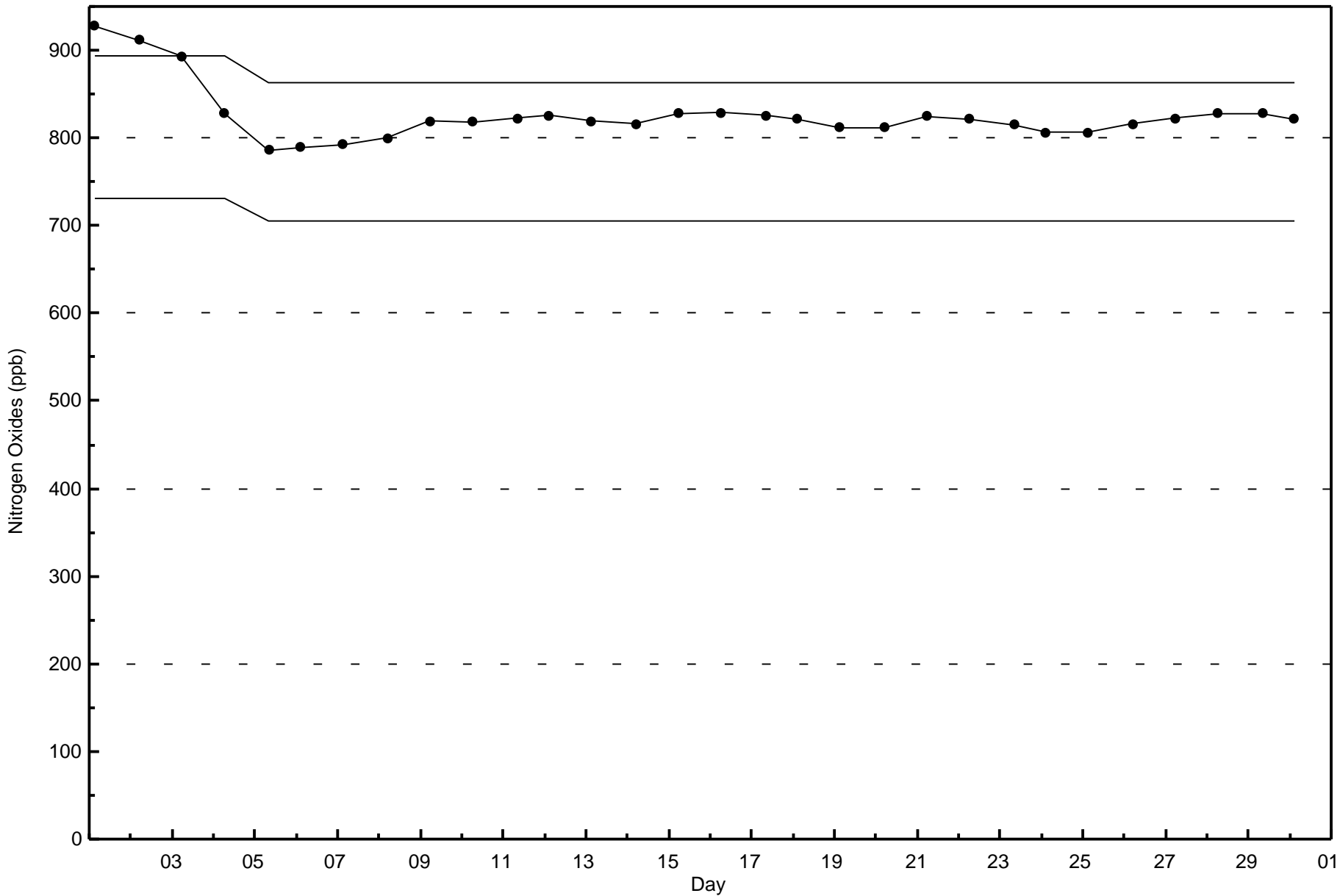


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes (AMS 6)









Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH₃) - ppb

Patricia McInnes - April 2017

Number of Exceedences (AAAQO): 1-hr: 0	Hours in Service: 720
Maximum Value: 0 ppb on Apr 1 01:00	Maximum Daily Average: 0.0 ppb on Apr 1
Minimum Value: 0 ppb on Apr 1 01:00	Hours of Data: 628
Maximum Diurnal Average: 0.0 ppb at hour 1	Hours of Missing Data: 92
Monthly Average: 0.0 ppb	Hours of Calibration: 41
Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0	Percent Operational Time: 92.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
2-Apr	0	0	Z	RE	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
3-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	0
4-Apr	M	M	M	M	M	M	M	M	C	C	C	C	M	M	M	M	M	M	M	M	M	M	M	M	--	0
5-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
6-Apr	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
7-Apr	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
8-Apr	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
10-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
11-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
12-Apr	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
13-Apr	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
14-Apr	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
15-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
17-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
18-Apr	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
20-Apr	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
21-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
22-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
23-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
26-Apr	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27-Apr	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28-Apr	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
29-Apr	0	0	0	0	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
30-Apr	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0

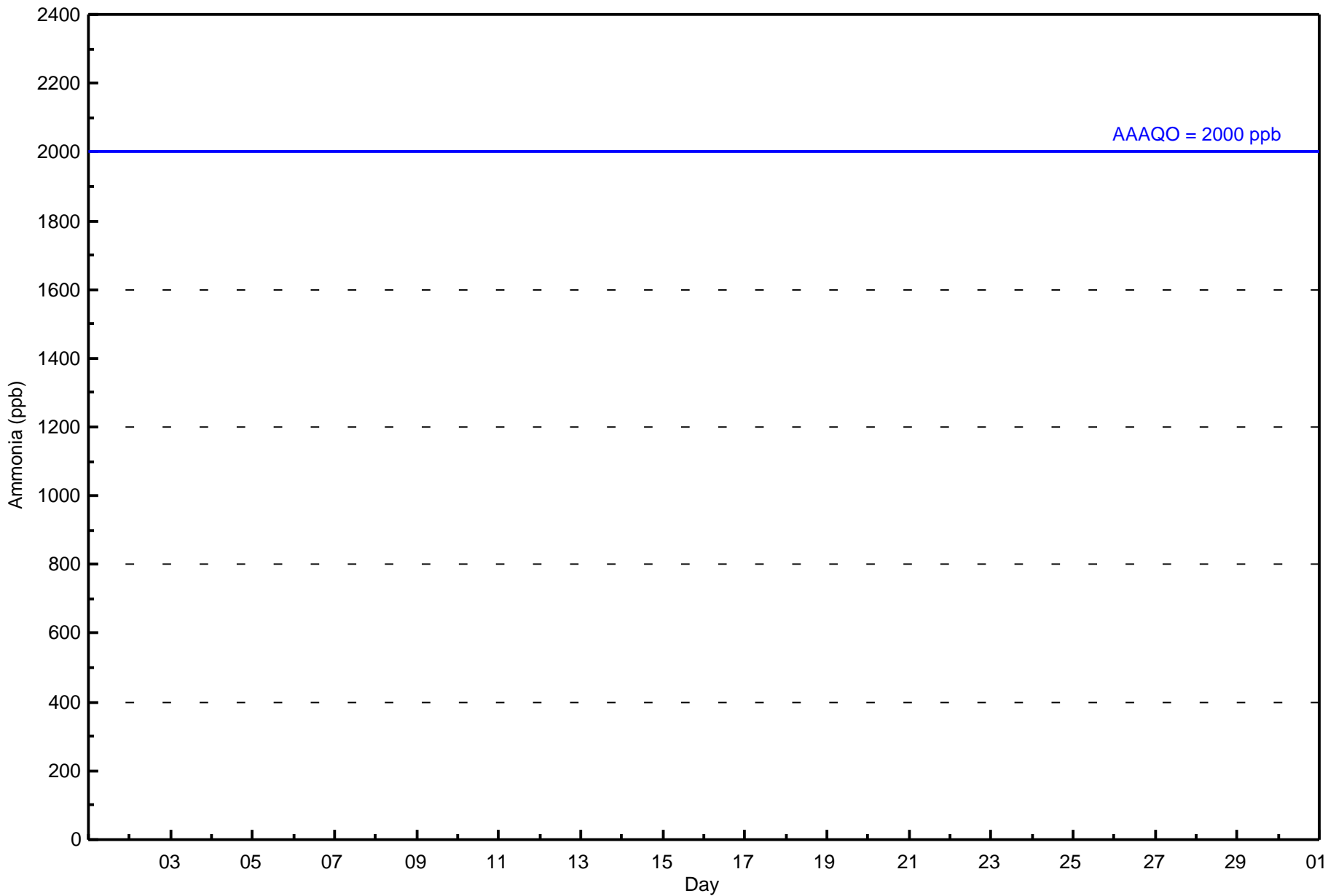
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance RE - Recovery
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Patricia McInnes - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	628	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 628

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ammonia (NH₃) - ppb
Patricia McInnes - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	127	63	35	14	34	53	42	47	47	39	18	16	13	20	13	39	620
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	127	63	35	14	34	53	42	47	47	39	18	16	13	20	13	39	620

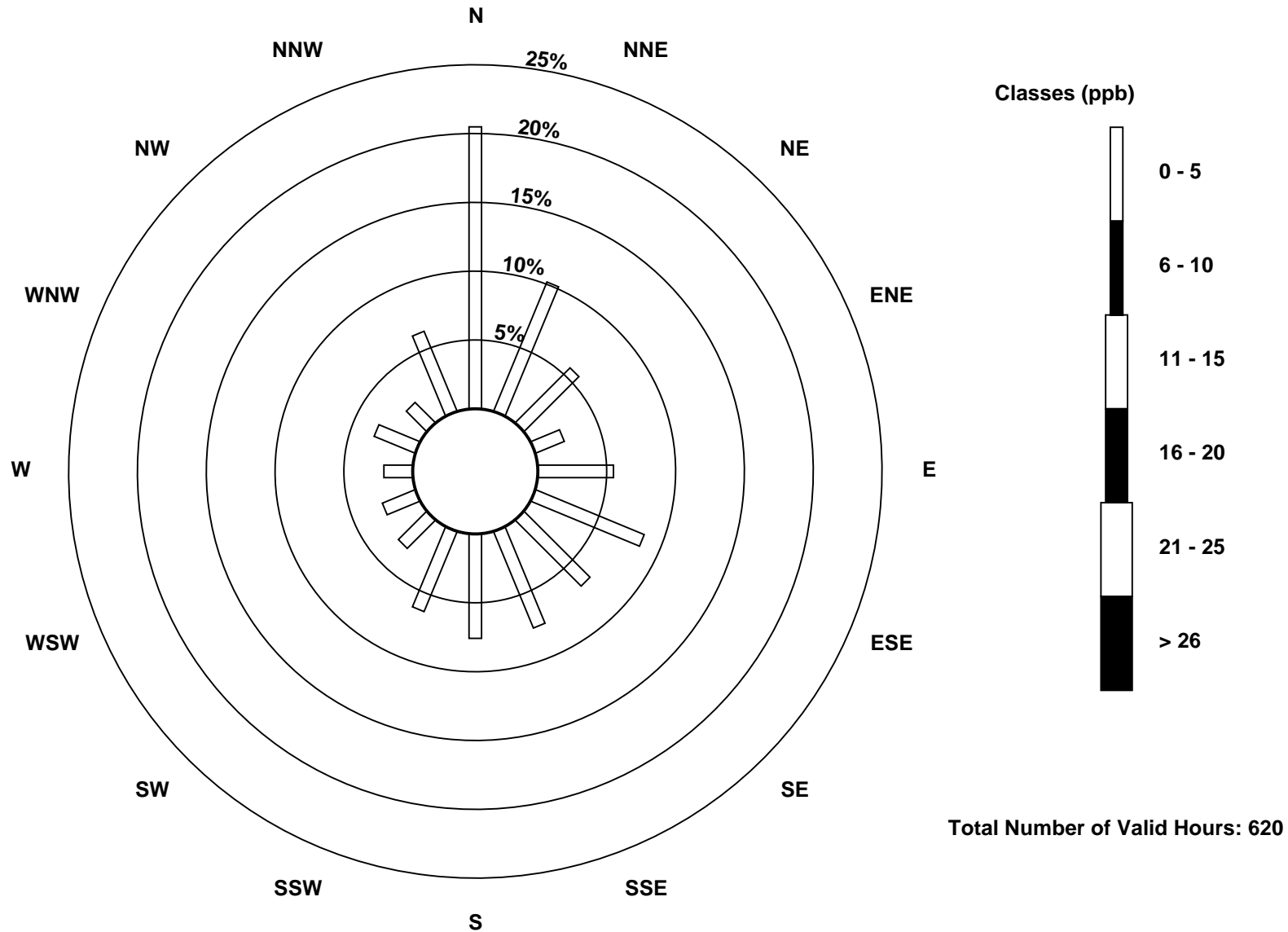
Total Number of Valid Hours: 620

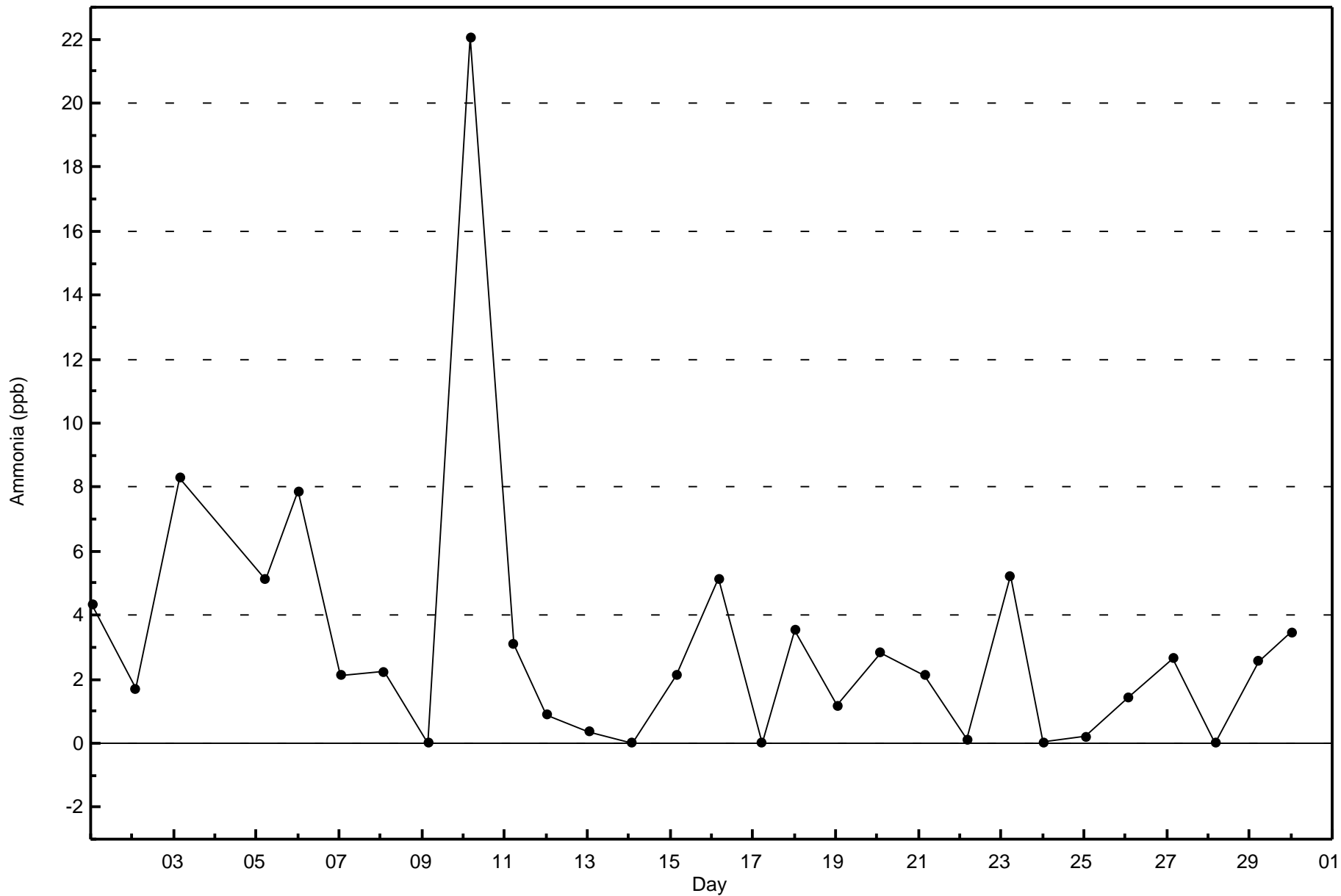
Total Number of Hours: 720

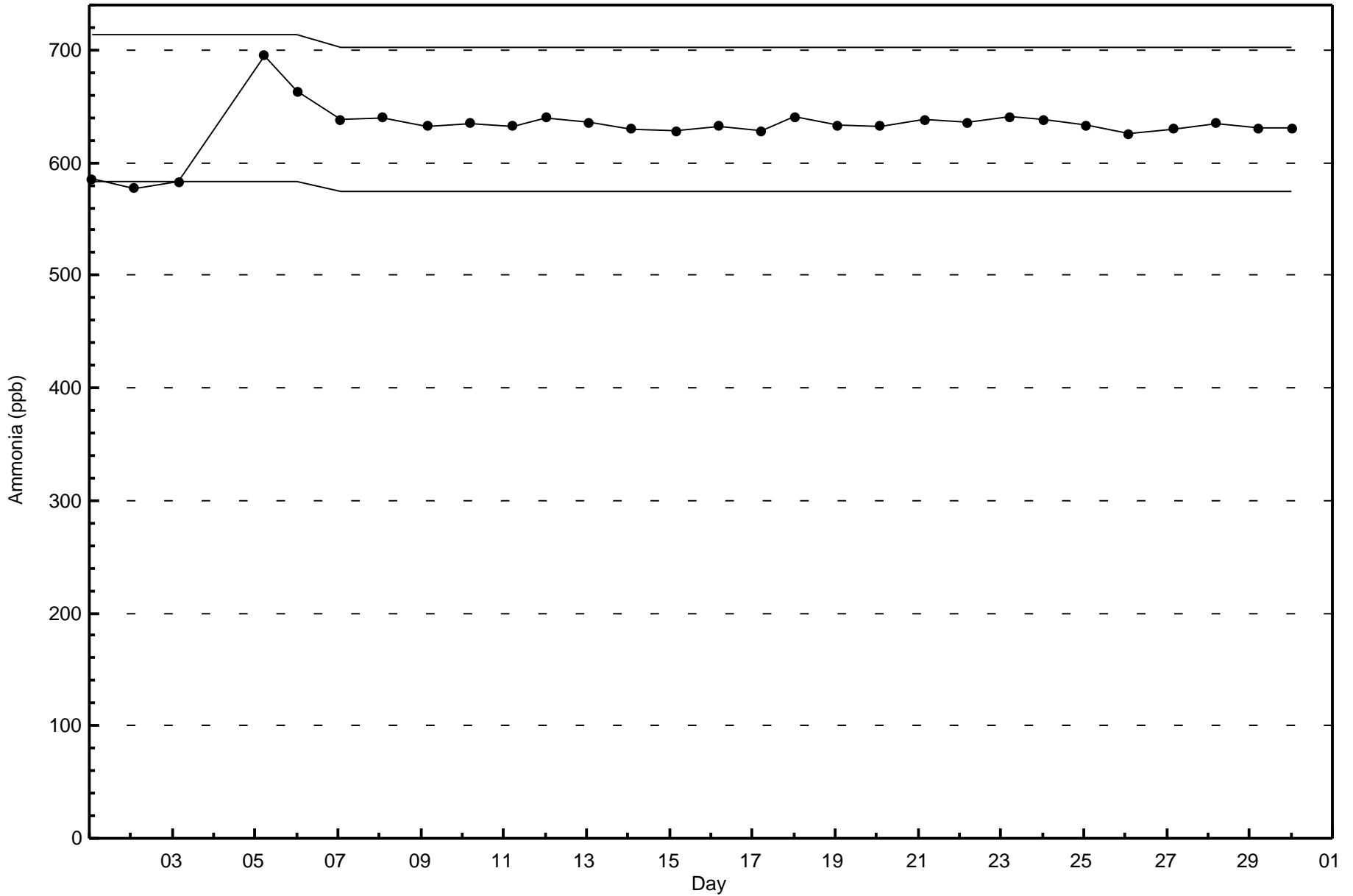


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ammonia (NH₃) - ppb
Patricia McInnes (AMS 6)









Number of Exceedences (AAAQO):	24-hr: 0	Hours in Service:	720
Maximum Value: 32.0 µg/m ³ on Apr 28 23:00	Maximum Daily Average: 7.5 µg/m ³ on Apr 28	Hours of Data:	718
Minimum Value: 0.6 µg/m ³ on Apr 1 14:00	Minimum Daily Average: 1.2 µg/m ³ on Apr 1	Hours of Missing Data:	2
Maximum Diurnal Average: 7.3 µg/m ³ at hour 21	Minimum Diurnal Average: 2.3 µg/m ³ at hour 13	Hours of Calibration:	2
Monthly Average: 4.09 µg/m ³	Percentiles: P ₁ = 0.6 P ₁₀ = 1.6 Q ₁ = 2.2 Median = 3.4 Q ₃ = 4.9 P ₉₀ = 7.2 P ₉₉ = 16.7	Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	6.1	2.3	1.7	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.9	2.4	0.9	1.2	1.6	1.1	1.2	6.1
2-Apr	0.9	0.9	1.0	1.0	1.2	1.2	1.3	1.1	1.1	1.0	0.8	0.6	0.9	2.1	1.4	1.4	1.9	4.2	9.5	3.2	3.3	2.5	2.4	3.8	2.0	9.5
3-Apr	4.8	4.9	4.5	6.6	5.2	5.6	5.7	5.0	1.8	1.7	2.4	1.7	1.6	3.2	4.7	2.2	2.2	2.7	4.6	2.2	2.5	21.1	11.2	6.2	4.8	21.1
4-Apr	1.6	1.8	1.6	2.0	2.4	5.9	7.0	2.5	1.8	0.6	2.4	1.7	1.4	1.8	3.2	2.6	3.8	1.7	2.0	6.2	16.9	3.5	6.6	13.9	4.1	16.9
5-Apr	19.5	4.4	2.1	4.5	4.4	2.4	2.8	2.3	4.3	4.1	2.9	1.7	1.1	7.0	1.4	2.3	2.0	2.5	2.6	3.3	3.5	2.9	2.9	4.0	3.8	19.5
6-Apr	5.8	8.5	6.6	4.4	4.5	5.6	4.4	6.1	5.6	2.5	2.7	2.4	2.3	1.1	0.9	0.8	0.8	0.7	0.8	2.4	2.0	4.4	1.9	9.0	3.6	9.0
7-Apr	5.5	2.6	3.4	6.6	6.6	8.7	11.9	8.5	7.6	6.5	9.2	3.3	3.5	3.9	4.0	5.3	3.0	3.6	5.6	7.6	4.9	4.9	4.5	7.6	5.8	11.9
8-Apr	4.4	3.8	4.4	4.9	5.4	5.5	7.4	5.9	4.5	3.3	4.2	4.2	4.3	5.2	4.7	4.1	3.2	3.6	3.1	3.2	3.0	2.8	2.5	2.4	4.2	7.4
9-Apr	3.2	3.9	3.7	3.0	3.2	3.7	4.2	4.7	3.2	1.8	1.8	2.1	1.6	2.0	1.7	2.1	1.8	4.0	4.1	8.2	7.2	6.1	9.2	7.2	3.9	9.2
10-Apr	4.6	5.6	5.1	6.9	8.1	7.2	6.8	5.5	3.2	2.5	2.1	2.3	2.3	2.7	2.7	3.2	3.8	5.1	6.2	10.3	16.9	6.9	5.5	8.4	5.6	16.9
11-Apr	5.4	4.8	7.5	4.1	5.2	4.4	4.0	4.5	4.3	4.5	3.9	4.5	4.0	4.8	4.5	4.2	4.6	4.7	5.4	5.7	3.5	3.7	5.1	4.4	4.7	7.5
12-Apr	5.3	4.5	5.1	5.3	6.4	8.2	9.3	5.9	4.8	3.8	3.2	3.1	3.3	3.2	2.9	2.8	3.3	4.4	4.8	8.1	10.5	9.7	11.0	7.4	5.7	11.0
13-Apr	5.0	5.3	11.2	6.7	7.3	6.3	5.9	3.9	2.8	2.3	2.5	2.3	2.0	2.5	2.2	2.6	3.5	3.7	4.4	4.0	4.8	3.9	3.4	3.1	4.2	11.2
14-Apr	3.8	4.1	3.4	3.7	4.2	4.8	4.8	4.7	4.5	4.3	4.2	3.5	4.0	3.9	3.7	3.2	2.5	2.5	2.1	1.9	2.1	1.9	1.6	1.7	3.4	4.8
15-Apr	2.1	2.4	2.5	2.3	2.5	2.6	2.6	2.4	1.8	1.6	1.6	1.6	1.8	1.9	2.2	2.1	2.7	2.7	2.5	4.5	14.6	16.1	12.3	3.5	3.9	16.1
16-Apr	3.0	6.4	5.3	4.2	4.0	4.3	5.8	2.2	1.9	1.6	1.6	1.6	1.5	1.2	1.3	1.6	1.5	2.8	2.8	5.1	5.5	3.7	4.4	3.4	3.2	6.4
17-Apr	3.8	8.1	2.7	2.0	1.8	2.1	2.2	2.5	2.4	2.3	2.8	3.9	3.7	2.6	2.3	2.1	2.1	2.4	3.0	3.2	3.0	2.9	2.9	3.1	2.9	8.1
18-Apr	4.9	4.5	3.4	3.9	4.0	4.0	4.0	4.1	3.7	3.1	3.2	2.7	2.8	3.4	3.1	3.1	3.0	3.6	3.6	4.3	4.5	4.5	4.8	4.2	3.8	4.9
19-Apr	4.1	5.0	5.4	5.3	5.1	5.7	5.8	4.9	4.2	3.2	2.9	2.8	3.2	2.8	2.8	2.9	3.0	3.4	3.9	6.3	9.6	6.7	5.6	6.1	4.6	9.6
20-Apr	7.7	9.9	8.2	6.9	6.6	6.4	6.4	5.0	4.4	4.4	3.6	4.1	4.5	6.0	5.8	2.8	3.1	3.2	2.9	3.3	2.7	4.9	3.2	4.9	5.0	9.9
21-Apr	7.3	5.6	4.0	3.2	3.6	2.9	3.6	2.3	1.6	1.8	1.5	1.6	1.8	2.2	2.1	2.0	2.2	2.5	2.4	2.5	13.9	9.3	2.5	2.9	3.6	13.9
22-Apr	3.5	3.7	5.0	4.6	9.6	5.0	2.8	2.7	2.2	1.8	1.6	1.8	1.9	1.6	1.9	2.2	2.3	2.5	2.8	3.6	4.5	5.1	6.0	6.2	3.5	9.6
23-Apr	4.7	4.5	4.8	4.2	3.9	5.5	2.8	3.0	1.9	1.9	1.8	1.7	1.6	1.5	1.6	1.9	2.2	2.8	4.4	5.0	8.9	4.8	3.2	2.5	3.4	8.9
24-Apr	2.2	2.0	2.0	2.5	2.7	3.2	2.6	2.4	2.2	1.9	2.1	1.9	1.6	1.9	1.6	1.3	1.5	1.8	1.9	1.8	2.3	2.4	2.8	2.3	2.1	3.2
25-Apr	3.6	4.3	4.6	4.5	4.3	4.1	2.9	2.3	1.7	1.8	1.9	2.0	1.6	1.8	2.3	2.6	2.8	3.3	5.1	4.4	3.7	3.6	3.6	3.2	3.2	5.1
26-Apr	3.3	3.3	3.4	4.2	4.2	5.2	4.7	3.5	2.5	1.7	1.8	2.7	2.0	2.0	2.6	2.7	3.6	4.2	4.3	7.3	7.4	4.9	3.0	4.7	3.7	7.4
27-Apr	3.5	3.6	4.3	6.9	8.2	8.0	6.7	6.5	4.8	3.7	2.1	1.9	1.5	1.6	1.8	1.5	2.7	2.2	2.9	6.3	11.8	9.8	4.8	5.9	4.7	11.8
28-Apr	5.6	4.1	2.6	5.2	14.0	16.1	3.0	2.2	2.0	1.7	1.2	1.3	2.1	2.3	2.3	2.6	4.3	6.6	11.4	16.8	20.2	10.1	32.0	10.7	7.5	32.0
29-Apr	7.2	8.5	4.3	4.4	4.8	4.5	4.6	3.1	2.3	2.2	2.3	2.6	2.6	2.5	2.8	3.2	3.7	3.6	5.4	4.6	16.1	6.9	9.9	7.5	5.0	16.1
30-Apr	9.9	9.1	6.4	7.2	7.6	7.2	5.5	3.4	2.3	2.1	1.8	1.6	1.4	2.5	3.2	1.8	3.6	8.9	6.5	7.5	6.8	9.0	12.2	7.6	5.6	12.2

5.1	4.7	4.3	4.4	5.1	5.2	4.7	3.8	3.1	2.6	2.6	2.4	2.3	2.7	2.6	2.5	2.7	3.4	4.1	5.2	7.3	6.0	6.1	5.3	Diurnal Average	
19.5	9.9	11.2	7.2	14.0	16.1	11.9	8.5	7.6	6.5	9.2	4.5	4.5	7.0	5.8	5.3	4.6	8.9	11.4	16.8	20.2	21.1	32.0	13.9	Diurnal Maximum	

C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m³

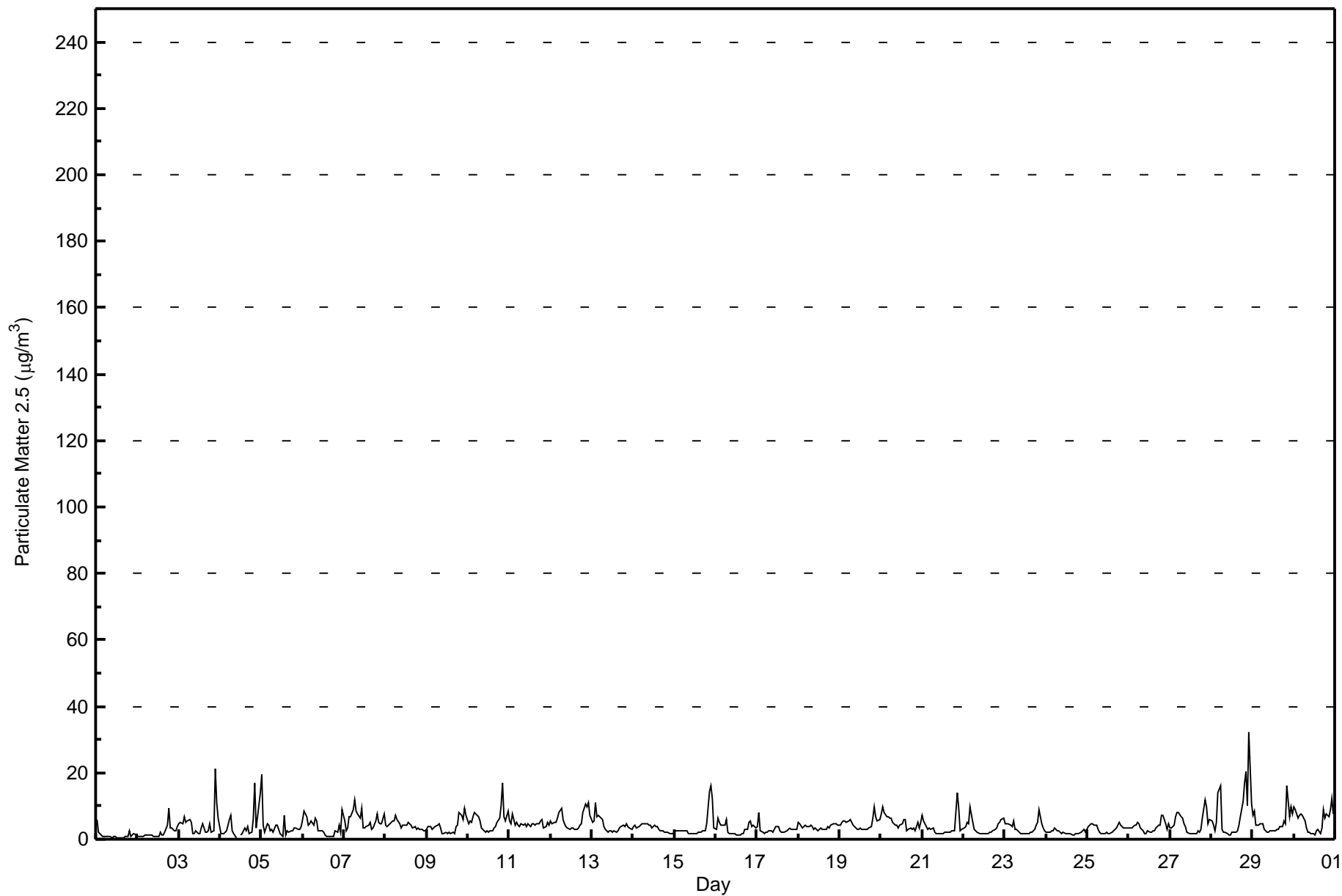


Wood Buffalo Environmental Association

Hourly Averages

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

Patricia McInnes - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Patricia McInnes - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	551	76.74	76.74
6 - 15	129	17.97	94.71
16 - 25	9	1.25	95.96
26 - 80	1	0.14	96.10
> 81.0	0	0.00	96.10

Total Number of Valid Hours: 718

Total Number of Hours: 720



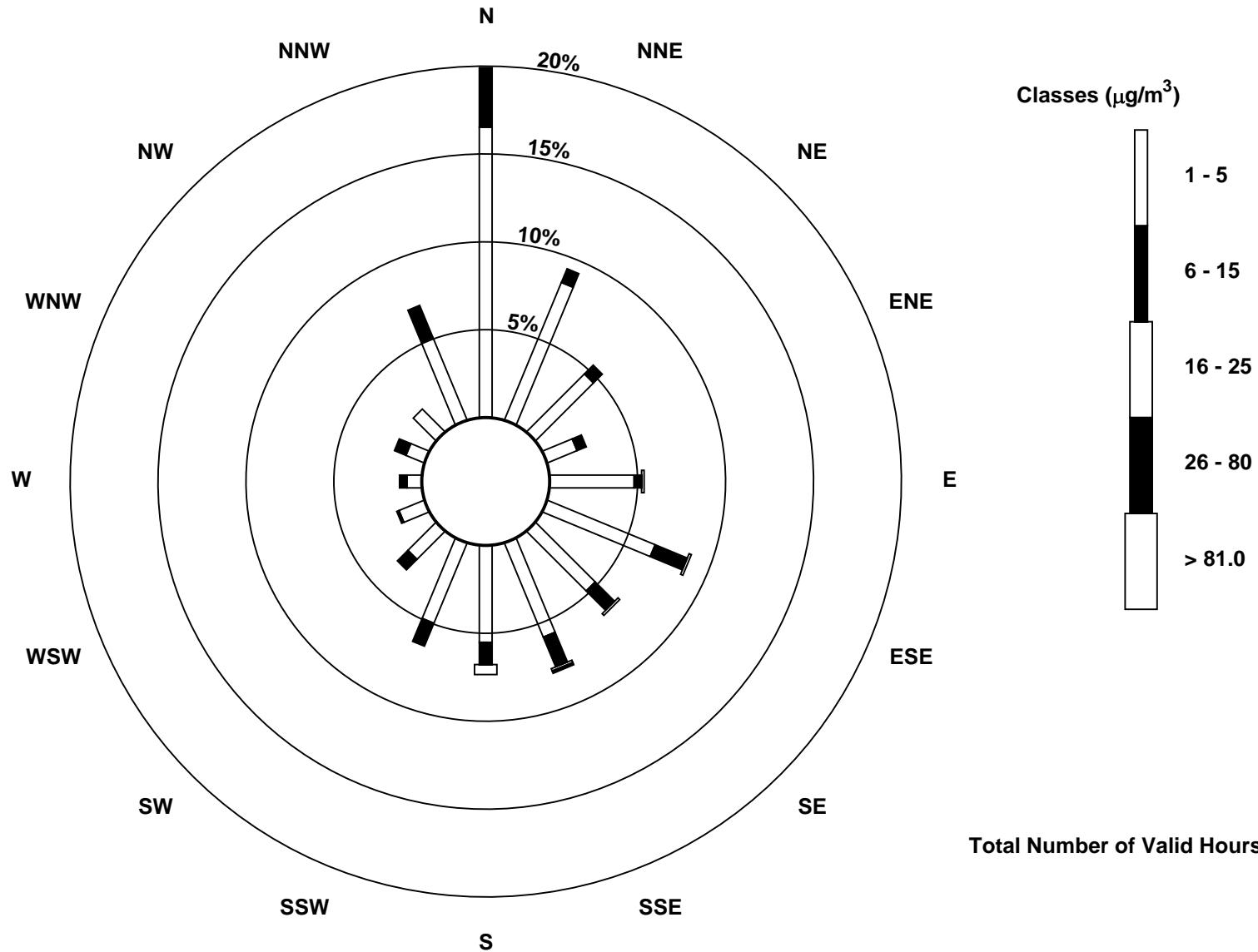
Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Patricia McInnes - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	117	60	33	13	34	47	34	41	39	35	16	11	6	8	13	36	543
6 - 15	24	6	5	4	3	14	11	13	9	10	6	1	3	5	0	14	128
16 - 25	0	0	0	0	1	1	1	1	4	0	0	0	0	0	0	0	8
26 - 80	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	66	38	17	38	62	46	56	52	45	22	12	9	13	13	50	680

Total Number of Valid Hours: 708

Total Number of Hours: 720





Wood Buffalo Environmental Association
Summary of Hour Averages

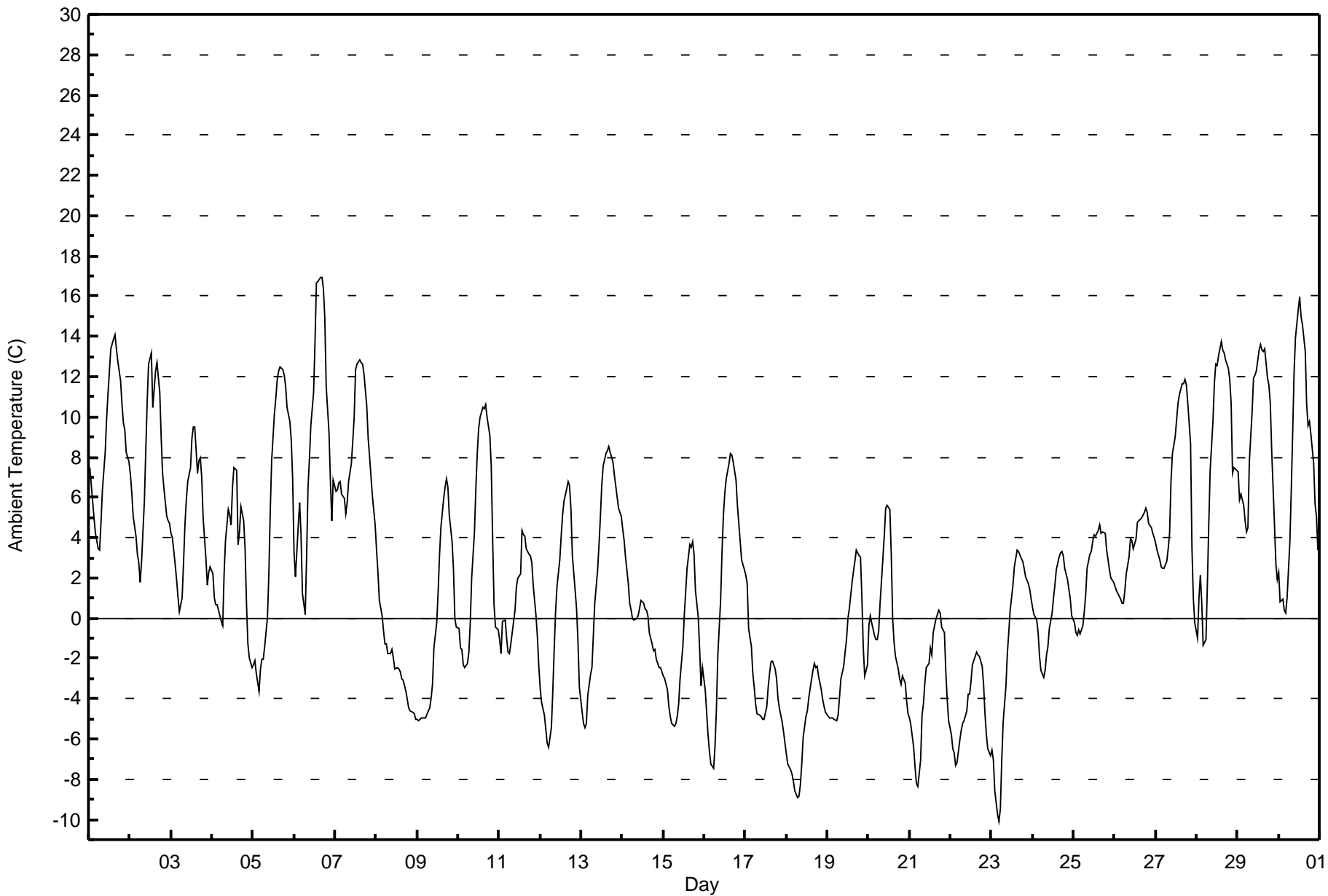
Ambient Temperature (AT) - C
Patricia McInnes - April 2017

Maximum Value: 16.9 C on Apr 6 17:00		Maximum Daily Average: 8.9 C on Apr 1		Hours in Service: 720																						
Minimum Value: -10.1 C on Apr 23 05:00		Minimum Daily Average: -5.5 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 6.2 C at hour 16		Minimum Diurnal Average: -1.9 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 2.28 C		Percentiles: P ₁ = -8.4 P ₁₀ = -4.9 Q ₁ = -2.2 Median = 2.0 Q ₃ = 6.2 P ₉₀ = 10.7 P ₉₉ = 14.8		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	7.5	6.7	5.8	5.0	4.2	3.5	3.4	4.8	6.4	8.2	9.9	11.2	12.3	13.4	13.9	14.1	13.4	12.7	11.8	10.6	9.7	9.4	8.3	7.8	8.9	14.1
2-Apr	7.1	6.2	5.0	4.1	3.2	2.8	1.8	2.9	5.8	8.3	10.8	12.6	13.2	10.5	11.4	12.3	12.7	11.3	9.0	7.2	6.4	5.0	4.9	4.7	7.5	13.2
3-Apr	4.2	4.0	2.7	1.9	1.1	0.3	1.0	2.7	4.6	5.9	6.8	7.5	8.9	9.5	9.5	7.2	7.8	8.0	7.0	5.0	2.9	1.6	2.3	2.6	4.8	9.5
4-Apr	2.2	1.1	0.7	0.7	0.4	-0.1	-0.3	2.2	3.9	5.4	5.1	4.6	6.5	7.5	7.4	3.6	4.3	5.5	4.8	3.5	0.7	-1.3	-2.0	-2.4	2.7	7.5
5-Apr	-2.3	-2.1	-2.7	-3.6	-2.5	-2.0	-2.0	-1.4	0.0	2.2	5.3	7.9	10.2	11.0	11.9	12.3	12.5	12.4	12.1	11.5	10.5	9.8	8.9	7.0	5.3	12.5
6-Apr	3.3	2.1	4.6	5.8	4.2	1.2	0.2	3.1	6.5	7.9	9.6	11.2	13.8	16.7	16.7	16.9	16.9	16.4	14.9	11.5	9.2	6.8	4.8	6.9	8.8	16.9
7-Apr	6.3	6.4	6.7	6.8	6.2	5.9	5.2	5.7	6.8	7.7	8.8	10.0	12.3	12.6	12.9	12.7	12.6	12.1	10.5	8.9	8.1	7.0	6.1	4.6	8.5	12.9
8-Apr	3.4	2.3	0.9	0.1	-0.6	-1.2	-1.3	-1.8	-1.7	-1.6	-2.0	-2.5	-2.5	-2.5	-2.7	-3.0	-3.1	-3.6	-4.1	-4.5	-4.6	-4.7	-4.8	-5.1	-2.1	3.4
9-Apr	-5.0	-5.1	-5.0	-5.0	-5.0	-5.0	-4.6	-4.5	-4.0	-3.3	-1.5	-0.3	1.2	3.1	4.5	6.0	6.5	6.9	6.5	5.1	3.8	2.4	0.0	-0.5	-0.1	6.9
10-Apr	-0.5	-1.5	-1.6	-2.3	-2.5	-2.2	-1.7	-0.2	2.0	4.3	6.4	8.2	9.4	10.0	10.5	10.4	10.6	10.0	9.1	7.5	3.9	0.7	-0.5	-0.6	3.7	10.6
11-Apr	-1.0	-1.7	-0.1	-0.1	-1.0	-1.7	-1.7	-1.3	-0.2	0.4	1.5	2.0	2.2	4.3	4.2	4.0	3.5	3.2	3.1	2.8	1.6	0.1	-0.9	-2.4	0.9	4.3
12-Apr	-3.5	-4.2	-4.8	-5.5	-6.2	-6.4	-5.5	-3.7	-1.6	0.3	1.6	2.9	4.1	5.1	5.8	6.5	6.8	6.6	5.4	3.1	1.4	0.5	-1.1	-3.4	0.2	6.8
13-Apr	-4.6	-5.3	-5.4	-5.3	-3.9	-2.8	-2.5	-0.9	0.7	2.3	3.6	5.0	6.6	7.5	8.2	8.3	8.5	8.3	7.8	7.1	6.6	6.0	5.5	5.0	2.8	8.5
14-Apr	4.4	3.9	3.0	1.7	0.8	0.4	0.0	-0.1	0.0	0.1	0.5	0.9	0.7	0.5	0.4	0.1	-0.7	-1.2	-1.6	-1.6	-2.0	-2.5	-2.5	-2.7	0.1	4.4
15-Apr	-2.9	-3.0	-3.5	-4.4	-4.9	-5.3	-5.4	-5.2	-4.9	-4.2	-3.0	-1.4	0.1	1.3	2.5	3.6	3.5	3.8	3.2	1.3	0.0	-1.5	-3.3	-2.5	-1.5	3.8
16-Apr	-3.6	-4.6	-5.8	-6.6	-7.2	-7.4	-6.4	-4.5	-1.8	0.9	3.3	5.1	6.2	6.9	7.7	8.2	8.1	7.8	6.9	5.6	4.7	3.8	2.9	2.4	1.4	8.2
17-Apr	2.2	1.7	-0.5	-1.4	-2.8	-3.4	-4.3	-4.8	-4.8	-4.9	-5.0	-5.0	-4.4	-3.4	-2.7	-2.2	-2.1	-2.5	-3.0	-4.0	-4.4	-5.2	-5.6	-6.2	-3.3	2.2
18-Apr	-6.7	-7.2	-7.5	-7.8	-8.1	-8.6	-8.9	-8.9	-8.3	-7.3	-5.9	-4.9	-4.6	-4.0	-3.5	-2.6	-2.3	-2.4	-2.4	-2.9	-3.5	-4.0	-4.4	-4.7	-5.5	-2.3
19-Apr	-4.9	-4.9	-5.0	-5.0	-5.0	-5.1	-4.8	-3.9	-3.0	-2.4	-1.7	-1.0	0.0	0.5	1.8	2.4	2.9	3.4	3.1	3.0	1.1	-1.5	-2.9	-2.3	-1.5	3.4
20-Apr	-0.3	0.1	-0.2	-0.9	-1.1	-1.1	-0.6	0.8	3.0	4.1	5.4	5.6	5.4	3.2	0.0	-1.2	-1.9	-2.5	-3.0	-3.3	-2.9	-3.2	-4.1	-4.8	-0.1	5.6
21-Apr	-4.9	-5.3	-6.4	-7.4	-8.2	-8.4	-7.1	-4.8	-4.2	-3.2	-2.4	-2.3	-1.5	-1.8	-0.7	0.0	0.2	0.4	0.3	-0.4	-0.7	-2.7	-4.1	-5.1	-3.4	0.4
22-Apr	-5.8	-6.5	-6.7	-7.3	-7.2	-6.1	-5.6	-5.2	-5.1	-4.6	-3.8	-3.8	-3.2	-2.3	-1.9	-1.7	-1.8	-1.9	-2.4	-3.3	-4.8	-5.8	-6.5	-6.8	-4.6	-1.7
23-Apr	-6.5	-7.1	-8.5	-9.8	-10.1	-9.5	-7.1	-5.2	-3.3	-1.7	-0.7	0.4	1.6	2.5	2.9	3.4	3.3	3.0	2.8	2.5	2.1	1.7	1.4	1.0	-1.7	3.4
24-Apr	0.5	0.2	-0.1	-0.7	-1.9	-2.6	-2.9	-2.6	-1.9	-1.4	-0.5	0.2	1.0	1.7	2.4	3.0	3.2	3.3	3.1	2.5	1.9	1.4	1.0	0.1	0.5	3.3
25-Apr	-0.2	-0.7	-0.9	-0.6	-0.8	-0.4	0.3	1.1	2.5	3.2	3.3	3.8	4.2	4.1	4.4	4.7	4.2	4.3	4.2	3.4	2.9	2.4	2.0	1.8	2.2	4.7
26-Apr	1.6	1.4	1.2	1.0	0.7	0.8	1.4	2.2	3.0	3.9	3.9	3.5	3.9	4.8	4.9	4.9	5.0	5.3	5.5	5.2	4.7	4.5	4.2	4.0	3.4	5.5
27-Apr	3.7	3.4	2.9	2.5	2.5	2.5	2.8	3.4	4.2	6.8	8.2	9.0	9.8	10.7	11.1	11.7	11.7	11.9	11.6	10.7	8.7	3.5	0.9	-0.3	6.4	11.9
28-Apr	-1.0	1.0	2.1	0.8	-1.3	-1.1	1.7	4.6	7.3	9.8	11.6	12.6	12.5	13.0	13.8	13.3	13.2	12.8	12.4	11.9	10.7	7.2	7.5	7.4	7.7	13.8
29-Apr	7.3	5.9	6.2	5.6	4.9	4.3	4.5	7.8	10.3	11.9	12.0	12.3	13.3	13.6	13.3	13.2	13.4	11.9	11.6	10.7	8.3	4.6	2.7	2.0	8.8	13.6
30-Apr	2.3	0.8	0.9	0.4	0.3	1.0	3.8	6.4	9.2	12.2	14.0	15.3	16.0	15.0	14.6	13.3	10.6	9.6	9.8	9.2	7.7	5.7	5.0	3.4	7.8	16.0
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Patricia McInnes - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Patricia McInnes - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	274	38.06	38.06
0 - 10	363	50.42	88.47
10 - 20	83	11.53	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



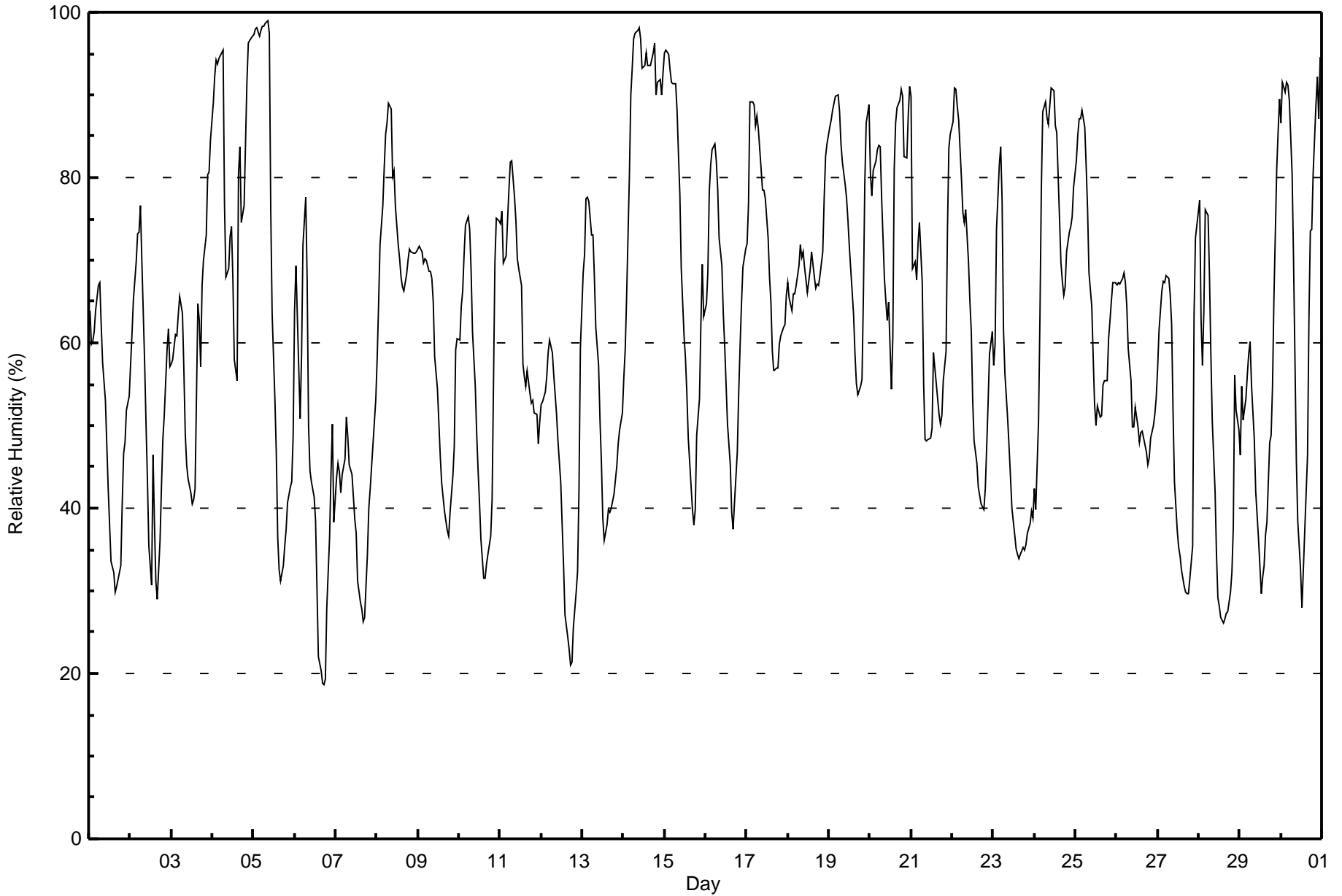
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Patricia McInnes - April 2017

Maximum Value: 99 % on Apr 5 09:00																		Maximum Daily Average: 89.2 % on Apr 14																		Hours in Service: 720	
Minimum Value: 19 % on Apr 6 18:00																		Minimum Daily Average: 40.6 % on Apr 7																		Hours of Data: 720	
Maximum Diurnal Average: 77.3 % at hour 6																		Minimum Diurnal Average: 47.7 % at hour 16																		Hours of Missing Data: 0	
Monthly Average: 61.6 %																		Percentiles: P ₁ = 22 P ₁₀ = 36 Q ₁ = 46 Median = 62 Q ₃ = 76 P ₉₀ = 89 P ₉₉ = 98																		Hours of Calibration: 0	
																																				Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	64	60	60	61	64	67	67	62	58	53	48	42	38	34	32	30	31	31	33	40	47	48	52	54	49.0	67											
2-Apr	57	61	65	70	73	73	77	70	58	50	43	35	31	46	38	31	29	36	43	48	51	59	62	57	52.7	77											
3-Apr	57	58	61	61	63	66	64	57	49	45	44	42	41	41	42	65	63	57	67	70	73	80	81	85	59.6	85											
4-Apr	89	92	94	94	94	95	95	77	68	69	73	74	68	58	55	80	84	75	77	84	91	96	97	97	82.4	97											
5-Apr	97	98	98	97	98	98	98	99	99	97	76	64	53	46	36	33	31	33	35	38	41	42	43	49	66.7	99											
6-Apr	64	69	57	51	58	72	78	67	50	45	43	41	39	30	22	20	19	19	19	28	36	44	50	38	44.2	78											
7-Apr	44	45	44	42	44	46	51	49	45	44	41	39	37	31	29	28	26	27	34	40	42	45	48	53	40.6	53											
8-Apr	58	65	72	77	81	85	87	89	88	80	81	76	72	70	68	67	66	68	70	71	71	71	71	71	74.0	89											
9-Apr	71	72	71	70	70	70	69	69	68	65	58	54	50	46	43	40	39	37	37	39	44	48	59	61	56.2	72											
10-Apr	60	64	66	71	74	75	74	69	61	55	49	45	41	36	32	31	33	34	37	41	55	70	75	75	55.1	75											
11-Apr	74	76	70	70	75	78	82	82	78	75	70	69	67	57	56	55	57	54	53	53	52	51	48	50	64.7	82											
12-Apr	53	53	54	56	59	60	59	56	54	51	48	43	38	33	27	24	23	21	21	26	30	32	42	59	42.6	60											
13-Apr	68	71	77	78	77	73	73	68	62	57	51	46	39	36	38	40	40	40	42	43	45	48	49	52	54.7	78											
14-Apr	56	59	66	80	90	93	97	97	98	98	97	93	94	95	94	93	94	95	96	90	92	92	90	93	89.2	98											
15-Apr	95	95	95	93	92	91	91	88	83	78	69	61	58	54	48	43	40	38	40	49	53	62	70	63	68.7	95											
16-Apr	65	69	78	81	83	84	82	79	73	69	64	60	55	50	45	39	37	41	47	54	60	65	69	71	63.3	84											
17-Apr	72	77	89	89	89	86	88	86	81	78	78	77	73	68	65	59	57	57	57	60	61	62	62	66	72.4	89											
18-Apr	67	66	64	66	66	67	69	72	70	71	69	66	68	69	71	68	67	67	67	68	71	78	83	84	69.7	84											
19-Apr	86	87	88	89	90	90	88	84	82	79	78	75	72	69	63	59	55	54	55	56	66	79	87	89	75.7	90											
20-Apr	80	78	81	82	83	84	84	78	68	65	63	65	54	61	81	87	88	89	91	90	83	82	87	91	78.9	91											
21-Apr	90	69	70	68	72	75	67	55	48	48	48	48	50	59	57	53	51	50	51	55	59	74	84	85	62.0	90											
22-Apr	87	91	91	89	87	80	76	75	76	70	65	61	53	48	45	43	42	41	40	42	48	53	59	61	63.3	91											
23-Apr	57	60	74	82	84	77	62	56	51	47	44	40	37	35	34	34	34	35	35	36	37	38	40	39	48.6	84											
24-Apr	42	40	51	63	79	88	89	87	86	89	91	90	86	85	80	70	67	66	67	71	73	74	75	79	74.6	91											
25-Apr	82	85	87	87	88	86	81	76	68	64	58	53	50	52	51	51	55	55	55	61	63	65	67	67	67.1	88											
26-Apr	67	67	67	68	68	67	64	59	55	50	50	52	50	48	49	49	49	47	45	46	48	50	51	53	55.1	68											
27-Apr	57	62	66	67	67	68	68	66	62	52	43	37	35	34	33	31	30	30	30	32	35	63	73	74	50.6	74											
28-Apr	77	63	57	64	76	75	68	59	50	42	34	29	28	27	26	27	27	28	30	32	38	56	52	50	46.5	77											
29-Apr	46	55	51	53	56	59	60	55	48	42	39	36	30	32	33	37	38	48	49	55	65	81	86	89	51.8	89											
30-Apr	87	92	90	91	91	89	80	70	58	46	39	33	28	32	37	46	63	74	74	81	89	92	87	95	69.3	95											
	69.1	69.9	71.8	73.6	76.4	77.3	76.2	71.8	66.5	62.5	58.5	54.9	51.1	49.5	47.8	47.7	47.8	48.2	49.8	53.3	57.3	63.4	66.6	68.3	Diurnal Average												
	97	98	98	97	98	98	98	99	99	98	97	93	94	95	94	93	94	95	96	90	92	96	97	97	Diurnal Maximum												





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - April 2017

Maximum Speed: 31 km/h on Apr 20 14:00	Maximum Daily Speed Average: 19.7 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 4 22:00	Minimum Daily Speed Average: 2.0 km/h on Apr 28	Hours of Data: 710
Maximum Diurnal Speed Average: 4.1 km/h at hour 14	Minimum Diurnal Speed Average: 1.4 km/h at hour 1	Hours of Missing Data: 10
Monthly Average Velocity: 2.9 km/h 33.8 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 7 Median = 10 Q ₃ = 15 P ₉₀ = 19 P ₉₉ = 25	Percent Operational Time: 98.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SW9	SW10	SW13	WSW14	WSW14	WSW13	SW13	WSW17	WSW18	WSW17	WSW21	WSW23	WSW22	W19	WNW16	W18	W12	W11	WNW10	NNW10	NW13	WSW10	SSW7	SW9	WSW12.7	WSW23	
2-Apr	SW11	WSW12	SW11	SW12	WSW7	SW9	S8	SSW11	SW10	SSW12	SW11	W11	WNW10	N4	WSW12	W9	NW11	NNE14	N6	WNW9	NW9	WNW6	NW8	NNW11	W6.2	NNE14	
3-Apr	NNW11	NNW11	NNW9	NNW11	NNW10	NNW10	NNW8	N7	NNW3	NNW1	N3	NW6	NNW5	NE8	ENE4	WNW15	WSW11	WSW8	SW7	W7	WSW4	S3	SW4	SE6	NW4.3	WNW15	
4-Apr	SSW6	S5	SW4	SSE5	SSE5	S3	SSE3	SE6	SSE7	SW13	WSW15	S5	E14	ESE12	SSE8	SSW19	SSW13	S11	SSE10	SE5	S1	WSW0	SW1	AF	S5.4	SSW19	
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	ESE9	ESE17	SE20	SSE22	SSE20	S19	S20	S20	S17	S16	SSE11	SSE10	SSE11	SSE7	SSE6	----	SSE22
6-Apr	ENE2	SE5	SE6	SE7	SSE4	SSE4	SSW3	SSW3	S6	SSW9	S8	SSW11	S13	W17	WNW20	WNW17	WNW13	WNW9	WNW7	NW5	NW5	NNW3	NW4	NNE6	WSW3.8	WNW20	
7-Apr	NNW5	N7	N7	N8	NNW11	N6	NNW5	NNW8	N8	NNW11	N12	NNW8	N12	ENE15	E14	NE14	NE19	NE17	NNE18	NNE21	NNE20	NNE19	NNE16	N11	NNE10.7	NNE21	
8-Apr	N14	N19	N20	N19	N20	N18	N20	N25	N24	N26	N25	N25	NNE25	N24	NNE24	NNE22	N20	N21	N18	NNE18	NNE13	NNE14	NNE13	N11	N19.7	N26	
9-Apr	N8	N9	N7	N4	N5	NNE4	NE3	SSE6	S7	S8	SSE8	SE8	SE10	SE10	SE9	SE10	SE9	ESE11	ESE11	ESE9	SE9	SE7	S5	SSE7	SE4.6	ESE11	
10-Apr	S8	SSE8	SSE9	SSE9	SSE8	SSE9	SSE8	SE8	S10	S9	SE8	SE9	SE10	ESE7	ESE10	ESE10	ESE9	E8	ESE9	SE8	SE3	WNW2	WNW4	W3	SE6.3	ESE10	
11-Apr	NNW5	NW5	NNW13	N17	N15	N15	N17	N17	N17	N19	N18	N20	NNW18	N21	N22	N22	N21	N20	N14	N14	N21	N20	N19	N17	N16.8	N22	
12-Apr	NNW13	NNW13	NNW14	NNW12	N8	N10	N11	N13	N11	N10	N11	N11	NNE10	N10	NNE10	N11	N14	N15	N15	N12	N11	NNW10	NNE4	N2	N10.9	N15	
13-Apr	NNE2	NNW2	NE2	NE3	E8	ENE7	NE7	ENE9	E13	ESE14	E15	E15	ENE18	E18	E18	E19	E18	E21	E18	E17	ENE13	ENE15	E16	E17	E12.3	E21	
14-Apr	ESE17	E15	E21	ENE16	NE14	NNE16	NE15	NE14	NE13	NE13	NE14	NE15	NE17	NE17	NE18	NE17	NE18	NNE17	NNE17	NE19	NE18	NE21	NNE20	NNE18	NE15.8	NE21	
15-Apr	NNE16	NNE17	NNE21	NNE22	NNE20	NNE19	NNE19	NNE19	NE19	NE17	NNE17	NNE16	NNE17	NNE14	NE13	N12	NNW15	NNW14	NW10	WNW5	SSW3	SSE6	SSE7	SE11	NNE11.7	NNE22	
16-Apr	SE11	SSE7	SSE7	SSE7	SSE7	SSE8	SSE8	S10	S11	SSW12	SSW12	SSW15	SSW16	SSW17	SSW17	SSW17	SSW17	SW16	SSW15	SSW11	SSW15	SSW11	SSW12	S9	SSW11.2	SSW17	
17-Apr	S4	NNW8	N18	N18	N22	N21	N23	N23	N25	N23	N22	N21	N21	NNE20	N20	N20	N19	N19	N19	N19	NNE20	NNE19	NNE17	NNE15	N18.4	N25	
18-Apr	NNE10	N11	N13	N13	N15	N15	N15	N15	N15	N15	NNW14	N14	N15	N14	N11	N10	N10	NNE10	N10	N11	N11	N12	N11	N12	N12.5	N15	
19-Apr	NNW11	NNW10	NNW9	NNW9	NNW9	NNW9	NNW7	N6	N5	WNW2	N2	N2	ENE2	S6	S9	SSW9	WSW9	WSW8	S7	S5	NNE1	NE2	E2	SE2	NW2.0	NNW11	
20-Apr	ESE4	ENE3	ESE3	ESE4	SE6	ESE5	N7	N5	E5	E5	NNE11	NNE15	N23	N31	N31	N29	N26	N24	N20	N18	NNE12	N10	NNW8	NNW9	N11.2	N31	
21-Apr	N10	N11	N13	N12	N7	NNW7	NNW5	N2	NNE7	NNE8	N10	NNE10	NNE12	NNE10	NE8	NNE6	NE6	NNE6	NNW6	NW4	WNW2	N4	NNW3	W3	N6.5	NNW13	
22-Apr	WNW3	W4	NW2	W3	N7	NNW18	N18	N19	NNE19	N19	N18	N18	NNE16	NNE17	NNE17	NNE18	NNE16	NNE14	N14	N13	N10	N8	N8	NNE6	N12.0	NNE19	
23-Apr	ENE6	E6	NE4	NNE4	N4	NE5	ESE8	E10	E12	ESE14	ESE13	ESE12	ESE10	SE9	SE11	SE11	SE12	SE12	ESE10	ESE8	ESE6	ESE7	E7	ESE8	ESE7.8	ESE14	
24-Apr	ESE6	E7	ESE10	E10	E11	ENE10	NE11	NE11	NE11	NE9	ENE7	NE8	ESE11	ESE12	ESE11	E14	E13	E13	ESE11	E10	E8	ENE7	ESE6	E14	E9.4	E14	
25-Apr	ESE8	ESE8	ESE7	ESE9	ESE10	ESE10	ESE11	ESE12	SE12	ESE12	SSE11	SSE13	SE14	SE14	SE14	SE14	SSE14	SSE14	S11	S13	S12	SSE11	SE9	SE9	SE8	SE10.3	SE14
26-Apr	SE7	ESE6	ESE6	SE6	SE6	SE7	SE9	SSE11	SSE13	SSE18	SSE19	SSE15	S17	S15	S15	S14	S14	S12	SSE10	ESE9	ESE6	SE6	SE9	SSE9	SSE10.0	SSE19	
27-Apr	SSE7	SSE7	SSW3	E4	ESE5	ESE7	ESE7	ESE10	ESE10	ESE8	SE12	ESE14	ESE7	ESE7	ESE4	ESE7	SE7	SSE6	SE5	SE6	SE7	WSW1	NW5	W3	SE5.5	ESE14	
28-Apr	SW3	SW9	WSW10	SSW4	S3	S6	SSW7	S7	S5	SSE4	SSE4	E6	E7	E4	NNE4	NE5	NNE9	NE8	ENE8	E6	ESE4	WNW2	SSE4	S4	SE2.0	WSW10	
29-Apr	SSW5	SSE4	S9	SSW7	SSW8	SSW8	SW9	SW9	SSW8	SSW10	SW15	SW14	SSW15	SSW20	SSW21	S17	S14	SW21	S14	SW11	S4	SW3	SSW4	SSW5	SSW10.2	SW21	
30-Apr	SSW6	SSW6	S5	S5	SSW5	SSW3	S3	S6	SSE7	SSE7	SSE10	S7	S9	E10	ESE5	WNW18	NW10	SSW6	W2	SW3	WNW3	NNW7	NNW6	WNW3	SSW2.4	WNW18	

NE1.4 NNE2.0 N2.7 NNE3.1 NNE3.7 NNE3.7 NNE4.1 NNE3.5 NE3.3 ENE2.5 NE2.6 NE2.8 NE3.6 NE4.1 NE2.7 NNE2.3 NNE2.8 NNE3.0 NE3.2 NE3.4 NNE3.5 NNE3.6 NNE3.0 NE2.3	Diurnal Average
ESE17 N19 NNE21 NNE22 N22 N21 N23 N25 N25 N26 N25 N25 NNE25 N31 N31 N29 N26 N24 N20 NNE21 N21 NE21 NNE20 NNE18	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



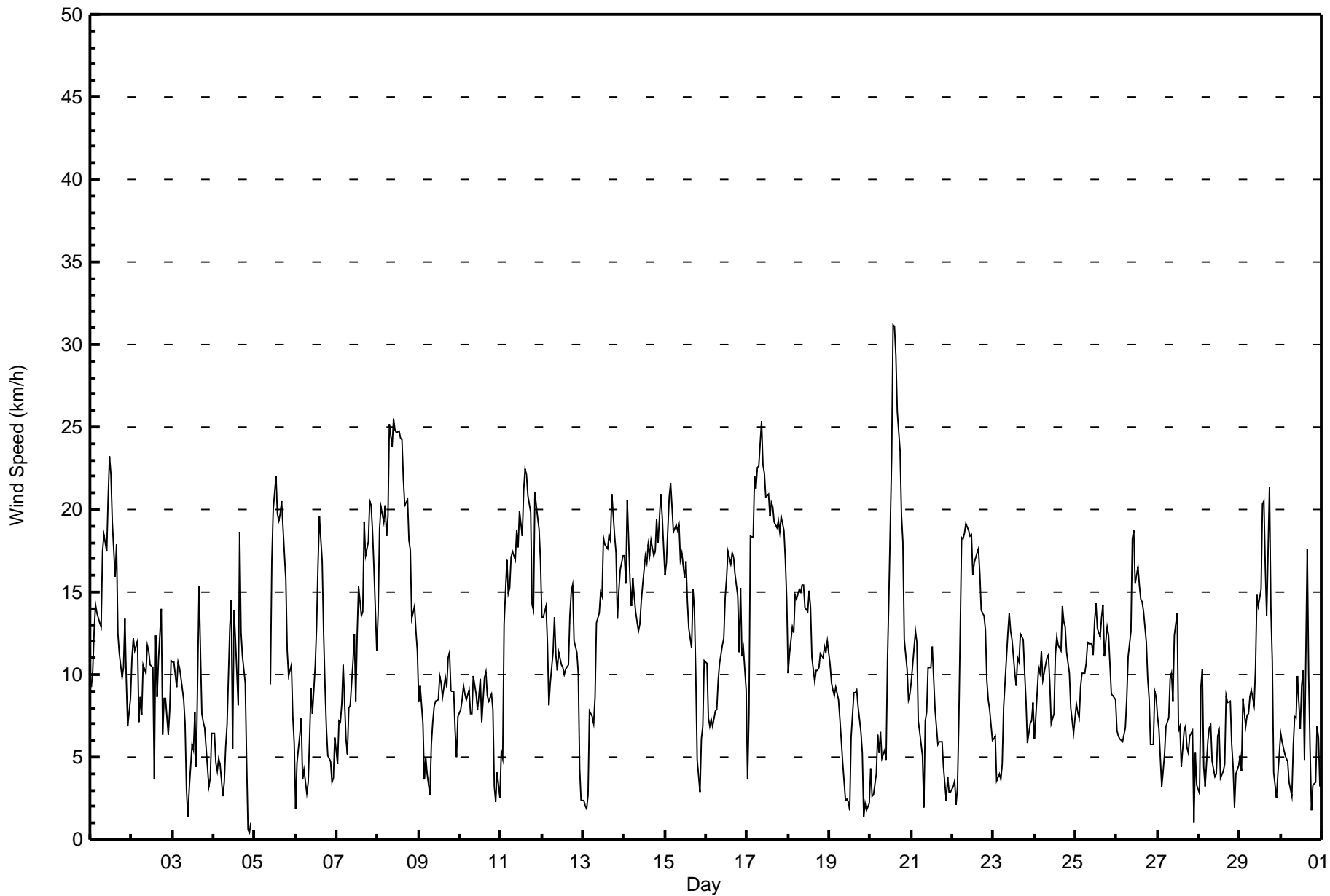
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Patricia McInnes - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 8 km/h on Apr 30 16:00	Hours of Data: 710
Minimum Value: 0 km/h on Apr 23 04:00	Hours of Missing Data: 10
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 0
	Percent Operational Time: 98.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2	2	2	2	2	2	2	4	4	4	4	5	5	5	4	4	3	2	2	4	5	3	1	2	5
2-Apr	2	2	2	2	3	2	2	2	3	2	3	4	5	6	4	3	4	5	2	1	1	1	2	2	6
3-Apr	1	1	2	1	1	1	1	1	1	1	2	2	3	3	2	3	3	2	2	1	2	1	2	2	3
4-Apr	3	1	2	1	1	2	2	1	2	4	3	4	3	3	2	4	4	3	2	1	1	1	1	AF	4
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	2	3	5	5	5	5	5	5	4	3	3	1	2	1	1	5
6-Apr	1	2	1	1	2	1	1	1	2	2	2	2	3	6	5	5	4	3	2	2	1	1	1	2	6
7-Apr	1	2	2	2	3	3	2	2	3	2	3	2	5	5	6	7	4	4	4	4	4	3	3	2	7
8-Apr	2	3	4	4	5	4	5	5	5	5	5	5	5	4	5	5	4	4	3	4	3	3	3	2	5
9-Apr	2	2	2	2	2	2	2	2	2	3	3	4	4	3	3	3	3	2	3	2	1	2	1	1	4
10-Apr	1	1	1	1	1	1	1	2	2	3	2	3	3	3	3	4	3	2	2	2	1	1	1	1	4
11-Apr	3	2	4	3	3	3	4	4	3	4	3	4	5	5	5	5	4	4	3	4	4	4	4	3	5
12-Apr	2	2	2	2	2	2	2	2	2	2	3	4	3	4	4	4	3	3	3	2	1	3	1	1	4
13-Apr	1	1	2	1	3	3	2	2	3	3	4	4	4	4	4	4	5	4	4	4	4	3	4	4	5
14-Apr	5	4	4	4	3	3	2	3	2	3	3	3	3	4	5	4	4	3	4	6	5	5	5	5	6
15-Apr	3	4	4	4	4	4	3	4	4	4	3	3	3	3	3	4	3	3	2	2	2	2	3	2	4
16-Apr	2	2	1	1	1	1	1	2	2	2	2	3	3	4	4	4	4	4	3	3	3	3	2	3	4
17-Apr	2	5	3	3	5	5	4	4	5	4	4	4	4	4	4	3	3	4	3	4	4	4	4	3	5
18-Apr	3	2	2	2	2	3	3	3	3	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3
19-Apr	2	1	2	2	2	1	1	1	1	1	1	1	1	2	3	2	2	3	1	1	1	1	1	1	3
20-Apr	1	1	1	1	2	1	2	2	2	2	3	5	5	6	7	6	5	5	4	3	3	2	1	1	7
21-Apr	2	2	2	2	2	1	1	1	2	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1	3
22-Apr	1	1	1	1	5	4	4	4	4	3	4	4	4	5	4	4	4	3	2	3	1	1	1	1	5
23-Apr	1	1	1	0	1	2	2	2	3	3	3	4	4	4	3	3	3	3	3	2	2	2	2	3	4
24-Apr	2	2	3	3	2	2	2	2	2	2	1	2	2	2	3	3	3	3	3	3	2	2	1	1	3
25-Apr	2	2	1	3	2	2	3	3	3	4	3	3	4	3	3	4	3	2	3	2	2	2	1	2	4
26-Apr	1	1	1	1	1	1	2	2	3	4	5	4	4	4	4	3	3	3	3	2	1	1	2	2	5
27-Apr	2	2	1	1	1	1	1	2	2	3	4	4	4	4	5	4	3	3	2	2	1	1	1	1	5
28-Apr	1	2	1	1	1	1	1	1	2	2	2	3	2	3	5	3	3	2	1	1	1	1	2	2	5
29-Apr	1	1	1	1	2	2	2	2	2	3	4	4	4	5	5	5	5	5	3	4	1	1	1	1	5
30-Apr	1	1	1	2	1	1	1	1	2	2	3	3	3	4	3	8	4	3	1	1	2	1	1	2	8
	5	5	4	4	5	5	5	5	5	5	5	5	5	6	7	8	5	5	4	6	5	5	5	5	
Diurnal Maximum																									

AF - Analyzer Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Patricia McInnes - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	122	17.18	17.18
6 - 11	302	42.54	59.72
12 - 19	223	31.41	91.13
20 - 28	60	8.45	99.58
29 - 38	3	0.42	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Patricia McInnes - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	6	7	4	5	9	4	9	15	10	6	3	6	9	7	10	122
6 - 11	40	14	10	7	14	41	36	36	21	18	13	7	4	6	6	29	302
12 - 19	52	35	20	6	17	12	5	9	15	15	7	9	4	5	1	11	223
20 - 28	34	11	1	0	2	0	1	2	2	2	1	3	0	1	0	0	60
29 - 38	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	66	38	17	38	62	46	56	53	45	27	22	14	21	14	50	710

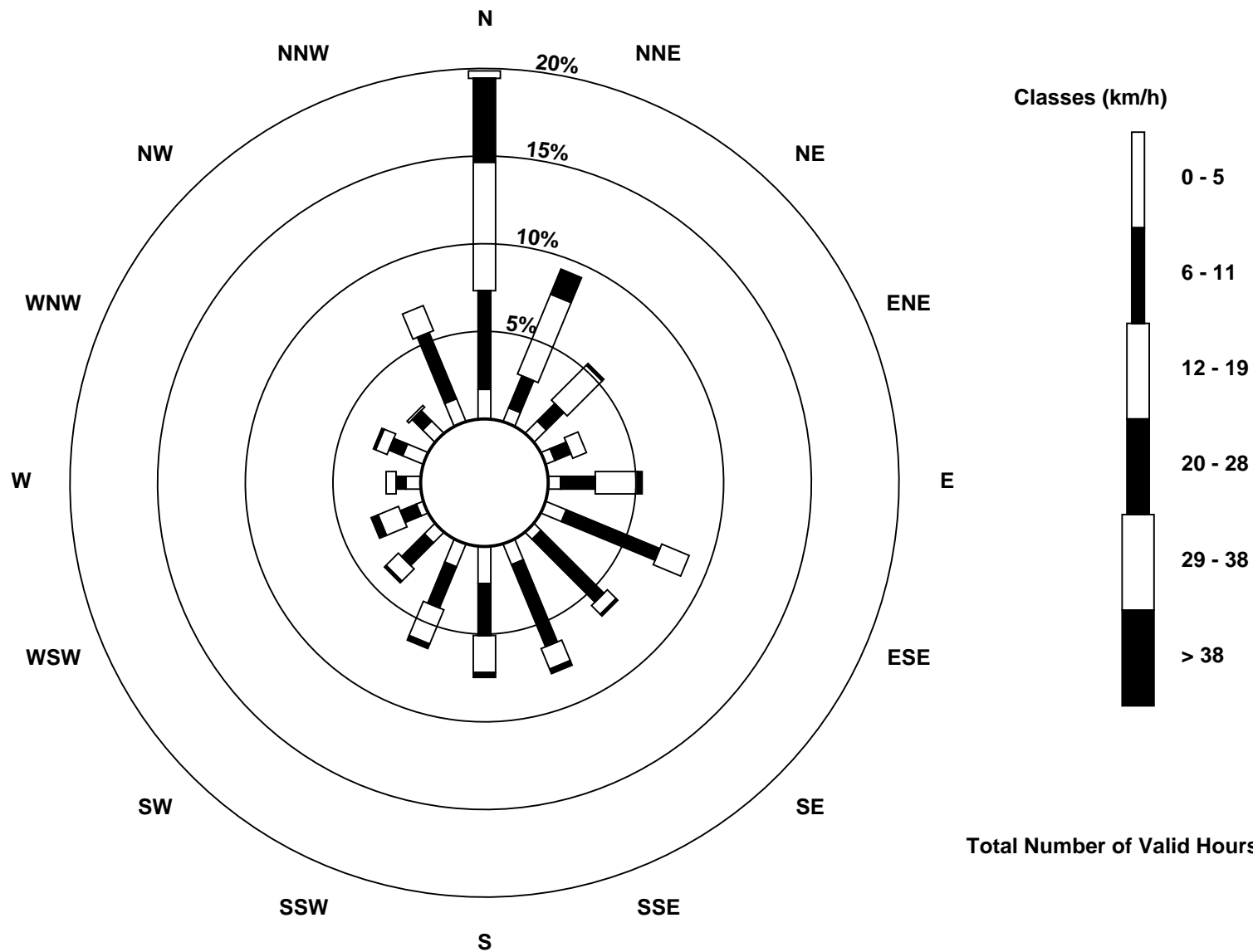
Total Number of Valid Hours: 710

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Patricia McInnes (AMS 6)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Patricia McInnes - April 2017

Direction of Maximum Speed: 354 deg on Apr 20 14:00 Direction of Maximum Daily Speed Average: 6.3 deg on Apr 8	Hours in Service: 720 Hours of Data: 710 Hours of Missing Data: 10
Direction of Minimum Speed: 253 deg on Apr 4 22:00 Direction of Minimum Daily Speed Average: 2.0 deg on Apr 28	Percent Operational Time: 98.6
Monthly Average Direction: 303.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	217	229	235	239	238	238	232	239	244	249	243	240	251	267	284	281	280	275	288	343	307	242	203	227	253.2
2-Apr	233	239	234	235	248	220	189	205	216	204	225	272	293	3	249	281	312	15	1	289	307	303	319	341	262.4
3-Apr	343	342	332	341	333	332	340	349	343	327	359	320	345	52	66	283	248	245	225	279	252	169	215	137	316.9
4-Apr	209	188	232	161	149	174	157	126	151	226	249	173	96	109	165	202	197	187	160	128	187	253	222	AF	177.3
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	117	116	128	150	155	177	173	180	178	172	164	157	160	157	147	--
6-Apr	58	142	141	144	152	149	195	203	176	194	181	200	190	261	282	288	282	294	294	310	312	329	321	15	245.3
7-Apr	346	349	354	2	335	6	344	337	356	345	352	327	349	58	86	55	49	48	24	20	19	14	12	2	16.1
8-Apr	357	351	353	352	4	1	1	1	5	7	5	4	13	9	14	14	8	5	11	21	20	19	19	8	6.3
9-Apr	3	349	353	358	9	17	46	148	182	181	150	130	141	131	142	143	142	108	113	117	125	138	171	163	125.7
10-Apr	182	160	162	158	160	163	149	142	174	170	133	143	128	119	105	108	107	86	113	131	139	285	296	266	141.5
11-Apr	346	323	347	352	350	350	0	2	359	4	0	349	340	350	353	2	7	2	0	352	4	4	359	350	355.9
12-Apr	342	344	347	348	352	350	352	355	360	352	355	11	22	358	19	6	351	358	356	352	351	347	12	6	355.7
13-Apr	17	334	34	55	81	76	51	63	95	110	90	79	77	80	98	94	95	94	86	88	76	75	80	83	84.1
14-Apr	102	84	82	66	47	33	35	46	51	49	56	49	38	36	37	36	40	32	28	50	47	37	26	31	46.7
15-Apr	23	19	18	20	21	17	19	27	40	45	24	22	19	29	41	11	339	327	322	290	194	168	157	135	21.0
16-Apr	131	147	160	153	151	167	168	184	188	193	192	197	204	207	208	202	212	220	203	200	202	207	195	189	192.9
17-Apr	177	341	352	356	358	1	2	2	5	8	2	9	5	12	0	9	7	9	8	10	19	26	28	22	6.9
18-Apr	13	2	8	6	10	6	1	355	354	354	346	360	1	360	5	7	10	12	9	357	355	352	352	350	0.5
19-Apr	348	348	342	345	346	347	339	354	359	298	355	352	76	179	189	210	239	242	185	178	25	48	98	124	317.7
20-Apr	103	73	121	109	126	105	4	4	99	84	22	15	4	354	357	359	359	1	3	4	27	357	341	339	8.6
21-Apr	357	7	349	353	349	337	341	7	30	15	11	26	14	19	40	24	36	29	344	314	289	4	339	273	4.7
22-Apr	288	278	305	269	350	345	3	10	15	11	9	9	24	24	29	30	15	17	7	4	355	354	3	19	8.7
23-Apr	59	86	45	12	350	45	111	101	100	109	114	114	106	127	141	129	135	134	116	107	116	106	101	113	109.4
24-Apr	113	92	111	94	83	68	51	48	56	53	60	53	105	103	108	103	87	89	91	104	94	86	74	109	85.6
25-Apr	122	107	112	113	118	117	122	118	129	120	154	155	146	154	150	147	162	176	178	172	156	138	133	133	141.3
26-Apr	136	121	122	126	131	129	127	153	155	153	149	168	173	170	174	189	187	178	155	122	119	125	132	153	154.6
27-Apr	159	166	197	101	102	110	116	118	121	116	127	122	116	103	113	122	144	160	137	132	135	249	315	280	127.7
28-Apr	233	223	241	192	170	188	193	191	174	152	154	97	90	83	13	45	29	46	77	87	109	301	158	188	141.4
29-Apr	199	164	191	195	212	212	221	223	192	195	225	220	201	205	205	185	177	214	188	215	185	231	208	213	203.7
30-Apr	196	194	184	188	205	209	169	189	168	148	151	170	172	89	113	299	323	195	267	232	286	342	327	299	200.2
	37.8	12.0	4.3	16.2	17.9	15.5	20.8	28.4	52.8	62.4	50.6	49.4	53.9	50.1	50.7	20.7	22.8	30.2	44.3	38.5	33.2	26.2	29.3	43.8	

Diurnal Average

AF - Analyzer Failure

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

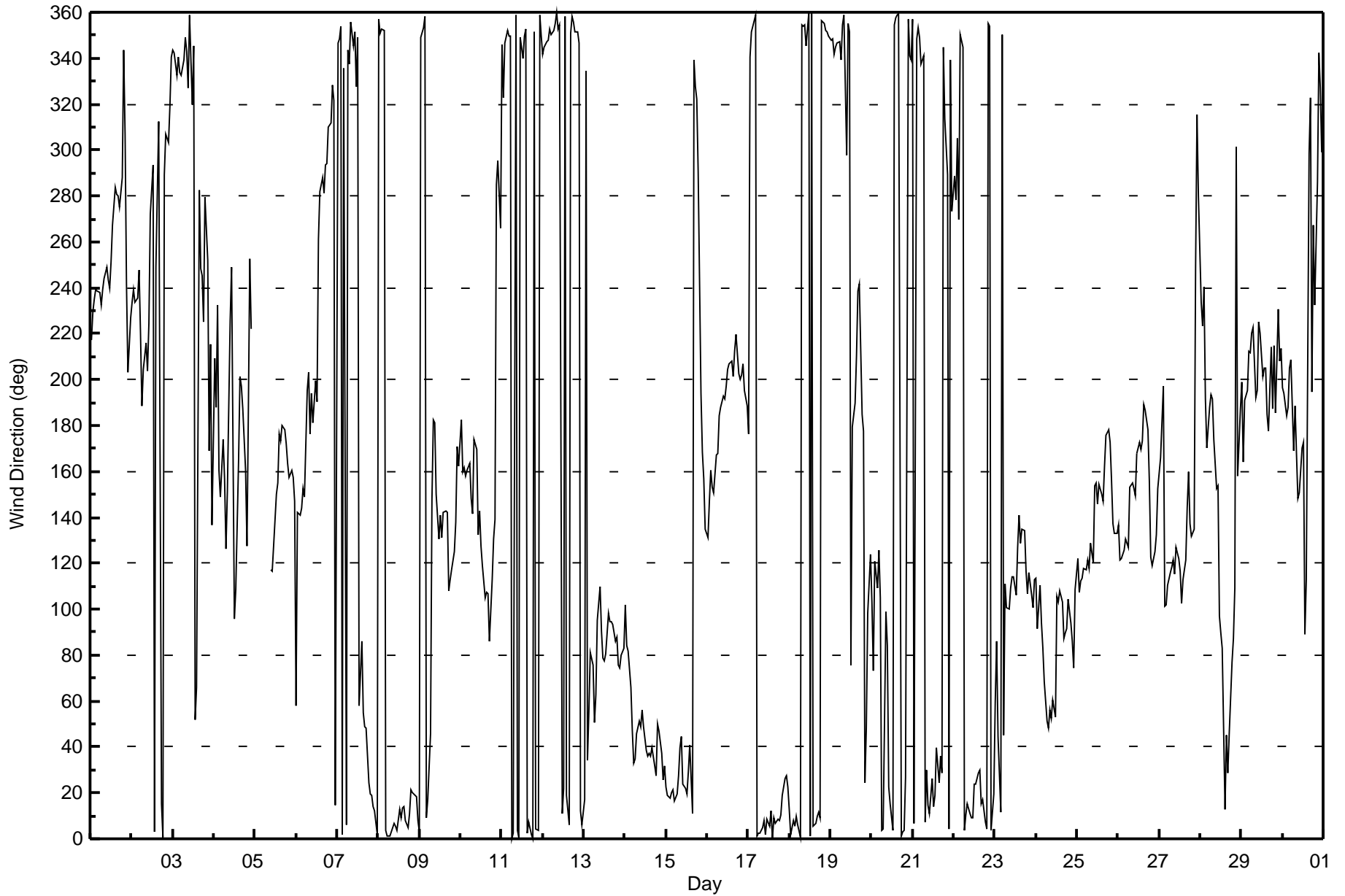
Wind Direction (WD) - deg
Patricia McInnes - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 93 deg on Apr 3 10:00	Hours of Data: 710
Minimum Value: 4 deg on Apr 10 04:00	Hours of Missing Data: 10
Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 13 Median = 16 Q ₃ = 25 P ₉₀ = 42 P ₉₉ = 87	Hours of Calibration: 0
	Percent Operational Time: 98.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	14	10	9	10	10	9	9	12	13	15	16	16	15	20	23	16	21	11	18	32	39	22	17	11	39
2-Apr	12	11	10	9	61	13	14	15	15	17	24	33	45	89	18	30	47	15	33	20	10	17	15	10	89
3-Apr	12	8	8	10	7	8	10	13	63	93	68	40	55	39	65	15	17	12	18	10	19	51	47	20	93
4-Apr	38	16	33	27	30	62	50	16	33	22	15	70	14	28	33	13	18	18	17	28	87	88	76	AF	88
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	16	15	17	16	22	19	14	14	14	12	10	8	9	9	10	22
6-Apr	65	14	12	10	39	15	37	20	17	19	20	20	17	27	21	22	27	19	8	25	11	37	29	37	65
7-Apr	44	24	14	28	15	46	39	21	20	15	15	12	18	36	33	31	14	14	14	11	10	11	11	13	46
8-Apr	14	14	13	16	14	15	15	16	14	16	16	18	16	16	15	17	15	14	17	18	13	14	19	19	19
9-Apr	26	14	24	68	43	65	84	44	37	31	41	37	33	31	42	31	30	17	12	11	9	10	17	16	84
10-Apr	11	10	5	4	5	7	11	15	19	30	26	28	32	53	28	24	27	21	17	11	39	24	9	48	53
11-Apr	25	31	11	14	14	14	16	16	18	16	21	16	14	16	16	16	16	14	16	14	15	15	16	13	31
12-Apr	10	9	11	11	14	12	12	15	17	21	25	31	34	38	32	36	19	17	15	13	12	17	32	53	53
13-Apr	35	49	78	47	14	15	16	15	17	19	19	23	17	19	19	17	15	14	12	13	13	13	12	12	78
14-Apr	15	15	12	15	14	9	11	12	13	13	14	14	12	12	14	14	12	12	15	14	13	14	13	12	15
15-Apr	11	10	10	10	10	11	10	14	14	15	14	14	15	18	17	36	12	12	11	44	73	25	25	14	73
16-Apr	11	15	13	8	8	10	12	12	14	14	14	15	16	15	17	14	16	14	13	13	12	14	11	18	18
17-Apr	54	31	14	16	16	16	14	15	14	15	16	16	15	17	18	16	15	13	15	13	11	11	12	11	54
18-Apr	15	12	12	12	12	14	14	15	16	14	17	20	18	21	19	22	23	17	16	15	14	14	13	12	23
19-Apr	12	13	10	12	10	11	12	16	23	47	74	65	76	30	25	28	22	26	15	11	92	39	46	33	92
20-Apr	26	36	45	25	21	29	23	38	33	47	23	13	16	16	17	16	16	15	15	15	18	15	8	9	47
21-Apr	14	14	11	12	16	8	21	65	26	31	24	24	23	33	32	41	40	52	27	21	43	18	23	9	65
22-Apr	14	15	42	30	27	12	14	15	14	14	18	17	19	21	22	18	19	21	19	13	12	11	12	13	42
23-Apr	17	12	28	17	15	31	15	18	18	18	22	25	32	42	26	28	23	15	15	12	15	14	24	20	42
24-Apr	26	11	15	20	11	15	13	12	14	13	21	24	17	16	17	20	17	16	17	14	13	12	12	14	26
25-Apr	13	13	10	13	11	12	15	17	19	26	29	21	19	18	20	19	18	19	16	13	12	11	10	11	29
26-Apr	13	11	12	11	10	11	14	17	17	19	18	20	18	22	27	20	15	17	26	13	11	12	11	13	27
27-Apr	13	14	31	22	9	12	13	13	15	28	27	25	62	73	90	62	43	60	46	19	8	68	13	42	90
28-Apr	22	6	7	43	12	9	13	24	46	55	69	42	34	81	87	67	31	17	18	17	25	28	46	26	87
29-Apr	14	12	13	12	8	14	13	20	27	27	21	23	25	21	19	18	24	13	18	15	16	31	13	10	31
30-Apr	9	12	8	19	24	36	28	21	21	30	26	54	41	40	72	40	25	49	87	47	41	11	21	52	87

65	49	78	68	61	65	84	65	63	93	74	70	76	89	90	67	47	60	87	47	92	88	76	53	
Diurnal Maximum																								

AF - Analyzer Failure





Wood Buffalo Environmental Association

SO₂ Calibration Summary

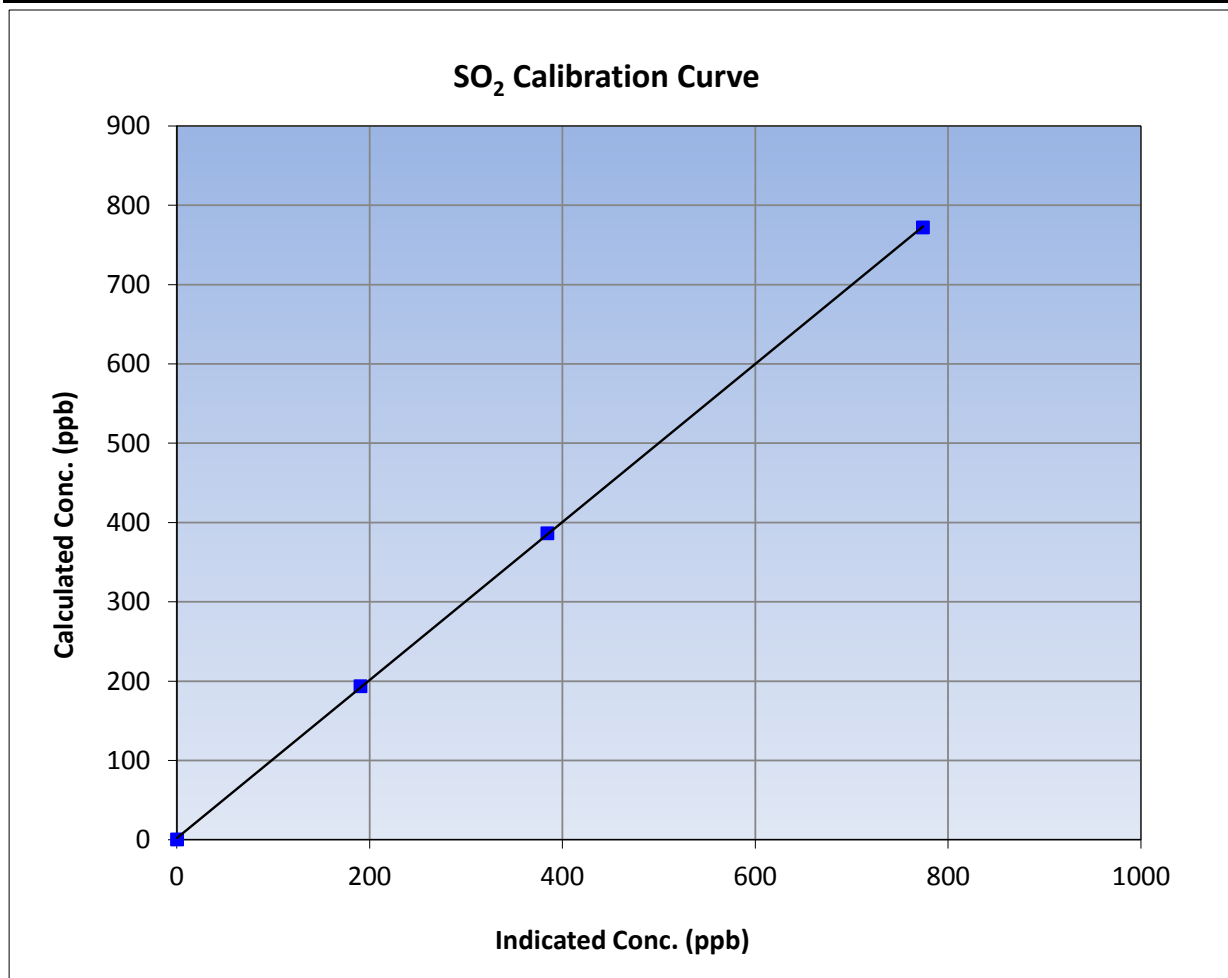
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 8, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	8:30	End Time (MST)	14:20
Analyzer make	Thermo 43i	Analyzer serial #	1008841397

Calibration Data

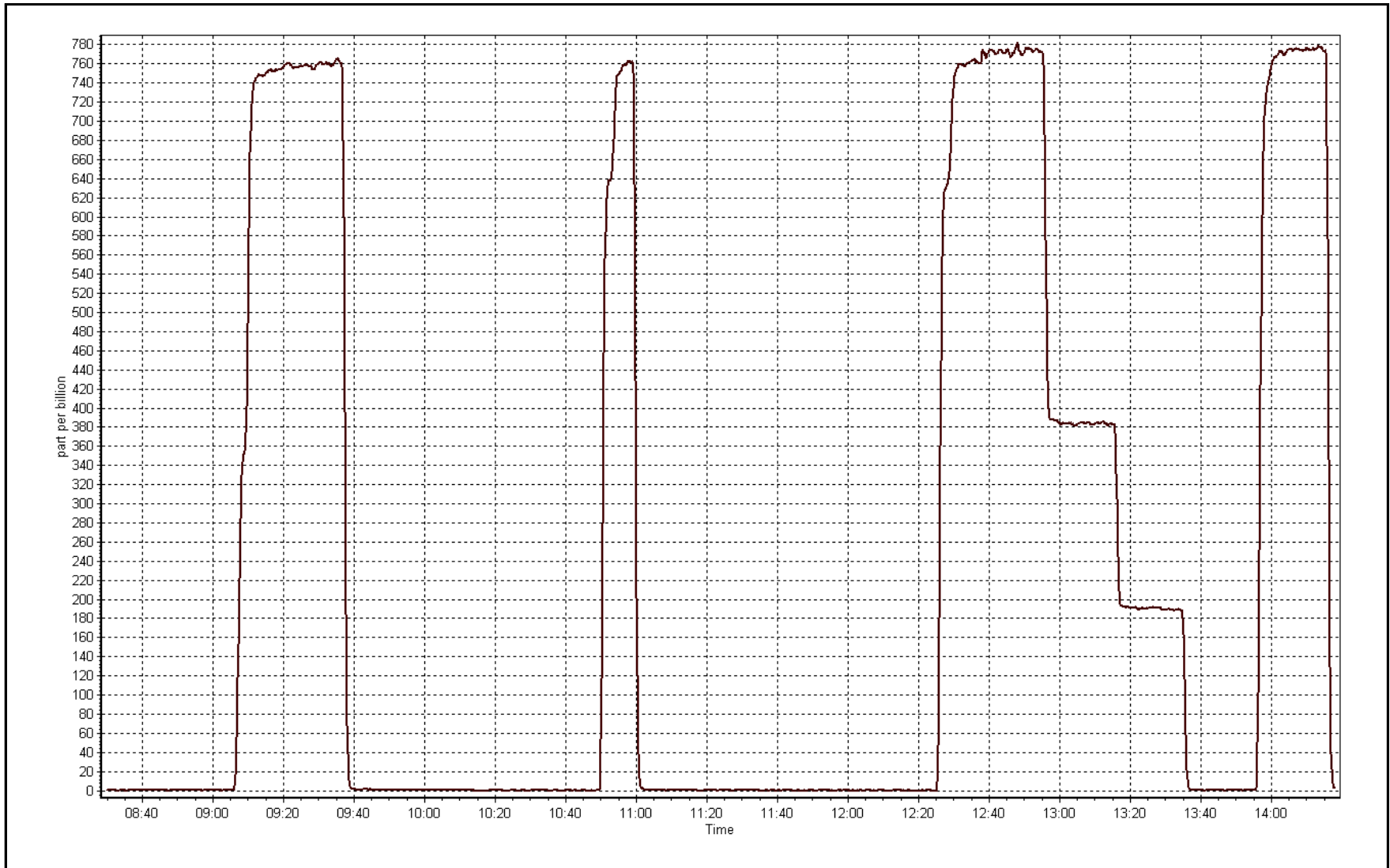
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.1	----	Correlation Coefficient	≥0.995
771.8	773.6	0.9977		
386.0	384.0	1.0050	Slope	0.90 - 1.10
193.4	190.3	1.0164		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 6, 2017

Location: Patricia McInnes





Wood Buffalo Environmental Association

TRS Calibration Summary

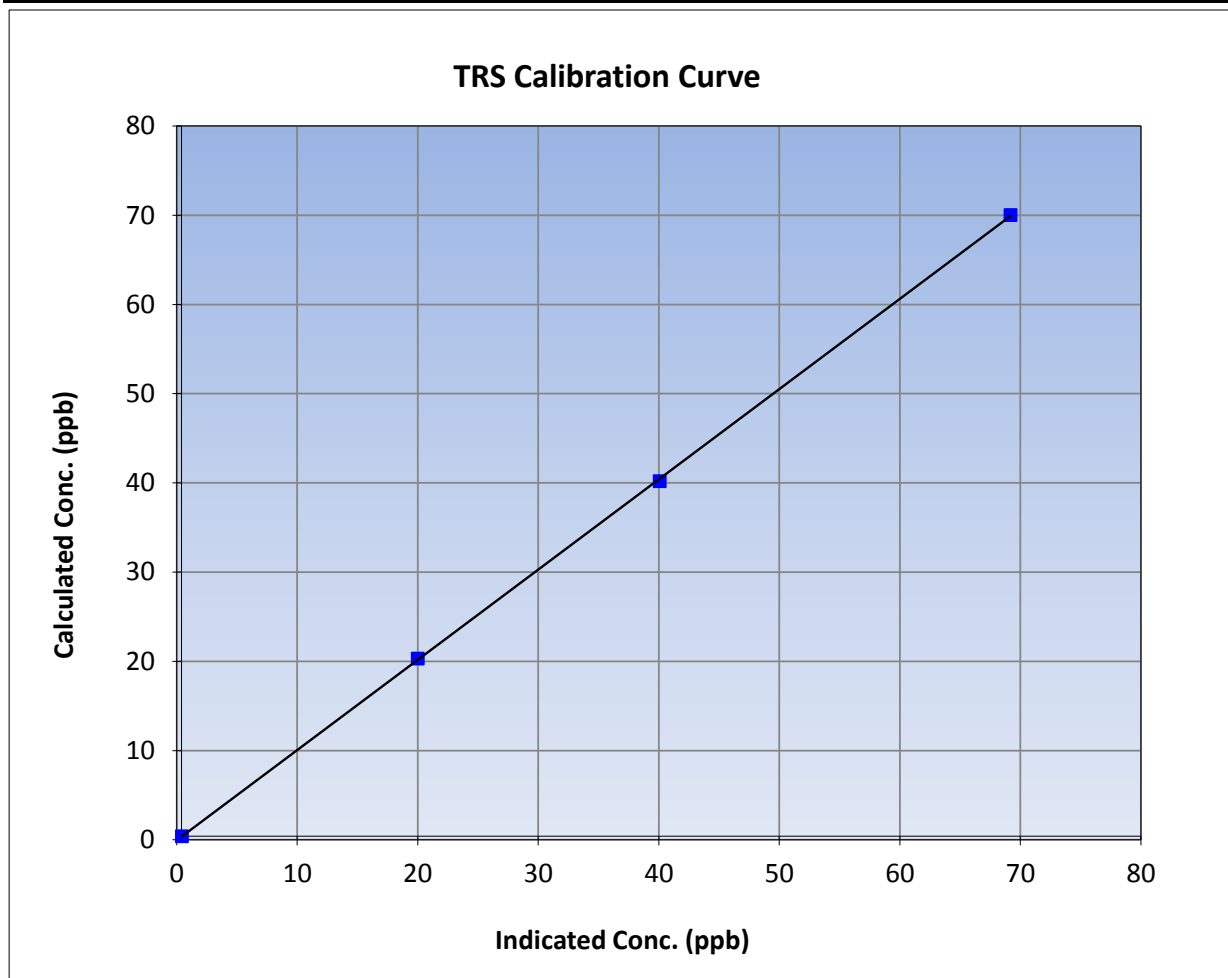
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 9, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	9:00	End Time (MST)	10:55
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1410661331

Calibration Data

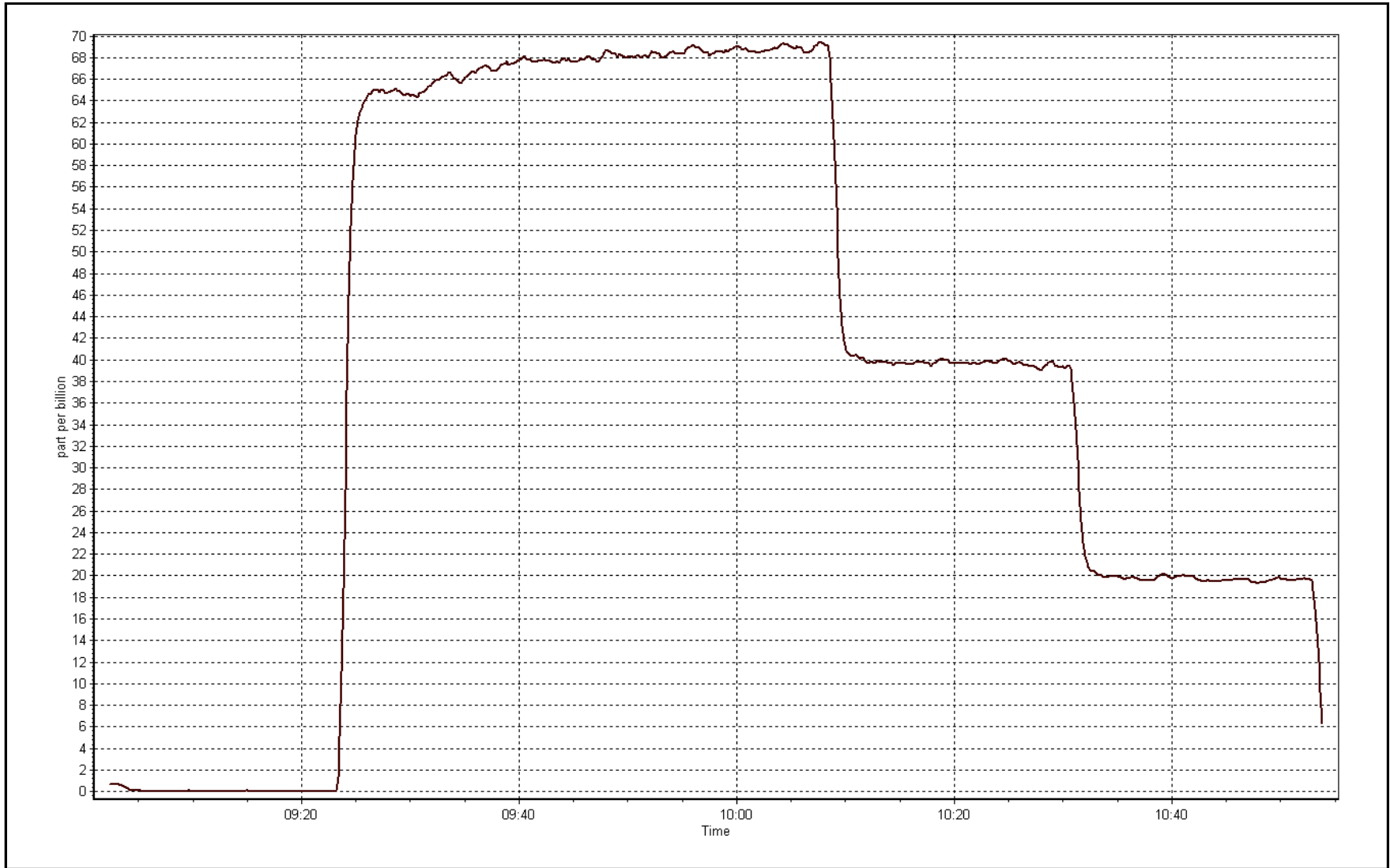
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999961	≥0.995
69.6	68.8	1.0124			
39.8	39.7	1.0033	Slope	1.011422	0.90 - 1.10
19.9	19.6	1.0150			
			Intercept	-0.054187	+/-3



TRS Calibration Plot

Date: April 12, 2017

Location: Patricia McInnes





Wood Buffalo Environmental Association

TRS Calibration Summary

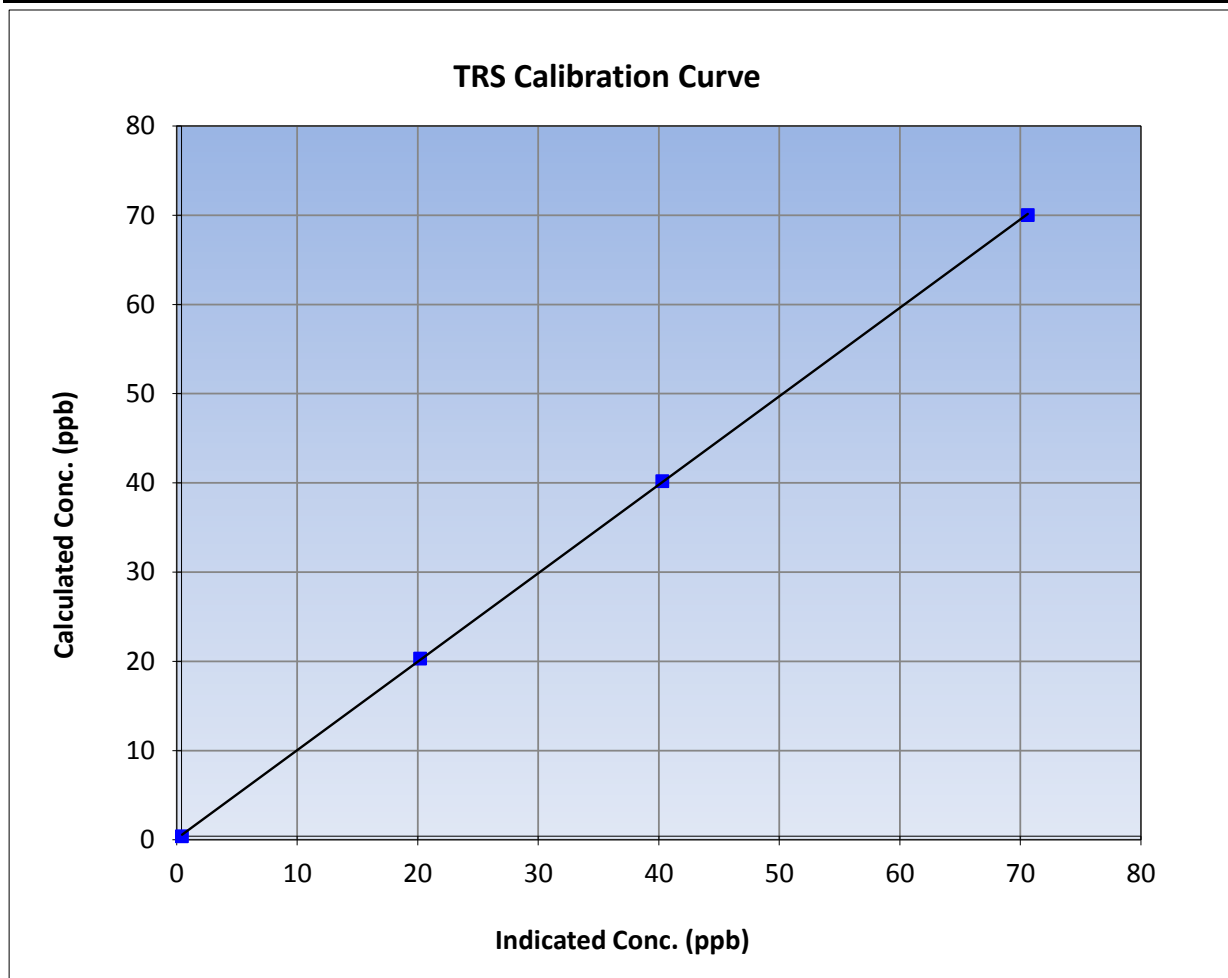
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	NA
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	12:00	End Time (MST)	14:50
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1218153358

Calibration Data

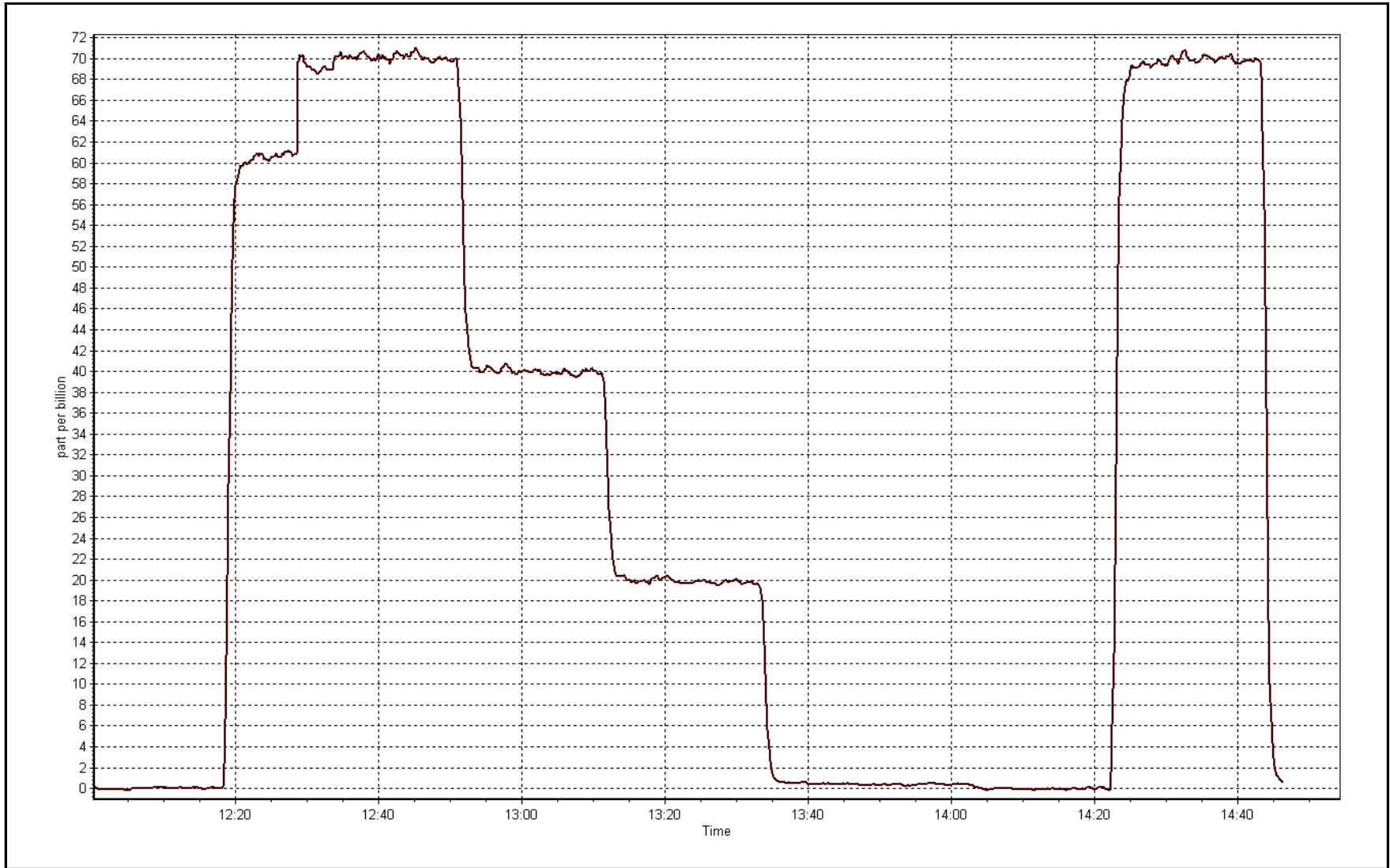
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999970	≥0.995
69.6	70.2	0.9917			
39.8	39.9	0.9978	Slope	0.991571	0.90 - 1.10
19.9	19.8	1.0058			
			Intercept	0.125428	+/-3



TRS Calibration Plot

Date: April 12, 2017

Location: Patricia McInnes





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	April 6, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	8:30	End time (MST):	14:20
Reason:	Routine		

Calibration Standards

Gas Cert Reference	LL107926	Cal Gas Expiry Date	February 16, 2019
CH4 Cal Gas Conc.	<u>505.0</u> ppm	CH4 Equiv Conc.	1068.8 ppm
C3H8 Cal Gas Conc.	<u>205.0</u> ppm	Station temp.	21 Deg C
Calibrator Model	API T700	Serial Number	2449
ZAG make/model	API T701	Serial Number	260

Analyzer Information

Analyzer make: Thermo 551

Analyzer serial #: 1331259521

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.1	75.0
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	175.0	175.0
CH4 SP Ratio	2.18E-04	2.20E-04	Flame Temp	405.0	405.0
CH4 Retention time	12.1	12.1	Carrier Pressure	35.8	35.7
NMHC SP Ratio	4.43E-05	4.41E-05	Fuel Pressure	42.3	42.3
NMHC Peak Area	193185	193915	Air Pressure	32.4	32.4

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	0.996683	0.995619
THC Cal Offset	0.059972	0.039936
CH4 Cal Slope	0.999081	0.993874
CH4 Cal Offset	0.036159	0.025886
NMHC Cal Slope	0.995815	0.998504
NMHC Cal Offset	0.024100	0.014086

Notes: H2 cylinder replaced after as founds. Pump replaced after as founds. Span adjusted.

Calibration Performed By:

Devin Russell



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5537	0.0	0.00	0.00	----
as found span	5458	84.2	16.24	16.38	0.991
calibrator zero	5537	0.0	0.00	0.00	----
high point	5458	84.2	16.24	16.29	0.997
second point	5499	42.1	8.12	8.09	1.004
third point	5522	21.1	4.07	4.01	1.015
as left zero	5537	0.0	0.00	0.00	----
as left span	5458	84.2	16.24	16.33	0.994
Average Correction Factor					1.005
Corrected As found	16.38	Prev response	16.23	*% change	-0.9%

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5537	0	0.00	0.00	----
as found span	5458	84.2	8.56	8.64	0.991
calibrator zero	5537	0	0.00	0.00	----
high point	5458	84.2	8.56	8.57	0.999
second point	5499	42.1	4.28	4.27	1.003
third point	5522	21.1	2.15	2.12	1.012
as left zero	5537	0	0.00	0.00	----
as left span	5458	84.2	8.56	8.58	0.998
Average Correction Factor					1.005
Corrected As found	8.64	Prev response	8.58	*% change	-0.7%

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5537	0.0	0.00	0.00	----
as found span	5458	84.2	7.67	7.73	0.993
calibrator zero	5537	0.0	0.00	0.00	----
high point	5458	84.2	7.67	7.71	0.995
second point	5499	42.1	3.84	3.81	1.007
third point	5522	21.1	1.92	1.89	1.017
as left zero	5537	0.0	0.00	0.00	----
as left span	5458	84.2	7.67	7.75	0.990
Average Correction Factor					1.006
Corrected As found	7.73	Prev response	7.64	*% change	-1.1%

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

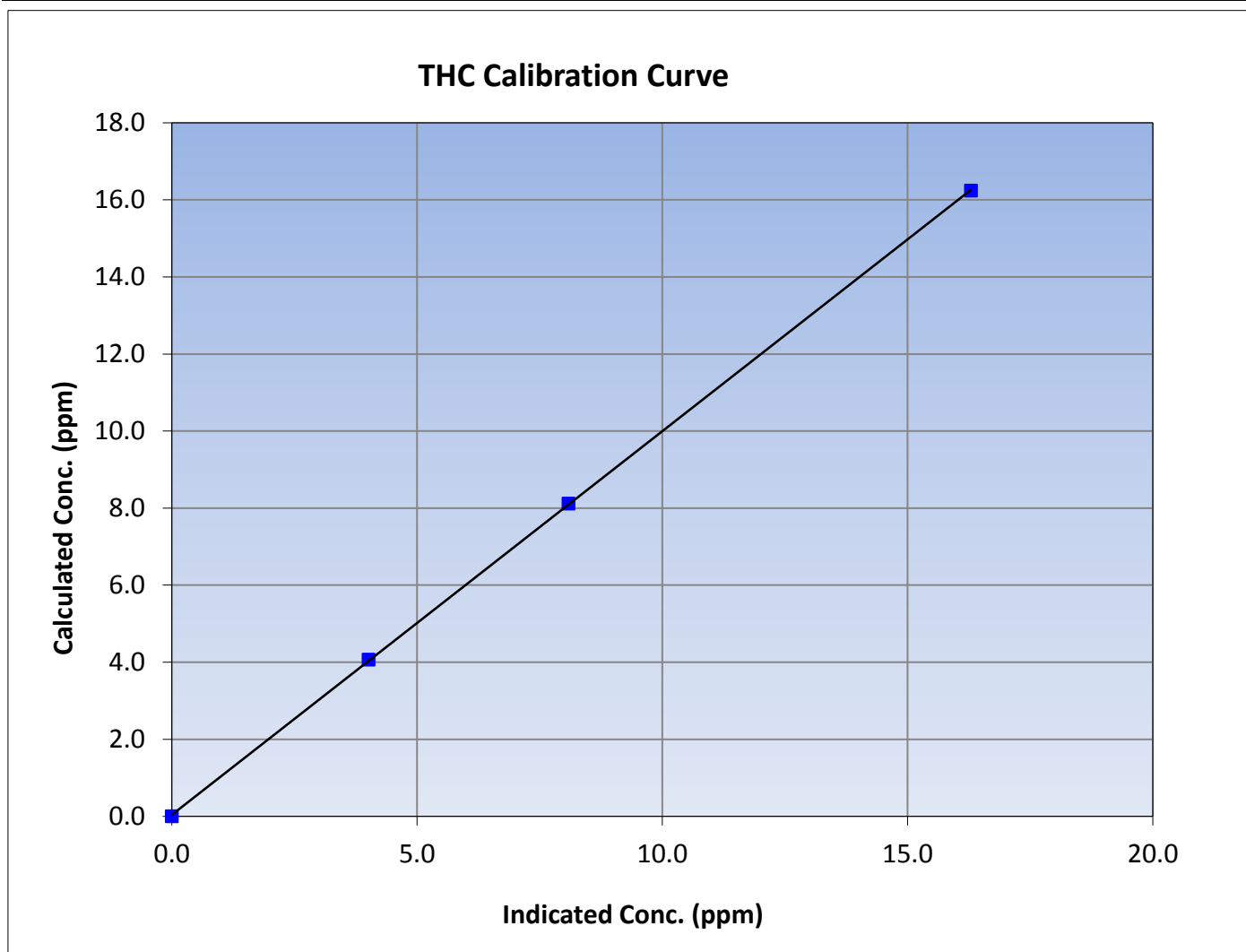
Version-02-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	AMS 06
Station Name	Patricia McInnes	Station Number	42802
Start Time (MST)	8:30	End Time (MST)	14:20
Analyzer make	Thermo 551	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999972	≥ 0.995			
16.24	16.29	0.9967						
8.12	8.09	1.0037				Slope	0.995619	0.90 - 1.10
4.07	4.01	1.0145						
			Intercept	0.039936	± 0.5			





Wood Buffalo Environmental Association

CH₄ Calibration Summary

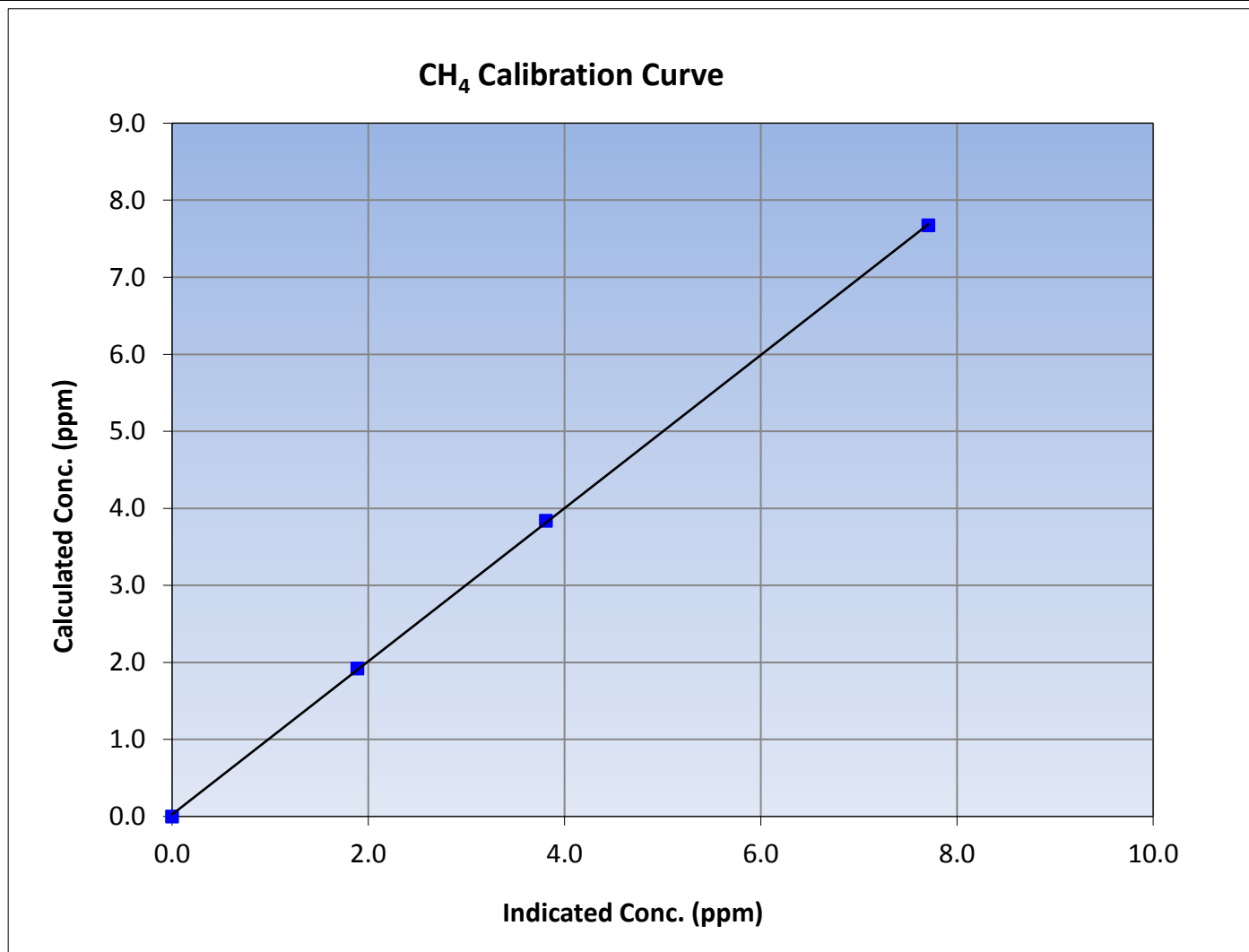
Version-02-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	AMS 06
Station Name	Patricia McInnes	Station Number	42802
Start Time (MST)	8:30	End Time (MST)	14:20
Analyzer make	Thermo 551	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	0.999942	<i>≥0.995</i>
7.67	7.71	0.9951			
3.84	3.81	1.0071			
1.92	1.89	1.0171			
			Slope	0.993874	<i>0.90 - 1.10</i>
			Intercept	0.025886	<i>+/-0.5</i>





Wood Buffalo Environmental Association

NMHC Calibration Summary

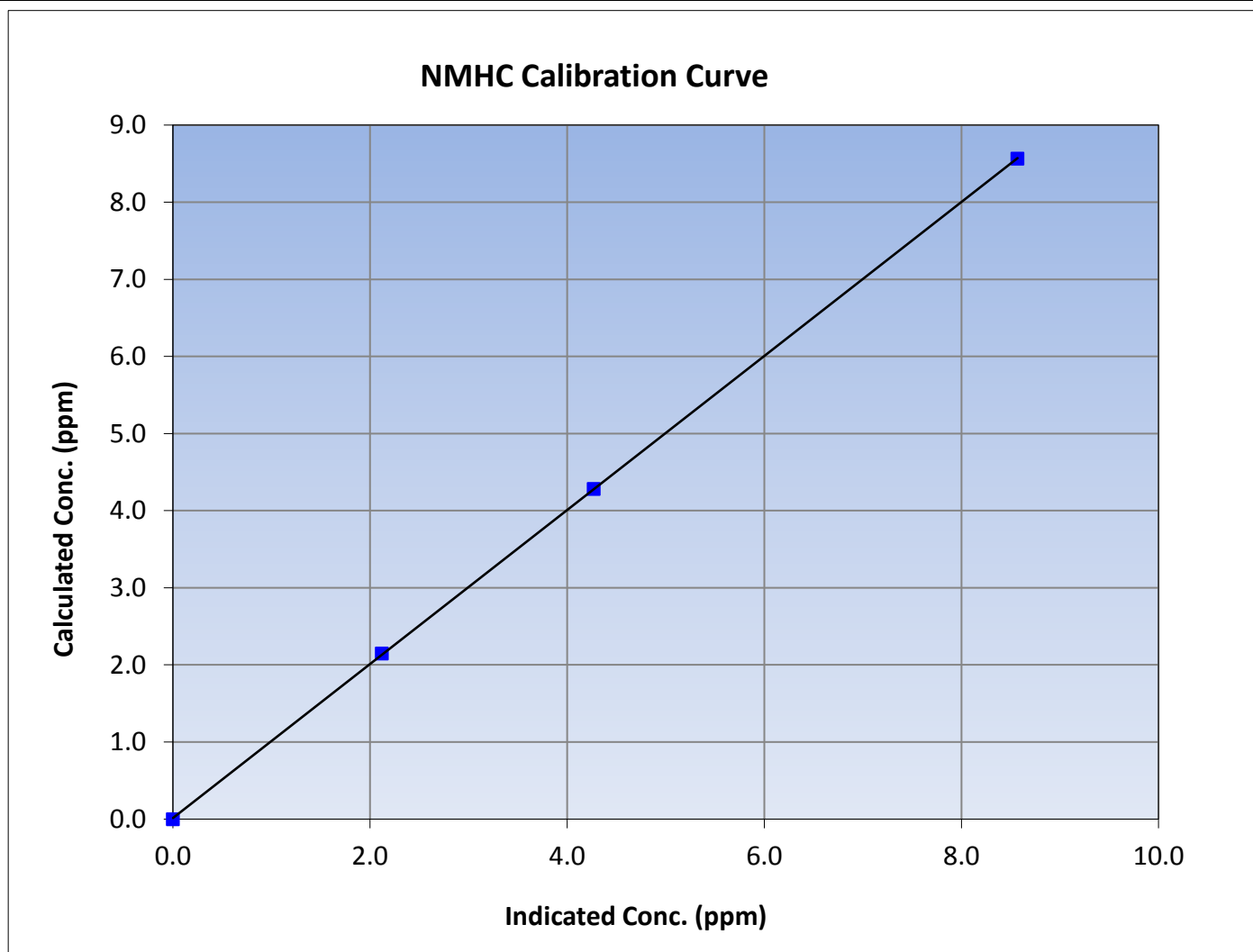
Version-02-2017

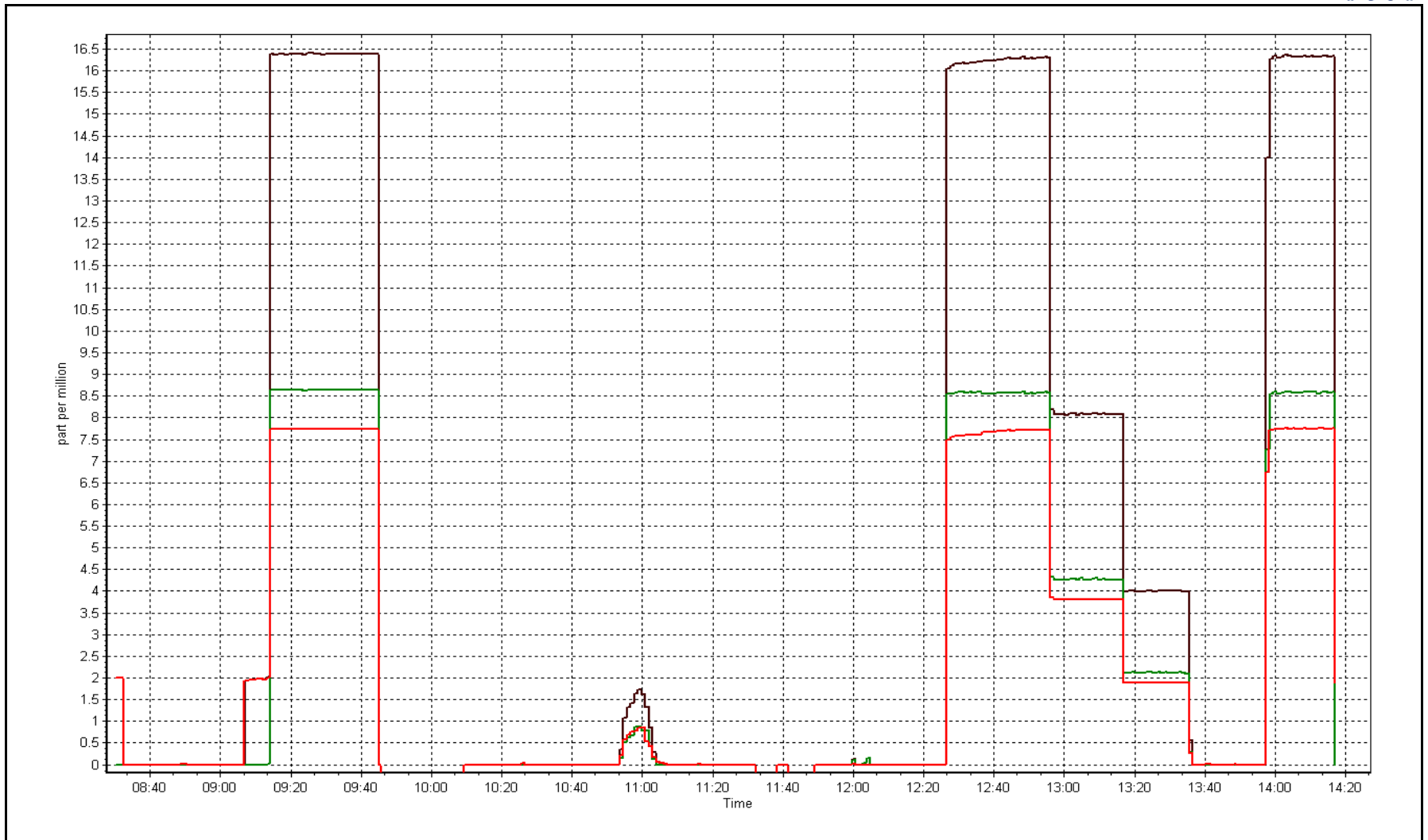
Station Information

Calibration Date	April 6, 2017	Previous Calibration	AMS 06
Station Name	Patricia McInnes	Station Number	42802
Start Time (MST)	8:30	End Time (MST)	14:20
Analyzer make	Thermo 551	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999988	<i>≥0.995</i>			
8.56	8.57	0.9994						
4.28	4.27	1.0031				Slope	0.998504	<i>0.90 - 1.10</i>
2.15	2.12	1.0122						
			Intercept	0.014086	<i>+/-0.5</i>			







Wood Buffalo Environmental Association

O₃ Calibration Summary

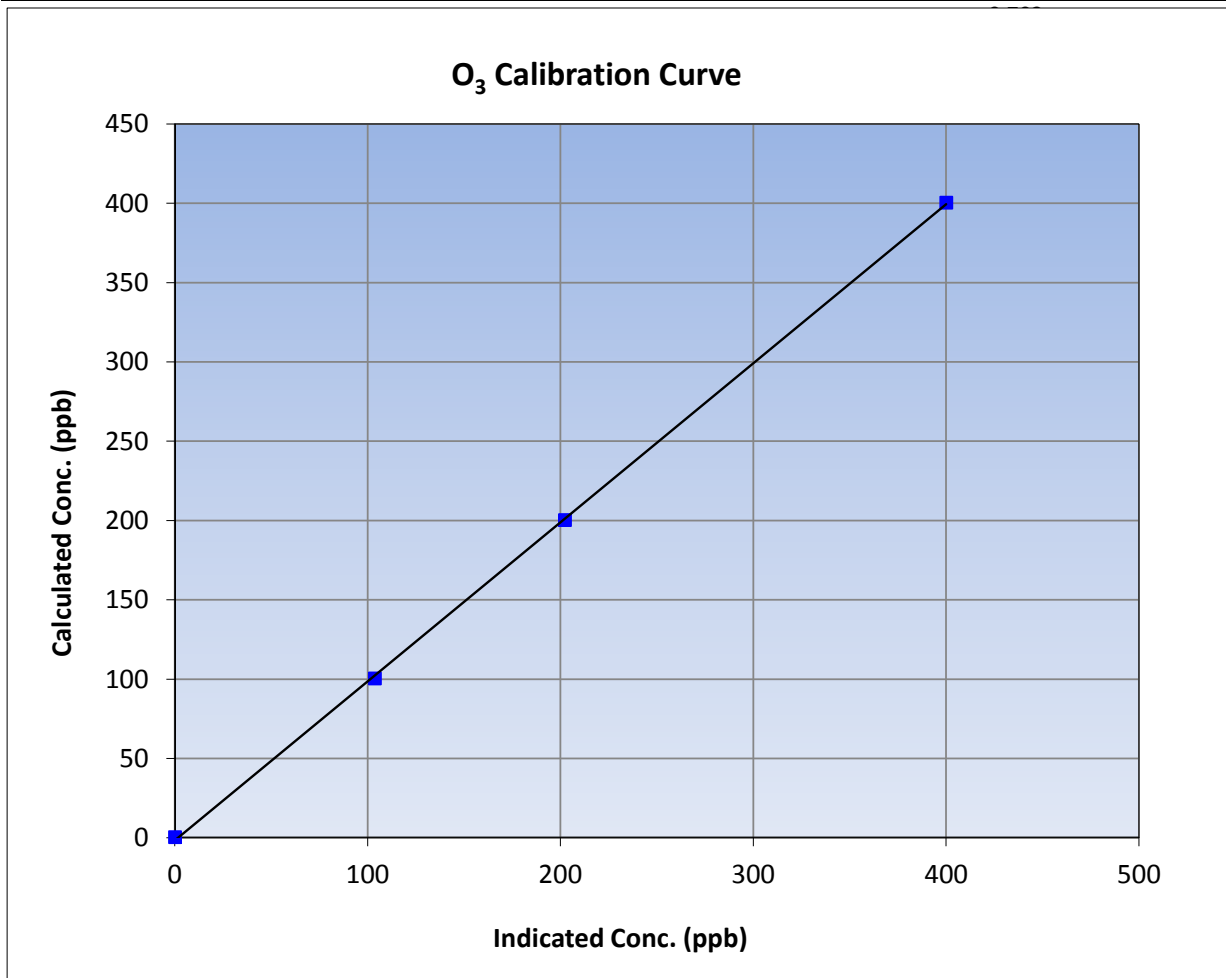
Version-03-2017

Station Information

Calibration Date	April 10, 2017	Previous Calibration	March 6, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	9:00	End Time (MST)	12:35
Analyzer make	Thermo 49i	Analyzer serial #	1300156234

Calibration Data

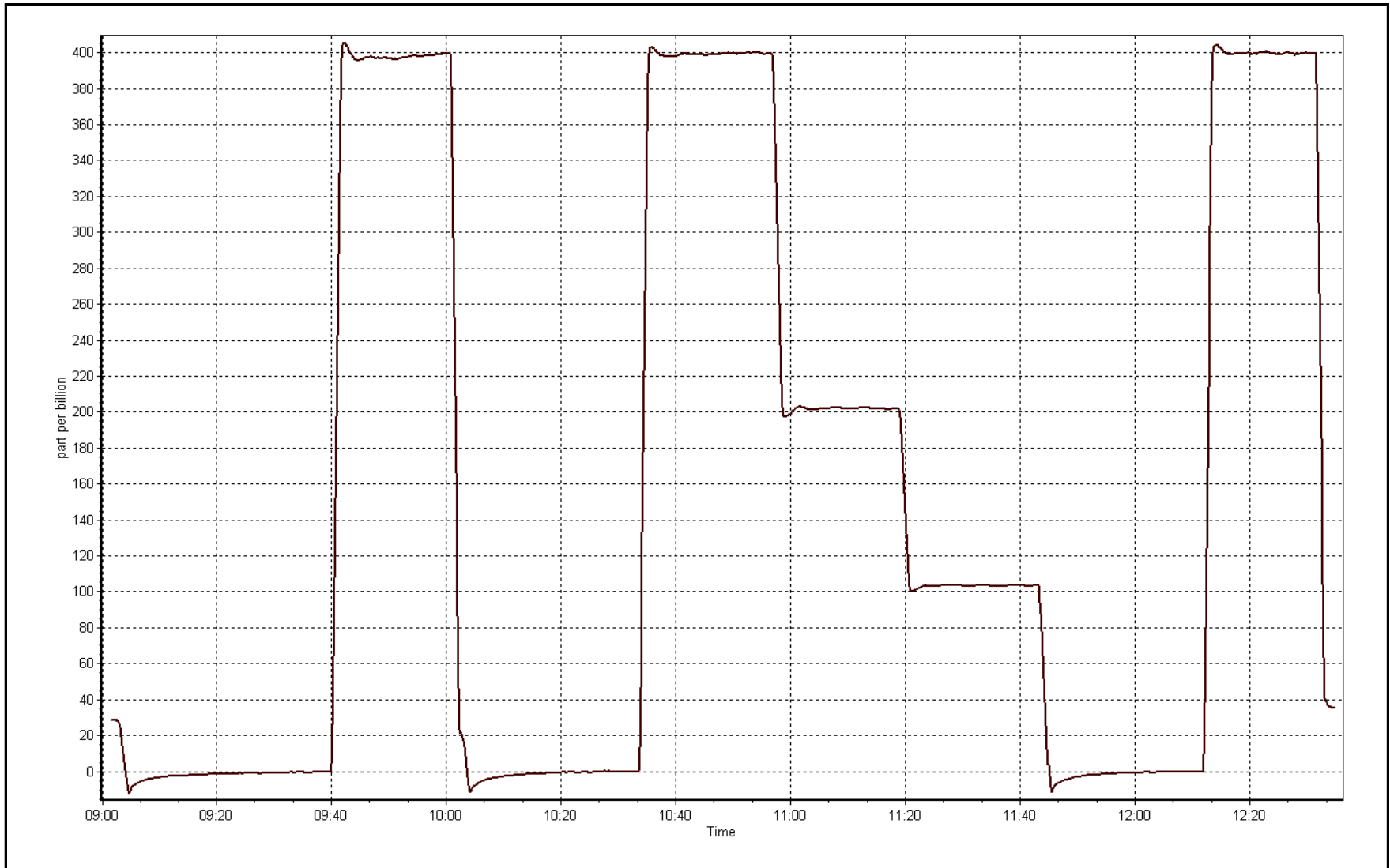
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	-0.2	----	Correlation Coefficient	≥0.995
400.0	399.6	1.0009		
200.0	202.0	0.9899	Slope	0.90 - 1.10
100.0	103.4	0.9670		
			Intercept	+/- 10



O₃ Calibration Plot

Date: April 10, 2017

Location: Patricia McInnes





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	April 4, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	7:55	End time (MST):	12:40
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL107926	Cal Gas Expiry Date	February 16, 2019
NOX Cal Gas Conc.	<u>52.4</u> ppb	NO Cal Gas Conc.	<u>52.4</u> ppb
Calibrator Model	API T700	Serial Number	2449
ZAG make/model	API T701	Serial Number	260

Analyzer Information

Analyzer make: Thermo 42i			Analyzer serial #: 1218153460		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	1.043	1.013	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	1.001	1.001	PMT Temperature	-3.0	-3.0
NO2 coefficient	1.000	1.000	Reaction cell Press	183.3	183.3
NO bkgrnd	3.1	3.0	Sample Flow	0.766	0.764
NOX bkgrnd	3.3	3.2	PMT Voltage	-772.6	-772.6

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.995004	1.000242
NO _x Cal Offset	0.157938	1.306089
NO Cal Slope	0.994821	0.999989
NO Cal Offset	0.000761	1.728967
NO ₂ Cal Slope	0.996966	0.998656
NO ₂ Cal Offset	-1.913860	1.086206



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Total flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5543	0.0	0.0	0.0	0.0	0.6	-0.2	0.7	----	----
as found span	5543	84.1	795.0	795.0	0.0	819.7	817.4	2.3	0.9699	0.9726
calibrator zero	5543	0.0	0.0	0.0	0.0	0.4	-0.1	0.5	----	----
high point	5543	84.1	795.0	795.0	0.0	794.3	794.0	0.3	1.0009	1.0012
second point	5543	42.1	398.0	398.0	0.0	396.0	395.6	0.3	1.0051	1.0060
third point	5543	21.1	199.5	199.5	0.0	196.3	196.1	0.2	1.0163	1.0174
as left zero										
as left span										
Average Correction Factor									1.0074	1.0082

Corrected As found	NO _x = 819.1 ppb	NO = 817.5 ppb		*Percent Change	NO _x = -2.5%
Previous Response	NO _x = 798.9 ppb	NO = 799.2 ppb		*Percent Change	NO = -2.2%

* = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	791.2	790.1	1.1	1.0049	1.0063	----	----
1st NO2 (400 ppb O3)	373.2	416.9	790.1	373.2	416.9	1.0062	----	0.9999	100.0%
2nd NO2 (200 ppb O3)	581.4	208.7	789.3	581.4	207.9	1.0073	----	1.0039	99.6%
3rd NO2 (100 ppb O3)	679.5	110.6	787.0	679.5	107.5	1.0103	----	1.0290	97.2%
2nd NO ref point	----	0.0	786.4	784.9	1.4	1.0110	1.0129	----	----
Average Correction Factor						1.0087	1.0096	1.0110	98.9%

Notes: As found span was around 3% high. Pump and charcoal scrubber were replaced last calibration. Span adjusted. As lefts not completed.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

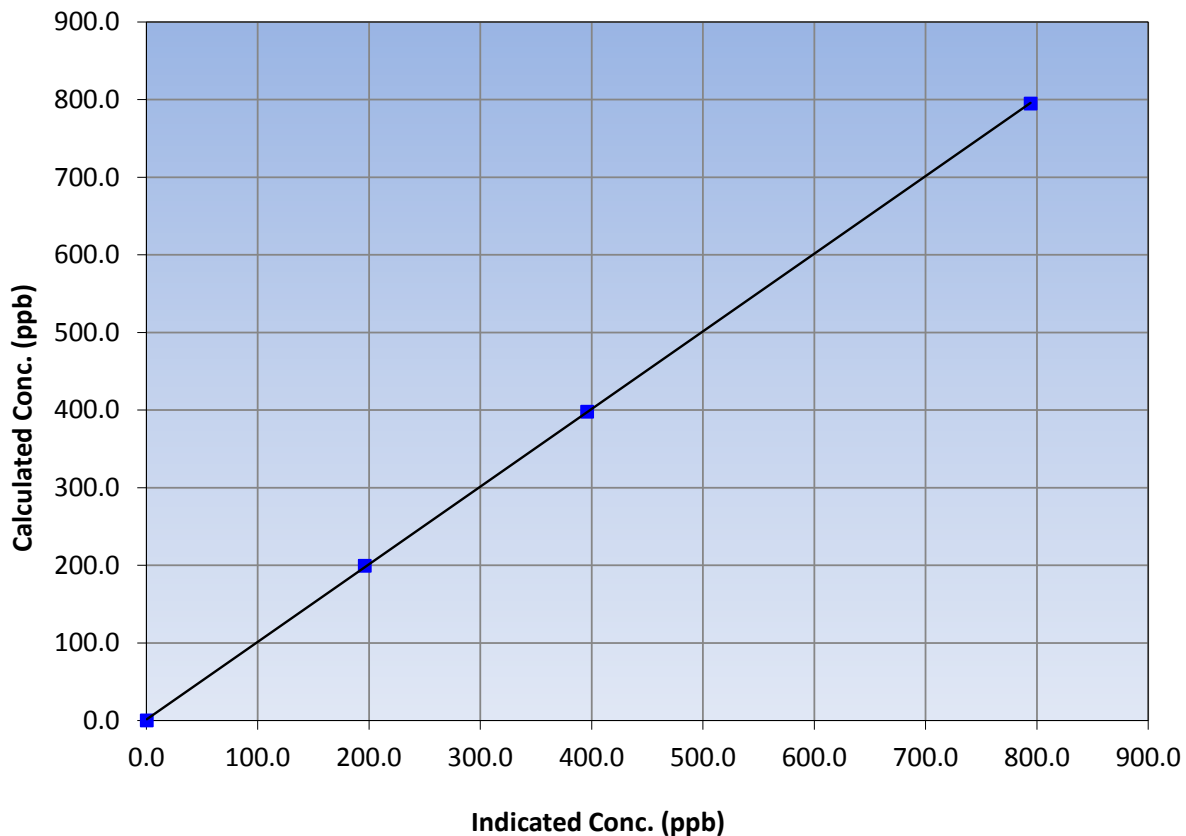
Station Information

Calibration Date	April 4, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	7:55	End Time (MST)	12:40
Analyzer make	Thermo 42i	Analyzer serial #	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.4	----	Correlation Coefficient	≥0.995	
795.0	794.3	1.0009			
398.0	396.0	1.0051			
199.5	196.3	1.0163			
			Slope	1.000242	0.90 - 1.10
			Intercept	1.306089	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

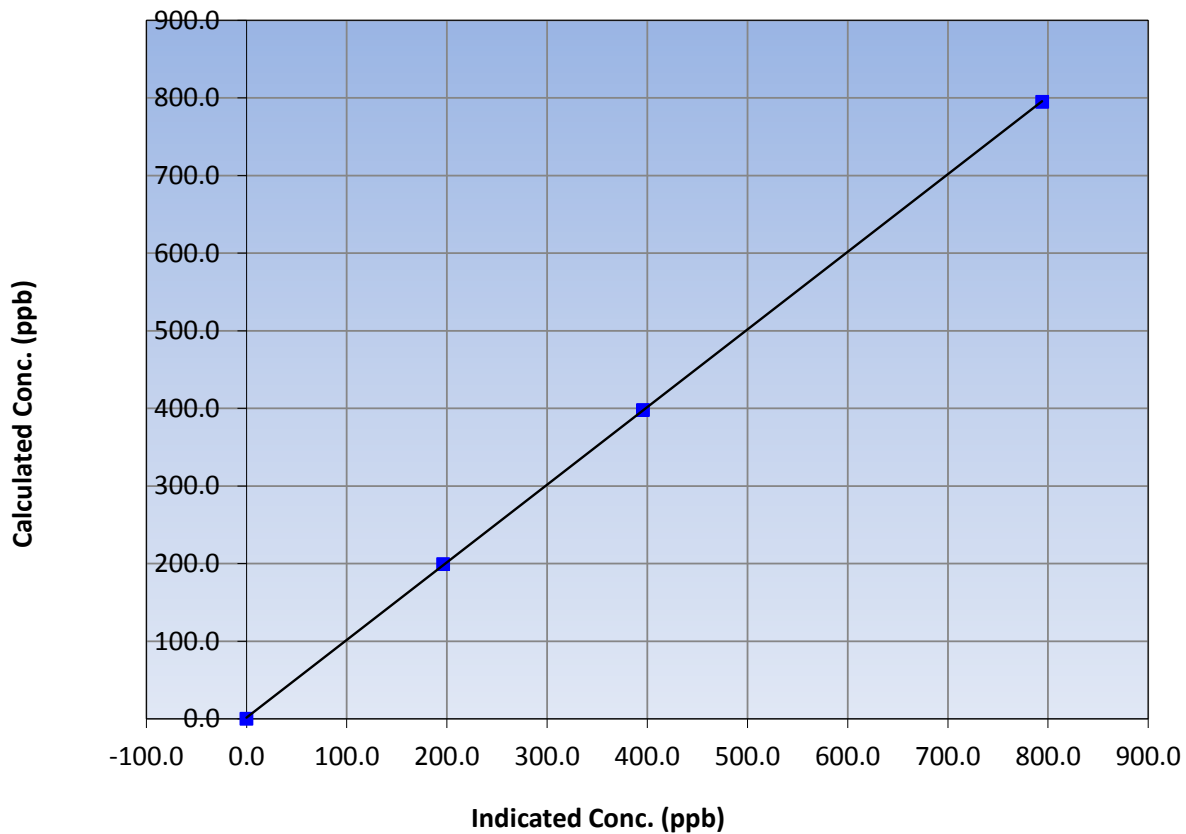
Station Information

Calibration Date	April 4, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	7:55	End Time (MST)	12:40
Analyzer make	Thermo 42i	Analyzer serial #	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
795.0	794.0	1.0012			
398.0	395.6	1.0060			
199.5	196.1	1.0174			
			Slope	0.999989	0.90 - 1.10
			Intercept	1.728967	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

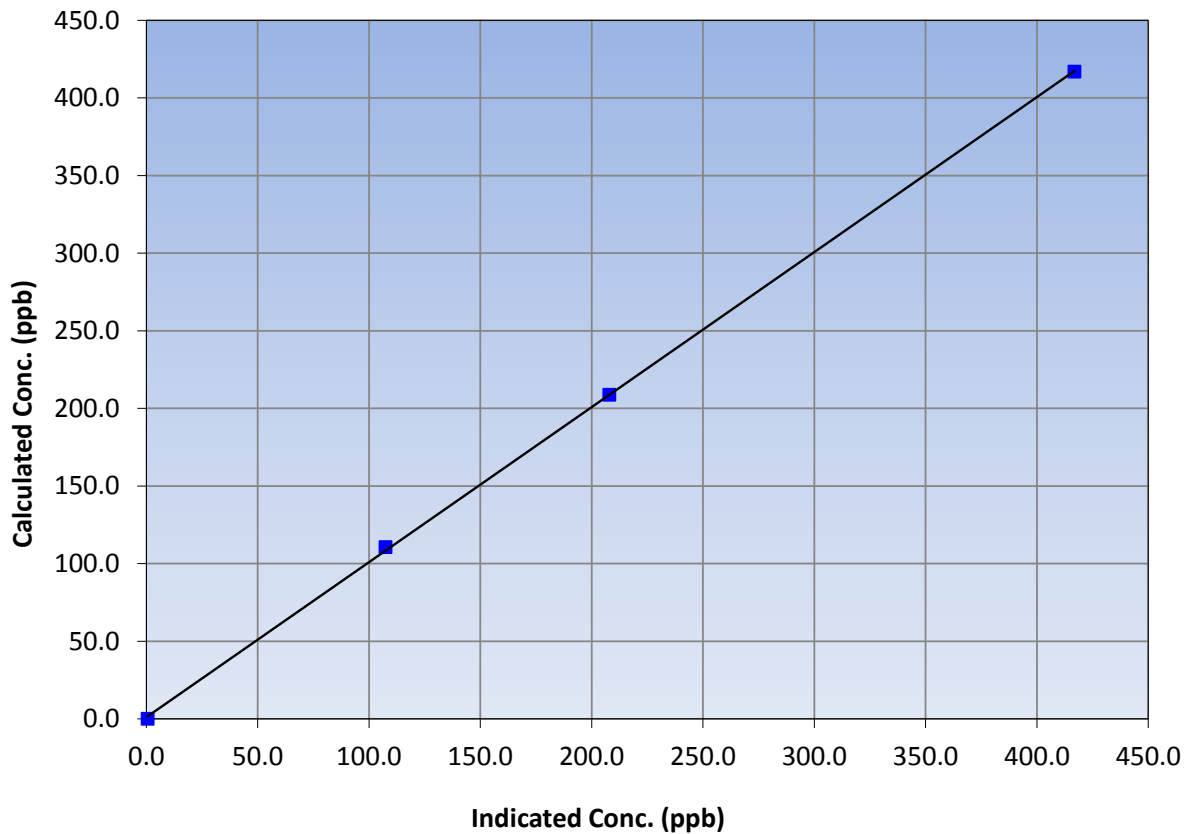
Station Information

Calibration Date	April 4, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	7:55	End Time (MST)	12:40
Analyzer make	Thermo 42i	Analyzer serial #	1218153460

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.5	----	Correlation Coefficient	≥0.995	
416.9	416.9	0.9999			
208.7	207.9	1.0039			
110.6	107.5	1.0290			
			Slope	0.998656	0.90 - 1.10
			Intercept	1.086206	+/-20

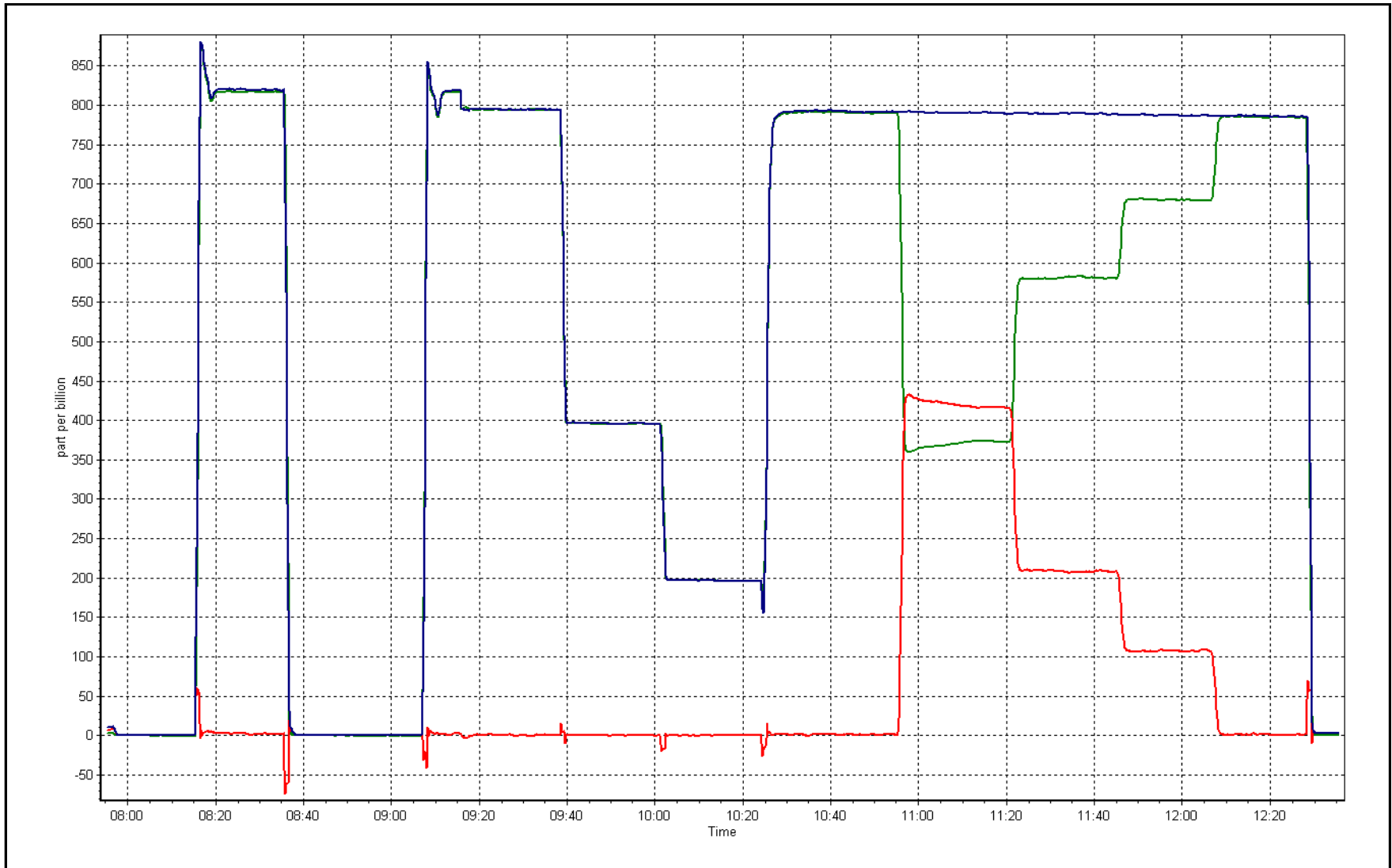
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 4, 2017

Location: Patricia McInnes





Wood Buffalo Environmental Association

TN - NO_x - NH₃ Calibration Report

Version-03-2017

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
NOX Cal Date:	April 3, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	8:00	End time (MST):	15:00
NH3 Cal Date:	April 4, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	9:35	End time (MST):	13:20
Reason:	Routine		

Calibration Standards

NOX Cal Gas Conc.	<u>52.4</u>	ppb	NO Gas Cylinder #	LL107926
NO Cal Gas Conc.	<u>52.4</u>	ppb	NO Cal Gas Expiry	February 16, 2019
NH3 Cal Gas Conc.	<u>95.4</u>	ppm	NH3 Gas Cylinder #	SA25992
			NH3 Cal Gas Expiry	May 24, 2017
Calibrator Model	API T700		Serial Number	2449
ZAG make/model	API T701		Serial Number	260

Analyzer Information

Analyzer make:	API T201	Analyzer serial #:	215		
Converter make:	API 501	Converter serial #:	217		
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>	
NO coefficient	1.230	1.230	NH3 Range (ppb)	0 - 1000 ppb	
NOX coefficient	1.255	1.255	NOX Range (ppb)	0 - 1000 ppb	
NO2 coefficient	1.000	1.000	PMT Temperature	7.0	7.0
NH3 coefficient	0.955	0.965	Reaction cell Press	4.4	4.5
TN coefficient	1.260	1.260	Sample Flow	563	562
NO bkgrnd	-2.9	-2.9	PMT Voltage	693	693
NOX bkgrnd	-2.5	-2.5	Moly Temperature	316.4	315.1
TN bkgrnd	-1.9	-1.9	NH3 Conv Temp	825	825

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.999390	1.001685
NO _x Cal Offset	2.139227	3.661642
NO Cal Slope	0.997832	0.999794
NO Cal Offset	2.516484	3.347615
NO ₂ Cal Slope	1.012816	1.002065
NO ₂ Cal Offset	0.234648	1.501720
NH3 Cal Slope	0.995377	0.996739
NH3 Cal Offset	0.385289	-1.199451
TN Cal Slope	0.970104	0.975970
TN Cal Offset	-0.200526	-2.436603



Wood Buffalo Environmental Association

TN - NOX - NH₃ Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Total flow rate (sccm)	Source gas flow rate (sccm)	Calculated TN concentration (ppb) (Cc)	Calculated NOX concentration (ppb) (Cc)	Calculated NH3 concentration (ppb) (Cc)	Indicated TN concentration (ppb) (Ic)	Indicated NOX concentration (ppb) (Ic)	Indicated NH3 concentration (ppb) (Ic)	TN Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NH3 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5543	0.0	0.0	0.0	0.0	0.6	0.7	-0.1	----	----
as found NO	5543	84.2	796.0	796.0	----	778.9	778.3	0.5	1.022	----
calibrator zero	5543	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
high NO point	5543	84.2	796.0	796.0	----	793.8	793.5	0.3	1.003	----
NO/O3 point	5543	84.2	796.0	796.0	----	783.0	782.2	0.8	1.017	----
as found NH3	5543	46.3	796.9	NA	796.9	787.6	----	767.4	1.012	1.038
first NH3	5543	46.3	796.9	NA	796.9	817.2	----	799.9	0.975	0.996
second NH3	5543	23.2	399.3	NA	399.3	414.2	----	402.8	0.964	0.991
third NH3	5543	11.7	201.4	NA	201.4	210.6	----	204.1	0.956	0.987
Average Correction Factor									1.0097	0.9913

Corrected As found TN = 778.2 ppb NO_x = 777.6 ppb NH3 = 767.5 ppb

Previous Response TN = 820.7 ppb NO_x = 794.3 ppb NH3 = 800.2 ppb

NH3 Previous Converter Efficiency = 95.5 %

NH3 Current Converter Efficiency = 96.5 %

*Percent Change TN = 5.5%

*Percent Change NO_x = 2.2%

*Percent Change NH3 = 4.3%

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

TN Calibration Summary

Version-03-2017

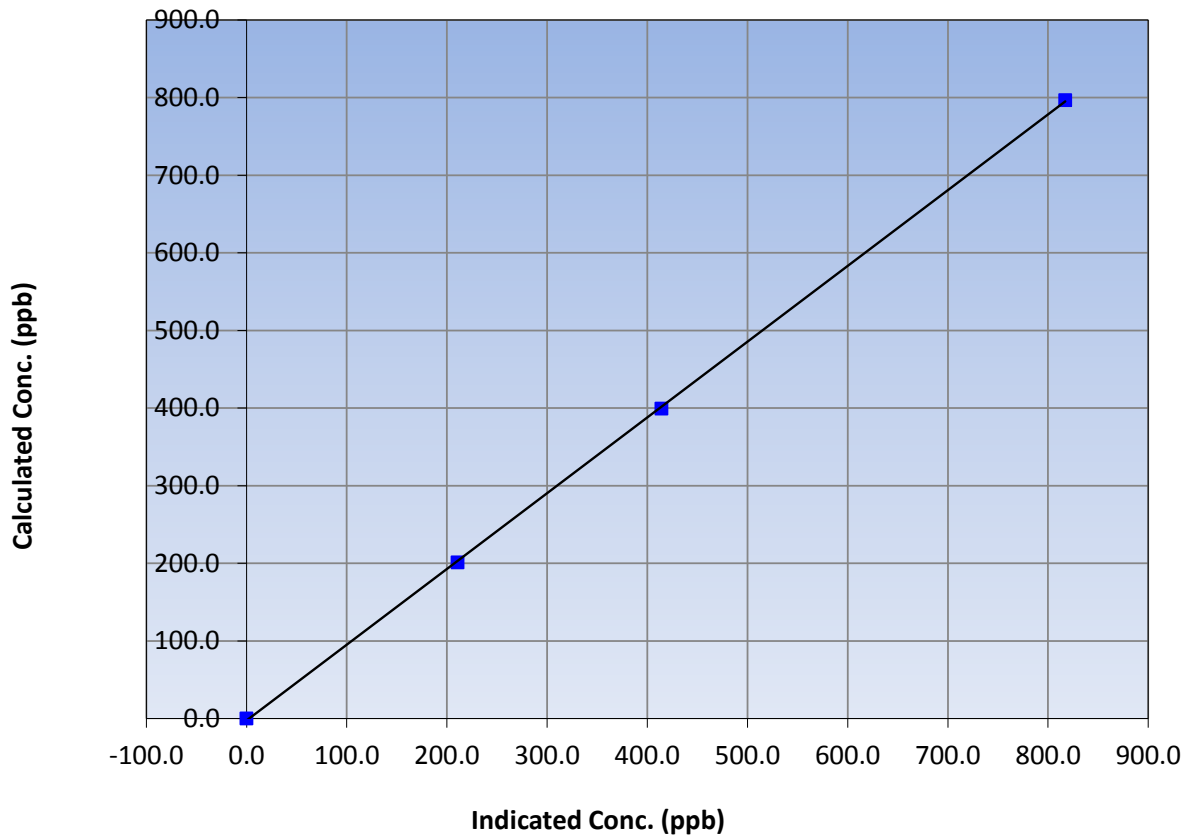
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	8:00	End Time (MST)	15:00
Analyzer make	API T201	Analyzer serial #	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
796.9	817.2	0.9751			
399.3	414.2	0.9641			
201.4	210.6	0.9561			
			Slope	0.975970	0.90 - 1.10
			Intercept	-2.436603	+/-20

TN Calibration Curve





Wood Buffalo Environmental Association

NH₃ Calibration Summary

Version-03-2017

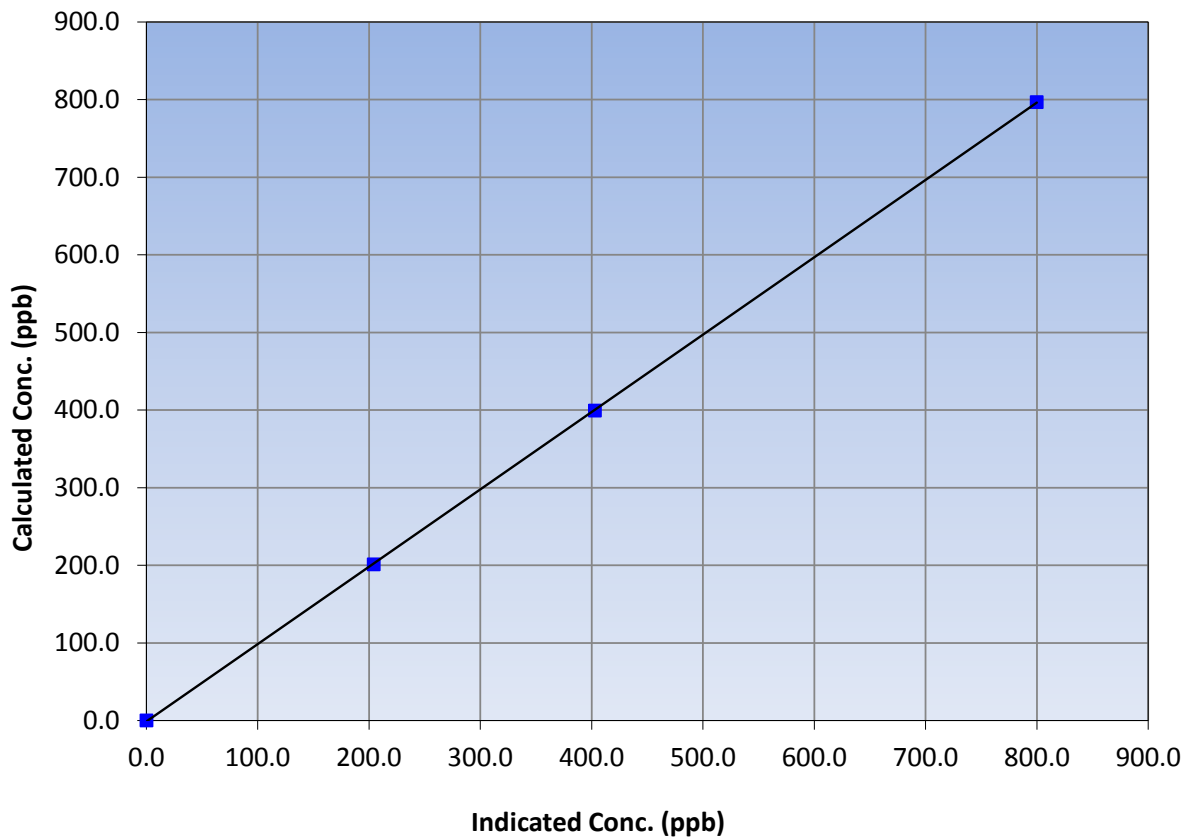
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	8:00	End Time (MST)	15:00
Analyzer make	API T201	Analyzer serial #	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
796.9	799.9	0.9962			
399.3	402.8	0.9912			
201.4	204.1	0.9865			
			Slope	0.996739	0.90 - 1.10
			Intercept	-1.199451	+/-20

NH₃ Calibration Curve





Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

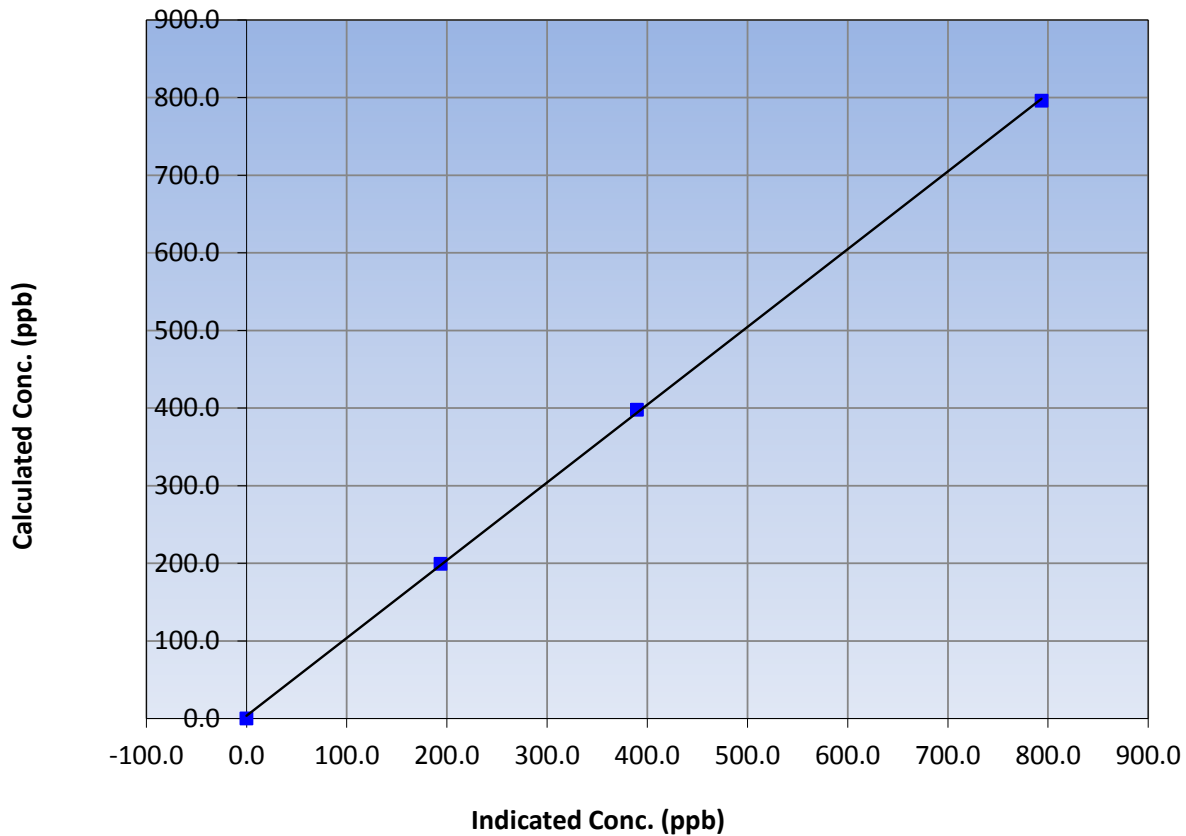
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	8:00	End Time (MST)	15:00
Analyzer make	API T201	Analyzer serial #	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
796.0	793.5	1.0032			
398.0	389.5	1.0217			
199.5	193.6	1.0304			
			Slope	1.001685	0.90 - 1.10
			Intercept	3.661642	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

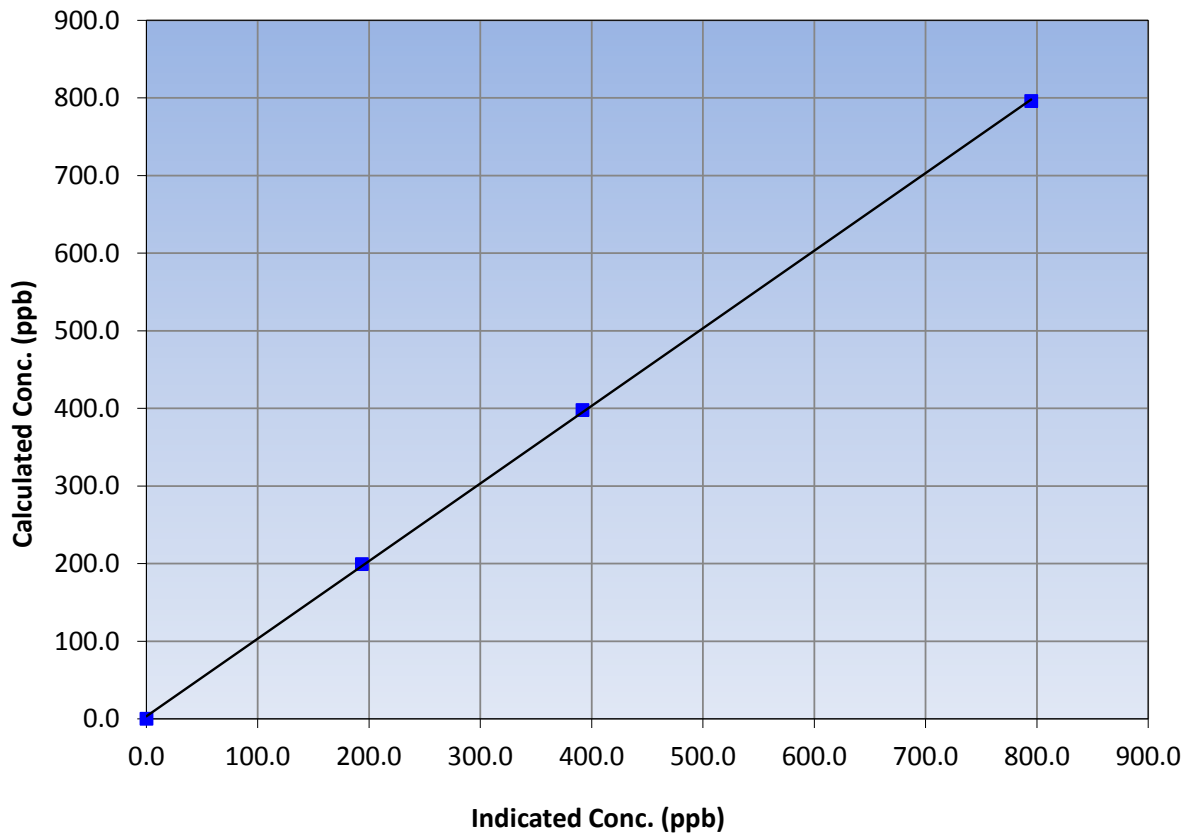
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	8:00	End Time (MST)	15:00
Analyzer make	API T201	Analyzer serial #	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
796.0	794.8	1.0014			
398.0	391.8	1.0158			
199.5	193.7	1.0298			
			Slope	0.999794	0.90 - 1.10
			Intercept	3.347615	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

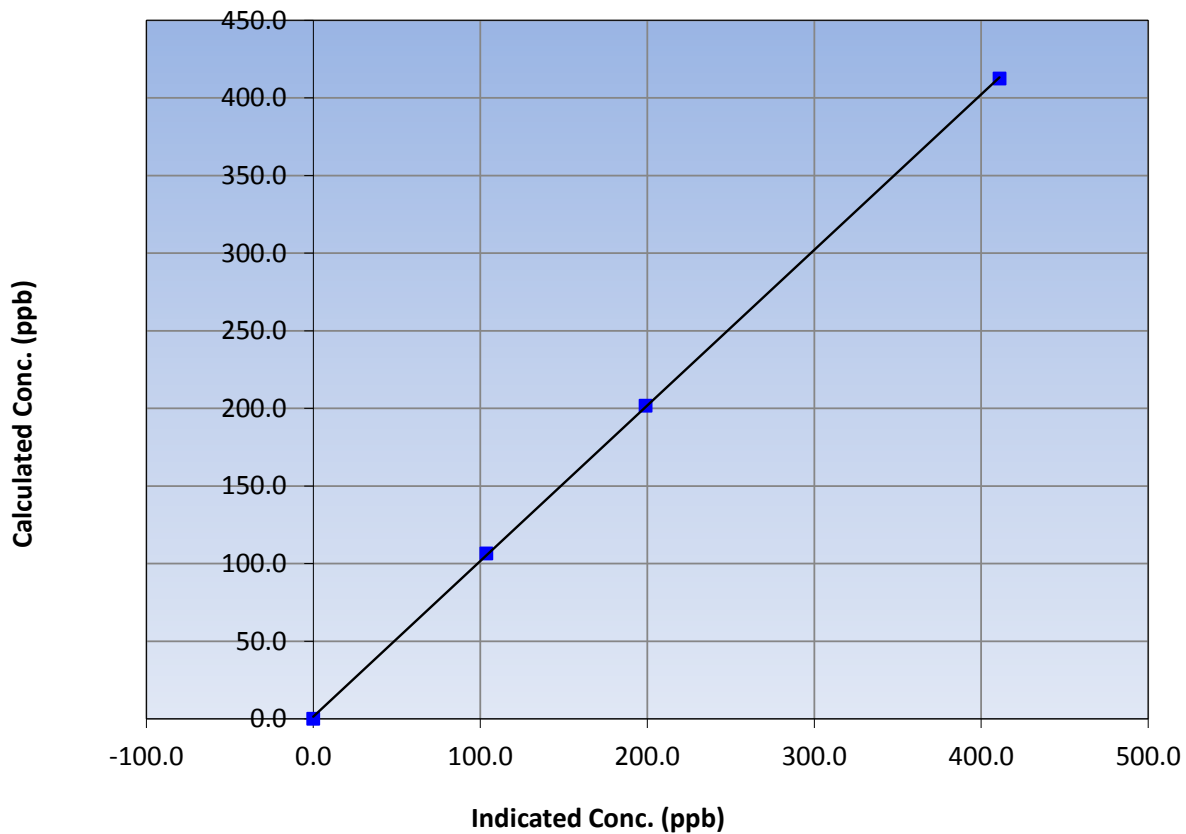
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 7, 2017
Station Name	Patricia McInnes	Station Number	AMS 06
Start Time (MST)	8:00	End Time (MST)	15:00
Analyzer make	API T201	Analyzer serial #	215

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient	≥0.995
412.5	410.9	1.0039		
201.8	199.0	1.0143		
106.5	103.5	1.0285		
			Slope	0.90 - 1.10
			Intercept	+/-20

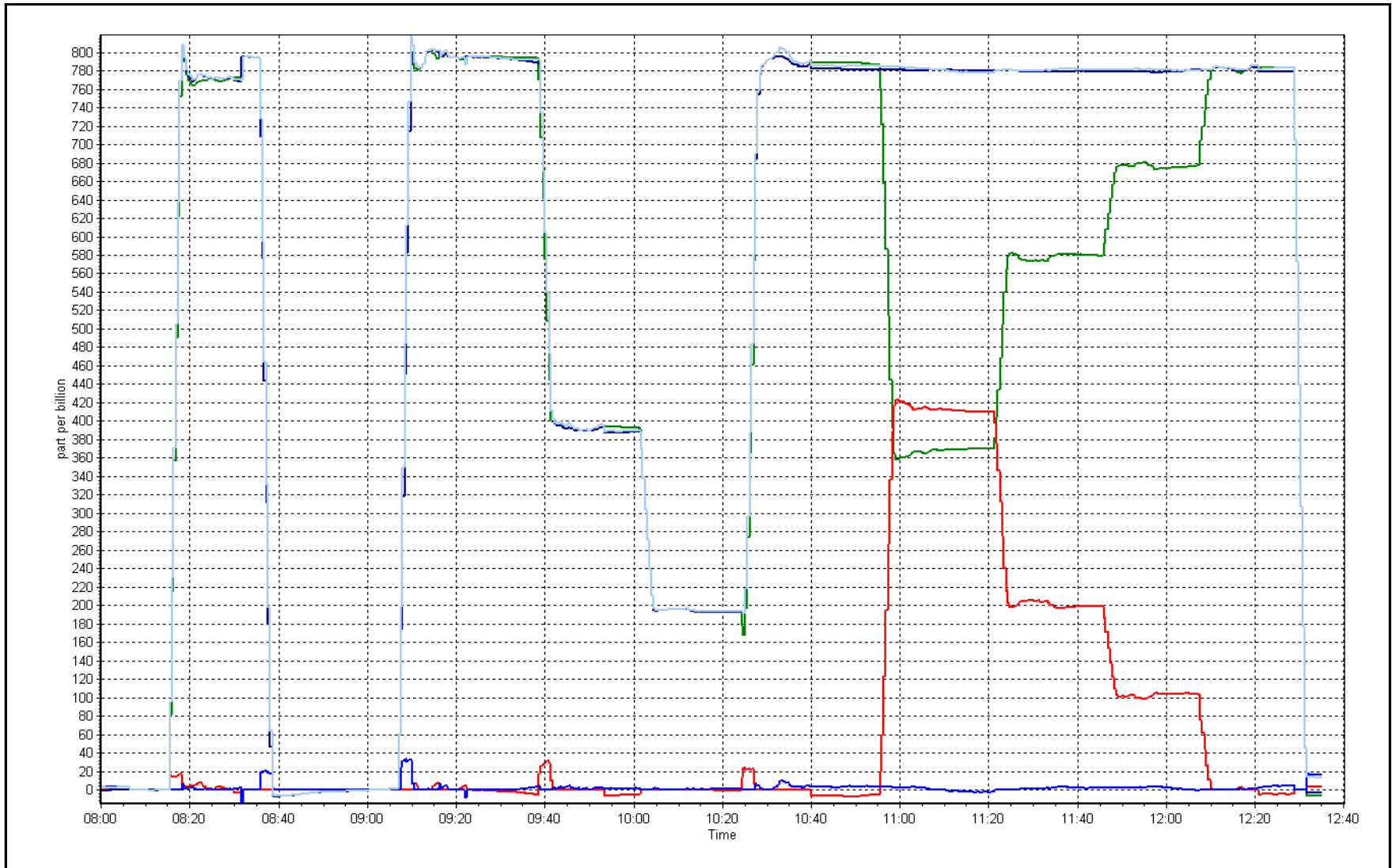
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 3, 2017

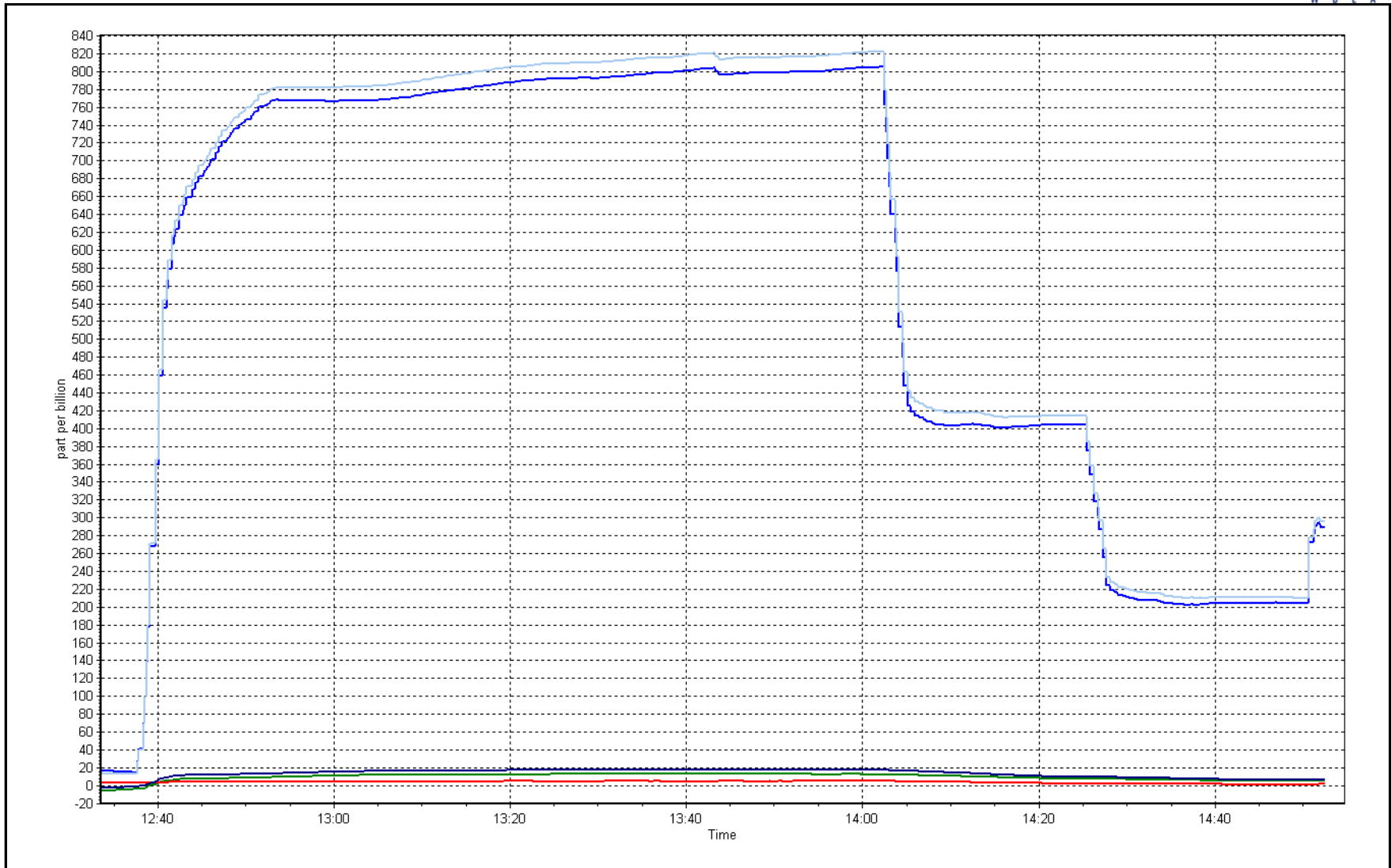
Location: Patricia McInnes



NH₃ Calibration Plot

Date: April 4, 2017

Location: Patricia McInnes





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Patricia McInnes	Station number:	AMS 06
Calibration Date:	April 4, 2017	Last Cal Date:	March 9, 2017
Start time (MST):	10:05	End time (MST):	11:32
Sharp Model:	Thermo SHARP 5030	S/N:	E-1475
Particulate Fraction:	PM2.5	C14 Source S/N:	5680
Flow Meter Make/Model:	Delta Cal	S/N:	1451
Temp/RH standard:	Delta Cal	S/N:	1451

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	5	4.8	5	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	974	971.25	974	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	996.6	1000	<input type="checkbox"/>	+/- 50 LPH
Nephelometer zero	0.2	-----	0.2	<input type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: _____ Last Cal Date: January 17, 2017
 Flow w/o adaptor: 16.65 Flow w/ adaptor: 16.47

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>2597</u>	Foil S/N: <u>2597</u>	
Foil Calibration	Foil Mass: <u>1167</u>	Foil Mass: <u>1167</u>	
	Calibration Date: <u>April 4, 2017</u>	Calibration Date: <u>June 9, 2016</u>	
(Limit) +/- 5% of previous	Correction Factor: <u>6887</u>	Correction Factor: <u>6877</u>	0.15%

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Cyclone head cleaned. No adjustments made to T1, P3, or flow. Foil Calibration completed; did not adjust. No adjustment to Nephelometer.

Calibration by: Devin Russell



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 7
ATHABASCA VALLEY
APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	684	36	36	100	10	0	2	0
TRS (ppb) Average	686	33	34	99.86	2	0	1	0
THC (ppm) Average	684	36	36	100	2.9	-	2.2	-
NMHC (ppm) Average	684	36	36	100	0.4	-	0.089	-
CH4(ppm) Average	684	36	36	100	2.6	-	2.1	-
O3 (ppb) Average	686	33	34	99.86	57	0	44	-
NO2 (ppb) Average	684	36	36	100	32	0	11	-
NO (ppb) Average	684	36	36	100	22	-	3	-
NOX (ppb) Average	684	36	36	100	42	-	13	-
PM2.5 (ug/m3) Average	712	2	8	99.17	25.5	-	8.1	0
CO(ppm) Average	686	33	34	99.86	0.3	0	0.1	-
Temperature 2 m (C) Average	720	0	0	100	16.7	-	9.9	-
Barometric Pressure (inHg) Average	720	0	0	100	29.5	-	29.5	-
Relative Humidity (%) Average	720	0	0	100	99	-	83	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	32	-	17	-
Wind Direction 10 m (deg) Average	719	0	1	99.86	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	0.4	1	-	0	0	0	0	0	1	10
TRS (ppb) Average	686	0.3	0	-	0	0	0	0	0	0	2
THC (ppm) Average	684	1.98	0.1	-	1.9	1.9	1.9	2	2	2	2.9
NMHC (ppm) Average	684	0.005	0.033	-	0	0	0	0	0	0	0.4
CH4(ppm) Average	684	1.97	0.1	-	1.9	1.9	1.9	2	2	2	2.6
O3 (ppb) Average	686	33.3	10	-	7	19	26	34	41	47	57
NO2 (ppb) Average	684	5.1	5	-	0	1	2	4	7	11	32
NO (ppb) Average	684	1	2	-	0	0	0	0	1	2	22
NOX (ppb) Average	684	6.1	6	-	0	1	3	5	8	13	42
PM2.5 (ug/m3) Average	712	5.36	2.4	-	0.4	2.9	3.9	4.8	6.3	8.1	25.5
CO(ppm) Average	686	0.12	0	-	0.1	0.1	0.1	0.1	0.1	0.1	0.3
Temperature 2 m (C) Average	720	2.81	5.5	-	-8.4	-3.9	-1.5	2.3	6.3	11.4	16.7
Barometric Pressure (inHg) Average	720	29.03	0.2	-	28.5	28.7	28.9	29	29.1	29.4	29.5
Relative Humidity (%) Average	720	61.2	18	-	19	35	47	62	76	86	99
Wind Speed 10 m (km/h) Average	719	9.4	6	-	0	2	5	9	13	17	32
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS, O3, CO	03 Apr 2017 10:00	03 Apr 2017 10:00	1	Maintenance - sample manifold cleaned
PM2.5	01 Apr 2017 16:00	01 Apr 2017 16:00	1	Unstable operation - excessive baseline drift
PM2.5	05 Apr 2017 15:00	05 Apr 2017 15:00	1	Unstable operation - excessive baseline drift
PM2.5	06 Apr 2017 14:00	06 Apr 2017 17:00	4	Unstable operation - excessive baseline drift
Wind Speed, Wind Direction	27 Apr 2017 05:00	27 Apr 2017 05:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Athabasca Valley - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 10 ppb on Apr 3 15:00	Maximum Daily Average: 2.0 ppb on Apr 12		Hours of Data:	684
Minimum Value: 0 ppb on Apr 1 05:00	Minimum Daily Average: 0.1 ppb on Apr 8		Hours of Missing Data:	36
Maximum Diurnal Average: 0.6 ppb at hour 15	Minimum Diurnal Average: 0.2 ppb at hour 1		Hours of Calibration:	36
Monthly Average: 0.4 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 4		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	1
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	1	1	1	1	1	0	0	0.5	3
3-Apr	0	0	Z	0	0	0	0	1	C	C	C	C	C	C	10	6	1	1	1	0	0	0	0	0	--	10
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0.3	1
6-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
7-Apr	Z	0	0	0	2	2	2	2	1	1	2	7	5	1	1	1	0	0	0	0	0	0	0	0	1.2	7
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
12-Apr	1	4	4	3	2	Z	1	2	4	9	6	4	1	1	1	1	1	1	0	0	0	0	0	0	2.0	9
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
14-Apr	1	Z	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	4	2	1	1	0	0	0.6	4
16-Apr	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
19-Apr	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	2	1	0	0	0	0	0	0	0	0	0.7	2
20-Apr	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0.2	1
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0.4	1
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0.3	1
30-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

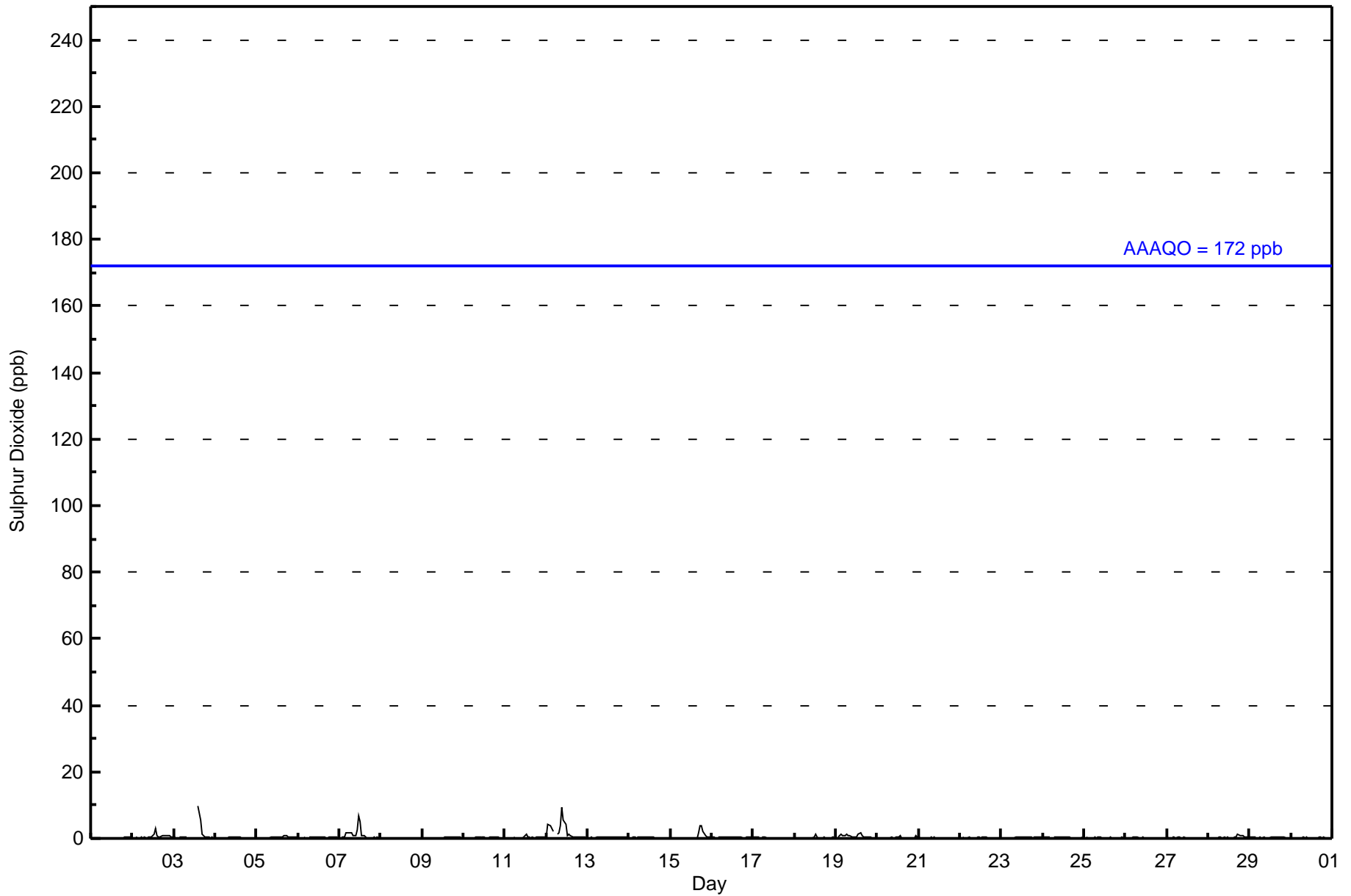
0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.6	0.5	0.4	0.6	0.4	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	Diurnal Average	
1	4	4	3	2	2	2	2	2	4	9	6	7	5	3	10	6	2	4	4	2	1	1	1	0	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

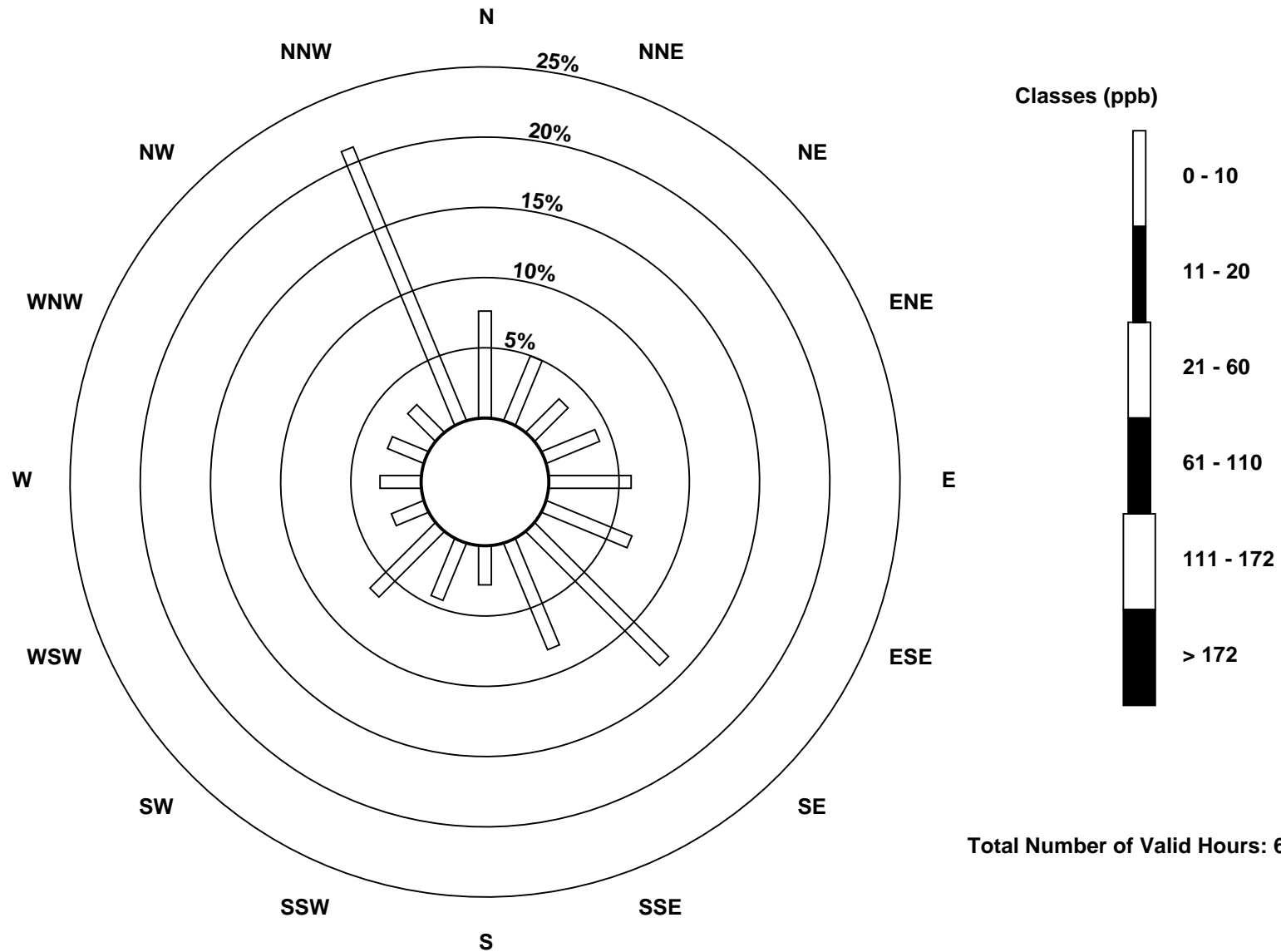
Total Number of Valid Hours: 683

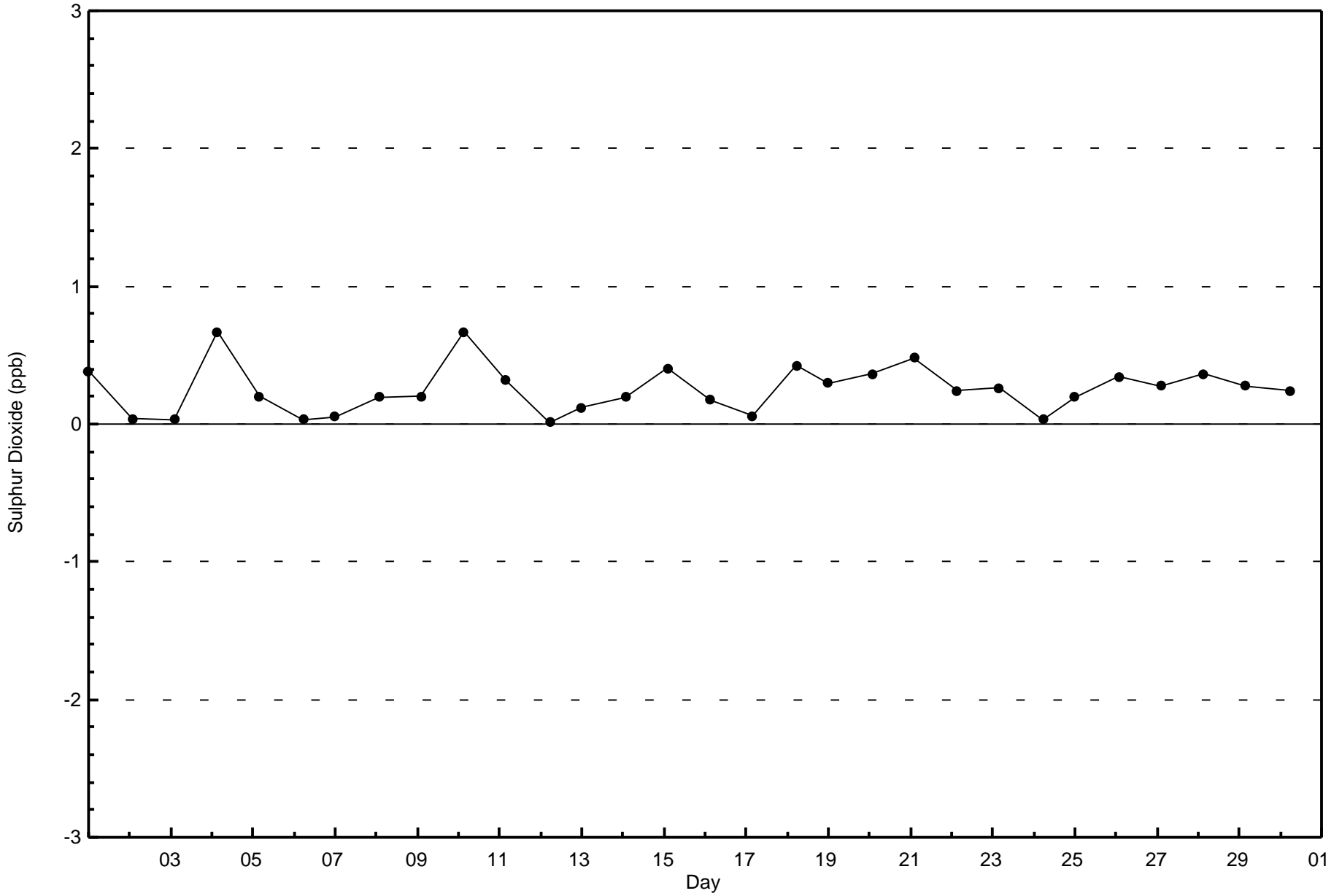
Total Number of Hours: 720

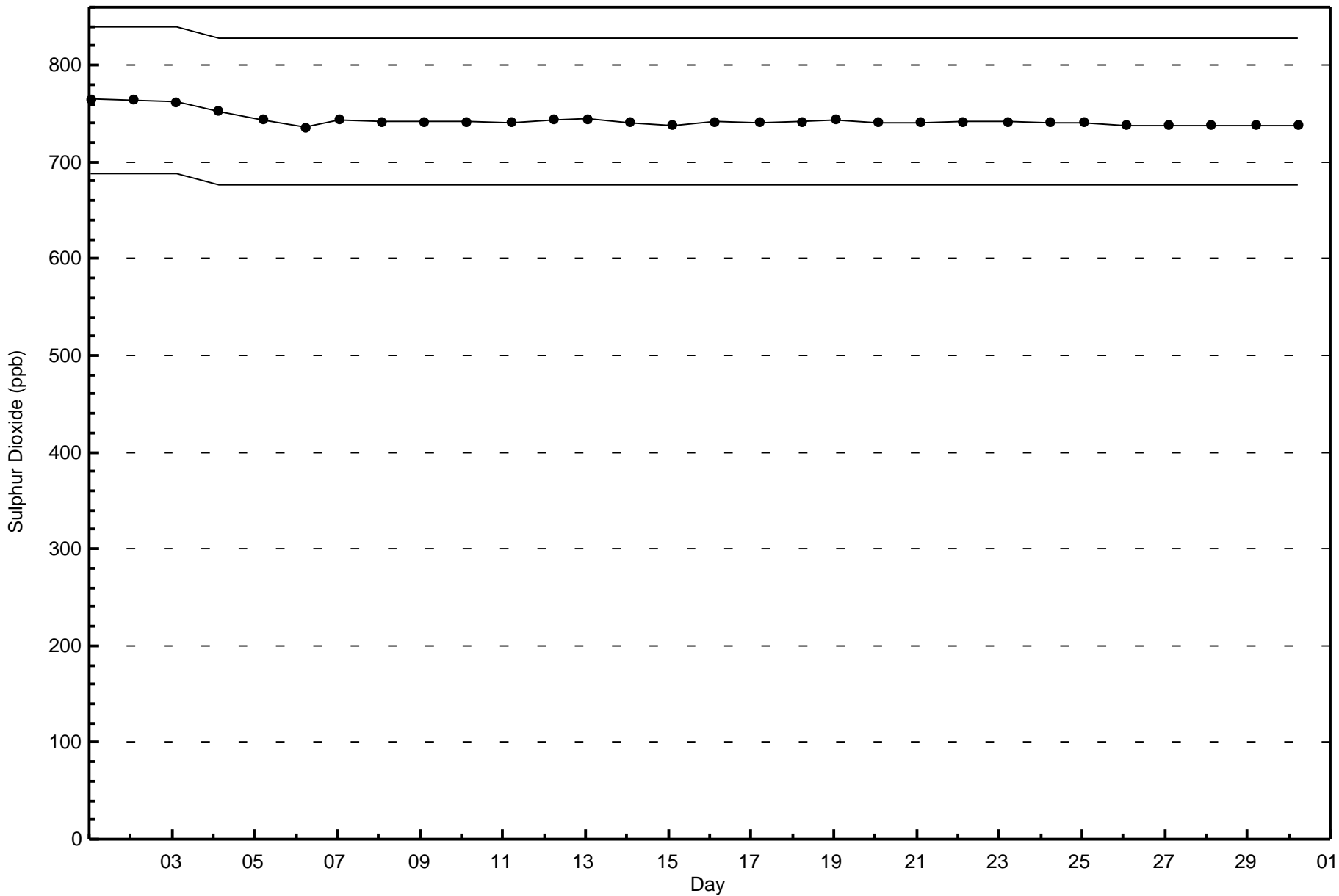


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley (AMS 7)









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

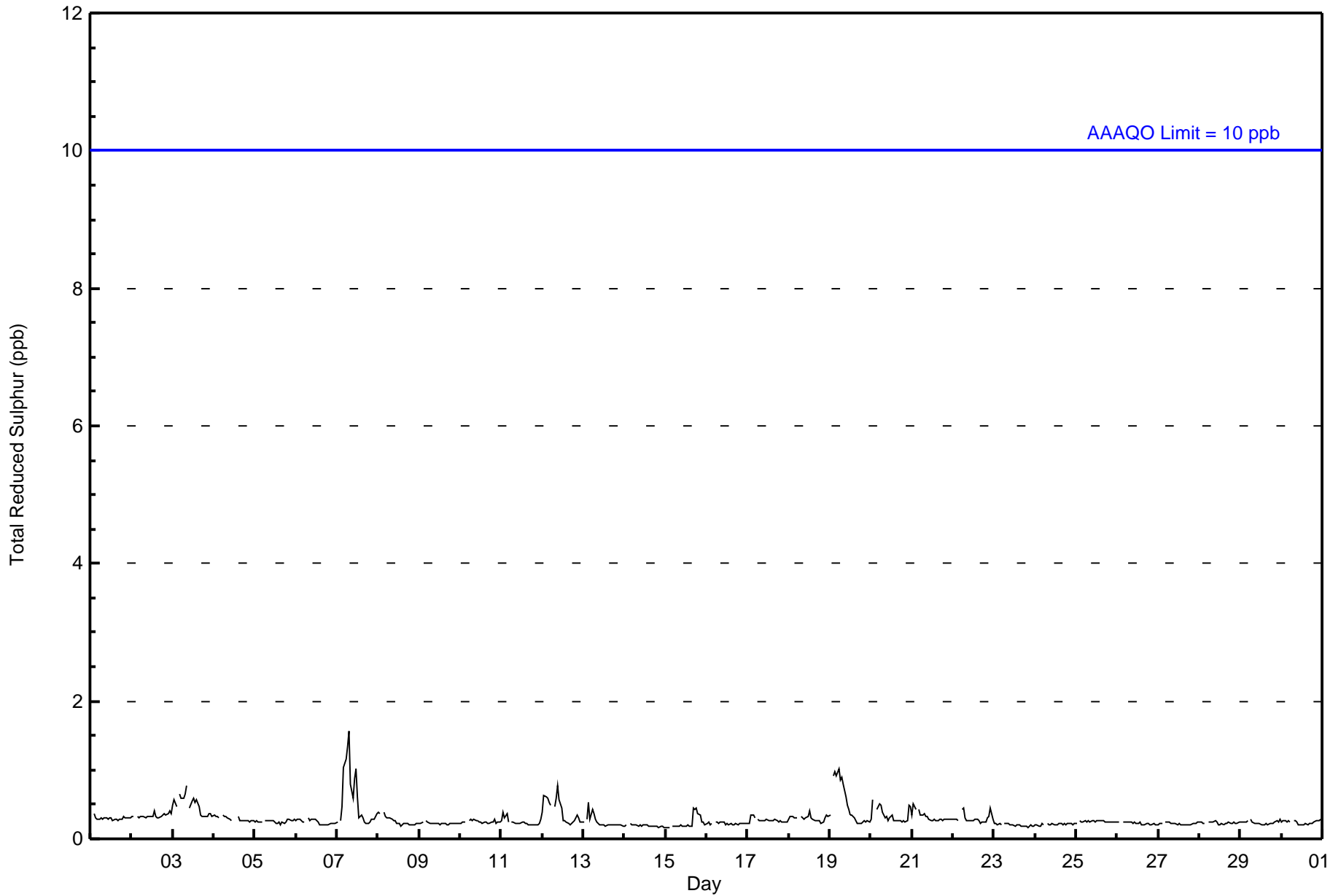
Athabasca Valley - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2 ppb on Apr 7 08:00	Maximum Daily Average: 0.6 ppb on Apr 7		Hours of Data:	686
Minimum Value: 0 ppb on Apr 14 21:00	Minimum Daily Average: 0.2 ppb on Apr 14		Hours of Missing Data:	34
Maximum Diurnal Average: 0.4 ppb at hour 6	Minimum Diurnal Average: 0.2 ppb at hour 17		Hours of Calibration:	33
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Apr	0	1	0	Z	1	1	1	1	1	M	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0.3	0
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
7-Apr	0	Z	0	0	1	1	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	2
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	1	1	1	1	0	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
13-Apr	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
19-Apr	0	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
20-Apr	0	1	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
21-Apr	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	Diurnal Average
0	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	686	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	56	33	22	27	38	43	95	54	20	32	45	18	20	18	20	144	685
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	33	22	27	38	43	95	54	20	32	45	18	20	18	20	144	685

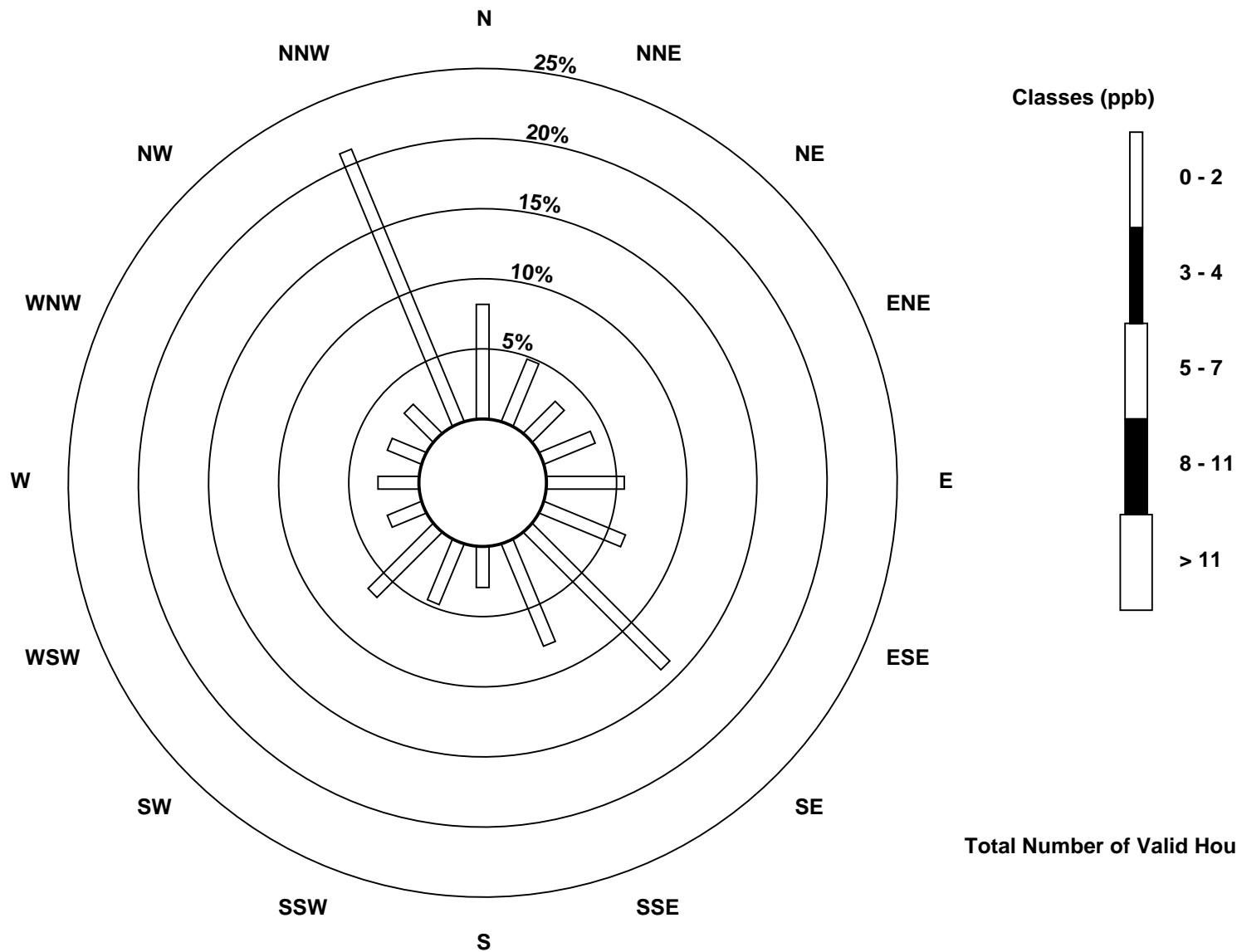
Total Number of Valid Hours: 685

Total Number of Hours: 720

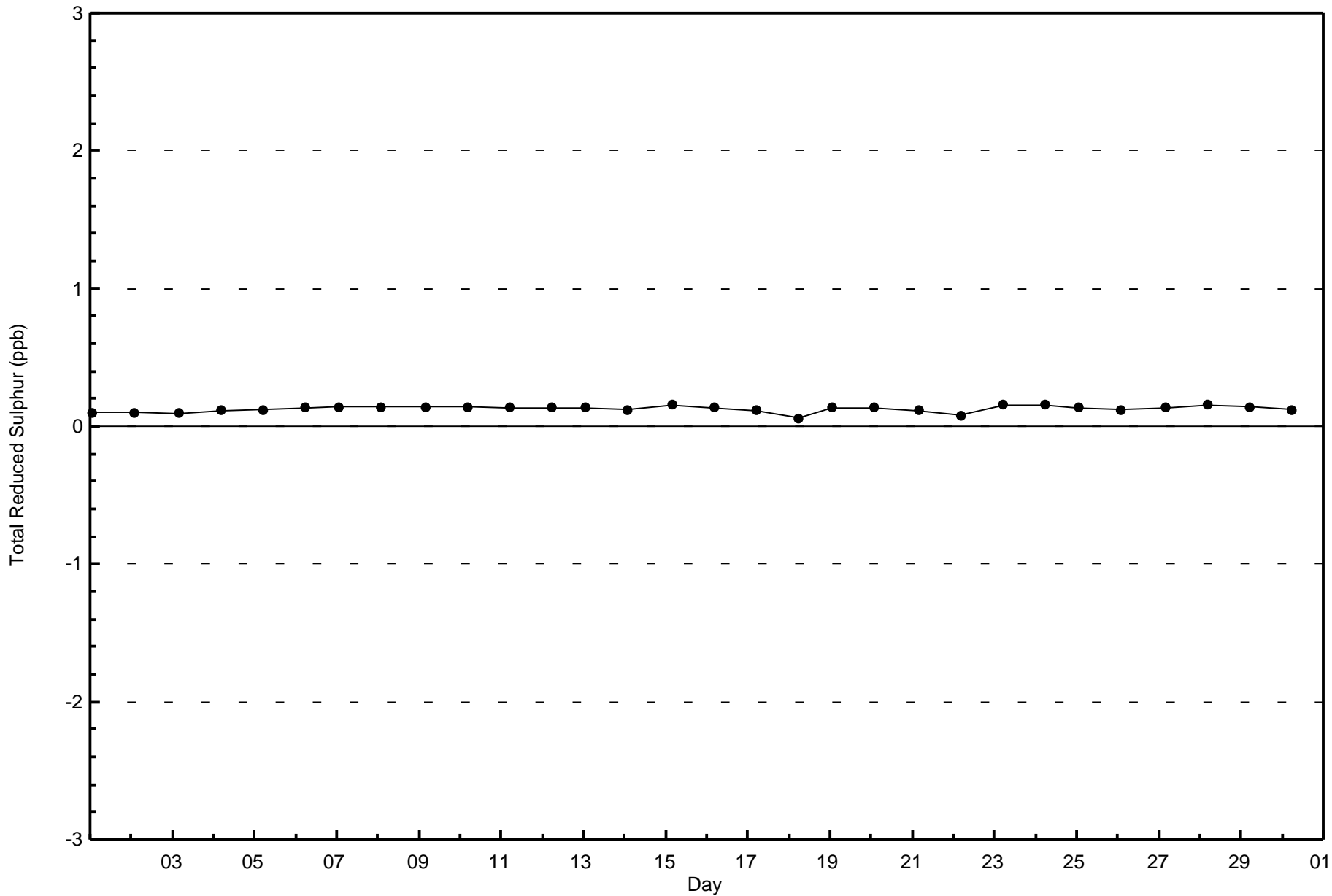


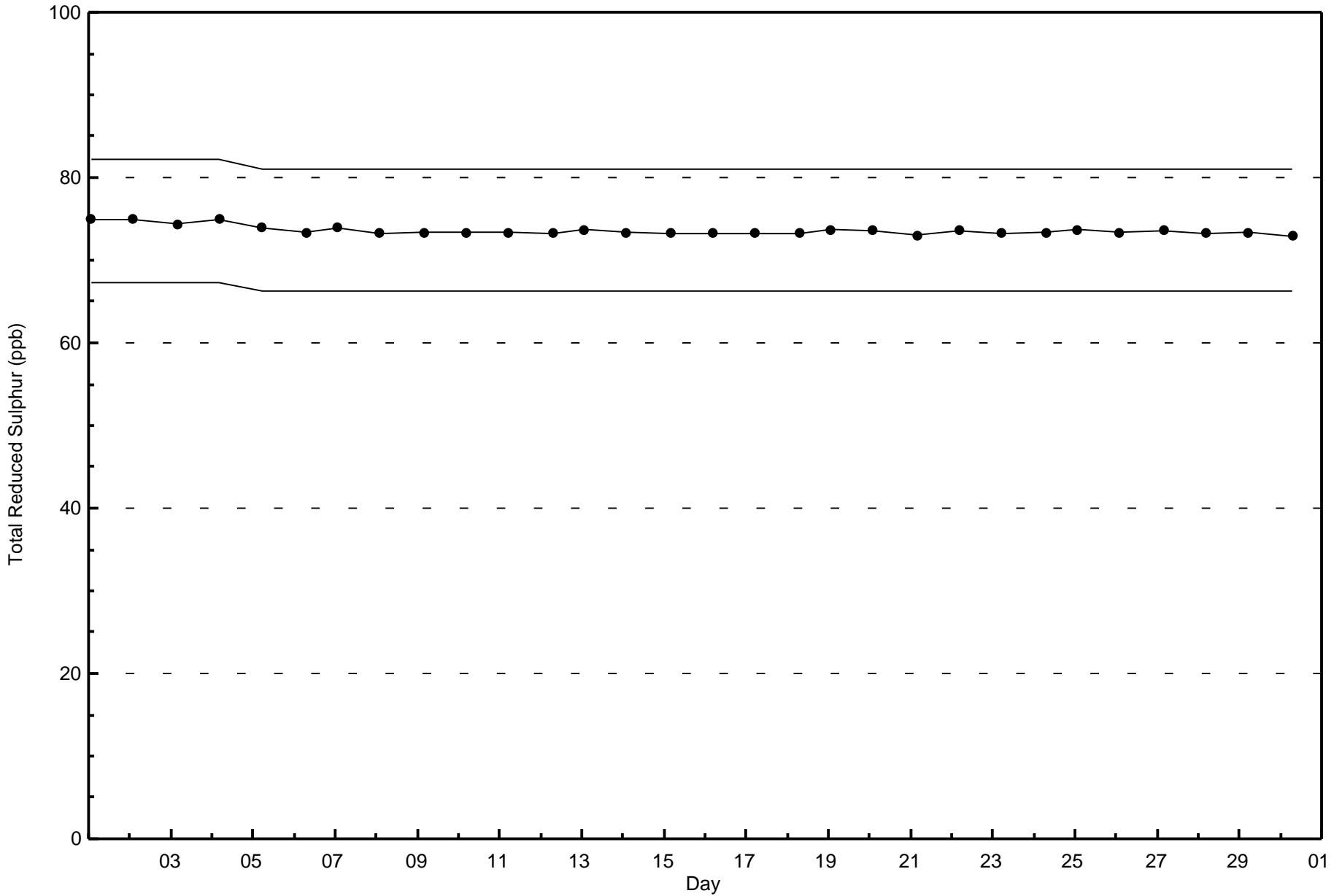
Wood Buffalo Environmental Association
Wind Rose Apr 2017

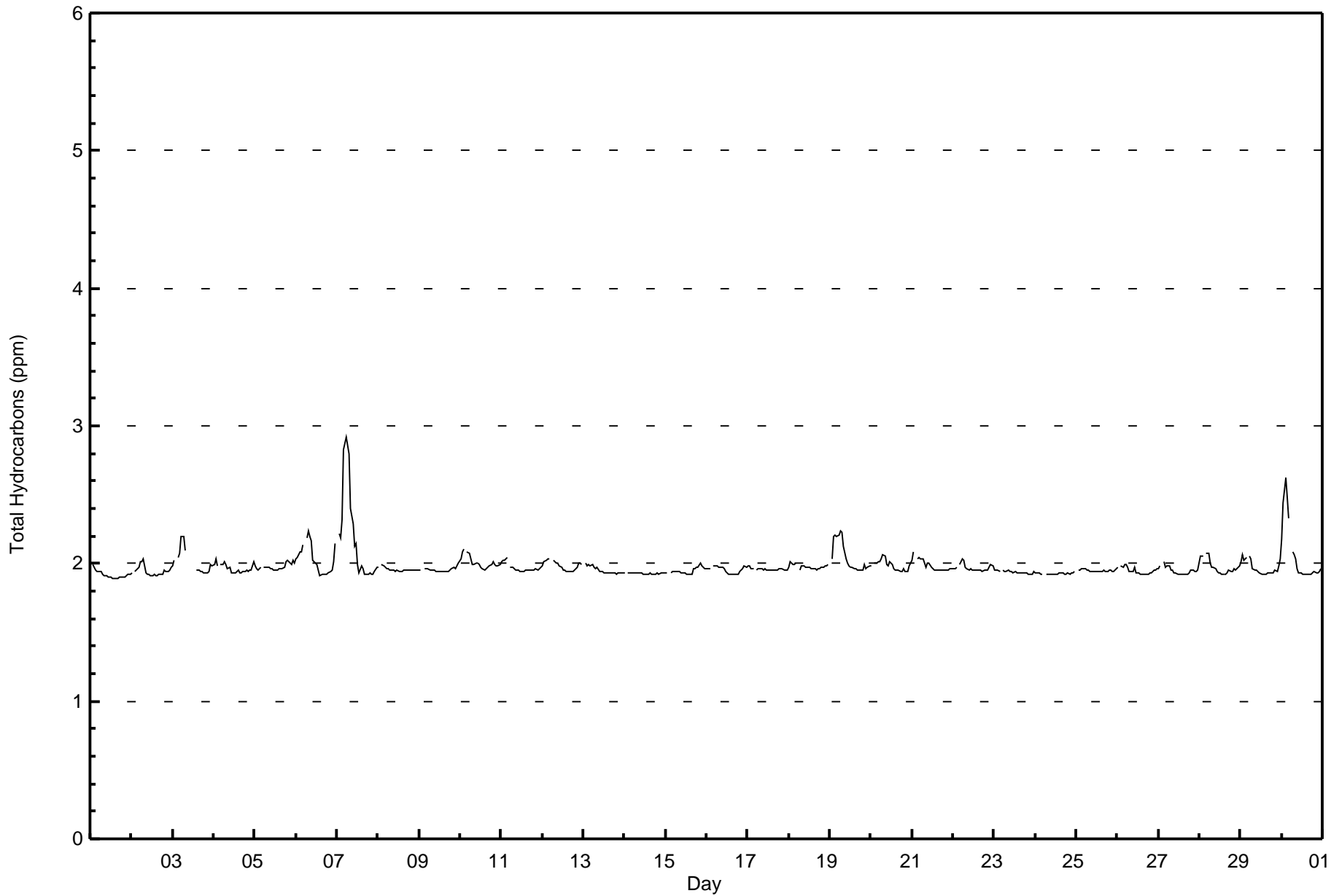
Total Reduced Sulphur (TRS) - ppb
Athabasca Valley (AMS 7)



Total Number of Valid Hours: 685









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Athabasca Valley - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	633	92.54	92.54
2.1 - 3.0	51	7.46	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Athabasca Valley - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	51	34	21	26	39	42	86	50	18	26	42	15	18	17	16	131	632
2.1 - 3.0	1	0	2	2	1	3	6	6	1	4	3	2	2	2	3	13	51
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

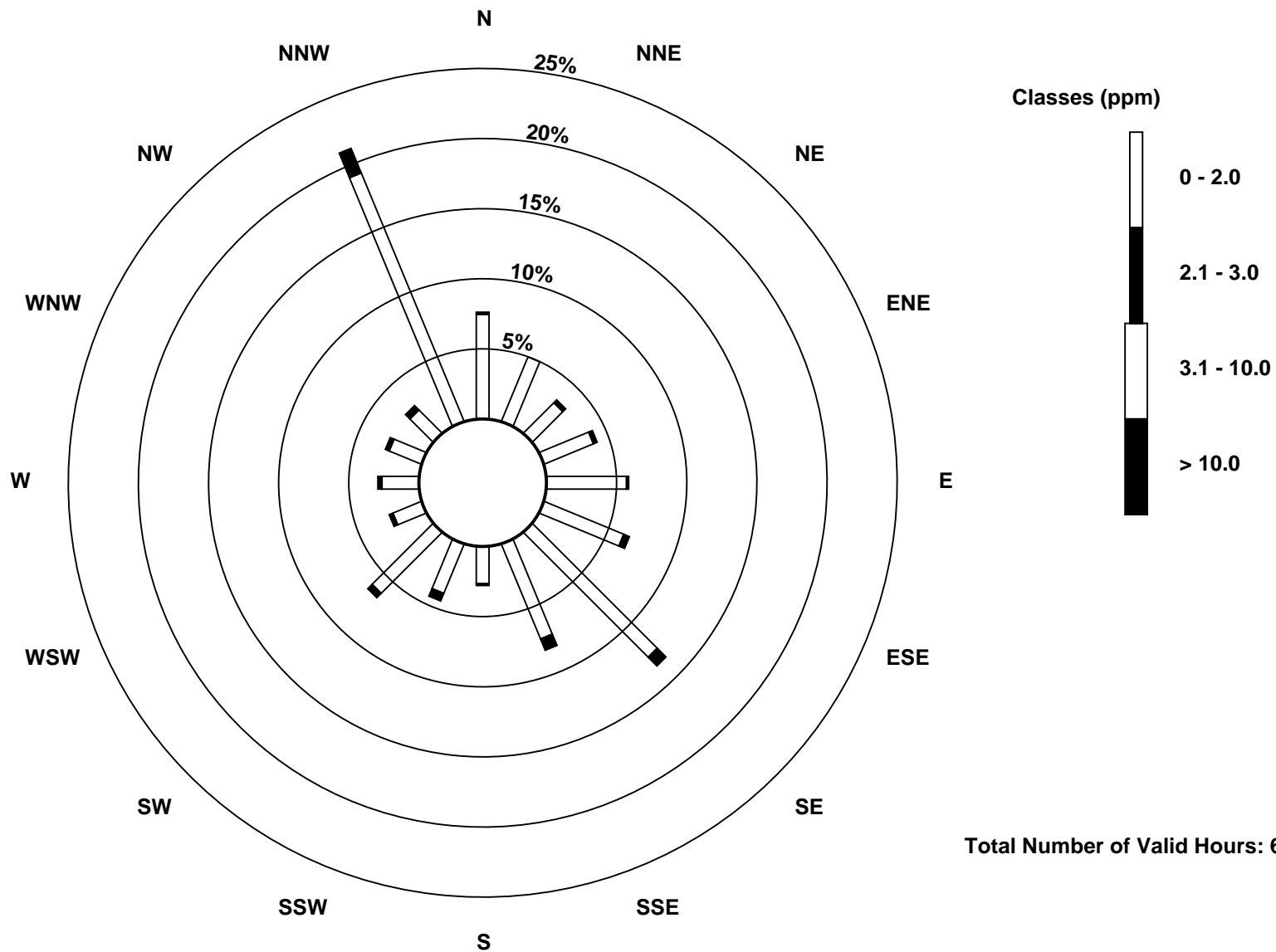
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

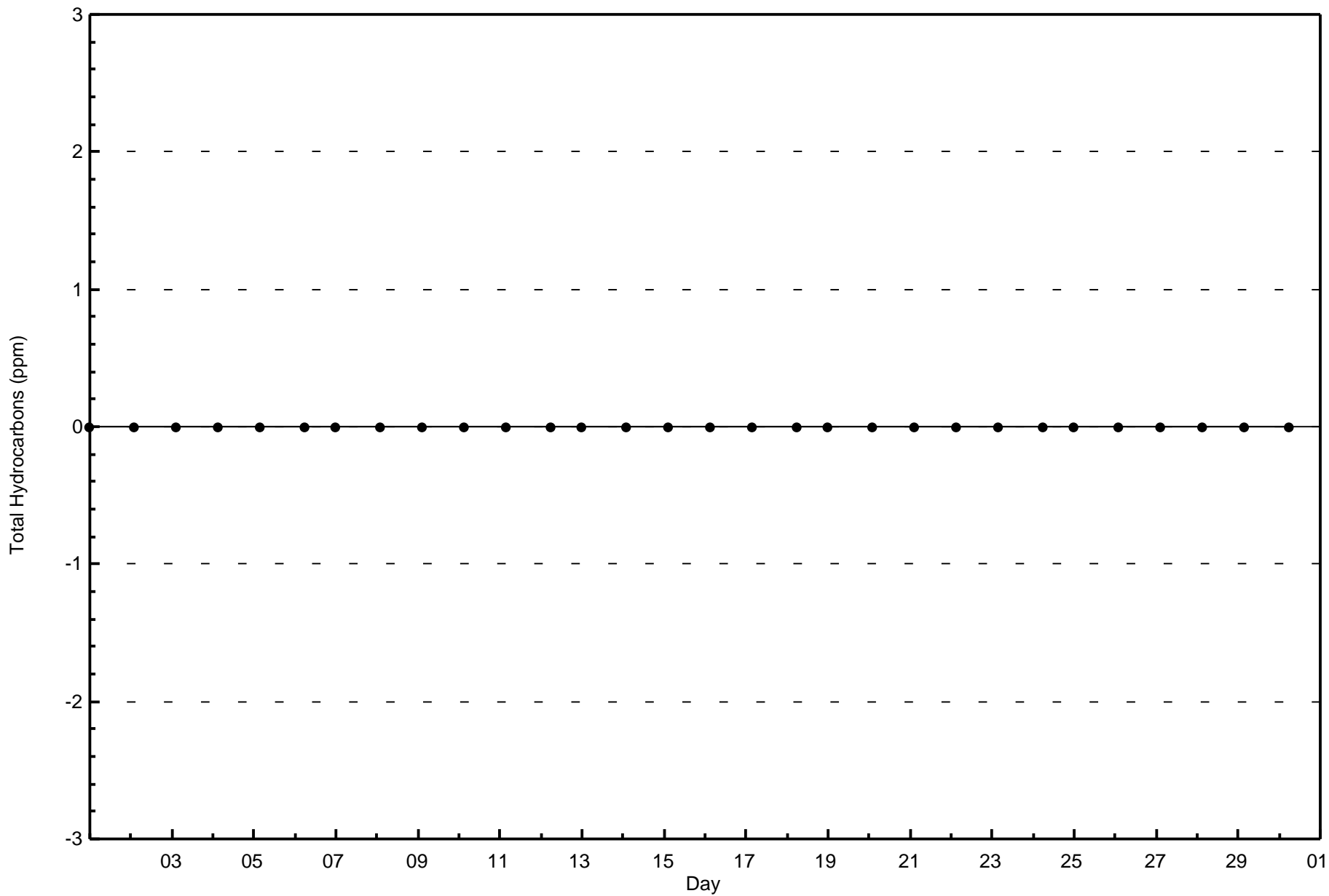
Total Hydrocarbons (THC) - ppm
Athabasca Valley (AMS 7)

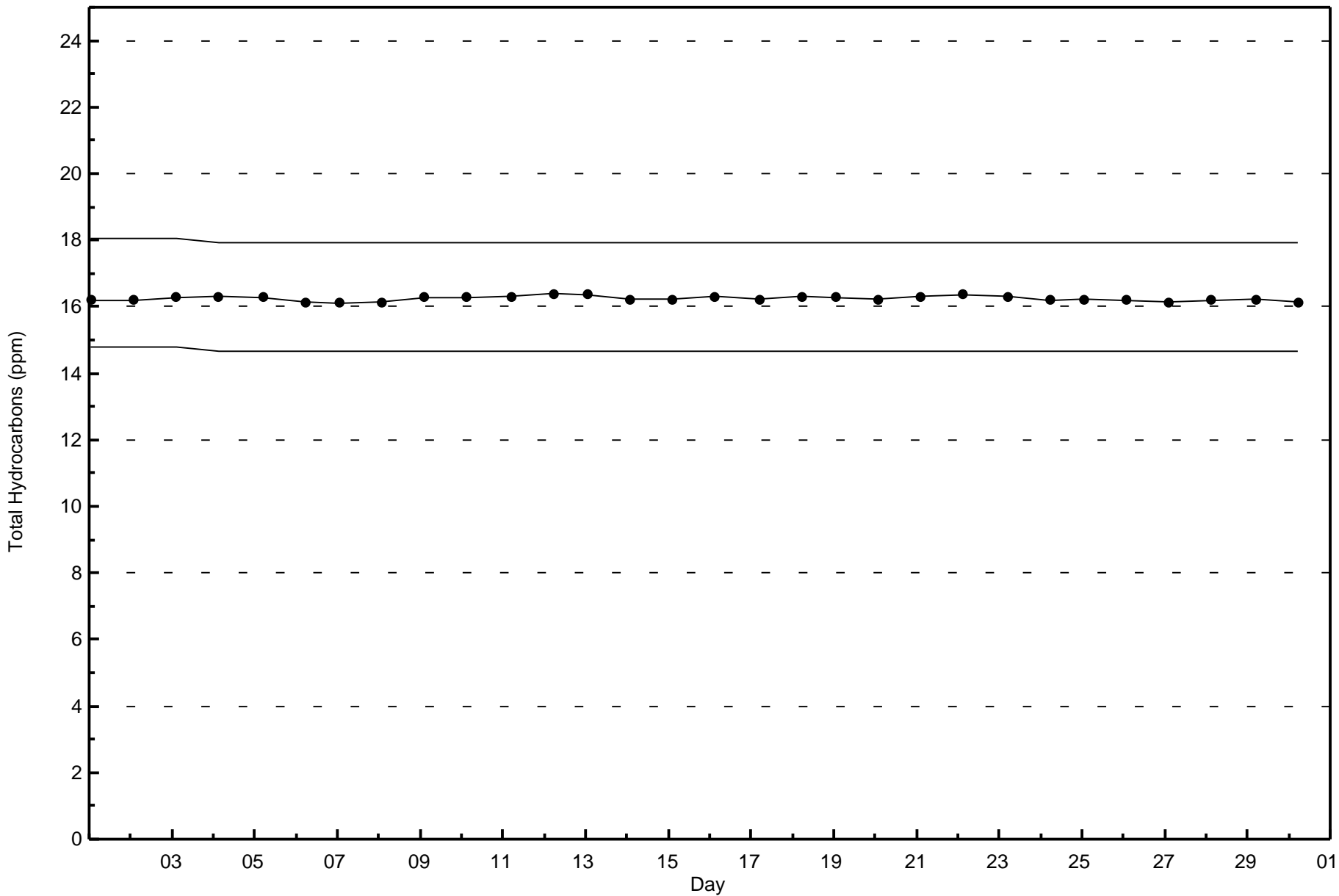


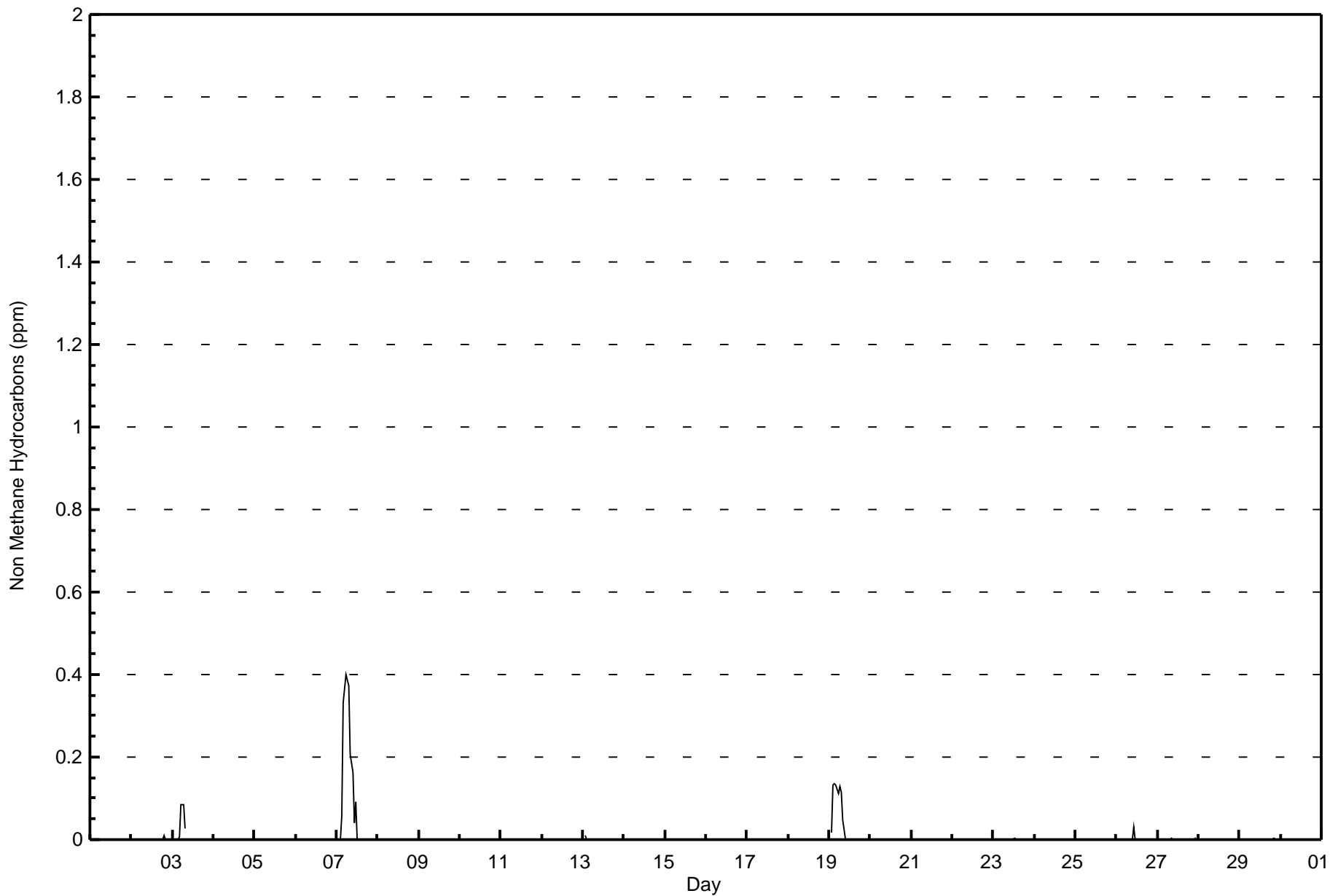


Wood Buffalo Environmental Association
Zero Responses

Total Hydrocarbons (THC) - ppm
Athabasca Valley - April 2017









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - April 2017**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	660	96.49	96.49
0.006 - 0.05	8	1.17	97.66
0.06 - 0.1	10	1.46	99.12
> 0.1	6	0.88	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	50	34	22	28	40	45	91	56	19	29	45	17	18	18	16	131	659
0.006 - 0.05	1	0	0	0	0	0	1	0	0	0	0	0	2	1	0	3	8
0.06 - 0.1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	7	10
> 0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	6
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

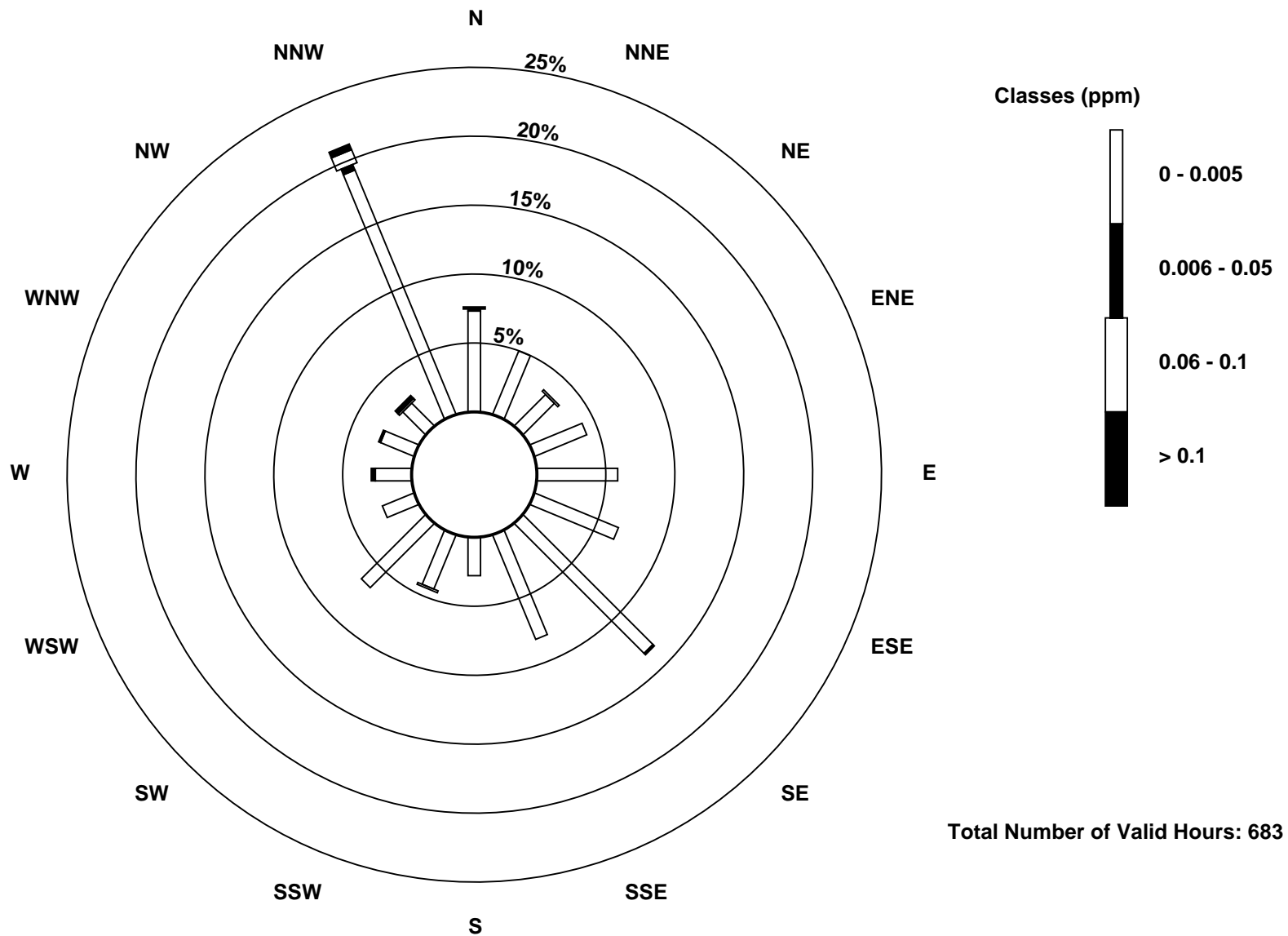
Total Number of Valid Hours: 683

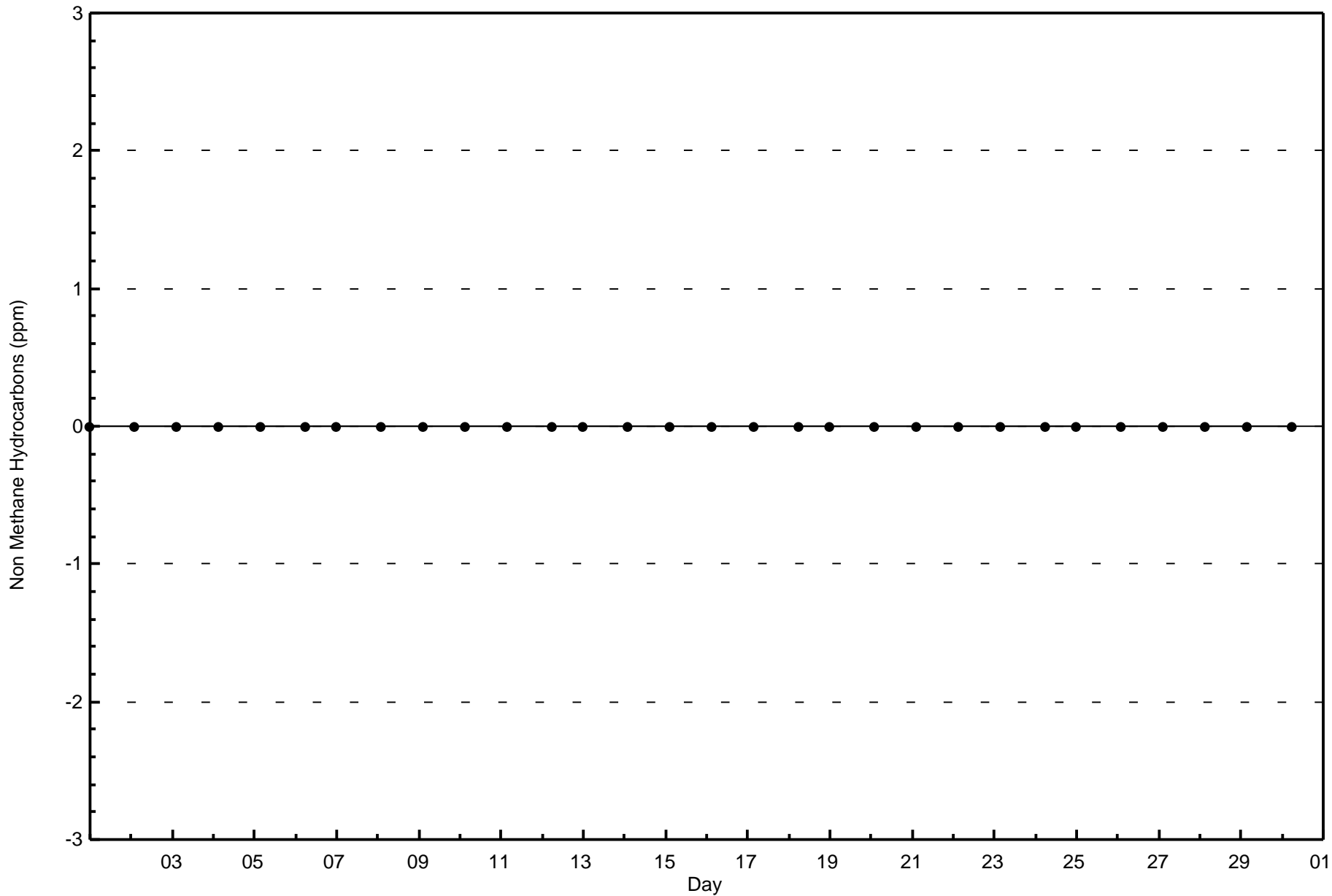
Total Number of Hours: 720

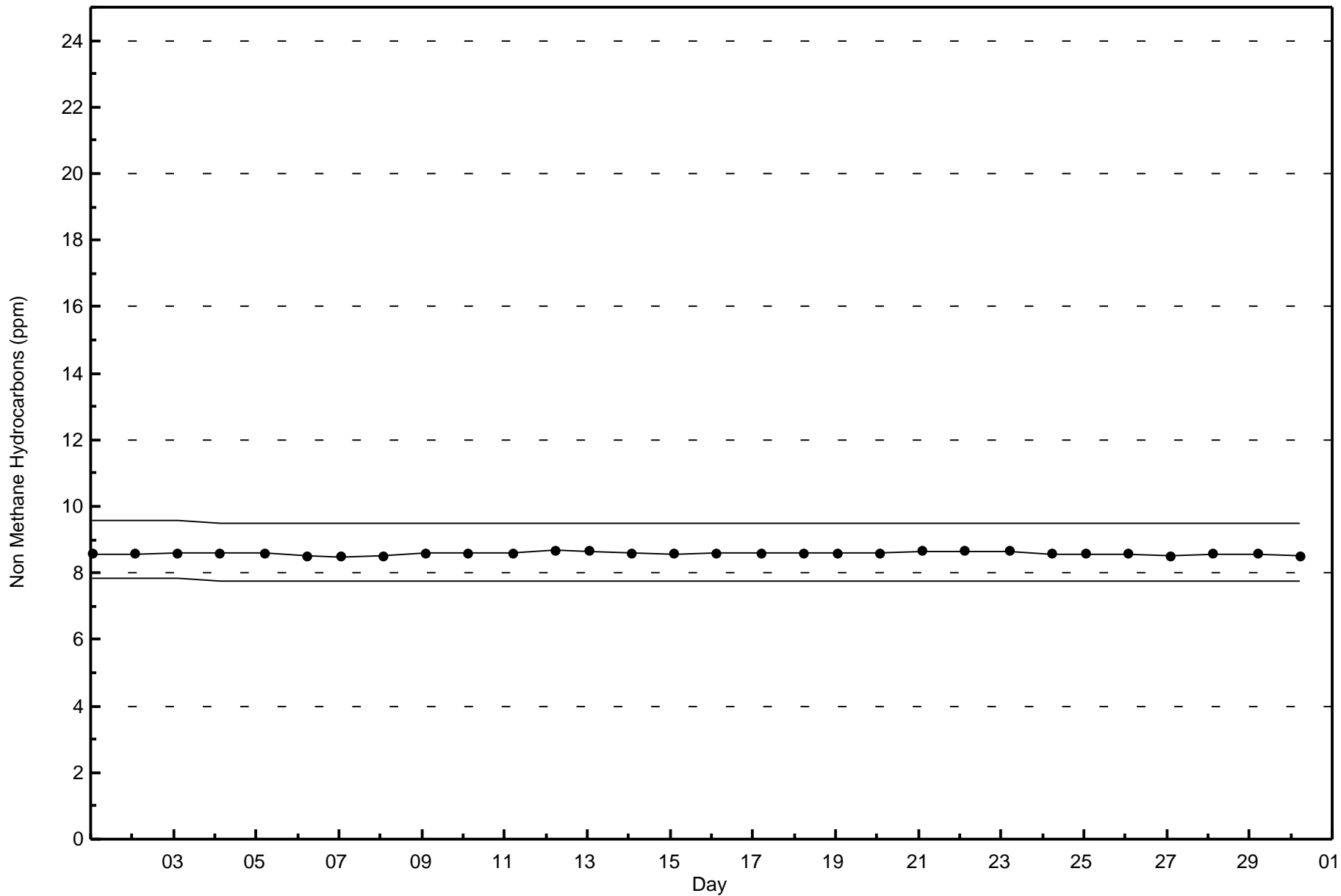


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley (AMS 7)









Wood Buffalo Environmental Association

Summary of Hour Averages

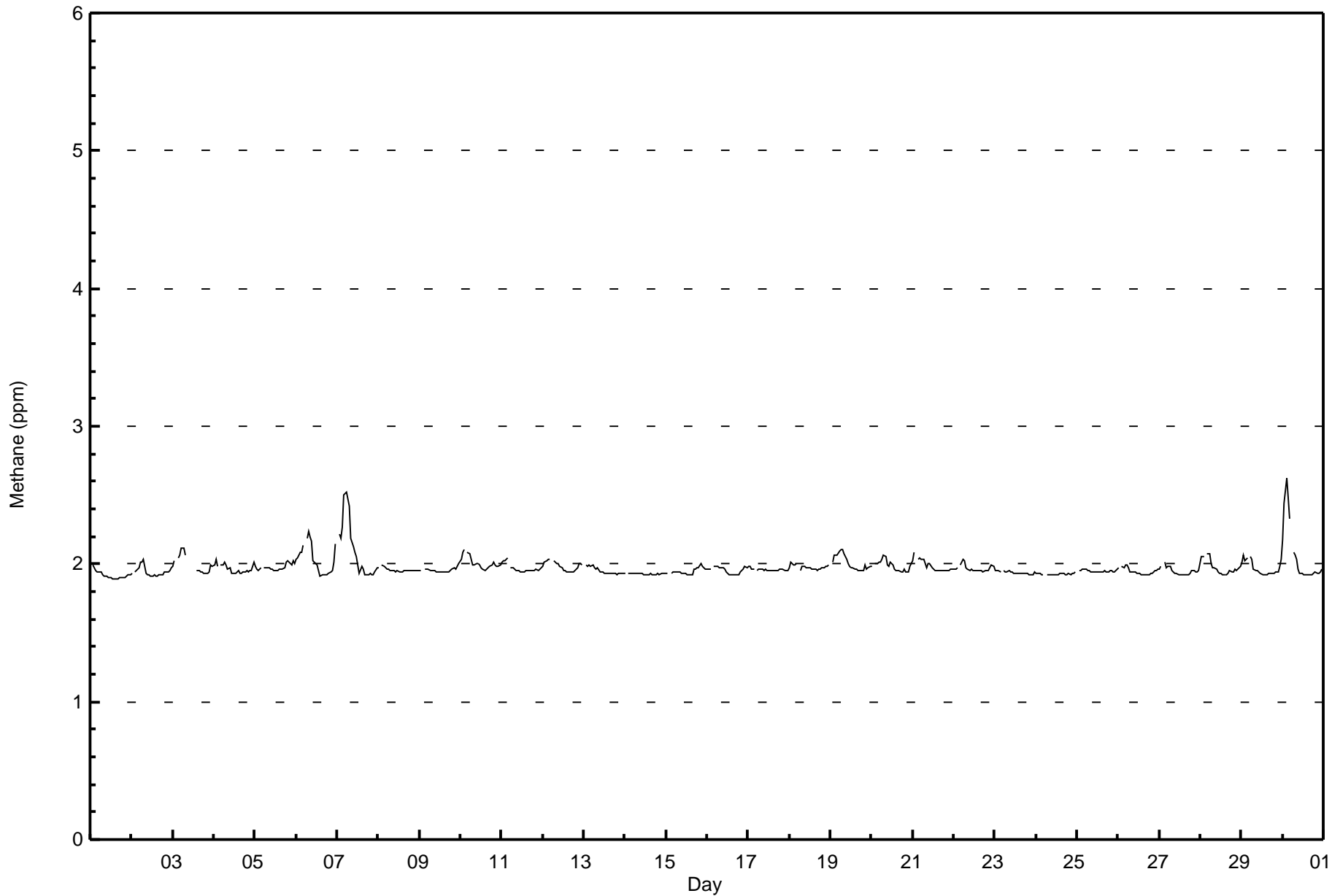
Methane (CH₄) - ppm

Athabasca Valley - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.6 ppm on Apr 30 03:00	Maximum Daily Average: 2.1 ppm on Apr 7		Hours of Data:	684
Minimum Value: 1.9 ppm on Apr 1 14:00	Minimum Daily Average: 1.9 ppm on Apr 1		Hours of Missing Data:	36
Maximum Diurnal Average: 2.0 ppm at hour 5	Minimum Diurnal Average: 1.9 ppm at hour 16		Hours of Calibration:	36
Monthly Average: 1.97 ppm	Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 1.9 Median = 2.0 Q ₃ = 2.0 P ₉₀ = 2.0 P ₉₉ = 2.4		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
2-Apr	1.9	Z	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0
3-Apr	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	C	C	C	C	C	C	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0
4-Apr	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
6-Apr	2.0	2.0	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.1	2.2
7-Apr	Z	2.2	2.2	2.3	2.5	2.5	2.5	2.4	2.2	2.1	2.1	2.1	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.5	2.5
8-Apr	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0
9-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Apr	2.0	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
11-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
12-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
13-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
14-Apr	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
15-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
16-Apr	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
17-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
18-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
19-Apr	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
20-Apr	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
21-Apr	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
22-Apr	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Apr	2.0	1.9	2.0	1.9	Z	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
24-Apr	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
25-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0
26-Apr	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
27-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0
28-Apr	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
29-Apr	2.0	2.1	2.0	2.0	Z	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1
30-Apr	2.2	2.4	2.6	2.5	2.3	Z	2.1	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.6
																								Diurnal Average				
																								Diurnal Maximum				

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Athabasca Valley - April 2017**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	633	92.54	92.54
2.1 - 3.0	51	7.46	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



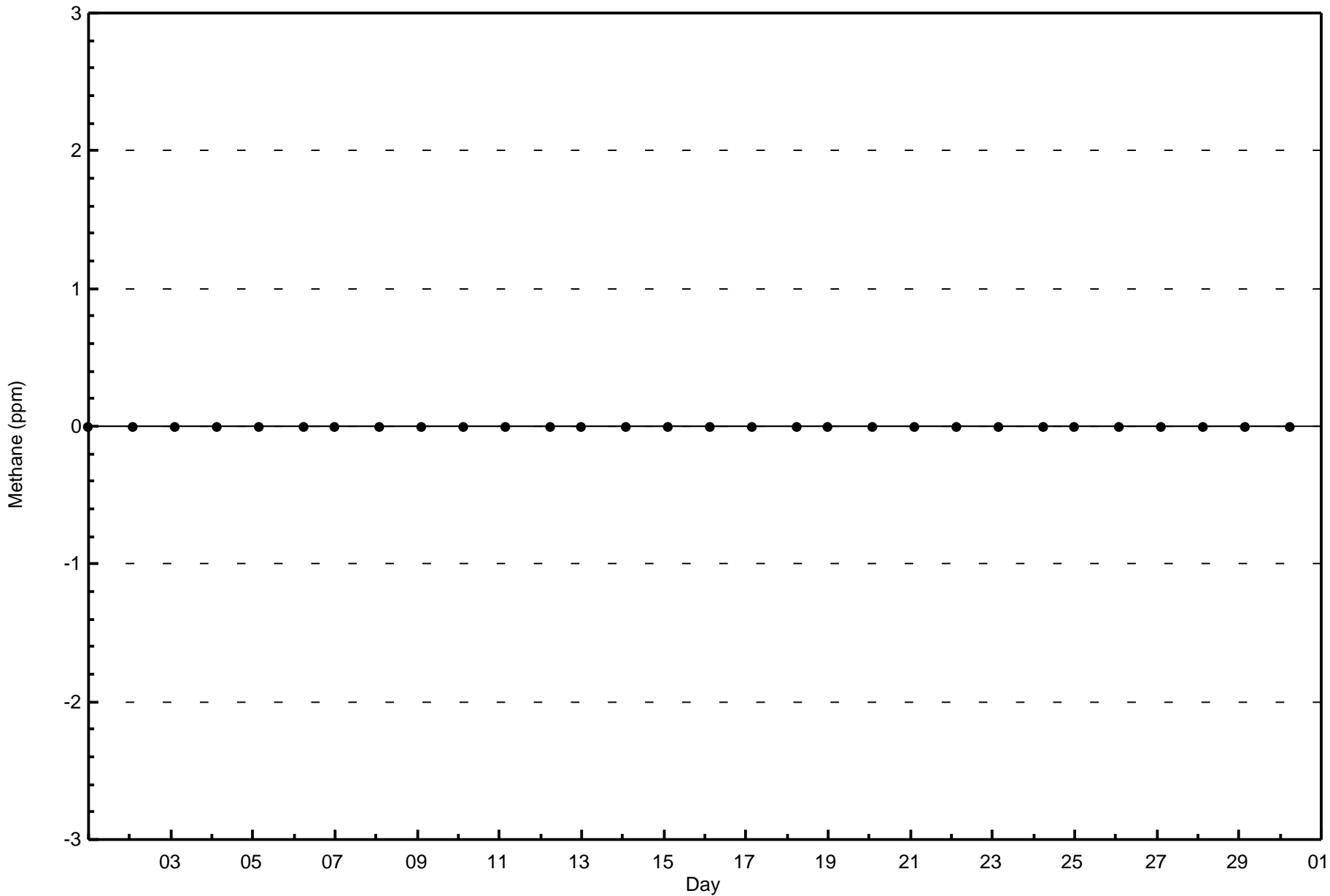
**Wood Buffalo Environmental Association
Frequency Distribution**

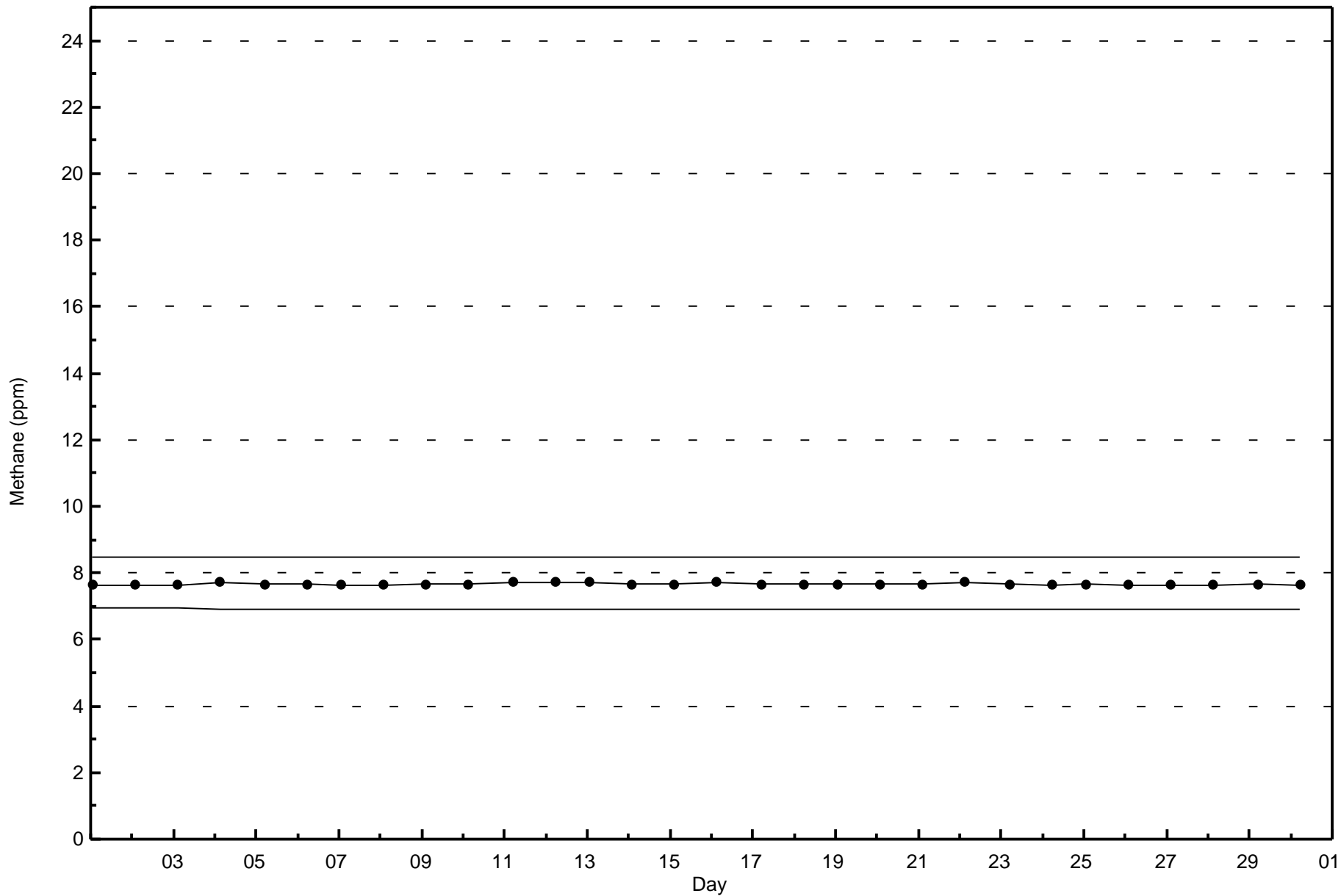
**Methane (CH₄) - ppm
Athabasca Valley - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	51	34	21	26	39	42	86	50	18	26	42	15	18	17	16	131	632
2.1 - 3.0	1	0	2	2	1	3	6	6	1	4	3	2	2	2	3	13	51
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

Total Number of Valid Hours: 683

Total Number of Hours: 720







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

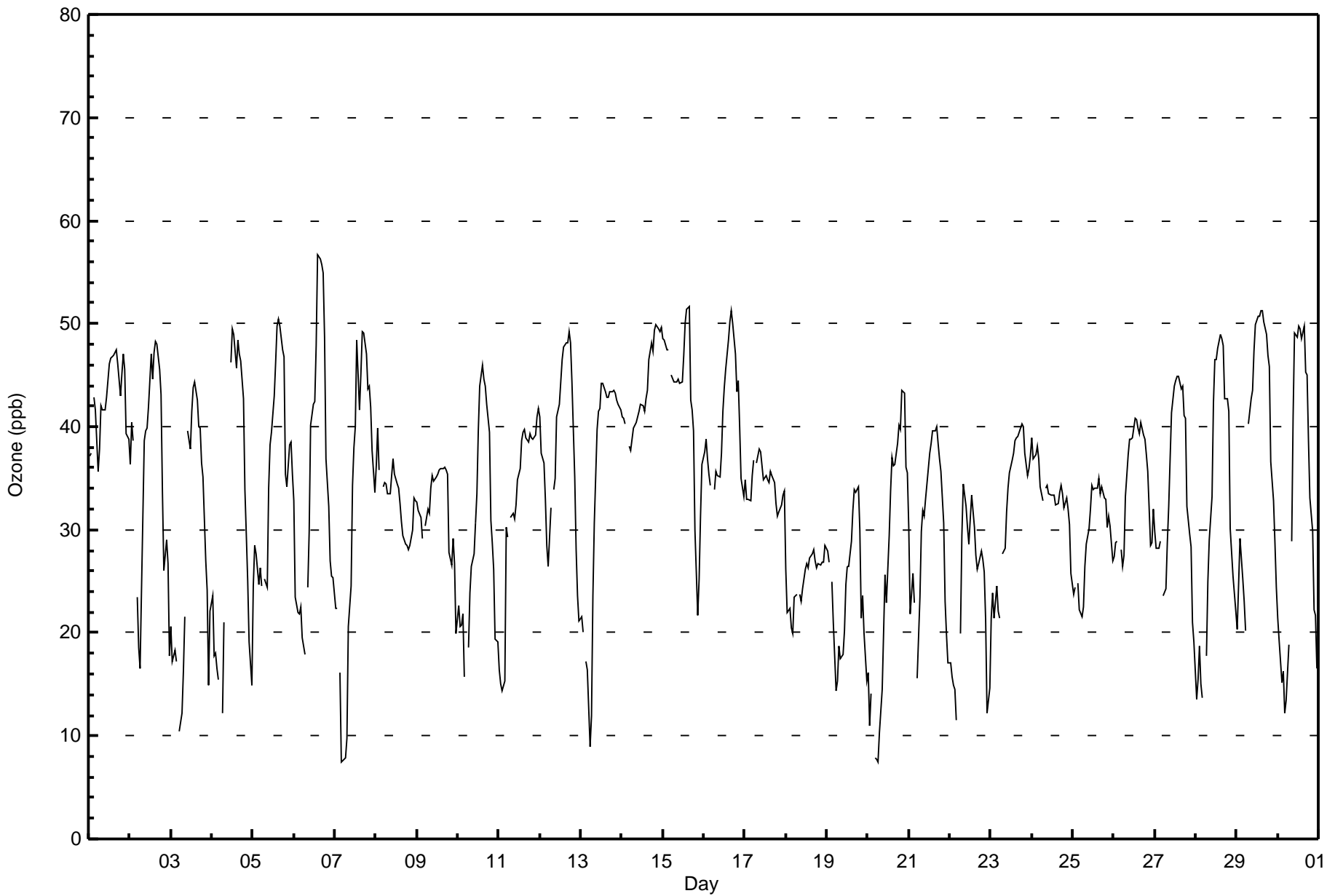
Athabasca Valley - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 57 ppb on Apr 6 15:00	Maximum Daily Average: 43.5 ppb on Apr 14		Hours of Data:	686
Minimum Value: 7 ppb on Apr 20 07:00	Minimum Daily Average: 24.0 ppb on Apr 22		Hours of Missing Data:	34
Maximum Diurnal Average: 42.1 ppb at hour 16	Minimum Diurnal Average: 23.4 ppb at hour 7		Hours of Calibration:	33
Monthly Average: 33.3 ppb	Percentiles: P ₁ = 9 P ₁₀ = 19 Q ₁ = 26 Median = 34 Q ₃ = 41 P ₉₀ = 47 P ₉₉ = 51		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	37	37	Z	43	42	36	38	42	42	42	43	45	46	47	47	47	47	46	43	45	47	46	39	39	42.8	47
2-Apr	36	40	39	Z	24	19	16	24	39	40	40	42	47	45	47	48	48	46	43	34	26	29	27	18	35.4	48
3-Apr	21	17	18	17	Z	10	12	16	22	M	40	38	41	44	44	43	40	40	36	35	27	24	15	22	28.3	44
4-Apr	24	18	18	17	15	Z	12	21	C	C	C	46	50	49	46	48	47	46	43	34	30	25	19	15	31.1	50
5-Apr	25	28	28	25	26	25	Z	25	24	34	38	39	43	46	50	50	50	47	47	35	34	38	38	35	36.2	50
6-Apr	33	23	22	22	22	19	18	Z	24	30	40	42	42	48	57	56	56	55	49	37	32	27	26	25	35.0	57
7-Apr	22	22	Z	16	7	8	8	10	21	25	34	38	40	48	42	45	49	49	47	44	44	42	38	34	31.8	49
8-Apr	36	40	36	Z	34	35	34	33	33	35	37	35	34	34	33	31	29	29	28	28	28	30	33	33	33.0	40
9-Apr	33	32	31	29	Z	30	32	32	34	35	35	35	35	36	36	36	36	36	35	28	27	29	27	20	32.1	36
10-Apr	23	21	21	22	16	Z	19	24	26	28	31	34	40	44	46	45	44	42	39	31	29	26	19	19	29.8	46
11-Apr	16	15	14	15	30	29	Z	31	32	31	32	35	36	39	39	40	39	38	39	39	39	39	41	42	32.7	42
12-Apr	41	37	37	33	28	26	32	Z	34	35	41	42	44	46	48	48	48	49	48	44	35	28	24	21	37.9	49
13-Apr	21	20	Z	17	16	9	12	24	31	40	41	42	44	44	43	43	43	43	43	44	43	43	42	42	34.4	44
14-Apr	41	41	40	Z	38	38	39	40	40	41	42	42	42	41	43	44	47	48	47	49	50	50	49	50	43.5	50
15-Apr	49	48	47	47	Z	45	44	44	44	45	44	44	47	50	51	52	43	42	40	30	22	25	31	36	42.2	52
16-Apr	38	39	37	35	34	Z	34	36	35	35	37	41	44	46	48	50	51	50	47	43	44	40	35	33	40.6	51
17-Apr	35	33	33	33	35	37	Z	36	38	38	36	35	35	35	35	36	35	35	33	31	32	32	33	34	34.5	38
18-Apr	26	22	22	20	20	23	24	Z	24	23	24	26	27	26	27	28	28	27	26	27	27	27	27	28	25.2	28
19-Apr	28	27	Z	25	21	14	15	19	17	18	20	25	26	26	29	32	34	34	34	30	21	24	20	15	24.1	34
20-Apr	16	11	14	Z	8	8	7	10	15	20	26	23	29	34	37	36	36	38	40	40	44	43	36	36	26.4	44
21-Apr	30	22	26	23	Z	16	23	30	32	31	33	36	37	38	40	40	40	38	37	36	31	23	20	17	30.3	40
22-Apr	17	16	15	15	12	Z	20	29	34	32	30	29	31	33	30	27	26	27	28	27	26	21	12	15	24.0	34
23-Apr	21	24	21	25	22	21	Z	28	28	32	34	36	37	37	39	39	39	40	40	40	37	35	36	37	32.6	40
24-Apr	39	37	37	38	37	34	33	Z	34	34	34	33	33	33	32	33	34	34	34	32	33	32	30	26	33.8	39
25-Apr	24	24	Z	25	22	22	22	26	29	30	32	34	34	34	34	35	33	34	33	33	30	31	30	27	29.6	35
26-Apr	27	29	29	Z	28	26	27	33	37	39	39	39	41	41	40	39	40	39	39	37	36	28	29	32	34.6	41
27-Apr	30	28	28	29	Z	24	24	29	32	37	41	44	45	45	45	44	44	41	41	32	30	28	21	19	33.9	45
28-Apr	14	15	19	15	14	Z	18	25	29	33	42	46	46	48	49	49	48	43	43	41	30	28	26	22	32.3	49
29-Apr	20	25	29	25	23	20	Z	40	43	43	47	50	51	51	51	51	50	49	47	46	37	33	29	24	38.5	51
30-Apr	21	19	15	16	12	13	19	Z	29	41	49	49	50	49	49	50	45	45	39	33	30	22	22	17	31.9	50

28.1	27.1	27.1	25.1	23.5	23.5	23.4	28.3	31.1	33.8	36.7	38.2	40.0	41.3	41.8	42.1	41.7	41.0	39.6	36.2	33.3	31.6	29.1	27.8	Diurnal Average		
49	48	47	47	42	45	44	44	44	44	45	49	50	51	51	57	56	56	55	49	49	50	50	49	50	Diurnal Maximum	

Z - zeronspan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	84	12.24	12.24
21 - 50	591	86.15	98.40
51 - 82	11	1.60	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	6	5	2	0	2	10	10	1	6	6	2	4	5	6	13	84
21 - 50	49	26	17	24	40	41	84	45	18	23	38	15	14	12	13	132	591
51 - 82	1	0	1	0	0	0	0	0	0	4	1	0	0	3	1	0	11
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	32	23	26	40	43	94	55	19	33	45	17	18	20	20	145	686

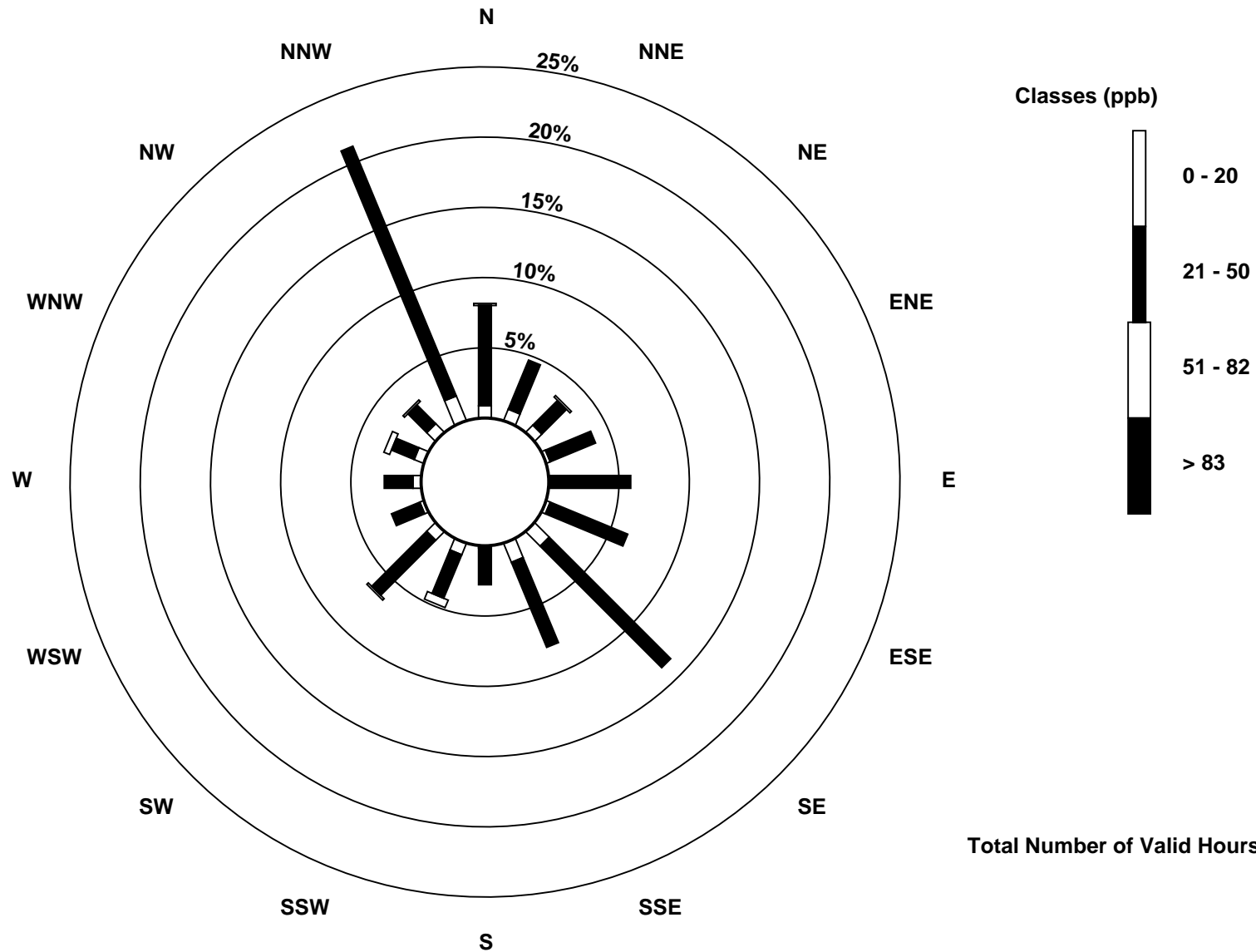
Total Number of Valid Hours: 686

Total Number of Hours: 720

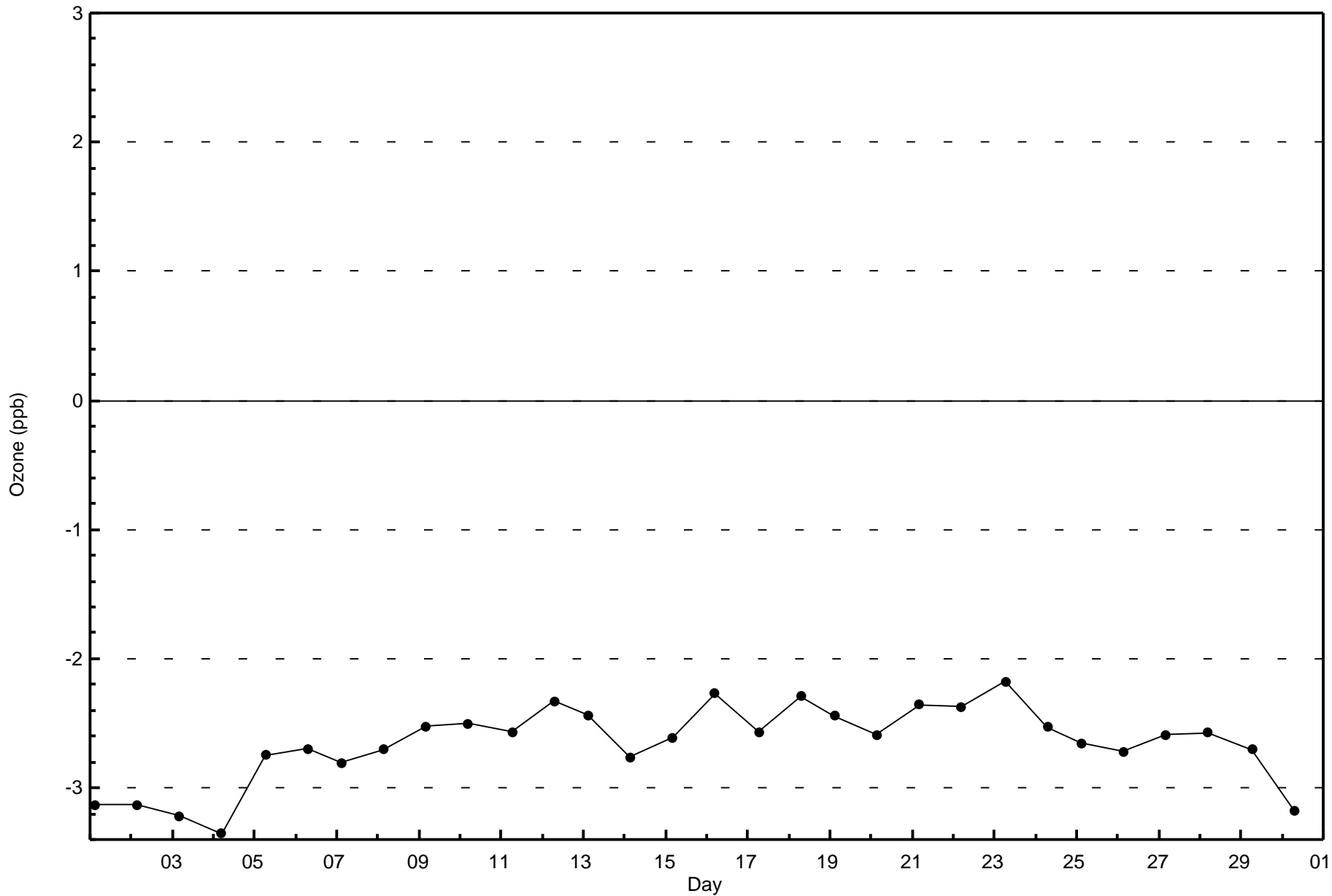


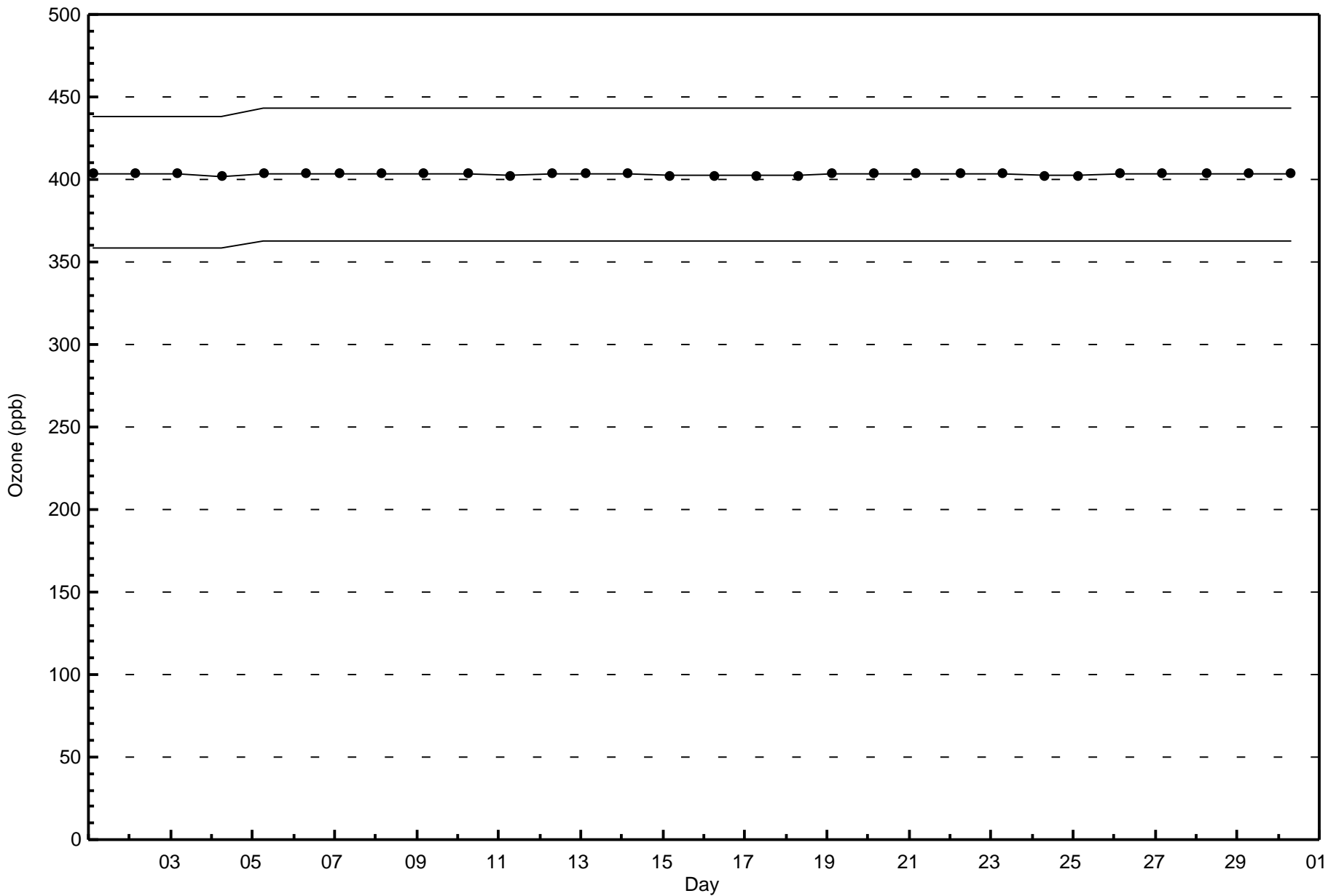
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Athabasca Valley (AMS 7)



Total Number of Valid Hours: 686





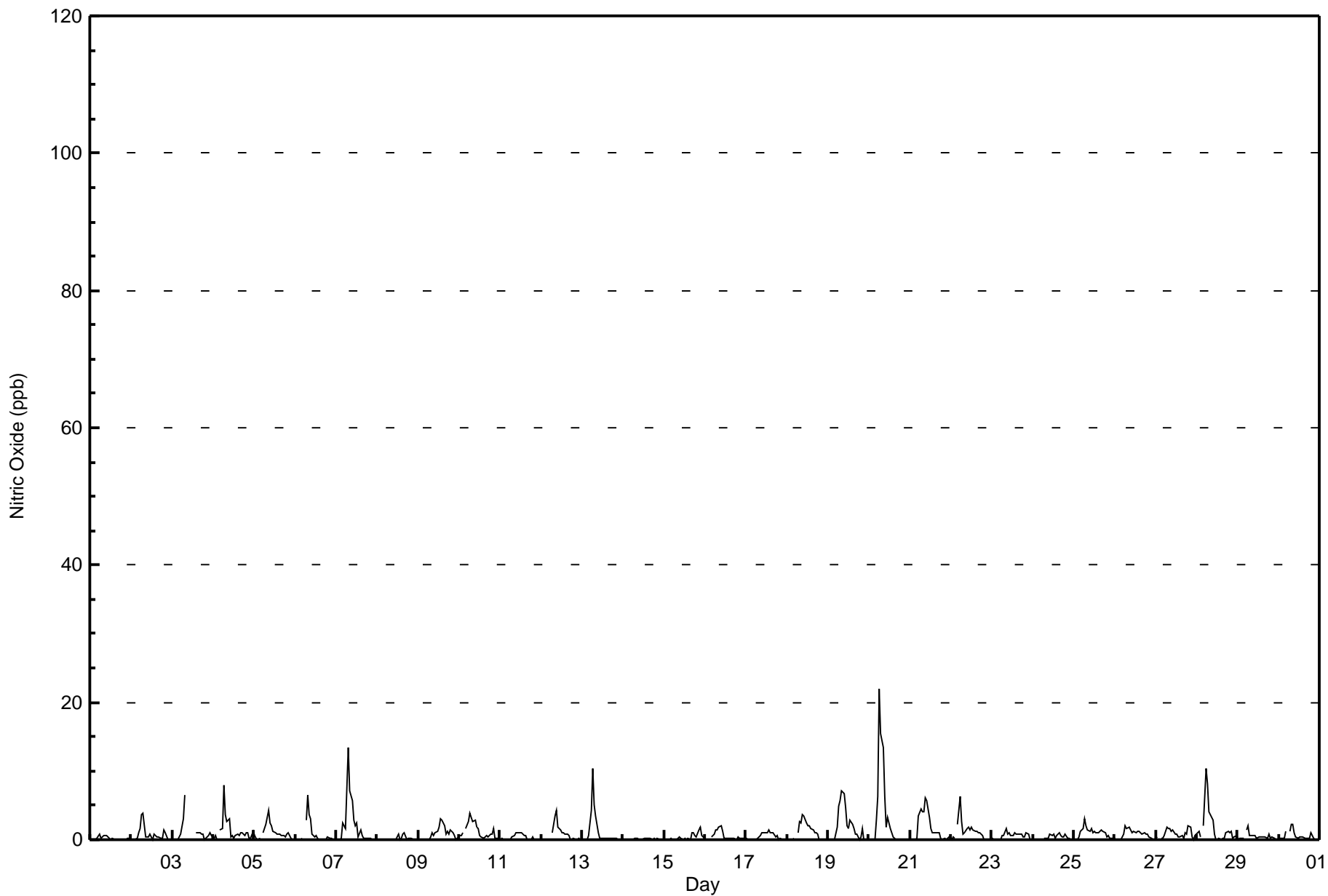


Maximum Value: 22 ppb on Apr 20 07:00		Maximum Daily Average: 3.3 ppb on Apr 20		Hours in Service: 720																							
Minimum Value: 0 ppb on Apr 1 16:00		Minimum Daily Average: 0.1 ppb on Apr 14		Hours of Data: 684																							
Maximum Diurnal Average: 3.3 ppb at hour 7		Minimum Diurnal Average: 0.1 ppb at hour 4		Hours of Missing Data: 36																							
Monthly Average: 1.0 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 7		Hours of Calibration: 36																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	Z	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
2-Apr	0	Z	0	0	1	2	4	4	0	0	0	1	0	1	1	0	0	0	0	1	1	0	0	0	0.8	4	
3-Apr	0	0	Z	0	0	1	3	7	C	C	C	C	C	C	1	1	1	1	1	0	0	1	1	1	--	7	
4-Apr	0	1	0	Z	1	2	8	4	3	3	2	1	0	1	1	1	1	1	1	1	1	0	0	1	1.3	8	
5-Apr	1	0	0	0	Z	1	2	2	4	2	2	1	1	1	1	1	1	1	0	1	1	0	0	0	1.0	4	
6-Apr	0	0	0	0	0	Z	3	7	4	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0.9	7	
7-Apr	Z	0	0	0	3	2	7	13	7	6	3	2	3	0	1	1	0	0	0	0	0	0	0	0	2.1	13	
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0.2	1	
9-Apr	0	0	Z	0	0	0	0	0	1	1	1	1	2	3	3	2	1	1	1	1	1	1	0	0	0.9	3	
10-Apr	1	1	1	Z	2	3	4	3	3	3	2	2	1	0	0	0	1	0	1	1	2	0	0	0	1.2	4	
11-Apr	0	0	0	0	Z	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.3	1	
12-Apr	0	0	0	0	0	Z	1	2	3	4	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0.8	4	
13-Apr	Z	0	0	0	1	4	10	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	10	
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	2	1	0	0.4	2	
16-Apr	0	0	0	Z	0	1	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2	
17-Apr	0	0	0	0	Z	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0.5	1	
18-Apr	0	0	0	0	0	Z	1	3	2	4	4	2	2	2	2	1	1	1	1	0	0	0	0	0	1.1	4	
19-Apr	Z	0	0	0	0	2	5	6	7	7	5	2	2	3	2	2	1	1	0	0	2	0	0	0	2.0	7	
20-Apr	0	Z	0	0	3	6	22	15	13	6	2	3	2	1	0	0	0	0	0	0	0	0	0	0	3.3	22	
21-Apr	0	0	Z	0	0	3	4	4	4	6	6	3	2	1	1	1	1	1	0	0	0	0	0	0	1.7	6	
22-Apr	0	0	0	Z	2	6	3	1	1	2	2	1	2	1	1	1	1	1	1	0	0	0	0	0	1.2	6	
23-Apr	0	0	0	0	Z	0	1	1	2	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0.6	2	
24-Apr	0	0	0	0	0	Z	0	0	0	0	1	1	1	0	1	1	1	1	0	0	1	0	0	0	0.3	1	
25-Apr	Z	0	0	0	1	2	3	2	1	1	2	1	1	1	1	1	1	1	1	0	1	0	0	0	1.0	3	
26-Apr	0	Z	0	0	0	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.8	2	
27-Apr	0	0	Z	0	0	1	2	2	2	1	1	1	1	0	0	1	0	1	1	2	2	0	0	1	0.8	2	
28-Apr	1	1	0	Z	2	10	8	4	4	3	1	0	0	0	0	0	0	1	1	1	1	0	0	1	1.8	10	
29-Apr	0	0	0	0	Z	1	2	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0.4	2	
30-Apr	0	0	0	0	1	Z	1	2	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.5	2	
		0.1	0.2	0.1	0.1	0.8	1.9	3.3	3.0	2.6	2.1	1.4	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.5	0.5	0.2	0.1	0.2	Diurnal Average	
		1	1	1	0	3	10	22	15	13	7	6	3	3	3	3	2	1	1	1	2	2	2	1	1	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Athabasca Valley - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Athabasca Valley - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	143	682
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

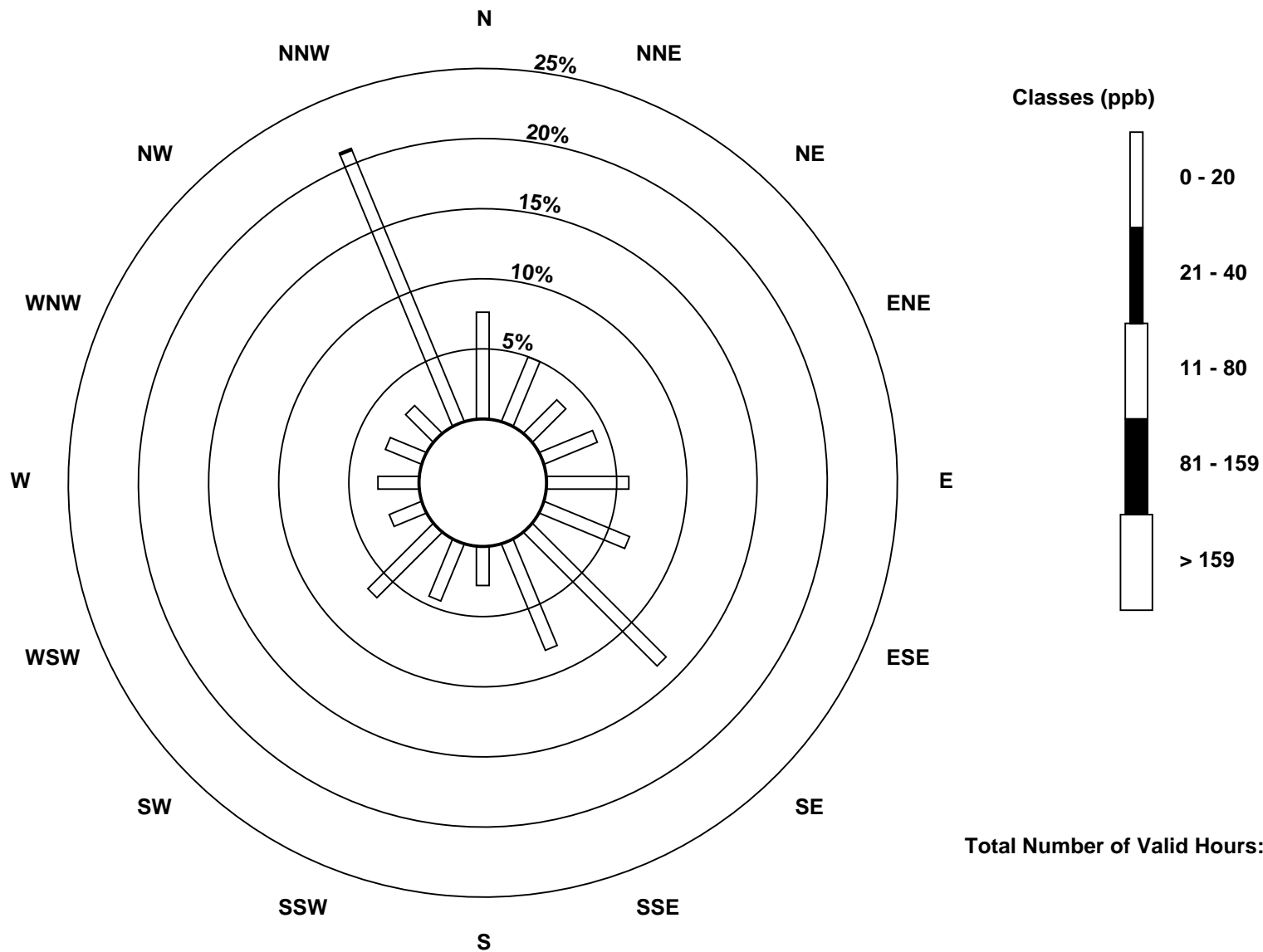
Total Number of Valid Hours: 683

Total Number of Hours: 720

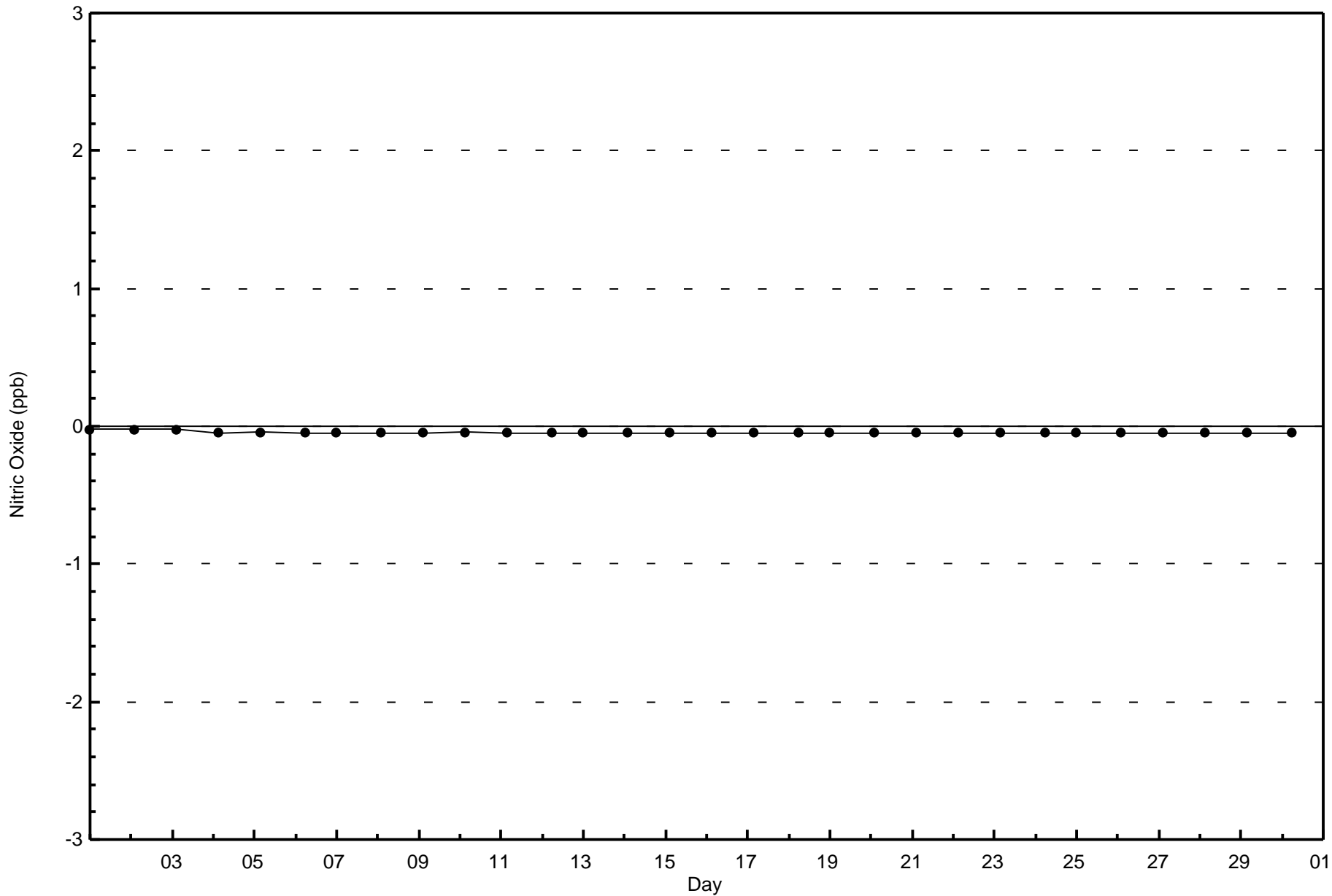


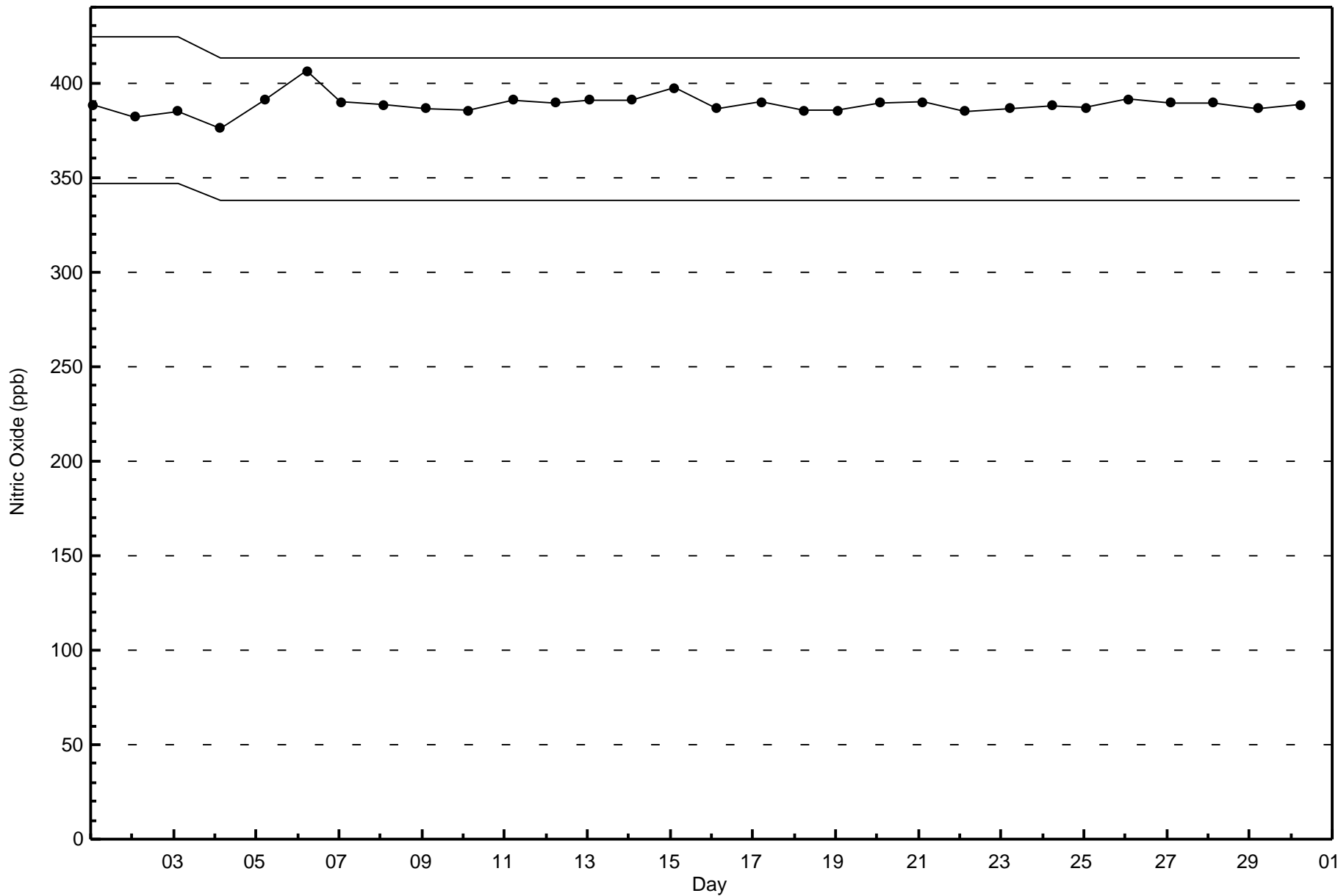
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Athabasca Valley (AMS 7)



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 32 ppb on Apr 7 05:00	Maximum Daily Average: 10.7 ppb on Apr 7
Minimum Value: 0 ppb on Apr 14 23:00	Hours of Data: 684
Maximum Diurnal Average: 10.3 ppb at hour 6	Hours of Missing Data: 36
Monthly Average: 5.1 ppb	Hours of Calibration: 36
Minimum Daily Average: 0.5 ppb on Apr 14	Percent Operational Time: 100.0
Minimum Diurnal Average: 2.1 ppb at hour 14	
Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 4 Q ₃ = 7 P ₉₀ = 11 P ₉₉ = 21	

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	3	2	2	3	7	4	1	2	2	1	1	1	1	1	1	2	3	5	3	1	2	6	4	2.6	7
2-Apr	5	Z	2	9	12	12	14	8	2	2	2	2	1	4	2	3	3	4	6	10	12	5	3	8	5.6	14
3-Apr	4	5	Z	5	9	11	10	10	C	C	C	C	C	C	3	3	3	4	6	5	9	6	12	8	--	12
4-Apr	5	9	4	Z	9	9	16	9	6	6	2	4	1	2	3	3	4	5	6	14	11	7	6	11	6.5	16
5-Apr	7	4	3	4	Z	6	7	8	10	5	4	3	2	3	3	5	5	6	6	16	15	11	6	9	6.4	16
6-Apr	5	5	5	5	5	Z	8	11	7	6	3	3	2	2	1	1	2	2	7	11	8	6	3	2	4.7	11
7-Apr	Z	3	1	15	32	32	30	29	21	18	11	9	7	2	8	5	1	1	1	2	2	2	6	9	10.7	32
8-Apr	6	Z	5	6	4	3	2	2	2	2	2	2	1	1	2	3	3	3	3	2	1	1	1	0	2.4	6
9-Apr	1	1	Z	3	3	2	1	3	3	2	2	2	2	3	3	2	2	3	4	12	12	9	6	8	3.8	12
10-Apr	8	8	8	Z	8	13	13	7	5	4	3	3	2	2	2	2	2	4	7	13	12	7	7	5	6.3	13
11-Apr	7	9	6	12	Z	4	5	3	2	3	3	2	3	2	2	2	3	4	3	3	4	5	5	4	4.1	12
12-Apr	4	6	6	9	14	Z	9	8	8	9	5	4	2	2	2	2	3	3	3	6	14	17	12	10	6.8	17
13-Apr	Z	8	8	11	9	20	22	12	8	2	1	1	0	1	1	1	1	1	0	0	1	0	0	0	4.6	22
14-Apr	1	Z	0	0	1	0	0	1	0	1	0	0	1	1	1	1	1	0	1	1	1	0	0	0	0.5	1
15-Apr	0	0	Z	0	0	0	0	0	1	1	0	0	1	1	1	0	3	4	6	14	16	16	9	7	3.5	16
16-Apr	7	6	4	Z	8	7	6	4	4	4	3	1	1	1	2	1	2	3	5	5	7	11	11	4.4	11	
17-Apr	9	5	3	4	Z	3	4	3	2	2	3	3	3	3	2	2	3	3	4	5	4	3	2	1	3.2	9
18-Apr	7	10	11	12	11	Z	6	7	5	5	4	3	3	3	3	3	3	4	5	5	5	5	6	5	5.6	12
19-Apr	Z	6	6	6	10	16	15	11	13	12	10	6	4	5	5	4	4	4	4	7	14	7	6	6	7.7	16
20-Apr	6	Z	7	8	12	12	15	13	11	9	4	9	6	3	3	4	4	4	4	5	3	2	8	6	6.7	15
21-Apr	10	17	Z	17	24	24	15	9	7	8	8	6	4	4	3	3	3	5	6	7	10	13	10	10	9.6	24
22-Apr	7	6	5	Z	9	17	12	5	3	3	3	2	2	2	2	2	2	2	3	3	5	9	15	9	5.6	17
23-Apr	3	2	2	1	Z	3	2	1	3	2	2	1	1	2	2	2	3	3	3	2	2	2	4	4	2.1	4
24-Apr	2	2	2	1	0	Z	1	1	0	1	2	2	1	1	1	3	1	1	1	2	0	1	1	5	1.3	5
25-Apr	Z	5	5	6	9	9	7	4	2	2	2	2	3	3	4	4	5	5	5	5	8	6	6	9	5.0	9
26-Apr	8	Z	7	7	8	9	11	8	4	3	4	4	3	3	3	4	4	4	5	6	4	8	5	6	5.5	11
27-Apr	8	9	Z	6	5	8	11	8	5	2	3	2	2	1	1	2	1	4	4	12	12	6	4	6	5.4	12
28-Apr	12	15	9	Z	11	19	13	7	6	6	2	1	1	2	1	2	3	7	6	6	16	10	7	10	7.5	19
29-Apr	9	11	9	11	Z	10	7	3	2	2	3	2	2	2	2	2	3	2	4	4	11	5	4	4	4.9	11
30-Apr	6	7	9	8	9	Z	3	4	5	3	2	2	2	2	1	1	3	4	6	10	8	4	4	4	4.7	10

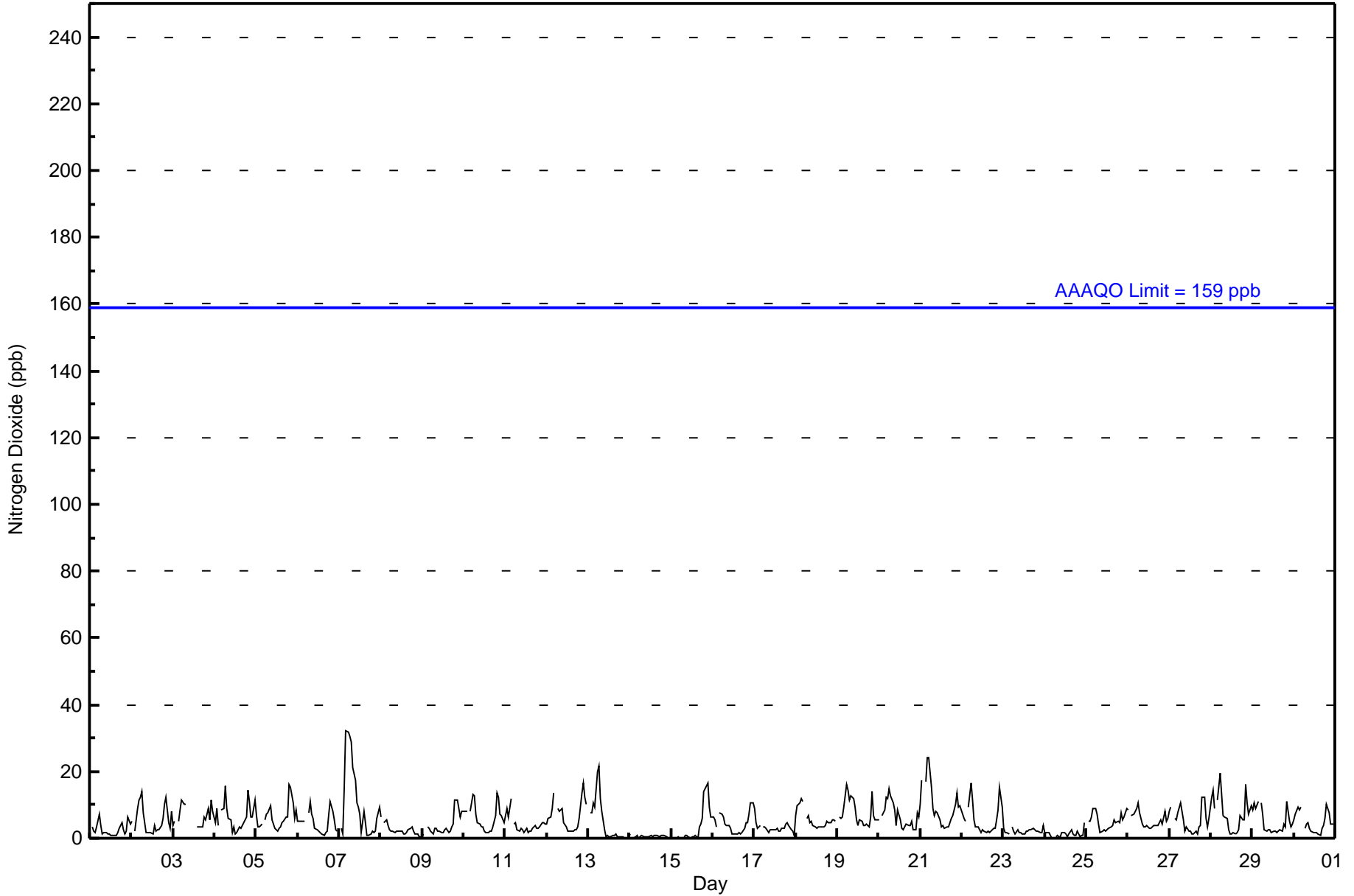
5.8	6.4	5.1	6.7	9.0	10.3	9.0	6.6	5.1	4.3	3.2	2.7	2.2	2.1	2.3	2.4	2.7	3.3	4.2	6.5	7.5	6.0	5.7	6.0	Diurnal Average
12	17	11	17	32	32	30	29	21	18	11	9	7	5	8	5	5	7	7	16	16	17	15	11	Diurnal Maximum

Z - zeronspan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	676	98.83	98.83
21 - 40	8	1.17	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	51	33	23	28	40	45	92	56	19	30	45	17	20	19	17	140	675
21 - 40	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	4	8
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

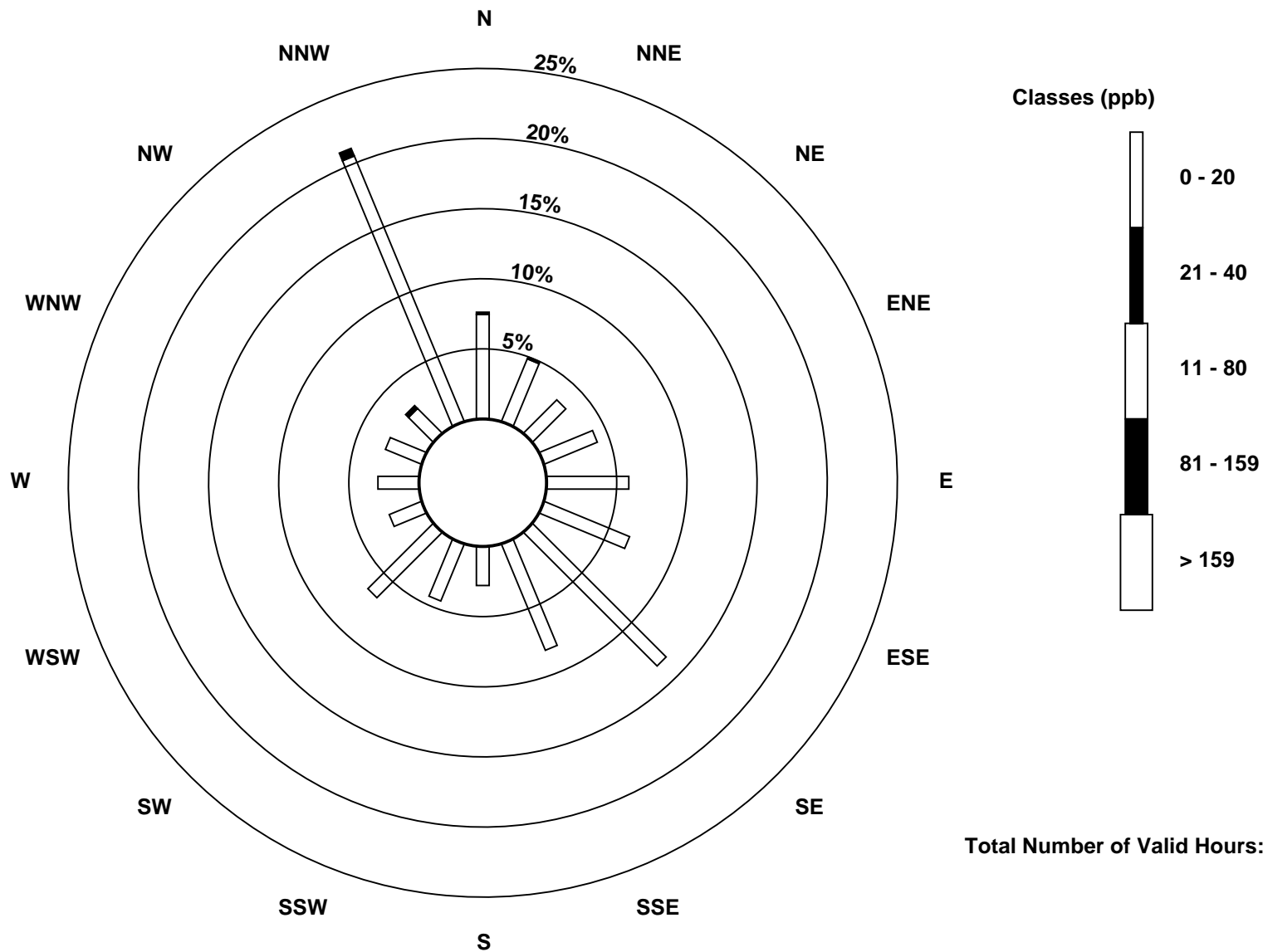
Total Number of Valid Hours: 683

Total Number of Hours: 720

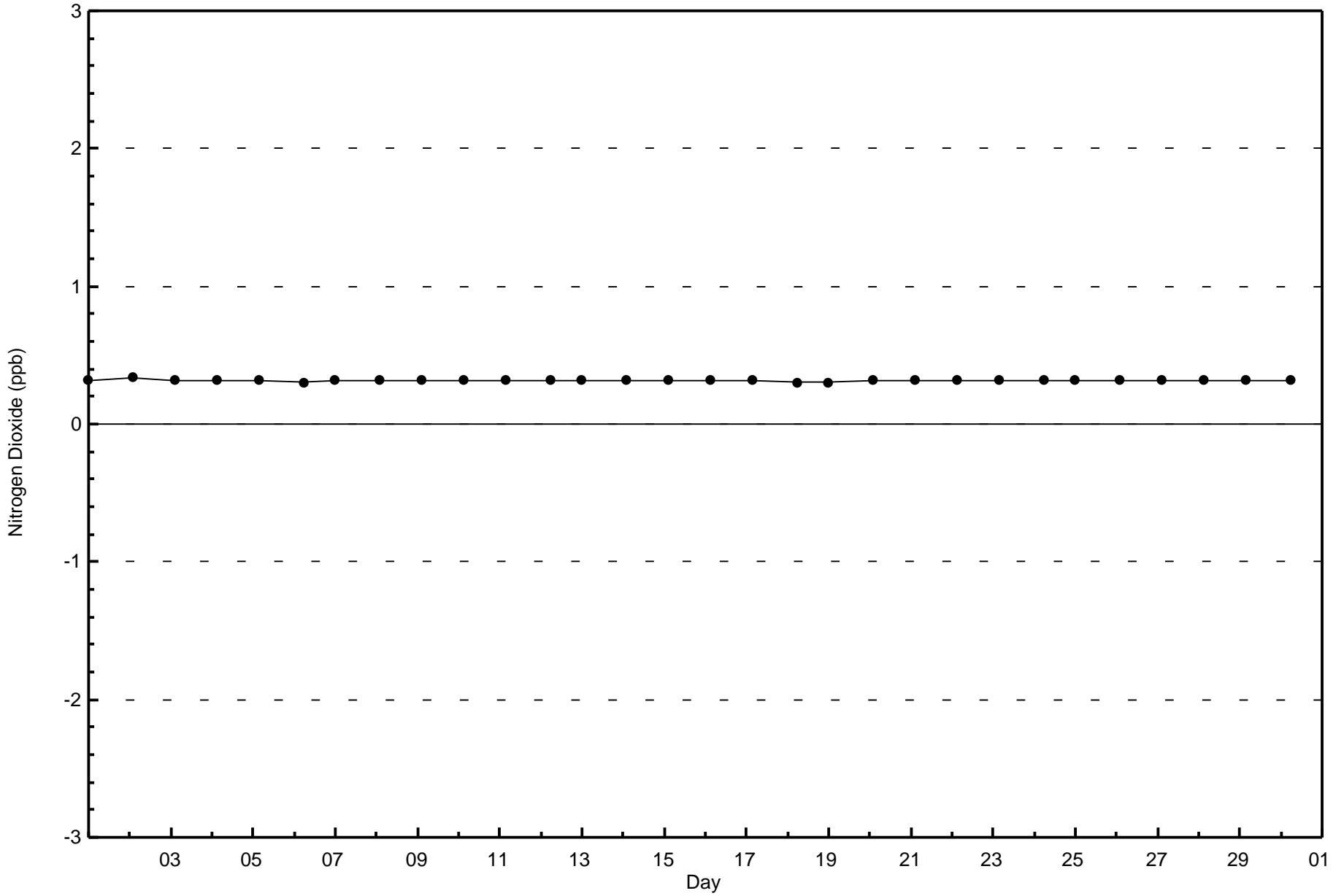


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley (AMS 7)



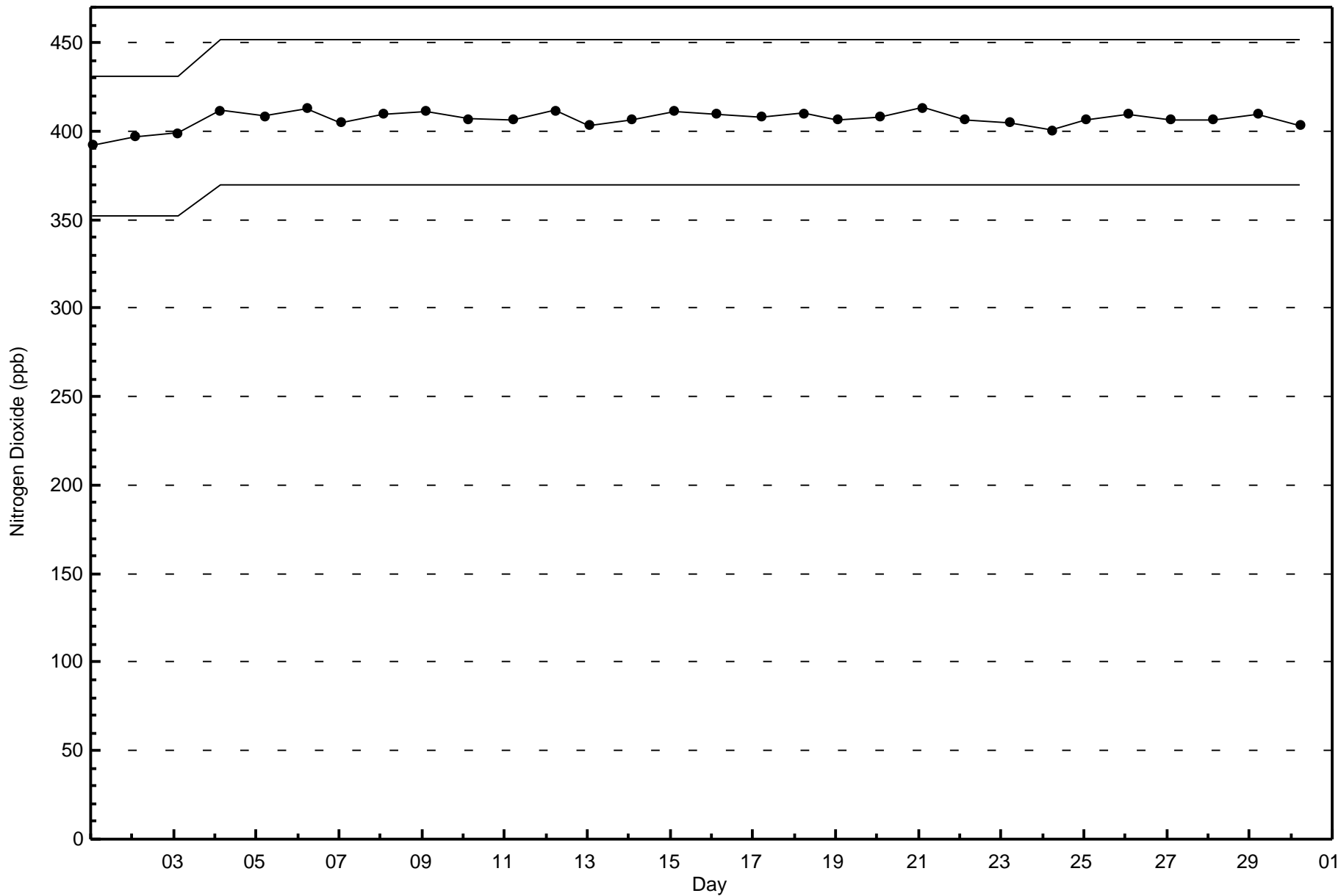
Total Number of Valid Hours: 683





Wood Buffalo Environmental Association
Span Responses

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

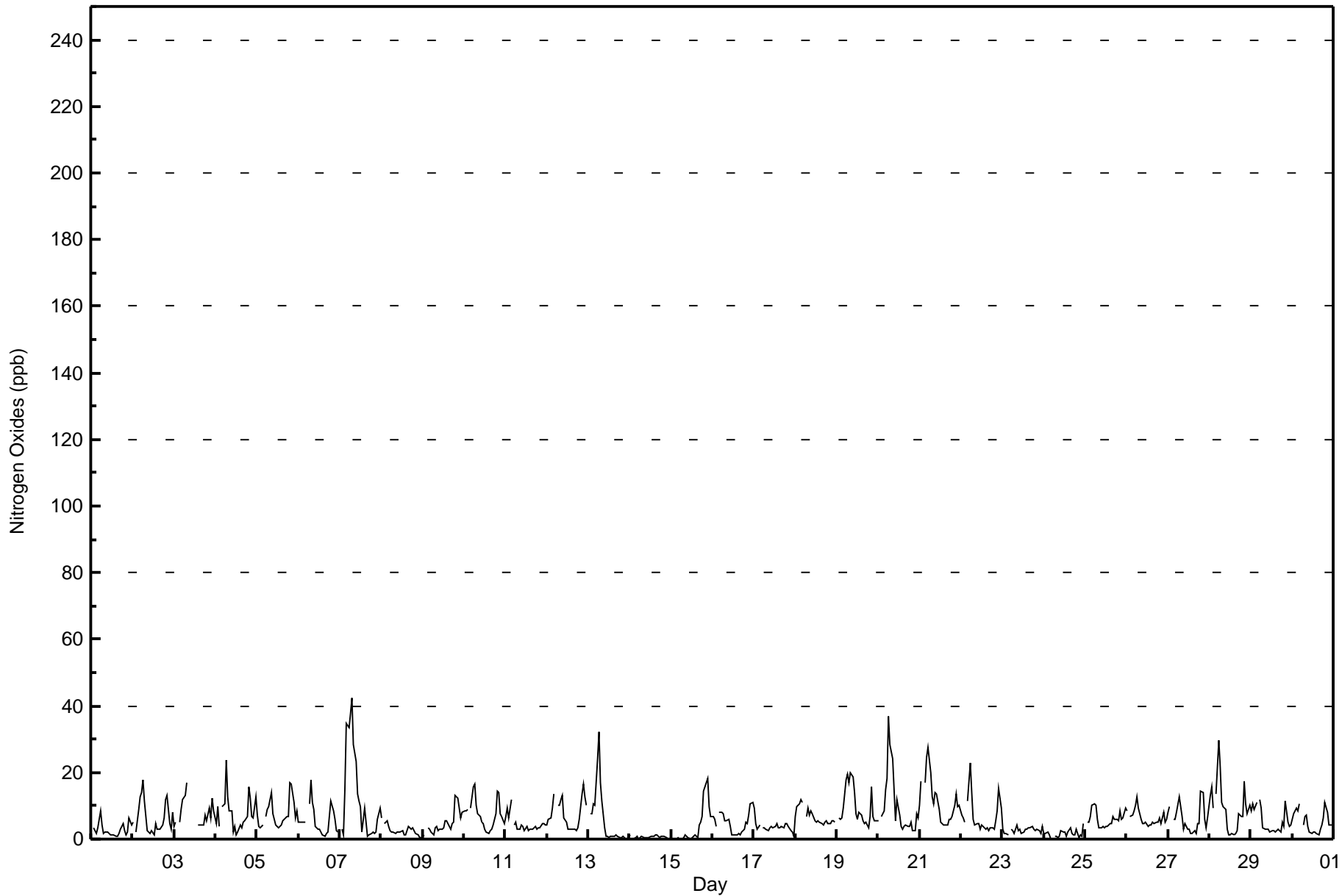
Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - April 2017

Maximum Value: 42 ppb on Apr 7 08:00																	Maximum Daily Average: 12.8 ppb on Apr 7							Hours in Service: 720																									
Minimum Value: 0 ppb on Apr 15 00:00																	Minimum Daily Average: 0.6 ppb on Apr 14							Hours of Data: 684																									
Maximum Diurnal Average: 12.2 ppb at hour 7																	Minimum Diurnal Average: 2.9 ppb at hour 14							Hours of Missing Data: 36																									
Monthly Average: 6.1 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 5 Q ₃ = 8 P ₉₀ = 13 P ₉₉ = 29							Hours of Calibration: 36																									
																								Percent Operational Time: 100.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	Z	3	2	2	3	8	4	2	2	2	2	1	1	1	1	1	2	3	5	3	1	2	6	4	2.7	8																							
2-Apr	5	Z	2	9	13	14	18	12	2	2	2	2	1	5	3	3	3	4	6	12	13	5	3	8	6.4	18																							
3-Apr	4	5	Z	5	9	12	13	17	C	C	C	C	C	C	4	4	4	4	7	5	9	6	12	8	--	17																							
4-Apr	5	10	4	Z	10	10	24	13	9	9	2	4	1	2	4	4	5	5	7	15	12	7	6	13	7.9	24																							
5-Apr	7	4	3	4	Z	7	9	10	14	8	6	4	3	4	4	5	6	7	7	17	16	11	6	9	7.4	17																							
6-Apr	5	5	5	5	5	Z	11	18	11	9	4	3	3	2	1	1	2	2	7	12	8	6	2	2	5.6	18																							
7-Apr	Z	3	1	15	35	34	38	42	28	23	14	12	10	2	9	5	1	1	2	2	2	2	6	9	12.8	42																							
8-Apr	6	Z	5	5	4	3	2	2	2	2	2	2	3	1	1	3	4	3	3	2	2	1	1	0	2.6	6																							
9-Apr	1	1	Z	3	3	2	1	3	4	3	3	3	4	6	6	4	3	5	5	13	12	9	6	8	4.7	13																							
10-Apr	8	9	9	Z	9	16	16	10	7	7	5	5	3	2	2	3	3	4	8	14	14	8	7	5	7.5	16																							
11-Apr	7	9	6	12	Z	4	5	3	3	4	4	3	4	3	3	3	3	4	3	3	4	4	5	4	4.4	12																							
12-Apr	4	6	6	9	14	Z	10	10	12	13	6	5	3	3	3	3	3	3	3	6	14	16	13	10	7.6	16																							
13-Apr	Z	8	8	11	10	24	32	17	12	3	1	1	1	1	1	1	1	1	1	1	1	0	0	0	5.8	32																							
14-Apr	1	Z	0	0	1	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0.6	1																							
15-Apr	0	0	Z	0	0	0	0	0	1	1	1	0	1	1	1	0	4	5	7	14	17	18	10	7	3.9	18																							
16-Apr	7	6	4	Z	8	8	8	6	6	6	4	1	1	1	1	2	1	2	3	5	5	7	11	11	4.9	11																							
17-Apr	9	5	3	4	Z	3	3	3	3	3	4	4	4	4	3	3	4	3	5	5	4	3	2	1	3.7	9																							
18-Apr	7	10	11	12	11	Z	7	9	7	9	8	6	5	5	5	5	4	5	6	5	5	5	6	5	6.8	12																							
19-Apr	Z	6	6	6	9	18	20	17	20	18	14	8	6	8	7	6	5	5	4	7	16	7	6	6	9.7	20																							
20-Apr	6	Z	7	8	15	18	37	28	24	15	6	12	7	4	3	4	4	4	4	5	3	2	8	6	10.0	37																							
21-Apr	10	17	Z	17	25	27	20	13	11	14	13	9	5	5	4	4	4	6	6	7	10	13	10	10	11.3	27																							
22-Apr	7	6	5	Z	12	23	14	6	4	5	4	3	4	4	3	3	3	3	3	3	5	8	15	9	6.8	23																							
23-Apr	3	2	2	1	Z	3	3	2	4	3	3	2	2	3	3	3	4	4	3	3	3	2	2	4	2.7	4																							
24-Apr	2	2	2	1	0	Z	1	1	0	1	2	2	2	1	2	4	2	1	1	3	1	1	1	5	1.6	5																							
25-Apr	Z	5	5	7	10	10	10	6	3	3	4	3	4	4	5	5	7	6	6	5	8	6	6	9	6.0	10																							
26-Apr	9	Z	7	7	9	10	13	9	6	5	5	5	4	4	4	5	5	5	5	6	5	8	5	6	6.3	13																							
27-Apr	8	10	Z	6	6	8	13	10	7	3	5	3	3	2	2	3	2	5	5	14	14	6	4	7	6.2	14																							
28-Apr	13	16	9	Z	13	30	21	11	10	9	3	1	1	2	1	2	3	8	7	7	17	11	8	10	9.2	30																							
29-Apr	9	11	9	11	Z	12	9	3	3	3	3	2	3	3	2	3	3	2	5	4	11	5	4	4	5.4	12																							
30-Apr	6	8	9	8	10	Z	4	7	7	4	2	2	2	2	2	1	3	4	6	11	8	4	4	4	5.2	11																							
																								6.0	6.6	5.2	6.8	9.8	12.2	12.2	9.7	7.7	6.5	4.5	3.7	3.1	2.9	3.1	3.1	3.2	3.8	4.6	7.0	8.0	6.2	5.8	6.2	Diurnal Average	
																								13	17	11	17	35	34	38	42	28	23	14	12	10	8	9	6	7	8	8	17	17	18	15	13	Diurnal Maximum	
Z - zerspan C - Calibration																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	667	97.51	97.51
21 - 40	16	2.34	99.85
41 - 80	1	0.15	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



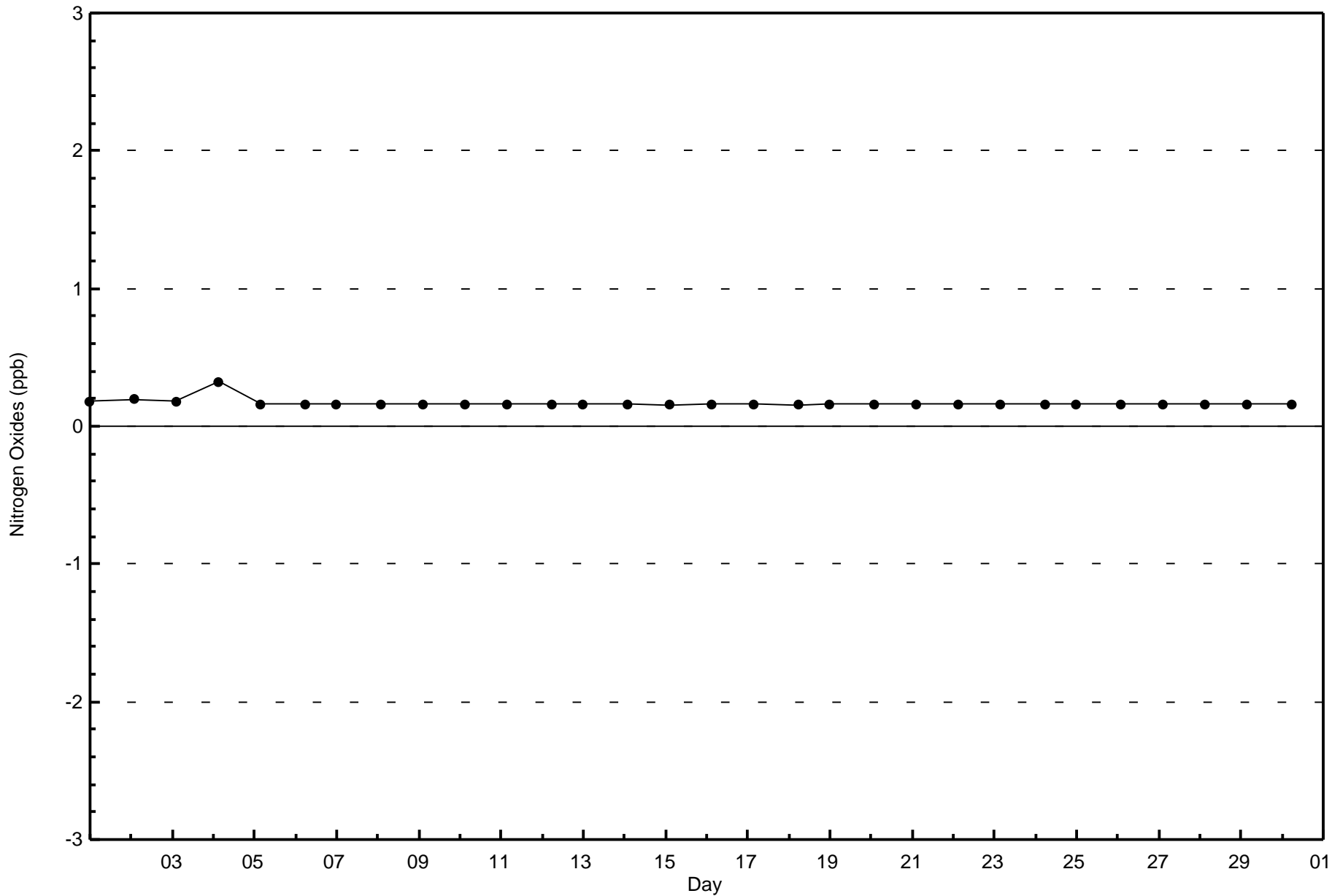
**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	50	32	22	27	40	45	91	54	19	30	45	17	20	19	17	138	666
21 - 40	2	2	1	1	0	0	1	2	0	0	0	0	0	0	1	6	16
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	34	23	28	40	45	92	56	19	30	45	17	20	19	19	144	683

Total Number of Valid Hours: 683

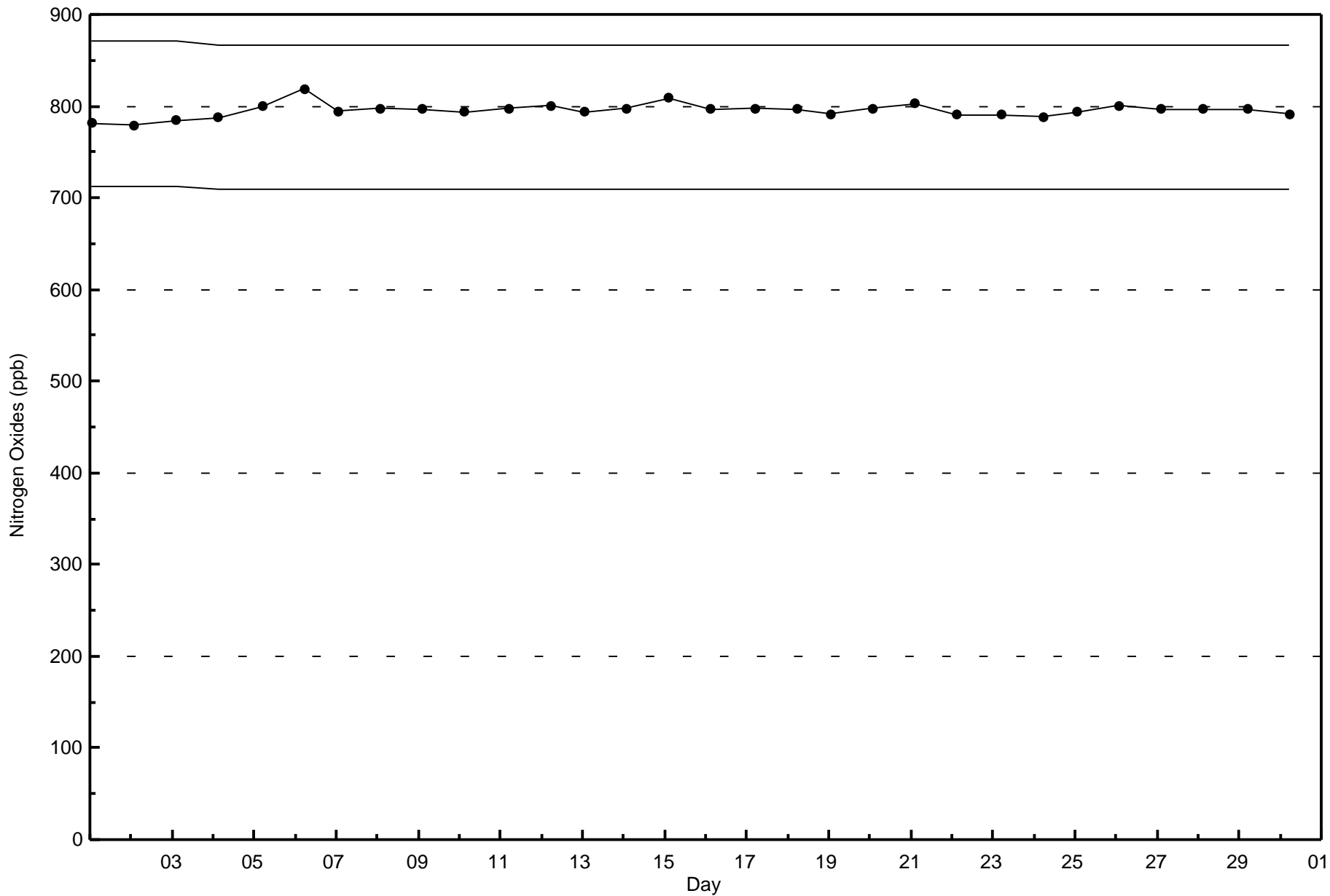
Total Number of Hours: 720





Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - April 2017





Number of Exceedences (AAAQO):	24-hr: 0	Hours in Service:	720
Maximum Value: 25.5 µg/m ³ on Apr 10 21:00	Maximum Daily Average: 8.1 µg/m ³ on Apr 10	Hours of Data:	712
Minimum Value: 0.4 µg/m ³ on Apr 6 18:00	Minimum Daily Average: 3.3 µg/m ³ on Apr 1	Hours of Missing Data:	8
Maximum Diurnal Average: 7.9 µg/m ³ at hour 21	Minimum Diurnal Average: 4.1 µg/m ³ at hour 14	Hours of Calibration:	2
Monthly Average: 5.36 µg/m ³	Percentiles: P ₁ = 1.0 P ₁₀ = 2.9 Q ₁ = 3.9 Median = 4.8 Q ₃ = 6.3 P ₉₀ = 8.1 P ₉₉ = 13.7	Percent Operational Time:	99.2

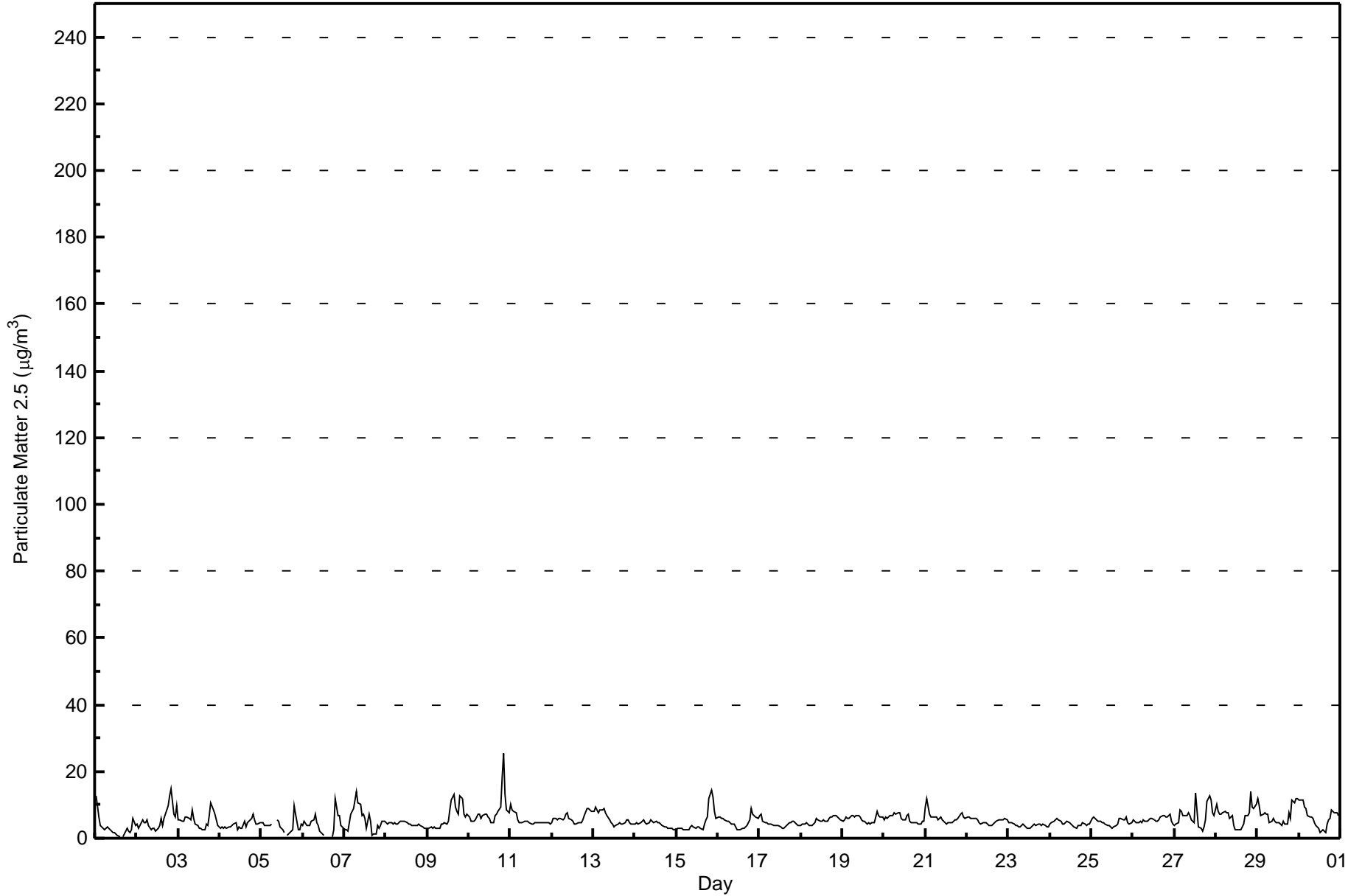
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	12.7	9.6	6.3	3.8	3.3	2.7	3.0	3.5	2.8	2.3	1.9	1.6	1.3	1.0	0.5	UO	0.6	1.3	2.9	1.9	1.6	2.4	5.9	3.7	3.3	12.7
2-Apr	4.3	2.9	3.6	5.5	4.8	4.5	5.3	3.9	2.7	3.1	2.9	2.2	2.8	3.6	6.0	3.9	5.8	8.5	9.7	12.5	15.0	7.3	6.2	9.7	5.7	15.0
3-Apr	5.5	5.7	4.9	5.0	6.2	6.3	5.8	5.4	8.5	5.8	4.3	3.9	3.0	2.8	2.5	2.7	4.3	3.9	6.8	10.5	8.6	7.0	5.6	3.8	5.4	10.5
4-Apr	3.0	3.2	3.1	3.3	3.2	3.2	3.3	3.7	4.3	4.8	2.5	3.5	3.0	3.0	4.9	3.4	4.5	5.3	5.8	7.0	5.3	4.3	4.3	4.6	4.0	7.0
5-Apr	4.5	4.8	3.9	3.8	3.9	3.7	4.1	C	C	5.5	5.2	3.6	2.6	1.6	UO	0.7	1.2	1.9	2.5	9.7	7.4	2.5	2.7	4.1	3.8	9.7
6-Apr	3.7	5.3	3.9	3.7	4.0	5.1	5.6	7.4	4.7	3.7	2.0	1.2	0.9	UO	UO	UO	UO	0.4	2.7	11.8	6.9	7.0	3.9	3.4	4.4	11.8
7-Apr	2.5	2.6	2.2	4.5	7.0	8.8	11.6	13.9	10.7	10.0	6.9	7.4	6.1	2.9	7.3	5.2	0.8	1.1	1.5	3.8	3.0	3.9	5.1	5.0	5.6	13.9
8-Apr	4.6	4.3	4.9	4.7	4.2	4.5	4.3	4.1	5.2	4.9	5.1	5.1	4.7	4.4	4.3	3.9	3.6	3.8	3.9	4.1	3.7	3.3	2.9	2.9	4.2	5.2
9-Apr	2.8	2.9	3.2	3.2	3.2	3.1	2.9	2.8	4.0	4.4	4.7	4.3	5.0	8.4	11.5	13.1	9.3	7.9	7.3	12.6	11.9	7.3	6.2	7.2	6.2	13.1
10-Apr	6.3	5.3	5.2	5.1	5.6	7.1	7.4	6.1	6.6	7.4	7.4	6.3	5.9	4.6	4.7	6.7	7.4	7.9	9.2	18.1	25.5	13.1	8.6	7.7	8.1	25.5
11-Apr	10.1	8.7	7.9	7.7	5.3	4.6	4.5	4.5	5.0	5.1	5.0	4.6	4.2	4.4	4.6	4.8	4.8	4.8	4.6	4.6	4.5	4.5	4.5	4.2	5.3	10.1
12-Apr	4.7	6.1	5.8	5.7	6.0	5.9	5.4	5.7	7.4	7.5	5.9	5.3	4.9	4.2	4.3	4.7	4.6	4.7	5.4	6.9	8.8	8.8	8.3	8.0	6.0	8.8
13-Apr	8.1	9.3	8.6	7.8	8.4	8.4	9.0	7.5	6.9	5.4	4.6	4.1	3.6	3.9	4.4	4.7	4.4	4.4	4.5	5.5	5.7	4.8	4.4	4.2	5.9	9.3
14-Apr	4.3	4.5	4.4	4.5	5.0	5.3	4.7	4.3	4.7	5.3	5.0	4.8	5.1	4.8	4.5	4.1	3.7	3.6	3.5	3.1	3.0	2.9	2.7	2.5	4.2	5.3
15-Apr	2.6	2.8	2.8	2.8	2.7	2.6	2.7	2.4	3.4	3.8	3.4	3.2	3.4	3.3	3.1	2.6	4.1	5.6	6.3	11.9	14.6	12.2	8.3	5.8	4.8	14.6
16-Apr	6.2	6.5	6.0	5.9	5.5	5.3	5.1	4.8	4.3	4.3	3.5	2.7	2.7	2.9	3.2	3.3	4.0	5.3	9.1	7.3	6.7	6.5	6.1	5.0	9.1	
17-Apr	6.6	7.0	5.2	4.5	4.5	4.1	4.1	4.0	3.6	3.6	3.7	3.7	3.2	2.8	3.1	3.3	3.8	4.5	4.8	4.9	5.0	4.3	4.0	3.8	4.3	7.0
18-Apr	3.9	4.3	4.3	4.5	4.4	4.0	3.8	4.2	4.7	5.8	5.6	5.1	4.9	5.5	5.2	5.2	5.8	6.5	6.4	6.7	6.8	6.2	6.1	5.4	5.2	6.8
19-Apr	5.0	5.3	6.2	6.1	6.0	6.7	6.6	6.5	6.8	6.9	6.3	5.4	5.2	5.1	4.4	4.7	4.4	4.8	4.8	6.1	8.1	6.8	6.4	6.2	5.9	8.1
20-Apr	5.7	6.5	6.1	6.7	6.8	6.7	7.8	7.3	7.8	7.7	5.7	5.7	5.6	6.9	7.0	5.0	4.7	4.7	4.6	4.7	4.4	4.2	5.1	5.2	6.0	7.8
21-Apr	9.5	12.0	7.3	6.4	6.3	6.3	6.3	5.7	6.0	6.3	5.5	4.6	4.2	4.5	4.5	4.5	4.9	5.6	5.7	6.1	7.3	7.5	6.4	6.1	6.2	12.0
22-Apr	6.5	6.4	6.1	6.0	6.1	6.0	5.3	4.6	4.4	4.5	4.6	4.5	4.3	3.9	3.8	4.2	4.8	5.1	5.4	5.3	5.6	5.5	6.1	5.6	5.2	6.5
23-Apr	4.6	4.6	4.5	4.2	4.0	3.8	3.5	3.3	4.1	3.9	3.4	3.1	3.1	3.5	3.8	4.2	3.6	4.3	4.1	3.9	4.2	3.8	3.5	3.6	3.9	4.6
24-Apr	4.2	4.9	5.0	5.7	5.8	5.5	5.1	4.4	4.4	4.7	4.9	4.6	4.1	3.7	3.2	2.9	3.7	3.9	4.0	4.5	4.1	4.0	4.2	4.3	4.4	5.8
25-Apr	6.0	6.5	6.0	5.4	5.2	4.9	4.5	4.5	4.1	3.9	3.9	3.5	3.0	3.3	3.8	4.4	5.9	6.1	5.7	5.5	6.5	4.7	4.4	4.7	4.8	6.5
26-Apr	5.5	5.1	4.8	4.7	5.0	4.7	5.5	5.0	5.1	5.6	6.0	5.8	5.5	5.2	5.1	5.6	6.5	6.7	6.9	6.3	6.5	7.2	5.2	4.2	5.6	7.2
27-Apr	3.8	4.4	4.6	8.4	8.1	6.6	6.6	6.8	7.7	6.9	5.7	4.7	13.8	8.7	3.3	3.0	2.0	3.2	5.6	10.9	12.9	11.4	7.7	6.9	6.8	13.8
28-Apr	10.3	8.0	7.2	7.1	7.8	7.9	7.5	7.6	6.1	6.6	3.9	2.4	2.6	2.6	2.6	3.3	4.3	6.8	6.6	7.7	14.1	9.2	9.0	10.1	6.7	14.1
29-Apr	11.9	9.8	7.0	7.0	7.7	7.2	7.1	4.8	5.2	5.7	5.1	4.8	4.7	4.1	3.7	5.0	4.1	4.2	7.5	5.9	11.4	10.4	11.7	12.1	7.0	12.1
30-Apr	11.3	11.4	11.4	9.4	9.1	6.8	6.3	6.5	6.0	4.6	3.6	3.1	1.9	2.1	2.4	1.8	4.4	5.4	5.9	8.3	7.5	7.6	7.4	6.6	6.3	11.4
																								Diurnal Average		
																								Diurnal Maximum		

C - Calibration	UO - Unstable Operation
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³	



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - April 2017**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	435	61.10	61.10
6 - 15	268	37.64	98.74
16 - 25	1	0.14	98.88
26 - 80	1	0.14	99.02
> 81.0	0	0.00	99.02

Total Number of Valid Hours: 712

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - April 2017**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	43	25	16	19	29	27	55	29	9	20	30	9	8	9	10	97	435
6 - 15	15	11	7	9	11	18	41	28	9	13	16	9	7	8	10	55	267
16 - 25	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
26 - 80	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	36	23	28	41	45	97	57	18	33	46	18	15	17	20	152	704

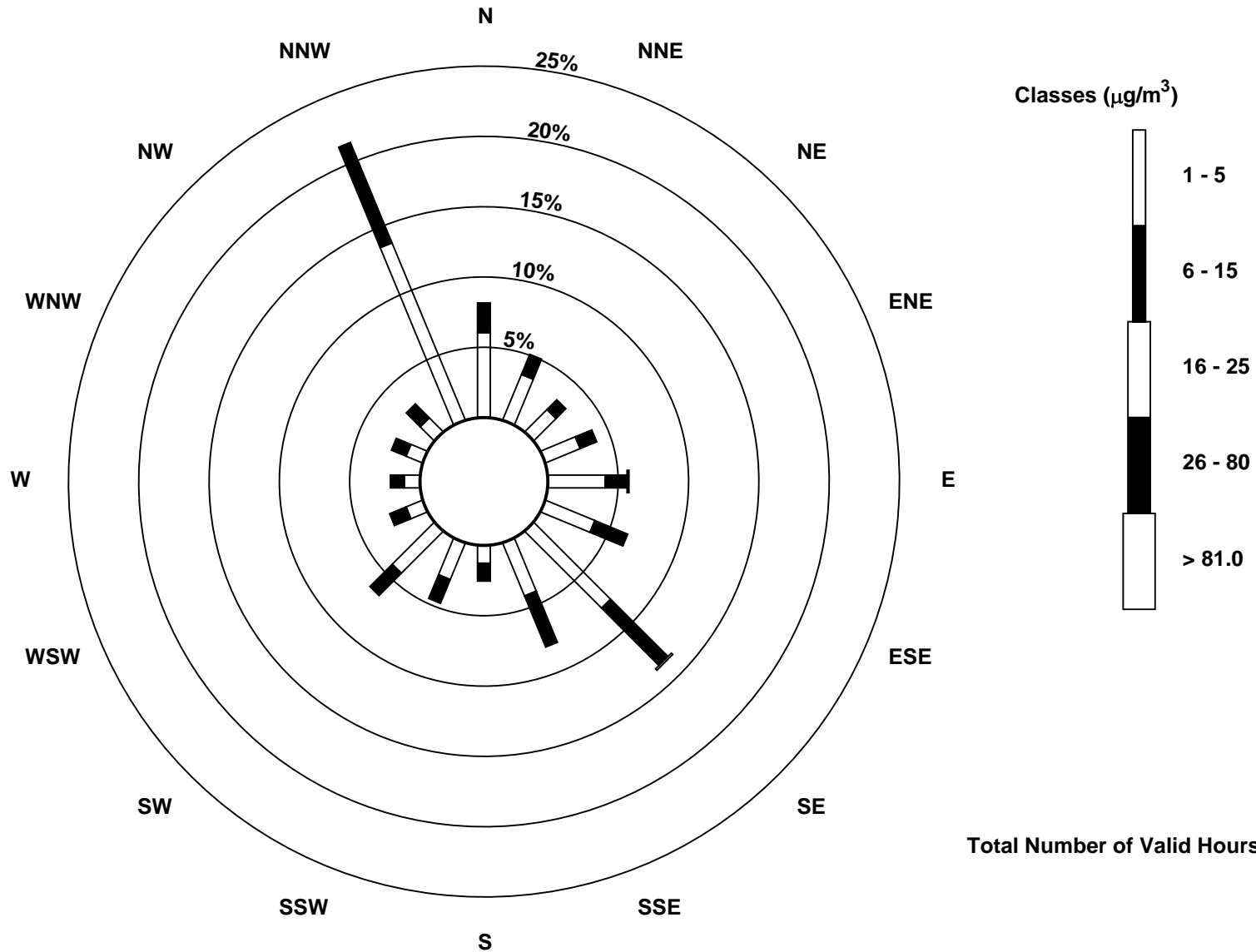
Total Number of Valid Hours: 711

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

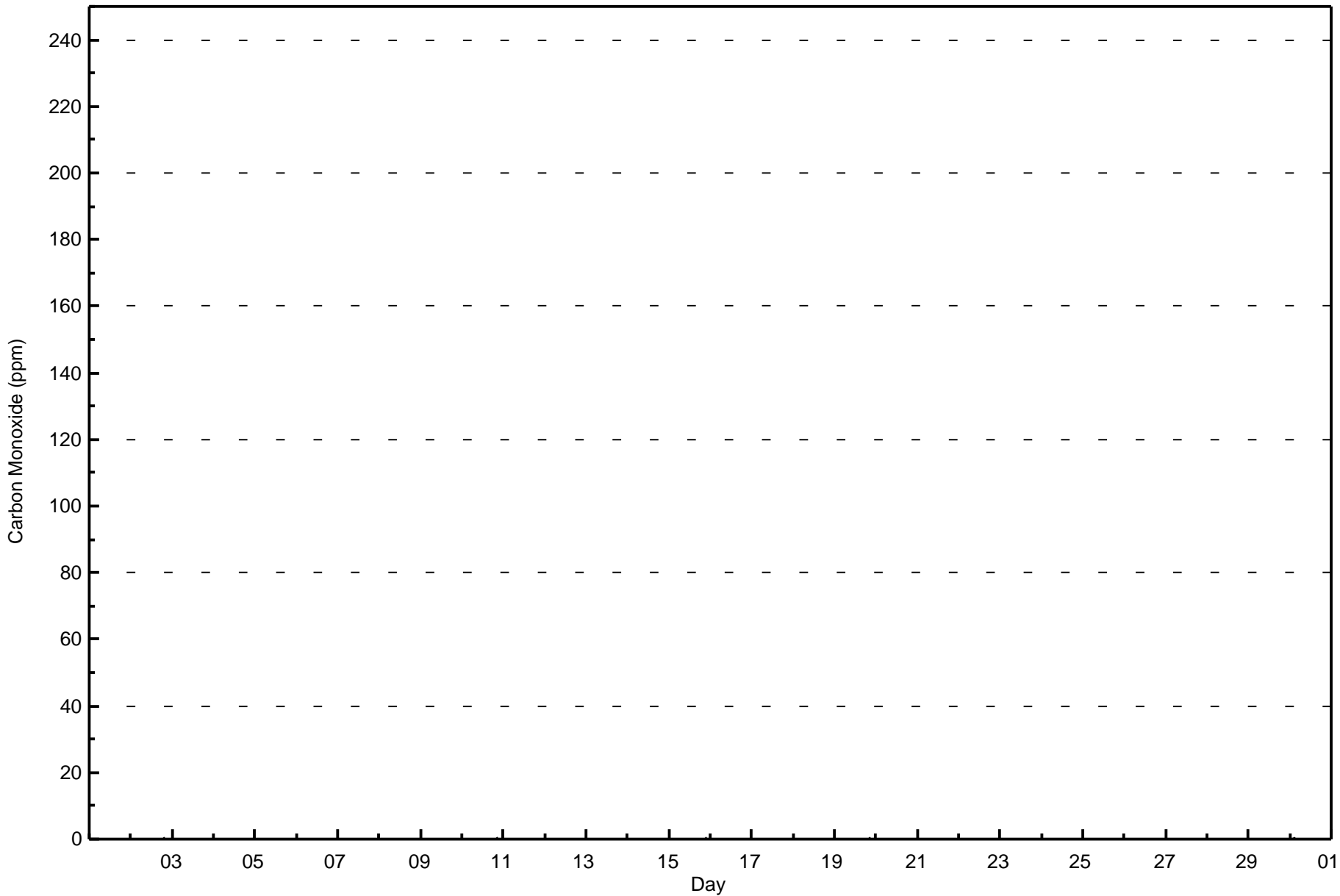
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley (AMS 7)





Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Athabasca Valley - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm
Athabasca Valley - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	686	100.00	100.00
0.4 - 0.5	0	0.00	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Athabasca Valley - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	53	33	23	29	38	43	88	58	20	32	44	18	20	20	21	145	685
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	33	23	29	38	43	88	58	20	32	44	18	20	20	21	145	685

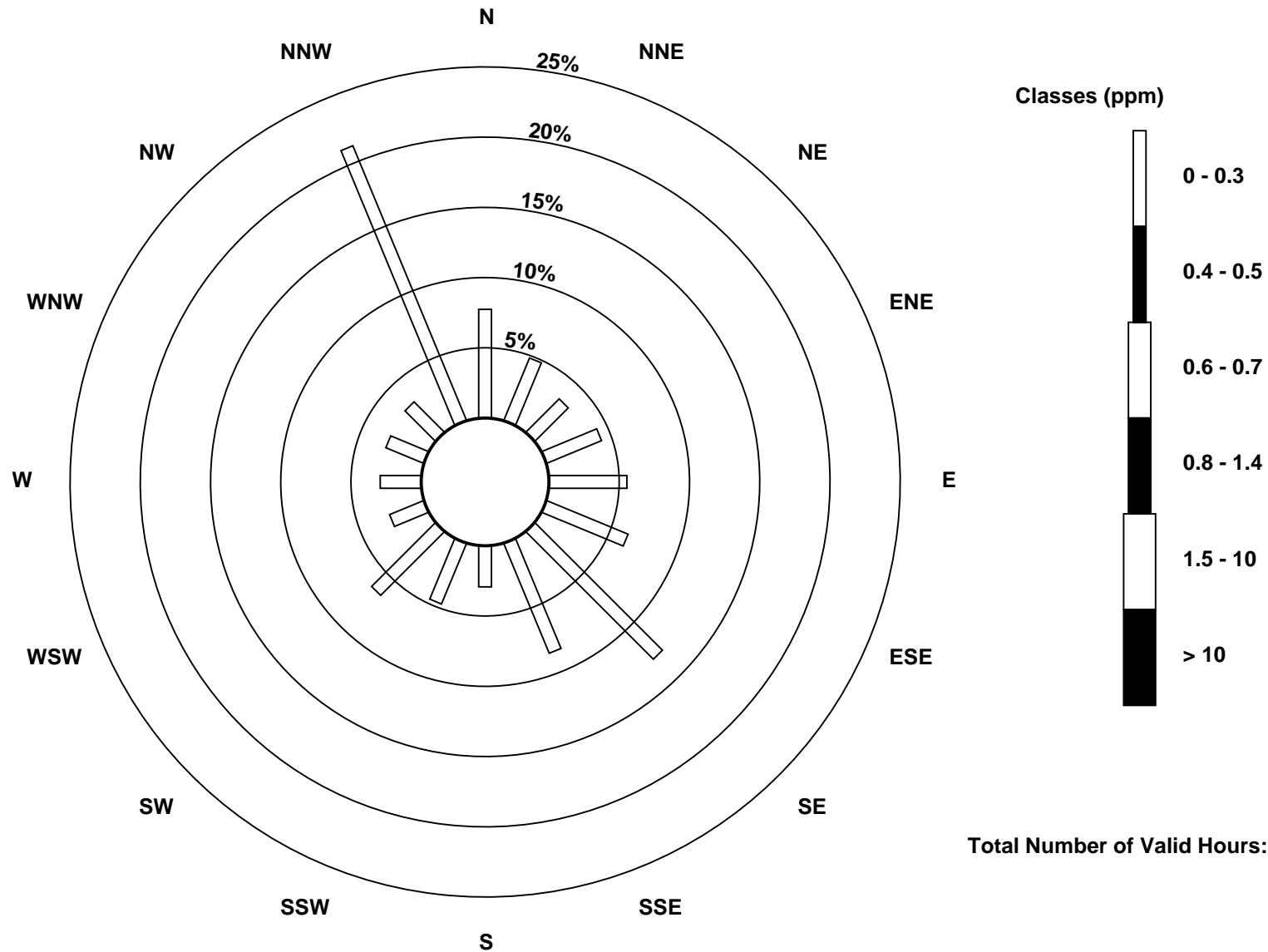
Total Number of Valid Hours: 685

Total Number of Hours: 720

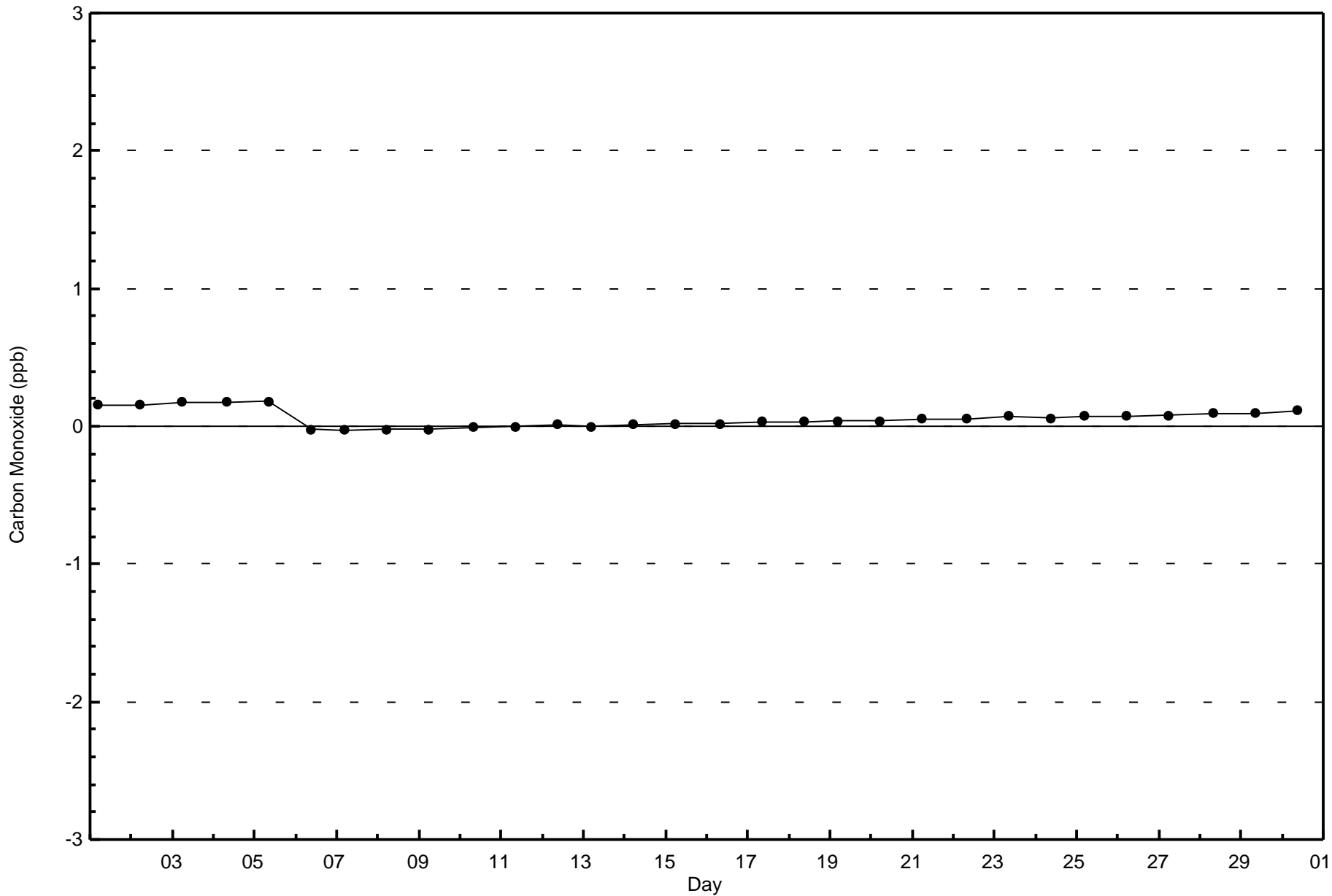


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Carbon Monoxide (CO) - ppm
Athabasca Valley (AMS 7)



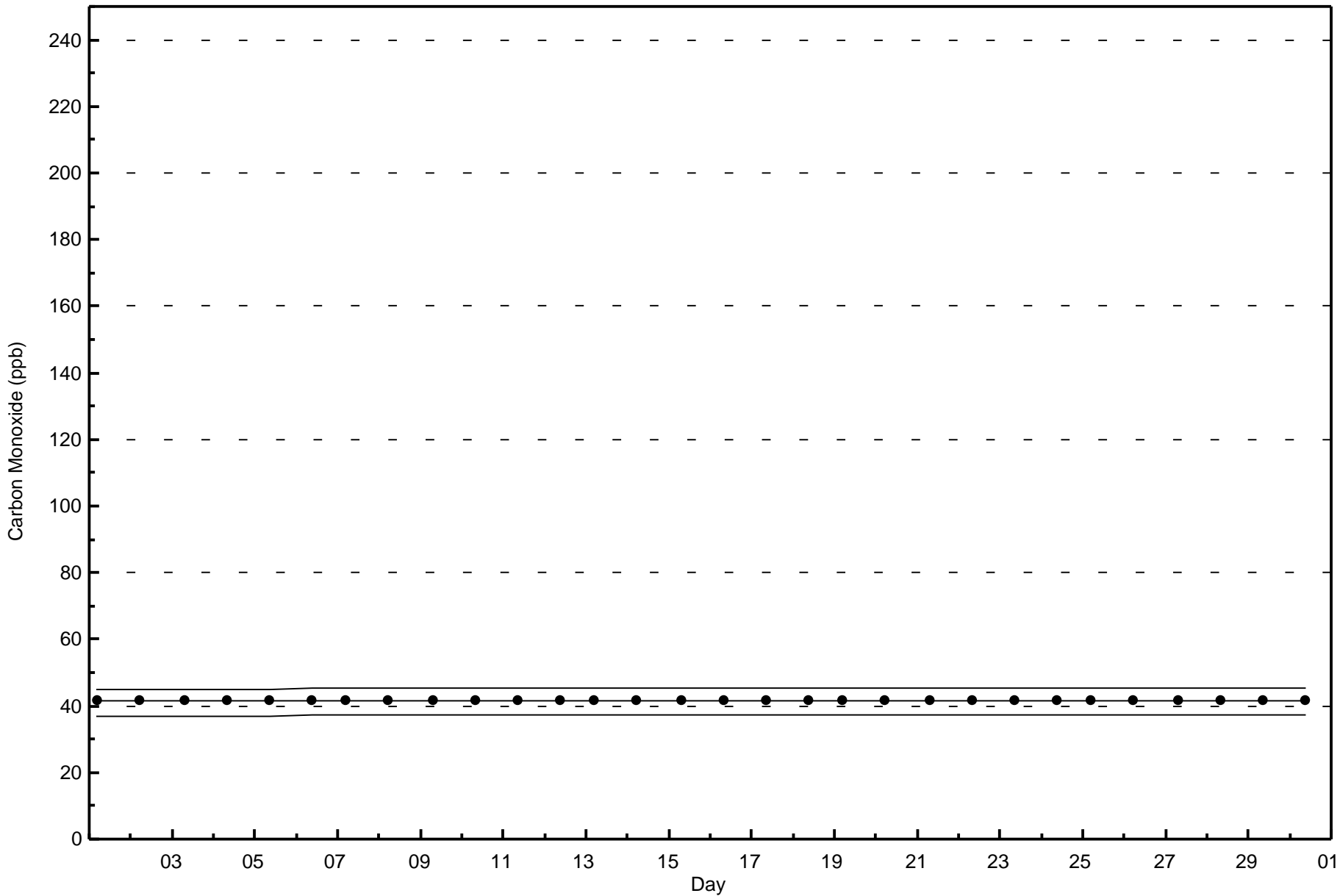
Total Number of Valid Hours: 685





Wood Buffalo Environmental Association
Span Responses

Carbon Monoxide (CO) - ppb
Athabasca Valley - April 2017

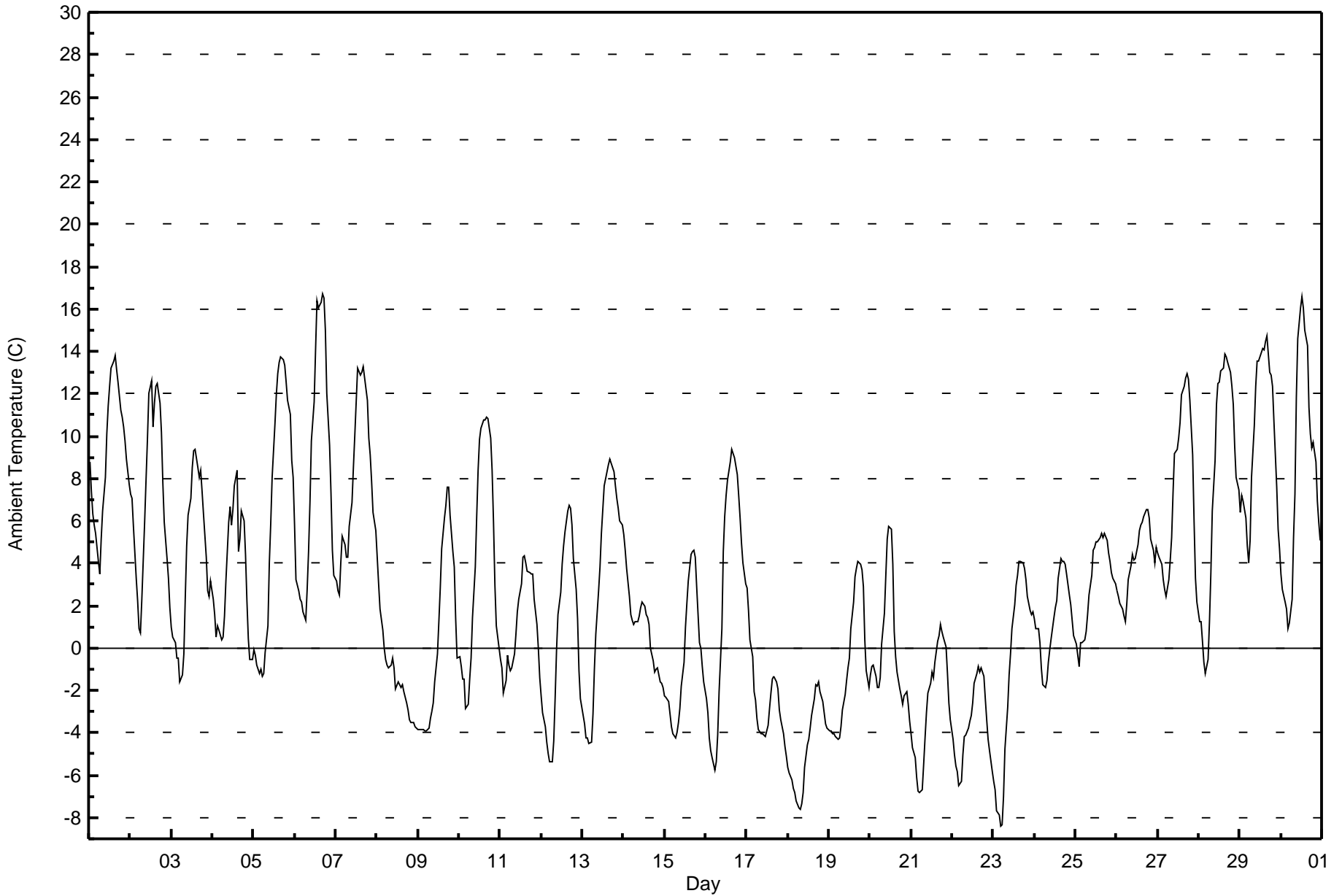




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Athabasca Valley - April 2017

Maximum Value: 16.7 C on Apr 6 17:00		Maximum Daily Average: 9.9 C on Apr 29		Hours in Service: 720																						
Minimum Value: -8.4 C on Apr 23 05:00		Minimum Daily Average: -4.7 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 6.8 C at hour 16		Minimum Diurnal Average: -1.6 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 2.81 C		Percentiles: P ₁ = -7.3 P ₁₀ = -3.9 Q ₁ = -1.5 Median = 2.3 Q ₃ = 6.3 P ₉₀ = 11.4 P ₉₉ = 16.0		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	8.8	7.4	6.3	5.8	5.4	4.1	3.5	5.1	6.4	8.1	10.1	11.4	12.3	13.2	13.5	13.8	13.1	12.6	11.3	10.9	10.4	9.8	8.9	7.7	9.2	13.8
2-Apr	7.2	7.1	5.7	3.3	2.3	0.9	0.7	2.3	5.9	7.9	9.9	12.0	12.6	10.5	11.6	12.4	12.5	11.6	10.1	7.8	5.9	4.2	3.3	1.9	7.1	12.6
3-Apr	1.0	0.5	0.3	-0.5	-0.5	-1.6	-1.2	-0.3	2.3	4.8	6.2	7.1	8.5	9.3	9.4	8.5	8.1	8.4	7.4	6.3	4.3	2.7	2.4	3.1	4.0	9.4
4-Apr	2.3	1.6	0.5	1.0	0.8	0.4	0.5	1.5	3.2	5.9	6.6	5.8	6.6	7.7	8.4	4.6	5.2	6.4	6.0	4.5	2.2	0.4	-0.6	-0.6	3.4	8.4
5-Apr	0.0	-0.3	-0.8	-1.2	-1.0	-1.4	-1.2	-0.2	1.1	4.0	5.9	8.0	10.6	11.9	12.9	13.5	13.8	13.6	13.4	12.6	11.7	11.1	8.8	8.0	6.4	13.8
6-Apr	5.8	3.2	2.7	2.3	2.2	1.7	1.3	2.8	4.6	6.9	9.8	11.6	14.1	16.4	16.0	16.3	16.7	16.5	15.0	12.0	9.6	7.3	4.6	3.5	8.5	16.7
7-Apr	3.2	2.7	2.5	4.0	5.3	4.9	4.3	4.3	5.7	6.9	8.5	10.0	11.6	13.2	12.9	13.0	13.3	12.8	11.7	9.9	9.1	7.8	6.4	5.6	7.9	13.3
8-Apr	4.3	3.1	1.8	0.9	0.0	-0.5	-0.8	-0.9	-0.8	-0.4	-1.0	-1.9	-1.6	-1.7	-1.9	-1.7	-2.1	-2.6	-2.9	-3.4	-3.5	-3.5	-3.7	-3.8	-1.2	4.3
9-Apr	-3.9	-3.8	-3.9	-3.9	-3.9	-3.9	-3.8	-3.3	-3.0	-2.6	-1.6	-0.3	1.3	2.8	4.7	6.1	6.8	7.6	7.6	6.3	4.6	3.8	1.4	-0.5	0.6	7.6
10-Apr	-0.4	-0.9	-1.5	-1.4	-2.9	-2.6	-1.5	-0.5	1.4	3.8	6.2	8.4	9.8	10.4	10.8	10.8	10.9	10.8	9.9	8.4	5.9	3.0	1.0	0.0	4.2	10.9
11-Apr	-0.6	-0.9	-2.2	-1.5	-0.3	-0.8	-1.1	-0.9	-0.3	0.6	1.7	2.3	3.0	4.3	4.3	4.0	3.6	3.6	3.5	3.5	2.3	1.1	0.0	-1.4	1.2	4.3
12-Apr	-2.3	-3.0	-3.7	-4.4	-5.0	-5.4	-5.3	-4.4	-2.3	-0.1	1.6	2.6	3.9	4.8	5.5	6.5	6.7	6.6	5.8	4.2	2.8	1.4	-1.1	-2.4	0.5	6.7
13-Apr	-3.2	-3.6	-4.3	-4.2	-4.5	-4.4	-3.1	-1.0	0.7	2.7	3.8	5.4	6.6	7.7	8.3	8.6	8.9	8.7	8.3	7.6	7.0	6.6	6.0	5.8	3.1	8.9
14-Apr	5.4	4.6	3.7	2.4	1.6	1.3	1.1	1.2	1.3	1.5	1.9	2.2	1.9	1.6	1.4	1.1	0.0	-0.6	-1.1	-1.0	-0.9	-1.6	-1.6	-1.8	1.1	5.4
15-Apr	-2.3	-2.3	-2.5	-3.1	-3.7	-4.1	-4.3	-4.0	-3.5	-2.8	-1.8	-0.6	1.0	2.1	3.2	4.4	4.5	4.6	4.3	2.9	0.3	0.0	-0.9	-1.6	-0.4	4.6
16-Apr	-2.4	-3.0	-4.2	-4.8	-5.2	-5.7	-5.4	-4.1	-2.0	0.9	4.5	6.2	7.2	8.0	8.8	9.3	9.2	9.0	8.2	7.2	6.1	5.0	4.0	3.0	2.5	9.3
17-Apr	2.8	1.8	0.4	-0.4	-2.0	-2.4	-3.3	-3.8	-4.0	-4.1	-4.1	-4.2	-3.7	-2.8	-2.1	-1.5	-1.3	-1.6	-1.9	-2.9	-3.4	-4.0	-4.7	-5.1	-2.4	2.8
18-Apr	-5.6	-5.9	-6.2	-6.6	-6.8	-7.2	-7.5	-7.6	-7.4	-6.8	-5.6	-4.5	-4.3	-3.8	-3.2	-2.4	-1.7	-1.8	-1.6	-2.0	-2.5	-3.1	-3.6	-3.8	-4.7	-1.6
19-Apr	-3.9	-3.9	-4.0	-4.1	-4.2	-4.3	-4.2	-3.7	-2.9	-2.2	-1.5	-0.9	-0.5	0.9	2.2	3.4	3.8	4.1	4.0	3.7	2.9	0.4	-1.1	-1.8	-0.7	4.1
20-Apr	-1.2	-0.9	-0.8	-1.4	-1.9	-1.9	-1.4	0.2	1.6	3.4	5.1	5.8	5.6	3.9	0.8	-0.4	-1.1	-1.9	-2.3	-2.6	-2.2	-2.0	-2.7	-3.5	-0.1	5.8
21-Apr	-4.0	-4.7	-5.2	-6.1	-6.8	-6.8	-6.7	-5.5	-4.3	-3.1	-2.2	-1.7	-1.1	-1.4	-0.7	0.3	0.6	1.1	0.8	0.5	0.1	-1.2	-2.6	-3.4	-2.7	1.1
22-Apr	-4.3	-5.1	-5.6	-5.8	-6.5	-6.3	-5.0	-4.2	-4.1	-3.8	-3.4	-3.2	-2.6	-1.7	-1.2	-0.9	-1.1	-0.9	-1.3	-2.4	-3.4	-4.3	-4.8	-5.8	-3.7	-0.9
23-Apr	-6.3	-6.7	-7.7	-7.9	-8.4	-8.3	-7.0	-4.8	-2.8	-1.3	-0.2	0.9	2.0	3.0	3.4	4.1	4.1	4.0	3.8	3.2	2.4	1.8	1.6	1.7	-1.1	4.1
24-Apr	1.4	0.9	0.9	0.3	-0.9	-1.7	-1.9	-1.5	-0.7	-0.1	0.5	1.4	1.9	2.2	3.3	4.2	4.1	4.1	3.9	3.5	2.5	2.1	1.3	0.6	1.3	4.2
25-Apr	0.2	-0.3	-0.8	0.2	0.2	0.4	0.8	1.6	2.5	3.4	4.6	4.7	5.0	5.0	5.2	5.4	5.2	5.4	5.1	4.5	4.1	3.6	3.3	3.0	3.0	5.4
26-Apr	2.7	2.4	2.1	1.8	1.5	1.2	2.1	3.2	3.9	4.4	4.1	4.2	4.9	5.5	5.8	6.0	6.2	6.5	6.5	6.1	5.1	4.6	4.0	4.8	4.2	6.5
27-Apr	4.5	4.3	3.9	3.2	2.8	2.4	3.3	4.1	5.2	7.3	9.2	9.4	9.9	10.6	12.0	12.4	12.7	13.0	12.7	11.7	9.1	6.0	3.3	2.2	7.3	13.0
28-Apr	1.3	1.2	0.3	-0.7	-1.2	-0.6	1.2	3.6	6.5	8.8	11.5	12.5	12.5	13.1	13.2	13.8	13.8	13.5	13.0	12.4	11.5	9.5	8.0	7.4	7.8	13.8
29-Apr	6.4	7.2	6.9	6.1	4.8	4.0	5.1	8.1	10.5	12.4	13.5	13.5	14.0	14.1	14.1	14.5	14.7	13.0	12.9	12.3	10.7	7.6	5.6	4.7	9.9	14.7
30-Apr	3.5	2.8	2.2	1.8	0.9	1.2	2.3	5.2	7.3	11.8	14.6	16.1	16.6	16.0	15.0	14.3	11.4	10.1	9.5	9.7	8.8	6.9	5.9	5.1	8.3	16.6
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Athabasca Valley - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	258	35.83	35.83
0 - 10	371	51.53	87.36
10 - 20	91	12.64	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

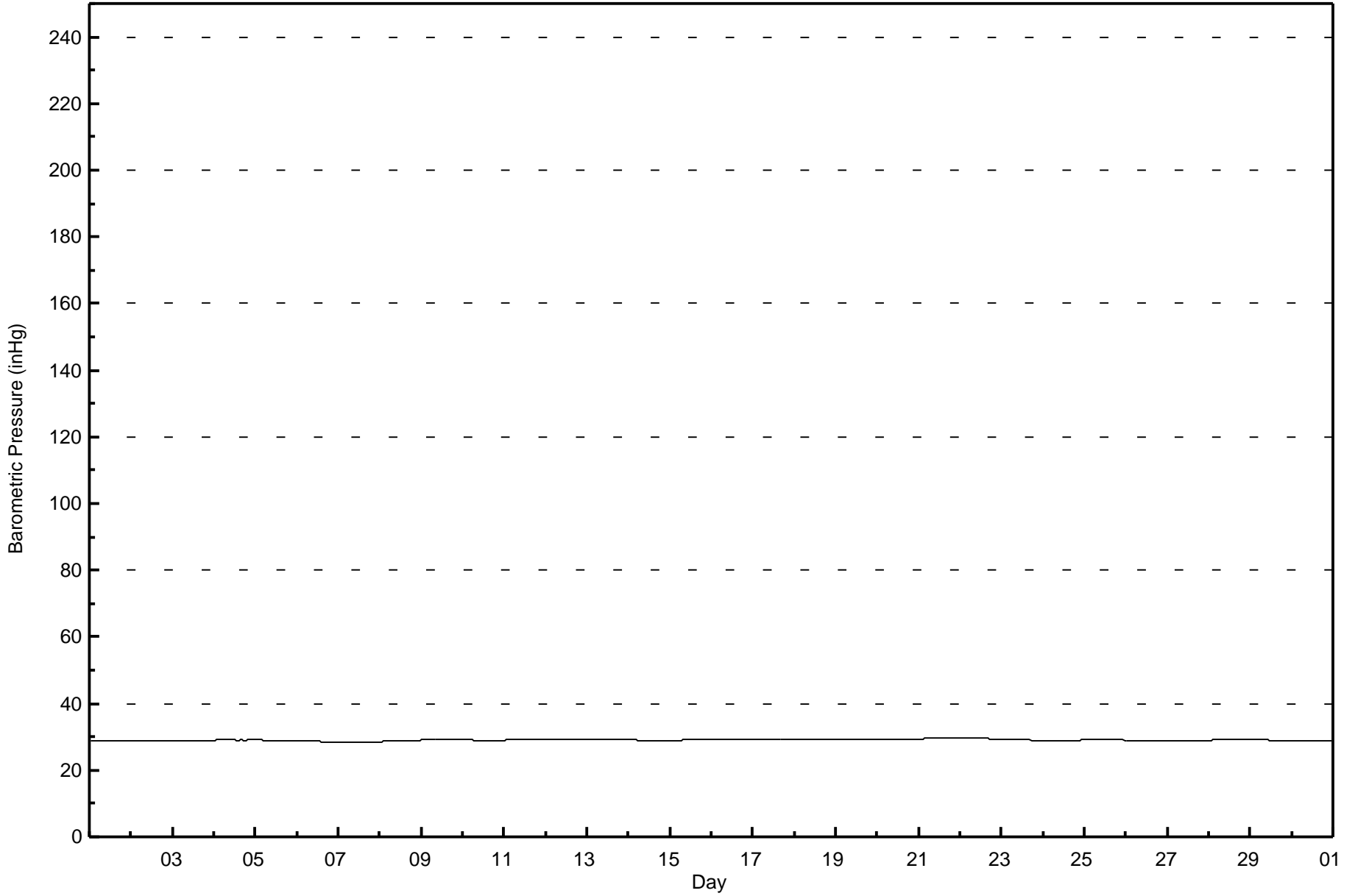


Maximum Value: 29.5 inHg on Apr 21 12:00 Maximum Daily Average: 29.5 inHg on Apr 21																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 28.5 inHg on Apr 7 14:00 Minimum Daily Average: 28.5 inHg on Apr 7 Maximum Diurnal Average: 29.0 inHg at hour 8 Minimum Diurnal Average: 29.0 inHg at hour 17 Monthly Average: 29.03 inHg Percentiles: P ₁ = 28.5 P ₁₀ = 28.7 Q ₁ = 28.9 Median = 29.0 Q ₃ = 29.1 P ₉₀ = 29.4 P ₉₉ = 29.5																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7
2-Apr	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8
3-Apr	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
4-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
5-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.9	29.0
6-Apr	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6
7-Apr	28.6	28.5	28.5	28.5	28.5	28.6	28.6	28.5	28.5	28.5	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.5	28.6
8-Apr	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	28.8	29.0
9-Apr	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2
10-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0
11-Apr	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3
12-Apr	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4
13-Apr	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.4
14-Apr	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	28.9	28.9	29.0	29.1
15-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2
16-Apr	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.1	29.2
17-Apr	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
18-Apr	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2
19-Apr	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
20-Apr	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.4	29.1	29.4
21-Apr	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
22-Apr	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5
23-Apr	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.2	29.4
24-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
25-Apr	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1
26-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
27-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	28.9	29.0
28-Apr	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
29-Apr	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
30-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Athabasca Valley - April 2017





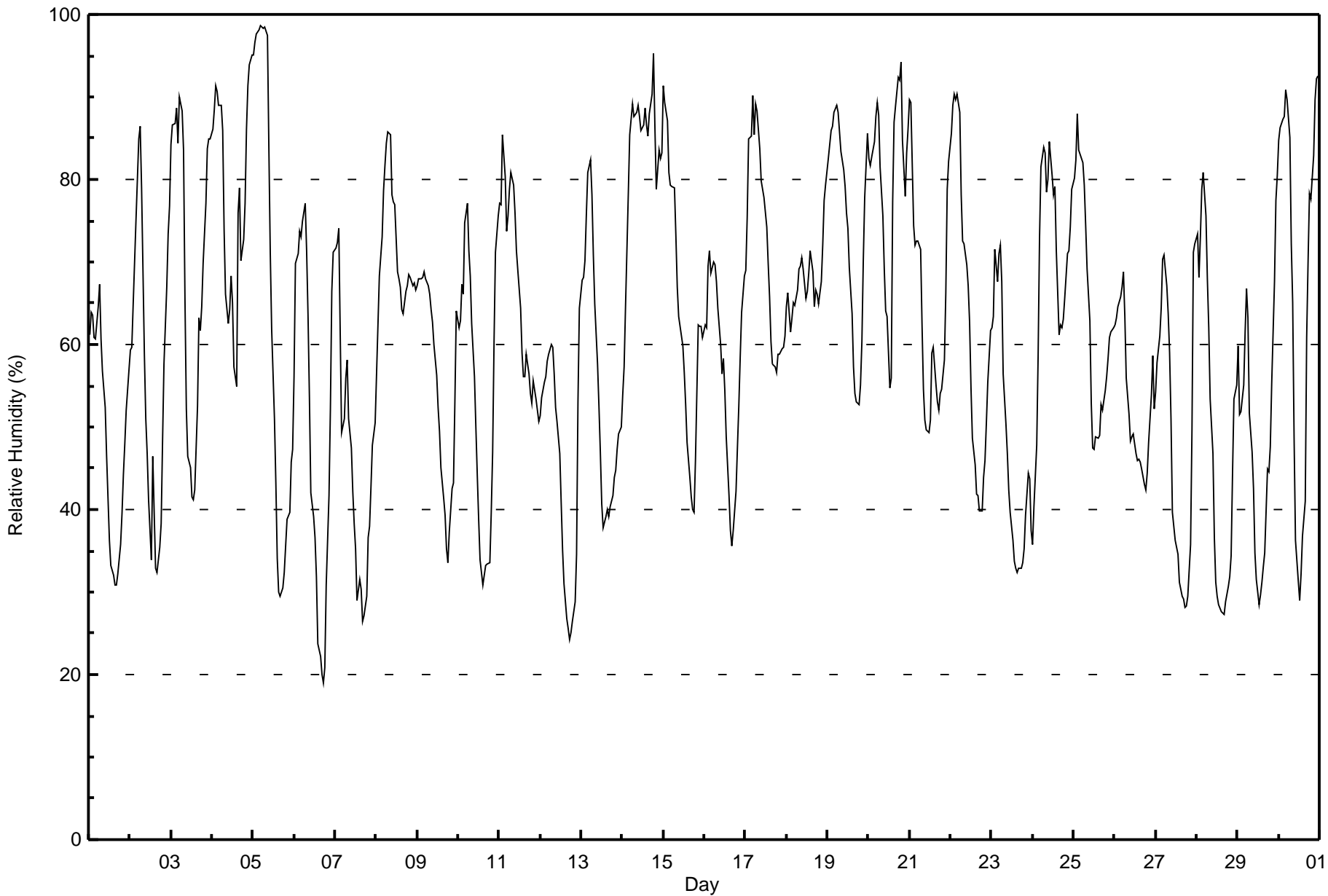
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Athabasca Valley - April 2017

Maximum Value: 99 % on Apr 5 05:00																		Maximum Daily Average: 82.9 % on Apr 14																		Hours in Service: 720	
Minimum Value: 19 % on Apr 6 18:00																		Minimum Daily Average: 44.8 % on Apr 12																		Hours of Data: 720	
Maximum Diurnal Average: 77.7 % at hour 6																		Minimum Diurnal Average: 46.4 % at hour 16																		Hours of Missing Data: 0	
Monthly Average: 61.2 %																		Percentiles: P ₁ = 25 P ₁₀ = 35 Q ₁ = 47 Median = 62 Q ₃ = 76 P ₉₀ = 86 P ₉₉ = 98																		Hours of Calibration: 0	
																																				Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	61	64	64	61	61	65	67	61	57	52	47	41	36	33	32	31	31	32	36	40	44	48	52	57	48.8	67											
2-Apr	59	60	65	75	80	85	86	79	59	51	47	41	34	46	40	33	32	35	38	48	58	67	73	77	57.1	86											
3-Apr	84	87	87	89	84	90	88	84	66	52	46	45	42	41	42	53	63	62	65	70	77	84	85	85	69.6	90											
4-Apr	86	88	91	91	89	89	86	74	66	63	64	68	65	57	55	76	79	70	73	77	86	91	94	95	78.1	95											
5-Apr	95	97	98	98	99	99	98	98	98	84	71	62	51	43	34	30	29	31	32	36	39	40	46	47	64.7	99											
6-Apr	56	70	71	74	73	75	77	71	64	54	42	39	37	32	24	22	20	19	21	31	42	52	66	71	50.1	77											
7-Apr	72	72	74	62	49	51	56	58	51	48	42	38	35	29	32	30	26	27	29	37	38	43	48	51	45.7	74											
8-Apr	57	62	68	73	79	82	84	86	85	78	77	77	69	68	67	64	64	67	67	69	68	67	68	67	71.3	86											
9-Apr	67	68	68	68	69	68	67	66	64	63	60	56	52	50	45	41	39	35	34	37	43	43	53	64	55.0	69											
10-Apr	62	63	67	66	75	77	71	68	62	56	50	44	39	34	31	32	33	33	34	40	47	60	71	76	53.8	77											
11-Apr	77	77	85	80	74	76	79	81	79	76	71	69	64	59	56	56	59	56	54	53	56	53	52	51	66.4	85											
12-Apr	51	54	55	56	58	59	60	60	56	52	51	47	41	35	31	27	26	24	25	26	29	35	53	64	44.8	64											
13-Apr	68	68	70	76	81	82	78	71	65	58	52	47	41	38	39	40	39	40	42	44	45	47	49	50	55.4	82											
14-Apr	54	57	65	78	86	87	89	88	88	89	88	86	87	89	87	85	88	90	95	86	79	84	83	83	82.9	95											
15-Apr	91	89	87	81	79	79	79	73	67	63	62	60	57	53	48	44	41	40	40	46	62	62	62	61	63.7	91											
16-Apr	62	62	70	71	69	70	70	68	64	60	57	58	54	49	42	37	36	38	42	47	52	58	64	68	57.0	71											
17-Apr	69	75	85	85	90	86	89	88	84	80	79	78	74	70	66	60	58	57	57	59	59	60	60	61	72.0	90											
18-Apr	65	66	62	63	65	65	67	69	69	71	69	66	66	69	71	69	65	67	66	65	68	72	77	79	67.9	79											
19-Apr	83	84	86	87	88	89	88	86	83	81	79	76	74	69	64	57	54	53	53	55	60	70	78	86	74.3	89											
20-Apr	82	82	83	85	88	89	88	82	76	69	64	63	55	56	77	87	89	92	92	94	85	78	83	86	80.2	94											
21-Apr	90	89	74	72	73	73	72	62	55	51	50	49	51	59	60	55	53	52	54	55	58	66	79	82	63.9	90											
22-Apr	86	89	90	90	90	88	78	73	72	70	67	63	55	49	45	42	42	40	40	44	46	51	55	62	63.5	90											
23-Apr	62	63	72	68	71	72	68	56	50	47	42	40	36	34	33	32	33	33	33	35	39	44	44	37	47.7	72											
24-Apr	36	40	48	59	73	81	84	83	79	80	85	81	78	79	71	61	62	62	63	66	71	71	74	79	69.4	85											
25-Apr	80	82	88	84	83	82	79	74	69	63	53	47	47	49	49	49	53	52	54	56	58	61	62	62	64.1	88											
26-Apr	62	63	65	66	67	69	63	56	52	48	49	49	47	46	46	46	45	43	42	44	48	54	59	52	53.4	69											
27-Apr	54	58	61	64	70	71	67	64	59	51	40	36	35	35	31	29	29	28	28	30	36	50	71	72	48.8	72											
28-Apr	73	68	73	79	81	76	68	62	53	47	37	31	29	28	28	28	27	29	31	32	34	44	53	55	48.6	81											
29-Apr	60	51	52	55	61	67	63	52	47	42	35	32	28	30	31	33	35	45	45	48	55	68	77	80	49.7	80											
30-Apr	85	86	87	88	91	90	85	72	65	49	36	31	29	32	37	41	61	70	78	78	83	90	92	93	68.7	93											
																								Diurnal Average													
																								Diurnal Maximum													





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Athabasca Valley - April 2017

Maximum Speed: 32 km/h on Apr 20 15:00	Maximum Daily Speed Average: 16.7 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 3 06:00	Minimum Daily Speed Average: 0.5 km/h on Apr 30	Hours of Data: 719
Maximum Diurnal Speed Average: 3.6 km/h at hour 7	Minimum Diurnal Speed Average: 0.9 km/h at hour 2	Hours of Missing Data: 1
Monthly Average Velocity: 2.1 km/h 17.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 5 Median = 9 Q ₃ = 13 P ₉₀ = 17 P ₉₉ = 24	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW8	SW8	SW12	SW12	SW9	SE4	SSE2	SW15	SW15	SW12	SW15	SW19	WSW22	W18	W18	W17	W14	W12	W10	NNW12	W13	WSW8	S3	SSW4	WSW9.8	WSW22
2-Apr	SSW6	SSW6	SSE2	SSE3	SSE2	SE3	SSW3	SW2	SSW6	SW9	SW11	SW13	NW7	NW5	SW14	WSW14	WNW7	N10	NW4	W5	SW4	WSW4	W5	NW5	WSW4.0	WSW14
3-Apr	W5	W4	WNW2	WNW4	W5	NE0	SSW0	WNW3	N3	N5	NNW5	NW4	NW6	N7	NNW6	WNW15	SW13	SW11	SW8	SSW3	SW3	SSW2	SE3	SE8	W2.8	WNW15
4-Apr	SSE6	SSE3	SSE2	SSE5	SSE4	SSE4	SSE4	SE8	SE10	S3	WSW13	SSW9	E8	ESE9	SE13	SSW18	S11	S10	S8	SSE4	S2	SSW1	W1	SE4	SSE5.2	SSW18
5-Apr	SSE9	ESE8	SE2	SW5	SE10	SSE12	SE11	SSE9	SSE7	SE11	SE17	SE20	SE24	SSE21	S15	S17	SSE16	SSE13	SSE12	SE8	SE8	SE10	S2	SSE5	SSE10.8	SE24
6-Apr	SE3	SSE2	SE4	E2	WSW3	SW6	SW3	SW2	SSW3	SW7	SW4	SW5	SW9	W9	WNW22	WNW16	WNW12	NW6	WNW3	WSW2	WSW2	S1	W6	WSW4	WSW4.3	WNW22
7-Apr	WSW3	WNW4	W4	NNW7	NNW11	NW5	NNW5	NW4	NNW7	N7	NNW8	NNW5	WNW5	ENE18	ESE10	ENE8	ENE18	ENE18	NE13	NNE15	NNE14	N12	N10	N9	NNE6.5	ENE18
8-Apr	N10	NNW15	NNW19	NNW21	NNW19	NNW20	NNW25	NNW22	NNW21	N20	N22	NNW23	N22	NNW24	NNW22	N18	N15	N16	NNE12	N12	N11	NNE11	ENE12	NNE8	N16.7	NNW25
9-Apr	N7	NNW9	NNW10	NNW9	NNW8	N6	N4	S2	ESE10	SE8	SE8	ESE11	ESE10	E12	ESE11	ESE10	ESE10	SE11	SE12	SE8	SE8	SE9	ESE1	SE2	E4.6	SE12
10-Apr	SE6	SSE6	SSE8	SE8	SSE4	SE6	SE10	SE13	SE10	SE9	SE10	SE11	SE7	ESE9	ESE7	ESE10	ESE7	ESE7	SE11	SE6	E1	NNW1	WSW2	SW1	SE6.7	SE13
11-Apr	NNW4	WNW3	W4	NW6	NNW12	NNW15	NNW17	NNW18	NNW18	NNW20	NNW20	NNW19	NNW21	NNW22	NNW24	NNW23	NNW20	NNW17	NNW12	N11	N15	N15	NNW16	NNW15	NNW15.1	NNW24
12-Apr	NNW13	NNW12	NNW14	NNW11	NNW9	NNW12	NNW10	N10	N9	N10	NNW12	NNW14	NNW13	NNW14	NNW14	NNW11	NNW15	NNW18	NNW17	NNW9	NNW10	NNW9	NNW2	WSW2	NNW11.1	NNW18
13-Apr	N0	N2	NNE2	NE2	N2	NNE1	NNE2	ENE2	SSE6	SE14	E13	E13	E19	E16	ESE16	ESE16	E18	E19	E18	E15	ENE10	ENE13	E15	E15	E9.7	E19
14-Apr	ESE15	E12	E17	ENE9	NE9	NNE9	NE10	ENE9	ENE10	ENE10	ENE11	ENE14	NE12	NNE11	NE14	NE15	NE11	NE9	NE7	ENE13	NE14	NNE11	N10	NNE11	NE10.4	E17
15-Apr	N10	N11	NNE12	NNE14	NNE12	NNE11	NNE12	NNE14	ENE16	N12	N13	NNE12	NNE11	NE12	N8	NNW16	WNW14	NW10	SW1	SSE4	S4	SSE8	SE11	SE11	NNE7.8	NNW16
16-Apr	SE10	SSE10	SSW7	S7	SE10	SSE10	SE10	SE10	SE9	SE7	SSW3	SW9	SW14	SW15	SW16	SSW15	SW16	SSW14	SSW12	SSE8	SSE11	SSE7	SSE8	SE7	S8.1	SW16
17-Apr	SE6	NE3	NNW23	NNW20	NNW23	NNW20	NNW21	NNW20	NNW22	NNW21	NNW23	NNW21	NNW21	NNW21	NNW21	NNW20	NNW20	NNW19	N16	N16	N14	NNE12	NNE11	NNE8	NNW16.6	NNW23
18-Apr	NNE7	N8	N11	N10	N10	N12	NNW14	NNW17	NNW17	NNW17	NNW14	NNW14	NNW17	NNW16	NNW13	NNW11	NNW11	NNW11	NNW10	NNW12	NNW12	NNW14	NNW14	NNW13	NNW12.5	NNW17
19-Apr	NNW11	NNW10	NW9	NNW10	NNW9	NNW10	NNW9	NNW6	NNW5	NW4	NNW5	N3	NW3	W1	SW6	SW9	SW7	SW8	WSW4	SSE2	SE5	N1	NNW1	NNW1	NW3.6	NNW11
20-Apr	NNE3	NNE2	NE1	NNE2	NE2	NNE3	NNW7	ENE2	NE4	WNW4	N10	NNW13	NNW21	NNW31	NNW32	NNW28	NNW25	NNW22	NNW18	NNW15	NNE7	NNW9	NNW9	NNW7	NNW11.2	NNW32
21-Apr	N7	NNW7	NNW8	NNW11	NNW7	N6	NNW7	NNW5	NNW7	NNW9	NNW13	NNW13	NNW14	NNW14	NW7	NNW8	NNW7	NNW7	NW5	NNW4	WSW1	NNW3	W2	SSW1	NNW7.0	NNW14
22-Apr	SW0	SW2	WSW2	SW1	NW3	NNW9	NNW15	N14	N14	NNW18	NNW20	NNW21	NNW18	N15	N15	N15	NNW16	N14	NNW12	NNW11	NNW12	NNW9	N7	NNE6	NNW10.9	NNW21
23-Apr	NE7	NE3	N3	NNE4	N5	NNE5	NNE2	E7	SE9	ESE11	SE13	ESE10	SE10	SSE13	SSE13	SE12	SE11	ESE10	ESE9	E6	ENE3	ENE4	E1	ESE4	ESE5.4	SSE13
24-Apr	ESE4	E5	ESE8	E10	E10	ENE6	ENE6	ENE7	ENE11	E9	E7	E8	E11	E12	ESE11	ESE12	E13	E13	E3	ESE11	E9	ENE4	NE3	SE1	E8.2	E13
25-Apr	SSE1	NNE2	ENE0	ESE6	SE7	SE7	SE8	ESE9	ESE12	SE15	SE16	SSE13	SSE12	SE12	SE13	SSE12	SSE12	SSE12	SSE13	S10	SE9	SE9	SE8	SE6	SE8.9	SE16
26-Apr	SE7	SE6	SE6	ESE7	SE7	ESE6	SE6	SE13	SE16	SE18	SE16	SE16	SSE14	SE15	SSE14	SSE12	SSE10	SSE10	SE8	ESE6	ESE4	E2	SE5	SE8	SE9.4	SE18
27-Apr	SE7	SE7	SE5	E2	AF	ESE4	ESE6	SE9	SE10	E9	SE13	ESE13	ESE10	E10	SE6	SE7	NW1	S9	SE7	SE6	SE3	NNE1	WNW2	SSW2	SE5.7	ESE13
28-Apr	S2	SSE5	SE3	SSE2	SE3	SSE5	SE6	E6	ENE3	NNE2	WSW3	WNW4	WNW6	NW6	NNW7	NNW9	N8	NE8	E7	ENE3	ESE2	SW1	SW4	S2	NE0.8	NNW9
29-Apr	SSE2	SSE5	SSE5	SE5	SE3	ESE4	E5	SSW5	SW4	E1	SSW10	SW14	SSW12	SSW15	SSW19	SSW15	SSW10	SW18	S11	SSW10	SSW4	S1	SW0	ENE2	SSW6.5	SSW19
30-Apr	SSW3	SSW2	ESE1	SE2	SE2	SSW1	ENE1	ESE3	WNW3	E2	SSE9	SSE6	S6	E8	NE11	NW13	NW9	WNW7	WSW1	SSW4	WSW2	WNW3	W4	SSE1	SW0.5	NW13

ENE1.2	NE0.9	N2.0	N2.5	N2.8	NNE3.0	N3.6	NNE2.5	NE2.4	NE2.8	NNE1.8	NNE1.6	N2.5	NNE3.5	NNW2.0	NW2.1	NNW2.5	N2.2	NE1.9	NE2.4	NE2.2	NNE2.5	NNE1.7	ENE1.6	Diurnal Average	
ESE15	NNW15	NNW23	NNW21	NNW23	NNW20	NNW25	NNW22	NNW22	NNW21	NNW23	NNW23	SE24	NNW31	NNW32	NNW28	NNW25	NNW22	E18	N16	N15	N15	NNW16	NNW15	Diurnal Maximum	

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

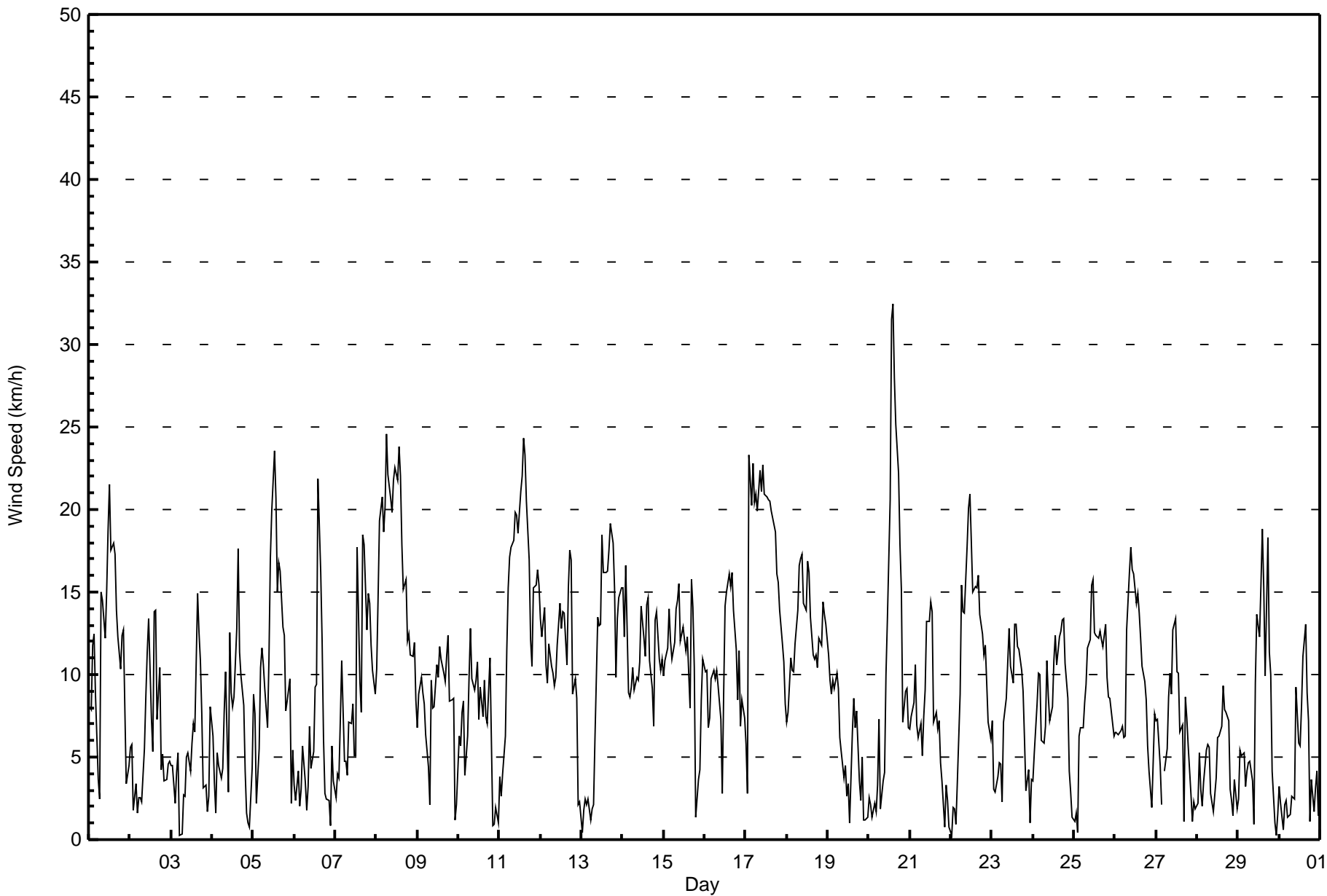
Wind Speed (WS) - km/h
Athabasca Valley - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 9 km/h on Apr 30 16:00	Hours of Data: 719
Minimum Value: 1 km/h on Apr 11 03:00	Hours of Missing Data: 1
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 7	Hours of Calibration: 0
	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2	2	3	2	3	2	4	3	3	4	3	5	5	5	5	4	4	3	1	5	7	4	2	2	7
2-Apr	3	3	2	1	1	1	1	3	3	3	2	2	6	7	3	6	3	5	2	3	2	1	1	1	7
3-Apr	1	1	1	1	2	1	2	1	1	2	2	1	3	2	2	5	2	1	3	2	2	2	1	2	5
4-Apr	3	1	2	2	2	2	2	2	2	3	4	3	3	4	4	4	3	3	2	2	2	1	2	2	4
5-Apr	2	2	2	2	3	3	3	2	2	3	4	5	6	6	5	5	4	4	3	2	2	2	2	2	6
6-Apr	2	1	2	1	2	2	2	2	1	3	2	2	3	7	5	4	6	2	2	2	2	2	1	2	7
7-Apr	2	1	1	4	3	1	1	2	2	1	2	2	2	6	6	7	4	3	3	4	3	3	2	2	7
8-Apr	2	3	4	4	4	4	5	6	5	5	5	5	6	5	5	5	4	4	4	3	3	3	4	3	6
9-Apr	2	2	2	2	2	2	1	2	2	3	4	4	4	4	4	3	3	3	3	2	2	3	1	1	4
10-Apr	3	2	3	2	2	3	3	3	2	2	2	2	3	3	3	3	3	3	3	2	1	1	1	1	3
11-Apr	4	1	1	3	4	4	3	3	4	3	3	4	5	5	5	5	4	4	3	3	3	3	3	3	5
12-Apr	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	3
13-Apr	1	1	1	1	1	1	1	1	3	4	3	4	5	6	5	5	5	5	4	4	3	3	3	5	6
14-Apr	5	3	5	3	3	2	3	4	3	4	3	4	4	4	4	4	7	6	5	5	4	4	3	4	7
15-Apr	2	3	3	3	3	2	3	4	4	4	4	3	3	3	4	4	3	3	3	1	1	1	4	2	4
16-Apr	2	3	1	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	2	3	2	1	1	4
17-Apr	2	4	3	3	4	4	4	5	5	5	4	5	4	4	4	5	4	4	4	4	3	3	3	2	5
18-Apr	1	2	3	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2	3	3	2	3	3	3	3
19-Apr	2	2	1	2	2	2	2	1	1	1	1	1	1	1	2	3	2	2	3	2	2	1	2	2	3
20-Apr	1	2	2	2	2	2	2	1	2	1	2	4	5	7	6	5	4	4	4	3	3	2	1	2	7
21-Apr	1	2	2	2	2	1	1	2	2	2	3	2	3	3	2	2	2	2	1	1	1	1	1	2	3
22-Apr	1	2	2	1	3	5	3	4	3	4	4	4	3	4	4	4	3	3	2	2	2	1	2	1	5
23-Apr	2	1	2	1	1	1	1	2	3	3	3	3	4	3	3	3	3	3	2	2	1	1	1	2	4
24-Apr	1	2	3	3	2	2	2	2	3	3	3	2	3	3	3	4	3	4	3	3	2	1	1	1	4
25-Apr	1	2	1	2	2	2	3	3	3	4	4	4	4	3	3	3	3	3	4	2	2	2	1	1	4
26-Apr	1	2	1	1	1	1	2	4	4	4	4	4	4	4	4	4	3	3	3	2	1	2	4	2	4
27-Apr	1	2	2	1	AF	1	2	2	2	3	4	3	4	4	4	4	3	3	3	2	2	1	1	2	4
28-Apr	2	1	2	1	2	1	1	1	1	1	2	2	1	2	2	2	2	2	2	1	1	2	3	2	3
29-Apr	2	1	1	2	2	2	2	2	2	3	4	5	6	5	5	5	3	4	3	4	1	1	2	1	6
30-Apr	1	2	1	2	1	1	2	2	1	2	3	3	3	4	5	9	5	5	2	2	2	2	2	2	9
	5	4	5	4	4	5	5	6	5	5	5	5	6	7	6	9	7	6	5	5	7	4	4	5	

Diurnal Maximum

AF - Analyzer Failure





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Athabasca Valley - April 2017

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	206	28.65	28.65
6 - 11	273	37.97	66.62
12 - 19	194	26.98	93.60
20 - 28	44	6.12	99.72
29 - 38	2	0.28	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Athabasca Valley - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	13	8	10	9	9	19	24	10	16	17	14	11	12	11	13	206
6 - 11	26	13	8	11	15	29	59	19	8	9	14	1	3	3	9	46	273
12 - 19	19	10	7	8	17	7	17	15	2	8	16	2	6	4	1	55	194
20 - 28	3	0	0	0	0	0	2	1	0	0	0	1	0	1	0	36	44
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	36	23	29	41	45	97	59	20	33	47	18	20	20	21	152	719

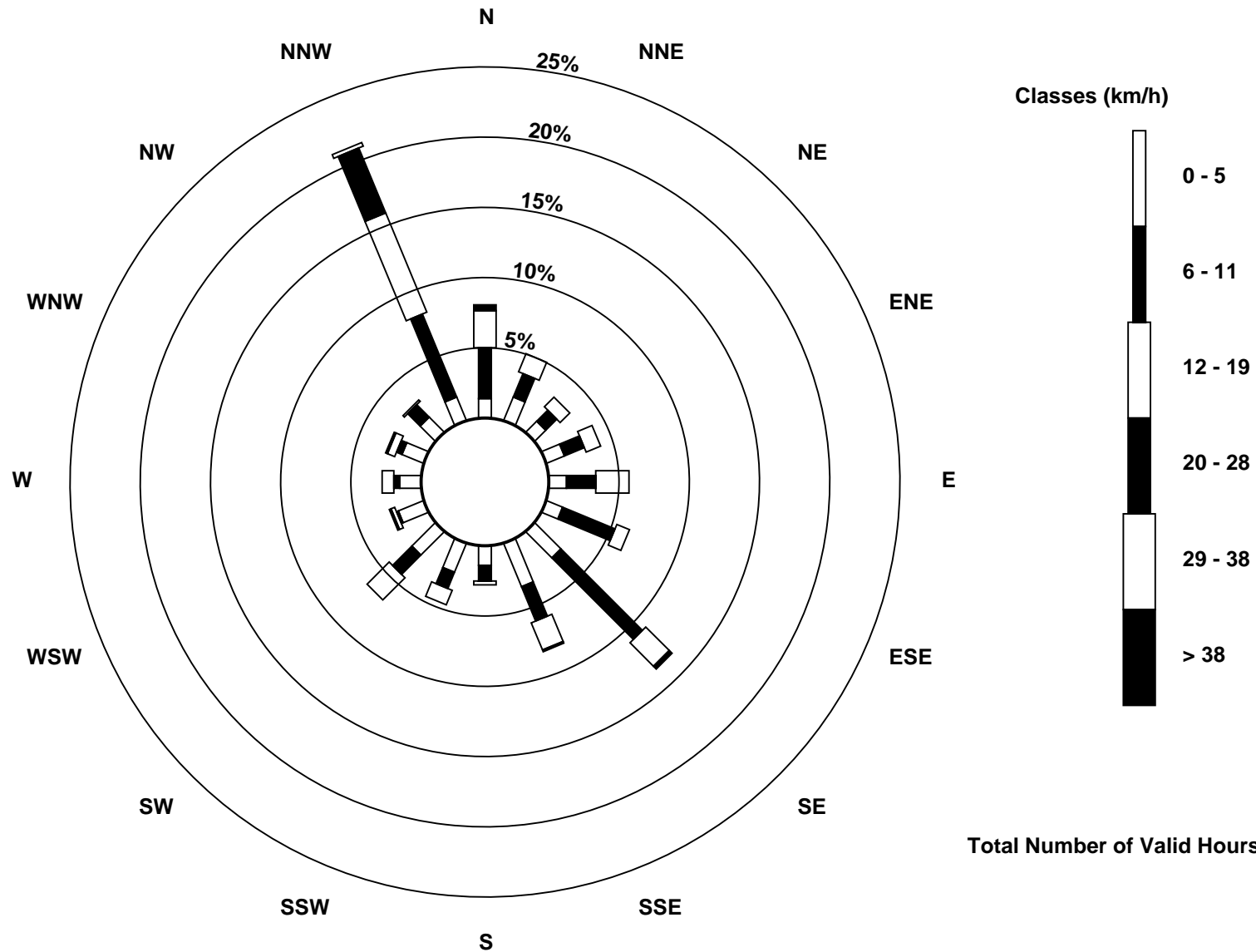
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Athabasca Valley (AMS 7)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Athabasca Valley - April 2017

Direction of Maximum Speed: 342 deg on Apr 20 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 353.3 deg on Apr 8	Hours of Data: 719
Direction of Minimum Speed: 38 deg on Apr 3 06:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 0.5 deg on Apr 30	Percent Operational Time: 99.9
Monthly Average Direction: 324.6 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	203	218	224	232	218	127	167	230	228	229	219	227	256	263	271	279	276	280	274	341	277	257	177	204	247.8
2-Apr	206	196	157	162	158	129	204	221	209	216	215	218	324	320	233	243	284	3	326	265	236	252	267	307	242.3
3-Apr	281	269	285	287	269	38	194	289	354	354	346	311	325	356	343	295	230	220	220	211	221	197	134	142	274.8
4-Apr	161	163	153	148	149	147	153	141	139	179	248	213	91	105	138	206	188	181	170	149	180	205	278	142	166.8
5-Apr	147	120	146	215	144	155	143	148	158	128	129	127	139	147	176	169	168	167	160	145	144	144	173	157	149.6
6-Apr	131	165	143	100	240	225	220	222	205	222	233	224	216	263	283	293	285	304	302	250	241	183	262	250	255.2
7-Apr	258	284	263	333	346	326	345	324	340	353	346	338	297	67	121	58	60	60	37	20	29	6	356	353	17.8
8-Apr	352	347	343	340	342	342	343	346	347	350	350	346	358	346	347	360	5	355	13	6	3	25	77	23	353.3
9-Apr	357	341	338	344	345	5	352	179	111	128	138	103	119	99	113	123	112	124	125	124	128	144	117	140	100.4
10-Apr	143	151	149	143	167	139	140	138	141	130	136	140	124	110	120	122	114	123	131	135	99	341	243	231	134.4
11-Apr	338	289	275	320	347	343	341	342	341	341	342	346	342	340	341	341	344	343	346	349	350	353	344	341	342.2
12-Apr	341	338	338	337	337	340	344	353	350	354	348	339	341	342	333	329	338	341	338	347	342	339	333	243	340.3
13-Apr	355	352	13	47	359	22	14	65	154	124	96	95	89	99	103	102	101	90	86	86	75	74	81	92	91.4
14-Apr	107	90	91	58	47	20	36	59	71	65	70	65	45	33	50	55	52	37	40	59	43	28	7	17	54.0
15-Apr	5	11	15	12	16	16	18	27	46	60	9	354	16	29	41	6	330	303	325	220	158	184	149	138	16.7
16-Apr	142	152	198	177	146	149	139	131	130	131	206	235	230	232	223	212	219	213	206	165	164	147	149	133	182.2
17-Apr	140	56	335	339	339	342	341	344	345	346	342	344	343	341	344	345	342	346	349	351	5	23	24	23	347.1
18-Apr	12	6	9	359	8	9	347	338	340	338	341	346	340	334	340	337	344	340	344	344	341	338	341	343	345.6
19-Apr	343	342	323	331	328	334	337	338	333	321	337	353	314	280	218	219	227	232	246	148	132	352	348	339	314.0
20-Apr	18	16	53	20	39	22	347	65	39	300	349	347	346	342	342	342	342	342	345	341	14	348	332	336	345.9
21-Apr	357	345	342	339	338	352	346	343	337	337	340	341	341	341	323	335	328	336	326	340	253	337	266	208	338.3
22-Apr	225	231	255	236	304	338	338	352	357	344	343	342	349	355	4	345	351	344	344	337	334	349	14	14	345.2
23-Apr	35	54	355	20	1	23	26	92	145	123	135	113	129	167	152	146	127	117	109	98	78	77	86	110	115.6
24-Apr	105	100	103	93	83	70	61	66	78	84	91	100	97	88	107	112	95	85	96	107	84	71	34	136	90.9
25-Apr	165	25	61	117	125	124	131	120	109	117	125	138	155	149	156	142	153	151	154	169	140	128	128	139	137.5
26-Apr	145	137	129	123	124	115	130	137	140	136	137	138	166	145	155	154	164	168	135	112	114	101	125	130	140.5
27-Apr	130	135	130	90	AF	121	121	126	132	101	131	118	119	94	132	141	312	181	141	137	125	17	291	202	127.6
28-Apr	185	158	139	160	145	154	136	88	64	28	257	287	290	319	340	344	356	55	81	74	121	214	230	189	55.2
29-Apr	151	162	155	141	143	114	89	208	215	96	199	216	202	211	210	193	193	230	182	206	192	177	214	59	195.5
30-Apr	196	205	123	137	128	200	57	112	296	88	156	165	181	100	52	309	307	303	257	213	257	285	260	155	215.4

78.2	44.9	359.1	359.7	3.9	14.5	10.9	30.9	44.5	42.1	26.6	20.2	2.5	15.6	346.9	323.8	343.8	353.4	46.0	39.3	35.3	20.1	17.7	59.1
Diurnal Average																							

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

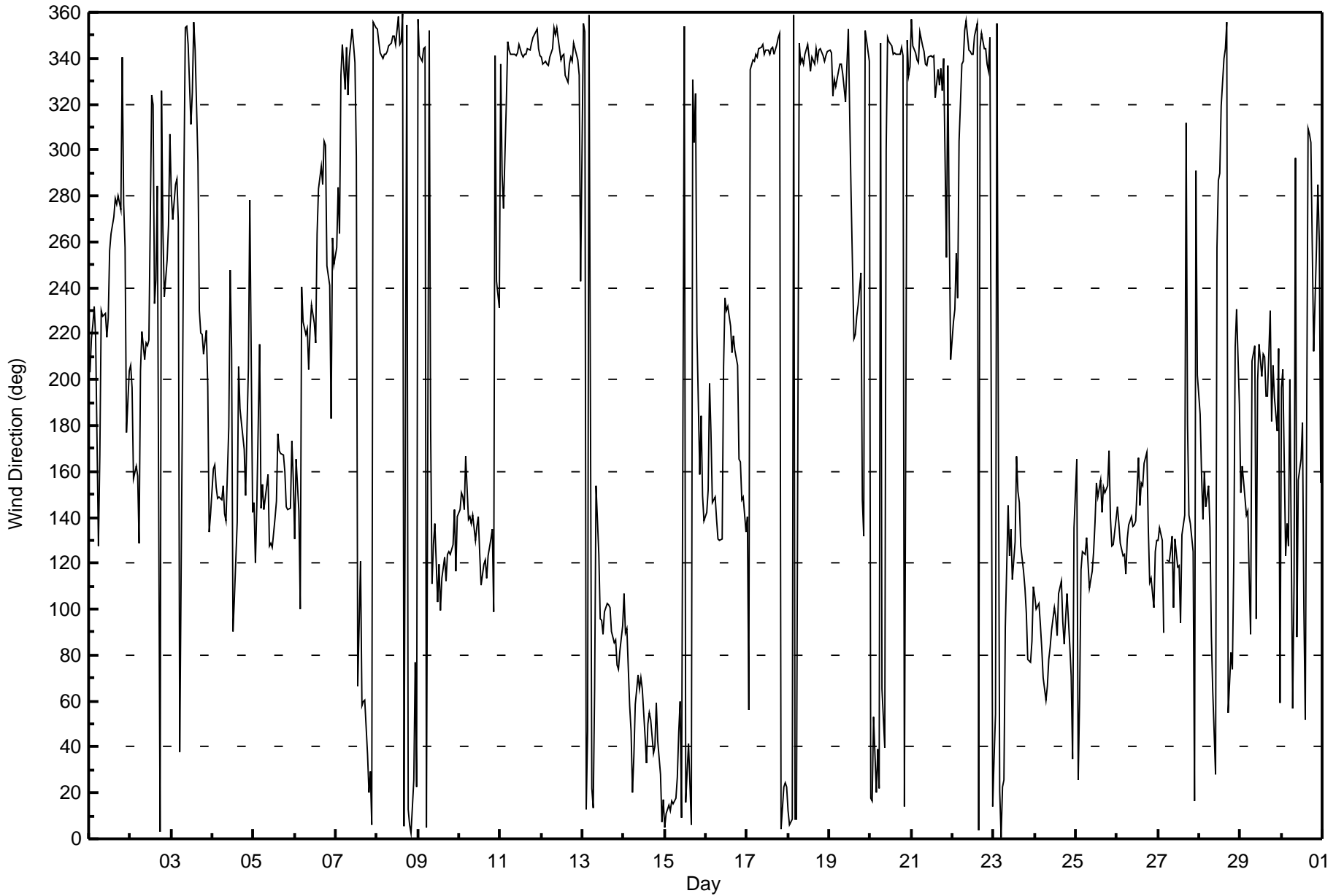
Wind Direction (WD) - deg
Athabasca Valley - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 105 deg on Apr 19 14:00	Hours of Data: 719
Minimum Value: 7 deg on Apr 22 22:00	Hours of Missing Data: 1
Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 16 Median = 21 Q ₃ = 38 P ₉₀ = 66 P ₉₉ = 91	Hours of Calibration: 0
	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	24	13	14	11	31	58	74	12	10	21	15	17	16	23	17	18	16	14	11	32	44	38	68	39	74
2-Apr	40	57	74	41	85	58	41	91	66	27	13	11	54	78	13	18	63	20	42	44	32	29	27	27	91
3-Apr	29	18	82	31	32	89	94	31	51	35	37	35	45	36	29	33	16	8	44	57	36	74	45	32	94
4-Apr	49	41	66	23	44	67	46	23	19	68	23	56	35	44	21	21	34	36	28	48	76	82	86	39	86
5-Apr	18	28	65	31	23	19	15	24	28	22	17	16	16	21	25	18	16	19	14	16	15	11	89	25	89
6-Apr	50	45	40	64	58	13	42	50	66	24	35	40	20	55	17	20	30	36	27	56	52	89	23	53	89
7-Apr	80	20	28	31	35	19	27	40	17	19	15	32	32	26	35	76	18	15	23	16	16	17	17	16	80
8-Apr	18	15	12	11	13	12	13	16	16	18	19	16	20	17	16	20	22	19	27	18	19	31	22	18	31
9-Apr	19	14	13	13	17	19	29	81	22	46	41	40	43	29	33	32	25	20	15	15	16	23	79	42	81
10-Apr	40	30	25	15	59	34	17	12	14	21	20	20	39	32	38	29	31	35	13	25	84	60	56	84	84
11-Apr	49	59	20	33	17	14	12	12	11	11	12	15	13	13	13	12	14	13	14	16	19	18	13	10	59
12-Apr	11	8	8	11	9	10	15	16	17	17	16	12	20	17	18	22	14	12	10	21	13	19	71	78	78
13-Apr	83	46	52	63	54	82	62	53	42	23	26	29	20	23	23	23	20	14	11	13	13	12	11	16	83
14-Apr	20	17	18	24	24	21	26	25	19	21	19	17	21	23	23	22	20	20	24	24	18	24	20	16	26
15-Apr	15	15	14	15	16	18	16	17	21	21	34	23	24	20	24	47	17	17	14	71	51	36	33	14	71
16-Apr	18	17	20	22	13	14	17	11	15	24	72	19	16	15	19	22	17	18	22	15	17	22	13	16	72
17-Apr	29	72	8	10	11	13	11	14	15	16	11	14	12	12	14	15	13	14	17	17	19	16	17	17	72
18-Apr	12	14	16	18	18	16	16	11	12	13	15	14	13	13	15	16	15	12	14	14	11	11	12	13	18
19-Apr	13	13	10	11	11	9	11	12	12	18	23	60	26	105	35	26	22	20	45	51	44	63	67	47	105
20-Apr	42	42	65	61	75	58	16	67	56	32	16	17	15	12	13	12	12	13	15	11	35	17	9	13	75
21-Apr	18	14	14	12	15	13	11	22	12	18	13	14	11	14	16	25	18	16	18	35	89	24	36	85	89
22-Apr	84	52	70	89	48	14	10	19	20	14	13	11	13	21	22	24	16	19	12	13	8	7	15	23	89
23-Apr	26	41	16	17	13	21	66	30	25	27	22	33	41	18	22	27	22	22	23	17	27	27	91	28	91
24-Apr	29	19	21	22	13	17	23	20	14	20	26	30	23	19	28	24	23	18	18	21	10	22	58	69	69
25-Apr	80	74	94	21	16	18	15	22	24	23	22	20	24	20	22	18	18	19	20	16	19	14	13	17	94
26-Apr	13	17	16	16	15	19	26	17	16	16	18	18	27	22	33	21	30	31	22	20	21	69	81	15	81
27-Apr	13	15	19	41	AF	19	20	16	17	32	27	24	32	44	57	64	88	35	38	28	32	49	23	73	88
28-Apr	64	12	44	55	18	15	17	16	72	73	73	59	28	27	22	20	21	34	10	34	67	86	71	70	86
29-Apr	74	22	29	22	56	61	35	65	89	100	41	30	39	35	21	29	34	14	26	23	34	80	99	55	100
30-Apr	55	63	75	66	39	79	80	88	42	90	26	64	64	59	42	25	49	51	75	59	80	60	30	71	90

84	74	94	89	85	89	94	91	89	100	73	64	64	105	57	76	88	51	75	71	89	89	99	85	
Diurnal Maximum																								

AF - Analyzer Failure





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	April 3, 2017	Last Cal Date:	March 3, 2017
Start time (MST):	8:30	End time (MST):	13:39
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>49.2</u>	ppm	Cal Gas Exp Date	February 16, 2019
Calibrator Make/Model	Teledyne API 700		Serial Number	2445
ZAG Make/Model	Teledyne API 701		Serial Number	1864

Analyzer Information

Analyzer make: Thermo 45C

Analyzer serial #: 630718530

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-619	-619
Calculated slope	1.002512	0.998998	Lamp voltage	802	802
Calculated intercept	-0.011583	1.799733	Pressure	695.7	695.7
Analyzer Background	18.5	18.1	Flow	0.479	0.479
Analyzer Coefficient	1.040	1.012	Intensity	43828	43828

SO₂ Calibration Data

Set Point	Total air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.3	----
as found span	5000	78.8	763.4	778.5	0.981
calibrator zero	5000	0.0	0.0	0.3	----
high point	5000	78.8	763.4	763.5	1.000
second point	5000	39.5	385.6	382.8	1.007
third point	5000	19.8	194.1	190.6	1.018
as left zero	5000	0.0	0.0	0.4	----
as left span	5000	78.8	763.4	760.1	1.004
Average Correction Factor					1.008

Corrected As found	778.20	Previous response	761.46	*% change	-2.2%
--------------------	--------	-------------------	--------	-----------	-------

* = > +/-5% change initiates investigation

Notes:

Span adjusted, no maintenance done

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

SO₂ Calibration Summary

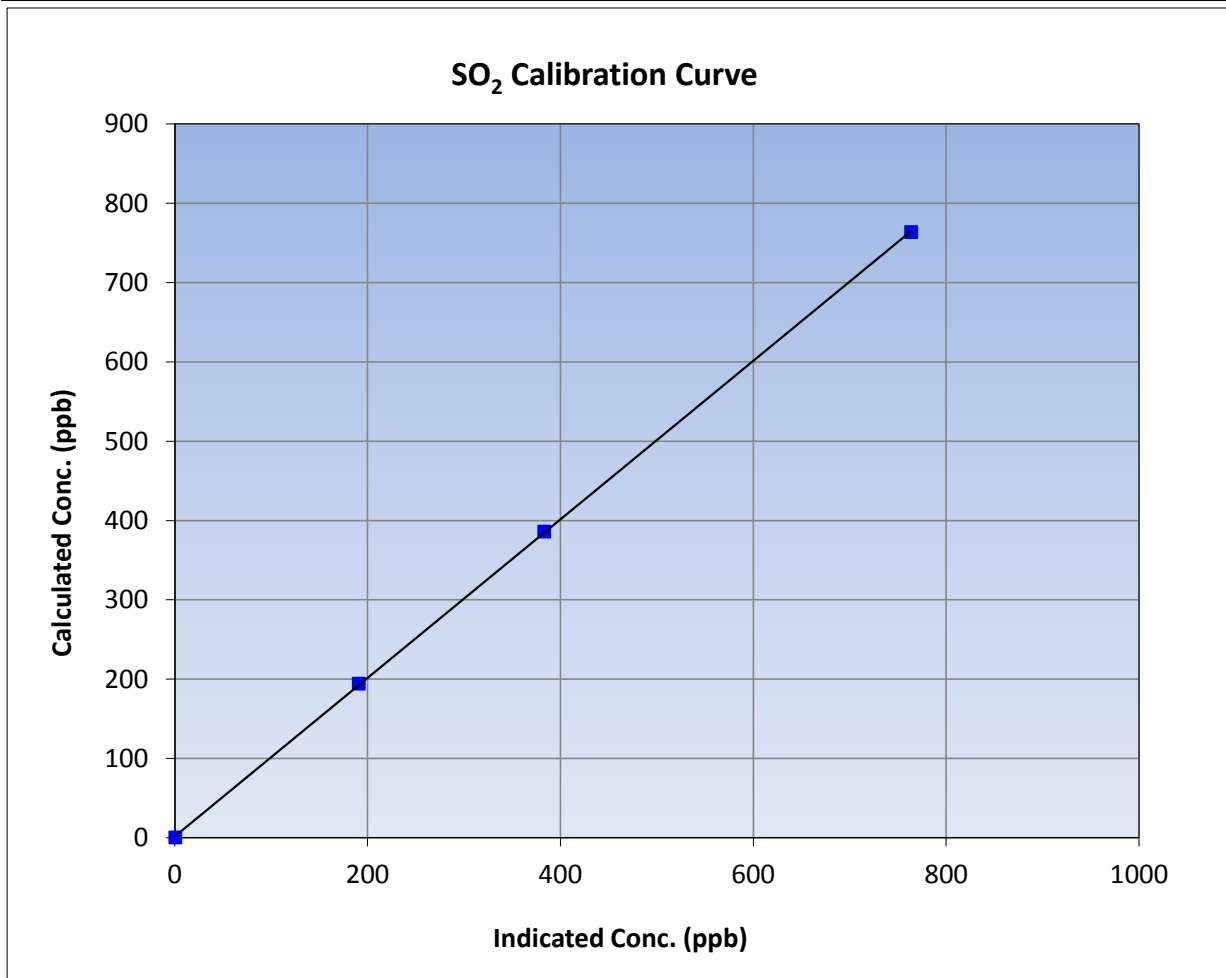
Version-03-2017

Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 3, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	8:30	End Time (MST)	13:39
Analyzer make	Thermo 45C	Analyzer serial #	630718530

Calibration Data

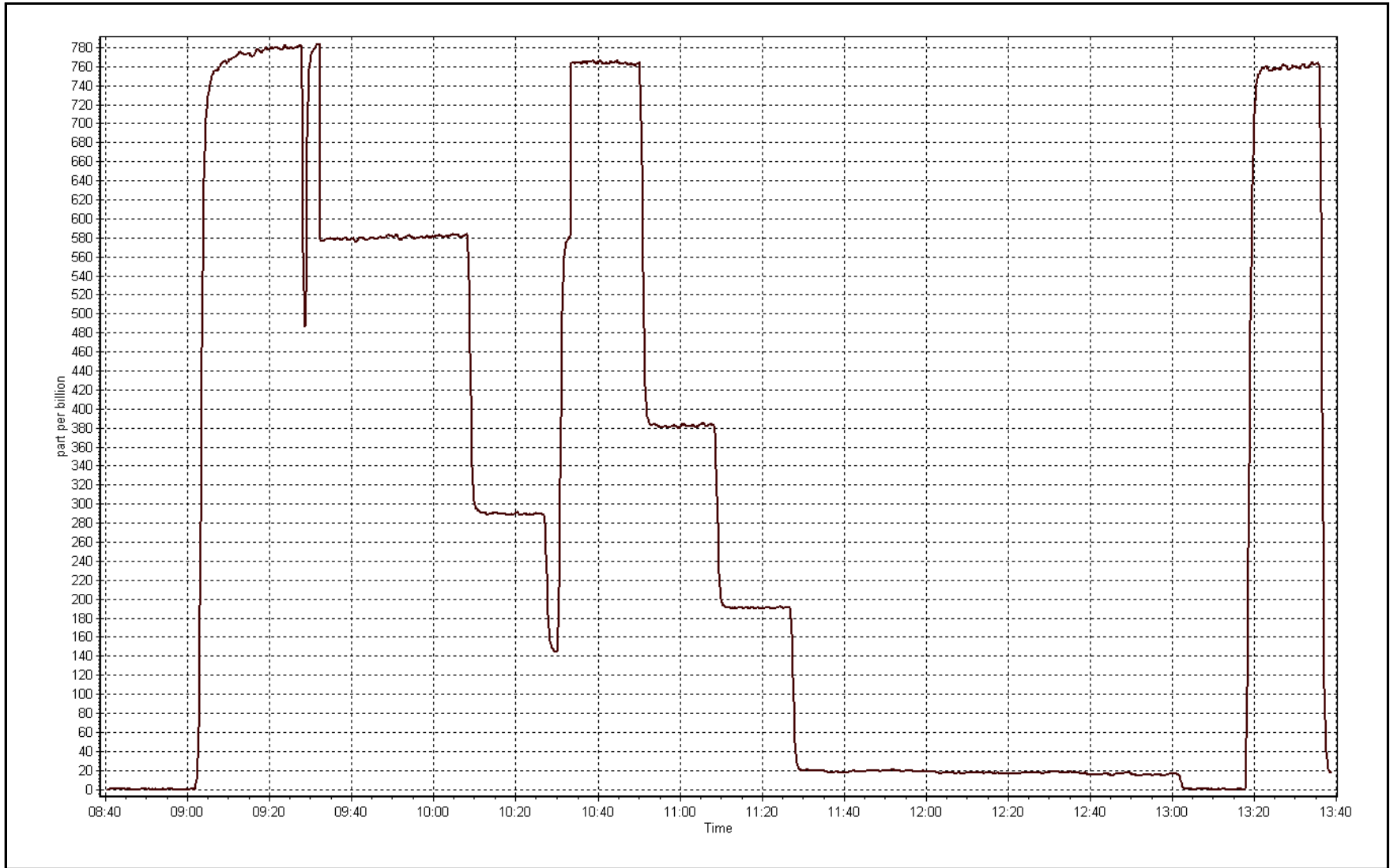
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.3	----	Correlation Coefficient	≥0.995
763.4	763.5	0.9998		
385.6	382.8	1.0074	Slope	0.90 - 1.10
194.1	190.6	1.0182		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 3, 2017

Location: Athabasca Valley





Wood Buffalo Environmental Association

TRS Calibration Summary

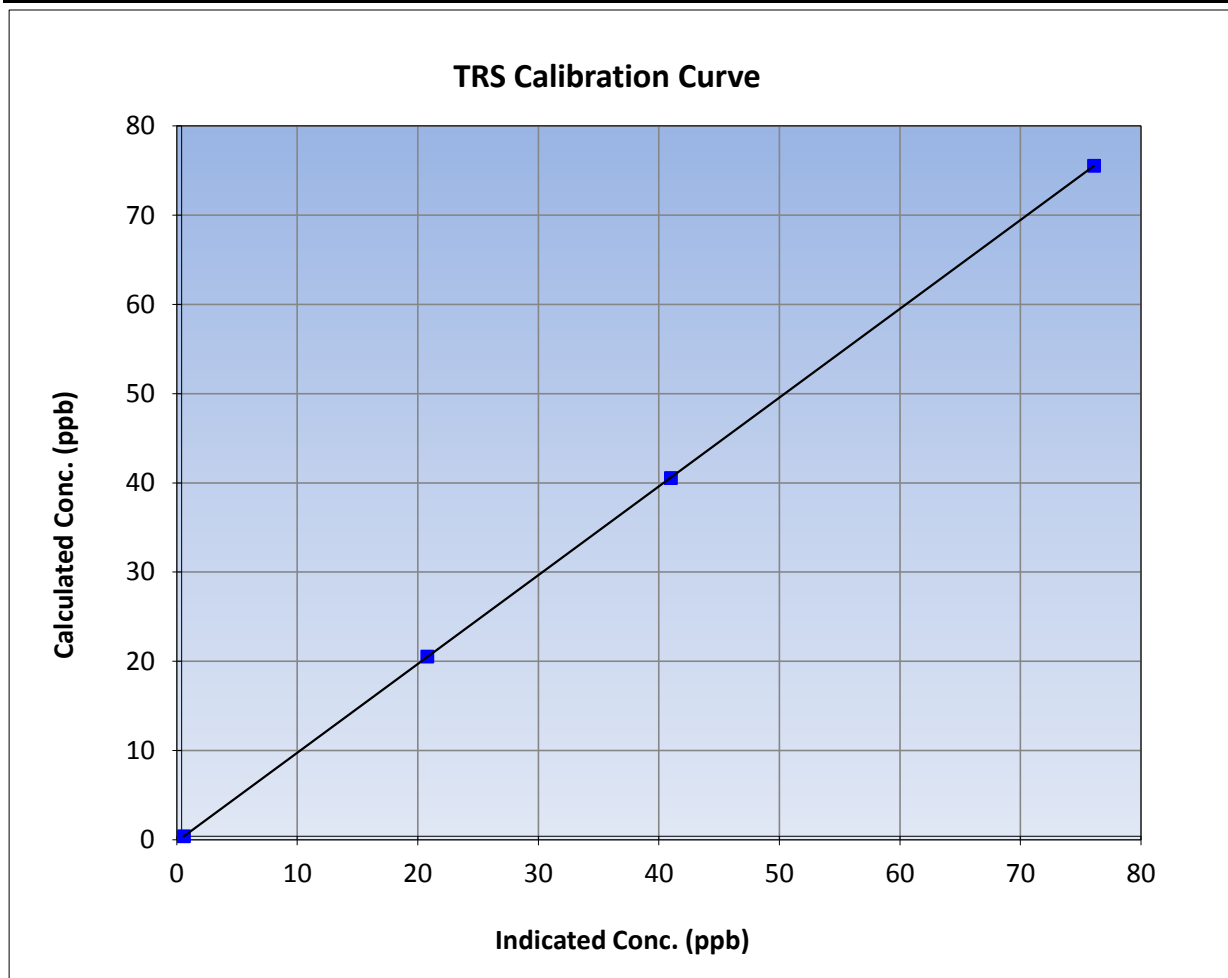
Version-03-2017

Station Information

Calibration Date	April 4, 2017	Previous Calibration	March 2, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	10:50	End Time (MST)	
Analyzer make	Thermo 49i	Analyzer serial #	1507964700

Calibration Data

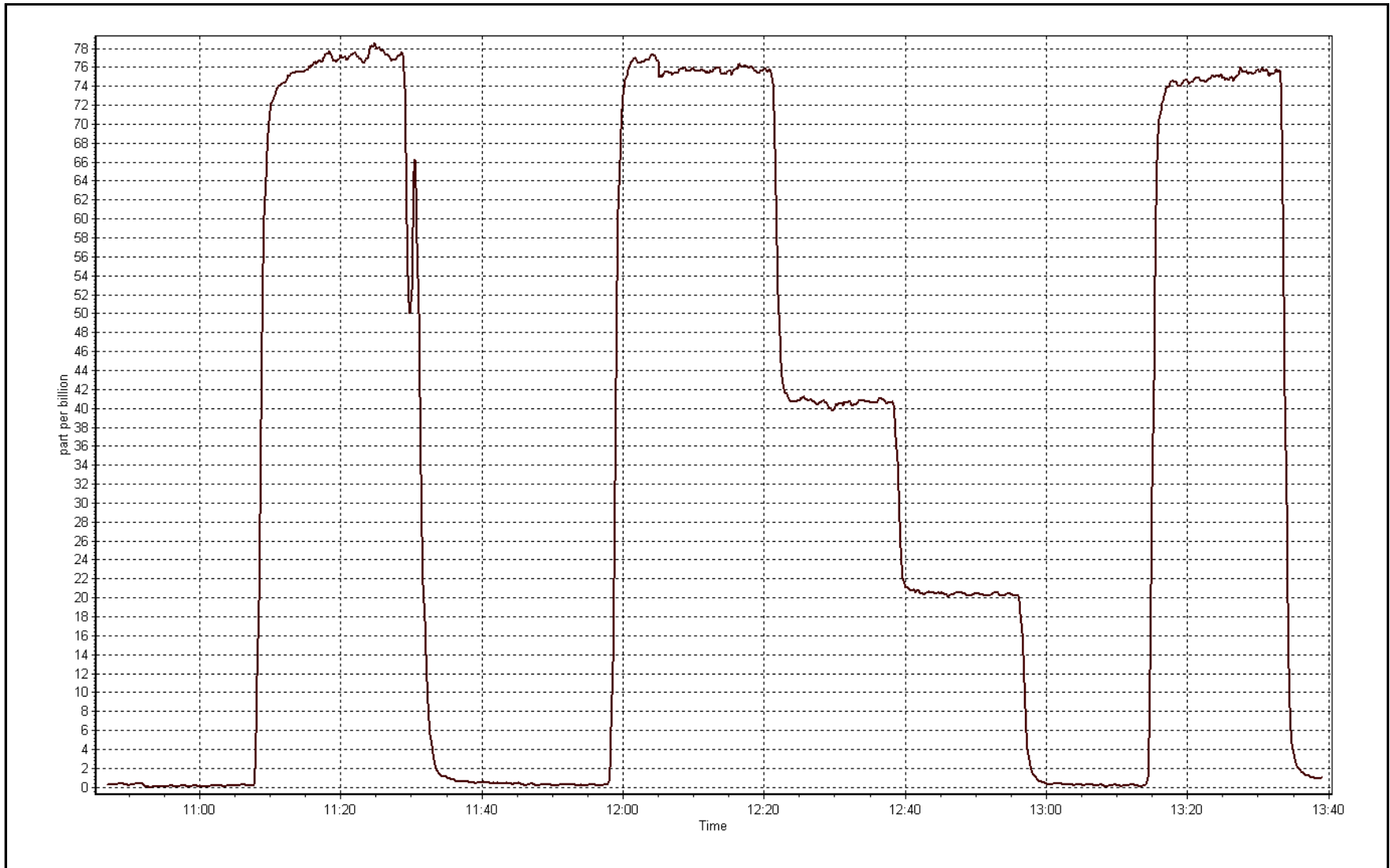
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.2	----	Correlation Coefficient	≥0.995
75.1	75.7	0.9925		
40.2	40.6	0.9892	Slope	0.90 - 1.10
20.1	20.4	0.9867		
			Intercept	+/-3



TRS Calibration Plot

Date: April 4, 2017

Location: Athabasca Valley





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	April 3, 2017	Last Cal Date:	March 3, 2017
Start time (MST):	8:40	End time (MST):	13:38
Reason:	Routine		

Calibration Standards

Gas Cert Reference	LL110103	Cal Gas Expiry Date	February-16-19
CH4 Cal Gas Conc.	<u>488.0</u> ppm	CH4 Equiv Conc.	1035.3 ppm
C3H8 Cal Gas Conc.	<u>199.0</u> ppm	Station temp.	25 Deg C
Calibrator Model	Teledyne API 700	Serial Number	2445
ZAG make/model	Teledyne API 701	Serial Number	1864

Analyzer Information

Analyzer make: Thermo 55i

Analyzer serial #: 1426262594

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.1	75.1
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	175.0	175.0
CH4 SP Ratio	0.000207	0.000210	Flame Temp	405.0	405.0
CH4 Retention time	12.6	12.8	Carrier Pressure	36.1	36.1
NMHC SP Ratio	4.04E-05	4.03E-05	Fuel Pressure	44.8	44.8
NMHC Peak Area	160286	213199	Air Pressure	25.9	25.9

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	1.001607	1.001538
THC Cal Offset	0.016458	0.012440
CH4 Cal Slope	1.002516	0.999620
CH4 Cal Offset	0.013915	0.015916
NMHC Cal Slope	1.000662	1.003241
NMHC Cal Offset	0.000559	-0.003456

Notes: span adjusted, No maintenance done

Calibration Performed By:

Melissa Lemay



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Total air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5000	0.0	0.00	0.00	----
as found span	5000	78.8	16.32	16.14	1.011
calibrator zero	5000	0.0	0.00	0.00	----
high point	5000	78.8	16.32	16.29	1.002
second point	5000	39.5	8.18	8.13	1.006
third point	5000	19.8	4.10	4.08	1.005
as left zero	5000	0.0	0.00	0.00	----
as left span	5000	78.8	16.32	16.30	1.001
Average Correction Factor					1.004
Corrected As found	16.14	Prev response	16.27	*% change	0.8%

NMHC Calibration Data

Set Point	Total air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5000	0	0.00	0.00	----
as found span	5000	78.8	8.62	8.60	1.003
calibrator zero	5000	0	0.00	0.00	----
high point	5000	78.8	8.62	8.60	1.003
second point	5000	39.5	4.32	4.31	1.003
third point	5000	19.8	2.17	2.17	0.999
as left zero	5000	0	0.00	0.00	----
as left span	5000	78.8	8.62	8.59	1.004
Average Correction Factor					1.002
Corrected As found	8.60	Prev response	8.62	*% change	0.2%

CH4 Calibration Data

Set Point	Total air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5000	0.0	0.00	0.00	----
as found span	5000	78.8	7.69	7.54	1.020
calibrator zero	5000	0.0	0.00	0.00	----
high point	5000	78.8	7.69	7.69	1.000
second point	5000	39.5	3.86	3.82	1.009
third point	5000	19.8	1.93	1.91	1.012
as left zero	5000	0.0	0.00	0.00	----
as left span	5000	78.8	7.69	7.69	1.000
Average Correction Factor					1.007
Corrected As found	7.54	Prev response	7.66	*% change	1.6%

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

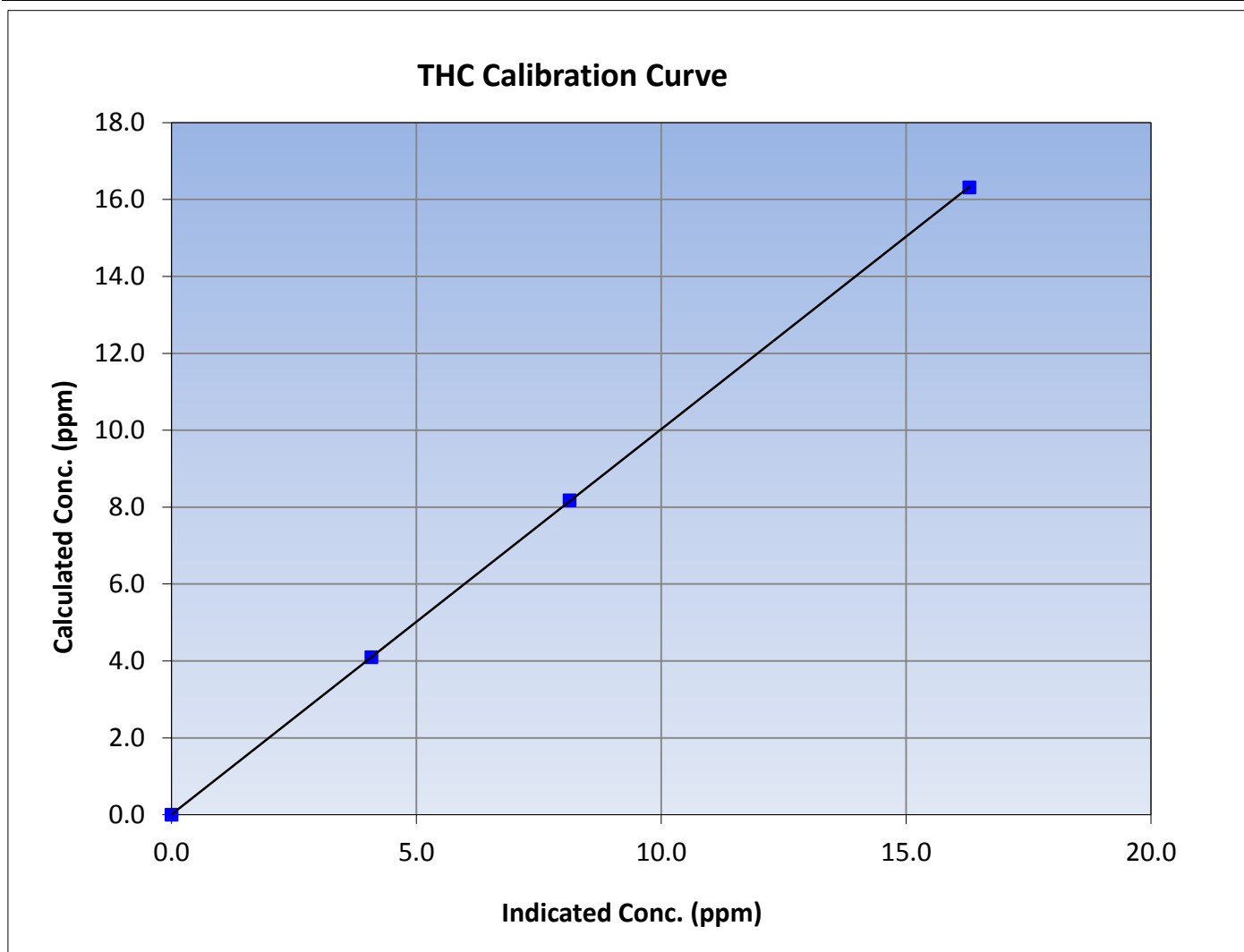
Version-02-2017

Station Information

Calibration Date	April 3, 2017	Previous Calibration	AMS 07
Station Name	Athabasca Valley	Station Number	42797
Start Time (MST)	8:40	End Time (MST)	13:38
Analyzer make	Thermo 55i	Analyzer serial #	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999994	≥ 0.995			
16.32	16.29	1.0016						
8.18	8.13	1.0060				Slope	1.001538	0.90 - 1.10
4.10	4.08	1.0048						
			Intercept	0.012440	± 0.5			





Wood Buffalo Environmental Association

CH₄ Calibration Summary

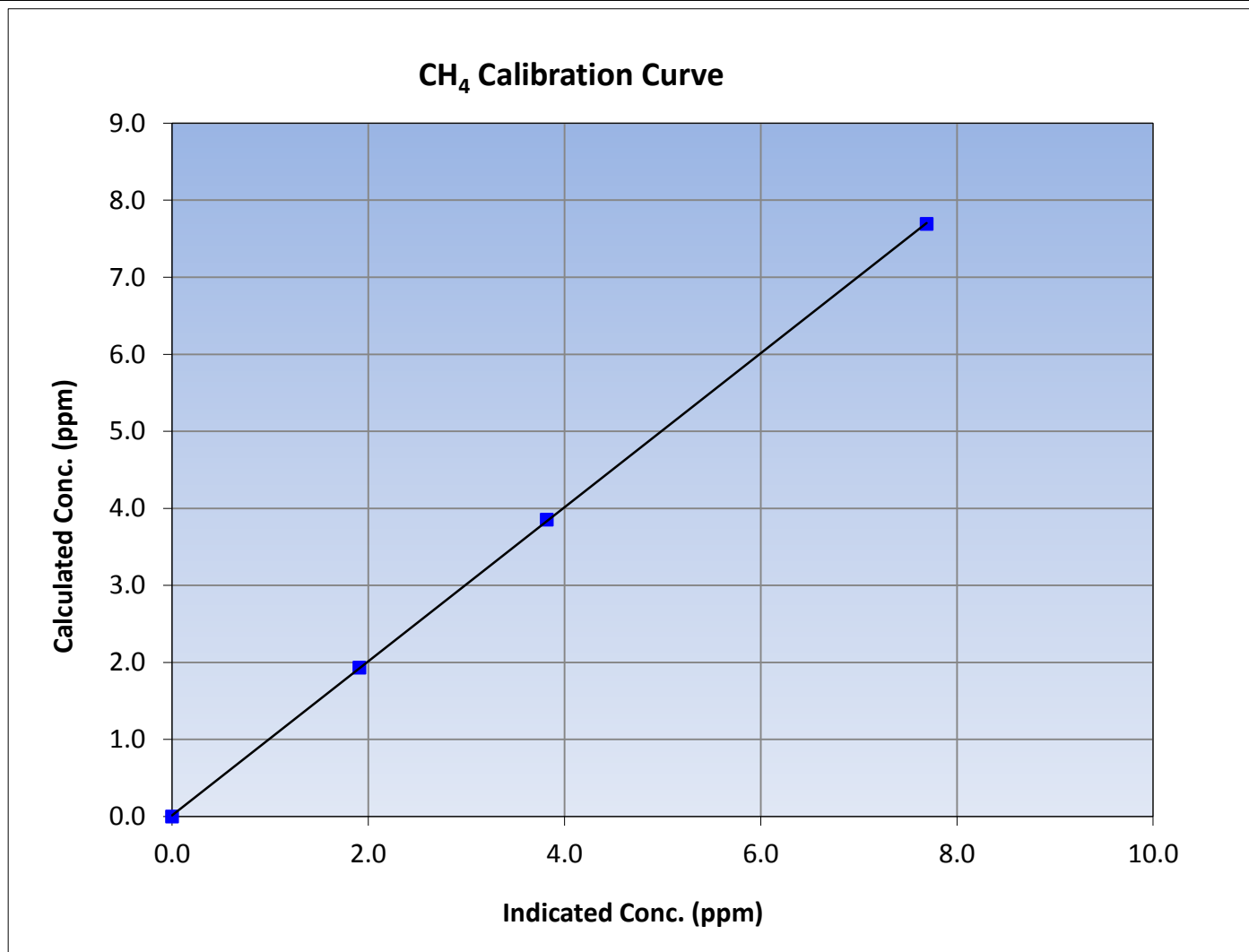
Version-02-2017

Station Information

Calibration Date	April 3, 2017	Previous Calibration	AMS 07
Station Name	Athabasca Valley	Station Number	42797
Start Time (MST)	8:40	End Time (MST)	13:38
Analyzer make	Thermo 55i	Analyzer serial #	1426262594

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	0.999973	≥0.995
7.69	7.69	1.0001			
3.86	3.82	1.0092			
1.93	1.91	1.0118			
			Slope	0.999620	0.90 - 1.10
			Intercept	0.015916	+/-0.5





Wood Buffalo Environmental Association

NMHC Calibration Summary

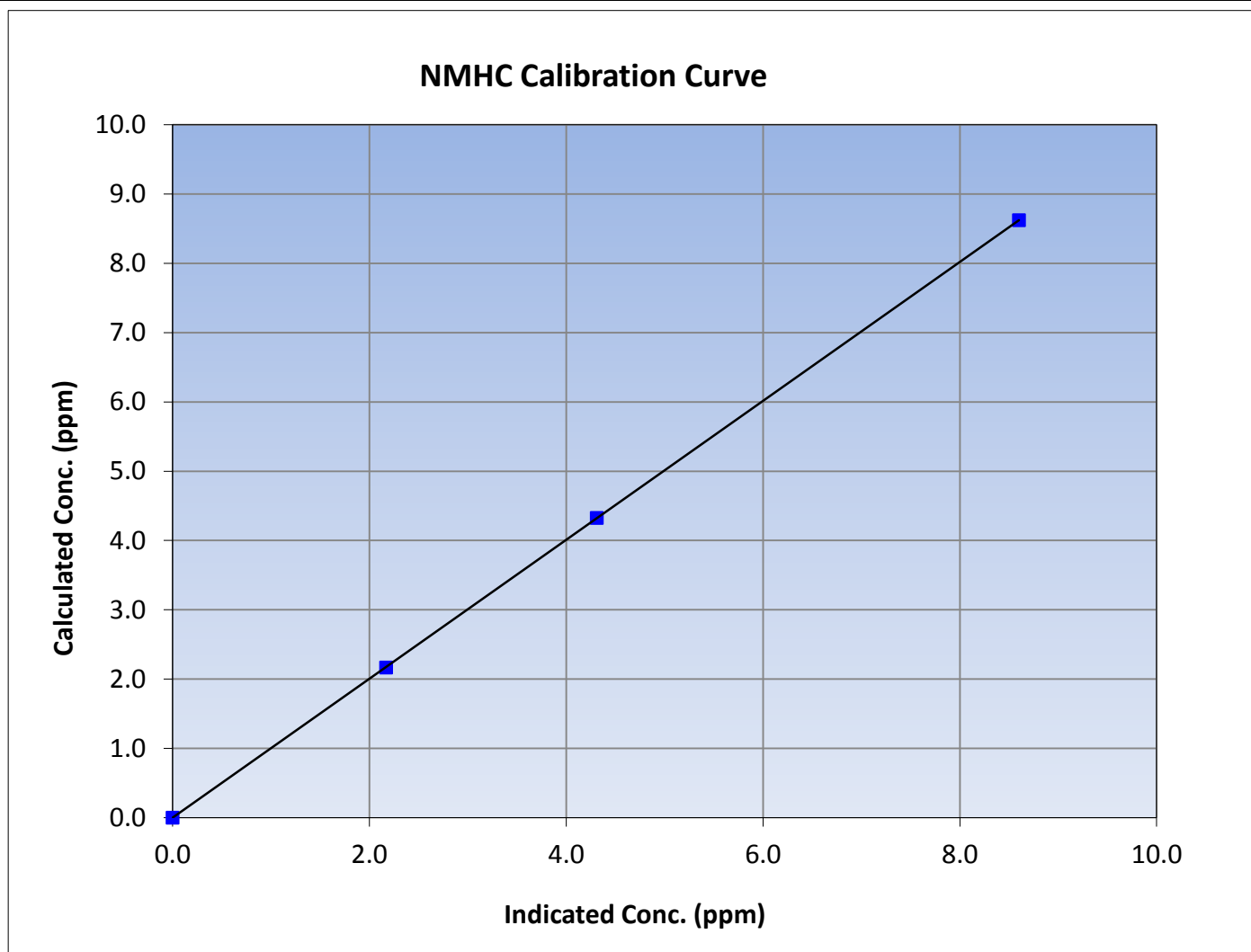
Version-02-2017

Station Information

Calibration Date	April 3, 2017	Previous Calibration	AMS 07
Station Name	Athabasca Valley	Station Number	42797
Start Time (MST)	8:40	End Time (MST)	13:38
Analyzer make	Thermo 55i	Analyzer serial #	1426262594

Calibration Data

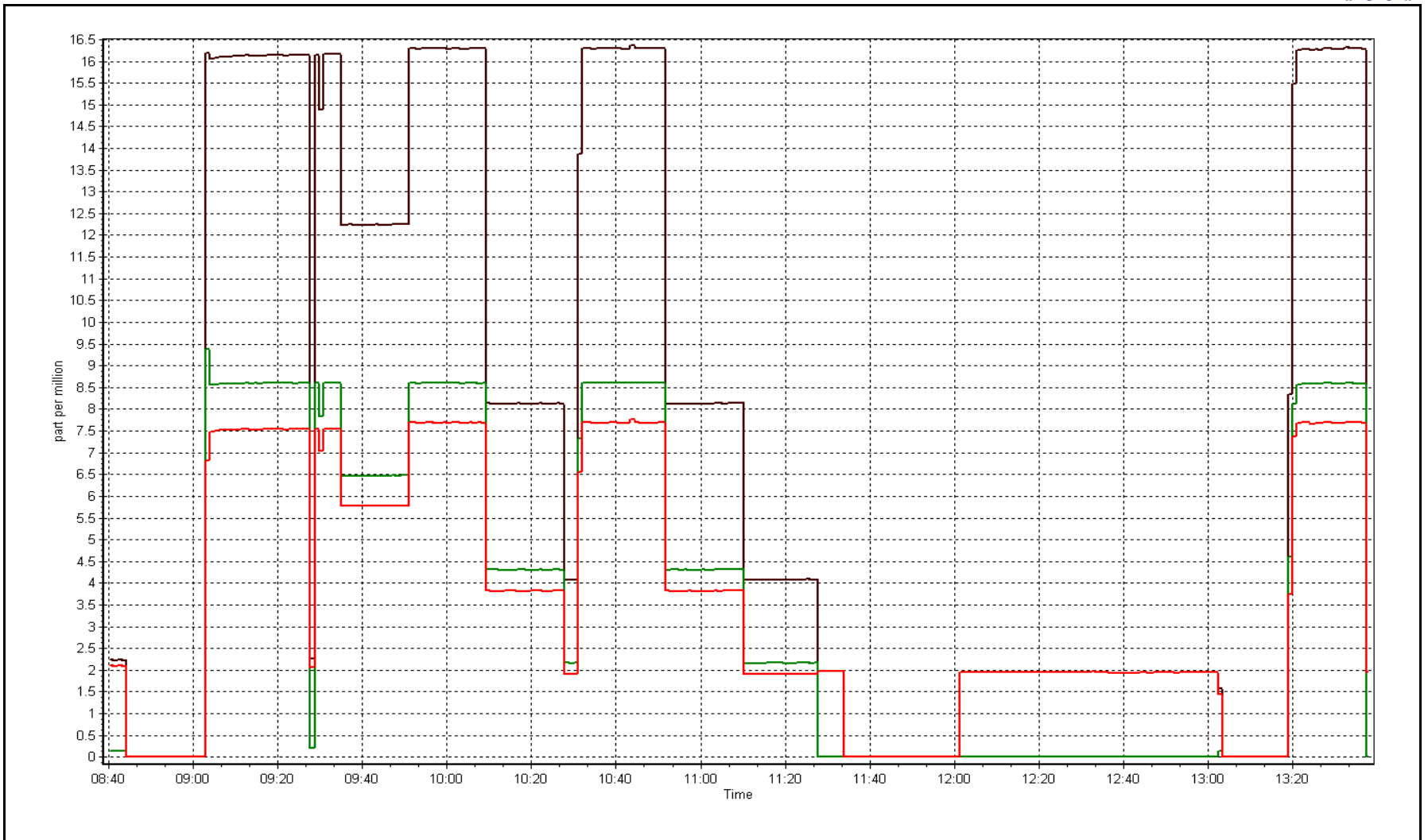
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999998	≥ 0.995			
8.62	8.60	1.0029						
4.32	4.31	1.0031				Slope	1.003241	0.90 - 1.10
2.17	2.17	0.9987						
			Intercept	-0.003456	± 0.5			



NMHC Calibration Plot

Date: April 3, 2017

Location: Athabasca Valley





Wood Buffalo Environmental Association

O₃ Calibration Summary

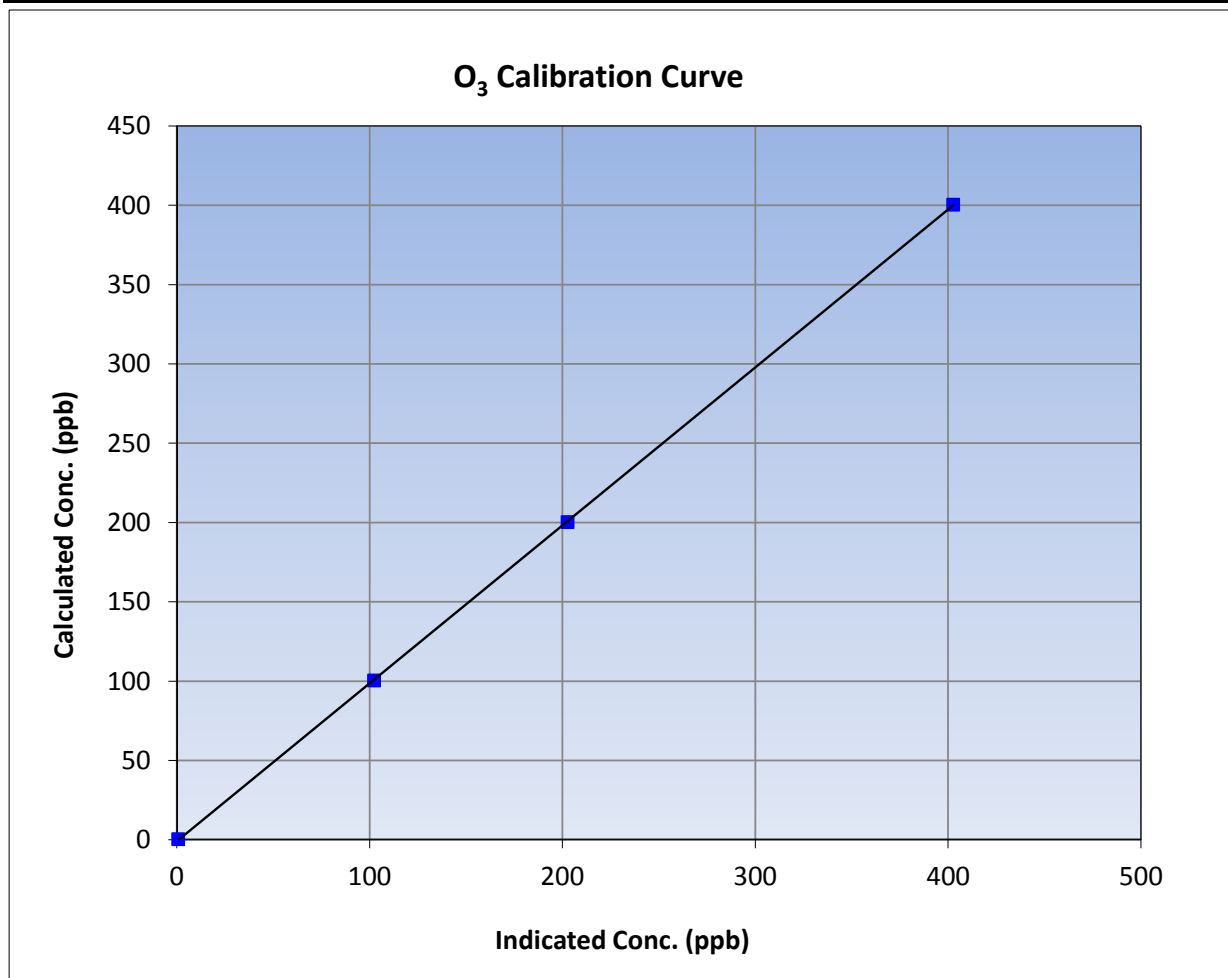
Version-03-2017

Station Information

Calibration Date	April 4, 2017	Previous Calibration	March 1, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	7:45	End Time (MST)	
Analyzer make	Thermo 49i	Analyzer serial #	1507964700

Calibration Data

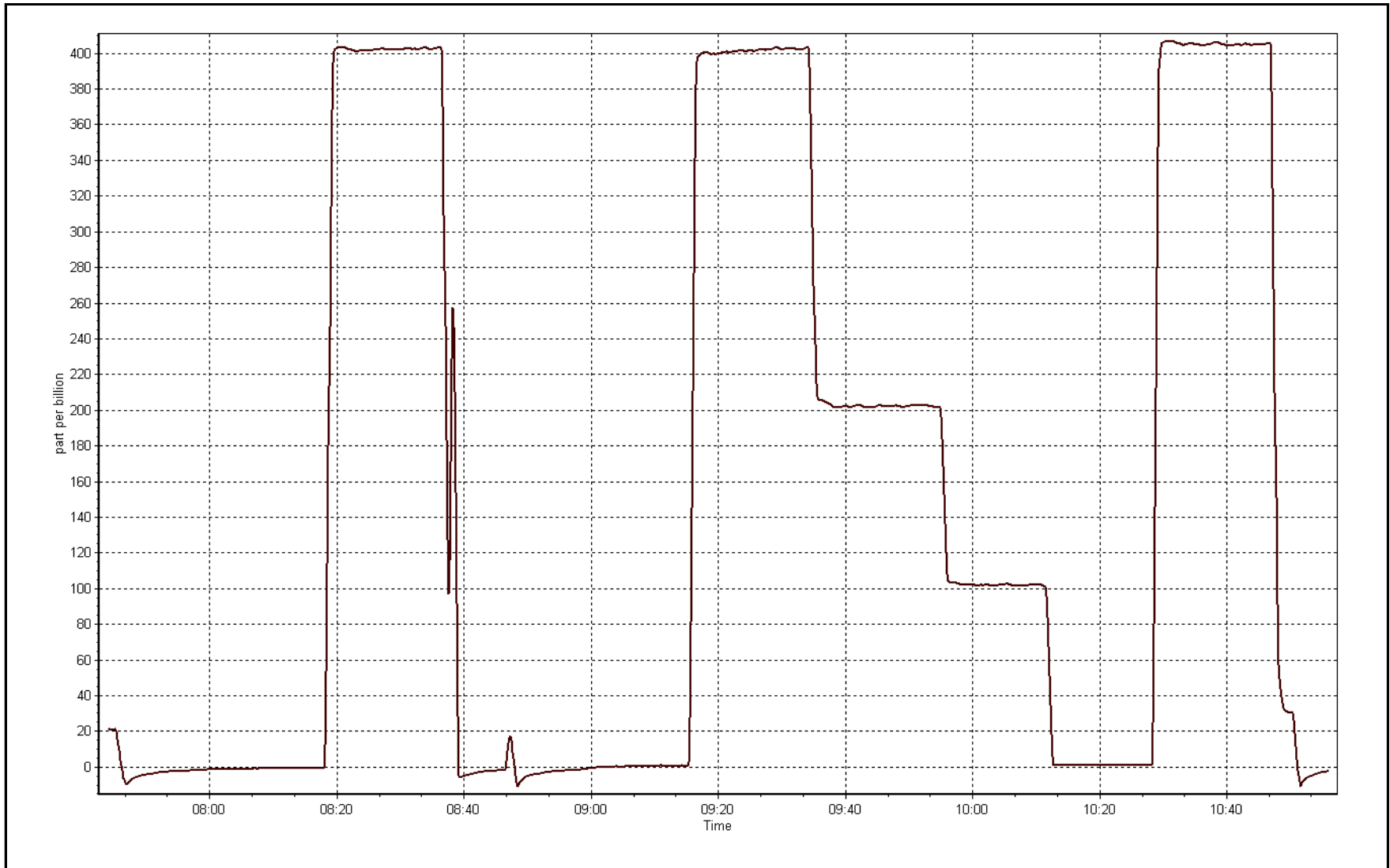
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.4	----	Correlation Coefficient	0.999989	≥0.995
400.0	402.3	0.9943			
200.0	202.3	0.9886	Slope	0.995864	0.90 - 1.10
100.0	101.9	0.9814			
			Intercept	-0.993988	+/- 10



O₃ Calibration Plot

Date: April 4, 2017

Location: Athabasca Valley





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Athabasca Valley	Station number:	AMS 07
Calibration Date:	April 3, 2017	Last Cal Date:	March 3, 2017
Start time (MST):	8:40	End time (MST):	13:37
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL110103	Cal Gas Expiry Date	February-16-19
NOX Cal Gas Conc.	<u>50.8</u> ppb	NO Cal Gas Conc.	<u>50.8</u> ppb
Calibrator Model	Teledyne API T700	Serial Number	2445
ZAG make/model	Teledyne API T701	Serial Number	1864

Analyzer Information

Analyzer make: Thermo 42C			Analyzer serial #: 601114773		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	1.177	1.189	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	0.999	0.999	PMT Temperature	-3.6	-3.6
NO2 coefficient	1.000	1.000	Reaction cell Press	139.7	139.7
NO bkgrnd	3.3	3.3	Sample Flow	0.872	0.872
NOX bkgrnd	3.5	3.5	PMT Voltage	-784	-784

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	1.000221	1.000611
NO _x Cal Offset	0.709921	0.610299
NO Cal Slope	0.998591	0.999527
NO Cal Offset	1.029383	0.489653
NO ₂ Cal Slope	0.999798	0.999651
NO ₂ Cal Offset	-0.139279	0.462636



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Total flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.0	0.0	0.2	-0.1	0.3	----	----
as found span	5000	78.8	800.6	800.6	0.0	790.8	790.9	0.0	1.0124	1.0123
calibrator zero	5000	0.0	0.0	0.0	0.0	0.2	-0.1	0.3	----	----
high point	5000	78.8	800.6	800.6	0.0	799.8	800.6	-0.8	1.0010	1.0000
second point	5000	39.5	401.3	401.3	0.0	400.4	401.1	-0.7	1.0023	1.0005
third point	5000	19.8	201.2	201.2	0.0	199.4	200.2	-0.6	1.0089	1.0048
as left zero	5000	0.0	0.0	0.0	0.0	0.2	-0.1	0.3	----	----
as left span	5000	78.8	800.6	385.8	414.8	790.0	381.5	408.4	1.0134	1.0113
Average Correction Factor									1.0041	1.0018

Corrected As found	NO _x = 790.6 ppb	NO = 791.0 ppb		*Percent Change	NO _x = 1.2%
Previous Response	NO _x = 799.7 ppb	NO = 800.7 ppb		*Percent Change	NO = 1.2%

* = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	795.2	797.0	-2.7	1.0068	1.0045	----	----
1st NO2 (400 ppb O3)	385.8	411.2	797.0	385.8	411.1	1.0045	----	1.0002	100.0%
2nd NO2 (200 ppb O3)	591.8	205.2	796.7	591.8	204.9	1.0049	----	1.0015	99.9%
3rd NO2 (100 ppb O3)	693.9	103.1	795.4	693.9	101.6	1.0065	----	1.0148	98.5%
2nd NO ref point	----	0.0	798.5	800.5	-1.9	1.0026	1.0001	----	----
Average Correction Factor						1.0047	1.0023	1.0055	99.5%

Notes: Span adjusted, no maintenance done, Drifting during GPT 2nd NO ref point used

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

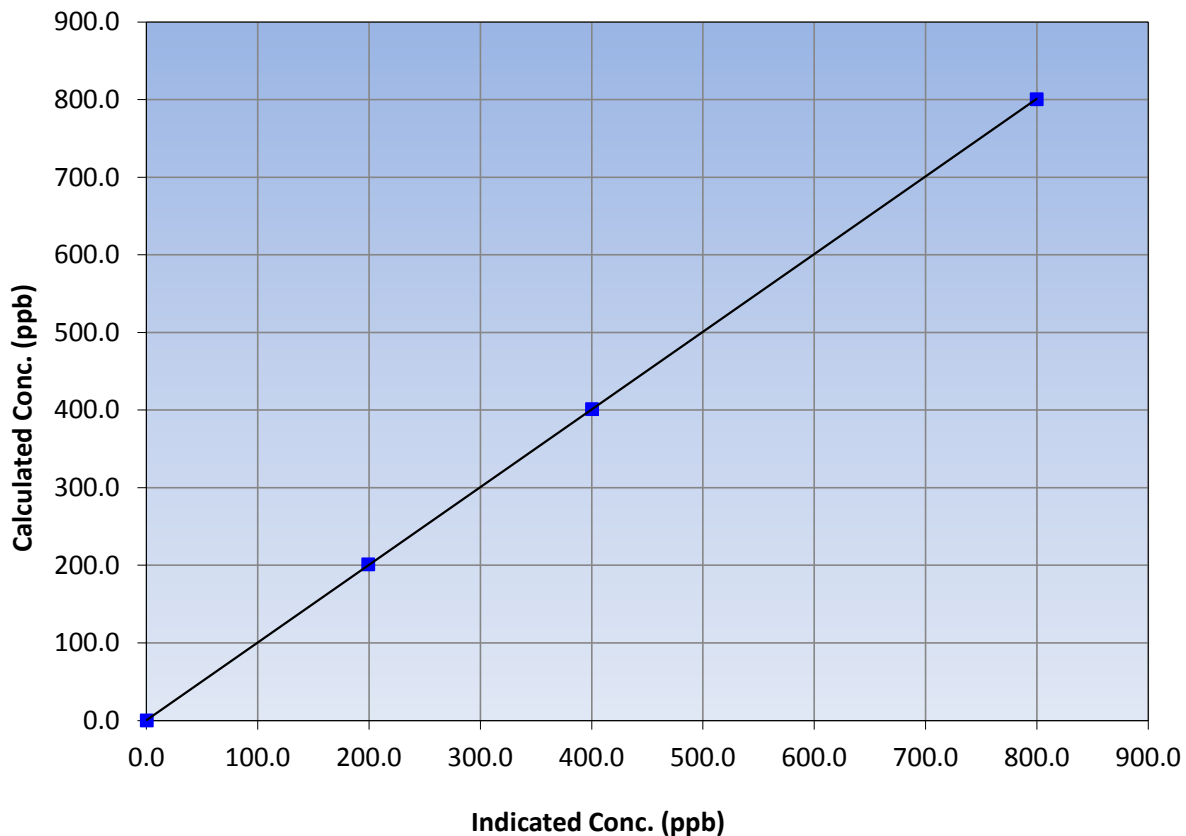
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 3, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	8:40	End Time (MST)	13:37
Analyzer make	Thermo 42C	Analyzer serial #	601114773

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.2	----	Correlation Coefficient	≥0.995	
800.6	799.8	1.0010			
401.3	400.4	1.0023			
201.2	199.4	1.0089			
			Slope	1.000611	0.90 - 1.10
			Intercept	0.610299	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

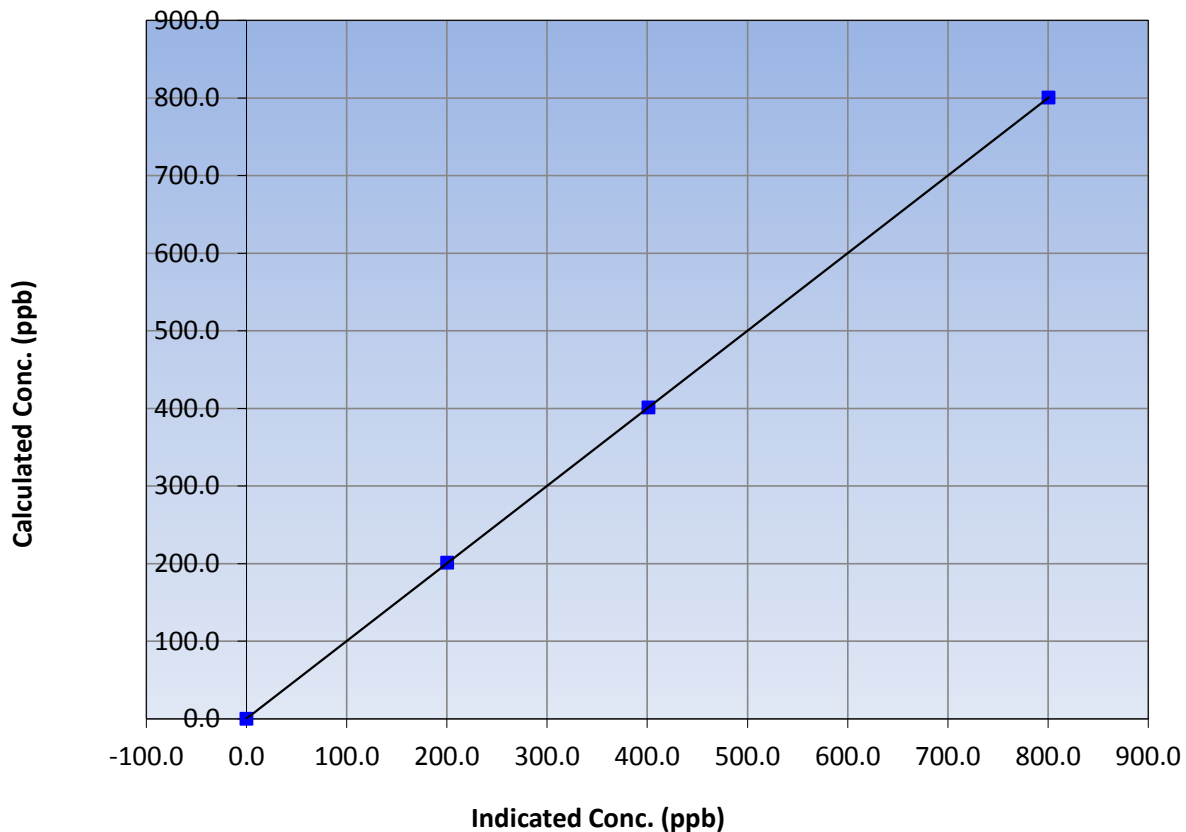
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 3, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	8:40	End Time (MST)	13:37
Analyzer make	Thermo 42C	Analyzer serial #	601114773

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
800.6	800.6	1.0000			
401.3	401.1	1.0005			
201.2	200.2	1.0048			
			Slope	0.999527	0.90 - 1.10
			Intercept	0.489653	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

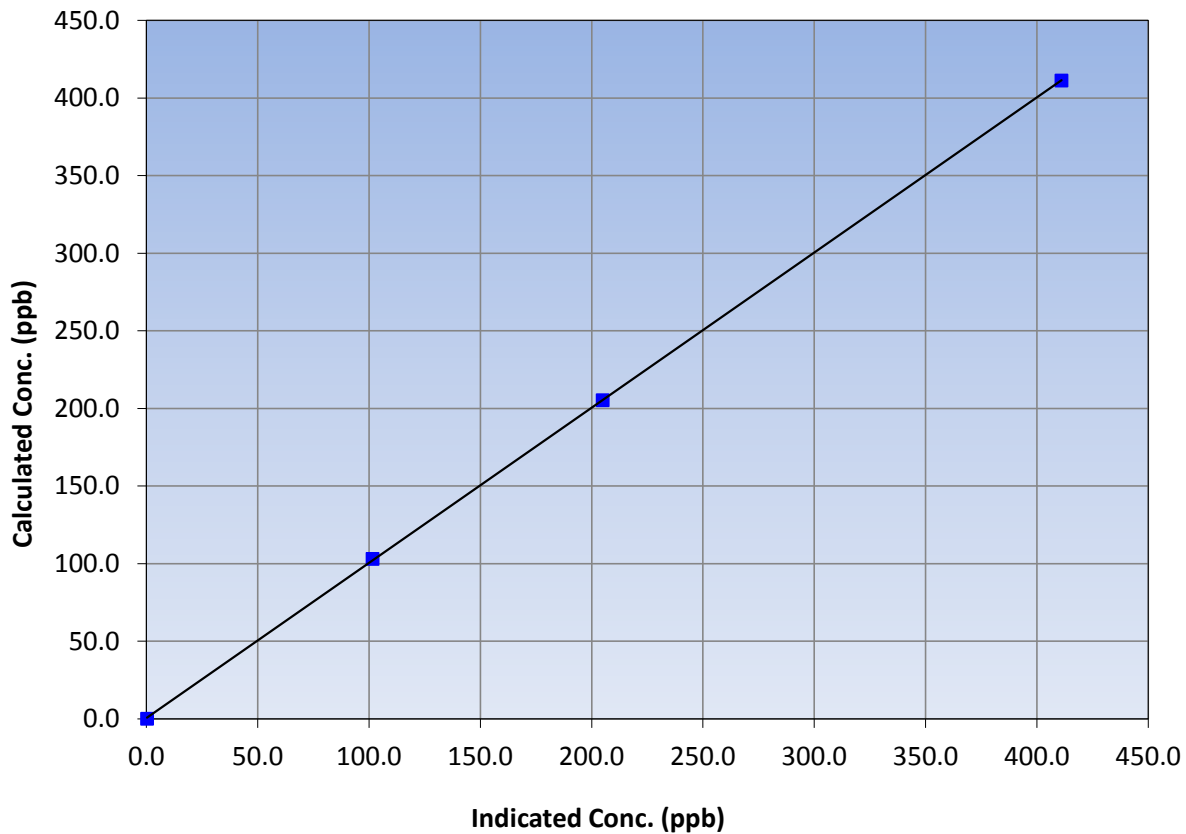
Station Information

Calibration Date	April 3, 2017	Previous Calibration	March 3, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	8:40	End Time (MST)	13:37
Analyzer make	Thermo 42C	Analyzer serial #	601114773

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.3	----	Correlation Coefficient	≥0.995	
411.2	411.1	1.0002			
205.2	204.9	1.0015			
103.1	101.6	1.0148			
			Slope	0.999651	0.90 - 1.10
			Intercept	0.462636	+/-20

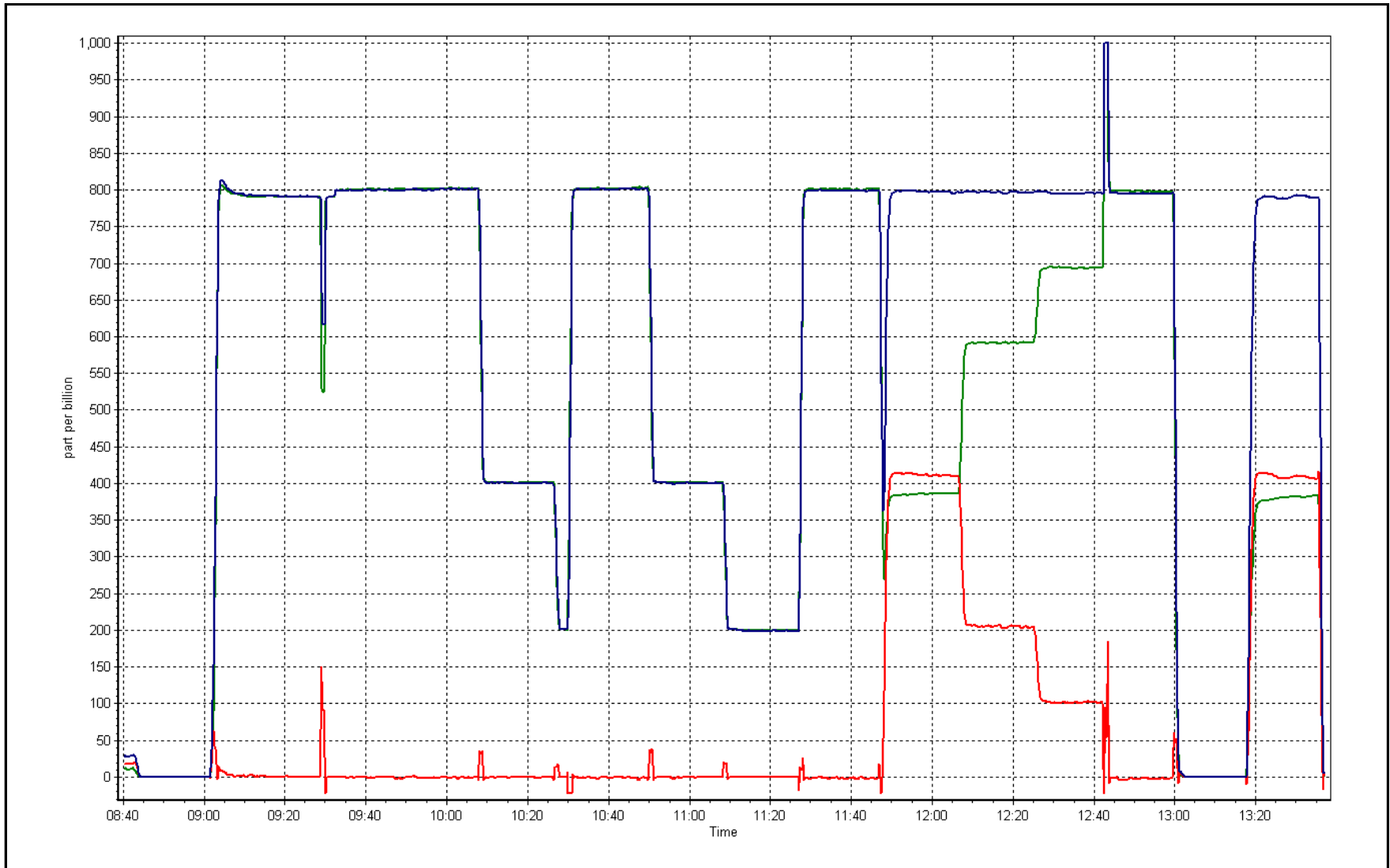
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 3, 2017

Location: Athabasca Valley





Wood Buffalo Environmental Association

CO Calibration Summary

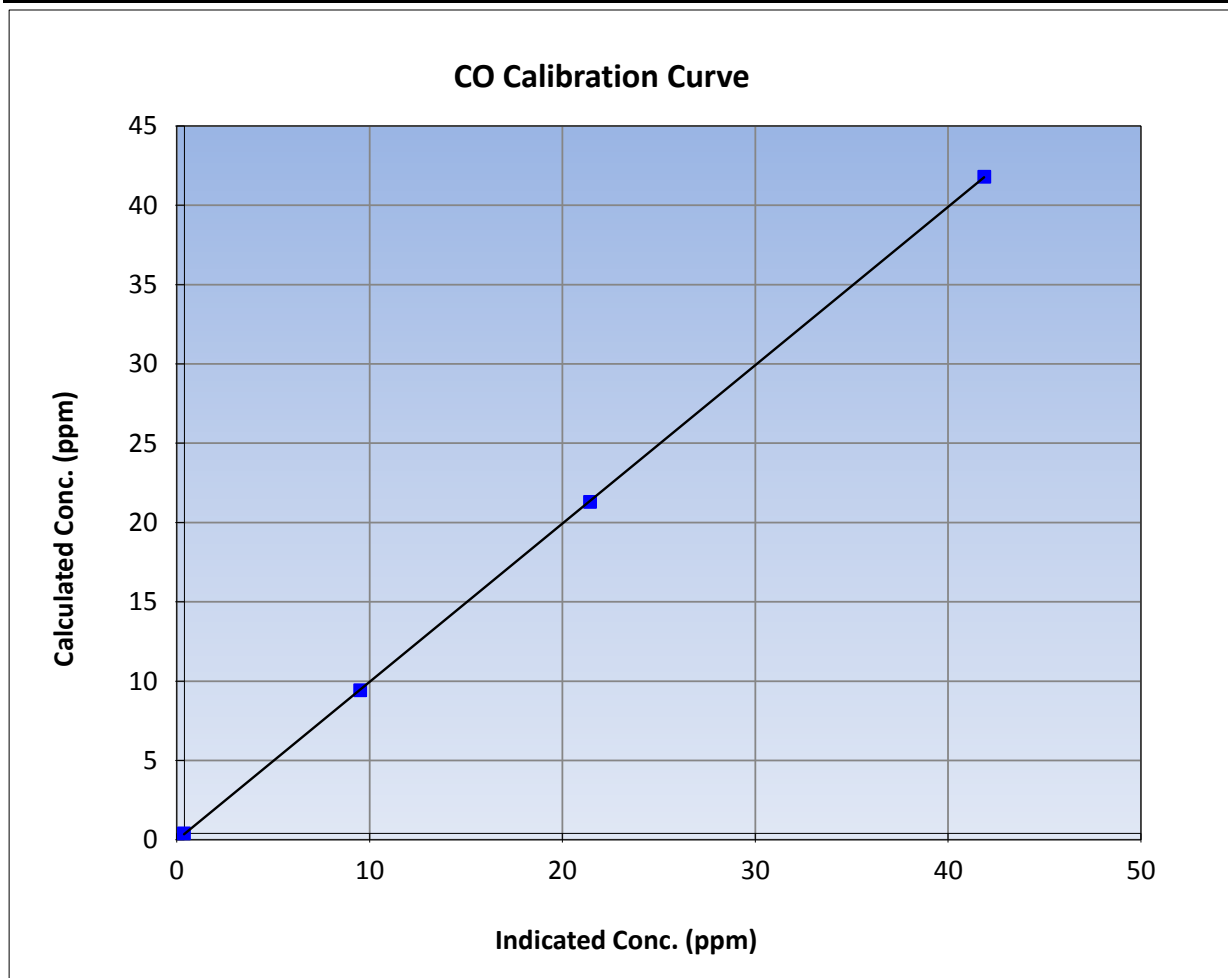
Version-03-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 1, 2017
Station Name	Athabasca Valley	Station Number	AMS 07
Start Time (MST)	9:50	End Time (MST)	12:23
Analyzer make	Thermo 48i-LTE	Analyzer serial #	1408761381

Calibration Data

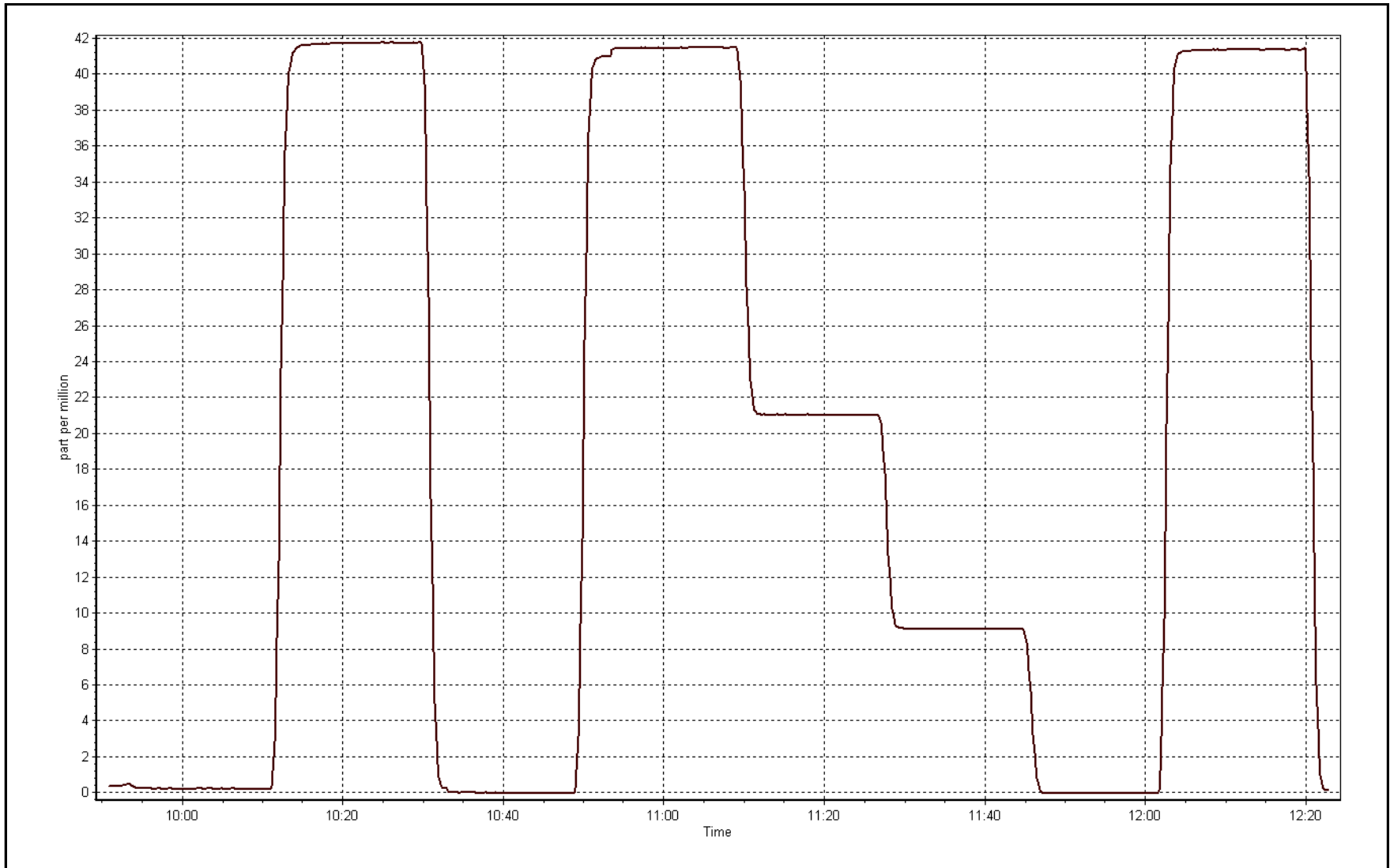
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999992	≥0.995
41.4	41.5	0.9984			
20.9	21.0	0.9942	Slope	0.998306	0.90 - 1.10
9.0	9.1	0.9911			
			Intercept	-0.032340	+/-1.5



CO Calibration Plot

Date: April 5, 2017

Location: Athabasca Valley





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS 8
FORT CHIPEWYAN
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	684	36	36	100	4	0	1	0
O3(ppb) Average	687	33	33	100	52	0	47	-
NO2(ppb) Average	683	36	37	99.86	8	0	3	-
NO(ppb) Average	683	36	37	99.86	4	-	1	-
NOX(ppb) Average	683	36	37	99.86	10	-	4	-
PM2.5(ug/m3) Average	718	2	2	100	21.7	-	7.6	0
Wind Speed 10 m (km/h) Average	720	0	0	100	38	-	33	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-
Temperature 2 m (C) Average	720	0	0	100	14.8	-	8.7	-
Relative Humidity (%) Average	720	0	0	100	96	-	77	-
Precipitation (mm) Total	720	0	0	100	0.5	-	1.3	-
Leaf Wetness (% of range) Average	720	0	0	100	17	-	2	-
Global Solar Radiation (W/m2) Average	720	0	0	100	824	-	305	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2(ppb) Average	684	0.2	0	-	0	0	0	0	0	0	0	4
O3(ppb) Average	687	36.6	8	-	7	24	31	39	43	47	52	52
NO2(ppb) Average	683	0.7	1	-	0	0	0	0	1	2	8	8
NO(ppb) Average	683	0.1	0	-	0	0	0	0	0	0	4	4
NOX(ppb) Average	683	0.9	1	-	0	0	0	0	1	2	10	10
PM2.5(ug/m3) Average	718	2.73	1.9	-	0.7	1.4	1.8	2.3	3.2	4.3	21.7	21.7
Wind Speed 10 m (km/h) Average	720	15.2	8	-	1	6	9	14	20	26	38	38
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	720	-0.39	5.5	-	-14.7	-7.6	-4.6	-0.8	3.8	6.5	14.8	14.8
Relative Humidity (%) Average	720	60.5	15	-	20	41	50	60	73	79	96	96
Precipitation (mm) Total	720	-	-	1.27	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	-0.2	1	-	-1	-1	0	0	0	0	17	17
Global Solar Radiation (W/m2) Average	720	228.5	263	-	0	0	0	99	436	653	824	824

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, NO, NOX	11 Apr 2017 16:00	11 Apr 2017 16:00	1	Power spike followed by stabilization period



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Fort Chipewyan - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 4 ppb on Apr 26 20:00	Maximum Daily Average: 1.1 ppb on Apr 26		Hours of Data:	684
Minimum Value: 0 ppb on Apr 6 22:00	Minimum Daily Average: 0.0 ppb on Apr 8		Hours of Missing Data:	36
Maximum Diurnal Average: 0.3 ppb at hour 20	Minimum Diurnal Average: 0.1 ppb at hour 14		Hours of Calibration:	36
Monthly Average: 0.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
3-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
5-Apr	0	0	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0.6	1	
6-Apr	1	1	1	1	2	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2	
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
10-Apr	1	2	1	Z	2	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	0	0	0	0.7	2	
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
16-Apr	0	0	0	Z	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1	
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
19-Apr	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	--	0	
20-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	1	2	1	1	2	3	2	0.7	3
26-Apr	0	Z	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	1	4	4	3	3	3	1.1	4	
27-Apr	2	1	Z	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0.4	2	
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.1	1	
30-Apr	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	

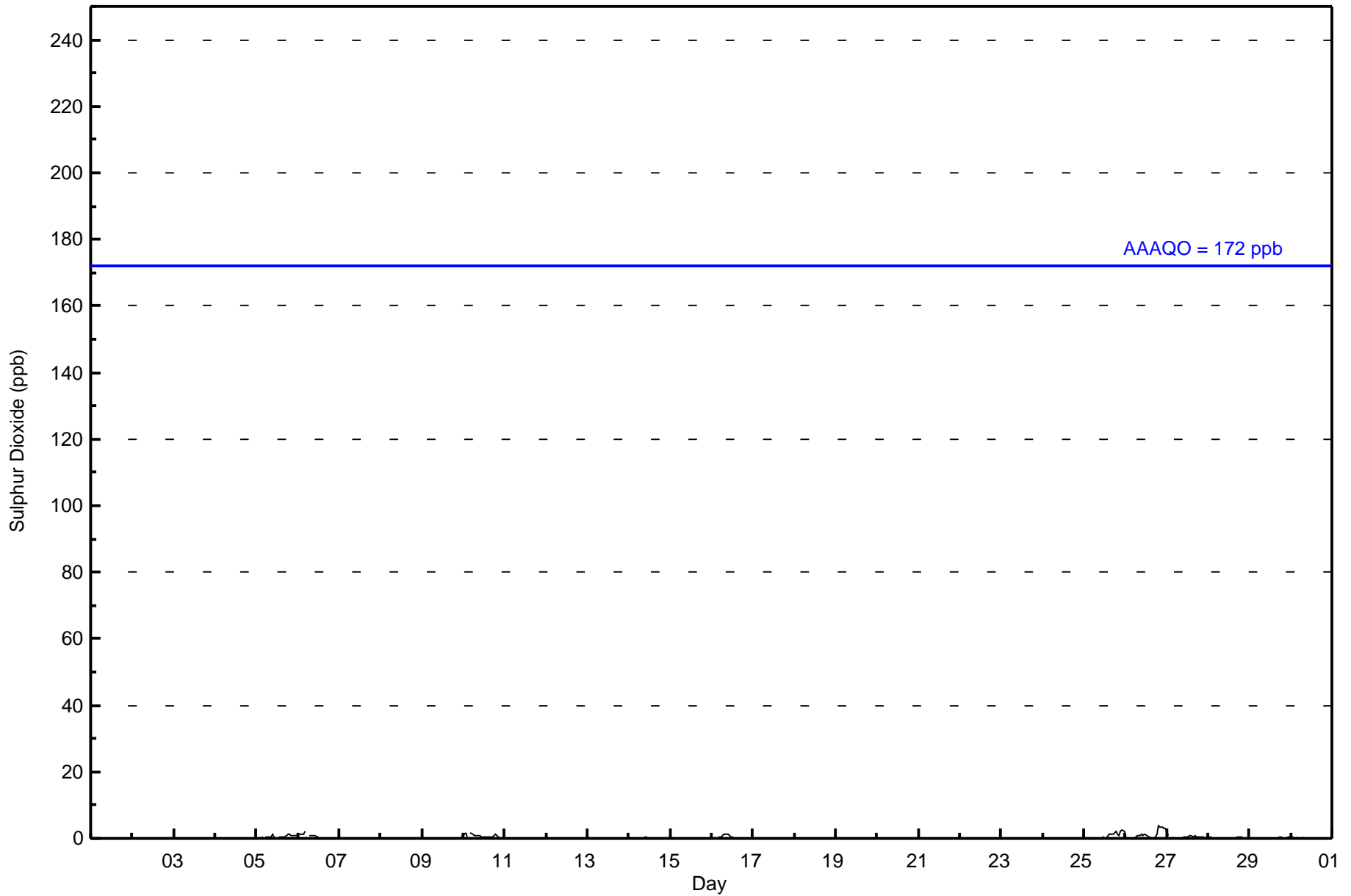
0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.3	Diurnal Average
2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	4	3	3	3	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	37	19	57	138	188	35	13	17	37	13	12	9	27	11	17	54	684
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	19	57	138	188	35	13	17	37	13	12	9	27	11	17	54	684

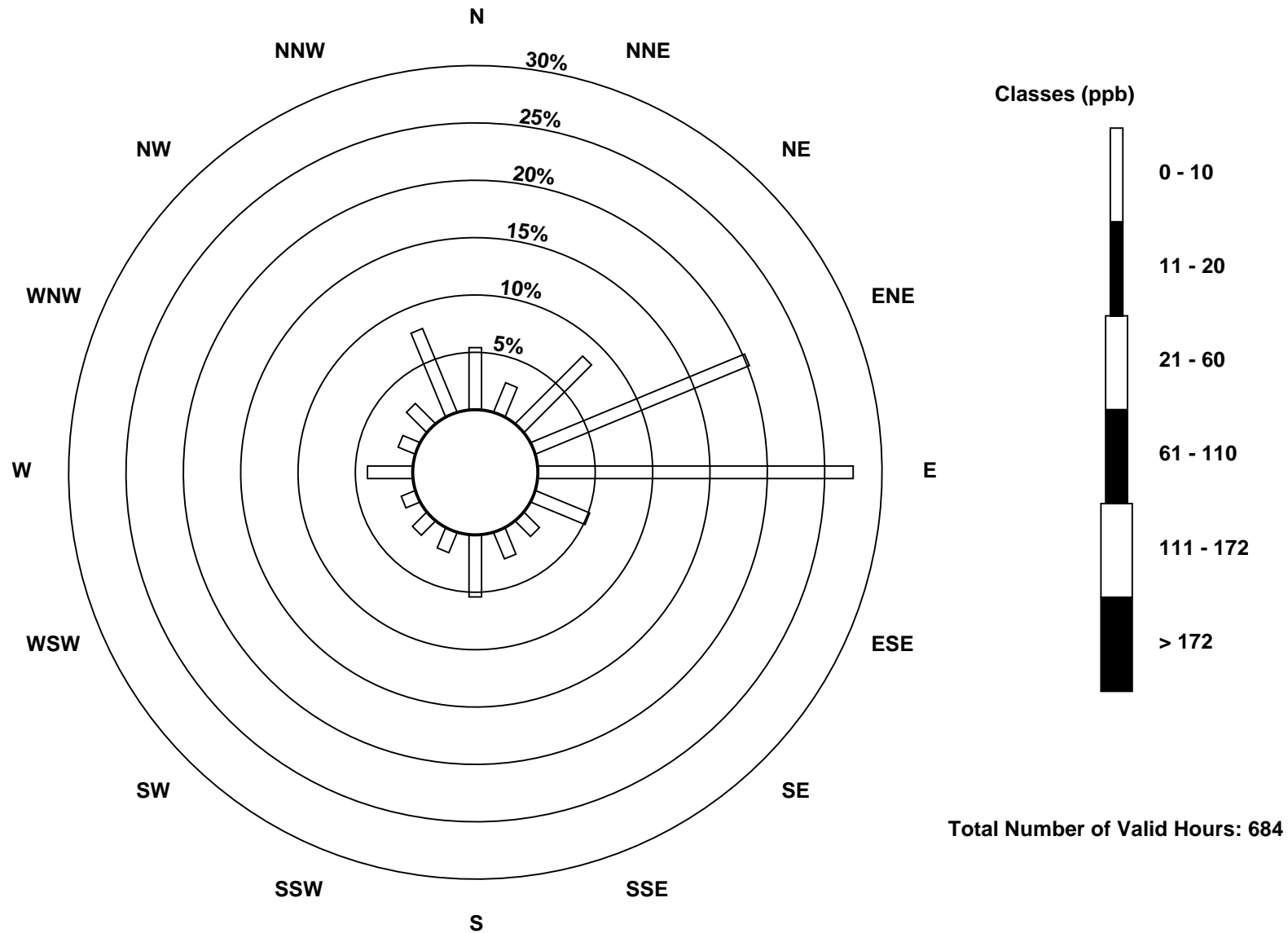
Total Number of Valid Hours: 684

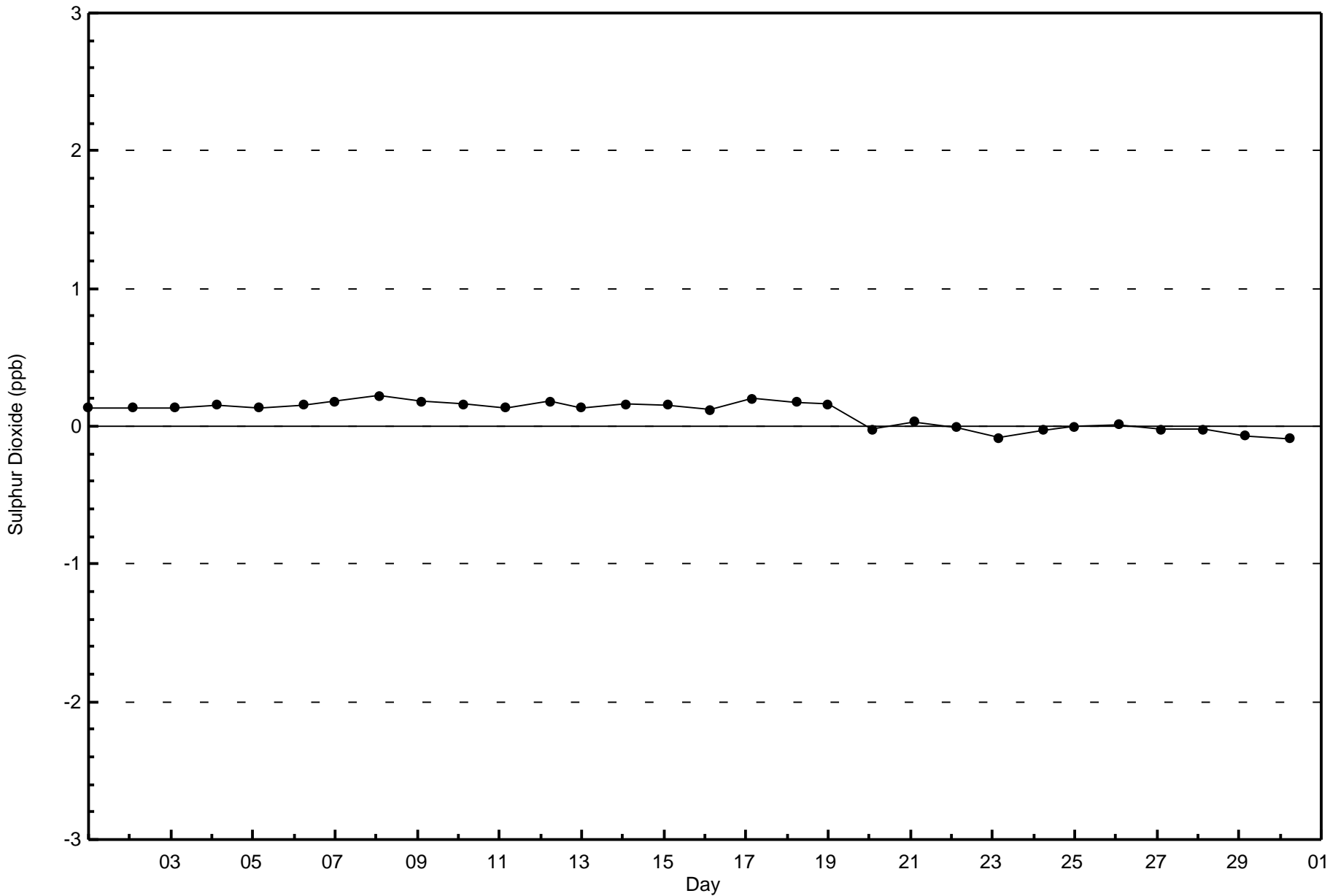
Total Number of Hours: 720

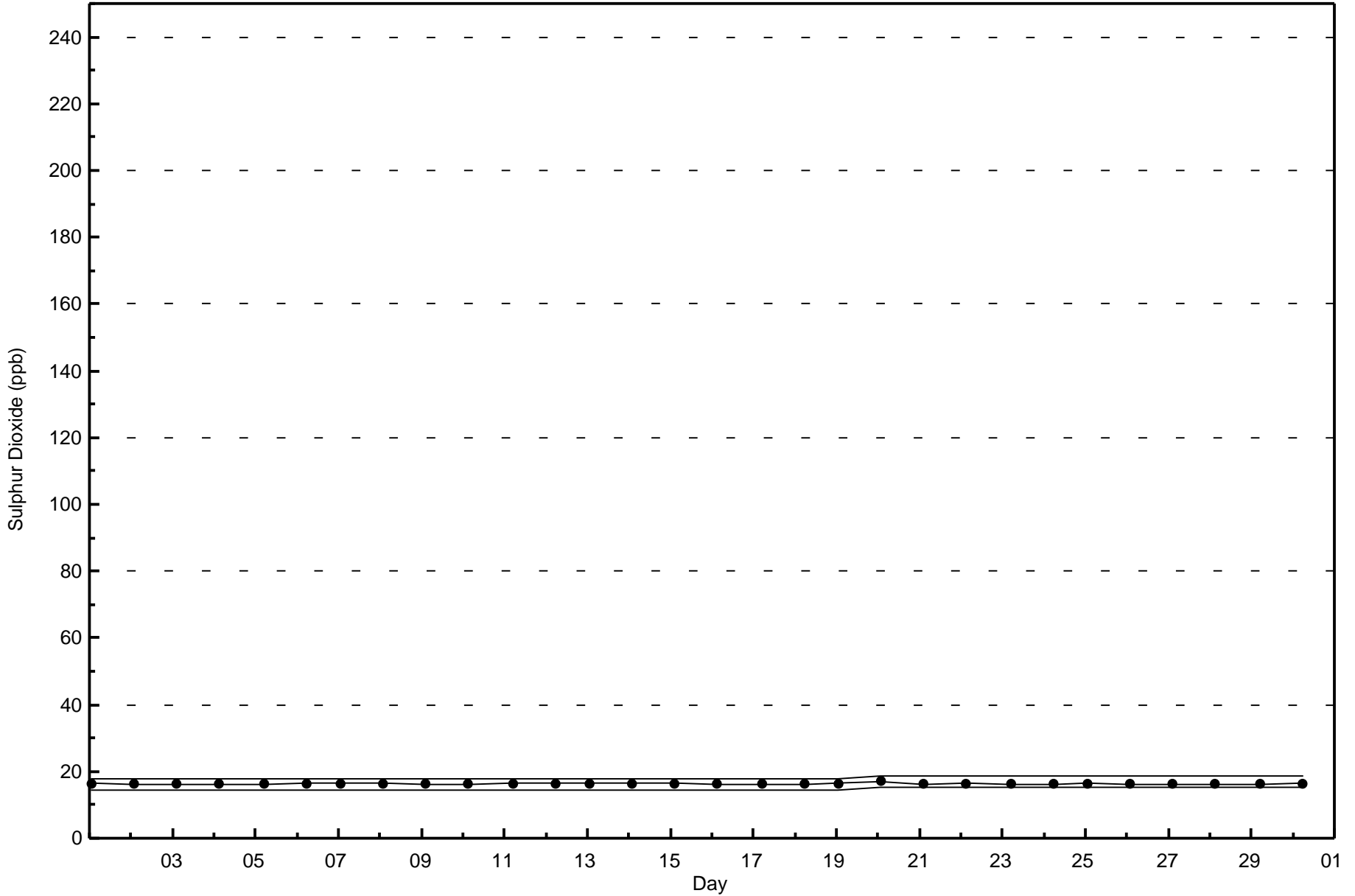


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan (AMS 8)









Wood Buffalo Environmental Association
Summary of Hour Averages

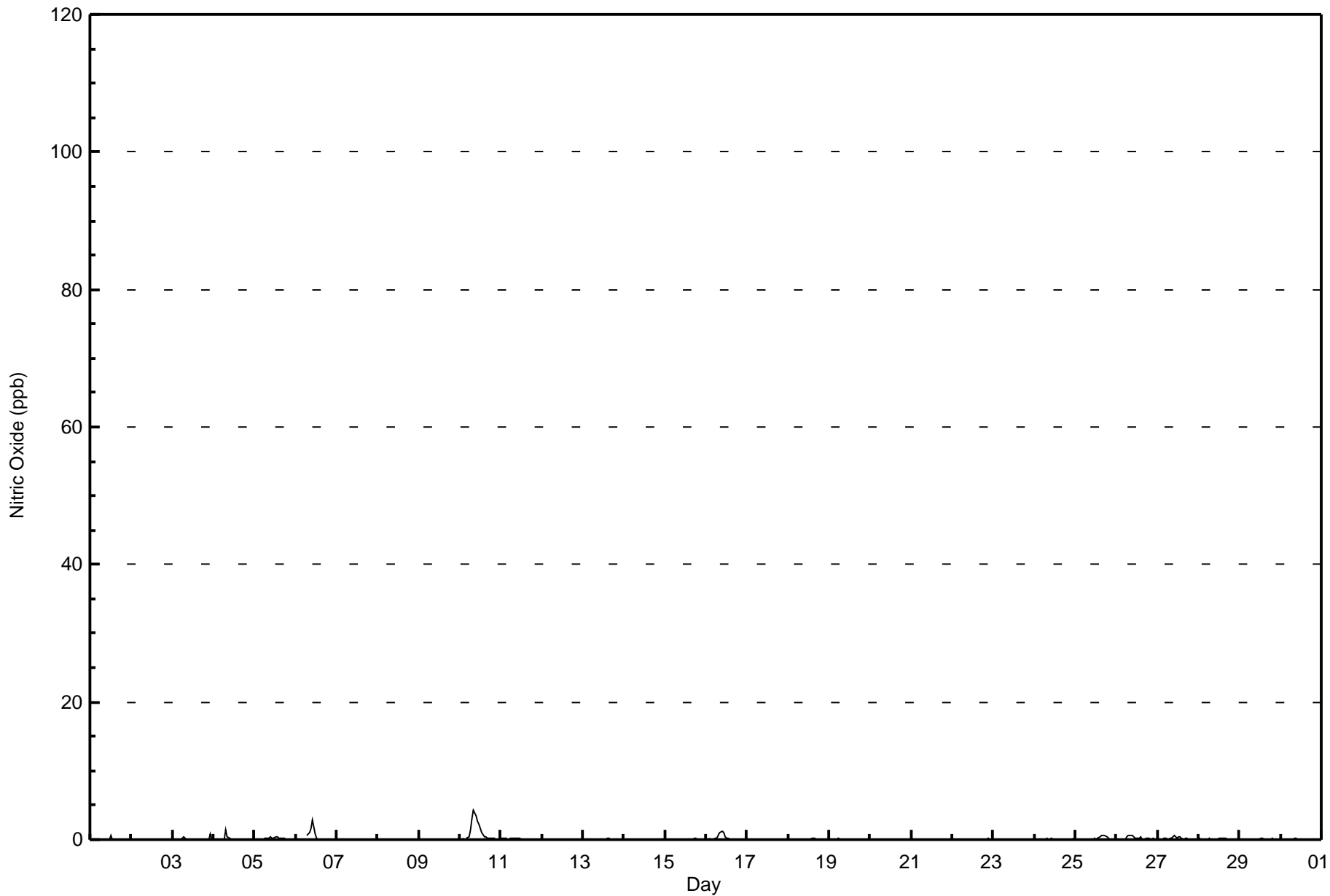
Nitric Oxide (NO) - ppb
Fort Chipewyan - April 2017

Maximum Value: 4 ppb on Apr 10 09:00																	Maximum Daily Average: 1.0 ppb on Apr 10																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 1 03:00																	Minimum Daily Average: 0.0 ppb on Apr 7																	Hours of Data: 683	
Maximum Diurnal Average: 0.3 ppb at hour 10																	Minimum Diurnal Average: 0.0 ppb at hour 21																	Hours of Missing Data: 37	
Monthly Average: 0.1 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1																	Hours of Calibration: 36	
																																		Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1								
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
3-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1								
4-Apr	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1								
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
6-Apr	0	0	0	0	0	Z	1	1	1	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3								
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
10-Apr	0	0	0	Z	0	0	1	3	4	4	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1.0	4								
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	PF	0	0	0	0	0	0	0	0	0	0.1	0								
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
16-Apr	0	0	0	Z	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
19-Apr	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	0								
20-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0.2	1								
26-Apr	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
27-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
30-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
																	Diurnal Average																		
																	Diurnal Maximum																		
Z - zerospan																	C - Calibration																	PF - Power Failure	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	19	57	138	187	35	13	17	37	13	12	9	27	11	17	54	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	19	57	138	187	35	13	17	37	13	12	9	27	11	17	54	683

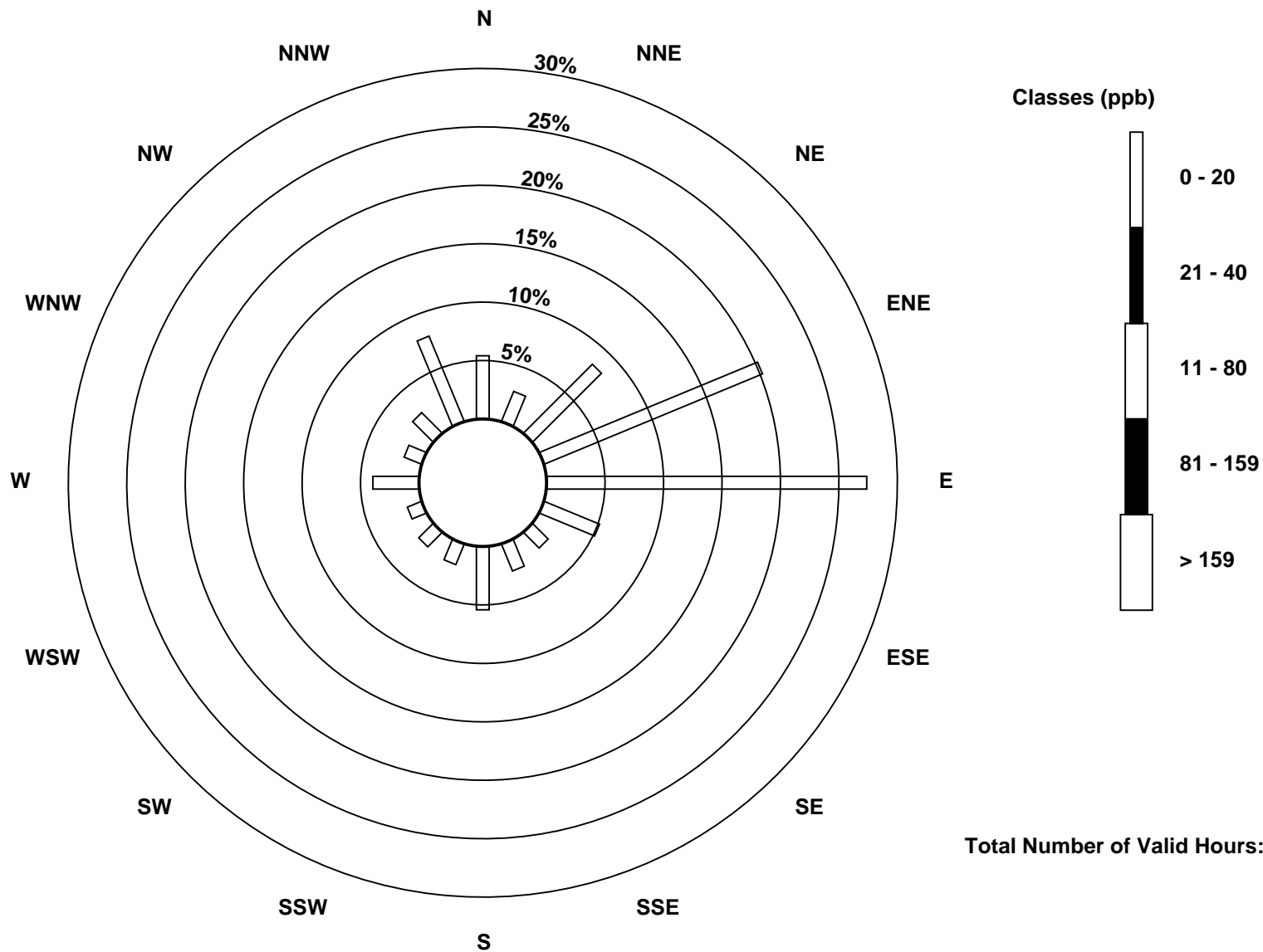
Total Number of Valid Hours: 683

Total Number of Hours: 720

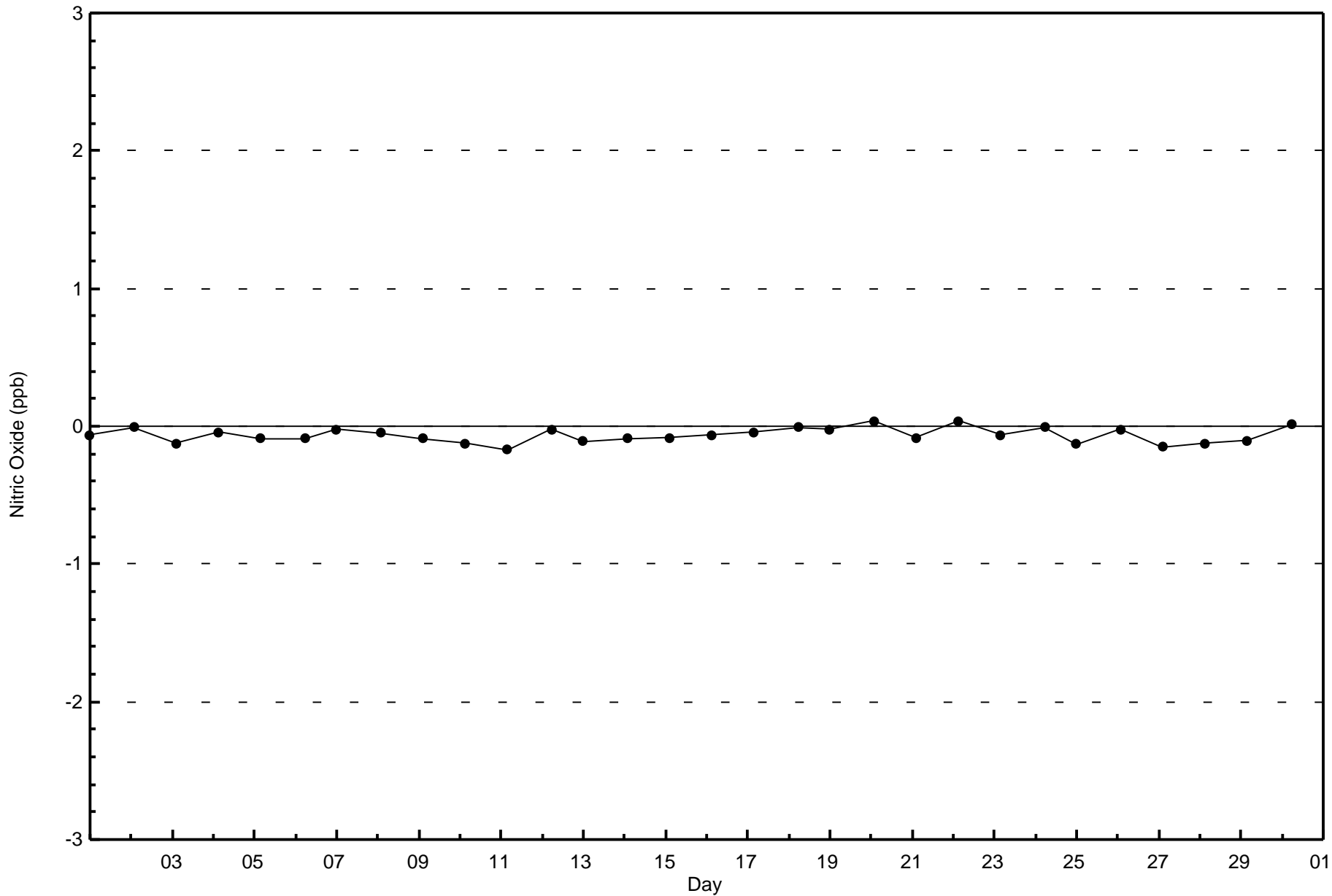


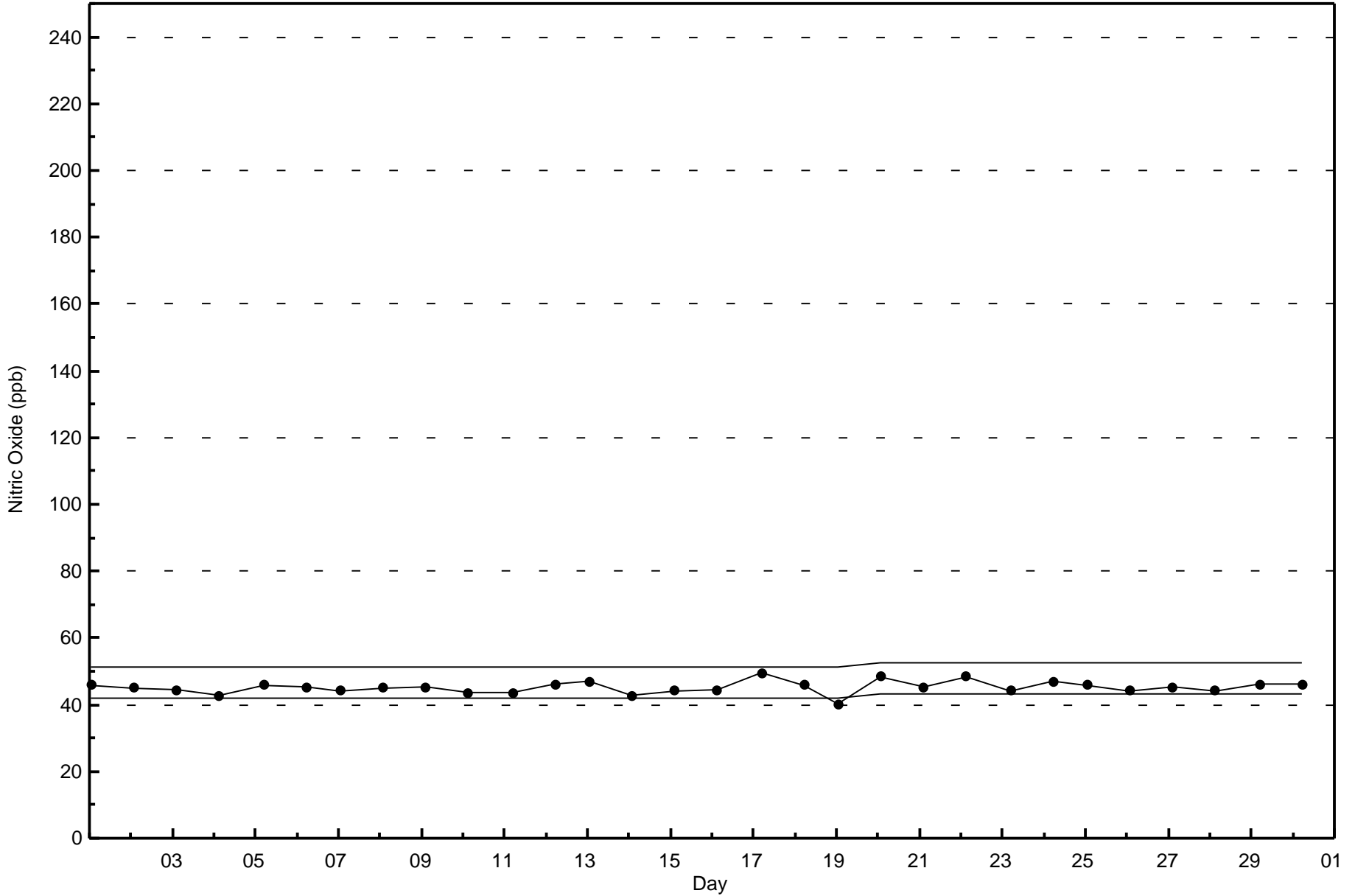
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Fort Chipewyan (AMS 8)



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort Chipewyan - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 8 ppb on Apr 10 06:00	Maximum Daily Average: 3.1 ppb on Apr 10		Hours of Data:	683
Minimum Value: 0 ppb on Apr 2 22:00	Minimum Daily Average: 0.3 ppb on Apr 18		Hours of Missing Data:	37
Maximum Diurnal Average: 1.2 ppb at hour 5	Minimum Diurnal Average: 0.4 ppb at hour 15		Hours of Calibration:	36
Monthly Average: 0.7 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 5		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	1	1	0.4	1
2-Apr	2	Z	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
3-Apr	0	0	Z	1	1	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0.6	3
4-Apr	1	0	0	Z	1	0	1	4	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0.6	4
5-Apr	0	0	0	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	3	1.1	3
6-Apr	3	3	3	4	5	Z	6	4	3	4	5	2	1	0	0	0	0	0	0	0	0	0	1	4	2.1	6
7-Apr	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.3	1
8-Apr	1	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0.4	1
9-Apr	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
10-Apr	2	3	3	Z	8	8	7	6	6	5	4	3	3	2	1	1	1	1	2	1	1	1	0	0	3.1	8
11-Apr	0	1	0	0	Z	0	1	1	1	1	1	1	0	0	0	PF	0	0	0	1	1	1	2	1	0.6	2
12-Apr	1	1	0	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.5	1
13-Apr	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.4	1
14-Apr	0	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	1	0	0	0.5	2
16-Apr	0	0	0	Z	1	2	2	3	3	3	3	2	2	1	1	1	1	1	1	0	0	0	0	0	1.2	3
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1
19-Apr	Z	0	0	3	4	2	1	0	0	0	C	C	C	C	C	C	0	0	0	1	2	3	3	2	--	4
20-Apr	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
21-Apr	2	3	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.5	3
22-Apr	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.3	1
23-Apr	1	1	2	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
24-Apr	0	1	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	1
25-Apr	Z	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	2	3	3	3	3	3	3	3	1.2	3
26-Apr	2	Z	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	1.5	3
27-Apr	4	3	Z	2	2	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1	4
28-Apr	4	2	2	Z	1	1	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	0.9	4
29-Apr	0	0	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	0.5	1
30-Apr	1	2	0	1	1	Z	0	0	1	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	0.6	2

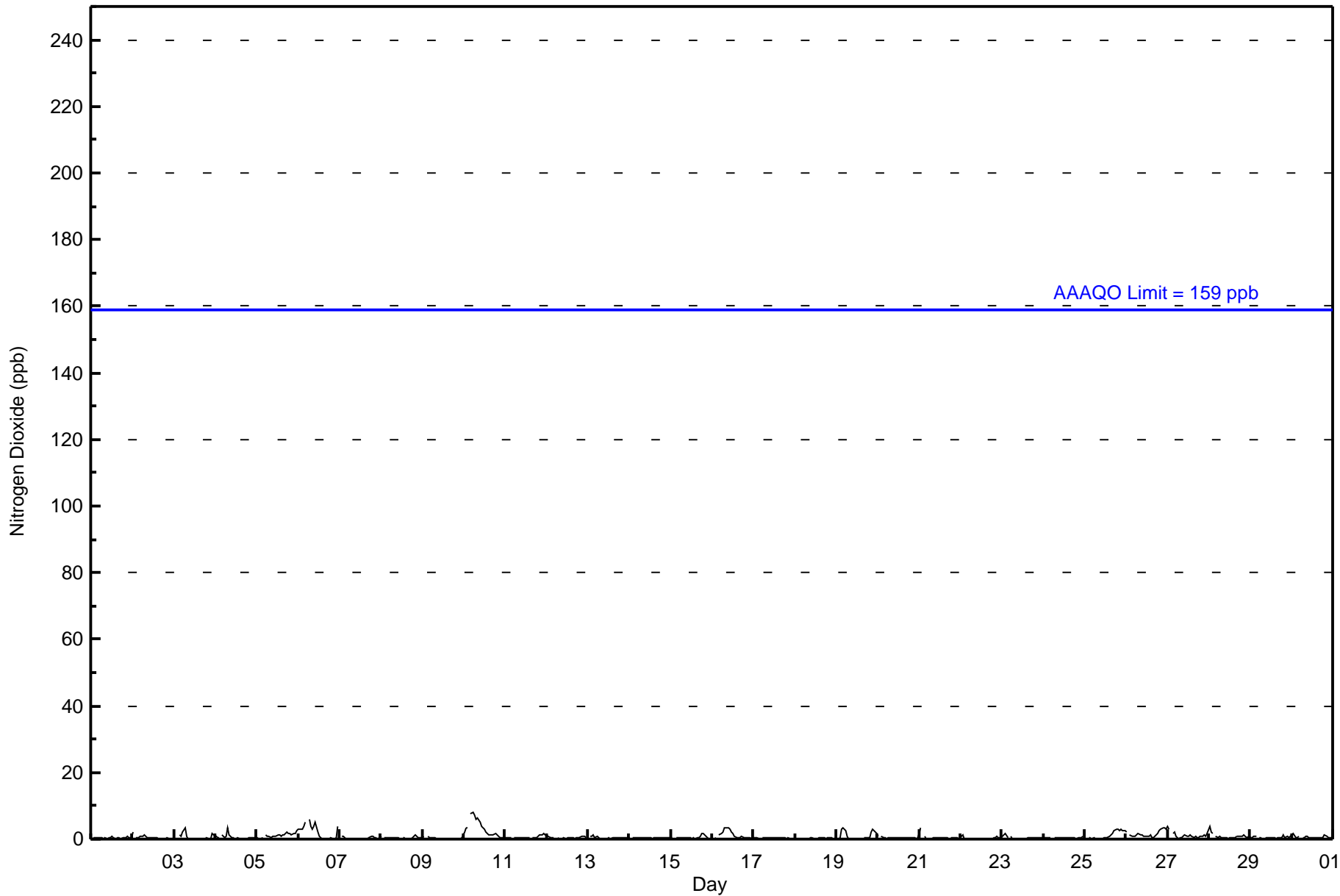
1.2	1.0	0.8	0.9	1.2	1.0	1.0	0.9	0.8	0.8	0.7	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.8	0.9	Diurnal Average	
4	3	3	4	8	8	7	6	6	5	5	3	3	2	1	1	2	3	3	3	3	3	3	4	Diurnal Maximum	

Z - zerspan C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	19	57	138	187	35	13	17	37	13	12	9	27	11	17	54	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	19	57	138	187	35	13	17	37	13	12	9	27	11	17	54	683

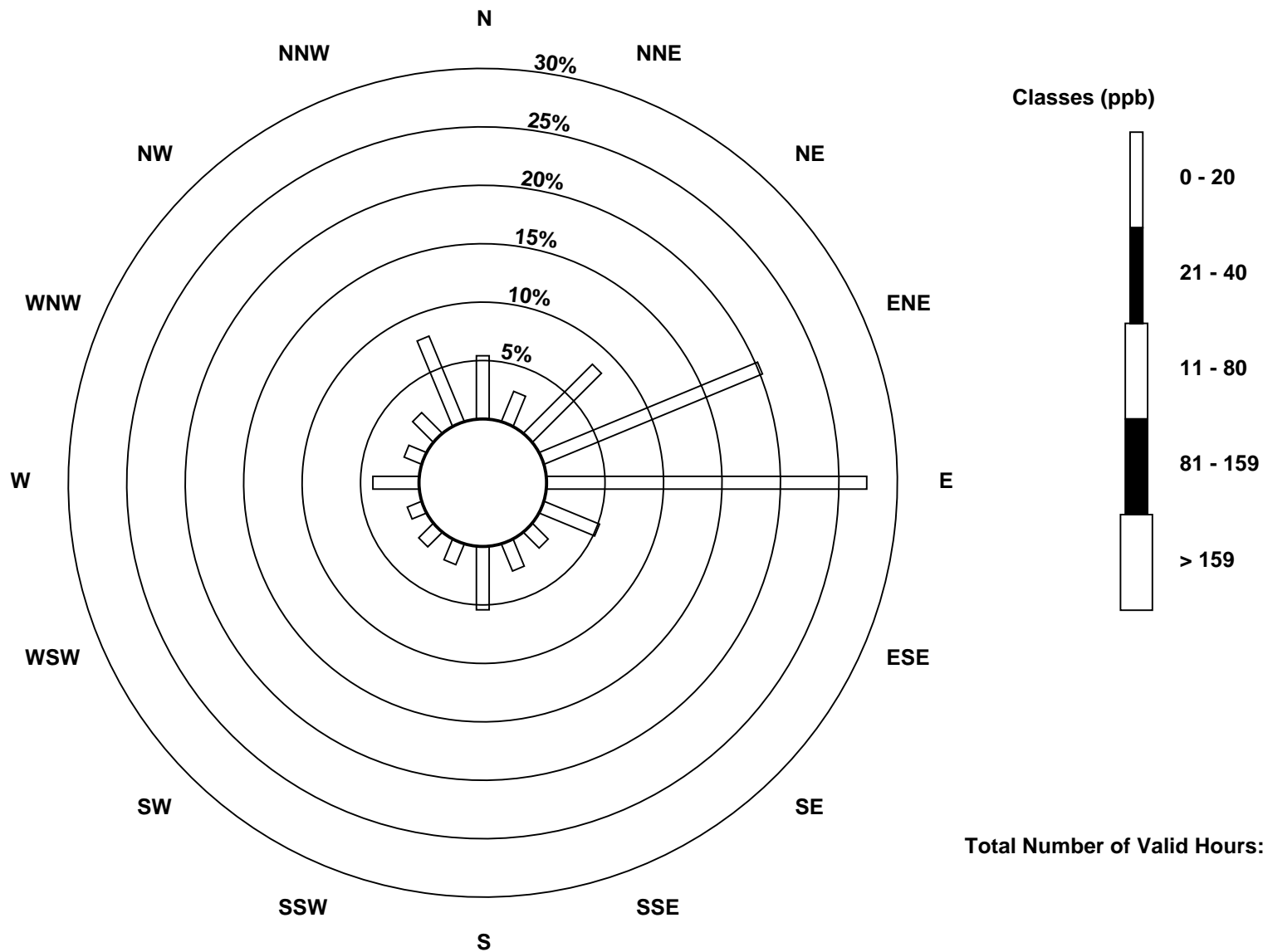
Total Number of Valid Hours: 683

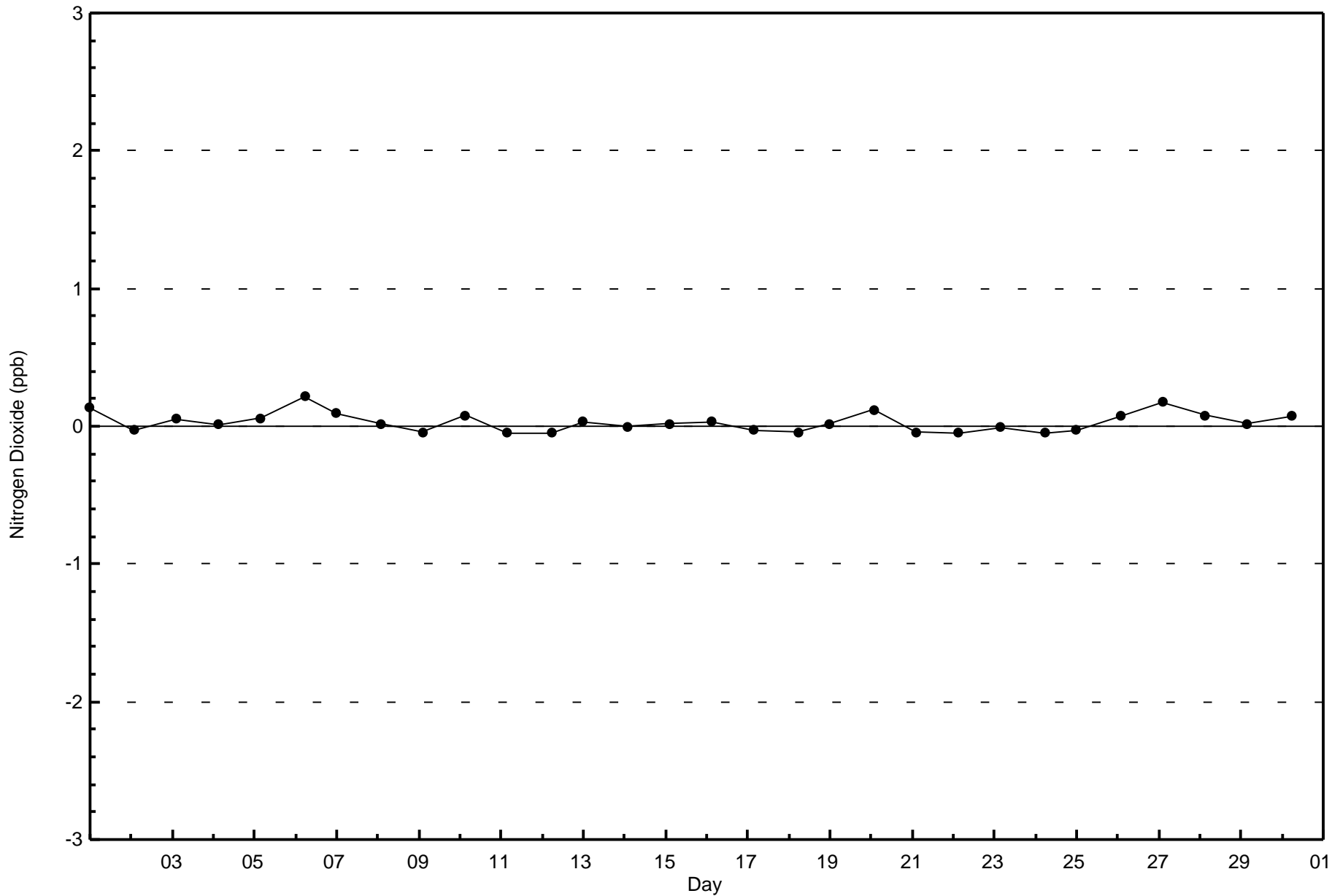
Total Number of Hours: 720

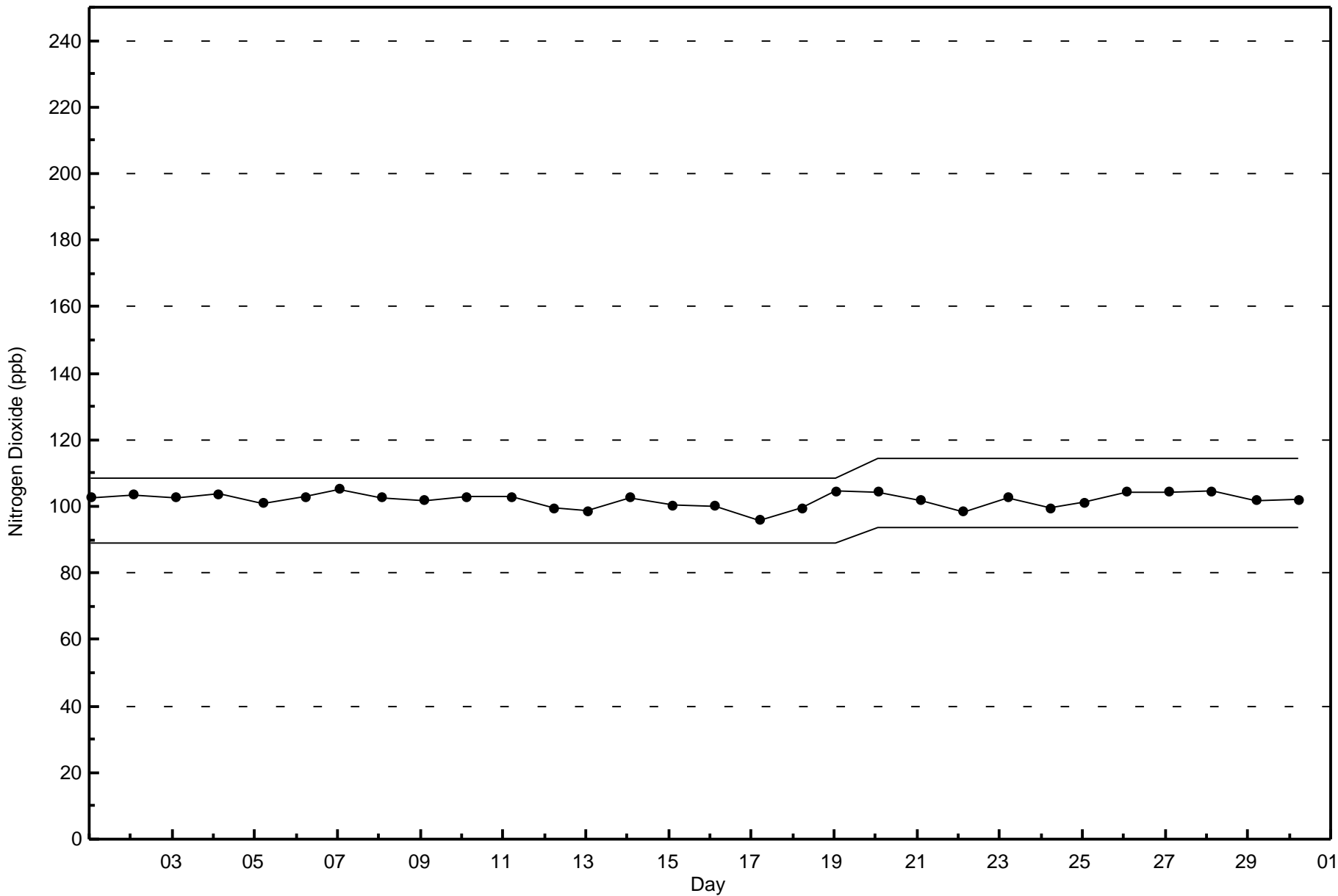


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan (AMS 8)









Wood Buffalo Environmental Association
Summary of Hour Averages

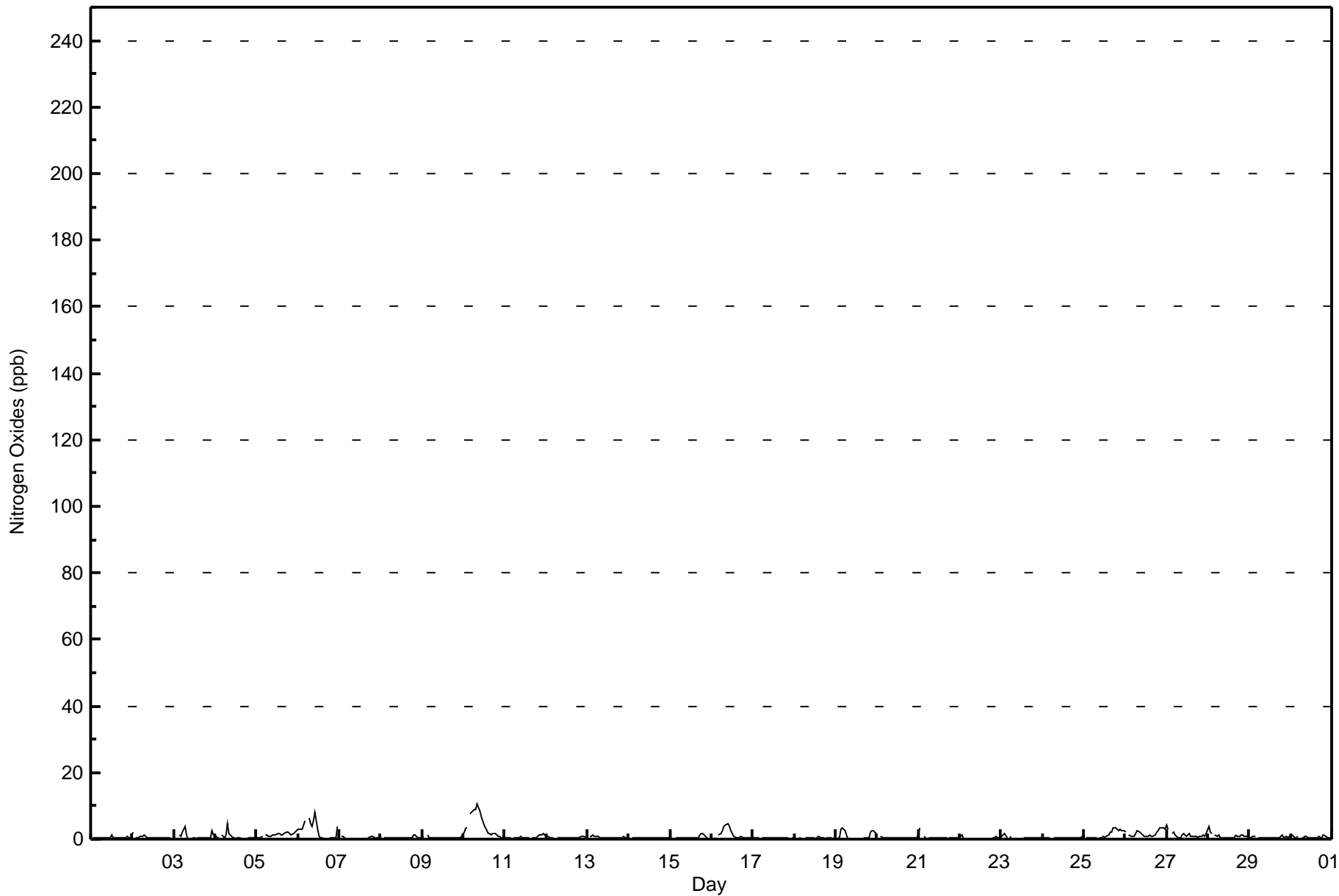
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - April 2017

Maximum Value: 10 ppb on Apr 10 09:00		Maximum Daily Average: 4.1 ppb on Apr 10		Hours in Service: 720																																													
Minimum Value: 0 ppb on Apr 7 07:00		Minimum Daily Average: 0.3 ppb on Apr 17		Hours of Data: 683																																													
Maximum Diurnal Average: 1.2 ppb at hour 5		Minimum Diurnal Average: 0.5 ppb at hour 16		Hours of Missing Data: 37																																													
Monthly Average: 0.9 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 8		Hours of Calibration: 36																																													
				Percent Operational Time: 99.9																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0.4	1																							
2-Apr	2	Z	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2																							
3-Apr	0	0	Z	1	1	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0.7	4																							
4-Apr	1	1	0	Z	1	0	1	5	2	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0.7	5																							
5-Apr	0	0	0	1	Z	1	1	1	1	1	1	1	2	1	1	1	2	2	2	2	1	2	2	3	1.3	3																							
6-Apr	3	3	3	4	5	Z	7	4	4	5	8	3	1	1	0	0	0	0	0	0	0	0	1	4	2.5	8																							
7-Apr	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.3	1																							
8-Apr	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.4	1																							
9-Apr	0	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1																							
10-Apr	2	4	3	Z	8	8	9	9	10	9	7	5	4	3	2	2	1	2	2	1	1	1	0	0	4.1	10																							
11-Apr	0	1	0	0	Z	1	1	1	1	1	1	1	0	0	PF	0	0	0	0	1	1	1	2	1	0.7	2																							
12-Apr	1	1	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0.5	1																							
13-Apr	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.5	1																							
14-Apr	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1																							
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	0	0	0	0.5	2																							
16-Apr	0	0	1	Z	1	2	2	4	4	5	4	3	2	1	1	0	1	1	1	0	0	0	0	0	1.4	5																							
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0																							
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.3	1																							
19-Apr	Z	0	0	3	4	3	1	0	0	0	C	C	C	C	C	C	0	0	0	1	2	3	2	2	--	4																							
20-Apr	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																							
21-Apr	2	3	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.5	3																							
22-Apr	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.3	1																							
23-Apr	1	1	2	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2																							
24-Apr	0	0	1	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	1																							
25-Apr	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	3	3	3	3	3	2	3	1.3	3																							
26-Apr	2	Z	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2	3	3	3	3	3	1.7	3																							
27-Apr	4	3	Z	2	2	1	0	0	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	2	1.3	4																							
28-Apr	4	2	2	Z	1	1	1	1	1	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1.0	4																							
29-Apr	1	0	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0.5	1																							
30-Apr	1	1	0	1	1	Z	0	0	1	1	1	1	1	0	0	0	1	0	1	1	1	0	0	0	0.7	1																							
																								1.2	1.1	0.8	0.9	1.2	1.1	1.2	1.2	1.0	1.1	1.0	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.9	Diurnal Average
																								4	4	3	4	8	8	9	9	10	9	8	5	4	3	2	2	2	2	3	3	3	3	3	3	4	Diurnal Maximum
Z - zerospan																								C - Calibration				PF - Power Failure																					



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	19	57	138	187	35	13	17	37	13	12	9	27	11	17	54	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	19	57	138	187	35	13	17	37	13	12	9	27	11	17	54	683

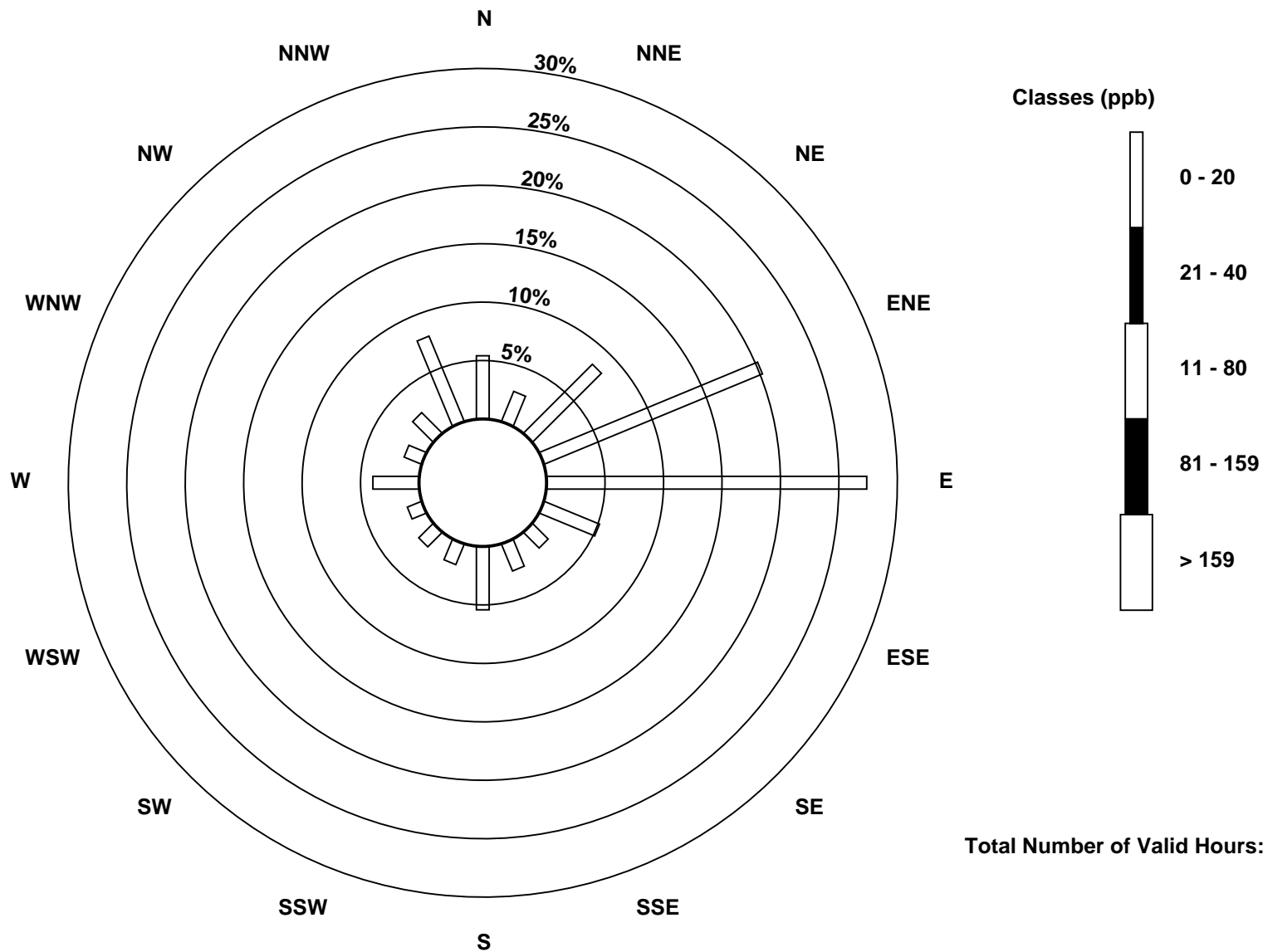
Total Number of Valid Hours: 683

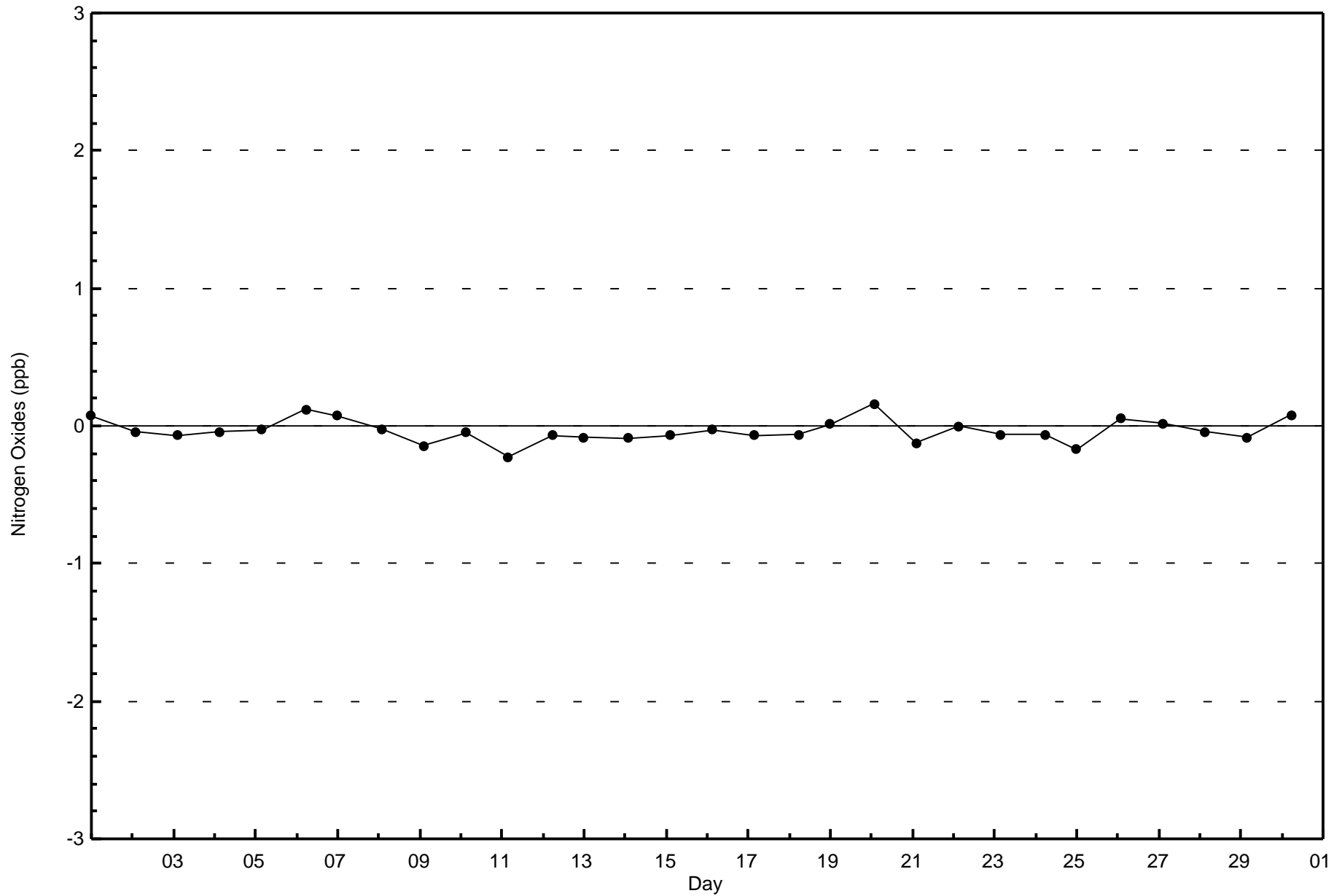
Total Number of Hours: 720

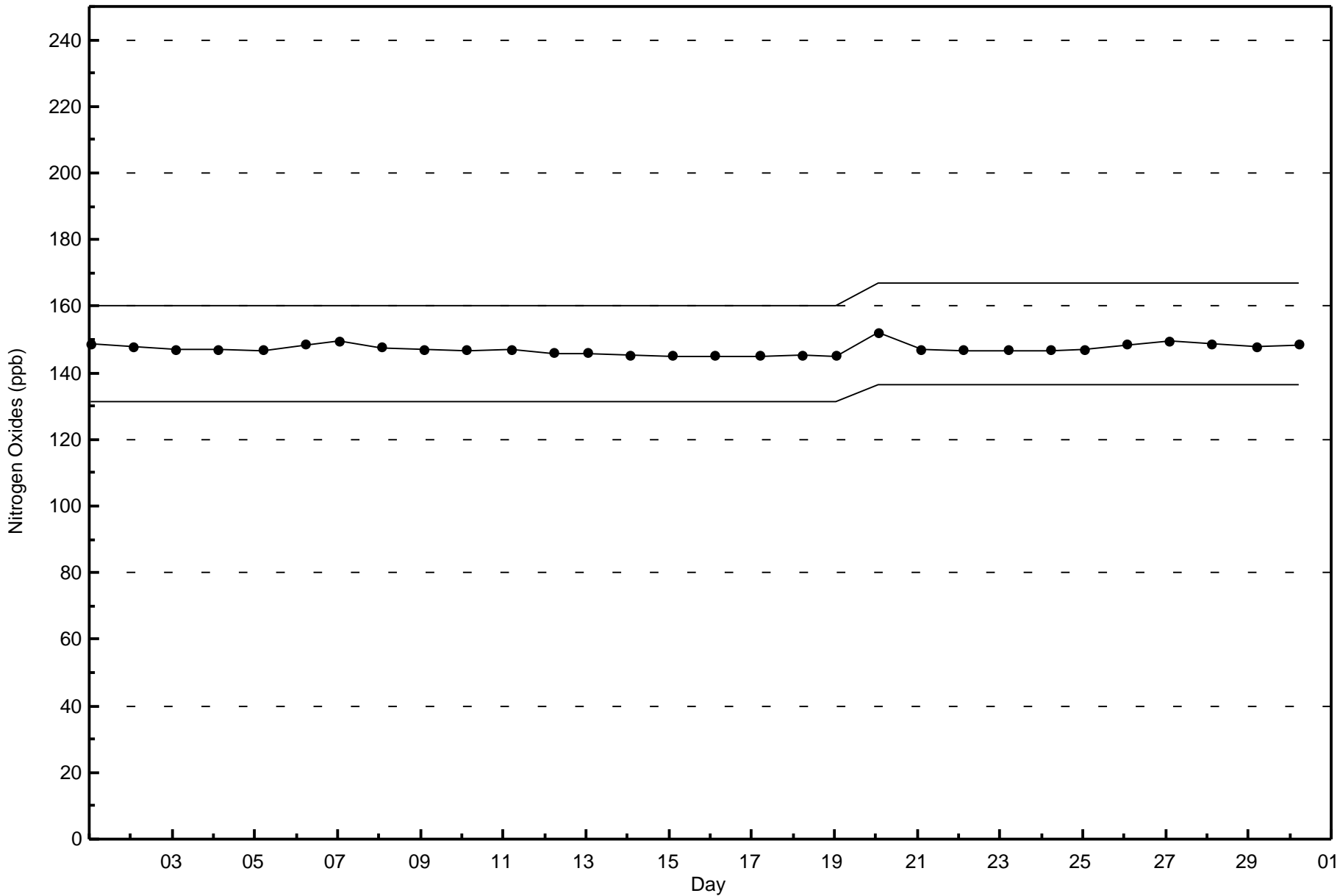


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan (AMS 8)









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort Chipewyan - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 52 ppb on Apr 11 14:00	Maximum Daily Average: 47.1 ppb on Apr 11		Hours of Data:	687
Minimum Value: 7 ppb on Apr 22 08:00	Minimum Daily Average: 17.6 ppb on Apr 22		Hours of Missing Data:	33
Maximum Diurnal Average: 40.9 ppb at hour 18	Minimum Diurnal Average: 31.7 ppb at hour 8		Hours of Calibration:	33
Monthly Average: 36.6 ppb	Percentiles: P ₁ = 15 P ₁₀ = 24 Q ₁ = 31 Median = 39 Q ₃ = 43 P ₉₀ = 47 P ₉₉ = 50		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	46	45	43	Z	41	43	41	40	41	41	41	41	42	44	44	45	44	44	43	43	43	41	42	41	42.6	46
2-Apr	40	39	35	37	Z	30	29	29	32	35	40	43	44	44	44	44	45	46	47	46	44	43	43	42	40.0	47
3-Apr	41	40	40	38	36	Z	34	37	41	40	41	42	42	42	42	42	42	41	41	41	41	40	38	40.2	42	
4-Apr	36	37	38	40	31	37	Z	26	29	35	43	46	45	45	45	48	49	48	49	47	46	45	45	41.6	49	
5-Apr	45	44	42	39	38	36	36	Z	35	36	41	44	46	48	50	45	44	43	47	47	48	46	44	41	42.9	50
6-Apr	39	38	36	33	30	28	32	35	Z	36	35	43	48	50	50	50	51	50	48	48	47	47	46	40	41.7	51
7-Apr	40	43	44	Z	40	39	39	38	39	40	38	39	39	39	39	39	39	43	44	43	41	39	38	36	39.8	44
8-Apr	34	33	32	32	Z	32	31	30	27	23	21	22	23	26	27	29	35	39	38	37	35	35	35	33	30.8	39
9-Apr	31	30	30	28	28	Z	28	27	27	26	26	27	29	30	29	29	31	32	30	30	30	30	29	29.0	32	
10-Apr	28	26	25	24	20	20	Z	22	23	27	29	32	35	38	39	38	39	37	39	38	36	36	36	38	31.4	39
11-Apr	39	39	41	45	46	46	47	Z	47	47	47	48	52	52	50	51	51	50	49	48	47	47	46	46	47.1	52
12-Apr	46	47	47	45	45	43	45	46	Z	45	44	44	46	47	48	48	48	48	49	48	48	47	45	45	46.2	49
13-Apr	44	43	43	Z	43	42	41	41	39	39	39	41	43	42	44	45	45	45	46	46	48	48	47	45	43.4	48
14-Apr	45	44	44	43	Z	42	41	41	41	41	41	42	44	45	46	46	47	47	47	47	49	48	44	44	44.7	49
15-Apr	43	42	42	41	41	Z	41	41	41	41	42	42	42	42	41	41	42	41	40	40	40	41	42	42	41.4	43
16-Apr	39	40	43	43	41	40	Z	37	36	35	36	38	40	42	41	41	41	41	38	38	39	37	40	40	39.4	43
17-Apr	39	39	38	38	36	31	28	Z	30	29	29	30	31	32	32	32	32	32	31	31	32	31	28	26	32.0	39
18-Apr	23	21	20	19	19	19	20	22	Z	25	27	30	31	32	32	36	39	39	40	40	37	32	30	31	28.8	40
19-Apr	32	33	33	Z	28	27	28	30	33	34	36	38	40	40	40	41	42	41	41	39	37	33	34	35	35.4	42
20-Apr	34	32	32	32	Z	35	38	C	C	C	48	49	49	49	49	48	47	46	46	43	42	37	34	30	40.9	49
21-Apr	24	22	24	23	24	Z	25	25	27	30	32	33	35	37	38	38	39	39	38	35	31	30	28	26	30.6	39
22-Apr	25	27	21	18	15	9	Z	7	8	11	12	12	14	15	17	18	20	22	21	22	22	23	22	22	17.6	27
23-Apr	21	20	17	18	17	19	20	Z	20	20	21	22	23	23	23	23	23	25	29	38	39	34	35	33	24.6	39
24-Apr	30	27	26	27	26	25	24	23	Z	22	22	24	26	25	25	26	26	26	26	26	26	26	25	25	25.3	30
25-Apr	25	25	25	Z	24	24	24	24	24	24	25	32	35	36	35	35	36	36	35	35	35	35	35	32	30.3	36
26-Apr	31	30	30	30	Z	30	31	32	35	37	39	40	41	43	43	44	45	44	41	39	38	36	35	34	36.9	45
27-Apr	30	30	32	31	30	Z	34	33	33	32	34	36	38	40	41	42	42	42	41	41	41	40	38	38	36.4	42
28-Apr	37	38	37	37	37	33	Z	34	36	37	37	38	41	42	42	42	43	47	46	46	44	42	42	42	39.9	47
29-Apr	42	41	39	37	34	31	30	Z	28	28	30	33	30	31	31	31	34	42	38	30	31	33	41	43	34.3	43
30-Apr	41	39	39	41	41	41	42	40	Z	42	43	43	42	42	43	43	45	49	49	47	47	44	42	39	42.8	49

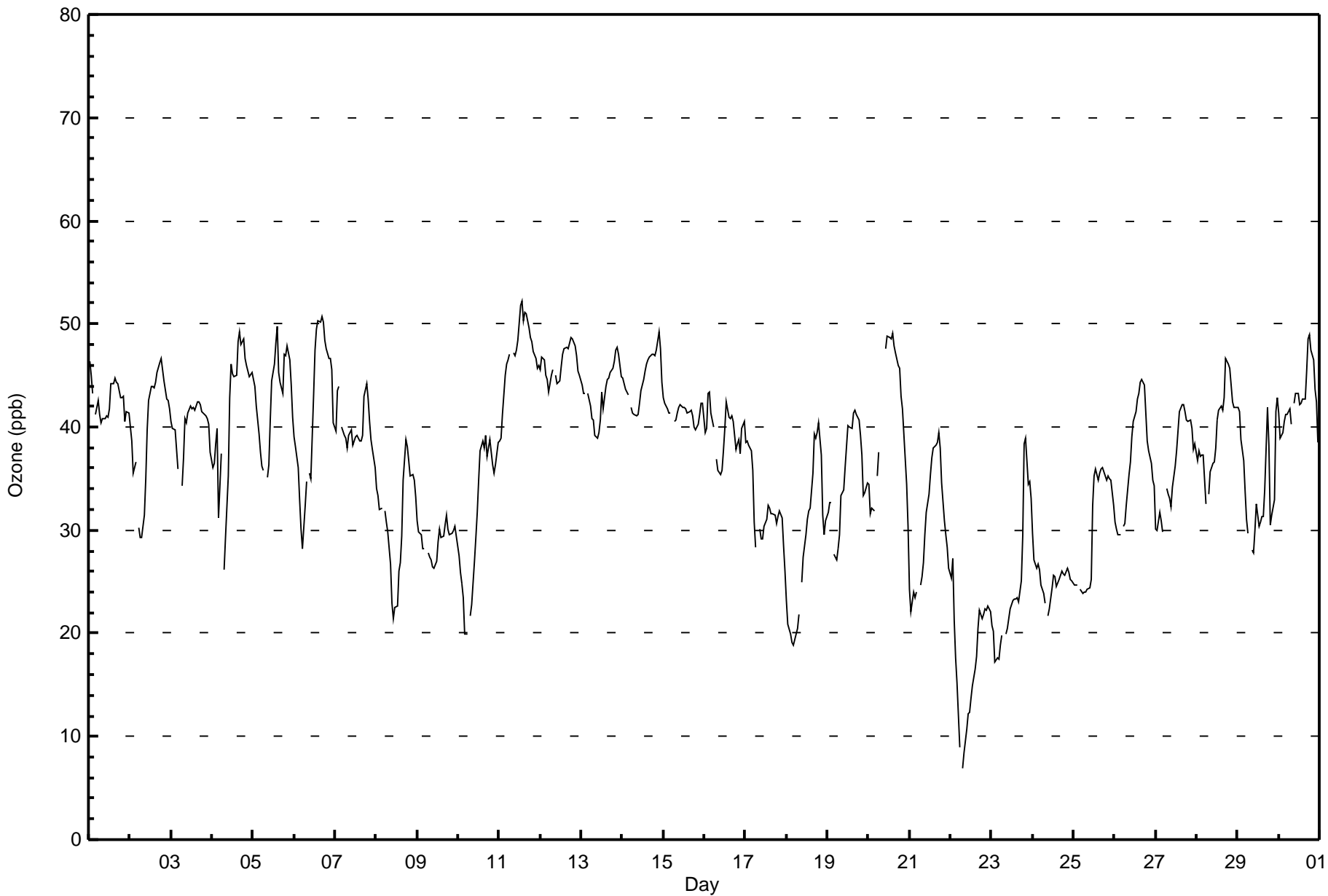
35.6	35.1	34.6	33.5	32.5	32.1	33.1	31.7	32.2	33.1	34.8	36.6	37.8	38.7	39.0	39.4	40.2	40.9	40.5	39.9	39.4	38.2	37.9	36.8	Diurnal Average	
46	47	47	45	46	46	47	46	47	47	48	49	52	52	50	51	51	50	49	48	48	49	48	46	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	28	4.08	4.08
21 - 50	654	95.20	99.27
51 - 82	5	0.73	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Fort Chipewyan - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	3	0	0	3	5	7	1	1	0	0	0	0	0	0	0	8	28
21 - 50	34	16	57	134	187	28	11	18	36	14	11	9	26	11	17	45	654
51 - 82	0	0	1	2	1	0	0	0	0	0	0	0	1	0	0	0	5
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	16	58	139	193	35	12	19	36	14	11	9	27	11	17	53	687

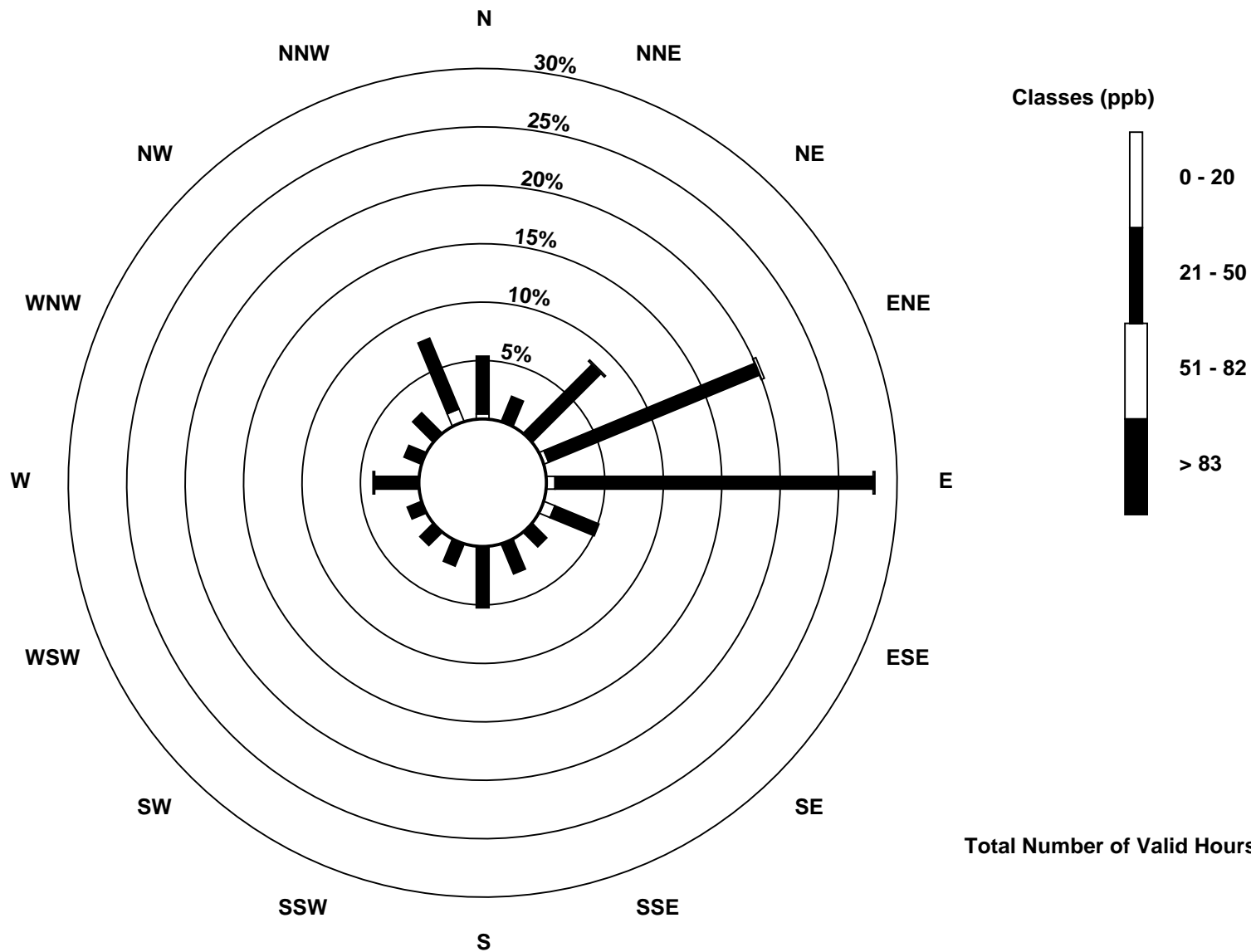
Total Number of Valid Hours: 687

Total Number of Hours: 720

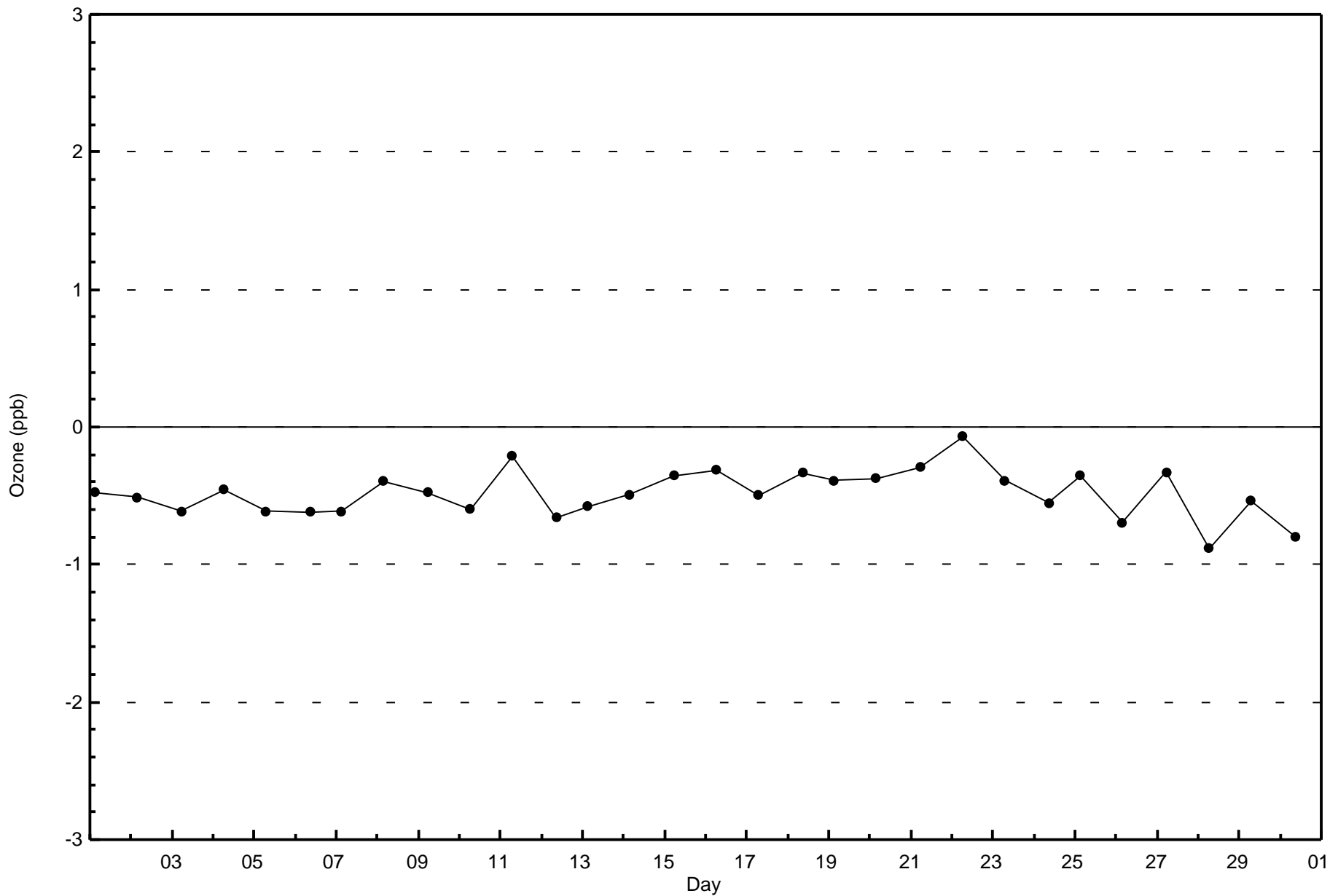


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Fort Chipewyan (AMS 8)



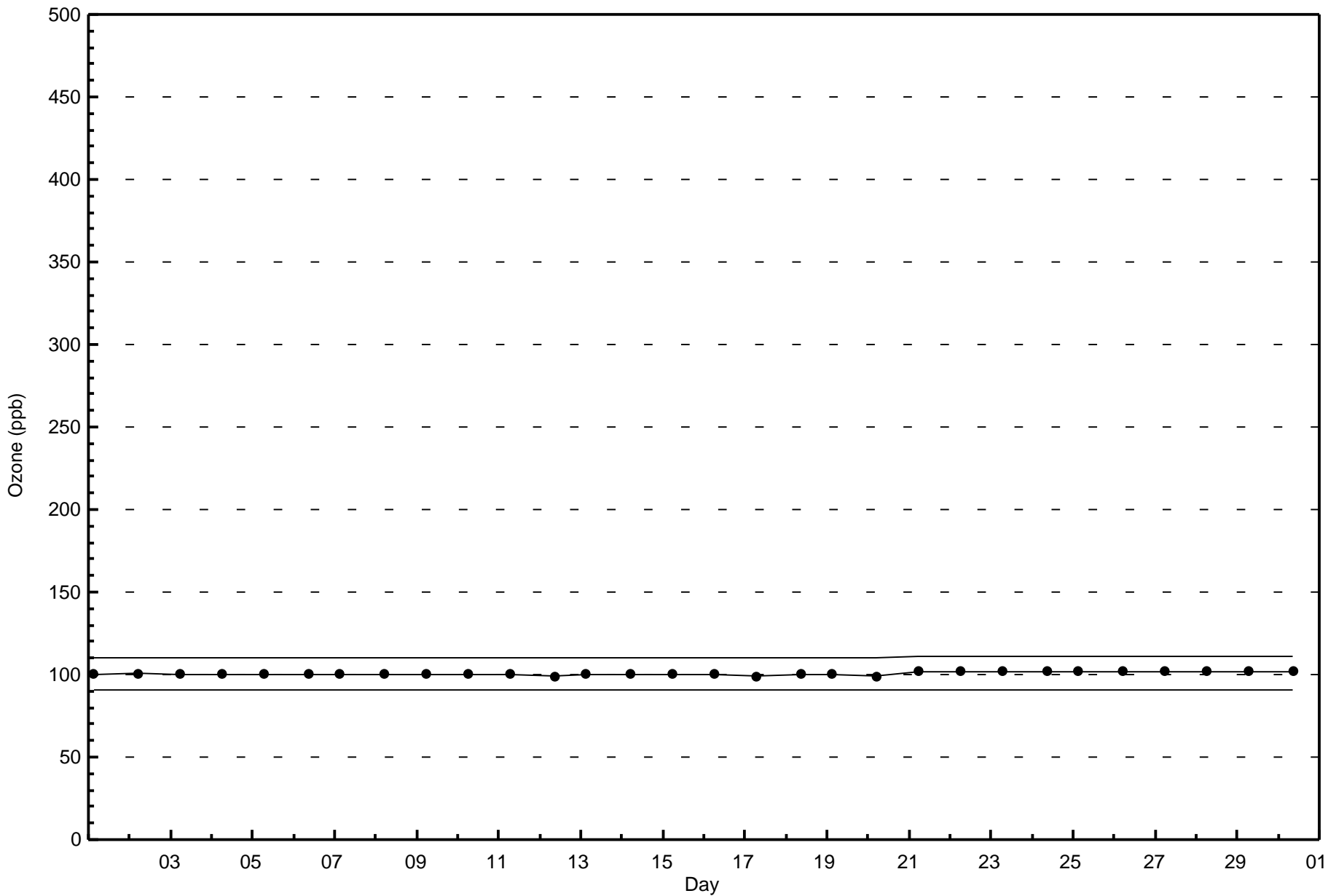
Total Number of Valid Hours: 687





Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Fort Chipewyan - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Chipewyan - April 2017

Number of Exceedences (AAAQO):	24-hr: 0	Hours in Service:	720
Maximum Value: 21.7 µg/m ³ on Apr 12 06:00	Maximum Daily Average: 7.6 µg/m ³ on Apr 12	Hours of Data:	718
Minimum Value: 0.7 µg/m ³ on Apr 4 17:00	Minimum Daily Average: 1.5 µg/m ³ on Apr 1	Hours of Missing Data:	2
Maximum Diurnal Average: 3.7 µg/m ³ at hour 5	Minimum Diurnal Average: 2.0 µg/m ³ at hour 13	Hours of Calibration:	2
Monthly Average: 2.73 µg/m ³	Percentiles: P ₁ = 0.7 P ₁₀ = 1.4 Q ₁ = 1.8 Median = 2.3 Q ₃ = 3.2 P ₉₀ = 4.3 P ₉₉ = 8.3	Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	1.3	1.5	1.6	1.6	1.6	1.2	1.2	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	6.1	1.0	1.3	4.3	2.3	1.9	1.5	6.1
2-Apr	7.5	5.0	2.0	1.5	2.0	2.6	2.2	2.1	1.4	1.5	1.3	1.1	1.0	1.2	1.4	1.7	1.2	1.3	1.5	1.5	1.6	1.6	1.7	1.7	2.0	7.5
3-Apr	1.7	1.8	1.8	1.9	1.9	2.0	4.6	2.1	1.2	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	3.1	8.8	1.9	8.8
4-Apr	3.3	1.7	1.6	1.8	3.6	1.8	3.3	6.1	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.8	1.2	1.3	1.3	1.1	1.0	1.6	6.1	1.6
5-Apr	1.0	1.1	1.2	1.5	1.7	2.0	1.9	1.9	1.6	1.7	1.5	1.5	1.9	2.0	2.0	2.5	3.7	4.7	4.1	4.3	4.0	3.7	4.1	4.5	2.5	4.7
6-Apr	3.7	3.6	3.8	4.1	4.8	4.9	3.8	2.9	2.4	2.0	2.1	1.7	1.3	1.1	0.8	0.7	0.7	0.8	0.8	1.6	1.8	1.4	1.9	5.2	2.4	5.2
7-Apr	3.3	8.6	3.5	1.7	1.6	1.6	1.5	1.6	1.7	1.9	1.5	1.6	1.6	1.5	1.5	1.5	1.5	2.0	2.8	3.5	3.8	4.1	3.9	3.8	2.6	8.6
8-Apr	4.2	6.7	7.0	5.6	4.0	3.5	3.5	2.9	3.8	3.8	3.5	2.8	2.1	1.9	2.1	2.3	1.6	1.3	1.6	2.2	2.6	2.4	2.4	2.5	3.2	7.0
9-Apr	2.0	2.1	1.9	1.6	2.1	1.7	1.4	2.1	1.9	1.9	1.9	1.8	1.7	1.6	1.7	1.7	1.7	1.6	1.8	1.9	2.2	2.3	2.1	2.3	1.9	2.3
10-Apr	2.7	3.0	2.8	3.1	3.4	3.2	3.0	2.3	2.3	2.1	2.1	2.2	2.3	2.4	2.6	3.5	4.0	3.5	3.9	3.8	3.1	2.8	2.5	2.5	2.9	4.0
11-Apr	2.9	3.1	3.1	3.0	2.9	2.6	2.6	2.4	2.2	1.7	1.6	1.5	1.4	1.3	1.4	1.4	1.5	1.6	1.8	2.1	2.4	2.6	2.0	2.4	2.2	3.1
12-Apr	2.2	1.9	1.9	2.1	21.6	21.7	19.1	13.2	11.5	10.4	9.1	8.2	7.0	6.1	5.4	4.8	4.5	4.6	4.5	4.9	6.0	4.9	4.1	3.5	7.6	21.7
13-Apr	4.0	3.4	3.6	4.6	3.5	3.1	2.4	1.9	1.7	1.7	1.7	1.9	1.9	2.0	2.1	2.0	1.9	1.9	2.0	2.5	2.1	1.9	1.9	1.9	2.4	4.6
14-Apr	1.9	1.9	1.9	1.9	2.0	2.1	2.2	2.2	2.2	2.4	2.4	2.2	2.2	2.5	2.8	2.7	2.6	2.5	2.3	2.6	2.9	3.1	3.0	2.9	2.4	3.1
15-Apr	3.5	3.9	3.7	3.4	3.4	3.5	3.2	2.8	2.3	2.0	1.8	1.8	1.8	1.9	2.0	2.0	2.1	2.6	2.1	2.2	3.1	2.7	2.4	2.0	2.6	3.9
16-Apr	1.8	1.8	2.0	2.0	2.1	2.6	2.5	2.2	2.3	2.2	2.3	2.4	2.5	2.2	2.4	2.1	2.0	2.4	2.6	1.7	1.5	1.5	1.9	2.4	2.1	2.6
17-Apr	3.2	3.7	4.1	4.2	3.7	4.0	3.4	2.9	2.6	2.2	2.0	2.0	1.9	1.8	1.8	2.0	1.9	1.8	1.9	2.1	2.5	2.9	2.8	3.1	2.7	4.2
18-Apr	4.3	4.9	4.6	4.4	4.1	3.6	3.3	2.8	2.2	1.9	1.9	1.8	1.7	3.2	4.4	4.3	3.9	2.2	1.9	2.2	2.4	2.8	2.6	2.5	3.1	4.9
19-Apr	2.9	3.3	3.7	5.3	4.2	3.7	2.2	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.6	1.5	1.8	1.6	2.2	4.2	4.8	6.3	6.4	3.7	2.9	6.4
20-Apr	2.4	1.9	1.7	1.7	1.8	2.2	1.9	C	C	2.0	1.8	1.4	1.3	1.3	1.3	1.2	1.3	1.3	1.6	2.1	2.4	2.6	2.5	3.3	1.9	3.3
21-Apr	2.8	2.6	2.2	2.1	2.3	2.2	1.9	2.4	2.4	2.3	2.3	2.3	2.3	2.5	2.5	2.3	2.3	2.2	2.3	3.2	4.1	3.8	3.9	3.0	2.6	4.1
22-Apr	3.2	3.5	3.9	3.9	4.4	4.8	4.4	3.8	3.1	2.7	2.4	2.8	3.2	2.9	2.5	2.1	1.8	1.8	1.9	2.5	3.1	3.4	3.1	3.2	3.1	4.8
23-Apr	2.8	5.4	4.4	2.7	2.2	2.1	1.9	1.9	1.8	1.8	1.8	1.9	1.8	1.8	1.9	1.8	1.9	1.9	1.7	1.7	1.9	2.2	1.8	1.7	2.2	5.4
24-Apr	2.2	3.1	3.5	3.4	3.8	3.7	3.3	2.7	2.2	1.9	1.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	2.1	2.3	2.8	2.9	2.8	2.4	3.8
25-Apr	2.5	2.8	3.0	3.1	2.9	2.9	2.3	2.0	1.9	1.9	2.0	1.8	1.4	1.6	2.3	2.6	2.4	2.6	3.2	3.7	3.7	4.3	4.3	4.4	2.7	4.4
26-Apr	3.4	3.2	3.2	3.0	3.0	3.1	2.7	2.3	2.1	1.9	1.5	1.4	1.6	1.7	1.8	1.7	2.0	2.7	3.4	4.4	5.5	5.4	5.4	5.5	3.0	5.5
27-Apr	7.7	8.5	9.2	9.1	8.0	6.8	5.1	4.8	4.6	4.4	3.6	3.3	3.5	3.1	3.2	3.1	3.2	3.4	3.9	3.9	4.7	5.8	5.1	5.6	5.2	9.2
28-Apr	6.0	4.0	3.7	2.9	2.9	2.8	3.1	2.6	2.5	2.1	1.9	1.6	1.4	1.4	1.3	1.6	2.3	2.9	3.1	3.6	3.3	2.9	3.0	3.0	2.7	6.0
29-Apr	3.0	3.1	3.2	2.9	3.2	3.4	3.1	2.9	2.8	2.6	2.4	1.9	1.8	1.8	2.0	2.3	2.4	2.9	2.6	2.9	3.5	3.6	3.0	3.1	2.8	3.6
30-Apr	3.1	3.0	2.6	2.9	3.0	2.5	2.0	1.9	1.9	2.3	2.7	2.9	3.1	3.2	3.1	3.1	2.8	3.0	2.9	3.6	5.1	3.8	3.9	3.4	3.0	5.1

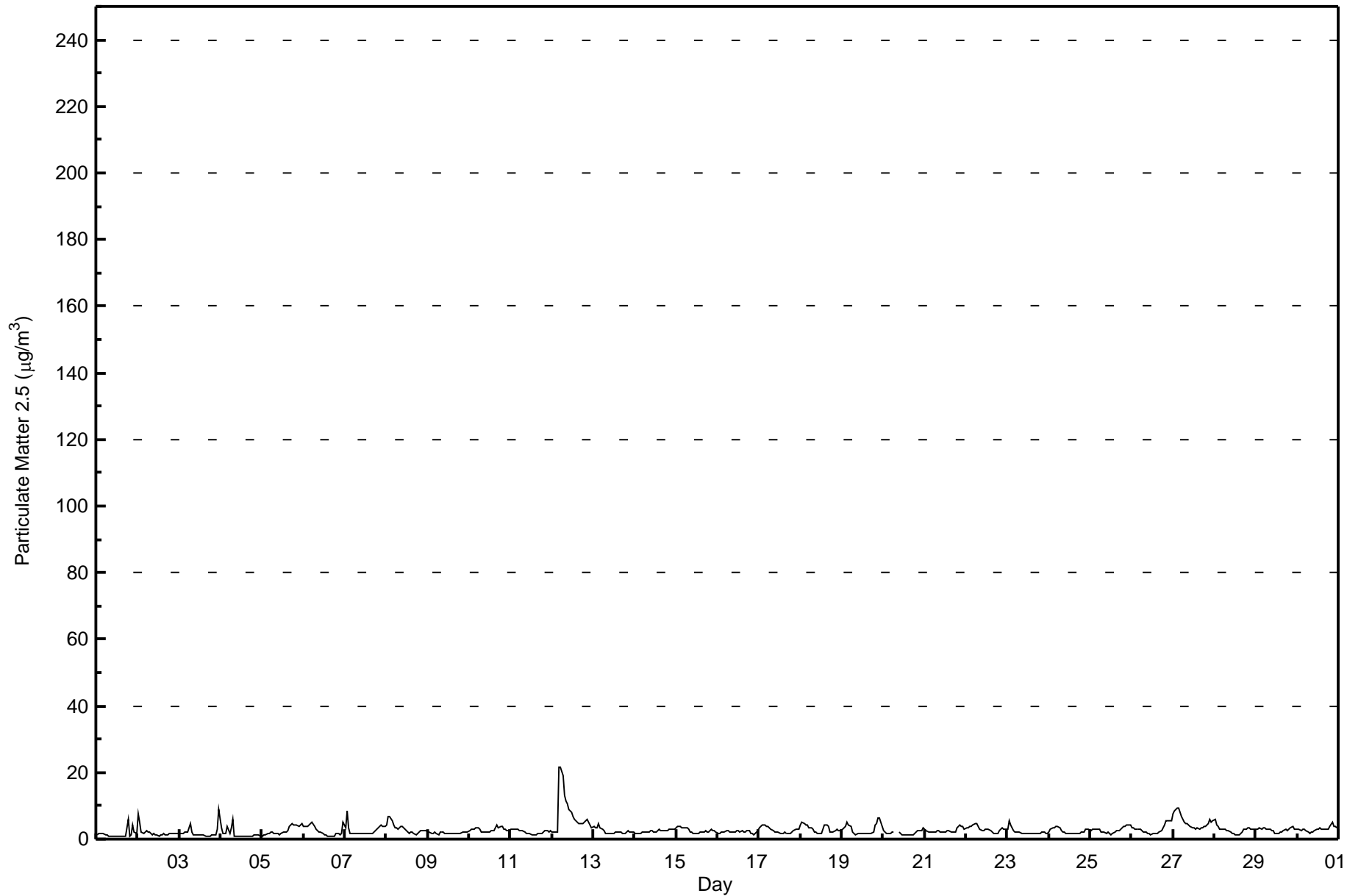
3.2	3.5	3.2	3.1	3.7	3.6	3.3	2.9	2.5	2.3	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.5	2.7	3.0	3.2	3.0	3.3	Diurnal Average	
7.7	8.6	9.2	9.1	21.6	21.7	19.1	13.2	11.5	10.4	9.1	8.2	7.0	6.1	5.4	4.8	4.5	4.7	6.1	4.9	6.0	6.3	6.4	8.8	Diurnal Maximum	

C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m³



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan - April 2017**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	658	91.64	91.64
6 - 15	28	3.90	95.54
16 - 25	3	0.42	95.96
26 - 80	0	0.00	95.96
> 81.0	0	0.00	95.96

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort Chipewyan - April 2017

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	40	18	57	136	178	30	13	19	37	14	11	6	16	10	17	56	658
6 - 15	0	0	2	7	9	6	1	0	1	0	1	0	0	1	0	0	28
16 - 25	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	40	18	59	145	188	36	14	19	38	14	12	6	16	11	17	56	689

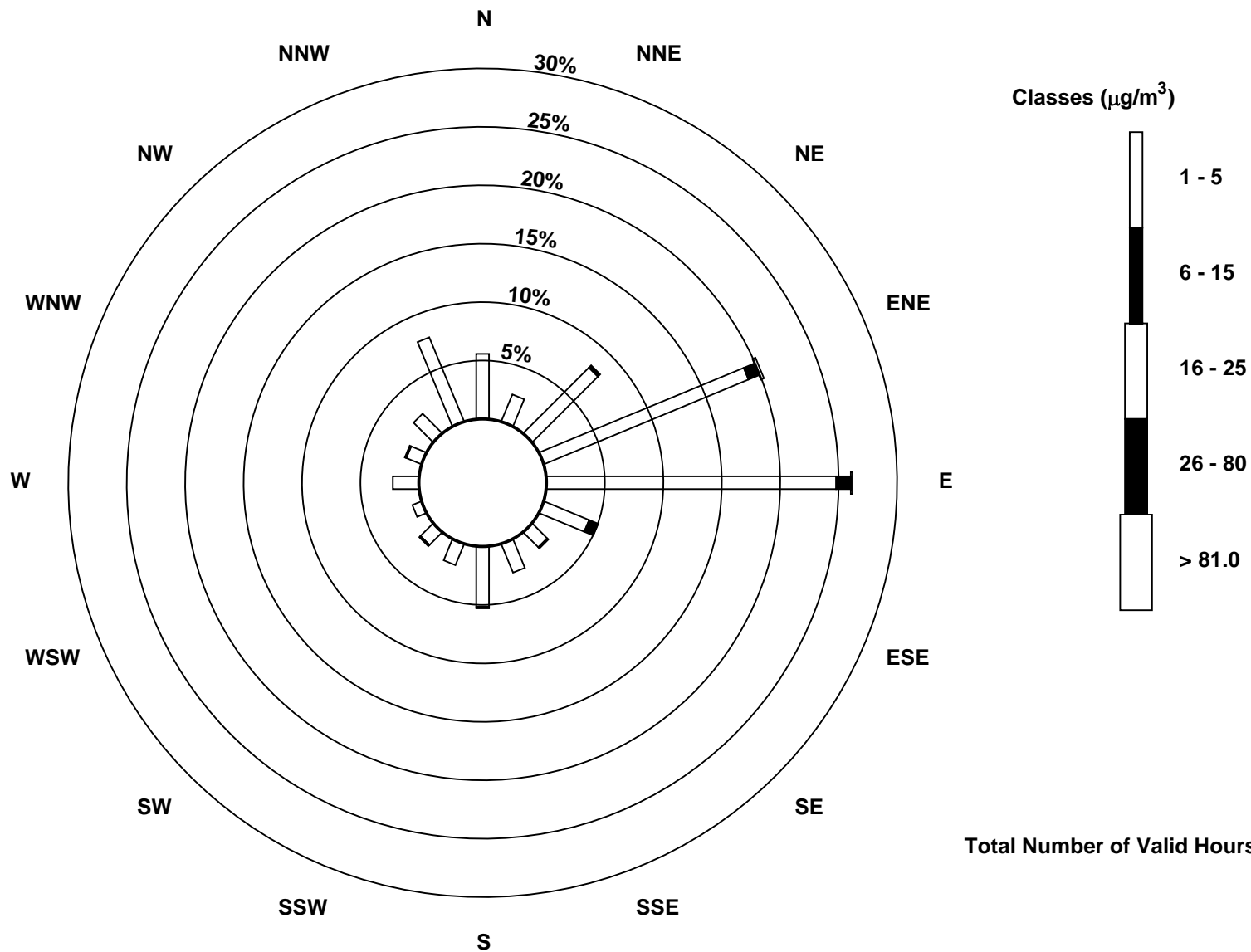
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan (AMS 8)



Total Number of Valid Hours: 718

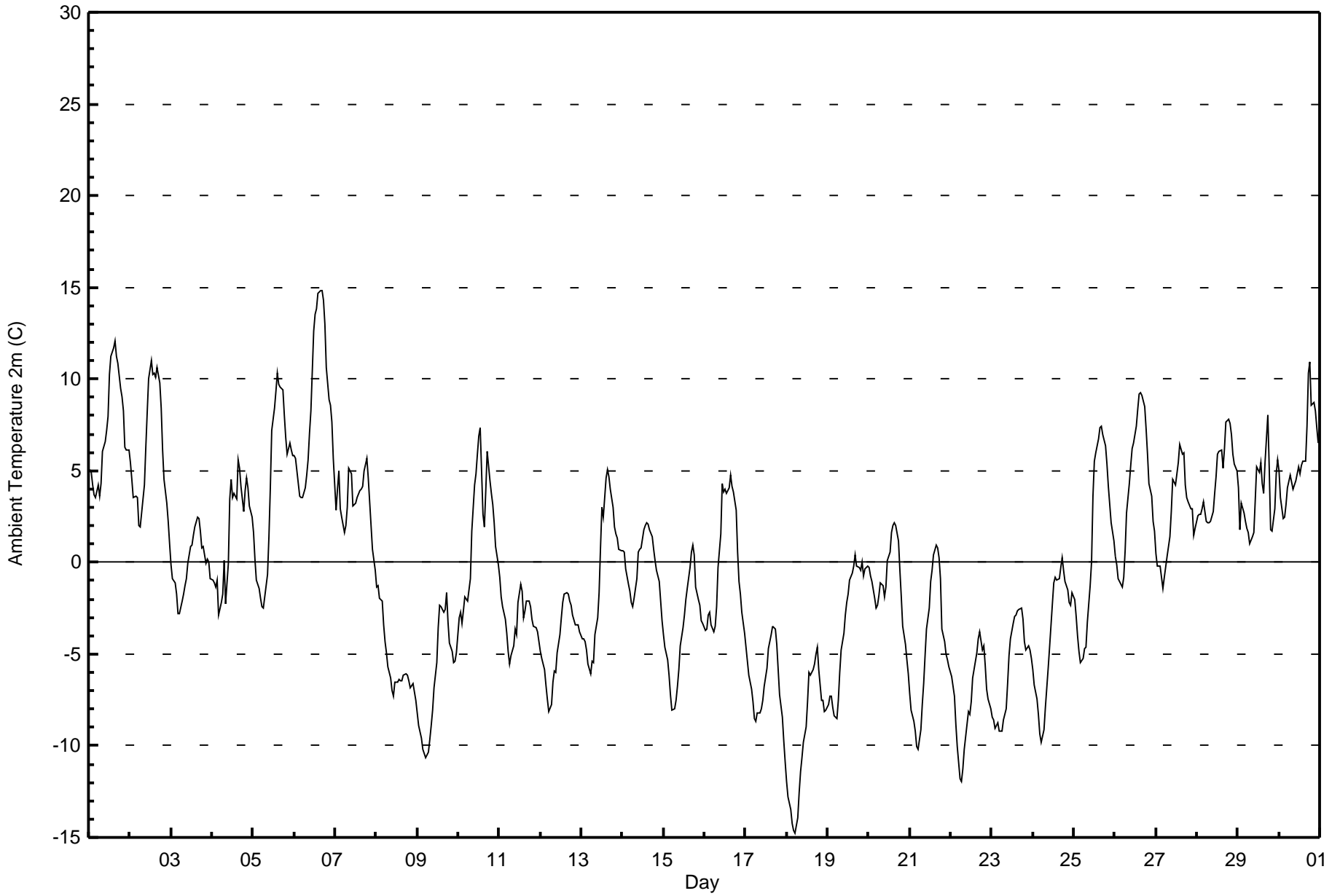


Maximum Value: 14.8 C on Apr 6 16:00		Maximum Daily Average: 8.7 C on Apr 6		Hours in Service: 720																							
Minimum Value: -14.7 C on Apr 18 06:00		Minimum Daily Average: -9.5 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 3.1 C at hour 18		Minimum Diurnal Average: -4.0 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: -0.39 C		Percentiles: P ₁ = -12.0 P ₁₀ = -7.6 Q ₁ = -4.6 Median = -0.8 Q ₃ = 3.8 P ₉₀ = 6.5 P ₉₉ = 12.6		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	5.0	4.9	4.2	3.7	3.5	4.2	3.6	4.3	6.1	6.6	7.2	8.0	10.3	11.2	11.7	12.1	11.2	10.9	9.5	9.0	8.2	6.3	6.2	6.1	7.2	12.1	
2-Apr	5.5	4.6	3.5	3.6	3.5	2.0	1.9	2.7	4.2	6.3	8.2	10.0	11.0	10.3	10.4	10.1	10.7	9.8	8.4	6.1	4.5	3.2	2.2	1.0	6.0	11.0	
3-Apr	-0.1	-0.9	-1.1	-1.8	-2.8	-2.8	-2.1	-1.8	-1.2	-0.9	0.0	0.9	1.0	1.4	2.0	2.5	2.4	1.7	0.8	0.9	-0.1	0.1	0.0	-0.9	-0.1	2.5	
4-Apr	-1.0	-1.2	-1.3	-1.0	-2.9	-2.2	-1.8	0.1	-2.2	-0.1	3.4	4.5	3.6	3.7	3.4	5.6	5.2	4.1	2.7	3.9	4.6	4.1	3.1	2.5	1.7	5.6	
5-Apr	1.6	0.2	-1.0	-1.4	-2.0	-2.4	-2.5	-1.9	-0.6	1.4	4.1	7.2	8.4	9.4	10.4	9.7	9.6	9.4	8.1	6.8	5.9	6.5	6.1	5.8	4.1	10.4	
6-Apr	5.8	5.6	4.3	3.6	3.5	3.6	4.0	4.8	5.6	7.1	8.3	12.6	13.5	13.8	14.7	14.8	14.8	14.3	13.0	10.6	8.9	8.5	7.7	5.7	8.7	14.8	
7-Apr	2.8	4.0	5.0	2.9	2.5	1.6	2.0	3.0	5.2	4.8	3.1	3.1	3.3	3.6	3.9	4.0	4.2	5.0	5.6	4.6	3.3	2.0	0.7	-0.4	3.3	5.6	
8-Apr	-1.3	-1.3	-1.9	-2.1	-3.4	-4.3	-4.9	-5.7	-6.3	-7.0	-7.3	-6.5	-6.5	-6.4	-6.4	-6.4	-6.2	-6.1	-6.1	-6.5	-6.8	-6.6	-7.0	-7.5	-5.5	-1.3	
9-Apr	-8.2	-8.9	-9.6	-10.2	-10.4	-10.7	-10.3	-9.6	-8.9	-8.1	-6.8	-5.5	-3.6	-2.3	-2.4	-2.7	-2.5	-1.7	-3.2	-4.4	-4.8	-5.4	-5.4	-4.9	-6.3	-1.7	
10-Apr	-3.0	-2.7	-3.3	-2.7	-1.9	-2.1	-1.5	-0.9	1.7	4.3	4.8	5.9	6.9	7.4	2.7	1.9	3.9	6.1	4.4	3.8	3.2	2.1	0.8	-0.1	1.7	7.4	
11-Apr	-0.8	-1.9	-2.4	-3.1	-3.9	-4.9	-5.5	-5.1	-4.5	-3.7	-4.0	-2.2	-1.2	-1.6	-3.0	-2.7	-2.1	-2.1	-2.4	-3.1	-3.5	-3.6	-3.8	-4.3	-3.1	-0.8	
12-Apr	-4.9	-5.2	-5.8	-6.7	-7.4	-8.2	-7.8	-6.5	-5.9	-6.0	-5.0	-4.0	-3.0	-2.2	-1.7	-1.6	-1.8	-2.1	-2.3	-2.9	-3.4	-3.4	-3.4	-3.8	-4.4	-1.6	
13-Apr	-4.1	-4.2	-4.3	-4.8	-5.6	-6.1	-5.4	-5.4	-3.9	-3.0	-1.6	0.8	3.0	2.5	4.6	5.0	4.7	4.0	3.0	2.0	1.5	1.3	0.7	0.6	-0.6	5.0	
14-Apr	0.6	0.6	-0.3	-1.2	-1.6	-2.2	-2.4	-1.9	-0.9	0.6	0.7	0.8	1.7	2.0	2.2	2.1	1.7	1.4	0.7	0.1	-0.4	-1.1	-2.1	-3.2	-0.1	2.2	
15-Apr	-4.0	-4.6	-5.3	-6.2	-7.2	-8.1	-8.0	-7.5	-6.7	-5.8	-4.6	-3.6	-2.8	-2.1	-1.4	-0.3	0.6	1.0	0.4	-1.3	-2.0	-2.3	-3.2	-3.3	-3.7	1.0	
16-Apr	-3.7	-3.7	-2.8	-2.7	-3.4	-3.8	-3.4	-2.4	-0.3	1.6	4.3	3.8	4.0	3.8	4.1	4.8	4.1	3.9	2.8	0.6	-1.1	-1.7	-2.7	-3.9	0.1	4.8	
17-Apr	-4.6	-5.4	-6.1	-6.9	-7.6	-8.5	-8.7	-8.2	-8.2	-8.0	-7.6	-6.8	-5.8	-4.7	-4.3	-4.0	-3.5	-3.6	-4.5	-5.8	-7.2	-8.5	-9.7	-10.9	-6.6	-3.5	
18-Apr	-12.0	-12.8	-13.5	-14.2	-14.6	-14.7	-14.0	-12.6	-11.4	-10.7	-9.8	-9.0	-7.6	-6.0	-6.1	-5.9	-5.6	-5.0	-4.6	-5.8	-7.5	-7.6	-8.2	-8.1	-9.5	-4.6	
19-Apr	-7.7	-7.3	-7.3	-7.9	-8.4	-8.5	-7.5	-6.0	-4.8	-3.9	-2.9	-2.2	-1.7	-1.0	-0.6	-0.2	0.4	-0.2	-0.3	-0.4	0.0	-0.7	-0.4	-0.2	-3.3	0.4	
20-Apr	-0.3	-0.7	-1.0	-2.0	-2.5	-2.3	-1.8	-1.1	-1.3	-1.9	-1.3	0.1	0.6	1.6	2.0	2.2	2.0	1.2	-0.4	-1.9	-3.4	-4.4	-5.3	-6.1	-1.2	2.2	
21-Apr	-7.1	-8.0	-8.7	-9.2	-10.0	-10.2	-9.1	-7.7	-6.6	-5.1	-3.6	-2.5	-1.1	-0.5	0.4	0.9	0.8	0.2	-0.9	-3.6	-4.3	-5.0	-5.3	-5.7	-4.7	0.9	
22-Apr	-6.2	-6.7	-7.3	-8.8	-10.1	-11.8	-12.0	-11.3	-10.2	-8.8	-8.1	-8.3	-7.6	-6.3	-5.4	-4.9	-4.1	-3.8	-4.8	-4.6	-5.6	-6.9	-7.4	-8.0	-7.5	-3.8	
23-Apr	-8.4	-8.6	-9.1	-8.7	-9.2	-9.2	-9.2	-8.6	-8.0	-6.6	-5.1	-4.2	-3.3	-3.0	-2.9	-2.7	-2.6	-2.5	-3.1	-4.3	-4.8	-4.5	-4.8	-5.3	-5.8	-2.5	
24-Apr	-5.9	-6.7	-7.5	-8.3	-9.4	-9.8	-9.1	-7.9	-6.8	-5.8	-4.6	-2.3	-1.1	-0.8	-1.0	-0.9	-0.3	0.2	-0.5	-1.0	-1.5	-2.2	-2.4	-1.6	-4.0	0.2	
25-Apr	-2.1	-3.0	-4.0	-4.9	-5.5	-5.2	-4.7	-4.6	-3.2	-1.2	0.0	3.6	5.6	6.0	6.8	7.4	7.4	6.9	6.3	5.4	4.1	3.1	2.2	1.1	1.1	7.4	
26-Apr	0.4	-0.1	-0.9	-1.2	-1.4	-0.8	0.7	2.7	4.3	5.3	6.2	6.5	7.4	8.3	9.2	9.2	9.1	8.5	7.3	5.9	4.3	3.6	2.3	1.7	4.1	9.2	
27-Apr	0.5	-0.2	-0.2	-0.8	-1.4	-0.8	0.3	0.9	1.4	2.8	4.5	4.2	4.9	5.5	6.5	5.9	6.0	4.2	3.5	3.3	2.9	2.9	1.5	1.8	2.5	6.5	
28-Apr	2.5	2.6	2.6	2.9	3.3	2.2	2.1	2.1	2.2	2.8	3.8	4.7	5.9	6.0	6.1	5.1	6.2	7.7	7.8	7.6	6.9	5.9	5.3	5.0	4.6	7.8	
29-Apr	4.0	1.8	3.2	2.7	2.3	1.9	1.7	1.0	1.4	1.7	3.4	5.2	4.9	5.4	4.3	3.8	5.4	8.1	5.2	1.8	1.7	3.0	4.8	5.6	3.5	8.1	
30-Apr	5.0	3.5	2.4	2.5	3.1	4.0	4.8	4.4	4.0	4.2	4.4	5.2	4.8	5.3	5.5	5.5	7.4	10.3	10.9	8.6	8.7	8.3	7.3	6.5	5.7	10.9	
		-1.7	-2.2	-2.7	-3.2	-3.7	-4.0	-3.7	-3.0	-2.2	-1.2	-0.2	1.0	1.8	2.3	2.5	2.7	3.0	3.1	2.2	1.2	0.4	-0.1	-0.7	-1.2	Diurnal Average	
		5.8	5.6	5.0	3.7	3.5	4.2	4.8	4.8	6.1	7.1	8.3	12.6	13.5	13.8	14.7	14.8	14.8	14.3	13.0	10.6	8.9	8.5	7.7	6.5	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 2m (AT 2m) - C
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Fort Chipewyan - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	391	54.31	54.31
0 - 10	305	42.36	96.67
10 - 20	24	3.33	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

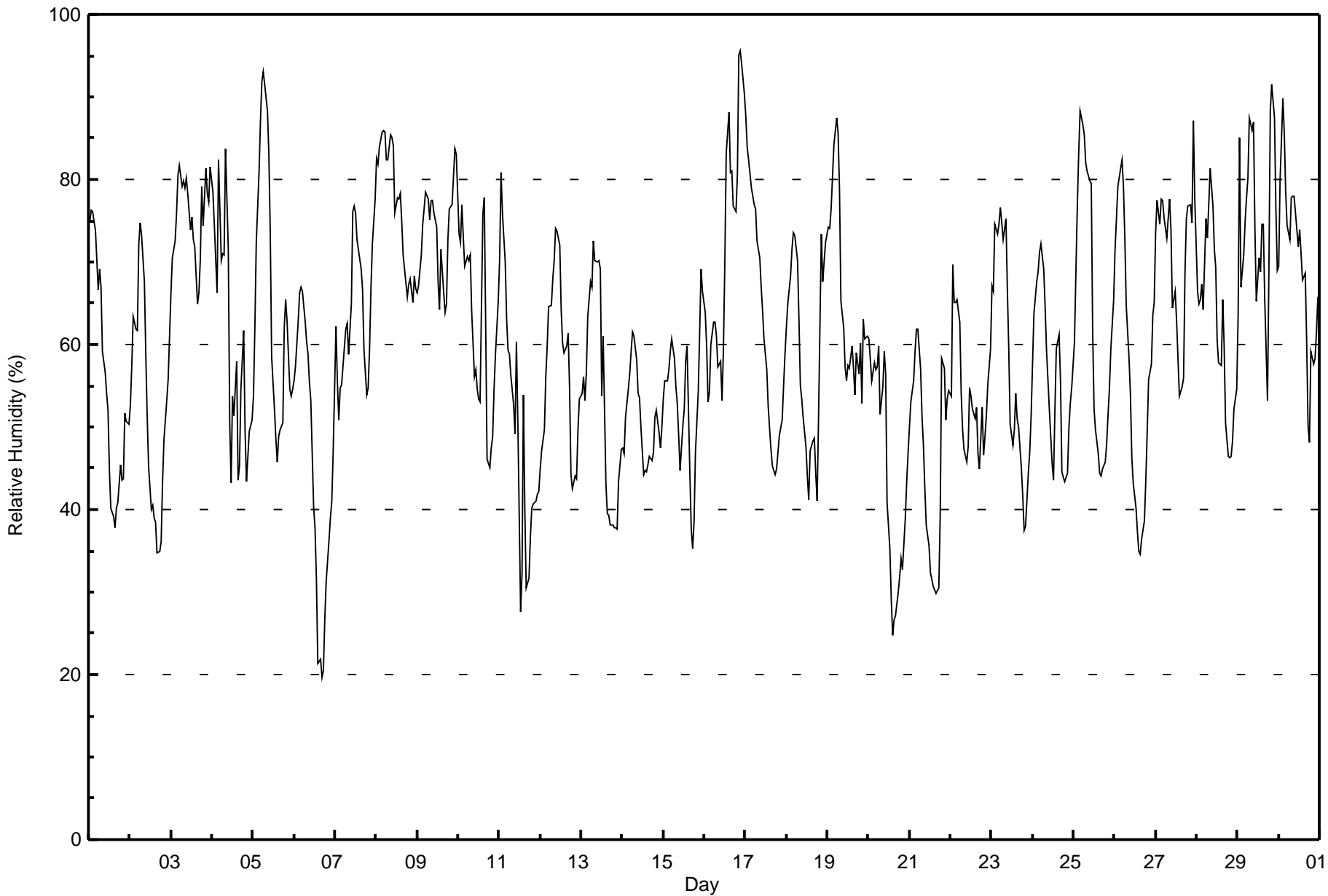
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Fort Chipewyan - April 2017

Maximum Value: 96 % on Apr 16 22:00 Maximum Daily Average: 77.0 % on Apr 8																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Minimum Value: 20 % on Apr 6 17:00 Minimum Daily Average: 44.6 % on Apr 20 Maximum Diurnal Average: 71.8 % at hour 6 Minimum Diurnal Average: 48.0 % at hour 18 Monthly Average: 60.5 % Percentiles: P ₁ = 27 P ₁₀ = 41 Q ₁ = 50 Median = 60 Q ₃ = 73 P ₉₀ = 79 P ₉₉ = 91																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	75	76	76	75	74	67	69	67	59	57	54	52	45	40	39	38	40	41	45	44	44	52	51	50	55.4	76
2-Apr	53	57	63	62	62	72	75	73	68	59	51	45	40	40	39	39	35	35	36	43	48	53	56	61	52.7	75
3-Apr	66	71	73	76	80	82	79	80	79	80	78	74	75	73	72	65	66	70	79	74	81	78	77	82	75.5	82
4-Apr	78	75	70	66	82	70	71	71	84	71	51	43	54	51	58	44	45	55	62	49	43	46	49	51	60.0	84
5-Apr	54	62	72	81	87	92	93	91	88	83	74	58	52	49	46	49	50	50	62	65	63	55	54	55	66.0	93
6-Apr	56	57	63	66	67	67	63	60	59	55	53	40	38	31	21	22	20	20	27	31	36	39	41	47	45.0	67
7-Apr	62	55	51	55	55	60	62	62	59	65	76	77	76	73	70	69	67	59	54	55	60	67	72	78	64.1	78
8-Apr	83	82	84	86	86	86	82	82	85	85	84	76	78	78	78	75	71	67	66	67	68	65	68	67	77.0	86
9-Apr	66	67	71	75	76	79	78	75	77	77	76	74	68	64	71	66	64	65	73	76	77	80	84	83	73.5	84
10-Apr	73	72	77	73	70	71	70	71	64	56	57	55	53	53	76	78	63	46	45	47	49	55	59	65	62.4	78
11-Apr	70	81	76	70	63	59	59	56	53	49	60	51	28	32	54	40	31	32	37	40	41	41	42	42	50.3	81
12-Apr	45	47	50	56	60	65	65	68	70	74	74	72	64	60	59	60	61	55	44	43	44	44	50	53	57.6	74
13-Apr	54	56	53	57	63	68	67	73	70	70	69	54	61	43	40	39	38	38	38	38	38	43	47	47	53.6	73
14-Apr	47	47	51	55	56	59	62	61	58	54	54	50	44	45	45	47	46	47	51	52	49	47	50	50	50.9	62
15-Apr	53	56	56	57	59	61	58	55	53	49	45	50	52	58	60	44	38	35	39	47	54	61	69	66	53.1	69
16-Apr	64	60	53	54	60	63	63	61	57	58	53	60	70	83	88	81	81	77	76	81	95	96	94	90	71.5	96
17-Apr	88	84	82	79	78	77	77	73	70	67	64	61	57	52	50	47	45	44	45	47	49	51	55	59	62.5	88
18-Apr	62	65	68	71	73	73	70	63	55	53	51	48	44	41	47	48	49	44	41	51	73	68	70	72	58.5	73
19-Apr	74	74	77	80	84	87	86	79	65	62	57	56	57	57	60	57	54	59	56	60	53	63	61	61	65.8	87
20-Apr	61	58	56	58	57	57	60	52	55	59	56	41	35	29	25	27	27	30	32	34	33	39	43	47	44.6	61
21-Apr	50	53	56	59	62	62	57	51	48	43	38	36	32	32	31	30	30	31	39	58	57	51	53	54	46.3	62
22-Apr	54	70	65	65	65	63	54	50	47	46	48	55	54	52	51	52	47	45	52	47	49	51	55	60	54.0	70
23-Apr	67	66	75	73	75	77	75	73	75	67	59	50	48	50	54	51	50	45	42	38	38	44	47	51	57.9	77
24-Apr	58	64	68	69	71	72	69	65	59	56	52	46	44	52	59	61	56	45	44	43	44	50	53	55	56.4	72
25-Apr	60	69	77	83	88	87	85	82	81	80	79	62	52	50	47	44	44	45	46	48	51	55	59	66	64.2	88
26-Apr	72	75	79	81	82	79	73	65	58	54	46	43	40	37	35	35	36	39	44	50	56	58	64	65	56.9	82
27-Apr	73	77	75	78	77	75	73	75	78	74	64	66	63	58	54	55	56	69	75	77	77	75	87	78	71.2	87
28-Apr	66	65	65	67	64	75	73	77	81	77	71	69	61	58	57	65	60	51	46	46	46	48	52	55	62.4	81
29-Apr	64	85	67	71	75	78	80	88	86	87	74	65	70	69	75	75	66	53	69	88	91	87	76	69	75.3	91
30-Apr	70	80	90	86	78	74	73	78	78	78	76	72	74	71	68	69	60	50	48	59	58	58	62	66	69.8	90
																			63.9 66.9 67.9 69.5 71.1 71.8 70.7 69.2 67.4 64.8 61.6 57.2 54.1 53.3 54.4 52.3 49.9 48.0 50.3 53.3 55.6 57.2 59.8 61.5					Diurnal Average		
																			88 85 90 86 88 92 93 91 88 87 84 77 78 83 88 81 81 77 79 88 95 96 94 90					Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Fort Chipewyan - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	1	0.14	0.14
20 - 40	59	8.19	8.33
40 - 60	304	42.22	50.56
60 - 80	291	40.42	90.97
80 - 100	65	9.03	100.00

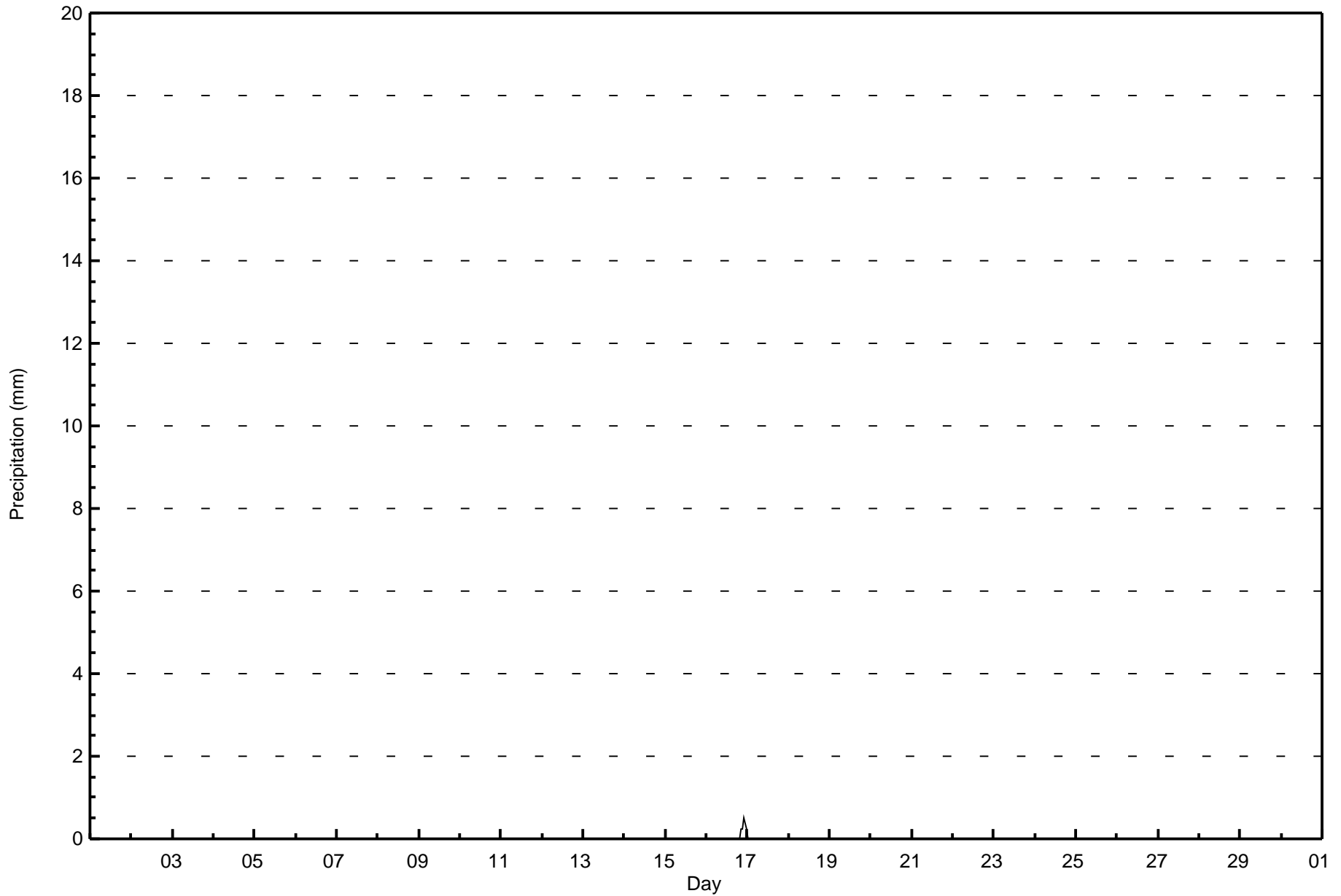
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Precipitation (PC) - mm
Fort Chipewyan - April 2017**

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	719	99.86	99.86
0.4 - 0.5	1	0.14	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

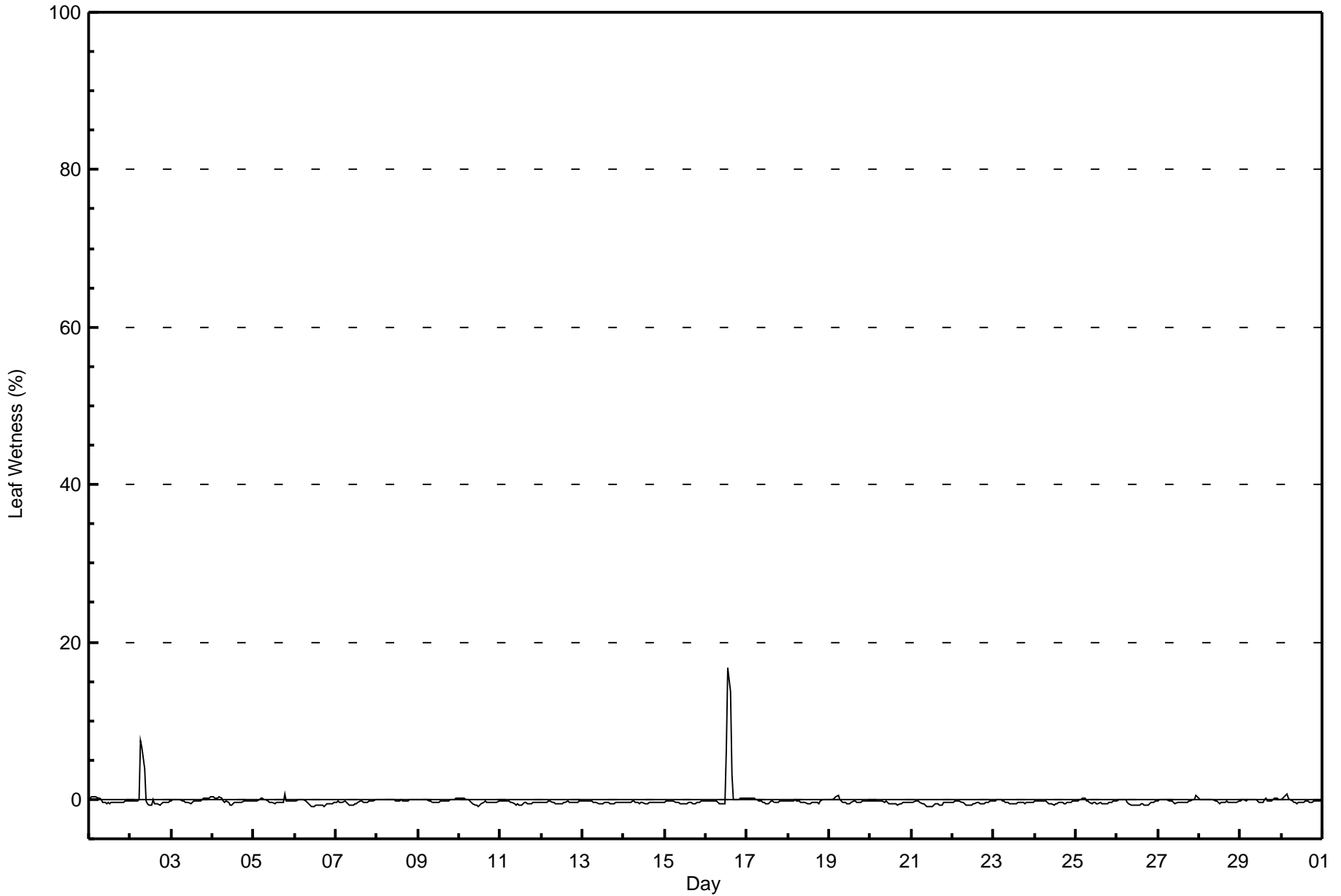


Maximum Value: 17 % on Apr 16 14:00 Maximum Daily Average: 1.5 % on Apr 16																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Minimum Value: -1 % on Apr 21 11:00 Minimum Daily Average: -0.5 % on Apr 21 Maximum Diurnal Average: 0.1 % at hour 14 Minimum Diurnal Average: -0.6 % at hour 12 Monthly Average: -0.2 % Percentiles: P ₁ = -1 P ₁₀ = -1 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 3																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	-0.2	0
2-Apr	0	0	0	0	0	0	7	7	4	0	-1	-1	-1	0	-1	-1	-1	-1	-1	0	0	0	0	0	0.4	7
3-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.1	0
4-Apr	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	-0.2	0
5-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-0.2	1
6-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	-0.5	0
7-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	-0.4	0
8-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.1	0
9-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.1	0
10-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	-0.3	0
11-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0	0	-1	-1	0	0	0	0	0	-0.4	0
12-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	-0.4	0
13-Apr	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	0	-1	-1	-1	0	0	0	0	0	-0.4	0
14-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.4	0
15-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	0	-1	-1	-1	0	0	0	0	0	-0.4	0
16-Apr	0	0	0	0	0	0	0	0	0	-1	-1	-1	6	17	14	3	0	0	0	0	0	0	0	0	1.5	17
17-Apr	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0	-0.2	0
18-Apr	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	0	0	-1	0	0	0	0	0	-0.3	0
19-Apr	0	0	0	0	0	1	0	0	0	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	-0.2	1
20-Apr	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	0	-0.4	0
21-Apr	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	0	-0.5	0
22-Apr	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0	0	-1	0	0	0	0	0	0	0	-0.4	0
23-Apr	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	-0.3	0
24-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	-0.4	0
25-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	-1	-1	-1	0	0	0	0	0	-0.3	0
26-Apr	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	0	0	0	-0.4	0
27-Apr	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	1	-0.2	1
28-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.2	0
29-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.1	0
30-Apr	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.2	1
																	Diurnal Average Diurnal Maximum									
-0.1 -0.1 -0.1 -0.1 0.0 -0.1 0.1 -0.1 -0.3 -0.5 -0.5 -0.6 -0.3 0.1 0.1 -0.2 -0.4 -0.4 -0.4 -0.4 -0.3 -0.2 -0.2 -0.2 -0.2 -0.2																	0 0 1 1 0 1 7 7 4 0 0 0 6 17 14 3 0 0 1 0 0 0 1 0									



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (SW) - %
Fort Chipewyan - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Leaf Wetness (SW) - %
Fort Chipewyan - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	72	82.76	82.76
0.4 - 0.5	5	5.75	88.51
0.6 - 0.7	3	3.45	91.95
0.8 - 1.4	0	0.00	91.95
1.5 - 10	5	5.75	97.70
> 10	2	2.30	100.00

Total Number of Valid Hours: 87

Total Number of Hours: 720



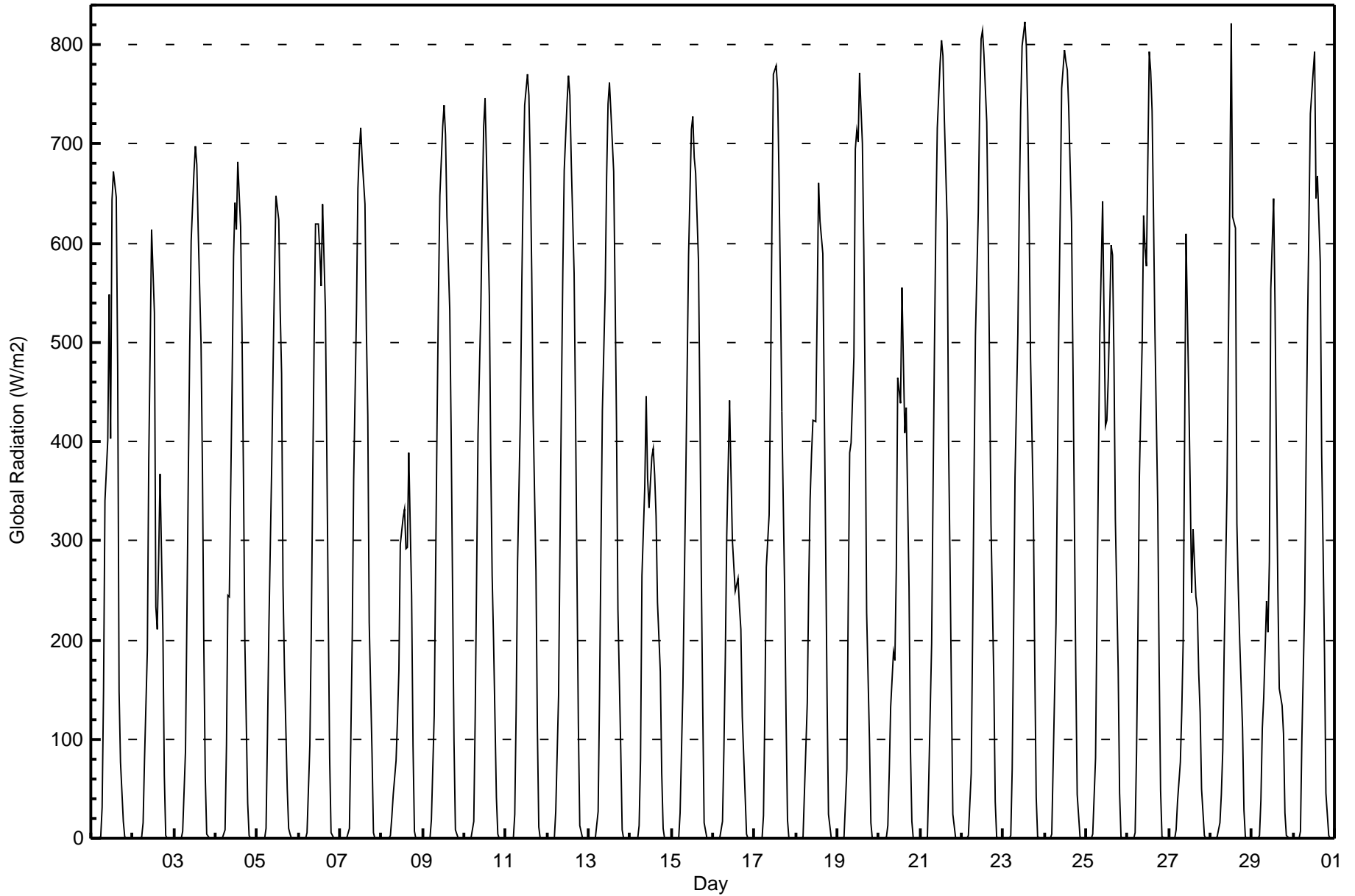
Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Fort Chipewyan - April 2017

Maximum Value: 824 W/m2 on Apr 23 13:00		Maximum Daily Average: 305.3 W/m2 on Apr 23		Hours in Service: 720																							
Minimum Value: 0 W/m2 on Apr 1 22:00		Minimum Daily Average: 112.9 W/m2 on Apr 8		Hours of Data: 720																							
Maximum Diurnal Average: 647.1 W/m2 at hour 13		Minimum Diurnal Average: 0.0 W/m2 at hour 23		Hours of Missing Data: 0																							
Monthly Average: 228.5 W/m2		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 99 Q ₃ = 436 P ₉₀ = 653 P ₉₉ = 799		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	0	0	0	0	0	1	31	149	340	401	548	403	644	672	647	475	149	77	17	1	0	0	0	0	189.7	672	
2-Apr	0	0	0	0	0	1	15	79	189	382	492	613	529	233	210	282	367	210	64	3	1	0	0	0	153.0	613	
3-Apr	0	0	0	0	0	7	88	225	367	497	602	671	698	678	612	498	371	189	61	4	0	0	0	0	232.1	698	
4-Apr	0	0	0	0	0	8	95	245	244	464	586	640	613	682	616	510	368	200	36	3	0	0	0	0	221.2	682	
5-Apr	0	0	0	0	0	10	103	213	376	476	569	647	624	533	469	256	172	50	10	5	0	0	0	0	188.0	647	
6-Apr	0	0	0	0	0	6	94	208	359	498	619	619	592	557	639	532	389	233	81	5	0	0	0	0	226.4	639	
7-Apr	0	0	0	0	0	9	101	205	362	533	655	694	716	684	640	512	425	218	86	6	0	0	0	0	243.6	716	
8-Apr	0	0	0	0	0	3	22	44	79	120	170	296	324	332	291	293	389	245	95	8	0	0	0	0	112.9	389	
9-Apr	0	0	0	0	0	18	124	271	417	545	647	717	739	709	627	533	408	251	98	8	0	0	0	0	254.7	739	
10-Apr	0	0	0	0	0	17	122	264	407	535	633	718	746	684	547	384	265	200	41	4	0	0	0	0	232.0	746	
11-Apr	0	0	0	0	0	25	131	279	428	561	663	739	770	748	678	570	427	269	111	12	0	0	0	0	267.2	770	
12-Apr	0	0	0	0	0	27	144	294	441	571	674	742	769	750	680	570	429	270	115	13	0	0	0	0	270.4	769	
13-Apr	0	0	0	0	0	27	146	292	431	552	667	741	762	733	672	548	417	231	90	9	0	0	0	0	263.2	762	
14-Apr	0	0	0	0	0	13	80	264	355	446	364	334	384	393	366	325	238	169	66	10	0	0	0	0	158.6	446	
15-Apr	0	0	0	0	0	25	152	260	360	473	588	715	727	686	670	582	437	268	134	16	0	0	0	0	254.0	727	
16-Apr	0	0	0	0	0	17	90	182	304	441	369	300	274	249	263	233	211	123	44	4	0	0	0	0	129.3	441	
17-Apr	0	0	0	0	0	22	132	274	327	454	622	770	778	754	665	556	430	248	119	19	0	0	0	0	257.1	778	
18-Apr	0	0	0	0	2	46	136	252	342	387	421	420	534	660	622	589	441	296	143	24	1	0	0	0	221.5	660	
19-Apr	0	0	0	0	1	70	239	389	399	485	694	713	702	771	700	592	439	228	100	16	0	0	0	0	272.4	771	
20-Apr	0	0	0	0	1	13	66	132	188	180	272	465	438	555	482	409	435	254	89	17	0	0	0	0	166.5	555	
21-Apr	0	0	0	0	2	61	197	351	496	622	716	782	804	789	725	621	398	280	149	24	1	0	0	0	292.4	804	
22-Apr	0	0	0	0	2	66	205	363	508	630	739	806	814	790	722	614	474	318	160	38	1	0	0	0	302.1	814	
23-Apr	0	0	0	0	3	70	210	364	509	635	734	799	824	799	730	623	484	329	170	42	1	0	0	0	305.3	824	
24-Apr	0	0	0	0	4	76	217	371	522	633	757	794	783	774	737	621	480	325	169	44	1	0	0	0	304.4	794	
25-Apr	0	0	0	0	4	81	227	374	509	642	524	415	421	464	598	588	486	322	170	46	1	0	0	0	244.8	642	
26-Apr	0	0	0	0	5	87	214	365	501	628	595	577	794	773	734	628	512	335	174	49	2	0	0	0	290.6	794	
27-Apr	0	0	0	0	8	38	76	128	200	400	610	446	350	248	311	244	233	166	126	49	2	0	0	0	151.6	610	
28-Apr	0	0	0	0	2	16	44	88	190	350	501	646	821	627	615	318	253	199	111	29	1	0	0	0	200.4	821	
29-Apr	0	0	0	0	3	39	110	142	239	208	279	553	645	535	386	249	151	133	105	25	2	0	0	0	158.6	645	
30-Apr	0	0	0	0	8	101	238	386	517	619	731	773	793	646	668	581	387	292	186	45	2	0	0	0	290.5	793	
		0.0	0.0	0.0	0.0	1.6	33.4	128.3	248.4	363.4	478.9	568.1	618.3	647.1	617.0	577.4	477.9	368.8	230.9	104.0	19.2	0.6	0.0	0.0	0.0	Diurnal Average	
		0	0	0	0	8	101	239	389	522	642	757	806	824	799	737	628	512	335	186	49	2	0	0	0	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Global Radiation (GR) - W/m2
Fort Chipewyan - April 2017**

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	306	42.50	42.50
21 - 100	55	7.64	50.14
101 - 300	112	15.56	65.69
301 - 600	138	19.17	84.86
601 - 900	109	15.14	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Fort Chipewyan - April 2017

Maximum Speed: 38 km/h on Apr 14 20:00	Maximum Daily Speed Average: 32.5 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 23 01:00	Minimum Daily Speed Average: 0.6 km/h on Apr 16	Hours of Data: 720
Maximum Diurnal Speed Average: 10.9 km/h at hour 17	Minimum Diurnal Speed Average: 7.7 km/h at hour 2	Hours of Missing Data: 0
Monthly Average Velocity: 8.9 km/h 72.6 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 9 Median = 14 Q ₃ = 20 P ₉₀ = 26 P ₉₉ = 34	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SE6	S5	SW11	SW10	SW10	WSW10	SW8	WSW12	W17	W18	W19	WSW13	WSW17	W23	W20	W18	W13	W11	WNW8	NNW6	NW6	WNW5	NW5	NNW4	WSW10.0	W23	
2-Apr	SW2	W3	NW6	NNW4	NNW3	SSE1	W3	WSW5	SW3	WSW9	W9	W10	NW11	WNW12	NW14	NW14	NW18	NNW15	NW11	NNW8	NNW8	NNW8	N7	N10	NW6.9	NW18	
3-Apr	N9	N9	N8	NNE4	N3	ENE5	ENE6	E12	E18	E18	E16	E14	E18	E16	E13	E13	E13	E13	E10	E10	E7	E4	ENE2	SE3	E8.9	E18	
4-Apr	W6	WNW10	WNW5	N1	E4	W3	NNE2	ENE4	E7	E7	ESE4	E9	E13	E11	E12	E17	E18	E15	E15	ENE9	ENE19	ENE19	ENE17	ENE20	ENE8.2	ENE20	
5-Apr	ENE18	E15	E13	E13	E13	E13	E13	E13	E14	E14	SE16	SSE27	S29	S30	S31	SSW27	S21	SW17	SSW28	SE15	SE15	S16	SSW10	SSW12	SSE12.8	S31	
6-Apr	SSW8	SSE6	ESE6	ESE6	SE7	SSE8	SSE8	SE7	SE5	ENE6	ENE8	W15	W19	W22	W28	W24	W21	W16	W13	W12	NW9	N7	NNE5	E6	W5.2	W28	
7-Apr	E9	ENE7	NNE8	NNW13	N15	N16	N17	N17	N13	ENE11	ESE11	E14	E13	E10	E11	E14	E17	ENE21	ENE17	NE11	NNE15	NNE14	N13	NNE11	NE9.7	ENE21	
8-Apr	NNE11	NE19	NE21	ENE19	ENE29	ENE21	NE18	ENE22	ENE25	ENE26	ENE25	ENE21	E29	E28	E29	E28	E28	E28	ENE19	ENE13	ENE14	ENE17	ENE17	ENE16	ENE21.2	E29	
9-Apr	ENE18	ENE17	ENE16	ENE13	ENE14	ENE13	E15	E17	E16	E17	E18	E20	E20	E20	E23	E25	E21	E15	E21	E22	E19	E19	E14	E10	E17.5	E25	
10-Apr	ESE7	ESE6	E9	ESE7	SSE7	SE6	SE4	ENE4	ENE4	ENE6	E10	E10	E9	E12	E20	E21	E20	NE21	NE26	NE21	NE20	NE22	NE28	NE26	ENE11.9	NE28	
11-Apr	NE26	NE21	NE23	NE26	NE25	NE21	NE17	NE18	NE17	NE18	ENE21	ENE20	NE25	ENE28	E32	E33	ENE31	ENE26	ENE22	ENE19	ENE16	ENE14	ENE15	ENE13	ENE21.1	E33	
12-Apr	ENE14	NE14	NE12	NE9	NE6	ENE8	E7	ESE10	ESE14	ESE18	ESE21	E24	E26	E24	E22	E22	E22	E23	ENE21	ENE20	ENE15	ENE11	ENE13	ENE13	E15.6	E26	
13-Apr	ENE11	ENE13	ENE11	ENE12	E14	ENE12	E13	E19	E16	E19	E17	E16	E20	E22	ENE25	ENE25	NE27	NE28	NE27	NE27	ENE28	ENE30	ENE27	ENE26	ENE19.5	ENE30	
14-Apr	ENE29	ENE30	ENE29	ENE29	ENE30	ENE34	ENE35	ENE35	ENE32	NE30	NE32	NE32	NE31	NE33	NE35	NE34	NE35	NE33	NE32	ENE38	ENE37	ENE36	ENE33	NE28	ENE32.5	ENE38	
15-Apr	ENE28	NE28	ENE29	ENE30	ENE34	ENE34	ENE31	ENE26	ENE25	ENE22	ENE20	ENE20	E21	E20	E22	ENE21	ENE16	NNE11	NE9	ENE16	E17	E16	ESE15	ENE21.0	ENE34		
16-Apr	ESE15	SE15	SSE17	SSE15	SSE12	SSE10	S11	S12	SSE5	ESE4	S7	WSW4	SSW8	SW7	W8	NW10	NNW10	N11	NNW12	NNW15	NNW15	NNW14	NNW15	NNW17	SW0.6	NNW17	
17-Apr	NNW13	NNW14	NNW14	NNW15	NNW13	NNW13	NNW13	N13	N14	NNW13	NNW13	NNW13	NNW13	NNW13	NNW12	NNW15	NNW12	NNW12	NNW12	NNW12	NNW11	NNW9	NNW11	NNW13	NNW11	NNW12.7	NNW15
18-Apr	N10	NNW9	NNW11	NNW11	NNW10	NNW12	N9	N7	NNW7	NW7	NW6	W8	SW8	SSW9	SE11	SE12	SE11	SSE6	SW7	SSW4	E5	SSW7	SW7	SW6	NW1.8	NNW12	
19-Apr	SSW4	S3	SSE1	E2	E4	E5	E7	ESE7	E10	E12	E13	E14	E16	E17	E16	E15	E11	E9	ENE7	E7	ENE6	E5	ENE6	E6	E7.9	E17	
20-Apr	ENE7	N6	NNW6	N11	N13	NNE8	NNE9	NNE13	NNE16	NNE15	N11	N12	N12	NNW14	N15	N13	N15	N16	NNW16	NNW14	NNW13	N12	N12	NNE10	N11.5	NNE16	
21-Apr	NE11	NNE8	NNE7	N5	N7	N10	N9	N7	WNW8	NW10	NNW9	NNW11	NW10	WNW14	WNW15	WNW15	NNW12	N11	NE8	ENE17	ENE14	NE11	NE8	NE12	N7.2	ENE17	
22-Apr	NNE9	N6	NNW13	NNW13	N14	N15	N14	NNW14	NNW12	N8	E7	ESE15	ESE14	ESE13	ESE15	E16	ESE10	ESE8	E9	WSW4	W9	WNW8	WSW2	W5	NNE4.4	E16	
23-Apr	NW1	ENE5	E8	ENE11	ENE11	E9	ESE13	ESE15	ESE17	E18	E20	E22	E23	E27	E28	ENE27	ENE29	ENE27	NE24	NE27	NE26	ENE27	ENE30	ENE28	ENE18.8	ENE30	
24-Apr	ENE26	ENE23	ENE22	ENE22	ENE22	ENE22	ENE23	ENE22	ENE21	ENE21	ENE19	ENE22	E24	E25	E28	E24	ENE21	NE21	NE19	NE14	NE11	NE12	ENE14	ENE20.4	E28		
25-Apr	E14	E16	E13	E13	ESE9	E5	ESE8	ESE11	E12	E13	E16	SSE14	SSE21	SSE20	SSE24	S20	S23	S25	S27	S26	S28	S24	S20	S19	SSE13.2	S28	
26-Apr	S19	S19	S14	S18	S17	S20	S20	S23	SSW27	S27	S26	S28	SSE24	S21	S17	S22	S21	SSW22	SSW23	S17	S15	S19	SSW11	S4	S19.4	S28	
27-Apr	E7	ESE7	ESE6	E6	ENE6	E11	ESE11	E12	E12	E12	E14	E17	E17	E16	E17	E17	E16	E15	E11	E10	E8	E9	E8	E8	E11.2	E17	
28-Apr	ENE8	ENE8	E8	E10	E8	NW2	W3	SSE2	E12	E17	E17	E19	E22	E23	E22	E20	E20	E17	ENE20	ENE19	ENE16	NE13	NE12	NE11	E12.8	E23	
29-Apr	E8	E8	ENE11	ENE8	E17	E18	E24	E24	E23	E20	E17	E20	E20	E20	ESE16	E22	E17	ENE20	E20	E10	E8	ENE8	E9	ENE7	E15.4	E24	
30-Apr	ENE7	E7	E13	E13	ENE13	ENE12	E11	ESE9	E8	E12	E17	E21	E22	E25	E25	ESE19	E21	ENE22	ENE19	ENE14	ENE18	NE17	NE18	NE19	E15.1	E25	

ENE8.3	ENE7.7	ENE7.8	ENE7.9	ENE8.5	ENE7.8	ENE7.8	ENE8.4	ENE8.9	ENE9.5	E10.3	E9.6	E10.7	E10.1	E10.7	E10.6	E10.9	ENE10.1	ENE9.0	ENE9.3	ENE9.5	ENE8.7	ENE8.8	ENE8.8	Diurnal Average
ENE29	ENE30	ENE29	ENE30	ENE34	ENE34	ENE35	ENE35	ENE32	NE30	NE32	NE32	NE31	NE33	NE35	NE34	NE35	NE33	NE32	ENE38	ENE37	ENE36	ENE33	ENE28	Diurnal Maximum

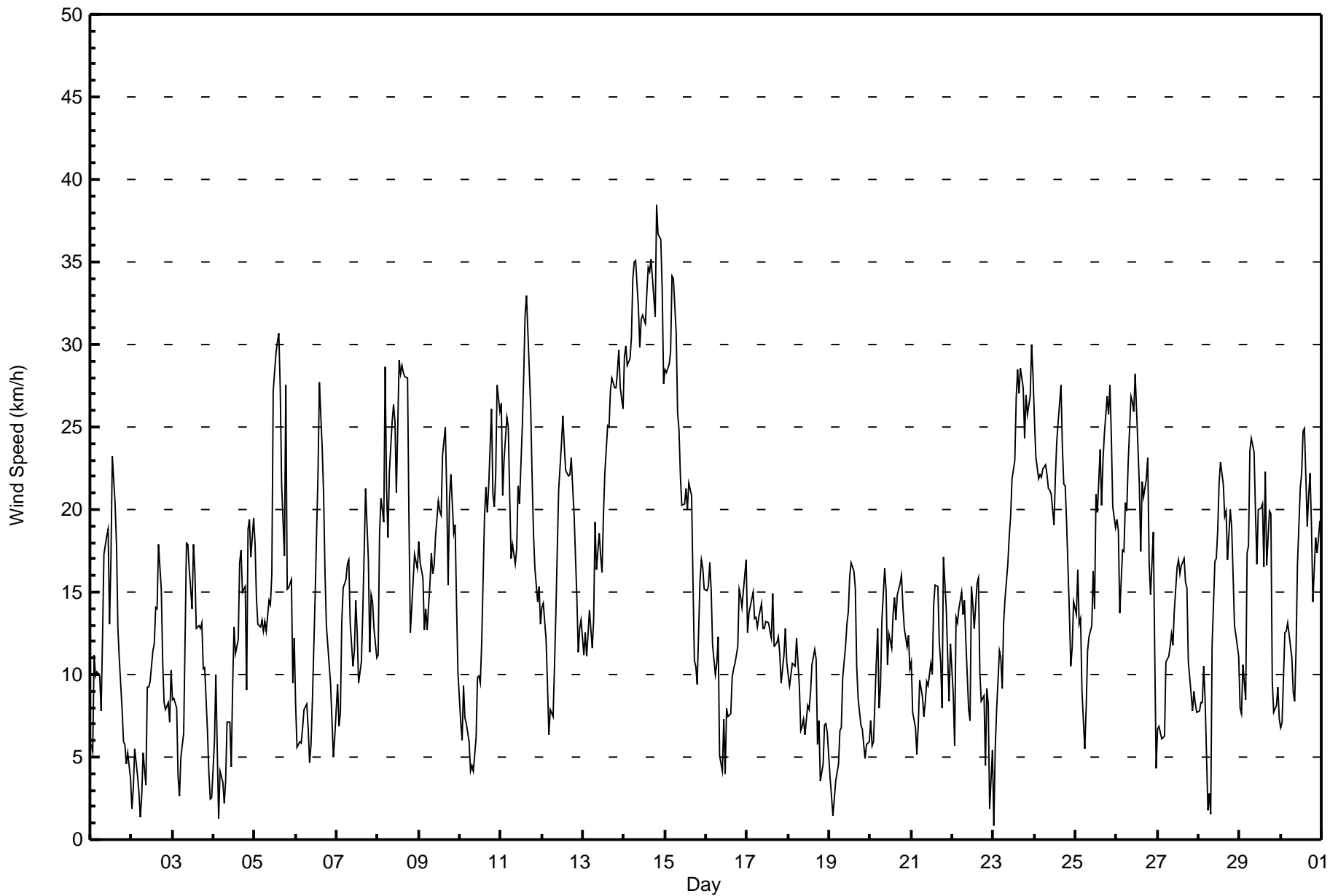
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort Chipewyan - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Apr 6 15:00 Minimum Value: 1 km/h on Apr 19 21:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2	1	2	2	1	1	1	3	4	4	5	4	5	6	5	5	5	3	1	1	1	1	3	2	6
2-Apr	2	3	3	2	2	2	2	4	2	3	2	3	4	4	4	4	6	5	4	2	2	2	2	2	6
3-Apr	3	2	2	3	1	2	1	3	1	1	3	2	2	2	2	2	2	2	1	1	2	1	1	1	3
4-Apr	2	1	3	1	2	2	1	1	1	1	1	2	2	2	2	1	1	3	2	3	2	2	2	2	3
5-Apr	2	3	1	2	3	2	1	1	1	1	7	4	4	5	5	5	3	7	6	2	2	3	2	1	7
6-Apr	2	1	1	1	2	2	2	1	2	2	3	5	5	6	8	7	6	4	3	2	2	3	3	1	8
7-Apr	2	2	3	3	3	3	3	4	4	4	3	4	3	2	2	3	2	3	3	2	3	3	3	3	4
8-Apr	2	4	4	5	5	4	3	4	4	4	4	5	3	3	3	2	3	3	4	2	2	2	2	2	5
9-Apr	2	2	2	2	2	2	2	2	1	2	1	2	2	2	3	2	3	2	3	3	3	1	3	1	3
10-Apr	1	2	1	1	1	1	1	1	1	1	2	2	2	3	4	2	3	4	5	4	4	5	5	6	6
11-Apr	6	5	6	6	5	6	4	4	4	4	5	5	5	5	3	3	4	4	4	2	2	2	1	2	6
12-Apr	2	3	2	2	2	2	1	2	1	1	3	2	2	2	2	2	3	3	2	2	3	3	2	2	3
13-Apr	2	2	2	1	2	2	3	2	1	2	1	1	2	2	3	4	5	5	5	5	4	4	3	3	5
14-Apr	4	4	4	4	4	5	5	5	5	5	5	6	6	6	7	6	7	6	6	7	6	6	5	4	7
15-Apr	4	4	4	5	5	5	5	5	4	4	3	3	3	2	2	3	4	3	3	2	3	2	3	1	5
16-Apr	2	2	3	4	2	2	1	2	2	1	2	3	3	3	2	3	3	4	4	4	5	5	5	6	6
17-Apr	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	4	4	4	4	3	4	4	3	5
18-Apr	3	3	4	3	3	3	4	2	2	3	3	3	3	2	2	3	3	2	2	1	1	1	1	1	4
19-Apr	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2	4	3	2	1	1	1	1	1	4
20-Apr	1	2	3	2	2	2	3	4	5	5	4	4	5	5	5	5	5	6	5	5	5	4	4	3	6
21-Apr	3	2	2	1	2	2	2	2	4	4	4	4	4	5	5	5	5	4	4	3	2	2	2	2	5
22-Apr	2	2	5	4	5	5	5	5	5	4	4	2	2	2	4	3	4	5	3	3	2	1	2	1	5
23-Apr	2	2	2	2	2	2	1	1	1	1	1	1	2	3	3	4	4	5	5	4	4	4	4	4	5
24-Apr	4	3	3	3	3	4	3	3	3	3	3	4	3	3	3	3	3	4	4	3	3	2	2	2	4
25-Apr	2	3	3	2	2	1	2	2	1	1	2	4	4	4	4	4	5	4	4	4	3	3	2	2	5
26-Apr	2	3	2	2	2	2	3	3	4	4	5	5	5	5	5	6	5	4	3	2	3	3	2	1	6
27-Apr	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	1	1	2	1	2	1	2	1	1	2
28-Apr	1	1	1	1	2	3	2	1	4	2	2	1	1	1	1	2	3	3	3	2	3	2	2	2	4
29-Apr	2	2	1	3	4	3	2	3	2	2	2	2	1	1	6	3	3	4	2	2	1	1	1	1	6
30-Apr	2	2	2	2	1	2	2	2	2	3	2	4	2	3	3	2	2	4	4	3	3	3	5	4	5
																	Diurnal Maximum								





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Chipewyan - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	53	7.36	7.36
6 - 11	199	27.64	35.00
12 - 19	266	36.94	71.94
20 - 28	162	22.50	94.44
29 - 38	40	5.56	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Chipewyan - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	3	3	0	6	7	3	3	4	3	2	2	4	5	2	3	3	53
6 - 11	19	12	8	26	47	17	6	6	2	6	9	2	7	5	10	17	199
12 - 19	18	5	16	44	87	15	5	4	12	1	1	3	10	4	4	37	266
20 - 28	0	0	25	47	54	2	0	5	18	5	0	0	6	0	0	0	162
29 - 38	0	0	10	23	4	0	0	0	3	0	0	0	0	0	0	0	40
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	40	20	59	146	199	37	14	19	38	14	12	9	28	11	17	57	720

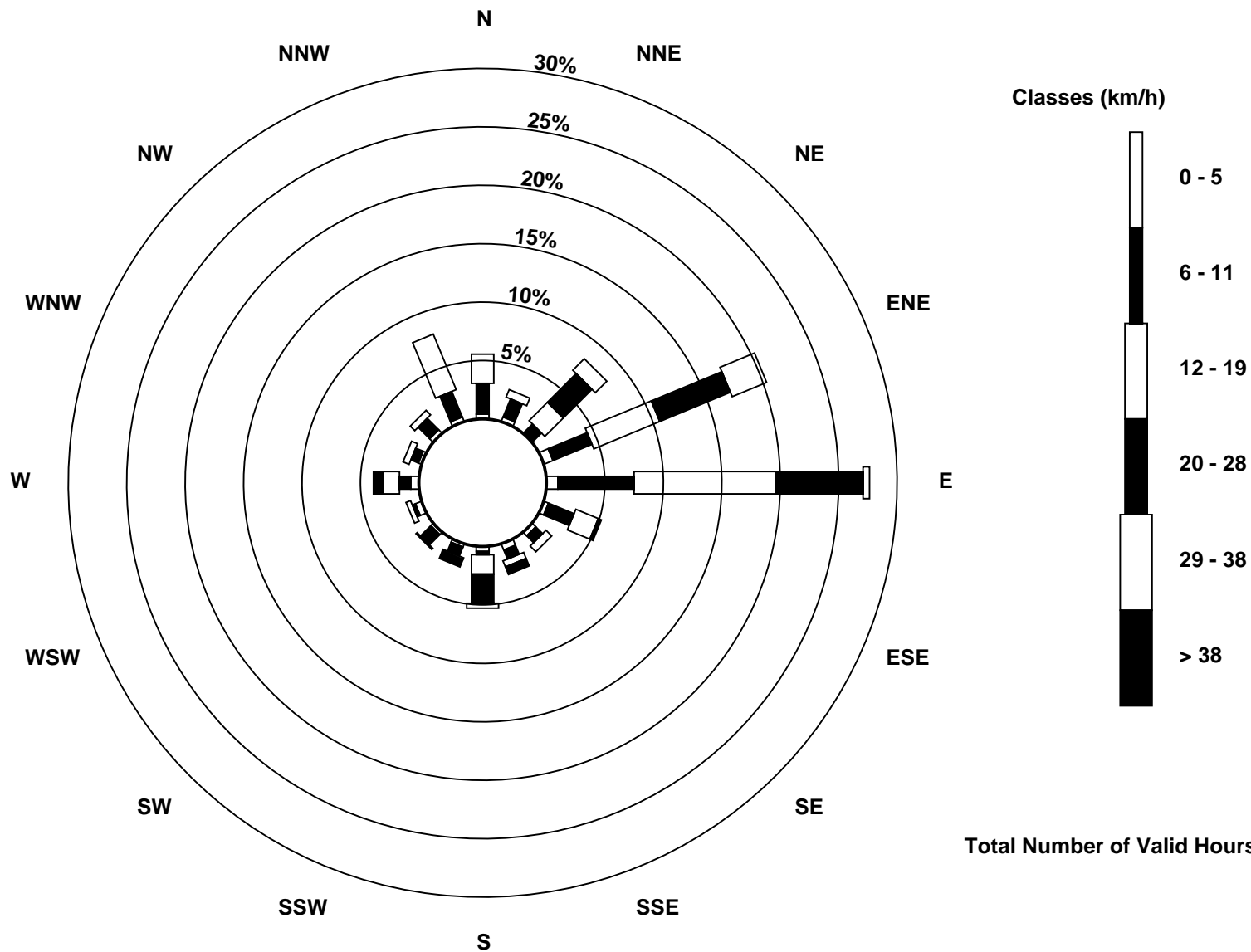
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Fort Chipewyan (AMS 8)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort Chipewyan - April 2017

Direction of Maximum Speed: 59 deg on Apr 14 20:00 Direction of Maximum Daily Speed Average: 56.8 deg on Apr 14	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 311 deg on Apr 23 01:00 Direction of Minimum Daily Speed Average: 0.6 deg on Apr 16	Percent Operational Time: 100.0
Monthly Average Direction: 19.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	132	187	225	226	228	244	230	240	260	262	262	250	251	261	259	261	264	275	291	334	323	282	318	343	257.0
2-Apr	216	268	305	336	347	150	277	258	231	253	270	280	323	302	312	310	323	330	326	338	342	345	359	351	313.2
3-Apr	351	351	11	21	350	63	77	87	86	85	84	90	93	90	91	88	92	90	92	88	95	99	78	136	80.4
4-Apr	271	294	303	359	79	267	24	72	90	92	108	90	93	90	94	87	88	85	86	75	67	69	72	76	78.4
5-Apr	74	81	88	90	87	93	101	97	93	97	127	165	169	180	178	199	185	214	194	144	143	178	208	212	152.0
6-Apr	199	151	119	110	137	149	159	138	127	70	78	263	266	265	279	271	267	278	278	281	307	358	30	85	261.6
7-Apr	84	68	27	347	354	354	354	350	3	70	119	101	98	98	89	90	91	74	60	34	20	13	10	14	44.0
8-Apr	12	40	48	66	66	63	54	67	70	70	77	66	86	85	84	85	85	83	74	60	68	75	77	77	71.2
9-Apr	74	69	74	66	75	74	79	84	85	89	93	92	88	89	90	85	87	88	94	97	90	95	99	87	86.0
10-Apr	119	113	87	105	161	137	127	74	62	74	94	90	99	99	96	97	80	53	53	46	41	40	46	40	71.1
11-Apr	38	38	40	47	48	45	48	46	49	42	78	67	55	75	90	85	76	68	70	67	62	59	62	59	60.6
12-Apr	64	54	49	50	56	75	98	103	108	108	104	101	89	88	90	90	89	86	74	69	67	57	69	70	82.5
13-Apr	71	69	66	76	80	78	84	88	91	95	95	92	85	84	68	57	54	46	45	48	57	65	71	70	69.4
14-Apr	70	68	65	59	59	58	57	58	57	54	54	52	50	52	52	51	53	53	53	59	59	60	58	54	56.8
15-Apr	57	56	57	58	59	59	59	58	64	60	63	77	82	87	89	75	57	30	22	42	69	80	87	102	64.9
16-Apr	119	140	163	166	161	163	173	180	153	120	182	241	213	231	273	308	341	351	346	345	346	346	346	345	230.5
17-Apr	345	337	335	337	338	339	338	349	351	336	335	343	342	348	332	320	330	336	335	341	343	346	344	346	339.3
18-Apr	349	346	343	342	342	347	349	359	345	318	306	275	233	202	138	131	126	149	227	207	86	202	217	217	310.1
19-Apr	207	187	154	93	83	80	98	109	94	88	88	93	90	91	93	99	99	94	77	84	63	82	75	93	92.7
20-Apr	77	353	347	350	352	12	14	16	16	12	1	357	2	342	349	357	354	351	330	348	348	349	351	22	358.1
21-Apr	38	29	19	2	351	353	5	358	303	313	337	293	311	297	303	301	334	358	35	75	69	47	34	46	355.8
22-Apr	32	350	344	348	349	351	350	347	331	5	92	112	114	112	109	92	104	104	96	248	280	301	241	262	33.2
23-Apr	311	57	82	78	68	91	113	105	108	89	87	89	88	84	82	64	63	61	53	53	53	59	65	68	73.5
24-Apr	67	63	60	58	58	57	58	59	61	65	71	68	74	83	88	88	82	62	52	47	42	51	54	70	65.4
25-Apr	79	85	88	95	105	101	108	102	89	93	91	158	168	167	163	187	189	187	190	187	184	187	188	177	156.2
26-Apr	175	177	178	182	180	176	183	183	196	179	174	174	161	169	190	172	170	196	200	191	184	188	204	182	181.2
27-Apr	95	102	111	97	69	92	106	94	91	87	91	87	85	86	82	82	82	92	88	88	93	79	89	80	88.7
28-Apr	76	68	80	85	80	305	271	156	96	97	98	101	90	88	91	94	83	80	71	65	60	56	56	55	81.4
29-Apr	80	91	73	77	82	83	88	88	89	94	84	87	95	91	112	94	93	77	99	87	85	78	85	63	88.1
30-Apr	63	96	90	79	62	75	82	110	98	96	96	99	101	100	96	102	88	73	64	68	58	43	54	55	81.2

66.5 63.3 59.2 60.1 59.9 61.3 68.2 72.2 73.5 76.2 86.2 93.1 93.0 94.1 91.9 86.0 78.9 67.3 66.5 61.5 58.9 59.9 59.7 61.0

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

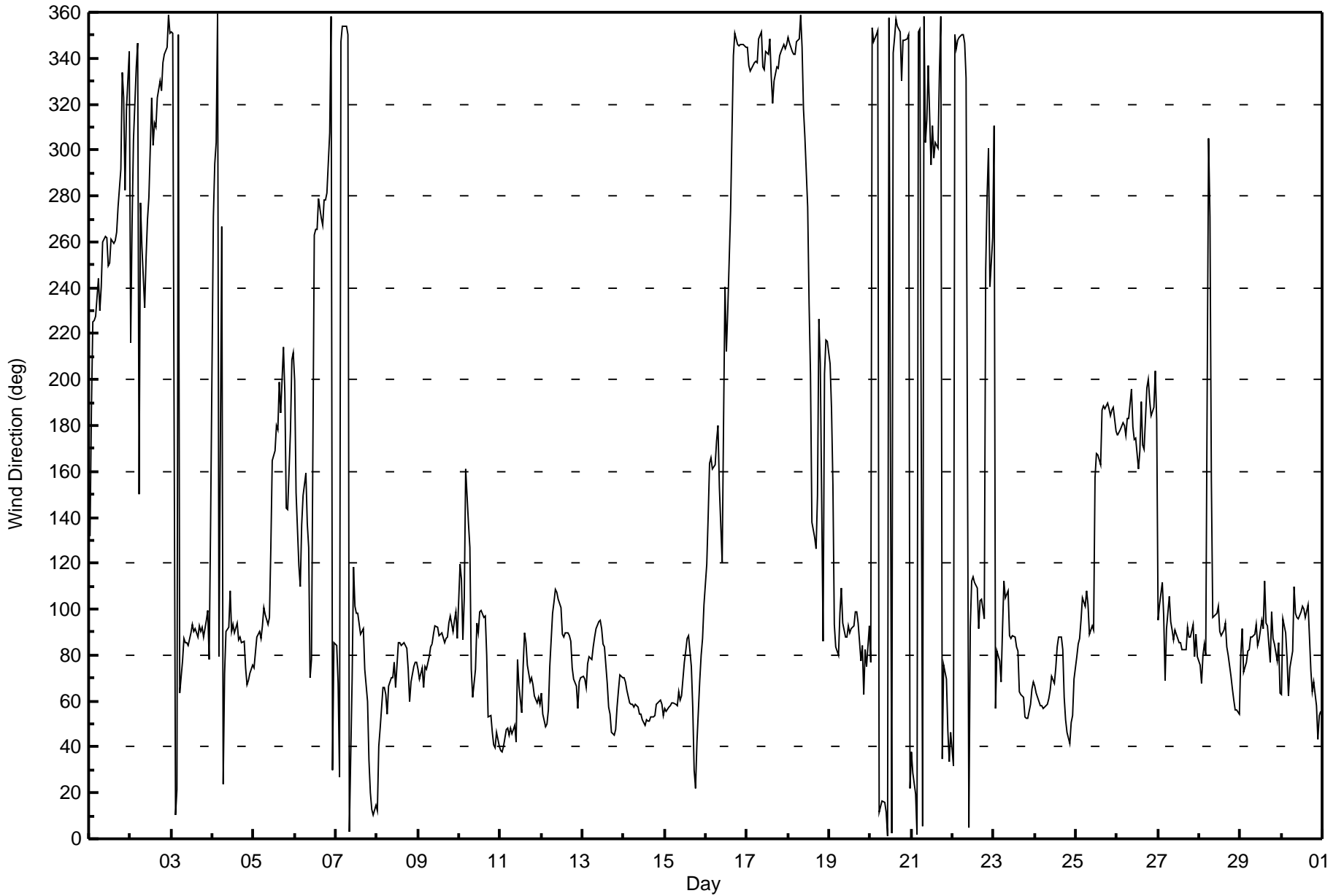
Wind Direction (WD) - deg
Fort Chipewyan - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 88 deg on Apr 23 01:00 Minimum Value: 2 deg on Apr 28 14:00 Percentiles: P ₁ = 4 P ₁₀ = 5 Q ₁ = 8 Median = 11 Q ₃ = 20 P ₉₀ = 32 P ₉₉ = 76																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	32	18	7	5	5	8	9	12	17	14	15	21	18	15	15	16	15	14	13	13	12	32	43	48	48
2-Apr	62	77	34	53	71	79	82	57	73	20	21	30	27	23	20	20	23	24	22	17	14	15	14	15	82
3-Apr	16	14	22	41	46	9	9	4	4	3	4	4	4	4	6	7	8	5	6	4	7	19	13	34	46
4-Apr	26	6	37	35	67	70	63	37	16	11	27	11	6	8	9	3	3	8	10	20	7	8	6	8	70
5-Apr	7	6	7	11	7	11	7	5	5	10	29	11	10	13	8	9	10	11	19	12	13	8	10	8	29
6-Apr	20	32	15	14	22	13	16	25	43	35	25	47	17	15	16	16	17	15	12	11	34	19	47	16	47
7-Apr	13	21	30	19	17	15	18	16	22	46	16	8	10	13	8	11	6	11	9	15	14	17	16	17	46
8-Apr	16	12	10	10	8	11	12	9	11	10	9	21	5	4	6	5	5	5	9	9	7	6	6	6	21
9-Apr	8	8	7	9	7	8	8	6	6	5	4	4	5	4	3	5	5	7	6	11	8	6	7	7	11
10-Apr	23	30	6	15	17	19	30	13	15	9	10	12	15	7	8	6	11	12	10	10	12	13	11	12	30
11-Apr	12	15	13	11	11	13	12	14	15	17	19	22	12	14	4	5	9	9	7	7	7	7	6	7	22
12-Apr	7	11	10	12	15	12	7	6	5	5	7	5	4	4	4	4	4	5	7	7	9	8	9	8	15
13-Apr	9	9	9	7	6	8	8	5	4	5	4	7	6	8	8	10	10	10	10	9	9	8	7	7	10
14-Apr	7	8	8	8	8	8	8	8	9	9	9	10	10	10	10	10	10	10	10	8	8	9	8	9	10
15-Apr	9	8	8	9	8	8	9	9	10	11	11	12	10	8	4	11	21	17	17	20	9	10	6	6	21
16-Apr	13	11	11	12	10	12	12	7	38	44	18	77	36	39	21	24	22	23	21	18	20	22	21	21	77
17-Apr	23	24	22	22	23	22	23	25	24	29	31	30	29	33	32	25	31	27	24	19	19	19	21	21	33
18-Apr	20	20	22	21	20	18	25	30	39	37	65	33	47	34	17	11	18	45	18	62	26	12	8	8	65
19-Apr	19	57	45	38	23	11	18	12	11	5	6	5	5	4	6	13	34	34	16	11	13	21	13	12	57
20-Apr	11	33	28	14	15	21	20	20	20	22	27	33	39	29	29	28	25	25	22	22	23	24	21	19	39
21-Apr	11	12	14	14	15	15	21	33	40	37	42	41	41	26	23	23	31	27	47	9	9	9	15	13	47
22-Apr	14	29	20	21	21	20	24	23	34	53	77	10	9	18	24	19	37	51	17	64	12	9	66	17	77
23-Apr	88	41	16	12	9	19	8	5	7	4	4	4	5	6	7	12	8	10	9	9	8	8	8	7	88
24-Apr	8	8	8	8	8	8	8	9	11	11	8	14	9	8	6	4	9	10	10	9	11	9	11	8	14
25-Apr	6	5	8	8	10	9	8	6	6	6	5	44	14	18	11	20	12	10	9	6	5	6	5	6	44
26-Apr	5	9	6	6	7	6	7	8	10	12	13	12	19	22	24	19	15	13	9	9	6	11	9	34	34
27-Apr	9	15	20	20	21	18	12	7	4	6	6	5	5	5	6	4	4	6	9	8	8	6	5	6	21
28-Apr	4	5	9	6	13	87	42	52	5	5	5	6	3	2	4	4	14	18	9	8	8	8	7	9	87
29-Apr	23	12	9	29	11	6	4	6	7	6	6	5	5	4	18	13	11	7	13	15	9	11	8	11	29
30-Apr	10	36	9	10	5	6	9	12	13	8	8	9	7	6	8	11	7	9	8	10	8	11	13	9	36
																		88 77 45 53 71 87 82 57 73 53 77 77 47 39 32 28 37 51 47 64 34 32 66 48							
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Fort Chipewyan - April 2017





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name: Fort Chipewyan Station number: AMS 08
 Calibration Date: April 19, 2017 Last Cal Date: March 22, 2017
 Start time (MST): 10:10 End time (MST): 15:35
 Reason: Routine

Calibration Standards

Cal Gas Concentration 2.35 ppm Cal Gas Exp Date 2/13/18
 Cal Gas Cylinder # LL79696
 Calibrator Make/Model API T700 Serial Number 2656
 ZAG Make/Model API T701 Serial Number 4698

Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1136451241

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-827	-827
Calculated slope	1.001791	0.991420	Lamp voltage	1026	1026
Calculated intercept	-0.100259	0.014210	Pressure	716.4	717.3
Analyzer Background	1.3	1.5	Flow	0.433	0.434
Analyzer Coefficient	1.117	1.125	Intensity	90	90

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5996	0.0	0.0	0.2	----
as found span	5955	44.8	17.5	17.6	0.996
calibrator zero	5996	0.0	0.0	0.0	----
high point	5955	44.8	17.5	17.6	0.995
second point	5970	29.9	11.7	11.9	0.986
third point	5985	15.0	5.9	5.9	0.994
as left zero	5996	0.0	0.0	0.0	----
as left span	5955	44.8	17.5	17.2	1.019

Average Correction Factor				0.992
Corrected As found	17.46	Previous response	17.62	*% change 0.9%

* = > +/-5% change initiates investigation

Notes: Zero and span adjusted.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

SO₂ Calibration Summary

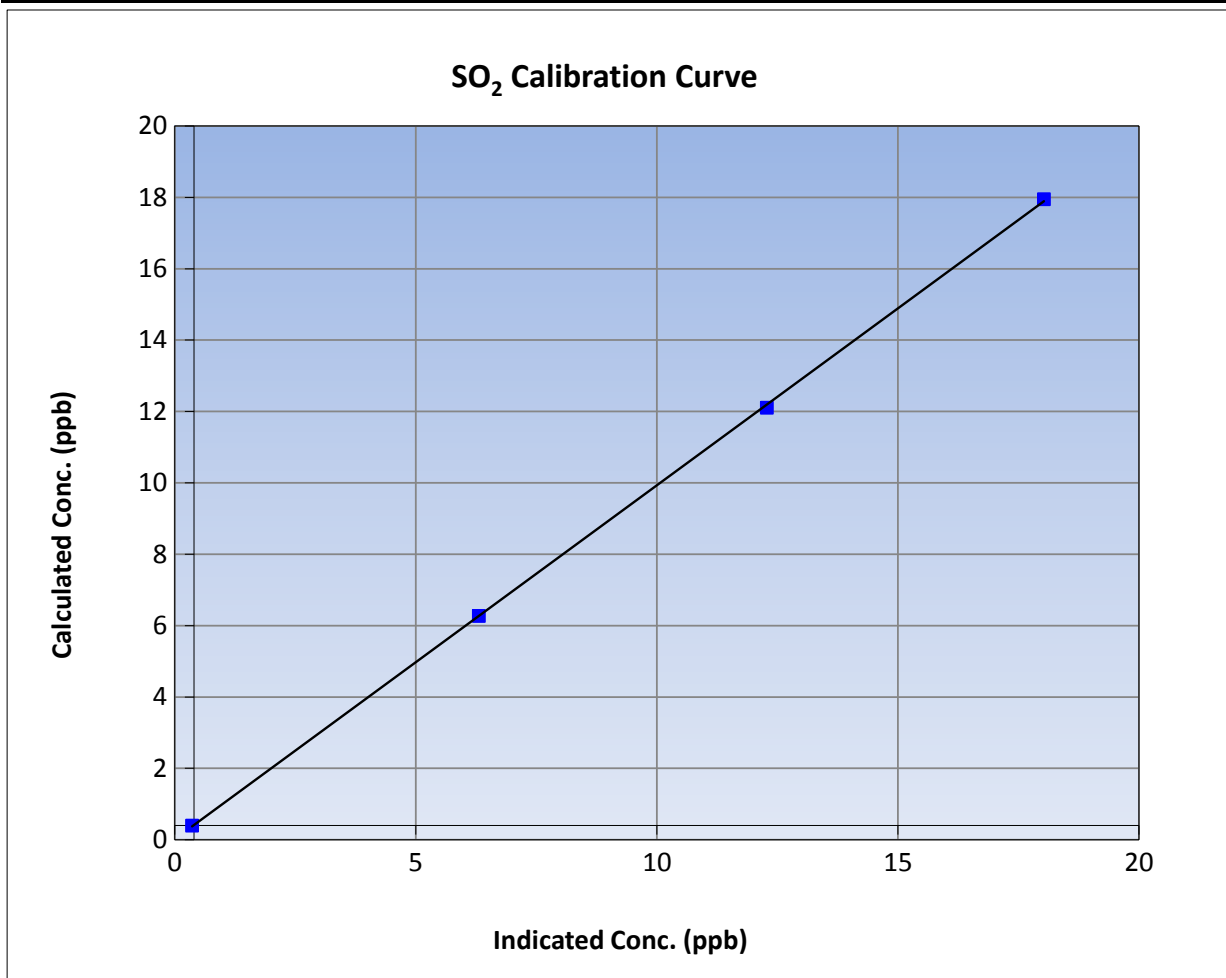
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 22, 2017
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	10:10	End Time (MST)	15:35
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1136451241

Calibration Data

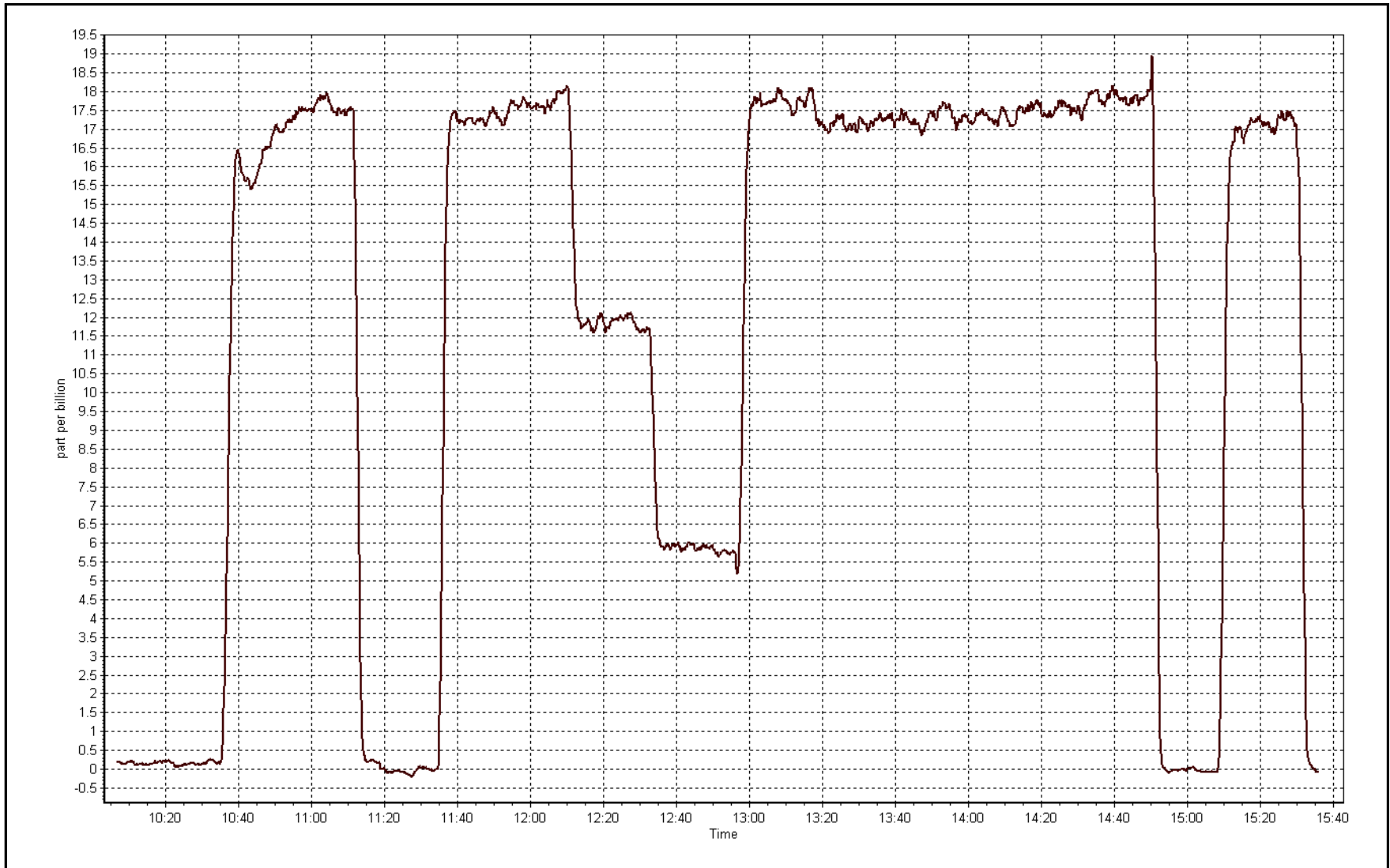
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999940	≥0.995
17.5	17.6	0.9953			
11.7	11.9	0.9858	Slope	0.991420	0.90 - 1.10
5.9	5.9	0.9941			
			Intercept	0.014210	+/-30



SO2 Calibration Plot

Date: April 19, 2017

Location: Fort Chipewyan





Wood Buffalo Environmental Association

O₃ Calibration Report

Version-03-2017

Station Information

Station Name: Fort Chipewyan Station number: AMS 08
 Calibration Date: April 20, 2017 Last Cal Date: March 22, 2017
 Start time (MST): 7:10 End time (MST): 10:00
 Reason: Routine

Calibration Standards

O3 generation mode: Photometer O3 reference Date: April 20, 2017
 Calibrator Make/Model: API T700 Serial Number: 2656
 ZAG Make/Model: API T701 Serial Number: 4698

Analyzer Information

Analyzer make: API T400 Analyzer serial #: 1020

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 500 ppb		Pressure	27.4	27
Calculated slope	1.001088	0.997187	Flow cell A	763.0	760.0
Calculated intercept	0.097618	0.002170	Flow cell B	766.0	756.0
Analyzer Background	-0.4	-0.4	O3 Measure	3634.1	3632.500
Analyzer Coefficient	0.997	1.016	O3 Reference	3634.1	3634

O₃ Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5994	800.0	0.0	-0.2	----
as found span	5844	811.6	100.0	98.8	1.012
calibrator zero	5994	800.0	0.0	0.0	----
high point	5844	811.6	100.0	100.3	0.997
second point	5849	777.0	80.0	80.2	0.998
third point	5849	715.6	50.0	50.2	0.997
as left zero	5994	800.0	0.0	0.2	----
as left span	5844	811.6	100.0	102.5	0.975
Average Correction Factor					0.997

Corrected As found 98.98 Previous response 99.79 *% change 0.8%

* = > +/-8% change initiates investigation

Notes: Span adjusted.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

O₃ Calibration Summary

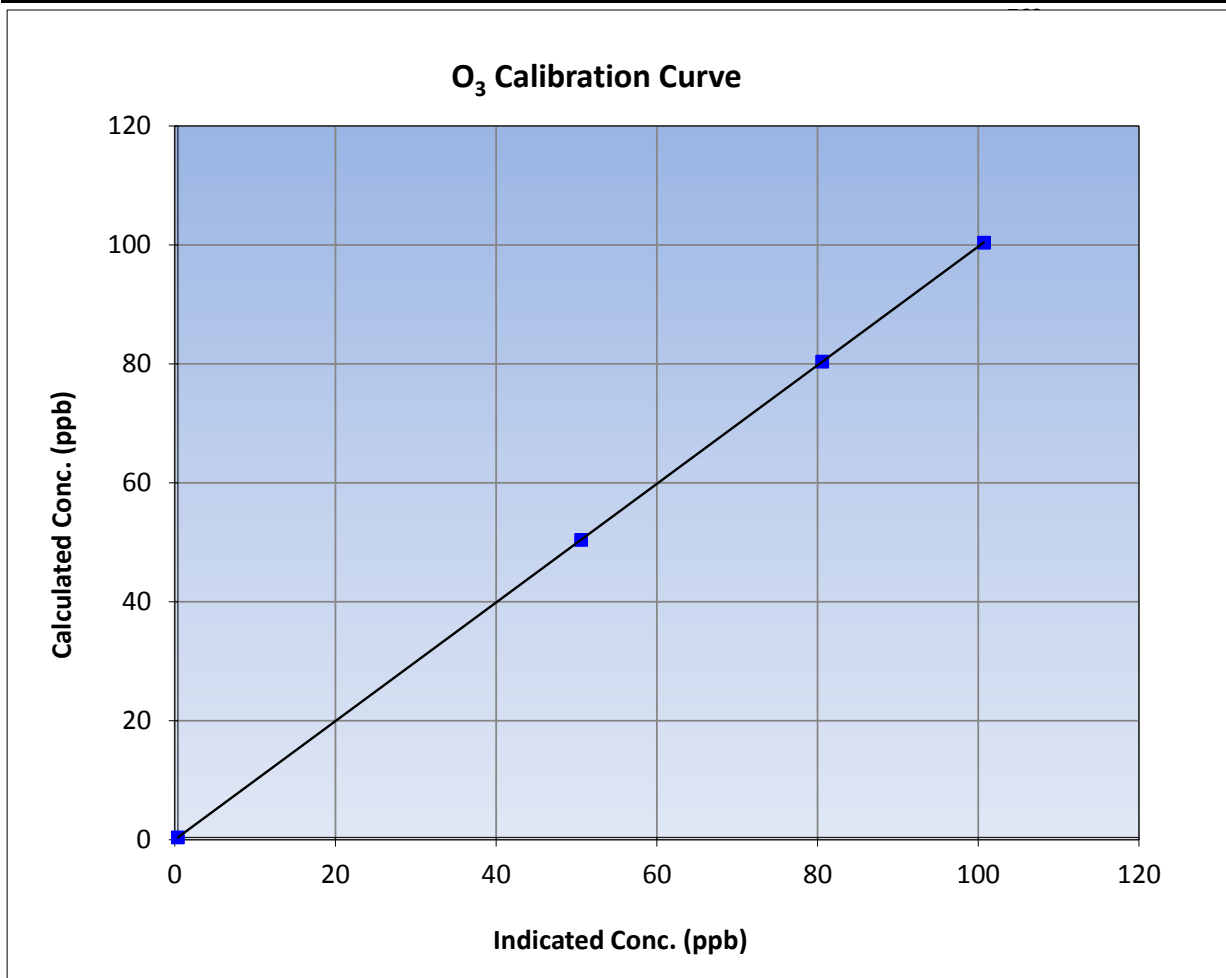
Version-03-2017

Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 22, 2017
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	7:10	End Time (MST)	10:00
Analyzer make	API T400	Analyzer serial #	1020

Calibration Data

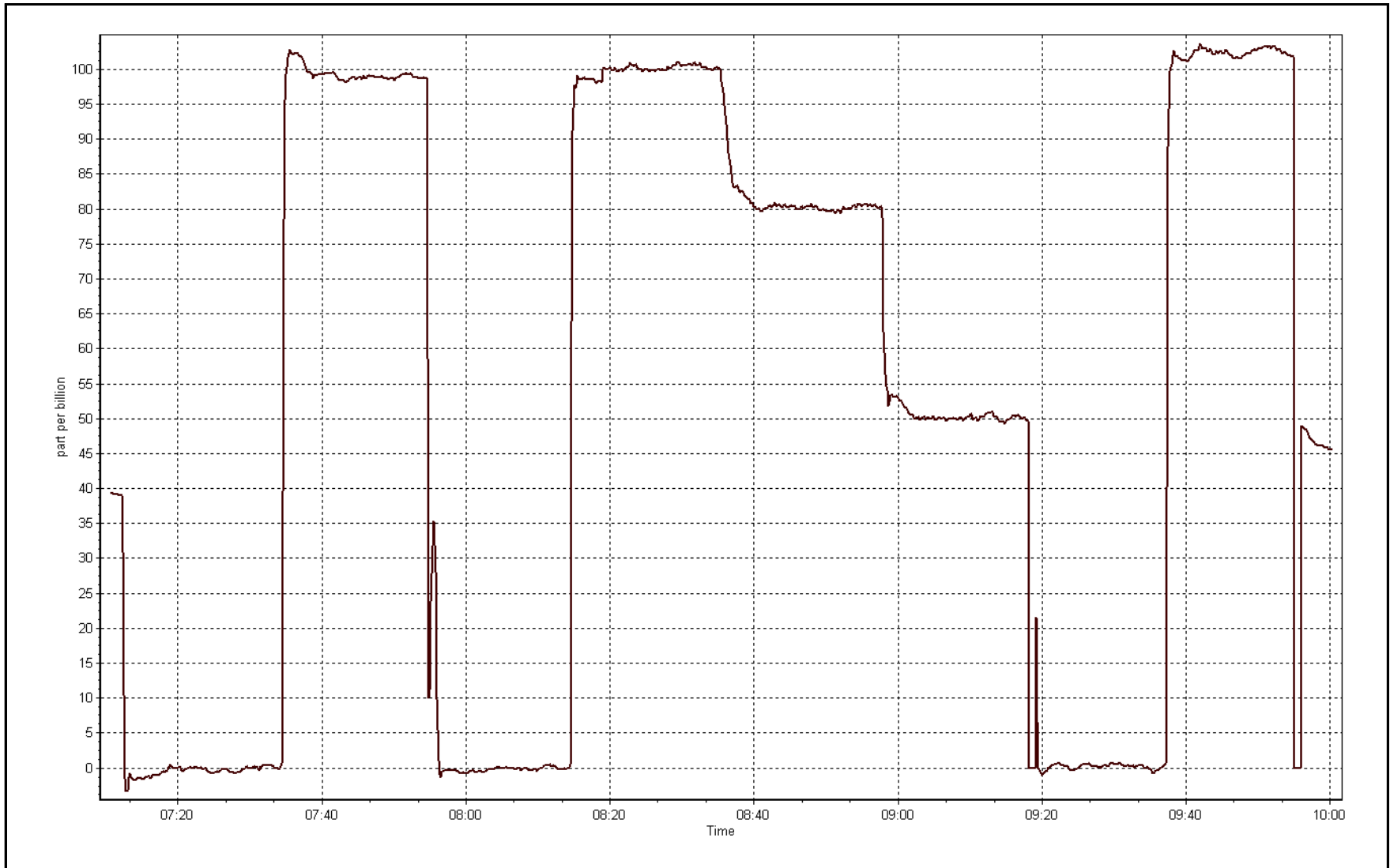
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.0	----	Correlation Coefficient	0.999999	≥0.995
100.0	100.3	0.9968			
80.0	80.2	0.9980	Slope	0.997187	0.90 - 1.10
50.0	50.2	0.9968			
			Intercept	0.002170	+/- 10



O₃ Calibration Plot

Date: April 20, 2017

Location: Fort Chipewyan





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	April 19, 2017	Last Cal Date:	March 22, 2017
Start time (MST):	10:10	End time (MST):	15:35
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL79696	Cal Gas Expiry Date	2/13/18
NOX Cal Gas Conc.	<u>20.1</u> ppb	NO Cal Gas Conc.	<u>20.1</u> ppb
Calibrator Model	API T700	Serial Number	2656
ZAG make/model	ATI T701	Serial Number	4698

Analyzer Information

Analyzer make: API T200u		Analyzer serial #: 11039	
	<u>Start</u>	<u>Finish</u>	
NO coefficient	1.299	1.337	NOX Range (ppb) 0 - 1000 ppb
NOX coefficient	1.317	1.350	PMT Temperature 5.1 5.1
NO2 coefficient	1.000	1.000	Reaction cell Press 4.2 4.2
NO bkgrnd	0.1	0.1	Sample Flow 1116 1116
NOX bkgrnd	0.2	0.2	PMT Voltage 502.0 502.0

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	1.001897	0.996198
NO _x Cal Offset	0.352197	0.171472
NO Cal Slope	1.004030	0.993941
NO Cal Offset	0.353600	0.251861
NO ₂ Cal Slope	1.001577	1.004909
NO ₂ Cal Offset	-0.230589	0.214691



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5996	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
as found span	5955	44.8	150.1	150.1	0.0	146.5	146.1	0.4	1.0245	1.0271
calibrator zero	5996	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
high point	5955	44.8	150.1	150.1	0.0	150.5	150.8	-0.4	0.9975	0.9950
second point	5970	29.9	100.2	100.2	0.0	100.5	100.5	0.0	0.9969	0.9969
third point	5985	15.0	50.3	50.3	0.0	50.1	50.1	0.0	1.0022	1.0028
as left zero	5996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
as left span	5955	44.8	150.1	43.2	106.9	151.3	42.6	108.8	0.9918	1.0136
Average Correction Factor									0.9989	0.9982

Corrected As found	NO _x = 146.6 ppb	NO = 146.2 ppb		*Percent Change	NO _x = 2.0%
Previous Response	NO _x = 149.4 ppb	NO = 149.1 ppb		*Percent Change	NO = 2.0%

* = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	150.5	150.9	-0.4	0.9974	0.9948	----	----
1st NO2 (100 ppb O3)	43.2	107.7	150.5	43.2	107.3	0.9975	----	1.0038	99.6%
2nd NO2 (80 ppb O3)	64.8	86.1	150.0	64.8	85.2	1.0005	----	1.0101	99.0%
3rd NO2 (50 ppb O3)	95.9	55.0	150.1	95.9	54.2	1.0000	----	1.0144	98.6%
2nd NO ref point	----	0.0	149.9	150.0	-0.1	1.0010	1.0004	----	----
Average Correction Factor						0.9997	0.9976	1.0094	99.1%

Notes:

Span adjusted slightly.

Calibration Performed By: Devin Russell



Wood Buffalo Environmental Association

NO_x Calibration Summary

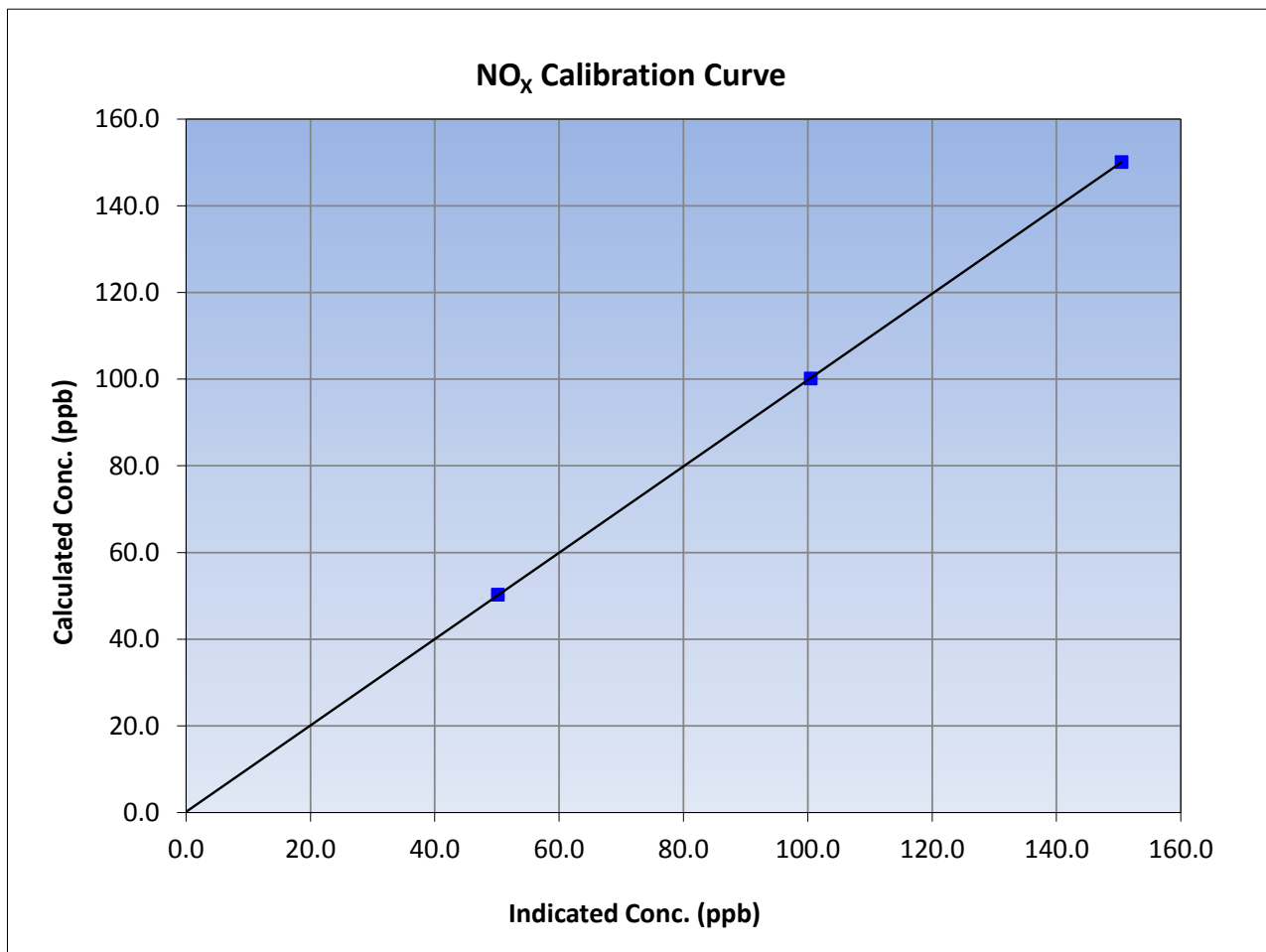
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 22, 2017
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	10:10	End Time (MST)	15:35
Analyzer make	API T200u	Analyzer serial #	11039

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
150.1	150.5	0.9975			
100.2	100.5	0.9969			
50.3	50.1	1.0022			
			Slope	0.996198	0.90 - 1.10
			Intercept	0.171472	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

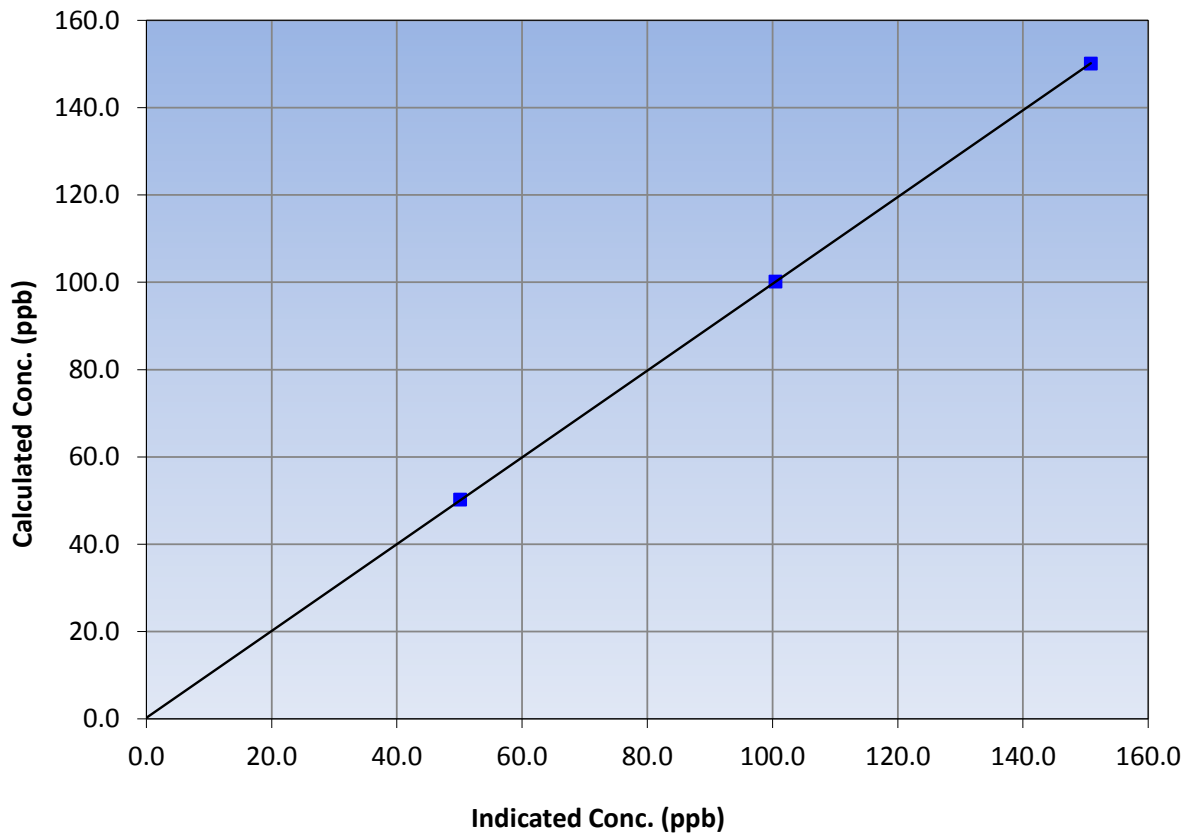
Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 22, 2017
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	10:10	End Time (MST)	15:35
Analyzer make	API T200u	Analyzer serial #	11039

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
150.1	150.8	0.9950			
100.2	100.5	0.9969			
50.3	50.1	1.0028			
			Slope	0.993941	0.90 - 1.10
			Intercept	0.251861	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

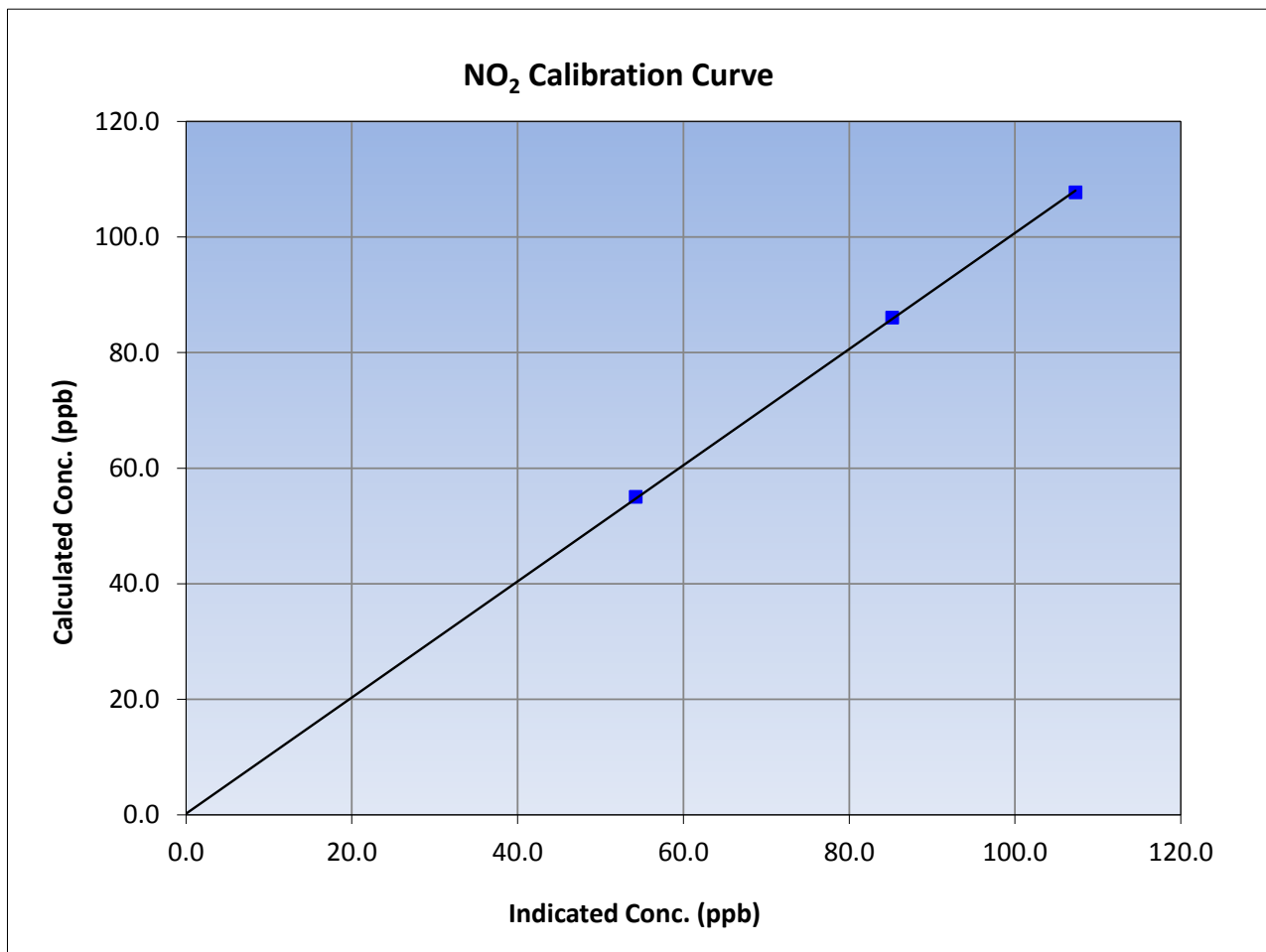
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 22, 2017
Station Name	Fort Chipewyan	Station Number	AMS 08
Start Time (MST)	10:10	End Time (MST)	15:35
Analyzer make	API T200u	Analyzer serial #	11039

Calibration Data

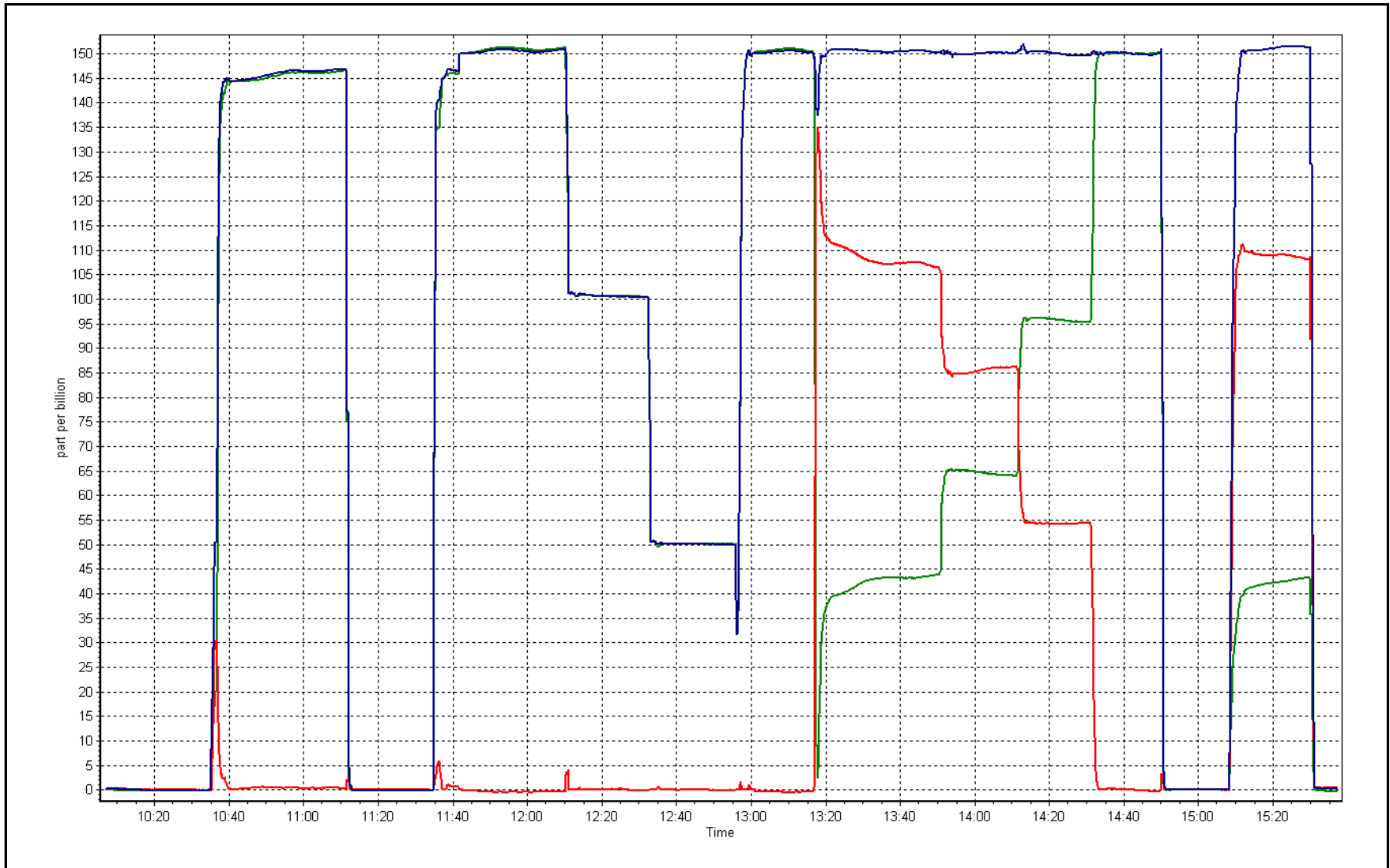
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
107.7	107.3	1.0038			
86.1	85.2	1.0101			
55.0	54.2	1.0144			
			Slope	1.004909	0.90 - 1.10
			Intercept	0.214691	+/-20



NO_x Calibration Plot

Date: April 19, 2017

Location: Fort Chipewyan





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Fort Chipewyan	Station number:	AMS 08
Calibration Date:	April 20, 2017	Last Cal Date:	March 23, 2017
Start time (MST):	7:15	End time (MST):	8:45
Sharp Model:	Thermo 5030	S/N:	E-2025
Particulate Fraction:	PM2.5	C14 Source S/N:	7414
Flow Meter Make/Model:	Delta Cal	S/N:	1450
Temp/RH standard:	Delta Cal	S/N:	1450

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	-2	-0.7	-2	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	987	990.98	987	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	1000.8	1000	<input type="checkbox"/>	+/- 50 LPH
Nephelometer zero	0.4	-----	0.4	<input type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: _____ Date of check: _____ Last Cal Date: March 23, 2017
 Flow w/o adaptor: _____ Flow w/ adaptor: _____

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: _____	Foil S/N: _____	
Foil Calibration	Foil Mass: _____	Foil Mass: _____	
	Calibration Date: _____	Calibration Date: _____	
(Limit) +/- 5% of previous	Correction Factor: <u>7120</u>	Correction Factor: <u>7000</u>	<u>1.71%</u>

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Cyclone head cleaned. No adjustments needed to temperature, pressure flow, or nephelometer.

Calibration by: Devin Russell



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 9 BARGE LANDING APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
 APRIL2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
TRS(ppb) Average	681	33	39	99.17	1	0	1	0
THC(ppm) Average	680	34	40	99.17	4.3	-	2.4	-
Temperature (C) Average	720	0	0	100	18.6	-	10.8	-
Relative Humidity (%) Average	720	0	0	100	98	-	82	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	19	-	12	-
Wind Direction 10 m (deg) Average	719	0	1	99.86	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
TRS(ppb) Average	681	0.3	0	-	0	0	0	0	0	1	1
THC(ppm) Average	680	2.23	0.2	-	2	2.1	2.1	2.2	2.3	2.4	4.3
Temperature (C) Average	720	2.47	6.2	-	-12.2	-5.3	-2.6	2.3	6.4	11.4	18.6
Relative Humidity (%) Average	720	58.4	19	-	14	34	44	58	72	86	98
Wind Speed 10 m (km/h) Average	719	7.2	4	-	0	3	4	7	10	12	19
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS, THC	13 Apr 2017 18:00	13 Apr 2017 23:00	6	Station power failure
Wind Speed, Wind Direction	01 Apr 2017 20:00	01 Apr 2017 20:00	1	Flat line in sensor output signal

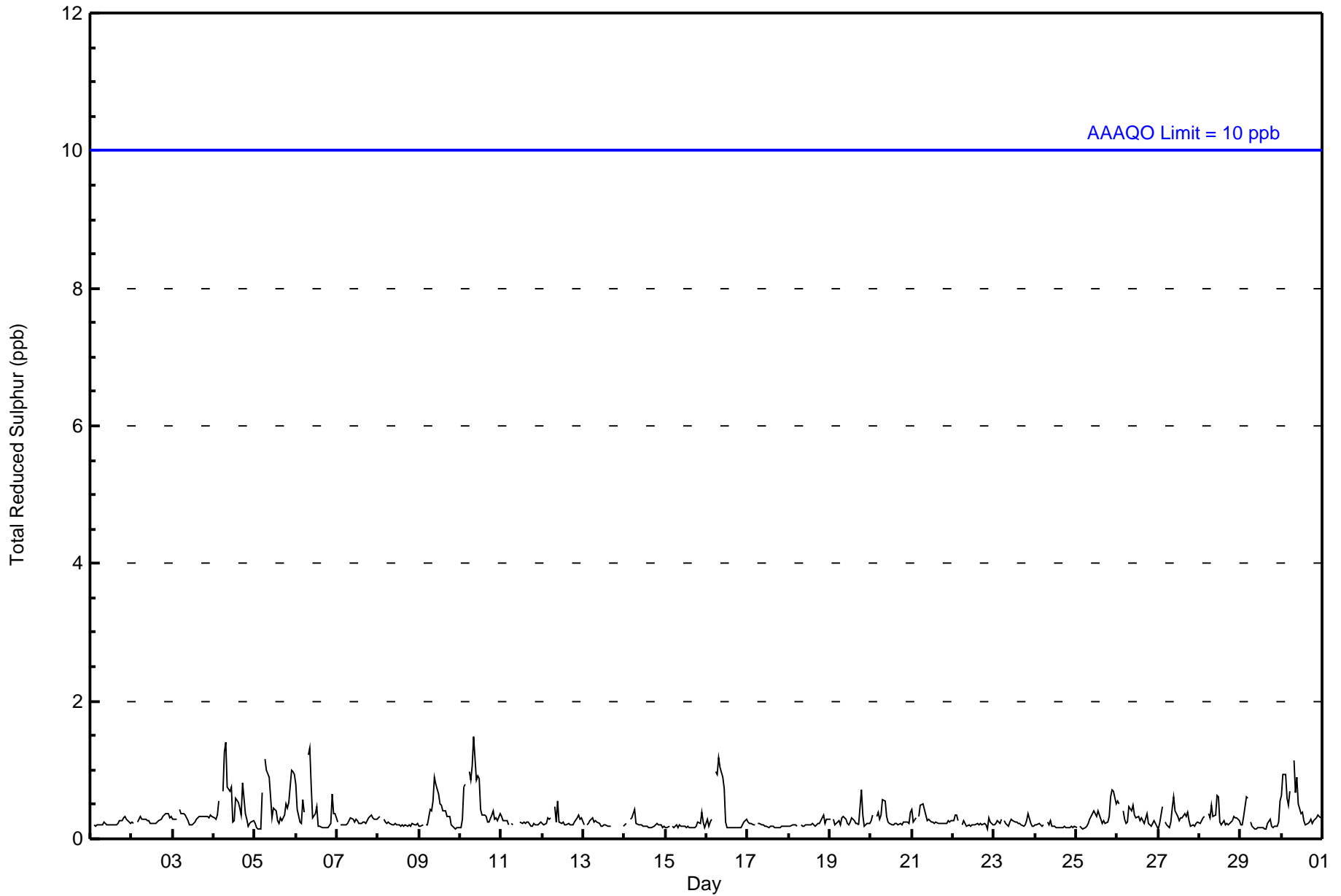


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1 ppb on Apr 10 09:00	Maximum Daily Average: 0.6 ppb on Apr 10		Hours of Data:	681
Minimum Value: 0 ppb on Apr 5 04:00	Minimum Daily Average: 0.2 ppb on Apr 15		Hours of Missing Data:	39
Maximum Diurnal Average: 0.5 ppb at hour 8	Minimum Diurnal Average: 0.2 ppb at hour 17		Hours of Calibration:	33
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 1		Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
4-Apr	0	0	0	1	Z	1	1	1	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0.5	1
5-Apr	0	0	0	0	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0.5	1
6-Apr	1	0	0	0	1	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.4	1
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	Z	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
10-Apr	0	0	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1
11-Apr	0	0	0	0	0	Z	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	0	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	--	0
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Apr	0	0	0	0	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
20-Apr	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
21-Apr	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.3	1
26-Apr	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
27-Apr	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Apr	0	0	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
29-Apr	0	0	0	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
30-Apr	1	1	1	1	0	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1

0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average
1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0	1	1	1	1	1	Diurnal Maximum

Z - zerospan C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Barge Landing - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	681	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	68	137	65	32	18	15	42	73	66	41	29	26	11	9	10	38	680
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	137	65	32	18	15	42	73	66	41	29	26	11	9	10	38	680

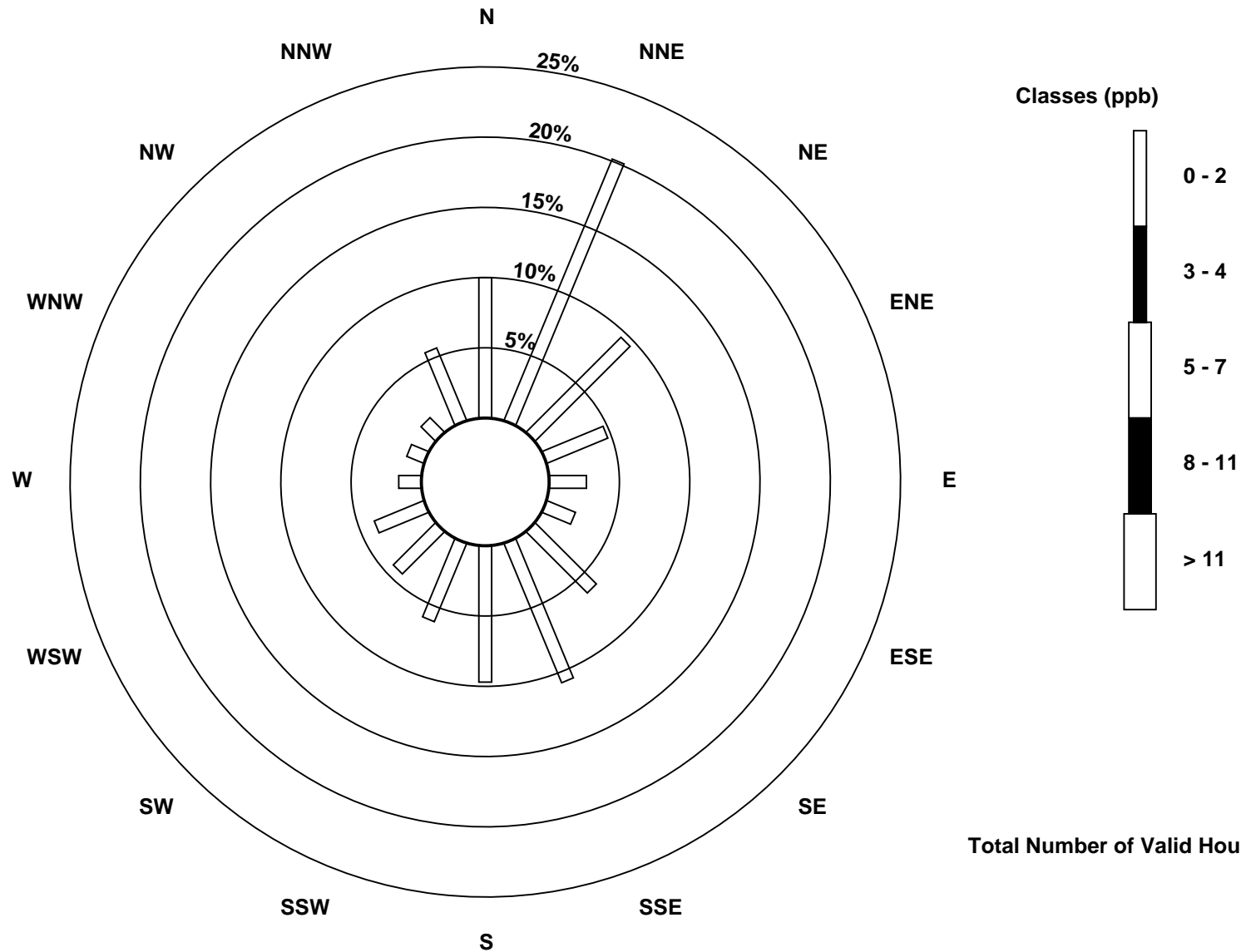
Total Number of Valid Hours: 680

Total Number of Hours: 720

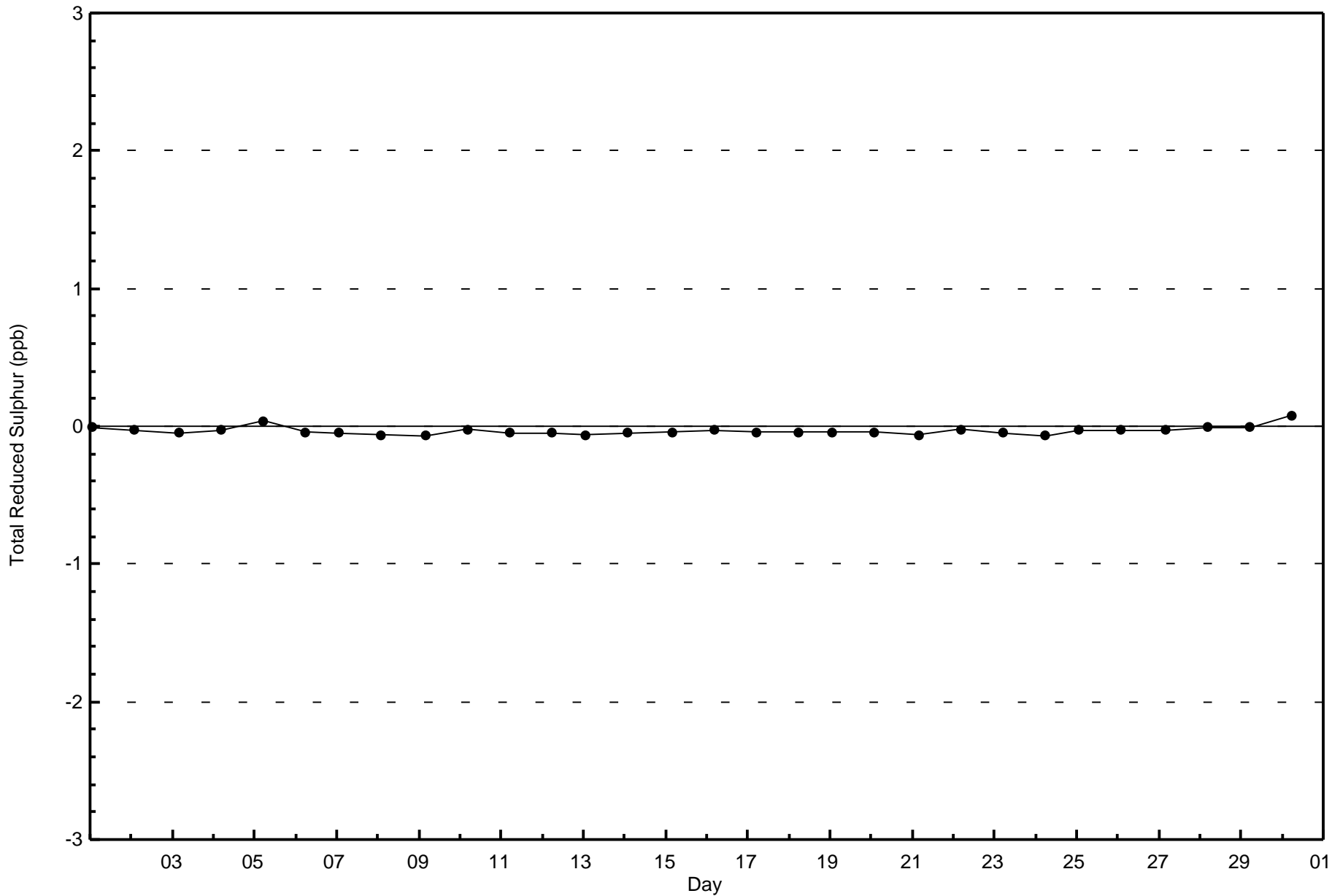


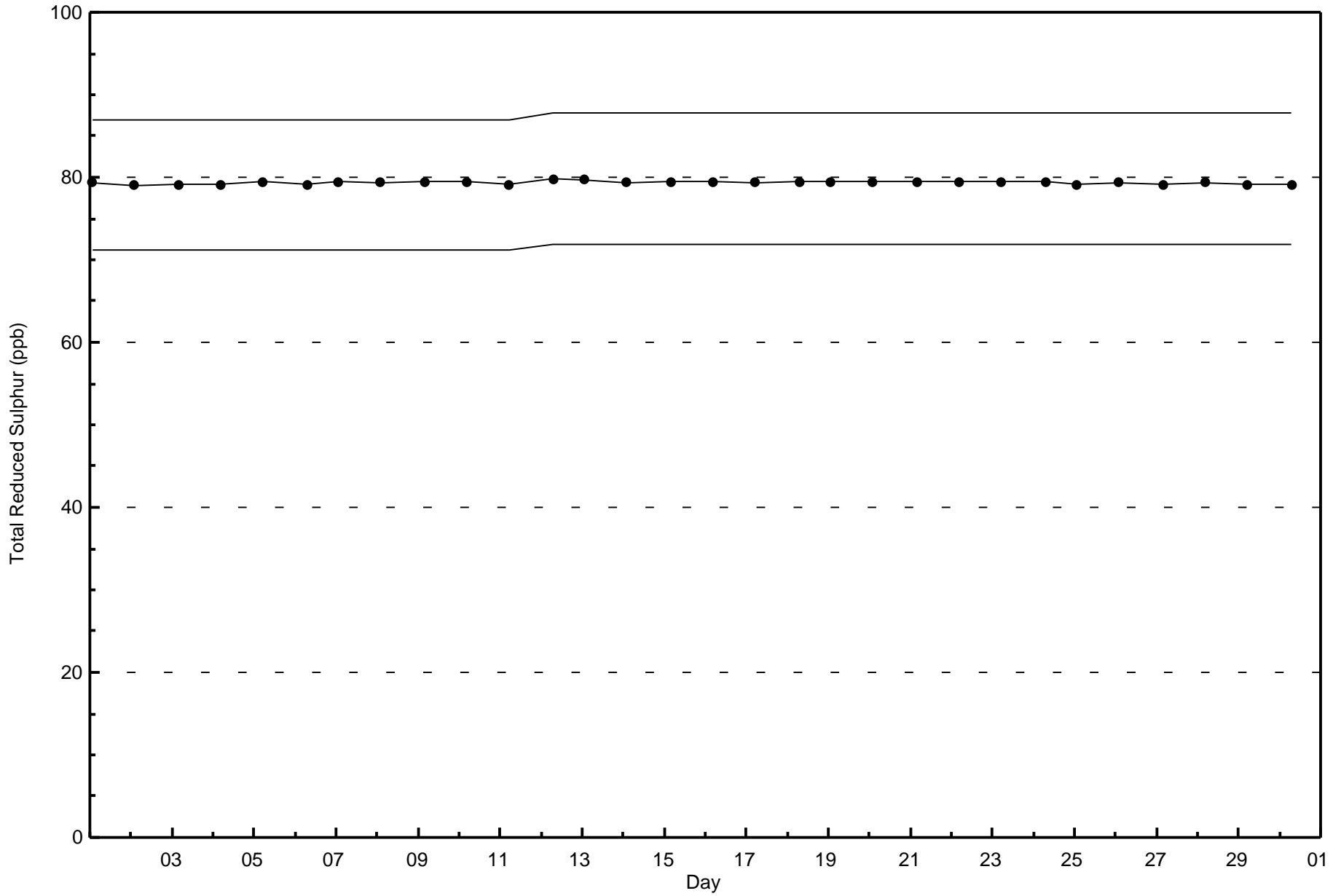
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Barge Landing (AMS 9)



Total Number of Valid Hours: 680







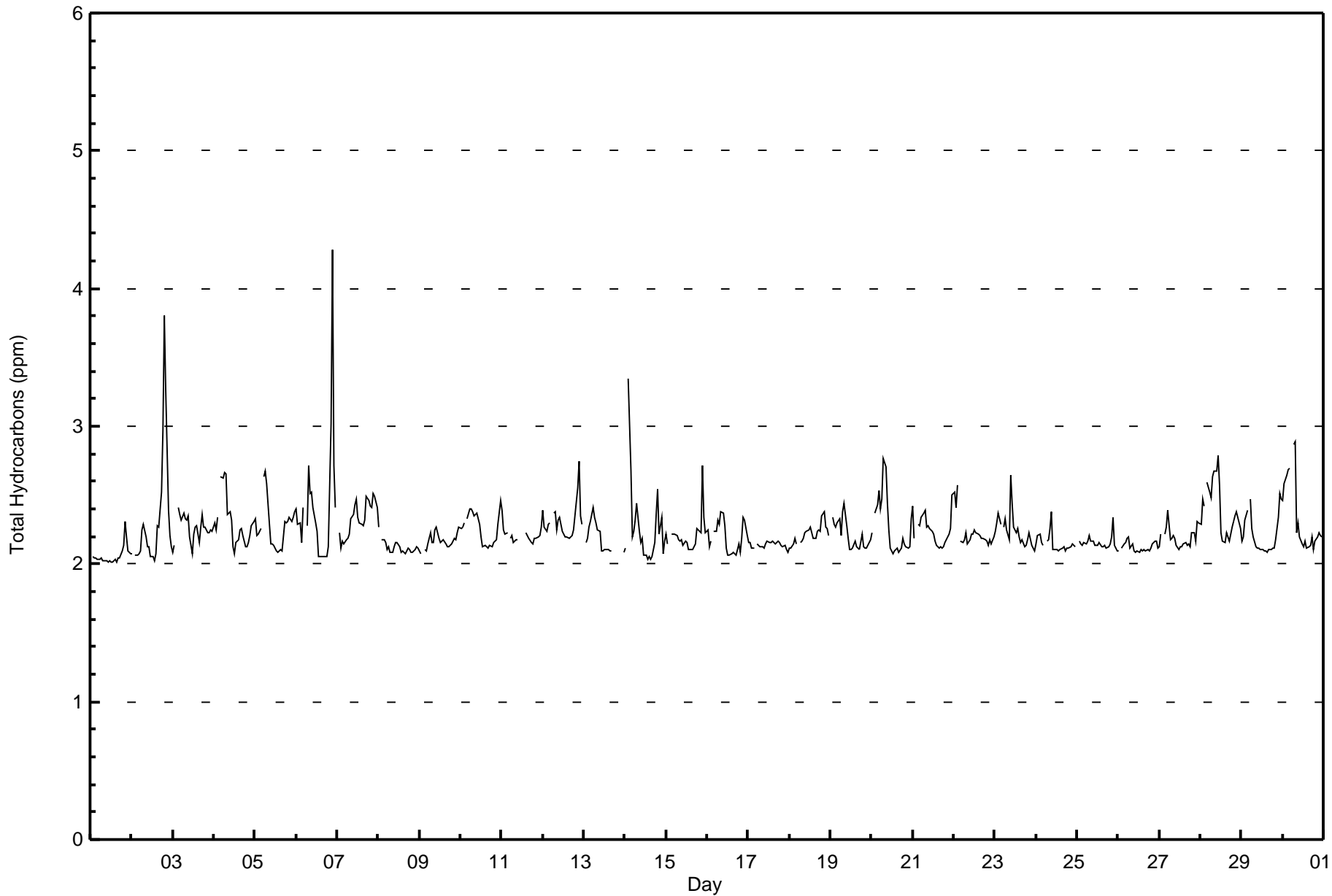
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - April 2017

Maximum Value: 4.3 ppm on Apr 6 22:00		Maximum Daily Average: 2.4 ppm on Apr 6		Hours in Service: 720																																													
Minimum Value: 2.0 ppm on Apr 1 11:00		Minimum Daily Average: 2.1 ppm on Apr 1		Hours of Data: 680																																													
Maximum Diurnal Average: 2.3 ppm at hour 22		Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Missing Data: 40																																													
Monthly Average: 2.23 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.9		Hours of Calibration: 34																																													
				Percent Operational Time: 99.2																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.3	2.3																						
2-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.3	2.5	3.0	3.8	3.3	2.4	2.2	2.1	2.1	2.3	3.8																						
3-Apr	2.1	2.1	Z	2.4	2.4	2.3	2.4	2.3	2.3	2.4	2.2	2.1	2.2	2.3	2.3	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4																						
4-Apr	2.3	2.2	2.3	Z	2.6	2.6	2.7	2.7	2.4	2.4	2.3	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.7																						
5-Apr	2.3	2.2	2.2	2.3	Z	2.6	2.7	2.6	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.7																						
6-Apr	2.4	2.3	2.3	2.2	2.4	Z	2.3	2.7	2.5	2.5	2.4	2.3	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	3.0	4.3	2.7	2.4	2.4	4.3	4.3																						
7-Apr	Z	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.4	2.4	2.5	2.5	2.4	2.3	2.5	2.5																						
8-Apr	2.3	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																						
9-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.3	2.3																						
10-Apr	2.3	2.3	2.3	Z	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.5	2.3	2.5	2.5																						
11-Apr	2.4	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.4																						
12-Apr	2.4	2.3	2.2	2.3	2.3	Z	2.4	2.4	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.7	2.3	2.3	2.3	2.7																						
13-Apr	Z	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	PF	PF	PF	PF	PF	PF	2.1	--	2.4																						
14-Apr	2.1	Z	3.3	2.7	2.2	2.2	2.3	2.4	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.0	2.1	2.2	2.4	2.5	2.2	2.3	2.1	2.2	2.3	3.3	3.3																						
15-Apr	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.7	2.3	2.2	2.2	2.7																						
16-Apr	2.3	2.1	2.2	Z	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.4																						
17-Apr	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2																						
18-Apr	2.1	2.1	2.1	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.4																						
19-Apr	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.4																						
20-Apr	2.2	Z	2.4	2.4	2.5	2.4	2.5	2.8	2.7	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.8																						
21-Apr	2.4	2.2	Z	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.5	2.2	2.2	2.5																						
22-Apr	2.5	2.4	2.6	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.6																						
23-Apr	2.2	2.3	2.4	2.3	Z	2.3	2.3	2.3	2.2	2.6	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.6																						
24-Apr	2.1	2.2	2.2	2.2	2.1	Z	2.2	2.2	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.4																						
25-Apr	Z	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.2	2.3																						
26-Apr	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2																						
27-Apr	2.1	2.2	Z	2.2	2.3	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.4																						
28-Apr	2.3	2.5	2.4	Z	2.6	2.5	2.5	2.6	2.7	2.7	2.8	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.8																						
29-Apr	2.2	2.2	2.3	2.4	Z	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.5	2.2	2.2	2.5																						
30-Apr	2.5	2.6	2.6	2.7	2.7	Z	2.9	2.9	2.2	2.3	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.9																						
																								2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.2	Diurnal Average
																								2.5	2.6	3.3	2.7	2.7	2.6	2.9	2.9	2.7	2.7	2.8	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.5	3.0	3.8	3.3	4.3	2.7	2.5	Diurnal Maximum
Z - zerospan																								C - Calibration				PF - Power Failure																					





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Barge Landing - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	21	3.09	3.09
2.1 - 3.0	655	96.32	99.41
3.1 - 10.0	4	0.59	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Barge Landing - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	2	0	0	0	0	1	1	2	6	3	1	3	2	21
2.1 - 3.0	62	139	62	30	17	16	42	71	67	39	27	20	8	8	7	39	654
3.1 - 10.0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	63	141	62	33	17	16	42	71	68	40	29	26	11	9	10	41	679

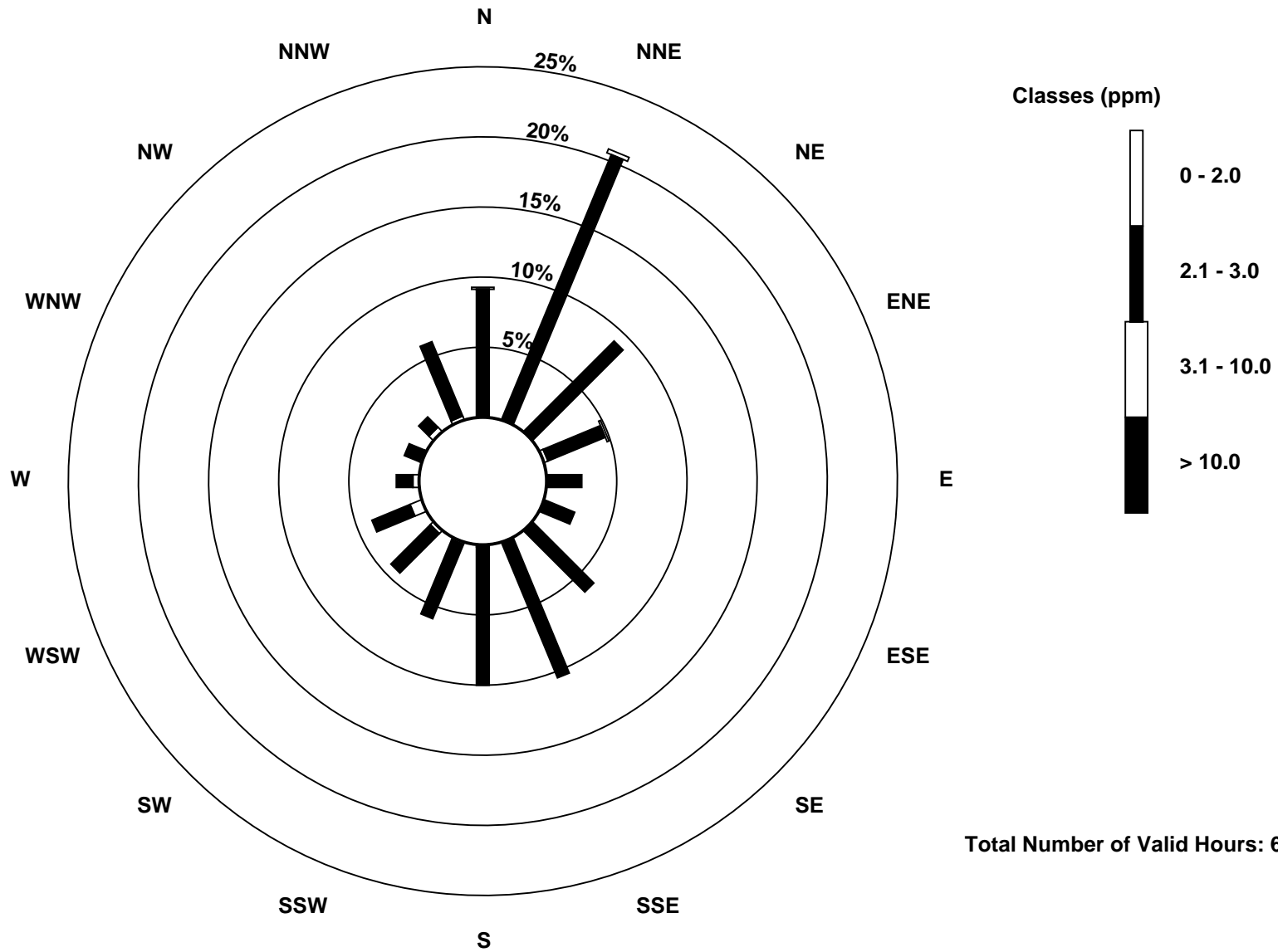
Total Number of Valid Hours: 679

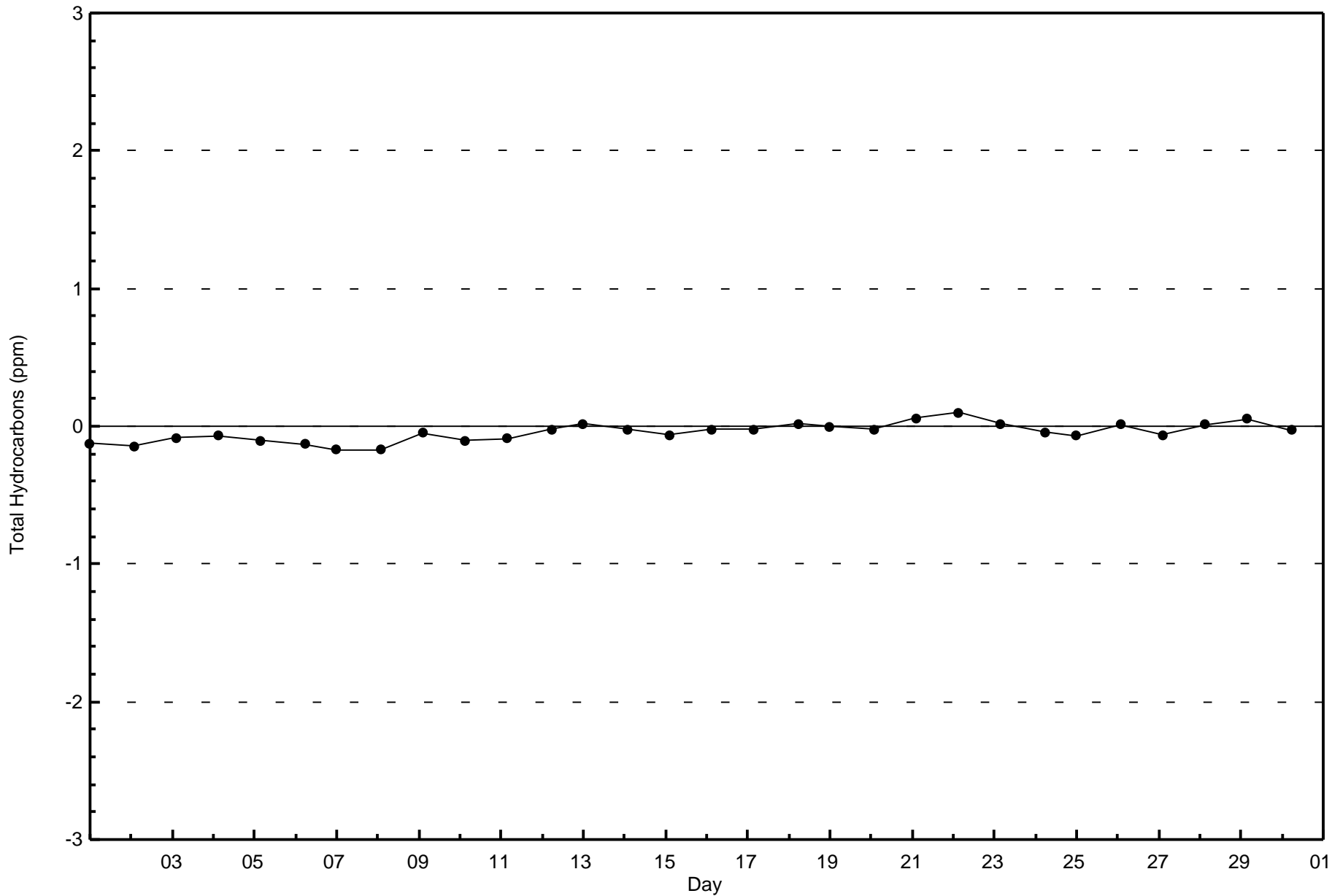
Total Number of Hours: 720

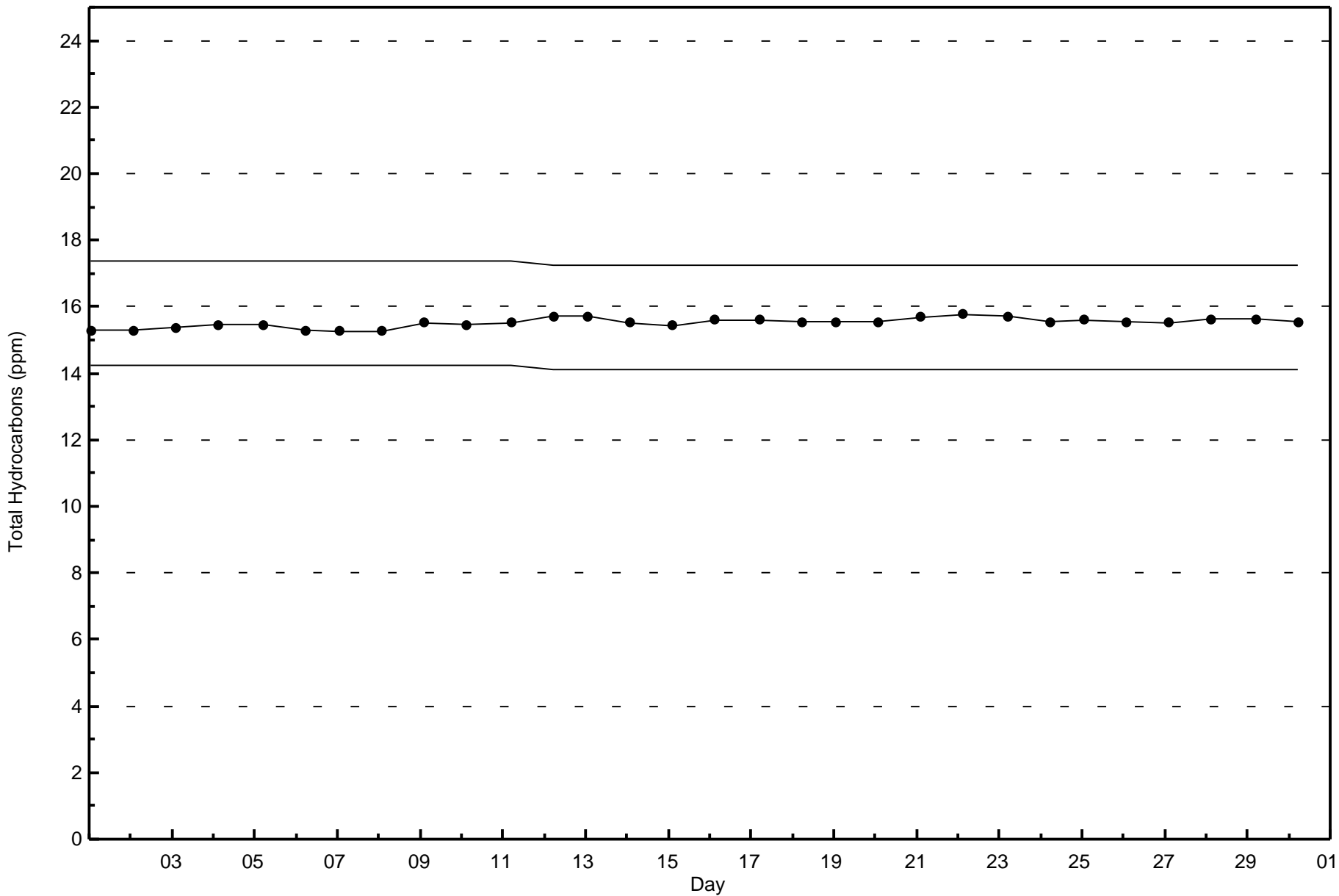


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Barge Landing (AMS 9)









Wood Buffalo Environmental Association
Summary of Hour Averages

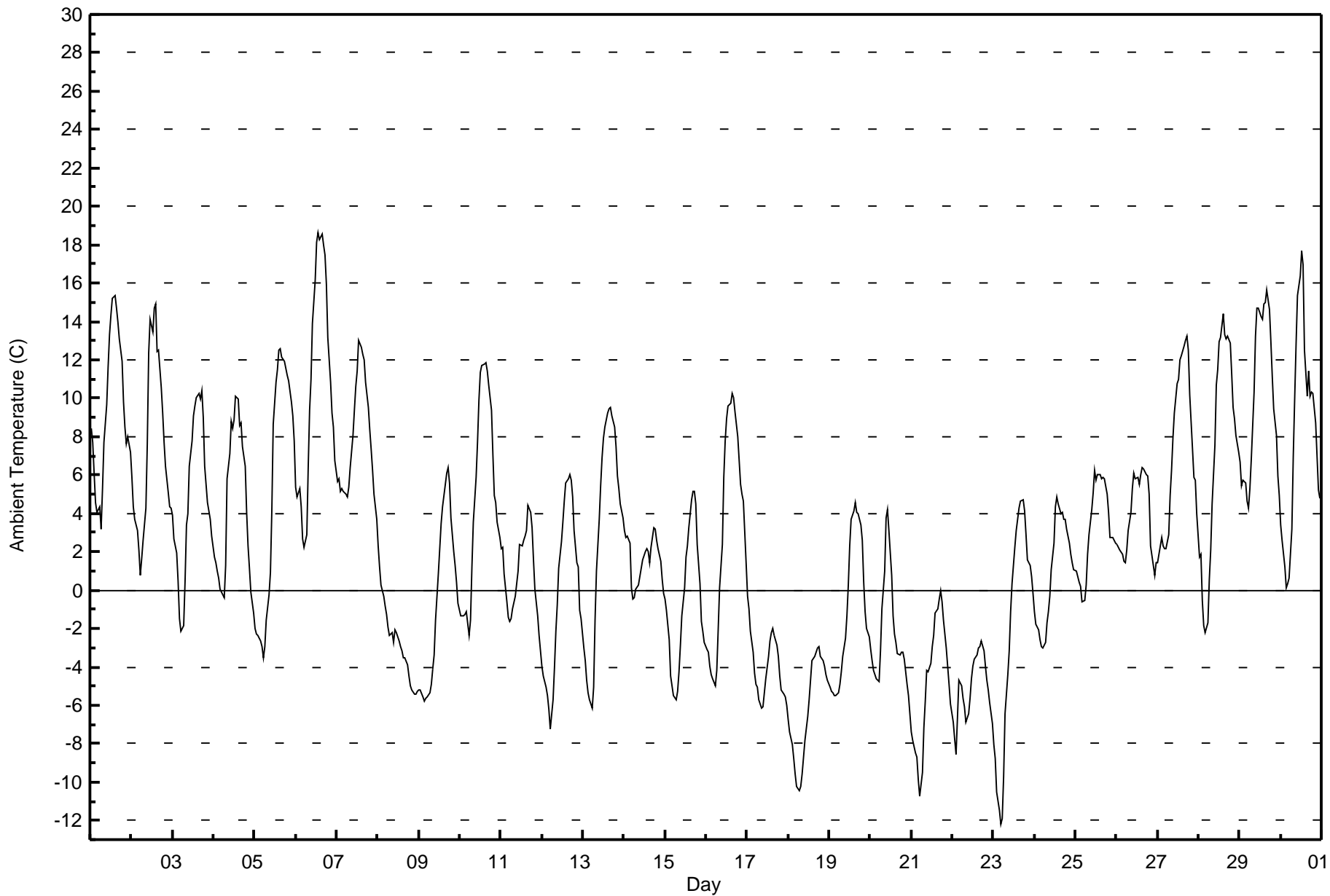
Ambient Temperature (AT) - C
Barge Landing - April 2017

Maximum Value: 18.6 C on Apr 6 14:00		Maximum Daily Average: 10.8 C on Apr 6		Hours in Service: 720																						
Minimum Value: -12.2 C on Apr 23 05:00		Minimum Daily Average: -6.3 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 6.8 C at hour 15		Minimum Diurnal Average: -2.6 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 2.47 C		Percentiles: P ₁ = -10.3 P ₁₀ = -5.3 Q ₁ = -2.6 Median = 2.3 Q ₃ = 6.4 P ₉₀ = 11.4 P ₉₉ = 17.3		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	8.4	7.7	6.1	4.6	4.0	4.3	3.2	5.3	7.7	9.7	11.6	13.3	14.3	15.2	15.4	14.7	14.0	13.1	11.9	9.8	8.5	7.6	8.0	7.2	9.4	15.4
2-Apr	5.8	4.4	3.7	3.1	2.1	0.8	1.6	2.6	4.3	7.7	12.3	14.1	13.4	14.7	14.9	12.4	12.5	10.5	9.2	7.7	6.4	5.1	4.4	4.2	7.4	14.9
3-Apr	3.9	2.7	2.0	0.5	-1.5	-2.1	-1.9	0.5	3.4	4.0	6.5	7.8	9.1	9.6	10.0	10.3	9.9	10.4	9.0	6.5	4.6	4.1	3.7	2.8	4.8	10.4
4-Apr	1.7	1.4	1.0	0.6	0.0	-0.2	-0.4	1.3	5.8	7.1	8.8	8.4	8.9	10.1	10.0	8.5	8.7	7.5	6.5	4.1	2.3	1.1	-0.1	-1.2	4.2	10.1
5-Apr	-2.0	-2.3	-2.4	-2.7	-2.9	-3.5	-2.9	-1.6	-0.3	0.9	4.1	8.6	10.8	11.5	12.5	12.6	12.1	11.9	11.6	11.2	10.9	9.8	9.1	7.8	5.2	12.6
6-Apr	5.4	4.9	5.3	4.4	2.7	2.2	2.9	6.4	9.4	11.0	13.9	16.1	18.1	18.6	18.3	18.6	18.0	17.5	15.9	13.2	10.9	9.2	8.5	6.8	10.8	18.6
7-Apr	5.7	5.8	5.2	5.3	5.1	5.0	4.8	5.4	6.4	8.0	9.4	10.6	11.4	13.0	12.6	12.3	12.0	10.9	9.6	8.4	7.3	6.2	5.0	3.7	7.9	13.0
8-Apr	2.3	1.2	0.3	-0.3	-0.8	-1.3	-1.9	-2.3	-2.2	-2.7	-2.1	-2.2	-2.7	-3.0	-3.2	-3.6	-3.5	-3.9	-4.5	-5.0	-5.2	-5.4	-5.4	-5.3	-2.6	2.3
9-Apr	-5.2	-5.2	-5.6	-5.8	-5.7	-5.5	-5.4	-4.9	-4.1	-3.4	-1.5	0.9	2.2	3.5	4.3	5.5	6.1	6.4	5.6	3.8	2.0	1.3	0.4	-0.7	-0.5	6.4
10-Apr	-1.3	-1.3	-1.4	-1.3	-1.1	-2.4	-1.5	1.2	3.5	5.9	7.7	9.9	11.3	11.7	11.8	11.9	11.4	10.7	9.3	7.0	4.9	4.5	3.5	2.8	5.0	11.9
11-Apr	2.2	2.2	0.8	-0.6	-1.4	-1.6	-1.5	-0.9	-0.3	0.3	1.0	2.4	2.3	2.6	2.8	3.1	4.4	4.0	3.2	1.6	0.0	-1.3	-2.4	-3.2	0.8	4.4
12-Apr	-3.9	-4.4	-5.0	-5.5	-6.2	-7.3	-5.7	-4.0	-2.1	-0.7	1.1	2.6	3.6	4.7	5.6	5.8	6.0	5.7	4.8	3.1	1.4	1.2	-1.0	-1.5	-0.1	6.0
13-Apr	-3.0	-3.7	-4.7	-5.4	-5.7	-6.2	-5.0	-1.6	1.0	3.7	5.4	6.9	8.0	8.5	9.2	9.4	9.5	9.1	8.5	7.5	5.9	5.3	4.5	3.7	3.0	9.5
14-Apr	3.1	2.8	2.8	2.4	0.1	-0.5	-0.4	0.0	0.3	0.7	1.2	1.6	2.0	2.2	2.0	1.5	2.2	3.3	3.2	2.6	2.2	1.5	0.5	-0.2	1.5	3.3
15-Apr	-0.5	-1.1	-2.6	-4.5	-5.0	-5.5	-5.7	-5.3	-4.3	-2.9	-1.3	0.1	1.7	2.3	3.3	4.7	5.1	5.1	4.5	2.4	0.4	-1.6	-2.2	-2.7	-0.6	5.1
16-Apr	-3.1	-3.2	-3.9	-4.4	-4.6	-5.0	-4.2	-2.1	0.1	2.4	5.9	7.8	8.9	9.6	9.8	10.2	10.0	9.3	8.0	6.7	5.5	5.0	4.6	1.4	3.1	10.2
17-Apr	-0.4	-1.0	-2.2	-3.2	-4.3	-4.9	-5.1	-5.7	-6.1	-6.1	-5.3	-4.6	-3.5	-2.6	-2.2	-2.0	-2.4	-2.9	-3.4	-4.5	-5.2	-5.4	-5.6	-6.0	-3.9	-0.4
18-Apr	-6.7	-7.4	-8.0	-8.8	-9.6	-10.2	-10.4	-10.2	-9.6	-8.7	-7.8	-6.6	-5.7	-4.7	-3.7	-3.5	-3.3	-3.0	-2.9	-3.5	-3.6	-4.0	-4.4	-4.7	-6.3	-2.9
19-Apr	-5.1	-5.3	-5.4	-5.5	-5.5	-5.4	-4.9	-4.3	-3.4	-2.5	-1.3	0.2	2.3	3.7	4.2	4.6	4.1	4.0	3.4	2.6	0.4	-1.1	-2.0	-2.4	-1.0	4.6
20-Apr	-3.1	-3.6	-4.2	-4.6	-4.7	-4.8	-3.1	-1.0	1.0	3.8	4.2	3.1	0.8	-1.3	-2.3	-2.7	-3.3	-3.4	-3.3	-3.2	-3.6	-4.9	-5.5	-6.5	-2.3	4.2
21-Apr	-7.4	-7.8	-8.5	-8.7	-9.9	-10.7	-9.5	-7.1	-5.8	-4.2	-4.3	-3.8	-2.9	-2.4	-1.2	-1.0	-0.4	-0.1	-0.6	-1.6	-3.0	-4.0	-4.9	-5.9	-4.8	-0.1
22-Apr	-6.9	-7.7	-8.5	-6.7	-4.7	-5.0	-5.6	-6.1	-6.9	-6.4	-5.6	-4.6	-4.0	-3.6	-3.4	-3.0	-2.9	-2.7	-3.2	-3.9	-4.7	-5.2	-5.9	-7.0	-5.2	-2.7
23-Apr	-8.0	-8.8	-10.5	-11.4	-12.2	-11.9	-9.7	-6.5	-4.4	-3.1	-1.1	0.3	2.2	3.1	3.7	4.3	4.6	4.7	4.1	2.9	1.6	1.3	0.7	-0.2	-2.3	4.7
24-Apr	-1.2	-1.8	-2.1	-2.6	-3.0	-3.0	-2.7	-1.7	-1.1	-0.3	1.0	2.4	4.4	4.9	4.5	4.0	4.1	3.7	3.7	3.2	2.5	1.9	1.4	1.1	1.0	4.9
25-Apr	1.0	0.7	0.4	0.2	-0.6	-0.5	0.2	1.9	2.9	4.2	5.0	6.2	5.7	6.0	6.0	5.8	5.9	5.8	5.0	4.0	2.7	2.8	2.7	2.5	3.2	6.2
26-Apr	2.3	2.2	2.1	1.9	1.5	1.4	2.1	3.1	4.1	5.3	6.1	5.8	5.9	5.5	6.0	6.4	6.3	6.0	6.0	5.0	2.3	1.3	0.8	1.5	3.8	6.4
27-Apr	1.5	1.9	2.7	2.3	2.1	2.2	2.9	4.9	6.2	7.9	9.3	10.7	11.0	12.0	12.2	12.7	13.0	13.2	12.5	10.2	7.3	5.9	5.7	4.0	7.3	13.2
28-Apr	1.7	1.9	-0.5	-1.8	-2.2	-1.7	0.5	2.1	4.5	7.6	10.7	11.5	12.9	13.2	14.4	13.3	13.1	13.3	12.9	11.3	9.5	8.9	8.1	7.2	7.2	14.4
29-Apr	6.7	5.4	5.7	5.6	4.7	4.3	5.3	6.8	10.4	13.2	14.7	14.7	14.3	14.1	14.9	15.0	15.7	14.6	13.0	11.1	9.5	8.0	5.9	4.9	9.9	15.7
30-Apr	3.4	2.6	1.2	0.1	0.3	0.6	3.2	7.0	9.9	12.8	15.3	16.4	17.7	16.9	12.5	10.1	11.4	10.1	10.3	10.2	8.7	7.0	5.2	4.8	8.3	17.7
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Barge Landing - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Barge Landing - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	267	37.08	37.08
0 - 10	354	49.17	86.25
10 - 20	99	13.75	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

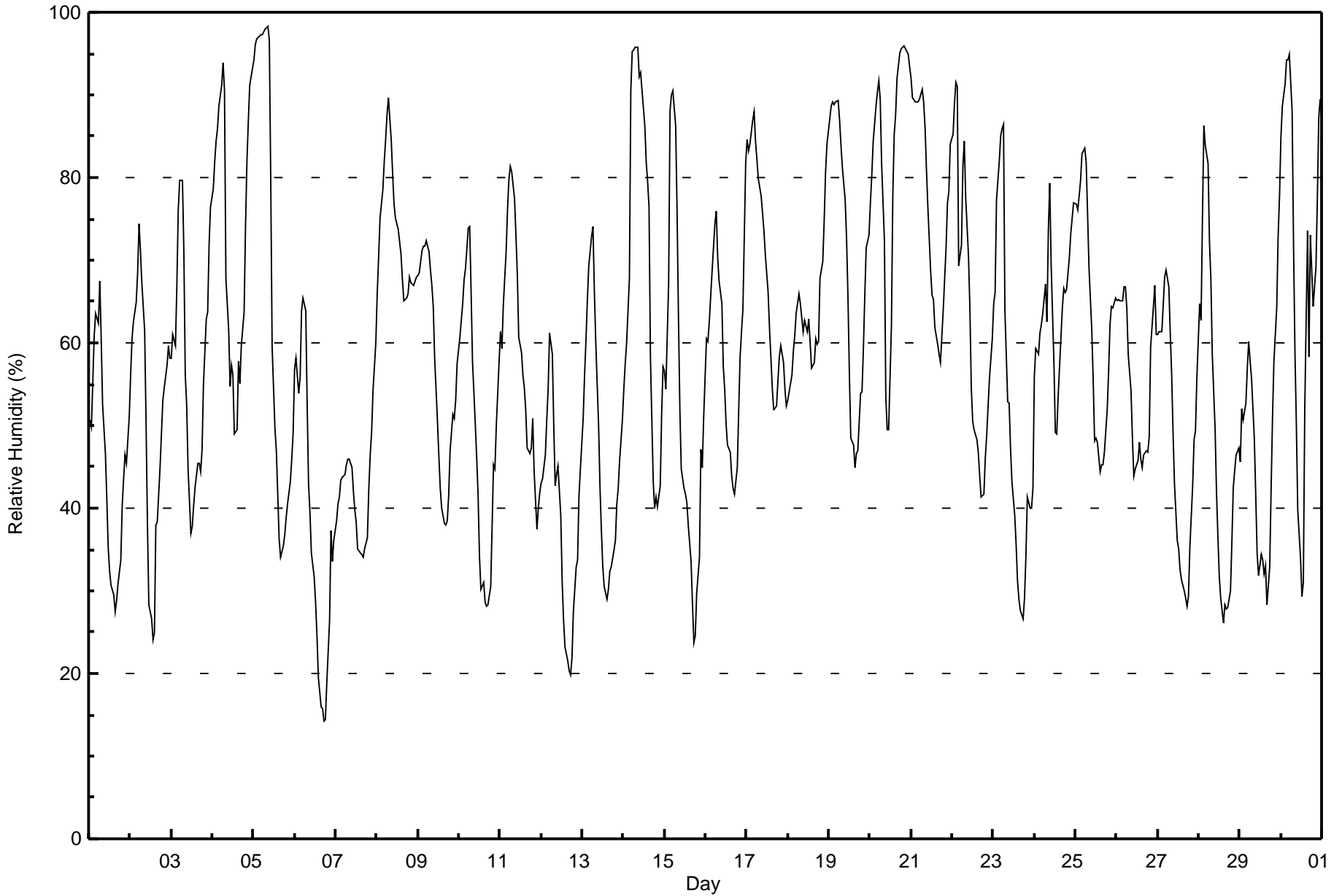
Barge Landing - April 2017

Maximum Value: 98 % on Apr 5 09:00																	Maximum Daily Average: 82.5 % on Apr 20																	Hours in Service: 720	
Minimum Value: 14 % on Apr 6 18:00																	Minimum Daily Average: 37.7 % on Apr 6																	Hours of Data: 720	
Maximum Diurnal Average: 77.2 % at hour 6																	Minimum Diurnal Average: 43.1 % at hour 17																	Hours of Missing Data: 0	
Monthly Average: 58.4 %																	Percentiles: P ₁ = 20 P ₁₀ = 34 Q ₁ = 44 Median = 58 Q ₃ = 72 P ₉₀ = 86 P ₉₉ = 96																	Hours of Calibration: 0	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	51	50	55	61	64	62	67	61	53	47	41	35	32	31	30	27	29	31	34	40	44	46	45	51	45.3	67									
2-Apr	56	60	63	65	69	74	71	67	61	51	38	28	27	24	25	38	38	45	49	53	55	57	60	58	51.3	74									
3-Apr	58	61	60	67	76	80	80	71	56	53	45	37	38	40	42	45	45	44	47	55	63	64	72	76	57.3	80									
4-Apr	79	82	84	86	89	91	94	91	68	62	55	57	56	49	50	58	55	60	64	74	82	87	91	93	73.1	94									
5-Apr	94	96	97	97	97	97	98	98	98	97	80	60	50	47	42	36	34	35	37	39	41	43	46	49	67.0	98									
6-Apr	57	58	54	56	64	65	64	53	43	39	35	32	29	25	20	16	16	14	14	19	26	37	34	36	37.7	65									
7-Apr	38	41	41	43	44	44	45	46	46	45	42	40	38	35	35	34	34	35	37	42	47	49	54	60	42.3	60									
8-Apr	66	70	75	79	82	85	88	90	85	81	77	75	74	72	71	68	65	65	66	68	67	67	68	68	73.7	90									
9-Apr	68	68	71	72	72	72	71	69	67	64	58	50	46	42	40	38	38	39	41	47	51	51	53	58	56.2	72									
10-Apr	61	63	65	68	69	74	74	66	58	50	46	41	34	30	31	29	28	28	30	38	45	45	50	58	49.2	74									
11-Apr	61	59	65	71	76	80	81	81	78	73	68	61	59	56	55	52	47	47	47	51	44	37	40	42	59.6	81									
12-Apr	43	44	46	51	54	61	59	50	43	44	45	39	31	26	23	22	20	20	22	28	33	34	41	45	38.5	61									
13-Apr	51	56	60	65	69	73	74	66	60	50	42	37	33	30	29	30	32	33	35	36	40	42	46	51	47.6	74									
14-Apr	54	58	60	68	90	95	95	96	96	92	93	90	86	82	79	76	58	43	40	41	40	43	51	57	70.3	96									
15-Apr	57	54	67	88	90	91	86	76	63	52	45	42	42	41	38	34	29	24	25	30	34	47	45	51	52.0	91									
16-Apr	60	60	63	66	69	74	76	70	67	65	57	54	50	48	47	44	42	42	45	52	58	61	64	82	59.0	82									
17-Apr	85	83	84	87	88	84	82	80	78	76	74	71	66	62	58	54	52	52	55	58	60	58	54	52	68.9	88									
18-Apr	53	54	56	59	61	64	66	65	63	61	63	61	63	60	57	58	61	60	60	68	70	75	81	84	63.4	84									
19-Apr	87	89	89	89	89	89	87	84	81	77	73	65	56	49	48	45	47	47	54	54	59	66	72	73	69.5	89									
20-Apr	77	80	84	89	90	92	90	82	72	53	50	50	62	78	85	88	92	95	96	96	96	95	95	93	82.5	96									
21-Apr	92	90	89	89	89	89	91	89	86	81	77	69	66	65	62	60	59	58	61	64	71	77	78	84	76.5	92									
22-Apr	85	89	91	91	69	72	81	84	78	71	64	55	50	49	48	47	44	41	42	46	49	52	56	60	63.2	91									
23-Apr	65	66	77	82	85	86	86	64	53	53	47	43	39	36	31	29	28	27	29	34	41	40	40	42	51.0	86									
24-Apr	56	59	59	61	62	63	67	63	74	79	70	57	49	49	53	61	64	67	66	66	70	73	75	77	64.2	79									
25-Apr	77	76	78	80	83	84	82	76	69	62	56	48	48	48	44	45	45	47	52	56	62	64	64	65	63.0	84									
26-Apr	65	65	65	65	67	67	64	59	54	49	44	45	46	48	46	45	47	47	47	49	59	64	67	61	55.6	67									
27-Apr	61	61	61	65	68	69	67	61	56	49	43	36	35	33	31	30	29	28	29	35	43	48	49	56	47.7	69									
28-Apr	65	63	75	86	84	82	72	68	59	50	42	37	32	29	26	28	28	28	30	36	43	45	46	47	50.0	86									
29-Apr	46	52	51	53	57	60	58	56	49	42	35	32	34	34	32	33	28	33	42	51	58	64	73	78	47.8	78									
30-Apr	85	89	91	94	94	95	88	72	59	50	40	34	29	31	52	74	58	73	69	64	69	77	87	89	69.4	95									
	65.1	66.6	69.3	73.0	75.3	77.2	76.8	71.7	65.7	60.5	54.7	49.4	46.7	44.9	44.3	44.8	43.1	43.6	45.5	49.7	54.0	57.0	59.9	63.3	Diurnal Average										
	94	96	97	97	97	97	98	98	98	97	93	90	86	82	85	88	92	95	96	96	96	95	95	93	Diurnal Maximum										



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Barge Landing - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Barge Landing - April 2017

Maximum Speed: 19 km/h on Apr 20 13:00	Maximum Daily Speed Average: 11.5 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 22 02:00	Minimum Daily Speed Average: 1.0 km/h on Apr 28	Hours of Data: 719
Maximum Diurnal Speed Average: 2.6 km/h at hour 16	Minimum Diurnal Speed Average: 1.0 km/h at hour 8	Hours of Missing Data: 1
Monthly Average Velocity: 1.7 km/h 53.6 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 4 Median = 7 Q ₃ = 10 P ₉₀ = 12 P ₉₉ = 15	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW7	WSW11	SW7	S3	SW6	WSW8	SSW6	WSW8	WSW10	WSW11	WSW12	WSW14	W13	W10	WNW7	NNW8	NW6	NNW6	NNW2	AF	WNNW1	WSW4	WSW5	WSW5	WSW6.2	WSW14
2-Apr	W3	SW2	SW4	WSW7	SW5	SSW5	SSW5	SW5	S5	SSE5	SSE5	NW7	NW11	NW12	NNW10	NE11	NE9	NNE8	NE6	NNE4	N4	N4	NNW5	NNW5	NNW2.1	NW12
3-Apr	N4	N4	N5	NNW4	NNW3	NNW1	NNE2	WSW3	N2	NNE3	ENE5	NE5	ENE6	ENE5	N4	NNW5	NNE5	NE6	ENE3	E3	ESE2	SW3	ESE1	W1	NNE2.3	ENE6
4-Apr	SSE4	SSE5	SSE4	SE5	ESE4	SSE5	S3	SSE3	SSE4	WSW6	WSW8	SW12	SW7	S5	SE3	ENE7	SE6	SSE8	SSE6	SE6	SE4	SSE3	ESE4	ESE5	SSE3.6	SW12
5-Apr	SE3	ESE4	SE4	SSE4	S4	SSW3	SSE5	SSW4	S5	SSE9	S8	S10	S16	SSE17	S15	S14	S10	S7	S9	S10	S10	SSE9	S7	S7	S7.8	SSE17
6-Apr	SE2	SE5	SSE6	SSE5	SSW3	SSE4	SSE5	SSE8	S9	S7	SSE8	S8	SW9	W13	W11	WSW15	WSW14	W10	W7	NNW4	NNE3	ENE4	N4	NNW6	SW3.8	WSW15
7-Apr	N4	NNW6	NNW6	NNW5	N5	N5	N4	NNW6	N6	NNE9	NNE10	NE11	NE13	NE13	NNE12	NNE13	NNE14	NE13	NNE12	NNE12	NNE12	NE12	NNE11	NNE9.0	NNE14	
8-Apr	NNE10	NNE10	NNE9	N11	NNE13	NNE12	NNE13	NNE14	NNE14	NNE14	NNE13	NNE13	NNE14	NNE14	NNE14	NNE14	NNE12	NNE12	NNE11	NNE11	N9	N9	NNE7	NE5	NNE11.5	NNE14
9-Apr	ENE5	NNE2	NNW5	NNW5	NNW3	W1	ENE2	SE2	SSW4	SW7	SSW7	S9	SSW9	SSW10	S11	S10	S9	SSE9	SSE6	SE6	SE6	SSE8	SSE6	SSE5	S4.1	S11
10-Apr	SSE5	SE6	SSE6	SSE8	S5	WSW2	SSE5	S8	S7	S8	S8	S8	S11	S10	S8	SSW8	SSW7	S6	SSE3	ESE4	SE2	SSW3	NNW3	N4	S5.2	S11
11-Apr	N5	N7	NNE8	NNE7	N9	NNE8	NNE10	NNE10	NNE12	NNE10	NNE11	NNE13	NNE12	NNE12	NE11	NE10	NNE11	NNE12	NNE12	N10	N9	N9	N7	N7	NNE9.5	NNE13
12-Apr	N6	N7	N5	N5	N4	NE2	NE5	NNE8	NNE8	NNE8	NE9	NNE9	NNE9	NNE9	NNE8	NNE9	NNE9	NNE8	NNE9	NNE7	N6	NNE7	NNW5	N6	NNE6.7	NNE9
13-Apr	NNW4	NNW4	N3	N3	N3	N3	NNW3	NNE3	NE7	ENE8	ENE8	ENE10	ENE11	ENE12	ENE12	ENE12	ENE12	ENE11	E10	E9	ENE9	ENE9	NE7	ENE7	ENE6.7	ENE12
14-Apr	NE5	NNE6	NNE6	NE7	N6	N7	N5	NNE8	NE10	NE10	NE11	NE12	NE12	ENE12	ENE14	ENE14	ENE9	NE12	NE11	NE12	NE11	NE13	NE13	NE9.5	ENE14	
15-Apr	NNE13	NE14	NE12	NNE11	NNE10	NNE10	NNE10	NNE9	NNE8	NNE9	NNE10	NNE10	NNE10	N12	N10	N9	NNE8	NNE8	NNE6	N4	N4	ESE2	SSE6	SSE7	NNE7.6	NE14
16-Apr	SSE9	SSE8	SSE7	SSE8	S8	S6	S8	S9	SSW9	S10	SSW11	SSW13	SW14	SW14	SSW14	SSW15	SSW15	SSW14	SSW10	SSW10	SSW8	SSW7	WSW2	N9	SSW8.7	SSW15
17-Apr	NNE10	NNE12	NNE13	NNE11	NNE14	NNE14	NNE13	NNE14	NNE14	NNE14	NNE11	NNE11	NE11	NE12	NE12	NE12	NE12	NE11	NE9	NNE11	N9	N10	N10	N9	NNE11.4	NNE14
18-Apr	N9	NNE10	NNE9	NNE9	NNE10	NNE10	NNE9	NNE9	NNE8	NNE7	NE7	NE7	NNE8	NNE8	NNE8	NNE8	NNE7	NNE6	NNE5	NNE4	NE4	NNE5	NE4	NNE4	NNE7.3	NNE10
19-Apr	N5	NNW4	NNW5	N5	NNW4	N2	NNW3	N3	NNW2	WNW3	WNW2	SW3	SW4	SSW3	SSW4	WSW8	SSW5	SSW6	SSE7	SW5	SW4	SSW2	SE4	SE3	WSW1.4	WSW8
20-Apr	SSE3	E1	N2	NNE2	ENE1	NW2	NNW2	NNW4	N5	NNE10	NNE12	NNE16	NNE19	NNE17	NNE15	NNE15	NNE13	NNE11	NNE8	N4	WSW1	NW3	NNW5	N6	NNE6.8	NNE19
21-Apr	N6	N8	N6	NNE4	NNW4	NNE1	NE1	E2	NE4	NNE4	NE4	NE5	NNE4	E3	E3	NE4	ENE2	ENE4	E3	E4	SE4	SE4	SE2	ESE3	NE2.6	N8
22-Apr	SW1	SW0	NW1	N5	NNE10	NNE11	NNE10	NNE10	NNE12	NNE11	NE11	NE10	NE9	NE10	NE9	NE9	NNE8	NNE8	NNE7	NE6	NE7	NE7	ENE7	NE4	NNE7.2	NNE12
23-Apr	NE3	NNE2	N2	ESE0	NE2	NNE2	NNW3	NNE2	NNE4	NNE7	NNE8	NNE9	N8	NNE9	N6	NNE6	NNE5	NE6	SSE5	SSE4	SE4	SE6	SE6	WSW0	NE3.0	NNE9
24-Apr	NNW7	NNW6	N5	NNW4	NNW5	NNW6	NNW5	N5	NE7	NE8	ENE11	ENE9	E9	E8	E8	E7	SE8	ESE6	ESE6	ESE6	SE6	ESE5	E5	ENE4.2	ENE11	
25-Apr	ESE5	ESE5	SE5	SE4	SE4	SE3	SE4	SSE6	SSE10	S9	SSE10	S11	S9	SSW8	SSE11	S10	S9	S10	S9	SSE6	SSE7	SSE9	SSE9	SSE8	SSE7.1	SSE11
26-Apr	SSE8	SSE9	SSE9	SSE8	SSE8	SSE8	SSE7	S12	S11	SSE13	SSE13	SSE13	SSE13	SSE12	S12	S10	S10	S11	S9	SSW6	SE3	E3	ESE4	SE5	SSE8.5	SSE13
27-Apr	SE6	SSE6	SSE6	SE5	SE6	SE6	SE5	S6	S8	S7	S9	S10	SSW10	SW10	WSW13	WSW9	WSW6	W8	WNNW5	NNW5	N4	N4	NNW3	WNNW2	SSW3.7	WSW13
28-Apr	NW3	NNW4	NW2	WSW2	SSE3	SSE4	SSE3	SSE4	SSE4	SW5	WSW6	WNNW4	ENE5	SSE4	WNNW4	NE5	NE4	ENE5	E5	ENE5	E4	E4	E3	SE3	ESE1.0	WSW6
29-Apr	S4	SE3	SSE7	S6	SSW4	SW4	SW7	SW7	SW7	WSW5	SSW11	SW11	SW13	SW12	SW11	SW12	SSW10	S10	SSW9	SSW7	S6	SSW5	SSE5	S4	SSW6.8	SW13
30-Apr	SSE3	SE3	SE4	SE5	SE5	SSW1	S5	S7	S8	SW5	SSW7	S5	WNNW3	NW10	NNE12	ENE13	ENE7	S7	S6	W4	NNW4	SE2	SE4	SSE3	SSE1.9	ENE13

NE1.7	NNE2.1	NE1.7	NE1.6	NNE1.7	NNE1.5	NE1.4	ENE1.0	NE1.3	NE1.6	E1.8	ENE1.4	NE1.3	NNE1.5	NE1.7	NE2.6	ENE2.3	ENE2.1	E2.2	ENE2.1	ENE2.2	ENE2.0	ENE2.0	NE2.0	Diurnal Average
NNE1.3	NE1.4	NNE1.3	NNE1.1	NNE1.4	NNE1.4	NNE1.3	NNE1.4	NNE1.4	NNE1.4	SSE1.3	NNE1.6	NNE1.9	SSE1.7	S15	NNE1.5	SSW1.5	SSW1.4	NNE1.2	NE1.2	NNE1.2	NNE1.2	NE1.3	NE1.3	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Barge Landing - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Apr 5 14:00	Hours of Data: 719
Minimum Value: 0 km/h on Apr 21 22:00	Hours of Missing Data: 1
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 5	Hours of Calibration: 0
	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2	3	2	2	3	3	2	2	3	3	3	4	4	4	4	3	3	2	1	AF	1	2	2	2	4
2-Apr	2	1	2	2	2	2	2	2	2	2	2	5	4	4	4	3	3	2	2	1	2	1	1	1	5
3-Apr	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	1	0	1	2	1	1	2
4-Apr	2	2	1	1	1	2	1	2	2	2	3	4	3	3	3	4	3	2	1	2	1	1	1	1	4
5-Apr	1	1	1	1	1	1	1	1	3	3	3	4	6	6	5	5	4	3	3	3	3	2	2	2	6
6-Apr	2	2	1	1	1	1	1	2	3	2	3	3	4	5	4	5	4	3	3	1	1	1	1	1	5
7-Apr	2	1	1	1	2	1	1	2	2	3	3	4	3	4	3	4	4	4	3	3	3	4	3	3	4
8-Apr	3	3	3	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	3	3	3	3	2	2	5
9-Apr	2	2	3	1	1	1	1	1	2	3	3	4	3	4	4	3	3	3	2	1	1	1	1	1	4
10-Apr	1	1	2	2	3	1	2	3	2	3	3	3	4	4	3	3	2	2	1	1	1	1	3	1	4
11-Apr	2	2	2	2	3	3	3	3	3	3	3	4	4	4	3	3	3	4	4	3	3	3	2	2	4
12-Apr	1	2	1	1	1	2	2	3	2	2	2	2	3	3	3	3	3	2	2	2	1	2	1	1	3
13-Apr	1	1	1	1	1	1	1	2	2	3	3	3	4	4	4	5	5	4	3	3	3	3	2	2	5
14-Apr	2	1	1	2	1	2	1	2	3	3	3	4	5	5	5	5	5	4	4	4	4	4	5	4	5
15-Apr	4	4	4	3	3	3	3	3	2	3	3	3	3	4	4	3	3	2	2	1	0	2	1	1	4
16-Apr	2	2	2	2	3	2	3	3	3	3	4	4	4	5	5	5	5	5	3	3	2	2	2	3	5
17-Apr	3	4	4	4	4	4	4	4	4	4	3	3	3	4	4	4	4	4	3	3	3	3	3	3	4
18-Apr	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	3
19-Apr	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	2	2	2	1	1	1	1	3
20-Apr	1	1	1	1	1	1	1	2	2	3	4	5	5	5	4	5	5	3	3	1	1	1	1	1	5
21-Apr	2	2	1	2	0	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	0	1	1	2
22-Apr	1	1	1	1	3	3	3	3	4	3	3	3	3	3	3	3	2	3	2	2	2	2	3	1	4
23-Apr	1	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	2	2	1	1	1	1	1	3
24-Apr	2	1	1	1	1	1	1	2	2	2	4	3	3	3	3	3	3	3	2	3	2	2	1	1	4
25-Apr	1	1	1	1	1	1	1	3	4	3	4	4	4	3	3	4	3	3	3	2	2	3	3	2	4
26-Apr	3	3	3	2	2	2	2	4	4	5	5	4	4	4	4	3	4	4	4	3	1	1	1	1	5
27-Apr	1	1	1	1	1	1	1	3	3	3	4	4	4	4	4	4	2	3	2	1	1	1	1	1	4
28-Apr	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	2
29-Apr	1	2	1	1	1	1	2	2	3	3	4	4	5	5	4	4	4	3	4	2	1	1	1	1	5
30-Apr	1	1	1	1	1	1	2	2	2	2	3	3	2	6	5	5	4	3	2	2	1	2	2	1	6
	4	4	4	4	4	4	4	4	4	5	5	5	6	6	5	5	5	5	5	4	4	4	4	5	4

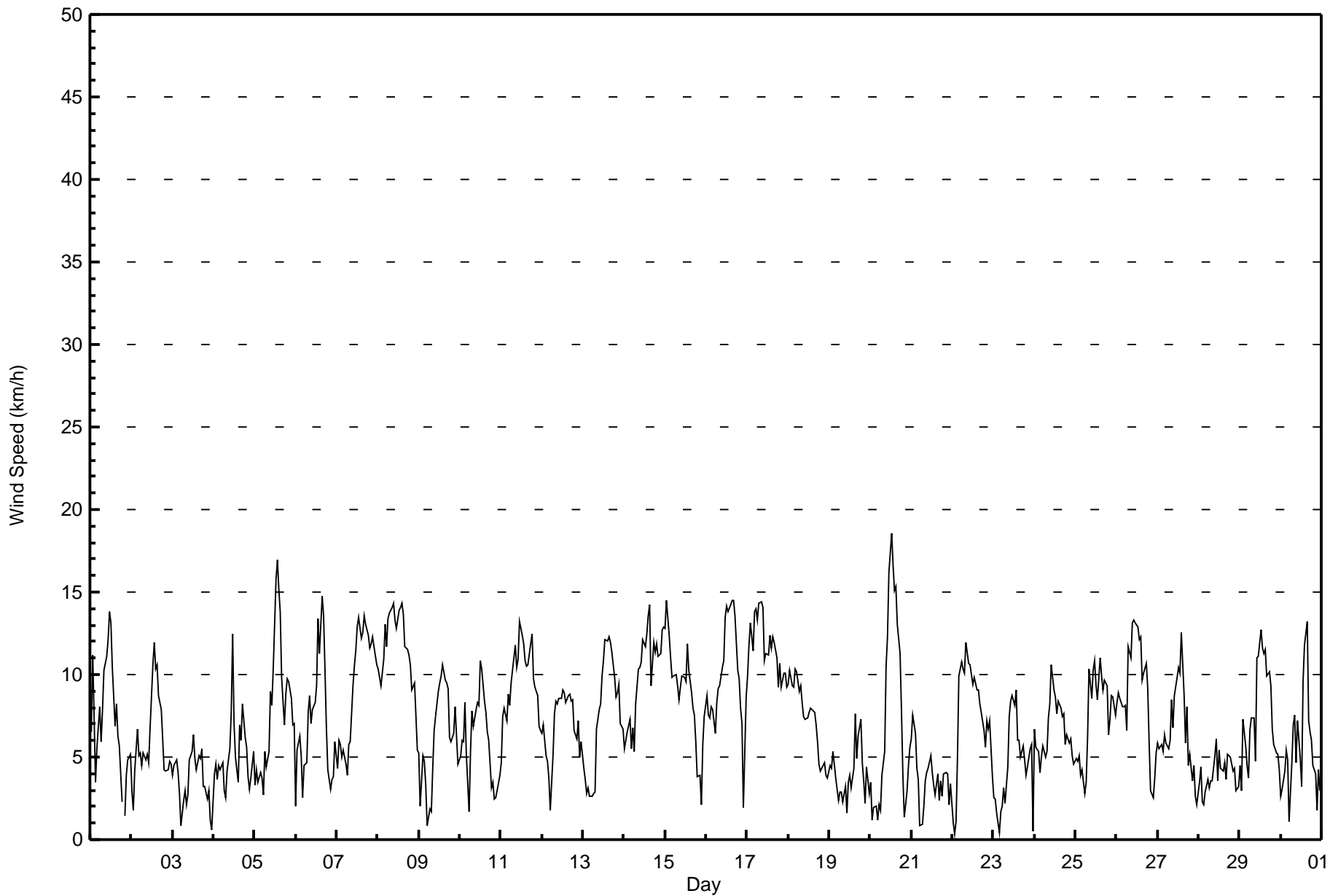
Diurnal Maximum

AF - Analyzer Failure



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Barge Landing - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Barge Landing - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	276	38.39	38.39
6 - 11	343	47.71	86.09
12 - 19	100	13.91	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Barge Landing - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	37	21	16	13	13	14	32	30	11	15	13	10	4	8	5	34	276
6 - 11	31	83	34	15	7	3	11	40	53	23	11	12	5	1	4	10	343
12 - 19	1	45	16	8	0	0	0	6	5	5	6	5	2	0	1	0	100
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	149	66	36	20	17	43	76	69	43	30	27	11	9	10	44	719

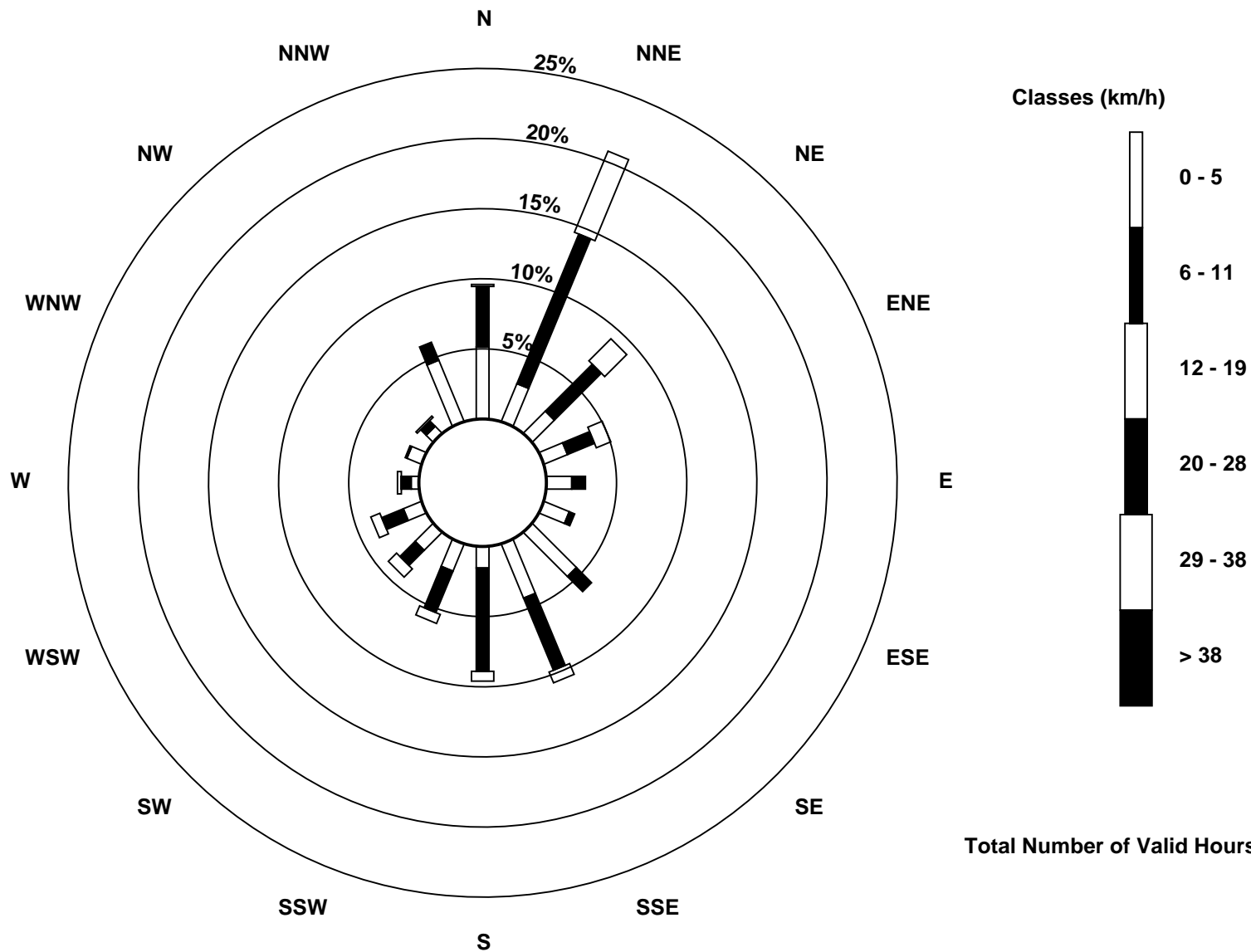
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Barge Landing (AMS 9)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Barge Landing - April 2017

Direction of Maximum Speed: 18 deg on Apr 20 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 21.0 deg on Apr 8	Hours of Data: 719
Direction of Minimum Speed: 218 deg on Apr 22 02:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 1.0 deg on Apr 28	Percent Operational Time: 99.9
Monthly Average Direction: 236.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	204	246	232	191	218	240	210	239	256	238	237	247	265	275	292	329	323	344	341	AF	286	254	253	242	254.1
2-Apr	273	230	228	242	229	211	209	225	178	147	167	323	324	318	344	38	37	32	38	23	356	352	341	334	330.0
3-Apr	354	359	357	347	344	334	18	240	3	33	78	45	68	69	352	336	26	52	76	95	114	232	105	259	28.5
4-Apr	168	164	149	140	119	160	188	157	166	258	240	235	219	183	144	64	125	162	147	128	144	163	122	121	165.8
5-Apr	145	122	132	150	179	208	159	194	181	158	185	186	176	162	177	181	186	189	173	175	173	168	181	177	173.5
6-Apr	143	137	150	147	192	154	154	166	190	189	166	188	224	262	269	250	244	259	263	340	33	62	355	347	219.7
7-Apr	354	346	341	346	350	355	349	339	351	23	32	38	35	35	32	29	32	35	31	27	25	32	35	24	22.6
8-Apr	20	17	13	11	17	21	24	17	15	25	29	31	26	20	29	14	19	28	28	24	10	8	13	45	21.0
9-Apr	60	17	333	335	347	278	70	140	208	222	202	172	195	195	189	179	170	159	151	146	144	151	154	147	173.3
10-Apr	152	145	166	164	185	243	158	179	176	188	178	183	190	175	178	195	194	184	159	120	133	205	333	2	176.3
11-Apr	7	10	19	19	10	13	13	19	19	23	21	16	30	29	37	36	33	18	17	10	10	359	355	358	18.1
12-Apr	1	1	353	354	3	37	56	26	32	28	38	25	27	23	32	22	22	28	24	12	8	23	339	359	19.8
13-Apr	343	347	1	355	0	358	334	31	45	59	59	59	67	71	78	68	66	66	79	81	67	68	56	61	58.5
14-Apr	47	29	23	36	357	356	358	32	40	40	41	52	54	59	69	62	59	53	45	45	53	48	52	43	45.1
15-Apr	33	35	38	26	32	33	26	32	28	20	17	21	13	350	360	353	18	29	26	4	356	119	150	148	25.1
16-Apr	160	163	161	163	175	180	180	178	192	183	204	210	218	218	208	207	210	210	197	200	195	192	241	5	196.1
17-Apr	20	20	19	12	16	16	21	16	18	23	28	26	37	42	46	45	50	44	36	15	9	10	10	8	24.3
18-Apr	9	12	23	22	23	27	23	31	30	32	35	35	23	28	21	22	27	15	25	31	34	24	40	20	24.8
19-Apr	351	348	348	352	345	354	342	4	339	291	286	234	226	210	210	246	212	211	162	229	218	211	141	137	252.7
20-Apr	149	100	9	19	57	325	334	332	353	26	30	21	18	19	19	19	14	19	28	356	257	325	348	356	15.6
21-Apr	8	3	353	14	342	26	54	94	38	27	39	36	25	86	99	37	74	70	88	82	134	129	136	120	46.9
22-Apr	227	218	304	354	15	20	20	32	15	23	43	45	45	50	41	37	31	17	22	52	52	54	62	37	32.8
23-Apr	45	18	3	121	44	22	339	18	33	26	23	14	7	19	3	15	22	52	163	165	140	134	126	240	35.5
24-Apr	341	344	350	335	335	339	336	353	34	39	68	69	84	82	81	82	92	128	112	113	111	124	118	100	63.1
25-Apr	113	119	131	143	133	137	146	163	151	175	166	174	188	205	168	172	183	177	177	166	159	168	166	168	165.4
26-Apr	168	168	164	155	147	149	159	170	180	163	160	153	168	168	191	183	174	191	188	207	124	101	120	129	167.0
27-Apr	142	154	158	144	141	136	144	172	178	187	169	188	199	229	240	245	237	262	294	348	355	353	333	286	198.7
28-Apr	311	345	309	257	168	149	159	151	166	227	256	283	74	147	282	46	51	69	83	75	91	90	100	136	107.3
29-Apr	170	127	158	174	202	214	215	228	233	238	209	219	224	231	223	235	208	182	195	195	187	197	165	177	206.5
30-Apr	165	143	142	126	145	205	184	180	184	223	199	180	285	307	23	74	70	172	188	281	339	139	128	162	156.3
	43.6	32.9	35.2	41.2	30.3	26.7	44.6	56.6	52.7	51.0	84.8	64.1	52.1	33.5	43.1	42.5	60.0	70.7	81.0	60.8	66.0	71.5	68.1	52.7	

Diurnal Average

AF - Analyzer Failure

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Barge Landing - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 96 deg on Apr 23 04:00	Hours of Data: 719
Minimum Value: 8 deg on Apr 5 00:00	Hours of Missing Data: 1
	Hours of Calibration: 0
	Percent Operational Time: 99.9
Percentiles: P ₁ = 9 P ₁₀ = 16 Q ₁ = 19 Median = 23 Q ₃ = 33 P ₉₀ = 49 P ₉₉ = 79	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	28	16	23	58	43	27	32	28	21	21	21	21	26	35	45	32	27	19	16	AF	42	34	25	20	58
2-Apr	72	69	55	17	27	20	27	22	36	37	54	59	26	25	37	21	29	18	17	18	16	15	16	19	72
3-Apr	18	13	14	18	40	43	25	50	66	62	43	39	38	46	55	41	30	25	19	12	48	49	54	87	87
4-Apr	50	16	22	21	10	42	41	51	55	22	36	22	52	63	80	24	55	25	15	13	13	41	17	8	80
5-Apr	44	11	15	13	30	37	25	33	30	25	35	35	28	26	25	25	27	38	25	23	22	18	21	18	44
6-Apr	79	31	10	11	47	24	16	29	31	35	35	39	46	26	32	24	21	25	31	19	35	32	34	14	79
7-Apr	23	12	14	13	17	16	26	19	28	27	21	19	18	19	18	16	18	17	17	16	16	17	17	18	28
8-Apr	19	19	20	22	19	19	19	20	21	21	20	18	22	22	20	22	22	21	19	20	21	21	24	37	37
9-Apr	28	58	43	18	22	72	59	77	50	40	45	42	40	40	35	34	32	25	21	13	8	10	13	16	77
10-Apr	12	8	20	17	43	39	22	26	32	37	32	37	33	34	34	40	38	28	17	15	50	49	70	22	70
11-Apr	14	17	16	18	21	21	20	20	20	20	21	21	21	21	21	19	23	21	19	20	21	21	21	20	23
12-Apr	17	18	19	16	15	75	21	24	22	23	22	25	26	28	27	25	23	20	20	17	18	19	17	16	75
13-Apr	21	15	15	21	16	17	32	49	25	29	26	25	24	21	22	22	21	20	22	24	18	18	19	19	49
14-Apr	20	14	18	23	28	20	20	16	19	17	18	19	21	19	22	20	21	22	20	18	20	19	21	19	28
15-Apr	17	19	21	18	18	18	19	19	20	20	20	21	26	24	29	29	28	21	18	13	12	65	13	9	65
16-Apr	17	19	18	19	25	27	24	25	30	30	29	28	29	29	30	28	27	26	24	24	22	21	65	24	65
17-Apr	21	21	20	21	20	19	19	19	19	19	21	22	20	22	23	21	21	21	21	19	20	20	20	20	23
18-Apr	20	20	21	21	19	19	19	19	23	23	25	27	26	27	29	24	26	26	27	25	18	19	26	34	34
19-Apr	19	17	19	18	18	19	32	51	55	49	77	66	76	84	83	33	56	32	25	25	22	56	17	22	84
20-Apr	10	42	23	48	65	42	30	18	29	19	18	19	20	20	19	20	19	17	27	56	28	15	14	65	
21-Apr	17	19	19	37	12	59	43	53	51	44	45	38	45	60	74	41	71	40	18	17	17	11	50	20	74
22-Apr	70	81	77	19	20	18	19	19	21	20	22	27	28	25	26	23	22	26	22	23	18	18	22	36	81
23-Apr	39	49	41	96	45	45	23	76	41	19	23	25	31	24	51	39	35	31	42	20	21	17	14	85	96
24-Apr	18	18	18	19	18	15	20	39	19	20	21	26	32	32	27	25	22	28	23	19	18	12	11	16	39
25-Apr	16	12	14	23	15	21	28	32	25	34	33	31	36	39	29	28	31	27	26	22	16	20	22	21	39
26-Apr	22	21	21	18	14	14	24	25	29	25	28	25	28	28	28	30	28	26	29	33	39	13	15	9	39
27-Apr	12	10	12	13	9	10	15	31	32	44	44	37	40	36	33	33	52	27	38	16	14	15	28	53	53
28-Apr	39	28	47	20	24	10	36	28	40	37	38	58	50	56	73	26	30	21	18	17	16	15	57	44	73
29-Apr	30	81	18	18	20	25	23	24	32	75	34	33	29	34	29	32	42	31	26	19	15	20	14	17	81
30-Apr	42	35	31	9	12	62	28	30	29	67	49	69	91	48	40	21	62	27	35	36	8	79	15	52	91

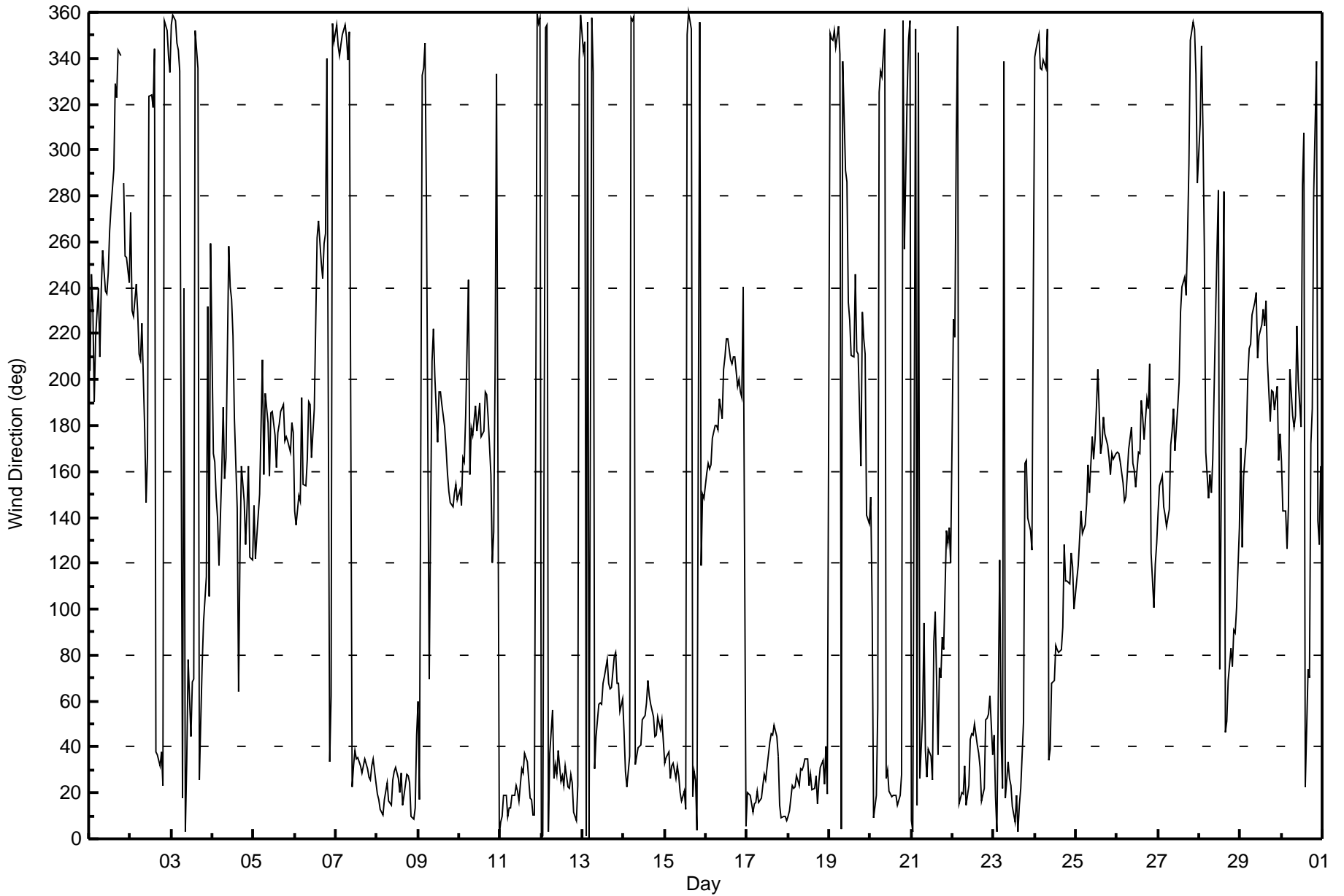
79	81	77	96	65	75	59	77	66	75	77	69	91	84	83	41	71	40	42	36	56	79	70	87	
Diurnal Maximum																								

AF - Analyzer Failure



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Barge Landing - April 2017





Wood Buffalo Environmental Association

TRS Calibration Summary

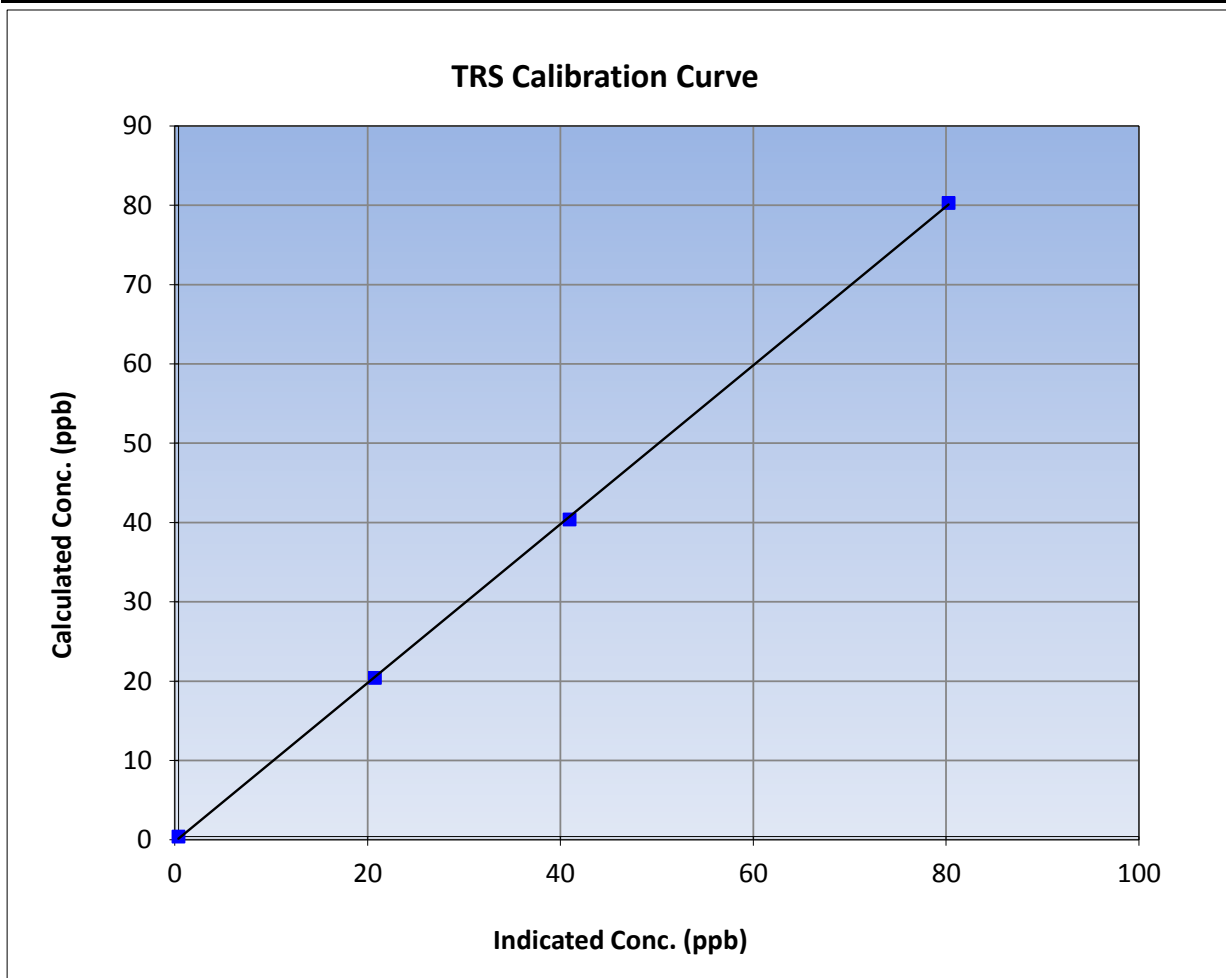
Version-03-2017

Station Information

Calibration Date	April 11, 2017	Previous Calibration	March 10, 2017
Station Name	Barge Landing	Station Number	AMS 09
Start Time (MST)	8:11	End Time (MST)	10:48
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1331259320

Calibration Data

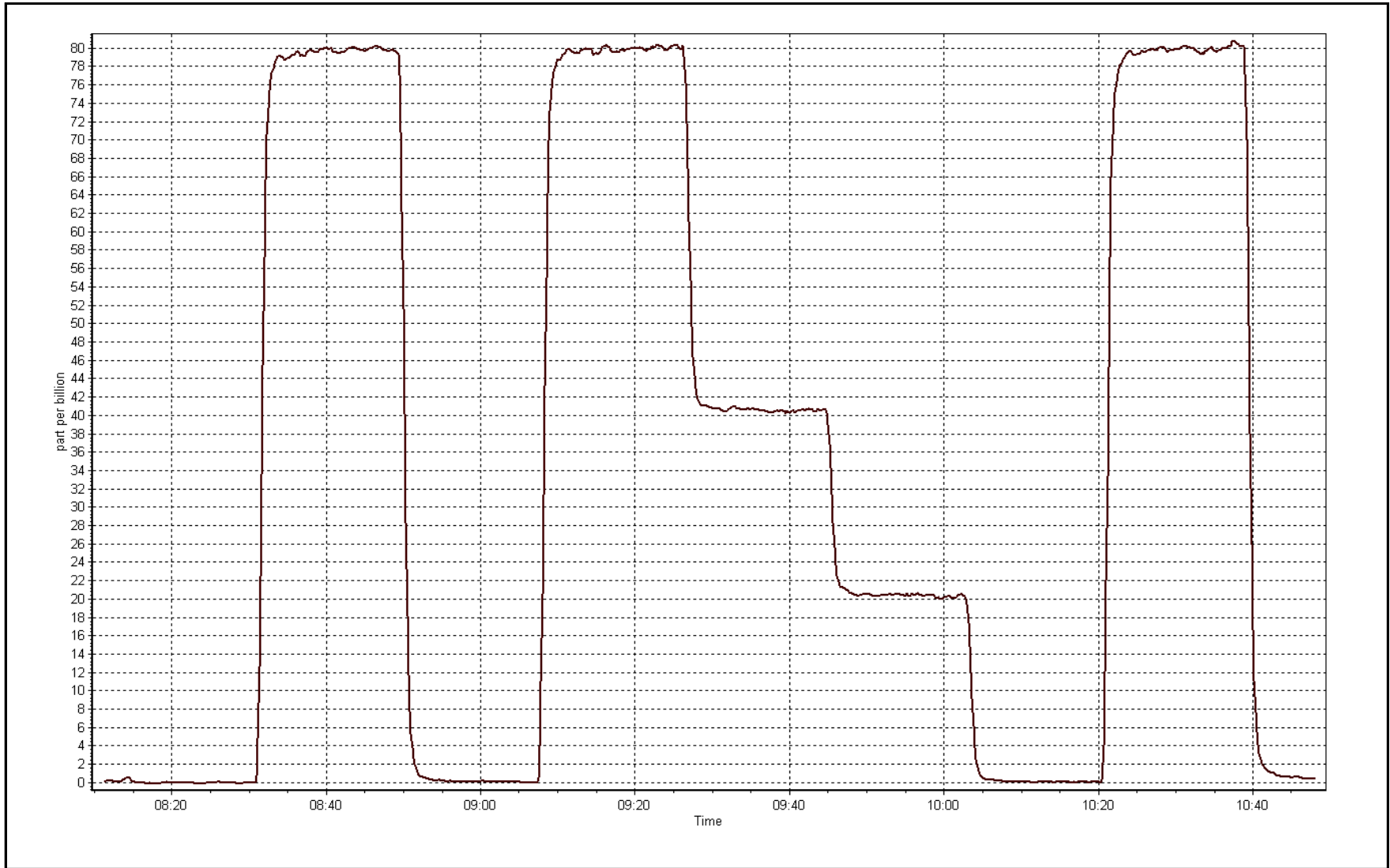
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999927	≥0.995
79.9	79.9	1.0007			
40.0	40.5	0.9865	Slope	1.001175	0.90 - 1.10
20.0	20.4	0.9821			
			Intercept	-0.251223	+/-3



TRS Calibration Plot

Date: April 11, 2017

Location: Barge Landing





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Barge Landing	Station number:	AMS 09
Calibration Date:	April 11, 2017	Last Cal Date:	March 10, 2017
Start time (MST):	10:38	End time (MST):	13:46
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000675	Cal Gas Expiry Date	November 4, 2019
CH4 Cal Gas Conc.	<u>511.0</u> ppm	CH4 Equiv Conc.	1055.5 ppm
C3H8 Cal Gas Conc.	<u>198.0</u> ppm	Station temp.	27 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11071107
ZAG Make/Model	API 701	Serial Number	4888

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1327059296
	<u>Start</u>	<u>Finish</u>	<u>Start</u> <u>Finish</u>
Analyzer Range	0 - 25 ppm	Bias voltage supply	-300 -300
Calculated slope	1.001054	Sample pressure	9.1 9.1
Calculated intercept	-0.048703	Fuel pressure	24.1 24.1
Analyzer Background	5.58	Air pressure	34.7 34.7
Analyzer Coefficient	4.276	Flame temperature	163.5 161.4

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5007	0.0	0.00	-0.01	----
as found span	4928	74.3	15.68	15.50	1.011
calibrator zero	5007	0.0	0.00	0.03	----
high point	4928	74.3	15.68	15.68	1.000
second point	4958	39.8	8.41	8.41	0.999
third point	4977	14.9	3.15	3.19	0.988
as left zero	5007	0.0	0.00	0.02	----
as left span	4928	74.3	15.68	15.61	1.004
Average Correction Factor					0.996
Corrected As found	15.51	Previous response	15.71	*% change	1.3%

* = > +/-5% change initiates investigation

Notes: Replaced the pump after the as founds. Changed inlet filter. Adjusted the zero and the span.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

THC Calibration Summary

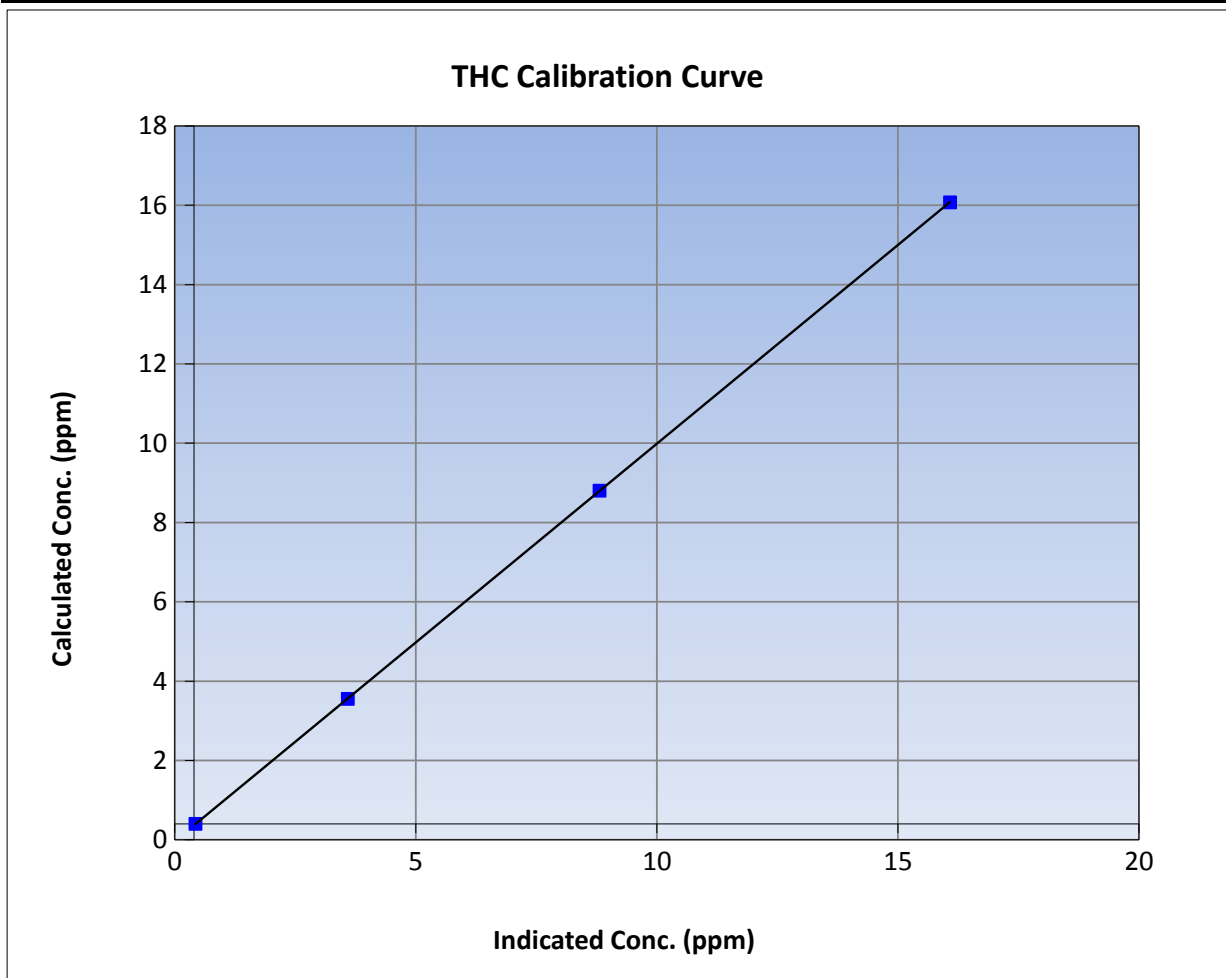
Version-03-2017

Station Information

Calibration Date	April 11, 2017	Previous Calibration	March 10, 2017
Station Name	Barge Landing	Station Number	AMS 09
Start Time (MST)	10:38	End Time (MST)	13:46
Analyzer make	Thermo 51i-LT	Analyzer serial #	1327059296

Calibration Data

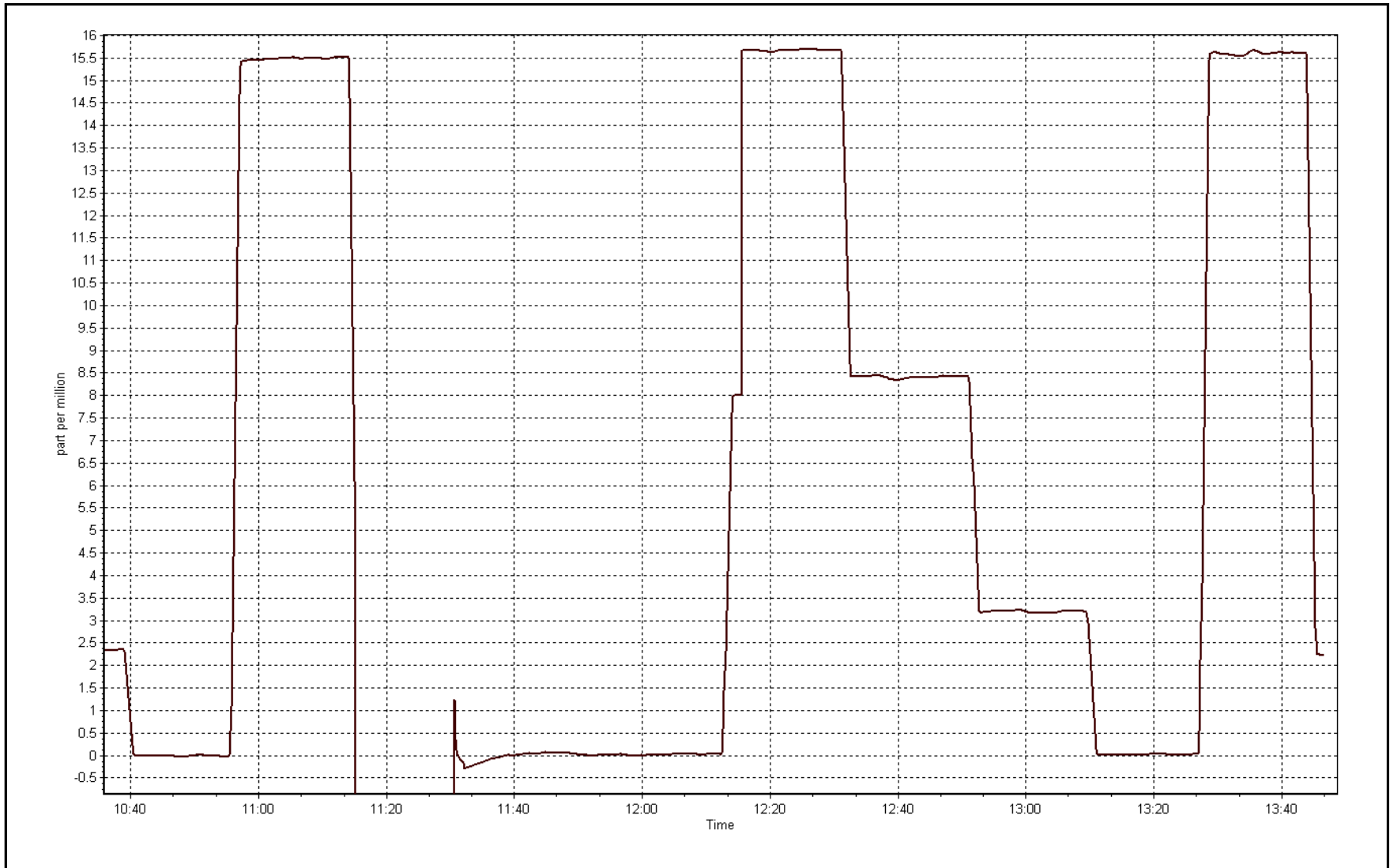
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999998	≥0.995
15.7	15.7	0.9998			
8.4	8.4	0.9995	Slope	1.002270	0.90 - 1.10
3.2	3.2	0.9876			
			Intercept	-0.034626	+/-1.5



THC Calibration Plot

Date: April 11, 2017

Location: Barge Landing





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

AMS 11 LOWER CAMP APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	687	33	33	100	145	0	19	0
H2S (ppb) Average	687	33	33	100	21	2	3	0
THC (ppm) Average	687	33	33	100	6	-	2.8	-
Temperature (C) Average	720	0	0	100	17.8	-	10.3	-
Relative Humidity (%) Average	720	0	0	100	98	-	82	-
Wind Speed 10 m (km/h) Average	720	0	0	100	27	-	18	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	687	2.6	9	-	0	0	0	0	1	6	145
H2S (ppb) Average	687	0.5	1	-	0	0	0	0	0	1	21
THC (ppm) Average	687	2.28	0.3	-	2	2.1	2.1	2.2	2.3	2.6	6
Temperature 2 m (C) Average	720	2.58	5.7	-	-11.1	-4.5	-1.9	2.3	6.3	10.6	17.8
Relative Humidity (%) Average	720	60	18	-	17	35	46	59	74	86	98
Wind Speed 10 m (km/h) Average	720	10	6	-	0	2	5	10	14	18	27
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
-----------	-----------------	---------------	---------------------	-------

No operational issues to report



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

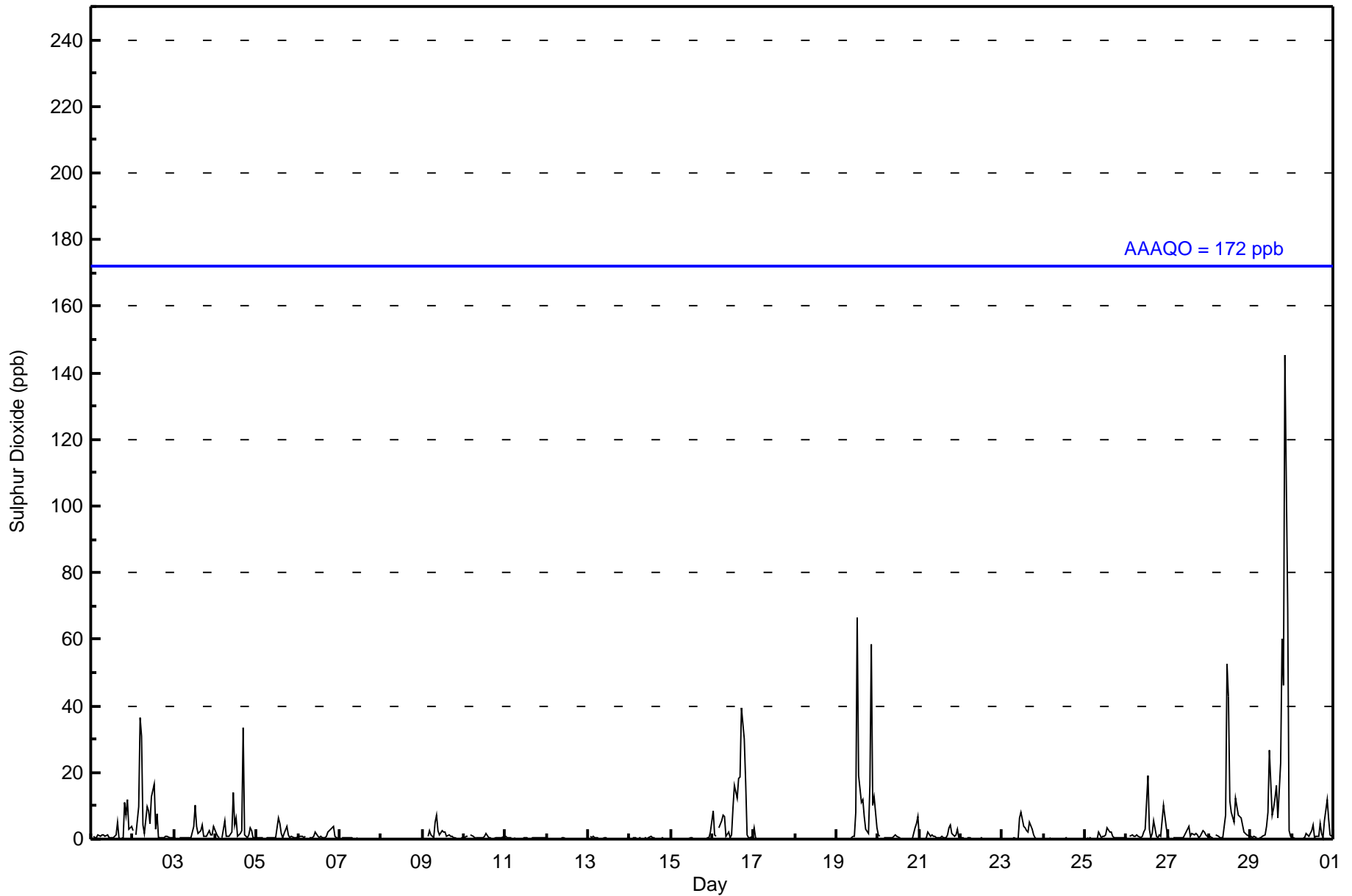
Lower Camp - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 145 ppb on Apr 29 21:00	Maximum Daily Average: 19.3 ppb on Apr 29		Hours of Data:	687
Minimum Value: 0 ppb on Apr 8 14:00	Minimum Daily Average: 0.0 ppb on Apr 8		Hours of Missing Data:	33
Maximum Diurnal Average: 8.1 ppb at hour 21	Minimum Diurnal Average: 0.4 ppb at hour 3		Hours of Calibration:	33
Monthly Average: 2.6 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 6 P ₉₉ = 44		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	1	5	1	0	0	11	7	12	3	4	2.4	12
2-Apr	3	Z	1	10	37	31	4	2	10	9	4	13	17	3	8	0	0	0	0	1	1	1	0	0	6.7	37
3-Apr	0	0	Z	0	0	0	0	0	0	1	0	4	10	4	2	3	4	1	1	1	3	1	1	4	1.8	10
4-Apr	2	1	0	Z	0	6	1	1	1	2	14	4	6	1	2	2	33	1	1	1	3	2	0	0	3.7	33
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	7	5	2	1	2	4	1	1	1	1	0	0	1.1	7
6-Apr	1	1	1	1	1	Z	0	1	0	1	2	1	1	1	0	1	1	2	3	3	4	1	0	0	1.1	4
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0.2	0
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	Z	1	2	1	1	5	7	2	1	2	2	2	1	1	1	1	0	0	0	0	0	0	1.4	7
10-Apr	1	1	1	Z	1	1	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	1	0.5	2
11-Apr	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	Z	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.3	2
16-Apr	8	1	1	Z	3	6	7	7	1	2	1	1	9	16	12	18	19	39	30	17	1	1	0	1	8.8	39
17-Apr	3	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	3
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	Z	0	0	0	0	0	0	0	0	1	1	8	66	19	11	12	7	3	2	16	58	10	13	3	10.0	66
20-Apr	1	1	Z	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	5	7	1.0	7
21-Apr	0	0	Z	0	0	2	1	1	1	1	0	0	1	0	0	1	3	4	2	1	1	3	0	0	1.1	4
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	0	0	0	0	Z	0	0	0	0	0	7	8	4	3	3	2	5	3	1	0	0	0	0	0	1.7	8
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	Z	0	0	0	0	0	0	0	2	0	1	1	1	3	2	2	1	0	0	0	0	0	0	0	0.7	3
26-Apr	0	Z	1	1	1	1	1	1	1	1	2	3	19	3	0	2	6	1	0	1	1	10	7	3	2.9	19
27-Apr	1	1	Z	0	0	0	0	0	1	1	1	3	4	1	2	1	2	1	1	1	2	2	1	1	1.2	4
28-Apr	1	1	0	Z	1	1	0	0	0	7	53	43	11	8	5	12	10	7	7	4	2	2	1	1	7.8	53
29-Apr	1	1	1	1	Z	0	0	1	1	4	8	27	7	9	12	16	6	23	60	46	145	69	3	1	19.3	145
30-Apr	1	0	0	0	0	Z	0	0	2	1	1	2	4	1	1	1	5	2	0	6	12	6	1	1	2.0	12

1.0	0.4	0.4	0.7	2.1	2.1	0.7	0.8	1.0	1.2	3.3	4.3	6.0	2.9	2.2	2.7	3.5	3.1	3.8	3.7	8.1	4.1	1.4	1.1	Diurnal Average	
8	1	1	10	37	31	7	7	10	9	53	43	66	19	12	18	33	39	60	46	145	69	13	7	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	651	94.76	94.76
11 - 20	21	3.06	97.82
21 - 60	12	1.75	99.56
61 - 110	2	0.29	99.85
111 - 172	1	0.15	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	124	43	20	19	19	37	138	53	6	2	5	18	43	41	30	53	651
11 - 20	0	0	0	0	1	1	0	3	4	2	4	2	2	1	0	1	21
21 - 60	0	1	0	0	0	0	1	0	5	2	2	0	1	0	0	0	12
61 - 110	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2
111 - 172	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	44	20	19	20	38	139	56	16	7	11	20	47	42	30	54	687

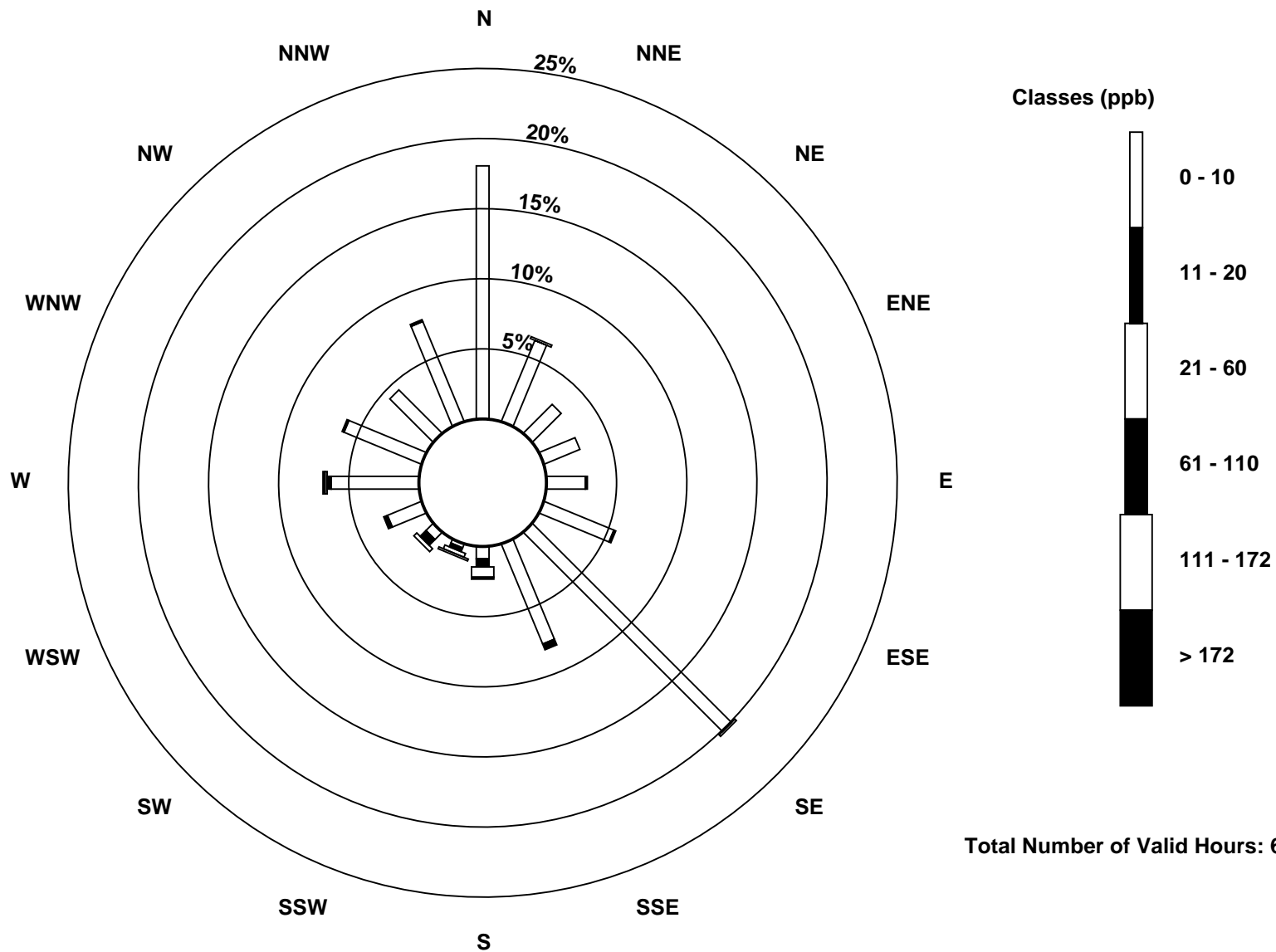
Total Number of Valid Hours: 687

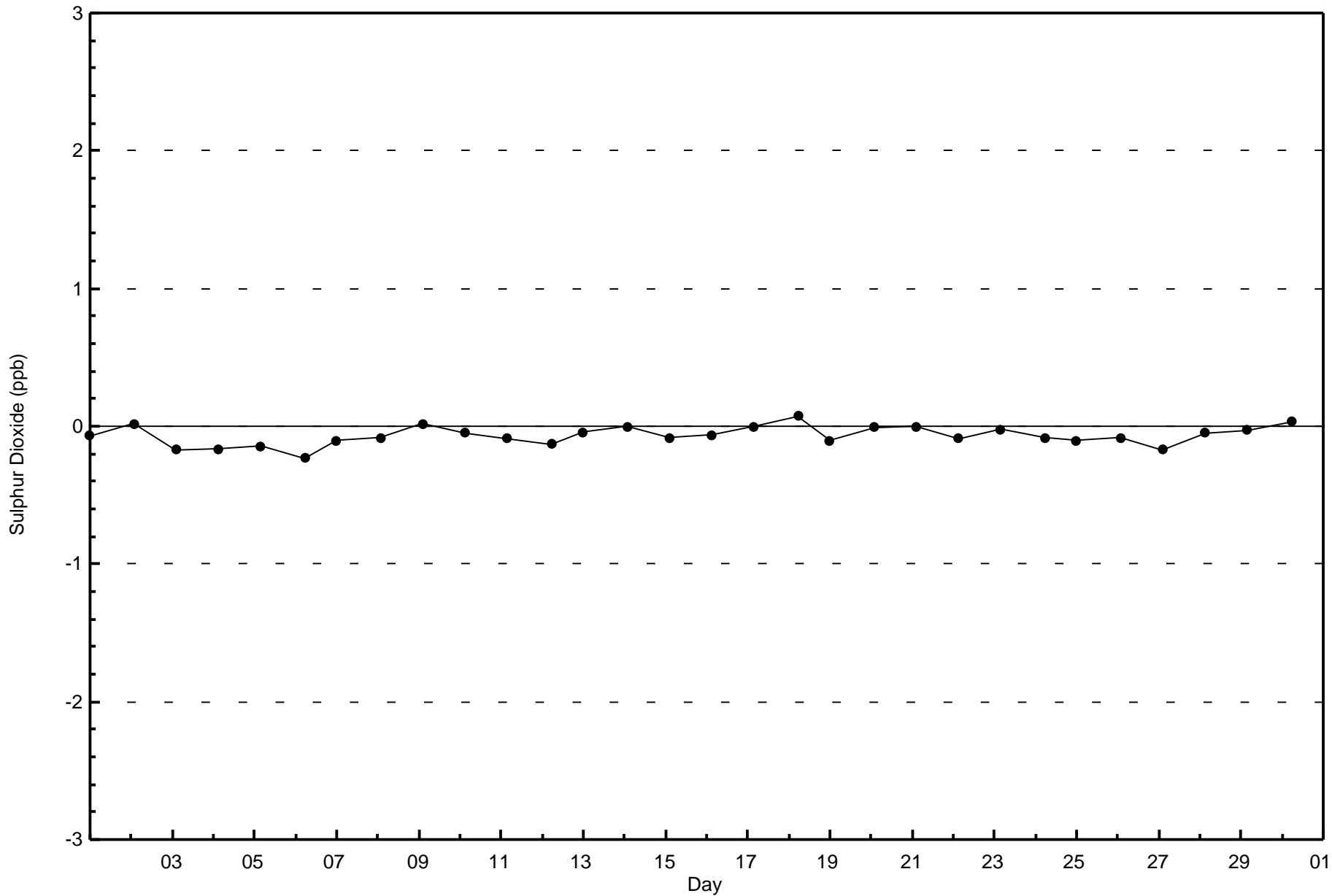
Total Number of Hours: 720

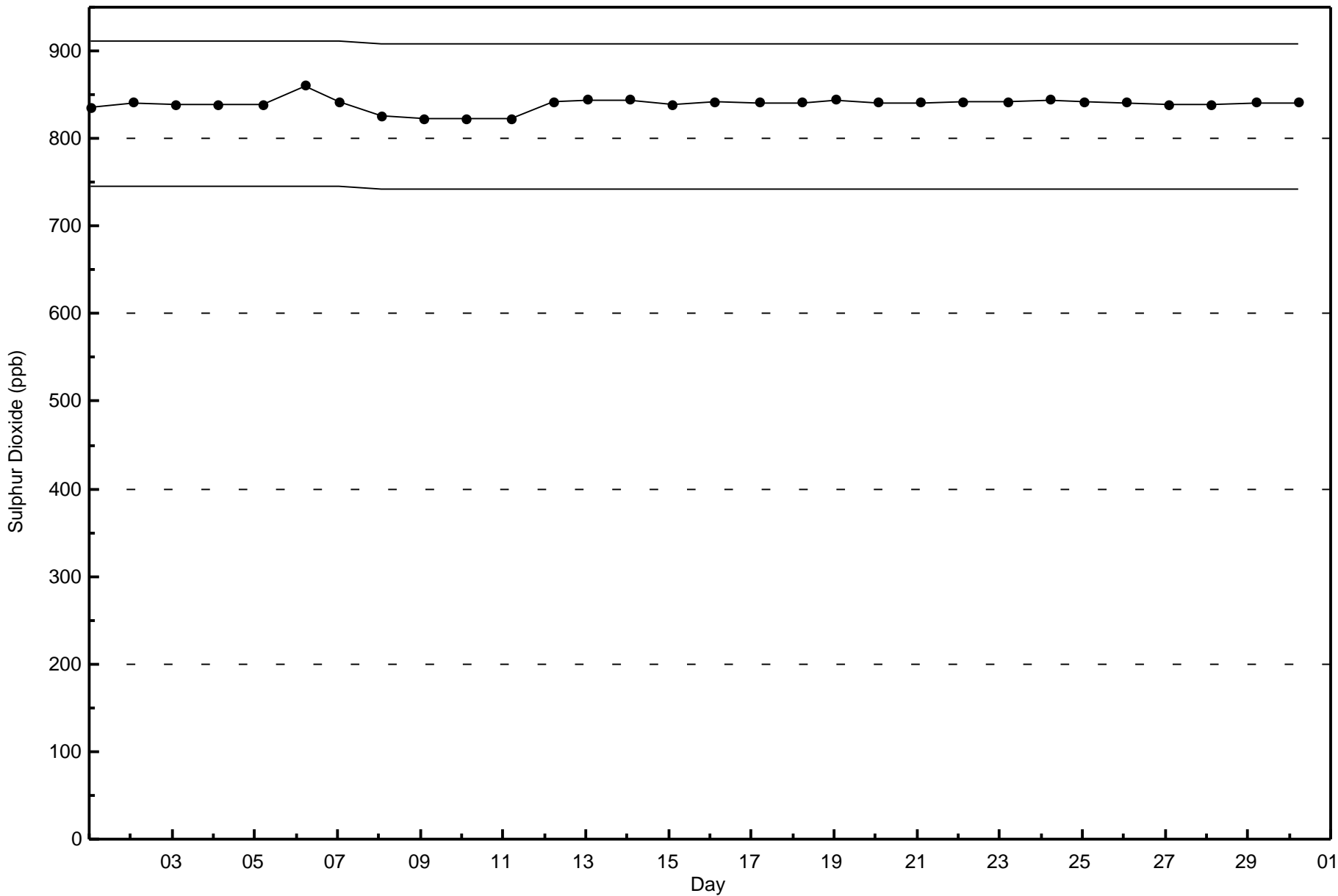


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Lower Camp (AMS 11)









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Lower Camp - April 2017

Number of Exceedences (AAAQO):	1-hr: 2	24-hr: 0	Hours in Service:	720
Maximum Value: 21 ppb on Apr 29 21:00	Maximum Daily Average: 2.7 ppb on Apr 29		Hours of Data:	687
Minimum Value: 0 ppb on Apr 10 12:00	Minimum Daily Average: 0.0 ppb on Apr 11		Hours of Missing Data:	33
Maximum Diurnal Average: 1.6 ppb at hour 21	Minimum Diurnal Average: 0.2 ppb at hour 15		Hours of Calibration:	33
Monthly Average: 0.5 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 5		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	4	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.5	4
2-Apr	0	0	Z	1	6	10	2	1	2	1	1	1	1	0	0	0	0	0	0	0	0	1	1	2	1.3	10
3-Apr	1	1	1	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0.5	1
4-Apr	1	2	1	1	Z	2	1	1	1	1	0	0	1	0	0	2	0	0	0	0	2	2	0	1	0.8	2
5-Apr	1	0	1	0	0	Z	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0.4	1
6-Apr	1	1	1	1	2	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0.7	2
7-Apr	1	Z	1	0	1	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.2	1
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
12-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
13-Apr	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	1
16-Apr	1	0	0	1	Z	1	0	0	0	0	0	1	2	1	2	2	5	3	1	0	0	0	1	1.1	5	
17-Apr	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	3	13	4	5	2	1.4	13
20-Apr	2	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	1
22-Apr	1	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1	0.6	3
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.2	2
28-Apr	0	1	1	1	Z	1	0	0	0	1	3	2	0	0	0	1	0	0	0	0	0	1	1	1	0.7	3
29-Apr	1	0	0	0	0	Z	0	0	0	0	1	6	1	1	2	2	0	2	9	5	21	4	2	3	2.7	21
30-Apr	2	1	2	2	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	3	2	1	1	0.8	3

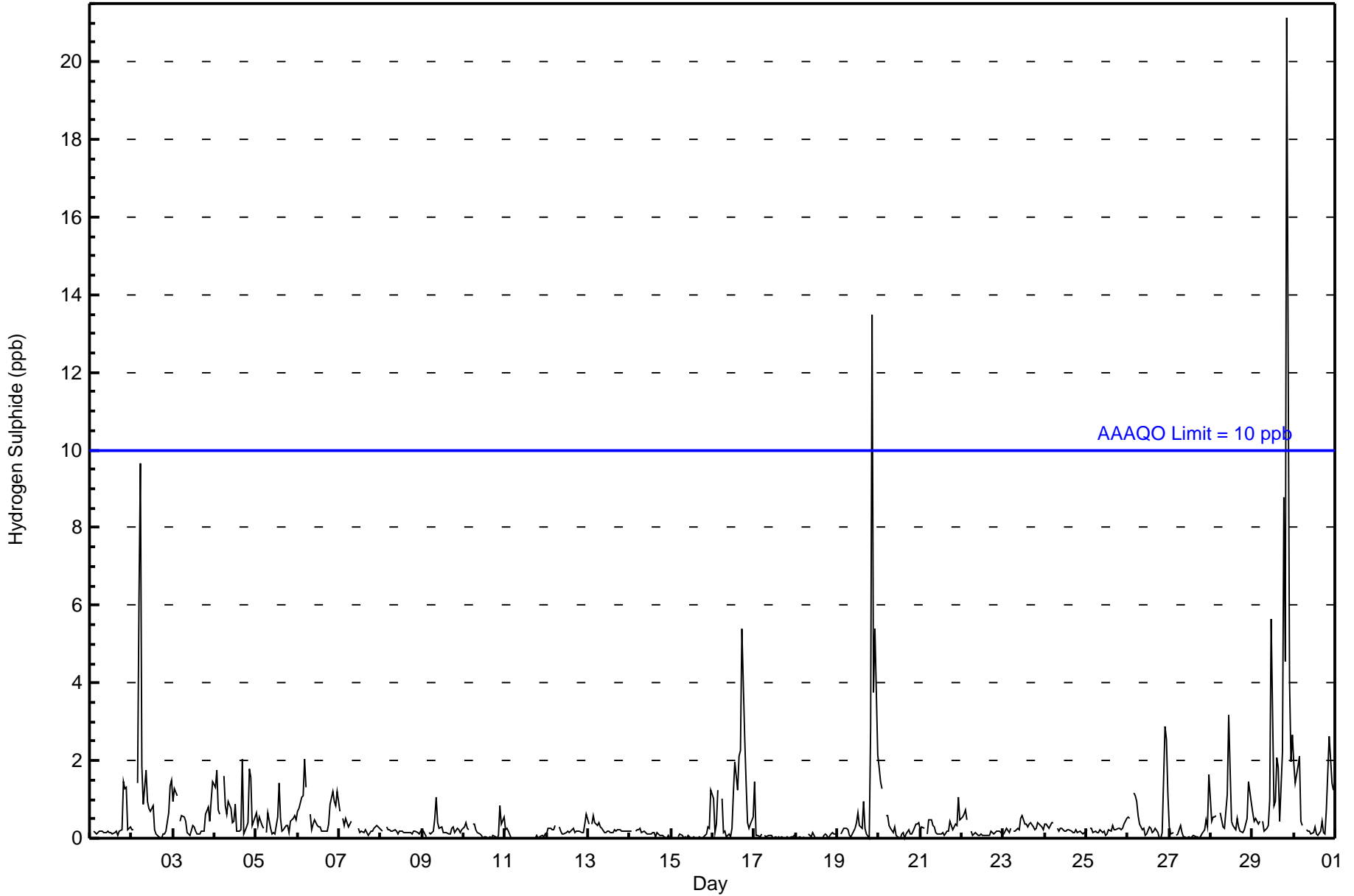
0.6	0.5	0.5	0.5	0.6	0.8	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.4	0.5	0.5	1.6	0.8	0.7	0.7	Diurnal Average
4	2	2	2	6	10	2	1	2	1	3	6	1	2	2	2	2	2	5	9	5	21	4	5	3	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Lower Camp - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	668	97.23	97.23
3 - 4	10	1.46	98.69
5 - 7	5	0.73	99.42
8 - 11	2	0.29	99.71
> 11	2	0.29	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	127	41	22	18	19	38	136	56	11	4	8	19	44	43	32	50	668
3 - 4	0	1	0	1	0	0	1	0	3	1	1	0	0	1	0	1	10
5 - 7	0	0	0	0	1	0	0	0	2	1	1	0	0	0	0	0	5
8 - 11	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
> 11	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Totals	127	42	22	19	20	38	138	56	16	8	11	19	44	44	32	51	687

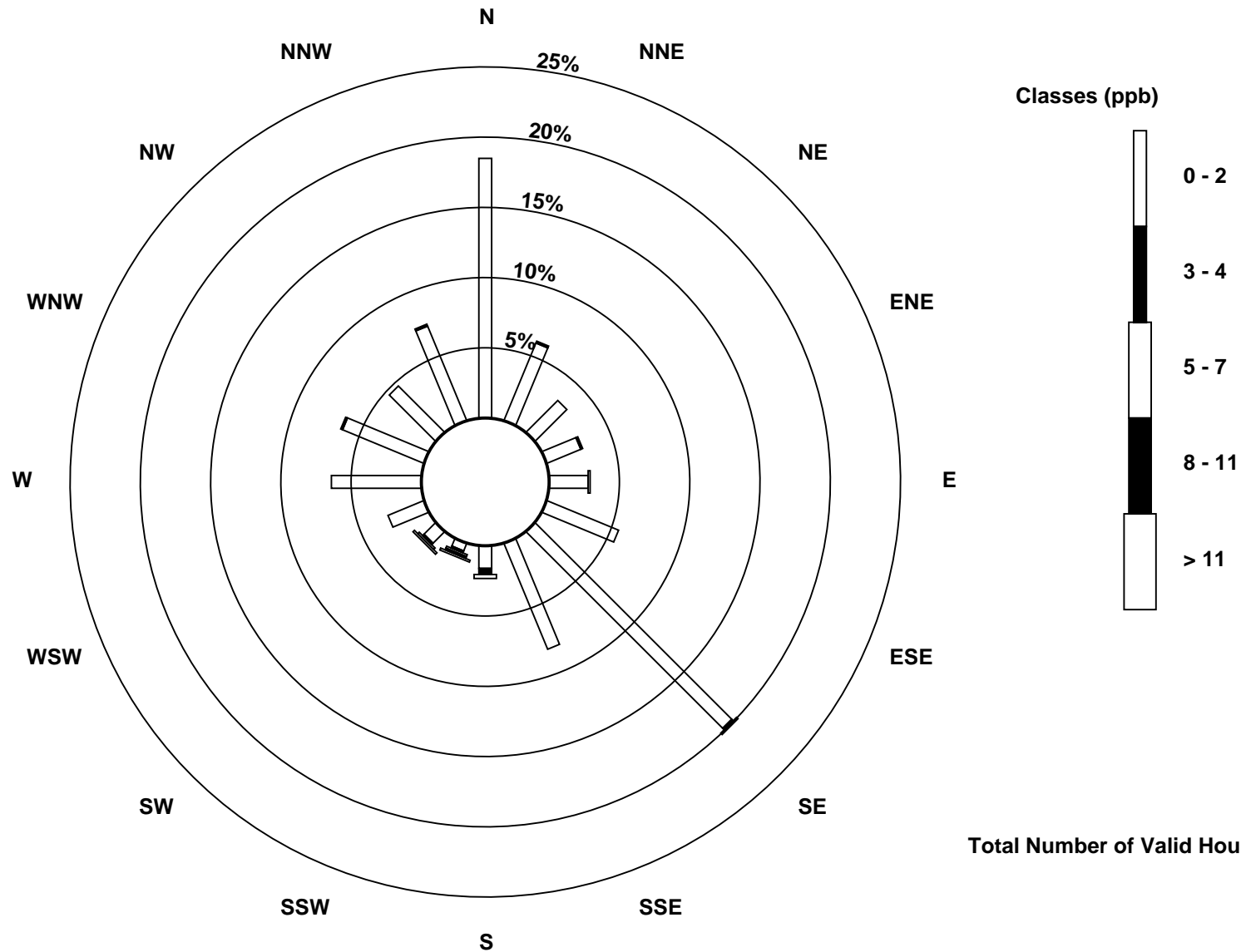
Total Number of Valid Hours: 687

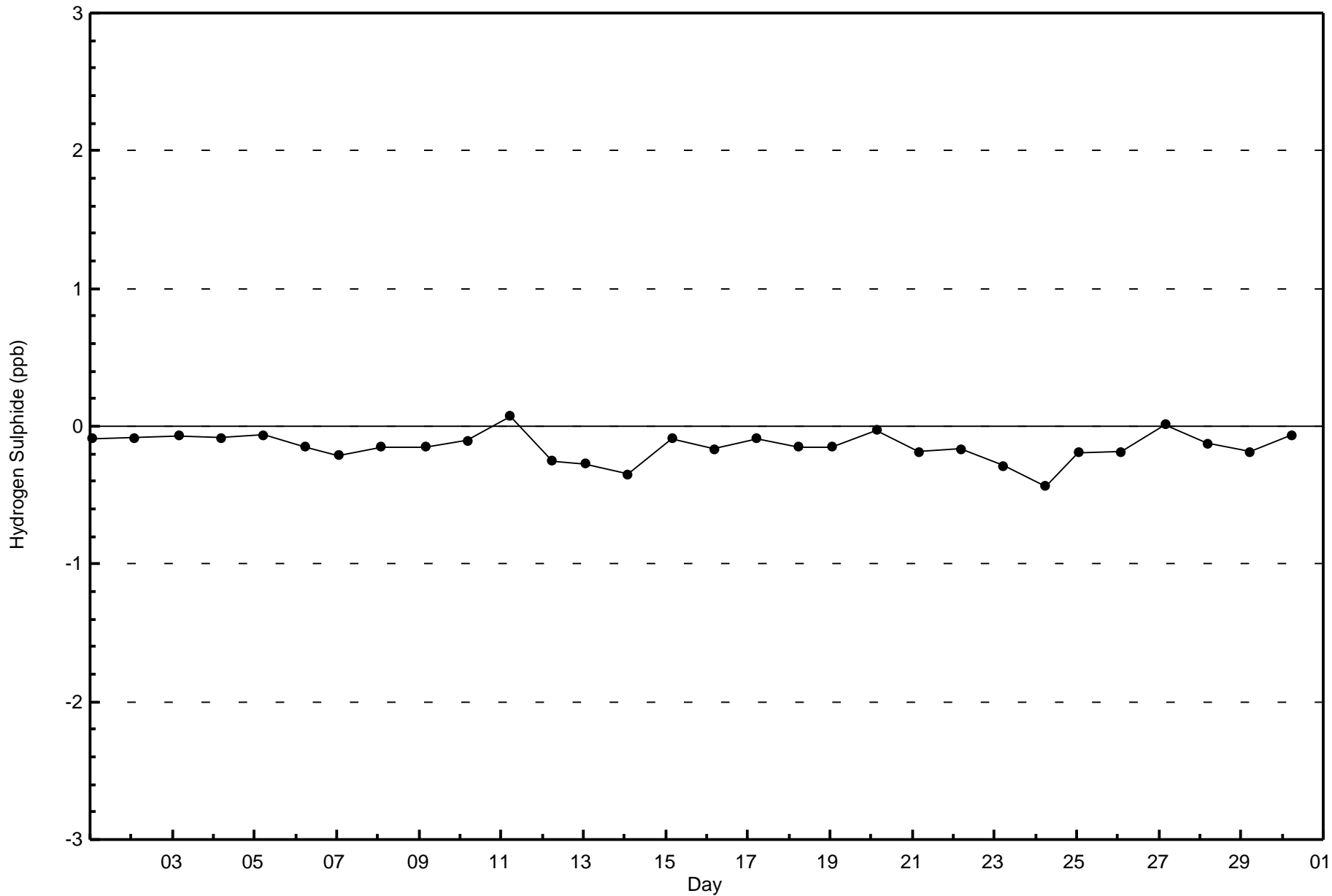
Total Number of Hours: 720

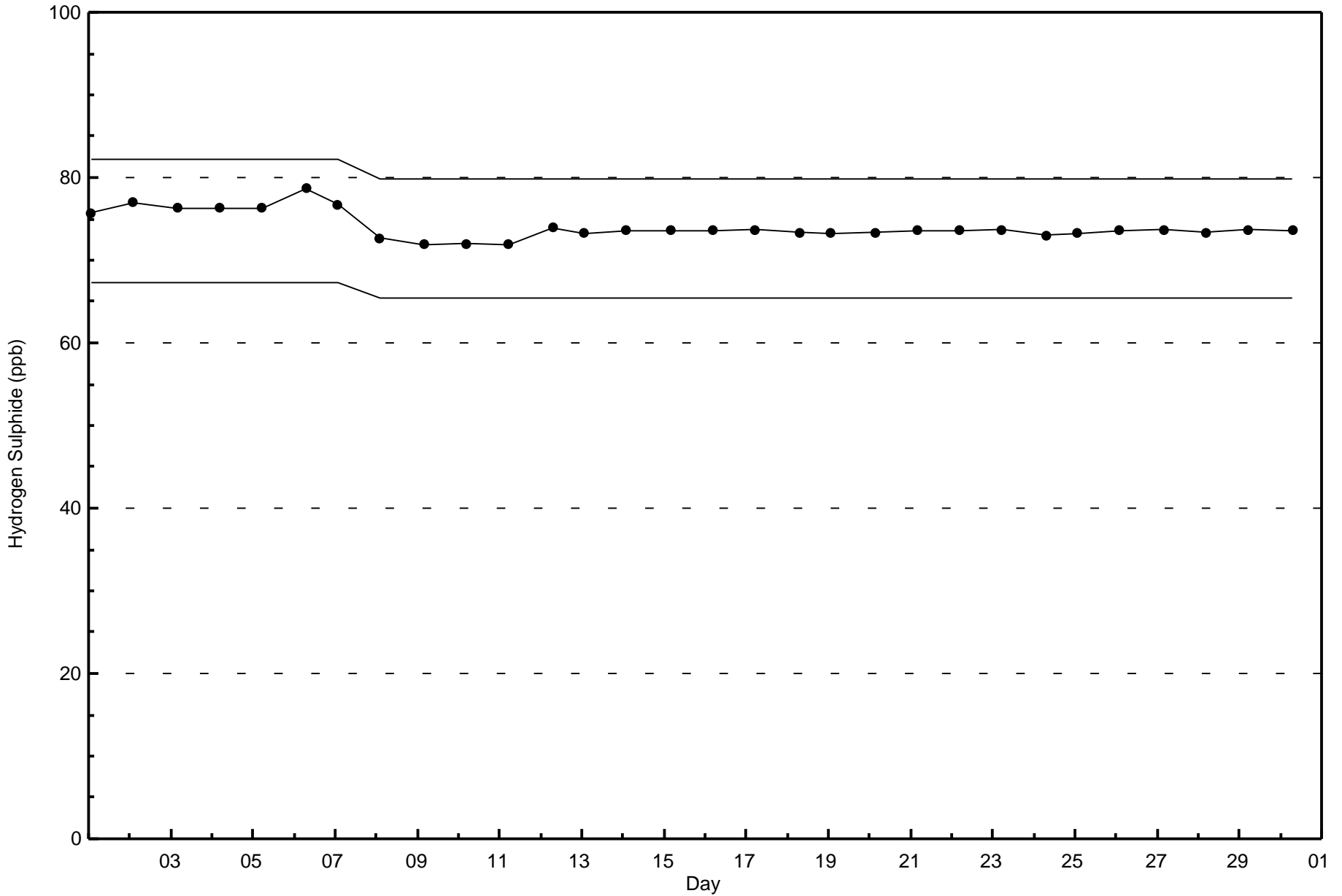


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Lower Camp (AMS 11)









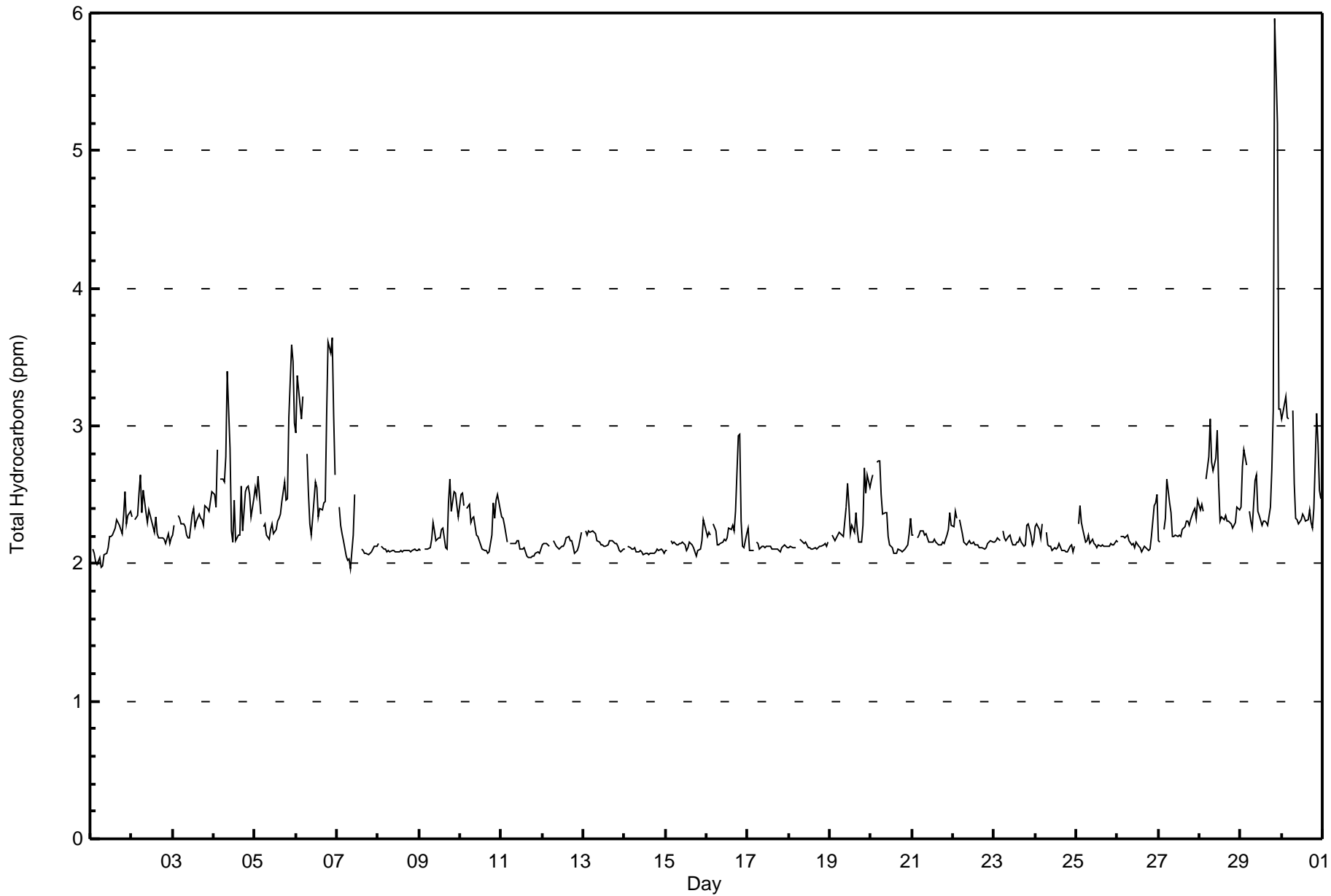
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - April 2017

Maximum Value: 6.0 ppm on Apr 29 21:00																			Maximum Daily Average: 2.8 ppm on Apr 29						Hours in Service: 720	
Minimum Value: 2.0 ppm on Apr 7 09:00																			Minimum Daily Average: 2.1 ppm on Apr 14						Hours of Data: 687	
Maximum Diurnal Average: 2.5 ppm at hour 21																			Minimum Diurnal Average: 2.2 ppm at hour 14						Hours of Missing Data: 33	
Monthly Average: 2.28 ppm																			Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.6 P ₉₉ = 3.4						Hours of Calibration: 33	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.4	2.5	2.3	2.4	2.4	2.2	2.5
2-Apr	2.3	Z	2.3	2.3	2.5	2.6	2.4	2.5	2.4	2.3	2.4	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.3	2.6
3-Apr	2.2	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.3	2.5
4-Apr	2.5	2.4	2.8	Z	2.6	2.6	2.6	2.8	3.4	2.8	2.2	2.2	2.5	2.2	2.2	2.2	2.6	2.2	2.5	2.6	2.6	2.5	2.3	2.5	2.5	3.4
5-Apr	2.6	2.5	2.6	2.4	Z	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.5	2.5	3.1	3.6	3.5	3.0	2.5	3.6
6-Apr	3.0	3.4	3.2	3.0	3.2	Z	2.8	2.5	2.3	2.2	2.3	2.6	2.6	2.3	2.4	2.4	2.4	2.4	3.1	3.6	3.5	3.6	3.1	2.6	2.8	3.6
7-Apr	Z	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.2	2.5	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5
8-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.1	2.4	2.6	2.4	2.5	2.5	2.4	2.3	2.3	2.6
10-Apr	2.5	2.5	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.5	2.5	2.4	2.3	2.5
11-Apr	2.3	2.3	2.3	2.2	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
12-Apr	2.1	2.1	2.2	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
13-Apr	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
14-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
15-Apr	2.1	2.1	Z	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.1	2.3
16-Apr	2.2	2.2	2.2	Z	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.4	2.9	2.9	2.3	2.1	2.1	2.2	2.3	2.9
17-Apr	2.3	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
18-Apr	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
19-Apr	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	2.4	2.2	2.3	2.2	2.4	2.2	2.2	2.2	2.3	2.7	2.5	2.6	2.6	2.3	2.7
20-Apr	2.6	2.6	Z	2.7	2.7	2.7	2.5	2.4	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.7
21-Apr	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.3	2.4	2.3	2.2	2.4
22-Apr	2.3	2.4	2.3	Z	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4
23-Apr	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.3	2.2	2.1	2.2	2.2	2.3
24-Apr	2.3	2.3	2.2	2.2	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
25-Apr	Z	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.4
26-Apr	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.4	2.5	2.2	2.5
27-Apr	2.2	2.2	Z	2.2	2.3	2.6	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.5	2.3	2.6
28-Apr	2.4	2.4	2.4	Z	2.6	2.8	3.1	2.7	2.7	2.8	3.0	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	3.1
29-Apr	2.4	2.7	2.8	2.7	Z	2.4	2.3	2.3	2.6	2.6	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.7	3.1	6.0	5.2	3.1	2.8	6.0
30-Apr	3.1	3.1	3.2	3.1	3.1	Z	3.1	2.6	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.4	3.1	2.9	2.5	2.5	2.6	3.2
																								Diurnal Average		
																								Diurnal Maximum		
2.3 2.4 2.4 2.3 2.3 2.3 2.3 2.3 2.3 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.3 2.5 2.4 2.4 2.3																								Diurnal Average		
3.1 3.4 3.2 3.1 3.2 2.8 3.1 2.8 3.4 2.8 3.0 2.6 2.6 2.3 2.4 2.4 2.6 2.6 3.1 3.6 6.0 5.2 3.5 3.1																								Diurnal Maximum		
Z - zerospan C - Calibration																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	10	1.46	1.46
2.1 - 3.0	652	94.91	96.36
3.1 - 10.0	25	3.64	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Lower Camp - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	3	0	0	0	0	0	0	0	0	0	0	4	0	1	1	1	10
2.1 - 3.0	120	43	19	19	19	37	130	56	13	6	10	16	46	39	27	52	652
3.1 - 10.0	1	1	1	0	1	1	9	0	3	1	1	0	1	2	2	1	25
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	44	20	19	20	38	139	56	16	7	11	20	47	42	30	54	687

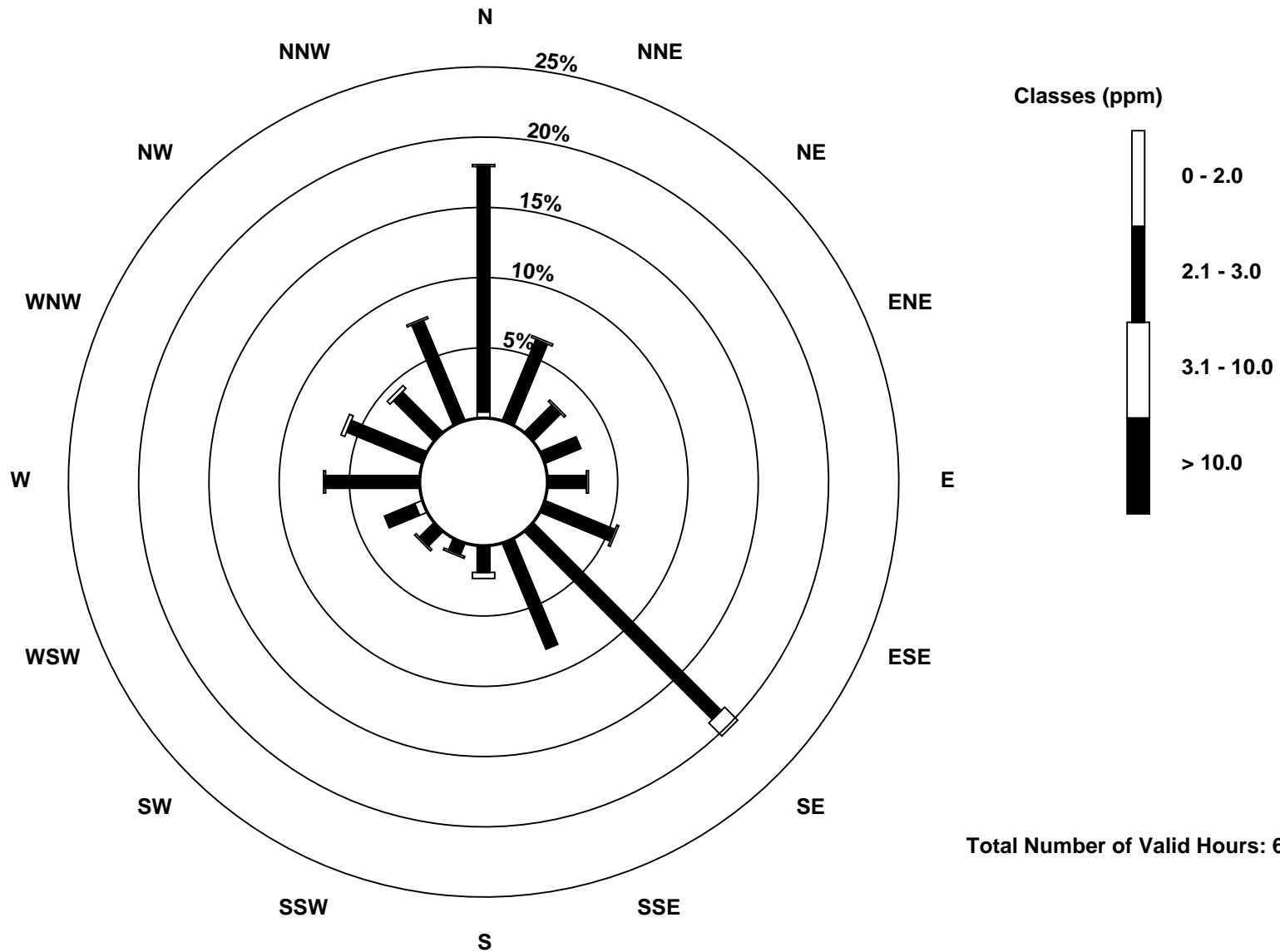
Total Number of Valid Hours: 687

Total Number of Hours: 720

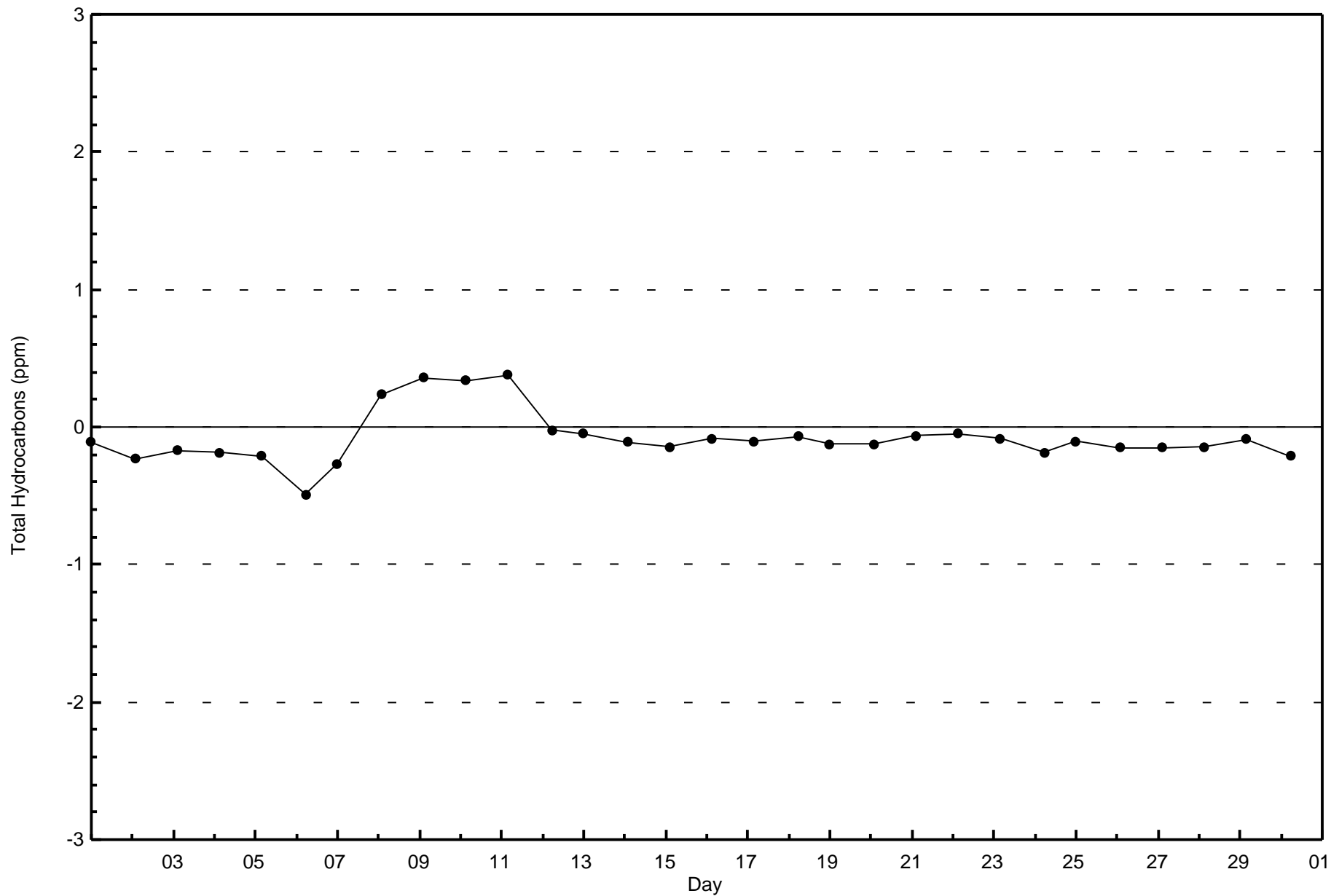


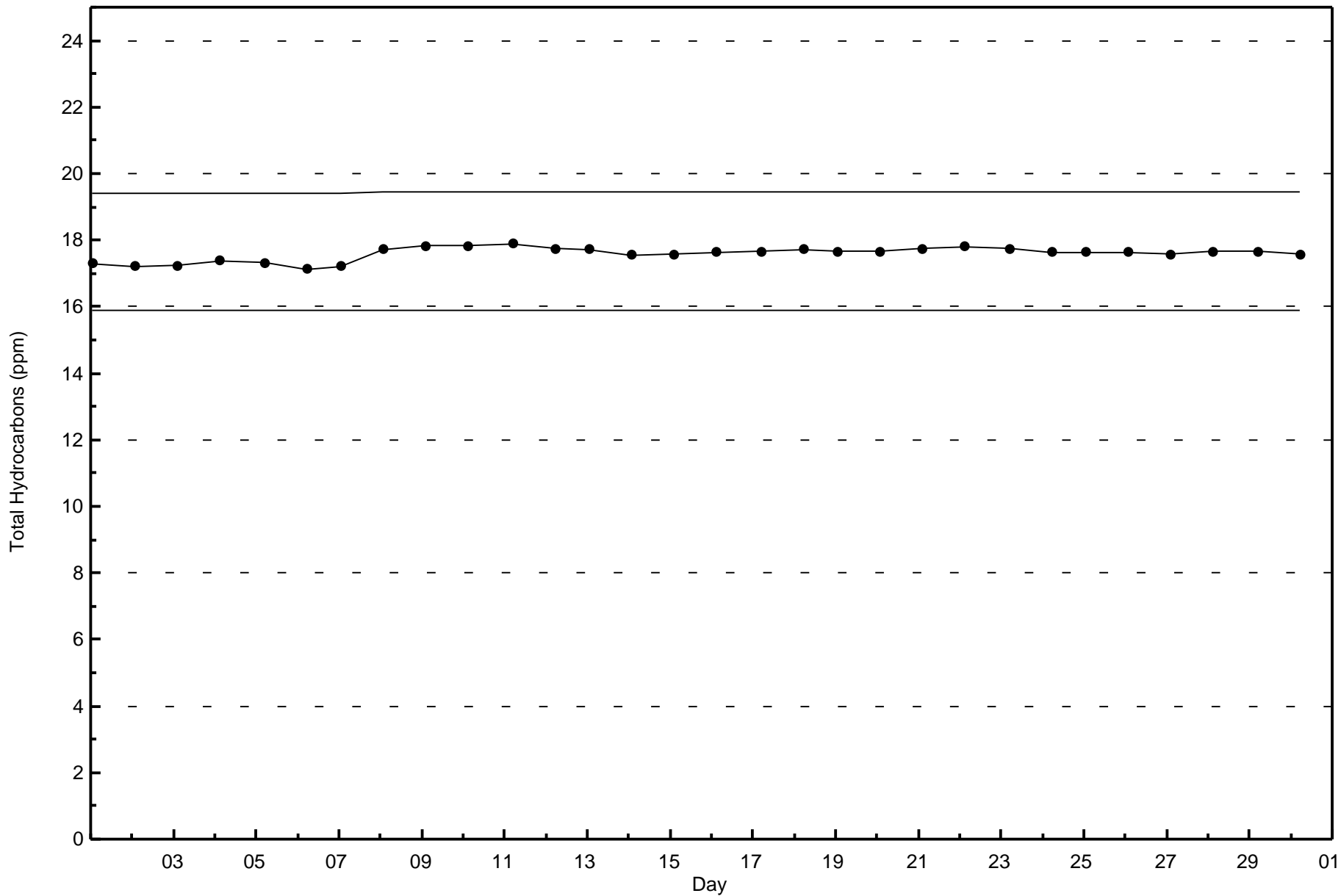
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Lower Camp (AMS 11)



Total Number of Valid Hours: 687







Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

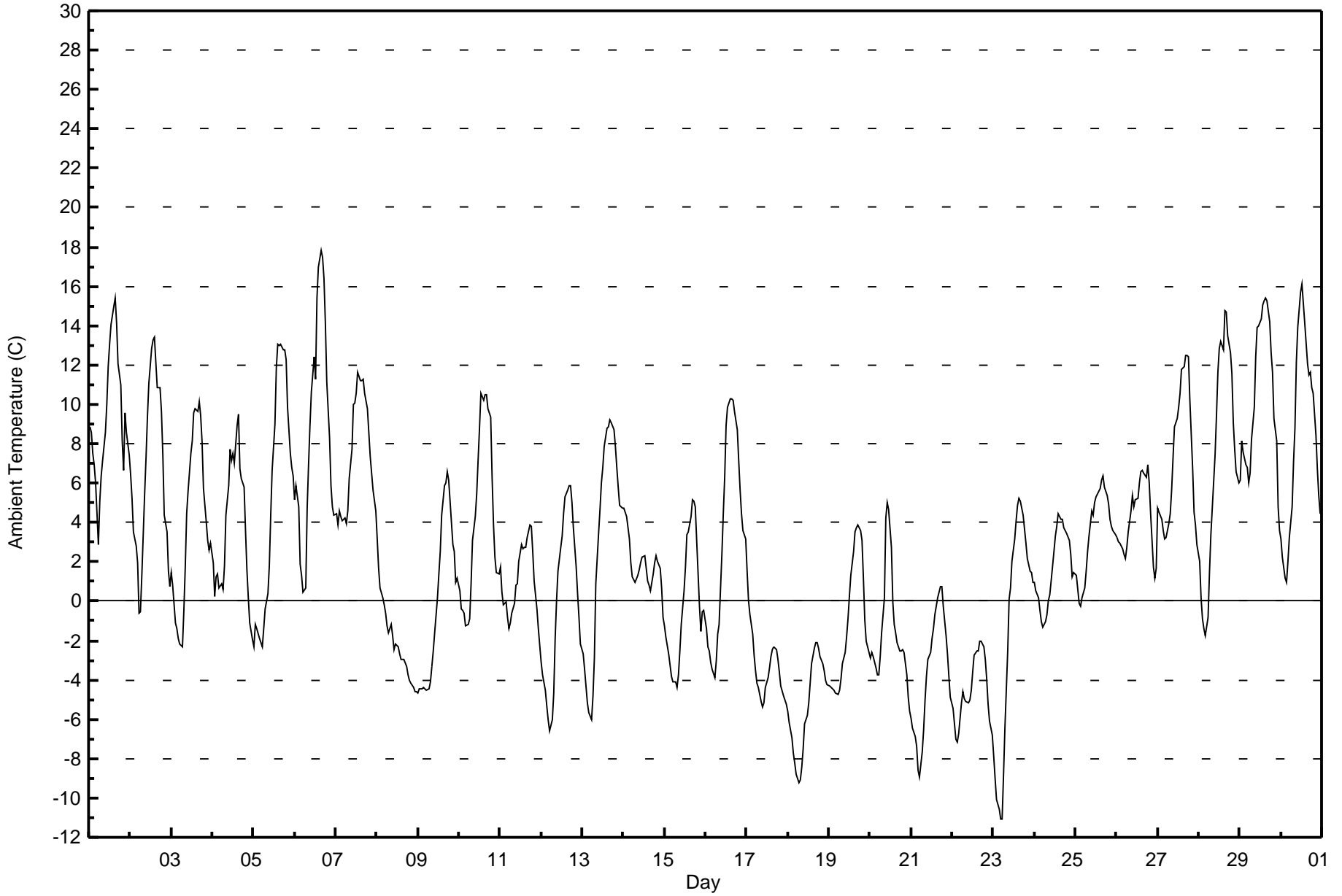
Lower Camp - April 2017

Maximum Value: 17.8 C on Apr 6 16:00		Maximum Daily Average: 10.3 C on Apr 29		Hours in Service: 720																							
Minimum Value: -11.1 C on Apr 23 05:00		Minimum Daily Average: -5.4 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 6.9 C at hour 16		Minimum Diurnal Average: -1.9 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 2.58 C		Percentiles: P ₁ = -9.0 P ₁₀ = -4.5 Q ₁ = -1.9 Median = 2.3 Q ₃ = 6.3 P ₉₀ = 10.6 P ₉₉ = 15.3		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	8.8	8.6	7.5	6.9	6.0	2.9	5.1	6.4	7.1	8.6	10.0	11.9	13.0	14.1	15.0	15.4	14.2	12.1	11.0	8.1	6.7	9.6	8.6	7.4	9.4	15.4	
2-Apr	6.4	5.2	3.5	2.8	1.9	-0.6	-0.6	1.3	5.4	7.3	9.3	11.1	12.8	13.3	13.4	12.2	10.8	10.9	9.6	7.4	4.4	3.5	1.5	0.7	6.4	13.4	
3-Apr	1.4	0.8	-1.1	-1.4	-1.9	-2.2	-2.3	-0.4	1.7	4.4	5.6	7.5	8.1	9.6	9.8	9.6	10.1	9.5	8.0	5.7	4.0	3.1	2.6	2.9	4.0	10.1	
4-Apr	1.9	0.3	1.3	1.4	0.6	0.9	0.6	1.8	4.3	5.9	7.7	7.2	7.5	7.0	8.9	9.5	6.8	6.2	5.8	3.6	1.6	0.2	-1.1	-1.9	3.7	9.5	
5-Apr	-2.3	-1.2	-1.4	-1.9	-2.1	-2.3	-1.4	-0.4	0.4	1.8	4.4	6.7	9.0	11.9	13.0	13.0	13.0	12.8	12.8	12.3	9.8	7.5	6.8	6.4	5.4	13.0	
6-Apr	5.1	5.9	4.8	1.9	1.3	0.5	0.6	4.7	6.9	8.9	10.6	12.4	11.3	15.4	16.9	17.8	17.5	16.4	14.1	11.1	8.3	5.9	4.8	4.3	8.7	17.8	
7-Apr	4.4	3.9	4.6	4.3	4.1	4.3	4.0	4.6	6.2	7.7	10.0	10.1	10.6	11.7	11.2	11.2	11.3	10.6	9.8	8.5	7.3	6.5	5.7	4.6	7.4	11.7	
8-Apr	3.2	1.7	0.7	0.2	-0.2	-0.6	-1.3	-1.6	-1.2	-1.7	-2.4	-2.2	-2.4	-2.7	-2.9	-3.0	-3.0	-3.3	-3.7	-4.0	-4.2	-4.4	-4.6	-4.6	-2.0	3.2	
9-Apr	-4.7	-4.4	-4.4	-4.4	-4.5	-4.5	-4.5	-4.1	-3.3	-2.6	-1.6	0.2	1.4	2.5	4.3	5.9	6.0	6.6	6.2	5.1	2.9	2.5	1.0	1.2	0.1	6.6	
10-Apr	0.6	-0.4	-0.4	-0.6	-1.3	-1.2	-0.9	0.9	3.1	4.3	5.4	7.1	8.8	10.5	10.2	10.5	10.5	9.8	9.4	6.3	3.8	2.3	1.5	1.4	4.2	10.5	
11-Apr	1.7	0.5	-0.2	0.0	-0.8	-1.4	-1.1	-0.6	-0.1	0.8	0.9	2.1	2.9	2.6	2.8	2.7	3.2	3.8	3.8	2.5	1.0	-0.4	-1.4	-2.2	1.0	3.8	
12-Apr	-3.1	-3.8	-4.5	-5.3	-6.0	-6.6	-6.0	-4.7	-1.9	0.1	1.5	2.8	3.3	4.4	5.3	5.7	5.9	5.9	5.0	3.7	1.8	0.4	-0.8	-2.2	0.0	5.9	
13-Apr	-2.6	-3.4	-4.3	-5.2	-5.7	-6.0	-4.8	-2.9	0.9	3.4	4.6	6.0	6.8	7.8	8.8	8.9	9.2	9.1	8.7	7.9	6.8	5.8	4.9	4.7	2.9	9.2	
14-Apr	4.8	4.5	4.3	3.2	2.0	1.2	1.1	0.9	1.3	1.6	1.9	2.2	2.3	1.7	1.0	0.8	0.5	1.4	2.0	2.3	2.0	1.6	0.7	-0.8	1.9	4.8	
15-Apr	-1.2	-1.8	-2.7	-3.2	-3.8	-4.1	-4.1	-4.4	-3.8	-2.6	-1.2	0.5	1.8	3.4	3.5	4.3	5.1	5.1	4.8	3.1	-0.3	-1.5	-0.5	-0.5	-0.2	5.1	
16-Apr	-1.4	-2.3	-2.5	-3.1	-3.5	-3.9	-3.0	-1.7	-1.2	2.4	4.4	6.3	8.9	9.8	10.3	10.3	10.2	9.6	8.7	7.2	5.7	4.5	3.6	3.2	3.4	10.3	
17-Apr	1.6	0.0	-0.7	-1.7	-2.7	-3.5	-4.2	-4.4	-5.1	-5.4	-5.2	-4.4	-3.9	-3.4	-2.8	-2.4	-2.3	-2.5	-3.0	-3.6	-4.3	-4.8	-5.0	-5.2	-3.3	1.6	
18-Apr	-5.6	-6.2	-6.9	-7.7	-8.2	-8.8	-9.2	-9.1	-8.4	-7.5	-6.2	-5.8	-5.2	-4.2	-3.2	-2.4	-2.1	-2.1	-2.4	-2.8	-3.2	-3.5	-4.0	-4.2	-5.4	-2.1	
19-Apr	-4.3	-4.4	-4.5	-4.5	-4.7	-4.7	-4.6	-4.0	-3.2	-2.6	-1.8	-0.9	0.2	1.3	2.5	3.5	3.7	3.9	3.6	3.1	1.2	-1.0	-2.1	-2.6	-1.1	3.9	
20-Apr	-2.9	-2.6	-2.8	-3.4	-3.7	-3.7	-2.8	-1.6	0.2	4.3	5.0	4.7	2.7	-0.1	-1.1	-1.6	-2.1	-2.6	-2.5	-2.5	-2.6	-3.7	-4.9	-5.6	-1.5	5.0	
21-Apr	-5.9	-6.4	-6.9	-7.4	-8.6	-8.9	-7.6	-6.5	-5.0	-3.8	-2.9	-2.6	-1.9	-1.4	-0.7	0.2	0.5	0.8	0.7	-0.2	-1.7	-2.7	-3.8	-4.9	-3.7	0.8	
22-Apr	-5.5	-6.2	-7.0	-7.1	-6.7	-5.2	-4.6	-4.9	-5.1	-5.2	-5.0	-4.5	-3.6	-2.8	-2.6	-2.5	-2.1	-2.0	-2.3	-2.9	-3.9	-5.2	-6.1	-6.8	-4.6	-2.0	
23-Apr	-7.9	-9.0	-10.1	-10.6	-11.1	-11.1	-8.8	-6.4	-2.5	0.1	0.7	2.0	3.1	4.1	4.9	5.2	5.1	4.4	3.7	3.0	2.2	1.5	1.5	1.0	-1.5	5.2	
24-Apr	1.0	0.6	0.2	-0.5	-1.1	-1.3	-1.0	-0.7	0.0	0.3	1.1	2.5	3.3	3.8	4.4	4.2	4.1	3.7	3.6	3.4	3.1	2.4	1.3	1.5	1.7	4.4	
25-Apr	1.3	0.6	-0.1	-0.3	0.2	0.7	1.5	2.6	3.3	4.6	4.3	5.0	5.3	5.5	5.7	6.2	6.4	5.8	5.3	4.9	4.2	3.8	3.6	3.4	3.5	6.4	
26-Apr	3.2	3.1	3.0	2.7	2.4	2.2	2.7	3.5	4.6	5.3	4.8	5.2	5.2	6.0	6.6	6.6	6.5	6.3	6.9	6.0	4.4	1.7	1.2	1.7	4.2	6.9	
27-Apr	4.8	4.5	4.1	3.6	3.2	3.2	3.9	4.5	5.7	7.3	8.9	9.3	9.9	10.6	11.8	11.9	12.5	12.5	12.4	10.2	6.7	4.5	3.9	2.9	7.2	12.5	
28-Apr	2.0	0.2	-0.9	-1.4	-1.8	-0.8	1.5	3.4	4.7	7.4	9.4	11.6	12.8	13.2	12.8	14.8	14.7	13.5	12.6	11.6	9.1	7.7	6.6	6.0	7.1	14.8	
29-Apr	6.1	8.1	7.6	7.0	6.8	6.0	6.5	8.2	9.8	12.4	13.9	14.0	14.4	15.1	15.2	15.4	15.3	14.2	12.6	11.6	9.3	8.1	4.8	3.6	10.3	15.4	
30-Apr	3.1	2.2	1.2	1.0	2.0	3.2	4.8	7.1	8.8	12.1	13.9	15.7	16.2	15.1	14.1	12.1	11.5	11.6	10.9	10.6	8.4	6.7	5.4	4.5	8.4	16.2	
		0.5	0.0	-0.6	-1.2	-1.6	-1.9	-1.3	-0.3	1.1	2.7	3.7	4.8	5.5	6.2	6.6	6.9	6.8	6.5	5.9	4.8	3.1	2.1	1.2	0.7	Diurnal Average	
		8.8	8.6	7.6	7.0	6.8	6.0	6.5	8.2	9.8	12.4	13.9	15.7	16.2	15.4	16.9	17.8	17.5	16.4	14.1	12.3	9.8	9.6	8.6	7.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Lower Camp - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Lower Camp - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	253	35.14	35.14
0 - 10	381	52.92	88.06
10 - 20	86	11.94	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

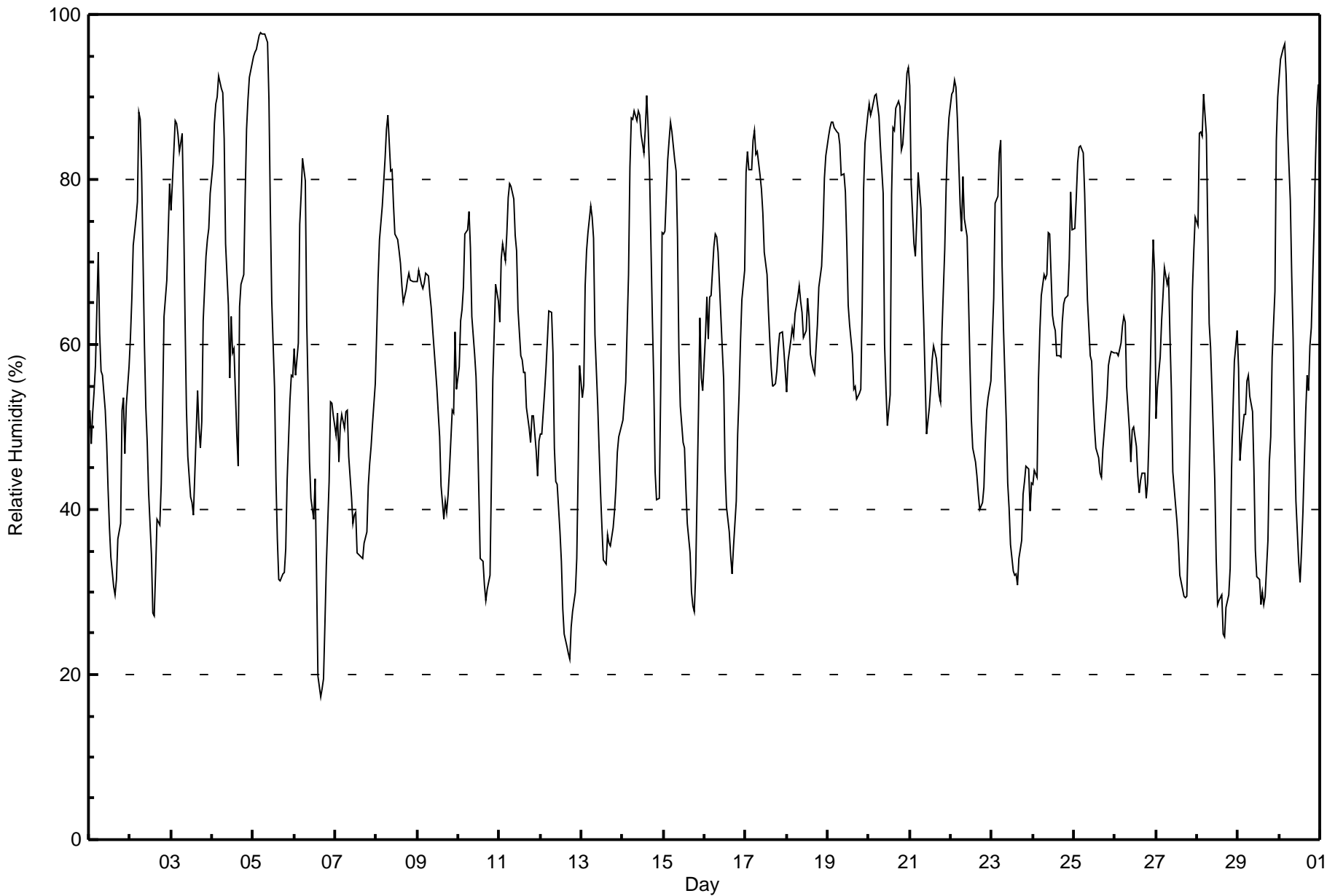
Lower Camp - April 2017

Maximum Value: 98 % on Apr 5 05:00 Maximum Daily Average: 81.9 % on Apr 20																		Hours in Service: 720 Hours of Data: 720								
Minimum Value: 17 % on Apr 6 16:00 Minimum Daily Average: 41.8 % on Apr 12 Maximum Diurnal Average: 77.6 % at hour 6 Minimum Diurnal Average: 44.1 % at hour 16 Monthly Average: 60.0 % Percentiles: P ₁ = 24 P ₁₀ = 35 Q ₁ = 46 Median = 59 Q ₃ = 74 P ₉₀ = 86 P ₉₉ = 96																		Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	52	48	52	54	57	71	61	57	56	52	48	42	38	34	31	30	32	36	38	52	54	47	53	57	48.0	71
2-Apr	61	66	72	75	77	88	87	81	60	52	48	42	35	27	27	32	39	38	43	53	63	68	74	80	57.8	88
3-Apr	76	80	87	87	85	83	86	76	63	52	46	42	41	39	44	54	50	47	51	63	71	73	74	78	64.5	87
4-Apr	82	87	89	90	93	91	90	85	72	65	56	63	59	60	49	45	65	67	68	78	86	90	92	94	75.7	94
5-Apr	95	95	96	97	98	98	98	98	97	90	76	65	55	44	37	32	31	32	32	35	44	53	56	56	67.0	98
6-Apr	59	56	60	75	78	83	80	63	54	46	41	39	44	32	20	17	18	20	26	33	43	53	53	51	47.7	83
7-Apr	49	52	46	50	52	50	52	52	46	42	38	39	40	35	34	34	34	36	37	43	46	48	50	55	44.2	55
8-Apr	61	68	73	77	80	83	86	88	81	81	77	73	73	71	70	67	65	67	68	69	68	68	68	68	72.8	88
9-Apr	68	69	67	67	67	69	68	66	64	62	59	55	52	49	43	39	41	40	42	45	52	52	62	55	56.3	69
10-Apr	57	63	64	67	73	74	76	72	63	59	56	50	42	34	34	31	29	30	32	44	56	62	67	65	54.2	76
11-Apr	63	70	72	70	73	78	79	79	78	73	71	64	59	58	57	57	52	50	48	51	51	47	44	48	62.3	79
12-Apr	49	49	54	57	60	64	64	59	47	43	43	37	34	28	25	23	23	22	26	28	30	34	45	58	41.8	64
13-Apr	54	55	67	71	74	77	75	73	61	53	47	42	38	34	33	37	36	36	38	40	43	47	49	50	51.2	77
14-Apr	51	53	55	69	81	88	87	88	87	88	88	85	83	86	90	86	81	63	56	45	41	41	55	74	71.8	90
15-Apr	73	74	82	85	87	86	82	81	73	59	53	48	48	43	38	35	30	28	28	32	52	63	56	54	57.9	87
16-Apr	61	66	61	66	66	72	73	73	71	63	59	56	45	40	37	34	32	35	41	49	54	60	65	69	56.3	73
17-Apr	81	83	81	81	85	86	83	83	81	79	76	71	68	64	60	57	55	55	57	60	61	62	59	57	70.2	86
18-Apr	54	58	60	62	61	64	66	67	65	64	61	62	66	63	59	57	56	60	62	67	69	74	80	83	64.2	83
19-Apr	85	86	87	87	86	86	86	84	81	81	78	72	65	62	59	55	55	53	54	55	65	79	84	88	73.8	88
20-Apr	89	88	89	90	90	89	88	84	78	60	55	50	54	78	86	86	89	89	89	84	84	90	93	93	81.9	93
21-Apr	91	80	72	71	75	81	76	68	63	56	49	52	55	58	60	58	56	54	53	61	72	79	84	87	67.2	91
22-Apr	90	91	92	91	87	77	74	80	75	73	66	58	51	47	46	44	42	40	41	43	48	52	54	56	63.2	92
23-Apr	61	66	77	78	83	85	70	62	51	43	40	36	33	32	32	31	34	36	42	43	45	45	40	43	50.3	85
24-Apr	43	45	44	56	62	66	68	68	73	73	64	62	62	59	59	58	63	65	65	66	66	70	78	74	63.0	78
25-Apr	74	78	82	84	84	83	78	71	65	59	58	53	50	47	46	44	44	47	52	54	57	58	59	59	62.0	84
26-Apr	59	59	59	60	62	63	63	55	50	46	50	50	48	44	42	44	44	44	41	43	49	66	73	69	53.4	73
27-Apr	51	55	58	63	66	69	67	68	61	54	45	41	38	36	32	30	30	29	30	37	56	67	71	75	51.2	75
28-Apr	74	86	86	85	90	85	74	63	60	49	44	34	28	29	30	25	25	28	30	33	45	52	58	62	53.1	90
29-Apr	57	46	48	52	52	56	56	54	52	45	35	32	32	28	30	28	29	36	46	49	59	66	85	90	48.4	90
30-Apr	92	95	96	97	93	86	77	68	61	49	41	34	31	35	40	52	56	54	60	62	74	82	89	92	67.3	97
	67.1	68.8	71.0	73.8	76.0	77.6	75.8	72.2	66.2	60.4	55.9	51.7	48.8	46.7	45.0	44.1	44.4	44.6	46.5	50.5	56.8	61.6	65.7	68.0	Diurnal Average	
	95	95	96	97	98	98	98	98	97	90	88	85	83	86	90	86	89	89	89	84	86	90	93	94	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Lower Camp - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Lower Camp - April 2017

Maximum Speed: 27 km/h on Apr 20 13:00	Maximum Daily Speed Average: 17.5 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 1 20:00	Minimum Daily Speed Average: 1.0 km/h on Apr 28	Hours of Data: 720
Maximum Diurnal Speed Average: 4.7 km/h at hour 11	Minimum Diurnal Speed Average: 1.1 km/h at hour 1	Hours of Missing Data: 0
Monthly Average Velocity: 2.3 km/h 50.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 5 Median = 10 Q ₃ = 14 P ₉₀ = 18 P ₉₉ = 24	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW11	WSW16	WSW16	WSW16	W14	N2WSW10	WSW16	WSW19	WSW21	W16	W16WSW20	WSW17	WSW14	W10	W9	NW5	WNW3	S0	NW2WSW11	W11	WSW9	WSW11.4	WSW21			
2-Apr	W9	NNW5	N2	SSE1	S1	SE4	SE4	SE4	E2	E4	SE9	S3WSW12	NW13	WNW15	N16	NNE15	N12	NNW6	W4	NNW1	WNW4	NW2	NNW1	NNW2.3	N16	
3-Apr	W3	NW3	NW3	W4	NW3	NW5	NNW1	N2	N5	WNW5	W6	W9	W6	W3	WNW9	W11	W9	WNW3	ENE1	WNW1	S1	NNE1	SE2	S1	WNW3.2	W11
4-Apr	NW4	ESE3	SE9	SE8	SE11	SE6	SE6	ESE5	SE13	SE11	SSE8	SW16	SSE7	ESE10	SE12	S11	S11	SE11	SE8	SSE2	NNW1	N1	NE1	ENE1	SSE5.8	SW16
5-Apr	NNE1	ESE6	SE9	ESE8	SE11	SE9	SE8	SSE10	SSE10	SE18	SE21	SE21	SE25	SSE18	SSE16	SSE12	S10	SSE9	SSE11	SSE8	SE11	SE12	SE13	SE11	SE11.5	SE25
6-Apr	SE4	SE9	SE2	ESE2	NW1	NW1	NNW1	SE7	SE16	SE10	ESE11	SE15	SE20	SSW8	W19WSW13	WSW15	WSW12	W8	SW2	NW2	WNW3	WNW2	WNW5	S3.3	SE20	
7-Apr	WNW4	WNW4	WNW5	WNW4	WNW4	WNW4	NW3	WNW3	NNW6	NNW11	NNW14	N18	N26	N26	N24	NNE24	NNE24	NNE24	NNE22	NNE18	N17	N18	N15	N16	N12.8	N26
8-Apr	N15	NNW14	NNW11	NNW13	N15	N20	N19	N17	N19	N23	N26	NNE25	N23	NNE24	N24	N21	N19	N19	N17	N15	N13	N15	N12	N9	N17.5	N26
9-Apr	NNW9	N11	NNE7	N6	N8	N8	N6	W3	S3	SSE6	SE8	SE10	SE11	SE12	SE10	SSE8	SE9	SSE9	SE11	SE10	SE9	SE13	SE12	SE7	SE4.4	SE13
10-Apr	SE10	SE9	SE11	SE13	SE13	SE13	SE14	SE14	SE15	SE16	SE15	SE14	SE12	SE10	SE13	SE10	SE10	SE9	SSE5	SE1	NNE1	ESE1	ENE1	W3	SE9.4	SE16
11-Apr	W5	NW3	NW6	NNW9	NNW10	NNW8	NNW10	N16	N18	N21	N19	N17	N19	N20	N20	N19	N15	N14	N16	N14	NNW11	NNW10	NNW9	NNW7	N12.6	N21
12-Apr	NW7	NW6	NNW6	NW5	NW4	NW3	NNW4	N7	NNW9	NNW10	N10	NNW12	N13	N10	NNW11	N11	N12	N14	N15	N9	WNW7	W7	NW3	NNW3	NNW7.6	N15
13-Apr	WNW5	W4	NW3	W4	W5	W5	WNW4	NW5	ENE6	ESE18	ESE12	SE17	ESE16	ESE20	E18	ESE17	ESE18	ESE19	E17	E15	ENE11	ENE8	NE7	ENE9	E7.6	ESE20
14-Apr	E9	E11	E10	ENE7	N6	NNW7	N8	NNE11	NE10	NE11	NE13	ENE16	NE15	NE18	NNE15	NE19	NE14	ENE9	NE8	ENE11	ENE14	ENE15	NE21	NNE18	NE11.3	NE21
15-Apr	NNE18	NE15	NE11	NNE12	N15	N13	NNE15	N13	N13	NNE12	N12	N12	NE11	N10	NNW17	NNW13	N13	N13	N11	NW4	W1	ESE3	SE8	SSE9	N9.4	NNE18
16-Apr	SE18	SE18	SE13	SE15	SE16	SE12	SE18	SE19	SE18	SE18	SE19	SE14	SW14	SW15	SSW15	SW15	SW16	SSW13	S9	S6	SSE6	SE9	SE8	SSE3	SSE11.0	SE19
17-Apr	NNW15	N17	N20	N19	N20	N17	N19	N18	N21	N21	N21	NNE19	NNE19	NNE18	NNE19	NNE18	NNE19	NNE18	NNE18	NNE15	N12	NNE12	N13	N13	N17.3	N21
18-Apr	N12	NNE13	N13	N12	N14	N14	NNE17	NNE15	N13	NNW12	NNW11	NNW13	N13	N11	NNW11	NNW11	NNE9	N12	NNE12	N11	N9	N9	NNW8	NNW7	N11.5	NNE17
19-Apr	NNW7	NNW7	NNW7	NNW8	N7	N7	NNW6	NNW5	NW4	WSW8	W8	WSW6	W7	WNW7	NNW4	ESE3	SE10	SSE7	SSE6	SW4	SW1	SE2	E1	ENE1	NW2.1	SE10
20-Apr	NNE1	WNW2	WNW4	W5	W5	WNW5	WNW3	NW4	N9	NNW11	N13	N22	N27	N24	N22	N22	N18	N17	N13	N7	NW7	W6	W5	W5	NNW9.3	N27
21-Apr	WNW6	NW7	NNW8	NNE6	NNW4	WNW2	WNW3	W3	W4	NNW4	N7	NNW6	WNW7	W8	W6	WNW7	WNW6	WNW5	WNW4	NW4	W4	N1	E1	NNW1	NW3.8	NNW8
22-Apr	W3	NW1	WNW3	WNW5	NW7	NNW9	N16	NNE16	NNE19	N19	N19	NNE16	N13	N14	N14	N14	N13	NNE12	N13	N12	NNE10	NNW4	NNW3	NE5	N10.1	N19
23-Apr	NE6	N5	WNW5	W6	W5	WNW6	NNW5	N4	ESE9	SE12	SE10	SE10	SE10	SE10	SE10	SE9	SE8	ESE10	ESE10	ESE8	ESE8	ESE11	ESE8	SE5.0	SE12	
24-Apr	ESE8	E5	ESE4	N5	NNW7	N6	ESE10	ENE9	NE11	E12	ESE16	ESE14	SE14	SE11	SE16	ESE14	ESE14	E14	ESE13	E8	ESE14	E8	NE5	NE3	E8.4	SE16
25-Apr	SE10	SE6	SSE2	SE2	SE7	SE17	SE19	SE22	SE19	SE19	SE16	SE22	SE20	SE15	SE11	SSE11	SSE10	SSE12	SSE10	SSE10	SSE11	SSE15	SSE13	SE12.4	SE22	
26-Apr	SSE13	SSE13	SSE12	SSE11	SSE10	SE10	SE12	SSE11	SSE11	SSE14	SE23	SE21	SSE14	SSE13	SSE12	SSE11	S10	SSE10	SSE9	SSE7	SSE5	ENE1	NNW1	SSE1	SSE10.4	SE23
27-Apr	SSE10	SSE8	SSE8	SE8	SE7	SE11	SE10	SE10	SE13	SE14	SE16	SE15	SE15	SE14	SE11	ESE6	WNW8	WNW8	W7	WNW5	W2	NNW1	SSE1	WNW4	SE5.9	SE16
28-Apr	WNW4	E1	E1	NE1	W1	E2	ESE6	SE7	SE8	ESE2	NNE4	W5	W2	NNE3	N6	W2	E3	ENE3	NE6	ENE4	W0	SW1	WNW2	NW2	ENE1.0	SE8
29-Apr	SE2	SE10	SE6	SE8	SE9	SSE9	SE11	SE13	SE13	SE11	SSE9	SW12	SW15	SSW11	SSW10	SSE11	SSE11	S9	SSW10	S5	SSW5	S4	NE2	NNW1	SSE7.1	SW15
30-Apr	E1	NNE1	N2	SE1	SE8	ESE7	SE9	SE14	ESE13	SE11	SE11	SE6	SE7	SE17	NE7	N15	WNW5	ENE9	E7	W5	S2	SSE1	NW1	ESE1	ESE4.3	SE17

NNE1.1	NE1.6	NNE1.1	NNE1.3	N1.5	NE2.1	ENE2.8	ENE2.9	ENE3.7	ENE4.0	ENE4.7	ENE3.3	ENE2.7	ENE2.9	NNE2.7	NNE3.4	NNE2.5	NE3.5	NE3.3	NE2.5	NE2.0	NE1.5	NE1.9	NNE1.5	Diurnal Average
SE18	SE18	N20	N19	N20	N20	N19	SE22	N21	N23	N26	NNE25	N27	N26	N24	NNE24	NNE24	NNE24	NNE22	NNE18	N17	N18	NE21	NNE18	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

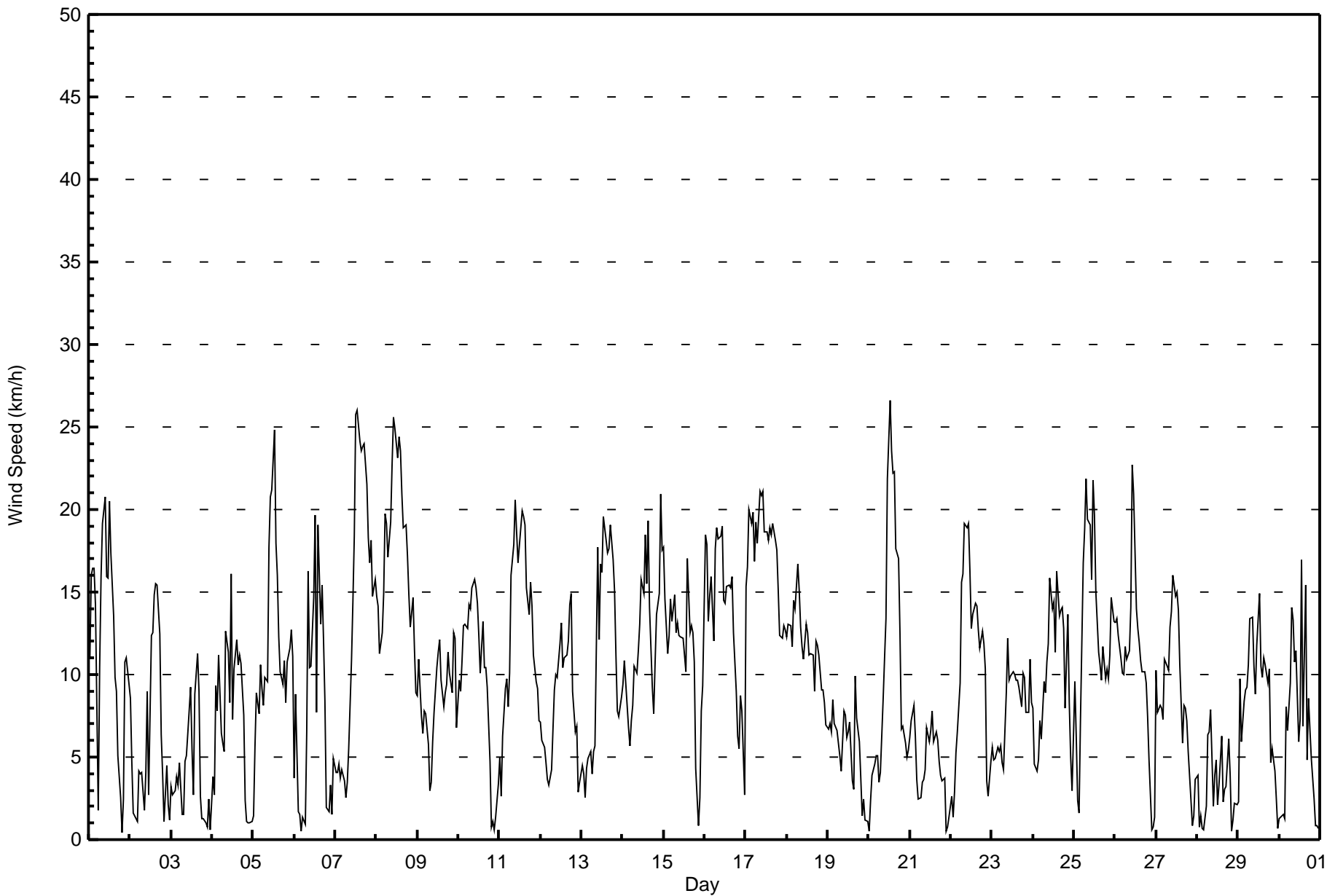
Wind Speed (WS) - km/h
Lower Camp - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Apr 14 21:00 Minimum Value: 1 km/h on Apr 20 07:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	4	3	3	4	2	3	5	4	4	3	4	4	4	3	3	3	2	1	1	3	5	5	2	5
2-Apr	3	1	2	2	1	1	1	1	1	2	2	5	4	6	4	6	5	5	3	2	1	2	1	1	6
3-Apr	1	1	1	1	1	1	1	1	1	1	2	2	3	2	4	2	2	2	1	1	2	1	2	3	4
4-Apr	2	1	3	2	4	3	3	4	1	3	3	4	3	3	4	4	5	3	3	1	2	2	1	1	5
5-Apr	1	3	2	2	3	2	3	3	3	5	3	4	6	6	5	4	3	3	3	2	2	1	2	2	6
6-Apr	2	2	3	1	2	2	1	4	1	3	2	2	2	4	4	3	3	2	2	3	1	2	1	2	4
7-Apr	2	2	1	2	2	1	2	1	2	2	4	4	5	5	5	5	5	5	4	4	3	3	3	4	5
8-Apr	3	4	3	3	4	4	5	4	5	5	6	5	5	5	5	5	4	4	4	4	3	3	2	2	6
9-Apr	2	2	2	1	2	2	2	2	2	2	3	5	4	4	3	3	3	3	3	2	2	2	2	3	5
10-Apr	2	3	2	2	2	3	2	2	2	2	2	2	3	3	3	2	2	2	2	1	2	2	1	3	3
11-Apr	2	1	2	3	2	2	3	4	4	4	4	4	4	4	4	3	3	3	4	4	3	2	2	2	4
12-Apr	2	1	1	1	1	1	2	1	2	2	3	3	4	4	3	3	3	3	3	3	1	1	2	1	4
13-Apr	2	1	1	1	1	1	1	1	5	3	4	4	4	5	6	5	4	4	3	3	2	2	2	3	6
14-Apr	3	3	3	3	2	2	2	2	2	3	3	4	4	4	4	5	4	4	5	4	7	6	6	4	7
15-Apr	4	4	3	3	3	3	3	3	3	3	3	3	4	3	4	3	3	3	2	2	2	3	3	4	4
16-Apr	5	4	4	3	4	4	4	2	2	2	3	4	4	5	6	5	5	4	4	2	1	2	1	2	6
17-Apr	6	4	4	5	4	4	4	4	5	4	5	4	4	5	5	4	4	4	4	3	3	2	2	2	6
18-Apr	2	2	3	2	3	4	4	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	4
19-Apr	2	2	2	2	2	2	1	1	1	2	1	1	2	2	2	2	3	2	2	2	1	1	1	1	3
20-Apr	1	2	2	1	1	1	1	2	3	3	4	5	5	5	4	5	4	4	4	3	2	1	1	1	5
21-Apr	1	2	2	3	1	1	1	1	2	2	3	2	2	2	2	2	1	1	1	1	1	1	1	2	3
22-Apr	1	1	1	1	1	4	3	5	5	4	4	4	5	4	5	4	4	4	3	2	2	1	2	2	5
23-Apr	1	2	1	1	1	1	1	1	3	3	3	3	3	3	2	3	3	2	2	2	2	3	2	3	3
24-Apr	3	3	2	1	3	2	3	2	3	3	4	4	4	3	3	3	3	3	2	2	3	2	2	3	4
25-Apr	3	3	2	3	7	3	3	3	3	4	4	4	5	6	4	3	4	4	3	3	3	4	4	4	7
26-Apr	4	4	4	3	3	3	3	4	4	4	6	6	6	4	4	4	4	3	3	3	3	1	1	2	6
27-Apr	3	2	2	2	2	1	2	2	3	2	4	5	4	5	4	2	3	2	1	1	2	1	2	2	5
28-Apr	2	1	1	1	1	1	2	1	1	2	1	1	1	3	2	2	1	2	2	1	1	1	1	2	3
29-Apr	3	2	2	2	2	2	2	3	1	2	5	4	5	5	5	4	4	4	4	1	1	2	1	1	5
30-Apr	1	1	1	2	2	2	1	2	2	3	3	4	4	3	5	6	4	3	2	2	2	1	2	2	6
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Lower Camp - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	189	26.25	26.25
6 - 11	263	36.53	62.78
12 - 19	227	31.53	94.31
20 - 28	41	5.69	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	7	6	7	10	9	11	9	9	1	4	0	28	35	26	17	189
6 - 11	26	6	9	9	6	16	71	36	7	5	0	6	17	10	6	33	263
12 - 19	72	26	6	3	5	13	54	13	0	2	7	12	3	1	1	9	227
20 - 28	22	6	1	0	0	1	9	0	0	0	0	2	0	0	0	0	41
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	130	45	22	19	21	39	145	58	16	8	11	20	48	46	33	59	720

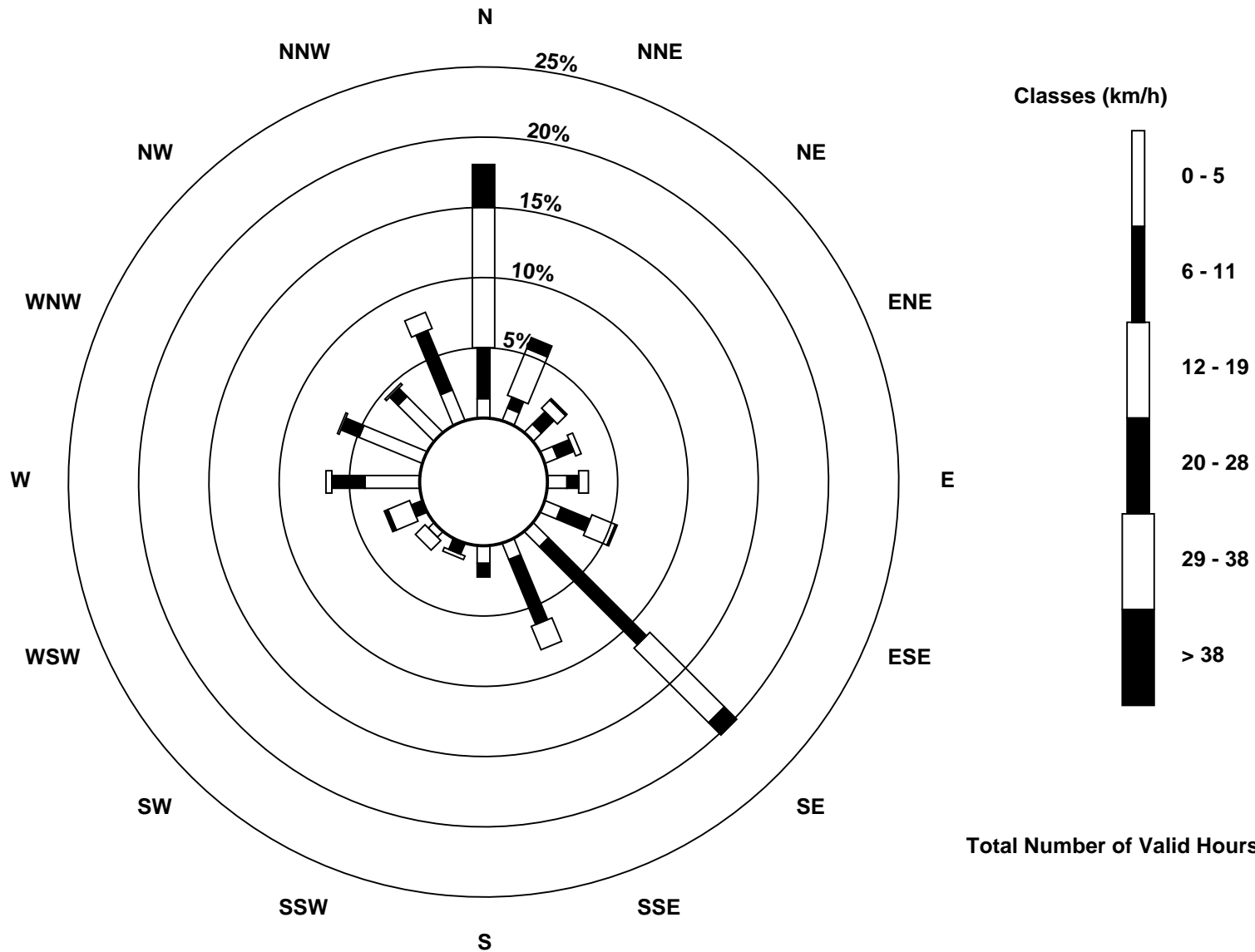
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Lower Camp (AMS 11)



Total Number of Valid Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Lower Camp - April 2017

Direction of Maximum Speed: 359 deg on Apr 20 13:00 Direction of Maximum Daily Speed Average: 1.4 deg on Apr 8	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 181 deg on Apr 1 20:00 Direction of Minimum Daily Speed Average: 1.0 deg on Apr 28	Percent Operational Time: 100.0
Monthly Average Direction: 315.4 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	213	238	240	246	259	351	250	249	255	252	263	268	257	258	255	273	279	307	282	181	320	246	261	256	255.2
2-Apr	278	328	354	155	181	128	131	133	100	101	134	181	242	318	294	6	19	8	341	264	327	294	319	340	332.1
3-Apr	276	307	311	280	306	319	339	7	5	287	278	265	259	267	289	275	260	302	64	283	170	20	124	181	285.3
4-Apr	307	120	136	132	131	126	125	118	136	136	159	236	156	122	129	174	186	136	141	150	333	350	54	74	146.5
5-Apr	16	113	134	116	133	130	138	148	155	127	128	133	139	157	160	162	171	166	160	164	145	138	140	142	143.0
6-Apr	135	137	128	116	304	309	339	128	134	130	122	133	132	199	261	255	256	257	259	231	306	282	282	296	188.9
7-Apr	300	299	289	294	294	302	307	302	328	342	346	354	7	10	11	12	19	20	20	17	10	11	3	358	2.7
8-Apr	350	347	336	342	357	4	356	352	357	357	11	15	8	13	2	5	356	2	11	9	2	3	9	358	1.4
9-Apr	329	5	19	359	357	359	351	274	180	150	140	144	135	130	143	153	137	151	145	142	142	139	139	141	126.8
10-Apr	142	135	134	139	133	144	138	134	133	128	126	125	132	146	134	128	135	140	161	135	27	120	71	280	134.6
11-Apr	279	304	318	340	339	334	345	354	356	7	357	350	357	2	7	11	2	359	351	355	339	330	336	336	352.1
12-Apr	321	322	328	324	324	310	332	349	337	333	350	346	3	352	348	359	2	360	9	2	287	277	308	331	343.6
13-Apr	301	276	324	277	276	271	288	324	66	119	115	130	117	112	100	114	108	108	95	97	77	59	50	66	101.2
14-Apr	88	89	88	70	358	330	9	25	36	43	46	59	45	48	33	45	48	72	49	59	59	58	34	20	46.6
15-Apr	25	37	36	15	0	3	13	353	10	13	2	358	20	1	331	340	349	4	7	319	268	114	146	149	8.3
16-Apr	135	132	145	140	146	143	131	129	124	130	129	135	224	216	211	218	219	210	188	175	152	145	143	150	157.3
17-Apr	345	0	3	9	0	356	4	5	5	10	8	16	13	18	25	23	24	32	25	13	8	12	10	11	10.9
18-Apr	10	12	9	360	357	9	12	14	351	345	334	341	352	357	347	348	13	4	12	5	354	351	345	341	358.7
19-Apr	332	338	329	346	351	351	329	327	320	255	259	253	280	300	347	119	146	155	151	214	235	141	93	77	303.8
20-Apr	15	294	291	278	279	282	294	326	351	339	1	3	359	355	358	2	353	352	1	358	319	261	271	270	345.4
21-Apr	287	311	338	27	332	298	297	278	263	328	359	347	291	262	264	282	290	310	298	322	273	1	79	342	307.2
22-Apr	279	325	301	282	306	341	7	14	14	4	11	16	4	354	355	357	3	18	8	7	22	336	347	48	2.7
23-Apr	35	360	291	278	274	282	339	352	122	135	130	140	135	135	134	137	136	124	123	118	102	110	117	121	124.4
24-Apr	112	91	117	352	339	4	115	71	56	90	106	110	130	127	129	112	108	92	103	87	109	92	41	46	98.2
25-Apr	127	140	151	132	125	131	128	128	127	131	134	128	129	139	144	158	166	160	162	164	164	161	161	159	141.0
26-Apr	157	155	159	154	149	146	141	163	167	150	130	136	150	161	166	166	171	168	167	164	149	68	295	160	153.7
27-Apr	156	152	151	146	141	125	133	132	131	130	126	128	128	125	136	118	301	298	280	300	277	292	167	293	138.7
28-Apr	291	82	94	50	272	96	122	137	134	106	18	272	277	20	359	281	99	63	55	64	278	218	301	319	65.9
29-Apr	141	138	138	137	146	147	136	134	133	126	162	216	225	198	207	168	163	183	205	182	196	177	42	334	166.0
30-Apr	100	25	353	132	127	116	131	128	121	124	126	133	132	131	55	353	297	74	86	262	170	149	315	107	112.6

13.9 48.6 33.3 16.9 8.5 34.0 60.1 66.5 73.6 78.5 75.6 75.9 71.0 56.9 19.6 24.3 29.2 45.9 48.5 40.5 44.1 47.8 48.8 23.5

Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

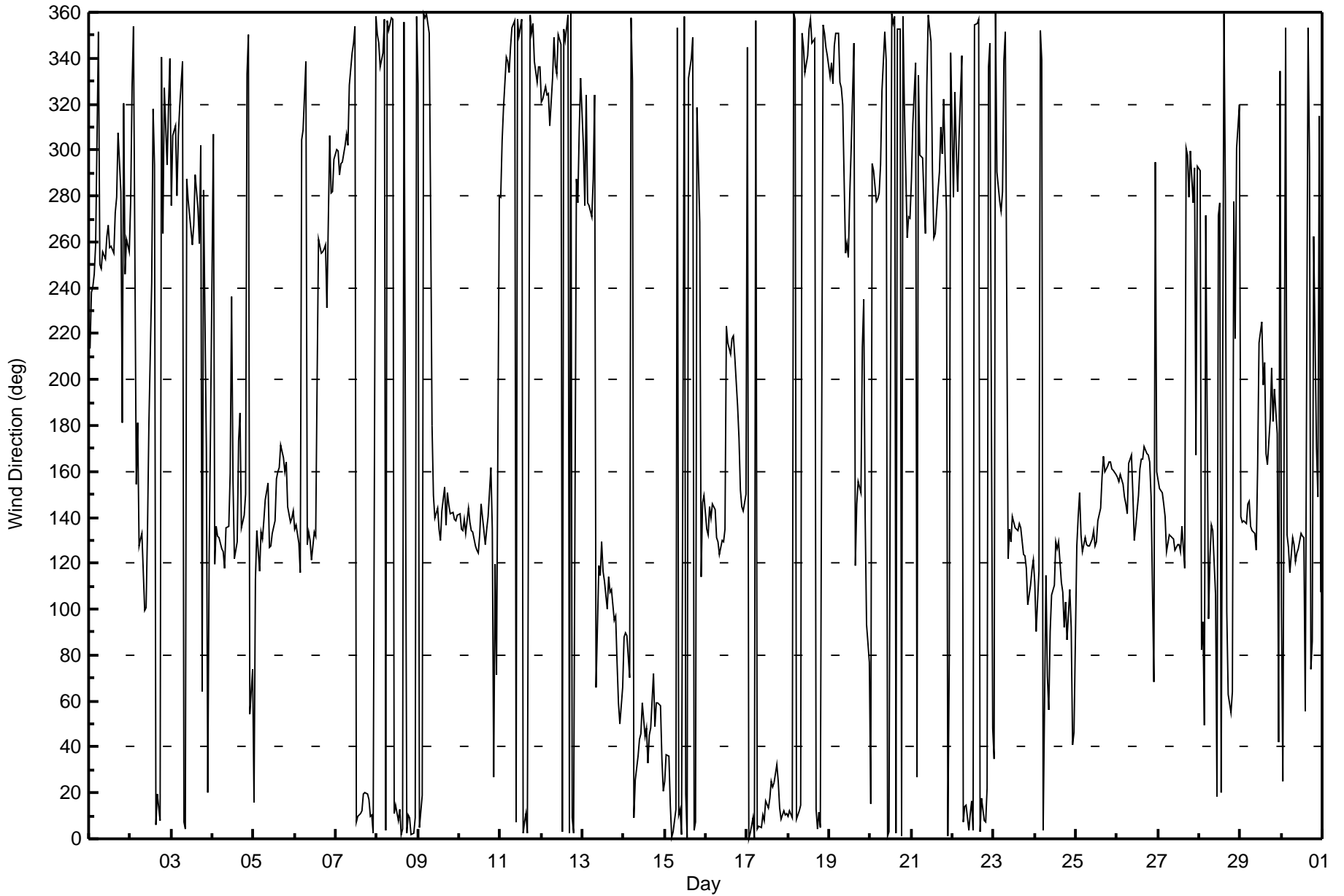
Wind Direction (WD) - deg
Lower Camp - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Apr 1 20:00 Minimum Value: 3 deg on Apr 4 09:00 Percentiles: P ₁ = 6 P ₁₀ = 11 Q ₁ = 15 Median = 20 Q ₃ = 32 P ₉₀ = 65 P ₉₉ = 95																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	31	13	12	13	24	78	17	16	12	12	15	15	12	12	14	20	38	30	47	101	70	39	16	15	101
2-Apr	33	40	74	91	78	13	19	13	76	49	8	79	18	32	19	36	20	21	29	27	67	28	28	67	91
3-Apr	26	39	35	17	28	22	64	45	29	35	25	20	53	84	34	17	15	49	69	59	69	97	56	96	97
4-Apr	72	38	12	11	10	61	25	39	3	13	32	16	49	15	23	30	35	11	21	61	90	97	58	70	97
5-Apr	54	36	12	25	11	10	17	22	29	11	8	10	16	24	25	25	27	24	21	23	15	6	7	12	54
6-Apr	34	11	97	58	93	65	68	36	4	12	11	5	6	62	11	15	13	12	15	88	71	43	77	30	97
7-Apr	51	40	21	31	34	29	29	19	20	20	19	18	18	17	15	14	16	13	13	12	13	15	18	18	51
8-Apr	18	18	19	19	18	16	18	18	18	18	18	18	18	17	19	20	19	18	18	14	18	13	13	18	20
9-Apr	14	16	15	22	17	17	30	56	67	47	41	36	21	23	34	35	27	23	21	11	11	8	7	17	67
10-Apr	12	11	9	11	8	12	8	8	8	6	6	8	19	27	11	15	10	13	23	73	75	94	72	70	94
11-Apr	26	38	16	21	19	18	21	18	18	16	17	21	21	20	18	18	18	19	19	18	19	15	17	20	38
12-Apr	20	15	13	12	20	32	29	23	21	21	25	25	27	31	26	26	19	20	14	16	14	15	64	40	64
13-Apr	34	19	39	24	15	15	18	22	65	14	28	16	18	15	21	18	16	12	13	11	15	33	18	21	65
14-Apr	19	18	29	40	47	17	22	18	15	12	13	14	15	16	15	15	19	27	29	16	20	29	17	15	47
15-Apr	15	19	17	16	17	17	15	21	18	18	22	22	28	44	20	23	20	20	15	42	87	60	20	20	87
16-Apr	15	12	17	13	16	20	12	8	7	6	8	27	23	23	29	24	20	22	28	25	14	13	12	81	81
17-Apr	26	17	16	19	17	19	16	17	18	16	16	22	21	23	19	20	19	20	18	13	13	13	14	14	26
18-Apr	14	14	14	18	18	21	17	16	20	21	23	21	21	31	24	22	26	20	17	18	18	19	21	22	31
19-Apr	20	21	19	21	21	21	18	24	27	16	15	20	29	31	69	65	19	24	18	42	73	44	58	66	73
20-Apr	64	44	33	19	18	16	24	26	18	21	16	17	19	20	17	18	19	20	19	37	25	8	13	13	64
21-Apr	15	15	21	42	47	37	21	26	41	48	45	39	24	23	61	31	25	23	19	22	27	75	74	75	75
22-Apr	31	83	51	22	15	26	16	17	16	17	16	19	31	22	29	25	26	26	16	15	11	54	62	52	83
23-Apr	25	43	15	14	11	10	35	40	24	10	16	22	16	14	10	12	11	13	11	10	10	14	10	18	43
24-Apr	43	66	41	48	28	49	14	22	17	24	16	20	14	22	12	19	16	17	14	14	16	18	41	67	67
25-Apr	18	33	63	82	79	7	7	8	10	10	15	10	11	23	29	29	34	24	23	23	22	22	21	21	82
26-Apr	20	19	21	21	20	19	18	26	29	22	13	15	31	29	27	30	31	28	28	29	25	94	93	81	94
27-Apr	19	18	17	15	13	7	8	8	10	8	16	18	14	18	41	38	29	24	16	27	71	75	96	34	96
28-Apr	63	60	46	65	87	56	13	6	4	79	34	37	78	68	20	96	69	54	20	21	90	79	37	82	96
29-Apr	91	8	17	14	13	13	10	5	5	10	51	28	23	41	51	38	37	34	22	26	15	57	33	73	91
30-Apr	53	80	52	93	26	30	8	7	8	12	17	81	63	6	67	30	75	50	29	49	61	83	65	80	93
	91	83	97	93	93	78	68	56	76	79	51	81	78	84	69	96	75	54	69	101	90	97	96	96	
	Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Lower Camp - April 2017





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	April 7, 2017	Last Cal Date:	March 6, 2017
Start time (MST):	11:15	End time (MST):	13:28
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>49.5</u>	ppm	Cal Gas Exp Date	February 16, 2019
Cal Gas Cylinder #	<u>LL101792</u>			
Calibrator Make/Model	Sabio 4010		Serial Number	11051107
ZAG Make/Model	API 701		Serial Number	3411

Analyzer Information

Analyzer make: TEI 43i

Analyzer serial #: 100841398

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-674.9	-674.9
Calculated slope	1.000433	0.996165	Lamp voltage	804	806
Calculated intercept	0.897601	0.740932	Pressure	701.2	699.3
Analyzer Background	12.2	12.1	Flow	0.622	0.622
Analyzer Coefficient	1.058	1.058	Intensity	90	91

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	0.0	----
as found span	4916	83.8	829.7	832.1	0.997
calibrator zero	5005	0.0	0.0	0.0	----
high point	4916	83.8	829.7	832.1	0.997
second point	4961	42.4	419.5	421.0	0.996
third point	4975	21.2	210.0	208.7	1.006
as left zero	5002	0.0	0.0	0.0	----
as left span	4915	83.8	829.8	830.9	0.999
Average Correction Factor					1.000
Corrected As found	832.16	Previous response	828.40	*% change	-0.5%

* = > +/-5% change initiates investigation

Notes:

No adjustments made.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

SO₂ Calibration Summary

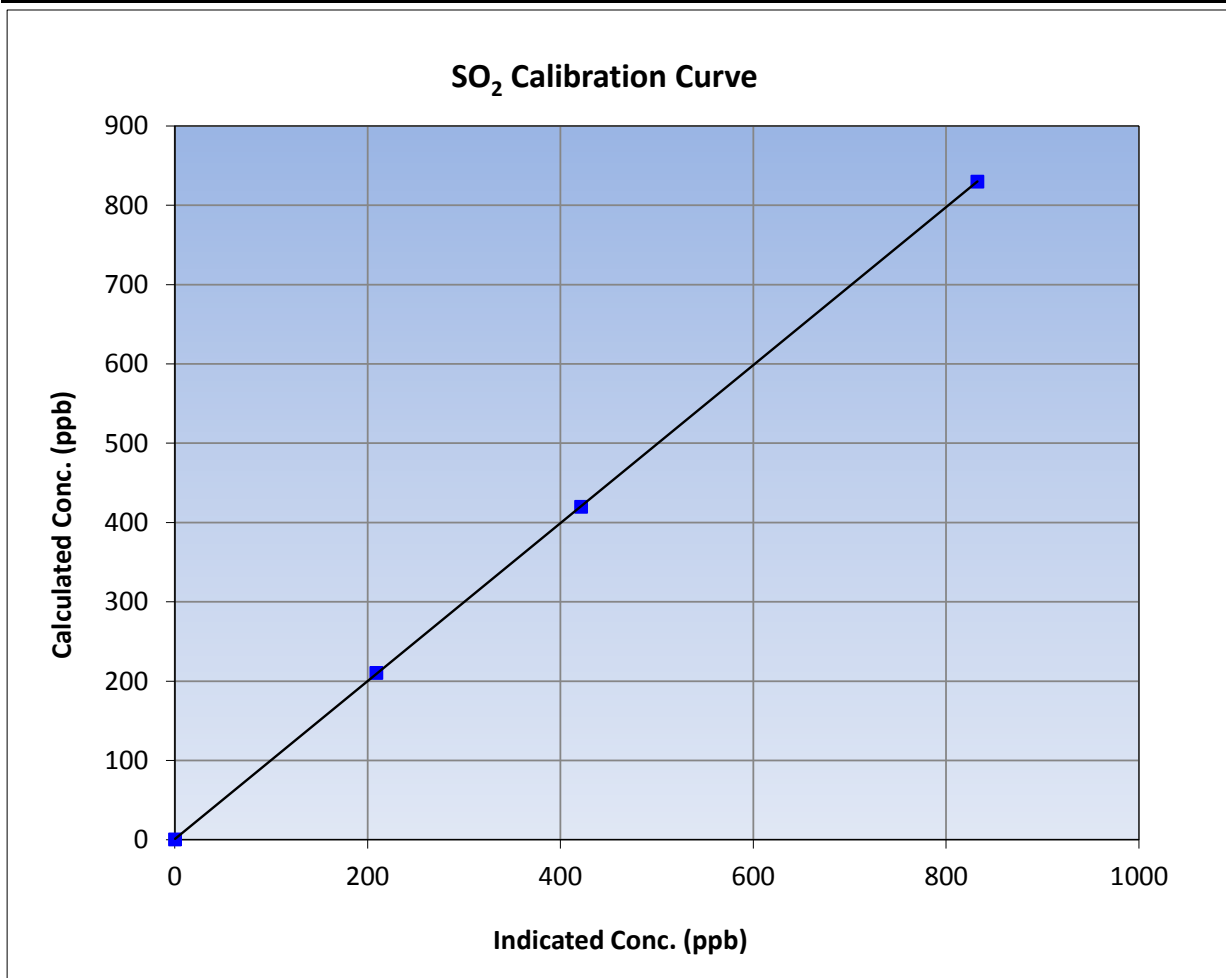
Version-03-2017

Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 6, 2017
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	11:15	End Time (MST)	13:28
Analyzer make	TEI 43i	Analyzer serial #	100841398

Calibration Data

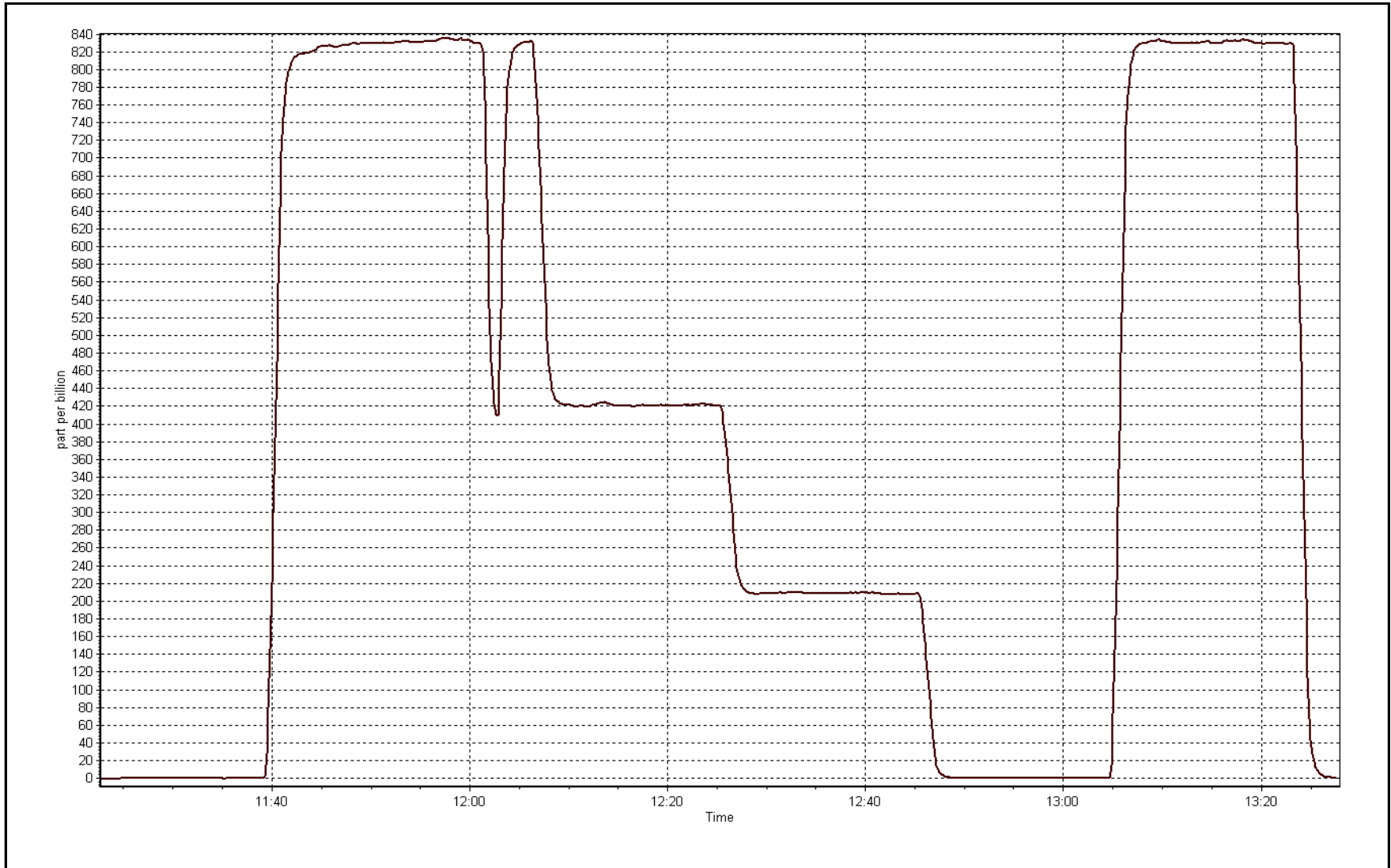
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999993	≥0.995
829.7	832.1	0.9970			
419.5	421.0	0.9964	Slope	0.996165	0.90 - 1.10
210.0	208.7	1.0062			
			Intercept	0.740932	+/-30



SO2 Calibration Plot

Date: April 7, 2017

Location: Lower Camp





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	April 7, 2017	Last Cal Date:	March 17, 2017
Start time (MST):	8:43	End time (MST):	11:07
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.15</u>	ppm	Cal Gas Exp Date	September 9, 2017
Cal Gas Cylinder #	<u>ALM061435</u>			
Calibrator Make/Model	Sabio 4010		Serial Number	11051107
ZAG Make/Model	API 701		Serial Number	3411

Analyzer Information

Analyzer make: Thermo 450i

Analyzer serial #: 1410661328

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	-671.2	-671.2
Calculated slope	0.997799	0.997425	Lamp voltage	796	795
Calculated intercept	0.126635	0.427748	Pressure	436.2	433.2
Analyzer Background	14.1	13.4	Flow	0.816	0.811
Analyzer Coefficient	1.271	1.229	Intensity	91	91

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.0	-0.2	----
as found span	4927	72.8	75.0	77.9	0.963
calibrator zero	5002	0.0	0.0	-0.2	----
high point	4927	72.8	75.0	74.8	1.002
second point	4961	38.8	40.0	39.6	1.009
third point	4980	19.4	20.0	19.4	1.033
as left zero	4998	0.0	0.0	0.1	----
as left span	4929	72.8	75.0	73.3	1.023
Average Correction Factor					1.015
Corrected As found	78.11	Previous response	75.03	*% change	-3.9%

* = > +/-5% change initiates investigation

Notes:

Adjusted Span

Calibration Performed By:

Aswin Sasi Kumar



Wood Buffalo Environmental Association

H₂S Calibration Summary

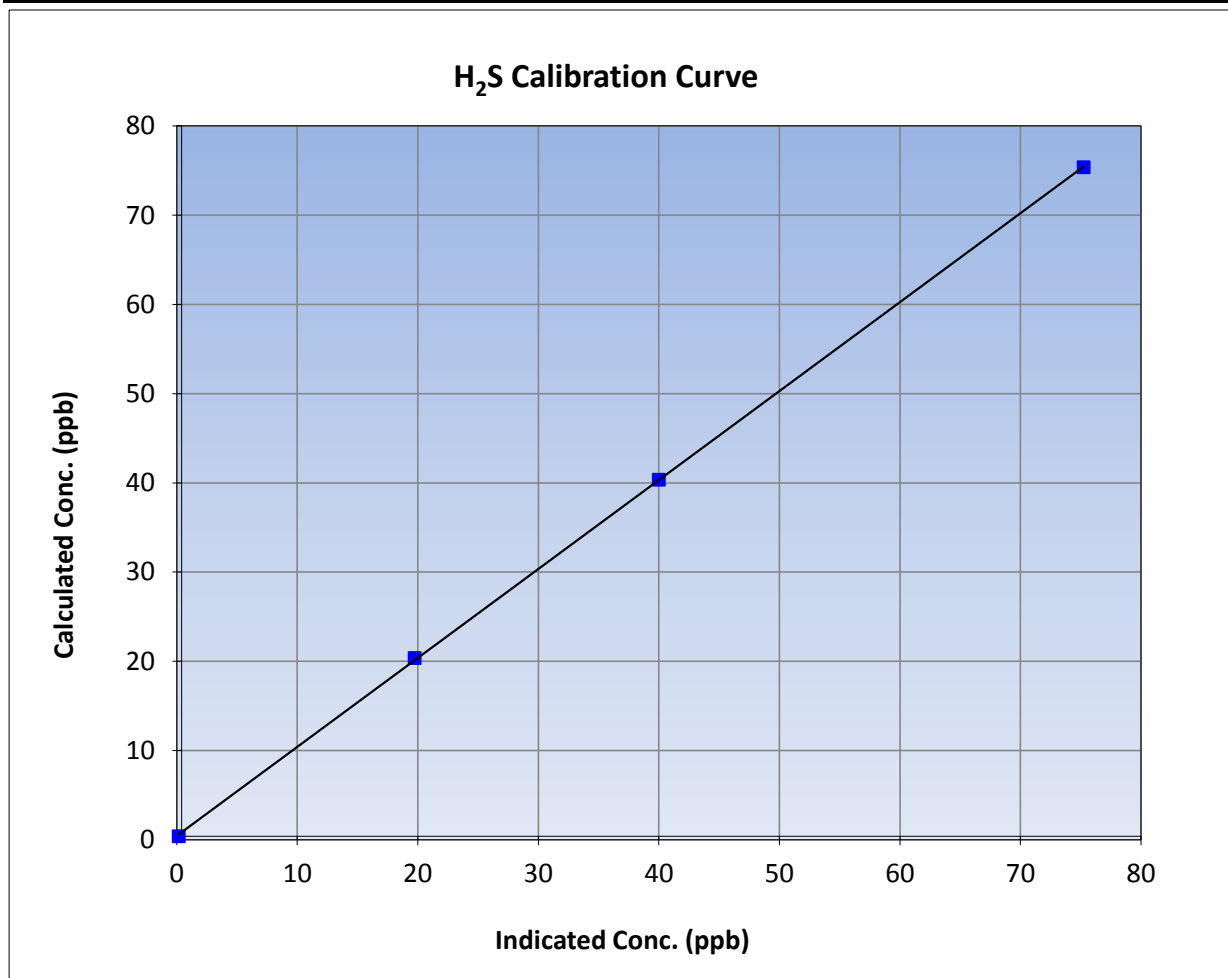
Version-03-2017

Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 17, 2017
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	8:43	End Time (MST)	11:07
Analyzer make	Thermo 450i	Analyzer serial #	1410661328

Calibration Data

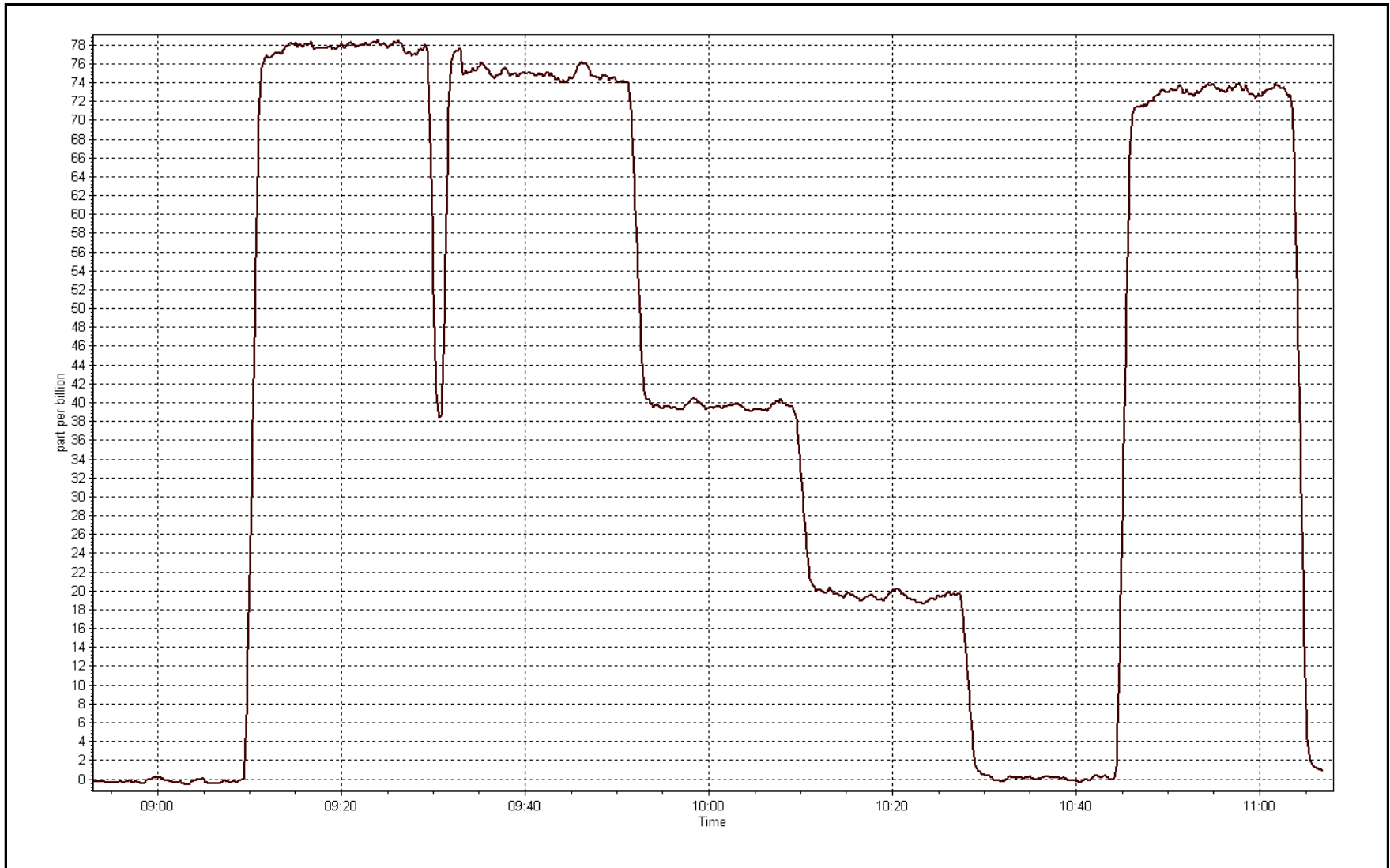
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	≥0.995
75.0	74.8	1.0020		
40.0	39.6	1.0092	Slope	0.90 - 1.10
20.0	19.4	1.0328		
			Intercept	+/-3



H₂S Calibration Plot

Date: April 7, 2017

Location: Lower Camp





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Lower Camp	Station number:	AMS 11
Calibration Date:	April 7, 2017	Last Cal Date:	March 30, 2017
Start time (MST):	11:15	End time (MST):	13:30
Reason:	Routine		

Calibration Standards

Gas Cert Reference	LL101792	Cal Gas Expiry Date	February 16, 2019
CH4 Cal Gas Conc.	<u>493.0</u> ppm	CH4 Equiv Conc.	1043.0 ppm
C3H8 Cal Gas Conc.	<u>200.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
ZAG Make/Model	API 701	Serial Number	3411

Analyzer Information

Analyzer make:	51-i-LT	Analyzer serial #:	1218153353
	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 25 ppm	Bias voltage supply	-298.2
Calculated slope	1.003639	Sample pressure	7.8
Calculated intercept	-0.018531	Fuel pressure	25.2
Analyzer Background	3.720	Air pressure	40.2
Analyzer Coefficient	4.475	Flame temperature	167.0
			<u>Finish</u>
			-298.4
			7.8
			25.2
			40.2
			167.1

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.00	0.12	----
as found span	4916	83.8	17.48	17.44	1.002
calibrator zero	5002	0.0	0.00	0.12	----
high point	4916	83.8	17.48	17.44	1.002
second point	4961	42.4	8.84	8.95	0.988
third point	4975	21.2	4.43	4.60	0.962
as left zero	5002	0.0	0.00	0.12	----
as left span	4915	83.8	17.48	17.58	0.995
Average Correction Factor					0.984
Corrected As found	17.32	Previous response	17.44	*% change	0.7%

* = > +/-5% change initiates investigation

Notes: No adjustments made.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

THC Calibration Summary

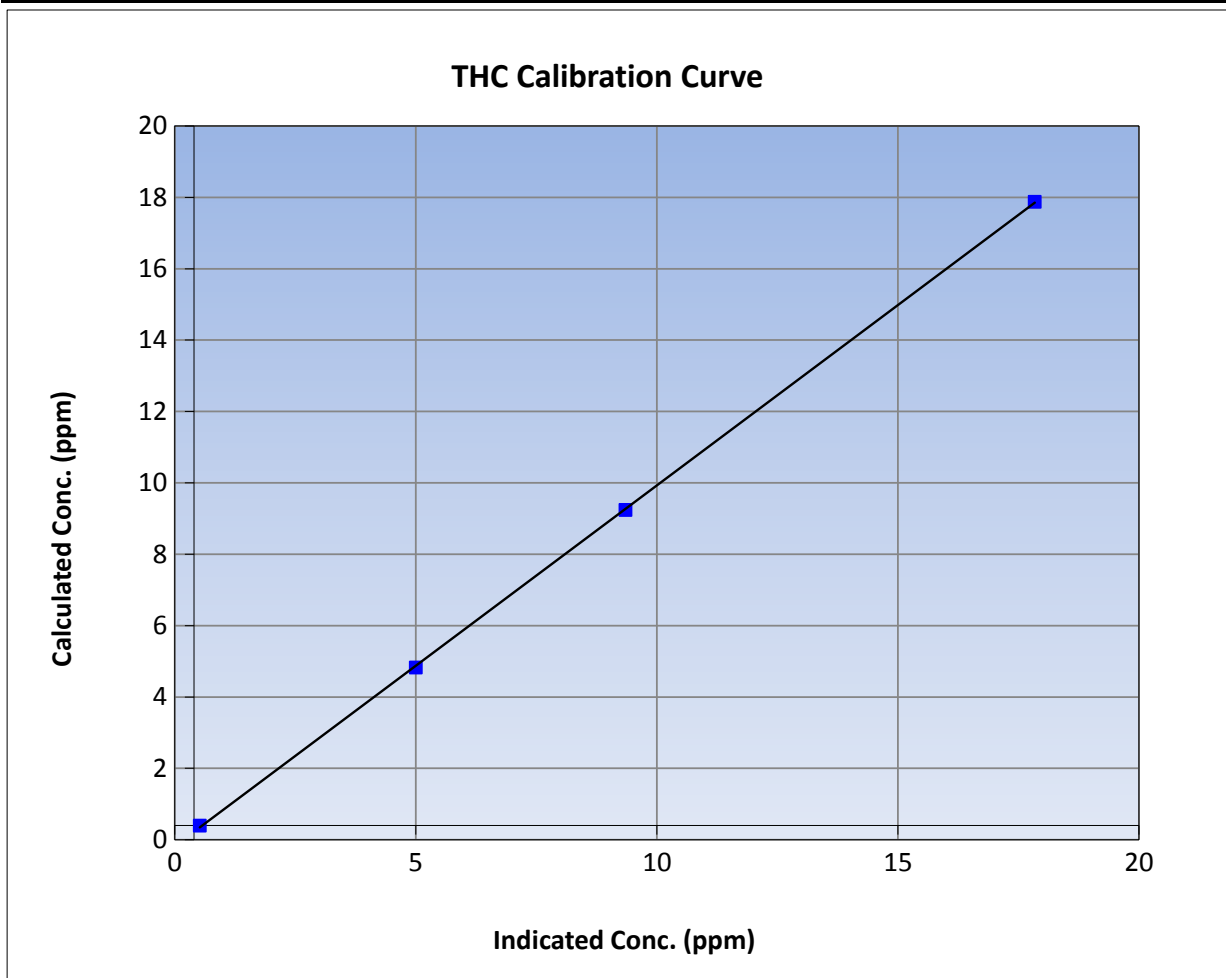
Version-03-2017

Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 30, 2017
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	11:15	End Time (MST)	13:30
Analyzer make	51-i-LT	Analyzer serial #	1218153353

Calibration Data

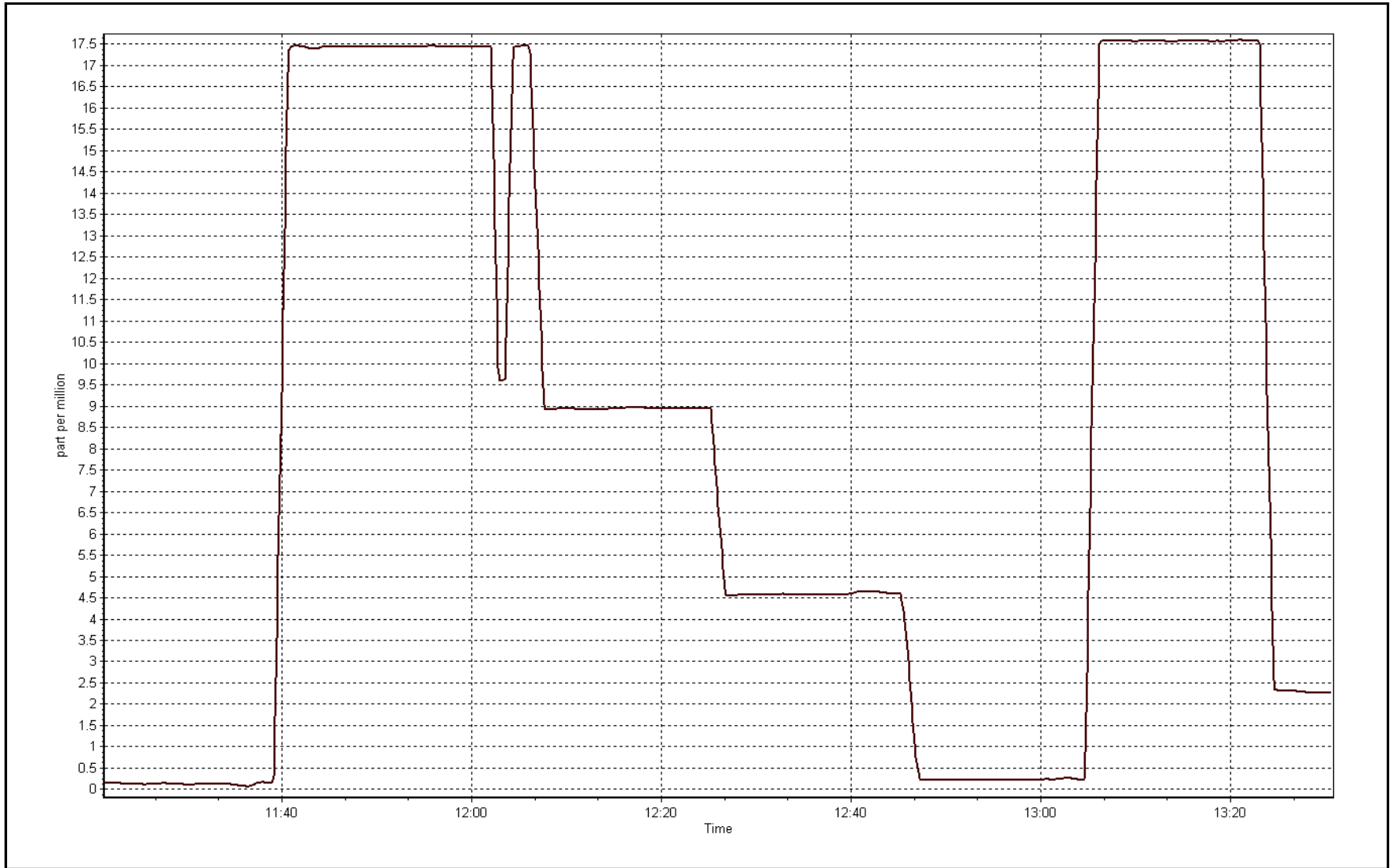
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999957	≥0.995
17.5	17.4	1.0024			
8.8	9.0	0.9876	Slope	1.010656	0.90 - 1.10
4.4	4.6	0.9621			
			Intercept	-0.173957	+/-1.5



THC Calibration Plot

Date: April 7, 2017

Location: Lower Camp





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 13
FORT MCKAY SOUTH
APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS 13)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	681	35	39	99.44	61	0	10	0
TRS(ppb) Average	681	35	39	99.44	3	0	1	0
THC(ppm) Average	682	34	38	99.44	4.9	-	2.7	-
O3(ppb) Average	674	33	46	98.19	57	0	40	-
NO2(ppb) Average	676	35	44	98.75	36	0	9	-
NO(ppb) Average	676	35	44	98.75	46	-	11	-
NOX(ppb) Average	676	35	44	98.75	70	-	19	-
PM2.5(ug/m3) Average	715	1	5	99.44	15.2	-	7.2	0
ET(C) Average	720	0	0	100	18.1	-	9.1	-
RH(%) Average	720	0	0	100	98	-	82	-
WS(km/h) Average	720	0	0	100	27	-	19	-
WD(deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS 13)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	681	1.8	5	-	0	0	0	0	1	4	61
TRS(ppb) Average	681	0.2	0	-	0	0	0	0	0	0	3
THC(ppm) Average	682	2.28	0.2	-	2.1	2.1	2.2	2.2	2.3	2.5	4.9
O3(ppb) Average	674	29	13	-	1	11	20	30	39	44	57
NO2(ppb) Average	676	5.1	4	-	0	1	2	4	7	11	36
NO(ppb) Average	676	1.6	5	-	0	0	0	0	1	3	46
NOX(ppb) Average	676	6.7	8	-	0	1	3	4	8	12	70
PM2.5(ug/m3) Average	715	4.35	2.5	-	0	1.6	2.4	3.8	5.9	7.8	15.2
Temperature 2 m (C) Average	720	1.78	6.4	-	-16.7	-5.4	-3.1	1.3	5.7	11.1	18.1
Relative Humidity (%) Average	720	60.4	19	-	13	34	46	60	75	87	98
Wind Speed 10 m (km/h) Average	720	9.5	6	-	0	2	4	9	14	18	27
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -FORT McKAY SOUTH (AMS 13)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	13 Apr 2017 18:00	13 Apr 2017 21:00	4	Station power failure
O3	22 Apr 2017 18:00	22 Apr 2017 21:00	4	Unstable operation - baseline drift
O3	26 Apr 2017 08:00	26 Apr 2017 12:00	5	Maintenance - UV lamp replacement
NO2, NO, NOX	10 Apr 2017 09:00	10 Apr 2017 11:00	3	Maintenance - NOX reference point generated for O3 cal
NO2, NO, NOX	26 Apr 2017 09:00	26 Apr 2017 10:00	2	Maintenance - NOX reference point generated for O3 cal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 61 ppb on Apr 30 09:00	Maximum Daily Average: 9.8 ppb on Apr 9		Hours of Data:	681
Minimum Value: 0 ppb on Apr 12 02:00	Minimum Daily Average: 0.0 ppb on Apr 12		Hours of Missing Data:	39
Maximum Diurnal Average: 4.3 ppb at hour 12	Minimum Diurnal Average: 0.3 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 1.8 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 4 P ₉₉ = 25		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
2-Apr	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1	
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0.4	1	
4-Apr	0	0	0	0	Z	0	0	1	1	2	2	1	19	14	23	7	3	19	2	1	1	0	0	0	4.3	23	
5-Apr	0	0	0	0	0	Z	0	2	4	1	4	14	2	1	8	7	3	1	1	3	1	1	1	1	2.4	14	
6-Apr	Z	0	0	0	0	0	1	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0.4	2	
7-Apr	0	Z	0	0	0	0	0	C	C	C	C	C	1	1	1	1	1	1	1	1	1	0	1	1	0.5	1	
8-Apr	1	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	
9-Apr	0	0	0	Z	0	1	4	10	10	29	23	36	20	23	26	18	10	2	2	2	2	2	3	2	9.8	36	
10-Apr	1	1	1	1	Z	1	1	1	1	2	10	29	12	2	6	6	8	5	2	1	1	1	1	1	4.1	29	
11-Apr	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	1	1	1	0.5	1
14-Apr	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1	
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
16-Apr	1	2	0	0	Z	1	1	2	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	3	
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	5	18	9	3	2	2	5	6	1	1	0	0	0	2.4	18	
20-Apr	0	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1	
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	14	18	7	1	0	0	0	1.9	18	
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
23-Apr	0	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.3	1	
24-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
25-Apr	0	Z	0	0	0	0	0	6	6	3	2	1	11	17	14	6	13	14	1	1	1	1	1	1	4.3	17	
26-Apr	1	1	Z	1	5	5	5	2	2	1	0	1	1	5	6	3	7	5	4	1	1	0	1	1	2.5	7	
27-Apr	0	1	1	Z	1	1	1	1	1	8	27	8	4	8	13	11	18	16	17	3	4	2	1	1	6.3	27	
28-Apr	0	0	0	0	Z	0	0	1	1	2	1	2	3	3	3	3	3	5	2	1	1	1	0	0	1.4	5	
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	8	8	0	0	0	1	1	1	1.1	8	
30-Apr	Z	1	1	0	0	0	0	3	61	12	12	25	14	3	3	2	2	2	1	3	2	1	0	0	6.5	61	

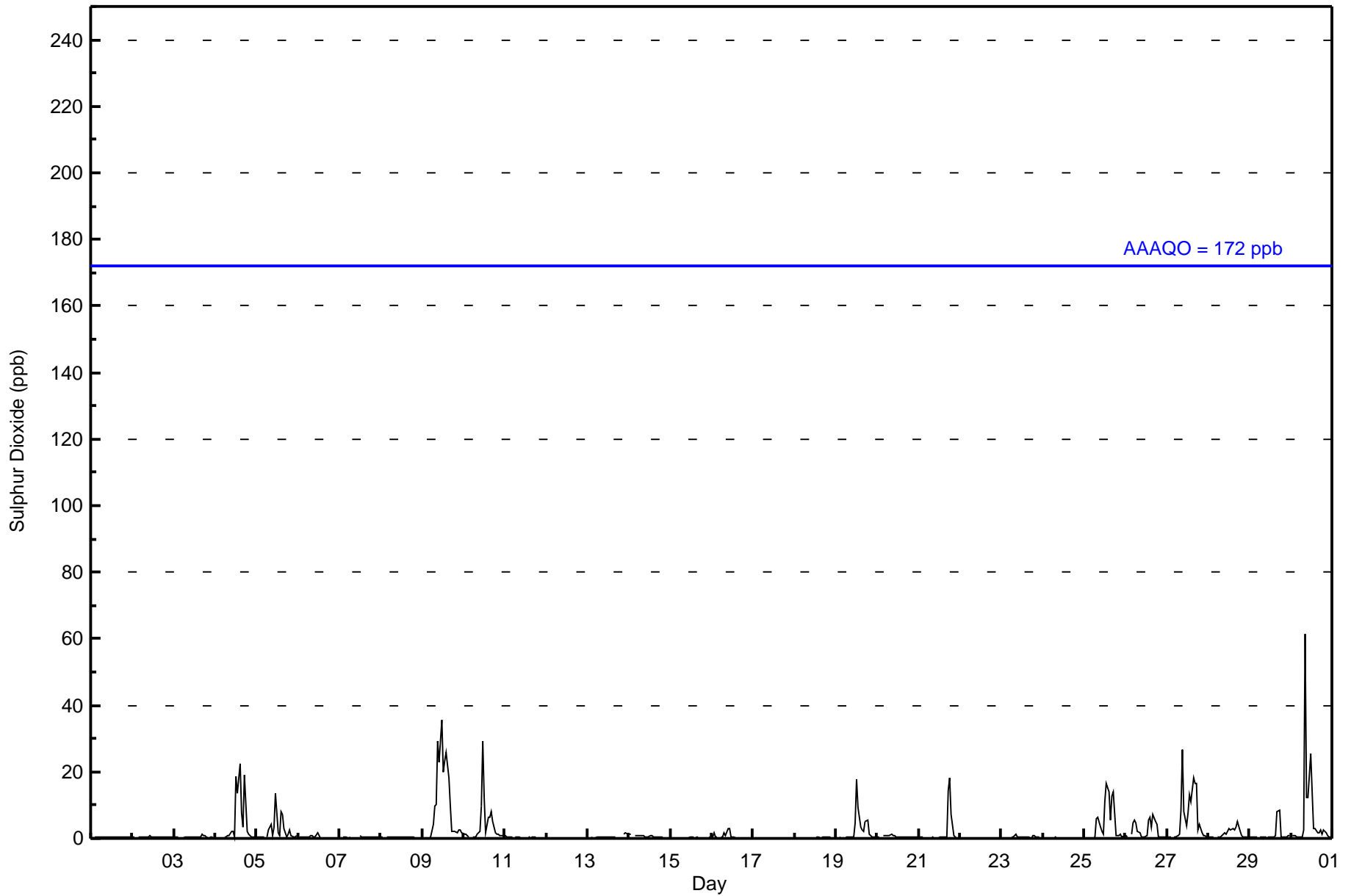
0.4	0.4	0.3	0.4	0.4	0.5	0.6	1.2	3.6	3.0	2.4	4.3	3.8	3.2	3.6	2.6	2.7	3.5	1.6	1.0	0.5	0.5	0.4	0.4	Diurnal Average	
1	2	1	1	5	5	5	10	61	29	23	36	20	23	26	18	16	19	18	7	2	2	3	2	Diurnal Maximum	

Z - zeronspan C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	648	95.15	95.15
11 - 20	23	3.38	98.53
21 - 60	9	1.32	99.85
61 - 110	1	0.15	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	141	102	23	15	4	10	12	54	72	58	33	29	21	11	21	42	648
11 - 20	0	0	0	0	0	2	2	7	8	2	1	1	0	0	0	0	23
21 - 60	0	0	0	0	0	0	1	3	4	0	1	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	102	23	15	4	12	16	64	84	60	35	30	21	11	21	42	681

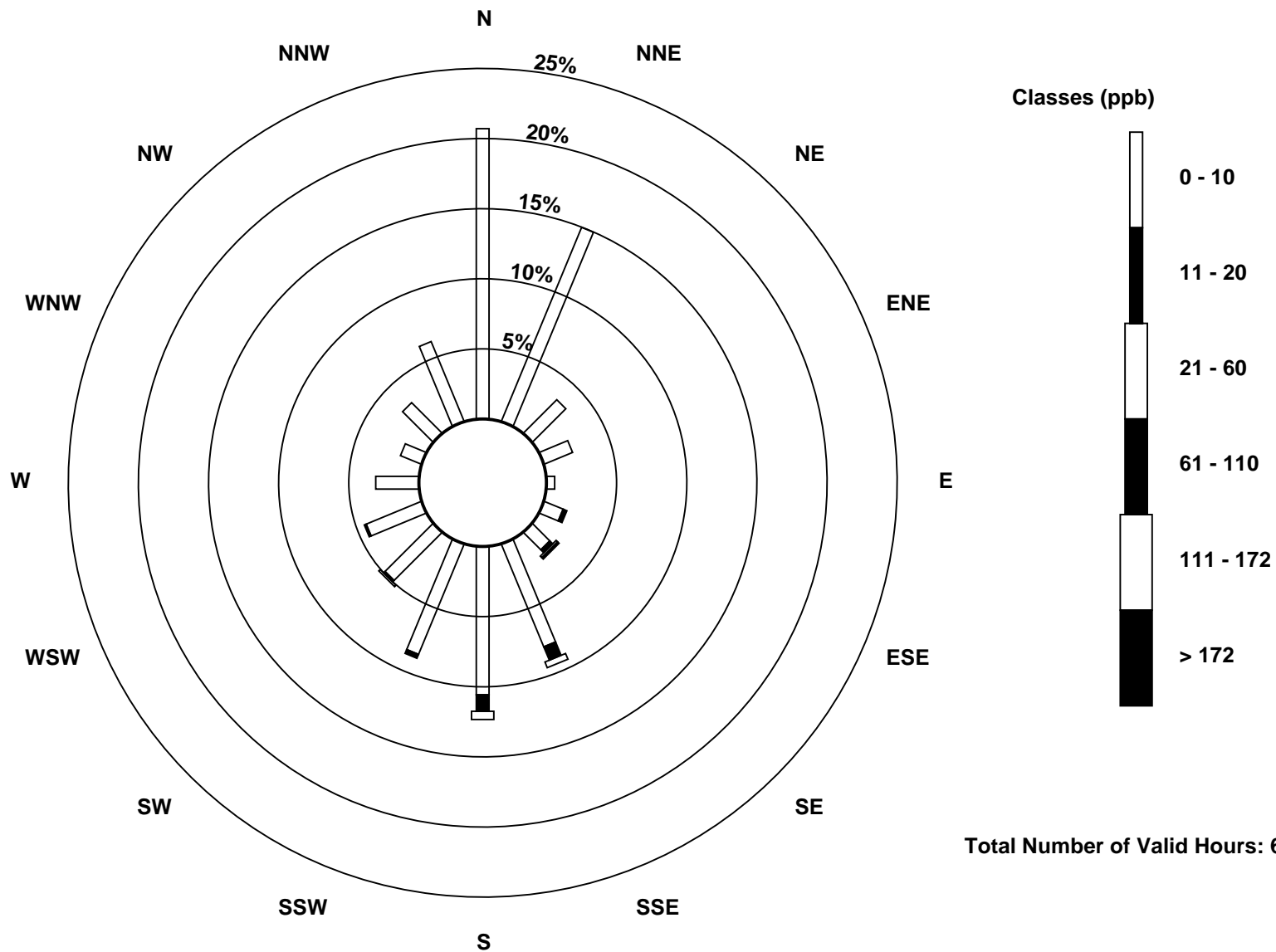
Total Number of Valid Hours: 681

Total Number of Hours: 720

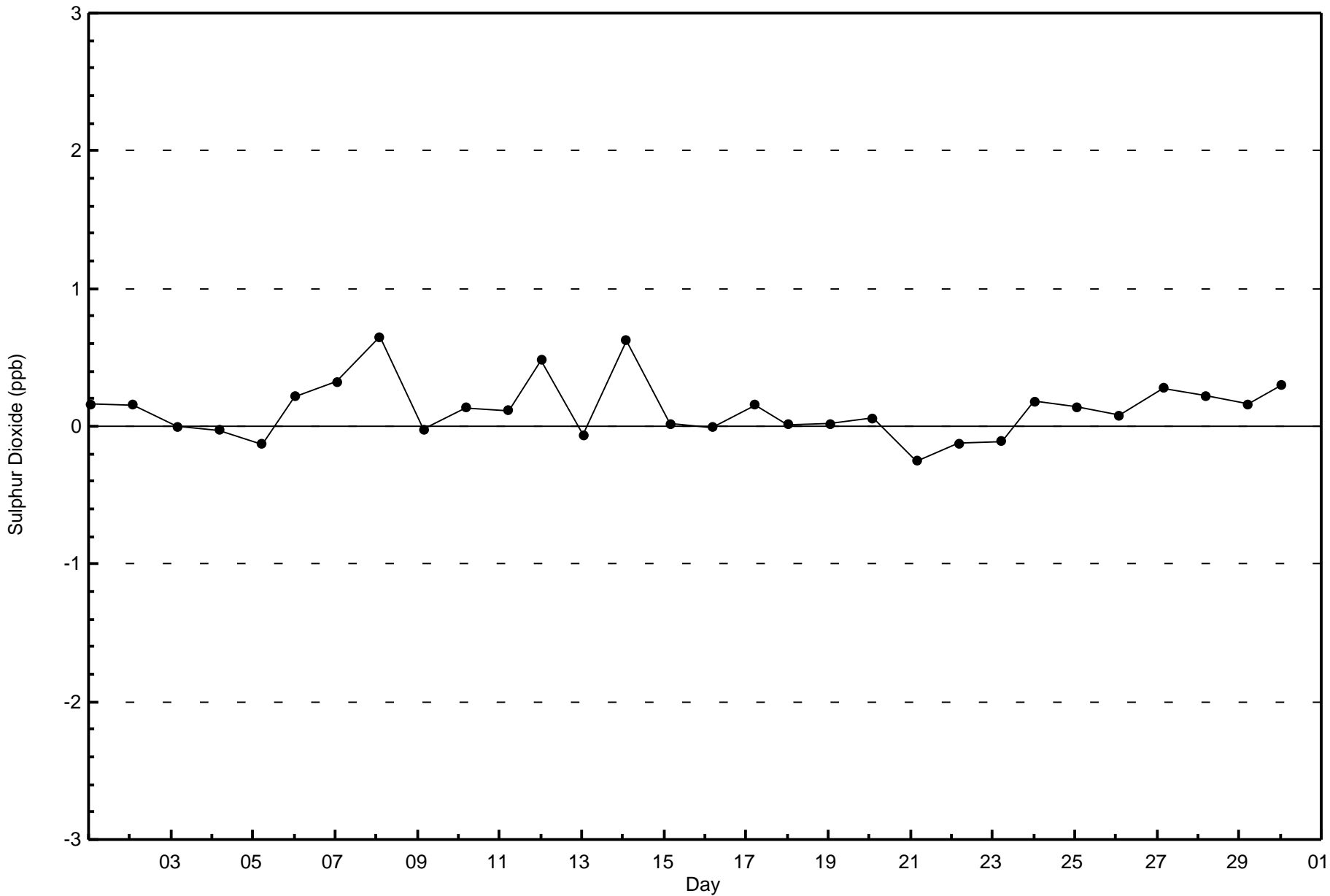


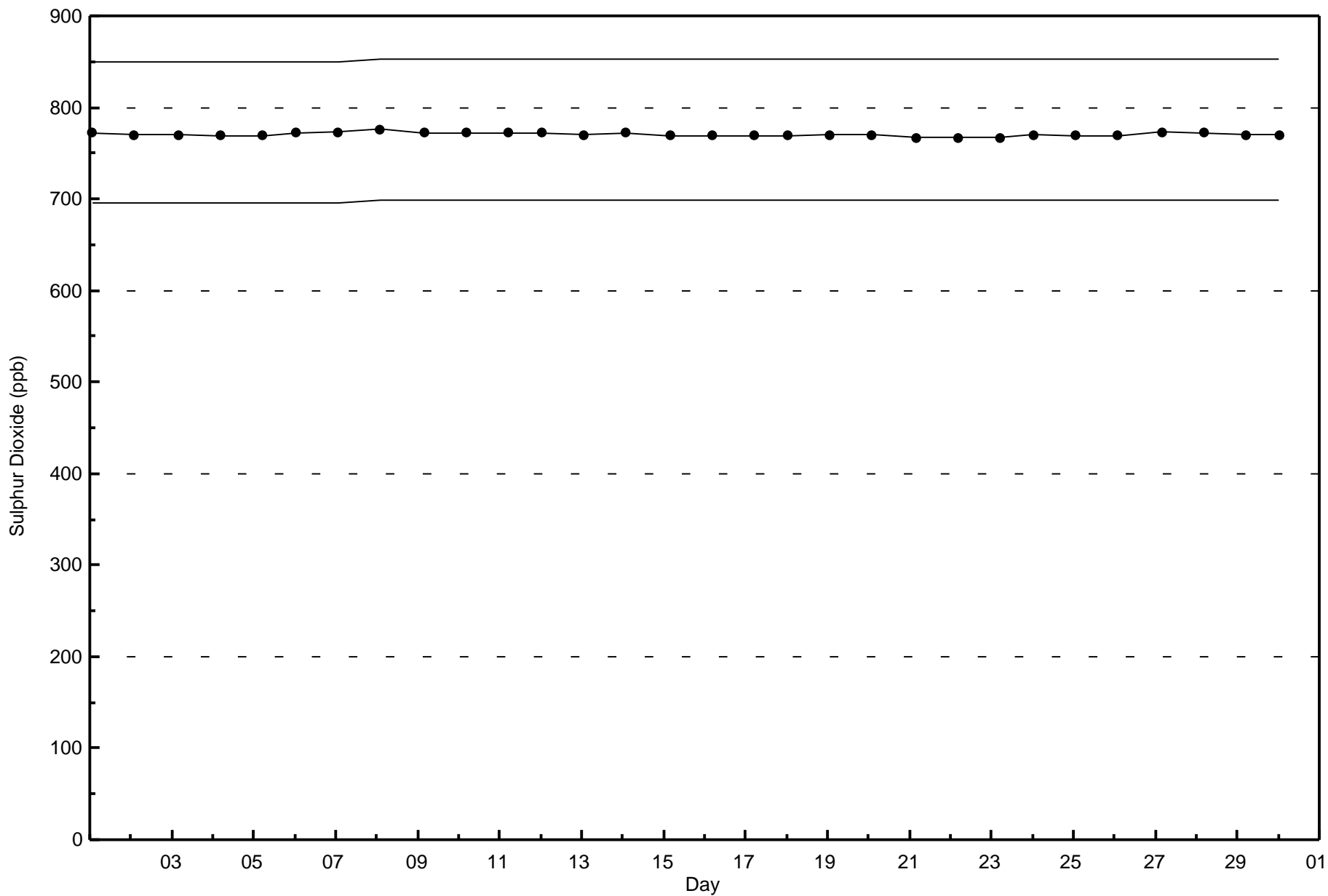
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Fort McKay South (AMS 13)



Total Number of Valid Hours: 681







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3 ppb on Apr 5 20:00	Maximum Daily Average: 0.6 ppb on Apr 5		Hours of Data:	681
Minimum Value: 0 ppb on Apr 29 11:00	Minimum Daily Average: 0.1 ppb on Apr 15		Hours of Missing Data:	39
Maximum Diurnal Average: 0.3 ppb at hour 8	Minimum Diurnal Average: 0.1 ppb at hour 17		Hours of Calibration:	35
Monthly Average: 0.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
2-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
3-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Apr	0	0	0	0	0	Z	1	1	1	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0.4	1
5-Apr	0	0	0	1	1	1	Z	1	1	0	0	1	0	0	0	0	0	0	0	3	1	0	1	1	0.6	3
6-Apr	2	Z	1	1	1	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
7-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
9-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1
10-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
11-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	0	0	0.2	0
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	1	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
20-Apr	0	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0.2	1
22-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
24-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.2	1
26-Apr	0	0	0	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
27-Apr	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Apr	0	0	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
29-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
30-Apr	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1

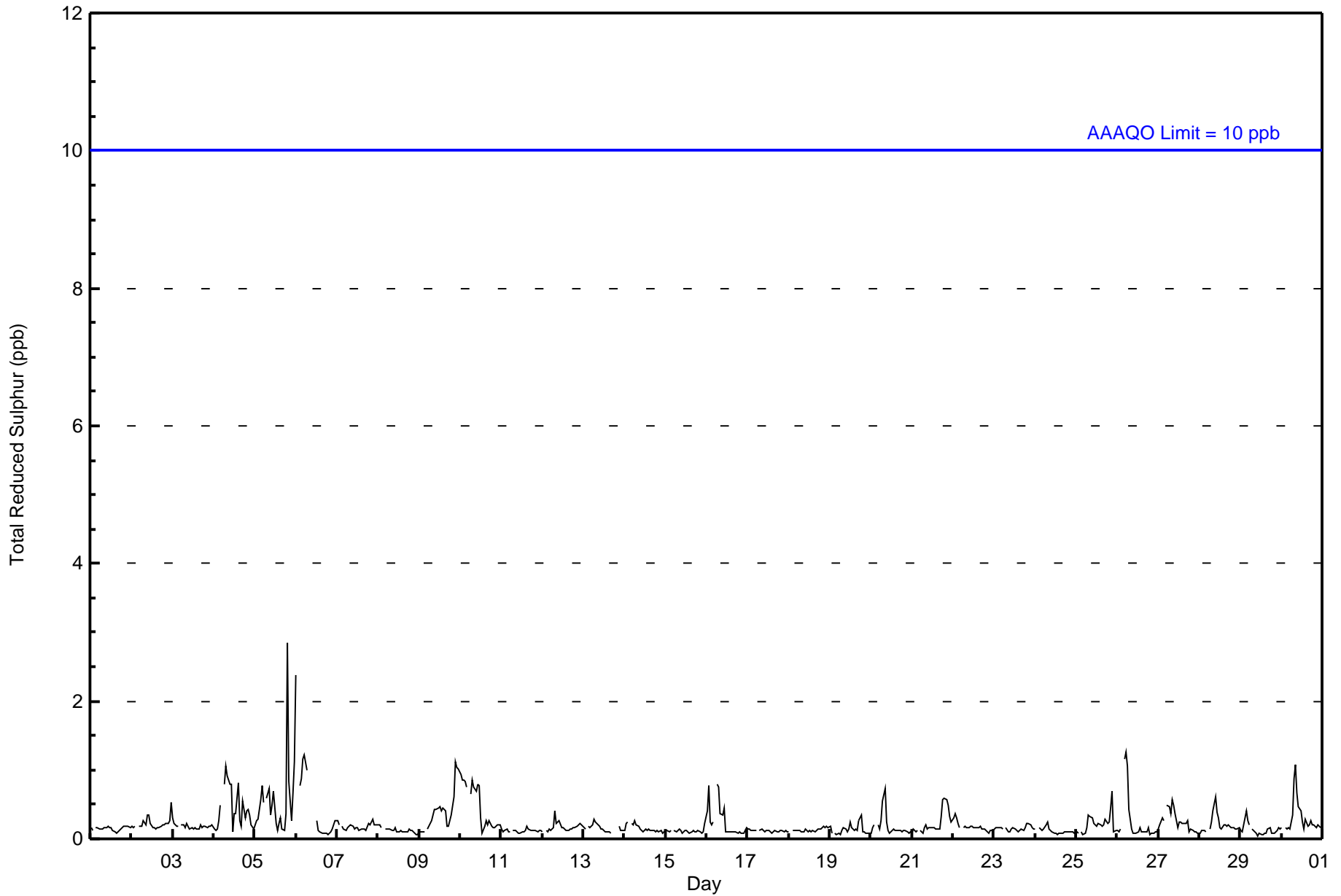
0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	Diurnal Average
2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	3	1	1	1	1	Diurnal Maximum

Z - zerospan C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	680	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	146	103	23	14	4	12	16	62	81	60	33	31	21	10	21	43	680
3 - 4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	146	103	23	14	4	12	16	62	82	60	33	31	21	10	21	43	681

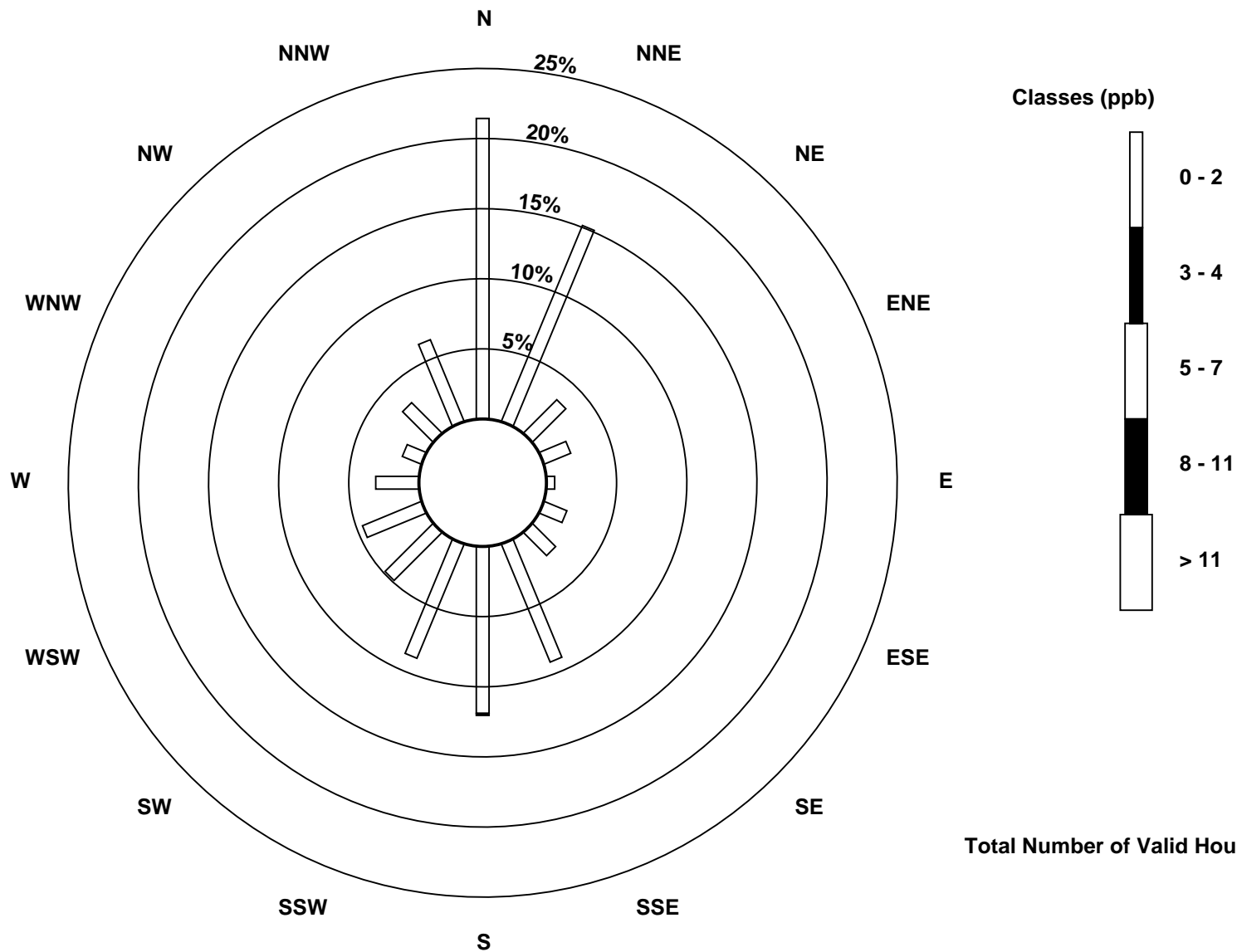
Total Number of Valid Hours: 681

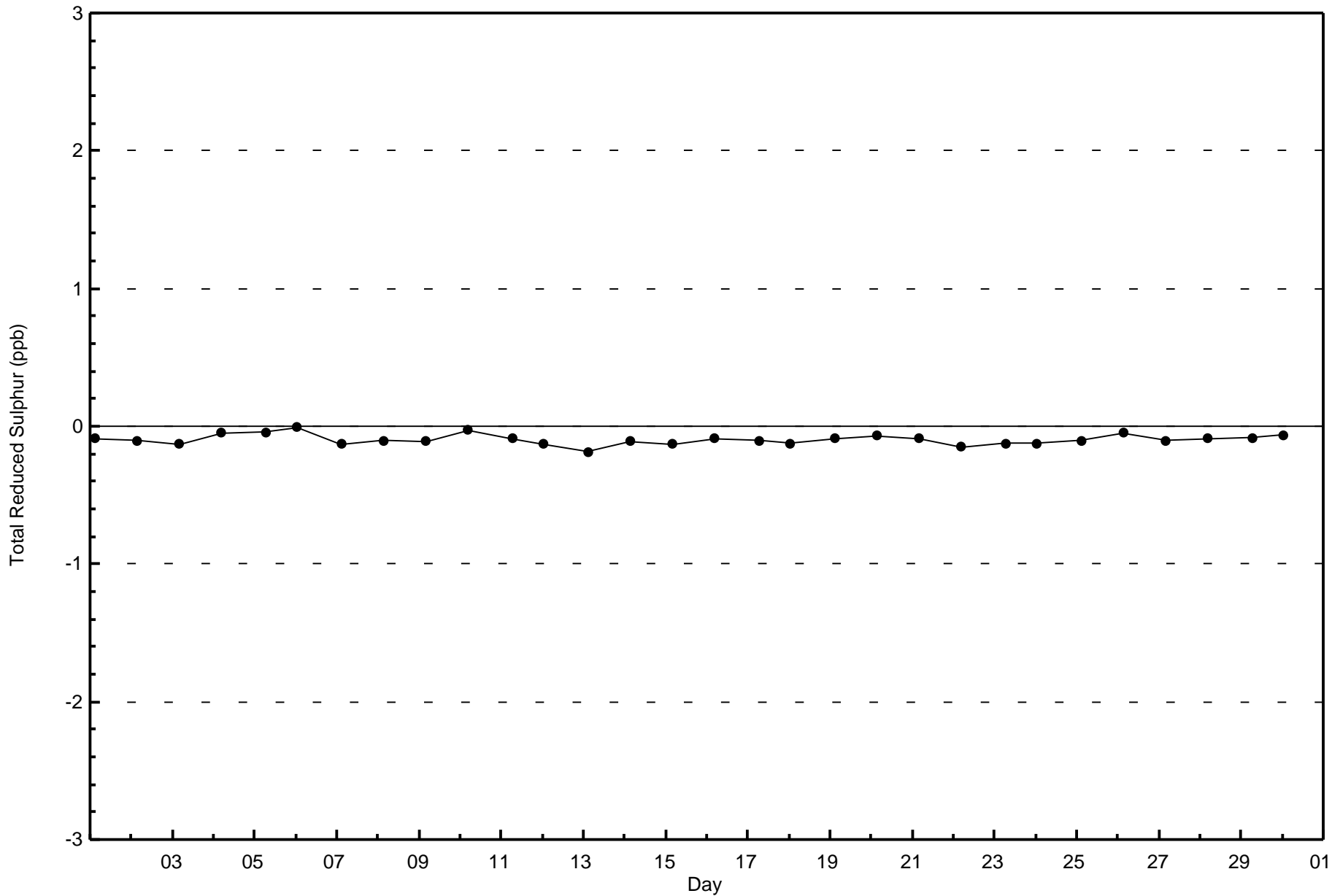
Total Number of Hours: 720

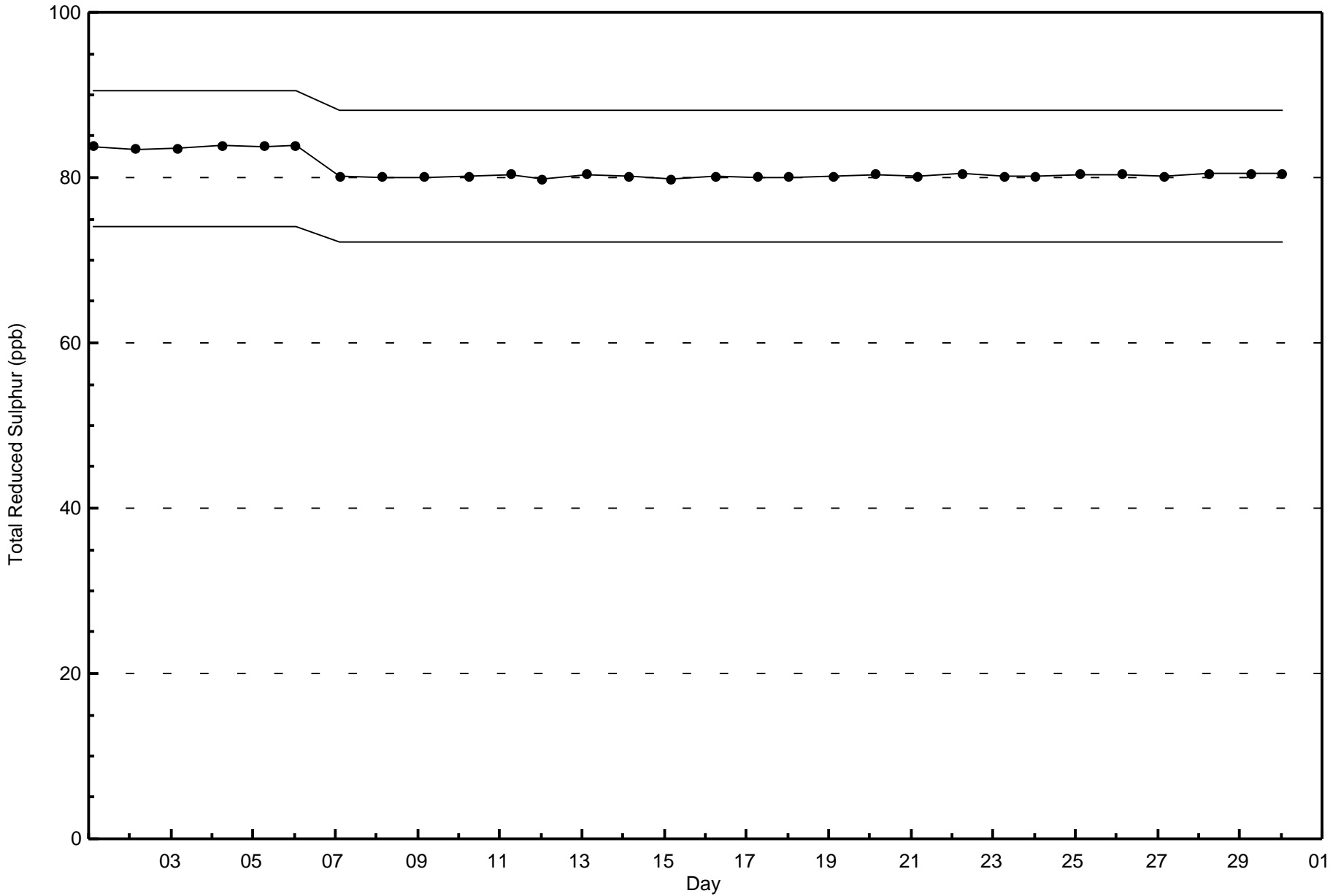


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Fort McKay South (AMS 13)









Wood Buffalo Environmental Association
Summary of Hour Averages

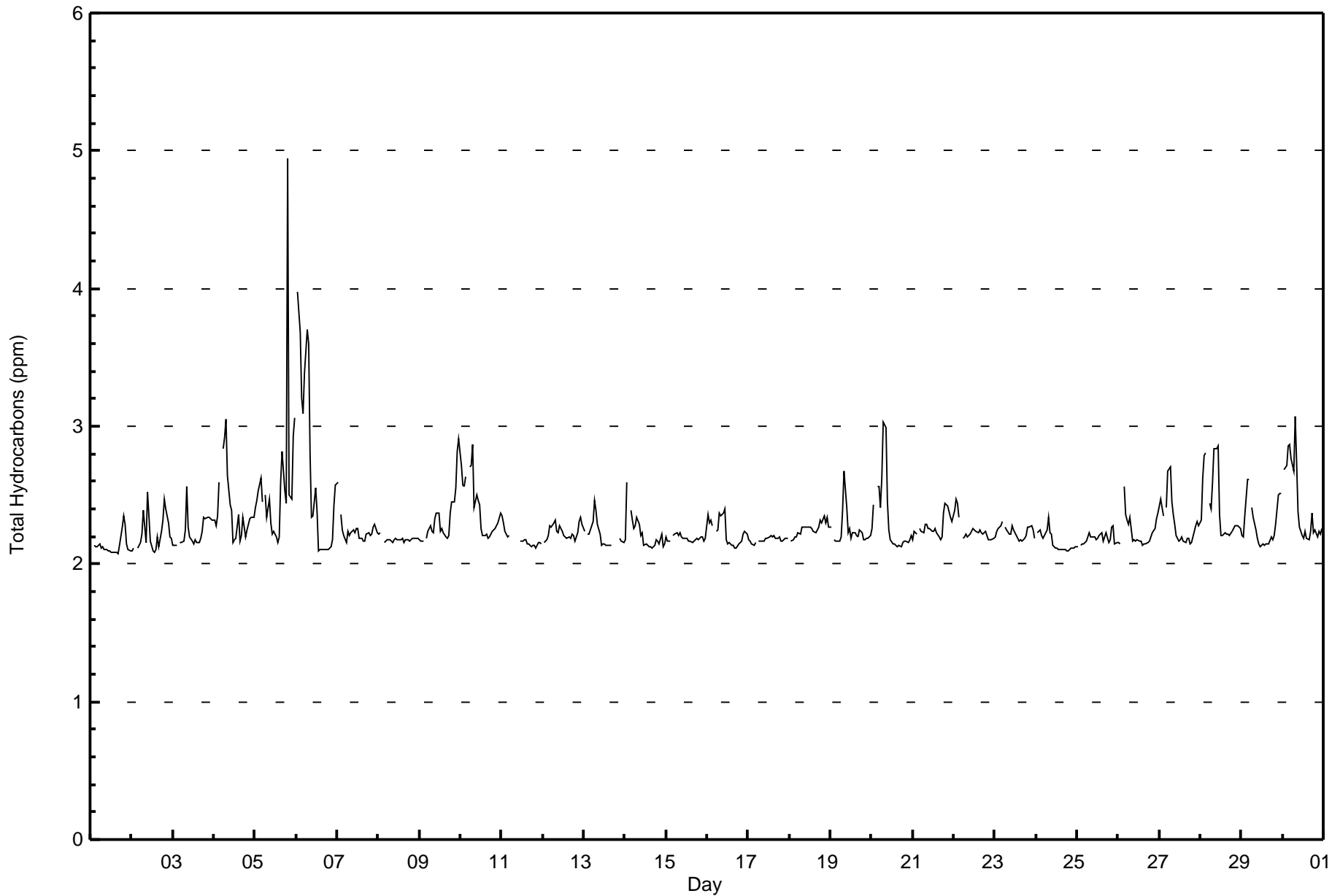
Total Hydrocarbons (THC) - ppm
Fort McKay South - April 2017

Maximum Value: 4.9 ppm on Apr 5 20:00 Maximum Daily Average: 2.7 ppm on Apr 6																	Hours in Service: 720 Hours of Data: 682 Hours of Missing Data: 38 Hours of Calibration: 34 Percent Operational Time: 99.4											
Minimum Value: 2.1 ppm on Apr 1 17:00 Minimum Daily Average: 2.1 ppm on Apr 1 Maximum Diurnal Average: 2.4 ppm at hour 8 Minimum Diurnal Average: 2.2 ppm at hour 14 Monthly Average: 2.28 ppm Percentiles: P ₁ = 2.1 P ₁₀ = 2.1 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.5 P ₉₉ = 3.1																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.3	2.3	
2-Apr	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.4	2.2	2.5	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.3	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2
3-Apr	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
4-Apr	2.3	2.3	2.4	2.6	Z	2.8	2.9	3.1	2.6	2.4	2.4	2.2	2.2	2.2	2.4	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
5-Apr	2.4	2.5	2.5	2.6	2.5	Z	2.5	2.3	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.6	2.8	2.5	2.4	4.9	2.5	2.5	2.9	3.1	2.6	2.6	4.9	
6-Apr	Z	4.0	3.7	3.2	3.1	3.4	3.7	3.6	2.8	2.3	2.4	2.6	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.6	2.7	2.7	4.0	
7-Apr	2.6	Z	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.6
8-Apr	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
9-Apr	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.2	2.2	2.3	2.4	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.5	2.6	2.8	2.9	2.3	2.3	2.9
10-Apr	2.7	2.6	2.6	2.6	Z	2.7	2.7	2.9	2.4	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.9
11-Apr	2.3	2.3	2.2	2.2	2.2	Z	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.3
12-Apr	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.3
13-Apr	2.2	Z	2.2	2.2	2.2	2.3	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	PF	PF	PF	PF	2.2	2.2	2.2	2.2	2.5	
14-Apr	2.2	2.6	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.6
15-Apr	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
16-Apr	2.4	2.3	2.3	2.3	Z	2.2	2.3	2.4	2.3	2.4	2.4	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
17-Apr	2.2	2.2	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
18-Apr	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
19-Apr	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.4	2.7	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7
20-Apr	2.3	2.4	Z	2.6	2.6	2.4	2.6	3.0	3.0	2.5	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.0
21-Apr	2.2	2.2	2.2	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4
22-Apr	2.4	2.5	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5
23-Apr	2.2	2.2	2.3	2.3	2.3	Z	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3
24-Apr	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
25-Apr	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3
26-Apr	2.2	2.1	Z	2.6	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.2	2.2	2.6
27-Apr	2.4	2.5	2.4	Z	2.4	2.7	2.7	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.7
28-Apr	2.3	2.6	2.8	2.8	Z	2.4	2.4	2.6	2.8	2.8	2.9	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.9
29-Apr	2.2	2.2	2.3	2.6	2.6	Z	2.4	2.3	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.5	2.5	2.5	2.5	2.5	2.6
30-Apr	Z	2.7	2.7	2.9	2.9	2.8	2.7	3.1	2.7	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.1
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration PF - Power Failure																												



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay South - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay South - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	671	98.39	98.39
3.1 - 10.0	11	1.61	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay South - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	141	103	23	15	4	11	15	63	83	56	34	29	21	10	21	42	671
3.1 - 10.0	0	0	0	0	0	1	1	1	1	4	1	1	0	1	0	0	11
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	103	23	15	4	12	16	64	84	60	35	30	21	11	21	42	682

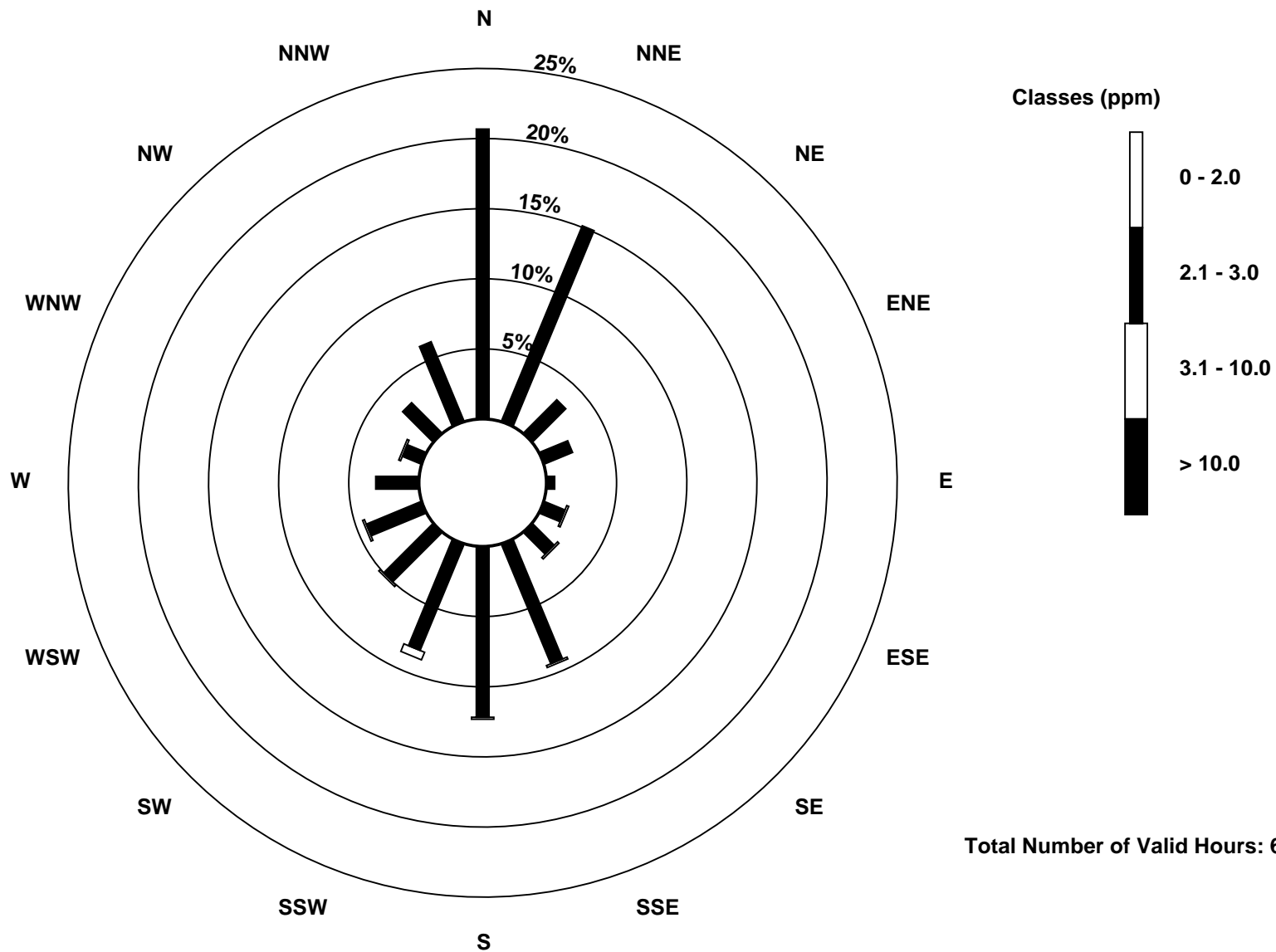
Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Fort McKay South (AMS 13)

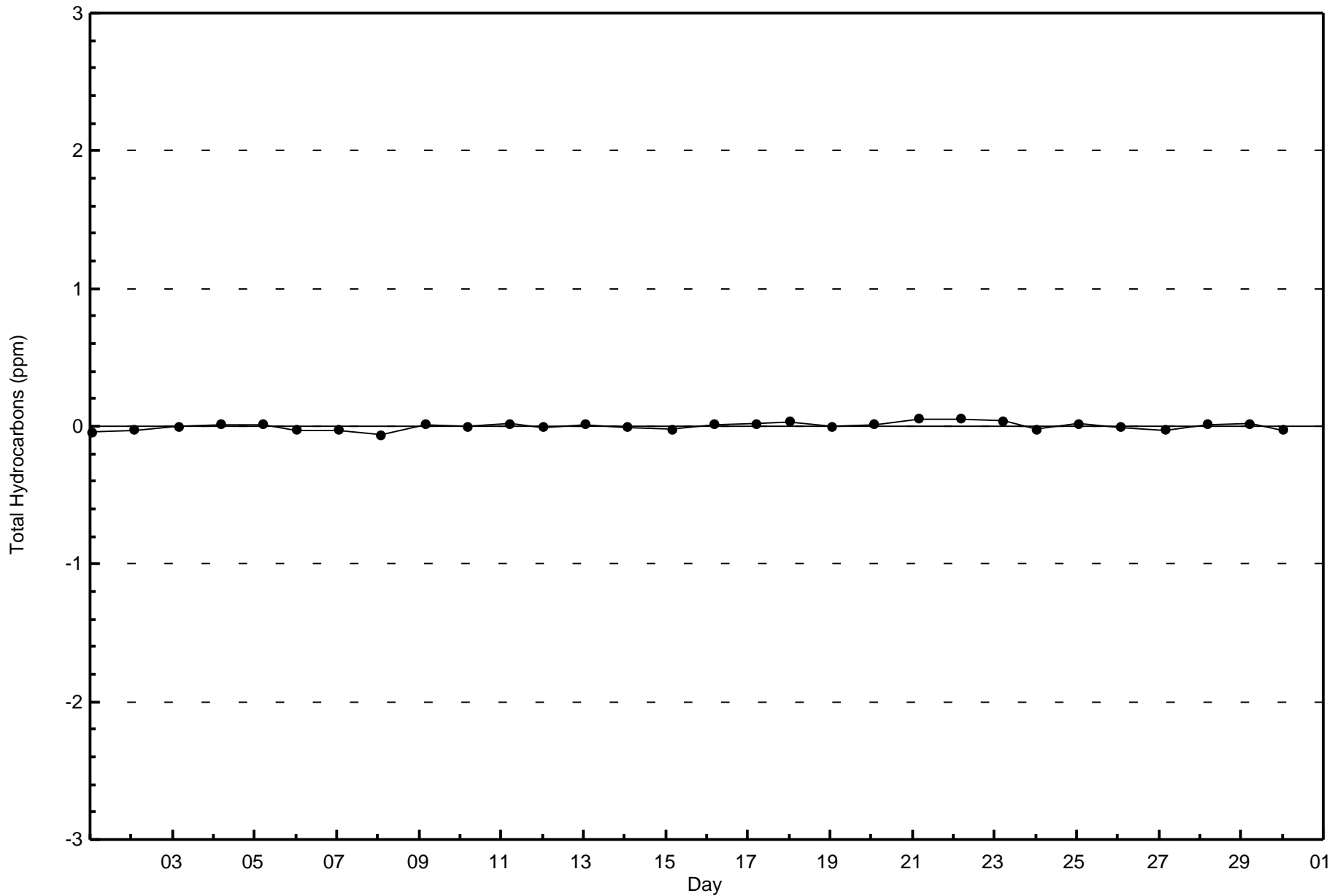


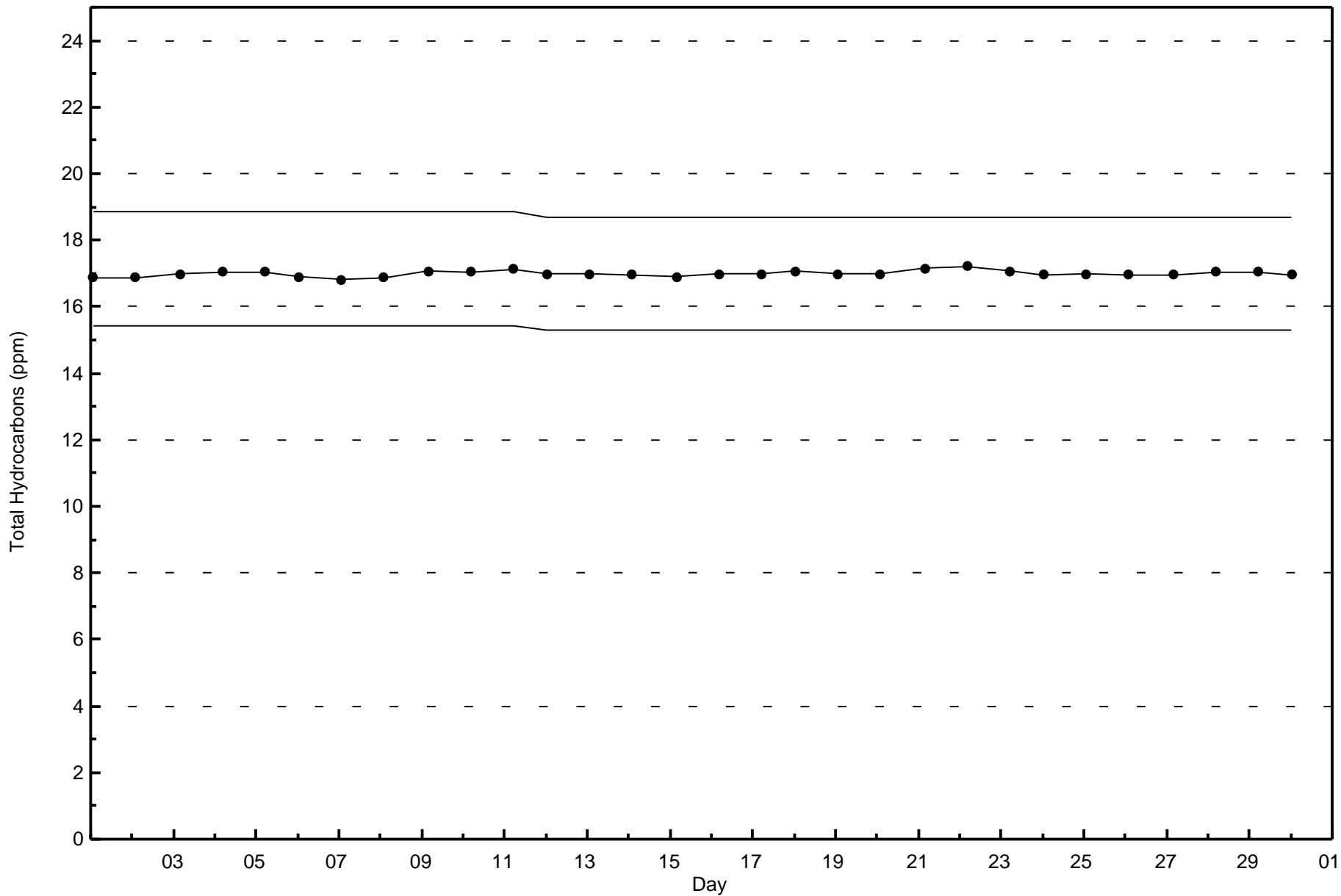
Total Number of Valid Hours: 682



Wood Buffalo Environmental Association
Zero Responses

Total Hydrocarbons (THC) - ppm
Fort McKay South - April 2017







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

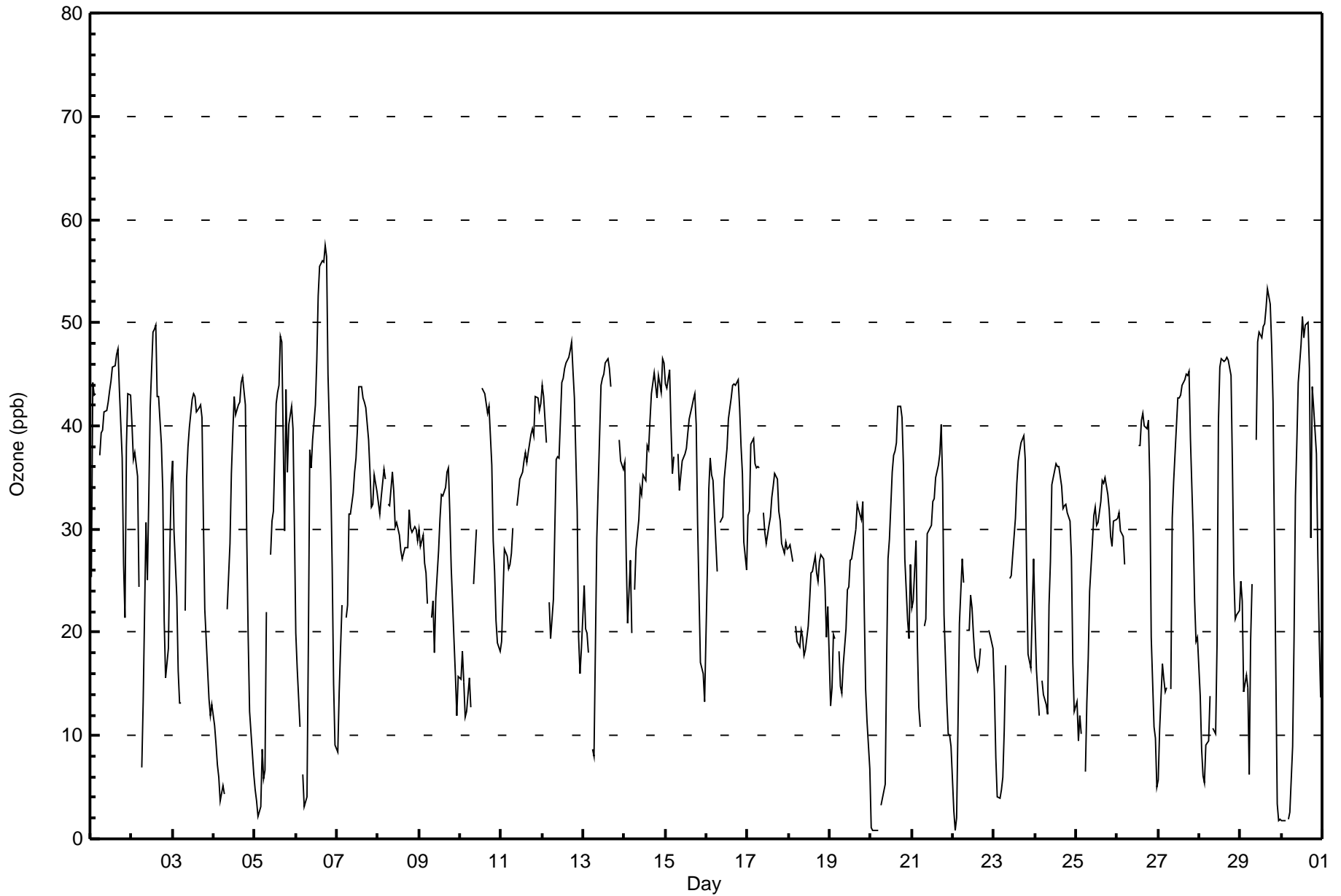
Fort McKay South - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 57 ppb on Apr 6 18:00	Maximum Daily Average: 40.1 ppb on Apr 1		Hours of Data:	674
Minimum Value: 1 ppb on Apr 20 04:00	Minimum Daily Average: 17.0 ppb on Apr 22		Hours of Missing Data:	46
Maximum Diurnal Average: 40.4 ppb at hour 17	Minimum Diurnal Average: 16.6 ppb at hour 6		Hours of Calibration:	33
Monthly Average: 29.0 ppb	Percentiles: P ₁ = 2 P ₁₀ = 11 Q ₁ = 20 Median = 30 Q ₃ = 39 P ₉₀ = 44 P ₉₉ = 52		Percent Operational Time:	98.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	25	44	43	43	Z	37	39	40	41	42	42	43	44	46	46	47	48	44	37	27	21	38	43	43	40.1	48
2-Apr	40	37	37	35	24	Z	7	13	31	25	33	42	49	49	50	43	43	38	34	21	16	18	28	34	32.5	50
3-Apr	37	30	23	16	13	13	Z	22	35	38	40	43	43	43	41	42	42	41	31	22	16	14	12	13	29.1	43
4-Apr	11	9	7	6	4	5	4	Z	22	29	35	39	43	41	42	42	44	45	42	29	20	12	10	6	23.9	45
5-Apr	5	4	2	3	9	6	7	22	Z	28	31	32	42	43	44	49	48	30	44	36	40	42	40	30	27.6	49
6-Apr	20	17	11	Z	6	3	4	19	38	36	39	42	46	53	56	56	56	57	56	45	35	26	15	9	32.4	57
7-Apr	8	14	19	23	Z	21	23	31	31	34	36	37	40	44	44	43	42	42	39	36	32	32	35	34	32.1	44
8-Apr	33	31	33	36	35	Z	32	32	36	34	30	31	29	28	27	28	28	28	32	30	30	30	30	29	31.0	36
9-Apr	30	28	29	27	26	23	Z	21	23	18	23	28	31	33	33	34	36	36	32	26	19	16	12	16	26.1	36
10-Apr	15	18	15	12	12	16	13	Z	25	30	C	C	C	44	43	42	41	42	36	29	26	21	19	18	25.9	44
11-Apr	19	24	28	27	26	27	28	30	Z	32	33	35	36	37	37	36	37	39	40	39	43	43	42	42	33.9	43
12-Apr	44	43	38	Z	23	19	23	30	37	37	37	44	45	46	46	47	47	48	45	43	32	20	16	18	36.0	48
13-Apr	24	20	20	18	Z	9	8	19	29	39	44	45	45	46	46	44	44	PF	PF	PF	PF	39	37	36	32.3	46
14-Apr	37	27	21	27	20	Z	24	28	31	34	33	35	35	38	38	41	43	45	44	43	45	43	47	46	35.8	47
15-Apr	44	44	45	40	35	37	Z	37	34	35	37	37	38	39	41	42	43	43	40	31	17	17	16	13	35.0	45
16-Apr	26	34	37	35	35	29	26	Z	31	31	35	36	38	41	43	44	44	44	45	42	38	35	29	26	35.8	45
17-Apr	31	32	38	39	36	36	36	36	Z	32	30	29	30	31	33	34	35	35	32	31	29	28	29	28	32.6	39
18-Apr	28	28	27	Z	21	19	19	20	20	18	18	21	23	26	26	27	26	25	27	28	27	24	20	23	23.4	28
19-Apr	13	15	20	19	Z	18	15	14	17	20	24	24	27	27	29	30	32	32	31	33	23	14	11	7	21.5	33
20-Apr	1	1	1	1	1	Z	3	4	5	17	27	29	36	37	38	38	42	42	41	36	27	21	19	27	21.5	42
21-Apr	22	23	29	19	13	11	Z	21	21	30	30	30	33	33	35	36	37	40	34	22	13	10	10	9	24.4	40
22-Apr	3	1	2	11	21	27	25	Z	20	20	24	22	20	18	16	17	18	UO	UO	UO	UO	20	20	18	17.0	27
23-Apr	14	8	4	4	5	6	10	17	Z	25	26	27	31	34	37	38	38	39	37	26	18	17	22	27	22.2	39
24-Apr	21	16	12	Z	15	14	13	12	23	27	34	36	36	36	36	34	32	32	32	32	31	27	17	12	25.3	36
25-Apr	13	9	12	10	Z	6	13	17	24	29	31	32	30	31	33	35	34	35	33	32	29	28	31	31	25.2	35
26-Apr	31	32	30	29	27	Z	29	M	M	M	M	M	38	38	41	41	40	40	41	35	20	11	10	5	29.7	41
27-Apr	6	11	17	15	14	15	Z	15	31	35	37	43	43	44	44	45	45	45	45	39	30	23	19	20	29.4	45
28-Apr	14	9	6	5	9	9	14	Z	11	10	19	40	46	47	46	46	47	46	45	36	26	21	22	22	25.9	47
29-Apr	25	23	14	16	15	6	19	25	Z	39	48	49	49	50	50	51	53	52	48	42	29	3	2	2	30.8	53
30-Apr	2	2	2	Z	2	3	9	19	33	38	44	48	51	49	50	50	46	29	44	42	37	27	19	14	28.6	51

21.4	21.1	20.8	20.7	17.9	16.6	17.7	22.7	27.0	29.6	32.9	35.7	37.8	39.0	39.6	40.1	40.4	39.8	38.8	33.2	27.4	24.1	22.7	21.9	Diurnal Average	
44	44	45	43	36	37	39	40	41	42	48	49	51	53	56	56	56	57	56	45	45	43	47	46	Diurnal Maximum	

Z - zerspan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	186	27.60	27.60
21 - 50	478	70.92	98.52
51 - 82	10	1.48	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	22	15	3	1	1	2	2	7	23	29	18	12	8	9	10	24	186
21 - 50	122	85	20	13	3	8	13	49	59	28	19	16	10	2	13	18	478
51 - 82	0	0	0	0	0	0	0	0	3	1	0	3	3	0	0	0	10
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	144	100	23	14	4	10	15	56	85	58	37	31	21	11	23	42	674

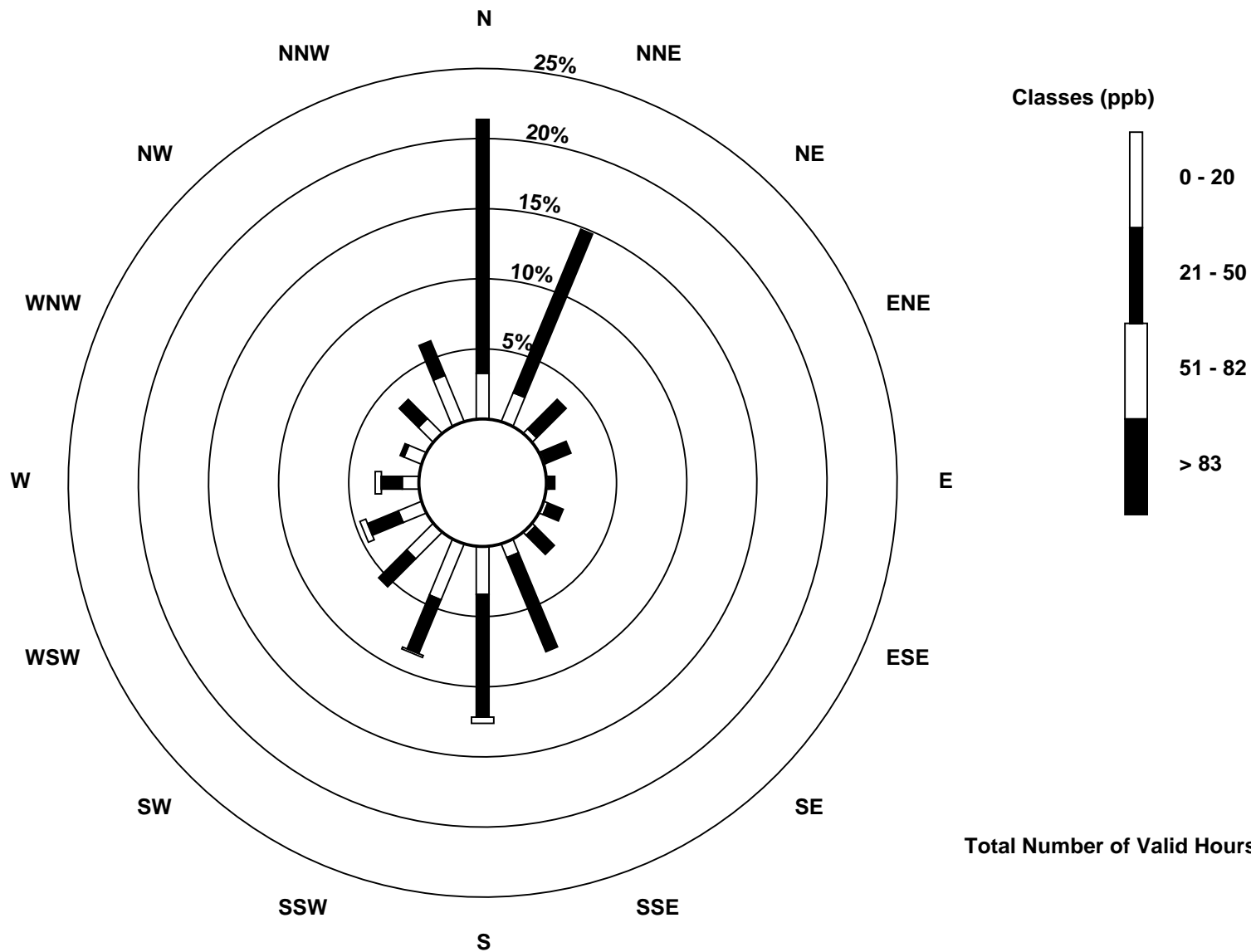
Total Number of Valid Hours: 674

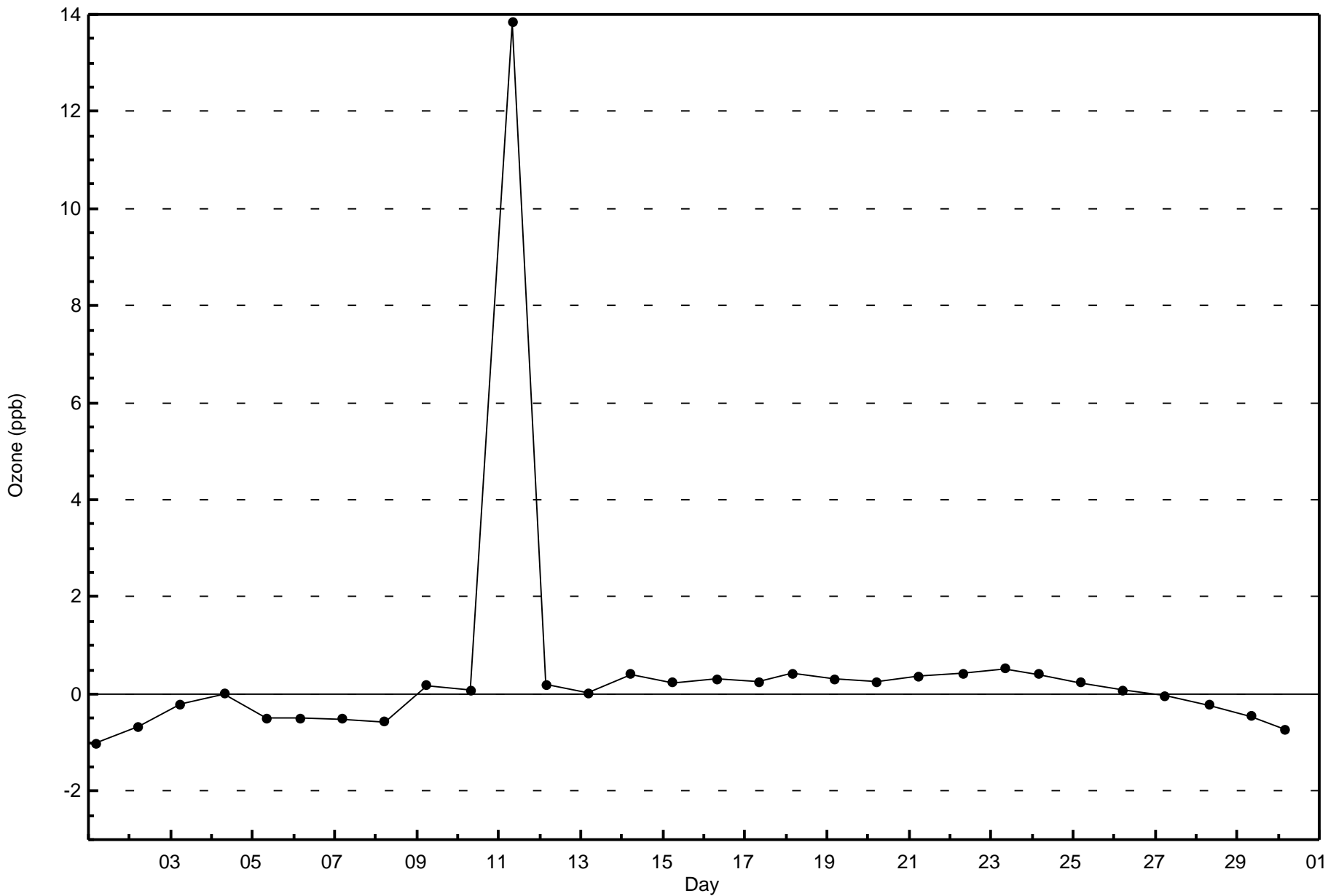
Total Number of Hours: 720

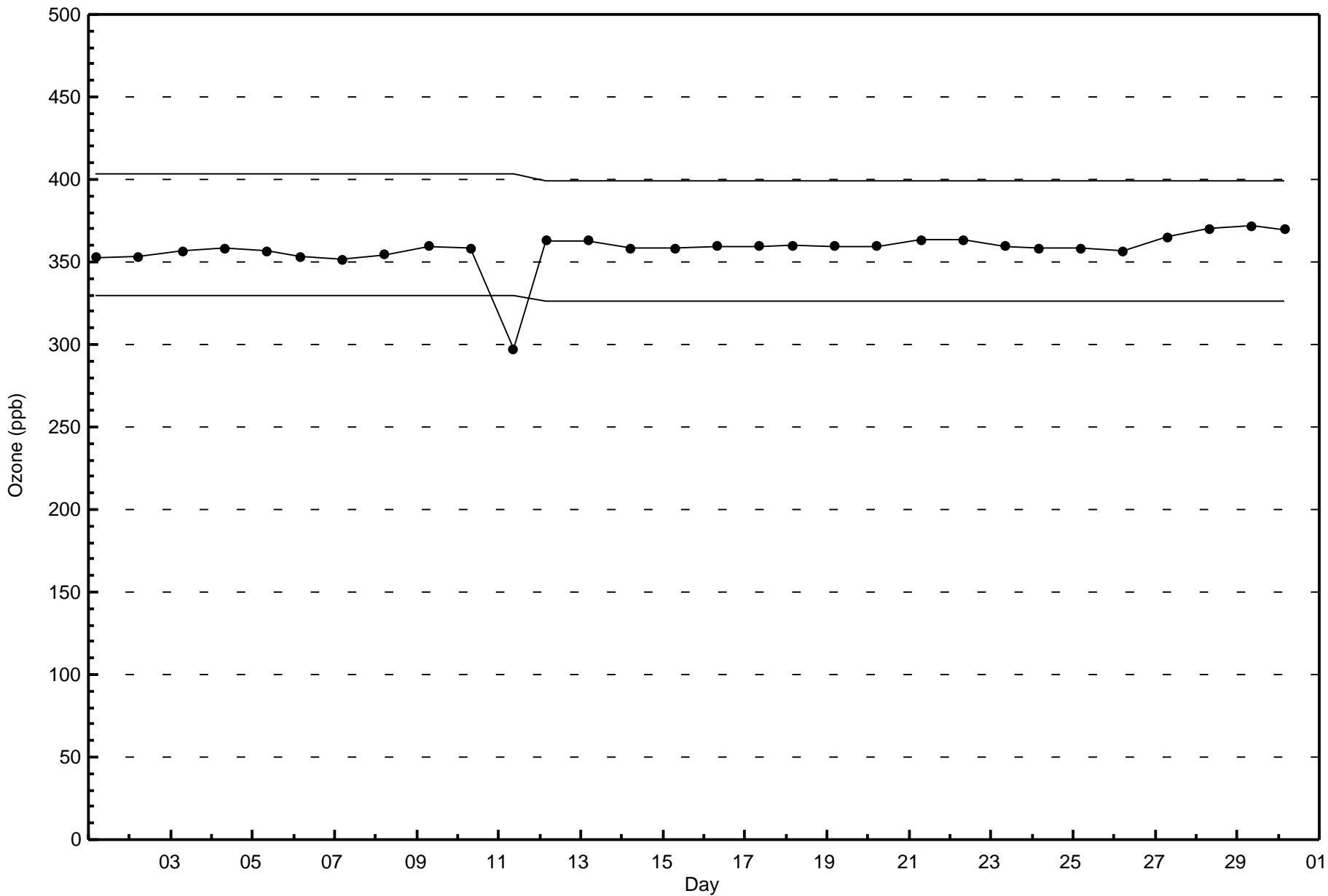


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Fort McKay South (AMS 13)







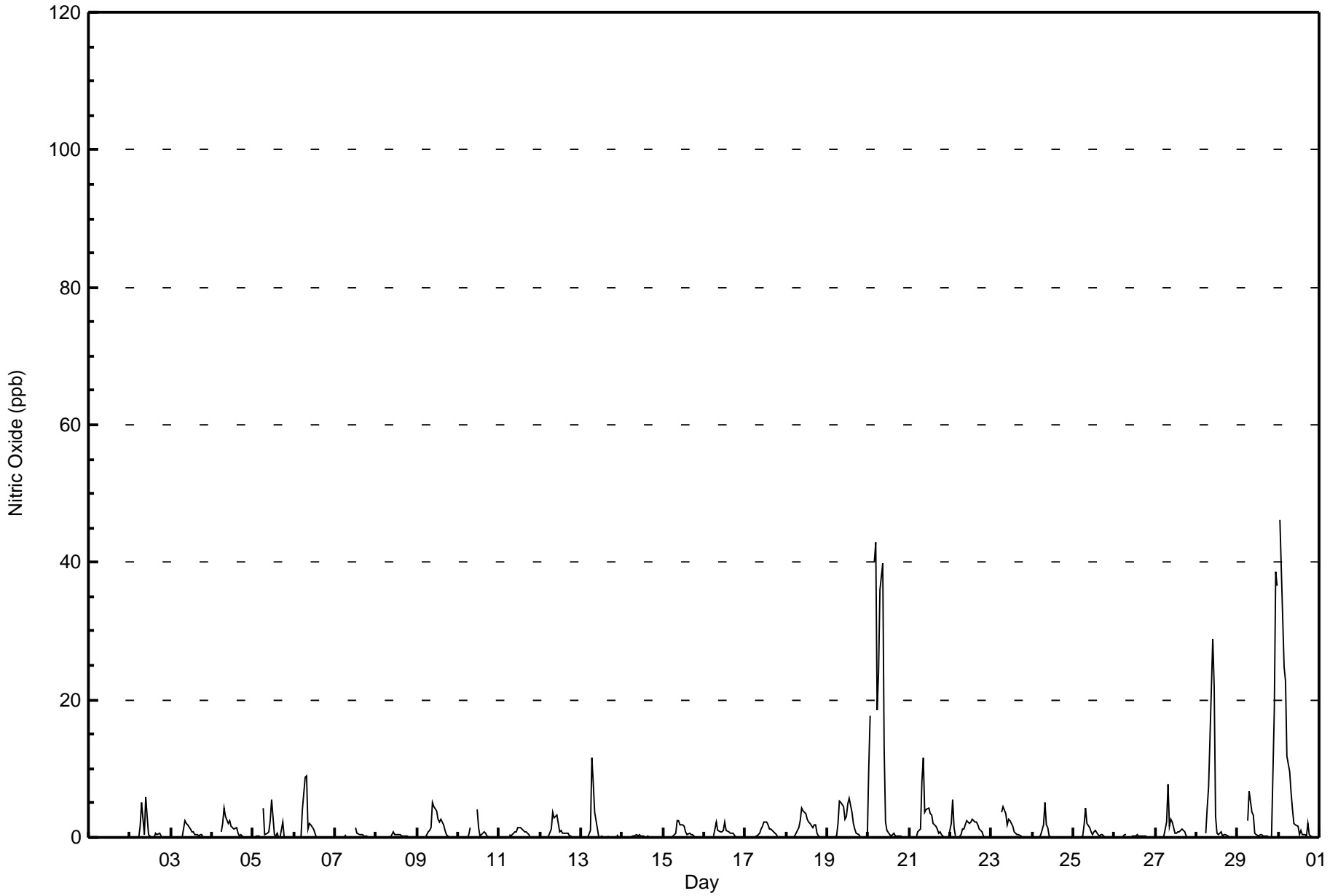


Maximum Value: 46 ppb on Apr 30 02:00		Maximum Daily Average: 10.8 ppb on Apr 20		Hours in Service: 720																																														
Minimum Value: 0 ppb on Apr 1 04:00		Minimum Daily Average: 0.1 ppb on Apr 1		Hours of Data: 676																																														
Maximum Diurnal Average: 4.6 ppb at hour 8		Minimum Diurnal Average: 0.0 ppb at hour 21		Hours of Missing Data: 44																																														
Monthly Average: 1.6 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 36		Hours of Calibration: 35																																														
				Percent Operational Time: 98.8																																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1																							
2-Apr	0	0	Z	0	0	0	2	5	0	6	3	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0.8	6																							
3-Apr	0	0	0	Z	0	0	0	1	3	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	3																							
4-Apr	0	0	0	0	Z	1	2	4	3	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0.9	4																							
5-Apr	0	0	0	0	0	Z	4	0	1	1	2	6	0	0	1	0	0	2	0	0	0	0	0	0	0	0.8	6																							
6-Apr	Z	0	0	0	0	4	9	9	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1.3	9																							
7-Apr	0	Z	0	0	0	0	0	C	C	C	C	C	2	1	0	0	0	0	0	0	0	0	0	0	0	0.2	2																							
8-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1																							
9-Apr	0	0	0	Z	0	0	1	1	1	5	5	4	3	2	3	2	1	0	0	0	0	0	0	0	0	1.2	5																							
10-Apr	0	0	0	0	Z	0	0	1	M	M	M	4	2	0	1	1	1	0	0	0	0	0	0	0	0	0.5	4																							
11-Apr	0	0	0	0	0	Z	0	0	1	1	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0.4	2																							
12-Apr	Z	0	0	0	0	0	1	4	3	3	3	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.8	4																							
13-Apr	0	Z	0	0	0	1	12	8	4	1	0	0	0	0	0	0	0	PF	PF	PF	PF	0	0	0	0	1.4	12																							
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
15-Apr	0	0	0	Z	0	0	0	1	2	2	2	2	2	1	0	1	0	1	0	0	0	0	0	0	0	0.6	2																							
16-Apr	0	0	0	0	Z	0	1	2	1	1	1	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0.6	2																							
17-Apr	0	0	0	0	0	Z	0	0	1	1	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0.6	2																							
18-Apr	Z	0	0	0	0	0	1	1	2	4	4	4	3	2	2	1	2	2	1	0	0	0	0	0	0	1.3	4																							
19-Apr	0	Z	0	0	0	0	2	5	5	5	3	3	5	6	4	2	1	1	0	0	0	0	0	0	0	1.8	6																							
20-Apr	10	18	Z	40	43	18	24	36	40	13	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	10.8	43																							
21-Apr	0	0	0	Z	0	1	1	8	12	4	4	4	3	3	2	2	1	1	1	0	0	0	0	0	0	2.1	12																							
22-Apr	2	5	1	0	Z	0	0	1	1	2	2	2	2	3	2	2	2	2	1	1	0	0	0	0	0	1.4	5																							
23-Apr	0	0	0	0	0	Z	4	5	3	2	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	1.0	5																							
24-Apr	Z	0	0	0	0	0	2	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	5																							
25-Apr	0	Z	0	0	0	0	2	4	2	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.6	4																							
26-Apr	0	0	Z	0	0	0	0	0	M	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
27-Apr	0	0	0	Z	0	0	2	8	2	3	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1.0	8																							
28-Apr	0	0	0	0	Z	1	4	7	14	29	22	3	1	0	1	0	0	0	0	0	0	0	0	0	0	3.6	29																							
29-Apr	0	0	0	0	0	Z	2	7	4	3	1	0	0	0	0	0	0	0	0	0	0	0	19	39	37	4.9	39																							
30-Apr	Z	46	32	25	23	12	10	7	4	2	2	2	0	1	0	0	0	2	0	0	0	0	0	0	0	7.3	46																							
																								0.5	2.8	1.4	2.6	2.7	1.6	2.9	4.6	4.1	3.6	2.5	1.7	1.2	1.0	0.8	0.7	0.5	0.5	0.2	0.1	0.0	0.6	1.3	1.2	Diurnal Average		
																								10	46	32	40	43	18	24	36	40	29	22	6	5	6	4	2	2	2	2	1	0	0	19	39	37	Diurnal Maximum	
Z - zerspan																								C - Calibration			M - Maintenance			PF - Power Failure																				



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort McKay South - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	98.08	98.08
21 - 40	11	1.63	99.70
41 - 80	2	0.30	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	138	102	23	15	3	11	15	61	82	57	34	30	20	11	20	41	663
21 - 40	3	0	0	0	1	1	0	0	1	3	0	0	1	0	1	0	11
11 - 80	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	102	23	15	4	12	15	61	83	60	35	30	21	11	21	42	676

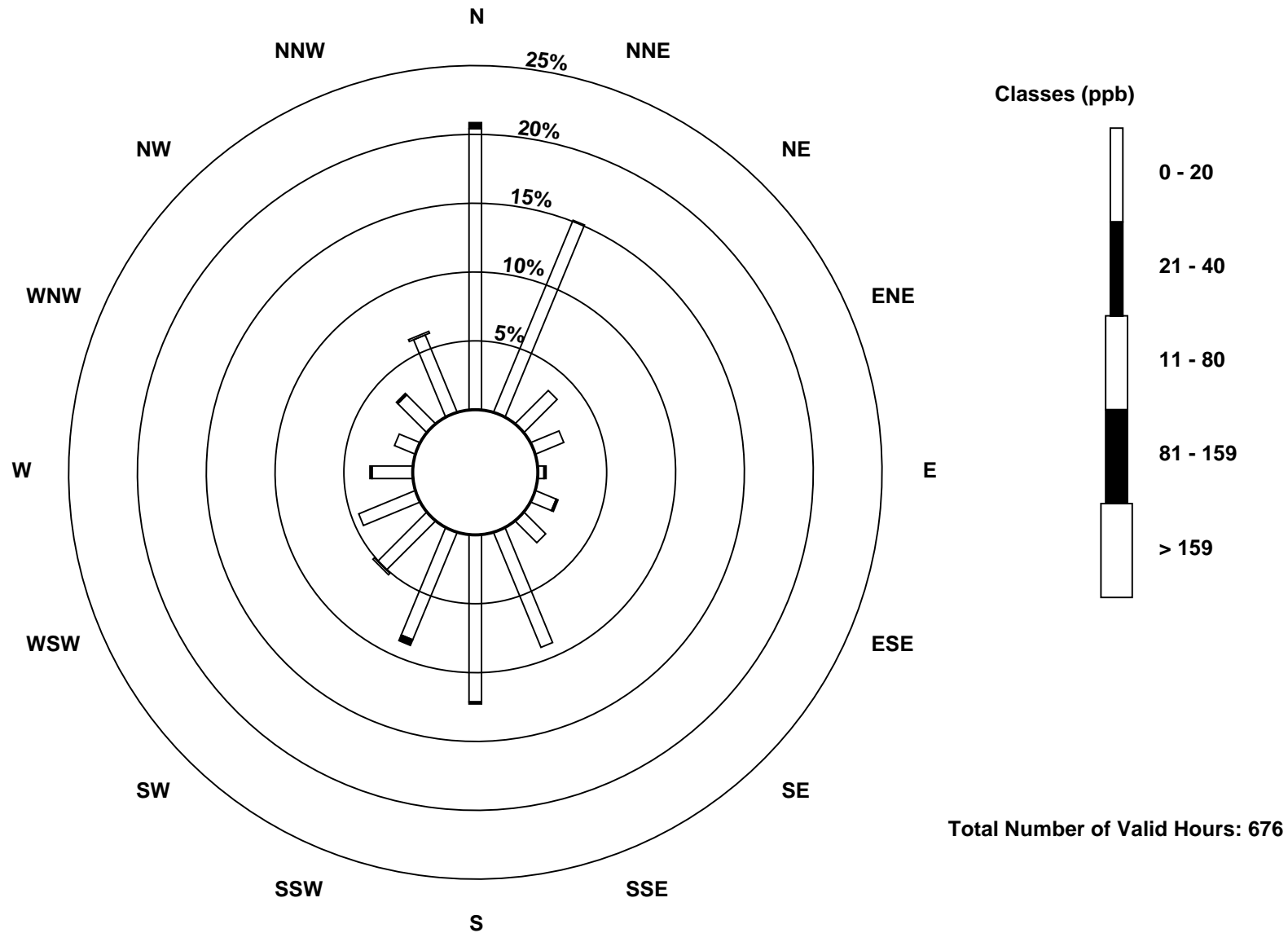
Total Number of Valid Hours: 676

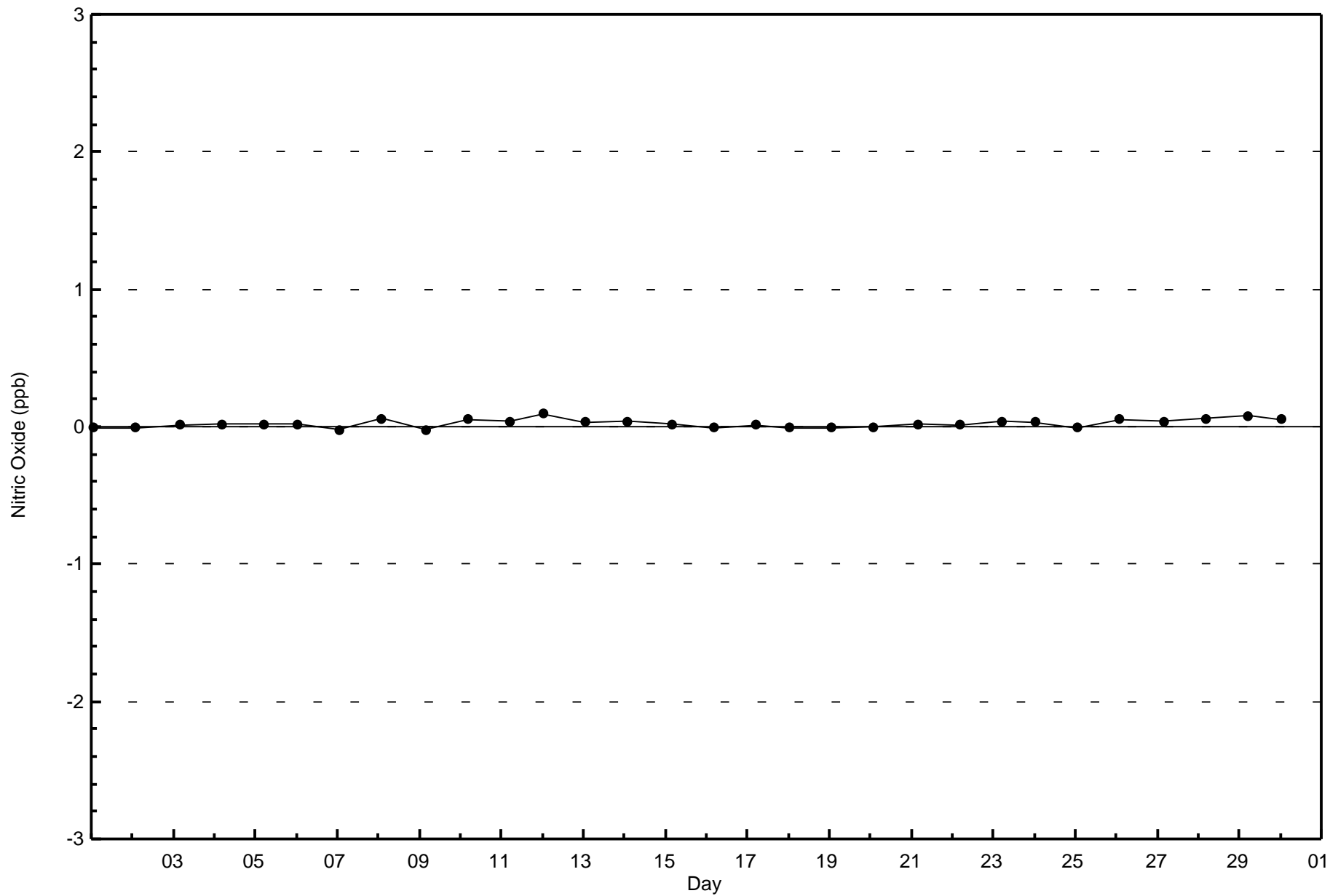
Total Number of Hours: 720

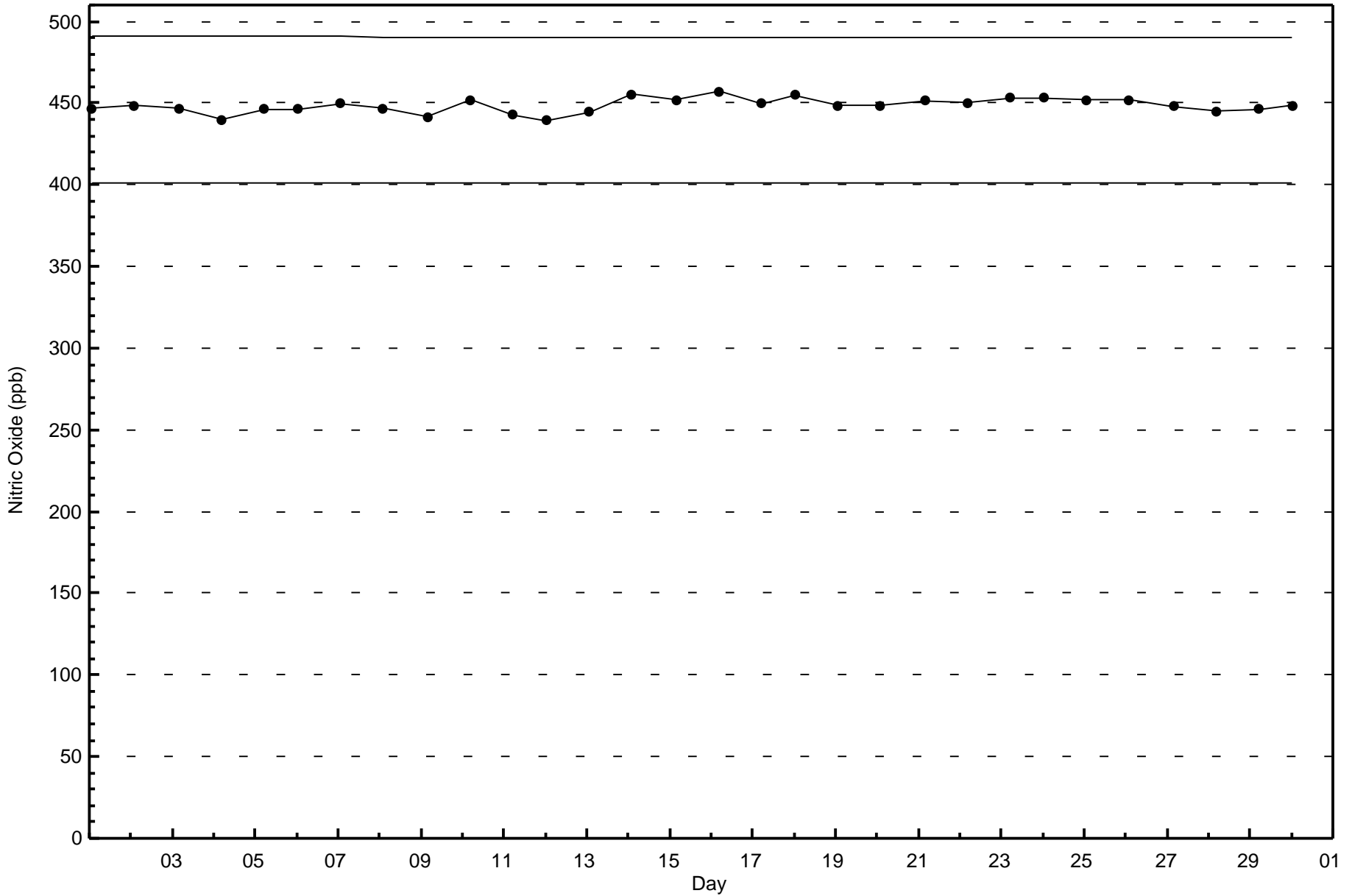


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Fort McKay South (AMS 13)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

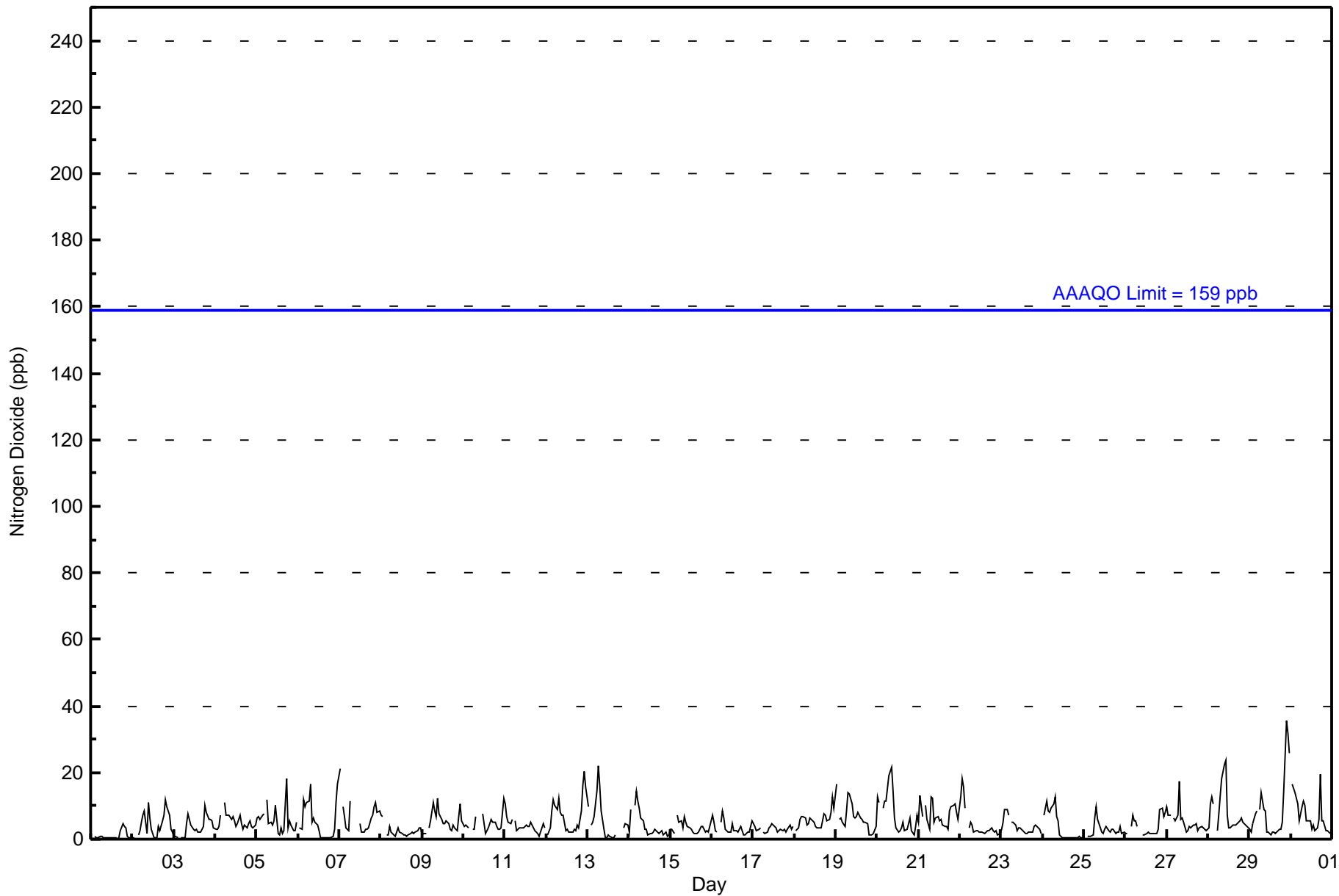
Fort McKay South - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0														Hours in Service: 720												
Maximum Value: 36 ppb on Apr 29 22:00														Maximum Daily Average: 8.7 ppb on Apr 29												
Minimum Value: 0 ppb on Apr 1 16:00														Minimum Daily Average: 1.9 ppb on Apr 1												
Maximum Diurnal Average: 8.6 ppb at hour 8														Minimum Diurnal Average: 2.6 ppb at hour 15												
Monthly Average: 5.1 ppb														Percentiles: P ₁ = 0 P ₁₀ = 1 O ₁ = 2 Median = 4 O ₃ = 7 P ₉₀ = 11 P ₉₉ = 22												
Hours of Data: 676														Hours of Missing Data: 44												
Hours of Calibration: 35														Hours of Calibration: 35												
Percent Operational Time: 98.8														Percent Operational Time: 98.8												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	21	Z	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	3	5	4	3	1	0	0	1.9	21
2-Apr	0	1	Z	1	3	5	7	9	2	11	6	3	0	0	0	4	3	6	7	12	10	7	3	2	4.4	12
3-Apr	1	1	1	Z	1	1	1	5	8	6	4	3	3	2	2	3	4	10	8	6	6	6	3	3.7	10	
4-Apr	3	3	4	7	Z	11	7	7	6	7	6	4	5	7	5	3	4	4	5	5	4	3	4	5.2	11	
5-Apr	6	7	6	7	8	Z	12	5	5	4	6	10	2	1	3	2	3	18	4	6	4	3	3	5	5.6	18
6-Apr	Z	3	3	12	10	11	17	5	6	5	4	3	1	0	0	0	0	0	0	0	1	3	11	17	5.4	17
7-Apr	21	Z	10	7	4	2	11	C	C	C	C	C	5	2	2	3	3	4	6	7	10	11	8	9	6.9	21
8-Apr	7	7	Z	1	1	4	2	2	1	2	3	2	2	1	1	1	1	2	2	2	2	3	3	4	2.4	7
9-Apr	1	2	2	Z	4	6	11	8	7	12	8	6	5	5	5	5	3	3	4	3	3	7	11	6	5.4	12
10-Apr	4	4	4	4	Z	3	3	7	M	M	M	8	5	2	3	5	6	5	5	4	3	3	4	12	4.6	12
11-Apr	11	7	5	5	6	Z	5	3	4	3	4	4	4	4	4	5	4	3	2	2	1	3	5	3	4.1	11
12-Apr	Z	1	3	8	12	10	9	12	8	7	7	3	3	2	2	2	3	2	4	3	8	16	20	16	7.1	20
13-Apr	10	Z	4	5	7	14	22	16	8	3	0	1	1	1	0	1	1	PF	PF	PF	PF	4	5	4	5.6	22
14-Apr	2	9	Z	10	14	12	9	6	5	3	3	1	2	2	2	3	3	2	2	3	1	2	1	1	4.3	14
15-Apr	3	3	2	Z	7	5	5	3	7	5	4	3	3	2	2	2	2	3	4	4	2	3	2	4	3.4	7
16-Apr	7	5	3	2	Z	5	8	6	3	2	2	2	5	3	3	2	3	4	1	1	2	2	2	5	3.4	8
17-Apr	5	4	2	3	3	Z	2	2	2	3	4	5	4	3	2	3	3	3	3	2	3	4	3	4	3.2	5
18-Apr	Z	2	4	6	7	7	7	4	5	6	6	5	4	4	3	3	6	8	7	6	6	8	13	10	5.9	13
19-Apr	17	Z	6	6	5	4	9	14	13	11	7	6	7	8	6	6	5	5	5	1	1	1	2	4	6.5	17
20-Apr	13	11	Z	9	11	12	15	19	22	15	6	4	2	2	4	5	3	3	5	6	3	1	4	7	7.8	22
21-Apr	5	13	7	Z	10	6	3	13	12	5	6	7	6	6	4	4	4	3	9	10	10	11	8	6	7.2	13
22-Apr	13	18	16	9	Z	4	5	4	2	3	3	2	2	2	2	2	2	3	3	3	2	2	1	2	4.6	18
23-Apr	3	5	9	9	7	Z	5	5	4	2	3	4	3	2	2	2	2	2	4	4	3	3	2	3.8	9	
24-Apr	Z	7	11	8	8	9	11	13	7	5	1	1	0	0	1	1	1	1	1	1	1	1	1	1	3.8	13
25-Apr	1	Z	1	1	1	1	6	10	6	3	2	2	3	4	3	2	3	3	2	2	2	4	2	2	2.8	10
26-Apr	2	2	Z	4	7	6	6	4	M	M	1	1	2	2	2	2	2	2	2	3	9	9	7	8	3.8	9
27-Apr	10	7	7	Z	6	5	7	18	6	6	5	2	3	4	4	4	4	4	5	3	4	4	3	3	5.3	18
28-Apr	3	10	13	11	Z	3	8	13	18	22	24	7	3	3	4	4	4	5	5	7	5	5	4	3	8.1	24
29-Apr	3	2	5	8	8	Z	9	14	9	8	2	2	1	2	2	2	2	3	3	5	14	36	32	26	8.7	36
30-Apr	Z	17	14	12	10	5	10	12	10	6	6	5	3	4	3	3	6	19	6	6	3	3	2	2	7.2	19
6.8 6.1 5.6 6.2 6.4 6.0 7.6 8.6 6.9 6.2 4.9 3.7 2.9 2.6 2.6 2.8 2.9 4.3 4.0 4.2 4.4 5.6 5.7 5.8														Diurnal Average												
21 18 16 12 14 14 22 19 22 22 24 10 7 8 7 6 6 19 10 12 14 36 32 26														Diurnal Maximum												
Z - zerspan C - Calibration M - Maintenance PF - Power Failure														Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb												



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	667	98.67	98.67
21 - 40	9	1.33	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	138	102	23	15	3	11	15	61	82	58	35	30	20	11	21	42	667
21 - 40	3	0	0	0	1	1	0	0	1	2	0	0	1	0	0	0	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	102	23	15	4	12	15	61	83	60	35	30	21	11	21	42	676

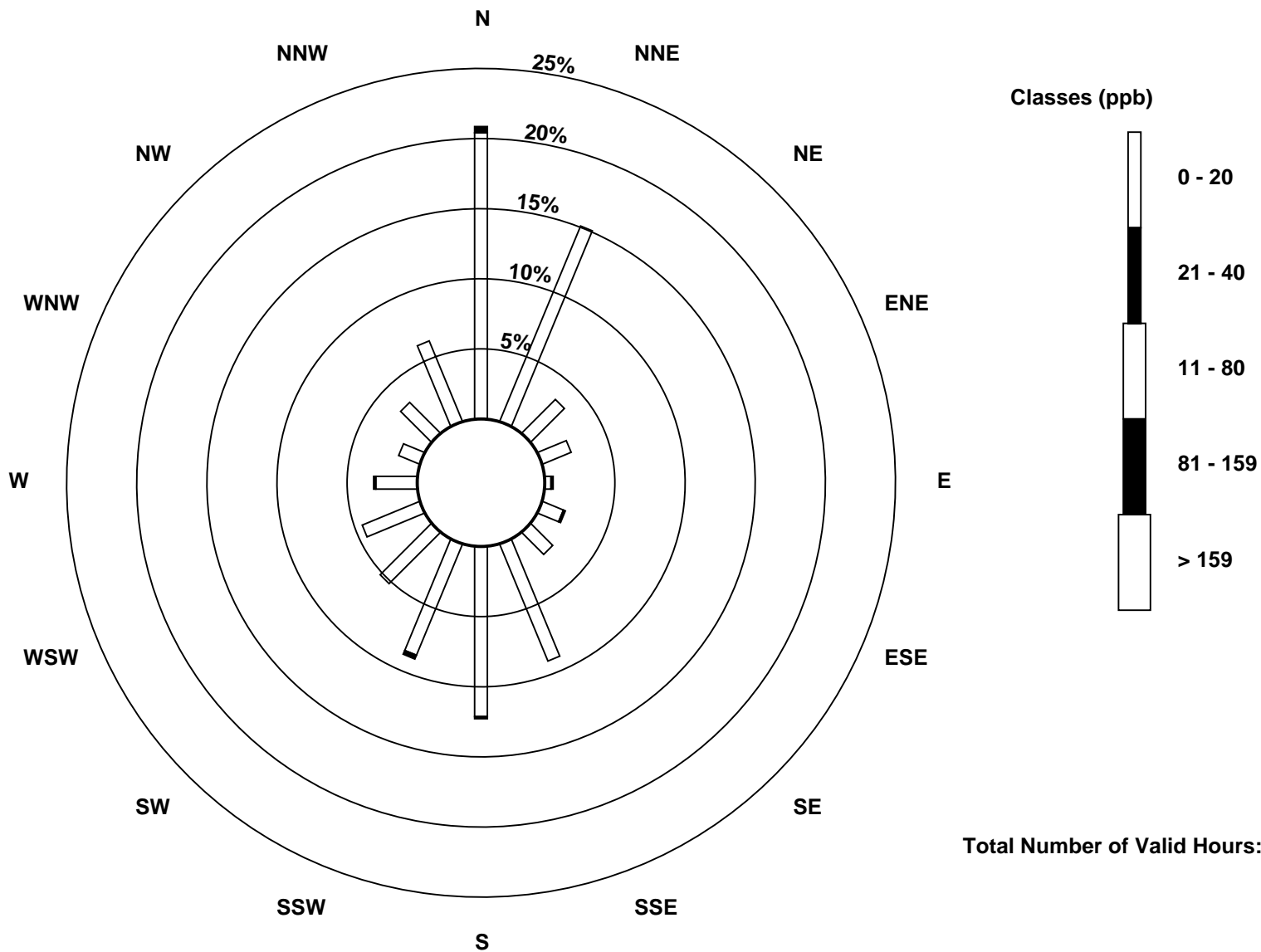
Total Number of Valid Hours: 676

Total Number of Hours: 720

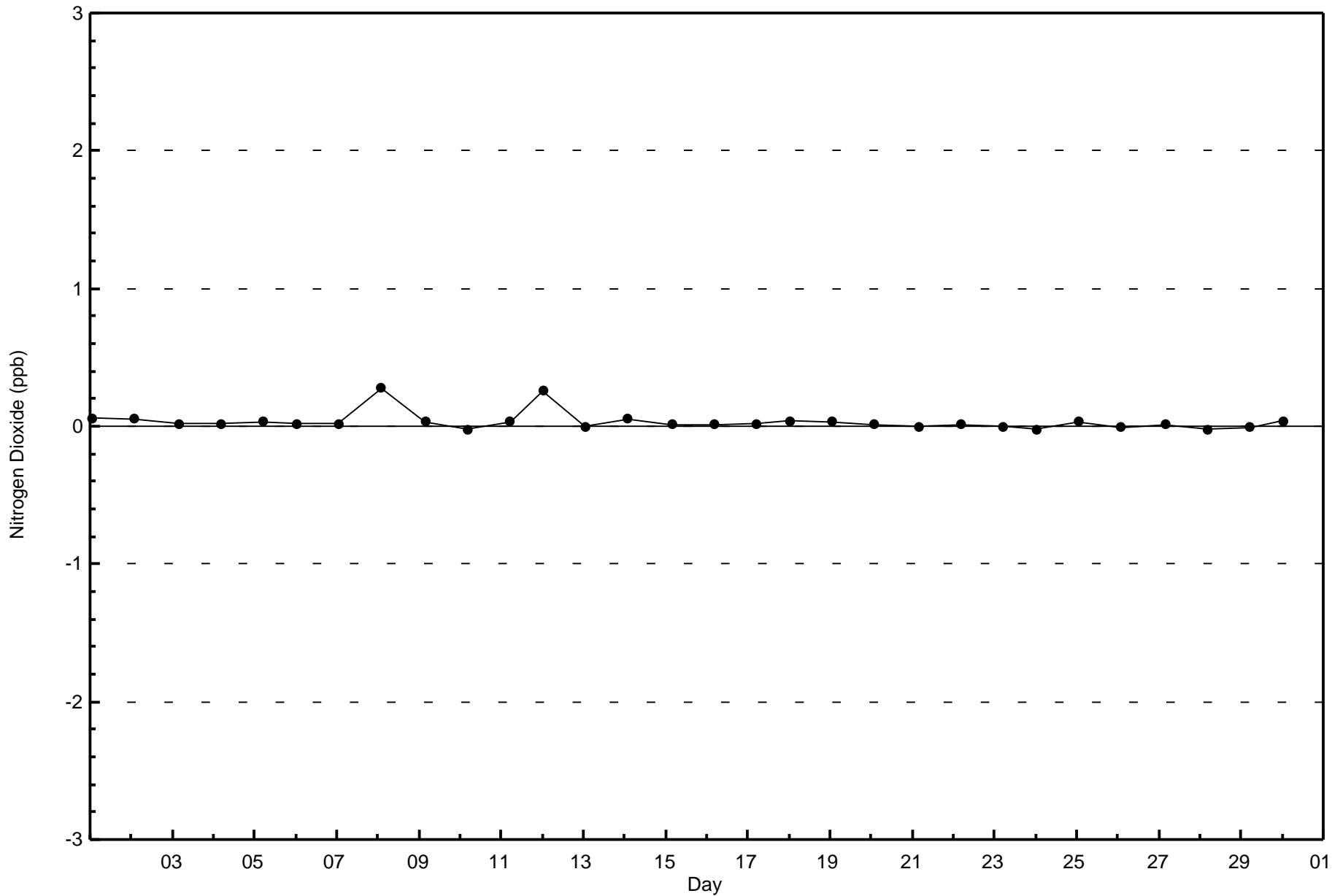


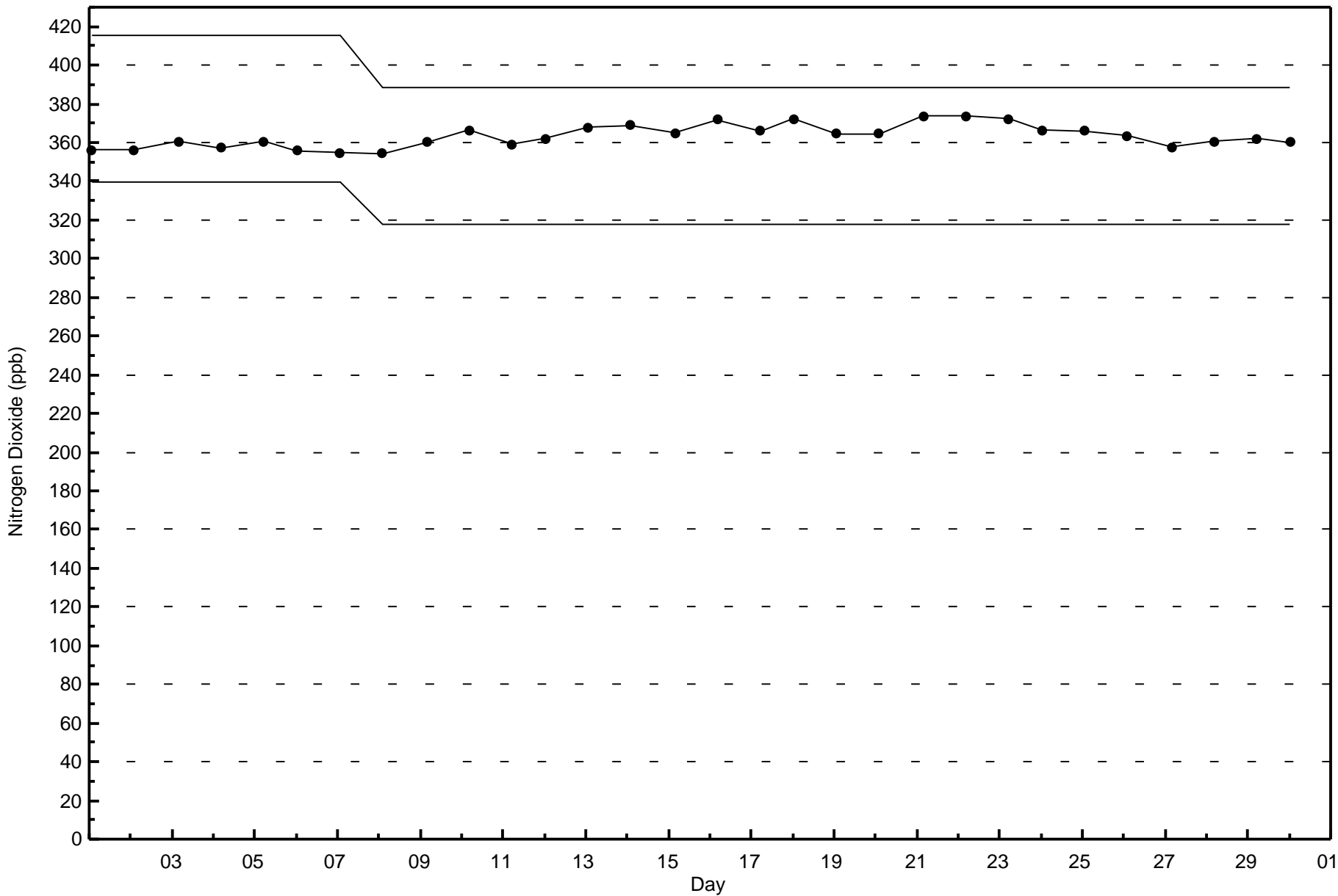
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South (AMS 13)



Total Number of Valid Hours: 676







Wood Buffalo Environmental Association
Summary of Hour Averages

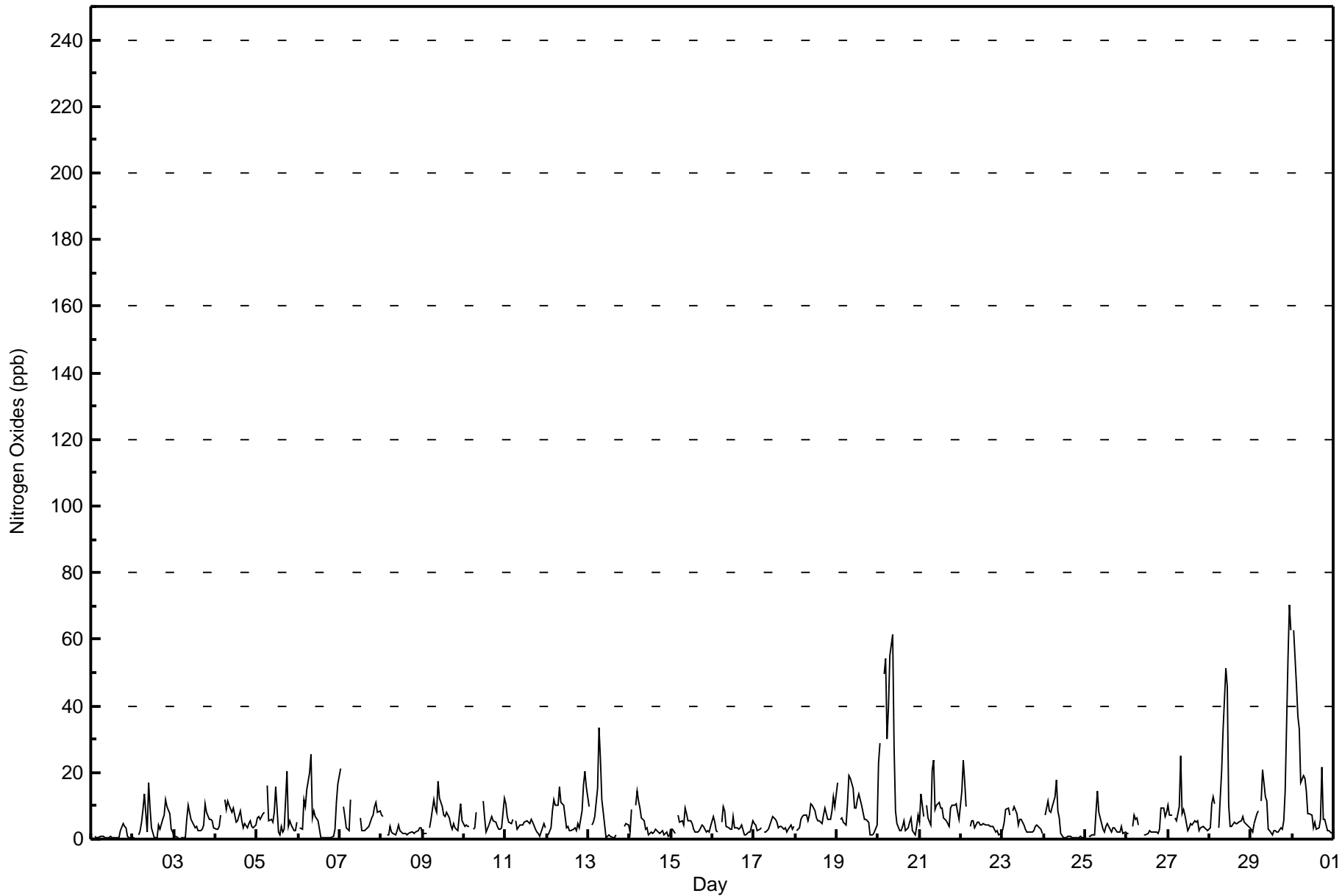
Nitrogen Oxides (NO_x) - ppb
Fort McKay South - April 2017

Maximum Value: 70 ppb on Apr 29 23:00		Maximum Daily Average: 18.6 ppb on Apr 20		Hours in Service: 720																						
Minimum Value: 0 ppb on Apr 1 16:00		Minimum Daily Average: 2.0 ppb on Apr 1		Hours of Data: 676																						
Maximum Diurnal Average: 13.2 ppb at hour 8		Minimum Diurnal Average: 3.4 ppb at hour 17		Hours of Missing Data: 44																						
Monthly Average: 6.7 ppb		Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 4 Q ₃ = 8 P ₉₀ = 12 P ₉₉ = 54		Hours of Calibration: 35																						
				Percent Operational Time: 98.8																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	22	Z	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	3	5	4	3	1	0	0	2.0	22
2-Apr	0	0	Z	1	3	5	9	14	2	17	9	3	0	0	0	4	3	6	7	12	10	7	3	2	5.2	17
3-Apr	1	1	1	Z	1	0	1	6	10	8	6	4	3	4	3	3	3	4	11	8	6	6	6	3	4.2	11
4-Apr	3	3	4	7	Z	12	9	11	10	8	9	7	5	6	8	5	3	5	4	5	5	4	3	4	6.2	12
5-Apr	6	7	6	7	8	Z	16	5	6	5	8	15	2	1	4	2	3	20	4	6	4	3	3	5	6.4	20
6-Apr	Z	3	3	12	10	15	20	26	6	8	7	6	3	1	0	0	0	0	0	0	1	3	11	17	6.7	26
7-Apr	21	Z	10	7	4	2	12	C	C	C	C	C	6	3	3	3	3	4	7	7	10	11	8	9	7.1	21
8-Apr	7	7	Z	1	1	4	2	2	1	2	4	3	2	2	2	1	2	2	2	2	2	3	3	4	2.6	7
9-Apr	1	2	2	Z	3	6	12	9	8	17	12	10	7	7	8	6	4	3	5	3	3	7	11	5	6.6	17
10-Apr	4	4	4	4	Z	3	3	8	M	M	M	12	6	2	4	5	7	5	5	4	3	3	3	12	5.1	12
11-Apr	11	7	5	5	6	Z	6	3	4	4	4	5	6	5	5	6	5	3	2	2	1	3	5	3	4.5	11
12-Apr	Z	1	3	8	12	10	10	16	11	10	10	3	4	3	3	3	3	3	5	3	8	16	20	16	7.9	20
13-Apr	10	Z	4	5	7	15	33	24	12	4	1	1	1	0	1	1	1	PF	PF	PF	PF	4	5	4	7.0	33
14-Apr	2	9	Z	10	14	12	9	7	6	3	4	1	2	2	2	3	3	2	2	3	1	2	1	1	4.4	14
15-Apr	3	3	2	Z	7	5	6	4	9	8	6	5	5	3	2	2	3	3	4	4	2	3	2	4	4.1	9
16-Apr	7	5	3	2	Z	5	10	8	4	3	3	3	7	4	3	3	4	4	1	1	2	2	2	5	4.0	10
17-Apr	5	4	2	3	3	Z	2	2	3	4	6	7	6	5	3	4	4	3	3	2	3	4	3	4	3.8	7
18-Apr	Z	2	4	6	7	7	7	6	7	11	10	8	7	6	5	5	7	9	8	6	6	8	13	10	7.2	13
19-Apr	17	Z	6	7	5	4	11	19	18	15	9	9	12	13	10	8	6	6	5	1	1	1	2	4	8.3	19
20-Apr	23	29	Z	49	54	30	40	55	62	27	8	4	2	3	4	6	3	3	5	6	3	1	4	7	18.6	62
21-Apr	5	13	7	Z	10	6	4	21	24	9	10	11	9	9	6	5	5	4	9	10	10	11	8	6	9.3	24
22-Apr	15	24	17	10	Z	4	5	6	3	5	5	4	4	5	4	4	4	4	4	3	2	2	1	2	6.0	24
23-Apr	3	5	9	9	7	Z	9	10	8	4	6	6	4	3	2	2	2	2	2	4	4	3	3	2	4.7	10
24-Apr	Z	7	11	8	8	10	13	18	9	7	2	1	0	0	1	1	1	1	0	1	1	1	1	1	4.3	18
25-Apr	1	Z	1	1	1	1	8	14	8	5	3	2	4	5	3	2	3	3	2	2	2	4	2	2	3.5	14
26-Apr	2	2	Z	4	7	6	6	4	M	M	1	1	2	2	2	2	2	2	2	3	9	9	7	8	3.9	9
27-Apr	10	7	7	Z	6	6	10	25	8	9	7	3	3	5	4	5	5	5	3	4	4	3	3	3	6.3	25
28-Apr	3	10	13	11	Z	3	12	21	33	51	46	10	4	4	5	5	5	5	6	7	5	4	4	3	11.7	51
29-Apr	3	2	5	8	8	Z	11	21	13	12	3	3	1	3	3	2	2	3	3	5	14	54	70	63	13.6	70
30-Apr	Z	63	46	37	33	17	19	18	14	8	7	7	3	5	3	3	6	21	6	6	3	3	2	2	14.5	63
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	645	95.41	95.41
21 - 40	20	2.96	98.37
41 - 80	11	1.63	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 676

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay South - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	134	100	23	14	3	9	15	58	82	54	34	28	19	11	20	41	645
21 - 40	5	2	0	1	0	2	0	3	0	4	0	2	1	0	0	0	20
11 - 80	2	0	0	0	1	1	0	0	1	2	1	0	1	0	1	1	11
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	141	102	23	15	4	12	15	61	83	60	35	30	21	11	21	42	676

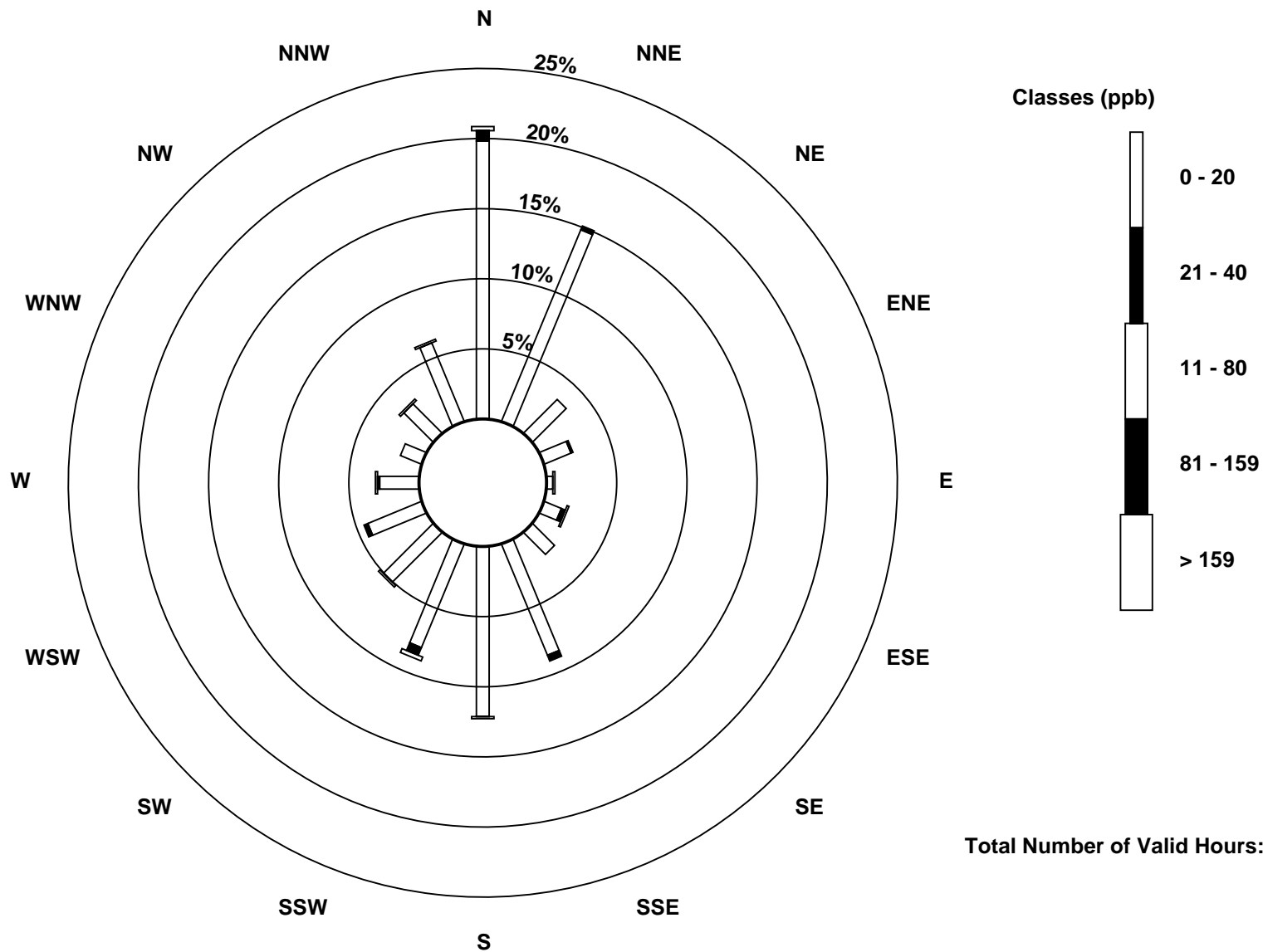
Total Number of Valid Hours: 676

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

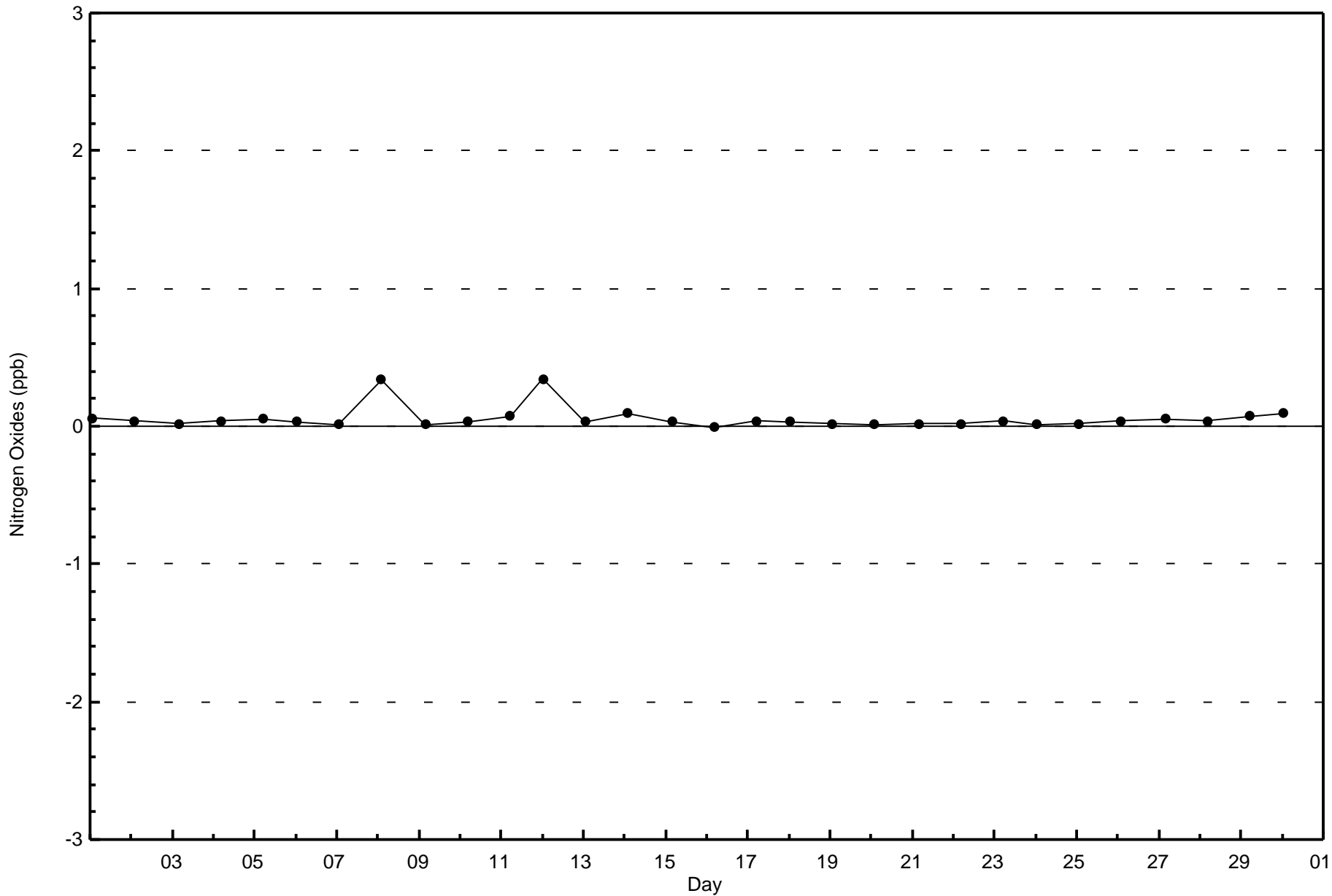
Nitrogen Oxides (NO_x) - ppb
Fort McKay South (AMS 13)

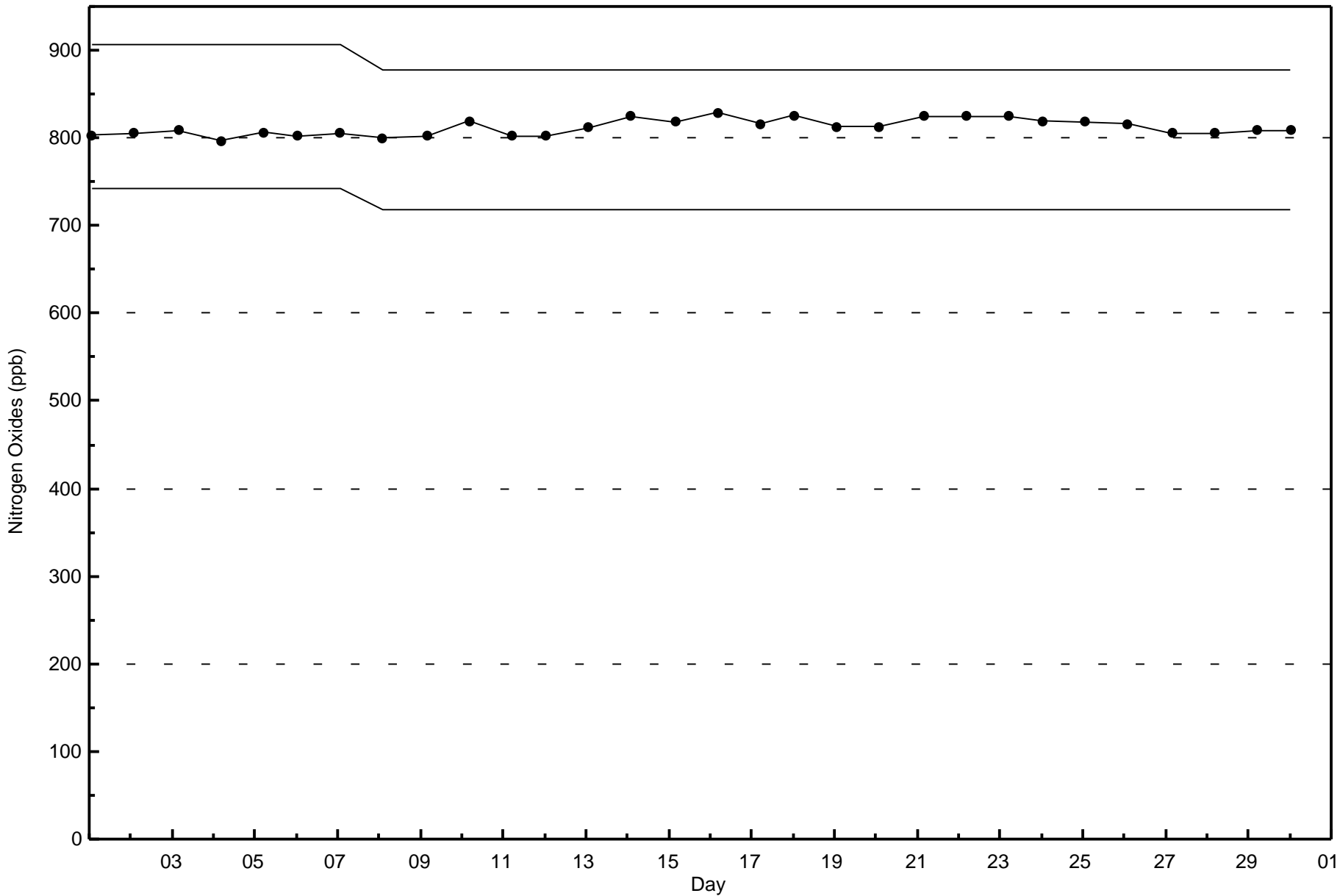




Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - April 2017







Summary of Hour Averages

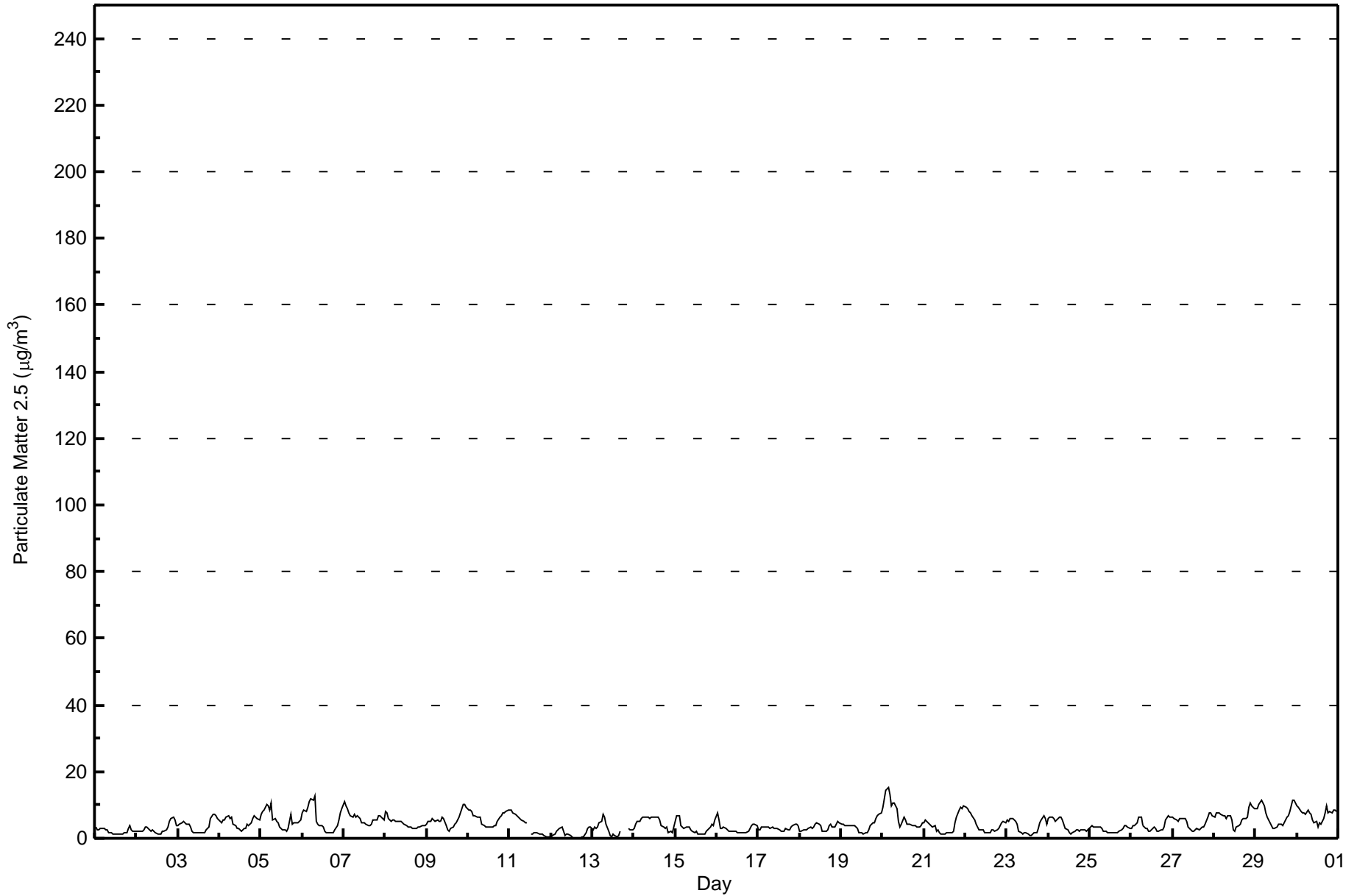
Fort McKay South - April 2017

Number of Exceedences (AAAQO): 24-hr: 0 Maximum Value: 15.2 µg/m ³ on Apr 20 04:00 Maximum Daily Average: 7.2 µg/m ³ on Apr 30		Hours in Service: 720 Hours of Data: 715 Hours of Missing Data: 5 Hours of Calibration: 1 Percent Operational Time: 99.4																								
Minimum Value: 0.0 µg/m ³ on Apr 12 15:00 Maximum Diurnal Average: 5.8 µg/m ³ at hour 2 Monthly Average: 4.35 µg/m ³		Minimum Daily Average: 1.4 µg/m ³ on Apr 12 Minimum Diurnal Average: 2.4 µg/m ³ at hour 15 Percentiles: P ₁ = 0.3 P ₁₀ = 1.6 Q ₁ = 2.4 Median = 3.8 Q ₃ = 5.9 P ₉₀ = 7.8 P ₉₉ = 11.5																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	3.5	2.7	2.7	2.9	2.8	2.9	2.6	2.6	1.7	1.5	1.4	1.4	1.2	1.2	1.2	1.1	1.2	1.5	1.8	2.9	3.8	2.8	1.9	2.0	2.1	3.8
2-Apr	2.0	2.0	2.2	2.1	2.5	3.3	3.3	3.1	2.1	2.4	2.1	1.6	1.4	1.4	1.4	2.0	2.0	2.4	3.3	5.2	6.0	6.4	5.4	3.9	2.9	6.4
3-Apr	3.7	4.1	4.8	5.0	4.8	4.2	4.2	3.6	2.2	1.8	1.8	1.6	1.6	1.6	1.8	1.8	2.4	2.8	3.3	5.9	7.3	7.3	6.7	6.0	3.8	7.3
4-Apr	5.2	4.8	5.4	5.7	6.4	6.6	6.1	6.5	4.4	3.9	3.2	2.8	2.7	2.1	2.9	3.0	4.0	3.8	4.7	6.1	6.7	6.2	5.8	5.7	4.8	6.7
5-Apr	7.2	8.2	8.5	10.0	9.6	8.4	10.7	5.6	5.8	5.1	4.8	3.6	2.6	2.6	2.6	2.3	2.8	7.1	4.2	4.8	4.6	4.7	5.0	5.4	5.7	10.7
6-Apr	7.5	8.3	8.0	9.2	10.9	11.8	11.4	12.7	5.1	4.3	4.0	3.7	3.4	2.2	1.8	1.6	1.7	1.5	1.6	2.3	3.7	5.5	7.6	9.0	5.8	12.7
7-Apr	10.8	9.7	8.8	7.5	6.8	6.2	7.3	6.2	6.7	5.9	4.8	4.5	4.8	4.4	3.9	3.6	4.2	5.4	5.7	5.6	6.8	6.7	6.2	5.6	6.2	10.8
8-Apr	8.2	7.6	6.1	5.3	5.4	5.6	4.9	5.0	4.9	4.9	4.9	4.3	3.8	3.6	3.5	3.3	2.9	2.9	3.0	3.2	3.4	3.8	4.0	3.8	4.5	8.2
9-Apr	4.3	5.1	5.1	5.9	5.4	5.2	5.7	5.2	5.1	6.4	5.9	3.9	2.7	2.3	2.9	3.3	4.4	4.8	5.6	6.5	8.9	10.1	10.2	9.4	5.6	10.2
10-Apr	8.6	8.3	7.9	6.6	6.8	6.4	6.3	6.5	4.4	3.7	3.3	3.4	3.5	3.2	3.3	3.8	3.9	4.9	6.6	6.9	7.6	7.6	7.9	8.4	5.8	8.6
11-Apr	8.3	8.5	7.8	7.3	6.8	6.5	6.0	5.3	5.0	4.8	4.6	C	1.4	1.3	1.5	1.8	1.7	1.4	1.2	1.1	0.7	0.4	0.3	0.4	3.7	8.5
12-Apr	0.3	0.9	1.1	2.0	2.7	2.8	3.6	2.1	1.0	1.1	1.4	0.7	0.3	0.2	0.0	0.0	0.0	0.1	0.4	0.6	1.5	3.1	3.3	3.5	1.4	3.6
13-Apr	2.7	3.2	2.9	3.3	4.5	5.0	7.0	6.5	4.3	2.1	1.0	0.6	1.1	0.7	0.5	1.0	2.2	PF	PF	PF	PF	3.2	2.7	2.7	2.9	7.0
14-Apr	2.9	4.0	5.0	4.9	5.8	6.4	6.4	6.3	6.3	6.0	6.4	6.4	6.5	6.2	6.3	5.3	4.0	3.2	3.1	3.3	1.7	2.0	1.7	3.3	4.7	6.5
15-Apr	4.9	6.8	6.8	3.7	3.3	3.1	3.5	3.4	3.3	2.6	2.3	1.8	2.1	1.4	1.3	1.4	1.4	1.2	2.3	2.4	3.3	4.1	3.9	5.5	3.2	6.8
16-Apr	7.7	5.3	2.9	2.8	3.3	3.0	2.7	2.3	2.2	2.2	2.2	1.9	1.6	1.6	1.6	1.6	1.8	1.9	2.0	3.1	3.9	4.2	4.2	3.6	2.9	7.7
17-Apr	2.7	2.7	3.3	3.5	3.6	3.5	3.3	3.1	3.5	3.2	2.9	2.9	2.4	2.3	2.2	2.3	2.9	2.5	2.6	3.3	3.9	4.3	4.3	3.8	3.1	4.3
18-Apr	2.0	2.0	2.3	2.3	2.6	2.9	3.4	3.1	3.3	4.4	4.6	4.0	3.7	2.1	2.0	2.0	2.7	3.9	4.1	3.4	3.3	4.3	5.0	4.6	3.3	5.0
19-Apr	4.2	4.1	3.7	3.8	3.8	3.6	3.6	3.9	4.0	2.9	1.6	1.6	1.7	1.4	1.5	1.7	2.7	3.7	4.6	4.6	5.8	6.6	7.4	7.8	3.8	7.8
20-Apr	9.5	11.8	14.6	15.2	13.3	9.8	10.7	10.6	9.0	5.2	3.3	4.1	6.5	5.6	4.4	4.3	4.1	3.9	3.9	3.9	3.3	3.3	4.0	4.5	7.0	15.2
21-Apr	4.7	5.5	4.7	4.2	3.7	3.2	3.6	2.3	2.4	1.6	1.3	1.3	1.4	1.6	1.6	1.7	1.8	2.1	4.5	6.4	8.5	9.5	9.1	9.6	4.0	9.6
22-Apr	9.2	9.0	8.2	7.7	7.0	5.6	4.4	3.6	2.7	2.6	2.3	1.9	1.5	1.7	1.9	2.4	2.6	2.3	2.7	3.0	3.9	4.5	5.0	4.9	4.2	9.2
23-Apr	5.3	4.9	5.9	5.9	5.5	5.0	4.4	2.3	1.6	1.2	1.5	1.5	1.2	1.0	0.9	1.2	1.6	1.8	2.9	4.6	5.4	6.9	6.1	4.4	3.5	6.9
24-Apr	5.8	6.2	6.3	5.7	5.1	5.5	6.3	6.3	5.3	4.4	3.0	2.3	1.8	1.4	1.7	2.2	2.6	2.4	2.1	2.6	2.4	2.4	2.1	2.3	3.7	6.3
25-Apr	3.6	3.7	3.5	3.5	3.5	3.3	3.4	3.1	2.3	2.1	1.7	1.5	1.5	1.5	1.6	1.8	1.7	1.9	2.5	3.0	4.0	3.9	3.4	3.1	2.7	4.0
26-Apr	3.2	3.6	4.0	4.5	6.2	6.5	6.3	3.8	3.0	3.0	2.2	2.2	3.0	3.3	2.8	2.3	2.3	2.5	2.6	3.5	5.5	6.7	6.5	6.3	4.0	6.7
27-Apr	6.4	6.0	5.5	5.0	5.9	5.8	5.8	5.8	4.9	3.2	2.9	2.2	2.3	2.6	2.9	2.7	2.9	3.2	3.5	4.4	6.3	7.6	7.5	6.7	4.7	7.6
28-Apr	6.5	7.8	7.7	7.7	7.2	6.6	6.8	5.8	6.9	6.8	5.7	2.6	2.3	3.4	3.7	4.4	5.6	5.8	5.8	6.5	9.3	10.5	9.7	9.0	6.4	10.5
29-Apr	8.9	9.0	10.2	11.6	10.7	9.9	7.5	6.5	4.6	3.8	2.9	2.9	3.2	4.4	4.0	4.1	3.9	5.5	6.2	6.9	8.0	11.6	11.2	10.8	7.0	11.6
30-Apr	9.7	9.1	8.0	7.5	7.5	7.3	8.3	7.5	7.3	5.6	4.7	5.1	3.6	4.6	4.4	6.0	7.5	9.9	7.6	8.1	7.8	8.4	8.7	8.1	7.2	9.9
																								Diurnal Average		
																								Diurnal Maximum		
																								5.6 5.8 5.8 5.7 5.8 5.5 5.7 5.0 4.2 3.6 3.2 2.7 2.6 2.4 2.4 2.5 2.9 3.3 3.6 4.3 5.1 5.6 5.6 5.5		
																								10.8 11.8 14.6 15.2 13.3 11.8 11.4 12.7 9.0 6.8 6.4 6.4 6.5 6.2 6.3 6.0 7.5 9.9 7.6 8.1 9.3 11.6 11.2 10.8		
C - Calibration PF - Power Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³																										



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	483	67.55	67.55
6 - 15	211	29.51	97.06
16 - 25	0	0.00	97.06
26 - 80	0	0.00	97.06
> 81.0	0	0.00	97.06

Total Number of Valid Hours: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South - April 2017**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	99	90	17	12	3	7	12	54	60	28	19	16	12	4	15	35	483
6 - 15	41	13	4	0	1	5	4	11	29	35	18	15	9	7	9	10	211
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	140	103	21	12	4	12	16	65	89	63	37	31	21	11	24	45	694

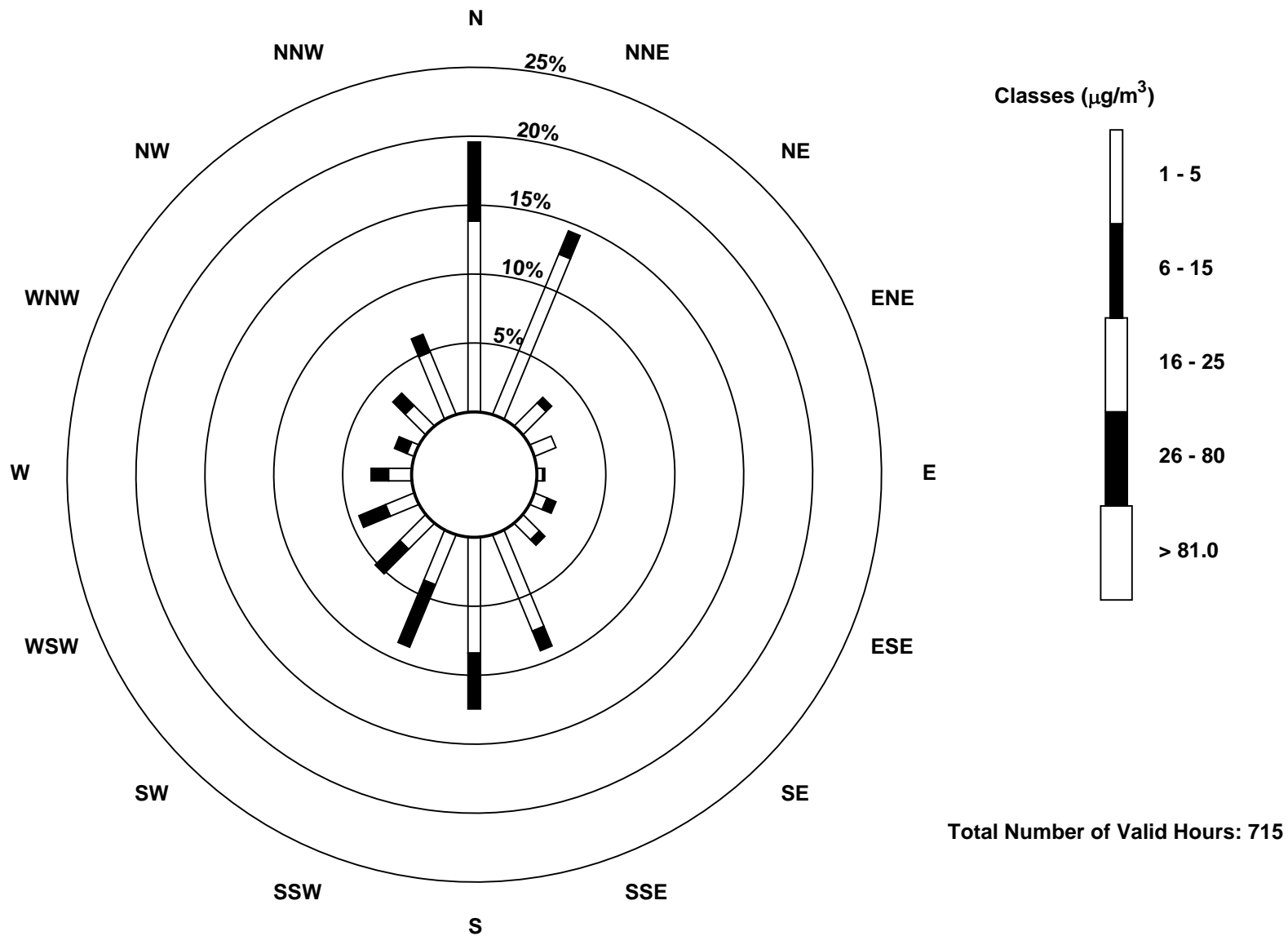
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South (AMS 13)





Wood Buffalo Environmental Association
Summary of Hour Averages

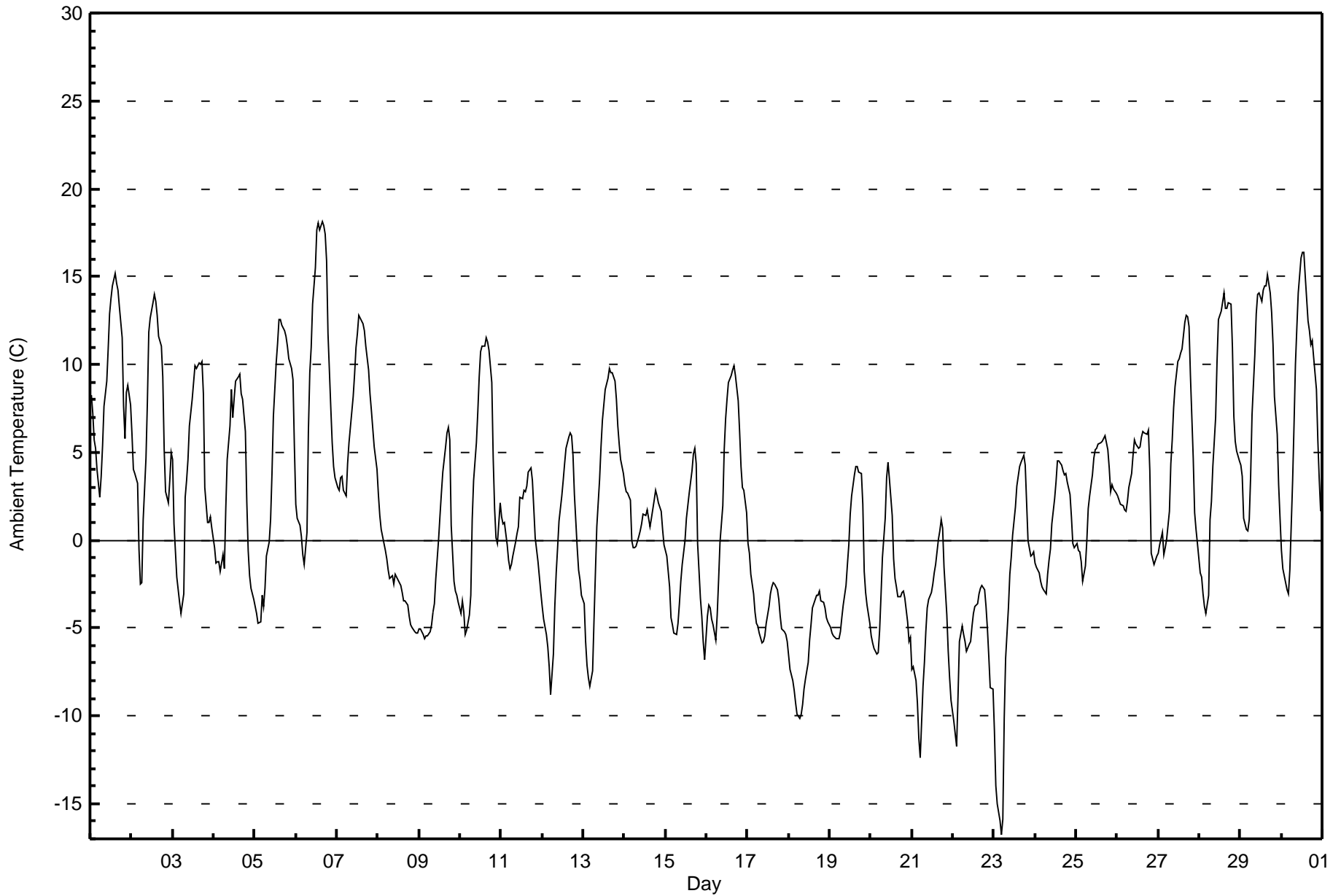
Ambient Temperature (AT) - C
Fort McKay South - April 2017

Maximum Value: 18.1 C on Apr 6 16:00		Maximum Daily Average: 9.1 C on Apr 1		Hours in Service: 720																						
Minimum Value: -16.7 C on Apr 23 05:00		Minimum Daily Average: -6.2 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 6.7 C at hour 17		Minimum Diurnal Average: -3.8 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 1.78 C		Percentiles: P ₁ = -11.3 P ₁₀ = -5.4 Q ₁ = -3.1 Median = 1.3 Q ₃ = 5.7 P ₉₀ = 11.1 P ₉₉ = 15.6		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	8.2	7.2	5.7	5.2	4.1	2.4	3.7	5.4	7.6	9.1	10.9	12.9	13.8	14.4	15.2	14.6	14.3	13.2	11.5	7.6	5.8	8.4	8.8	7.7	9.1	15.2
2-Apr	6.0	4.0	3.8	3.3	-0.5	-2.5	-2.4	1.1	4.7	7.9	11.8	12.6	13.5	14.0	13.6	12.8	11.6	11.0	9.3	5.1	2.7	2.1	3.4	5.0	6.4	14.0
3-Apr	4.6	1.0	-2.1	-2.8	-3.6	-4.2	-3.0	2.4	3.4	4.6	6.5	8.0	9.0	9.9	9.8	10.1	10.0	10.1	8.3	3.0	1.0	1.0	1.3	0.7	3.7	10.1
4-Apr	-0.4	-1.3	-1.3	-1.2	-1.8	-0.9	-1.6	1.8	4.6	6.5	8.6	7.0	8.1	9.0	9.3	9.4	8.3	8.0	6.2	2.2	-0.6	-2.0	-2.8	-3.3	3.0	9.4
5-Apr	-3.8	-4.2	-4.7	-4.7	-3.1	-3.8	-2.7	-0.9	-0.1	1.2	3.8	7.0	10.1	11.2	12.5	12.6	12.3	11.9	11.6	11.0	10.3	9.8	9.1	5.3	4.7	12.6
6-Apr	2.0	1.3	0.9	0.2	-0.8	-1.4	0.4	6.2	9.5	11.0	13.5	15.5	17.6	18.1	17.6	18.1	17.9	17.4	15.9	11.8	7.5	5.5	4.2	3.6	8.9	18.1
7-Apr	3.0	2.8	3.5	3.6	2.8	2.5	4.4	5.5	6.4	8.1	9.5	10.9	11.7	12.8	12.5	12.3	11.9	11.0	9.7	8.3	7.4	6.3	5.3	4.0	7.3	12.8
8-Apr	2.6	1.4	0.6	-0.2	-0.6	-1.0	-1.7	-2.2	-2.0	-2.5	-2.0	-2.1	-2.4	-2.5	-3.0	-3.4	-3.5	-3.7	-4.3	-4.8	-5.0	-5.2	-5.3	-5.3	-2.4	2.6
9-Apr	-5.1	-5.0	-5.4	-5.6	-5.5	-5.4	-5.2	-4.8	-4.1	-3.6	-2.2	0.0	1.4	2.7	3.9	5.3	6.1	6.5	5.7	0.9	-2.4	-2.9	-3.1	-3.5	-1.3	6.5
10-Apr	-4.2	-3.4	-4.1	-5.3	-5.2	-4.2	-3.2	1.2	3.4	5.6	7.3	9.3	10.7	11.0	11.1	11.5	11.3	10.8	9.0	4.6	1.8	0.1	-0.2	2.1	3.4	11.5
11-Apr	1.4	0.9	1.0	-0.3	-1.2	-1.6	-1.4	-0.9	-0.1	0.4	0.7	2.4	2.3	2.8	2.7	3.0	3.8	4.1	3.4	1.8	0.1	-1.2	-2.1	-3.0	0.8	4.1
12-Apr	-3.8	-4.5	-5.4	-6.1	-7.2	-8.8	-6.5	-3.8	-1.9	-0.4	1.1	2.5	3.4	4.4	5.2	5.9	6.1	5.9	4.8	2.6	-0.5	-1.7	-2.3	-3.2	-0.6	6.1
13-Apr	-3.6	-5.7	-7.1	-7.9	-8.3	-7.5	-4.6	-1.9	0.8	3.5	5.3	6.8	7.7	8.5	9.2	9.7	9.5	9.0	8.0	6.5	5.5	4.6	3.8	2.6	9.7	2.6
14-Apr	3.1	2.7	2.7	2.3	0.0	-0.5	-0.4	-0.4	0.2	0.5	0.9	1.4	1.4	1.7	1.2	0.8	1.3	2.3	2.8	2.5	2.2	1.6	0.6	-0.3	1.3	3.1
15-Apr	-0.6	-0.9	-2.7	-4.4	-4.8	-5.3	-5.4	-4.7	-3.6	-2.4	-1.4	0.0	1.3	1.9	2.7	4.0	4.9	5.2	4.4	-0.2	-3.3	-4.3	-5.8	-6.8	-1.3	5.2
16-Apr	-4.4	-3.7	-3.9	-4.5	-4.8	-5.7	-4.3	-2.3	-0.1	2.0	5.2	6.9	8.0	8.9	9.3	9.7	10.0	9.3	7.9	6.2	4.2	3.0	2.9	1.5	2.6	10.0
17-Apr	-0.2	-0.8	-1.9	-3.1	-4.1	-4.7	-4.9	-5.3	-5.9	-5.8	-5.4	-4.7	-3.8	-3.1	-2.6	-2.5	-2.5	-2.8	-3.4	-4.3	-5.1	-5.2	-5.4	-5.8	-3.9	-0.2
18-Apr	-6.6	-7.4	-8.0	-8.6	-9.3	-9.9	-10.2	-9.9	-9.4	-8.5	-7.9	-6.9	-5.7	-4.8	-3.9	-3.4	-3.1	-3.1	-2.9	-3.5	-3.5	-3.9	-4.4	-4.6	-6.2	-2.9
19-Apr	-4.9	-5.3	-5.5	-5.5	-5.6	-5.6	-5.2	-4.4	-3.7	-2.6	-1.4	-0.3	1.5	2.5	3.7	4.2	4.2	3.9	3.8	2.0	-1.8	-3.0	-3.7	-4.7	-1.6	4.2
20-Apr	-5.4	-5.8	-6.1	-6.5	-6.4	-5.1	-3.1	-1.0	1.3	3.6	4.4	3.4	1.4	-1.1	-2.1	-2.6	-3.2	-3.2	-3.0	-2.9	-3.3	-4.7	-5.8	-5.5	-2.6	4.4
21-Apr	-7.3	-7.2	-8.0	-9.3	-11.2	-12.4	-8.4	-7.0	-5.2	-3.8	-3.4	-3.0	-2.5	-1.9	-1.3	0.1	0.5	1.2	0.7	-1.6	-4.2	-6.4	-7.8	-9.1	-4.9	1.2
22-Apr	-10.3	-11.1	-11.7	-8.8	-5.8	-4.9	-5.4	-5.8	-6.3	-5.9	-5.8	-4.9	-4.2	-3.7	-3.6	-3.1	-2.7	-2.5	-2.8	-3.7	-5.1	-6.7	-8.4	-8.5	-5.9	-2.5
23-Apr	-10.9	-13.9	-15.0	-15.9	-16.7	-15.9	-10.2	-6.7	-3.9	-1.9	-1.0	0.3	1.9	3.0	3.7	4.2	4.4	4.8	4.2	2.1	0.0	-0.9	-0.9	-0.7	-3.6	4.8
24-Apr	-1.3	-1.6	-1.9	-2.3	-2.7	-2.8	-3.0	-1.9	-1.1	-0.5	1.0	2.3	3.3	4.5	4.5	4.2	4.0	3.7	3.8	3.3	2.6	1.3	-0.2	-0.4	0.8	4.5
25-Apr	-0.2	-0.6	-0.6	-1.3	-2.3	-1.5	0.0	1.8	2.5	3.7	4.6	5.2	5.2	5.5	5.6	5.6	5.8	5.9	5.1	4.1	2.8	3.2	2.9	2.7	2.7	5.9
26-Apr	2.5	2.3	2.1	1.9	1.7	1.6	2.2	3.0	3.8	4.8	5.7	5.5	5.2	5.3	5.9	6.2	6.1	6.0	6.2	3.9	-0.8	-1.4	-1.2	-0.9	3.2	6.2
27-Apr	-0.8	-0.3	0.4	-0.8	-0.4	0.1	1.7	4.3	5.7	7.5	8.8	10.1	10.3	10.6	10.9	12.4	12.8	12.7	12.1	9.4	4.6	1.6	0.6	-0.2	5.6	12.8
28-Apr	-1.9	-2.1	-3.1	-3.8	-4.2	-3.1	1.2	2.2	4.2	7.0	10.2	12.6	12.8	13.0	14.0	13.2	13.2	13.5	13.4	11.0	7.0	5.7	5.1	4.5	6.1	14.0
29-Apr	4.3	3.6	1.3	0.6	0.5	1.1	3.6	7.1	10.6	12.9	14.0	14.1	13.6	14.2	14.5	14.4	15.1	14.0	13.0	11.1	8.2	6.0	3.1	1.2	8.4	15.1
30-Apr	-0.6	-1.7	-2.4	-2.8	-3.1	-1.7	3.4	6.6	10.0	12.1	14.0	16.1	16.4	16.3	15.0	12.4	11.9	11.1	11.4	10.4	8.6	5.7	3.5	1.7	7.3	16.4
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Fort McKay South - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort McKay South - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	318	44.17	44.17
0 - 10	308	42.78	86.94
10 - 20	94	13.06	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

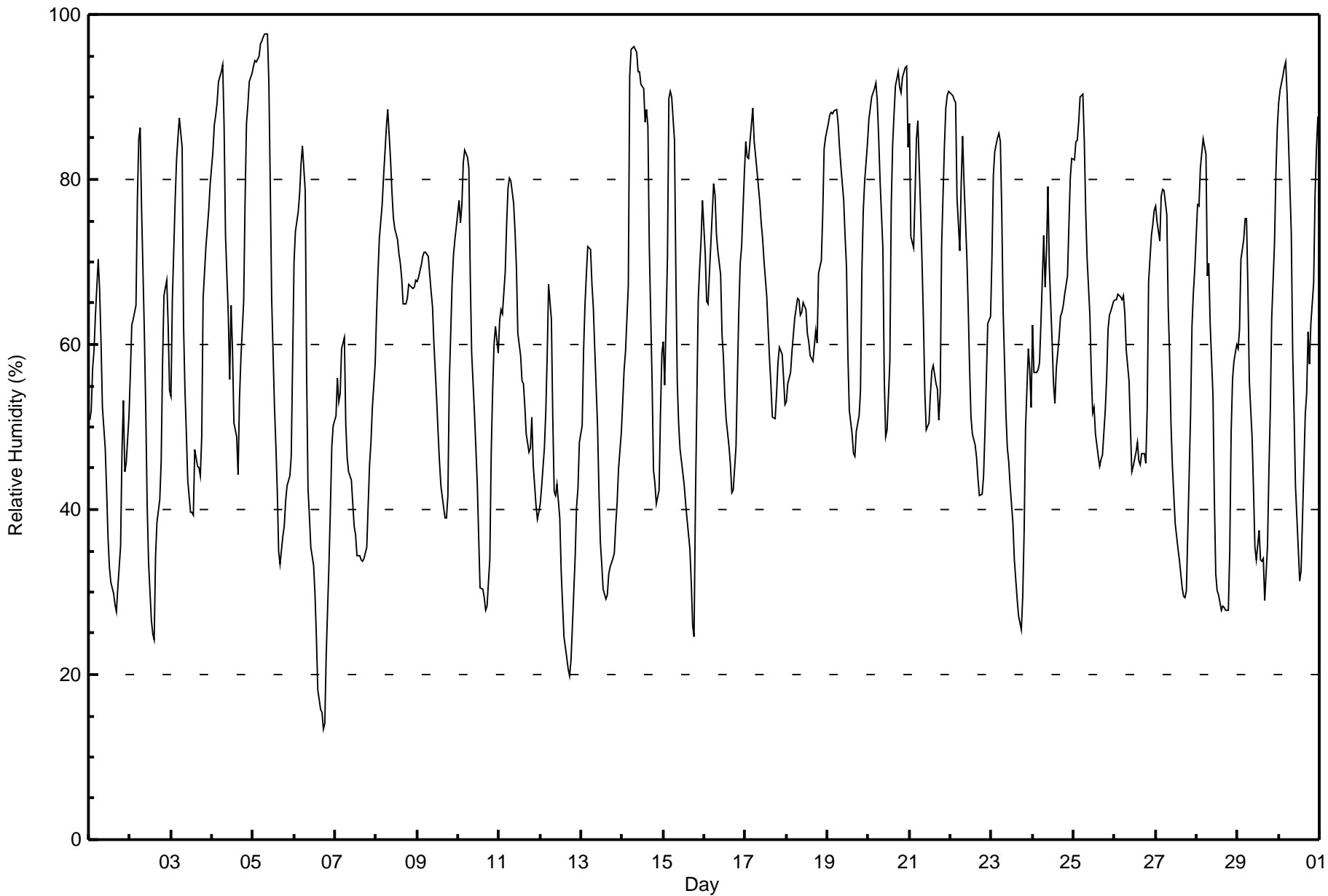
**Relative Humidity (RH) - %
Fort McKay South - April 2017**

Maximum Value: 98 % on Apr 5 08:00 Maximum Daily Average: 81.9 % on Apr 20																		Hours in Service: 720 Hours of Data: 720																																																	
Minimum Value: 13 % on Apr 6 18:00 Minimum Daily Average: 39.6 % on Apr 12 Maximum Diurnal Average: 80.4 % at hour 6 Minimum Diurnal Average: 43.2 % at hour 17 Monthly Average: 60.4 % Percentiles: P ₁ = 22 P ₁₀ = 34 Q ₁ = 46 Median = 60 Q ₃ = 75 P ₉₀ = 87 P ₉₉ = 96																		Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																											
1-Apr	51	52	57	59	63	70	67	60	52	48	42	37	33	31	30	28	28	31	36	47	53	45	46	51	46.5	70																																									
2-Apr	57	62	63	65	78	85	86	77	61	52	40	34	27	25	24	34	38	41	46	58	66	68	62	54	54.3	86																																									
3-Apr	54	65	78	82	85	87	84	62	54	49	44	40	40	39	47	45	44	49	66	72	74	76	79	60.9	87																																										
4-Apr	83	87	88	89	92	93	94	86	73	64	56	65	59	51	49	44	53	58	65	77	87	89	92	93	74.5	94																																									
5-Apr	94	94	94	95	96	97	97	98	98	92	79	66	53	48	42	35	33	37	38	41	43	44	46	58	67.4	98																																									
6-Apr	70	74	76	78	82	84	79	56	43	39	35	33	30	24	18	16	15	13	14	22	34	40	48	50	44.7	84																																									
7-Apr	51	56	53	54	59	61	50	46	45	44	41	38	37	34	34	34	34	34	35	41	45	48	52	58	45.2	61																																									
8-Apr	64	69	73	77	80	83	86	88	82	79	75	74	73	71	70	68	65	65	66	67	67	67	67	68	72.6	88																																									
9-Apr	68	68	70	71	71	71	71	68	66	65	60	53	49	46	43	40	39	39	42	55	67	71	73	74	60.0	74																																									
10-Apr	77	75	77	82	84	83	81	68	59	52	48	43	37	30	30	29	28	28	34	47	54	60	62	59	55.3	84																																									
11-Apr	63	64	64	69	74	79	80	80	77	74	69	61	59	56	55	53	49	47	47	51	45	41	39	40	59.8	80																																									
12-Apr	41	43	47	52	59	67	63	51	42	42	43	39	33	29	25	22	21	20	22	26	34	40	43	48	39.6	67																																									
13-Apr	50	59	65	69	72	72	67	64	60	50	42	36	33	30	29	30	32	33	34	35	38	41	45	49	47.3	72																																									
14-Apr	53	57	59	67	93	96	96	96	95	93	93	91	91	87	88	87	72	55	45	43	41	42	52	59	73.0	96																																									
15-Apr	60	55	71	90	91	90	85	69	55	50	47	44	43	41	39	35	31	26	25	41	65	69	73	78	57.2	91																																									
16-Apr	71	65	65	69	72	80	78	73	71	68	61	58	54	51	48	45	42	42	48	56	64	70	72	81	62.7	81																																									
17-Apr	85	83	82	87	89	84	83	81	77	75	73	70	66	62	58	55	51	51	54	58	60	59	56	53	68.8	89																																									
18-Apr	53	55	57	59	61	63	66	65	64	64	65	64	61	60	59	58	60	62	60	69	70	76	84	85	64.2	85																																									
19-Apr	87	88	88	88	88	88	87	84	81	77	73	69	59	52	49	47	46	50	51	54	69	76	80	84	71.6	88																																									
20-Apr	87	89	90	91	92	90	85	80	72	56	49	50	58	77	84	88	91	93	91	91	92	94	94	84	81.9	94																																									
21-Apr	87	73	72	78	85	87	76	70	63	54	50	51	54	57	57	55	55	51	54	72	84	89	90	91	68.9	91																																									
22-Apr	90	90	90	89	78	71	80	85	80	71	65	57	51	49	48	46	44	42	42	44	49	56	63	63	64.3	90																																									
23-Apr	71	81	83	85	86	85	76	64	52	47	46	43	38	34	32	29	27	25	29	37	50	59	57	52	53.7	86																																									
24-Apr	62	57	57	57	58	62	73	67	71	79	70	60	55	53	57	61	63	64	65	66	68	74	80	83	65.1	83																																									
25-Apr	82	85	85	87	90	90	85	76	70	64	57	52	52	49	46	45	46	47	52	56	62	64	64	65	65.4	90																																									
26-Apr	65	65	66	66	65	66	64	59	56	50	45	45	47	48	46	45	47	47	46	52	68	73	75	76	57.6	76																																									
27-Apr	77	75	73	78	79	79	76	65	59	50	45	38	37	35	34	31	30	29	30	37	52	62	66	69	54.3	79																																									
28-Apr	77	77	81	83	85	83	68	70	63	54	41	32	30	30	28	28	28	28	28	35	49	56	58	60	53.0	85																																									
29-Apr	59	62	70	73	75	75	67	56	49	42	35	34	37	34	34	34	29	36	45	52	63	72	81	86	54.2	86																																									
30-Apr	89	91	93	94	94	90	79	74	59	52	43	35	31	33	39	52	54	61	58	63	67	78	84	88	66.6	94																																									
																		69.3		70.5		72.8		76.1		79.2		80.4		77.6		71.3		65.0		59.8		54.4		50.4		47.6		45.5		44.7		44.0		43.2		43.3		45.0		52.0		59.3		63.2		65.9		68.0		Diurnal Average	
																		94		94		94		95		96		97		97		98		98		93		93		91		91		87		88		88		91		93		91		91		92		94		94		93		Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort McKay South - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h
Fort McKay South - April 2017

Maximum Speed: 27 km/h on Apr 20 13:00	Maximum Daily Speed Average: 18.9 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 3 02:00	Minimum Daily Speed Average: 1.4 km/h on Apr 19	Hours of Data: 720
Maximum Diurnal Speed Average: 3.9 km/h at hour 16	Minimum Diurnal Speed Average: 1.4 km/h at hour 22	Hours of Missing Data: 0
Monthly Average Velocity: 2.7 km/h 20.0 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 9 Q ₃ = 14 P ₉₀ = 18 P ₉₉ = 24	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW9	SW9	SW9	SW10	SSW6	SSW6	SW9	SW11	WSW11	WSW13	SW14	SW15	WSW14	W11	W7	NW7	NNW8	NNW7	NW4	W3	SW2	W9	WSW10	WSW10	WSW7.4	SW15
2-Apr	WSW6	SW2	WSW8	SW5	SSW2	SSW3	S3	S5	SSE5	ESE5	ESE8	WSW3	W12	NW12	NW13	NNE14	NNE13	NNE13	N6	W2	WNW3	NW4	NW7	NNW8	NW2.6	NNE14
3-Apr	NNW7	WSW0	W2	NW2	SW1	SW2	SSW1	NE0	NE4	NE5	E4	ENE6	ENE6	NE8	NW8	NNW8	N7	NE6	NNE3	WSW2	WSW4	SW3	WNW1	SW2	N1.7	NW8
4-Apr	S4	S4	S6	S4	S1	SSW4	SSW3	ESE2	SE7	SSW10	SW14	SSE6	SE9	SSE8	SE9	S14	S11	SSE7	S4	SW3	SSW1	SW3	SSW3	S5.3	S14	
5-Apr	SSW2	NW1	SSW1	S5	S4	S1	S4	S7	S8	SSE14	SSE12	SE16	SSE25	SSE26	S21	S19	S13	S9	S12	S11	S12	SSE14	S13	SSW6	SSE10.3	SSE26
6-Apr	SSW3	WNW1	SSW3	SSW2	SW2	WSW2	SSW3	SSE7	S11	S9	S9	SSE12	SSW13	WSW14	WSW13	W14	WSW11	W11	W7	NW4	WNW1	NW2	NW4	NNW3	SW4.7	WSW14
7-Apr	N3	NNW2	NNW4	NW2	NW3	NNW3	N5	N10	N13	N17	NNE20	N22	NNE22	NNE21	NNE21	NNE20	NNE21	NNE18	N20	N19	N20	NNE18	N19	N19	N14.1	N22
8-Apr	N17	N15	N17	N17	N21	N20	NNE19	N22	N24	NNE24	NNE21	N23	NNE22	NNE23	NNE23	NNE24	N20	NNE17	NNE17	NNE17	N16	N15	N12	N8	N18.9	N24
9-Apr	NNE7	N4	NNW5	N7	NNE7	N5	NNE4	ENE3	S5	SW7	S9	S13	SSE12	SSE13	SSE14	SSE13	SSE13	SE12	SSE9	S3	SSW4	S4	S4	SSW4	SSE4.1	SSE14
10-Apr	S6	SSW4	W2	SSW4	S6	SSW3	S5	S8	SE9	S10	SSE10	SE11	SSE15	SE15	SSE13	SSE9	SSE8	SSE9	SE4	SW2	SW2	WSW4	NNW2	N8	SSE5.6	SSE15
11-Apr	N7	N9	N14	N15	N13	N11	N13	N18	N18	N17	N17	NNE19	N22	N19	NNE20	NNE16	NNE15	N16	N18	N15	N13	N13	N13	N12	N15.1	N22
12-Apr	N11	NNW8	NNW7	NNW7	NNW5	WNW1	N3	N11	NNE15	N14	N13	N16	N15	N14	N15	N14	N16	N15	N12	N9	NNW7	NNW8	NNW7	NNW7	N10.2	N16
13-Apr	NNW7	NNW5	NW3	NNW3	N4	N5	N5	N7	N11	NE7	NE9	ENE12	NNE14	ENE12	ENE14	NE15	NE16	ENE12	ENE11	ENE9	NE8	NNE8	NNE9	NNE8	NE7.9	NE16
14-Apr	NNE9	N11	N13	N11	N11	N11	N12	N14	N15	NNE15	NNE15	NNE14	NNE13	NNE15	NE11	NE13	NE10	NNE11	NNE13	NNE14	NE13	NNE14	NNE18	NNE20	NNE12.9	NNE20
15-Apr	NNE21	NNE20	NNE21	N20	N16	NNE17	NNE15	NNE14	NNE15	N15	NNE16	N16	N16	N19	N17	N15	N14	N12	N10	NW4	WNW3	SW4	SW3	S4	N12.5	NNE21
16-Apr	S11	S10	S12	S12	S12	S9	SSE11	SSE12	S13	S13	S16	S18	SSW18	SSW19	SSW21	S21	SSW19	S16	S13	S11	S9	S7	SSW3	N15	S11.9	SSW21
17-Apr	N18	N18	N22	N22	N21	N23	NNE21	N21	N24	NNE20	NNE18	NNE18	NNE19	NNE18	NNE18	NNE18	NNE19	NNE17	NNE15	N17	N14	N15	N16	N16	NNE18.5	N24
18-Apr	N14	N13	N17	N15	N15	NNE16	NNE16	NNE15	NNE14	NNE12	NNE11	NNE11	N12	N14	N12	N13	N12	N12	N9	NNE7	NNE6	NNE7	NNE5	N6	N11.7	N17
19-Apr	NNW7	NNW6	NNW6	NNW6	NNW5	NNW3	NNW4	N5	NE3	N3	NNE3	ESE4	SSE10	S10	SW7	SSW8	SSW9	S7	S6	SW5	WSW5	SW4	SSW3	WSW2	SW1.4	S10
20-Apr	WSW2	W1	NW2	NW2	NNW2	N5	N4	N7	N11	N19	NNE19	N25	N27	N27	N26	N25	N23	N20	N14	N6	WSW3	W4	NNW5	NNW9	N11.3	N27
21-Apr	NNW5	NNW10	NNW9	NNW5	NW3	WSW3	N1	NNE4	ENE4	NE5	NNE6	N8	N5	NE3	N4	SE4	SSE5	S5	SSW4	SW1	W2	SW2	WSW1	WSW2	N1.9	NNW10
22-Apr	WSW2	WSW2	W2	NNW6	N13	N17	N16	NNE16	N18	NNE17	NNE15	NNE16	NNE15	NNE15	NE14	NNE14	NNE13	N14	N11	NNE8	NNE6	N5	NNW6	N7	NNE10.4	N18
23-Apr	N5	WNW1	WNW2	W2	NW2	NW3	N5	NNE4	ENE3	NNE8	N10	N10	NNE6	NE5	NNE7	N6	N5	S3	SSW5	SSW3	S3	SSW2	SSE4	S3	N2.2	N10
24-Apr	N6	N9	N8	NNW7	NNW6	NNW8	N7	N8	N14	NNE12	NE11	ENE10	ENE10	E8	SE8	E6	ENE7	ESE8	ESE5	ESE5	ENE4	SE4	SSE1	N3	NE4.8	N14
25-Apr	NE2	NNE1	ENE1	N1	NNW3	NNW3	SSE2	SSE10	SSE16	SSE12	SSE15	SSE15	S12	S12	S14	SSE15	SSE15	S14	SSE13	S11	S9	SSE12	SSE12	SSE13	SSE8.7	SSE16
26-Apr	SSE13	SSE12	SSE11	SSE11	SSE10	S8	SSE11	SSE14	SSE18	SSE21	SSE20	SSE19	SSE20	SSE19	S15	S14	S17	S13	S13	SSW5	WSW3	W3	WNW1	W1	SSE11.6	SSE21
27-Apr	SSW2	S3	SSW3	SSW3	SSW3	SSW1	S3	SSE7	SSE12	S8	SE11	SSE15	SSE10	S10	ESE6	SSW7	SW7	WSW7	W5	NNW6	NNW4	NW3	W2	SW3	S3.8	SSE15
28-Apr	W4	SSE1	SW3	SW3	SSW2	S3	SE2	ESE3	ESE3	ESE5	E4	NNE6	NE8	NNE7	ENE7	NNE6	NNE6	NE5	NE7	NNE2	WNW2	SW2	WSW1	SSW2	NE1.7	NE8
29-Apr	SSW4	WSW1	SSW4	SSW4	S4	S4	S6	SSE5	S5	SSW9	S15	SSW12	SW15	SSW14	SSW14	SSW12	S17	S11	SSW15	SSW9	SSW6	SSW6	S2	W2	SSW7.8	S17
30-Apr	SW3	SW2	SSW3	SSW2	SSW1	SW1	SSE4	SE6	SE9	ESE7	SE8	S9	S8	NW6	NNE22	NE16	S2	SSW7	SSE6	W6	NW4	S3	SSW2	WSW2	SSE1.5	NNE22
N2.9 N2.8NNW3.1NNW3.0 N3.1 N3.4NNE3.0NNE3.4 NE3.6 NE3.7 ENE3.8 NE3.5 NE3.0 NE3.0NNE3.5NNE3.9NNE2.9 NE2.5 NE2.2 N2.0 N1.8NNW1.4 N2.2 N3.4																								Diurnal Average		
NNE21 NNE20 N22 N22 N21 N23 NNE21 N22 N24 NNE24 NNE21 N25 N27 N27 N26 N25 N23 N20 N20 N19 N20 NNE18 N19 NNE20																								Diurnal Maximum		

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

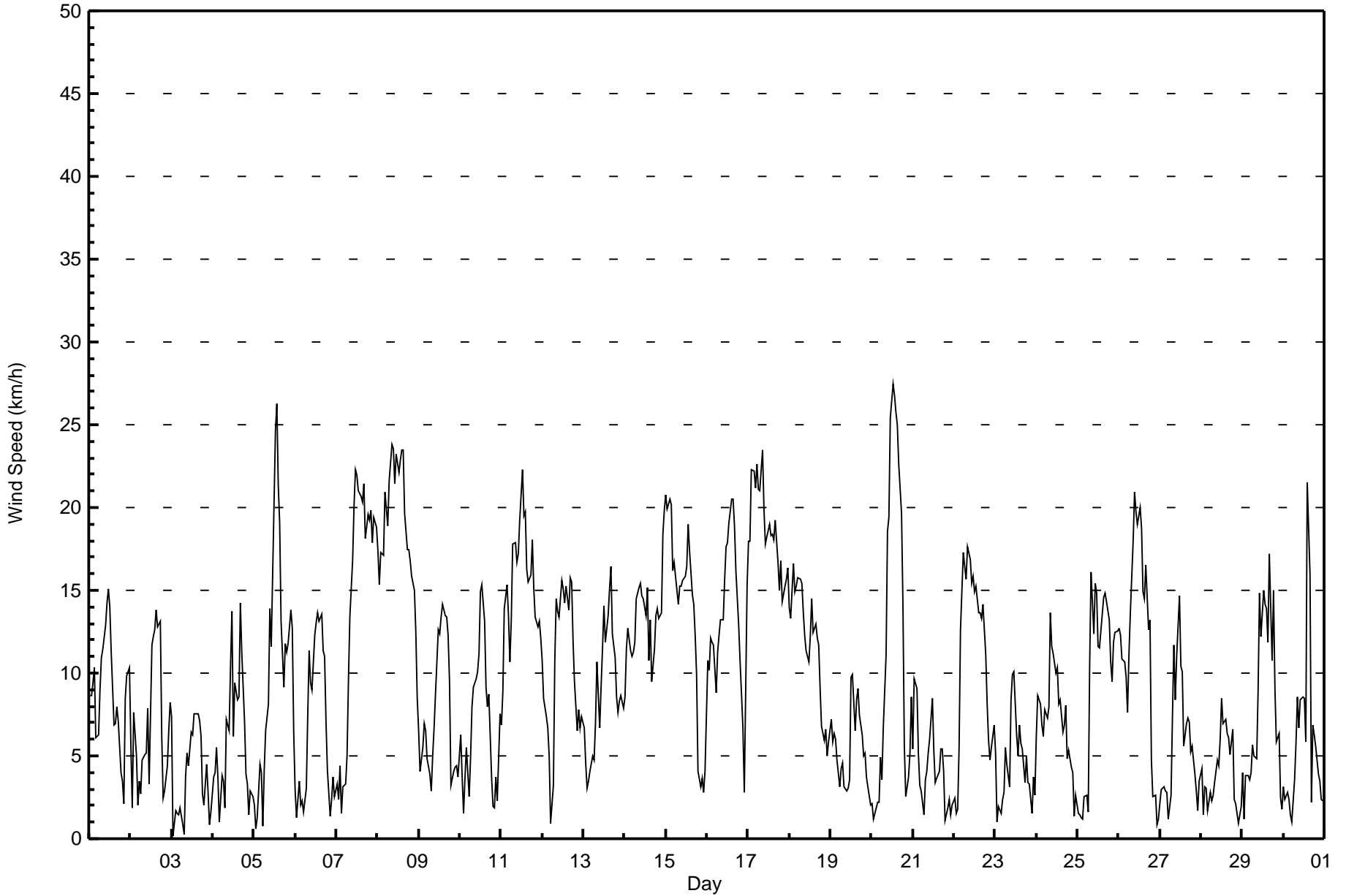
Wind Speed (WS) - km/h
Fort McKay South - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Apr 30 14:00 Minimum Value: 0 km/h on Apr 28 21:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	2	2	2	3	2	2	3	4	4	4	4	5	5	4	3	2	3	3	1	1	1	3	3	2	5
2-Apr	3	2	3	3	1	1	1	2	1	1	3	3	4	5	5	4	6	4	2	1	1	1	1	2	6
3-Apr	2	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	2	2	2	1	1	1	1	3	4
4-Apr	2	1	1	1	1	3	2	2	2	2	3	4	3	3	3	2	4	4	2	1	1	2	1	2	4
5-Apr	1	1	1	1	1	1	3	2	4	3	4	4	5	5	6	4	4	3	2	1	2	2	4	1	6
6-Apr	1	1	1	1	1	1	1	4	2	2	3	3	5	5	5	6	5	4	2	1	1	1	1	1	6
7-Apr	1	2	2	1	2	2	2	2	3	4	4	5	5	6	4	4	5	4	4	4	4	3	4	3	6
8-Apr	3	3	4	4	4	4	5	5	6	5	5	6	5	5	5	5	5	4	4	4	3	3	3	2	6
9-Apr	2	1	3	1	1	2	2	2	3	2	4	5	4	4	4	3	4	3	2	1	1	1	1	1	5
10-Apr	1	2	1	1	1	1	1	1	2	3	3	3	3	3	3	3	2	2	1	1	1	1	3	2	3
11-Apr	1	3	3	3	3	3	3	3	4	3	4	4	4	5	5	4	4	4	4	3	3	3	3	2	5
12-Apr	2	2	1	1	2	1	2	3	3	3	3	4	4	3	4	4	3	3	2	2	1	1	1	1	4
13-Apr	1	1	1	1	1	1	1	1	2	3	3	4	4	4	4	4	4	4	3	3	2	2	2	2	4
14-Apr	2	2	2	3	2	2	2	2	3	3	3	3	4	5	5	5	5	4	4	4	4	4	5	6	6
15-Apr	5	5	5	4	4	4	4	3	3	3	3	3	4	4	3	4	3	2	2	1	2	2	1	2	5
16-Apr	2	2	2	2	2	1	2	2	3	3	3	4	4	5	5	4	5	4	2	2	1	1	2	7	7
17-Apr	4	4	5	5	5	5	5	5	5	5	4	4	4	4	4	5	4	4	4	4	3	3	4	4	5
18-Apr	3	3	3	4	4	4	3	3	3	3	3	3	3	3	4	3	3	2	2	2	1	2	1	2	4
19-Apr	1	1	1	1	2	1	1	1	1	1	2	2	3	3	3	3	2	3	3	1	1	2	2	1	3
20-Apr	1	1	1	1	1	1	1	2	3	4	4	6	6	6	5	5	5	4	6	2	1	1	3	2	6
21-Apr	2	2	2	2	1	1	1	1	1	2	2	3	3	3	2	2	2	2	1	1	1	1	1	1	3
22-Apr	2	1	2	2	4	4	3	4	4	4	4	4	4	4	4	4	4	3	2	2	2	1	1	1	4
23-Apr	1	1	1	1	1	1	1	2	2	3	3	3	4	3	3	3	2	1	1	1	1	1	1	1	4
24-Apr	2	1	1	1	1	1	1	2	3	2	3	4	4	3	3	2	2	3	2	2	1	1	1	1	4
25-Apr	1	1	1	1	1	1	2	4	3	3	5	4	3	4	3	3	3	3	3	2	2	2	3	2	5
26-Apr	2	2	2	2	2	2	3	3	4	4	4	4	4	4	4	4	3	3	3	3	1	1	1	1	4
27-Apr	0	1	1	1	1	1	1	3	3	3	5	4	5	4	3	4	3	3	2	2	1	2	1	1	5
28-Apr	1	1	1	1	1	2	1	1	1	1	2	3	2	3	2	2	2	2	2	1	0	1	1	1	3
29-Apr	1	1	2	1	1	1	2	1	2	4	5	5	4	4	5	4	4	3	5	2	1	1	2	1	5
30-Apr	1	1	2	1	1	1	2	2	2	2	3	3	3	8	6	5	4	3	2	2	1	2	2	1	8
																	Diurnal Maximum								
																	5 5 5 5 5 5 5 5 6 5 5 6 6 8 6 6 6 6 4 6 4 4 4 5 7								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Fort McKay South - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay South - April 2017

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	240	33.33	33.33
6 - 11	207	28.75	62.08
12 - 19	221	30.69	92.78
20 - 28	52	7.22	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay South - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	20	8	8	6	2	8	4	8	29	40	25	20	13	11	18	20	240
6 - 11	33	24	10	8	2	4	10	21	31	13	8	7	6	0	4	26	207
12 - 19	78	52	6	4	0	0	2	31	27	9	4	4	2	0	2	0	221
20 - 28	23	21	0	0	0	0	0	5	2	1	0	0	0	0	0	0	52
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	154	105	24	18	4	12	16	65	89	63	37	31	21	11	24	46	720

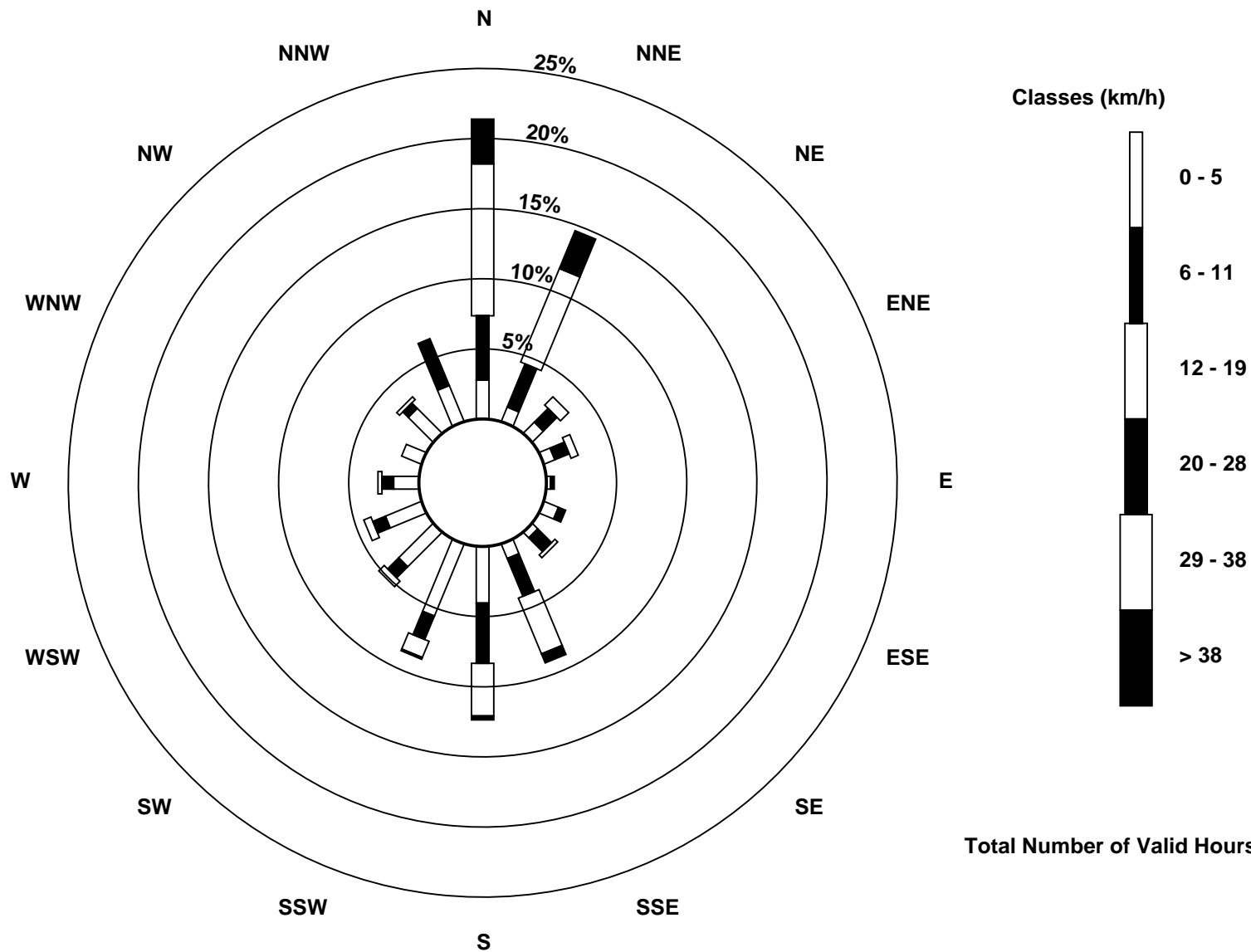
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Fort McKay South (AMS 13)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay South - April 2017

Direction of Maximum Speed: 10 deg on Apr 20 13:00 Direction of Maximum Daily Speed Average: 9.8 deg on Apr 8	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 244 deg on Apr 3 02:00 Direction of Minimum Daily Speed Average: 1.4 deg on Apr 19	Percent Operational Time: 100.0
Monthly Average Direction: 250.9 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	205	216	217	222	197	193	223	226	252	240	229	220	249	272	279	313	330	337	312	266	232	259	255	250	243.6
2-Apr	250	225	244	224	194	193	186	189	154	104	116	253	276	310	318	17	13	16	6	279	282	316	317	331	316.9
3-Apr	345	244	266	321	221	236	212	39	56	56	90	66	70	49	307	329	5	38	26	246	249	227	293	233	10.5
4-Apr	190	191	179	176	187	204	208	105	138	141	196	215	154	146	163	134	171	180	156	186	225	210	228	202	175.2
5-Apr	196	312	206	175	180	169	180	188	171	156	156	142	161	159	170	178	182	171	176	173	170	168	174	199	168.7
6-Apr	209	289	205	208	229	258	192	162	180	172	171	162	204	252	247	266	255	260	268	309	288	308	323	346	226.6
7-Apr	359	342	345	320	322	337	4	355	2	8	12	8	14	18	13	12	14	15	11	10	10	13	10	10	9.4
8-Apr	9	2	358	358	2	8	12	11	9	15	13	11	17	13	17	16	5	16	14	15	6	5	5	2	9.8
9-Apr	20	10	343	354	15	351	20	62	184	226	176	182	156	163	163	160	151	144	150	177	196	182	188	200	160.0
10-Apr	190	193	260	201	179	193	184	169	138	173	155	142	150	146	158	151	157	164	144	225	220	245	333	352	162.8
11-Apr	353	359	7	3	5	11	8	7	8	8	10	15	9	9	15	15	13	10	7	7	360	359	349	354	6.9
12-Apr	350	345	341	338	344	303	6	6	15	11	8	7	8	11	6	7	10	2	7	0	338	338	338	341	0.7
13-Apr	341	335	317	338	354	357	4	11	3	51	51	57	33	65	60	42	35	58	67	66	36	29	21	24	35.2
14-Apr	15	10	10	11	353	360	2	3	7	14	15	24	19	29	43	35	36	30	31	29	36	28	28	21	19.7
15-Apr	15	19	20	7	10	13	15	20	15	7	12	6	5	349	356	352	355	8	1	325	293	218	215	177	6.4
16-Apr	180	183	174	174	176	180	164	163	181	183	183	184	194	193	188	194	190	181	183	182	183	196	4	183.6	
17-Apr	7	9	6	7	8	9	13	10	6	17	21	17	22	28	29	28	29	33	26	6	2	10	8	7	14.6
18-Apr	358	355	6	7	9	19	18	18	20	18	22	21	5	2	10	1	8	5	4	15	21	12	21	11	10.5
19-Apr	348	338	334	335	328	327	331	349	36	7	15	112	158	177	218	199	197	174	178	232	258	216	212	250	236.1
20-Apr	238	274	319	309	334	359	0	3	3	7	14	9	10	7	10	8	5	6	10	351	251	279	340	347	3.5
21-Apr	345	344	348	347	315	248	354	12	57	36	29	9	4	48	11	138	160	179	203	221	273	235	254	238	357.8
22-Apr	244	243	259	337	360	7	9	18	9	16	30	20	23	30	35	23	19	359	4	27	33	7	338	10	14.0
23-Apr	354	293	296	273	305	323	358	23	74	20	1	357	18	42	19	357	351	184	200	201	180	196	160	170	3.5
24-Apr	1	354	351	344	337	345	357	358	4	22	41	59	70	90	141	89	64	111	123	107	77	130	152	7	39.4
25-Apr	48	25	71	0	328	335	150	147	154	152	156	152	186	185	172	164	164	176	167	174	174	167	161	162	164.0
26-Apr	163	164	160	164	167	171	156	162	157	163	163	160	154	162	183	169	176	183	175	204	238	259	298	270	167.4
27-Apr	202	191	203	208	199	197	182	158	156	185	128	156	164	182	109	204	218	250	267	332	329	307	279	221	183.9
28-Apr	281	168	235	215	195	181	126	123	120	120	95	24	40	25	59	25	22	49	36	27	285	234	253	206	52.1
29-Apr	196	255	192	205	187	182	169	147	184	194	187	205	215	211	202	208	178	181	193	193	201	209	182	262	195.3
30-Apr	225	215	197	211	208	223	159	133	143	116	124	176	182	316	18	41	185	194	168	268	307	183	197	257	151.0

349.4 352.0 347.6 345.8 354.1 359.9 15.9 30.7 40.2 42.4 60.7 54.1 48.9 39.4 32.0 31.5 32.6 39.7 41.4 5.2 349.1 341.4 349.6 352.0

Diurnal Average

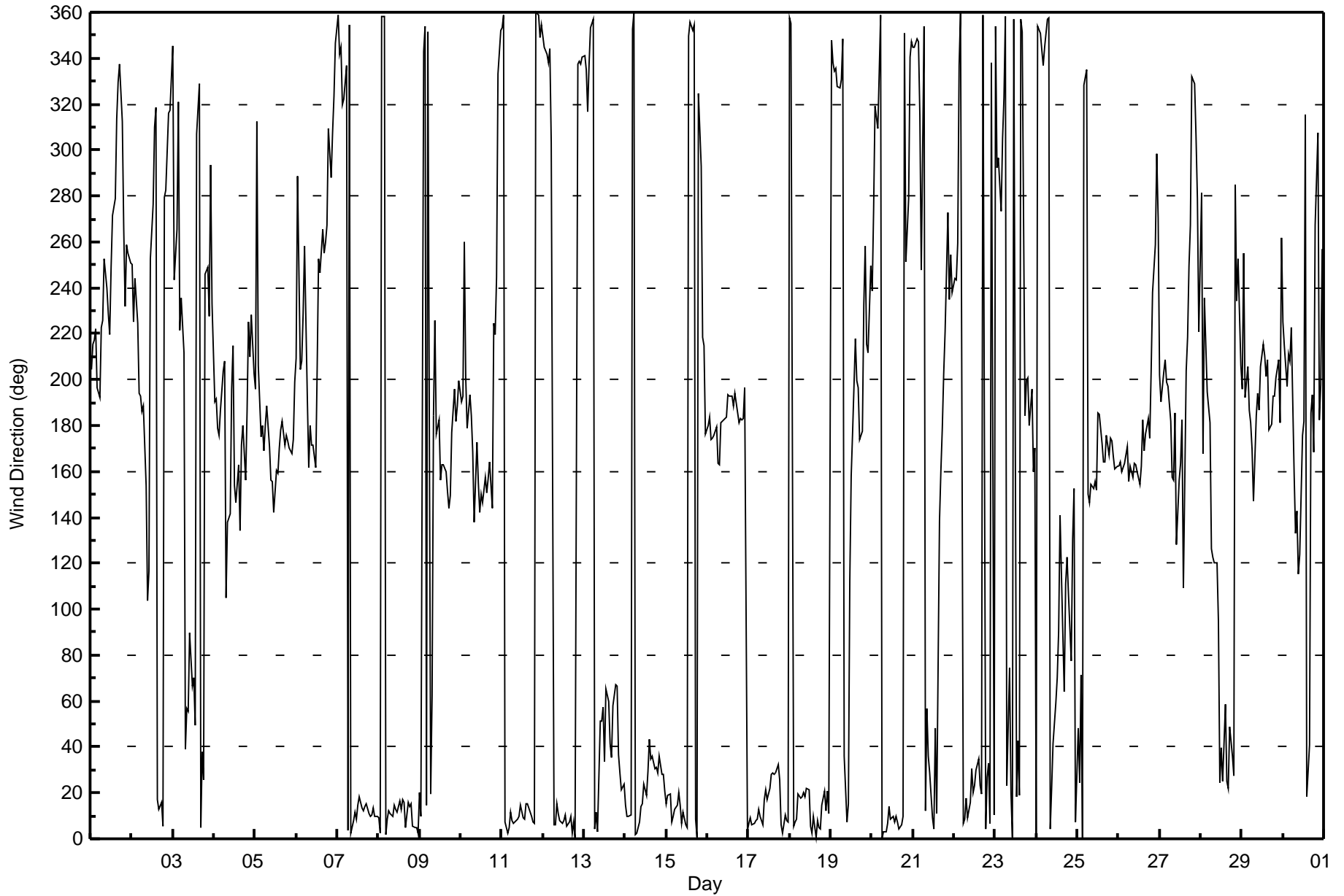
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay South - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Apr 3 08:00 Minimum Value: 6 deg on Apr 5 20:00 Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 16 Median = 20 Q ₃ = 34 P ₉₀ = 55 P ₉₉ = 86																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	20	18	18	20	29	21	23	25	27	25	25	26	32	37	61	34	24	16	18	28	60	23	18	17	61
2-Apr	65	81	29	47	58	19	68	35	27	33	25	91	38	32	21	26	17	16	15	45	27	22	14	13	91
3-Apr	23	89	45	92	58	53	70	101	39	30	66	51	51	42	40	42	28	21	53	24	12	60	74	58	101
4-Apr	49	23	14	19	81	55	36	82	17	26	31	22	56	30	29	28	21	18	22	22	22	87	36	29	87
5-Apr	35	92	77	14	17	80	35	17	23	13	26	18	16	13	17	13	14	28	11	6	8	8	13	11	92
6-Apr	45	59	18	39	31	56	16	17	18	22	36	22	37	35	34	35	33	26	22	20	65	55	20	29	65
7-Apr	16	78	34	70	60	52	36	15	16	17	15	17	17	17	18	15	16	16	15	14	14	14	14	14	78
8-Apr	14	15	16	16	16	17	16	18	18	18	17	17	17	17	17	17	18	18	18	19	16	15	16	17	19
9-Apr	26	42	26	17	14	21	61	52	41	34	47	33	30	25	23	21	19	15	12	17	10	9	10	17	61
10-Apr	10	23	72	22	19	33	11	13	16	28	30	20	18	17	21	30	30	13	14	26	48	21	71	14	72
11-Apr	12	14	14	15	16	14	15	16	17	16	17	17	17	18	19	17	20	18	15	14	15	16	15	14	20
12-Apr	13	15	11	10	12	74	54	18	15	17	23	18	23	24	21	26	18	16	14	13	12	12	10	9	74
13-Apr	10	10	31	14	10	12	14	15	16	52	37	32	22	31	27	25	19	25	26	24	21	21	14	14	52
14-Apr	13	11	12	15	15	15	14	13	14	14	13	16	21	18	25	22	26	20	22	17	21	18	20	19	26
15-Apr	17	17	16	15	15	16	15	15	16	17	17	17	19	19	21	22	21	19	15	23	15	43	32	27	43
16-Apr	10	11	10	11	10	8	10	12	15	17	18	17	20	19	17	16	17	16	11	10	7	10	46	22	46
17-Apr	14	14	17	16	16	16	16	16	16	17	18	19	20	20	18	19	19	20	19	17	15	15	16	16	20
18-Apr	15	15	15	16	17	16	18	18	18	21	23	23	20	19	25	19	19	17	18	22	16	16	16	18	25
19-Apr	13	13	14	14	19	23	21	26	35	65	70	66	34	40	58	41	27	43	47	15	20	38	35	31	70
20-Apr	42	46	54	41	55	14	15	20	18	15	16	16	16	16	15	17	16	16	14	31	40	17	37	13	55
21-Apr	15	13	13	15	25	20	65	30	41	43	35	28	66	83	57	64	43	25	23	71	52	46	69	50	83
22-Apr	71	67	61	29	15	16	16	16	18	19	20	23	22	25	25	24	26	17	18	20	21	32	20	16	71
23-Apr	12	62	42	34	23	30	11	44	70	34	32	32	76	75	52	62	41	58	15	19	19	39	17	59	76
24-Apr	15	12	12	10	14	13	16	17	16	16	27	32	32	48	30	46	38	26	45	30	32	16	71	15	71
25-Apr	42	42	55	55	12	13	67	18	14	21	19	23	21	21	25	18	16	19	14	9	9	10	10	9	67
26-Apr	9	10	9	11	11	12	12	14	14	15	16	16	15	17	21	19	17	17	20	19	19	35	75	48	75
27-Apr	25	17	18	21	12	16	27	15	21	34	39	23	38	36	66	75	49	32	25	13	18	55	59	38	75
28-Apr	32	71	25	31	67	18	37	49	35	31	55	59	29	43	46	28	22	39	19	40	29	37	46	69	71
29-Apr	18	72	20	21	22	22	13	29	53	41	25	36	25	25	27	28	17	18	15	12	9	11	45	45	72
30-Apr	37	42	36	20	72	59	55	28	25	42	37	43	43	77	23	23	92	18	37	27	30	58	58	47	92
	71	92	77	92	81	80	70	101	70	65	70	91	76	83	66	75	92	58	53	71	65	87	75	69	
Diurnal Maximum																									





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	April 7, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	7:35	End time (MST):	11:34
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>49.8</u>	ppm	Cal Gas Exp Date	September 8, 2018
Cal Gas Cylinder #	<u>LL110515</u>			
Calibrator Make/Model	Sabio 4010		Serial Number	11041107
ZAG Make/Model	API 701		Serial Number	5613

Analyzer Information

Analyzer make: API T100

Analyzer serial #: 599

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		HVPS voltage	524	524
Calculated slope	0.998769	0.993381	Lamp voltage	2487	2487
Calculated intercept	1.866363	1.601862	Pressure	25.8	25.8
Analyzer Background	32.9	32.9	Flow	671	671
Analyzer Coefficient	1.052	1.052	Lamp Ratio	84	84

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.3	----
as found span	4923	78.8	784.6	784.0	1.001
calibrator zero	5000	0.0	0.0	0.3	----
high point	4923	78.8	784.6	789.4	0.994
second point	4961	39.4	392.4	391.6	1.002
third point	4977	19.7	196.3	194.7	1.008
as left zero	5000	0.0	0.0	0.6	----
as left span	4923	78.8	784.6	782.7	1.002
Average Correction Factor					1.001
Corrected As found	783.70	Previous response	783.67	*% change	0.0%

* = > +/-5% change initiates investigation

Notes:

No adjustments or maintenance done

Calibration Performed By:

Melissa Lemay



Wood Buffalo Environmental Association

SO₂ Calibration Summary

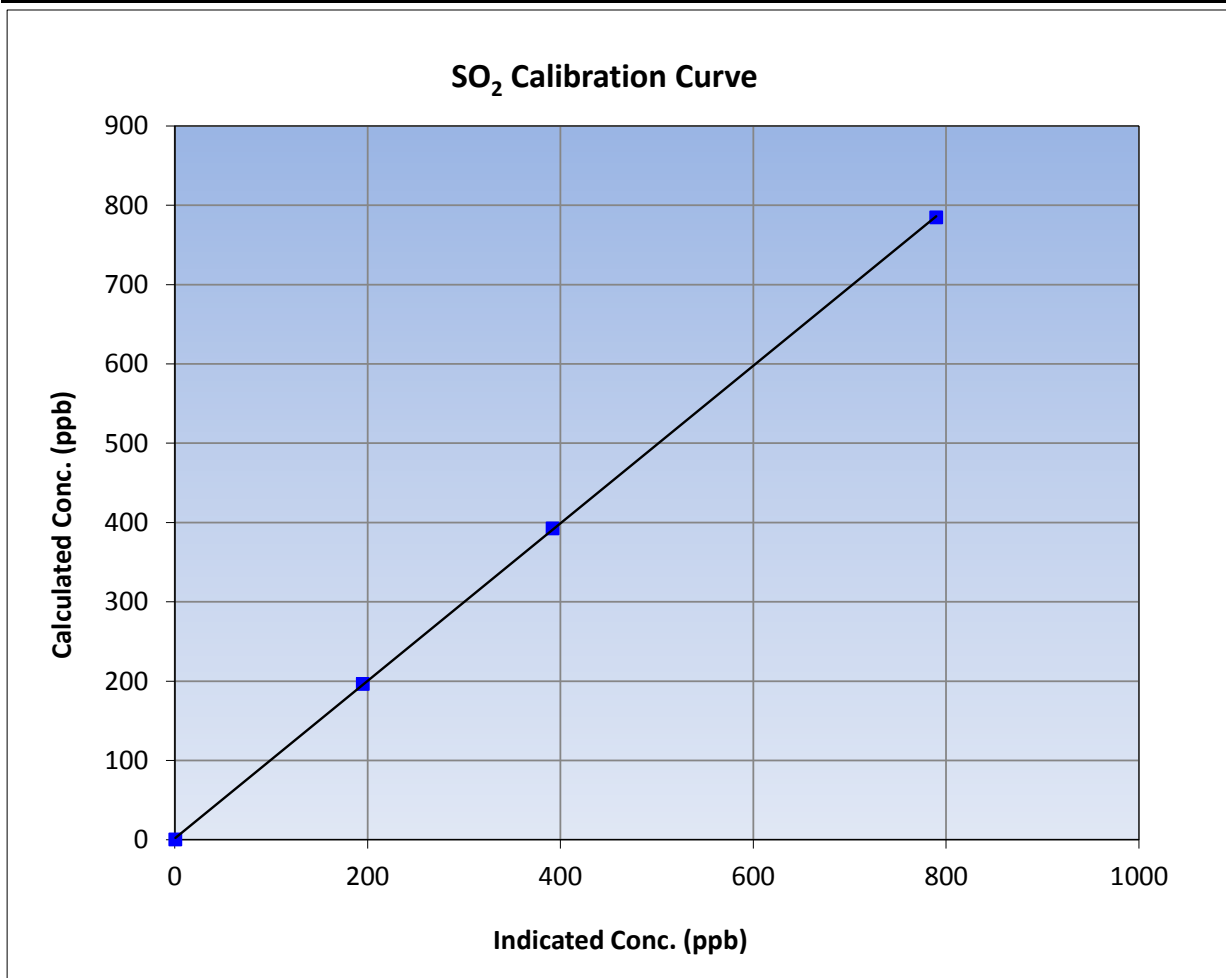
Version-03-2017

Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 7, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	7:35	End Time (MST)	11:34
Analyzer make	API T100	Analyzer serial #	599

Calibration Data

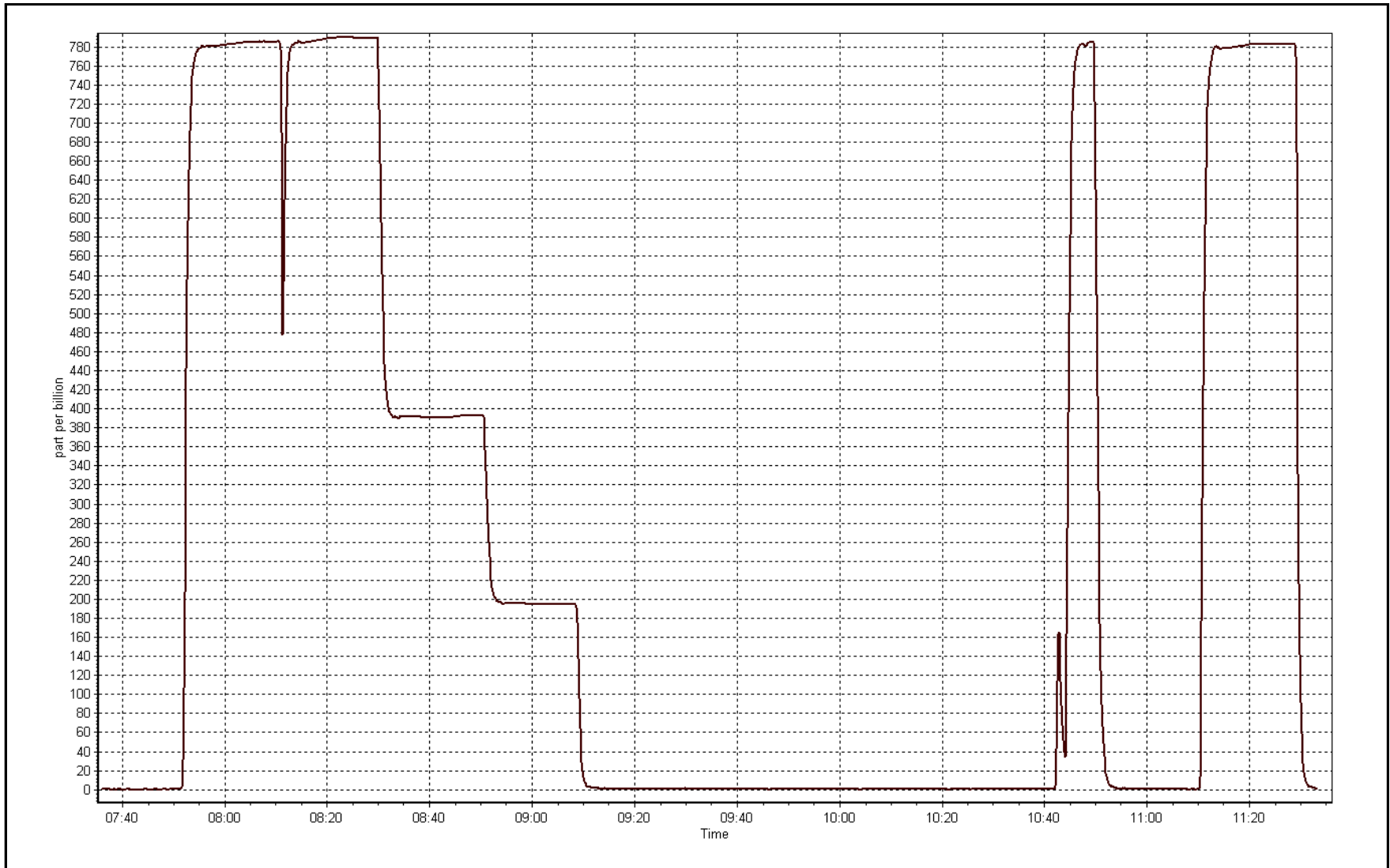
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.3	----	Correlation Coefficient	0.999970	≥0.995
784.6	789.4	0.9939			
392.4	391.6	1.0020	Slope	0.993381	0.90 - 1.10
196.3	194.7	1.0084			
			Intercept	1.601862	+/-30



SO2 Calibration Plot

Date: April 7, 2017

Location: Fort McKay South





Wood Buffalo Environmental Association

TRS Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	April 6, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	7:10	End time (MST):	11:23
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.07</u>	ppm	Cal Gas Exp Date	September 9, 2017
Calibrator Make/Model	Sabio 4010		Serial Number	11041107
ZAG Make/Model	API 701		Serial Number	5613

Analyzer Information

Analyzer make:	Thermo 43i-TLE	Analyzer serial #:	1218153359	
Converter make:	CDN-101	Converter Serial #:	456	
	<u>Start</u>	<u>Finish</u>		
Analyzer Range	0 - 100 ppb	PMT voltage	-727	
Calculated slope	0.987314	0.994994	Lamp voltage	1017
Calculated intercept	0.376967	0.258240	Pressure	682.6
Analyzer Background	2.18	2.1	Flow	0.435
Analyzer Coefficient	1.063	1.014	Intensity	90

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	-0.1	----
as found span	4921	78.9	80.0	84.2	0.950
calibrator zero	5000	0.0	0.0	-0.1	----
high point	4921	78.9	80.0	80.2	0.998
second point	4960	39.4	40.0	39.9	1.001
third point	4981	19.6	19.9	19.5	1.019
as left zero	5000	0.0	0.0	0.0	----
as left span	4921	78.9	80.0	80.3	0.996
Average Correction Factor					1.006

Corrected As found	84.34	Previous response	80.66	*% change	-4.4%
--------------------	-------	-------------------	-------	-----------	-------

* = > +/-5% change initiates investigation

Notes: Full removal Cal done and linear; Leak check done, converter efficiency done, and scrubber test done and all Passed; Pump changed out, span adjusted and filter changed out

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

TRS Calibration Summary

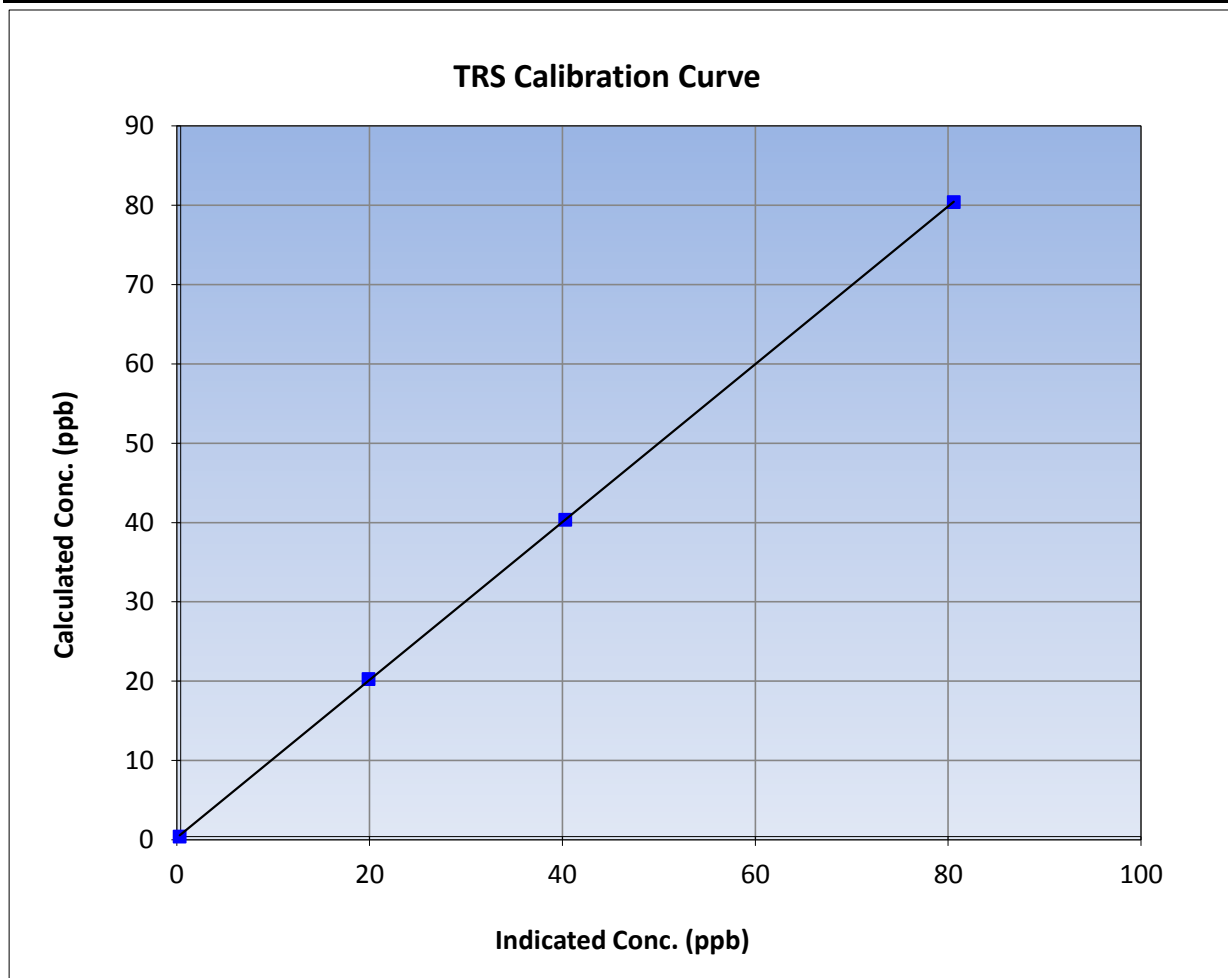
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 8, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	7:10	End Time (MST)	11:23
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1218153359

Calibration Data

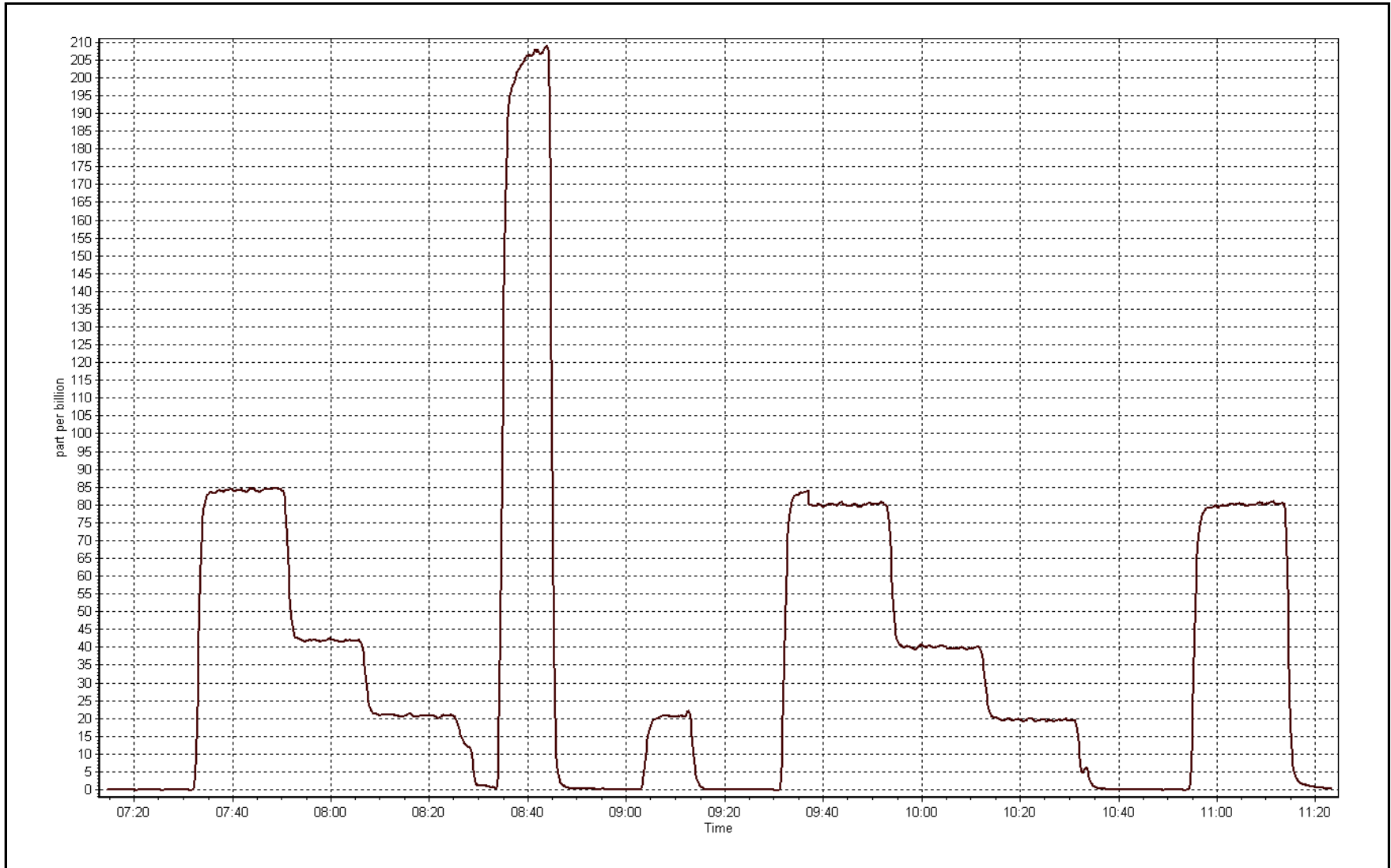
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.1	----	Correlation Coefficient	0.999979	≥0.995
80.0	80.2	0.9976			
40.0	39.9	1.0014	Slope	0.994994	0.90 - 1.10
19.9	19.5	1.0191			
			Intercept	0.258240	+/-3



TRS Calibration Plot

Date: April 6, 2017

Location: Fort McKay South





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	April 11, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	7:24	End time (MST):	10:56
Reason:	Routine		

Calibration Standards

Gas Cert Reference	LL110515	Cal Gas Expiry Date	September-08-18
CH4 Cal Gas Conc.	<u>517.0</u> ppm	CH4 Equiv Conc.	1067.0 ppm
C3H8 Cal Gas Conc.	<u>200.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11041107
ZAG Make/Model	Teledyne API 701	Serial Number	5613

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1505164380
	<u>Start</u>	<u>Finish</u>	<u>Start</u>
Analyzer Range	0 - 25 ppm	Bias voltage supply	-303
Calculated slope	0.989913	Sample pressure	9.2
Calculated intercept	0.048936	Fuel pressure	23.1
Analyzer Background	3.074	Air pressure	34.2
Analyzer Coefficient	1.320	Flame temperature	152.5

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.00	0.01	----
as found span	4920	78.9	16.84	16.98	0.992
calibrator zero	5000	0.0	0.00	0.01	----
high point	4920	78.9	16.84	16.82	1.001
second point	4969	39.3	8.37	8.33	1.005
third point	4981	19.6	4.18	4.15	1.008
as left zero	5000	0.0	0.00	0.02	----
as left span	4920	78.9	16.84	16.94	0.994
Average Correction Factor					1.005
Corrected As found	16.97	Previous response	16.96	*% change	0.0%

* = > +/-5% change initiates investigation

Notes: Pump changed out for preventative maintenance; zero and span adjusted

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

THC Calibration Summary

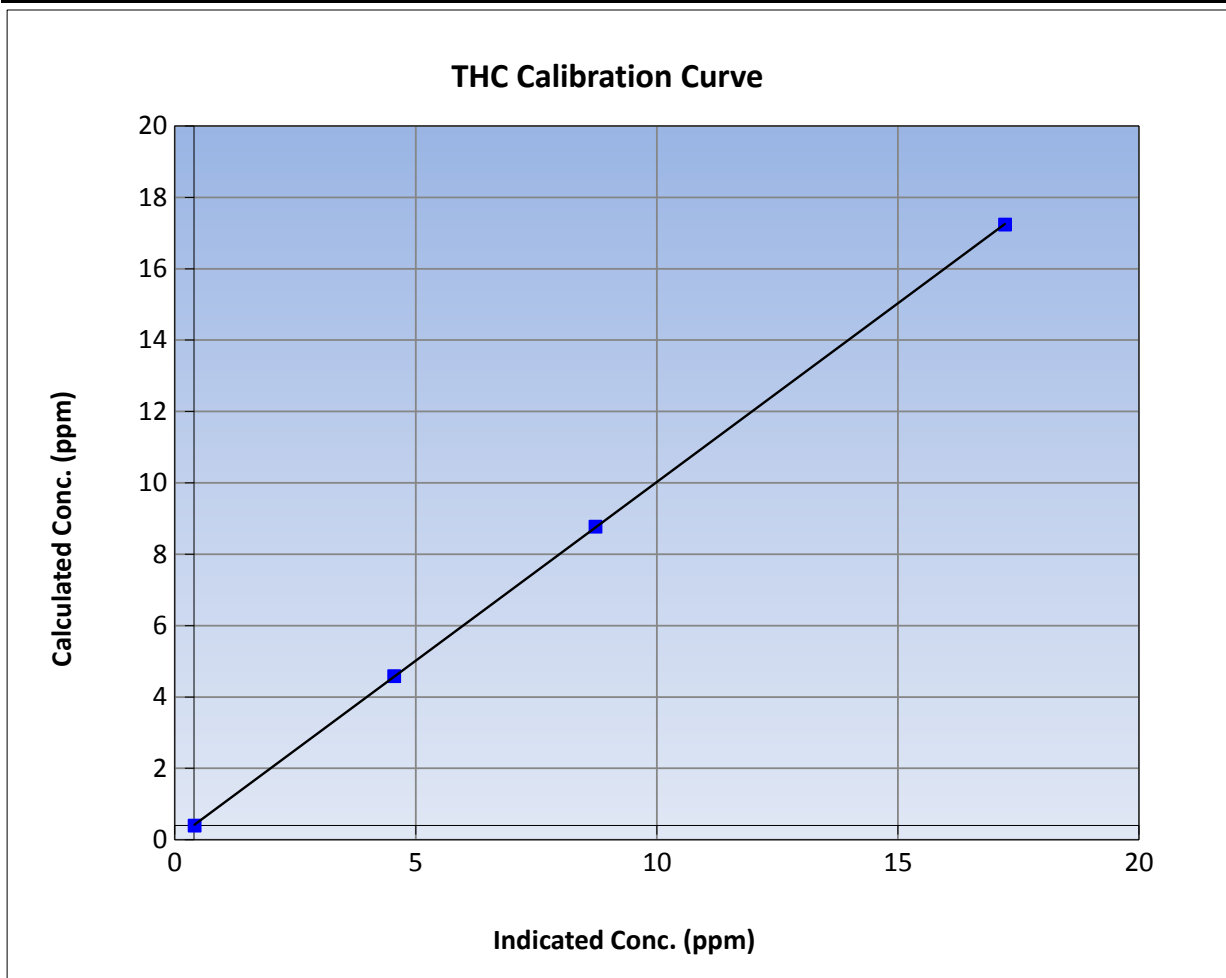
Version-03-2017

Station Information

Calibration Date	April 11, 2017	Previous Calibration	March 7, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	7:24	End Time (MST)	10:56
Analyzer make	Thermo 51i-LT	Analyzer serial #	1505164380

Calibration Data

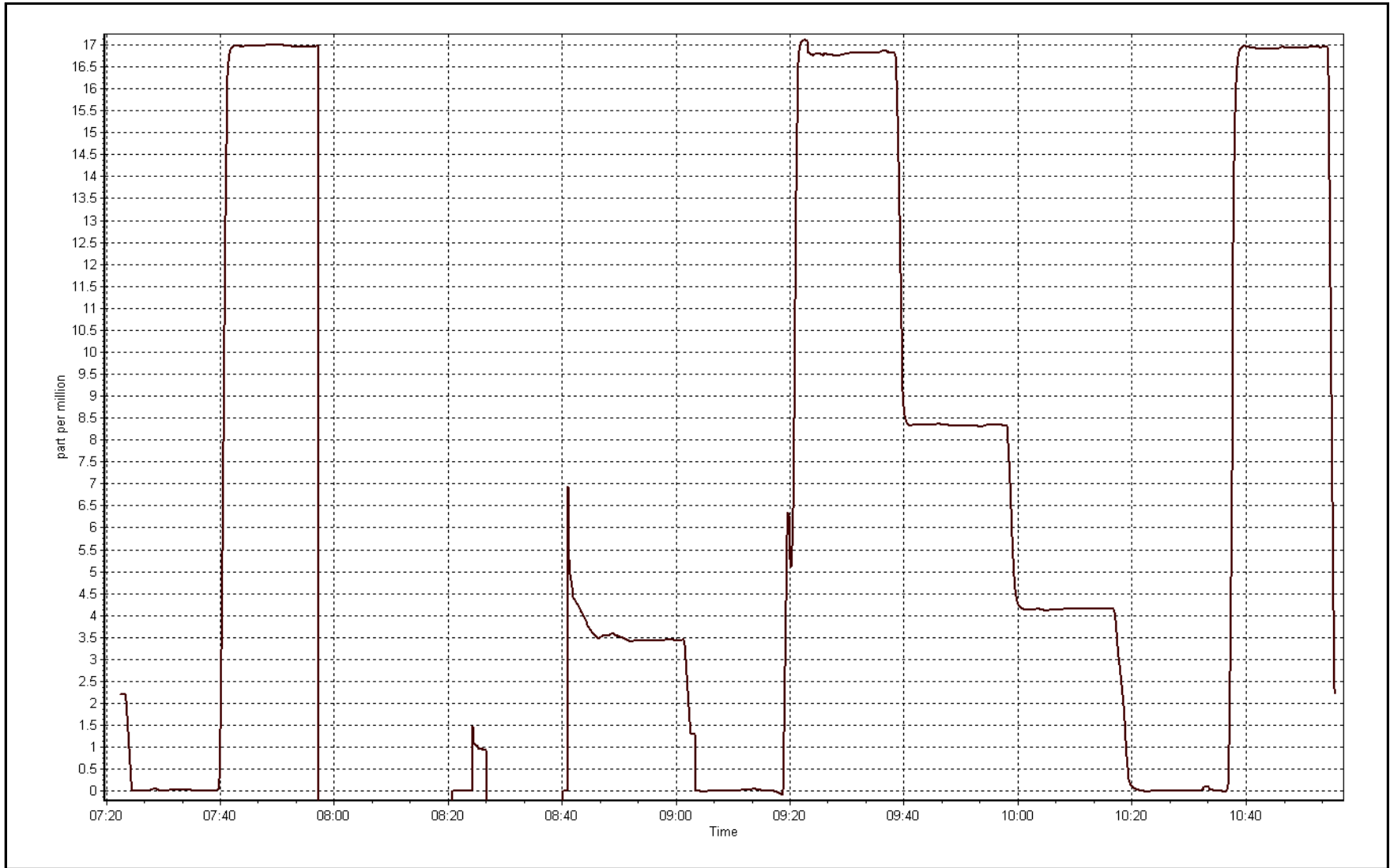
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999992	
16.8	16.8	1.0012			≥0.995
8.4	8.3	1.0051	Slope	1.001376	
4.2	4.2	1.0077			0.90 - 1.10
			Intercept	0.011376	+/-1.5



THC Calibration Plot

Date: April 11, 2017

Location: Fort McKay South





Wood Buffalo Environmental Association

O₃ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	April 10, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	10:15	End time (MST):	12:32
Reason:	Routine		

Calibration Standards

O3 generation mode:	Nox GPT	O3 reference Date:	April 7, 2017
Calibrator Make/Model:	Sabio 4010	Serial Number:	5613
ZAG Make/Model:	Teledyne API 701	Serial Number:	11038

Analyzer Information

Analyzer make: API T400

Analyzer serial #: 825

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 500 ppb		Pressure	26	26
Calculated slope	1.005247	0.995206	Flow	760	760
Calculated intercept	0.134770	-0.852721	Intensity	4213.6	4213.6
Analyzer Background	2.0	2.0			
Analyzer Coefficient	1.004	1.004			

O₃ Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.6	----
as found span	5000	0.896	345.6	347.9	0.993
calibrator zero	5000	0.0	0.0	0.6	----
high point	5000	0.896	345.6	347.9	0.993
second point	5000	0.581	205.2	207.3	0.990
third point	5000	0.355	107.8	109.4	0.985
as left zero	5000	0.0	0.0	0.5	----
as left span	5000	0.896	345.6	357.2	0.968
Average Correction Factor					0.990

Corrected As found	347.30	Previous response	343.66	*% change	-1.0%
--------------------	--------	-------------------	--------	-----------	-------

* = > +/-8% change initiates investigation

Notes: Nox GPT check done April 10,2017 points were within 3% of last calibration, April 7,2017 GPT points used; No adjustments or maintenance done

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

O₃ Calibration Summary

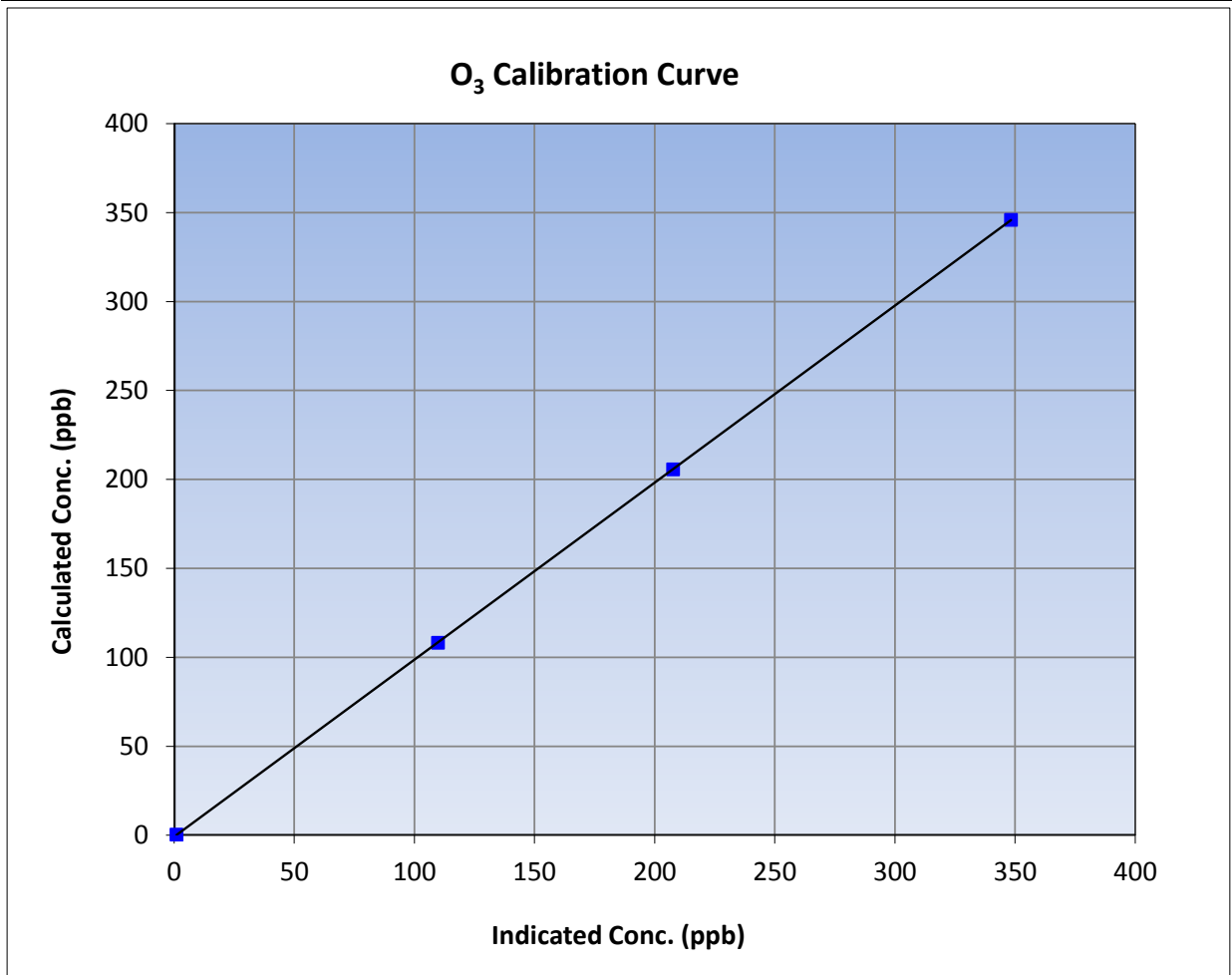
Version-03-2017

Station Information

Calibration Date	April 10, 2017	Previous Calibration	March 8, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:15	End Time (MST)	12:32
Analyzer make	API T400	Analyzer serial #	825

Calibration Data

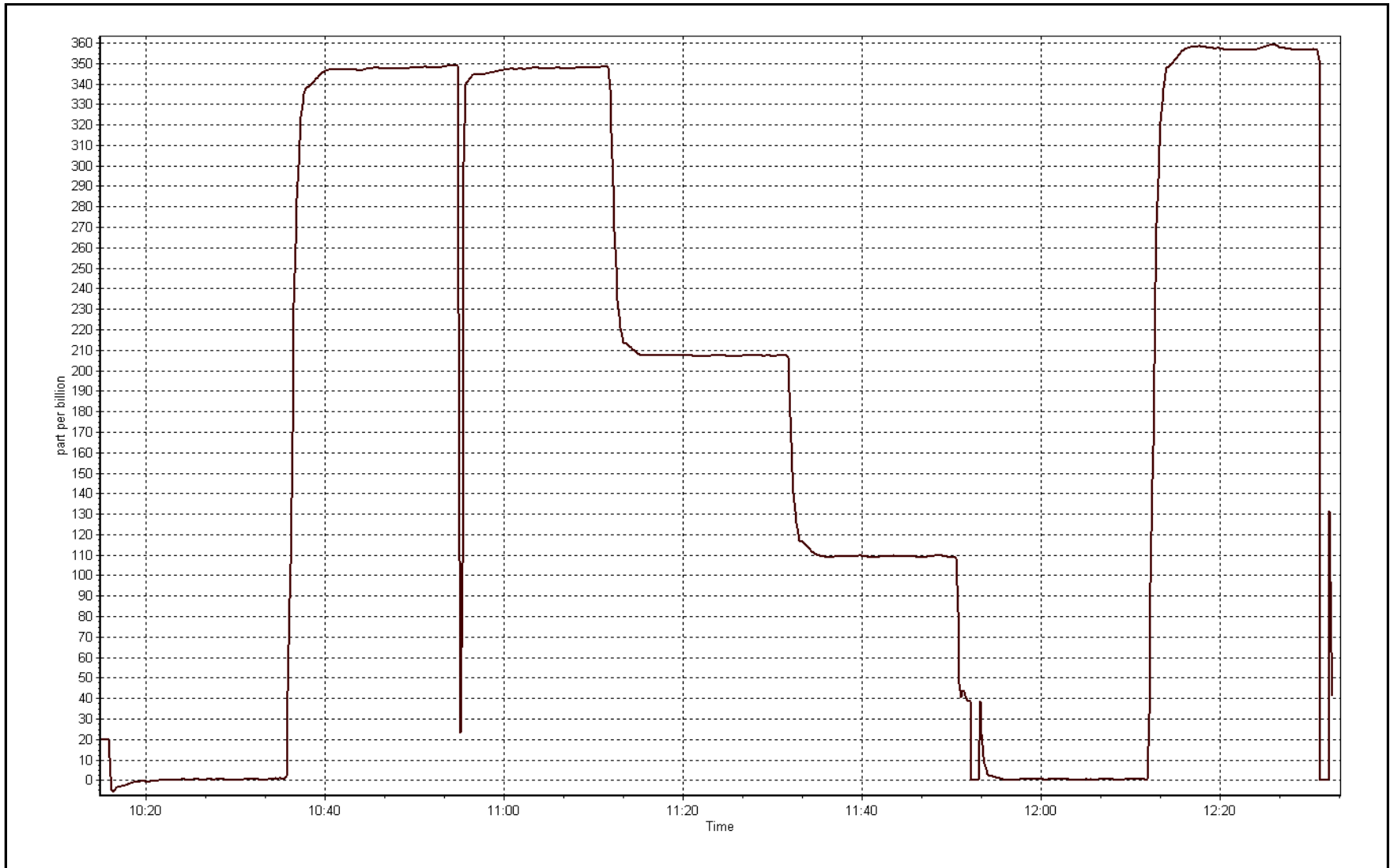
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.6	----	Correlation Coefficient	0.999996	≥0.995
345.6	347.9	0.9934	Slope	0.995206	0.90 - 1.10
205.2	207.3	0.9899	Intercept	-0.852721	+/- 10
107.8	109.4	0.9854			



O₃ Calibration Plot

Date: April 10, 2017

Location: Fort McKay South





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	April 7, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	7:35	End time (MST):	11:32
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL110515	Cal Gas Expiry Date	September-08-18
NOX Cal Gas Conc.	<u>50.9</u> ppb	NO Cal Gas Conc.	<u>50.7</u> ppb
Calibrator Model	Sabio 4010	Serial Number	11041107
ZAG make/model	API T701	Serial Number	5613

Analyzer Information

Analyzer make:	Thermo 42i	Analyzer serial #:	1410661329	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
NO coefficient	1.069	1.088	NOX Range (ppb)	0 - 1000 ppb
NOX coefficient	1.002	1.000	PMT Temperature	-2.7 -2.7
NO ₂ coefficient	1.000	1.000	Reaction cell Press	181.5 181.5
NO bkgrnd	7.9	8.0	Sample Flow	0.806 0.806
NOX bkgrnd	8.0	8.1	PMT Voltage	-827.7 -827.7

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	1.000526	1.000339
NO _x Cal Offset	0.600649	1.189998
NO Cal Slope	1.000512	0.999159
NO Cal Offset	0.501166	1.147893
NO ₂ Cal Slope	0.994056	1.002136
NO ₂ Cal Offset	1.070378	0.533311



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
as found span	4923	78.8	801.9	798.7	3.2	791.2	786.9	4.3	1.0135	1.0151
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.1	----	----
high point	4923	78.8	801.9	798.7	3.2	801.4	799.2	2.1	1.0006	0.9994
second point	4961	39.4	401.1	399.5	1.6	398.1	397.0	0.8	1.0074	1.0063
third point	4977	19.7	200.7	199.9	0.8	198.8	198.5	0.3	1.0094	1.0070
as left zero	5000	0.0	0.0	0.0	0.0	0.2	0.1	0.1	----	----
as left span	4923	78.8	801.9	448.5	353.4	810.0	452.8	357.2	0.9900	0.9905
Average Correction Factor									1.0058	1.0042

Corrected As found NO_x = 791.1 ppb NO = 786.9 ppb *Percent Change NO_x = 1.2%
 Previous Response NO_x = 800.9 ppb NO = 797.8 ppb *Percent Change NO = 1.4%
 * = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		3.2	765.4	794.1	1.3	1.0477	1.0058	----	----
1st NO2 (400 ppb O3)	448.5	348.8	796.5	448.5	348.0	1.0068	----	1.0022	99.8%
2nd NO2 (200 ppb O3)	588.9	208.4	795.7	588.9	206.8	1.0078	----	1.0075	99.3%
3rd NO2 (100 ppb O3)	686.3	111.0	795.9	686.3	109.6	1.0075	----	1.0123	98.8%
2nd NO ref point	----	3.2	797.8	796.5	1.4	1.0051	1.0028	----	----
Average Correction Factor						1.0068	1.0043	1.0073	99.3%

Notes: Span adjusted, no maintenance done; Due to drift during GPT the 2nd NO ref point used

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

NO_x Calibration Summary

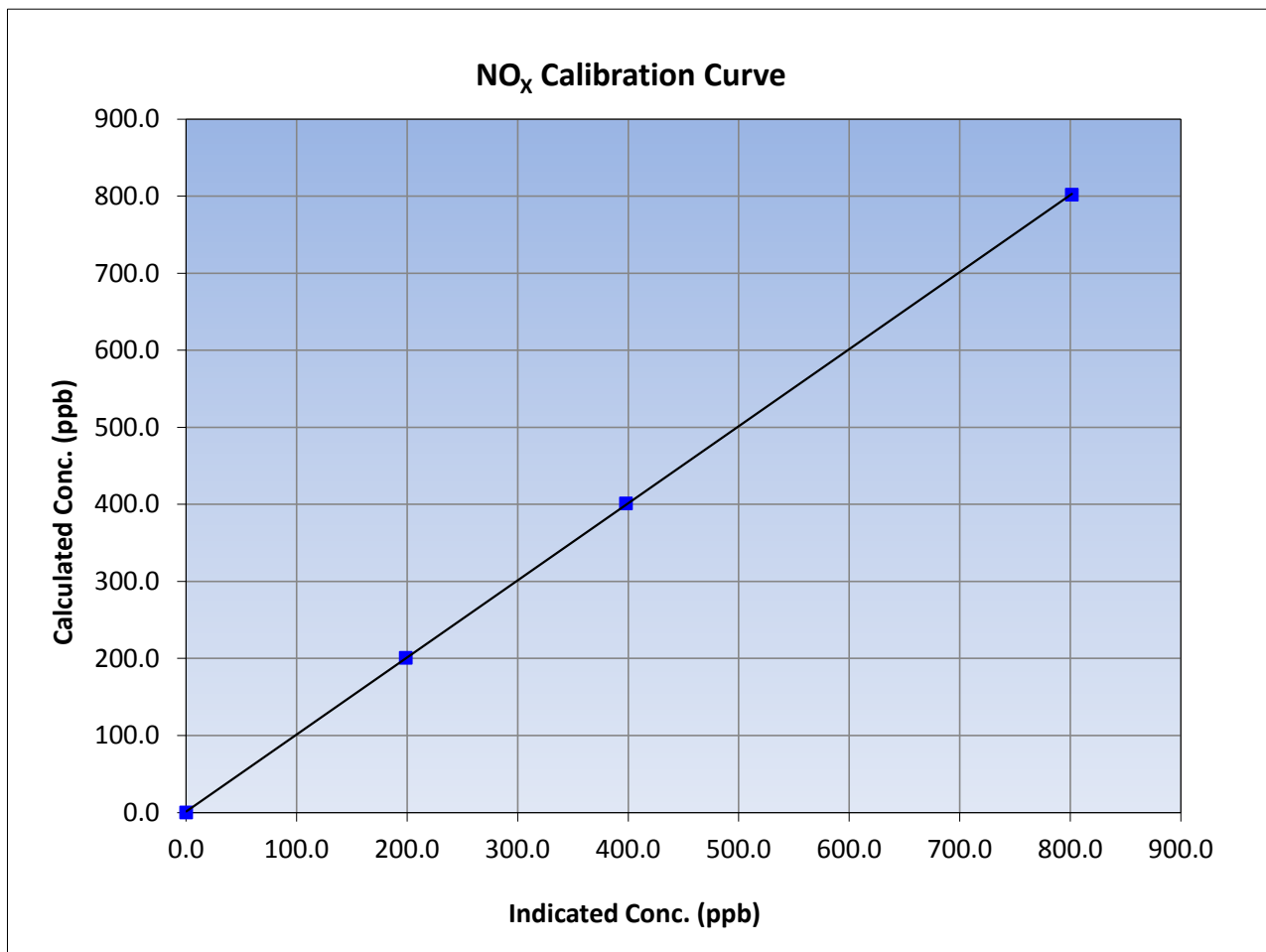
Version-03-2017

Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 7, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	7:35	End Time (MST)	11:32
Analyzer make	Thermo 42i	Analyzer serial #	1410661329

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
801.9	801.4	1.0006			
401.1	398.1	1.0074			
200.7	198.8	1.0094			
			Slope	1.000339	0.90 - 1.10
			Intercept	1.189998	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

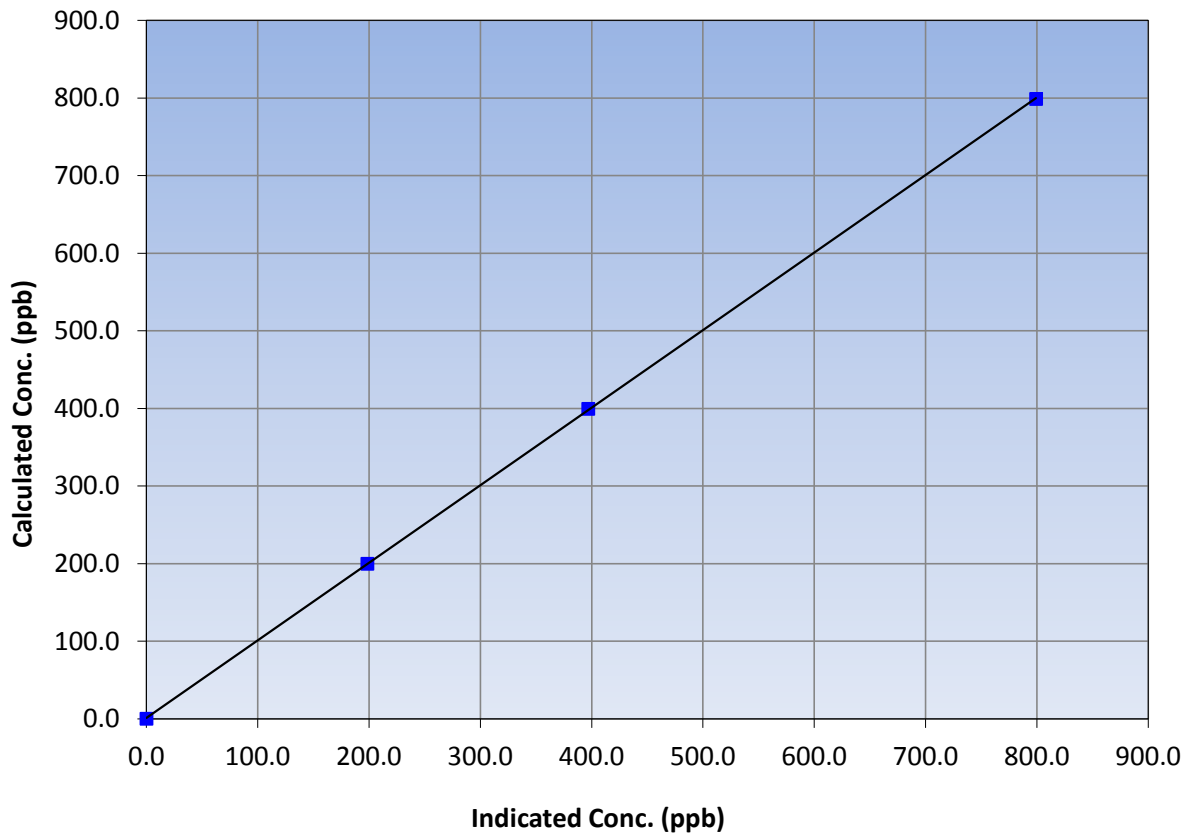
Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 7, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	7:35	End Time (MST)	11:32
Analyzer make	Thermo 42i	Analyzer serial #	1410661329

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
798.7	799.2	0.9994			
399.5	397.0	1.0063			
199.9	198.5	1.0070			
			Slope	0.999159	0.90 - 1.10
			Intercept	1.147893	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

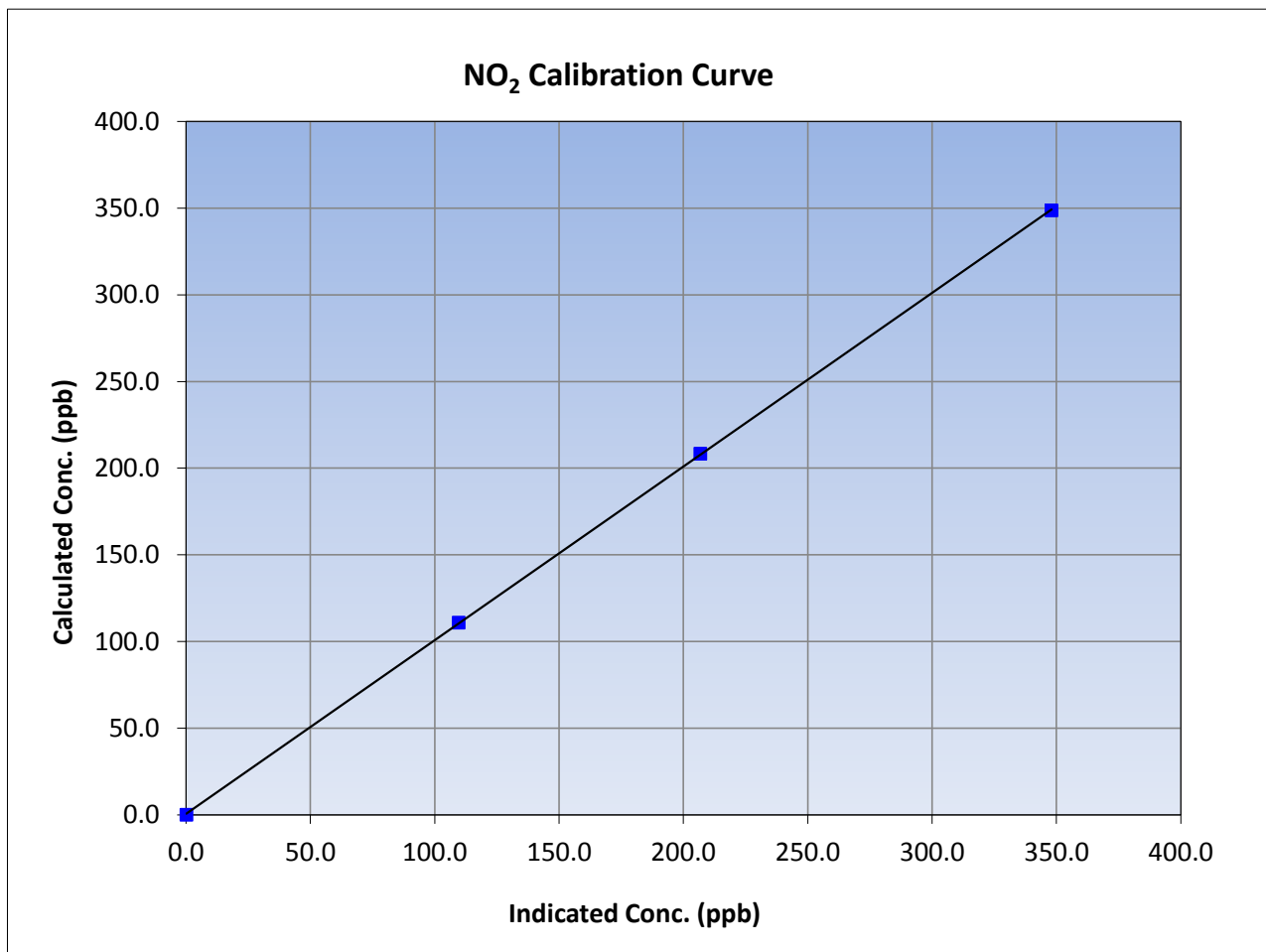
Version-03-2017

Station Information

Calibration Date	April 7, 2017	Previous Calibration	March 7, 2017
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	7:35	End Time (MST)	11:32
Analyzer make	Thermo 42i	Analyzer serial #	1410661329

Calibration Data

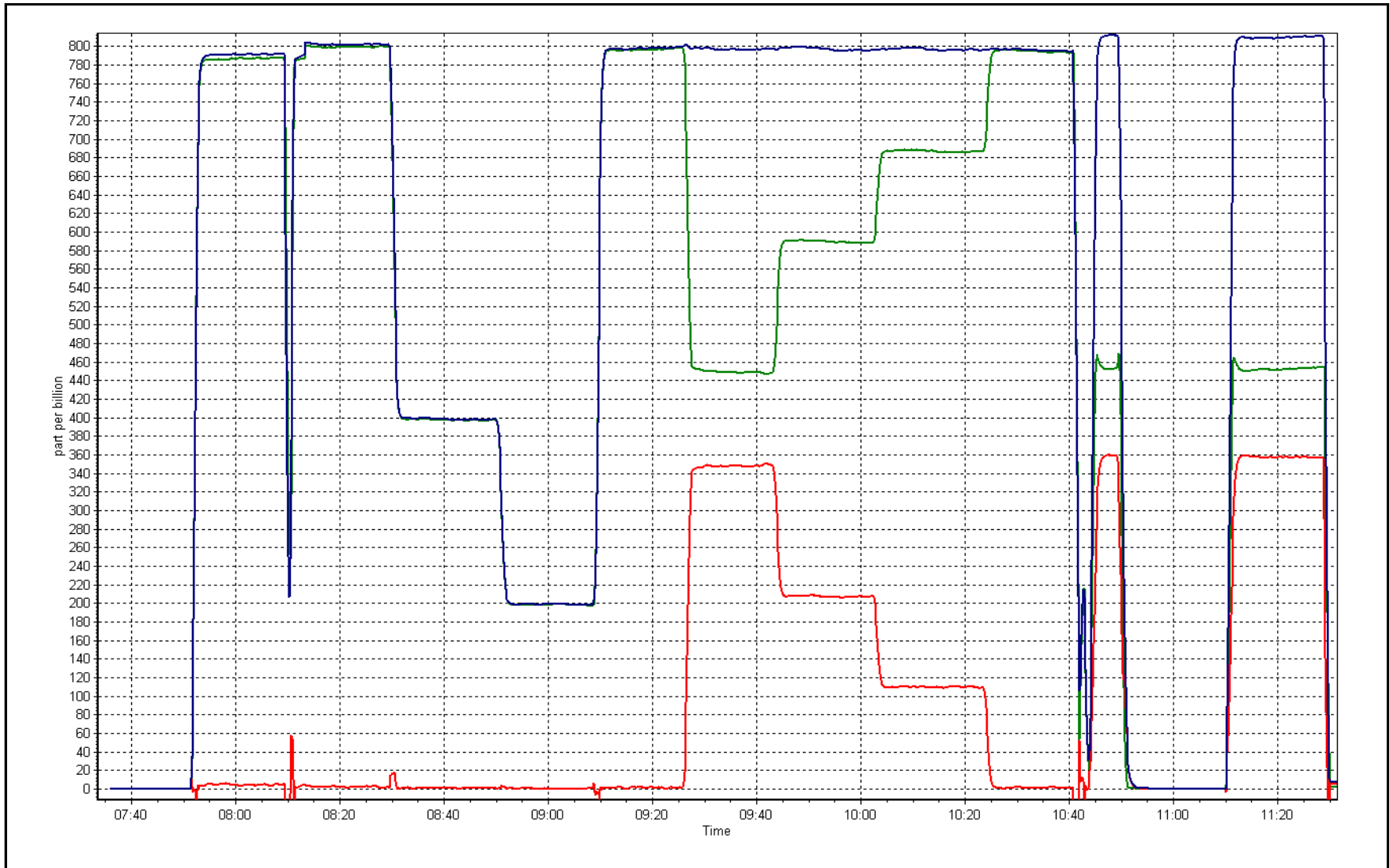
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
348.8	348.0	1.0022			
208.4	206.8	1.0075			
111.0	109.6	1.0123			
			Slope	1.002136	0.90 - 1.10
			Intercept	0.533311	+/-20



NO_x Calibration Plot

Date: April 7, 2017

Location: Fort McKay South





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Fort McKay South	Station number:	AMS 13
Calibration Date:	April 11, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	10:57	End time (MST):	12:01
Sharp Model:	5030	S/N:	E-803
Particulate Fraction:	PM2.5	C14 Source S/N:	4066
Flow Meter Make/Model:	Delta Cal	S/N:	1450
Temp/RH standard:	Delta Cal	S/N:	1450

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	2	1	2	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	977	988	977	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	978	1000	<input checked="" type="checkbox"/>	+/- 50 LPH
Nephelometer zero	3.1	-----	0	<input checked="" type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: April 11, 2017 Last Cal Date: February 8, 2017
 Flow w/o adaptor: 16.34 Flow w/ adaptor: 16.00

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>5872</u>	Foil S/N: <u>5872</u>	
Foil Calibration	Foil Mass: <u>1337</u>	Foil Mass: <u>1337</u>	
	Calibration Date: <u>April 11, 2017</u>	Calibration Date: <u>June 9, 2016</u>	
(Limit) +/- 5% of previous	Correction Factor: <u>6965</u>	Correction Factor: <u>7150</u>	-2.59%

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Flow and Nephelometer adjusted, Cyclone head cleaned

Calibration by: Melissa Lemay



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

**AMS 14
ANZAC
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	683	35	37	99.72	6	0	2	0
TRS(ppb) Average	683	34	37	99.58	1	0	0	0
THC(ppm) Average	684	35	36	99.86	2.5	-	2	-
NMHC(ppm) Average	684	35	36	99.86	0.075	-	0.003	-
CH4(ppm) Average	684	35	36	99.86	2.5	-	2	-
NO2(ppb) Average	681	35	39	99.44	13	0	5	-
NO(ppb) Average	681	35	39	99.44	9	-	1	-
NOX(ppb) Average	681	35	39	99.44	17	-	6	-
O3(ppb) Average	685	33	35	99.72	55	0	46	-
PM2.5(ug/m3) Average	719	1	1	100	34.5	-	5.7	0
AT 2m(C) Average	720	0	0	100	16.5	-	9	-
RH(%) Average	720	0	0	100	99	-	94	-
Leaf Wetness (% of range) Average	720	0	0	100	65	-	16	-
WS(km/h) Average	714	0	6	99.17	22	-	17	-
WD(deg) Average	714	0	6	99.17	-	-	-	-
PC(mm) Total	720	0	0	100	2.3	-	13	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2(ppb) Average	683	0.3	0	-	0	0	0	0	0	0	0	6
TRS(ppb) Average	683	0.2	0	-	0	0	0	0	0	0	0	1
THC(ppm) Average	684	1.91	0	-	1.9	1.9	1.9	1.9	1.9	1.9	2	2.5
NMHC (ppm) Average	684	0.001	0.004	-	0	0	0	0	0	0	0	0.075
CH4(ppm) Average	684	1.91	0	-	1.9	1.9	1.9	1.9	1.9	1.9	2	2.5
NO2(ppb) Average	681	1.2	2	-	0	0	0	1	1	3	13	
NO(ppb) Average	681	0.3	1	-	0	0	0	0	0	1	9	
NOX(ppb) Average	681	1.5	2	-	0	0	0	1	2	4	17	
O3(ppb) Average	685	37.1	8	-	12	25	32	38	43	47	55	
PM2.5(ug/m3) Average	719	2.55	2.5	-	0.2	0.9	1.3	1.7	2.9	5.7	34.5	
Temperature 2 m (C) Average	720	1.7	5.4	-	-11.6	-5	-2.1	1.2	5.4	9.4	16.5	
Relative Humidity (%) Average	720	65.4	19	-	22	39	51	67	79	90	99	
Leaf Wetness (% of range) Average	720	1.5	6	-	0	0	0	0	1	2	65	
Wind Speed 20 m (km/h) Average	714	8.7	4	-	0	4	6	8	11	14	22	
Wind Direction 20 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-	
Precipitation (mm) Total	720	-	-	16.76	-	-	-	-	-	-	-	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
CH4, NMHC, THC	13 Apr 2017 12:00	13 Apr 2017 12:00	1	Maintenance - WBEA audit
NO2, NO, NOX	11 Apr 2017 10:00	11 Apr 2017 13:00	4	Maintenance - WBEA audit
O3	11 Apr 2017 14:00	11 Apr 2017 15:00	2	Maintenance - WBEA audit
SO2	11 Apr 2017 13:00	11 Apr 2017 14:00	2	Maintenance - WBEA audit
TRS	13 Apr 2017 10:00	13 Apr 2017 12:00	3	Maintenance - WBEA audit
Wind Speed, Wind Direction	05 Apr 2017 03:00	05 Apr 2017 08:00	6	Flat line in sensor output signal

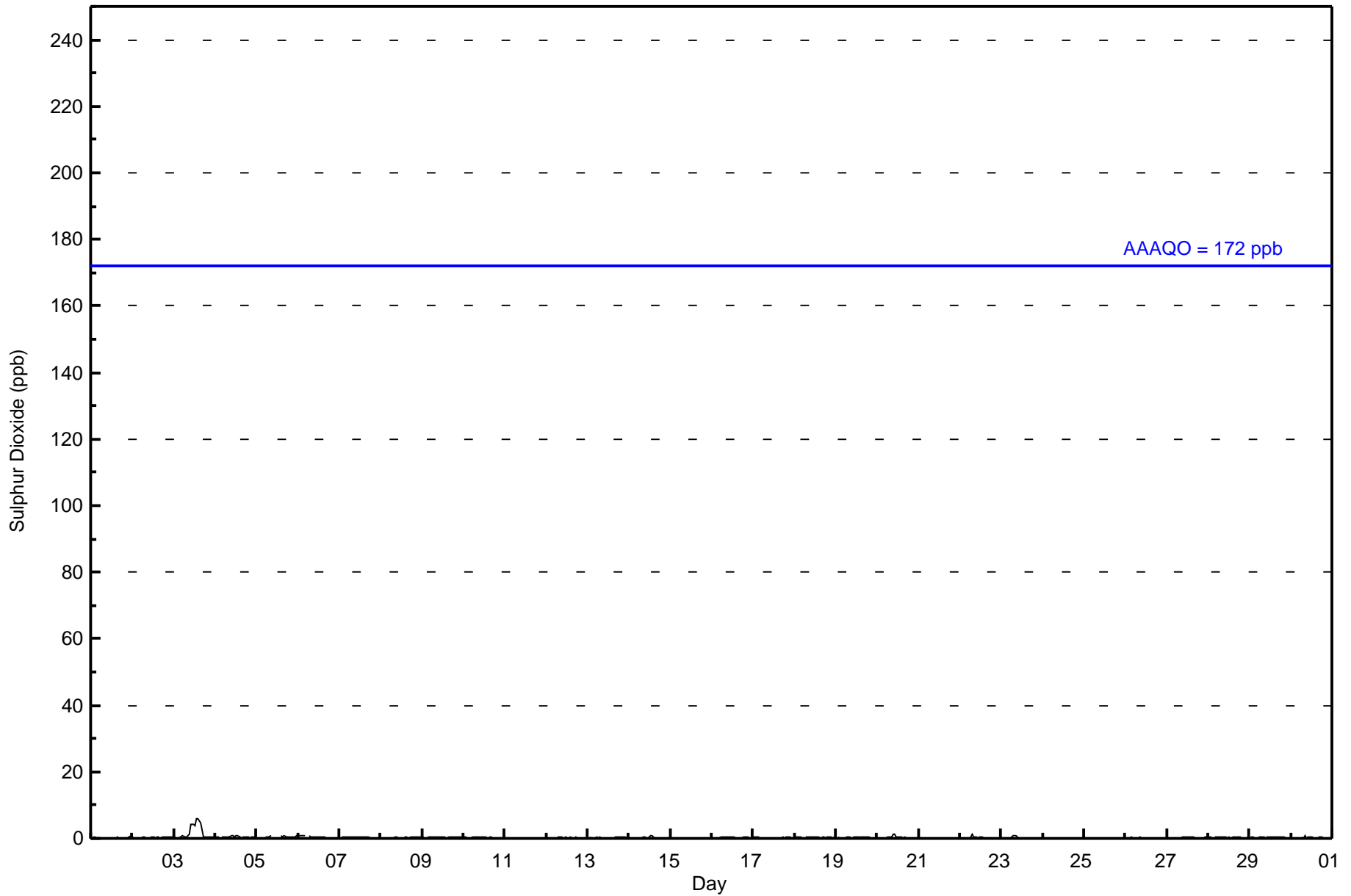


Number of Exceedences (AAAQO):		1-hr: 0 24-hr: 0		Hours in Service:		720																																										
Maximum Value: 6 ppb on Apr 3 15:00		Maximum Daily Average: 1.7 ppb on Apr 3		Hours of Data:		683																																										
Minimum Value: 0 ppb on Apr 20 21:00		Minimum Daily Average: 0.0 ppb on Apr 21		Hours of Missing Data:		37																																										
Maximum Diurnal Average: 0.5 ppb at hour 14		Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Calibration:		35																																										
Monthly Average: 0.3 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 2		Percent Operational Time:		99.7																																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0.2	1																						
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0.3	1																						
3-Apr	0	0	Z	1	1	1	1	1	1	1	4	4	4	6	6	4	2	0	0	0	0	0	0	0	1.7	6																						
4-Apr	0	1	1	Z	0	0	0	0	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0.5	1																						
5-Apr	0	0	0	0	Z	0	1	1	1	1	C	C	C	C	C	1	1	1	0	0	1	0	0	1	0.5	1																						
6-Apr	1	1	1	1	1	Z	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1																						
7-Apr	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																						
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0																						
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	M	M	0	0	0	0	0	0	0	0	0	0	0.1	0																						
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.2	1																						
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.2	1																						
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																						
16-Apr	0	0	0	Z	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																						
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0																						
19-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
20-Apr	0	Z	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																						
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0																						
22-Apr	0	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1																						
23-Apr	0	0	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1																						
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																						
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																						
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																						
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0																						
29-Apr	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1																						
30-Apr	0	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1																						
																								0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
																								1	1	1	1	1	1	1	1	1	1	4	4	4	6	6	4	2	0	0	1	1	1	1	1	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	683	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	23	678
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	23	678

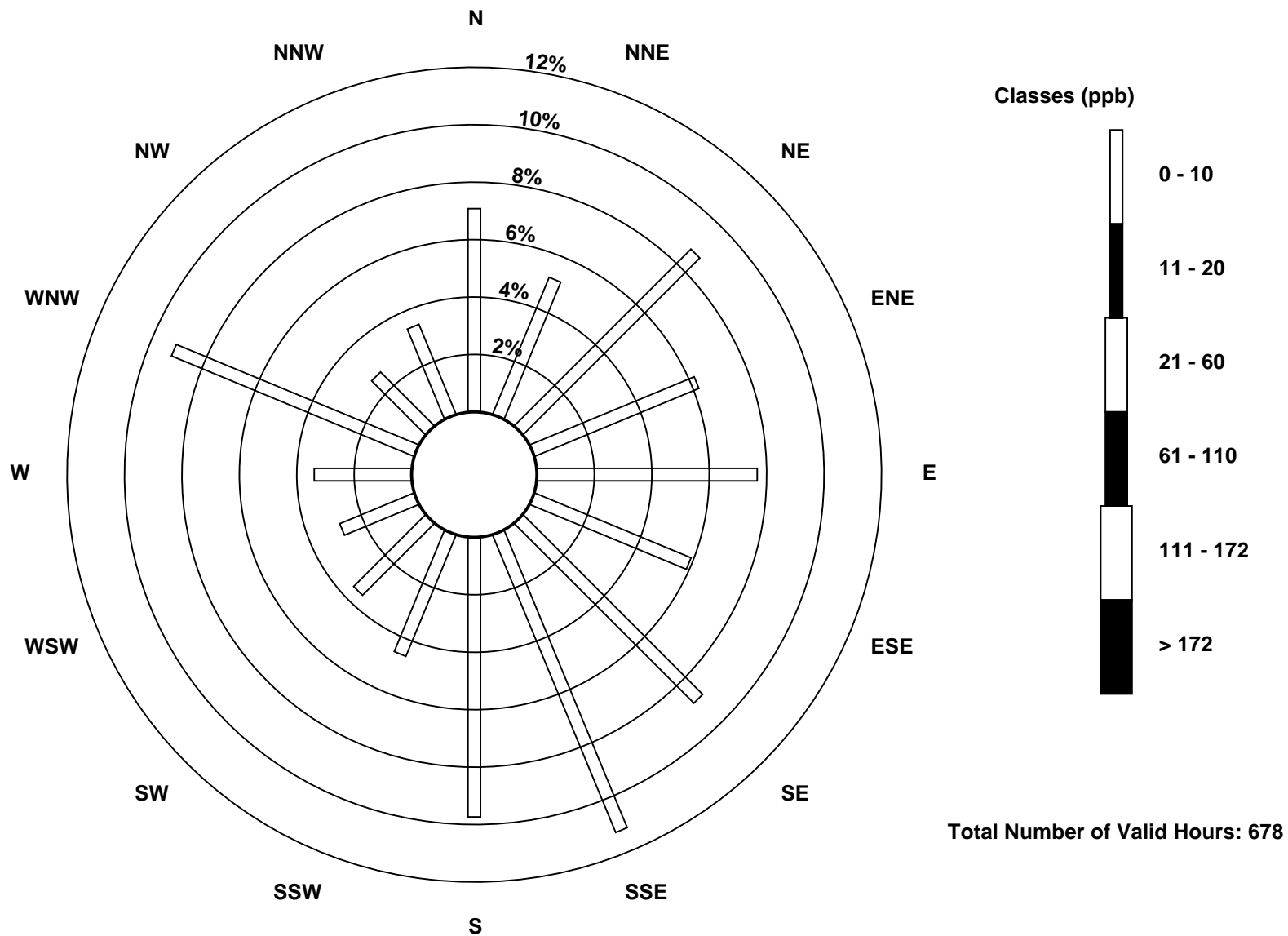
Total Number of Valid Hours: 678

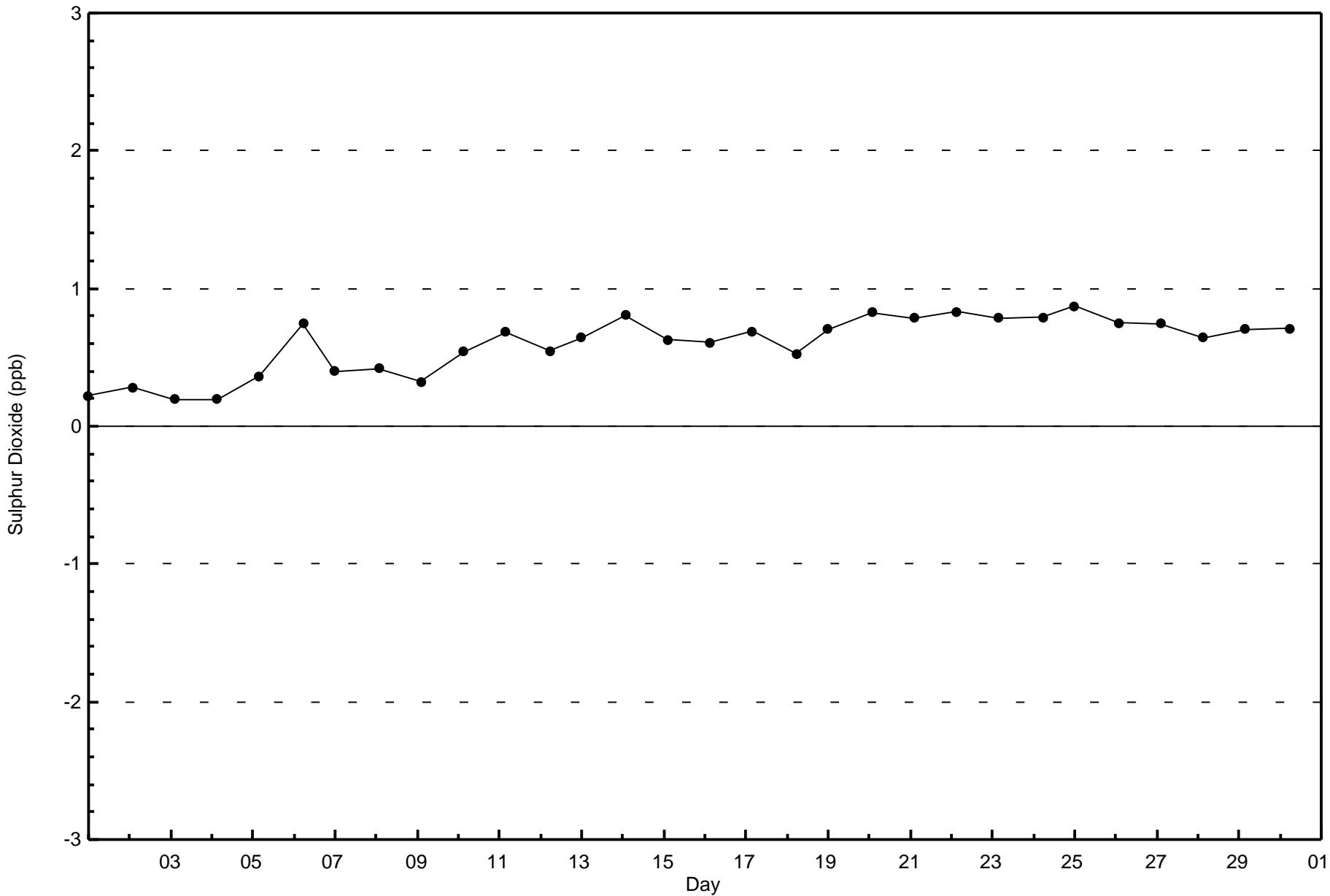
Total Number of Hours: 720

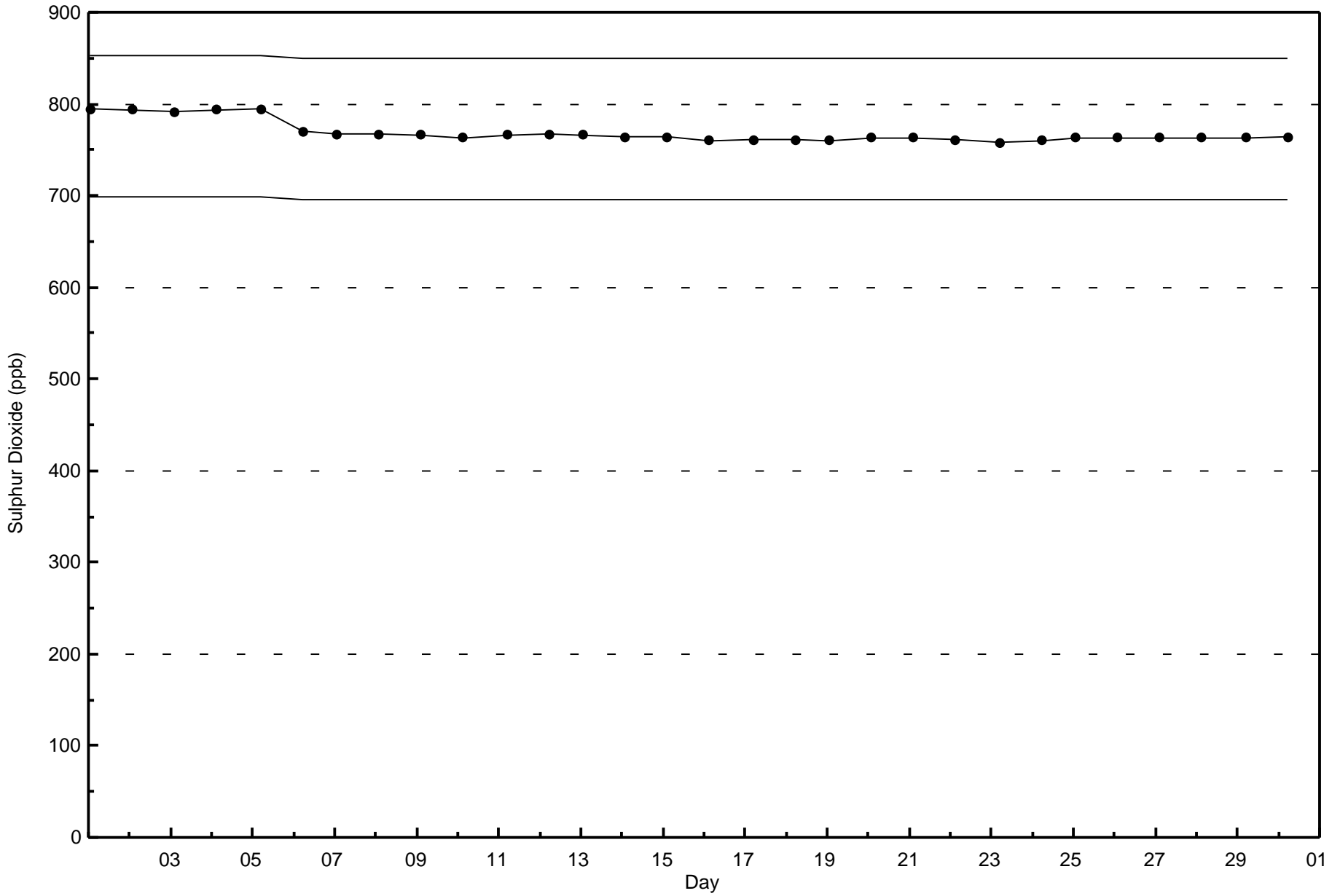


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Anzac (AMS 14)









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

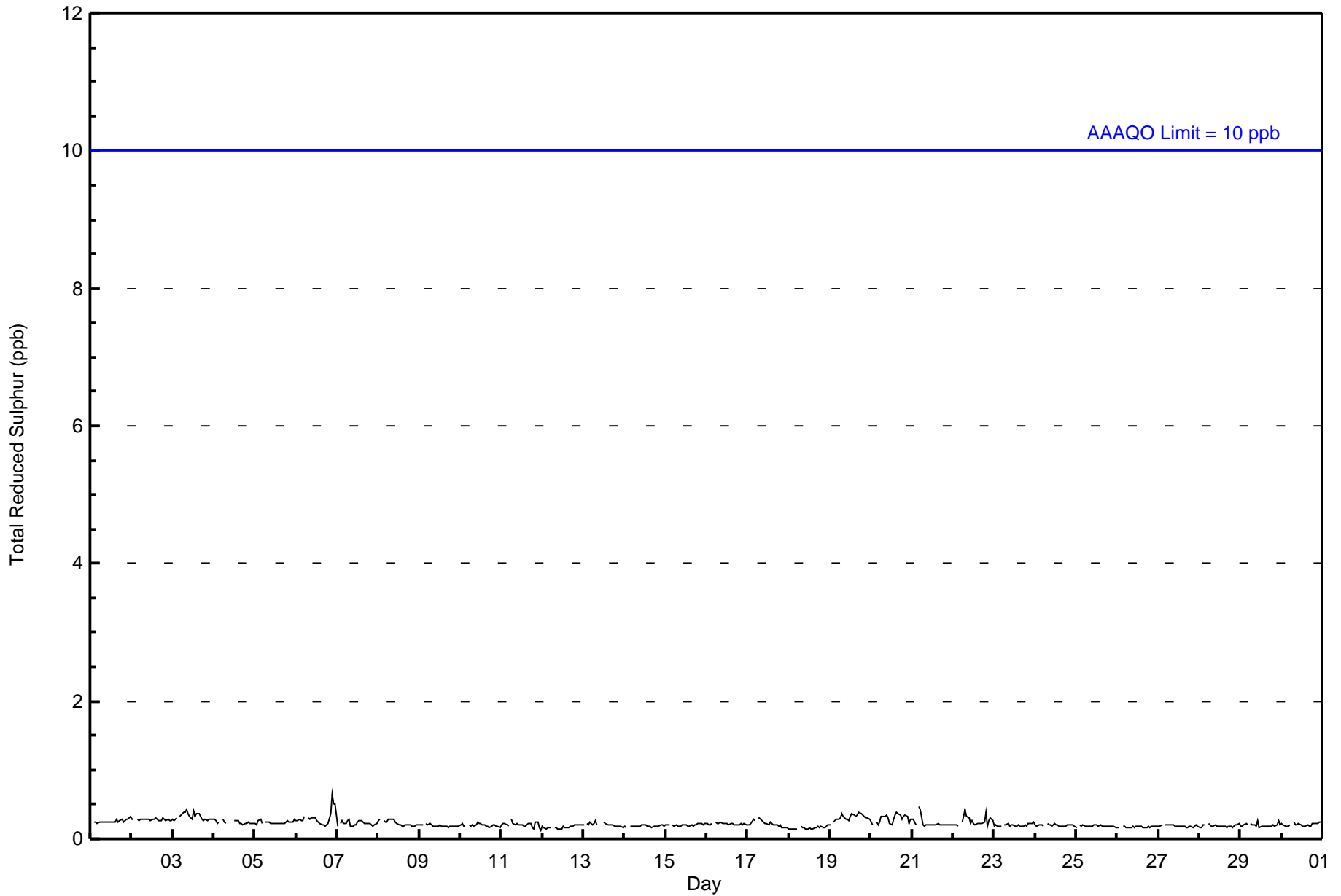
Anzac - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 1 ppb on Apr 6 22:00 Maximum Daily Average: 0.3 ppb on Apr 3																Hours in Service: 720 Hours of Data: 683 Hours of Missing Data: 37 Hours of Calibration: 34 Percent Operational Time: 99.6											
Minimum Value: 0 ppb on Apr 12 00:00 Minimum Daily Average: 0.2 ppb on Apr 18 Maximum Diurnal Average: 0.2 ppb at hour 7 Minimum Diurnal Average: 0.2 ppb at hour 18 Monthly Average: 0.2 ppb Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
4-Apr	0	0	0	0	Z	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.3	1
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
12-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
13-Apr	0	Z	0	0	0	0	0	0	0	M	M	M	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
20-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
0.2																								Diurnal Average			
0																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	683	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	46	36	62	39	50	40	58	81	65	32	24	17	23	62	17	26	678
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	36	62	39	50	40	58	81	65	32	24	17	23	62	17	26	678

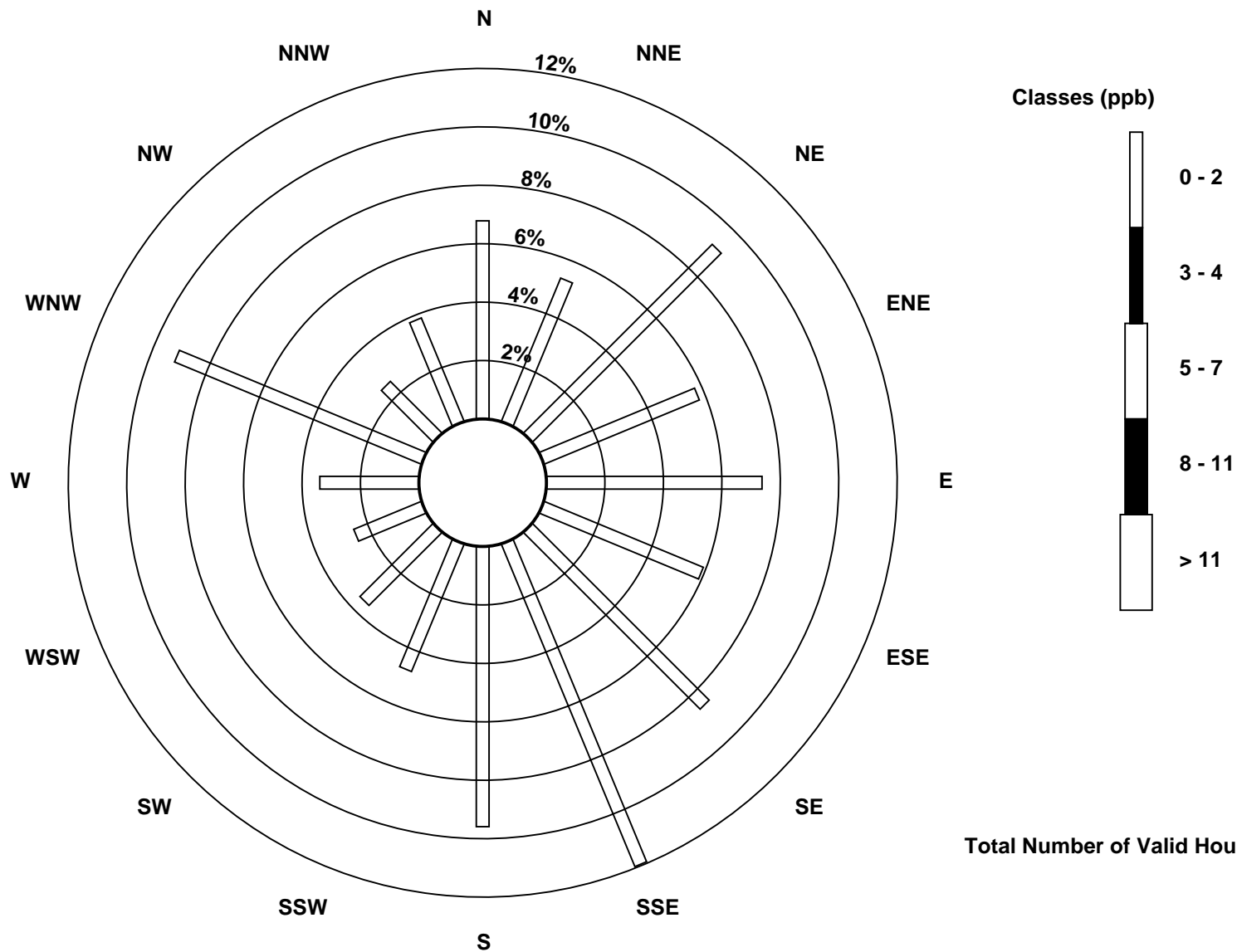
Total Number of Valid Hours: 678

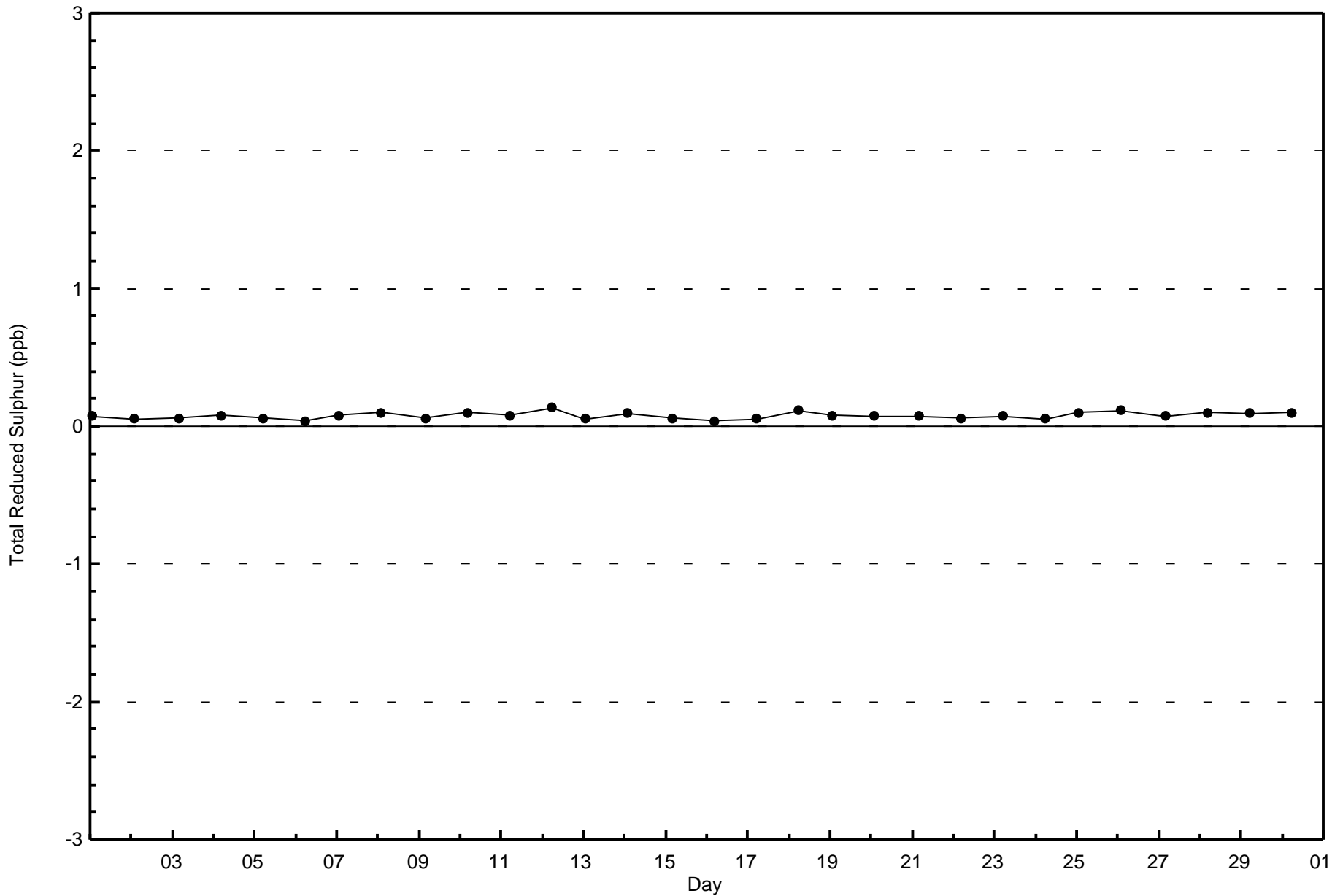
Total Number of Hours: 720

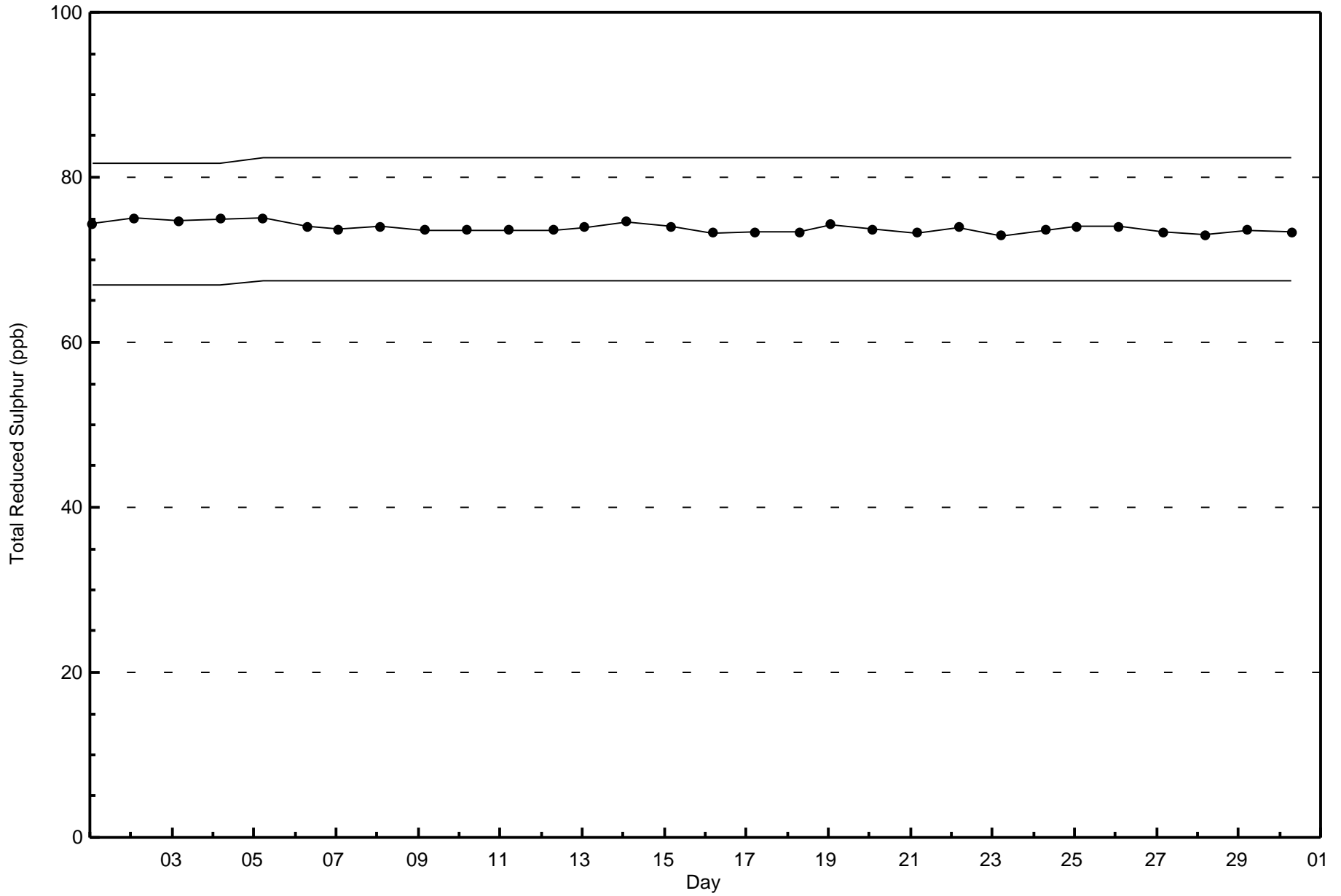


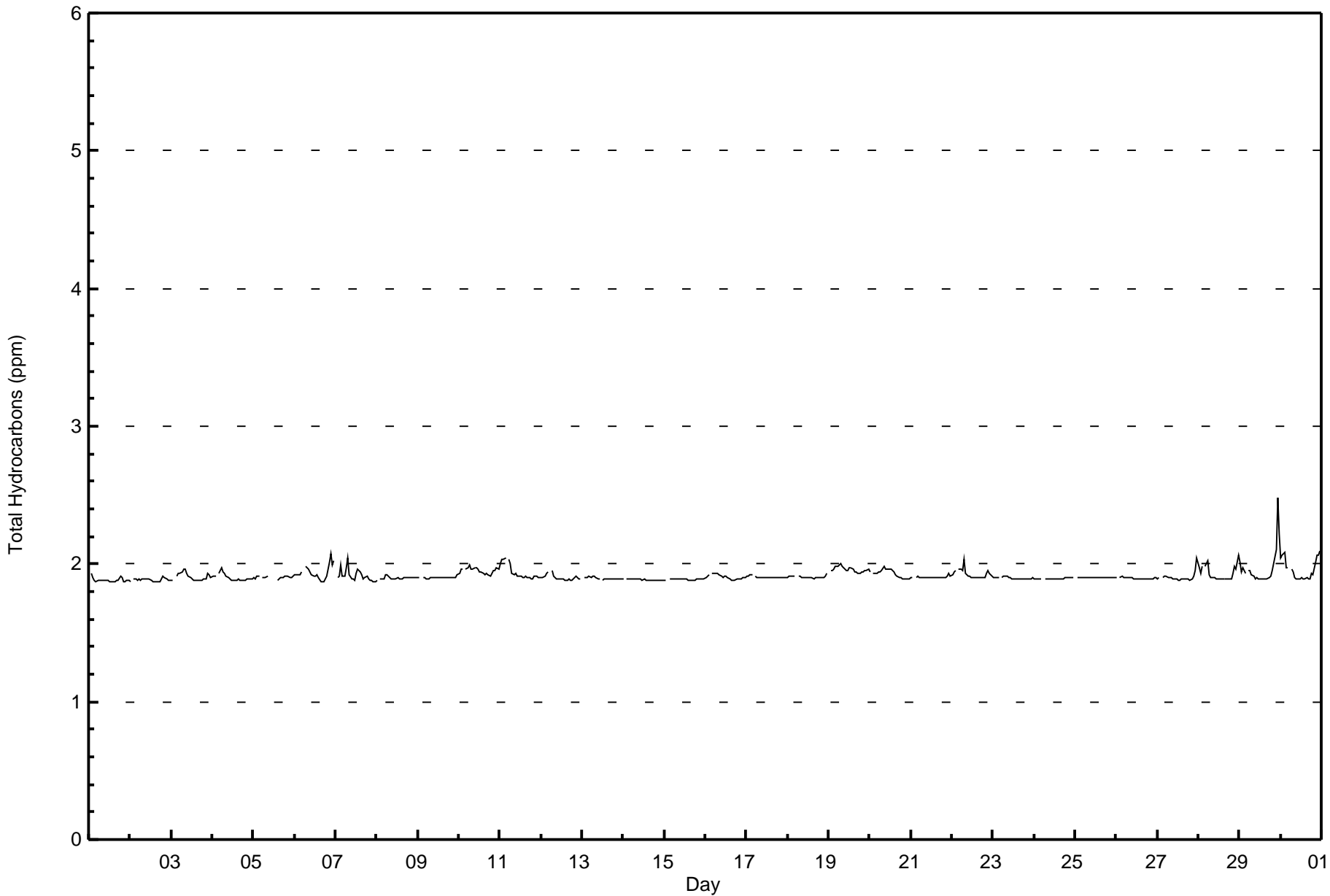
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Anzac (AMS 14)











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	674	98.54	98.54
2.1 - 3.0	10	1.46	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	48	35	59	42	51	40	60	76	63	30	22	19	20	62	17	25	669
2.1 - 3.0	0	0	0	0	0	0	0	0	3	1	2	0	3	0	1	0	10
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	51	40	60	76	66	31	24	19	23	62	18	25	679

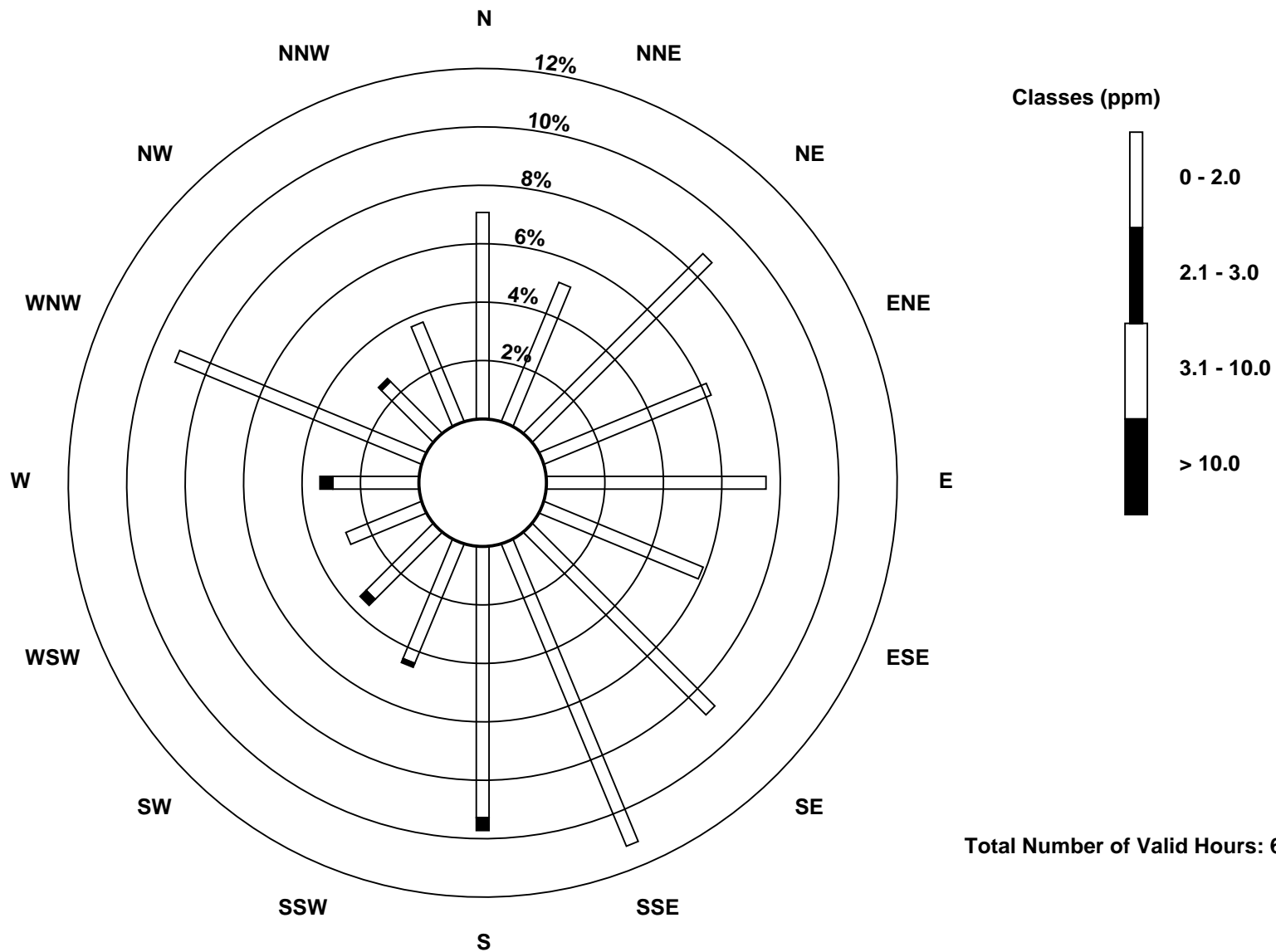
Total Number of Valid Hours: 679

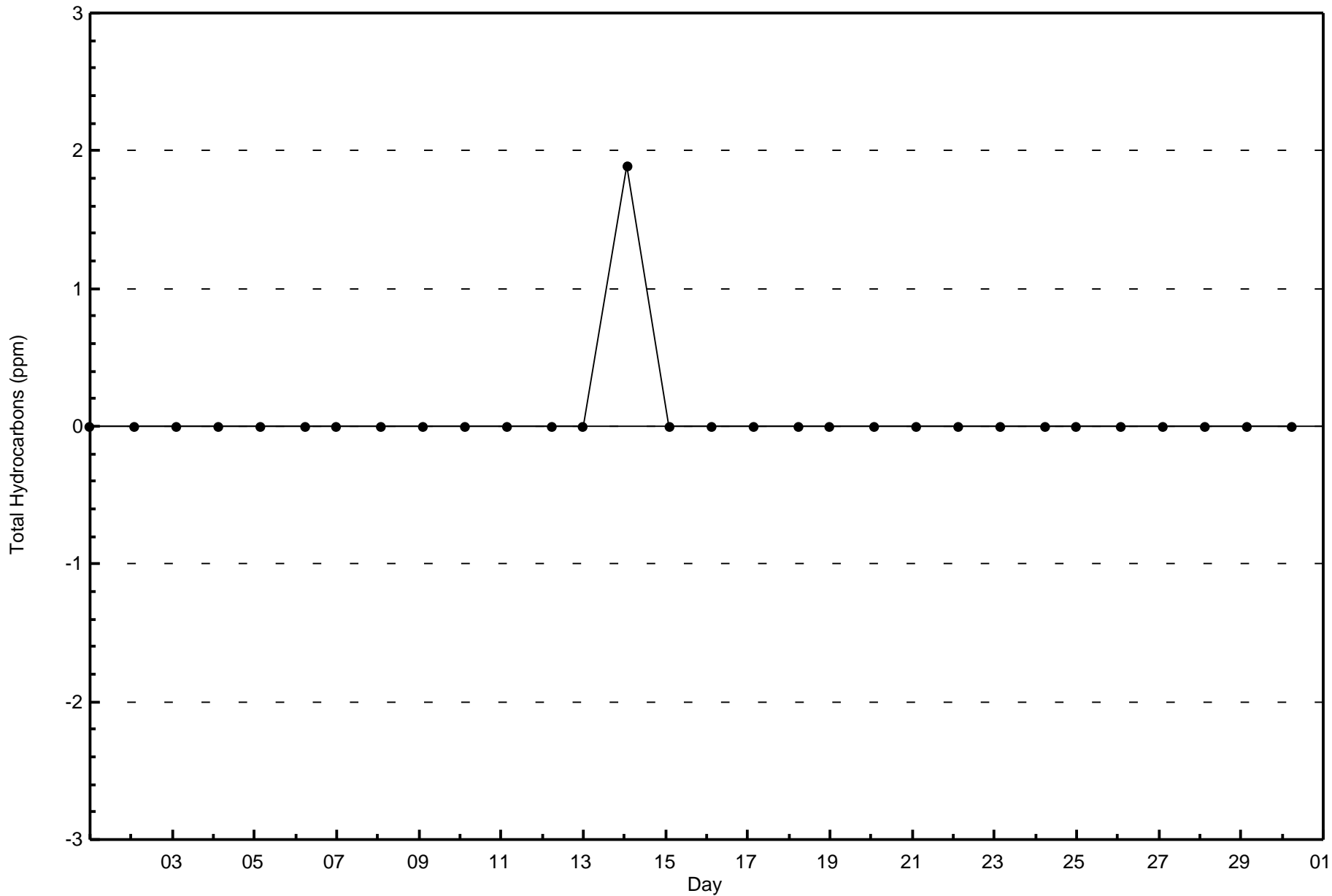
Total Number of Hours: 720

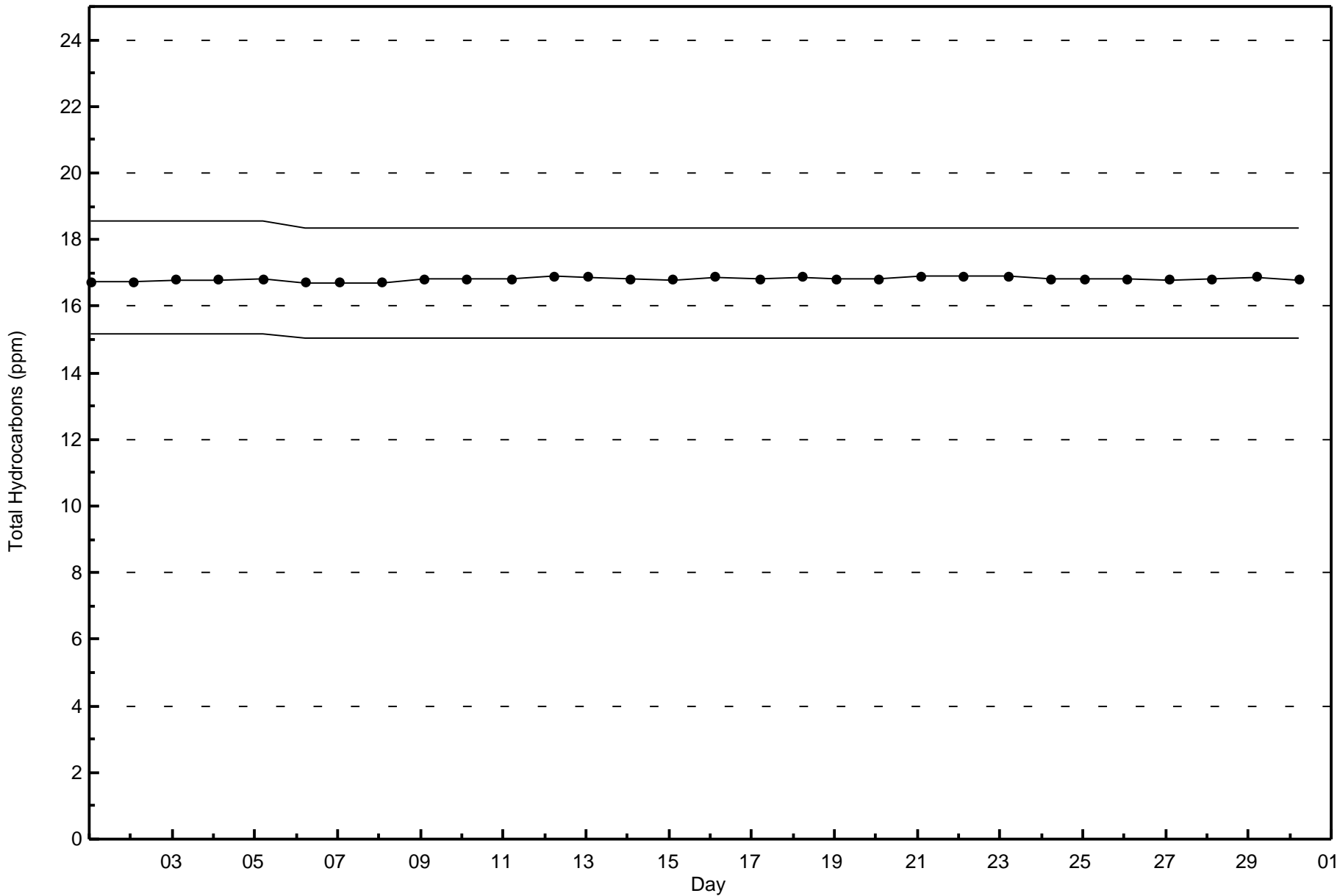


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Anzac (AMS 14)



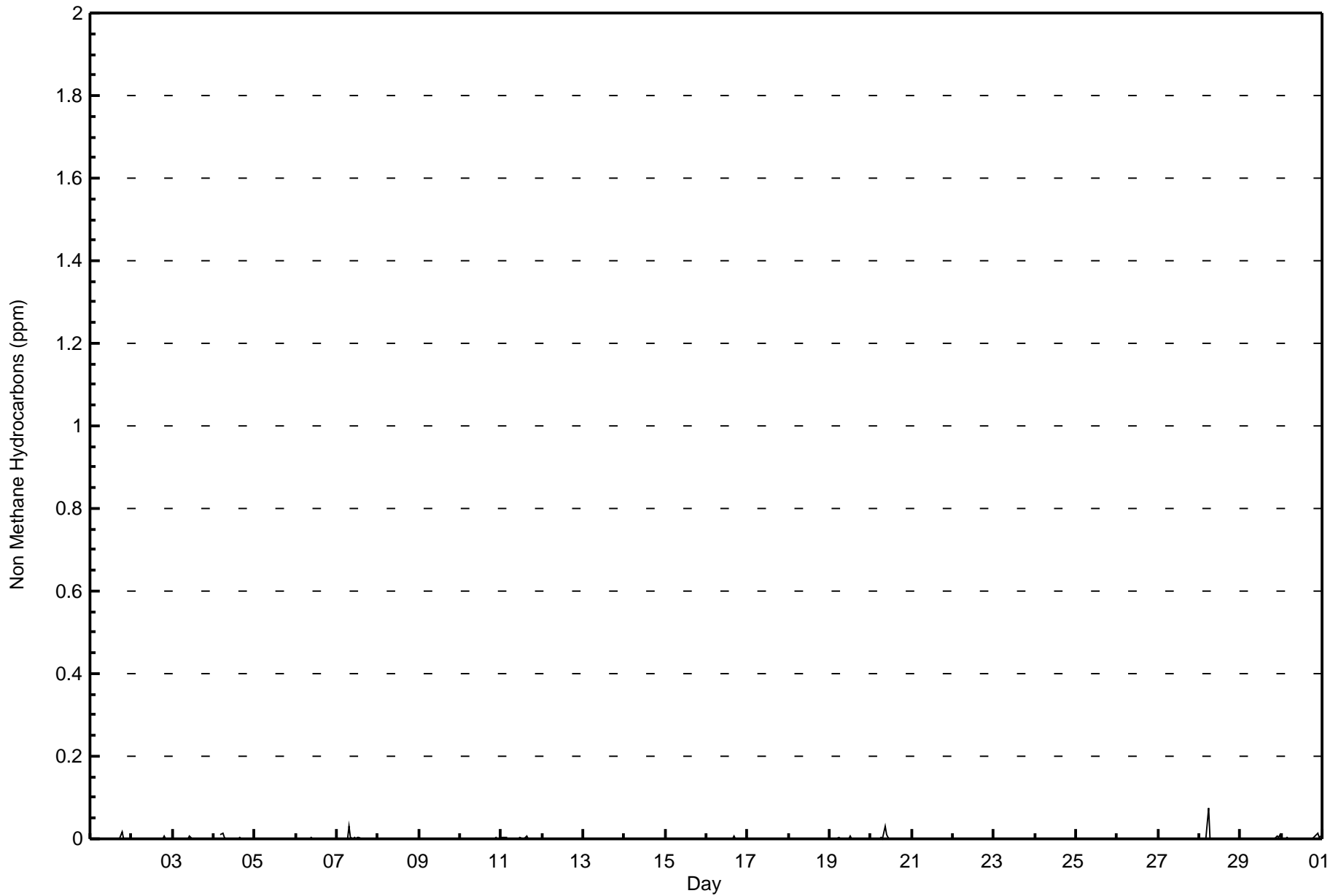






Maximum Value: 0.075 ppm on Apr 28 06:00		Maximum Daily Average: 0.003 ppm on Apr 28		Hours in Service: 720																						
Minimum Value: 0.000 ppm on Apr 1 03:00		Minimum Daily Average: 0.000 ppm on Apr 5		Hours of Data: 684																						
Maximum Diurnal Average: 0.004 ppm at hour 6		Minimum Diurnal Average: 0.000 ppm at hour 18		Hours of Missing Data: 36																						
Monthly Average: 0.001 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0		Hours of Calibration: 35																						
				Percent Operational Time: 99.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018	0.002	0.000	0.000	0.000	0.000	0.001	0.018
2-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.007
3-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
4-Apr	0.000	0.000	0.000	Z	0.010	0.015	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.015
5-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
7-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.029	0.005	0.000	0.002	0.000	0.003	0.003	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029
8-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.001	0.002
11-Apr	0.005	0.002	0.002	0.002	Z	0.000	0.002	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.002	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
12-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
17-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19-Apr	Z	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
20-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.004	0.001	0.030	0.009	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030
21-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
23-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Apr	0.000	0.000	0.000	Z	0.000	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075
29-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.004	0.009
30-Apr	0.001	0.001	0.002	0.002	0.001	Z	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.009	0.014	0.005	0.008	0.002	0.014
																								Diurnal Average		
																								Diurnal Maximum		
																								0.001 0.001		
																								0.005 0.009		

Z - zerospan C - Calibration M - Maintenance





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	668	97.66	97.66
0.006 - 0.05	15	2.19	99.85
0.06 - 0.1	1	0.15	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	48	35	59	42	50	40	58	75	65	28	24	18	20	59	18	24	663
0.006 - 0.05	0	0	0	0	1	0	2	1	1	2	0	1	3	3	0	1	15
0.06 - 0.1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	51	40	60	76	66	31	24	19	23	62	18	25	679

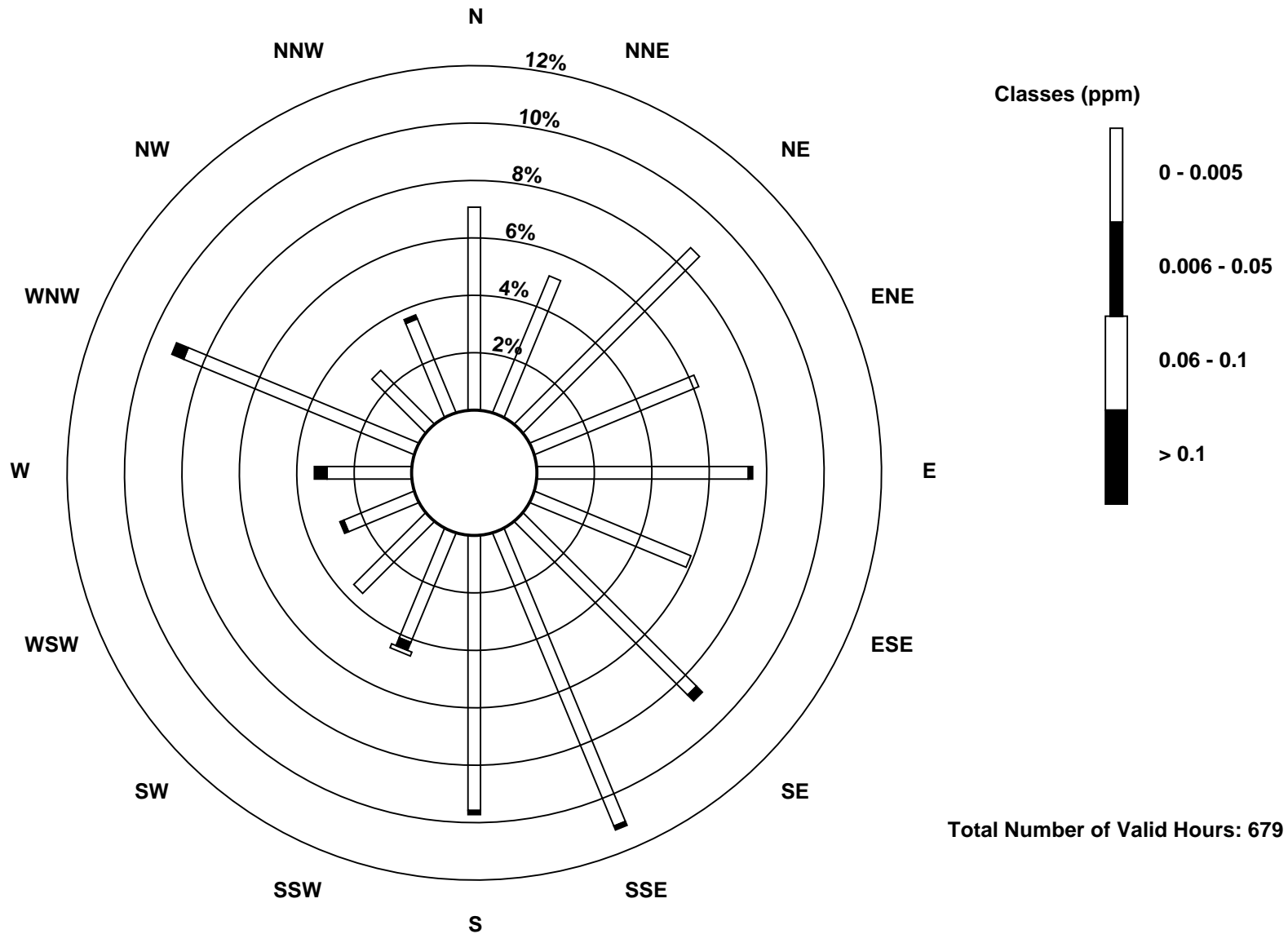
Total Number of Valid Hours: 679

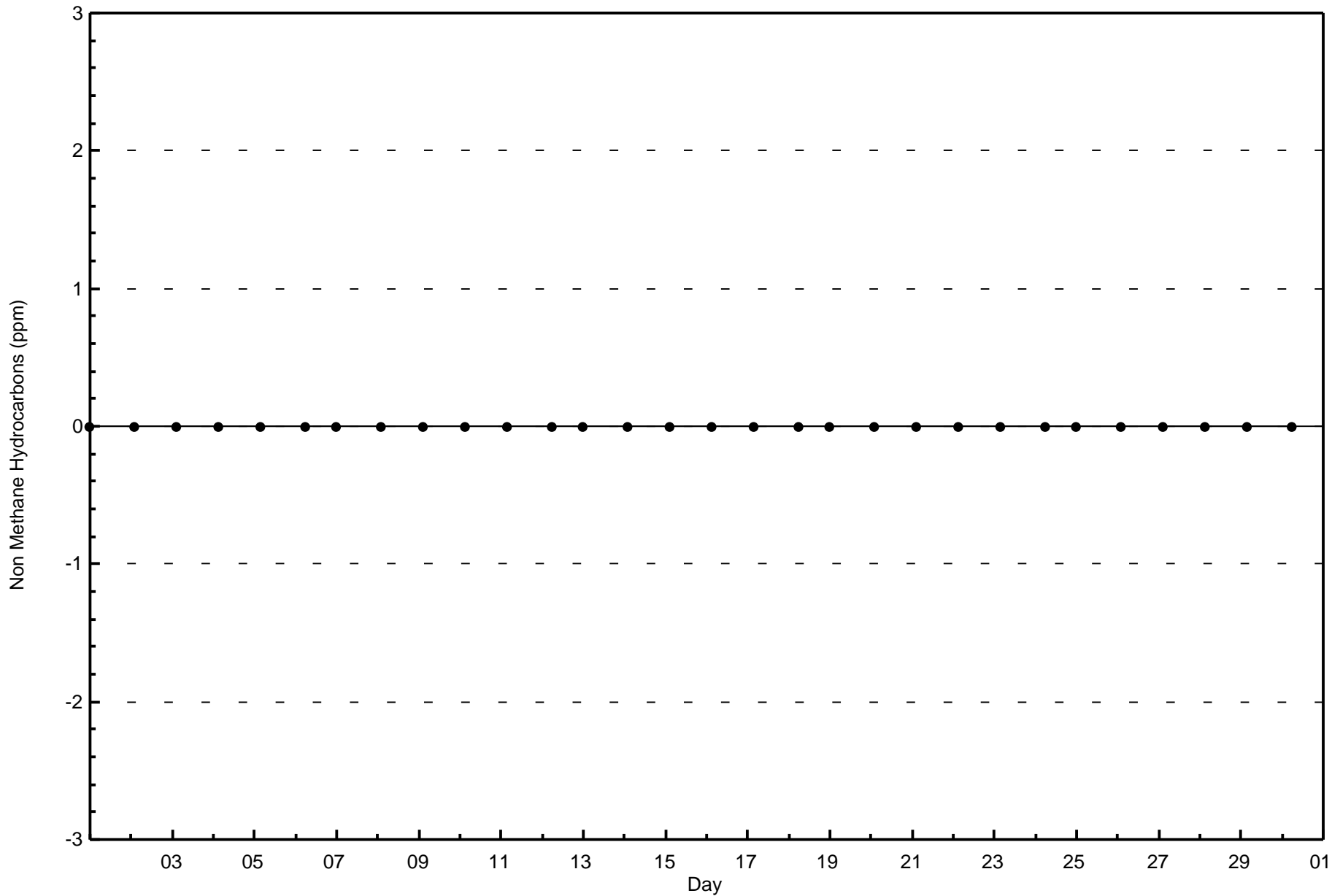
Total Number of Hours: 720

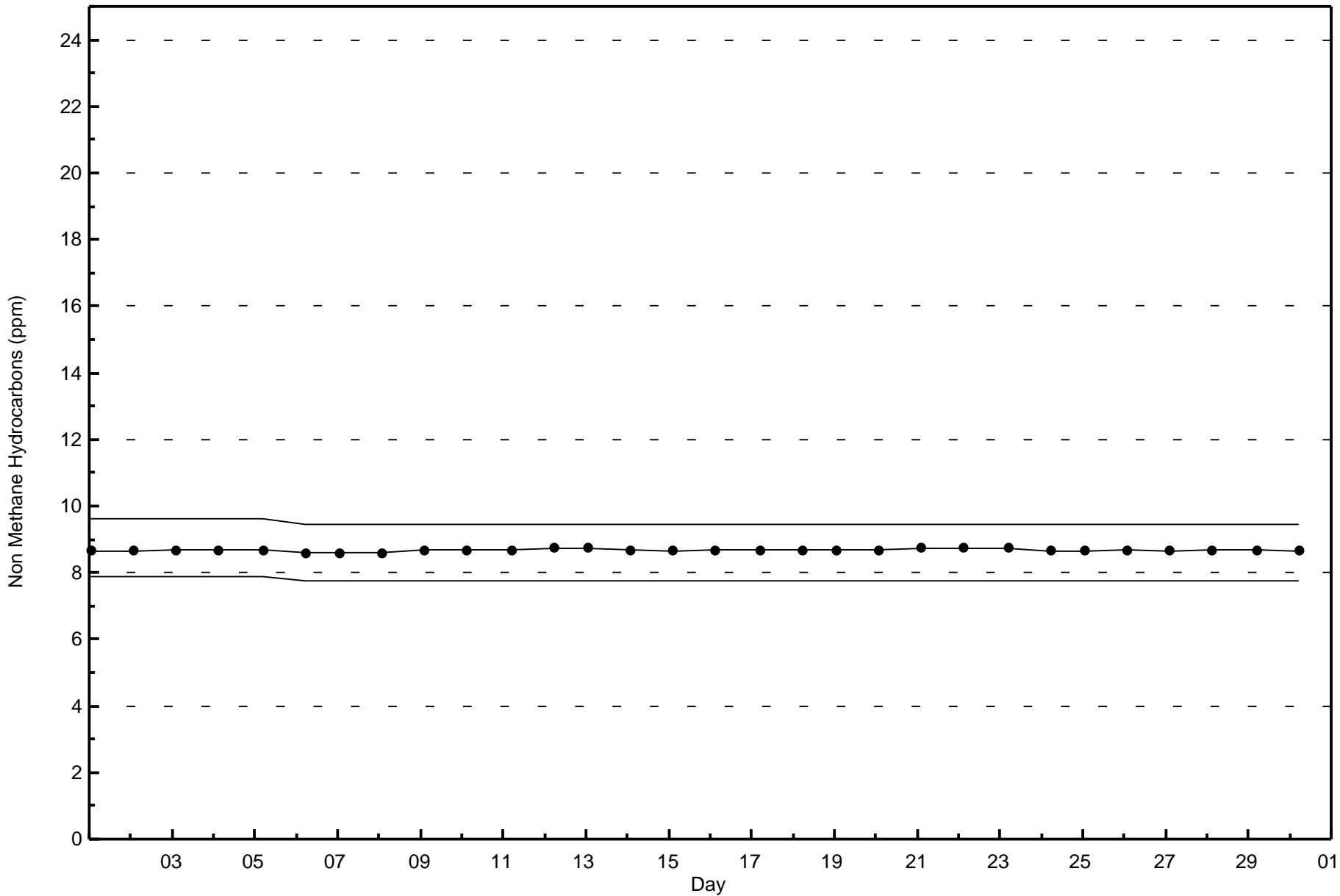


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Non Methane Hydrocarbons (NMHC) - ppm
Anzac (AMS 14)



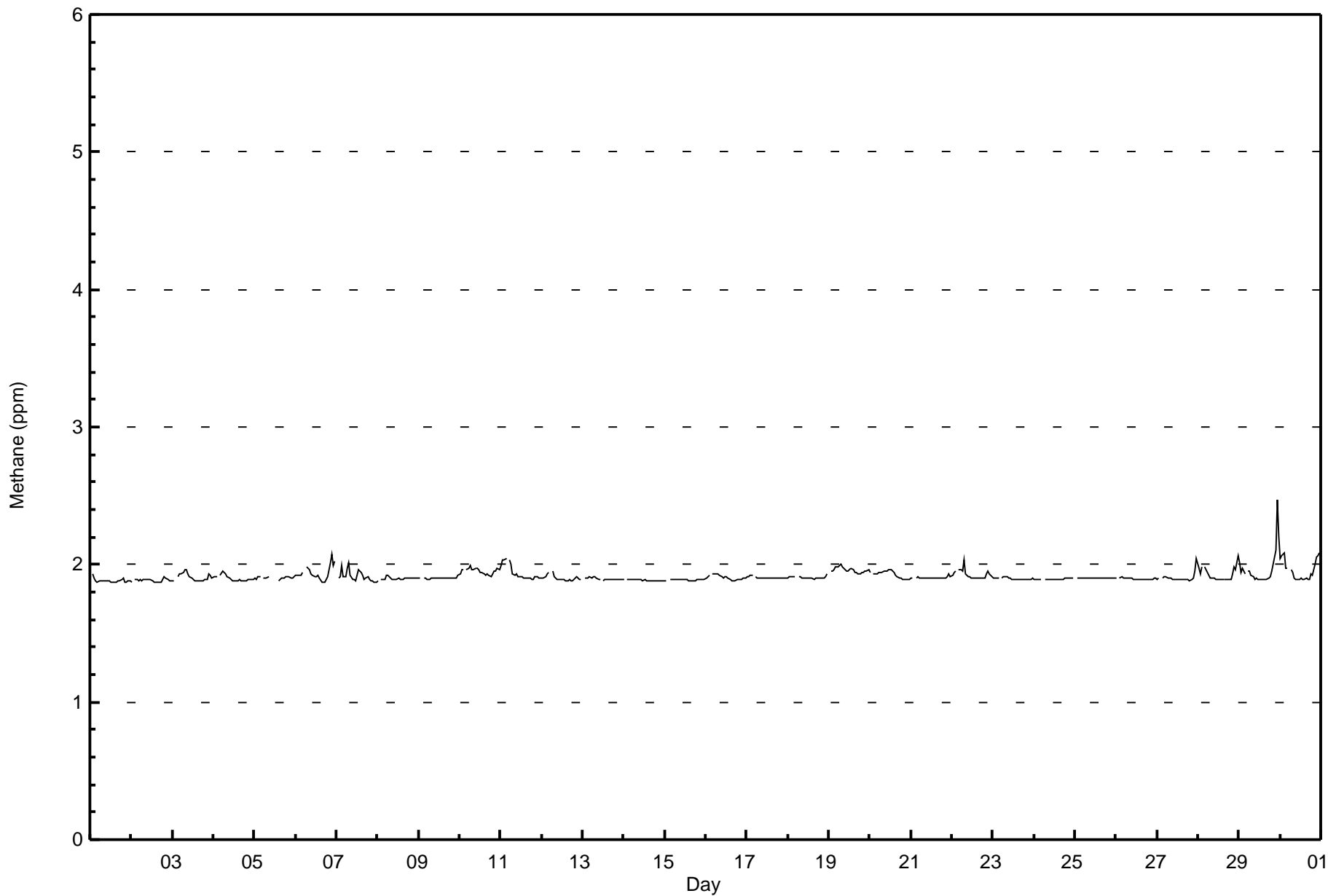






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Anzac - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	674	98.54	98.54
2.1 - 3.0	10	1.46	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Anzac - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	48	35	59	42	51	40	60	76	63	30	22	19	20	62	17	25	669
2.1 - 3.0	0	0	0	0	0	0	0	0	3	1	2	0	3	0	1	0	10
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	51	40	60	76	66	31	24	19	23	62	18	25	679

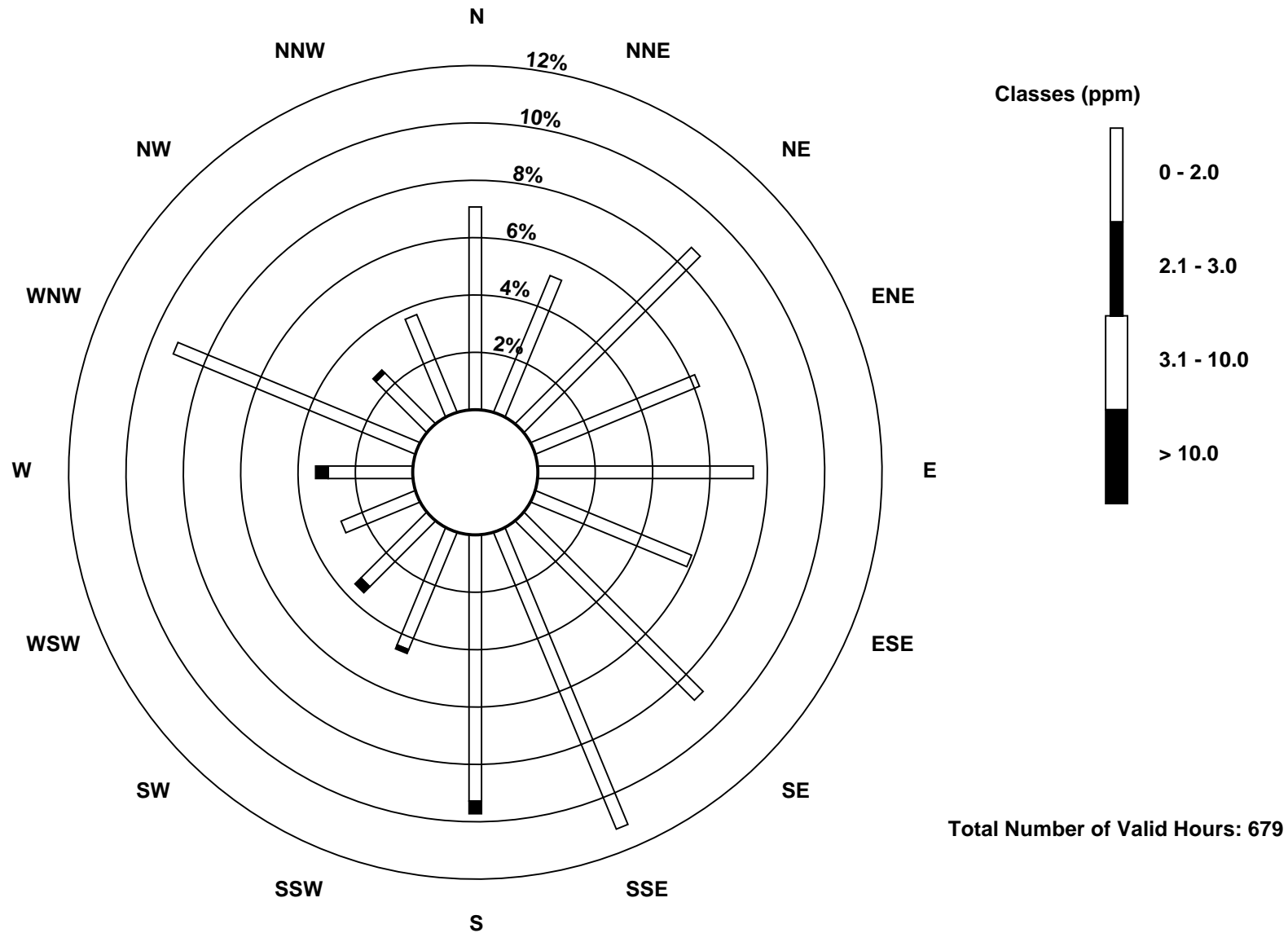
Total Number of Valid Hours: 679

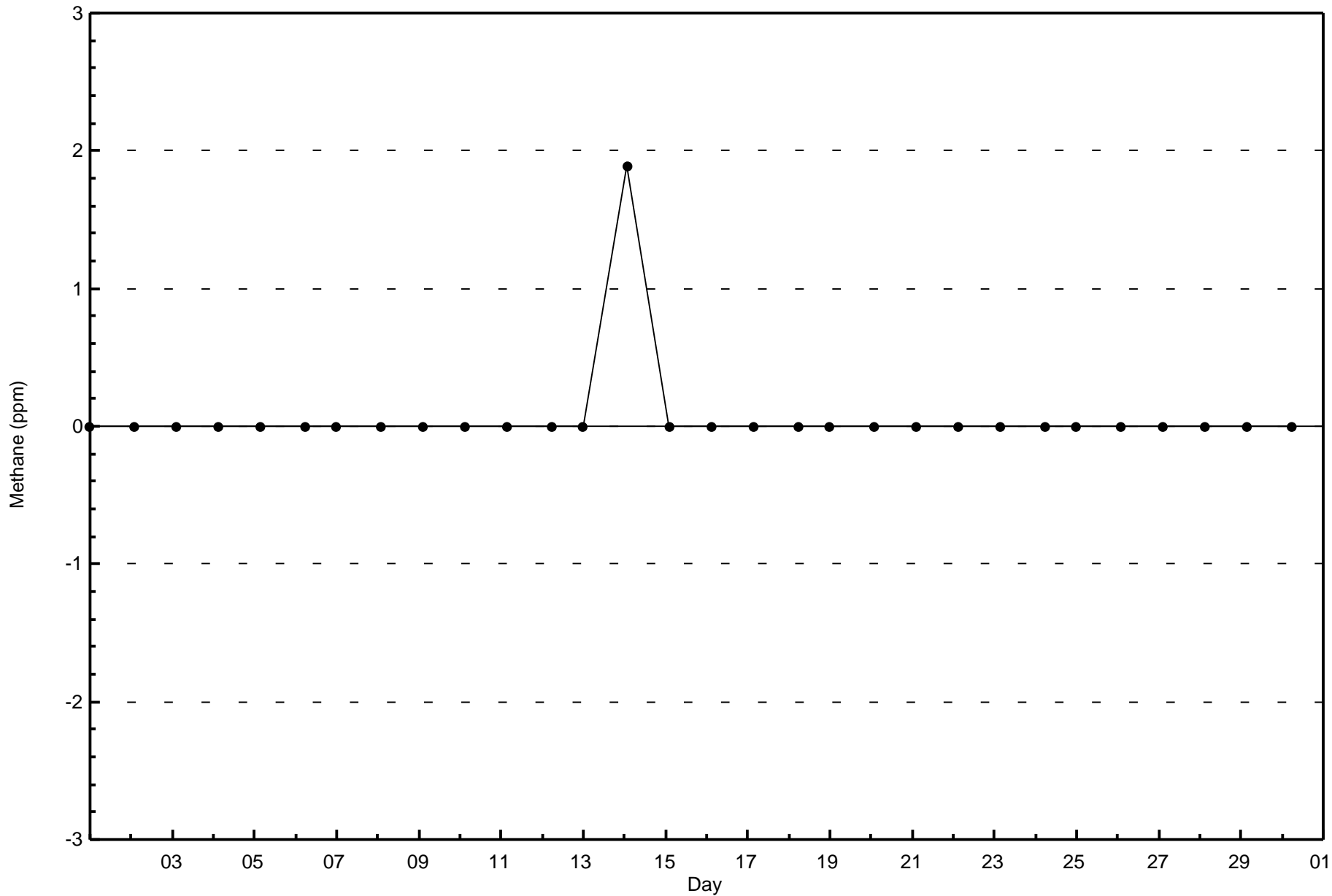
Total Number of Hours: 720

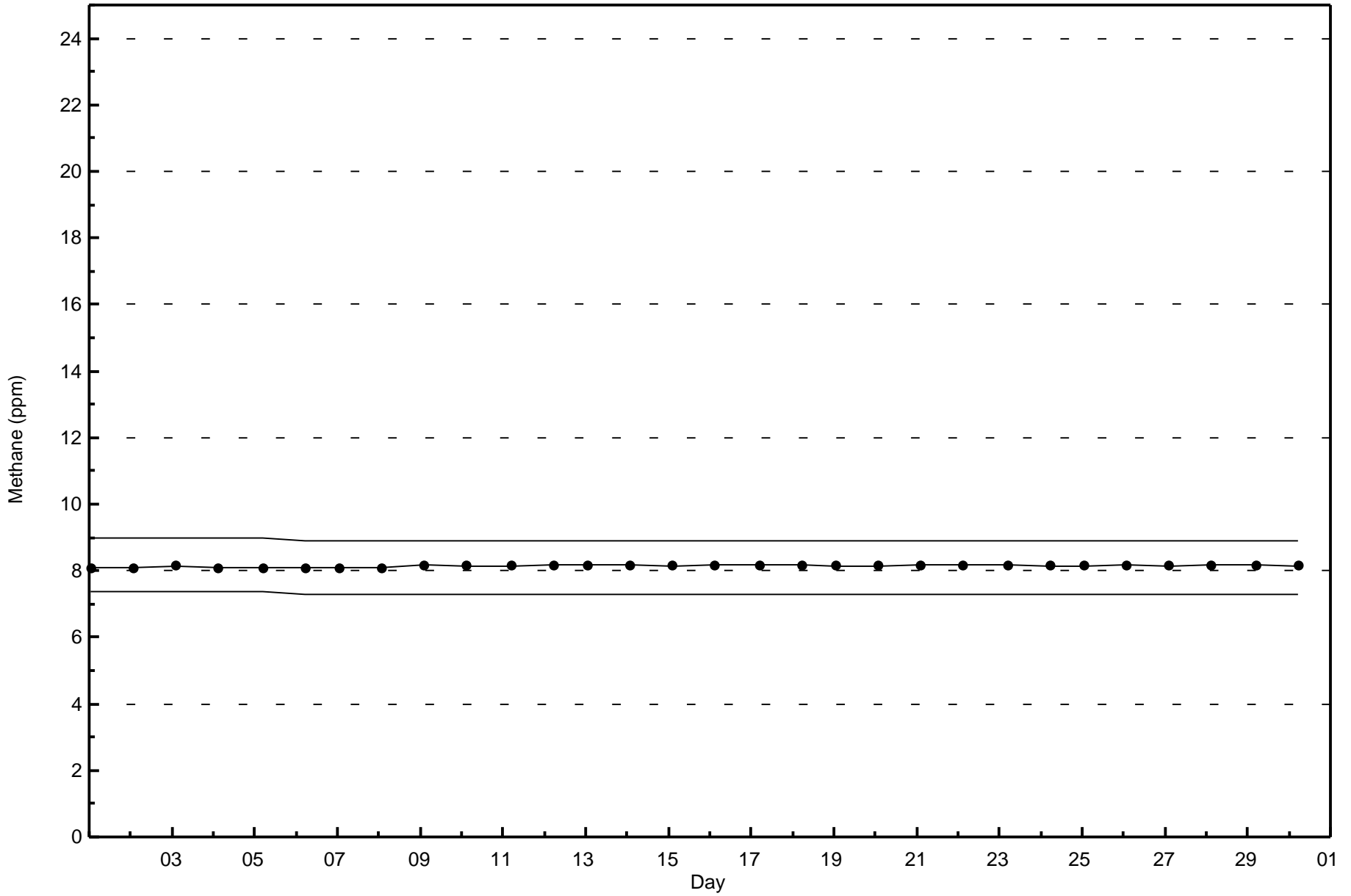


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Methane (CH₄) - ppm
Anzac (AMS 14)







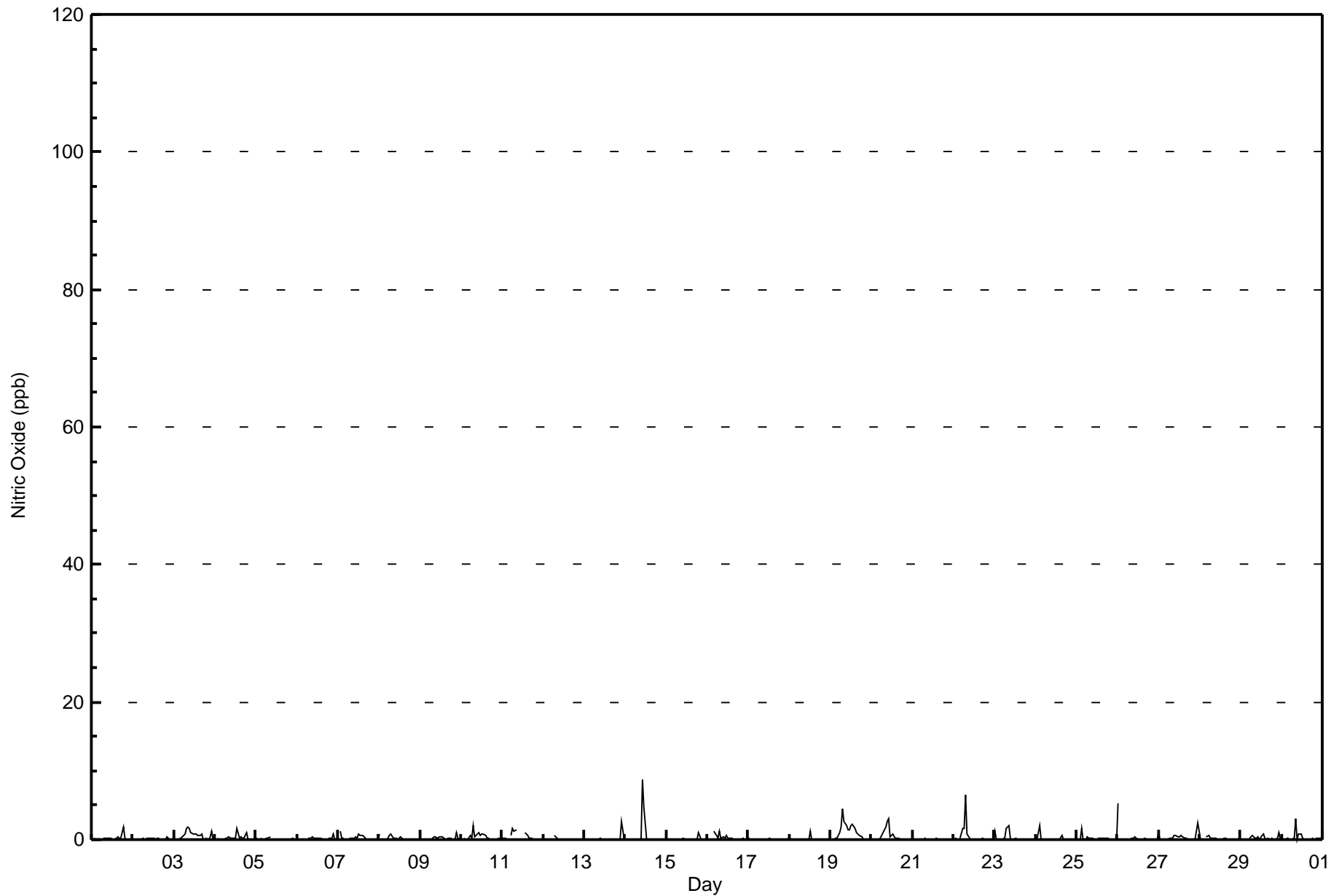


Maximum Value: 9 ppb on Apr 14 11:00																	Maximum Daily Average: 1.0 ppb on Apr 19																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 12 14:00																	Minimum Daily Average: 0.1 ppb on Apr 21																	Hours of Data: 681	
Maximum Diurnal Average: 0.8 ppb at hour 8																	Minimum Diurnal Average: 0.1 ppb at hour 21																	Hours of Missing Data: 39	
Monthly Average: 0.3 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 3																	Hours of Calibration: 35	
																	Percent Operational Time: 99.4																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0.2	2									
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
3-Apr	0	0	Z	0	0	0	1	2	2	2	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0.6	2									
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0.2	2									
5-Apr	0	0	0	0	Z	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0.1	0									
6-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1									
7-Apr	Z	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.3	1									
8-Apr	1	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1									
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0.2	1									
10-Apr	0	0	0	Z	0	1	0	2	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.4	2									
11-Apr	0	0	0	0	Z	1	2	1	1	M	M	M	M	1	1	1	0	0	0	0	0	0	0	0	0.4	2									
12-Apr	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0.1	3									
14-Apr	0	Z	0	0	0	0	0	0	0	0	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0.6	9									
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.1	1									
16-Apr	0	0	0	Z	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1									
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
19-Apr	Z	0	0	0	0	1	2	4	3	2	1	1	2	2	2	1	1	1	0	0	0	0	0	0	1.0	4									
20-Apr	0	Z	0	0	0	0	1	1	2	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0.5	3									
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
22-Apr	0	0	0	Z	0	2	2	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	7									
23-Apr	1	0	0	0	Z	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2									
24-Apr	0	0	2	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	2									
25-Apr	Z	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2									
26-Apr	5	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	5									
27-Apr	1	0	Z	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	2	0.4	2									
28-Apr	0	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
29-Apr	0	0	0	0	Z	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0.3	1									
30-Apr	0	0	0	0	0	Z	0	0	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	3									
																	Diurnal Average		Diurnal Maximum																
																	0.4		5																
																	0.1		1																
																	0.1		2																
																	0.1		2																
																	0.1		1																
																	0.3		2																
																	0.4		2																
																	0.8		7																
																	0.6		3																
																	0.4		3																
																	0.7		9																
																	0.4		5																
																	0.4		2																
																	0.4		2																
																	0.3		2																
																	0.2		1																
																	0.1		1																
																	0.1		1																
																	0.2		2																
																	0.1		1																
																	0.1		0																
																	0.1		1																
																	0.3		3																
																	0.1		2																
																	Z - zerospan		C - Calibration																
																			M - Maintenance																



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	21	676
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	21	676

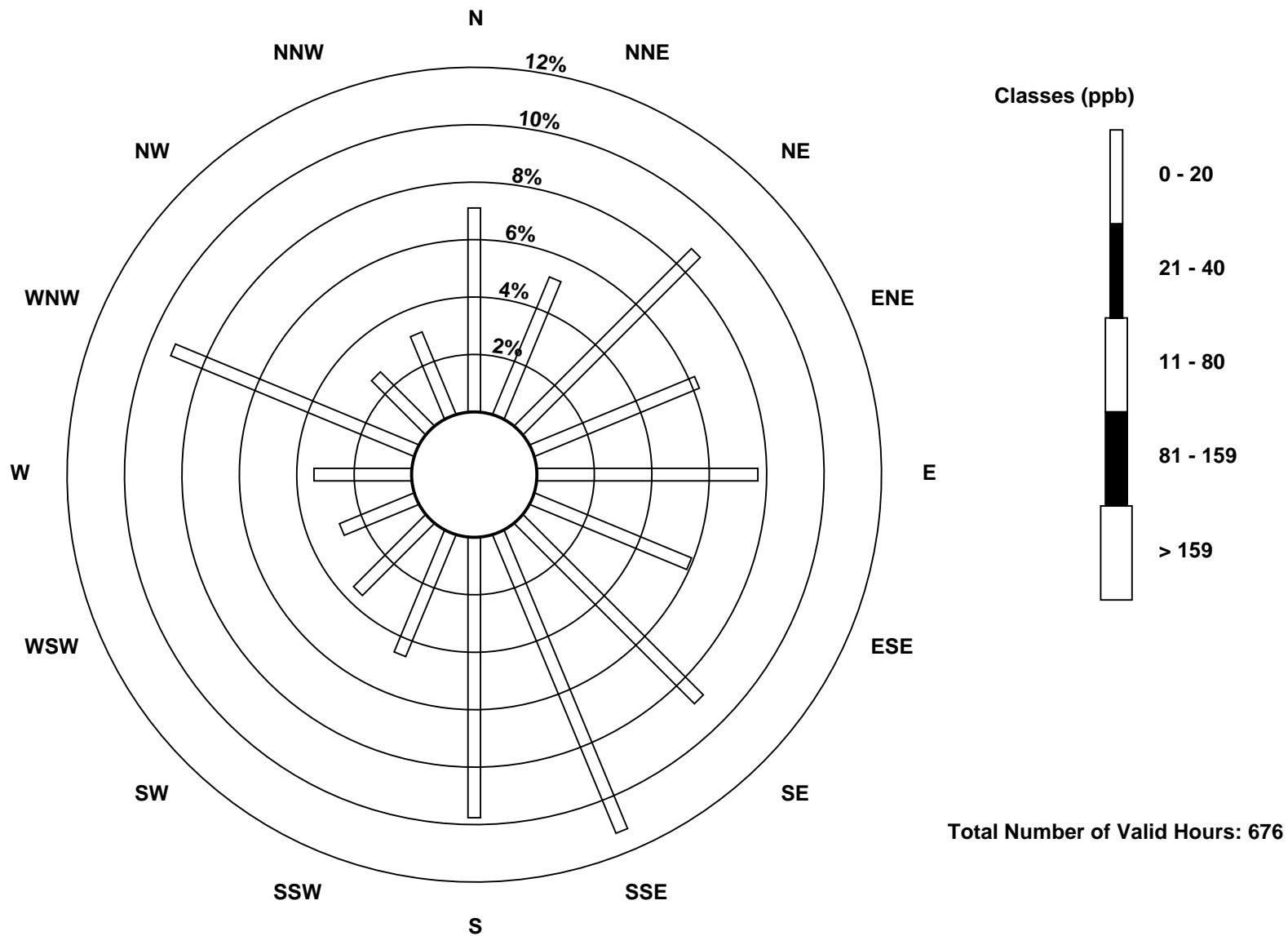
Total Number of Valid Hours: 676

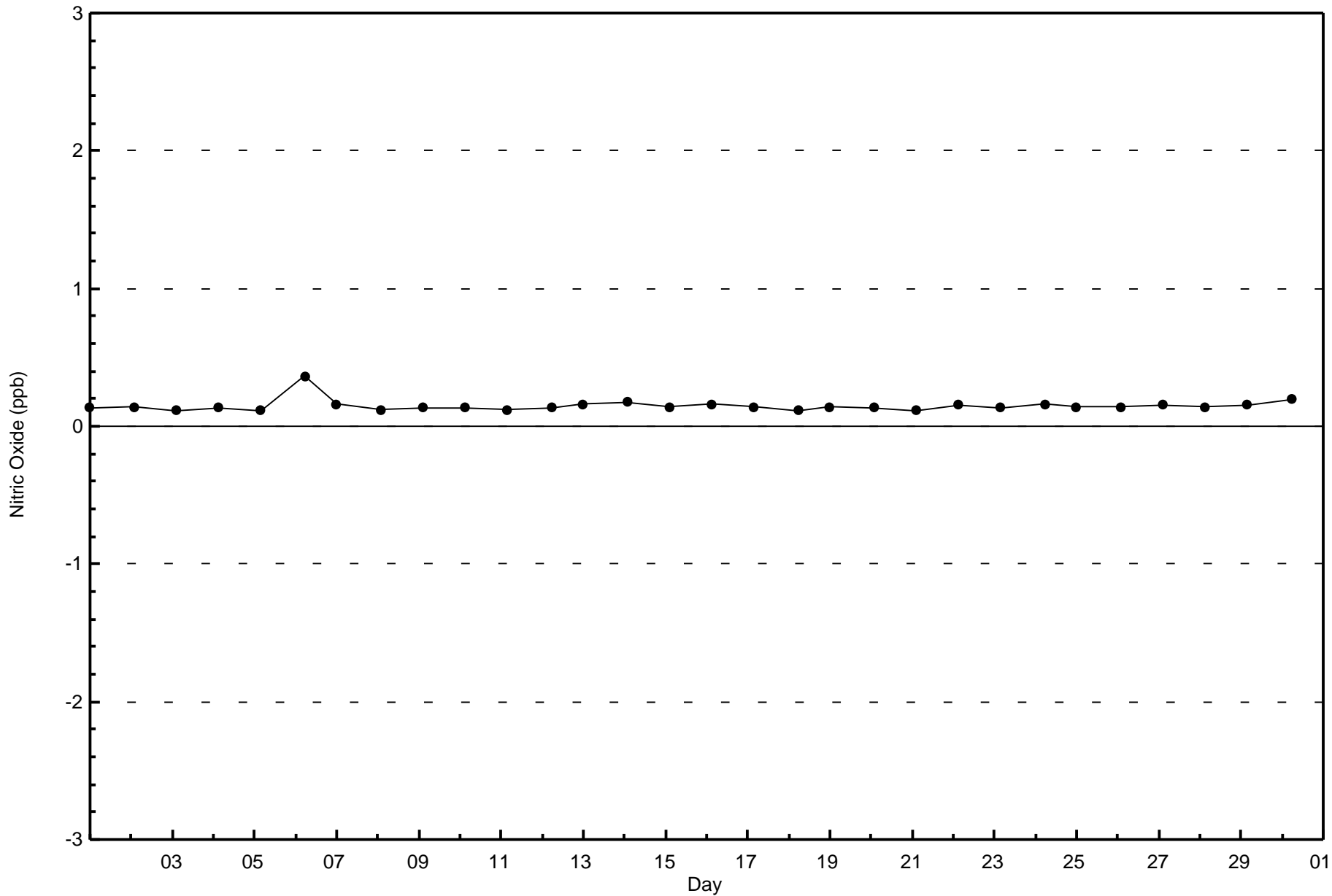
Total Number of Hours: 720

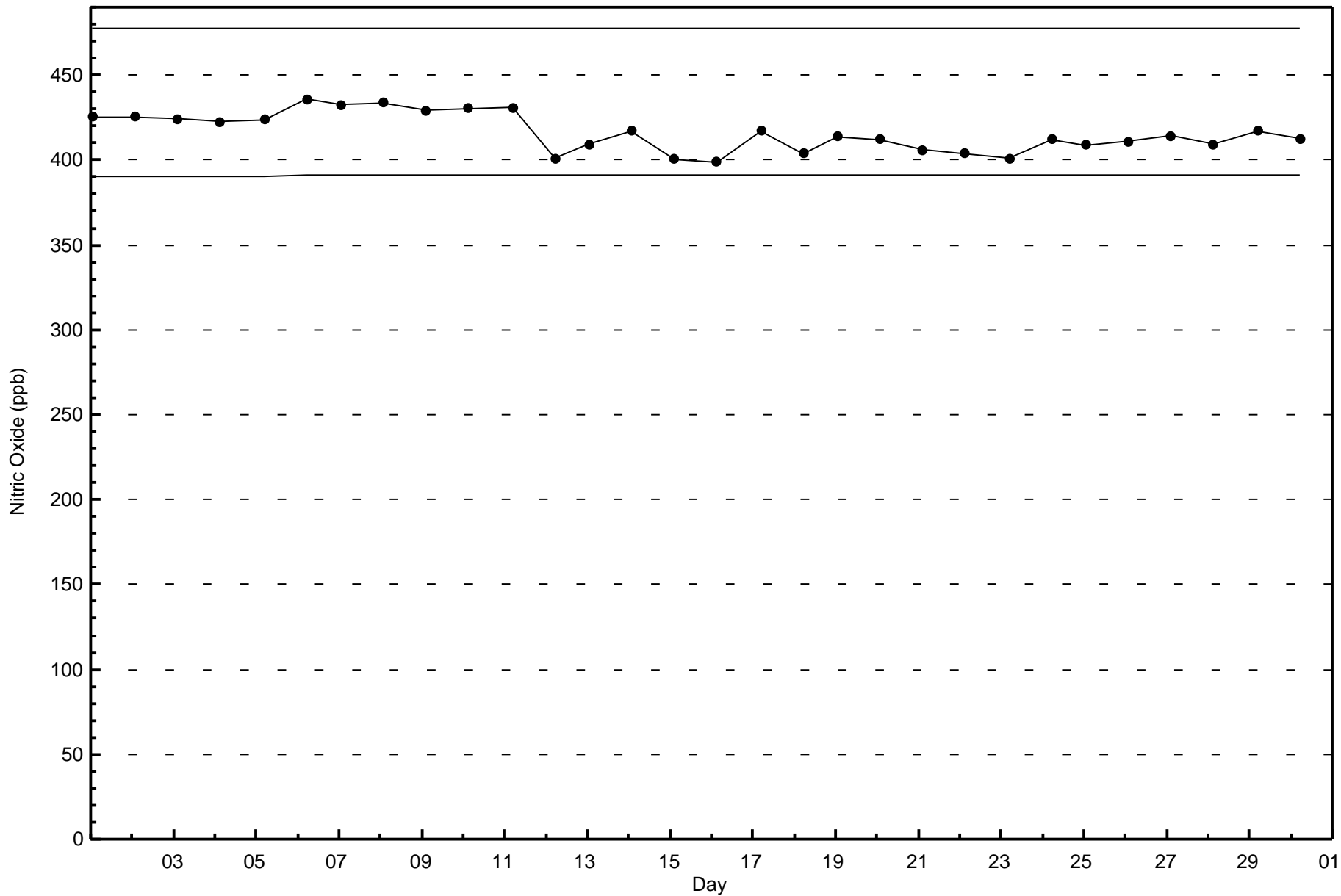


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Anzac (AMS 14)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Anzac - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 13 ppb on Apr 11 06:00	Maximum Daily Average: 4.6 ppb on Apr 19		Hours of Data:	681
Minimum Value: 0 ppb on Apr 17 23:00	Minimum Daily Average: 0.4 ppb on Apr 21		Hours of Missing Data:	39
Maximum Diurnal Average: 2.2 ppb at hour 6	Minimum Diurnal Average: 0.6 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 1.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 8		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	Z	2	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	6	2	1	0	0	1	1.0	6	
2-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	3	2	1	1	1	0.9	3	
3-Apr	1	1	Z	3	5	5	6	7	6	4	3	2	2	2	2	2	2	1	1	1	1	5	6	2	3.0	7	
4-Apr	1	1	2	Z	1	1	1	2	1	1	1	1	1	1	1	2	1	1	3	1	1	2	2	1	1.2	3	
5-Apr	1	1	1	1	Z	1	1	2	2	C	C	C	C	C	1	1	1	1	1	1	1	2	1	2	1.3	2	
6-Apr	2	2	2	2	2	Z	3	2	2	2	1	1	1	1	1	1	1	1	1	3	4	3	1	1	1.7	4	
7-Apr	Z	1	1	2	1	1	2	3	1	1	2	2	4	5	4	2	1	1	1	0	0	0	0	0	1.6	5	
8-Apr	1	Z	0	0	0	5	6	4	1	1	1	0	2	1	0	0	0	1	1	0	0	0	0	0	1.2	6	
9-Apr	0	0	Z	0	0	0	0	2	2	1	0	1	1	1	1	0	1	1	1	1	1	3	3	1	0.9	3	
10-Apr	1	1	1	Z	1	2	1	2	1	1	2	2	3	2	1	1	1	1	1	1	1	1	2	1	1.2	3	
11-Apr	4	5	6	4	Z	13	11	5	4	M	M	M	M	2	2	2	2	1	0	0	0	0	0	0	3.2	13	
12-Apr	0	1	2	4	5	Z	5	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1.1	5	
13-Apr	Z	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	2	
14-Apr	0	Z	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3	
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	1	2	0.5	3	
16-Apr	1	1	1	Z	3	2	1	2	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0.9	3	
17-Apr	1	1	1	1	Z	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2	
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6	0.4	6	
19-Apr	Z	6	8	7	7	7	8	8	5	4	4	3	4	4	4	3	3	3	3	3	3	3	4	4	3	4.6	8
20-Apr	3	Z	1	1	2	2	3	3	5	5	4	2	2	2	1	1	1	1	0	0	0	0	0	0	1.8	5	
21-Apr	0	2	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0.4	2	
22-Apr	1	1	1	Z	2	4	5	11	3	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1.5	11	
23-Apr	1	1	4	4	Z	2	1	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	4	
24-Apr	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0.5	1	
25-Apr	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0.6	1	
26-Apr	5	Z	1	1	1	1	0	1	1	1	1	1	0	0	0	0	1	0	0	0	1	2	1	1	0.8	5	
27-Apr	3	1	Z	1	1	1	1	1	0	2	2	1	1	2	1	1	1	0	0	0	0	0	3	8	1.3	8	
28-Apr	1	1	1	Z	2	2	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0.8	2	
29-Apr	1	1	1	1	Z	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1	2	2	5	2	1.4	5	
30-Apr	1	1	1	2	2	Z	1	1	5	1	3	3	1	1	1	1	1	1	1	1	3	3	2	2	1.7	5	

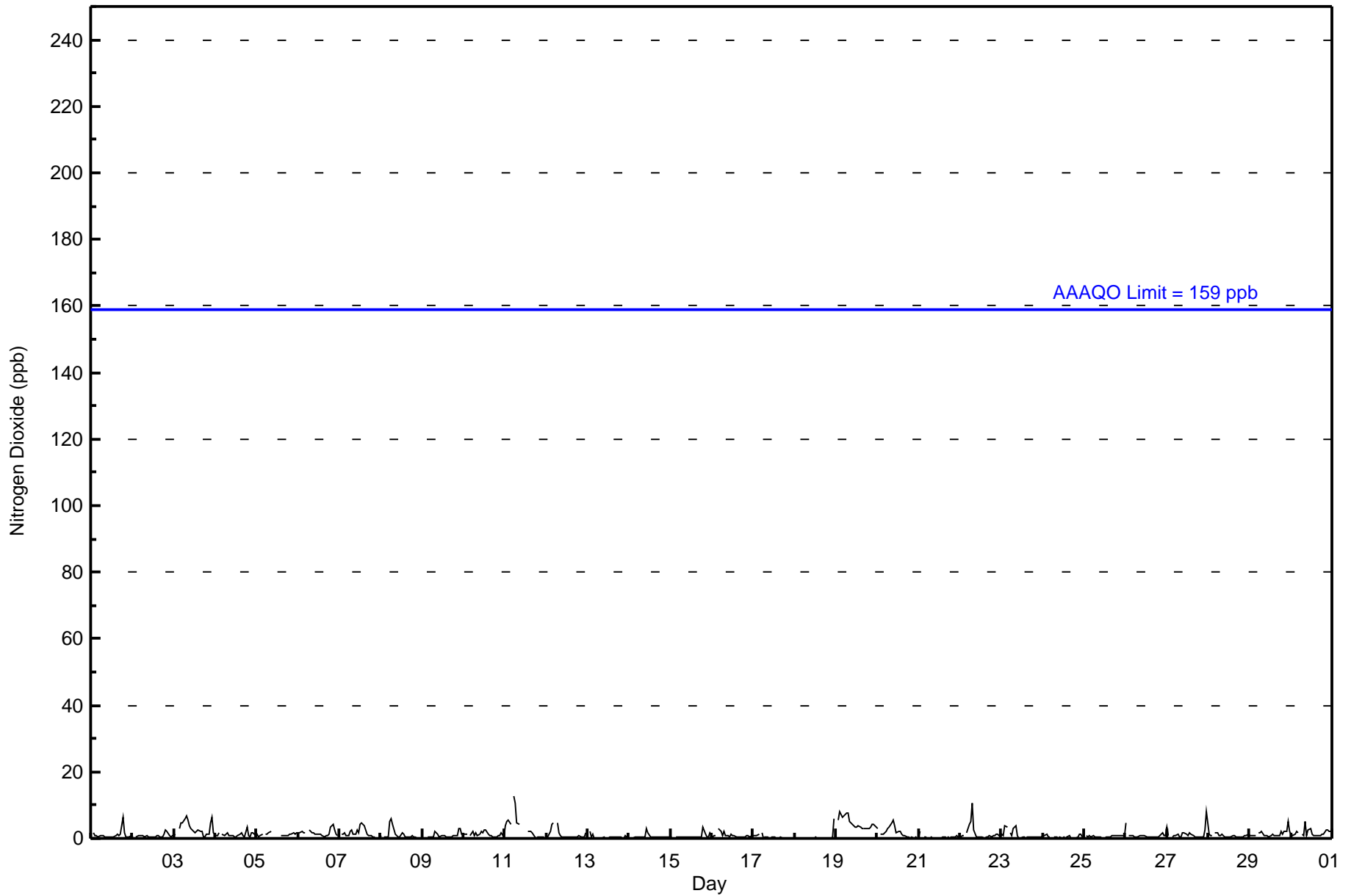
1.3	1.3	1.5	1.6	1.4	2.2	2.1	2.2	1.7	1.1	1.1	0.9	1.0	1.1	0.9	0.8	0.7	0.6	1.0	1.0	0.9	1.2	1.3	1.3	Diurnal Average
5	6	8	7	7	13	11	11	6	5	4	3	4	5	4	3	3	3	6	3	4	5	6	8	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	21	676
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	21	676

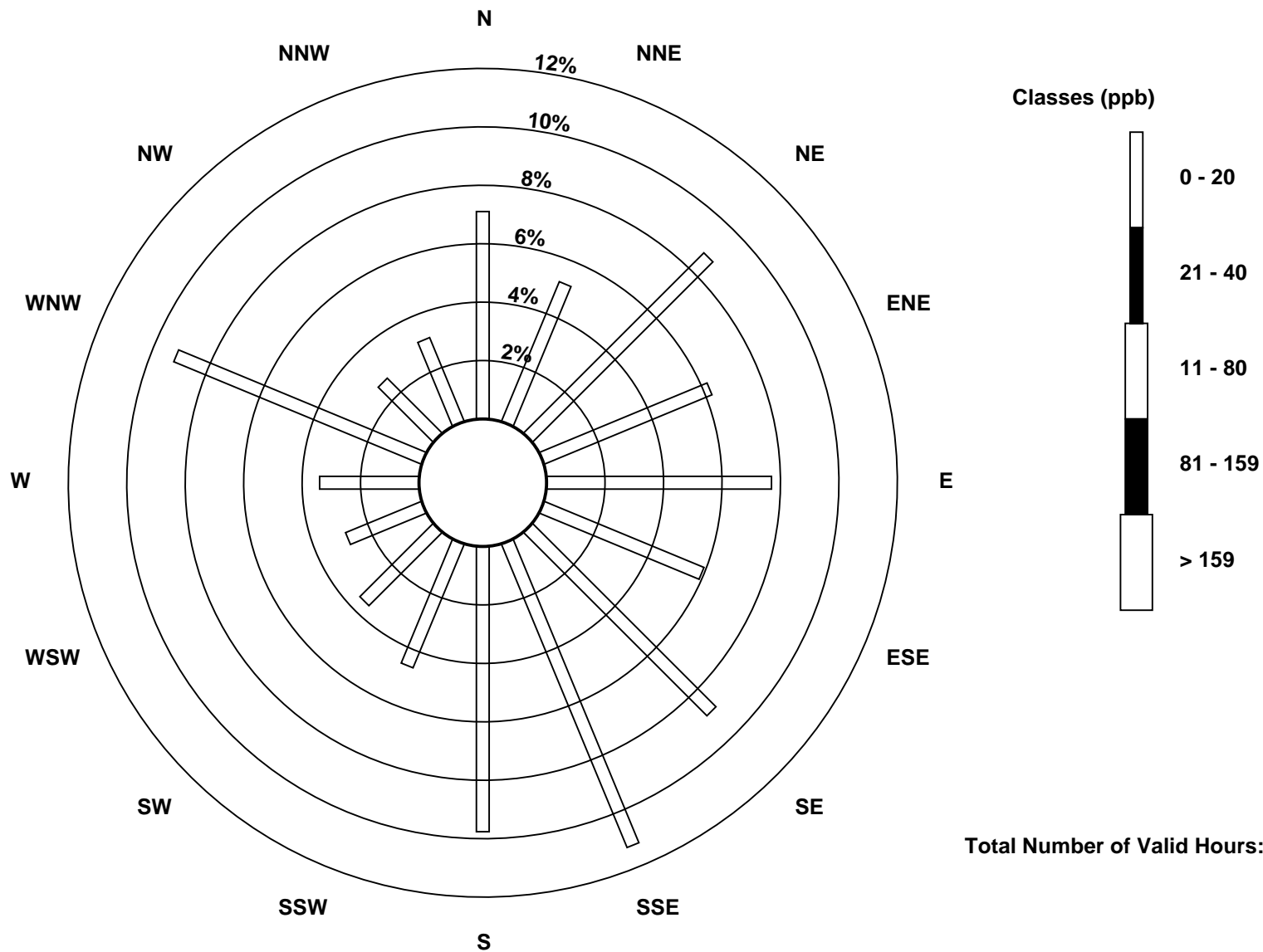
Total Number of Valid Hours: 676

Total Number of Hours: 720

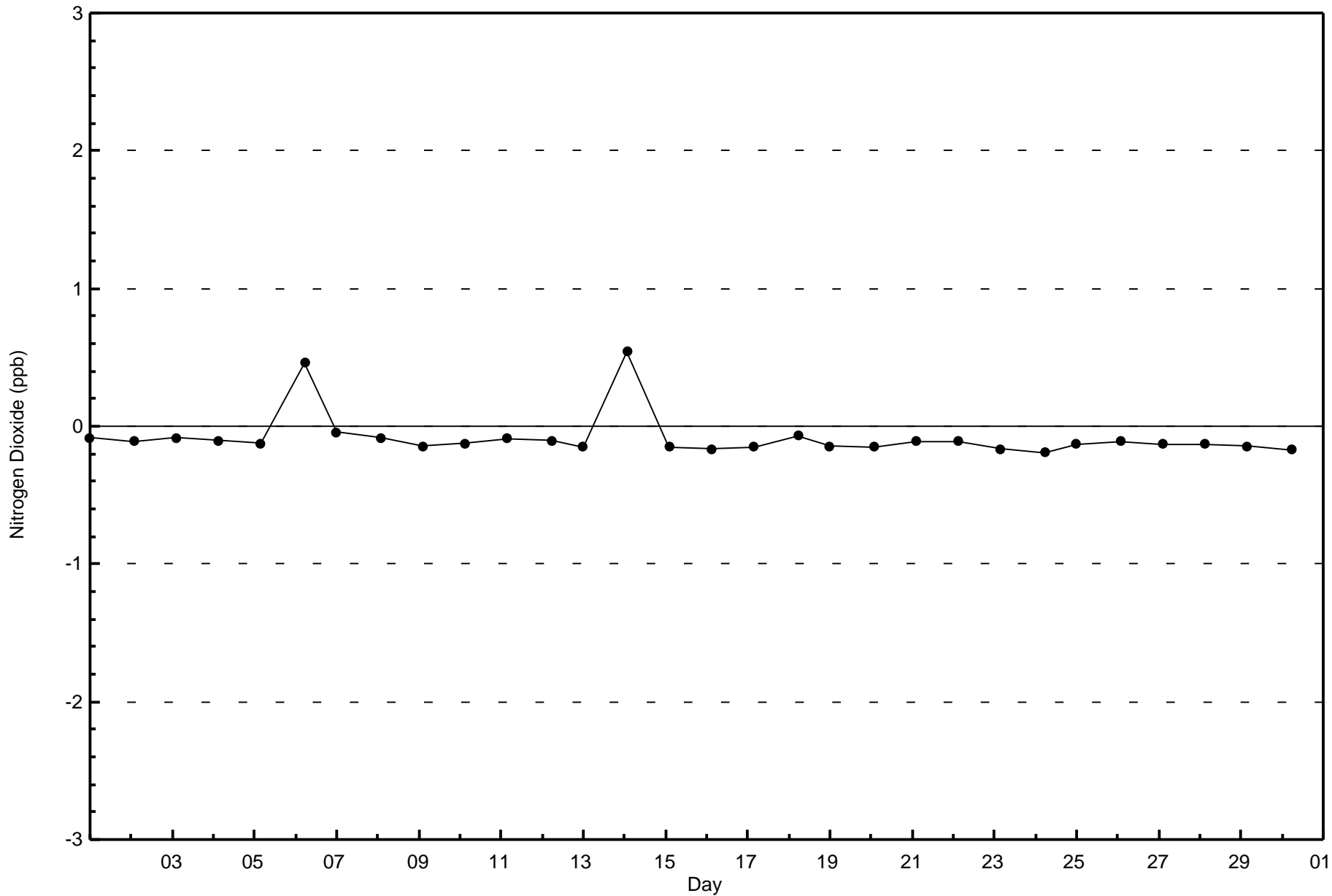


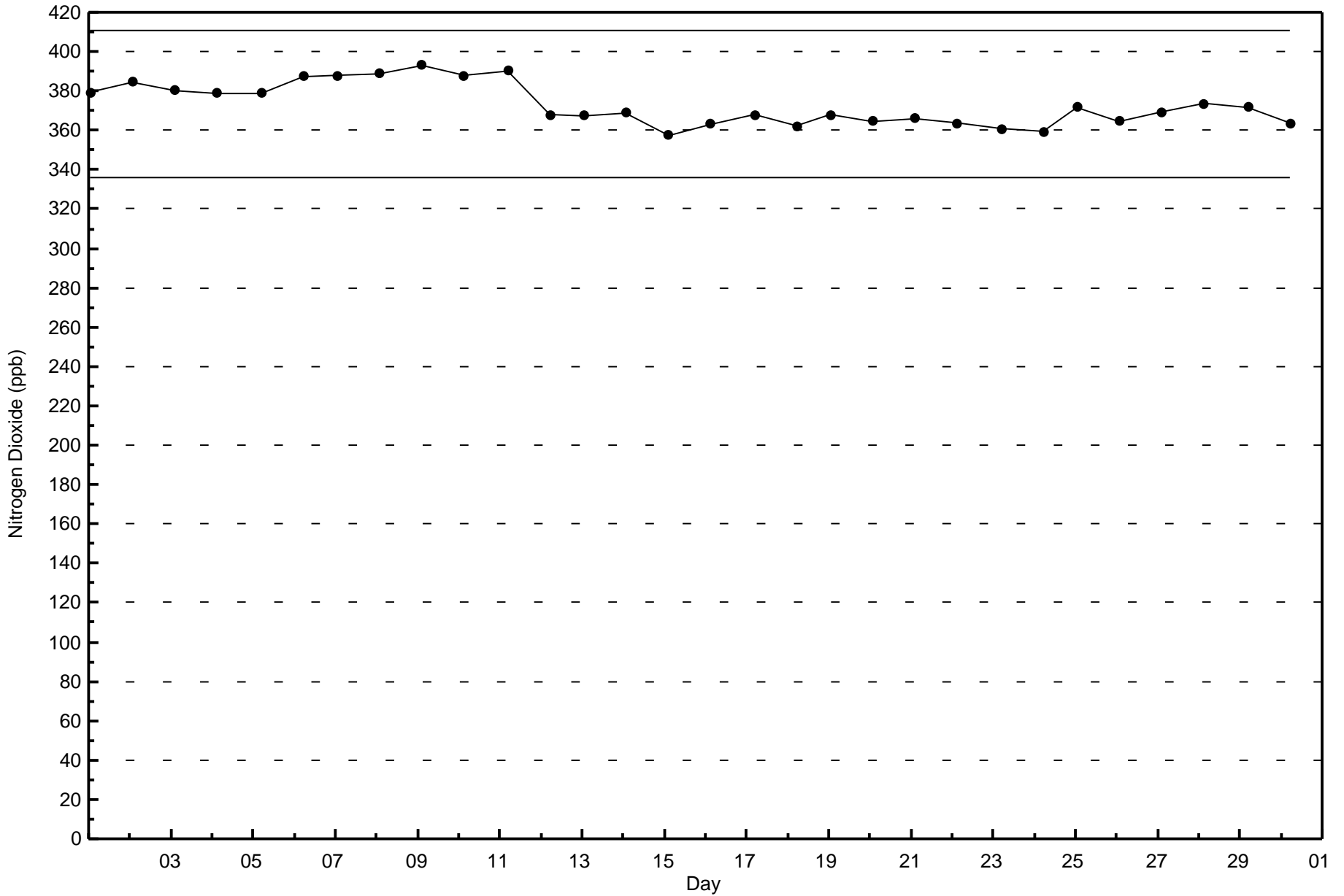
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Anzac (AMS 14)



Total Number of Valid Hours: 676





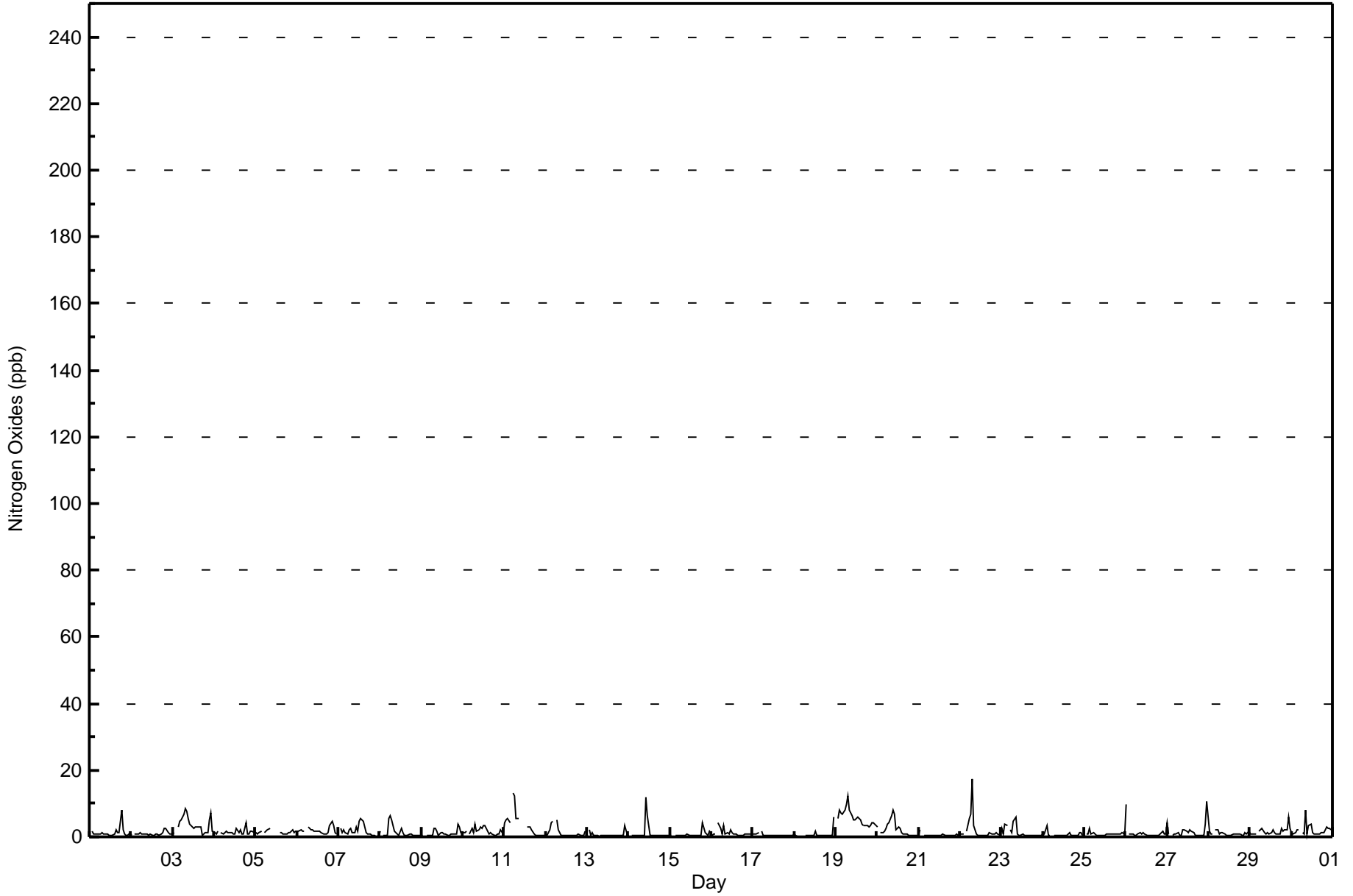


Maximum Value: 17 ppb on Apr 22 08:00																	Maximum Daily Average: 5.7 ppb on Apr 19																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 18 04:00																	Minimum Daily Average: 0.4 ppb on Apr 21																	Hours of Data: 681	
Maximum Diurnal Average: 2.9 ppb at hour 8																	Minimum Diurnal Average: 0.7 ppb at hour 18																	Hours of Missing Data: 39	
Monthly Average: 1.5 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 10																	Hours of Calibration: 35	
																																		Percent Operational Time: 99.4	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	2	1	1	1	1	1	1	1	1	1	1	0	1	1	2	1	1	8	2	1	0	1	1	1.3	8									
2-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	3	3	1	1	1	1.0	3									
3-Apr	1	1	Z	3	5	5	7	8	8	5	4	3	3	3	3	3	3	1	1	1	1	5	7	2	3.6	8									
4-Apr	1	1	2	Z	1	1	1	2	1	1	1	1	1	3	1	2	1	1	4	1	1	2	2	1	1.4	4									
5-Apr	1	1	1	1	Z	1	2	2	3	C	C	C	C	C	1	1	1	1	1	1	1	2	1	2	1.4	3									
6-Apr	2	2	2	2	2	Z	3	3	2	2	2	2	2	2	1	1	1	1	1	4	5	3	1	1	1.9	5									
7-Apr	Z	2	1	2	1	1	2	3	1	1	3	2	5	6	4	3	1	1	1	1	0	0	0	0	1.9	6									
8-Apr	2	Z	0	0	0	5	6	5	1	1	1	1	2	1	1	0	1	1	1	1	0	0	0	0	1.4	6									
9-Apr	0	0	Z	0	0	0	0	2	2	2	1	1	1	1	1	0	1	1	1	1	1	4	3	1	1.1	4									
10-Apr	1	1	2	Z	1	2	1	4	2	2	3	3	3	3	2	1	1	1	1	1	1	1	2	1	1.6	4									
11-Apr	4	5	6	4	Z	13	12	6	6	M	M	M	M	3	3	3	2	1	0	0	0	0	0	0	3.6	13									
12-Apr	0	0	2	4	5	Z	5	2	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1.2	5									
13-Apr	Z	2	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0.5	3									
14-Apr	0	Z	0	0	0	0	0	0	0	0	12	6	0	0	0	0	0	0	0	0	0	0	0	0	1.1	12									
15-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	1	1	1	2	0.6	4									
16-Apr	1	1	1	Z	4	3	1	3	1	1	1	2	1	1	1	1	0	0	1	1	1	1	1	1	1.2	4									
17-Apr	1	1	1	1	Z	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.5	2									
18-Apr	1	0	0	0	0	Z	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6	0.6	6									
19-Apr	Z	6	8	7	7	8	10	12	8	6	5	5	5	6	5	4	4	3	3	3	3	4	4	3	5.7	12									
20-Apr	3	Z	1	1	2	3	4	4	6	8	7	2	3	3	1	1	1	1	0	0	0	0	0	0	2.3	8									
21-Apr	0	2	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0.4	2									
22-Apr	1	1	1	Z	2	6	7	17	3	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	2.0	17									
23-Apr	3	1	4	4	Z	2	1	5	6	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1.3	6									
24-Apr	1	1	3	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0.6	3									
25-Apr	Z	1	1	3	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0.8	3									
26-Apr	10	Z	1	1	1	0	1	1	1	1	1	1	0	0	0	1	0	0	0	1	2	1	1	1	1.1	10									
27-Apr	4	1	Z	1	1	1	1	1	0	2	2	2	1	2	2	1	1	0	0	0	0	0	4	10	1.7	10									
28-Apr	2	1	1	Z	2	2	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	2	1.0	2									
29-Apr	1	1	1	1	Z	2	2	3	1	1	1	1	1	2	1	1	1	1	2	2	2	2	6	2	1.6	6									
30-Apr	1	1	1	2	2	Z	1	1	8	1	4	4	1	1	1	1	1	1	1	1	3	3	2	2	2.0	8									
																	Diurnal Average																		
																	Diurnal Maximum																		
Z - zerospan																	C - Calibration																	M - Maintenance	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	21	676
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	35	59	42	52	40	60	76	66	31	24	19	23	62	18	21	676

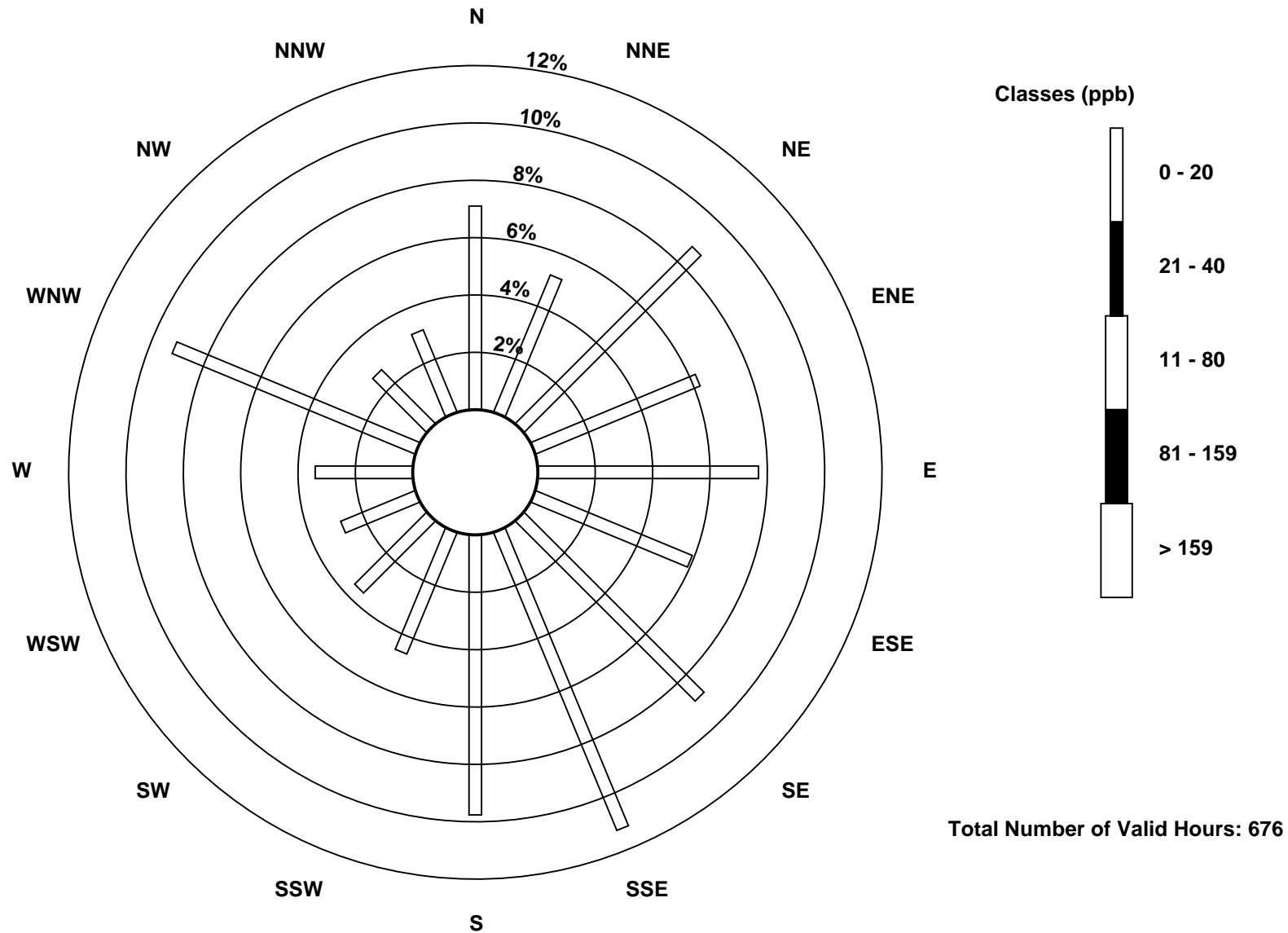
Total Number of Valid Hours: 676

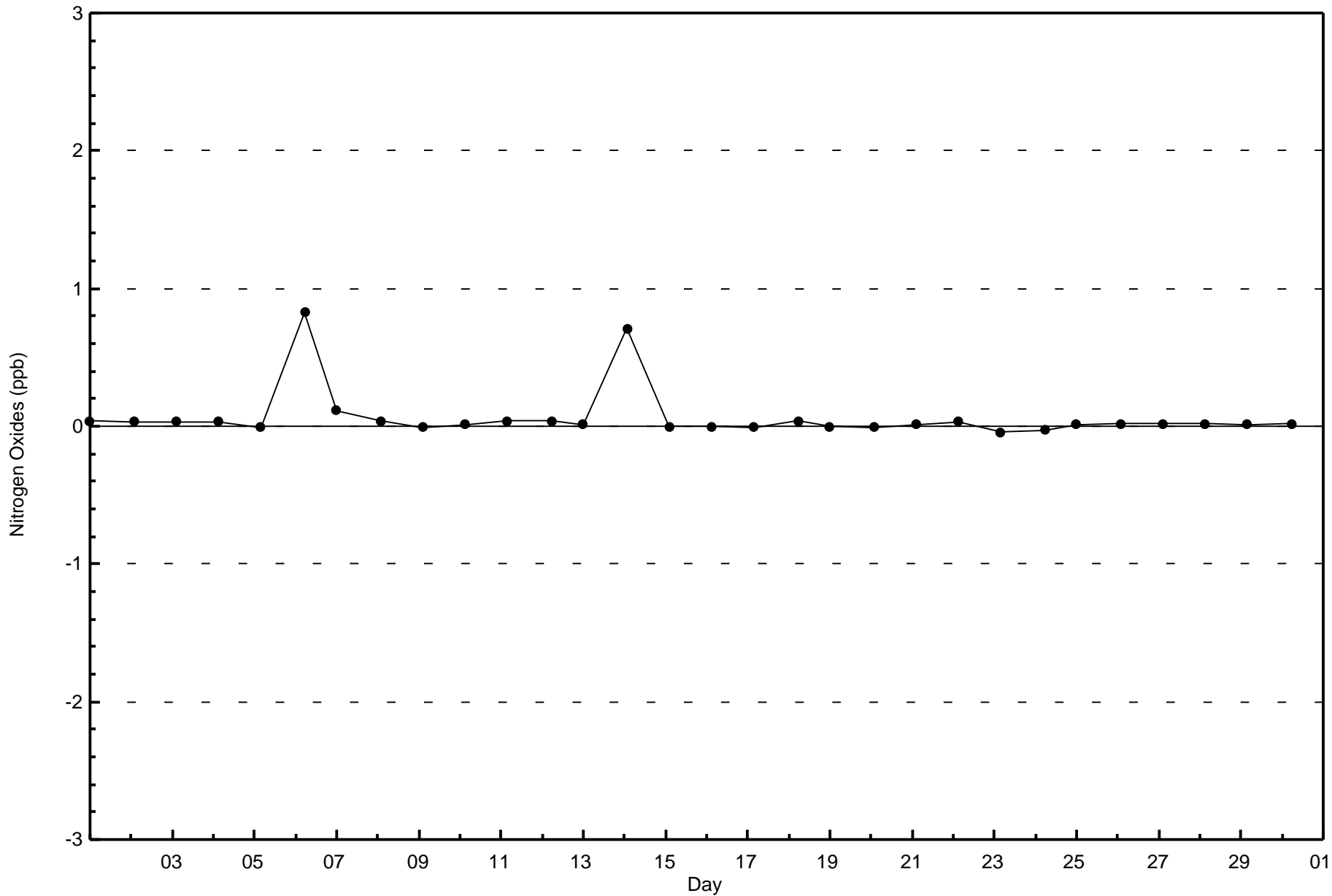
Total Number of Hours: 720

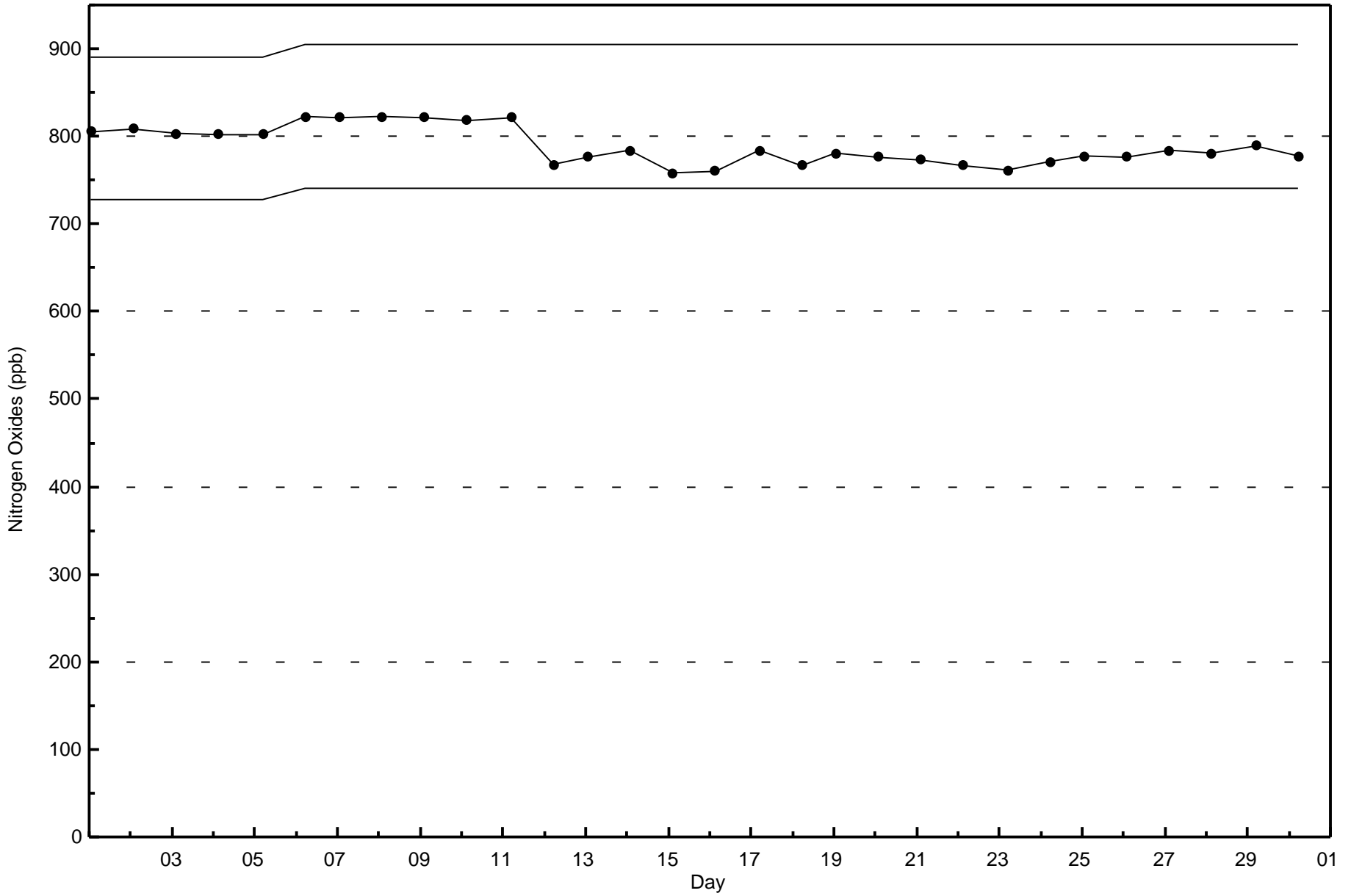


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Anzac (AMS 14)









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Anzac - April 2017

Number of Exceedences (AAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 55 ppb on Apr 6 17:00	Maximum Daily Average: 46.3 ppb on Apr 15		Hours of Data:	685
Minimum Value: 12 ppb on Apr 30 23:00	Minimum Daily Average: 22.8 ppb on Apr 19		Hours of Missing Data:	35
Maximum Diurnal Average: 42.9 ppb at hour 17	Minimum Diurnal Average: 31.3 ppb at hour 5		Hours of Calibration:	33
Monthly Average: 37.1 ppb	Percentiles: P ₁ = 16 P ₁₀ = 25 O ₁ = 32 Median = 38 O ₃ = 43 P ₉₀ = 47 P ₉₉ = 52		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	37	41	Z	46	45	44	44	43	43	43	43	44	45	46	46	48	47	46	37	44	46	45	44	45	43.9	48
2-Apr	43	41	40	Z	43	41	42	42	41	41	41	41	43	47	46	48	50	49	45	42	44	43	44	43	43.5	50
3-Apr	41	40	36	34	Z	30	27	27	31	36	41	43	44	44	43	44	42	41	42	39	37	25	25	29	36.6	44
4-Apr	33	37	35	27	21	Z	33	31	32	38	42	C	C	C	44	46	46	45	40	40	36	35	35	32	36.4	46
5-Apr	25	18	22	30	31	33	Z	36	35	37	38	39	44	52	52	52	52	50	48	48	47	46	45	40.6	52	
6-Apr	45	45	42	42	40	38	33	Z	39	43	44	45	46	45	48	53	55	54	51	41	30	25	26	20	41.3	55
7-Apr	42	44	Z	32	38	37	31	30	38	41	43	44	43	42	43	43	44	44	43	42	44	44	43	42	40.6	44
8-Apr	40	40	39	Z	37	28	26	28	33	34	36	39	34	34	35	34	32	30	27	25	27	28	30	30	32.4	40
9-Apr	32	33	34	34	Z	35	35	32	32	33	34	34	34	35	36	38	38	37	38	37	36	34	33	34	34.7	38
10-Apr	37	37	34	28	32	Z	26	27	30	31	31	35	38	39	41	45	43	45	46	41	36	30	20	17	34.3	46
11-Apr	17	12	17	15	18	15	Z	24	24	26	28	28	29	M	M	35	35	35	36	37	35	36	38	38	27.5	38
12-Apr	36	34	32	28	25	20	24	Z	42	45	47	48	49	50	51	51	51	52	51	47	34	44	43	39	41.0	52
13-Apr	40	37	Z	36	36	35	35	35	37	40	40	42	43	42	42	42	42	41	41	41	40	40	40	40	39.5	43
14-Apr	40	39	38	Z	37	38	38	39	40	41	39	41	42	43	43	43	45	47	48	48	49	49	49	49	42.9	49
15-Apr	49	49	48	47	Z	45	44	44	44	44	44	44	46	48	50	52	52	52	50	44	40	44	44	42	46.3	52
16-Apr	40	36	36	37	36	Z	39	39	42	44	45	44	44	46	48	48	48	48	46	46	46	46	48	49	43.5	49
17-Apr	49	47	44	44	30	34	Z	40	41	41	37	39	39	39	39	40	40	39	38	36	36	35	34	34	38.9	49
18-Apr	33	33	32	32	32	32	31	Z	32	33	34	35	34	36	37	38	38	39	38	38	36	36	31	19	34.0	39
19-Apr	16	19	Z	18	19	19	19	19	21	24	26	26	27	26	26	28	28	29	28	27	23	18	17	24	22.8	29
20-Apr	25	28	28	Z	25	20	22	24	24	23	27	32	35	37	38	35	33	35	38	40	43	44	46	44	32.5	46
21-Apr	43	41	41	40	Z	37	36	37	39	39	41	40	40	41	41	42	44	44	43	42	40	38	33	26	39.5	44
22-Apr	21	17	14	16	24	Z	27	20	28	31	33	35	36	35	35	36	37	35	32	32	29	27	18	26	28.0	37
23-Apr	27	27	24	24	24	25	Z	27	28	34	34	35	36	37	37	40	41	42	44	43	44	44	43	41	34.8	44
24-Apr	38	39	38	37	35	34	34	Z	35	34	34	32	31	31	32	31	32	32	32	31	31	30	30	30	33.3	39
25-Apr	28	28	Z	27	26	25	26	26	28	30	32	33	34	35	36	36	36	36	36	36	36	35	34	36	31.9	36
26-Apr	33	35	36	Z	35	37	38	40	39	39	41	41	40	41	43	43	42	41	40	39	38	37	37	37	38.7	43
27-Apr	33	33	34	35	Z	34	33	34	37	41	41	41	42	41	42	42	42	43	44	44	38	33	25	17	37.0	44
28-Apr	32	35	21	34	26	Z	34	42	43	45	46	47	46	46	47	48	48	48	47	42	32	27	25	22	38.5	48
29-Apr	32	41	38	39	40	38	Z	43	45	50	50	52	51	51	50	51	51	50	47	42	39	32	16	25	42.2	52
30-Apr	22	22	23	28	27	26	33	Z	40	47	46	47	51	52	51	49	53	50	42	37	24	12	12	13	35.1	53

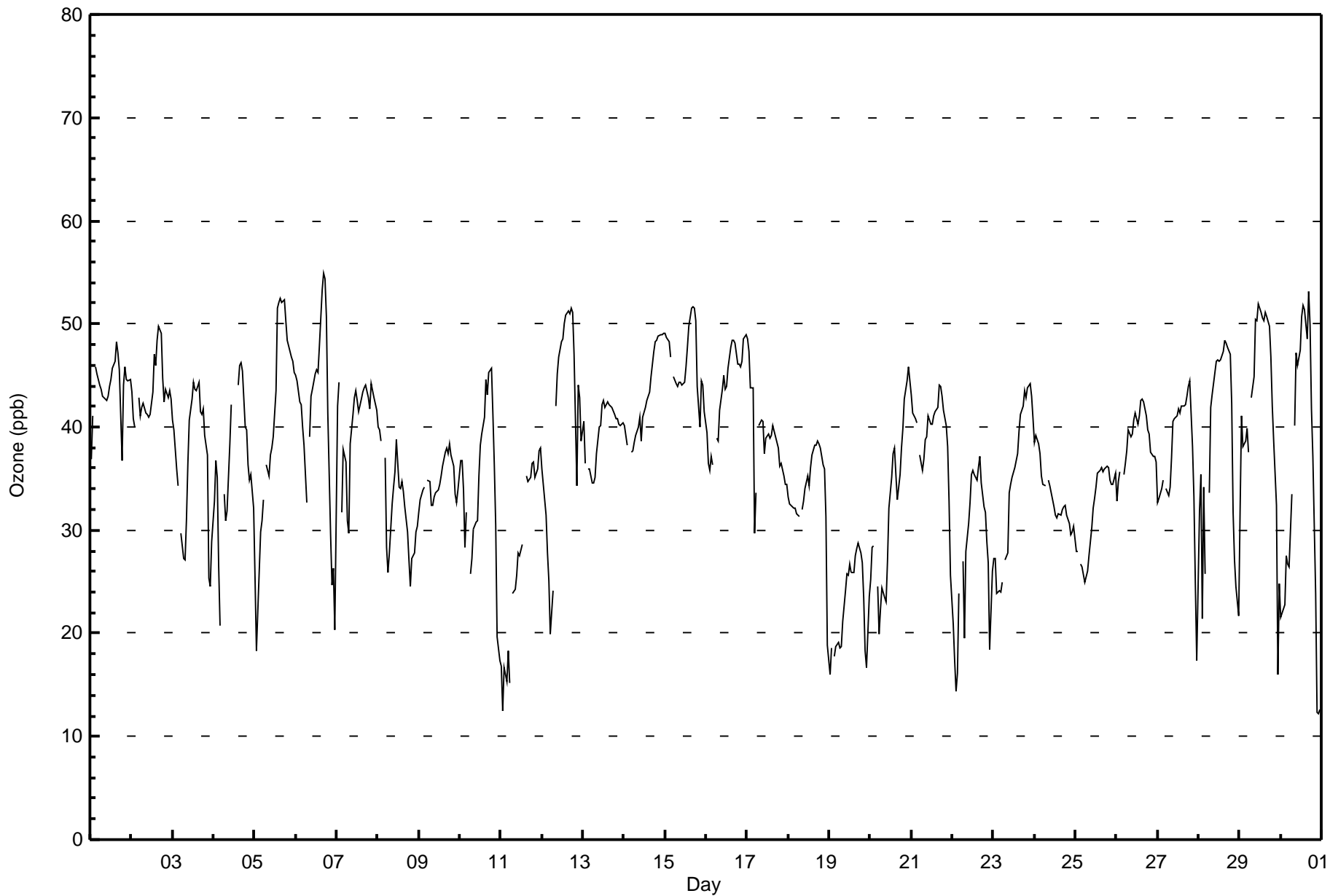
34.3	34.3	33.1	32.4	31.3	31.9	32.4	33.2	35.4	37.6	38.5	39.6	40.2	41.5	42.2	42.8	42.9	42.7	41.3	39.8	37.2	35.5	33.6	32.9	Diurnal Average	
49	49	48	47	45	45	44	44	45	50	50	52	51	52	52	53	55	54	51	48	49	49	49	49	Diurnal Maximum	

Z - zeronspan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAQO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Anzac - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	32	4.67	4.67
21 - 50	627	91.53	96.20
51 - 82	26	3.80	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Anzac - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	3	0	1	1	0	1	3	2	1	1	2	2	6	5	3	1	32
21 - 50	43	35	55	38	49	39	57	78	59	27	19	18	16	54	13	22	622
51 - 82	0	1	4	2	1	0	0	0	5	3	3	0	0	4	3	0	26
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	36	60	41	50	40	60	80	65	31	24	20	22	63	19	23	680

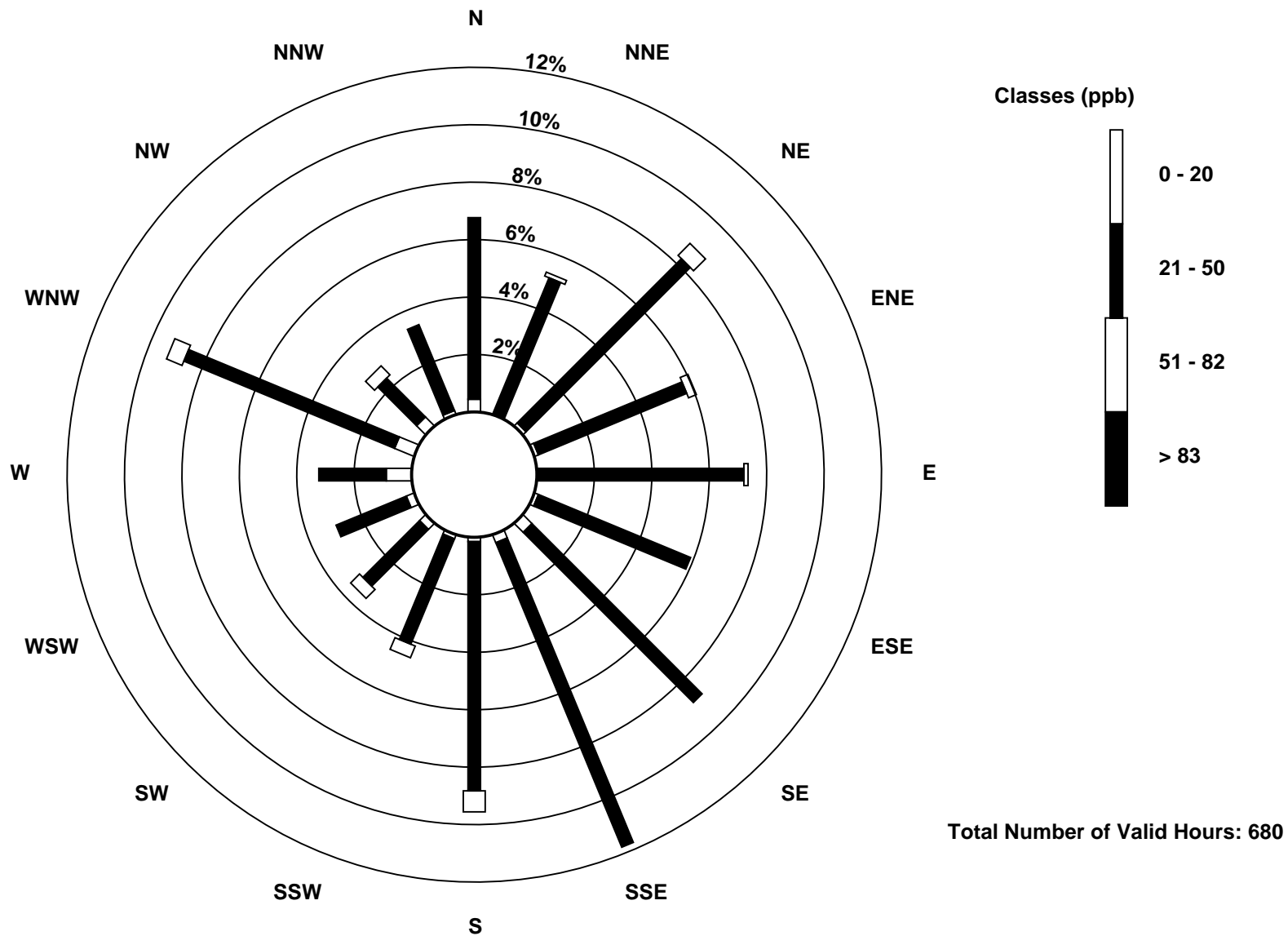
Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Anzac (AMS 14)



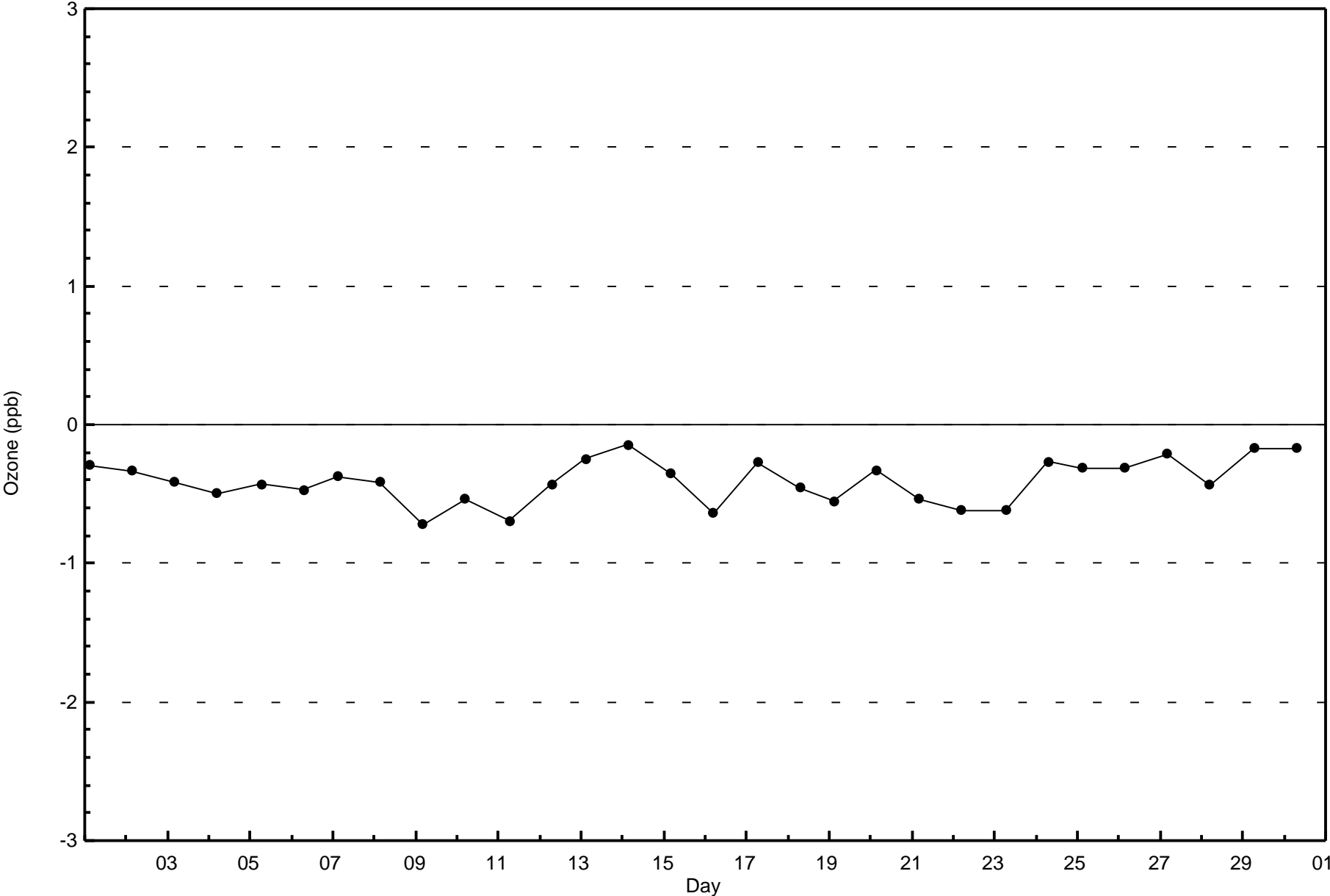


Wood Buffalo Environmental Association

Zero Responses

Ozone (O₃) - ppb

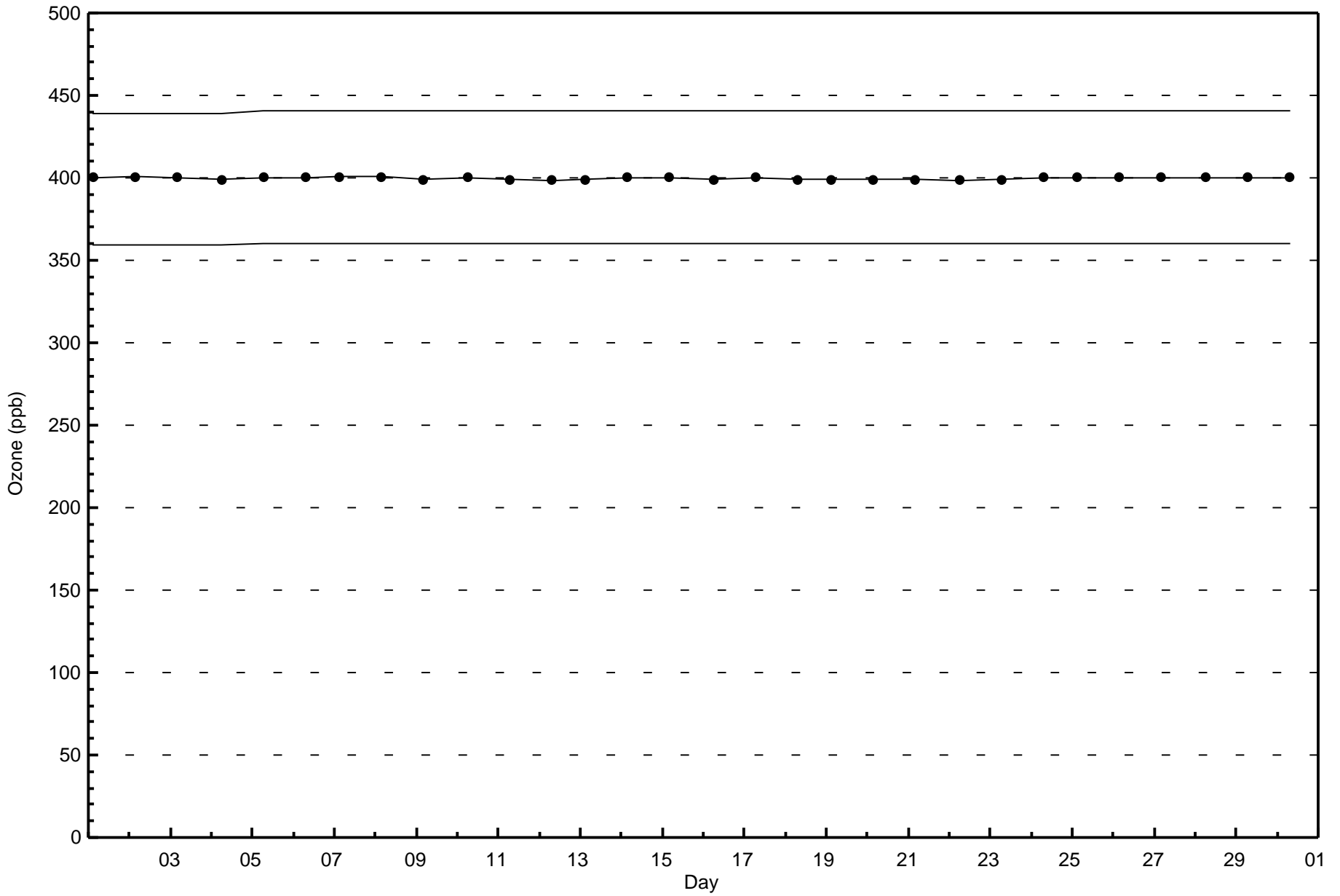
Anzac - April 2017





Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Anzac - April 2017





Number of Exceedences (AAAQO):	24-hr: 0	Hours in Service:	720
Maximum Value: 34.5 µg/m ³ on Apr 29 11:00	Maximum Daily Average: 5.7 µg/m ³ on Apr 29	Hours of Data:	719
Minimum Value: 0.2 µg/m ³ on Apr 7 23:00	Minimum Daily Average: 1.1 µg/m ³ on Apr 9	Hours of Missing Data:	1
Maximum Diurnal Average: 4.1 µg/m ³ at hour 3	Minimum Diurnal Average: 1.7 µg/m ³ at hour 12	Hours of Calibration:	1
Monthly Average: 2.55 µg/m ³	Percentiles: P ₁ = 0.3 P ₁₀ = 0.9 Q ₁ = 1.3 Median = 1.7 Q ₃ = 2.9 P ₉₀ = 5.7 P ₉₉ = 12.1	Percent Operational Time:	100.0

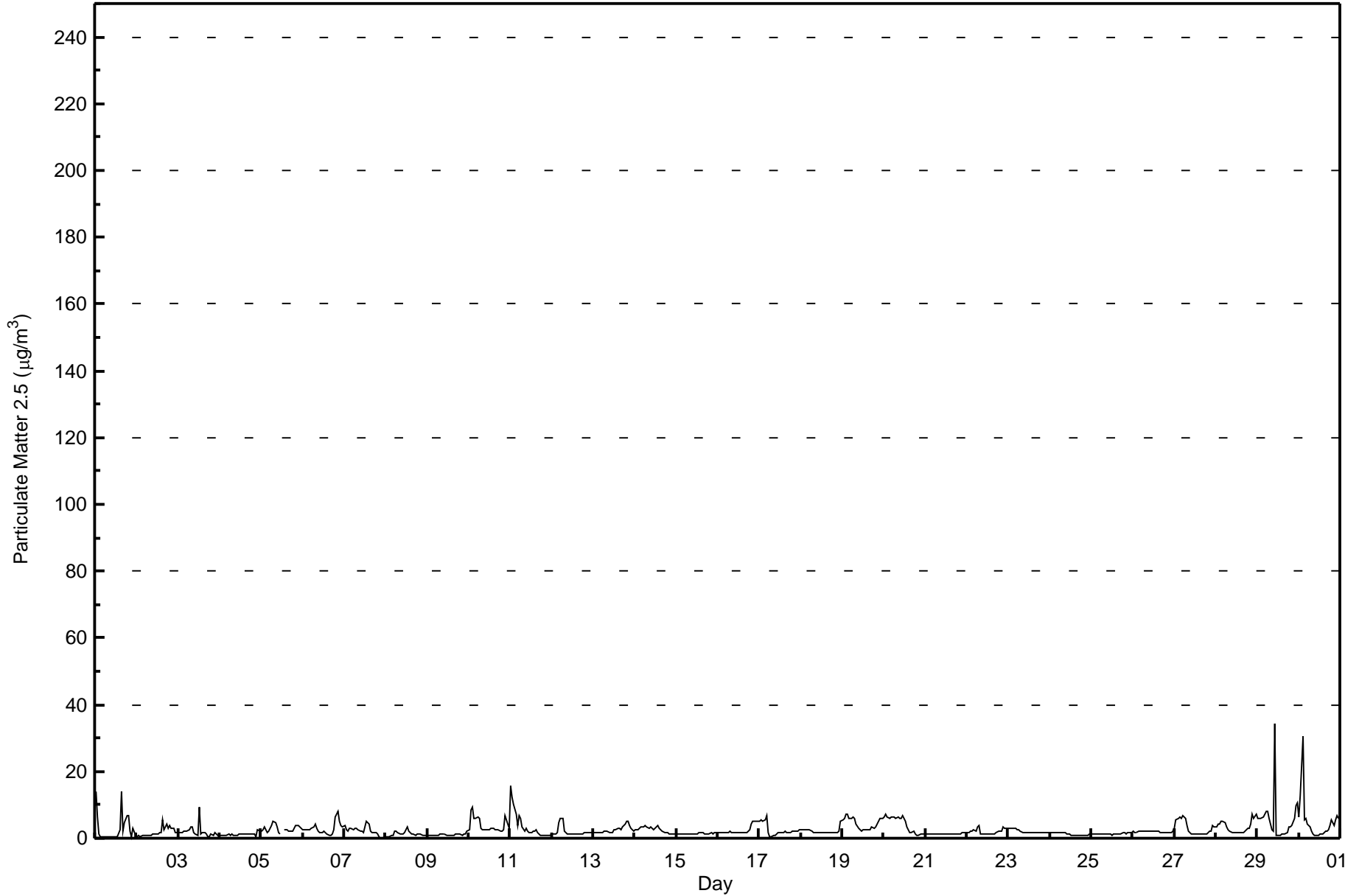
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	14.1	6.3	1.2	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	2.5	14.0	2.3	4.6	6.6	6.8	2.2	0.4	3.0	0.7	2.9	14.1																							
2-Apr	0.6	0.6	0.6	0.7	0.8	0.9	0.9	0.9	1.0	1.1	1.2	1.4	1.3	1.5	1.7	5.5	2.6	4.1	2.8	3.9	3.1	2.8	1.8	1.6	1.8	5.5																							
3-Apr	1.5	1.5	1.8	2.0	2.2	2.3	2.6	3.5	3.2	1.9	1.1	1.0	9.4	1.2	1.7	1.6	1.3	0.5	0.4	1.2	0.8	1.6	1.1	1.0	1.9	9.4																							
4-Apr	0.9	0.7	0.9	1.0	0.9	1.1	1.1	1.2	1.0	0.9	0.9	1.2	1.2	1.1	1.3	1.3	1.3	1.1	1.1	1.3	1.2	0.5	2.5	2.3	1.2	2.5																							
5-Apr	2.3	2.4	3.3	1.8	2.1	3.1	3.8	5.1	4.9	3.3	1.7	1.4	C	2.7	2.4	2.4	2.0	2.3	2.3	2.9	3.8	3.6	3.3	2.9	2.9	5.1																							
6-Apr	2.7	2.4	2.7	2.6	2.7	3.0	3.2	4.1	2.9	2.1	1.7	1.9	2.0	1.6	1.1	0.7	1.0	1.1	2.8	6.4	8.2	5.0	3.7	3.3	2.9	8.2																							
7-Apr	3.9	2.8	2.2	3.0	2.9	2.6	2.8	3.0	2.4	2.0	2.2	1.8	3.4	5.1	4.0	2.3	1.6	1.5	1.6	1.3	0.6	0.2	0.2	0.3	2.2	5.1																							
8-Apr	0.5	0.5	0.6	0.8	0.8	2.0	2.3	1.8	1.3	1.5	1.3	1.8	3.2	2.0	1.5	1.1	1.2	0.9	1.2	1.5	1.1	1.0	0.8	0.8	1.3	3.2																							
9-Apr	0.7	0.6	0.7	0.7	0.8	0.9	0.9	1.1	1.4	1.3	1.5	0.9	1.1	1.0	0.9	1.0	1.2	1.1	1.3	1.2	1.0	1.4	1.5	2.0	1.1	2.0																							
10-Apr	2.7	8.5	9.5	6.0	6.0	6.2	6.0	2.9	2.6	2.7	2.6	2.4	2.6	2.8	3.1	2.5	2.5	2.4	2.1	2.3	2.5	6.8	5.5	3.0	4.0	9.5																							
11-Apr	15.8	12.3	10.0	7.2	3.7	6.6	5.8	3.4	2.2	2.9	2.0	1.6	1.7	1.9	2.0	2.6	1.9	0.8	0.8	0.9	0.9	0.9	0.9	1.0	3.8	15.8																							
12-Apr	1.1	1.3	1.4	1.5	4.5	6.0	6.1	2.3	1.5	1.3	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.6	1.6	1.6	1.8	1.8	1.9	6.1																							
13-Apr	1.7	1.6	1.5	1.6	1.7	1.9	2.1	2.2	1.9	1.8	1.7	1.7	2.3	2.7	2.8	2.9	2.6	3.3	4.3	5.0	4.9	3.6	2.8	2.3	2.5	5.0																							
14-Apr	2.4	2.5	2.7	3.2	3.5	3.6	3.8	3.3	3.0	3.4	2.9	2.5	3.3	3.8	2.9	2.6	2.1	1.7	1.5	1.5	1.4	1.3	1.3	1.2	2.6	3.8																							
15-Apr	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.5	1.6	1.6	1.4	1.4	1.3	1.4	1.6	1.5	1.6	1.6	1.4	1.6																							
16-Apr	1.6	1.7	1.6	1.6	1.7	1.7	1.7	2.2	1.7	1.6	1.6	1.7	1.6	1.6	1.7	1.7	1.7	1.9	2.4	4.2	5.2	5.3	5.2	5.0	2.4	5.3																							
17-Apr	5.1	5.5	5.0	5.4	6.7	1.9	0.4	0.3	0.8	1.0	1.1	1.7	1.7	1.7	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.4	2.4	6.7																							
18-Apr	2.5	2.5	2.4	2.4	2.4	2.4	2.3	1.9	1.8	1.8	1.7	1.6	1.9	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.9	5.2	2.1	5.2																								
19-Apr	5.5	6.0	7.3	7.2	5.9	6.0	6.2	5.9	4.3	3.0	2.4	2.1	2.4	2.7	2.6	2.6	2.7	3.4	3.1	3.3	4.4	5.1	5.8	5.9	4.4	7.3																							
20-Apr	6.3	7.3	6.5	6.1	6.4	6.3	6.2	6.0	6.4	6.0	6.1	6.7	5.2	3.5	2.6	1.8	1.7	2.1	1.2	0.8	0.9	1.1	1.2	1.2	4.1	7.3																							
21-Apr	1.2	1.2	1.1	1.2	1.2	1.2	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.3	1.4	1.5	1.4	1.7	1.6	1.6	1.4	1.7																							
22-Apr	1.6	1.8	1.9	2.1	2.4	2.1	3.3	3.6	1.5	1.3	1.3	1.4	1.4	1.3	1.2	1.2	1.3	1.8	1.9	2.1	2.3	3.3	2.9	2.9	2.0	3.6																							
23-Apr	2.9	3.2	3.2	3.1	2.8	2.7	2.3	2.0	1.9	1.7	1.7	1.7	1.8	1.7	1.6	1.5	1.6	1.6	1.7	1.6	1.6	1.6	1.6	1.7	2.0	3.2																							
24-Apr	1.6	1.8	1.9	1.8	1.6	1.6	1.7	1.6	1.7	1.6	1.5	1.2	0.9	0.8	0.8	0.8	0.8	1.0	1.1	0.9	0.9	0.9	1.2	1.3	1.3	1.9																							
25-Apr	1.4	1.3	1.2	1.2	1.2	1.3	1.2	1.3	1.2	1.1	1.1	1.1	1.0	1.1	1.2	1.2	1.2	1.4	1.5	1.5	1.5	1.5	1.5	1.7	1.3	1.7																							
26-Apr	2.1	1.9	1.9	1.9	2.0	1.9	2.0	1.9	2.0	2.0	2.1	2.2	2.0	2.0	2.1	1.9	1.9	1.8	1.6	1.6	1.5	1.5	1.7	2.1	1.9	2.2																							
27-Apr	3.0	5.6	6.0	6.5	6.0	6.6	6.0	4.0	2.3	1.6	1.4	1.2	1.2	1.2	1.3	1.3	1.3	1.1	1.1	1.1	1.9	2.0	3.9	3.3	3.0	6.6																							
28-Apr	3.4	4.2	4.4	5.1	4.9	4.6	3.6	2.6	2.2	1.8	1.7	1.5	1.6	1.7	1.7	1.7	1.7	2.2	2.8	2.9	4.0	7.2	5.9	7.3	3.4	7.3																							
29-Apr	5.9	6.1	6.1	6.2	7.0	8.2	7.9	5.7	2.6	2.0	34.5	0.9	0.8	1.0	1.1	1.3	1.4	1.7	3.4	3.3	3.9	5.9	9.8	10.7	5.7	34.5																							
30-Apr	6.4	12.6	30.6	5.6	5.9	4.2	3.4	2.3	1.4	1.0	1.0	1.0	1.2	1.1	1.3	1.9	2.3	2.4	3.7	5.7	3.9	5.4	6.6	5.8	4.9	30.6																							
																								3.4	3.6	4.1	3.0	3.1	3.2	3.1	2.6	2.1	1.9	2.8	1.7	2.1	1.8	1.8	2.2	1.7	1.8	2.1	2.5	2.4	2.6	2.8	2.8	Diurnal Average	
																								15.8	12.6	30.6	7.2	7.0	8.2	7.9	6.0	6.4	6.0	34.5	6.7	9.4	5.1	4.0	14.0	2.7	4.6	6.6	6.8	8.2	7.2	9.8	10.7	Diurnal Maximum	

C - Calibration	
Alberta Ambient Air Quality Objectives (AAAQO):	24-hr 30 µg/m ³



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Anzac - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	558	77.61	77.61
6 - 15	73	10.15	87.76
16 - 25	1	0.14	87.90
26 - 80	2	0.28	88.18
> 81.0	0	0.00	88.18

Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Anzac - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	42	25	55	37	50	32	53	64	57	25	14	14	9	42	15	18	552
6 - 15	1	0	0	1	2	2	3	17	8	3	8	5	6	8	4	5	73
16 - 25	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
26 - 80	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	25	55	38	52	34	56	81	66	29	22	20	15	50	19	23	628

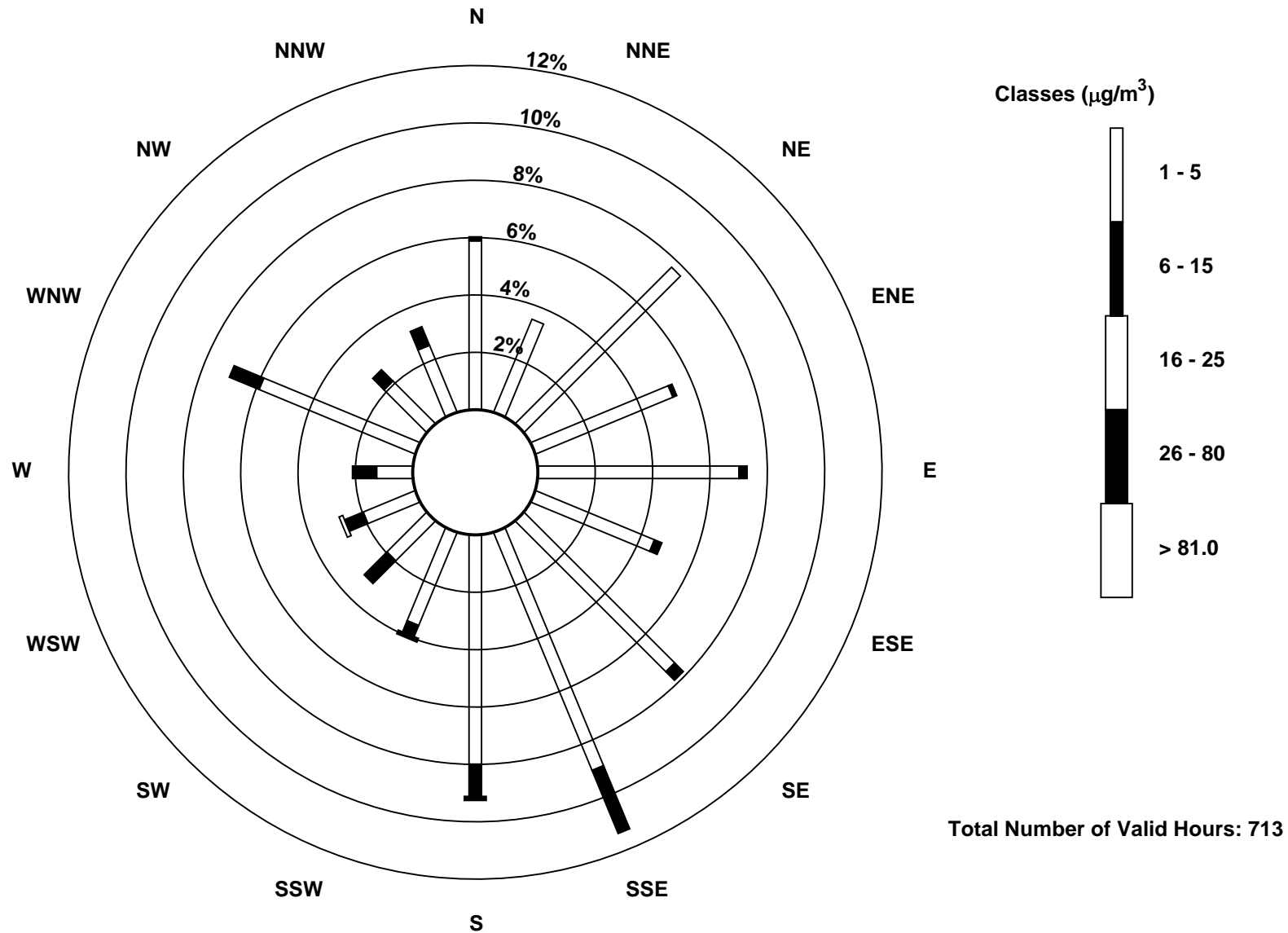
Total Number of Valid Hours: 713

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Anzac (AMS 14)



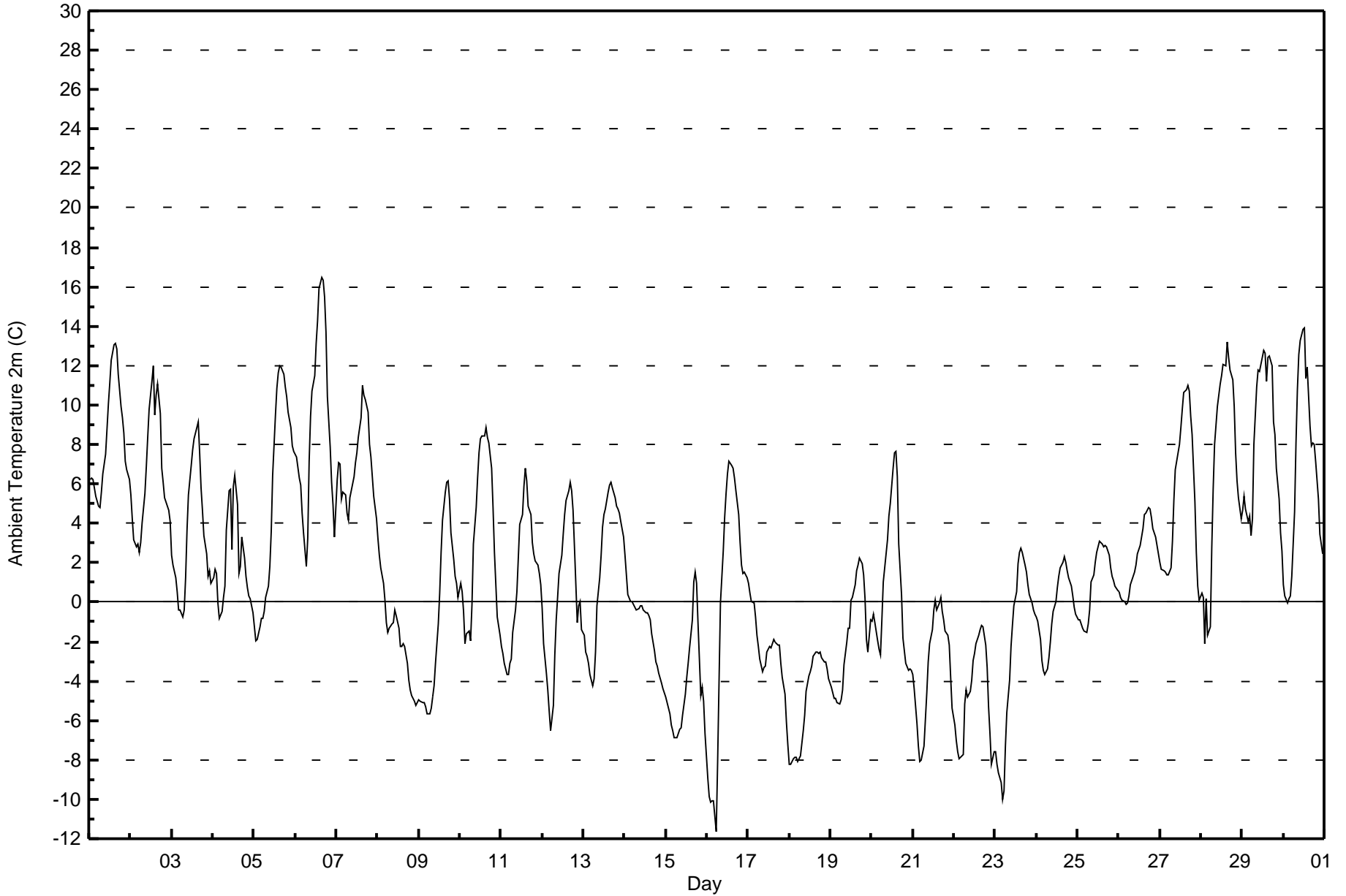


Maximum Value: 16.5 C on Apr 6 16:00																			Maximum Daily Average: 9.0 C on Apr 6						Hours in Service: 720	
Minimum Value: -11.6 C on Apr 16 06:00																			Minimum Daily Average: -5.0 C on Apr 18						Hours of Data: 720	
Maximum Diurnal Average: 5.6 C at hour 16																			Minimum Diurnal Average: -2.3 C at hour 6						Hours of Missing Data: 0	
Monthly Average: 1.70 C																			Percentiles: P ₁ = -9.2 P ₁₀ = -5.0 Q ₁ = -2.1 Median = 1.2 Q ₃ = 5.4 P ₉₀ = 9.4 P ₉₉ = 13.8						Hours of Calibration: 0	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	6.2	6.3	6.3	5.8	5.3	4.9	4.8	5.6	6.5	7.5	8.8	10.1	11.1	12.3	13.0	13.1	12.8	11.6	9.9	9.3	8.6	7.1	6.7	6.2	8.3	13.1
2-Apr	5.4	4.2	3.1	2.8	2.9	2.5	3.0	4.0	5.5	6.9	8.4	9.8	11.2	12.0	9.5	10.5	11.1	9.5	6.8	6.1	5.3	4.9	4.7	4.1	6.4	12.0
3-Apr	2.4	1.9	1.2	0.5	-0.4	-0.4	-0.8	-0.4	1.2	3.7	5.4	6.9	7.7	8.3	8.6	9.2	7.6	5.8	4.6	3.4	2.4	1.3	1.6	0.9	3.4	9.2
4-Apr	1.3	1.7	1.5	-0.1	-0.8	-0.4	0.3	0.8	3.6	5.7	5.7	2.7	5.8	6.5	4.9	1.4	1.8	3.3	2.2	1.3	0.8	0.3	0.2	-0.6	2.1	6.5
5-Apr	-1.3	-2.0	-1.9	-1.3	-0.9	-0.8	-0.5	0.2	0.8	1.8	3.6	6.5	9.5	10.9	11.6	12.0	11.9	11.5	10.9	10.4	9.7	8.8	8.0	7.7	5.3	12.0
6-Apr	7.5	7.3	6.3	5.9	4.5	3.5	1.8	3.2	7.2	9.4	10.7	11.5	13.2	14.3	15.9	16.5	16.3	15.5	13.7	10.4	7.8	6.1	4.9	3.3	9.0	16.5
7-Apr	6.2	7.0	7.0	5.2	5.6	5.4	4.5	4.1	5.3	6.0	6.4	7.1	7.6	8.4	9.4	11.0	10.5	10.3	9.6	8.0	7.4	6.3	5.4	4.2	7.0	11.0
8-Apr	3.2	2.4	1.7	0.9	0.1	-1.0	-1.5	-1.3	-1.1	-1.1	-0.4	-0.7	-1.3	-2.2	-2.3	-2.1	-2.2	-3.1	-4.0	-4.5	-4.7	-5.0	-5.2	-5.1	-1.7	3.2
9-Apr	-5.0	-5.0	-5.1	-5.1	-5.3	-5.7	-5.7	-5.4	-4.8	-4.2	-3.1	-1.1	0.5	2.5	4.2	5.6	6.1	6.1	5.2	3.5	2.2	1.3	1.0	0.2	-0.7	6.1
10-Apr	1.0	0.6	-0.5	-2.1	-1.6	-1.4	-2.0	-0.1	3.0	4.8	6.3	7.6	8.3	8.4	8.4	8.9	8.4	8.1	6.8	4.8	2.5	0.9	-0.8	-1.7	3.3	8.9
11-Apr	-2.3	-2.6	-3.1	-3.7	-3.6	-3.1	-2.9	-1.5	-0.4	0.5	2.2	3.9	4.4	5.9	6.8	6.2	4.9	4.4	3.0	2.5	2.1	1.9	1.5	0.9	1.2	6.8
12-Apr	-0.3	-2.1	-3.6	-4.5	-5.5	-6.5	-5.3	-2.7	-0.9	0.3	1.4	2.4	3.5	4.4	5.2	5.7	6.1	5.7	4.6	2.8	-1.0	-0.2	0.0	-1.4	0.3	6.1
13-Apr	-1.7	-2.6	-2.8	-3.1	-3.7	-4.3	-3.9	-2.5	-0.2	1.2	2.4	3.8	4.4	4.7	5.6	5.9	6.1	5.8	5.3	4.9	4.7	4.5	4.1	3.3	1.8	6.1
14-Apr	2.4	1.4	0.4	0.0	0.0	-0.1	-0.2	-0.4	-0.3	-0.2	-0.2	-0.4	-0.5	-0.5	-0.6	-0.9	-1.6	-2.5	-3.0	-3.3	-3.6	-4.1	-4.3	-4.6	-1.1	2.4
15-Apr	-4.8	-5.1	-5.7	-6.2	-6.5	-6.9	-6.9	-6.7	-6.4	-6.4	-5.8	-4.7	-3.8	-3.1	-2.3	-0.9	1.0	1.5	1.0	-1.0	-4.8	-4.3	-5.0	-6.7	-4.2	1.5
16-Apr	-8.9	-9.8	-10.2	-10.1	-10.1	-11.6	-8.1	-4.0	0.0	2.6	4.3	5.5	6.5	7.1	6.9	6.8	6.3	5.7	4.4	3.0	1.9	1.5	1.6	1.2	-0.3	7.1
17-Apr	1.0	0.5	0.0	-0.1	-0.8	-1.7	-2.2	-2.9	-3.5	-3.3	-3.2	-2.5	-2.2	-2.3	-2.1	-1.9	-2.0	-2.1	-2.2	-3.1	-3.8	-4.7	-6.1	-7.2	-2.4	1.0
18-Apr	-8.2	-8.2	-8.0	-7.9	-7.9	-8.1	-7.8	-7.2	-6.5	-5.7	-4.5	-3.7	-3.5	-3.2	-2.7	-2.6	-2.5	-2.6	-2.5	-2.8	-3.1	-3.0	-3.4	-3.9	-5.0	-2.5
19-Apr	-4.3	-4.6	-4.9	-4.9	-5.1	-5.2	-5.0	-4.4	-3.2	-2.0	-1.3	-1.3	0.1	0.2	0.9	1.6	1.9	2.2	2.0	1.4	0.2	-1.9	-2.6	-0.9	-1.7	2.2
20-Apr	-1.0	-0.6	-1.1	-2.0	-2.4	-2.7	-0.9	1.0	2.4	3.1	4.4	5.0	6.8	7.6	7.7	6.3	2.9	0.4	-1.8	-2.5	-3.1	-3.4	-3.4	-3.5	0.8	7.7
21-Apr	-3.7	-4.4	-6.2	-7.3	-8.1	-8.0	-7.3	-6.0	-4.6	-3.0	-2.1	-1.4	-0.4	0.1	-0.4	0.0	0.2	-0.4	-0.9	-1.5	-1.7	-2.2	-3.8	-5.4	-3.3	0.2
22-Apr	-6.2	-7.0	-7.6	-7.9	-7.9	-7.7	-5.2	-4.5	-4.8	-4.5	-3.9	-2.9	-2.6	-2.1	-1.7	-1.4	-1.2	-1.2	-2.2	-3.3	-5.3	-6.7	-8.2	-7.6	-4.7	-1.2
23-Apr	-7.6	-8.3	-8.7	-9.2	-10.0	-9.6	-7.3	-5.6	-3.9	-2.2	-1.2	-0.2	0.5	2.0	2.5	2.7	2.5	1.9	1.6	0.9	0.4	-0.1	-0.4	-0.6	-2.5	2.7
24-Apr	-0.7	-1.0	-1.9	-3.0	-3.5	-3.7	-3.4	-2.8	-2.1	-1.1	-0.5	0.0	0.8	1.3	1.7	2.0	2.3	2.0	1.6	1.2	0.8	0.3	-0.3	-0.6	-0.4	2.3
25-Apr	-0.9	-0.9	-1.1	-1.3	-1.4	-1.5	-1.1	-0.4	1.0	1.4	2.0	2.5	2.8	3.1	2.9	2.8	2.9	2.8	2.4	1.7	1.3	1.1	0.8	0.6	1.0	3.1
26-Apr	0.5	0.2	0.1	0.1	-0.1	-0.1	0.3	0.9	1.3	1.6	1.9	2.4	2.9	3.3	3.7	4.5	4.5	4.8	4.7	4.3	3.7	3.3	2.9	2.4	2.3	4.8
27-Apr	2.0	1.7	1.6	1.5	1.4	1.3	1.7	3.1	5.1	6.8	7.1	8.0	8.9	9.8	10.7	10.8	11.0	10.7	9.5	8.5	5.1	2.5	0.8	0.1	5.4	11.0
28-Apr	0.5	0.2	-2.1	0.2	-1.7	-1.2	2.7	5.8	8.0	9.9	10.5	11.0	11.5	12.1	12.0	13.2	12.4	11.8	11.3	9.9	7.6	6.2	5.3	4.2	6.7	13.2
29-Apr	4.6	5.4	4.7	4.1	4.4	3.3	4.3	8.0	10.9	11.7	11.7	12.1	12.8	12.6	11.2	12.4	12.5	12.0	9.2	8.5	6.8	5.2	3.5	2.6	8.1	12.8
30-Apr	0.9	0.3	0.0	0.2	0.3	1.3	4.6	8.0	10.8	12.6	13.3	13.8	13.9	11.4	11.9	8.9	7.9	8.1	8.0	7.1	5.3	3.5	2.9	2.5	6.6	13.9
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 2m (AT 2m) - C
Anzac - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Anzac - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	295	40.97	40.97
0 - 10	364	50.56	91.53
10 - 20	61	8.47	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



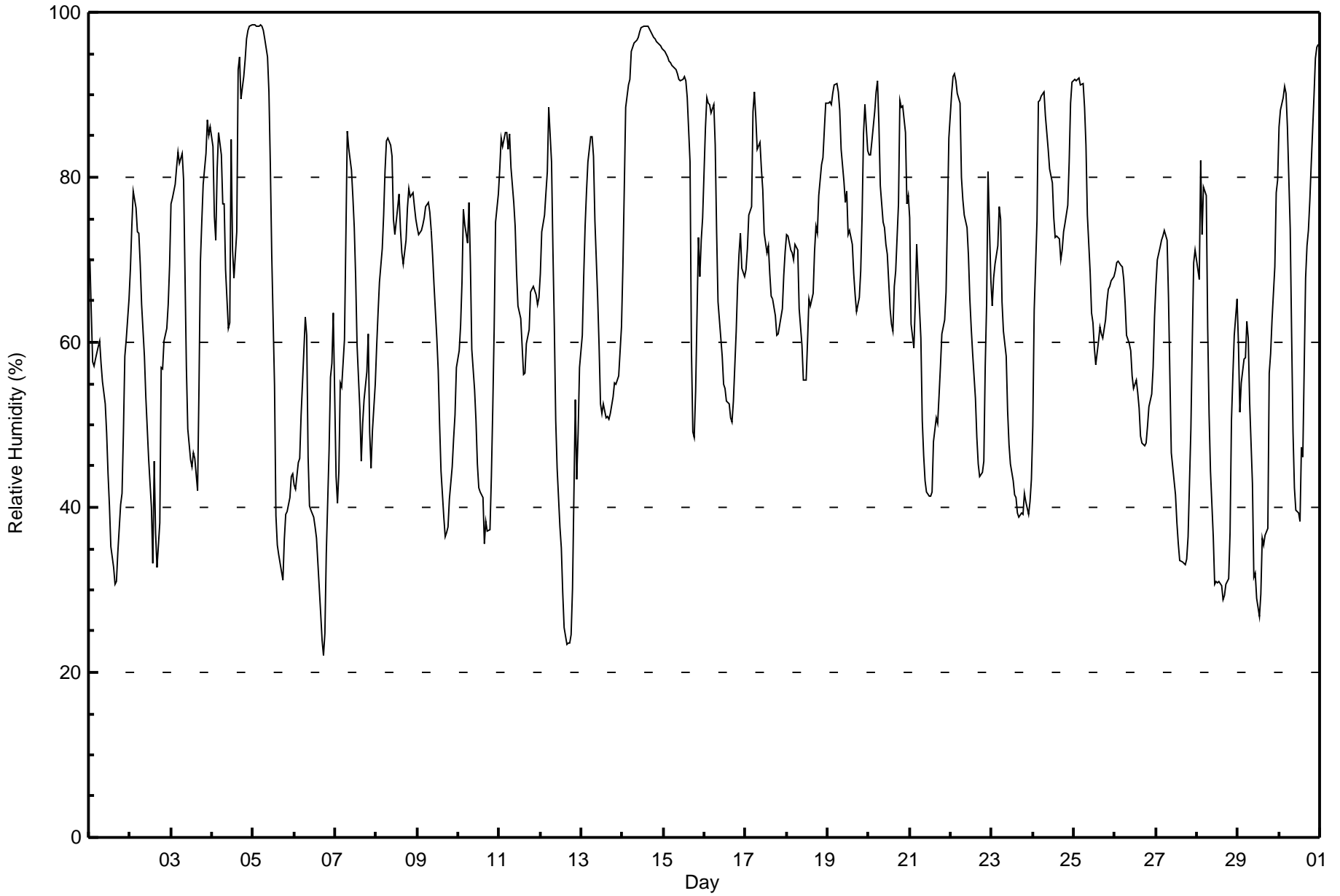
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Anzac - April 2017

Maximum Value: 99 % on Apr 5 01:00																			Maximum Daily Average: 94.3 % on Apr 14						Hours in Service: 720																								
Minimum Value: 22 % on Apr 6 18:00																			Minimum Daily Average: 43.1 % on Apr 6						Hours of Data: 720																								
Maximum Diurnal Average: 80.0 % at hour 6																			Minimum Diurnal Average: 52.0 % at hour 17						Hours of Missing Data: 0																								
Monthly Average: 65.4 %																			Percentiles: P ₁ = 25 P ₁₀ = 39 Q ₁ = 51 Median = 67 Q ₃ = 79 P ₉₀ = 90 P ₉₉ = 98						Hours of Calibration: 0																								
																									Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	70	64	58	57	58	60	60	58	55	53	49	44	40	35	33	31	31	35	40	42	49	58	60	65	50.2	70																							
2-Apr	69	74	78	76	73	73	69	65	58	53	50	46	40	33	46	37	33	38	57	57	60	62	65	69	57.5	78																							
3-Apr	77	77	79	81	83	82	83	80	68	57	50	46	45	47	46	42	54	70	75	79	83	87	85	86	69.2	87																							
4-Apr	84	75	72	81	85	83	77	77	69	62	62	85	71	68	73	93	95	90	92	94	97	98	98	99	82.4	99																							
5-Apr	99	98	98	98	99	98	98	97	95	90	82	71	55	39	35	34	33	31	36	39	39	41	44	44	66.4	99																							
6-Apr	43	42	45	46	51	55	63	61	46	40	40	39	38	36	33	27	24	22	25	34	47	56	57	64	43.1	64																							
7-Apr	44	41	44	55	55	60	73	86	84	81	78	74	68	60	52	46	50	53	57	61	49	45	49	55	59.0	86																							
8-Apr	60	64	67	71	75	81	84	85	84	83	75	73	76	78	74	71	69	72	76	79	78	78	76	75	75.2	85																							
9-Apr	74	73	74	74	75	76	77	76	74	70	67	61	57	50	44	39	36	37	38	41	45	48	51	57	58.9	77																							
10-Apr	59	62	67	76	74	72	77	70	59	54	50	45	42	42	41	36	38	37	37	44	52	62	75	78	56.3	78																							
11-Apr	81	85	84	85	85	83	85	81	77	74	68	64	63	59	56	56	60	62	66	66	67	66	65	65	71.1	85																							
12-Apr	68	73	75	78	81	88	82	71	62	51	45	38	35	30	25	23	23	24	25	30	53	43	49	57	51.2	88																							
13-Apr	61	68	74	78	82	85	85	83	75	65	59	53	51	52	51	51	51	51	53	55	55	56	56	62	63.0	85																							
14-Apr	69	79	88	91	92	95	96	96	97	97	98	98	98	98	98	98	98	97	97	97	96	96	96	96	94.3	98																							
15-Apr	95	95	95	94	94	94	93	93	93	92	92	92	92	92	90	82	59	49	48	54	73	68	72	75	82.3	95																							
16-Apr	86	90	89	89	88	89	84	73	65	61	58	55	54	53	53	51	50	53	61	67	71	73	69	68	68.7	90																							
17-Apr	69	71	75	76	88	90	87	83	84	81	78	73	71	72	68	66	65	63	61	61	62	64	68	71	72.9	90																							
18-Apr	73	73	71	71	70	72	71	64	62	60	55	55	60	65	64	66	71	74	73	78	81	82	86	89	70.3	89																							
19-Apr	89	89	89	90	91	91	90	88	83	80	77	78	73	74	72	68	66	64	65	69	75	85	89	83	80.0	91																							
20-Apr	83	83	84	88	90	92	86	79	75	74	72	71	64	62	61	67	69	77	89	89	89	85	77	78	78.4	92																							
21-Apr	75	62	59	65	72	68	60	51	46	43	42	41	41	42	48	51	50	54	57	61	63	66	75	85	57.4	85																							
22-Apr	90	92	93	92	90	89	80	77	75	74	70	65	62	59	53	48	45	44	44	46	57	65	81	68	69.1	93																							
23-Apr	64	68	70	72	76	75	65	61	58	52	48	45	43	41	41	39	39	39	39	42	41	39	41	43	51.8	76																							
24-Apr	50	64	75	89	89	90	90	88	85	83	81	79	75	73	73	70	71	73	74	77	82	89	91	78.5	91																								
25-Apr	92	92	92	92	91	91	88	84	75	69	64	62	59	57	60	62	61	61	63	65	66	67	67	68	72.9	92																							
26-Apr	69	70	70	69	69	68	65	61	60	59	56	54	55	54	52	49	48	47	48	50	52	54	57	63	58.2	70																							
27-Apr	67	70	71	72	73	74	72	65	56	47	45	42	38	36	34	33	33	33	34	36	50	60	70	71	53.4	74																							
28-Apr	69	68	82	73	79	78	62	51	44	36	31	31	31	31	30	29	29	31	31	37	50	56	61	65	49.4	82																							
29-Apr	60	52	55	58	58	62	61	53	43	31	32	29	27	29	36	35	37	37	56	59	63	69	78	80	50.0	80																							
30-Apr	86	88	90	91	90	86	74	61	49	42	40	39	38	47	46	68	72	73	77	82	90	94	96	96	71.5	96																							
																								72.4	73.4	75.5	77.7	79.3	80.0	78.0	73.9	68.5	63.8	60.4	58.3	55.5	53.8	53.0	52.3	52.0	52.9	56.5	59.5	64.3	66.8	70.1	72.2	Diurnal Average	
																								99	98	98	98	99	98	98	97	97	97	98	98	98	98	98	98	98	97	97	97	97	98	98	99	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Anzac - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	81	11.25	11.25
40 - 60	188	26.11	37.36
60 - 80	277	38.47	75.83
80 - 100	174	24.17	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

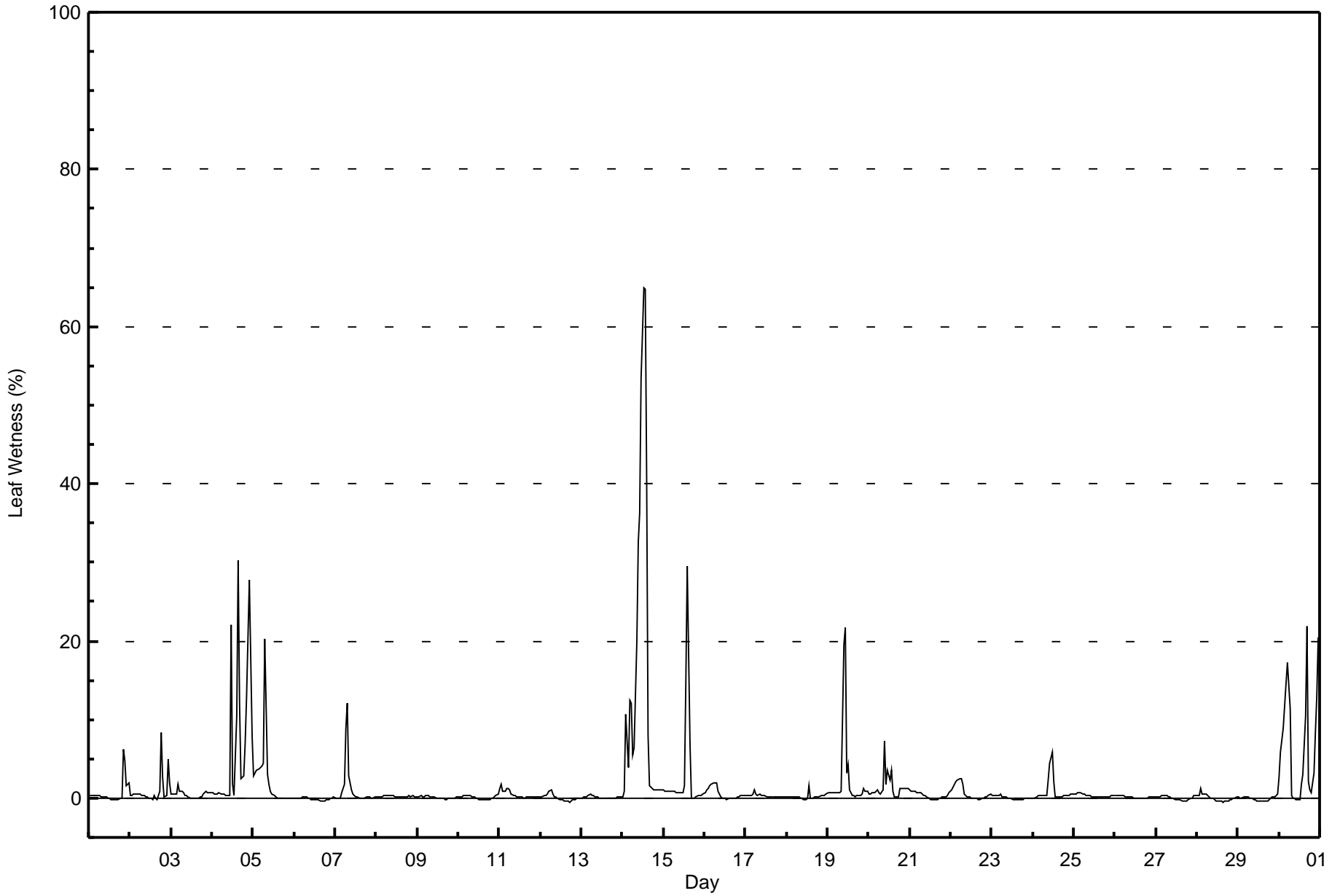


Maximum Value: 65 % on Apr 14 13:00																	Maximum Daily Average: 15.9 % on Apr 14										Hours in Service: 720	
Minimum Value: 0 % on Apr 28 16:00																	Minimum Daily Average: -0.1 % on Apr 6										Hours of Data: 720	
Maximum Diurnal Average: 3.0 % at hour 12																	Minimum Diurnal Average: 0.2 % at hour 18										Hours of Missing Data: 0	
Monthly Average: 1.5 %																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 29										Hours of Calibration: 0	
																	Percent Operational Time: 100.0											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	2	2	0.7	6			
2-Apr	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	8	3	0	0	5	2	1.0	8		
3-Apr	1	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.5	2			
4-Apr	1	1	0	1	1	1	0	0	0	0	22	2	0	10	30	12	2	3	7	13	20	28	8	6.8	30			
5-Apr	3	3	4	4	4	4	4	20	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2.2	20			
6-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.1	0			
7-Apr	0	0	0	0	1	2	9	12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	12			
8-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0			
9-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0			
10-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	1			
11-Apr	1	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2			
12-Apr	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1			
13-Apr	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1			
14-Apr	0	1	11	4	12	12	6	6	20	33	36	53	65	65	40	8	2	1	1	1	1	1	1	15.9	65			
15-Apr	1	1	1	1	1	1	1	1	1	1	1	2	15	30	7	0	0	0	0	0	0	0	0	2.7	30			
16-Apr	1	1	1	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2			
17-Apr	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1			
18-Apr	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0.2	2			
19-Apr	1	1	1	1	1	1	1	1	1	20	22	3	4	1	0	0	0	0	0	1	1	1	1	2.6	22			
20-Apr	1	1	1	1	1	1	1	0	1	7	2	4	2	4	1	0	0	0	1	1	1	1	1	1.4	7			
21-Apr	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1			
22-Apr	1	1	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.7	2			
23-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0			
24-Apr	0	0	0	0	0	0	0	0	0	2	4	6	2	0	0	0	0	0	0	0	0	0	1	0.8	6			
25-Apr	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1			
26-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0			
27-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0			
28-Apr	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1			
29-Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.1	0			
30-Apr	3	6	9	12	15	17	11	0	0	0	0	0	2	3	10	22	2	1	1	3	8	13	21	6.6	22			
0.6 0.7 1.2 1.1 1.6 1.8 1.5 1.7 1.2 2.3 2.2 3.0 2.5 2.9 2.8 1.8 1.1 0.2 0.5 0.5 0.9 1.4 1.8 1.4																	Diurnal Average											
3 6 11 12 15 17 11 20 20 33 36 53 65 65 40 30 22 2 8 7 13 20 28 21																	Diurnal Maximum											



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (SW) - %
Anzac - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (SW) - %
Anzac - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	296	52.67	52.67
0.4 - 0.5	66	11.74	64.41
0.6 - 0.7	43	7.65	72.06
0.8 - 1.4	61	10.85	82.92
1.5 - 10	65	11.57	94.48
> 10	31	5.52	100.00

Total Number of Valid Hours: 562

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Anzac - April 2017

Maximum Speed: 22 km/h on Apr 14 15:00	Maximum Daily Speed Average: 16.7 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 30 20:00	Minimum Daily Speed Average: 0.4 km/h on Apr 28	Hours of Data: 714
Maximum Diurnal Speed Average: 2.8 km/h at hour 19	Minimum Diurnal Speed Average: 1.1 km/h at hour 16	Hours of Missing Data: 6
Monthly Average Velocity: 1.9 km/h 106.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 19	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW14	WSW12	W13	W15	W14	W14	W15	W13	W14	WNW14	WNW14	WNW13	WNW13	WNW12	WNW10	WNW10	NW9	NW6	WNW4	W10	WNW9	NNW9	NW8	W8	WNW10.4	W15
2-Apr	SW7	WSW8	WSW6	W7	W8	WNW8	WNW10	WNW10	WNW12	WNW11	WNW11	WNW12	WNW11	WNW12	N9	WNW10	NW12	NW9	NNE1	W7	WNW7	NW7	WNW10	W8	WNW8.1	NW12
3-Apr	WNW8	WNW8	WNW7	WNW7	WNW7	WNW7	WNW5	WNW5	WNW7	WNW7	WNW8	NNW10	NNW10	NNW13	NNW13	NNW13	NW11	WNW11	WNW9	WNW8	WNW6	WNW4	SE1	SSE6	NNW6.9	NNW13
4-Apr	SSE8	S10	SSW6	SSW3	SE4	SSE7	SSE7	S4	S5	WNW8	W9	WSW13	E11	E12	S5	WSW9	SSW6	SSW9	S8	SSE7	SSE7	S11	S9	SSW5	S4.9	WSW13
5-Apr	S5	SSE4	AF	AF	AF	AF	AF	AF	SSE13	SSE13	SSE15	SSE16	S18	S20	S16	S16	S17	SSW15	S13	S12	SSE11	SSE11	S13	S14	S13.1	S20
6-Apr	S15	S14	S11	S10	SSE8	SSE7	SSE4	S4	SSW5	WNW4	WNW9	WNW6	WNW10	WNW9	WNW9	WNW11	WNW10	NW7	NW5	WSW2	W4	NW3	NE4	NE5	WSW2.9	S15
7-Apr	NE8	ENE7	ESE5	ESE4	E7	SE4	SW3	S6	S9	S3	SW4	WNW6	W7	W6	SW4	SSE5	SE7	SE4	SE5	E5	ENE12	NE10	NE11	NE10	ESE2.5	ENE12
8-Apr	NE10	NNE9	N8	N7	NNW8	NW8	NNW11	NNW12	N13	N13	N15	N15	NNW15	NNW15	N13	N12	N12	NNE12	N10	N9	NE9	NNE9	NNE8	NNE6	N10.1	N15
9-Apr	NNE6	NE3	NE2	ENE3	ENE4	ENE4	ESE5	SSE6	SSE7	S7	S8	SE9	SE12	SE14	SE14	SSE14	SSE14	SSE12	S8	SSE8	S9	S10	SSE11	S10	SSE6.9	SE14
10-Apr	SSW9	SSW7	SW6	S4	S5	S5	SSE8	SSE9	SSE9	SSE10	SE9	ESE8	SE9	SE12	SE12	SSE11	SE12	SE10	SE6	ESE5	SE5	SSE5	SSE4	SE3	SSE6.9	SE12
11-Apr	WSW3	N1	NNW1	W3	WNW6	WNW8	WNW8	NNW8	NNW11	NNW12	NNW11	NNW11	NNW13	NNW12	NNW14	NNW17	N13	N12	NNE11	NNE9	NNE5	NE6	NE7	NE6	NNW7.4	NNW17
12-Apr	NNE7	N7	NNW5	WNW4	WNW3	W3	NW3	NE5	NE8	NE11	NE9	NE11	NE11	NE10	NE9	NNE7	NE7	ENE8	E8	ESE5	E4	ESE7	SE9	SE7	NE4.9	NE11
13-Apr	SE9	SE6	SE10	ESE7	E7	E7	E9	ESE10	ESE16	ESE15	E16	E16	E16	E15	E16	E17	E18	E18	E15	E15	E15	E15	E19	ESE16	E13.1	E19
14-Apr	E17	E17	E18	E18	E15	E17	E16	E18	E19	E20	E18	ENE21	ENE21	ENE20	ENE22	ENE21	ENE18	ENE14	ENE14	ENE14	ENE14	NE14	NE12	NE12	ENE16.7	ENE22
15-Apr	NE11	NE13	NE16	NE15	NE13	NE12	NE12	NE13	ENE14	ENE16	ENE13	NE12	NE12	NE13	NE12	NE13	NE11	ENE11	ENE8	E6	SE4	SSE8	S8	SSE7	ENE9.8	ENE16
16-Apr	SSE7	SSE7	SSE7	SSE7	S8	S7	S7	S5	S6	SSW5	SSW3	SE5	SSE9	SSW9	SW14	SW15	SSW14	SSW14	SSW12	SSW10	SSW8	SSW9	SW11	SW9	SSW7.9	SW15
17-Apr	SW8	SW6	NW1	NW5	NNW9	N11	N11	N13	N12	N10	N11	N13	N12	N12	N12	N11	NNE9	NNE9	NNE9	NNE11	NNE9	NE11	NE10	NE8	N8.4	N13
18-Apr	NNE7	NNE6	NE7	NE6	NE6	NE7	NE8	NE9	ENE8	ENE8	ENE8	NE9	NE8	NE9	NE8	NE8	NE7	NE7	ENE7	ENE5	ENE3	NE2	NNE4	N4	NE6.5	NE9
19-Apr	NW3	NW4	NNW4	NW3	WNW4	WNW3	WNW4	W3	SSW1	SSE1	N3	WNW5	WNW5	W5	WSW4	W4	WNW4	WSW3	ESE1	E4	SE5	SE6	SE7	SSE8	W1.2	SSE8
20-Apr	SSE9	SSE9	SSE7	SSE6	SSE6	ESE5	SE5	ESE4	SE4	E4	E6	ENE6	NE7	NNE9	N12	NNE12	N15	NNE15	NNE14	NNE11	NNE10	NNE9	NNE7	N8	NE4.8	N15
21-Apr	N8	NNE6	N6	N7	N6	NNE5	NE3	ENE5	ENE8	NE4	ENE9	NE5	ENE5	N6	NNE8	NNE6	ENE7	ENE7	NE6	ENE5	ESE3	SSW4	SSW2	S2	NE4.3	ENE9
22-Apr	SSE3	S2	SSW3	WSW4	WSW6	WSW5	N9	N10	N10	N9	NNE9	N9	N11	N10	NNE9	N8	NNE9	N9	N9	N7	N5	N3	ENE5	E6	N5.1	N11
23-Apr	E6	SE6	SE7	SE6	ESE6	SE7	SSE8	SSE10	SE10	ESE13	ESE13	SE12	SE12	SE12	ESE12	ESE11	E12	E11	E11	E8	ESE7	ESE6	E5	E4	ESE8.5	ESE13
24-Apr	SE7	SE9	ESE10	E9	E11	E10	E10	E12	ESE11	ESE11	ESE13	ESE13	ESE14	ESE13	ESE12	E12	E12	ESE13	ESE11	ESE9	SE8	SE8	SE8	ESE9	ESE10.4	ESE14
25-Apr	SE10	SE10	SE10	SE9	SE8	SE9	SSE10	SSE9	SSE9	SSE11	SSE11	SSE13	SSE10	SSE13	S13	S11	S12	S13	S11	S11	SSE8	SSE8	S9	S9	SSE9.9	S13
26-Apr	S10	S12	S10	S8	SSE8	SSE8	SSE9	SSE11	SSE13	SSE13	S13	S14	S14	S14	S14	S12	SSE11	SSE8	SSE8	SE7	ESE6	SE7	SSE7	SSE6	SSE10.0	S14
27-Apr	SSE5	SSE5	SSE6	SSE8	SSE7	SSE6	SSE8	SSE10	SSE10	SE13	SE11	ESE8	SE9	SE9	SE9	SE8	SE5	E9	ENE7	ENE7	E5	SE5	S5	SW6	SE6.6	SE13
28-Apr	WSW7	WSW5	NNW4	WNW8	WSW5	SSW4	S5	WSW3	WSW3	SSW5	NW7	ESE1	WNW2	NE7	NE4	ESE7	NE6	NE8	NE5	ENE5	SE4	S3	S4	SW5	SW0.4	WNW8
29-Apr	WSW5	SW6	SW6	SSW5	WSW7	SW6	SW6	WSW5	S4	SSW12	SSW12	SW16	SSW15	SW15	SW17	SW15	SSW12	SW11	WNW7	SSW5	S5	S5	SW3	SSW5	SW7.9	SW17
30-Apr	S5	S5	S4	SSE4	SSE6	SSE6	S6	S5	ESE3	SE6	SSE9	SE9	S8	WNW12	NW5	SW10	WNW2	WSW4	W1	NNW0	WSW2	W4	W3	W4	SSW3.0	WNW12

SSE2.4 SSE2.6 SE1.8 SE1.1 SE1.1 SE1.4 ESE1.3 ESE1.6 ESE2.5 ESE2.5 E2.2 E2.0 E2.4 ENE1.7 ENE1.9 E1.1 ENE1.9 E2.4 E2.8 E2.6 E2.7 ESE2.7 ESE2.7 SE2.1	Diurnal Average
E17 E17 E18 E18 E15 E17 E16 E18 E19 E20 E18 ENE21 ENE21 S20 ENE22 ENE21 ENE18 E18 E15 E15 E15 E15 E19 ESE16	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Anzac - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Apr 5 14:00	Hours of Data: 714
Minimum Value: 1 km/h on Apr 29 23:00	Hours of Missing Data: 6
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	4	4	4	5	5	4	5	5	4	5	4	5	4	4	3	4	3	2	1	6	5	3	3	2	6	
2-Apr	2	2	1	2	2	2	3	3	4	3	3	4	3	6	6	3	6	5	4	2	2	2	3	2	6	
3-Apr	2	2	2	2	2	2	1	2	2	2	3	3	4	3	4	4	4	3	2	2	2	1	2	1	4	
4-Apr	2	2	3	1	1	1	2	2	2	2	5	6	3	4	4	3	2	2	2	2	2	3	2	1	6	
5-Apr	1	1	AF	AF	AF	AF	AF	AF	4	4	4	5	6	7	5	6	6	5	4	3	3	3	3	4	7	
6-Apr	3	3	3	3	2	3	1	2	1	2	3	2	3	3	3	4	3	2	2	2	1	1	2	1	4	
7-Apr	2	2	2	2	2	2	2	2	2	3	1	1	2	2	1	3	2	2	2	2	4	3	3	3	4	
8-Apr	3	3	2	2	2	2	3	3	4	3	4	4	5	4	4	4	3	4	3	3	3	2	2	2	5	
9-Apr	2	2	2	1	2	3	2	2	2	3	3	4	4	4	4	4	4	3	2	2	2	2	3	3	4	
10-Apr	3	2	2	2	1	1	3	3	2	2	2	2	3	3	4	3	3	3	2	1	1	2	1	1	4	
11-Apr	1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	4	3	3	1	2	2	2	4	
12-Apr	2	2	1	1	1	1	1	2	3	3	2	3	4	3	3	4	3	3	2	2	1	2	2	2	4	
13-Apr	3	2	2	2	2	2	2	3	5	5	5	5	5	4	4	5	6	6	5	4	5	5	6	6	6	
14-Apr	6	5	5	5	4	5	5	5	5	5	5	6	5	6	5	6	6	4	4	4	4	4	4	3	6	
15-Apr	3	4	4	4	4	3	3	3	4	5	3	4	4	4	4	3	3	3	2	2	1	2	2	1	5	
16-Apr	1	2	2	2	2	1	1	2	1	1	1	2	3	3	5	4	4	4	4	3	2	3	3	4	5	
17-Apr	3	3	1	3	2	3	3	4	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	2	4	
18-Apr	2	2	2	2	2	2	2	3	2	2	2	3	3	2	2	2	2	1	2	1	1	1	1	1	3	
19-Apr	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	2	2	
20-Apr	2	3	2	2	1	1	2	1	2	2	2	2	3	3	3	3	4	4	4	4	4	3	2	2	4	
21-Apr	2	2	1	1	1	2	1	3	3	2	3	2	3	3	3	2	2	2	2	2	1	1	1	1	3	
22-Apr	1	1	1	1	1	2	3	3	3	3	2	2	3	3	3	3	3	3	2	2	1	1	2	1	3	
23-Apr	2	2	2	2	2	2	3	2	3	4	4	3	3	3	4	3	4	3	3	2	2	1	1	1	4	
24-Apr	3	3	3	3	3	3	3	4	3	3	4	4	4	3	4	3	4	3	4	3	3	3	2	3	4	
25-Apr	3	3	3	3	2	2	3	3	3	3	3	3	4	4	3	3	3	4	3	3	2	2	2	3	4	
26-Apr	3	3	2	2	2	2	3	3	3	4	4	4	4	5	5	4	4	3	2	2	2	2	2	2	5	
27-Apr	1	1	1	2	2	1	2	3	3	4	4	5	4	4	4	3	3	3	2	2	1	1	1	2	5	
28-Apr	1	1	1	2	1	2	1	1	2	2	2	2	3	3	3	3	3	3	1	1	1	1	1	1	3	
29-Apr	1	1	1	1	2	1	1	2	3	4	4	5	6	5	5	4	4	4	3	1	1	1	1	1	6	
30-Apr	1	1	1	1	2	1	2	2	2	3	4	4	5	4	2	5	4	3	1	1	2	1	1	1	5	
	6	5	5	5	5	5	5	5	5	5	5	5	6	6	7	6	6	6	6	5	6	5	5	6	6	

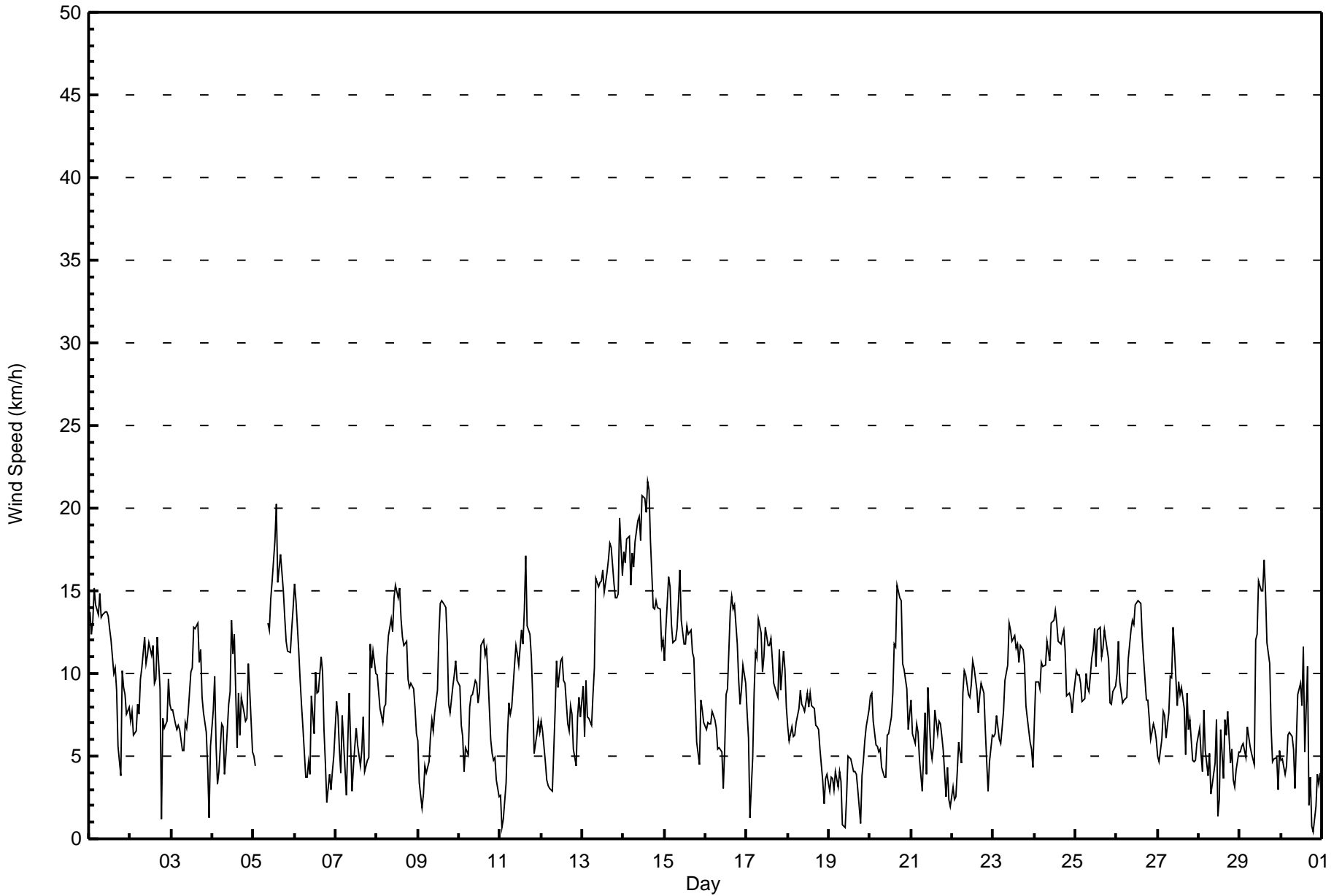
Diurnal Maximum

AF - Analyzer Failure



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Anzac - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	168	23.53	23.53
6 - 11	368	51.54	75.07
12 - 19	171	23.95	99.02
20 - 28	7	0.98	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	5	4	11	10	7	11	15	11	22	14	5	14	9	16	9	5	168
6 - 11	27	28	39	16	18	18	37	62	27	10	13	6	8	40	9	10	368
12 - 19	17	4	13	11	28	12	10	11	20	8	7	2	7	9	1	11	171
20 - 28	0	0	0	5	1	0	0	0	1	0	0	0	0	0	0	0	7
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	36	63	42	54	41	62	84	70	32	25	22	24	65	19	26	714

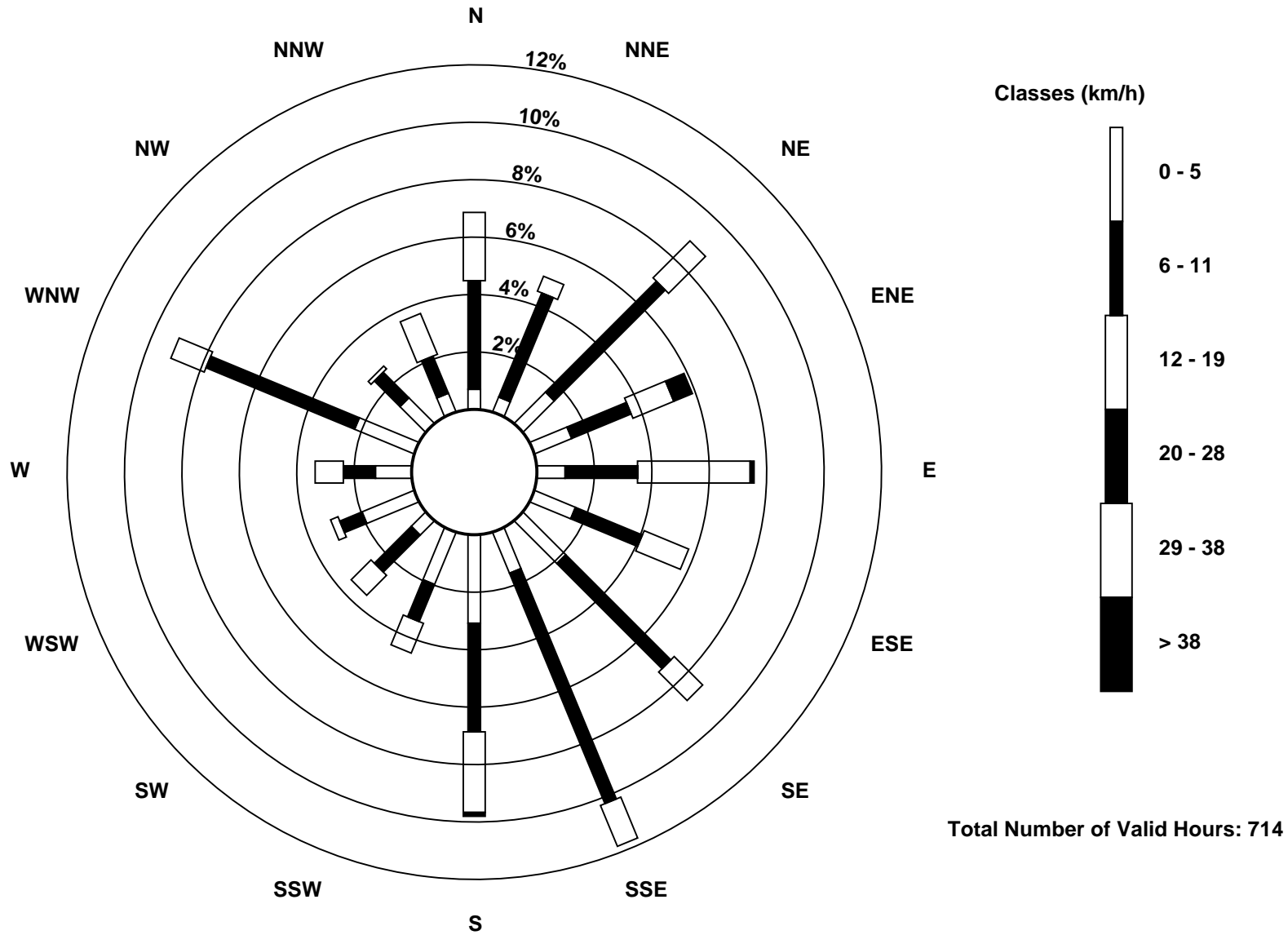
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Anzac (AMS 14)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Anzac - April 2017

Direction of Maximum Speed: 76 deg on Apr 14 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 75.4 deg on Apr 14	Hours of Data: 714
Direction of Minimum Speed: 331 deg on Apr 30 20:00	Hours of Missing Data: 6
Direction of Minimum Daily Speed Average: 0.4 deg on Apr 28	Percent Operational Time: 99.2
Monthly Average Direction: 234.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	228	248	263	271	266	264	271	278	276	284	283	292	299	300	302	300	311	322	293	269	301	345	323	276	282.0
2-Apr	235	237	249	281	281	288	291	294	291	297	302	297	291	300	352	299	307	320	29	260	287	317	303	279	292.6
3-Apr	294	291	292	286	295	301	296	286	292	287	292	328	336	330	336	342	315	292	296	297	292	292	145	151	306.4
4-Apr	167	176	194	192	135	148	160	172	179	296	278	247	81	95	177	242	205	209	170	161	161	178	177	197	182.0
5-Apr	173	152	AF	AF	AF	AF	AF	AF	161	154	153	163	177	186	189	191	189	195	184	174	165	165	174	184	176.0
6-Apr	186	183	179	169	153	162	162	176	207	303	299	293	293	292	302	301	298	315	322	248	281	318	48	51	246.3
7-Apr	56	77	122	105	99	144	225	191	183	178	236	303	278	260	233	155	142	135	143	84	69	56	54	44	105.7
8-Apr	36	12	360	351	344	319	331	338	355	3	1	1	346	342	352	354	354	27	7	6	48	32	33	30	0.7
9-Apr	22	40	43	76	71	76	106	154	160	170	176	144	135	139	138	153	158	161	169	156	170	171	167	190	149.4
10-Apr	198	202	214	190	182	185	166	162	158	147	132	123	132	144	144	149	143	146	145	121	130	150	160	135	154.2
11-Apr	254	2	340	281	297	299	300	327	341	335	338	343	340	339	333	334	351	11	26	22	14	38	51	48	345.7
12-Apr	12	356	335	296	300	277	313	43	50	49	35	51	37	50	36	32	51	65	91	114	91	113	128	130	50.8
13-Apr	128	131	127	123	99	101	101	104	112	118	101	98	86	95	100	94	92	101	94	85	88	95	99	109	101.2
14-Apr	95	98	87	84	85	79	81	81	79	84	81	75	77	77	76	76	66	57	60	57	58	56	56	51	75.4
15-Apr	44	46	48	50	52	49	53	56	59	64	60	47	42	44	56	38	53	62	74	82	133	162	171	166	59.3
16-Apr	164	166	168	167	173	172	176	187	187	197	213	144	150	196	216	216	211	209	204	201	198	209	227	235	195.8
17-Apr	236	222	326	319	339	3	4	7	4	6	1	357	360	2	4	8	12	13	14	17	33	37	42	41	6.6
18-Apr	33	32	37	41	40	47	56	56	59	65	67	40	46	44	48	50	49	52	76	67	61	52	20	359	48.8
19-Apr	313	324	341	309	301	288	298	266	206	162	350	293	303	264	237	273	296	249	107	99	130	135	141	160	266.3
20-Apr	168	156	150	150	157	114	131	119	126	100	85	64	37	25	5	12	5	18	20	20	19	31	21	351	44.9
21-Apr	8	18	354	359	8	33	51	71	61	44	59	53	59	11	15	22	60	60	45	66	114	209	204	170	38.8
22-Apr	166	171	194	247	243	252	351	355	6	9	16	3	10	10	12	2	12	351	8	8	358	4	66	88	4.4
23-Apr	98	135	131	134	120	135	153	147	134	120	111	126	134	124	105	105	92	86	89	101	113	106	99	99	116.2
24-Apr	125	128	108	87	84	90	91	99	105	109	115	109	106	107	103	97	100	106	110	112	123	135	127	121	107.2
25-Apr	130	143	141	143	137	141	155	152	160	162	157	151	165	165	170	176	187	175	182	179	168	167	178	181	161.8
26-Apr	175	173	175	174	159	159	163	166	168	166	169	182	174	174	171	174	163	156	165	146	120	137	168	166	166.7
27-Apr	161	153	155	148	151	151	148	156	153	133	140	122	138	145	135	133	126	86	74	69	98	139	169	222	137.1
28-Apr	242	243	339	298	252	193	170	238	244	208	312	116	291	47	55	120	44	49	42	74	127	184	182	234	230.6
29-Apr	245	236	230	205	245	223	227	258	180	209	201	225	203	218	234	217	207	223	294	212	190	189	233	206	219.8
30-Apr	180	175	175	155	162	167	174	173	107	139	150	144	175	288	317	222	286	255	264	331	241	264	275	278	193.0

152.7 154.8 138.0 135.5 123.8 126.4 121.9 106.8 112.0 107.9 91.9 81.9 82.5 75.7 70.5 88.1 75.5 80.8 83.5 90.5 100.8 112.8 119.8 142.5

Diurnal Average

AF - Analyzer Failure

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

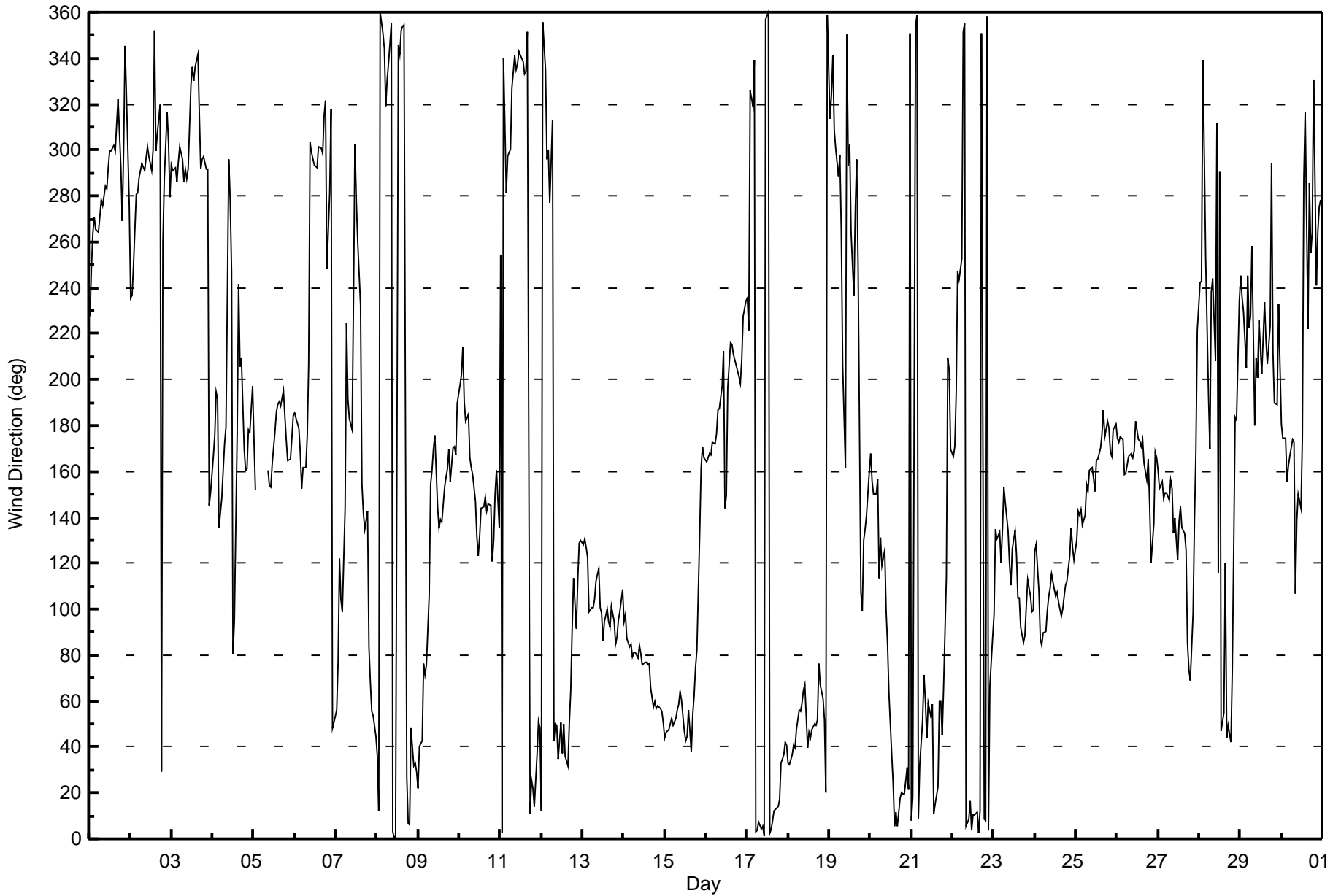
Wind Direction (WD) - deg
Anzac - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 98 deg on Apr 28 12:00	Hours of Data: 714
Minimum Value: 8 deg on Apr 22 05:00	Hours of Missing Data: 6
Percentiles: P ₁ = 11 P ₁₀ = 15 Q ₁ = 17 Median = 21 Q ₃ = 26 P ₉₀ = 40 P ₉₉ = 90	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	18	19	21	22	21	22	22	24	24	23	24	25	21	21	24	24	22	29	30	29	49	18	23	25	49
2-Apr	14	11	23	17	16	18	20	19	22	20	20	21	23	30	37	21	29	37	95	20	22	19	24	20	95
3-Apr	15	18	18	17	15	15	17	22	22	24	39	28	32	23	25	25	36	20	18	13	14	16	89	16	89
4-Apr	15	14	32	34	26	14	15	48	41	27	30	43	21	26	67	24	34	26	21	20	17	17	20	19	67
5-Apr	19	15	AF	AF	AF	AF	AF	AF	19	21	20	24	26	26	25	25	24	22	20	18	17	18	17	19	26
6-Apr	17	16	16	17	19	17	16	20	29	45	23	39	27	28	28	22	21	22	17	42	14	35	21	11	45
7-Apr	11	21	38	44	32	51	62	17	17	85	29	23	26	22	41	58	35	41	21	37	17	16	15	15	85
8-Apr	16	15	17	14	15	16	15	16	18	17	18	19	24	17	20	18	20	19	20	20	19	21	20	18	24
9-Apr	19	52	74	52	42	77	41	36	36	34	39	32	28	21	22	23	21	20	19	16	14	13	15	21	77
10-Apr	26	25	20	24	19	16	10	23	16	23	25	34	31	28	24	26	21	20	20	12	12	17	18	32	34
11-Apr	55	91	91	35	16	16	16	21	17	17	22	25	21	25	20	16	23	18	16	15	14	20	16	16	91
12-Apr	21	15	17	22	25	17	25	28	22	24	26	28	31	36	32	50	45	32	28	18	19	19	21	13	50
13-Apr	17	19	16	19	22	23	22	19	20	22	25	26	22	24	25	23	23	22	21	17	19	22	21	23	26
14-Apr	21	21	18	17	18	16	17	16	16	18	17	16	17	16	16	18	16	15	16	17	15	16	15	15	21
15-Apr	15	15	15	14	14	15	15	17	17	19	20	22	22	21	19	20	18	17	19	18	18	15	15	12	22
16-Apr	12	12	14	15	13	10	10	22	21	26	64	55	32	43	23	22	21	21	21	23	25	23	16	22	64
17-Apr	24	32	73	33	15	18	17	16	17	19	16	17	18	18	18	21	19	22	17	17	17	17	16	16	73
18-Apr	15	17	18	18	17	15	19	22	22	28	27	27	32	21	23	21	22	19	21	19	23	34	33	20	34
19-Apr	25	29	20	19	17	30	19	31	89	94	53	28	38	42	34	43	60	62	78	27	15	11	14	16	94
20-Apr	15	24	20	20	12	19	32	26	37	61	35	27	27	24	19	18	19	18	19	17	18	21	18	16	61
21-Apr	20	19	11	11	13	19	35	33	34	65	30	52	65	58	30	40	29	22	20	16	36	21	29	53	65
22-Apr	12	28	26	16	8	18	19	18	19	21	26	25	24	26	37	36	28	23	21	15	12	27	22	17	37
23-Apr	24	18	16	20	25	22	22	22	24	25	28	24	28	26	29	28	27	19	20	23	24	30	22	22	30
24-Apr	29	20	20	18	17	19	19	20	21	22	20	22	21	21	22	24	21	22	21	22	18	20	21	18	29
25-Apr	17	19	19	19	21	19	19	26	26	22	22	22	26	25	21	21	24	20	19	18	17	18	17	19	26
26-Apr	17	15	18	18	18	16	19	20	19	20	25	26	23	23	24	27	28	25	21	17	19	21	19	16	28
27-Apr	17	16	16	17	16	17	17	18	26	27	34	56	40	44	42	42	69	35	28	12	20	16	17	21	69
28-Apr	12	17	33	18	12	35	18	56	61	56	37	98	89	62	75	47	47	21	25	13	31	25	17	16	98
29-Apr	20	19	15	11	16	18	15	30	69	28	29	25	33	36	21	25	30	37	25	17	13	16	21	14	69
30-Apr	18	13	13	16	14	15	18	22	60	48	43	39	58	23	40	52	90	70	84	94	59	10	21	18	94
	55	91	91	52	42	77	62	56	89	94	64	98	89	62	75	58	90	70	95	94	59	35	89	53	

Diurnal Maximum

AF - Analyzer Failure





Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

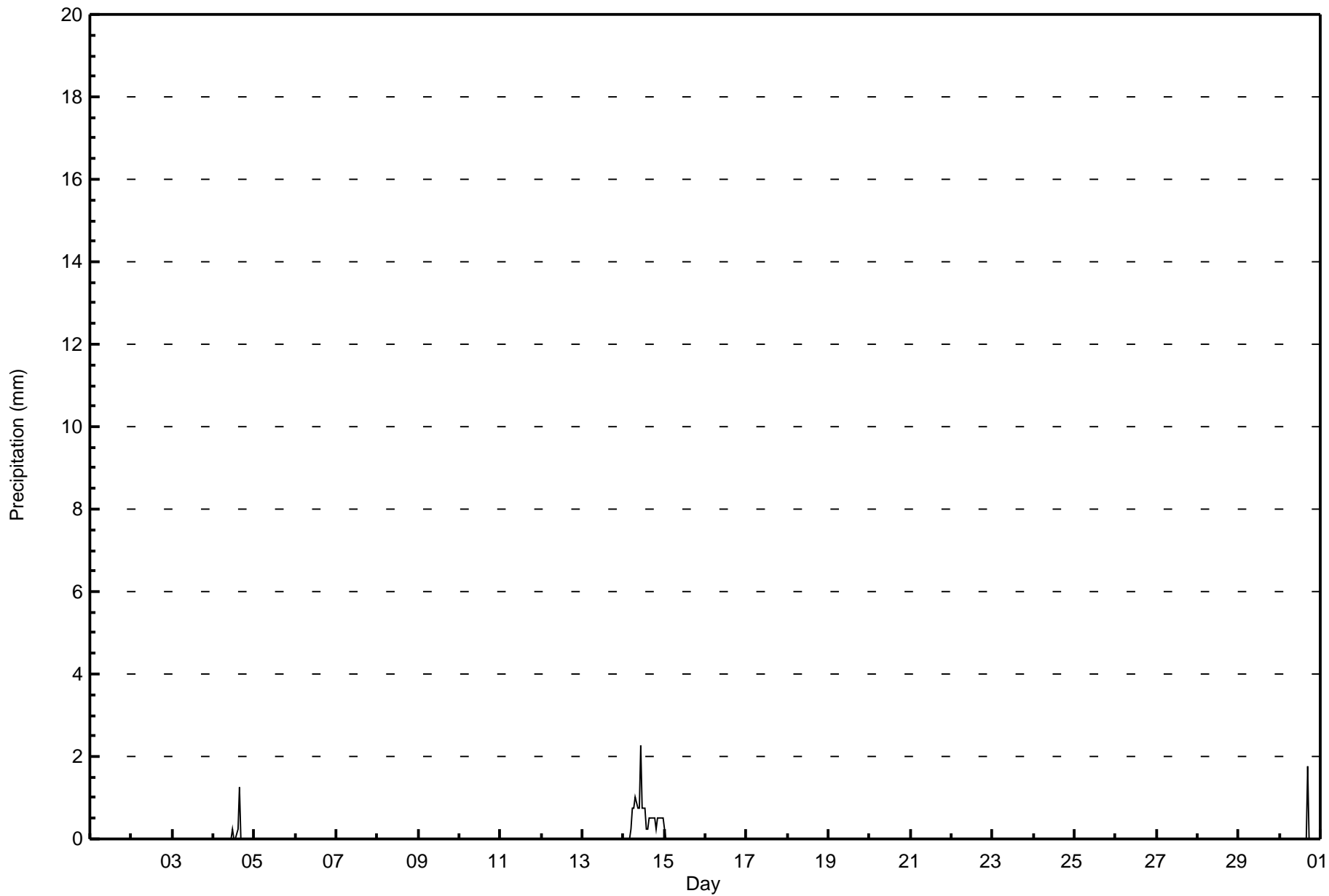
Anzac - April 2017

Maximum Value: 2.3 mm on Apr 14 11:00 Maximum Daily Total: 13.0 mm on Apr 14		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																																																							
Minimum Value: 0.0 mm on Apr 1 01:00 Maximum Diurnal Total: 2.3 mm at hour 17 Monthly Total: 16.76 mm		Minimum Daily Total: 0.0 mm on Apr 1 Minimum Diurnal Total: 0.0 mm at hour 2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.8																																																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																	
1-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
2-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
3-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
4-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.3																							
5-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
6-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
7-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
8-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
9-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
10-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
11-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
12-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
13-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																								
14-Apr	0.0	0.0	0.0	0.0	0.3	0.8	0.8	1.0	0.8	0.8	2.3	0.8	0.8	0.3	0.3	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5																								
15-Apr	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3																							
16-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
17-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
18-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
19-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
20-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
21-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
22-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
23-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
24-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
25-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
26-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
27-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
28-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
29-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
30-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
																								0.3	0.0	0.0	0.0	0.3	0.8	0.8	1.0	0.8	0.8	2.3	1.0	0.8	0.3	0.5	1.8	2.3	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Diurnal Average	
																								0.3	0.0	0.0	0.0	0.3	0.8	0.8	1.0	0.8	0.8	2.3	0.8	0.8	0.3	0.3	1.3	1.8	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Anzac - April 2017





Wood Buffalo Environmental Association

SO₂ Calibration Summary

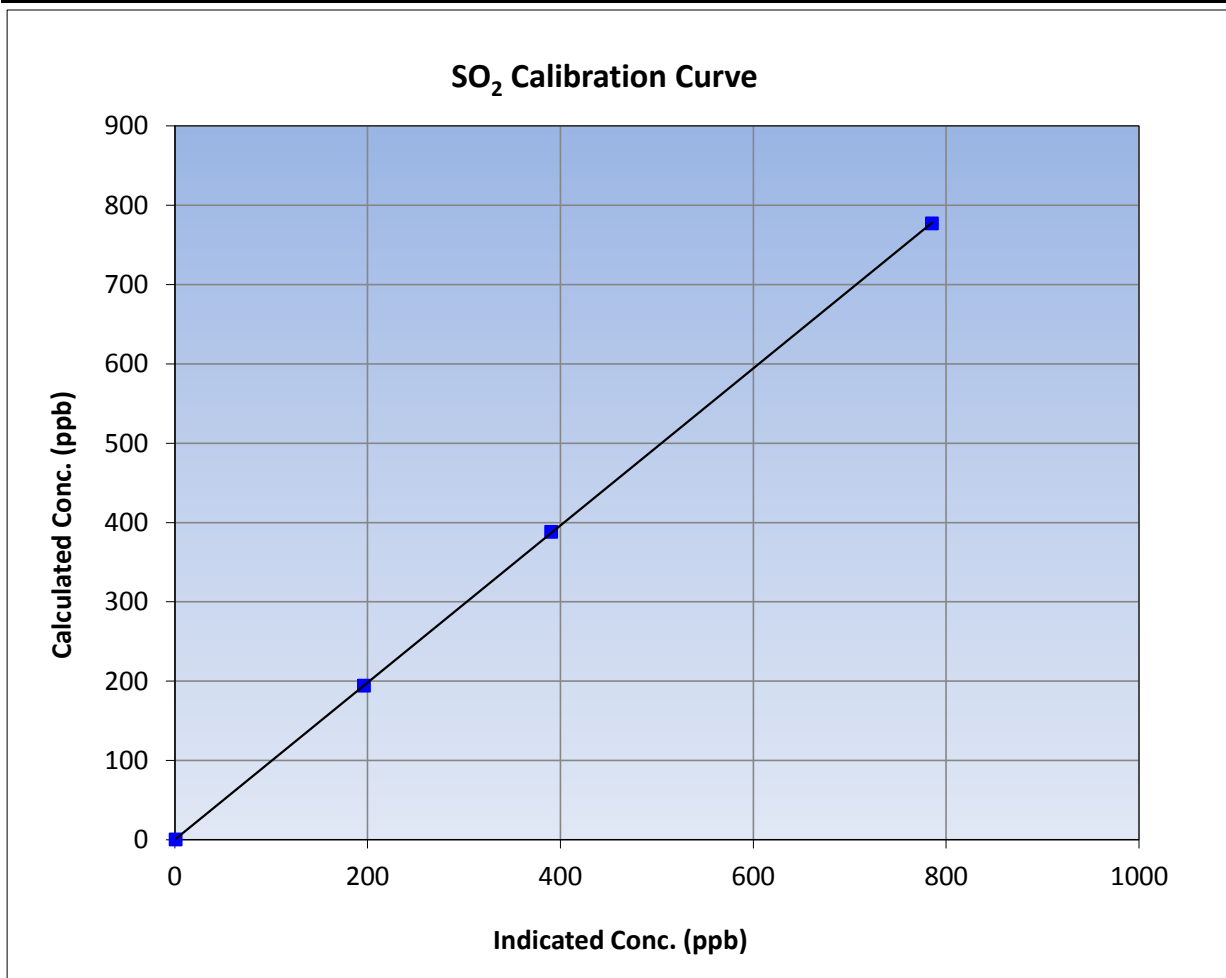
Version-03-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 43i	Analyzer serial #	1152430005

Calibration Data

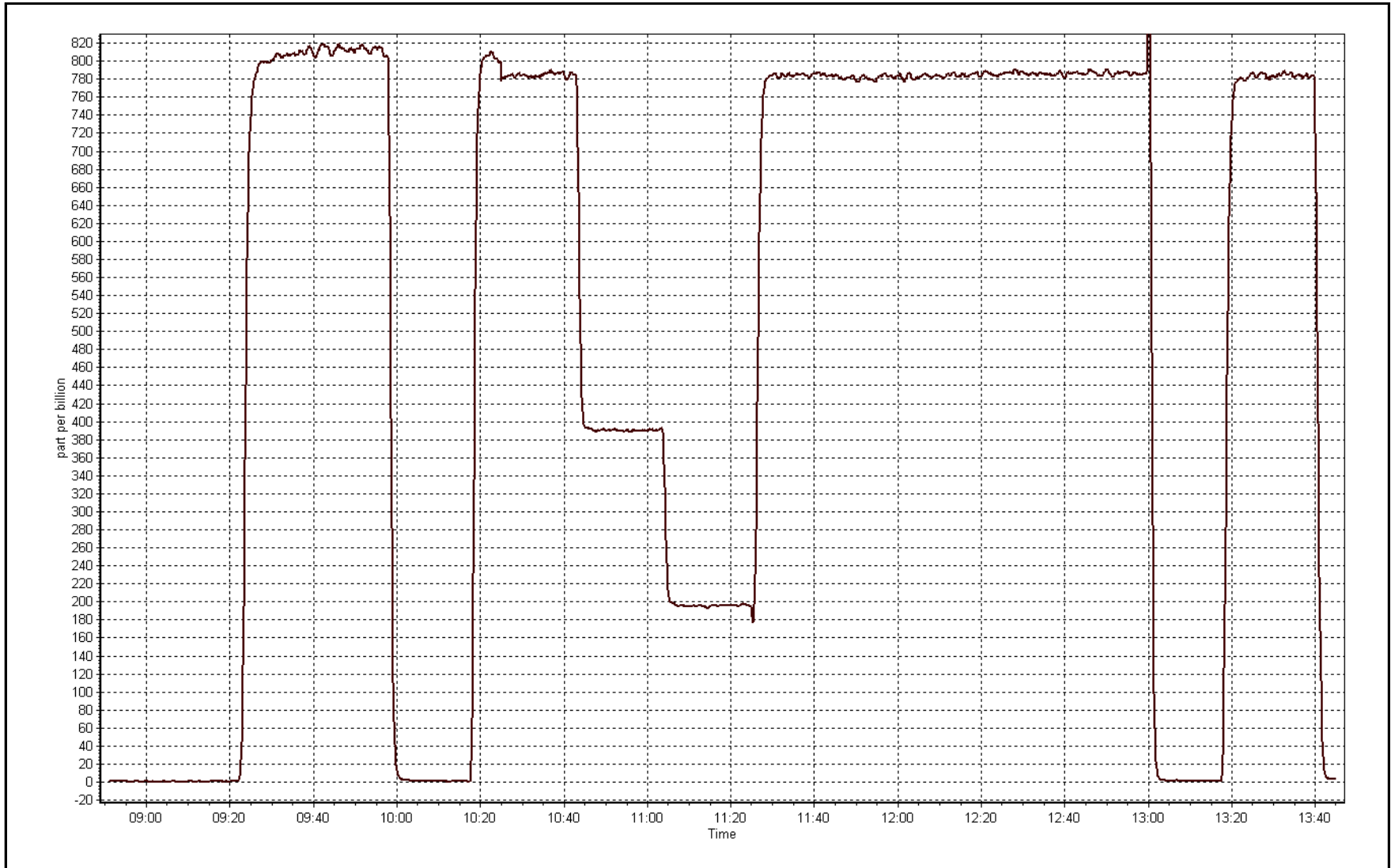
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.6	----	Correlation Coefficient	0.999990	≥0.995
777.0	785.0	0.9898			
388.0	390.0	0.9948	Slope	0.990572	0.90 - 1.10
194.1	195.9	0.9907			
			Intercept	0.131514	+/-30



SO2 Calibration Plot

Date: April 5, 2017

Location: Anzac





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	April 5, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	8:50	End time (MST):	13:45
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000647	Cal Gas Expiry Date	November 4, 2019
CH4 Cal Gas Conc.	<u>513.0</u> ppm	CH4 Equiv Conc.	1060.3 ppm
C3H8 Cal Gas Conc.	<u>199.0</u> ppm	Station temp.	22 Deg C
Calibrator Model	Teledyne API T700	Serial Number	2659
ZAG make/model	Teledyne API 701	Serial Number	4764

Analyzer Information

Analyzer make: Thermo 55i

Analyzer serial #: 1218153355

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.1	75.1
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	175.0	175.0
CH4 SP Ratio	NA	1.96E-04	Flame Temp	405.0	405.0
CH4 Retention time	NA	11.6	Carrier Pressure	33.3	33.3
NMHC SP Ratio	NA	3.80E-05	Fuel Pressure	47.9	47.9
NMHC Peak Area	NA	228420	Air Pressure	36.6	36.6

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	0.996439	0.997665
THC Cal Offset	0.036160	0.038729
CH4 Cal Slope	NA	0.995954
CH4 Cal Offset	NA	0.036598
NMHC Cal Slope	0.994580	0.999233
NMHC Cal Offset	0.008065	0.002230

Notes: Sample inlet filter replaced after as founds. Hydrogen cylinder replaced after as founds. Was not able to retain "start" CH4 SP ratio and RT, and NMHC SP ratio and peak area because analyzer had wiped out all that info from previous months for some reason; had to adjust span to grab that info.

Calibration Performed By:

Asad Hidayat



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5005	0.0	0.00	0.00	----
as found span	4931	79.3	16.78	16.82	0.998
calibrator zero	5005	0.0	0.00	0.00	----
high point	4932	79.3	16.78	16.81	0.998
second point	4972	39.6	8.38	8.30	1.009
third point	4989	19.8	4.19	4.15	1.010
as left zero	5005	0.0	0.00	0.00	----
as left span	4931	79.3	16.78	16.72	1.004
Average Correction Factor					1.006
Corrected As found	16.82	Prev response	16.80	*% change	-0.1%

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5005	0	0.00	0.00	----
as found span	4931	79.3	8.66	8.69	0.997
calibrator zero	5005	0	0.00	0.00	----
high point	4932	79.3	8.66	8.67	0.999
second point	4972	39.6	4.32	4.31	1.003
third point	4989	19.8	2.16	2.17	0.997
as left zero	5005	0	0.00	0.00	----
as left span	4931	79.3	8.66	8.62	1.005
Average Correction Factor					1.000
Corrected As found	8.69	Prev response	8.70	*% change	0.1%

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5005	0.0	0.00	0.00	----
as found span	4931	79.3	8.12	8.13	0.999
calibrator zero	5005	0.0	0.00	0.00	----
high point	4932	79.3	8.12	8.14	0.997
second point	4972	39.6	4.05	3.99	1.016
third point	4989	19.8	2.03	1.98	1.024
as left zero	5005	0.0	0.00	0.00	----
as left span	4931	79.3	8.12	8.11	1.001
Average Correction Factor					1.012
Corrected As found	8.13	Prev response	NA	*% change	NA

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

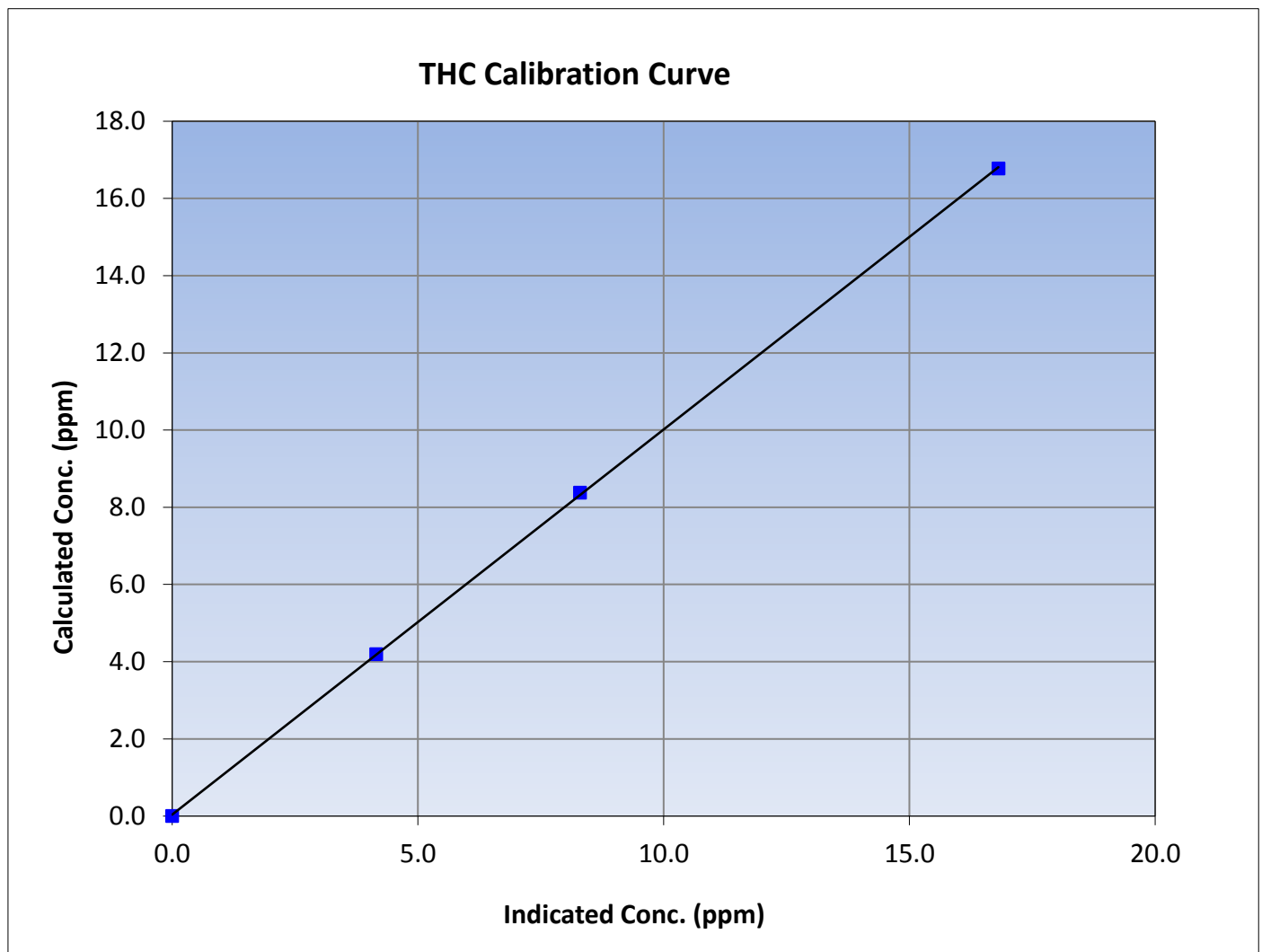
Version-02-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 55i	Analyzer serial #	1218153355

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999961	≥ 0.995			
16.78	16.81	0.9981						
8.38	8.30	1.0094				Slope	0.997665	0.90 - 1.10
4.19	4.15	1.0099						
			Intercept	0.038729	± 0.5			





Wood Buffalo Environmental Association

CH₄ Calibration Summary

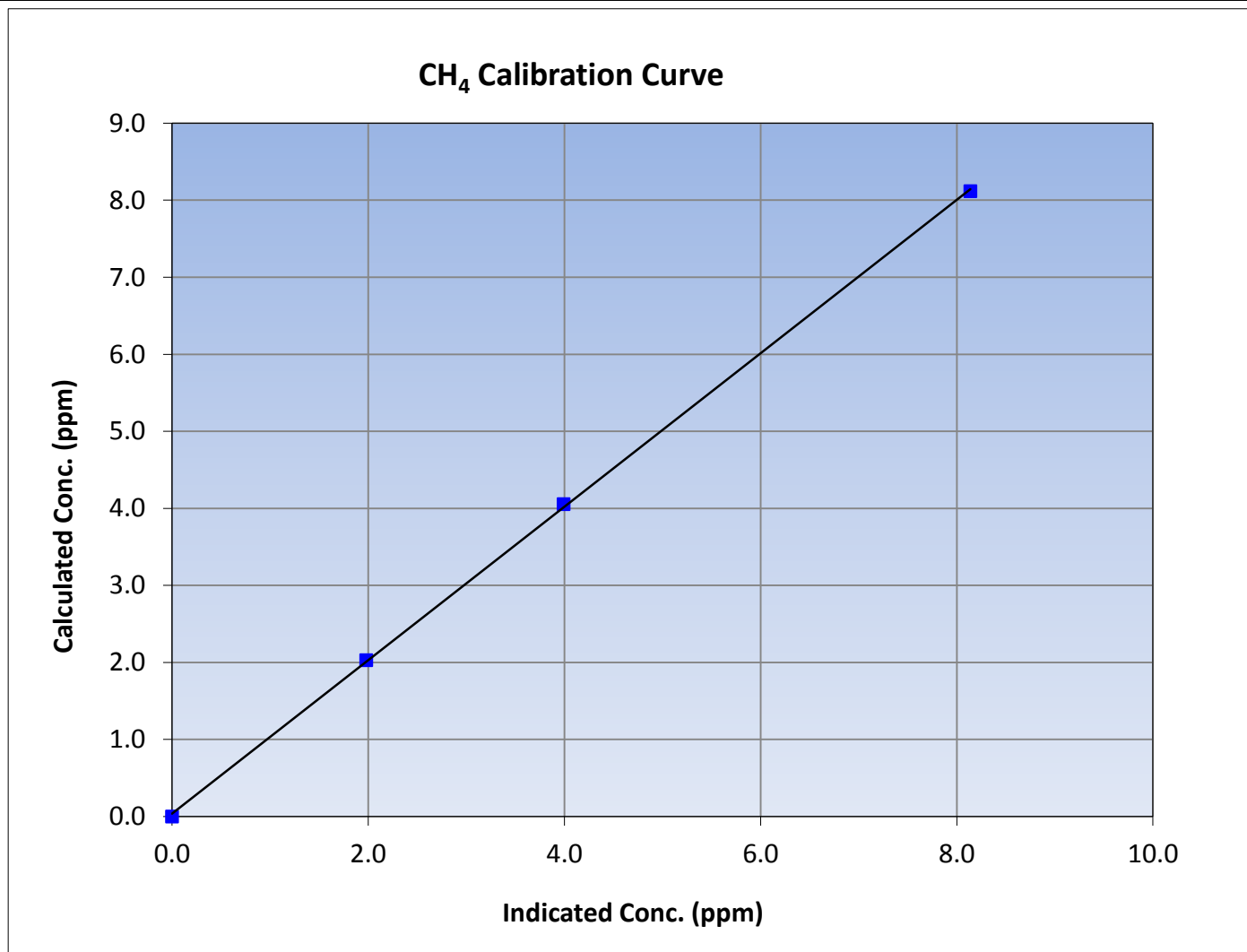
Version-02-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 55i	Analyzer serial #	1218153355

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999882	≥ 0.995			
8.12	8.14	0.9973						
4.05	3.99	1.0159				Slope	0.995954	0.90 - 1.10
2.03	1.98	1.0242						
			Intercept	0.036598	± 0.5			





Wood Buffalo Environmental Association

NMHC Calibration Summary

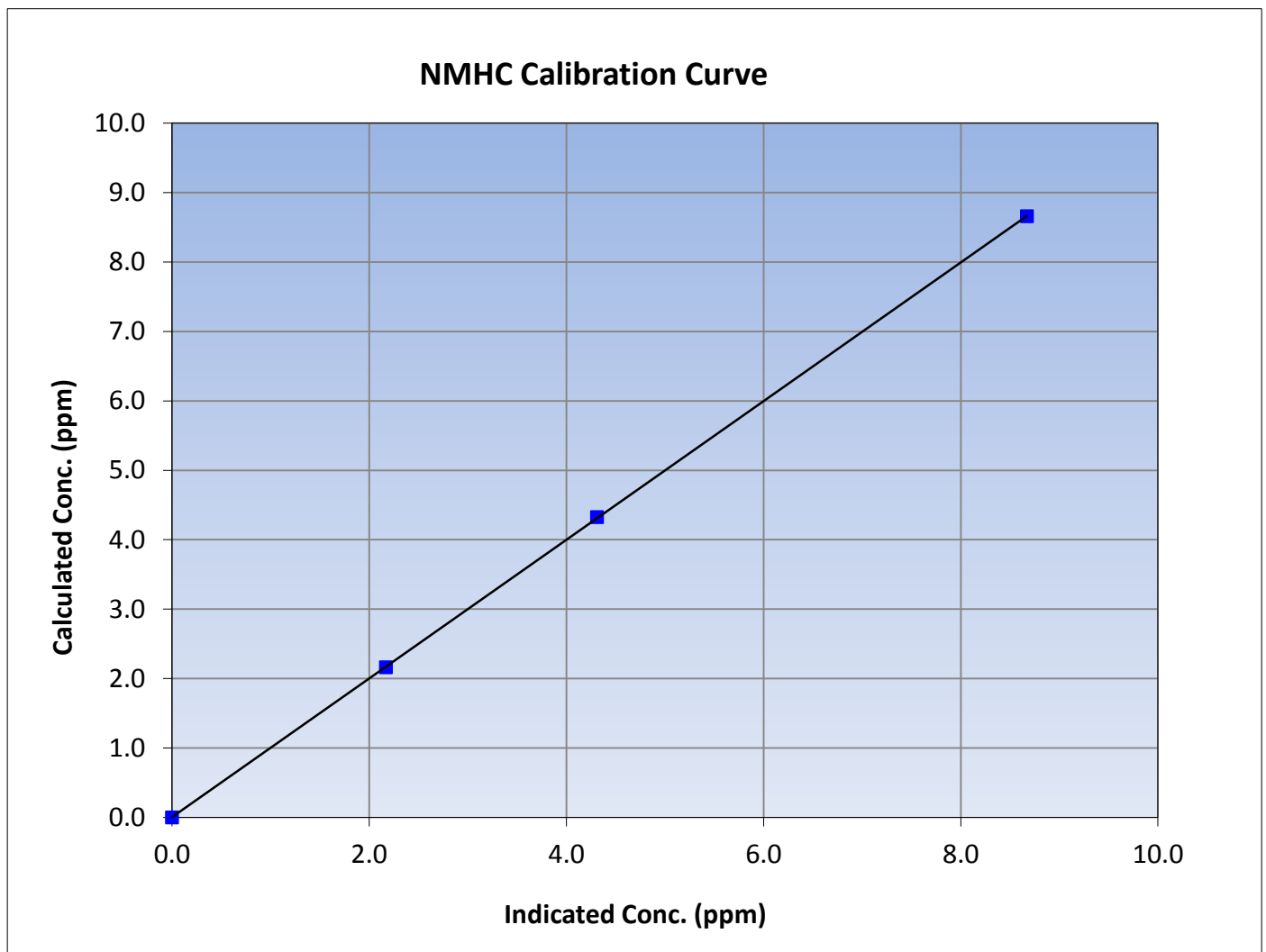
Version-02-2017

Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 55i	Analyzer serial #	1218153355

Calibration Data

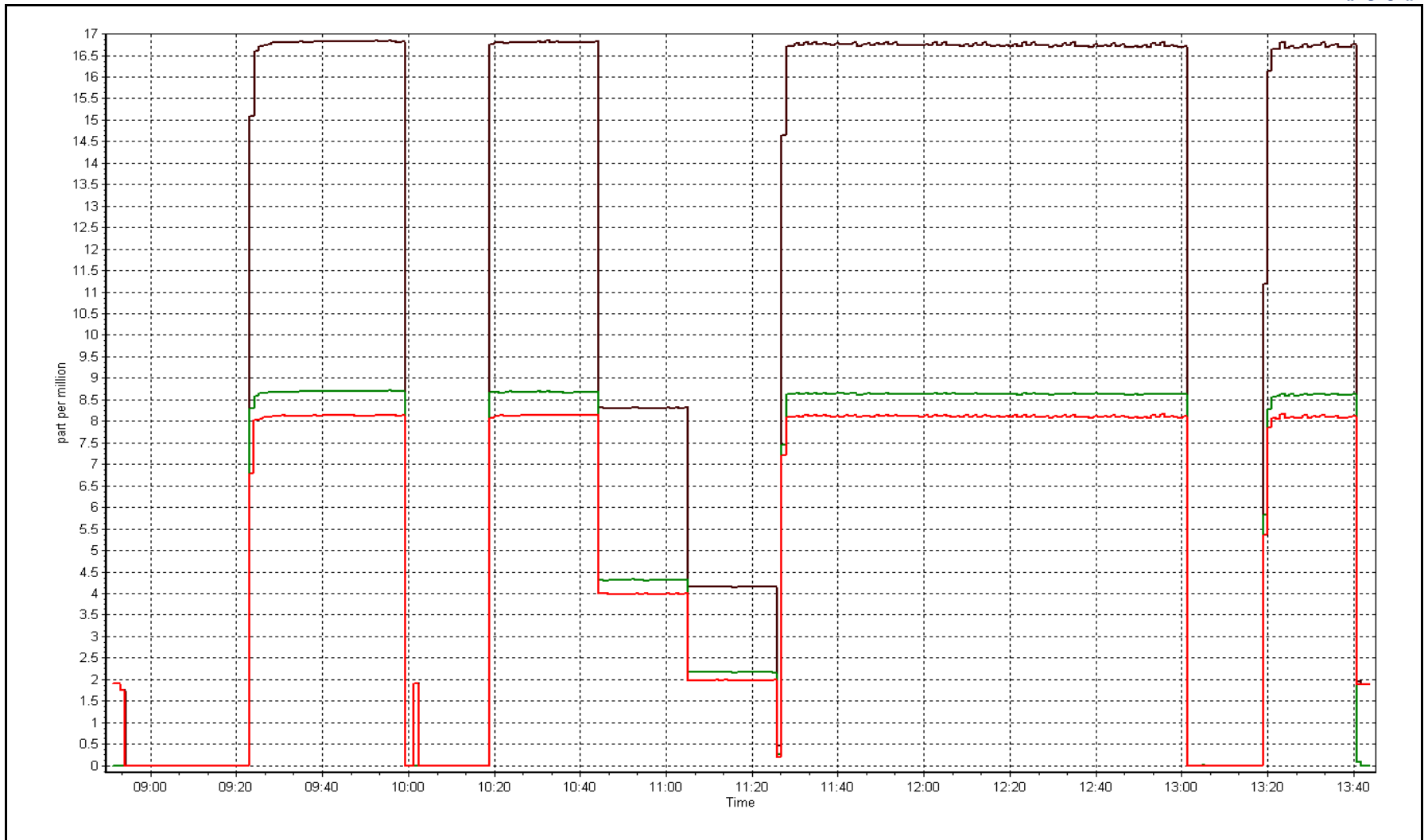
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999992	≥ 0.995			
8.66	8.67	0.9988						
4.32	4.31	1.0033				Slope	0.999233	0.90 - 1.10
2.16	2.17	0.9969						
			Intercept	0.002230	± 0.5			



NMHC Calibration Plot

Date: April 5, 2017

Location: Anzac





Wood Buffalo Environmental Association

O₃ Calibration Report

Version-03-2017

Station Information

Station Name: Anzac Station number: AMS 14
 Calibration Date: April 4, 2017 Last Cal Date: March 7, 2017
 Start time (MST): 11:00 End time (MST): 13:25
 Reason: Routine

Calibration Standards

O₃ generation mode: Photometer O₃ reference Date: NA
 Calibrator Make/Model: API T700 Serial Number: 2659
 ZAG Make/Model: API 701 Serial Number: 4764

Analyzer Information

Analyzer make: Thermo 49i Analyzer serial #: 1426262595

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 500 ppb		Pressure	657	663
Calculated slope	1.001614	1.001093	Flow cell A	0.704	0.708
Calculated intercept	-2.077831	-1.602767	Flow cell B	0.715	0.719
Analyzer Background	-1.0	-1.0	Cell A Intensity	92048	91981
Analyzer Coefficient	1.017	1.017	Cell B Intensity	105891	105825

O₃ Calibration Data

Set Point	Total air flow rate (scm)	Calibrator Lamp Voltage Drive	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	800.0	0.0	-0.1	----
as found span	5000	971.5	400.0	400.4	0.999
calibrator zero	5000	800.0	0.0	-0.1	----
high point	5000	971.5	400.0	400.4	0.999
second point	5000	793.5	200.0	202.0	0.990
third point	5000	685.3	100.0	103.4	0.967
as left zero	5000	800.0	0.0	1.5	----
as left span	5000	791.6	400.0	400.3	0.999
Average Correction Factor					0.985

Corrected As found 400.48 Previous response 401.43 *% change 0.2%

* = > +/-8% change initiates investigation

Notes:

Sample inlet filter replaced after as founds. No adjustments made.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

O₃ Calibration Summary

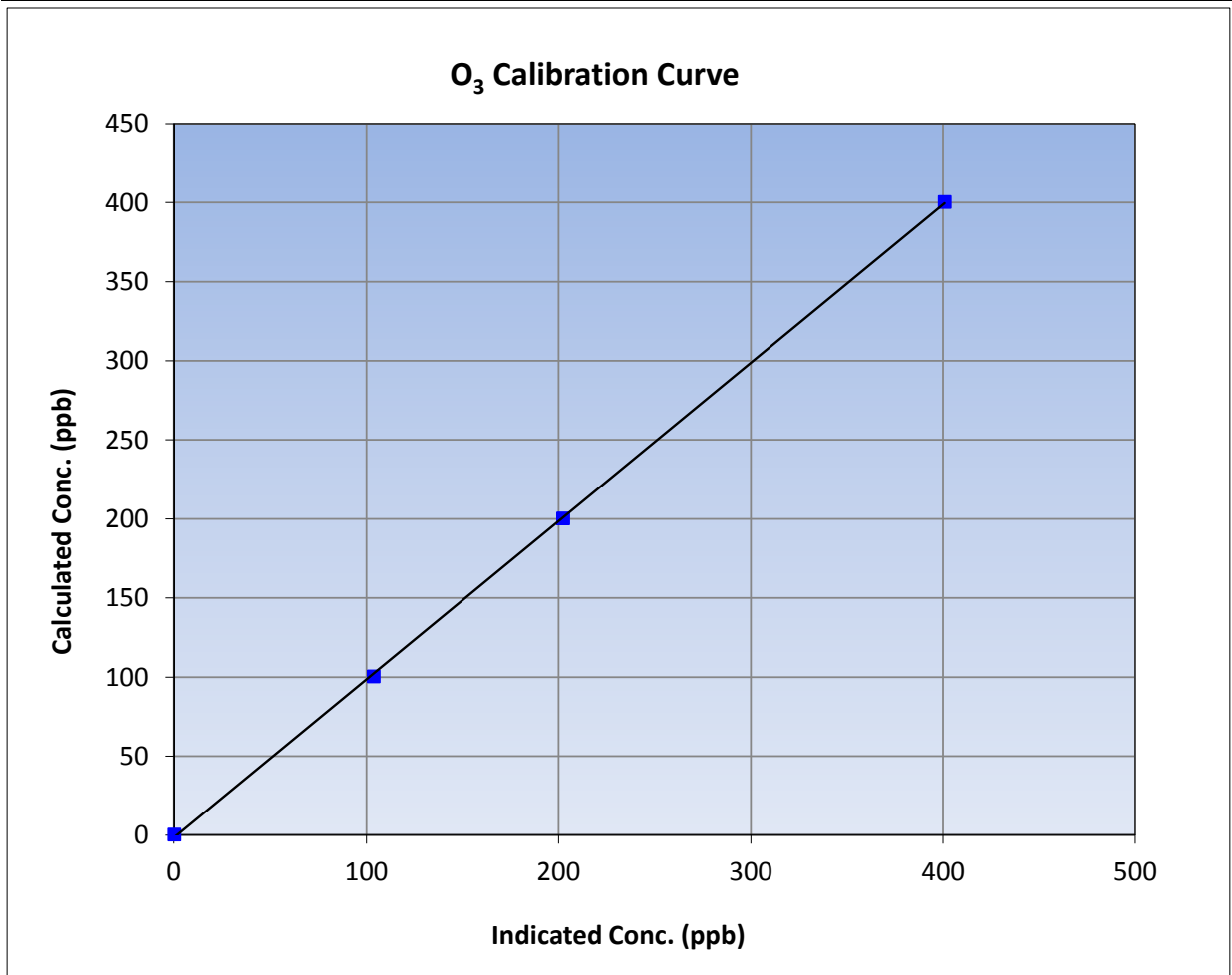
Version-03-2017

Station Information

Calibration Date	April 4, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	11:00	End Time (MST)	13:25
Analyzer make	Thermo 49i	Analyzer serial #	1426262595

Calibration Data

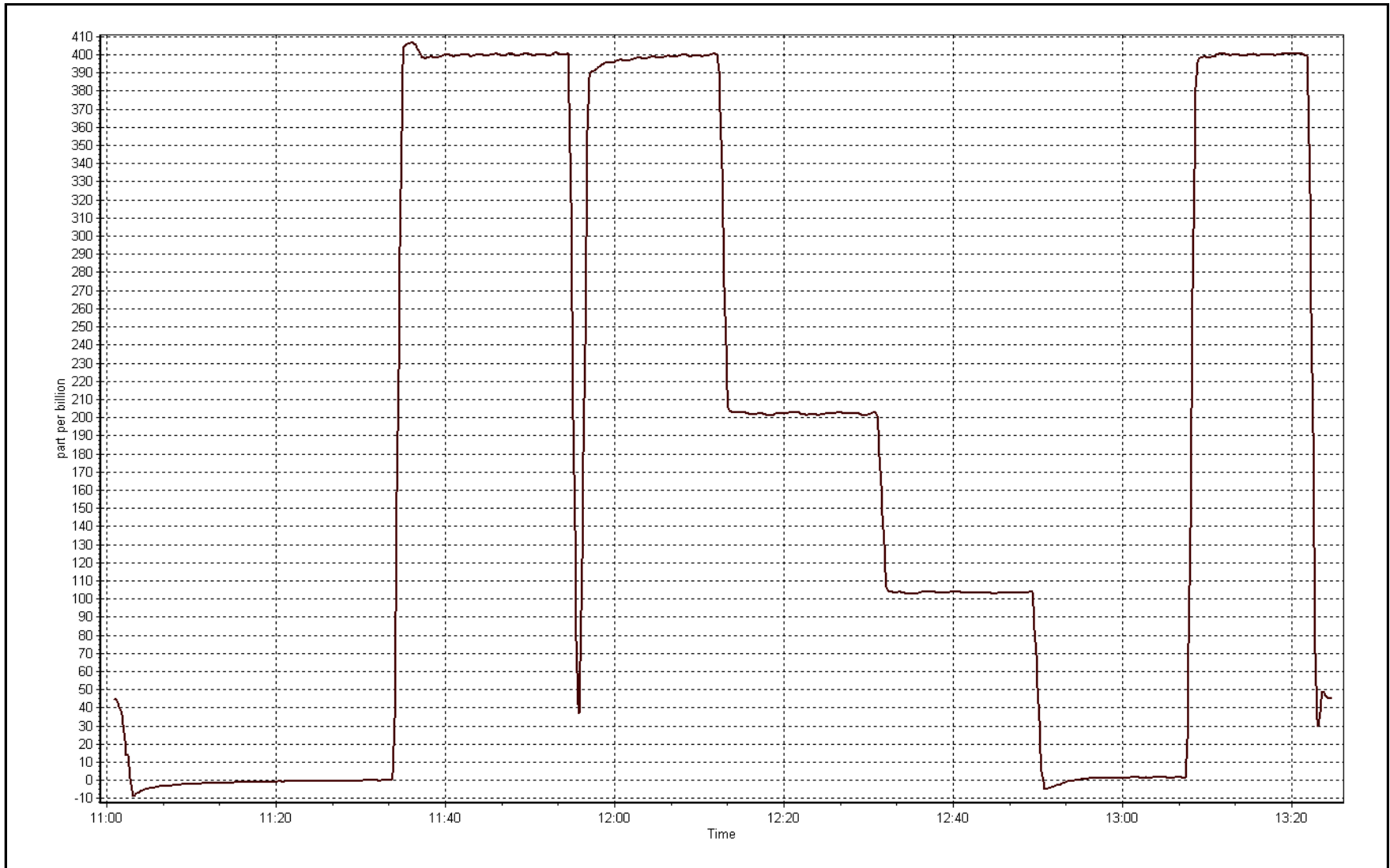
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	0.999914	≥0.995
400.0	400.4	0.9991			
200.0	202.0	0.9903	Slope	1.001093	0.90 - 1.10
100.0	103.4	0.9671			
			Intercept	-1.602767	+/- 10



O₃ Calibration Plot

Date: April 4, 2017

Location: Anzac





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	April 5, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	8:50	End time (MST):	13:45
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	EY0000647	Cal Gas Expiry Date	November 4, 2019
NOX Cal Gas Conc.	<u>50.5</u> ppb	NO Cal Gas Conc.	<u>50.5</u> ppb
Calibrator Model	Teledyne API T700	Serial Number	2659
ZAG make/model	Teledyne API 701	Serial Number	4764

Analyzer Information

Analyzer make:	Thermo 42i	Analyzer serial #:	1426262592	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
NO coefficient	1.105	1.117	NOX Range (ppb)	0 - 1000 ppb
NOX coefficient	1.002	1.002	PMT Temperature	327.1 322.6
NO ₂ coefficient	1.000	1.000	Reaction cell Press	180.4 180.7
NO bkgrnd	4.1	4.2	Sample Flow	0.688 0.724
NOX bkgrnd	4.3	4.4	PMT Voltage	-808.1 -808.1

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.999845	0.995742
NO _x Cal Offset	0.981628	0.466570
NO Cal Slope	1.000721	0.997119
NO Cal Offset	0.838626	0.243167
NO ₂ Cal Slope	0.999431	1.003094
NO ₂ Cal Offset	-0.803522	-0.389501



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	----	----
as found span	4932	79.3	799.1	799.1	0.0	790.1	789.6	0.5	1.0114	1.0121
calibrator zero	5005	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	----	----
high point	4932	79.3	799.1	799.1	0.0	802.5	801.5	1.1	0.9957	0.9970
second point	4972	39.6	399.0	399.0	0.0	399.4	399.4	0.0	0.9991	0.9991
third point	4989	19.8	199.6	199.6	0.0	199.9	199.8	0.1	0.9987	0.9990
as left zero	5005	0.0	0.0	0.0	0.0	0.2	0.3	-0.1	----	----
as left span	4931	79.3	799.3	420.7	378.5	824.1	434.4	389.7	0.9698	0.9685
Average Correction Factor									0.9979	0.9984

Corrected As found	NO _x = 790.0 ppb	NO = 789.4 ppb		*Percent Change	NO _x = 1.0%
Previous Response	NO _x = 798.3 ppb	NO = 797.7 ppb		*Percent Change	NO = 1.1%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	806.7	804.7	2.0	0.9907	0.9931	----	----
1st NO2 (400 ppb O3)	420.7	383.9	803.6	420.7	382.8	0.9945	----	1.0028	99.7%
2nd NO2 (200 ppb O3)	612.3	192.4	804.8	612.3	192.5	0.9930	----	0.9992	100.1%
3rd NO2 (100 ppb O3)	705.5	99.1	805.1	705.5	99.6	0.9926	----	0.9955	100.5%
2nd NO ref point	----	0.0	806.7	804.7	2.0	0.9907	0.9931	----	----
Average Correction Factor						0.9927	0.9931	0.9992	100.1%

Notes: Sample inlet filter replaced after as founds. Adjusted span only. Used 2nd high NO point for GPT reference.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

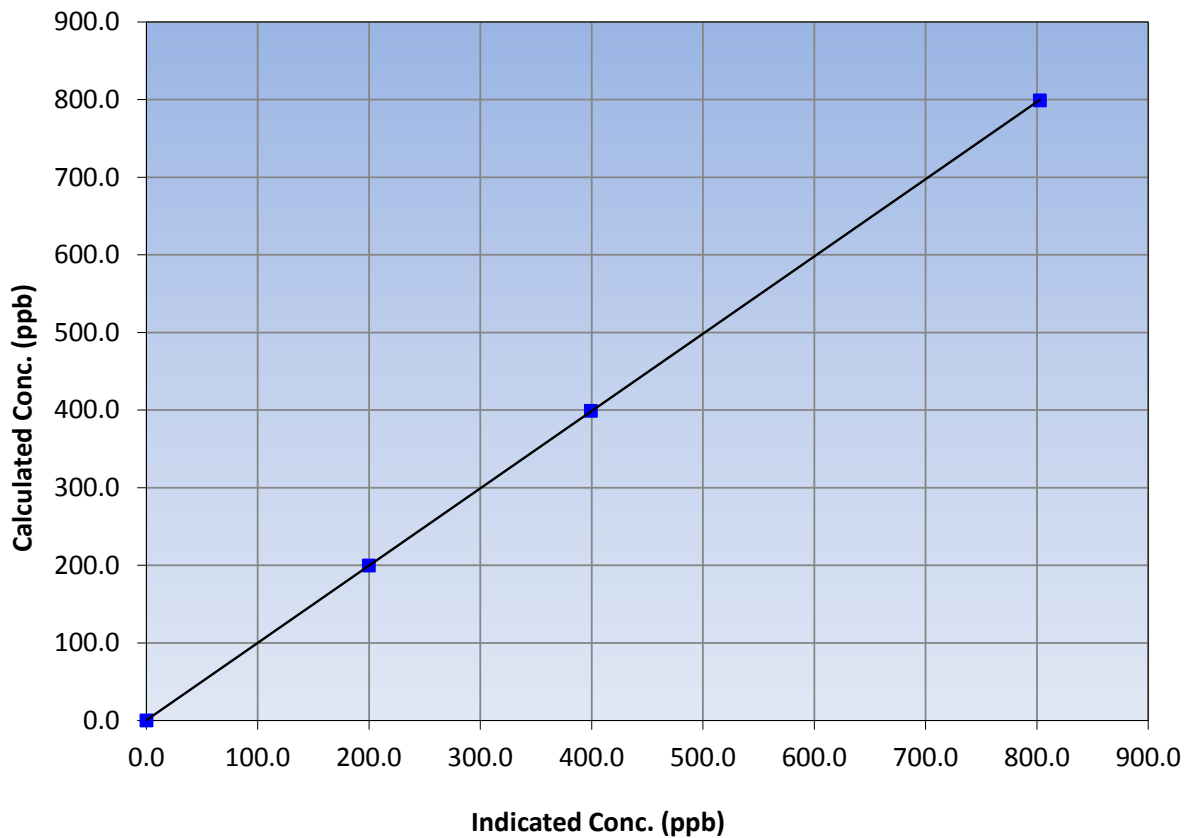
Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 42i	Analyzer serial #	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
799.1	802.5	0.9957			
399.0	399.4	0.9991			
199.6	199.9	0.9987			
			Slope	0.995742	0.90 - 1.10
			Intercept	0.466570	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

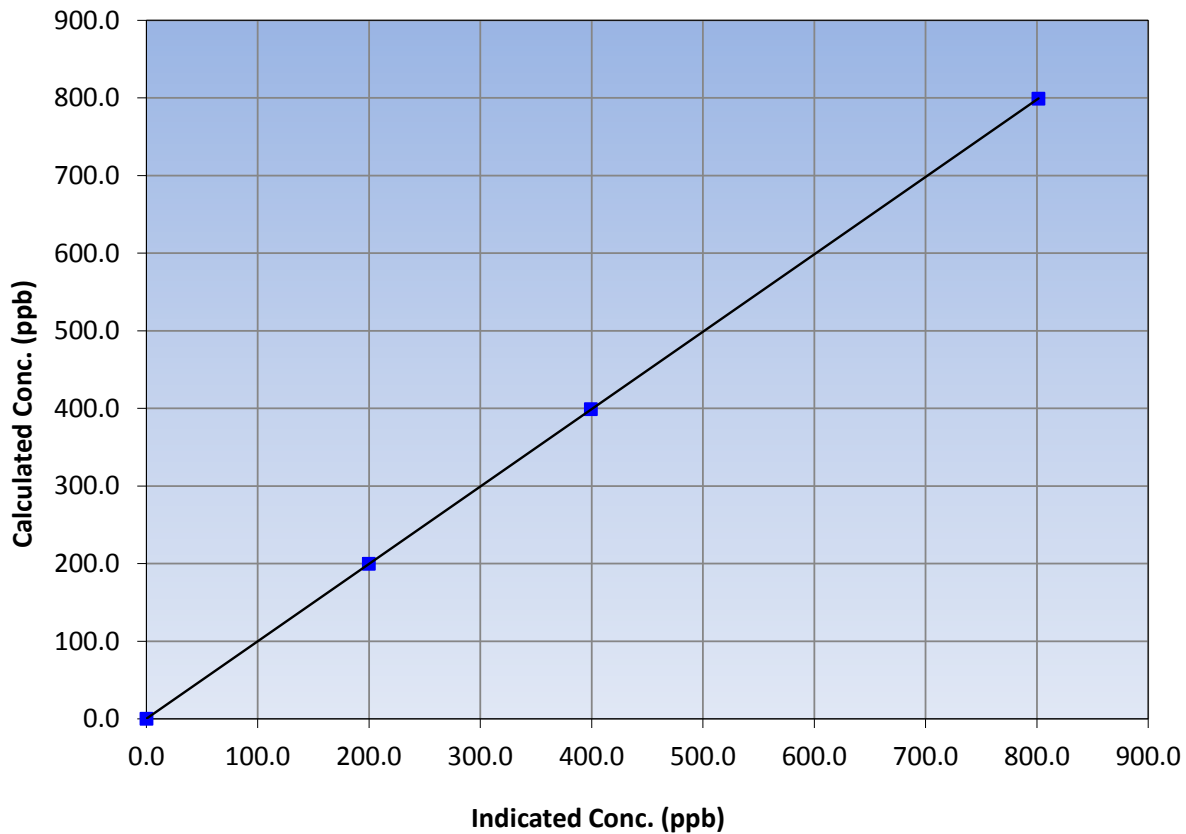
Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 42i	Analyzer serial #	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
799.1	801.5	0.9970			
399.0	399.4	0.9991			
199.6	199.8	0.9990			
			Slope	0.997119	0.90 - 1.10
			Intercept	0.243167	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

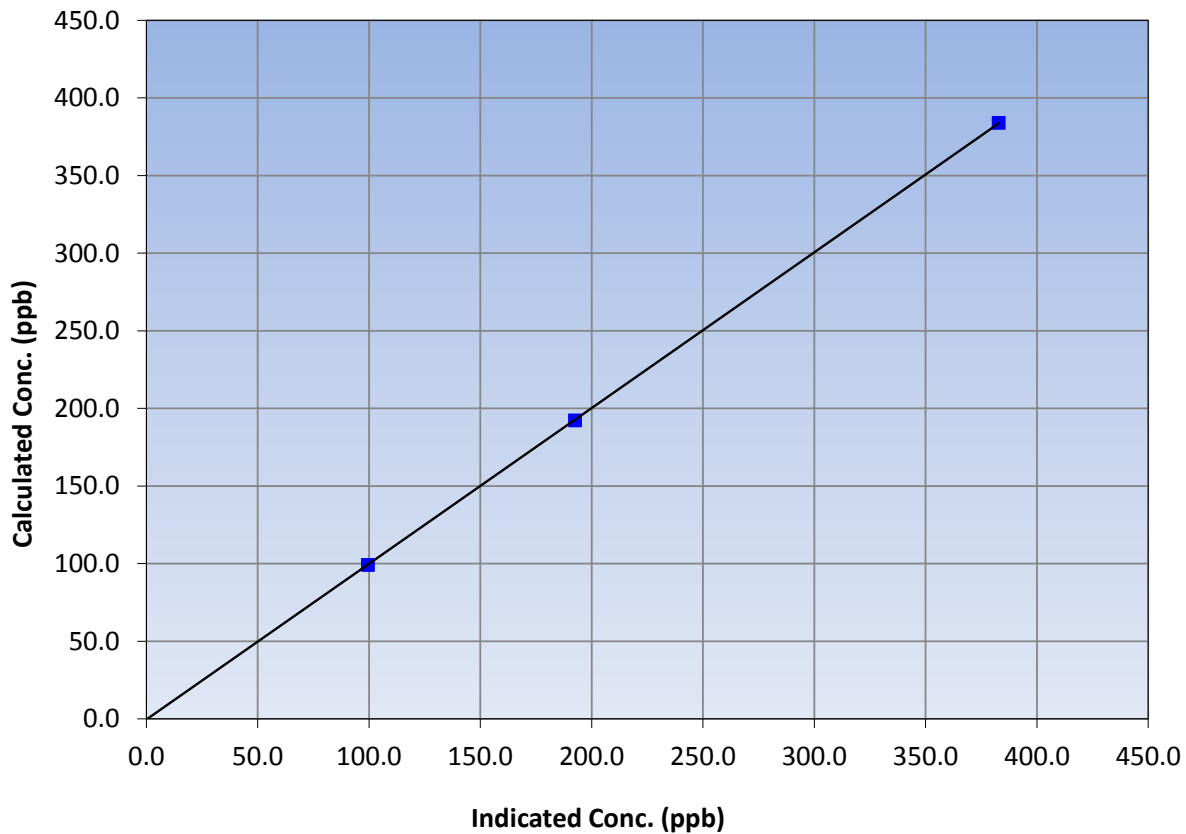
Station Information

Calibration Date	April 5, 2017	Previous Calibration	March 7, 2017
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:50	End Time (MST)	13:45
Analyzer make	Thermo 42i	Analyzer serial #	1426262592

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>
0.0	-0.1	----	Correlation Coefficient Slope Intercept	≥0.995 0.90 - 1.10 +/-20
383.9	382.8	1.0028		
192.4	192.5	0.9992		
99.1	99.6	0.9955		

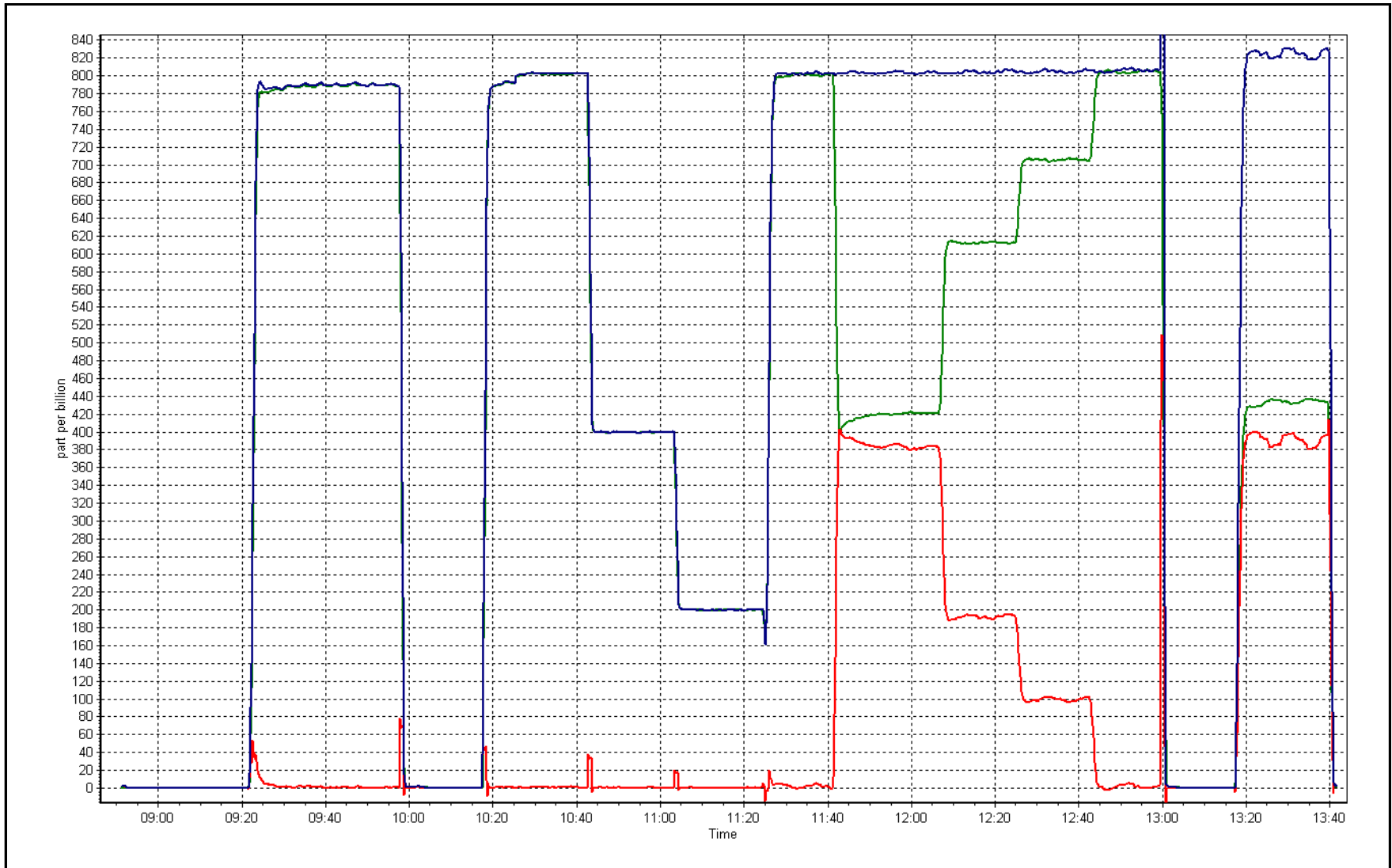
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 5, 2017

Location: Anzac





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Anzac	Station number:	AMS 14
Calibration Date:	April 5, 2017	Last Cal Date:	March 7, 2017
Start time (MST):	12:00	End time (MST):	13:05
Sharp Model:	5030	S/N:	E1093
Particulate Fraction:	PM2.5	C14 Source S/N:	4933
Flow Meter Make/Model:	Delta cal	S/N:	1019
Temp/RH standard:	Delta cal	S/N:	1019

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	8	9.1	8	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	952	950.8	952	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	1012	1000	<input type="checkbox"/>	+/- 50 LPH
Nephelometer zero	-0.3	-----	-0.3	<input type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: April 5, 2017 Last Cal Date: January 13, 2017
 Flow w/o adaptor: 16.86 Flow w/ adaptor: 16.71

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>5872</u>	Foil S/N: <u>5872</u>	
Foil Calibration	Foil Mass: <u>1337</u>	Foil Mass: <u>1337</u>	
	Calibration Date: <u>June 15, 2016</u>	Calibration Date: <u>16-Mar-16</u>	
(Limit) +/- 5% of previous	Correction Factor: <u>7212</u>	Correction Factor: <u>7124</u>	1.24%

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Cyclone head cleaned. Quarterly calibration test passed. No adjustments made.

Calibration by: Asad Hidayat



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

AMS 15 HORIZON APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - HORIZON (AMS 15)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO ₂ (ppb) Average	684	36	36	100	42	0	10	0
TRS (ppb) Average	687	33	33	100	4	0	0	0
THC (ppm) Average	684	36	36	100	6.6	-	2.8	-
NO ₂ (ppb) Average	684	36	36	100	45	0	14	-
NO (ppb) Average	684	36	36	100	192	-	18	-
NO _X (ppb) Average	684	36	36	100	233	-	32	-
PM _{2.5} (ug/m ³) Average	716	1	4	99.58	34	-	12.9	0
Temperature 2 m (C) Average	720	0	0	100	18.3	-	9.5	-
Wind Speed 10 m (km/h) Average	718	0	2	99.72	27	-	17	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-
Precipitation (mm) Total	720	0	0	100	2.5	-	8.4	-
Relative Humidity (%) Average	720	0	0	100	99	-	80	-
Global Solar Radiation (W/m ²) Average	720	0	0	100	844	-	265	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - HORIZON (AMS 15)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	1.6	4	-	0	0	0	0	1	3	42
TRS (ppb) Average	687	0.3	0	-	0	0	0	0	0	0	4
THC (ppm) Average	684	2.2	0.3	-	2	2.1	2.1	2.1	2.2	2.3	6.6
NO2 (ppb) Average	684	3.6	6	-	0	0	1	2	4	9	45
NO (ppb) Average	684	1.4	10	-	0	0	0	0	0	2	192
NOX (ppb) Average	684	4.9	14	-	0	0	1	2	5	11	233
PM2.5 (ug/m3) Average	716	4.6	4	-	0.5	1.6	2.4	3.5	5.2	8.1	34
Temperature 2 m (C) Average	720	1.93	6.3	-	-12	-5.8	-3	1.5	5.9	11.1	18.3
Wind Speed 10 m (km/h) Average	718	10.3	5	-	1	4	6	9	15	18	27
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	13.97	-	-	-	-	-	-	-
Relative Humidity (%) Average	720	57.9	19	-	16	33	44	57	72	83	99
Global Solar Radiation (W/m2) Average	720	183.2	233	-	0	0	0	59	343	567	844

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -HORIZON (AMS 15)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	17 Apr 2017 01:00	17 Apr 2017 03:00	3	Unstable operation - excessive baseline drift
Wind Speed, Wind Direction	20 Apr 2017 03:00	20 Apr 2017 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	26 Apr 2017 21:00	26 Apr 2017 21:00	1	Flat line in sensor output signal



Summary of Hour Averages

Horizon - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 42 ppb on Apr 9 10:00	Maximum Daily Average: 9.5 ppb on Apr 9		Hours of Data:	684
Minimum Value: 0 ppb on Apr 8 00:00	Minimum Daily Average: 0.3 ppb on Apr 8		Hours of Missing Data:	36
Maximum Diurnal Average: 3.9 ppb at hour 12	Minimum Diurnal Average: 0.6 ppb at hour 5		Hours of Calibration:	36
Monthly Average: 1.6 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 16		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.3	1
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	8	1	0.8	8
3-Apr	0	1	1	Z	0	1	1	0	1	1	5	2	1	1	1	2	2	0	1	0	0	0	0	1.0	5	
4-Apr	0	0	0	0	Z	0	0	0	0	1	0	0	1	12	8	7	5	3	1	7	4	2	1	1	2.5	12
5-Apr	1	0	1	0	0	Z	1	2	1	4	15	18	14	6	7	2	0	1	1	1	1	2	1	3.5	18	
6-Apr	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	3	2	2	0.8	3
7-Apr	1	Z	1	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
8-Apr	0	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Apr	0	0	0	Z	0	1	1	5	29	42	38	13	2	10	14	9	13	13	13	5	2	2	3	2	9.5	42
10-Apr	1	1	1	1	Z	1	1	1	1	0	1	1	7	8	8	5	5	3	4	4	4	3	2	1	2.7	8
11-Apr	1	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1
12-Apr	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0.5	2
13-Apr	1	Z	0	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
14-Apr	1	1	Z	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.6	1
15-Apr	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.5	1
16-Apr	1	2	4	5	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	5
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
18-Apr	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
19-Apr	0	Z	0	0	0	1	1	1	C	C	C	C	C	C	3	1	0	0	0	1	1	1	1	1	--	3
20-Apr	1	1	Z	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
21-Apr	0	0	0	Z	0	0	0	1	0	0	1	3	3	2	2	1	0	0	0	1	2	2	4	8	1.4	8
22-Apr	5	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	5
23-Apr	0	0	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
24-Apr	Z	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
25-Apr	0	Z	0	0	0	0	0	3	10	13	16	13	12	8	10	7	3	2	2	1	1	1	1	2	4.6	16
26-Apr	1	1	Z	3	3	4	5	6	5	21	6	9	9	7	3	1	1	3	1	1	0	1	1	0	4.0	21
27-Apr	1	1	1	Z	1	1	1	2	2	1	2	14	8	7	3	4	1	1	0	0	0	1	1	1	2.3	14
28-Apr	0	1	2	1	Z	0	1	0	1	1	1	1	3	2	3	3	2	2	2	2	1	1	1	1	1.4	3
29-Apr	1	1	1	1	1	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0.5	1
30-Apr	Z	0	0	0	0	0	0	0	0	1	17	31	13	3	7	1	1	1	1	2	5	3	2	1	4.0	31

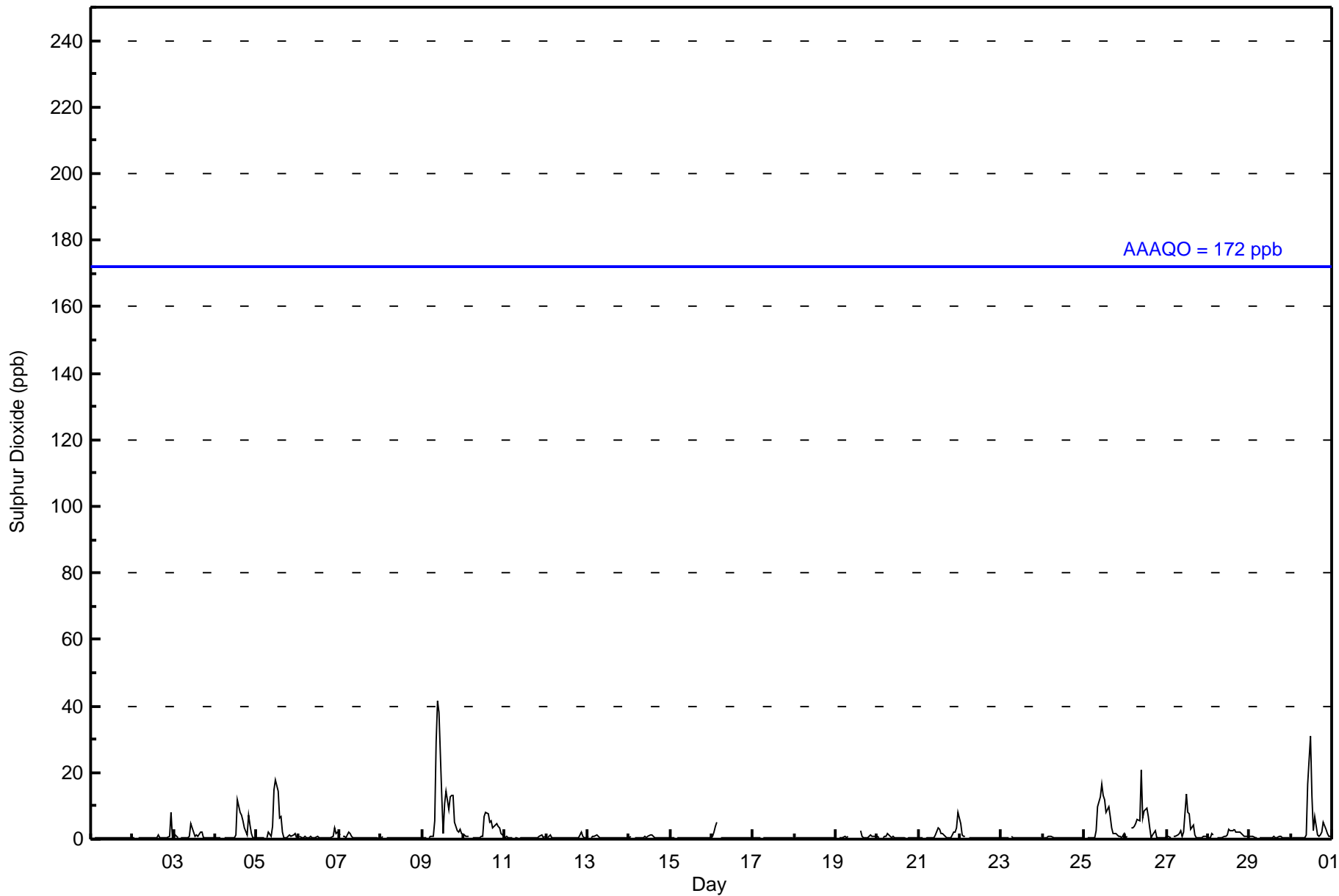
0.7	0.7	0.7	0.8	0.6	0.7	0.7	1.0	2.0	3.1	3.8	3.9	2.8	2.6	2.5	1.7	1.4	1.2	1.1	1.2	1.0	1.0	1.1	0.9	Diurnal Average	
5	2	4	5	3	4	5	6	29	42	38	31	14	12	14	9	13	13	13	7	4	3	8	8	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Horizon - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	663	96.93	96.93
11 - 20	16	2.34	99.27
21 - 60	5	0.73	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Horizon - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	26	185	98	23	16	14	11	25	66	79	43	23	10	14	16	13	662
11 - 20	0	0	0	0	0	0	1	2	7	5	0	0	0	0	0	1	16
21 - 60	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0	5
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	185	98	23	16	14	12	28	74	86	44	23	10	14	16	14	683

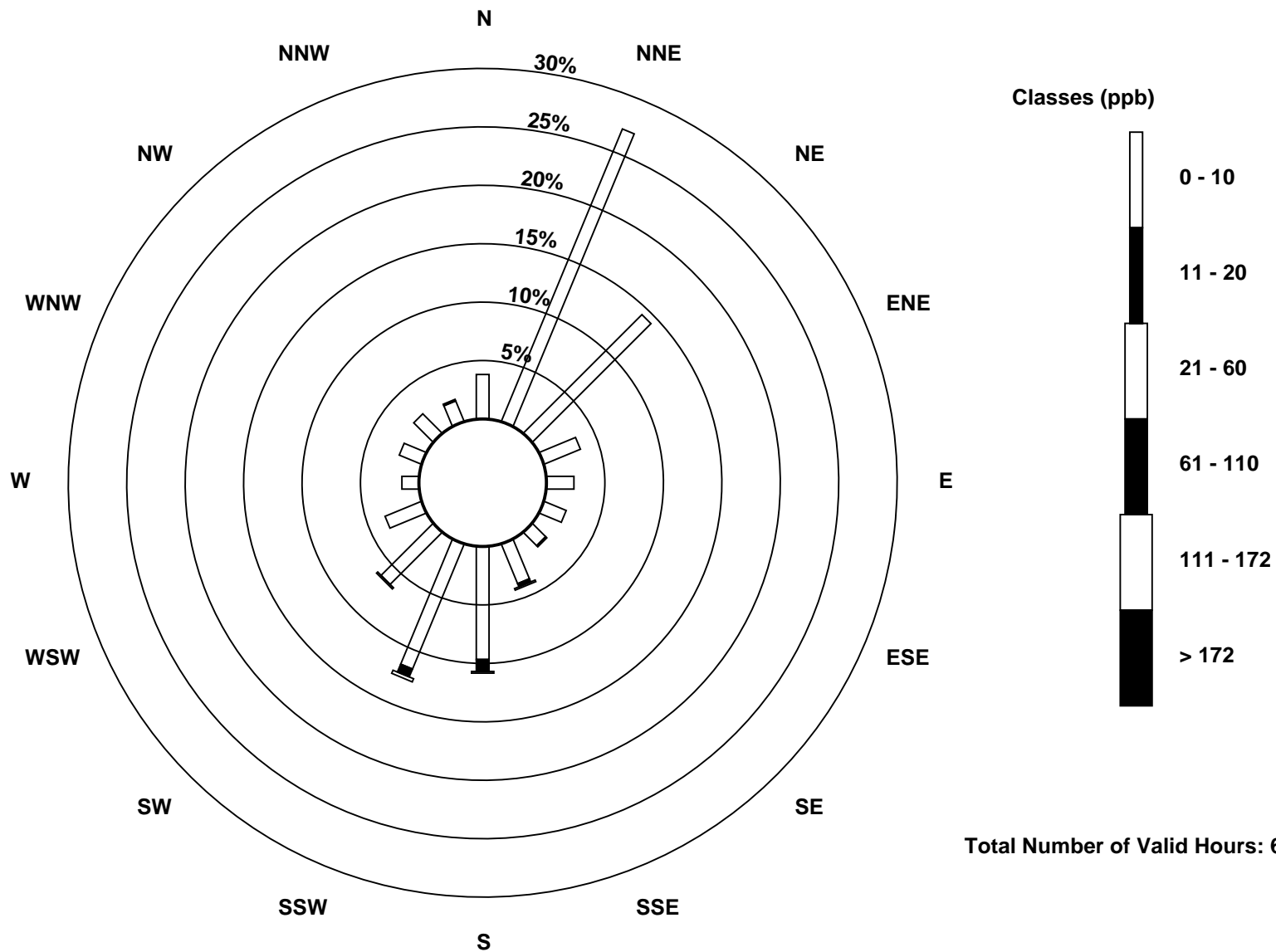
Total Number of Valid Hours: 683

Total Number of Hours: 720

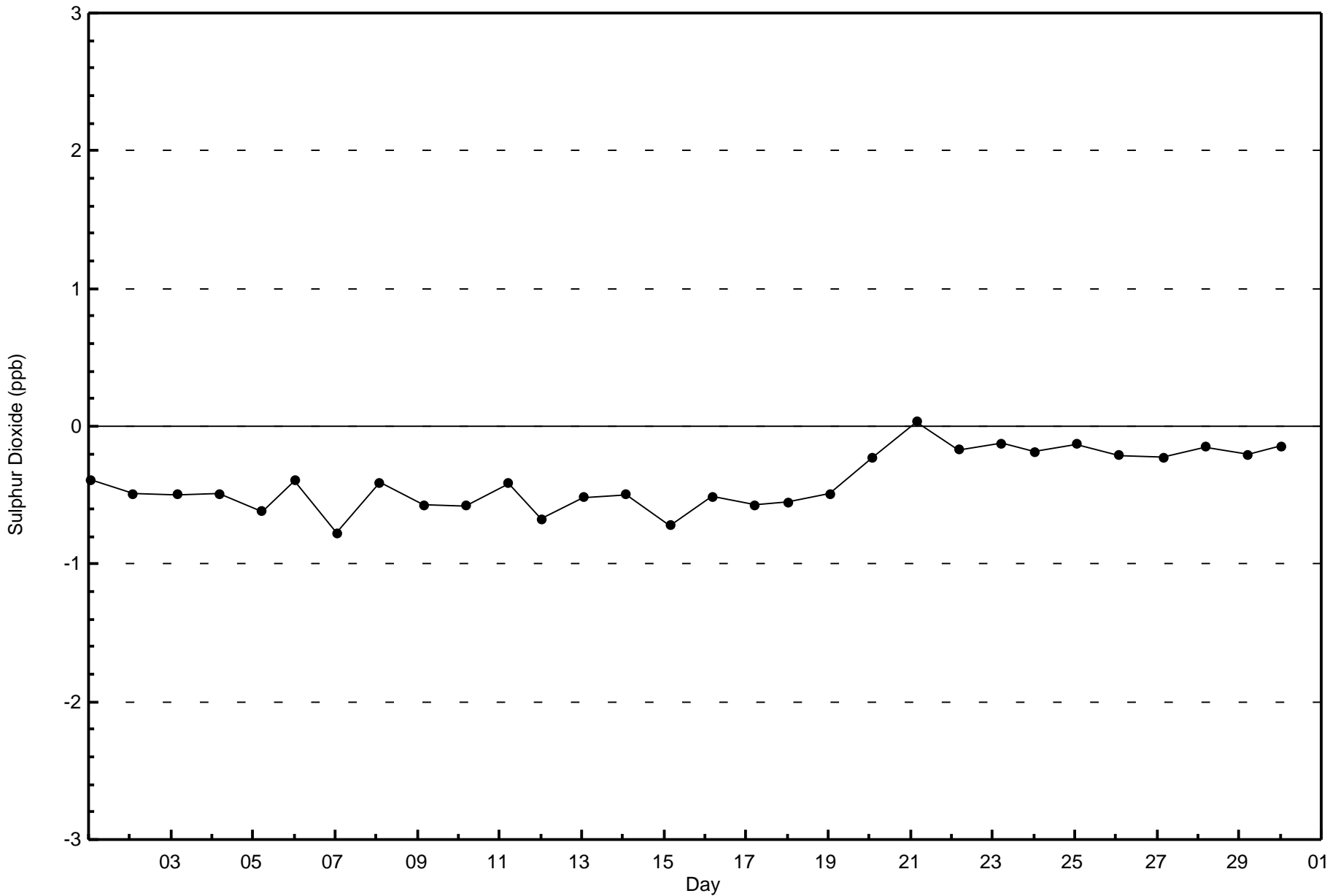


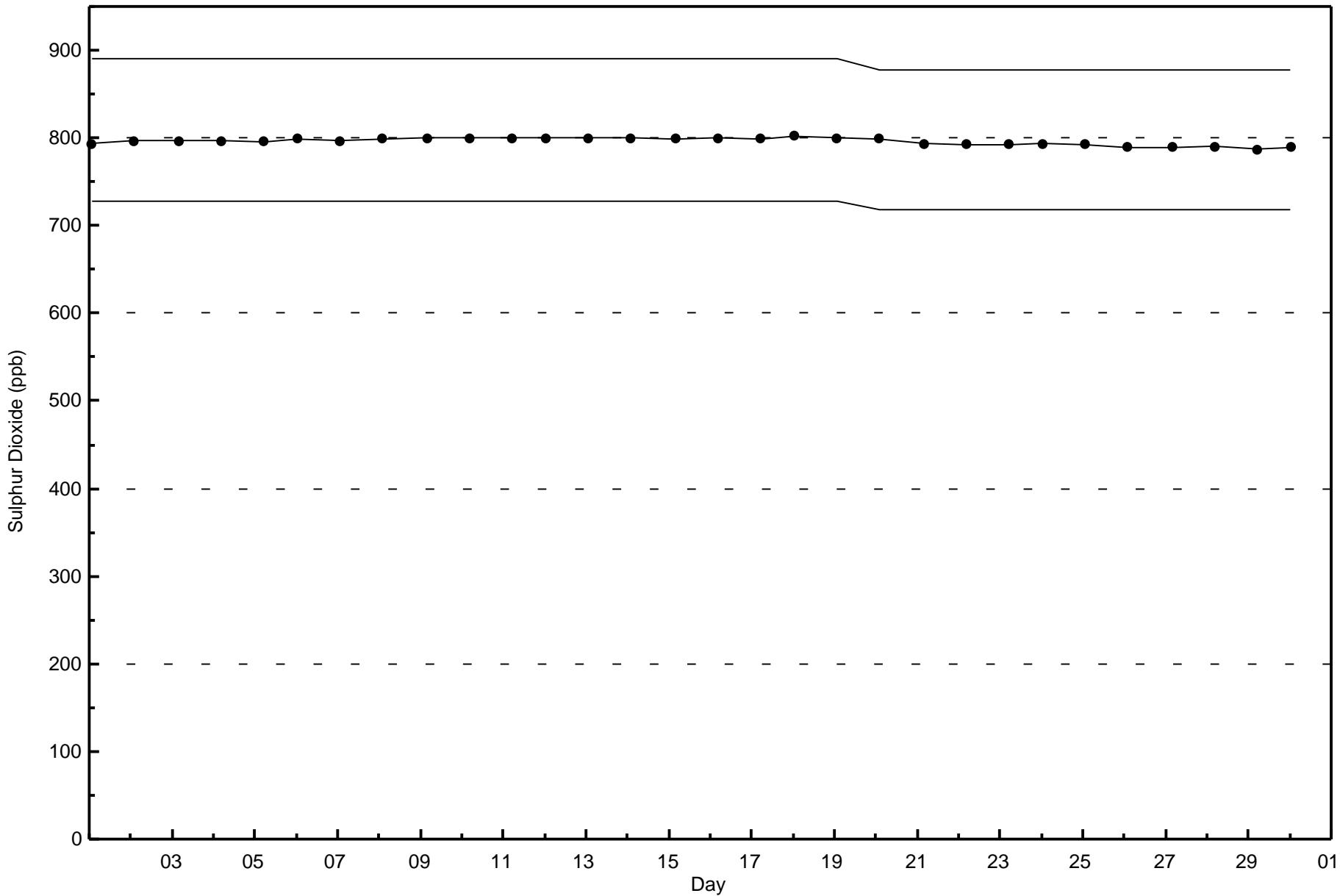
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Horizon (AMS 15)



Total Number of Valid Hours: 683







Summary of Hour Averages

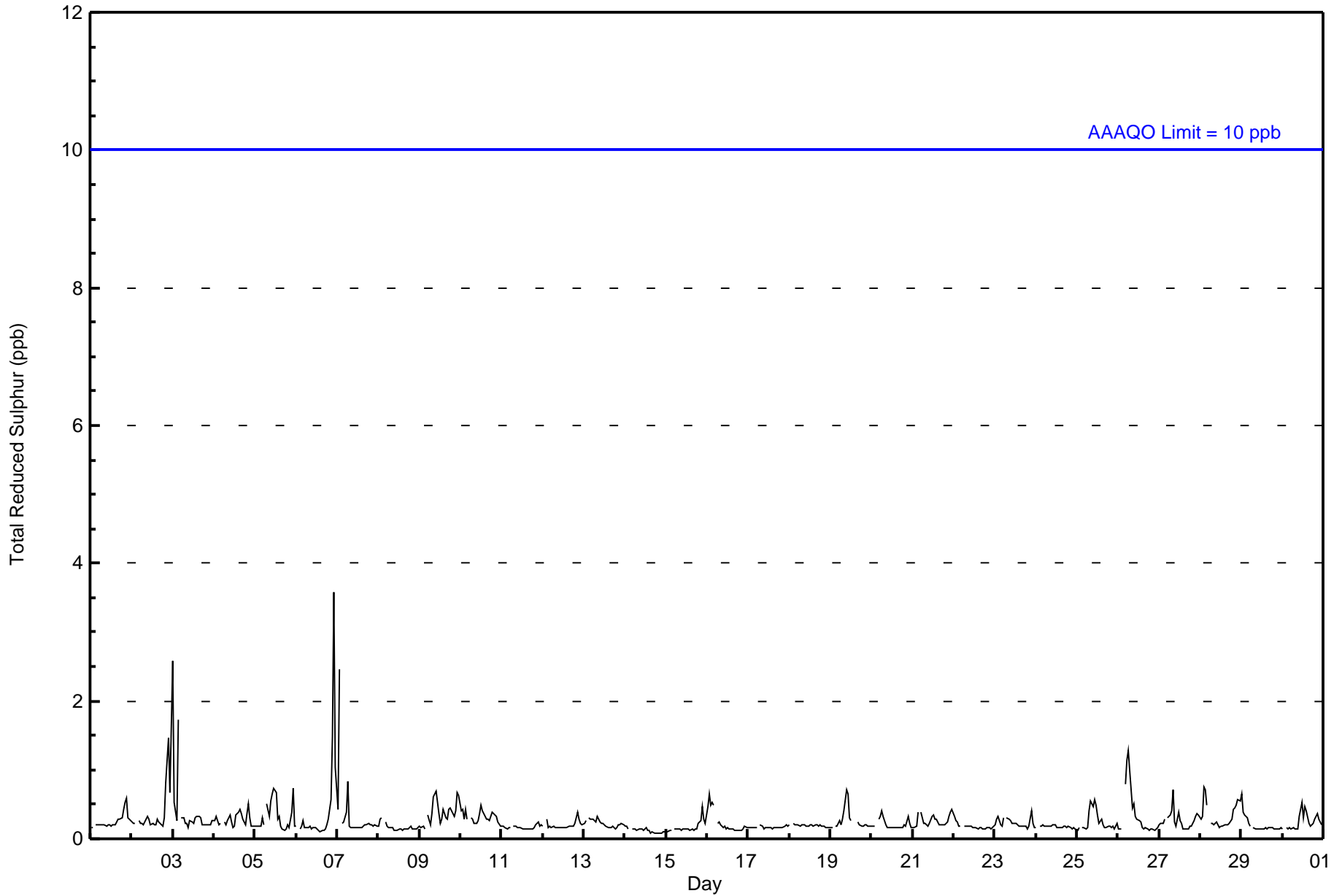
Horizon - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 4 ppb on Apr 6 23:00	Maximum Daily Average: 0.4 ppb on Apr 3		Hours of Data:	687
Minimum Value: 0 ppb on Apr 14 18:00	Minimum Daily Average: 0.1 ppb on Apr 14		Hours of Missing Data:	33
Maximum Diurnal Average: 0.4 ppb at hour 23	Minimum Diurnal Average: 0.2 ppb at hour 18		Hours of Calibration:	33
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0.3	1
2-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	0.4	2
3-Apr	3	1	0	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3
4-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
5-Apr	0	0	0	0	0	0	Z	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0.3	1
6-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4	1	0.4	4
7-Apr	0	2	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	0	Z	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0.4	1
10-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
11-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Apr	0	1	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
19-Apr	0	0	Z	0	0	0	0	0	0	1	1	0	0	C	C	C	0	0	0	0	0	0	0	0	0.3	1
20-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
22-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
24-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	0	Z	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
26-Apr	0	0	0	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
27-Apr	0	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Apr	0	0	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
29-Apr	1	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
30-Apr	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1

0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	Diurnal Average
3	2	1	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	4	2	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	99.71	99.71
3 - 4	2	0.29	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	26	183	98	23	16	13	12	28	75	85	45	22	10	14	17	16	683
3 - 4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	184	98	23	16	13	12	28	75	85	45	22	10	14	17	16	685

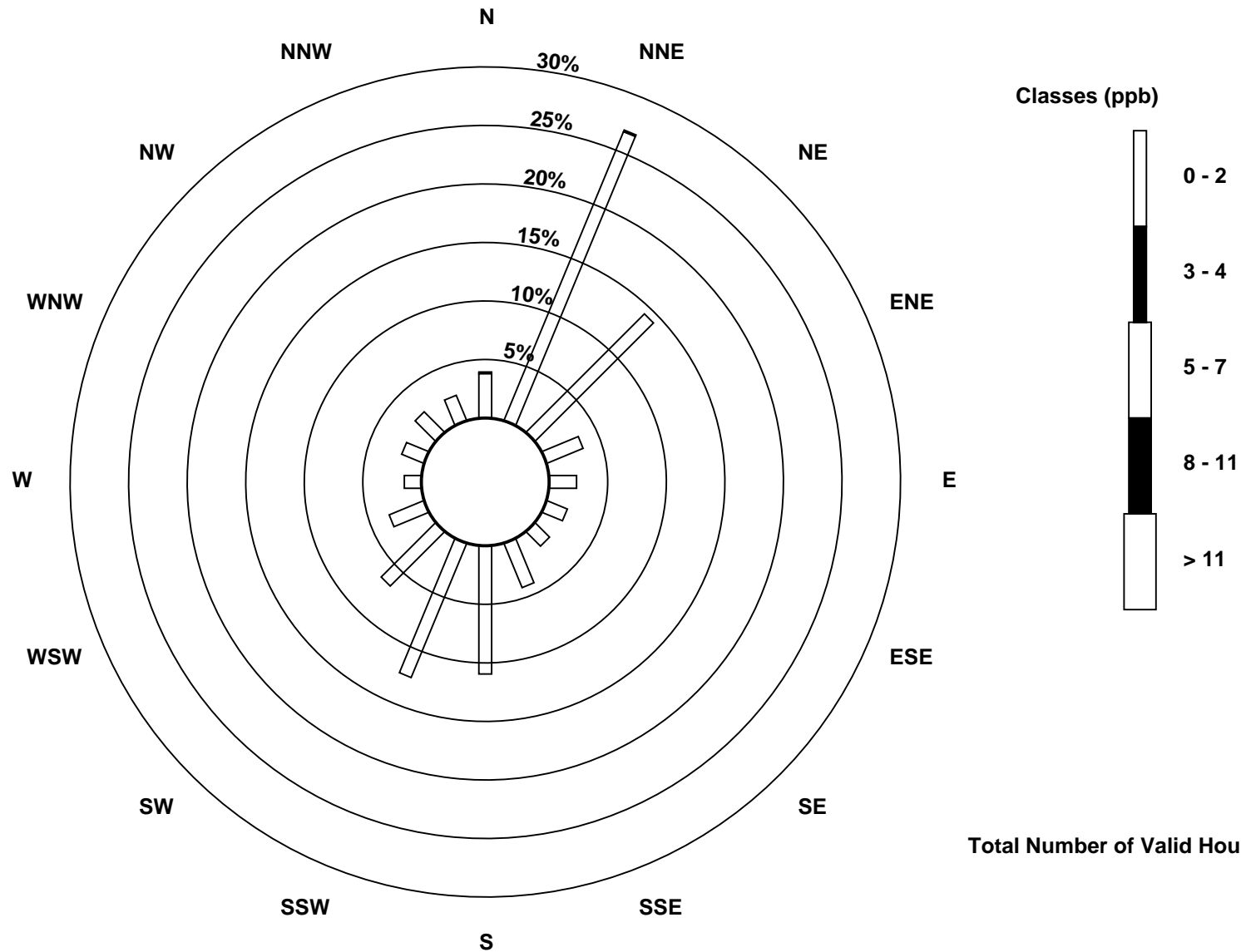
Total Number of Valid Hours: 685

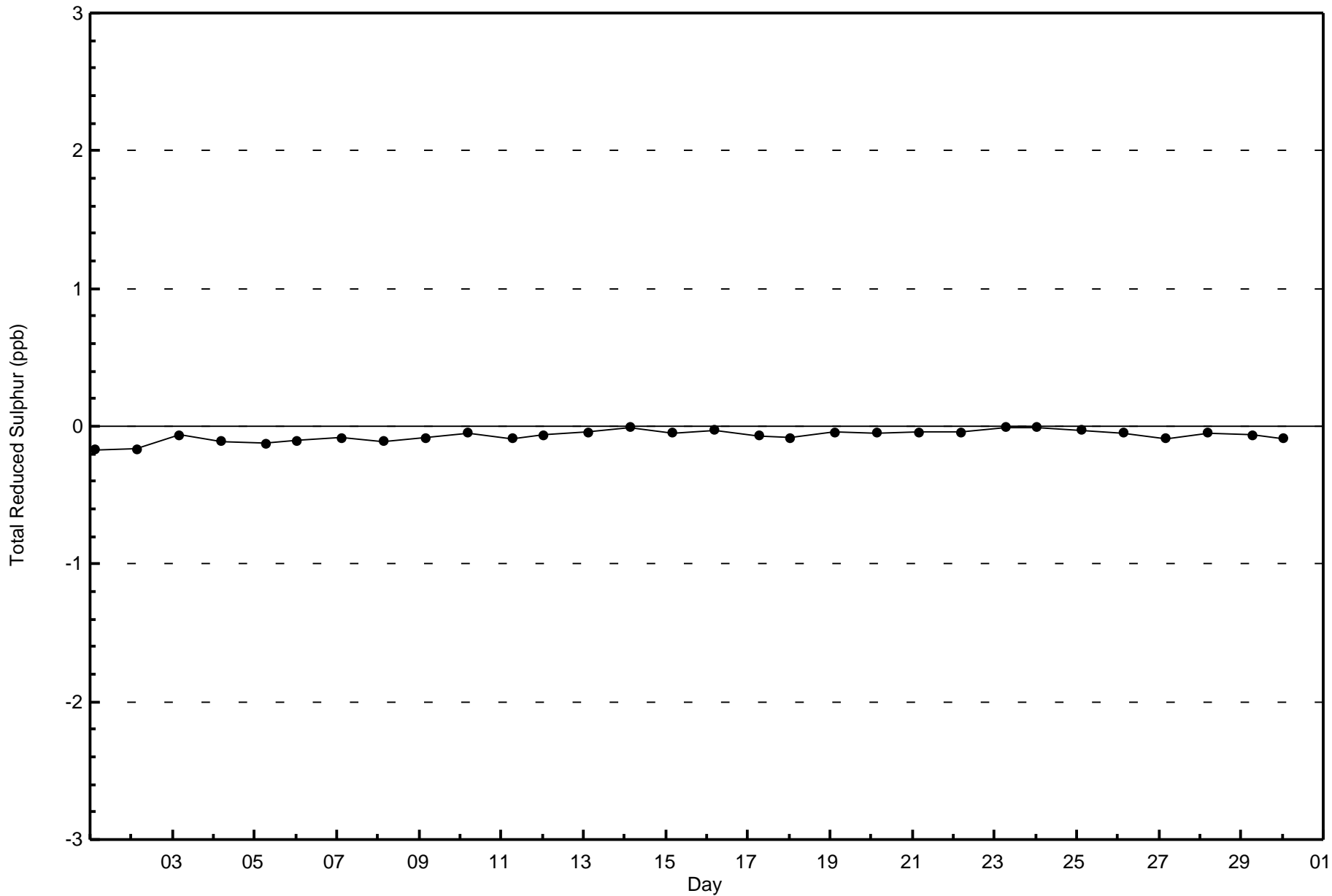
Total Number of Hours: 720

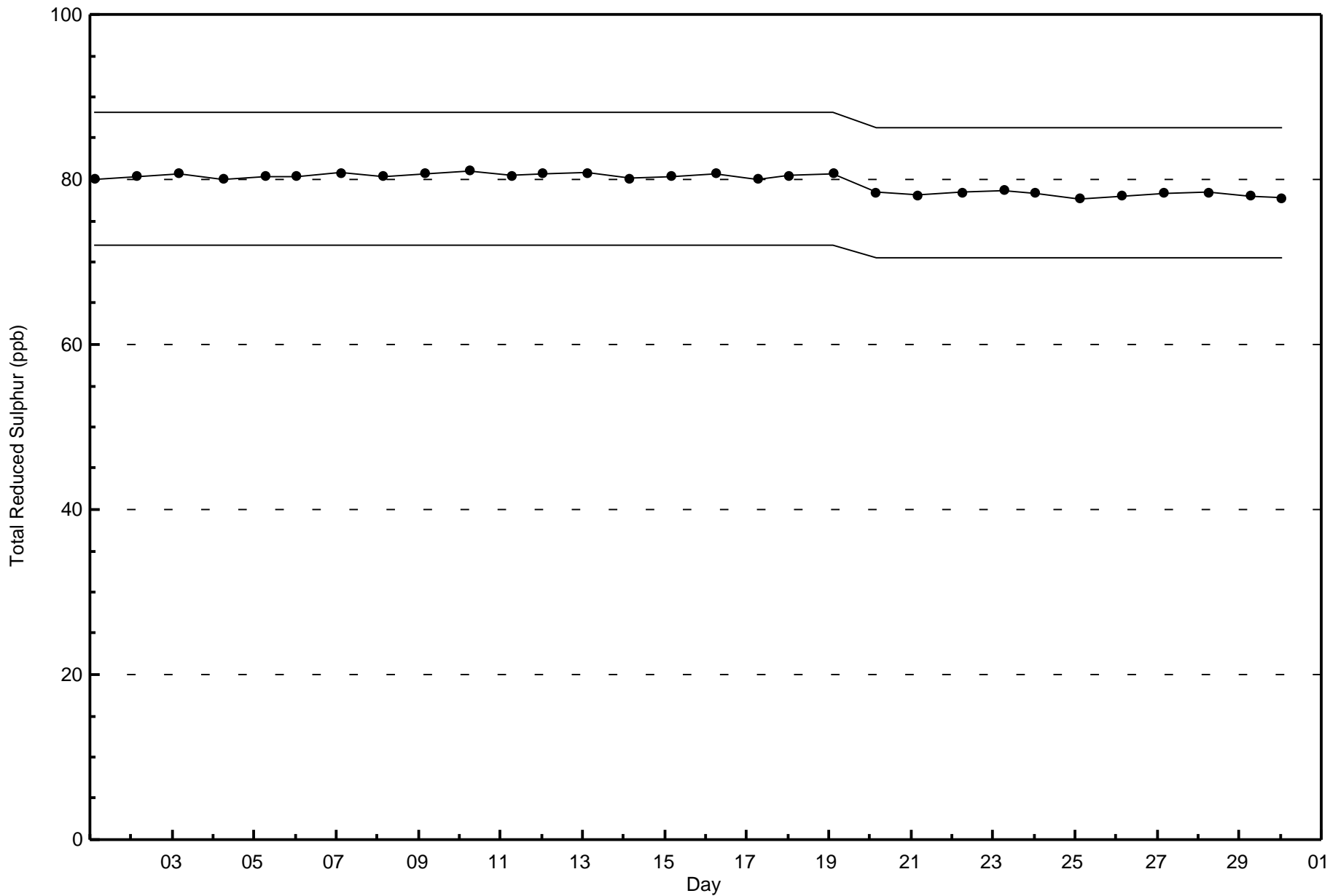


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Horizon (AMS 15)









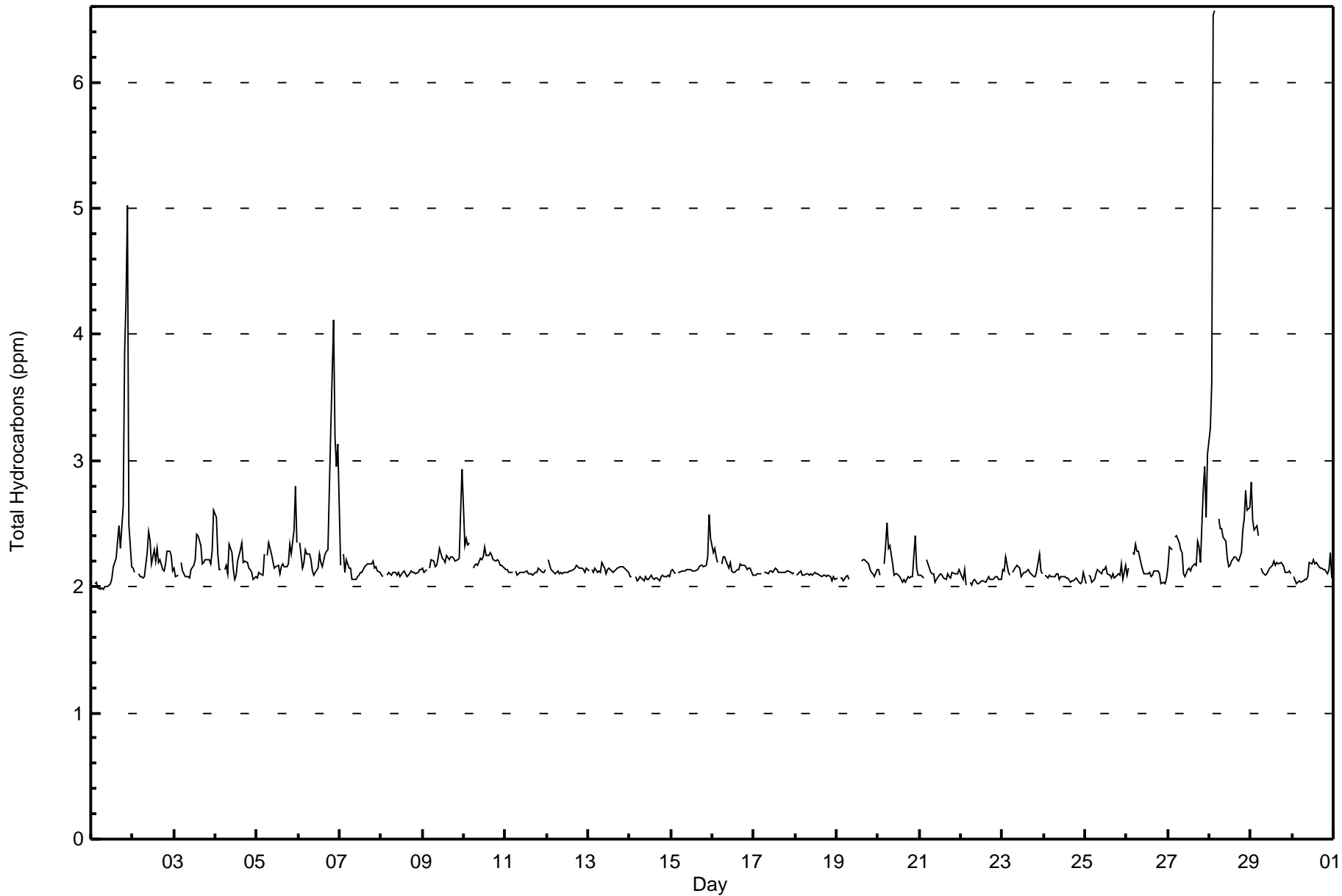
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Horizon - April 2017

Maximum Value: 6.6 ppm on Apr 28 04:00 Maximum Daily Average: 2.8 ppm on Apr 28																				Hours in Service: 720 Hours of Data: 684 Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0						
Minimum Value: 2.0 ppm on Apr 1 08:00 Minimum Daily Average: 2.1 ppm on Apr 22 Maximum Diurnal Average: 2.3 ppm at hour 22 Minimum Diurnal Average: 2.1 ppm at hour 12 Monthly Average: 2.20 ppm Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 3.5																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.4	2.5	2.3	2.6	3.9	4.3	5.0	2.5	2.2	2.4	5.0
2-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.4	2.2	2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.3	2.1	2.2	2.4
3-Apr	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.2	2.6
4-Apr	2.6	2.3	2.1	2.1	Z	2.1	2.2	2.1	2.3	2.3	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.6
5-Apr	2.1	2.1	2.1	2.1	2.3	Z	2.2	2.4	2.3	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.8	2.3	2.2	2.8
6-Apr	Z	2.4	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.8	3.2	4.1	3.2	3.0	3.1	2.5	4.1
7-Apr	2.2	Z	2.3	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.3
8-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
9-Apr	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.9	2.3	2.9
10-Apr	2.3	2.4	2.3	2.4	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.4
11-Apr	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12-Apr	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2
13-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2
14-Apr	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
15-Apr	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.6	2.4	2.2	2.6	
16-Apr	2.3	2.3	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3
17-Apr	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
18-Apr	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
19-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	--
20-Apr	2.1	2.1	Z	2.2	2.3	2.5	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.4	2.1	2.1	2.2	2.5
21-Apr	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
22-Apr	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Apr	2.1	2.1	2.2	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.3
24-Apr	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1
25-Apr	2.0	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2
26-Apr	2.1	2.1	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.3
27-Apr	2.2	2.3	2.3	Z	2.4	2.4	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.8	3.0	2.6	3.1	3.1
28-Apr	3.3	3.6	6.5	6.6	Z	2.5	2.5	2.5	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.5	2.8	2.6	2.6	6.6
29-Apr	2.8	2.5	2.5	2.5	2.4	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.8
30-Apr	Z	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.3
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Horizon - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	39	5.70	5.70
2.1 - 3.0	633	92.54	98.25
3.1 - 10.0	12	1.75	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Horizon - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	8	6	1	2	2	1	1	2	3	8	3	0	0	0	1	38
2.1 - 3.0	26	176	92	22	14	12	11	27	72	83	36	19	7	13	12	11	633
3.1 - 10.0	0	1	0	0	0	0	0	0	0	0	0	1	3	1	4	2	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	185	98	23	16	14	12	28	74	86	44	23	10	14	16	14	683

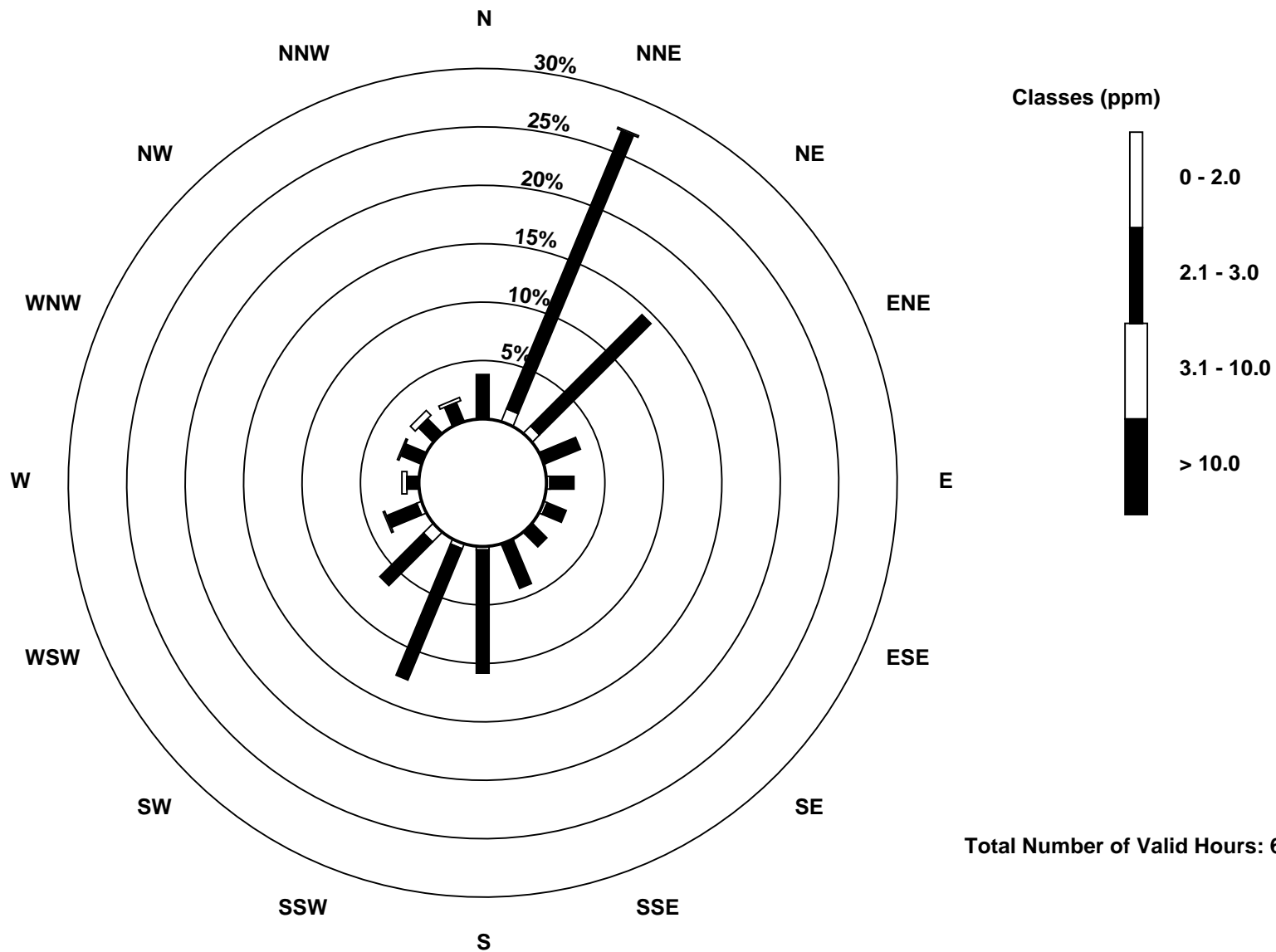
Total Number of Valid Hours: 683

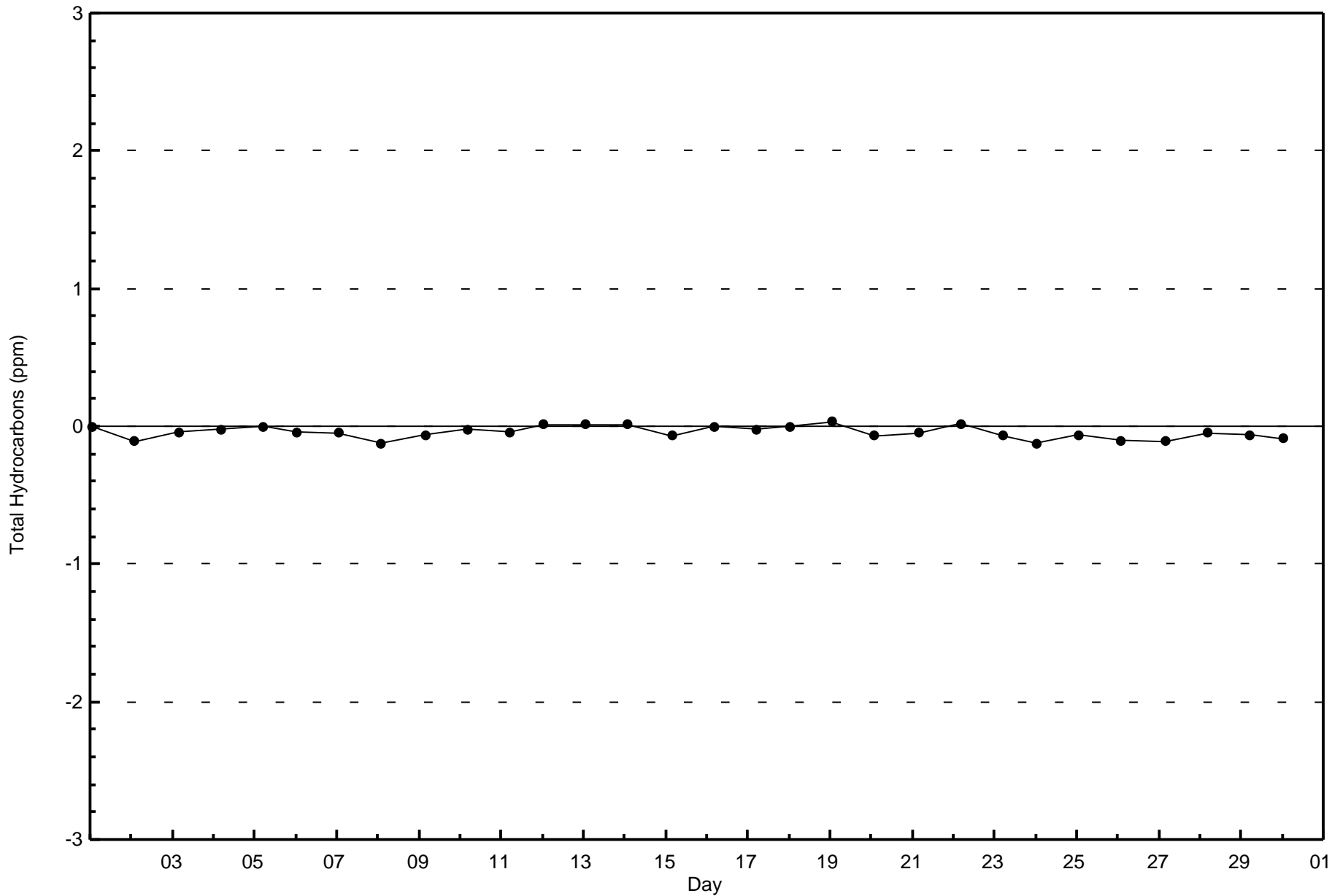
Total Number of Hours: 720

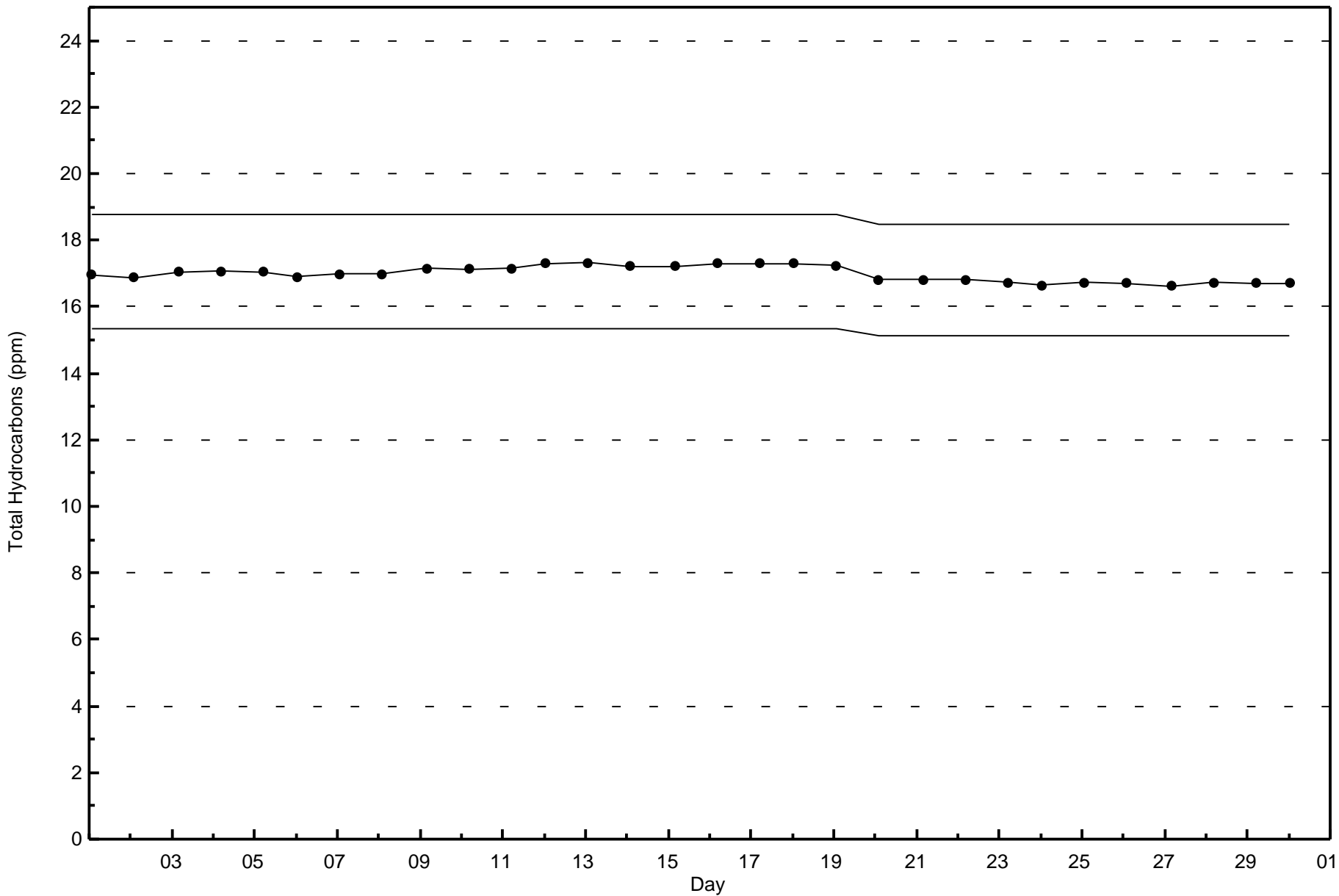


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Horizon (AMS 15)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Horizon - April 2017

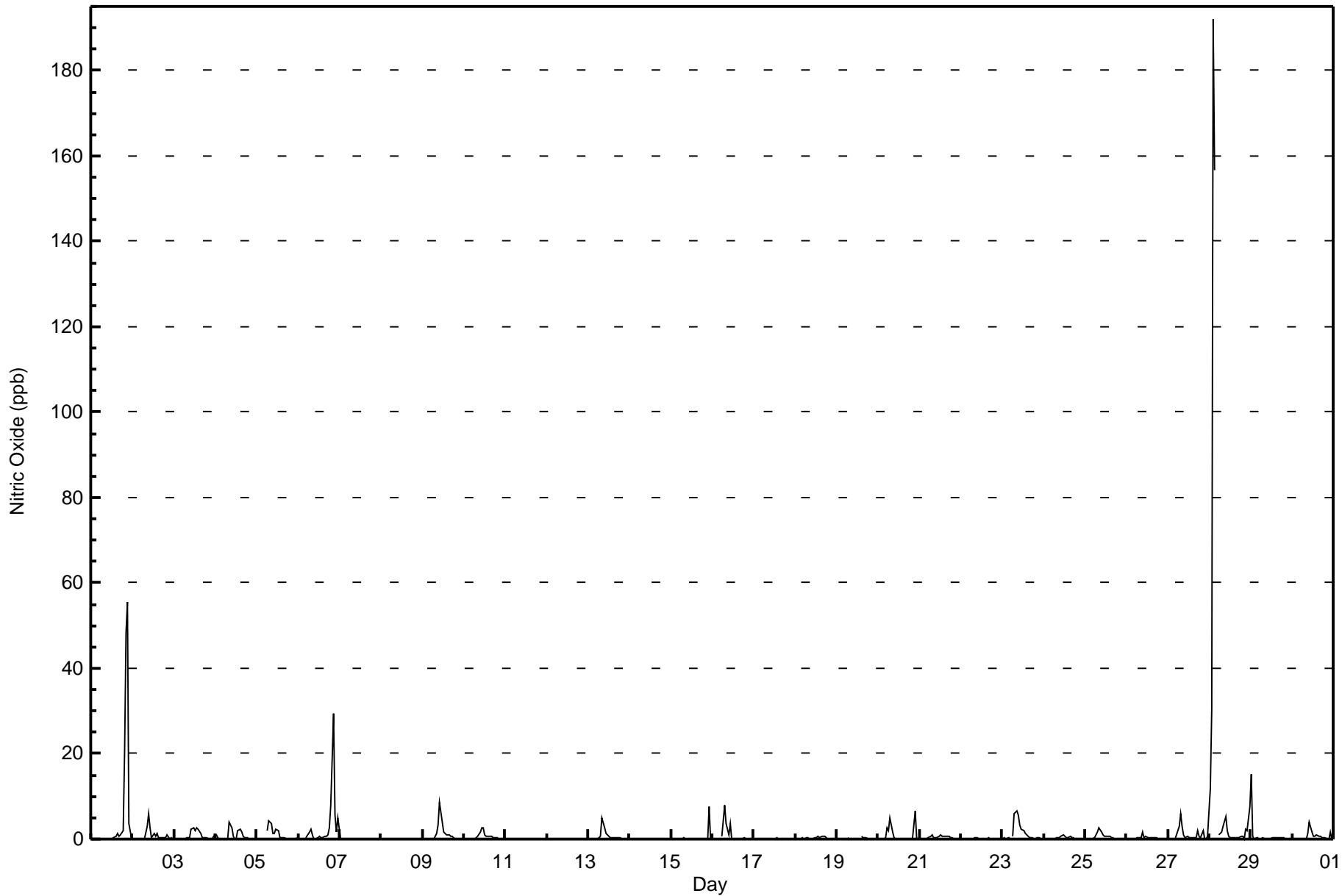
Maximum Value: 192 ppb on Apr 28 03:00																		Maximum Daily Average: 18.3 ppb on Apr 28																		Hours in Service: 720	
Minimum Value: 0 ppb on Apr 1 04:00																		Minimum Daily Average: 0.0 ppb on Apr 8																		Hours of Data: 684	
Maximum Diurnal Average: 7.7 ppb at hour 3																		Minimum Diurnal Average: 0.1 ppb at hour 5																		Hours of Missing Data: 36	
Monthly Average: 1.4 ppb																		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 2 P ₉₉ = 18																		Hours of Calibration: 36	
																																				Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	21	48	56	3	0	5.8	56											
2-Apr	0	0	Z	0	0	0	0	0	3	6	2	0	1	1	1	0	0	0	0	0	1	0	0	0	0.8	6											
3-Apr	0	0	0	Z	0	0	0	0	0	0	2	3	2	3	2	1	0	0	0	0	0	0	0	1	0.7	3											
4-Apr	1	0	0	0	Z	0	0	0	4	3	1	0	0	2	2	2	1	0	0	0	0	0	0	0	0.7	4											
5-Apr	0	0	0	0	0	Z	2	4	4	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0.8	4											
6-Apr	Z	0	0	0	0	1	2	2	1	0	0	0	1	0	0	1	1	1	3	8	30	6	2	5	2.7	30											
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0											
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0											
9-Apr	0	0	0	Z	0	0	0	1	1	3	9	4	2	1	1	1	1	1	0	0	0	0	0	0	1.1	9											
10-Apr	0	0	0	0	Z	0	0	0	1	2	3	3	1	1	1	1	1	0	0	0	0	0	0	0	0.5	3											
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0											
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0											
13-Apr	0	Z	0	0	0	0	0	1	5	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	5											
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0											
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0.4	8											
16-Apr	0	0	0	0	Z	1	4	8	4	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0	8											
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0											
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0.2	1											
19-Apr	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	1	0	0	0	0	0	0	0	0	--	1											
20-Apr	0	0	Z	0	0	3	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0.8	7											
21-Apr	0	0	0	Z	0	0	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0.4	1											
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0											
23-Apr	0	0	0	0	0	Z	1	6	7	6	3	2	2	1	1	1	0	0	0	0	0	0	0	0	1.4	7											
24-Apr	Z	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0.2	1											
25-Apr	0	Z	0	0	0	0	1	2	3	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.5	3											
26-Apr	0	0	Z	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2											
27-Apr	0	0	0	Z	0	1	3	6	3	1	0	1	0	0	0	0	0	2	1	0	2	0	0	1	1.0	6											
28-Apr	12	30	192	157	Z	1	1	2	3	5	2	1	0	0	0	0	0	0	1	1	0	2	2	7	18.3	192											
29-Apr	15	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	15											
30-Apr	Z	0	0	0	0	0	0	0	0	1	4	2	1	1	1	1	1	0	0	0	0	0	2	0	0.6	4											
																		Diurnal Average		Diurnal Maximum																	
																		1.2		15																	
																		1.3		30																	
																		7.7		192																	
																		6.3		157																	
																		0.1		0																	
																		0.3		3																	
																		0.6		4																	
																		1.3		8																	
																		1.4		7																	
																		1.3		6																	
																		1.2		9																	
																		0.8		4																	
																		0.6		2																	
																		0.5		3																	
																		0.5		2																	
																		0.4		2																	
																		0.3		1																	
																		0.4		2																	
																		0.3		3																	
																		1.1		21																	
																		2.8		48																	
																		2.4		56																	
																		0.6		8																	
																		0.5		7																	

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Horizon - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	677	98.98	98.98
21 - 40	3	0.44	99.42
41 - 80	2	0.29	99.71
81 - 159	1	0.15	99.85
> 159	1	0.15	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	26	185	98	23	16	14	12	28	74	86	44	23	7	13	14	13	676
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	3
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Totals	26	185	98	23	16	14	12	28	74	86	44	23	10	14	16	14	683

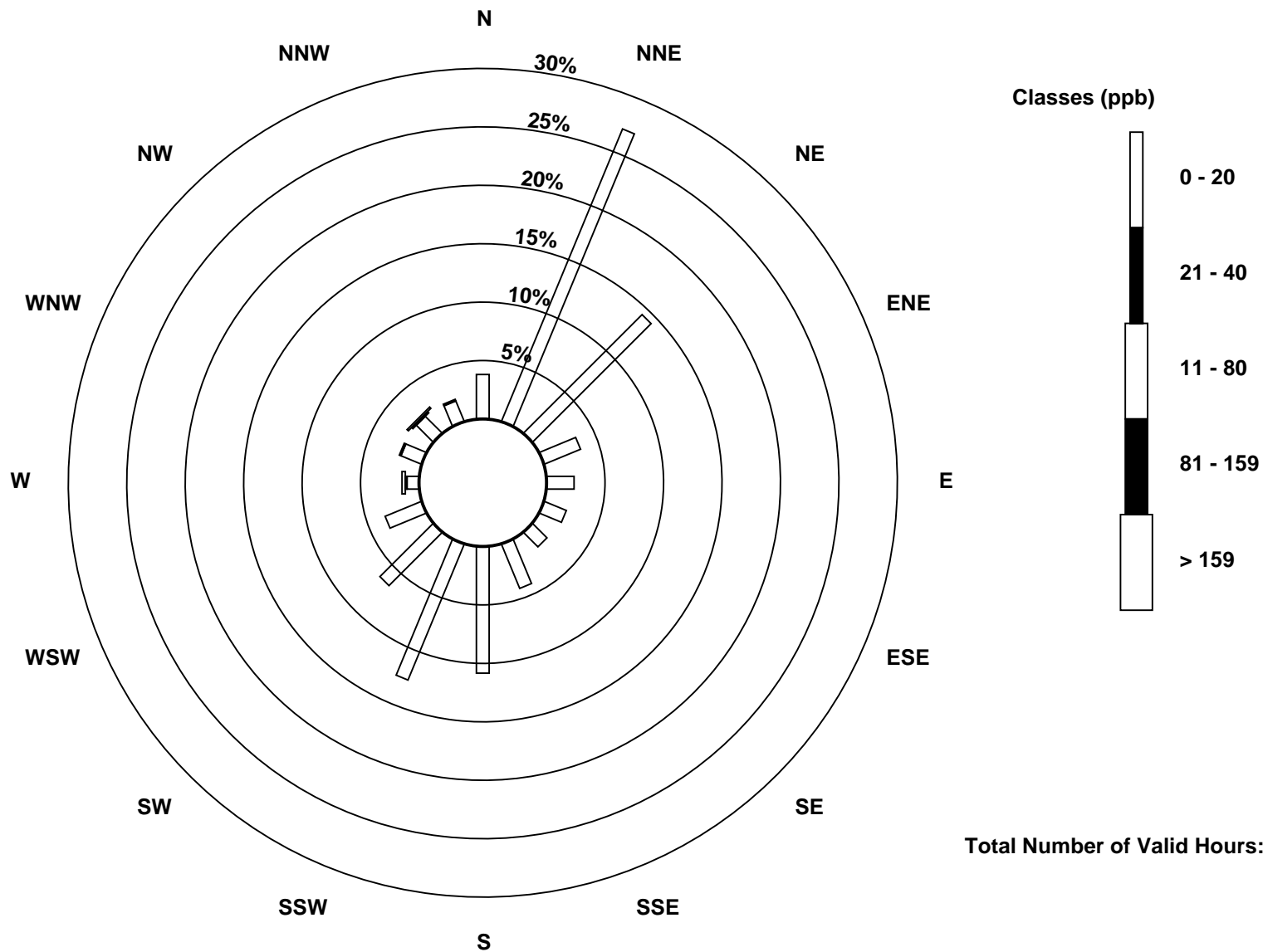
Total Number of Valid Hours: 683

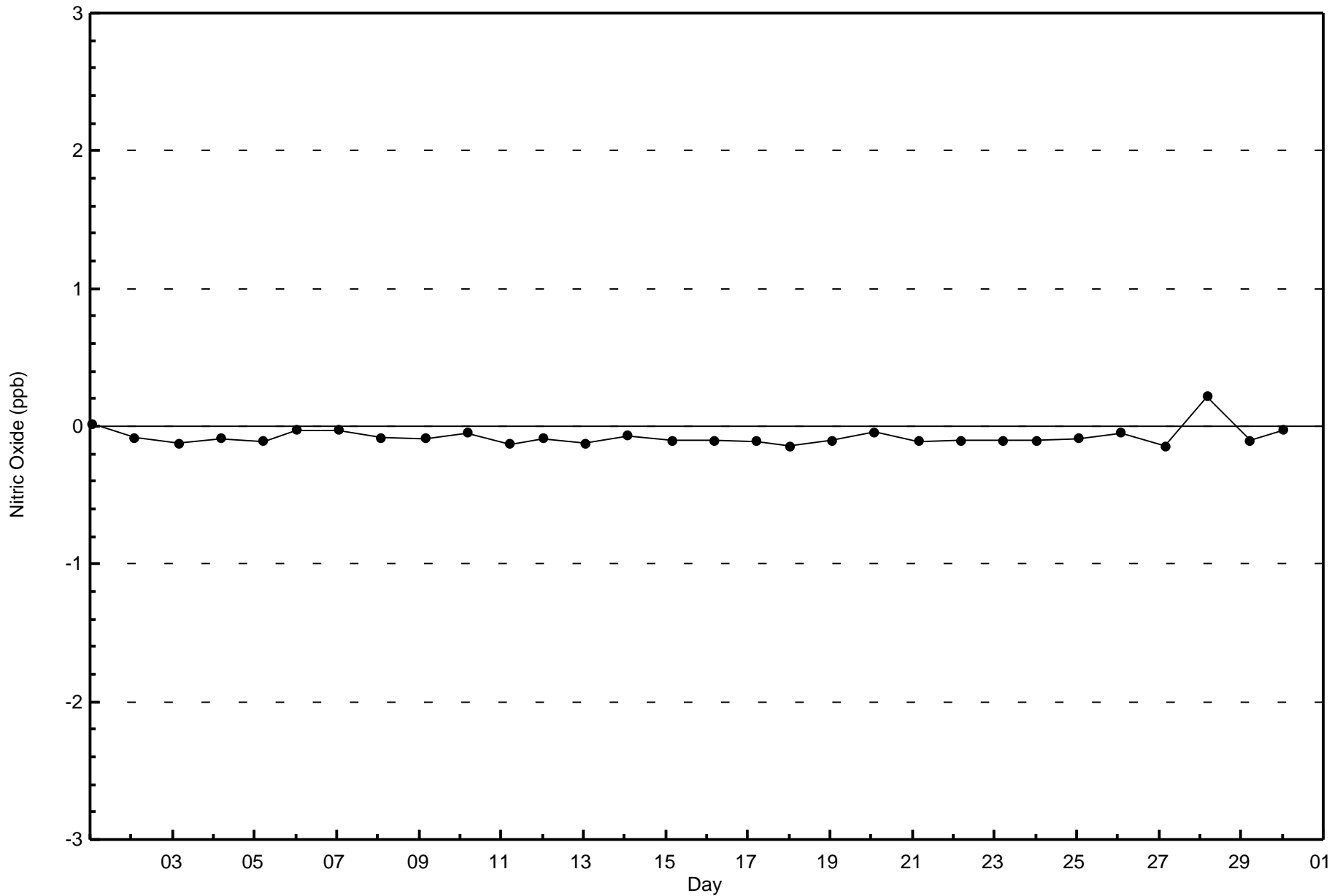
Total Number of Hours: 720

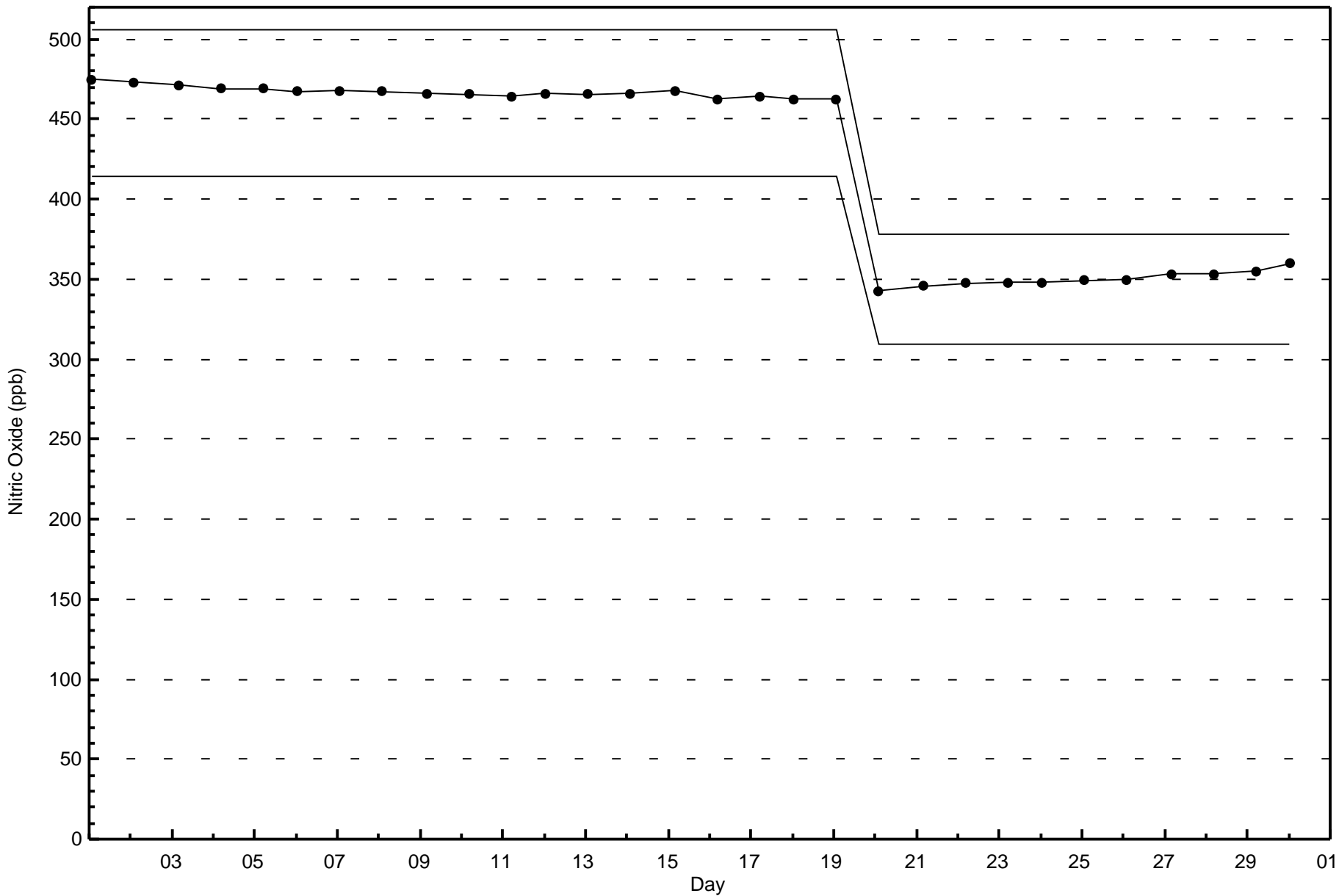


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Horizon (AMS 15)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Horizon - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 45 ppb on Apr 6 21:00	Maximum Daily Average: 14.0 ppb on Apr 28
Minimum Value: 0 ppb on Apr 8 15:00	Hours of Data: 684
Maximum Diurnal Average: 7.1 ppb at hour 22	Hours of Missing Data: 36
Monthly Average: 3.6 ppb	Hours of Calibration: 36
Minimum Daily Average: 0.3 ppb on Apr 8	Percent Operational Time: 100.0
Minimum Diurnal Average: 1.6 ppb at hour 17	
Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 1 Median = 2 Q ₃ = 4 P ₉₀ = 9 P ₉₉ = 36	

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	3	6	6	12	24	37	40	39	8	0	7.8	40
2-Apr	1	0	Z	0	0	0	0	0	9	11	6	2	4	2	4	1	0	1	1	3	6	4	11	2	3.0	11
3-Apr	4	5	2	Z	1	2	2	2	1	1	5	6	5	10	8	5	1	1	5	6	6	5	7	11	4.4	11
4-Apr	12	4	1	1	Z	1	1	0	9	5	2	0	1	6	8	8	3	4	4	5	4	5	4	2	3.9	12
5-Apr	2	2	1	1	10	Z	12	12	10	5	5	5	2	2	1	2	1	2	4	5	5	6	11	4.8	12	
6-Apr	Z	5	1	3	6	14	15	9	3	1	1	1	3	1	1	2	4	7	24	40	45	28	20	20	11.1	45
7-Apr	2	Z	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	3
8-Apr	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Apr	1	1	1	Z	1	5	3	4	7	9	10	5	3	3	3	3	3	3	3	4	4	4	4	6	3.8	10
10-Apr	7	10	14	9	Z	2	2	2	3	4	6	6	3	2	2	2	3	3	4	4	4	4	3	1	4.3	14
11-Apr	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0.4	1
12-Apr	Z	1	3	0	0	1	0	1	0	0	1	1	0	0	0	0	1	0	0	2	4	1	1	1	0.8	4
13-Apr	2	Z	1	1	1	2	2	3	11	6	3	2	2	2	1	1	1	1	2	1	5	6	4	4	2.8	11
14-Apr	2	2	Z	0	0	0	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.7	2
15-Apr	1	1	1	Z	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	1	4	7	22	13	2.4	22
16-Apr	9	6	6	5	Z	10	12	12	5	1	4	0	0	0	0	0	0	0	1	1	1	2	1	0	3.4	12
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0.4	1
18-Apr	Z	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1	2	4	3	3	1	1	2	1	1.1	4
19-Apr	1	Z	1	1	1	1	1	2	C	C	C	C	C	C	2	1	1	1	1	1	1	1	1	1	--	2
20-Apr	1	1	Z	5	10	12	8	11	4	1	1	0	0	1	1	1	1	1	1	2	2	20	2	2	3.6	20
21-Apr	4	1	1	Z	3	5	3	2	1	1	1	1	2	1	1	1	2	3	4	7	5	5	7	12	3.1	12
22-Apr	9	5	5	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	3	5	1.7	9
23-Apr	4	4	4	4	4	Z	2	6	6	6	4	3	3	3	2	2	2	2	2	3	9	17	5	1	4.3	17
24-Apr	Z	1	1	1	2	1	1	1	2	1	2	2	1	2	2	2	2	2	2	1	3	2	1	1	1.4	3
25-Apr	1	Z	3	2	1	4	7	7	8	7	5	4	3	3	3	2	2	2	2	3	2	4	7	5	3.7	8
26-Apr	8	7	Z	3	3	4	4	4	3	5	2	2	2	2	2	1	2	1	1	1	1	1	1	2	2.5	8
27-Apr	3	6	5	Z	9	9	11	11	8	3	2	3	2	2	1	1	1	8	5	11	27	18	17	23	8.1	27
28-Apr	29	24	41	40	Z	7	6	7	9	11	5	3	2	2	3	3	3	4	8	18	21	29	22	27	14.0	41
29-Apr	31	19	15	15	10	Z	1	1	1	1	0	0	0	1	1	1	1	1	2	1	1	1	1	1	4.6	31
30-Apr	Z	1	1	0	1	1	1	1	1	3	8	5	3	6	3	3	3	3	3	3	3	3	10	2	2.8	10

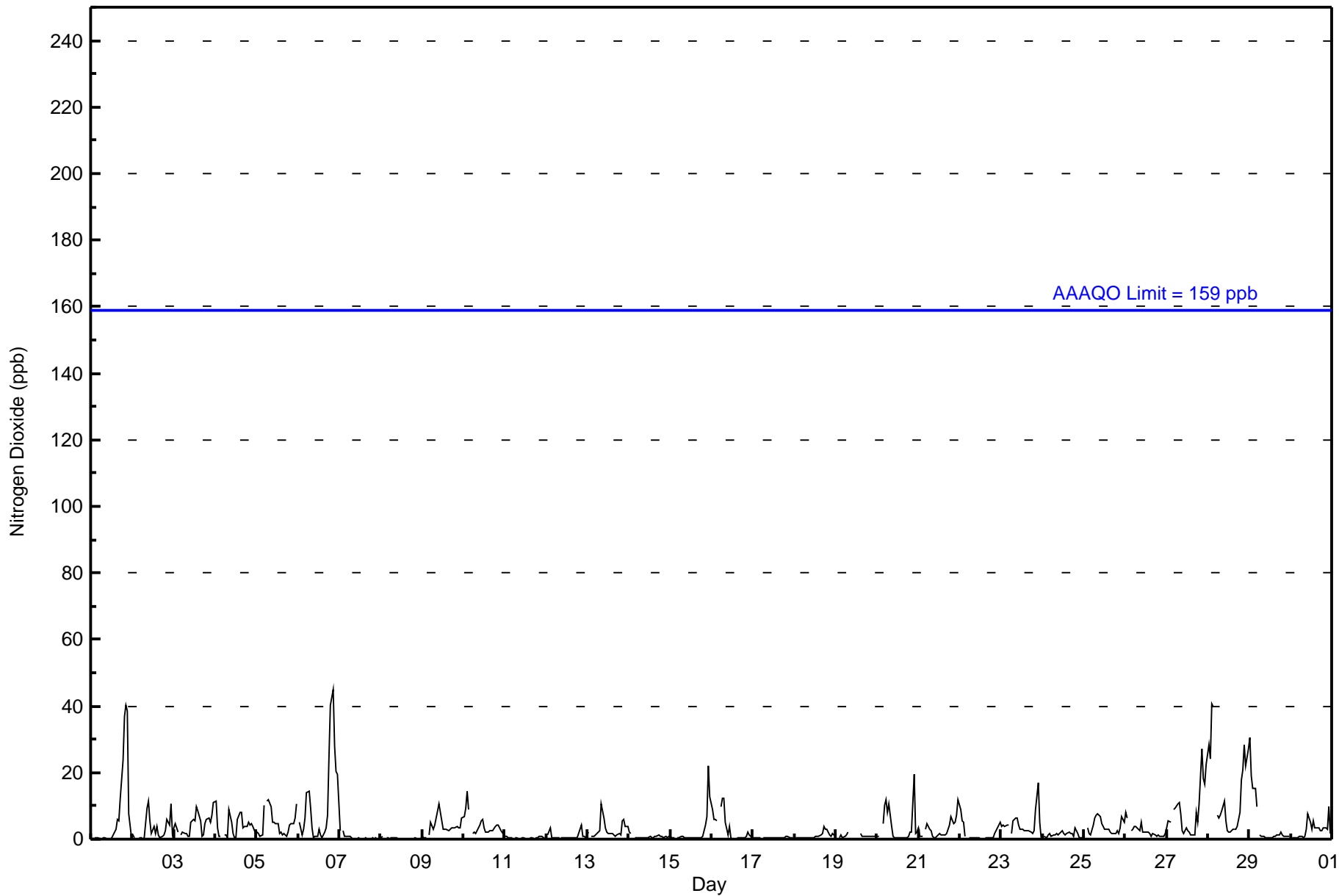
5.3	4.2	4.5	3.8	2.7	3.3	3.3	3.4	3.5	2.9	2.6	1.9	1.7	1.8	1.9	1.8	1.6	2.2	3.5	5.5	6.9	7.1	5.6	5.1	Diurnal Average	
31	24	41	40	10	14	15	12	11	11	10	6	5	10	8	8	6	12	24	40	45	39	22	27	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Horizon - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	664	97.08	97.08
21 - 40	18	2.63	99.71
41 - 80	2	0.29	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Horizon - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	26	184	97	23	15	13	12	28	73	85	44	22	7	10	12	12	663
21 - 40	0	1	1	0	1	1	0	0	1	1	0	1	3	4	3	1	18
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	185	98	23	16	14	12	28	74	86	44	23	10	14	16	14	683

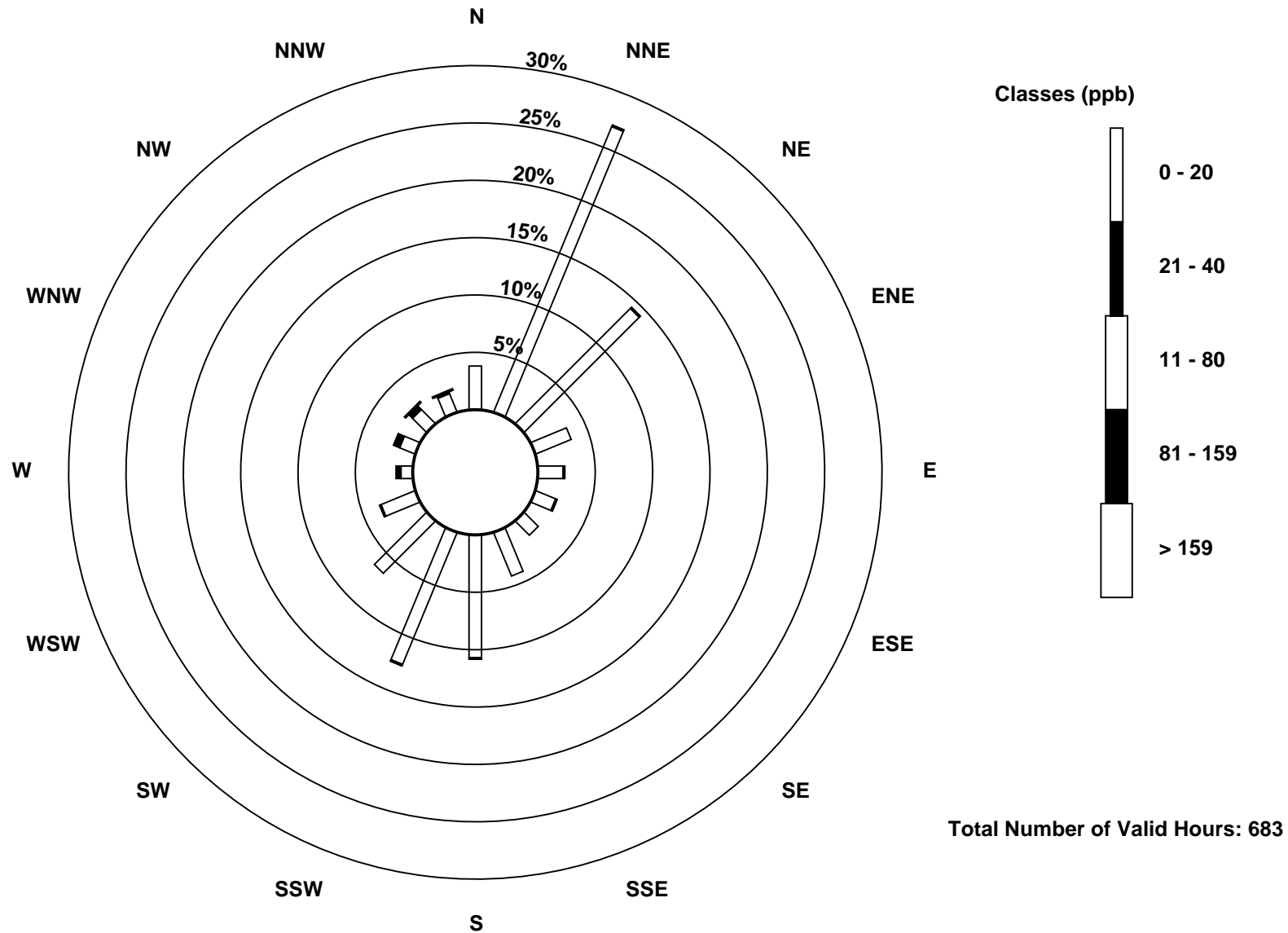
Total Number of Valid Hours: 683

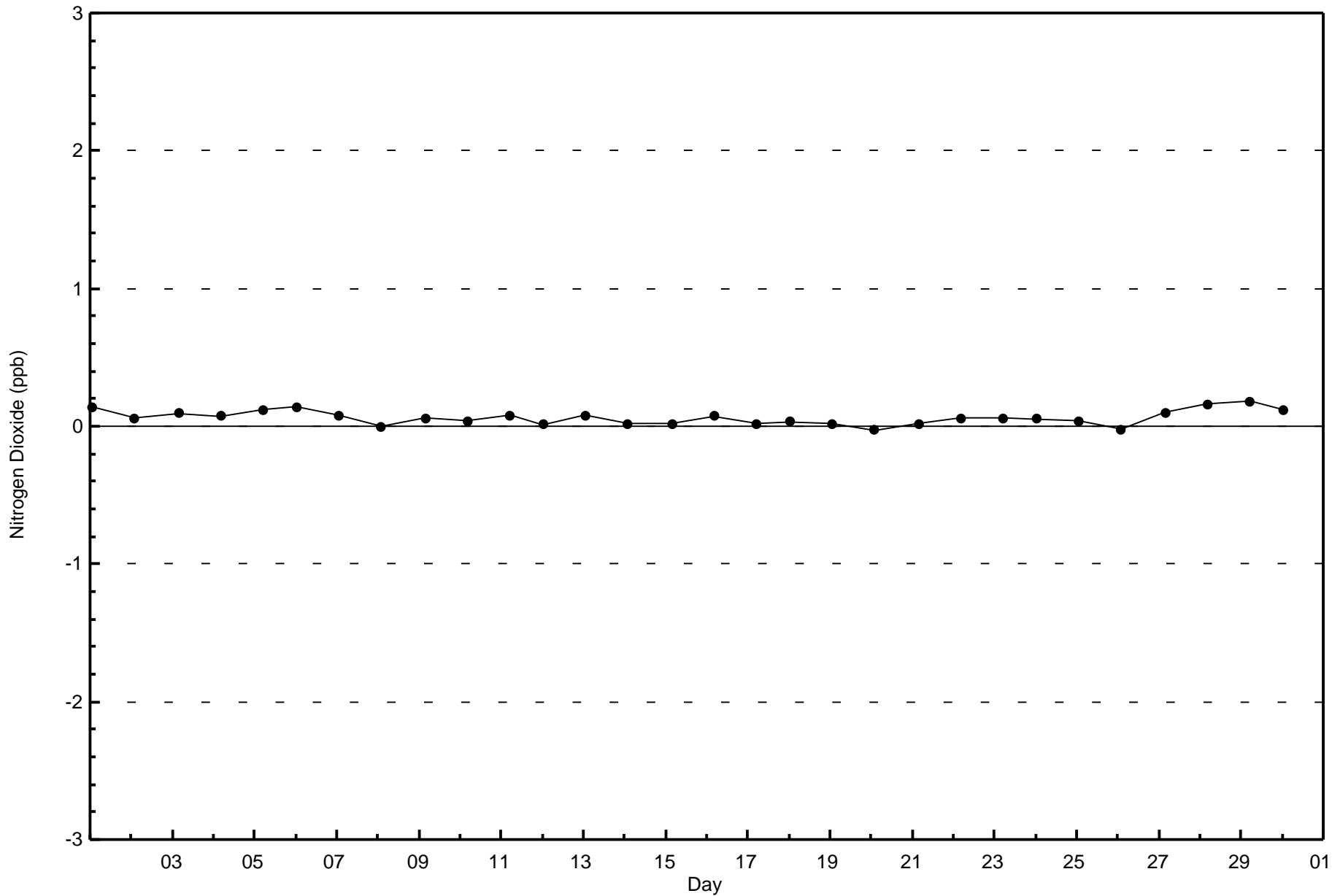
Total Number of Hours: 720

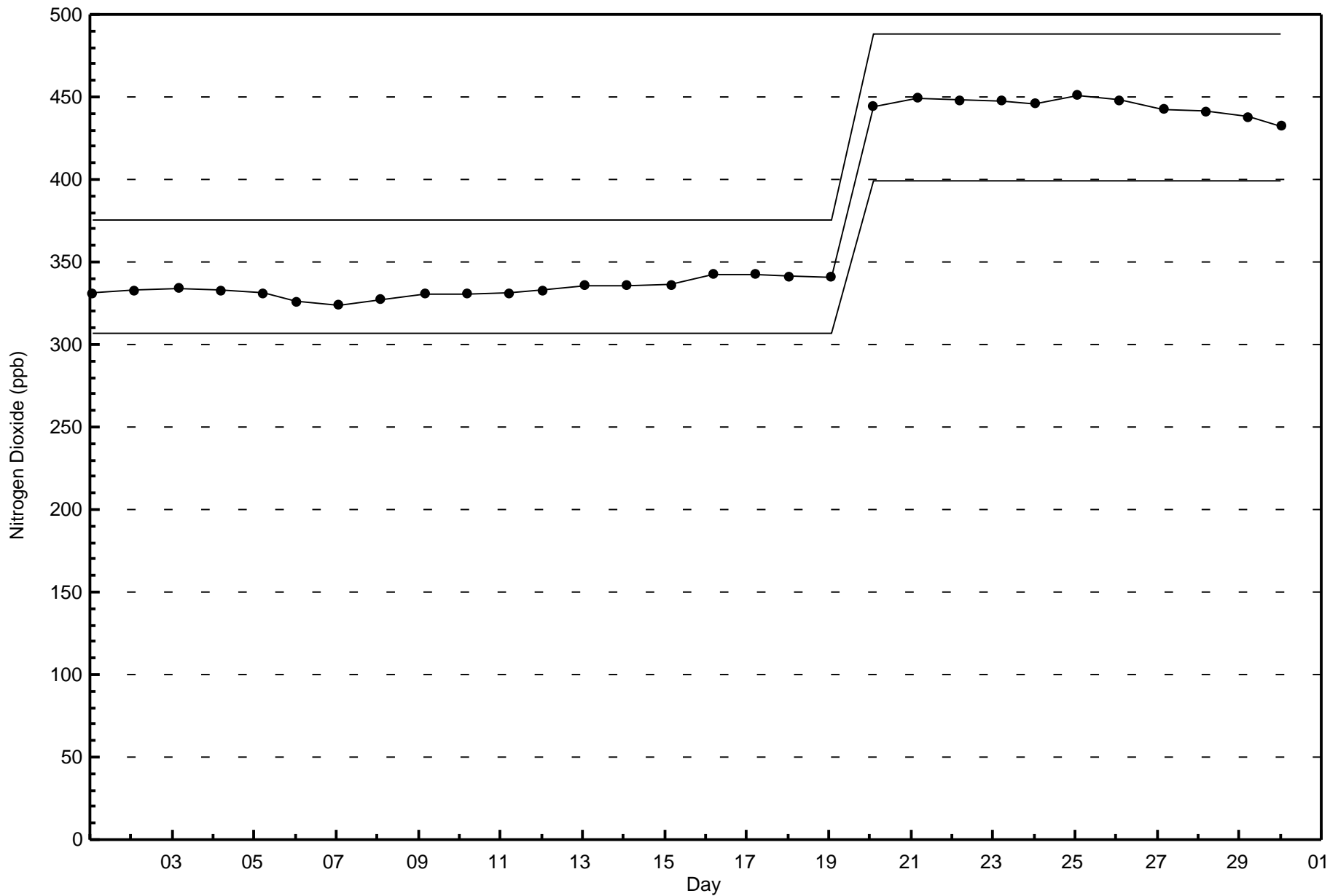


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Horizon (AMS 15)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

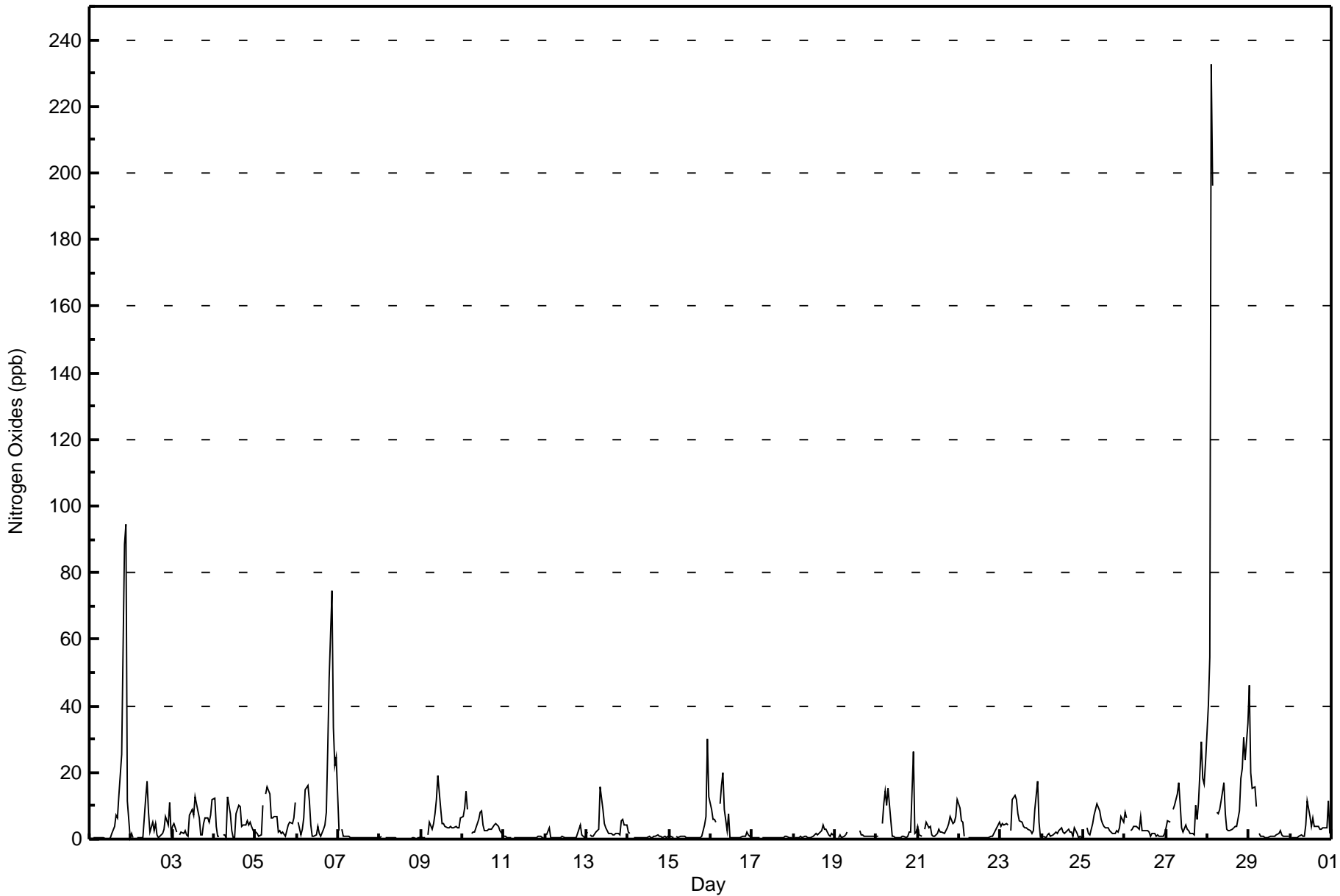
Horizon - April 2017

Maximum Value: 233 ppb on Apr 28 03:00																		Maximum Daily Average: 32.3 ppb on Apr 28																		Hours in Service: 720	
Minimum Value: 0 ppb on Apr 8 15:00																		Minimum Daily Average: 0.3 ppb on Apr 8																		Hours of Data: 684	
Maximum Diurnal Average: 12.2 ppb at hour 3																		Minimum Diurnal Average: 1.9 ppb at hour 17																		Hours of Missing Data: 36	
Monthly Average: 4.9 ppb																		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 1 Median = 2 Q ₃ = 5 P ₉₀ = 11 P ₉₉ = 53																		Hours of Calibration: 36	
																																				Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	2	4	7	6	13	26	58	88	94	11	0	13.6	94												
2-Apr	2	0	Z	0	0	0	0	0	12	17	8	2	5	3	5	1	1	1	2	3	7	4	11	2	3.8	17											
3-Apr	4	5	2	Z	1	2	2	2	1	1	7	9	7	13	11	7	1	1	5	6	6	5	7	12	5.1	13											
4-Apr	12	4	1	1	Z	1	1	0	13	8	2	0	1	8	10	10	4	4	4	5	4	5	4	2	4.6	13											
5-Apr	2	2	1	1	10	Z	14	16	13	6	6	7	2	3	2	2	1	2	4	5	5	6	11	5.6	16												
6-Apr	Z	5	1	3	6	15	16	11	4	1	1	1	4	2	1	3	4	8	27	48	74	33	22	25	13.7	74											
7-Apr	2	Z	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	3											
8-Apr	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1											
9-Apr	1	1	1	Z	1	5	3	5	8	12	19	10	5	4	4	3	4	4	4	4	4	3	4	6	4.9	19											
10-Apr	7	9	14	9	Z	2	2	2	3	6	8	8	4	3	3	3	3	3	4	5	4	4	3	1	4.8	14											
11-Apr	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0.5	1											
12-Apr	Z	1	3	0	0	0	0	1	0	0	1	1	1	0	1	1	1	1	1	2	4	1	1	1	0.9	4											
13-Apr	2	Z	1	1	1	2	2	3	16	9	5	3	2	2	2	1	1	2	2	1	6	6	4	4	3.4	16											
14-Apr	2	2	Z	0	0	0	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2											
15-Apr	1	1	0	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	4	7	30	13	2.8	30											
16-Apr	9	6	6	5	Z	10	16	20	9	2	8	0	0	0	0	0	0	1	1	1	1	2	1	0	4.4	20											
17-Apr	0	0	0	0	0	Z	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0.5	1											
18-Apr	Z	1	1	1	1	0	1	1	0	0	1	1	1	2	1	2	2	4	3	3	1	1	2	1	1.3	4											
19-Apr	1	Z	1	1	1	1	1	2	C	C	C	C	C	C	2	1	1	1	1	1	1	1	1	1	--	2											
20-Apr	1	1	Z	5	10	14	10	15	6	1	1	1	0	0	1	1	1	1	1	2	2	26	2	2	4.5	26											
21-Apr	4	1	1	Z	3	5	4	4	1	1	1	2	3	2	2	2	3	4	5	7	5	5	7	12	3.5	12											
22-Apr	9	5	5	1	Z	1	1	0	1	0	0	0	0	0	0	1	1	1	1	1	2	3	3	5	1.8	9											
23-Apr	4	5	4	5	4	Z	3	12	13	12	8	5	5	4	4	3	3	2	2	3	9	17	5	0	5.7	17											
24-Apr	Z	1	1	1	2	1	1	2	2	2	3	2	2	2	2	3	2	2	1	3	2	1	1	1	1.7	3											
25-Apr	1	Z	3	2	1	5	7	9	11	8	6	5	4	3	3	2	2	2	2	3	2	4	7	5	4.2	11											
26-Apr	8	7	Z	2	3	4	4	4	3	7	3	3	3	3	2	1	2	2	1	1	1	1	1	2	2.8	8											
27-Apr	3	6	5	Z	9	10	14	17	11	3	2	4	3	3	2	2	1	10	6	11	29	18	16	23	9.1	29											
28-Apr	40	54	233	196	Z	8	7	9	12	17	7	3	2	3	3	3	4	4	9	18	21	31	24	35	32.3	233											
29-Apr	46	20	15	15	10	Z	2	1	1	1	0	0	1	1	1	1	1	2	3	1	1	1	1	1	5.5	46											
30-Apr	Z	1	1	0	0	1	1	1	1	4	12	7	4	6	4	4	4	3	3	3	3	3	11	2	3.4	12											
																		Diurnal Average		Diurnal Maximum																	
6.5 5.5 12.2 10.1 2.7 3.6 3.9 4.7 4.9 4.2 3.8 2.7 2.3 2.4 2.4 2.2 1.9 2.6 3.8 6.6 9.7 9.4 6.2 5.6																																					
46 54 233 196 10 15 16 20 16 17 19 10 7 13 11 10 6 13 27 58 88 94 30 35																																					
Z - zerspan		C - Calibration																																			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Horizon - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	661	96.64	96.64
21 - 40	14	2.05	98.68
41 - 80	5	0.73	99.42
81 - 159	2	0.29	99.71
> 159	2	0.29	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Horizon - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	184	97	23	15	13	12	28	73	85	44	22	7	10	11	11	660
21 - 40	1	1	1	0	1	1	0	0	0	1	0	1	0	3	2	2	14
11 - 80	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Totals	26	185	98	23	16	14	12	28	74	86	44	23	10	14	16	14	683

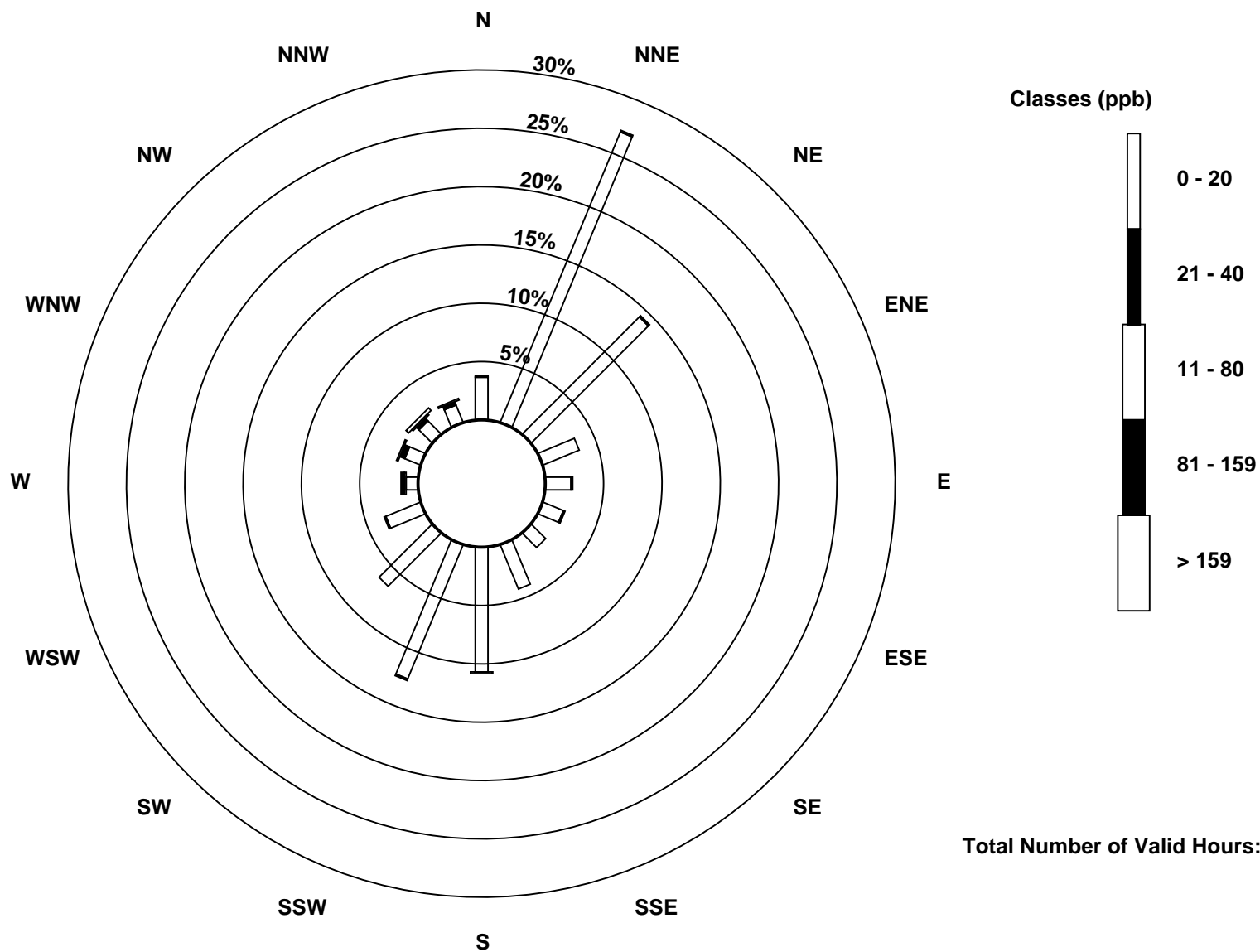
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Horizon (AMS 15)

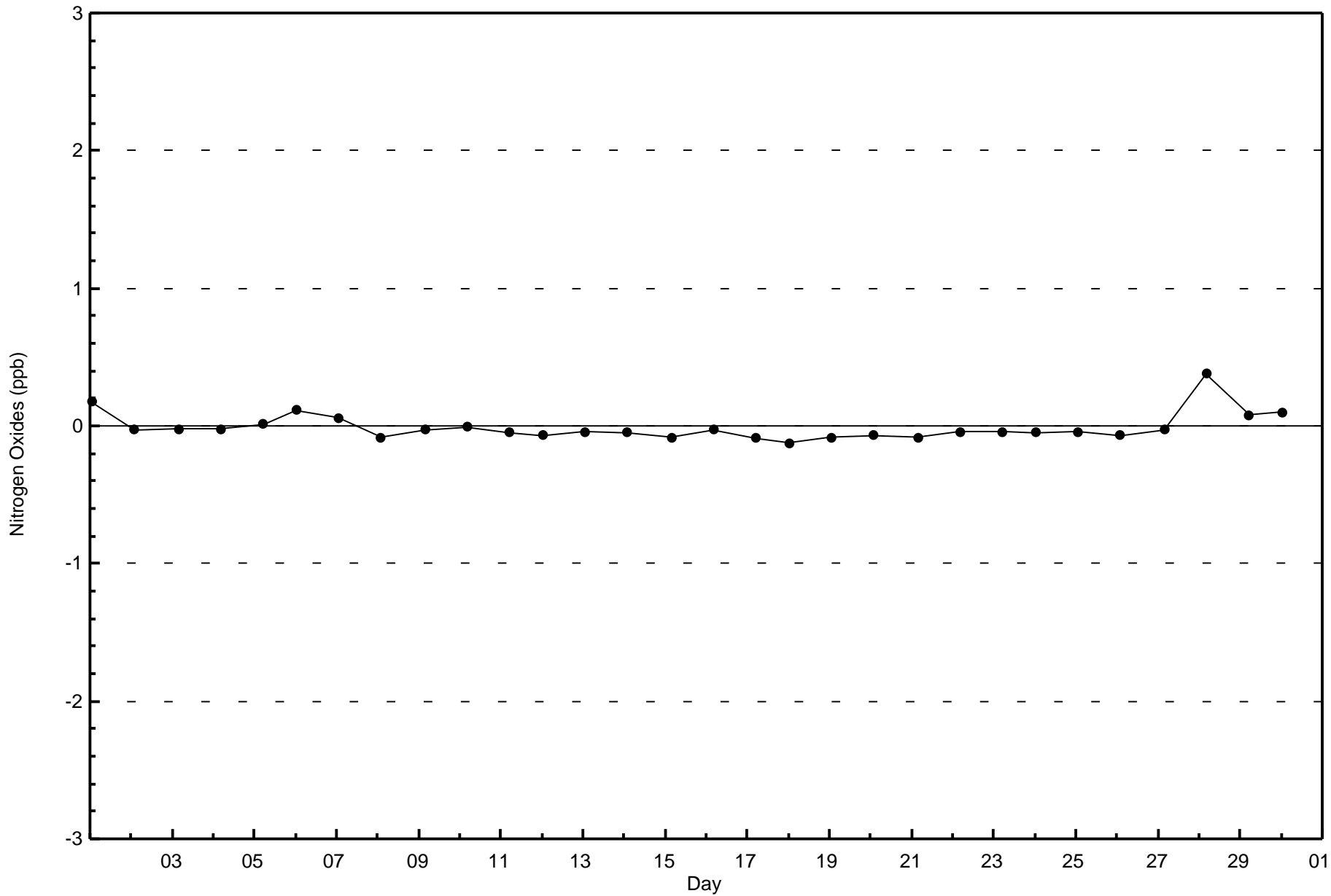


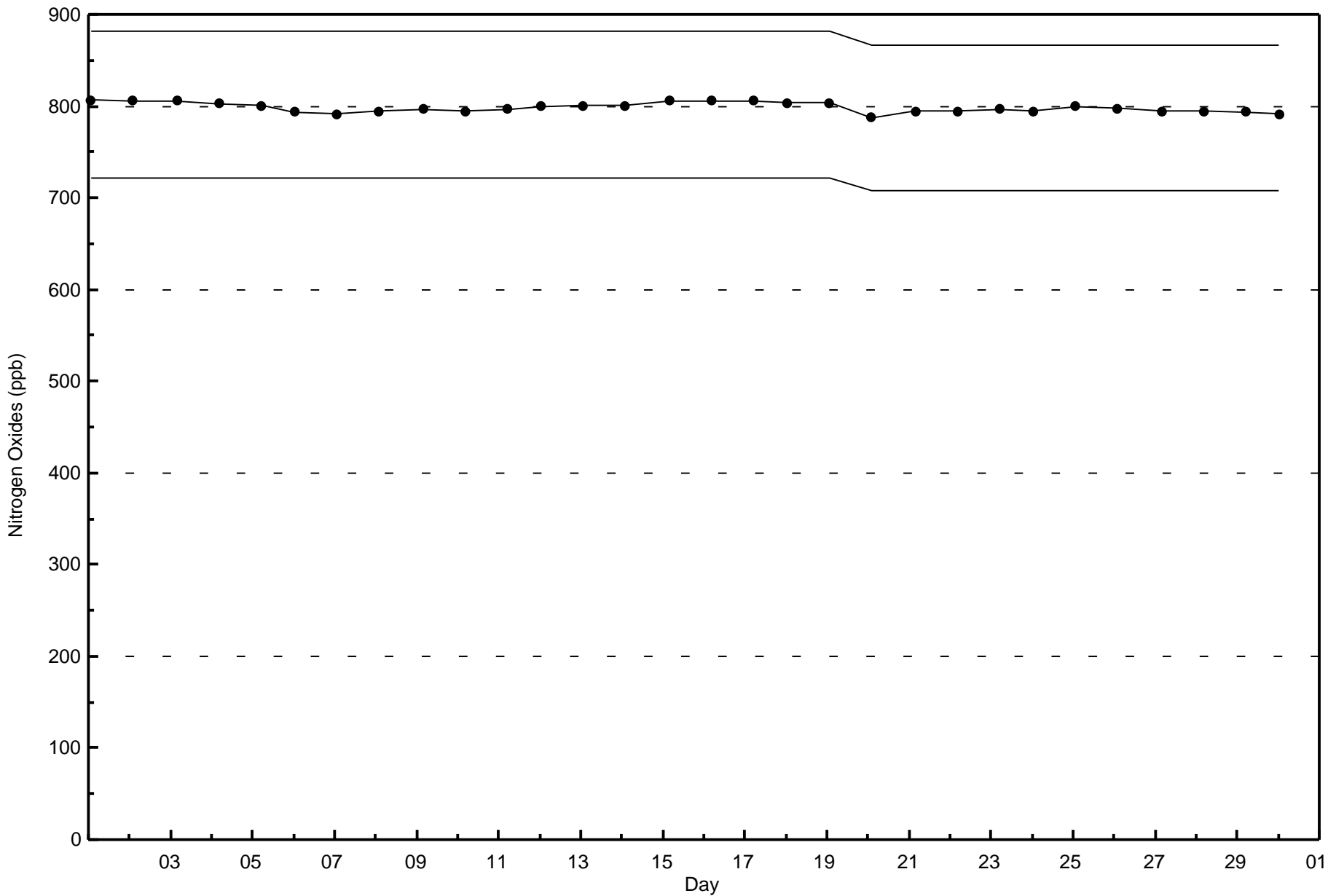
Total Number of Valid Hours: 683



Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_x) - ppb
Horizon - April 2017



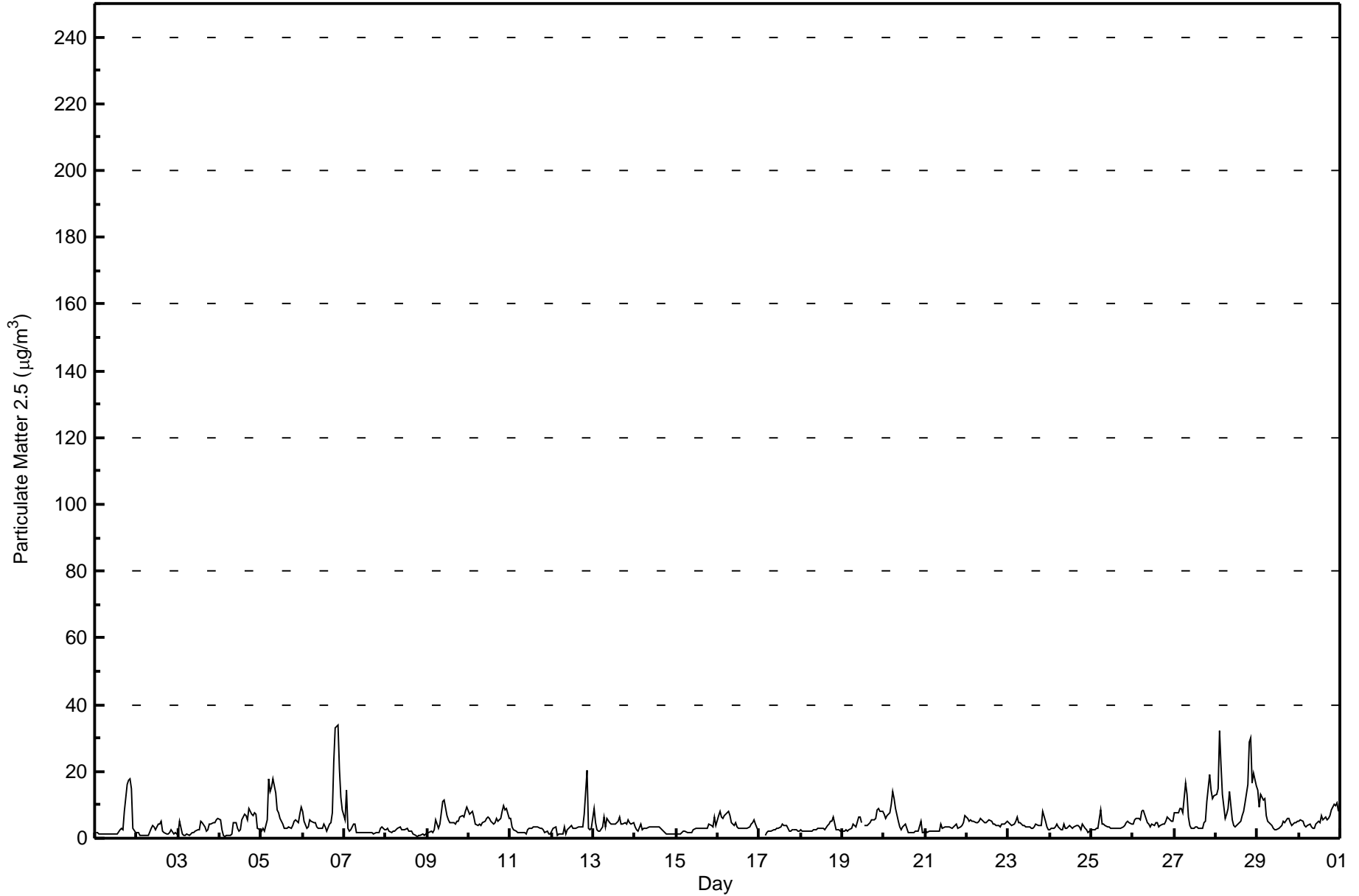




Summary of Hour Averages

Horizon - April 2017

Number of Exceedences (AAAQO): 24-hr: 0 Maximum Value: 34.0 µg/m ³ on Apr 6 21:00 Minimum Value: 0.5 µg/m ³ on Apr 8 19:00 Maximum Diurnal Average: 7.9 µg/m ³ at hour 21 Monthly Average: 4.60 µg/m ³																	Maximum Daily Average: 12.9 µg/m ³ on Apr 28 Minimum Daily Average: 2.0 µg/m ³ on Apr 8 Minimum Diurnal Average: 3.5 µg/m ³ at hour 12 Percentiles: P ₁ = 0.7 P ₁₀ = 1.6 Q ₁ = 2.4 Median = 3.5 Q ₃ = 5.2 P ₉₀ = 8.1 P ₉₉ = 21.4																	Hours in Service: 720 Hours of Data: 716 Hours of Missing Data: 4 Hours of Calibration: 1 Percent Operational Time: 99.6	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	1.5	1.5	1.4	1.4	1.3	1.2	1.3	1.2	1.2	1.1	1.1	1.1	1.2	1.4	2.4	2.9	2.7	8.1	16.2	17.5	17.9	15.0	3.2	1.5	4.4	17.9									
2-Apr	1.7	1.6	0.7	0.7	0.7	0.7	0.9	1.0	3.0	3.7	3.2	2.5	4.1	4.1	5.2	2.0	1.7	1.4	1.3	1.6	2.4	1.4	1.7	1.4	2.0	5.2									
3-Apr	1.5	5.2	1.2	1.0	0.8	1.2	0.9	1.2	1.7	1.7	2.0	2.4	2.3	5.0	4.7	3.6	1.9	2.5	4.1	4.2	4.6	4.7	5.4	6.0	2.9	6.0									
4-Apr	5.6	2.3	0.8	0.5	0.7	0.7	0.8	1.4	4.7	4.6	2.8	2.2	2.4	5.3	7.0	6.7	5.4	8.9	7.0	6.9	7.4	7.3	2.8	2.4	4.0	8.9									
5-Apr	2.2	2.8	2.3	5.7	17.6	14.0	15.2	17.6	13.5	8.5	7.5	6.0	4.2	3.0	3.0	2.8	3.4	2.9	3.8	5.1	5.7	4.7	7.1	9.4	7.0	17.6									
6-Apr	7.9	5.2	3.1	3.6	5.3	4.9	4.5	4.8	3.4	3.0	2.9	2.8	4.1	3.4	2.3	4.4	4.8	7.8	22.8	33.2	34.0	20.9	12.3	8.5	8.8	34.0									
7-Apr	5.4	14.3	3.1	2.2	2.6	4.2	4.4	1.8	1.8	1.8	1.8	1.7	1.7	1.8	1.6	1.5	1.7	1.5	1.5	1.6	1.8	3.0	3.3	2.5	2.9	14.3									
8-Apr	2.5	2.8	2.0	1.8	2.1	2.3	2.7	2.9	3.3	2.4	2.7	2.7	2.9	2.2	2.0	1.9	1.5	0.8	0.5	0.6	0.9	1.2	1.0	1.1	2.0	3.3									
9-Apr	1.6	1.7	1.9	1.9	2.6	5.6	2.8	4.1	7.7	11.1	11.5	6.8	5.4	4.6	4.8	4.5	4.1	5.1	5.1	6.5	6.7	6.5	8.0	9.3	5.4	11.5									
10-Apr	7.2	7.6	7.9	6.4	4.2	3.9	4.1	3.6	4.8	5.3	5.8	6.3	6.0	5.0	4.2	4.7	6.1	5.2	5.9	8.1	9.9	8.4	8.7	6.0	6.1	9.9									
11-Apr	5.8	3.3	2.6	2.0	1.8	1.7	1.7	1.7	1.5	1.3	2.5	3.0	3.0	3.2	3.5	3.3	3.2	3.2	3.2	2.8	1.8	2.0	1.1	1.1	2.5	5.8									
12-Apr	1.9	3.1	3.5	1.0	1.3	1.3	1.1	3.5	1.3	2.5	3.1	3.8	3.2	3.1	3.2	3.3	3.3	3.2	3.3	7.0	20.3	3.0	2.5	3.0	3.6	20.3									
13-Apr	8.9	4.8	2.4	2.1	2.2	3.6	6.5	3.5	5.8	4.8	4.4	4.3	4.2	4.4	4.9	6.5	4.2	4.2	4.7	4.1	5.6	4.6	4.1	4.8	4.6	8.9									
14-Apr	3.3	2.7	2.1	4.1	2.6	2.9	2.8	3.1	3.3	3.5	3.2	3.5	3.3	3.3	3.4	3.0	2.7	1.7	1.4	1.4	1.3	1.3	1.3	1.2	2.6	4.1									
15-Apr	1.2	1.2	1.5	1.6	1.9	2.3	1.7	1.6	1.6	1.7	2.4	2.9	3.0	3.1	3.1	3.2	3.1	2.8	2.8	4.3	3.9	3.3	6.2	4.0	2.7	6.2									
16-Apr	6.7	7.9	6.4	5.8	6.7	7.6	8.1	6.6	4.8	4.0	4.6	3.2	3.1	2.9	2.8	2.8	2.9	3.1	3.6	4.1	4.6	5.3	4.2	2.1	4.7	8.1									
17-Apr	UO	UO	UO	0.8	1.6	2.1	2.1	2.3	2.7	2.7	2.9	2.9	3.5	4.3	3.9	3.6	3.6	2.2	2.2	2.4	2.5	2.3	2.1	2.0	2.6	4.3									
18-Apr	2.4	2.2	1.9	2.0	2.1	2.1	2.3	2.5	2.7	2.7	2.8	3.0	3.0	3.1	2.6	4.0	4.2	5.3	5.1	6.3	2.7	2.4	2.5	2.2	3.0	6.3									
19-Apr	2.2	2.2	2.4	2.3	2.3	2.8	4.3	3.7	3.2	6.4	6.4	4.5	C	3.7	4.0	4.2	4.8	5.4	5.6	6.1	8.4	8.9	8.2	8.1	4.8	8.9									
20-Apr	7.4	6.0	6.8	7.5	10.3	14.0	11.7	9.1	5.0	3.2	2.7	3.4	4.1	3.0	1.8	1.7	1.8	1.8	1.9	2.2	2.3	5.1	1.9	1.9	4.9	14.0									
21-Apr	2.3	1.8	2.0	2.0	1.9	2.1	2.0	2.2	2.3	4.3	3.1	3.5	3.4	3.4	3.3	3.1	3.3	3.7	4.2	3.2	3.3	3.8	4.7	6.9	3.2	6.9									
22-Apr	6.0	5.1	5.6	5.1	5.2	4.7	4.6	4.9	5.9	5.1	4.8	4.5	5.3	5.6	4.9	4.2	4.1	3.9	3.8	3.4	4.1	4.3	4.2	5.1	4.8	6.0									
23-Apr	4.8	4.3	3.8	4.1	5.3	6.4	4.5	4.8	3.9	3.3	3.2	3.4	3.0	3.0	3.4	4.0	3.7	3.8	3.9	8.2	5.2	3.2	2.7	4.2	8.2										
24-Apr	2.7	2.9	3.1	3.6	4.2	3.5	2.7	2.7	4.2	2.9	3.0	3.7	3.3	3.0	3.3	3.6	3.7	3.3	2.6	4.3	2.8	2.4	1.8	2.0	3.1	4.3									
25-Apr	2.6	2.7	2.5	2.9	2.9	8.4	4.1	4.2	3.9	3.5	3.3	3.1	3.1	3.0	3.0	3.1	3.0	3.1	3.5	4.0	4.8	5.2	4.5	4.4	3.7	8.4									
26-Apr	4.4	5.4	5.8	5.8	5.7	8.0	8.4	7.2	4.7	4.3	3.5	4.1	3.8	4.5	4.5	3.2	3.8	4.3	4.1	5.2	6.3	5.5	5.2	5.1	5.1	8.4									
27-Apr	7.8	7.7	7.5	8.7	9.1	7.5	16.4	13.2	6.2	4.0	3.0	3.1	3.6	3.5	3.2	3.1	2.8	4.8	5.2	10.9	19.1	14.5	11.7	12.6	7.9	19.1									
28-Apr	13.2	14.7	32.2	22.0	13.2	5.9	7.2	8.9	14.2	5.4	3.9	3.2	3.8	4.3	4.9	6.6	8.0	10.5	16.0	28.8	30.1	16.3	19.7	15.5	12.9	32.2									
29-Apr	14.2	9.3	13.1	11.3	11.7	6.7	5.3	4.6	3.7	3.1	2.7	2.5	3.1	3.4	3.9	5.2	4.5	6.0	5.9	4.5	3.9	4.5	4.6	5.0	5.9	14.2									
30-Apr	5.1	5.4	5.1	3.9	3.3	3.7	4.2	3.3	3.1	2.8	4.1	5.0	4.7	6.8	5.6	6.3	5.6	6.0	6.6	8.5	10.0	9.5	10.8	7.9	5.7	10.8									
																								Diurnal Average											
																								Diurnal Maximum											
4.8 4.8 4.7 4.1 4.4 4.5 4.6 4.4 4.3 3.8 3.7 3.5 3.5 3.7 3.7 3.7 3.7 4.2 5.3 6.8 7.9 6.1 5.3 4.9 14.2 14.7 32.2 22.0 17.6 14.0 16.4 17.6 14.2 11.1 11.5 6.8 6.0 6.8 7.0 6.7 8.0 10.5 22.8 33.2 34.0 20.9 19.7 15.5																																			
C - Calibration UO - Unstable Operation Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³																																			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Horizon - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	537	75.00	75.00
6 - 15	140	19.55	94.55
16 - 25	15	2.09	96.65
26 - 80	5	0.70	97.35
> 81.0	0	0.00	97.35

Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Horizon - April 2017

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	22	175	91	19	10	8	9	18	55	58	27	16	4	10	8	7	537
6 - 15	6	11	6	4	4	4	3	10	22	25	18	7	4	1	6	7	138
16 - 25	0	3	1	0	2	0	0	0	0	1	1	0	2	3	1	1	15
26 - 80	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	5
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	189	98	23	16	14	12	28	77	84	46	23	10	14	17	16	695

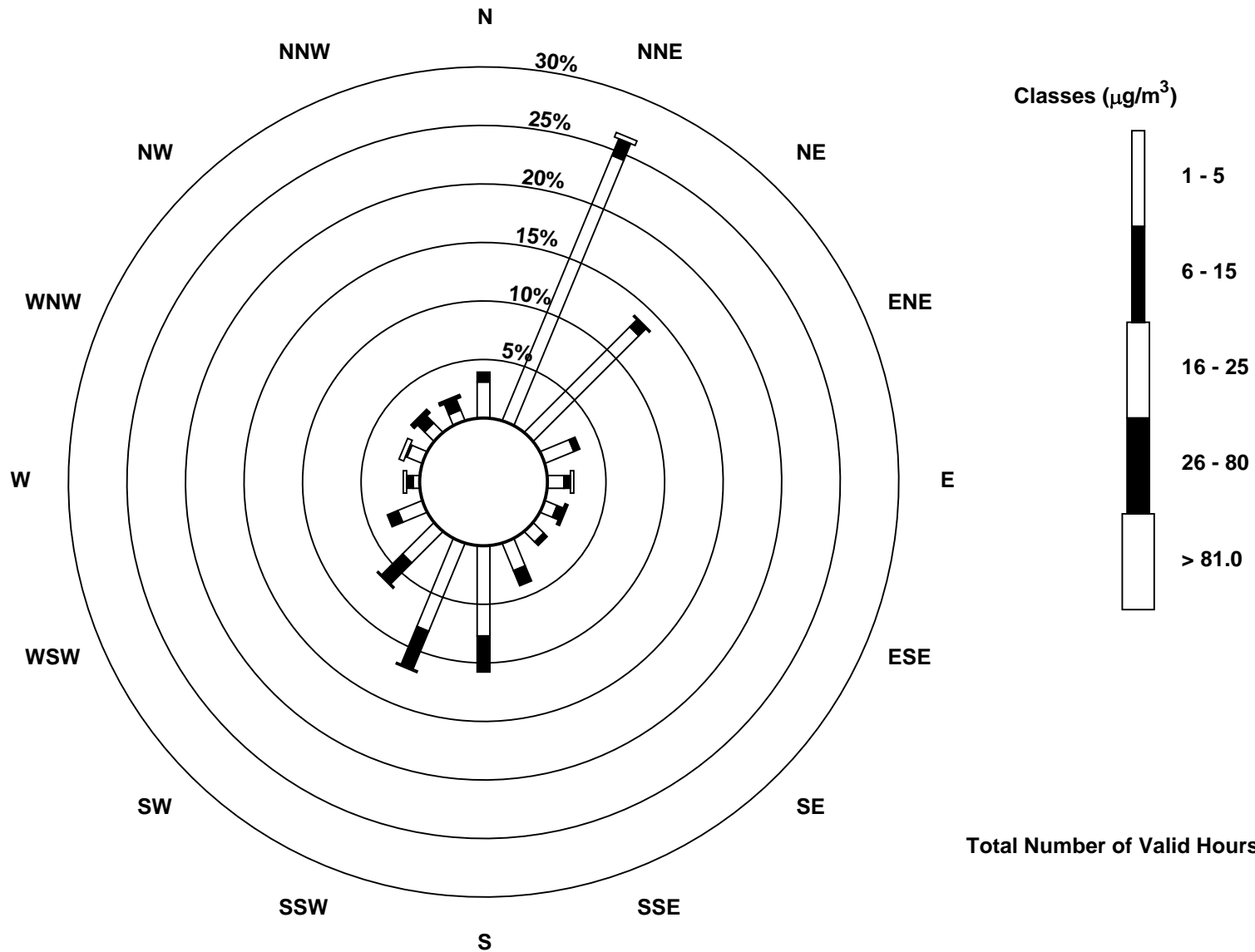
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Horizon (AMS 15)





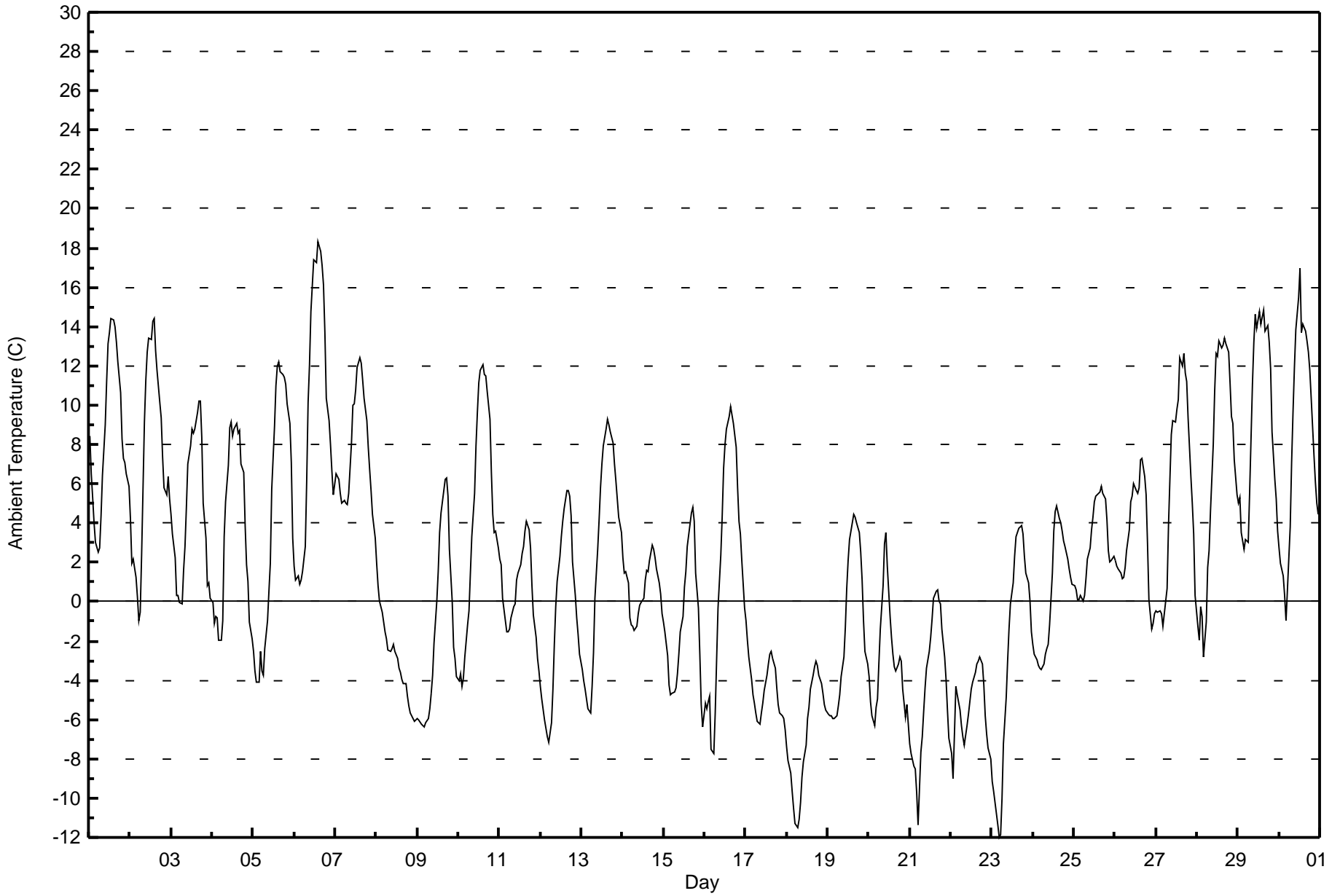
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Horizon - April 2017

Maximum Value: 18.3 C on Apr 6 15:00		Maximum Daily Average: 9.5 C on Apr 6		Hours in Service: 720																							
Minimum Value: -12.0 C on Apr 23 05:00		Minimum Daily Average: -6.9 C on Apr 18		Hours of Data: 720																							
Maximum Diurnal Average: 6.7 C at hour 16		Minimum Diurnal Average: -3.0 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 1.93 C		Percentiles: P ₁ = -10.6 P ₁₀ = -5.8 Q ₁ = -3.0 Median = 1.5 Q ₃ = 5.9 P ₉₀ = 11.1 P ₉₉ = 16.9		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	8.4	6.5	5.3	4.0	3.0	2.5	2.8	4.4	6.5	9.0	11.2	13.1	13.7	14.4	14.3	14.0	13.2	12.2	10.6	8.3	7.3	7.1	6.5	5.9	8.5	14.4	
2-Apr	4.3	2.0	2.2	1.3	0.2	-1.0	-0.5	2.4	9.1	11.3	12.7	13.4	13.4	14.3	14.4	12.8	11.8	10.1	9.4	7.4	5.8	5.4	6.3	5.2	7.2	14.4	
3-Apr	4.5	3.5	2.3	0.3	0.3	-0.1	-0.1	1.6	2.8	4.8	7.0	7.9	8.8	8.6	8.8	9.6	10.2	10.2	8.3	5.0	3.2	0.8	0.9	0.2	4.6	10.2	
4-Apr	-0.1	-1.1	-0.7	-0.8	-2.0	-2.0	-1.0	3.3	5.1	7.0	8.9	9.1	8.4	8.8	9.1	8.6	8.7	7.0	6.6	3.9	1.9	1.0	-1.0	-1.9	3.6	9.1	
5-Apr	-2.6	-3.5	-4.1	-4.1	-2.6	-3.5	-3.7	-2.4	-1.0	0.6	2.0	5.7	8.9	11.0	12.0	12.2	11.7	11.6	11.4	11.0	10.1	9.1	7.1	3.2	4.2	12.2	
6-Apr	1.8	1.1	1.3	0.9	1.1	1.5	2.8	6.2	10.1	12.0	14.8	17.4	17.4	17.2	18.3	17.8	17.1	16.1	13.7	10.3	9.2	8.0	6.7	5.5	9.5	18.3	
7-Apr	6.5	6.4	6.3	5.5	5.0	5.2	5.0	4.9	5.5	8.1	10.0	10.1	10.8	11.9	12.4	12.2	11.3	10.3	9.2	7.9	6.7	5.7	4.4	3.2	7.7	12.4	
8-Apr	2.0	0.8	0.0	-0.5	-1.0	-1.5	-1.9	-2.5	-2.6	-2.4	-2.1	-2.5	-2.9	-3.4	-3.6	-4.0	-4.2	-4.2	-4.8	-5.3	-5.7	-6.0	-6.1	-6.1	-2.9	2.0	
9-Apr	-6.0	-6.0	-6.2	-6.3	-6.3	-6.1	-5.9	-5.4	-4.7	-3.8	-2.1	0.1	1.5	3.5	4.5	5.6	6.3	6.3	5.4	2.6	0.0	-2.3	-2.9	-3.8	-1.3	6.3	
10-Apr	-4.0	-3.6	-4.3	-3.9	-2.8	-1.2	-0.5	1.5	3.3	5.5	7.9	9.6	11.1	11.8	12.0	11.6	11.5	10.7	9.3	6.6	4.4	3.5	3.6	2.7	4.4	12.0	
11-Apr	2.2	1.9	0.2	-1.0	-1.5	-1.5	-1.4	-0.9	-0.3	-0.1	1.1	1.5	1.9	2.4	2.8	3.6	4.1	3.7	2.7	0.8	-0.7	-1.8	-2.9	-3.5	0.6	4.1	
12-Apr	-4.3	-5.0	-6.0	-6.4	-6.8	-7.2	-6.2	-4.4	-2.2	-0.3	1.0	2.3	3.3	4.1	4.8	5.6	5.7	5.4	4.3	2.0	0.3	-0.8	-1.7	-2.6	-0.6	5.7	
13-Apr	-3.4	-4.0	-4.5	-5.0	-5.5	-5.7	-4.3	-2.6	0.2	2.6	4.2	5.8	7.0	8.0	8.8	9.3	9.0	8.6	8.1	7.0	6.2	5.2	4.3	3.5	2.6	9.3	
14-Apr	2.3	1.5	1.5	0.9	-0.8	-1.2	-1.3	-1.5	-1.3	-0.6	-0.2	-0.1	0.2	1.1	1.6	1.6	2.1	2.9	2.6	2.2	1.6	0.9	0.4	-0.6	0.7	2.9	
15-Apr	-1.0	-1.6	-2.8	-4.2	-4.7	-4.6	-4.6	-4.4	-3.7	-2.7	-1.6	-0.7	0.7	1.5	2.8	4.0	4.5	4.8	4.1	1.5	-0.3	-2.7	-5.2	-6.4	-1.1	4.8	
16-Apr	-5.2	-5.5	-5.1	-4.8	-7.5	-7.7	-5.7	-3.0	-0.3	2.4	4.4	6.8	8.0	8.8	9.4	9.9	9.5	9.1	7.9	5.8	4.1	3.4	2.1	-0.4	1.9	9.9	
17-Apr	-1.0	-2.0	-2.8	-4.0	-4.8	-5.2	-5.6	-6.1	-6.2	-5.7	-5.2	-4.5	-3.8	-3.2	-2.7	-2.6	-2.9	-3.4	-4.4	-5.2	-5.7	-5.8	-5.9	-6.5	-4.4	-1.0	
18-Apr	-7.3	-8.1	-8.7	-9.6	-10.5	-11.3	-11.5	-11.1	-10.2	-9.0	-8.2	-7.3	-6.0	-5.3	-4.4	-3.8	-3.3	-3.0	-3.2	-3.8	-4.2	-4.7	-5.2	-5.5	-6.9	-3.0	
19-Apr	-5.7	-5.8	-5.8	-5.9	-6.0	-5.8	-5.3	-4.7	-3.8	-2.8	-1.3	0.7	2.1	3.2	4.0	4.4	4.3	4.0	3.5	2.5	1.1	-1.0	-2.5	-3.2	-1.2	4.4	
20-Apr	-3.8	-5.1	-5.8	-6.3	-5.4	-5.0	-3.1	-1.4	0.8	2.9	3.5	1.8	-0.8	-1.9	-2.6	-3.3	-3.5	-3.2	-2.8	-3.0	-4.4	-5.9	-5.3	-6.2	-2.9	3.5	
21-Apr	-7.3	-7.8	-8.4	-8.5	-9.7	-11.3	-7.6	-6.9	-5.6	-4.4	-3.4	-2.5	-1.8	-0.9	0.2	0.5	0.6	0.1	-0.1	-1.4	-2.8	-4.0	-5.5	-6.9	-4.4	0.6	
22-Apr	-7.7	-9.0	-6.7	-4.3	-4.7	-5.5	-6.3	-6.8	-7.3	-6.3	-5.7	-5.1	-4.5	-4.1	-3.6	-3.2	-3.0	-2.8	-3.2	-4.2	-5.8	-6.7	-7.5	-8.0	-5.5	-2.8	
23-Apr	-9.1	-9.6	-10.2	-11.3	-12.0	-11.8	-10.0	-7.2	-4.9	-3.0	-1.4	-0.1	1.0	2.3	3.3	3.5	3.7	3.9	3.5	2.3	1.5	1.0	0.0	-1.5	-2.8	3.9	
24-Apr	-2.2	-2.7	-3.0	-3.3	-3.4	-3.4	-3.1	-2.7	-2.4	-2.2	-1.2	1.5	3.6	4.6	4.9	4.2	4.0	3.6	3.1	2.8	2.1	1.7	1.2	0.9	0.4	4.9	
25-Apr	0.8	0.6	0.1	0.1	0.3	0.0	0.3	1.2	2.2	2.7	3.6	4.3	5.1	5.4	5.5	5.6	5.9	5.5	5.2	4.2	2.6	2.0	2.1	2.3	2.8	5.9	
26-Apr	2.1	1.8	1.6	1.5	1.2	1.2	1.7	2.6	3.6	5.1	5.4	6.0	5.7	5.5	5.8	7.2	7.3	6.4	5.5	3.0	0.1	-1.4	-1.1	-0.6	3.2	7.3	
27-Apr	-0.5	-0.5	-0.5	-0.6	-1.2	-0.6	0.6	3.8	6.2	8.5	9.2	9.1	9.8	10.3	12.4	12.0	12.6	11.6	11.2	9.4	6.4	5.0	3.4	0.3	5.8	12.6	
28-Apr	-1.3	-2.0	-0.2	-0.8	-2.8	-1.0	1.7	2.6	4.6	8.0	10.7	12.6	12.5	13.3	12.9	13.1	13.4	13.1	12.7	11.1	9.4	9.0	7.2	5.5	6.9	13.4	
29-Apr	5.0	5.3	3.6	2.6	3.2	3.1	3.0	5.6	11.1	13.2	14.6	13.9	14.8	14.1	14.5	14.8	13.8	14.1	13.2	11.8	8.6	6.2	5.2	3.6	9.1	14.8	
30-Apr	2.8	2.0	1.3	0.3	-0.9	0.6	3.8	7.1	9.6	11.9	13.8	15.5	17.0	13.7	14.1	13.7	13.2	12.7	11.7	10.3	7.5	6.1	5.0	4.4	8.2	17.0	
		-1.0	-1.7	-2.0	-2.5	-3.0	-3.0	-2.3	-0.9	0.8	2.4	3.8	4.8	5.6	6.0	6.6	6.7	6.6	6.2	5.5	3.9	2.4	1.3	0.5	-0.6	Diurnal Average	
		8.4	6.5	6.3	5.5	5.0	5.2	5.0	7.1	11.1	13.2	14.8	17.4	17.4	17.2	18.3	17.8	17.1	16.1	13.7	11.8	10.1	9.1	7.2	5.9	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Horizon - April 2017

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	298	41.39	41.39
0 - 10	330	45.83	87.22
10 - 20	92	12.78	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

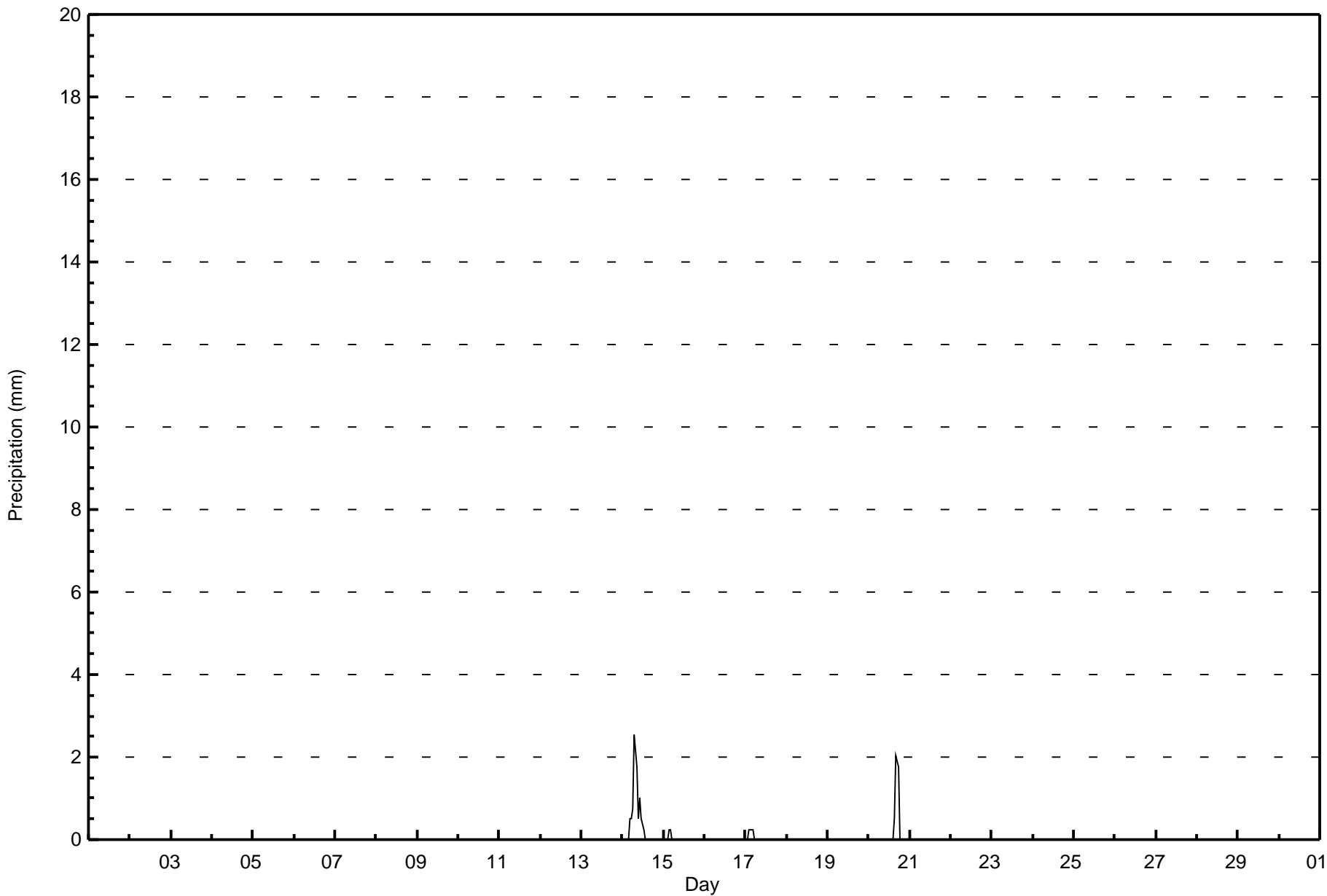
Horizon - April 2017

Maximum Value: 2.5 mm on Apr 14 08:00 Maximum Daily Total: 8.4 mm on Apr 14																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																
Minimum Value: 0.0 mm on Apr 1 01:00 Minimum Daily Total: 0.0 mm on Apr 1 Maximum Diurnal Total: 2.5 mm at hour 8 Minimum Diurnal Total: 0.0 mm at hour 1 Monthly Total: 13.97 mm Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.3																																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
2-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
3-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
4-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
6-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
7-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
9-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
10-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14-Apr	0.0	0.0	0.0	0.0	0.5	0.5	0.8	2.5	1.8	0.5	1.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15-Apr	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17-Apr	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
																								Diurnal Average											
																								Diurnal Maximum											



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Horizon - April 2017





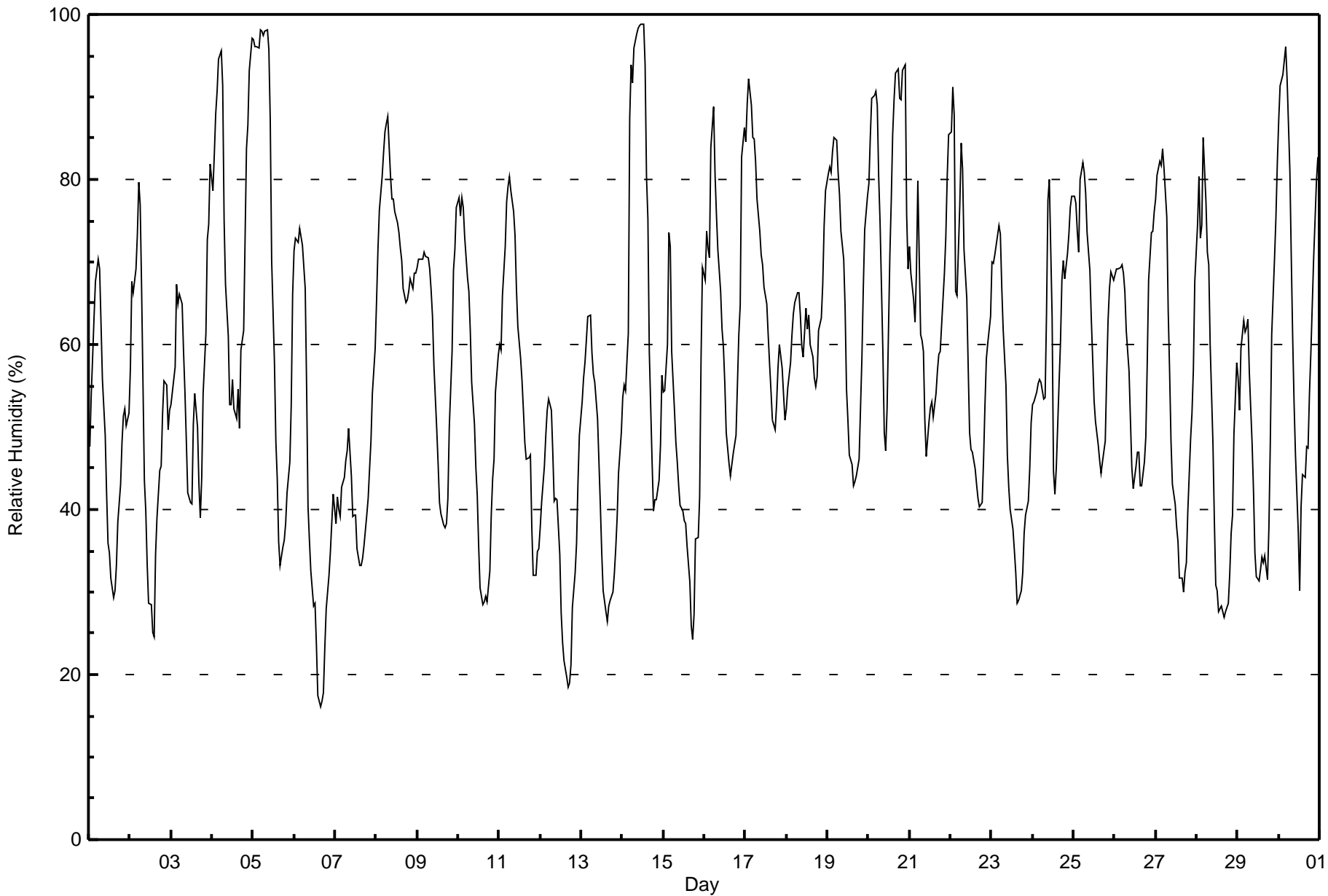
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Horizon - April 2017

Maximum Value: 99 % on Apr 14 13:00																	Maximum Daily Average: 79.5 % on Apr 20																	Hours in Service: 720																
Minimum Value: 16 % on Apr 6 16:00																	Minimum Daily Average: 36.5 % on Apr 12																	Hours of Data: 720																
Maximum Diurnal Average: 75.4 % at hour 6																	Minimum Diurnal Average: 42.1 % at hour 17																	Hours of Missing Data: 0																
Monthly Average: 57.9 %																	Percentiles: P ₁ = 21 P ₁₀ = 33 Q ₁ = 44 Median = 57 Q ₃ = 72 P ₉₀ = 83 P ₉₉ = 98																	Hours of Calibration: 0																
																																		Percent Operational Time: 100.0																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	48	54	58	63	68	70	69	63	56	49	42	36	35	32	29	30	33	38	43	48	51	52	50	52	48.7	70																								
2-Apr	57	68	66	69	73	80	77	67	44	40	33	29	28	25	25	35	39	45	45	52	56	55	50	52	50.3	80																								
3-Apr	53	54	57	67	65	66	65	59	54	48	42	41	41	50	54	50	43	39	44	54	61	73	75	82	55.7	82																								
4-Apr	79	83	88	91	95	96	91	75	67	61	53	53	56	52	51	55	50	59	62	73	84	87	93	97	72.9	97																								
5-Apr	97	96	96	96	98	98	97	98	98	96	87	70	58	48	44	36	33	35	36	38	42	46	53	66	69.3	98																								
6-Apr	71	73	72	74	73	72	67	55	40	36	32	28	29	23	17	16	17	18	23	28	32	35	38	42	42.2	74																								
7-Apr	38	41	40	39	43	44	46	47	50	44	39	39	39	35	33	33	34	36	39	41	45	48	54	59	42.1	59																								
8-Apr	65	71	76	80	83	86	87	88	80	78	78	76	75	73	72	70	67	65	65	66	68	67	69	69	73.9	88																								
9-Apr	69	70	70	70	71	71	71	69	67	63	58	50	46	41	40	38	38	38	41	50	59	69	72	77	58.6	77																								
10-Apr	78	76	78	77	73	68	66	62	55	50	45	42	36	31	28	29	29	29	33	39	44	46	54	59	51.1	78																								
11-Apr	60	59	66	72	77	79	80	79	76	73	67	62	58	56	52	48	46	46	47	38	32	32	35	35	57.3	80																								
12-Apr	38	41	45	49	52	53	52	47	41	41	41	35	27	24	22	20	18	19	21	28	32	36	43	49	36.5	53																								
13-Apr	53	56	58	61	63	64	59	56	55	51	46	40	35	30	28	26	28	29	30	32	35	39	44	49	44.5	64																								
14-Apr	54	55	54	61	87	94	92	96	98	98	99	99	99	94	80	75	59	46	40	41	41	44	48	56	71.3	99																								
15-Apr	54	54	60	74	72	59	52	48	46	43	41	40	39	38	36	31	26	24	27	37	37	42	58	69	46.1	74																								
16-Apr	68	74	72	70	84	89	81	76	72	66	62	60	55	49	46	44	45	47	49	55	61	65	83	86	64.9	89																								
17-Apr	85	89	92	89	85	85	82	78	74	71	70	67	65	61	58	54	51	50	53	57	60	57	54	51	68.2	92																								
18-Apr	52	55	58	61	64	65	66	66	63	60	59	64	62	64	60	59	56	55	56	62	63	67	74	79	62.1	79																								
19-Apr	81	82	81	83	85	85	81	78	74	70	64	55	51	47	45	43	43	44	46	52	58	67	74	78	65.3	85																								
20-Apr	79	85	90	90	91	89	80	75	59	49	47	52	71	77	85	90	93	93	90	90	93	94	76	69	79.5	94																								
21-Apr	72	69	65	63	69	80	61	60	59	51	46	51	52	53	51	54	57	59	59	62	69	73	80	85	62.6	85																								
22-Apr	86	91	88	66	66	77	84	81	72	66	57	49	47	47	45	43	41	40	41	46	53	58	60	63	61.2	91																								
23-Apr	70	70	71	73	74	73	67	62	55	47	43	40	38	35	32	29	29	30	32	37	39	41	45	51	49.3	74																								
24-Apr	53	53	54	55	56	55	53	54	64	77	80	63	45	42	45	55	60	68	70	68	71	73	77	78	61.3	80																								
25-Apr	78	77	74	71	80	82	81	78	74	69	63	58	53	51	48	46	44	46	48	56	63	67	69	68	64.3	82																								
26-Apr	69	69	69	69	70	69	67	62	57	51	45	43	45	47	47	43	43	46	49	58	68	73	74	76	58.6	76																								
27-Apr	78	81	82	82	84	81	75	64	57	48	43	41	38	36	32	32	30	32	34	40	48	52	57	68	54.7	84																								
28-Apr	75	80	73	74	85	77	71	70	60	48	39	31	30	28	28	28	27	28	29	32	37	39	49	58	49.8	85																								
29-Apr	56	52	59	63	61	62	63	57	48	42	35	32	31	33	34	34	34	31	38	48	61	70	75	82	50.1	82																								
30-Apr	87	91	93	94	96	92	81	71	61	53	47	37	30	40	44	44	48	47	54	59	71	75	80	83	65.7	96																								
																								66.7	69.0	70.2	71.6	74.8	75.4	72.2	68.0	62.5	58.0	53.4	49.4	47.1	45.4	43.7	43.0	42.1	42.8	44.8	49.6	54.5	58.1	62.1	66.2	Diurnal Average		
																								97	96	96	96	98	98	97	98	98	98	99	99	99	99	94	85	90	93	93	90	90	93	94	93	97	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Horizon - April 2017

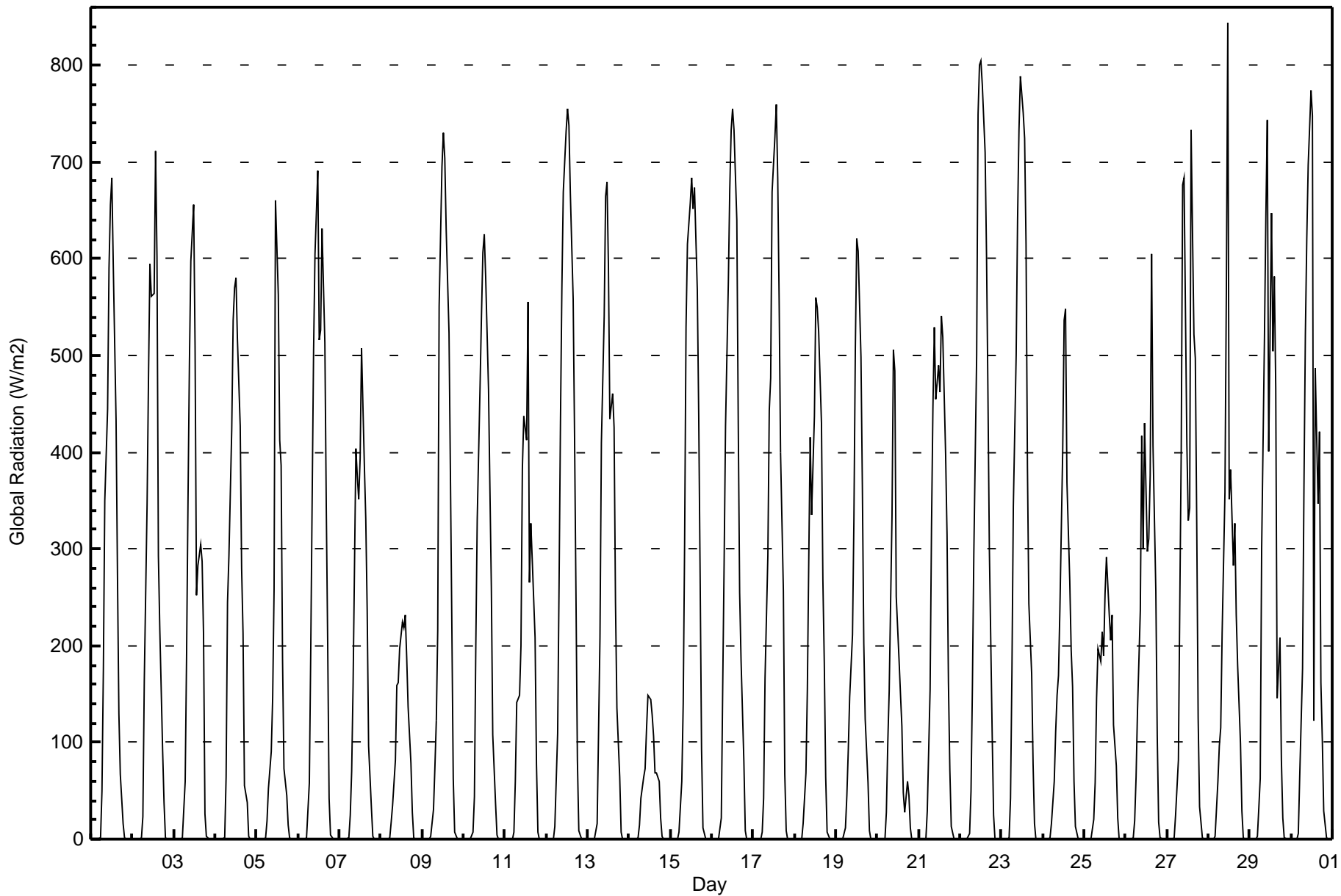
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	7	0.97	0.97
20 - 40	130	18.06	19.03
40 - 60	265	36.81	55.83
60 - 80	220	30.56	86.39
80 - 100	98	13.61	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 844 W/m2 on Apr 28 12:00		Maximum Daily Average: 264.7 W/m2 on Apr 22		Hours in Service: 720																						
Minimum Value: 0 W/m2 on Apr 1 01:00		Minimum Daily Average: 44.1 W/m2 on Apr 14		Hours of Data: 720																						
Maximum Diurnal Average: 547.4 W/m2 at hour 12		Minimum Diurnal Average: 0.0 W/m2 at hour 4		Hours of Missing Data: 0																						
Monthly Average: 183.2 W/m2		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 59 Q ₃ = 343 P ₉₀ = 567 P ₉₉ = 749		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	0	0	0	1	49	174	349	445	590	656	683	595	433	272	130	68	15	1	0	0	0	0	185.9	683
2-Apr	0	0	0	0	0	1	23	163	347	478	595	561	564	711	601	293	217	91	37	2	0	0	0	0	195.2	711
3-Apr	0	0	0	0	0	2	60	192	352	493	598	656	509	252	283	305	287	212	26	2	0	0	0	0	176.2	656
4-Apr	0	0	0	0	0	2	64	245	293	424	536	570	579	518	428	281	213	55	38	3	0	0	0	0	177.0	579
5-Apr	0	0	0	0	0	2	20	53	91	145	258	660	562	413	386	187	73	45	15	2	0	0	0	0	121.3	660
6-Apr	0	0	0	0	0	2	58	195	353	505	604	690	516	527	631	513	344	202	43	5	0	0	0	0	216.1	690
7-Apr	0	0	0	0	0	1	25	70	158	404	375	351	394	507	386	331	235	96	32	3	0	0	0	0	140.5	507
8-Apr	0	0	0	0	0	2	17	35	82	159	161	197	224	219	232	188	137	79	28	2	0	0	0	0	73.5	232
9-Apr	0	0	0	0	0	4	31	75	123	216	551	695	730	705	629	523	376	223	63	7	0	0	0	0	206.3	730
10-Apr	0	0	0	0	0	7	43	201	331	468	541	606	625	580	465	362	261	108	37	4	0	0	0	0	193.3	625
11-Apr	0	0	0	0	0	7	60	142	148	200	383	437	412	556	265	326	289	209	77	7	0	0	0	0	146.5	556
12-Apr	0	0	0	0	0	13	109	262	431	570	669	732	756	738	668	558	415	251	81	8	0	0	0	0	260.9	756
13-Apr	0	0	0	0	0	17	111	208	410	540	664	679	592	435	461	426	244	136	65	7	0	0	0	0	208.2	679
14-Apr	0	0	0	0	0	1	15	43	65	73	114	149	145	128	106	68	68	60	22	3	0	0	0	0	44.1	149
15-Apr	0	0	0	0	0	8	60	140	306	529	615	657	683	651	674	567	437	271	93	12	0	0	0	0	237.5	683
16-Apr	0	0	0	0	0	22	158	286	428	576	672	733	755	733	639	432	254	185	81	9	0	0	0	0	248.5	755
17-Apr	0	0	0	0	0	7	42	166	293	443	476	669	726	759	684	557	399	256	67	9	0	0	0	0	231.4	759
18-Apr	0	0	0	0	0	17	69	154	288	415	335	438	559	549	525	430	269	183	64	8	0	0	0	0	179.3	559
19-Apr	0	0	0	0	0	11	45	92	147	211	331	506	620	609	498	364	203	123	58	9	0	0	0	0	159.5	620
20-Apr	0	0	0	0	0	28	99	153	334	506	483	251	185	150	116	49	28	59	46	12	0	0	0	0	104.1	506
21-Apr	0	0	0	0	1	29	154	322	446	528	454	489	462	540	519	397	315	162	72	13	0	0	0	0	204.4	540
22-Apr	0	0	0	0	0	5	50	159	295	500	749	800	804	780	710	604	460	300	109	24	1	0	0	0	264.7	804
23-Apr	0	0	0	0	1	42	172	344	500	640	733	789	750	725	615	385	244	171	77	16	0	0	0	0	258.5	789
24-Apr	0	0	0	0	1	17	59	110	149	169	237	403	536	547	369	266	195	157	60	13	1	0	0	0	137.1	547
25-Apr	0	0	0	0	1	20	58	146	197	183	215	189	254	292	232	206	232	119	75	22	1	0	0	0	101.6	292
26-Apr	0	0	0	0	1	18	64	133	236	417	301	431	298	310	376	604	407	256	106	18	1	0	0	0	165.8	604
27-Apr	0	0	0	0	2	25	82	245	403	677	684	408	329	343	733	522	497	325	125	33	1	0	0	0	226.5	733
28-Apr	0	0	0	0	3	60	96	116	213	359	570	844	351	382	282	327	231	179	99	29	1	0	0	0	172.5	844
29-Apr	0	0	0	0	2	32	63	299	519	645	743	401	647	504	582	466	146	209	81	21	2	0	0	0	223.5	743
30-Apr	0	0	0	0	6	65	176	365	522	621	696	775	748	123	487	347	421	162	103	29	1	0	0	0	235.3	775
		0.0	0.0	0.0	0.0	0.6	15.6	71.0	176.2	293.6	418.0	497.9	547.4	533.3	496.0	467.3	371.8	267.6	165.0	63.1	11.1	0.3	0.0	0.0	0.0	Diurnal Average
		0	0	0	0	6	65	176	365	522	677	749	844	804	780	733	604	497	325	125	33	2	0	0	0	Diurnal Maximum





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Horizon - April 2017

Maximum Speed: 27 km/h on Apr 20 13:00	Maximum Daily Speed Average: 17.2 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 21 06:00	Minimum Daily Speed Average: 0.2 km/h on Apr 21	Hours of Data: 718
Maximum Diurnal Speed Average: 4.0 km/h at hour 17	Minimum Diurnal Speed Average: 2.1 km/h at hour 12	Hours of Missing Data: 2
Monthly Average Velocity: 2.7 km/h 39.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 15 P ₉₀ = 18 P ₉₉ = 23	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	WSW10	SW13	SW12	SW14	SW14	SW13	SW15	SW13	SW15	WSW18	WSW16	WSW18	W17	WNW15	WNW19	WNW18	NW15	NW11	WNW5	W5	W6	W7	WSW10	WSW10	WSW11.1	WNW19
2-Apr	WSW5	SSW9	SW12	SW9	SW9	SSW7	SSW8	W9	NNE2	NW12	WNW19	WNW24	NW24	NW22	NNE15	NNE15	NNE12	NE8	N5	N7	N7	N13	N8	NW6.1	NW24	
3-Apr	NNE7	NNE7	N7	NNW6	N5	N5	NE6	NNE4	N4	E4	SSE5	E5	E5	WNW12	WNW7	N5	NNE9	ENE9	E6	SE5	SSW5	WSW3	SW5	W2	NNE2.6	WNW12
4-Apr	SW5	S5	SSW7	SSW7	S4	SSW7	SSW8	WSW6	SE5	SE7	SW10	SW17	WSW12	NNW3	NNW6	E12	ESE9	ESE7	SSE5	S5	SSW7	SSW7	SW6	SSW6	SSW4.7	SW17
5-Apr	SW3	SSE3	S5	SSW4	SSW6	SW5	SW4	SW5	S5	S10	S11	SSW9	SSW8	S16	S20	S18	SSW15	SSW15	S10	S11	S10	S12	SSW9	W4	S8.8	S20
6-Apr	SSW5	SW5	SSW7	SW6	SW7	SW8	SSW8	S8	SW11	SSW9	S10	SSW8	WNW20	W17	WSW15	WNW18	WNW16	NW14	WNW10	NW6	NNW4	NNE4	N5	NNW7	W6.2	WNW20
7-Apr	NNE7	N7	NNE6	NE5	NNE5	NNE8	NNE8	NNE9	NE14	NE15	NE18	NE18	NNE19	NNE22	NNE18	NNE20	NNE23	NNE21	NNE19	NNE18	NNW4	NNE17	NNE17	NNE17	NNE14.4	NNE23
8-Apr	NNE16	NNE13	NNE17	NNE17	NNE18	NNE20	NNE20	NNE21	NNE23	NE18	NE18	NE19	NE20	NE20	NE22	NE22	NNE19	NNE17	NNE17	NE16	NE14	NNE13	NE9	NNE10	NNE17.2	NNE23
9-Apr	N6	NE7	NE7	NE4	ESE3	SSE1	SSE2	SSW4	SSW9	SW9	SSW8	SSW11	S10	S10	S12	S11	S11	SSE10	SSE7	SSE5	SSE5	SSW4	WSW2	SW5	S4.5	S12
10-Apr	SSW8	SSW8	SSW7	S9	S9	S9	S8	S9	SSW10	SSW10	SSW9	S9	S11	S11	S11	SSE9	SSE7	SSE7	SSE5	SE3	S5	SW5	NE8	NNE7	S6.7	S11
11-Apr	NNE9	NNE13	NE12	NNE12	NNE12	NNE14	NNE15	NNE16	NNE15	NNE16	NNE17	NE16	NE16	NE17	NNE16	NE14	NE17	NNE17	NNE17	N17	NNE15	NNE14	NNE10	N10	NNE14.3	NE17
12-Apr	NNE10	NNE8	NNE7	NNE8	NNE9	NNE9	NNE7	NE9	NNE11	NE12	NE11	NE11	NE10	NE10	NE11	NNE12	NE13	NE11	NNE12	NNE9	NNE8	NNE8	NNE9	NNE7	NNE9.4	NE13
13-Apr	NNE7	NNE6	NNE7	NNE8	NNE7	NNE7	NNE7	NE9	E11	NE13	NE13	ENE16	ENE15	ENE16	E16	ENE16	ENE17	ENE15	ENE14	ENE14	ENE13	ENE12	NE12	NE10.9	ENE17	
14-Apr	NNE10	NNE11	NNE14	NNE14	NNE13	NNE14	NNE14	NNE15	NNE18	NNE15	NNE16	NNE17	NNE18	NNE14	NE21	NE18	NE19	NE18	NE19	NE19	NE19	NE20	NE17	NE20	NE16.1	NE21
15-Apr	NE19	NNE21	NE20	NE21	NE19	NE20	NNE17	NNE16	NNE17	NNE15	NNE14	NE15	NNE13	NNE14	NE21	NE19	NE19	NNE8	NNE7	N5	NNW5	N3	SSW4	S6	NNE11.8	NNE21
16-Apr	S11	SSW11	S11	S10	SW5	SSW9	SSW9	SSW12	SSW15	SSW16	SSW15	SSW19	SSW18	SSW19	SSW20	SSW18	SSW18	SSW19	SSW15	SSW11	S8	NE2	NNE13	NNE18	SSW10.6	SSW20
17-Apr	NNE18	NNE19	NNE16	NNE17	NNE19	NNE19	NNE19	NE19	NE17	NNE17	NNE16	NE16	NE17	NE18	NE18	NE19	NE20	NNE17	NNE14	NNE12	NNE13	NNE15	NNE17	NNE16.8	NE20	
18-Apr	NNE15	NNE16	NNE16	NNE15	NNE14	NNE17	NNE13	NNE13	NNE11	NNE10	NE8	NE8	NNE7	NE9	NNE7	NE6	NE5	NE6	ENE7	ENE6	NE7	NNE8	NE8	NE7	NNE9.8	NNE17
19-Apr	NE6	NNE5	NNE7	NE6	NNE5	NNE5	NNE4	NE4	NNW3	NNW3	NW2	SSW6	S6	S5	S7	WSW8	SW8	WSW7	WSW7	SW7	WSW7	SW7	SW5	SW7	WSW1.8	WSW8
20-Apr	SW5	WSW3	AF	NNW2	NNE5	NNE4	NNE6	NNE9	NNE16	NNE19	NNE23	NNE25	NNE27	NNE25	NNE21	NE21	NNE18	NNE12	NNE9	NNE4	W2	NW6	N9	N8	NNE11.2	NNE27
21-Apr	NNE8	NNE9	NNE9	N8	N5	NW1	NNE4	N4	NNW6	NNW5	N4	SSE3	SSE2	S4	SSW6	SSW6	S6	SE6	SE7	SSE6	S6	S7	SW7	WSW7	ESE0.2	NNE9
22-Apr	SW6	WSW6	N6	NNE13	NNE15	NNE16	NNE15	NNE17	NE16	NE14	NE16	NE13	NE12	NE12	NE12	NE12	NE10	NE9	NE10	NE8	NE7	NE7	NE6	NE6	NE9.8	NNE17
23-Apr	N5	NNE7	N6	NNE6	NNE6	NNE6	NNE7	NNE6	NW4	E7	E7	E9	ENE9	NE8	ENE8	E7	NE7	NNE8	NNE8	NE7	ENE7	ENE6	NNE6	NNE10	NE6.1	NNE10
24-Apr	NNE9	NNE10	NNE9	NNE8	NNE8	NNE9	NNE9	NNE9	NNE10	NNE11	NNE11	NE11	ENE15	ENE14	ENE14	ENE14	E11	ESE9	SE6	ESE4	SE6	ESE5	ESE5	ESE5	NE7.6	ENE15
25-Apr	E5	NE4	NE4	ESE4	SSE5	SE4	SE4	S8	S10	S9	S9	S8	SSW12	SSW14	S12	S12	S12	S12	S11	S11	SSE9	SSE10	S10	S12	S7.7	SSW14
26-Apr	S13	S12	S11	S9	SSE7	S7	S8	S12	S16	S15	SSE14	S16	S14	SSE15	S16	SSW18	S15	SSW17	SSW12	SSW6	AF	SSW5	S2	NE1	S11.0	SSW18
27-Apr	NE2	NNW2	NW3	N2	NE2	NNE3	NNE2	S4	SSW9	S9	S12	S11	SSW10	SSW6	SW13	SW5	WSW10	NW11	NNW11	NW9	NNW5	N5	NNW5	NW6	WSW2.3	SW13
28-Apr	WSW3	WNW4	NW7	NW4	SW3	SW6	SSW2	S3	SSE4	SSW5	SSE5	NE5	NNW4	WSW2	NNE4	E6	SE3	ESE6	E5	ESE5	ESE5	E6	NE4	WNW2	SE0.9	NW7
29-Apr	S7	ESE3	E3	S7	SSW10	SW11	SSW12	SSW10	SW13	SW15	SSW13	SW16	SW19	SSW18	SSW16	SSW15	SSW10	S10	S10	SSW11	SSW8	SSW9	SSW9	SSW9	SSW10.3	SW19
30-Apr	SSW9	SSW9	SSW8	SSW9	SW7	S6	SSW6	SSW7	SSE4	S4	SE1	SSE6	SSW5	NNW23	N18	ENE12	ESE15	SSE15	SSW13	SW6	WSW4	W4	SW4	SSW6	SSW3.2	NNW23

NNE2.5 NNE2.8 NNE3.3 NNE2.9 NNE2.9 NNE3.0 NE2.9 NE2.5 NNE2.3 ENE2.6 ENE2.8 ENE2.1 NNE2.3 NNE2.9 NNE2.3 ENE3.8 ENE4.0 ENE3.6 NE2.9 NE2.4 NE2.4 NE2.3 NNE3.0 NNE3.2	Diurnal Average
NE19 NNE21 NE20 NE21 NE19 NE20 NNE20 NNE21 NNE23 NNE19 NNE23 NNE25 NNE27 NNE25 NW22 NE22 NNE23 NNE21 NE19 NE19 NE20 NNE17 NNE17 NE20	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

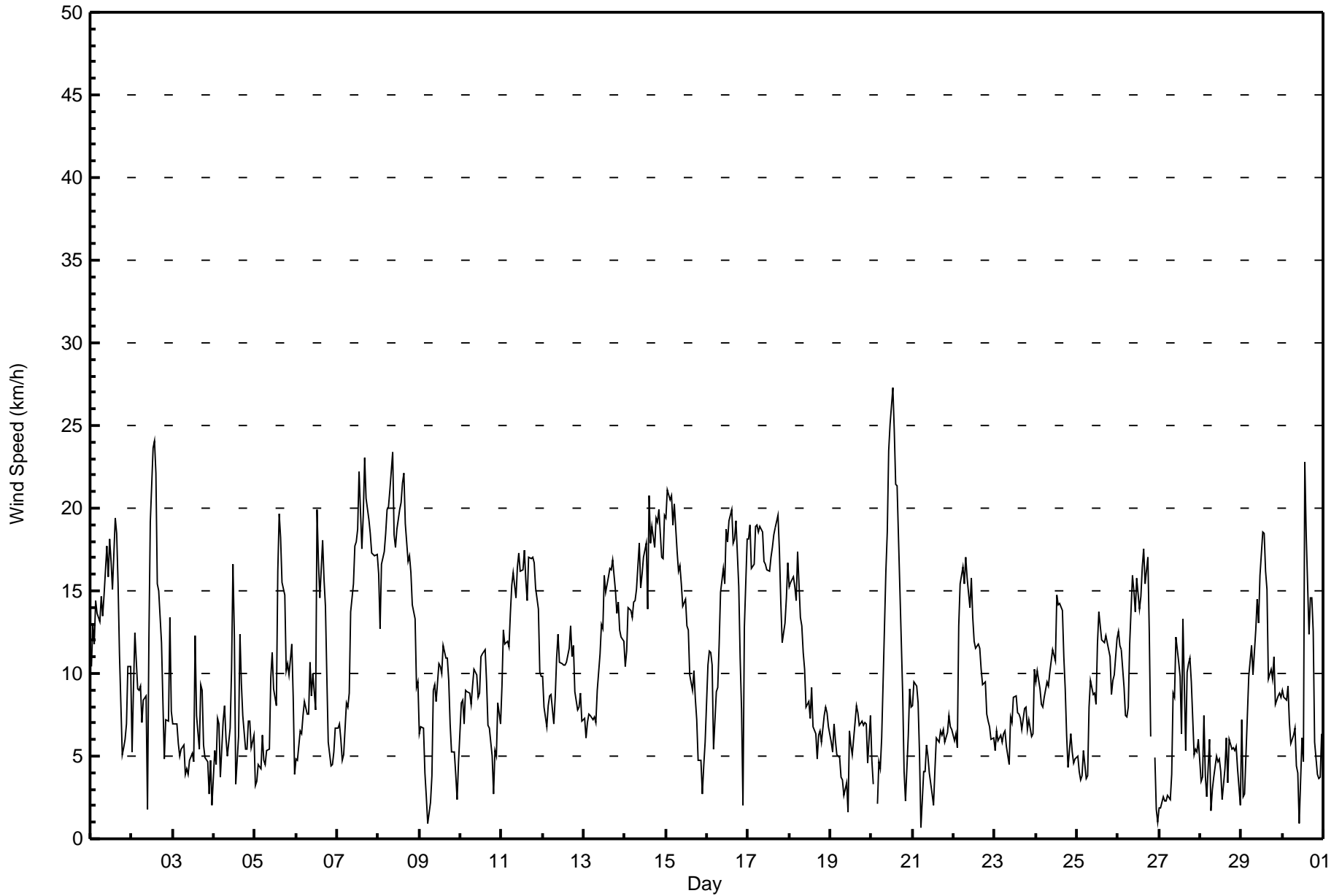
Wind Speed (WS) - km/h
Horizon - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Apr 20 14:00	Hours of Data: 718
Minimum Value: 0 km/h on Apr 3 20:00	Hours of Missing Data: 2
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6	Hours of Calibration: 0
	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	2	2	2	3	3	3	4	4	4	4	5	5	5	4	3	3	3	1	1	1	2	2	2	5
2-Apr	3	2	2	1	1	1	2	2	2	2	6	4	5	4	6	6	5	3	3	1	3	1	4	2	6
3-Apr	1	1	2	1	1	1	2	1	1	2	2	3	2	5	3	3	2	3	1	0	1	2	2	2	5
4-Apr	1	2	2	1	1	2	2	3	3	2	5	4	5	3	3	3	3	2	2	1	1	1	1	1	5
5-Apr	3	1	2	1	1	2	1	1	2	3	3	3	5	5	5	5	4	5	2	3	2	3	2	2	5
6-Apr	1	1	1	1	1	2	1	2	3	2	3	4	6	4	5	5	4	2	1	1	1	1	1	2	6
7-Apr	2	1	1	1	2	2	2	2	3	4	5	4	5	5	5	5	6	5	5	4	4	4	4	4	6
8-Apr	4	3	4	4	5	5	5	5	6	4	4	5	5	6	5	5	5	5	5	4	4	4	3	3	6
9-Apr	3	3	2	1	2	2	2	2	3	3	3	4	4	4	4	3	3	2	2	1	1	1	1	2	4
10-Apr	2	1	1	1	1	2	2	2	2	3	3	3	4	3	4	3	3	2	1	2	1	1	3	1	4
11-Apr	2	3	3	3	3	4	4	4	4	5	5	4	4	5	4	4	4	4	4	4	4	4	2	2	5
12-Apr	2	2	1	1	2	2	2	2	3	3	3	3	4	4	4	4	3	3	3	2	1	1	2	1	4
13-Apr	1	1	1	1	1	1	2	2	3	3	4	4	4	5	5	5	5	4	4	3	3	3	2	2	5
14-Apr	2	2	3	3	3	3	3	4	4	4	4	4	4	4	6	6	6	5	5	5	5	4	5	6	6
15-Apr	5	6	6	5	5	5	4	4	4	4	4	4	3	3	3	3	3	2	2	1	1	1	1	1	6
16-Apr	2	2	2	2	1	1	2	3	3	4	3	5	4	5	5	4	4	4	3	2	2	3	4	5	5
17-Apr	6	5	5	5	5	5	5	4	5	5	4	4	4	4	4	5	5	5	4	4	3	4	4	4	6
18-Apr	4	4	4	4	4	4	3	3	3	3	3	2	2	3	3	3	2	2	2	1	2	2	2	1	4
19-Apr	1	1	2	1	1	1	1	1	1	1	2	2	3	3	3	4	3	3	3	1	2	1	2	1	4
20-Apr	1	1	AF	1	1	2	2	3	5	5	6	6	7	7	6	6	5	3	2	1	1	2	2	1	7
21-Apr	1	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2
22-Apr	1	1	2	3	4	4	4	4	5	4	4	5	4	4	4	3	3	3	3	2	1	1	1	2	5
23-Apr	1	1	1	1	1	1	2	2	1	2	3	4	3	3	3	3	3	2	2	1	1	2	3	3	4
24-Apr	2	2	2	2	2	2	2	2	2	3	3	4	4	4	4	4	3	3	2	2	1	1	1	1	4
25-Apr	1	1	1	1	1	1	1	3	3	2	3	3	4	4	4	3	3	3	3	3	2	2	2	3	4
26-Apr	3	3	3	2	2	2	2	3	4	4	4	4	4	4	4	5	5	5	4	2	AF	1	2	1	5
27-Apr	2	1	1	2	1	1	1	5	3	4	4	3	4	3	5	4	3	3	2	1	1	1	1	1	5
28-Apr	2	2	1	2	3	1	1	1	1	1	2	2	2	3	2	2	2	2	2	1	1	1	1	1	3
29-Apr	2	3	2	2	2	1	2	2	3	4	4	5	7	5	5	4	3	3	2	3	1	1	1	1	7
30-Apr	1	1	1	2	1	2	2	2	2	2	3	3	4	5	5	4	4	4	4	2	1	2	2	1	5

6	6	6	5	5	5	5	5	5	6	5	6	6	7	7	6	6	6	5	5	5	5	4	5	6	
Diurnal Maximum																									

AF - Analyzer Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Horizon - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	145	20.19	20.20
6 - 11	306	42.62	62.81
12 - 19	234	32.59	95.40
20 - 28	33	4.60	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Horizon - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	14	16	11	1	5	9	7	15	11	10	15	7	5	3	5	11	145
6 - 11	12	73	36	7	9	4	5	10	48	54	20	11	3	2	7	5	306
12 - 19	3	93	42	15	2	1	0	3	19	24	15	5	2	7	3	0	234
20 - 28	0	14	12	0	0	0	0	0	1	1	0	0	0	2	2	1	33
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	29	196	101	23	16	14	12	28	79	89	50	23	10	14	17	17	718

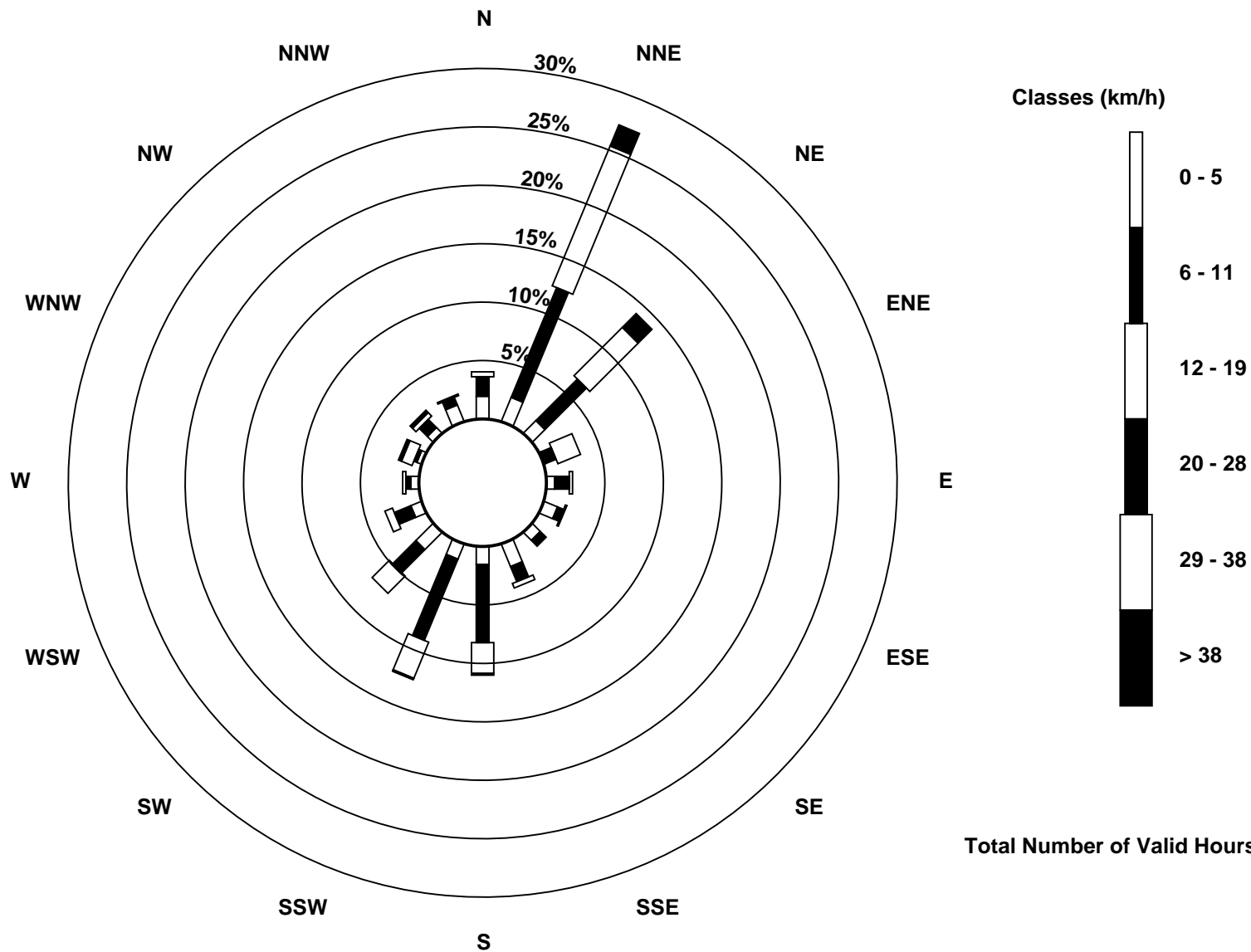
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Horizon (AMS 15)





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Horizon - April 2017

Direction of Maximum Speed: 22 deg on Apr 20 13:00 Direction of Maximum Daily Speed Average: 29.6 deg on Apr 8	Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2
Direction of Minimum Speed: 326 deg on Apr 21 06:00 Direction of Minimum Daily Speed Average: 0.2 deg on Apr 21	Percent Operational Time: 99.7
Monthly Average Direction: 219.9 deg	

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	243	222	233	236	226	225	225	224	232	239	243	247	269	285	289	303	322	322	289	276	279	275	239	241	255.6	
2-Apr	238	212	231	223	215	217	202	211	267	16	322	302	302	308	315	15	21	32	37	5	357	350	354	10	311.3	
3-Apr	25	17	6	340	3	11	44	32	5	96	158	82	79	301	290	357	29	65	93	134	202	256	233	266	19.5	
4-Apr	219	189	208	208	184	208	208	238	142	128	215	222	239	347	341	93	106	116	168	174	192	205	218	192	192.7	
5-Apr	214	166	188	201	203	219	224	219	184	170	175	212	193	180	174	181	193	194	175	185	180	185	183	201	260	189.3
6-Apr	205	223	213	218	216	220	202	191	218	208	189	209	293	267	254	292	295	315	303	307	346	12	355	347	261.4	
7-Apr	13	359	21	41	12	20	18	32	34	35	34	34	29	27	33	30	25	28	28	30	31	32	33	31	28.8	
8-Apr	26	21	18	14	18	23	29	28	16	35	36	46	45	38	38	35	24	24	21	38	43	31	36	27	29.6	
9-Apr	10	39	36	45	122	150	167	204	211	215	196	192	172	180	187	187	177	160	150	161	168	213	249	226	179.8	
10-Apr	195	201	195	188	180	173	170	190	192	194	195	174	177	175	188	157	167	168	168	138	182	216	34	30	179.6	
11-Apr	31	32	34	33	32	30	31	31	32	32	30	35	35	36	33	43	41	33	21	9	13	19	26	7	29.5	
12-Apr	15	12	32	25	20	27	25	35	30	36	50	51	49	35	35	26	35	37	27	20	19	22	17	18	30.0	
13-Apr	18	23	25	19	19	15	15	22	40	86	55	46	64	71	78	79	72	60	60	64	68	63	60	49	55.5	
14-Apr	31	32	33	33	32	27	31	27	21	27	28	27	18	30	46	52	50	42	40	42	46	43	48	39	35.9	
15-Apr	36	32	39	40	38	37	33	31	30	26	26	24	23	16	20	15	31	19	15	0	343	8	199	181	29.4	
16-Apr	182	192	189	188	217	196	201	196	193	197	195	210	210	208	209	209	204	199	192	193	191	44	30	29	198.3	
17-Apr	25	22	28	24	22	25	27	23	36	35	31	31	42	45	41	45	46	48	33	29	27	19	23	21	31.5	
18-Apr	18	19	27	27	32	29	32	31	24	28	40	38	27	40	33	44	52	44	67	69	37	32	37	36	32.7	
19-Apr	35	28	26	36	19	27	16	34	327	340	322	204	186	170	191	240	228	250	251	230	244	230	233	226	250.2	
20-Apr	234	241	AF	333	20	16	26	19	27	26	27	27	22	29	29	34	32	27	20	27	274	322	11	7	22.7	
21-Apr	27	24	17	8	4	326	26	1	347	332	350	156	156	190	210	205	186	132	145	147	184	191	218	248	112.6	
22-Apr	234	248	349	20	26	29	29	26	38	40	49	45	42	43	44	37	47	42	42	42	55	47	55	35	35.8	
23-Apr	8	21	10	30	23	30	27	19	316	82	80	90	68	42	59	81	46	26	26	45	62	76	33	24	43.2	
24-Apr	26	30	22	19	17	18	26	24	28	27	29	48	63	73	66	73	84	116	134	109	126	114	123	105	55.3	
25-Apr	84	50	40	106	149	132	141	180	175	176	185	187	195	193	181	176	180	180	185	171	166	168	175	178	173.1	
26-Apr	174	173	173	174	168	172	183	179	189	181	167	169	172	166	183	199	184	192	211	201	AF	199	177	55	181.0	
27-Apr	39	329	326	2	56	31	20	184	192	172	170	170	192	194	227	228	252	308	327	314	336	352	344	307	248.0	
28-Apr	254	296	310	313	217	214	213	169	159	207	154	54	330	246	12	85	143	120	101	112	109	97	39	285	127.8	
29-Apr	191	105	79	172	208	215	213	201	221	224	200	217	220	211	213	211	194	184	184	210	196	207	203	207	206.1	
30-Apr	204	201	201	195	216	189	205	197	167	181	145	147	210	337	356	64	110	167	208	231	247	280	229	213	199.1	
23.5 23.8 21.6 27.3 27.8 29.4 34.5 37.0 31.5 62.9 63.1 62.9 25.7 19.8 28.0 56.6 59.1 63.1 51.6 54.0 54.5 36.7 28.4 17.5																										
Diurnal Average																										

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

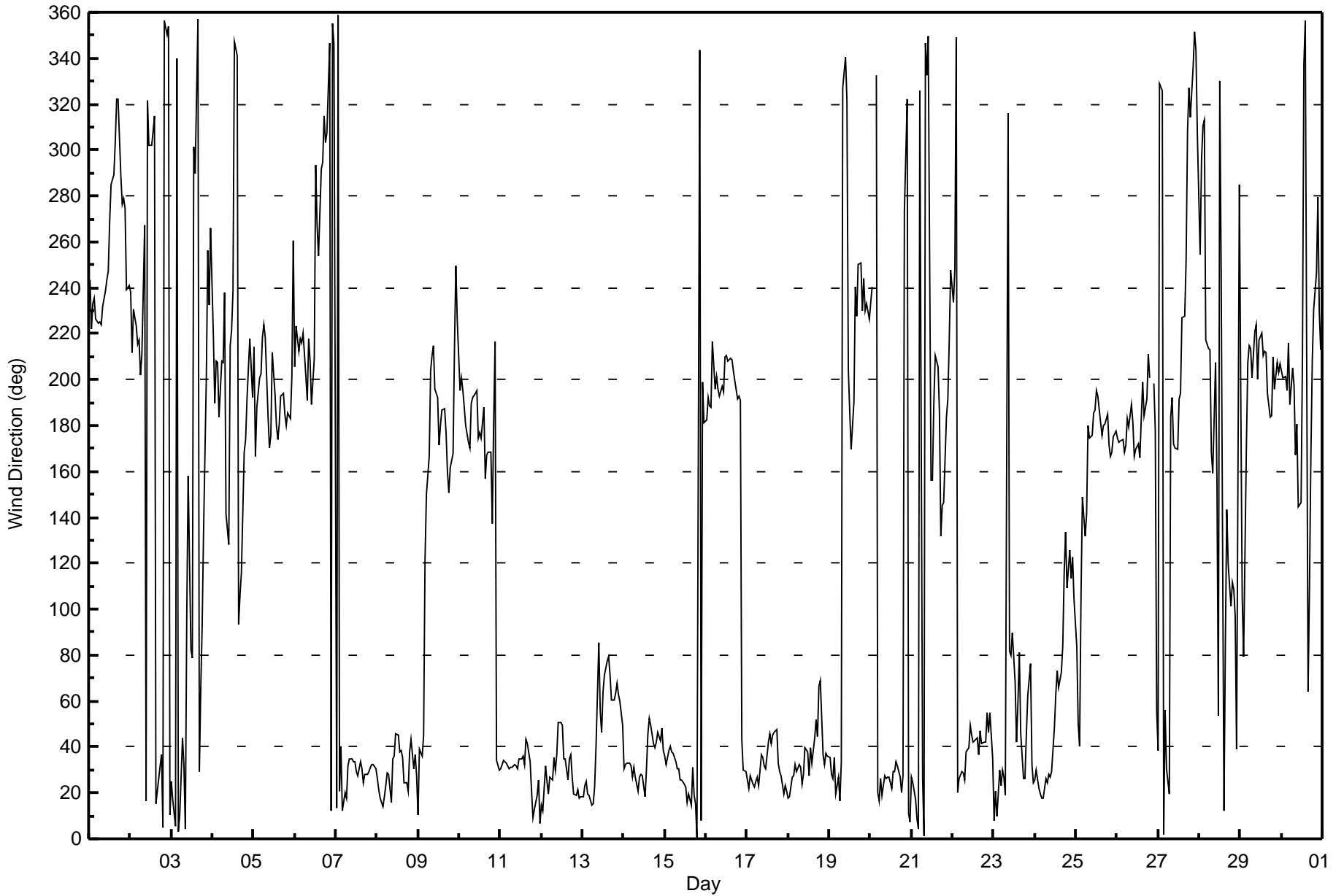
Wind Direction (WD) - deg
Horizon - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 106 deg on Apr 30 11:00	Hours of Data: 718
Minimum Value: 7 deg on Apr 28 21:00	Hours of Missing Data: 2
Percentiles: P ₁ = 8 P ₁₀ = 13 Q ₁ = 16 Median = 19 Q ₃ = 26 P ₉₀ = 43 P ₉₉ = 81	Hours of Calibration: 0
	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	18	13	13	10	12	14	14	16	19	16	21	18	24	24	15	16	19	8	11	12	15	24	11	12	24
2-Apr	32	16	10	12	13	10	17	11	28	91	37	18	14	18	21	28	22	17	16	33	40	24	21	19	91
3-Apr	15	15	14	17	17	10	17	30	39	67	56	80	66	26	32	47	24	26	12	21	26	49	33	60	80
4-Apr	18	48	21	17	31	19	13	52	66	31	51	19	28	84	45	25	28	17	28	24	9	10	22	23	84
5-Apr	74	21	17	22	16	28	21	17	27	20	21	30	73	21	19	19	17	22	15	15	13	13	16	43	74
6-Apr	13	15	12	12	13	14	25	19	21	27	25	55	23	27	28	25	21	11	8	13	18	30	22	19	55
7-Apr	15	16	18	13	19	17	16	17	17	18	19	19	19	19	21	20	19	18	18	17	18	19	18	18	21
8-Apr	17	18	17	20	19	19	19	19	21	18	18	17	17	19	17	19	21	22	20	18	18	19	20	22	22
9-Apr	26	21	18	30	41	98	73	58	24	25	53	33	32	33	27	31	26	25	17	11	18	23	19	15	98
10-Apr	8	11	16	12	17	12	14	17	17	21	29	32	30	32	26	29	38	21	12	43	24	24	30	12	43
11-Apr	15	18	18	17	17	18	18	19	19	19	21	19	21	20	21	20	21	18	20	20	18	19	17	17	21
12-Apr	18	18	14	13	14	16	18	20	22	22	30	35	32	33	36	27	23	24	18	15	13	12	16	14	36
13-Apr	11	10	8	10	10	11	15	18	24	26	24	25	22	23	22	21	19	16	15	14	15	15	13	14	26
14-Apr	15	17	18	18	18	18	18	18	19	18	19	17	18	18	17	19	21	20	17	16	14	16	16	18	21
15-Apr	19	19	20	17	18	19	19	19	18	19	20	21	22	23	24	24	21	21	19	14	12	47	25	28	47
16-Apr	15	10	12	16	26	10	13	15	15	16	15	16	17	16	17	16	17	15	14	12	10	80	19	19	80
17-Apr	18	19	18	19	19	18	18	18	18	20	19	21	22	21	22	19	19	17	19	18	17	19	19	18	22
18-Apr	19	19	19	19	18	17	19	21	22	26	27	31	34	27	45	50	51	33	24	19	26	19	16	18	51
19-Apr	17	18	19	18	19	18	22	34	31	45	88	37	67	76	44	42	33	27	19	13	15	11	42	11	88
20-Apr	18	69	AF	66	13	19	16	21	19	19	18	20	19	19	18	18	19	21	36	27	28	14	13	69	
21-Apr	14	15	15	14	21	70	16	30	24	20	53	89	82	67	34	30	35	28	21	15	10	8	10	14	89
22-Apr	21	19	55	20	18	18	19	19	18	21	20	25	32	29	28	26	32	33	21	23	10	10	13	14	55
23-Apr	15	11	10	8	7	9	16	27	37	37	54	45	44	60	54	38	40	24	19	15	15	31	42	19	60
24-Apr	18	18	16	18	17	17	19	21	20	19	19	33	27	25	24	22	26	31	25	20	17	15	13	16	33
25-Apr	12	23	14	28	17	16	27	22	23	26	24	31	21	20	26	24	21	20	18	16	13	13	15	15	31
26-Apr	15	15	15	16	14	17	17	17	18	23	26	25	22	23	22	22	24	20	16	12	AF	26	64	71	71
27-Apr	55	33	19	26	18	26	20	78	26	46	30	30	38	58	27	75	32	22	12	8	24	28	20	13	78
28-Apr	49	46	7	23	58	14	73	22	32	27	52	69	63	91	66	36	71	31	24	8	7	12	27	56	91
29-Apr	16	60	51	17	11	9	10	18	22	20	31	23	21	19	24	20	28	32	16	14	12	10	9	9	60
30-Apr	8	8	10	11	15	13	16	21	57	69	106	63	83	22	24	43	24	27	20	21	47	13	59	18	106

74	69	55	66	58	98	73	78	66	91	106	89	83	91	66	75	71	33	28	43	47	80	64	71	
Diurnal Maximum																								

AF - Analyzer Failure





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Horizon	Station number:	AMS 15
Calibration Date:	April 19, 2017	Last Cal Date:	March 22, 2017
Start time (MST):	8:37	End time (MST):	13:35
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>50</u>	ppm	Cal Gas Exp Date	September 26, 2017
Cal Gas Cylinder #	<u>S0002488</u>			
Calibrator Make/Model	Teledyne API T700		Serial Number	1223
ZAG Make/Model	Teledyne API 701		Serial Number	1004

Analyzer Information

Analyzer make: Thermo 43i

Analyzer serial #: 710321322

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-622	-622
Calculated slope	0.999660	0.999718	Lamp voltage	870	871
Calculated intercept	-0.298715	-0.703841	Pressure	706.9	713.6
Analyzer Background	20.5	19.8	Flow	0.554	0.557
Analyzer Coefficient	1.020	1.011	Intensity	91	91

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5070	0.0	0.0	-0.6	----
as found span	4995	81.6	803.7	808.0	0.995
calibrator zero	5070	0.0	0.0	0.0	----
high point	4995	81.6	803.7	804.2	0.999
second point	5040	40.6	399.6	401.1	0.996
third point	5060	20.3	199.8	201.1	0.994
as left zero	5070	0.0	0.0	0.2	----
as left span	4995	81.6	803.7	805.0	0.998
Average Correction Factor					0.996
Corrected As found	808.56	Previous response	804.26	*% change	-0.5%

* = > +/-5% change initiates investigation

Notes: Sample inlet filter replaced after as founds. Performed preventative maintenance on THC, hence long zero point after as founds. Adjusted zero and span.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

SO₂ Calibration Summary

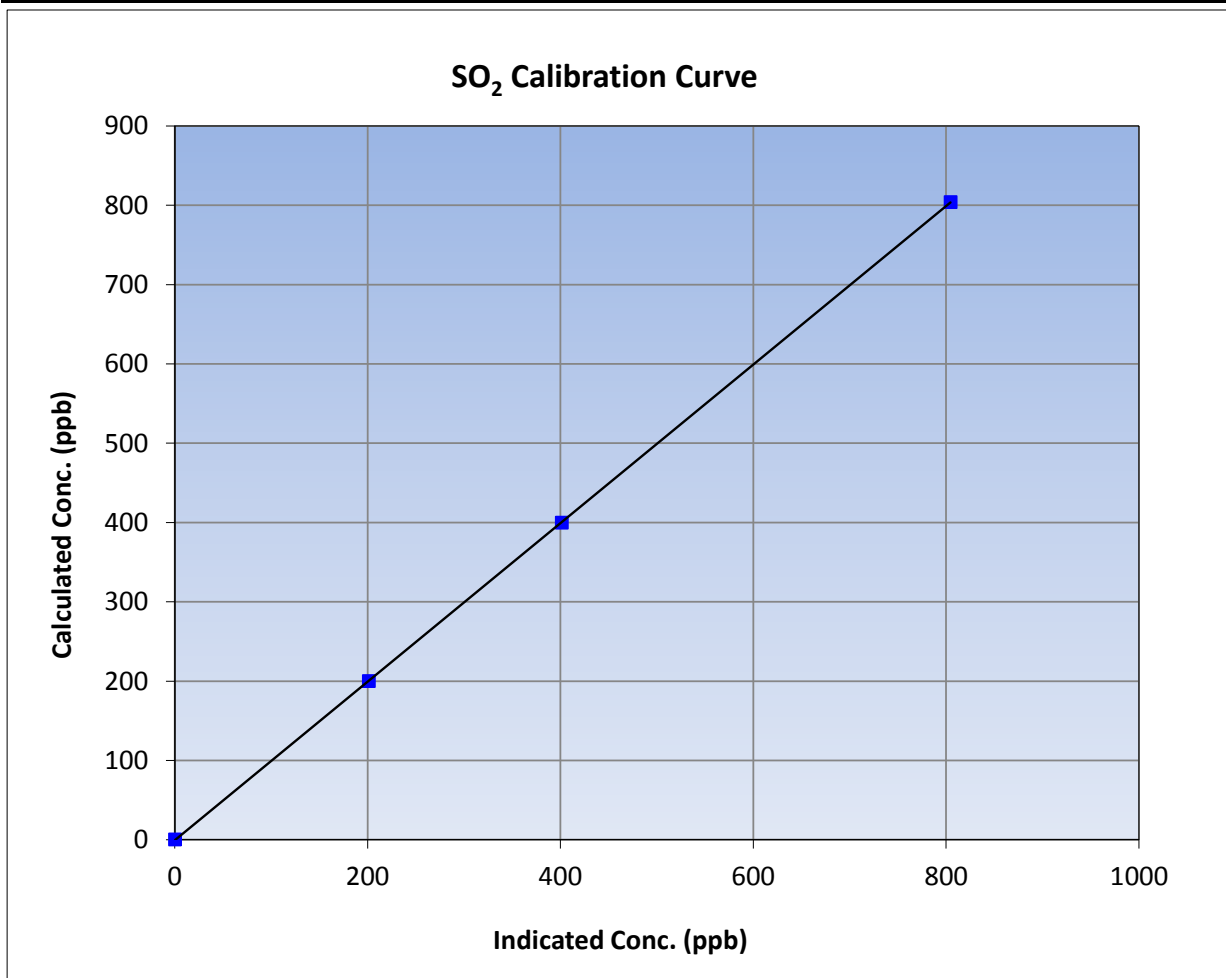
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 22, 2017
Station Name	Horizon	Station Number	AMS 15
Start Time (MST)	8:37	End Time (MST)	13:35
Analyzer make	Thermo 43i	Analyzer serial #	710321322

Calibration Data

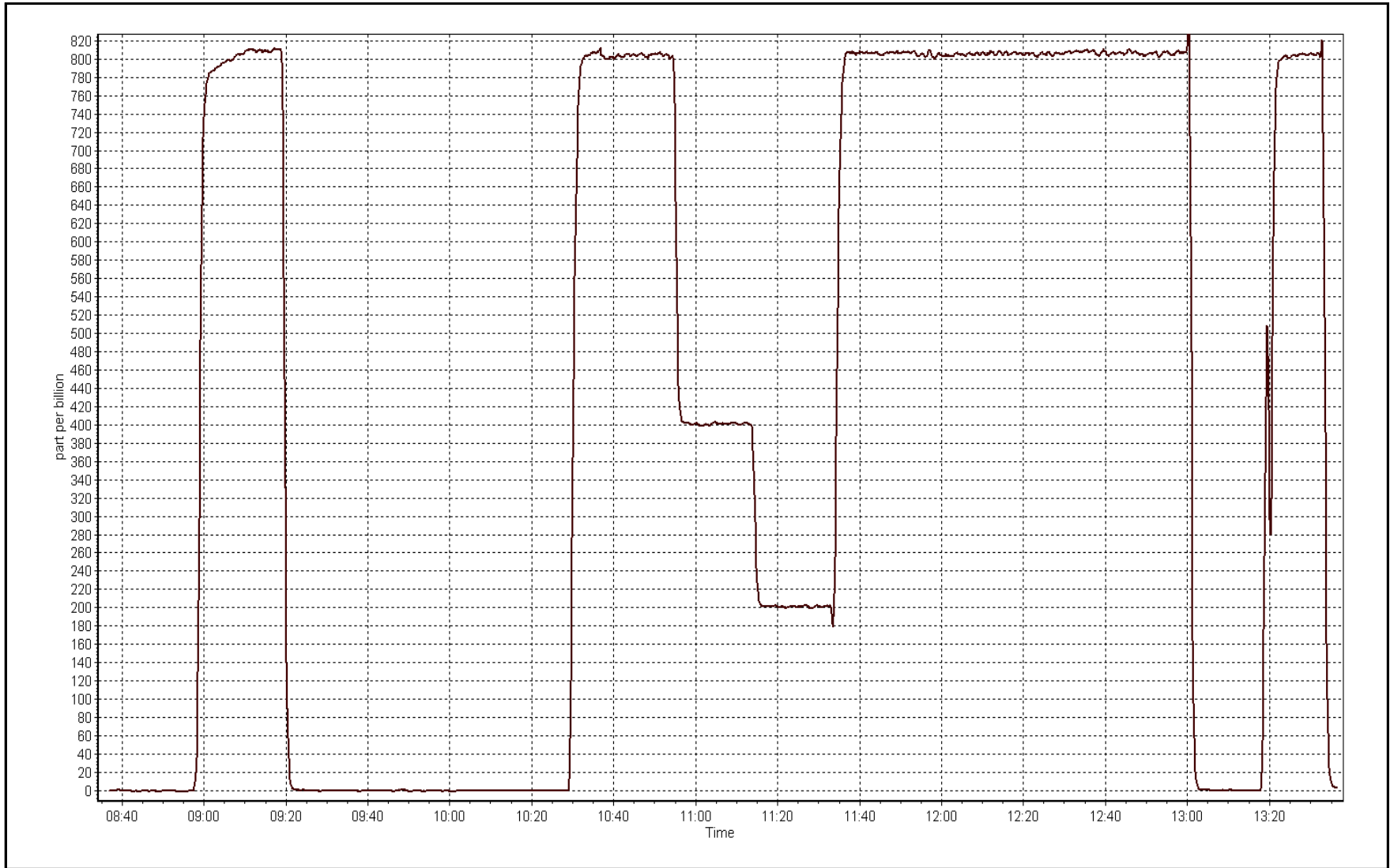
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.0	----	Correlation Coefficient	≥0.995
803.7	804.2	0.9994		
399.6	401.1	0.9963	Slope	0.90 - 1.10
199.8	201.1	0.9936		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 19, 2017

Location: Horizon





Wood Buffalo Environmental Association

TRS Calibration Summary

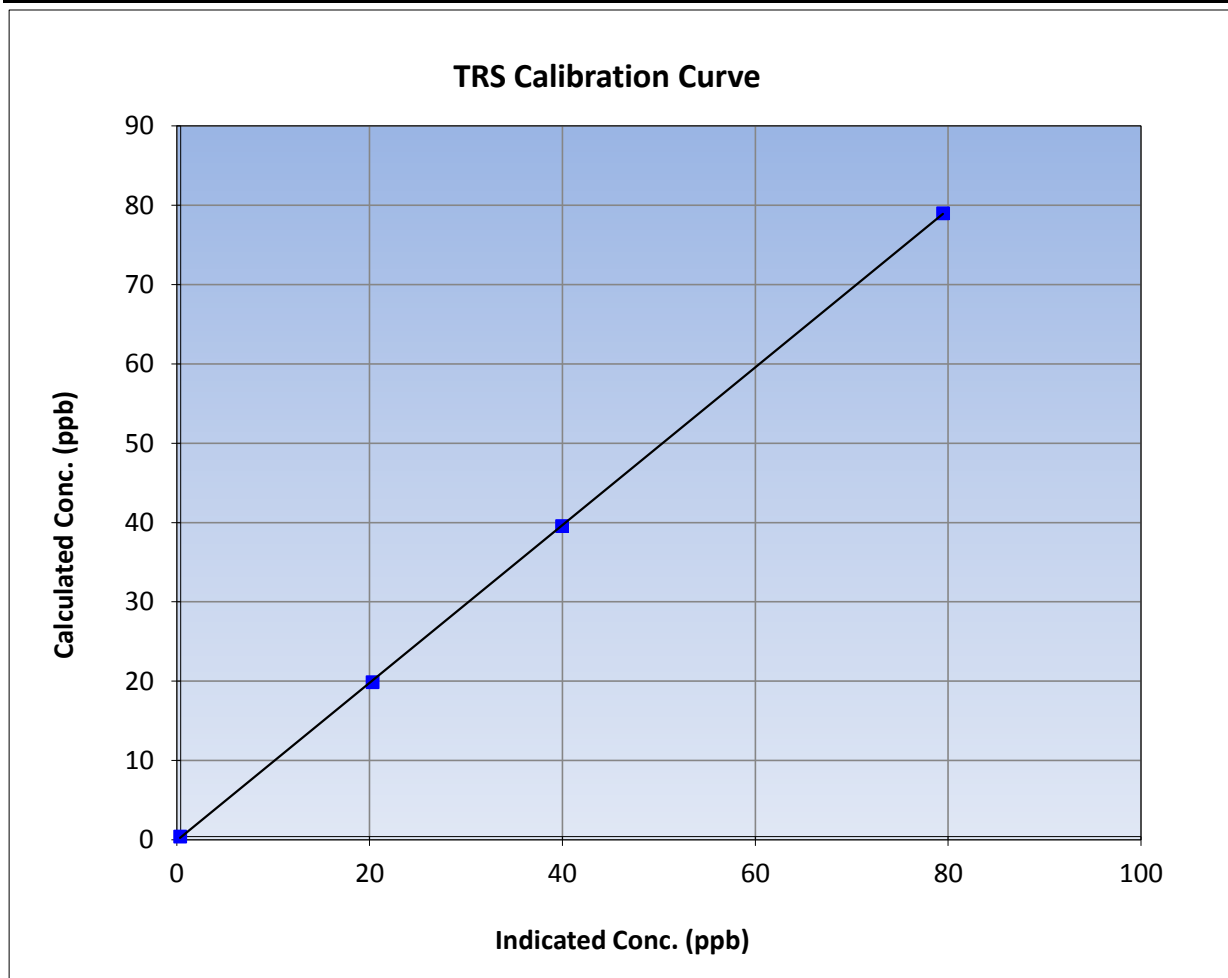
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 15, 2017
Station Name	Horizon	Station Number	AMS 15
Start Time (MST)	13:33	End Time (MST)	15:50
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1151680032

Calibration Data

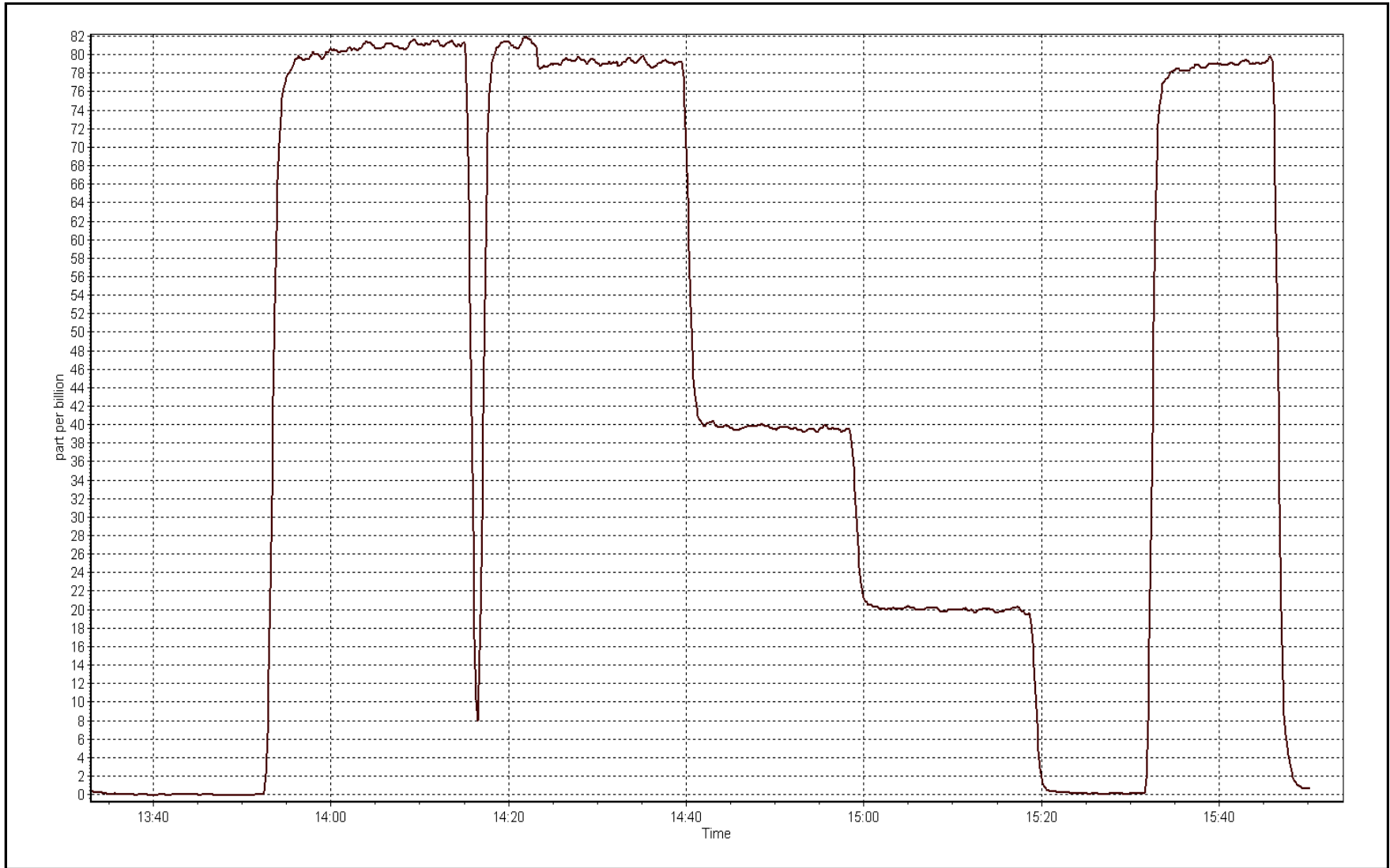
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999977	≥0.995
78.6	79.1	0.9941			
39.2	39.6	0.9901	Slope	0.994849	0.90 - 1.10
19.5	19.9	0.9783			
			Intercept	-0.133276	+/-3



TRS Calibration Plot

Date: April 19, 2017

Location: Horizon





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Horizon	Station number:	AMS 15
Calibration Date:	April 19, 2017	Last Cal Date:	March 17, 2017
Start time (MST):	8:36	End time (MST):	13:35
Reason:	Routine		

Calibration Standards

Gas Cert Reference	S0002488	Cal Gas Expiry Date	September 26, 2017
CH4 Cal Gas Conc.	<u>505.0</u> ppm	CH4 Equiv Conc.	1046.8 ppm
C3H8 Cal Gas Conc.	<u>197.0</u> ppm	Station temp.	Deg C
Calibrator Make/Model	Teledyne API T700	Serial Number	1223
ZAG Make/Model	Teledyne API 701	Serial Number	1004

Analyzer Information

Analyzer make: Thermo 51-LT		Analyzer serial #: 1327059295		
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 25 ppm		Bias voltage supply	-300 -301
Calculated slope	1.001129	0.997990	Sample pressure	8.7 8.7
Calculated intercept	-0.040587	0.022893	Fuel pressure	26.3 26.3
Analyzer Background	2.390	2.370	Air pressure	38.0 38.0
Analyzer Coefficient	3.196	3.167	Flame temperature	155.7 155.7

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5070	0.0	0.00	0.00	----
as found span	4995	81.6	16.83	17.11	0.983
calibrator zero	5070	0.0	0.00	-0.04	----
high point	4995	81.6	16.83	16.83	1.000
second point	5040	40.6	8.36	8.36	1.001
third point	5060	20.3	4.18	4.19	0.998
as left zero	5070	0.0	0.00	-0.01	----
as left span	4995	81.6	16.83	16.92	0.994
Average Correction Factor					1.000
Corrected As found	17.11	Previous response	16.85	*% change	-1.5%

* = > +/-5% change initiates investigation

Notes: Sample inlet filter replaced after as founds. Sample pump replaced after as founds for preventative maintenance. No adjustments made. Adjusted span.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

THC Calibration Summary

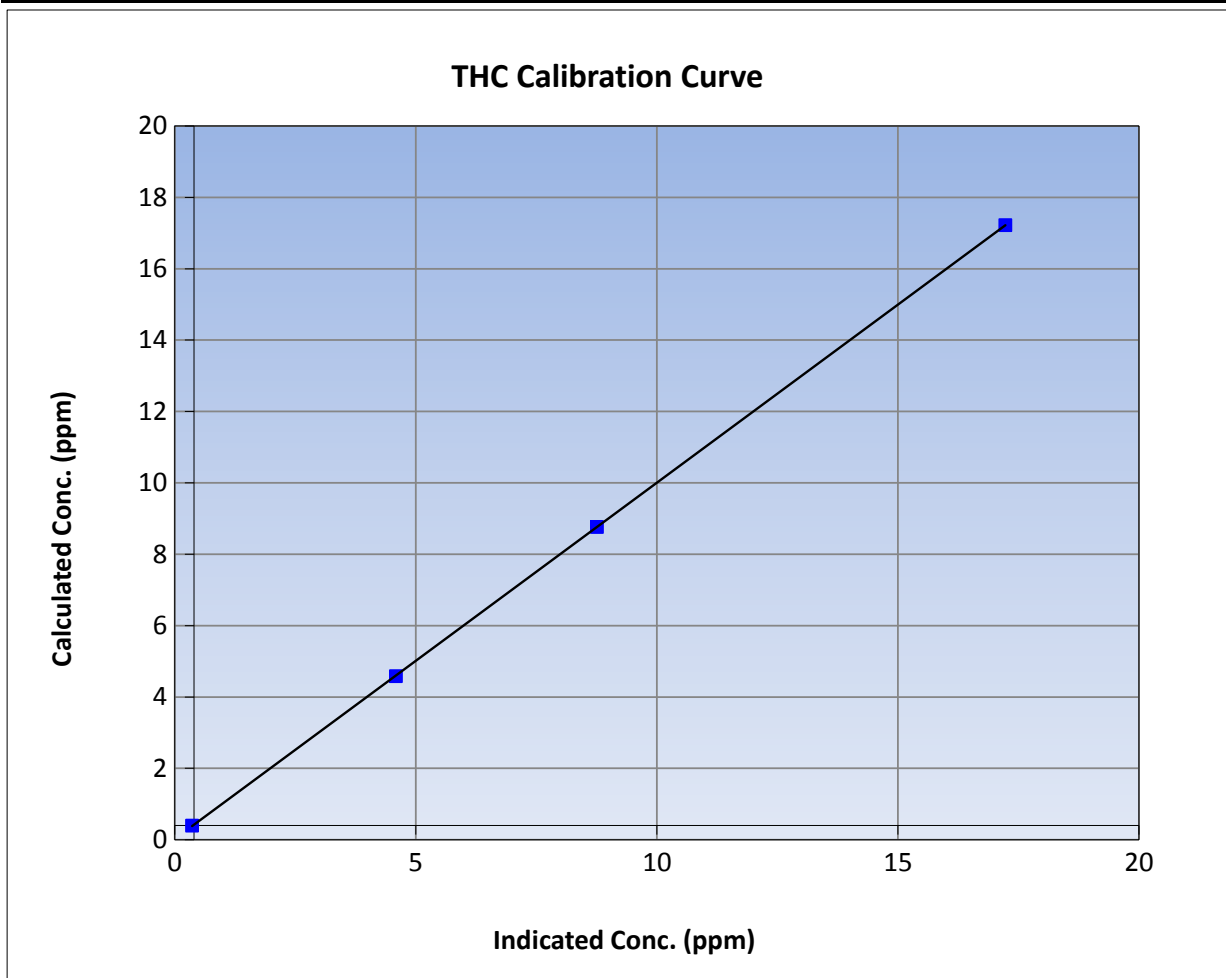
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 17, 2017
Station Name	Horizon	Station Number	AMS 15
Start Time (MST)	8:36	End Time (MST)	13:35
Analyzer make	Thermo 51-LT	Analyzer serial #	1327059295

Calibration Data

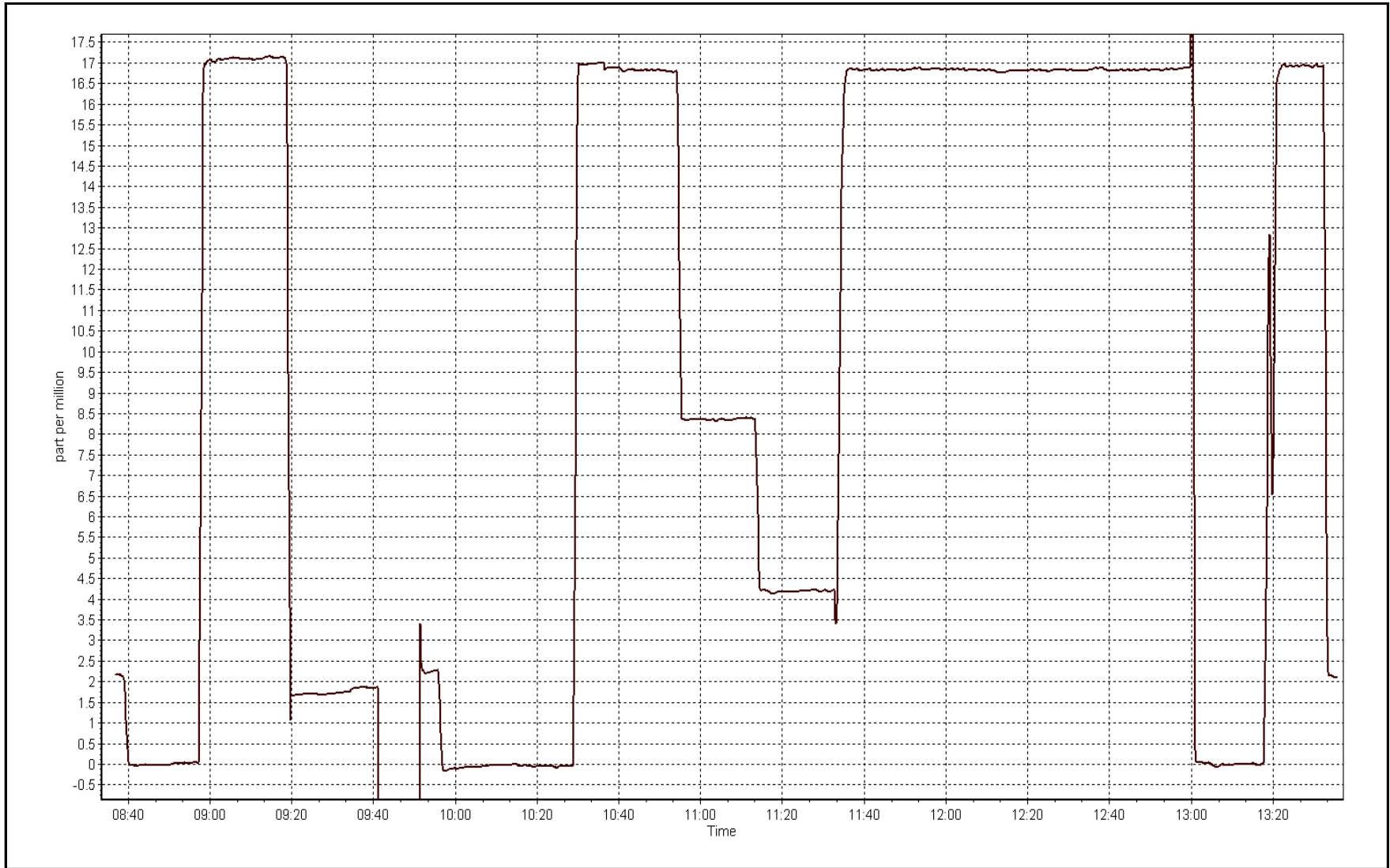
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999995	≥0.995
16.8	16.8	0.9997			
8.4	8.4	1.0006	Slope	0.997990	0.90 - 1.10
4.2	4.2	0.9982			
			Intercept	0.022893	+/-1.5



THC Calibration Plot

Date: April 19, 2017

Location: Horizon





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Horizon	Station number:	AMS 15
Calibration Date:	April 19, 2017	Last Cal Date:	March 17, 2017
Start time (MST):	8:36	End time (MST):	13:35
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	S0002488	Cal Gas Expiry Date	September 26, 2017
NOX Cal Gas Conc.	<u>48.9</u> ppb	NO Cal Gas Conc.	<u>48.9</u> ppb
Calibrator Model	Teledyne API T700	Serial Number	1223
ZAG make/model	Teledyne API 701	Serial Number	1004

Analyzer Information

Analyzer make: Thermo 42i			Analyzer serial #: 710321429		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	0.739	0.729	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	1.001	1.000	PMT Temperature	325.0	324.6
NO2 coefficient	1.000	1.000	Reaction cell Press	151.5	151.2
NO bkgrnd	9.2	9.1	Sample Flow	0.769	0.766
NOX bkgrnd	9.3	9.2	PMT Voltage	-778.9	-778.9

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.997369	1.000105
NO _x Cal Offset	-0.188115	-0.705638
NO Cal Slope	0.998125	1.000096
NO Cal Offset	-0.027995	-0.647794
NO ₂ Cal Slope	0.994507	0.999215
NO ₂ Cal Offset	-0.575945	-0.909970



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5070	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
as found span	4995	81.6	786.0	786.0	0.0	801.5	799.9	1.6	0.9806	0.9826
calibrator zero	5070	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	----	----
high point	4995	81.6	786.0	786.0	0.0	786.0	786.1	0.0	1.0000	0.9999
second point	5040	40.6	390.8	390.8	0.0	392.4	392.3	0.2	0.9958	0.9962
third point	5060	20.3	195.4	195.4	0.0	196.5	196.4	0.1	0.9944	0.9949
as left zero	5070	0.0	0.0	0.0	0.0	0.8	0.8	0.0	----	----
as left span	4995	81.6	786.0	349.5	436.5	783.8	348.4	435.6	1.0028	1.0032
Average Correction Factor									0.9967	0.9970

Corrected As found	NO _x = 801.6 ppb	NO = 800.0 ppb		*Percent Change	NO _x = -1.7%
Previous Response	NO _x = 788.3 ppb	NO = 787.5 ppb		*Percent Change	NO = -1.6%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	786.5	783.6	2.9	0.9994	1.0031	----	----
1st NO2 (400 ppb O3)	349.5	434.1	784.2	349.5	434.7	1.0023	----	0.9985	100.1%
2nd NO2 (200 ppb O3)	560.9	222.7	785.4	560.9	224.6	1.0007	----	0.9919	100.8%
3rd NO2 (100 ppb O3)	667.3	116.3	785.5	667.3	118.1	1.0007	----	0.9846	101.6%
2nd NO ref point	----	0.0	786.3	783.9	2.6	0.9996	1.0027	----	----
Average Correction Factor						1.0008	1.0029	0.9917	100.8%

Notes: Sample inlet filter replaced after as founds. Performed preventative maintenance on THC, hence long zero point after as founds. Adjusted span.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

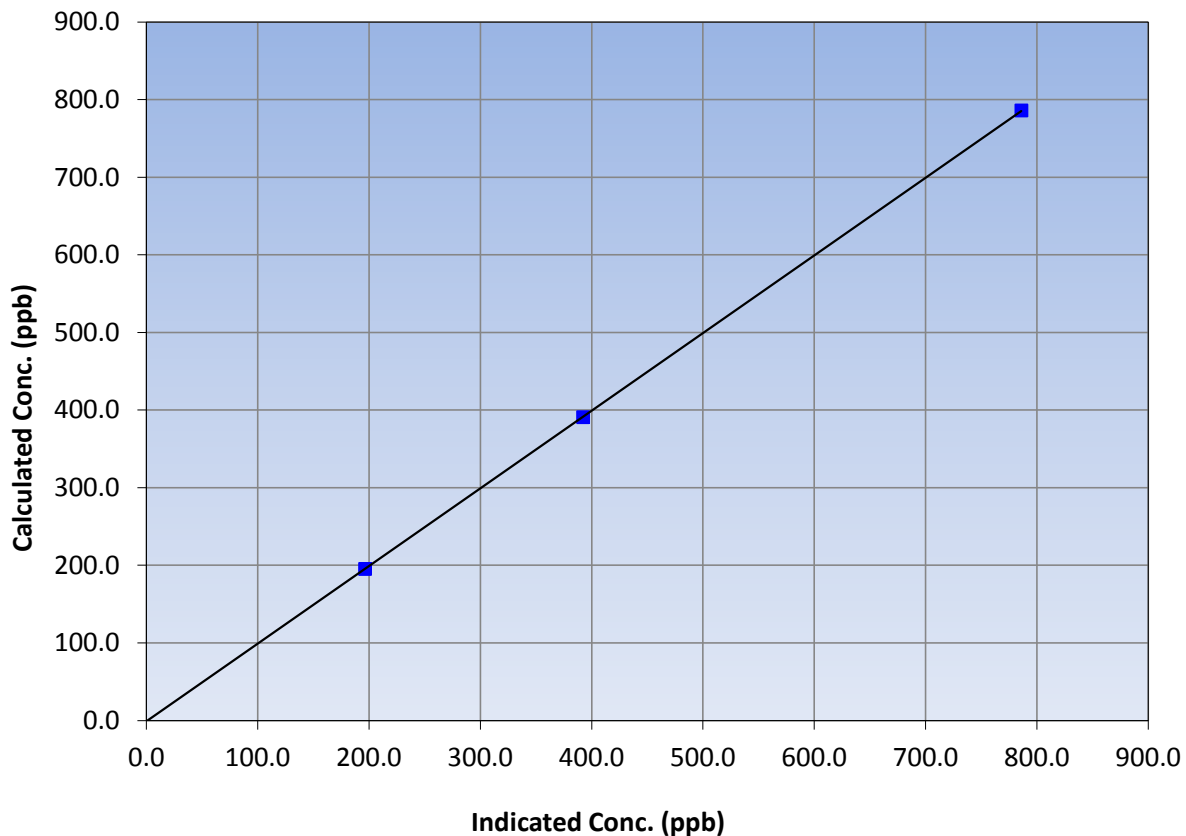
Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 17, 2017
Station Name	Horizon	Station Number	AMS 15
Start Time (MST)	8:36	End Time (MST)	13:35
Analyzer make	Thermo 42i	Analyzer serial #	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
786.0	786.0	1.0000			
390.8	392.4	0.9958			
195.4	196.5	0.9944			
			Slope	1.000105	0.90 - 1.10
			Intercept	-0.705638	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

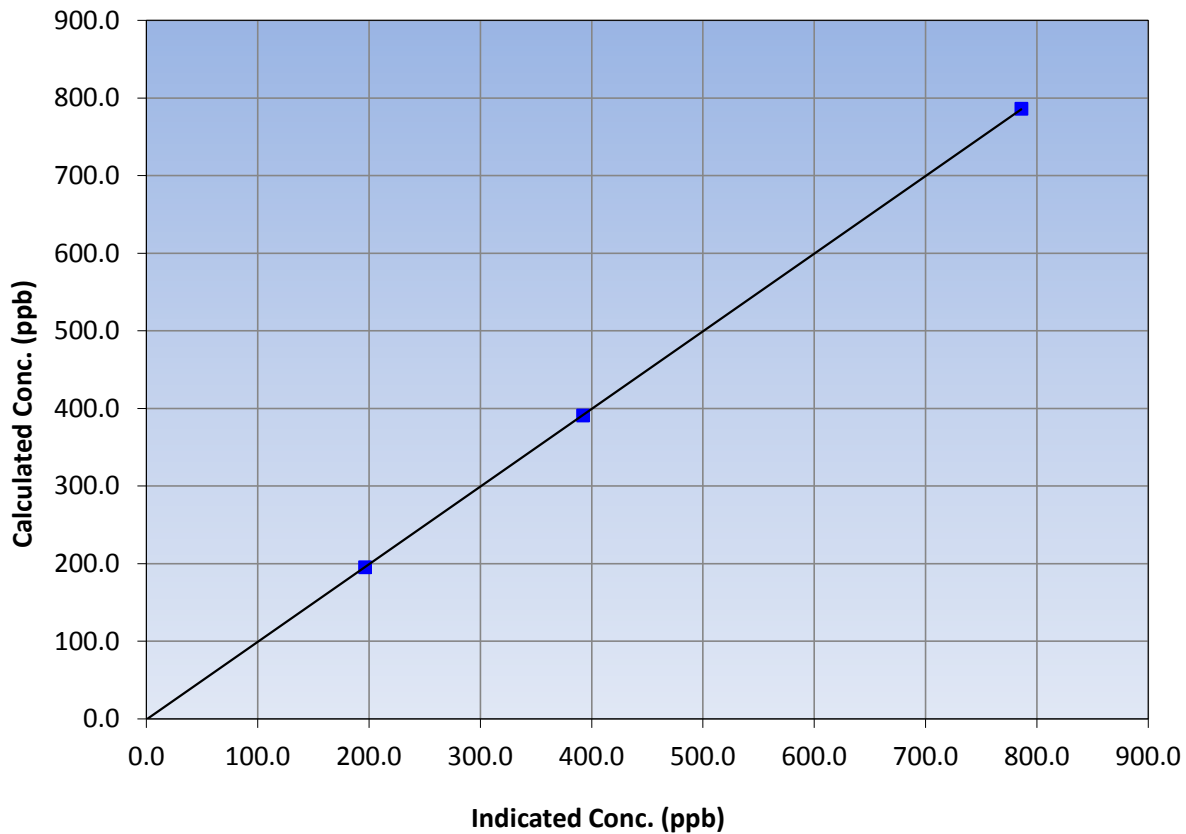
Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 17, 2017
Station Name	Horizon	Station Number	AMS 15
Start Time (MST)	8:36	End Time (MST)	13:35
Analyzer make	Thermo 42i	Analyzer serial #	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	0.999995	≥0.995
786.0	786.1	0.9999			
390.8	392.3	0.9962	Slope	1.000096	0.90 - 1.10
195.4	196.4	0.9949			
			Intercept	-0.647794	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

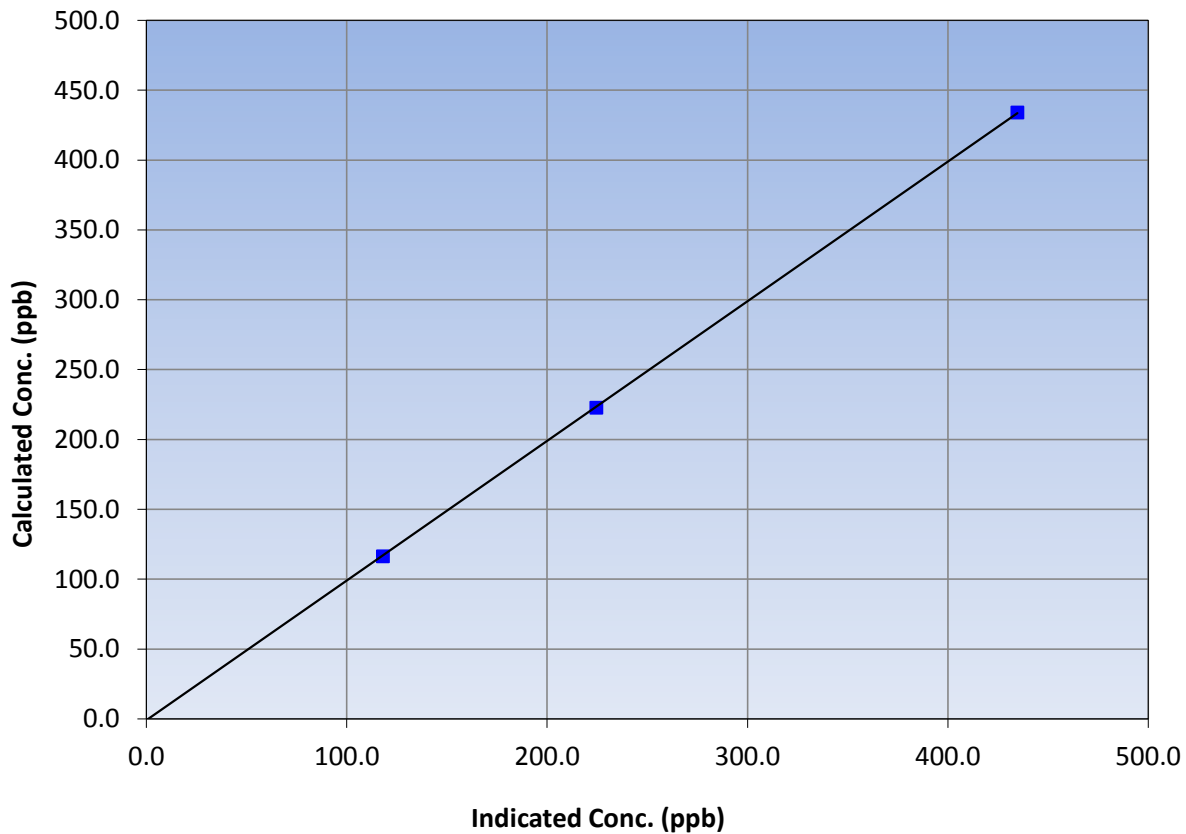
Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 17, 2017
Station Name	Horizon	Station Number	AMS 15
Start Time (MST)	8:36	End Time (MST)	13:35
Analyzer make	Thermo 42i	Analyzer serial #	710321429

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
434.1	434.7	0.9985			
222.7	224.6	0.9919			
116.3	118.1	0.9846			
			Slope	0.999215	0.90 - 1.10
			Intercept	-0.909970	+/-20

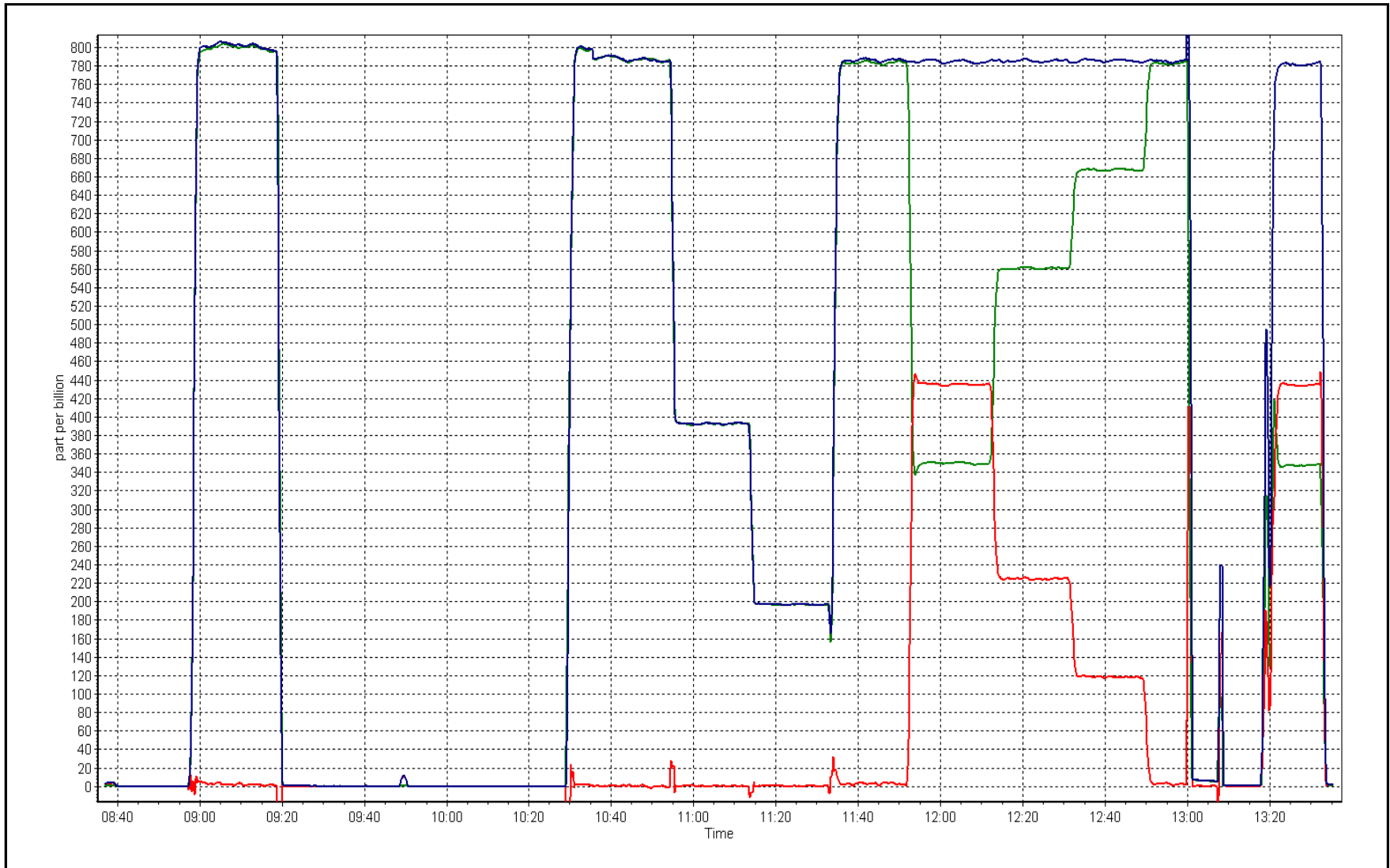
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 19, 2017

Location: Horizon





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Horizon	Station number:	AMS 15
Calibration Date:	April 19, 2017	Last Cal Date:	March 22, 2017
Start time (MST):	11:51	End time (MST):	13:03
Sharp Model:	5030	S/N:	E-2020
Particulate Fraction:	PM2.5	C14 Source S/N:	7409
Flow Meter Make/Model:	Delta cal	S/N:	1019
Temp/RH standard:	NA	S/N:	NA

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	2.0	2.2	2.2	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	968.0	978.0	975.0	<input checked="" type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000.0	1099.0	1008.0	<input checked="" type="checkbox"/>	+/- 50 LPH
Nephelometer zero	0.0	-----	0.0	<input type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: April 19, 2017 Last Cal Date: March 22, 2017
 Flow w/o adaptor: 16.78 Flow w/ adaptor: 16.70

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>2395</u>	Foil S/N: <u>2022</u>	
Foil Calibration	Foil Mass: _____	Foil Mass: <u>February 6, 2017</u>	
	Calibration Date: _____	Calibration Date: _____	
(Limit) +/- 5% of previous	Correction Factor: _____	Correction Factor: <u>7127</u>	---

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Adjusted pressure and flow. Leak check done after as founds; passed. Cyclone head cleaned at site.

Calibration by: Asad Hidayat



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS 16
MUSKEG RIVER
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MUSKEG RIVER (AMS 16)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	684	36	36	100	49	0	6	0
THC (ppm) Average	684	36	36	100	5.2	-	2.8	-
NO2 (ppb) Average	684	36	36	100	46	0	19	-
NO (ppb) Average	684	36	36	100	73	-	19	-
NOX (ppb) Average	684	36	36	100	118	-	38	-
PM2.5 (ug/m3) Average	719	1	1	100	45.1	-	9.3	0
Temperature 2 m (C) Average	720	0	0	100	18.3	-	10	-
Relative Humidity (%) Average	720	0	0	100	98	-	80	-
Barometric Pressure (inHg) Average	720	0	0	100	29.5	-	29.4	-
Wind Speed 10 m (km/h) Average	720	0	0	100	31	-	23	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MUSKEG RIVER (AMS 16)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	1.2	3	-	0	0	0	0	1	2	49
THC (ppm) Average	684	2.4	0.4	-	2	2.1	2.2	2.3	2.5	2.7	5.2
NO2 (ppb) Average	684	8.4	8	-	0	1	2	6	13	20	46
NO (ppb) Average	684	6.2	9	-	0	0	0	2	9	19	73
NOX (ppb) Average	684	14.6	16	-	0	1	3	9	21	36	118
PM2.5 (ug/m3) Average	719	5.22	4.4	-	0.7	1.8	2.6	3.8	6.2	10	45.1
Temperature 2 m (C) Average	720	1.97	6	-	-13.9	-5.5	-3.1	1.8	5.9	10.6	18.3
Relative Humidity (%) Average	720	59.4	18	-	18	35	46	59	72	85	98
Barometric Pressure (inHg) Average	720	28.94	0.2	-	28.5	28.6	28.8	28.9	29.1	29.3	29.5
Wind Speed 10 m (km/h) Average	720	12.7	7	-	1	5	7	12	18	23	31
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MUSKEG RIVER (AMS 16)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
-----------	-----------------	---------------	---------------------	-------

No operational issues to report



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Muskeg River - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 49 ppb on Apr 10 12:00	Maximum Daily Average: 5.7 ppb on Apr 10		Hours of Data:	684
Minimum Value: 0 ppb on Apr 1 04:00	Minimum Daily Average: 0.0 ppb on Apr 13		Hours of Missing Data:	36
Maximum Diurnal Average: 3.5 ppb at hour 12	Minimum Diurnal Average: 0.1 ppb at hour 5		Hours of Calibration:	36
Monthly Average: 1.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 18		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2	
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0.2	1	
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0.2	1	
4-Apr	0	0	0	0	Z	0	0	1	1	1	1	2	2	6	3	3	2	1	2	0	0	0	0	0	1.0	6	
5-Apr	0	0	0	0	0	Z	0	0	2	2	0	0	0	0	1	1	0	1	2	3	2	0	0	0	0.6	3	
6-Apr	Z	0	0	0	0	0	0	0	6	3	0	2	1	0	0	0	0	0	1	1	0	0	0	0	0.7	6	
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0.4	1	
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0.4	1	
9-Apr	0	0	0	Z	0	0	0	3	5	5	7	6	7	9	10	10	9	8	4	1	1	0	0	0	3.8	10	
10-Apr	0	0	1	1	Z	2	1	2	5	9	33	49	18	5	1	1	0	1	0	0	0	0	0	1	5.7	49	
11-Apr	1	1	1	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1	
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
14-Apr	0	0	Z	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1	
15-Apr	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
16-Apr	0	0	0	0	Z	0	4	15	11	9	10	3	0	0	0	0	0	0	2	0	6	9	5	0	3.3	15	
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
19-Apr	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	11	4	2	1	4	9	2	1	1	1	--	11
20-Apr	0	0	Z	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
22-Apr	0	0	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
24-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
25-Apr	0	Z	0	0	0	0	0	0	2	1	0	0	1	1	1	2	2	1	2	1	0	0	0	0	0.6	2	
26-Apr	0	0	Z	0	0	0	3	6	0	1	3	2	15	11	12	7	3	3	2	1	0	0	0	0	3.0	15	
27-Apr	0	0	0	Z	0	0	0	7	19	5	0	1	2	5	8	9	9	5	3	1	1	1	1	1	3.3	19	
28-Apr	1	1	0	0	Z	0	0	1	2	1	1	0	1	2	1	1	1	1	1	1	0	0	0	0	0.8	2	
29-Apr	0	0	0	1	1	Z	1	0	0	0	15	23	4	1	3	4	3	3	2	5	2	1	1	1	3.1	23	
30-Apr	Z	0	0	0	0	0	1	2	22	19	14	11	2	4	0	0	0	0	0	0	2	1	0	0	3.5	22	

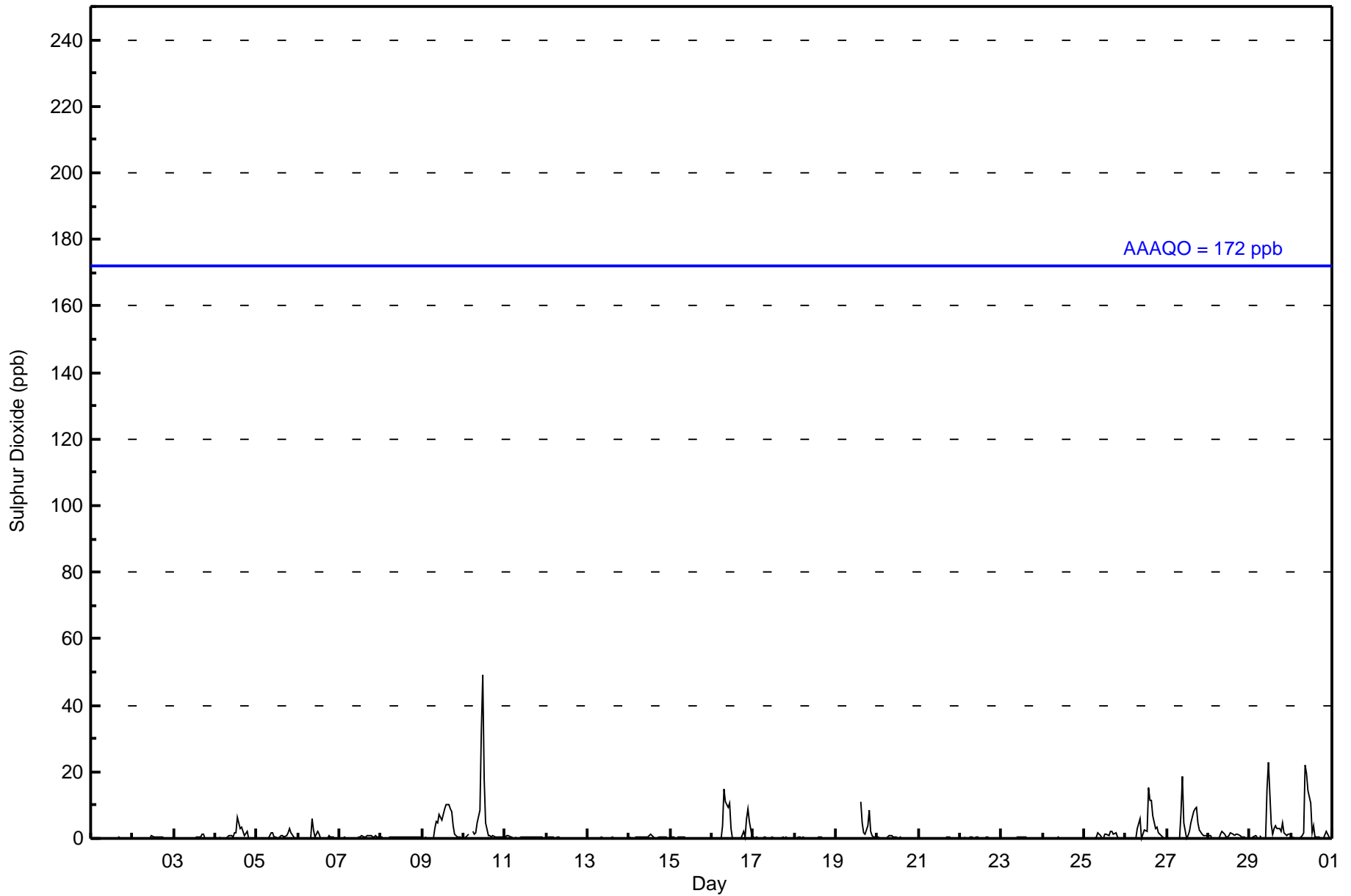
0.2	0.2	0.2	0.2	0.1	0.2	0.4	1.0	2.5	2.5	3.2	3.5	1.5	1.7	1.7	1.7	1.3	1.2	1.0	0.9	0.7	0.6	0.4	0.2	Diurnal Average	
2	1	1	1	1	2	4	15	22	19	33	49	18	15	11	12	9	9	5	9	6	9	5	1	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Muskeg River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	668	97.66	97.66
11 - 20	12	1.75	99.42
21 - 60	4	0.58	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	45	148	81	53	8	13	16	60	96	66	24	11	7	15	13	12	668
11 - 20	0	0	0	0	0	0	0	0	3	6	3	0	0	0	0	0	12
21 - 60	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	148	81	53	8	13	16	60	99	74	29	11	7	15	13	12	684

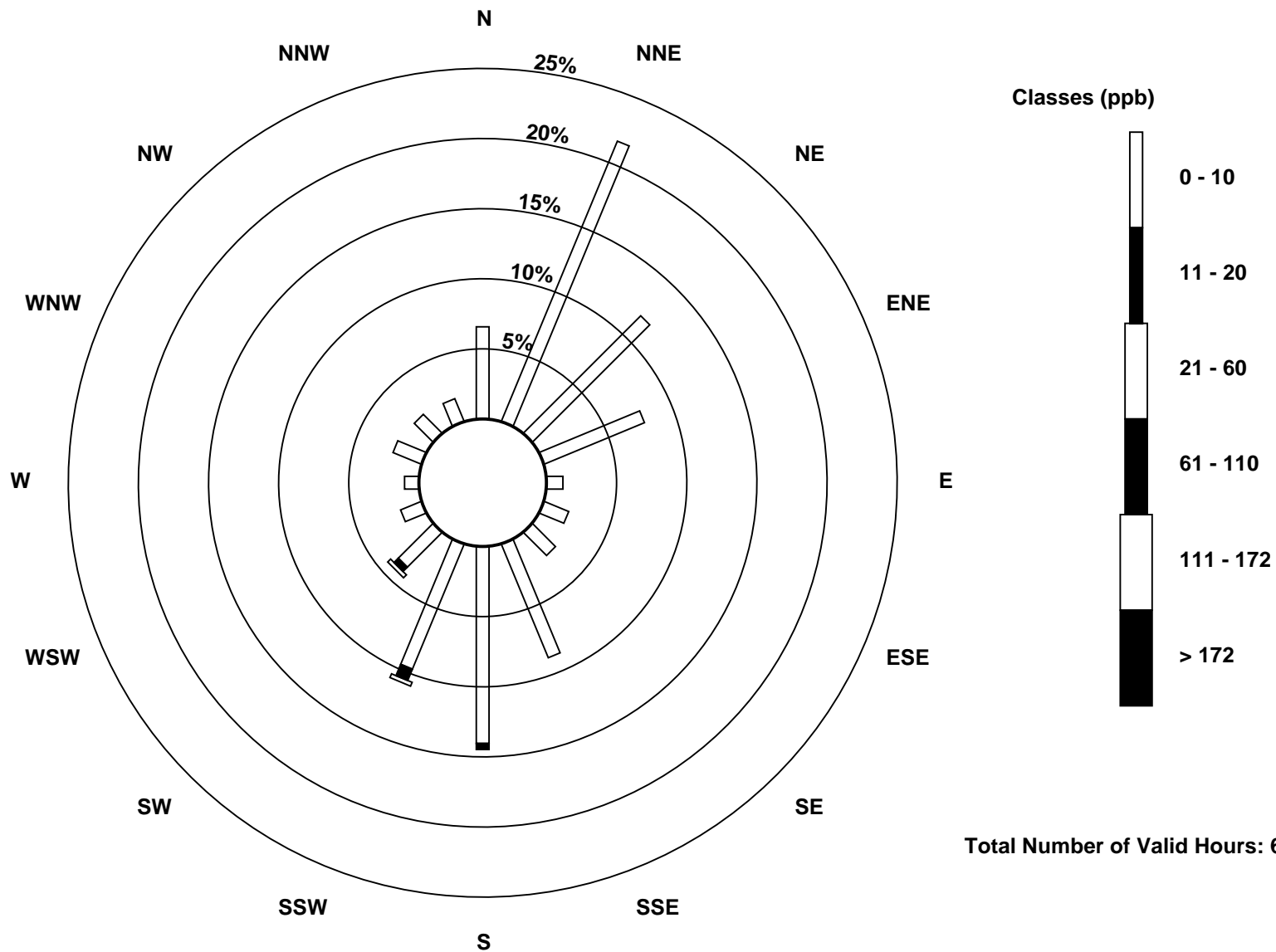
Total Number of Valid Hours: 684

Total Number of Hours: 720

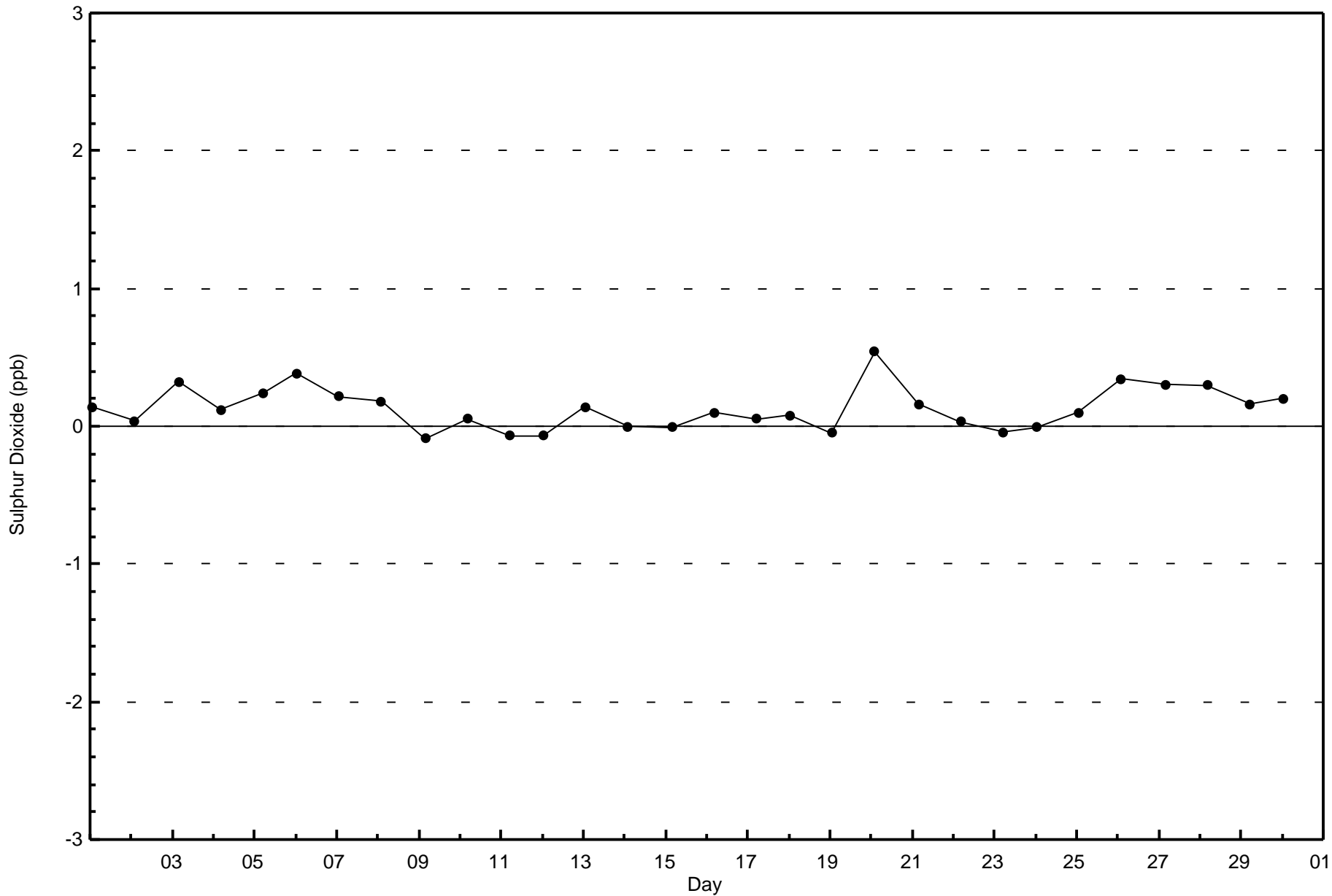


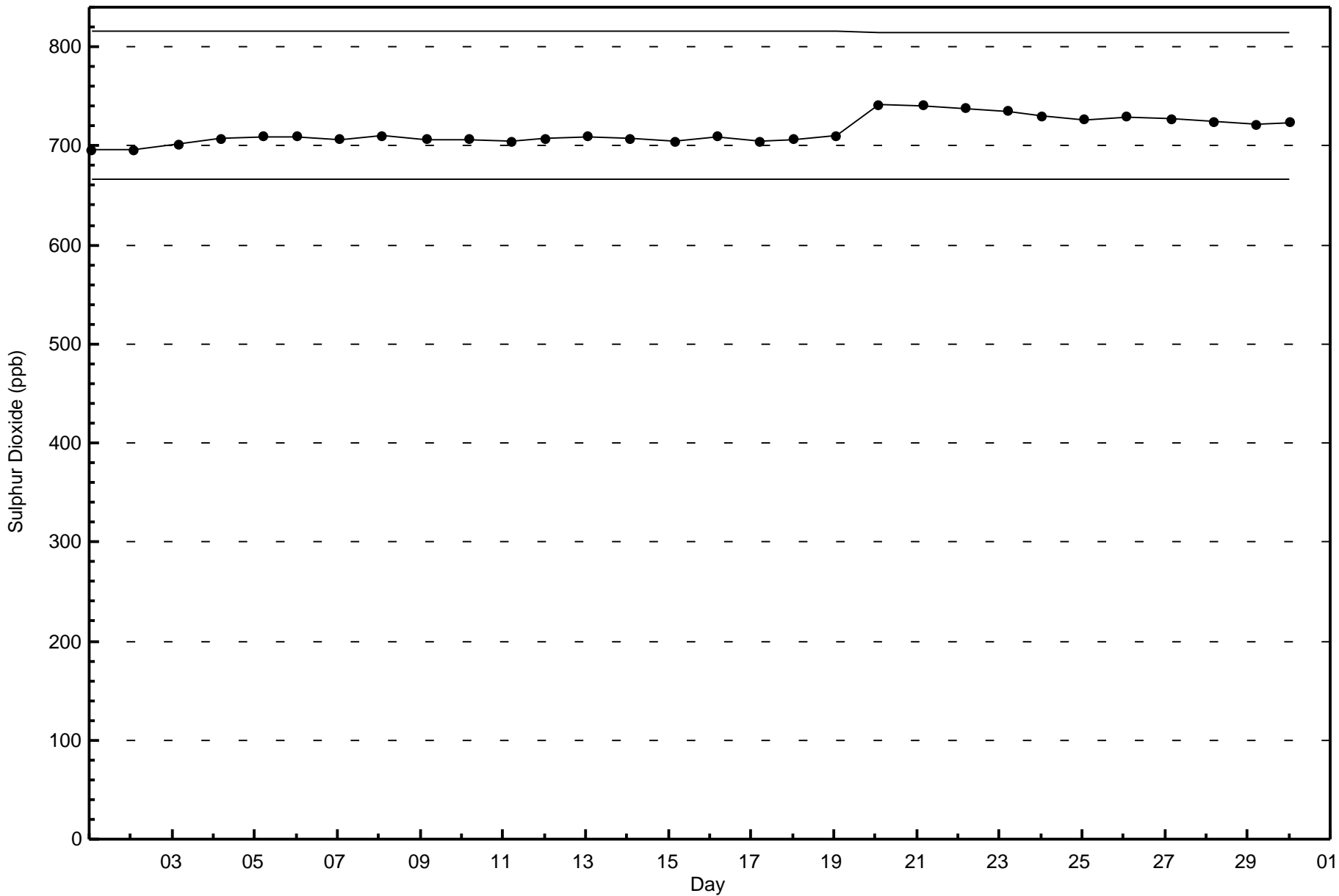
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Muskeg River (AMS 16)



Total Number of Valid Hours: 684







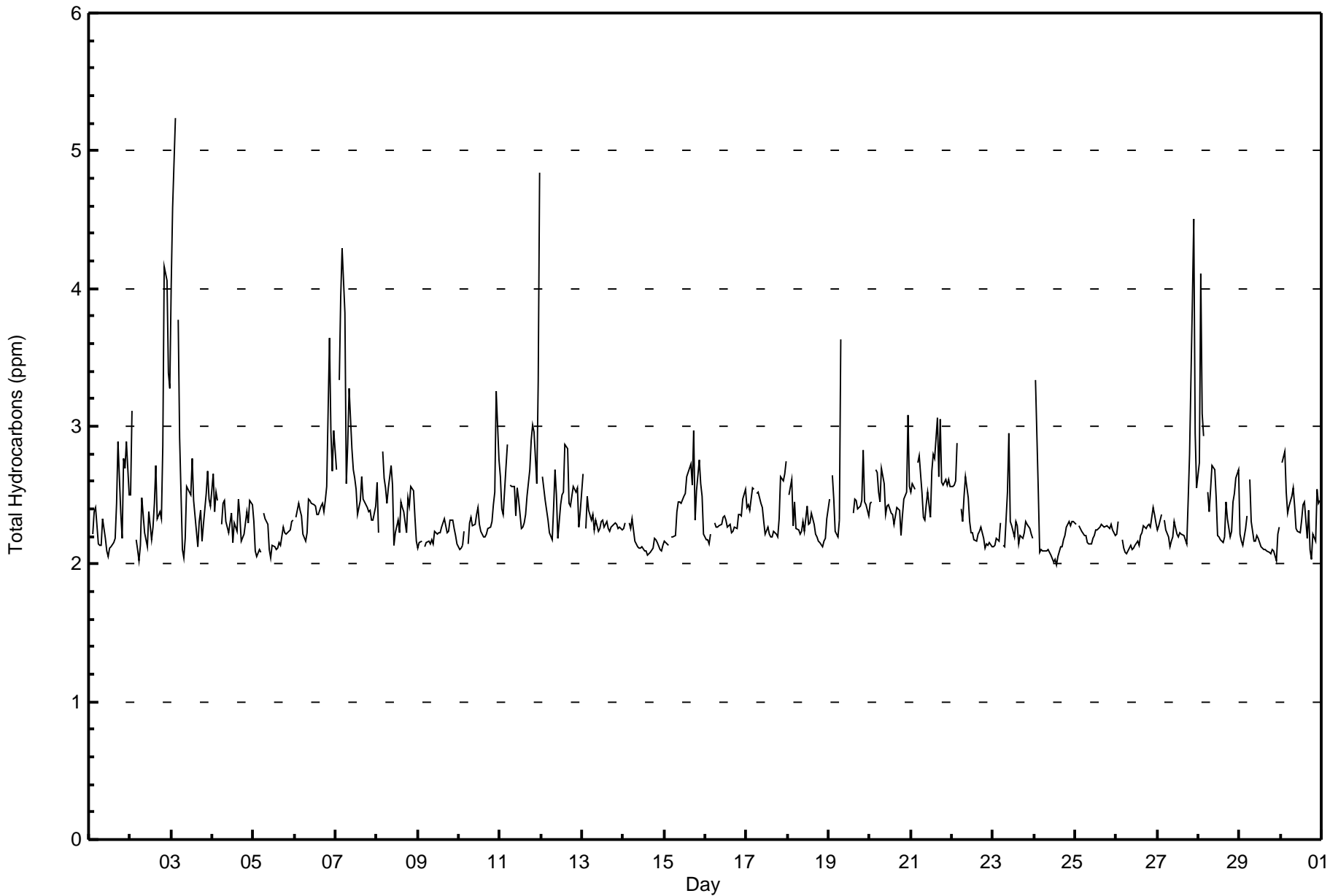
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Muskeg River - April 2017

Maximum Value: 5.2 ppm on Apr 3 03:00		Maximum Daily Average: 2.8 ppm on Apr 7		Hours in Service: 720																							
Minimum Value: 2.0 ppm on Apr 24 14:00		Minimum Daily Average: 2.2 ppm on Apr 14		Hours of Data: 684																							
Maximum Diurnal Average: 2.6 ppm at hour 2		Minimum Diurnal Average: 2.3 ppm at hour 14		Hours of Missing Data: 36																							
Monthly Average: 2.40 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.5 P ₉₀ = 2.7 P ₉₉ = 4.1		Hours of Calibration: 36																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	2.3	Z	2.2	2.4	2.4	2.1	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.9	2.4	2.2	2.8	2.7	2.9	2.5	2.3	2.9	
2-Apr	2.5	3.1	Z	2.2	2.1	2.0	2.1	2.5	2.2	2.2	2.1	2.4	2.2	2.3	2.4	2.7	2.3	2.4	2.3	2.9	4.2	4.1	3.4	3.3	2.6	4.2	
3-Apr	4.0	4.6	5.2	Z	3.8	2.9	2.1	2.0	2.2	2.6	2.5	2.5	2.8	2.5	2.4	2.1	2.3	2.4	2.2	2.3	2.5	2.7	2.5	2.4	2.8	5.2	
4-Apr	2.7	2.4	2.5	2.5	Z	2.3	2.4	2.5	2.3	2.2	2.3	2.4	2.2	2.3	2.2	2.5	2.4	2.2	2.2	2.3	2.4	2.3	2.5	2.4	2.4	2.7	
5-Apr	2.3	2.1	2.1	2.1	2.1	Z	2.4	2.3	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.4	
6-Apr	Z	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6	3.6	3.0	2.7	3.0	2.5	3.6	
7-Apr	2.7	Z	3.3	3.9	4.3	3.8	2.6	2.9	3.3	2.8	2.7	2.6	2.5	2.4	2.5	2.6	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.8	4.3	
8-Apr	2.6	2.2	Z	2.8	2.6	2.6	2.4	2.6	2.7	2.6	2.1	2.2	2.3	2.2	2.5	2.4	2.4	2.2	2.5	2.4	2.6	2.5	2.3	2.2	2.4	2.8	
9-Apr	2.1	2.2	2.2	Z	2.1	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.2	2.3	
10-Apr	2.1	2.1	2.1	2.2	Z	2.1	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.5	3.3	2.8	2.3	3.3	
11-Apr	2.6	2.4	2.4	2.7	2.9	Z	2.6	2.6	2.6	2.3	2.5	2.5	2.3	2.3	2.3	2.4	2.5	2.7	2.9	3.0	3.0	2.6	3.3	4.8	2.7	4.8	
12-Apr	Z	2.6	2.5	2.4	2.3	2.2	2.2	2.4	2.7	2.5	2.2	2.4	2.5	2.5	2.9	2.8	2.4	2.4	2.5	2.6	2.5	2.6	2.3	2.4	2.5	2.9	
13-Apr	2.7	Z	2.3	2.5	2.4	2.3	2.4	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.7	
14-Apr	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	
15-Apr	2.2	2.2	2.1	Z	2.2	2.2	2.2	2.4	2.5	2.5	2.4	2.5	2.5	2.6	2.7	2.7	2.6	3.0	2.3	2.5	2.8	2.6	2.5	2.2	2.4	3.0	
16-Apr	2.2	2.2	2.1	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.3	2.5	2.5	2.3	2.5	
17-Apr	2.4	2.4	2.4	2.6	2.5	Z	2.5	2.5	2.4	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.6	2.7	2.7	2.4	2.7
18-Apr	Z	2.5	2.6	2.3	2.4	2.3	2.2	2.2	2.2	2.3	2.2	2.4	2.3	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.6
19-Apr	2.5	Z	2.6	2.5	2.2	2.2	2.3	3.6	C	C	C	C	C	C	2.4	2.5	2.5	2.4	2.4	2.5	2.8	2.4	2.4	2.3	--	3.6	
20-Apr	2.4	2.5	Z	2.7	2.7	2.5	2.5	2.7	2.6	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.2	2.4	2.5	2.5	3.1	2.6	2.5	3.1	
21-Apr	2.5	2.6	2.5	Z	2.7	2.8	2.5	2.3	2.3	2.4	2.5	2.3	2.7	2.8	2.8	3.1	2.6	3.0	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	3.1
22-Apr	2.6	2.6	2.6	2.9	Z	2.4	2.3	2.5	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.2	2.1	2.2	2.1	2.3	2.9	
23-Apr	2.1	2.1	2.2	2.2	2.3	Z	2.1	2.1	2.5	3.0	2.3	2.3	2.2	2.3	2.3	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	3.0	
24-Apr	Z	3.3	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.2	3.3	
25-Apr	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	
26-Apr	2.2	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.4	
27-Apr	2.2	2.3	2.4	Z	2.3	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.5	2.8	3.9	4.5	2.9	2.6	2.5	4.5
28-Apr	2.7	4.1	3.1	2.9	Z	2.5	2.4	2.5	2.7	2.7	2.5	2.2	2.2	2.2	2.2	2.2	2.5	2.3	2.2	2.2	2.5	2.5	2.6	2.7	2.5	4.1	
29-Apr	2.2	2.2	2.1	2.3	2.3	Z	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.3	2.2	2.6	
30-Apr	Z	2.7	2.8	2.5	2.4	2.4	2.5	2.6	2.4	2.3	2.2	2.2	2.3	2.4	2.5	2.2	2.4	2.1	2.0	2.2	2.2	2.5	2.4	2.5	2.4	2.8	
		2.5	2.6	2.5	2.5	2.5	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.5	2.5	2.5	Diurnal Average		
		4.0	4.6	5.2	3.9	4.3	3.8	2.6	3.6	3.3	3.0	2.7	2.6	2.8	2.8	2.9	3.1	2.6	3.0	2.9	3.0	4.2	4.5	3.4	4.8	Diurnal Maximum	
Z - zerospan		C - Calibration																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Muskeg River - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	8	1.17	1.17
2.1 - 3.0	650	95.03	96.20
3.1 - 10.0	26	3.80	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Muskeg River - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	3	0	0	1	0	3	1	0	0	0	0	0	0	8
2.1 - 3.0	33	144	80	50	8	13	15	60	95	73	28	11	7	14	13	6	650
3.1 - 10.0	12	4	1	0	0	0	0	0	1	0	1	0	0	1	0	6	26
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	148	81	53	8	13	16	60	99	74	29	11	7	15	13	12	684

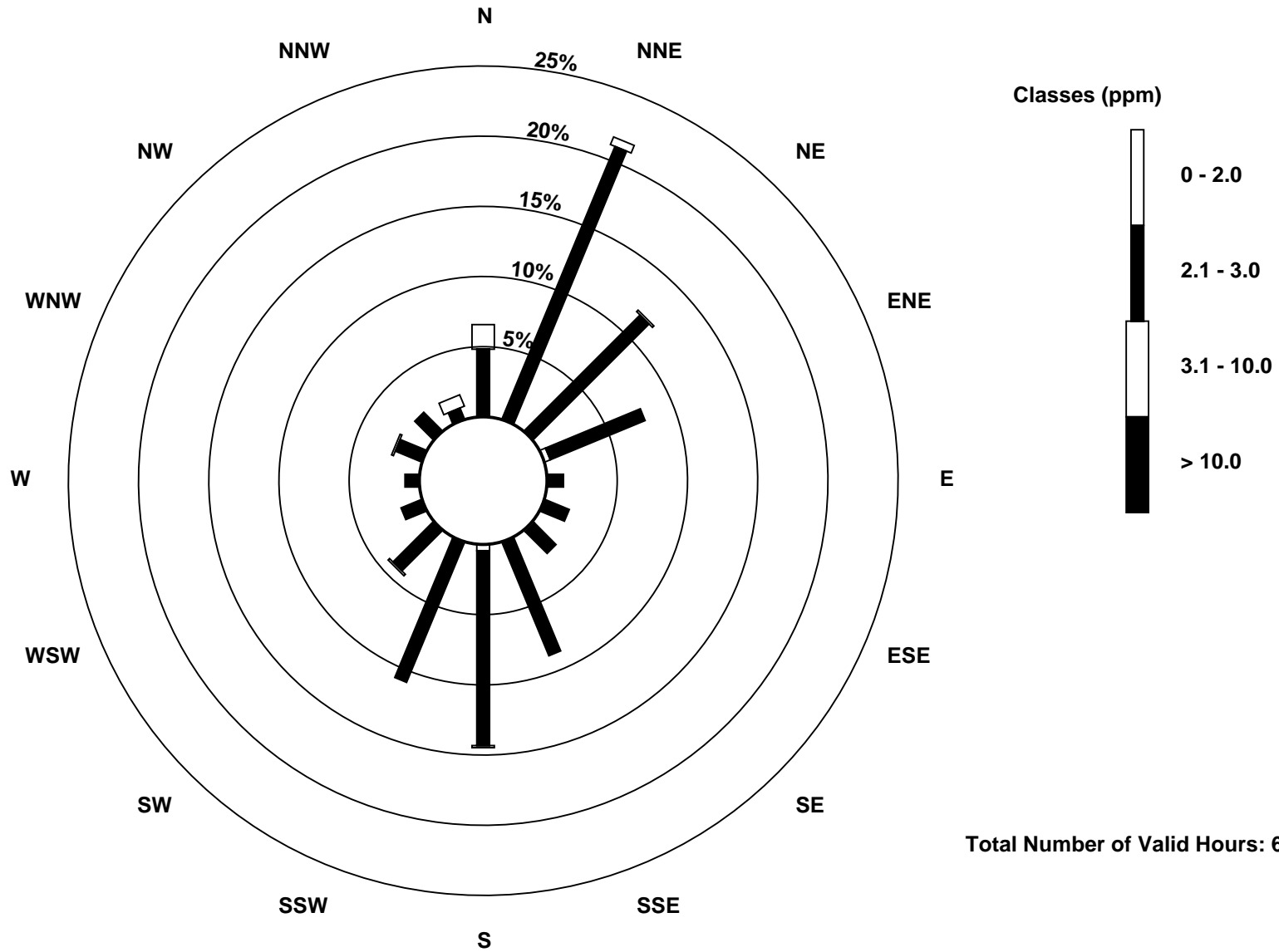
Total Number of Valid Hours: 684

Total Number of Hours: 720

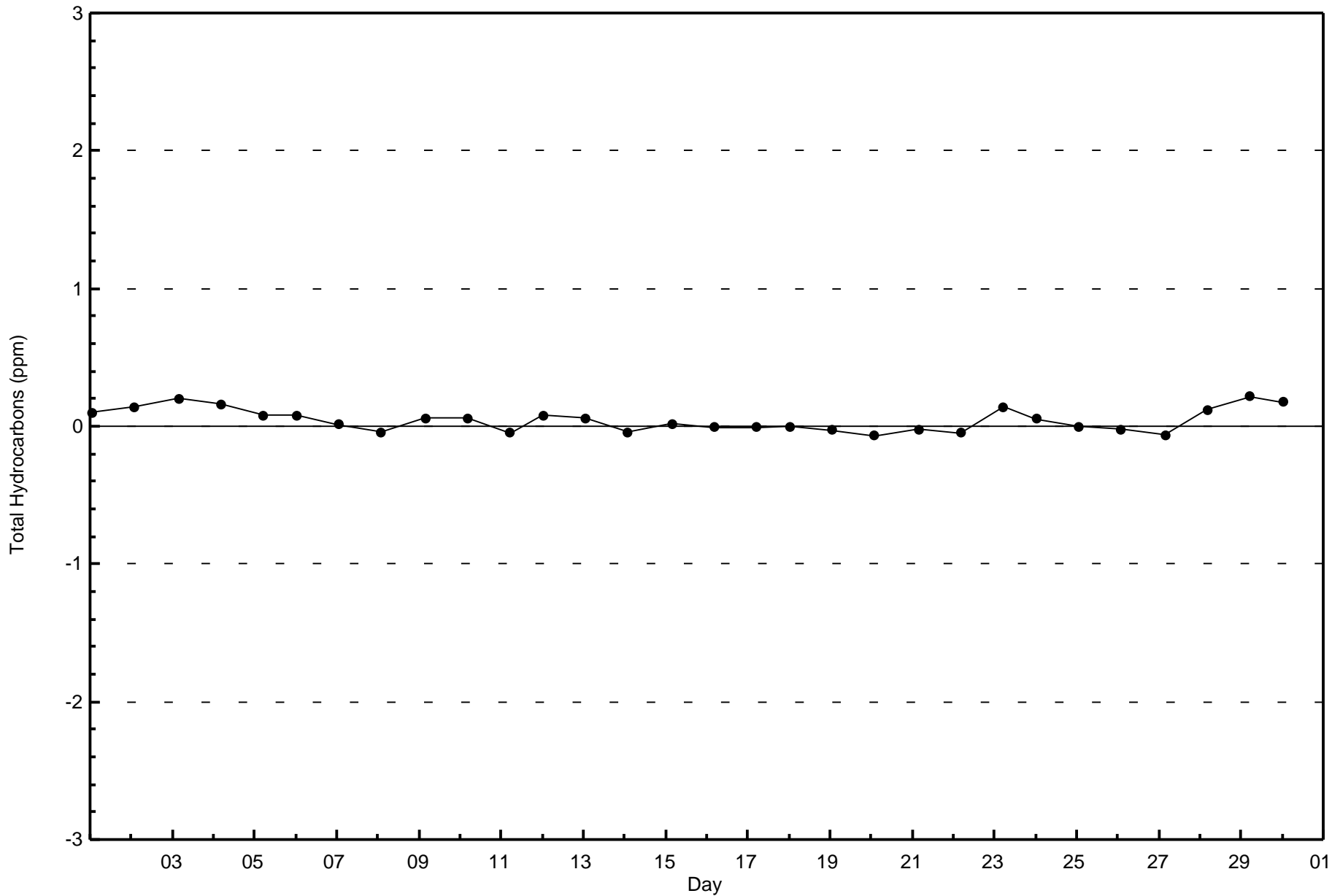


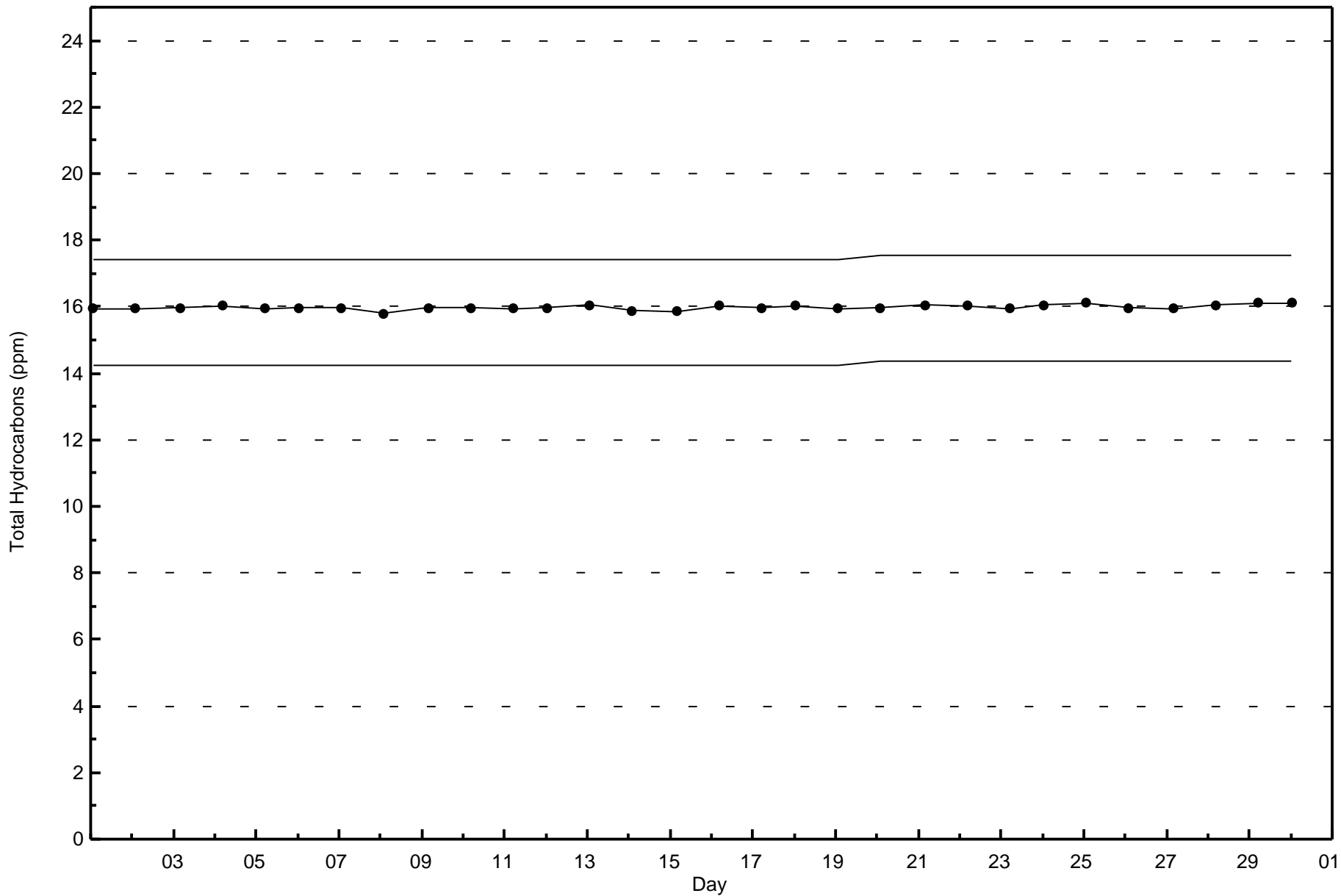
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Muskeg River (AMS 16)



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

Nitric Oxide (NO) - ppb
Muskeg River - April 2017

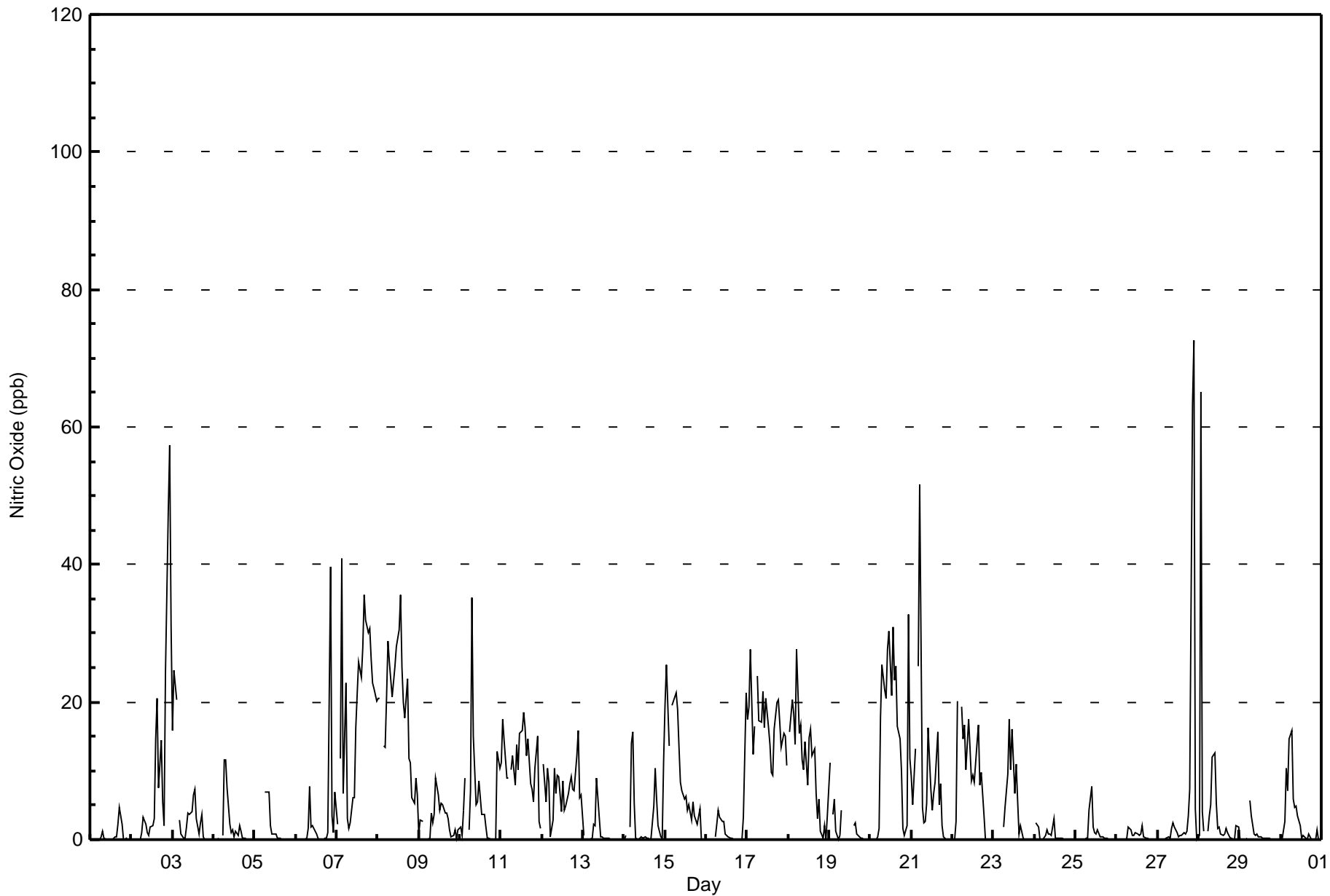
Maximum Value: 73 ppb on Apr 27 22:00																	Maximum Daily Average: 19.2 ppb on Apr 8																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 1 01:00																	Minimum Daily Average: 0.5 ppb on Apr 26																	Hours of Data: 684	
Maximum Diurnal Average: 8.4 ppb at hour 2																	Minimum Diurnal Average: 3.1 ppb at hour 20																	Hours of Missing Data: 36	
Monthly Average: 6.2 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 2 Q ₃ = 9 P ₉₀ = 19 P ₉₉ = 38																	Hours of Calibration: 36	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2	5	2	0	0	0	0	0	0.5	5									
2-Apr	0	0	Z	0	0	0	1	3	2	1	1	2	2	3	15	20	7	15	5	2	24	48	57	31	10.5	57									
3-Apr	16	25	20	Z	3	1	0	0	2	4	4	4	7	7	3	1	2	4	0	0	0	0	0	0	4.5	25									
4-Apr	0	0	0	0	Z	1	12	12	8	2	1	1	0	1	1	2	1	0	0	0	0	0	0	0	1.8	12									
5-Apr	0	0	0	0	0	Z	7	7	7	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1.1	7									
6-Apr	Z	0	0	0	0	0	0	2	8	2	2	1	1	0	0	0	0	0	0	1	40	3	1	7	3.0	40									
7-Apr	2	Z	12	41	7	23	3	2	2	6	6	16	21	26	24	28	36	32	30	31	26	23	22	20	19.0	41									
8-Apr	21	21	Z	14	13	21	29	26	21	23	25	28	31	36	25	20	18	23	12	11	6	5	9	7	19.2	36									
9-Apr	1	3	3	Z	0	0	0	4	3	4	9	6	4	5	5	4	4	3	1	0	1	1	0	2	2.7	9									
10-Apr	2	1	4	9	Z	1	7	35	15	5	5	9	6	4	4	2	0	0	0	0	0	0	13	10	5.7	35									
11-Apr	11	17	14	9	9	Z	10	12	8	14	10	15	16	19	16	12	15	8	7	6	10	15	3	2	11.3	19									
12-Apr	Z	11	6	10	8	0	3	10	7	9	9	4	9	4	5	7	8	9	7	7	12	16	6	7	7.6	16									
13-Apr	1	Z	0	0	0	0	2	2	9	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	9									
14-Apr	0	1	Z	2	14	16	5	0	0	0	0	0	0	0	0	0	0	5	10	6	2	0	0	11	3.2	16									
15-Apr	20	25	14	Z	20	20	21	19	13	8	7	6	6	4	5	3	6	4	3	2	4	0	0	0	9.2	25									
16-Apr	0	0	0	0	Z	0	2	4	3	3	3	1	1	0	0	0	0	0	0	0	0	0	3	21	1.9	21									
17-Apr	18	19	28	12	17	Z	24	17	17	22	16	21	16	14	10	9	16	20	20	17	13	15	15	11	16.8	28									
18-Apr	Z	16	20	18	14	28	15	17	12	10	14	8	15	16	12	13	7	3	6	1	0	2	0	3	10.9	28									
19-Apr	11	Z	4	6	1	0	1	4	C	C	C	C	C	C	2	2	1	1	0	0	0	0	0	0	--	11									
20-Apr	0	0	Z	0	0	2	18	25	22	20	28	30	21	31	23	25	17	15	10	2	1	2	33	12	14.6	33									
21-Apr	9	5	13	Z	25	52	5	2	3	5	16	7	4	7	8	16	5	8	2	0	0	0	0	0	8.4	52									
22-Apr	0	0	3	20	Z	19	15	17	10	17	13	8	9	8	14	17	8	10	3	0	0	0	0	0	8.4	20									
23-Apr	0	0	0	0	0	Z	2	5	10	18	10	16	7	11	6	1	2	0	0	0	0	0	0	0	3.8	18									
24-Apr	Z	2	2	0	0	0	1	1	1	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0.6	3									
25-Apr	0	Z	0	0	0	0	0	0	4	8	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0.8	8									
26-Apr	0	0	Z	0	0	0	0	2	1	1	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0.5	2									
27-Apr	0	0	0	Z	0	0	0	0	2	2	2	1	0	1	1	1	1	1	3	7	63	73	4	0	7.1	73									
28-Apr	1	65	4	1	Z	1	3	5	12	13	5	2	2	1	1	1	2	1	0	0	0	0	2	2	5.3	65									
29-Apr	0	0	0	0	0	Z	6	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	6									
30-Apr	Z	0	3	10	7	15	16	6	5	5	4	2	0	1	0	0	1	0	0	0	0	2	0	0	3.3	16									
																	Diurnal Average		Diurnal Maximum																
																	4.5		21																
																	8.4		65																
																	5.9		28																
																	6.1		41																
																	5.5		25																
																	8.0		52																
																	7.0		29																
																	8.2		35																
																	7.1		22																
																	7.2		23																
																	6.8		28																
																	6.8		30																
																	6.3		31																
																	7.0		36																
																	6.1		25																
																	6.3		28																
																	5.3		36																
																	5.6		32																
																	4.2		30																
																	3.1		31																
																	6.8		63																
																	6.9		73																
																	5.6		57																
																	4.8		31																

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Muskeg River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	629	91.96	91.96
21 - 40	48	7.02	98.98
41 - 80	7	1.02	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	39	107	81	53	8	13	16	60	98	74	29	11	7	15	12	6	629
21 - 40	5	41	0	0	0	0	0	0	1	0	0	0	0	0	0	1	48
11 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	7
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	148	81	53	8	13	16	60	99	74	29	11	7	15	13	12	684

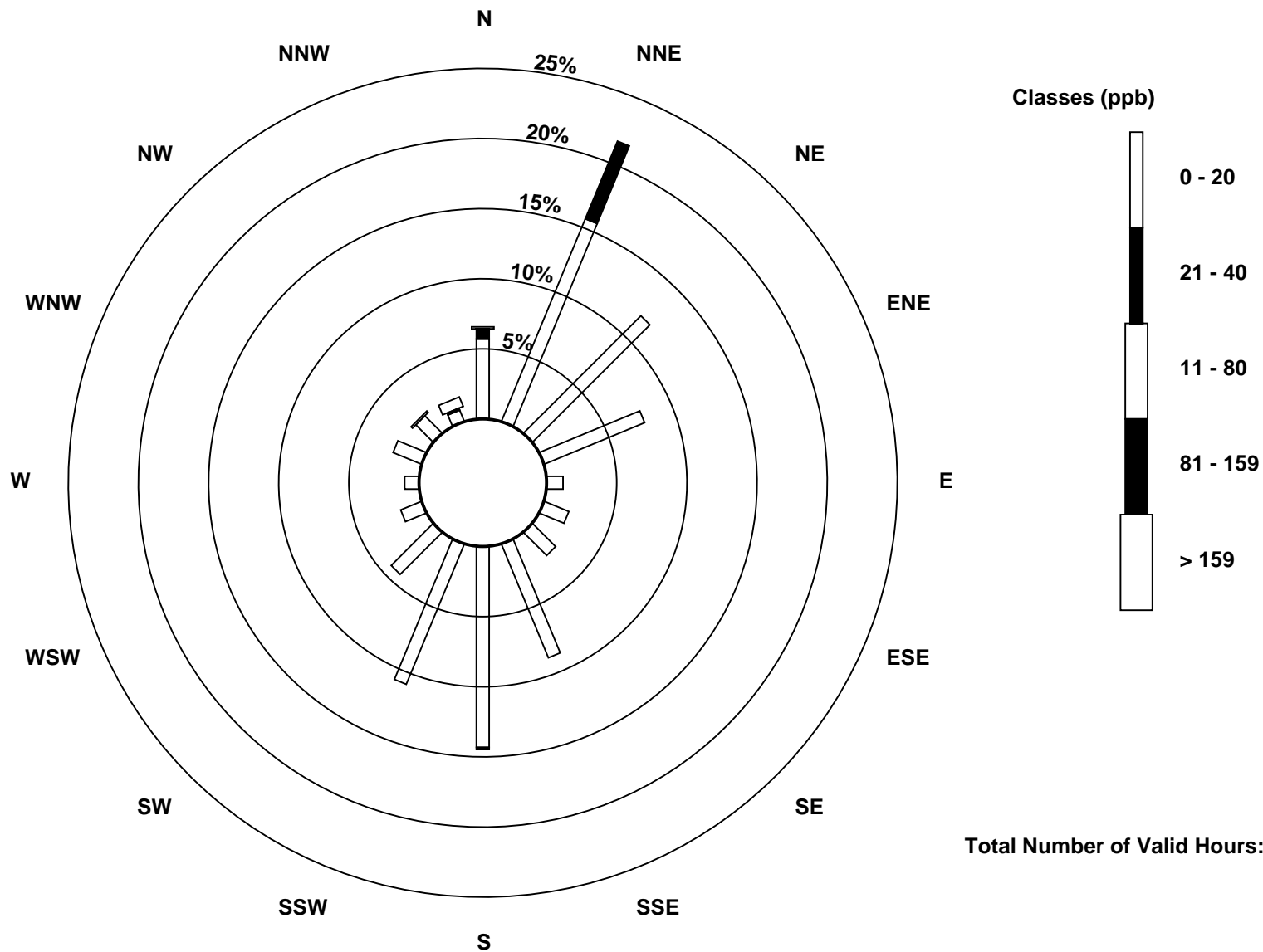
Total Number of Valid Hours: 684

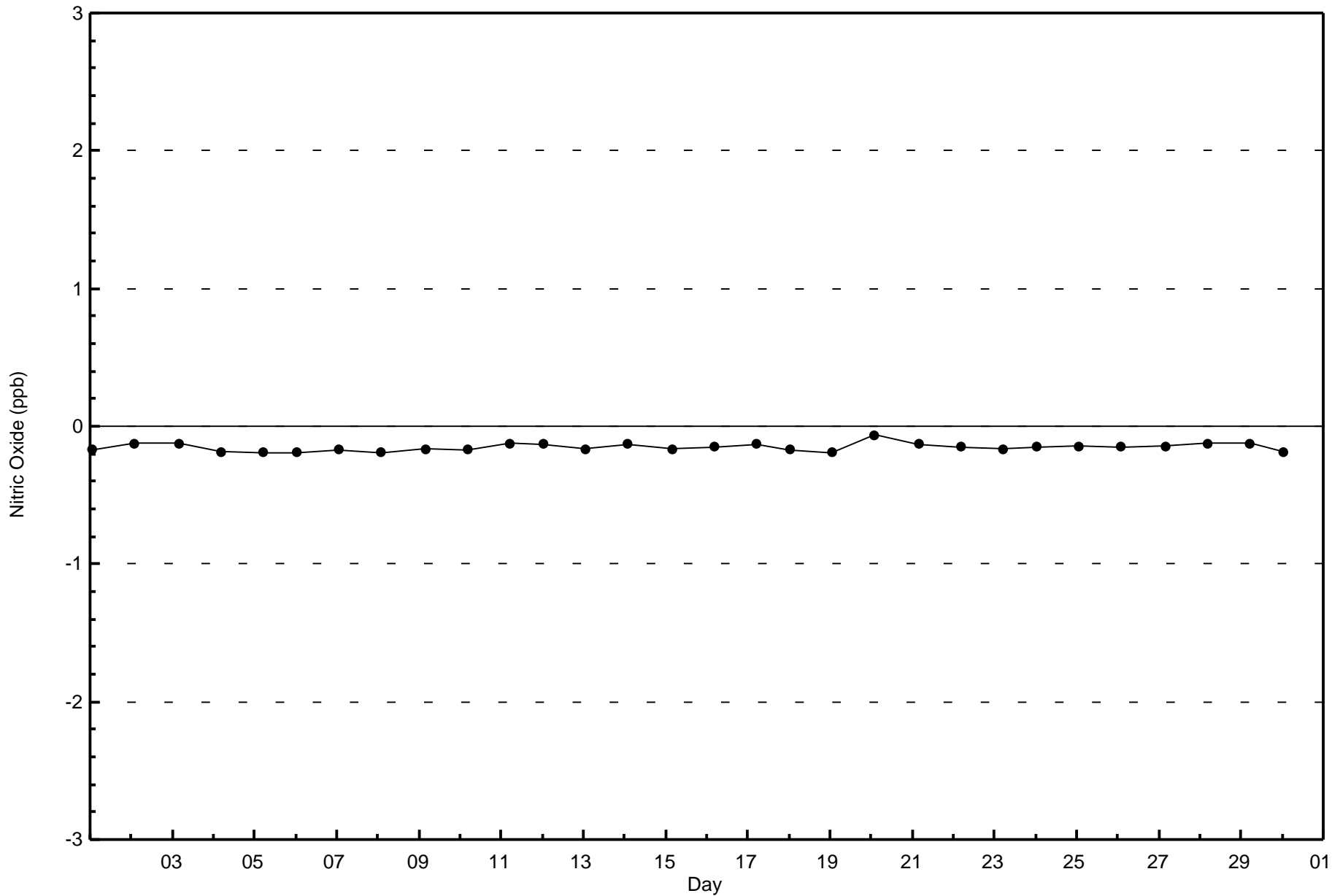
Total Number of Hours: 720

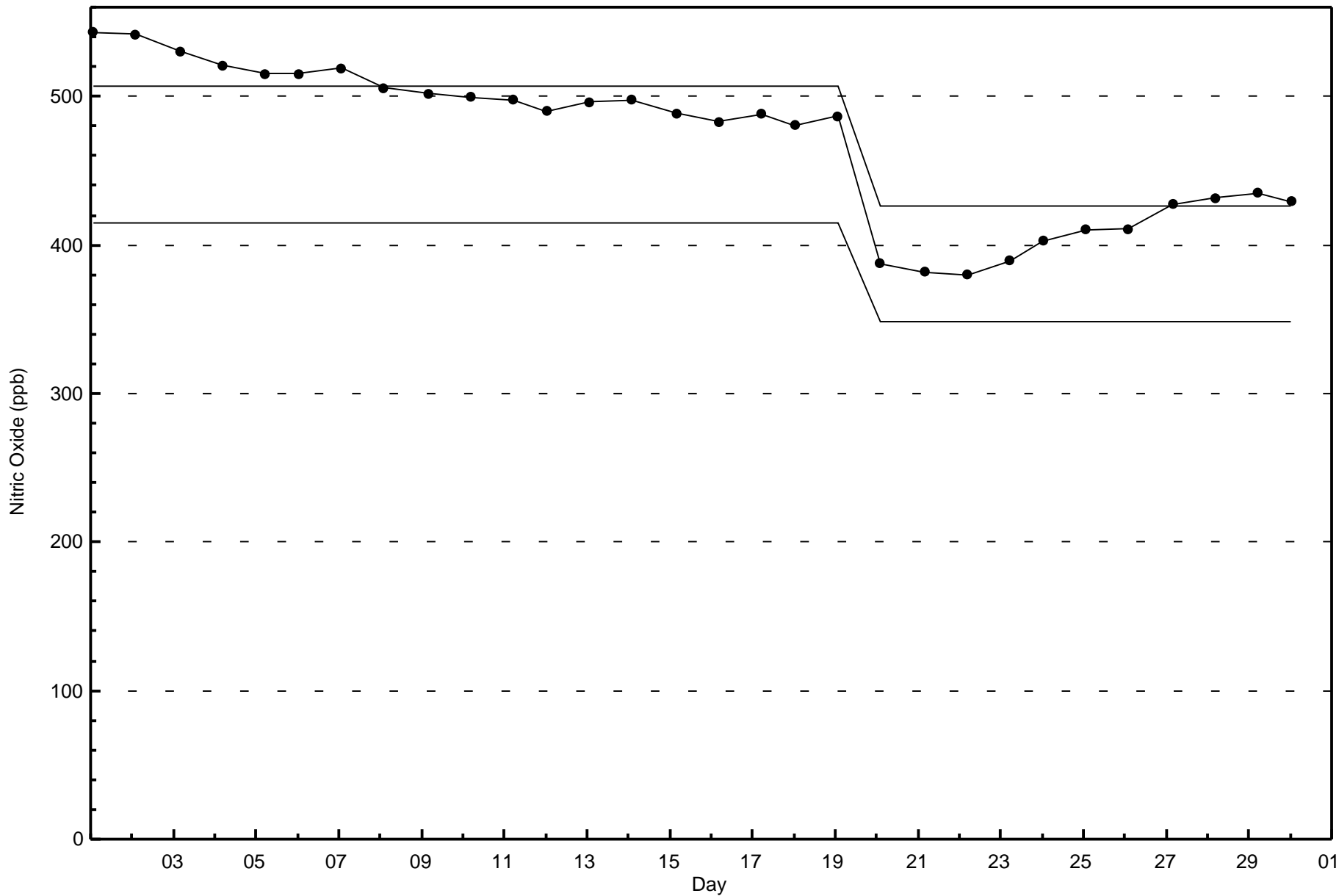


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Muskeg River (AMS 16)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Muskeg River - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 46 ppb on Apr 27 21:00	Maximum Daily Average: 19.1 ppb on Apr 7		Hours of Data:	684
Minimum Value: 0 ppb on Apr 1 04:00	Minimum Daily Average: 2.1 ppb on Apr 25		Hours of Missing Data:	36
Maximum Diurnal Average: 11.9 ppb at hour 2	Minimum Diurnal Average: 5.3 ppb at hour 13		Hours of Calibration:	36
Monthly Average: 8.4 ppb	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 6 Q ₃ = 13 P ₉₀ = 20 P ₉₉ = 36		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	2	Z	0	0	0	4	8	5	0	0	0	0	0	1	1	13	25	25	4	3	4	6	0	4.4	25	
2-Apr	1	0	Z	2	1	6	12	11	5	1	1	5	6	4	14	20	9	17	9	7	24	37	43	40	11.8	43
3-Apr	37	31	31	Z	18	8	2	0	4	9	8	8	11	13	8	3	12	12	8	9	5	4	4	8	10.9	37
4-Apr	7	10	14	17	Z	17	21	16	10	4	2	6	1	4	5	9	7	1	3	4	5	6	10	7	7.9	21
5-Apr	5	0	0	0	2	Z	14	15	14	8	2	1	2	0	0	0	0	2	2	6	5	7	17	19	5.2	19
6-Apr	Z	17	9	1	1	1	2	5	15	5	5	3	2	0	0	0	0	1	4	6	38	21	18	21	7.5	38
7-Apr	15	Z	22	34	17	31	8	5	5	7	7	15	18	21	21	23	27	27	24	25	23	23	21	20	19.1	34
8-Apr	21	18	Z	14	11	14	19	16	15	16	15	15	14	16	12	12	12	15	8	9	8	8	9	7	13.1	21
9-Apr	1	3	4	Z	1	1	3	4	6	6	8	6	5	5	6	6	6	6	5	7	4	3	0	4	4.3	8
10-Apr	9	12	22	26	Z	12	18	24	16	7	8	11	9	5	4	2	1	2	2	4	5	6	16	14	10.2	26
11-Apr	15	13	12	8	9	Z	10	10	7	10	9	10	11	14	14	12	13	8	8	12	17	20	7	7	11.2	20
12-Apr	Z	14	9	15	13	2	4	14	7	10	9	6	8	6	7	9	11	13	16	13	18	24	11	13	10.9	24
13-Apr	9	Z	3	5	8	11	13	7	9	4	1	1	0	1	1	1	0	0	0	0	0	0	0	0	3.2	13
14-Apr	0	3	Z	5	14	17	8	1	0	2	1	1	0	0	0	0	1	7	13	9	4	2	1	13	4.5	17
15-Apr	19	25	15	Z	17	18	19	14	12	8	6	6	6	7	7	5	7	7	6	8	15	7	6	0	10.4	25
16-Apr	7	4	0	3	Z	14	12	11	7	5	5	2	2	1	1	0	0	0	1	0	1	2	6	17	4.4	17
17-Apr	17	17	22	14	16	Z	17	14	12	13	11	10	9	7	6	6	10	12	13	13	11	14	12	10	12.3	22
18-Apr	Z	11	14	11	8	13	8	7	6	5	7	5	7	8	8	10	6	4	8	2	1	3	1	6	6.8	14
19-Apr	13	Z	8	10	2	0	5	13	C	C	C	C	C	C	5	7	4	4	4	6	4	3	4	8	--	13
20-Apr	12	10	Z	7	8	11	21	21	18	13	16	20	15	23	22	25	20	17	10	15	32	24	32	19	17.9	32
21-Apr	14	10	15	Z	27	33	9	5	2	5	15	8	7	10	12	21	11	20	12	9	7	7	7	8	11.9	33
22-Apr	10	12	14	20	Z	14	10	10	6	7	6	3	3	2	4	5	4	6	3	0	1	1	0	1	6.2	20
23-Apr	1	2	3	5	6	Z	4	5	8	13	7	10	5	8	6	2	3	2	2	6	2	1	0	0	4.3	13
24-Apr	Z	9	7	2	2	3	3	6	2	2	1	3	1	1	1	2	1	0	1	0	1	1	1	0	2.1	9
25-Apr	1	Z	1	1	1	1	1	1	2	3	3	3	3	2	3	1	2	2	1	2	2	2	4	7	2.1	7
26-Apr	11	19	Z	5	2	2	3	8	5	3	3	3	3	3	3	4	3	2	3	2	2	6	4	2	4.3	19
27-Apr	0	6	15	Z	7	4	4	1	5	7	5	3	2	3	3	3	4	6	20	26	46	46	14	5	10.2	46
28-Apr	15	37	25	20	Z	9	11	15	19	19	12	4	6	4	4	6	14	11	7	10	20	20	25	23	14.6	37
29-Apr	2	2	4	11	19	Z	22	12	3	2	3	3	2	2	2	2	2	2	1	1	2	2	2	3	4.5	22
30-Apr	Z	11	19	28	27	26	21	11	10	11	9	6	1	3	6	3	6	5	1	2	8	20	6	3	10.5	28

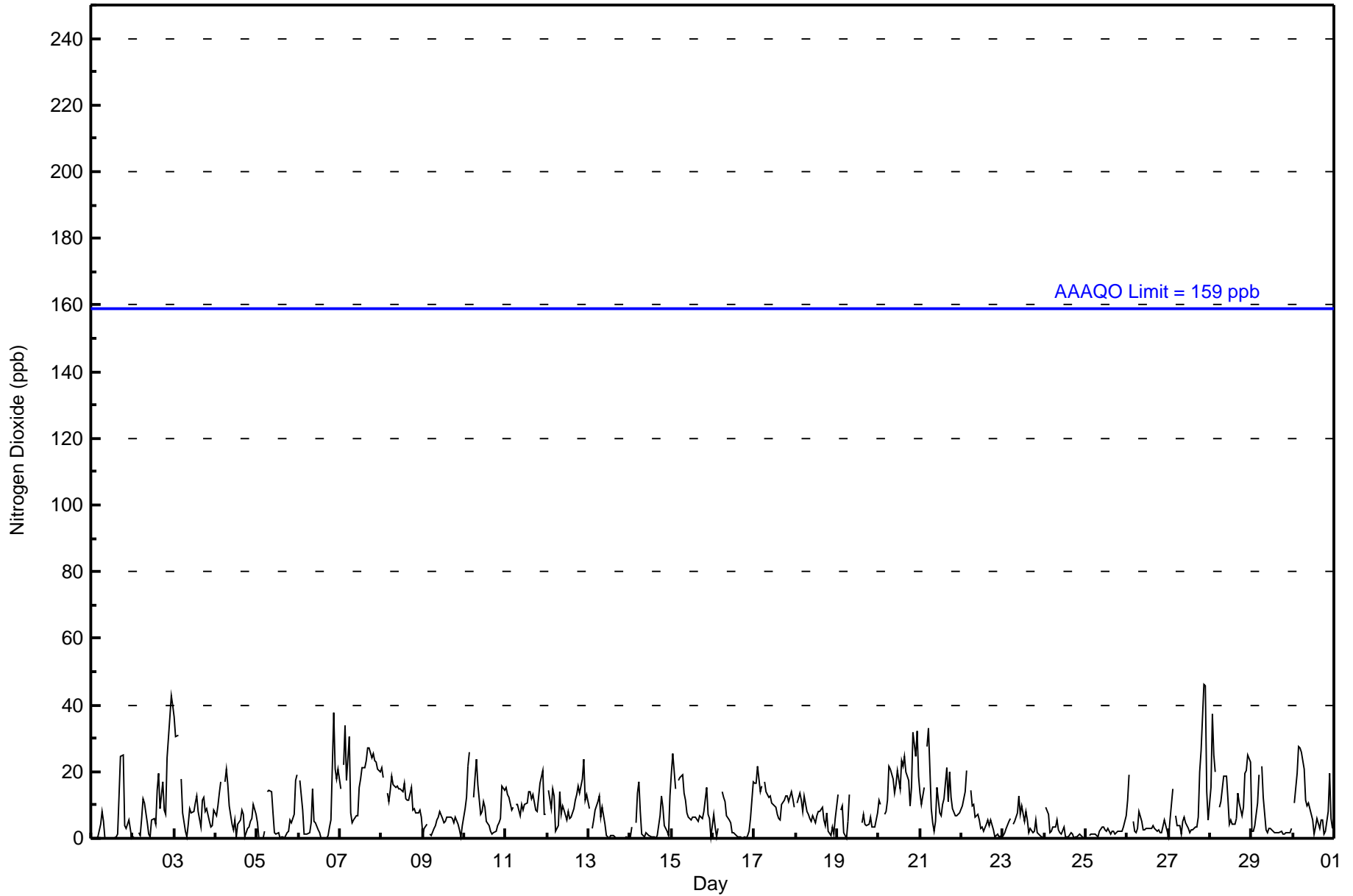
9.7	11.9	11.5	10.5	9.5	10.9	10.4	9.5	7.9	7.0	6.2	6.0	5.3	6.0	6.0	6.7	6.9	7.8	7.3	7.2	10.4	10.7	9.5	9.5	Diurnal Average
37	37	31	34	27	33	22	24	19	19	16	20	18	23	22	25	27	27	25	26	46	46	43	40	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Muskeg River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	628	91.81	91.81
21 - 40	53	7.75	99.56
41 - 80	3	0.44	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	38	126	80	52	7	13	15	60	94	69	29	10	7	14	10	4	628
21 - 40	7	22	1	1	1	0	1	0	5	5	0	1	0	1	3	5	53
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	148	81	53	8	13	16	60	99	74	29	11	7	15	13	12	684

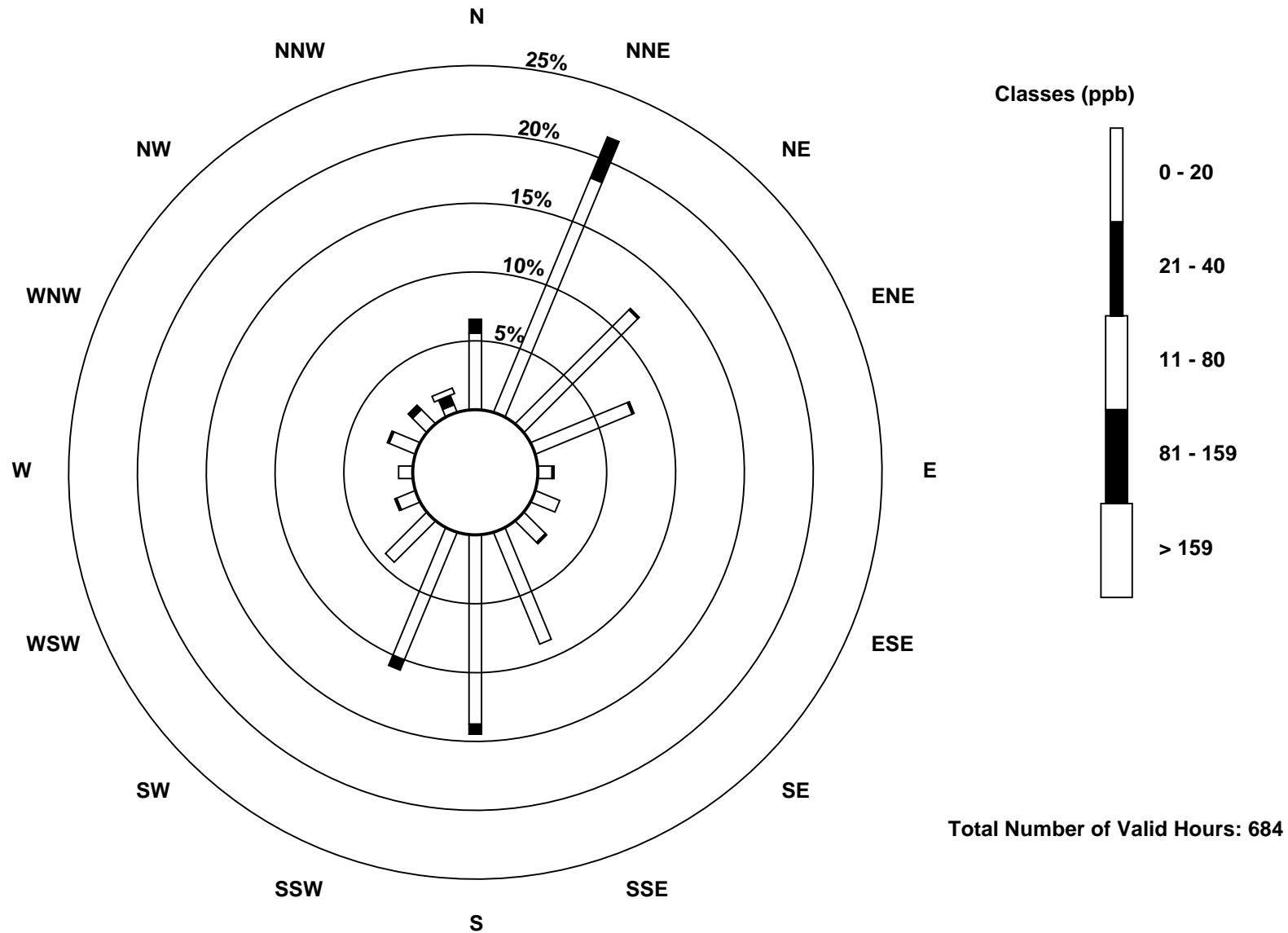
Total Number of Valid Hours: 684

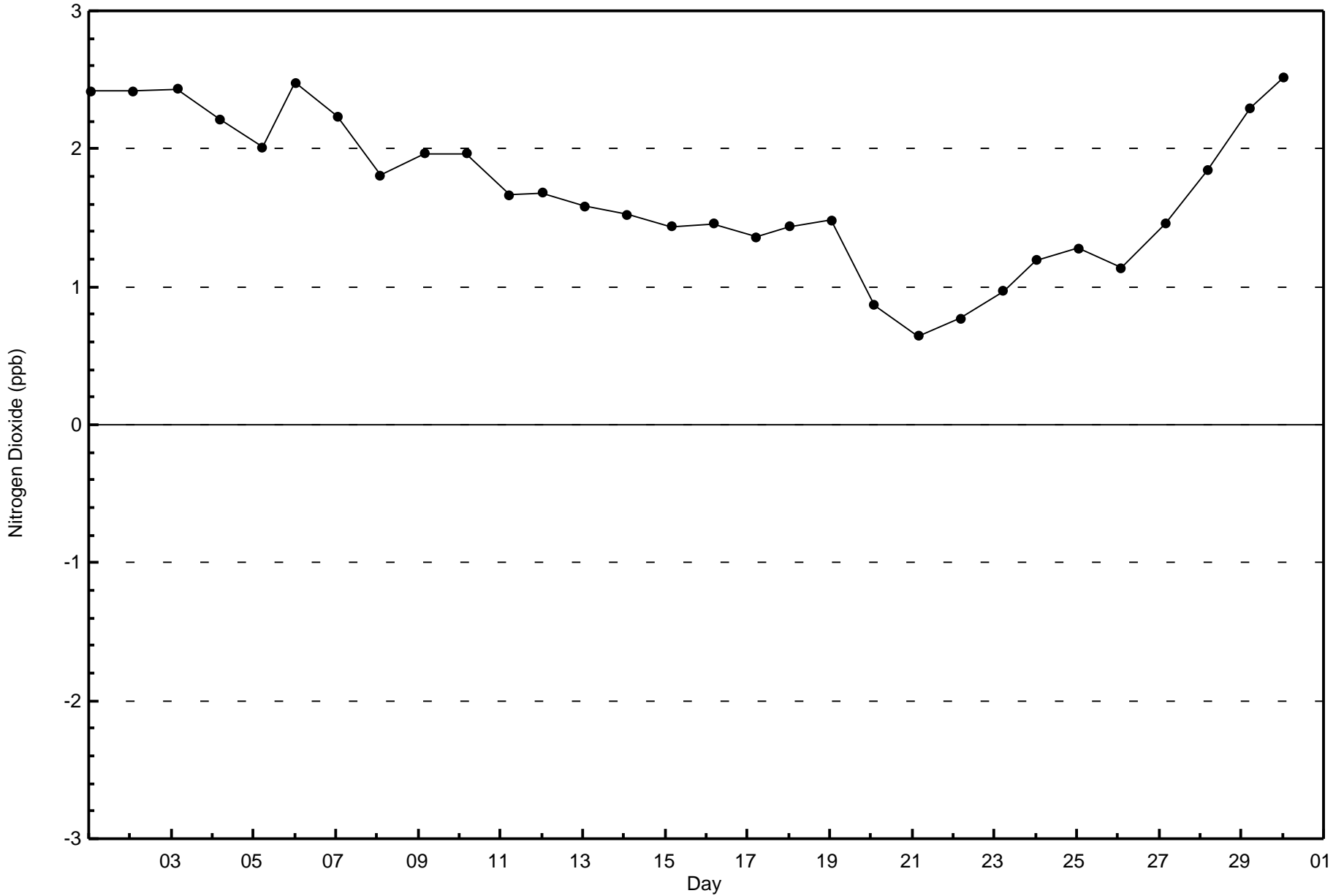
Total Number of Hours: 720

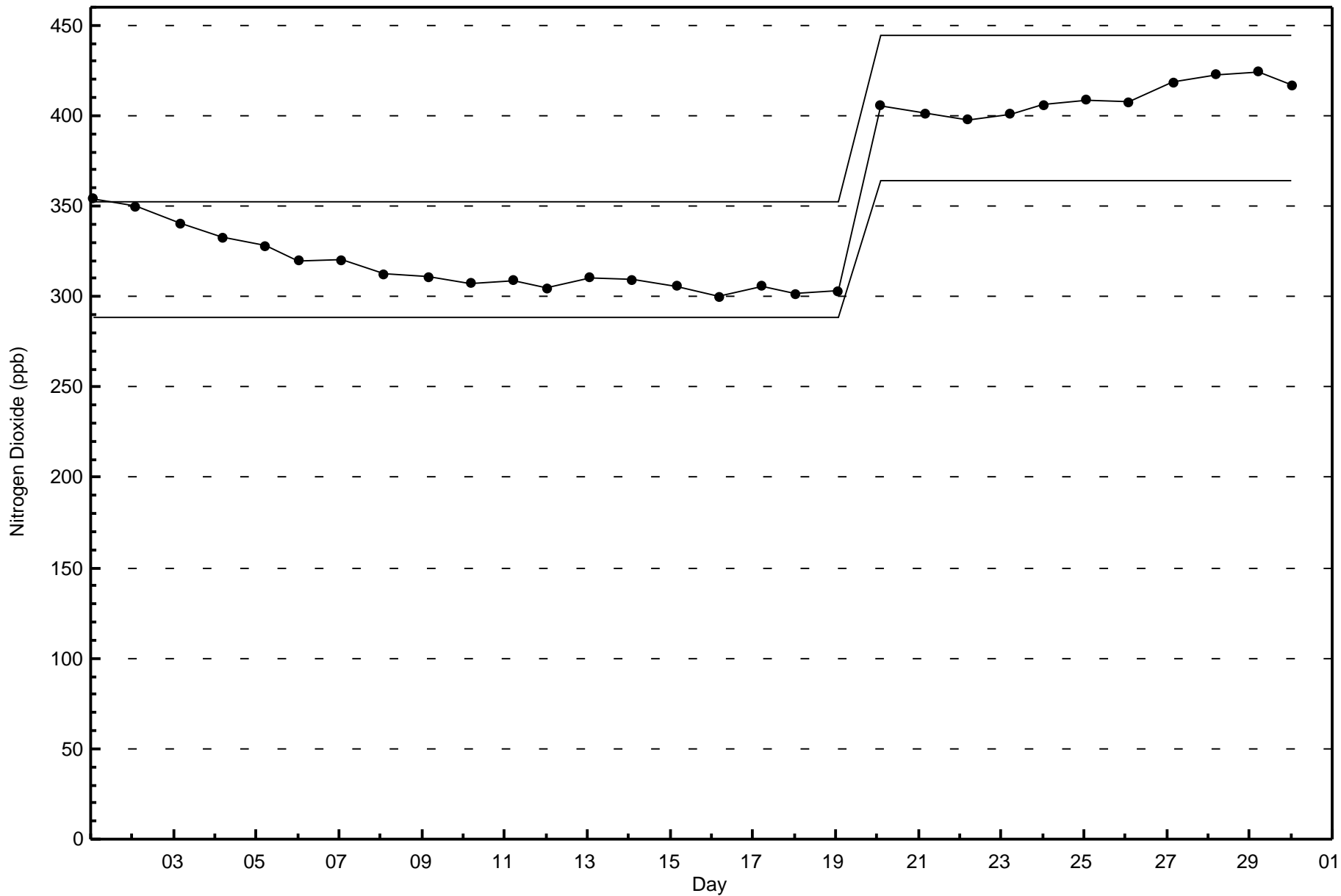


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Muskeg River (AMS 16)









Wood Buffalo Environmental Association
Summary of Hour Averages

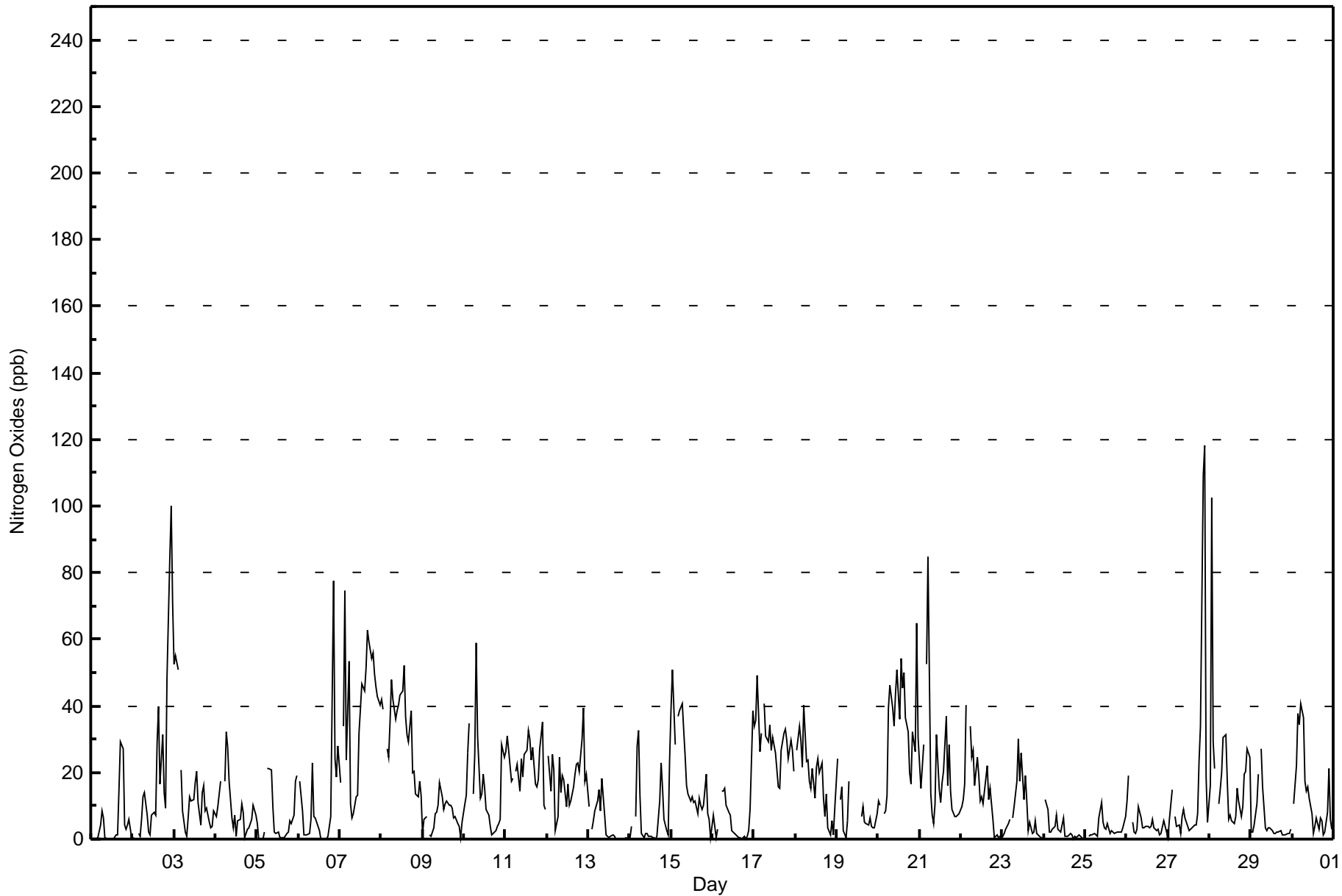
Nitrogen Oxides (NO_x) - ppb
Muskeg River - April 2017

Maximum Value: 118 ppb on Apr 27 22:00		Maximum Daily Average: 38.1 ppb on Apr 7		Hours in Service: 720																																													
Minimum Value: 0 ppb on Apr 1 04:00		Minimum Daily Average: 2.7 ppb on Apr 24		Hours of Data: 684																																													
Maximum Diurnal Average: 20.3 ppb at hour 2		Minimum Diurnal Average: 10.4 ppb at hour 20		Hours of Missing Data: 36																																													
Monthly Average: 14.6 ppb		Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 9 Q ₃ = 21 P ₉₀ = 36 P ₉₉ = 75		Hours of Calibration: 36																																													
				Percent Operational Time: 100.0																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	2	Z	0	0	0	4	9	6	0	0	0	0	0	1	1	15	29	27	4	3	4	6	0	4.9	29																								
2-Apr	1	0	Z	2	1	6	13	14	7	2	1	7	8	7	29	40	17	31	14	9	48	84	100	71	22.3	100																							
3-Apr	52	55	51	Z	21	8	2	1	6	13	11	12	17	20	11	4	14	16	8	9	5	4	4	8	15.3	55																							
4-Apr	7	10	14	17	Z	17	32	27	17	6	3	7	1	5	6	11	8	1	3	4	5	6	10	7	9.8	32																							
5-Apr	5	0	0	0	2	Z	21	21	21	10	2	2	2	0	1	0	0	2	2	6	4	7	17	19	6.3	21																							
6-Apr	Z	17	9	1	1	1	2	6	23	7	6	4	3	0	0	0	0	1	4	7	78	24	19	28	10.4	78																							
7-Apr	17	Z	34	74	24	53	11	6	8	13	13	32	39	47	45	51	63	59	54	56	49	46	43	40	38.1	74																							
8-Apr	42	39	Z	27	25	35	48	42	36	39	40	43	45	52	37	31	29	39	20	20	14	13	18	13	32.4	52																							
9-Apr	2	6	7	Z	1	1	3	8	8	10	17	13	9	10	11	10	10	9	6	7	5	4	1	5	7.1	17																							
10-Apr	11	13	26	35	Z	13	25	59	31	12	14	20	15	9	7	4	1	2	2	4	5	6	28	25	15.9	59																							
11-Apr	26	31	27	17	18	Z	20	22	15	24	19	26	27	32	30	24	28	16	15	18	27	35	10	9	22.4	35																							
12-Apr	Z	25	14	25	21	3	7	24	14	19	18	10	16	10	11	16	19	22	23	20	30	40	17	20	18.5	40																							
13-Apr	10	Z	3	5	9	11	15	8	18	7	1	1	0	1	1	0	0	0	0	0	0	0	0	0	4.0	18																							
14-Apr	0	4	Z	7	28	33	13	2	0	2	2	1	1	0	1	0	1	12	23	15	6	2	1	24	7.7	33																							
15-Apr	39	51	28	Z	37	38	41	33	25	16	13	12	13	11	12	8	12	10	9	10	20	7	6	0	19.5	51																							
16-Apr	7	4	0	3	Z	14	14	15	10	8	7	3	2	2	1	1	1	0	1	0	1	2	9	38	6.2	38																							
17-Apr	34	36	49	26	32	Z	41	31	29	34	27	31	26	21	16	15	26	32	33	30	24	30	27	20	29.1	49																							
18-Apr	Z	27	34	30	22	40	23	24	17	15	21	12	22	24	20	23	12	7	14	3	1	5	1	9	17.7	40																							
19-Apr	24	Z	12	16	3	0	6	18	C	C	C	C	C	C	7	10	5	5	4	6	4	3	4	8	--	24																							
20-Apr	11	10	Z	7	9	13	39	46	39	34	44	51	36	54	45	50	36	32	20	17	32	26	65	31	32.5	65																							
21-Apr	23	15	28	Z	53	85	14	7	5	10	31	15	11	17	20	37	16	28	14	9	7	7	7	8	20.3	85																							
22-Apr	10	12	16	40	Z	34	25	27	16	24	19	11	13	11	18	22	12	15	6	0	1	1	0	1	14.6	40																							
23-Apr	1	2	3	5	6	Z	6	10	17	30	17	26	12	19	11	2	5	2	2	6	2	1	0	0	8.0	30																							
24-Apr	Z	12	9	2	2	3	4	7	3	3	2	6	1	1	1	2	1	0	1	0	1	1	0	0	2.7	12																							
25-Apr	1	Z	1	1	1	2	1	1	6	11	5	4	3	5	2	3	2	2	2	2	2	2	3	7	3.0	11																							
26-Apr	11	19	Z	5	2	2	3	10	6	3	3	4	4	4	4	6	4	2	3	1	2	6	4	2	4.8	19																							
27-Apr	0	6	15	Z	7	4	4	2	7	9	6	4	2	3	3	4	4	7	23	34	109	118	19	5	17.3	118																							
28-Apr	16	102	29	21	Z	11	15	20	30	31	17	6	7	5	5	7	15	12	7	10	20	20	27	25	19.9	102																							
29-Apr	2	2	4	11	19	Z	27	16	3	2	4	3	2	2	2	2	2	2	1	1	1	2	2	3	5.1	27																							
30-Apr	Z	11	22	38	34	40	37	17	14	15	12	8	2	4	6	3	6	6	1	2	8	21	6	3	13.8	40																							
																								14.2	20.3	17.4	16.7	15.1	18.9	17.3	17.7	15.0	14.2	13.0	12.7	11.6	13.0	12.1	12.9	12.2	13.4	11.5	10.4	17.1	17.6	15.1	14.3	Diurnal Average	
																								52	102	51	74	53	85	48	59	39	39	44	51	45	54	45	51	63	59	54	56	109	118	100	71	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Muskeg River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	506	73.98	73.98
21 - 40	135	19.74	93.71
41 - 80	37	5.41	99.12
81 - 159	6	0.88	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Muskeg River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	27	38	71	52	7	13	12	60	90	65	28	10	7	14	9	3	506
21 - 40	12	81	10	1	1	0	4	0	8	9	1	1	0	1	3	3	135
11 - 80	6	29	0	0	0	0	0	0	1	0	0	0	0	0	0	1	37
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	148	81	53	8	13	16	60	99	74	29	11	7	15	13	12	684

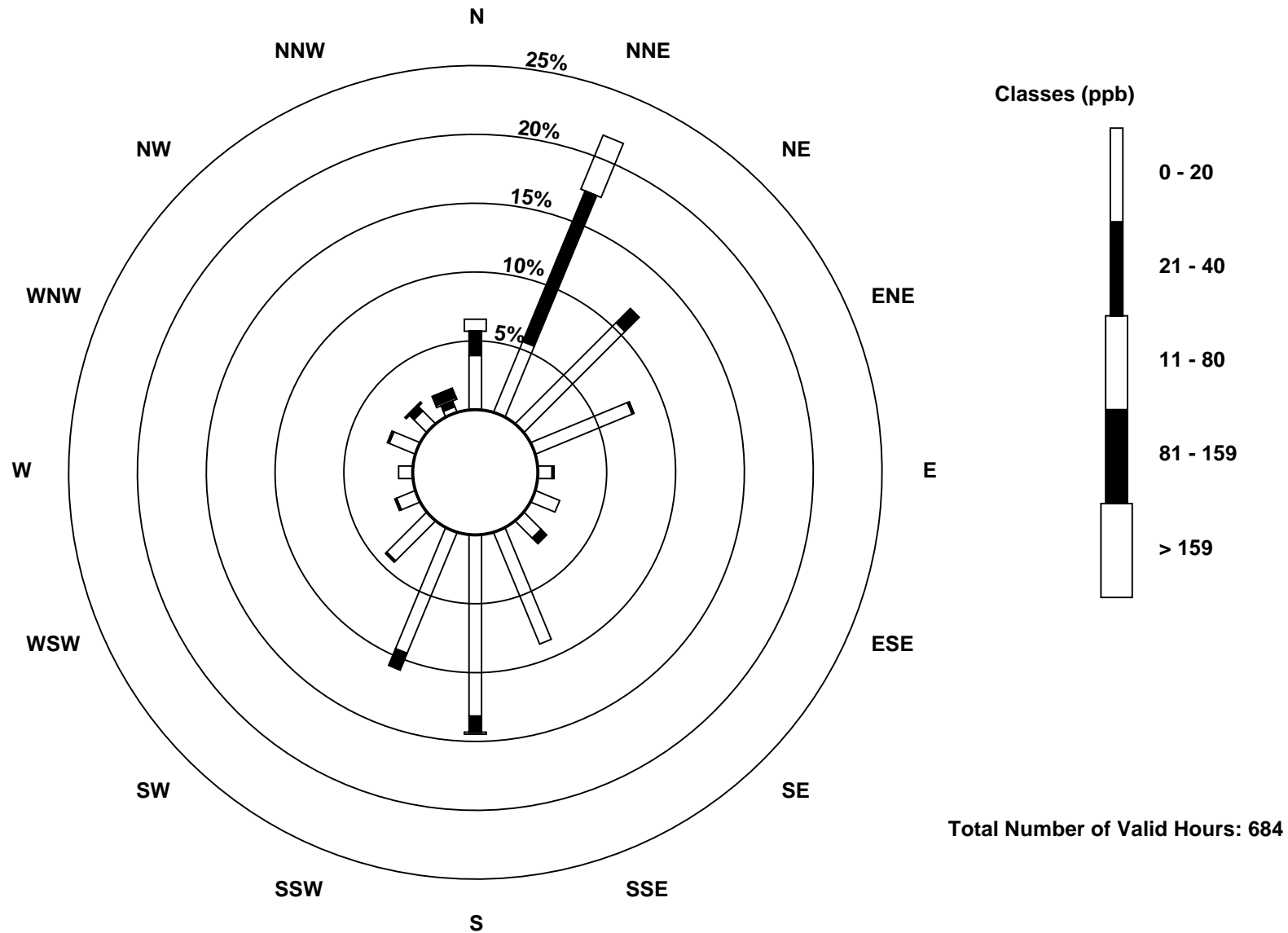
Total Number of Valid Hours: 684

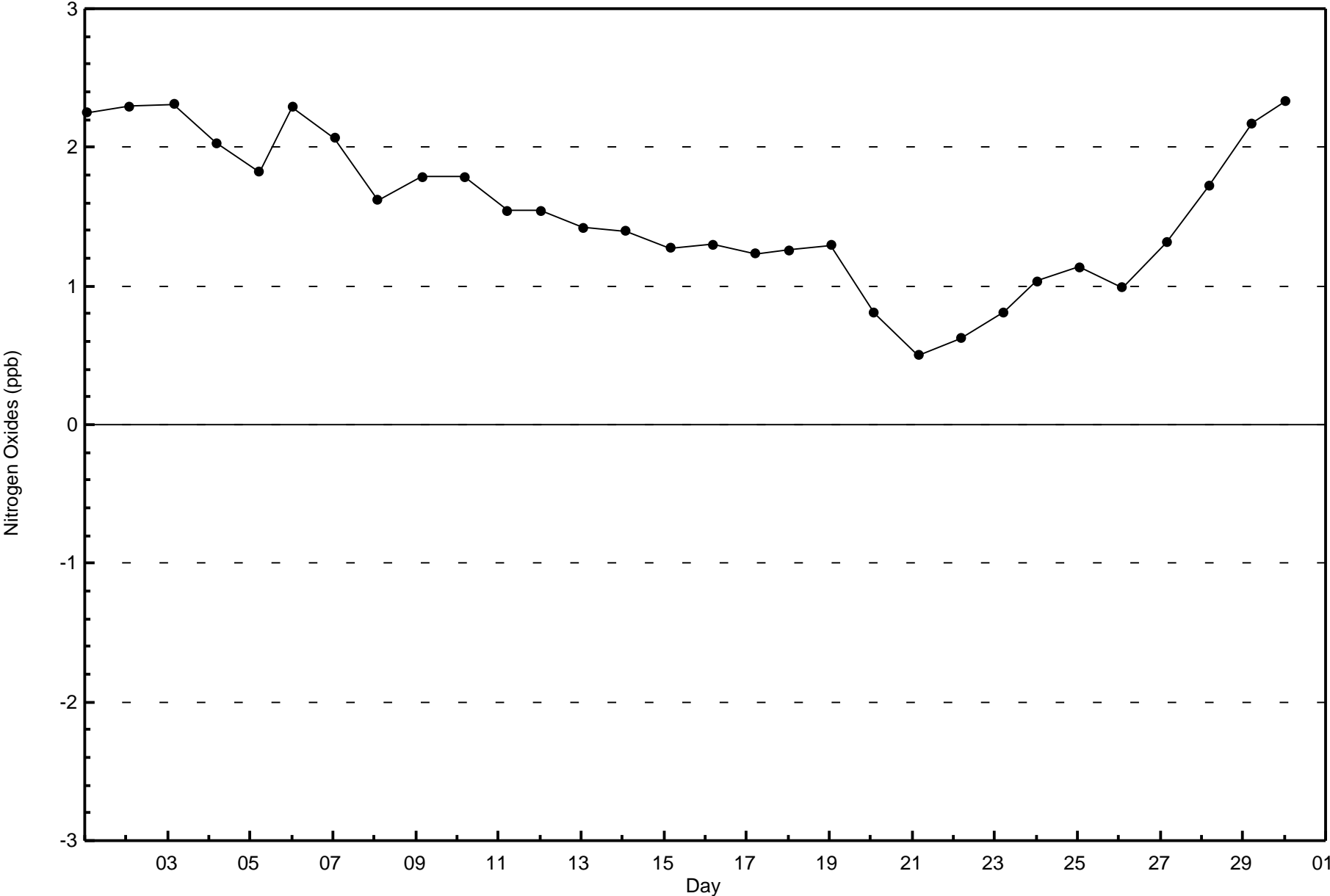
Total Number of Hours: 720

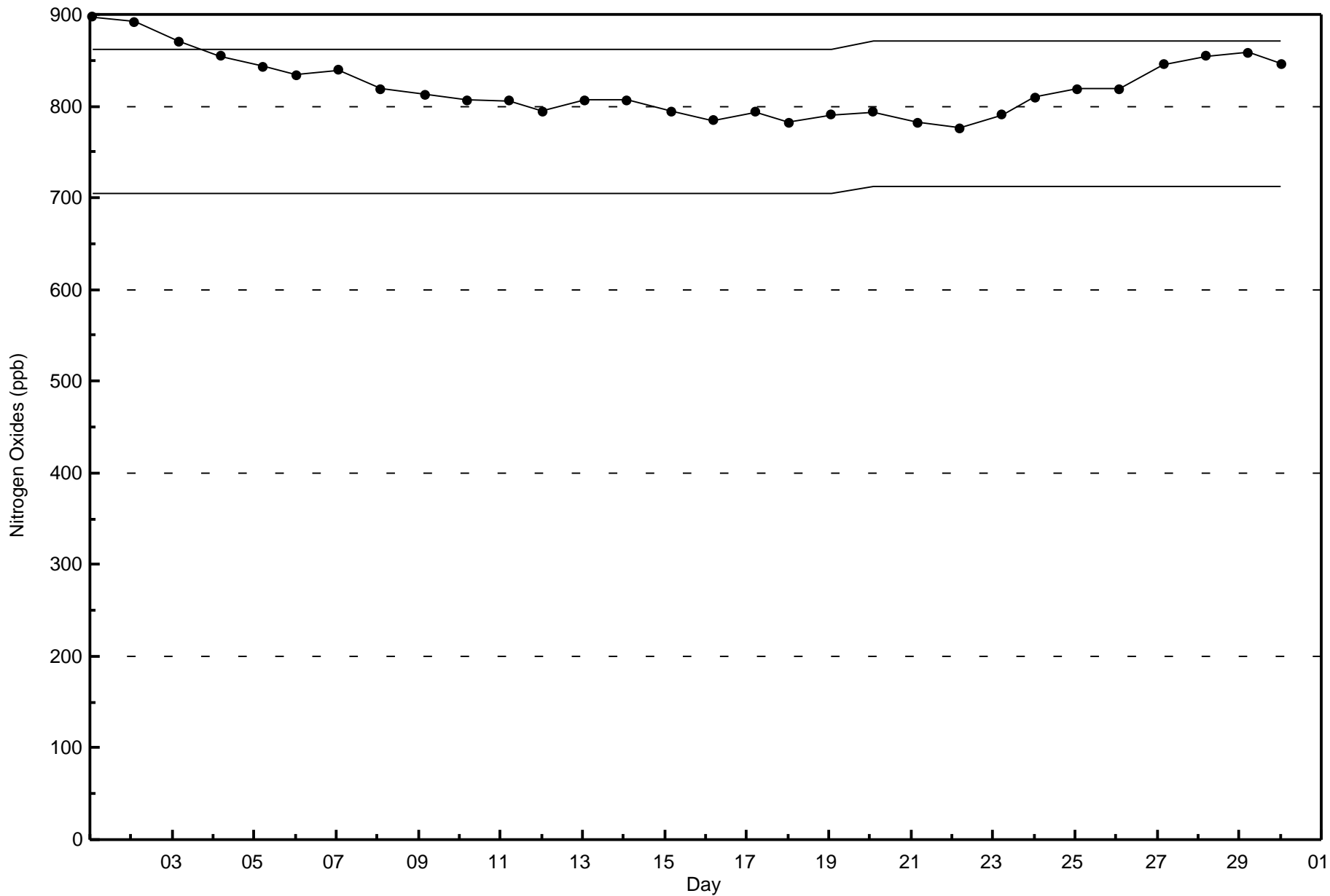


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Muskeg River (AMS 16)







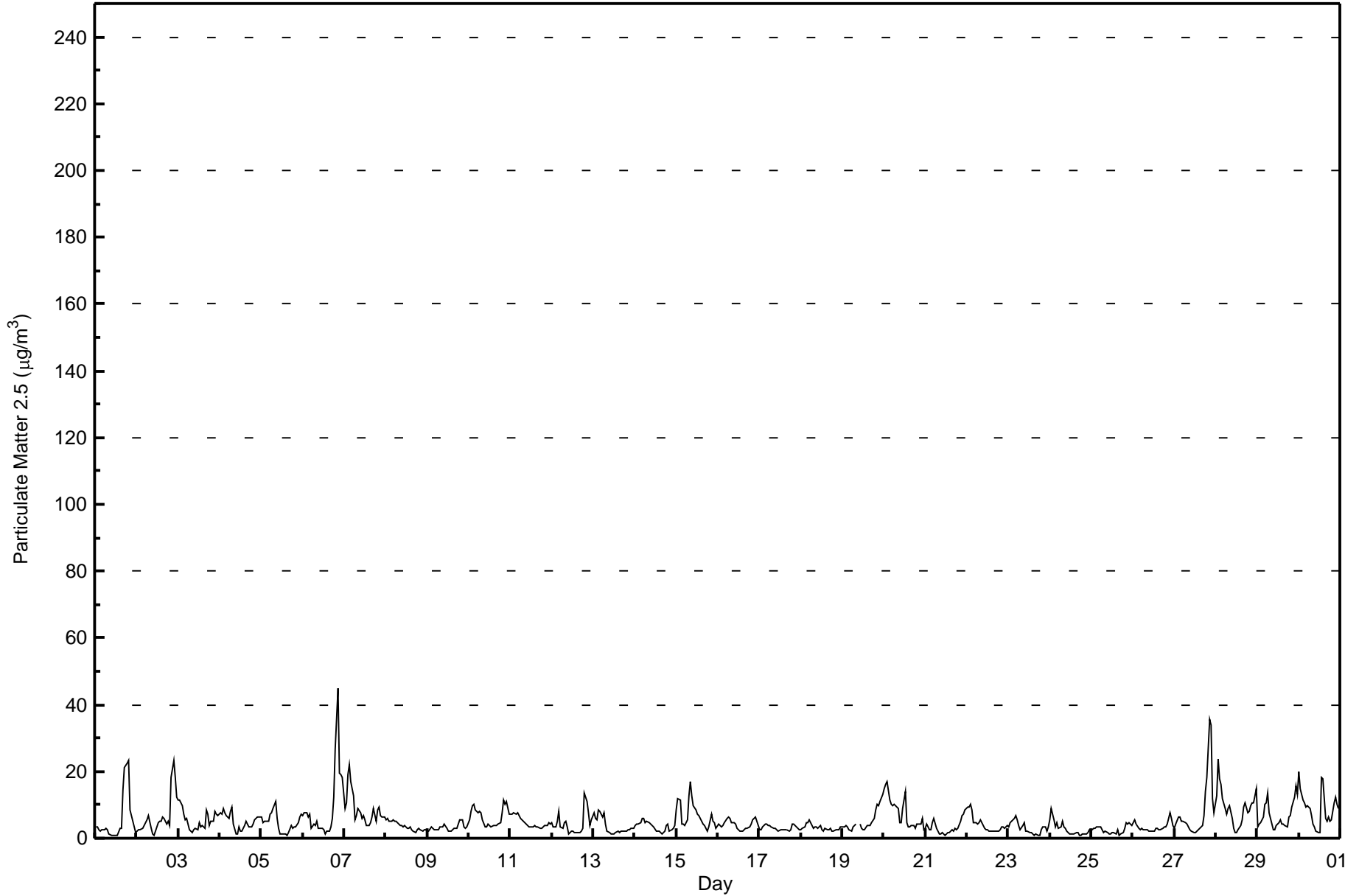


Number of Exceedences (AAAQO): 24-hr: 0 Maximum Value: 45.1 µg/m ³ on Apr 6 21:00 Maximum Daily Average: 9.3 µg/m ³ on Apr 28		Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 1 Percent Operational Time: 100.0																								
Minimum Value: 0.7 µg/m ³ on Apr 1 14:00 Maximum Diurnal Average: 8.5 µg/m ³ at hour 21 Monthly Average: 5.22 µg/m ³		Minimum Daily Average: 2.5 µg/m ³ on Apr 25 Minimum Diurnal Average: 3.0 µg/m ³ at hour 11 Percentiles: P ₁ = 0.9 P ₁₀ = 1.8 Q ₁ = 2.6 Median = 3.8 Q ₃ = 6.2 P ₉₀ = 10.0 P ₉₉ = 23.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	3.3	3.4	2.4	2.2	2.4	2.5	3.1	2.4	1.2	0.8	0.9	0.8	1.0	0.7	2.9	3.1	14.5	21.1	22.3	23.4	8.6	6.9	4.9	1.9	5.7	23.4
2-Apr	2.1	2.4	2.5	3.1	3.7	4.6	5.7	7.0	3.1	1.3	1.0	1.9	4.7	5.2	5.0	6.4	6.1	4.3	5.2	3.9	18.1	23.2	18.4	12.2	6.3	23.2
3-Apr	11.4	11.5	9.6	7.2	5.6	6.0	2.4	2.1	1.8	2.4	3.0	2.5	4.5	3.3	3.8	3.0	8.7	7.3	3.8	5.1	5.3	8.2	7.1	6.6	5.5	11.5
4-Apr	7.7	7.2	8.9	7.8	6.8	6.1	8.1	9.2	4.2	1.3	1.1	3.3	2.2	2.3	3.9	5.0	4.4	3.6	3.5	4.2	5.5	6.0	6.2	6.5	5.2	9.2
5-Apr	6.2	4.9	5.0	5.0	5.0	7.1	7.8	8.8	11.0	6.1	3.1	1.4	1.2	1.2	1.2	1.0	1.7	3.8	3.0	3.4	3.4	4.6	6.5	7.3	4.6	11.0
6-Apr	6.9	7.5	7.8	6.2	7.2	3.1	4.3	3.7	5.2	3.0	3.1	3.0	2.5	1.4	1.9	2.3	3.2	5.8	12.2	26.9	45.1	19.5	18.9	18.3	9.1	45.1
7-Apr	8.7	10.8	19.1	22.0	16.9	12.5	5.4	6.8	9.0	7.5	5.7	6.7	5.6	4.0	3.7	4.5	6.3	8.9	5.0	8.5	9.2	6.9	6.6	6.2	8.6	22.0
8-Apr	5.6	6.0	4.9	5.3	5.4	4.9	4.9	4.6	4.0	3.8	3.4	3.7	3.1	3.1	3.3	2.7	2.0	1.7	2.6	2.8	2.5	2.3	2.5	2.7	3.7	6.0
9-Apr	2.2	2.3	3.6	2.8	2.4	2.4	2.6	3.3	3.4	3.5	4.0	2.9	2.2	2.0	2.2	3.0	3.1	3.0	4.1	5.5	5.4	3.2	2.9	3.6	3.2	5.5
10-Apr	5.3	7.9	9.9	10.3	8.5	7.5	8.0	7.7	5.4	3.4	3.4	4.4	4.0	3.2	3.7	3.6	3.8	4.2	4.7	7.5	11.6	10.3	10.9	7.1	6.5	11.6
11-Apr	7.3	7.2	7.6	7.2	7.6	6.6	5.9	5.4	4.6	4.3	3.6	3.3	3.3	3.2	3.6	3.6	3.4	2.8	3.1	3.6	3.9	3.7	4.7	4.3	4.7	7.6
12-Apr	4.5	3.4	3.5	5.2	8.1	3.3	3.1	4.7	5.2	3.5	1.5	2.2	2.0	1.5	1.5	1.9	1.9	2.0	2.8	13.7	11.0	7.6	3.7	5.5	4.3	13.7
13-Apr	7.6	5.9	5.7	8.6	7.9	6.1	7.6	4.0	2.3	1.6	1.4	1.3	1.3	1.6	2.2	1.9	2.0	2.3	1.9	2.1	2.5	2.6	2.9	3.1	3.6	8.6
14-Apr	3.8	4.1	4.2	4.5	5.8	5.9	4.7	4.9	4.7	4.1	3.9	3.2	2.2	2.2	2.1	1.7	1.2	2.0	3.6	4.1	2.3	2.7	3.0	3.8	3.5	5.9
15-Apr	8.6	12.1	11.4	4.3	4.2	3.9	5.4	12.6	17.1	12.6	9.6	8.4	7.0	6.8	6.0	4.3	3.6	3.1	2.0	3.6	7.2	5.3	4.5	2.8	6.9	17.1
16-Apr	4.3	3.8	3.4	3.9	4.7	6.1	6.3	5.9	4.5	4.6	4.3	3.1	2.4	2.0	2.1	2.6	2.9	3.1	3.5	4.4	5.4	6.0	6.4	3.7	4.1	6.4
17-Apr	2.5	2.8	3.6	4.3	4.4	4.0	3.7	3.2	3.0	3.1	2.5	2.1	2.4	2.4	2.4	2.6	2.3	2.1	2.5	4.4	4.4	3.4	2.8	2.7	3.1	4.4
18-Apr	2.4	2.8	3.4	4.5	4.7	5.6	3.8	2.9	3.5	3.5	2.8	3.8	2.5	2.1	2.8	2.7	2.5	2.9	2.1	2.1	2.4	2.6	2.6	3.4	3.1	5.6
19-Apr	3.5	3.4	3.8	3.4	2.4	2.3	3.2	3.8	4.4	C	4.2	2.9	2.4	2.4	3.8	4.0	4.0	4.6	6.0	8.3	10.0	9.9	11.0	13.0	5.1	13.0
20-Apr	15.0	16.3	17.1	11.3	10.1	9.7	10.2	9.7	8.8	4.8	4.8	9.0	13.9	4.7	3.2	3.6	3.9	3.7	2.9	4.2	4.4	4.3	5.9	2.7	7.7	17.1
21-Apr	3.1	4.2	2.6	2.5	4.8	5.8	2.8	2.3	1.4	1.2	1.5	1.0	1.4	1.6	1.7	2.4	2.1	3.1	2.6	3.0	5.1	6.6	7.1	8.4	3.3	8.4
22-Apr	9.3	9.4	10.1	8.5	4.6	4.8	4.4	4.5	5.4	3.9	2.9	2.6	2.7	2.2	2.2	2.3	2.0	2.1	2.3	2.6	3.4	3.3	3.2	3.7	4.2	10.1
23-Apr	3.4	4.6	4.9	6.1	6.6	5.7	4.0	2.7	3.7	4.5	2.1	2.0	1.6	1.6	1.2	0.8	1.4	0.9	0.9	2.4	3.4	3.3	2.1	3.5	3.1	6.6
24-Apr	5.7	9.0	5.7	3.2	4.8	3.1	3.4	5.3	3.2	3.2	2.2	1.4	1.3	1.3	1.4	1.6	1.6	0.9	1.0	1.1	1.1	1.4	1.7	2.6	2.8	9.0
25-Apr	2.5	2.9	3.0	3.4	3.3	3.3	2.7	1.8	2.0	1.8	1.3	1.4	1.6	1.6	1.2	2.3	1.0	1.1	1.8	2.8	4.5	4.2	4.5	3.9	2.5	4.5
26-Apr	4.5	5.4	4.3	2.9	2.7	2.8	2.8	2.7	2.5	2.0	2.0	2.3	2.2	2.9	2.9	2.4	2.7	3.0	3.4	3.2	4.4	7.6	5.9	3.9	3.4	7.6
27-Apr	3.1	4.2	6.2	6.4	4.9	5.2	4.5	4.3	3.4	2.6	2.1	1.6	1.7	2.3	2.7	3.6	3.9	6.7	14.0	18.3	35.5	33.7	11.7	7.5	7.9	35.5
28-Apr	12.5	23.6	17.9	16.1	11.9	9.0	7.2	8.7	9.8	5.9	3.1	1.5	1.8	2.6	4.0	5.4	9.5	10.5	7.5	8.0	9.7	10.4	10.8	15.0	9.3	23.6
29-Apr	3.6	4.1	4.6	6.4	10.0	10.6	13.7	7.4	4.2	2.6	2.6	3.7	4.7	5.3	4.3	4.2	4.0	3.5	6.5	6.8	9.2	12.3	15.6	13.2	6.8	15.6
30-Apr	19.9	14.6	11.6	10.4	9.3	9.9	9.0	6.6	4.3	3.4	2.1	1.8	1.7	18.4	17.8	6.0	4.9	6.2	5.2	5.6	10.4	12.2	10.2	8.8	8.8	19.9
																								Diurnal Average		
																								Diurnal Maximum		
																								6.2 6.9 6.9 6.5 6.2 5.7 5.4 5.3 4.9 3.7 3.0 3.0 3.0 3.2 3.4 3.1 3.8 4.3 4.7 6.5 8.5 7.8 6.8 6.3		
																								19.9 23.6 19.1 22.0 16.9 12.5 13.7 12.6 17.1 12.6 9.6 9.0 13.9 18.4 17.8 6.4 14.5 21.1 22.3 26.9 45.1 33.7 18.9 18.3		
C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³																										



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Muskeg River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Muskeg River - April 2017**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	492	68.43	68.43
6 - 15	190	26.43	94.85
16 - 25	23	3.20	98.05
26 - 80	4	0.56	98.61
> 81.0	0	0.00	98.61

Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Muskeg River - April 2017

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	28	110	68	43	2	13	10	46	66	47	26	12	2	11	5	3	492
6 - 15	14	44	16	7	6	0	6	16	36	30	1	0	3	4	5	2	190
16 - 25	4	2	1	1	0	0	0	0	4	0	1	1	0	1	3	5	23
26 - 80	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	157	85	51	8	13	16	62	106	77	28	13	5	16	14	12	709

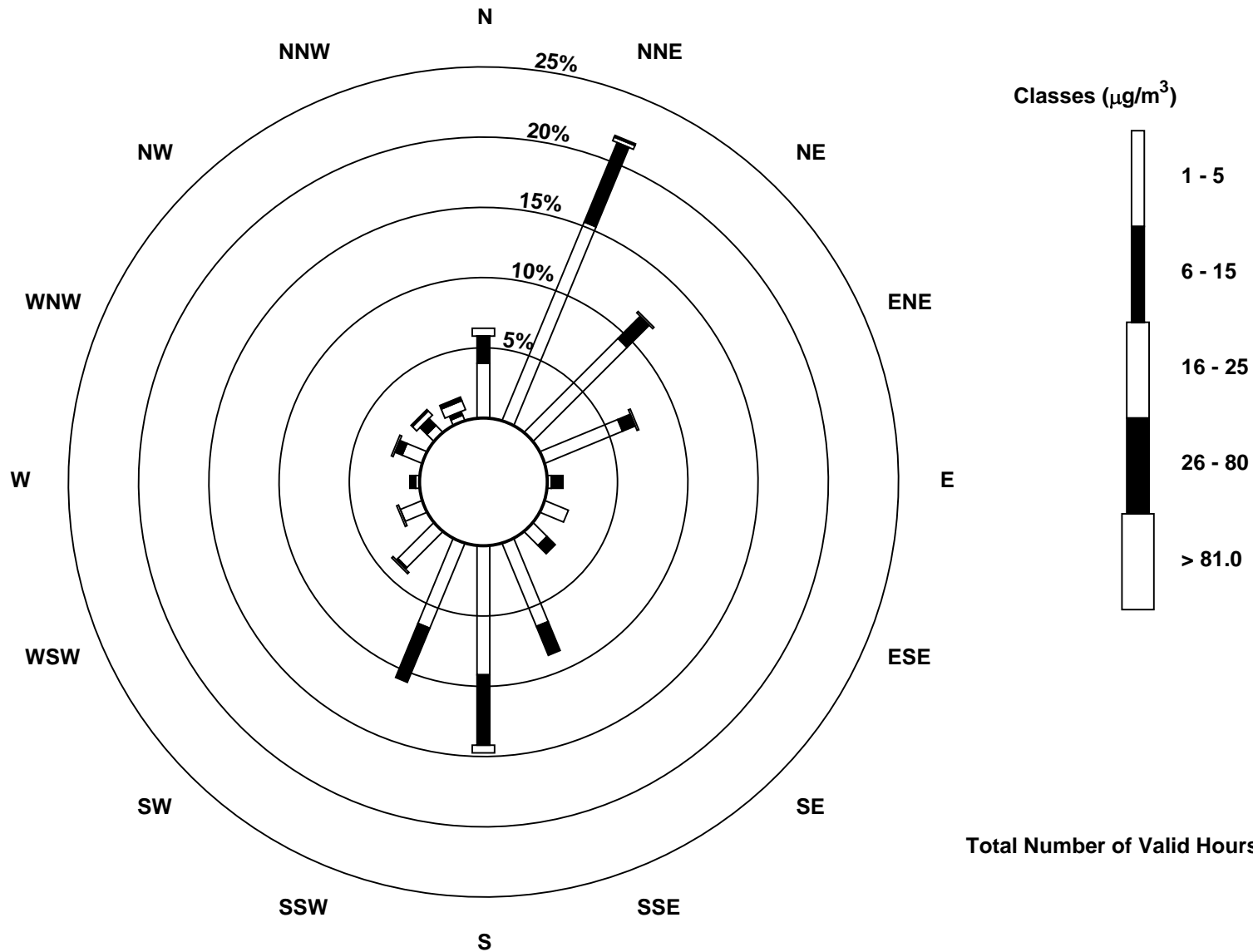
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Muskeg River (AMS 16)





Wood Buffalo Environmental Association
Summary of Hour Averages

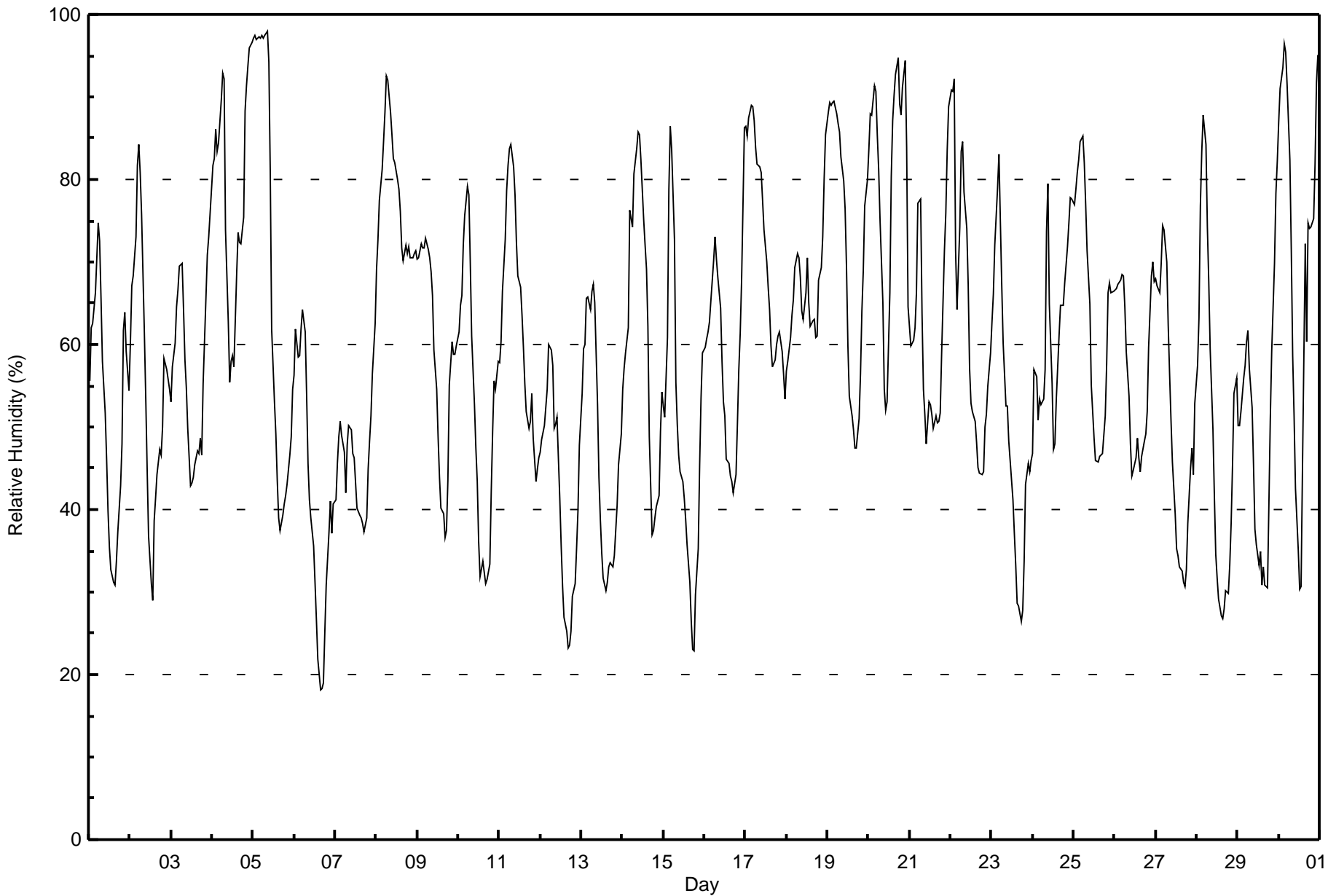
Relative Humidity (RH) - %
Muskeg River - April 2017

Maximum Value: 98 % on Apr 5 09:00 Maximum Daily Average: 80.4 % on Apr 20																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																									
Minimum Value: 18 % on Apr 6 16:00 Minimum Daily Average: 41.1 % on Apr 6 Maximum Diurnal Average: 75.8 % at hour 6 Minimum Diurnal Average: 44.9 % at hour 17 Monthly Average: 59.4 % Percentiles: P ₁ = 23 P ₁₀ = 35 Q ₁ = 46 Median = 59 Q ₃ = 72 P ₉₀ = 85 P ₉₉ = 97																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																				
1-Apr	56	62	63	64	66	75	72	66	58	52	46	40	35	33	31	31	34	37	43	48	62	64	59	54	52.1	75																		
2-Apr	60	67	68	73	82	84	81	76	61	53	45	37	31	29	39	41	44	47	47	50	58	57	56	55	55.9	84																		
3-Apr	53	57	60	65	67	70	70	64	58	55	50	43	43	44	45	47	47	49	47	55	66	71	73	76	57.2	76																		
4-Apr	82	82	86	83	84	90	93	92	74	63	55	58	59	57	69	74	72	72	76	88	91	94	96	97	78.6	97																		
5-Apr	97	97	97	97	97	97	97	98	98	94	81	62	53	49	44	39	37	39	41	42	43	47	49	55	68.7	98																		
6-Apr	56	62	58	59	62	64	62	54	46	41	39	36	31	27	22	18	18	19	25	31	37	41	37	41	41.1	64																		
7-Apr	41	46	49	51	49	47	42	48	50	50	47	46	43	40	39	39	38	37	39	45	48	51	56	63	46.0	63																		
8-Apr	69	73	77	81	85	88	93	92	88	86	83	82	80	79	76	72	70	72	71	72	70	70	71	71	78.0	93																		
9-Apr	70	70	72	72	72	73	72	71	69	66	59	55	49	44	40	39	37	38	44	55	60	59	59	60	58.5	73																		
10-Apr	61	65	66	72	76	79	78	70	61	53	47	43	36	32	34	32	31	31	33	42	50	56	55	58	52.6	79																		
11-Apr	58	60	67	73	79	82	84	84	82	78	72	68	67	64	60	55	52	50	51	54	49	43	45	46	63.4	84																		
12-Apr	47	48	50	52	55	60	59	58	50	50	51	41	36	31	27	25	23	24	25	29	31	35	40	48	41.5	60																		
13-Apr	54	59	60	66	66	64	66	67	65	53	44	39	35	32	30	31	33	34	33	34	37	41	45	49	47.4	67																		
14-Apr	55	57	59	62	76	75	74	81	84	86	85	82	75	72	69	62	49	37	38	39	40	42	49	54	62.6	86																		
15-Apr	53	51	61	79	86	83	73	55	50	47	45	43	41	39	36	31	27	23	23	30	35	46	54	59	48.7	86																		
16-Apr	60	61	62	63	65	70	73	70	68	64	58	53	51	46	46	44	43	42	44	50	57	61	68	86	58.6	86																		
17-Apr	86	85	88	89	89	87	84	82	82	81	77	74	70	67	64	60	57	58	60	61	62	59	56	53	72.2	89																		
18-Apr	57	58	61	63	65	69	71	70	68	64	63	66	71	65	62	63	63	61	61	68	69	73	80	85	66.6	85																		
19-Apr	88	89	89	89	90	88	87	86	83	80	76	69	60	54	51	50	47	47	51	56	64	69	77	80	71.7	90																		
20-Apr	84	88	88	91	91	85	81	75	65	55	52	53	66	80	87	90	93	95	89	88	91	94	84	65	80.4	95																		
21-Apr	62	60	61	62	66	77	78	64	55	51	48	53	53	52	50	51	51	51	52	59	71	76	84	89	61.4	89																		
22-Apr	91	91	92	71	64	74	83	85	78	74	67	57	53	52	51	48	45	44	44	45	50	52	55	59	63.6	92																		
23-Apr	63	66	72	79	83	75	67	60	53	53	48	46	41	37	33	29	28	27	28	34	43	46	45	46	50.0	83																		
24-Apr	47	57	56	51	53	53	53	57	74	79	65	55	47	48	53	61	65	65	65	68	72	75	78	78	61.4	79																		
25-Apr	77	79	81	82	85	85	82	77	71	65	55	52	49	46	46	46	47	47	51	58	66	68	66	66	64.4	85																		
26-Apr	67	67	67	68	69	68	65	59	54	48	44	45	46	49	46	45	46	48	49	52	60	68	70	68	57.0	70																		
27-Apr	68	67	66	70	74	74	70	62	56	51	46	39	35	34	33	33	31	31	33	38	45	47	44	53	50.1	74																		
28-Apr	57	63	77	83	88	84	74	68	59	50	42	35	32	29	27	27	28	30	30	33	38	45	54	56	50.4	88																		
29-Apr	50	50	52	56	58	60	62	57	52	45	38	36	33	35	31	33	31	31	41	51	59	70	78	82	49.6	82																		
30-Apr	87	91	94	96	95	92	82	71	59	51	42	35	30	31	45	72	60	75	74	74	75	82	92	95	70.9	96																		
																			65.2	67.7	69.9	72.1	74.5	75.8	74.3	70.6	65.7	61.2	55.7	51.5	48.4	46.5	46.2	46.3	44.9	45.3	46.9	51.6	56.7	60.0	62.5	64.9	Diurnal Average	
																			97	97	97	97	97	97	97	98	98	94	85	82	80	80	87	90	93	95	89	88	91	94	96	97	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Muskeg River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Muskeg River - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	3	0.42	0.42
20 - 40	107	14.86	15.28
40 - 60	273	37.92	53.19
60 - 80	224	31.11	84.31
80 - 100	113	15.69	100.00

Total Number of Valid Hours: 720

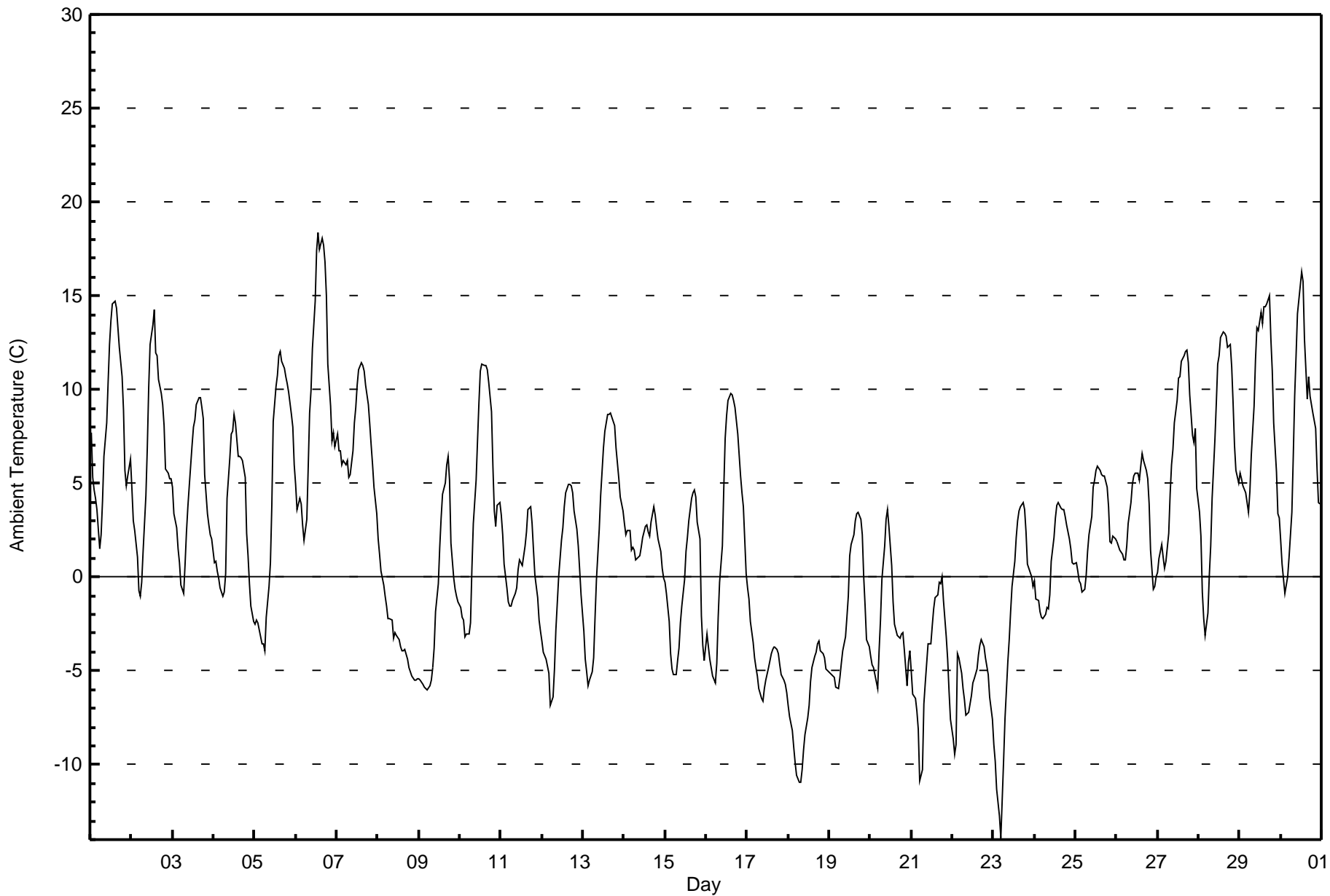
Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Muskeg River - April 2017

Maximum Value: 18.3 C on Apr 6 14:00 Maximum Daily Average: 10.0 C on Apr 6		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: -13.9 C on Apr 23 05:00 Maximum Diurnal Average: 6.2 C at hour 17 Monthly Average: 1.97 C		Minimum Daily Average: -6.8 C on Apr 18 Minimum Diurnal Average: -2.7 C at hour 6 Percentiles: P ₁ = -10.6 P ₁₀ = -5.5 Q ₁ = -3.1 Median = 1.8 Q ₃ = 5.9 P ₉₀ = 10.6 P ₉₉ = 16.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	7.7	5.3	4.7	4.2	3.6	1.5	2.3	4.1	6.4	8.2	10.4	12.4	13.6	14.6	14.7	14.3	13.3	12.3	10.7	8.9	5.7	4.8	5.4	6.3	8.1	14.7
2-Apr	4.7	3.0	2.5	1.0	-0.7	-1.0	-0.2	1.4	4.3	6.8	10.1	12.4	13.5	14.2	11.9	11.8	10.6	9.8	9.2	8.1	5.8	5.6	5.2	5.3	6.5	14.2
3-Apr	4.8	3.4	2.6	1.5	0.8	-0.4	-0.9	0.7	2.4	3.8	4.9	7.0	8.0	8.4	9.2	9.6	9.6	9.1	8.5	5.4	3.4	2.7	2.3	2.0	4.5	9.6
4-Apr	0.8	0.9	0.3	0.0	-0.5	-1.0	-0.8	0.2	4.2	6.4	7.6	7.7	8.6	8.2	6.4	6.4	6.4	6.2	5.3	2.3	1.2	-0.4	-1.5	-2.4	3.0	8.6
5-Apr	-2.5	-2.3	-2.4	-3.2	-3.6	-3.6	-3.9	-2.1	-0.5	0.8	3.8	8.3	10.2	10.8	11.8	12.0	11.5	11.1	10.7	10.3	9.9	8.6	8.0	6.0	4.6	12.0
6-Apr	4.9	3.6	4.2	3.9	2.8	2.0	3.1	5.9	8.7	9.9	12.2	14.7	17.4	18.3	17.4	18.1	17.7	16.8	15.0	11.3	9.1	7.3	7.7	7.0	10.0	18.3
7-Apr	7.6	6.8	6.7	6.0	6.2	6.0	6.2	5.3	5.5	6.8	8.2	9.1	10.2	11.1	11.4	11.2	11.0	10.3	9.2	8.2	7.0	6.0	4.8	3.4	7.7	11.4
8-Apr	2.1	1.2	0.3	-0.4	-1.0	-1.5	-2.2	-2.2	-2.3	-3.2	-2.9	-3.1	-3.4	-3.7	-4.0	-3.9	-3.8	-4.4	-4.8	-5.0	-5.2	-5.5	-5.5	-5.4	-2.9	2.1
9-Apr	-5.5	-5.5	-5.7	-5.8	-6.0	-6.0	-5.8	-5.5	-4.8	-3.8	-1.8	-0.3	1.6	3.2	4.4	5.1	6.0	6.4	5.2	1.8	0.0	-0.7	-1.0	-1.3	-1.1	6.4
10-Apr	-1.6	-2.2	-2.3	-3.2	-3.0	-3.1	-2.5	0.5	2.9	5.2	7.2	9.2	11.0	11.3	11.3	11.0	10.4	8.8	5.9	3.6	2.7	3.8	4.0	4.3	11.3	
11-Apr	3.3	2.3	0.7	-0.6	-1.3	-1.5	-1.6	-1.3	-0.9	-0.6	0.4	0.9	0.7	1.1	1.7	2.4	3.6	3.7	2.8	1.4	0.1	-1.1	-2.3	-2.9	0.5	3.7
12-Apr	-3.4	-4.0	-4.4	-4.7	-5.2	-6.8	-6.4	-4.9	-2.8	-1.4	0.1	1.9	2.6	3.7	4.5	5.0	5.0	4.9	4.5	3.5	2.6	1.7	0.4	-1.0	-0.2	5.0
13-Apr	-2.9	-4.4	-5.0	-5.8	-5.5	-5.0	-4.3	-2.1	-0.2	2.6	4.3	5.6	6.8	7.8	8.7	8.7	8.7	8.6	8.1	6.9	6.1	5.2	4.3	3.5	2.5	8.7
14-Apr	2.9	2.3	2.5	2.5	1.5	1.6	1.4	0.9	1.0	1.1	1.6	2.1	2.7	2.8	2.4	2.1	2.9	3.7	3.3	2.6	2.0	1.4	0.4	0.0	2.0	3.7
15-Apr	-0.3	-0.9	-2.4	-4.1	-4.9	-5.2	-5.2	-4.4	-3.8	-2.4	-1.5	-0.1	1.4	2.1	3.0	4.2	4.5	4.6	4.2	2.9	2.0	-2.1	-3.7	-4.4	-0.7	4.6
16-Apr	-3.0	-3.7	-4.4	-4.8	-5.2	-5.6	-4.6	-2.1	-0.3	1.7	4.7	7.4	8.6	9.4	9.8	9.7	9.4	9.1	7.6	6.5	5.4	4.5	3.7	0.2	2.7	9.8
17-Apr	-0.6	-1.2	-2.4	-3.5	-4.3	-4.8	-5.3	-5.9	-6.5	-6.6	-5.9	-5.5	-4.8	-4.4	-4.1	-3.8	-3.7	-3.9	-4.1	-4.7	-5.2	-5.5	-5.7	-6.2	-4.5	-0.6
18-Apr	-6.8	-7.5	-8.2	-9.1	-9.9	-10.5	-11.0	-11.0	-10.2	-9.2	-8.4	-7.5	-6.8	-5.6	-4.8	-4.3	-4.0	-3.5	-3.4	-3.9	-4.1	-4.3	-4.9	-5.0	-6.8	-3.4
19-Apr	-5.1	-5.2	-5.3	-5.4	-5.9	-5.9	-5.4	-4.6	-3.9	-3.2	-2.2	-1.0	1.1	1.7	2.3	3.0	3.4	3.5	3.1	2.3	0.0	-1.6	-3.3	-3.7	-1.7	3.5
20-Apr	-4.2	-4.7	-4.8	-5.6	-6.0	-3.9	-2.3	-0.1	1.7	3.1	3.6	2.7	0.6	-1.3	-2.5	-2.8	-3.1	-3.3	-3.1	-3.0	-3.9	-5.8	-4.5	-4.0	-2.4	3.6
21-Apr	-5.0	-6.3	-6.5	-7.1	-8.1	-10.9	-10.3	-6.8	-5.7	-4.6	-3.6	-3.6	-2.6	-1.7	-1.1	-1.0	-0.3	-0.3	0.0	-1.3	-3.2	-4.4	-6.1	-7.6	-4.5	0.0
22-Apr	-8.7	-9.4	-8.9	-4.1	-4.3	-5.1	-5.9	-6.6	-7.4	-7.2	-6.8	-6.3	-5.6	-5.4	-4.9	-4.2	-3.6	-3.4	-3.7	-4.3	-4.8	-5.2	-6.4	-7.6	-5.8	-3.4
23-Apr	-8.9	-9.8	-11.3	-12.8	-13.9	-11.8	-9.7	-7.5	-4.5	-3.3	-1.8	-0.5	0.8	2.1	3.0	3.6	3.7	4.0	3.6	2.4	0.7	0.2	0.0	-0.5	-3.0	4.0
24-Apr	-0.2	-1.2	-1.2	-1.8	-2.2	-2.2	-2.0	-1.6	-1.7	-1.0	0.8	2.1	3.2	3.9	4.0	3.7	3.6	3.6	3.3	2.8	2.1	1.5	0.7	0.7	0.9	4.0
25-Apr	0.8	0.3	-0.2	-0.4	-0.8	-0.7	0.1	1.4	2.3	3.2	4.8	5.2	5.7	5.9	5.7	5.5	5.4	5.4	4.8	3.7	1.9	1.8	2.2	2.1	2.8	5.9
26-Apr	1.9	1.7	1.4	1.2	0.9	0.9	1.6	2.9	4.0	4.9	5.4	5.5	5.5	5.2	5.9	6.6	6.2	5.7	5.3	3.9	1.4	-0.6	-0.5	0.0	3.2	6.6
27-Apr	0.2	1.0	1.7	1.1	0.5	0.8	2.3	4.4	6.0	6.8	8.2	9.4	10.6	10.7	11.5	11.8	12.0	12.1	11.4	9.7	7.5	7.2	8.0	4.7	6.7	12.1
28-Apr	3.4	2.2	-0.8	-2.2	-3.1	-1.9	0.1	1.7	4.2	7.3	9.3	11.4	11.8	12.8	13.1	13.0	12.9	12.3	12.4	11.2	9.3	7.1	5.7	5.0	6.6	13.1
29-Apr	5.5	5.3	4.9	4.5	4.0	3.5	4.5	6.5	9.1	11.6	13.3	13.2	14.1	13.5	14.4	14.4	14.6	15.0	12.7	11.0	8.3	5.6	3.4	3.1	9.0	15.0
30-Apr	1.9	0.7	-0.9	-0.4	0.0	1.1	3.4	6.4	9.6	11.8	14.0	15.5	16.3	15.8	12.7	9.5	10.7	9.6	9.2	8.8	7.9	5.8	4.0	3.9	7.4	16.3
	-0.2	-0.9	-1.5	-2.0	-2.5	-2.7	-2.2	-0.9	0.6	1.8	3.3	4.5	5.4	5.9	6.0	6.1	6.2	6.0	5.3	4.0	2.5	1.4	0.8	0.2	Diurnal Average	
	7.7	6.8	6.7	6.0	6.2	6.0	6.2	6.5	9.6	11.8	14.0	15.5	17.4	18.3	17.4	18.1	17.7	16.8	15.0	11.3	9.9	8.6	8.0	7.0	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Muskeg River - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	285	39.58	39.58
0 - 10	355	49.31	88.89
10 - 20	80	11.11	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

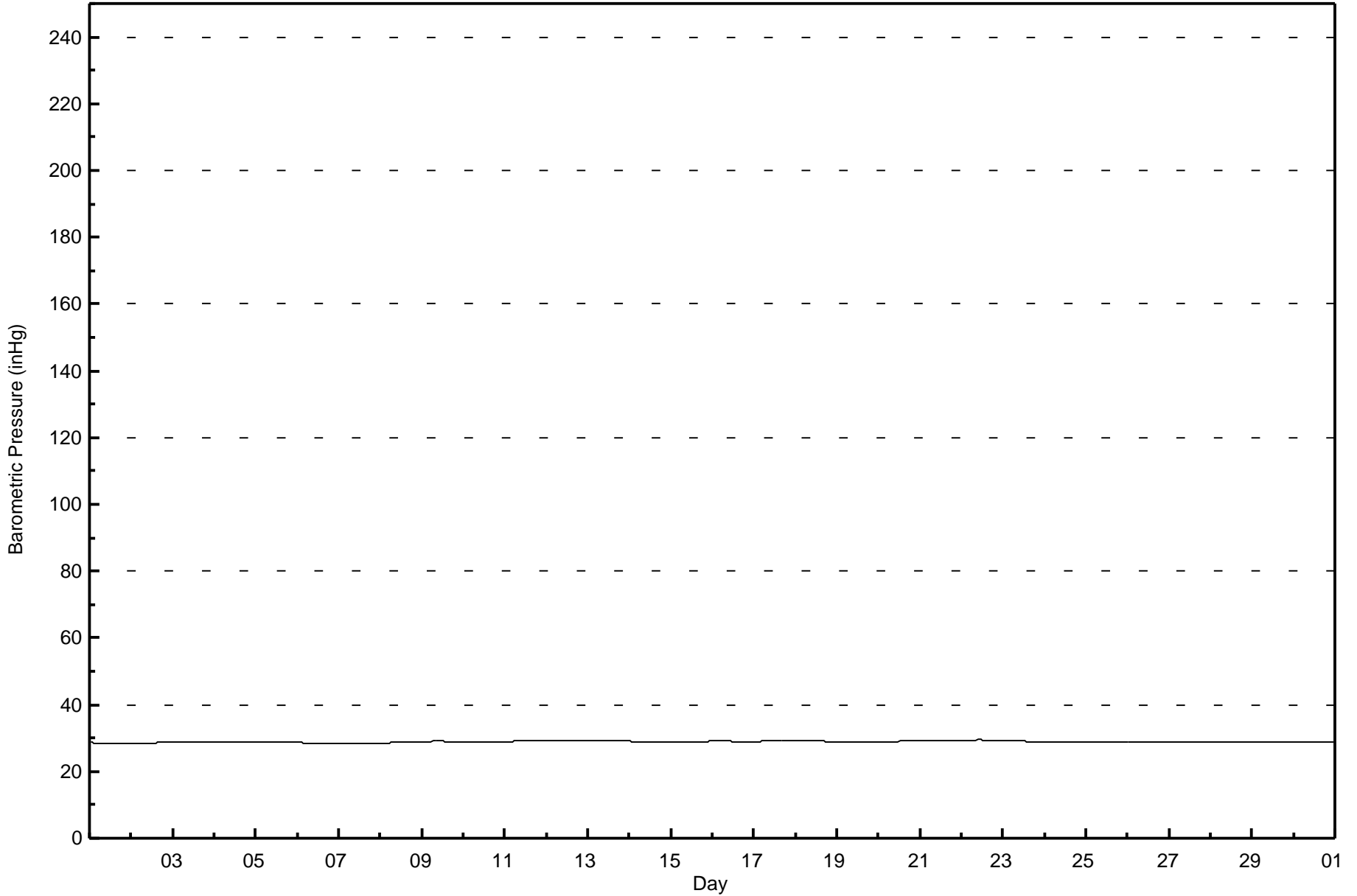


Maximum Value: 29.5 inHg on Apr 22 11:00 Maximum Daily Average: 29.4 inHg on Apr 21																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 28.5 inHg on Apr 7 03:00 Minimum Daily Average: 28.5 inHg on Apr 7 Maximum Diurnal Average: 29.0 inHg at hour 8 Minimum Diurnal Average: 28.9 inHg at hour 18 Monthly Average: 28.94 inHg Percentiles: P ₁ = 28.5 P ₁₀ = 28.6 Q ₁ = 28.8 Median = 28.9 Q ₃ = 29.1 P ₉₀ = 29.3 P ₉₉ = 29.4																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6																						
2-Apr	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.6	28.8																					
3-Apr	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9																					
4-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9																					
5-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.8	28.9																					
6-Apr	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6																					
7-Apr	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5																					
8-Apr	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.7	28.9																					
9-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	29.0	29.1																					
10-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9																					
11-Apr	28.9	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.1	29.3																						
12-Apr	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3																					
13-Apr	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3	29.3																					
14-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0																					
15-Apr	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0																					
16-Apr	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1																					
17-Apr	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.1	29.2																					
18-Apr	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2																					
19-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0																					
20-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.1	29.3																					
21-Apr	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4																					
22-Apr	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.5																					
23-Apr	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.1	29.3																					
24-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0																					
25-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0																					
26-Apr	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9																					
27-Apr	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9																					
28-Apr	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0																					
29-Apr	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9																					
30-Apr	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8																					
																						28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	Diurnal Average	
																						29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Muskeg River - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Muskeg River - April 2017

Maximum Speed: 31 km/h on Apr 20 15:00	Maximum Daily Speed Average: 23.1 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 21 06:00	Minimum Daily Speed Average: 1.1 km/h on Apr 19	Hours of Data: 720
Maximum Diurnal Speed Average: 5.7 km/h at hour 18	Minimum Diurnal Speed Average: 2.7 km/h at hour 13	Hours of Missing Data: 0
Monthly Average Velocity: 4.3 km/h 43.6 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 12 Q ₃ = 18 P ₉₀ = 23 P ₉₉ = 28	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW11	SW18	SW19	SW20	SW12	SSE8	S11	SSW10	SW16	SW15	SW20	SW20	W18	W13WNW12WNW15	NW11	NNW9	NW7	NW7	WNW5	W4	WSW9	WSW9	WSW9	WSW9	WSW9.7	SW20
2-Apr	SW8	SW10	SW6	S6	SSW7	SSW7	SSW7	SSW8	SSW7	S8	S7	WNW4WNW15	NNW16	NNE18	NNE20	NNE18	NNE19	NE17	NE10	N7	NNW11	NNW13	NNW15	NNW15	NNW3.5	NNE20
3-Apr	N15	N14	N12	N6	NE6	NE4	ENE4	SE3	SW3	WSW2	NE3	WNW3	N7	NNE7	NNW6	WNW7	NW6	NE7	ESE7	SSE3	SSE5	SSW5	SSW5	SSW4	N2.5	N15
4-Apr	SSE7	S6	SSE5	S7	S6	S6	SSW7	SSW5	SSE6	ESE4	WSW6	SW14	SW14	NE5	ENE9	NNE5	ENE4	SSE10	SE9	SSE8	SSW7	S6	SSE6	SSE5	S4.5	SW14
5-Apr	SSE6	S7	S6	S7	S6	SSW6	S7	SSW6	SSW7	SSE16	S11	S16	SSE27	SSE30	S24	S20	S16	SSW10	S12	S14	S11	S12	S12	S10	S12.2	SSE30
6-Apr	S6	SSE5	S5	S5	SSW8	SSW9	S8	S8	SSW11	SSW10	S11	S12	SSW14	WSW21	WSW18	WSW18	WSW15	WNW12	WNW8	NW9	NNE5	ENE8	NE10	NNE9	SW5.6	WSW21
7-Apr	NE12	NE11	N11	N11	N13	N14	NNE18	NNE13	N16	NNE19	NNE16	NNE18	NNE24	NNE24	NNE21	NNE22	NNE26	NNE28	NNE30	NNE28	NNE29	NNE24	NNE23	NNE23	NNE19.5	NNE30
8-Apr	NNE21	NNE23	N22	N23	N23	NNE25	NNE26	NNE25	N27	NNE27	NNE28	NNE26	NNE27	NNE28	NNE27	NNE25	NNE23	NNE23	NNE22	NNE21	NNE18	NNE18	NNE16	NE14	NNE23.1	NNE28
9-Apr	ENE10	NE9	ENE9	ENE6	SE3	SSE3	SSW4	SSW6	SSW6	SSW7	SSW10	SSW11	SSW12	S12	SSW12	SSW13	S11	S11	SSE9	SSE7	SSE10	SSE10	S10	S10	S6.3	SSW13
10-Apr	S9	S6	S7	SSW8	S7	SSW5	S8	S7	S8	SSW9	SSW9	SW10	SSW12	S12	S11	SSW9	SSW8	SSW7	S5	SSE6	SSE6	S6	N8	NNE17	S6.1	NNE17
11-Apr	NNE20	NNE25	NNE24	NNE18	NNE19	NNE19	NNE22	NNE21	NNE21	NNE22	NNE19	NNE21	NNE22	NNE23	NNE21	NNE19	NNE20	N20	N22	N18	N17	NNE20	N18	N19	NNE20.0	NNE25
12-Apr	NNE17	NNE19	NNE18	NNE17	NE17	NE9	NE13	NNE9	N12	NNE12	NNE15	N13	N14	N13	N14	N14	NNE15	NNE16	NNE16	NNE20	NNE21	NNE15	NE16	NNE11	NNE14.2	NNE21
13-Apr	NE5	NE7	ENE6	NE5	NE7	ENE10	NE9	ENE7	NE10	ENE12	ENE13	ENE14	ENE16	ENE17	E16	ENE18	ENE21	ENE21	ENE18	ENE16	ENE22	ENE20	ENE20	ENE16	ENE13.3	ENE22
14-Apr	ENE15	NE18	NE19	NE17	NNE17	NNE18	NE19	NE19	NE25	NE23	NE25	NE23	ENE24	ENE23	ENE26	ENE27	ENE22	NE26	NE25	NE25	NE22	NE24	NE26	NE26	NE22.0	ENE27
15-Apr	NNE28	NNE30	NE27	NNE27	NNE25	NNE23	NNE23	NNE20	NNE18	NNE16	N18	N18	N17	N17	N17	N16	N15	N14	NE14	NE11	NE11	ESE6	SSE10	S12	NNE15.5	NNE30
16-Apr	SSE16	S15	S14	S15	S13	S10	S13	S12	SSW12	S15	SSW14	SSW17	SW19	SW20	SSW20	SSW18	SSW17	SSW17	SSW14	SSW13	SSW10	SSW7	NNE5	NNE26	SSW11.6	NNE26
17-Apr	NNE23	NNE22	NNE24	N22	N23	NNE24	NNE25	N24	NNE24	NNE22	NNE22	NNE23	NNE22	NE23	NE24	NE25	NE25	NNE23	NE23	NNE22	NNE19	NNE19	NNE21	N21	NNE22.3	NNE25
18-Apr	NNE21	NNE21	NNE20	NNE24	NNE21	NNE22	NE20	NE19	NE16	NNE14	NNE13	NNE12	NNE12	NNE14	NNE13	NNE14	NE11	NE10	NE10	NE10	NE10	NE9	NE10	NNE14.6	NNE24	
19-Apr	NNE10	NNE9	NNE10	NNE9	ENE6	ENE6	ESE3	NNE2	NW3	W5	WNW4	WSW4	S7	SSW7	SW3	SW6	WSW6	SSW7	S8	SSW6	SW6	SSW6	SSW6	S6	SW1.1	NNE10
20-Apr	SSE4	S4	WSW2	ENE4	NE6	NE6	NE10	NNE13	NNE18	NNE23	NNE25	NNE27	N30	NNE29	NNE31	NNE27	NNE22	NNE20	NE19	N9	WSW2	NW6	NNE16	NNE19	NNE14.3	NNE31
21-Apr	NNE20	N19	NNE21	NE13	NNE11	NW1	SSE2	ENE5	NE10	N6	NW7	ENE6	NW6	W6	SW5	WNW5	WNW5	NNE2	SSE3	SE4	SSE5	S4	S4	SSW5	NNE3.5	NNE21
22-Apr	SSW5	S4	WNW4	NNE19	NNE26	NNE24	NNE25	NNE22	N23	NNE20	NNE19	NE21	NE18	NE18	NE18	NNE19	NNE14	NNE14	NE13	ENE13	NE17	NE18	NE18	NE14	NNE15.5	NNE26
23-Apr	ENE12	NE7	NE6	ENE6	ENE5	ENE8	NE9	NE7	NNW1	N5	NNE9	NNE13	NE13	NE12	NE11	ENE10	NE11	ENE9	ENE9	ESE6	SE8	ESE8	ESE9	SE6	ENE7.1	NE13
24-Apr	NNE8	NNE9	NE10	ENE12	ENE9	ENE9	ENE9	NE10	NE11	NE15	ENE15	ENE16	ENE12	ENE12	ENE12	E11	ESE9	E6	ESE9	ESE7	ESE6	SE6	SE5	SE5	ENE9.0	ENE16
25-Apr	ESE7	ESE5	SSE5	SE3	SSE5	SSE3	SSE6	SSE13	SSE13	S10	S15	S13	SSW15	S13	SSE17	S15	S12	S13	S14	S13	SSE12	S12	SSE14	SSE13	S10.6	SSE17
26-Apr	SSE13	SSE13	SSE13	SSE14	SSE13	SSE12	SSE12	S16	S20	S17	S16	S18	S19	S16	SSW15	S15	S14	SSE16	S14	S8	SSE5	SE6	SSE6	SSE6	S13.0	S20
27-Apr	SSE9	S9	SSE9	SSE8	SSE8	SSE7	SSE8	SSE10	S12	SSW9	S9	S11	SW13	SSW8	SW7	W5	NW8	NW7	NNW7	NNW8	NNW9	NNW10	NNE13	E8	S3.0	NNE13
28-Apr	N3	NNW5	S3	SW3	S7	S6	S5	S4	SE2	S6	SE4	ENE7	NE5	SSE4	WSW3	WNW4	W3	ENE6	E6	E7	E8	E8	E6	SE6	ESE2.3	E8
29-Apr	S5	S7	S5	SSW6	SSW7	SSW6	SSW8	SSW10	SW13	SW11	SW14	SW14	SW19	SW17	SSW16	SSW15	S12	SSE16	SSW12	SSW10	S7	S7	S8	S8	SSW10.0	SW19
30-Apr	S6	SSE6	SE8	S7	SSW8	SSW6	S7	SSW6	SSW7	SSW4	SSW6	SW9	WNW7	NW10WNW16	SSE8	N10	SE8	S11	W9	NW7	SE1	S5	SSW7	SSW3.6	WNW16	

NE5.1 NE4.9 NE4.9 NE4.6 NE4.6 NE4.7 NE4.9 NE3.5NNE3.2 NE3.3 NE3.4 NE2.9NNE2.7NNE3.7NNE4.1NNE4.3NNE5.1 NE5.7 ENE5.7 NE4.6 NE4.6 NE4.6 NE5.1 NE5.3	Diurnal Average
NNE28 NNE30 NNE27 NNE27 NNE26 NNE25 NNE26 NNE25 N27 NNE27 NNE28 NNE27 N30 SSE30 NNE31 NNE27 NNE26 NNE28 NNE30 NNE28 NNE29 NE24 NE26 NE26	Diurnal Maximum

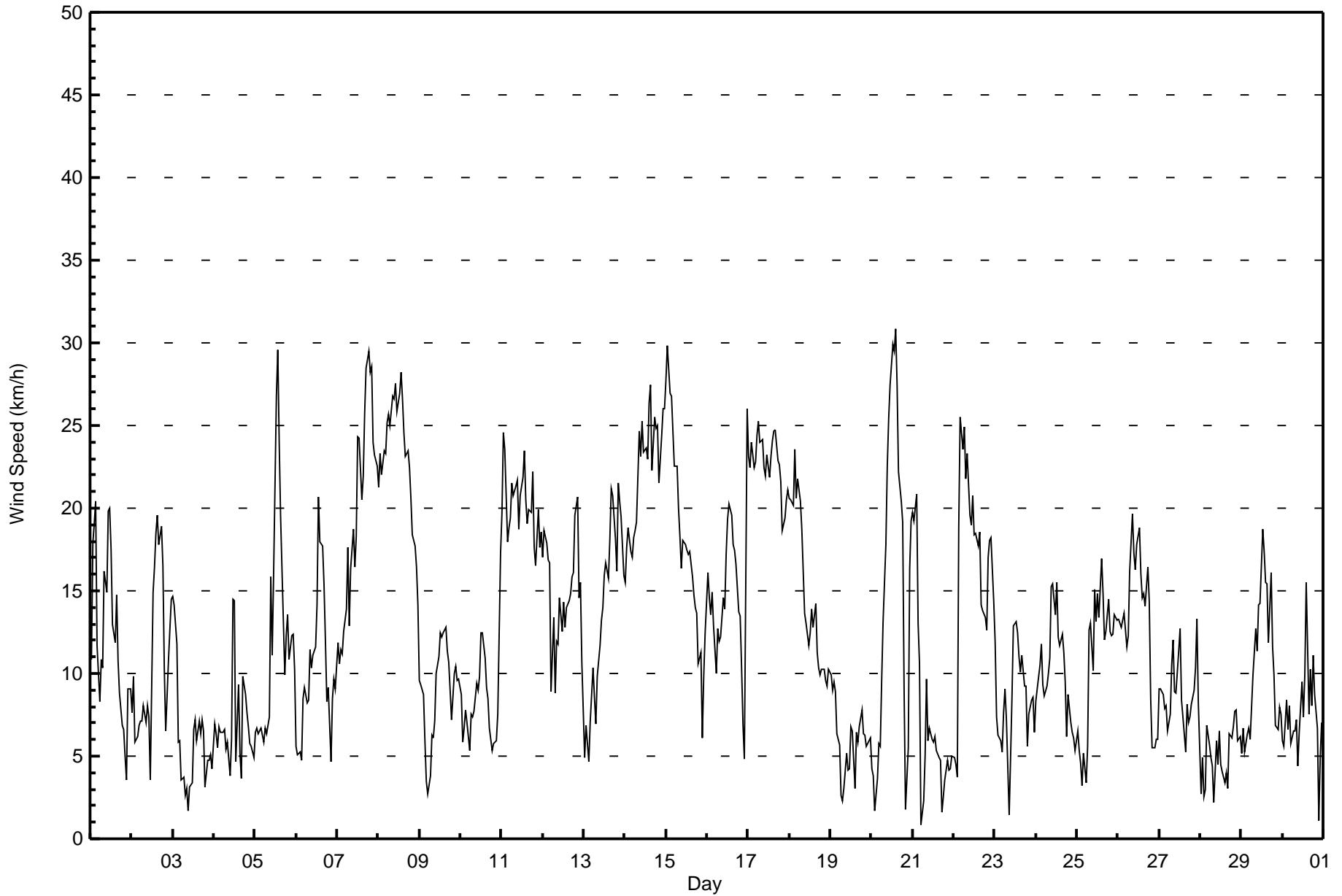
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Muskeg River - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Apr 16 23:00 Minimum Value: 1 km/h on Apr 21 23:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	5	3	2	6	2	2	3	3	3	3	4	4	4	5	4	3	3	1	1	1	2	2	4	6
2-Apr	3	2	3	1	1	1	2	2	2	2	2	2	8	5	5	4	4	5	4	3	5	3	3	3	8
3-Apr	3	3	4	3	3	4	2	1	1	2	2	2	3	3	3	3	2	2	1	1	2	2	1	4	
4-Apr	2	1	1	2	1	2	2	2	2	2	4	5	5	4	5	2	3	3	2	2	1	1	1	2	5
5-Apr	3	1	2	1	2	1	2	2	2	4	4	8	7	7	7	6	5	3	3	3	3	2	2	8	
6-Apr	2	2	1	1	2	2	2	2	3	3	3	3	5	5	5	5	4	3	2	1	2	2	3	5	
7-Apr	3	2	3	3	3	3	4	4	4	4	3	4	6	4	4	5	5	5	5	4	4	5	4	6	
8-Apr	5	5	5	5	5	6	6	6	6	5	5	5	5	6	6	5	5	5	5	4	4	4	3	6	
9-Apr	3	3	3	4	1	1	2	2	2	3	3	4	4	4	4	4	3	3	3	1	2	2	2	4	
10-Apr	2	1	1	2	1	2	1	2	2	2	3	3	4	4	4	3	3	2	1	1	1	2	6	6	
11-Apr	3	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	5	5	5	4	4	4	4	5	
12-Apr	3	4	3	3	3	4	2	3	3	3	3	4	4	4	4	5	3	3	3	3	3	3	2	5	
13-Apr	2	1	1	2	2	3	2	2	2	4	5	5	4	5	5	5	5	4	3	4	3	3	2	5	
14-Apr	3	3	2	2	3	4	3	4	5	4	4	5	6	5	8	7	6	5	5	4	3	5	5	8	
15-Apr	5	6	5	5	4	4	4	4	4	3	4	4	4	4	5	4	4	3	3	2	2	2	2	6	
16-Apr	3	3	3	3	3	3	3	3	4	4	4	6	5	6	6	5	6	6	5	4	3	2	9	9	
17-Apr	5	5	5	5	5	5	5	5	5	5	4	4	4	5	4	4	5	4	4	5	4	5	4	5	
18-Apr	4	4	4	5	4	4	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	3	2	5	
19-Apr	2	2	2	3	2	2	2	1	1	1	2	2	3	2	3	3	4	3	2	2	1	1	1	4	
20-Apr	1	1	1	1	3	2	2	3	4	4	5	6	6	6	7	6	5	5	5	3	2	2	8	8	
21-Apr	5	4	4	3	3	1	1	4	2	2	2	3	2	2	2	1	2	1	1	1	1	1	1	5	
22-Apr	2	2	4	5	5	5	5	4	5	4	4	4	3	4	4	4	3	4	3	2	3	3	2	5	
23-Apr	1	2	1	1	2	2	1	2	2	2	3	4	4	5	4	4	3	3	3	2	1	2	2	5	
24-Apr	3	2	2	2	1	1	2	2	2	2	4	5	5	4	5	4	4	3	2	2	2	2	1	5	
25-Apr	2	2	1	1	1	1	2	3	3	3	4	4	5	4	4	4	4	4	4	3	2	2	3	5	
26-Apr	2	2	2	2	2	2	3	4	4	4	5	5	5	4	5	4	5	4	4	2	1	1	1	5	
27-Apr	2	2	2	1	1	1	1	3	3	3	4	4	4	5	4	3	4	2	3	2	2	2	4	5	
28-Apr	2	2	3	1	1	1	1	1	1	1	1	3	3	3	2	2	1	2	1	1	1	1	3	3	
29-Apr	3	2	1	2	1	1	2	4	4	3	5	5	6	5	6	4	4	5	4	4	1	1	1	6	
30-Apr	1	2	1	2	2	1	2	2	3	3	3	3	3	9	7	3	5	4	4	2	2	4	2	9	
Diurnal Maximum																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Muskeg River - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	91	12.64	12.64
6 - 11	269	37.36	50.00
12 - 19	222	30.83	80.83
20 - 28	131	18.19	99.03
29 - 38	7	0.97	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Muskeg River - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	5	6	5	0	3	8	16	12	9	4	5	4	8	2	2	91
6 - 11	8	13	34	21	7	11	8	27	54	49	9	4	2	3	12	7	269
12 - 19	25	51	27	19	1	0	0	17	37	18	14	3	2	5	0	3	222
20 - 28	10	83	18	10	0	0	0	1	3	1	4	1	0	0	0	0	131
29 - 38	1	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	157	85	55	8	14	16	62	106	77	31	13	8	16	14	12	720

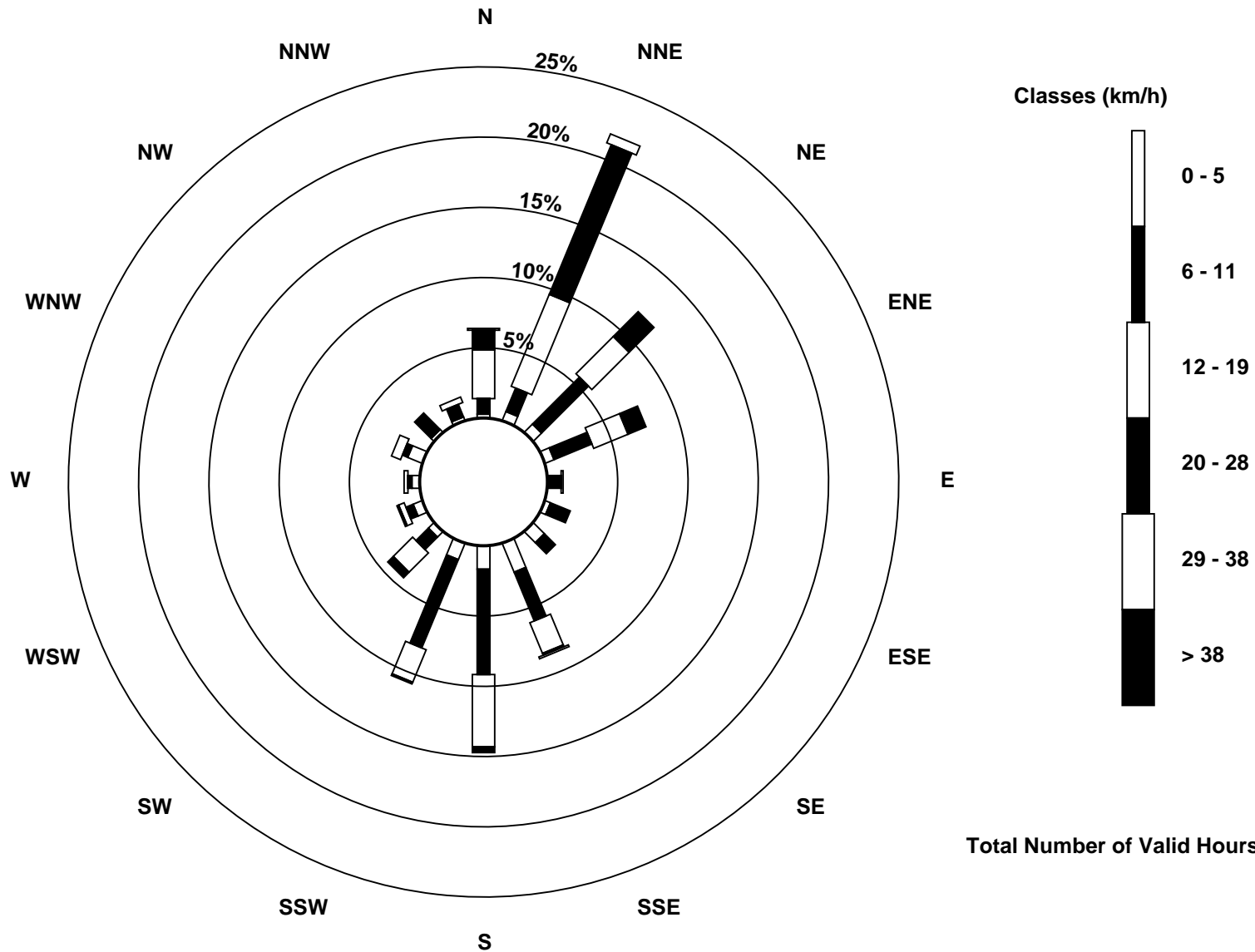
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Muskeg River (AMS 16)



Total Number of Valid Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Muskeg River - April 2017

Direction of Maximum Speed: 23 deg on Apr 20 15:00 Direction of Maximum Daily Speed Average: 18.2 deg on Apr 8	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 307 deg on Apr 21 06:00 Direction of Minimum Daily Speed Average: 1.1 deg on Apr 19	Percent Operational Time: 100.0
Monthly Average Direction: 199.8 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	199	228	229	233	221	148	187	212	235	217	228	232	259	262	302	302	319	327	314	306	288	267	255	238	244.0
2-Apr	230	226	220	175	198	201	205	206	201	177	174	287	295	328	25	16	32	28	37	36	349	340	336	346	346.1
3-Apr	349	351	354	11	39	40	66	143	215	237	36	297	354	26	335	297	312	55	110	158	156	196	198	203	1.0
4-Apr	161	184	165	186	180	187	192	192	147	113	253	228	234	38	75	22	63	159	141	149	204	176	157	156	174.9
5-Apr	165	183	182	186	188	209	191	206	193	158	177	178	168	167	175	182	183	200	169	173	177	178	185	179	177.8
6-Apr	183	166	182	186	206	202	185	182	194	204	187	176	213	255	258	246	254	291	301	307	21	66	43	25	226.9
7-Apr	48	38	7	357	4	2	24	19	8	15	20	21	22	27	25	18	22	24	24	25	24	24	23	23	21.1
8-Apr	20	24	11	7	10	15	20	14	10	18	28	28	22	22	15	14	16	29	14	19	12	15	23	40	18.2
9-Apr	64	52	62	61	132	152	195	201	201	211	195	199	206	184	196	201	190	170	152	155	156	159	179	179	173.0
10-Apr	183	177	189	192	186	192	178	182	180	196	207	216	193	186	186	201	206	192	184	147	150	174	1	31	185.9
11-Apr	27	26	24	17	12	17	21	18	13	23	13	25	33	25	29	20	18	9	4	10	11	20	2	1	17.9
12-Apr	13	26	25	26	35	56	45	30	7	17	29	353	9	358	358	4	31	33	30	27	27	22	39	30	22.9
13-Apr	48	52	57	55	47	59	52	57	34	66	73	74	69	77	94	71	61	62	64	65	62	61	61	63	64.1
14-Apr	57	36	35	37	31	29	40	45	48	45	43	53	59	59	63	60	58	45	39	40	42	49	50	38	46.5
15-Apr	31	27	34	27	32	34	30	22	17	12	3	3	1	356	356	357	2	8	42	36	39	109	164	170	22.6
16-Apr	163	170	174	171	172	182	173	184	198	191	193	210	218	215	205	198	201	200	196	202	199	199	17	25	191.8
17-Apr	22	16	15	6	11	19	15	7	12	19	29	30	30	36	39	38	37	33	36	24	12	15	13	7	21.8
18-Apr	20	18	16	26	21	32	36	36	35	30	33	25	31	33	14	29	38	40	38	50	53	51	52	37	31.0
19-Apr	22	21	16	33	64	67	105	21	309	267	301	247	186	212	234	235	242	211	188	197	221	210	199	180	224.8
20-Apr	163	186	254	68	56	48	45	31	30	27	23	17	9	22	23	21	21	23	37	5	253	320	17	23	23.2
21-Apr	14	2	25	43	24	307	151	62	42	3	318	57	314	267	233	303	283	21	159	128	163	188	186	194	13.4
22-Apr	201	186	295	16	22	26	27	25	4	18	31	43	40	43	37	32	30	25	47	64	47	46	44	48	32.3
23-Apr	61	55	55	72	71	63	55	42	328	351	21	28	41	41	44	58	53	72	76	109	126	118	120	130	61.1
24-Apr	31	19	43	63	59	65	64	40	49	44	59	64	63	71	75	78	98	120	101	117	115	122	133	124	70.4
25-Apr	123	123	158	144	147	149	165	160	167	180	172	175	192	171	163	172	184	183	177	172	162	171	168	168	168.9
26-Apr	166	166	161	156	154	157	164	173	170	178	177	173	171	174	194	176	178	161	169	169	163	146	152	151	168.8
27-Apr	163	173	162	161	150	152	149	164	178	203	179	177	214	212	236	270	304	314	334	332	337	348	31	83	189.4
28-Apr	354	344	184	227	180	172	169	185	146	170	145	78	47	168	252	292	272	65	93	87	89	81	87	138	122.2
29-Apr	169	187	172	194	212	205	210	211	215	225	218	215	219	223	209	211	187	166	193	193	187	182	181	182	202.2
30-Apr	169	157	143	180	194	197	184	201	209	210	201	236	297	322	297	162	11	138	173	269	317	135	172	212	211.0

49.5	35.9	36.6	39.4	43.4	48.6	55.5	50.1	32.3	40.2	46.1	45.9	23.2	32.6	30.9	27.8	30.9	48.5	56.3	50.1	49.4	56.2	50.8	48.2
Diurnal Average																							

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

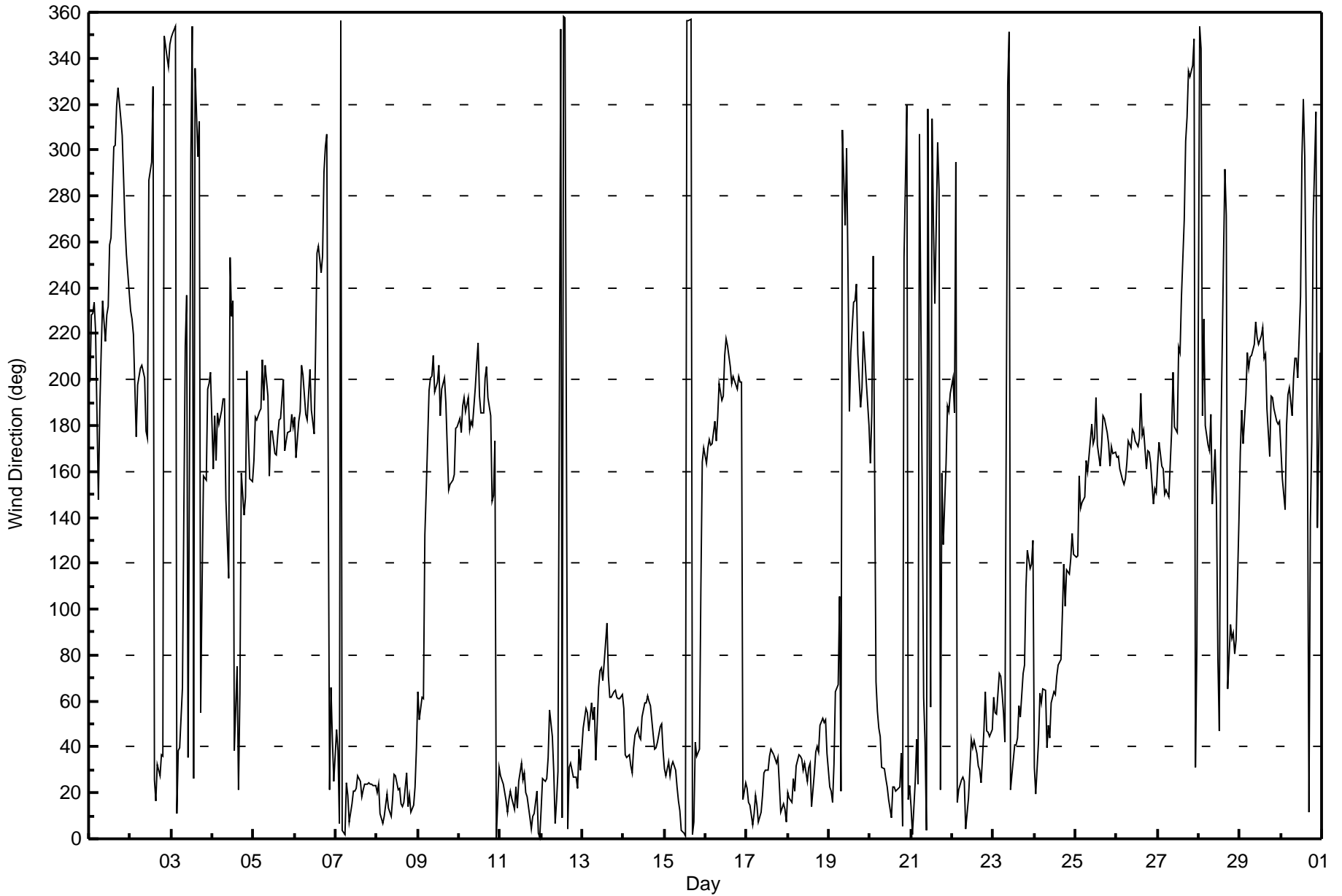
Wind Direction (WD) - deg
Muskeg River - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 98 deg on Apr 23 09:00 Minimum Value: 6 deg on Apr 1 04:00 Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 24 P ₉₀ = 38 P ₉₉ = 78																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	18	10	8	6	39	14	28	19	11	20	12	15	20	23	30	15	21	21	10	6	24	49	15	33	49
2-Apr	33	12	63	25	16	12	16	17	25	23	29	70	29	36	26	17	18	12	13	18	39	12	12	14	70
3-Apr	14	15	17	31	39	72	45	48	54	89	70	73	46	39	53	32	34	29	19	27	14	25	29	21	89
4-Apr	24	12	10	17	11	25	34	29	26	67	73	18	20	78	40	60	61	15	16	16	15	20	17	24	78
5-Apr	10	15	17	15	16	16	22	22	22	13	29	26	16	15	18	19	17	26	18	12	15	13	14	12	29
6-Apr	20	19	17	14	17	14	16	23	24	23	25	27	29	15	18	20	23	19	14	21	26	12	17	20	29
7-Apr	16	10	20	16	16	18	15	20	17	16	23	15	12	11	15	13	12	9	9	8	8	10	10	10	23
8-Apr	14	12	17	15	15	15	14	16	16	18	11	14	17	13	18	18	18	12	19	15	18	17	16	20	20
9-Apr	23	25	28	64	25	31	47	33	30	35	32	31	28	27	28	25	26	20	13	9	10	9	14	12	64
10-Apr	15	12	11	14	15	17	11	19	23	22	29	29	26	29	26	33	26	21	14	18	8	38	76	9	76
11-Apr	9	9	10	15	16	15	13	14	18	14	19	17	14	15	17	17	17	18	16	17	17	13	15	14	19
12-Apr	15	10	10	8	12	22	7	24	21	25	20	27	26	29	26	24	18	15	12	9	7	10	9	12	29
13-Apr	21	10	16	22	11	9	10	15	16	33	28	26	20	24	24	22	14	12	10	10	8	9	8	9	33
14-Apr	10	8	7	9	11	11	10	12	11	10	10	12	13	13	14	13	14	13	12	10	10	13	13	15	15
15-Apr	13	12	12	10	11	11	11	15	15	18	17	16	20	22	18	20	21	22	9	13	10	37	11	10	37
16-Apr	10	12	13	12	13	17	14	21	22	19	25	24	20	20	22	22	22	23	21	21	19	17	77	10	77
17-Apr	12	16	14	17	15	14	16	16	16	15	17	13	15	14	13	11	12	12	12	15	17	16	17	16	17
18-Apr	15	16	17	11	17	11	12	11	16	22	18	23	21	20	23	19	19	15	21	18	16	20	16	9	23
19-Apr	12	12	14	22	20	22	52	63	36	24	45	59	52	43	91	32	71	29	21	29	16	13	22	12	91
20-Apr	19	16	47	35	18	14	9	11	11	11	13	14	17	12	11	12	14	16	12	31	67	14	24	13	67
21-Apr	18	16	10	18	18	85	23	45	16	38	33	45	35	33	38	42	33	71	49	24	16	16	9	17	85
22-Apr	31	45	63	21	12	12	10	16	18	17	19	12	17	12	16	17	23	24	15	13	8	8	7	11	63
23-Apr	6	10	13	13	33	14	13	16	98	53	39	22	26	32	44	28	18	17	17	22	12	14	15	18	98
24-Apr	24	19	12	7	9	9	11	10	18	11	19	29	20	27	28	20	25	22	26	17	17	16	10	13	29
25-Apr	15	20	15	15	12	11	16	15	21	28	24	26	29	26	15	16	22	23	18	13	9	11	12	12	29
26-Apr	11	11	10	10	9	10	13	16	15	18	23	20	19	21	24	25	27	16	16	12	20	9	9	10	27
27-Apr	10	11	11	10	9	9	11	18	21	28	40	28	31	46	55	70	38	33	24	16	11	15	21	16	70
28-Apr	71	29	75	44	9	6	12	20	65	22	31	58	75	79	70	53	62	23	17	10	8	10	15	23	79
29-Apr	32	19	21	21	13	13	16	23	21	20	24	21	20	21	28	21	29	21	20	20	14	10	15	10	32
30-Apr	17	17	13	17	15	16	19	27	31	78	54	34	58	44	37	51	52	61	38	29	16	93	22	7	93
	71	45	75	64	39	85	52	63	98	89	73	73	75	79	91	70	71	71	49	31	67	93	77	33	
	Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Muskeg River - April 2017





Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Muskeg River	Station number:	AMS 16
Calibration Date:	April 18, 2017	Last Cal Date:	March 1, 2017
Start time (MST):	8:27	End time (MST):	13:30
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>48.2</u>	ppm	Cal Gas Exp Date	November 4, 2017
Cal Gas Cylinder #	<u>EY0000638</u>			
Calibrator Make/Model	API T700		Serial Number	493
ZAG Make/Model	API 701		Serial Number	2155

Analyzer Information

Analyzer make: Thermo 43i

Analyzer serial #: 1118148498

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-710	-710
Calculated slope	1.004404	0.994941	Lamp voltage	827	827
Calculated intercept	1.306963	2.229834	Pressure	712.0	715.0
Analyzer Background	8.4	8.5	Flow	0.442	0.443
Analyzer Coefficient	1.021	1.037	Intensity	90	90

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.0	-0.1	----
as found span	4930	76.6	737.5	721.5	1.022
calibrator zero	5002	0.0	0.0	-0.1	----
high point	4930	76.6	737.5	740.2	0.996
second point	4971	38.5	370.4	368.4	1.006
third point	4990	19.4	186.7	183.7	1.016
as left zero	5002	0.0	0.0	0.2	----
as left span	4930	76.6	737.5	737.9	0.999

Average Correction Factor				1.006
Corrected As found	721.67	Previous response	732.91	*% change 1.6%

* = > +/-5% change initiates investigation

Notes:

Changed inlet filter after asfound. Adjusted the span.

Calibration Performed By:

Jayne Marcoux



Wood Buffalo Environmental Association

SO₂ Calibration Summary

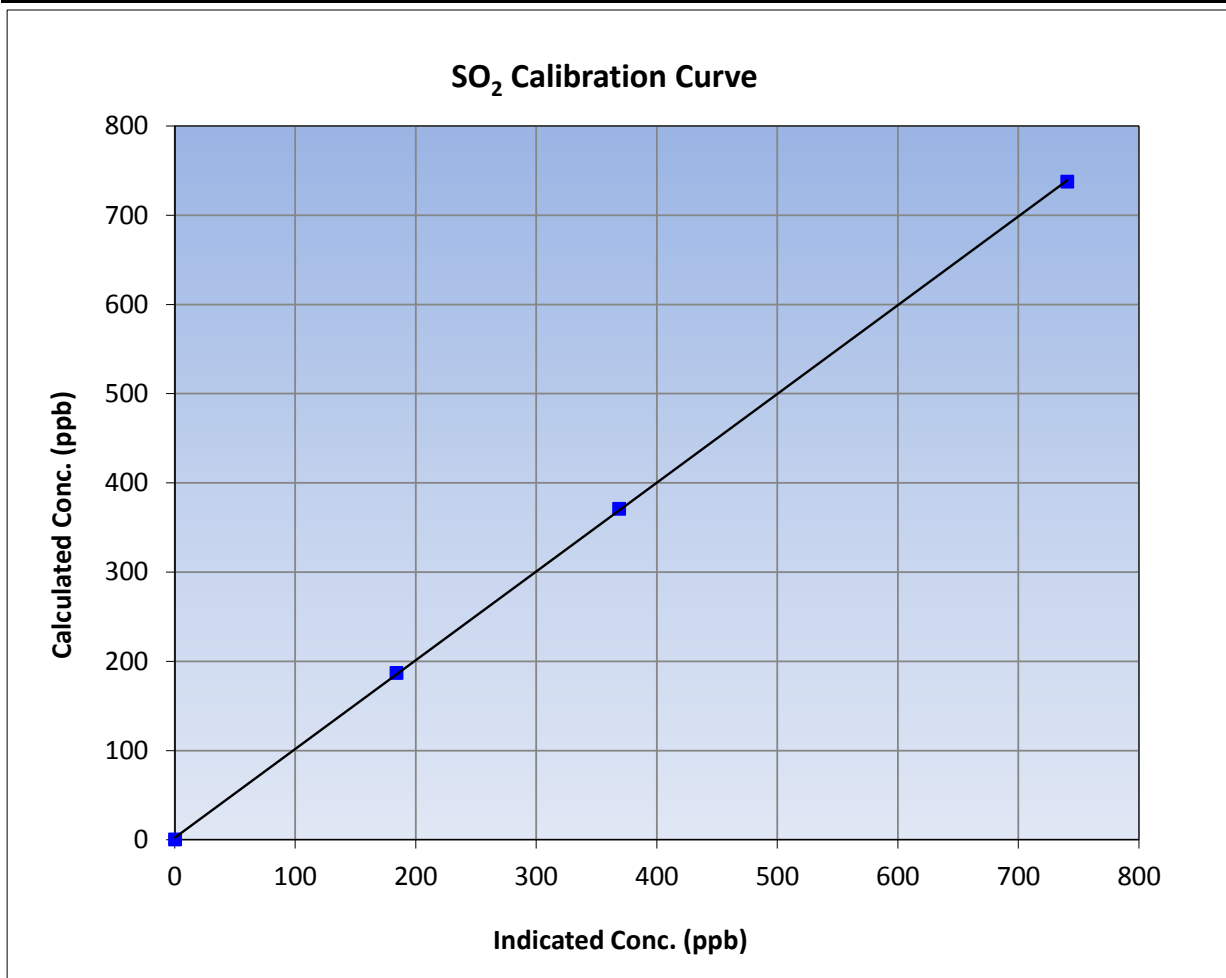
Version-03-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	March 1, 2017
Station Name	Muskeg River	Station Number	AMS 16
Start Time (MST)	8:27	End Time (MST)	13:30
Analyzer make	Thermo 43i	Analyzer serial #	1118148498

Calibration Data

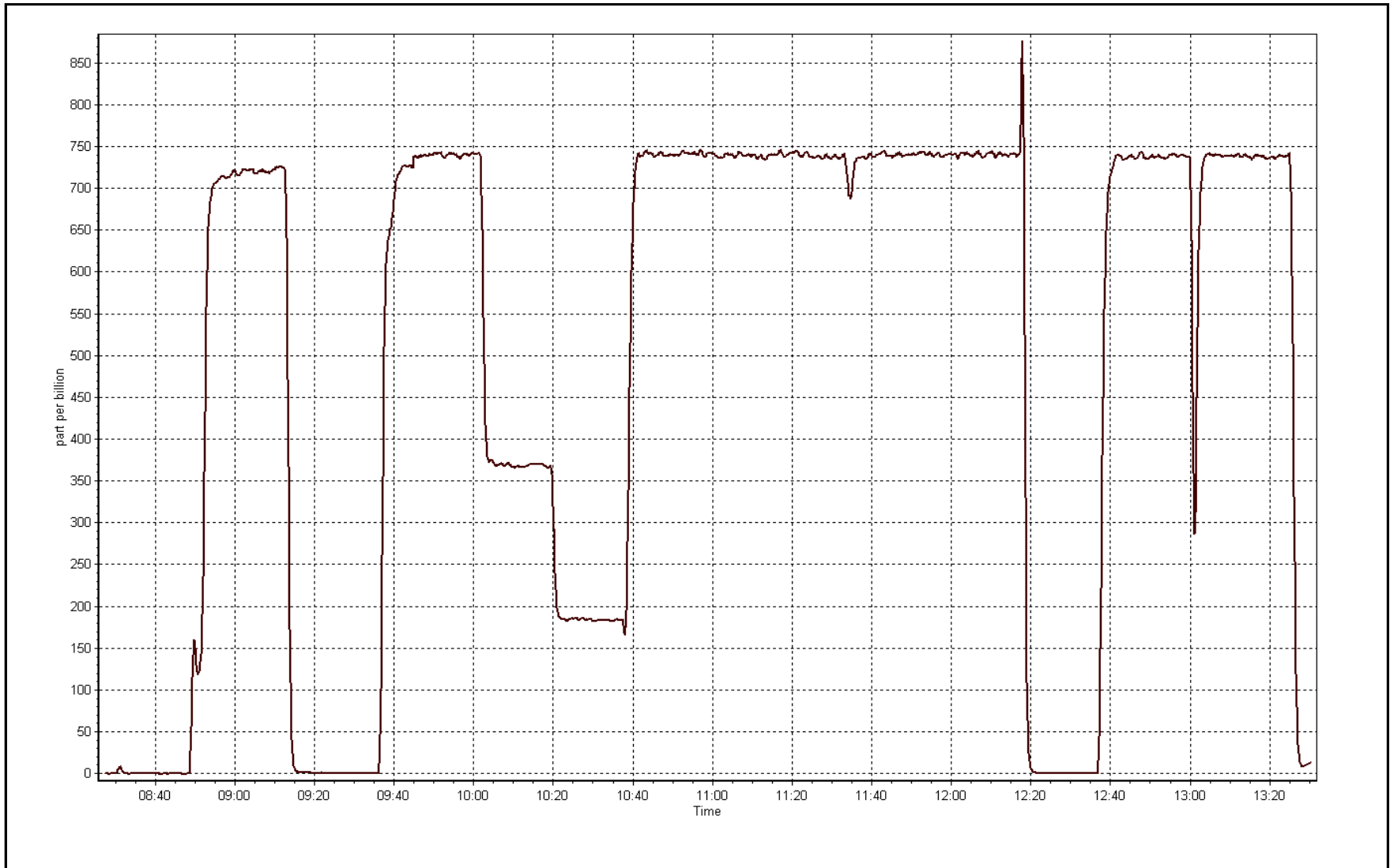
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	-0.1	----	Correlation Coefficient	≥0.995
737.5	740.2	0.9962		
370.4	368.4	1.0057	Slope	0.90 - 1.10
186.7	183.7	1.0163		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 18, 2017

Location: Muskeg River



Changed inlet filter after asfounds. Adjsuted the span.



Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Muskeg River	Station number:	AMS 16
Calibration Date:	April 19, 2017	Last Cal Date:	March 1, 2017
Start time (MST):	8:27	End time (MST):	13:28
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000638	Cal Gas Expiry Date	November-04-17
CH4 Cal Gas Conc.	<u>502.0</u> ppm	CH4 Equiv Conc.	1035.5 ppm
C3H8 Cal Gas Conc.	<u>194.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	493
ZAG Make/Model	API 701	Serial Number	2155

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1218153458
	<u>Start</u>	<u>Finish</u>	<u>Start</u>
Analyzer Range	0 - 25 ppm	Bias voltage supply	-287
Calculated slope	0.998886	Sample pressure	8.2
Calculated intercept	0.048952	Fuel pressure	24.2
Analyzer Background	2.370	Air pressure	34.9
Analyzer Coefficient	4.753	Flame temperature	156.9
			157.1

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.00	-0.04	----
as found span	4930	76.6	15.84	15.84	1.000
calibrator zero	5002	0.0	0.00	-0.04	----
high point	4930	76.6	15.84	15.84	1.000
second point	4971	38.5	7.96	7.93	1.004
third point	4990	19.4	4.01	4.05	0.990
as left zero	5002	0.0	0.00	0.10	----
as left span	4930	76.6	15.84	16.04	0.988
Average Correction Factor					0.998
Corrected As found	15.88	Previous response	15.81	*% change	-0.4%

* = > +/-5% change initiates investigation

Notes: Changed inlet filter after asfound. No adjustments needed.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

THC Calibration Summary

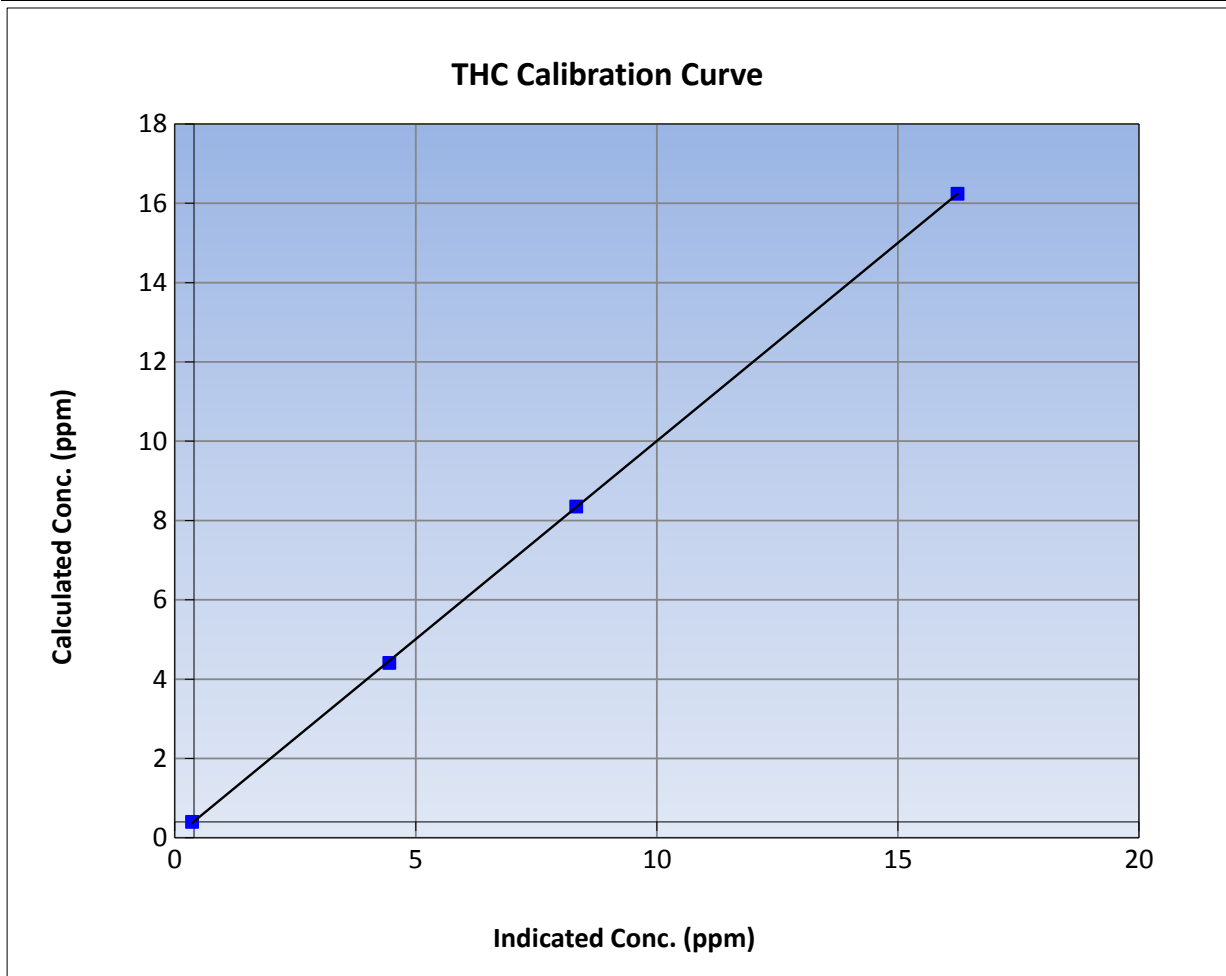
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 1, 2017
Station Name	Muskeg River	Station Number	AMS 16
Start Time (MST)	8:27	End Time (MST)	13:28
Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153458

Calibration Data

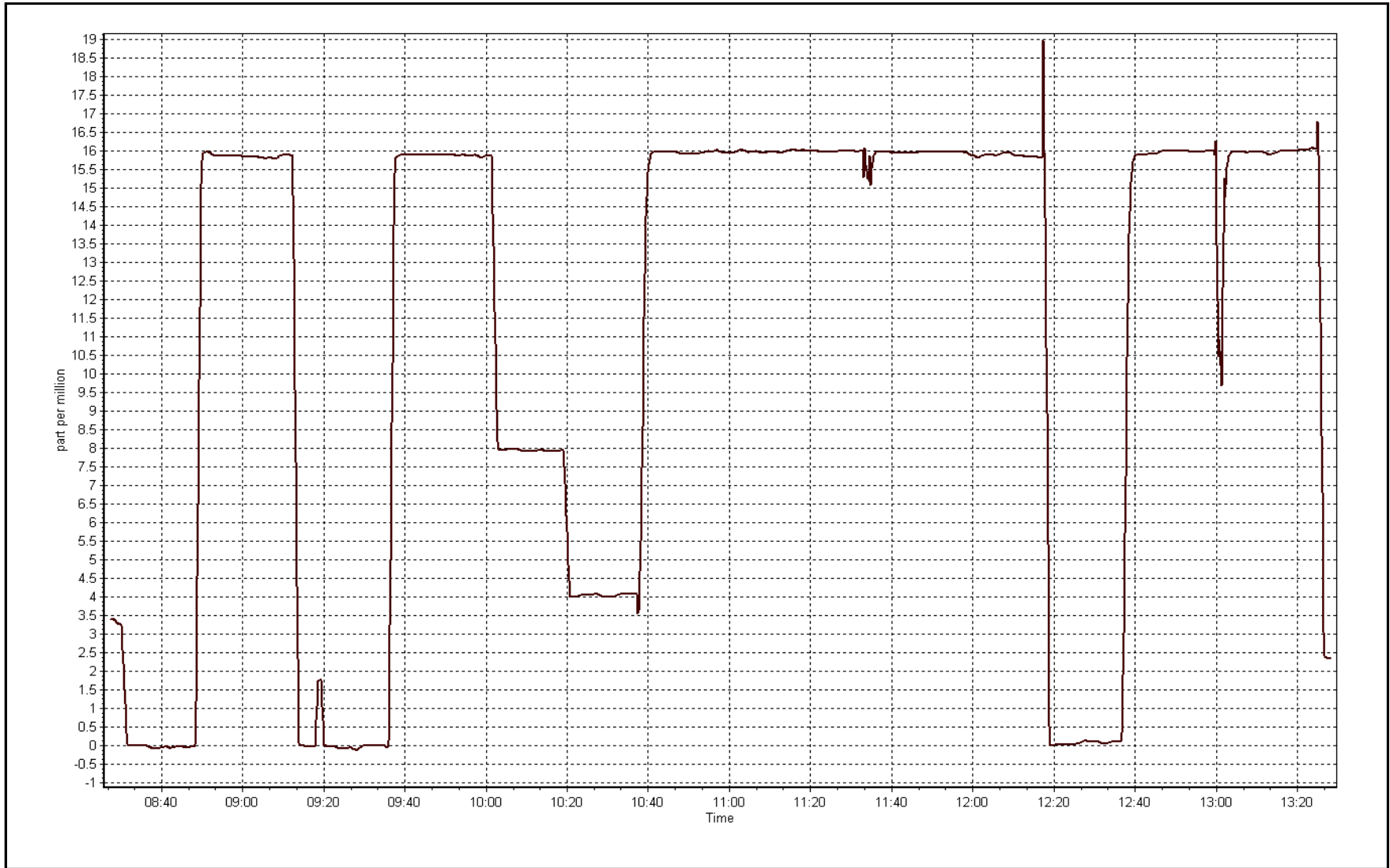
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999973	≥0.995
15.8	15.8	1.0002			
8.0	7.9	1.0036	Slope	0.999197	0.90 - 1.10
4.0	4.1	0.9902			
			Intercept	0.013418	+/-1.5



THC Calibration Plot

Date: April 19, 2017

Location: Muskeg River





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Muskeg River	Station number:	AMS 16
Calibration Date:	April 19, 2017	Last Cal Date:	March 3, 2017
Start time (MST):	8:27	End time (MST):	13:29
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	EY0000638	Cal Gas Expiry Date	November-04-19
NOX Cal Gas Conc.	<u>52.4</u> ppb	NO Cal Gas Conc.	<u>52.4</u> ppb
Calibrator Model	API T700	Serial Number	493
ZAG make/model	API T701	Serial Number	2155

Analyzer Information

Analyzer make: Thermo 42i			Analyzer serial #: 1426262593		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	1.129	1.181	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	1.000	0.997	PMT Temperature	-3.0	-2.8
NO2 coefficient	0.999	1.000	Reaction cell Press	178.0	178.6
NO bkgrnd	9.5	9.9	Sample Flow	0.870	0.859
NOX bkgrnd	10.1	10.6	PMT Voltage	-744.4	-744.8

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.998615	0.999969
NO _x Cal Offset	1.976078	0.207190
NO Cal Slope	0.998492	0.997975
NO Cal Offset	2.353819	0.464319
NO ₂ Cal Slope	1.025379	0.985600
NO ₂ Cal Offset	0.681852	0.075468



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5002	0.0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
as found span	4930	76.6	801.7	801.7	0.0	779.7	775.8	3.9	1.0283	1.0334
calibrator zero	5002	0.0	0.0	0.0	0.0	-0.2	-0.2	0.0	----	----
high point	4930	76.6	801.7	801.7	0.0	801.6	803.0	-1.4	1.0002	0.9984
second point	4971	38.5	402.7	402.7	0.0	402.4	403.1	-0.7	1.0008	0.9991
third point	4990	19.4	202.9	202.9	0.0	202.8	202.5	0.3	1.0007	1.0023
as left zero	5002	0.0	0.0	0.0	0.0	1.0	-0.1	1.1	----	----
as left span	4930	76.6	801.7	407.0	394.7	783.9	387.7	396.2	1.0227	1.0498
Average Correction Factor									1.0006	0.9999

Corrected As found NO_x = 779.9 ppb NO = 775.9 ppb *Percent Change NO_x = 2.7%
 Previous Response NO_x = 800.8 ppb NO = 800.6 ppb *Percent Change NO = 3.2%
 * = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	790.9	790.8	0.1	1.0137	1.0138	----	----
1st NO2 (400 ppb O3)	407.0	383.8	796.4	407.0	389.4	1.0067	----	0.9856	101.5%
2nd NO2 (200 ppb O3)	593.0	197.8	793.5	593.0	200.5	1.0104	----	0.9867	101.3%
3rd NO2 (100 ppb O3)	688.2	102.6	792.2	688.2	104.0	1.0120	----	0.9862	101.4%
2nd NO ref point	----	0.0	790.9	790.8	0.1	1.0137	1.0138	----	----
Average Correction Factor						1.0107	1.0138	0.9862	101.4%

Notes: Changed out inlet filter after asfinds. Adjusted the span. Used second NO ref point due to drift. As left span was set to 300ppb of O3, not 400ppb. Made the adjustment and completed as lefts.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

NO_x Calibration Summary

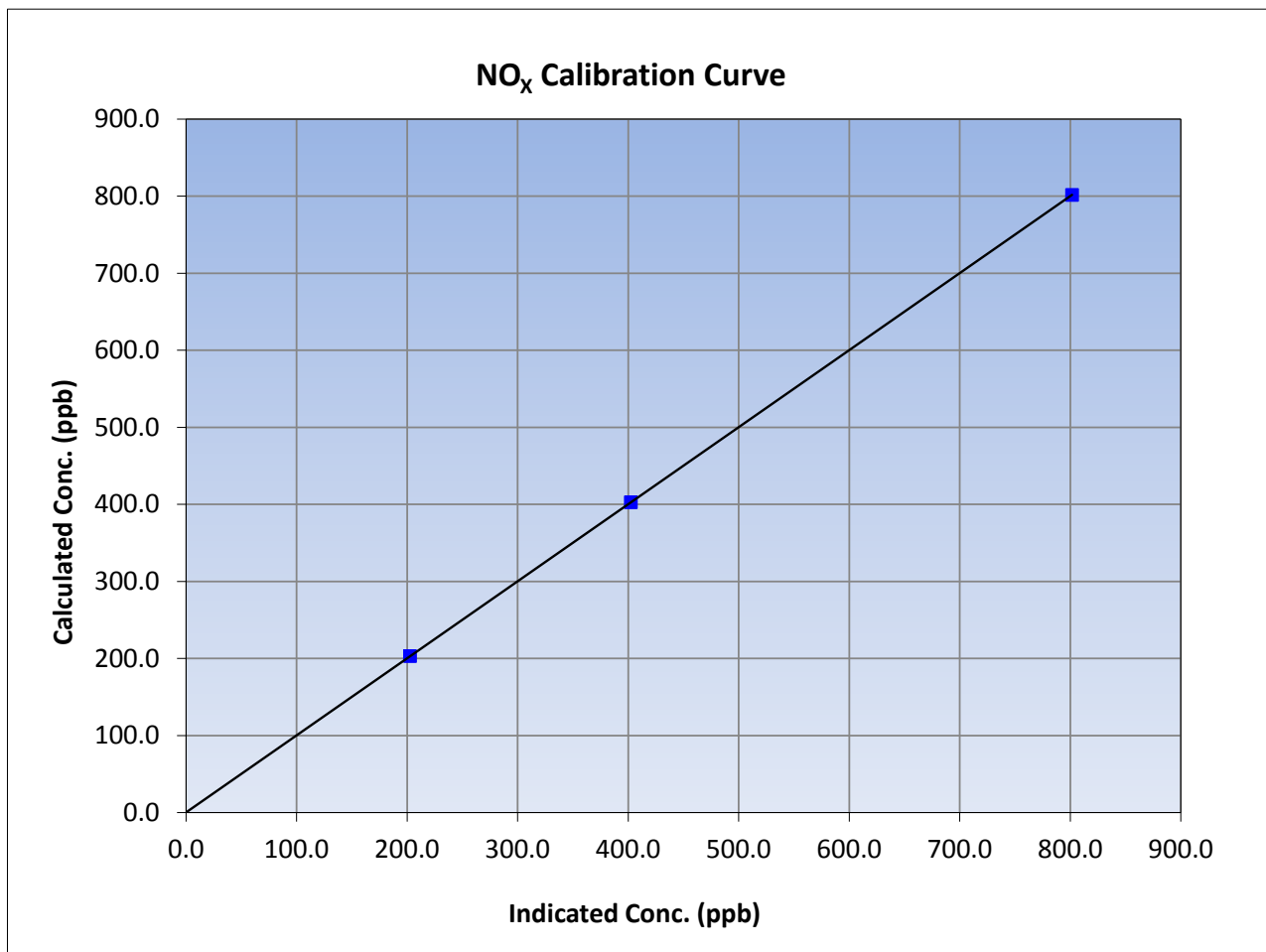
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 3, 2017
Station Name	Muskeg River	Station Number	AMS 16
Start Time (MST)	8:27	End Time (MST)	13:29
Analyzer make	Thermo 42i	Analyzer serial #	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.2	----	Correlation Coefficient	≥0.995	
801.7	801.6	1.0002			
402.7	402.4	1.0008			
202.9	202.8	1.0007			
			Slope	0.999969	0.90 - 1.10
			Intercept	0.207190	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

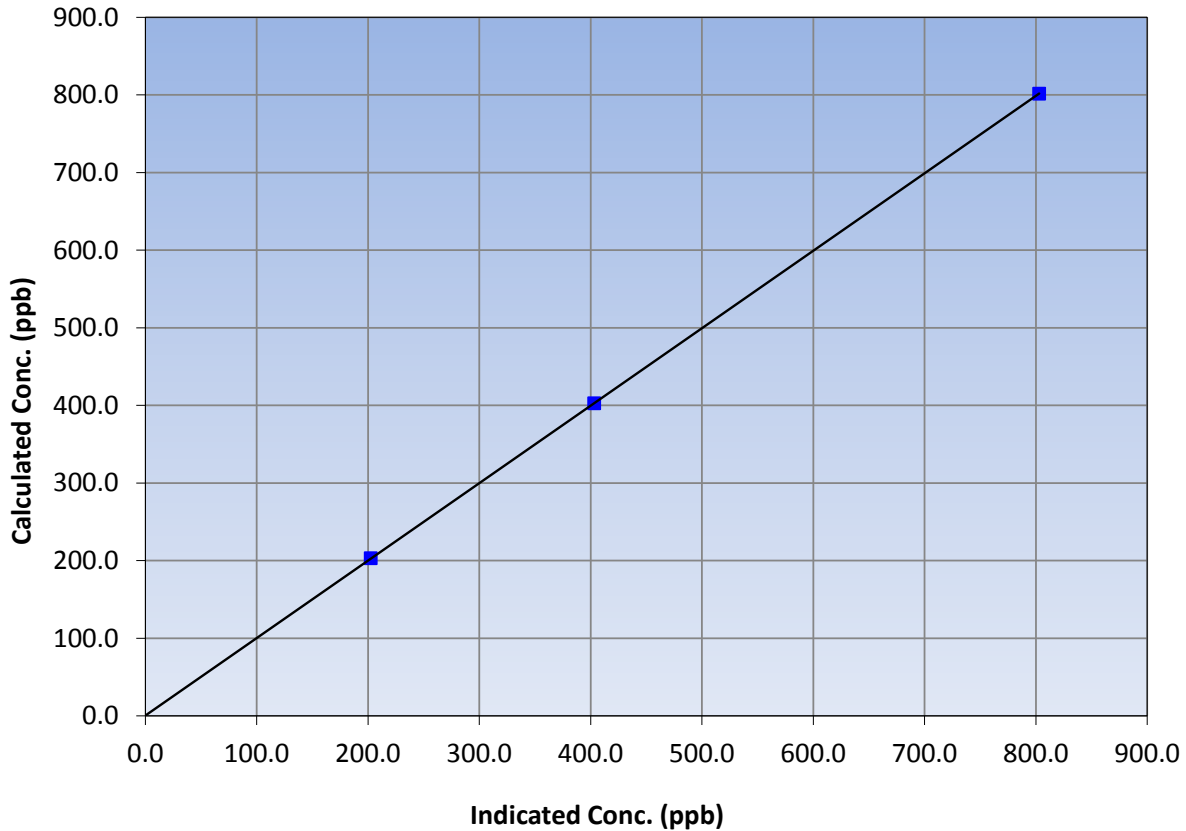
Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 3, 2017
Station Name	Muskeg River	Station Number	AMS 16
Start Time (MST)	8:27	End Time (MST)	13:29
Analyzer make	Thermo 42i	Analyzer serial #	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	≥0.995	
801.7	803.0	0.9984			
402.7	403.1	0.9991			
202.9	202.5	1.0023			
			Slope	0.997975	0.90 - 1.10
			Intercept	0.464319	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

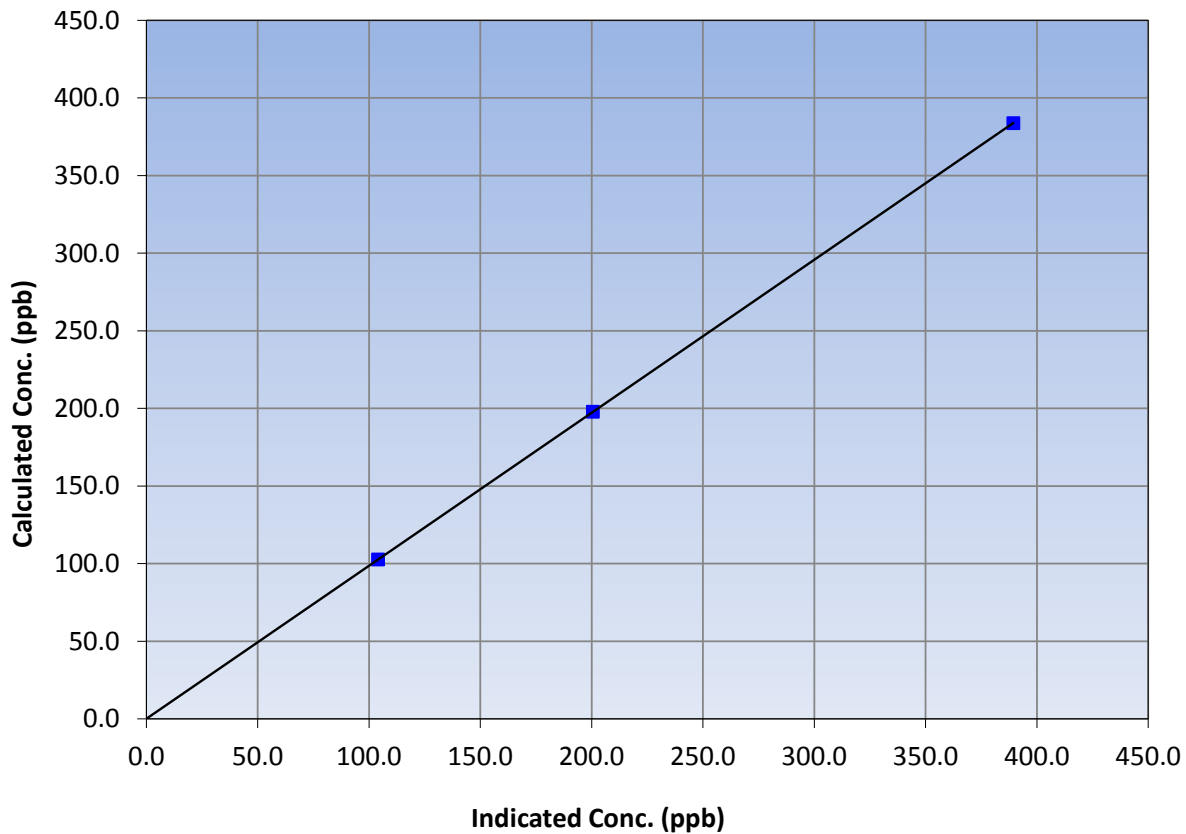
Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 3, 2017
Station Name	Muskeg River	Station Number	AMS 16
Start Time (MST)	8:27	End Time (MST)	13:29
Analyzer make	Thermo 42i	Analyzer serial #	1426262593

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
383.8	389.4	0.9856			
197.8	200.5	0.9867			
102.6	104.0	0.9862			
			Slope	0.985600	0.90 - 1.10
			Intercept	0.075468	+/-20

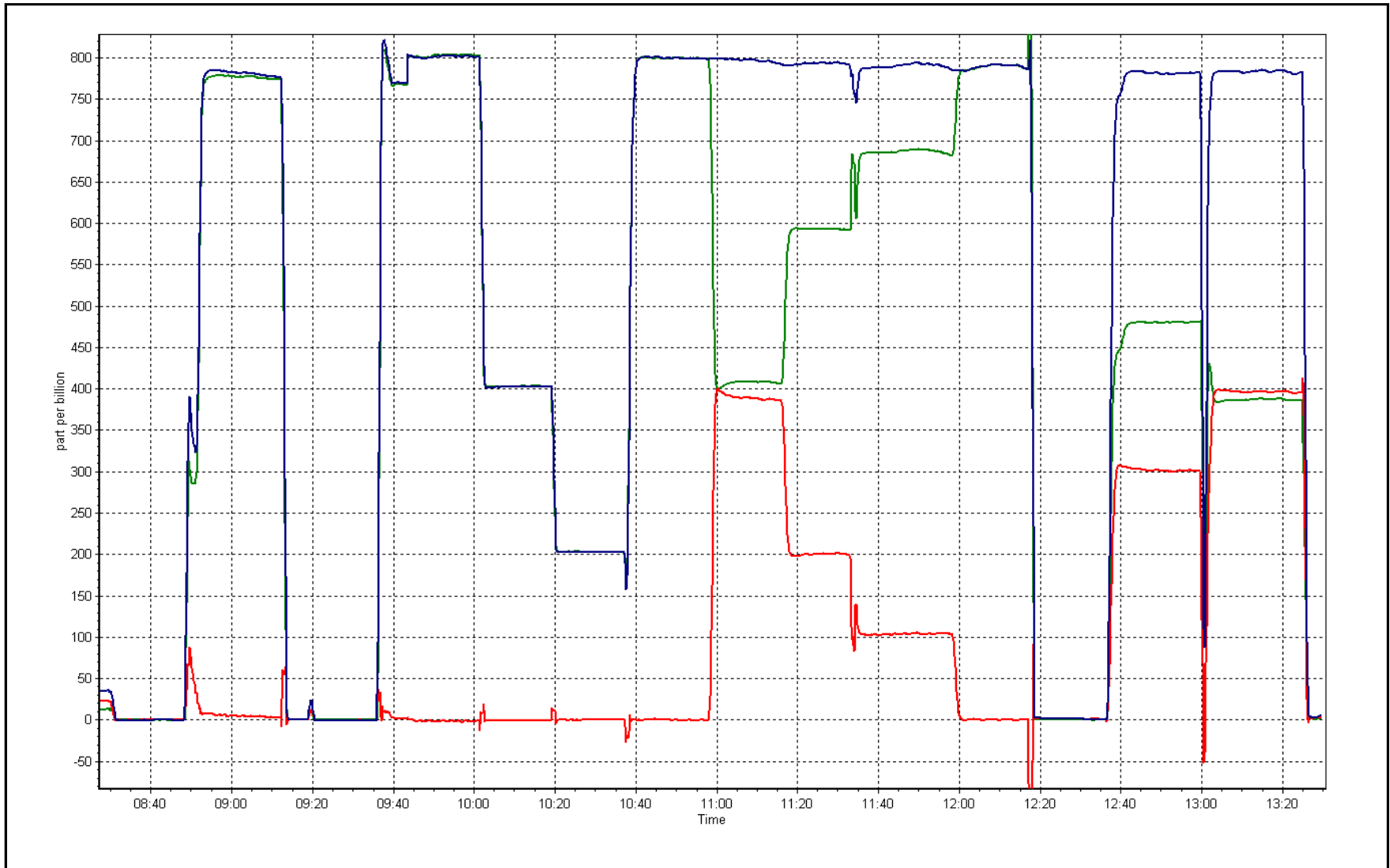
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 19, 2017

Location: Muskeg River





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Muskeg River	Station number:	AMS 16
Calibration Date:	April 19, 2017	Last Cal Date:	March 1, 2017
Start time (MST):	9:00	End time (MST):	9:50
Sharp Model:	Thermo/Sharp 5030	S/N:	E-798
Particulate Fraction:	PM2.5	C14 Source S/N:	4142
Flow Meter Make/Model:	DeltaCal	S/N:	628
Temp/RH standard:	NA	S/N:	NA

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	-3	-2.7	-3	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	970	969	970	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	982.2	995	<input checked="" type="checkbox"/>	+/- 50 LPH
Nephelometer zero	1.8		0	<input checked="" type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: _____ Last Cal Date: December 12, 2016
 Flow w/o adaptor: _____ Flow w/ adaptor: _____

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: _____	Foil S/N: _____	
Foil Calibration	Foil Mass: _____	Foil Mass: _____	
	Calibration Date: _____	Calibration Date: _____	
(Limit) +/- 5% of previous	Correction Factor: _____	Correction Factor: _____	---

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Adjusted the flow and the nephelometer.

Calibration by: Jayme Marcoux



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

**AMS 17
WAPASU
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	35	35	100	44	0	5	0
H2S (ppb) Average	687	33	33	100	1	0	0	0
THC (ppm) Average	686	34	34	100	2.5	-	2.2	-
O3 (ppb) Average	687	33	33	100	54	0	45	-
NO2 (ppb) Average	685	35	35	100	19	0	4	-
NO (ppb) Average	685	35	35	100	3	-	1	-
NOX (ppb) Average	685	35	35	100	19	-	5	-
PM2.5 (ug/m3) Average	716	1	4	99.58	11	-	5.6	0
Temperature 2 m (C) Average	720	0	0	100	15.9	-	9.6	-
Relative Humidity (%) Average	720	0	0	100	98	-	83	-
Precipitation (mm) Total	720	0	0	100	3.9	-	6.3	-
Wind Speed 10 m (km/h) Average	716	0	4	99.44	20	-	17	-
Wind Direction 10 m (deg) Average	716	0	4	99.44	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.7	3	-	0	0	0	0	0	1	44
H2S (ppb) Average	687	0.1	0	-	0	0	0	0	0	0	1
THC (ppm) Average	686	2.15	0	-	2.1	2.1	2.1	2.1	2.2	2.2	2.5
O3 (ppb) Average	687	36.4	8	-	4	25	31	37	43	46	54
NO2 (ppb) Average	685	1.1	2	-	0	0	0	0	1	3	19
NO (ppb) Average	685	0.3	0	-	0	0	0	0	0	1	3
NOX (ppb) Average	685	1.3	2	-	0	0	0	0	1	3	19
PM2.5 (ug/m3) Average	716	3.42	1.6	-	0.2	1.7	2.3	3.1	4.1	5.6	11
Temperature 2 m (C) Average	720	1.02	6.1	-	-16.1	-6.8	-3.4	0.9	5.3	9.7	15.9
Relative Humidity (%) Average	720	59.5	19	-	18	35	43	59	75	87	98
Precipitation (mm) Total	720	-	-	15.86	-	-	-	-	-	-	-
Wind Speed 10 m (km/h) Average	716	9.2	4	-	0	4	6	9	12	14	20
Wind Direction 10 m (deg) Average	716	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	17 Apr 2017 02:00	17 Apr 2017 04:00	3	Unstable operation - excessive baseline drift
Wind Speed, Wind Direction	03 Apr 2017 04:00	03 Apr 2017 05:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	19 Apr 2017 05:00	19 Apr 2017 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	27 Apr 2017 23:00	27 Apr 2017 23:00	1	Flat line in sensor output signal



Summary of Hour Averages

Wapasu - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 44 ppb on Apr 29 10:00	Maximum Daily Average: 4.8 ppb on Apr 1		Hours of Data:	685
Minimum Value: 0 ppb on Apr 12 14:00	Minimum Daily Average: 0.1 ppb on Apr 13		Hours of Missing Data:	35
Maximum Diurnal Average: 2.5 ppb at hour 10	Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Calibration:	35
Monthly Average: 0.7 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 12		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	7	8	9	11	11	13	11	8	2	2	17	9	0	0	0	0	0	0	0	0	0	0	1	4.8	17
2-Apr	0	Z	1	2	2	2	2	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	3
3-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
4-Apr	0	0	0	Z	0	0	0	0	4	8	4	1	0	0	1	2	1	1	0	0	0	0	0	0	1.1	8
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Apr	0	0	0	0	0	Z	0	0	6	5	4	9	11	3	1	0	0	0	0	0	0	0	0	0	1.8	11
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
10-Apr	0	0	0	Z	0	0	0	1	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	6
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	0	0	0	0	Z	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	2	0.2	2
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Apr	0	0	0	Z	0	0	0	0	1	1	3	4	2	5	4	2	2	2	0	0	0	0	0	0	1.3	5
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	Z	0	1	0	0	0	0	0	1	1	1	1	1	1	3	9	12	15	10	9	5	2	1	1	3.3	15
20-Apr	1	Z	0	0	0	0	0	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	0	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
24-Apr	1	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Apr	0	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
29-Apr	0	1	0	0	Z	0	1	15	19	44	10	0	0	0	1	0	0	0	0	1	0	0	0	0	4.1	44
30-Apr	0	0	0	0	0	Z	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2

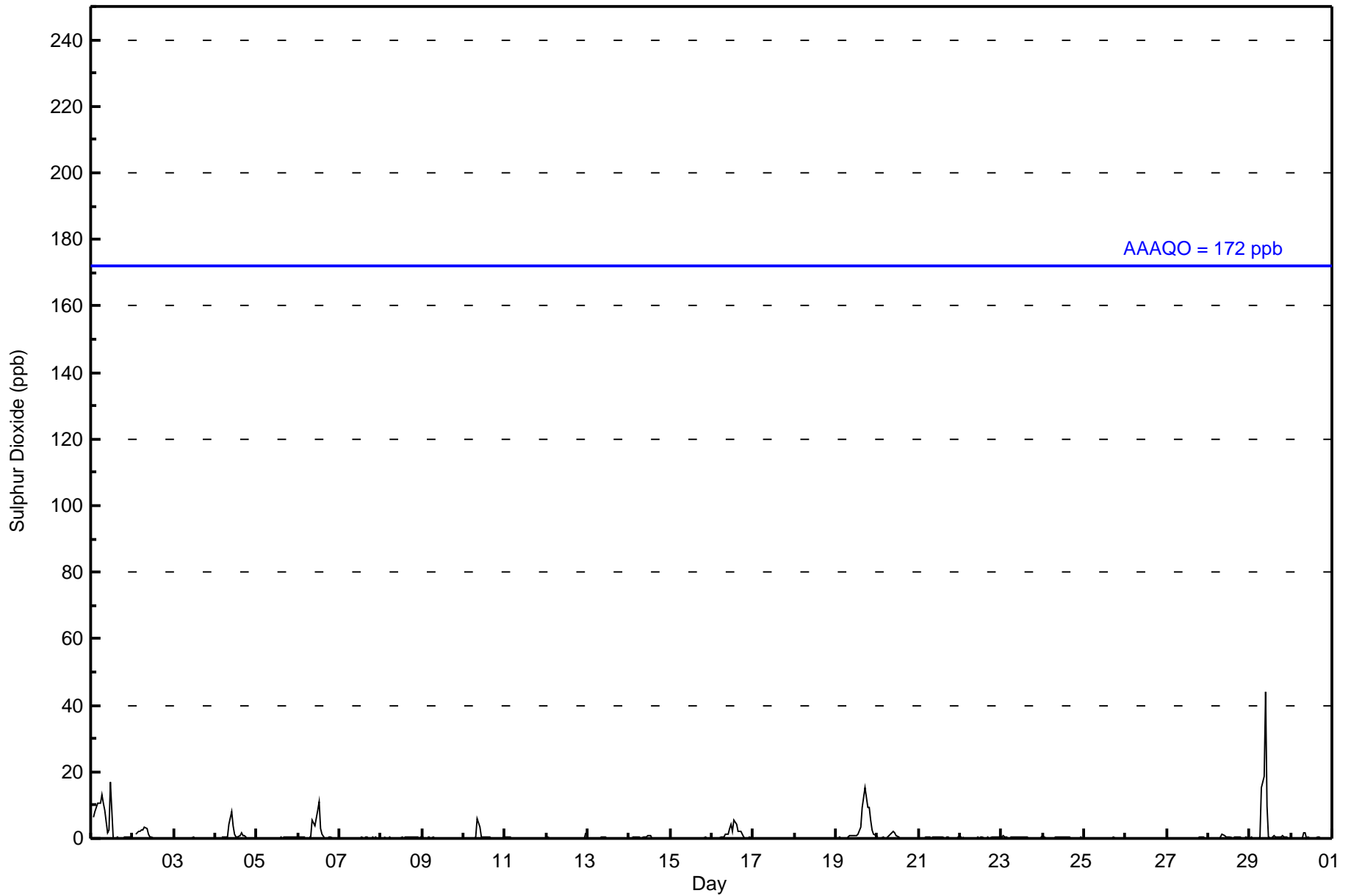
0.2	0.4	0.5	0.6	0.6	0.7	0.7	1.3	1.9	2.5	1.0	1.3	0.9	0.5	0.5	0.6	0.7	0.7	0.5	0.5	0.3	0.2	0.2	0.2	Diurnal Average
1	7	8	9	11	11	13	15	19	44	10	17	11	5	4	9	12	15	10	9	5	2	1	2	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Wapasu - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	674	98.39	98.39
11 - 20	10	1.46	99.85
21 - 60	1	0.15	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	65	98	45	31	39	56	55	103	66	34	32	11	7	6	5	17	670
11 - 20	0	0	0	0	0	0	0	0	0	2	5	1	0	2	0	0	10
21 - 60	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681

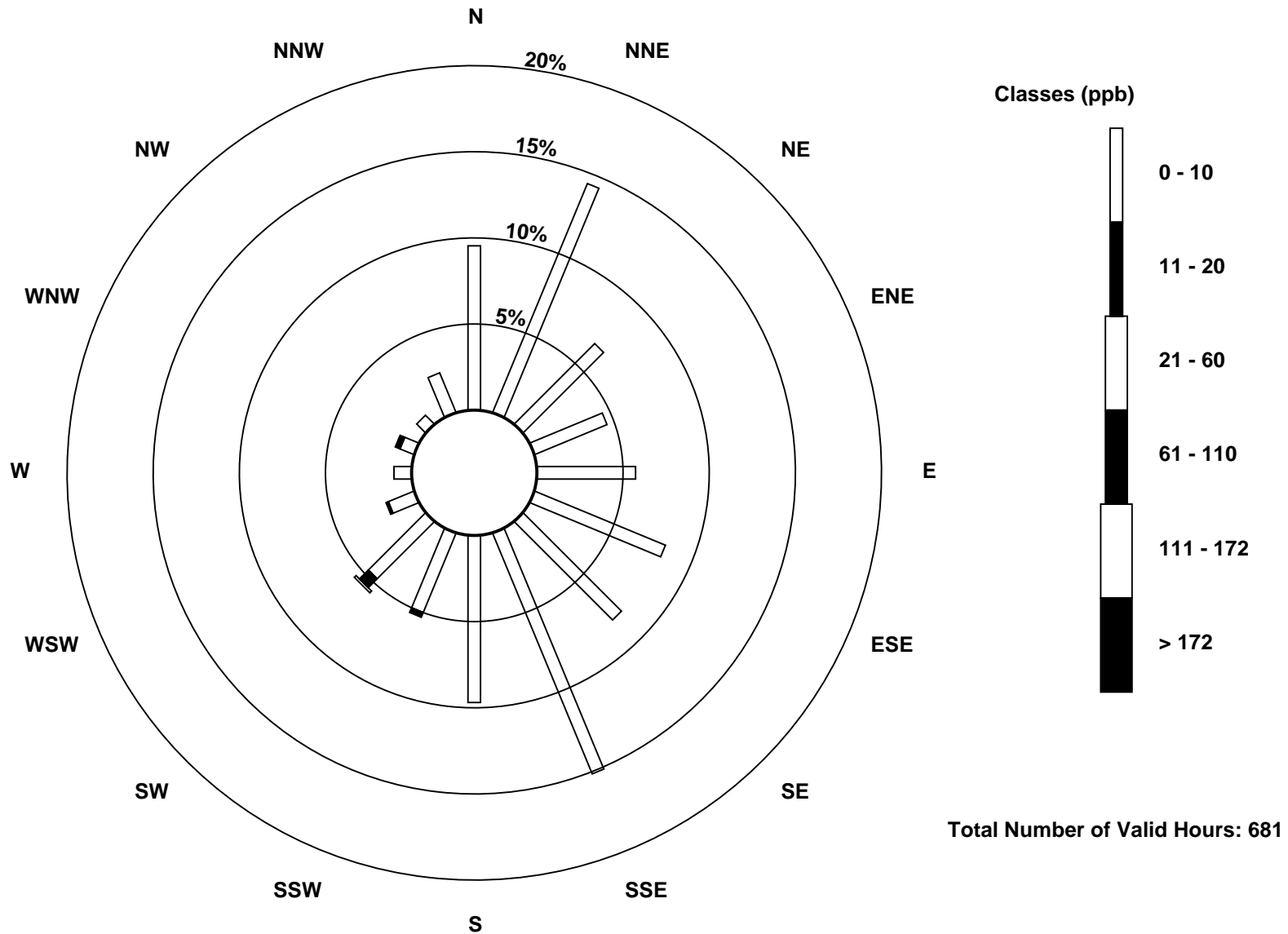
Total Number of Valid Hours: 681

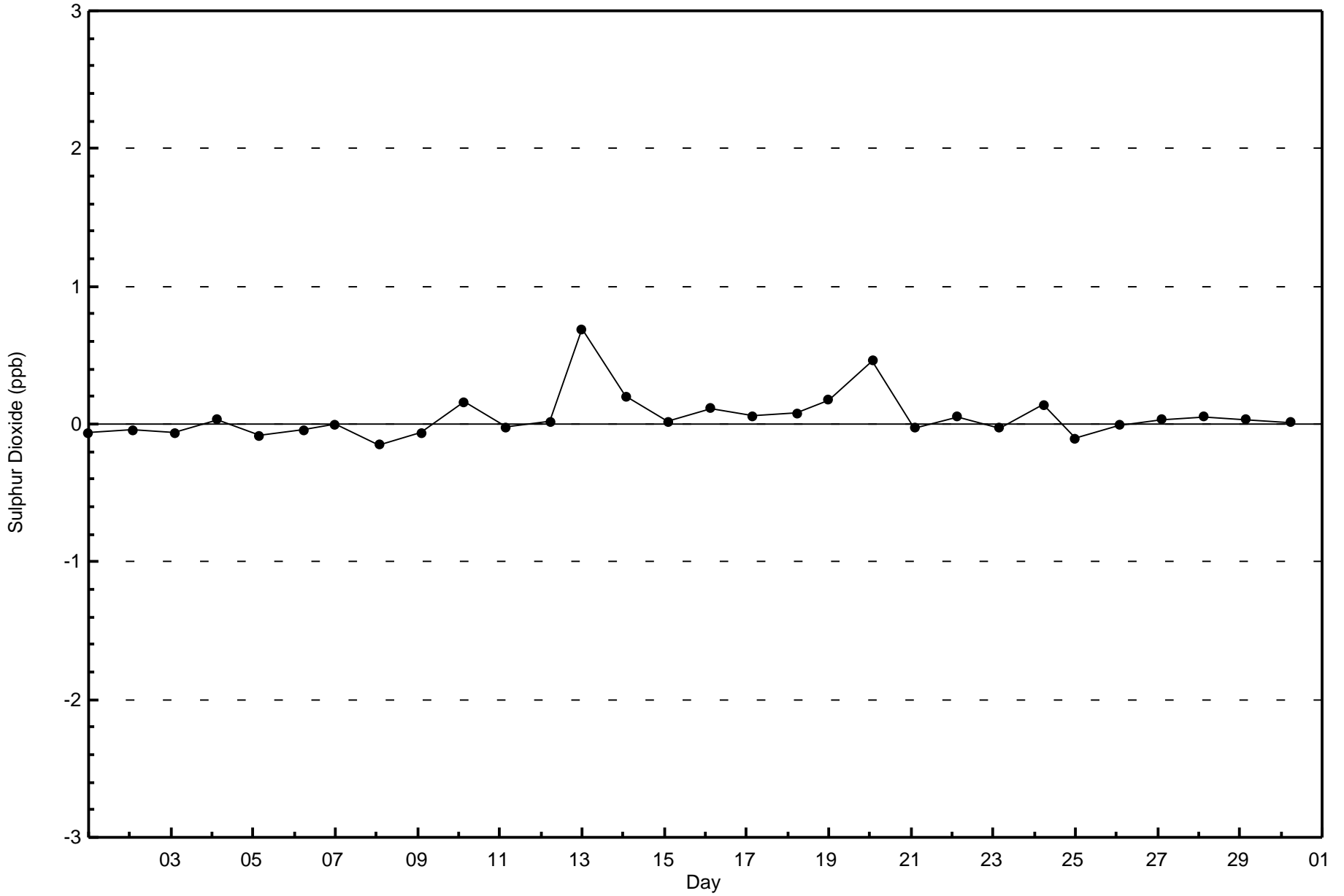
Total Number of Hours: 720

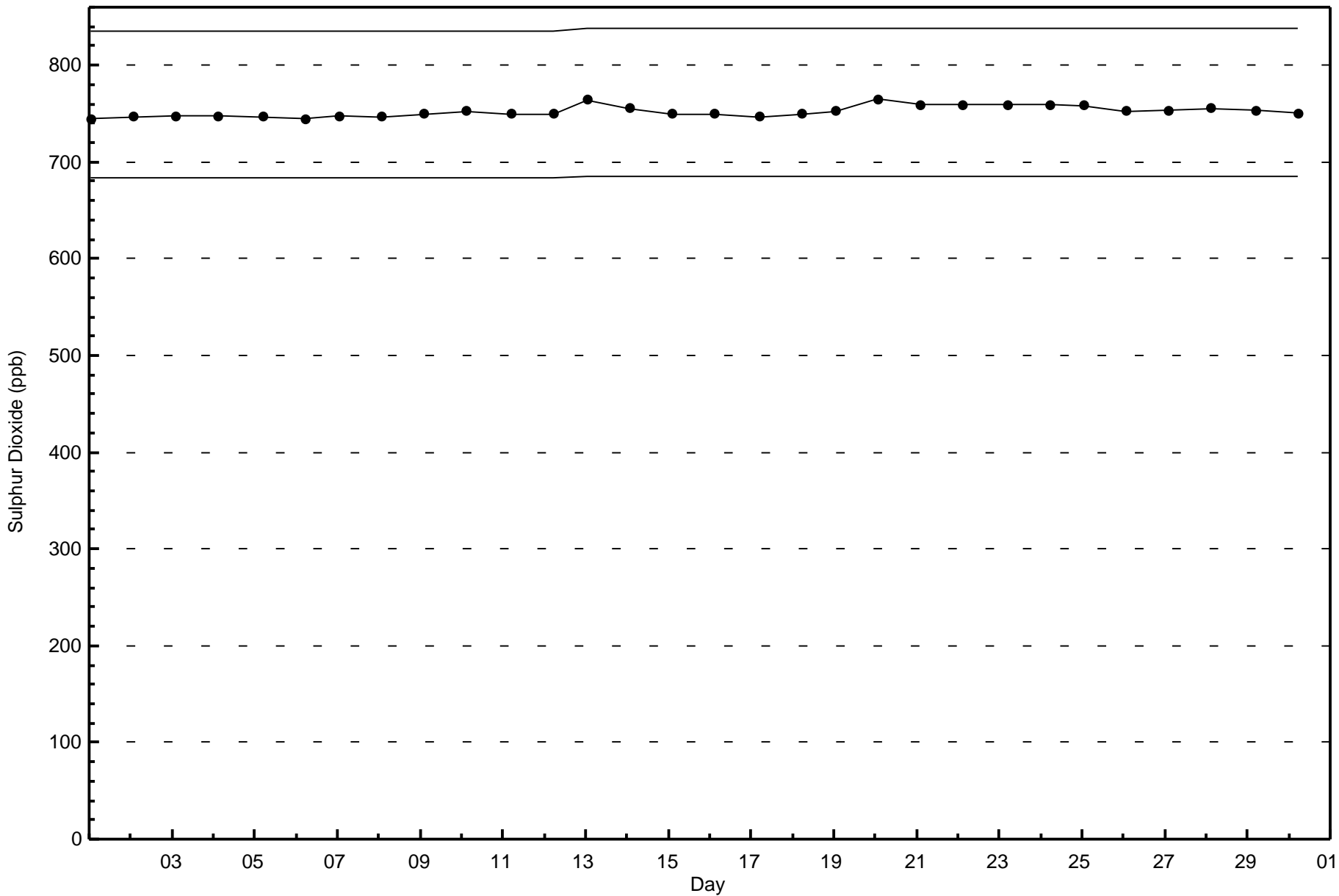


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Wapasu (AMS 17)









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1 ppb on Apr 27 22:00	Maximum Daily Average: 0.2 ppb on Apr 1		Hours of Data:	687
Minimum Value: 0 ppb on Apr 1 14:00	Minimum Daily Average: 0.0 ppb on Apr 30		Hours of Missing Data:	33
Maximum Diurnal Average: 0.1 ppb at hour 7	Minimum Diurnal Average: 0.0 ppb at hour 17		Hours of Calibration:	33
Monthly Average: 0.1 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	0	Z	0	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
20-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0

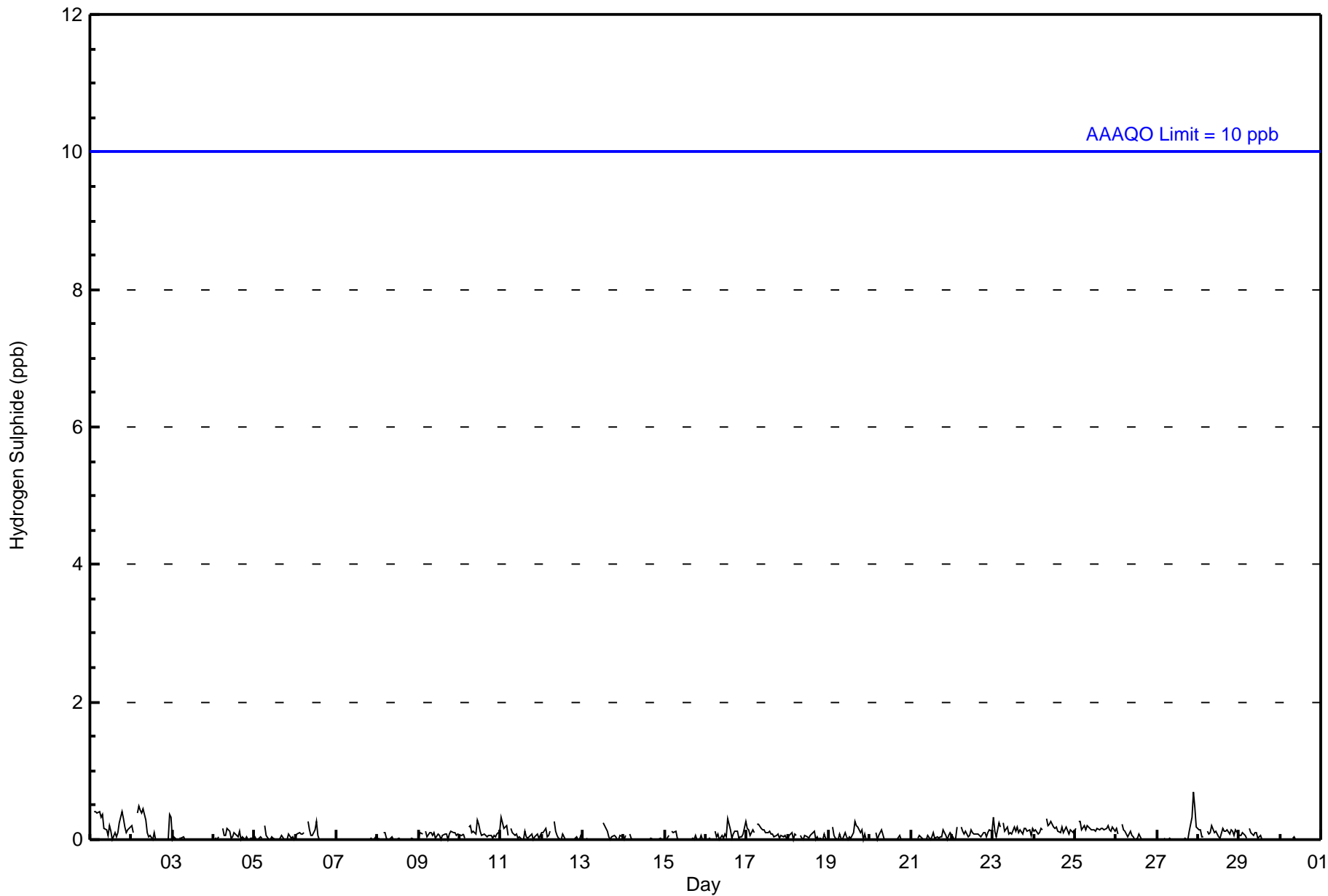
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Wapasu - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	687	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	67	101	45	33	37	53	55	103	66	37	37	12	7	8	5	18	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	101	45	33	37	53	55	103	66	37	37	12	7	8	5	18	684

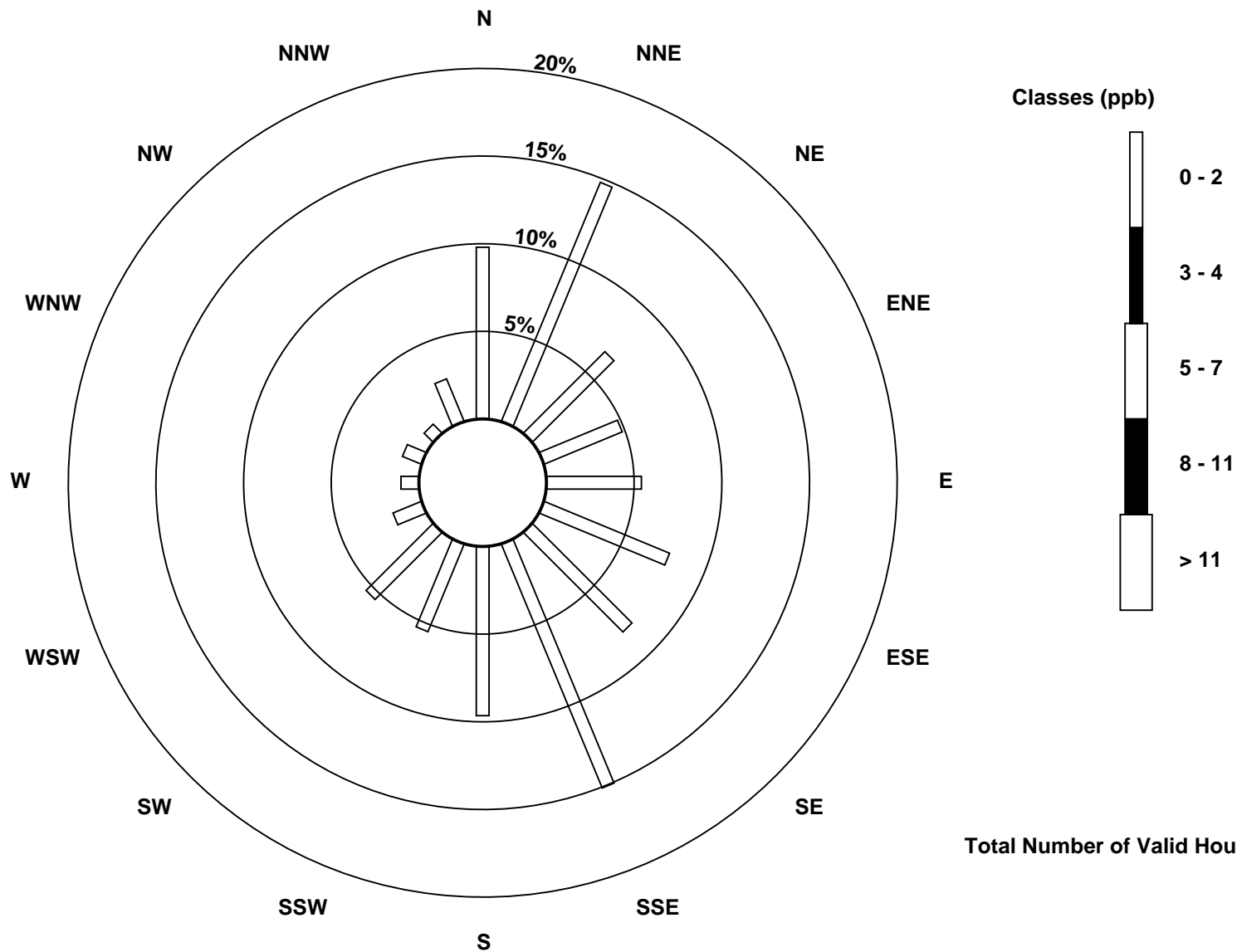
Total Number of Valid Hours: 684

Total Number of Hours: 720

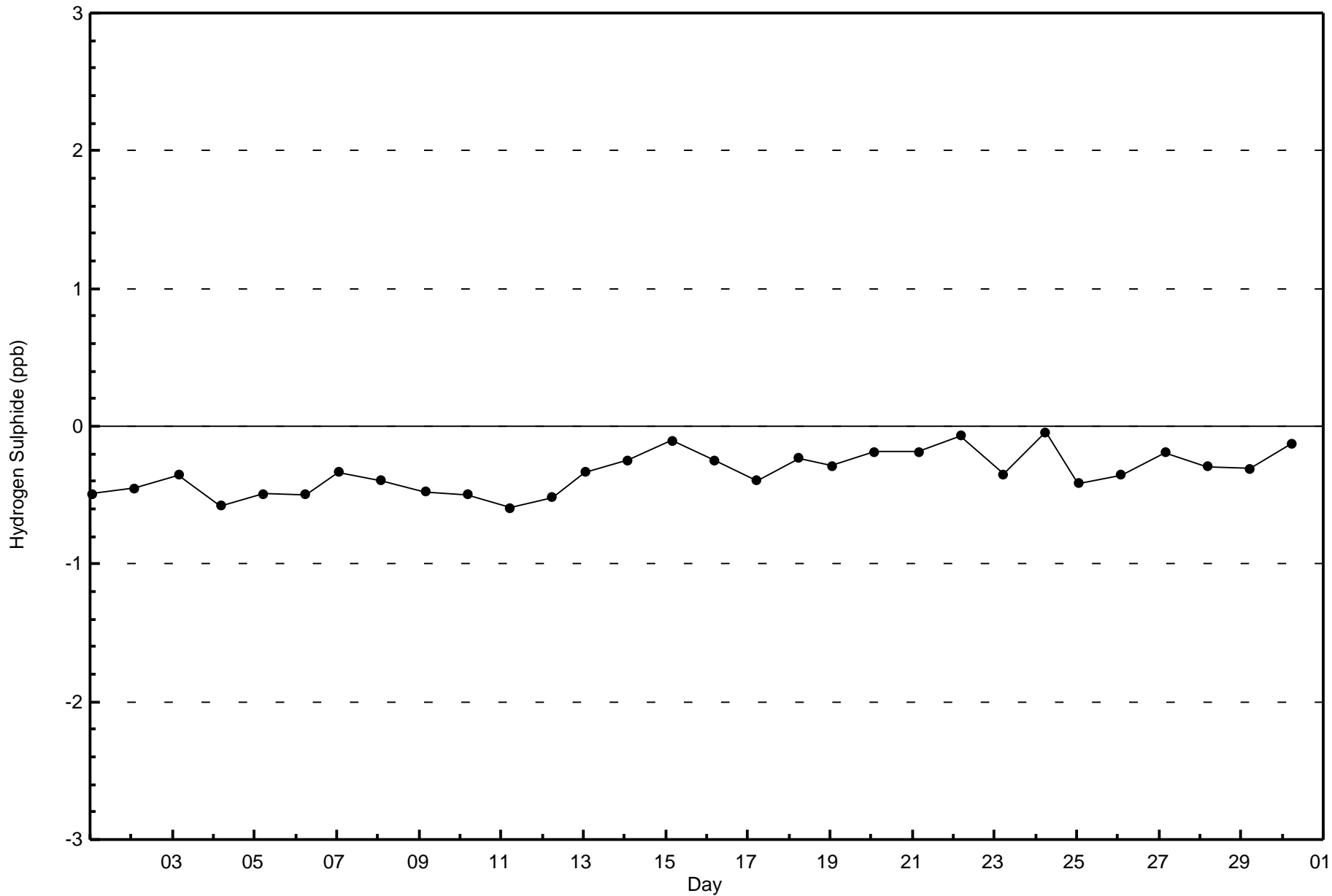


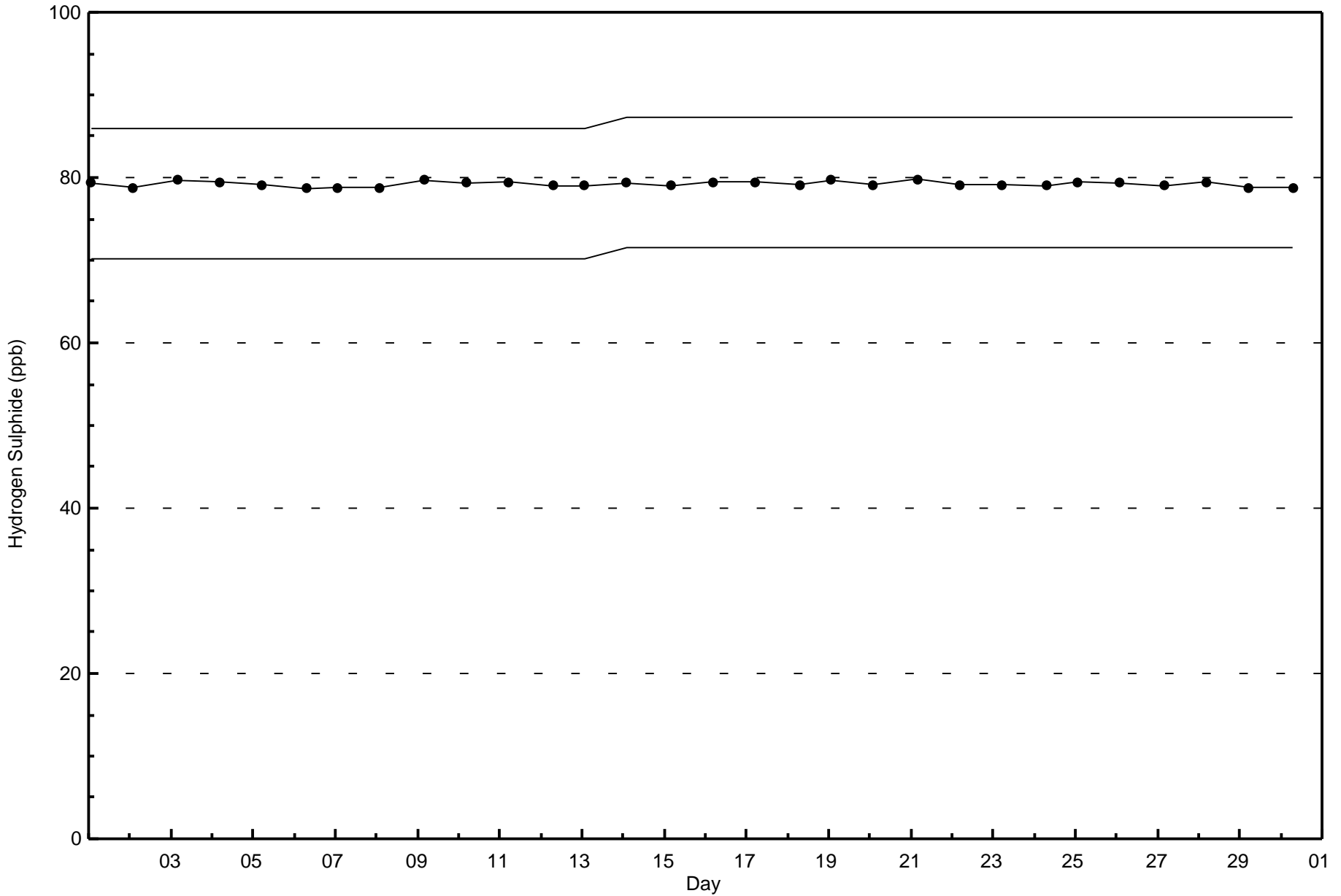
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Wapasu (AMS 17)



Total Number of Valid Hours: 684







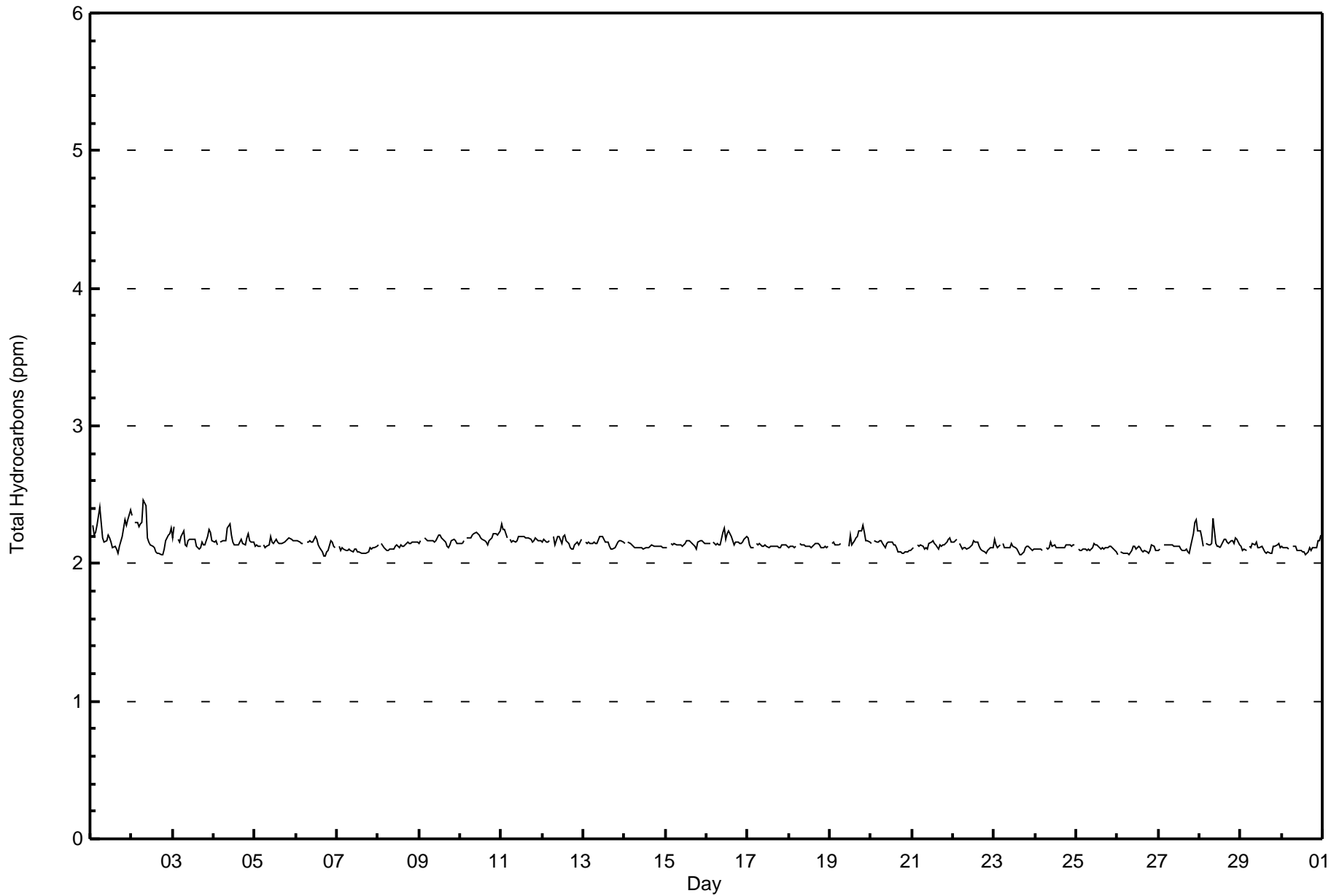
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Wapasu - April 2017

Maximum Value: 2.5 ppm on Apr 2 08:00																	Maximum Daily Average: 2.2 ppm on Apr 1																	Hours in Service: 720	
Minimum Value: 2.1 ppm on Apr 6 17:00																	Minimum Daily Average: 2.1 ppm on Apr 26																	Hours of Data: 686	
Maximum Diurnal Average: 2.2 ppm at hour 22																	Minimum Diurnal Average: 2.1 ppm at hour 17																	Hours of Missing Data: 34	
Monthly Average: 2.15 ppm																	Percentiles: P ₁ = 2.1 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.2 P ₉₉ = 2.3																	Hours of Calibration: 34	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	2.3	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.4	2.2	2.4									
2-Apr	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.5	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.5									
3-Apr	2.2	2.3	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3									
4-Apr	2.2	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3									
5-Apr	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2									
6-Apr	2.2	2.2	2.2	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2									
7-Apr	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1									
8-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2									
9-Apr	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2									
10-Apr	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2									
11-Apr	2.3	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3									
12-Apr	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2									
13-Apr	Z	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2									
14-Apr	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
15-Apr	2.1	2.1	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2									
16-Apr	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3									
17-Apr	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
18-Apr	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1									
19-Apr	Z	2.1	2.2	2.1	2.1	2.1	2.1	C	C	C	C	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3									
20-Apr	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
21-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2									
22-Apr	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
23-Apr	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
24-Apr	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
25-Apr	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
26-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1									
27-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.1	2.3									
28-Apr	2.2	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.1	2.2	2.3									
29-Apr	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2									
30-Apr	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2									
																								Diurnal Average											
																								Diurnal Maximum											
																								Z - zerospan C - Calibration											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	686	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - April 2017

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	66	102	45	31	39	56	52	103	66	36	38	12	6	8	5	17	682
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	66	102	45	31	39	56	52	103	66	36	38	12	6	8	5	17	682

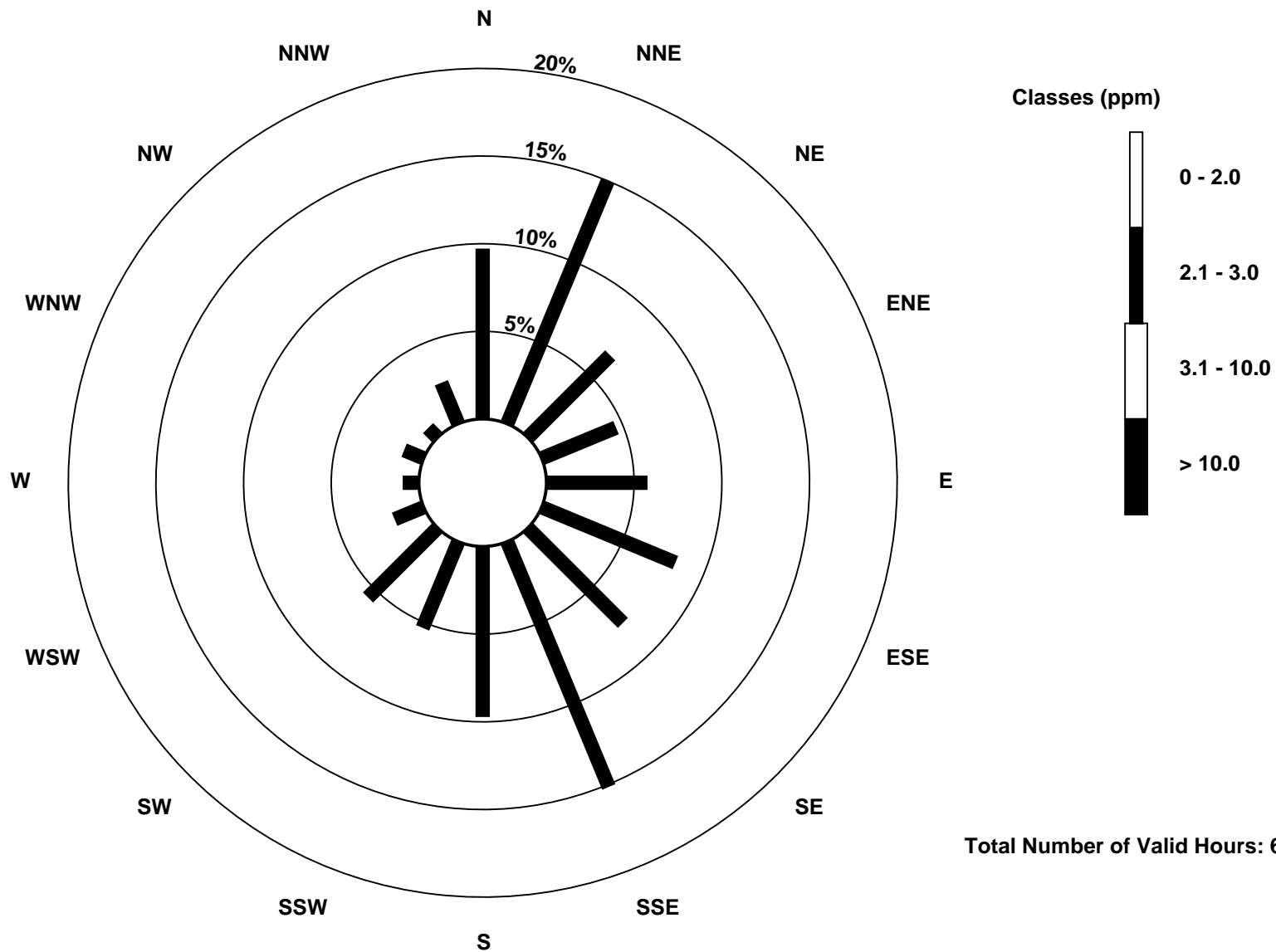
Total Number of Valid Hours: 682

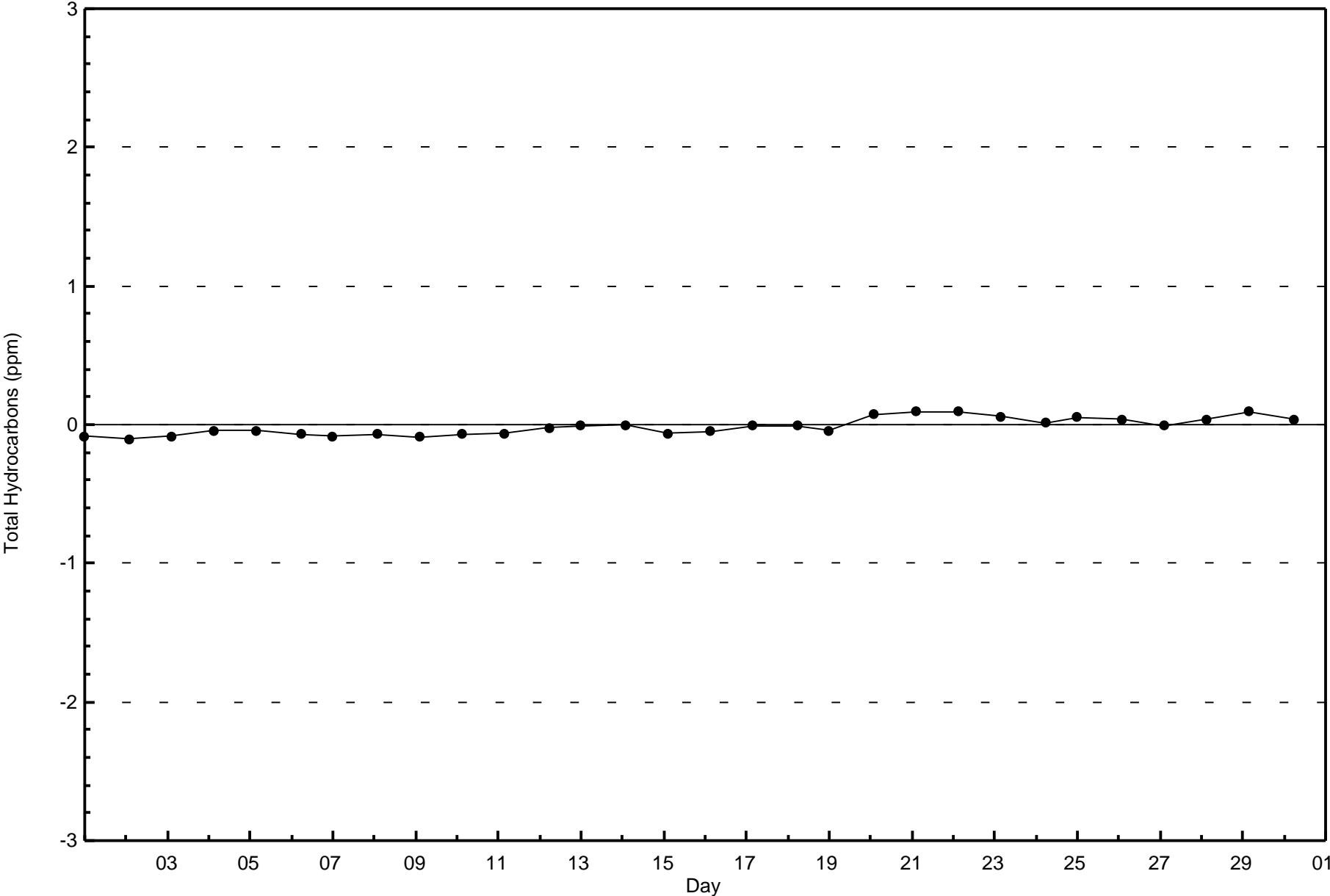
Total Number of Hours: 720

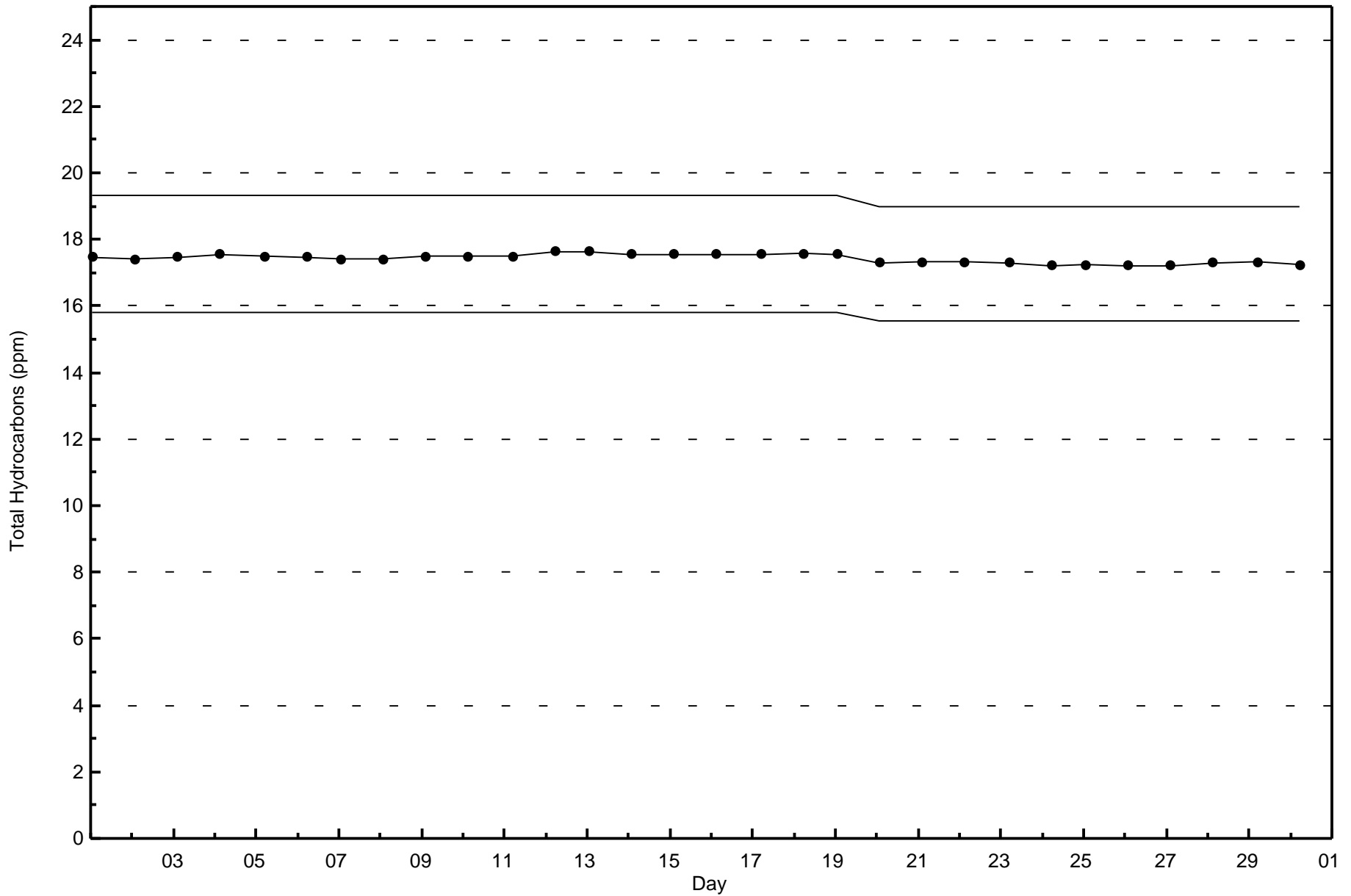


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Wapasu (AMS 17)









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Wapasu - April 2017

Number of Exceedences (AAAO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 54 ppb on Apr 6 17:00	Maximum Daily Average: 44.9 ppb on Apr 15		Hours of Data:	687
Minimum Value: 4 ppb on May 1 00:00	Minimum Daily Average: 23.8 ppb on Apr 22		Hours of Missing Data:	33
Maximum Diurnal Average: 41.1 ppb at hour 17	Minimum Diurnal Average: 32.0 ppb at hour 4		Hours of Calibration:	33
Monthly Average: 36.4 ppb	Percentiles: P ₁ = 16 P ₁₀ = 25 Q ₁ = 31 Median = 37 O ₃ = 43 P ₉₀ = 46 P ₉₉ = 50		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	40	33	39	Z	34	32	35	37	41	40	41	43	43	43	45	46	46	42	38	27	22	23	29	24	36.7	46
2-Apr	22	25	27	29	Z	23	21	23	32	39	42	44	44	45	46	45	44	43	42	41	32	22	21	24	33.8	46
3-Apr	36	24	17	15	15	Z	16	38	43	43	44	48	48	45	43	43	42	41	41	33	25	23	24	39	34.3	48
4-Apr	41	38	39	34	35	36	Z	36	35	36	39	42	42	43	43	39	41	42	43	36	30	34	31	31	37.7	43
5-Apr	34	33	33	34	32	33	38	Z	40	41	44	46	45	45	49	53	51	50	48	48	47	46	47	45	42.7	53
6-Apr	44	44	44	43	43	42	42	42	Z	43	44	42	44	47	49	53	54	53	50	44	35	36	42	44	44.4	54
7-Apr	46	45	45	Z	46	45	43	44	40	42	42	41	43	45	46	45	45	44	43	43	43	43	42	41	43.5	46
8-Apr	40	37	35	33	Z	33	32	32	34	36	32	31	30	29	28	27	26	25	27	28	30	30	29	29	31.0	40
9-Apr	31	31	28	31	32	Z	33	32	33	32	33	33	34	36	37	38	38	38	36	33	34	34	35	35	33.8	38
10-Apr	34	34	35	35	34	33	Z	33	33	34	36	41	42	43	43	44	45	45	43	37	33	37	39	33	37.6	45
11-Apr	22	24	26	27	29	29	29	Z	30	31	33	35	37	38	39	39	40	39	40	41	43	43	42	41	34.7	43
12-Apr	41	38	32	28	31	30	34	40	Z	42	46	47	47	49	49	50	50	49	49	47	42	38	41	41	41.7	50
13-Apr	43	42	40	Z	39	39	39	C	C	C	42	45	45	45	46	45	45	45	45	44	44	43	42	40	42.9	46
14-Apr	38	36	39	39	Z	39	39	39	39	39	39	39	39	40	43	48	49	48	48	48	47	47	48	48	42.6	49
15-Apr	48	48	45	44	44	Z	42	42	41	43	45	47	51	45	45	46	46	46	47	45	41	41	46	47	44.9	51
16-Apr	46	44	44	44	43	43	Z	42	40	40	41	42	41	42	44	48	48	47	47	46	44	43	41	30	43.0	48
17-Apr	33	37	37	37	38	37	37	Z	38	37	36	35	35	34	34	33	33	34	33	33	32	31	30	30	34.5	38
18-Apr	30	29	28	27	26	24	23	23	Z	25	26	26	27	27	28	29	30	30	31	32	34	33	31	31	28.4	34
19-Apr	29	27	25	Z	19	17	26	28	30	30	28	26	27	28	30	27	27	29	31	28	24	25	23	23	26.3	31
20-Apr	24	24	24	23	Z	19	19	27	28	30	32	32	34	38	38	40	43	44	45	44	40	35	37	39	33.0	45
21-Apr	40	35	33	30	27	Z	20	32	34	34	33	33	34	36	38	39	39	38	37	34	25	19	18	23	31.8	40
22-Apr	20	19	18	21	29	31	Z	29	28	20	23	24	23	22	24	23	24	25	26	27	25	22	23	23	23.8	31
23-Apr	22	23	25	24	25	25	26	Z	30	31	33	35	38	38	41	43	44	43	41	38	38	39	38	37	33.8	44
24-Apr	34	31	31	31	31	32	33	33	Z	35	37	36	34	34	32	32	33	34	33	31	30	30	28	27	32.3	37
25-Apr	29	29	29	Z	28	30	31	31	32	32	33	33	34	36	38	37	37	35	35	34	34	34	33	33	32.9	38
26-Apr	34	34	34	34	Z	36	37	38	39	40	41	42	40	40	40	39	40	41	42	41	37	33	38	38	38.2	42
27-Apr	38	37	36	35	34	Z	35	36	37	39	41	42	42	42	43	42	43	43	42	38	29	16	17	27	36.2	43
28-Apr	21	21	32	22	24	19	Z	31	33	39	42	45	46	46	42	42	42	43	42	37	35	30	37	39	35.2	46
29-Apr	40	43	44	42	41	41	39	Z	40	42	46	49	49	49	49	50	49	50	49	43	41	41	40	38	44.1	50
30-Apr	39	38	37	37	35	37	39	40	Z	47	48	48	48	49	50	46	40	42	37	30	25	14	9	4	36.4	50

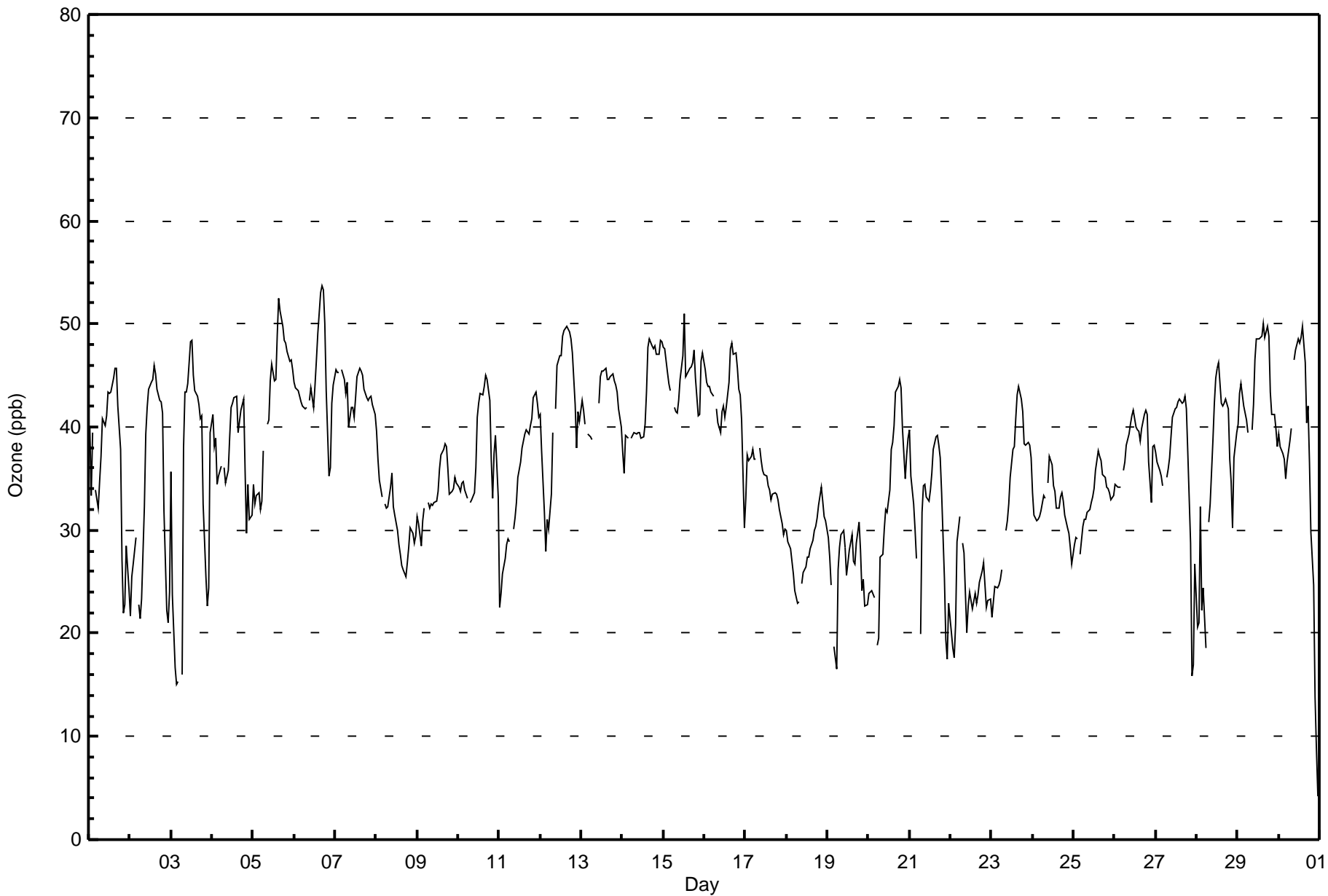
34.6	33.4	33.3	32.0	32.5	32.1	32.3	34.5	35.4	36.6	38.1	39.1	39.5	39.9	40.7	41.0	41.1	40.9	40.3	37.7	34.7	32.9	33.4	33.6	Diurnal Average	
48	48	45	44	46	45	43	44	43	47	48	49	51	49	50	53	54	53	50	48	47	47	48	48	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Wapasu - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Wapasu - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	21	3.06	3.06
21 - 50	660	96.07	99.13
51 - 82	6	0.87	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	1	0	0	2	3	6	4	0	0	0	0	0	0	0	0	17
21 - 50	65	99	47	31	35	49	51	104	62	34	37	12	4	8	5	17	660
51 - 82	0	0	0	1	0	0	0	0	2	0	0	0	3	0	0	0	6
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	66	100	47	32	37	52	57	108	64	34	37	12	7	8	5	17	683

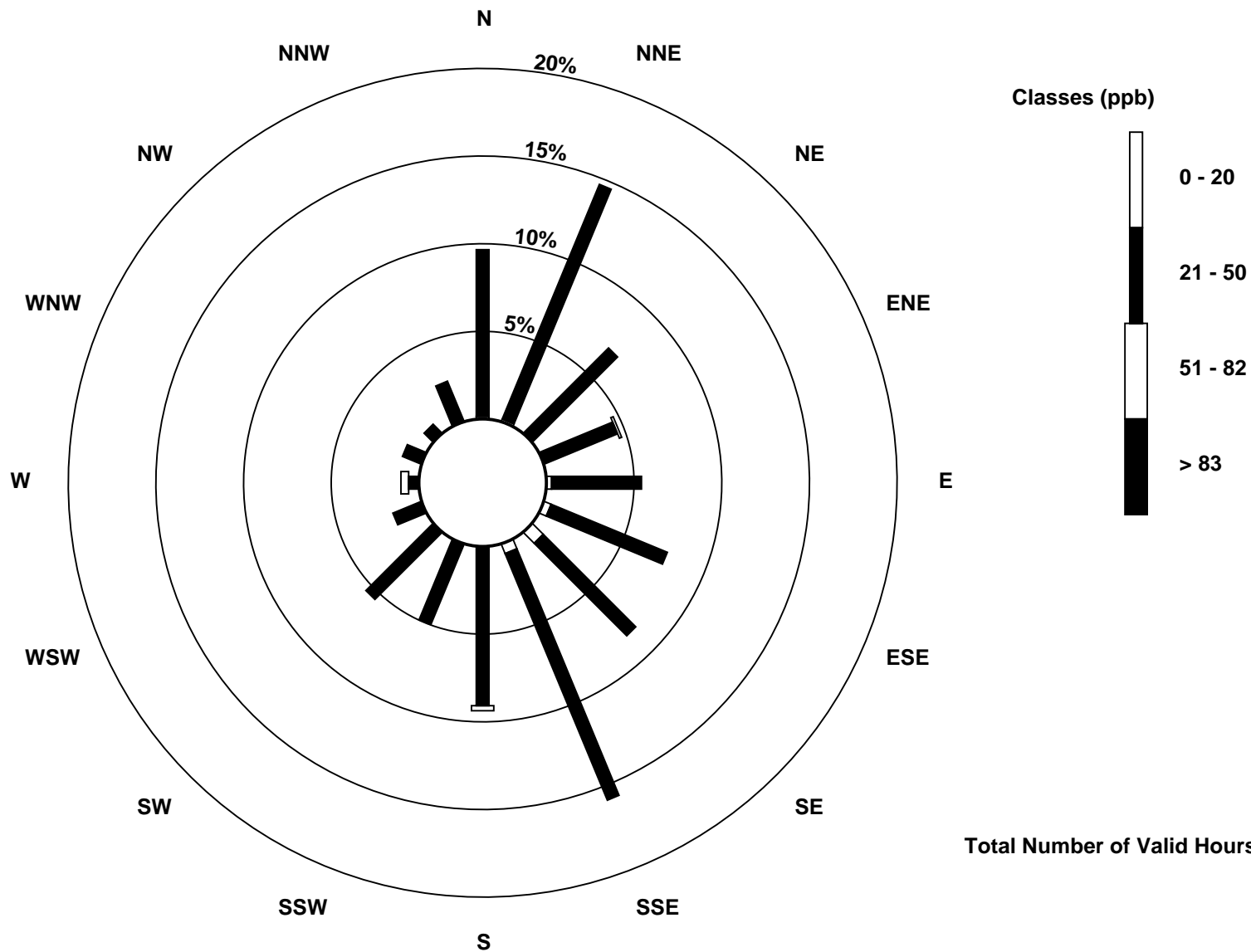
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Wapasu (AMS 17)

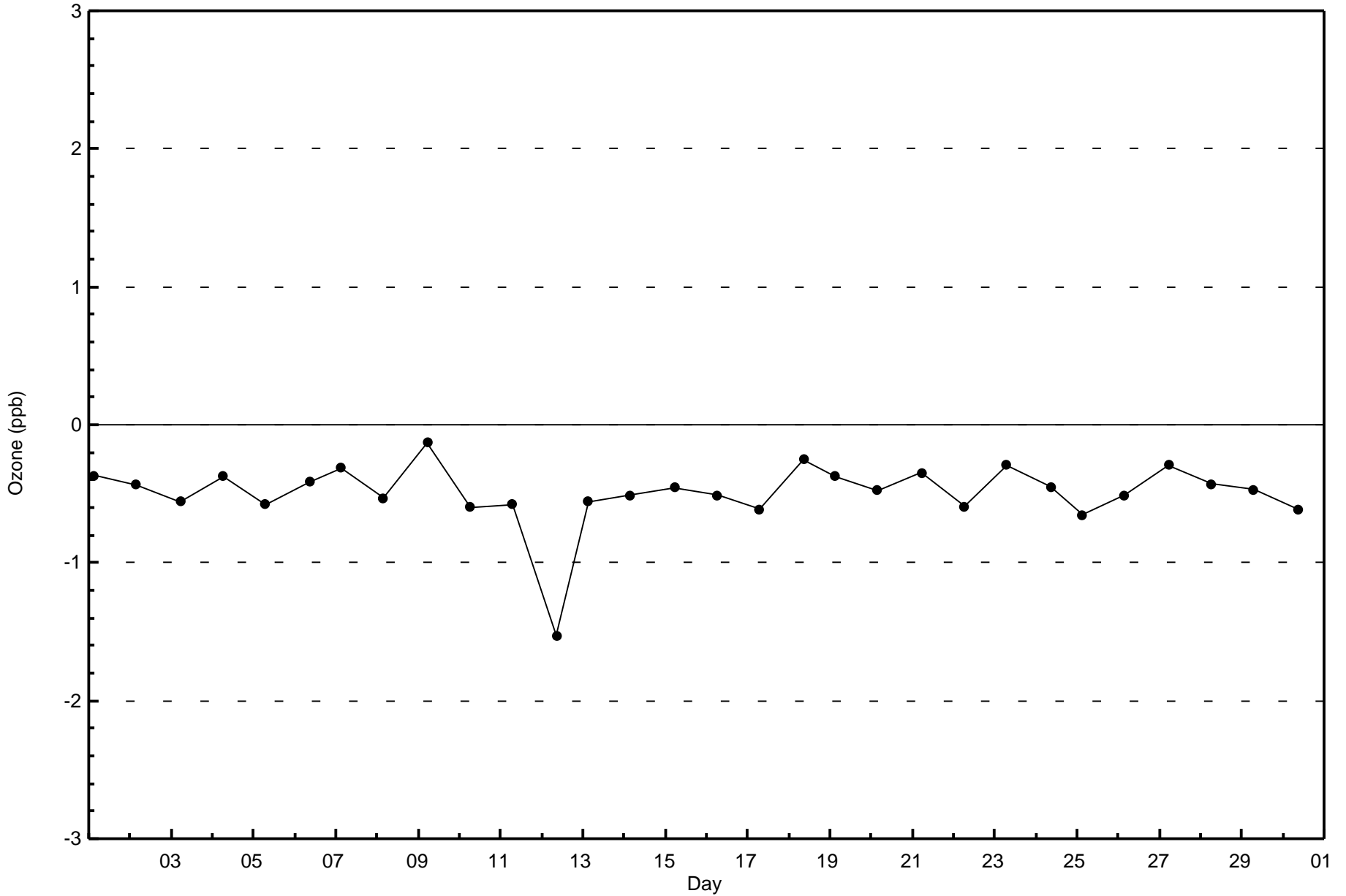


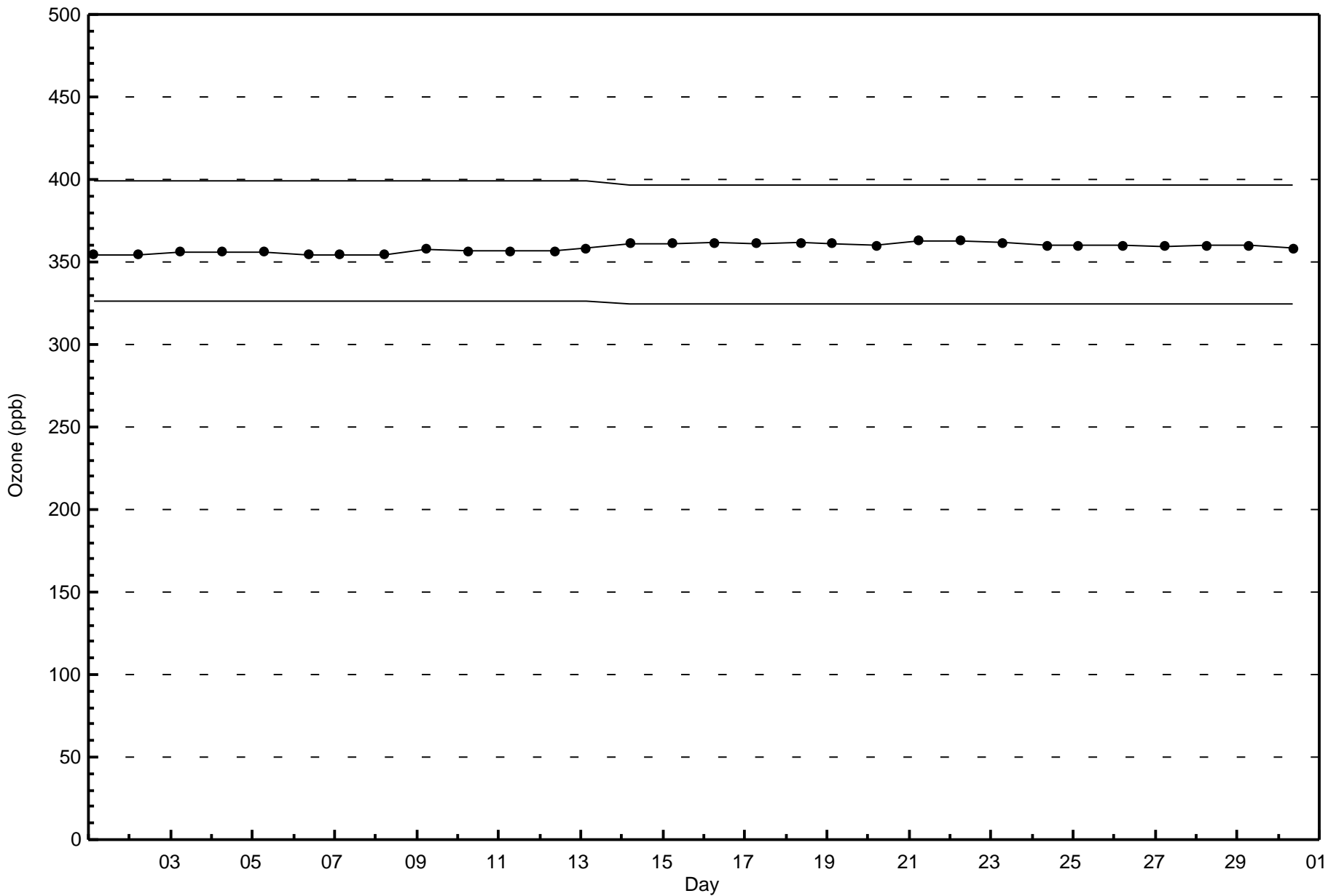
Total Number of Valid Hours: 683



Wood Buffalo Environmental Association
Zero Responses

Ozone (O₃) - ppb
Wapasu - April 2017





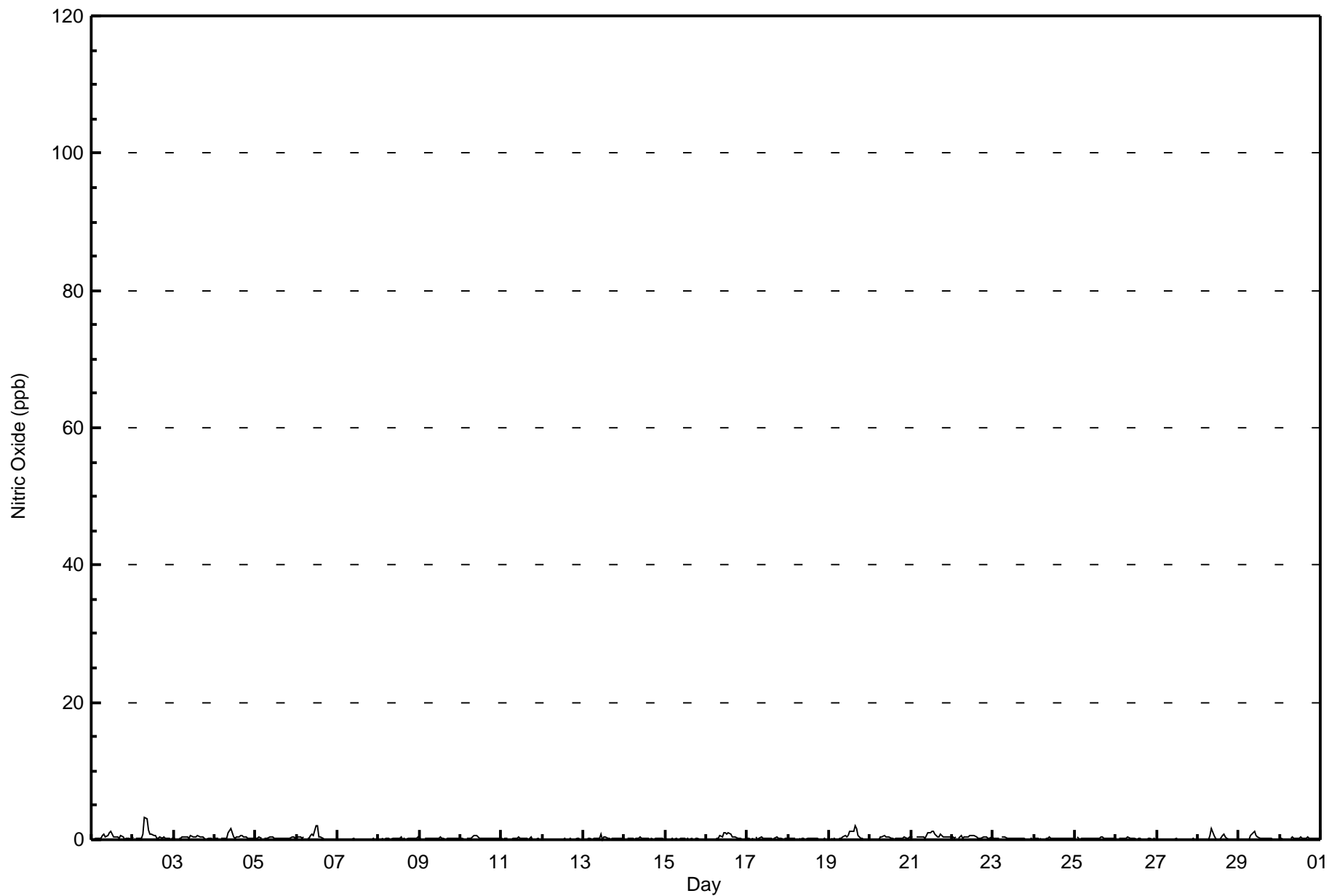


Maximum Value: 3 ppb on Apr 2 08:00																	Maximum Daily Average: 0.6 ppb on Apr 2																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 6 18:00																	Minimum Daily Average: 0.0 ppb on Apr 27																	Hours of Data: 685	
Maximum Diurnal Average: 0.5 ppb at hour 9																	Minimum Diurnal Average: 0.1 ppb at hour 4																	Hours of Missing Data: 35	
Monthly Average: 0.3 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 2																	Hours of Calibration: 35	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0.4	1								
2-Apr	0	Z	0	0	0	0	1	3	3	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	3								
3-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.3	1								
4-Apr	0	0	0	Z	0	0	0	0	1	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.4	2								
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0								
6-Apr	0	0	0	0	0	Z	0	0	1	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2								
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
10-Apr	0	0	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
12-Apr	0	0	0	0	0	Z	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
13-Apr	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
16-Apr	0	0	0	Z	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1								
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
19-Apr	Z	0	0	0	0	0	0	0	1	1	0	1	1	1	1	2	2	1	0	0	0	0	0	0	0	0.5	2								
20-Apr	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
21-Apr	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0.6	1								
22-Apr	0	0	0	Z	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1								
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
24-Apr	0	0	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0								
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0								
28-Apr	0	0	0	Z	0	0	0	1	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.2	2								
29-Apr	0	0	0	0	Z	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1								
30-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0								
																								Diurnal Average											
																								Diurnal Maximum											
																								Z - zerospan C - Calibration											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Wapasu - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681

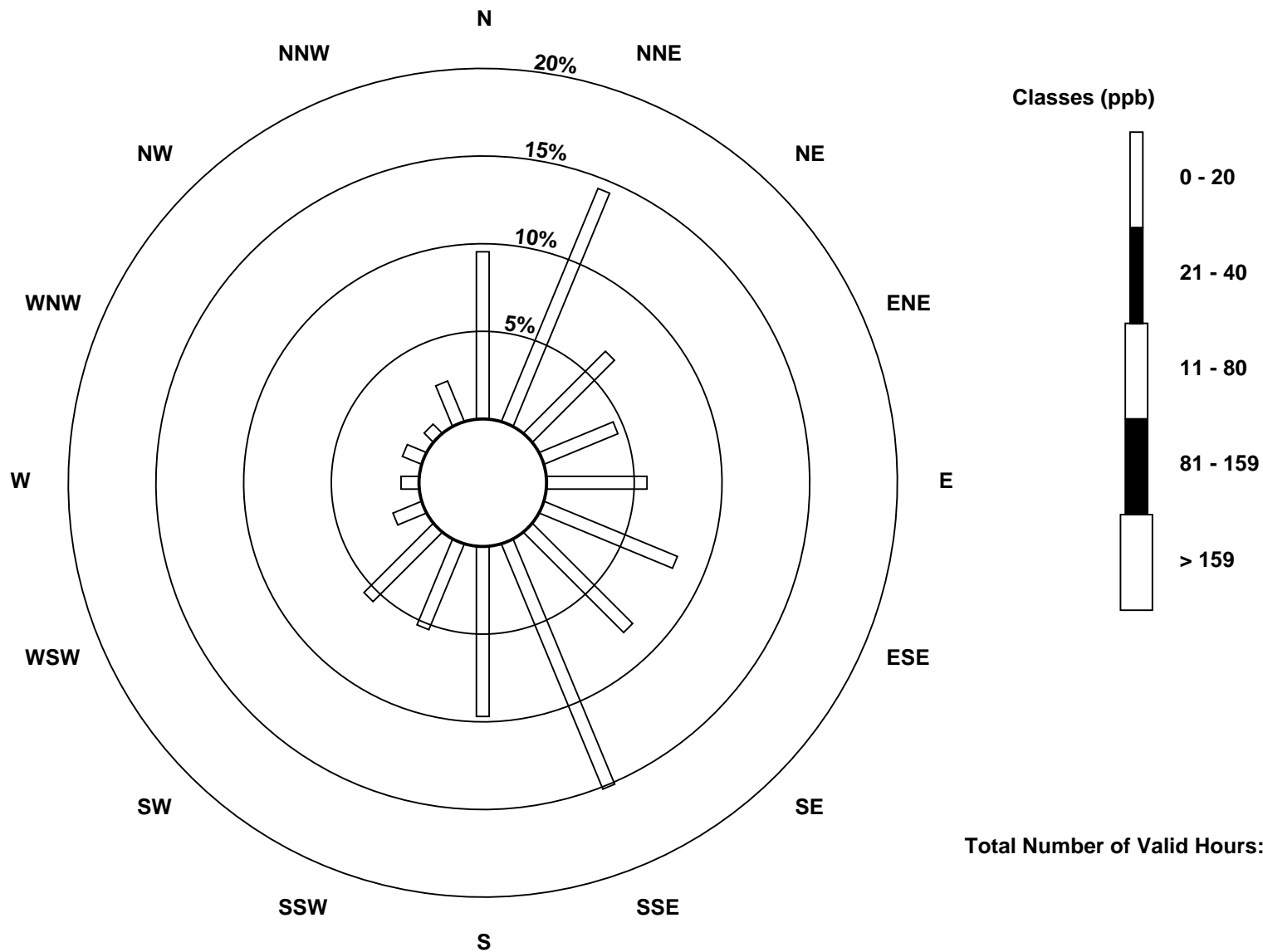
Total Number of Valid Hours: 681

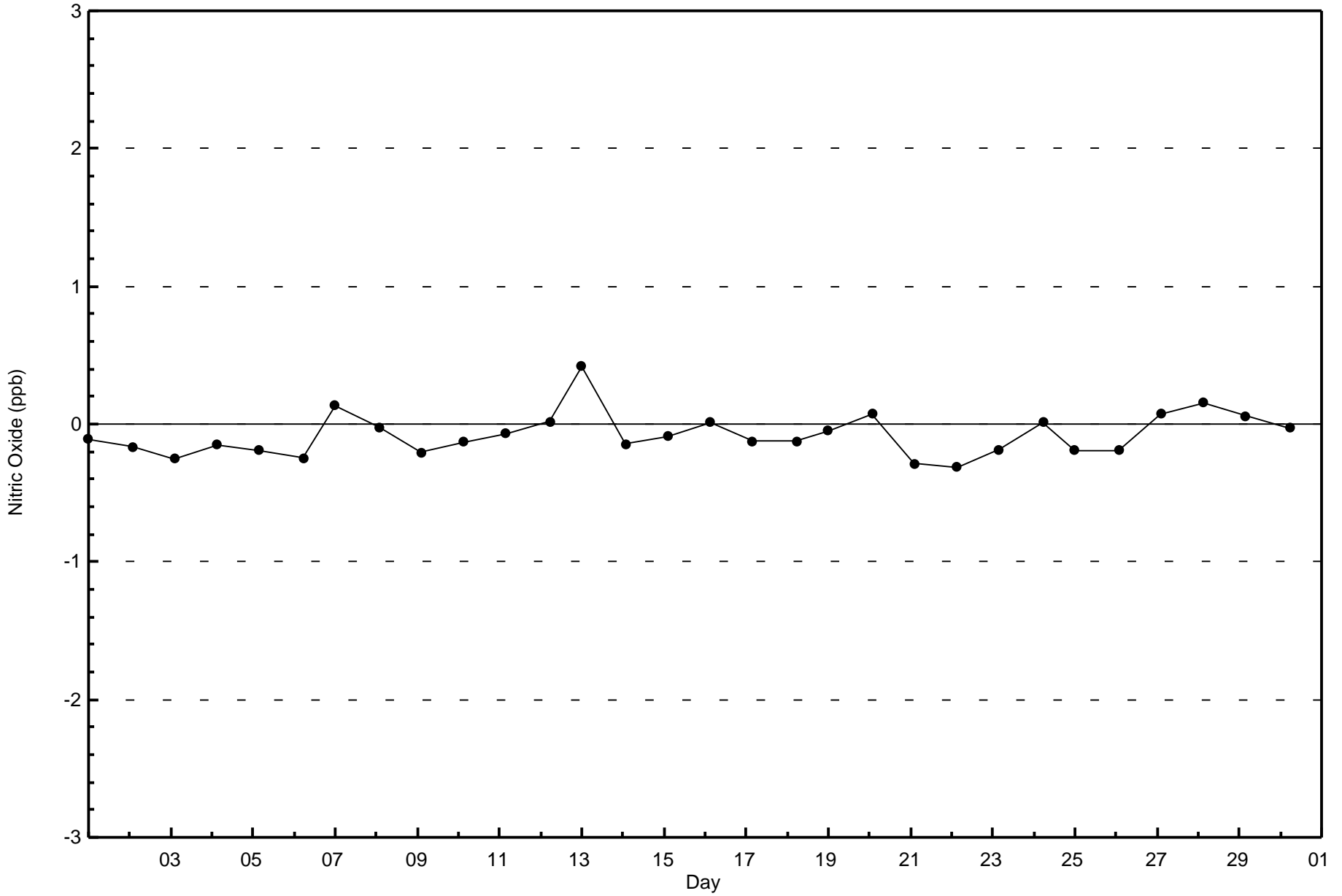
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Wapasu (AMS 17)

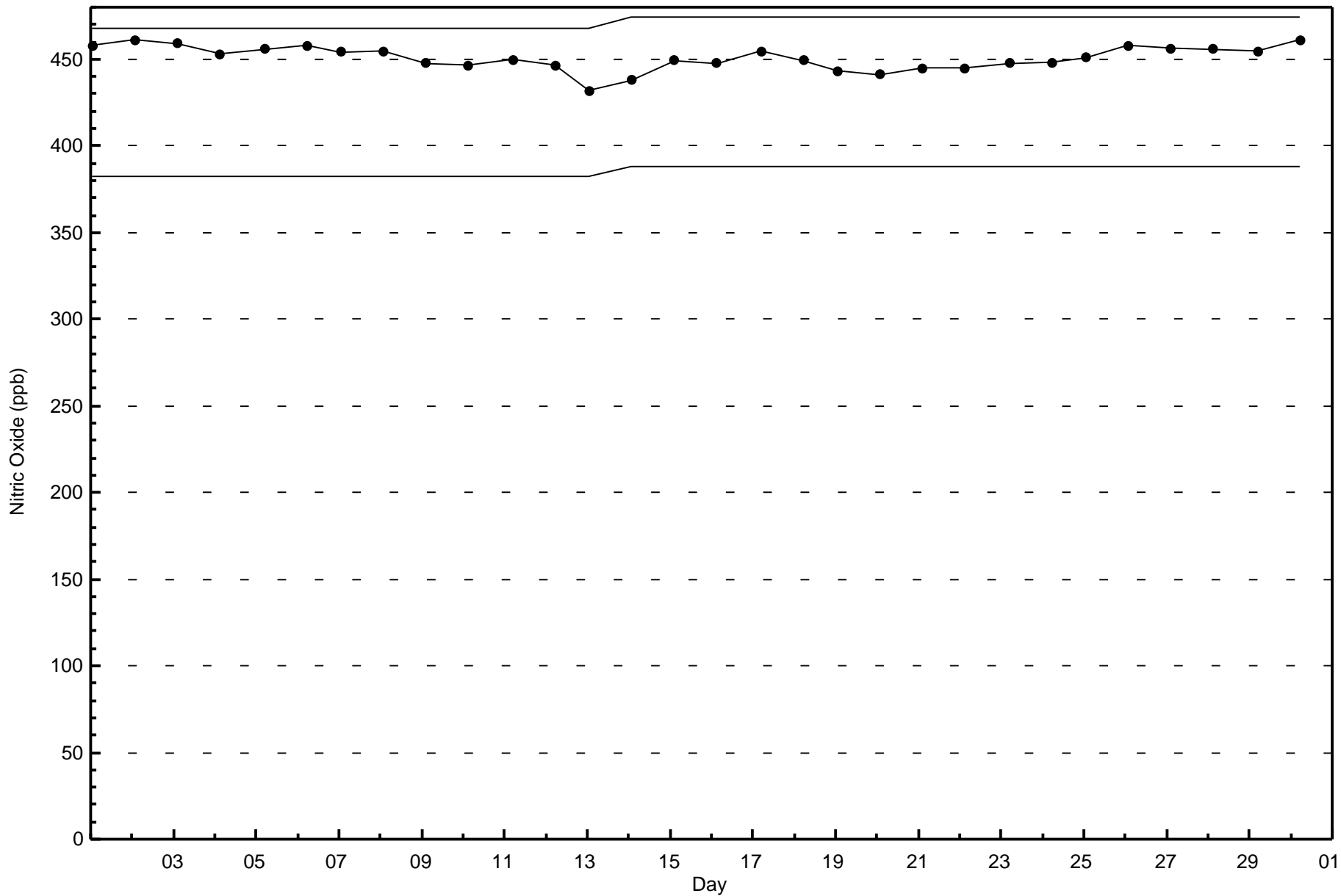






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Wapasu - April 2017





Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 19 ppb on Apr 27 22:00	Maximum Daily Average: 4.3 ppb on Apr 2		Hours of Data:	685
Minimum Value: 0 ppb on Apr 2 19:00	Minimum Daily Average: 0.0 ppb on Apr 25		Hours of Missing Data:	35
Maximum Diurnal Average: 1.6 ppb at hour 23	Minimum Diurnal Average: 0.7 ppb at hour 14		Hours of Calibration:	35
Monthly Average: 1.1 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 10		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	9	3	5	9	10	7	5	2	2	3	3	2	1	1	1	0	4	4	4	3	3	3	5	3.9	10
2-Apr	4	Z	3	4	4	9	12	12	8	4	2	1	2	1	1	0	1	0	0	0	0	2	14	15	4.3	15
3-Apr	1	1	Z	0	1	1	1	1	0	0	1	0	0	1	1	1	1	2	0	0	1	1	1	0	0.7	2
4-Apr	0	0	0	Z	1	0	0	1	3	5	3	1	1	1	1	3	2	3	2	1	1	0	0	0	1.3	5
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0.3	1
6-Apr	0	1	1	1	1	Z	1	1	2	2	2	6	6	2	2	1	0	0	2	2	4	4	1	0	1.7	6
7-Apr	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
8-Apr	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
9-Apr	0	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
10-Apr	0	0	1	Z	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	1	0.6	1
11-Apr	7	9	6	3	Z	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1.3	9
12-Apr	0	0	1	1	0	Z	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	1	2	4	0.5	4
13-Apr	Z	0	0	0	0	0	1	0	0	0	2	0	1	1	1	1	0	0	0	0	0	0	0	1	0.4	2
14-Apr	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.2	2
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.1	1
16-Apr	0	0	0	Z	0	0	0	0	1	1	2	3	3	3	2	2	2	3	2	2	2	1	3	6	1.7	6
17-Apr	2	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	Z	0	1	0	0	0	1	1	2	2	2	2	3	3	3	7	9	8	5	7	7	5	5	4	3.3	9
20-Apr	2	Z	2	2	1	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1.0	2
21-Apr	0	0	Z	1	0	0	0	0	0	0	1	1	2	1	1	0	0	2	3	3	2	2	2	2	1.0	3
22-Apr	1	1	1	Z	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	3
23-Apr	2	1	0	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
24-Apr	1	0	0	0	0	Z	0	1	1	2	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0.4	2
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	5	9	19	12	4	2.3	19
28-Apr	2	1	0	Z	0	0	1	4	8	3	1	1	1	1	4	5	4	4	4	4	2	1	2	1	2.4	8
29-Apr	0	1	0	0	Z	1	1	4	4	4	3	2	1	1	2	1	2	1	2	5	4	2	2	3	1.9	5
30-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	0	1	1	0.9	3

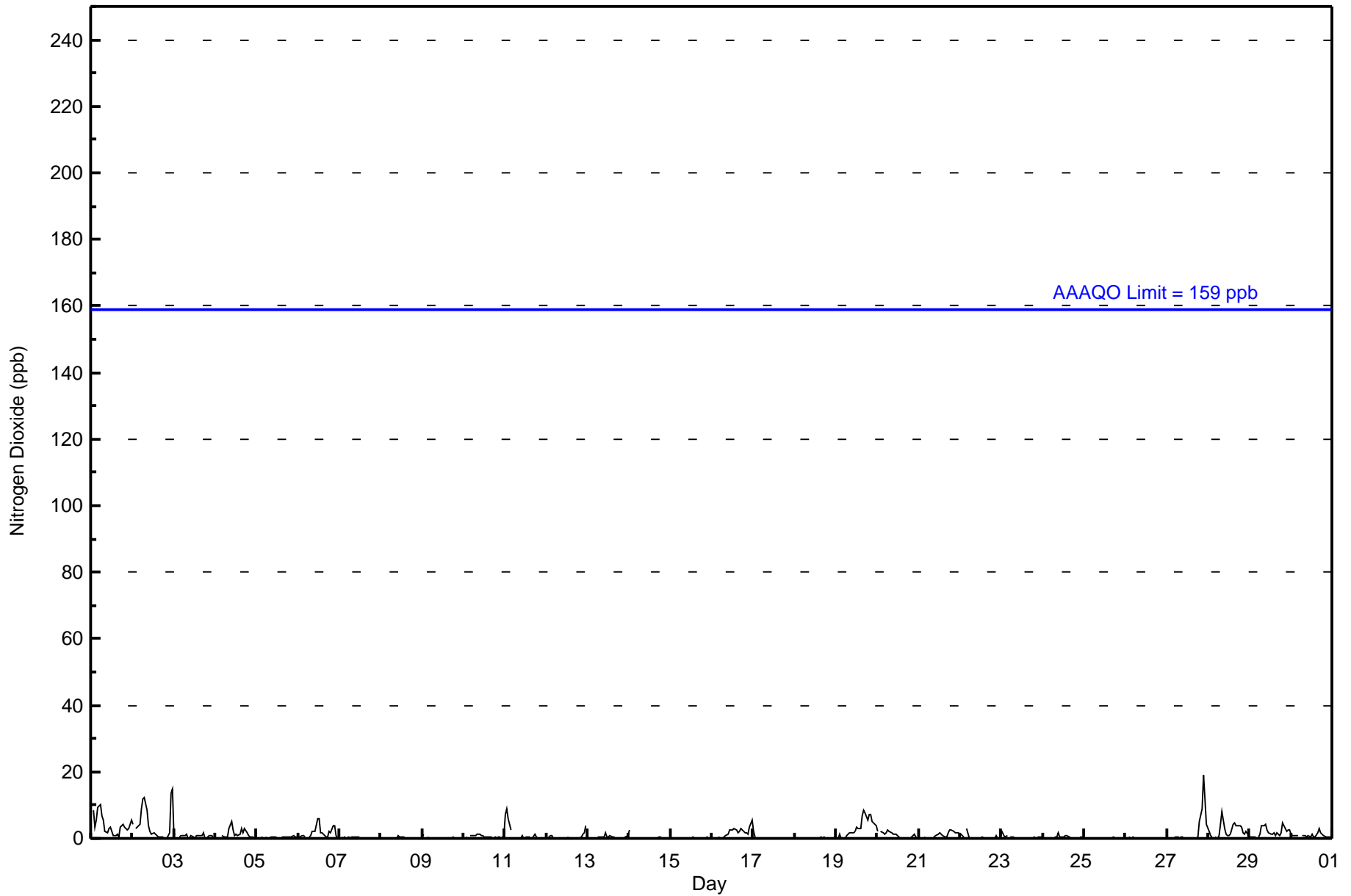
1.1	1.1	0.9	0.8	0.9	1.0	1.0	1.3	1.2	1.0	0.9	0.9	0.8	0.7	0.7	0.8	0.9	1.1	0.9	1.1	1.2	1.5	1.6	1.6	Diurnal Average
7	9	6	5	9	10	12	12	8	5	3	6	6	3	4	7	9	8	5	7	9	19	14	15	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Wapasu - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Wapasu - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681

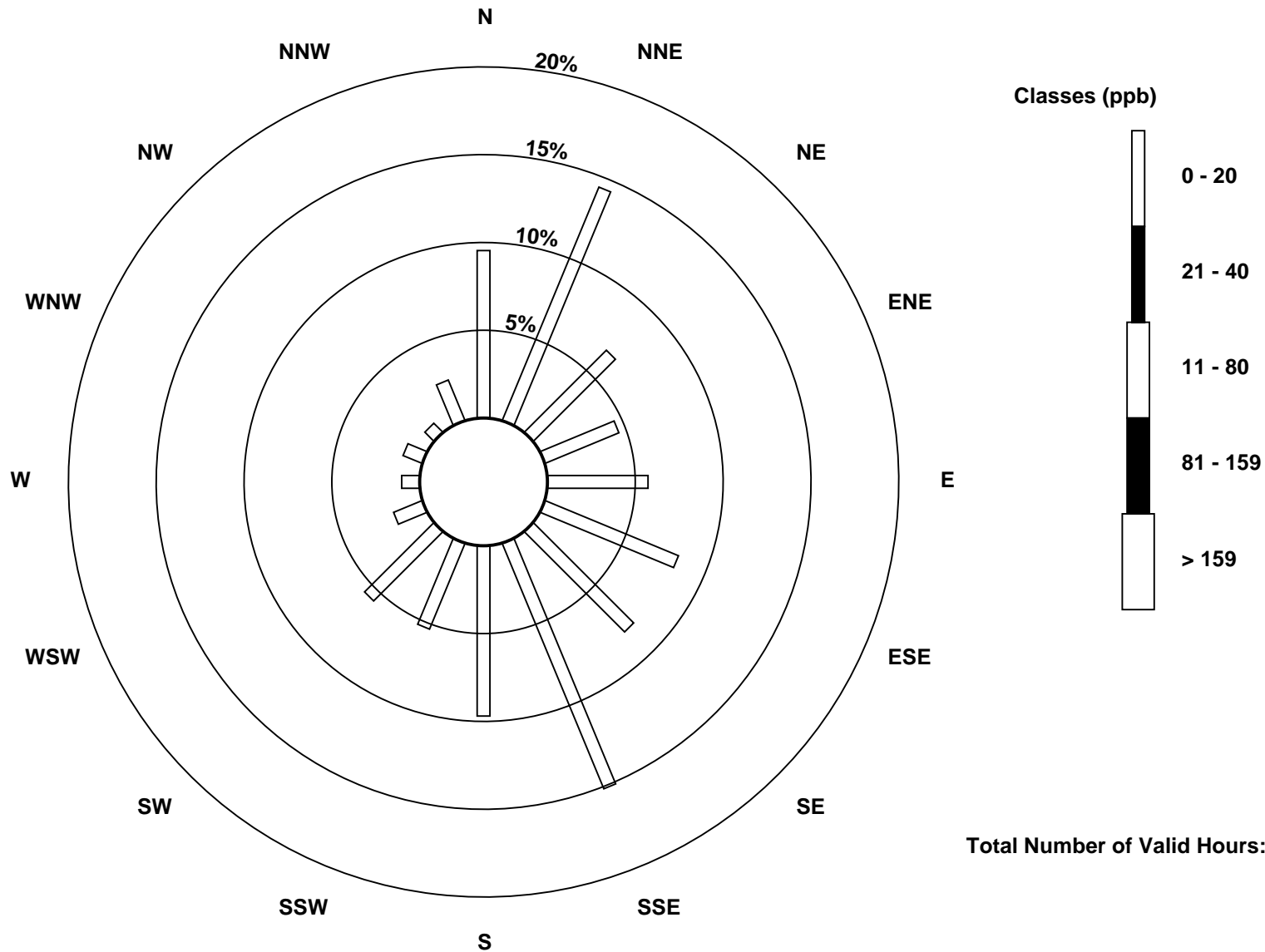
Total Number of Valid Hours: 681

Total Number of Hours: 720

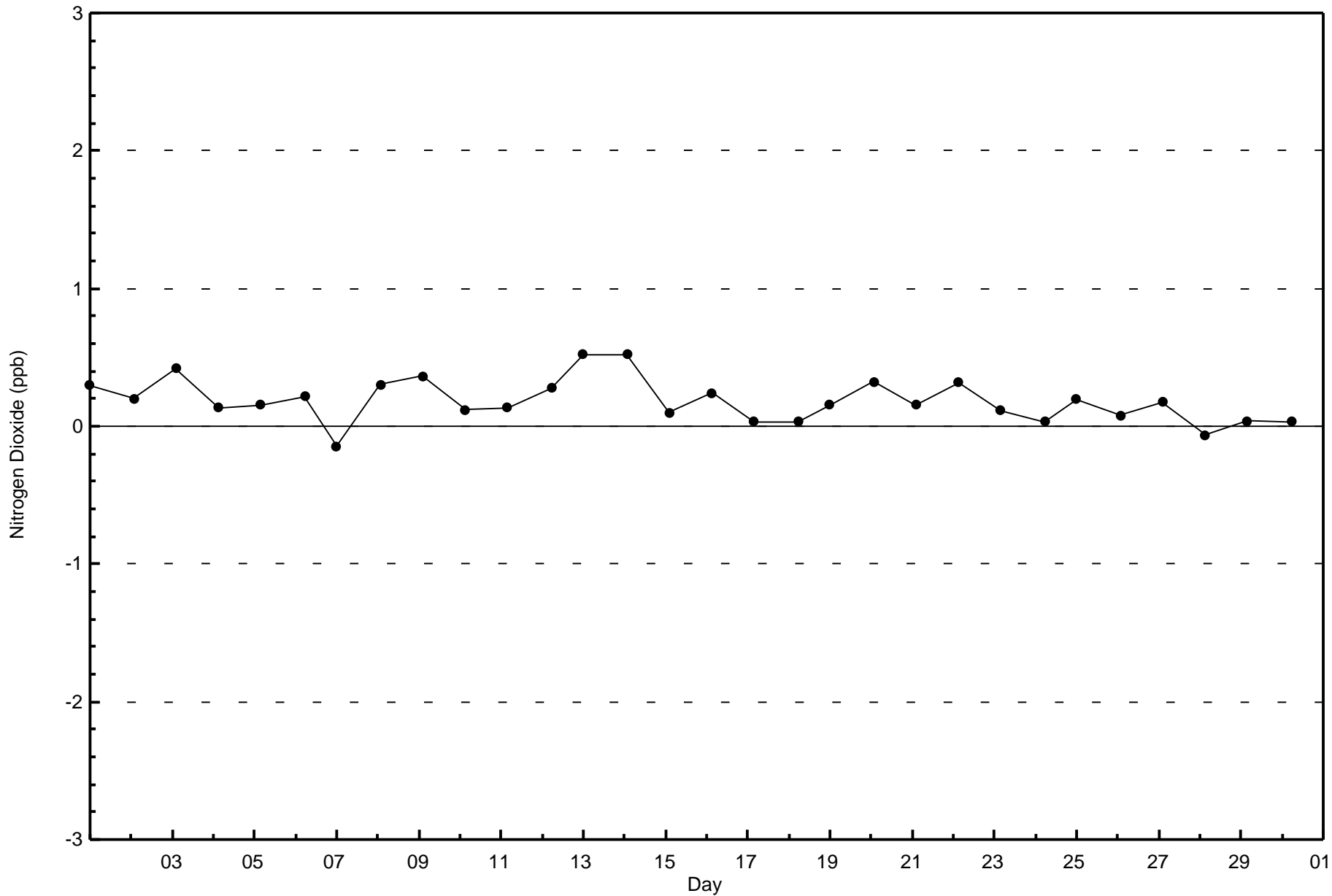


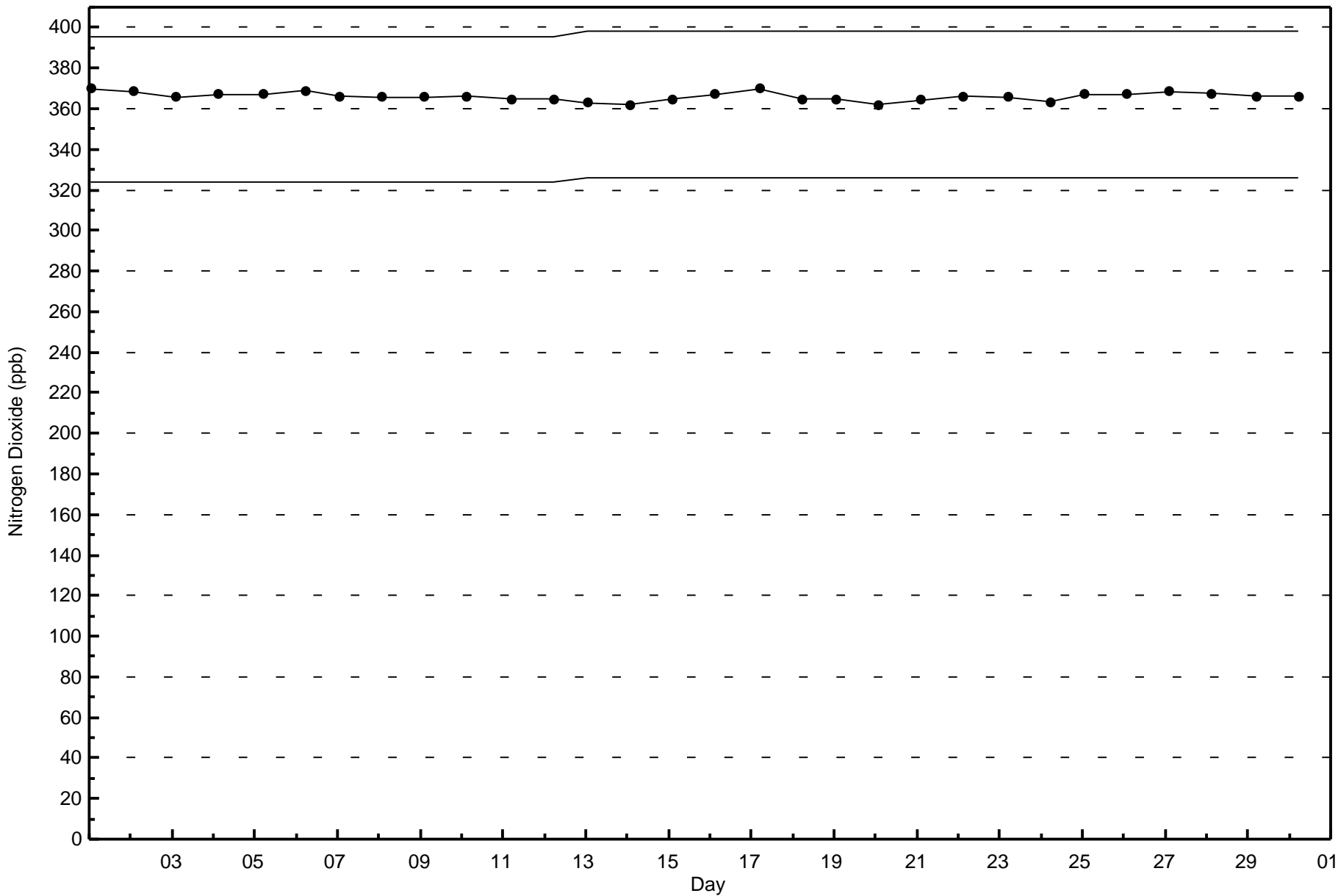
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Wapasu (AMS 17)



Total Number of Valid Hours: 681





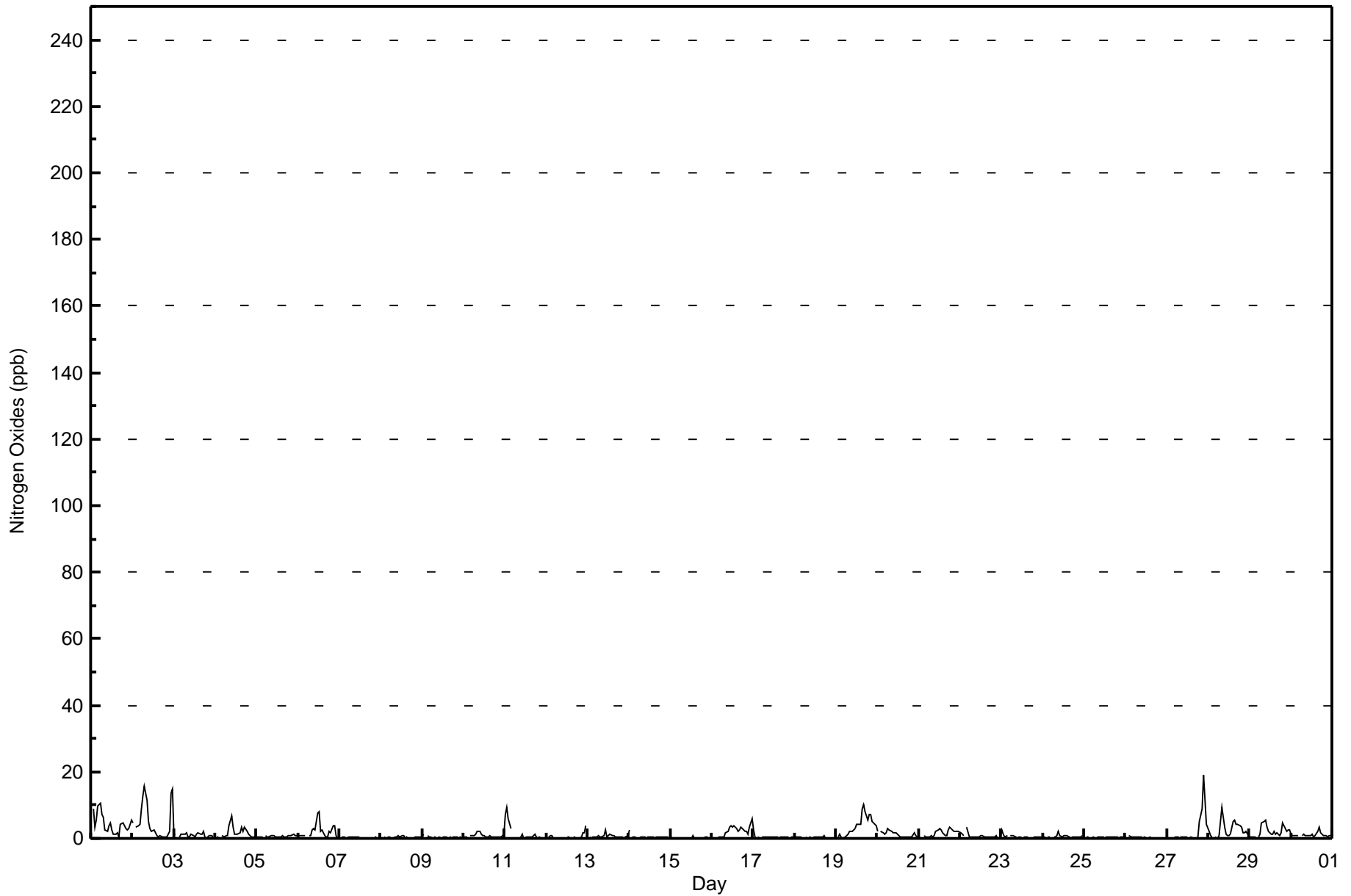


Maximum Value: 19 ppb on Apr 27 22:00																	Maximum Daily Average: 4.9 ppb on Apr 2																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 7 17:00																	Minimum Daily Average: 0.2 ppb on Apr 15																	Hours of Data: 685	
Maximum Diurnal Average: 1.8 ppb at hour 23																	Minimum Diurnal Average: 0.9 ppb at hour 4																	Hours of Missing Data: 35	
Monthly Average: 1.3 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 1 P ₉₀ = 3 P ₉₉ = 11																	Hours of Calibration: 35	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	9	3	5	10	11	7	6	3	2	4	5	3	1	1	2	1	4	4	4	3	3	3	5	4.3	11									
2-Apr	5	Z	3	4	4	9	13	16	11	5	3	2	2	2	1	1	1	0	0	0	0	2	14	15	4.9	16									
3-Apr	1	1	Z	1	1	1	1	2	0	0	1	1	1	1	1	1	1	2	1	0	1	1	0	1.0	2										
4-Apr	0	0	0	Z	1	1	1	1	4	7	3	1	1	1	2	3	2	3	2	1	1	1	0	1.6	7										
5-Apr	0	0	0	1	Z	1	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0.6	1										
6-Apr	1	1	1	1	1	Z	1	1	3	3	3	8	8	2	2	1	0	0	2	2	4	4	1	0	2.1	8									
7-Apr	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1									
8-Apr	0	Z	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1									
9-Apr	0	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.3	1									
10-Apr	0	1	1	Z	1	1	1	1	2	2	1	1	1	1	1	1	0	0	0	0	1	1	0	1	0.8	2									
11-Apr	7	9	6	3	Z	0	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	1.4	9									
12-Apr	0	0	1	1	0	Z	0	C	C	C	C	C	0	0	0	0	0	0	0	0	1	2	2	4	0.6	4									
13-Apr	Z	0	0	0	0	0	1	0	0	1	2	0	1	1	1	1	0	0	0	0	0	1	1	1	0.6	2									
14-Apr	3	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0.4	3									
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0.2	1									
16-Apr	0	0	0	Z	0	0	0	1	2	2	3	4	3	4	3	2	2	3	2	2	2	1	3	6	2.0	6									
17-Apr	3	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3									
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1									
19-Apr	Z	0	1	0	0	0	1	1	2	2	2	3	4	4	4	9	10	8	6	7	7	5	5	4	3.8	10									
20-Apr	2	Z	2	2	1	2	3	3	2	2	2	2	1	0	0	0	0	0	0	0	1	2	1	0	1.2	3									
21-Apr	0	0	Z	1	0	0	0	1	0	1	2	2	3	2	2	1	1	3	3	3	2	2	2	2	1.5	3									
22-Apr	2	1	1	Z	3	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0.7	3									
23-Apr	2	1	0	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2									
24-Apr	0	0	0	0	0	Z	0	1	1	2	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0.6	2									
25-Apr	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.3	1									
26-Apr	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1									
27-Apr	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5	9	19	12	4	2.3	19									
28-Apr	2	1	0	Z	0	0	1	5	9	4	1	1	1	1	5	6	4	4	4	4	2	1	2	1	2.6	9									
29-Apr	0	0	0	0	Z	1	1	5	5	6	3	2	1	1	2	1	2	1	2	5	4	2	3	3	2.2	6									
30-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	1	1	1	1.1	3									
																	Diurnal Average		Diurnal Maximum																
																	1.3		7																
																	1.2		9																
																	1.0		6																
																	0.9		5																
																	1.1		10																
																	1.2		11																
																	1.2		13																
																	1.6		16																
																	1.7		11																
																	1.5		7																
																	1.4		4																
																	1.3		8																
																	1.2		8																
																	1.0		4																
																	1.0		5																
																	1.1		9																
																	1.1		10																
																	1.3		8																
																	1.1		6																
																	1.3		7																
																	1.4		9																
																	1.7		19																
																	1.8		14																
																	1.7		15																
																	Z - zerospan		C - Calibration																



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Wapasu - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Wapasu - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	98	45	31	39	56	55	103	66	36	38	12	7	8	5	17	681

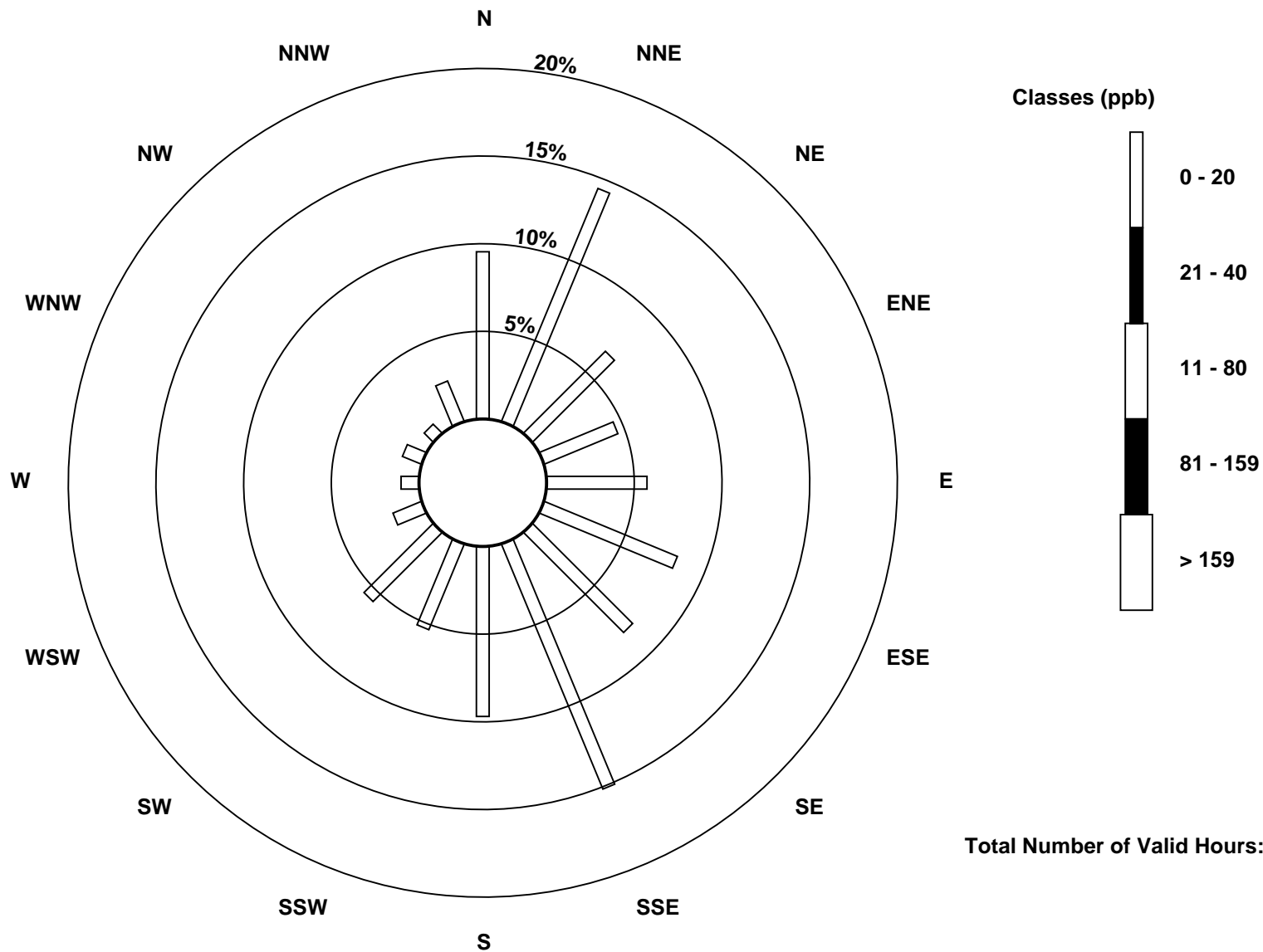
Total Number of Valid Hours: 681

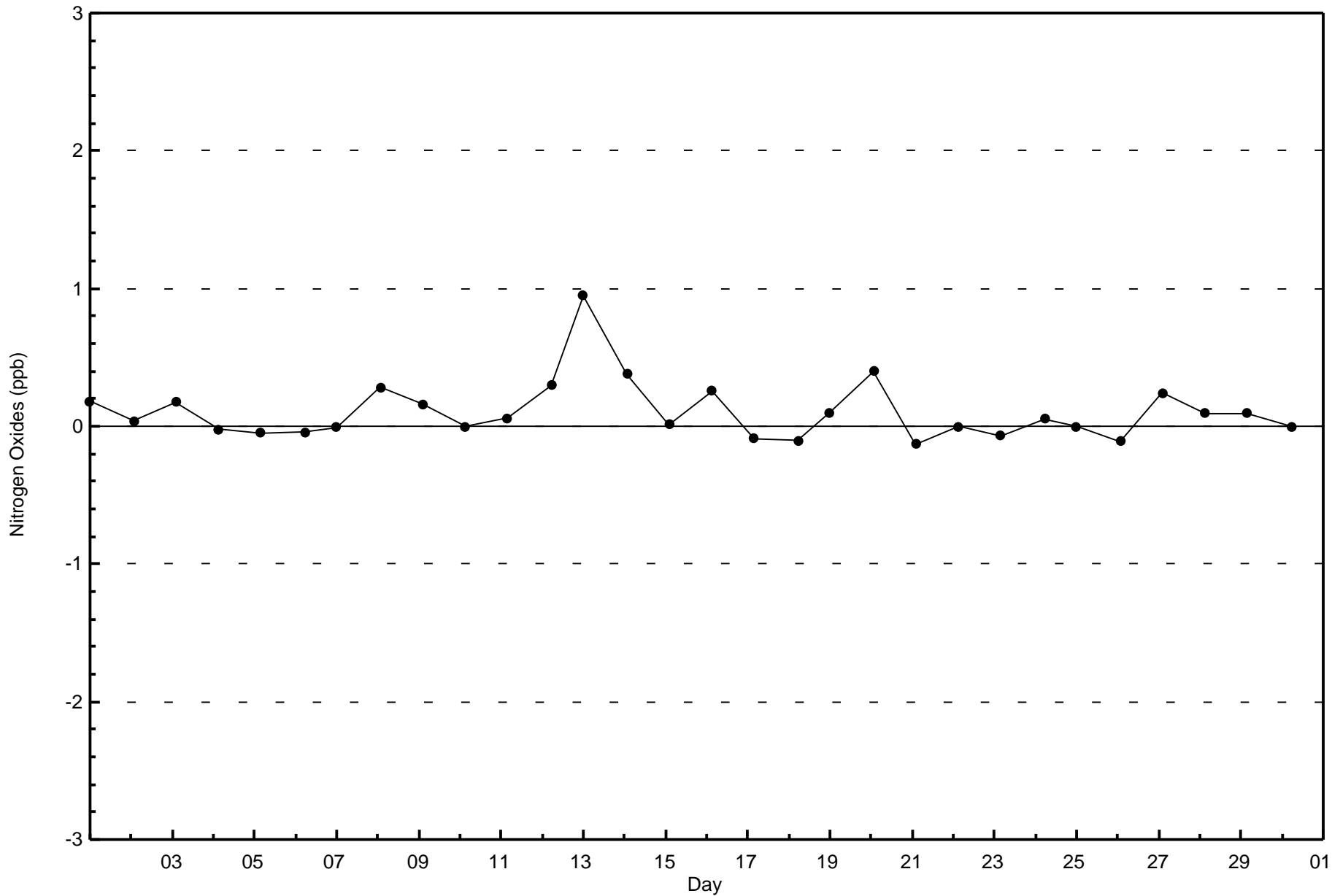
Total Number of Hours: 720

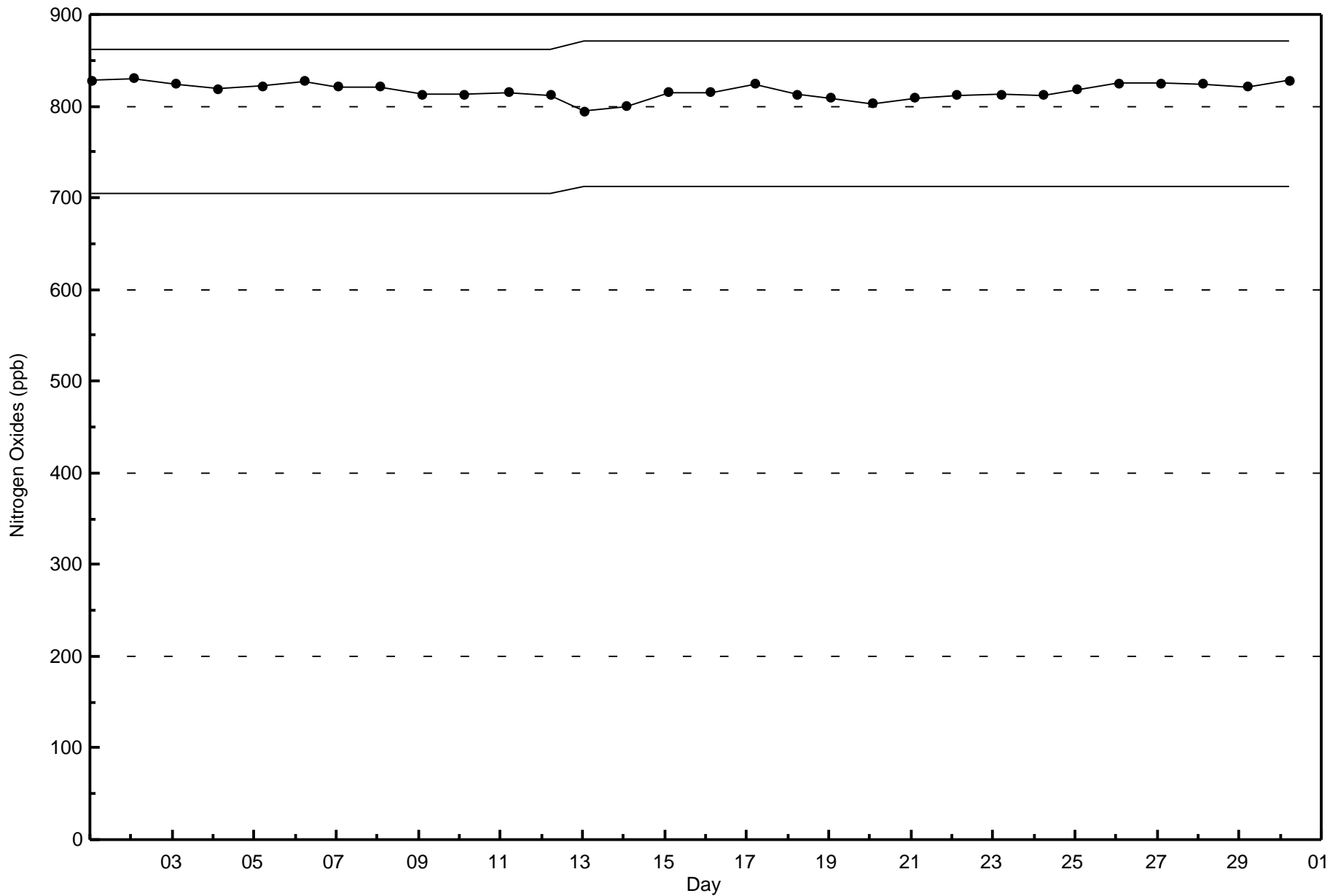


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Wapasu (AMS 17)









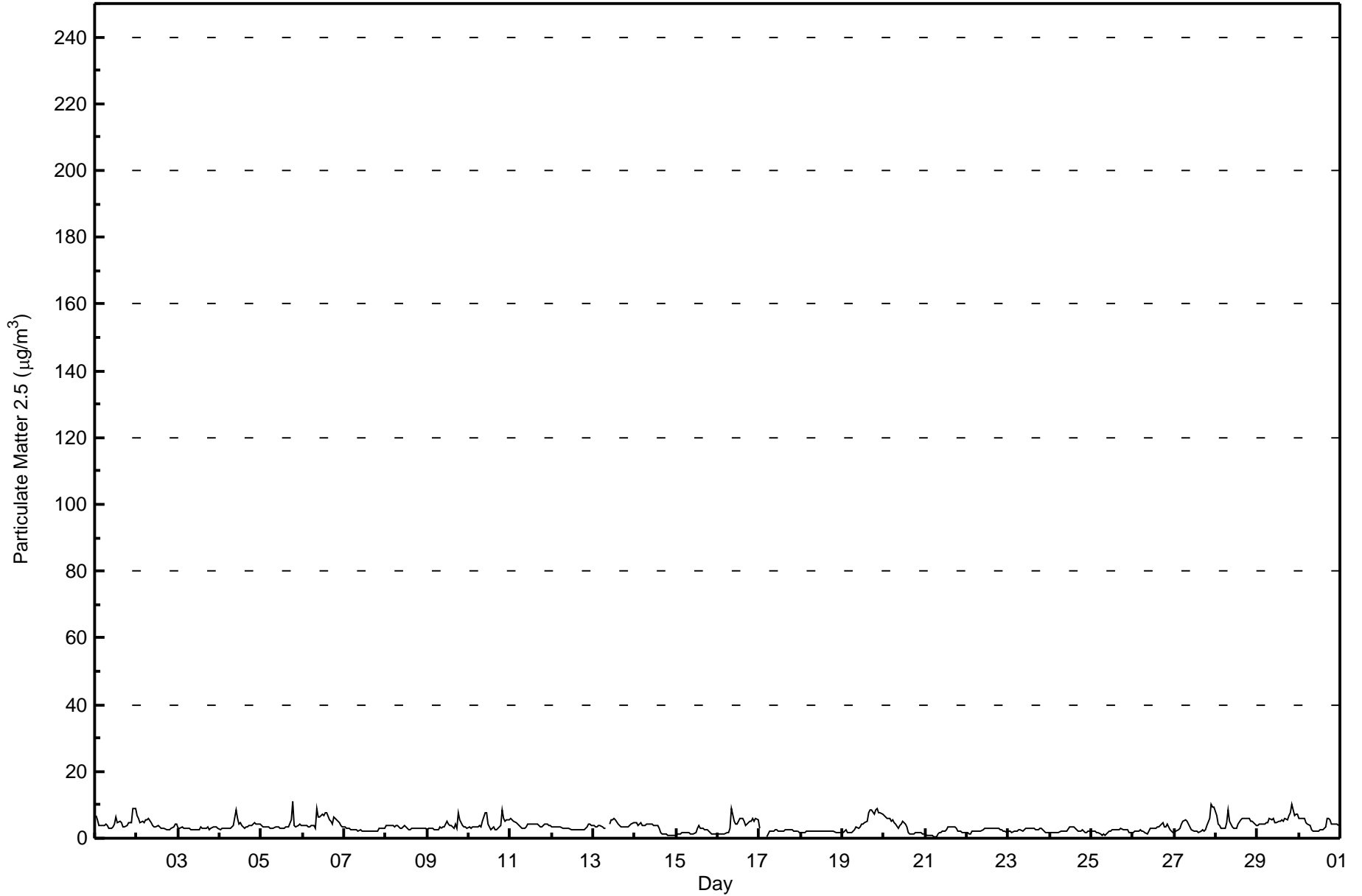
Number of Exceedences (AAAQO): 24-hr: 0 Maximum Value: 11.0 µg/m ³ on Apr 5 19:00 Minimum Value: 0.2 µg/m ³ on Apr 21 06:00 Maximum Diurnal Average: 3.8 µg/m ³ at hour 19 Monthly Average: 3.42 µg/m ³																	Maximum Daily Average: 5.6 µg/m ³ on Apr 29 Minimum Daily Average: 1.9 µg/m ³ on Apr 21 Minimum Diurnal Average: 2.9 µg/m ³ at hour 5 Percentiles: P ₁ = 1.0 P ₁₀ = 1.7 Q ₁ = 2.3 Median = 3.1 Q ₃ = 4.1 P ₉₀ = 5.6 P ₉₉ = 8.7																	Hours in Service: 720 Hours of Data: 716 Hours of Missing Data: 4 Hours of Calibration: 1 Percent Operational Time: 99.6	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	6.6	5.5	3.8	3.7	3.6	3.8	4.2	3.6	3.1	3.0	3.4	4.2	6.2	4.7	5.2	4.6	3.2	3.4	4.0	4.5	4.6	4.8	8.8	8.8	4.6	8.8									
2-Apr	7.0	5.9	4.5	4.9	4.7	5.6	5.5	5.8	4.5	3.7	3.4	3.3	3.9	3.5	3.0	2.8	2.8	2.7	2.6	2.7	2.9	3.5	4.2	4.0	4.1	7.0									
3-Apr	2.8	3.0	3.3	3.0	2.9	2.9	2.8	2.4	2.4	2.5	2.6	2.6	2.6	3.4	3.1	3.0	3.1	3.2	2.7	2.9	3.3	3.3	3.3	2.8	2.9	3.4									
4-Apr	2.6	2.9	2.9	3.1	2.9	2.9	2.9	3.3	3.9	8.4	6.1	4.3	4.5	3.9	3.2	3.4	3.5	3.9	4.0	4.2	4.8	4.3	4.3	4.2	3.9	8.4									
5-Apr	3.8	3.5	3.2	3.4	3.2	3.1	2.8	2.9	3.3	3.5	3.3	3.0	3.0	3.0	3.6	3.6	3.4	5.5	11.0	3.7	3.6	3.7	4.0	3.9	3.8	11.0									
6-Apr	3.7	3.7	3.8	3.6	3.4	3.9	3.8	3.0	8.7	6.3	6.5	7.1	6.7	7.6	7.6	5.3	5.2	4.3	6.2	6.0	5.0	4.6	3.6	3.4	5.1	8.7									
7-Apr	3.3	3.1	2.9	2.8	2.6	2.6	2.6	2.4	2.3	2.6	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.2	2.8	3.0	3.2	3.1	2.5	3.3									
8-Apr	3.8	3.8	3.8	3.7	3.7	3.5	3.8	3.7	3.1	2.9	3.3	3.8	3.1	2.6	2.6	2.8	2.8	3.0	2.9	2.9	2.9	2.9	3.0	2.9	3.2	3.8									
9-Apr	2.7	2.8	2.9	2.8	2.7	2.7	2.7	3.3	2.9	3.5	3.5	5.1	4.4	4.0	3.8	2.9	4.0	3.0	7.4	5.4	4.0	3.4	3.3	3.2	3.6	7.4									
10-Apr	3.3	3.2	3.4	3.4	3.4	3.6	3.7	3.3	5.1	7.6	7.5	4.4	3.4	2.7	3.5	2.6	2.7	3.1	3.7	8.3	6.0	5.2	5.4	5.4	4.3	8.3									
11-Apr	5.7	5.4	5.2	4.5	4.1	3.9	3.6	3.2	2.9	3.5	4.2	4.0	4.1	4.0	4.2	4.4	4.1	3.6	3.4	3.8	4.0	4.1	3.9	3.7	4.1	5.7									
12-Apr	3.4	3.5	3.5	3.5	3.5	3.2	3.0	2.8	2.8	2.9	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.7	3.3	4.0	4.0	3.9	3.1	4.0									
13-Apr	3.6	3.6	3.6	3.8	3.7	3.4	3.1	2.9	C	4.0	5.4	5.6	5.8	5.6	4.4	3.8	3.6	3.4	3.3	3.4	3.3	3.7	4.3	4.5	4.0	5.8									
14-Apr	4.5	4.5	3.9	4.5	3.9	3.9	3.9	4.2	4.1	4.3	4.1	3.7	4.0	3.9	2.9	1.9	1.4	1.2	1.1	1.0	1.0	0.9	1.0	1.0	2.9	4.5									
15-Apr	1.0	1.2	1.4	1.5	1.7	1.6	1.6	1.5	1.4	1.3	1.5	1.7	3.2	3.9	3.1	2.8	2.6	2.5	2.5	2.0	1.3	1.4	1.3	1.3	1.9	3.9									
16-Apr	1.4	1.3	1.3	1.2	1.3	1.5	1.8	3.0	8.9	5.1	4.0	4.4	5.1	5.9	5.8	5.0	3.9	4.3	4.9	5.1	6.1	5.3	6.0	5.3	4.1	8.9									
17-Apr	3.1	UO	UO	UO	0.4	1.4	1.9	2.1	2.1	2.4	2.5	2.3	2.2	2.2	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.2	2.1	1.9	2.2	3.1									
18-Apr	1.7	1.8	1.9	1.9	2.0	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	1.8	1.8	1.8	1.9	2.0	2.2									
19-Apr	1.9	1.9	2.7	1.8	1.8	1.8	2.0	2.4	3.3	2.9	3.3	4.2	4.2	4.6	5.0	7.6	8.4	8.7	7.3	8.3	8.7	7.5	7.6	7.4	4.8	8.7									
20-Apr	6.7	6.2	6.0	5.9	5.2	5.4	4.8	4.0	2.8	3.7	4.3	5.3	4.3	3.3	1.6	1.3	1.4	1.4	1.5	1.5	1.5	1.5	1.4	1.2	3.4	6.7									
21-Apr	1.1	1.0	0.9	0.9	0.8	0.2	0.4	1.4	1.5	1.7	2.0	2.2	2.5	3.4	3.2	3.3	3.2	3.3	2.9	2.1	1.9	1.7	1.7	1.8	1.9	3.4									
22-Apr	1.6	1.4	1.3	1.9	2.3	2.1	1.9	2.0	2.1	2.6	2.8	2.8	3.1	3.2	2.9	3.0	2.9	2.9	2.9	2.7	2.5	2.3	2.1	1.8	2.4	3.2									
23-Apr	2.2	2.2	1.9	2.0	2.1	2.2	2.4	2.5	2.2	2.6	3.1	3.0	2.9	3.0	2.8	2.8	2.7	2.7	2.9	2.9	2.7	1.7	1.6	1.7	2.5	3.1									
24-Apr	1.7	1.7	1.6	1.6	1.7	1.7	2.3	2.0	2.0	2.2	2.2	3.2	3.3	3.5	3.3	2.7	2.3	2.3	2.2	2.4	1.5	1.8	2.0	2.1	2.2	3.5									
25-Apr	2.3	2.3	2.1	1.8	1.6	1.2	1.0	1.1	1.1	1.9	2.2	2.2	2.3	2.7	2.7	2.5	2.6	3.0	2.4	2.7	2.6	2.5	1.6	1.7	2.1	3.0									
26-Apr	1.9	2.0	2.1	2.2	2.3	2.3	2.1	1.8	1.4	2.3	2.9	3.2	3.2	3.1	3.2	3.3	3.6	4.6	3.2	3.6	4.1	2.5	2.1	1.9	2.7	4.6									
27-Apr	1.9	2.2	2.7	3.0	4.2	5.2	5.4	5.2	4.2	3.3	2.5	2.1	2.0	1.9	1.9	2.0	2.6	2.1	2.6	3.8	5.9	10.0	9.1	9.3	4.0	10.0									
28-Apr	7.0	4.4	3.7	3.0	3.1	3.0	4.5	8.3	5.1	3.4	2.9	2.9	3.1	4.4	5.5	6.0	5.8	5.8	6.1	6.1	5.0	5.1	4.7	3.8	4.7	8.3									
29-Apr	3.6	4.4	4.2	4.2	4.4	4.6	4.7	5.8	5.3	6.1	4.8	4.7	5.3	5.1	5.7	4.9	5.8	5.6	6.7	7.8	10.3	6.9	7.2	7.1	5.6	10.3									
30-Apr	6.0	6.0	5.8	5.7	4.9	4.1	3.7	2.6	2.3	2.1	2.0	2.1	2.6	2.4	2.5	3.4	6.1	6.1	5.4	4.1	4.1	4.2	4.2	3.9	4.0	6.1									
																								Diurnal Average											
																								Diurnal Maximum											
																								3.4 7.0											
																								3.3 6.2											
																								3.1 6.0											
																								3.1 5.9											
																								2.9 5.2											
																								3.0 5.6											
																								3.0 5.5											
																								3.2 8.3											
																								3.3 8.9											
																								3.5 8.4											
																								3.4 7.5											
																								3.5 7.1											
																								3.4 6.7											
																								3.5 7.6											
																								3.4 7.6											
																								3.4 7.6											
																								3.4 8.4											
																								3.5 8.7											
																								3.8 11.0											
																								3.8 8.3											
																								3.8 10.3											
																								3.7 10.0											
																								3.8 9.1											
																								3.7 9.3											
																								3.6 9.3											

C - Calibration UO - Unstable Operation
 Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m³



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	625	87.29	87.29
6 - 15	79	11.03	98.32
16 - 25	0	0.00	98.32
26 - 80	0	0.00	98.32
> 81.0	0	0.00	98.32

Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	60	101	45	28	34	54	57	100	53	24	27	5	7	5	5	17	622
6 - 15	5	2	1	1	2	2	4	12	14	13	11	7	0	3	0	1	78
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	103	46	29	36	56	61	112	67	37	38	12	7	8	5	18	700

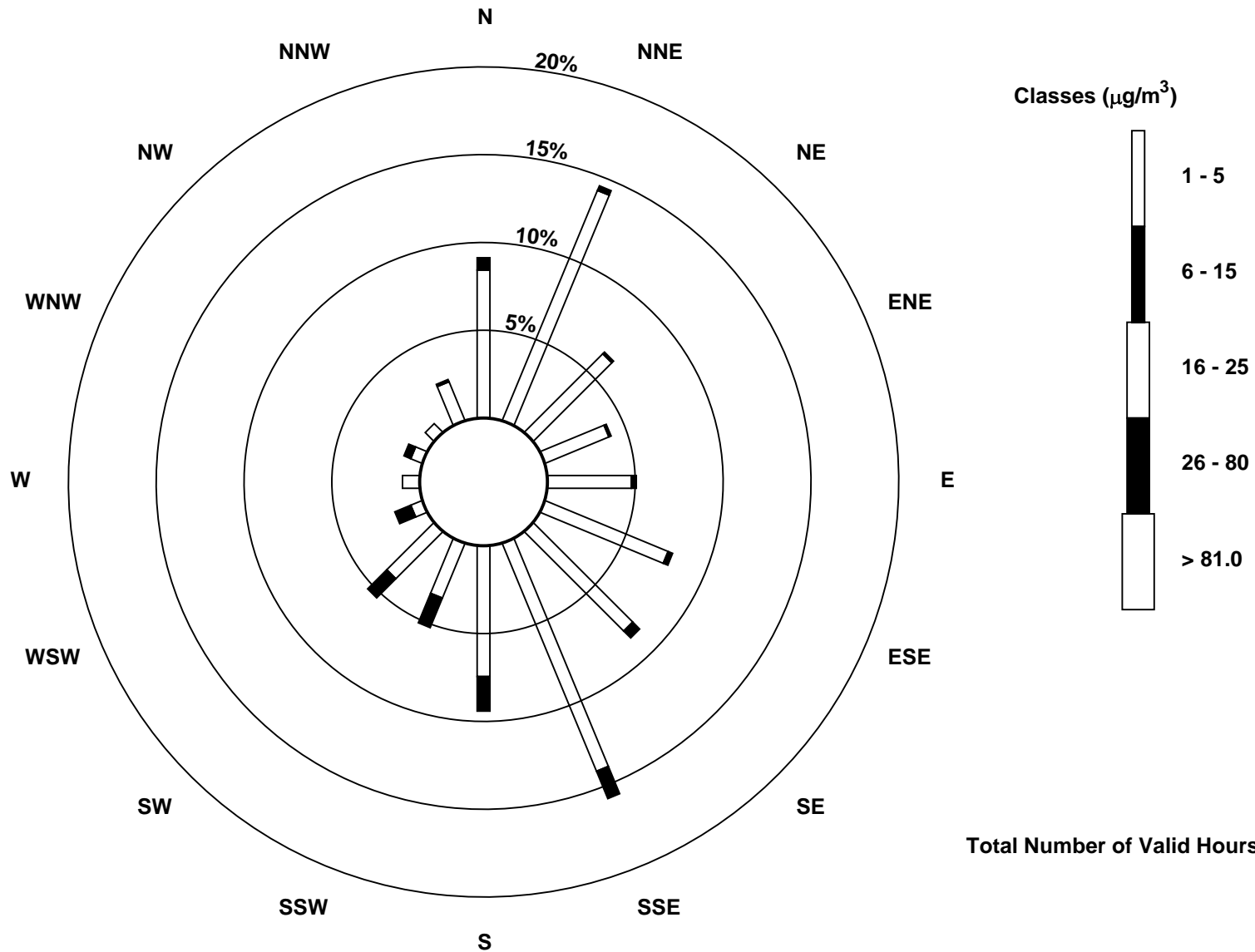
Total Number of Valid Hours: 712

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu (AMS 17)

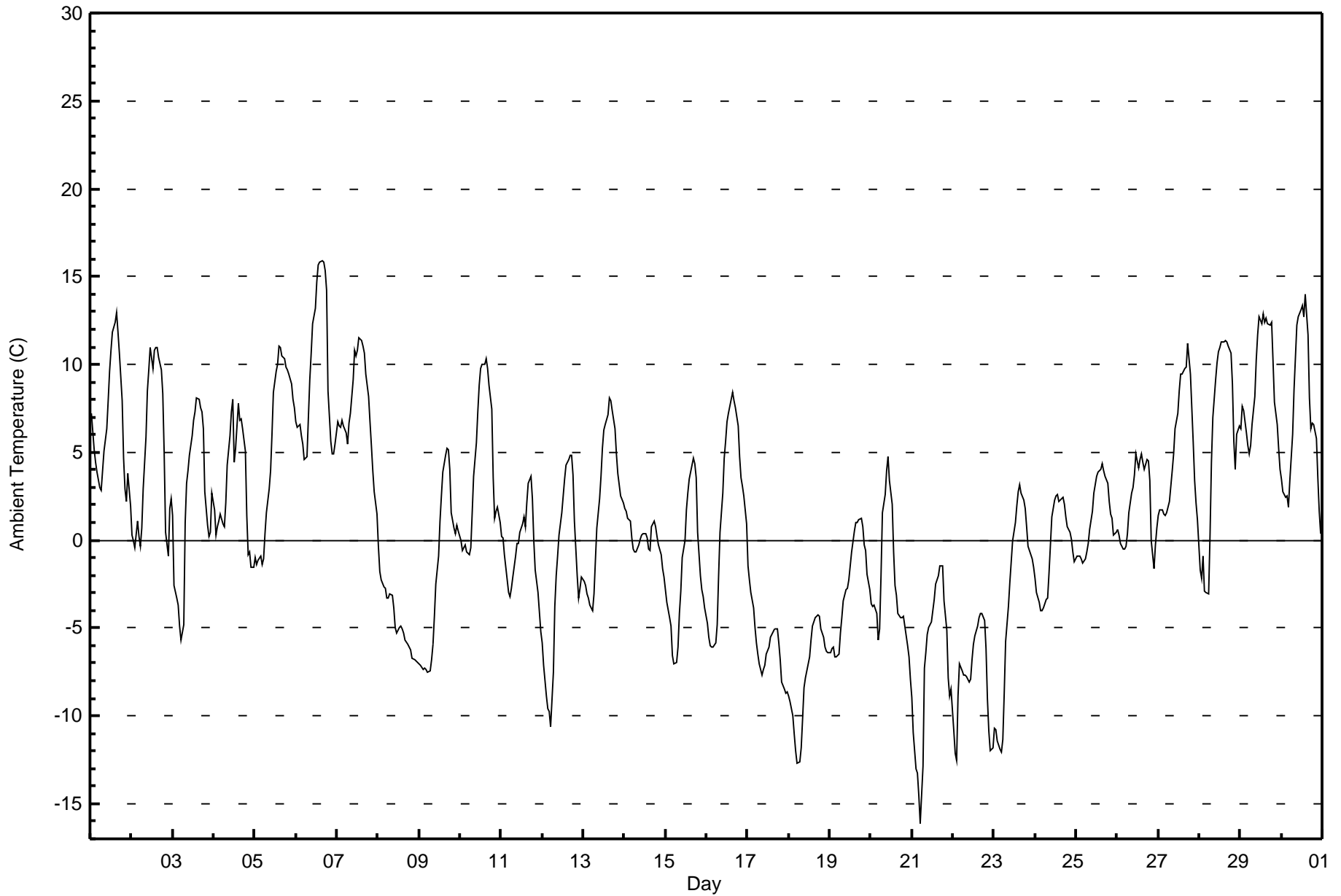




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Wapasu - April 2017

Maximum Value: 15.9 C on Apr 6 16:00 Maximum Daily Average: 9.6 C on Apr 6		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: -16.1 C on Apr 21 06:00 Maximum Diurnal Average: 5.2 C at hour 16 Monthly Average: 1.02 C		Minimum Daily Average: -7.8 C on Apr 22 Minimum Diurnal Average: -3.3 C at hour 6 Percentiles: P ₁ = -12.7 P ₁₀ = -6.8 Q ₁ = -3.4 Median = 0.9 Q ₃ = 5.3 P ₉₀ = 9.7 P ₉₉ = 14.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	7.2	6.2	5.2	4.4	3.9	3.0	2.8	3.9	5.1	6.4	8.0	9.6	10.8	11.8	12.4	13.0	11.8	10.7	8.0	4.7	2.9	2.2	3.8	1.9	6.7	13.0
2-Apr	0.3	0.0	-0.4	1.1	0.2	-0.4	0.7	2.9	5.9	8.5	9.7	10.9	9.7	10.8	10.9	11.0	10.4	9.7	8.3	4.9	0.4	-0.9	1.8	2.3	5.0	11.0
3-Apr	1.4	-2.6	-3.3	-3.7	-4.9	-5.7	-4.8	1.0	3.2	4.0	4.8	5.9	6.8	7.3	8.1	8.0	7.5	7.3	6.3	2.7	0.9	0.2	0.4	2.7	2.2	8.1
4-Apr	1.8	0.3	0.7	1.1	1.5	0.9	0.8	2.1	4.3	5.9	7.3	8.0	4.4	5.3	7.8	6.8	6.9	6.4	5.1	1.4	-0.8	-0.7	-1.5	-1.6	3.1	8.0
5-Apr	-1.0	-1.4	-1.2	-0.9	-1.4	-1.1	0.4	1.5	3.0	3.9	6.1	8.4	9.6	10.0	11.0	10.9	10.5	10.4	9.9	9.7	9.5	8.9	8.0	7.5	5.5	11.0
6-Apr	6.7	6.4	6.6	6.0	5.4	4.6	4.8	7.0	9.2	10.6	12.3	13.2	14.7	15.7	15.8	15.9	15.8	15.4	14.3	8.5	5.6	4.9	4.9	5.5	9.6	15.9
7-Apr	6.7	6.5	6.5	6.8	6.5	6.1	5.5	6.6	7.2	9.2	10.8	10.4	10.8	11.5	11.3	11.0	10.6	9.4	8.2	6.7	5.4	3.9	2.8	1.5	7.6	11.5
8-Apr	-0.4	-1.8	-2.3	-2.7	-2.8	-3.3	-3.3	-3.1	-3.1	-3.9	-5.0	-5.3	-5.0	-4.9	-5.1	-5.3	-5.6	-6.0	-6.1	-6.3	-6.7	-6.8	-6.9	-6.9	-4.5	-0.4
9-Apr	-7.0	-7.1	-7.4	-7.3	-7.4	-7.5	-7.4	-6.8	-5.9	-4.3	-2.5	-0.9	1.1	2.5	3.9	4.8	5.3	5.1	4.0	1.6	0.7	0.4	0.9	0.5	-1.7	5.3
10-Apr	0.0	-0.6	-0.4	-0.3	-0.7	-0.8	-0.4	1.5	3.6	5.5	7.3	8.8	9.8	10.0	10.0	10.3	9.7	8.8	7.4	3.6	1.3	1.6	1.9	1.0	4.1	10.3
11-Apr	0.2	0.1	-0.8	-2.2	-3.0	-3.2	-2.7	-2.1	-0.9	-0.2	-0.2	0.5	1.0	1.3	0.8	2.1	3.2	3.6	2.4	0.0	-1.7	-3.0	-4.1	-5.2	-0.6	3.6
12-Apr	-5.9	-7.1	-8.9	-9.6	-9.7	-10.6	-7.5	-3.8	-2.0	-0.9	0.3	1.6	2.5	3.5	4.3	4.6	4.8	4.8	3.7	1.1	-2.1	-3.3	-2.7	-2.1	-1.9	4.8
13-Apr	-2.3	-2.6	-3.1	-3.3	-3.7	-4.0	-3.1	-1.1	0.7	2.3	3.6	5.2	6.2	6.6	7.1	8.1	8.0	7.4	6.3	4.9	3.8	3.2	2.6	2.2	2.3	8.1
14-Apr	1.8	1.6	1.3	1.1	0.1	-0.5	-0.7	-0.7	-0.3	0.0	0.3	0.4	0.3	0.1	-0.5	-0.6	0.7	1.1	0.8	0.2	-0.3	-0.8	-1.6	-2.1	0.1	1.8
15-Apr	-2.8	-3.5	-4.4	-4.9	-6.5	-7.0	-7.0	-6.1	-4.2	-2.9	-1.0	0.0	1.8	2.7	3.4	4.3	4.7	4.3	3.5	0.4	-2.0	-2.8	-3.2	-3.9	-1.5	4.7
16-Apr	-4.7	-5.5	-6.0	-6.1	-6.1	-5.9	-4.8	-2.1	0.4	2.7	4.7	5.6	6.8	7.2	8.0	8.4	8.0	7.6	6.5	4.8	3.5	3.1	2.5	0.9	1.6	8.4
17-Apr	-1.5	-2.3	-3.0	-3.8	-5.0	-5.9	-6.5	-7.1	-7.7	-7.4	-7.1	-6.5	-6.1	-5.5	-5.4	-5.2	-5.1	-5.0	-5.9	-6.8	-8.1	-8.5	-8.7	-8.7	-5.9	-1.5
18-Apr	-8.9	-9.2	-10.0	-11.0	-12.0	-12.7	-12.6	-11.9	-10.1	-8.4	-7.8	-7.0	-6.6	-5.7	-4.9	-4.4	-4.3	-4.2	-4.3	-5.1	-5.6	-6.1	-6.3	-6.4	-7.7	-4.2
19-Apr	-6.4	-6.2	-6.1	-6.6	-6.7	-6.5	-5.3	-4.4	-3.5	-2.8	-2.7	-2.3	-1.5	-0.6	0.5	1.0	1.0	1.1	1.2	0.8	-0.3	-0.6	-1.9	-2.8	-2.6	1.2
20-Apr	-3.6	-3.7	-3.7	-4.2	-5.7	-5.1	-2.0	1.5	2.6	4.0	4.8	3.4	2.1	-0.7	-2.6	-3.1	-4.1	-4.4	-4.4	-4.4	-4.9	-6.0	-6.6	-7.9	-2.5	4.8
21-Apr	-8.9	-11.0	-13.0	-13.3	-14.5	-16.1	-12.9	-7.3	-6.4	-5.3	-5.0	-4.6	-4.0	-3.4	-2.5	-2.0	-1.5	-1.5	-1.5	-3.5	-5.1	-7.8	-8.9	-8.4	-7.0	-1.5
22-Apr	-10.8	-12.2	-12.6	-8.9	-7.1	-7.4	-7.7	-7.7	-7.8	-8.1	-7.9	-6.8	-5.9	-5.4	-4.9	-4.4	-4.2	-4.2	-4.5	-6.1	-9.0	-10.9	-12.0	-11.8	-7.8	-4.2
23-Apr	-10.7	-10.8	-11.4	-11.9	-12.0	-11.3	-8.7	-5.8	-3.8	-2.4	-1.2	0.0	1.0	1.9	2.8	3.1	2.7	2.3	1.8	0.8	-0.3	-0.9	-1.1	-1.5	-3.2	3.1
24-Apr	-2.2	-3.0	-3.6	-4.0	-4.0	-3.9	-3.4	-3.3	-1.9	-0.2	1.3	2.2	2.5	2.6	2.2	2.3	2.4	2.1	1.4	0.8	0.4	0.1	-0.6	-1.3	-0.5	2.6
25-Apr	-0.9	-0.9	-0.9	-1.1	-1.3	-1.1	-0.7	-0.2	0.6	1.7	2.7	3.2	3.6	3.9	4.0	4.3	4.0	3.6	3.3	2.2	1.5	1.2	0.3	0.4	1.4	4.3
26-Apr	0.6	0.3	-0.2	-0.5	-0.5	-0.3	0.4	1.6	2.7	3.0	3.7	4.9	4.1	4.6	4.9	4.4	4.1	4.6	4.5	3.4	0.0	-1.6	-0.2	0.7	2.0	4.9
27-Apr	1.4	1.7	1.7	1.5	1.4	1.6	2.2	3.1	3.9	4.9	6.3	7.2	8.5	9.4	9.5	9.8	9.9	11.2	10.3	9.4	5.5	3.4	2.1	1.2	5.3	11.2
28-Apr	-1.7	-2.2	-0.9	-2.9	-3.0	-3.1	0.3	4.4	7.0	9.1	10.0	10.8	10.9	11.3	11.3	11.4	11.3	11.0	10.7	8.9	5.6	4.0	6.0	6.5	5.7	11.4
29-Apr	6.4	7.6	7.4	6.1	5.4	4.9	5.4	6.5	8.2	10.2	11.7	12.7	12.3	12.9	12.4	12.6	12.3	12.2	12.4	10.2	7.9	6.6	5.2	4.0	8.9	12.9
30-Apr	3.4	2.8	2.5	2.5	1.9	3.4	6.0	8.6	10.4	12.2	12.7	13.1	13.4	12.7	14.0	11.7	8.1	6.4	6.7	6.6	5.8	3.6	1.6	0.4	7.1	14.0
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Wapasu - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	313	43.47	43.47
0 - 10	341	47.36	90.83
10 - 20	66	9.17	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



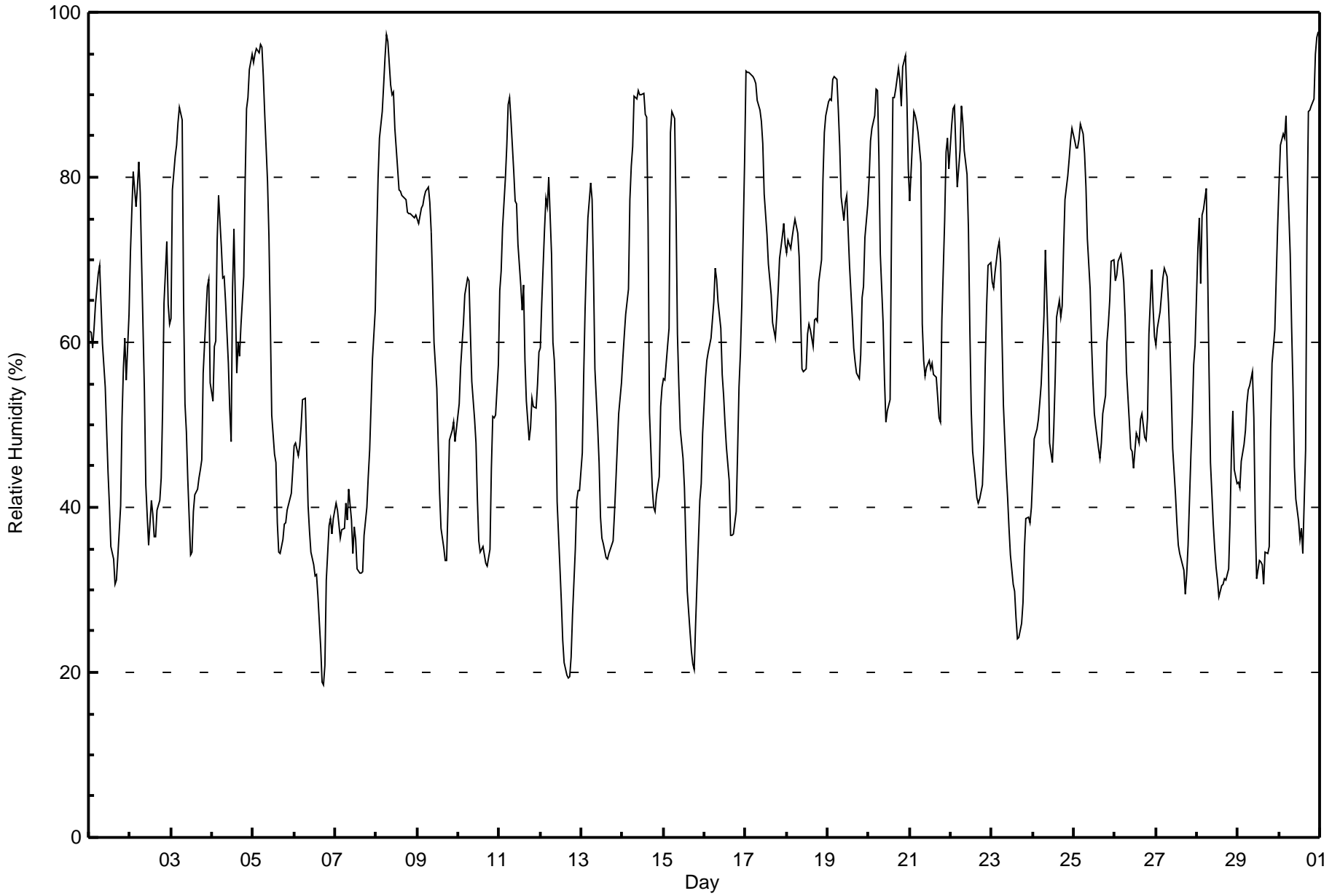
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Wapasu - April 2017

Maximum Value: 98 % on May 1 00:00 Maximum Daily Average: 82.7 % on Apr 8																		Hours in Service: 720 Hours of Data: 720																																																			
Minimum Value: 18 % on Apr 6 18:00 Minimum Daily Average: 37.2 % on Apr 6 Maximum Diurnal Average: 76.5 % at hour 6 Minimum Diurnal Average: 44.9 % at hour 17 Monthly Average: 59.5 % Percentiles: P ₁ = 21 P ₁₀ = 35 Q ₁ = 43 Median = 59 Q ₃ = 75 P ₉₀ = 87 P ₉₉ = 95																		Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																																																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																													
1-Apr	61	61	59	62	65	68	69	65	60	55	49	44	40	35	34	31	31	34	40	51	57	61	55	63	52.1	69																																											
2-Apr	71	76	81	76	79	82	78	70	54	43	39	35	41	39	36	36	40	41	44	52	65	72	65	62	57.3	82																																											
3-Apr	63	78	83	84	87	88	87	65	53	49	43	34	35	40	41	42	44	45	46	56	63	67	68	55	58.9	88																																											
4-Apr	53	59	60	72	78	72	68	68	65	57	52	48	67	74	56	60	58	62	68	80	88	90	93	95	68.5	95																																											
5-Apr	94	95	96	95	96	96	92	88	79	73	63	51	46	45	38	35	34	36	38	38	40	41	42	44	62.3	96																																											
6-Apr	47	48	46	48	50	53	53	47	40	37	35	33	32	32	29	23	19	18	21	31	38	39	37	39	37.2	53																																											
7-Apr	41	40	38	36	37	37	41	38	42	38	34	38	36	33	32	32	32	37	40	44	47	52	58	64	40.3	64																																											
8-Apr	73	80	85	88	91	95	97	96	91	90	90	86	81	78	78	78	78	77	76	76	76	75	75	75	82.7	97																																											
9-Apr	75	74	76	77	78	78	79	77	73	67	60	54	48	42	37	35	34	34	40	48	49	50	48	50	57.7	79																																											
10-Apr	53	57	60	62	66	68	67	61	55	51	48	41	36	35	35	34	33	33	35	45	51	51	51	57	49.4	68																																											
11-Apr	66	69	74	80	84	89	90	87	81	77	77	72	67	64	67	58	53	48	50	53	52	52	55	59	67.6	90																																											
12-Apr	59	65	74	77	76	80	71	60	58	53	41	33	29	24	21	20	19	19	22	27	35	41	42	42	45.3	80																																											
13-Apr	47	56	64	70	75	79	77	68	57	50	45	39	36	36	34	34	34	35	36	39	43	47	51	55	50.4	79																																											
14-Apr	58	61	63	66	77	81	84	90	89	90	90	90	88	87	74	52	42	40	39	42	44	44	52	55	68.6	90																																											
15-Apr	56	55	60	62	85	88	87	76	61	55	49	46	42	36	30	25	23	21	20	26	36	41	43	49	48.8	88																																											
16-Apr	56	58	59	60	61	65	69	68	65	62	56	54	50	47	43	37	37	37	40	47	55	59	65	82	55.3	82																																											
17-Apr	93	93	93	92	92	92	91	89	88	87	84	78	73	69	68	66	62	61	63	66	70	73	74	72	78.8	93																																											
18-Apr	71	72	71	73	74	75	73	70	64	57	56	57	61	62	62	59	63	63	62	67	70	80	85	87	68.2	87																																											
19-Apr	89	89	89	92	92	92	88	84	78	75	77	78	74	69	63	59	58	56	56	59	65	67	73	77	74.9	92																																											
20-Apr	80	84	86	87	91	90	83	71	62	55	50	52	53	73	90	90	91	93	92	89	93	95	89	81	80.0	95																																											
21-Apr	77	81	88	87	87	85	82	62	58	56	57	58	57	57	56	56	53	51	50	63	75	83	85	81	68.5	88																																											
22-Apr	86	88	89	84	79	83	89	87	83	80	74	62	52	47	43	41	41	41	43	48	57	64	69	70	66.6	89																																											
23-Apr	67	67	68	71	72	70	61	52	44	41	37	34	31	30	27	24	24	26	28	35	39	39	38	40	44.4	72																																											
24-Apr	44	48	49	51	53	55	63	71	66	60	48	45	50	56	63	65	63	64	71	77	80	82	84	86	62.3	86																																											
25-Apr	84	84	84	85	86	85	83	79	73	66	60	55	51	50	47	46	48	51	54	60	62	65	70	70	66.6	86																																											
26-Apr	68	68	70	71	69	67	63	56	50	47	47	45	49	48	48	51	51	48	48	51	61	69	64	61	57.1	71																																											
27-Apr	60	62	64	66	68	69	68	65	60	54	47	41	38	35	34	33	32	30	32	35	46	51	57	60	50.3	69																																											
28-Apr	71	75	67	75	76	79	69	56	45	38	35	33	31	29	31	31	31	31	33	38	47	52	45	43	48.4	79																																											
29-Apr	43	42	46	48	49	52	54	55	56	51	38	31	33	33	33	31	35	34	35	49	57	62	68	74	46.3	74																																											
30-Apr	79	84	85	85	87	81	71	62	54	45	41	38	36	38	34	47	74	88	88	89	89	95	97	98	70.2	98																																											
																		66.1		69.0		70.8		72.7		75.3		76.5		74.9		69.4		63.5		58.6		54.1		50.2		48.8		48.1		46.6		45.1		44.9		45.2		47.0		52.6		58.3		61.9		63.3		64.8		Diurnal Average			
																		94		95		96		95		96		96		97		96		91		90		90		90		90		90		88		90		90		91		93		92		89		93		95		97		98		Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Wapasu - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	5	0.69	0.69
20 - 40	134	18.61	19.31
40 - 60	235	32.64	51.94
60 - 80	218	30.28	82.22
80 - 100	128	17.78	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

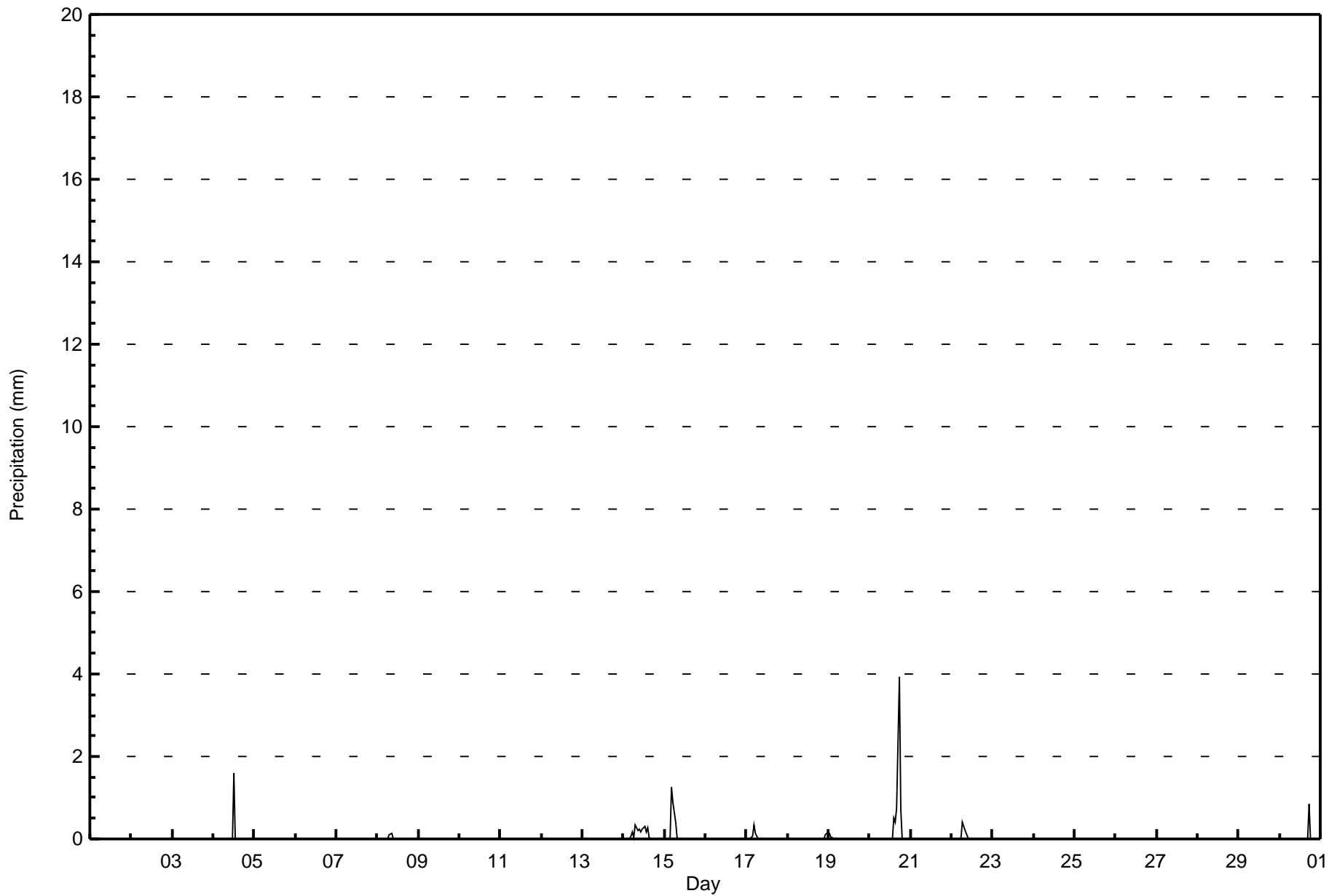
Wapasu - April 2017

Maximum Value: 3.9 mm on Apr 20 18:00																			Maximum Daily Total: 6.3 mm on Apr 20						Hours in Service: 720											
Minimum Value: 0.0 mm on Apr 1 01:00																			Minimum Daily Total: 0.0 mm on Apr 1						Hours of Data: 720											
Maximum Diurnal Total: 4.8 mm at hour 18																			Minimum Diurnal Total: 0.0 mm at hour 20						Hours of Missing Data: 0											
Monthly Total: 15.86 mm																			Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.7						Hours of Calibration: 0											
																									Percent Operational Time: 100.0											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24												
1-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
2-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
3-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
4-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	
5-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
6-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
7-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	
9-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14-Apr	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.3
15-Apr	0.0	0.0	0.0	0.1	1.3	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.3	
16-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17-Apr	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	
18-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	
19-Apr	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	
20-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.7	3.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	3.9	
21-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	
23-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30-Apr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8	
																			0.1 0.1 0.1 0.1 1.7 1.2 0.9 0.8 0.6 0.3 0.2 0.2 1.9 0.2 0.8 0.5 0.7 4.8 0.7 0.0 0.0 0.0 0.1 0.1						Diurnal Average											
																			0.1 0.1 0.1 0.1 1.3 0.9 0.4 0.3 0.2 0.3 0.2 0.2 1.6 0.2 0.5 0.4 0.7 3.9 0.7 0.0 0.0 0.0 0.1 0.1						Diurnal Maximum											



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Wapasu - April 2017





Maximum Speed: 20 km/h on Apr 5 13:00	Maximum Daily Speed Average: 16.0 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 30 21:00	Minimum Daily Speed Average: 2.0 km/h on Apr 19	Hours of Data: 716
Maximum Diurnal Speed Average: 5.2 km/h at hour 2	Minimum Diurnal Speed Average: 0.8 km/h at hour 13	Hours of Missing Data: 4
Monthly Average Velocity: 2.7 km/h 107.7 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 14 P ₉₉ = 19	Percent Operational Time: 99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW10	SW12	SW11	SW12	SW12	SSW9	SW10	SW15	SW17	SW15	SW17	SW15	WSW14	W13	W11	WNW12	NNW11	N7	SE1	SE3	SE3	WSW0	S4	S4	SW8.0	SW17
2-Apr	S4	SSE5	SSE6	S6	S5	S6	S5	SSW5	WSW5	NW7	NW9	WNW10	WNW9	N11	N12	NNW15	N13	N11	N9	NE5	ENE3	N4	N5	NNE6	NNW3.0	NNW15
3-Apr	NNE3	SE2	SE3	AF	AF	ENE4	E4	NNE6	N7	N8	N9	N10	NNW11	NNW10	NNW10	NNW11	N9	NNE5	ENE4	ESE4	SE3	SSE5	SE6	SE9	NNE3.5	NNW11
4-Apr	SE6	SSE6	SSE8	SSE8	SSE7	SSE7	SSE8	S8	SW8	WSW5	WSW3	SW8	ESE4	N6	NW5	WSW8	S4	SW11	SSW5	SSE4	SSE6	SSE5	SE5	SE6	S4.4	SW11
5-Apr	SSE8	SSE7	SSE8	SSE8	SSE7	SSE10	SSE12	SSE16	S15	S16	SSE19	S19	S20	S19	S18	S16	S13	S11	S9	S11	S13	SSE13	SSE15	SSE13	SSE12.8	S20
6-Apr	S10	SSE12	SSE12	SSE11	SSE10	SSE9	SSE8	SSE9	SSW8	S8	SW9	SW11	WSW13	WSW15	WSW14	W14	W13	W10	WNW5	N2	ENE5	ENE5	E5	E8	SSW5.2	WSW15
7-Apr	E10	E9	E7	E7	E7	E6	ENE7	ENE6	NNE8	NNE10	NNE12	N14	NNE14	NNE14	NE13	NNE13	NNE13	NNE12	NNE12	NNE12	NE12	NE11	NE11	NNE11	NE9.5	N14
8-Apr	NNE9	NNE7	NNE9	NNE8	NNE11	NNE12	NNE13	N12	N14	N15	N14	N17	N15	N15	N15	N14	N14	N12	NNE10	NNE8	NNE9	NNE7	NE7	ENE7	NNE11.0	N17
9-Apr	NE6	ENE4	NE3	SE5	SE5	SE7	S5	S6	S9	SSW10	S9	SSW10	S10	SSW10	SSW10	SSW11	SSW11	SSW11	S7	SSE8	SSE11	SSE12	SSE13	SSE13	S7.2	SSE13
10-Apr	SSE11	SSE11	S11	S10	S9	S8	S8	S9	SSW10	SSW10	SW10	SW11	SSW10	S8	SSW10	S8	SSE8	S7	S4	SE5	SE6	SSE6	SE4	NNW3	S7.5	SSE11
11-Apr	NNW5	N8	N9	N7	N10	NNE9	NNE10	NNE11	N11	N13	N15	N14	NNE13	NNE13	N13	N11	NNE11	N13	N12	N9	N8	N6	NNE5	NE5	N9.9	N15
12-Apr	NE6	ENE5	ENE4	NE4	NE5	NE5	NE5	NNE5	N8	NNE9	NNE9	NNE10	NNE10	NNE10	NNE9	NNE10	NNE9	NNE9	NNE8	NNE6	NE5	E6	ESE9	ESE10	NE6.4	NNE10
13-Apr	SE10	SE10	SE10	SE11	SE11	SE11	ESE10	ESE11	ESE14	ESE15	ESE13	ESE15	E15	E15	E15	E14	E14	E15	E12	E10	E12	E14	E14	E14	ESE12.2	E15
14-Apr	ESE16	ESE18	E17	E16	E15	E17	E16	E16	E17	E18	ENE16	ENE16	ENE16	ENE19	ENE19	ENE17	ENE16	ENE16	ENE16	ENE16	ENE13	ENE16	ENE15	ENE15	E16.0	ENE19
15-Apr	NE16	NE19	ENE15	NE13	NE12	NE12	NE10	NE9	NE9	NE9	NE10	NE11	ENE10	N13	NNE11	N12	NNE11	NNE9	NE7	E4	ESE6	SE8	SE10	SSE13	NE8.5	NE19
16-Apr	SSE12	SSE14	SSE14	SSE14	SSE13	SSE13	S12	S11	SSW11	SW12	WSW14	SW16	SW16	SW18	SW16	SW17	SW18	SW17	SSW12	SSW8	SSW8	SSW7	SSW7	NNW10	SSW10.8	SW18
17-Apr	N13	NNE11	N12	N12	NNE13	NNE12	NNE12	NNE14	NNE14	NNE13	NNE12	NNE13	NNE13	NNE13	N14	NNE13	NNE13	NNE12	NNE11	NNE9	NE6	NNE5	NNE5	NNE6	NNE11.1	NNE14
18-Apr	NNE4	NNE5	NNE7	NNE7	NNE7	NNE8	NE10	NE8	NNE8	NNE9	NNE8	NNE9	NNE8	NNE10	NNE9	NNE9	NE8	NNE8	NE7	NE6	NE6	NE6	ENE6	ENE5	NNE7.2	NE10
19-Apr	ENE5	ESE4	NE2	NNW3	AF	ESE2	SE4	SE3	SE3	SE2	W5	WNW3	SW7	SW7	SW6	WSW5	WNW5	WNW5	SW4	SW6	S4	SSW5	S5	SSE4	SSW2.0	SW7
20-Apr	SSE6	SSE6	SE6	SE6	ESE5	ESE4	ESE5	ESE7	NNE7	NNE10	N12	N16	NNE16	NNE16	NNE13	NNE16	NE15	NNE12	NE11	NE7	N4	NNE4	NE5	NE7	NE6.7	NNE16
21-Apr	NNE6	NNE4	NE5	E4	E3	E3	E3	NNE6	NNE8	N8	NNW8	NNW6	NW5	NNW6	N3	WNW4	NNW5	N6	N3	ENE1	SE2	SSE4	SSE5	SSE5	NNE2.6	N8
22-Apr	SE5	SE6	SSE4	NNW5	NNE8	NNE10	NNE9	NNE10	N12	N12	N13	N11	N12	N13	N12	N10	NNE10	N9	NE7	NE5	NE5	ENE5	E6	E7	NNE6.9	N13
23-Apr	ESE9	ESE10	SE8	SE8	SE9	SE9	SE9	SE8	ESE5	E5	ESE6	ESE8	ESE6	ESE8	ESE8	ESE8	SE9	SE8	ESE7	ESE8	ESE9	ESE11	SE11	SE11	ESE8.2	SE11
24-Apr	ESE12	ESE12	ESE12	SE11	SE11	SE11	SE10	ESE9	ESE10	ESE13	E14	ESE12	E13	E12	ESE12	ESE13	ESE11	ESE10	ESE9	ESE7	ESE7	ESE7	ESE6	ESE6	ESE10.4	E14
25-Apr	SE8	SE9	SE9	SE10	SE11	SSE11	SSE12	SSE13	SSE12	SSE11	SSE12	S11	S11	S11	S12	S12	SSW12	SSW11	S10	SSE11	SSE10	SSE10	SSE9	SSE10	SSE10.2	SSE13
26-Apr	SSE11	SSE12	SSE11	SSE11	SSE12	SSE13	SSE14	SSE14	S13	S13	S14	S14	S15	S14	S13	SSE15	S12	SSW13	S10	SSE9	SE5	SE7	SE9	SSE10	SSE11.5	S15
27-Apr	SSE11	SSE9	SSE7	SSE7	SSE8	SE8	SSE8	SSE9	S11	S9	SSE10	SSE8	SSE9	S7	S6	SE5	SSW3	SW5	ESE4	NNW6	NNE3	NNE4	AF	ESE4	SSE5.5	SSE11
28-Apr	SSE6	SSE6	SSE6	SE5	SSE6	SE6	SSE4	S3	NW2	NNE6	NE8	N7	NNW4	WSW6	N6	N7	N7	N5	NE3	ENE4	ESE5	ESE6	ESE8	SE8	E2.1	ESE8
29-Apr	SSE7	S8	SSE7	SSE7	SSE8	SSE8	S8	SSW9	SW11	SW9	SSW11	SW12	SSW15	SSW14	SW11	SSW10	SSW9	S9	SSW11	SW10	S5	S6	SSE6	S7	SSW8.3	SSW15
30-Apr	SSE6	SSE5	SSE6	SSE7	SSE7	SSE7	SSE7	S8	SSW9	SW8	SW7	W6	SSE6	SE10	ENE6	NNW7	SSW8	SSW10	SSE6	ESE5	ESE0	SE4	SE3	SE4	S4.4	SSW10

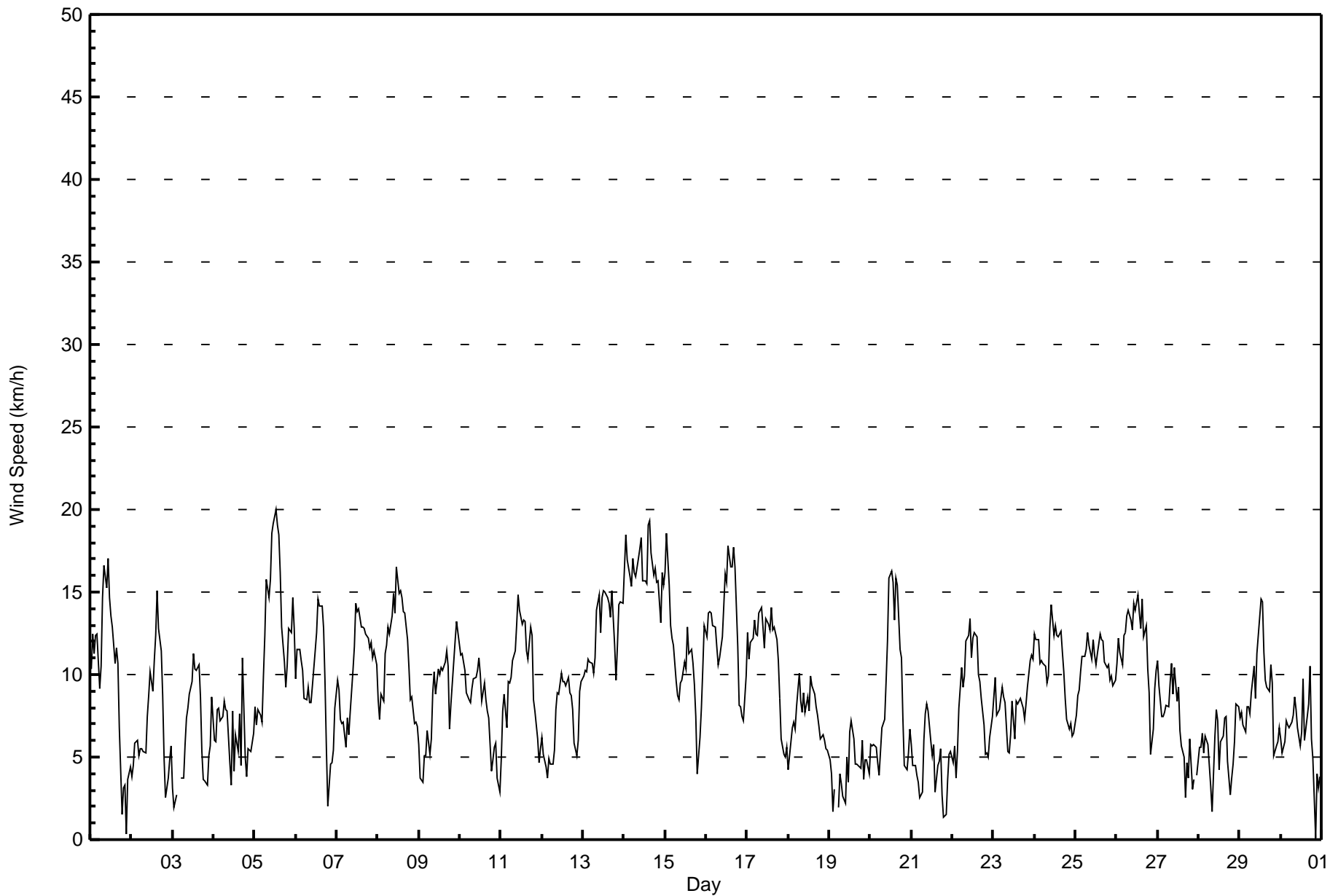
ESE4.8	SE5.2	SE4.8	SE4.5	ESE4.9	ESE4.9	ESE4.6	SE3.9	SE1.5	E1.3	E1.1	N0.8	E0.8	NNE1.0	NNE1.4	NNE1.9	NE1.8	NE1.4	ENE2.5	E3.0	E3.6	ESE4.0	ESE5.1	ESE5.0	Diurnal Average	
ESE16	NE19	E17	E16	E15	E17	E16	E16	E17	E18	SSE19	S19	S20	SSE19	ENE19	ENE19	SW18	SW17	ENE16	ENE16	ENE16	E14	ENE16	ENE15	Diurnal Maximum	

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Wapasu - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	139	19.41	19.41
6 - 11	375	52.37	71.79
12 - 19	201	28.07	99.86
20 - 28	1	0.14	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 716

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	7	12	14	13	8	13	23	11	12	4	2	5	1	5	3	6	139
6 - 11	28	61	26	6	10	30	38	73	36	28	19	2	3	2	2	11	375
12 - 19	32	32	8	14	22	14	0	29	18	5	17	5	3	1	0	1	201
20 - 28	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	67	105	48	33	40	57	61	113	67	37	38	12	7	8	5	18	716

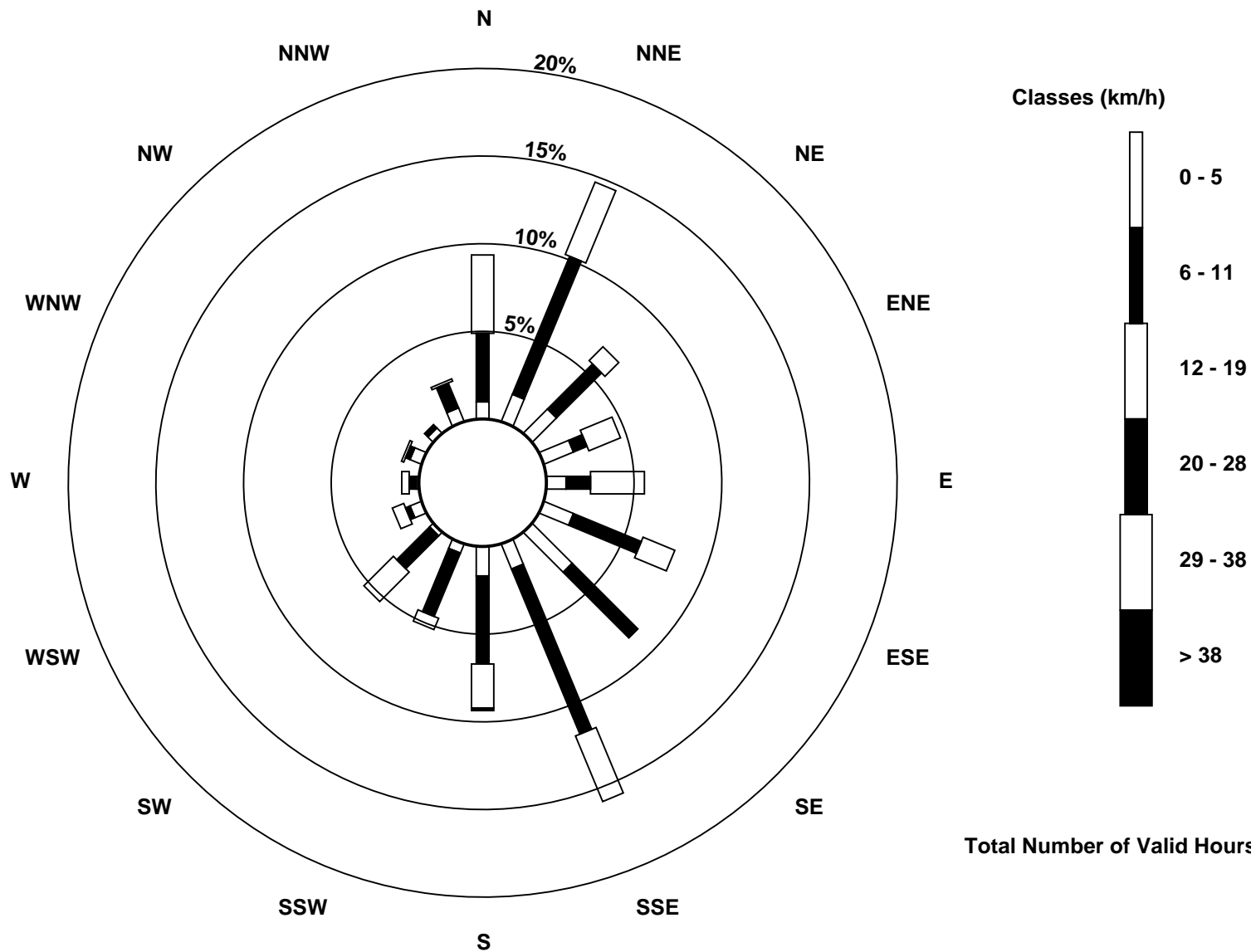
Total Number of Valid Hours: 716

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Wapasu (AMS 17)



Total Number of Valid Hours: 716



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Wapasu - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Apr 5 13:00	Hours of Data: 716
Minimum Value: 0 km/h on Apr 3 02:00	Hours of Missing Data: 4
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6	Hours of Calibration: 0
	Percent Operational Time: 99.4

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	4	4	3	3	3	3	4	4	4	4	5	4	5	4	4	4	3	2	1	1	1	1	1	1	5
2-Apr	1	1	1	1	1	1	1	2	2	2	3	4	5	5	5	5	4	4	3	1	1	2	1	2	5
3-Apr	2	0	1	AF	AF	1	1	2	2	2	3	4	4	3	4	3	3	2	1	1	1	1	2	2	4
4-Apr	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	4	4	2	1	1	1	1	1	4
5-Apr	1	2	1	2	1	2	3	4	5	5	5	7	7	6	7	6	5	4	3	3	4	3	4	4	7
6-Apr	3	3	3	3	3	2	2	3	3	3	3	3	4	4	4	4	4	4	2	1	1	1	1	2	4
7-Apr	2	2	2	2	2	2	2	3	3	4	4	5	5	5	5	4	4	4	4	4	4	4	3	3	5
8-Apr	3	2	3	3	4	4	4	5	5	5	4	5	5	5	5	5	4	4	4	3	3	3	2	3	5
9-Apr	2	1	1	2	1	2	2	2	3	4	3	4	4	3	4	4	4	4	2	2	2	3	3	3	4
10-Apr	3	3	4	3	3	2	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1	2	2	4
11-Apr	2	2	3	2	3	3	3	4	4	4	4	4	4	5	5	4	3	4	4	3	2	2	1	1	5
12-Apr	1	1	1	2	1	1	2	2	3	3	3	4	4	4	4	4	3	3	3	1	1	2	2	2	4
13-Apr	2	2	2	3	3	2	3	3	4	4	4	5	5	5	5	5	4	5	4	3	4	4	4	4	5
14-Apr	5	6	5	5	5	5	5	5	5	6	6	5	5	6	6	7	6	5	6	5	5	4	6	5	7
15-Apr	6	6	5	4	4	4	3	3	3	3	3	3	3	5	4	4	4	3	2	1	1	2	2	3	6
16-Apr	4	4	4	4	4	4	3	3	3	3	4	5	5	5	6	5	5	5	4	2	2	2	2	4	6
17-Apr	4	4	4	4	4	4	4	5	5	4	4	4	4	4	5	4	4	4	4	3	2	1	1	2	5
18-Apr	2	2	2	2	2	2	3	3	2	3	3	4	3	3	3	3	3	2	2	2	2	2	1	1	4
19-Apr	1	1	1	1	AF	2	1	1	1	2	2	2	3	3	4	3	2	1	2	3	2	1	1	1	4
20-Apr	1	1	1	1	1	1	1	2	2	3	4	5	6	5	5	5	6	4	4	3	2	1	1	2	6
21-Apr	1	1	1	1	1	1	1	3	2	3	3	3	2	2	3	3	2	2	1	1	2	1	1	1	3
22-Apr	1	1	2	3	2	3	3	4	4	4	4	4	4	4	4	4	3	3	2	2	1	1	1	1	4
23-Apr	2	2	2	2	2	2	2	2	3	3	3	4	4	4	4	4	3	3	2	2	2	3	3	3	4
24-Apr	3	3	3	3	3	3	3	3	3	5	5	4	4	4	4	4	4	3	3	2	2	2	1	1	5
25-Apr	2	2	2	3	3	3	3	4	4	4	5	4	4	4	4	4	4	4	3	3	3	3	2	3	5
26-Apr	3	3	3	3	3	3	4	4	4	4	5	5	5	5	5	5	4	4	3	4	1	2	2	2	5
27-Apr	3	2	2	2	2	2	2	3	4	3	4	4	4	3	3	4	2	3	1	2	2	1	AF	1	4
28-Apr	1	1	1	1	1	0	1	1	2	2	3	3	3	3	3	3	2	3	1	1	1	1	2	2	3
29-Apr	2	3	1	1	2	2	2	3	3	3	4	5	6	5	4	4	3	3	4	3	1	1	1	1	6
30-Apr	1	1	1	1	1	1	2	2	3	3	3	3	4	3	4	3	3	4	1	1	2	1	1	1	4
	6	6	5	5	5	5	5	5	5	6	6	7	7	6	7	7	6	5	6	5	5	4	6	5	

Diurnal Maximum

AF - Analyzer Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Wapasu - April 2017

Direction of Maximum Speed: 172 deg on Apr 5 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 79.2 deg on Apr 14	Hours of Data: 716
Direction of Minimum Speed: 102 deg on Apr 30 21:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 2.0 deg on Apr 19	Percent Operational Time: 99.4
Monthly Average Direction: 165.8 deg	

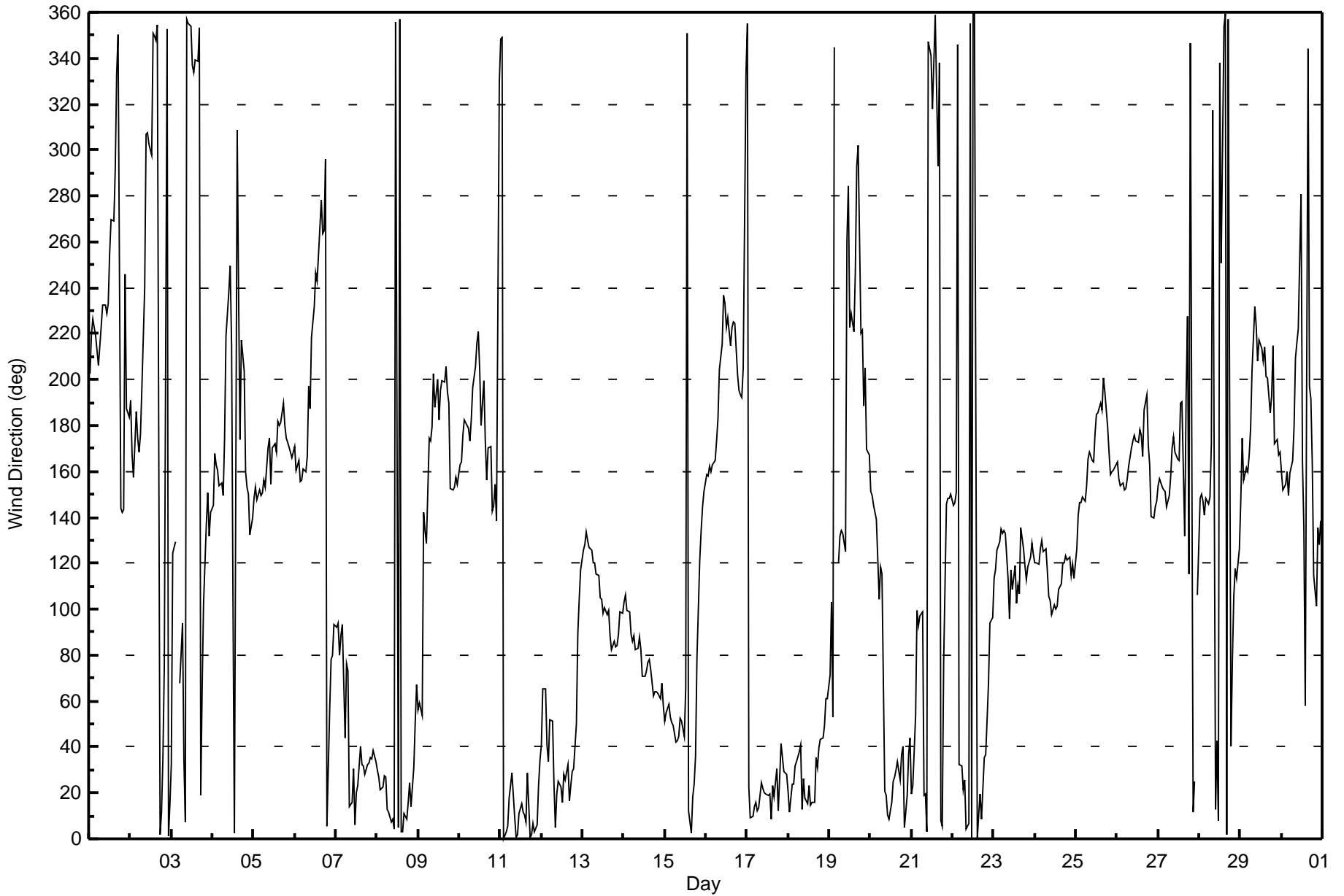
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	203	220	226	223	219	206	215	224	232	233	229	233	255	270	269	292	333	350	144	142	143	246	187	183	234.8
2-Apr	191	167	158	186	174	169	176	197	240	307	307	302	298	351	349	348	354	2	11	36	76	352	1	15	334.1
3-Apr	33	124	130	AF	AF	68	94	33	7	357	355	354	337	334	339	339	353	19	66	103	138	151	132	142	14.7
4-Apr	145	168	163	161	154	155	150	174	219	238	249	215	103	2	309	237	174	217	204	160	153	150	133	140	177.4
5-Apr	148	153	148	152	150	151	156	153	170	174	154	170	172	169	182	180	181	190	180	174	173	168	166	168	167.6
6-Apr	171	161	164	156	156	161	160	167	197	187	218	232	246	243	254	278	263	265	296	5	57	78	80	93	204.1
7-Apr	92	94	80	88	93	44	76	73	14	16	30	6	20	23	40	32	32	28	32	33	35	35	38	33	39.9
8-Apr	30	27	22	22	27	27	13	11	7	9	4	356	5	357	3	3	11	9	16	25	14	31	51	67	14.0
9-Apr	56	59	54	142	134	129	174	173	179	203	188	200	182	195	199	199	206	194	190	152	152	153	157	154	172.8
10-Apr	163	164	176	182	181	179	173	183	197	206	216	221	204	180	200	174	156	170	171	143	145	154	139	329	181.5
11-Apr	348	349	0	3	6	17	23	29	9	1	2	11	15	12	10	8	29	1	2	7	3	6	23	34	9.4
12-Apr	41	65	65	41	34	52	51	24	5	19	25	22	16	28	26	32	16	23	29	31	50	89	104	117	38.5
13-Apr	126	128	133	130	127	126	120	121	115	115	105	104	98	101	98	99	88	82	86	83	84	89	99	98	105.1
14-Apr	103	106	99	99	89	86	89	82	83	88	82	71	71	73	77	78	74	62	64	64	63	61	68	58	79.2
15-Apr	51	55	59	53	50	49	42	43	45	52	51	45	66	351	12	2	19	24	36	79	122	134	144	151	51.4
16-Apr	159	158	162	160	163	165	174	183	204	216	237	233	223	227	214	223	225	224	202	195	193	192	205	334	201.7
17-Apr	355	22	9	10	14	16	12	13	24	22	20	19	19	20	9	23	18	30	12	26	42	29	28	28	17.8
18-Apr	21	12	24	24	32	33	38	41	13	26	18	15	23	15	16	16	36	31	40	43	44	50	61	61	29.3
19-Apr	71	103	53	345	AF	120	132	134	133	125	261	285	223	229	221	247	293	302	221	221	188	205	170	167	208.7
20-Apr	151	149	145	139	122	104	119	115	21	19	10	8	16	25	27	30	34	26	37	40	5	19	36	44	38.6
21-Apr	19	23	53	99	92	97	99	19	20	3	347	341	318	338	359	293	338	8	6	76	146	149	148	150	19.2
22-Apr	145	146	151	346	32	31	21	25	4	7	355	0	359	360	0	10	19	9	35	37	52	68	94	97	21.5
23-Apr	114	117	126	129	135	133	134	133	113	96	117	109	119	102	111	107	135	126	119	113	119	123	129	124	120.9
24-Apr	120	120	120	126	130	125	126	117	106	104	97	102	100	101	109	111	120	120	123	121	123	115	120	113	114.5
25-Apr	126	141	146	146	149	147	154	166	168	165	164	176	185	185	190	187	201	194	180	168	159	160	160	163	167.3
26-Apr	164	157	154	155	152	153	157	162	170	173	176	173	173	178	176	167	186	194	172	163	140	140	145	147	165.4
27-Apr	154	157	153	152	151	145	149	158	171	175	168	165	165	190	190	132	194	227	115	347	12	25	AF	106	158.9
28-Apr	148	150	147	141	148	146	149	172	317	13	43	8	338	251	354	359	2	357	40	77	105	118	114	127	87.0
29-Apr	147	175	156	162	160	167	179	204	232	223	208	217	213	208	214	201	201	185	193	215	172	174	167	169	194.3
30-Apr	160	152	154	160	149	159	165	180	209	216	222	280	164	135	58	344	197	192	164	114	102	136	128	139	169.3

119.0 125.5 124.6 128.5 121.9 116.4 122.2 126.6 128.6 88.4 81.2 11.2 80.4 29.2 30.1 26.3 41.5 46.6 78.6 91.2 100.7 110.7 116.1 112.0

Diurnal Average

AF - Analyzer Failure

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Wapasu - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 96 deg on Apr 21 15:00	Hours of Data: 716
Minimum Value: 4 deg on Apr 28 03:00	Hours of Missing Data: 4
	Hours of Calibration: 0
	Percent Operational Time: 99.4
Percentiles: P ₁ = 7 P ₁₀ = 16 Q ₁ = 21 Median = 27 Q ₃ = 32 P ₉₀ = 42 P ₉₉ = 74	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	28	21	18	19	22	27	27	18	17	19	17	25	31	33	37	42	24	21	66	14	12	84	31	23	84
2-Apr	26	23	9	20	24	12	19	28	44	38	38	38	42	42	29	26	26	30	28	16	40	48	24	24	48
3-Apr	61	38	27	AF	AF	23	27	28	32	35	30	36	27	31	31	34	24	31	25	7	23	6	19	14	61
4-Apr	15	31	21	21	18	18	17	28	28	50	86	37	69	44	47	45	60	28	28	17	10	10	11	11	86
5-Apr	11	15	14	16	14	15	19	20	30	29	23	30	30	28	30	29	28	31	29	28	24	23	23	26	31
6-Apr	27	22	24	19	21	22	22	26	29	35	33	24	29	25	27	31	30	29	26	59	24	8	15	17	59
7-Apr	20	18	21	22	20	35	32	40	32	29	34	28	33	34	32	29	32	30	27	26	26	27	25	25	40
8-Apr	27	26	30	29	30	30	29	31	29	30	27	24	27	26	29	28	31	30	30	30	30	31	28	30	31
9-Apr	30	55	32	37	26	23	36	43	34	35	39	43	38	35	38	35	29	31	27	15	15	17	20	18	55
10-Apr	21	23	28	28	26	26	27	32	29	29	26	26	39	43	38	37	30	25	28	7	6	8	61	44	61
11-Apr	20	18	26	27	27	32	29	31	30	26	27	31	33	33	30	28	31	29	27	28	29	29	27	20	33
12-Apr	21	27	20	28	24	15	25	31	27	38	46	41	45	42	43	40	41	35	29	21	17	19	13	16	46
13-Apr	17	17	16	17	17	17	18	23	25	26	29	29	28	26	29	30	28	24	25	23	22	23	23	24	30
14-Apr	23	23	23	24	26	24	24	23	24	25	25	24	24	24	24	25	26	23	23	25	26	24	26	25	26
15-Apr	25	24	25	25	26	23	26	27	29	34	36	34	35	32	36	36	37	32	27	43	10	13	15	17	43
16-Apr	22	21	23	21	23	25	28	31	29	22	21	23	24	21	26	28	22	20	29	26	26	27	27	33	33
17-Apr	24	30	30	31	30	29	31	31	31	29	31	31	31	34	28	31	32	30	30	29	22	23	25	28	34
18-Apr	32	28	30	27	27	25	27	29	31	37	39	41	47	33	41	35	37	33	28	26	24	23	21	20	47
19-Apr	22	24	68	22	AF	49	19	26	52	76	37	59	37	41	46	59	39	36	34	25	33	29	15	17	76
20-Apr	9	11	10	17	12	20	16	22	38	33	32	29	32	31	31	29	29	31	30	31	26	17	23	19	38
21-Apr	22	20	11	11	12	22	25	29	31	35	48	53	56	57	96	73	61	30	57	65	67	12	12	9	96
22-Apr	17	10	28	35	27	25	31	32	28	30	25	30	30	32	34	36	38	35	29	20	13	18	11	12	38
23-Apr	16	16	15	14	15	17	18	21	51	64	54	69	71	56	50	43	31	23	19	18	17	18	17	17	71
24-Apr	19	19	19	20	17	18	19	22	25	28	31	33	31	32	26	25	25	22	23	18	19	19	14	14	33
25-Apr	18	17	18	17	17	17	21	26	29	32	33	33	34	33	35	34	32	30	29	25	20	22	20	21	35
26-Apr	23	18	17	18	19	19	20	25	28	31	31	38	30	34	33	30	32	31	29	25	9	10	13	15	38
27-Apr	16	19	19	16	17	16	18	21	25	31	32	44	43	55	56	54	67	75	41	36	28	13	AF	22	75
28-Apr	9	7	4	7	6	5	9	25	87	42	43	64	79	62	57	38	34	44	27	19	17	9	13	15	87
29-Apr	26	31	16	18	19	23	27	31	21	36	32	33	28	30	37	40	31	33	37	24	28	19	15	12	40
30-Apr	12	11	10	16	12	17	21	32	34	40	48	54	57	26	69	54	39	27	22	21	94	30	11	13	94
Diurnal Maximum																									
61 55 68 37 30 49 36 43 87 76 86 69 79 62 96 73 67 75 66 65 94 84 61 44																									

AF - Analyzer Failure



Wood Buffalo Environmental Association

SO₂ Calibration Summary

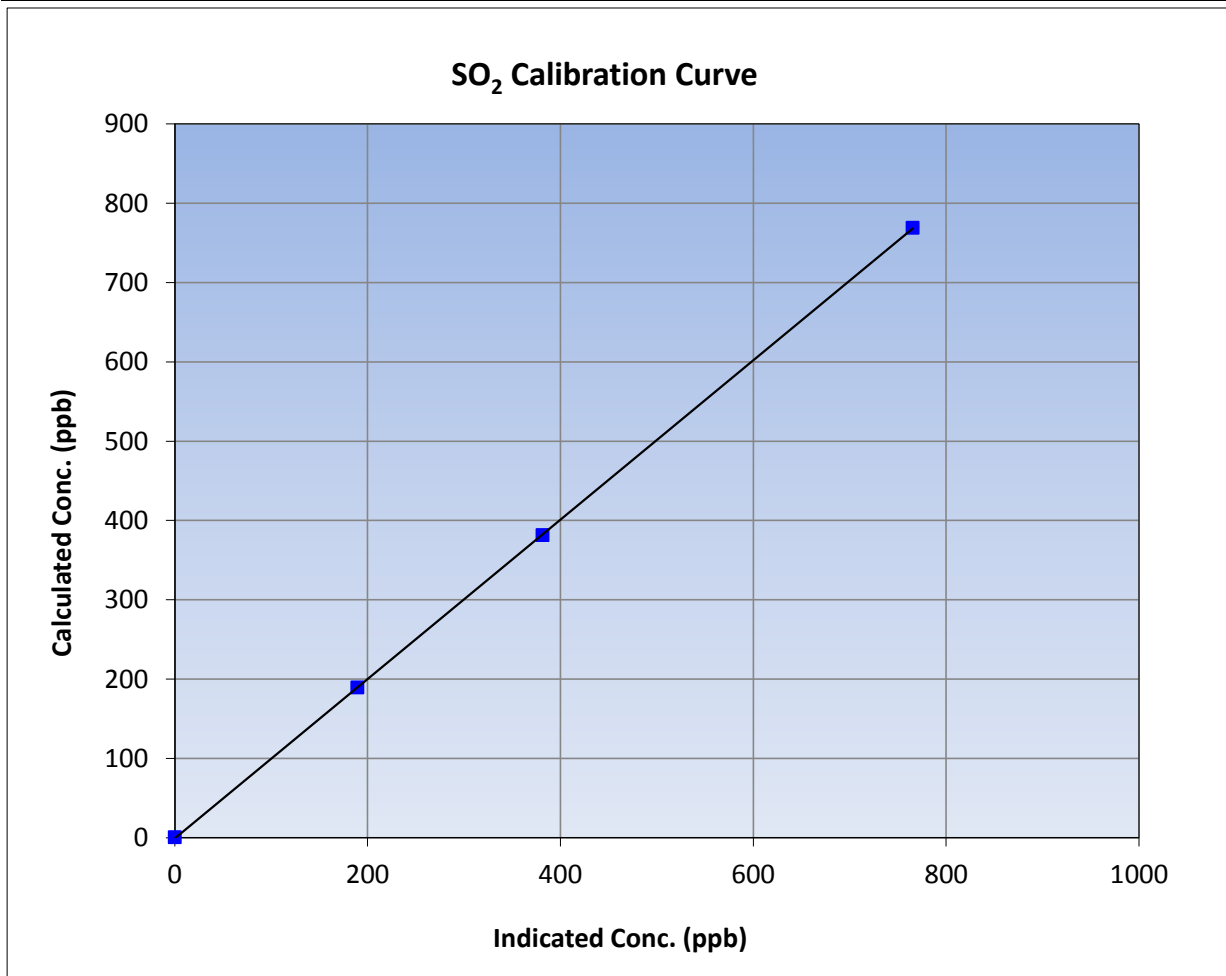
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 9, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:10	End Time (MST)	11:44
Analyzer make	Thermo 43i	Analyzer serial #	1218153459

Calibration Data

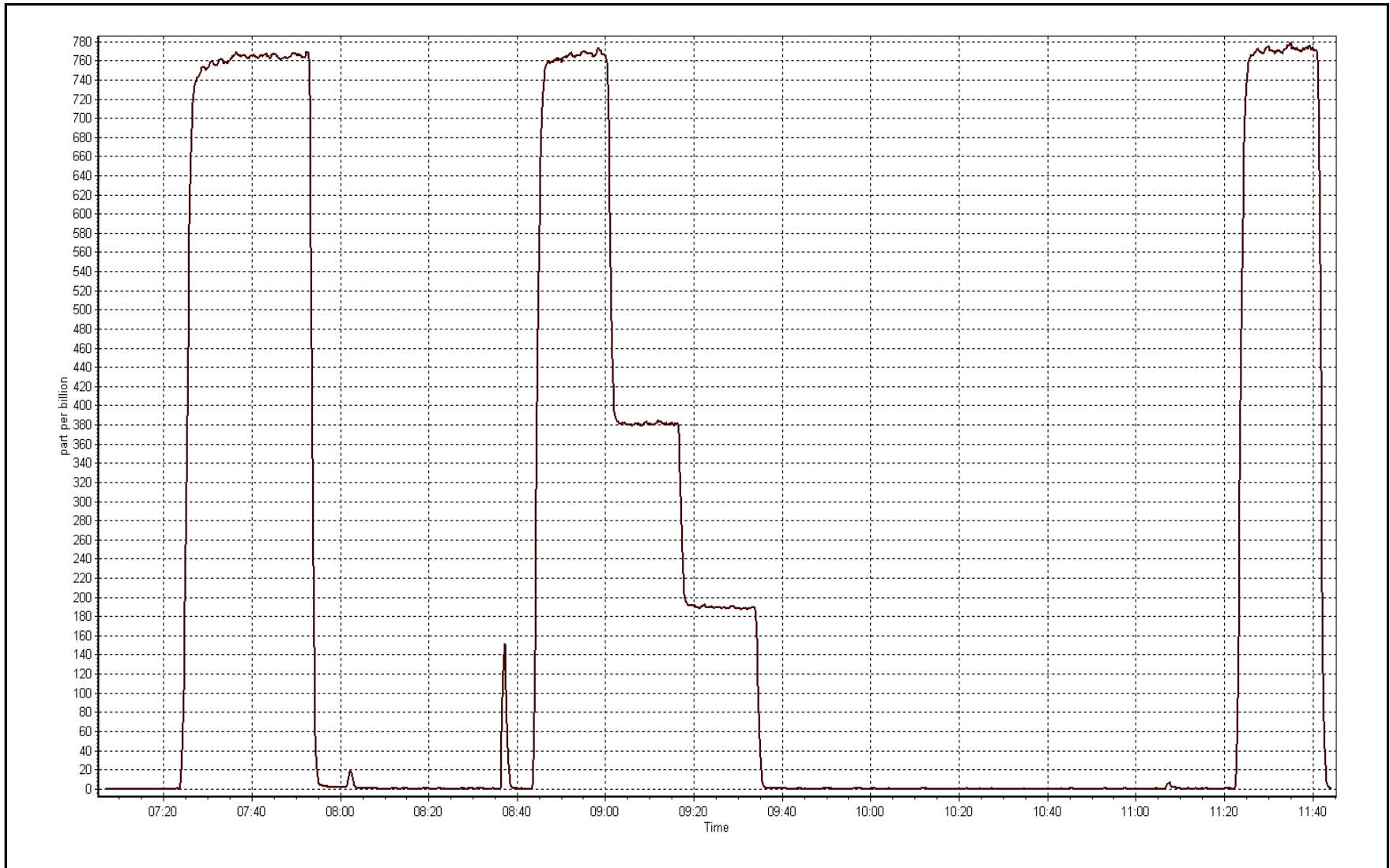
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.1	----	Correlation Coefficient	0.999992	≥0.995
768.6	765.0	1.0047			
381.2	381.3	0.9999	Slope	1.004712	0.90 - 1.10
189.1	189.2	0.9996			
			Intercept	-0.689356	+/-30



SO2 Calibration Plot

Date: April 12, 2017

Location: Wapasu





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	April 13, 2017	Last Cal Date:	March 10, 2017
Start time (MST):	9:15	End time (MST):	11:57
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.10</u>	ppm	Cal Gas Exp Date	September 9, 2017
Cal Gas Cylinder #	<u>CC107167</u>			
Calibrator Make/Model	API T700		Serial Number	997
ZAG Make/Model	API T701		Serial Number	4427

Analyzer Information

Analyzer make:	Thermo 450i	Analyzer serial #:	1218153583		
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 100 ppb	PMT voltage	-674.9	-674.9	
Calculated slope	1.005163	0.992831	Lamp voltage	759	759
Calculated intercept	-0.496820	-0.202449	Pressure	557.0	557.0
Analyzer Background	15.0	15.0	Flow	0.978	0.978
Analyzer Coefficient	1.055	1.055	Intensity	100	100

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5095	0.0	0.0	-0.4	----
as found span	4945	78.3	79.5	79.6	0.999
calibrator zero	5095	0.0	0.0	0.2	----
high point	4945	78.3	79.5	80.3	0.990
second point	4960	39.2	40.0	40.4	0.990
third point	4980	19.5	19.9	20.3	0.980
as left zero	5097	0.0	0.0	0.3	----
as left span	4922	77.9	79.5	80.2	0.991
Average Correction Factor					0.987
Corrected As found	80.00	Previous response	79.58	*% change	-0.5%

* = > +/-5% change initiates investigation

Notes:

No adjustments or maintenance done

Calibration Performed By: Melissa Lemay



Wood Buffalo Environmental Association

H₂S Calibration Summary

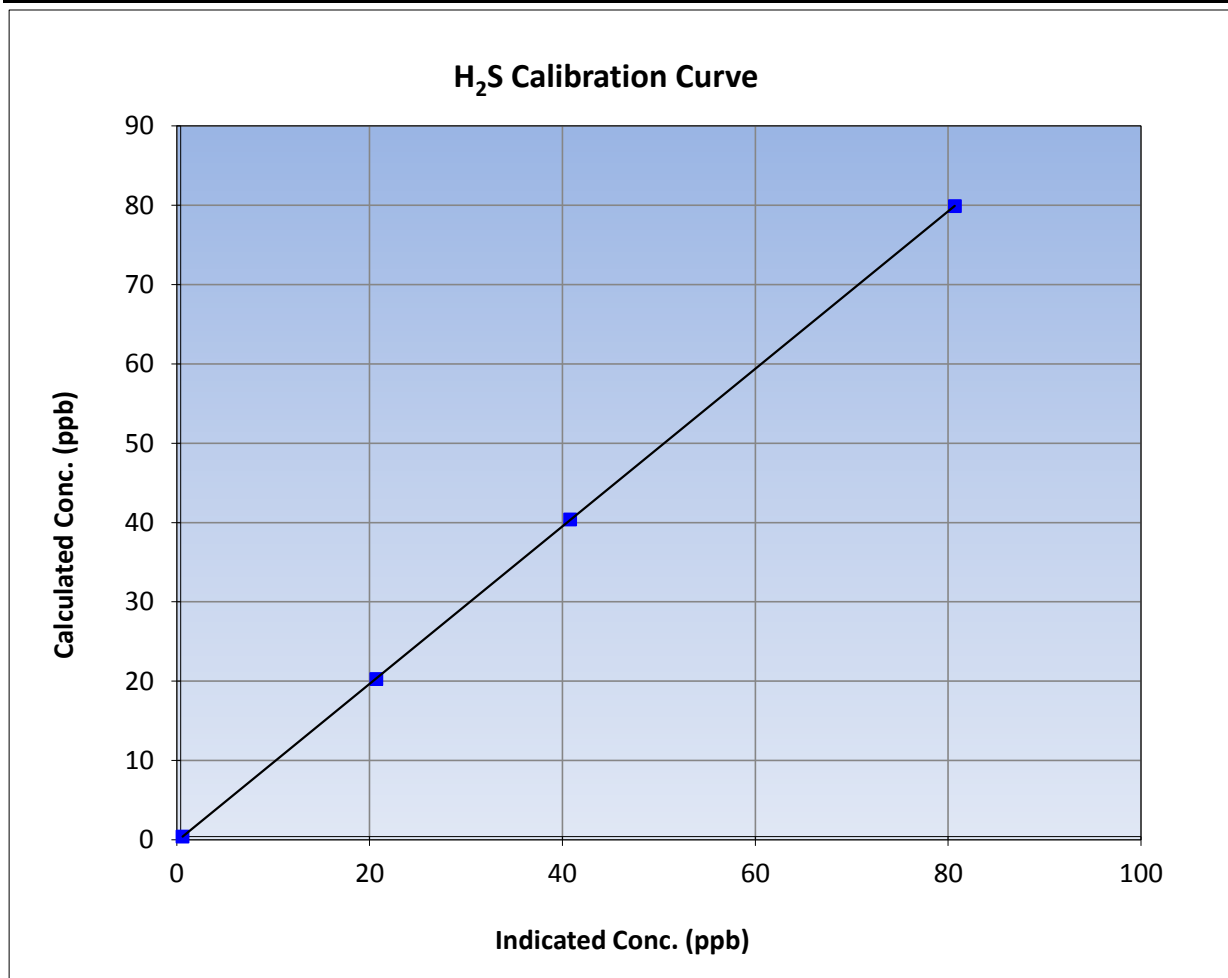
Version-03-2017

Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 10, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	9:15	End Time (MST)	11:57
Analyzer make	Thermo 450i	Analyzer serial #	1218153583

Calibration Data

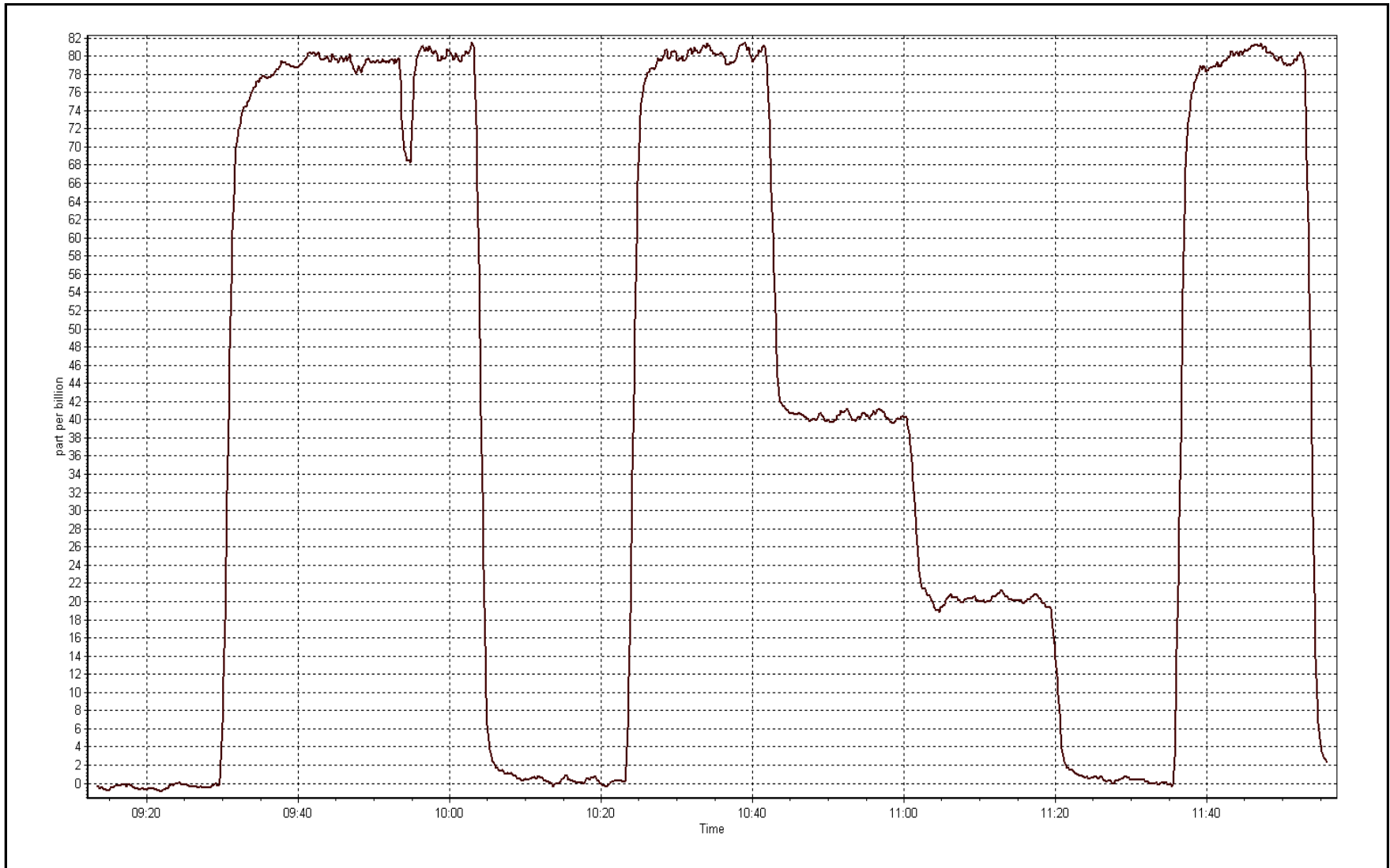
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.2	----	Correlation Coefficient	≥0.995
79.5	80.3	0.9900		
40.0	40.4	0.9899	Slope	0.90 - 1.10
19.9	20.3	0.9799		
			Intercept	+/-3



H₂S Calibration Plot

Date: April 13, 2017

Location: Wapasu





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	April 19, 2017	Last Cal Date:	March 9, 2017
Start time (MST):	7:30	End time (MST):	10:17
Reason:	Routine		

Calibration Standards

Gas Cert Reference	SA130010A	Cal Gas Expiry Date	December-12-16
CH4 Cal Gas Conc.	<u>512.0</u> ppm	CH4 Equiv Conc.	1092.3 ppm
C3H8 Cal Gas Conc.	<u>211.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	API T700	Serial Number	997
ZAG Make/Model	API T701	Serial Number	4427

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1218153352
	<u>Start</u>	<u>Finish</u>	<u>Start</u>
Analyzer Range	0 - 25 ppm	Bias voltage supply	-296.5
Calculated slope	0.999712	Sample pressure	8.5
Calculated intercept	-0.030142	Fuel pressure	24.8
Analyzer Background	4.414	Air pressure	39.0
Analyzer Coefficient	3.150	Flame temperature	160.5

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.00	-0.09	----
as found span	5020	80.4	17.22	17.46	0.986
calibrator zero	5000	0.0	0.00	0.04	----
high point	5019	80.4	17.22	17.23	0.999
second point	5060	40.2	8.61	8.67	0.993
third point	5079	20.1	4.31	4.36	0.988
as left zero	5000	0.0	0.00	0.06	----
as left span	4909	80.3	17.58	17.21	1.021
Average Correction Factor					0.993
Corrected As found	17.55	Previous response	17.25	*% change	-1.7%

* = > +/-5% change initiates investigation

Notes: Pump changed out for preventative maintenance, zero and span adjusted

Calibration Performed By:



Wood Buffalo Environmental Association

THC Calibration Summary

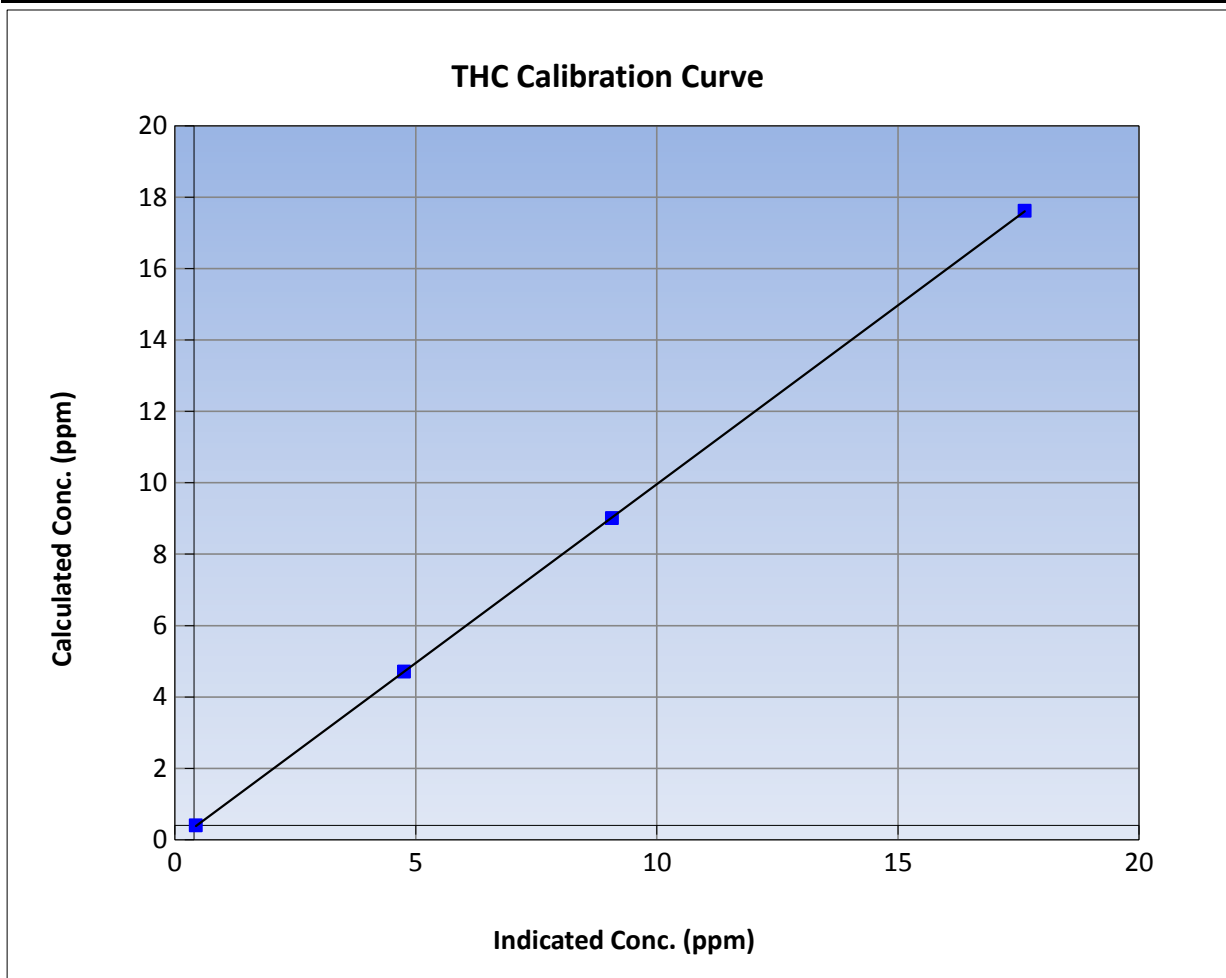
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 9, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:30	End Time (MST)	10:17
Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153352

Calibration Data

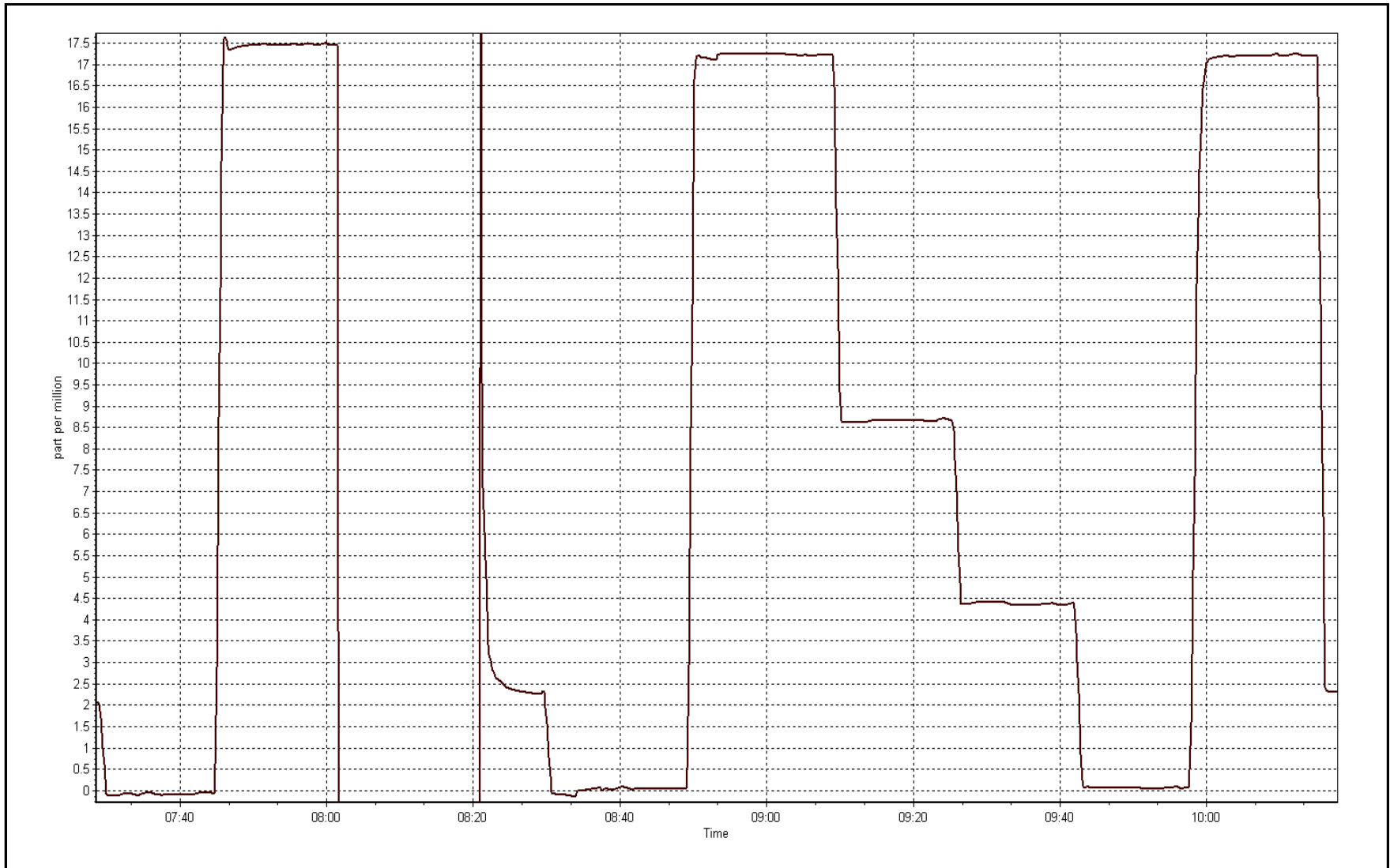
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999994	
17.2	17.2	0.9995			≥0.995
8.6	8.7	0.9930	Slope	1.002002	
4.3	4.4	0.9875			0.90 - 1.10
			Intercept	-0.056238	+/-1.5



THC Calibration Plot

Date: April 19, 2017

Location: Wapasu





Wood Buffalo Environmental Association

O₃ Calibration Summary

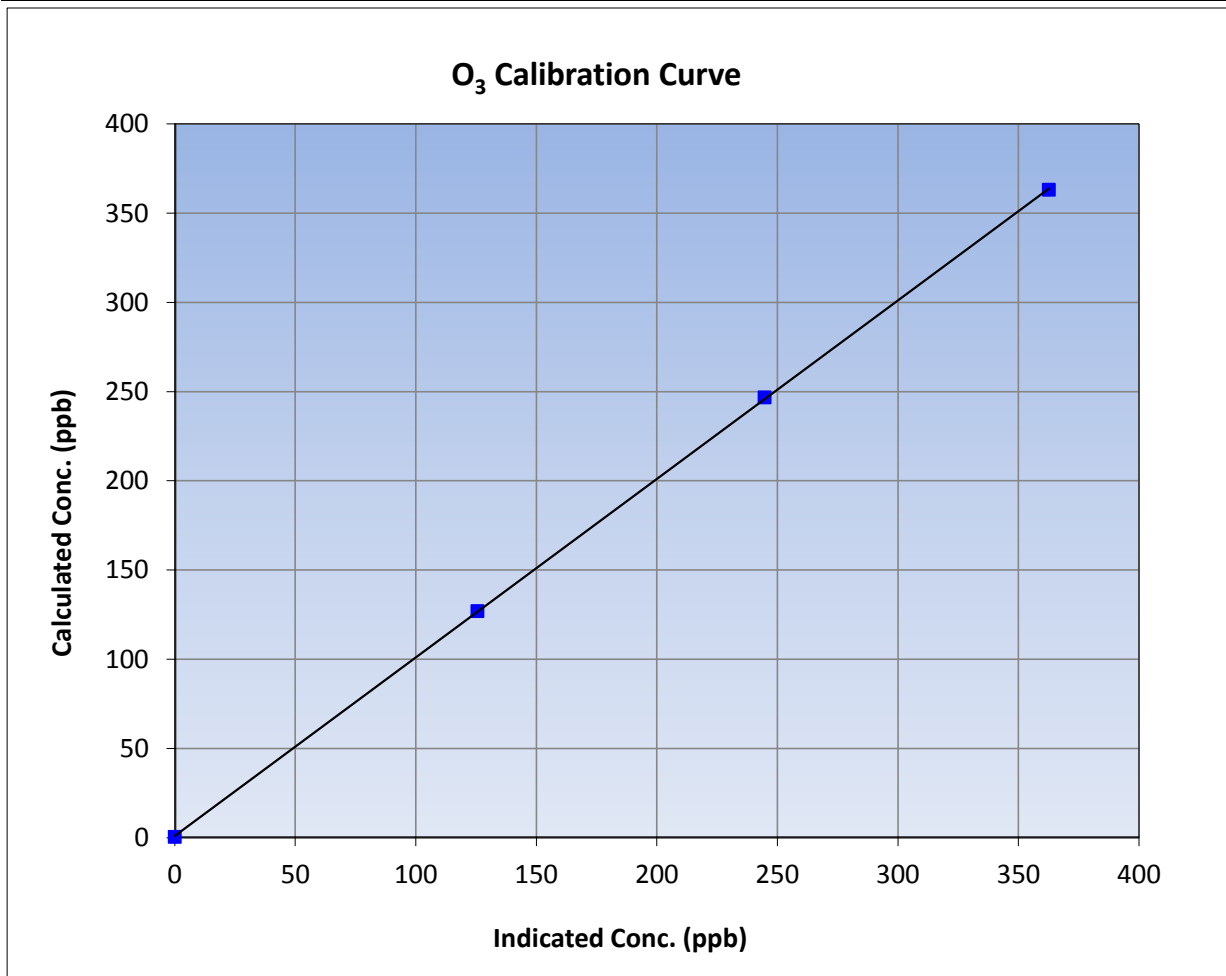
Version-03-2017

Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 10, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:10	End Time (MST)	9:15
Analyzer make	Teledyne T400	Analyzer serial #	824

Calibration Data

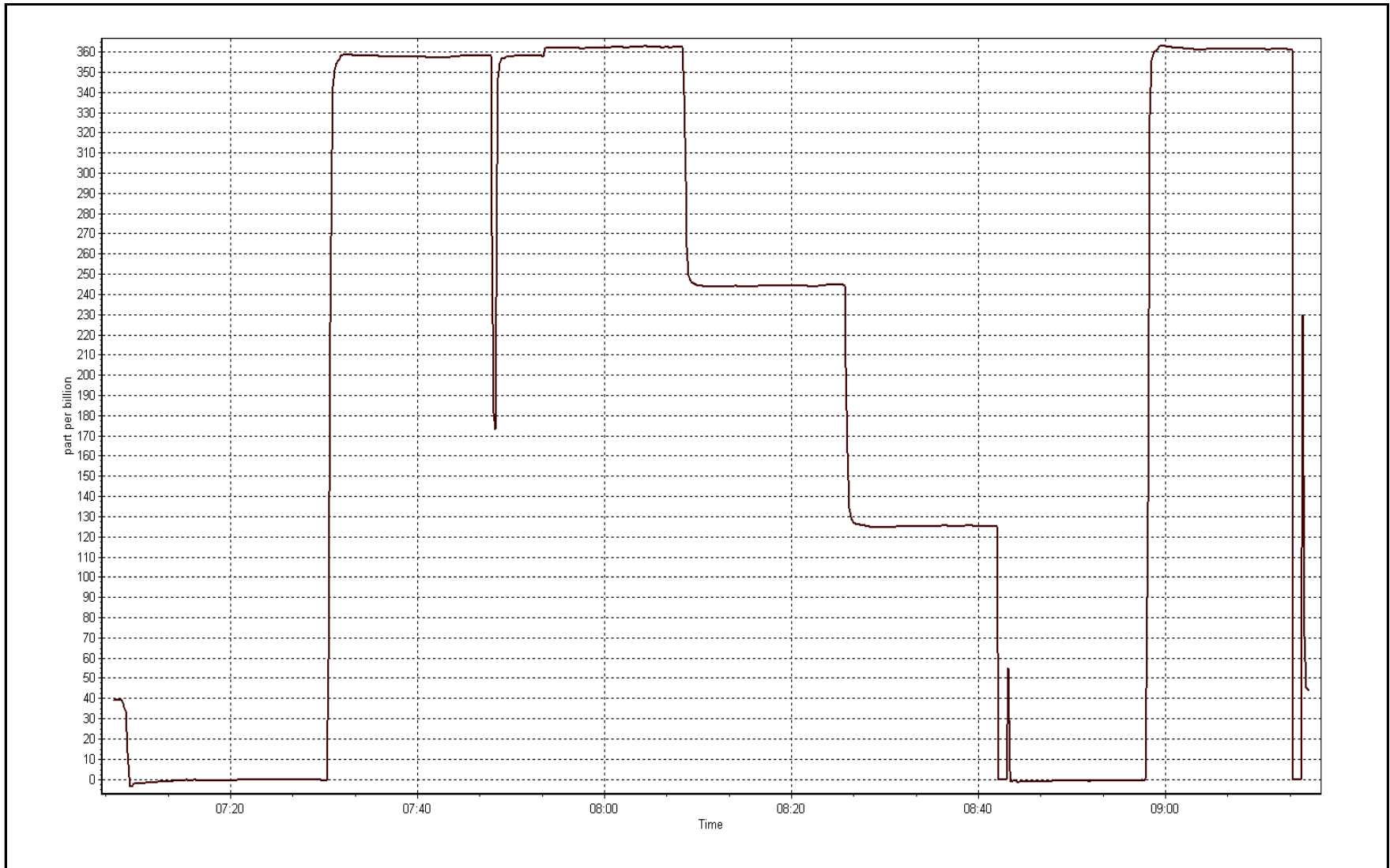
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.3	----	Correlation Coefficient	0.999973	≥0.995
362.7	362.3	1.0011	Slope	1.000809	0.90 - 1.10
246.3	244.3	1.0082	Intercept	0.877079	+/- 10
126.6	125.2	1.0112			



O₃ Calibration Plot

Date: April 13, 2017

Location: Wapasu





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	April 12, 2017	Last Cal Date:	March 9, 2017
Start time (MST):	7:10	End time (MST):	11:43
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	SA130010A	Cal Gas Expiry Date	December-12-16
NOX Cal Gas Conc.	<u>49.7</u> ppb	NO Cal Gas Conc.	<u>49.7</u> ppb
Calibrator Model	API T700	Serial Number	997
ZAG make/model	API T701	Serial Number	4427

Analyzer Information

Analyzer make: API T200		Analyzer serial #: 722	
	<u>Start</u>	<u>Finish</u>	
NO coefficient	0.933	0.933	NOX Range (ppb) 0 - 1000 ppb
NOX coefficient	0.933	0.933	PMT Temperature 7.0 7.0
NO2 coefficient	1.000	1.000	Reaction cell Press 3.2 3.2
NO bkgrnd	0.0	0.0	Sample Flow 452 452
NOX bkgrnd	0.1	0.1	HVPS Voltage 781 781

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.999334	0.998305
NO _x Cal Offset	0.366037	-0.968149
NO Cal Slope	0.999453	0.999487
NO Cal Offset	0.224935	-0.206954
NO ₂ Cal Slope	1.022044	1.023998
NO ₂ Cal Offset	-0.651129	-0.086780



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.0	0.0	0.1	-0.1	0.2	----	----
as found span	4920	80.4	799.1	799.1	0.0	800.7	799.5	1.2	0.9980	0.9995
calibrator zero	5000	0.0	0.0	0.0	0.0	0.1	-0.1	0.2	----	----
high point	4920	80.4	799.1	799.1	0.0	800.7	799.5	1.2	0.9980	0.9995
second point	5000	40.2	396.4	396.4	0.0	399.4	397.2	2.1	0.9925	0.9980
third point	5060	20.1	196.6	196.6	0.0	198.2	197.1	1.0	0.9921	0.9977
as left zero	5000	0.0	0.0	0.0	0.0	0.2	-0.1	0.2	----	----
as left span	4909	80.4	800.9	435.8	365.1	788.1	433.4	354.7	1.0162	1.0055
Average Correction Factor									0.9942	0.9984

Corrected As found	NO _x = 800.6 ppb	NO = 799.6 ppb		*Percent Change	NO _x = -0.2%
Previous Response	NO _x = 799.3 ppb	NO = 799.3 ppb		*Percent Change	NO = 0.0%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	797.9	798.5	-0.6	1.0015	1.0008	----	----
1st NO2 (400 ppb O3)	435.8	362.7	790.1	435.8	354.2	1.0114	----	1.0240	97.7%
2nd NO2 (200 ppb O3)	552.2	246.3	793.1	552.2	240.9	1.0076	----	1.0224	97.8%
3rd NO2 (100 ppb O3)	671.9	126.6	795.2	671.9	123.4	1.0049	----	1.0259	97.5%
2nd NO ref point	----	0.0	795.2	794.6	0.7	1.0049	1.0057	----	----
Average Correction Factor						1.0072	1.0032	1.0241	97.6%

Notes:

No adjustments or maintenance done

Calibration Performed By:

Melissa Lemay



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

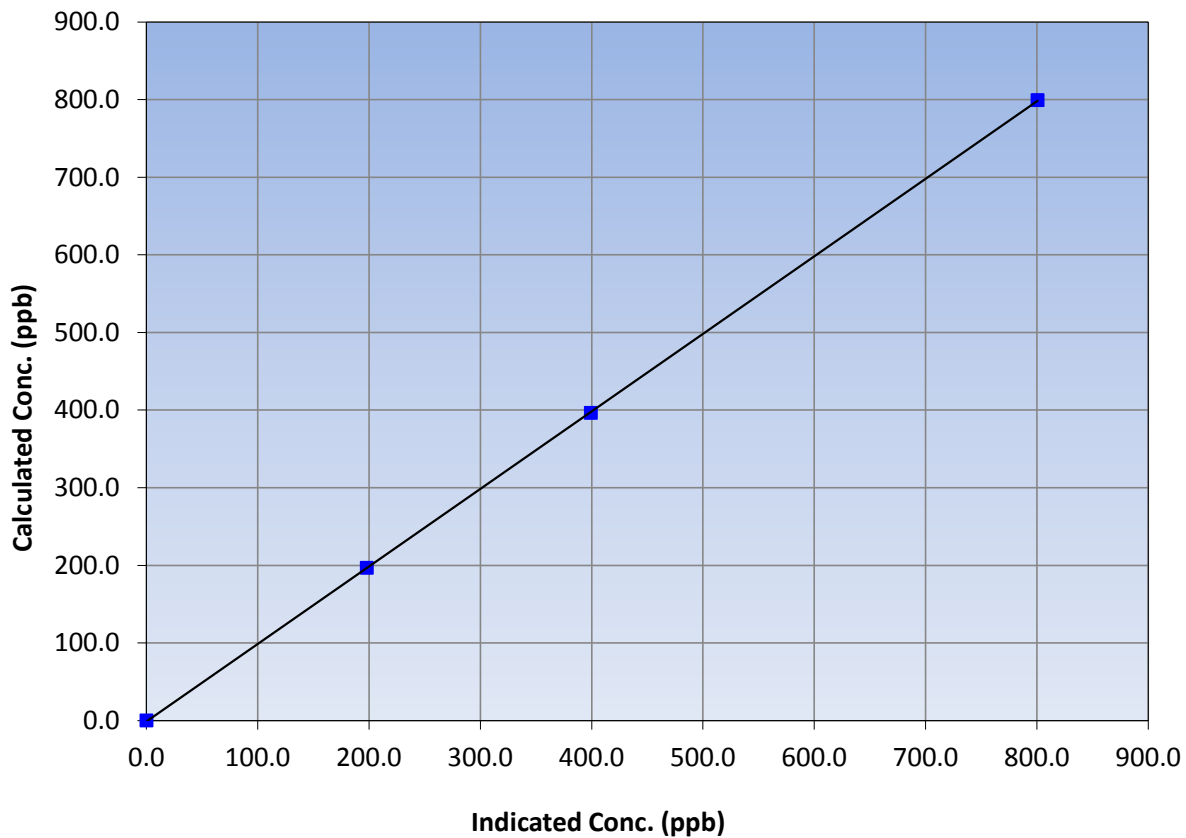
Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 9, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:10	End Time (MST)	11:43
Analyzer make	API T200	Analyzer serial #	722

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
799.1	800.7	0.9980			
396.4	399.4	0.9925			
196.6	198.2	0.9921			
			Slope	0.998305	0.90 - 1.10
			Intercept	-0.968149	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

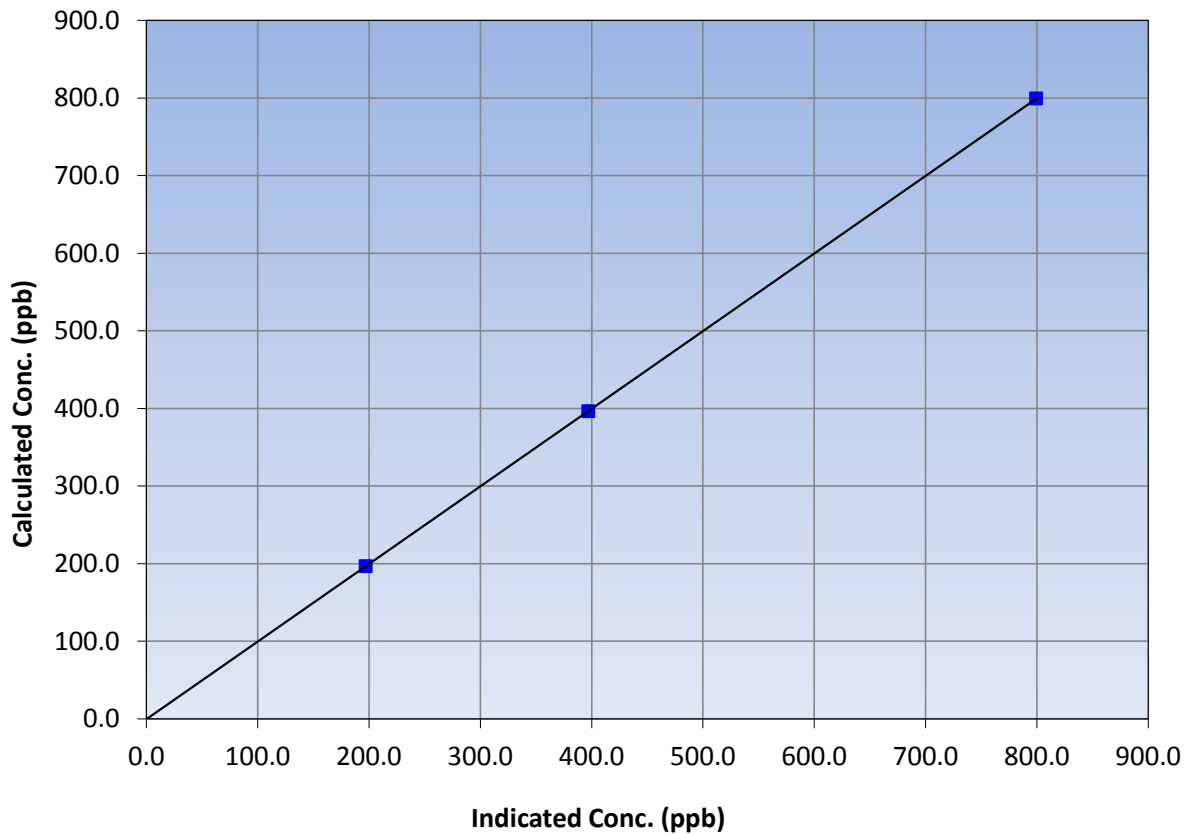
Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 9, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:10	End Time (MST)	11:43
Analyzer make	API T200	Analyzer serial #	722

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
799.1	799.5	0.9995			
396.4	397.2	0.9980			
196.6	197.1	0.9977			
			Slope	0.999487	0.90 - 1.10
			Intercept	-0.206954	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

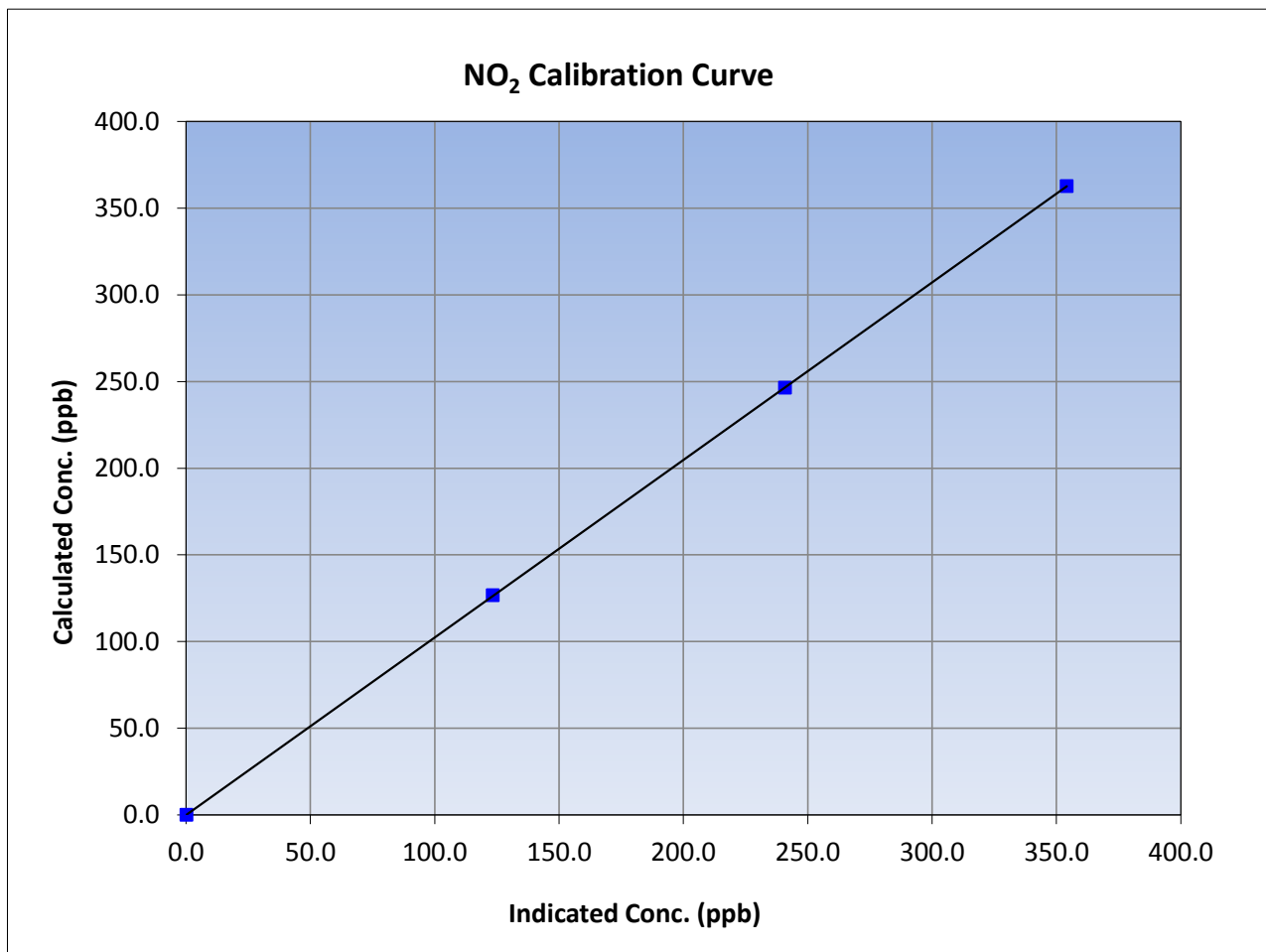
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 9, 2017
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	7:10	End Time (MST)	11:43
Analyzer make	API T200	Analyzer serial #	722

Calibration Data

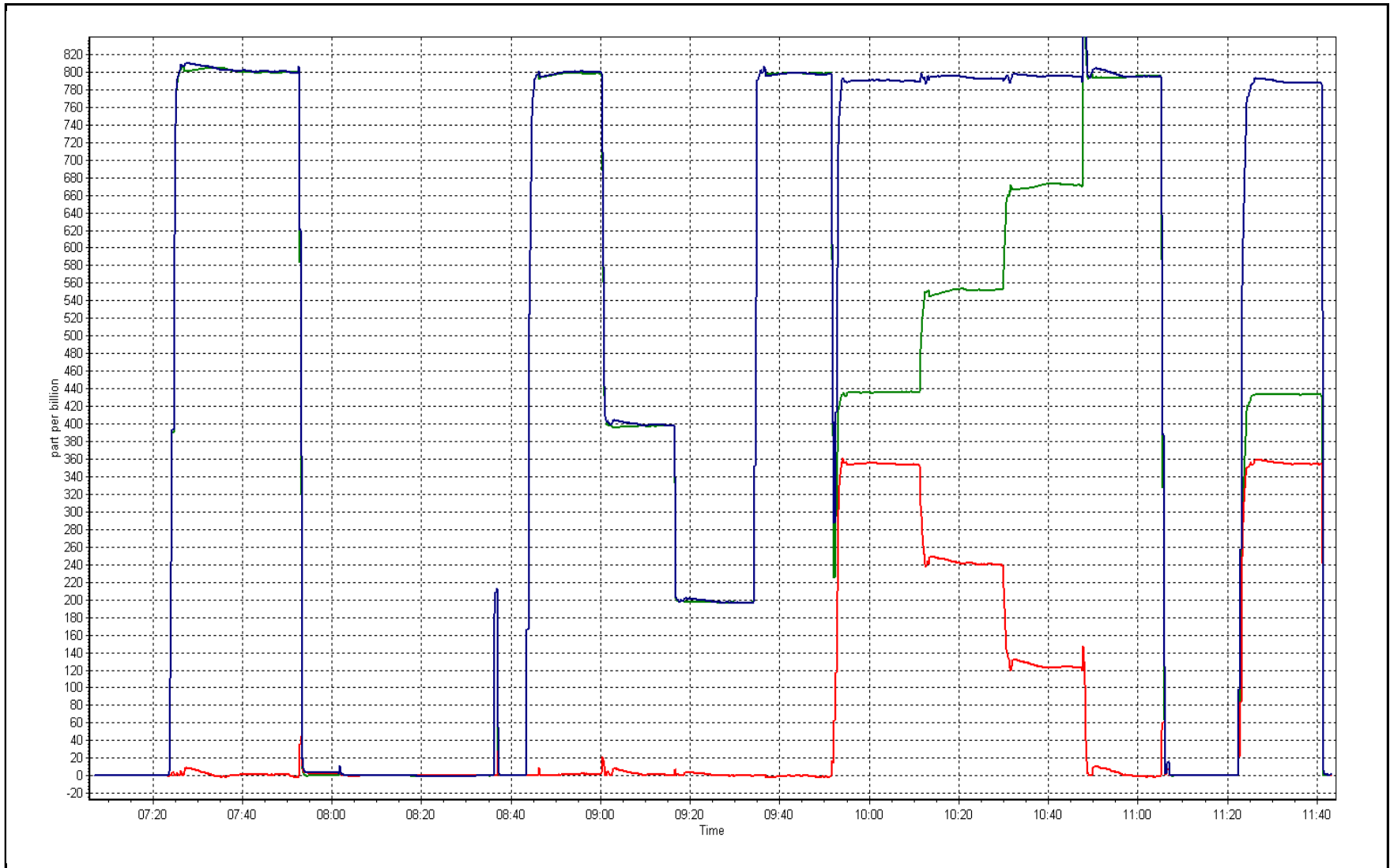
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.2	----	Correlation Coefficient	≥0.995	
362.7	354.2	1.0240			
246.3	240.9	1.0224			
126.6	123.4	1.0259			
			Slope	1.023998	0.90 - 1.10
			Intercept	-0.086780	+/-20



NO_x Calibration Plot

Date: April 12, 2017

Location: Wapasu





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Wapasu	Station number:	AMS 17
Calibration Date:	April 13, 2017	Last Cal Date:	March 10, 2017
Start time (MST):	7:57	End time (MST):	9:00
Sharp Model:	5030	S/N:	CM-2390
Particulate Fraction:	PM2.5	C14 Source S/N:	10391
Flow Meter Make/Model:	Delta Cal	S/N:	1450
Temp/RH standard:	Delta Cal	S/N:	1450

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	2	0	2	<input checked="" type="checkbox"/>	+/- 2 °C
P3 (hPa)	962	964	962	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	970	1000	<input checked="" type="checkbox"/>	+/- 50 LPH
Nephelometer zero	1.1	-----	0	<input checked="" type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified <input type="checkbox"/>				
Cyclone cleaning :	PM10 Cyclone <input checked="" type="checkbox"/>		PM2.5 Cyclone <input checked="" type="checkbox"/>		
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test:	Date of check: <u>April 13, 2017</u>	Last Cal Date: <u>March 10, 2017</u>
	Flow w/o adaptor: <u>16.1</u>	Flow w/ adaptor: <u>16</u>

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>2519</u>	Foil S/N: <u>2519</u>	
Foil Calibration	Foil Mass: <u>1326</u>	Foil Mass: <u>1326</u>	
	Calibration Date: <u>April 13, 2017</u>	Calibration Date: <u>December 8, 2016</u>	
(Limit) +/- 5% of previous	Correction Factor: <u>6986</u>	Correction Factor: <u>7090</u>	-1.47%

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Cyclone Head Cleaned; Flow, Nephelometer, and T1 Adjusted

Calibration by: Melissa Lemay



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 18
STONY MOUNTAIN
APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS 18)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	685	35	35	100	2	0	1	0
TRS(ppb) Average	687	33	33	100	0	0	0	0
THC(ppm) Average	685	35	35	100	2.1	-	2	-
NMHC(ppm) Average	685	35	35	100	0.064	-	0.009	-
CH4(ppm) Average	685	35	35	100	2.1	-	2	-
O3 (ppb) Average	687	33	33	100	60	0	53	-
NO2 (ppb) Average	685	35	35	100	3	0	1	-
NO (ppb) Average	685	35	35	100	1	-	0	-
NOX (ppb) Average	685	35	35	100	4	-	1	-
PM2.5 (ug/m3) Average	718	2	2	100	11.7	-	4.9	0
Wind Speed 10 m (km/h) Average	652	0	68	90.56	19	-	13	-
Wind Direction 10 m (deg) Average	652	0	68	90.56	-	-	-	-
Temperature 2 m (C) Average	720	0	0	100	15.7	-	9.9	-
Relative Humidity (%) Average	720	0	0	100	99	-	97.0	-
Precipitation (mm) Total	720	0	0	100	2.6	-	22.0	-
Leaf Wetness (% of range) Average	720	0	0	100	65	-	12.0	-
Global Solar Radiation (W/m2) Average	720	0	0	100	892	-	269.0	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS 18)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2 (ppb) Average	685	0.3	0	-	0	0	0	0	0	0	0	2
TRS (ppb) Average	687	0.3	0	-	0	0	0	0	0	0	0	0
THC (ppm) Average	685	1.95	0	-	1.9	1.9	1.9	1.9	2	2	2	2.1
NMHC(ppm) Average	685	0.001	0.005	-	0	0	0	0	0	0	0	0.064
CH4(ppm) Average	685	1.94	0	-	1.9	1.9	1.9	1.9	2	2	2	2.1
O3 (ppb) Average	687	45.4	6	-	28	37	42	46	50	53	60	60
NO2 (ppb) Average	685	0.8	0	-	0	0	1	1	1	1	3	3
NO (ppb) Average	685	0.1	0	-	0	0	0	0	0	0	1	1
NOX (ppb) Average	685	0.9	0	-	0	0	1	1	1	2	4	4
PM2.5 (ug/m3) Average	718	2.96	1.2	-	1	1.7	2.2	2.7	3.5	4.6	11.7	11.7
Wind Speed 10 m (km/h) Average	652	8.8	3	-	0	4	7	9	11	13	19	19
Wind Direction 10 m (deg) Average	652	-	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	720	1.36	5	-	-12.8	-4.7	-2	0.7	4.8	8.8	15.7	15.7
Relative Humidity (%) Average	720	70.4	20	-	26	39	53	74	88	96	99	99
Precipitation (mm) Total	720	-	-	57.09	-	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	720	3.1	5	-	0	1	1	2	2	5	65	65
Global Solar Radiation (W/m2) Average	720	168.6	228	-	0	0	0	40	276	557	892	892

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS 18)
ARPIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	04 Apr 2017 22:00	05 Apr 2017 04:00	7	Flat line in sensor output signal
Wind Speed, Wind Direction	14 Apr 2017 00:00	16 Apr 2017 10:00	59	Flat line in sensor output signal
Wind Speed, Wind Direction	19 Apr 2017 05:00	19 Apr 2017 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Apr 2017 21:00	30 Apr 2017 21:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Stony Mountain - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2 ppb on Apr 3 14:00	Maximum Daily Average: 0.6 ppb on Apr 3		Hours of Data:	685
Minimum Value: 0 ppb on Apr 14 05:00	Minimum Daily Average: 0.0 ppb on Apr 19		Hours of Missing Data:	35
Maximum Diurnal Average: 0.4 ppb at hour 13	Minimum Diurnal Average: 0.2 ppb at hour 2		Hours of Calibration:	35
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Apr	0	0	0	Z	0	0	0	0	0	1	1	1	2	2	2	1	0	0	0	0	0	0	0	0	0.6	2
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
5-Apr	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0.4	1
6-Apr	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	Z	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.3	1
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.3	1
14-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	1	0	0	0	0	0	0	0	0.1	1
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
20-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0.3	1
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.3	2
22-Apr	1	0	1	1	Z	0	1	2	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.5	2
23-Apr	0	0	1	0	0	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0.5	1
24-Apr	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0.4	1
25-Apr	1	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1
26-Apr	0	0	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
27-Apr	0	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
30-Apr	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1

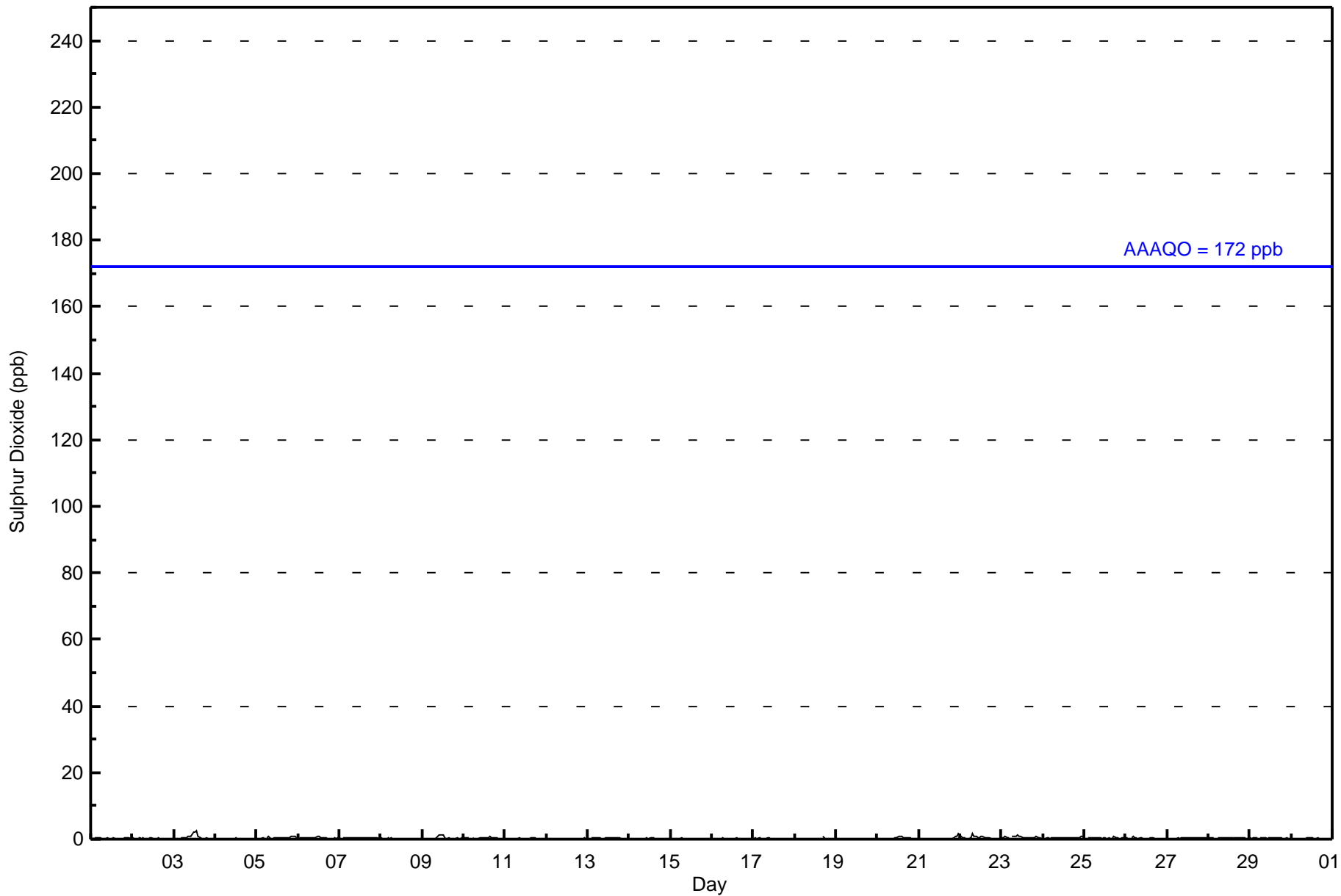
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
1	0	1	1	1	1	1	1	2	1	1	1	2	2	2	1	1	1	1	1	0	1	1	1	1	2	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	685	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

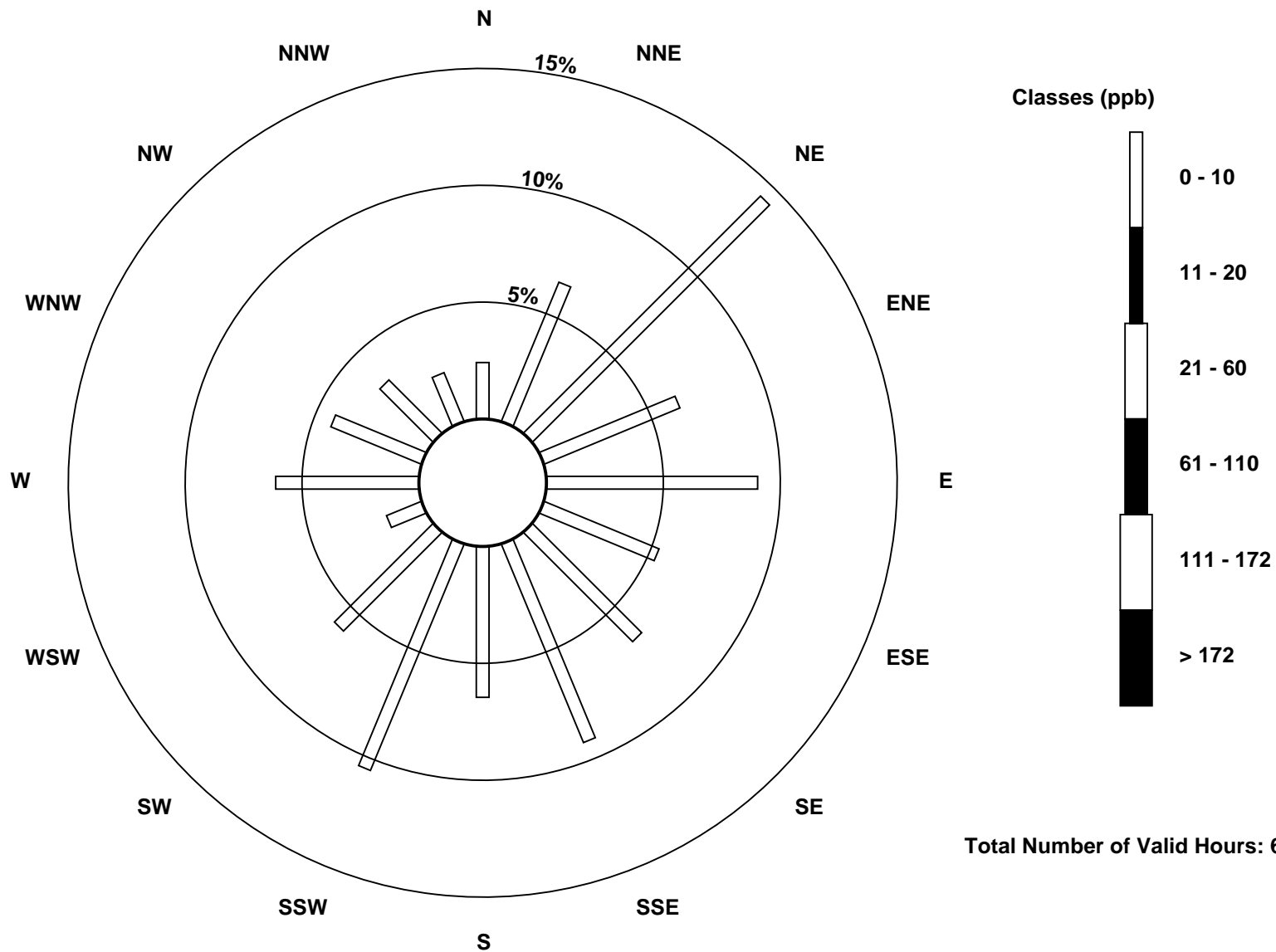
Total Number of Valid Hours: 620

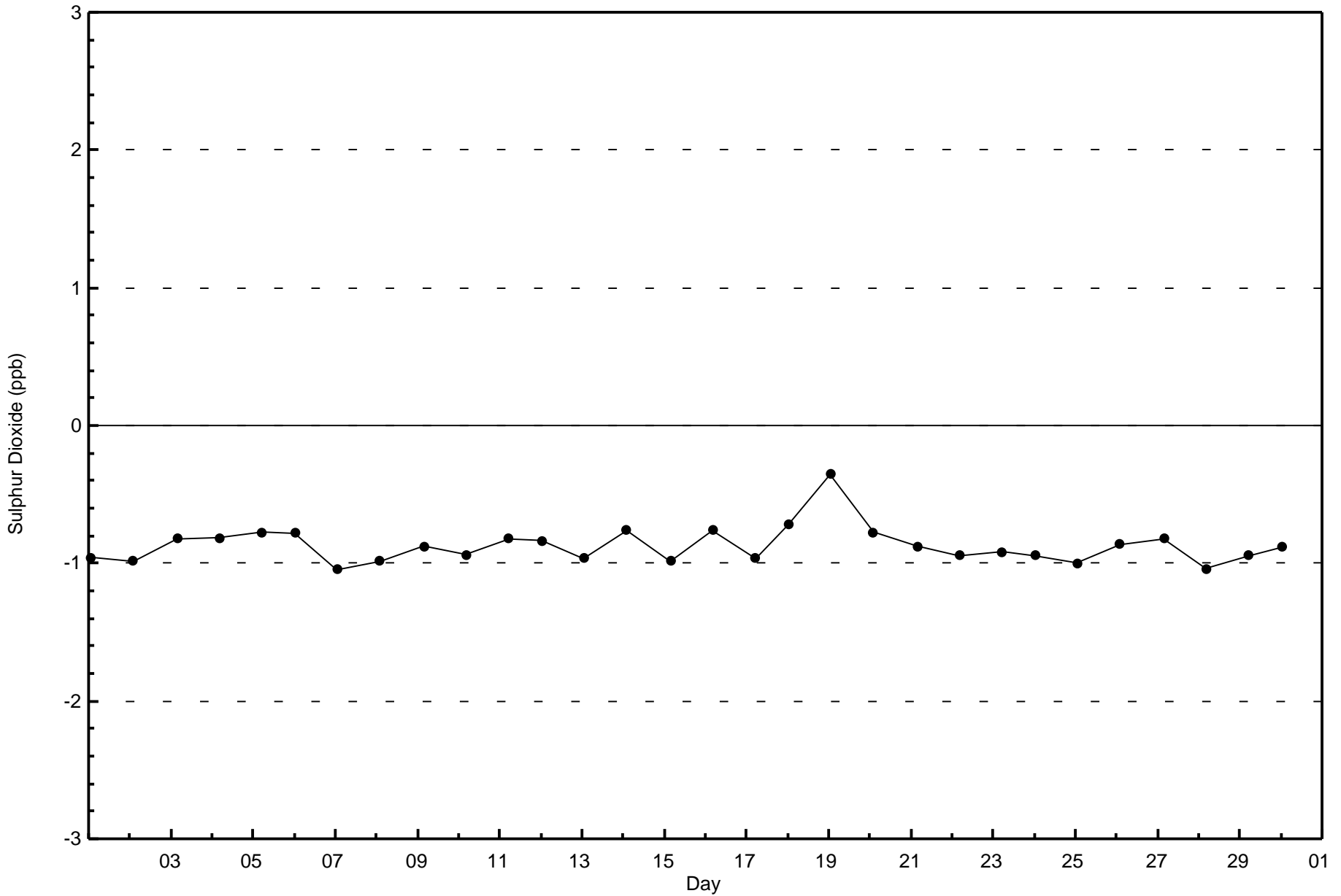
Total Number of Hours: 720

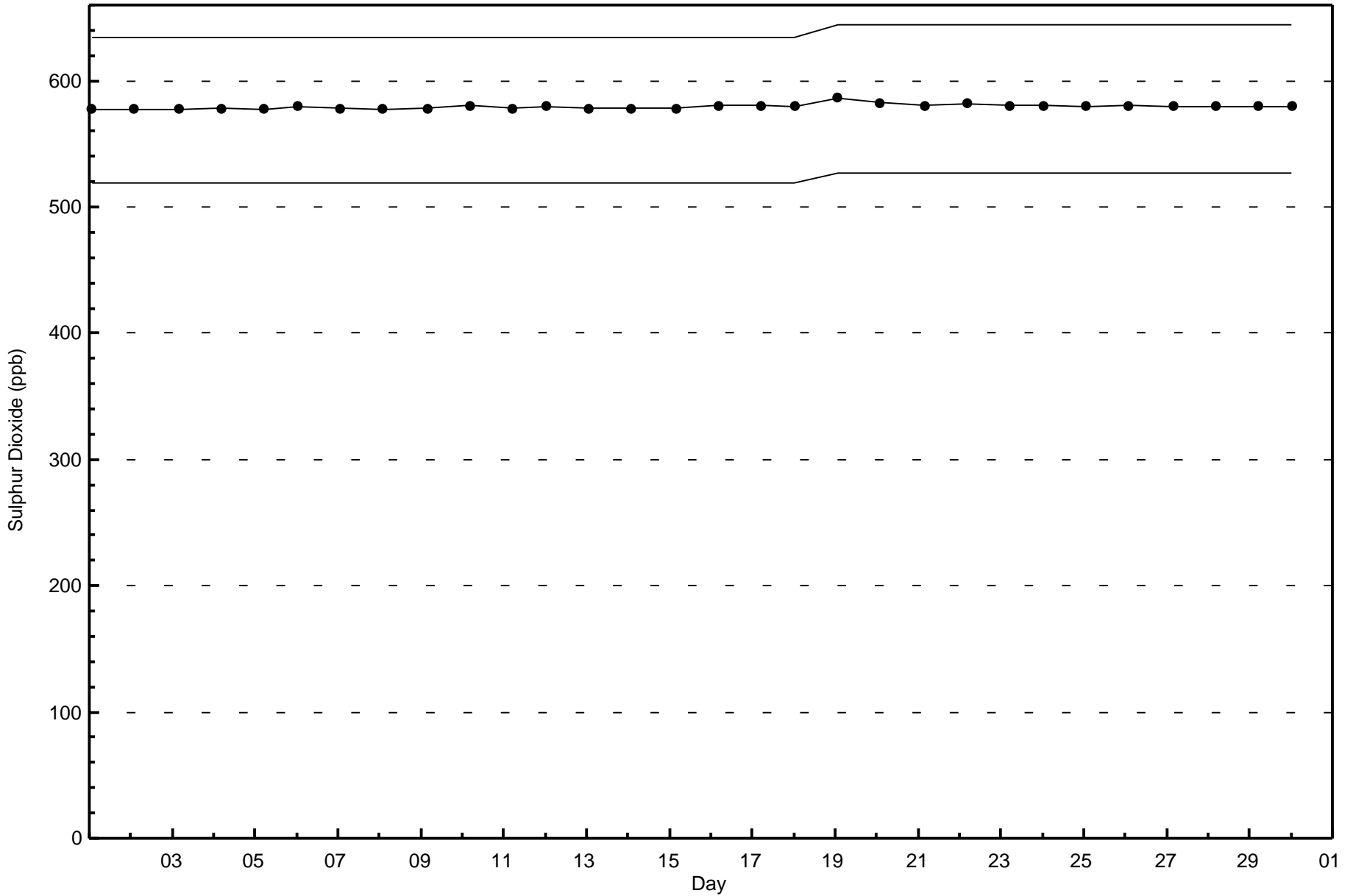


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Stony Mountain (AMS 18)









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 0 ppb on Apr 29 01:00	Maximum Daily Average: 0.4 ppb on Apr 3		Hours of Data:	687
Minimum Value: 0 ppb on Apr 18 01:00	Minimum Daily Average: 0.3 ppb on Apr 15		Hours of Missing Data:	33
Maximum Diurnal Average: 0.3 ppb at hour 5	Minimum Diurnal Average: 0.3 ppb at hour 24		Hours of Calibration:	33
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
2-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
3-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
4-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
5-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
6-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
7-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
9-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
10-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
11-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
12-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
16-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
19-Apr	0	0	Z	0	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.3	0
20-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
22-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
23-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
24-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
25-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
26-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
27-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
28-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
29-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
30-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0

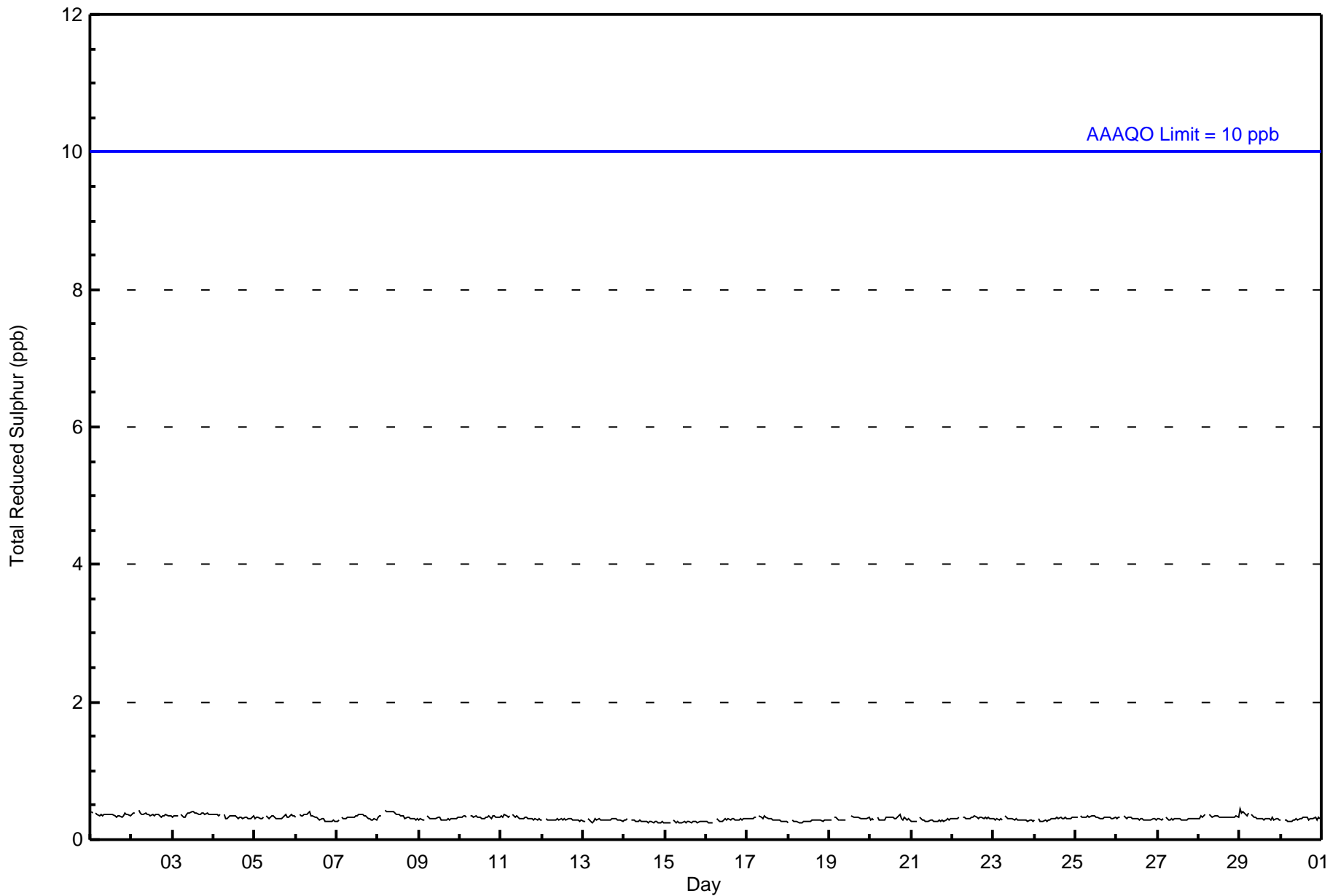
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Stony Mountain - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	687	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



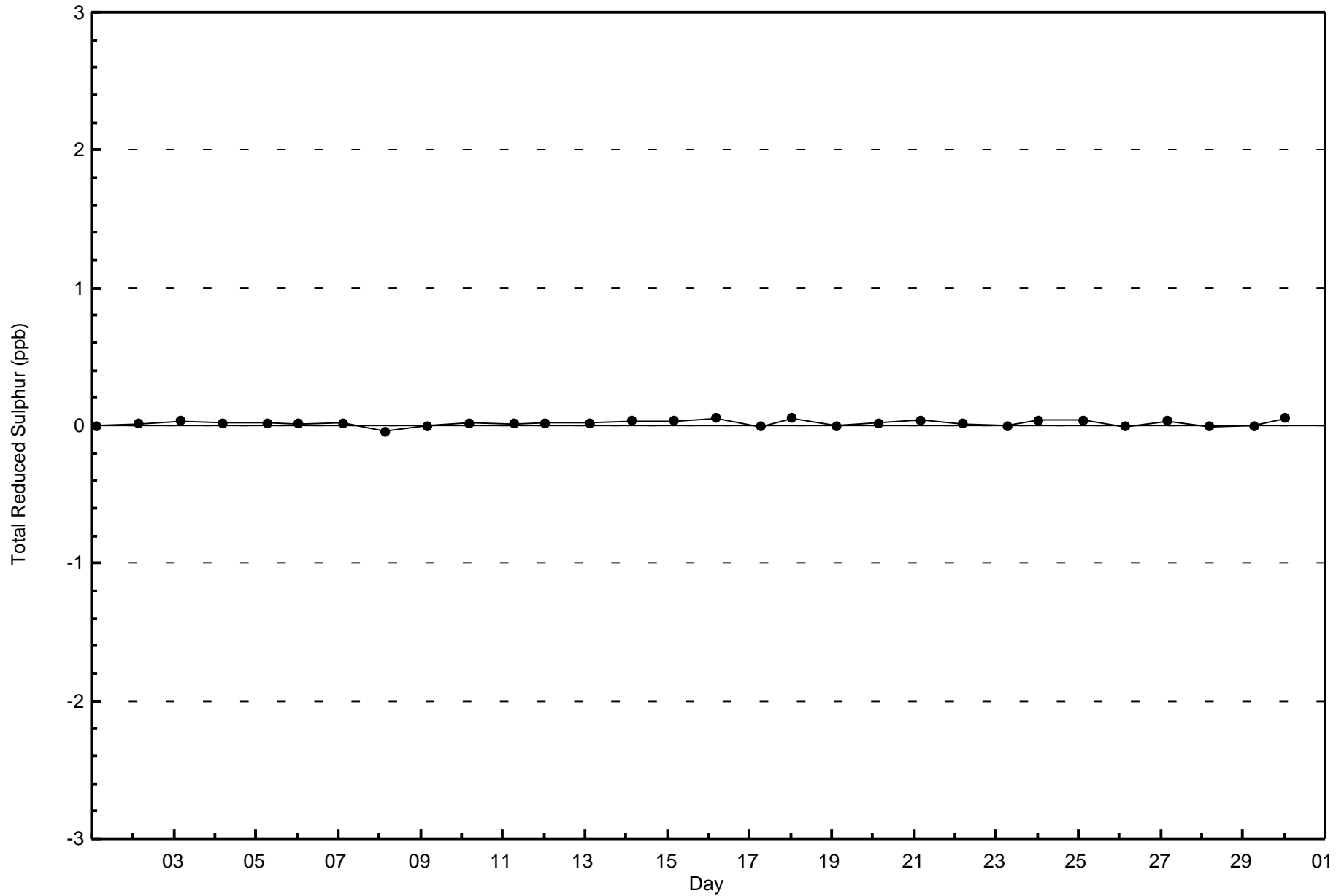
Wood Buffalo Environmental Association
Frequency Distribution

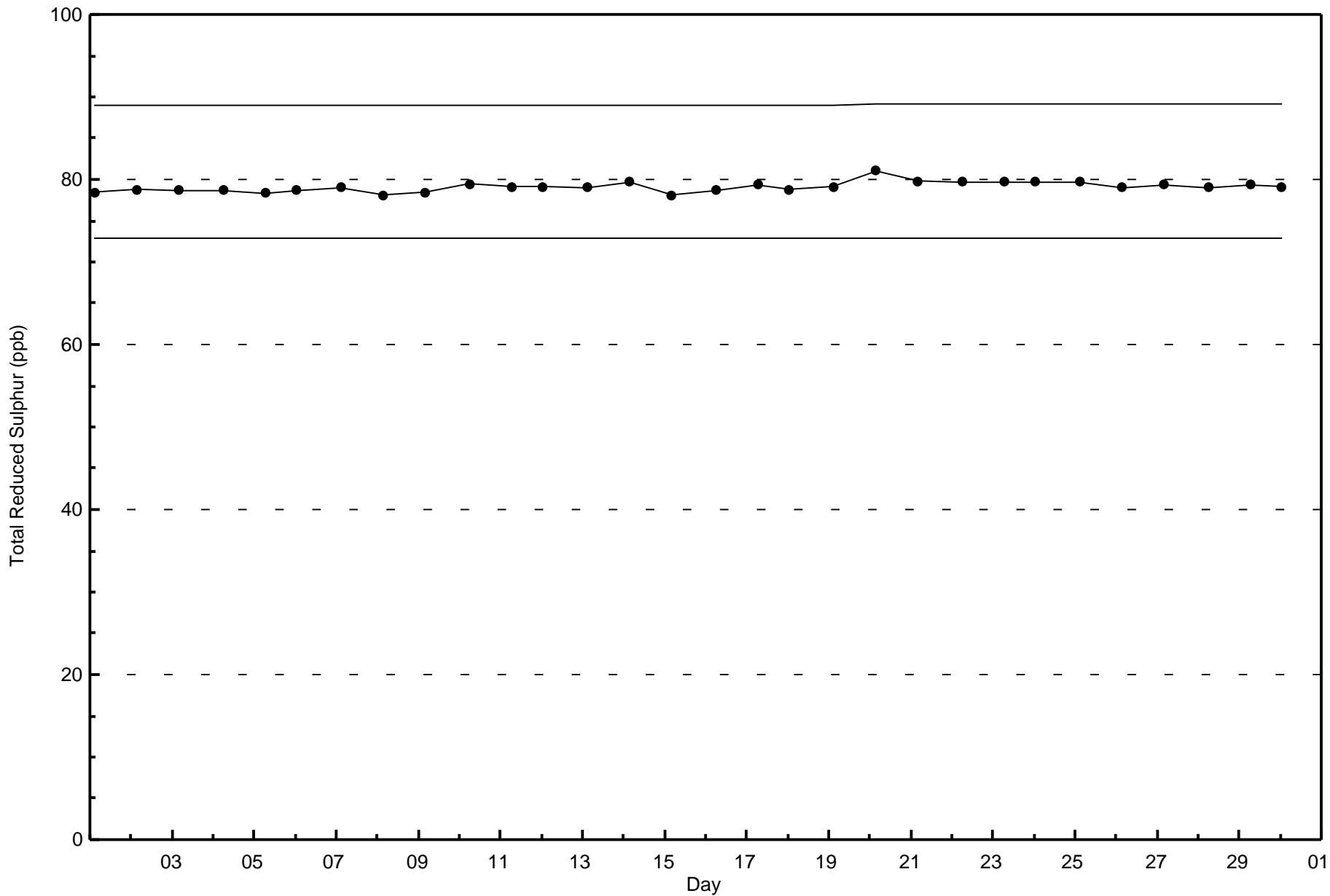
Total Reduced Sulphur (TRS) - ppb
Stony Mountain - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	15	39	85	43	60	35	39	58	41	65	33	9	39	26	22	13	622
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	39	85	43	60	35	39	58	41	65	33	9	39	26	22	13	622

Total Number of Valid Hours: 622

Total Number of Hours: 720







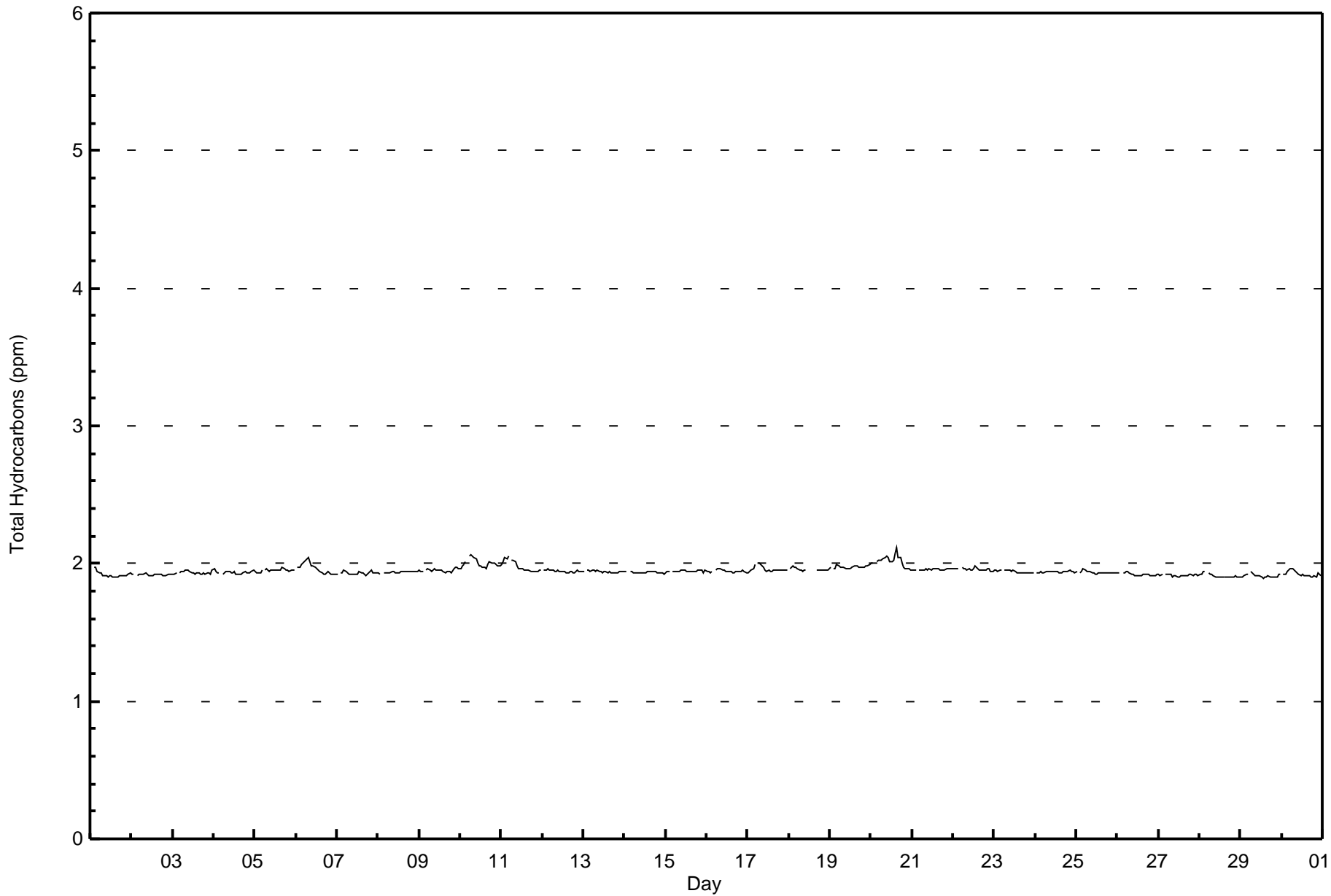
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Stony Mountain - April 2017

Maximum Value: 2.1 ppm on Apr 20 16:00 Maximum Daily Average: 2.0 ppm on Apr 20																				Hours in Service: 720 Hours of Data: 685 Hours of Missing Data: 35 Hours of Calibration: 35 Percent Operational Time: 100.0								
Minimum Value: 1.9 ppm on Apr 29 14:00 Minimum Daily Average: 1.9 ppm on Apr 28 Maximum Diurnal Average: 2.0 ppm at hour 5 Minimum Diurnal Average: 1.9 ppm at hour 20 Monthly Average: 1.95 ppm Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 1.9 Median = 1.9 Q ₃ = 2.0 P ₉₀ = 2.0 P ₉₉ = 2.1																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	
2-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
3-Apr	1.9	1.9	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
4-Apr	2.0	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
5-Apr	1.9	1.9	1.9	1.9	1.9	Z	2.0	2.0	1.9	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
6-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
7-Apr	1.9	Z	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0
8-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
9-Apr	1.9	1.9	1.9	Z	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Apr	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
11-Apr	2.0	2.0	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1
12-Apr	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0
13-Apr	1.9	Z	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
14-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
15-Apr	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	1.9	1.9	2.0
16-Apr	1.9	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0
17-Apr	1.9	1.9	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0
18-Apr	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	C	C	C	C	C	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
19-Apr	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
20-Apr	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
21-Apr	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
22-Apr	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0
23-Apr	1.9	2.0	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
24-Apr	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
25-Apr	1.9	Z	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
26-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
27-Apr	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
28-Apr	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
29-Apr	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
30-Apr	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration																												





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	678	98.98	98.98
2.1 - 3.0	7	1.02	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	15	40	89	39	56	33	41	56	39	62	36	10	38	26	19	14	613
2.1 - 3.0	0	0	0	0	0	0	0	1	1	3	1	0	0	0	1	0	7
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

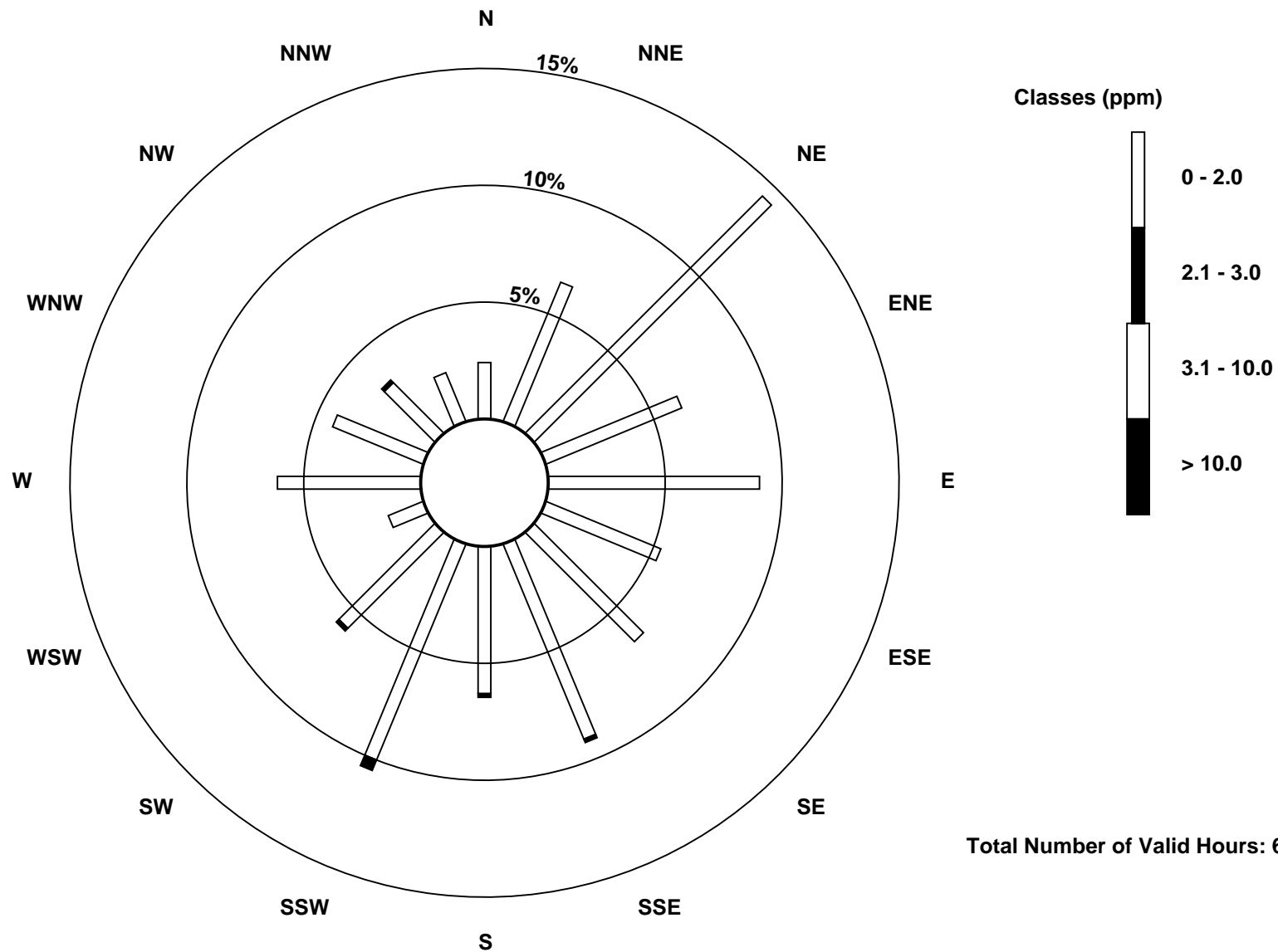
Total Number of Valid Hours: 620

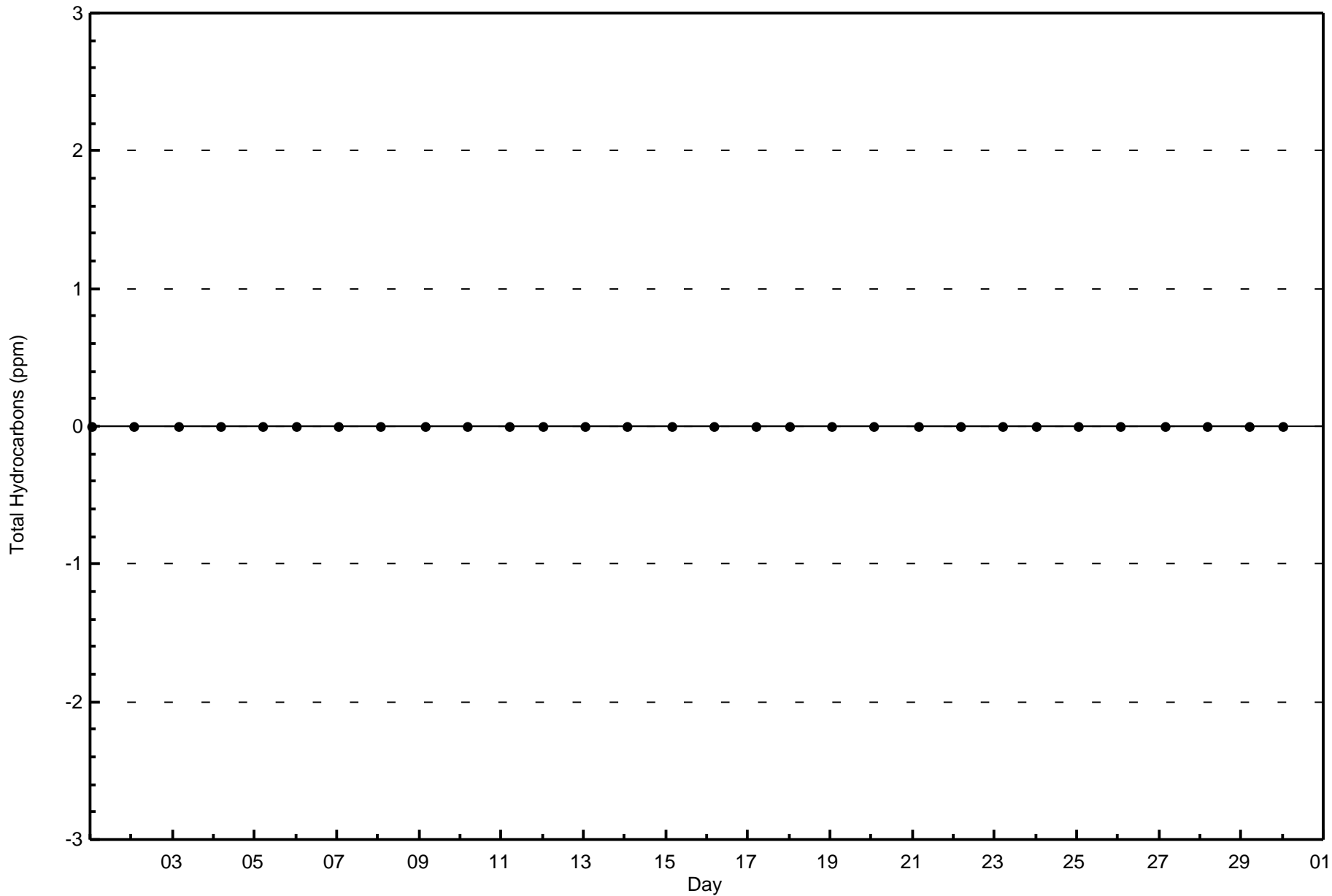
Total Number of Hours: 720

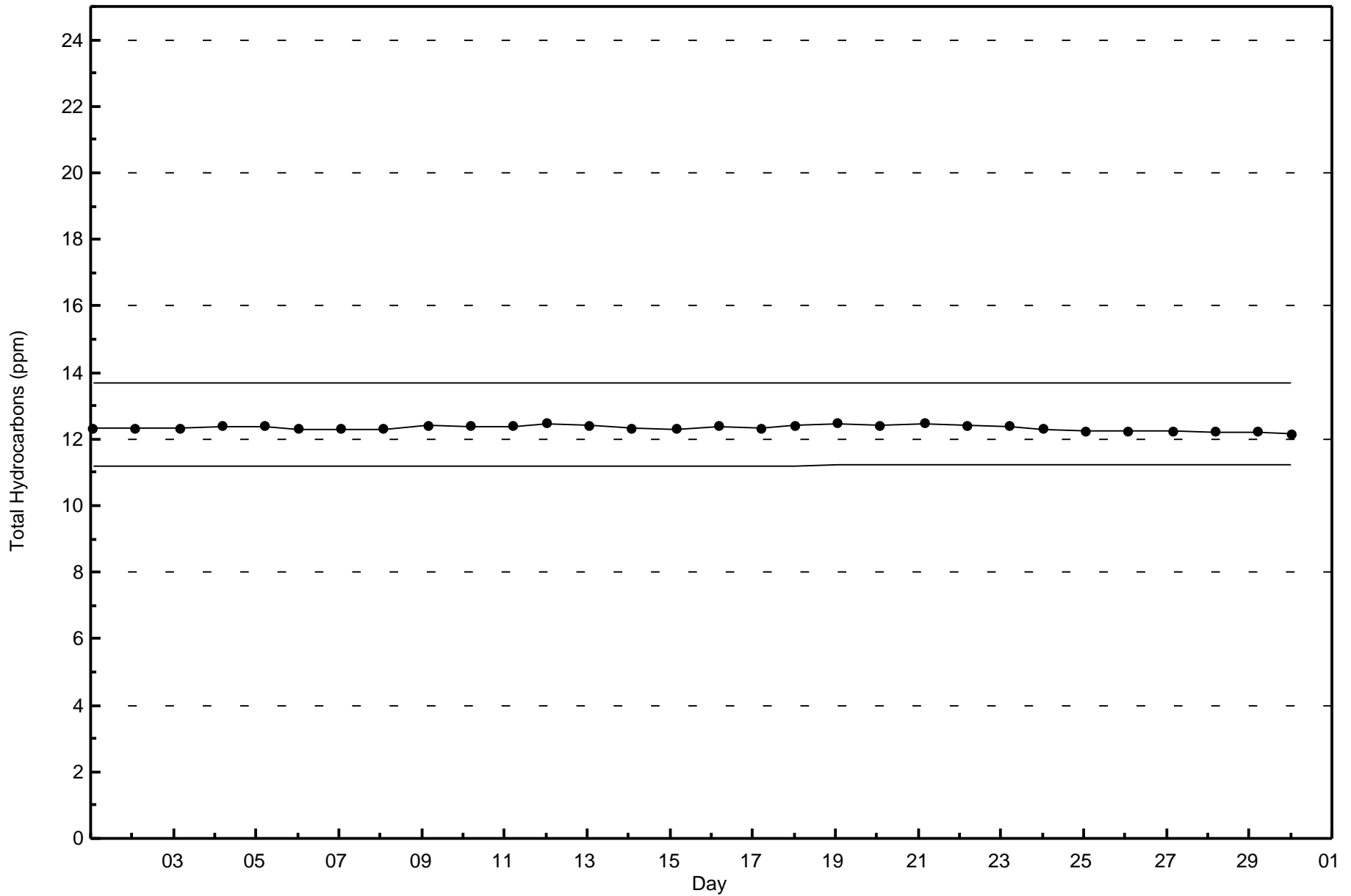


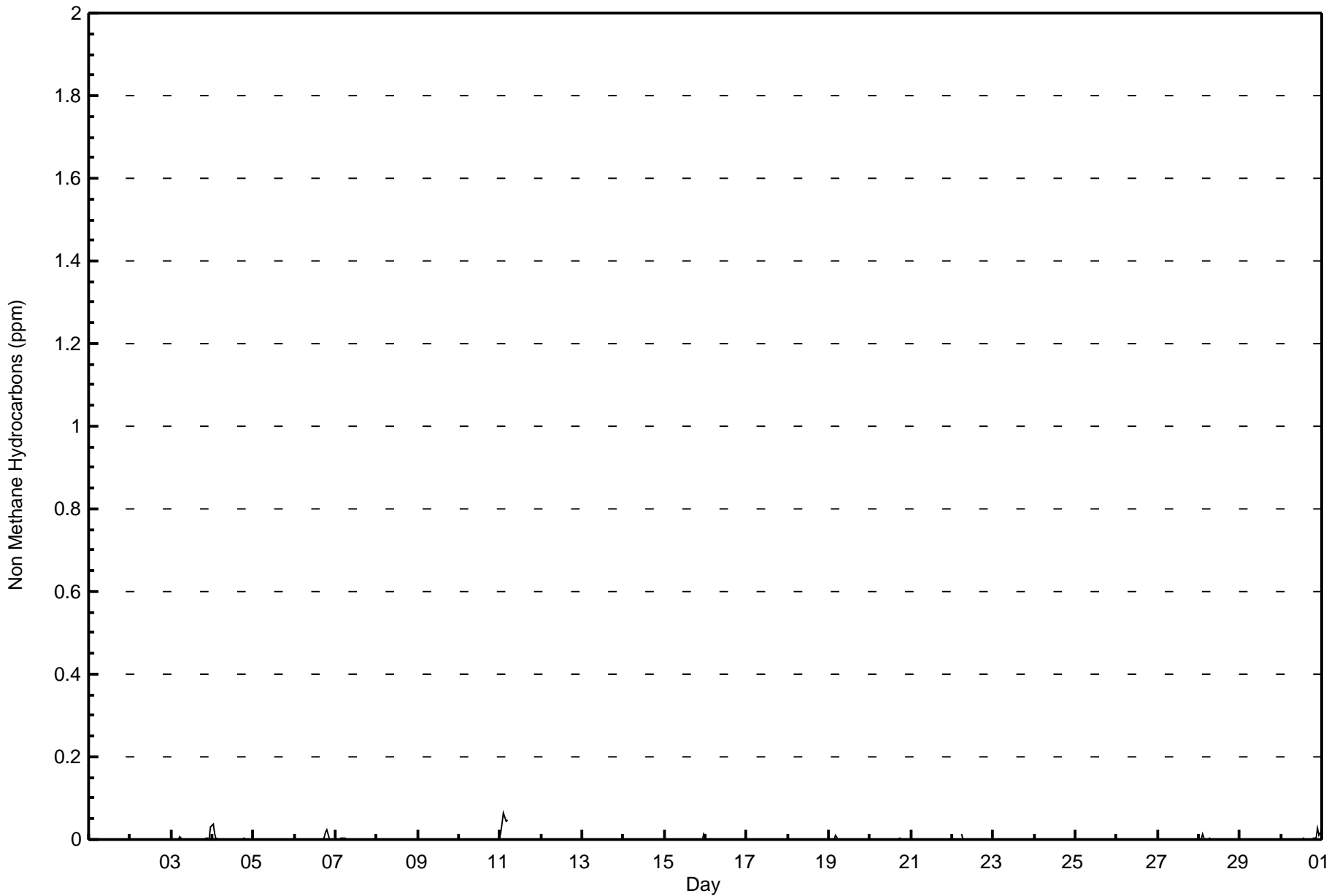
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Stony Mountain (AMS 18)











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - April 2017**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	667	97.37	97.37
0.006 - 0.05	17	2.48	99.85
0.06 - 0.1	1	0.15	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



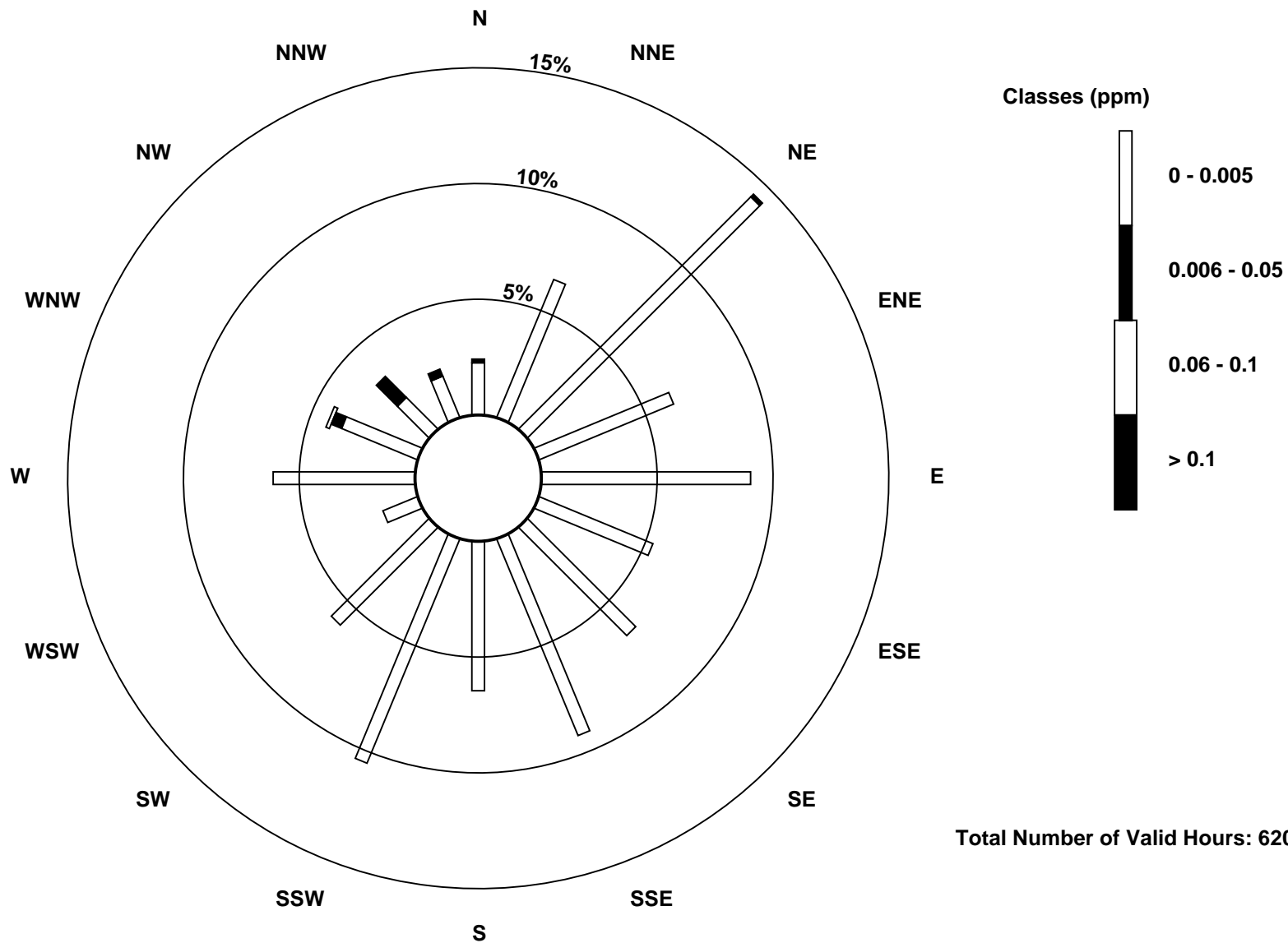
Wood Buffalo Environmental Association
Frequency Distribution

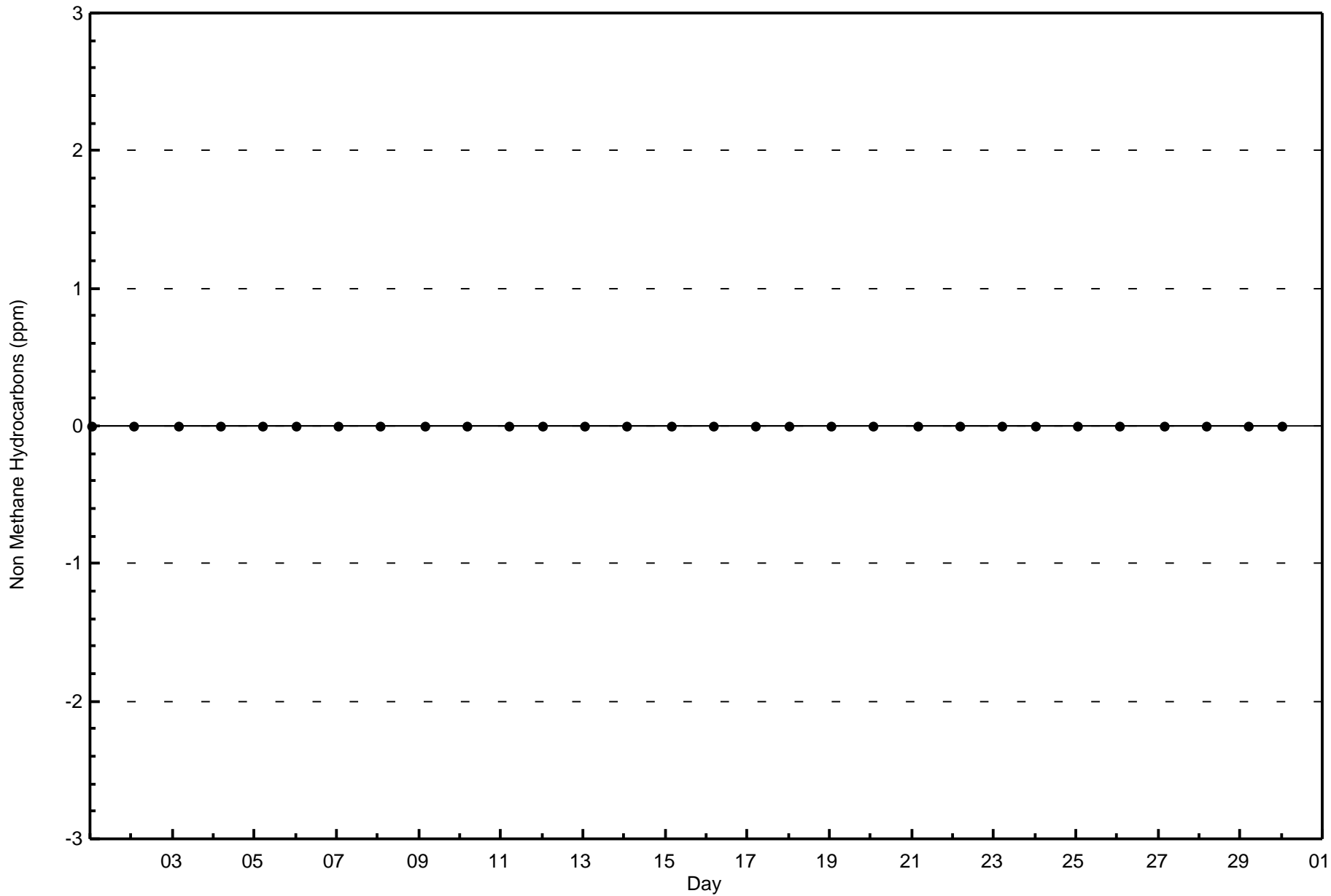
Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - April 2017

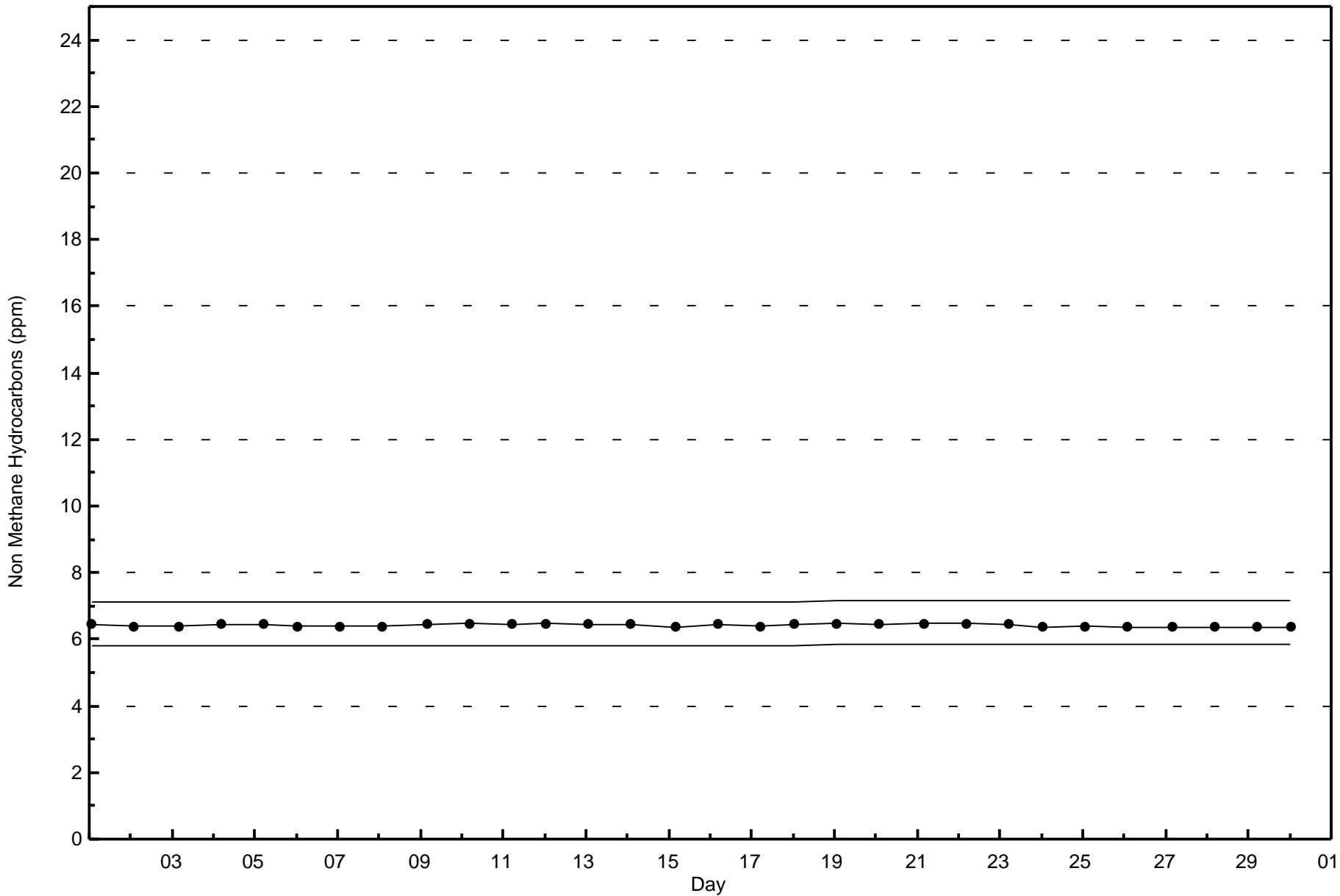
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	14	40	88	39	56	33	41	57	40	65	37	10	38	22	12	12	604
0.006 - 0.05	1	0	1	0	0	0	0	0	0	0	0	0	0	3	8	2	15
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

Total Number of Valid Hours: 620

Total Number of Hours: 720



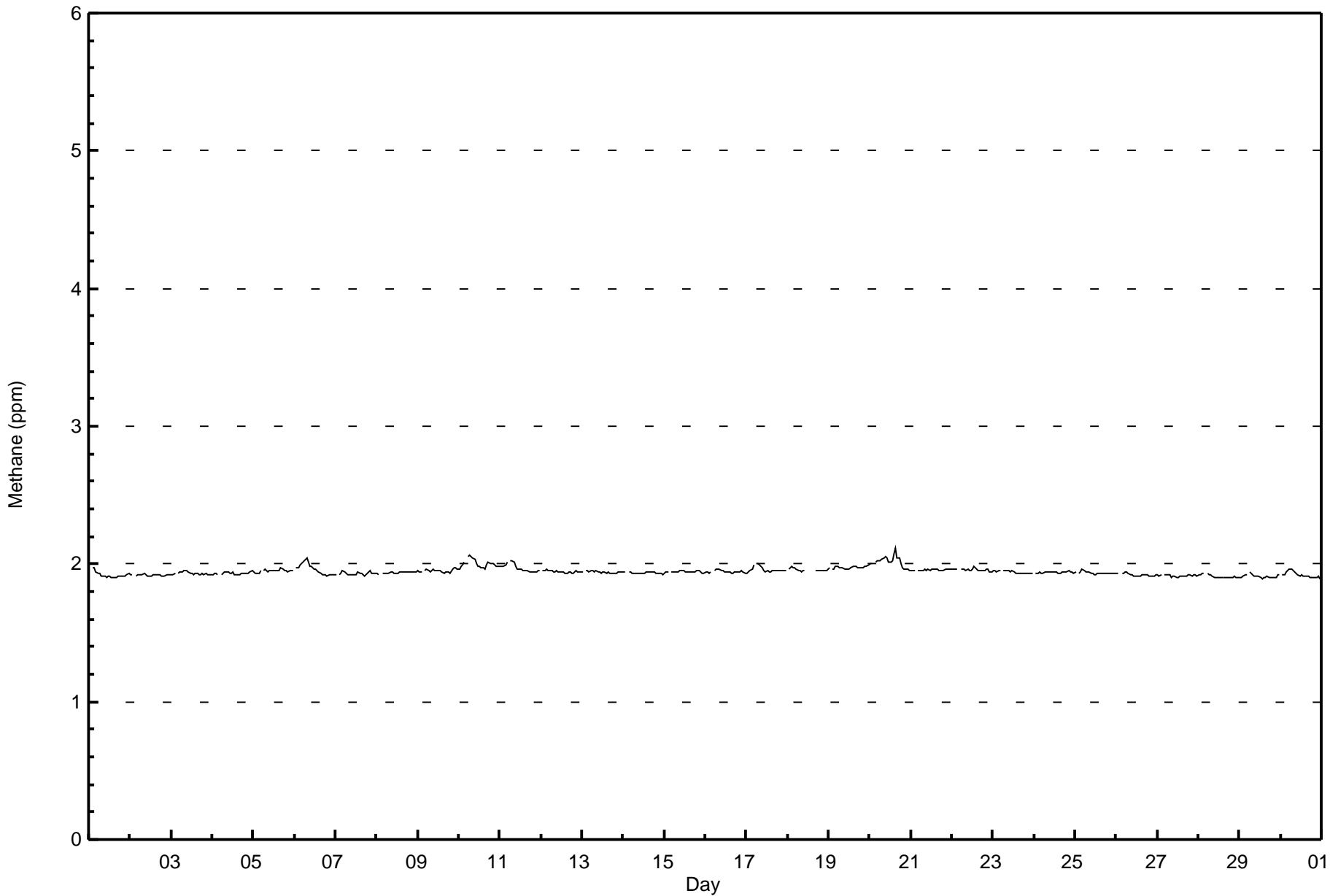






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Stony Mountain - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	679	99.12	99.12
2.1 - 3.0	6	0.88	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Stony Mountain - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	15	40	89	39	56	33	41	56	39	62	36	10	38	26	20	14	614
2.1 - 3.0	0	0	0	0	0	0	0	1	1	3	1	0	0	0	0	0	6
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

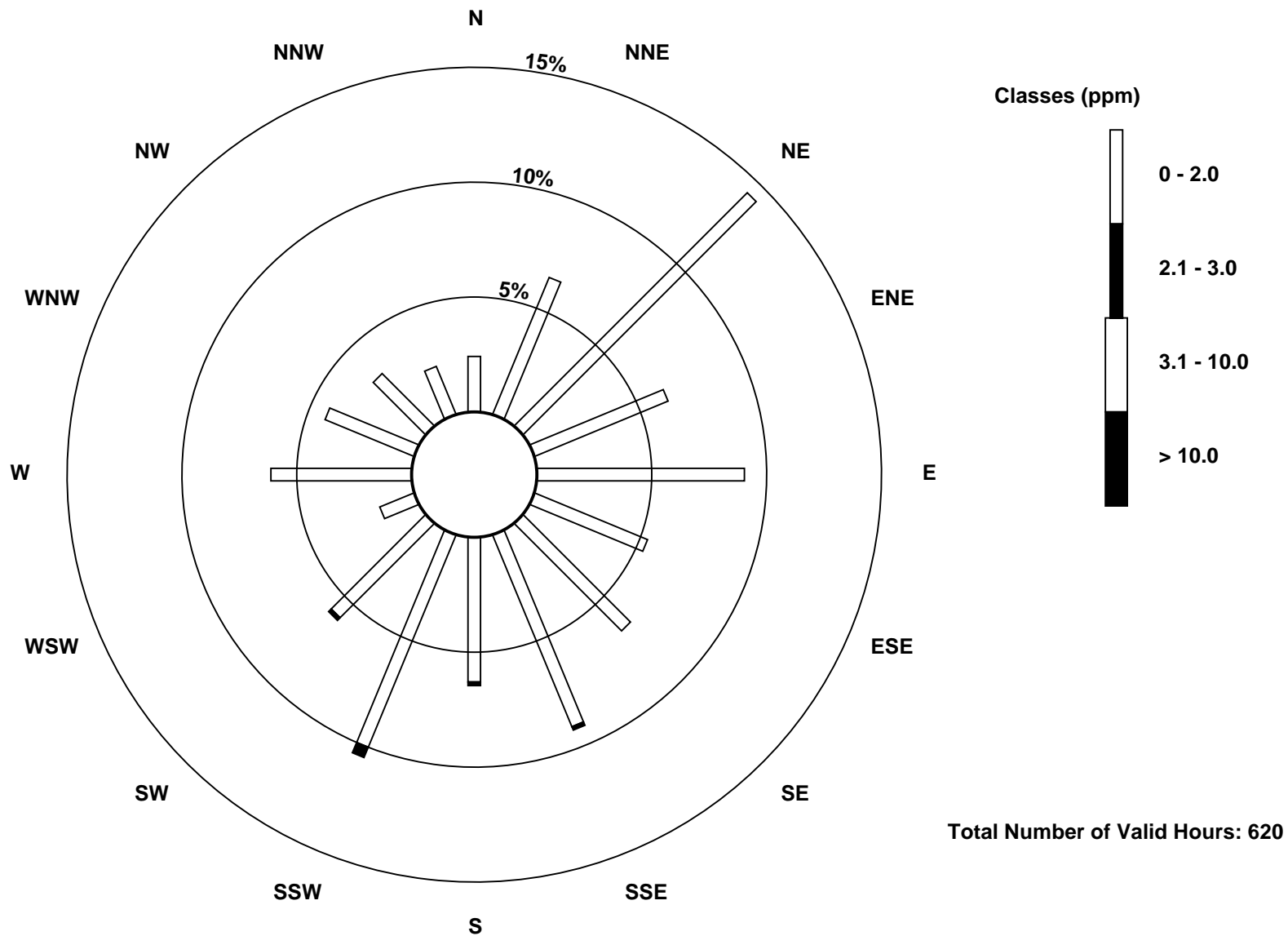
Total Number of Valid Hours: 620

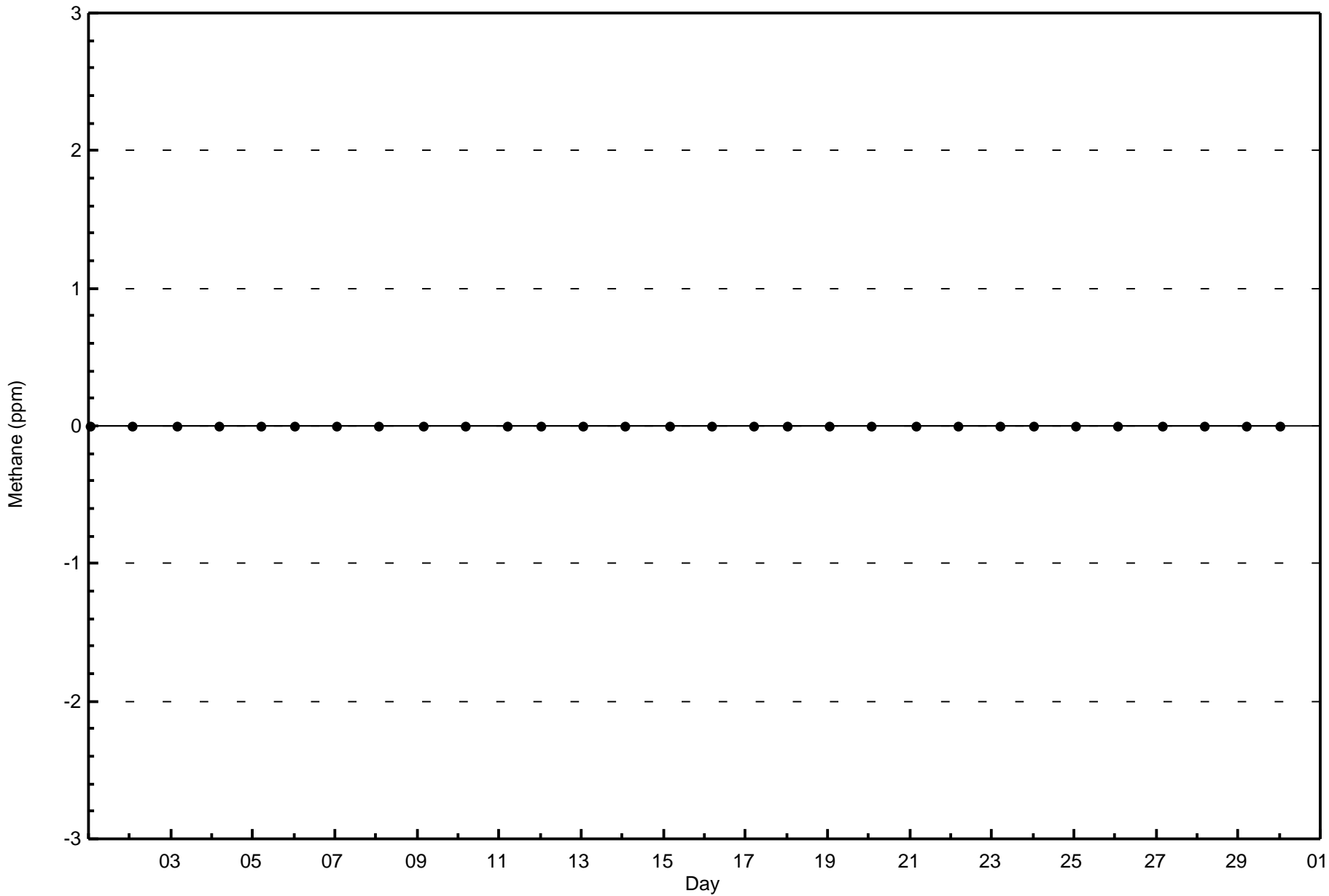
Total Number of Hours: 720

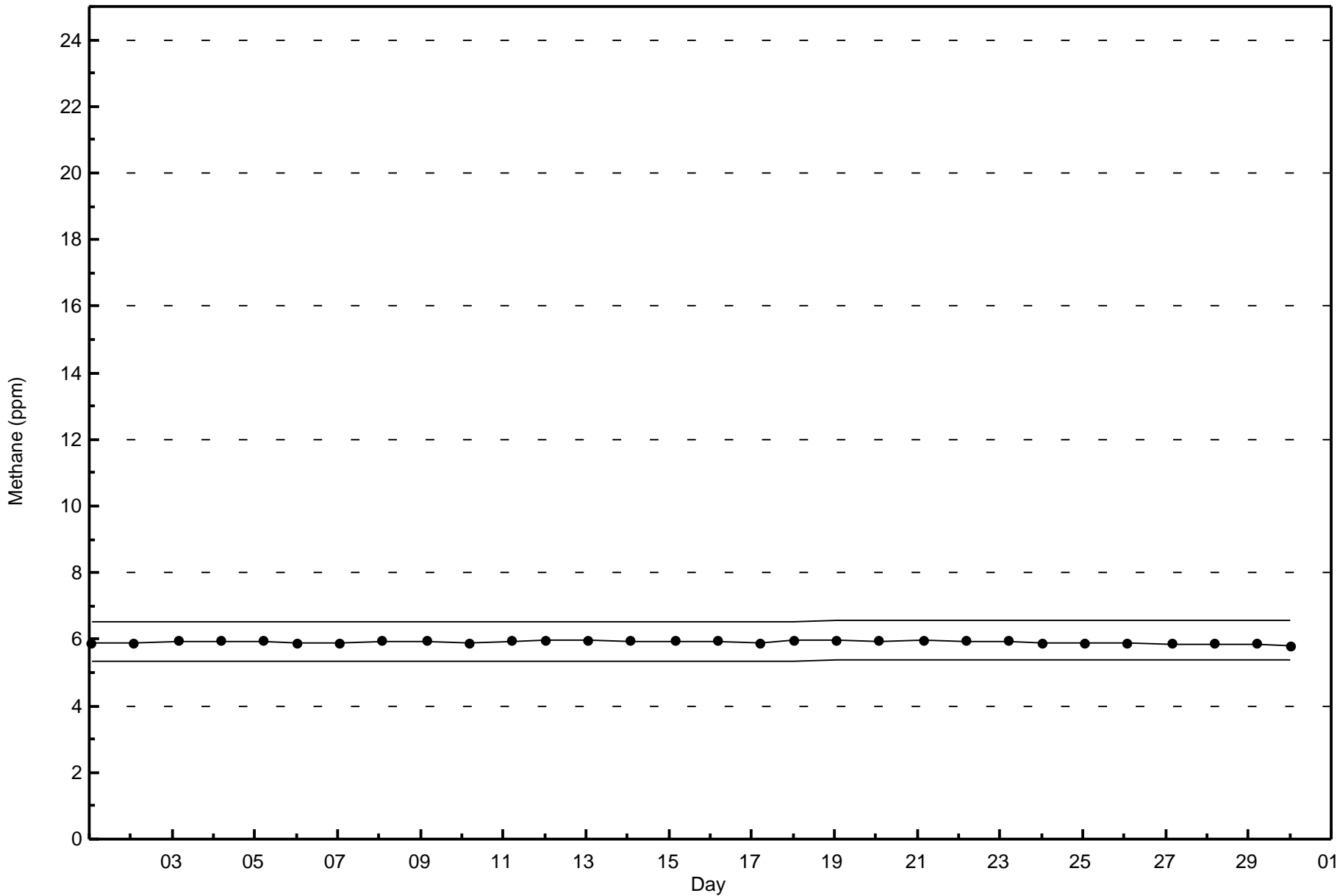


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Methane (CH₄) - ppm
Stony Mountain (AMS 18)







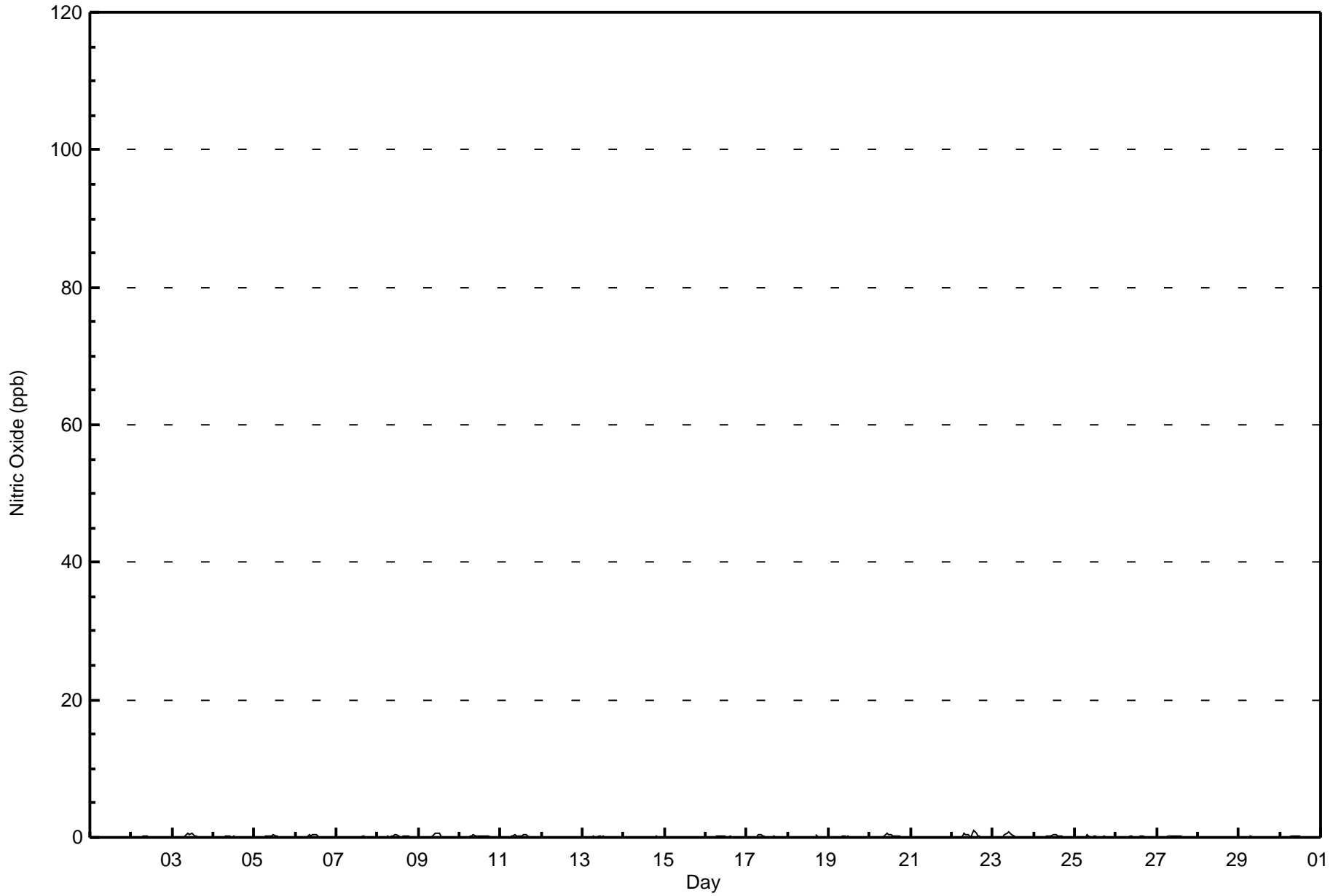


Maximum Value: 1 ppb on Apr 22 14:00														Maximum Daily Average: 0.2 ppb on Apr 22														Hours in Service: 720	
Minimum Value: 0 ppb on Apr 6 20:00														Minimum Daily Average: 0.0 ppb on Apr 12														Hours of Data: 685	
Maximum Diurnal Average: 0.2 ppb at hour 10														Minimum Diurnal Average: 0.0 ppb at hour 24														Hours of Missing Data: 35	
Monthly Average: 0.1 ppb														Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1														Hours of Calibration: 35	
																												Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
3-Apr	0	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1		
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
6-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
9-Apr	0	0	0	Z	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1		
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0		
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0.1	0		
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
20-Apr	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1		
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
22-Apr	0	0	0	0	Z	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.2	1		
23-Apr	0	0	0	0	0	Z	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1		
24-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
30-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0		
														0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.1 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0														Diurnal Average	
														0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0														Diurnal Maximum	
Z - zerospan														C - Calibration															



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Stony Mountain - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

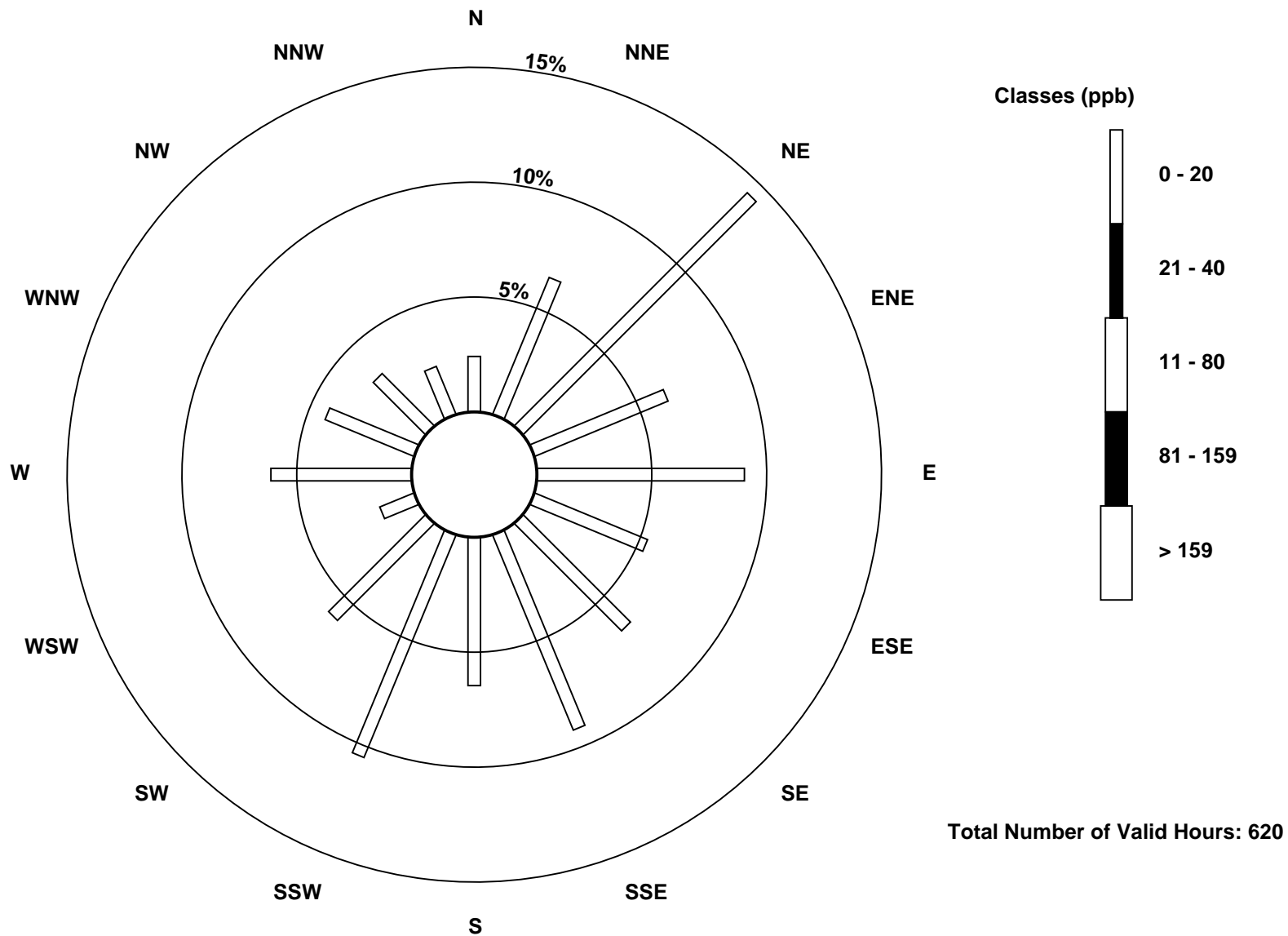
Total Number of Valid Hours: 620

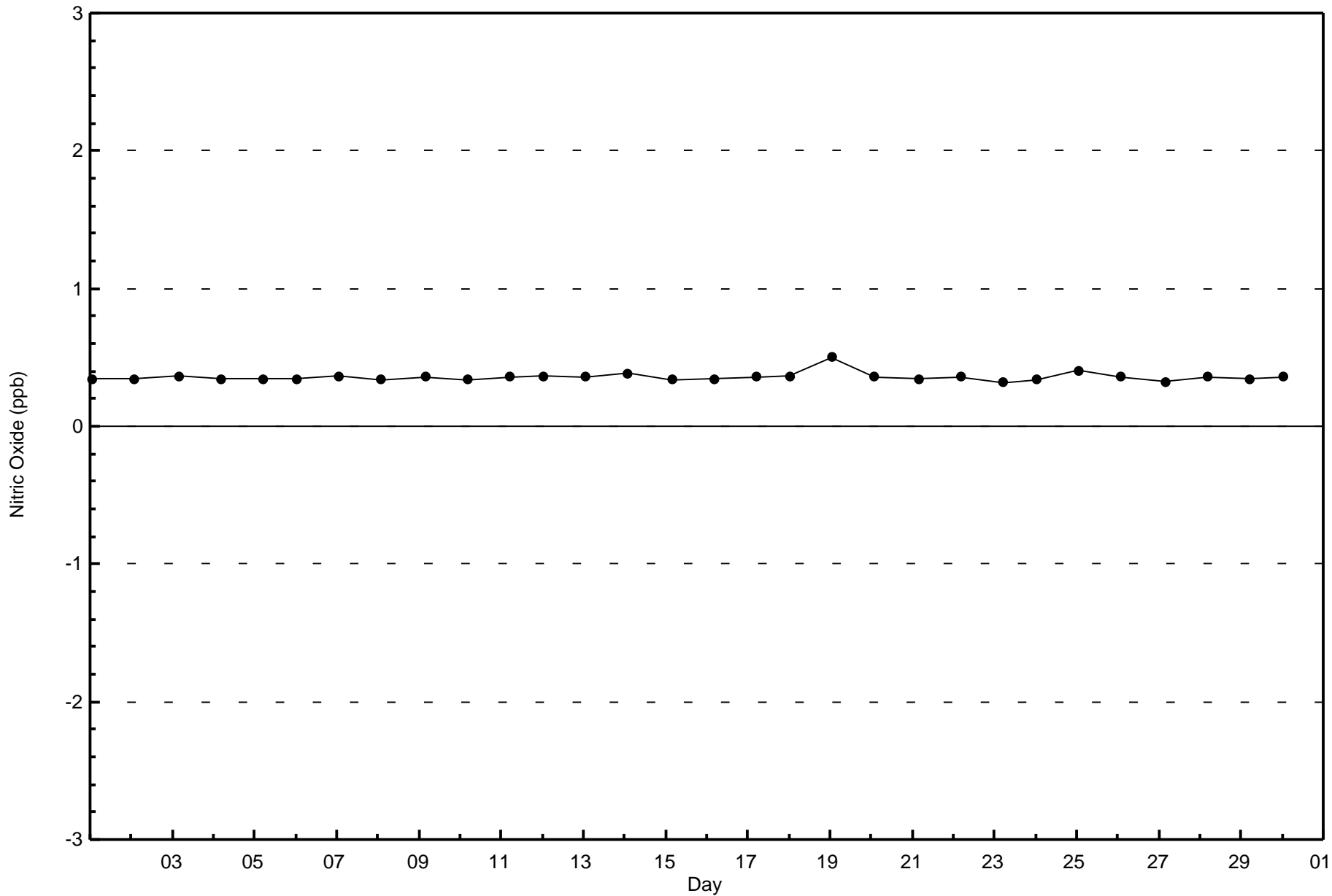
Total Number of Hours: 720

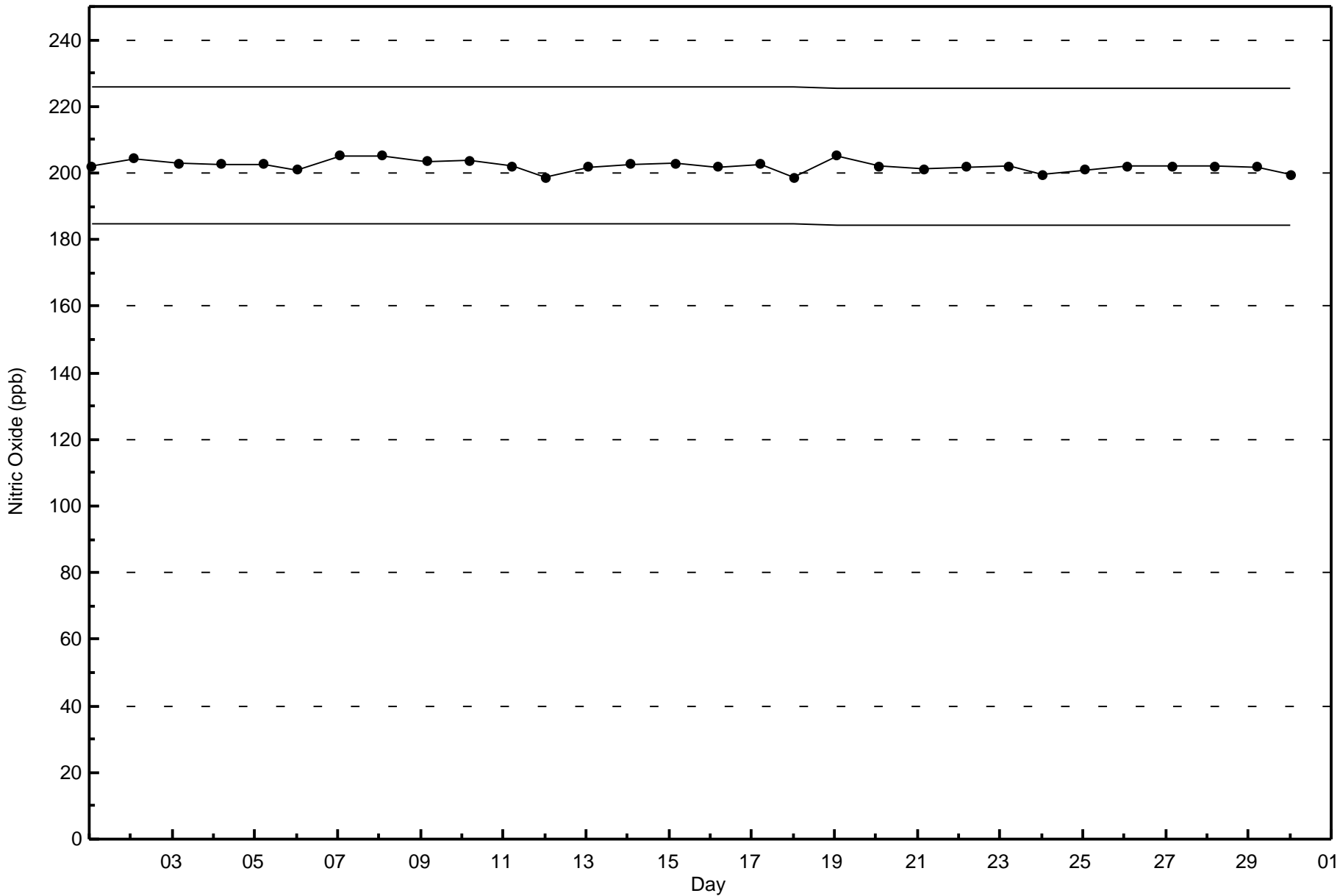


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Stony Mountain (AMS 18)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Stony Mountain - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3 ppb on Apr 22 04:00	Maximum Daily Average: 1.3 ppb on Apr 6		Hours of Data:	685
Minimum Value: 0 ppb on Apr 8 04:00	Minimum Daily Average: 0.4 ppb on Apr 14		Hours of Missing Data:	35
Maximum Diurnal Average: 1.0 ppb at hour 7	Minimum Diurnal Average: 0.7 ppb at hour 16		Hours of Calibration:	35
Monthly Average: 0.8 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 1 Median = 1 Q ₃ = 1 P ₉₀ = 1 P ₉₉ = 2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	2	Z	2	2	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	0	1	1	1	1	0.7	2
2-Apr	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0	1	0.5	1
3-Apr	1	1	1	Z	1	1	1	1	2	2	2	1	1	1	1	1	1	1	0	1	0	0	0	0	0.8	2
4-Apr	0	0	1	0	Z	1	1	1	1	1	0	1	1	1	0	0	0	1	1	1	1	1	1	1	0.6	1
5-Apr	1	1	1	1	1	Z	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.2	2
6-Apr	Z	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1.3	2
7-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0.7	1
8-Apr	0	0	Z	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0.7	1
9-Apr	0	0	0	Z	0	0	0	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2
10-Apr	2	2	1	1	Z	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	2
11-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	2	2	2	2	2	1	2	1	1	1	1	0	1.2	2
12-Apr	Z	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0.5	1
13-Apr	1	Z	1	1	1	1	2	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	0	0	0.7	2
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1
15-Apr	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0.4	1
16-Apr	0	0	0	0	Z	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0.5	1
17-Apr	1	1	1	1	1	Z	2	1	1	1	1	0	1	1	0	0	1	0	0	0	0	1	1	1	0.7	2
18-Apr	Z	1	1	1	1	1	1	0	0	0	1	C	C	C	C	C	1	1	1	1	1	1	1	1	0.6	1
19-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
20-Apr	1	1	Z	1	1	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	1	1	0	1.2	2
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	2	0.6	2
22-Apr	1	1	1	3	Z	2	2	2	1	1	1	1	2	3	2	1	1	1	0	1	1	1	0	1	1.1	3
23-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	0	0.9	1
24-Apr	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0.7	1
25-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	0.9	2
26-Apr	1	1	Z	1	2	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2
27-Apr	1	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
28-Apr	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
29-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
30-Apr	Z	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	2

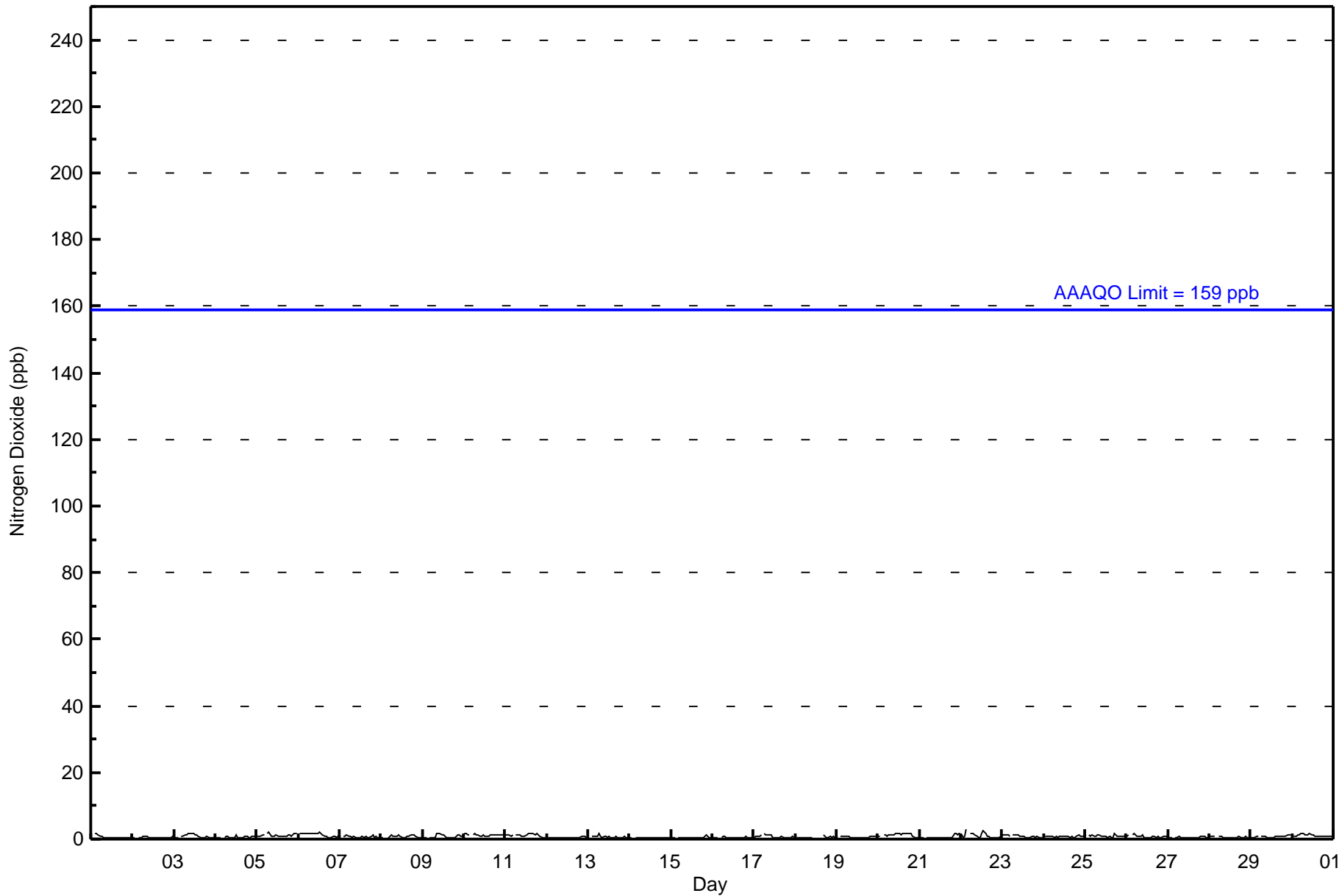
0.8	0.7	0.8	0.9	0.9	0.8	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7	0.7	Diurnal Average
2	2	2	3	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

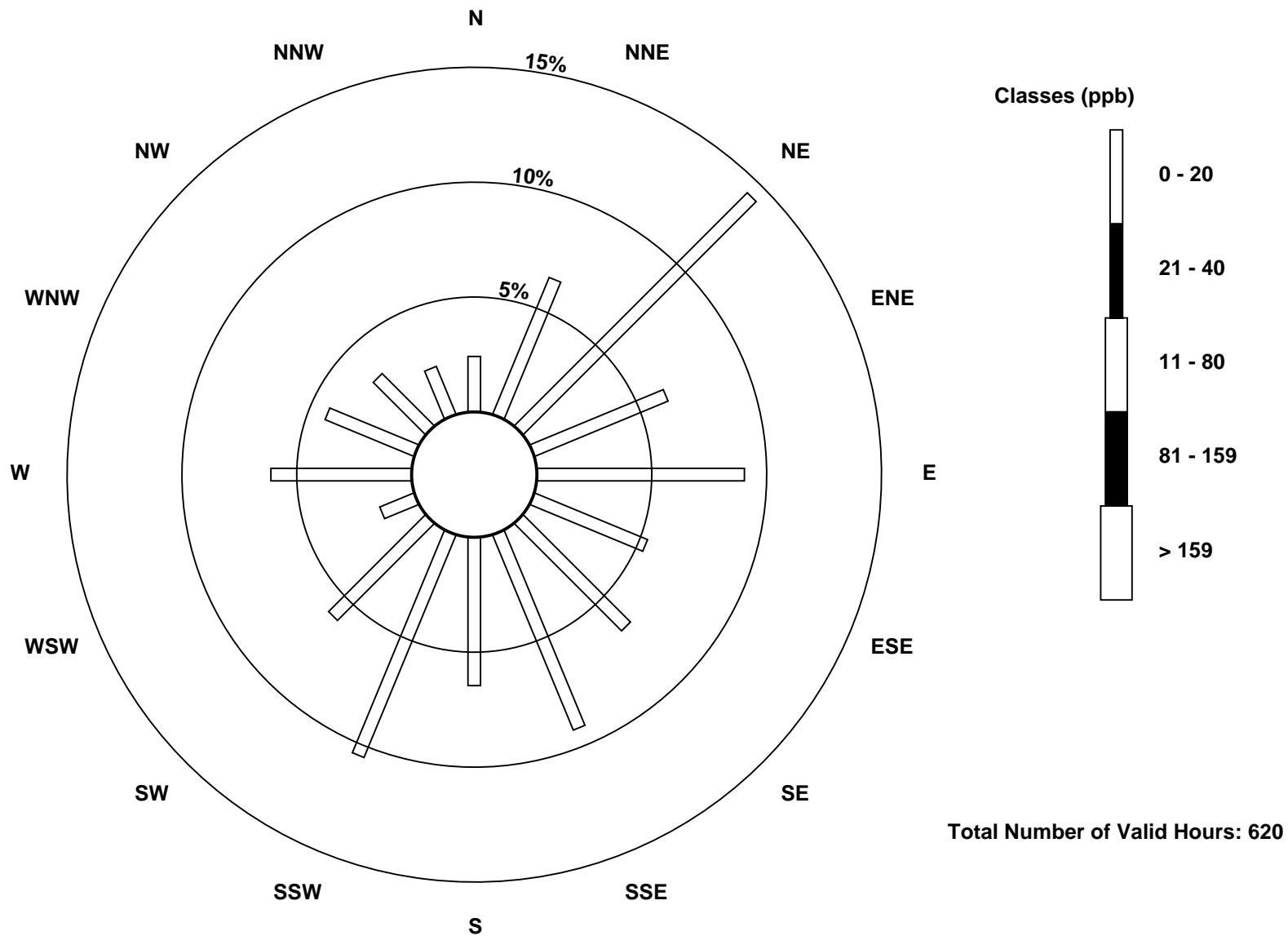
Total Number of Valid Hours: 620

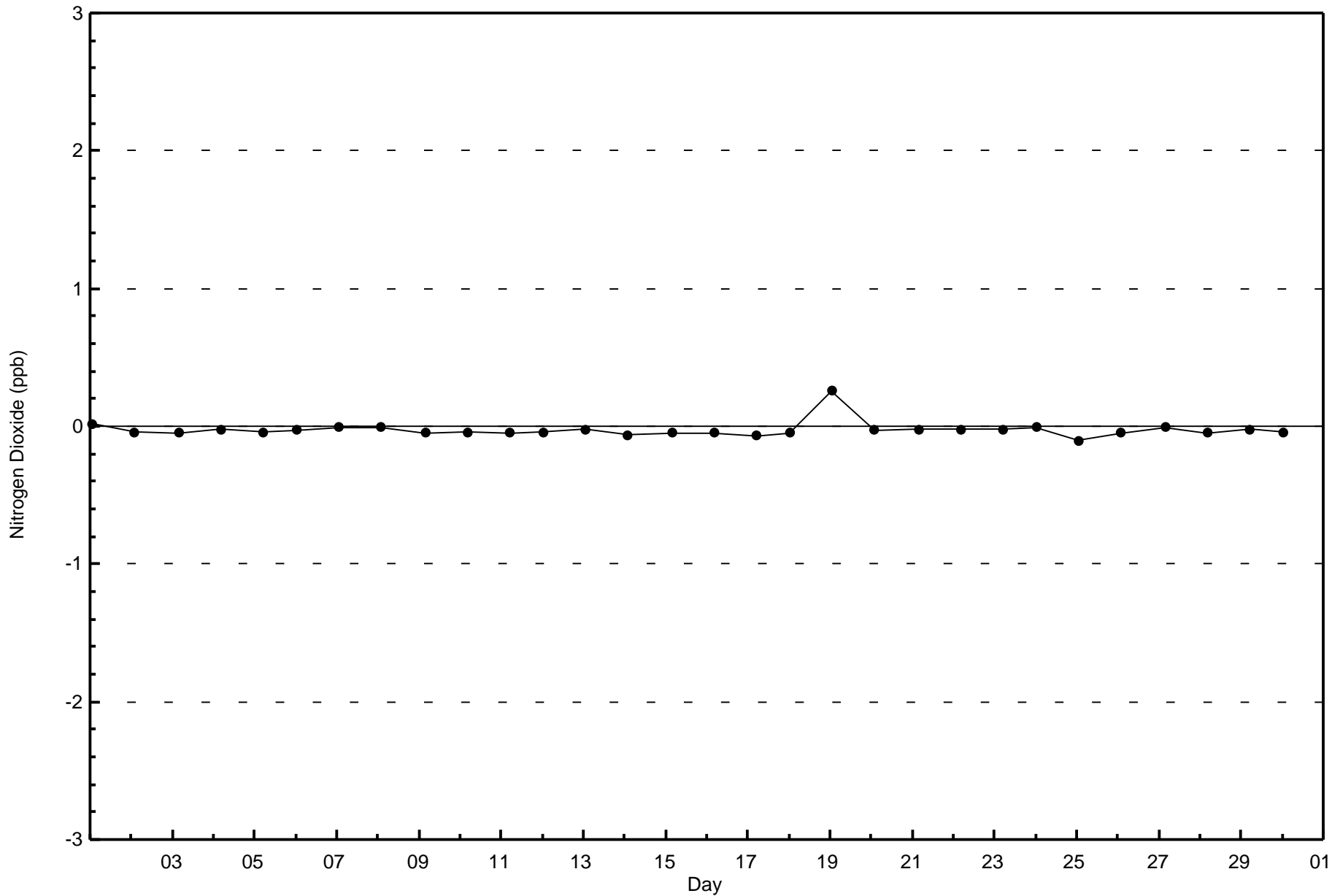
Total Number of Hours: 720

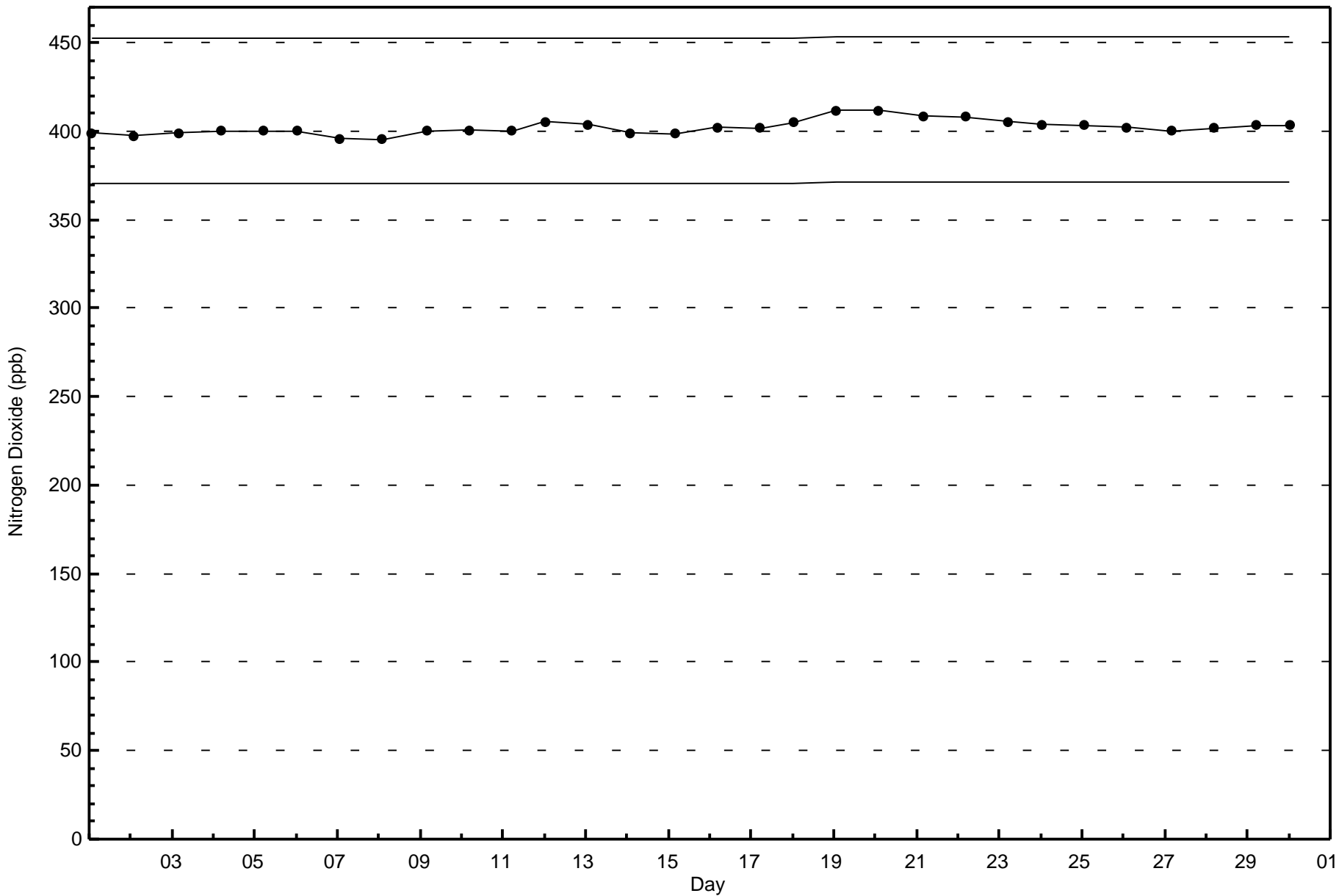


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain (AMS 18)









Wood Buffalo Environmental Association
Summary of Hour Averages

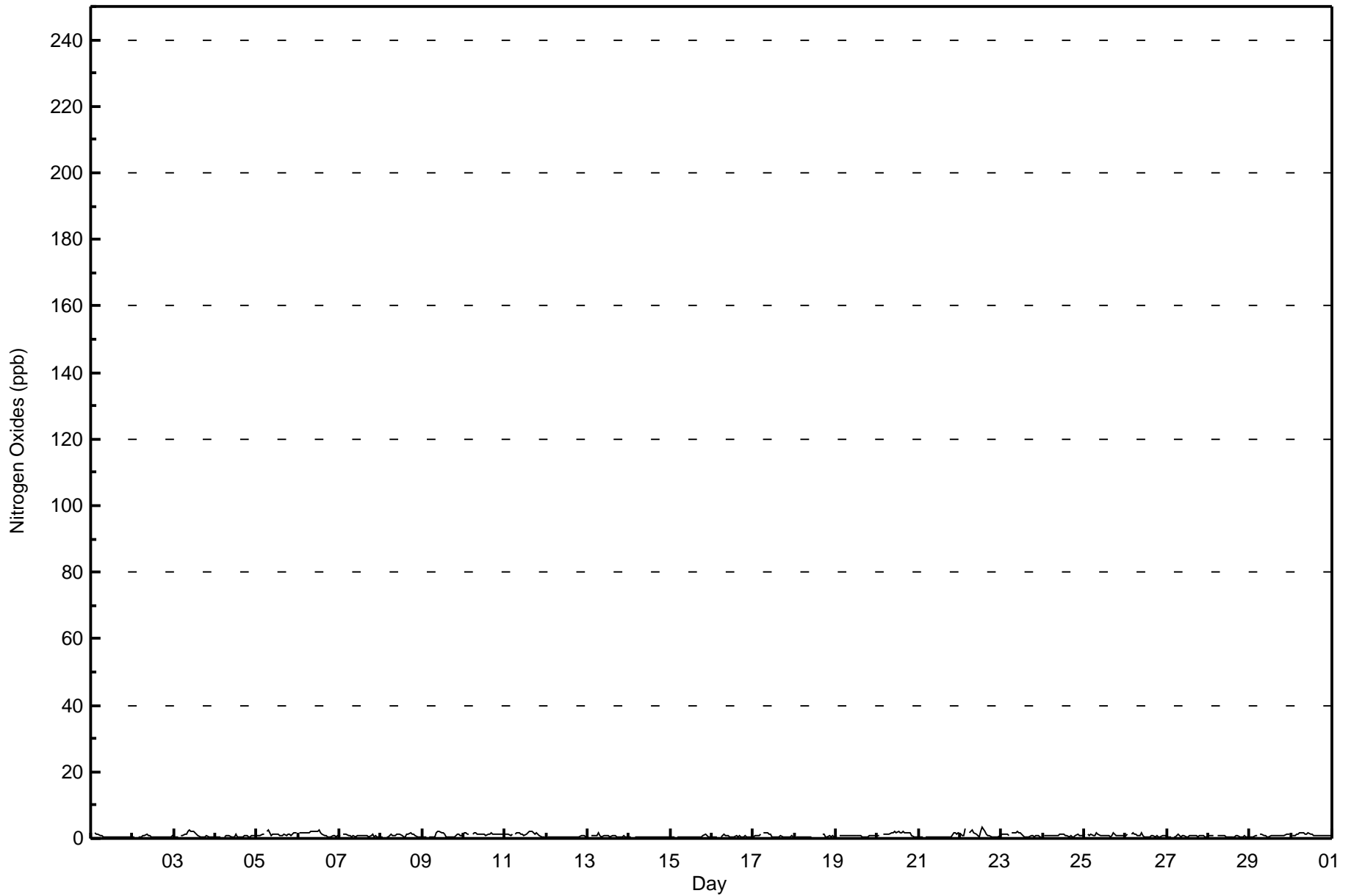
Nitrogen Oxides (NO_x) - ppb
Stony Mountain - April 2017

Maximum Value: 4 ppb on Apr 22 14:00		Maximum Daily Average: 1.4 ppb on Apr 6		Hours in Service: 720																																												
Minimum Value: 0 ppb on Apr 8 02:00		Minimum Daily Average: 0.4 ppb on Apr 14		Hours of Data: 685																																												
Maximum Diurnal Average: 1.1 ppb at hour 8		Minimum Diurnal Average: 0.7 ppb at hour 23		Hours of Missing Data: 35																																												
Monthly Average: 0.9 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 1 Median = 1 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 2		Hours of Calibration: 35																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	2	Z	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	0.7	2																						
2-Apr	0	0	Z	1	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0.6	1																						
3-Apr	1	1	0	Z	1	1	1	1	2	2	2	2	1	1	1	0	0	0	1	0	0	0	0	0	1.0	2																						
4-Apr	0	0	1	0	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0.7	1																						
5-Apr	1	1	1	1	1	Z	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.3	3																						
6-Apr	Z	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	0	1	1	1	1	1	1.4	2																						
7-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1																						
8-Apr	0	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	0	0	0	0.8	2																						
9-Apr	0	0	0	Z	0	0	0	0	2	2	2	2	2	1	0	1	1	1	0	1	1	1	1	1	0.9	2																						
10-Apr	2	2	1	1	Z	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1.3	2																						
11-Apr	1	1	1	1	1	Z	1	2	2	1	1	1	2	2	2	2	2	1	2	1	1	0	1	0	1.3	2																						
12-Apr	Z	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0.5	1																						
13-Apr	1	Z	1	1	1	1	2	1	0	1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	0.7	2																						
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.4	1																						
15-Apr	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0.5	1																						
16-Apr	0	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0.6	1																						
17-Apr	1	1	1	1	1	Z	2	2	2	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0.8	2																						
18-Apr	Z	1	1	1	0	0	0	0	0	1	1	C	C	C	C	C	1	1	1	1	1	1	1	1	0.6	1																						
19-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1																						
20-Apr	1	1	Z	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	0	1.4	2																						
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	2	0.6	2																						
22-Apr	1	1	1	3	Z	2	2	2	1	1	1	1	2	4	2	1	1	1	0	1	1	1	0	1	1.3	4																						
23-Apr	1	1	1	1	1	Z	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	1.0	2																						
24-Apr	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0.8	1																						
25-Apr	1	Z	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1.0	2																						
26-Apr	1	1	Z	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	2																						
27-Apr	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1																						
28-Apr	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1																						
29-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1																						
30-Apr	Z	1	1	1	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	2																						
																								0.8	0.7	0.8	1.0	0.9	0.9	1.1	1.1	1.0	1.0	1.0	0.9	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	Diurnal Average
																								2	2	2	3	2	2	2	3	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2	2	Diurnal Maximum
Z - zerospan C - Calibration																																																



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	89	39	56	33	41	57	40	65	37	10	38	26	20	14	620

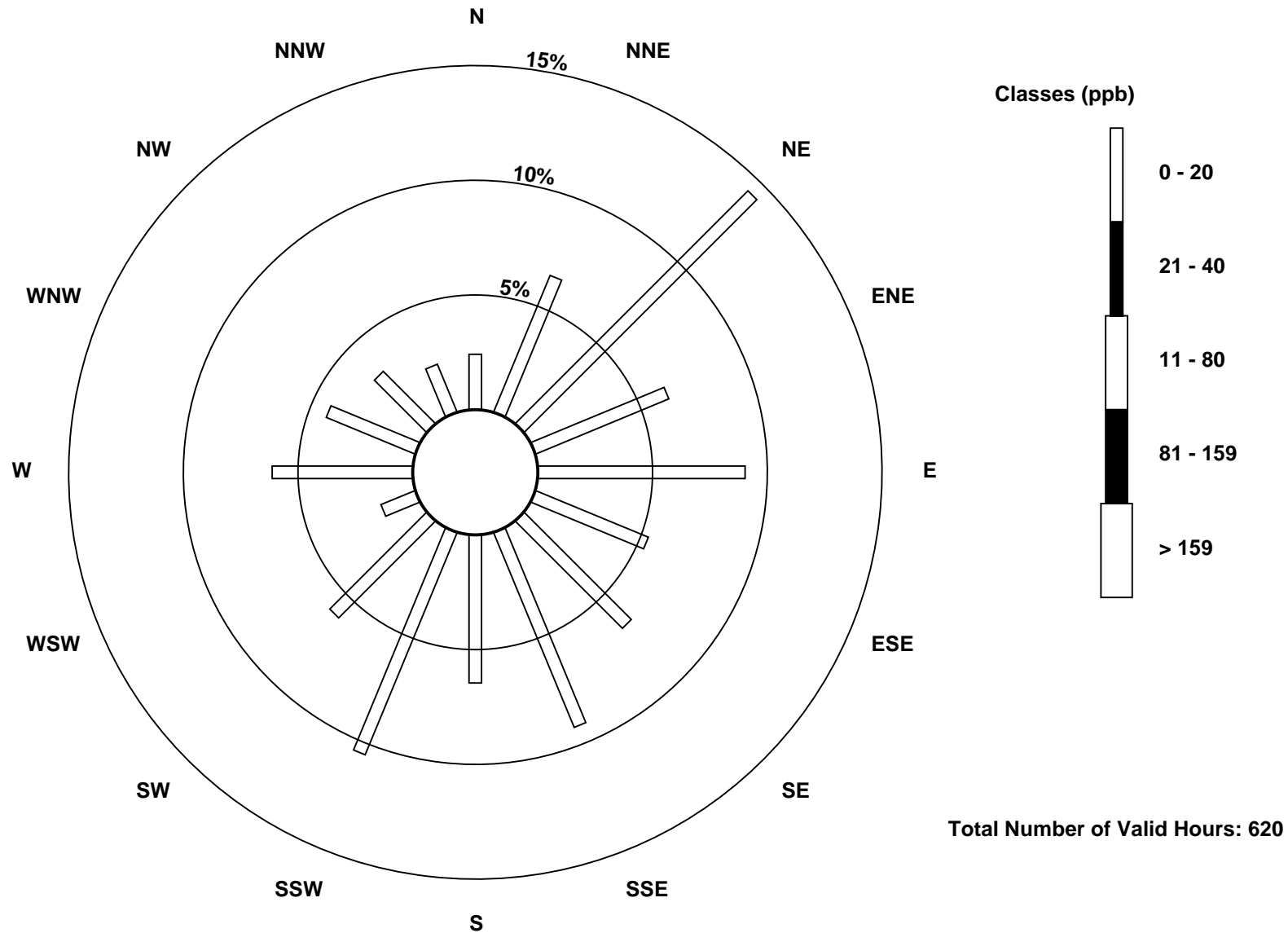
Total Number of Valid Hours: 620

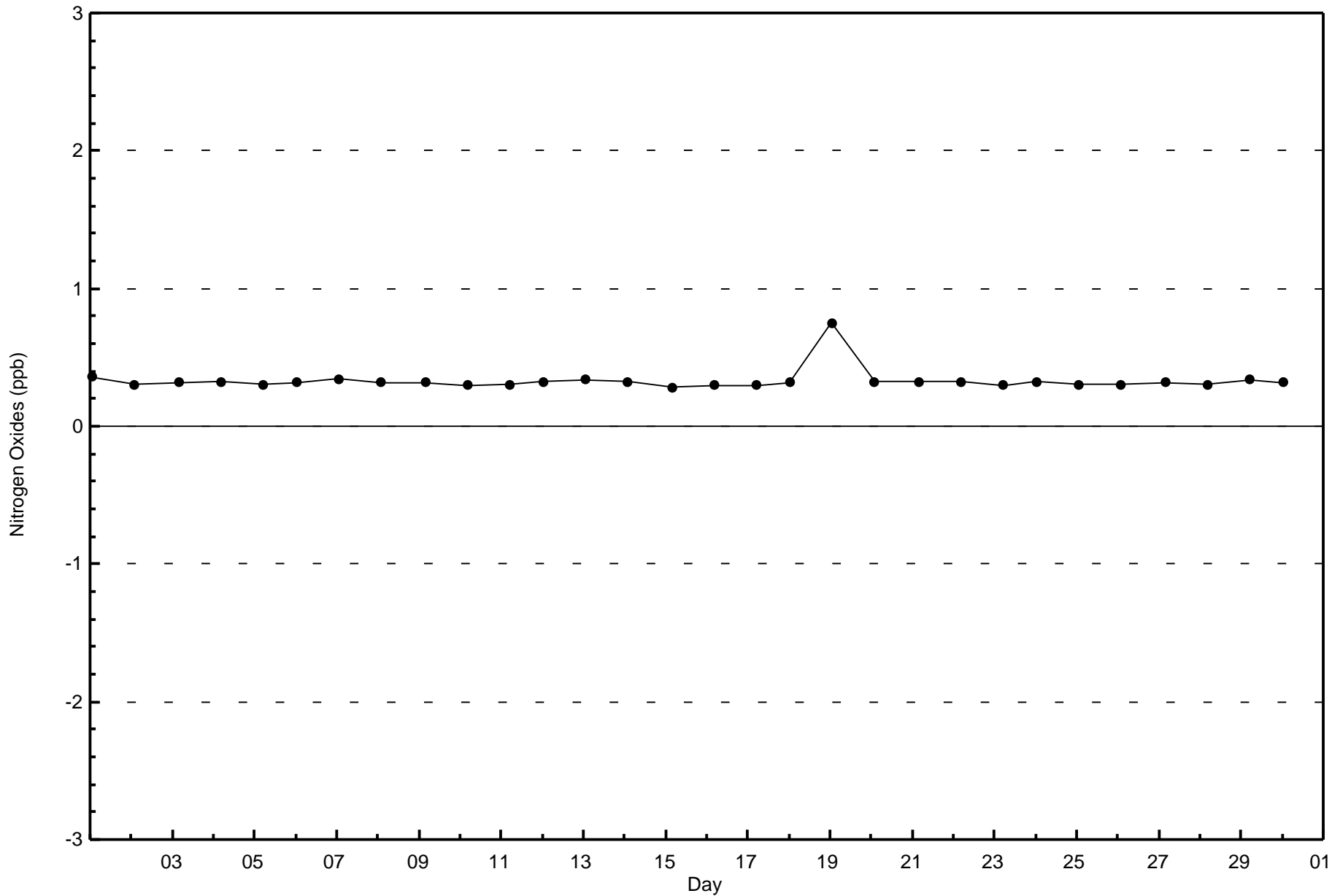
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Stony Mountain (AMS 18)

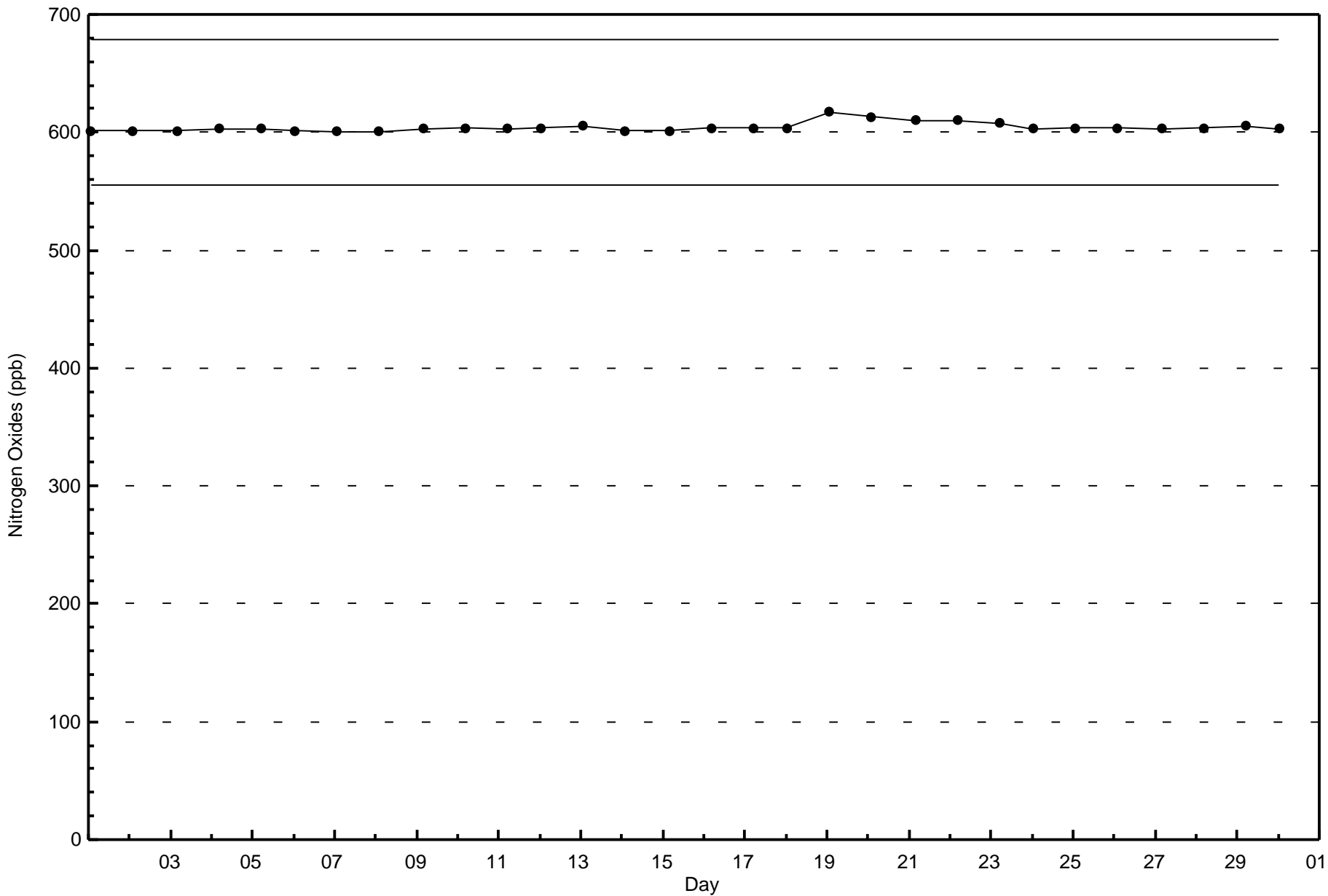






Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Stony Mountain - April 2017

Number of Exceedences (AAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 60 ppb on Apr 30 16:00	Maximum Daily Average: 53.0 ppb on Apr 29		Hours of Data:	687
Minimum Value: 28 ppb on Apr 25 05:00	Minimum Daily Average: 36.8 ppb on Apr 24		Hours of Missing Data:	33
Maximum Diurnal Average: 48.8 ppb at hour 16	Minimum Diurnal Average: 41.3 ppb at hour 6		Hours of Calibration:	33
Monthly Average: 45.4 ppb	Percentiles: P ₁ = 31 P ₁₀ = 37 Q ₁ = 42 Median = 46 Q ₃ = 50 P ₉₀ = 53 P ₉₉ = 59		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	40	41	41	Z	43	45	45	48	48	50	51	52	53	54	53	54	53	53	53	52	51	51	50	50	49.1	54
2-Apr	50	49	49	51	Z	49	46	44	44	45	47	49	52	53	52	52	54	54	54	54	54	53	52	50	50.2	54
3-Apr	48	47	45	44	42	Z	38	37	36	38	45	48	48	49	50	50	51	50	48	48	47	47	48	48	45.7	51
4-Apr	46	44	42	42	42	43	Z	33	35	39	46	48	45	50	51	50	49	48	49	46	42	41	38	38	43.7	51
5-Apr	40	41	39	38	43	44	43	Z	42	43	45	47	52	55	56	58	56	55	56	55	54	53	51	51	48.6	58
6-Apr	52	52	Z	49	47	46	45	45	47	47	47	48	49	50	54	58	59	60	60	59	59	59	58	57	52.4	60
7-Apr	57	52	51	Z	46	47	49	54	54	52	51	50	48	47	46	45	49	48	48	48	47	46	46	45	49.0	57
8-Apr	46	45	44	43	Z	42	41	42	44	45	44	44	45	45	45	44	43	41	40	38	36	35	32	32	41.6	46
9-Apr	34	36	38	37	36	Z	36	37	35	35	36	38	39	41	42	44	47	50	48	47	42	41	40	39	39.9	50
10-Apr	36	35	35	34	34	33	Z	32	34	36	42	47	48	48	48	46	38	36	38	40	40	41	42	41	39.3	48
11-Apr	41	40	38	38	36	33	33	Z	37	39	45	49	48	47	47	48	46	44	39	38	38	39	40	41	41.2	49
12-Apr	42	44	Z	43	43	43	44	44	46	47	49	51	53	53	53	53	52	52	53	53	52	48	47	47	48.3	53
13-Apr	45	44	42	Z	39	37	38	39	40	42	44	45	46	47	46	46	46	46	46	47	45	44	43	42	43.5	47
14-Apr	42	42	42	42	Z	42	42	42	42	43	43	44	44	44	45	45	46	46	47	50	51	51	51	51	45.1	51
15-Apr	52	52	52	52	51	Z	49	49	49	48	48	48	48	48	48	49	49	49	50	49	49	49	50	50	49.5	52
16-Apr	49	50	51	45	42	41	Z	40	41	42	47	48	47	48	51	53	54	53	50	47	49	50	48	48	47.5	54
17-Apr	49	48	46	44	44	45	43	Z	47	46	38	40	41	42	43	43	43	44	44	44	44	43	42	42	43.7	49
18-Apr	41	40	Z	39	39	39	40	41	40	40	40	41	42	42	42	42	42	42	41	41	41	40	39	40	40.7	42
19-Apr	40	38	39	Z	38	36	34	C	C	C	42	45	46	44	43	42	42	42	41	42	43	42	40	37	40.8	46
20-Apr	38	38	40	40	Z	38	39	35	33	37	42	47	49	50	53	47	50	45	42	36	39	41	43	47	42.2	53
21-Apr	48	50	50	49	48	Z	49	46	45	48	48	48	48	48	47	47	48	48	47	47	46	45	46	45	47.5	50
22-Apr	45	45	44	42	42	42	Z	45	48	48	49	50	47	46	46	45	45	45	45	44	43	42	42	40	44.9	50
23-Apr	39	38	38	37	36	35	35	Z	38	41	43	45	47	49	50	50	48	47	46	47	46	45	45	46	43.2	50
24-Apr	45	44	Z	41	40	38	36	36	37	37	37	37	37	37	36	37	37	36	34	34	33	34	33	32	36.8	45
25-Apr	31	30	29	Z	28	29	31	29	31	36	38	40	41	41	42	43	43	43	45	45	44	44	44	45	37.9	45
26-Apr	44	43	44	43	Z	42	43	45	45	43	45	46	46	46	46	46	46	46	46	46	44	43	42	41	44.3	46
27-Apr	41	41	41	41	41	Z	43	47	49	50	50	50	50	50	51	52	52	52	50	49	48	48	49	49	47.6	52
28-Apr	49	50	49	45	46	47	Z	49	51	54	56	56	56	56	56	57	56	56	56	56	54	54	54	53	52.9	57
29-Apr	53	52	52	52	52	50	48	Z	52	55	57	56	56	56	56	56	56	56	55	53	52	51	50	49	53.0	57
30-Apr	48	48	Z	46	45	44	45	47	49	53	54	57	56	54	57	60	56	56	56	57	57	52	54	55	52.5	60

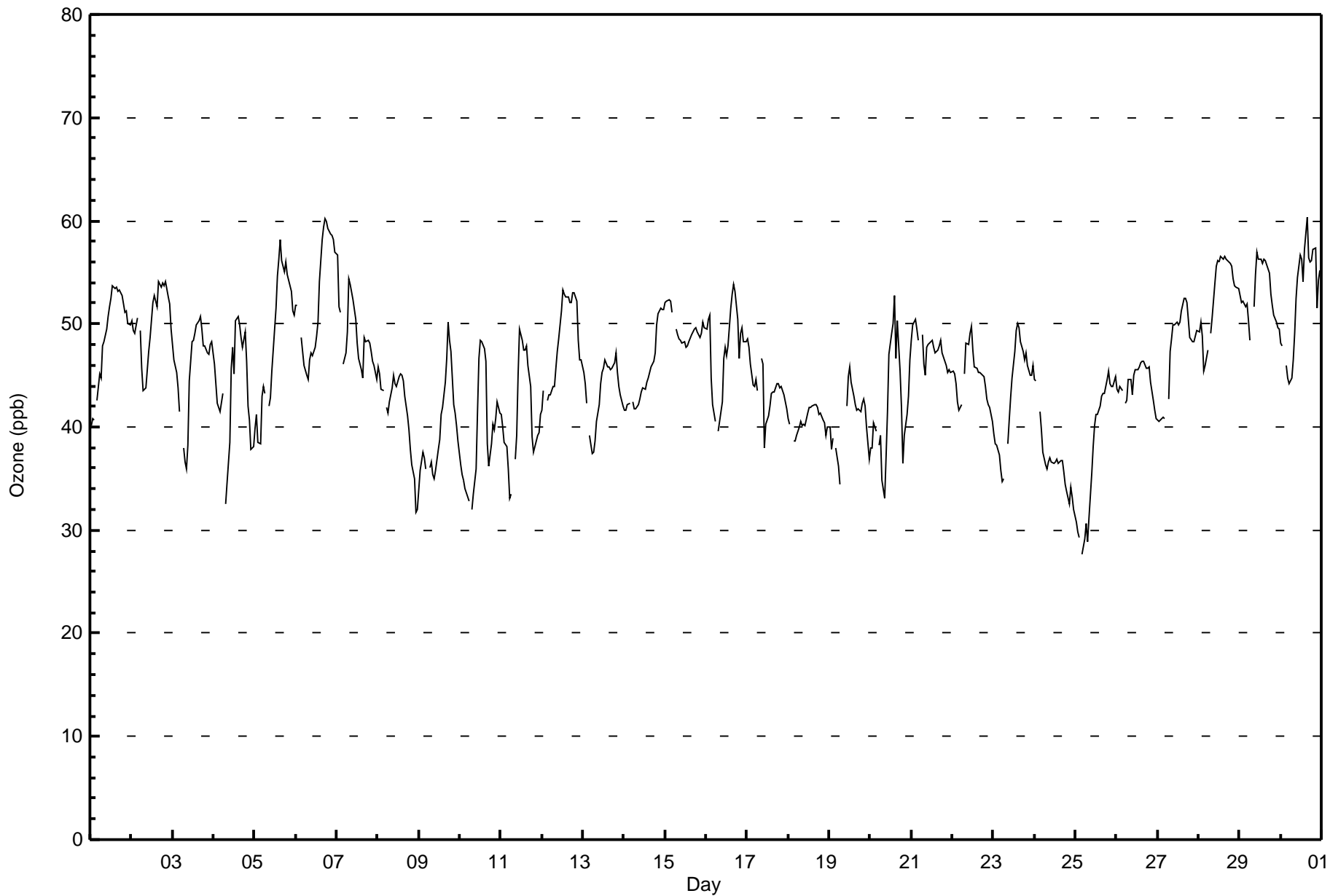
44.3	44.0	43.3	43.1	41.6	41.3	41.4	41.8	42.6	44.1	45.6	47.1	47.6	48.0	48.6	48.8	48.6	48.1	47.6	47.0	46.3	45.7	45.3	45.0	Diurnal Average		
57	52	52	52	52	50	49	54	54	55	57	57	56	56	57	60	59	60	60	60	59	59	59	58	57	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAQO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
21 - 50	552	80.35	80.35
51 - 82	135	19.65	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Stony Mountain - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 50	14	34	80	37	53	30	37	48	30	48	24	6	14	18	17	8	498
51 - 82	1	6	8	4	5	5	2	11	9	15	15	3	24	7	4	5	124
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	40	88	41	58	35	39	59	39	63	39	9	38	25	21	13	622

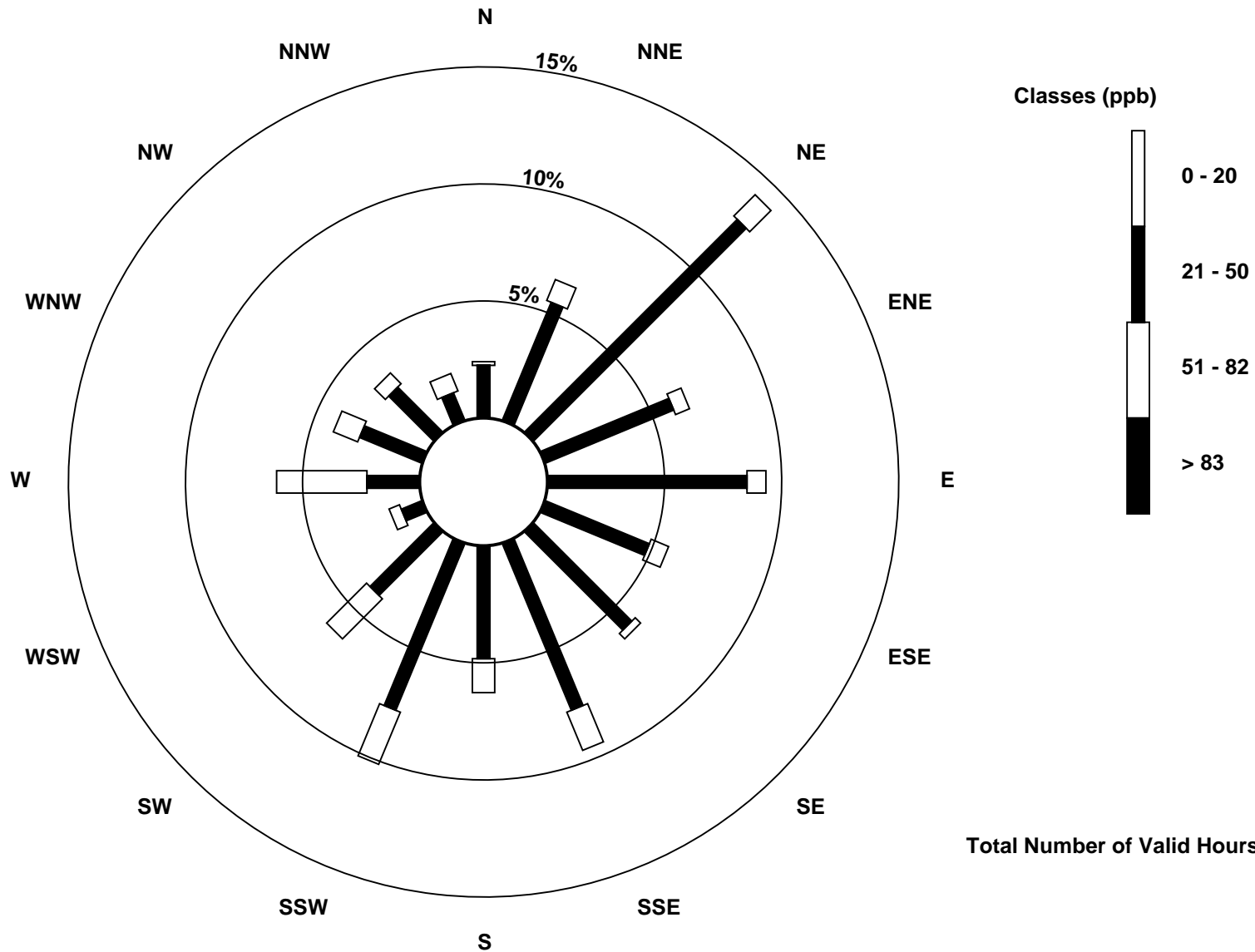
Total Number of Valid Hours: 622

Total Number of Hours: 720

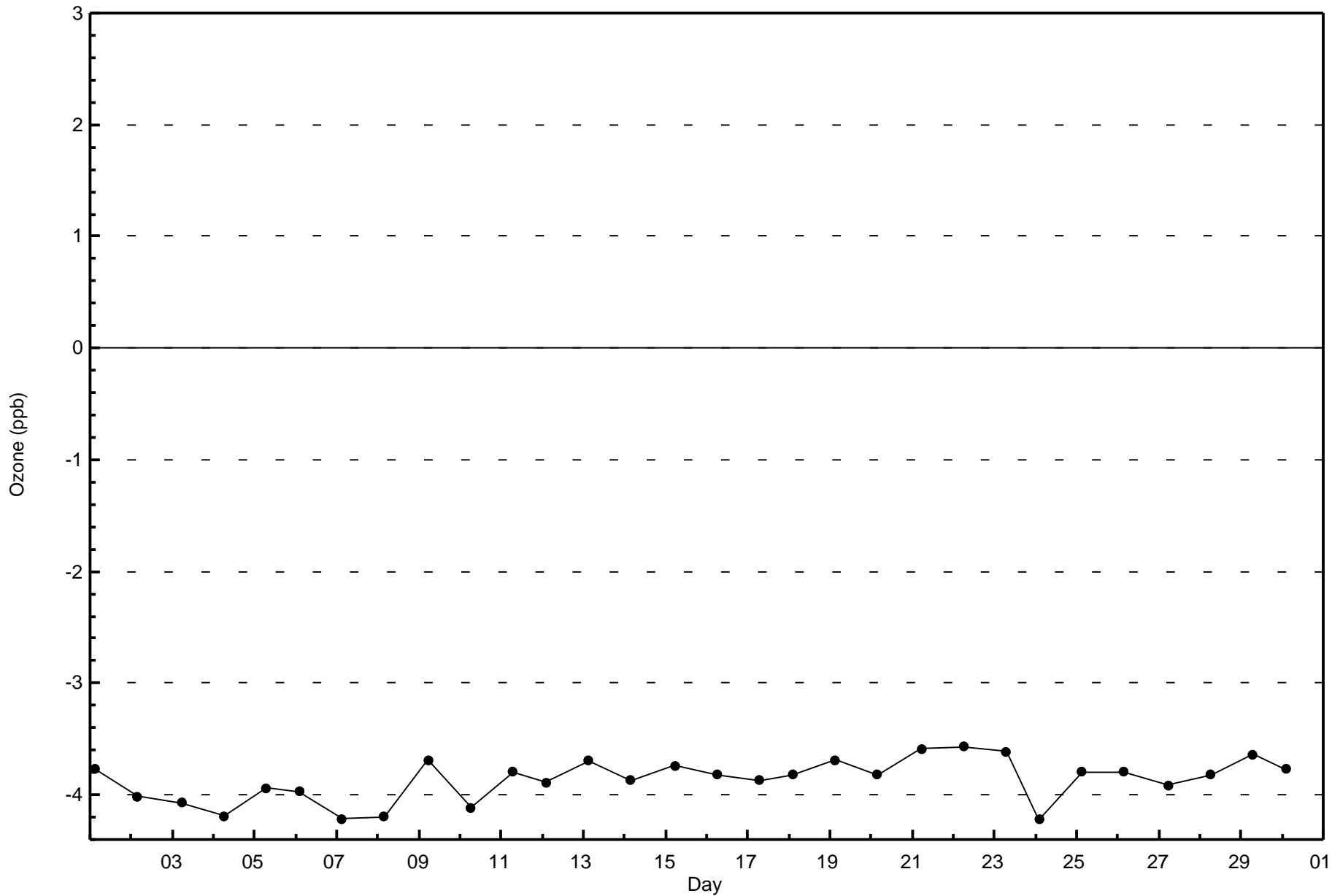


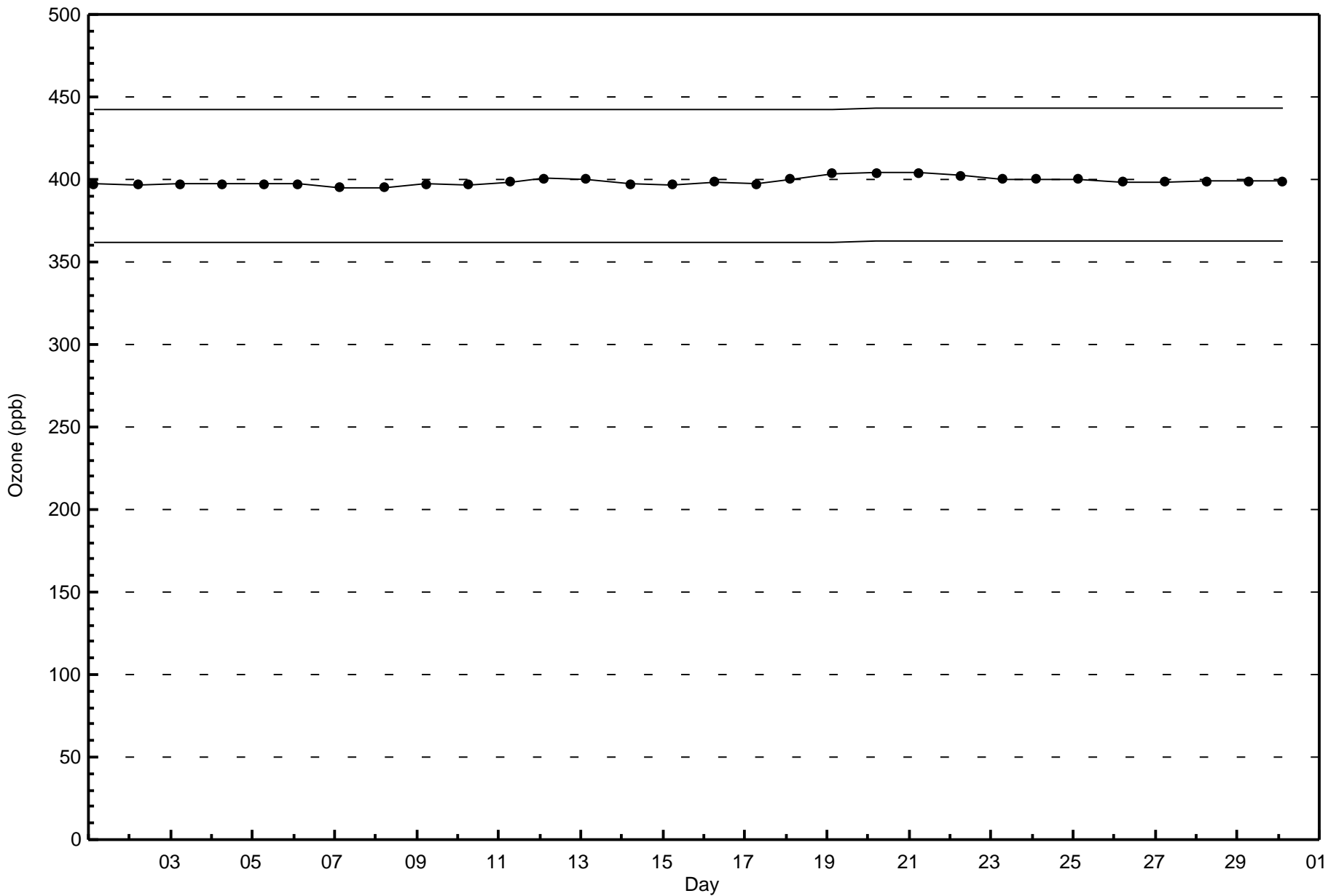
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Stony Mountain (AMS 18)



Total Number of Valid Hours: 622







Wood Buffalo Environmental Association

Summary of Hour Averages

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

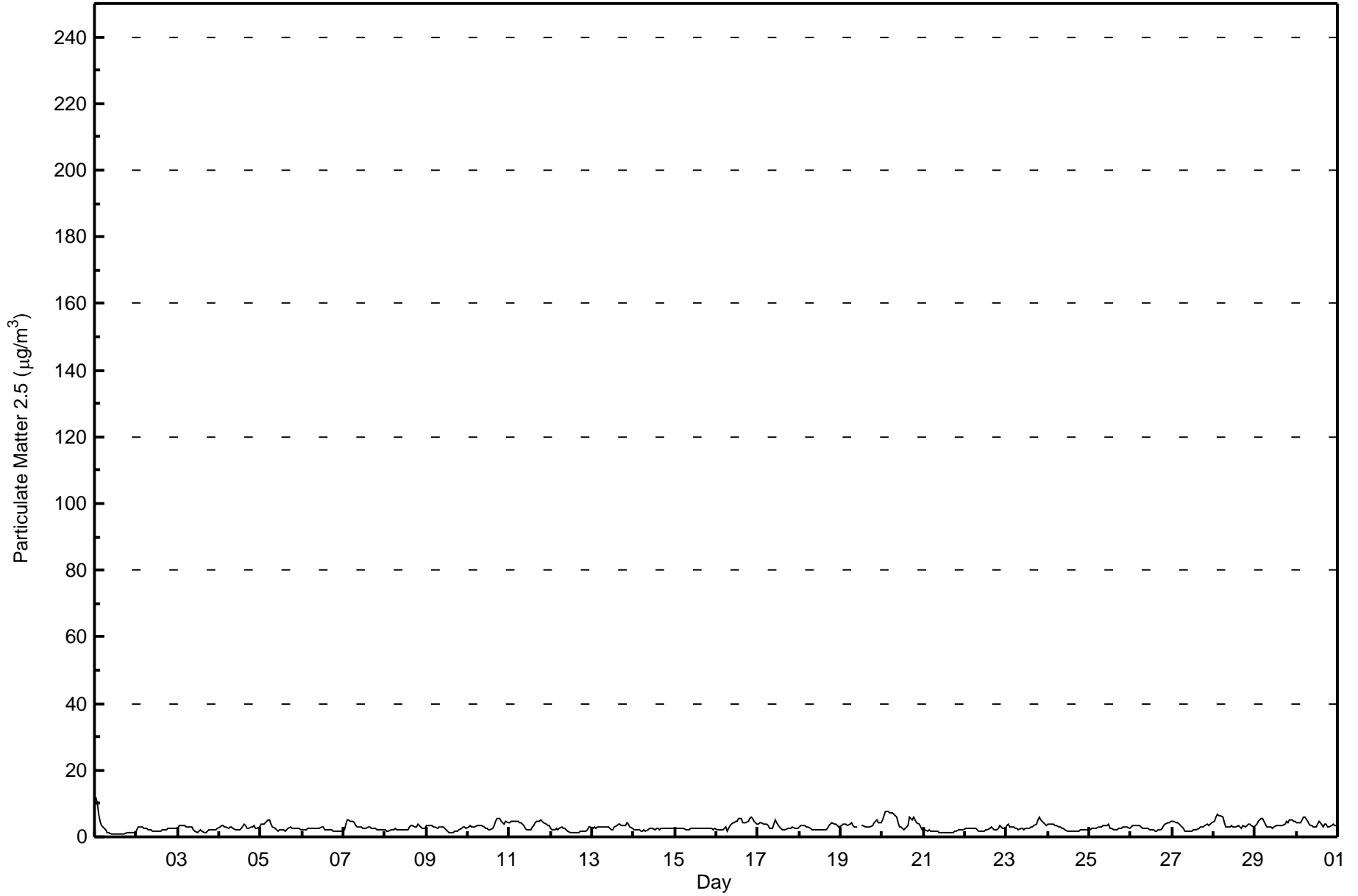
Stony Mountain - April 2017

Number of Exceedences (AAAQO): 24-hr: 0 Maximum Value: 11.7 µg/m ³ on Apr 1 01:00 Minimum Value: 1.0 µg/m ³ on Apr 1 11:00 Maximum Diurnal Average: 3.7 µg/m ³ at hour 2 Monthly Average: 2.96 µg/m ³		Maximum Daily Average: 4.9 µg/m ³ on Apr 20 Minimum Daily Average: 1.7 µg/m ³ on Apr 21 Minimum Diurnal Average: 2.3 µg/m ³ at hour 13 Percentiles: P ₁ = 1.0 P ₁₀ = 1.7 Q ₁ = 2.2 Median = 2.7 O ₃ = 3.5 P ₉₀ = 4.6 P ₉₉ = 7.1		Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2 Hours of Calibration: 2 Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Apr	11.7	10.0	6.9	4.7	3.5	2.3	2.0	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.2	1.3	1.3	2.5	11.7																							
2-Apr	2.2	3.0	2.9	2.8	2.7	2.6	2.6	2.1	2.0	1.9	1.8	1.8	1.6	1.6	1.8	2.3	2.2	2.2	2.5	2.5	2.7	2.6	2.6	2.6	2.3	3.0																						
3-Apr	2.8	3.4	3.3	3.2	3.2	3.0	3.0	2.9	2.9	2.2	1.6	1.4	1.5	1.9	1.7	1.5	1.4	1.8	2.2	2.3	2.2	2.0	2.1	2.5	2.3	3.4																						
4-Apr	2.9	3.5	3.2	3.0	2.8	2.7	2.8	2.9	2.6	2.1	1.9	1.9	2.0	2.6	3.7	3.5	2.7	2.6	2.9	3.1	3.2	2.6	2.4	2.9	2.8	3.7																						
5-Apr	3.9	4.0	3.9	4.5	5.1	4.9	3.9	3.1	2.5	2.0	1.8	2.0	2.0	2.0	1.9	2.2	2.8	2.9	2.5	2.5	2.5	2.4	2.3	2.9	5.1																							
6-Apr	2.2	2.2	2.2	2.3	2.4	2.5	2.6	2.6	2.7	2.6	2.6	2.8	2.9	2.3	2.2	2.0	1.9	1.9	1.9	1.8	1.8	1.9	1.8	1.9	2.3	2.9																						
7-Apr	2.2	3.8	5.1	5.0	4.7	4.8	4.0	3.5	3.1	2.9	2.8	2.7	2.4	2.6	2.9	3.1	2.7	2.5	2.4	2.3	2.1	2.3	2.2	2.2	3.1	5.1																						
8-Apr	1.9	1.9	1.9	2.0	2.0	2.1	2.6	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.8	3.2	3.4	3.0	3.1	3.7	3.2	2.6	2.5	2.7	2.5	3.7																						
9-Apr	3.3	3.5	3.3	3.2	3.0	2.9	2.7	2.9	3.2	3.0	2.9	2.0	1.5	1.4	1.4	1.4	1.6	1.6	1.7	2.0	2.6	3.0	2.9	2.7	2.5	3.5																						
10-Apr	2.8	3.2	3.1	2.9	3.0	3.3	3.3	3.4	3.3	2.9	2.7	2.6	2.2	2.1	2.3	3.2	4.5	5.3	5.4	4.6	4.2	3.9	4.7	4.3	3.5	5.4																						
11-Apr	4.3	4.7	4.8	4.6	4.7	4.8	4.4	4.0	3.3	2.5	1.9	2.1	2.3	2.9	3.3	4.3	4.7	4.7	5.2	4.8	4.3	3.6	3.3	3.3	3.9	5.2																						
12-Apr	2.6	2.3	2.3	2.4	2.3	2.4	2.9	2.7	2.5	2.0	1.8	1.5	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.8	2.3	2.8	2.9	2.0	2.9																						
13-Apr	2.7	2.8	2.7	2.8	3.1	2.9	2.9	3.1	3.2	2.8	2.5	2.0	2.2	2.8	3.4	3.9	3.8	3.3	3.4	3.6	4.1	3.8	3.0	2.7	3.1	4.1																						
14-Apr	2.2	2.2	2.2	2.0	1.8	1.8	1.9	1.9	2.2	2.4	2.8	2.4	2.2	2.5	2.4	2.3	2.4	2.5	2.5	2.5	2.4	2.6	2.6	2.5	2.3	2.8																						
15-Apr	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.5	2.6	2.7	2.6	2.7	2.7	2.6	2.5	2.5	2.3	2.5	2.5	2.7																						
16-Apr	2.2	2.1	2.1	2.0	1.9	3.1	1.6	2.5	3.3	4.1	4.3	4.5	4.9	5.7	5.6	4.4	4.0	4.2	4.7	5.6	6.0	5.4	4.9	3.7	3.9	6.0																						
17-Apr	3.8	4.1	4.2	4.0	3.9	3.7	3.2	2.7	2.4	3.8	5.0	4.2	3.1	2.7	2.3	2.2	2.3	2.5	2.7	2.7	2.8	2.7	2.6	2.4	3.2	5.0																						
18-Apr	3.0	3.5	3.3	3.3	2.9	2.9	2.5	2.3	2.2	2.1	2.2	2.2	2.2	2.3	2.1	2.3	2.5	3.3	4.0	4.2	3.8	3.7	3.5	3.0	2.9	4.2																						
19-Apr	3.2	3.7	3.7	3.7	3.6	3.7	4.1	3.5	3.0	2.8	C	C	3.2	3.3	3.0	2.9	2.9	2.9	3.3	4.2	4.7	4.9	4.4	4.1	3.6	4.9																						
20-Apr	5.0	6.4	7.8	7.5	7.1	7.2	7.1	6.6	5.8	4.2	2.9	2.9	2.3	2.3	2.8	3.4	5.8	5.1	6.1	4.9	4.3	3.7	3.0	2.3	4.9	7.8																						
21-Apr	2.1	2.0	1.9	2.0	1.9	1.7	1.6	1.7	1.6	1.2	1.2	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.7	1.9	2.0	2.1	2.1	2.1	1.7	2.1																						
22-Apr	2.5	2.5	2.6	2.5	2.5	2.5	2.4	2.2	1.6	1.6	1.6	1.6	1.9	2.2	2.4	2.8	2.7	2.3	2.2	2.7	3.4	3.0	2.6	2.7	2.4	3.4																						
23-Apr	3.3	3.7	3.1	3.0	2.9	2.4	2.4	2.3	2.4	2.1	2.3	2.5	2.7	2.8	3.1	3.6	4.0	4.9	5.8	5.1	4.4	3.9	3.6	3.3	5.8																							
24-Apr	3.7	3.9	4.0	3.6	3.5	3.5	3.1	2.8	2.5	2.5	2.0	1.7	1.7	1.6	1.5	1.6	1.5	1.5	1.7	2.0	2.1	2.1	2.2	2.4	4.0																							
25-Apr	2.2	2.3	2.6	2.7	2.7	2.8	2.9	3.0	3.2	3.3	3.4	3.6	2.7	2.4	2.2	2.2	2.3	2.5	2.4	2.9	3.1	2.9	2.8	2.7	2.7	3.6																						
26-Apr	2.9	3.4	3.3	3.3	3.3	3.4	2.9	2.5	2.5	2.6	2.4	2.2	2.3	2.1	1.9	1.8	2.0	2.3	2.6	3.2	3.7	4.1	4.1	4.8	2.9	4.8																						
27-Apr	4.6	4.6	4.4	4.2	3.8	3.3	2.6	1.7	1.7	1.6	1.6	1.8	2.0	2.0	2.0	2.5	2.9	3.0	2.9	3.4	3.8	3.5	3.7	4.3	3.0	4.6																						
28-Apr	4.7	6.0	6.6	6.3	6.2	5.8	4.3	2.8	2.8	2.9	3.2	3.0	3.0	3.1	3.3	3.2	2.8	3.2	3.1	3.2	3.8	3.7	3.3	3.1	3.9	6.6																						
29-Apr	3.3	3.9	4.8	5.5	5.5	4.7	3.7	3.0	3.0	3.0	2.5	3.0	3.5	3.4	3.3	3.6	3.3	4.0	4.7	4.4	5.2	5.2	4.7	4.6	4.0	5.5																						
30-Apr	4.2	4.3	4.3	5.1	5.8	6.0	4.8	3.6	3.5	3.6	3.1	3.0	3.7	4.8	4.2	3.0	3.9	3.7	3.1	3.0	3.5	3.7	3.5	3.4	4.0	6.0																						
																								3.4	3.7	3.6	3.6	3.5	3.4	3.1	2.8	2.7	2.5	2.4	2.3	2.3	2.5	2.5	2.6	2.8	2.9	3.0	3.2	3.3	3.2	3.0	2.9	Diurnal Average
																								11.7	10.0	7.8	7.5	7.1	7.2	7.1	6.6	5.8	4.2	5.0	4.5	4.9	5.7	5.6	4.4	5.8	5.3	6.1	5.8	6.0	5.4	4.9	4.8	Diurnal Maximum
C - Calibration																																																
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³																																																



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	685	95.40	95.40
6 - 15	26	3.62	99.03
16 - 25	0	0.00	99.03
26 - 80	0	0.00	99.03
> 81.0	0	0.00	99.03

Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Stony Mountain - April 2017

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	16	41	91	43	62	35	41	59	37	59	31	8	32	26	22	14	617
6 - 15	1	0	0	0	0	0	1	1	4	9	8	0	1	1	0	0	26
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	41	91	43	62	35	42	60	41	68	39	8	33	27	22	14	643

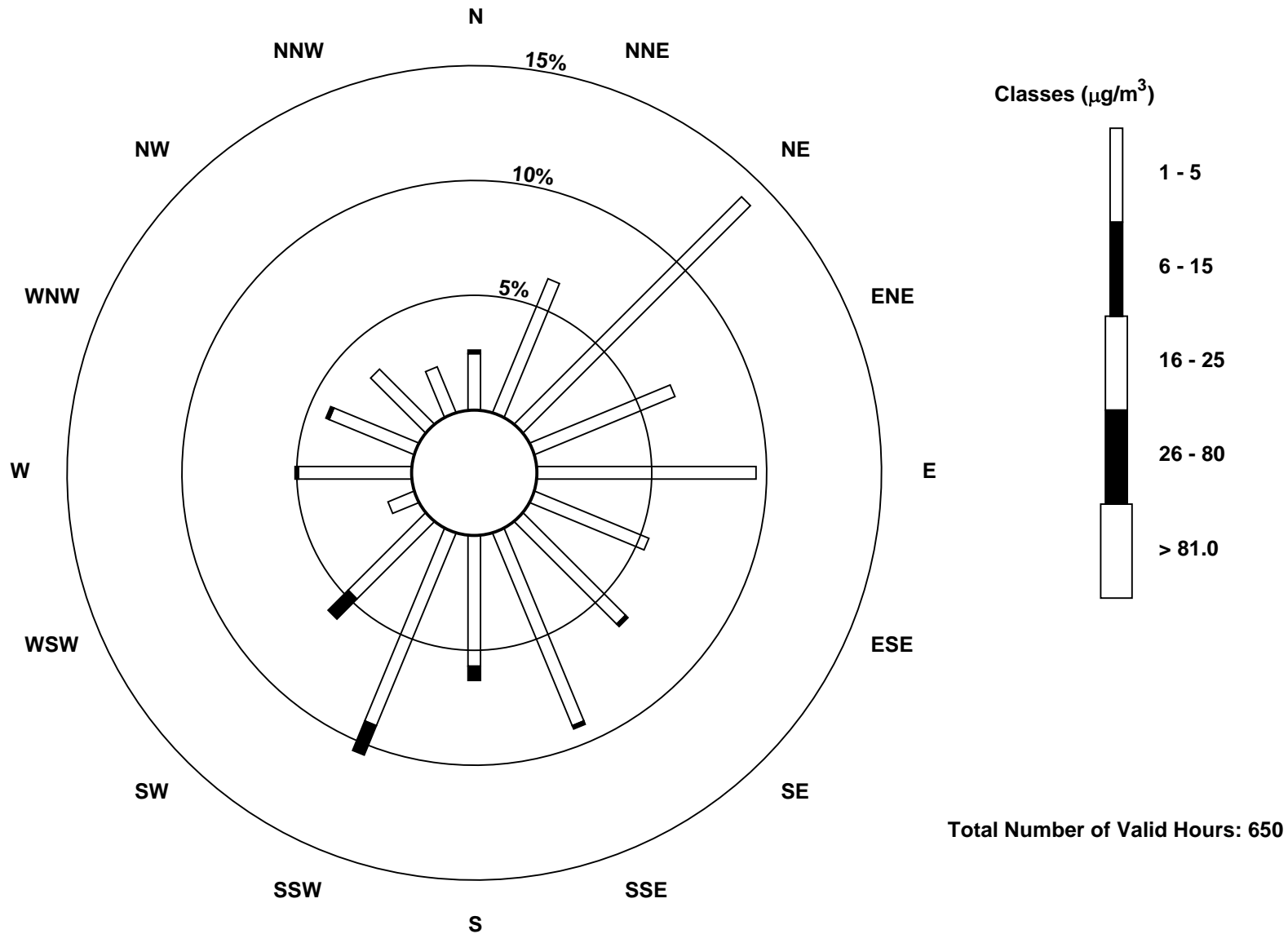
Total Number of Valid Hours: 650

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain (AMS 18)



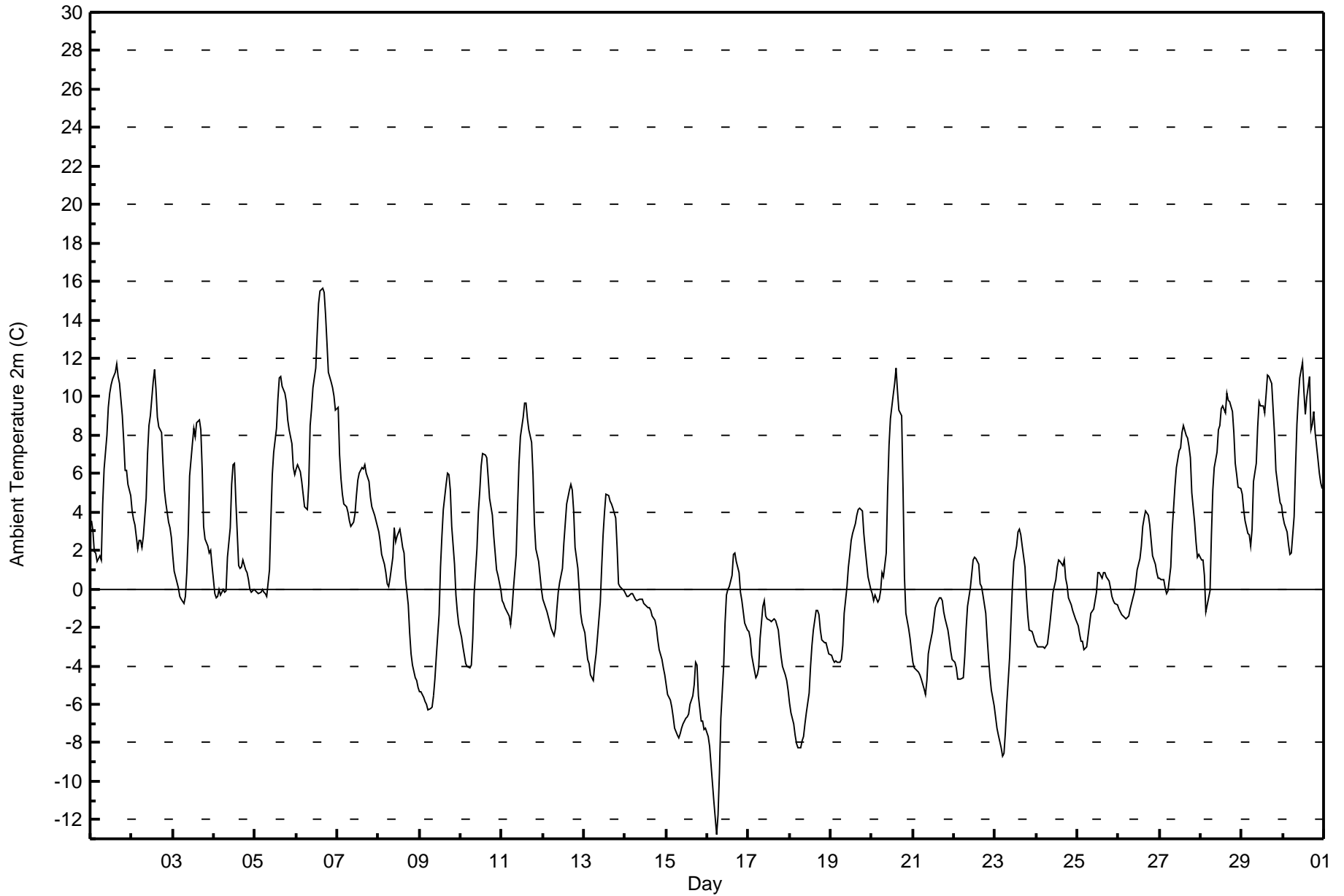


Maximum Value: 15.7 C on Apr 6 16:00																				Maximum Daily Average: 9.9 C on Apr 6					Hours in Service: 720				
Minimum Value: -12.8 C on Apr 16 06:00																				Minimum Daily Average: -6.3 C on Apr 15					Hours of Data: 720				
Maximum Diurnal Average: 5.0 C at hour 16																				Minimum Diurnal Average: -2.2 C at hour 6					Hours of Missing Data: 0				
Monthly Average: 1.36 C																				Percentiles: P ₁ = -8.6 P ₁₀ = -4.7 Q ₁ = -2.0 Median = 0.7 Q ₃ = 4.8 P ₉₀ = 8.8 P ₉₉ = 12.4					Hours of Calibration: 0				
																				Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Apr	3.6	3.0	1.9	1.8	1.4	1.7	1.5	4.4	6.2	8.0	9.5	10.2	10.6	10.9	11.3	11.7	11.1	10.7	9.0	7.7	6.2	6.2	5.5	4.8	6.6	11.7			
2-Apr	4.1	3.6	3.3	2.1	2.5	2.5	2.2	2.7	4.7	7.0	8.5	9.0	10.8	11.4	10.4	8.9	8.5	8.2	6.5	5.2	4.5	3.5	3.2	2.7	5.7	11.4			
3-Apr	1.7	0.9	0.3	0.0	-0.4	-0.5	-0.7	-0.4	0.9	2.8	5.9	7.5	8.3	7.9	8.7	8.8	8.3	6.2	3.3	2.6	2.2	1.9	2.0	1.2	3.3	8.8			
4-Apr	-0.2	-0.5	-0.4	-0.1	-0.4	0.0	-0.2	-0.1	1.7	3.1	5.4	6.5	6.6	4.5	1.2	1.0	1.1	1.5	1.0	0.8	0.5	0.0	-0.2	0.0	1.4	6.6			
5-Apr	-0.1	-0.2	-0.3	-0.2	0.0	-0.1	-0.2	-0.4	1.0	3.6	5.9	7.1	8.4	9.9	11.0	11.0	10.5	10.2	9.8	8.8	8.3	7.6	6.3	5.9	5.2	11.0			
6-Apr	6.2	6.5	6.1	5.6	4.9	4.3	4.1	5.4	8.5	9.4	10.5	11.5	13.3	14.8	15.5	15.7	15.4	14.3	12.8	11.3	10.7	10.5	10.1	9.3	9.9	15.7			
7-Apr	9.4	7.0	5.7	4.9	4.4	4.2	4.0	3.6	3.2	3.4	3.9	4.8	5.7	6.0	6.3	6.3	6.4	6.0	5.6	4.8	4.2	4.0	3.8	3.3	5.0	9.4			
8-Apr	2.9	2.4	1.8	1.3	0.8	0.3	0.1	0.6	1.6	3.2	2.4	2.7	3.1	2.7	2.2	1.9	0.6	-0.8	-2.3	-3.4	-4.0	-4.6	-4.8	-5.1	0.2	3.2			
9-Apr	-5.3	-5.3	-5.6	-5.8	-6.0	-6.3	-6.2	-6.1	-5.6	-4.7	-3.5	-1.3	1.1	2.8	4.1	5.4	6.1	5.9	5.1	3.3	1.3	-0.3	-1.2	-1.8	-1.3	6.1			
10-Apr	-2.5	-3.0	-3.5	-3.9	-4.0	-4.1	-4.0	-2.6	-0.3	2.1	4.0	5.1	6.4	7.0	7.0	6.9	5.8	4.7	3.9	2.7	1.9	1.0	0.7	0.0	1.3	7.0			
11-Apr	-0.6	-0.8	-1.0	-1.3	-1.4	-1.8	-1.1	0.0	1.8	4.3	6.5	7.9	8.9	9.6	9.6	8.9	8.3	7.6	6.0	3.4	2.1	1.4	0.7	0.0	3.3	9.6			
12-Apr	-0.6	-0.8	-1.2	-1.5	-1.8	-2.1	-2.4	-2.1	-1.0	-0.2	0.4	1.1	2.3	3.4	4.4	5.2	5.5	5.2	4.0	2.2	1.0	-0.1	-1.2	-1.8	0.7	5.5			
13-Apr	-2.3	-3.0	-3.7	-3.9	-4.5	-4.8	-4.0	-3.4	-2.5	-0.7	1.1	2.8	4.0	4.9	4.8	4.6	4.4	4.2	3.7	2.1	0.3	0.1	0.0	-0.1	0.2	4.9			
14-Apr	-0.2	-0.4	-0.4	-0.2	-0.3	-0.4	-0.5	-0.6	-0.6	-0.5	-0.6	-0.7	-0.9	-1.0	-1.0	-1.1	-1.4	-1.7	-2.0	-2.7	-3.1	-3.7	-4.1	-4.5	-1.4	-0.2			
15-Apr	-5.0	-5.5	-5.8	-6.2	-6.7	-7.2	-7.6	-7.7	-7.5	-7.3	-7.0	-6.7	-6.6	-6.5	-6.0	-5.6	-5.0	-3.8	-3.9	-5.6	-6.9	-6.9	-7.3	-7.2	-6.3	-3.8			
16-Apr	-7.7	-8.2	-9.2	-10.1	-11.0	-12.8	-11.8	-9.6	-6.7	-4.1	-1.8	-0.3	-0.1	0.1	0.7	1.8	1.9	1.5	0.8	-0.2	-0.6	-1.2	-1.8	-2.1	-3.8	1.9			
17-Apr	-2.2	-2.5	-3.5	-4.2	-4.6	-4.5	-4.1	-2.6	-0.9	-0.6	-1.4	-1.5	-1.6	-1.7	-1.7	-1.6	-1.7	-2.1	-2.8	-3.5	-4.1	-4.5	-4.8	-5.2	-2.8	-0.6			
18-Apr	-5.9	-6.4	-7.0	-7.6	-8.0	-8.3	-8.2	-7.9	-7.6	-7.0	-6.4	-5.4	-4.0	-3.0	-2.2	-1.1	-1.1	-1.3	-2.2	-2.6	-2.8	-2.8	-3.1	-3.4	-4.8	-1.1			
19-Apr	-3.5	-3.7	-3.8	-3.8	-3.8	-3.8	-3.7	-3.0	-1.3	0.2	1.1	1.8	2.5	2.9	3.4	3.8	4.1	4.2	4.1	2.9	2.1	1.4	0.6	0.0	0.2	4.2			
20-Apr	-0.3	-0.6	-0.4	-0.7	-0.5	-0.1	0.8	0.6	1.9	5.1	7.5	8.9	10.1	10.7	11.5	10.4	9.3	9.0	5.1	0.6	-1.2	-2.1	-2.6	-3.3	3.3	11.5			
21-Apr	-3.8	-4.1	-4.3	-4.3	-4.5	-4.7	-5.2	-5.5	-4.8	-3.4	-2.9	-2.2	-1.5	-1.0	-0.8	-0.5	-0.5	-0.6	-1.2	-1.6	-2.1	-2.7	-3.2	-3.7	-2.9	-0.5			
22-Apr	-3.8	-4.1	-4.7	-4.7	-4.7	-4.6	-3.5	-2.1	-0.9	0.0	0.8	1.5	1.6	1.6	1.3	0.3	0.1	-0.3	-1.3	-2.5	-3.6	-4.5	-5.3	-6.1	-2.1	1.6			
23-Apr	-6.7	-7.3	-7.6	-8.3	-8.7	-8.5	-7.5	-6.0	-3.6	-1.7	0.1	1.4	2.2	2.9	3.1	2.8	2.2	1.1	-0.3	-1.4	-2.1	-2.2	-2.5	-2.7	-2.5	3.1			
24-Apr	-2.9	-3.0	-3.0	-3.0	-3.0	-3.1	-2.9	-2.3	-1.6	-0.9	-0.2	0.5	1.2	1.5	1.4	1.2	1.5	0.6	0.2	-0.4	-0.8	-1.1	-1.3	-1.6	-1.0	1.5			
25-Apr	-1.9	-2.3	-2.7	-2.7	-3.2	-3.0	-2.4	-1.8	-1.3	-1.0	-0.6	-0.2	0.9	0.9	0.6	0.8	0.8	0.6	0.4	0.0	-0.4	-0.6	-0.8	-0.8	-0.9	0.9			
26-Apr	-1.1	-1.2	-1.3	-1.5	-1.6	-1.5	-1.4	-1.0	-0.4	-0.2	0.3	1.0	1.6	2.3	3.3	3.7	4.1	3.8	3.4	2.5	1.7	1.3	0.8	0.6	0.8	4.1			
27-Apr	0.5	0.5	0.5	0.0	-0.2	-0.1	1.2	3.0	4.2	5.4	6.3	7.2	7.3	8.1	8.5	8.0	7.8	7.4	6.8	5.0	3.5	2.5	1.6	1.8	4.0	8.5			
28-Apr	1.5	1.5	0.7	-1.2	-0.8	-0.1	2.8	5.1	6.3	7.1	8.3	8.5	9.3	9.5	9.1	10.2	9.8	9.7	9.3	8.1	6.6	5.9	5.3	5.2	5.7	10.2			
29-Apr	4.9	4.1	3.6	2.9	2.8	2.2	3.1	5.6	6.5	8.5	9.7	9.5	9.5	9.2	10.1	11.1	11.1	10.7	9.4	8.0	6.2	5.0	4.5	4.3	6.8	11.1			
30-Apr	3.8	3.4	3.0	2.3	1.8	1.9	3.8	6.3	8.6	10.0	11.0	11.8	10.3	9.1	10.0	11.0	8.3	8.6	9.2	8.1	6.7	6.0	5.5	5.2	6.9	11.8			
																								Diurnal Average					
																								Diurnal Maximum					



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 2m (AT 2m) - C
Stony Mountain - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Stony Mountain - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	325	45.14	45.14
0 - 10	355	49.31	94.44
10 - 20	40	5.56	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



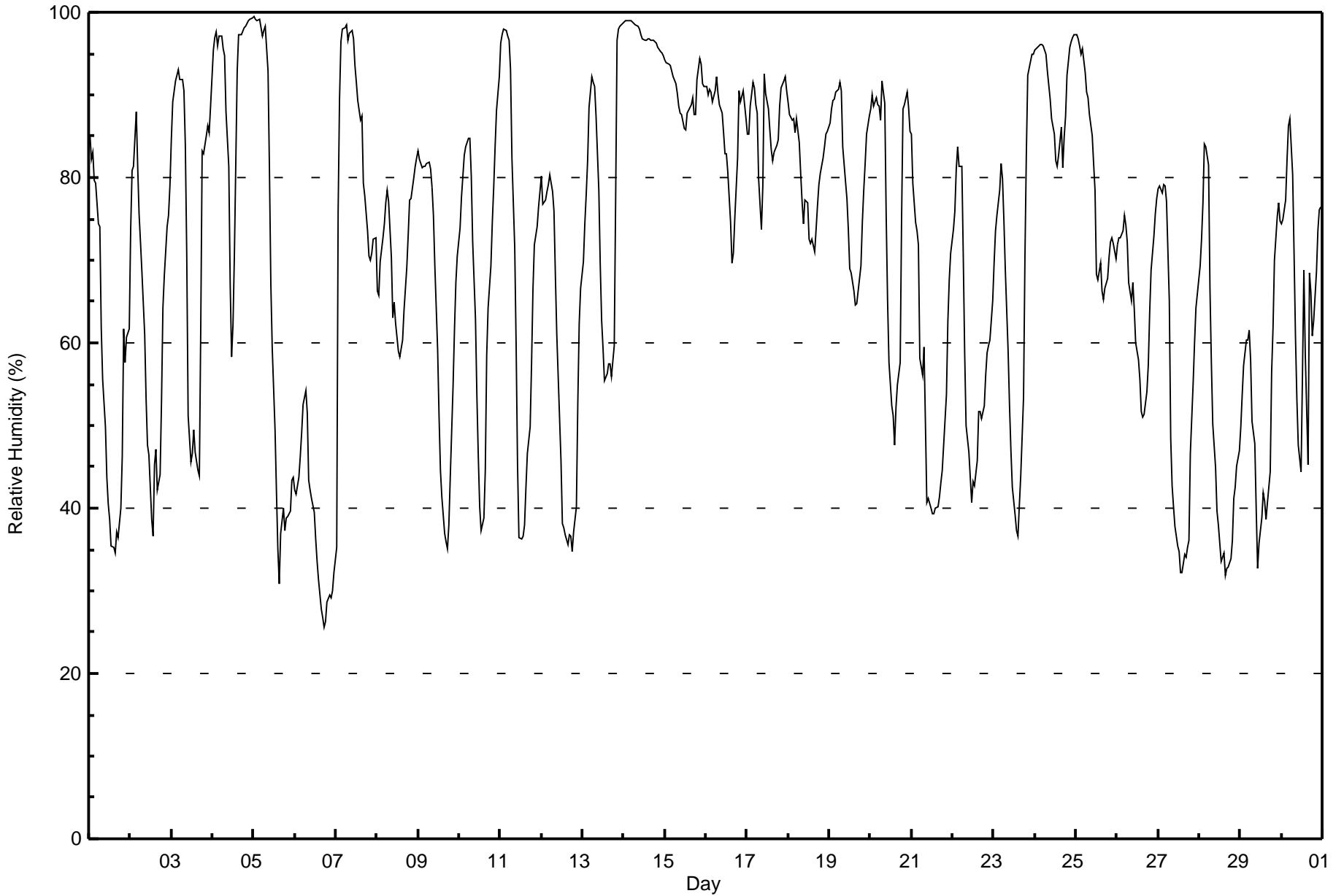
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Stony Mountain - April 2017

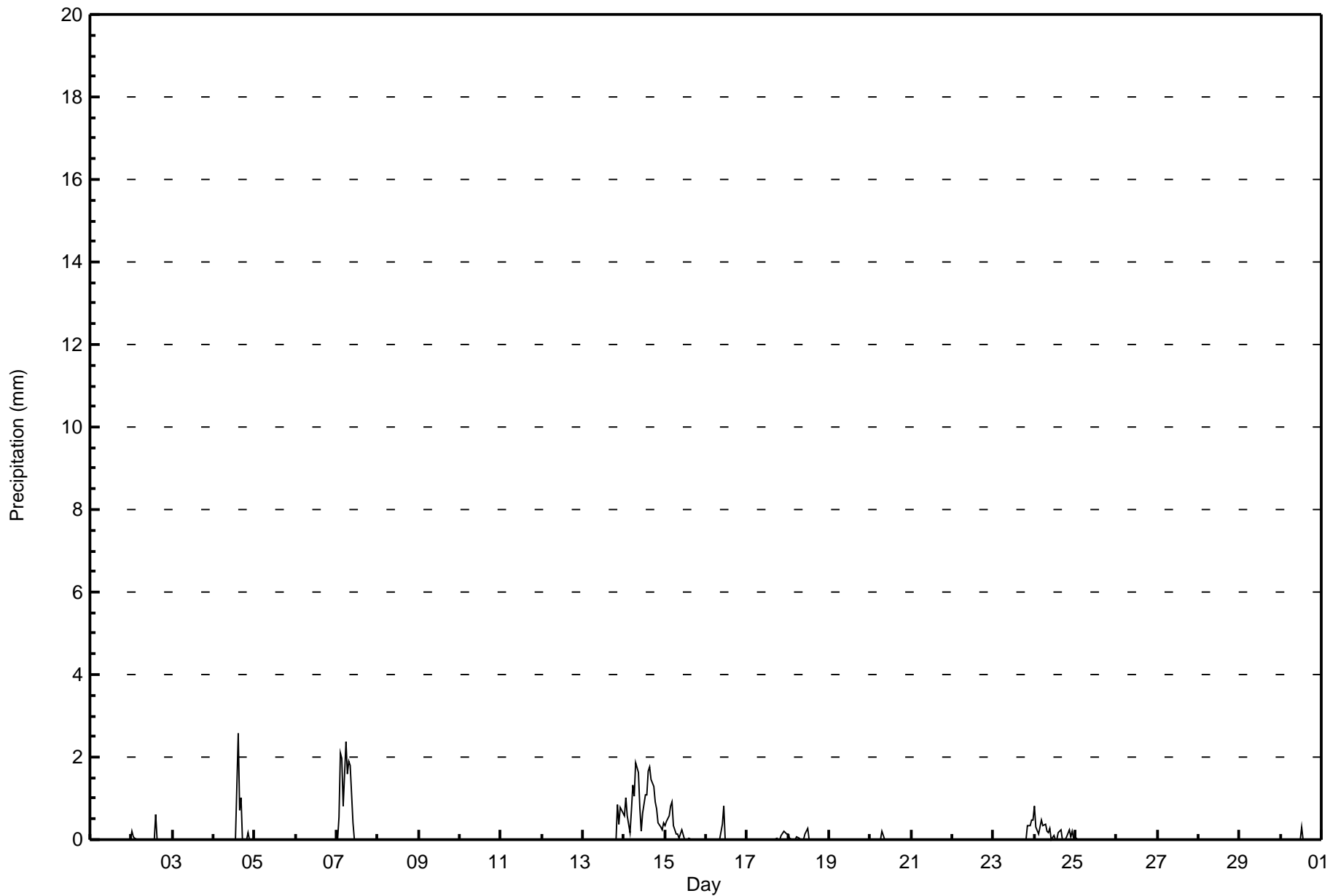
Maximum Value: 99 % on Apr 5 01:00																		Maximum Daily Average: 97.3 % on Apr 14																		Hours in Service: 720														
Minimum Value: 26 % on Apr 6 18:00																		Minimum Daily Average: 37.7 % on Apr 6																		Hours of Data: 720														
Maximum Diurnal Average: 84.9 % at hour 5																		Minimum Diurnal Average: 55.3 % at hour 16																		Hours of Missing Data: 0														
Monthly Average: 70.4 %																		Percentiles: P ₁ = 30 P ₁₀ = 39 Q ₁ = 53 Median = 74 Q ₃ = 88 P ₉₀ = 96 P ₉₉ = 99																		Hours of Calibration: 0														
																																				Percent Operational Time: 100.0														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	85	82	83	80	79	74	74	62	56	50	44	41	39	35	35	35	37	36	40	46	62	58	61	62	56.4	85																								
2-Apr	74	81	81	88	81	76	72	69	61	53	48	46	39	37	45	47	42	44	53	64	68	74	75	79	62.4	88																								
3-Apr	85	89	92	92	93	92	92	90	84	71	51	46	47	49	47	45	44	62	83	83	85	86	85	89	74.2	93																								
4-Apr	95	97	98	96	97	97	96	95	88	81	67	58	62	71	93	97	97	97	98	98	99	99	99	99	90.6	99																								
5-Apr	99	99	99	99	98	97	98	98	93	81	67	59	49	42	35	31	37	40	37	39	39	40	43	44	65.2	99																								
6-Apr	42	42	44	46	49	52	54	52	43	42	41	40	36	34	31	28	27	26	26	29	29	29	30	32	37.7	54																								
7-Apr	35	76	90	96	98	98	98	97	98	98	97	93	91	89	87	87	79	78	74	71	70	71	73	73	84.0	98																								
8-Apr	66	66	70	73	74	77	78	77	70	63	65	62	59	58	59	60	64	69	73	77	77	80	81	82	70.2	82																								
9-Apr	83	82	81	81	81	82	82	81	79	75	69	59	51	45	41	37	36	35	38	44	55	62	67	71	63.2	83																								
10-Apr	74	78	80	83	84	85	85	80	72	63	54	46	40	37	39	45	58	64	69	75	79	84	88	92	68.9	92																								
11-Apr	96	97	98	98	97	97	93	82	72	60	45	36	36	37	38	43	47	50	58	66	72	74	76	78	68.6	98																								
12-Apr	80	77	77	78	79	80	78	76	68	61	56	46	38	38	37	36	37	37	35	37	40	53	62	67	57.2	80																								
13-Apr	70	74	78	82	89	92	92	91	87	78	70	63	59	55	56	57	57	56	60	78	97	98	98	99	76.5	99																								
14-Apr	99	99	99	99	99	99	99	98	98	98	97	97	97	97	97	97	97	97	96	96	96	95	95	95	95	97.3	99																							
15-Apr	94	94	94	93	93	92	91	90	89	88	88	86	86	88	88	89	90	88	88	92	94	94	91	91	90.4	94																								
16-Apr	91	90	91	90	89	90	92	90	89	88	85	83	83	81	75	70	71	75	82	91	89	90	90	87	85.5	92																								
17-Apr	85	85	89	91	91	89	88	80	74	79	93	90	88	86	83	82	83	84	85	89	91	92	92	90	86.6	93																								
18-Apr	89	88	87	87	86	87	84	80	77	74	77	77	73	72	73	71	74	77	79	80	82	84	85	86	80.4	89																								
19-Apr	87	88	89	90	90	91	92	91	84	79	78	74	69	69	66	65	65	66	69	75	79	82	85	88	79.5	92																								
20-Apr	88	90	89	90	89	89	87	92	89	76	65	58	52	51	48	52	55	58	75	88	89	90	88	86	76.4	92																								
21-Apr	85	79	75	74	72	58	56	59	50	41	41	40	39	39	40	40	41	43	45	48	54	63	68	71	55.0	85																								
22-Apr	74	76	81	84	81	81	70	59	50	47	44	41	43	43	46	52	52	51	52	56	59	60	60	65	59.4	84																								
23-Apr	70	74	75	78	82	80	75	69	59	52	47	43	39	37	40	44	53	70	83	92	94	95	95	95	66.0	95																								
24-Apr	95	96	96	96	96	96	95	93	91	90	87	85	82	81	83	86	81	85	87	92	96	96	97	97	90.9	97																								
25-Apr	97	97	96	95	96	93	90	90	88	85	82	79	68	68	70	66	65	67	68	70	72	73	72	70	79.8	97																								
26-Apr	72	73	73	73	75	74	72	67	65	67	64	60	58	56	52	51	51	54	57	64	69	73	76	77	65.6	77																								
27-Apr	79	79	78	79	79	77	65	48	43	40	38	35	35	32	32	34	34	35	36	47	55	60	64	66	53.0	79																								
28-Apr	69	72	77	84	84	82	67	58	50	45	40	38	36	34	35	32	33	33	34	36	41	43	45	47	50.5	84																								
29-Apr	50	54	57	60	60	62	58	50	48	40	33	36	39	42	41	39	41	44	56	62	70	75	77	75	52.8	77																								
30-Apr	74	75	77	82	86	87	80	71	61	53	48	44	56	69	59	45	69	66	61	63	69	74	76	76	67.6	87																								
																								79.5	81.6	83.1	84.6	84.9	84.2	81.8	77.8	72.5	67.3	62.6	58.7	56.4	55.7	55.5	55.3	56.9	59.0	62.9	67.9	72.3	74.7	76.6	77.6	Diurnal Average		
																								99	99	99	99	99	99	99	98	98	98	97	97	97	97	97	97	97	97	98	98	99	99	99	99	99	Diurnal Maximum	





Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Stony Mountain - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Precipitation (PC) - mm
Stony Mountain - April 2017**

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	672	93.33	93.33
0.4 - 0.5	11	1.53	94.86
0.6 - 0.7	8	1.11	95.97
0.8 - 1.4	17	2.36	98.33
1.5 - 10	11	1.53	99.86
> 10	0	0.00	99.86

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

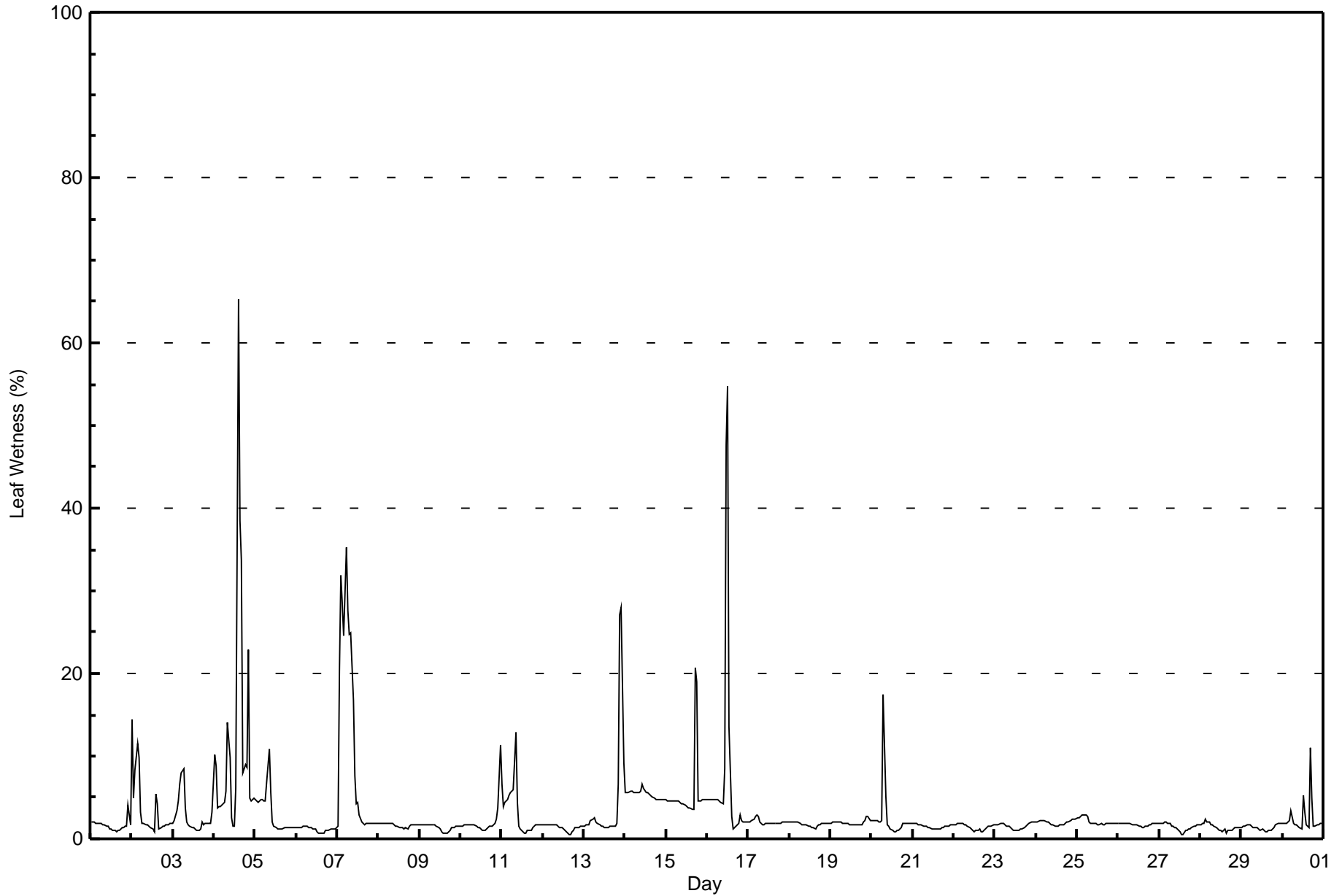
Stony Mountain - April 2017

Maximum Value: 65 % on Apr 4 15:00 Maximum Daily Average: 11.7 % on Apr 4																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Minimum Value: 0 % on Apr 27 15:00 Minimum Daily Average: 1.2 % on Apr 6 Maximum Diurnal Average: 4.0 % at hour 9 Minimum Diurnal Average: 2.1 % at hour 20 Monthly Average: 3.1 % Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 5 P ₉₉ = 31																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	4	2	1.6	4
2-Apr	14	5	8	11	10	3	2	2	2	2	2	1	1	1	5	4	1	1	1	2	2	2	2	2	3.6	14
3-Apr	2	2	3	5	7	8	8	4	2	2	2	1	1	1	1	1	2	2	2	2	2	2	3	2.7	8	
4-Apr	10	9	4	4	4	4	4	6	14	10	3	2	2	6	65	39	34	8	9	9	23	5	5	5	11.7	65
5-Apr	5	5	4	5	5	5	5	7	11	6	2	2	1	1	1	1	1	1	1	1	1	1	1	3.1	11	
6-Apr	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	2	
7-Apr	2	20	32	28	25	35	28	25	25	17	8	4	4	3	2	2	2	2	2	2	2	2	2	11.4	35	
8-Apr	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	1.6	2	
9-Apr	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1.4	2	
10-Apr	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	4	2.0	11	
11-Apr	7	4	4	5	5	6	6	6	13	4	1	1	1	1	1	1	1	1	1	2	2	2	2	3.2	13	
12-Apr	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.4	2	
13-Apr	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	7	27	28	9	4.4	28	
14-Apr	6	6	6	6	6	6	6	6	6	7	6	6	6	6	5	5	5	5	5	5	5	5	5	5.4	7	
15-Apr	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	21	19	5	5	5	5	5.6	21	
16-Apr	5	5	5	5	5	5	5	5	4	4	9	48	55	14	3	1	1	1	2	3	2	2	2	8.0	55	
17-Apr	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	3	
18-Apr	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	1.7	2	
19-Apr	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	1.9	3	
20-Apr	2	2	2	2	2	2	2	17	5	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2.5	17	
21-Apr	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1.5	2	
22-Apr	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.4	2	
23-Apr	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1.6	2	
24-Apr	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0	2	
25-Apr	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2.1	3	
26-Apr	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	2	1.7	2	
27-Apr	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1	1	1	1	2	2	2	1.4	2	
28-Apr	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	2	
29-Apr	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.4	2	
30-Apr	2	2	2	2	2	3	2	2	2	2	1	1	5	3	2	1	11	5	2	2	2	2	2	2.5	11	
																	Diurnal Average Diurnal Maximum									
3.1 3.3 3.7 3.8 3.7 4.0 3.6 3.9 4.0 2.9 2.2 3.2 3.5 2.1 3.8 2.7 2.8 2.5 2.4 2.1 2.8 2.9 3.1 2.7																	14 20 32 28 25 35 28 25 25 17 9 48 55 14 65 39 34 21 19 9 23 27 28 11									



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Stony Mountain - April 2017

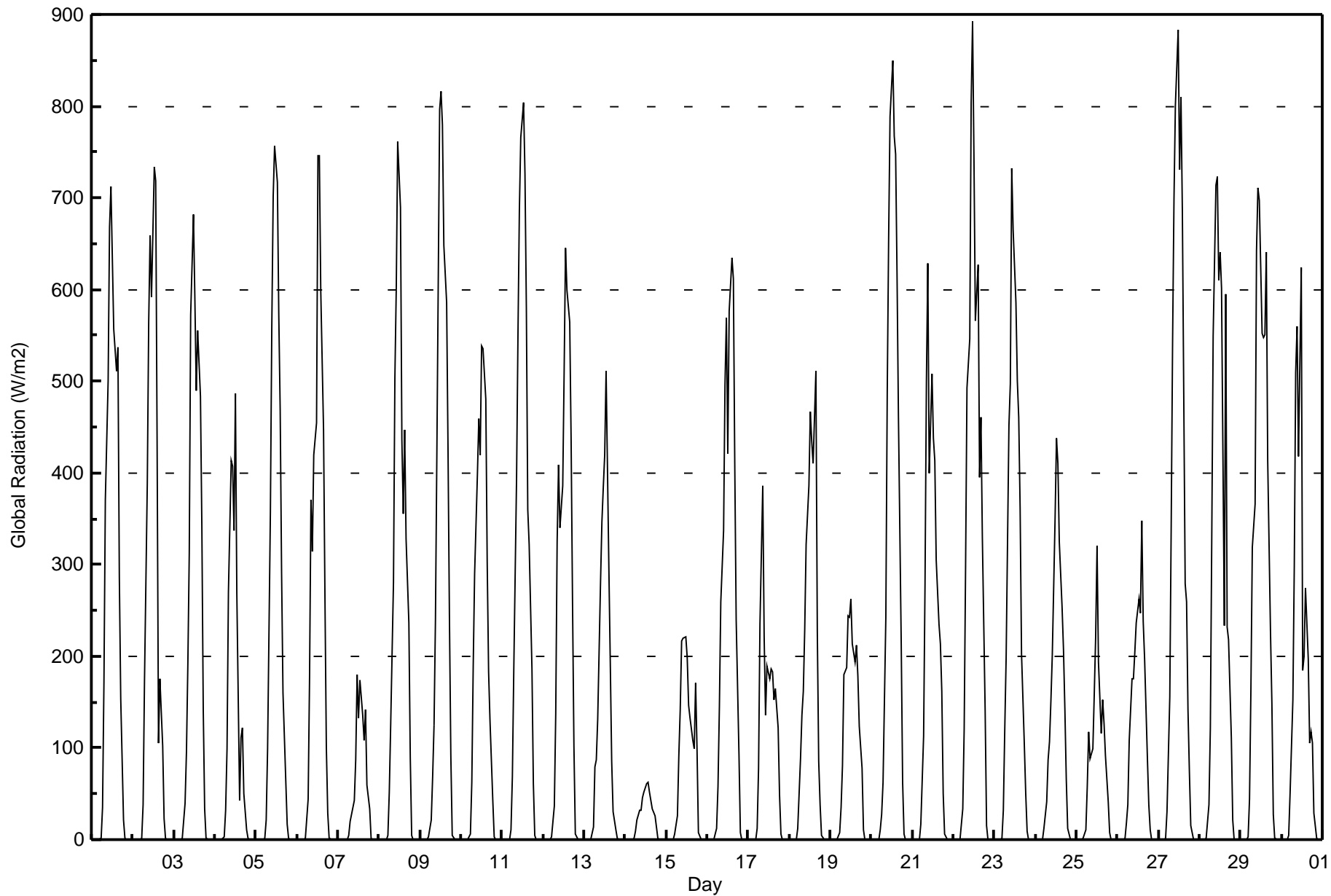
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	1	0.14	0.14
0.6 - 0.7	12	1.67	1.81
0.8 - 1.4	179	24.86	26.67
1.5 - 10	479	66.53	93.19
> 10	29	4.03	97.22

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 892 W/m2 on Apr 22 12:00		Maximum Daily Average: 269.3 W/m2 on Apr 22		Hours in Service: 720																							
Minimum Value: 0 W/m2 on Apr 1 01:00		Minimum Daily Average: 20.4 W/m2 on Apr 14		Hours of Data: 720																							
Maximum Diurnal Average: 512.1 W/m2 at hour 12		Minimum Diurnal Average: 0.1 W/m2 at hour 1		Hours of Missing Data: 0																							
Monthly Average: 168.6 W/m2		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 40 Q ₃ = 276 P ₉₀ = 557 P ₉₉ = 804		Hours of Calibration: 0																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	0	0	0	0	0	1	36	171	371	501	669	712	634	557	511	537	287	154	22	1	0	0	0	0	215.2	712	
2-Apr	0	0	0	0	0	2	39	174	389	564	659	591	734	719	435	105	175	102	23	1	0	0	0	0	196.4	734	
3-Apr	0	0	0	1	0	2	40	95	192	312	572	682	591	490	555	483	342	142	34	1	0	0	0	0	189.0	682	
4-Apr	0	0	0	0	0	2	32	98	270	414	408	337	487	268	42	112	122	50	11	1	0	0	0	0	110.7	487	
5-Apr	0	0	0	0	0	2	21	99	357	558	701	756	717	572	469	291	159	64	17	1	0	0	0	0	199.5	756	
6-Apr	0	0	0	0	0	2	44	177	371	315	420	455	746	746	600	447	266	101	30	1	0	0	0	0	196.7	746	
7-Apr	0	0	0	0	0	0	5	20	28	43	87	180	133	174	136	108	141	59	33	2	0	0	0	0	47.9	180	
8-Apr	0	0	0	0	0	5	52	125	280	504	603	761	690	437	356	447	328	237	91	4	0	0	0	0	205.1	761	
9-Apr	0	0	0	0	0	2	21	68	125	240	419	797	816	780	648	586	424	242	92	4	0	0	0	0	219.4	816	
10-Apr	0	0	0	0	0	6	63	189	289	398	459	419	539	535	480	302	183	130	43	3	0	0	0	0	168.2	539	
11-Apr	0	0	0	0	0	11	68	184	395	550	687	766	804	726	579	360	323	187	60	5	1	0	0	0	237.8	804	
12-Apr	0	0	0	0	0	3	36	137	325	409	340	386	510	646	600	564	434	259	103	6	0	0	0	0	198.3	646	
13-Apr	0	0	0	0	0	13	80	86	131	279	346	384	419	511	294	192	86	31	11	1	0	0	0	0	119.3	511	
14-Apr	0	0	0	0	0	1	10	22	33	32	47	51	62	63	53	43	33	25	13	2	0	0	0	0	20.4	63	
15-Apr	0	0	0	0	0	5	27	91	142	217	220	221	198	147	132	108	99	171	99	7	0	0	0	0	78.6	221	
16-Apr	0	0	0	0	0	12	58	145	259	336	496	569	421	576	635	612	408	240	94	8	0	0	0	0	202.9	635	
17-Apr	0	0	0	0	0	13	78	235	385	222	136	189	176	186	183	153	165	122	49	6	0	0	0	0	95.8	385	
18-Apr	0	0	0	0	0	12	88	136	161	229	323	387	466	435	410	511	227	86	38	5	0	0	0	0	146.5	511	
19-Apr	0	0	0	0	0	8	35	80	180	188	245	242	262	214	194	212	179	123	78	10	0	0	0	0	93.8	262	
20-Apr	0	0	0	0	0	11	28	63	243	489	656	788	850	767	747	616	462	213	63	6	0	0	0	0	250.2	850	
21-Apr	0	0	0	0	0	16	113	277	499	628	400	509	438	413	306	235	214	162	51	7	0	0	0	0	177.8	628	
22-Apr	0	0	0	0	1	33	121	296	492	546	804	892	743	565	628	395	461	330	140	16	1	0	0	0	269.3	892	
23-Apr	0	0	0	0	1	32	120	198	452	498	733	665	586	500	461	361	203	104	50	9	0	0	0	0	207.1	733	
24-Apr	0	0	0	0	1	12	41	87	107	151	201	350	438	411	324	253	207	141	65	12	0	0	0	0	116.7	438	
25-Apr	0	0	0	0	1	11	58	118	88	100	159	221	320	194	116	153	127	92	41	8	0	0	0	0	75.3	320	
26-Apr	0	0	0	0	1	19	39	109	175	175	205	236	263	247	348	238	197	89	39	10	0	0	0	0	99.5	348	
27-Apr	0	0	0	0	1	31	155	341	543	699	801	884	731	810	683	279	259	141	74	16	1	0	0	0	268.7	884	
28-Apr	0	0	0	0	2	38	122	328	548	714	723	610	641	600	234	595	232	218	111	22	1	0	0	0	239.2	723	
29-Apr	0	0	0	0	2	44	165	318	367	642	710	698	553	548	550	641	413	225	148	27	1	0	0	0	252.3	710	
30-Apr	0	0	0	0	5	51	153	298	510	559	418	624	184	199	275	197	106	117	106	29	1	0	0	0	159.7	624	
		0.1	0.1	0.1	0.1	0.6	13.4	64.9	158.9	290.3	383.7	454.9	512.1	505.1	467.8	399.5	337.9	242.0	145.2	60.9	7.6	0.3	0.1	0.1	0.1	Diurnal Average	
		0	0	0	1	5	51	165	341	548	714	804	892	850	810	747	641	462	330	148	29	1	0	0	0	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Stony Mountain - April 2017

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	328	45.56	45.56
21 - 100	86	11.94	57.50
101 - 300	136	18.89	76.39
301 - 600	116	16.11	92.50
601 - 900	54	7.50	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Stony Mountain - April 2017

Maximum Speed: 19 km/h on Apr 13 16:00	Maximum Daily Speed Average: 13.1 km/h on Apr 13	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 5 06:00	Minimum Daily Speed Average: 2.2 km/h on Apr 30	Hours of Data: 652
Maximum Diurnal Speed Average: 3.2 km/h at hour 10	Minimum Diurnal Speed Average: 0.8 km/h at hour 7	Hours of Missing Data: 68
Monthly Average Velocity: 1.8 km/h 113.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 9 Q ₃ = 11 P ₉₀ = 13 P ₉₉ = 17	Percent Operational Time: 90.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW12	SW11	SW9	SW11	SW11	SW11	SW12	WSW12	W15	W14	W14	W13	W13	W13	WSW10	W11	W11	WNW8	W6	W10	W15	W13	W11	WNW9	WSW10.6	W15
2-Apr	WNW8	NW8	NW5	SW4	WSW8	W13	W16	W15	W13	WNW11	WNW10	W11	W12	W13	NW8	WNW10	W11	W8	WNW9	W14	W13	WNW10	W11	W13	W10.2	W16
3-Apr	WNW13	WNW10	WNW9	WNW10	WNW10	WNW9	WNW9	WNW9	NW7	NW5	NW7	NW8	NW10	NNW9	NNW8	NW9	NNW8	NNW8	NW8	WNW8	WNW7	WNW7	WNW8	NW4	WNW8.1	WNW13
4-Apr	NW2	N1	SSW4	SW5	W2	SW4	S5	SSW7	S5	SSE3	S5	SSE2	ESE13	SE9	SE7	SSW2	E3	N4	NNW1	S1	SSE4	AF	AF	AF	SSE2.7	ESE13
5-Apr	AF	AF	AF	AF	SSE1	SSE0	SE1	SE7	SE11	SSE14	SSE18	S17	S16	SSE16	S17	S18	S16	SSE13	SSE11	SSE11	SSE11	SSE11	S9	SSE10	SSE11.1	S18
6-Apr	SSE11	SSE11	S10	S9	S7	S7	SSW10	SW13	WSW10	W9	WSW9	W11	WNW10	NW8	W8	WNW7	W4	W5	WNW4	NW3	NNW3	N5	NNE6	ENE6	WSW3.9	SW13
7-Apr	SE6	E2	NE4	NNW4	NNW6	NW6	N7	NNE13	NNE10	NNE9	NNE11	NE9	ENE8	ENE10	NE10	NE11	ENE12	ENE9	NE10	NE9	NE9	NE8	NE10	NE13	NE7.6	NE13
8-Apr	NE15	NNE11	N11	N11	N9	N9	N9	N10	NNE14	NNE15	NNE16	NNE15	N12	NNE12	NNE11	NNE12	N11	NE12	NE12	NE11	NE13	NE11	NE10	NE8	NNE11.2	NNE16
9-Apr	NE8	NE6	ENE7	ENE8	NE6	ENE5	E4	E6	ESE5	E6	ESE5	ESE6	ESE6	SSE6	SE8	SSE7	S7	SSW9	S6	S6	SSW12	SSW11	S12	S12	SE4.2	S12
10-Apr	S13	SSW14	SSW13	S11	S11	SSW12	SSW10	S10	S7	SSE7	SSE8	SE8	ESE8	SE10	SSE8	SE6	SSE10	S10	SSW7	S5	S5	SSW6	SW7	SSW6	S8.1	SSW14
11-Apr	NNW2	NW2	WNW4	NW3	NW5	NW5	NNW4	N6	NNE8	NE9	NE9	NE11	NNE11	NE11	NNE12	NE13	NNE13	NNE11	NNE12	NNE11	NNE10	NE10	NE10	NE11	NNE7.6	NE13
12-Apr	NE9	NE9	NE8	NE8	NE9	NE8	NE10	NNE9	NE11	NE10	NE9	NE10	NE10	NE9	NE8	E8	E8	E8	ENE9	NE9	NE10	ENE10	E9	E9	NE8.6	NE11
13-Apr	ESE7	E6	NE7	ENE9	E9	ENE8	ENE10	E14	E13	ENE13	ENE15	ENE17	ENE16	E18	ENE18	ENE19	ENE17	ENE17	ENE17	E17	ENE12	ENE14	ENE14	AF	ENE13.1	ENE19
14-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
15-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSW10	SSW12	SSW11	SSW14	SSW14	SSW11	SSW11	SSW11	S8	S9	S14	SSW15	SSW16	SSW16	----	SSW16
17-Apr	SSW14	SSW12	SSW10	SSW10	SSW11	SSW8	NNE5	NE3	NE6	NE9	NNE10	NE11	NE11	NE11	NE11	NE12	NE14	NE12	NE10	NE10	NNE9	NNE9	NE8	NE10	NE4.6	SSW14
18-Apr	NE11	NE12	NE13	NE12	NE11	NE9	ENE11	ENE11	NE10	ENE11	ENE10	ENE10	ENE9	E8	E7	E8	ENE8	ENE6	NE8	NE7	E5	E4	NNE5	NE4	ENE8.3	NE13
19-Apr	E3	N2	NNE3	E2	AF	ENE1	SSE3	S2	NW2	WNW3	WSW5	SW7	SW8	SW8	SW9	WSW9	SW7	WSW6	SSW5	SSW5	SSW6	SSW6	SSW7	SSW10	SW4.0	SSW10
20-Apr	SSW13	SW13	SSW12	SSW11	SSW10	SSW9	SSW12	S8	SSE7	SSE8	SE9	SE12	SSE10	S11	SSW11	SW13	SW11	W7	N12	N12	NNE14	NNE13	NE14	NNE14	S3.6	NNE14
21-Apr	NNE13	NE12	NE12	NNE9	N8	NNE8	NNE11	NE12	NE12	NE10	NE10	NE9	NE8	NE8	NE7	NE7	ENE8	E6	ENE8	ENE6	ESE5	SE6	SE6	ESE5	NE7.3	NNE13
22-Apr	SE5	SE5	SSE2	SSE2	ESE2	NE2	E3	E5	ENE4	NNE6	NE9	NNE9	NNE9	NNE8	NNE11	NE11	NE11	NE11	NE11	NE10	NE10	ENE9	E7	E7	NE6.0	NE11
23-Apr	E7	ESE7	E6	ESE6	E5	E6	E7	E8	E11	E11	E13	E12	E13	E13	ESE13	ESE12	ESE11	SE13	SE12	SE10	ESE8	E8	E10	E11	E9.4	SE13
24-Apr	E10	E11	E10	E9	E8	E8	E8	E9	ESE9	E9	E9	E10	E11	E12	E11	E11	E11	ESE12	ESE11	E9	ESE8	ESE8	ESE7	ESE7	E9.4	ESE12
25-Apr	ESE6	ESE7	SE6	SE5	SE7	SE6	ESE5	ESE6	ESE6	SE6	SSE8	SSE9	SSE9	SSE10	SSE8	S10	SSE9	SSE8	SSE8	SE8	SSE7	SSE8	SSE9	SSE7	SSE7.0	S10
26-Apr	SSE6	S7	SSE7	SSE6	SSE6	SSE8	SSE8	SE8	SE8	SE10	SE10	SE11	SSE11	SE9	SE9	SE8	SE9	SSE8	SSE9	SSE10	SSE8	SSE8	SSE6	SSE6	SSE8.0	SE11
27-Apr	SSE6	SSE5	SE4	SE6	SE6	SE7	SE7	SE11	SE11	ESE12	E11	E10	E10	E10	ENE10	E9	ESE9	ESE8	SE7	S7	SSW8	SSW9	SSW9	SW10	SE6.5	ESE12
28-Apr	SW8	W8	WNW7	SW5	SW7	SW7	W3	NW3	ESE4	S4	S3	W2	W4	SW4	SW2	WSW5	SSW4	SSW4	SW5	SW5	SSW7	SW8	SW10	SW10	SW4.5	SW10
29-Apr	SW10	SW10	SW9	SW9	SW8	SW8	SW9	SSW8	SSW8	S9	SSW13	SSW15	SSW15	S13	SSE11	SSW12	S12	SW10	W10	SW7	SSW5	SSW7	SSW9	SSW9	SSW9.3	SSW15
30-Apr	SSW8	SSW9	SSW9	SSW8	SSW7	S5	S5	SSE5	SSE7	SSE7	ESE7	ESE8	NE5	NNW5	NNW5	WSW7	W9	WNW5	ENE3	NNE2	AF	NW4	NNW3	NW4	SSW2.2	SSW9

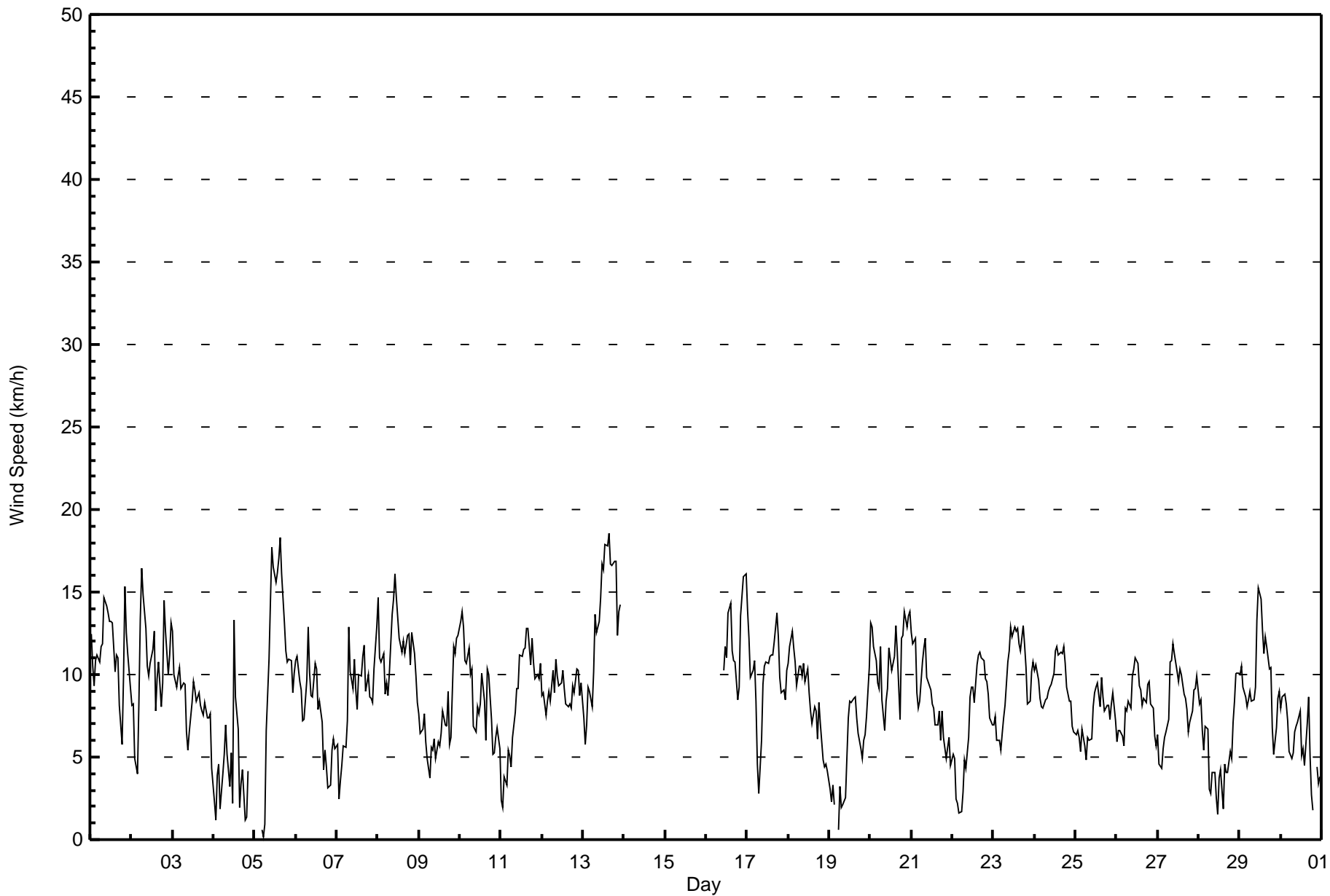
SSE1.8 SSE1.3 SSE1.0 SSE1.5 S1.2SSW1.2 SE0.8 ESE1.7 E2.7 E3.2 E3.1 E2.9 E2.8 ESE2.8 ESE2.6 ESE1.9 ESE2.5 ESE2.1 E2.4 E2.0 ESE1.6 ESE1.7 SE1.8 SE1.4	Diurnal Average
NE15 SSW14 SSW13 NE12 SW11 W13 W16 W15 W15 NNE15 SSE18 ENE17 ENE16 E18 ENE18 ENE19 ENE17 ENE17 ENE17 E17 W15 SSW15 SSW16 SSW16	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Stony Mountain - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Stony Mountain - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	108	16.56	16.56
6 - 11	422	64.72	81.29
12 - 19	122	18.71	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 652

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Stony Mountain - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	4	5	4	10	7	5	10	10	8	8	2	6	4	12	9	108
6 - 11	10	23	69	26	43	23	34	46	20	40	28	7	16	22	10	5	422
12 - 19	3	14	17	13	9	5	3	4	11	20	4	1	17	1	0	0	122
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	41	91	43	62	35	42	60	41	68	40	10	39	27	22	14	652

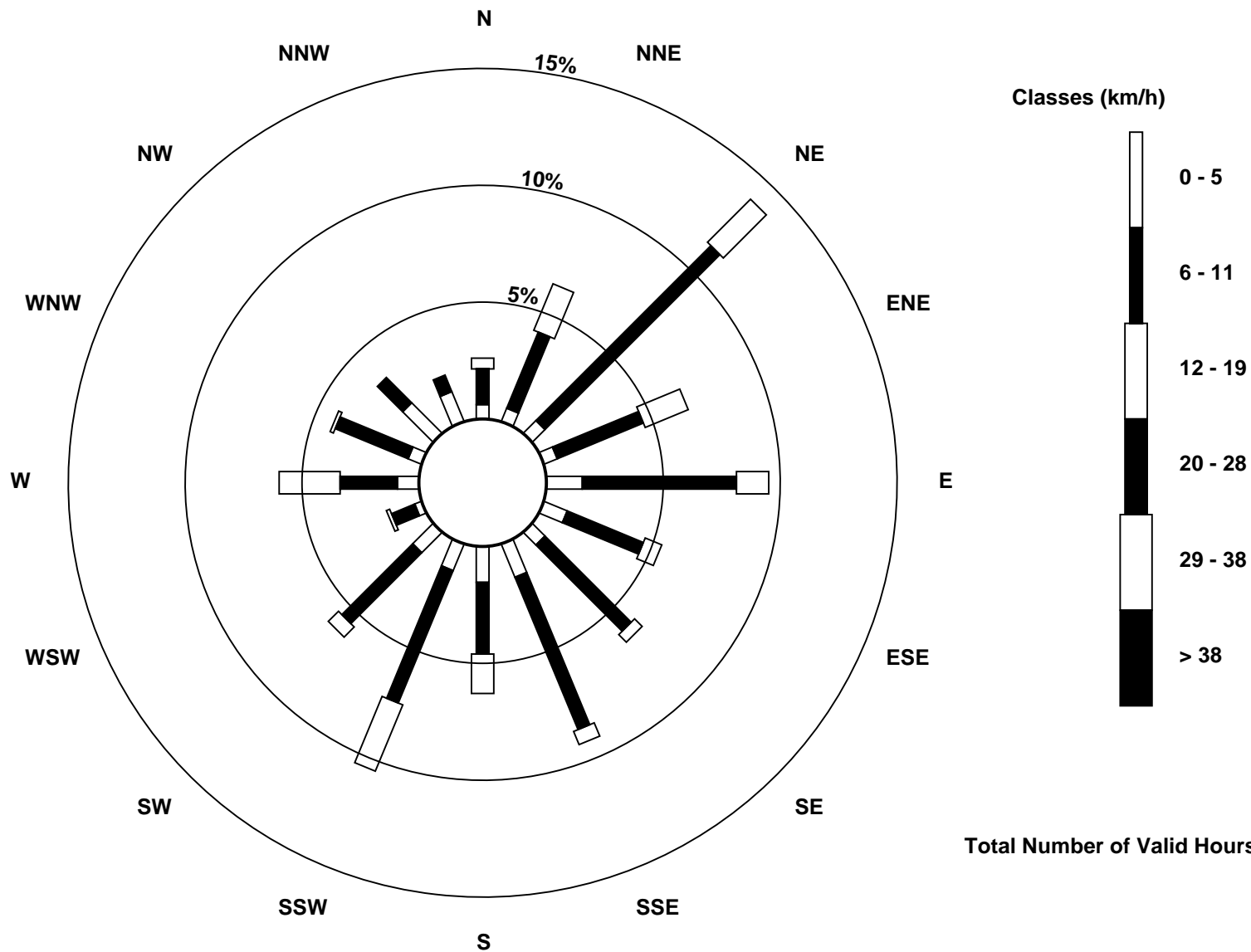
Total Number of Valid Hours: 652

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Stony Mountain (AMS 18)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Stony Mountain - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 6 km/h on Apr 5 16:00			Hours of Data:	652
Minimum Value: 0 km/h on Apr 11 01:00			Hours of Missing Data:	68
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6			Hours of Calibration:	0
			Percent Operational Time:	90.6

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	3	2	2	2	2	3	3	4	5	4	5	5	4	5	4	4	4	3	2	6	5	4	3	3	6	
2-Apr	3	3	3	1	2	4	5	4	4	4	3	4	4	5	5	5	4	3	3	4	5	3	3	4	5	
3-Apr	4	3	2	3	3	2	2	2	2	2	3	3	4	4	3	4	3	4	3	2	2	2	2	1	4	
4-Apr	1	1	2	2	1	1	1	2	1	2	2	2	6	4	3	2	1	2	1	2	1	AF	AF	AF	6	
5-Apr	AF	AF	AF	AF	2	1	2	4	4	5	6	5	5	6	6	6	6	5	4	3	3	3	2	3	6	
6-Apr	3	3	2	2	2	2	2	4	3	3	3	3	4	4	4	3	2	2	1	1	1	2	1	2	4	
7-Apr	3	2	2	1	2	2	3	4	3	3	3	3	3	3	3	3	4	3	3	2	2	2	3	4	4	
8-Apr	4	3	3	4	3	3	3	4	5	5	5	5	5	4	4	4	4	3	3	3	3	3	3	2	5	
9-Apr	2	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	
10-Apr	4	4	3	3	2	3	2	3	2	2	3	3	3	4	3	3	3	3	3	1	1	1	1	1	4	
11-Apr	0	1	1	1	1	1	1	2	2	3	3	4	4	4	5	4	4	4	4	4	3	3	3	3	5	
12-Apr	2	2	2	2	3	2	3	3	3	3	3	4	4	4	3	3	3	3	3	2	3	3	2	3	4	
13-Apr	2	1	1	2	2	2	3	4	4	3	5	5	5	6	5	5	5	5	6	5	4	4	4	AF	6	
14-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
15-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	4	3	4	4	4	4	3	3	2	3	4	4	4	4	4	
17-Apr	4	4	2	2	3	2	2	1	2	2	3	3	3	3	3	3	4	4	4	3	3	2	2	3	4	
18-Apr	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	1	1	1	1	3	
19-Apr	1	1	1	1	AF	1	1	1	1	2	2	3	2	2	3	3	2	2	2	1	1	1	2	3	3	
20-Apr	3	3	3	3	2	2	3	3	2	2	3	4	4	4	4	4	3	3	4	5	5	4	4	5	5	
21-Apr	4	3	4	3	3	3	3	4	3	3	3	3	4	3	3	2	3	3	2	2	2	2	2	1	4	
22-Apr	2	1	1	1	1	1	1	2	2	3	4	4	3	3	5	4	4	3	3	3	3	2	2	2	5	
23-Apr	2	2	1	1	1	2	2	2	3	3	4	4	4	4	4	4	4	4	4	3	2	3	3	3	4	
24-Apr	3	3	3	2	2	2	3	3	3	3	3	3	3	4	3	3	4	4	3	3	2	2	2	2	4	
25-Apr	2	2	2	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	
26-Apr	2	2	2	2	2	3	2	3	3	3	3	4	3	4	3	3	3	3	3	3	3	2	2	2	4	
27-Apr	2	1	1	2	2	2	2	4	4	4	4	4	4	4	4	3	3	3	2	3	2	2	2	2	4	
28-Apr	2	2	2	2	1	1	1	1	2	3	3	2	2	3	2	3	3	2	2	1	1	2	3	3	3	
29-Apr	3	3	3	2	2	2	2	3	3	4	5	5	5	4	4	5	4	5	4	2	1	1	2	2	5	
30-Apr	2	2	2	2	2	1	1	2	2	2	3	3	3	2	2	4	3	2	2	2	AF	1	1	1	4	
	4	4	4	4	3	4	5	4	5	5	6	5	6	6	6	6	6	6	5	6	6	5	4	4	5	
Diurnal Maximum																										

AF - Analyzer Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Stony Mountain - April 2017

Direction of Maximum Speed: 74 deg on Apr 13 16:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 75.0 deg on Apr 13	Hours of Data: 652
Direction of Minimum Speed: 165 deg on Apr 5 06:00	Hours of Missing Data: 68
Direction of Minimum Daily Speed Average: 2.2 deg on Apr 30	Percent Operational Time: 90.6
Monthly Average Direction: 213.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	216	218	217	219	223	228	225	251	266	267	266	262	276	271	253	262	265	285	278	272	266	271	276	297	255.6	
2-Apr	297	306	311	225	242	261	272	278	279	299	282	273	276	280	308	298	275	269	282	265	275	285	269	281	278.3	
3-Apr	294	299	298	294	293	294	296	299	310	313	316	315	311	329	333	325	348	327	315	298	301	301	297	316	308.1	
4-Apr	318	357	205	217	261	225	184	198	178	163	191	165	119	144	142	208	95	10	347	184	163	AF	AF	AF	167.5	
5-Apr	AF	AF	AF	AF	162	165	138	124	135	152	156	169	181	167	176	177	171	166	159	154	161	166	170	164	163.9	
6-Apr	164	168	173	176	171	176	199	216	243	262	250	270	284	304	278	282	280	279	291	321	347	10	19	60	237.6	
7-Apr	124	93	39	343	329	325	0	28	30	24	30	43	72	59	55	52	67	68	51	49	43	37	35	35	41.1	
8-Apr	35	22	8	9	1	0	0	5	21	25	26	27	8	14	14	18	11	46	51	42	47	42	49	39	24.1	
9-Apr	35	52	66	58	49	70	96	100	103	97	112	118	105	148	139	163	181	204	186	187	194	193	190	187	141.1	
10-Apr	191	193	197	189	189	196	192	187	178	163	161	145	120	129	151	141	167	188	201	187	188	194	216	211	179.6	
11-Apr	335	319	303	318	314	319	348	360	21	49	41	36	30	48	22	36	33	26	28	17	22	35	49	51	25.2	
12-Apr	46	39	40	45	37	38	41	32	51	50	54	43	53	35	56	81	80	99	57	48	55	75	94	100	55.4	
13-Apr	109	79	53	68	79	70	69	83	83	67	68	67	73	87	78	74	77	67	77	83	77	70	70	AF	75.0	
14-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
15-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	196	198	212	207	211	200	204	195	186	183	189	195	197	201	--	
17-Apr	203	203	196	197	206	213	12	39	41	41	30	38	39	36	38	38	43	36	36	23	32	43	45	45.2		
18-Apr	43	46	52	47	51	55	61	63	56	65	57	62	70	79	86	80	78	63	36	52	98	93	24	45	59.5	
19-Apr	96	3	30	98	AF	74	148	191	307	283	247	220	223	218	231	241	233	238	206	206	200	199	205	207	218.3	
20-Apr	212	214	212	208	199	201	203	190	167	155	139	135	156	171	199	223	221	260	8	10	15	16	41	23	189.9	
21-Apr	29	36	35	22	9	17	24	34	52	55	47	39	50	48	39	52	71	89	66	72	110	140	138	122	48.8	
22-Apr	132	130	152	151	109	52	84	93	74	25	38	26	30	16	20	39	40	44	44	51	46	62	81	86	51.7	
23-Apr	98	110	89	106	85	90	85	96	89	90	81	87	96	99	117	102	115	132	135	125	108	100	85	85	101.2	
24-Apr	85	84	89	89	88	81	89	88	103	95	87	88	91	91	89	84	96	110	107	99	103	103	108	113	93.7	
25-Apr	112	122	135	124	130	143	116	106	121	136	147	153	156	160	163	178	167	163	159	141	155	153	155	157	146.9	
26-Apr	163	169	167	168	166	163	147	139	143	135	133	146	147	145	130	126	137	151	153	153	156	155	149	149	148.2	
27-Apr	147	150	145	146	141	138	136	132	140	113	101	98	98	96	72	98	112	117	140	176	206	198	208	220	133.5	
28-Apr	234	276	289	215	218	223	265	326	112	180	182	278	266	216	214	247	200	192	221	220	213	222	228	235	229.5	
29-Apr	234	235	232	232	232	225	219	210	203	191	207	207	203	190	168	207	191	226	259	222	193	192	200	211	211.3	
30-Apr	207	204	203	201	201	191	184	162	149	161	108	110	48	331	327	237	276	297	65	26	AF	317	335	319	203.5	

154.2 158.7 150.9 159.6 181.0 193.0 135.6 105.7 93.3 88.3 94.8 97.4 99.0 107.8 104.0 111.8 117.0 115.3 81.1 92.9 118.5 117.8 127.5 136.1

Diurnal Average

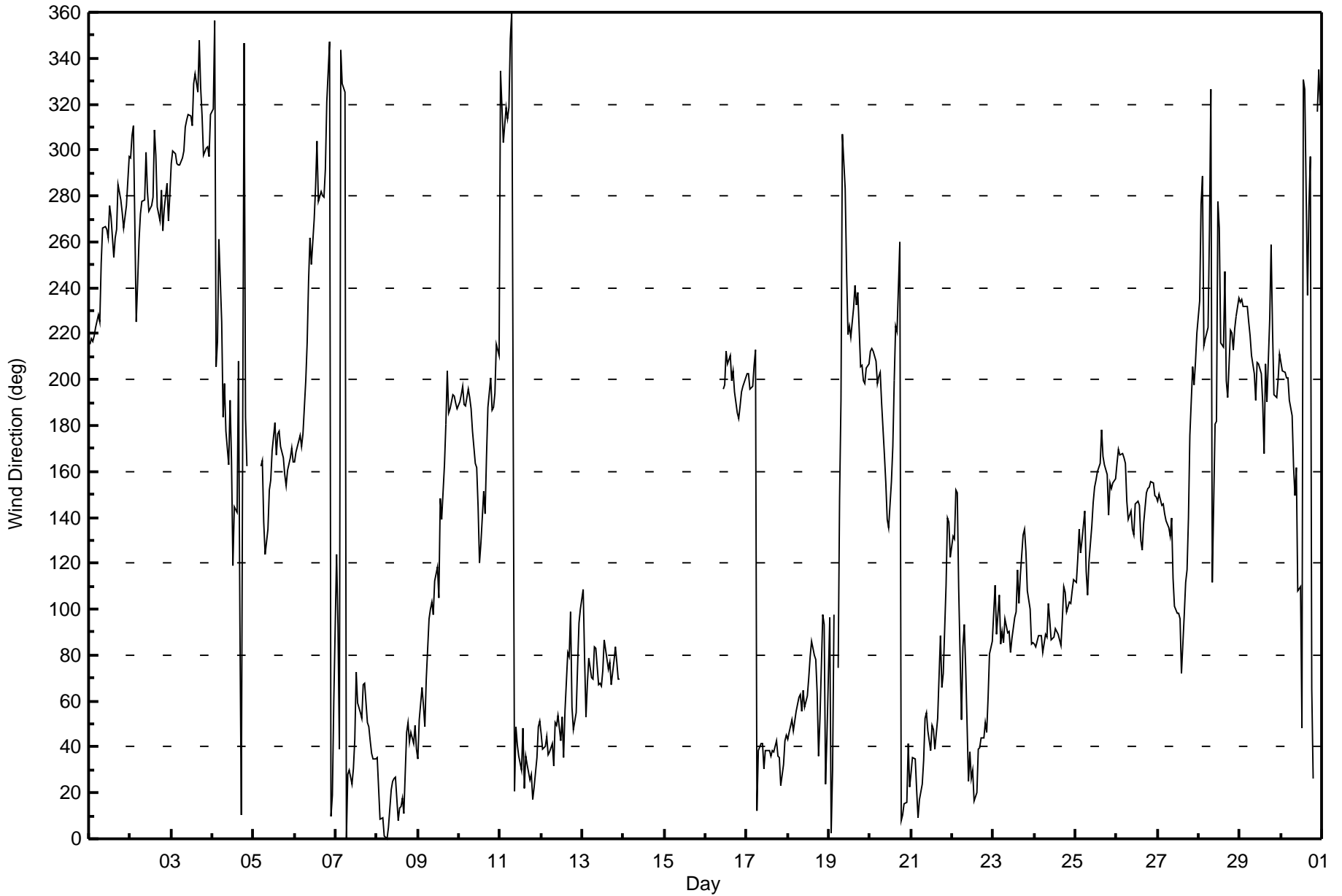
AF - Analyzer Failure

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Stony Mountain - April 2017





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Stony Mountain - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 103 deg on Apr 28 12:00	Hours of Data: 652
Minimum Value: 7 deg on Apr 11 05:00	Hours of Missing Data: 68
Percentiles: P ₁ = 12 P ₁₀ = 16 Q ₁ = 18 Median = 22 Q ₃ = 29 P ₉₀ = 40 P ₉₉ = 74	Hours of Calibration: 0
	Percent Operational Time: 90.6

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	19	18	14	16	16	19	18	26	24	26	27	31	30	31	36	32	27	26	18	21	22	21	18	21	36	
2-Apr	23	19	61	16	18	23	21	20	22	28	31	31	31	28	44	32	25	32	28	23	19	18	21	20	61	
3-Apr	18	18	16	16	15	16	16	17	17	25	37	36	32	32	34	35	38	38	26	17	16	17	16	12	38	
4-Apr	28	69	55	42	66	16	15	19	30	55	48	80	24	44	42	74	67	30	18	78	20	AF	AF	AF	80	
5-Apr	AF	AF	AF	AF	11	46	55	22	23	26	27	28	26	28	28	27	25	25	24	21	22	24	20	19	55	
6-Apr	20	21	18	18	17	20	15	19	28	28	30	28	36	42	39	40	63	25	16	14	11	17	17	35	63	
7-Apr	40	73	47	19	19	21	25	22	20	23	20	23	24	19	23	21	18	20	15	15	15	17	17	17	73	
8-Apr	18	20	20	20	21	22	23	24	23	25	26	26	30	31	27	28	27	23	17	19	18	22	21	27	31	
9-Apr	22	22	30	22	22	45	56	37	45	41	60	53	67	54	45	53	54	25	22	16	18	17	18	18	67	
10-Apr	18	17	17	16	16	16	17	20	25	34	39	37	38	34	41	47	30	26	22	16	13	13	11	13	47	
11-Apr	28	18	9	8	7	13	16	25	25	23	32	30	33	31	31	24	23	28	22	20	20	18	16	15	33	
12-Apr	16	17	15	16	19	19	17	23	21	27	29	29	27	34	49	43	44	31	20	14	15	21	15	15	49	
13-Apr	15	24	13	16	16	18	16	18	19	18	19	19	21	20	21	18	19	18	21	20	17	17	17	AF	24	
14-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
15-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	21	24	27	26	24	29	25	21	21	19	20	18	18	19	29	
17-Apr	18	18	17	16	16	34	36	34	31	21	25	20	21	22	21	21	21	17	19	18	19	18	17	16	36	
18-Apr	17	16	15	17	16	16	17	19	17	18	20	19	19	26	29	27	23	26	20	21	19	24	19	27	29	
19-Apr	45	19	25	28	AF	50	19	45	56	48	34	29	25	25	25	26	26	26	19	19	12	12	15	17	56	
20-Apr	18	18	17	17	16	22	16	17	23	23	30	26	34	35	35	24	25	40	23	27	22	22	19	21	40	
21-Apr	23	20	19	22	22	22	22	25	23	30	25	31	33	46	31	27	27	32	18	20	35	21	20	16	46	
22-Apr	18	21	22	23	37	17	23	40	56	47	41	37	35	38	31	26	26	22	21	18	17	15	18	17	56	
23-Apr	15	18	18	21	22	14	17	19	19	20	22	20	29	22	25	30	23	26	24	22	18	18	17	17	30	
24-Apr	17	18	17	17	16	17	19	19	18	20	20	19	21	18	19	22	20	19	17	17	17	17	18	16	22	
25-Apr	17	17	18	24	18	18	33	19	24	30	26	30	29	26	29	27	25	28	25	25	22	23	24	23	33	
26-Apr	26	21	22	21	21	26	23	26	30	24	27	28	29	33	31	29	29	27	26	23	22	22	18	20	33	
27-Apr	20	23	21	18	19	20	23	25	32	29	24	37	40	30	28	28	26	25	24	25	16	16	16	16	40	
28-Apr	20	20	16	33	14	12	44	51	60	77	85	103	66	71	86	65	67	60	24	17	13	15	19	18	103	
29-Apr	19	18	17	17	18	19	19	24	24	33	29	26	25	30	34	33	26	38	24	21	12	15	15	16	38	
30-Apr	17	16	15	14	16	17	23	29	39	48	44	45	59	21	35	55	34	44	51	29	AF	13	28	26	59	
	45	73	61	42	66	50	56	51	60	77	85	103	67	71	86	74	67	60	51	78	35	24	28	35		
	Diurnal Maximum																									

AF - Analyzer Failure



Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	April 18, 2017	Last Cal Date:	March 13, 2017
Start time (MST):	11:11	End time (MST):	15:51
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>49.4</u>	ppm	Cal Gas Exp Date	February 16, 2019
Cal Gas Cylinder #	<u>LL110090</u>			
Calibrator Make/Model	API T700		Serial Number	1222
ZAG Make/Model	API 701		Serial Number	5610

Analyzer Information

Analyzer make: Thermo 43i

Analyzer serial #: JC1501301453

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-601	-601
Calculated slope	0.992926	0.993804	Lamp voltage	899	900
Calculated intercept	1.778731	1.185092	Pressure	667.8	658.1
Analyzer Background	21.3	21.5	Flow	0.378	0.374
Analyzer Coefficient	0.902	0.902	Intensity	86	86

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5009	0.0	0.0	-0.9	----
as found span	4941	59.1	583.9	586.3	0.996
calibrator zero	4984	0.0	0.0	-0.9	----
high point	4941	59.1	583.9	586.3	0.996
second point	4984	29.6	291.7	292.7	0.996
third point	4999	14.8	145.8	144.9	1.007
as left zero	5011	0.0	0.0	-0.6	----
as left span	4830	59.0	596.2	591.9	1.007
Average Correction Factor					1.000
Corrected As found	587.18	Previous response	586.28	*% change	-0.2%

* = > +/-5% change initiates investigation

Notes:

No adjustments made.

Calibration Performed By:

Aswin Sasi Kumar



Wood Buffalo Environmental Association

SO₂ Calibration Summary

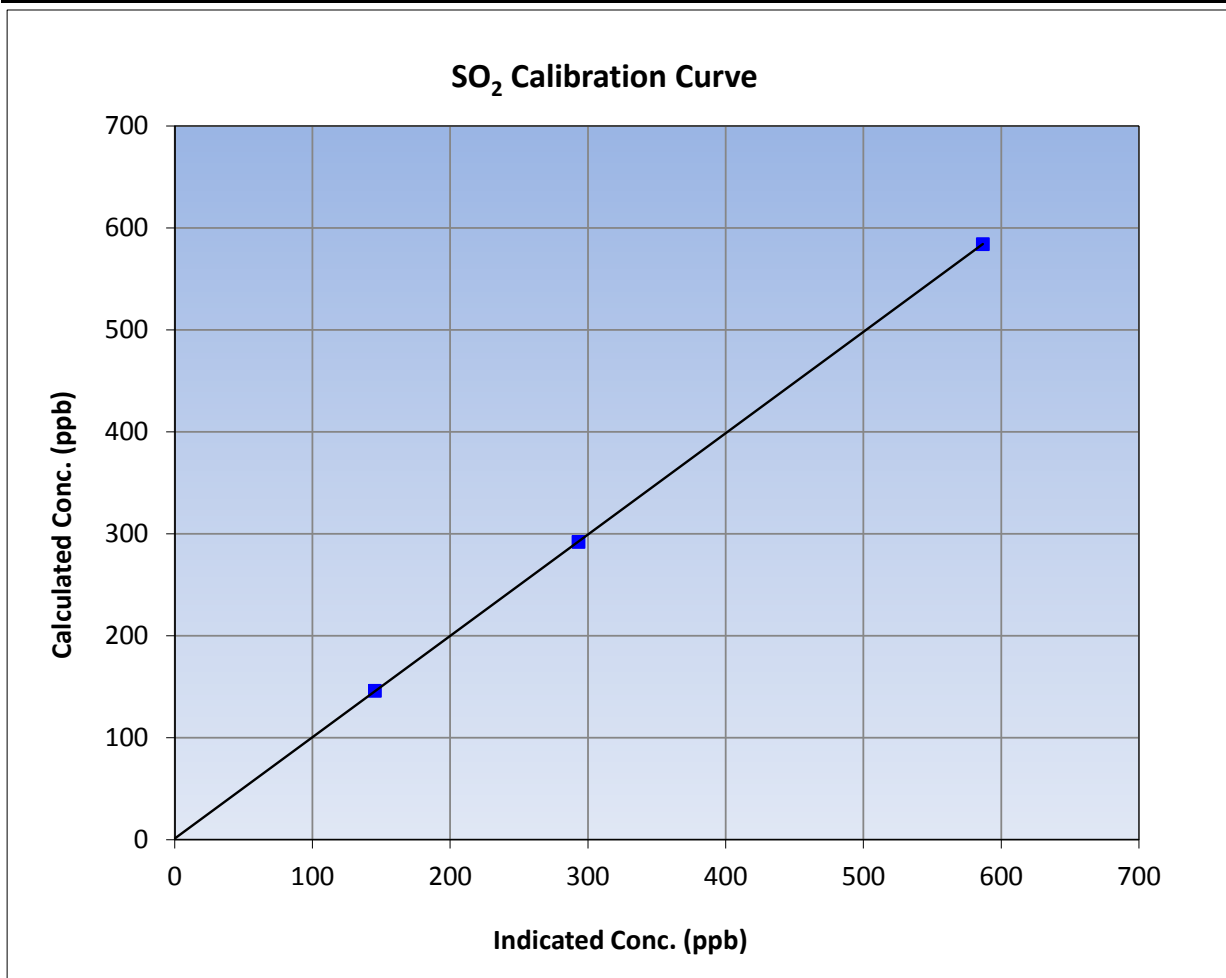
Version-03-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	March 13, 2017
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 43i	Analyzer serial #	JC1501301453

Calibration Data

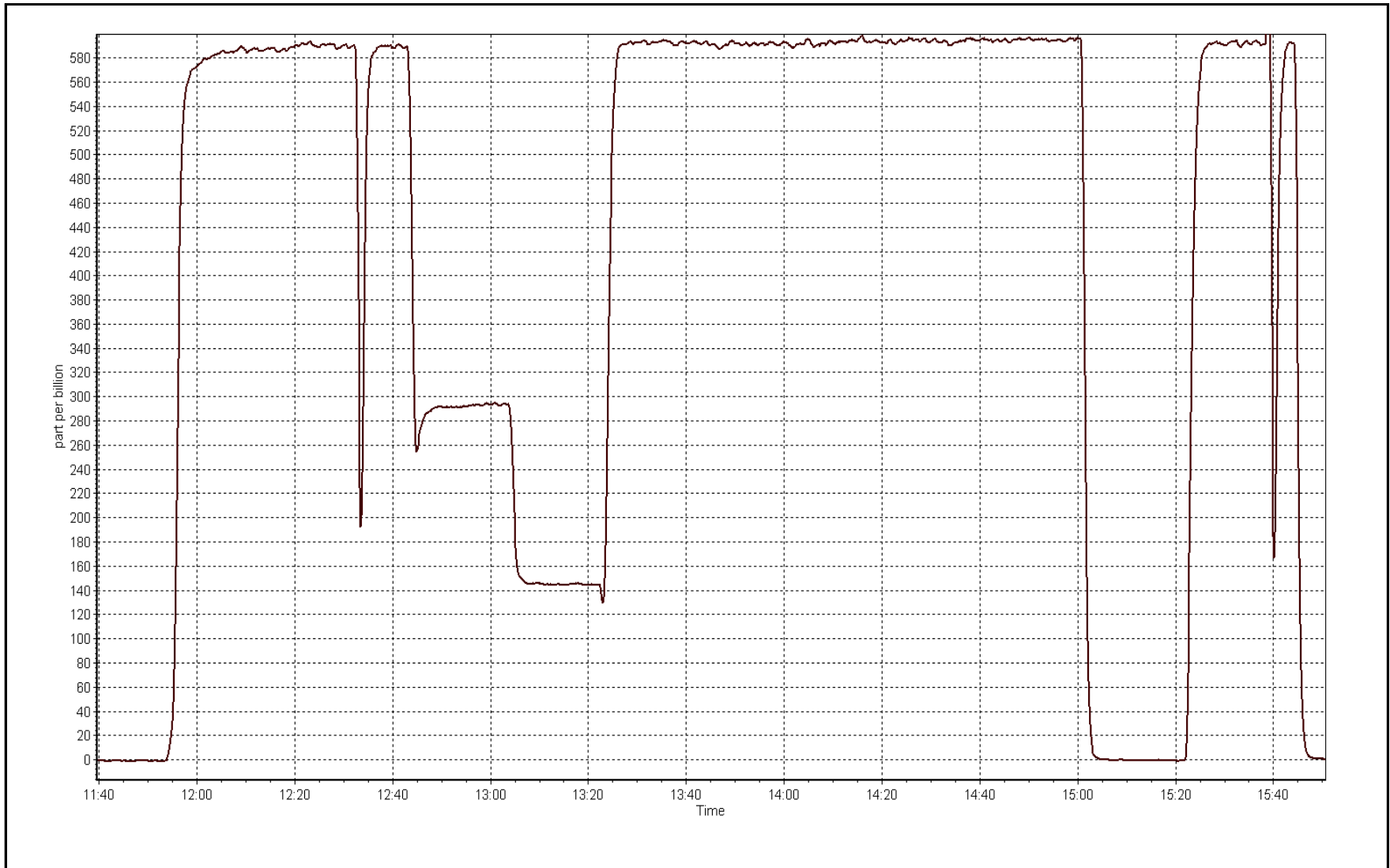
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.9	----	Correlation Coefficient	0.999996	≥0.995
583.9	586.3	0.9959			
291.7	292.7	0.9964	Slope	0.993804	0.90 - 1.10
145.8	144.9	1.0066			
			Intercept	1.185092	+/-30



SO2 Calibration Plot

Date: April 18, 2017

Location: Stony Mountain





Wood Buffalo Environmental Association

TRS Calibration Summary

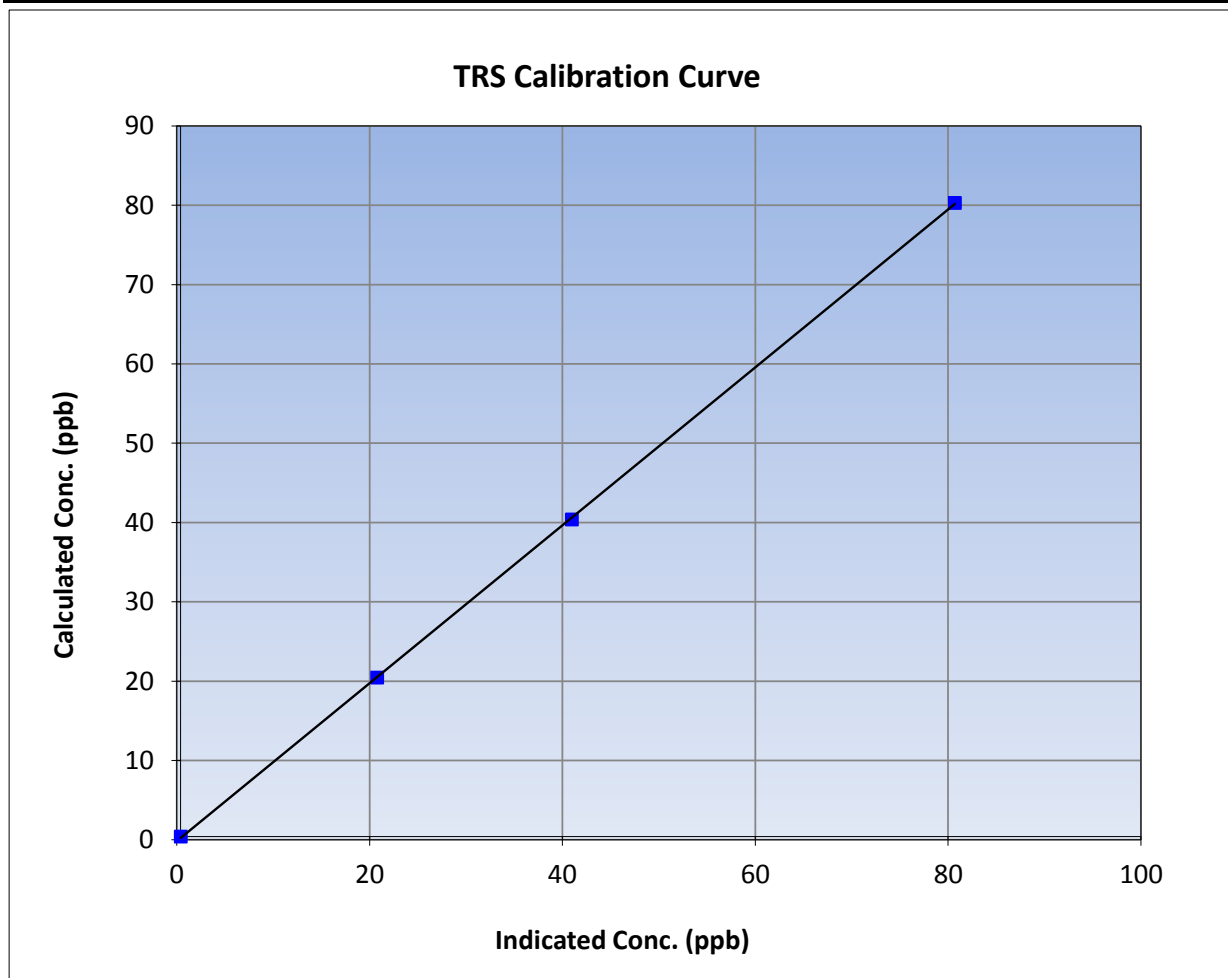
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 14, 2017
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	9:55	End Time (MST)	11:59
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1336160090

Calibration Data

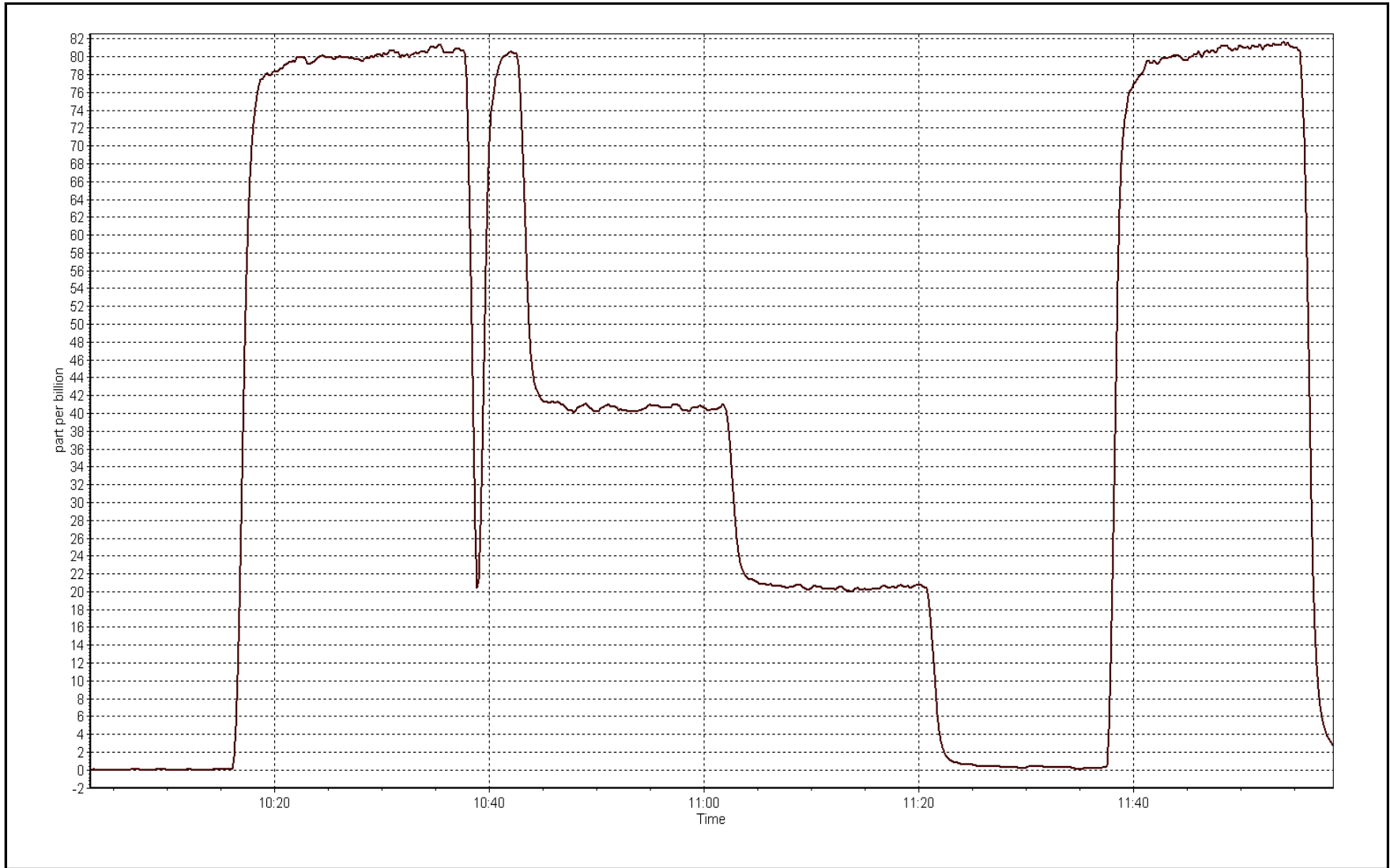
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999970	≥0.995
79.9	80.3	0.9951			
40.0	40.6	0.9857	Slope	0.995655	0.90 - 1.10
20.1	20.4	0.9829			
			Intercept	-0.180476	+/-3



TRS Calibration Plot

Date: April 19, 2017

Location: Stony Mountain





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	April 18, 2017	Last Cal Date:	March 13, 2017
Start time (MST):	11:11	End time (MST):	15:51
Reason:	Routine Also performing cylinder change		

Calibration Standards

Gas Cert Reference	LL110090	Cal Gas Expiry Date	February-16-19
CH4 Cal Gas Conc.	<u>491.0</u> ppm	CH4 Equiv Conc.	1041.0 ppm
C3H8 Cal Gas Conc.	<u>200.0</u> ppm	Station temp.	23 Deg C
Calibrator Model	API 700	Serial Number	1222
ZAG make/model	Teledyne API 701	Serial Number	5610

Analyzer Information

Analyzer make: Thermo 55i

Analyzer serial #: 1505164831

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.0	75.0
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	175.1	175.0
CH4 SP Ratio	0.000205	0.000205	Flame Temp	405.0	405.0
CH4 Retention time	11.8	11.8	Carrier Pressure	31.5	31.5
NMHC SP Ratio	4.49E-05	4.49E-05	Fuel Pressure	44.3	44.3
NMHC Peak Area	144305	144305	Air Pressure	34.5	34.5

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	0.986603	0.993271
THC Cal Offset	0.033764	0.029718
CH4 Cal Slope	0.977962	0.981213
CH4 Cal Offset	0.01774	0.018731
NMHC Cal Slope	0.994446	1.004280
NMHC Cal Offset	0.015997	0.010900

Notes: N2 cylinder changed out after as found. No adjustments required.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5009	0.0	0.00	0.00	----
as found span	4941	59.1	12.30	12.38	0.994
calibrator zero	5009	0.0	0.00	0.00	----
high point	4941	59.1	12.30	12.38	0.994
second point	4984	29.6	6.15	6.12	1.004
third point	4998	14.8	3.07	3.05	1.008
as left zero	5011	0.0	0.00	0.00	----
as left span	4836	59.0	12.55	12.39	1.013
Average Correction Factor					1.002
Corrected As found	12.38	Prev response	12.44	*% change	0.5%

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5009	0	0.00	0.00	----
as found span	4941	59.1	6.50	6.47	1.005
calibrator zero	5009	0	0.00	0.00	----
high point	4941	59.1	6.50	6.47	1.005
second point	4984	29.6	3.25	3.21	1.012
third point	4998	14.8	1.62	1.60	1.015
as left zero	5011	0	0.00	0.00	----
as left span	4836	59	6.63	6.47	1.025
Average Correction Factor					1.010
Corrected As found	6.47	Prev response	6.52	*% change	0.8%

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5009	0.0	0.00	0.00	----
as found span	4941	59.1	5.80	5.91	0.982
calibrator zero	5009	0.0	0.00	0.00	----
high point	4941	59.1	5.80	5.91	0.982
second point	4984	29.6	2.90	2.91	0.996
third point	4998	14.8	1.45	1.45	1.000
as left zero	5011	0.0	0.00	0.00	----
as left span	4836	59.0	5.92	5.92	1.000
Average Correction Factor					0.993
Corrected As found	5.91	Prev response	5.92	*% change	0.1%

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

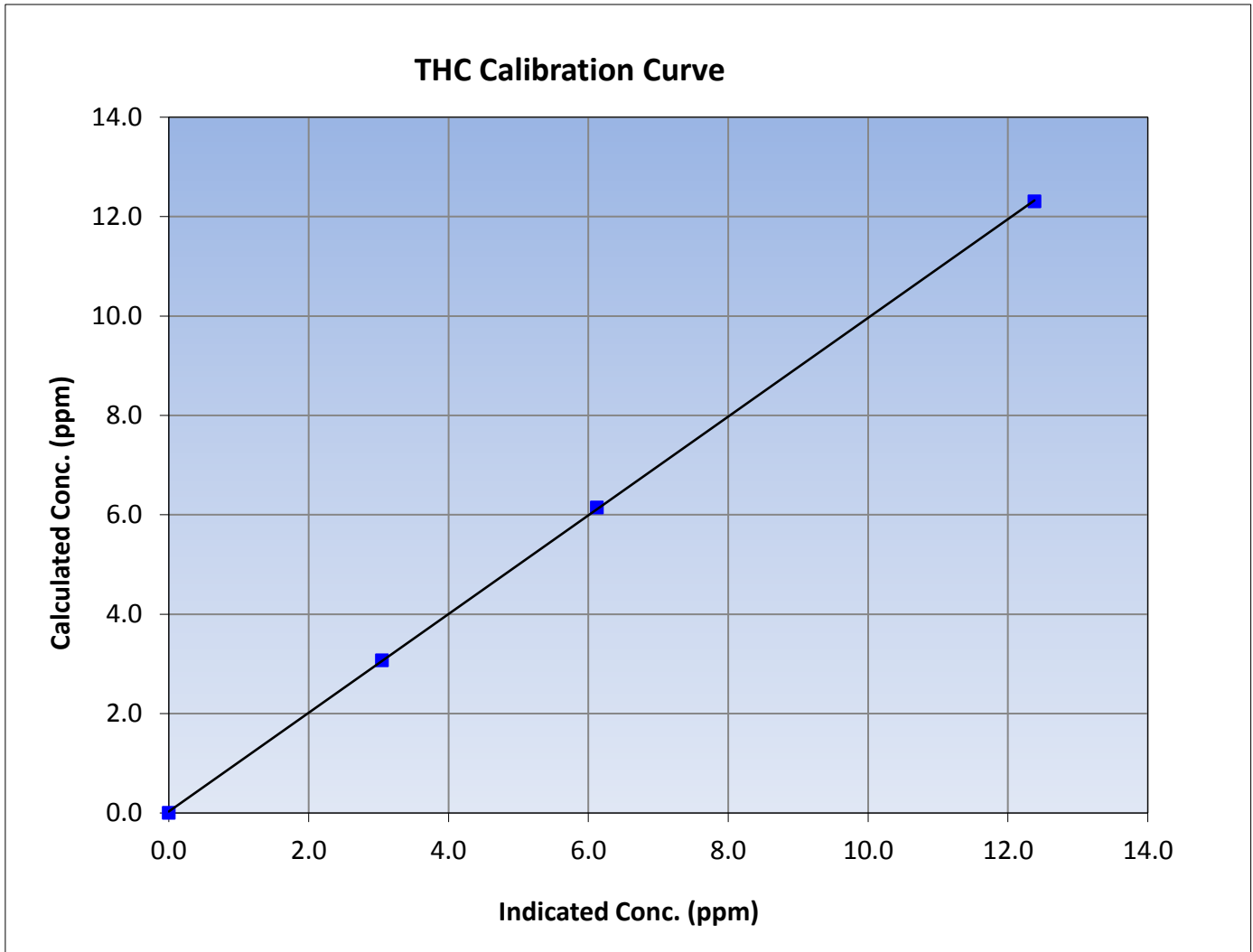
Version-02-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	AMS 18
Station Name	Stony Mountain	Station Number	42807
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 55i	Analyzer serial #	1505164831

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.00	0.00	----	Correlation Coefficient	≥0.995	
12.30	12.38	0.9939			
6.15	6.12	1.0042			
3.07	3.05	1.0077			
			Slope	0.993271	0.90 - 1.10
			Intercept	0.029718	+/-0.5





Wood Buffalo Environmental Association

CH₄ Calibration Summary

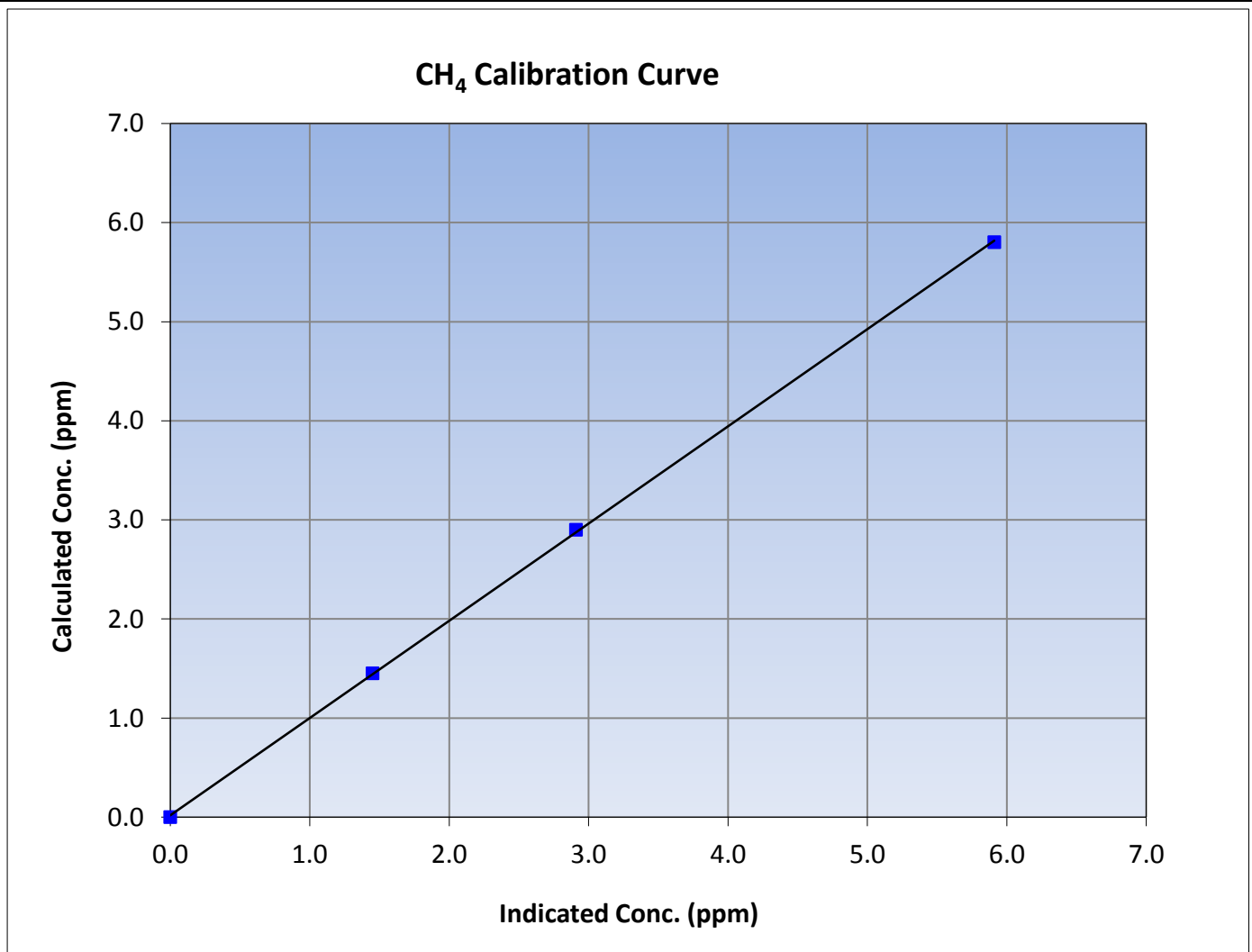
Version-02-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	AMS 18
Station Name	Stony Mountain	Station Number	42807
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 55i	Analyzer serial #	1505164831

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999933	≥0.995			
5.80	5.91	0.9820						
2.90	2.91	0.9962				Slope	0.981213	0.90 - 1.10
1.45	1.45	0.9998						
			Intercept	0.018731	+/-0.5			





Wood Buffalo Environmental Association

NMHC Calibration Summary

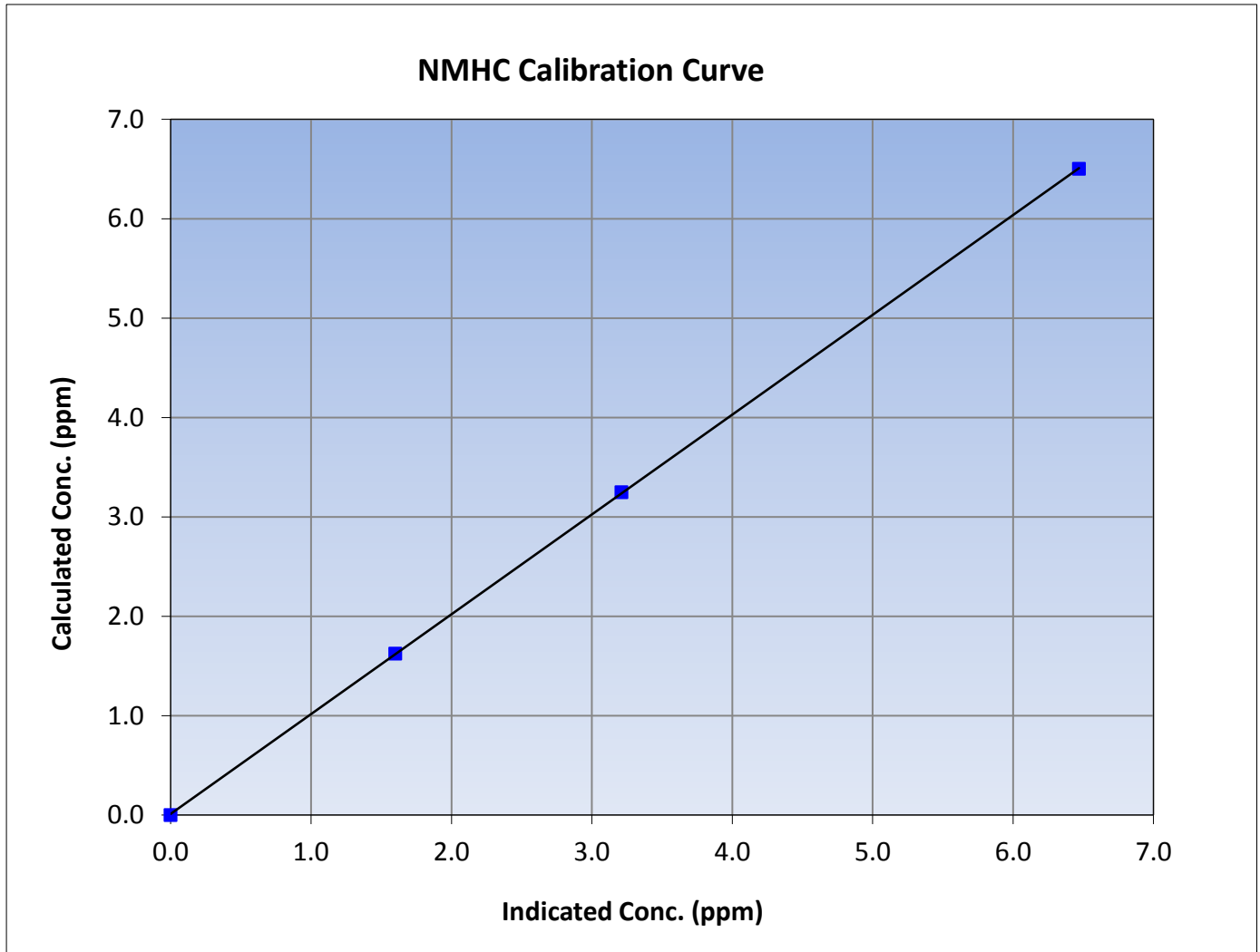
Version-02-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	AMS 18
Station Name	Stony Mountain	Station Number	42807
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 55i	Analyzer serial #	1505164831

Calibration Data

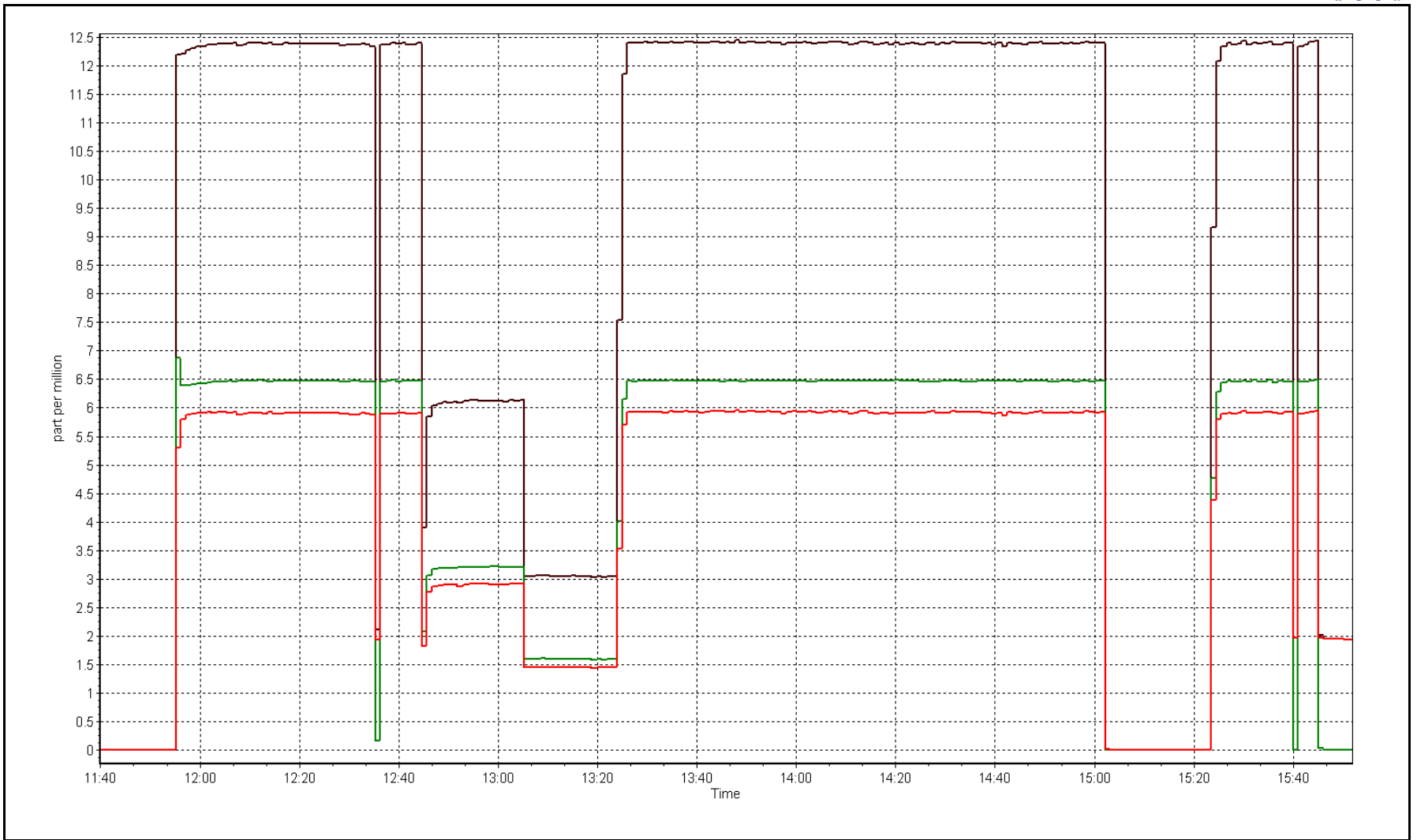
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.00	0.00	----	Correlation Coefficient	≥0.995	
6.50	6.47	1.0048			
3.25	3.21	1.0116			
1.62	1.60	1.0149			
			Slope	1.004280	0.90 - 1.10
			Intercept	0.010900	+/-0.5



NMHC Calibration Plot

Date: April 18, 2017

Location: Stony Mountain





Wood Buffalo Environmental Association

O₃ Calibration Summary

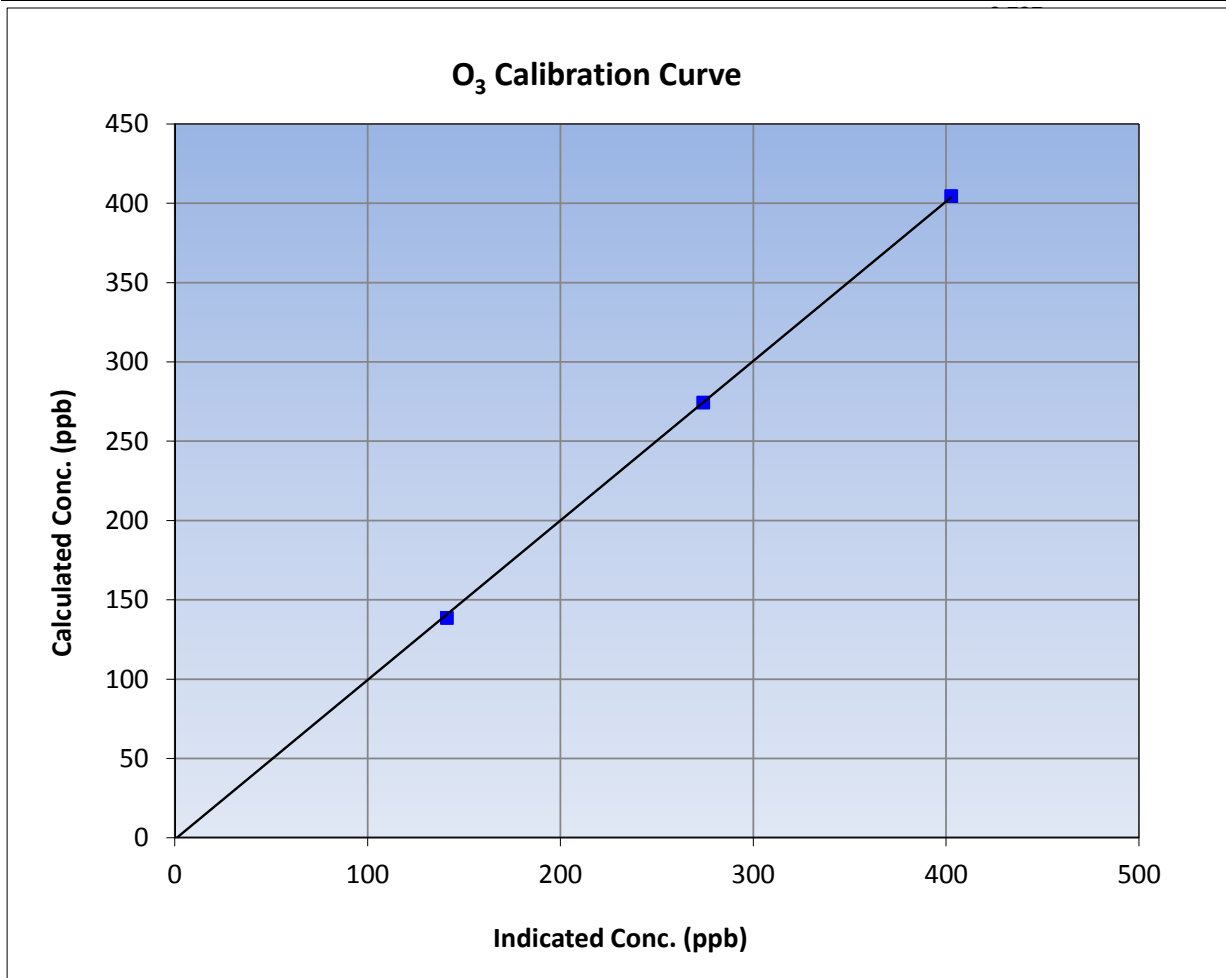
Version-03-2017

Station Information

Calibration Date	April 19, 2017	Previous Calibration	March 24, 2017
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	7:15	End Time (MST)	9:49
Analyzer make	Thermo 49i	Analyzer serial #	1501663733

Calibration Data

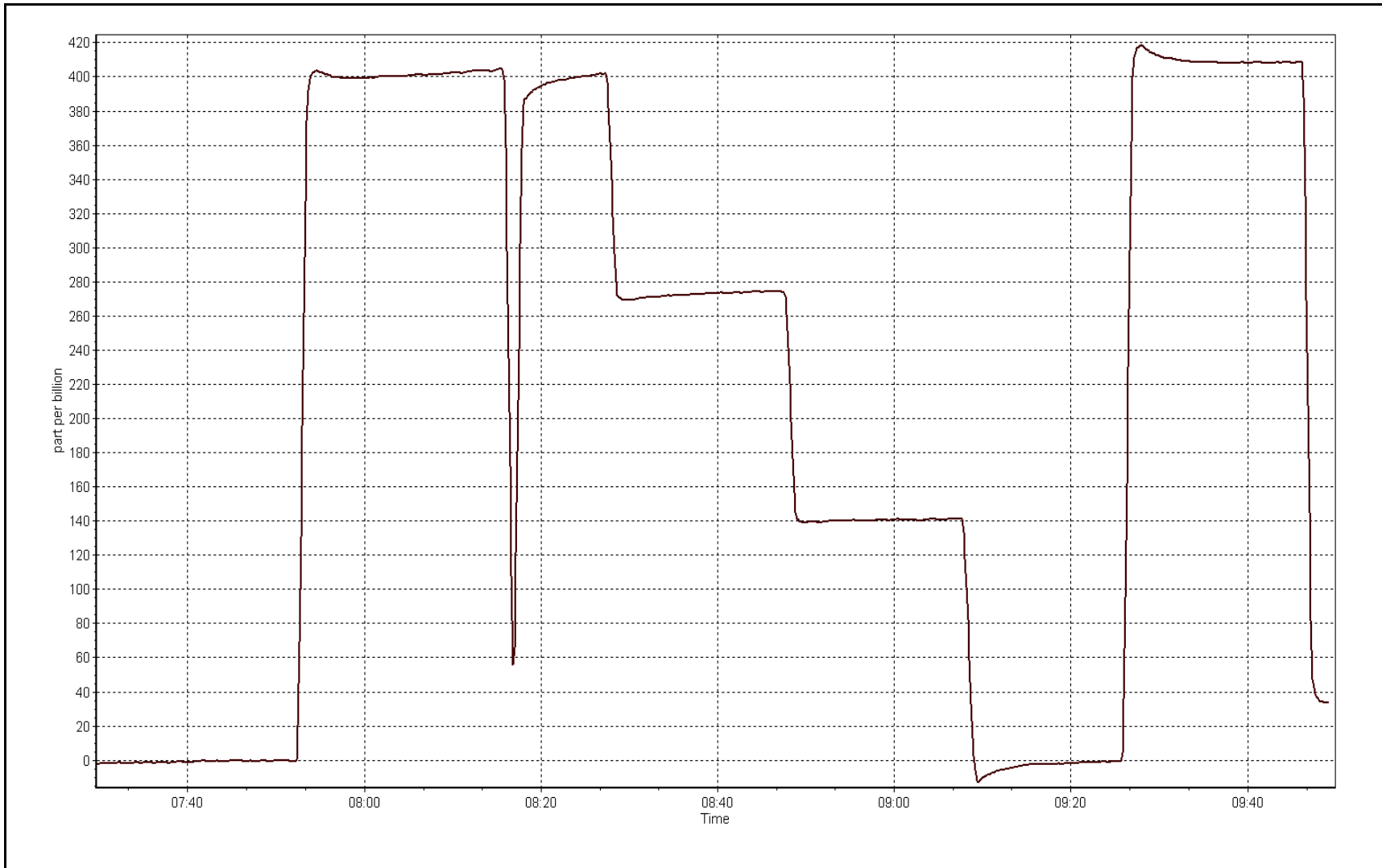
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.4	----	Correlation Coefficient	0.999907	≥0.995
404.2	402.2	1.0051			
274.0	273.7	1.0010	Slope	1.005547	0.90 - 1.10
138.2	140.8	0.9815			
			Intercept	-1.094412	+/- 10



O₃ Calibration Plot

Date: April 19, 2017

Location: Stony Mountain



Aswin Sasi Kumar



Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	April 18, 2017	Last Cal Date:	March 13, 2017
Start time (MST):	11:11	End time (MST):	15:51
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL110090	Cal Gas Expiry Date	Saturday, February 16, 2019
NOX Cal Gas Conc.	<u>50.9</u> ppb	NO Cal Gas Conc.	<u>50.9</u> ppb
Calibrator Model	API T700	Serial Number	1222
ZAG make/model	Teledyne API T701	Serial Number	5610

Analyzer Information

Analyzer make:	Thermo 42i	Analyzer serial #:	1336160088	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
NO coefficient	0.986	0.986	NOX Range (ppb)	0 - 1000 ppb
NOX coefficient	0.996	0.996	PMT Temperature	-3.1 -2.8
NO2 coefficient	0.999	0.999	Reaction cell Press	197.8 197.2
NO bkgrnd	1.8	1.8	Sample Flow	0.725 0.715
NOX bkgrnd	1.9	1.9	PMT Voltage	-850.3 -849.9

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.985909	0.993710
NO _x Cal Offset	0.985560	-0.114871
NO Cal Slope	0.982930	0.990915
NO Cal Offset	0.954778	-0.147455
NO ₂ Cal Slope	1.014316	0.995268
NO ₂ Cal Offset	-0.838133	-1.226312



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5009	0.0	0.0	0.0	0.0	0.2	0.3	-0.1	----	----
as found span	4941	59.1	601.6	601.6	0.0	605.2	606.9	-1.8	0.9941	0.9913
calibrator zero	5009	0.0	0.0	0.0	0.0	0.2	0.3	-0.1	----	----
high point	4941	59.1	601.6	601.6	0.0	605.2	606.9	-1.8	0.9941	0.9913
second point	4984	29.6	300.5	300.5	0.0	303.7	304.7	-1.1	0.9897	0.9862
third point	4999	14.8	150.2	150.2	0.0	150.5	150.7	-0.2	0.9986	0.9969
as left zero	5011	0.0	0.0	0.0	0.0	0.5	0.5	0.0	----	----
as left span	4838	59.0	613.3	210.8	402.5	616.4	203.8	412.9	0.9949	1.0343
Average Correction Factor									0.9941	0.9915

Corrected As found	NO _x = 605.0 ppb	NO = 606.6 ppb		*Percent Change	NO _x = 0.7%
Previous Response	NO _x = 609.2 ppb	NO = 611.1 ppb		*Percent Change	NO = 0.7%

* = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	614.1	615.0	-0.9	0.9798	0.9782	----	----
1st NO2 (400 ppb O3)	210.8	404.2	617.0	210.8	406.2	0.9751	----	0.9952	100.5%
2nd NO2 (200 ppb O3)	341.0	274.0	618.5	341.0	277.5	0.9727	----	0.9875	101.3%
3rd NO2 (100 ppb O3)	476.8	138.2	618.5	476.8	141.7	0.9727	----	0.9754	102.5%
2nd NO ref point	----	0.0	618.1	618.8	-0.7	0.9734	0.9722	----	----
Average Correction Factor						0.9735	0.9752	0.9860	101.4%

Notes:

No adjustments made.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

NO_x Calibration Summary

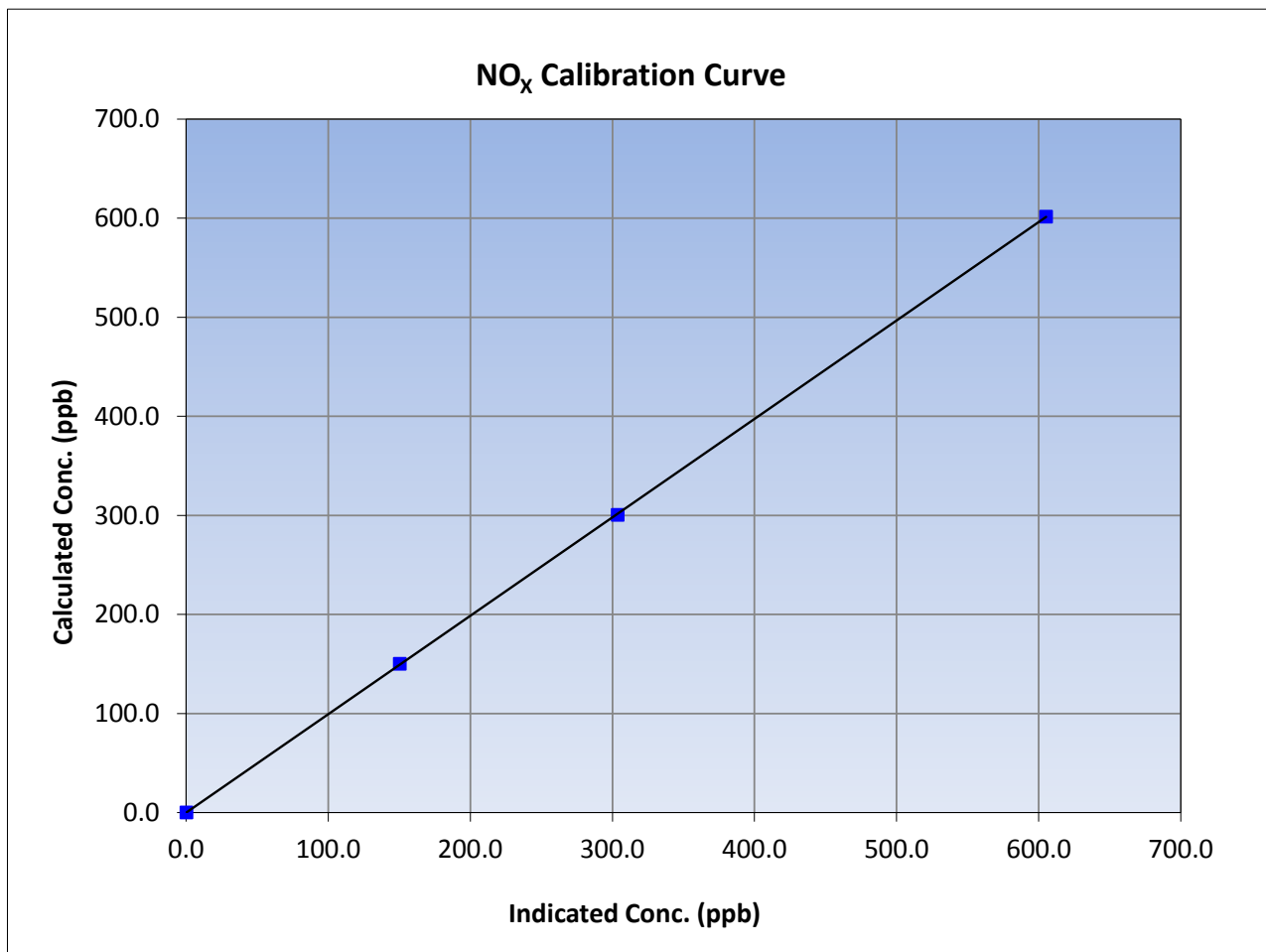
Version-03-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	March 13, 2017
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 42i	Analyzer serial #	1336160088

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.2	----	Correlation Coefficient	≥0.995	
601.6	605.2	0.9941			
300.5	303.7	0.9897			
150.2	150.5	0.9986			
			Slope	0.993710	0.90 - 1.10
			Intercept	-0.114871	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

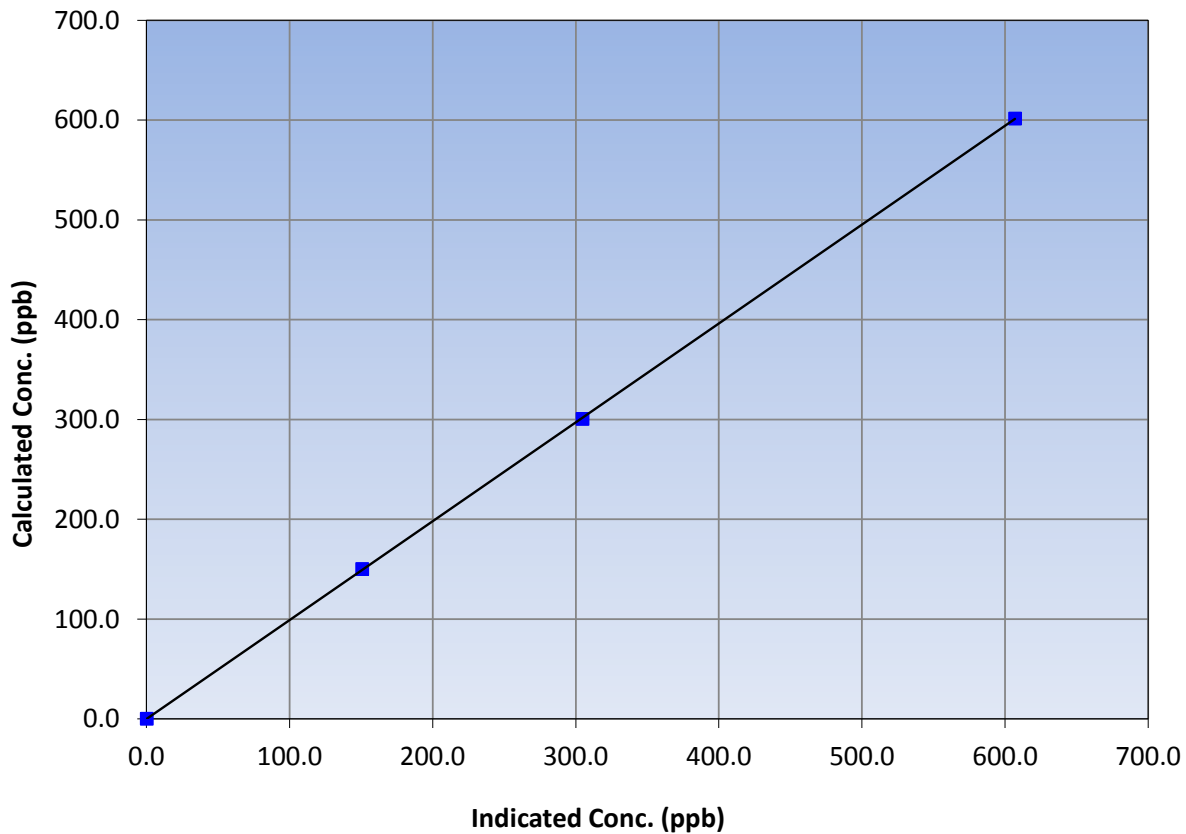
Station Information

Calibration Date	April 18, 2017	Previous Calibration	March 13, 2017
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 42i	Analyzer serial #	1336160088

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.3	----	Correlation Coefficient	≥0.995	
601.6	606.9	0.9913			
300.5	304.7	0.9862			
150.2	150.7	0.9969			
			Slope	0.990915	0.90 - 1.10
			Intercept	-0.147455	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

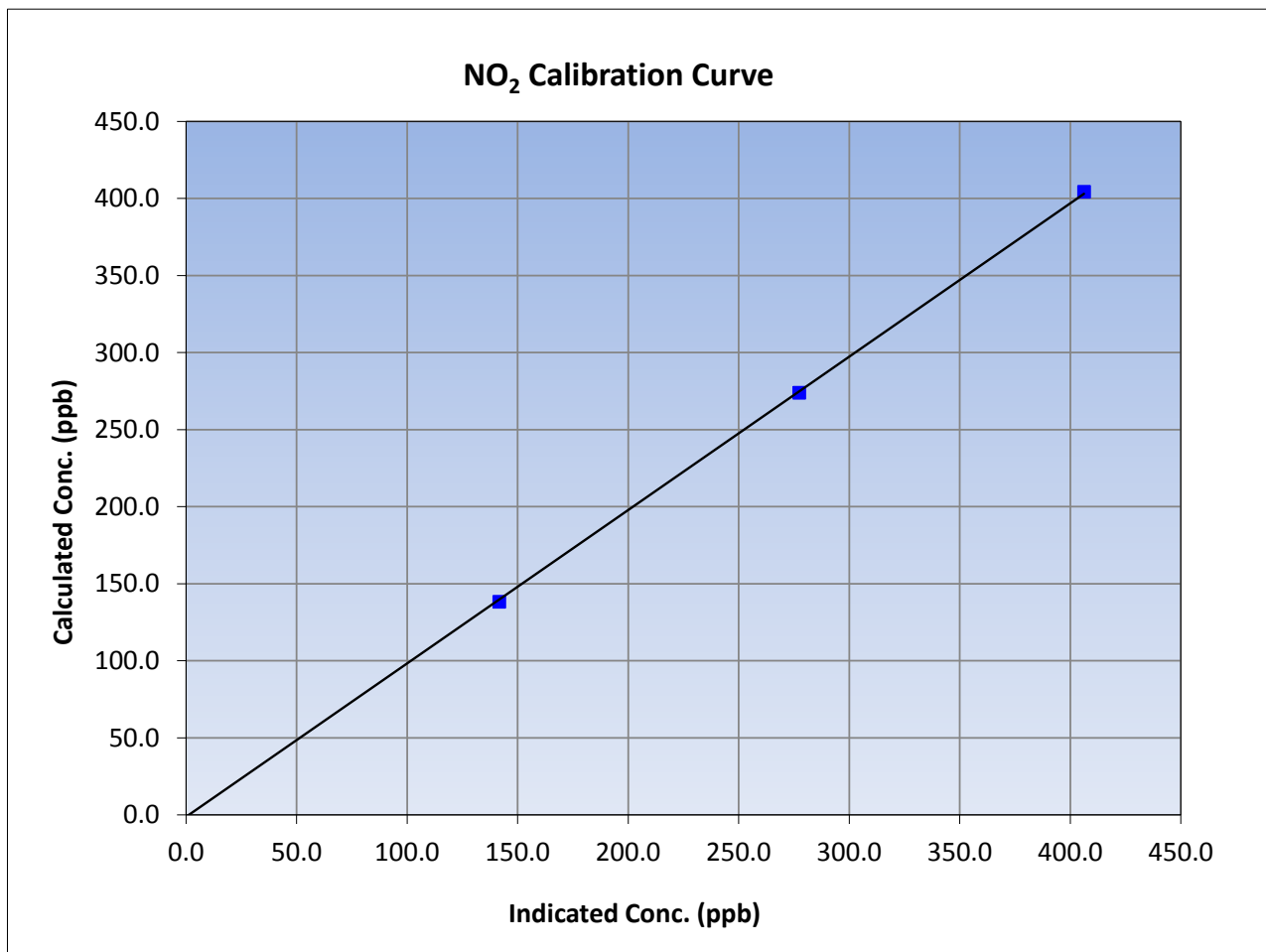
Version-03-2017

Station Information

Calibration Date	April 18, 2017	Previous Calibration	March 13, 2017
Station Name	Stony Mountain	Station Number	AMS 18
Start Time (MST)	11:11	End Time (MST)	15:51
Analyzer make	Thermo 42i	Analyzer serial #	1336160088

Calibration Data

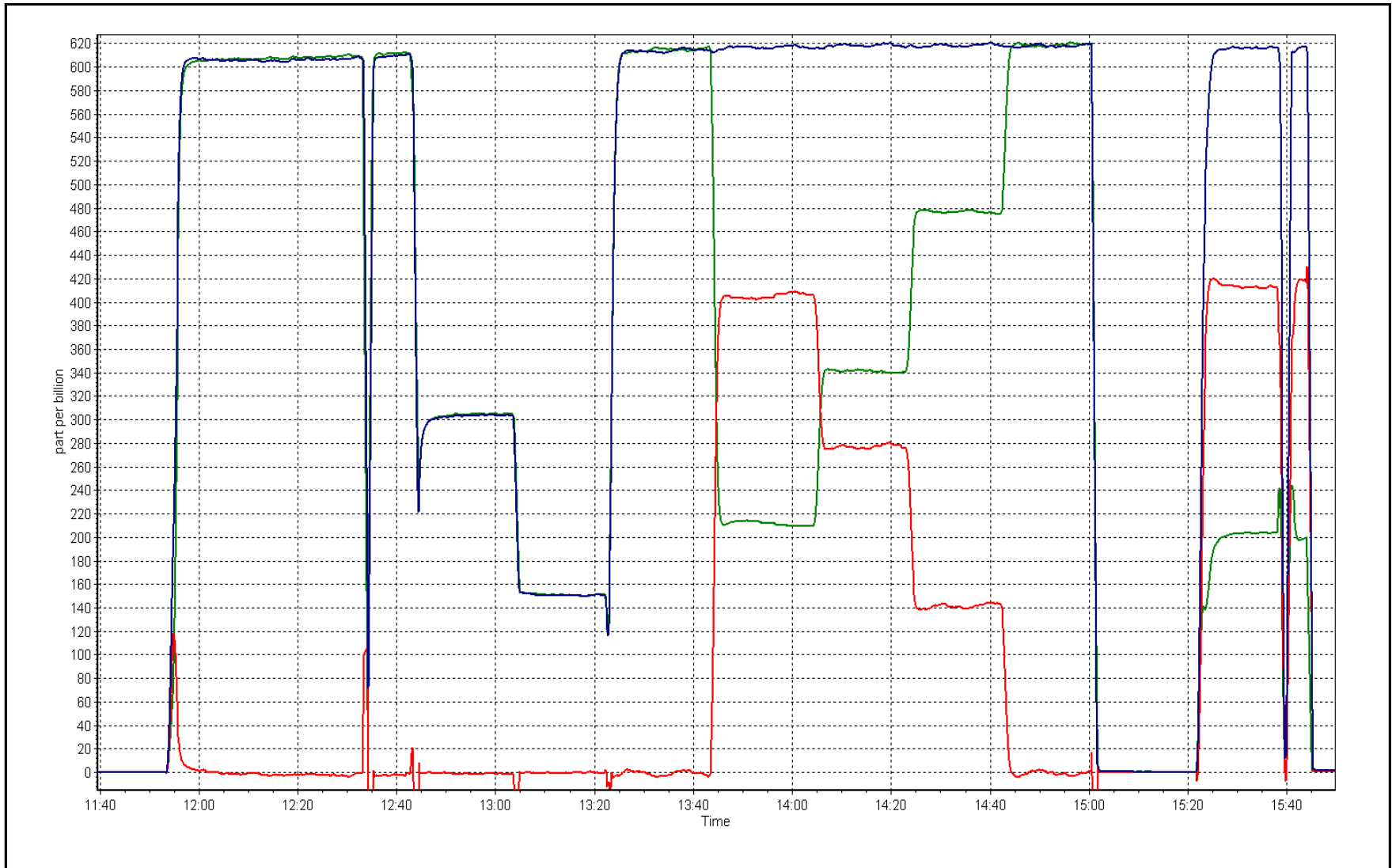
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient Slope Intercept	≥0.995 0.90 - 1.10 +/-20
404.2	406.2	0.9952		
274.0	277.5	0.9875		
138.2	141.7	0.9754		



NO_x Calibration Plot

Date: April 18, 2017

Location: Stony Mountain





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Stony Mountain	Station number:	AMS 18
Calibration Date:	April 19, 2017	Last Cal Date:	March 14, 2017
Start time (MST):	10:25	End time (MST):	11:50
Sharp Model:	Thermo 5030 SHARP	S/N:	E-781
Particulate Fraction:	PM2.5	C14 Source S/N:	4048
Flow Meter Make/Model:	Delta-Cal	S/N:	954
Temp/RH standard:	Delta-Cal	S/N:	954

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	0	2	0	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	933	935.25	933	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	993	1000	993	<input type="checkbox"/>	+/- 50 LPH
Nephelometer zero	0.5	-----	0.5	<input type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: _____ Last Cal Date: _____
 Flow w/o adaptor: _____ Flow w/ adaptor: _____

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: _____	Foil S/N: _____	
Foil Calibration	Foil Mass: _____	Foil Mass: _____	
	Calibration Date: _____	Calibration Date: _____	
(Limit) +/- 5% of previous	Correction Factor: _____	Correction Factor: _____	---

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: No adjustments required.

Calibration by: Aswin Sasi Kumar



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

AMS 19 FIREBAG APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	683	35	37	99.72	25	0	4	0
H2S (ppb) Average	685	34	35	99.86	1	0	0	0
THC (ppm) Average	685	33	35	99.72	2.6	-	2.3	-
NO2 (ppb) Average	683	35	37	99.72	16	0	4	-
NO (ppb) Average	683	35	37	99.72	4	-	1	-
NOX (ppb) Average	683	35	37	99.72	16	-	5	-
Temperature 2 m (C) Average	720	0	0	100	14.6	-	9.1	-
Relative Humidity (%) Average	720	0	0	100	98	-	88	-
Wind Speed 10 m (km/h) Average	720	0	0	100	37	-	26	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	683	0.6	2	-	0	0	0	0	0	1	25
H2S (ppb) Average	685	0.2	0	-	0	0	0	0	0	0	1
THC (ppm) Average	685	2.15	0.1	-	2	2.1	2.1	2.1	2.2	2.2	2.6
NO2 (ppb) Average	683	1.9	2	-	0	0	0	1	2	5	16
NO (ppb) Average	683	0.3	1	-	0	0	0	0	0	1	4
NOX (ppb) Average	683	2.2	3	-	0	0	0	1	3	6	16
Temperature 2 m (C) Average	720	0.43	5.9	-	-15.3	-7.7	-4	0.5	5	8.5	14.6
Relative Humidity (%) Average	720	60.8	19	-	19	36	45	61	76	87	98
Wind Speed 10 m (km/h) Average	720	13.7	6	-	1	6	9	13	18	22	37
	6	720	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS 19)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	20 Apr 2017 12:00	20 Apr 2017 12:00	1	Maintenance - station router replaced
AIR QUALITY ANALYZERS	27 Apr 2017 11:00	27 Apr 2017 11:00	1	Maintenance - sample manifold blower replaced



Summary of Hour Averages

Firebag - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 25 ppb on Apr 29 09:00	Maximum Daily Average: 4.5 ppb on Apr 1		Hours of Data:	683
Minimum Value: 0 ppb on Apr 8 07:00	Minimum Daily Average: 0.0 ppb on Apr 26		Hours of Missing Data:	37
Maximum Diurnal Average: 1.7 ppb at hour 9	Minimum Diurnal Average: 0.2 ppb at hour 1		Hours of Calibration:	35
Monthly Average: 0.6 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 11		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	7	8	8	7	10	10	11	13	11	6	7	1	0	0	0	0	0	0	0	0	0	1	4.5	13
2-Apr	1	2	Z	5	5	3	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	5
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
4-Apr	0	0	0	0	Z	0	0	0	1	2	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0.4	2
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Apr	Z	0	0	0	0	0	0	0	3	4	1	2	7	4	2	0	0	0	0	0	0	0	0	0	1.1	7
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
10-Apr	0	0	0	0	Z	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	6	0.5	6
13-Apr	0	Z	0	0	0	0	0	1	3	1	1	1	1	1	1	0	1	0	0	0	0	0	1	1	0.6	3
14-Apr	1	1	Z	1	1	1	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0.5	2
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	0	Z	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	0	Z	1	0	0	0	0	0	1	1	0	0	1	0	0	1	6	10	11	8	8	3	1	1	2.4	11
20-Apr	1	0	Z	0	0	0	0	2	1	1	1	M	1	0	0	0	0	0	0	0	0	0	0	0	0.4	2
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	5	0.5	5
24-Apr	Z	9	3	1	0	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	9
25-Apr	0	Z	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0.0	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Apr	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
29-Apr	0	0	0	0	0	Z	0	14	25	20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8	25
30-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

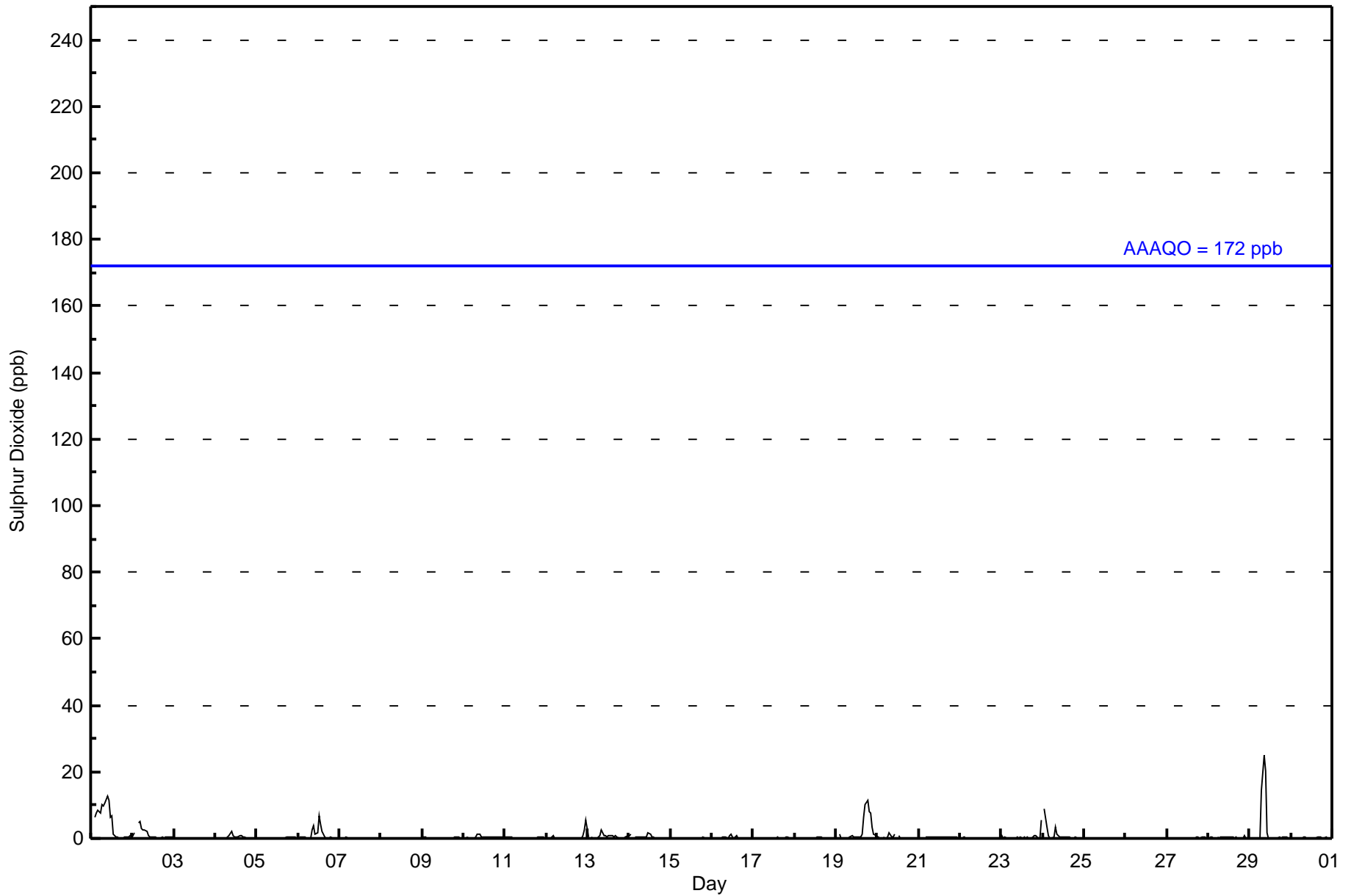
0.2	0.6	0.6	0.7	0.7	0.6	0.6	1.2	1.7	1.6	0.8	0.6	0.7	0.4	0.3	0.2	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.6	Diurnal Average	
1	9	7	8	8	7	10	14	25	20	11	6	7	4	2	1	6	10	11	8	8	3	3	6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Firebag - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	676	98.98	98.98
11 - 20	6	0.88	99.85
21 - 60	1	0.15	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	65	99	40	33	43	61	18	57	100	48	35	20	13	8	13	23	676
11 - 20	0	0	0	0	0	0	0	0	0	0	2	3	1	0	0	0	6
21 - 60	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683

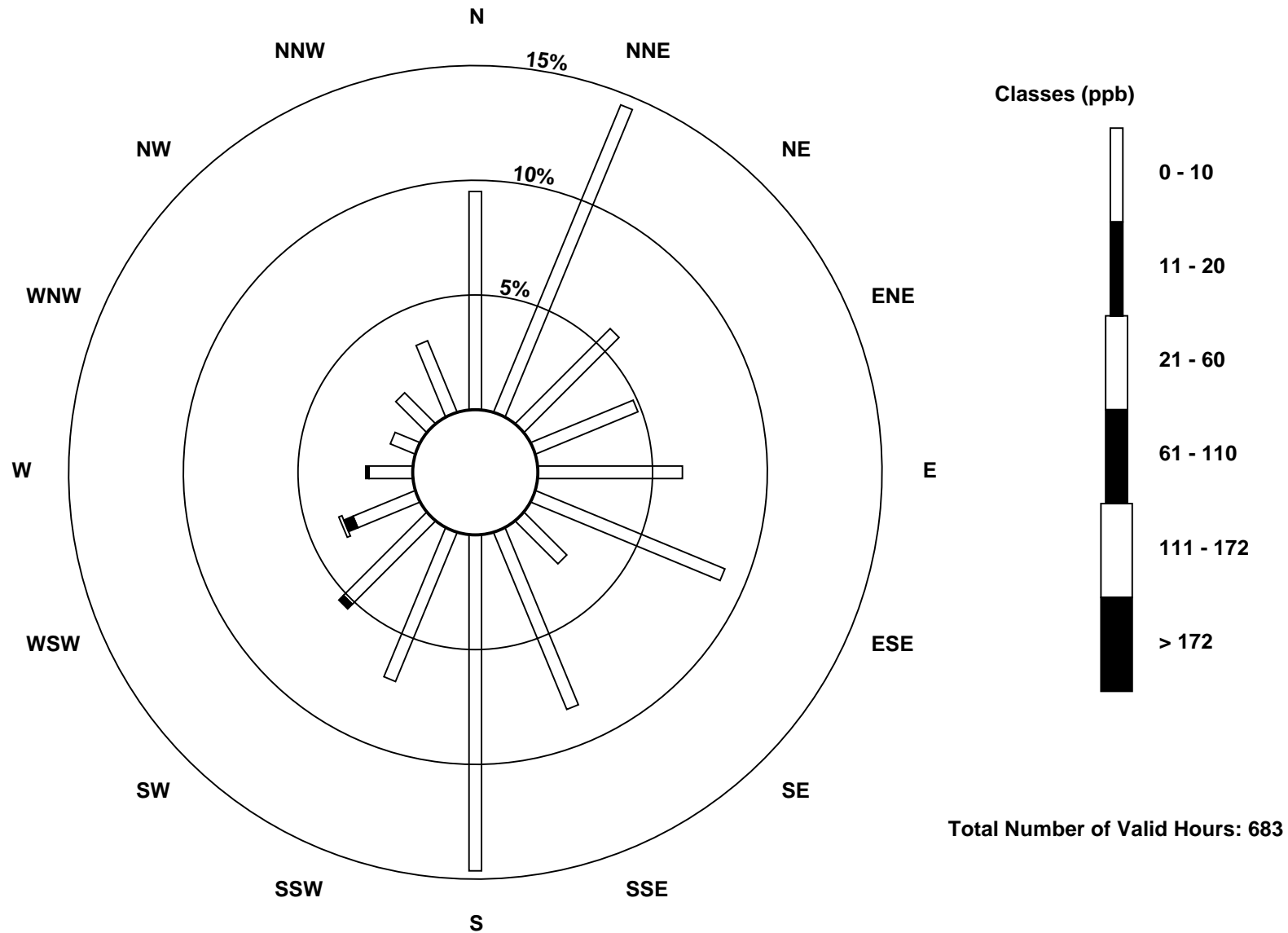
Total Number of Valid Hours: 683

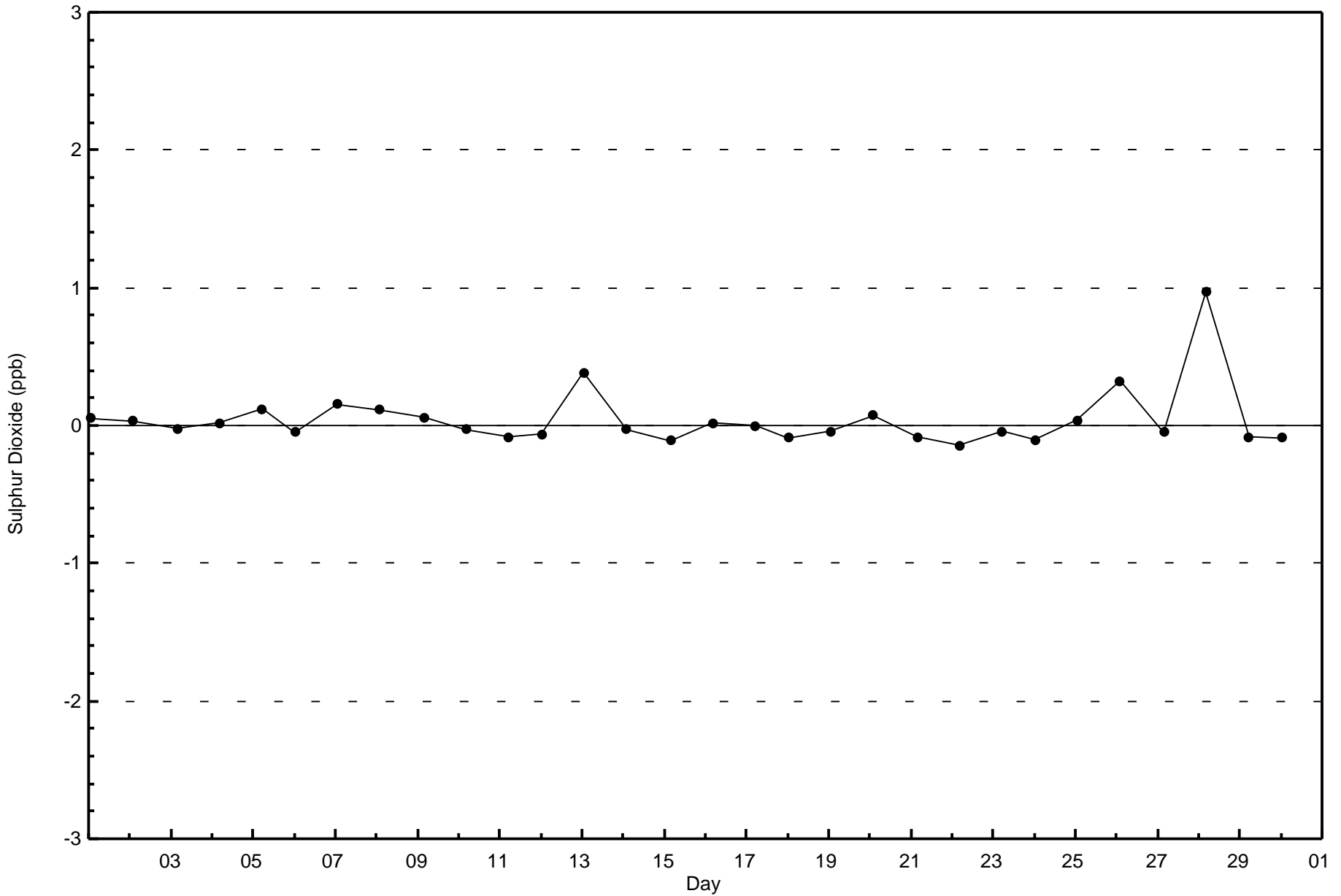
Total Number of Hours: 720

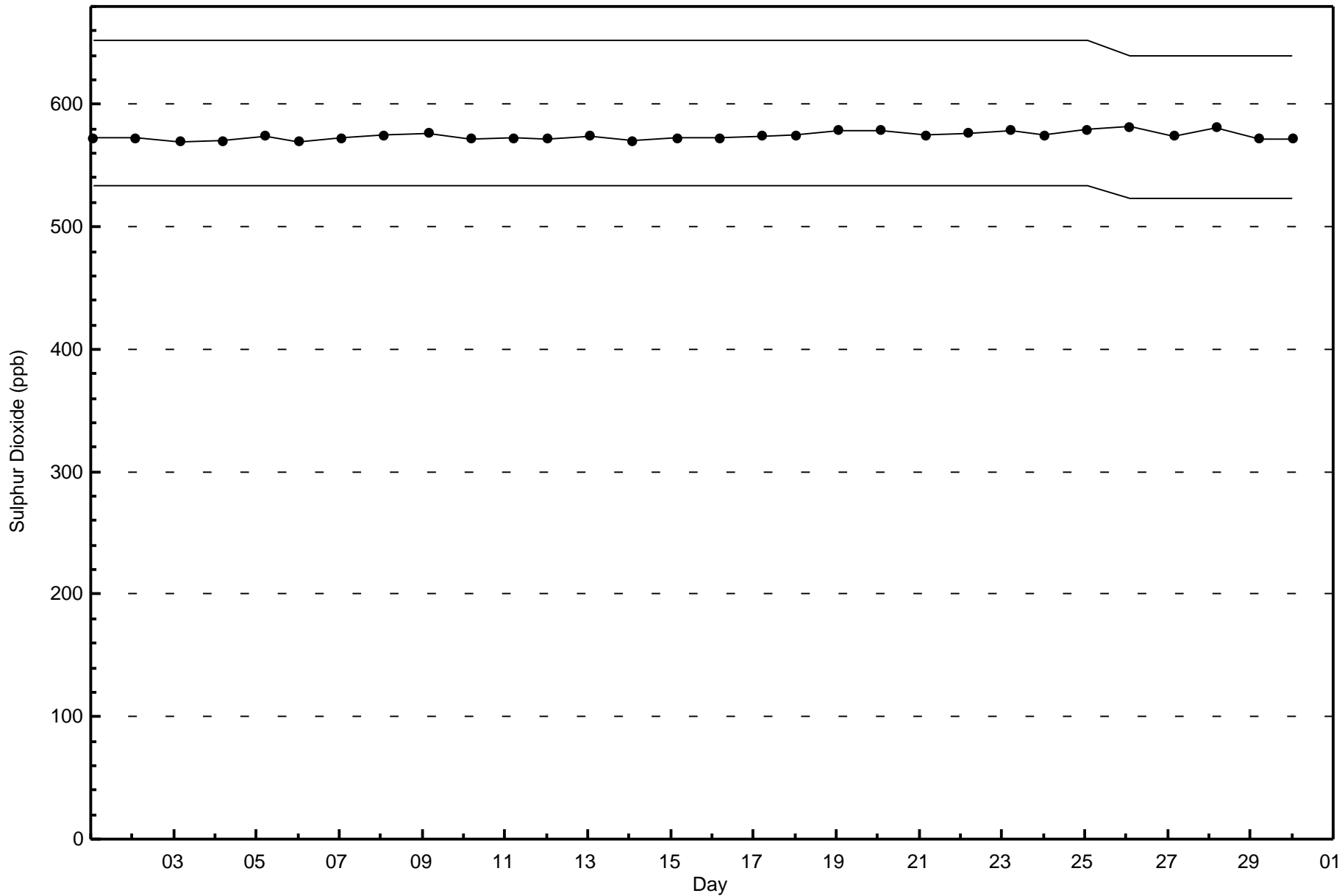


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Firebag (AMS 19)









Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 1 ppb on Apr 12 23:00	Maximum Daily Average: 0.4 ppb on Apr 1
Minimum Value: 0 ppb on Apr 4 18:00	Hours of Data: 685
Maximum Diurnal Average: 0.3 ppb at hour 5	Hours of Missing Data: 35
Monthly Average: 0.2 ppb	Hours of Calibration: 34
Minimum Daily Average: 0.1 ppb on Apr 5	Percent Operational Time: 99.9
Minimum Diurnal Average: 0.1 ppb at hour 14	
Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1	

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
2-Apr	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
3-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
4-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
7-Apr	0	1	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
10-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
20-Apr	0	0	0	Z	1	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
22-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.2	1
23-Apr	1	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
24-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Apr	0	0	0	0	Z	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
30-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

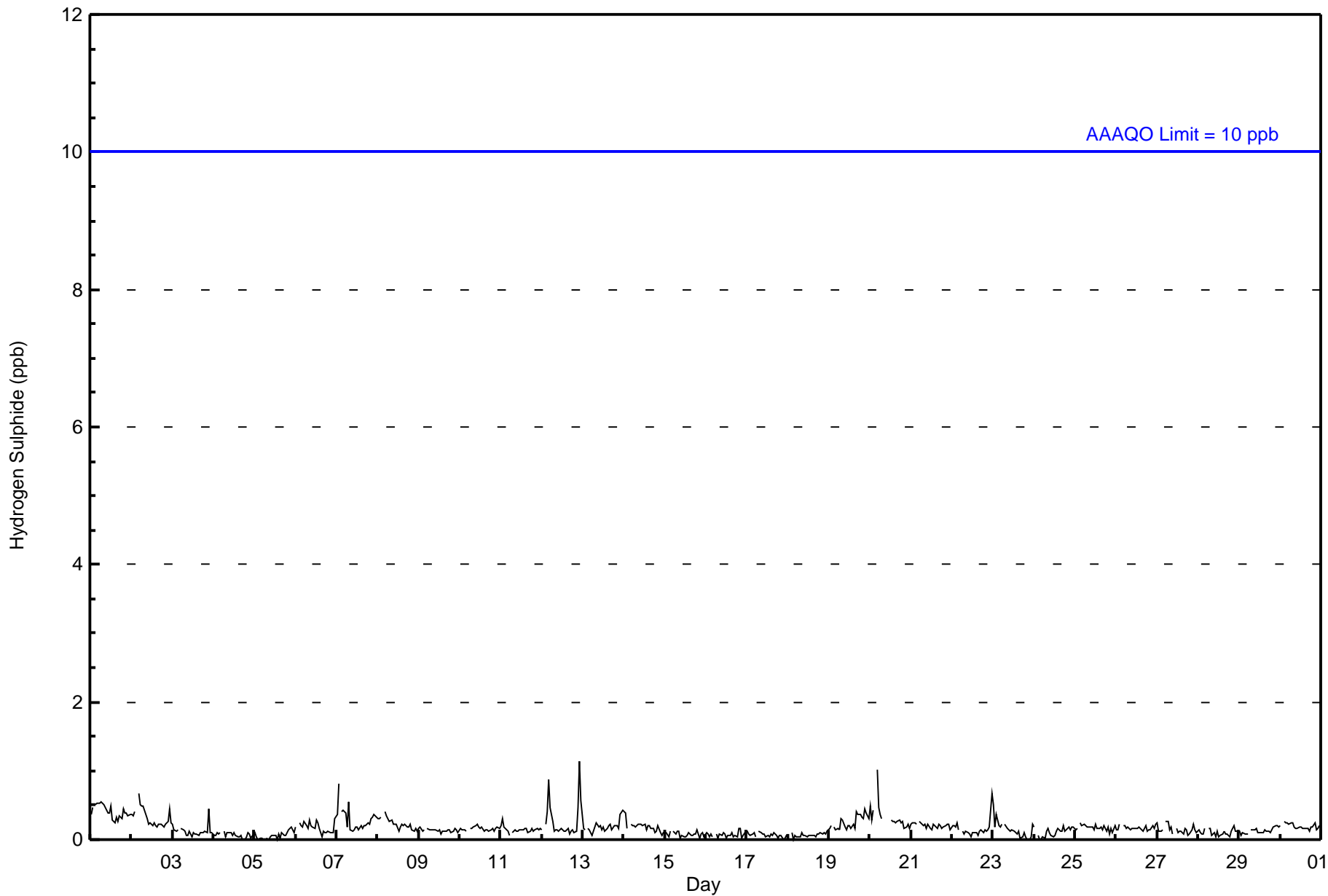
0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	Diurnal Average
1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Firebag - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Firebag - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	65	97	39	33	43	60	18	55	108	48	36	24	14	8	13	24	685
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	97	39	33	43	60	18	55	108	48	36	24	14	8	13	24	685

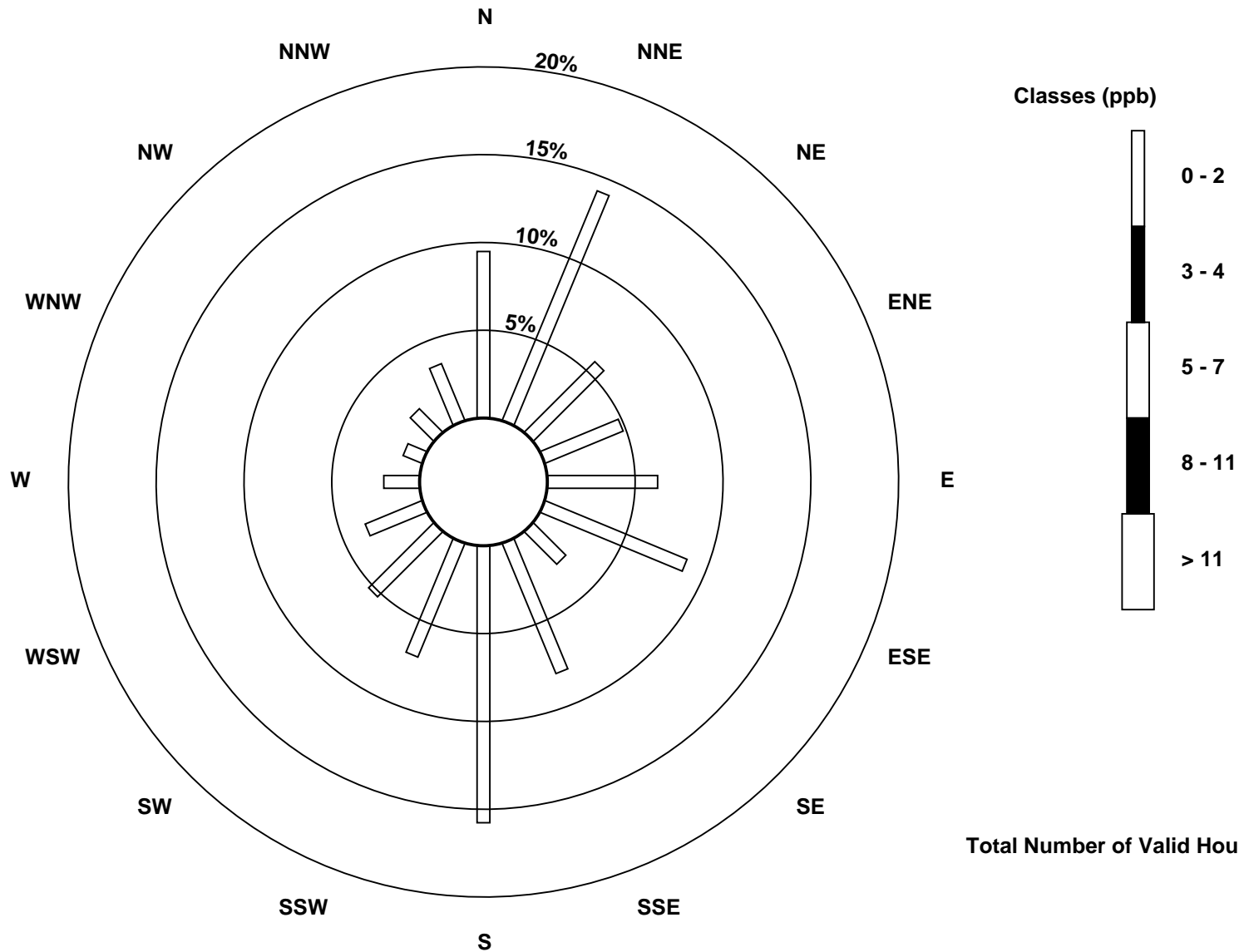
Total Number of Valid Hours: 685

Total Number of Hours: 720

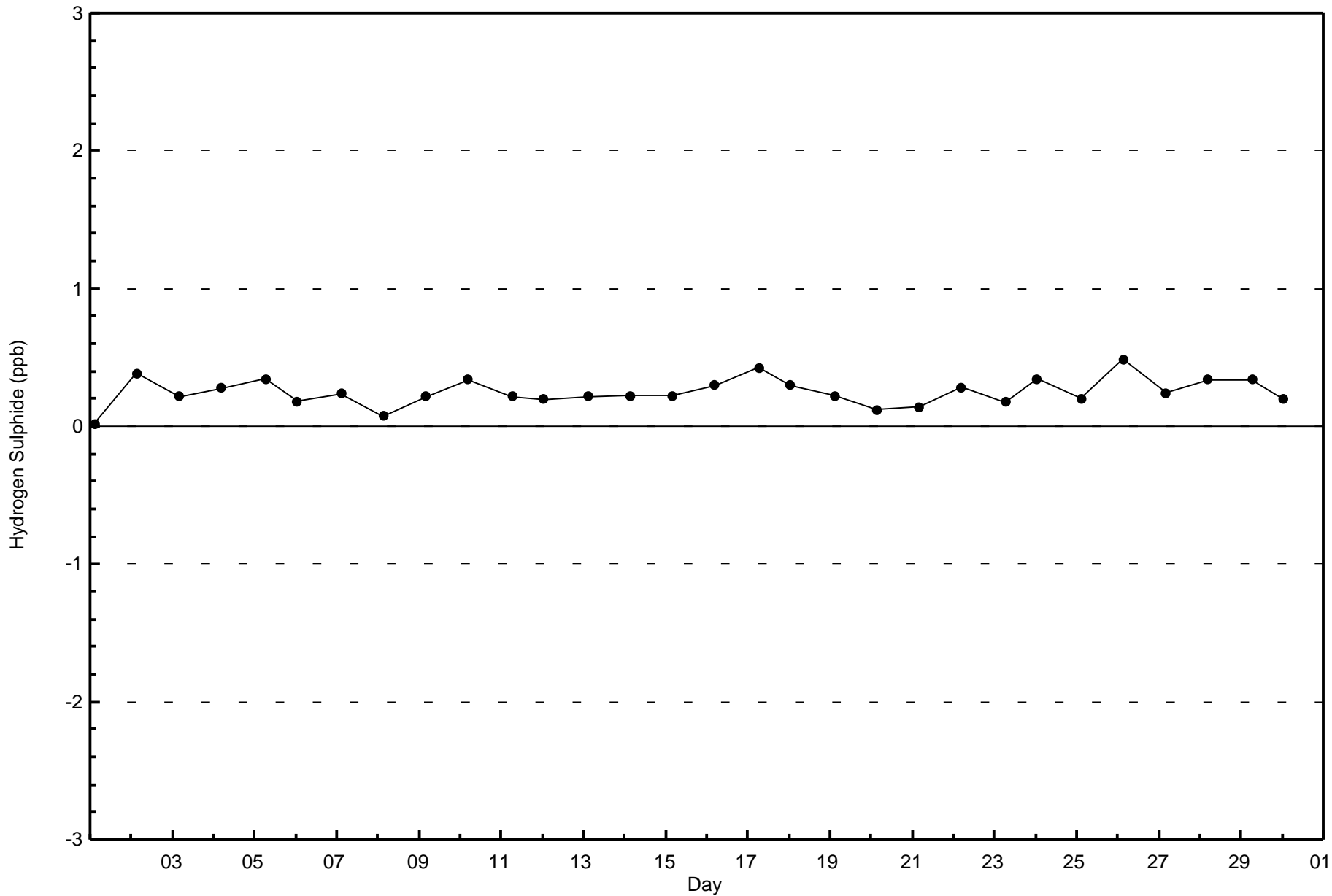


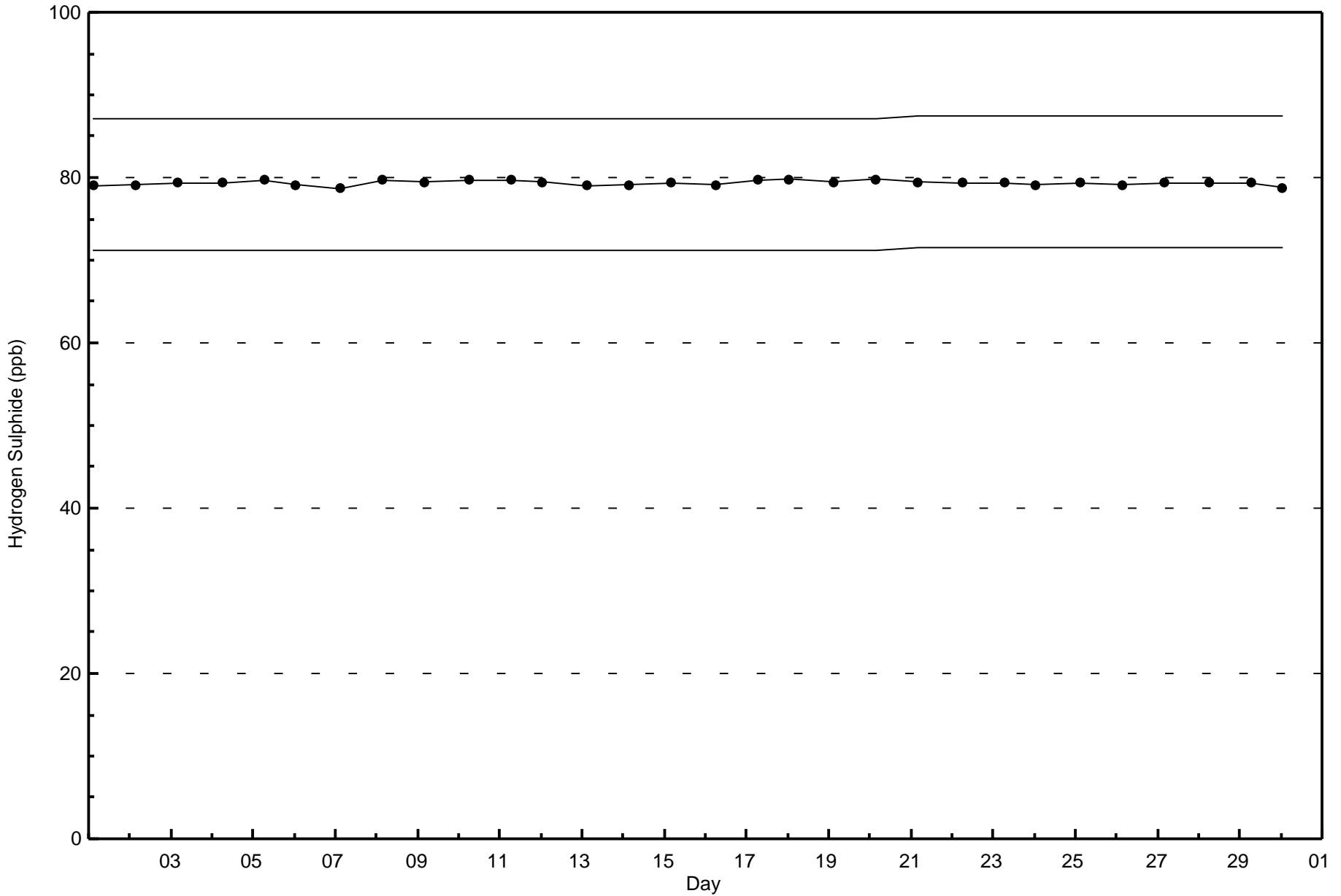
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Firebag (AMS 19)



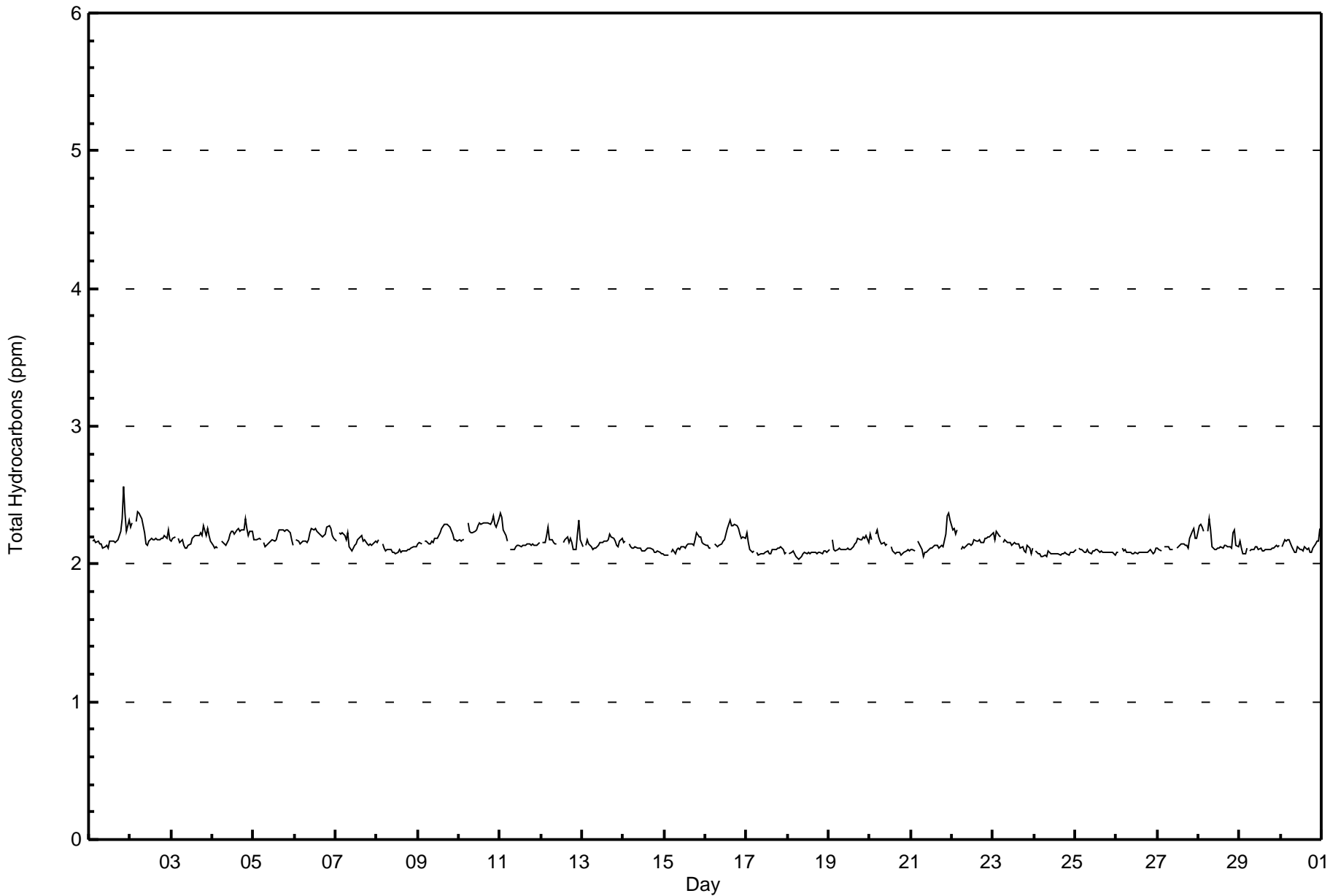
Total Number of Valid Hours: 685







Maximum Value: 2.6 ppm on Apr 1 21:00																				Maximum Daily Average: 2.3 ppm on Apr 10					Hours in Service: 720			
Minimum Value: 2.0 ppm on Apr 18 07:00																				Minimum Daily Average: 2.1 ppm on Apr 24					Hours of Data: 685			
Maximum Diurnal Average: 2.2 ppm at hour 21																				Minimum Diurnal Average: 2.1 ppm at hour 9					Hours of Missing Data: 35			
Monthly Average: 2.15 ppm																				Percentiles: P ₁ = 2.1 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.2 P ₉₉ = 2.3					Hours of Calibration: 33			
																									Percent Operational Time: 99.7			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.4	2.2	2.3	2.2	2.6		
2-Apr	2.3	2.3	Z	2.3	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
3-Apr	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.3		
4-Apr	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3		
5-Apr	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2		
6-Apr	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.3		
7-Apr	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2		
8-Apr	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2		
9-Apr	2.1	2.2	2.1	Z	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3		
10-Apr	2.2	2.2	2.2	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3		
11-Apr	2.4	2.3	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4		
12-Apr	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.1	C	C	C	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.3		
13-Apr	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2		
14-Apr	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2		
15-Apr	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2		
16-Apr	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3		
17-Apr	2.2	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2		
18-Apr	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
19-Apr	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
20-Apr	2.2	2.2	Z	2.2	2.3	2.2	2.2	2.1	2.2	2.1	2.1	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3		
21-Apr	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.4	2.3	2.1	2.4		
22-Apr	2.2	2.3	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3		
23-Apr	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2		
24-Apr	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
25-Apr	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
26-Apr	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
27-Apr	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.1	2.3		
28-Apr	2.3	2.3	2.3	2.2	Z	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.2	2.3		
29-Apr	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2		
30-Apr	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.3		
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration M - Maintenance																												





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	2	0.29	0.29
2.1 - 3.0	683	99.71	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2.1 - 3.0	65	94	40	33	43	61	18	57	105	48	37	24	14	8	13	23	683
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	96	40	33	43	61	18	57	105	48	37	24	14	8	13	23	685

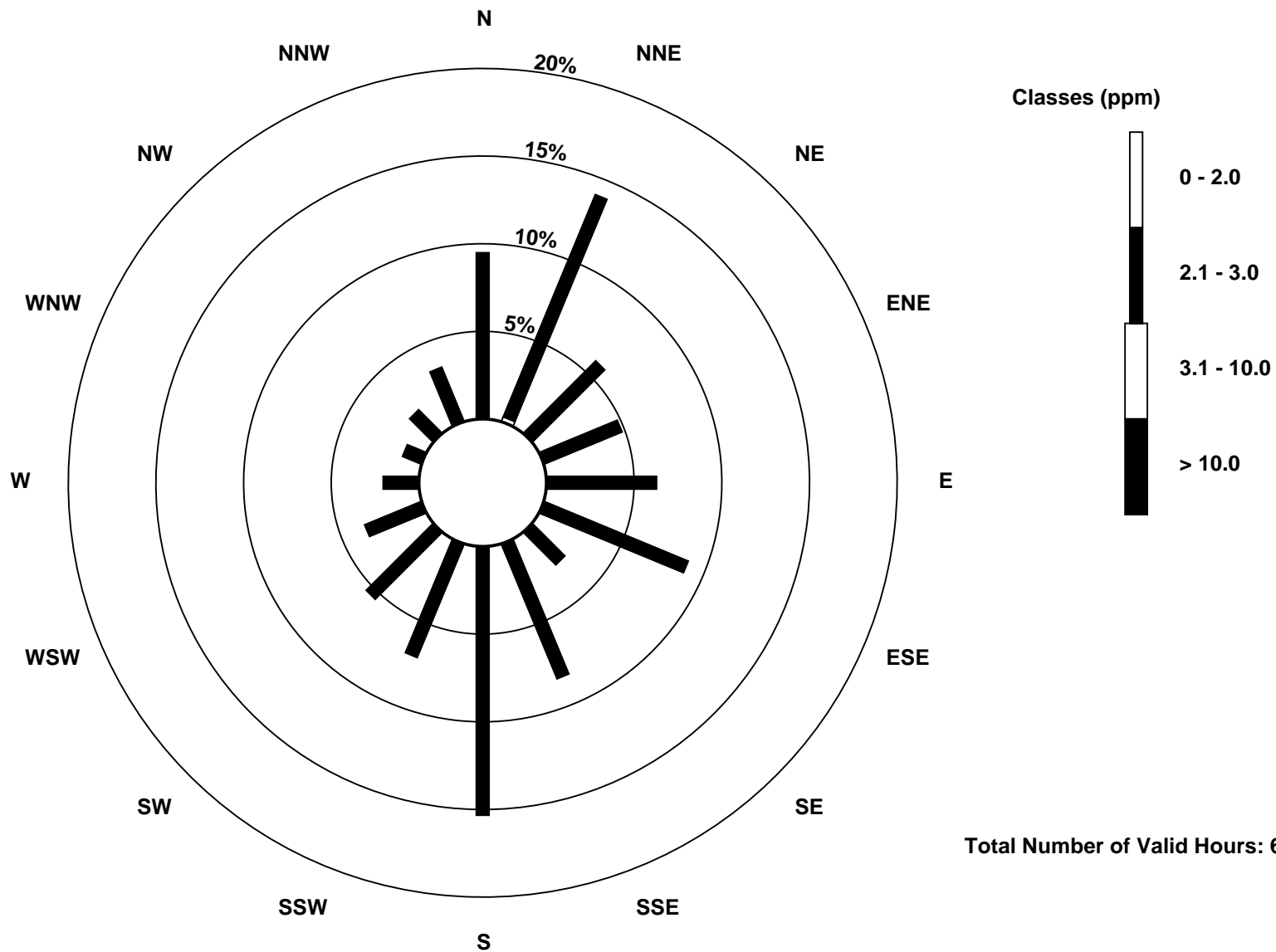
Total Number of Valid Hours: 685

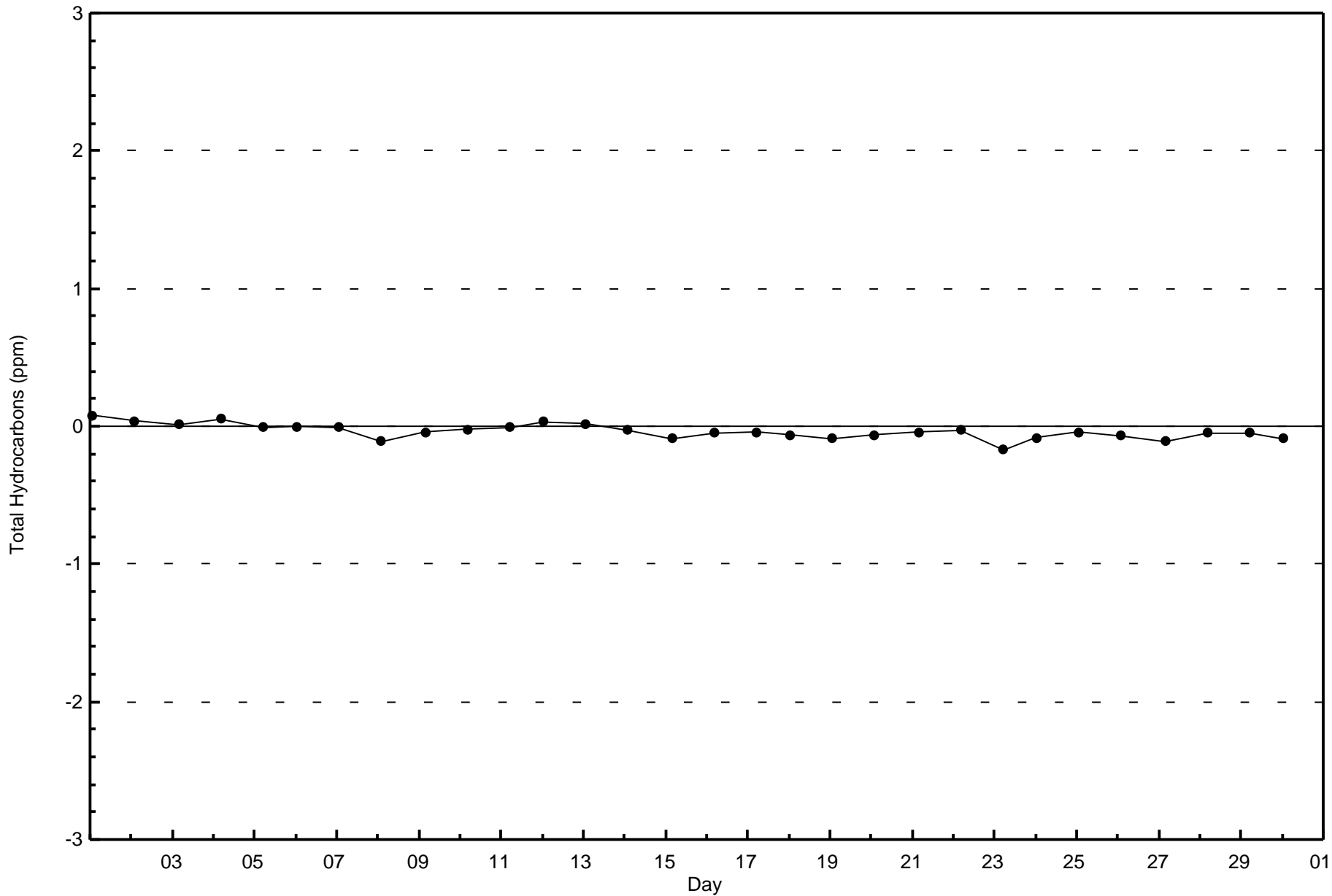
Total Number of Hours: 720

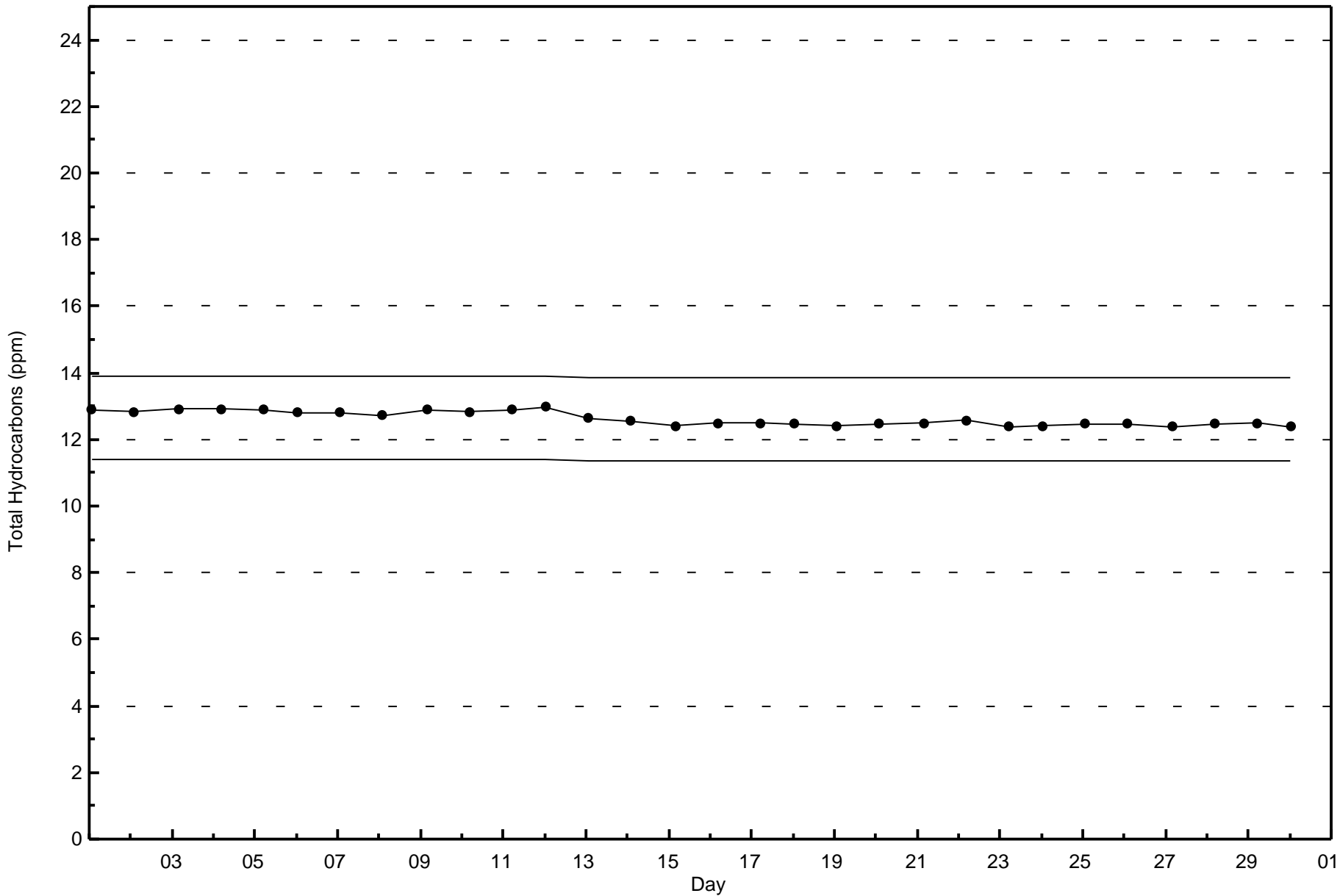


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Firebag (AMS 19)







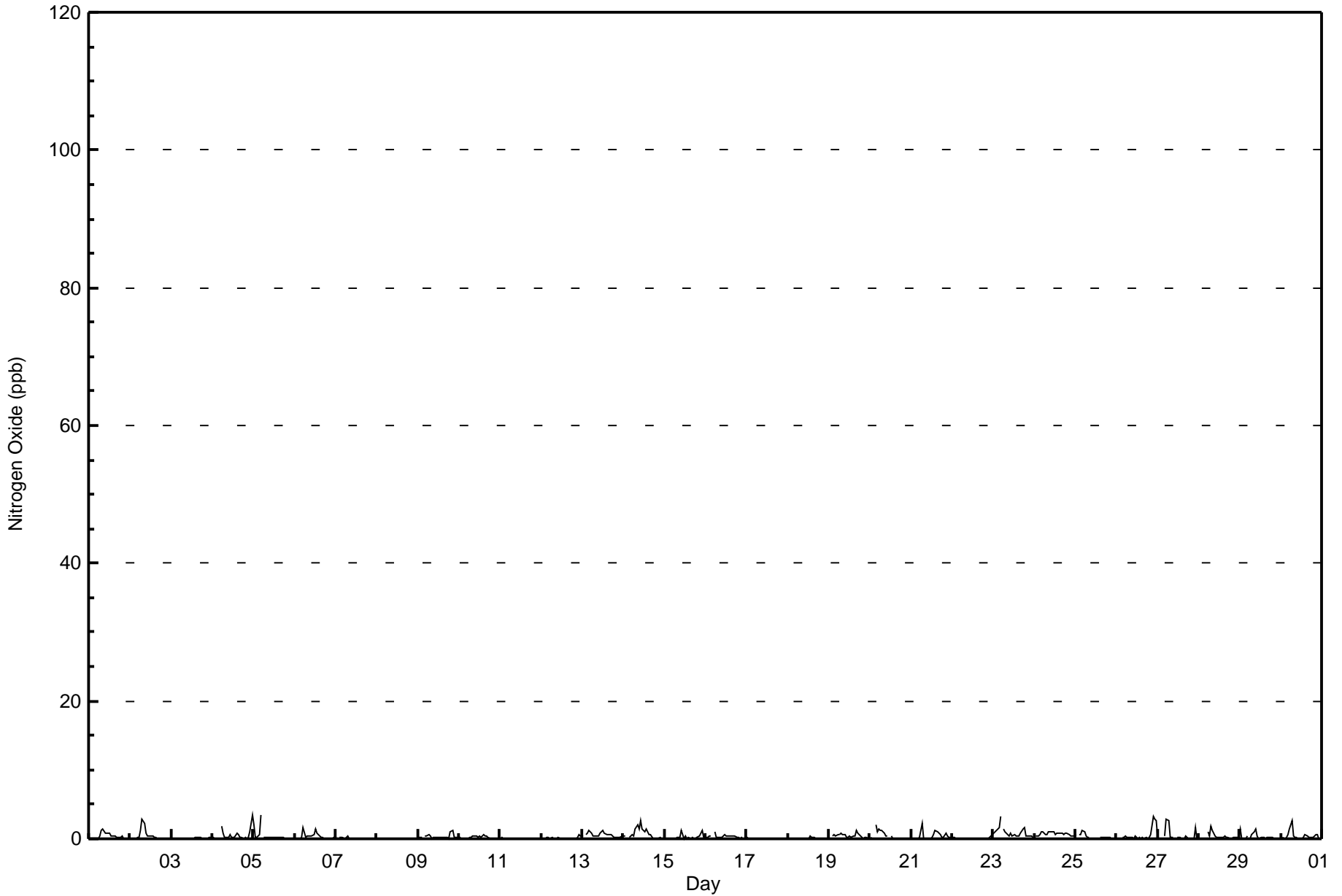


Maximum Value: 4 ppb on Apr 5 05:00		Maximum Daily Average: 0.9 ppb on Apr 23		Hours in Service: 720																																													
Minimum Value: 0 ppb on Apr 29 02:00		Minimum Daily Average: 0.1 ppb on Apr 8		Hours of Data: 683																																													
Maximum Diurnal Average: 0.7 ppb at hour 6		Minimum Diurnal Average: 0.2 ppb at hour 2		Hours of Missing Data: 37																																													
Monthly Average: 0.3 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 3		Hours of Calibration: 35																																													
				Percent Operational Time: 99.7																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	0	Z	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1																							
2-Apr	0	0	Z	0	0	0	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3																							
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
4-Apr	0	0	0	0	Z	2	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	3	0.5	3																							
5-Apr	2	0	0	1	4	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	4																							
6-Apr	Z	0	0	0	0	2	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0.3	2																							
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
9-Apr	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.3	1																							
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1																							
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
12-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1																							
13-Apr	0	Z	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.6	1																							
14-Apr	0	0	Z	0	0	1	0	1	2	1	3	1	1	1	1	1	1	1	0	0	0	0	0	0	0.7	3																							
15-Apr	0	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0.3	1																							
16-Apr	0	0	0	0	Z	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																							
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0																							
19-Apr	0	Z	0	1	0	1	1	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.4	1																							
20-Apr	0	0	Z	2	1	1	1	1	1	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2																							
21-Apr	0	0	0	Z	0	0	2	0	0	0	0	0	0	1	1	1	1	1	0	0	1	0	0	0	0.4	2																							
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1																							
23-Apr	1	1	1	2	3	Z	2	1	1	0	1	0	1	0	1	0	1	1	1	2	0	0	0	0	0.9	3																							
24-Apr	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.7	1																							
25-Apr	1	Z	1	1	1	1	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0.4	1																							
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	3	0.5	3																							
27-Apr	0	0	0	Z	0	3	3	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	2	0	0.5	3																							
28-Apr	0	0	0	0	Z	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2																							
29-Apr	1	0	0	0	0	Z	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																							
30-Apr	Z	0	0	0	1	1	3	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0.4	3																							
																								0.3	0.2	0.2	0.4	0.6	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.3	Diurnal Average	
																								2	1	1	2	4	3	3	3	3	2	1	3	1	1	1	1	1	1	1	2	1	1	3	3	3	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxide (NO) - ppb
Firebag - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxide (NO) - ppb
Firebag - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxide (NO) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683

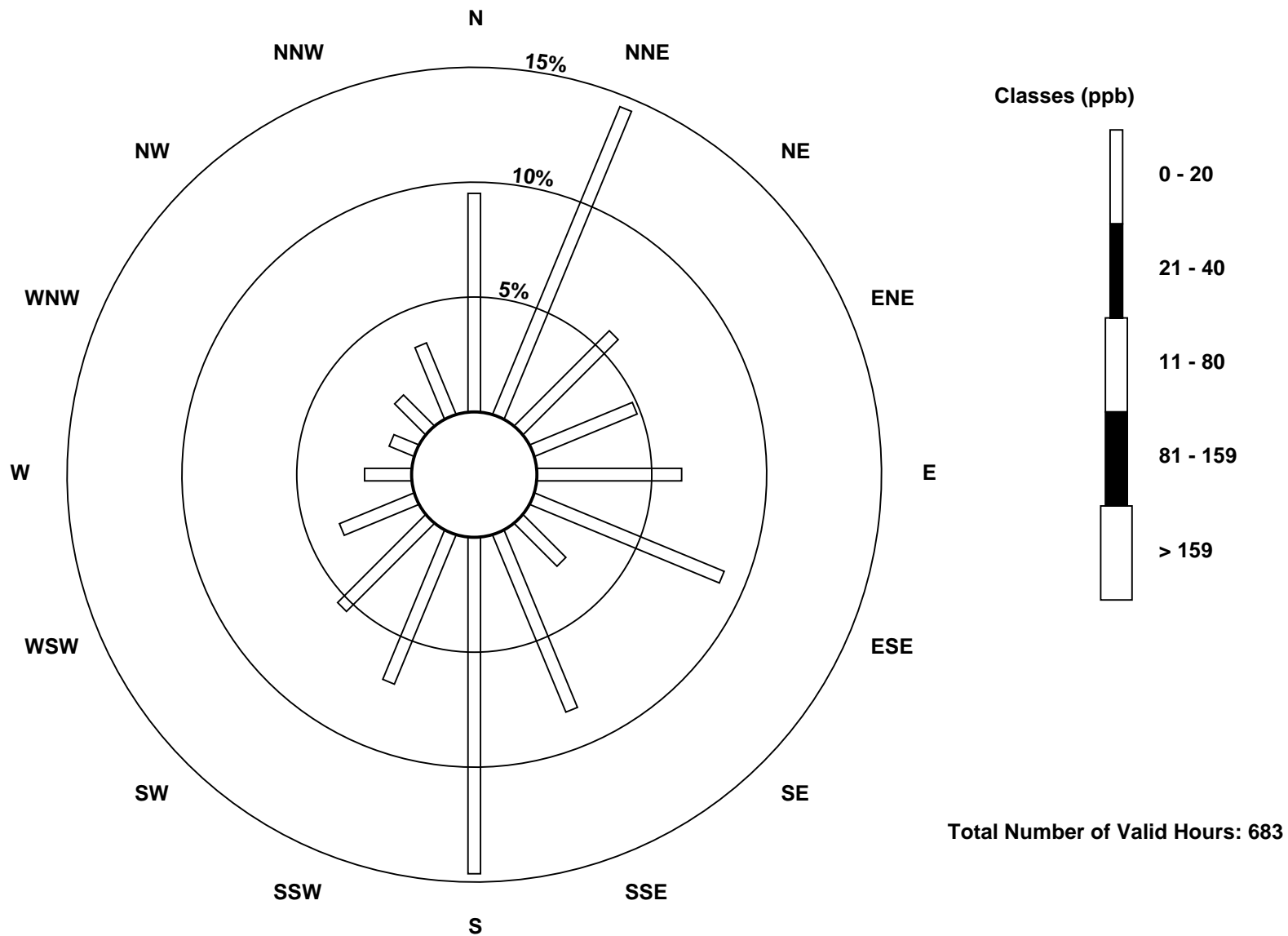
Total Number of Valid Hours: 683

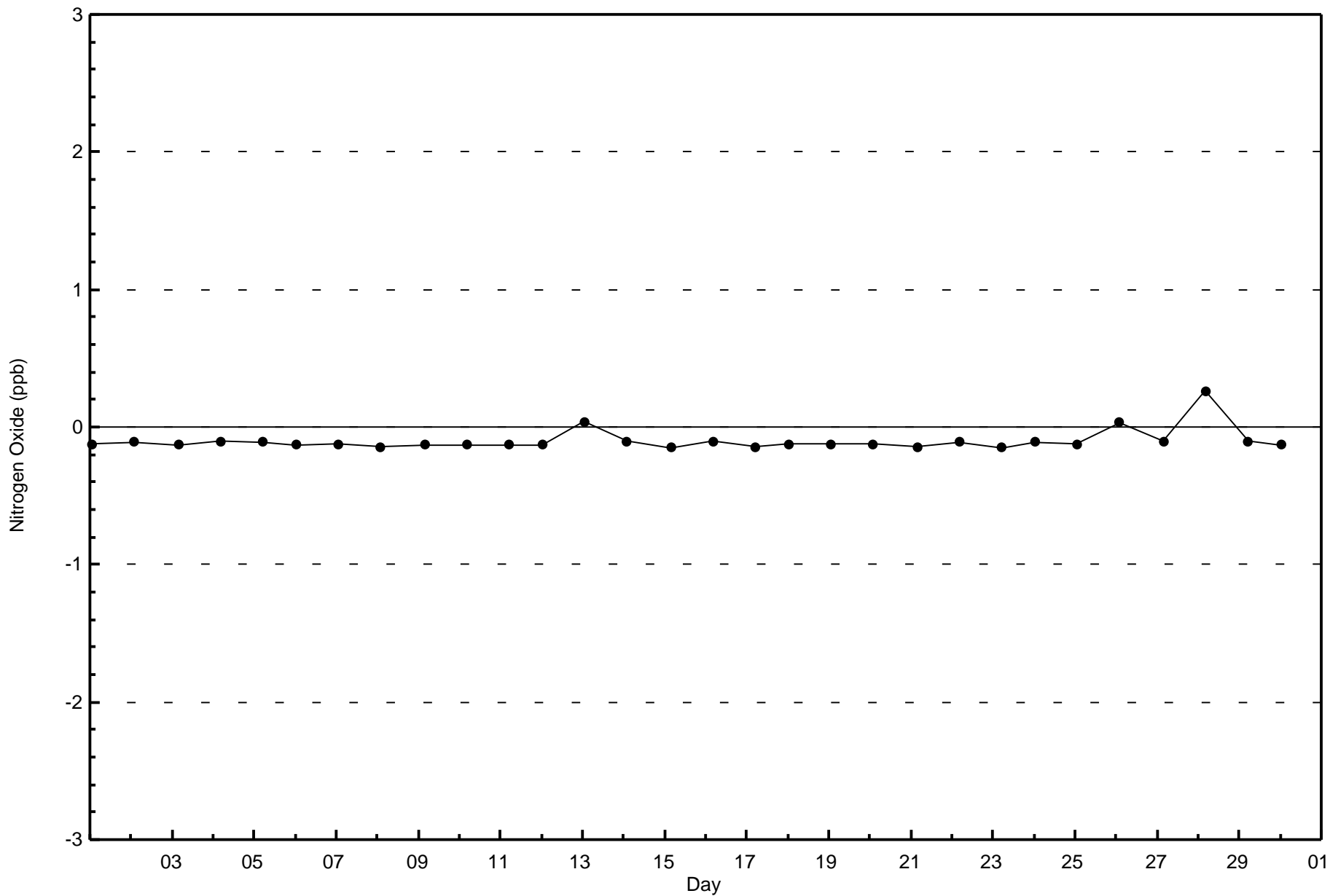
Total Number of Hours: 720

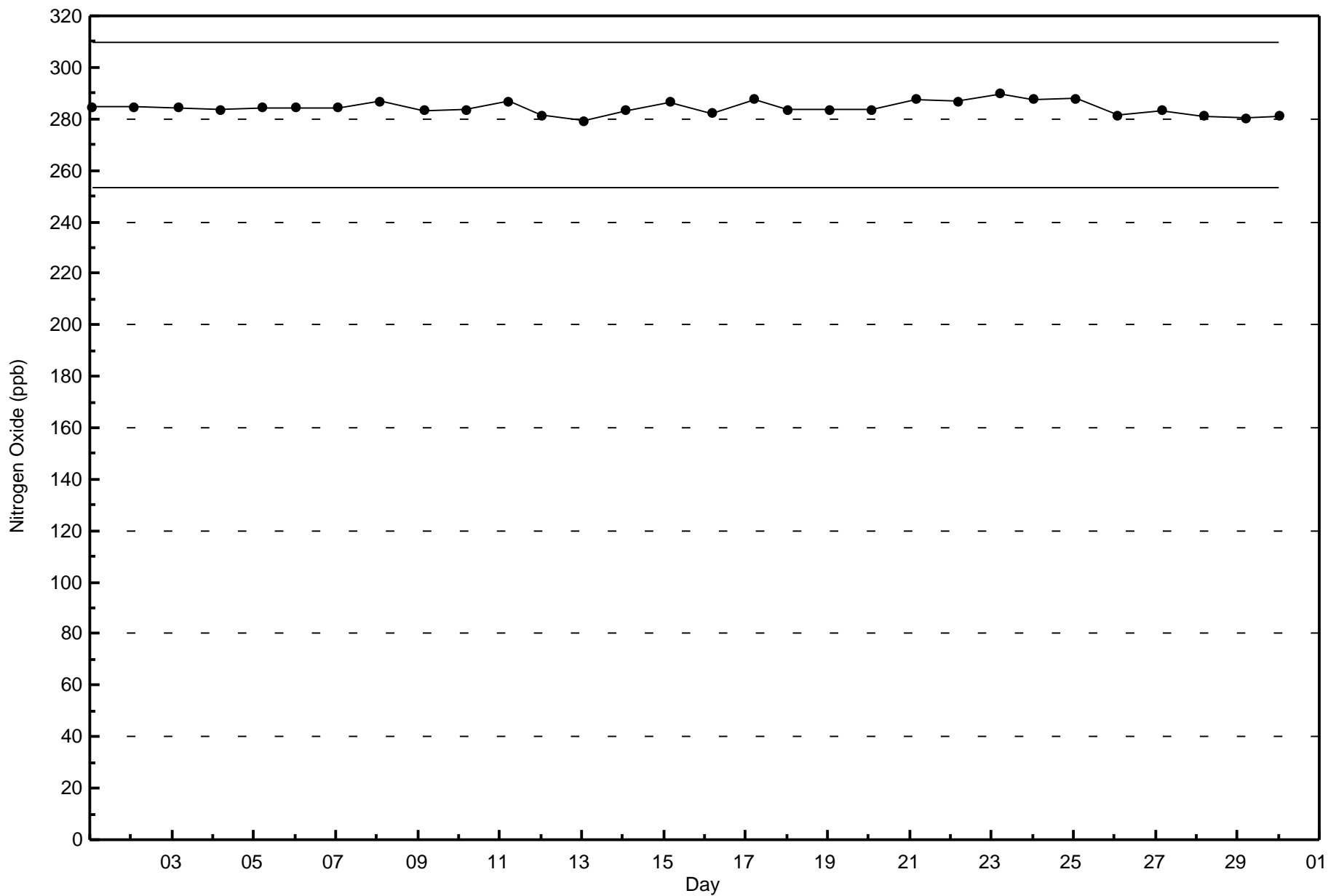


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxide (NO) - ppb
Firebag (AMS 19)









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 16 ppb on Apr 2 06:00	Maximum Daily Average: 4.3 ppb on Apr 2		Hours of Data:	683
Minimum Value: 0 ppb on Apr 2 19:00	Minimum Daily Average: 0.2 ppb on Apr 8		Hours of Missing Data:	37
Maximum Diurnal Average: 3.9 ppb at hour 6	Minimum Diurnal Average: 0.9 ppb at hour 12		Hours of Calibration:	35
Monthly Average: 1.9 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 2 P ₉₀ = 5 P ₉₉ = 12		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	1	Z	4	4	4	5	4	5	4	2	2	2	2	1	1	1	1	3	6	13	8	2	3	7	3.7	13
2-Apr	4	5	Z	6	12	16	15	12	6	2	1	1	2	1	1	1	0	0	0	0	0	1	12	2	4.3	16
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	2	3	2	0.5	3
4-Apr	1	1	0	1	Z	6	3	1	1	1	2	1	1	1	1	3	3	1	1	2	2	4	6	12	2.3	12
5-Apr	6	1	2	3	9	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.6	9
6-Apr	Z	1	1	1	1	6	1	2	2	2	1	2	5	3	2	1	1	1	1	3	3	1	0	4	1.8	6
7-Apr	6	Z	6	5	3	3	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	6
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	1	3	1	Z	2	2	2	1	0	0	0	0	0	0	1	1	0	0	3	3	1	1	0	1.0	3	
10-Apr	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	1	2	2	1	1.2	2
11-Apr	4	7	2	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	7
12-Apr	Z	0	0	2	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4	14	5	1.5	14
13-Apr	2	Z	3	5	7	4	2	1	1	1	2	2	3	2	2	2	3	2	1	1	2	2	3	3	2.3	7
14-Apr	5	5	Z	2	5	7	4	7	8	5	7	4	4	4	4	3	0	0	0	0	1	1	0	3.4	8	
15-Apr	0	0	0	Z	0	0	0	0	0	0	2	0	1	0	1	0	0	0	1	3	4	6	5	1	1.1	6
16-Apr	1	1	1	1	Z	3	1	1	1	1	1	2	1	1	1	2	2	2	1	1	1	0	0	1	1.1	3
17-Apr	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.3	1
19-Apr	1	Z	4	2	2	3	3	2	2	1	1	1	1	1	1	2	7	7	7	6	7	6	6	3	3.3	7
20-Apr	4	3	Z	8	9	7	5	3	2	1	1	M	1	0	0	0	0	0	0	0	0	0	0	0	2.1	9
21-Apr	0	0	0	Z	0	0	5	0	0	0	0	0	1	1	2	2	2	2	2	2	6	8	7	13	2.3	13
22-Apr	10	8	2	7	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	1.7	10
23-Apr	6	3	5	4	8	Z	2	1	1	1	1	1	1	1	1	1	2	4	5	2	3	2	3	3	2.5	8
24-Apr	Z	3	2	2	4	3	2	2	2	2	2	2	1	2	2	2	2	2	3	3	3	3	3	3	2.3	4
25-Apr	3	Z	3	3	3	2	1	1	0	C	C	C	C	C	1	1	1	1	1	1	1	0	0	0	1.2	3
26-Apr	0	1	Z	1	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	1	4	13	9	8	1.9	13
27-Apr	1	1	0	Z	3	11	8	1	1	1	M	1	1	1	0	0	1	1	1	1	3	7	7	2	2.4	11
28-Apr	3	2	2	2	Z	8	3	8	4	2	1	1	1	2	2	2	2	2	2	2	8	8	2	5	3.2	8
29-Apr	9	1	1	1	4	Z	1	3	4	4	2	1	1	1	1	1	1	1	1	3	4	3	4	2	2.1	9
30-Apr	Z	2	4	3	5	8	7	2	1	1	1	1	1	1	2	2	3	1	1	6	6	5	1	2	2.7	8

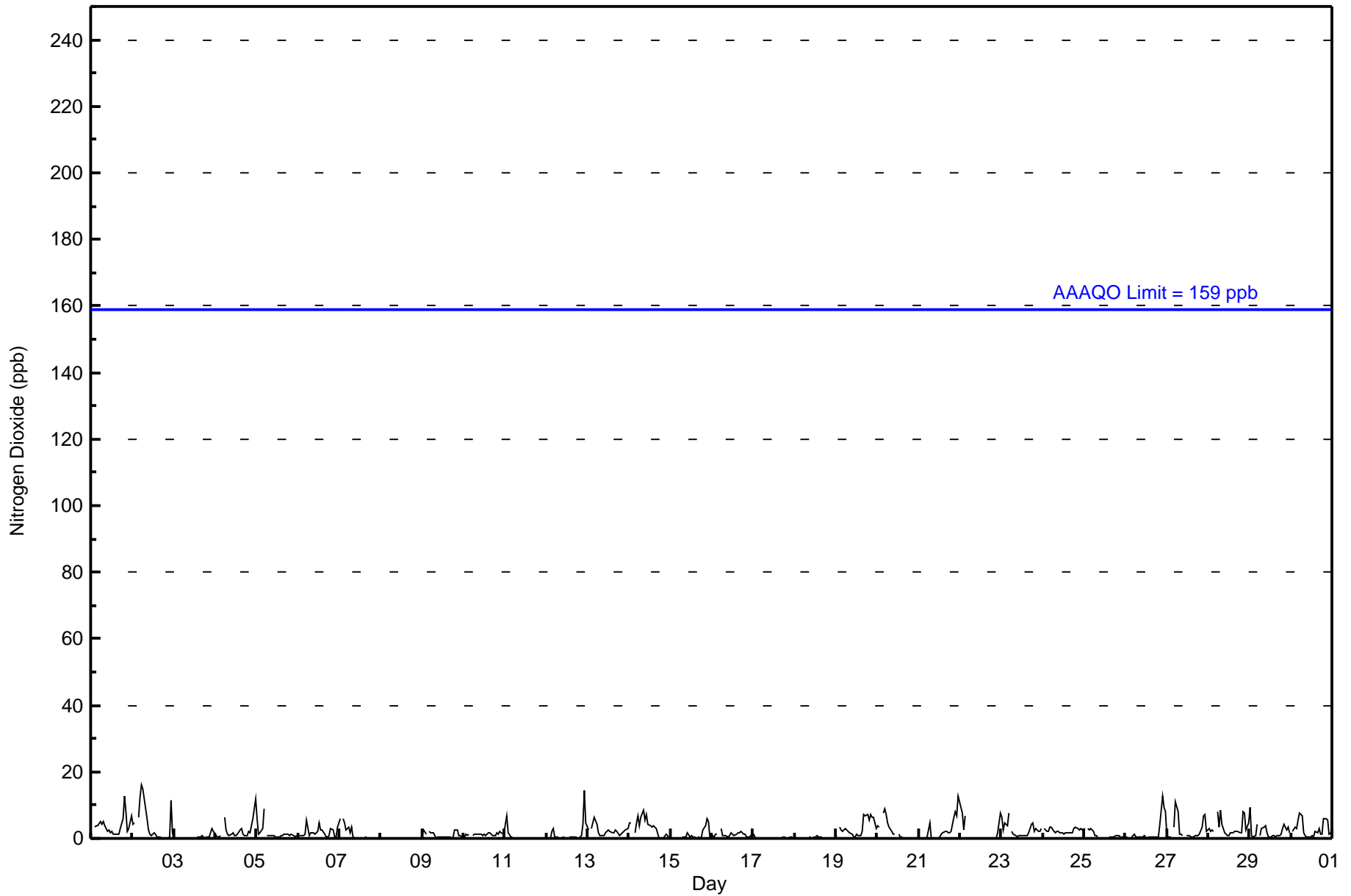
2.8	1.9	1.7	2.5	3.4	3.9	2.4	2.0	1.5	1.1	1.1	0.9	1.0	0.9	1.0	1.0	1.2	1.1	1.2	1.9	2.4	2.7	3.1	2.9	Diurnal Average
10	8	6	8	12	16	15	12	8	5	7	4	5	4	4	4	7	7	7	13	8	13	14	13	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Firebag - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Firebag - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683

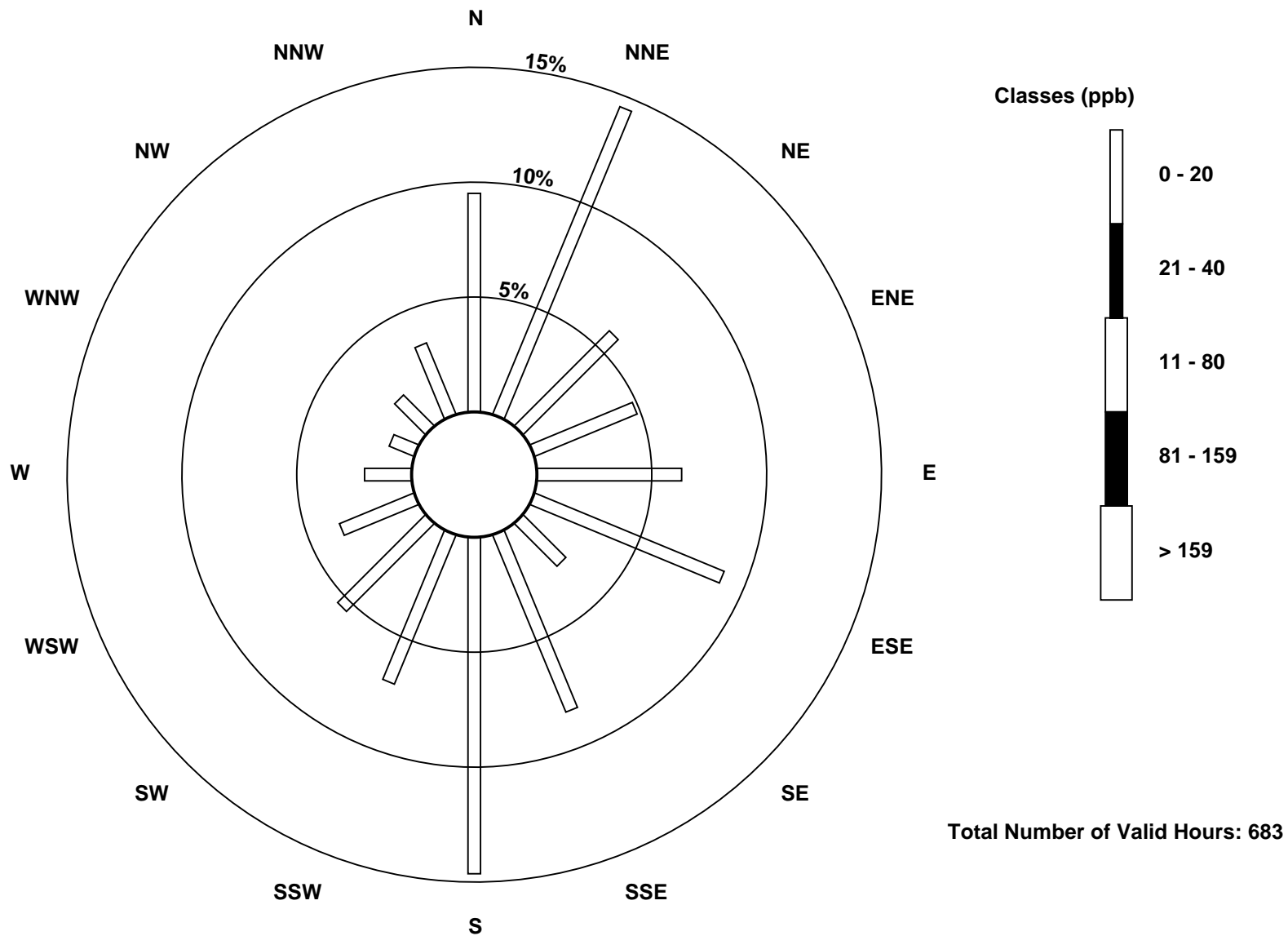
Total Number of Valid Hours: 683

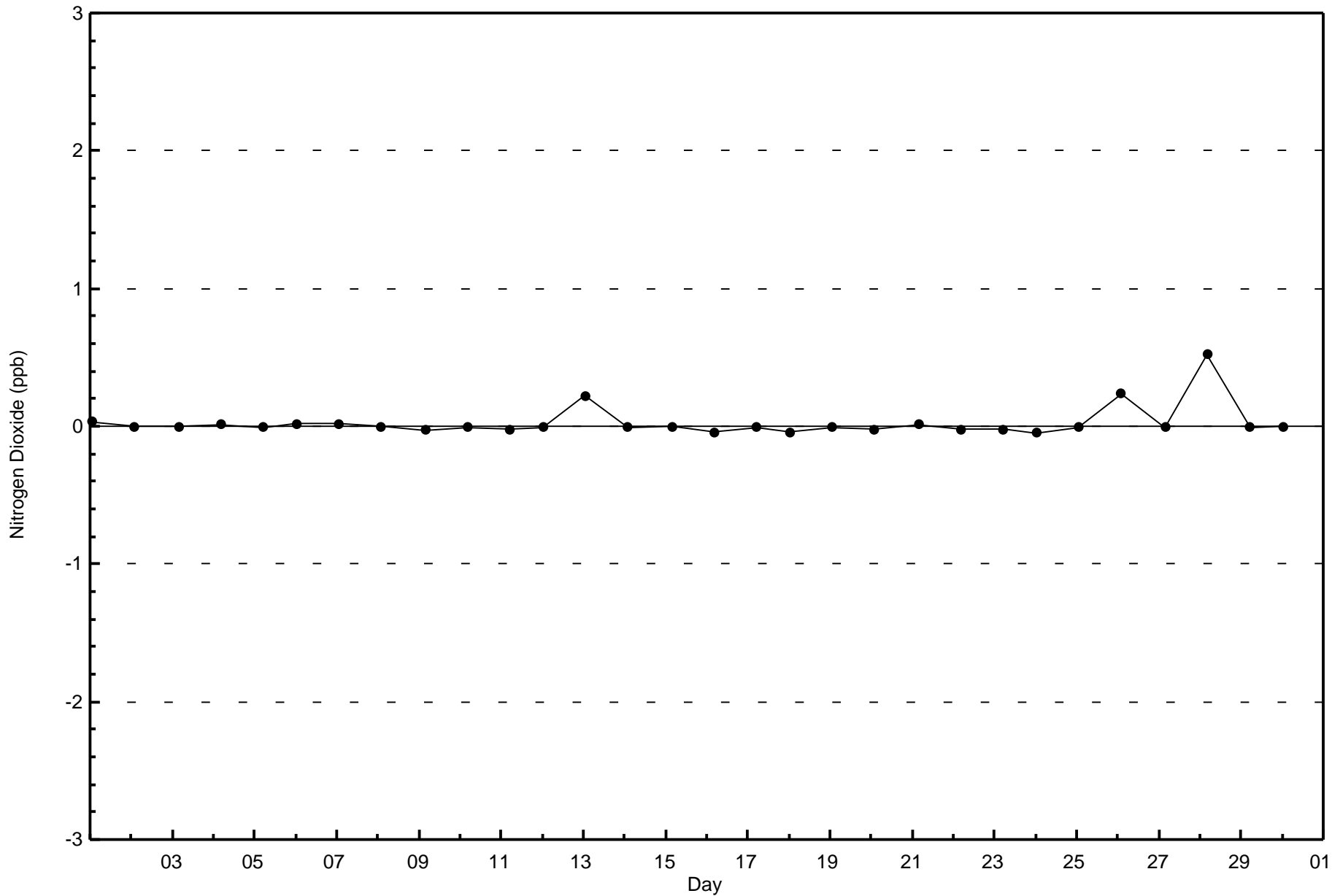
Total Number of Hours: 720

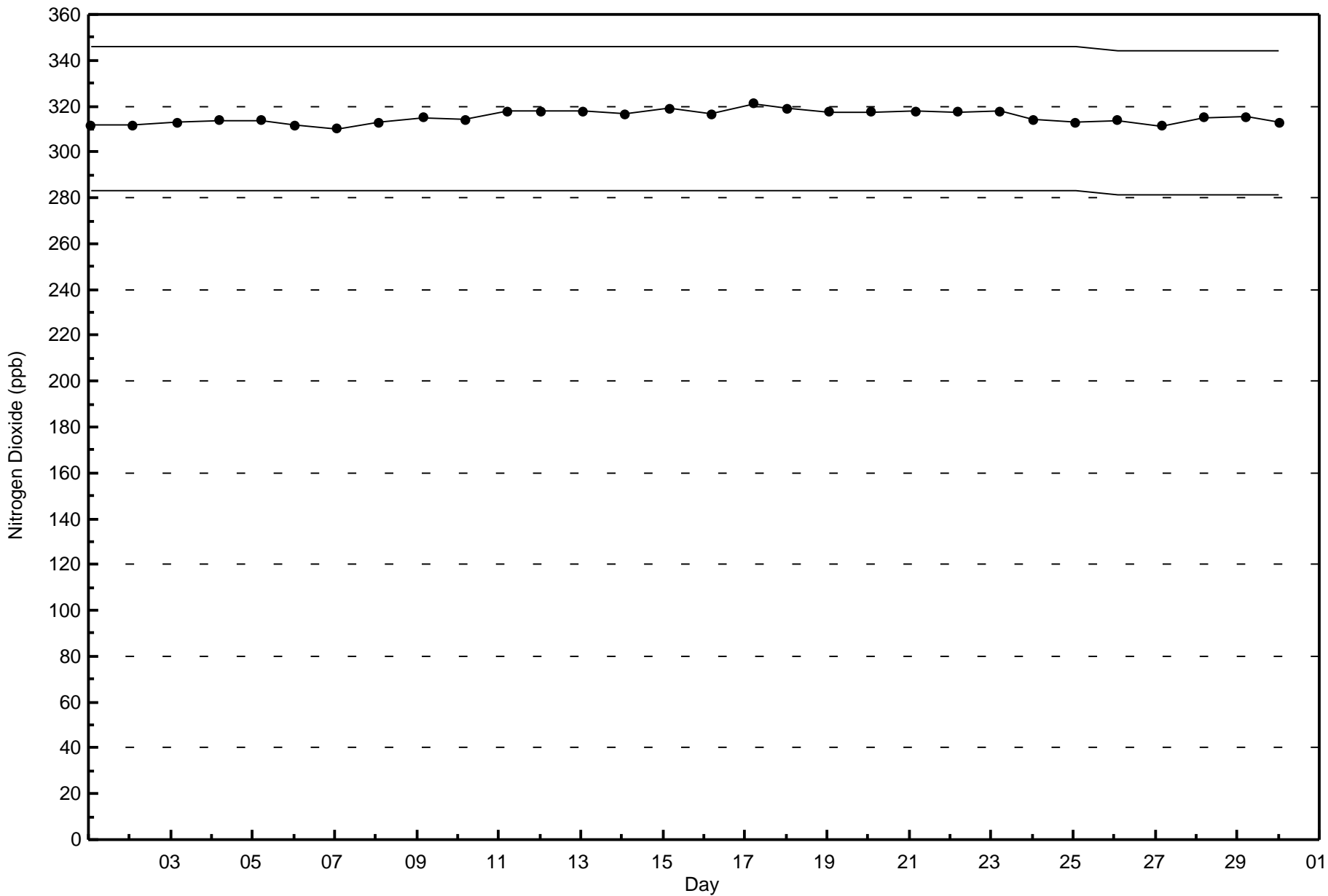


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Firebag (AMS 19)

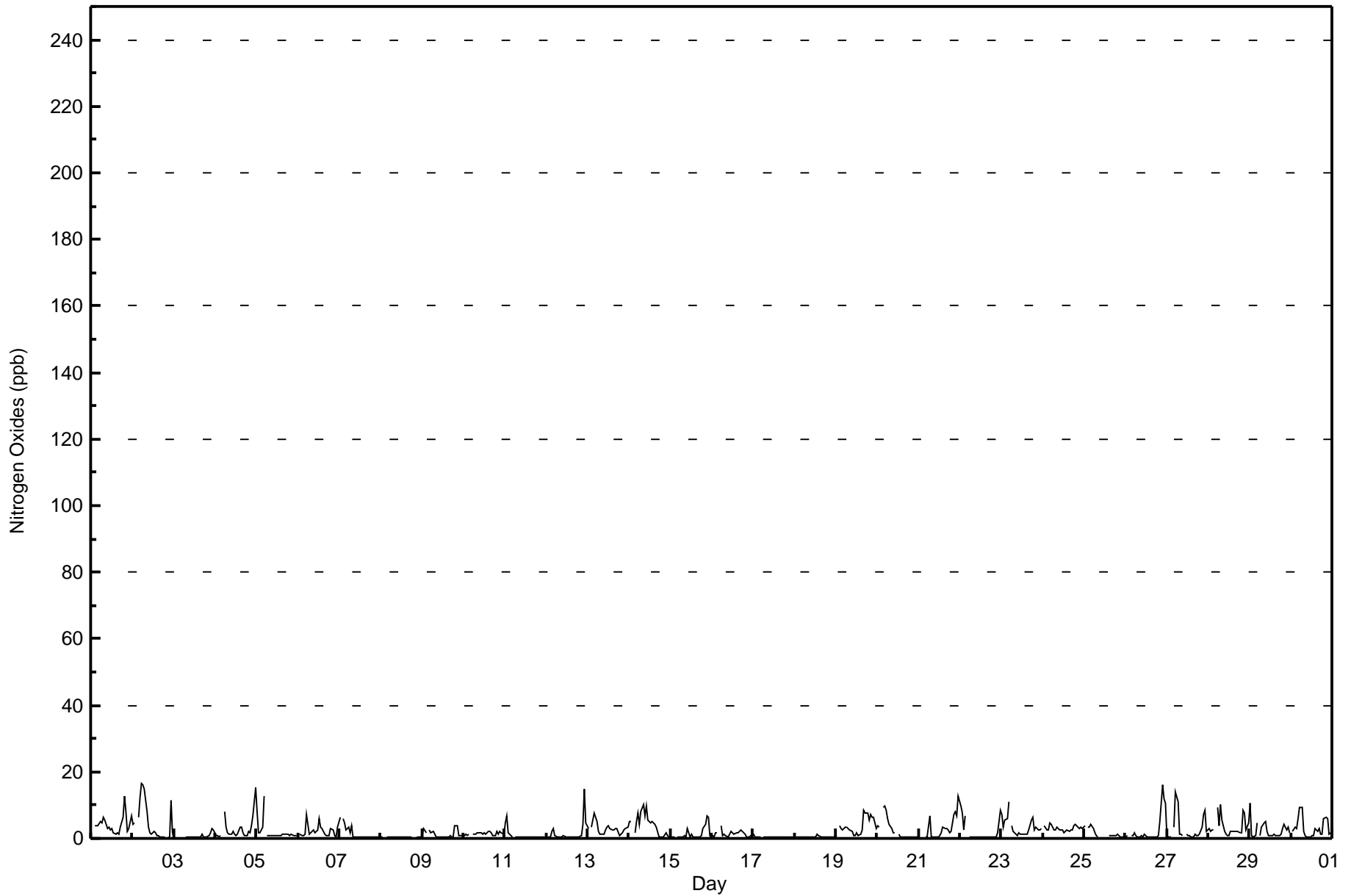








Maximum Value: 16 ppb on Apr 2 06:00																	Maximum Daily Average: 4.8 ppb on Apr 2																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 3 06:00																	Minimum Daily Average: 0.2 ppb on Apr 8																	Hours of Data: 683	
Maximum Diurnal Average: 4.6 ppb at hour 6																	Minimum Diurnal Average: 1.2 ppb at hour 12																	Hours of Missing Data: 37	
Monthly Average: 2.2 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 3 P ₉₀ = 6 P ₉₉ = 13																	Hours of Calibration: 35	
																																		Percent Operational Time: 99.7	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	2	Z	4	4	4	5	5	6	5	3	3	3	3	2	1	2	1	3	6	13	8	2	3	7	4.1	13									
2-Apr	4	5	Z	6	12	16	16	15	8	3	2	1	2	2	1	1	0	0	0	0	0	1	12	2	4.8	16									
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	2	3	3	0.6	3									
4-Apr	1	1	0	1	Z	8	3	2	1	1	2	1	1	1	3	3	1	1	1	2	2	4	7	15	2.8	15									
5-Apr	8	2	2	4	13	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.0	13									
6-Apr	Z	1	1	1	1	7	1	2	2	2	2	2	6	3	3	1	1	1	1	3	3	1	0	4	2.2	7									
7-Apr	6	Z	6	5	3	3	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	6									
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0									
9-Apr	1	3	2	Z	2	2	2	1	0	0	1	0	1	0	0	1	1	0	0	4	4	1	1	1	1.2	4									
10-Apr	1	1	1	1	Z	1	1	1	2	2	2	1	2	1	2	2	2	1	1	2	1	2	2	1	1.4	2									
11-Apr	4	7	2	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	7									
12-Apr	Z	0	0	2	3	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4	15	5	1.6	15									
13-Apr	3	Z	3	5	8	5	2	1	1	1	3	3	4	3	2	2	3	3	1	1	2	3	3	3	2.9	8									
14-Apr	5	5	Z	2	5	7	4	8	10	7	10	5	5	5	5	4	3	0	0	0	1	1	0	0	4.1	10									
15-Apr	0	0	0	Z	0	0	0	0	1	1	3	0	1	0	1	0	0	0	1	3	4	7	7	1	1.4	7									
16-Apr	1	1	2	2	Z	4	1	1	1	1	1	2	1	1	2	2	2	2	2	1	1	1	1	1	1.4	4									
17-Apr	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1									
18-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.4	1									
19-Apr	1	Z	4	3	3	3	3	3	3	2	1	1	2	1	1	3	8	8	8	6	7	7	7	3	3.7	8									
20-Apr	4	3	Z	9	10	9	6	4	3	1	2	M	1	0	0	0	0	0	0	0	0	0	0	0	2.6	10									
21-Apr	0	0	0	Z	0	0	7	0	0	0	0	0	1	2	3	3	3	2	2	2	7	8	7	13	2.7	13									
22-Apr	10	8	3	7	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	1.8	10										
23-Apr	7	4	6	6	11	Z	4	2	1	1	2	1	1	1	1	1	3	6	6	3	3	3	3	3	3.4	11									
24-Apr	Z	4	3	3	5	4	3	2	3	3	3	3	2	2	3	2	3	2	4	4	3	3	3	3	3.0	5									
25-Apr	4	Z	3	3	4	3	2	1	1	C	C	C	C	C	1	1	1	1	1	1	1	0	0	0	1.6	4									
26-Apr	1	1	Z	1	1	2	1	1	0	1	0	1	0	1	0	1	0	1	0	1	5	16	12	11	2.5	16									
27-Apr	1	1	1	Z	4	14	11	1	1	1	M	1	1	1	0	0	1	1	1	1	3	7	9	2	2.9	14									
28-Apr	3	2	2	2	Z	9	4	10	6	2	1	1	1	2	2	2	2	2	2	2	8	8	3	5	3.5	10									
29-Apr	11	1	1	1	5	Z	1	3	5	5	2	1	1	1	1	1	1	1	1	1	3	4	3	4	2	2.4	11								
30-Apr	Z	2	4	3	6	9	9	2	1	1	1	1	1	1	3	2	3	1	1	6	6	6	1	2	3.1	9									
																	Diurnal Average																		
																	Diurnal Maximum																		
Z - zerospan																	C - Calibration																	M - Maintenance	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	99	40	33	43	61	18	57	100	48	37	24	14	8	13	23	683

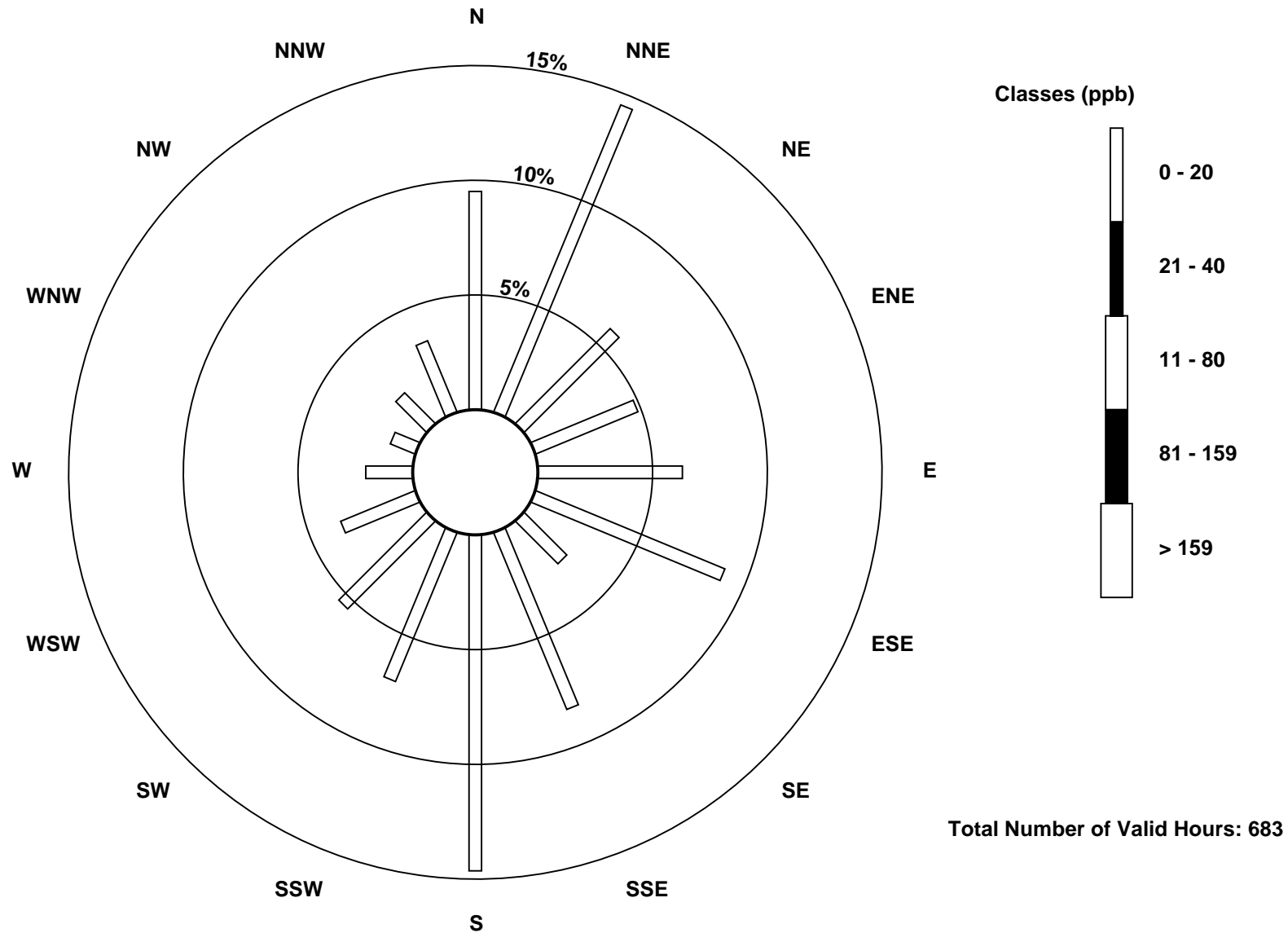
Total Number of Valid Hours: 683

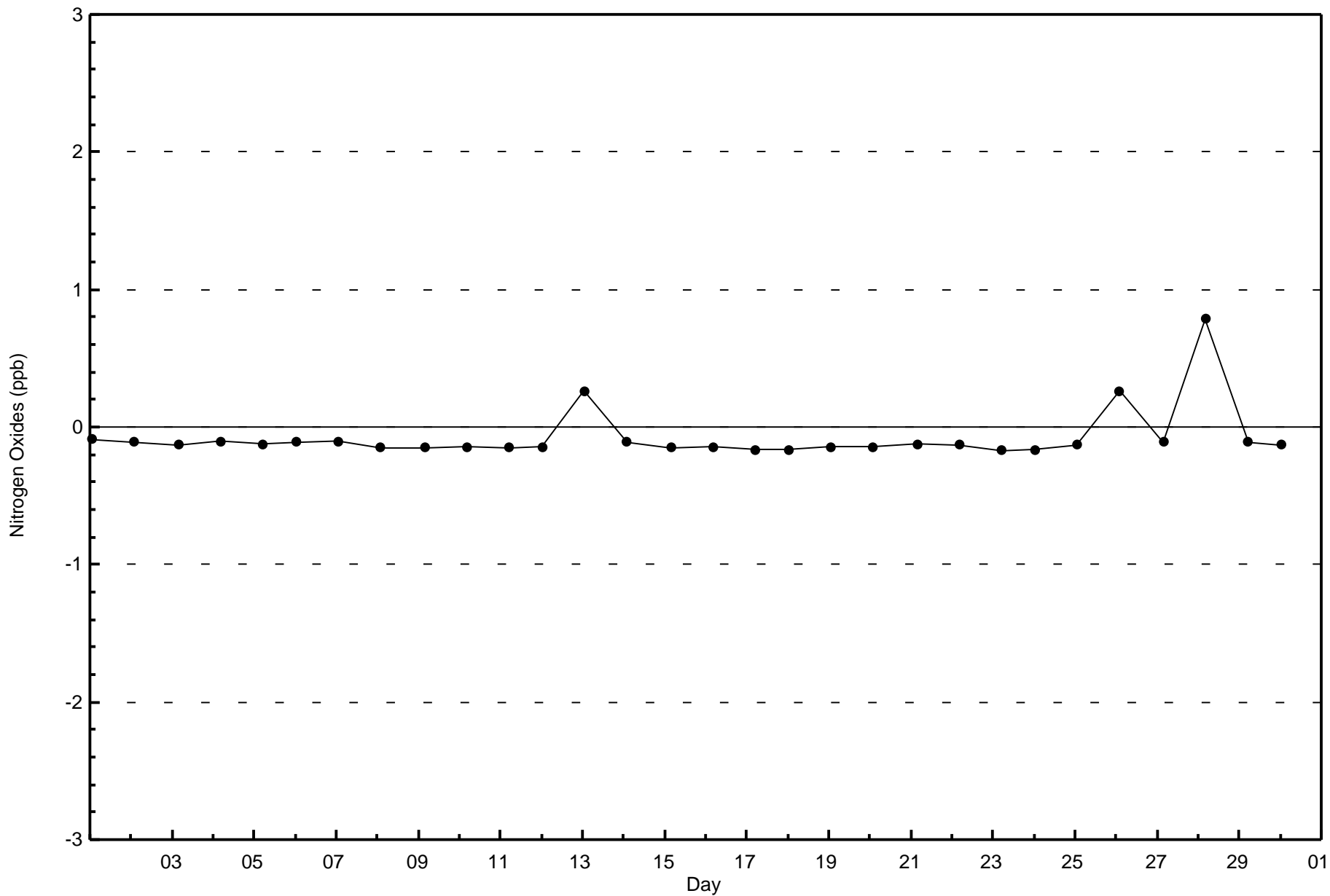
Total Number of Hours: 720

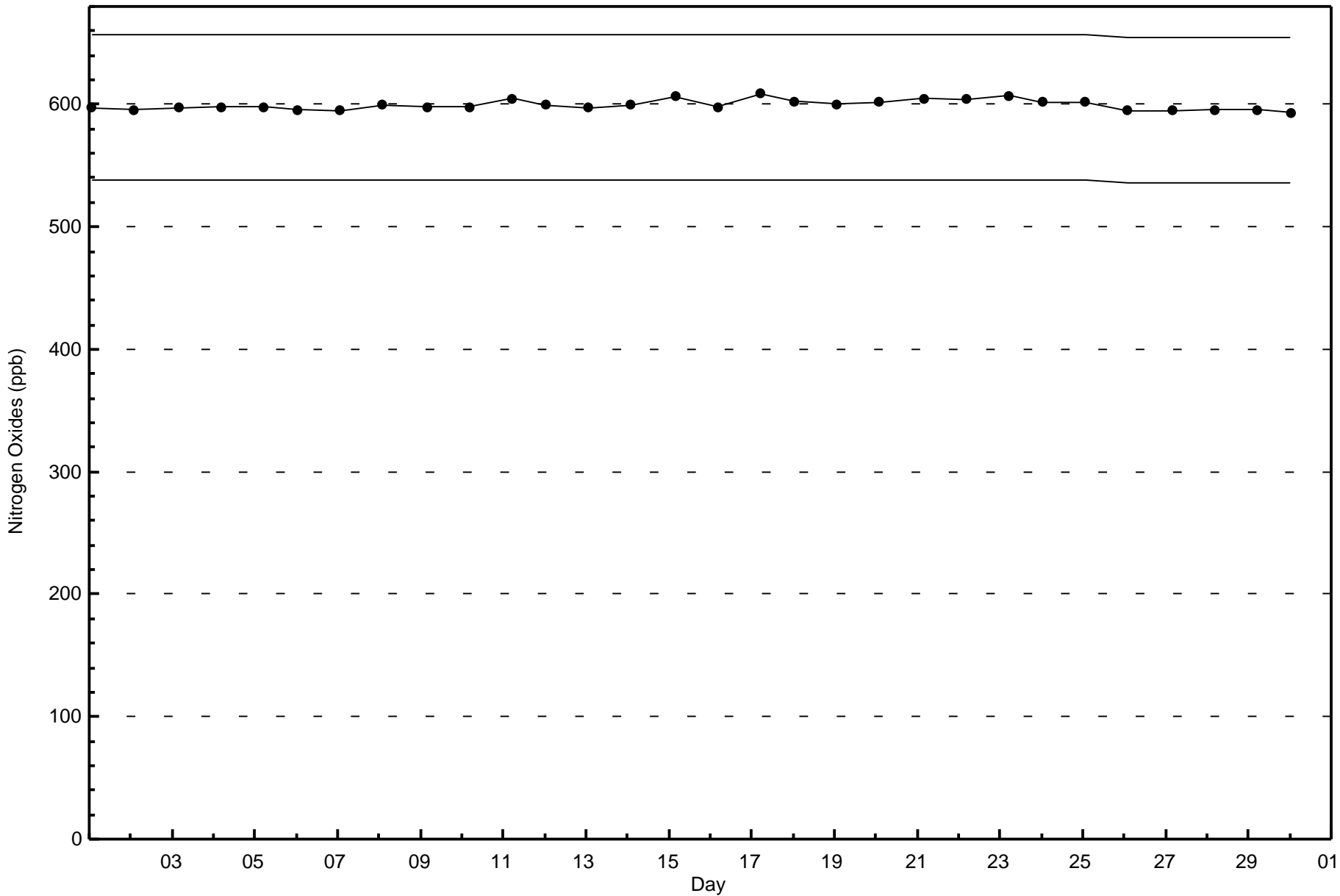


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Firebag (AMS 19)









Wood Buffalo Environmental Association
Summary of Hour Averages

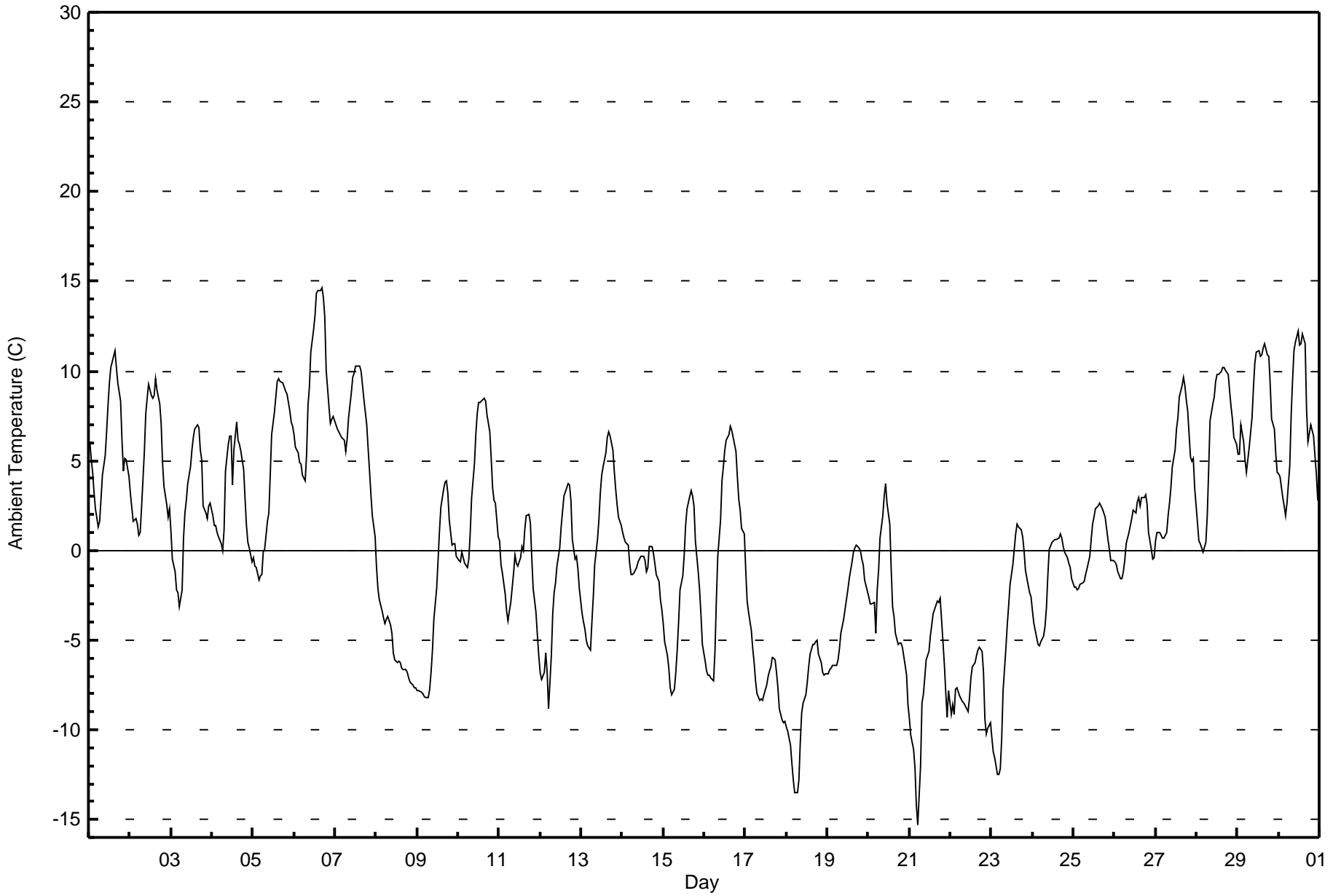
Ambient Temperature (AT) - C
Firebag - April 2017

Maximum Value: 14.6 C on Apr 6 17:00		Maximum Daily Average: 9.1 C on Apr 6		Hours in Service: 720																						
Minimum Value: -15.3 C on Apr 21 06:00		Minimum Daily Average: -8.5 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 3.9 C at hour 16		Minimum Diurnal Average: -3.5 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 0.43 C		Percentiles: P ₁ = -12.5 P ₁₀ = -7.7 Q ₁ = -4.0 Median = 0.5 Q ₃ = 5.0 P ₉₀ = 8.5 P ₉₉ = 12.9		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	6.1	5.1	4.4	3.3	2.4	1.3	1.6	2.9	4.2	5.3	6.6	8.1	9.3	10.2	10.9	11.2	10.2	9.3	8.3	6.2	4.4	5.1	5.0	4.1	6.1	11.2
2-Apr	3.2	2.4	1.6	1.8	1.4	0.9	1.0	2.4	5.5	7.6	8.5	9.2	8.6	8.5	8.7	9.6	9.0	8.1	7.1	4.9	3.6	2.5	1.8	2.3	5.0	9.6
3-Apr	1.1	-0.5	-1.2	-2.2	-2.4	-3.1	-2.2	0.7	2.1	2.8	3.7	4.7	5.6	6.3	6.8	7.0	6.8	5.6	5.1	2.5	2.1	1.7	2.4	2.6	2.4	7.0
4-Apr	2.0	1.4	1.4	1.0	0.7	0.4	0.0	1.2	4.4	5.9	6.4	6.4	3.7	5.6	7.2	6.2	5.9	5.5	4.5	2.8	1.4	0.5	0.2	-0.6	3.1	7.2
5-Apr	-0.4	-0.9	-0.9	-1.6	-1.4	-1.3	-0.1	0.0	1.7	2.1	4.2	6.5	7.7	8.5	9.4	9.6	9.4	9.4	9.1	8.9	8.7	7.8	7.2	7.0	4.6	9.6
6-Apr	6.5	5.8	5.4	4.9	4.8	4.2	3.9	5.4	8.1	9.1	11.1	12.3	13.1	14.4	14.5	14.5	14.6	14.1	13.0	10.0	8.0	7.0	7.3	7.5	9.1	14.6
7-Apr	7.0	6.7	6.6	6.4	6.3	6.1	5.5	6.2	7.4	8.8	9.7	9.9	10.2	10.3	10.3	10.0	9.2	8.4	7.0	5.7	4.4	3.1	2.0	0.7	7.0	10.3
8-Apr	-1.0	-2.1	-2.7	-3.4	-3.8	-4.1	-3.9	-3.6	-4.1	-4.6	-5.7	-6.1	-6.3	-6.2	-6.3	-6.5	-6.7	-6.7	-6.8	-7.1	-7.3	-7.5	-7.7	-7.6	-5.3	-1.0
9-Apr	-7.8	-7.8	-7.9	-7.9	-8.1	-8.2	-8.2	-7.8	-6.8	-5.6	-3.9	-2.1	-0.5	1.1	2.4	3.4	3.8	3.8	3.2	1.7	0.3	0.4	0.4	-0.3	-2.6	3.8
10-Apr	-0.6	-0.6	-0.1	-0.4	-0.7	-0.9	-0.5	1.0	2.9	4.8	6.4	7.6	8.3	8.3	8.4	8.5	8.4	7.6	6.6	5.1	3.5	2.8	2.6	0.8	3.7	8.5
11-Apr	0.5	-0.8	-1.3	-2.4	-3.4	-3.9	-3.3	-2.9	-1.3	-0.3	-0.7	-0.9	-0.4	0.2	0.0	1.1	1.9	2.0	1.5	-0.4	-2.1	-3.4	-4.7	-5.9	-1.3	2.0
12-Apr	-6.8	-7.2	-6.8	-5.7	-6.8	-8.8	-5.9	-3.5	-2.3	-1.8	-0.8	0.2	1.3	2.2	3.1	3.5	3.7	3.7	2.8	0.6	-0.5	-0.3	-1.0	-2.1	-1.6	3.7
13-Apr	-3.6	-4.0	-4.4	-5.0	-5.4	-5.5	-4.0	-2.6	-0.8	0.6	1.7	3.2	4.2	4.7	5.4	6.3	6.6	6.4	5.6	4.4	3.4	2.6	1.9	1.4	1.0	6.6
14-Apr	1.0	0.7	0.4	0.3	-0.7	-1.4	-1.4	-1.2	-1.0	-0.7	-0.5	-0.4	-0.3	-0.6	-1.2	-1.0	0.2	0.3	-0.2	-0.7	-1.3	-1.7	-2.7	-3.3	-0.7	1.0
15-Apr	-4.1	-5.0	-5.9	-6.6	-7.7	-8.1	-7.7	-6.8	-5.5	-4.0	-2.2	-1.4	-0.2	1.4	2.3	3.0	3.4	3.0	2.5	0.5	-1.2	-2.2	-3.6	-5.2	-2.6	3.4
16-Apr	-6.2	-6.7	-6.9	-7.0	-7.1	-7.2	-5.6	-2.8	-0.3	1.7	3.9	4.6	5.6	6.2	6.5	6.9	6.7	6.3	5.5	4.1	2.9	2.2	1.2	0.9	0.6	6.9
17-Apr	-1.1	-2.8	-3.5	-4.5	-5.4	-6.3	-7.2	-8.0	-8.3	-8.3	-8.4	-8.0	-7.5	-7.0	-6.7	-6.5	-5.9	-6.1	-6.8	-7.7	-8.9	-9.5	-9.6	-9.6	-6.8	-1.1
18-Apr	-9.8	-10.1	-10.8	-11.9	-12.8	-13.5	-13.5	-12.8	-10.7	-9.1	-8.5	-8.0	-7.4	-6.5	-5.7	-5.2	-5.2	-5.1	-5.0	-5.8	-6.3	-6.8	-7.0	-6.9	-8.5	-5.0
19-Apr	-6.8	-6.7	-6.6	-6.4	-6.4	-6.4	-6.1	-5.5	-4.6	-3.8	-3.3	-2.7	-2.2	-1.6	-0.6	-0.1	0.1	0.3	0.2	0.0	-0.5	-0.8	-1.7	-2.3	-3.1	0.3
20-Apr	-2.6	-2.9	-3.0	-2.9	-4.6	-2.2	-1.1	0.7	2.0	3.0	3.7	2.7	1.5	-1.0	-3.1	-3.7	-4.6	-5.2	-5.2	-5.1	-5.4	-6.4	-6.9	-8.6	-2.5	3.7
21-Apr	-9.4	-10.3	-11.1	-12.1	-14.2	-15.3	-12.0	-8.5	-8.0	-7.1	-6.1	-5.6	-4.8	-4.1	-3.5	-3.1	-2.8	-2.9	-2.7	-3.9	-6.3	-7.9	-9.3	-7.9	-7.4	-2.7
22-Apr	-9.1	-8.6	-9.1	-7.8	-7.7	-8.2	-8.3	-8.5	-8.5	-8.8	-9.0	-8.2	-7.1	-6.5	-6.3	-5.9	-5.5	-5.4	-5.7	-6.8	-9.3	-10.3	-10.0	-9.6	-7.9	-5.4
23-Apr	-10.5	-11.2	-11.5	-12.5	-12.5	-12.2	-10.6	-7.8	-5.5	-4.2	-3.0	-1.9	-0.8	0.0	0.9	1.5	1.3	1.1	0.8	0.0	-1.1	-2.0	-2.3	-2.6	-4.4	1.5
24-Apr	-3.4	-4.1	-4.8	-5.3	-5.4	-5.1	-4.8	-4.2	-3.2	-1.4	0.1	0.4	0.5	0.6	0.6	0.7	1.0	0.7	0.3	-0.1	-0.4	-0.7	-0.9	-1.6	-1.7	1.0
25-Apr	-2.1	-2.1	-2.2	-2.1	-1.9	-1.8	-1.7	-1.3	-1.1	-0.3	0.6	1.4	1.8	2.3	2.5	2.6	2.5	2.3	1.9	1.3	0.6	0.1	-0.5	-0.6	0.1	2.6
26-Apr	-0.6	-0.8	-1.2	-1.6	-1.6	-1.2	-0.6	0.3	1.0	1.4	1.8	2.3	2.1	2.7	2.9	2.5	3.0	2.9	3.1	2.5	1.0	0.0	-0.5	-0.4	0.9	3.1
27-Apr	0.5	1.0	1.0	0.9	0.7	0.7	1.0	1.9	2.6	3.5	4.7	5.6	6.8	7.4	8.6	9.2	9.6	9.2	8.4	7.8	5.2	5.0	5.1	3.5	4.6	9.6
28-Apr	1.5	0.5	0.3	0.1	-0.1	0.5	1.9	4.5	7.2	8.1	8.6	9.4	9.8	9.8	9.9	10.2	10.2	10.1	9.8	8.9	8.0	7.3	6.3	5.9	6.2	10.2
29-Apr	5.3	5.4	7.0	6.0	5.1	4.3	5.0	5.7	7.4	9.1	10.4	11.0	11.1	10.8	10.9	11.3	11.6	10.9	10.8	9.3	7.3	6.7	5.4	4.3	8.0	11.6
30-Apr	4.3	4.1	2.9	2.4	1.9	2.6	4.8	7.5	9.5	11.2	11.6	12.2	11.5	11.5	12.1	11.5	7.8	6.0	6.5	7.0	6.4	5.3	4.3	2.8	7.0	12.2
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Firebag - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Firebag - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	335	46.53	46.53
0 - 10	349	48.47	95.00
10 - 20	36	5.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



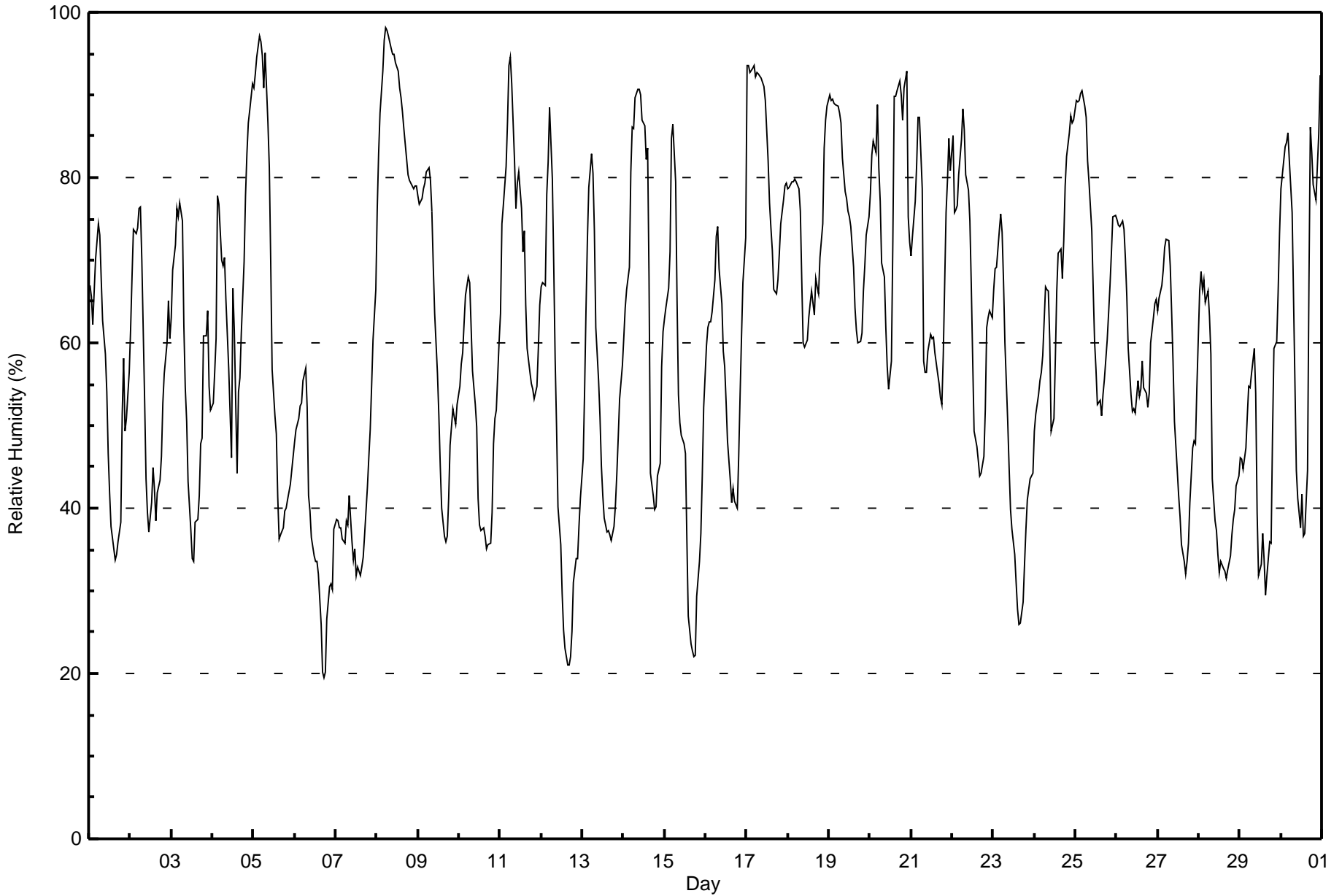
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Firebag - April 2017

Maximum Value: 98 % on Apr 8 06:00 Maximum Daily Average: 88.1 % on Apr 8																		Hours in Service: 720 Hours of Data: 720									
Minimum Value: 19 % on Apr 6 18:00 Minimum Daily Average: 37.9 % on Apr 6 Maximum Diurnal Average: 77.2 % at hour 6 Minimum Diurnal Average: 46.6 % at hour 17 Monthly Average: 60.8 % Percentiles: P ₁ = 22 P ₁₀ = 36 Q ₁ = 45 Median = 61 Q ₃ = 76 P ₉₀ = 87 P ₉₉ = 95																		Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	67	66	62	66	70	74	73	68	63	59	54	47	42	38	35	34	34	36	38	51	58	49	51	56	53.8	74	
2-Apr	62	68	74	73	74	76	76	70	53	43	39	37	41	45	42	39	42	43	46	53	56	60	65	60	55.8	76	
3-Apr	63	69	72	76	75	77	75	62	55	50	43	37	34	34	38	39	42	48	49	61	61	64	55	52	55.4	77	
4-Apr	53	56	61	78	77	70	69	70	65	57	52	46	67	62	44	54	56	61	70	78	83	87	88	91	66.4	91	
5-Apr	91	93	94	97	96	95	91	95	87	81	70	57	51	49	41	36	37	38	40	40	41	43	45	46	64.7	97	
6-Apr	48	49	51	52	53	55	57	52	42	40	36	34	34	34	32	26	20	19	20	27	30	31	30	37	37.9	57	
7-Apr	39	38	38	38	36	36	38	38	42	36	34	35	32	33	32	33	34	37	43	46	50	55	60	66	40.3	66	
8-Apr	76	83	88	93	97	98	98	97	96	95	95	94	93	91	90	88	86	82	80	80	79	79	79	79	88.1	98	
9-Apr	78	77	77	79	79	81	81	80	76	69	64	56	51	45	40	37	36	37	41	48	52	51	50	53	59.9	81	
10-Apr	55	58	59	62	66	68	67	62	57	53	50	41	38	37	38	37	35	36	36	40	48	51	52	60	50.1	68	
11-Apr	64	74	77	81	87	94	95	91	82	76	79	81	76	71	73	65	59	56	55	54	53	55	59	65	71.8	95	
12-Apr	67	67	67	78	82	88	80	69	58	50	40	36	30	25	23	21	21	22	25	31	34	34	38	41	47.0	88	
13-Apr	46	54	64	72	79	83	80	74	62	55	51	45	42	39	37	37	36	38	40	44	49	53	57	57	53.1	83	
14-Apr	61	64	66	69	81	86	86	90	91	91	90	87	86	82	84	68	44	42	40	40	44	45	57	61	68.9	91	
15-Apr	63	64	67	71	85	86	79	65	54	50	49	48	47	36	27	24	23	22	22	29	33	37	44	52	49.1	86	
16-Apr	60	62	63	63	64	68	73	74	69	65	59	57	53	48	43	41	42	41	40	46	54	61	67	73	57.7	74	
17-Apr	94	94	93	93	94	92	93	93	92	92	91	89	82	77	74	71	66	66	68	71	74	77	79	79	83.0	94	
18-Apr	79	79	80	80	80	80	79	76	68	60	59	60	63	65	66	63	68	67	66	70	74	83	87	89	72.5	89	
19-Apr	90	89	90	89	89	89	88	87	82	78	77	76	75	74	69	64	61	60	60	61	66	69	73	75	76.4	90	
20-Apr	78	83	84	83	89	81	77	70	68	62	57	54	58	72	90	90	90	92	90	87	91	93	75	72	78.6	93	
21-Apr	70	73	77	82	87	87	79	58	56	56	59	61	61	61	59	56	55	53	52	58	76	80	85	81	67.6	87	
22-Apr	85	76	76	77	80	85	88	86	80	78	75	67	58	49	47	46	44	44	46	52	62	63	64	63	66.3	88	
23-Apr	66	69	69	74	76	73	67	60	50	45	40	37	34	31	28	26	29	33	37	41	44	44	44	44	47.7	76	
24-Apr	49	51	54	55	56	58	67	66	66	60	49	51	58	66	71	71	68	72	79	83	85	87	87	87	66.6	87	
25-Apr	89	89	89	90	90	89	87	82	79	74	67	60	57	52	53	51	54	56	60	64	67	71	75	75	71.7	90	
26-Apr	75	74	74	75	74	70	66	59	54	52	52	52	55	54	54	58	55	54	52	54	60	63	65	65	61.0	75	
27-Apr	64	65	67	69	71	73	72	69	64	58	51	45	41	39	36	34	32	33	36	41	47	48	48	55	52.4	73	
28-Apr	66	69	66	68	65	66	63	59	44	39	37	34	32	34	33	32	31	33	34	37	39	40	43	44	46.1	69	
29-Apr	46	46	45	47	51	55	55	56	59	54	40	32	33	37	34	29	32	36	36	49	59	60	66	73	47.1	73	
30-Apr	79	80	84	84	85	82	76	65	55	45	41	38	42	37	37	45	67	86	83	79	77	81	85	92	67.7	92	
	67.4	69.3	70.9	73.8	76.3	77.2	75.8	71.4	65.6	60.7	56.7	53.1	52.2	50.5	49.0	47.1	46.6	47.9	49.3	53.6	58.0	60.3	62.3	64.9		Diurnal Average	
	94	94	94	97	97	98	98	97	96	95	95	94	93	91	90	90	90	90	92	90	87	91	93	88	92		Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Firebag - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	1	0.14	0.14
20 - 40	130	18.06	18.19
40 - 60	213	29.58	47.78
60 - 80	246	34.17	81.94
80 - 100	130	18.06	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Firebag - April 2017

Maximum Speed: 37 km/h on Apr 5 13:00	Maximum Daily Speed Average: 25.2 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 1 km/h on Apr 27 19:00	Minimum Daily Speed Average: 2.1 km/h on Apr 28	Hours of Data: 720
Maximum Diurnal Speed Average: 5.4 km/h at hour 24	Minimum Diurnal Speed Average: 1.6 km/h at hour 17	Hours of Missing Data: 0
Monthly Average Velocity: 3.1 km/h 106.8 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 9 Median = 13 Q ₃ = 18 P ₉₀ = 22 P ₉₉ = 29	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SSW18	SW17	SW16	SW16	SW15	SW14	SW16	SW18WSW22	WSW22	WSW23	WSW23	WSW21	W18	W15WNW13	NNW13	NNW8	NW4	SW4	W5	WNW6	WSW6	WSW9	WSW12.3	WSW23		
2-Apr	WSW9	SW9	SSW10	SW12	SW11	SW12	SW11	SW11	W10	NW13	NW14	NW13WNW13	NNW15	NNW15	NNW22	NNW17	N17	N14	N8	N6	NNW9	NNW9	N10	NW7.4	NNW22	
3-Apr	NNE9	N6	NNW3	NNW6	N9	N8	N8	N9	N13	N12	N10	NNW13	N12	NNW13	NNW14	NW14	NW13	NNW10	N4	NE3	ENE7	ESE3	S5	SSE13	N6.8	NW14
4-Apr	SSE13	S13	S14	S14	S11	S12	S11	S11	SSW11	SSW4	SSE7	S10	NNE10	NW5	ESE5	SSW9	S16	SSW15	SSW7	S6	S9	S6	SSE9	SE10	S8.3	S16
5-Apr	SSE12	SSE12	SSE13	SSE11	SSE12	SSE14	SSE19	SSE24	S25	S28	SSE29	SSE32	S37	S35	S33	S31	S26	S23	S18	S22	S23	S22	S24	S25	S22.6	S37
6-Apr	S20	S19	S17	S15	S15	S11	S12	S12	SSW12	SSW10	SW11	WSW17	WSW16	WSW18	W18	W19	W16	WSW15	W9	NNW4	NNE7	NE7	ENE9	ENE13	SW7.7	S20
7-Apr	E13	E15	E12	E11	ENE10	ENE9	ENE11	E13	ENE17	NE21	NE20	NE20	NE22	NNE23	NE19	NNE21	NNE22	NNE19	NNE20	NNE19	NNE20	NNE19	NNE17	NNE17	NE15.9	NNE23
8-Apr	NNE15	NNE14	NNE17	NNE18	NNE18	NNE19	NNE21	N21	N22	N22	N22	N21	N21	N21	N21	N22	NNE20	NNE18	NNE16	NNE15	NNE12	NNE13	NE12	ENE11	NNE17.6	N22
9-Apr	ENE8	ESE6	S4	S6	SSE7	S7	SSE8	SSE10	S14	S12	S13	S14	S14	S14	S16	S16	SSW16	SSW18	SSW15	SSE10	SSE13	S17	S18	SSE17	S11.4	S18
10-Apr	S18	S18	SSW21	SSW20	SSW20	SSW18	SSW18	SSW18	SW16	SW15	SSW12	SSW11	SSE10	S11	S11	SSE11	SSE12	S14	S10	S7	S8	S7	SSW5	W5	SSW12.4	SSW21
11-Apr	NW6	NNW9	N10	N13	N17	N20	NNE19	NNE19	NNE19	N18	N20	NNE20	N20	NNE19	N18	NNE18	NNE17	NNE18	NNE17	N15	N14	N12	NNE11	NNE9	N15.5	NNE20
12-Apr	NE8	NE8	ENE7	E5	E5	NE5	NE3	NNE7	NNE11	NNE12	NNE12	NNE12	NNE12	NNE11	NNE10	NNE12	NNE11	NNE12	NNE14	NNE10	ENE8	E14	E14	ESE12	NE8.5	E14
13-Apr	ESE13	ESE12	ESE12	ESE11	ESE12	ESE12	ESE14	ESE18	ESE22	ESE21	E19	E21	E22	E23	E22	E23	E21	E21	E22	E22	E24	E25	E25	E25	E18.9	E25
14-Apr	E25	E24	E26	E25	E23	E22	E27	E28	E27	E29	E27	ENE28	ENE27	ENE28	ENE28	ENE29	ENE26	ENE24	ENE27	ENE25	ENE23	ENE22	ENE23	ENE23	ENE25.2	E29
15-Apr	NE25	NE27	NE22	NE18	NE18	NE19	NE16	NE16	NE16	NE17	ENE16	NE18	ENE16	NE18	NE14	NE14	NNE15	NNE15	NE9	E9	ESE9	SE10	SSE14	SSE15	ENE13.8	NE27
16-Apr	SSE15	SSE17	S18	S20	S19	S17	S18	SSW21	SSW19	SSW18	SW20	SW19	SW21	SW23	SW25	SW25	SW23	SW22	SW20	SSW13	SSW14	SSW16	SW12	WSW8	SSW17.2	SW25
17-Apr	NNW15	N20	N19	N21	N20	NNE22	N23	N23	N20	NNE20	N19	NNE20	NNE21	NNE21	N20	N21	NNE20	NNE19	NNE17	NNE15	NNE11	NNE9	N8	NNE9	NNE17.8	NNE23
18-Apr	N8	N9	N12	N13	NNE14	NNE16	NNE16	NNE12	NNE10	NNE9	NE8	N8	N9	NNE10	NNE11	NNE11	NNE11	NE10	NE11	NNE11	NE11	NE11	ENE10	ENE9	NNE10.4	NNE16
19-Apr	ENE8	E8	ESE8	ESE9	ESE7	ESE7	SE8	SE7	SE5	SE5	SSW5	W7	WSW5	SW8	WSW9	WSW9	WSW4	WSW7	W6	SW7	SSW6	S7	SSW7	S8	S3.4	WSW9
20-Apr	S8	S8	S7	SSE8	ESE5	ESE8	ESE8	ESE10	E9	NE10	NE11	NNE21	NNE25	NNE26	NNE24	NNE25	NNE26	NNE25	NNE20	NE14	N8	N9	NNE13	NNE11	NE10.2	NNE26
21-Apr	NNE11	NNE11	NNE11	NE5	NNE4	NNW2	N3	N11	N14	N14	N12	N8	NW5	WNW8	WNW8	NW9	NW7	NNW7	NNW5	WNW2	SSW2	SW5	SW4	S4	NNW5.2	N14
22-Apr	SSE3	SSW8	WSW6	NW8	N16	NNE17	NNE16	NNE18	NNE18	N18	N18	N16	N15	NNW16	N15	N13	NNE13	NNE11	N9	NNE9	NNE8	NE9	ENE10	E11	NNE10.2	N18
23-Apr	ESE10	ESE12	ESE11	ESE11	ESE11	ESE11	ESE10	ESE11	SE8	ESE9	ESE9	ESE8	ESE10	ESE10	SE10	ESE8	SSE10	SE10	ESE12	ESE13	ESE12	ESE12	ESE11	ESE14	ESE10.3	ESE14
24-Apr	ESE16	ESE14	ESE14	ESE13	ESE13	ESE12	ESE13	ESE14	E12	ESE17	E21	E19	E19	E18	E18	ESE15	SE14	ESE14	ESE12	ESE11	ESE9	ESE8	ESE8	ESE8	ESE13.6	E21
25-Apr	ESE8	SE9	SE10	SE12	SSE13	SSE14	SSE17	SSE19	S19	S18	S20	S19	S19	S21	S20	S20	S20	S20	S21	S17	SSE15	SSE15	SSE14	SSE14	S15.8	S21
26-Apr	S14	S14	SSE13	SSE14	SSE15	SSE16	SSE19	SSE21	S22	S20	S20	S25	S24	S23	S24	S21	S20	S19	S16	SSE14	SSE9	SE10	SE11	SSE13	S17.2	S25
27-Apr	SSE14	SSE12	SSE11	SSE10	SSE9	SE9	SSE9	SSE12	S15	S13	SSE14	SSE14	SSE12	SE9	S8	SSW6	S6	S4	WSW1	ENE3	NW6	NNW7	SSE1	W1	SSE7.1	S15
28-Apr	S4	S5	SSW5	SSW6	SSW4	SSW5	WSW3	WNW4	NE5	NE10	NE12	NNE12	N5	NNW6	NNW6	N7	NE3	NE5	NE5	ENE6	E8	ESE7	ESE7	SE9	ENE2.1	NNE12
29-Apr	SE9	SSW11	SW13	SSW9	S10	S11	SSW15	SW15	WSW17	WSW11	SSW16	SSW18	SSW19	SW17	SSW17	SSW15	SSW16	SSW14	S17	SW15	S8	S10	S9	S9	SSW12.7	SSW19
30-Apr	SSW9	SSW9	S7	S10	SSE10	S8	S9	S12	SSW12	SSW10	WSW9	WNW6	W8	SSE5	ENE7	E12	WSW16	SW13	SW10	SSE4	SE9	W3	N4	NNE2	SSW5.5	WSW16

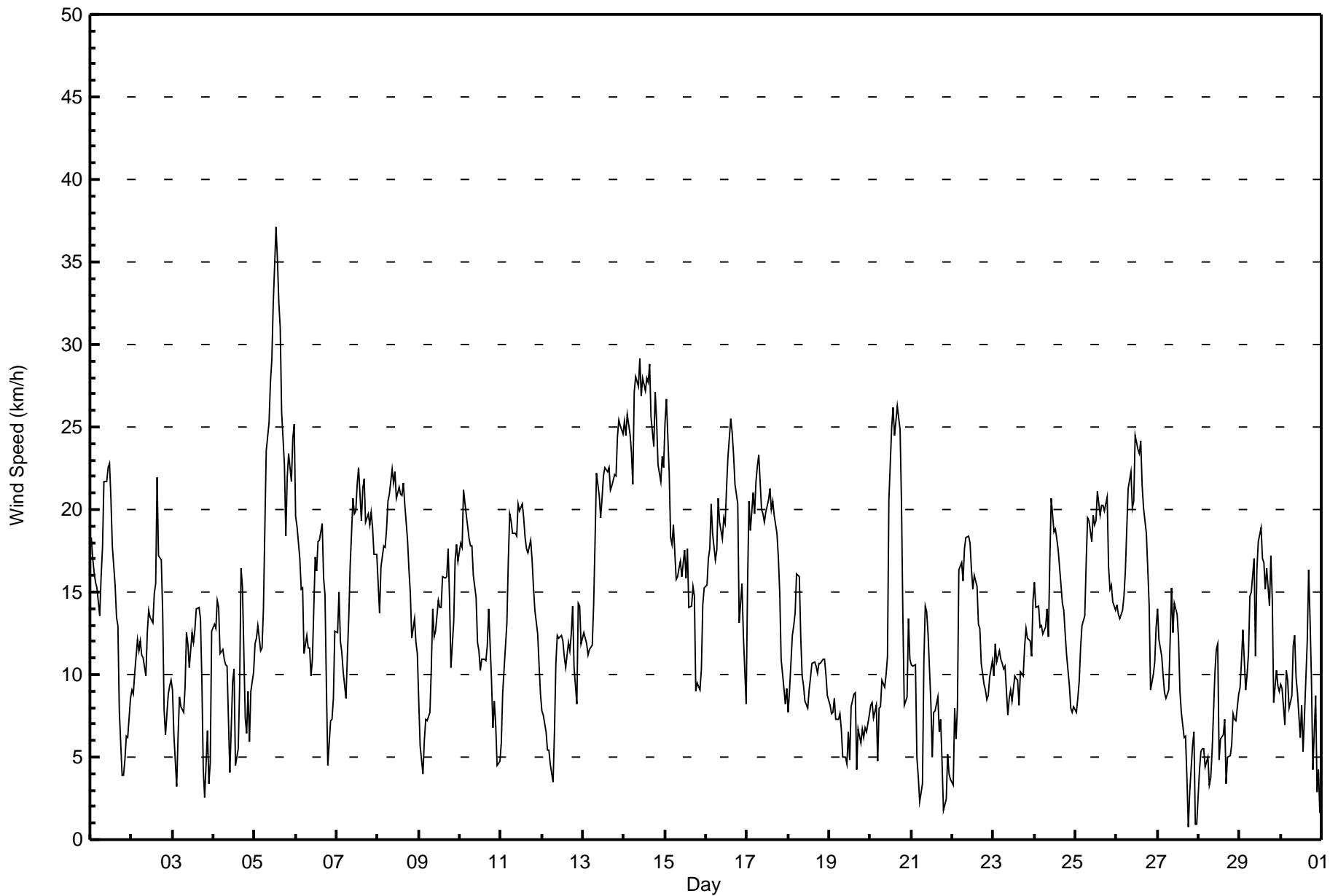
ENE5.1	SE4.8	SE4.4	SE4.4	ESE4.2	ESE4.3	ESE4.5	SE4.5	ESE2.7	E2.8	E2.5	ENE1.9	ENE1.7	NE1.8	ENE1.6	NE1.9	ENE1.6	ENE1.9	ENE2.7	E3.7	E4.2	ESE4.3	ESE4.9	ESE5.4	Diurnal Average
E25	NE27	E26	E25	E23	NNE22	E27	E28	E27	E29	SSE29	SSE32	S37	S35	S33	S31	NNE26	NNE25	ENE27	ENE25	E24	E25	E25	S25	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Firebag - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Firebag - April 2017

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	59	8.19	8.19
6 - 11	239	33.19	41.39
12 - 19	280	38.89	80.28
20 - 28	134	18.61	98.89
29 - 38	8	1.11	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	2	8	1	2	3	2	4	6	7	3	4	4	2	3	4	59
6 - 11	21	28	13	15	6	33	15	17	32	17	8	10	5	4	5	10	239
12 - 19	25	48	15	4	13	26	2	36	42	24	18	6	5	2	5	9	280
20 - 28	18	24	7	12	24	2	0	2	27	4	9	4	0	0	0	1	134
29 - 38	0	0	0	1	1	0	0	2	4	0	0	0	0	0	0	0	8
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	102	43	33	46	64	19	61	111	52	38	24	14	8	13	24	720

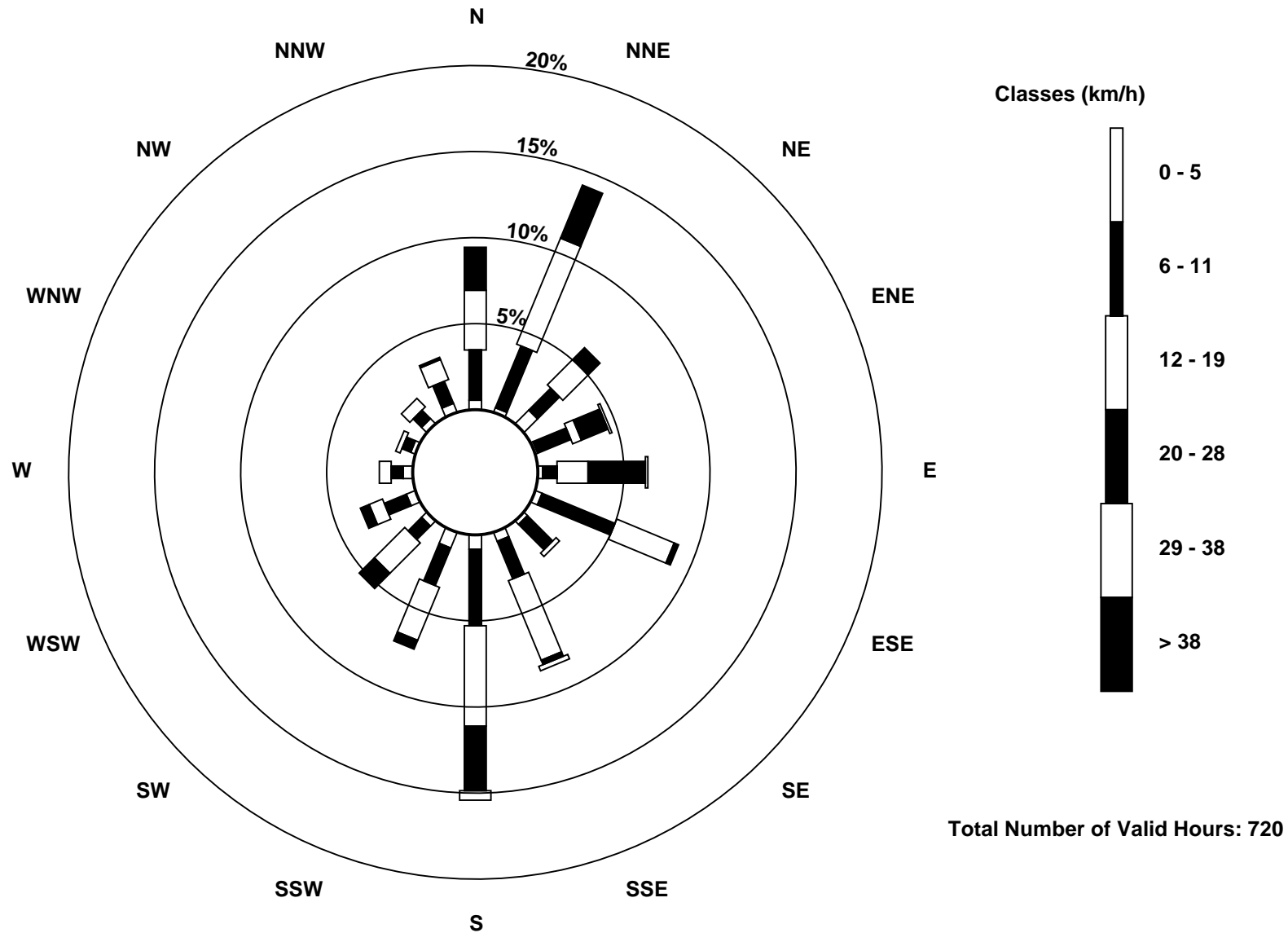
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Firebag (AMS 19)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Firebag - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Apr 4 17:00 Minimum Value: 1 km/h on Apr 21 21:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	3	3	2	2	2	2	4	4	3	4	4	4	5	4	4	3	2	1	1	1	1	2	2	5
2-Apr	1	1	1	1	1	1	1	2	2	3	3	4	7	6	5	5	4	4	3	2	1	1	2	2	7
3-Apr	1	1	1	1	2	2	1	2	3	3	3	3	4	4	4	4	3	2	1	2	1	2	2	4	
4-Apr	2	3	2	2	1	1	1	2	2	2	3	3	3	4	3	5	4	7	4	2	1	2	1	1	7
5-Apr	2	1	2	1	2	2	3	4	5	4	5	6	7	6	7	5	4	4	3	3	3	3	3	4	7
6-Apr	3	2	2	2	2	1	2	2	2	2	3	4	3	4	5	5	5	3	3	2	1	1	1	2	5
7-Apr	2	3	3	2	3	2	3	3	3	4	4	5	5	5	4	4	4	4	4	4	4	3	3	3	5
8-Apr	3	2	3	3	4	4	5	5	5	5	5	4	4	4	4	4	4	4	3	3	2	2	3	3	5
9-Apr	2	2	2	2	2	2	2	3	3	3	4	4	4	3	4	4	3	3	3	2	2	3	2	2	4
10-Apr	2	3	3	3	3	3	3	3	2	3	3	3	4	4	3	4	4	3	2	2	1	1	2	3	4
11-Apr	1	1	2	2	3	4	3	4	3	4	4	4	4	4	4	4	4	3	4	4	3	2	2	1	4
12-Apr	1	2	1	1	1	1	2	2	3	3	4	5	4	5	6	4	4	3	3	2	2	3	2	2	6
13-Apr	2	2	2	2	2	2	3	4	4	4	4	4	5	4	5	4	5	4	4	4	4	4	4	4	5
14-Apr	5	4	5	5	5	4	6	5	5	6	6	6	6	6	6	7	7	6	6	6	5	5	6	5	7
15-Apr	5	6	6	4	4	3	3	3	3	3	3	4	4	4	4	4	4	3	3	2	2	2	3	2	6
16-Apr	2	2	2	3	2	2	2	3	3	3	4	4	4	5	5	4	4	4	4	2	2	2	2	2	5
17-Apr	3	5	5	5	4	5	5	5	4	4	4	4	4	5	4	5	5	4	3	3	2	2	2	2	5
18-Apr	2	2	2	2	3	3	3	2	2	2	3	3	3	4	4	3	3	2	2	2	2	2	2	1	4
19-Apr	1	1	1	2	1	1	2	1	1	1	2	2	2	3	3	3	2	2	2	1	1	1	1	1	3
20-Apr	1	1	2	1	2	1	2	2	2	3	5	5	5	6	5	5	5	6	5	3	1	1	3	2	6
21-Apr	2	2	1	1	1	1	2	3	3	4	3	3	2	3	3	3	3	2	1	1	1	1	1	2	4
22-Apr	2	3	2	2	3	3	3	4	4	4	3	4	4	5	4	4	4	3	3	1	1	1	2	2	5
23-Apr	2	2	2	2	2	2	2	2	2	3	4	3	3	5	4	4	3	2	2	2	2	2	3	5	
24-Apr	2	2	2	2	2	2	2	2	2	4	4	5	3	3	3	3	3	2	2	2	2	1	1	1	5
25-Apr	1	2	2	2	2	2	3	3	3	3	4	4	5	4	5	4	3	3	3	3	2	2	2	2	5
26-Apr	2	2	2	2	2	2	3	4	3	5	4	5	5	5	4	4	4	4	3	3	1	2	2	2	5
27-Apr	3	2	2	1	1	1	1	2	2	3	3	4	4	4	6	5	4	2	2	2	2	2	3	1	6
28-Apr	1	2	1	1	1	1	1	1	4	3	3	4	4	4	4	3	2	2	2	2	1	1	2	1	4
29-Apr	1	2	4	1	1	2	2	3	3	3	4	5	5	5	5	4	4	3	3	4	1	1	1	1	5
30-Apr	1	1	1	1	1	2	1	2	2	3	4	3	5	6	4	4	4	3	2	2	2	2	2	1	6
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Firebag - April 2017

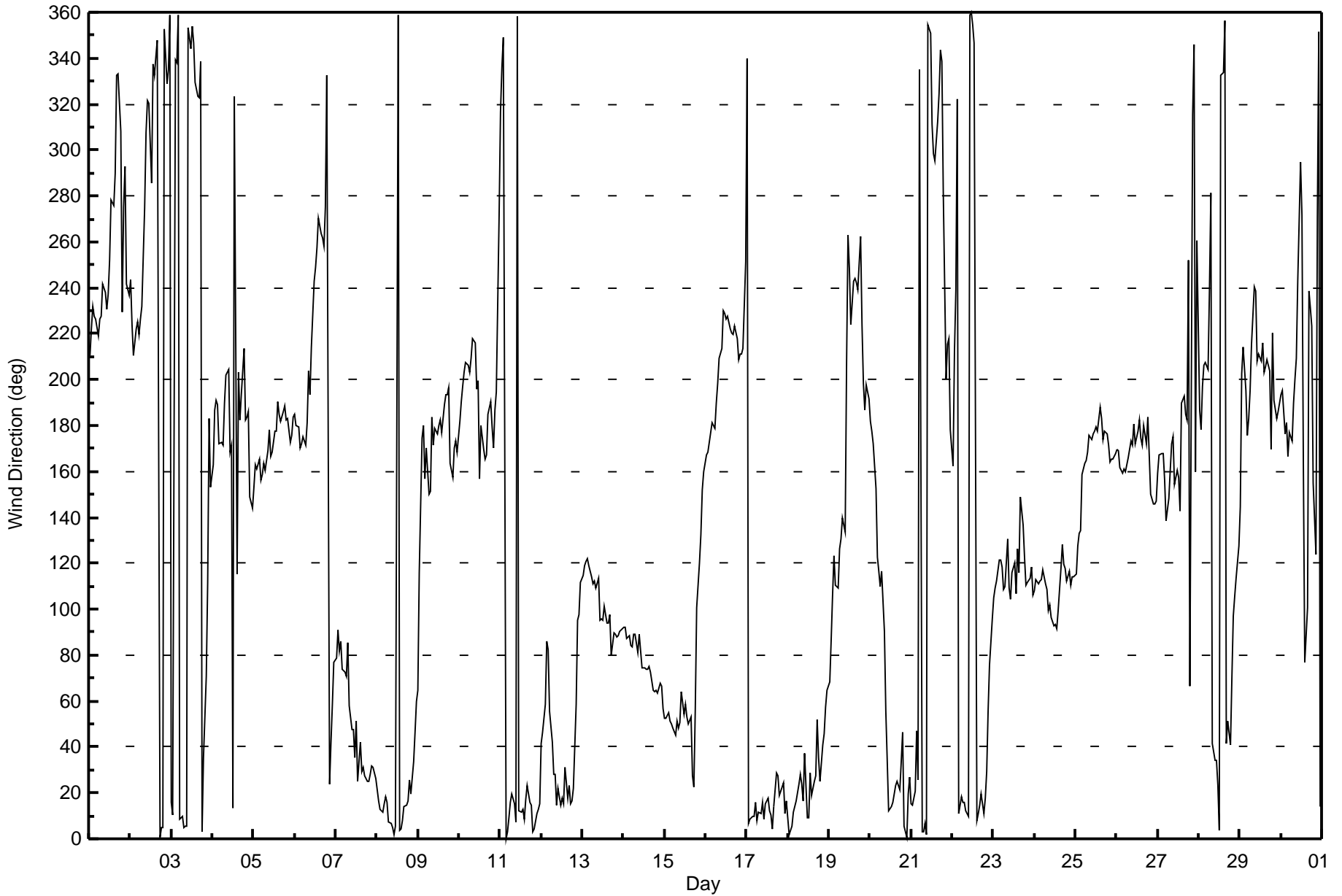
Direction of Maximum Speed: 178 deg on Apr 5 13:00 Direction of Maximum Daily Speed Average: 77.3 deg on Apr 14	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 252 deg on Apr 27 19:00 Direction of Minimum Daily Speed Average: 2.1 deg on Apr 28	Percent Operational Time: 100.0
Monthly Average Direction: 192.6 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	211	222	232	227	226	219	226	228	242	238	231	237	252	278	276	290	332	333	308	229	275	293	241	237	244.8
2-Apr	244	224	211	222	225	219	226	232	275	307	321	320	285	337	333	341	348	1	5	5	353	329	335	359	307.5
3-Apr	16	10	339	338	359	8	10	5	5	6	353	344	354	347	329	323	323	338	3	36	71	112	183	153	355.1
4-Apr	163	187	191	189	172	173	172	189	202	204	168	172	13	323	115	203	183	193	213	182	184	186	149	144	180.3
5-Apr	153	163	161	165	156	159	164	161	169	178	167	168	178	178	190	185	182	186	189	183	183	173	176	184	175.0
6-Apr	185	180	179	170	172	175	171	181	204	194	214	243	249	257	270	263	262	258	275	333	24	42	58	77	215.3
7-Apr	79	91	82	86	74	72	71	85	58	47	48	35	51	25	42	29	31	27	25	25	28	31	31	26	45.1
8-Apr	21	17	13	12	15	18	16	8	7	5	2	6	359	4	4	8	14	15	16	26	19	33	47	60	13.5
9-Apr	65	116	174	180	157	171	150	151	184	172	179	176	180	182	177	189	193	193	197	163	157	170	173	168	173.7
10-Apr	182	190	197	203	207	206	203	209	218	216	196	200	157	180	169	165	167	185	191	179	171	187	195	272	194.2
11-Apr	317	336	349	0	3	9	16	19	15	8	358	12	11	13	8	17	23	16	15	3	5	11	13	16	9.0
12-Apr	42	47	59	86	83	56	42	28	28	15	22	14	17	15	31	18	23	15	16	22	58	95	98	112	39.8
13-Apr	115	119	121	122	119	114	111	112	109	113	95	96	95	101	94	94	97	80	89	89	88	88	90	92	99.1
14-Apr	92	92	87	89	84	83	89	89	81	89	82	74	75	74	75	72	64	64	64	64	63	68	67	57	77.3
15-Apr	53	53	55	51	50	48	45	51	48	51	64	54	59	53	50	53	28	22	56	101	120	132	152	160	59.5
16-Apr	167	168	172	177	181	179	190	198	209	213	230	229	227	228	222	221	219	224	218	209	211	211	214	251	207.7
17-Apr	340	7	9	10	10	16	8	11	11	16	8	15	18	12	10	4	14	28	27	19	21	25	11	16	12.4
18-Apr	9	2	6	11	14	17	24	28	24	16	37	9	9	29	19	25	28	52	35	25	41	46	58	64	25.5
19-Apr	68	87	106	123	110	109	126	131	140	134	207	263	248	224	243	244	242	239	262	224	198	187	198	191	179.3
20-Apr	182	177	172	152	123	116	110	117	90	56	34	12	14	16	19	23	25	22	33	46	5	1	20	27	35.7
21-Apr	15	14	21	47	26	335	3	3	6	2	355	351	311	298	295	312	325	344	339	282	200	215	218	178	348.1
22-Apr	162	213	239	322	11	18	16	16	12	10	359	360	355	347	8	11	15	19	11	18	29	55	76	95	12.4
23-Apr	105	109	113	122	121	119	109	110	130	109	105	116	120	107	127	116	149	137	123	110	112	113	119	106	116.4
24-Apr	108	113	111	113	113	117	111	109	100	102	97	93	93	92	99	118	128	120	118	112	116	110	114	114	107.7
25-Apr	115	127	133	134	158	164	165	168	175	174	176	178	179	177	188	183	174	178	176	172	164	165	165	168	169.4
26-Apr	170	169	162	159	161	160	163	166	173	171	181	172	178	183	175	171	180	172	184	167	150	146	146	147	169.1
27-Apr	159	167	168	168	156	138	148	160	172	175	154	161	157	143	190	193	185	182	252	66	315	346	160	261	164.2
28-Apr	187	178	197	206	207	204	240	282	41	34	34	23	4	332	334	357	42	51	41	70	97	106	114	128	57.4
29-Apr	144	203	214	195	176	183	195	215	241	239	208	211	208	216	203	206	209	204	169	220	191	183	186	190	203.0
30-Apr	194	195	177	181	166	177	173	190	200	210	243	295	272	164	77	100	239	231	223	155	124	270	352	14	196.6

122.6 131.9 136.1 136.4 120.8 115.9 119.8 126.0 120.9 93.1 92.0 74.2 73.2 47.3 60.8 52.8 69.3 67.5 74.4 86.6 95.0 102.5 110.8 114.8

Diurnal Average

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Firebag - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Apr 30 14:00 Minimum Value: 4 deg on Apr 2 22:00 Percentiles: P ₁ = 6 P ₁₀ = 8 Q ₁ = 10 Median = 13 Q ₃ = 19 P ₉₀ = 32 P ₉₉ = 77																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	10	10	9	9	7	8	9	10	10	11	12	14	15	21	21	30	16	11	23	25	17	27	32	9	32
2-Apr	10	13	9	8	8	7	6	11	25	18	17	21	35	41	21	14	17	16	13	9	15	4	7	13	41
3-Apr	7	9	22	13	11	10	9	11	16	19	21	19	23	27	27	19	20	13	19	30	6	51	57	8	57
4-Apr	9	8	8	6	8	7	8	17	18	43	32	35	36	40	93	40	20	12	16	13	9	9	17	8	93
5-Apr	10	7	8	8	12	10	8	8	9	10	10	11	10	11	10	10	8	7	8	7	6	8	8	7	12
6-Apr	7	7	7	7	8	11	7	9	12	19	22	18	20	21	21	18	18	14	12	19	16	8	6	11	22
7-Apr	11	9	12	12	33	16	14	19	13	14	16	16	16	18	20	13	12	11	10	9	9	9	8	9	33
8-Apr	9	10	10	11	11	11	12	15	13	16	15	15	16	15	16	16	16	16	14	16	15	14	14	17	17
9-Apr	32	36	67	33	27	32	26	23	15	25	22	16	20	20	19	21	17	12	12	14	9	8	8	8	67
10-Apr	9	7	9	10	9	8	8	8	9	15	17	23	31	29	29	30	31	9	6	15	7	11	21	38	38
11-Apr	12	8	10	13	13	12	10	12	13	15	17	17	16	20	15	15	15	13	17	13	13	10	9	9	20
12-Apr	9	16	8	15	15	24	32	17	24	23	30	29	35	32	43	27	25	19	13	8	25	11	8	12	43
13-Apr	10	10	10	11	10	10	11	12	12	12	15	16	14	14	15	15	14	10	10	10	10	10	10	10	16
14-Apr	10	10	10	11	12	11	11	11	11	11	12	11	12	11	10	12	13	11	11	11	11	13	13	11	13
15-Apr	11	10	11	10	10	9	10	10	14	17	19	16	22	19	25	22	20	17	31	18	12	12	9	8	31
16-Apr	8	8	8	9	7	8	7	8	12	13	15	16	15	16	15	16	15	12	11	9	8	8	9	43	43
17-Apr	13	16	13	13	14	12	15	13	14	14	14	16	17	17	15	18	17	15	11	11	10	9	10	10	18
18-Apr	12	12	11	9	10	10	11	15	16	22	26	34	29	31	31	23	27	18	16	13	8	8	10	11	34
19-Apr	12	12	11	14	15	13	14	17	25	37	37	25	49	30	25	27	54	40	38	16	10	8	13	5	54
20-Apr	7	7	8	14	22	11	15	16	25	31	34	14	15	13	11	12	10	11	12	9	14	10	12	7	34
21-Apr	8	9	7	16	12	40	26	13	15	20	16	34	56	36	38	33	30	21	19	48	27	23	29	20	56
22-Apr	36	12	11	37	12	11	12	13	13	17	18	19	22	25	20	27	20	25	16	8	5	13	10	9	37
23-Apr	11	9	11	10	10	10	10	12	32	30	34	40	33	36	33	49	20	17	16	9	9	10	11	11	49
24-Apr	9	10	10	10	9	11	11	16	15	19	19	17	18	15	13	15	14	15	11	11	11	12	12	12	19
25-Apr	11	12	10	9	12	9	10	11	13	17	12	17	14	15	15	14	13	11	9	9	8	8	8	8	17
26-Apr	8	9	8	8	8	9	9	10	12	19	12	19	15	18	13	13	18	17	13	11	8	7	8	9	19
27-Apr	8	8	8	9	10	10	10	10	11	14	23	24	33	49	65	79	56	59	95	24	28	10	88	82	95
28-Apr	14	9	10	9	7	10	21	19	69	25	23	34	89	60	61	32	50	27	28	19	16	17	15	11	89
29-Apr	12	28	16	7	9	9	8	12	11	31	17	18	24	22	31	27	18	20	13	9	15	9	7	10	31
30-Apr	8	8	7	10	7	9	7	17	15	32	40	53	42	96	44	33	16	12	20	49	14	68	30	65	96
																	Diurnal Maximum								
																	36 36 67 37 33 40 32 23 69 43 40 53 89 96 93 79 56 59 95 49 28 68 88 82								



Wood Buffalo Environmental Association

SO₂ Calibration Summary

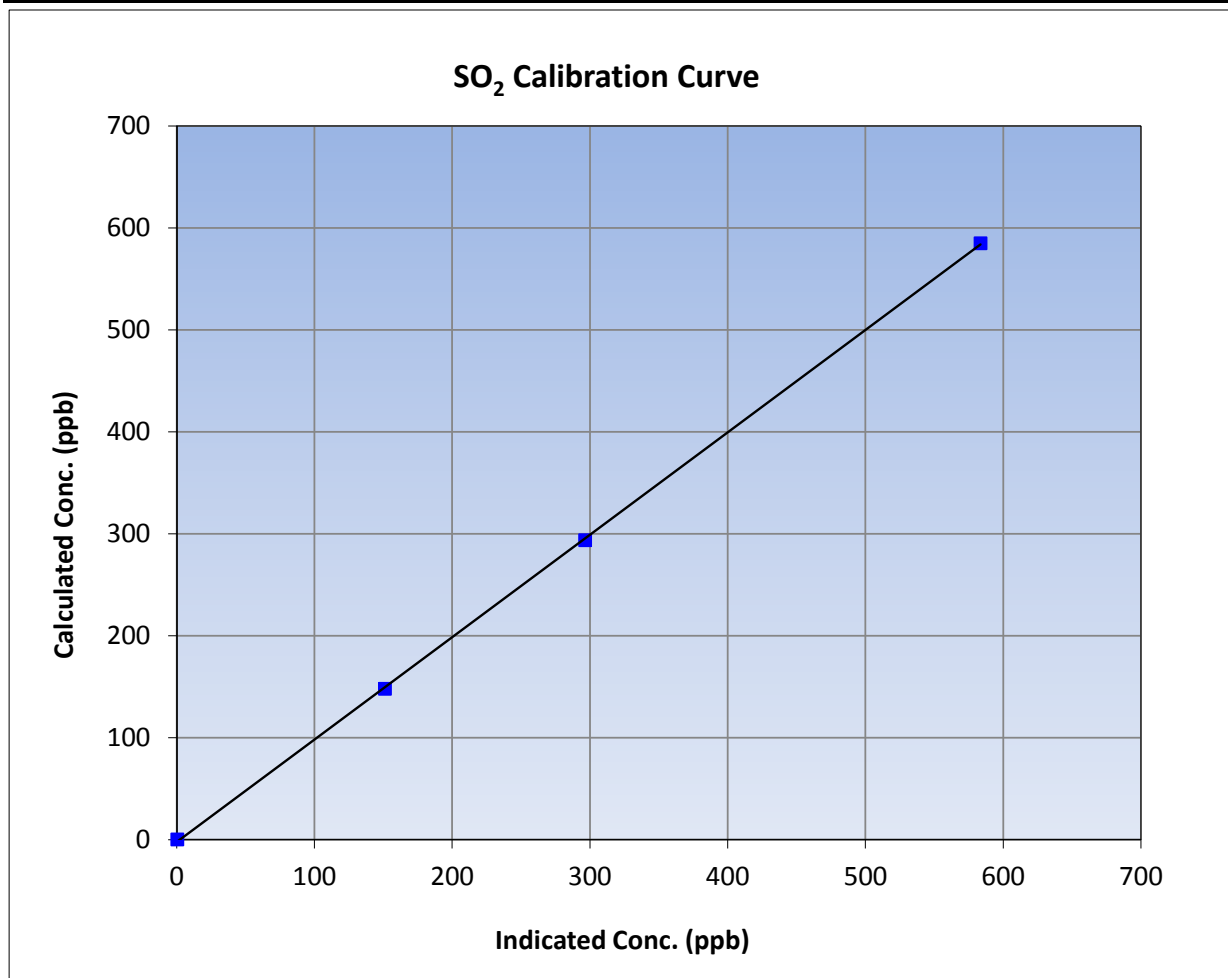
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 6, 2017
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	9:08	End Time (MST)	13:29
Analyzer make	Thermo 43i	Analyzer serial #	1410661308

Calibration Data

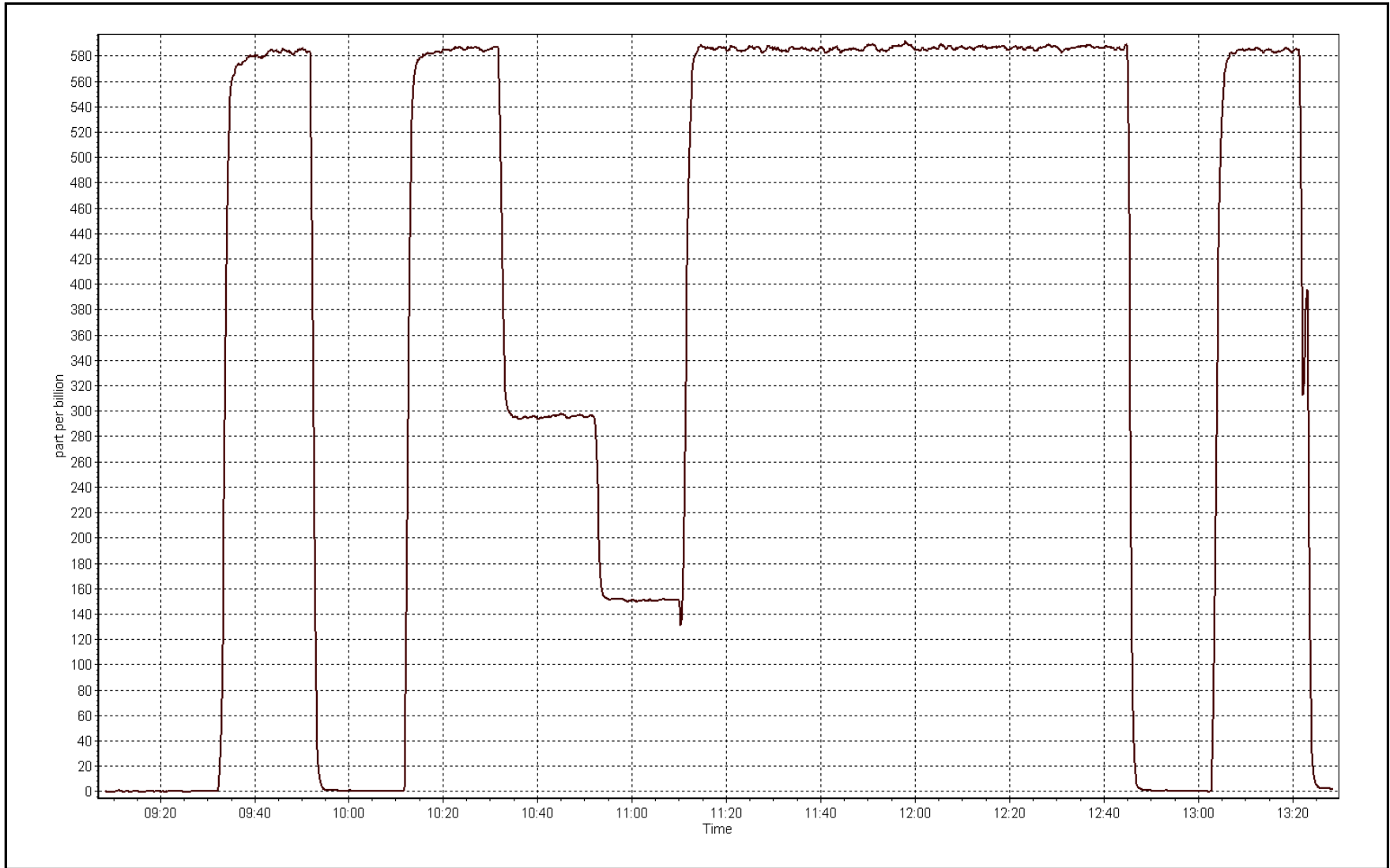
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999935	
584.8	583.1	1.0029			≥0.995
293.3	296.0	0.9909	Slope	1.004303	
147.7	150.8	0.9789			0.90 - 1.10
			Intercept	-2.181749	+/-30



SO2 Calibration Plot

Date: April 25, 2017

Location: Firebag





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	April 20, 2017	Last Cal Date:	March 24, 2017
Start time (MST):	8:29	End time (MST):	11:55
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.30</u>	ppm	Cal Gas Exp Date	February 13, 2018
Cal Gas Cylinder #	<u>LL77486</u>			
Calibrator Make/Model	API T700		Serial Number	996
ZAG Make/Model	API 701		Serial Number	201

Analyzer Information

Analyzer make: Thermo 450i

Analyzer serial #: 815129098

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	-573	-574
Calculated slope	1.007499	1.002789	Lamp voltage	933	933
Calculated intercept	-0.445986	-0.573487	Pressure	540.7	542.8
Analyzer Background	13.7	13.5	Flow	0.952	0.959
Analyzer Coefficient	1.157	1.150	Intensity	85	85

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	4998	0.0	0.0	0.2	----
as found span	4935	75.6	80.0	80.7	0.992
calibrator zero	4998	0.0	0.0	0.2	----
high point	4935	75.6	80.0	80.1	0.999
second point	4974	37.8	40.0	40.8	0.981
third point	4993	19.0	20.1	20.9	0.961
as left zero	4998	0.0	0.0	0.4	----
as left span	4935	75.6	80.0	80.1	0.999
Average Correction Factor					0.980
Corrected As found	80.45	Previous response	79.82	*% change	-0.8%

* = > +/-5% change initiates investigation

Notes:

Changed out inlet filter after asfinds. Slightly adjusted the span.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

H₂S Calibration Summary

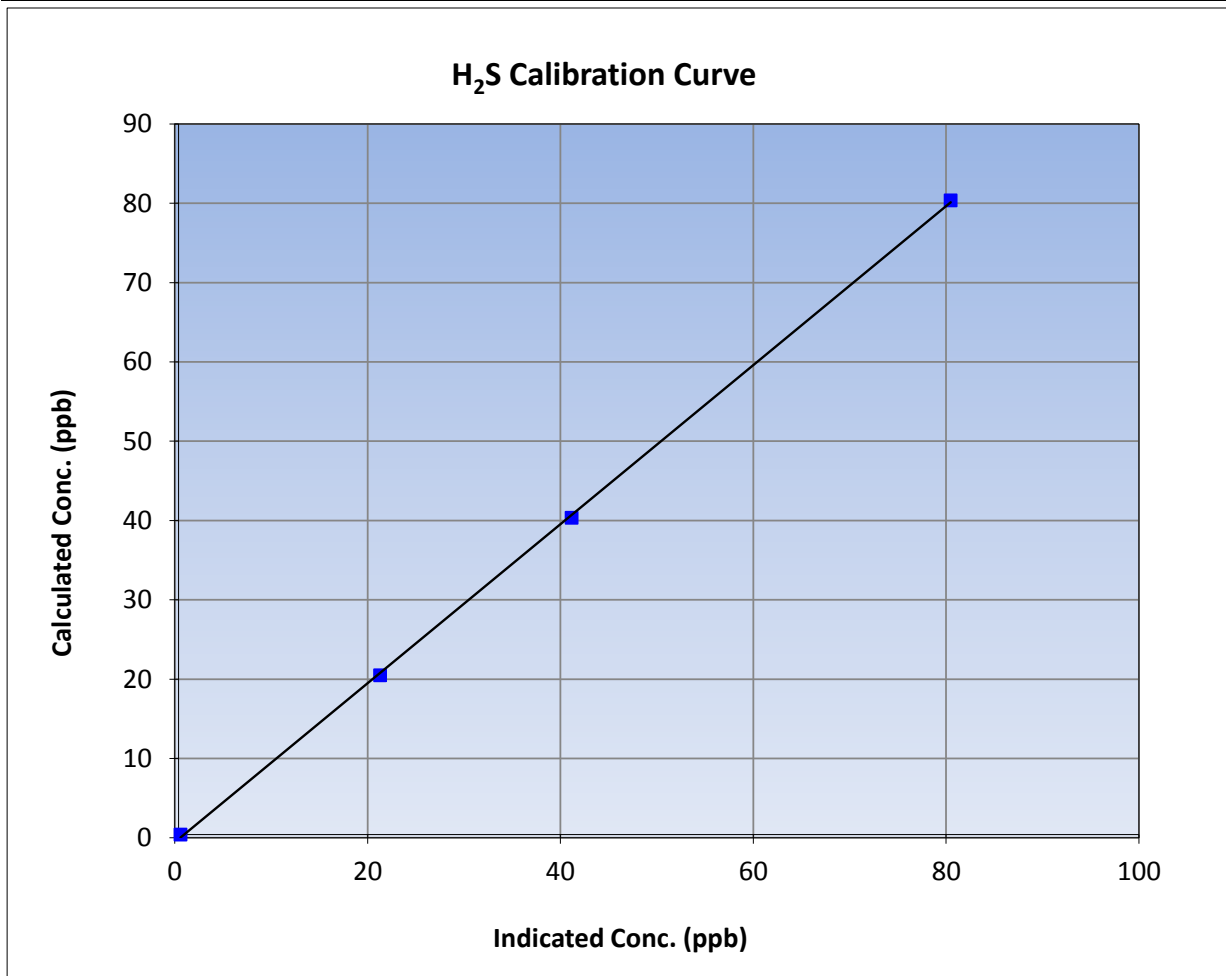
Version-03-2017

Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 24, 2017
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	8:29	End Time (MST)	11:55
Analyzer make	Thermo 450i	Analyzer serial #	815129098

Calibration Data

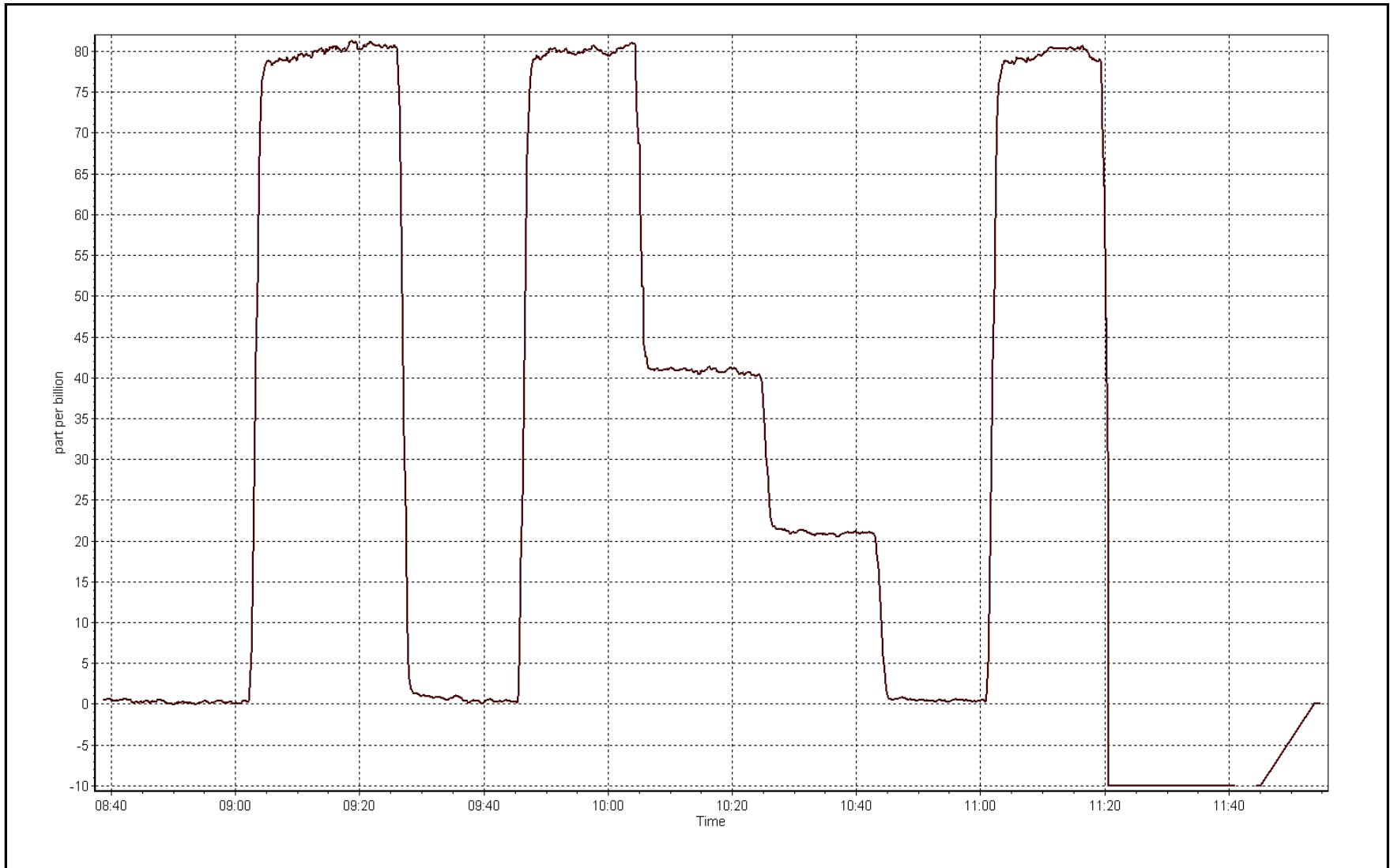
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.2	----	Correlation Coefficient	0.999891	
80.0	80.1	0.9986			≥0.995
40.0	40.8	0.9809	Slope	1.002789	
20.1	20.9	0.9613			0.90 - 1.10
			Intercept	-0.573487	+/-3



H₂S Calibration Plot

Date: April 20, 2017

Location: Firebag





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	April 12, 2017	Last Cal Date:	March 6, 2017
Start time (MST):	9:53	End time (MST):	12:42
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000652	Cal Gas Expiry Date	November-04-17
CH4 Cal Gas Conc.	<u>513.0</u> ppm	CH4 Equiv Conc.	1057.5 ppm
C3H8 Cal Gas Conc.	<u>198.0</u> ppm	Station temp.	Deg C
Calibrator Make/Model	API T700	Serial Number	996
ZAG Make/Model	API 701	Serial Number	201

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1336160089
	<u>Start</u>	<u>Finish</u>	<u>Start</u> <u>Finish</u>
Analyzer Range	0 - 25 ppm	Bias voltage supply	-306 -307
Calculated slope	0.996051	Sample pressure	8.6 8.6
Calculated intercept	-0.018847	Fuel pressure	23.0 23.0
Analyzer Background	1.840	Air pressure	34.9 34.9
Analyzer Coefficient	3.625	Flame temperature	157.1 157.5

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	4999	0.0	0.00	0.00	----
as found span	4952	59.8	12.62	12.90	0.978
calibrator zero	4999	0.0	0.00	0.00	----
high point	4952	59.8	12.62	12.64	0.998
second point	4982	30.0	6.33	6.38	0.992
third point	4996	15.1	3.19	3.26	0.977
as left zero	4999	0.0	0.00	0.00	----
as left span	4952	59.8	12.62	12.68	0.995
Average Correction Factor					0.989
Corrected As found	12.90	Previous response	12.69	*% change	-1.7%

* = > +/-5% change initiates investigation

Notes: Changed hydrogen cylinder after asfinds. Changed inlet filter. Adjusted the span.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

THC Calibration Summary

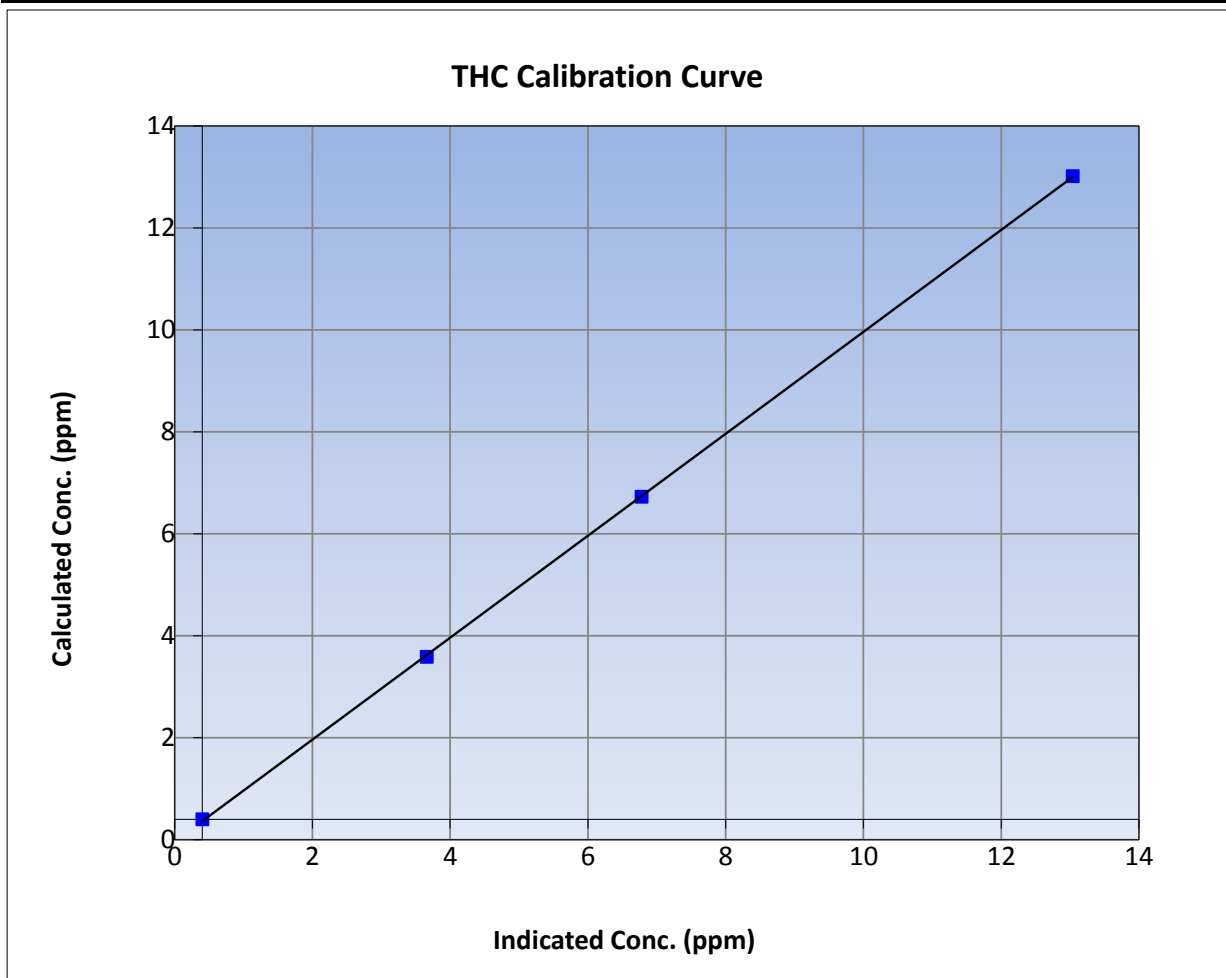
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 6, 2017
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	9:53	End Time (MST)	12:42
Analyzer make	Thermo 51i-LT	Analyzer serial #	1336160089

Calibration Data

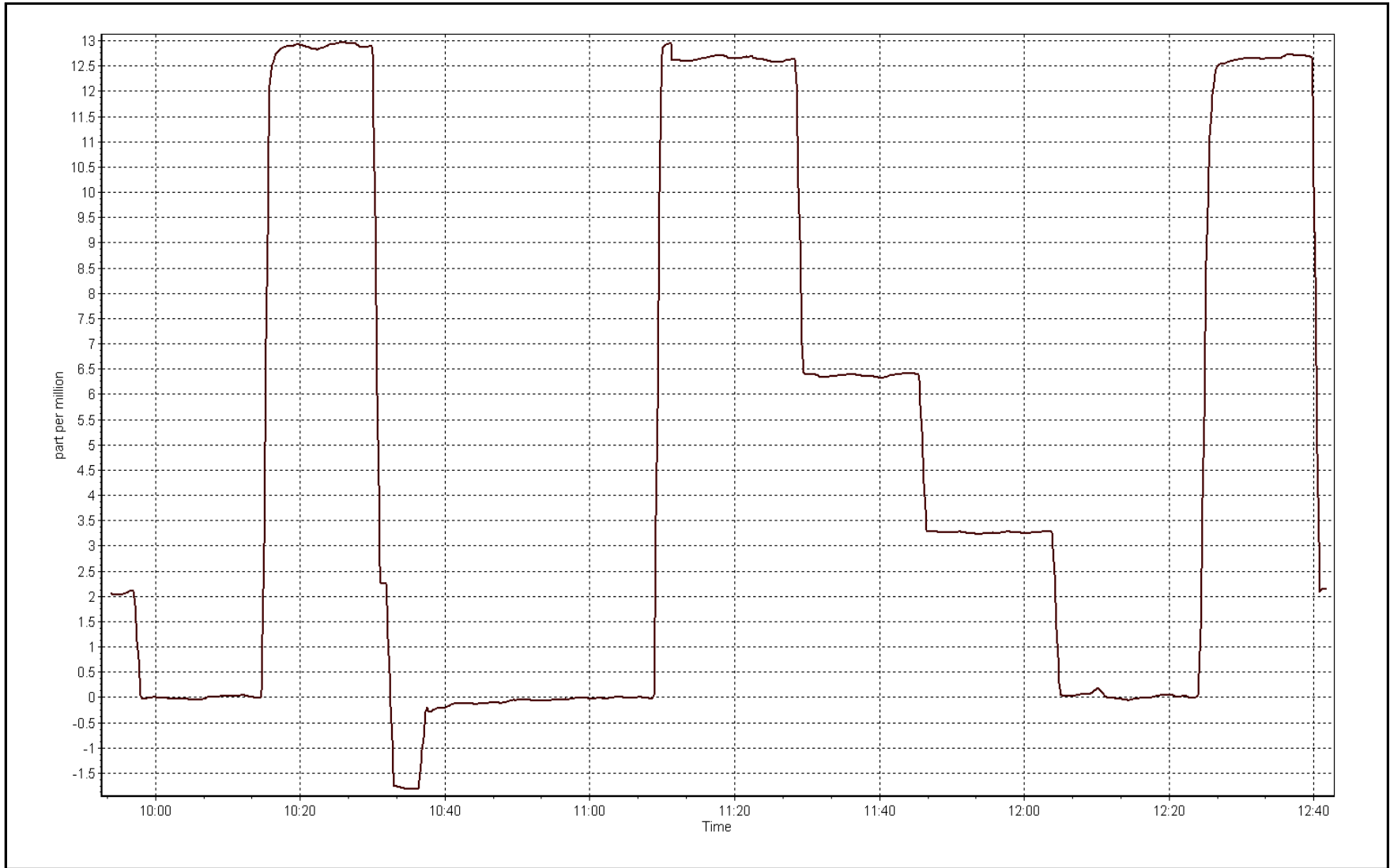
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999965	≥0.995
12.6	12.6	0.9983			
6.3	6.4	0.9921	Slope	0.999688	0.90 - 1.10
3.2	3.3	0.9775			
			Intercept	-0.034686	+/-1.5



THC Calibration Plot

Date: April 12, 2017

Location: Firebag





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Firebag	Station number:	AMS 19
Calibration Date:	April 25, 2017	Last Cal Date:	March 23, 2017
Start time (MST):	9:08	End time (MST):	13:22
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	EY0000652	Cal Gas Expiry Date	November 4, 2019
NOX Cal Gas Conc.	<u>50.2</u> ppb	NO Cal Gas Conc.	<u>50.2</u> ppb
Calibrator Model	API T700	Serial Number	996
ZAG make/model	API T701H	Serial Number	201

Analyzer Information

Analyzer make:	Thermo 42i	Analyzer serial #:	1410661309	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
NO coefficient	0.942	0.934	NOX Range (ppb)	0 - 1000 ppb
NOX coefficient	1.000	1.000	PMT Temperature	-2.7 -2.9
NO2 coefficient	1.000	1.000	Reaction cell Press	162.7 162.0
NO bkgrnd	4.1	4.1	Sample Flow	0.632 0.631
NOX bkgrnd	4.2	4.1	PMT Voltage	-780.3 -780.7

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	1.003685	1.000060
NO _x Cal Offset	-1.774161	-1.709531
NO Cal Slope	1.003036	0.999552
NO Cal Offset	-1.640401	-1.722665
NO ₂ Cal Slope	0.997718	0.997307
NO ₂ Cal Offset	1.224732	-0.373474



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	4999	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	----	----
as found span	4951	59.8	599.1	599.1	0.0	605.2	604.5	0.7	0.9900	0.9910
calibrator zero	4999	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0	----	----
high point	4951	59.8	599.1	599.1	0.0	599.8	600.1	-0.3	0.9989	0.9984
second point	4982	30.0	300.5	300.5	0.0	303.3	303.4	-0.2	0.9908	0.9903
third point	4996	15.1	151.3	151.3	0.0	154.8	154.9	-0.1	0.9772	0.9769
as left zero	4999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	----	----
as left span	4951	59.8	599.1	288.8	310.3	598.8	283.7	315.0	1.0005	1.0177
Average Correction Factor									0.9890	0.9885

Corrected As found	NO _x = 605.4 ppb	NO = 604.7 ppb		*Percent Change	NO _x = -1.1%
Previous Response	NO _x = 598.7 ppb	NO = 598.9 ppb		*Percent Change	NO = -0.9%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	599.9	599.0	1.0	0.9986	1.0002	----	----
1st NO2 (400 ppb O3)	288.8	310.2	599.8	288.8	311.1	0.9988	----	0.9972	100.3%
2nd NO2 (200 ppb O3)	389.6	209.4	600.2	389.6	210.6	0.9982	----	0.9943	100.6%
3rd NO2 (100 ppb O3)	492.0	107.0	600.1	492.0	108.1	0.9983	----	0.9892	101.1%
2nd NO ref point	----	0.0	599.8	598.9	0.9	0.9988	1.0003	----	----
Average Correction Factor						0.9985	1.0003	0.9936	100.6%

Notes: Changed inlet filter after asfinds. Adjusted the span.

Calibration Performed By: Jayme Marcoux



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

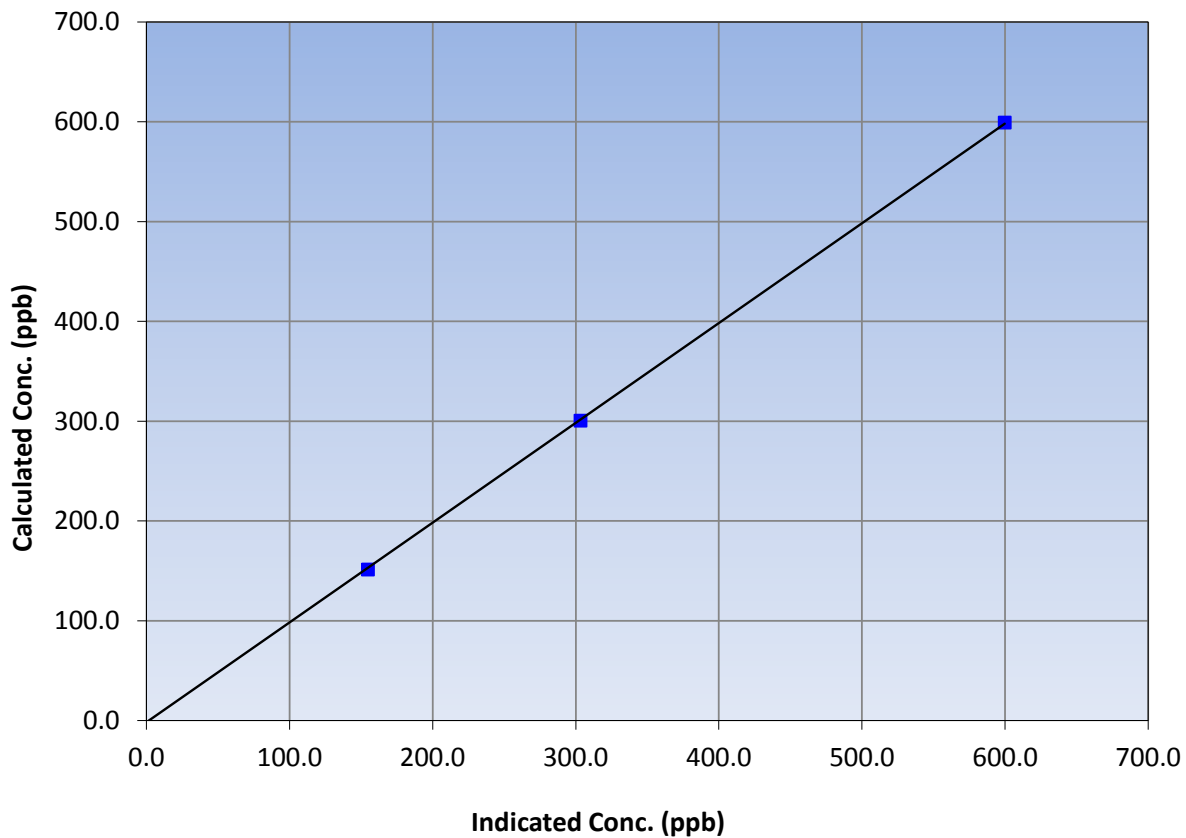
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 23, 2017
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	9:08	End Time (MST)	13:22
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.2	----	Correlation Coefficient	≥0.995	
599.1	599.8	0.9989			
300.5	303.3	0.9908			
151.3	154.8	0.9772			
			Slope	1.000060	0.90 - 1.10
			Intercept	-1.709531	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

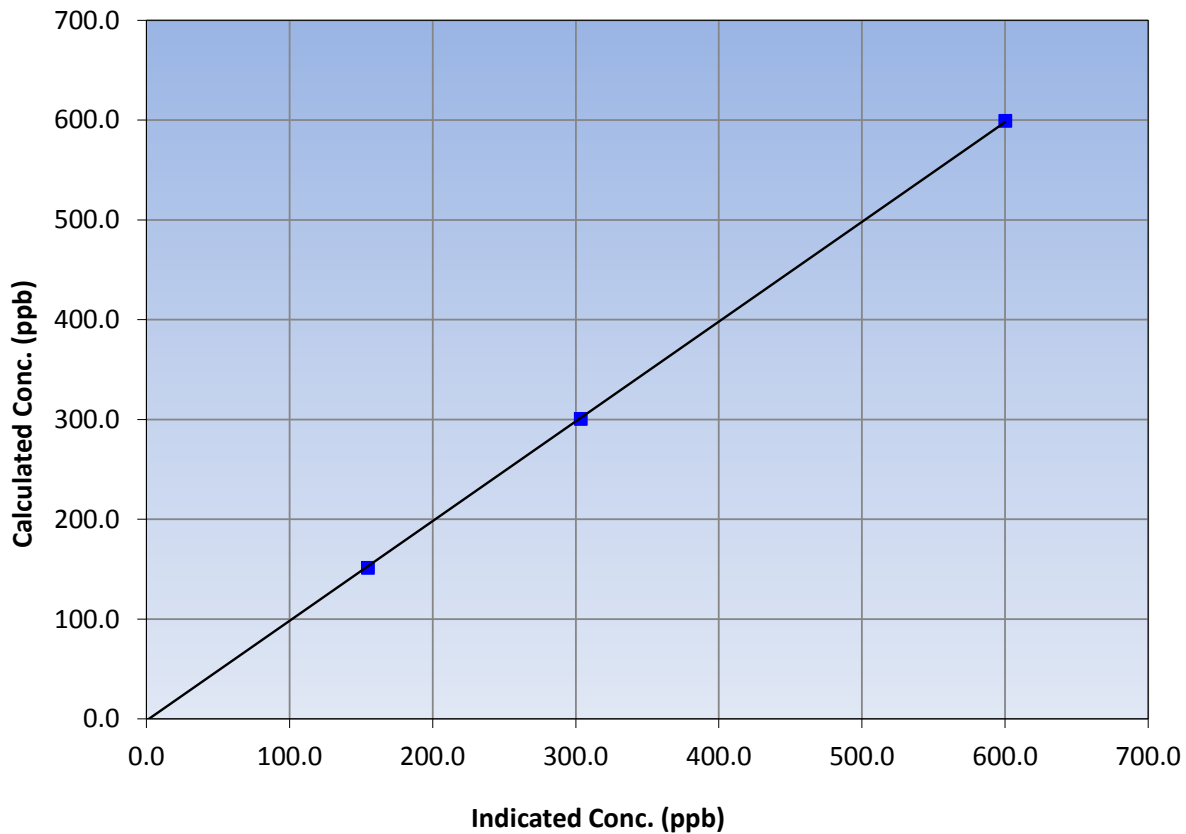
Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 23, 2017
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	9:08	End Time (MST)	13:22
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
599.1	600.1	0.9984			
300.5	303.4	0.9903			
151.3	154.9	0.9769			
			Slope	0.999552	0.90 - 1.10
			Intercept	-1.722665	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

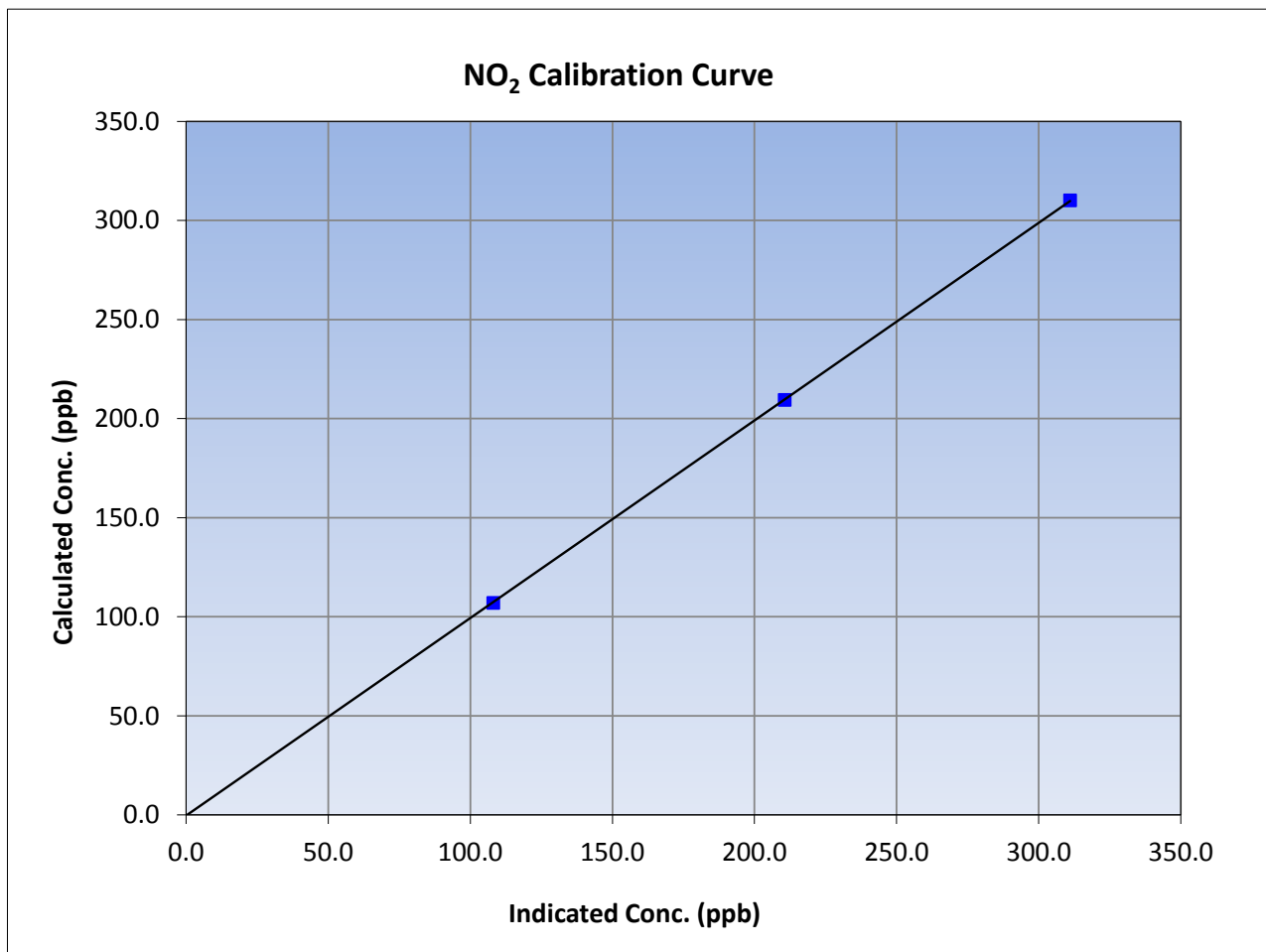
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 23, 2017
Station Name	Firebag	Station Number	AMS 19
Start Time (MST)	9:08	End Time (MST)	13:22
Analyzer make	Thermo 42i	Analyzer serial #	1410661309

Calibration Data

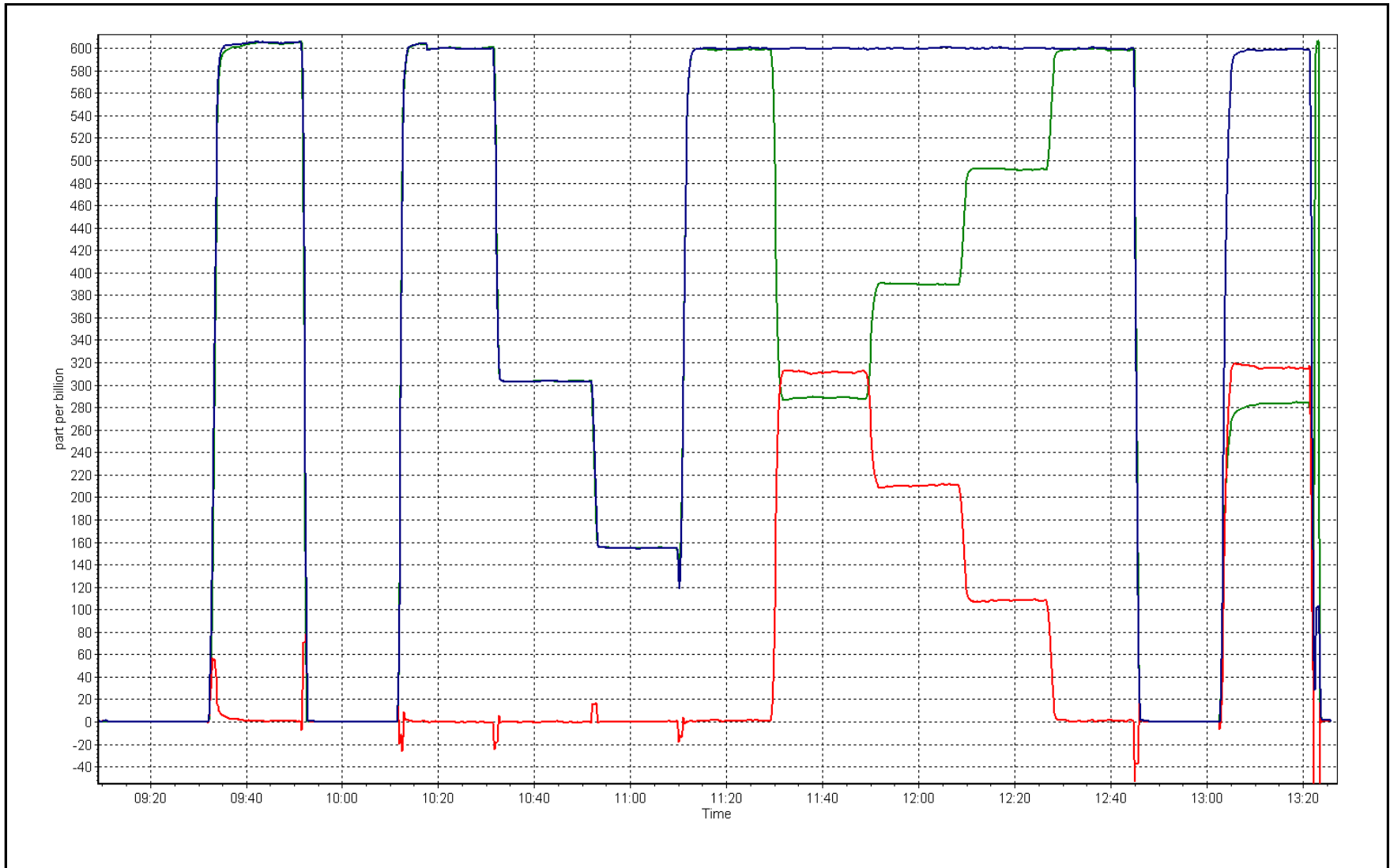
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.0	----	Correlation Coefficient	≥0.995	
310.2	311.1	0.9972			
209.4	210.6	0.9943			
107.0	108.1	0.9892			
			Slope	0.997307	0.90 - 1.10
			Intercept	-0.373474	+/-20



NO_x Calibration Plot

Date: April 25, 2017

Location: Firebag





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS 20
MACKAY RIVER
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS 20)

APRIL 2017

MONTHLY SUMMARY for
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	34	35	99.86	33	0	6	0
H2S (ppb) Average	680	32	40	98.89	1	0	0	0
THC (ppm) Average	685	34	35	99.86	2.6	-	2.3	-
NO2 (ppb) Average	685	34	35	99.86	23	0	6	-
NO (ppb) Average	685	34	35	99.86	5	-	2	-
NOX (ppb) Average	685	34	35	99.86	23	-	7	-
Temperature 2 m (C) Average	720	0	0	100	15.7	-	8.2	-
Relative Humidity (%) Average	720	0	0	100	98	-	94	-
Precipitation (mm) Total	720	0	0	100	1.8	-	24.1	-
Wind Speed 10 m (km/h) Average	708	0	12	98.33	18	-	13	-
Wind Direction 10 m (deg) Average	708	0	12	98.33	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS 20)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	1	3	-	0	0	0	0	0	3	33
H2S (ppb) Average	680	0.2	0	-	0	0	0	0	0	0	1
THC (ppm) Average	685	2.19	0.1	-	2	2.1	2.1	2.2	2.2	2.3	2.6
NO2 (ppb) Average	685	1.8	2	-	0	0	1	1	2	4	23
NO (ppb) Average	685	0.3	1	-	0	0	0	0	0	1	5
NOX (ppb) Average	685	2.1	3	-	0	0	0	1	3	5	23
Temperature 2 m (C) Average	720	0.73	5.9	-	-17.6	-6.5	-3.2	0.1	4.7	9.5	15.7
Relative Humidity (%) Average	720	66.1	20	-	18	38	49	67	84	93	98
Precipitation (mm) Total	720	-	-	38.57	-	-	-	-	-	-	-
Wind Speed 10 m (km/h) Average	708	7.5	4	-	0	2	4	7	10	13	18
Wind Direction 10 m (deg) Average	708	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS 20) APRIL
2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	21 Apr 2017 10:00	21 Apr 2017 10:00	1	Maintenance - station router replaced
H2S	04 Apr 2017 02:00	04 Apr 2017 03:00	2	Unstable operation - excessive baseline drift
H2S	12 Apr 2017 08:00	12 Apr 2017 08:00	1	Maintenance - verify daily QA response
H2S	19 Apr 2017 14:00	19 Apr 2017 14:00	1	Unstable operation - excessive baseline drift
H2S	20 Apr 2017 11:00	20 Apr 2017 11:00	1	Maintenance - manifold cleaning
H2S	24 Apr 2017 23:00	24 Apr 2017 23:00	1	Unstable operation - excessive baseline drift
H2S	27 Apr 2017 14:00	27 Apr 2017 14:00	1	Unstable operation - excessive baseline drift
Wind Speed, Wind Direction	04 Apr 2017 22:00	05 Apr 2017 09:00	12	Flat line in sensor output signal -sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

MacKay River - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 33 ppb on Apr 19 10:00	Maximum Daily Average: 6.2 ppb on Apr 19		Hours of Data:	685
Minimum Value: 0 ppb on Apr 5 08:00	Minimum Daily Average: 0.1 ppb on Apr 16		Hours of Missing Data:	35
Maximum Diurnal Average: 2.4 ppb at hour 10	Minimum Diurnal Average: 0.2 ppb at hour 3		Hours of Calibration:	34
Monthly Average: 1.0 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 3 P ₉₉ = 14		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.2	1
3-Apr	0	0	Z	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
7-Apr	Z	1	0	2	6	4	1	0	4	6	7	7	4	2	4	2	0	0	0	0	0	0	0	0	2.2	7
8-Apr	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	6	0.9	7
9-Apr	5	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	5
10-Apr	0	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
12-Apr	0	0	0	0	0	Z	0	1	3	11	3	1	0	7	10	9	8	8	7	4	1	0	0	1	3.2	11
13-Apr	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Apr	0	Z	0	0	0	0	1	2	1	1	1	1	2	1	5	3	3	3	3	3	2	3	1	1	1.6	5
15-Apr	0	0	Z	0	0	0	0	0	3	5	6	7	6	4	2	1	1	1	0	0	0	0	0	0	1.7	7
16-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	1
18-Apr	0	0	0	0	0	Z	2	3	4	5	6	8	8	13	19	11	6	6	11	10	14	10	1	1	6.0	19
19-Apr	Z	1	1	0	0	0	0	6	21	33	25	23	14	7	3	2	2	1	1	1	1	1	1	1	6.2	33
20-Apr	1	Z	1	1	0	0	0	0	0	C	C	C	C	1	0	0	0	0	0	0	9	0	0	0	0.8	9
21-Apr	0	0	Z	0	0	0	1	3	15	M	7	7	9	11	7	6	2	1	2	3	4	2	1	1	3.8	15
22-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	10	8	4	2	0	1.2	10
23-Apr	0	1	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	1	2	3	2	0	0	0	0	0	0	1	0	0	0.5	3
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.2	1
30-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0.3	2

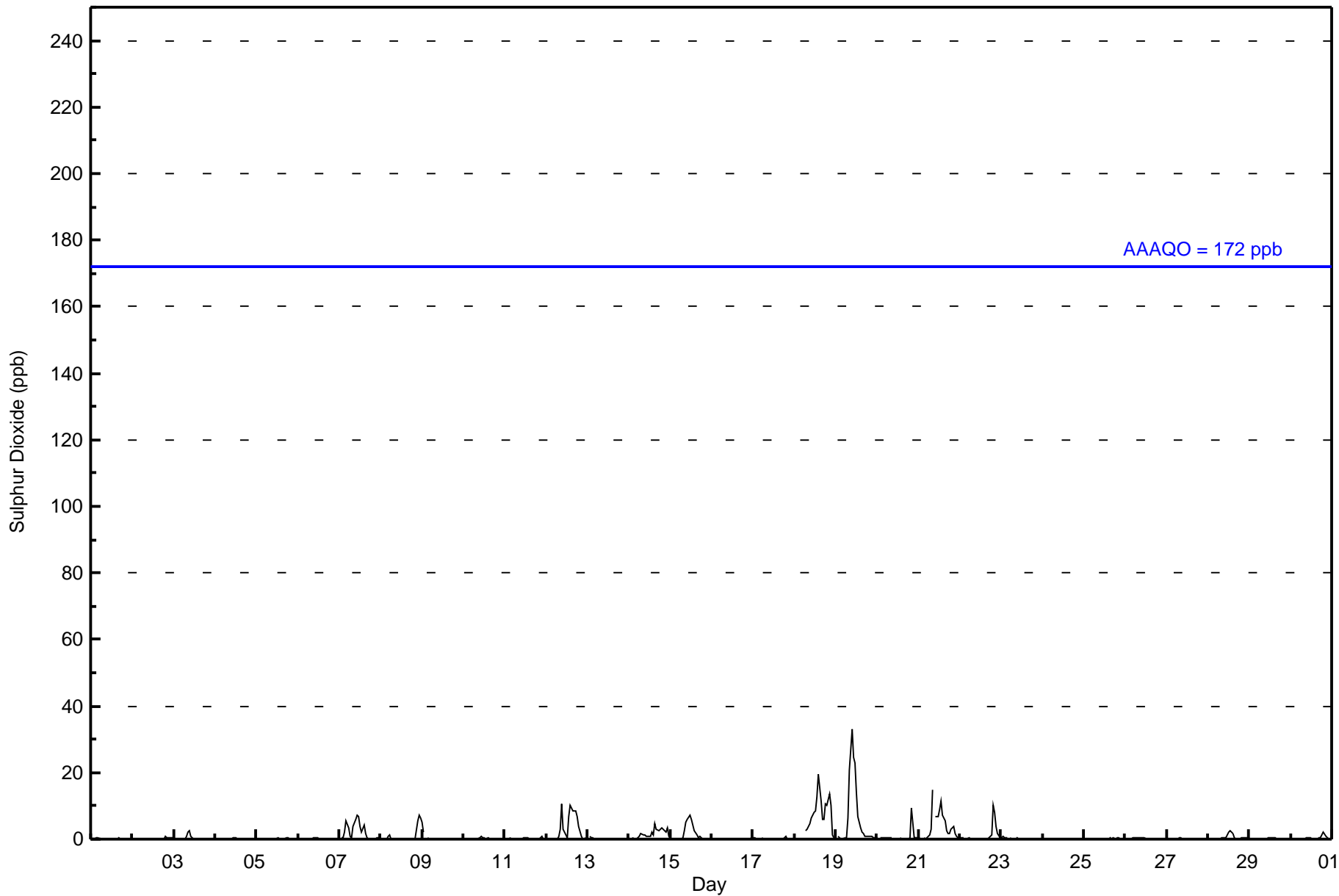
0.4	0.3	0.2	0.2	0.4	0.3	0.3	0.6	1.8	2.4	2.1	2.0	1.6	1.7	1.8	1.3	0.8	0.8	1.0	1.2	1.4	0.9	0.6	0.4	Diurnal Average	
5	2	1	2	6	4	2	6	21	33	25	23	14	13	19	11	8	8	11	10	14	10	7	6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
MacKay River - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
MacKay River - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	672	98.10	98.10
11 - 20	9	1.31	99.42
21 - 60	4	0.58	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
MacKay River - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	16	129	93	38	41	51	57	72	54	26	23	22	27	8	2	2	661
11 - 20	0	1	3	3	1	0	0	0	0	0	0	0	1	0	0	0	9
21 - 60	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	4
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	130	96	41	42	51	57	72	55	26	23	22	29	8	4	2	674

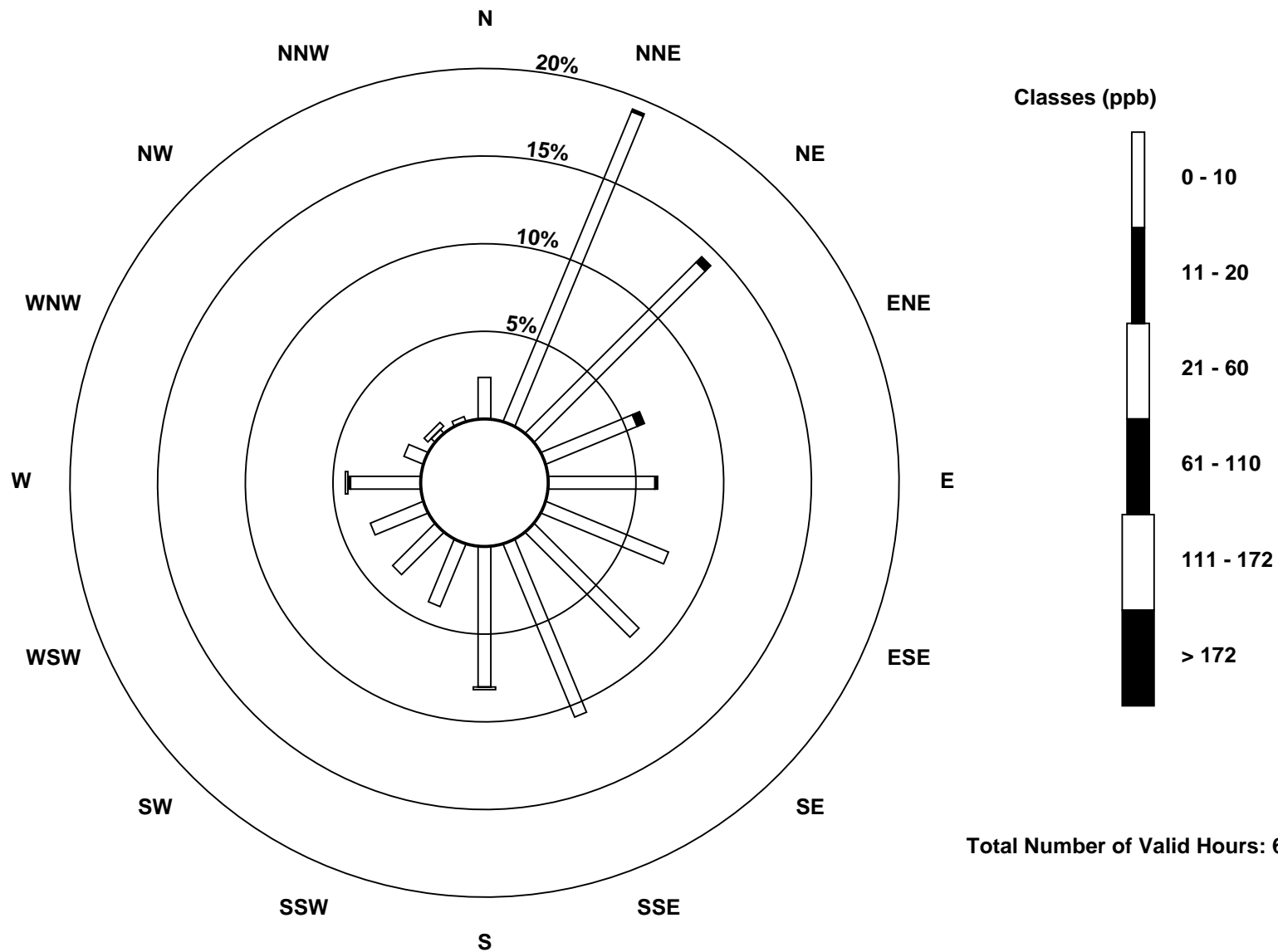
Total Number of Valid Hours: 674

Total Number of Hours: 720

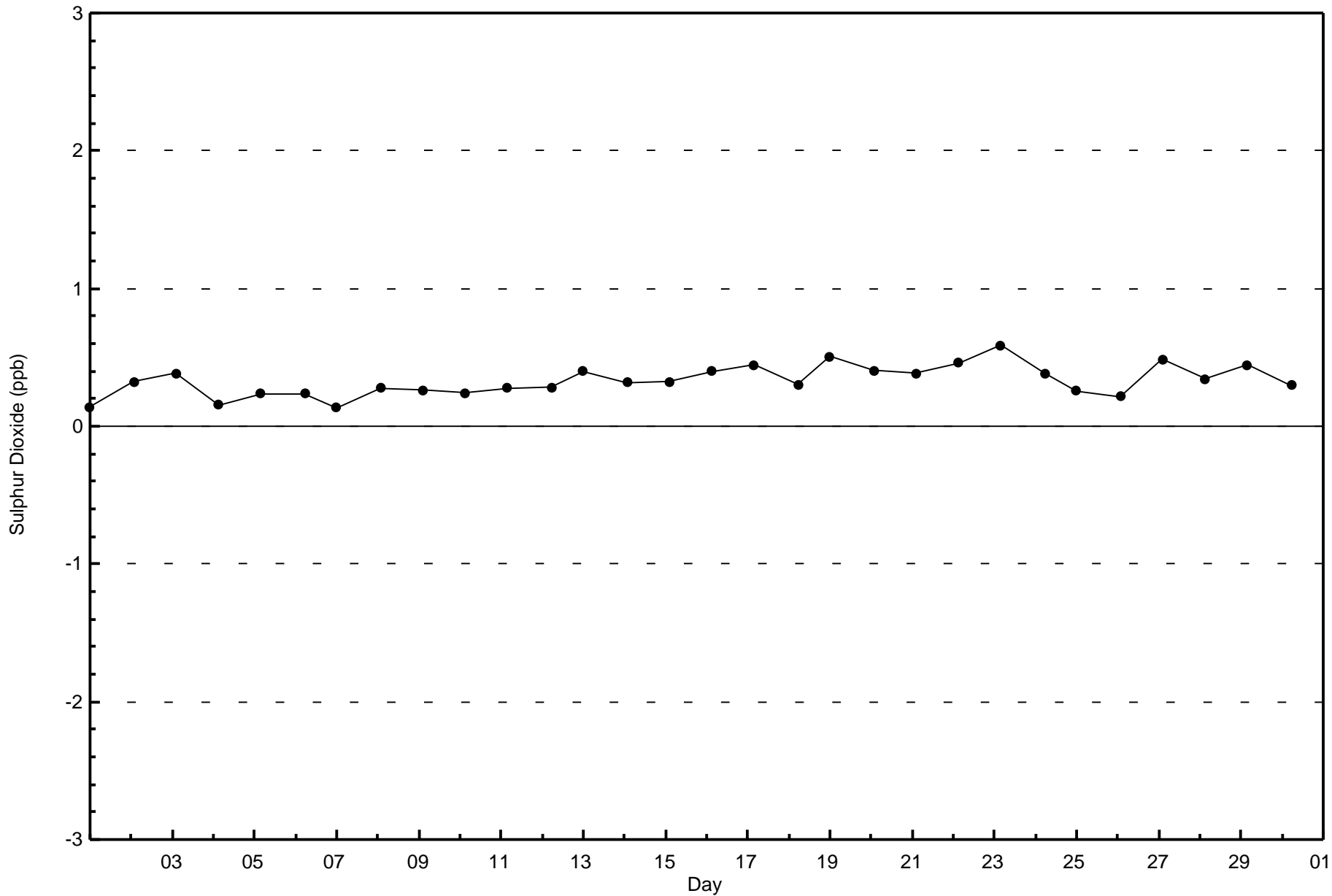


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Mackay River (AMS 20)



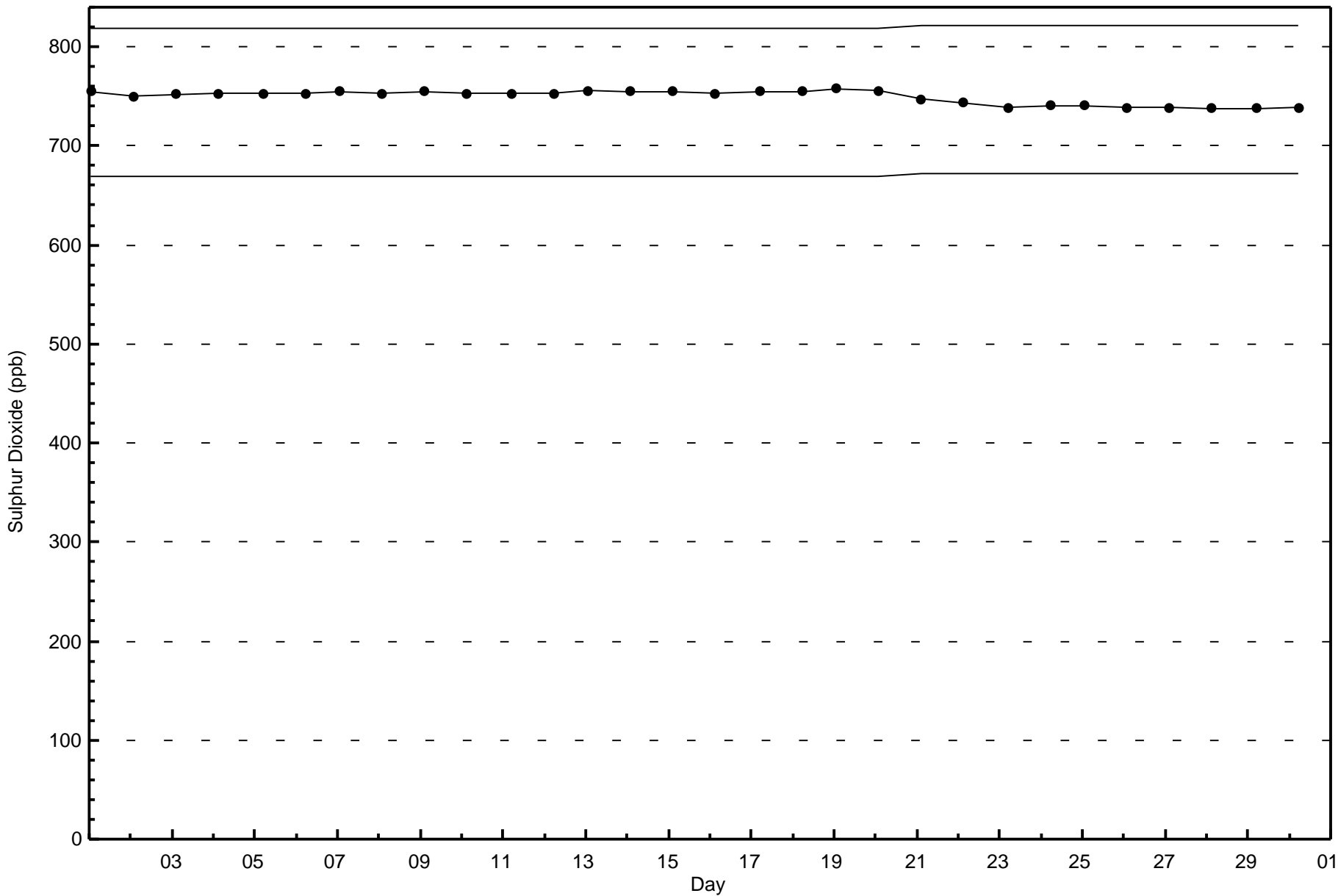
Total Number of Valid Hours: 674





Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
MacKay River - April 2017





Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 1 ppb on Apr 7 05:00	Maximum Daily Average: 0.3 ppb on Apr 7		Hours of Data:	680
Minimum Value: 0 ppb on Apr 29 07:00	Minimum Daily Average: 0.1 ppb on Apr 25		Hours of Missing Data:	40
Maximum Diurnal Average: 0.2 ppb at hour 10	Minimum Diurnal Average: 0.2 ppb at hour 19		Hours of Calibration:	32
Monthly Average: 0.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0		Percent Operational Time:	98.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Apr	0	UO	UO	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
7-Apr	0	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	1	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	0	0	0	0	0	Z	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	1	0	0	UO	0	0	0	0	0	0	0	0	0	0	0.2	1
20-Apr	0	0	Z	0	0	0	0	0	0	0	M	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
21-Apr	0	0	0	Z	0	0	0	0	0	M	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UO	0.2	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	UO	0	0	0	0	0	0	0	0	0	0	0.2	0
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

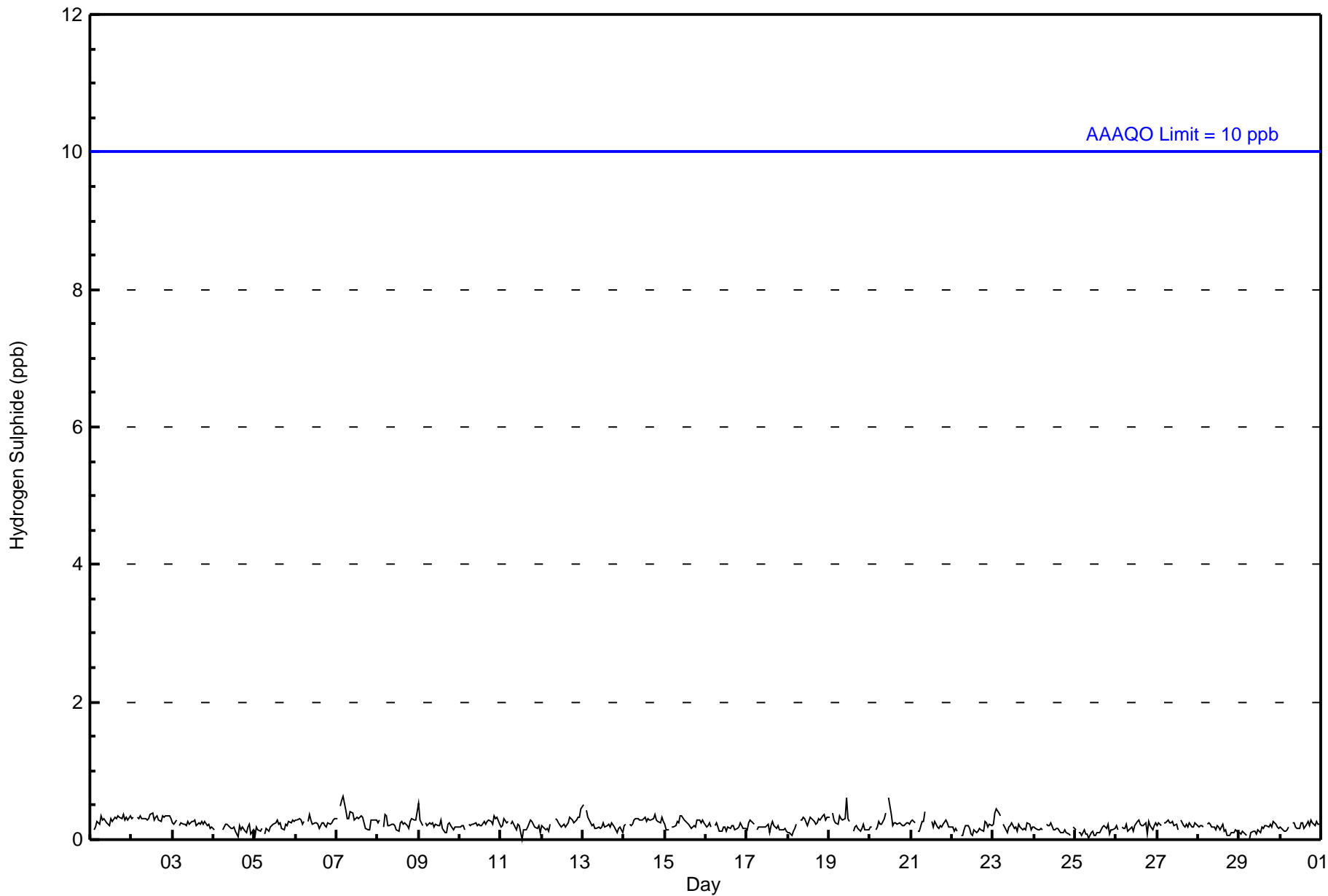
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
1	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerspan C - Calibration M - Maintenance UO - Unstable Operation
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
MacKay River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
MacKay River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	680	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
MacKay River - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	16	129	96	42	42	48	57	74	52	27	22	21	29	8	4	2	669
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	129	96	42	42	48	57	74	52	27	22	21	29	8	4	2	669

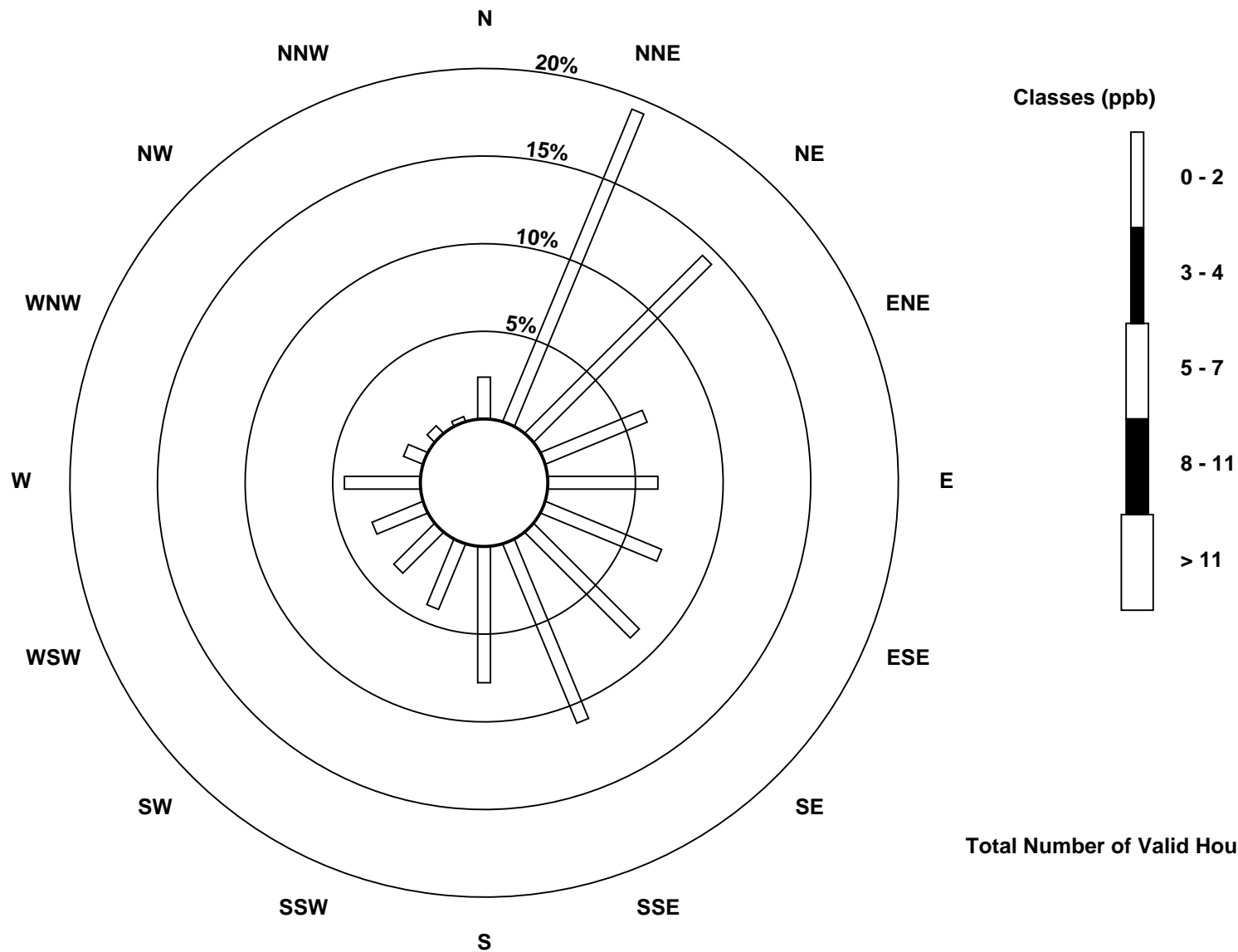
Total Number of Valid Hours: 669

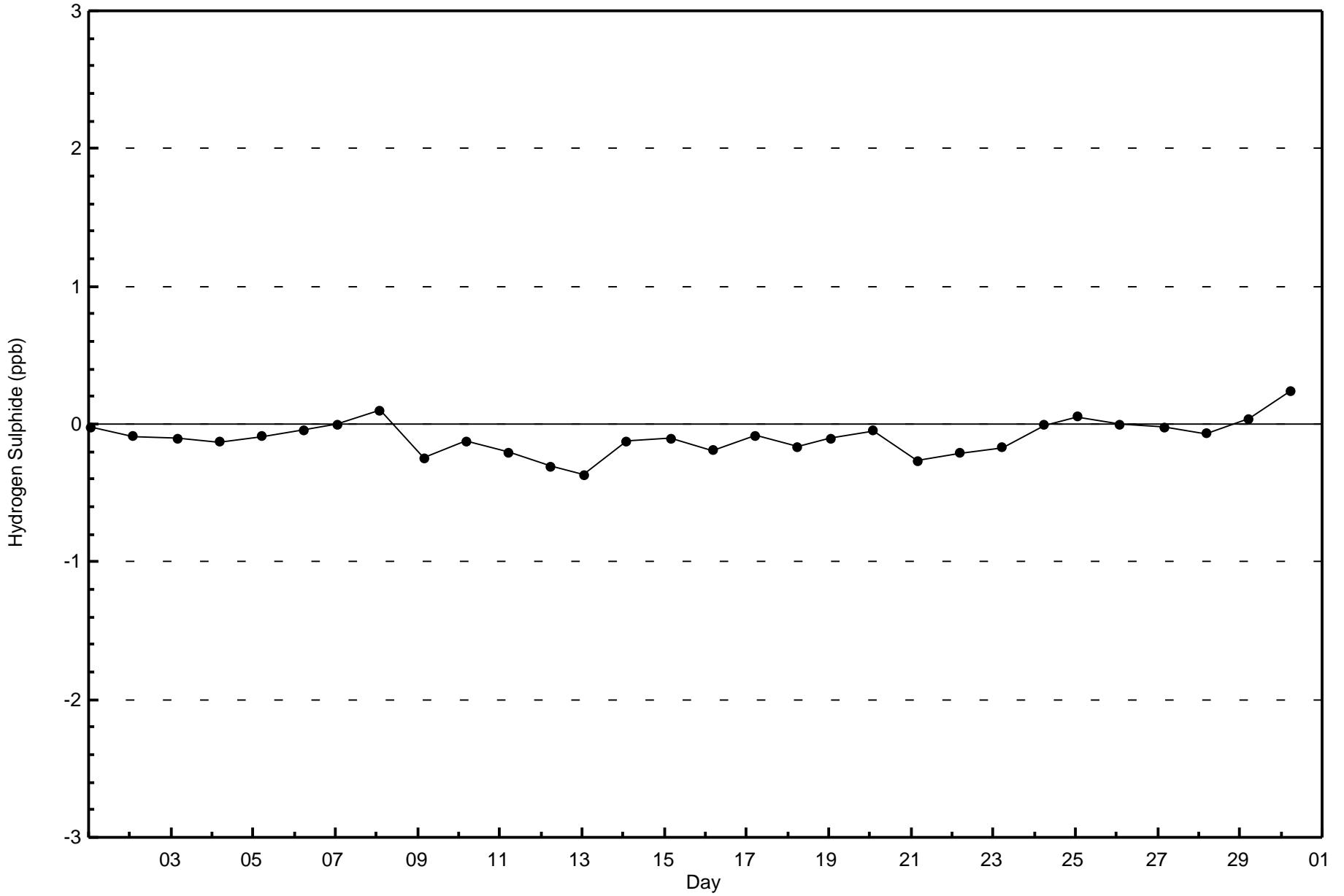
Total Number of Hours: 720

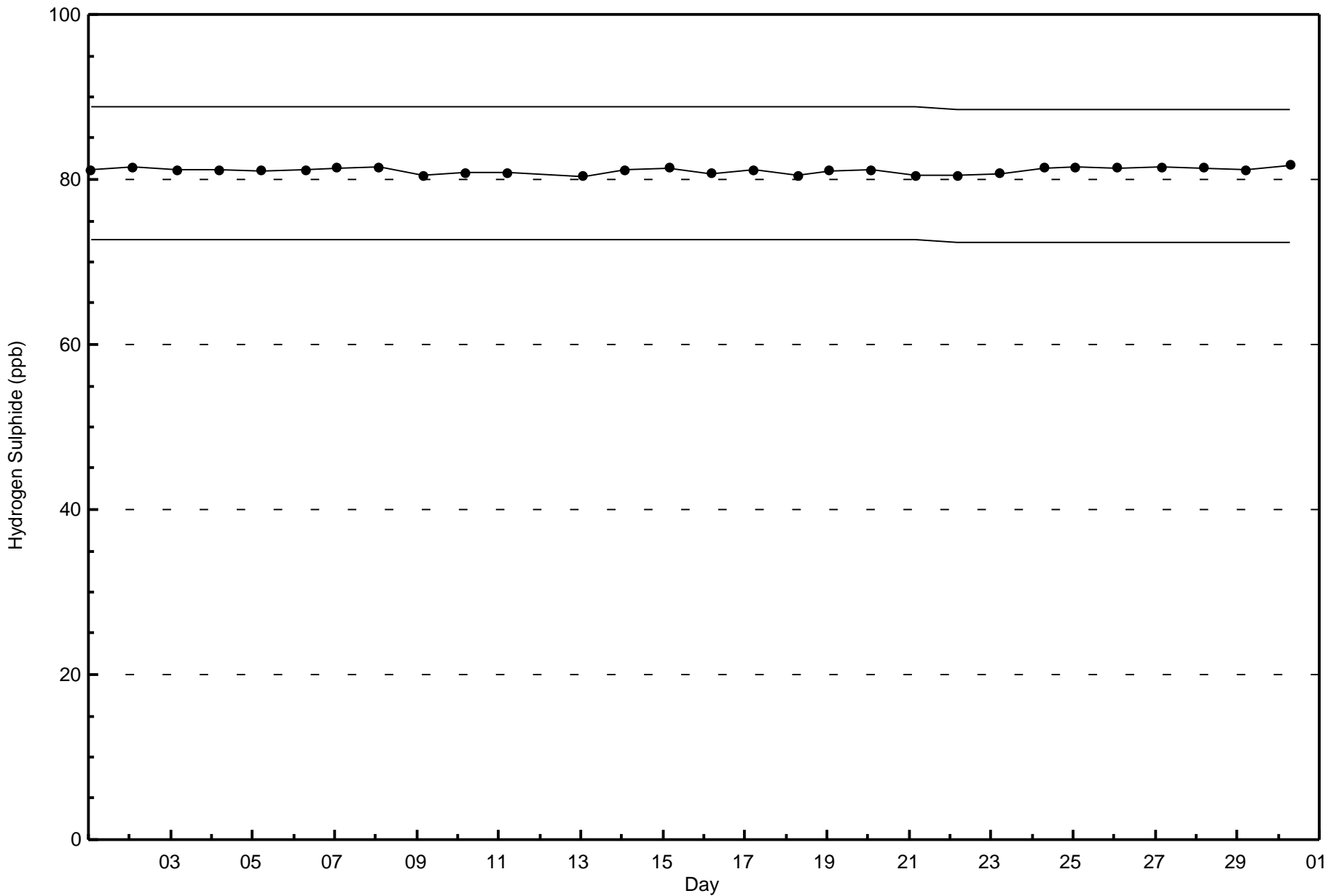


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Mackay River (AMS 20)



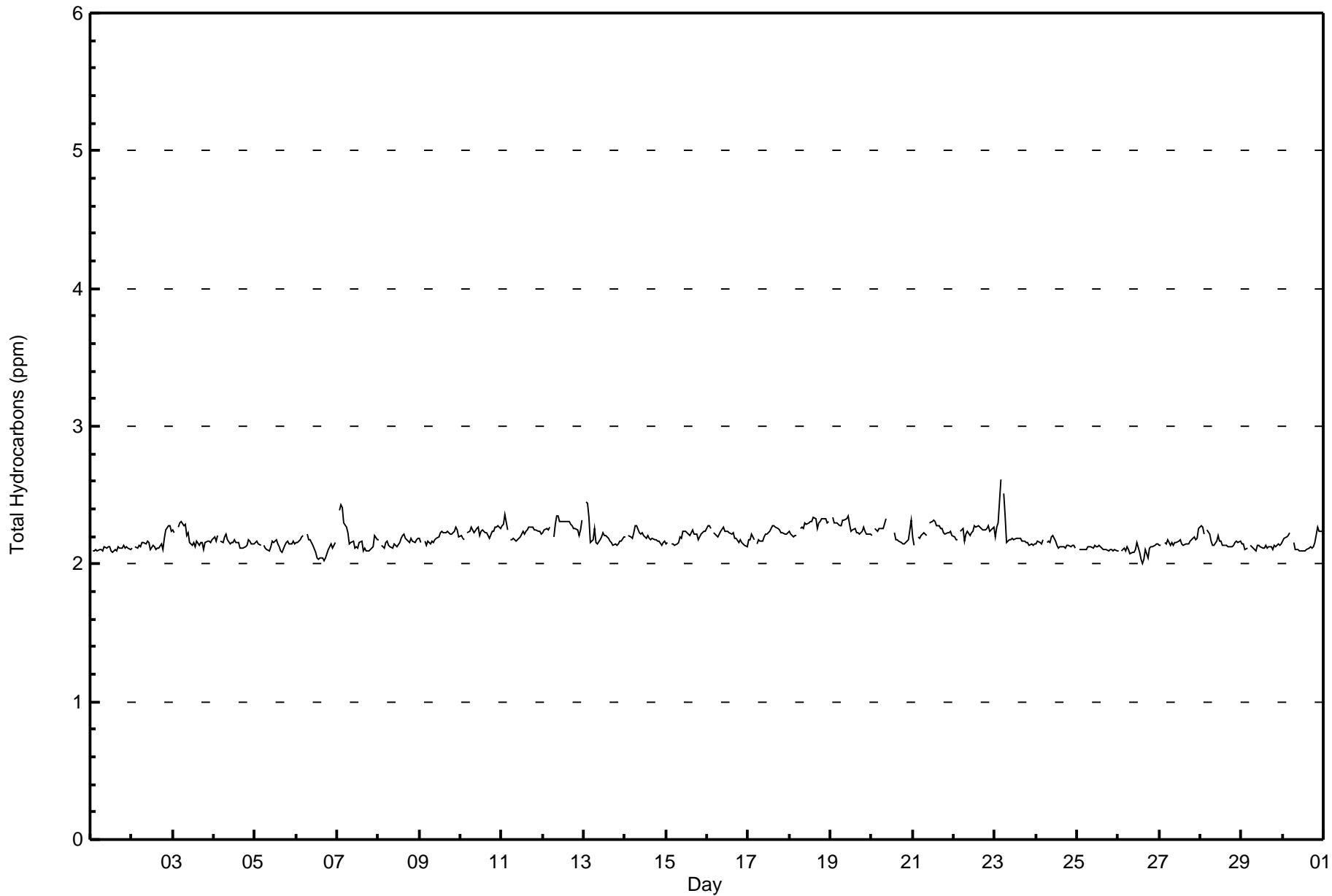






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
MacKay River - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
MacKay River - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	10	1.46	1.46
2.1 - 3.0	675	98.54	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
MacKay River - April 2017

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 2.0	0	0	0	0	0	0	1	3	0	0	0	0	5	1	0	0	10
2.1 - 3.0	16	130	96	41	42	51	56	69	55	26	23	22	24	7	4	2	664
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	130	96	41	42	51	57	72	55	26	23	22	29	8	4	2	674

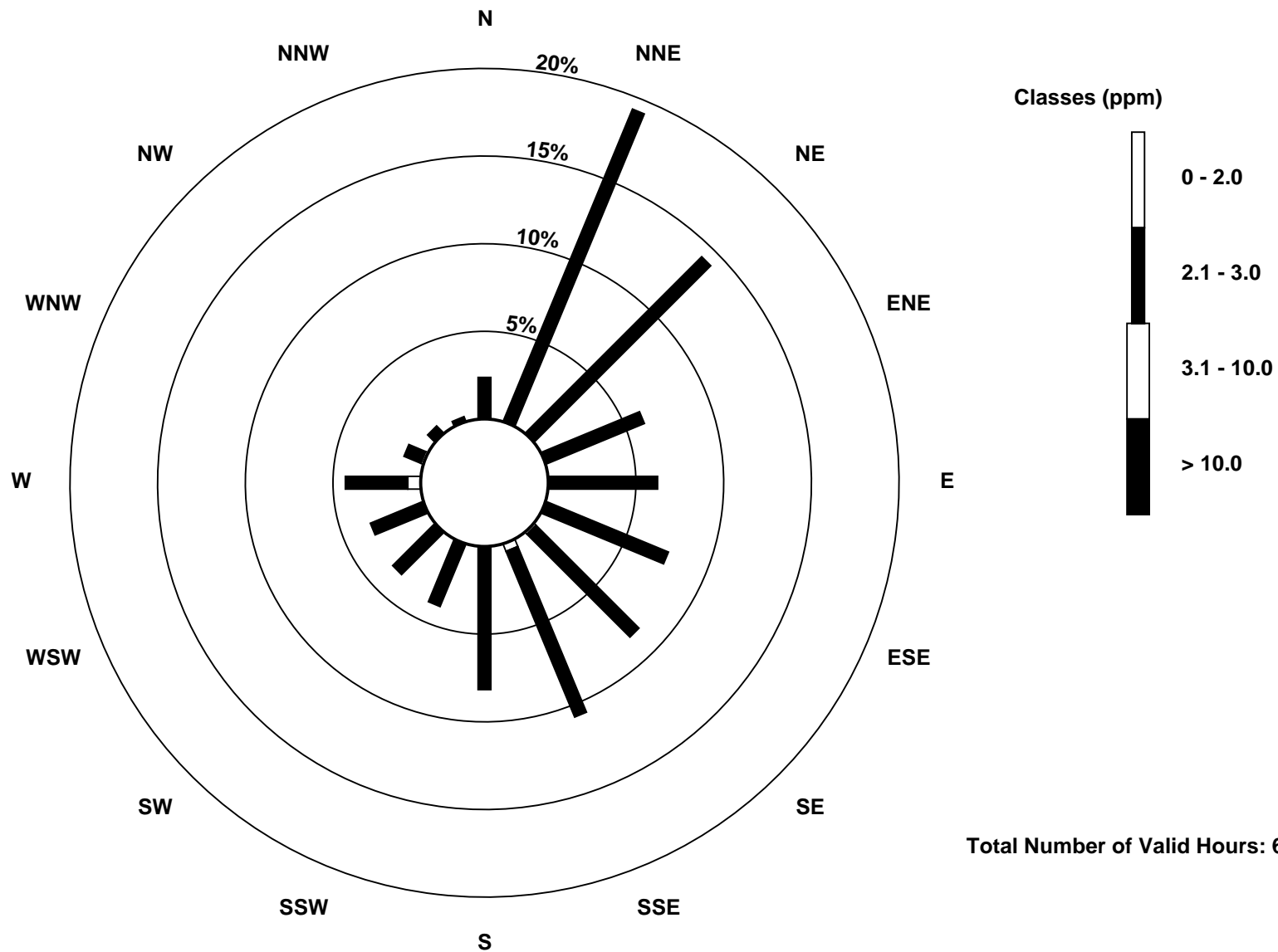
Total Number of Valid Hours: 674

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Mackay River (AMS 20)



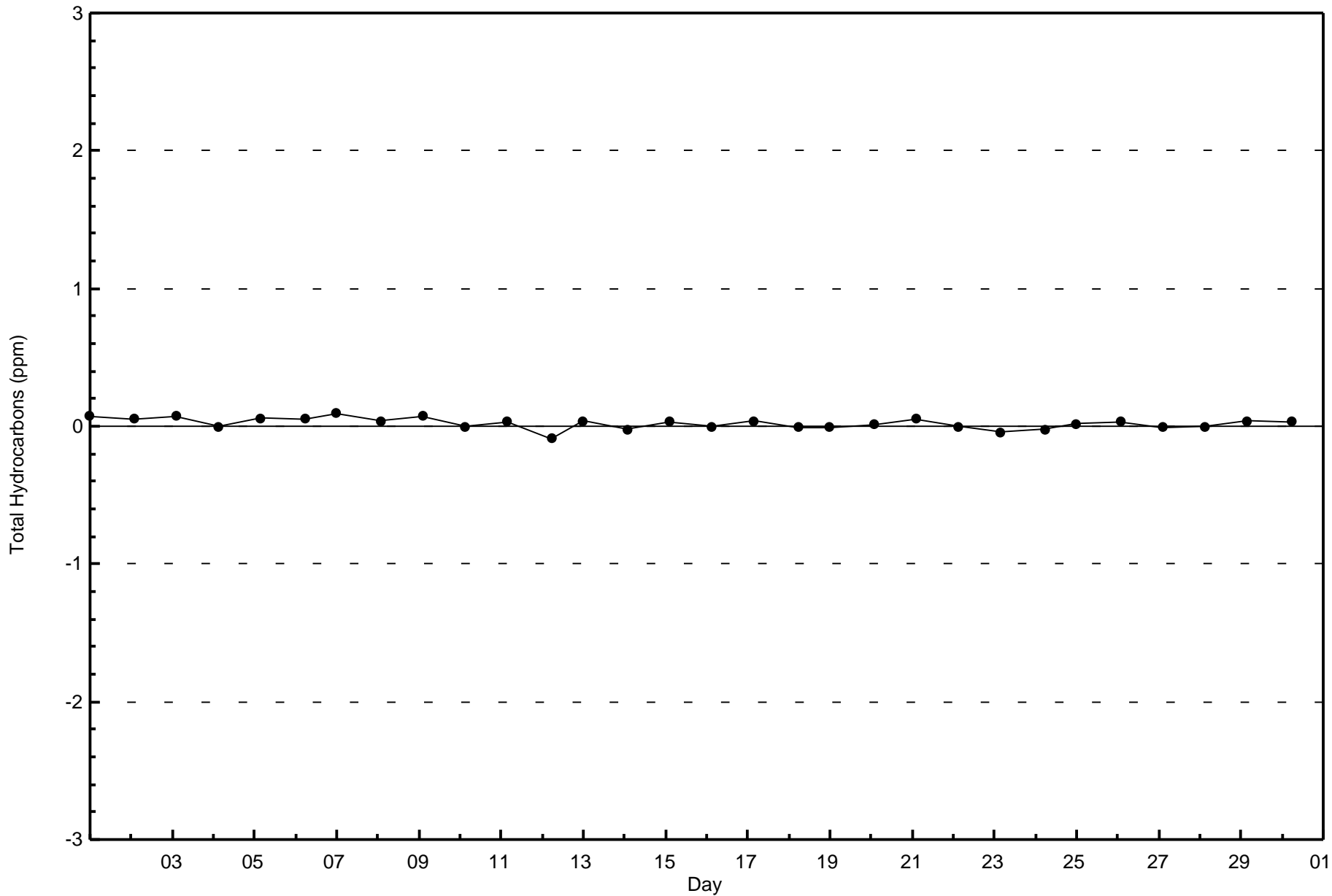


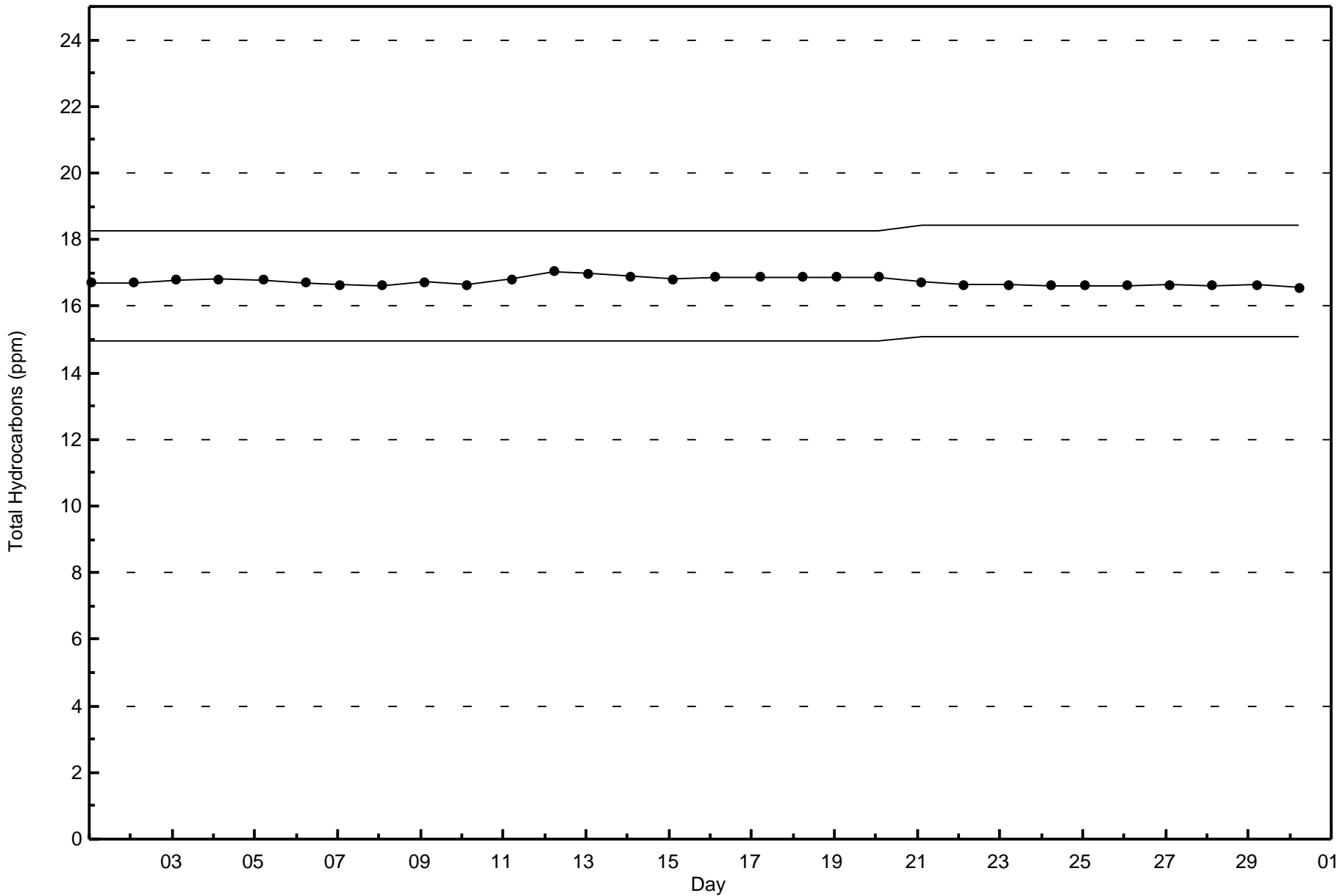
Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

MacKay River - April 2017







Wood Buffalo Environmental Association
Summary of Hour Averages

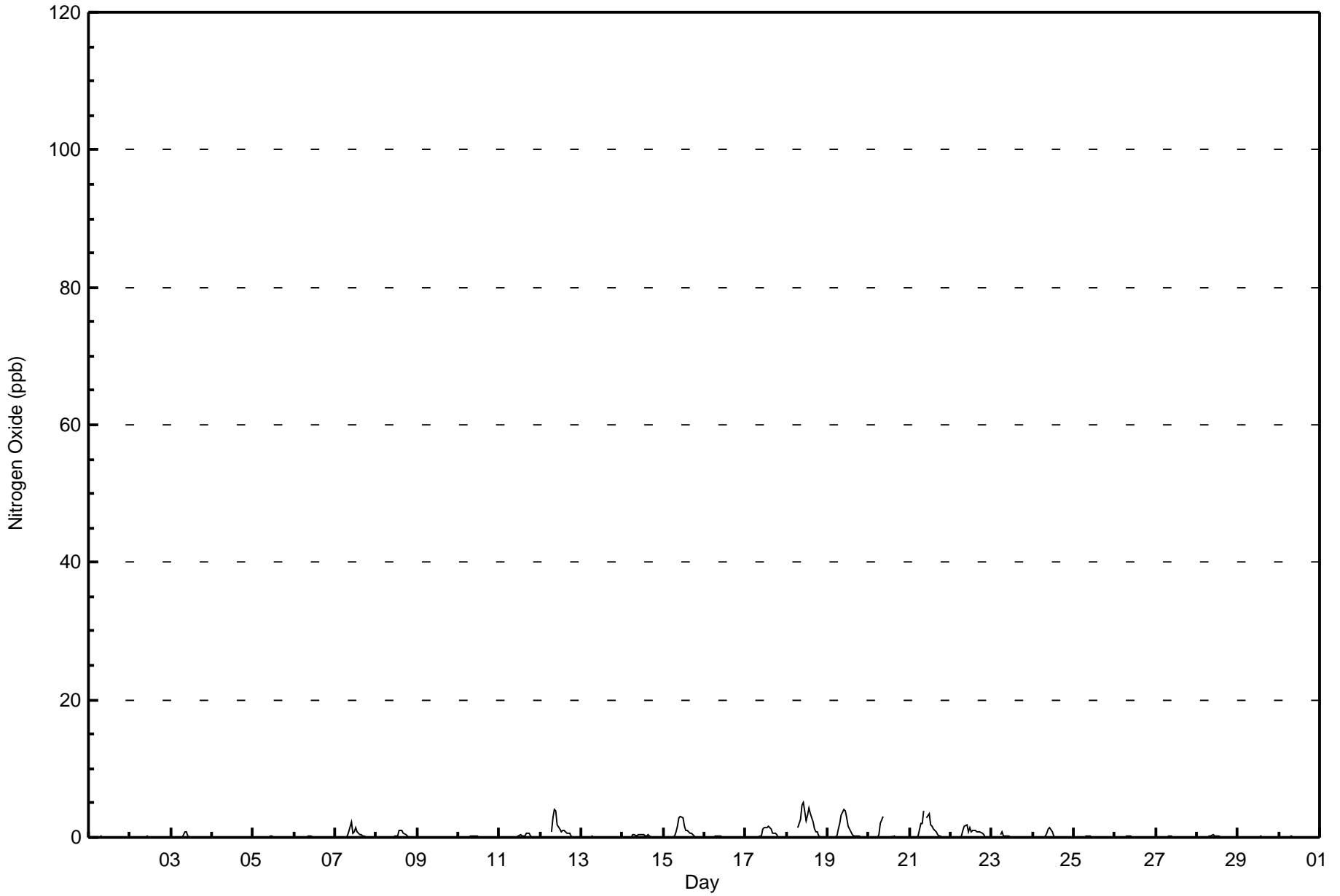
Nitrogen Oxide (NO) - ppb
MacKay River - April 2017

Maximum Value: 5 ppb on Apr 18 11:00																	Maximum Daily Average: 1.5 ppb on Apr 18																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 1 18:00																	Minimum Daily Average: 0.0 ppb on Apr 4																	Hours of Data: 685	
Maximum Diurnal Average: 0.9 ppb at hour 10																	Minimum Diurnal Average: 0.0 ppb at hour 1																	Hours of Missing Data: 35	
Monthly Average: 0.3 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 4																	Hours of Calibration: 34	
																																		Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
3-Apr	0	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
6-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
7-Apr	Z	0	0	0	0	0	0	0	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	2									
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.2	1									
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0.1	1									
12-Apr	0	0	0	0	0	Z	1	3	4	4	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0.9	4									
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0									
15-Apr	0	0	Z	0	0	0	0	1	2	3	3	3	2	1	1	1	1	0	0	0	0	0	0	0	0.8	3									
16-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
17-Apr	0	0	0	0	Z	0	0	0	0	1	1	2	2	1	1	1	1	1	0	0	0	0	0	0	0.5	2									
18-Apr	0	0	0	0	0	Z	2	2	3	5	5	2	3	4	3	2	1	1	1	0	0	0	0	0	1.5	5									
19-Apr	Z	0	0	0	0	0	1	2	3	4	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0.9	4									
20-Apr	0	Z	0	0	0	0	0	2	3	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.3	3									
21-Apr	0	0	Z	0	0	0	2	2	4	M	3	3	2	2	1	1	0	0	0	0	0	0	0	0	0.9	4									
22-Apr	0	0	0	Z	0	0	0	1	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.6	2									
23-Apr	0	0	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
24-Apr	0	0	0	0	0	Z	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1									
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
30-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
																								Diurnal Average											
																								Diurnal Maximum											
Z - zerospan C - Calibration M - Maintenance																																			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxide (NO) - ppb
MacKay River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxide (NO) - ppb
MacKay River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxide (NO) - ppb
MacKay River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	16	130	96	41	42	51	57	72	55	26	23	22	29	8	4	2	674
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	130	96	41	42	51	57	72	55	26	23	22	29	8	4	2	674

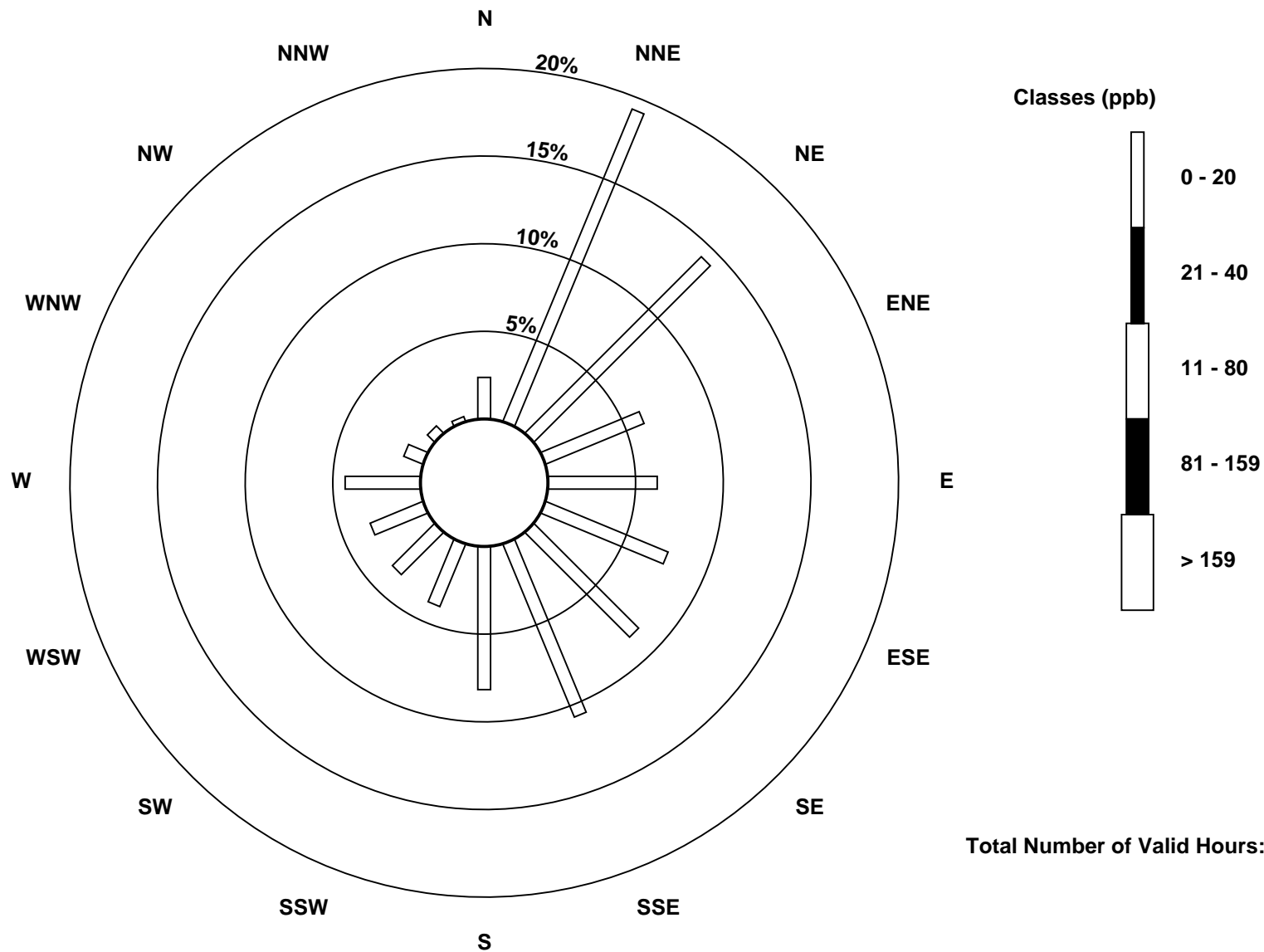
Total Number of Valid Hours: 674

Total Number of Hours: 720

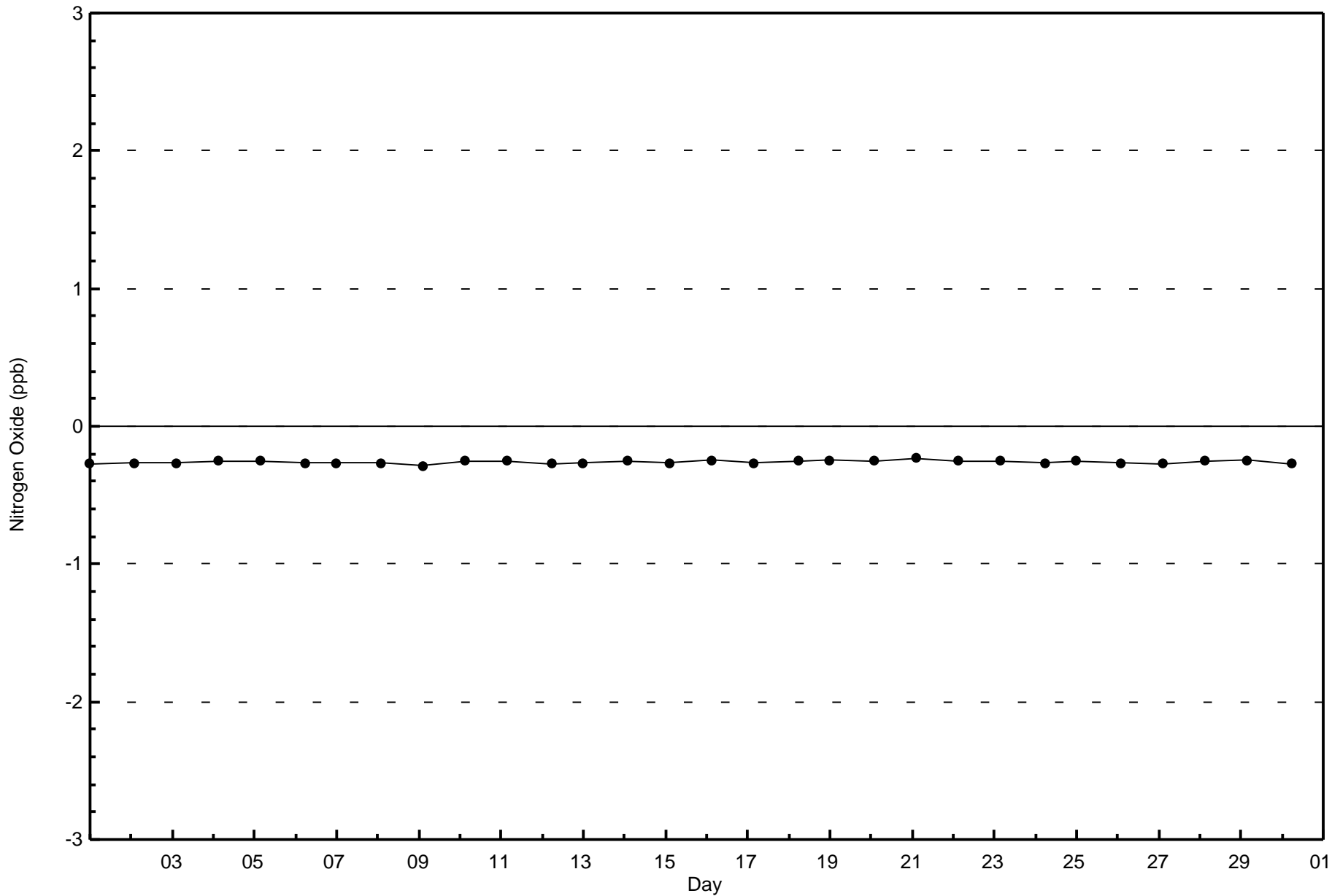


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxide (NO) - ppb
Mackay River (AMS 20)



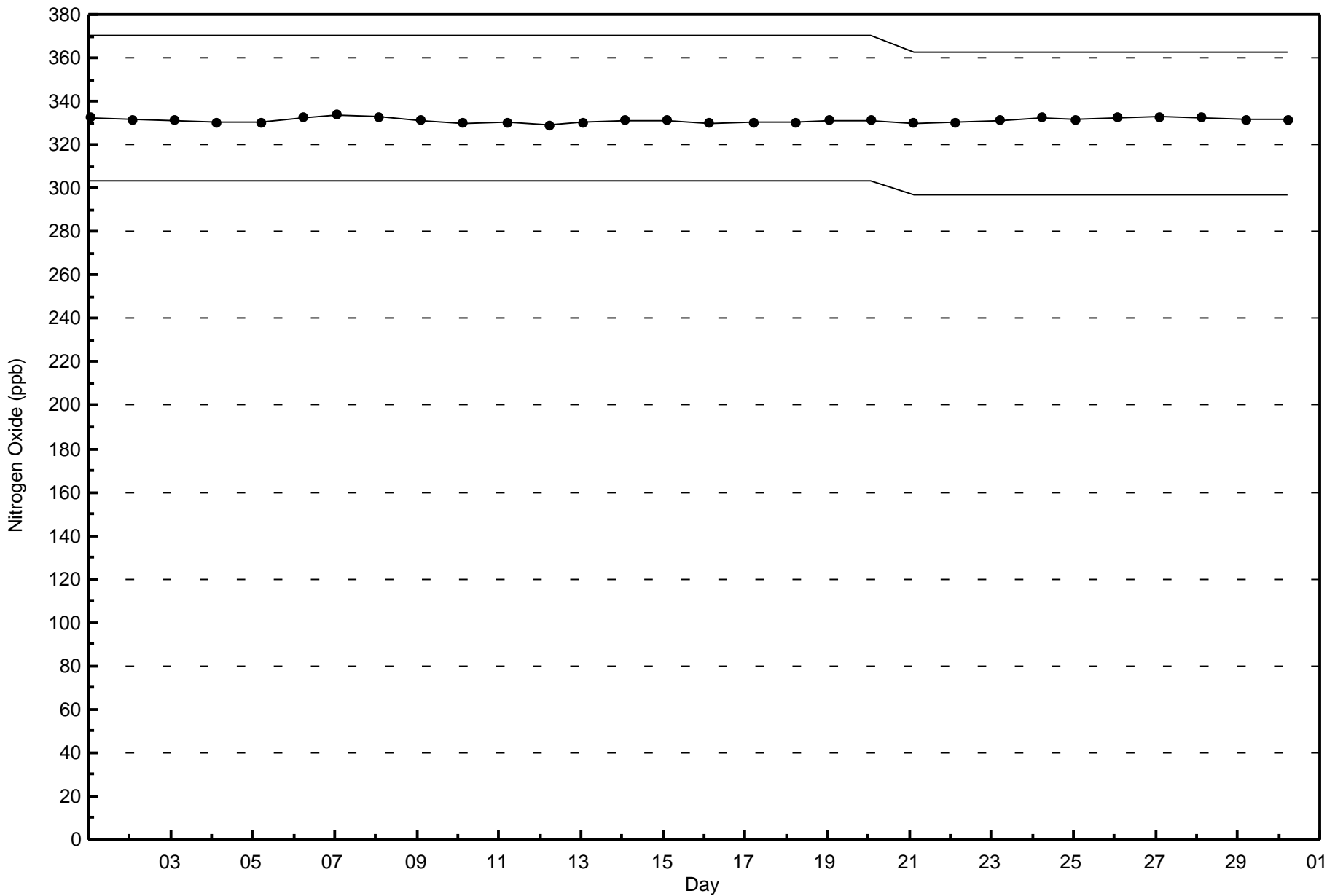
Total Number of Valid Hours: 674





Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxide (NO) - ppb
MacKay River - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

MacKay River - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 23 ppb on Apr 13 02:00	Maximum Daily Average: 6.0 ppb on Apr 7		Hours of Data:	685
Minimum Value: 0 ppb on Apr 3 22:00	Minimum Daily Average: 0.3 ppb on Apr 4		Hours of Missing Data:	35
Maximum Diurnal Average: 3.3 ppb at hour 3	Minimum Diurnal Average: 1.1 ppb at hour 17		Hours of Calibration:	34
Monthly Average: 1.8 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 1 Median = 1 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 12		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
2-Apr	0	Z	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	2	2	2	1	1	0.7	2
3-Apr	1	1	Z	2	1	1	1	1	3	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0.8	3
4-Apr	0	0	0	Z	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
5-Apr	0	0	0	0	Z	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
6-Apr	1	1	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.6	1
7-Apr	Z	10	17	16	13	10	6	3	7	8	2	4	4	4	4	3	3	3	3	2	1	3	7	6	6.0	17
8-Apr	5	Z	1	1	3	3	0	0	0	1	1	1	1	2	2	2	2	2	3	4	3	3	4	5	2.1	5
9-Apr	5	2	Z	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.9	5
10-Apr	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0.7	1
11-Apr	1	2	11	3	Z	1	1	1	1	1	1	1	1	1	1	2	4	5	3	1	1	1	1	1	1.8	11
12-Apr	1	1	1	1	1	Z	7	10	10	8	4	3	3	3	4	3	3	4	5	5	4	4	9	18	4.8	18
13-Apr	Z	23	17	7	1	1	2	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	1	0	2.6	23
14-Apr	0	Z	0	1	3	3	6	4	3	3	2	2	2	2	1	2	2	2	3	3	2	2	2	2	2.3	6
15-Apr	4	2	Z	2	2	2	3	4	4	3	6	5	4	3	2	2	2	2	2	2	1	1	1	1	2.5	6
16-Apr	1	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.6	1
17-Apr	1	2	6	2	Z	1	1	1	1	1	3	3	2	3	3	2	2	2	3	2	2	3	1	3	2.2	6
18-Apr	4	3	2	2	4	Z	7	6	5	5	5	3	4	5	5	4	3	4	6	8	12	12	8	9	5.4	12
19-Apr	Z	11	10	9	7	6	7	6	7	8	6	5	3	2	2	2	1	1	2	2	3	2	1	1	4.4	11
20-Apr	2	Z	2	2	2	2	2	4	5	C	C	C	C	1	1	1	1	1	1	2	3	3	3	2	2.1	5
21-Apr	2	3	Z	6	3	4	6	5	7	M	4	5	4	3	2	2	2	2	2	3	4	3	2	2	3.4	7
22-Apr	1	1	1	Z	1	2	2	5	4	3	2	2	2	1	1	1	1	2	2	5	6	5	4	3	2.5	6
23-Apr	3	5	5	5	Z	3	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1.4	5
24-Apr	1	1	1	1	1	Z	0	1	2	3	3	2	1	0	1	0	0	1	1	0	0	1	0	0	0.8	3
25-Apr	Z	0	0	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0.5	1
26-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0.5	1
27-Apr	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	0.6	2
28-Apr	3	2	1	Z	1	0	0	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1.2	3
29-Apr	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.7	1
30-Apr	0	0	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	1	0.9	3

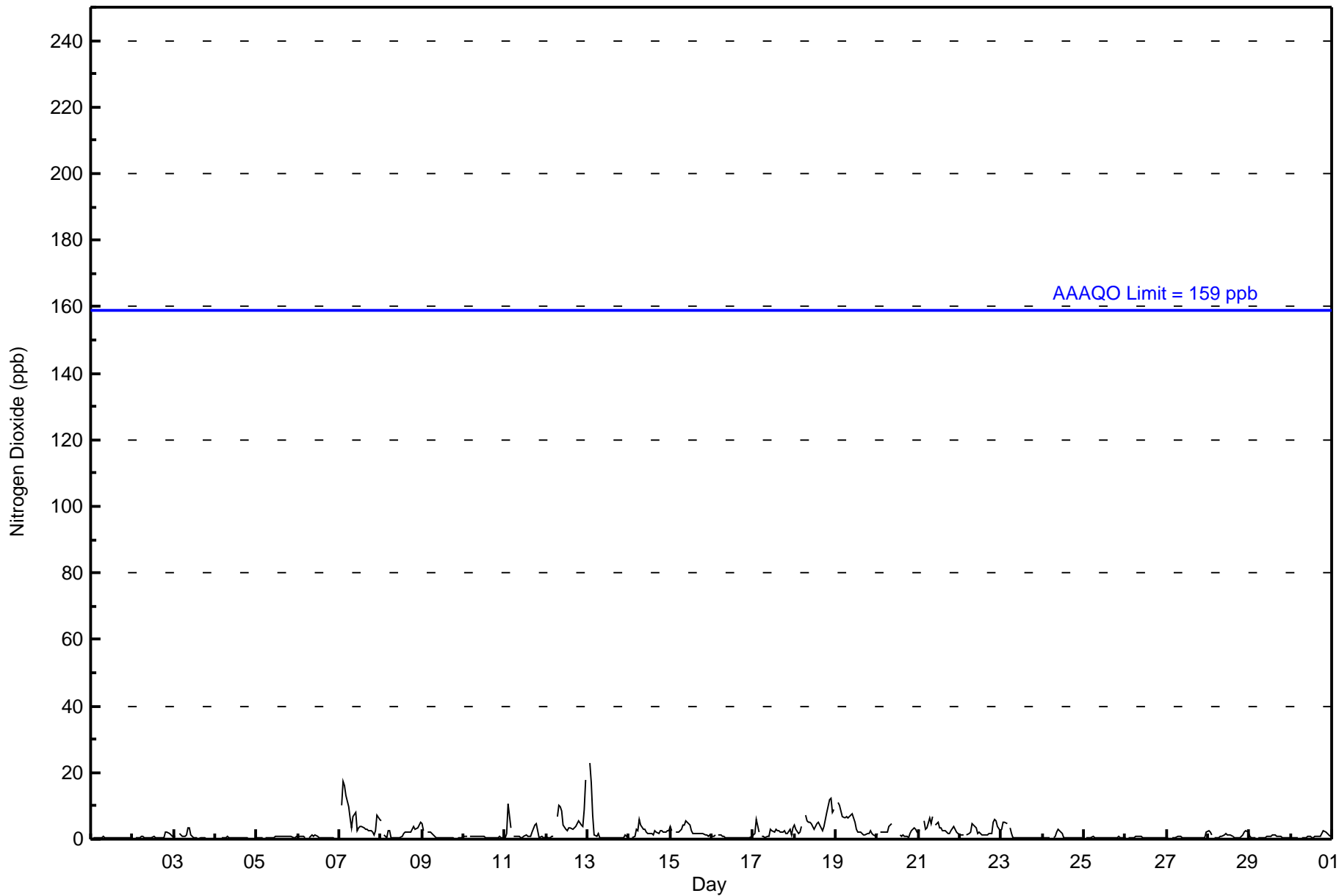
1.6	3.0	3.3	2.6	2.0	1.8	2.1	2.1	2.3	2.1	1.7	1.5	1.3	1.3	1.2	1.1	1.1	1.2	1.4	1.7	1.7	1.8	1.8	2.2	Diurnal Average	
5	23	17	16	13	10	7	10	10	8	6	5	4	5	5	4	3	4	6	8	12	12	9	18	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
MacKay River - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
MacKay River - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
MacKay River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	16	130	95	41	42	51	57	72	55	26	23	22	29	8	4	2	673
21 - 40	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	130	96	41	42	51	57	72	55	26	23	22	29	8	4	2	674

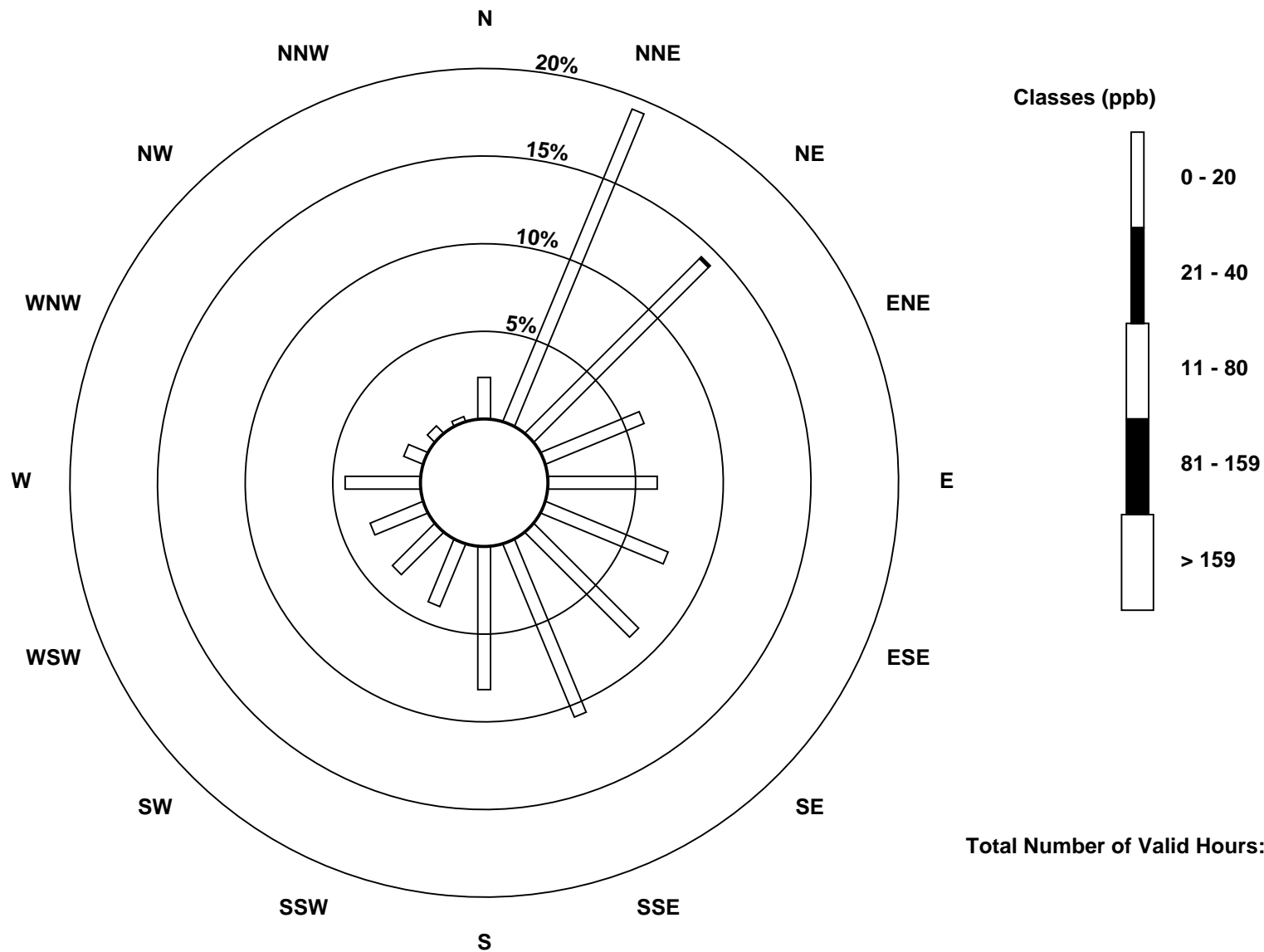
Total Number of Valid Hours: 674

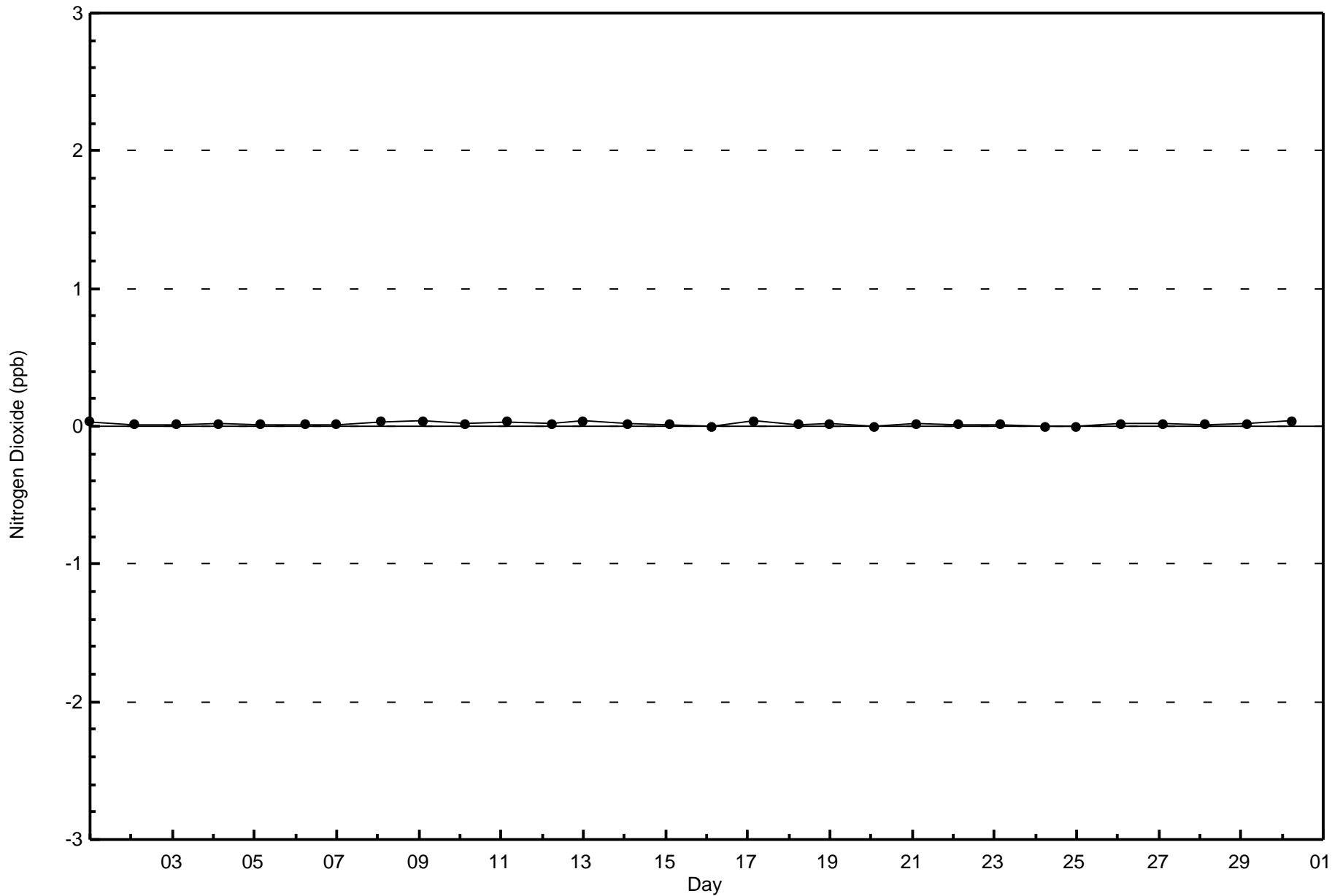
Total Number of Hours: 720

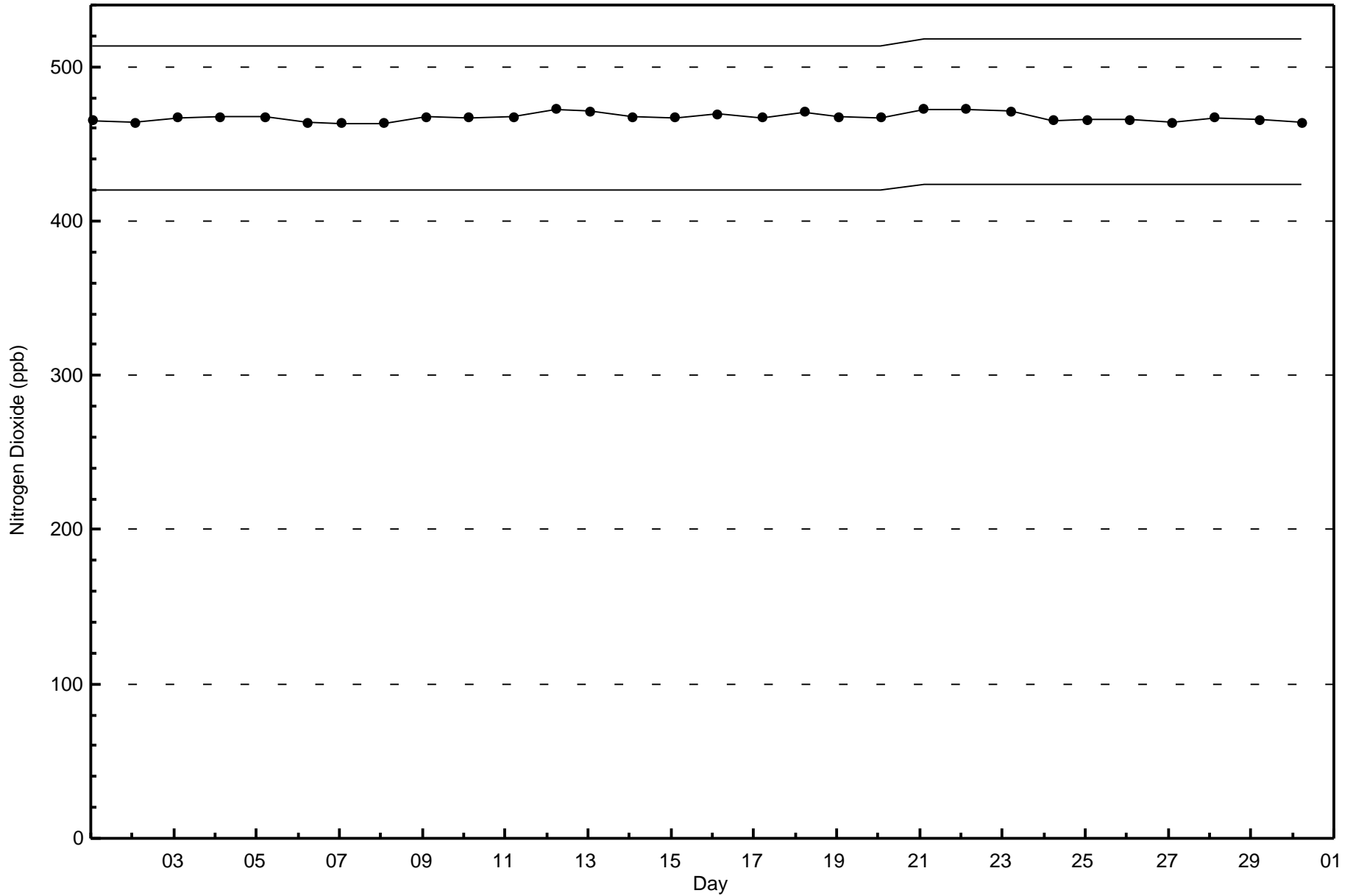


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Mackay River (AMS 20)









Wood Buffalo Environmental Association
Summary of Hour Averages

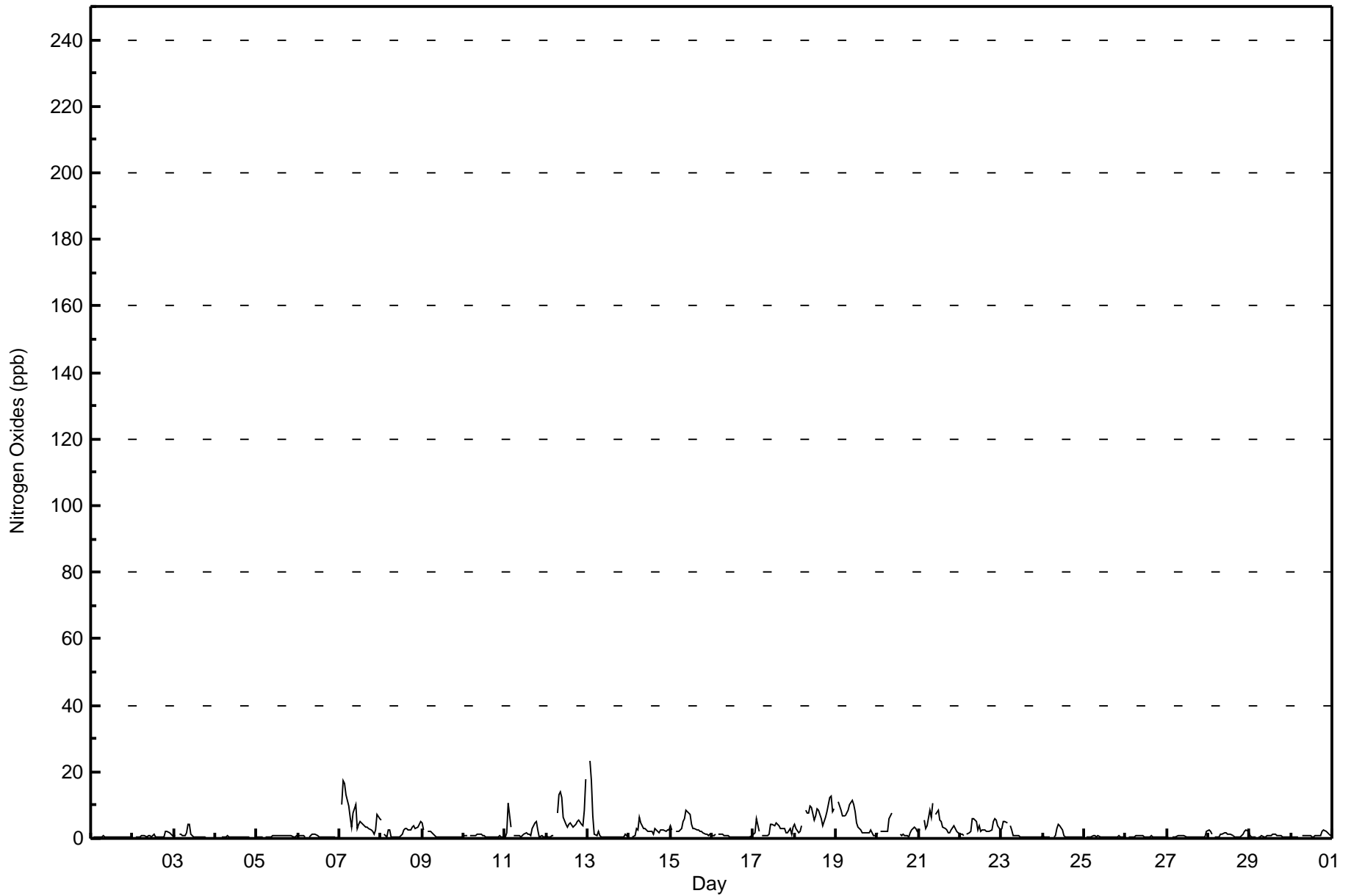
Nitrogen Oxides (NO_x) - ppb
MacKay River - April 2017

Maximum Value: 23 ppb on Apr 13 02:00		Maximum Daily Average: 6.9 ppb on Apr 18		Hours in Service: 720																																													
Minimum Value: 0 ppb on Apr 4 02:00		Minimum Daily Average: 0.3 ppb on Apr 4		Hours of Data: 685																																													
Maximum Diurnal Average: 3.3 ppb at hour 3		Minimum Diurnal Average: 1.4 ppb at hour 17		Hours of Missing Data: 35																																													
Monthly Average: 2.1 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 13		Hours of Calibration: 34																																													
				Percent Operational Time: 99.9																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	Z	1	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1																							
2-Apr	0	Z	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	2	2	1	1	1	0.8	2																							
3-Apr	1	1	Z	1	1	1	1	2	4	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0.9	4																							
4-Apr	0	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																							
5-Apr	0	0	0	0	Z	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1																							
6-Apr	1	1	1	1	1	Z	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1																							
7-Apr	Z	10	17	16	13	10	6	3	8	10	3	4	5	4	4	3	3	3	3	2	1	3	7	6	6.4	17																							
8-Apr	5	Z	1	1	3	3	0	0	0	0	1	1	1	3	3	3	3	3	3	4	3	3	4	5	2.3	5																							
9-Apr	5	2	Z	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.9	5																							
10-Apr	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0.8	1																							
11-Apr	1	2	11	3	Z	1	1	1	1	1	1	1	2	1	1	3	5	5	3	0	1	0	1	2.0	11																								
12-Apr	1	1	1	1	1	Z	8	13	14	12	6	4	3	4	5	3	4	4	5	5	4	4	9	18	5.7	18																							
13-Apr	Z	23	17	7	1	1	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2.6	23																							
14-Apr	0	Z	0	1	3	3	6	5	3	3	3	2	2	1	3	3	2	3	3	2	2	2	2	2	2.4	6																							
15-Apr	4	2	Z	2	2	2	3	5	6	9	8	7	4	3	3	2	3	2	2	2	1	1	1	1	3.3	9																							
16-Apr	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.6	1																							
17-Apr	1	2	6	2	Z	1	1	1	1	1	4	4	4	4	4	4	3	3	3	2	2	3	1	3	2.6	6																							
18-Apr	4	3	2	2	4	Z	9	8	8	10	9	6	7	9	9	6	4	5	6	8	12	13	8	9	6.9	13																							
19-Apr	Z	11	10	9	7	7	8	8	10	12	10	8	5	3	2	2	2	2	2	2	3	2	1	1	5.4	12																							
20-Apr	2	Z	2	2	2	2	2	6	8	C	C	C	C	1	1	1	1	1	1	2	3	3	3	2	2.4	8																							
21-Apr	2	3	Z	6	3	4	8	6	11	M	7	9	5	5	4	3	3	2	2	3	4	3	2	2	4.3	11																							
22-Apr	1	1	1	Z	1	2	2	6	6	5	3	4	2	2	2	2	2	2	2	5	6	5	4	3	3.1	6																							
23-Apr	3	5	5	5	Z	4	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	5																							
24-Apr	1	1	1	1	1	Z	0	1	3	4	4	3	1	0	0	0	1	1	1	0	0	0	0	0	1.0	4																							
25-Apr	Z	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0.5	1																							
26-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0.6	1																							
27-Apr	1	1	Z	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0.6	2																							
28-Apr	3	2	1	Z	1	0	0	1	1	2	2	1	1	1	1	0	0	0	0	1	1	2	2	2	1.3	3																							
29-Apr	1	1	0	0	Z	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.7	1																							
30-Apr	0	0	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	0.9	3																							
																								1.6	3.0	3.3	2.6	2.0	1.9	2.3	2.6	3.1	3.0	2.5	2.2	1.8	1.8	1.6	1.4	1.4	1.4	1.5	1.7	1.7	1.8	1.8	2.2	Diurnal Average	
																								5	23	17	16	13	10	9	13	14	12	10	9	7	9	9	6	4	5	6	8	12	13	9	18	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
MacKay River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
MacKay River - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
MacKay River - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	16	130	95	41	42	51	57	72	55	26	23	22	29	8	4	2	673
21 - 40	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	16	130	96	41	42	51	57	72	55	26	23	22	29	8	4	2	674

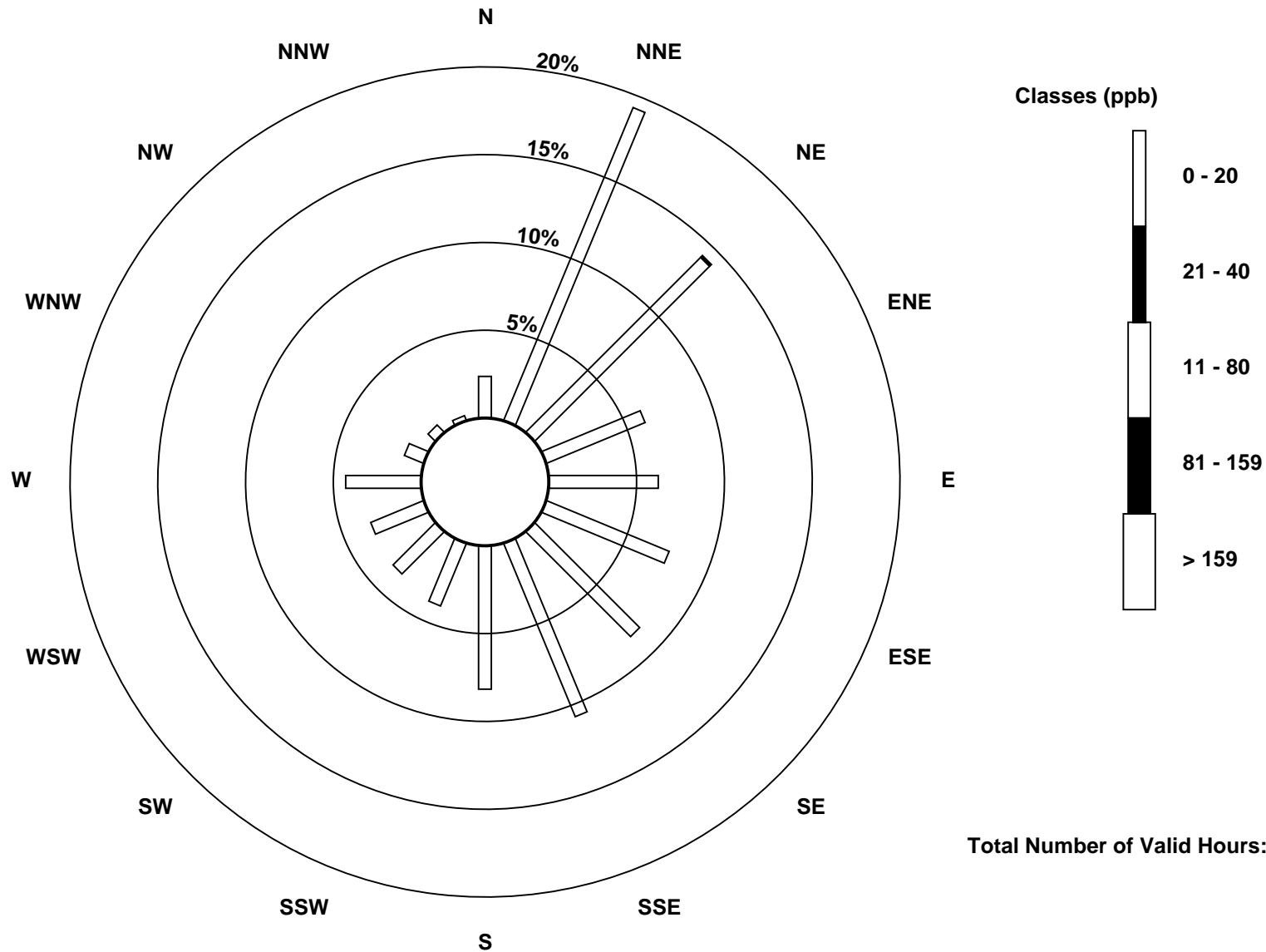
Total Number of Valid Hours: 674

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
MacKay River (AMS 20)

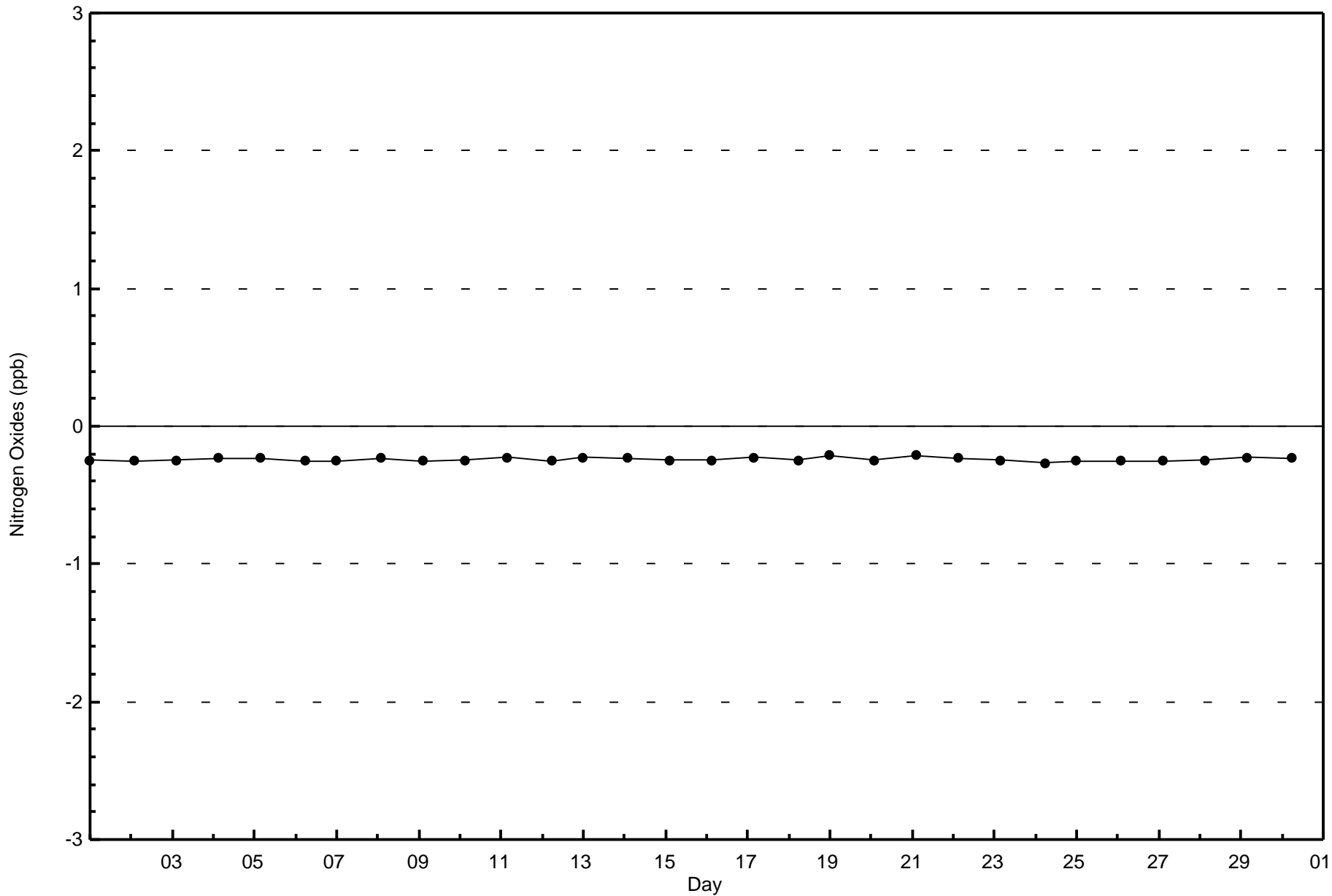


Total Number of Valid Hours: 674



Wood Buffalo Environmental Association
Zero Responses

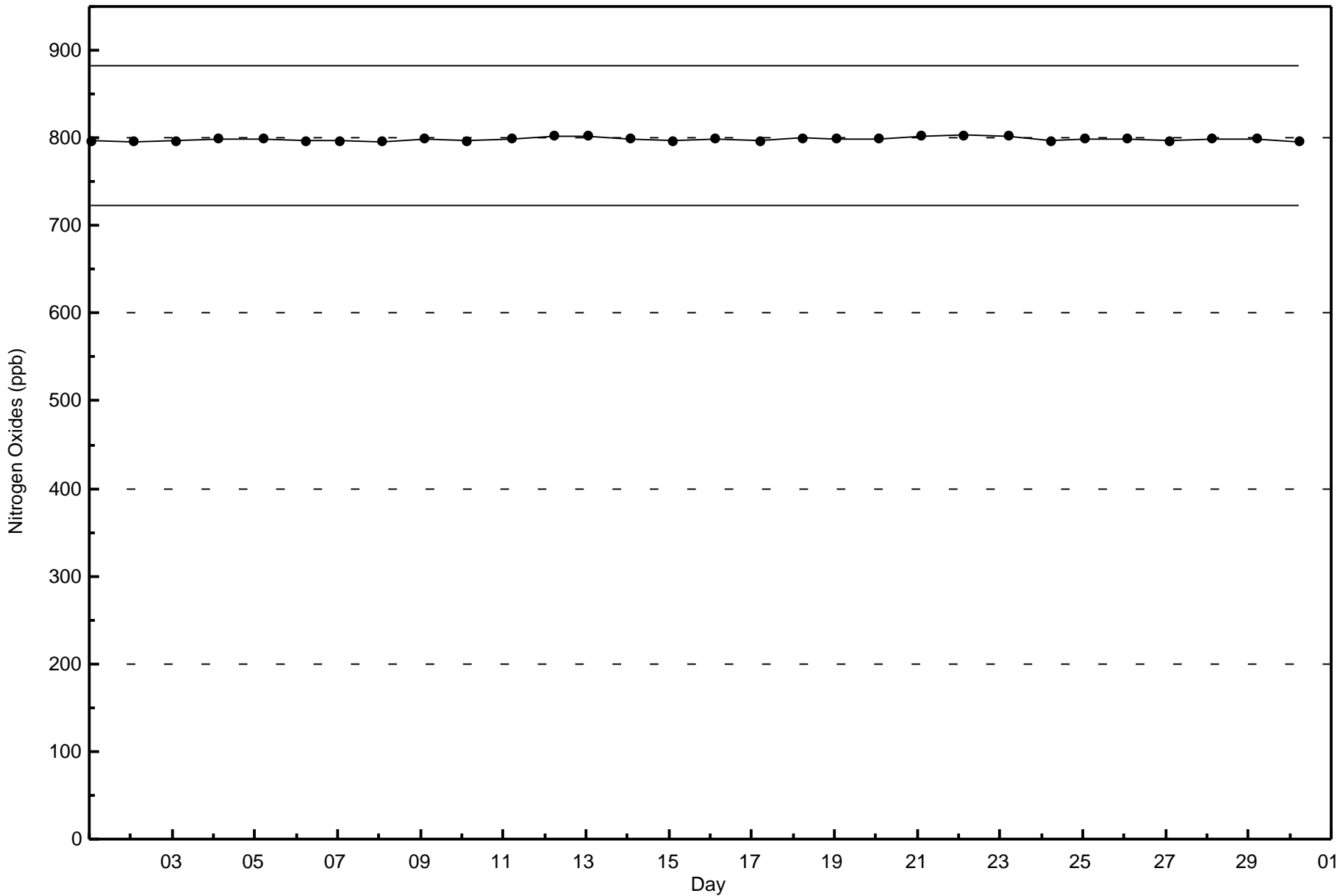
Nitrogen Oxides (NO_x) - ppb
MacKay River - April 2017





Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
MacKay River - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

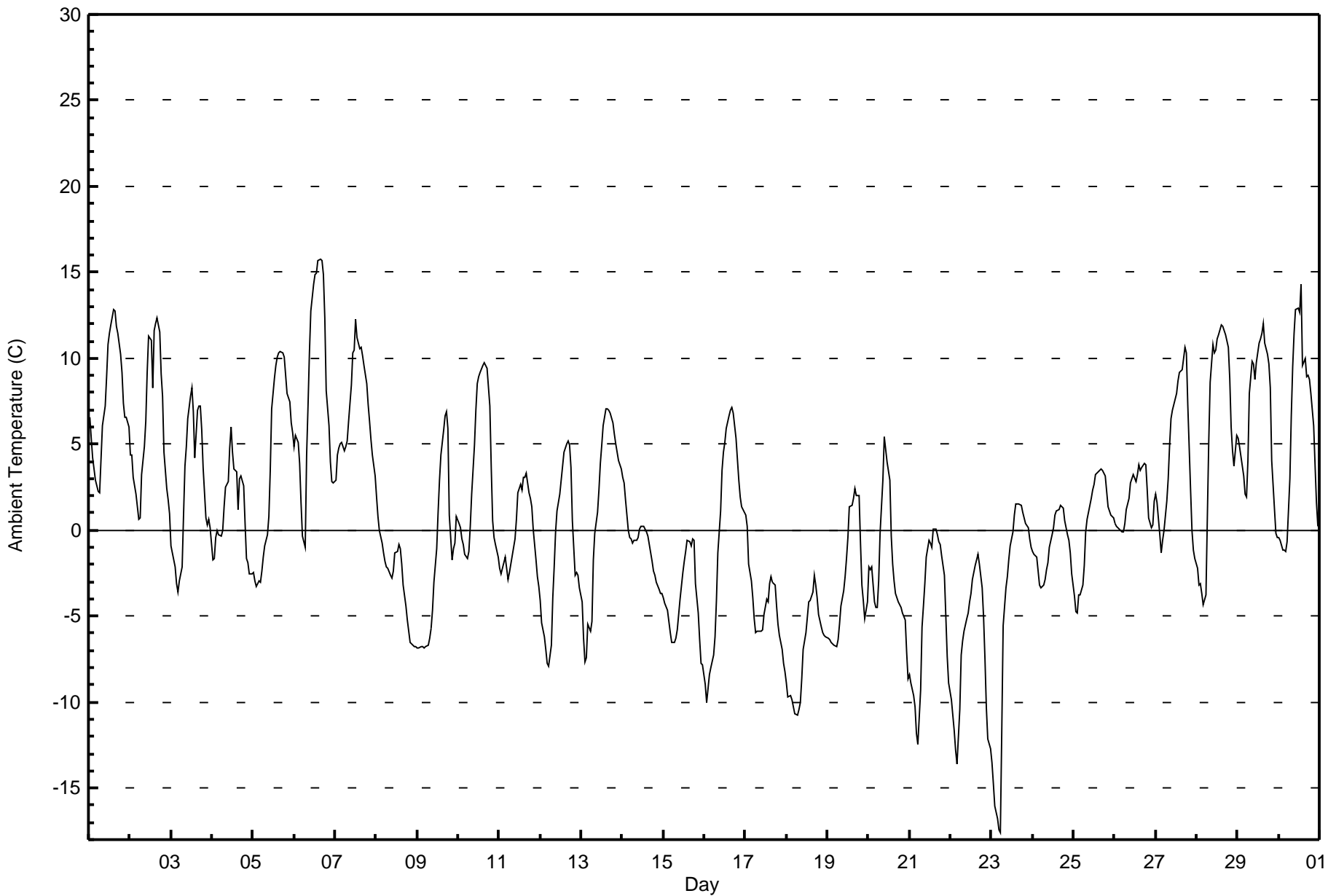
MacKay River - April 2017

Maximum Value: 15.7 C on Apr 6 16:00		Maximum Daily Average: 8.2 C on Apr 6		Hours in Service: 720																						
Minimum Value: -17.6 C on Apr 23 06:00		Minimum Daily Average: -7.0 C on Apr 22		Hours of Data: 720																						
Maximum Diurnal Average: 4.9 C at hour 16		Minimum Diurnal Average: -3.9 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 0.73 C		Percentiles: P ₁ = -12.8 P ₁₀ = -6.5 Q ₁ = -3.2 Median = 0.1 Q ₃ = 4.7 P ₉₀ = 9.5 P ₉₉ = 14.0		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	6.6	5.4	4.2	3.5	2.9	2.2	2.1	4.1	6.0	7.2	8.9	10.8	11.5	12.0	12.8	12.8	11.9	11.5	10.2	9.1	7.4	6.5	6.5	6.0	7.6	12.8
2-Apr	4.4	4.3	3.1	2.1	1.3	0.6	0.7	3.2	4.9	6.3	9.1	11.3	11.0	8.3	11.6	12.0	12.3	11.6	9.1	7.8	4.6	2.4	1.8	1.0	6.0	12.3
3-Apr	-0.9	-1.3	-2.1	-3.1	-3.6	-2.9	-2.1	0.9	3.8	4.9	6.5	7.8	8.3	6.9	4.2	6.9	7.2	7.2	5.8	3.6	0.8	0.3	0.7	0.2	2.5	8.3
4-Apr	-1.7	-1.7	-0.4	0.0	-0.3	-0.4	0.0	1.3	2.5	2.8	4.8	6.0	4.5	3.5	3.4	1.2	3.0	3.2	2.6	0.4	-1.6	-1.9	-2.6	-2.6	1.1	6.0
5-Apr	-2.5	-2.9	-3.3	-2.9	-3.0	-2.4	-1.6	-0.9	-0.2	0.8	3.4	7.1	8.9	9.6	10.1	10.3	10.4	3.2	10.1	9.0	8.0	7.4	6.3	5.7	4.1	10.4
6-Apr	4.9	5.5	5.1	3.9	1.6	-0.3	-1.0	4.4	7.2	10.3	12.7	14.3	14.9	15.0	15.7	15.7	15.7	14.9	12.3	8.1	6.1	4.0	2.9	2.8	8.2	15.7
7-Apr	2.9	4.4	4.8	5.0	5.1	4.6	4.8	5.2	6.3	8.5	10.3	10.5	12.2	11.2	10.6	10.6	10.2	9.6	8.6	7.3	6.3	5.3	4.4	3.1	7.2	12.2
8-Apr	1.9	0.8	0.0	-0.8	-1.3	-1.8	-2.2	-2.2	-2.6	-2.8	-2.4	-1.3	-1.2	-0.9	-1.0	-2.0	-3.2	-4.4	-5.2	-5.9	-6.5	-6.7	-6.8	-6.8	-2.7	1.9
9-Apr	-6.8	-6.9	-6.8	-6.8	-6.8	-6.8	-6.7	-6.3	-5.7	-4.7	-3.0	-1.1	1.0	2.9	4.4	5.8	6.6	6.9	6.0	0.9	-1.8	-1.1	-0.7	0.8	-1.5	6.9
10-Apr	0.4	0.1	-0.5	-0.8	-1.4	-1.6	-1.2	0.3	2.1	4.9	7.0	8.6	8.9	9.2	9.6	9.7	9.5	9.4	7.2	3.6	0.6	-0.4	-0.9	-1.6	3.4	9.7
11-Apr	-2.2	-2.5	-2.2	-1.5	-2.2	-2.8	-2.5	-2.0	-1.0	-0.5	0.6	2.2	2.6	2.3	3.1	3.0	3.3	2.2	1.9	1.3	0.0	-1.7	-2.7	-3.3	-0.2	3.3
12-Apr	-4.1	-5.4	-6.2	-7.0	-7.7	-7.9	-6.7	-3.9	-2.1	-0.1	1.1	2.1	2.9	3.8	4.6	5.1	5.2	5.0	3.7	0.6	-2.6	-2.4	-2.7	-3.3	-1.2	5.2
13-Apr	-4.2	-6.3	-7.7	-7.4	-5.4	-5.9	-5.3	-1.7	-0.2	1.0	2.3	3.9	4.9	6.1	7.1	7.1	7.0	6.8	6.3	5.6	5.0	4.5	4.1	3.6	1.3	7.1
14-Apr	3.1	2.7	1.8	0.0	-0.4	-0.5	-0.7	-0.6	-0.6	-0.4	0.1	0.2	0.2	0.1	-0.1	-0.3	-0.8	-1.8	-2.4	-2.6	-3.0	-3.4	-3.7	-3.7	-0.7	3.1
15-Apr	-4.0	-4.2	-4.7	-5.3	-6.0	-6.5	-6.5	-6.3	-5.8	-4.9	-4.0	-2.4	-1.8	-1.2	-0.6	-0.6	-0.9	-0.5	-0.6	-3.1	-4.8	-6.4	-7.8	-7.9	-4.0	-0.5
16-Apr	-9.0	-10.0	-9.2	-8.4	-8.0	-7.3	-6.2	-4.1	-1.3	1.1	3.5	4.5	5.1	5.9	6.6	7.0	7.1	6.8	5.3	4.1	2.9	1.9	1.4	1.1	0.0	7.1
17-Apr	0.9	0.2	-2.0	-3.0	-3.9	-5.2	-5.9	-5.8	-5.9	-5.8	-4.9	-4.0	-4.2	-3.1	-2.7	-3.0	-3.2	-4.4	-5.5	-6.1	-6.9	-7.7	-8.2	-4.4	0.9	
18-Apr	-8.9	-9.7	-9.6	-9.9	-10.3	-10.7	-10.7	-10.4	-10.0	-8.7	-6.9	-6.0	-5.1	-4.2	-4.1	-3.6	-2.7	-3.2	-3.9	-4.9	-5.6	-6.0	-6.1	-6.2	-7.0	-2.7
19-Apr	-6.3	-6.4	-6.5	-6.6	-6.7	-6.8	-6.4	-5.4	-4.4	-3.5	-2.7	-1.7	-0.4	1.4	1.4	1.8	2.5	2.0	2.0	-0.8	-3.2	-4.1	-5.2	-4.1	-2.9	2.5
20-Apr	-2.1	-2.3	-2.1	-4.1	-4.5	-4.5	-2.9	-0.2	2.9	5.4	4.7	4.0	2.9	-0.3	-1.9	-2.9	-3.7	-4.2	-4.3	-4.5	-4.8	-5.3	-7.1	-8.6	-2.1	5.4
21-Apr	-8.4	-8.9	-9.6	-10.3	-11.8	-12.5	-9.3	-5.6	-4.4	-3.1	-1.5	-0.6	-0.8	-1.0	0.1	0.0	-0.2	-0.7	-0.9	-1.5	-2.6	-5.0	-7.3	-8.9	-4.8	0.1
22-Apr	-9.8	-10.8	-11.7	-12.8	-13.6	-10.4	-7.3	-6.5	-5.9	-5.2	-4.8	-4.1	-3.7	-2.9	-2.1	-1.7	-1.4	-2.0	-3.4	-5.1	-7.5	-10.4	-12.2	-12.7	-7.0	-1.4
23-Apr	-13.6	-14.7	-16.1	-16.8	-17.5	-17.6	-11.8	-5.5	-3.4	-2.7	-1.7	-0.9	-0.1	0.8	1.5	1.5	1.5	1.5	1.1	0.7	0.4	0.1	-0.5	-1.0	-4.8	1.5
24-Apr	-1.3	-1.4	-1.6	-2.4	-3.2	-3.4	-3.2	-2.8	-2.3	-1.9	-1.0	-0.2	0.1	0.9	1.1	1.2	1.5	1.4	1.3	0.5	-0.2	-0.6	-1.3	-2.5	-0.9	1.5
25-Apr	-3.8	-4.8	-4.8	-3.7	-3.8	-3.2	-2.0	-0.1	0.6	1.4	1.9	2.3	2.7	3.2	3.4	3.5	3.6	3.4	3.1	2.2	1.4	1.1	0.9	0.7	0.4	3.6
26-Apr	0.4	0.2	0.1	0.0	-0.1	-0.1	0.4	1.2	1.8	2.7	3.0	3.2	2.8	3.2	3.8	3.5	3.7	3.9	3.8	2.3	0.7	0.1	0.3	1.7	1.8	3.9
27-Apr	2.1	1.6	-0.3	-1.3	-0.6	0.0	1.7	3.0	4.9	6.5	6.9	7.6	7.9	8.7	9.2	9.3	10.0	10.6	10.3	7.3	2.3	0.0	-1.2	-1.7	4.4	10.6
28-Apr	-2.2	-3.2	-3.1	-3.7	-4.3	-3.8	0.8	5.2	8.6	10.8	10.3	10.5	11.1	11.4	12.0	11.9	11.6	11.4	10.7	8.8	6.0	4.6	3.7	5.5	5.6	12.0
29-Apr	5.4	4.8	4.3	3.1	2.1	1.9	4.0	7.9	9.8	9.6	8.7	9.7	10.9	11.1	11.5	12.0	10.9	10.3	9.7	8.3	4.0	1.2	-0.2	-0.5	6.7	12.0
30-Apr	-0.4	-0.6	-1.1	-1.1	-1.3	-0.6	3.0	6.6	9.5	11.5	12.8	12.9	12.7	14.3	9.6	10.0	8.9	9.0	8.8	7.9	6.1	3.8	1.6	0.2	6.0	14.3
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
MacKay River - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
MacKay River - April 2017

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	352	48.89	48.89
0 - 10	307	42.64	91.53
10 - 20	61	8.47	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



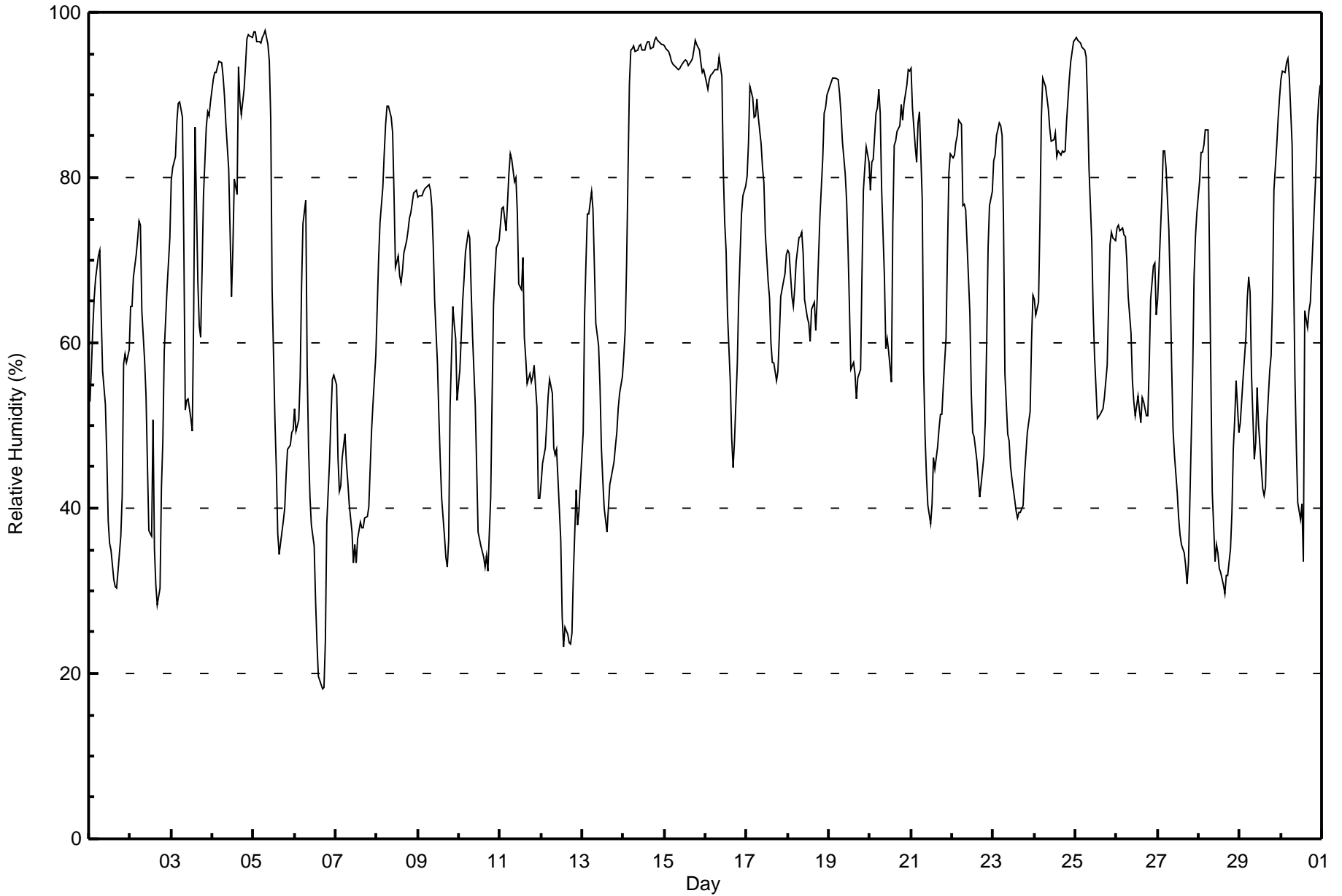
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

MacKay River - April 2017

Maximum Value: 98 % on Apr 5 08:00																		Maximum Daily Average: 94.3 % on Apr 15						Hours in Service: 720																										
Minimum Value: 18 % on Apr 6 17:00																		Minimum Daily Average: 39.1 % on Apr 12						Hours of Data: 720																										
Maximum Diurnal Average: 82.4 % at hour 6																		Minimum Diurnal Average: 51.8 % at hour 17						Hours of Missing Data: 0																										
Monthly Average: 66.1 %																		Percentiles: P ₁ = 24 P ₁₀ = 38 Q ₁ = 49 Median = 67 Q ₃ = 84 P ₉₀ = 93 P ₉₉ = 97						Hours of Calibration: 0																										
																		Percent Operational Time: 100.0																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	53	57	62	65	68	70	71	63	57	53	46	38	36	35	31	30	30	32	37	42	58	59	58	59	50.4	71																								
2-Apr	64	64	68	71	73	75	74	64	58	54	45	37	37	51	35	31	28	30	43	48	59	67	70	73	54.9	75																								
3-Apr	80	81	83	87	89	89	87	72	52	53	53	51	49	63	86	67	62	61	69	78	86	88	87	89	73.4	89																								
4-Apr	92	93	93	93	94	94	92	90	86	81	73	66	72	80	78	93	89	88	91	94	97	97	97	97	88.3	97																								
5-Apr	98	98	96	96	96	97	97	98	96	94	87	66	51	45	37	34	36	39	40	44	47	48	49	49	68.3	98																								
6-Apr	52	49	51	56	67	74	77	57	47	41	38	35	29	24	20	19	18	18	24	38	46	51	56	56	43.5	77																								
7-Apr	55	46	42	43	46	49	45	43	40	37	33	36	33	36	38	38	38	39	39	40	45	50	53	58	42.6	58																								
8-Apr	64	70	75	79	83	86	89	89	87	86	78	69	70	68	67	69	71	72	74	75	76	78	78	78	76.3	89																								
9-Apr	78	78	78	78	79	79	79	78	76	72	65	57	51	46	41	37	34	33	36	52	64	62	60	53	61.1	79																								
10-Apr	57	61	65	68	71	73	73	67	61	52	45	37	36	35	34	33	34	32	41	53	64	68	71	72	54.4	73																								
11-Apr	74	76	76	74	77	81	83	82	79	80	76	67	66	70	61	58	55	56	55	56	57	52	41	41	66.5	83																								
12-Apr	43	45	47	50	54	56	54	47	47	47	44	36	27	23	26	25	24	24	25	32	42	38	40	43	39.1	56																								
13-Apr	49	63	70	76	76	78	76	69	62	60	55	47	43	40	37	40	43	44	46	47	49	52	54	56	55.5	78																								
14-Apr	59	62	70	91	95	96	96	95	95	96	96	95	95	96	96	96	96	96	97	97	97	96	96	96	91.7	97																								
15-Apr	96	96	95	95	94	94	93	93	93	93	94	94	94	94	94	94	94	95	97	97	96	95	94	93	94.3	97																								
16-Apr	92	91	92	92	93	93	93	93	95	92	81	75	71	64	55	48	45	48	58	65	71	76	78	79	76.6	95																								
17-Apr	80	84	91	90	87	87	90	87	84	81	79	73	67	65	60	58	58	56	57	61	66	67	68	71	73.6	91																								
18-Apr	71	71	66	64	67	70	73	73	73	71	65	63	62	60	64	65	61	65	71	75	82	88	89	90	70.8	90																								
19-Apr	91	92	92	92	92	92	90	88	84	81	77	72	65	57	58	56	53	56	57	69	79	81	84	82	76.5	92																								
20-Apr	79	82	82	88	88	91	88	79	68	59	60	59	55	74	84	84	86	86	89	87	89	91	93	93	80.6	93																								
21-Apr	93	88	84	82	87	88	77	57	49	44	40	38	40	46	45	48	50	51	51	55	61	71	80	83	62.8	93																								
22-Apr	82	83	84	85	87	87	77	77	76	68	64	54	49	49	46	44	41	43	46	51	60	72	77	78	65.8	87																								
23-Apr	82	83	85	87	86	85	75	56	49	48	45	44	41	40	39	39	40	44	47	49	52	60	66	66	57.5	87																								
24-Apr	65	63	65	75	87	92	91	90	88	86	84	85	85	83	83	83	83	83	83	87	92	94	95	96	84.1	96																								
25-Apr	97	97	96	96	96	95	95	89	81	72	64	58	55	51	51	52	52	53	57	65	72	73	73	72	73.4	97																								
26-Apr	74	74	74	74	73	73	70	66	61	55	53	51	54	52	50	53	53	51	51	57	65	69	70	63	62.0	74																								
27-Apr	65	69	78	83	83	81	74	67	57	50	46	42	39	37	36	35	33	31	33	41	56	68	73	76	56.3	83																								
28-Apr	80	83	83	84	86	86	71	56	42	34	36	35	33	32	31	30	32	32	35	39	47	51	55	49	51.6	86																								
29-Apr	50	53	56	61	65	68	66	56	46	48	55	50	45	42	42	43	50	57	58	65	79	84	87	90	59.0	90																								
30-Apr	92	93	93	94	94	92	84	69	56	47	41	39	41	33	64	62	64	65	69	73	81	86	90	91	71.3	94																								
																								73.5	74.8	76.3	78.9	81.1	82.4	80.0	73.7	68.3	64.5	60.6	55.7	53.1	53.1	53.0	52.1	51.8	52.5	55.7	61.0	67.7	70.8	72.5	73.2	Diurnal Average		
																								98	98	96	96	96	97	97	98	96	96	96	95	95	96	96	96	96	96	96	97	97	97	97	97	97	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
MacKay River - April 2017**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	4	0.56	0.56
20 - 40	82	11.39	11.94
40 - 60	204	28.33	40.28
60 - 80	209	29.03	69.31
80 - 100	221	30.69	100.00

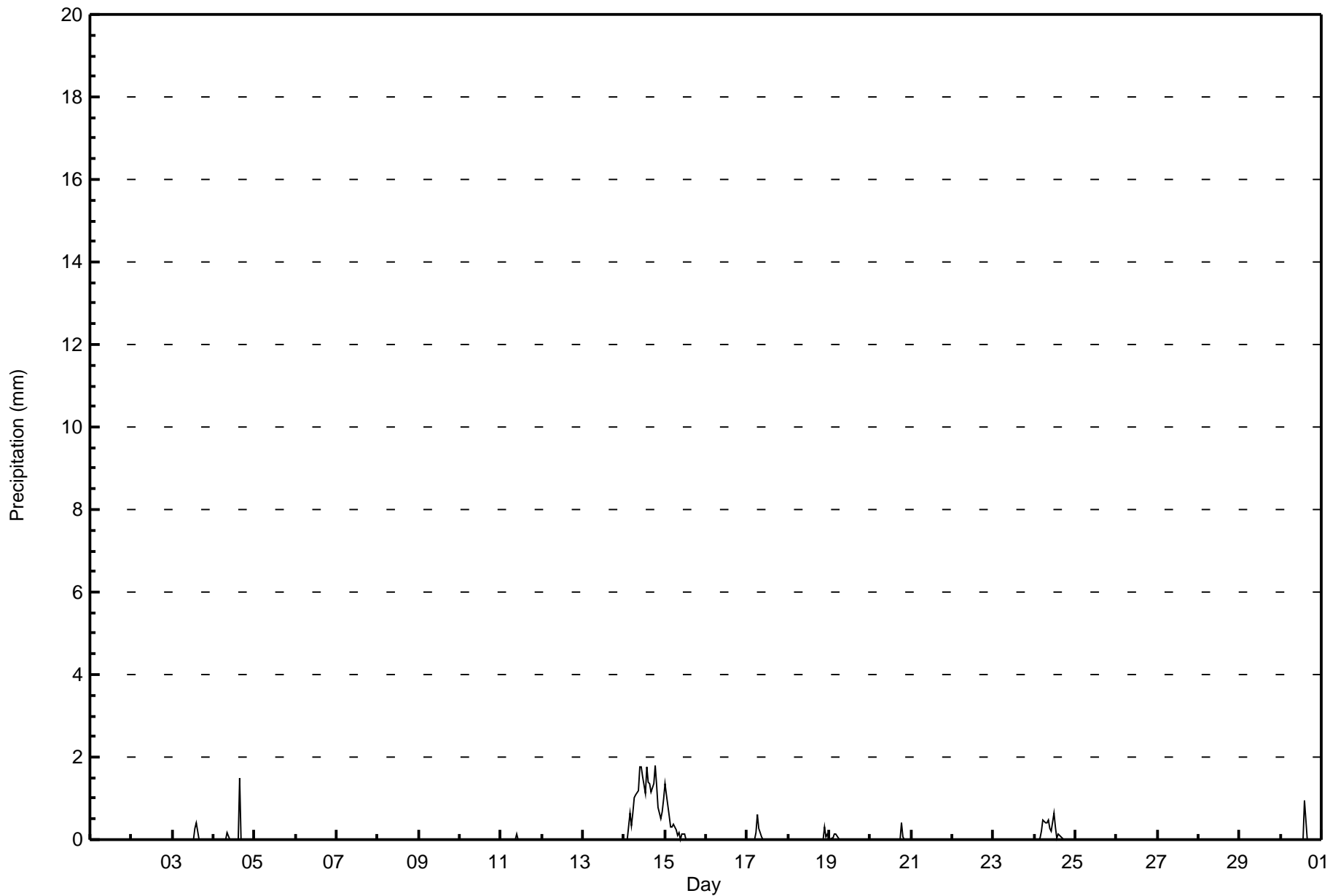
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
MacKay River - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
MacKay River - April 2017

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	686	95.28	95.28
0.4 - 0.5	8	1.11	96.39
0.6 - 0.7	6	0.83	97.22
0.8 - 1.4	14	1.94	99.17
1.5 - 10	5	0.69	99.86
> 10	0	0.00	99.86

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
MacKay River - April 2017

Maximum Speed: 18 km/h on Apr 20 17:00	Maximum Daily Speed Average: 12.8 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 7 00:00	Minimum Daily Speed Average: 0.6 km/h on Apr 3	Hours of Data: 708
Maximum Diurnal Speed Average: 3.5 km/h at hour 17	Minimum Diurnal Speed Average: 1.8 km/h at hour 1	Hours of Missing Data: 12
Monthly Average Velocity: 2.7 km/h 70.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 16	Percent Operational Time: 98.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW9	SW8	SW9	SW8	SW8	SW8	SW8	WSW9	WSW12	WSW12	SW11	WSW11	W11	W11	W10	W10	WNW11	W6	W6	W8	WSW7	WSW3	SW6	SW7	WSW8.1	WSW12
2-Apr	SW6	SW7	SW7	SW6	SW6	WSW6	W6	W6	W6	W7	WSW8	WSW8	WNW12	SW6	WSW9	W11	W10	W8	W4	NNE6	S2	SE1	SW1	SW2	WSW5.2	WNW12
3-Apr	SSE1	S1	SSW2	SW1	N2	ENE1	WSW1	N1	SSW1	WSW3	W4	W4	WNW6	NNW11	NE7	E4	N4	ESE5	SSW6	SSE4	S4	S4	S4	SW2	SW0.6	NNW11
4-Apr	SE3	SE4	SE6	SSE5	S6	SSW6	WSW0	SE4	SE6	SE11	ESE12	ESE12	SE8	ENE3	SE6	SE7	SE8	SE9	S6	SSW1	SE2	AF	AF	AF	SE5.3	ESE12
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	SE8	ESE9	SE12	SSE15	S16	S14	S14	S9	SSE9	SSE8	SSE6	SSE6	SSE7	SSE6	S6	----	S16
6-Apr	S6	S7	SSE6	SSE4	SSE2	SE2	SSE2	SW3	W5	W6	W8	W11	W12	W12	W10	WNW12	W9	W8	WSW3	SSE1	SE2	SE2	SE2	NNE0	WSW3.8	W12
7-Apr	N2	NE4	NE4	NE5	NNE4	ENE3	NE4	NE6	NE8	NNE8	NNE11	NE10	NE14	NE13	NE13	NNE16	NE15	NE15	NNE16	NNE14	NNE16	NNE14	NNE14	NNE14	NE10.1	NNE16
8-Apr	NNE14	NNE12	NNE13	NNE13	NNE13	NNE13	NNE12	NNE15	NNE16	NNE14	NNE15	NE15	NE14	NE14	NE13	NE12	NE13	NE13	NNE13	NE11	NNE12	NE10	NE9	NE7	NNE12.4	NNE16
9-Apr	NE6	NE4	E3	ESE2	E3	ESE4	ESE3	SSE5	S6	SSE7	SSE7	SSE9	SE10	SSE9	SSE9	S9	S9	S8	S6	SE4	SE5	SE5	SSE5	S9	SSE5.1	SE10
10-Apr	S9	S11	S10	S10	S8	S6	S7	S9	S10	SSE8	S8	SSE9	SSE8	ESE8	SE6	ESE6	ESE5	NNE4	ENE2	ESE4	SE4	ESE4	ESE4	SSE3	SSE5.7	S11
11-Apr	ENE2	NNE3	NE5	NNE8	NNE9	NNE9	NNE10	NNE11	NNE11	NNE9	NNE11	N14	N13	NNE12	NNE13	NNE13	NNE13	NE12	NE11	NNE9	NNE11	NNE11	NNE10	NNE9	NNE9.9	N14
12-Apr	NNE8	NNE7	NNE6	NNE5	NNE5	NNE5	NNE6	NNE10	NNE9	NE7	NNE9	N10	NNE10	NNE11	NNE10	NE9	NE9	NE9	NE8	NE5	NE4	NE6	NE6	NE5	NNE7.3	NNE11
13-Apr	NE4	NE2	E1	E2	ENE4	NE2	NE3	E7	E12	E12	ENE12	ENE12	ENE14	E12	ENE13	ENE12	ENE12	E13	E10	ENE9	ENE8	ENE9	ENE10	ENE9	ENE8.3	ENE14
14-Apr	ENE8	ENE9	NE10	NE10	NE11	NE12	NE13	NE13	NE12	NE12	NE13	NE14	NE15	NE16	NE16	NE16	NE16	NE14	NE13	NE15	NE13	NE14	NNE13	NE12.8	NE16	
15-Apr	NNE12	NNE13	NNE13	NNE13	NNE15	NNE14	NNE12	NNE13	NNE13	NE12	NNE11	NNE10	NNE10	NNE10	N10	N8	NNE6	N4	WNW2	W2	W1	WSW2	SSE5	NNE8.3	NNE15	
16-Apr	SSE3	SSE4	SSE7	SSE7	S7	S8	S8	S6	SSW7	SSW7	SSW8	SSW10	SSW12	SSW11	SSW11	SSW13	SSW12	SSW12	SSW10	S9	SSW7	SSW7	S8	SSW7	SSW8.0	SSW13
17-Apr	SSW4	NNE7	NE12	NNE14	NNE14	NNE14	NNE12	NNE14	NNE14	NNE14	NNE13	NE13	NE13	NNE12	NNE11	NE12	NE11	NE12	NE12	NNE11	NE10	NNE10	NNE8	NNE6	NNE11.0	NNE14
18-Apr	NNE5	NNE6	NNE8	NNE8	NNE8	NNE8	NNE9	NNE9	NNE10	NNE8	NNE8	ENE8	NE10	ENE8	ENE7	ENE7	E6	NE7	NNE8	NNE7	NE6	NNE5	NNE5	NNE4	NE7.0	NNE10
19-Apr	NNE4	NNE4	N4	N4	NNE4	NNE4	NNE4	N4	NW2	NW2	S1	W3	W5	WSW5	W5	WSW6	W6	WSW5	WNW5	NE1	ESE3	ESE3	ESE3	SE4	NW1.4	W6
20-Apr	ESE4	E2	ESE3	E2	ESE3	NE3	NE4	E4	ENE5	ENE6	NE12	NE13	NNE16	NNE18	NNE17	NNE17	NNE18	NNE16	NNE15	NNE14	NNE7	N4	NNW3	NW3	NNE7.8	NNE18
21-Apr	NNE4	NE5	NE4	NNE4	NE2	NNE3	NE1	E5	E6	E5	ENE6	NE7	NE8	NE9	E5	ENE6	E7	ESE5	ESE6	ESE4	SE3	ESE1	SE2	SE2	ENE3.9	NE9
22-Apr	SE2	SSE3	SE3	SE2	E1	NE6	NNE11	NNE11	NNE13	NNE12	NNE13	NNE12	NNE11	N11	NNE9	NNE7	NNE8	NE9	NE10	ENE6	ENE3	ESE1	ENE2	NE3	NNE6.2	NNE13
23-Apr	NE2	ESE1	E1	ENE2	NE2	N2	ENE2	ESE7	ESE8	E10	ESE12	E11	E11	ESE10	ESE10	ESE9	E9	ESE7	E6	ENE5	E5	ESE6	SE7	SE5	ESE5.9	ESE12
24-Apr	ESE5	E4	E7	E7	NE6	NE8	NE9	ENE9	ENE11	NE10	ENE9	E8	E10	E8	ESE10	E9	E8	ENE7	ENE4	ENE3	ENE3	ENE3	ENE3	ENE2	ENE6.5	ENE11
25-Apr	ENE1	E2	ESE4	ESE5	ESE5	ESE5	SE5	SE8	SE8	SSE8	SSE7	SE9	SE8	SSE6	SSE7	SSE9	SSE8	SSE9	SSE7	SSE8	SE7	SSE7	SSE6	SSE7	SE6.2	SE9
26-Apr	SSE7	SSE6	SSE7	SSE6	SSE6	SE6	SSE8	SSE10	SSE12	SSE11	SE11	SSE12	SSE13	SSE13	SSE12	SE10	SSE9	SSE9	SE8	SE3	ESE3	ESE3	ESE4	SE5	SSE8.0	SSE13
27-Apr	S5	SSE4	SE3	SE3	ESE3	ESE4	ESE6	SE7	S7	SE10	SSE11	SE10	SE7	ESE6	E8	ESE7	E4	ESE3	NE7	NNE4	E2	ESE2	ENE2	SE2	ESE4.5	SSE11
28-Apr	SSE4	S3	SSW4	SE2	SE2	SE3	S3	SW3	SE1	NNE3	NW4	N7	NE6	NNE7	E6	E4	E7	E6	E4	ESE4	ESE4	SE4	SE4	S6	ESE2.1	N7
29-Apr	S7	S8	S8	S7	S7	S7	SSW6	SW7	SW9	SSW10	SSW9	SSW8	S11	S10	S11	SSE8	SW6	S14	SSW10	SSW6	S3	SSE3	SSE5	SSE4	S7.3	S14
30-Apr	SSE6	SSE5	SSE5	SSE4	SE3	SSE4	S6	S7	S7	SSE7	SSE7	S6	SE7	SE1	WNW6	NE9	NNE12	NNE10	NE6	NE1	W1	WSW1	SE2	SSE2	SE2.1	NNE12

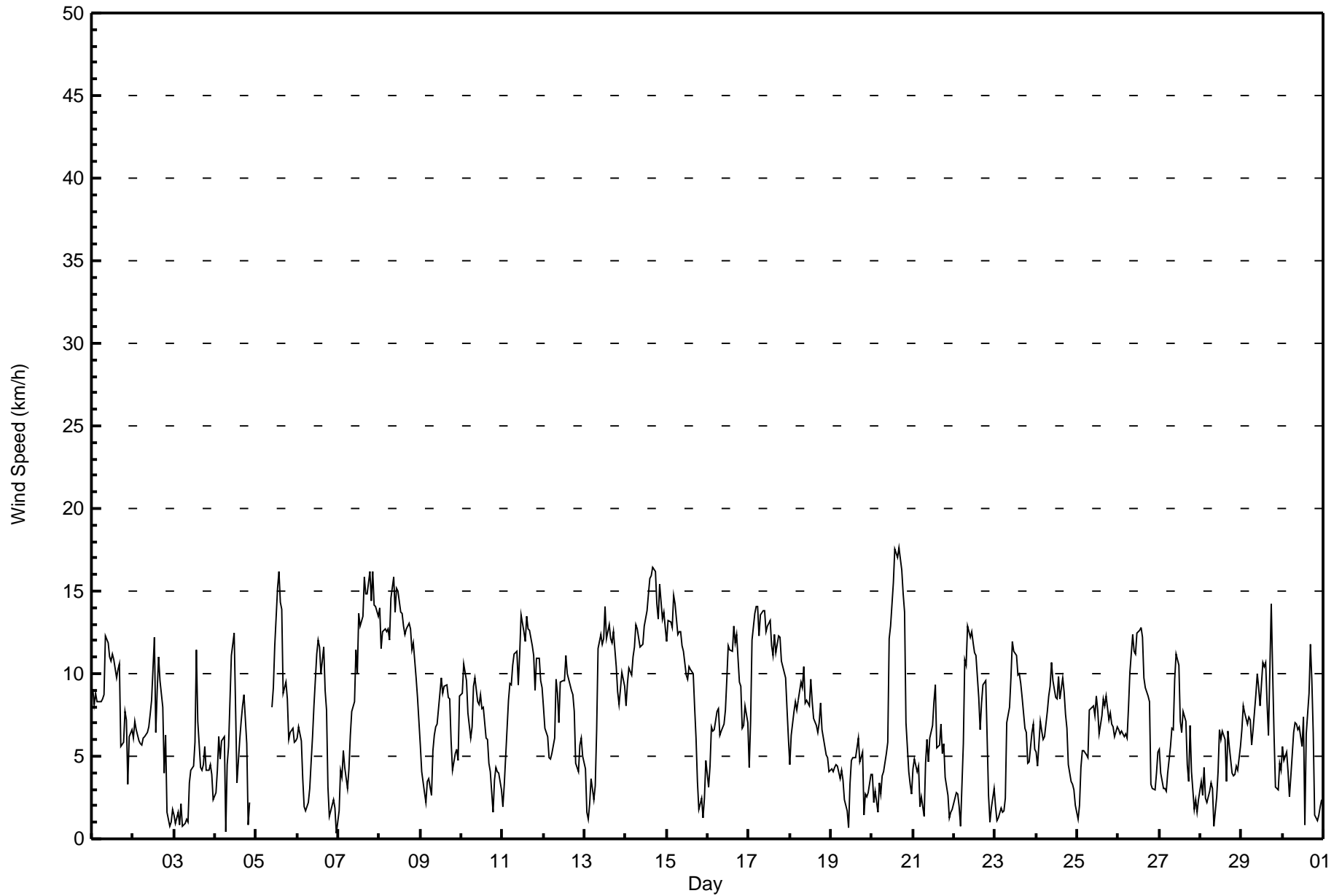
ESE1.8	E1.8	E2.2	ENE2.2	ENE2.2	NE2.2	NE2.5	ENE2.8	ENE2.5	E3.0	ENE3.2	ENE3.4	ENE3.5	ENE3.4	ENE3.3	ENE3.4	NE3.5	ENE3.5	ENE3.3	ENE3.3	ENE2.8	ENE2.7	E2.4	E1.8	Diurnal Average
NNE14	NNE13	NNE13	NNE14	NNE15	NNE14	NE13	NNE15	NNE16	NNE14	NNE15	NE15	NNE16	NNE18	NNE17	NNE17	NNE18	NNE16	NNE16	NNE14	NNE16	NNE14	NNE14	NNE14	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
MacKay River - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
MacKay River - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	234	33.05	33.05
6 - 11	342	48.31	81.36
12 - 19	132	18.64	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
MacKay River - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	21	24	19	20	33	36	24	10	5	6	10	9	2	4	1	234
6 - 11	5	59	40	19	21	15	24	46	43	18	19	10	18	4	0	1	342
12 - 19	2	58	38	6	4	3	1	6	4	4	0	2	2	2	0	0	132
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	138	102	44	45	51	61	76	57	27	25	22	29	8	4	2	708

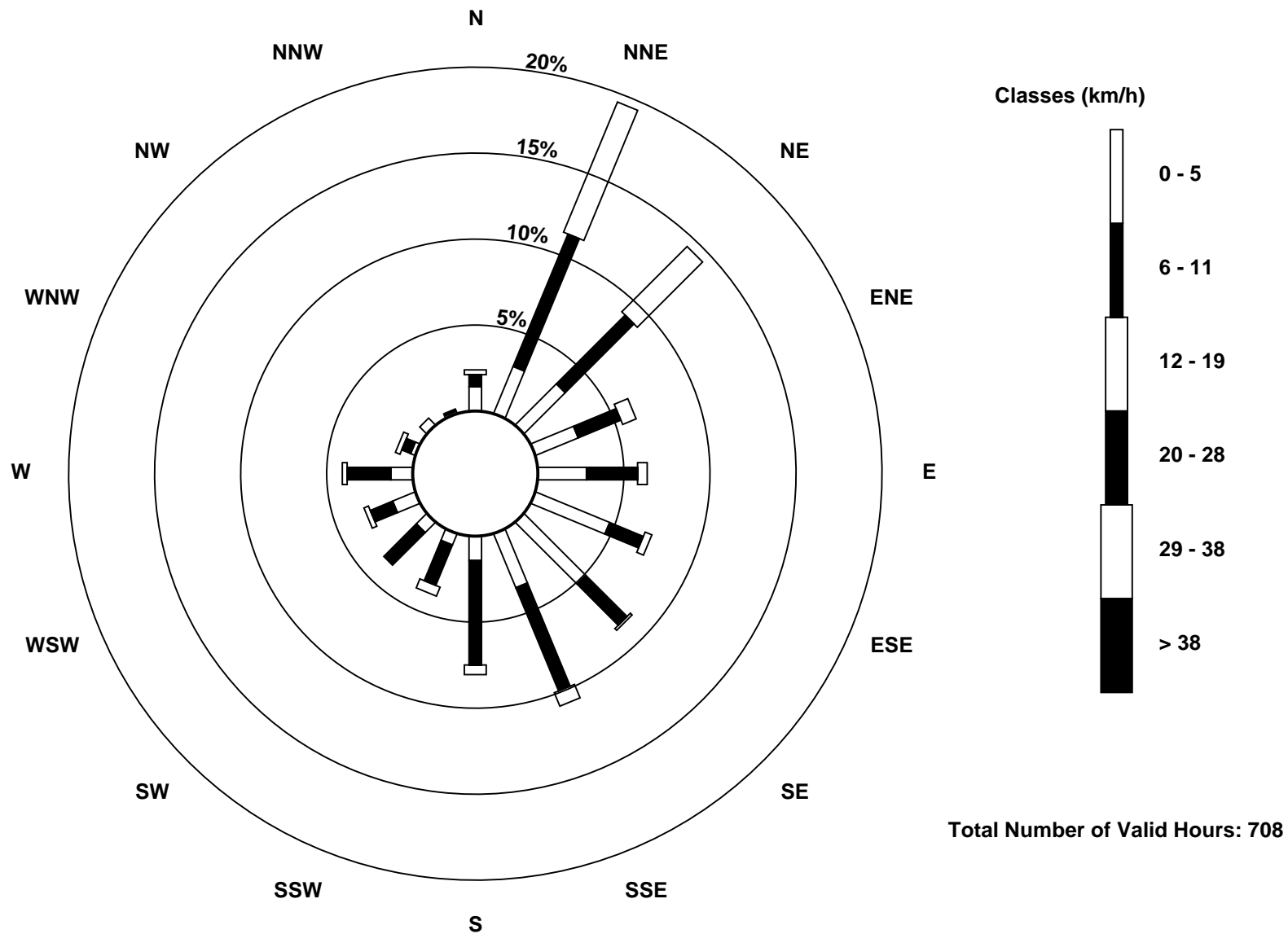
Total Number of Valid Hours: 708

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Mackay River (AMS 20)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
MacKay River - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Apr 2 13:00	Hours of Data: 708
Minimum Value: 0 km/h on Apr 21 23:00	Hours of Missing Data: 12
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 3 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 0
	Percent Operational Time: 98.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	3	2	3	2	2	3	3	5	4	4	5	5	5	4	4	5	2	3	3	4	1	2	2	5
2-Apr	1	2	2	2	2	2	2	3	3	3	3	3	7	4	3	5	4	4	3	3	1	1	1	1	7
3-Apr	1	1	1	1	1	1	1	2	1	2	2	3	3	6	3	2	3	2	1	1	1	1	1	1	6
4-Apr	1	1	1	1	1	2	1	2	3	4	4	4	4	2	2	3	3	3	2	2	1	AF	AF	AF	4
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	3	3	4	5	5	5	4	4	4	4	3	2	2	2	2	5
6-Apr	2	2	2	2	1	1	1	2	2	3	3	5	4	5	4	4	4	3	2	1	0	1	1	1	5
7-Apr	1	1	1	2	2	1	1	2	3	3	4	3	5	5	5	5	6	5	6	5	5	5	5	4	6
8-Apr	5	4	4	4	4	5	4	5	5	5	5	5	5	4	4	4	4	4	4	4	4	3	3	3	5
9-Apr	3	2	2	2	2	2	2	2	2	3	3	3	4	3	4	3	3	3	2	1	1	1	1	2	4
10-Apr	2	3	3	3	2	2	2	3	3	2	3	3	3	3	3	3	2	1	1	1	1	1	1	1	3
11-Apr	2	1	2	2	3	3	4	4	4	3	3	4	4	4	4	4	4	4	4	3	3	4	3	3	4
12-Apr	3	2	2	1	1	1	3	3	2	3	4	4	3	4	4	4	4	3	2	1	1	1	2	1	4
13-Apr	1	1	1	1	1	1	1	3	4	4	4	4	5	5	4	5	5	5	4	3	3	3	4	4	5
14-Apr	3	4	4	3	3	4	4	4	4	4	4	4	5	5	5	6	6	6	5	5	5	5	5	4	6
15-Apr	4	4	4	4	4	5	4	4	4	4	4	3	3	3	3	3	2	2	1	1	1	1	1	2	5
16-Apr	1	1	1	1	1	2	2	2	2	2	2	3	4	4	4	5	4	5	3	3	2	2	2	3	5
17-Apr	2	4	4	5	5	5	4	5	5	5	4	4	5	4	4	5	4	4	4	4	4	3	3	2	5
18-Apr	1	2	2	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	1	1	3	3
19-Apr	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	2	3	2	2	1	1	1	1	1	3
20-Apr	1	1	1	1	1	1	2	2	2	3	4	5	5	6	6	6	5	6	5	5	3	2	1	1	6
21-Apr	1	1	1	1	1	1	1	3	2	2	3	3	4	4	3	3	3	2	2	1	1	1	0	1	4
22-Apr	1	0	1	1	2	2	4	3	4	4	4	4	4	4	4	4	3	3	3	2	1	1	1	1	4
23-Apr	1	1	1	1	1	1	3	2	3	3	4	4	4	4	3	3	3	2	3	2	2	2	2	2	4
24-Apr	2	1	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	3
25-Apr	1	1	1	1	1	1	1	2	2	3	3	3	3	3	2	3	3	2	3	3	2	2	2	2	3
26-Apr	2	2	2	2	2	2	3	4	4	3	3	4	4	4	4	3	3	3	3	2	1	1	1	1	4
27-Apr	2	1	1	1	1	1	1	2	3	3	4	4	4	3	3	3	3	2	3	1	1	1	1	1	4
28-Apr	1	1	1	0	1	1	1	2	1	2	3	3	3	3	3	2	3	2	1	1	1	1	1	2	3
29-Apr	2	2	2	2	1	2	2	3	3	3	3	3	4	5	4	4	3	4	4	3	1	0	1	1	5
30-Apr	1	1	1	2	1	1	2	2	2	3	3	3	3	3	3	4	4	4	2	2	1	1	1	1	4

5	4	4	5	5	5	4	5	5	5	5	5	5	7	6	6	6	6	6	6	6	5	5	5	5	4
Diurnal Maximum																									

AF - Analyzer Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
MacKay River - April 2017

Direction of Maximum Speed: 14 deg on Apr 20 17:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 43.3 deg on Apr 14	Hours of Data: 708
Direction of Minimum Speed: 14 deg on Apr 7 00:00	Hours of Missing Data: 12
Direction of Minimum Daily Speed Average: 0.6 deg on Apr 3	Percent Operational Time: 98.3
Monthly Average Direction: 170.8 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	231	220	216	225	222	218	221	238	246	252	235	246	265	281	265	279	295	268	259	263	255	252	224	228	246.9
2-Apr	217	218	218	225	232	249	259	263	265	265	257	257	291	229	246	270	273	279	274	33	178	128	214	223	254.9
3-Apr	158	181	204	227	351	73	249	358	193	253	265	262	289	327	51	87	359	119	194	153	181	186	170	219	231.8
4-Apr	137	134	146	168	180	205	242	129	143	125	109	114	125	65	127	143	133	146	183	203	136	AF	AF	AF	137.5
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	140	121	143	165	176	179	178	179	152	165	155	147	154	158	171	--
6-Apr	174	178	158	162	159	146	161	218	266	269	262	275	270	270	262	285	272	268	258	164	135	141	132	14	247.8
7-Apr	11	34	36	37	31	63	37	40	42	25	20	46	44	39	34	31	35	34	33	30	30	32	33	30	33.9
8-Apr	29	28	23	17	12	16	17	20	18	19	22	35	38	38	43	49	39	42	33	48	26	36	37	40	29.5
9-Apr	53	46	90	116	84	121	116	148	177	159	161	155	129	164	154	180	176	188	175	129	130	136	166	187	151.6
10-Apr	181	185	187	188	181	178	180	185	188	167	180	147	150	119	142	122	110	20	67	122	133	123	120	158	161.9
11-Apr	78	20	34	30	23	27	30	23	25	19	17	10	5	24	20	19	29	42	41	33	27	24	25	26	24.9
12-Apr	31	28	28	27	28	26	29	30	17	35	18	9	32	29	32	37	50	38	37	38	37	39	39	38	30.9
13-Apr	36	41	99	99	68	43	36	80	95	97	73	68	68	80	71	74	76	92	92	78	75	62	67	74	76.0
14-Apr	71	68	56	42	46	42	41	46	44	45	47	50	42	41	40	38	38	41	42	44	44	38	34	26	43.3
15-Apr	28	24	23	23	22	25	31	30	32	34	32	31	20	14	14	8	2	14	351	286	265	259	257	148	22.1
16-Apr	162	148	154	160	171	184	185	185	199	207	197	207	200	202	203	210	207	200	196	188	201	193	190	203	193.6
17-Apr	204	23	39	31	28	24	22	22	24	28	32	34	35	32	32	35	44	40	37	30	35	28	30	32	31.3
18-Apr	29	32	33	28	30	25	26	30	23	26	33	63	46	69	58	72	85	37	23	30	39	27	29	20	37.7
19-Apr	19	21	6	5	13	13	16	3	322	326	173	265	264	253	259	247	263	258	298	44	105	110	116	126	320.2
20-Apr	110	89	110	82	122	37	39	83	66	71	36	37	28	26	24	21	14	19	23	24	27	359	329	323	30.4
21-Apr	24	39	34	32	51	27	40	88	100	94	73	51	41	38	92	67	97	102	103	110	139	118	129	137	70.7
22-Apr	146	151	146	142	87	35	30	28	29	30	15	26	21	5	22	32	32	40	41	57	63	111	69	37	33.2
23-Apr	38	123	89	78	38	2	60	106	106	98	104	88	94	102	108	109	100	117	99	77	90	122	142	135	101.5
24-Apr	116	93	89	84	38	41	50	55	58	59	54	68	81	97	96	102	85	82	69	70	66	68	69	72	73.5
25-Apr	60	98	114	119	115	120	125	131	141	157	151	139	130	160	156	158	155	155	166	151	144	155	156	153	144.1
26-Apr	148	155	159	152	150	146	154	156	157	155	143	161	164	155	160	143	148	153	140	127	119	110	123	144	150.9
27-Apr	171	158	137	130	113	115	121	138	173	141	149	131	140	108	87	120	82	104	48	32	83	115	59	140	123.4
28-Apr	154	179	201	133	140	145	180	218	127	33	326	357	50	28	91	82	84	87	84	104	121	132	132	170	104.0
29-Apr	188	189	187	176	178	187	200	233	233	195	202	201	180	180	171	163	217	183	194	199	178	156	161	164	189.1
30-Apr	147	155	147	149	146	154	175	190	177	157	165	172	143	146	293	40	15	15	45	53	268	248	129	157	136.9

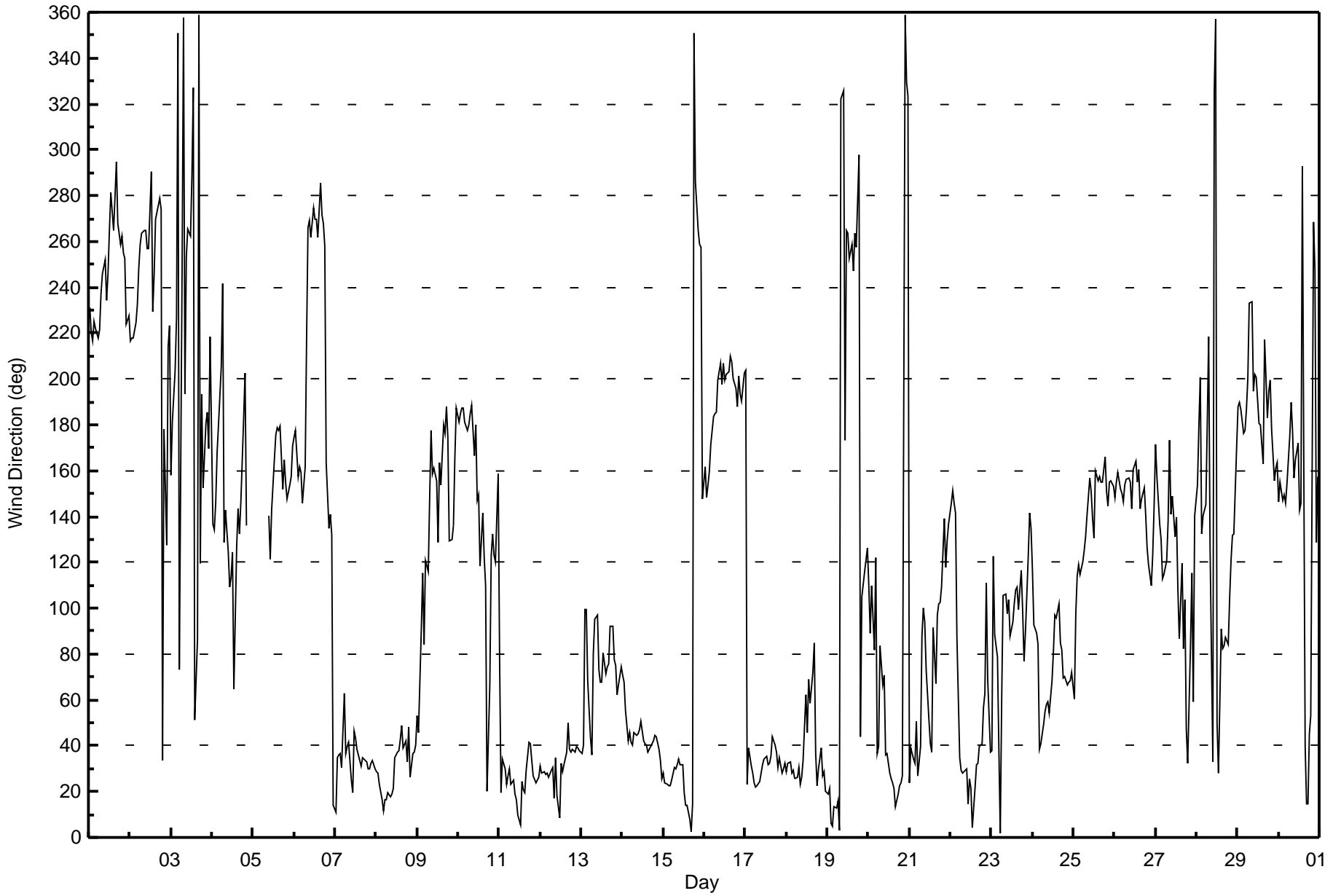
103.0	93.3	93.9	74.9	61.2	56.1	54.0	65.6	68.4	82.6	70.6	72.8	67.2	58.9	71.8	68.2	55.6	70.5	63.5	63.4	69.9	74.4	82.3	99.3
Diurnal Average																							

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
MacKay River - April 2017





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
MacKay River - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 105 deg on Apr 30 14:00	Hours of Data: 708
Minimum Value: 8 deg on Apr 30 01:00	Hours of Missing Data: 12
Percentiles: P ₁ = 10 P ₁₀ = 18 Q ₁ = 24 Median = 28 O ₃ = 38 P ₉₀ = 50 P ₉₉ = 86	Hours of Calibration: 0
	Percent Operational Time: 98.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	33	26	23	30	24	22	25	36	42	41	35	43	44	43	45	39	31	45	47	44	43	44	24	25	47
2-Apr	18	22	20	23	28	40	48	53	50	48	45	48	46	52	39	42	43	45	73	37	61	69	85	66	85
3-Apr	36	86	44	51	69	32	84	71	93	62	74	80	52	38	45	62	41	33	19	28	24	19	34	48	93
4-Apr	14	14	12	25	16	26	86	34	45	20	24	25	41	58	33	29	25	25	34	88	10	AF	AF	AF	88
5-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	28	25	31	29	26	26	25	27	25	27	24	21	24	23	24	31
6-Apr	20	21	24	26	53	44	34	34	45	51	43	45	40	44	46	41	43	46	45	41	17	12	16	91	91
7-Apr	69	22	43	28	35	48	25	29	30	30	29	33	31	30	27	27	27	24	24	23	24	24	24	69	69
8-Apr	24	23	24	24	23	24	24	26	25	26	26	27	28	29	31	31	29	27	26	27	26	28	26	30	31
9-Apr	39	46	57	82	57	46	76	43	37	48	48	40	42	40	45	33	38	33	21	14	11	15	24	18	82
10-Apr	19	19	19	18	19	22	23	24	24	25	34	40	46	37	43	44	41	36	28	18	9	11	12	11	46
11-Apr	56	19	22	21	22	24	23	24	24	25	26	27	33	27	26	27	27	26	25	25	23	22	24	24	56
12-Apr	26	23	24	24	20	21	22	22	26	41	36	38	40	38	40	37	40	29	24	15	17	17	20	20	41
13-Apr	21	53	49	24	25	33	24	31	30	31	36	35	32	33	33	35	32	30	32	34	32	29	31	33	53
14-Apr	32	34	28	22	24	25	25	25	25	23	26	26	26	25	24	25	24	24	25	26	24	26	23	23	34
15-Apr	23	23	23	23	23	24	23	23	24	24	25	27	27	27	27	27	28	25	31	30	22	41	17	31	41
16-Apr	35	11	9	12	17	15	18	23	25	28	29	31	29	30	30	28	28	23	22	20	22	17	18	35	35
17-Apr	37	23	25	26	24	25	25	26	26	25	25	29	29	28	32	30	29	28	26	25	26	25	27	20	37
18-Apr	19	19	21	24	26	22	24	27	25	32	41	42	34	42	40	39	40	30	25	25	24	22	22	23	42
19-Apr	23	23	22	22	23	22	20	25	64	93	102	65	65	62	52	52	49	50	36	63	20	14	22	24	102
20-Apr	18	43	42	53	47	42	33	32	41	52	29	29	26	25	25	27	26	27	24	25	25	35	13	19	53
21-Apr	23	18	20	18	39	18	56	38	38	75	57	42	49	39	67	58	36	49	29	19	22	47	14	21	75
22-Apr	20	20	12	24	61	25	23	26	25	26	29	29	33	34	45	61	36	31	29	27	34	34	46	24	61
23-Apr	68	33	28	31	23	29	57	25	27	30	29	33	32	32	31	31	27	25	43	31	32	28	28	28	68
24-Apr	29	27	33	32	26	24	25	26	29	27	26	34	34	31	32	25	32	32	32	33	28	28	25	28	34
25-Apr	20	27	14	15	16	16	20	23	29	32	38	30	37	48	34	28	29	25	28	24	22	24	25	25	48
26-Apr	22	25	23	23	23	21	25	28	26	30	29	30	32	30	30	30	31	31	26	21	11	10	27	24	32
27-Apr	26	26	15	16	17	13	17	29	44	36	32	34	63	43	34	35	65	69	33	19	45	41	58	24	69
28-Apr	15	34	17	12	14	12	35	61	99	81	78	60	50	49	56	62	41	33	28	19	13	11	12	26	99
29-Apr	17	16	15	18	14	18	23	43	42	34	33	43	40	37	32	41	47	23	24	22	18	10	12	12	47
30-Apr	8	9	9	17	23	15	16	30	32	56	63	59	43	105	36	42	38	31	30	87	81	72	39	14	105

69	86	57	82	69	48	86	71	99	93	102	80	65	105	67	62	65	69	73	88	81	72	85	91	
Diurnal Maximum																								

AF - Analyzer Failure



Wood Buffalo Environmental Association

SO₂ Calibration Summary

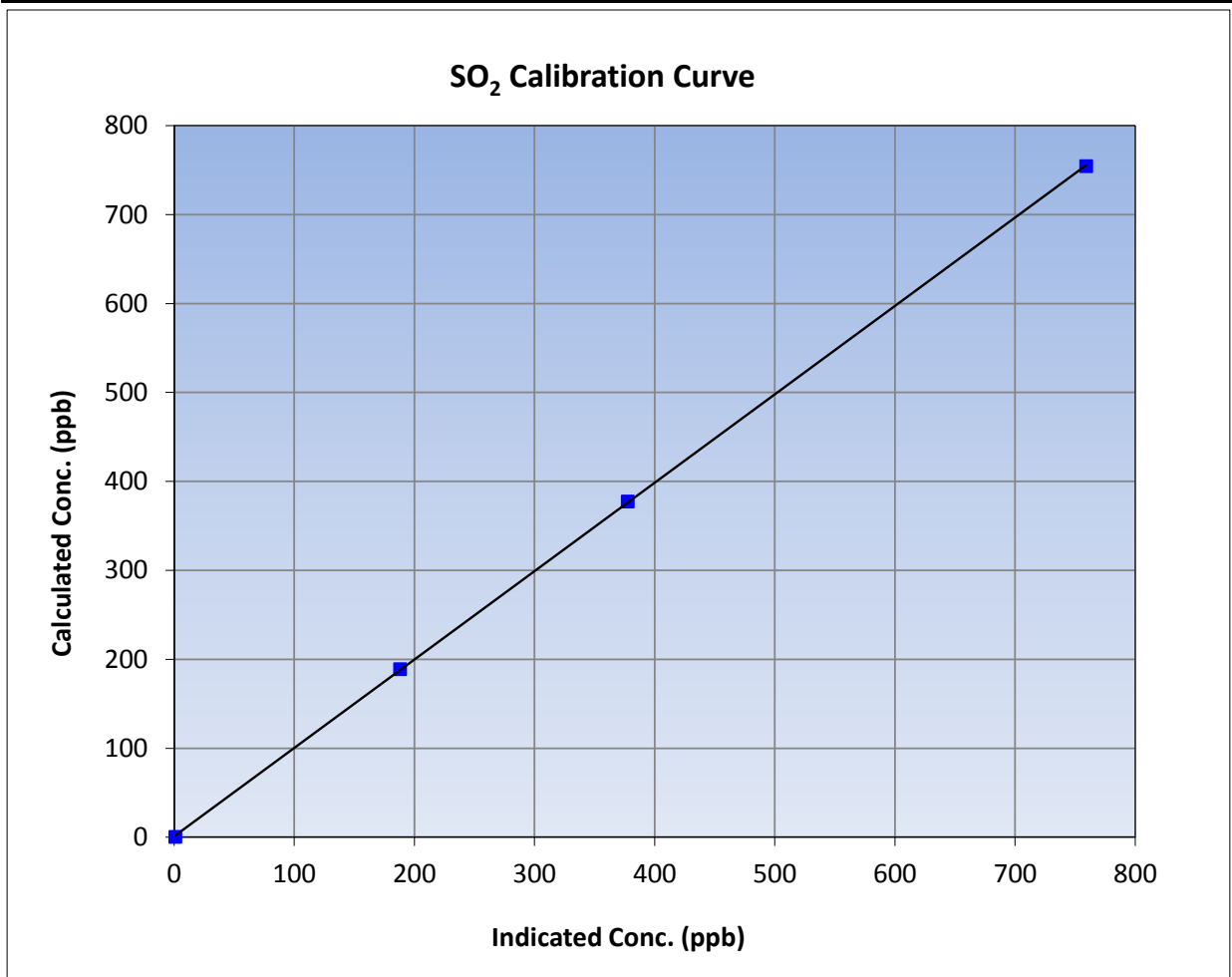
Version-03-2017

Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 14, 2017
Station Name	MacKay River	Station Number	AMS 20
Start Time (MST)	9:15	End Time (MST)	13:07
Analyzer make	Thermo 43i	Analyzer serial #	1501301450

Calibration Data

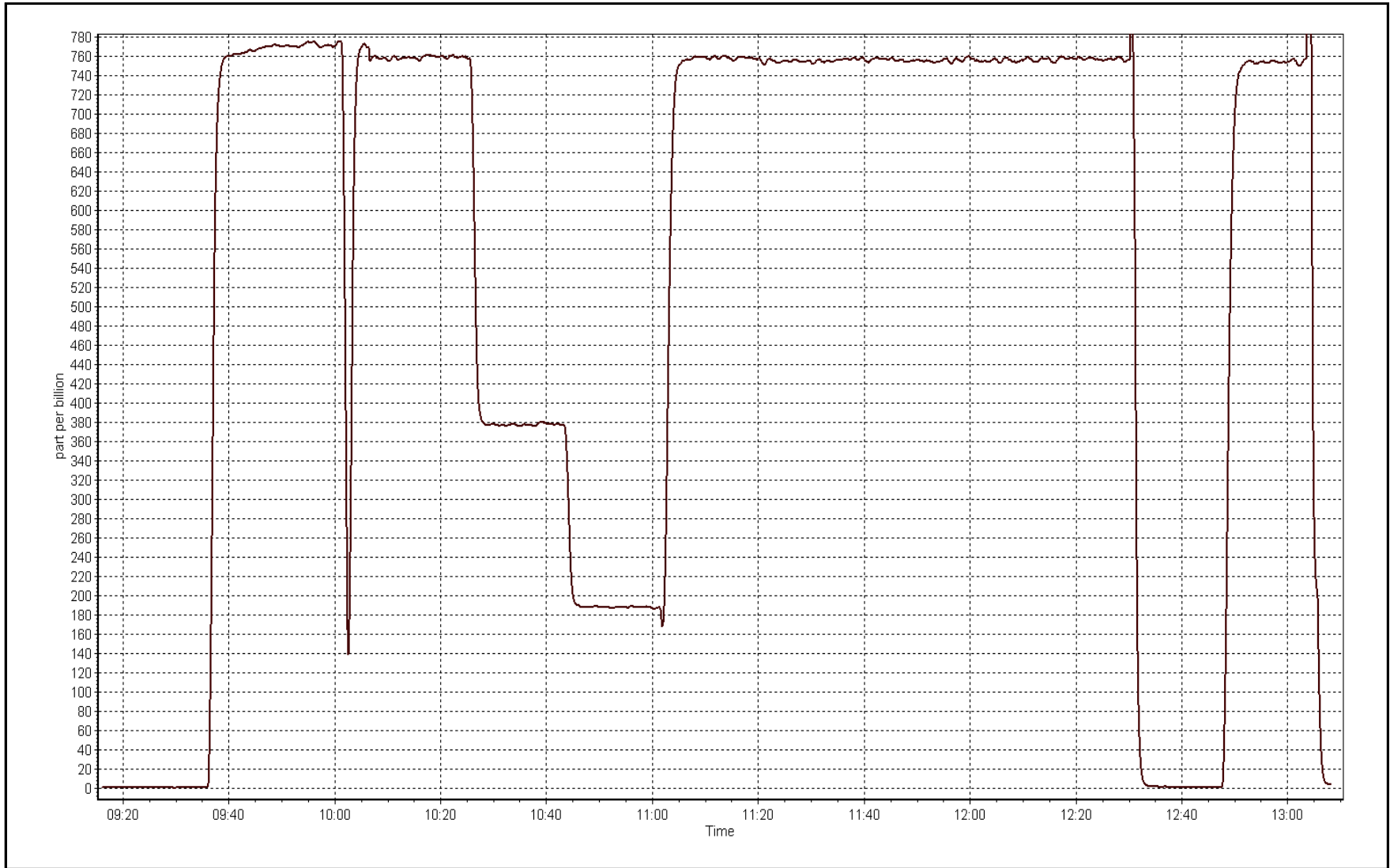
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.5	----	Correlation Coefficient	0.999981	≥0.995
754.2	758.8	0.9939	Slope	0.993852	0.90 - 1.10
377.2	377.3	0.9997	Intercept	0.959691	+/-30
188.6	187.7	1.0049			



SO2 Calibration Plot

Date: April 20, 2017

Location: MacKay River





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	April 21, 2017	Last Cal Date:	March 15, 2017
Start time (MST):	10:00	End time (MST):	12:05
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>5.35</u>	ppm	Cal Gas Exp Date	February 13, 2018
Cal Gas Cylinder #	<u>LL119508</u>			
Calibrator Make/Model	Teledyne API T700		Serial Number	1220
ZAG Make/Model	Teledyne API 701		Serial Number	4766

Analyzer Information

Analyzer make: Teledyne API T101

Analyzer serial #: 196

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	505	504
Calculated slope	0.993988	0.998002	Lamp voltage	2424	2424
Calculated intercept	0.123566	0.248493	Pressure	22.9	22.9
Analyzer Background	25.4	25.4	Flow	0.610	0.611
Analyzer Coefficient	0.990	0.990	Intensity	60	60

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	-0.2	----
as found span	4935	75.6	80.7	80.7	1.001
calibrator zero	5005	0.0	0.0	-0.2	----
high point	4935	75.6	80.7	80.7	1.001
second point	4975	37.9	40.4	40.2	1.006
third point	4995	19.0	20.3	20.0	1.012
as left zero	5005	0.0	0.0	-0.2	----
as left span	4935	75.6	80.7	80.7	1.000
Average Correction Factor					1.006
Corrected As found	80.87	Previous response	81.09	*% change	0.3%

* = > +/-5% change initiates investigation

Notes:

Sample inlet filter replaced after as founds. No adjustments.

Calibration Performed By:

Asad Hidayat



Wood Buffalo Environmental Association

H₂S Calibration Summary

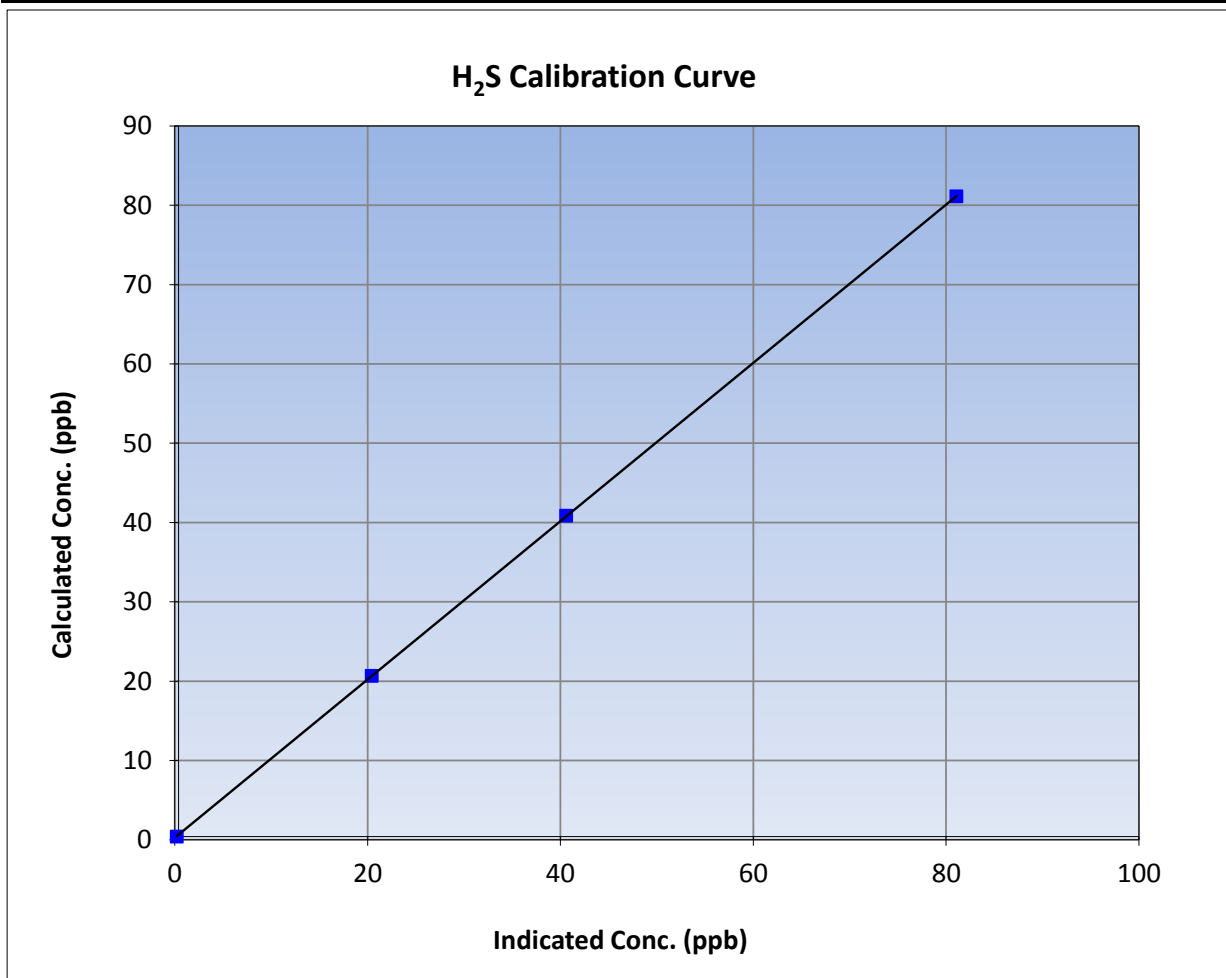
Version-03-2017

Station Information

Calibration Date	April 21, 2017	Previous Calibration	March 15, 2017
Station Name	MacKay River	Station Number	AMS 20
Start Time (MST)	10:00	End Time (MST)	12:05
Analyzer make	Teledyne API T101	Analyzer serial #	196

Calibration Data

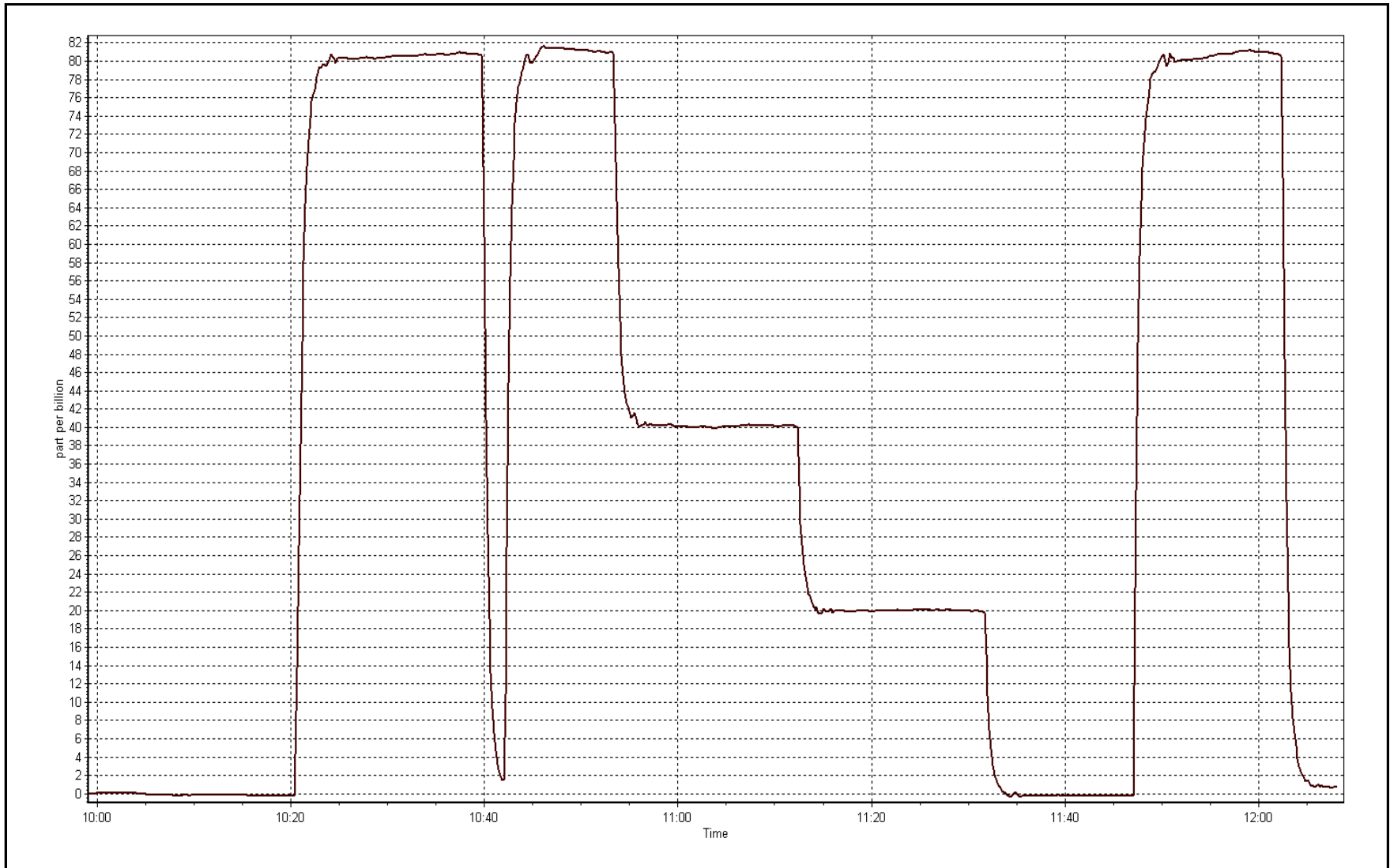
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	0.999996	≥0.995
80.7	80.7	1.0005			
40.4	40.2	1.0062	Slope	0.998002	0.90 - 1.10
20.3	20.0	1.0116			
			Intercept	0.248493	+/-3



H₂S Calibration Plot

Date: April 21, 2017

Location: MacKay River





Wood Buffalo Environmental Association

THC Calibration Report

Version-03-2017

Station Information

Station Name:	MacKay River	Station number:	AMS 20
Calibration Date:	April 20, 2017	Last Cal Date:	March 14, 2017
Start time (MST):	9:15	End time (MST):	13:07
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000657	Cal Gas Expiry Date	November 4, 2019
CH4 Cal Gas Conc.	<u>513.0</u> ppm	CH4 Equiv Conc.	1060.3 ppm
C3H8 Cal Gas Conc.	<u>199.0</u> ppm	Station temp.	22 Deg C
Calibrator Make/Model	Teledyne API T700	Serial Number	1220
ZAG Make/Model	Teledyne API 701	Serial Number	4766

Analyzer Information

Analyzer make:	Thermo 51i-LT	Analyzer serial #:	1501663727
	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 25 ppm	Bias voltage supply	-298
Calculated slope	1.007863	Sample pressure	8.6
Calculated intercept	-0.050542	Fuel pressure	23.9
Analyzer Background	2.150	Air pressure	34.3
Analyzer Coefficient	4.345	Flame temperature	147.7

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.00	0.03	----
as found span	4930	78.7	16.66	16.84	0.989
calibrator zero	5005	0.0	0.00	0.03	----
high point	4930	78.7	16.66	16.66	1.000
second point	4975	39.4	8.33	8.34	0.999
third point	4995	19.7	4.17	4.19	0.994
as left zero	5005	0.0	0.00	0.04	----
as left span	4930	78.7	16.66	16.66	1.000
Average Correction Factor					0.998
Corrected As found	16.81	Previous response	16.58	*% change	-1.4%

* = > +/-5% change initiates investigation

Notes:

Sample inlet filter replaced after as founds. Adjusted span.

Calibration Performed By:

Asad Hidayat



Wood Buffalo Environmental Association

THC Calibration Summary

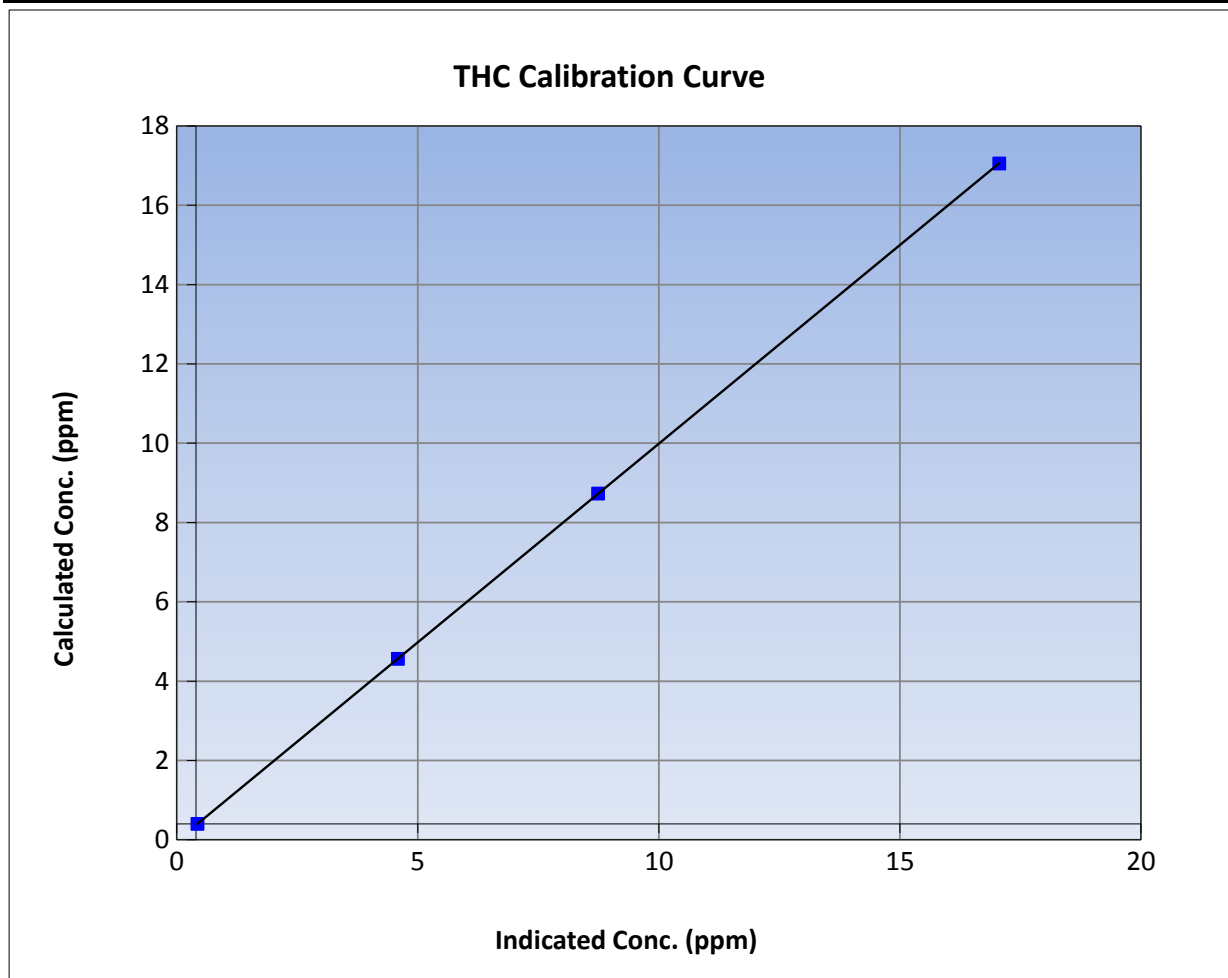
Version-03-2017

Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 14, 2017
Station Name	MacKay River	Station Number	AMS 20
Start Time (MST)	9:15	End Time (MST)	13:07
Analyzer make	Thermo 51i-LT	Analyzer serial #	1501663727

Calibration Data

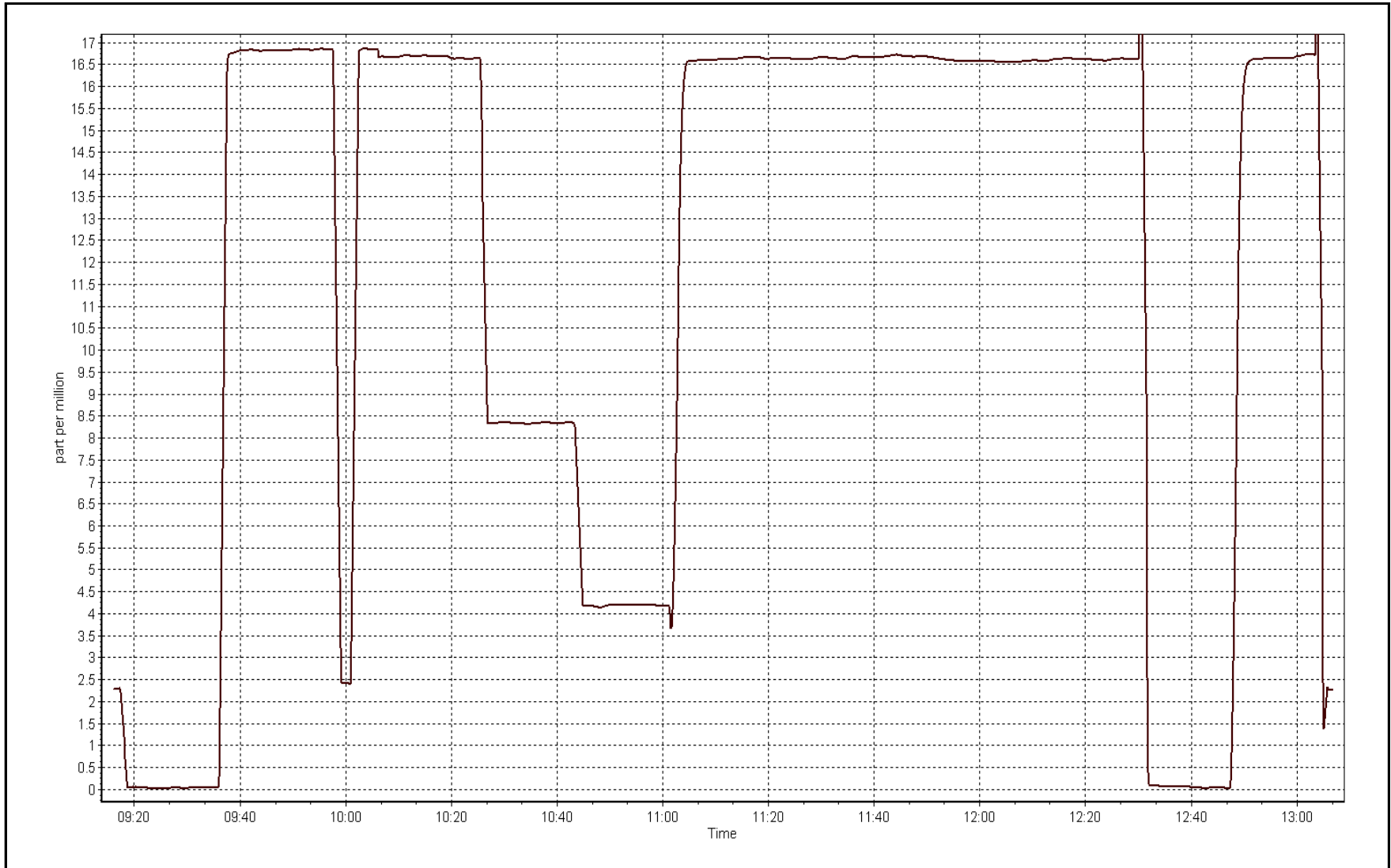
Calculated Concentration (ppm) (Cc)	Indicated Concentration (ppm) (lc)	Correction factor (Cc/lc)	Statistical Evaluation	<u>Limits</u>	
0.0	0.0	----	Correlation Coefficient	1.000000	
16.7	16.7	1.0000			≥0.995
8.3	8.3	0.9989	Slope	1.001852	
4.2	4.2	0.9941			0.90 - 1.10
			Intercept	-0.029712	+/-1.5



THC Calibration Plot

Date: April 20, 2017

Location: MacKay River





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Mackay River	Station number:	AMS 20
Calibration Date:	April 20, 2017	Last Cal Date:	March 14, 2017
Start time (MST):	9:15	End time (MST):	13:07
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	EY0000657	Cal Gas Expiry Date	November 4, 2019
NOX Cal Gas Conc.	<u>50.9</u> ppb	NO Cal Gas Conc.	<u>50.9</u> ppb
Calibrator Model	Teledyne API T700	Serial Number	1220
ZAG make/model	Teledyne API 701	Serial Number	4766

Analyzer Information

Analyzer make:	Thermo 42i	Analyzer serial #:	1505164379	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
NO coefficient	1.052	1.054	NOX Range (ppb)	0 - 1000 ppb
NOX coefficient	0.999	0.997	PMT Temperature	325.0 322.4
NO ₂ coefficient	0.995	0.995	Reaction cell Press	167.5 167.5
NO bkgrnd	3.1	3.1	Sample Flow	0.831 0.830
NOX bkgrnd	3.1	3.1	PMT Voltage	-767.4 -767.4

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	1.000043	0.998844
NO _x Cal Offset	0.375004	1.204128
NO Cal Slope	0.999348	0.997927
NO Cal Offset	1.037757	1.357200
NO ₂ Cal Slope	0.994316	0.993759
NO ₂ Cal Offset	-0.280629	0.357529



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	0.0	0.0	-0.1	-0.2	0.1	----	----
as found span	4930	78.7	799.8	799.8	0.0	800.1	799.2	0.9	0.9996	1.0007
calibrator zero	5005	0.0	0.0	0.0	0.0	-0.1	-0.2	0.1	----	----
high point	4930	78.7	799.8	799.8	0.0	800.0	800.8	-0.8	0.9997	0.9988
second point	4975	39.4	399.9	399.9	0.0	398.8	398.5	0.3	1.0028	1.0035
third point	4995	19.7	200.0	200.0	0.0	197.8	198.0	0.7	1.0111	1.0098
as left zero	5005	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	----	----
as left span	4930	78.7	799.8	337.0	462.8	800.0	335.2	464.8	0.9997	1.0053
Average Correction Factor									1.0046	1.0040

Corrected As found	NO _x = 800.2 ppb	NO = 799.4 ppb		*Percent Change	NO _x = -0.1%
Previous Response	NO _x = 799.4 ppb	NO = 799.3 ppb		*Percent Change	NO = 0.0%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	799.5	798.6	0.9	1.0003	1.0015	----	----
1st NO2 (400 ppb O3)	337.0	461.6	801.3	337.0	464.3	0.9981	----	0.9942	100.6%
2nd NO2 (200 ppb O3)	561.0	237.5	799.7	561.0	238.7	1.0001	----	0.9952	100.5%
3rd NO2 (100 ppb O3)	676.2	122.3	798.4	676.2	122.1	1.0017	----	1.0016	99.8%
2nd NO ref point	----	0.0	798.1	796.8	1.3	1.0021	1.0038	----	----
Average Correction Factor						1.0005	1.0026	0.9970	100.3%

Notes: Sample inlet filter replaced after as founds. Adjusted span.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

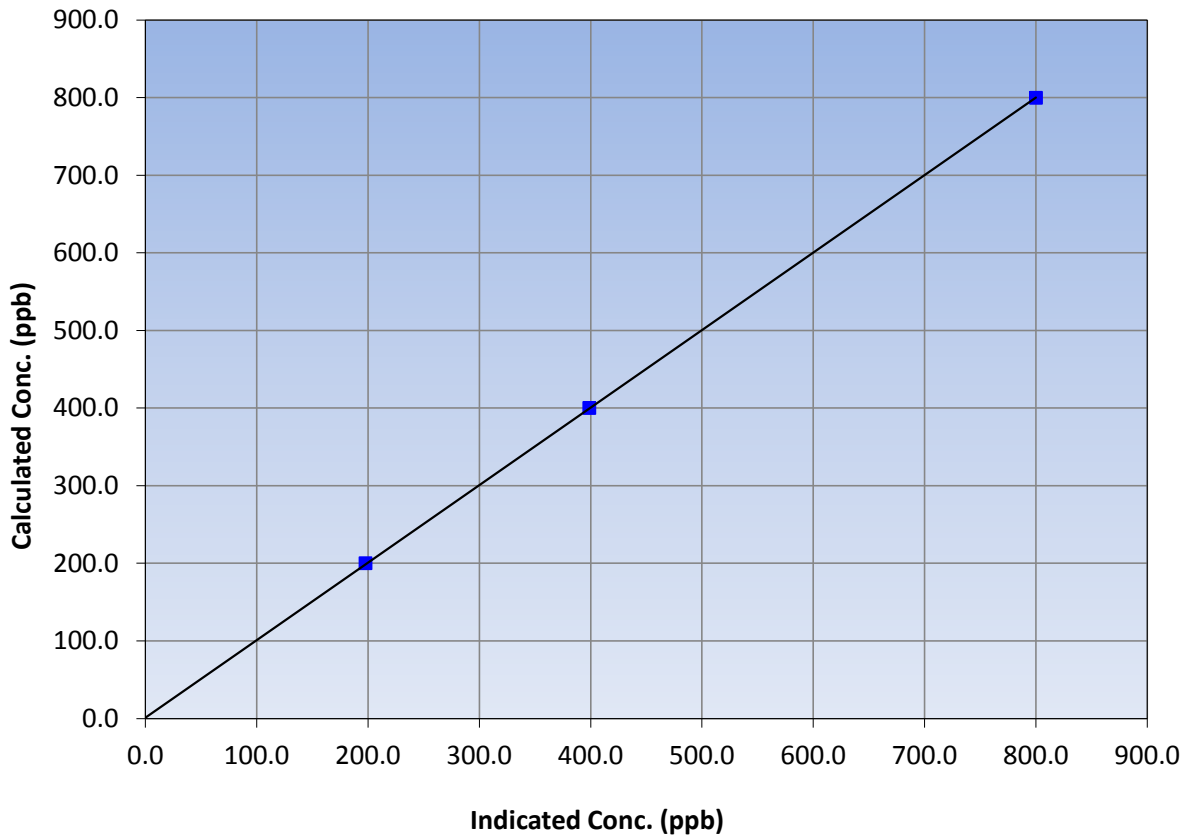
Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 14, 2017
Station Name	MackKay River	Station Number	AMS 20
Start Time (MST)	9:15	End Time (MST)	13:07
Analyzer make	Thermo 42i	Analyzer serial #	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
799.8	800.0	0.9997			
399.9	398.8	1.0028			
200.0	197.8	1.0111			
			Slope	0.998844	0.90 - 1.10
			Intercept	1.204128	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

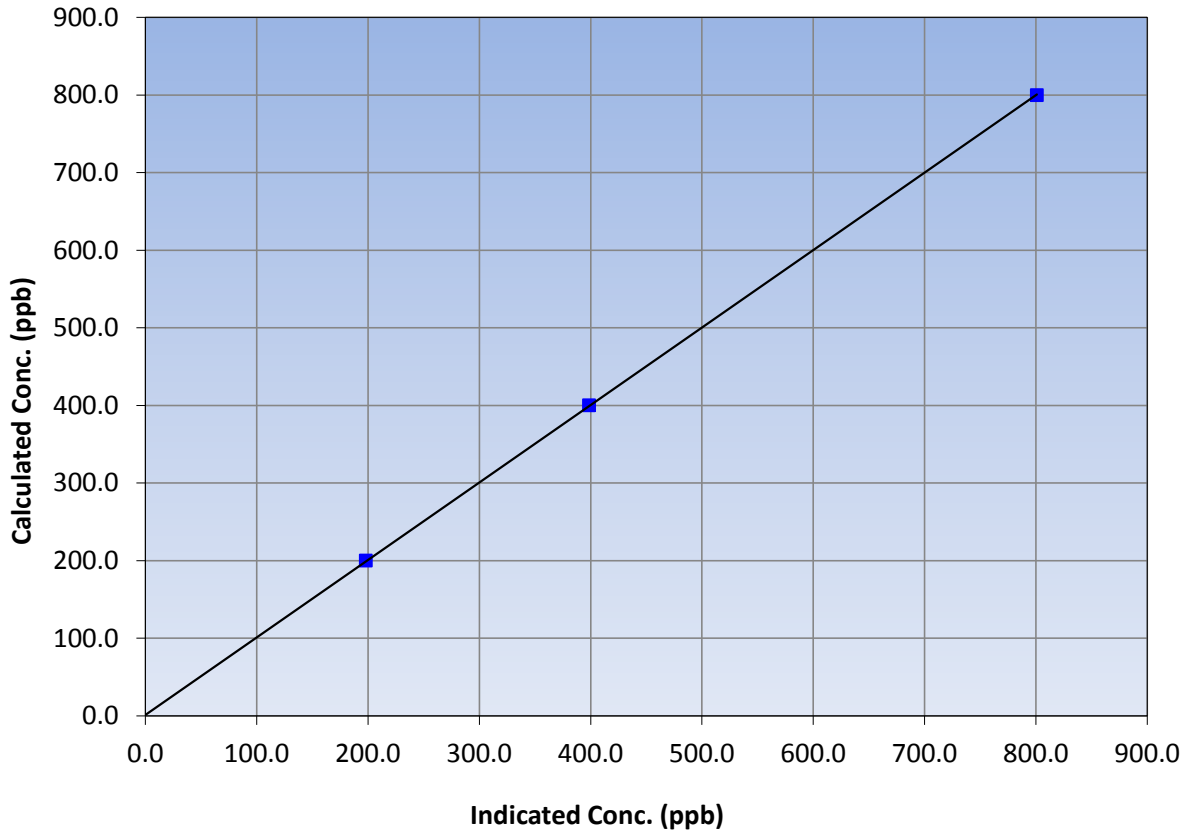
Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 14, 2017
Station Name	Mackay River	Station Number	AMS 20
Start Time (MST)	9:15	End Time (MST)	13:07
Analyzer make	Thermo 42i	Analyzer serial #	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	0.999990	≥0.995
799.8	800.8	0.9988			
399.9	398.5	1.0035	Slope	0.997927	0.90 - 1.10
200.0	198.0	1.0098			
			Intercept	1.357200	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

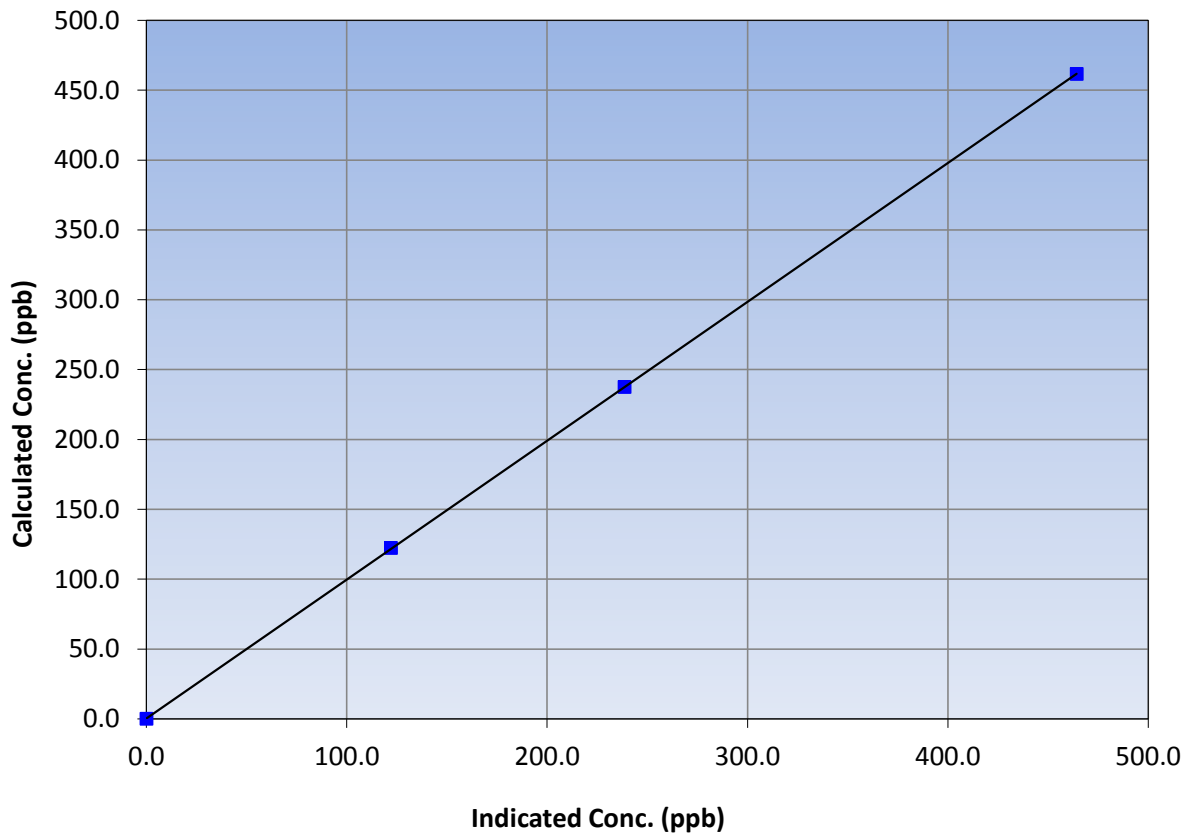
Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 14, 2017
Station Name	Mackay River	Station Number	AMS 20
Start Time (MST)	9:15	End Time (MST)	13:07
Analyzer make	Thermo 42i	Analyzer serial #	1505164379

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	0.1	----	Correlation Coefficient	≥0.995	
461.6	464.3	0.9942			
237.5	238.7	0.9952			
122.3	122.1	1.0016			
			Slope	0.993759	0.90 - 1.10
			Intercept	0.357529	+/-20

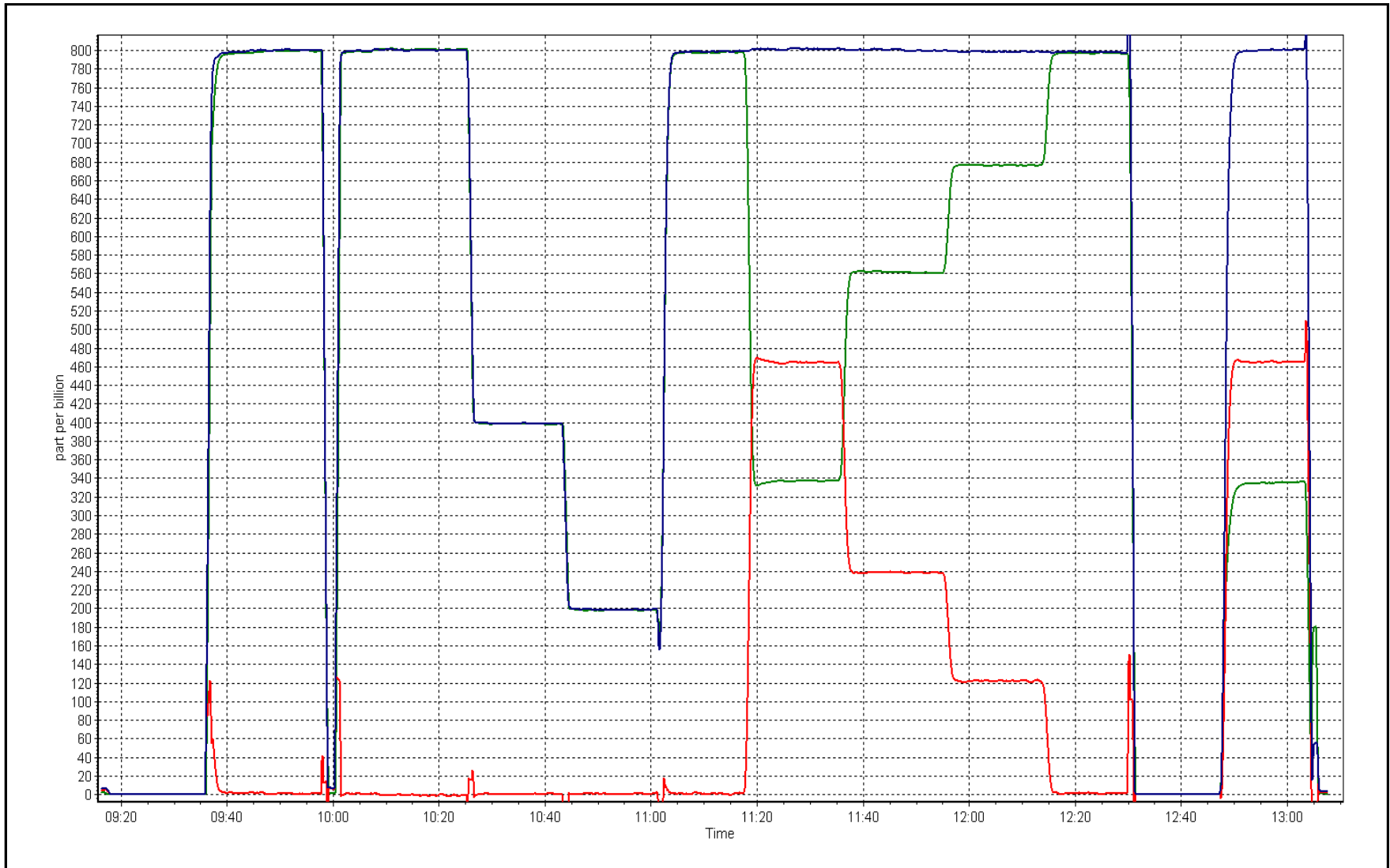
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 20, 2017

Location: MacKay River





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS 21
CONKLIN COMMUNITY
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	685	35	35	100	3	0	1	0
TRS(ppb) Average	686	33	34	99.86	0	0	0	0
THC(ppm) Average	685	35	35	100	2.4	-	2	-
NMHC(ppm) Average	685	35	35	100	0.036	-	0.003	-
CH4(ppm) Average	685	35	35	100	2.4	-	2	-
O3 (ppb) Average	687	32	33	99.86	57	0	46	-
NO2 (ppb) Average	685	35	35	100	21	0	4	-
NO (ppb) Average	685	35	35	100	6	-	1	-
NOX (ppb) Average	685	35	35	100	27	-	5	-
PM2.5 (ug/m3) Average	697	1	23	96.94	24.1	-	6.3	0
Wind Speed 10 m (km/h) Average	718	0	2	99.72	21	-	12	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-
Temperature 2 m (C) Average	720	0	0	100	16.1	-	7.8	-
Relative Humidity (%) Average	720	0	0	100	98	-	96.0	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.3	0	-	0	0	0	0	0	1	3
TRS (ppb) Average	686	0.3	0	-	0	0	0	0	0	0	0
THC (ppm) Average	685	1.92	0.1	-	1.8	1.9	1.9	1.9	1.9	2	2.4
NMHC(ppm) Average	685	0	0.002	-	0	0	0	0	0	0	0.036
CH4(ppm) Average	685	1.92	0.1	-	1.8	1.9	1.9	1.9	1.9	2	2.4
O3 (ppb) Average	687	39	10	-	6	22	35	41	46	50	57
NO2 (ppb) Average	685	1.4	2	-	0	0	1	1	2	3	21
NO (ppb) Average	685	0.3	1	-	0	0	0	0	0	1	6
NOX (ppb) Average	685	1.6	2	-	0	0	0	1	2	4	27
PM2.5 (ug/m3) Average	697	2.97	2.2	-	1.1	1.5	2	2.4	3.1	4.3	24.1
Wind Speed 10 m (km/h) Average	718	7.2	4	-	0	2	4	7	10	12	21
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	720	1.35	5.3	-	-15.2	-4.7	-2.2	0.6	4.7	9.1	16.1
Relative Humidity (%) Average	720	70.4	20	-	27	39	55	74	88	95	98

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
 APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS, O3	13 Apr 2017 10:00	13 Apr 2017 10:00	1	Maintenance - manifold cleaning
PM2.5	14 Apr 2017 14:00	15 Apr 2017 11:00	22	Flat line in sensor output signal
Wind Speed, Wind Direction	16 Apr 2017 02:00	16 Apr 2017 02:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Apr 2017 21:00	30 Apr 2017 21:00	1	Flat line in sensor output signal



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3 ppb on Apr 3 14:00	Maximum Daily Average: 0.7 ppb on Apr 3		Hours of Data:	685
Minimum Value: 0 ppb on Apr 5 00:00	Minimum Daily Average: 0.0 ppb on Apr 8		Hours of Missing Data:	35
Maximum Diurnal Average: 0.4 ppb at hour 14	Minimum Diurnal Average: 0.2 ppb at hour 4		Hours of Calibration:	35
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 1		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Apr	0	0	Z	0	0	0	0	0	0	1	1	1	2	2	3	1	0	0	0	0	1	0	0	0	0.7	3
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.3	1
6-Apr	0	0	0	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.2	1
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.3	1
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0.3	1
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	Z	0	0	0	0	0	0	0	0	C	C	C	C	C	1	0	1	1	0	0	0	0	0	0	0.3	1
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
19-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
20-Apr	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.4	1
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
22-Apr	1	1	1	Z	1	0	0	1	2	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.5	2
23-Apr	0	0	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.2	1
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0.4	1
26-Apr	1	Z	1	1	0	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1
27-Apr	0	1	Z	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
30-Apr	0	0	0	0	0	Z	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2

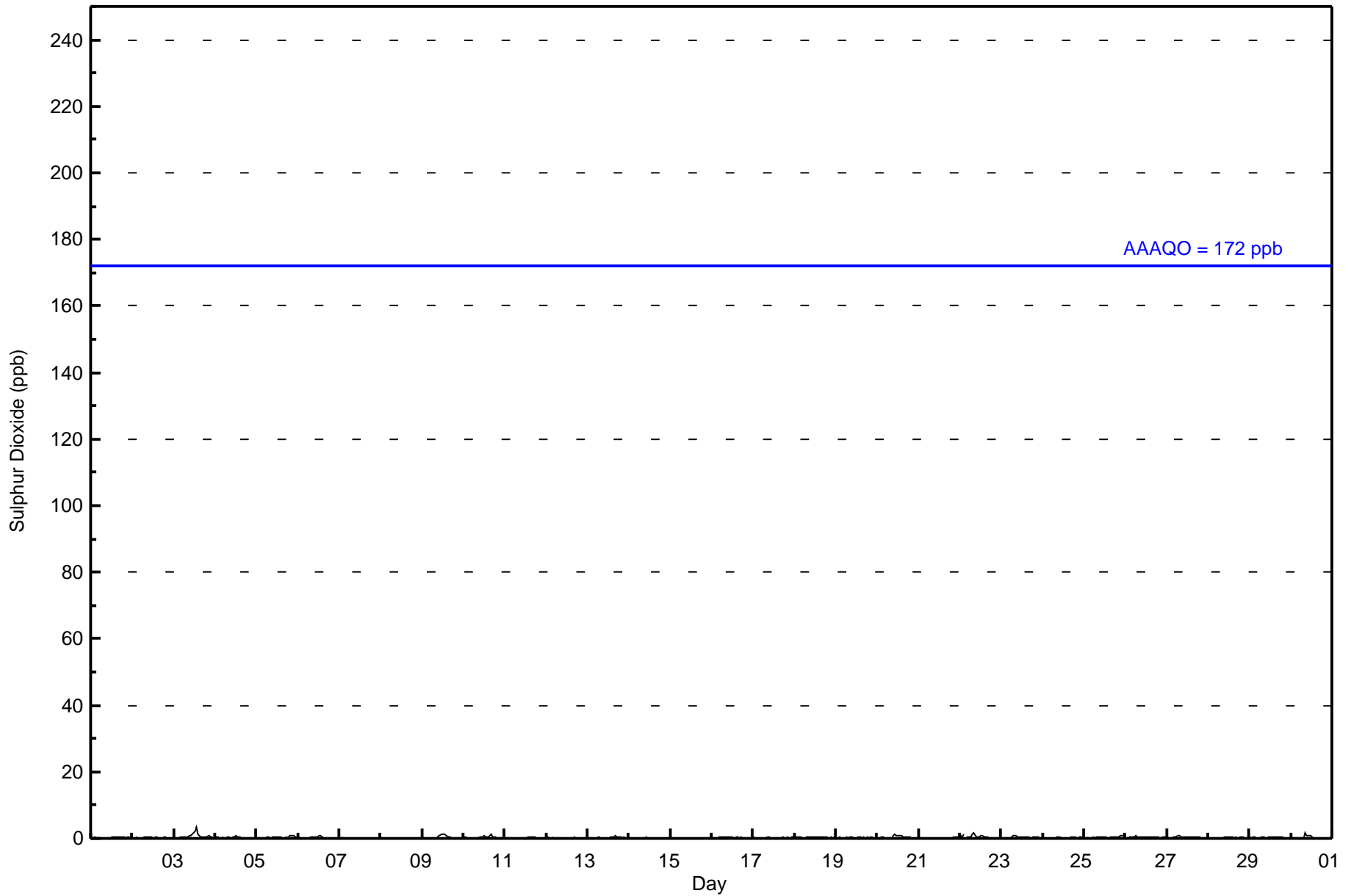
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
1	1	1	1	1	1	0	1	1	2	1	1	2	2	3	1	1	1	1	1	0	1	1	1	1	1	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	685	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Conklin - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

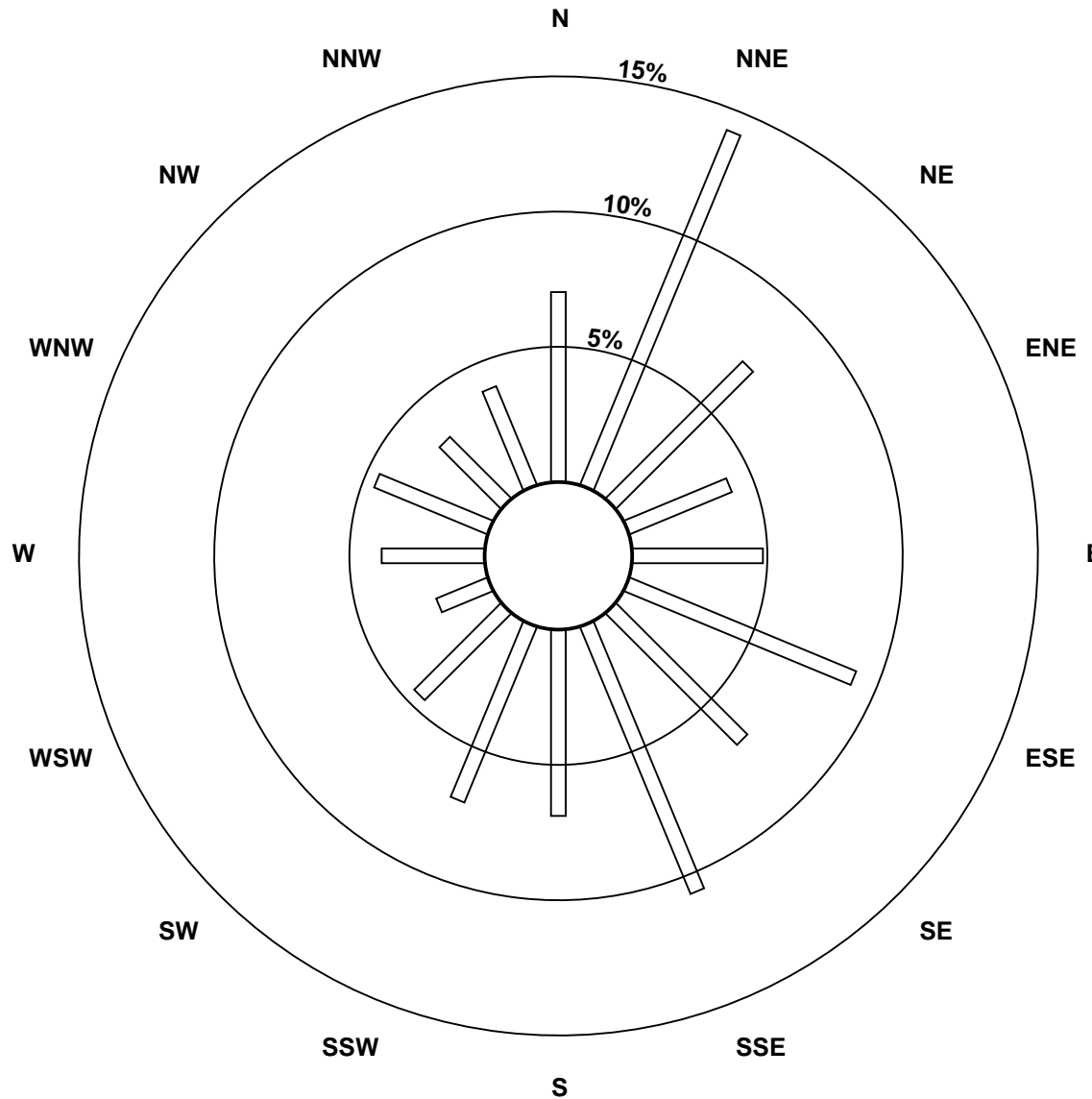
Total Number of Valid Hours: 683

Total Number of Hours: 720

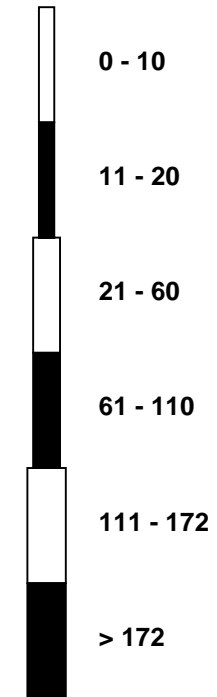


Wood Buffalo Environmental Association
Wind Rose Apr 2017

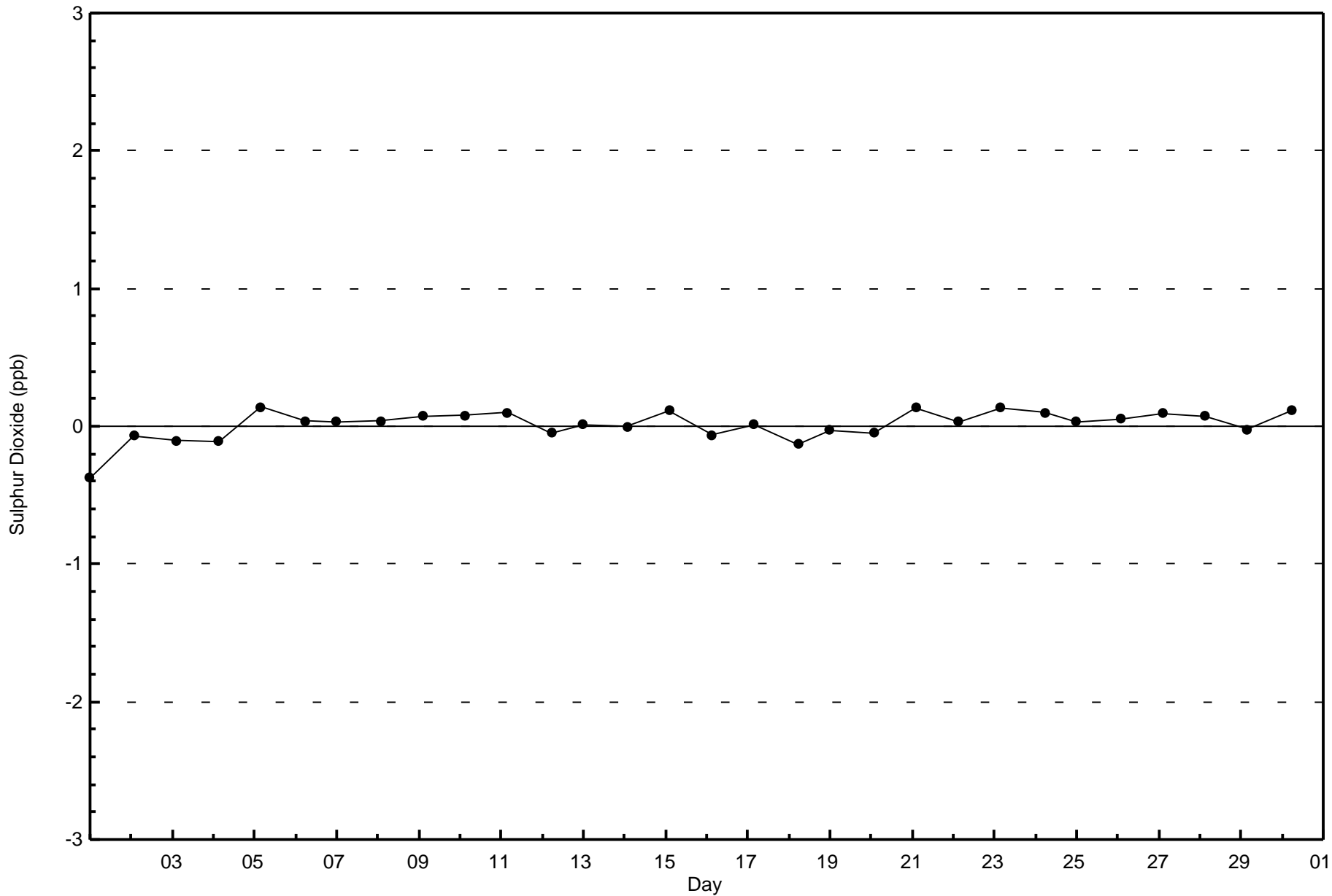
Sulphur Dioxide (SO₂) - ppb
Conklin (AMS 21)

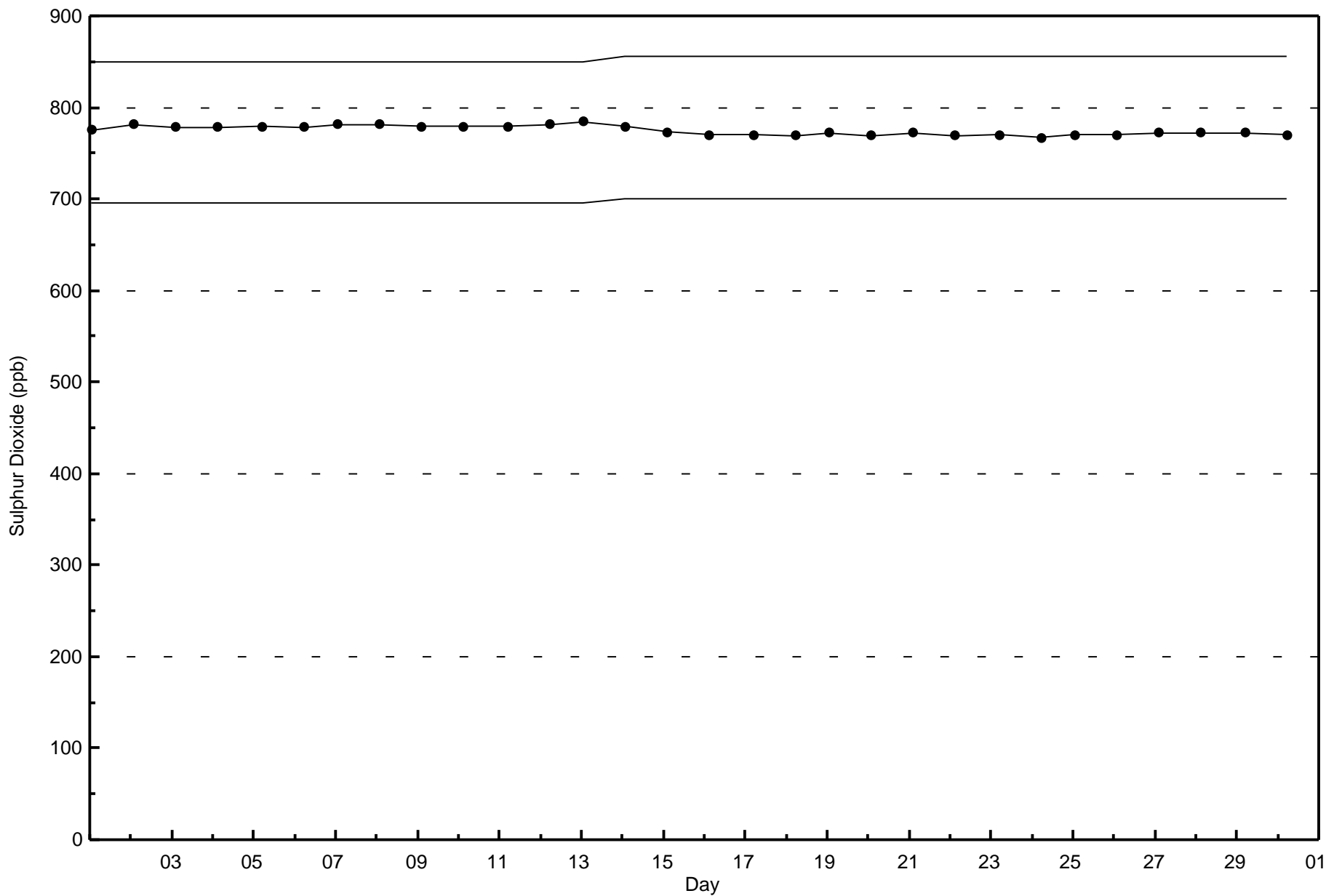


Classes (ppb)



Total Number of Valid Hours: 683







Summary of Hour Averages

Conklin - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 0 ppb on Apr 6 09:00	Maximum Daily Average: 0.4 ppb on Apr 2		Hours of Data:	686
Minimum Value: 0 ppb on Apr 11 05:00	Minimum Daily Average: 0.3 ppb on Apr 11		Hours of Missing Data:	34
Maximum Diurnal Average: 0.4 ppb at hour 9	Minimum Diurnal Average: 0.3 ppb at hour 2		Hours of Calibration:	33
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
6-Apr	0	0	0	0	0	0	Z	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
12-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
13-Apr	0	Z	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
20-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0

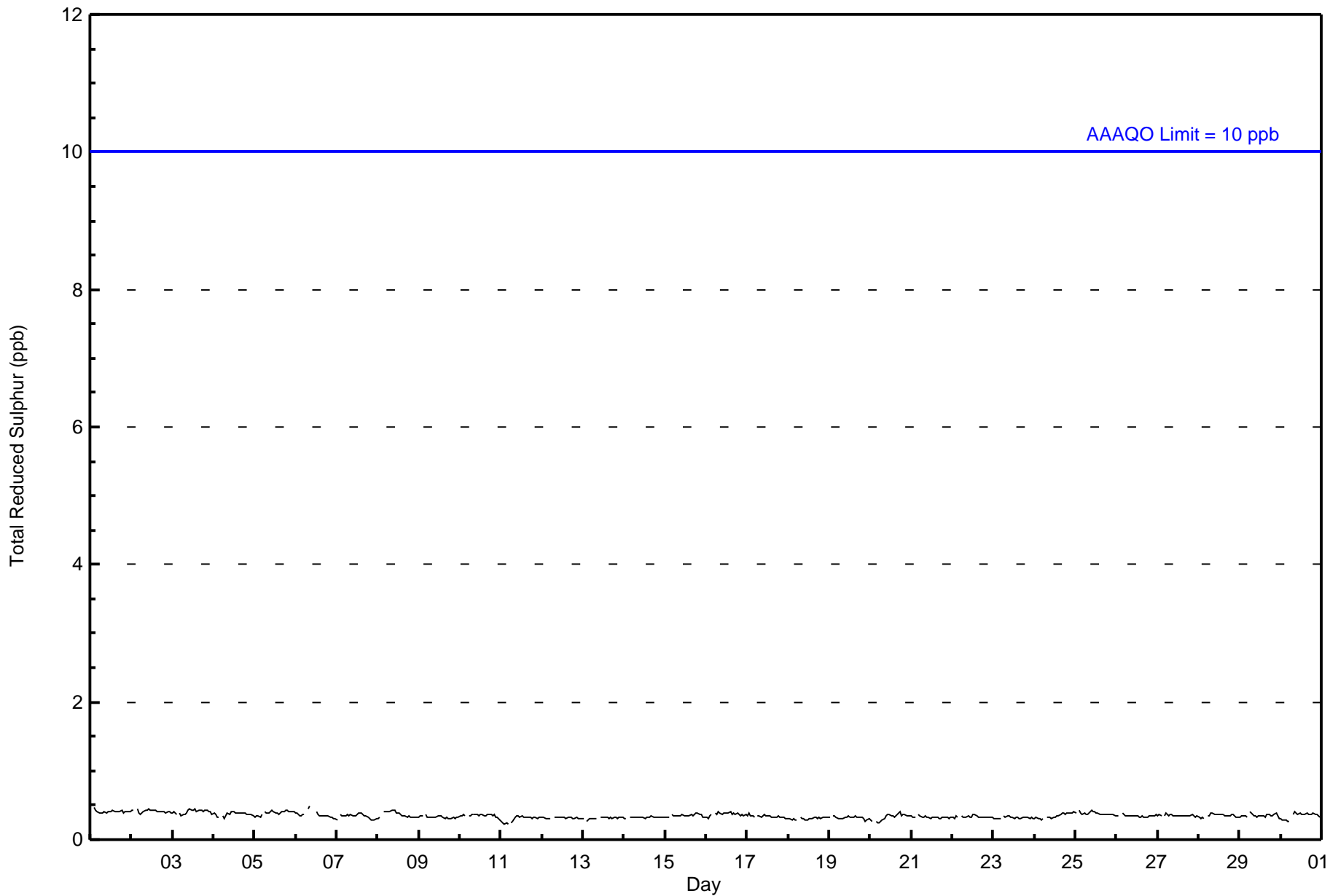
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	Diurnal Average
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Conklin - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	686	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Conklin - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	49	96	51	32	33	62	46	66	52	49	31	13	25	29	23	27	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	96	51	32	33	62	46	66	52	49	31	13	25	29	23	27	684

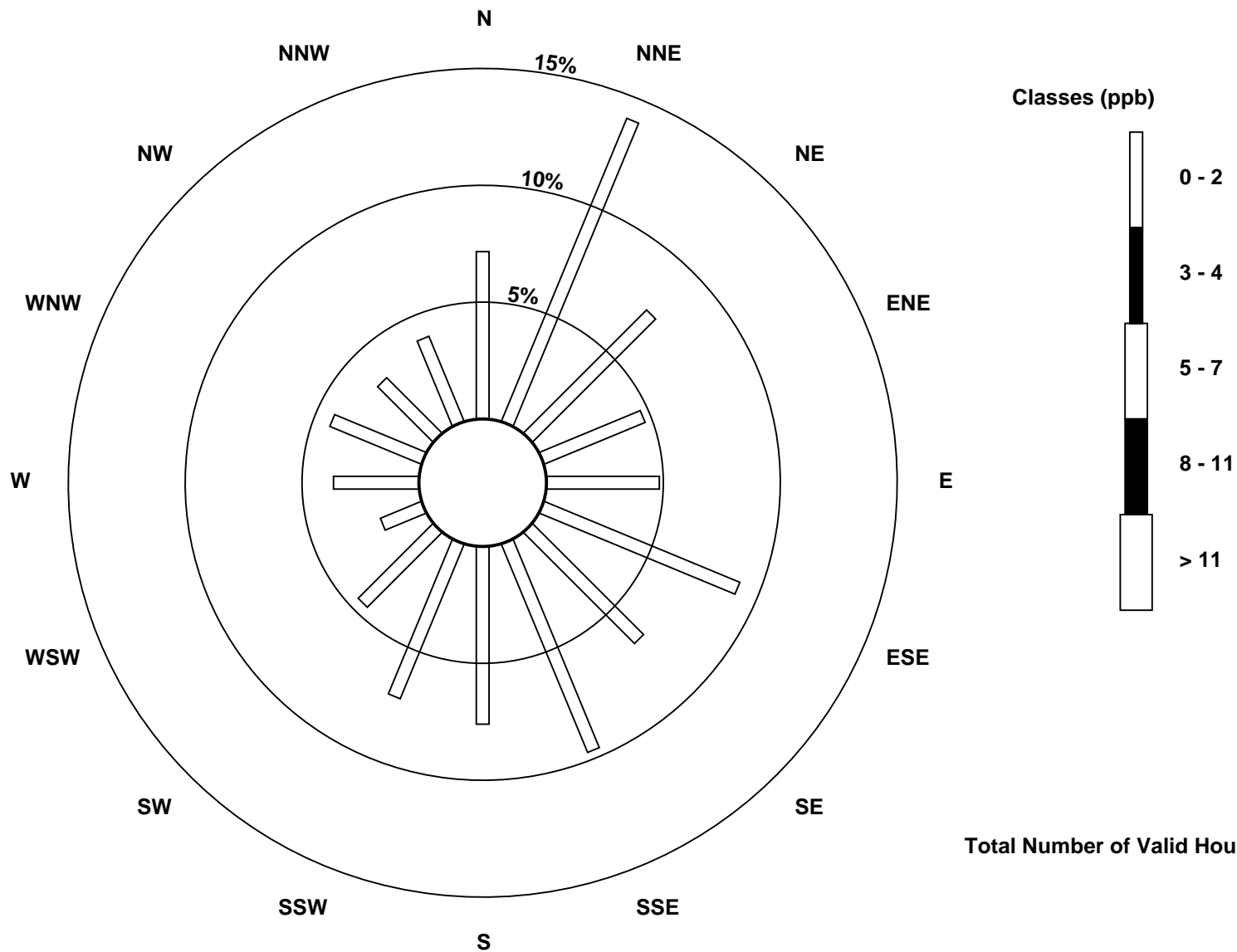
Total Number of Valid Hours: 684

Total Number of Hours: 720

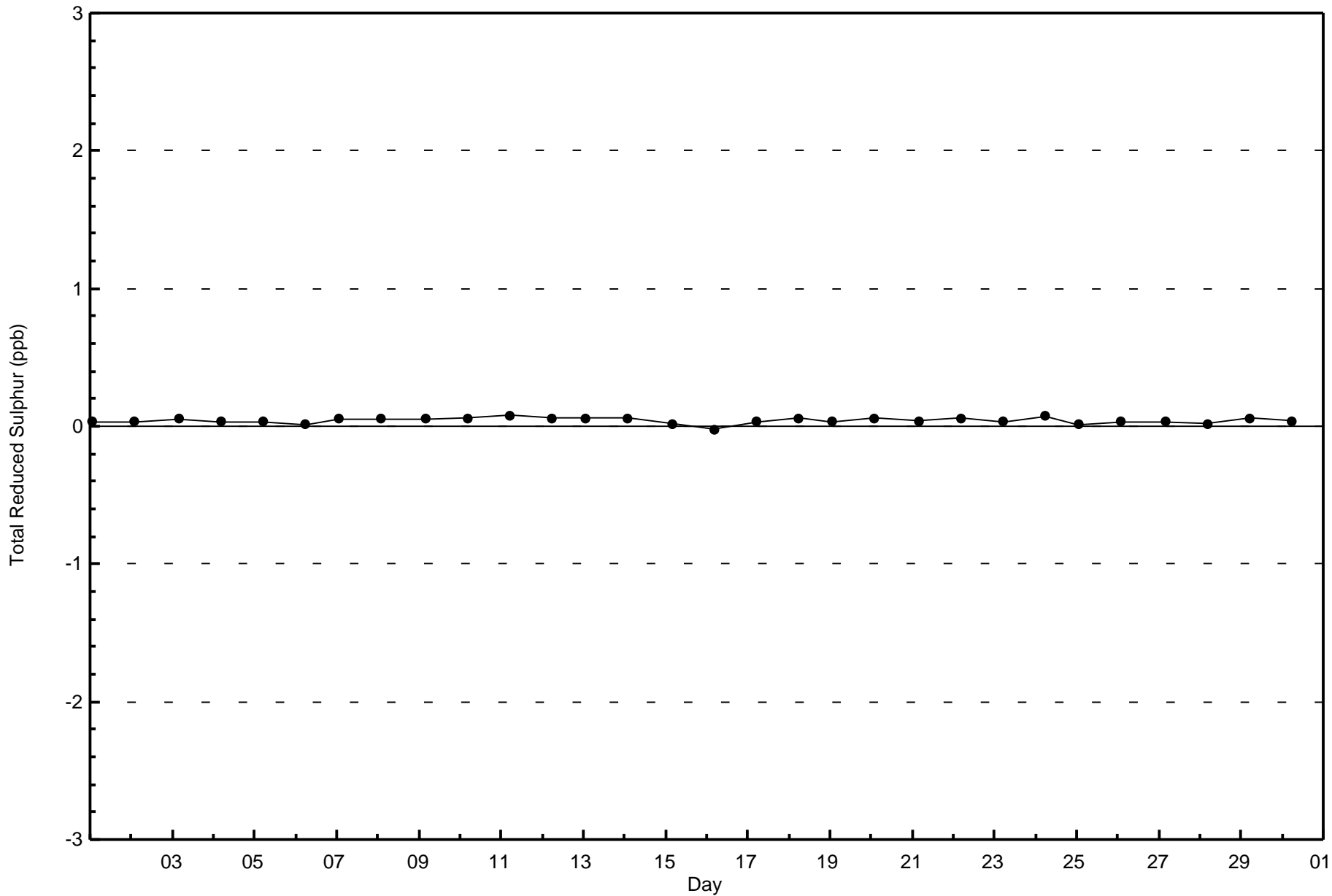


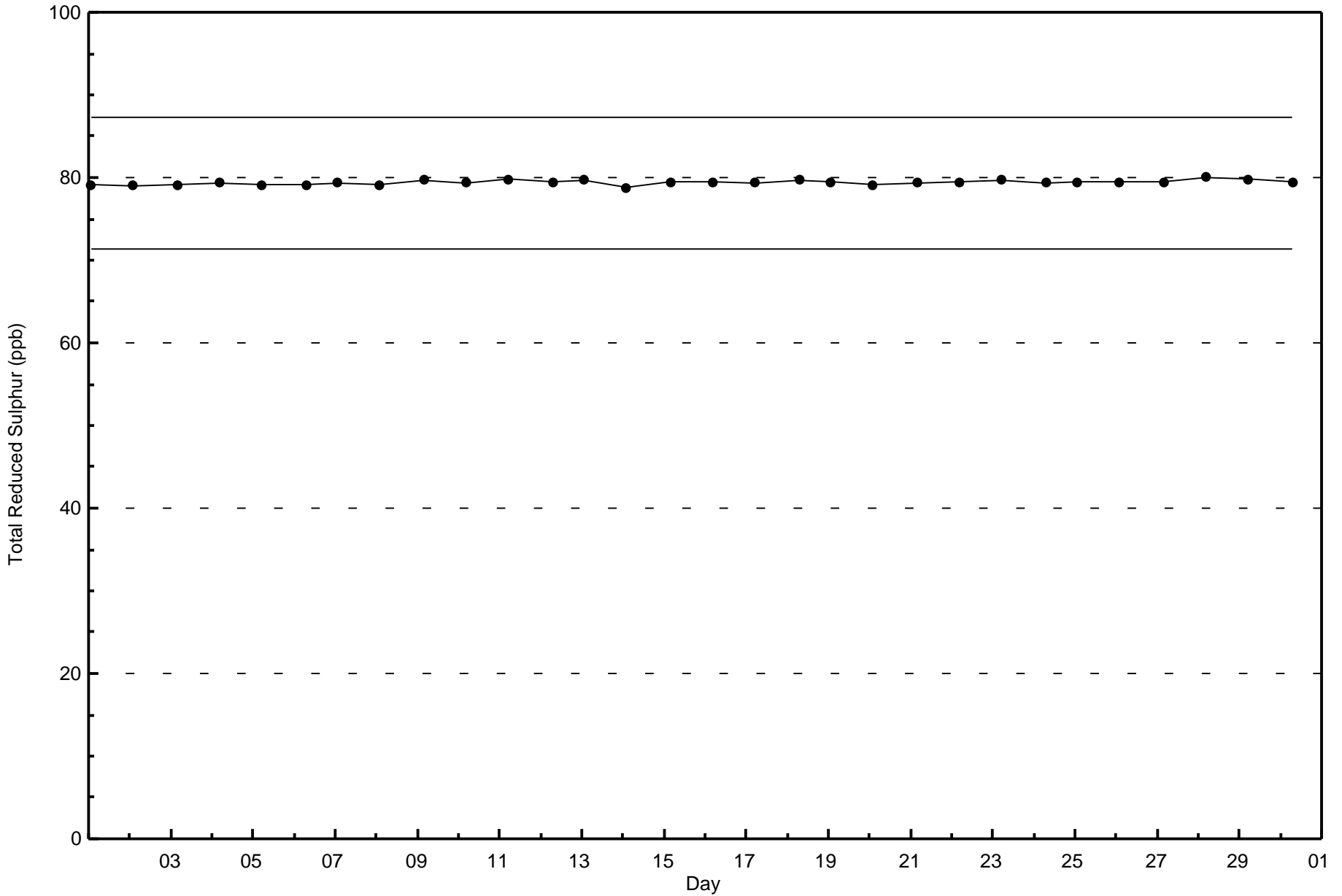
Wood Buffalo Environmental Association
Wind Rose Apr 2017

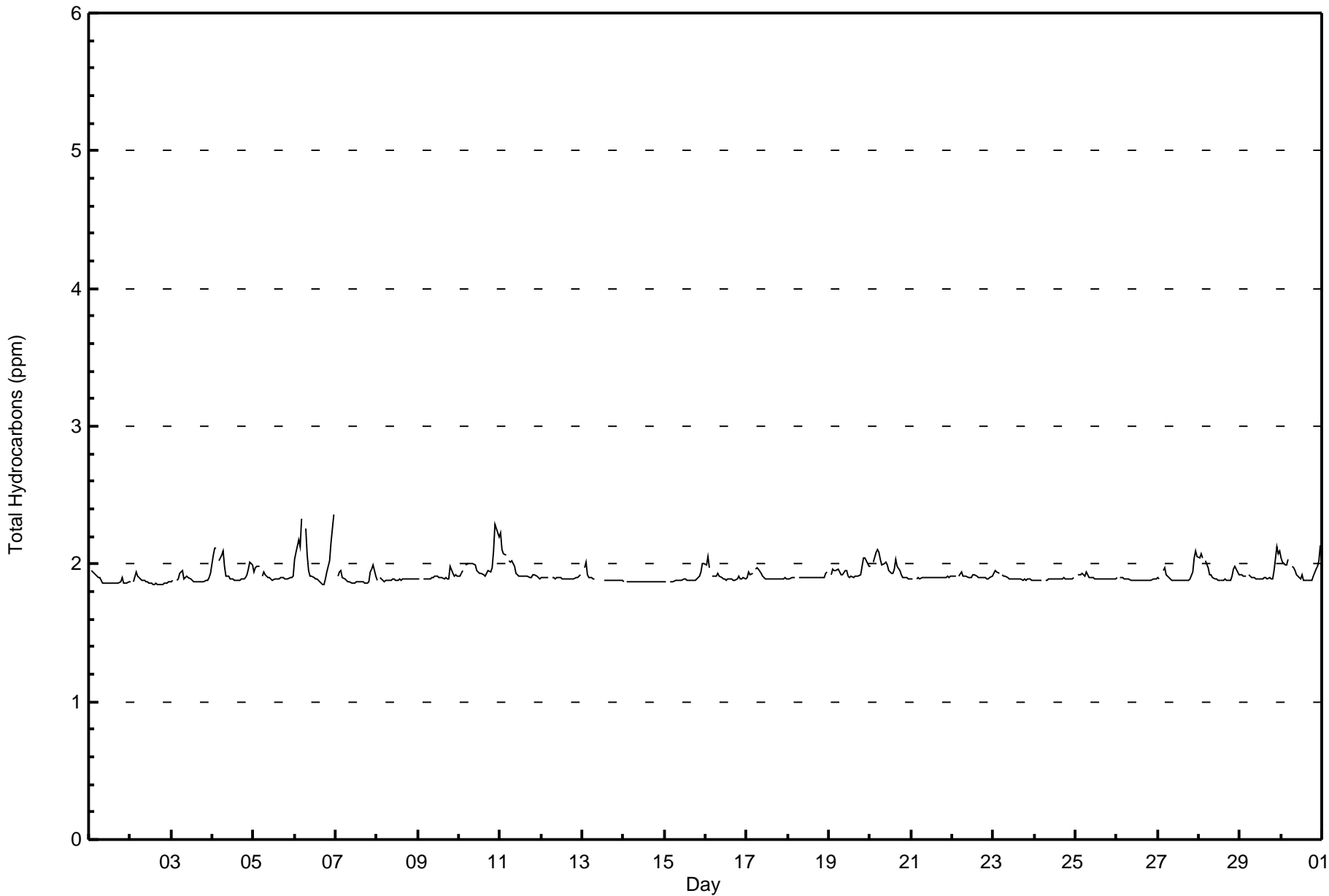
Total Reduced Sulphur (TRS) - ppb
Conklin (AMS 21)



Total Number of Valid Hours: 684









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	652	95.18	95.18
2.1 - 3.0	33	4.82	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	48	97	49	28	32	61	44	63	41	44	28	13	23	31	22	27	651
2.1 - 3.0	0	0	0	0	1	1	3	10	6	4	3	1	3	0	0	0	32
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

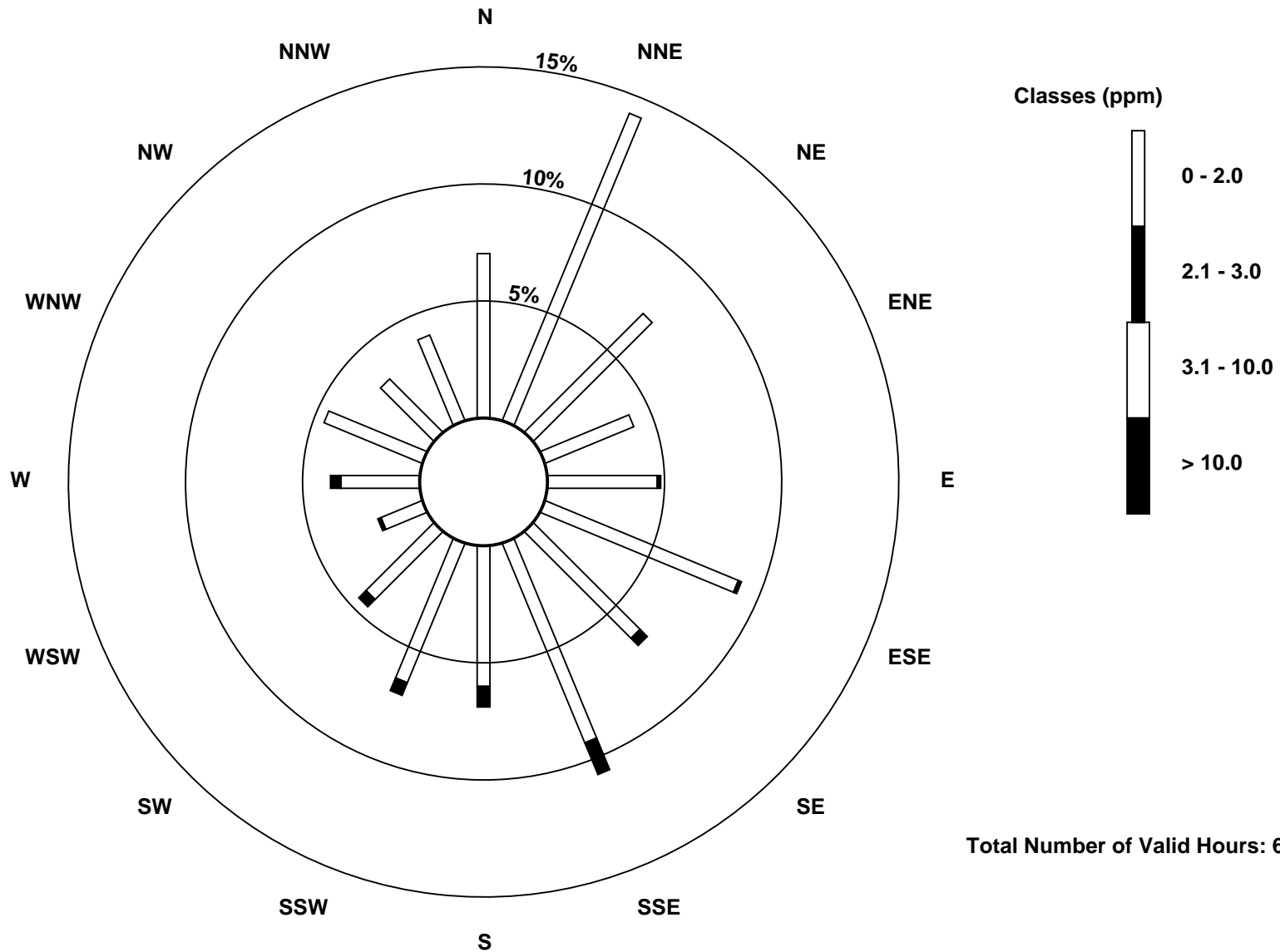
Total Number of Valid Hours: 683

Total Number of Hours: 720

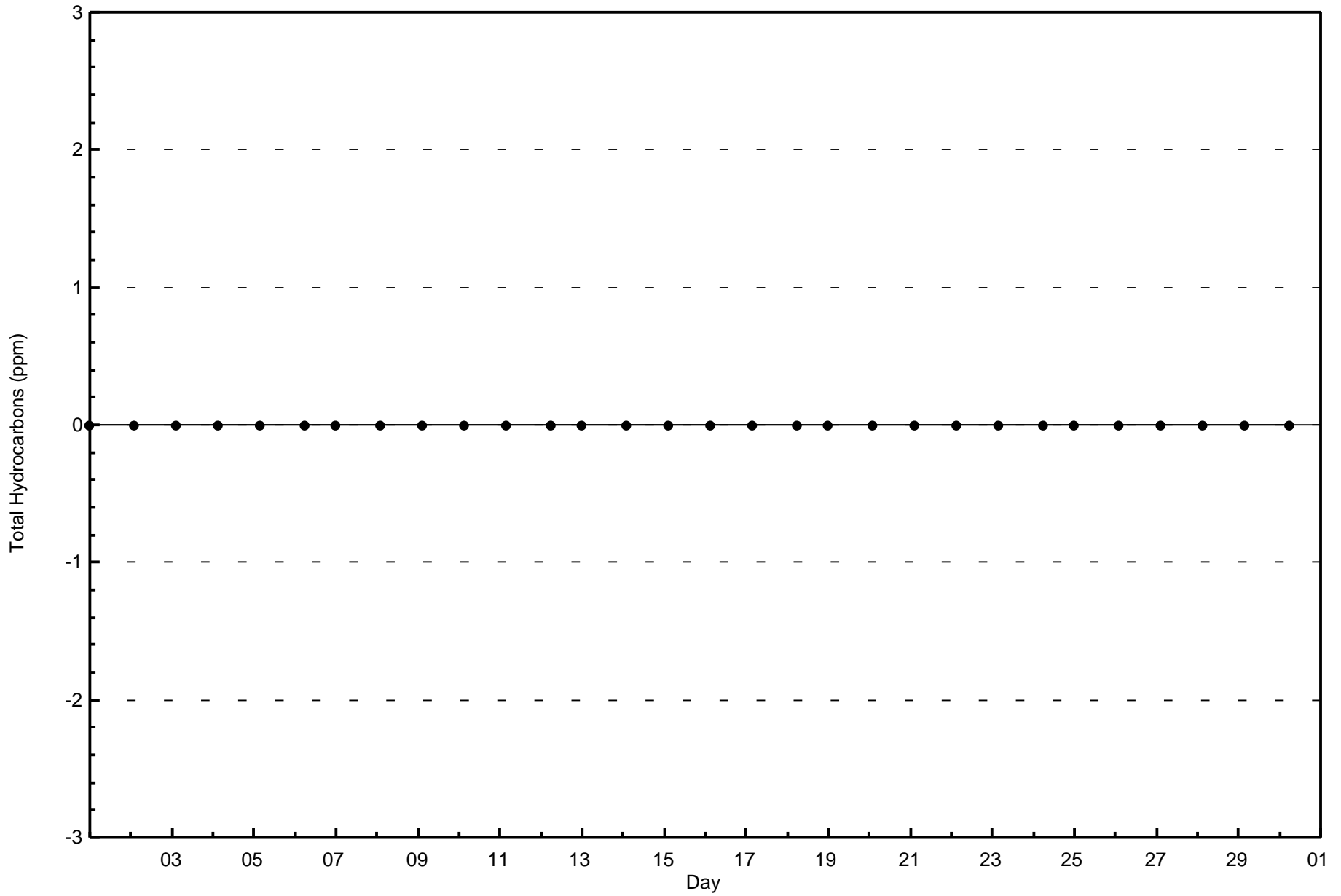


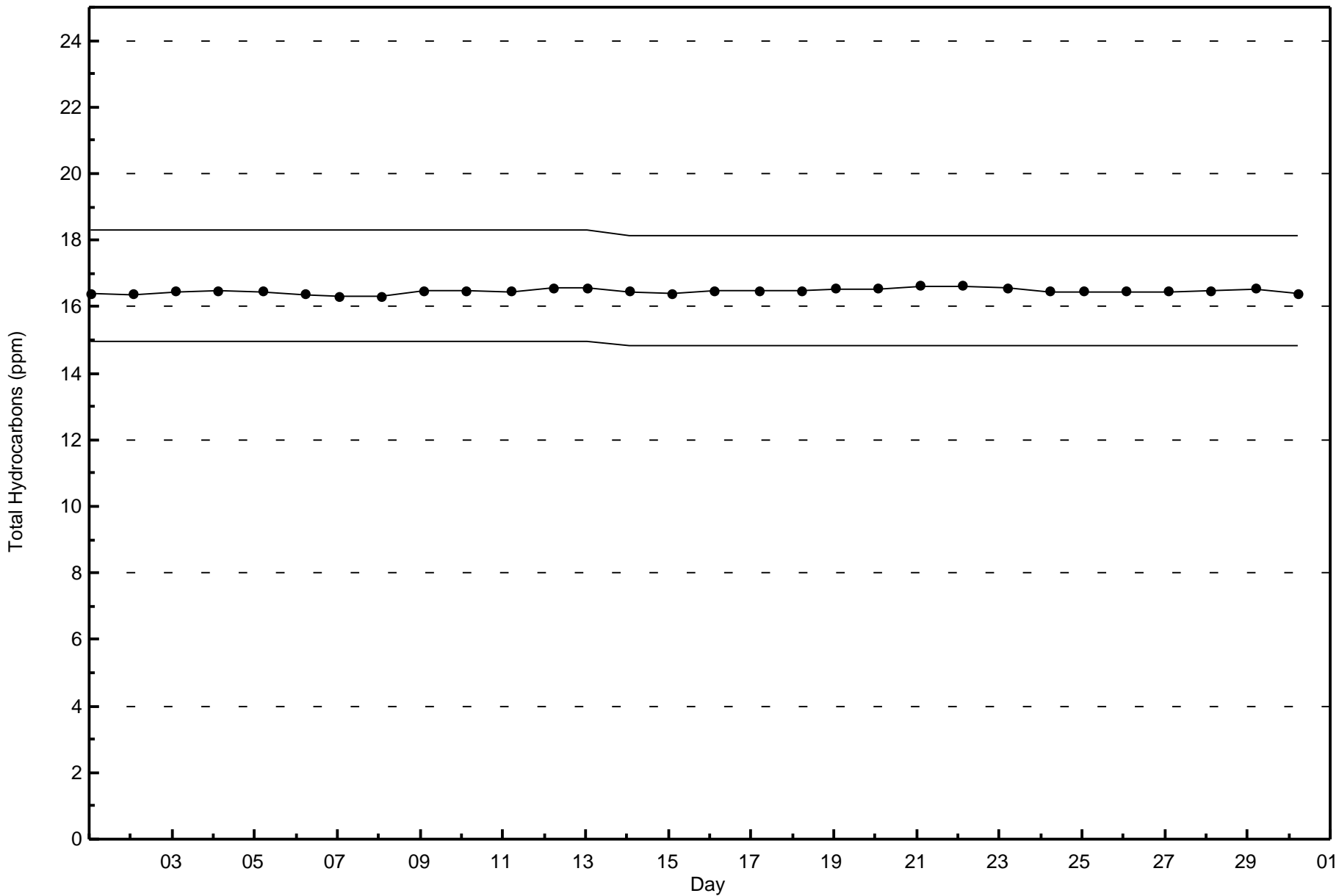
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Conklin (AMS 21)



Total Number of Valid Hours: 683







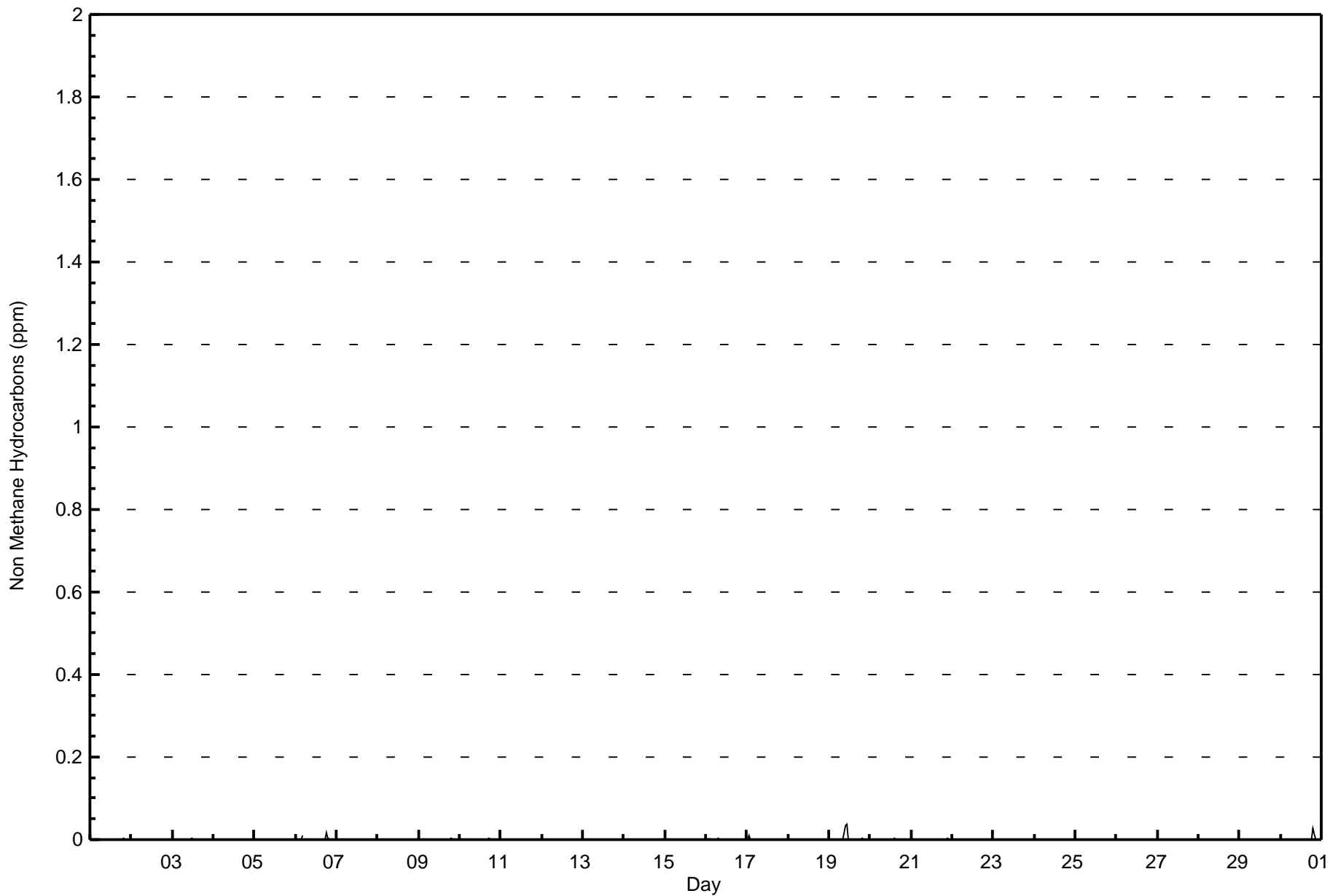
Summary of Hour Averages

Conklin - April 2017

Maximum Value: 0.036 ppm on Apr 19 11:00		Maximum Daily Average: 0.003 ppm on Apr 19		Hours in Service: 720
Minimum Value: 0.000 ppm on Apr 1 02:00		Minimum Daily Average: 0.000 ppm on Apr 2		Hours of Data: 685
Maximum Diurnal Average: 0.001 ppm at hour 20		Minimum Diurnal Average: 0.000 ppm at hour 6		Hours of Missing Data: 35
Monthly Average: 0.000 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0		Hours of Calibration: 35
Percent Operational Time: 100.0				

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002			
2-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
3-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003	
4-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
5-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
6-Apr	0.000	0.000	0.000	0.000	0.009	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018			
7-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
8-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
9-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003	
10-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	
11-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
14-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
16-Apr	0.000	0.000	0.004	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
17-Apr	0.000	0.009	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.009	
18-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.035	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.036	0.036	
20-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.005	
21-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	
22-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
23-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
24-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
26-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
27-Apr	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002
28-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30-Apr	0.003	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.027	0.027	
0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.000 0.000 0.000 0.000																								Diurnal Average									
0.003 0.009 0.004 0.002 0.009 0.000 0.001 0.003 0.000 0.035 0.036 0.003 0.000 0.000 0.005 0.000 0.000 0.003 0.018 0.027 0.001 0.002 0.000 0.000																								Diurnal Maximum									

Z - zerspan	C - Calibration
-------------	-----------------





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Conklin - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	679	99.12	99.12
0.006 - 0.05	6	0.88	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



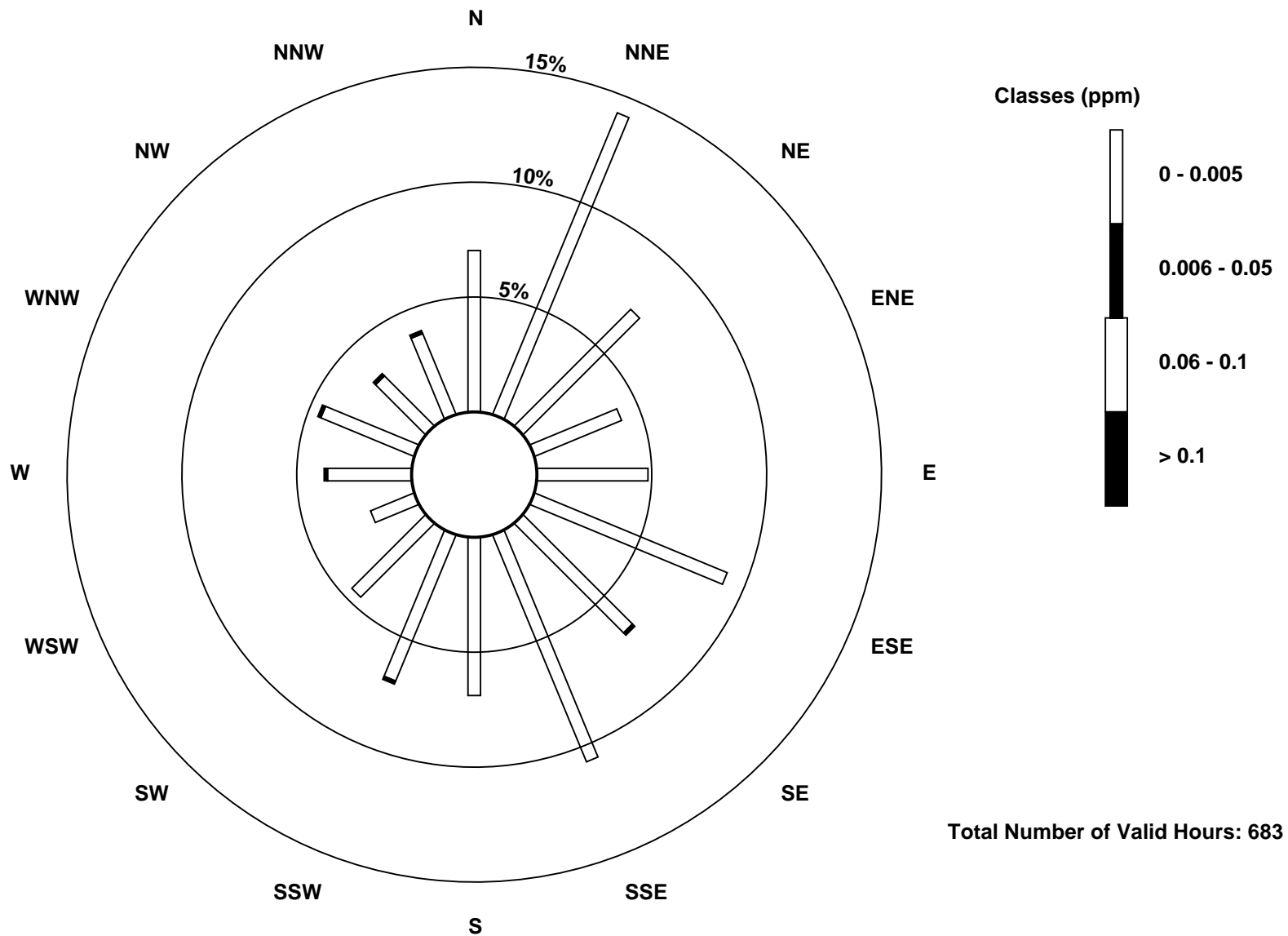
**Wood Buffalo Environmental Association
Frequency Distribution**

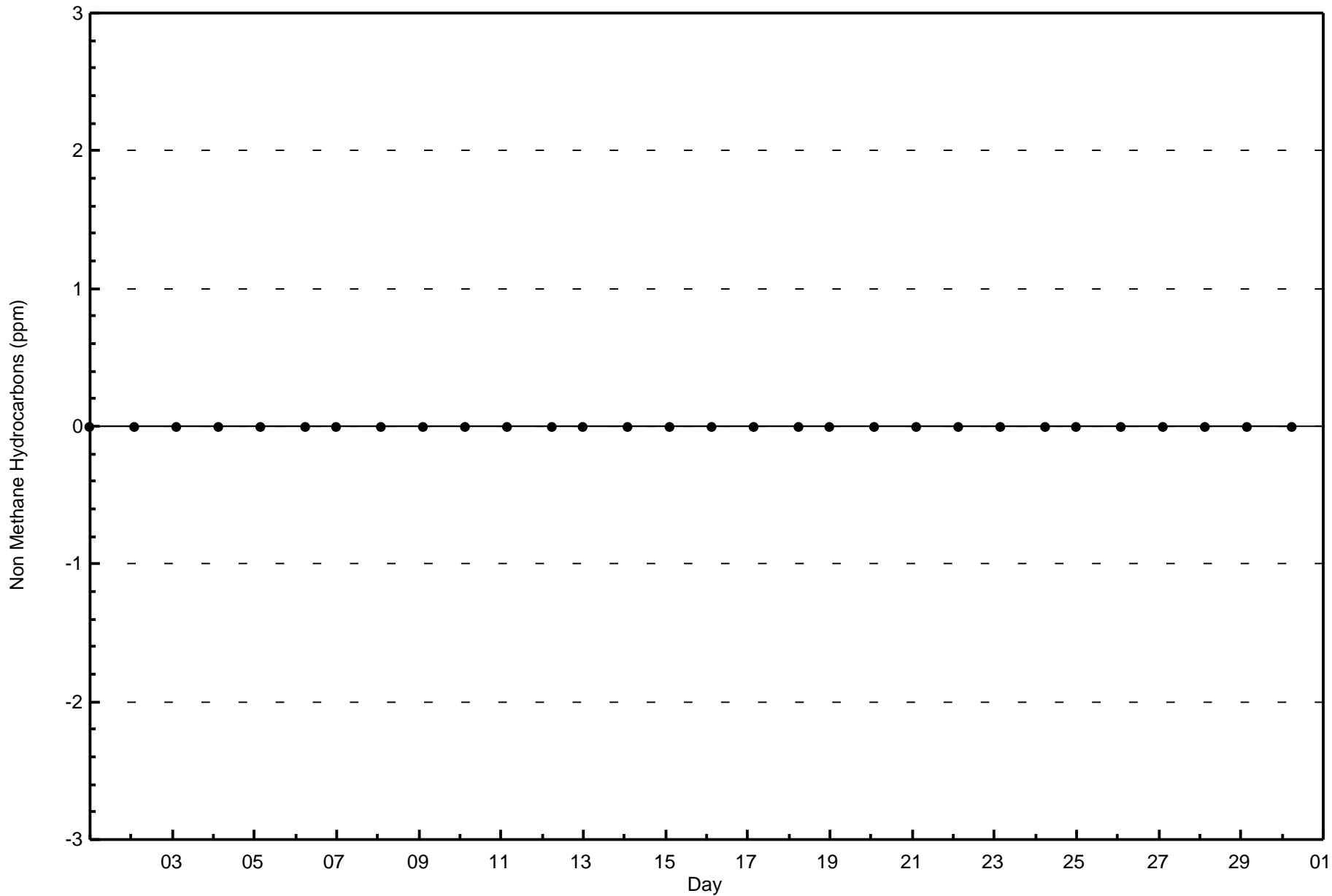
**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - April 2017**

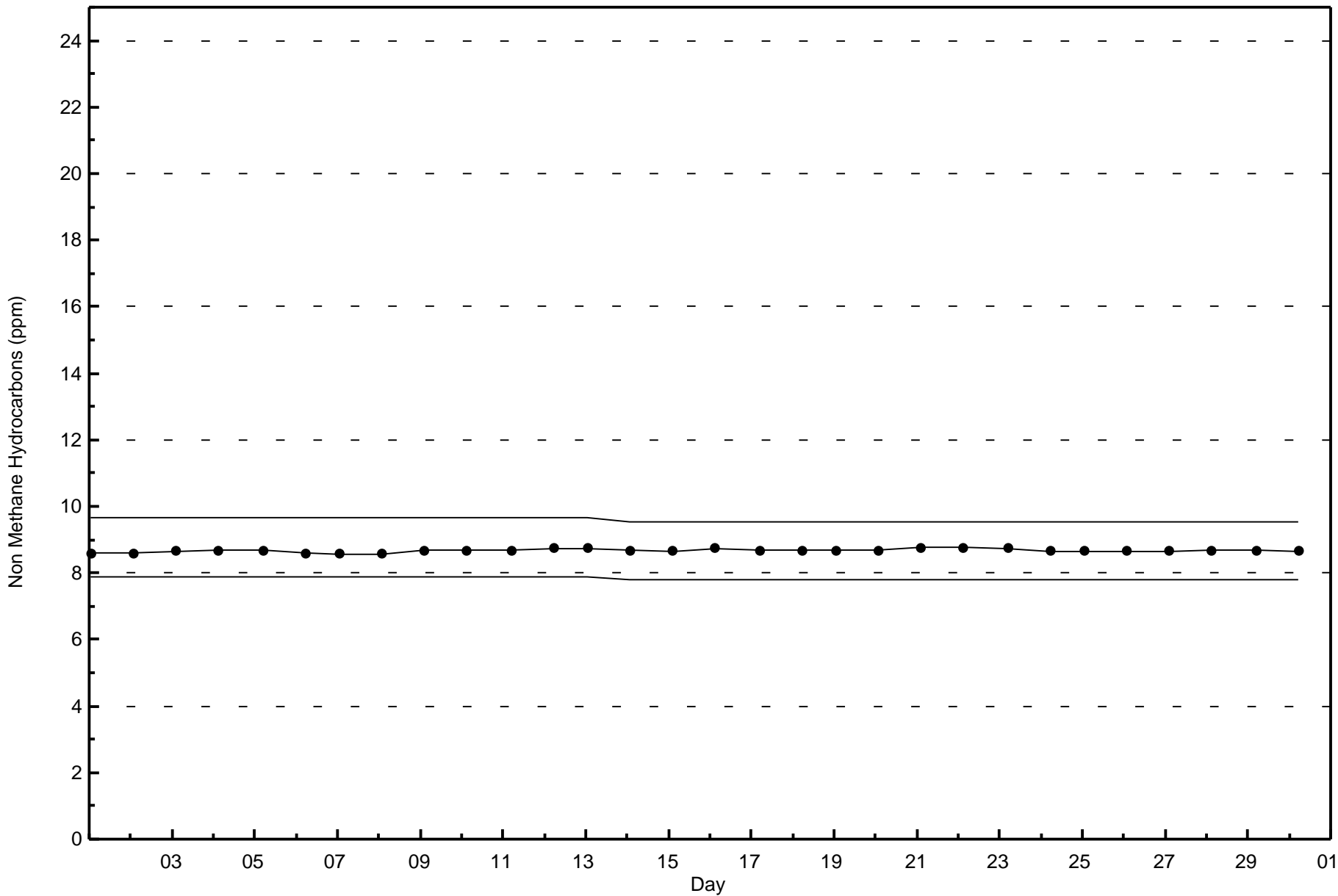
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	48	97	49	28	33	62	46	73	47	47	31	14	25	30	21	26	677
0.006 - 0.05	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	1	6
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

Total Number of Valid Hours: 683

Total Number of Hours: 720









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Conklin - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 2.4 ppm on Apr 7 00:00	Maximum Daily Average: 2.0 ppm on Apr 6
Minimum Value: 1.8 ppm on Apr 6 17:00	Minimum Daily Average: 1.9 ppm on Apr 14
Maximum Diurnal Average: 2.0 ppm at hour 3	Minimum Diurnal Average: 1.9 ppm at hour 17
Monthly Average: 1.92 ppm	Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 1.9 Median = 1.9 Q ₃ = 1.9 P ₉₀ = 2.0 P ₉₉ = 2.2
	Hours of Data: 685
	Hours of Missing Data: 35
	Hours of Calibration: 35
	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24									
1-Apr	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0
2-Apr	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
3-Apr	1.9	1.9	Z	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
4-Apr	2.1	2.1	2.1	Z	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Apr	1.9	2.0	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
6-Apr	2.0	2.1	2.2	2.1	2.3	Z	2.3	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	2.0	2.2	2.3	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
7-Apr	Z	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
8-Apr	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
9-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
10-Apr	1.9	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
11-Apr	2.2	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2
12-Apr	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
13-Apr	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	C	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
14-Apr	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
15-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
16-Apr	2.0	2.1	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
17-Apr	1.9	1.9	1.9	1.9	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
18-Apr	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
19-Apr	Z	1.9	2.0	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
20-Apr	2.0	Z	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
21-Apr	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
22-Apr	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
23-Apr	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
24-Apr	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
25-Apr	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
26-Apr	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
27-Apr	1.9	1.9	Z	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
28-Apr	2.0	2.1	2.0	Z	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
29-Apr	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
30-Apr	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1

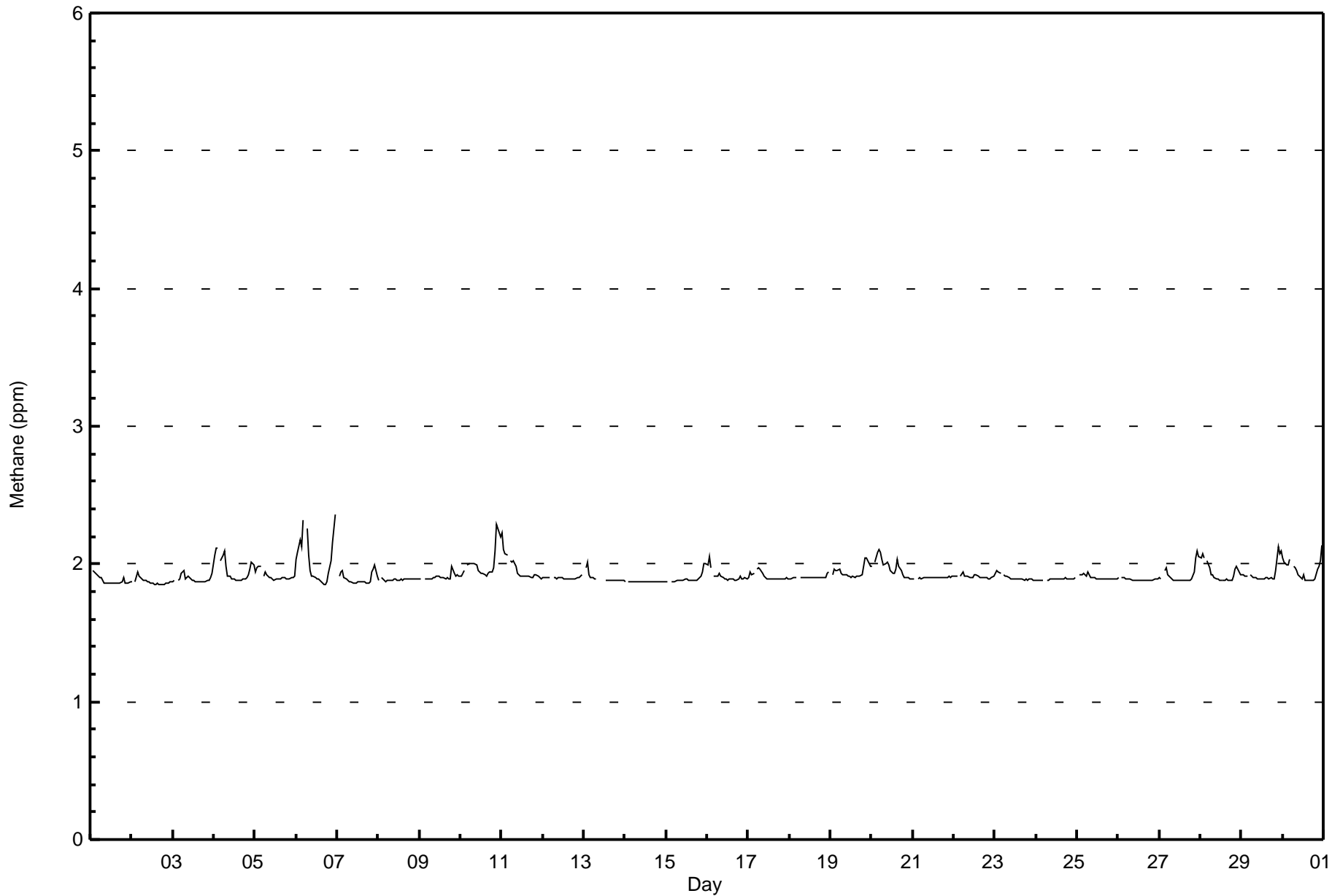
1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	Diurnal Average	
2.2	2.1	2.2	2.1	2.3	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.3	2.3	2.4	Diurnal Maximum	

Z - zerspan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Conklin - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	652	95.18	95.18
2.1 - 3.0	33	4.82	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	48	97	49	28	32	61	44	63	41	44	28	13	23	31	22	27	651
2.1 - 3.0	0	0	0	0	1	1	3	10	6	4	3	1	3	0	0	0	32
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

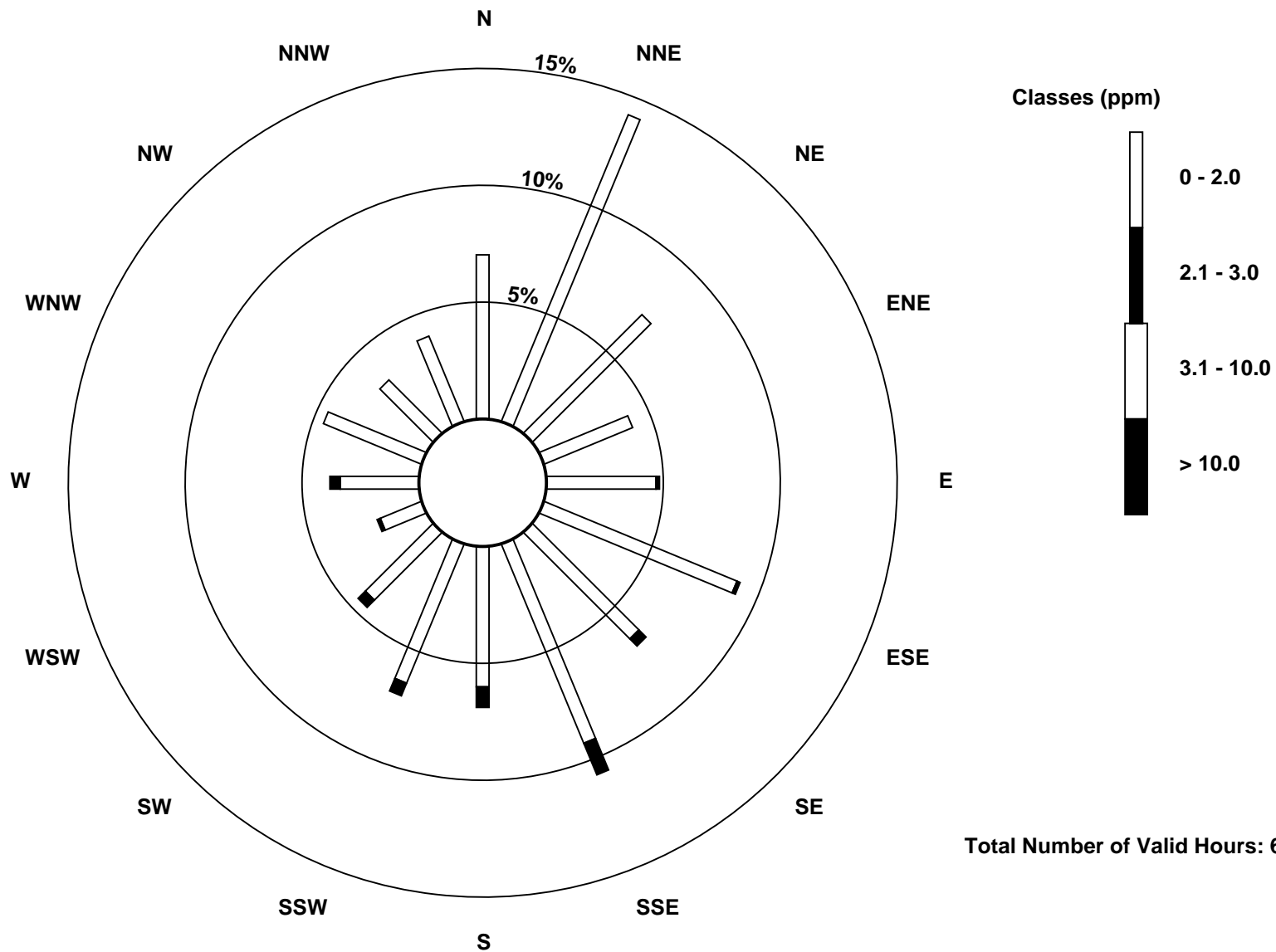
Total Number of Valid Hours: 683

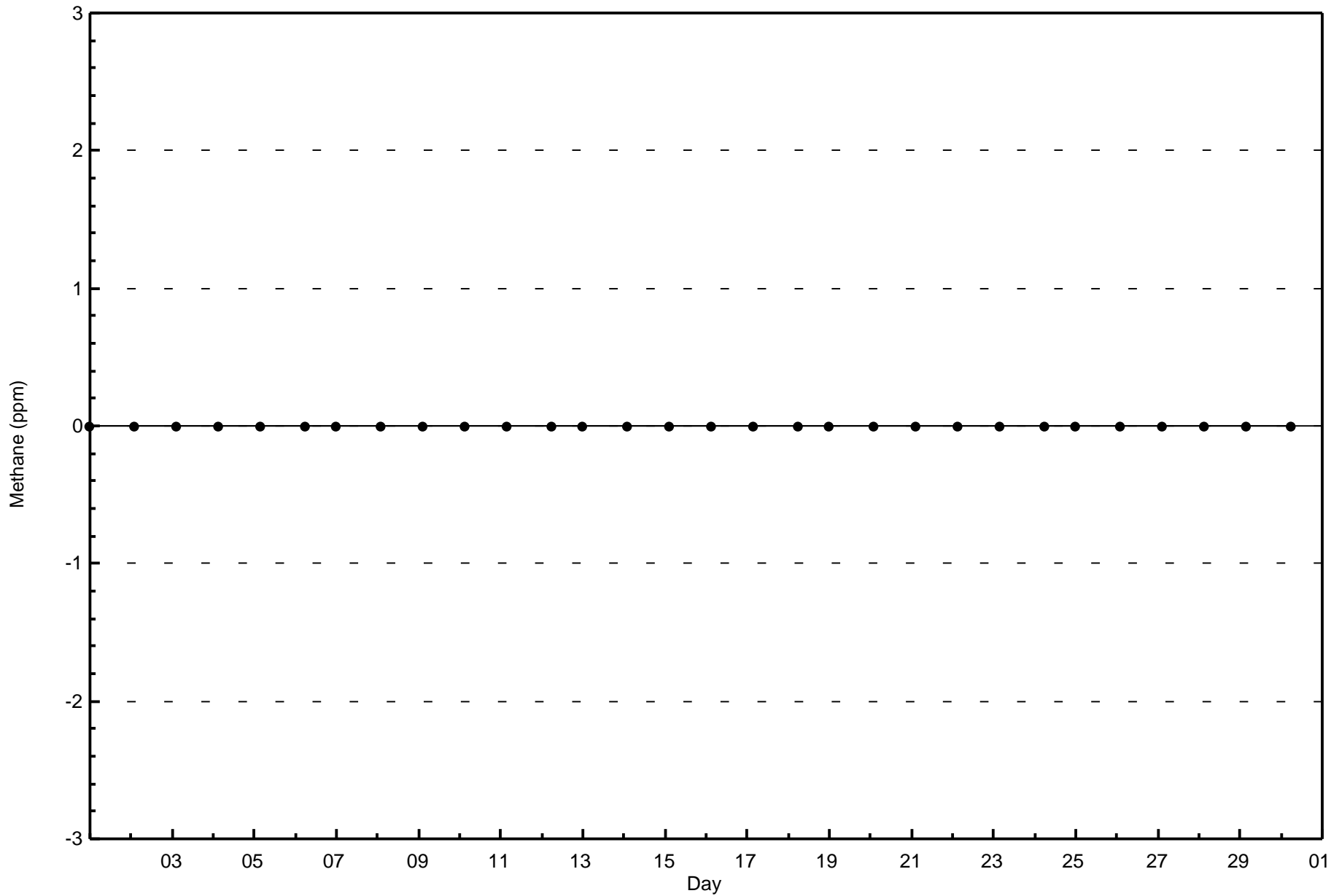
Total Number of Hours: 720

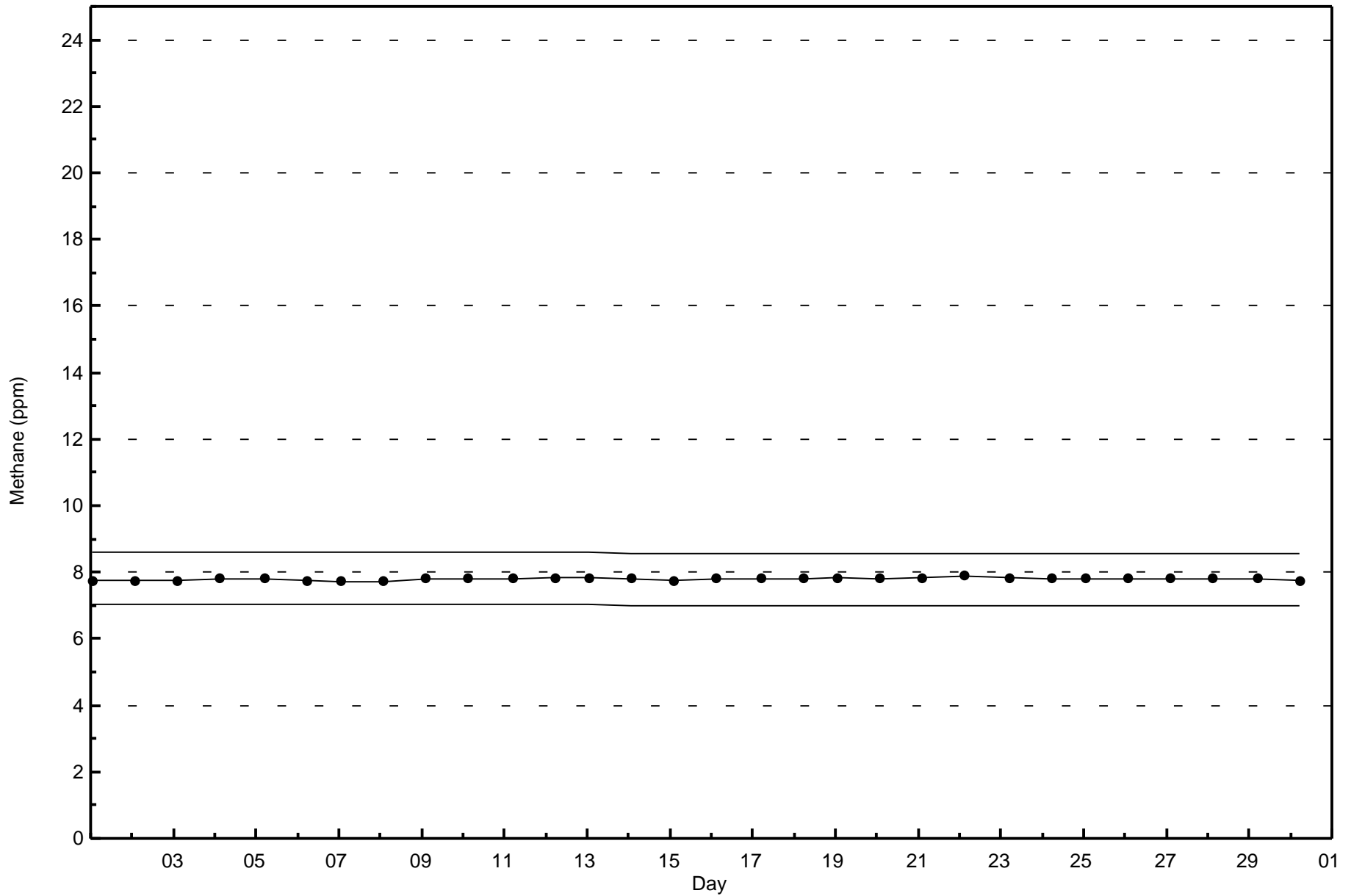


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Methane (CH₄) - ppm
Conklin (AMS 21)







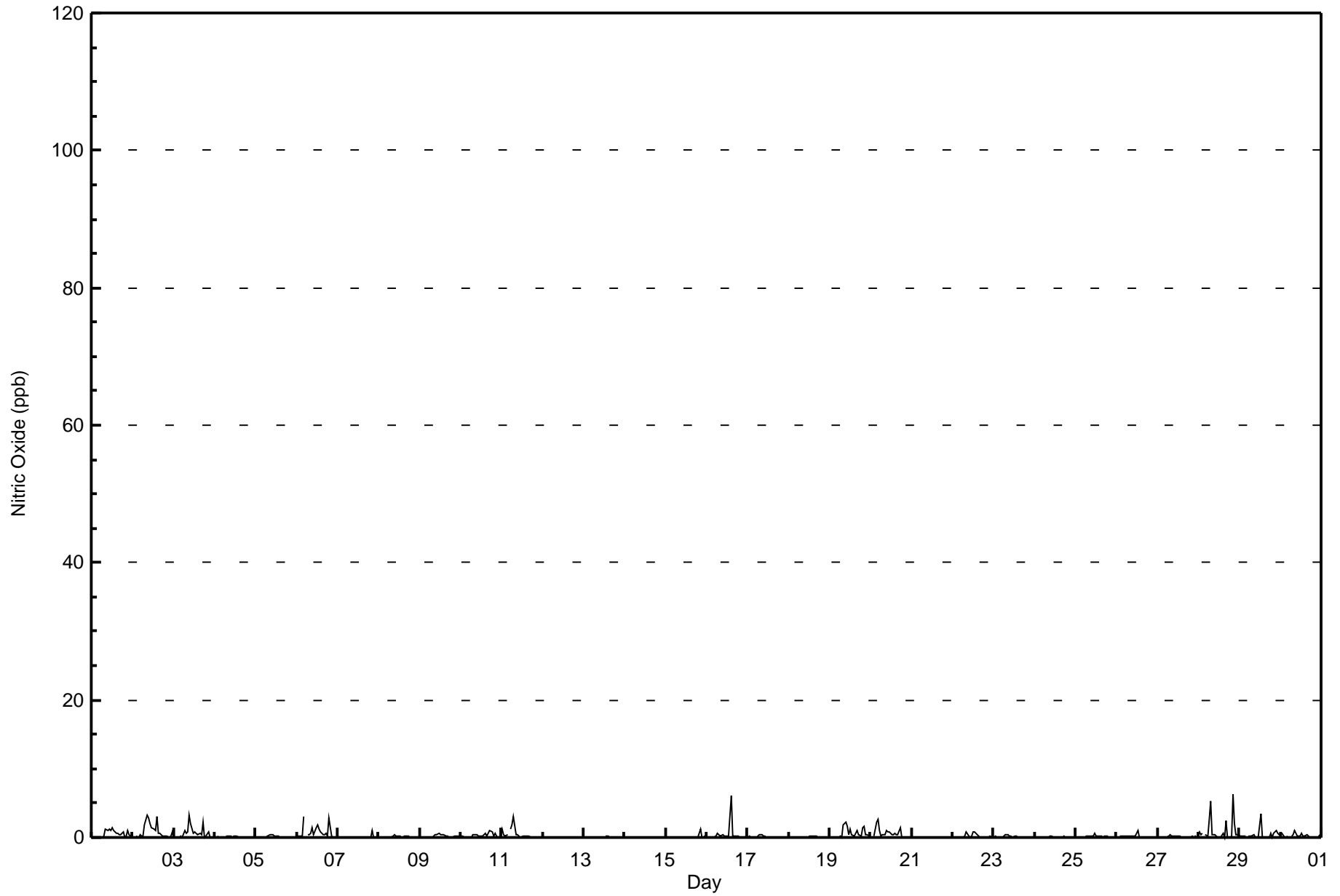


Maximum Value: 6 ppb on Apr 28 21:00																	Maximum Daily Average: 1.1 ppb on Apr 28																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 1 02:00																	Minimum Daily Average: 0.0 ppb on Apr 14																	Hours of Data: 685	
Maximum Diurnal Average: 0.6 ppb at hour 10																	Minimum Diurnal Average: 0.1 ppb at hour 3																	Hours of Missing Data: 35	
Monthly Average: 0.3 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 3																	Hours of Calibration: 35	
																	Percent Operational Time: 100.0																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	1	0	0	1	0	0	0.5	1									
2-Apr	0	Z	0	0	0	0	0	2	3	3	2	2	1	1	3	1	1	0	0	0	0	0	0	1	0.9	3									
3-Apr	0	0	Z	0	0	0	1	1	1	3	2	1	1	1	0	1	0	2	0	0	1	0	0	0	0.6	3									
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
6-Apr	0	0	0	0	3	Z	0	0	1	1	0	1	2	1	1	0	0	1	0	3	0	0	0	0	0.7	3									
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.1	1									
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1									
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0.3	1									
11-Apr	1	0	0	1	Z	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3									
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
13-Apr	Z	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.1	1									
16-Apr	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0.4	6									
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
19-Apr	Z	0	0	0	0	0	0	0	2	2	2	0	1	0	0	1	1	0	0	1	2	0	0	0	0.6	2									
20-Apr	0	Z	0	2	3	1	0	0	0	1	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0.6	3									
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
22-Apr	0	0	0	Z	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.2	1									
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0									
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1									
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0									
28-Apr	1	0	1	Z	0	0	3	5	0	0	0	0	0	0	1	0	2	0	0	0	6	2	0	0	1.1	6									
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	1	1	1	0	0.4	4									
30-Apr	1	1	0	0	0	Z	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1									
																	Diurnal Average		Diurnal Maximum																
																	0.1		1																
																	0.1		1																
																	0.1		1																
																	0.1		2																
																	0.3		3																
																	0.1		1																
																	0.3		3																
																	0.5		5																
																	0.5		3																
																	0.6		3																
																	0.4		2																
																	0.3		2																
																	0.5		4																
																	0.3		1																
																	0.5		6																
																	0.2		1																
																	0.3		2																
																	0.2		2																
																	0.1		1																
																	0.2		3																
																	0.4		6																
																	0.2		2																
																	0.1		1																
																	0.1		1																
																	Diurnal Average		Diurnal Maximum																
Z - zerospan																	C - Calibration																		



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Conklin - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - April 2017**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

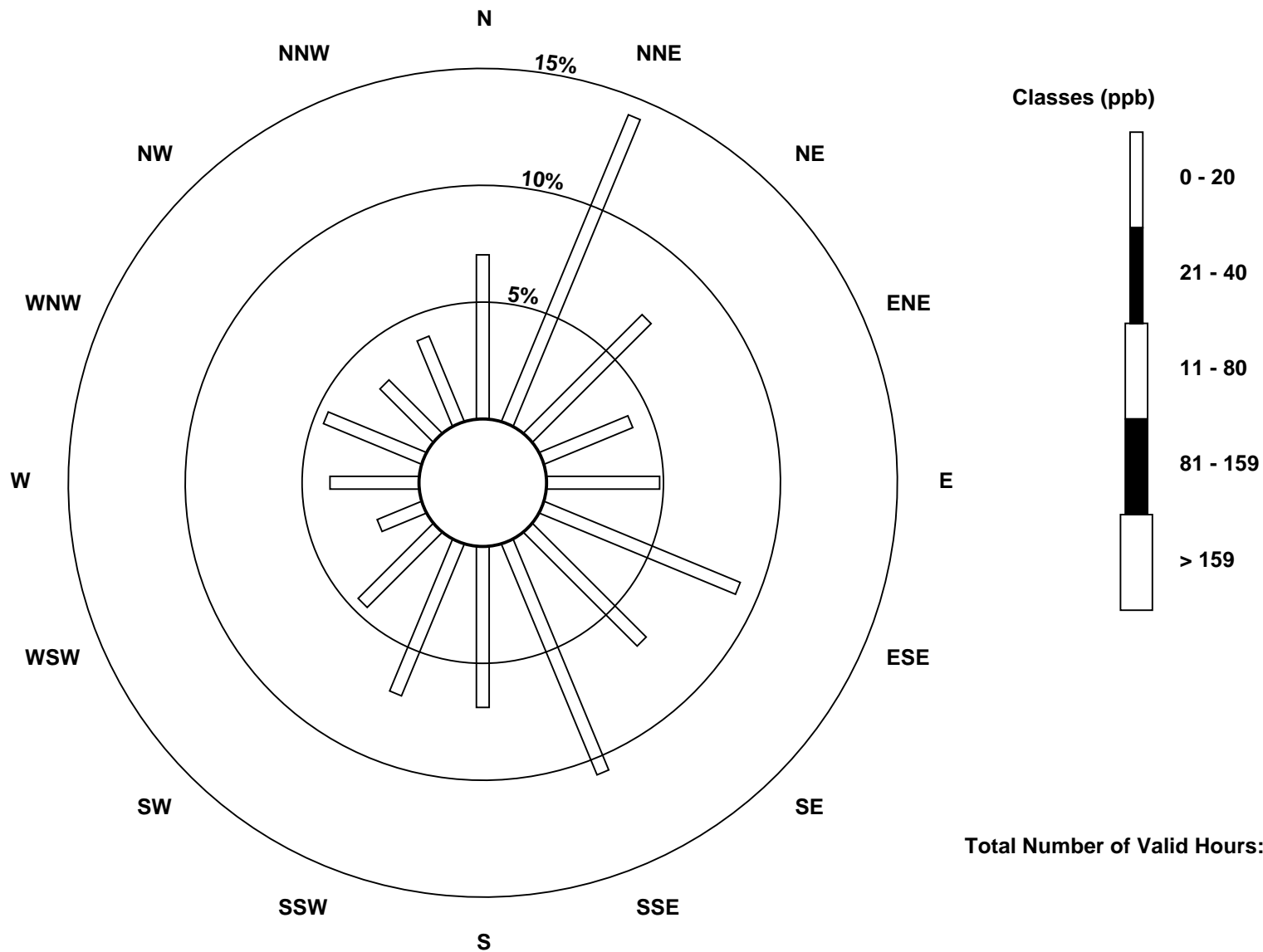
Total Number of Valid Hours: 683

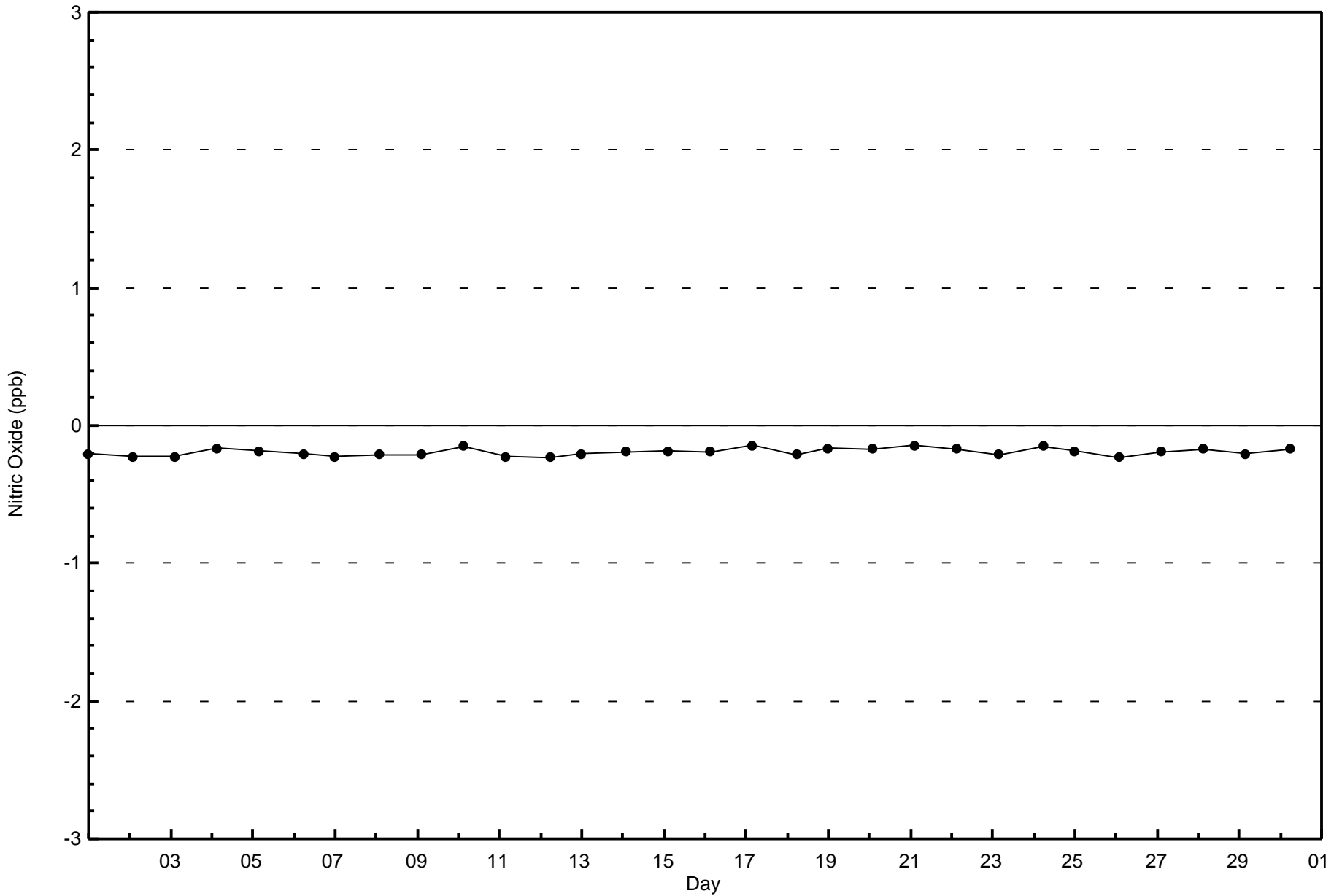
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Conklin (AMS 21)

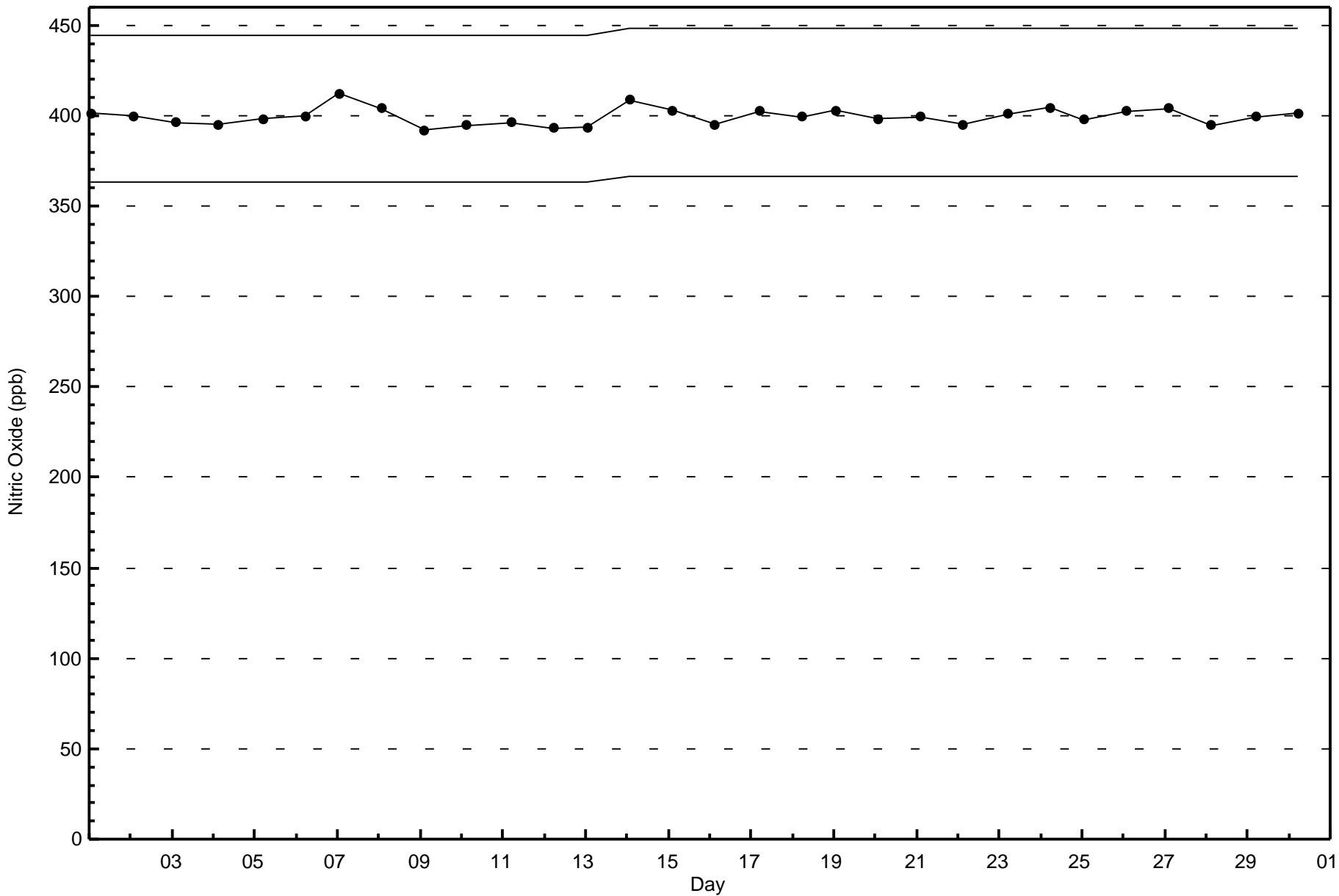






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Conklin - April 2017





Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 21 ppb on Apr 28 21:00	Maximum Daily Average: 4.2 ppb on Apr 28		Hours of Data:	685
Minimum Value: 0 ppb on Apr 7 20:00	Minimum Daily Average: 0.2 ppb on Apr 14		Hours of Missing Data:	35
Maximum Diurnal Average: 2.5 ppb at hour 21	Minimum Diurnal Average: 1.0 ppb at hour 16		Hours of Calibration:	35
Monthly Average: 1.4 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 1 Median = 1 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 7		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	2	2	2	2	2	1	1	3	3	2	3	3	3	2	2	2	3	9	3	2	4	5	2	2.6	9
2-Apr	4	Z	5	1	2	1	1	5	6	5	4	3	3	3	3	3	3	2	2	2	2	1	2	4	2.8	6
3-Apr	1	1	Z	1	2	2	5	2	2	7	4	2	2	2	1	1	1	2	1	3	5	5	1	1	2.2	7
4-Apr	1	1	1	Z	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	3	1.1	3
5-Apr	1	1	1	1	Z	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1.3	2
6-Apr	2	3	2	2	2	Z	2	2	2	5	2	4	4	4	3	2	3	7	4	9	3	5	4	3	3.3	9
7-Apr	Z	1	2	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	3	3	1	1	0.9	3
8-Apr	1	Z	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0.7	1
9-Apr	0	0	Z	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	2	2	1.1	3
10-Apr	2	2	1	Z	1	1	1	1	1	1	1	2	2	1	1	1	2	3	3	3	4	2	2	2	1.7	4
11-Apr	3	3	2	2	Z	2	1	3	1	1	1	1	1	1	1	1	2	1	1	1	1	0	0	0	1.4	3
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1
13-Apr	Z	1	0	0	1	1	1	1	C	C	C	C	C	1	1	1	1	0	0	0	1	1	0	0	0.5	1
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	5	4	2	3	1.0	5
16-Apr	4	2	1	Z	7	1	2	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1.3	7
17-Apr	1	1	1	1	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	1
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1	0.4	1
19-Apr	Z	1	1	1	1	1	1	1	4	4	3	1	2	1	1	2	2	2	2	2	5	6	2	2	1.9	6
20-Apr	1	Z	1	4	3	2	1	2	1	2	2	2	2	1	2	2	2	2	4	2	2	1	1	0	1.7	4
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0.4	1
22-Apr	1	1	2	Z	1	1	0	1	2	1	1	1	2	2	1	1	1	0	0	0	0	0	1	0	0.8	2
23-Apr	1	1	1	1	Z	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1	0	0	0.7	1
24-Apr	1	1	1	1	1	Z	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	1	1	0.5	1
25-Apr	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1.0	2
26-Apr	2	Z	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	2
27-Apr	1	2	Z	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	2	1	1.3	4
28-Apr	3	7	5	Z	3	2	4	10	2	1	1	1	1	1	2	1	2	1	1	6	21	17	7	2	4.2	21
29-Apr	2	1	1	1	Z	1	1	1	2	1	1	1	1	1	1	1	1	1	2	2	6	9	6	3	2.0	9
30-Apr	3	1	1	0	1	Z	1	1	3	2	2	2	3	2	2	3	1	1	1	2	2	1	1	5	1.7	5

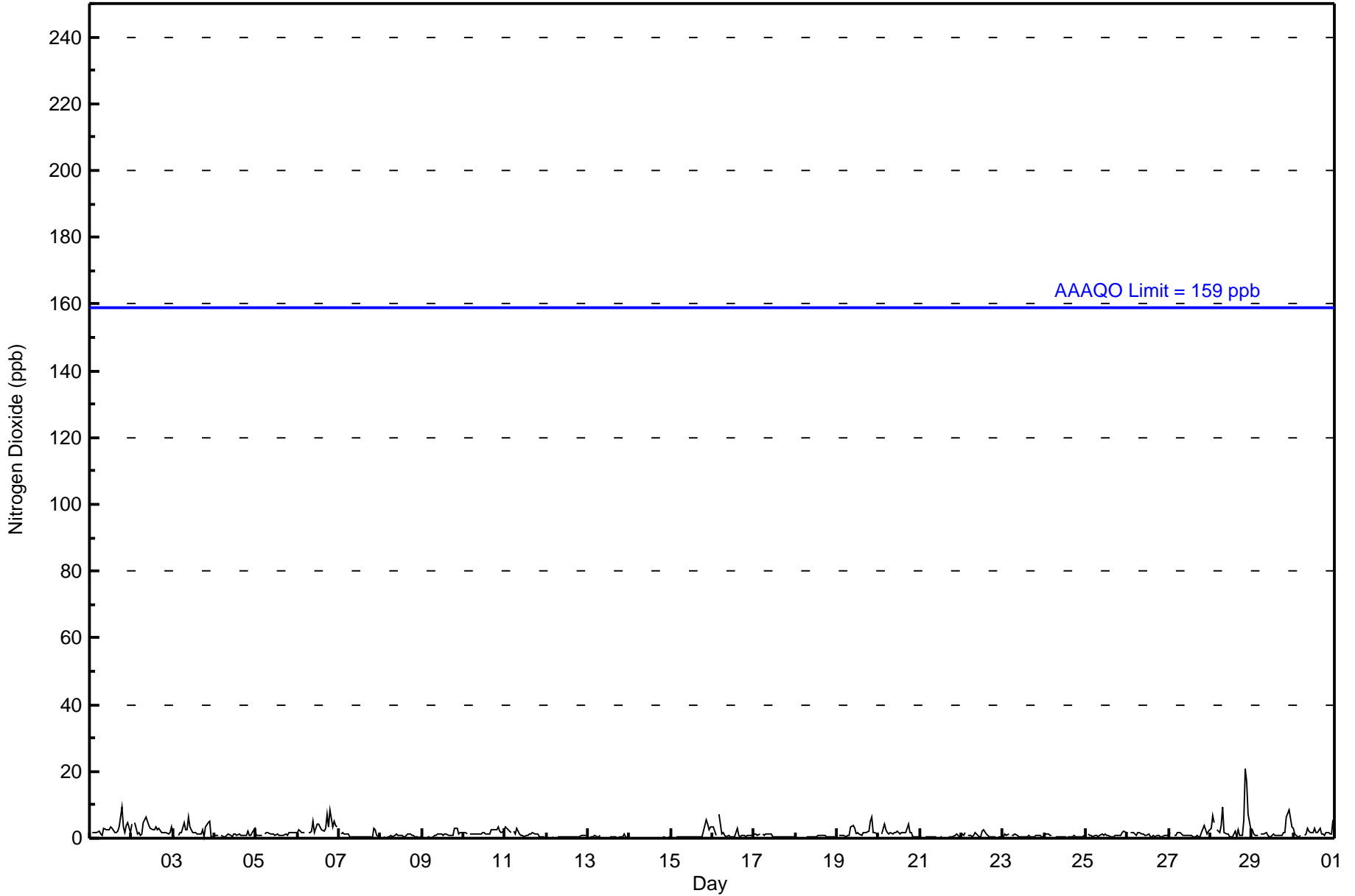
1.4	1.3	1.3	1.0	1.2	1.0	1.1	1.5	1.4	1.5	1.1	1.0	1.2	1.0	1.1	1.0	1.1	1.3	1.3	1.8	2.5	2.3	1.6	1.5	Diurnal Average
4	7	5	4	7	2	5	10	6	7	4	4	4	4	3	3	3	7	9	9	21	17	7	5	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Conklin - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	97	49	28	33	62	47	73	47	47	31	14	26	31	22	27	682
21 - 40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

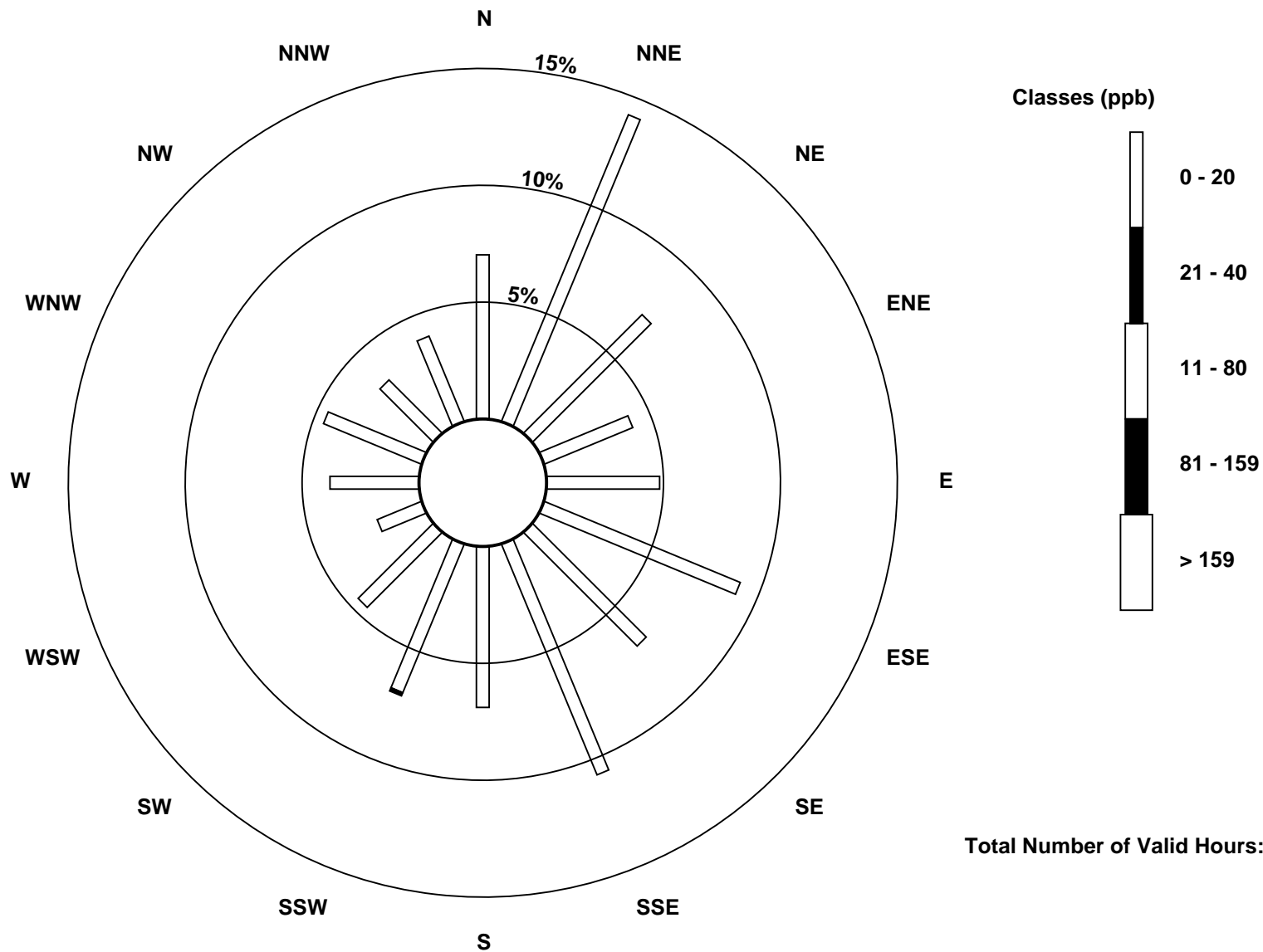
Total Number of Valid Hours: 683

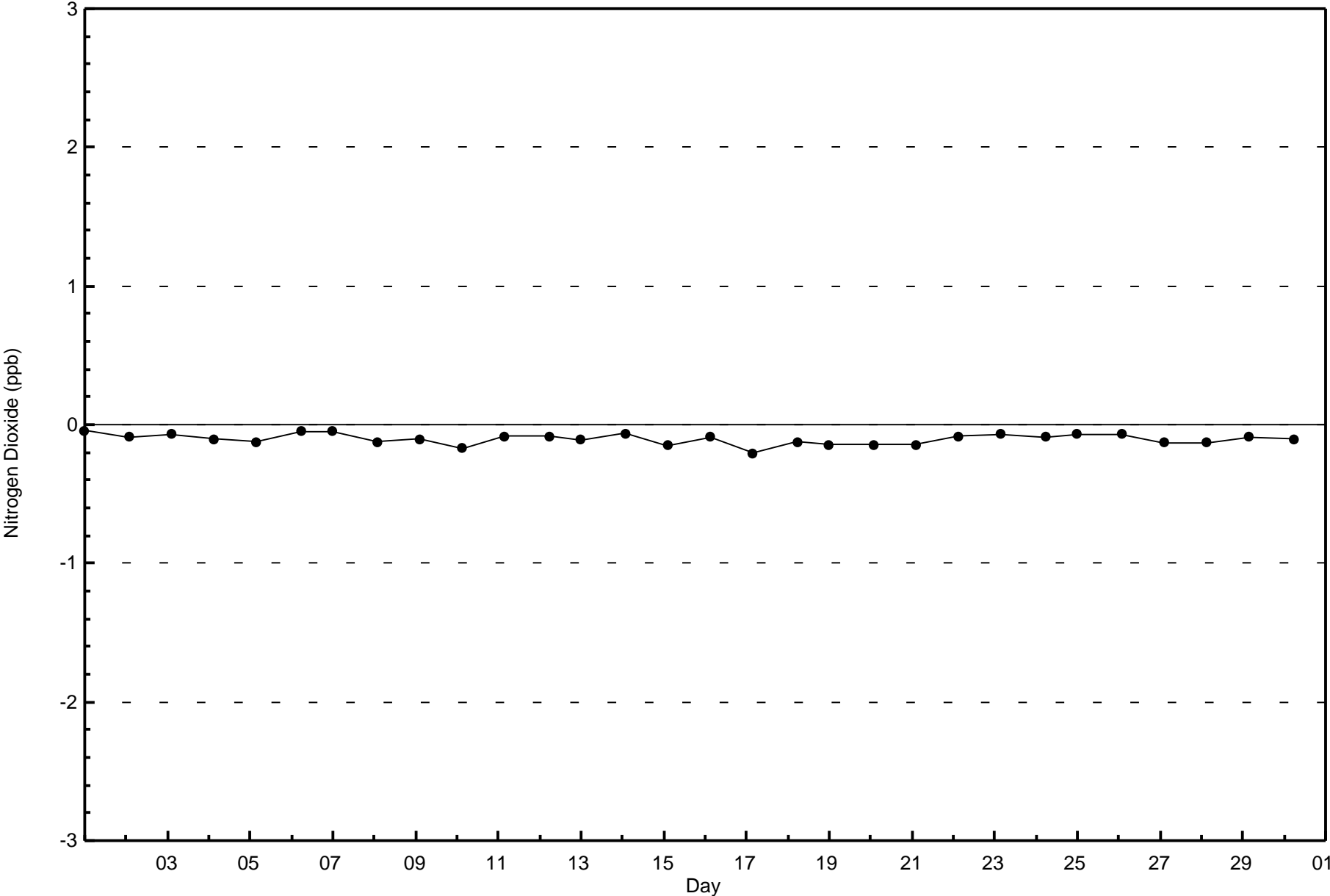
Total Number of Hours: 720

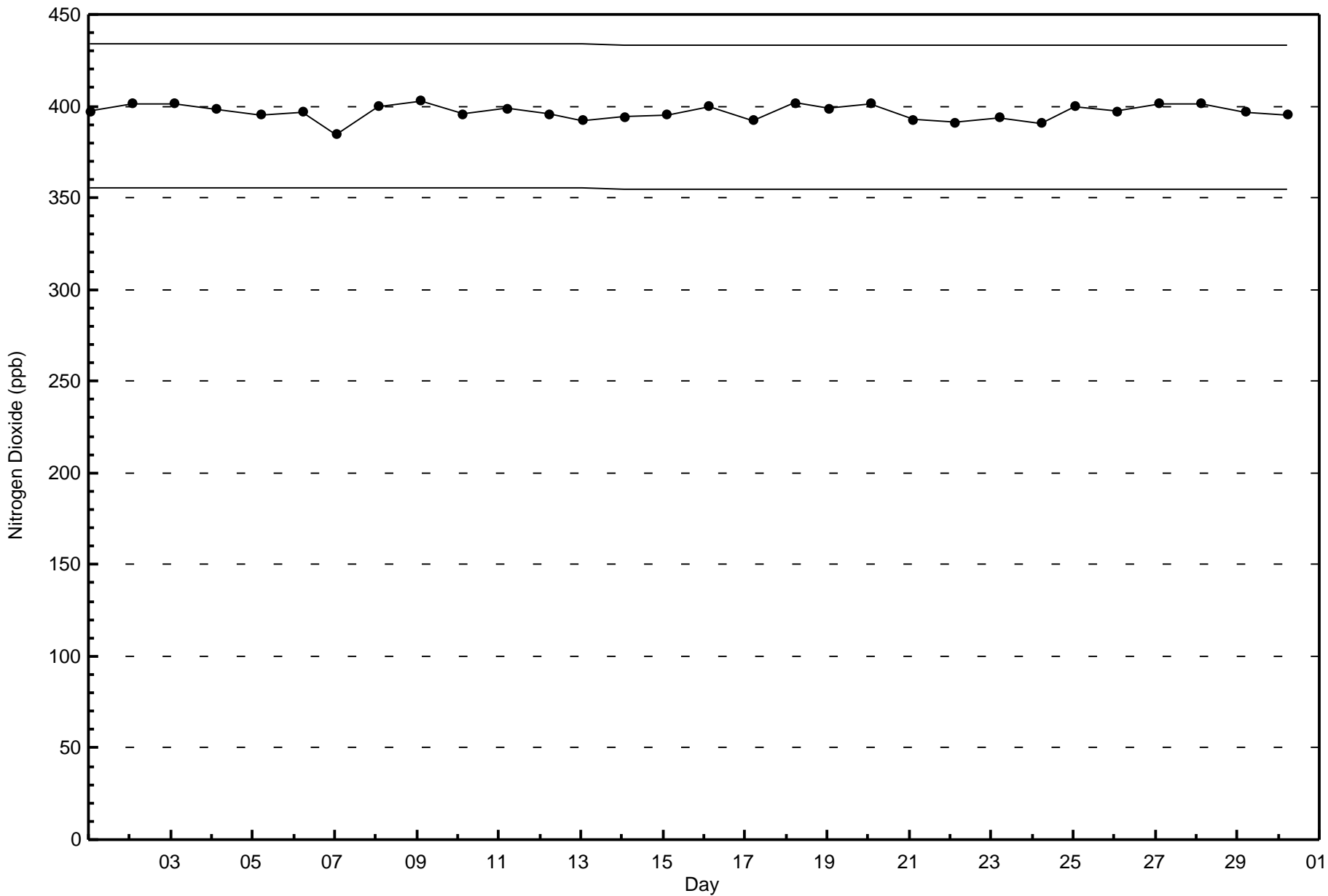


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Conklin (AMS 21)







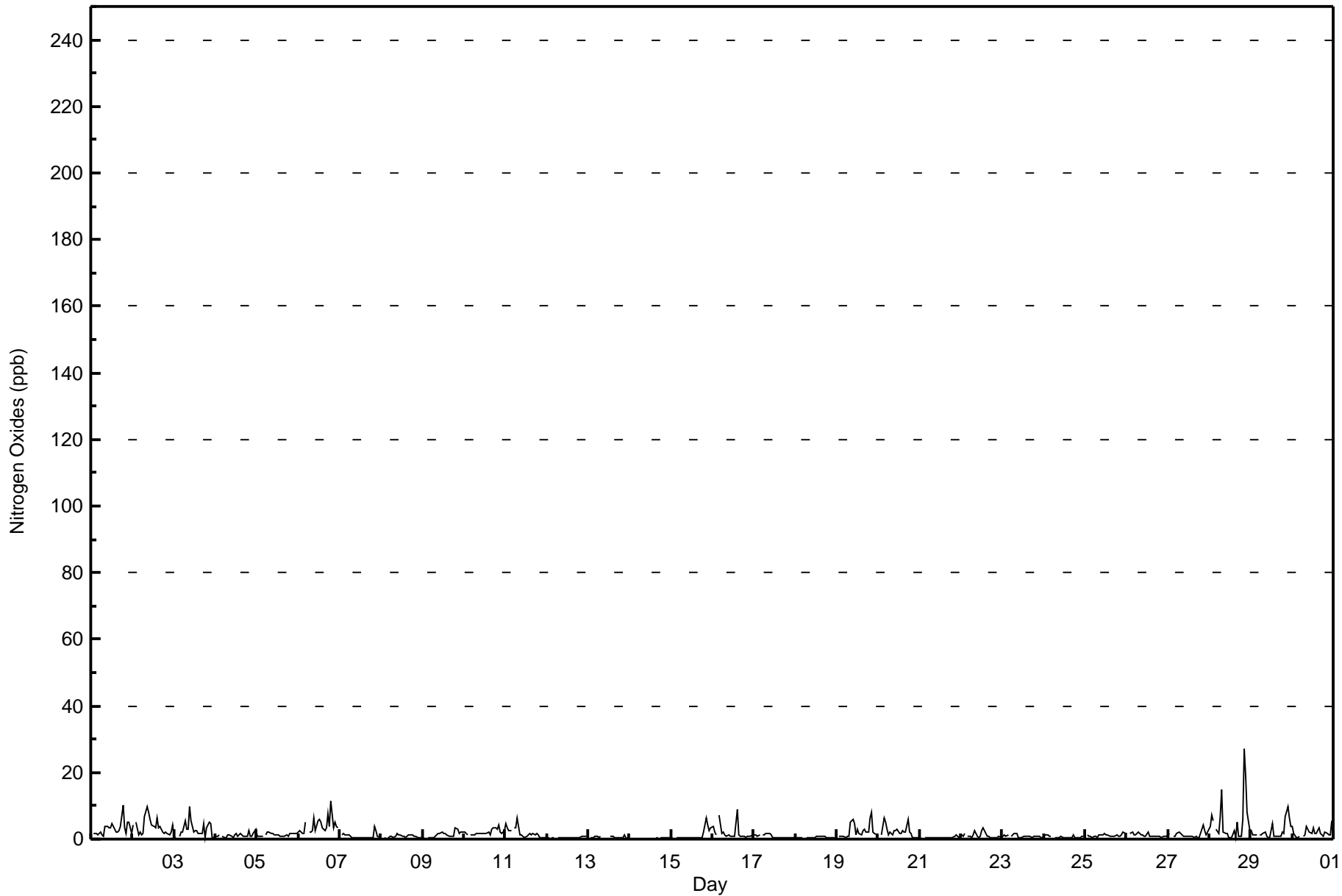


Maximum Value: 27 ppb on Apr 28 21:00																	Maximum Daily Average: 5.3 ppb on Apr 28																	Hours in Service: 720	
Minimum Value: 0 ppb on Apr 14 01:00																	Minimum Daily Average: 0.2 ppb on Apr 14																	Hours of Data: 685	
Maximum Diurnal Average: 3.0 ppb at hour 21																	Minimum Diurnal Average: 1.1 ppb at hour 4																	Hours of Missing Data: 35	
Monthly Average: 1.6 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 10																	Hours of Calibration: 35	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	Z	2	2	2	1	2	1	1	4	4	4	4	5	4	2	2	3	4	10	3	2	5	5	2	3.1	10									
2-Apr	4	Z	5	1	2	1	2	7	10	8	6	4	4	3	6	3	4	2	2	2	2	1	2	4	3.7	10									
3-Apr	1	0	Z	1	2	2	6	3	3	10	6	2	3	3	2	2	2	5	1	4	5	5	1	1	2.9	10									
4-Apr	1	1	1	Z	1	1	0	1	1	1	1	2	1	2	1	1	1	1	1	2	1	1	2	3	1.2	3									
5-Apr	1	1	1	1	Z	1	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1.4	2									
6-Apr	2	3	2	2	5	Z	2	2	3	6	2	6	6	5	3	3	3	8	4	11	4	5	4	3	4.1	11									
7-Apr	Z	1	2	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	3	1	1	0.9	4									
8-Apr	0	Z	0	0	0	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0.8	2									
9-Apr	0	0	Z	0	0	0	0	1	1	2	2	2	2	2	1	1	1	1	1	3	3	2	2	2	1.3	3									
10-Apr	2	2	1	Z	1	1	1	2	2	2	2	2	2	2	2	1	3	4	3	3	4	2	2	3	2.1	4									
11-Apr	5	3	3	2	Z	3	3	6	1	1	1	1	1	1	2	1	2	1	2	1	1	0	0	0	1.8	6									
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1									
13-Apr	Z	1	0	0	1	1	1	1	C	C	C	C	C	1	1	1	1	0	0	0	1	1	0	0	0.5	1									
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0									
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	4	3	3	1.1	6									
16-Apr	4	2	1	Z	7	2	2	1	1	1	1	1	1	1	9	1	1	1	1	1	1	1	1	1	1.8	9									
17-Apr	1	1	1	1	Z	1	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	2									
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	0.5	1									
19-Apr	Z	1	1	1	1	0	1	1	5	6	5	1	3	2	1	3	3	2	2	7	8	2	2	1	2.5	8									
20-Apr	1	Z	1	7	5	3	1	2	1	3	3	3	2	2	2	2	2	6	2	2	1	0	0	0	2.2	7									
21-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.4	1									
22-Apr	1	1	2	Z	1	1	0	1	2	1	1	1	3	3	2	1	1	0	0	0	0	0	1	1	1.0	3									
23-Apr	1	1	1	1	Z	1	1	2	2	1	1	0	1	1	1	1	1	0	1	1	1	0	0	0	0.8	2									
24-Apr	1	1	1	1	1	Z	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0.6	1									
25-Apr	Z	1	1	1	0	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	2	2	1.1	2									
26-Apr	2	Z	2	2	1	1	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1.2	2									
27-Apr	1	2	Z	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	4	3	1	2	1.4	4									
28-Apr	4	7	5	Z	3	2	7	15	2	2	2	0	1	1	3	1	5	1	1	6	27	19	8	3	5.3	27									
29-Apr	3	1	1	1	Z	1	1	2	2	1	1	1	5	1	1	1	1	1	2	2	7	10	6	4	2.4	10									
30-Apr	4	2	0	0	1	Z	1	1	4	3	2	2	3	2	2	3	2	1	1	2	2	1	1	6	2.0	6									
																	1.6																	Diurnal Average	
																	5																	Diurnal Maximum	
Z - zerospan																	C - Calibration																		



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Conklin - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	684	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	97	49	28	33	62	47	73	47	47	31	14	26	31	22	27	682
21 - 40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	49	28	33	62	47	73	47	48	31	14	26	31	22	27	683

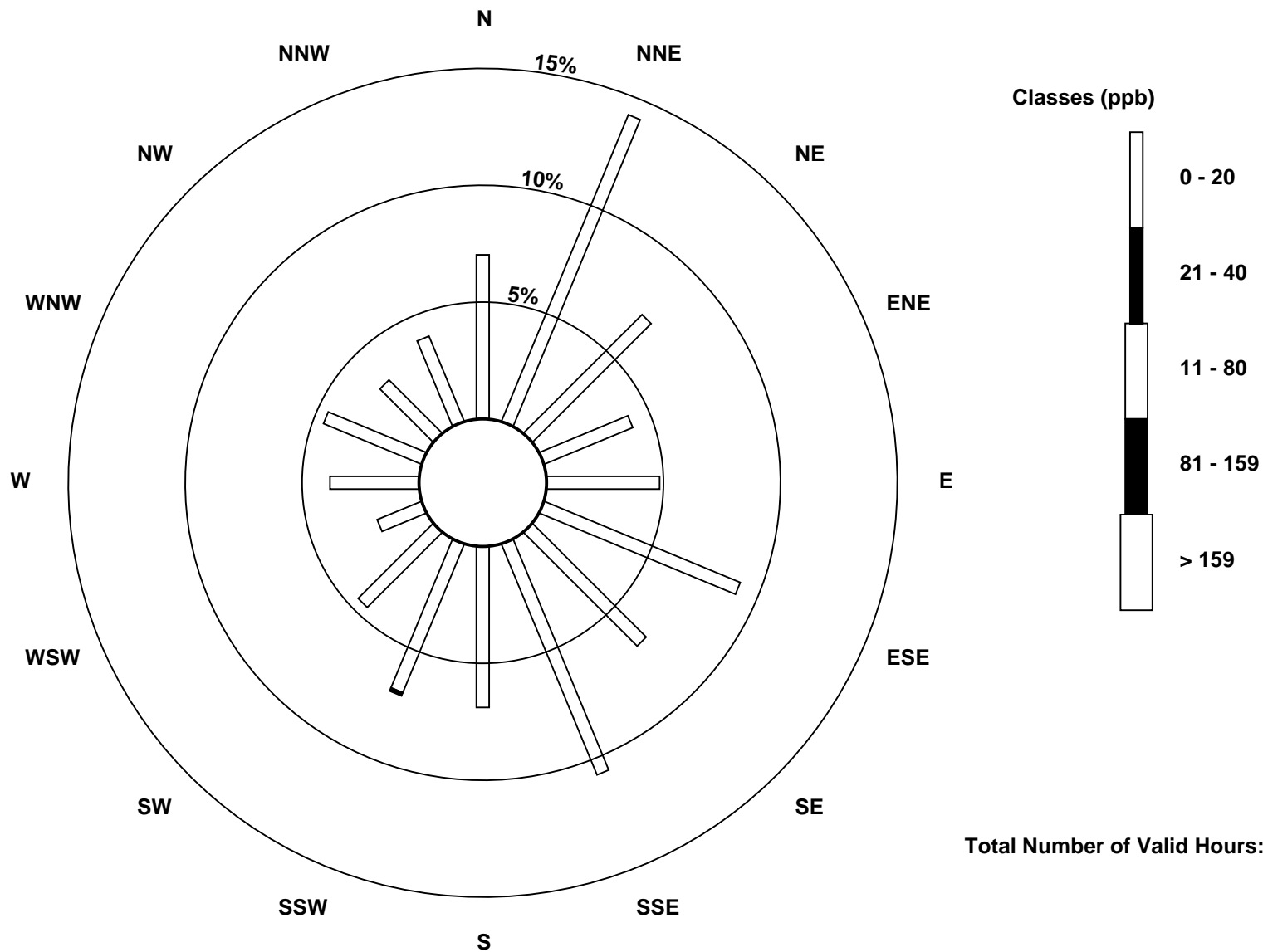
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

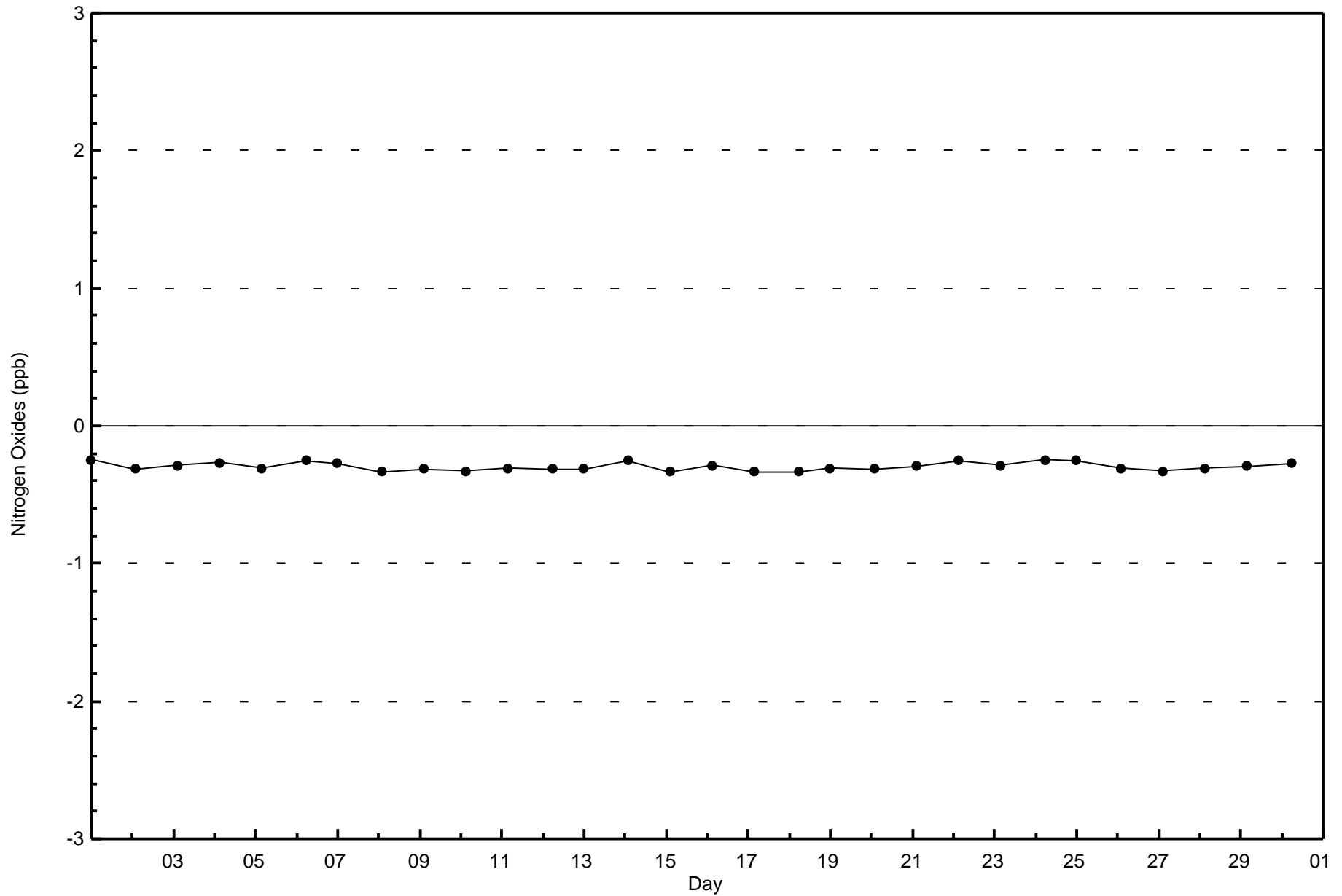
Nitrogen Oxides (NO_x) - ppb
Conklin (AMS 21)

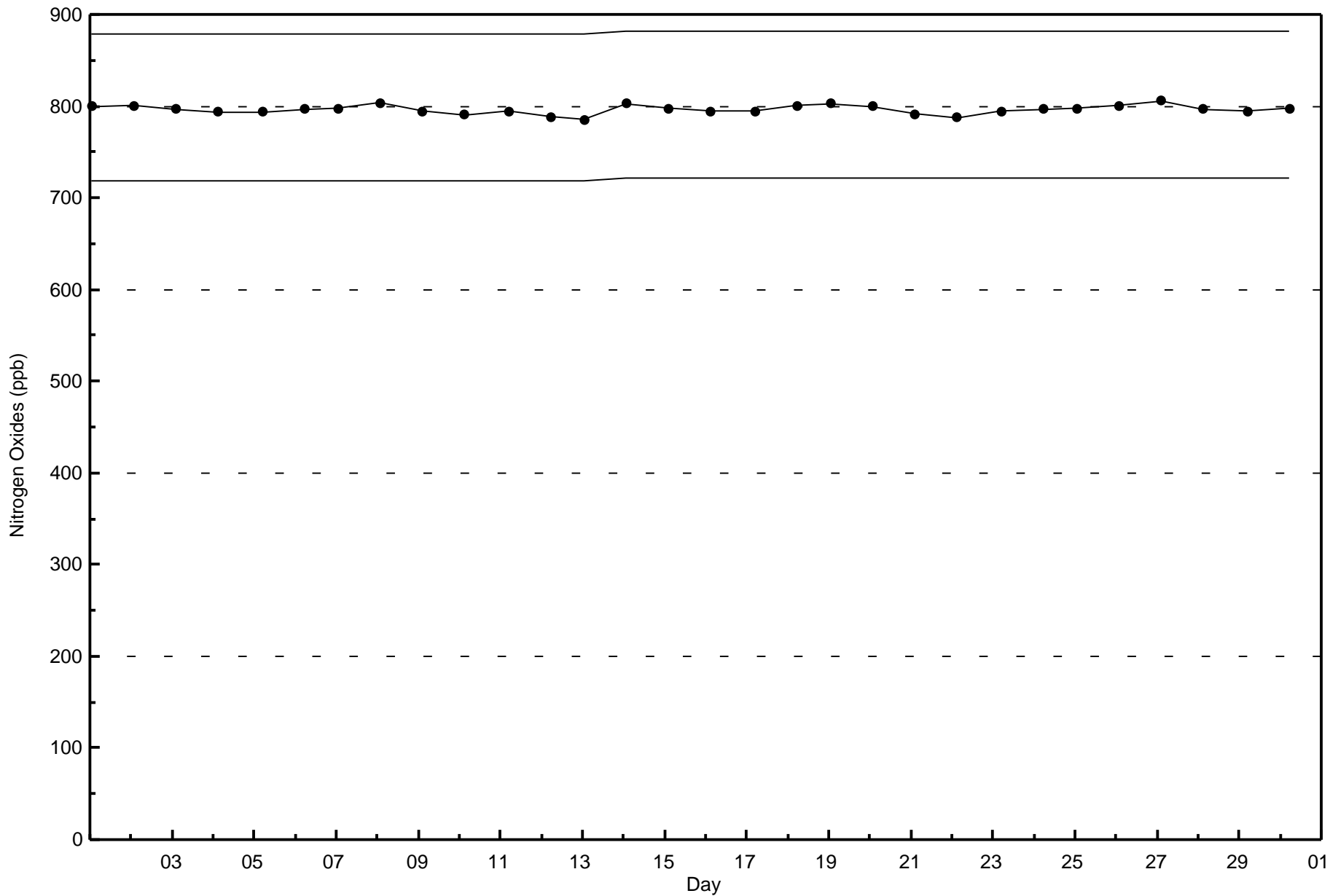




Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_x) - ppb
Conklin - April 2017







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Conklin - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 57 ppb on Apr 30 16:00	Maximum Daily Average: 46.0 ppb on Apr 12		Hours of Data:	687
Minimum Value: 6 ppb on Apr 11 06:00	Minimum Daily Average: 30.8 ppb on Apr 11		Hours of Missing Data:	33
Maximum Diurnal Average: 46.8 ppb at hour 16	Minimum Diurnal Average: 29.4 ppb at hour 5		Hours of Calibration:	32
Monthly Average: 39.0 ppb	Percentiles: P ₁ = 9 P ₁₀ = 22 Q ₁ = 35 Median = 41 Q ₃ = 46 P ₉₀ = 50 P ₉₉ = 55		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	38	37	Z	38	39	39	40	41	45	46	47	48	49	50	50	51	50	49	41	36	48	46	45	46	44.3	51
2-Apr	45	43	Z	Z	32	35	37	39	38	40	43	45	48	49	49	49	49	50	49	51	50	48	46	45	44.4	51
3-Apr	44	41	39	39	Z	24	19	32	32	30	38	46	46	47	48	48	48	46	45	42	40	36	39	31	39.1	48
4-Apr	20	16	15	19	15	Z	13	20	31	34	41	42	43	47	48	48	47	45	43	40	35	26	17	16	31.3	48
5-Apr	21	20	21	19	32	41	Z	35	39	41	44	47	50	53	55	57	55	53	54	52	51	50	49	48	42.9	57
6-Apr	36	25	22	21	19	17	15	Z	42	43	45	C	C	47	50	54	55	51	45	28	25	19	16	14	32.7	55
7-Apr	28	45	Z	35	40	41	45	50	50	48	47	47	45	43	42	42	46	46	45	41	31	24	32	39	41.4	50
8-Apr	43	43	42	Z	41	41	41	41	42	42	41	42	43	43	44	43	41	40	38	37	35	33	31	33	39.9	44
9-Apr	34	36	36	36	Z	35	35	35	35	34	35	36	38	38	39	42	46	47	47	32	36	38	37	36	37.5	47
10-Apr	33	33	32	30	29	Z	28	29	31	33	40	43	45	46	46	45	36	34	36	32	21	16	14	12	32.4	46
11-Apr	8	8	7	7	6	6	Z	17	31	38	41	49	48	48	45	46	44	41	37	36	36	35	37	40	30.8	49
12-Apr	39	41	41	42	42	42	43	Z	45	46	48	49	51	51	51	51	50	50	52	50	49	46	42	37	46.0	52
13-Apr	39	26	Z	31	36	35	36	37	40	M	43	44	44	45	44	45	44	44	45	46	43	42	41	39	40.5	46
14-Apr	39	39	40	Z	40	40	39	39	40	41	41	41	41	42	43	43	44	45	46	48	49	50	50	50	43.0	50
15-Apr	51	51	51	50	Z	49	48	47	47	47	47	47	46	46	47	48	48	48	47	40	27	22	18	15	42.9	51
16-Apr	17	16	24	22	27	Z	35	37	38	41	43	45	46	46	47	51	52	51	48	39	42	45	46	46	39.3	52
17-Apr	46	46	43	40	40	34	Z	39	44	43	36	38	39	40	42	42	42	42	42	42	42	41	40	40	41.1	46
18-Apr	39	38	38	37	37	39	42	Z	38	39	40	40	40	40	40	41	41	40	40	39	39	37	37	38	39.1	42
19-Apr	36	33	Z	33	29	27	30	31	29	32	35	43	44	43	42	40	40	39	37	22	11	12	12	22	31.4	44
20-Apr	22	17	14	Z	9	10	16	24	25	30	38	45	48	49	50	47	47	44	40	35	38	40	42	45	33.6	50
21-Apr	47	49	49	48	Z	47	47	44	43	46	46	47	46	46	45	46	46	46	46	45	44	43	44	42	45.7	49
22-Apr	42	42	41	41	38	Z	39	44	45	46	47	47	45	44	44	44	44	43	43	42	41	40	37	35	42.4	47
23-Apr	30	26	26	27	25	30	Z	35	37	40	42	43	46	48	48	47	46	44	44	43	42	43	43	43	39.2	48
24-Apr	42	41	40	39	37	35	34	Z	35	35	35	35	35	35	35	35	35	33	32	31	30	31	32	31	34.8	42
25-Apr	30	26	Z	23	22	24	23	24	30	33	37	38	39	39	41	42	41	42	43	42	41	41	41	41	35.0	43
26-Apr	39	40	41	Z	41	41	41	43	42	41	43	43	43	44	45	44	44	43	44	44	42	40	38	38	42.0	45
27-Apr	37	36	36	29	Z	33	35	42	46	48	48	48	48	48	49	51	51	50	48	44	33	24	20	19	40.0	51
28-Apr	19	12	13	14	12	Z	27	30	47	50	52	54	55	55	53	54	53	55	55	41	17	18	26	39	37.0	55
29-Apr	38	39	40	40	35	34	Z	46	50	54	55	54	53	54	55	55	54	54	50	49	32	18	17	15	43.0	55
30-Apr	14	16	17	16	12	11	17	Z	39	49	52	53	52	54	56	57	54	54	55	47	32	28	24	15	35.8	57

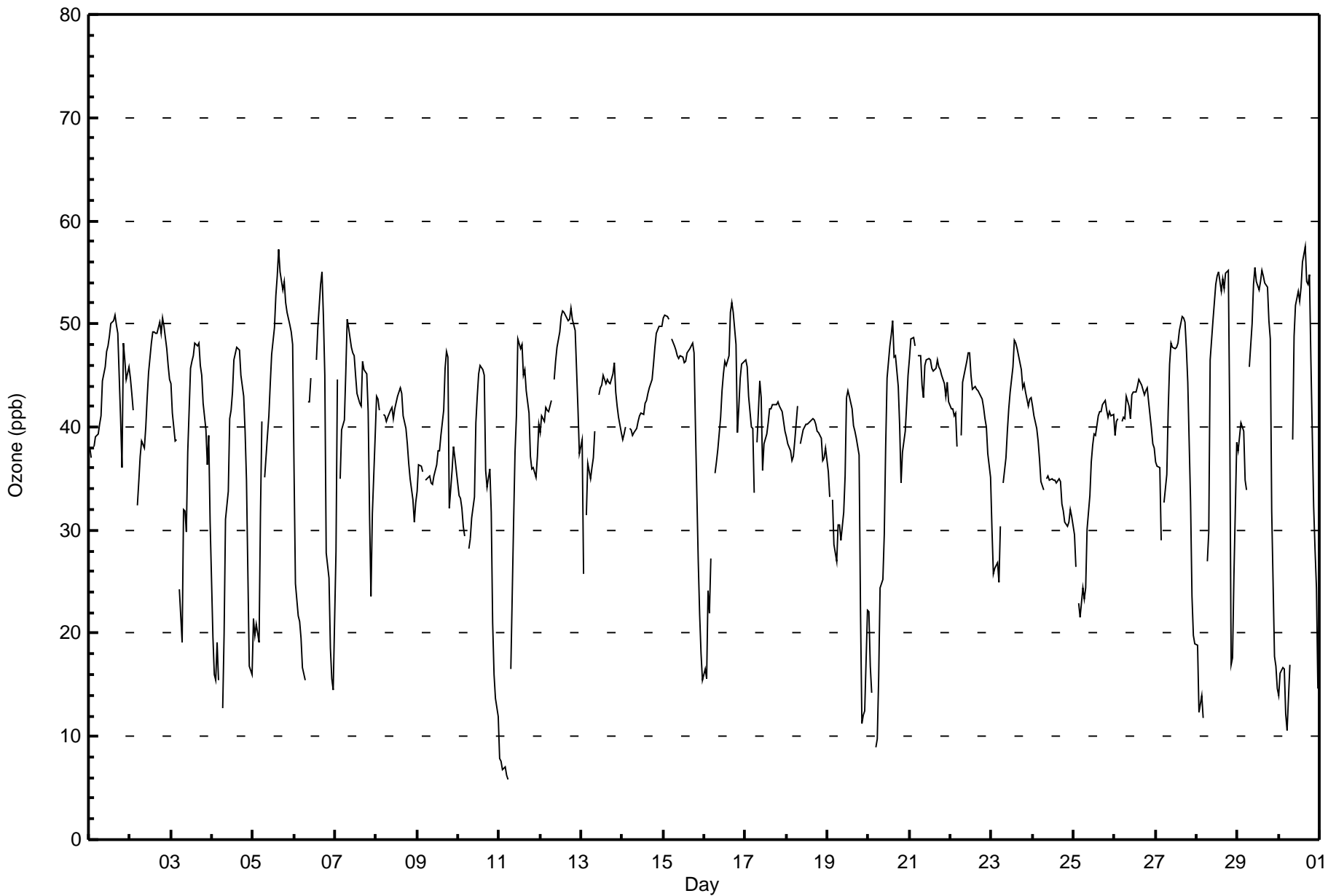
33.8	32.7	32.3	31.1	29.4	32.3	33.1	36.0	39.1	41.0	43.0	44.8	45.4	46.0	46.5	46.8	46.5	45.7	44.5	40.5	36.8	34.3	33.8	33.7	Diurnal Average		
51	51	51	50	42	49	48	50	50	54	55	54	55	55	56	57	55	55	55	55	52	51	50	50	50	Diurnal Maximum	

Z - zerspan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Conklin - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	60	8.73	8.73
21 - 50	574	83.55	92.29
51 - 82	53	7.71	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Conklin - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	0	0	0	1	2	9	13	11	8	4	2	3	1	3	1	59
21 - 50	47	93	46	32	31	57	37	52	29	30	26	10	19	24	19	21	573
51 - 82	1	5	4	0	0	3	1	5	11	8	2	2	3	4	3	1	53
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	98	50	32	32	62	47	70	51	46	32	14	25	29	25	23	685

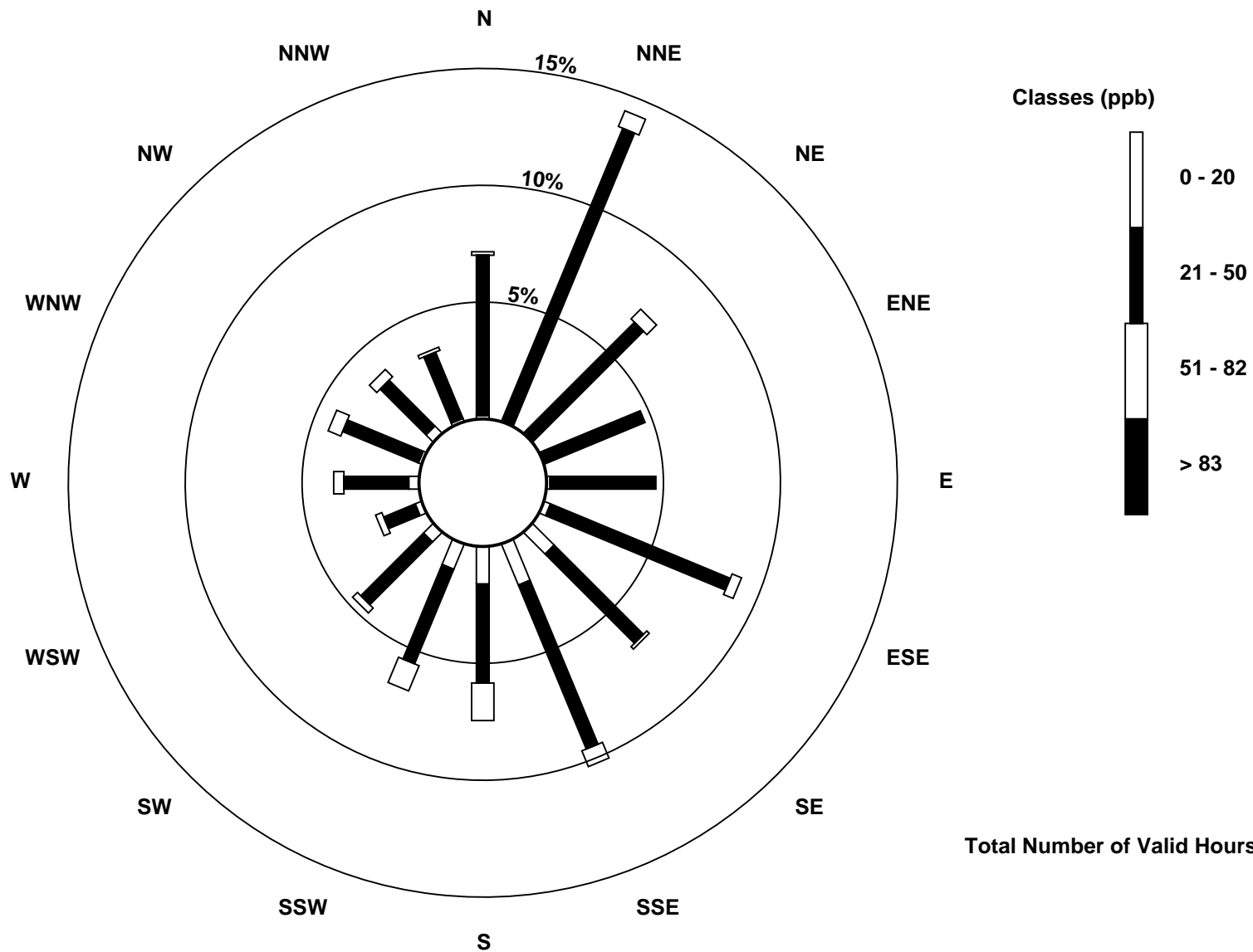
Total Number of Valid Hours: 685

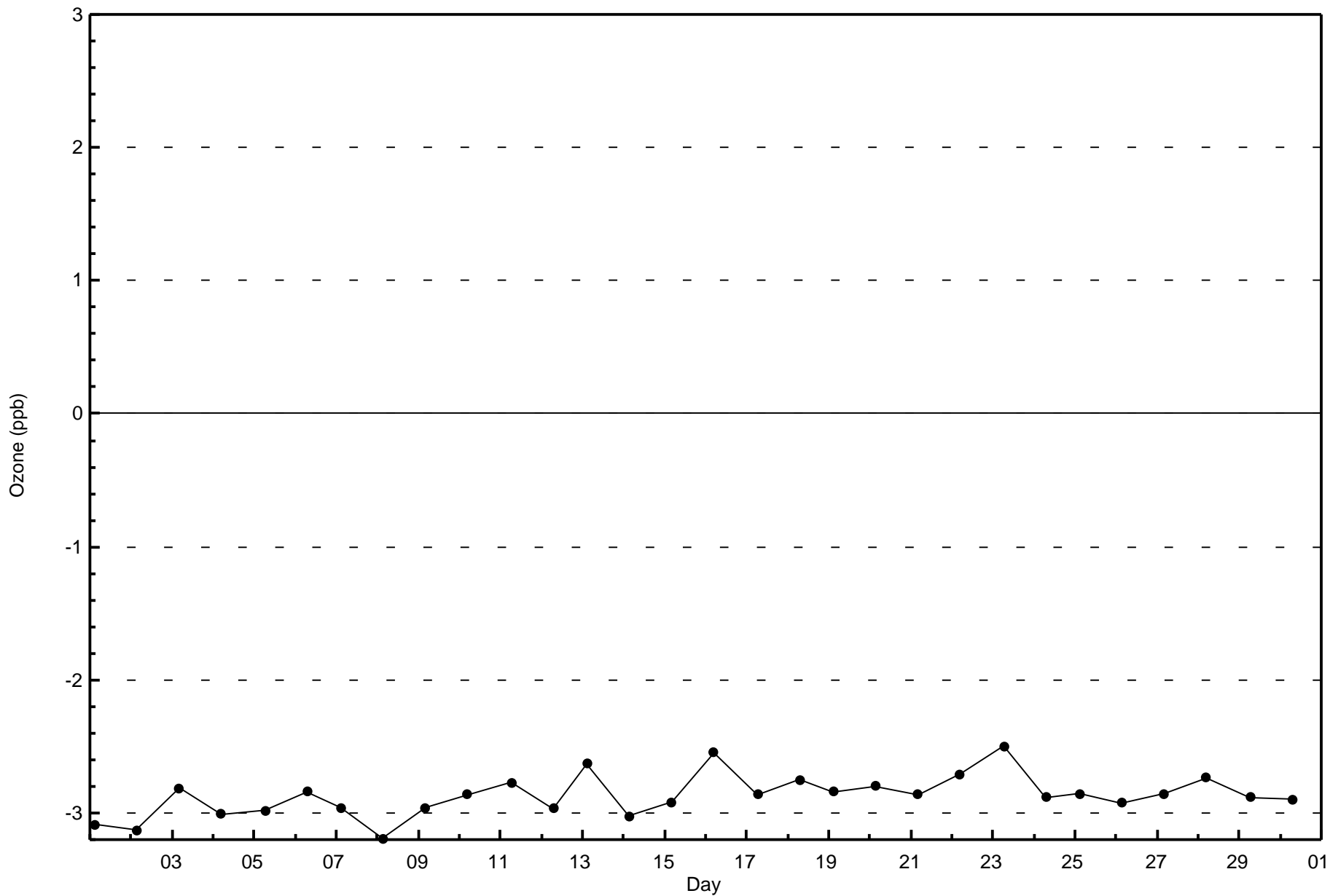
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Ozone (O₃) - ppb
Conklin (AMS 21)

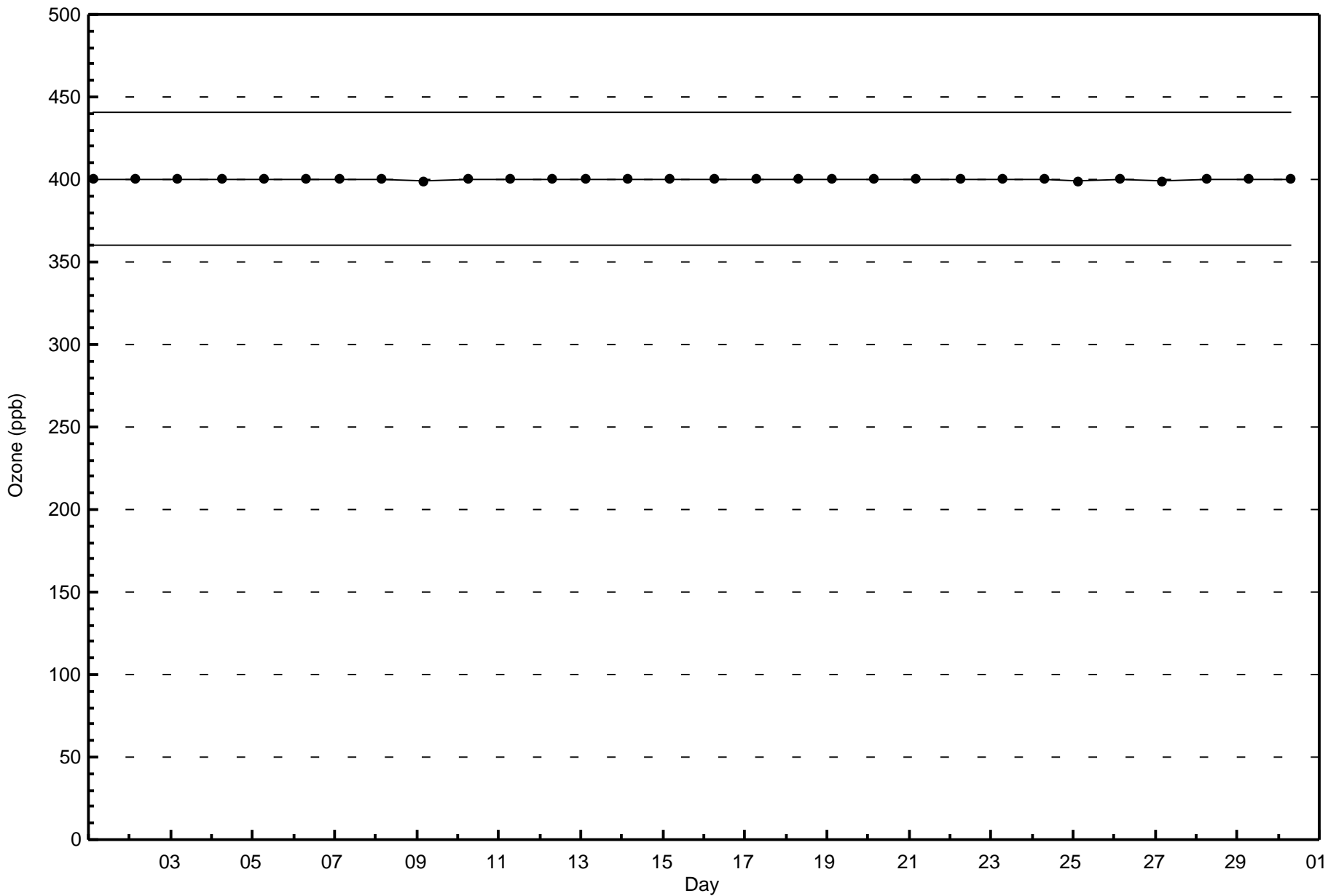






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Conklin - April 2017





Summary of Hour Averages

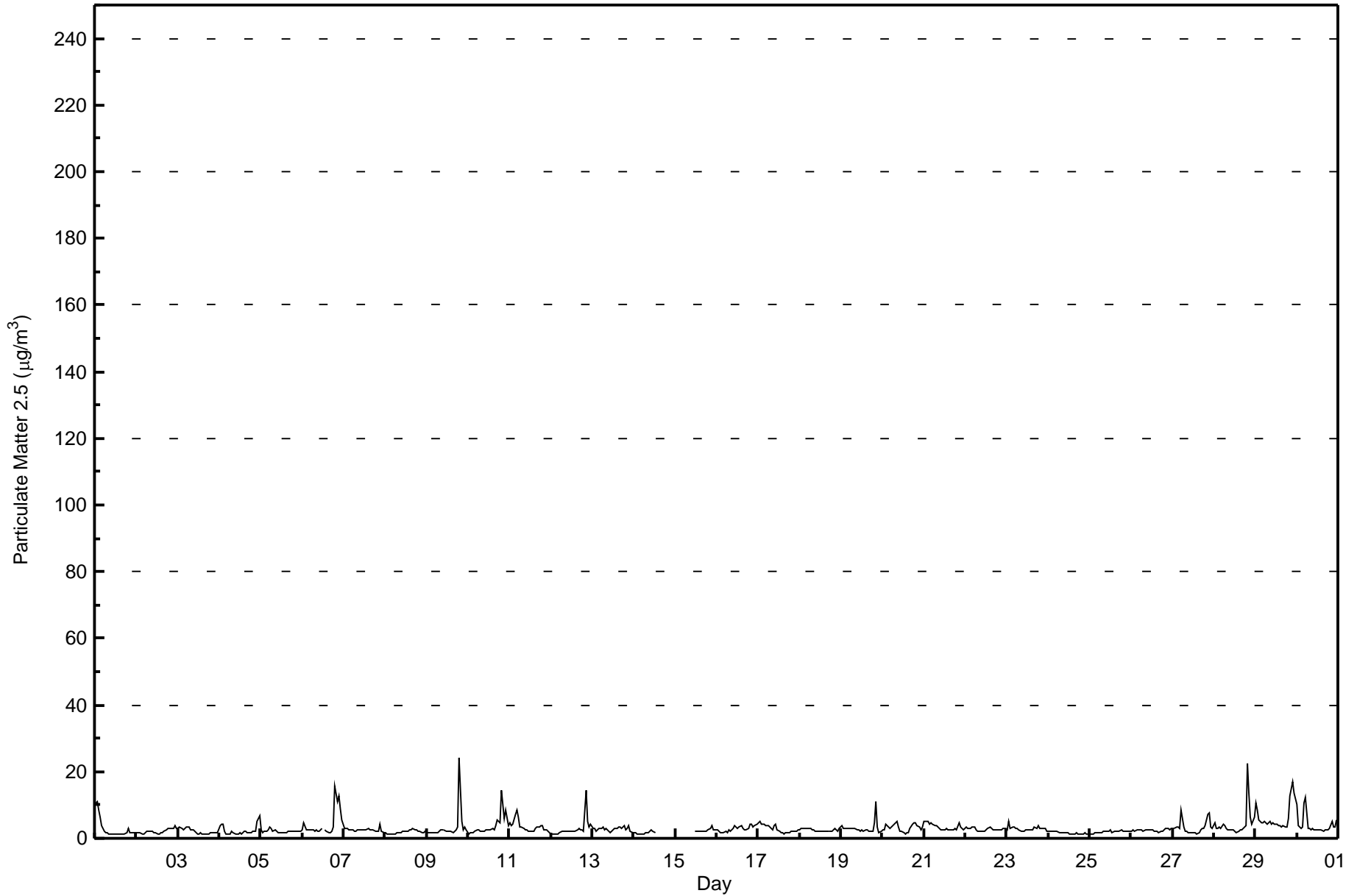
Conklin - April 2017

Number of Exceedences (AAAQO): 24-hr: 0 Maximum Value: 24.1 µg/m ³ on Apr 9 20:00 Minimum Value: 1.1 µg/m ³ on Apr 1 16:00 Maximum Diurnal Average: 5.1 µg/m ³ at hour 20 Monthly Average: 2.97 µg/m ³											Maximum Daily Average: 6.3 µg/m ³ on Apr 29 Minimum Daily Average: 1.7 µg/m ³ on Apr 24 Minimum Diurnal Average: 2.2 µg/m ³ at hour 13 Percentiles: P ₁ = 1.2 P ₁₀ = 1.5 Q ₁ = 2.0 Median = 2.4 Q ₃ = 3.1 P ₉₀ = 4.3 P ₉₉ = 13.4											Hours in Service: 720 Hours of Data: 697 Hours of Missing Data: 23 Hours of Calibration: 1 Percent Operational Time: 96.9				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	10.4	10.9	8.7	6.4	3.9	2.2	1.8	1.5	1.2	1.3	1.3	1.4	1.1	1.3	1.2	1.1	1.2	1.1	1.9	3.0	1.9	1.7	1.7	1.7	2.9	10.9
2-Apr	1.8	1.6	1.5	1.4	1.4	1.6	2.1	2.0	2.0	1.9	1.5	1.5	1.4	1.5	1.5	1.5	2.1	2.4	2.8	2.8	3.1	3.1	4.0	2.8	2.0	4.0
3-Apr	3.1	3.4	2.9	2.6	3.1	3.4	3.3	2.8	2.5	2.7	2.2	1.4	1.3	1.6	1.4	1.3	1.4	1.4	1.4	1.6	1.8	1.7	1.6	1.7	2.1	3.4
4-Apr	3.9	4.4	4.4	2.2	1.4	1.4	1.2	2.0	1.7	1.3	1.3	1.5	1.5	1.5	1.9	1.9	1.8	1.9	1.8	2.3	2.3	2.3	5.1	6.8	2.4	6.8
5-Apr	2.4	1.9	1.9	2.2	2.7	3.5	2.9	2.3	2.5	2.2	1.9	1.7	1.7	1.7	1.6	1.8	2.0	2.1	2.2	2.1	2.1	2.1	2.2	2.3	2.2	3.5
6-Apr	2.4	4.6	2.6	2.6	2.5	2.4	2.5	2.2	2.4	2.2	2.2	2.8	C	2.4	2.0	1.7	1.5	2.0	3.3	15.6	11.0	12.6	8.9	5.5	4.3	15.6
7-Apr	3.1	2.8	2.8	2.5	2.5	2.7	2.3	2.3	2.5	2.4	2.5	2.4	2.6	2.7	2.8	2.3	2.6	2.4	2.3	1.9	2.0	4.1	2.0	1.7	2.5	4.1
8-Apr	1.5	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.7	1.8	2.1	2.2	2.2	2.2	2.4	2.7	3.0	2.3	2.4	2.2	2.2	1.8	1.8	1.9	1.9	3.0
9-Apr	1.9	1.8	1.8	1.8	1.8	1.8	1.9	2.2	2.3	2.5	2.4	2.2	2.1	2.2	2.2	1.9	2.1	2.4	3.3	24.1	5.2	2.6	3.4	2.4	3.3	24.1
10-Apr	1.2	1.5	1.6	1.6	2.3	2.5	2.5	2.3	2.1	1.9	2.3	2.4	2.6	2.5	2.8	2.5	4.0	5.6	4.8	14.3	10.0	5.9	8.5	3.8	3.8	14.3
11-Apr	4.7	3.9	4.1	7.2	8.3	6.2	3.5	3.6	2.8	2.5	2.5	2.1	2.1	2.0	2.1	2.9	3.2	3.5	3.8	3.7	2.7	2.6	2.1	1.6	3.5	8.3
12-Apr	1.5	1.4	1.4	1.4	1.5	1.8	2.2	2.3	2.2	2.2	2.1	1.9	2.0	2.3	2.1	2.6	2.9	2.7	2.7	2.1	14.3	5.0	3.5	4.3	2.8	14.3
13-Apr	3.1	2.9	2.3	2.6	3.0	2.9	3.3	2.4	3.0	2.3	1.9	2.1	2.3	3.0	2.9	3.2	3.3	3.0	4.0	2.7	3.0	3.9	2.3	1.6	2.8	4.0
14-Apr	1.7	1.7	1.5	1.3	1.3	1.3	1.4	1.5	1.8	2.1	2.4	2.1	1.9	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	2.4
15-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.0	2.1	2.2	2.3	2.1	2.2	2.2	2.4	3.0	3.6	2.6	2.4	--	3.6
16-Apr	2.4	1.9	1.8	1.6	1.7	2.0	1.8	2.7	2.1	3.1	3.7	3.5	3.0	3.3	3.9	3.1	2.7	2.5	3.1	4.3	4.1	3.6	3.8	4.2	2.9	4.3
17-Apr	4.7	5.2	4.3	4.3	3.9	3.6	3.8	3.2	2.4	3.7	4.3	2.4	2.1	1.7	1.6	1.4	1.6	1.8	1.9	2.0	2.0	2.1	2.1	2.6	2.9	5.2
18-Apr	2.7	2.9	3.2	3.0	3.1	3.0	3.0	2.6	2.7	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	3.0	2.3	2.1	2.8	2.5	3.2
19-Apr	3.7	3.1	3.0	3.2	3.1	2.9	3.0	3.0	3.0	2.6	2.4	2.3	2.5	2.3	2.6	2.5	2.2	2.2	2.3	4.8	11.0	3.5	1.8	2.0	3.1	11.0
20-Apr	2.4	2.6	4.3	3.4	3.2	3.3	3.9	4.2	5.1	3.3	2.2	2.0	1.5	1.4	1.6	1.9	2.9	4.1	4.6	4.6	3.9	3.3	2.3	3.3	3.1	5.1
21-Apr	4.9	5.1	5.1	4.3	4.5	4.1	3.9	3.8	3.4	3.0	2.7	2.7	2.4	2.9	2.5	2.7	2.6	2.6	2.8	2.7	4.8	3.6	2.9	2.5	3.4	5.1
22-Apr	3.5	3.0	2.8	3.1	3.3	3.2	2.5	2.1	2.1	2.2	2.1	2.2	2.4	2.8	3.2	3.1	2.6	2.4	2.4	2.7	2.4	2.5	2.9	2.8	2.7	3.5
23-Apr	2.7	5.0	2.8	3.4	3.2	2.9	2.9	2.3	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.5	3.3	3.1	3.7	3.0	2.9	3.1	2.8	2.1	2.8	5.0
24-Apr	2.2	2.2	2.3	2.1	2.1	2.2	1.9	1.9	1.7	1.7	1.7	1.5	1.4	1.3	1.3	1.4	1.5	1.3	1.3	1.4	1.4	1.5	1.4	1.4	1.7	2.3
25-Apr	1.4	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.9	2.0	2.1	2.1	2.1	2.7	1.9	2.0	2.0	1.9	2.2	2.4	2.3	2.2	2.3	2.2	1.9	2.7
26-Apr	2.3	2.4	2.3	2.3	2.3	2.4	2.3	2.2	2.3	2.5	2.4	2.4	2.4	2.3	2.1	2.0	1.9	1.9	2.0	2.3	3.1	2.8	2.7	3.0	2.4	3.1
27-Apr	3.1	3.1	3.5	3.3	3.0	8.5	3.3	2.0	2.0	1.7	1.7	1.7	1.7	1.6	1.3	1.6	2.5	2.8	2.9	3.8	7.3	7.6	3.3	2.9	3.2	8.5
28-Apr	4.5	2.8	2.8	3.5	3.0	4.3	3.7	2.8	2.4	2.7	2.6	2.6	2.2	1.7	2.1	2.5	2.6	2.9	3.9	22.3	13.4	6.3	4.2	6.6	4.5	22.3
29-Apr	10.6	8.4	5.4	4.6	4.6	5.1	4.7	4.4	4.9	4.1	4.9	4.0	4.2	3.7	3.9	3.4	3.7	3.5	3.5	5.9	12.8	16.9	13.7	11.7	6.3	16.9
30-Apr	10.0	3.8	3.2	3.4	10.8	12.3	3.0	2.9	2.5	2.9	2.7	2.5	2.7	2.5	2.4	2.2	2.4	2.4	2.6	3.1	5.2	3.5	3.5	5.6	4.1	12.3
																								Diurnal Average		
																								Diurnal Maximum		
3.6 3.4 3.0 2.9 3.1 3.3 2.7 2.5 2.5 2.4 2.4 2.2 2.2 2.2 2.2 2.2 2.2 2.4 2.5 2.8 5.1 5.0 4.1 3.5 3.3 10.6 10.9 8.7 7.2 10.8 12.3 4.7 4.4 5.1 4.1 4.9 4.0 4.2 3.7 3.9 3.4 4.0 5.6 4.8 24.1 14.3 16.9 13.7 11.7																										
C - Calibration AF - Analyzer Failure Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m ³																										



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	659	94.55	94.55
6 - 15	34	4.88	99.43
16 - 25	4	0.57	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 697

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	52	83	47	33	34	62	48	70	46	41	23	13	25	29	23	28	657
6 - 15	0	1	0	0	0	2	1	4	6	6	10	1	1	1	1	0	34
16 - 25	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0	4
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	84	47	33	34	64	49	74	53	49	33	14	26	30	25	28	695

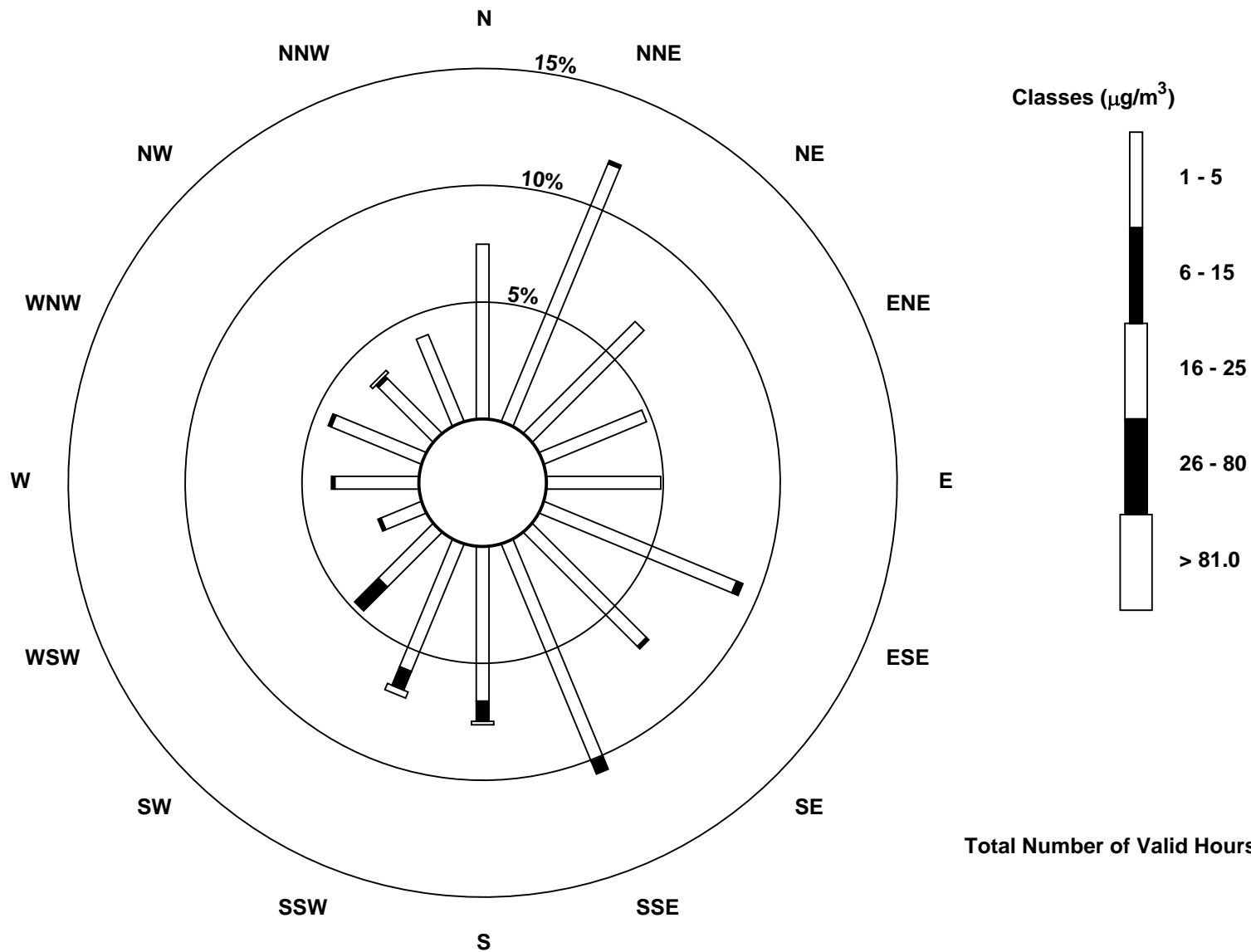
Total Number of Valid Hours: 695

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin (AMS 21)

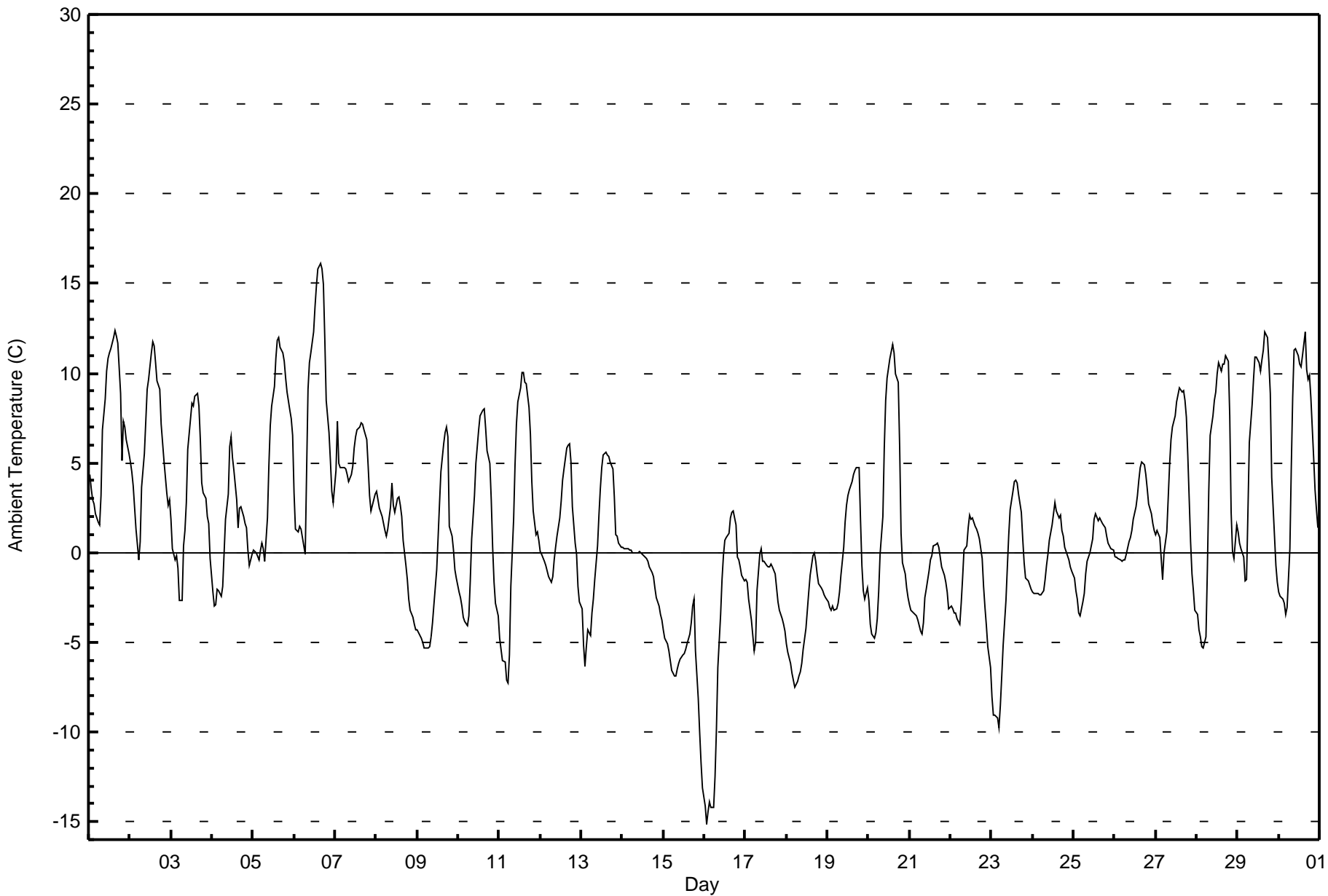




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Conklin - April 2017

Maximum Value: 16.1 C on Apr 6 16:00		Maximum Daily Average: 7.8 C on Apr 6		Hours in Service: 720																						
Minimum Value: -15.2 C on Apr 16 02:00		Minimum Daily Average: -6.2 C on Apr 15		Hours of Data: 720																						
Maximum Diurnal Average: 5.8 C at hour 16		Minimum Diurnal Average: -3.0 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 1.35 C		Percentiles: P ₁ = -12.7 P ₁₀ = -4.7 Q ₁ = -2.2 Median = 0.6 Q ₃ = 4.7 P ₉₀ = 9.1 P ₉₉ = 11.4		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	4.3	3.5	3.0	2.7	2.1	1.7	1.6	3.2	6.9	8.5	10.1	10.8	11.1	11.4	12.0	12.3	12.1	11.7	8.8	5.1	7.3	7.0	6.3	5.5	7.0	12.3
2-Apr	5.0	4.5	3.7	1.3	0.4	-0.4	0.6	3.6	5.5	7.3	9.1	9.7	11.1	11.8	11.5	10.6	9.6	9.1	7.2	6.2	5.2	3.3	2.6	3.0	5.9	11.8
3-Apr	1.9	0.3	-0.4	-0.2	-0.9	-2.6	-2.7	0.4	1.3	2.8	5.7	7.5	8.3	8.2	8.7	8.9	8.2	6.3	3.9	3.3	3.0	2.0	1.6	-0.3	3.1	8.9
4-Apr	-2.2	-3.0	-2.9	-2.1	-2.1	-2.4	-1.9	-0.1	1.9	3.3	5.9	6.4	5.3	4.6	2.9	1.4	2.5	2.5	2.0	1.7	1.4	0.1	-0.7	-0.1	1.0	6.4
5-Apr	0.1	0.1	0.0	-0.4	0.2	0.5	0.2	-0.5	1.9	4.8	7.1	8.1	9.3	10.8	11.8	12.0	11.5	11.1	10.6	9.7	8.9	7.9	7.4	6.6	5.8	12.0
6-Apr	3.3	1.3	1.1	1.4	1.3	0.8	-0.1	4.6	9.1	10.6	11.1	12.3	13.7	14.9	15.8	16.1	15.8	14.9	11.9	8.5	6.7	5.1	3.4	2.8	7.8	16.1
7-Apr	4.5	7.3	4.9	4.7	4.7	4.7	4.7	4.3	4.0	4.3	4.8	5.8	6.4	6.8	7.0	7.2	7.2	6.9	6.3	4.8	3.2	2.3	2.6	3.2	5.1	7.3
8-Apr	3.4	3.0	2.5	2.0	1.6	1.2	0.9	1.3	2.6	3.9	2.6	2.3	3.0	3.1	2.7	2.0	0.7	-0.7	-1.5	-2.6	-3.2	-3.6	-4.0	-4.3	0.8	3.9
9-Apr	-4.3	-4.5	-4.7	-5.0	-5.3	-5.3	-5.3	-5.2	-4.7	-3.9	-2.9	-0.9	0.8	2.7	4.5	6.1	6.7	7.0	6.5	1.4	0.9	0.1	-0.9	-1.4	-0.7	7.0
10-Apr	-2.2	-2.5	-2.9	-3.6	-3.9	-4.0	-3.5	-1.6	0.8	3.2	5.0	5.9	6.9	7.6	7.9	8.0	6.9	5.7	4.9	3.0	0.3	-1.6	-2.8	-3.5	1.4	8.0
11-Apr	-4.8	-5.4	-6.1	-6.1	-7.1	-7.3	-5.7	-1.9	1.8	4.9	7.1	8.4	9.2	10.0	10.0	9.5	9.4	8.1	6.6	4.0	2.3	1.0	1.2	0.7	2.1	10.0
12-Apr	0.1	-0.1	-0.5	-0.8	-1.0	-1.3	-1.7	-1.3	-0.4	0.3	0.9	1.9	2.9	4.0	4.7	5.8	6.0	6.1	5.0	2.5	0.5	-0.1	-1.9	-2.8	1.2	6.1
13-Apr	-3.1	-5.2	-6.3	-5.2	-4.3	-4.6	-3.4	-2.6	-1.5	0.4	2.1	3.6	4.8	5.4	5.6	5.4	5.4	5.1	4.7	3.1	1.0	0.9	0.5	0.3	0.5	5.6
14-Apr	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.3	-0.5	-0.8	-1.1	-1.4	-2.0	-2.5	-3.0	-3.4	-3.8	-0.8	0.3
15-Apr	-4.3	-4.8	-5.1	-5.5	-6.0	-6.6	-6.9	-6.9	-6.5	-6.2	-5.9	-5.7	-5.6	-5.4	-5.1	-4.5	-3.9	-3.0	-2.6	-5.5	-8.1	-10.0	-11.7	-13.2	-6.2	-2.6
16-Apr	-14.1	-15.2	-14.4	-13.9	-14.2	-14.2	-12.5	-9.8	-6.4	-3.5	-1.5	-0.1	0.7	0.8	1.1	1.9	2.3	2.3	1.6	-0.3	-0.4	-0.8	-1.3	-1.6	-4.7	2.3
17-Apr	-1.5	-1.7	-2.6	-3.8	-4.6	-5.5	-5.0	-2.1	-0.1	0.2	-0.5	-0.5	-0.7	-0.8	-0.8	-0.7	-0.8	-1.2	-2.0	-2.7	-3.2	-3.7	-4.0	-4.4	-2.2	0.2
18-Apr	-5.1	-5.5	-6.2	-6.7	-7.1	-7.5	-7.2	-6.9	-6.7	-6.2	-5.4	-4.3	-3.2	-2.2	-1.2	-0.2	0.0	-0.5	-1.2	-1.7	-2.0	-2.1	-2.3	-2.5	-3.9	0.0
19-Apr	-2.7	-3.1	-3.2	-3.0	-3.2	-3.2	-2.8	-2.2	-1.3	0.3	1.7	2.7	3.2	3.5	3.9	4.4	4.6	4.8	4.7	1.8	-0.7	-2.1	-2.6	-1.9	0.1	4.8
20-Apr	-2.7	-4.0	-4.5	-4.8	-4.4	-3.7	-2.2	-0.1	2.0	5.8	8.5	9.7	10.8	11.2	11.6	11.2	10.0	9.5	5.9	1.1	-0.5	-1.2	-1.9	-2.5	2.7	11.6
21-Apr	-2.9	-3.2	-3.4	-3.4	-3.5	-3.7	-4.4	-4.6	-3.9	-2.5	-2.1	-1.1	-0.4	-0.2	0.4	0.4	0.6	0.3	-0.2	-0.8	-1.3	-1.6	-2.2	-3.1	-1.9	0.6
22-Apr	-3.0	-3.1	-3.4	-3.4	-3.7	-4.0	-2.9	-1.4	0.1	0.4	1.4	2.1	1.8	2.0	1.5	1.3	1.0	0.8	-0.3	-1.9	-3.0	-4.1	-5.3	-6.4	-1.4	2.1
23-Apr	-8.0	-9.0	-9.0	-9.2	-9.7	-8.5	-6.8	-5.1	-2.6	-0.8	1.0	2.4	3.4	3.9	4.0	3.9	3.2	2.3	0.7	-0.5	-1.4	-1.6	-1.8	-2.0	-2.1	4.0
24-Apr	-2.2	-2.3	-2.3	-2.3	-2.4	-2.4	-2.1	-1.5	-0.7	-0.1	0.7	1.6	2.1	2.8	2.3	1.9	2.1	1.3	0.9	0.3	-0.1	-0.4	-0.8	-1.0	-0.2	2.8
25-Apr	-1.4	-2.1	-2.6	-3.4	-3.6	-2.8	-2.3	-1.2	-0.5	-0.1	0.4	0.8	1.8	2.1	1.8	1.9	1.8	1.6	1.4	0.9	0.6	0.4	0.3	0.1	-0.2	2.1
26-Apr	-0.3	-0.2	-0.3	-0.4	-0.5	-0.4	-0.4	-0.1	0.6	0.8	1.2	1.9	2.6	3.2	4.1	4.7	5.1	4.9	4.3	3.5	2.7	2.1	1.6	1.2	1.8	5.1
27-Apr	1.0	1.2	0.8	-0.4	-1.5	0.0	1.2	3.0	4.9	6.3	7.0	7.6	8.4	8.8	9.2	9.0	9.0	8.5	7.5	5.4	0.6	-1.2	-2.1	-3.2	3.8	9.2
28-Apr	-3.5	-4.3	-4.7	-5.3	-5.4	-4.7	-0.9	3.4	6.5	7.6	8.5	9.0	10.0	10.6	10.1	10.5	10.5	10.9	10.7	7.6	2.3	0.0	-0.3	1.6	3.8	10.9
29-Apr	1.2	0.5	0.2	-0.3	-1.6	-1.5	2.2	6.1	8.3	9.7	10.9	10.9	10.6	10.1	10.8	11.3	12.3	12.0	10.6	8.9	4.2	0.9	-0.7	-1.6	5.7	12.3
30-Apr	-2.2	-2.4	-2.6	-2.8	-3.5	-3.1	0.2	4.7	8.7	11.3	11.4	11.0	10.5	10.4	11.0	12.3	10.2	9.7	9.9	8.6	5.2	3.5	2.4	1.4	5.2	12.3
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Conklin - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	315	43.75	43.75
0 - 10	347	48.19	91.94
10 - 20	58	8.06	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



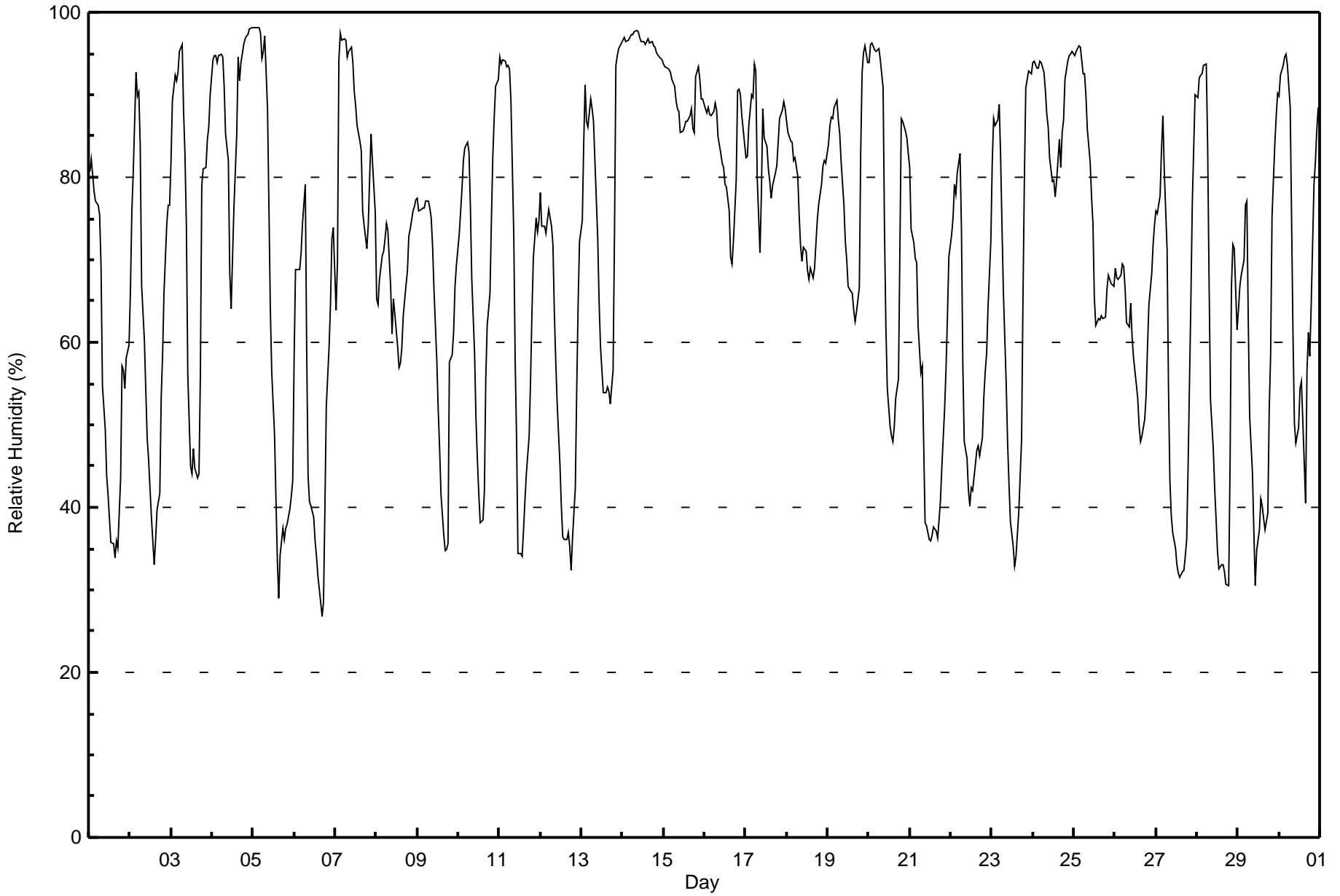
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Conklin - April 2017

Maximum Value: 98 % on Apr 5 01:00																	Maximum Daily Average: 96.4 % on Apr 14																	Hours in Service: 720															
Minimum Value: 27 % on Apr 6 17:00																	Minimum Daily Average: 52.2 % on Apr 21																	Hours of Data: 720															
Maximum Diurnal Average: 86.3 % at hour 5																	Minimum Diurnal Average: 53.1 % at hour 16																	Hours of Missing Data: 0															
Monthly Average: 70.4 %																	Percentiles: P ₁ = 32 P ₁₀ = 39 Q ₁ = 55 Median = 74 Q ₃ = 88 P ₉₀ = 95 P ₉₉ = 98																	Hours of Calibration: 0															
																																		Percent Operational Time: 100.0															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	81	82	80	78	77	77	75	69	55	49	44	42	39	36	36	34	36	35	44	57	57	54	58	60	56.4	82																							
2-Apr	66	76	80	93	90	90	84	67	60	54	48	46	39	36	33	36	40	42	53	59	66	74	77	77	61.9	93																							
3-Apr	82	89	92	92	93	95	96	88	83	74	56	45	44	47	45	44	44	56	79	81	81	85	86	90	73.6	96																							
4-Apr	94	95	95	94	95	95	95	91	85	82	69	64	70	76	85	95	92	94	96	97	97	97	98	98	89.5	98																							
5-Apr	98	98	98	98	97	94	95	97	88	76	64	56	49	41	34	29	34	37	36	37	38	40	41	43	63.4	98																							
6-Apr	58	69	69	69	71	74	79	59	44	41	40	39	36	34	32	28	27	28	40	52	59	65	73	74	52.5	79																							
7-Apr	64	70	94	97	97	97	97	95	95	96	94	90	89	86	84	83	76	74	71	74	80	85	82	76	85.3	97																							
8-Apr	65	65	68	70	71	72	74	74	67	61	65	63	60	57	57	59	63	67	69	73	74	76	76	77	67.7	77																							
9-Apr	77	76	76	76	76	77	77	76	75	72	66	58	52	47	42	37	35	35	36	58	58	61	67	69	61.6	77																							
10-Apr	73	76	79	82	84	84	83	76	68	59	51	46	42	38	38	42	56	62	66	75	82	87	91	92	67.9	92																							
11-Apr	95	94	94	94	93	94	93	89	73	58	48	34	34	34	37	41	44	49	55	64	70	75	73	75	67.1	95																							
12-Apr	78	74	74	73	75	76	74	72	64	58	53	45	40	36	36	36	37	35	32	36	42	54	65	72	55.8	78																							
13-Apr	75	84	91	87	86	89	88	87	82	73	65	60	57	54	54	55	54	53	57	73	94	95	96	96	75.1	96																							
14-Apr	97	97	96	97	97	97	97	98	98	98	97	96	96	96	97	97	96	96	96	96	95	95	94	94	96.4	98																							
15-Apr	94	93	93	93	93	92	91	89	88	88	85	86	86	87	87	87	88	86	86	92	93	92	90	89	89.5	94																							
16-Apr	88	88	89	88	87	88	89	88	85	83	82	81	79	79	76	70	69	72	80	91	91	90	87	84	83.5	91																							
17-Apr	82	83	86	90	90	94	93	80	71	78	88	85	84	81	80	78	79	80	81	84	87	88	89	88	84.1	94																							
18-Apr	87	85	84	84	82	82	80	75	72	70	72	71	69	68	69	68	69	72	75	77	79	81	82	82	76.5	87																							
19-Apr	84	86	87	87	89	89	87	85	82	77	72	70	67	66	66	64	63	64	67	83	93	95	96	94	79.7	96																							
20-Apr	94	96	96	95	95	95	96	94	91	73	62	54	50	49	48	50	53	56	71	87	87	86	85	83	76.9	96																							
21-Apr	81	74	72	70	70	62	56	57	48	38	38	36	36	37	38	37	36	39	41	45	52	57	63	70	52.2	81																							
22-Apr	73	75	79	78	81	83	74	57	48	46	42	40	42	42	45	47	48	46	48	53	56	59	64	72	58.3	83																							
23-Apr	82	87	86	87	89	83	74	66	55	48	43	38	35	33	34	37	40	48	66	80	91	93	93	93	65.8	93																							
24-Apr	94	94	93	93	94	94	93	90	88	86	82	80	80	78	80	85	81	85	87	92	94	95	95	95	88.6	95																							
25-Apr	95	95	96	96	96	93	93	90	86	82	78	74	65	62	63	63	63	63	63	67	68	68	67	67	77.1	96																							
26-Apr	69	68	68	68	70	69	66	62	62	65	61	58	55	53	50	48	49	51	54	60	65	68	72	74	61.8	74																							
27-Apr	76	76	78	83	87	81	71	54	43	39	37	35	33	32	32	32	32	34	36	45	65	77	83	90	56.3	90																							
28-Apr	90	92	92	93	94	94	84	67	53	47	42	39	35	33	33	33	32	31	31	45	67	72	71	62	59.6	94																							
29-Apr	64	67	68	70	77	77	63	51	44	37	30	35	37	41	40	39	37	39	52	58	75	84	87	90	56.8	90																							
30-Apr	90	92	94	95	95	94	89	75	61	50	48	50	54	55	50	41	57	61	58	65	79	82	86	88	71.1	95																							
																								81.5	83.2	85.0	85.7	86.3	86.1	83.5	77.3	70.4	65.2	60.7	57.2	55.1	53.8	53.3	53.1	54.3	56.4	60.8	68.5	74.5	77.7	79.6	80.5	Diurnal Average	
																								98	98	98	98	97	97	97	98	98	98	97	96	96	96	97	97	96	96	96	96	97	97	98	98	Diurnal Maximum	





Maximum Speed: 21 km/h on Apr 5 16:00	Maximum Daily Speed Average: 11.8 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 11 06:00	Minimum Daily Speed Average: 0.6 km/h on Apr 30	Hours of Data: 718
Maximum Diurnal Speed Average: 3.2 km/h at hour 12	Minimum Diurnal Speed Average: 0.8 km/h at hour 21	Hours of Missing Data: 2
Monthly Average Velocity: 1.7 km/h 79.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 10 P ₉₀ = 12 P ₉₉ = 17	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	SW11	SW11	SW10	SW12	SW9	SW10	SW9	SW10	W13	W13	W13	W11WNW12	W11WSW12WSW12	W11	WNW8	WNW3	WNW4	W15	W10	WNW8	NW6	WSW9.3	W15			
2-Apr	W6	NW4	WNW3	SSW4	SSW5	S5	SW5	W7	W8	WNW8	WNW8	WNW9WNW10WNW11	NW11	NW10	W9	W7	W7	W13	WNW8	NW5	SW5	W6	W6.4	W13		
3-Apr	NW6	NNW4	NW4	NW4	WNW3	WSW2	NW1	NW6	NW5	WNW5	WNW6	NW9	NW11	NW12	NNW12	NW11	NNW10	NNW11	NW9	WNW5	NNW5	NNW2	NNW3	N2	NW6.0	NNW12
4-Apr	W1	SSE1	SSW3	SE2	SSE1	SE2	SSE4	S3	S4	SSE3	ESE6	ESE8	SE12	ESE12	SW2	ESE1	NNW3	NNE3	NNW5	SW2	SSE3	E1	SW1	WSW1	SE2.0	ESE12
5-Apr	SSE2	SE2	SE3	SSE2	SE4	SSE7	ESE6	SE9	ESE9	SSE16	SSE20	SSE21	SSE17	SSE18	S19	S21	S19	SSE14	SSE12	SSE11	SSE10	SSE9	SSE9	SSE7	SSE10.9	S21
6-Apr	SSE6	SSE3	SSE5	SSE4	SE4	S2	SSE2	SSW6	WSW9	WNW6	SW8	W10	WNW9	WNW9	WNW7	NW7	WNW5	WNW3	NW2	NW2	WNW1	W1	SW1	SW2	WSW2.7	W10
7-Apr	SW3	SE4	NNW3	NNW6	NNW6	NNW6	NNW8	N10	N7	N7	NNE7	NE5	ENE5	NE7	NE8	NE9	NE8	NE5	NNE6	N4	N5	NNW4	NNW7	N8	NNE4.9	N10
8-Apr	N10	N9	N9	N11	N11	N12	N13	N13	N14	N16	N18	NNE16	N14	N14	NNE13	NNE14	NNE14	NNE13	NNE10	NE10	NNE9	NNE10	NNE8	NE8	NNE11.8	N18
9-Apr	NNE6	N7	N6	NNE5	NE4	ENE3	ESE6	E4	ESE3	E5	E7	E8	ESE8	E10	E8	SSE7	SSW9	S7	SSW5	SSW2	SSW7	SSW8	SSW7	S9	SE3.0	ESE10
10-Apr	S9	S8	S7	SSE5	SSE5	SSE6	SSE5	S6	SE4	SE5	S8	ESE7	E9	ESE10	SSE10	S6	S11	S9	S6	SW2	S2	S2	ESE2	SSW0	SSE5.4	S11
11-Apr	W1	S1	WSW1	SSE2	NW1	SSE0	SSW1	NNW4	N7	NNE7	ESE8	NE10	NNE11	NNE12	NNE13	NNE13	NNE14	N13	N12	N9	N7	N5	NE5	NE7	NNE5.8	NNE14
12-Apr	NNE4	N5	N4	NNE6	NNE6	NNE6	NNE8	NNE8	NNE10	N9	N9	NNE9	NNE7	NE8	NNE7	ESE9	SE10	E7	NE8	NNE5	NNE3	E4	NE3	E2	NE5.4	NNE10
13-Apr	E3	NW2	NNW3	NNE3	NE4	NE4	ENE6	E9	ENE9	NE10	NE11	ENE12	ENE12	E14	ENE13	ENE14	E13	ENE11	E14	E15	ENE7	ENE9	ENE10	NE10	ENE8.5	E15
14-Apr	NE10	NE11	NE11	NE11	NE9	NE10	NE10	NE11	NE10	NE11	NE12	NE12	NE13	NE13	NE14	NE13	NE12	NE12	NE12	NNE11	NNE12	NNE12	NNE11	NNE10	NE11.2	NE14
15-Apr	NNE11	NNE11	NNE10	NNE11	NNE12	NNE12	NNE13	NNE13	NNE12	NNE11	NNE11	NNE11	NNE10	NNE12	NNE10	NNE7	NNE7	NNE5	NNE4	WSW0	W1	SW1	NW1	WNW1	NNE7.9	NNE13
16-Apr	SSW1	AF	SSE4	S4	S4	S4	S5	SSW6	SSW4	SSW7	SSW9	S12	SSW11	SSW11	SSW10	SSW10	SSW11	S9	S7	SE7	SSE8	S6	S8	SSW9	S7.0	S12
17-Apr	SSW6	S6	S8	S9	S5	ESE1	NNW1	SW1	NNE4	NNE8	NNE10	NNE9	NNE10	NNE10	NNE11	NNE11	NNE11	NNE11	NNE11	NNE9	NNE8	NNE7	NNE6	NNE6	NNE4.6	NNE11
18-Apr	NNE7	NNE7	NNE9	NNE8	NE7	NE7	ENE6	ENE8	NE8	NE9	NE8	E8	ENE7	E7	E6	E6	ENE6	NE5	N6	NNE5	NE2	N2	N4	N3	NE5.7	NE9
19-Apr	N1	NNW3	NNW2	WNW1	NNW2	NW1	SSE3	NE1	NW1	W3	W2	SW6	SW8	SW8	SW7	WSW8	WSW7	WSW5	S3	SSW2	SSW4	SSW4	S4	S5	SW2.8	SW8
20-Apr	SE1	N3	SE1	SSE4	S2	SE1	ESE3	SE4	ESE4	ESE6	ESE10	SE11	SSE11	SSW10	SSW9	SW13	SW11	W6	N15	N13	N11	NNE11	NNE11	N11	E0.7	N15
21-Apr	NNE10	NNE9	NNE10	NNE8	N8	N8	NNE11	NNE10	NNE9	NE8	NNE7	NE6	NNE6	ENE7	ESE7	ENE4	ENE6	ENE6	NE5	ENE4	ESE5	SSE5	SE6	SE2	NE5.4	NNE11
22-Apr	SSE3	SE3	SE3	ESE3	WSW1	NNW2	N3	SE4	ESE4	NE6	N6	NE10	NNE9	NNE11	NNE12	NNE13	N12	NNE11	NNE10	NNE7	NNE6	NE4	ENE2	ENE3	NNE4.7	NNE13
23-Apr	NNE1	N1	NNW3	N1	N3	N2	E5	ESE8	E8	ESE10	E11	ESE12	ESE12	ESE11	ESE13	SE14	SE13	SE14	SE13	SE10	ESE7	E6	E7	ENE6	ESE7.1	SE14
24-Apr	ENE6	ENE5	E7	ENE5	ENE5	ENE5	E6	E6	ESE9	E9	ESE9	E10	ESE12	ESE11	ESE10	E9	E11	ESE10	ESE8	E7	E6	ESE6	ESE6	ESE5	E7.4	ESE12
25-Apr	ESE5	ESE4	ESE4	ENE1	SE5	SE3	ESE4	ESE6	ESE7	ESE7	SE11	SSE10	SSE9	SSE10	S10	SSE9	SSE10	SSE10	SSE9	SE7	SSE8	SE10	SSE10	SSE8	SE6.9	SE11
26-Apr	SSE3	S4	SSE6	S6	SSE8	SSE9	SSE10	SSE11	SE9	SE10	SE13	SE12	SE12	SE11	ESE10	ESE10	SE10	SSE10	SSE10	SSE11	SSE10	SSE7	SSE5	SE6	SE8.4	SE13
27-Apr	SE5	SE6	ENE3	N2	N3	ESE3	ESE5	SE9	SE11	ESE12	ESE13	ESE13	ESE10	ESE10	ESE8	ESE9	SE11	ESE9	SE7	S5	SW2	SSE3	SSE4	E1	ESE6.1	ESE13
28-Apr	SSE1	SSW1	SSE3	S3	SSE2	SSE2	S2	WNW1	WSW2	WSW4	WNW4	NE2	S3	S5	WSW4	S6	SSW6	SW6	S5	SSW3	SSW4	SSW6	SSW6	SSW6	SSW3.1	SSW6
29-Apr	SSW6	SSW7	SSW7	SSW6	S5	SSE4	SSE5	SW6	SW8	SSW12	S14	SSW15	SW14	SSW14	S10	S11	SSW10	SSW11	W11	SW6	SW1	S3	S3	SSE2	SSW7.4	SSW15
30-Apr	S4	SSE5	SE5	SE4	SE2	S2	SE3	SE2	ESE4	ESE8	ESE7	NE6	NNW10	NW11	NW7	W4WNW10	W6	N4	NNW1	AF	NNW3	WNW1	SW1	N0.6	NW11	

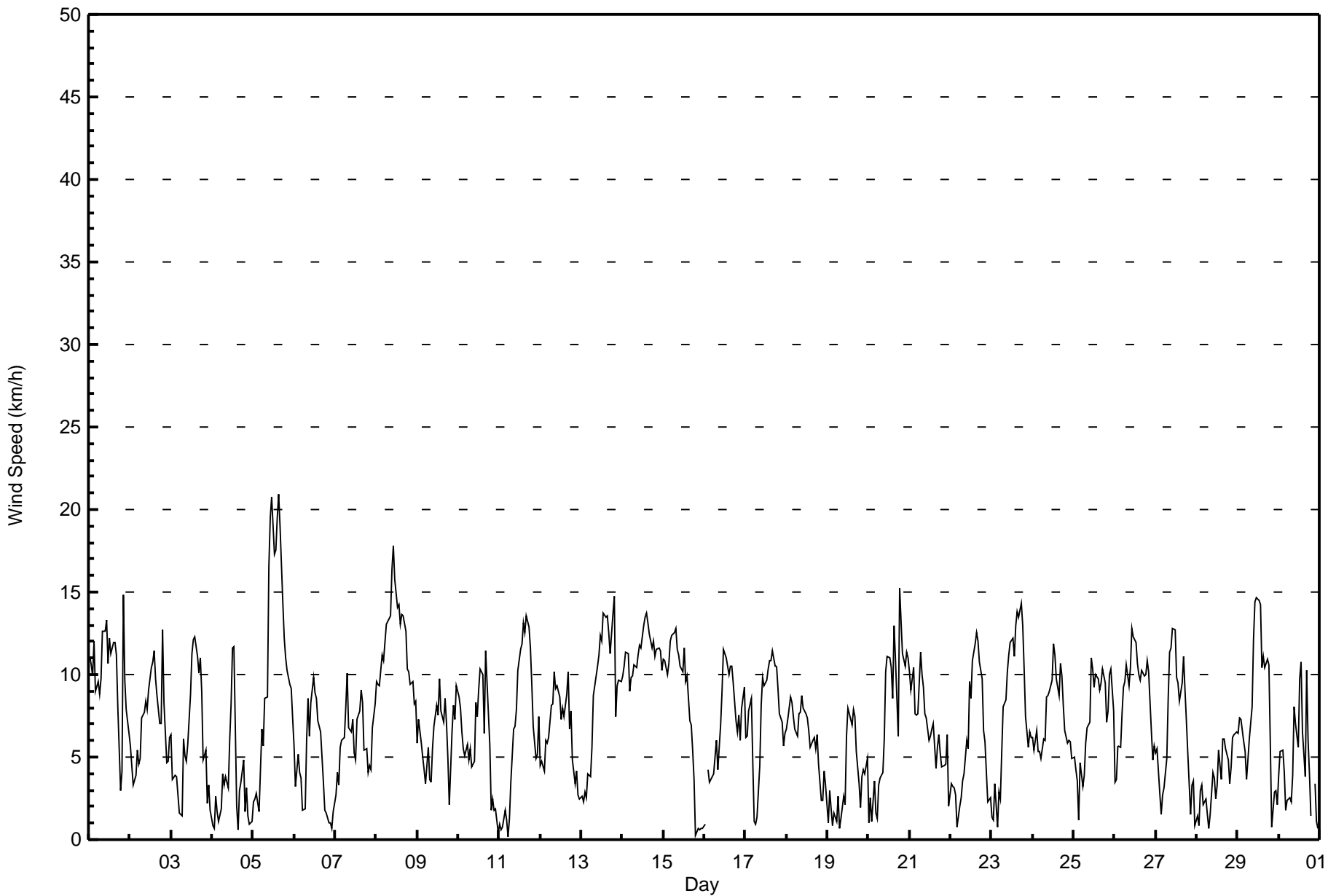
E0.9	ENE1.0	ENE1.1	ENE0.9	NE1.0	ENE1.1	ENE2.1	E1.8	ENE2.1	ENE2.8	E3.2	E3.2	E2.5	E2.7	E2.2	E2.0	ESE1.5	E1.4	ENE2.2	ENE1.4	ENE0.8	E1.1	E1.3	ENE1.2	Diurnal Average
SW11	NNE11	NE11	SW12	NNE12	NNE12	N13	N13	N14	SSE16	SSE20	SSE21	SSE17	SSE18	S19	S21	S19	SE14	N15	E15	W15	NNE12	NNE11	N11	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Conklin - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	256	35.65	35.65
6 - 11	369	51.39	87.05
12 - 19	90	12.53	99.58
20 - 28	3	0.42	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	18	11	12	13	8	17	24	34	27	16	14	9	6	15	13	19	256
6 - 11	21	70	32	15	23	39	18	32	21	30	16	3	15	15	11	8	369
12 - 19	13	19	9	5	3	8	7	6	4	3	3	2	5	1	1	1	90
20 - 28	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	100	53	33	34	64	49	74	53	49	33	14	26	31	25	28	718

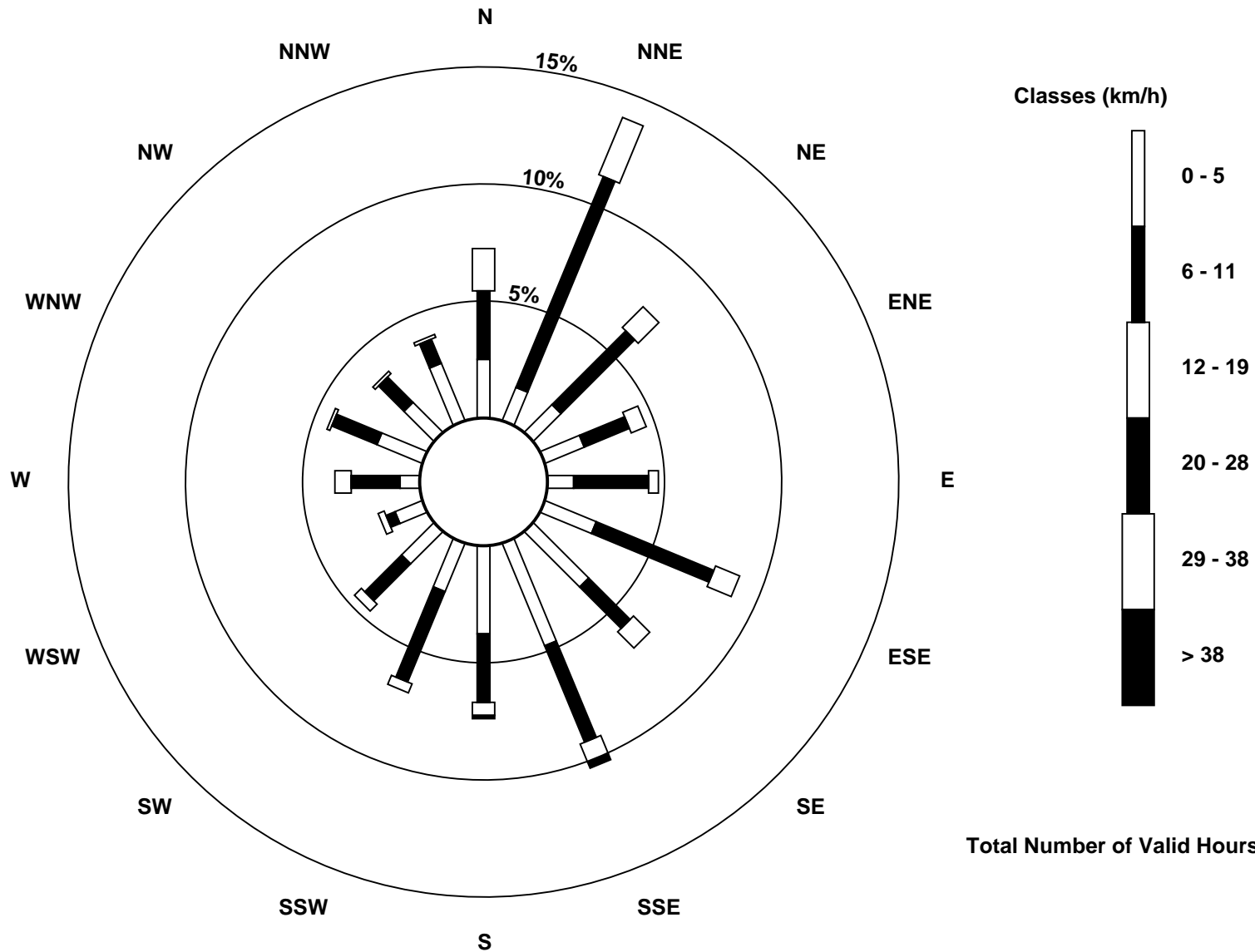
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Conklin (AMS 21)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Conklin - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Apr 5 16:00	Hours of Data: 718
Minimum Value: 0 km/h on Apr 13 03:00	Hours of Missing Data: 2
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 5	Hours of Calibration: 0
	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	3	2	3	2	2	2	2	4	5	4	4	5	5	4	4	5	4	1	6	5	4	4	2	6
2-Apr	2	2	2	1	2	1	3	3	3	3	3	4	4	5	5	4	4	2	3	4	4	2	2	2	5
3-Apr	2	1	2	2	2	1	1	2	2	1	2	3	4	4	4	4	5	6	4	2	2	1	1	1	6
4-Apr	1	2	2	1	1	2	1	1	2	1	2	2	4	4	4	2	3	1	1	1	1	1	1	1	4
5-Apr	1	1	1	1	2	2	2	3	4	5	5	6	5	5	6	7	5	4	3	2	2	2	3	1	7
6-Apr	1	1	2	1	2	2	1	2	3	2	2	4	3	3	3	3	2	2	1	1	1	1	1	2	4
7-Apr	3	3	2	2	2	2	2	3	2	2	2	2	2	3	3	4	3	2	2	1	1	2	1	2	4
8-Apr	3	3	2	3	3	3	4	4	4	6	5	4	5	4	4	4	4	4	4	3	3	3	3	3	6
9-Apr	2	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	1	2	2	2	2	2	3
10-Apr	2	2	1	1	1	1	1	1	2	2	3	2	3	3	4	3	3	3	2	1	1	1	2	1	4
11-Apr	1	1	1	1	1	1	1	2	2	3	2	4	5	4	5	4	4	4	4	3	2	1	2	3	5
12-Apr	1	2	1	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2	1	1	2	1	1	3
13-Apr	1	1	0	1	2	1	3	3	3	4	4	4	5	5	5	5	5	4	5	5	3	4	4	3	5
14-Apr	4	4	4	4	3	3	3	3	4	3	4	5	4	5	5	4	4	4	5	4	3	4	4	3	5
15-Apr	4	3	3	3	4	4	4	4	4	3	3	3	4	3	3	2	2	2	1	1	1	1	1	1	4
16-Apr	1	AF	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	2	1	1	2	2	3	3
17-Apr	2	2	1	2	3	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	3
18-Apr	2	2	3	2	2	2	2	3	2	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	3
19-Apr	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	2
20-Apr	1	1	2	1	2	1	3	2	2	1	3	3	3	4	4	4	3	4	5	5	4	4	4	4	5
21-Apr	3	3	3	3	2	2	3	3	3	4	3	3	3	3	3	2	2	2	2	2	2	1	2	2	4
22-Apr	1	1	1	1	1	1	1	2	2	2	3	4	3	4	4	4	4	3	3	2	2	1	1	1	4
23-Apr	1	1	1	1	1	1	2	2	3	3	3	4	4	3	4	4	4	4	4	3	2	2	2	2	4
24-Apr	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	3	2	2	2	2	1	1	4
25-Apr	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	2	3	3	3	2	2	2	3	2	3
26-Apr	1	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	3
27-Apr	1	2	1	1	1	1	1	3	3	4	4	4	4	3	3	3	3	2	2	3	1	1	1	1	4
28-Apr	1	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	2	1	1	1	1	1	3
29-Apr	1	1	1	2	2	1	1	2	3	4	5	5	5	4	4	3	3	4	3	3	1	1	1	2	5
30-Apr	1	1	1	1	1	1	1	1	2	3	2	2	2	3	4	3	5	3	2	1	AF	1	1	2	5
	4	4	4	4	4	4	4	4	4	6	5	6	5	5	6	7	5	6	5	6	5	4	4	4	

Diurnal Maximum

AF - Analyzer Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Conklin - April 2017

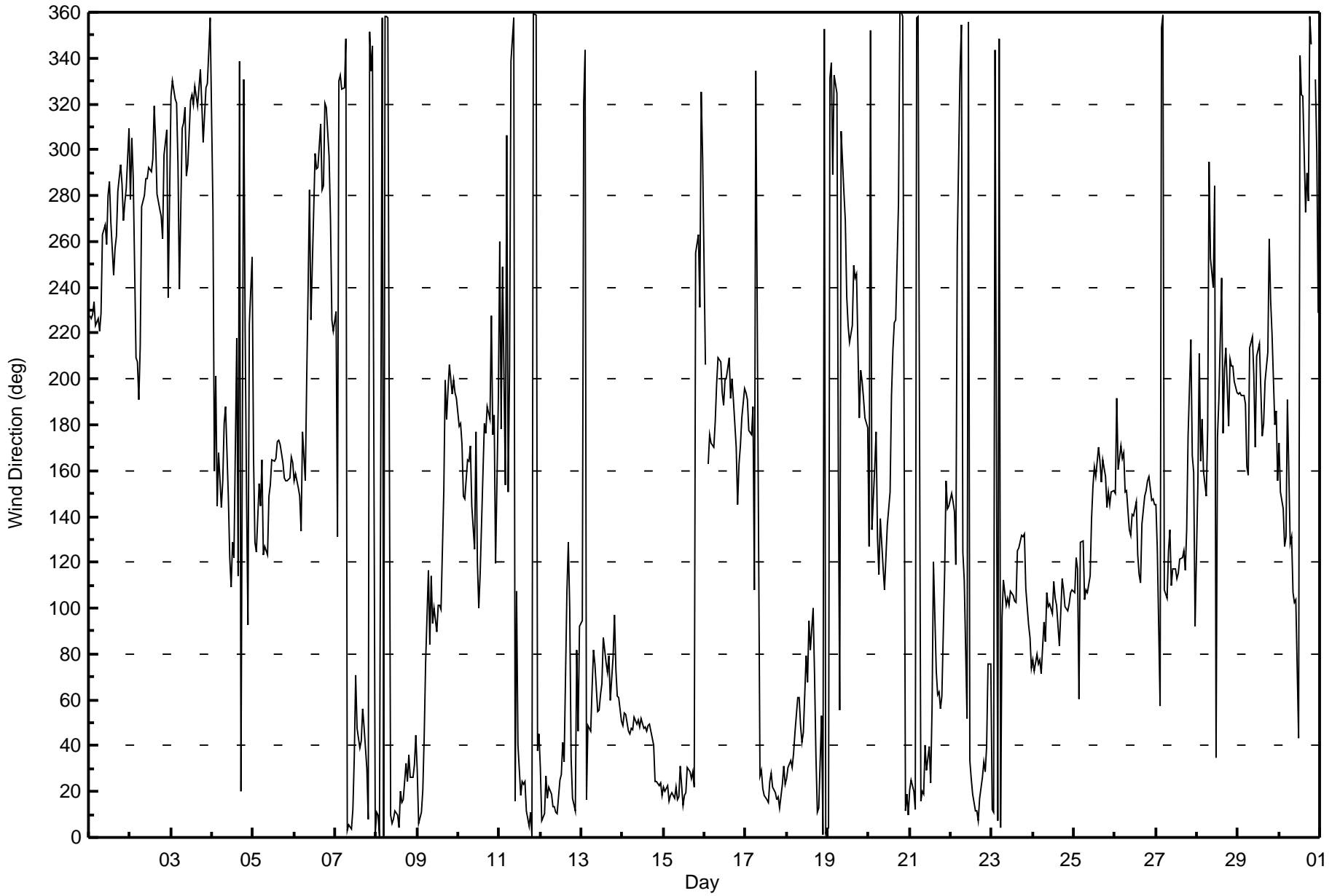
Direction of Maximum Speed: 173 deg on Apr 5 16:00 Direction of Maximum Daily Speed Average: 12.8 deg on Apr 8	Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2
Direction of Minimum Speed: 151 deg on Apr 11 06:00 Direction of Minimum Daily Speed Average: 0.6 deg on Apr 30	Percent Operational Time: 99.7
Monthly Average Direction: 224.5 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	228	226	229	234	223	227	221	229	263	267	259	280	286	268	246	257	263	282	294	285	269	277	283	309	256.3
2-Apr	279	305	288	209	208	191	214	275	280	288	288	292	290	296	319	304	281	274	271	261	298	309	236	279	279.7
3-Apr	323	330	322	320	293	239	309	312	318	288	294	321	324	320	328	319	327	335	320	303	327	329	343	358	320.3
4-Apr	274	160	202	145	168	144	156	181	188	148	122	109	129	122	218	114	339	20	331	222	149	93	224	253	138.1
5-Apr	166	128	125	154	145	165	123	127	123	149	154	165	164	165	173	173	171	163	157	156	156	157	166	163	158.9
6-Apr	156	159	153	149	133	177	156	200	239	283	226	274	299	292	292	311	283	284	320	319	297	270	226	221	253.2
7-Apr	229	131	330	333	327	327	348	3	6	4	12	35	71	48	39	42	56	48	30	8	352	334	346	2	12.7
8-Apr	11	10	1	357	1	358	358	357	10	6	8	12	9	4	20	15	16	32	24	36	26	26	32	45	12.8
9-Apr	29	6	11	21	45	76	117	84	114	93	100	89	102	101	100	151	200	182	196	206	194	200	194	191	124.9
10-Apr	179	180	172	149	148	165	164	171	145	125	177	120	100	115	159	180	177	188	182	228	176	184	120	192	159.7
11-Apr	260	178	249	154	306	151	204	339	358	16	107	40	18	25	23	25	12	5	11	0	360	359	38	45	19.1
12-Apr	30	7	10	27	17	22	19	14	13	11	10	25	27	42	33	107	129	100	35	17	12	82	47	92	35.2
13-Apr	94	321	344	17	49	46	65	82	76	55	55	62	67	87	77	72	79	60	79	97	74	62	61	51	68.5
14-Apr	49	54	54	46	45	48	47	52	49	51	48	52	48	48	46	49	50	44	25	24	23	24	18	18	43.2
15-Apr	22	20	23	16	18	19	17	22	17	18	31	14	18	19	30	29	26	29	22	255	263	231	325	297	20.3
16-Apr	207	AF	163	176	172	170	181	198	209	207	194	188	199	201	209	192	200	191	170	145	163	171	183	196	188.5
17-Apr	194	191	178	176	188	108	334	232	27	30	21	18	16	16	25	28	22	20	16	18	13	23	31	23	26.1
18-Apr	25	30	33	30	37	46	61	61	49	42	46	80	68	95	82	100	71	35	11	13	53	1	353	2	46.9
19-Apr	4	331	338	289	333	325	159	55	308	281	269	236	224	216	223	250	244	246	183	204	199	192	183	179	229.5
20-Apr	127	352	134	161	177	131	115	139	118	108	122	136	151	193	212	225	226	276	360	360	358	12	19	10	82.1
21-Apr	21	25	20	12	357	358	16	20	19	40	30	40	24	57	120	73	62	63	56	61	116	156	144	145	39.1
22-Apr	150	146	142	119	257	335	354	124	112	52	356	34	26	19	12	12	8	17	26	33	28	40	75	76	30.6
23-Apr	12	11	343	7	349	4	96	112	101	104	101	108	106	103	102	125	126	132	131	132	109	93	87	74	107.7
24-Apr	77	73	80	75	78	71	94	85	107	101	102	98	112	104	102	84	98	113	108	100	99	102	107	108	97.0
25-Apr	107	122	117	60	129	129	104	108	107	114	139	153	162	157	170	164	155	165	157	144	151	145	151	152	144.4
26-Apr	150	191	160	171	166	168	151	151	134	132	141	140	146	124	114	111	137	149	152	155	157	147	147	145	145.0
27-Apr	145	126	57	353	359	108	105	125	134	110	117	117	113	115	122	122	125	117	134	175	217	167	159	92	122.3
28-Apr	155	211	164	183	160	149	178	295	252	240	284	35	174	191	244	176	204	214	179	209	206	206	199	194	199.1
29-Apr	194	194	193	193	189	162	158	214	219	201	170	210	216	195	175	181	199	212	261	235	220	180	186	156	198.8
30-Apr	172	150	144	127	131	191	128	131	107	103	104	44	341	324	323	273	290	278	358	346	AF	331	299	229	0.8
	81.0	63.4	70.1	64.2	56.0	70.3	78.0	79.0	65.8	69.3	95.8	84.8	79.4	87.4	80.4	101.2	118.6	91.8	56.7	66.9	64.5	81.8	95.5	74.4	

Diurnal Average

AF - Analyzer Failure

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Conklin - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Apr 4 16:00	Hours of Data: 718
Minimum Value: 9 deg on Apr 28 22:00	Hours of Missing Data: 2
	Hours of Calibration: 0
	Percent Operational Time: 99.7
Percentiles: P ₁ = 13 P ₁₀ = 18 Q ₁ = 22 Median = 28 Q ₃ = 39 P ₉₀ = 62 P ₉₉ = 91	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	21	19	19	17	19	19	20	19	24	30	28	32	31	32	33	29	30	29	25	32	22	25	26	21	33
2-Apr	24	21	50	25	22	25	48	34	32	31	30	34	32	35	29	31	28	39	34	22	28	21	35	31	50
3-Apr	25	22	28	32	40	60	64	26	21	28	41	34	31	26	26	27	26	18	21	27	33	31	25	60	64
4-Apr	52	91	64	81	92	83	12	38	41	60	41	22	21	22	89	100	39	51	16	64	28	74	66	64	100
5-Apr	63	55	45	74	52	17	32	19	21	18	19	21	23	21	21	20	18	18	15	15	14	15	16	13	74
6-Apr	11	24	29	43	54	81	76	30	28	32	31	32	32	31	47	39	36	26	24	23	38	38	62	40	81
7-Apr	95	76	33	18	20	19	19	22	24	23	24	49	46	31	31	29	34	37	26	18	17	18	10	21	95
8-Apr	22	19	20	18	19	20	20	20	23	25	24	27	30	30	28	25	27	22	24	22	29	30	30	33	33
9-Apr	35	21	37	32	53	68	40	71	74	73	33	45	49	33	43	57	37	35	25	62	17	18	18	17	74
10-Apr	14	17	14	14	13	18	18	24	50	45	29	42	35	37	34	53	24	23	24	65	36	53	74	75	75
11-Apr	49	86	45	60	41	92	70	29	24	44	43	35	35	34	36	27	23	25	23	19	17	21	34	30	92
12-Apr	29	21	19	26	23	21	23	26	30	32	31	37	50	44	49	36	23	49	24	18	26	49	53	54	54
13-Apr	62	22	13	43	43	47	36	36	35	33	33	34	36	34	34	33	35	34	34	30	39	35	33	30	62
14-Apr	34	32	31	30	28	30	29	31	30	29	30	31	29	32	29	30	29	27	27	24	24	23	23	24	34
15-Apr	24	23	22	22	23	22	22	23	22	24	23	24	22	27	23	25	25	27	26	75	54	68	32	54	75
16-Apr	39	AF	16	25	27	20	27	19	29	31	25	20	24	24	27	26	22	23	17	10	14	26	24	23	39
17-Apr	36	20	16	15	80	80	55	67	67	33	26	25	26	24	23	23	23	23	21	22	20	22	20	22	80
18-Apr	23	20	23	21	25	28	35	38	35	32	33	40	42	54	39	56	44	44	23	27	51	28	15	28	56
19-Apr	87	14	13	36	18	35	45	85	75	32	60	25	26	27	23	20	18	22	33	45	10	13	21	15	87
20-Apr	89	31	96	28	89	82	75	72	46	21	23	26	25	31	41	23	25	43	22	24	22	23	23	24	96
21-Apr	24	25	23	22	19	19	24	31	42	59	46	61	70	54	43	64	53	41	39	43	40	19	16	86	86
22-Apr	20	28	27	57	60	13	37	72	79	47	70	49	47	36	27	26	28	30	24	22	27	34	57	53	79
23-Apr	66	85	18	74	20	38	39	23	28	30	30	29	26	30	23	27	19	21	20	20	20	31	36	38	85
24-Apr	40	40	36	39	37	39	33	36	26	28	26	31	21	26	30	34	31	20	22	26	31	26	20	22	40
25-Apr	21	22	35	80	19	48	29	25	23	20	18	19	32	23	21	20	19	18	17	13	15	15	15	16	80
26-Apr	36	54	19	20	18	19	17	21	22	24	21	21	22	22	27	25	23	18	18	16	16	15	14	15	54
27-Apr	16	27	50	52	29	43	27	27	27	28	27	25	43	45	42	25	24	20	20	38	60	31	42	69	69
28-Apr	94	65	40	20	52	61	76	84	88	69	68	92	91	70	58	41	40	36	39	21	17	9	10	16	94
29-Apr	16	14	14	18	38	55	22	31	26	27	30	28	27	25	33	29	38	27	23	25	77	39	38	87	87
30-Apr	19	27	14	22	70	49	60	75	60	32	40	41	17	16	31	67	30	29	32	33	AF	17	53	79	79
	95	91	96	81	92	92	76	85	88	73	70	92	91	70	89	100	53	51	39	75	77	74	74	87	

Diurnal Maximum

AF - Analyzer Failure



Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	April 13, 2017	Last Cal Date:	March 9, 2017
Start time (MST):	8:27	End time (MST):	12:35
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>51.4</u>	ppm	Cal Gas Exp Date	February 9, 2018
Cal Gas Cylinder #	<u>EY0000359</u>			
Calibrator Make/Model	Teledyne API T700		Serial Number	2658
ZAG Make/Model	Teledyne API 701		Serial Number	5611

Analyzer Information

Analyzer make: Thermo 43i

Analyzer serial #: 1428701363

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-655	-654
Calculated slope	0.997548	1.000615	Lamp voltage	852	853
Calculated intercept	0.759310	1.472806	Pressure	638.5	663.4
Analyzer Background	21.9	21.9	Flow	0.471	0.487
Analyzer Coefficient	0.908	0.895	Intensity	92	92

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	0.1	----
as found span	4934	76.5	784.8	792.3	0.991
calibrator zero	5005	0.0	0.0	0.1	----
high point	4934	76.5	784.8	783.8	1.001
second point	4975	38.4	393.7	390.7	1.008
third point	4990	19.2	197.0	194.2	1.014
as left zero	5005	0.0	0.0	0.5	----
as left span	4934	76.5	784.8	783.3	1.002
Average Correction Factor					1.008
Corrected As found	792.20	Previous response	785.94	*% change	-0.8%

* = > +/-5% change initiates investigation

Notes:

Sample inlet filter replaced after as founds. Adjusted span.

Calibration Performed By:

Asad Hidayat



Wood Buffalo Environmental Association

SO₂ Calibration Summary

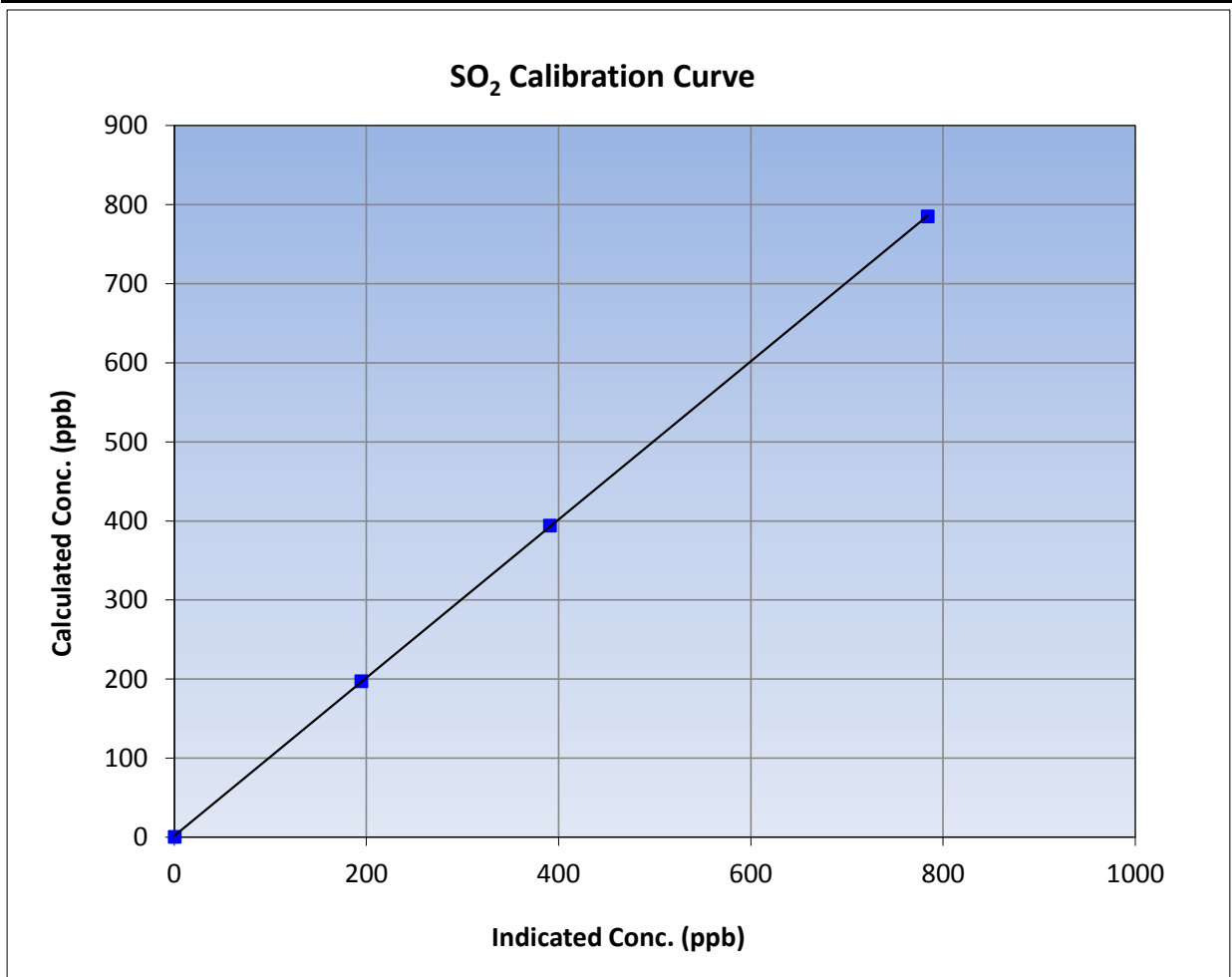
Version-03-2017

Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:35
Analyzer make	Thermo 43i	Analyzer serial #	1428701363

Calibration Data

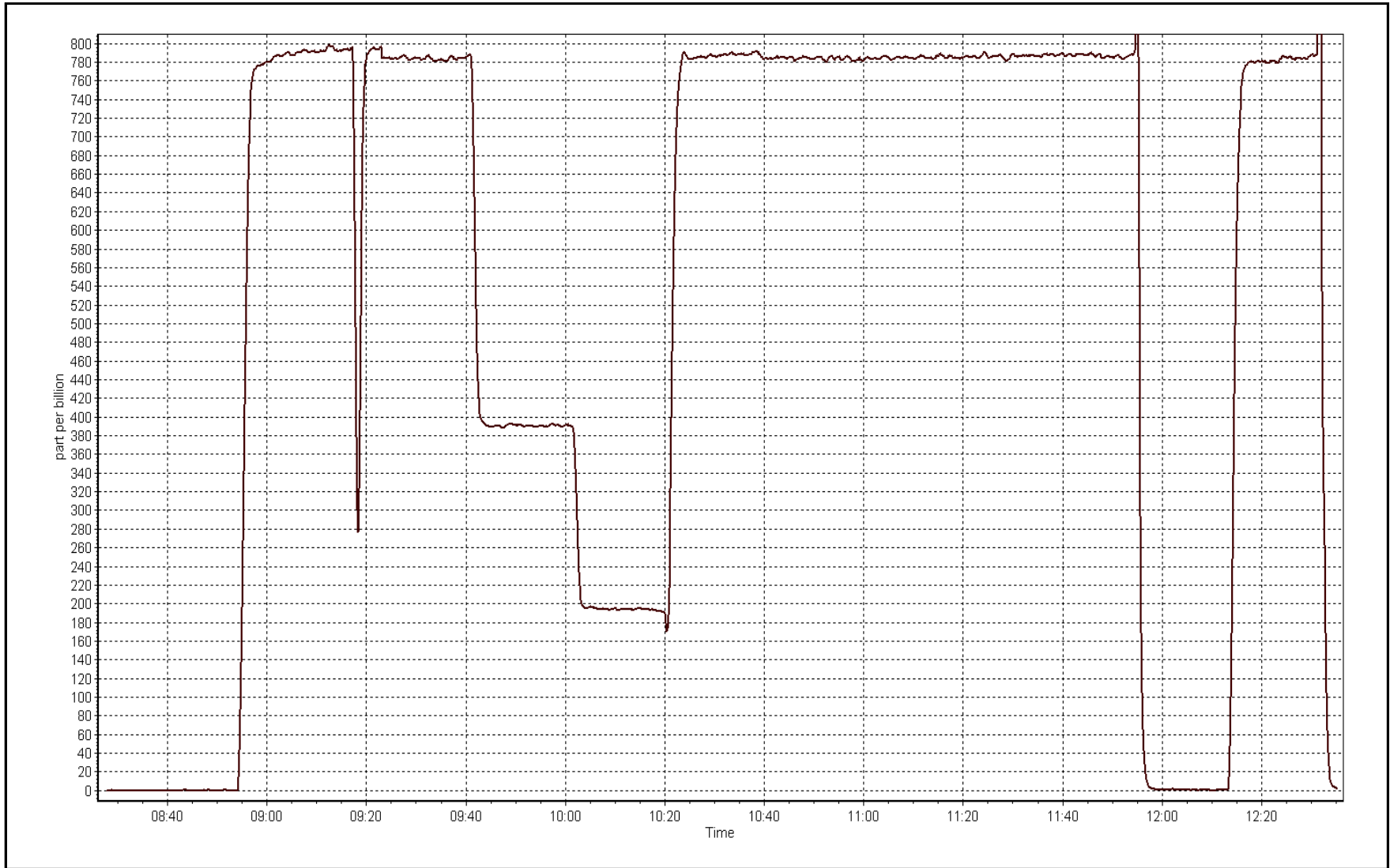
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.1	----	Correlation Coefficient	≥0.995
784.8	783.8	1.0013		
393.7	390.7	1.0077	Slope	0.90 - 1.10
197.0	194.2	1.0144		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 13, 2017

Location: Conklin





Wood Buffalo Environmental Association

TRS Calibration Report

Version-03-2017

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	April 6, 2017	Last Cal Date:	March 13, 2017
Start time (MST):	9:10	End time (MST):	11:05
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	4.97	ppm	Cal Gas Exp Date	February 12, 2019
Calibrator Make/Model	Teledyne API T700		Serial Number	2658
ZAG Make/Model	Teledyne API 701		Serial Number	5611

Analyzer Information

Analyzer make: Thermo 43i-TLE

Analyzer serial #: 1236656116

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0	100	PMT voltage	-731	-732
Calculated slope	0.999384	1.003005	Lamp voltage	1038	1038
Calculated intercept	-0.010163	0.007564	Pressure	655.5	657.3
Analyzer Background	1.5	1.5	Flow	0.423	0.424
Analyzer Coefficient	0.994	0.994	Intensity	93	92

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	0.0	----
as found span	4932	80.6	79.9	79.7	1.003
calibrator zero	5005	0.0	0.0	0.0	----
high point	4932	80.6	79.9	79.7	1.003
second point	4971	40.4	40.1	40.0	1.002
third point	4992	20.3	20.1	20.0	1.008
as left zero	5005	0.0	0.0	0.2	----
as left span	4932	80.6	79.9	79.4	1.006
Average Correction Factor					1.004

Corrected As found	79.63	Previous response	79.97	*% change	0.4%
--------------------	-------	-------------------	-------	-----------	------

** = > +/-5% change initiates investigation*

Notes:

Sample inlet filter replaced after as founds. No adjustments made.

Calibration Performed By:

Asad Hidayat



Wood Buffalo Environmental Association

TRS Calibration Summary

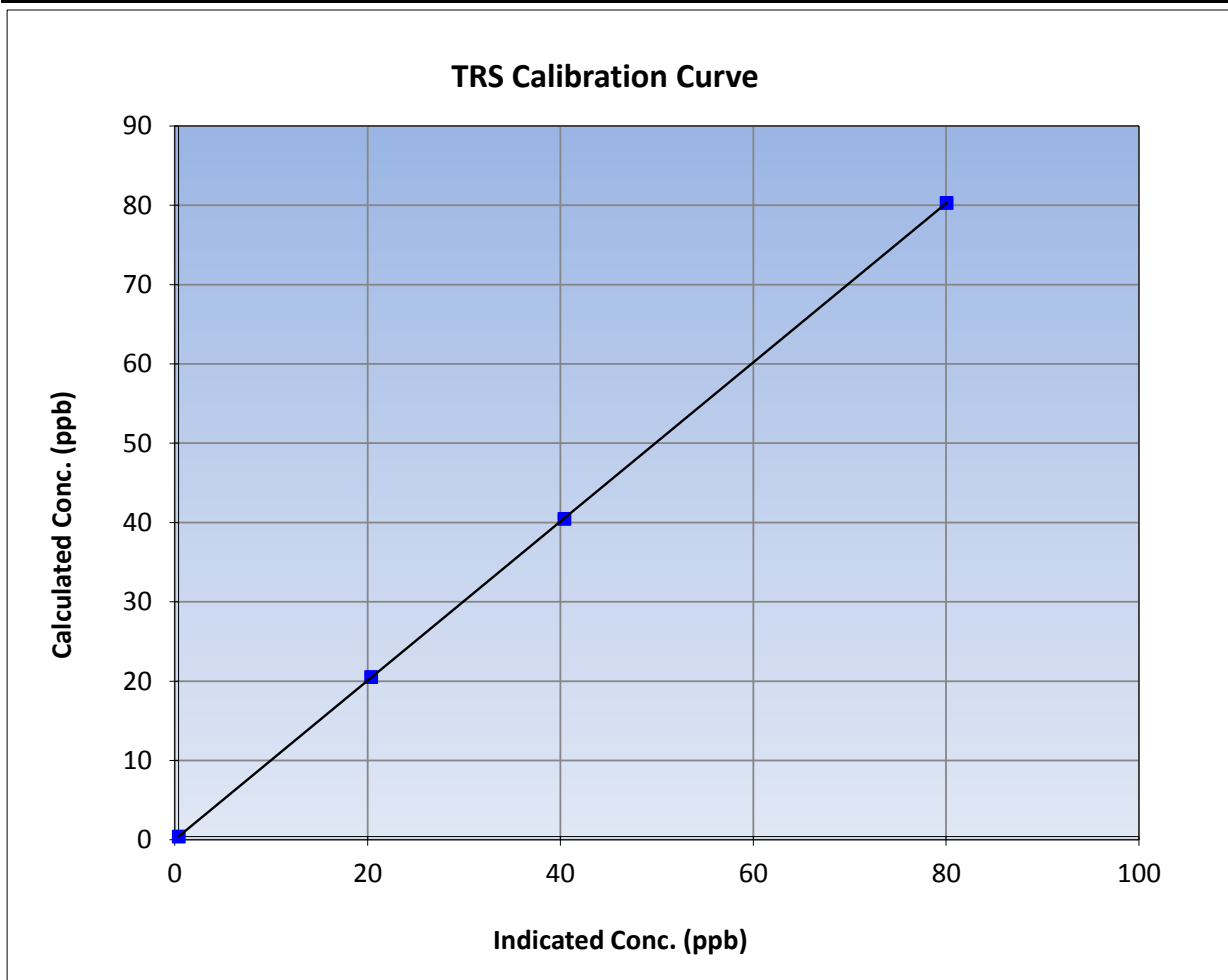
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 13, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	9:10	End Time (MST)	11:05
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1236656116

Calibration Data

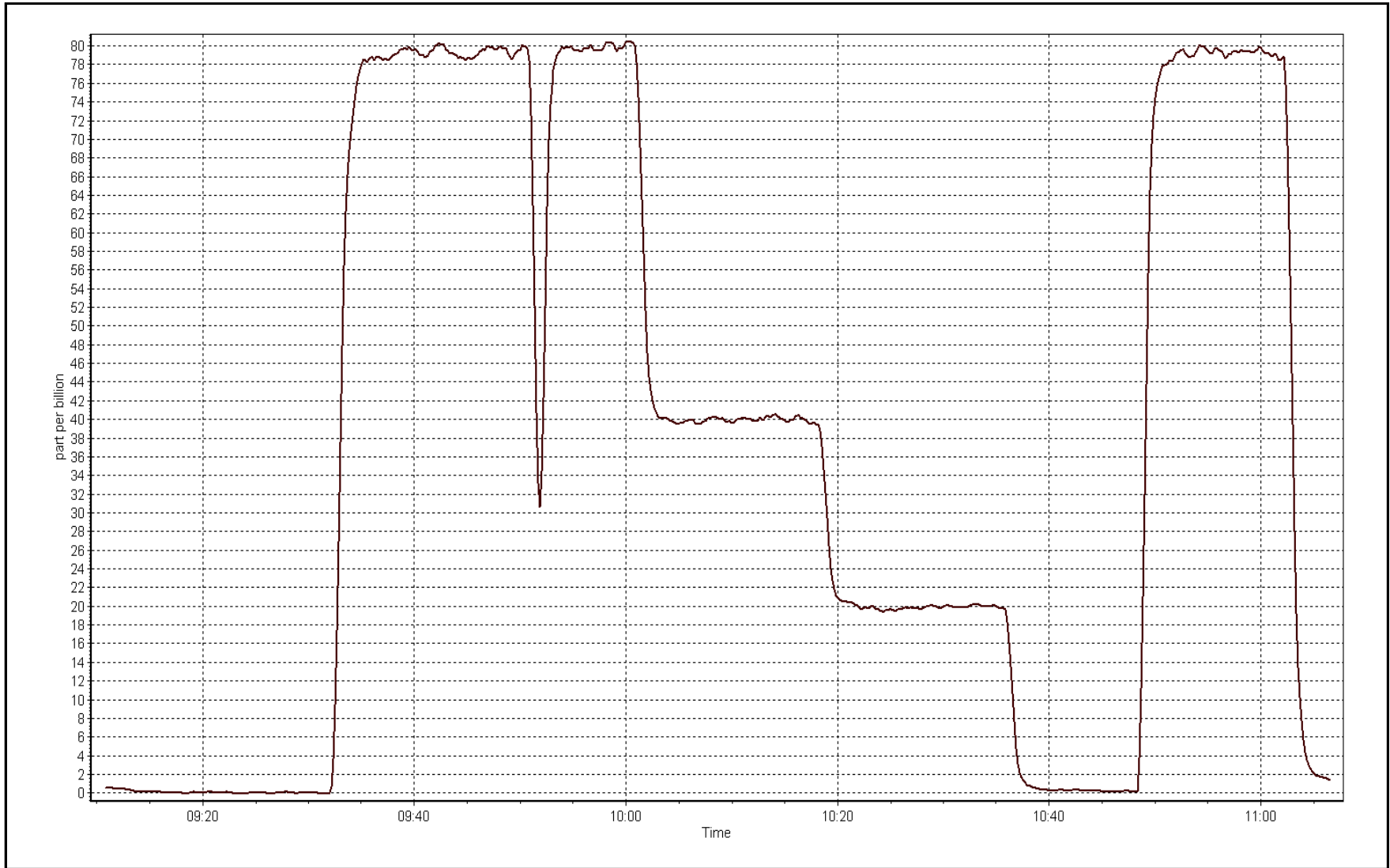
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.0	----	Correlation Coefficient	0.999996	≥0.995
79.9	79.7	1.0032			
40.1	40.0	1.0017	Slope	1.003005	0.90 - 1.10
20.1	20.0	1.0079			
			Intercept	0.007564	+/-3



TRS Calibration Plot

Date: April 6, 2017

Location: Conklin





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	April 13, 2017	Last Cal Date:	March 9, 2017
Start time (MST):	8:27	End time (MST):	12:33
Reason:	Routine		

Calibration Standards

Gas Cert Reference	EY0000359	Cal Gas Expiry Date	February 9, 2018
CH4 Cal Gas Conc.	<u>512.0</u> ppm	CH4 Equiv Conc.	1084.0 ppm
C3H8 Cal Gas Conc.	<u>208.0</u> ppm	Station temp.	22 Deg C
Calibrator Model	Teledyne API T700	Serial Number	2658
ZAG make/model	Teledyne API 701	Serial Number	5611

Analyzer Information

Analyzer make: Thermo 55i

Analyzer serial #: 1152430011

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.1	75.1
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	175.0	175.0
CH4 SP Ratio	1.70E-04	1.70E-04	Flame Temp	405.0	405.0
CH4 Retention time	12.0	12.0	Carrier Pressure	37.0	37.0
NMHC SP Ratio	4.12E-05	4.12E-05	Fuel Pressure	49.7	49.7
NMHC Peak Area	212481	212481	Air Pressure	34.3	34.3

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	0.997788	0.999148
THC Cal Offset	0.080357	0.083217
CH4 Cal Slope	NA	0.997823
CH4 Cal Offset	NA	0.040368
NMHC Cal Slope	0.996745	1.000448
NMHC Cal Offset	0.044031	0.044927

Notes: Sample inlet filter replaced after as founds. No adjustments.

Calibration Performed By:

Asad Hidayat



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5005	0.0	0.00	0.00	----
as found span	4934	76.5	16.55	16.53	1.001
calibrator zero	5005	0.0	0.00	0.00	----
high point	4934	76.5	16.55	16.53	1.001
second point	4974	38.3	8.28	8.14	1.018
third point	4990	19.2	4.15	4.01	1.036
as left zero	5005	0.0	0.00	0.00	----
as left span	4934	76.5	16.55	16.49	1.004
Average Correction Factor					1.018
Corrected As found	16.53	Prev response	16.51	*% change	-0.1%

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5005	0	0.00	0.00	----
as found span	4934	76.5	8.73	8.71	1.003
calibrator zero	5005	0	0.00	0.00	----
high point	4934	76.5	8.73	8.71	1.003
second point	4974	38.3	4.37	4.29	1.019
third point	4990	19.2	2.19	2.11	1.039
as left zero	5005	0	0.00	0.00	----
as left span	4934	76.5	8.73	8.71	1.003
Average Correction Factor					1.020
Corrected As found	8.71	Prev response	8.72	*% change	0.1%

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5005	0.0	0.00	0.00	----
as found span	4934	76.5	7.82	7.82	1.000
calibrator zero	5005	0.0	0.00	0.00	----
high point	4934	76.5	7.82	7.82	1.000
second point	4974	38.3	3.91	3.84	1.019
third point	4990	19.2	1.96	1.90	1.033
as left zero	5005	0.0	0.00	0.00	----
as left span	4934	76.5	7.82	7.79	1.003
Average Correction Factor					1.017
Corrected As found	7.82	Prev response	NA	*% change	NA

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

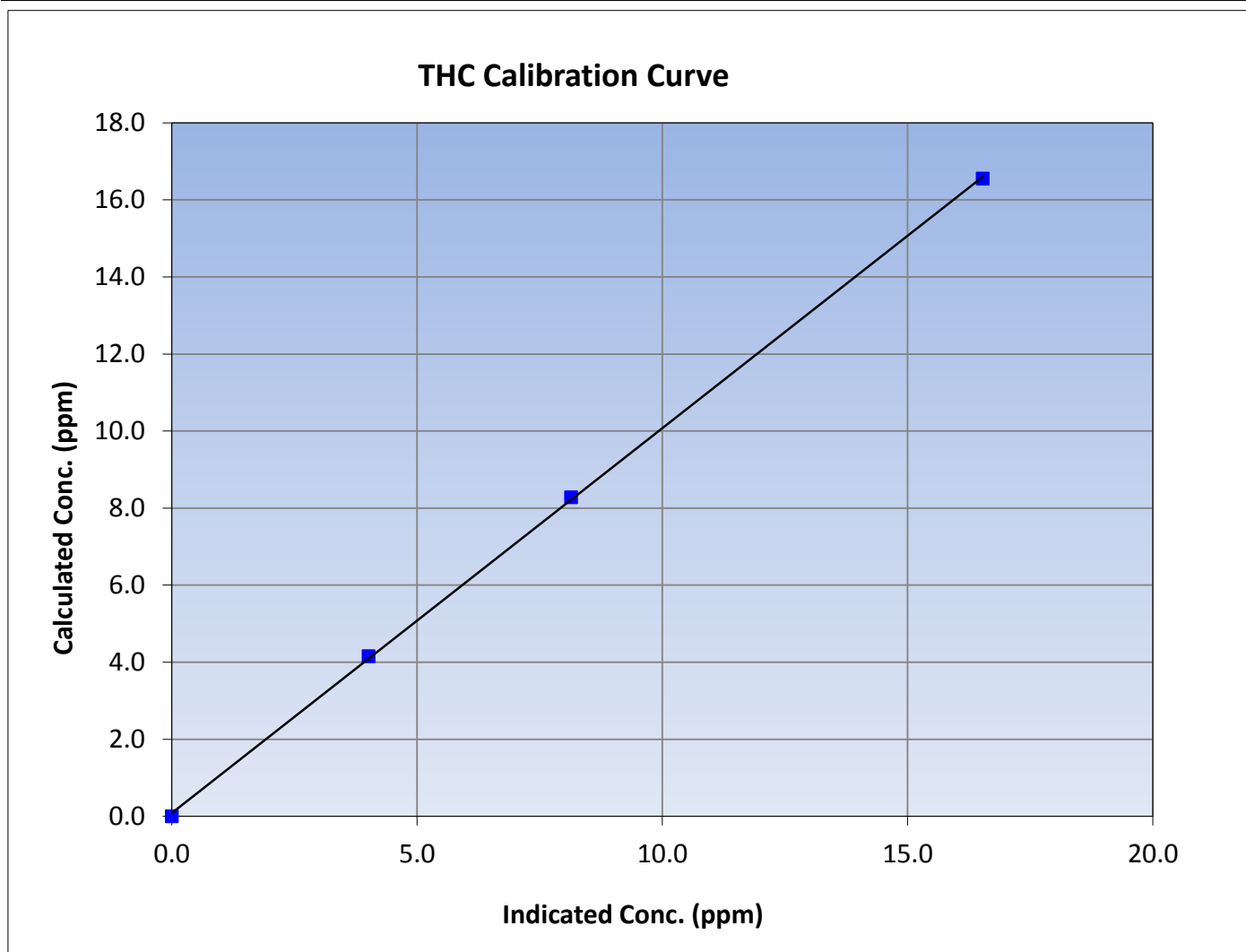
Version-02-2017

Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:33
Analyzer make	Thermo 55i	Analyzer serial #	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999880	≥ 0.995			
16.55	16.53	1.0012						
8.28	8.14	1.0176				Slope	0.999148	0.90 - 1.10
4.15	4.01	1.0361						
			Intercept	0.083217	± 0.5			





Wood Buffalo Environmental Association

CH₄ Calibration Summary

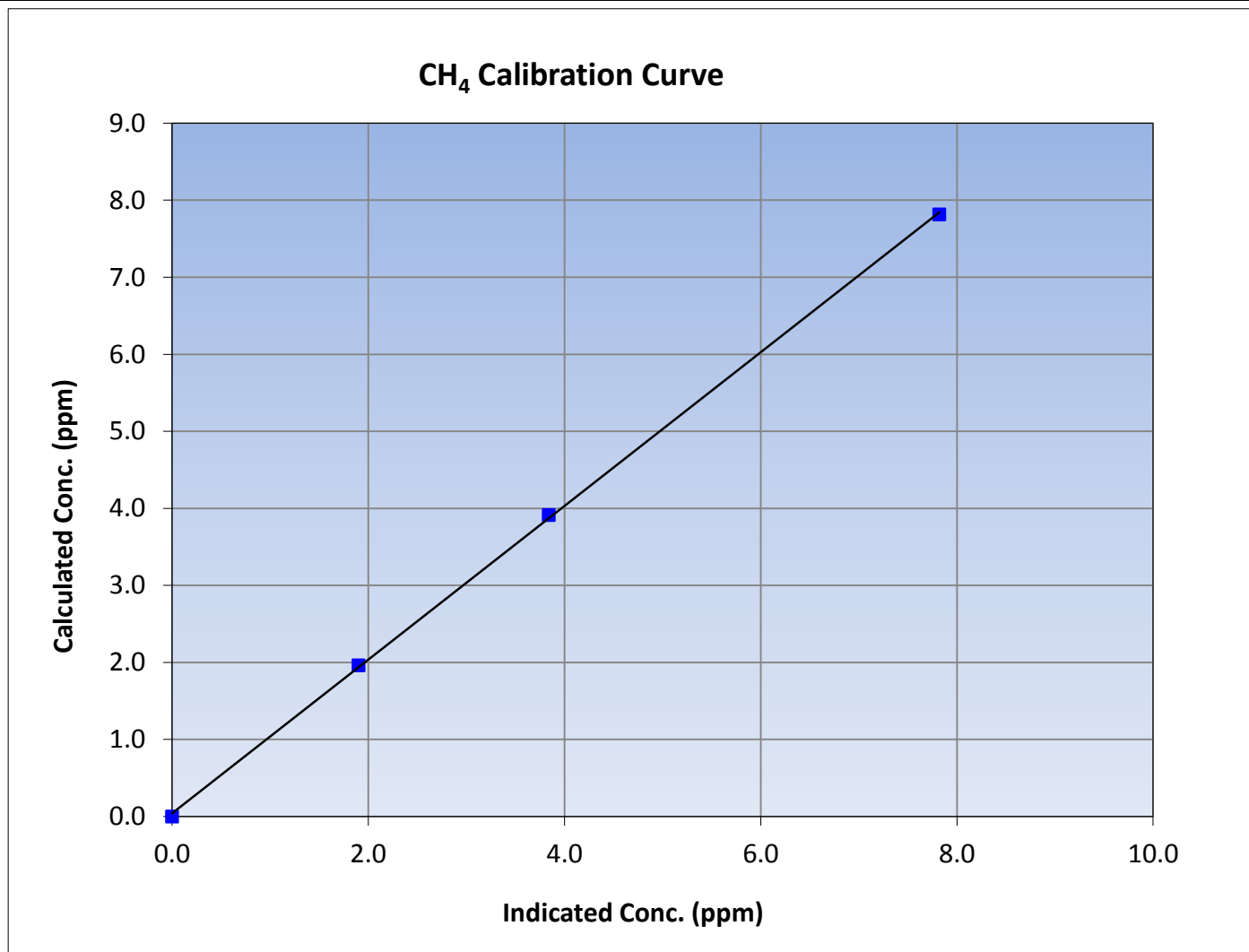
Version-02-2017

Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:33
Analyzer make	Thermo 55i	Analyzer serial #	1152430011

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999862	≥ 0.995			
7.82	7.82	0.9996						
3.91	3.84	1.0188				Slope	0.997823	0.90 - 1.10
1.96	1.90	1.0329						
			Intercept	0.040368	± 0.5			





Wood Buffalo Environmental Association

NMHC Calibration Summary

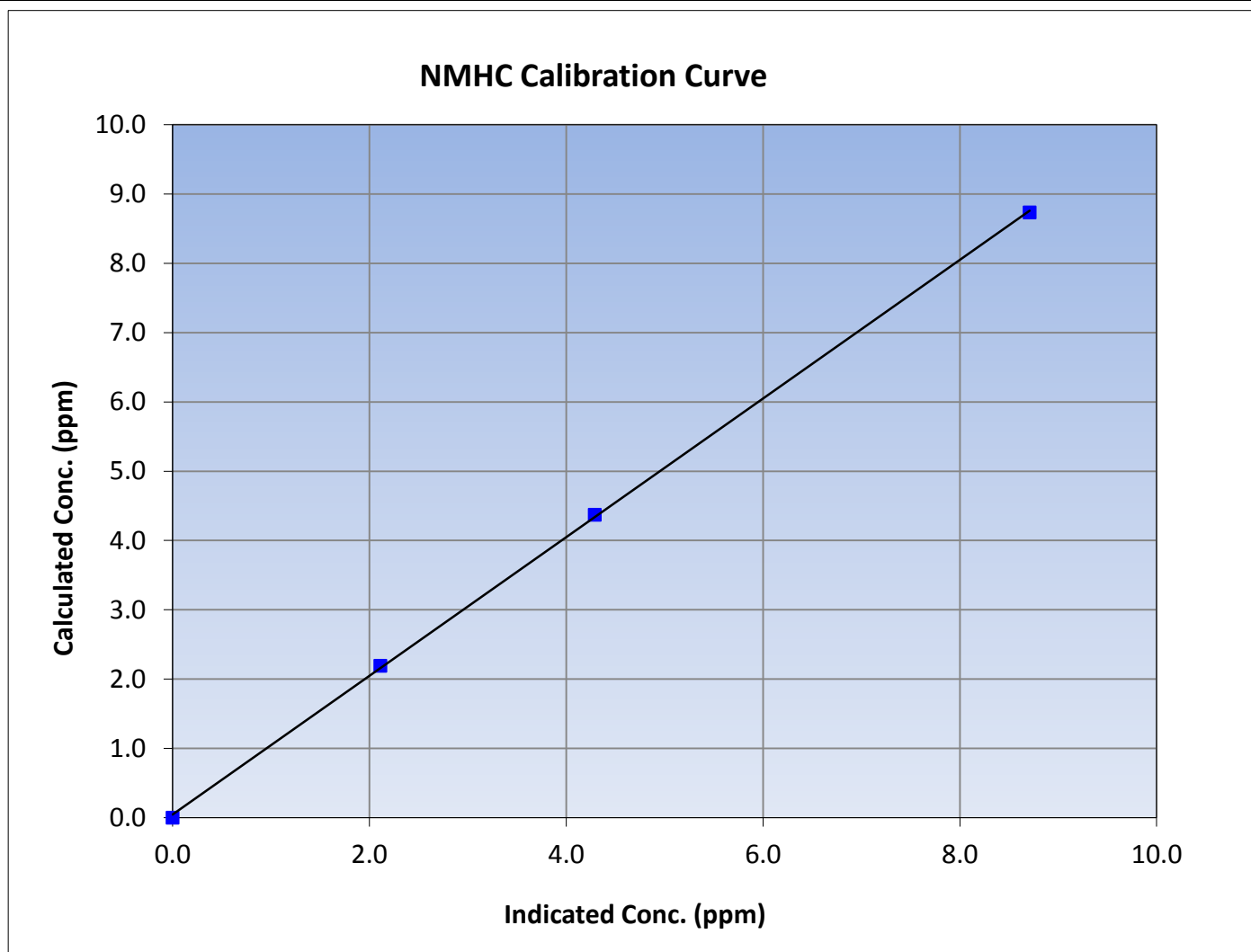
Version-02-2017

Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:33
Analyzer make	Thermo 55i	Analyzer serial #	1152430011

Calibration Data

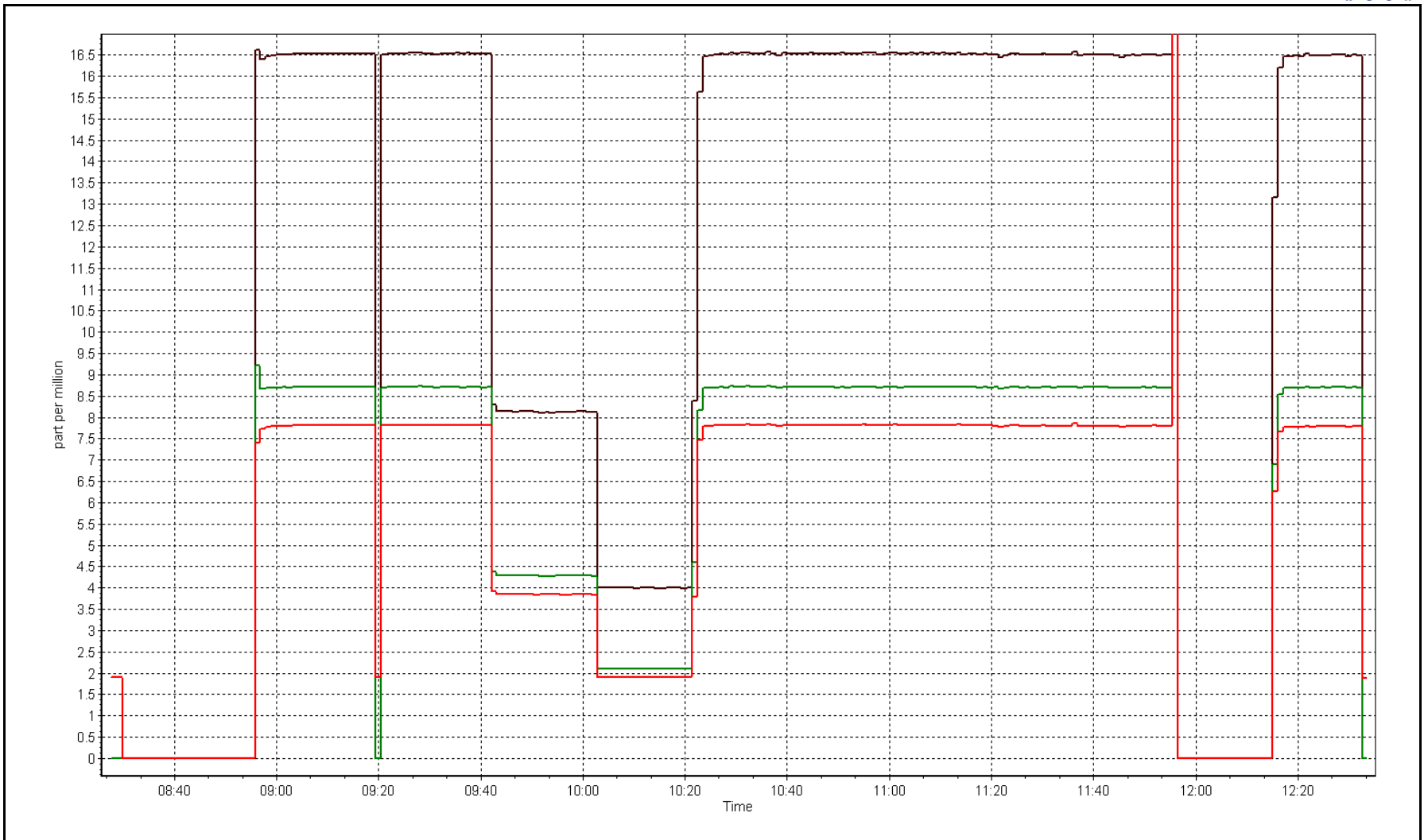
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999876	≥ 0.995			
8.73	8.71	1.0027						
4.37	4.29	1.0188				Slope	1.000448	0.90 - 1.10
2.19	2.11	1.0391						
			Intercept	0.044927	± 0.5			



NMHC Calibration Plot

Date: April 13, 2017

Location: Conklin





Wood Buffalo Environmental Association

O₃ Calibration Summary

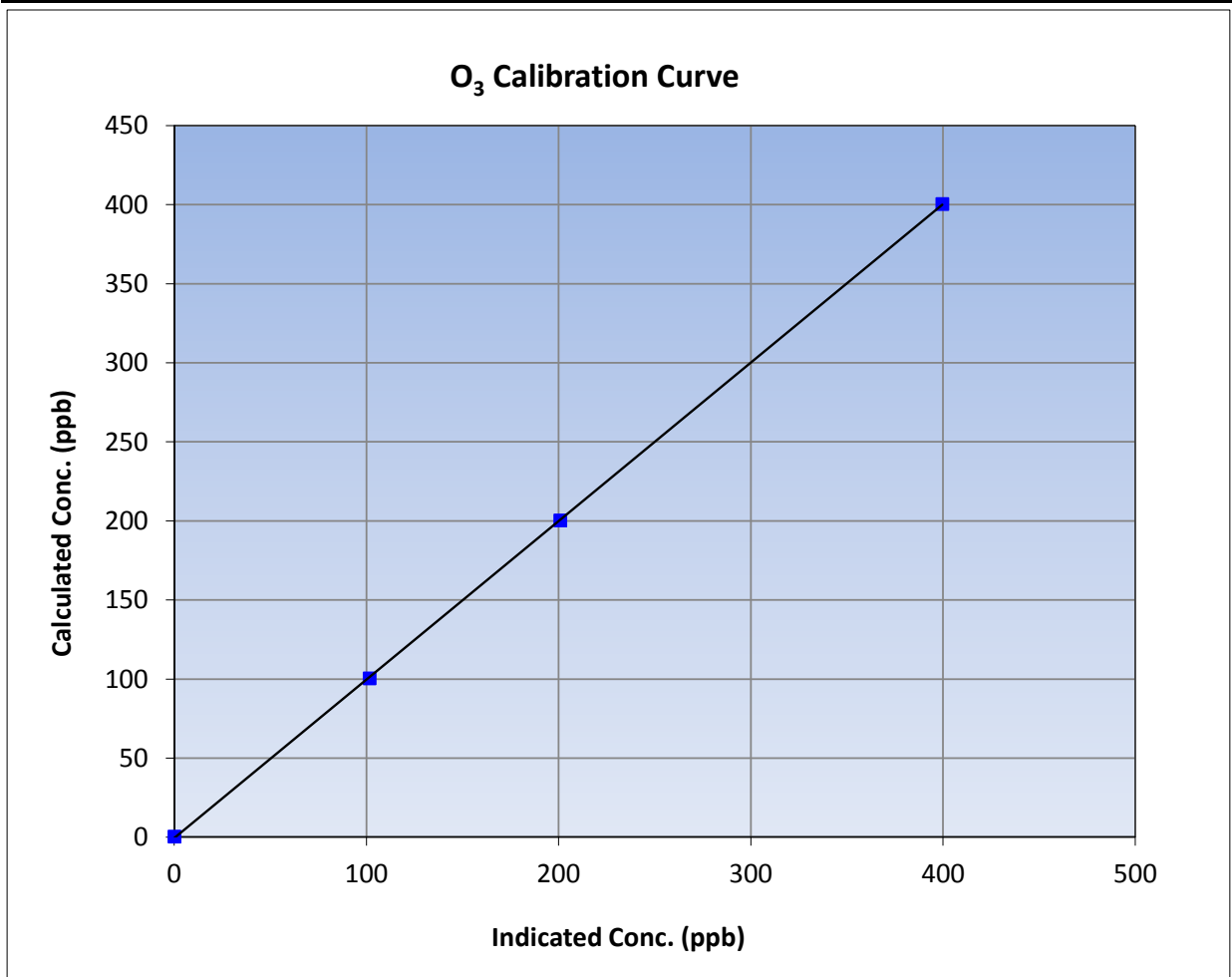
Version-03-2017

Station Information

Calibration Date	April 6, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	11:02	End Time (MST)	13:10
Analyzer make	Thermi 49i	Analyzer serial #	1501663734

Calibration Data

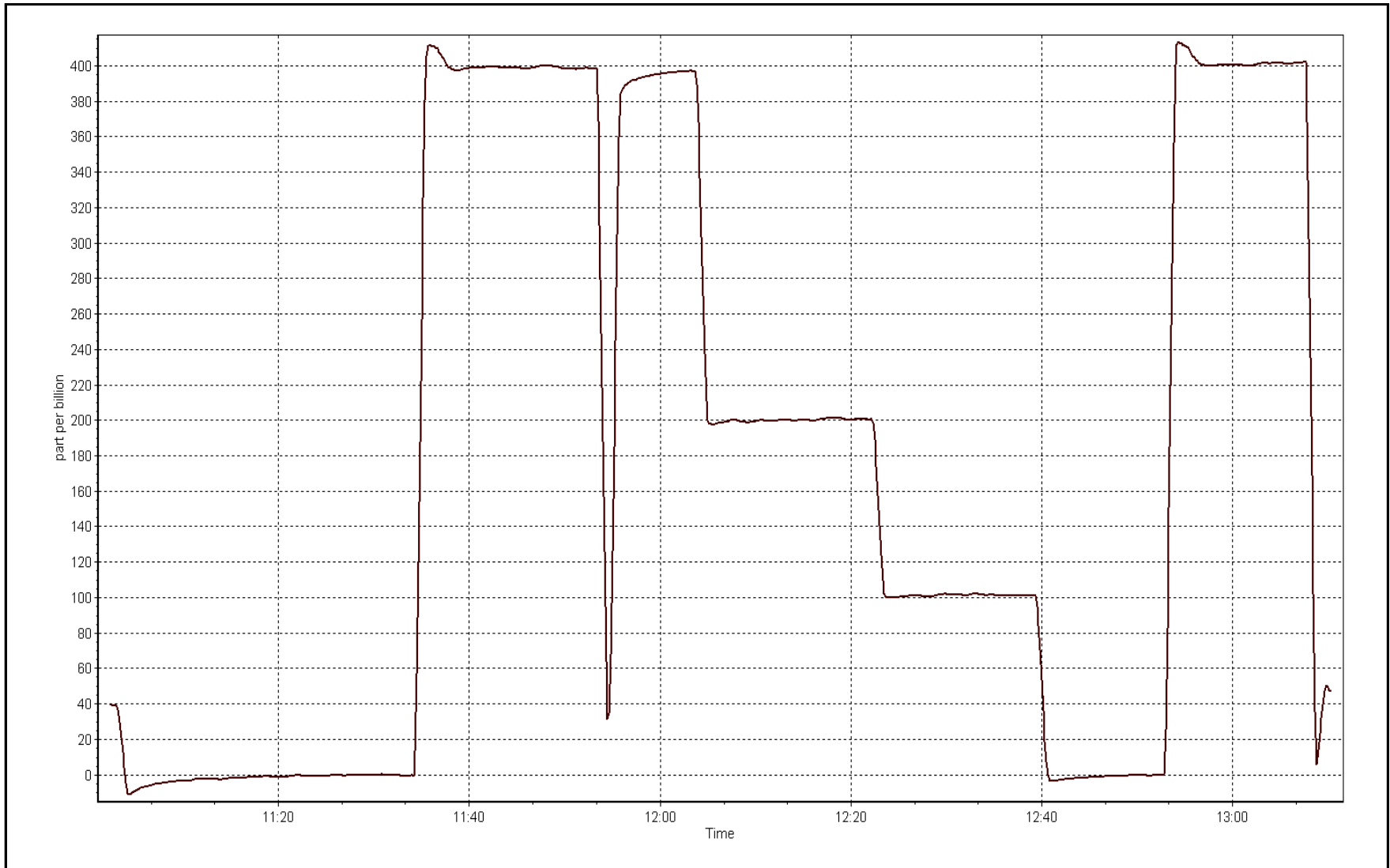
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.3	----	Correlation Coefficient	0.999977	≥0.995
400.0	399.2	1.0019			
200.0	200.4	0.9979	Slope	1.002380	0.90 - 1.10
100.0	101.3	0.9869			
			Intercept	-0.589360	+/- 10



O₃ Calibration Plot

Date: April 6, 2017

Location: Conklin





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	April 13, 2017	Last Cal Date:	March 9, 2017
Start time (MST):	8:27	End time (MST):	12:33
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	EY0000359	Cal Gas Expiry Date	February 9, 2018
NOX Cal Gas Conc.	<u>52.4</u> ppb	NO Cal Gas Conc.	<u>52.4</u> ppb
Calibrator Model	Teledyne API T700	Serial Number	2658
ZAG make/model	Teledyne API 701	Serial Number	5611

Analyzer Information

Analyzer make: Thermi 42i			Analyzer serial #: 1501663731		
	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	1.462	1.488	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	0.999	0.998	PMT Temperature	-3.1	-2.6
NO ₂ coefficient	1.000	1.000	Reaction cell Press	166.4	162.6
NO bkgrnd	9.5	9.7	Sample Flow	0.716	0.701
NOX bkgrnd	9.6	9.8	PMT Voltage	-840.6	-840.6

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.997119	0.997346
NO _x Cal Offset	1.055747	0.791576
NO Cal Slope	0.997515	0.997288
NO Cal Offset	1.341042	0.993891
NO ₂ Cal Slope	0.997292	0.999369
NO ₂ Cal Offset	-0.580117	-1.033597



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5005	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
as found span	4934	76.5	800.0	800.0	0.0	785.3	784.1	1.2	1.0188	1.0203
calibrator zero	5005	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.1	----	----
high point	4934	76.5	800.0	800.0	0.0	801.5	801.5	0.1	0.9982	0.9982
second point	4975	38.3	400.3	400.3	0.0	400.7	400.5	0.2	0.9991	0.9995
third point	4990	19.2	200.8	200.8	0.0	199.9	199.3	0.6	1.0049	1.0080
as left zero	5005	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	----	----
as left span	4934	76.5	800.0	402.0	398.0	803.5	399.3	404.2	0.9957	1.0068
Average Correction Factor									1.0007	1.0019

Corrected As found	NO _x = 785.6 ppb	NO = 784.3 ppb		*Percent Change	NO _x = 2.0%
Previous Response	NO _x = 801.3 ppb	NO = 800.7 ppb		*Percent Change	NO = 2.1%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	802.7	801.4	1.3	0.9967	0.9984	----	----
1st NO2 (400 ppb O3)	402.0	399.3	802.2	402.0	400.2	0.9973	----	0.9978	100.2%
2nd NO2 (200 ppb O3)	599.5	201.9	802.6	599.5	203.1	0.9968	----	0.9941	100.6%
3rd NO2 (100 ppb O3)	701.0	100.4	804.0	701.0	103.0	0.9951	----	0.9746	102.6%
2nd NO ref point	----	0.0	803.8	802.5	1.3	0.9953	0.9969	----	----
Average Correction Factor						0.9961	0.9976	0.9888	101.1%

Notes: Sample inlet filter replaced after as founds. Adjusted span only.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

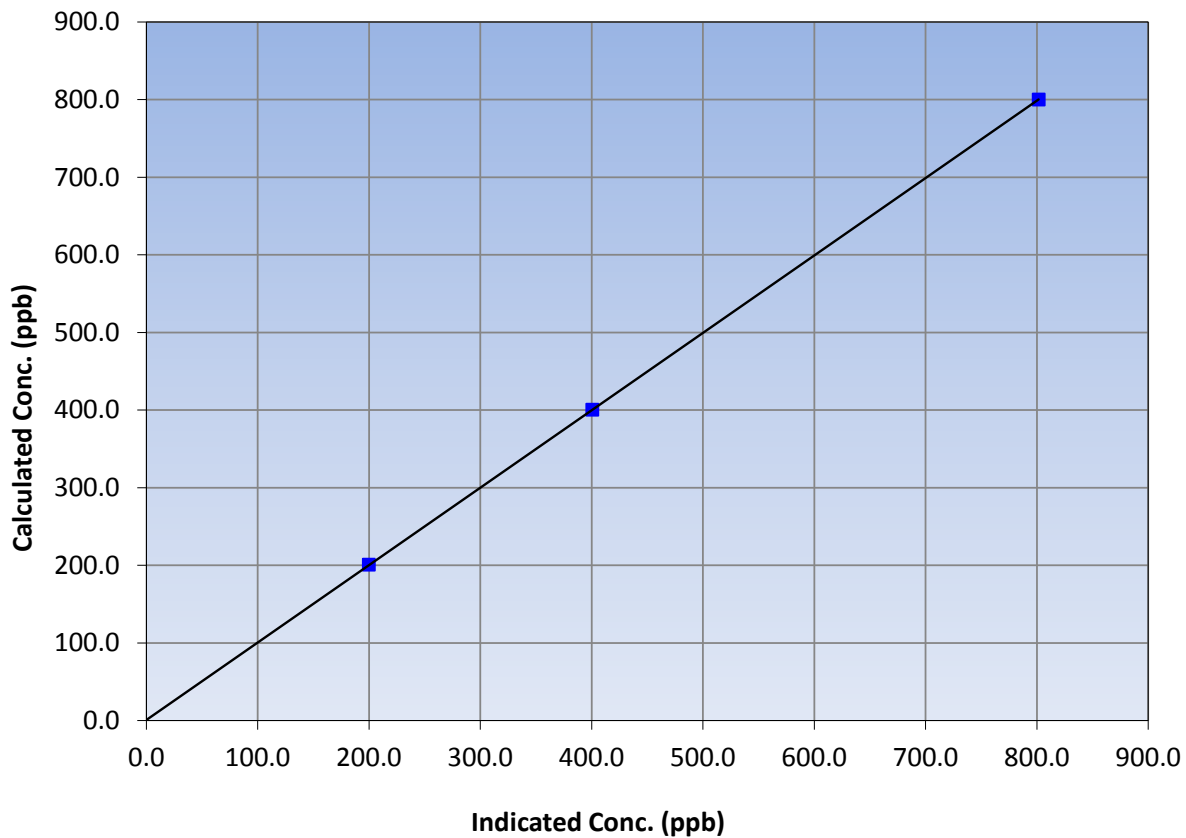
Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:33
Analyzer make	Thermi 42i	Analyzer serial #	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.3	----	Correlation Coefficient	≥0.995	
800.0	801.5	0.9982			
400.3	400.7	0.9991			
200.8	199.9	1.0049			
			Slope	0.997346	0.90 - 1.10
			Intercept	0.791576	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

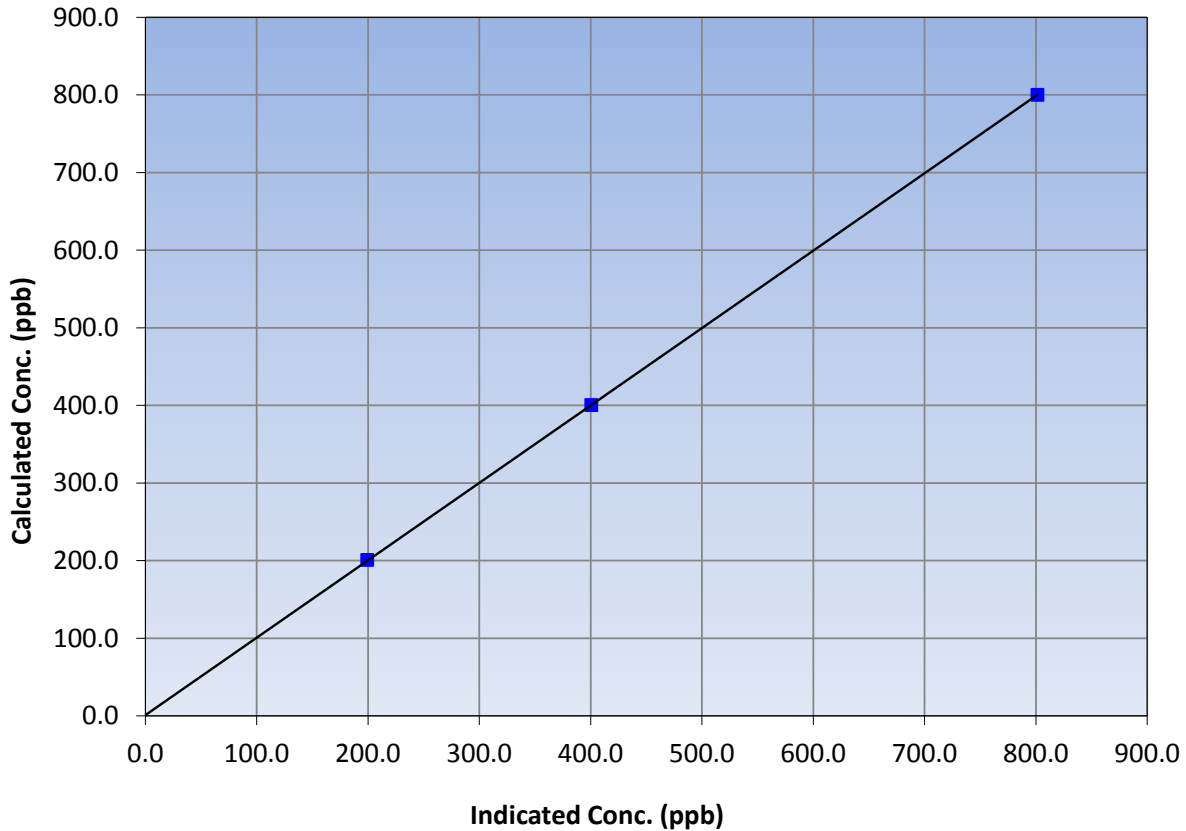
Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:33
Analyzer make	Thermi 42i	Analyzer serial #	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.2	----	Correlation Coefficient	≥0.995	
800.0	801.5	0.9982			
400.3	400.5	0.9995			
200.8	199.3	1.0080			
			Slope	0.997288	0.90 - 1.10
			Intercept	0.993891	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

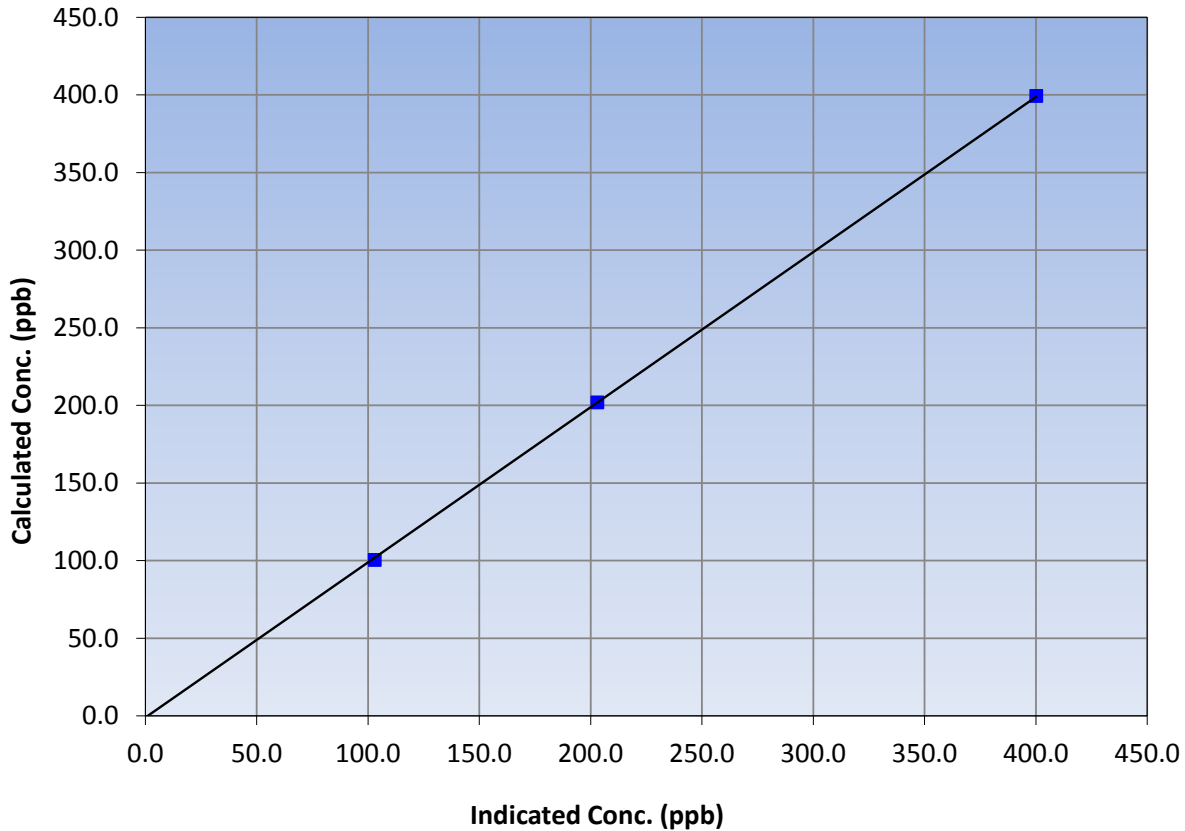
Station Information

Calibration Date	April 13, 2017	Previous Calibration	March 9, 2017
Station Name	Conklin	Station Number	AMS 21
Start Time (MST)	8:27	End Time (MST)	12:33
Analyzer make	Thermi 42i	Analyzer serial #	1501663731

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.1	----	Correlation Coefficient	≥0.995	
399.3	400.2	0.9978			
201.9	203.1	0.9941			
100.4	103.0	0.9746			
			Slope	0.999369	0.90 - 1.10
			Intercept	-1.033597	+/-20

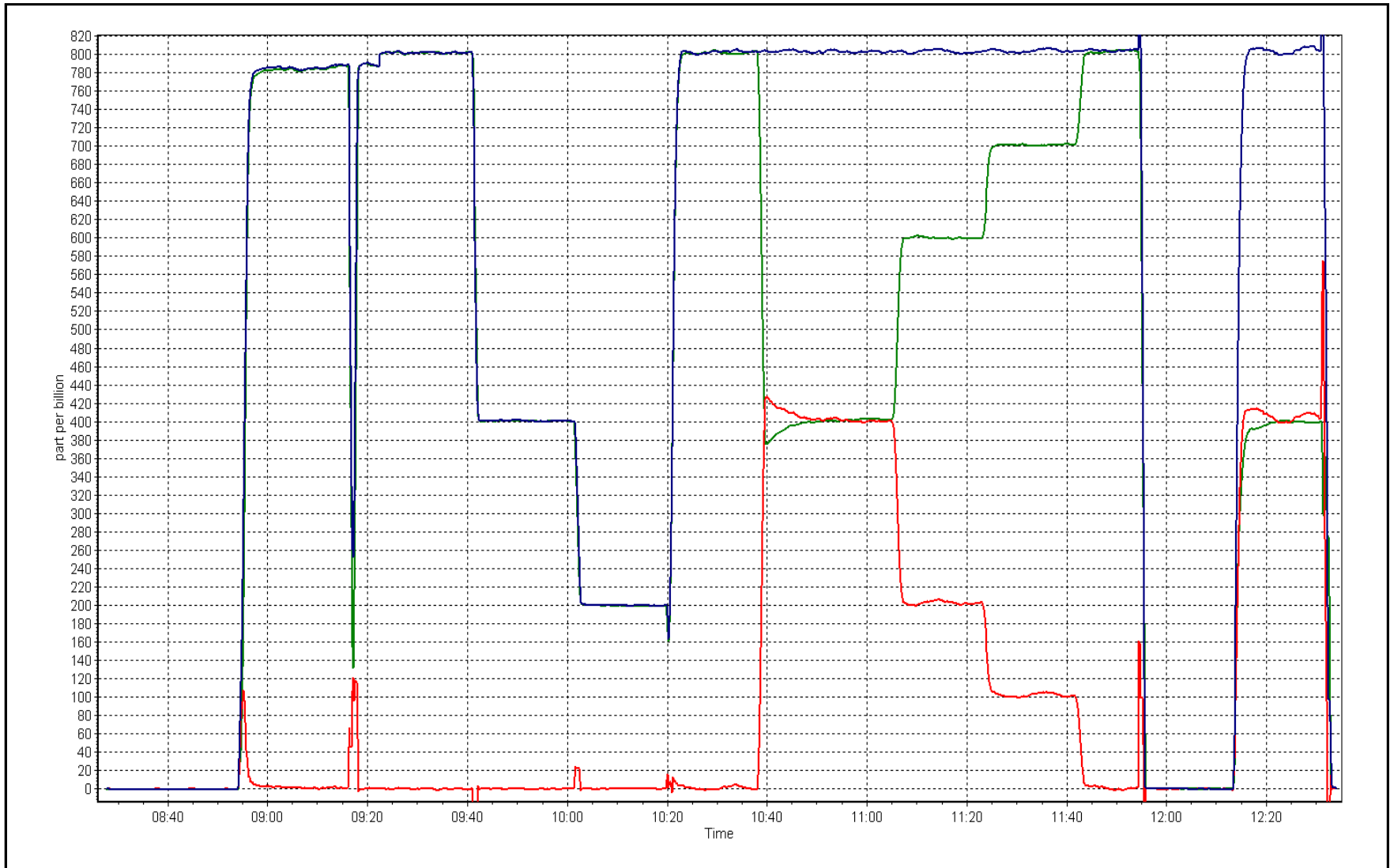
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 13, 2017

Location: Conklin





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-02-2017

Station Information

Station Name:	Conklin	Station number:	AMS 21
Calibration Date:	April 6, 2017	Last Cal Date:	March 13, 2017
Start time (MST):	11:50	End time (MST):	12:27
Sharp Model:	5030	S/N:	7494
Particulate Fraction:	PM2.5	C14 Source S/N:	CM-0404
Flow Meter Make/Model:	Delta Cal	S/N:	1019
Temp/RH standard:	Delta Cal	S/N:	1019

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T1 (°C)	13	13.1	13	<input type="checkbox"/>	+/- 2 °C
P3 (hPa)	937	935.9	937	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1005	1014	1005	<input type="checkbox"/>	+/- 50 LPH
Nephelometer zero	0.4	-----	0.4	<input type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified	<input checked="" type="checkbox"/>			
Cyclone cleaning :	PM10 Cyclone	<input checked="" type="checkbox"/>	PM2.5 Cyclone	<input checked="" type="checkbox"/>	
Date Filter Tape Installed:					

Quarterly Calibration Test

Leak Test: Date of check: February 16, 2017 Last Cal Date: October 12, 2016
 Flow w/o adaptor: 16.96 Flow w/ adaptor: 16.86

(Limit) 0.4 LPM

<u>Adjusted</u>	<u>Current Test</u>	<u>Previous Test</u>	<u>% Change</u>
<input type="checkbox"/>	Foil S/N: <u>2598</u>	Foil S/N: <u>2598</u>	
Foil Calibration	Foil Mass: <u>1265</u>	Foil Mass: <u>1265</u>	
	Calibration Date: <u>October 12, 2016</u>	Calibration Date: <u>June 14, 2016</u>	
(Limit) +/- 5% of previous	Correction Factor: <u>7119</u>	Correction Factor: <u>5603</u>	27.06%

Annual Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	(Limits)
T2 (°C)				<input type="checkbox"/>	+/- 2 °C
T3 (°C)				<input type="checkbox"/>	+/- 2 °C
T4 (°C)				<input type="checkbox"/>	+/- 2 °C
RH (%)				<input type="checkbox"/>	+/- 10%
Date Sample Tube Cleaned:					
Date Pump Rebuilt/Replaced:					

Notes: Cyclone head cleaned. No adjustments made.

Calibration by: Asad Hidayat



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

**AMS 22
JANVIER
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS 22)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	682	36	38	99.72	3	0	1	0
TRS(ppb) Average	685	35	35	100	0	0	0	0
THC(ppm) Average	681	35	39	99.44	2.1	-	2	-
NMHC(ppm) Average	681	35	39	99.44	0.007	-	0	-
CH4(ppm) Average	681	35	39	99.44	2.1	-	2	-
O3 (ppb) Average	684	34	36	99.72	62	0	52	-
NO2 (ppb) Average	683	35	37	99.72	6	0	2	-
NO (ppb) Average	683	35	37	99.72	4	-	1	-
NOX (ppb) Average	683	35	37	99.72	10	-	3	-
PM2.5 (ug/m3) Average	691	5	29	96.67	37.2	-	5.8	0
Wind Speed 10 m (km/h) Average	720	0	0	100	22	-	16	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-
Temperature 2 m (C) Average	720	0	0	100	17.1	-	10.4	-
Relative Humidity (%) Average	720	0	0	100	98	-	96.0	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS 22)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2 (ppb) Average	682	0.1	0	-	0	0	0	0	0	0	0	3
TRS (ppb) Average	685	0.2	0	-	0	0	0	0	0	0	0	0
THC (ppm) Average	681	1.9	0	-	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.1
NMHC(ppm) Average	681	0	0	-	0	0	0	0	0	0	0	0.007
CH4(ppm) Average	681	1.9	0	-	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.1
O3 (ppb) Average	684	44.6	8	-	12	33	40	45	50	54	62	62
NO2 (ppb) Average	683	0.8	1	-	0	0	0	1	1	2	6	6
NO (ppb) Average	683	0.1	0	-	0	0	0	0	0	0	4	4
NOX (ppb) Average	683	0.9	1	-	0	0	0	1	1	2	10	10
PM2.5 (ug/m3) Average	691	2.89	2.7	-	0.1	1.1	1.6	2.2	3.4	5.3	37.2	37.2
Wind Speed 10 m (km/h) Average	720	7.5	4	-	0	2	4	7	10	13	22	22
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	720	2.08	5.4	-	-11.4	-4.2	-1.7	1.2	5.7	9.8	17.1	17.1
Relative Humidity (%) Average	720	65.7	21	-	23	36	48	68	84	93	98	98

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS 22)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NMHC, CH4, THC	10 Apr 2017 11:00	10 Apr 2017 12:00	2	Maintenance - replaced carrier gas
NMHC, CH4, THC, SO2,O3, NOX, NO, NO2	20 Apr 2017 08:00	20 Apr 2017 09:00	2	Maintenance - new calibrator installed
PM 2.5	01 Apr 2017 01:00	01 Apr 2017 10:00	10	Flat line in sensor output signal
PM 2.5	19 Apr 2017 15:00	19 Apr 2017 15:00	1	Maintenance - station operator on site
PM 2.5	22 Apr 2017 20:00	23 Apr 2017 08:00	13	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Janvier - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3 ppb on Apr 3 17:00	Maximum Daily Average: 0.6 ppb on Apr 10		Hours of Data:	682
Minimum Value: 0 ppb on Apr 2 18:00	Minimum Daily Average: 0.0 ppb on Apr 24		Hours of Missing Data:	38
Maximum Diurnal Average: 0.2 ppb at hour 9	Minimum Diurnal Average: 0.1 ppb at hour 21		Hours of Calibration:	36
Monthly Average: 0.1 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
3-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	2	3	2	0	0	0	0	0	0	0.5	3
4-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Apr	0	0	1	1	1	Z	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
10-Apr	0	1	1	Z	1	1	1	1	2	2	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0.6	2
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.2	1
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.1	1
14-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
20-Apr	0	Z	0	0	0	0	0	M	M	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0.1	1
21-Apr	0	0	Z	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	--	0
22-Apr	0	0	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	0	0	Z	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2

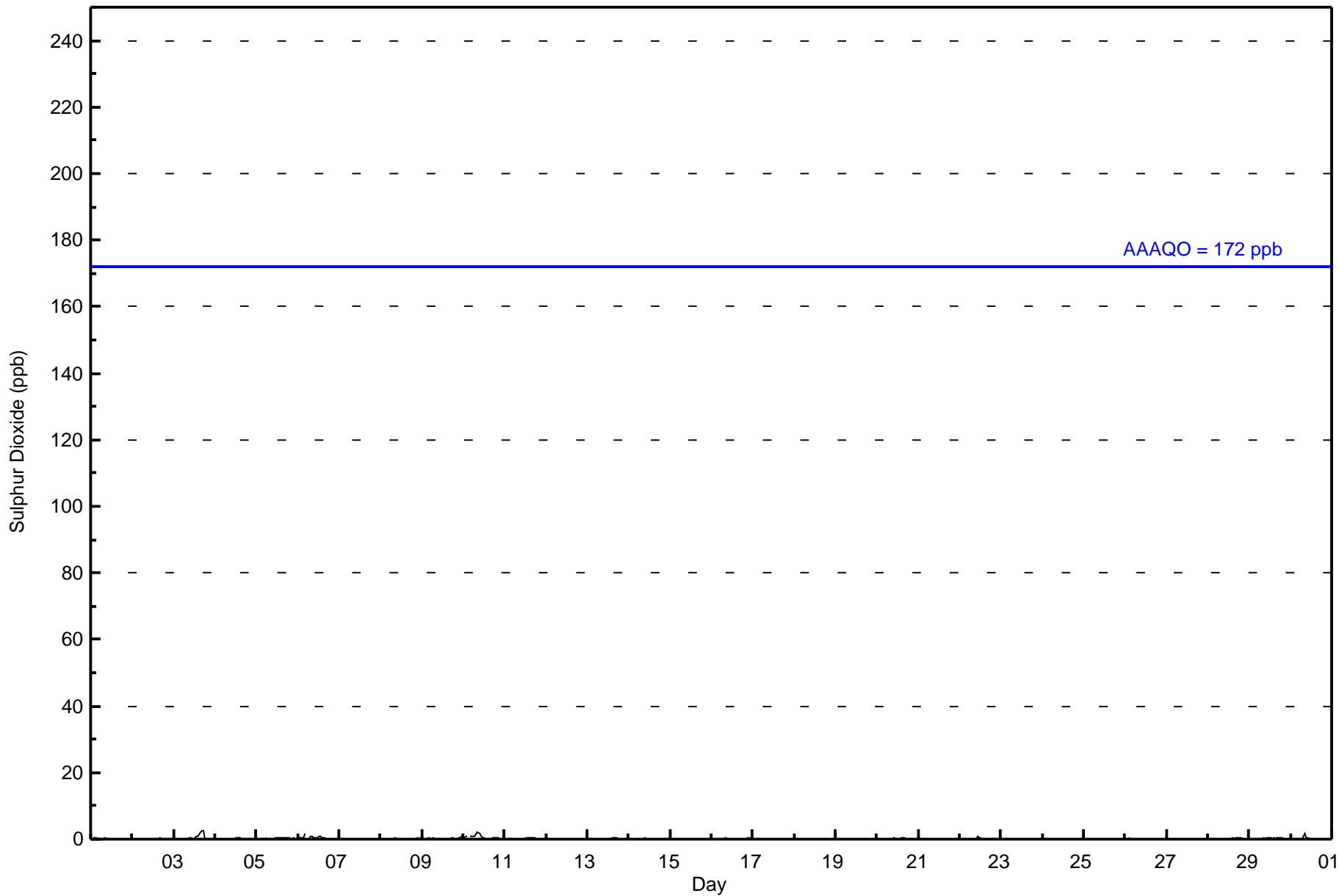
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
0	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	2	3	2	0	1	0	1	0	1	0	1	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	682	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Janvier - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	53	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	682
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	682

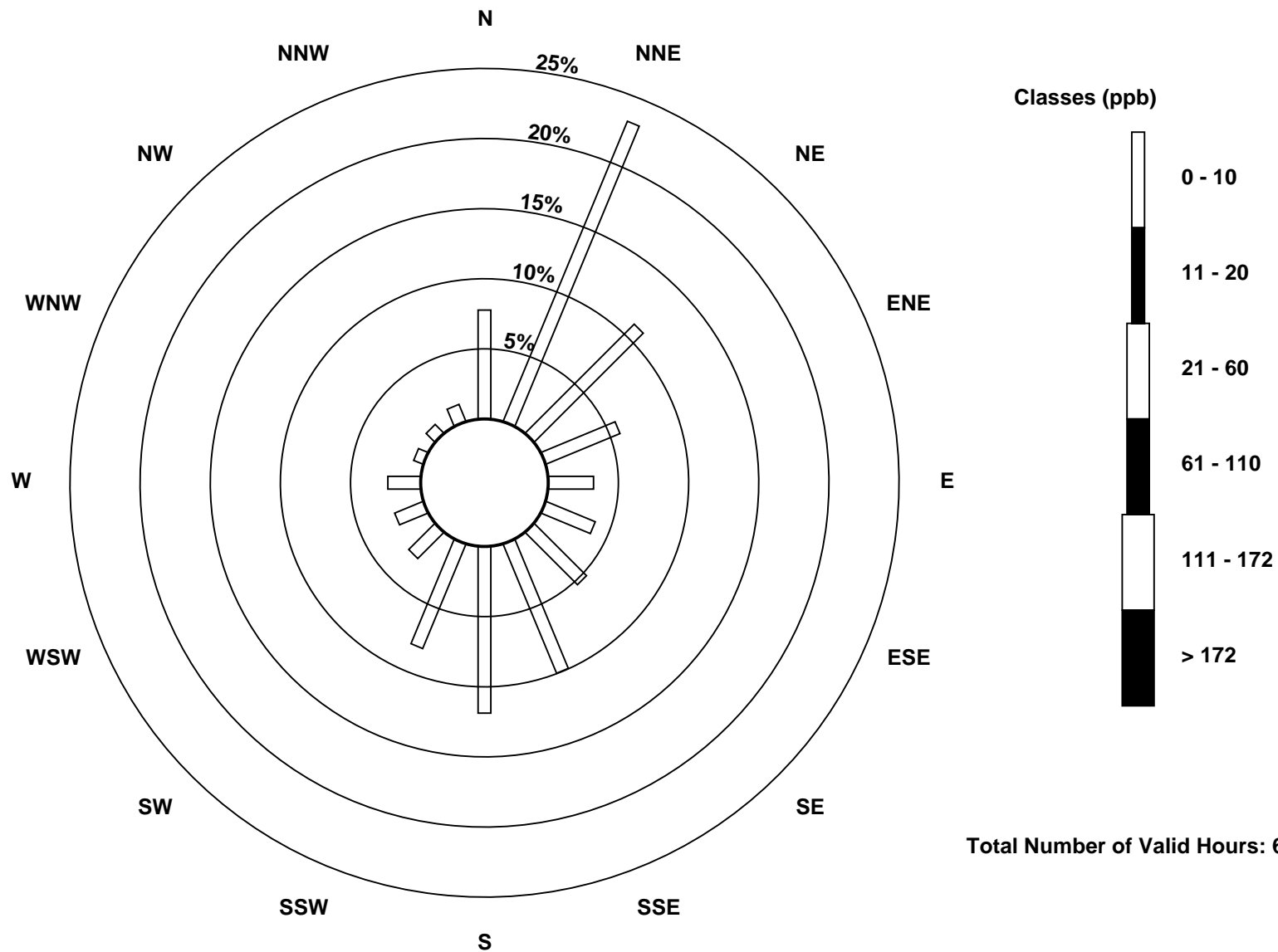
Total Number of Valid Hours: 682

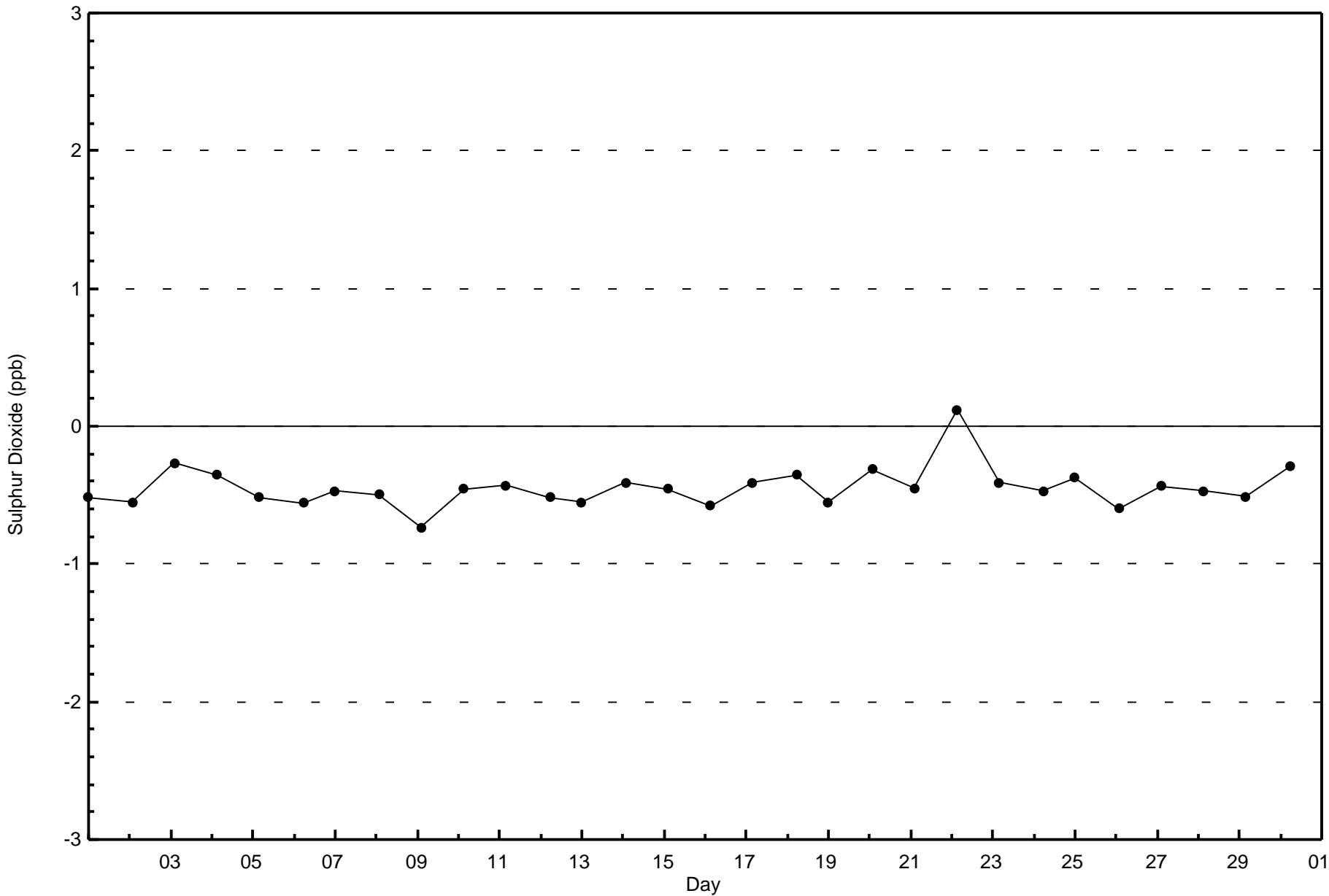
Total Number of Hours: 720

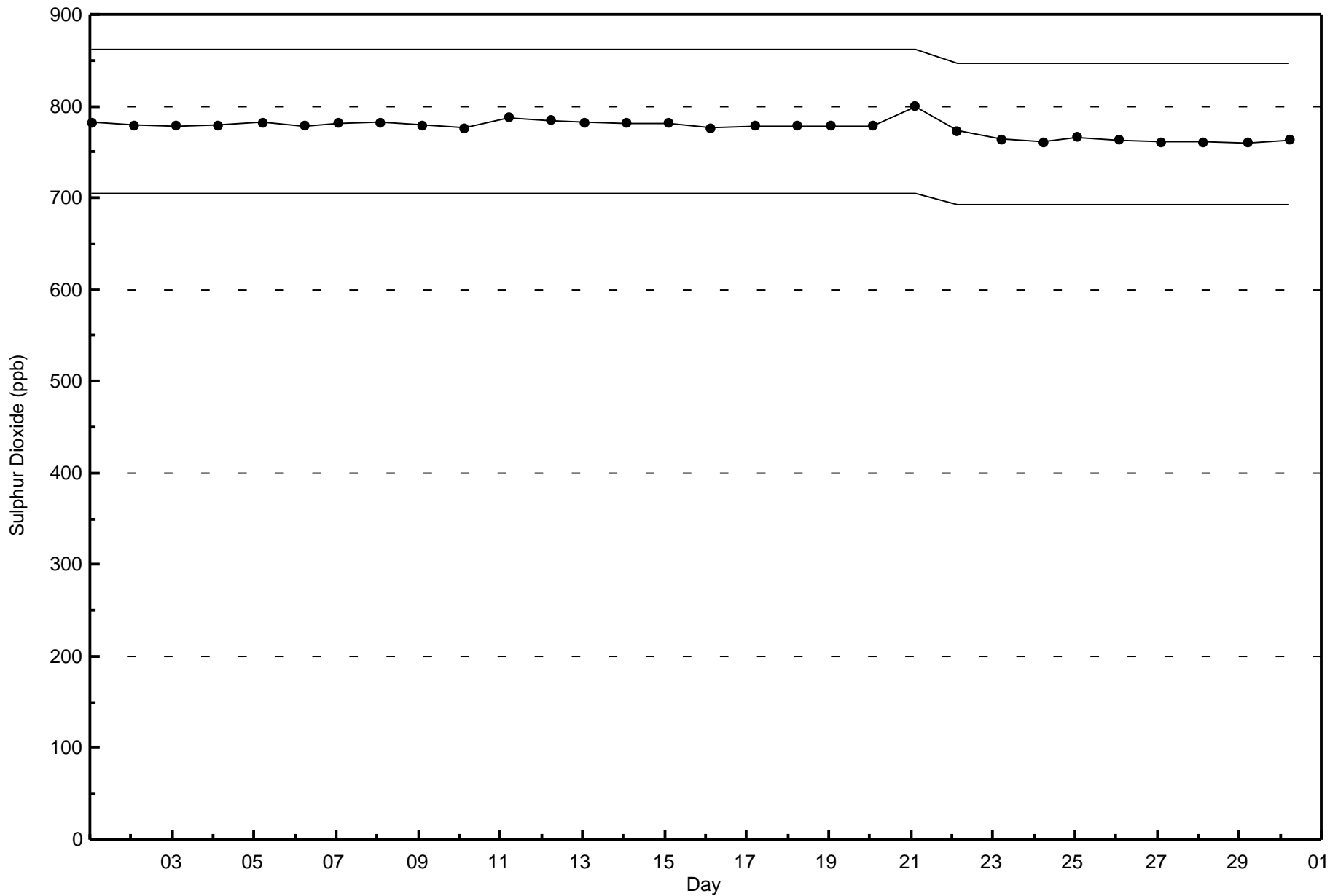


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Janvier (AMS 22)









Summary of Hour Averages

Janvier - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 0 ppb on Apr 8 04:00	Maximum Daily Average: 0.2 ppb on Apr 2		Hours of Data:	685
Minimum Value: 0 ppb on Apr 15 01:00	Minimum Daily Average: 0.1 ppb on Apr 14		Hours of Missing Data:	35
Maximum Diurnal Average: 0.2 ppb at hour 9	Minimum Diurnal Average: 0.1 ppb at hour 2		Hours of Calibration:	35
Monthly Average: 0.2 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 0		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
3-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
7-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
8-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
11-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
12-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
17-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
20-Apr	0	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0.2	0
21-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
22-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
23-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
24-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
25-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
26-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0

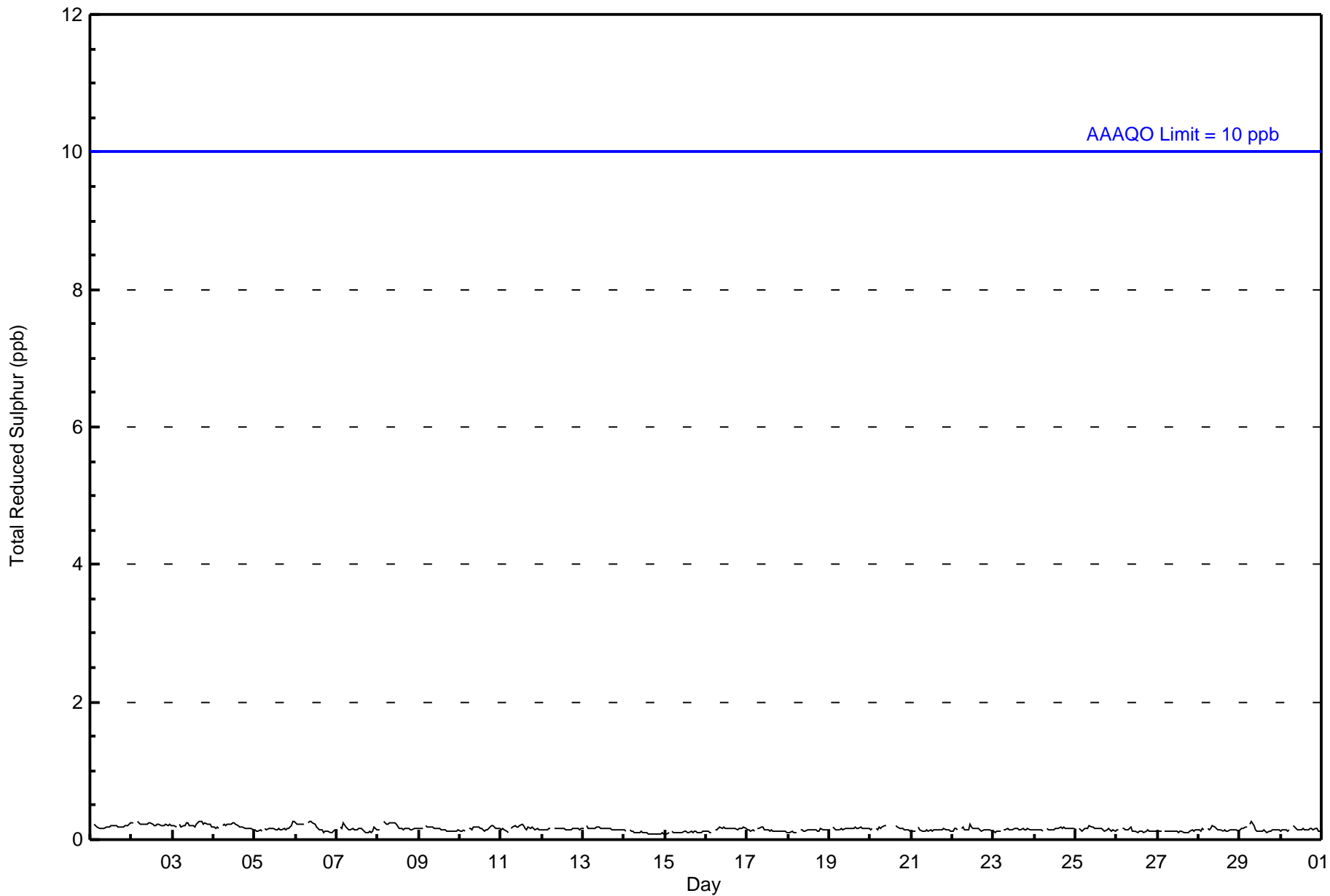
0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	Diurnal Average
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	685	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	58	157	75	41	21	25	38	67	79	55	18	15	16	5	6	9	685
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	157	75	41	21	25	38	67	79	55	18	15	16	5	6	9	685

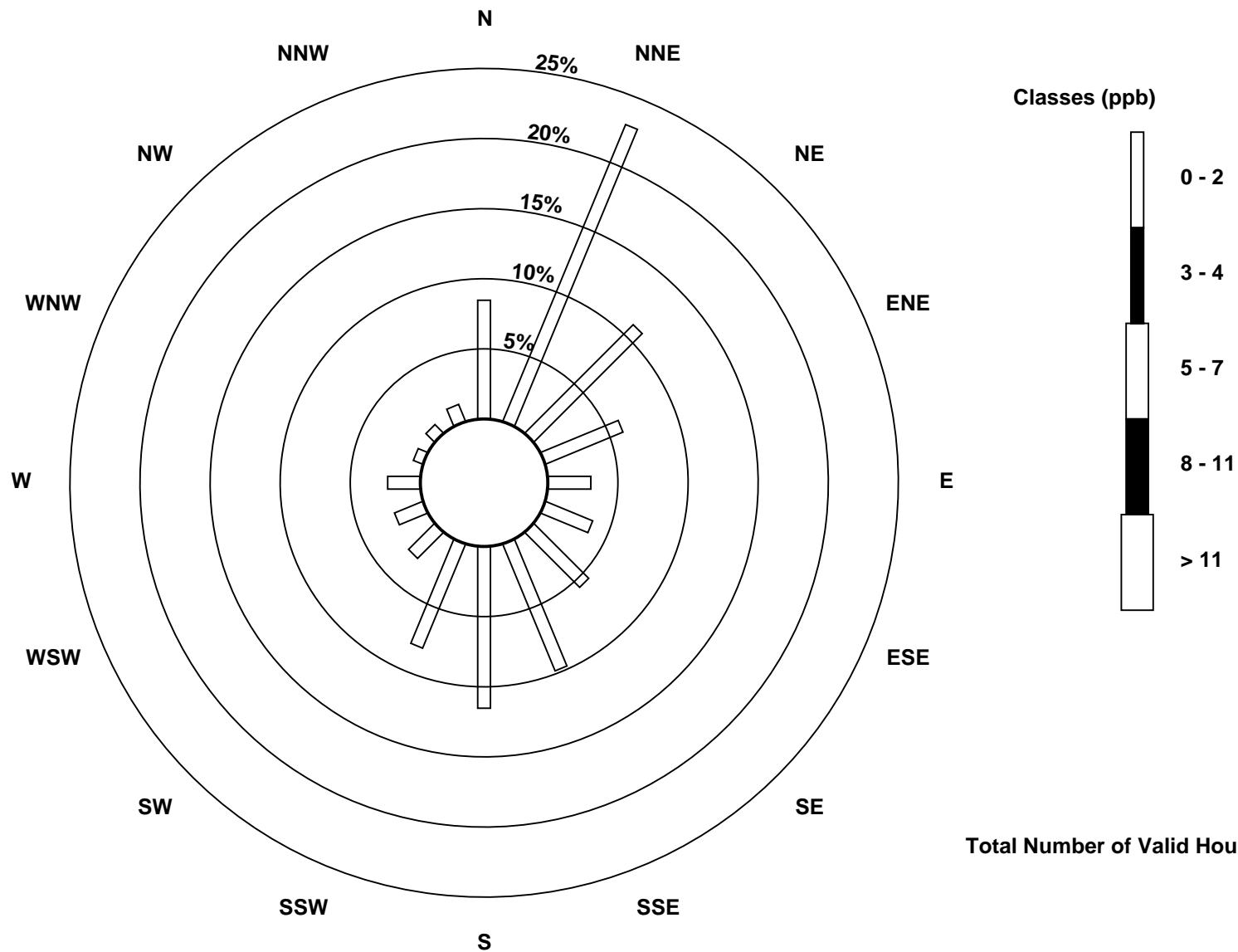
Total Number of Valid Hours: 685

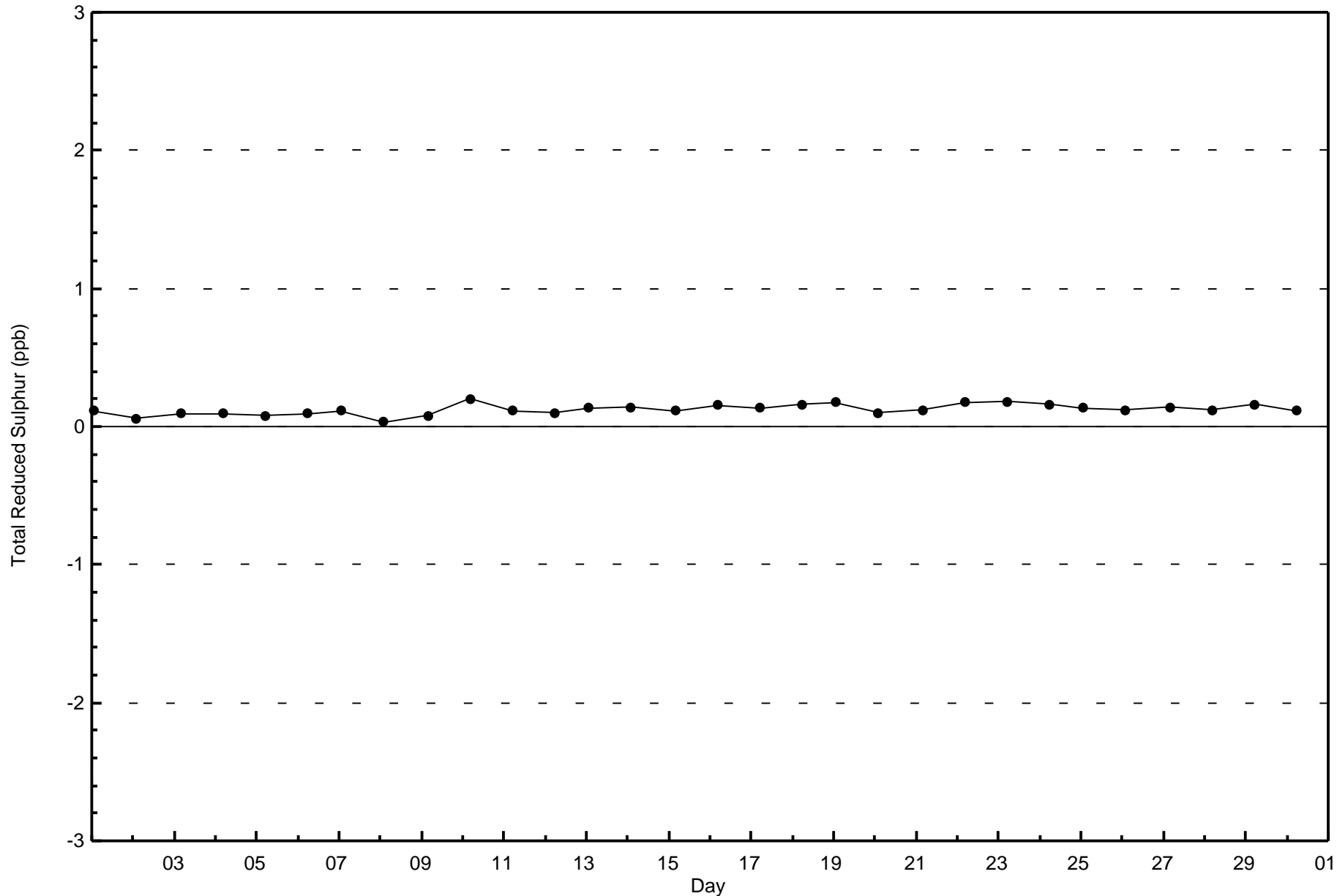
Total Number of Hours: 720

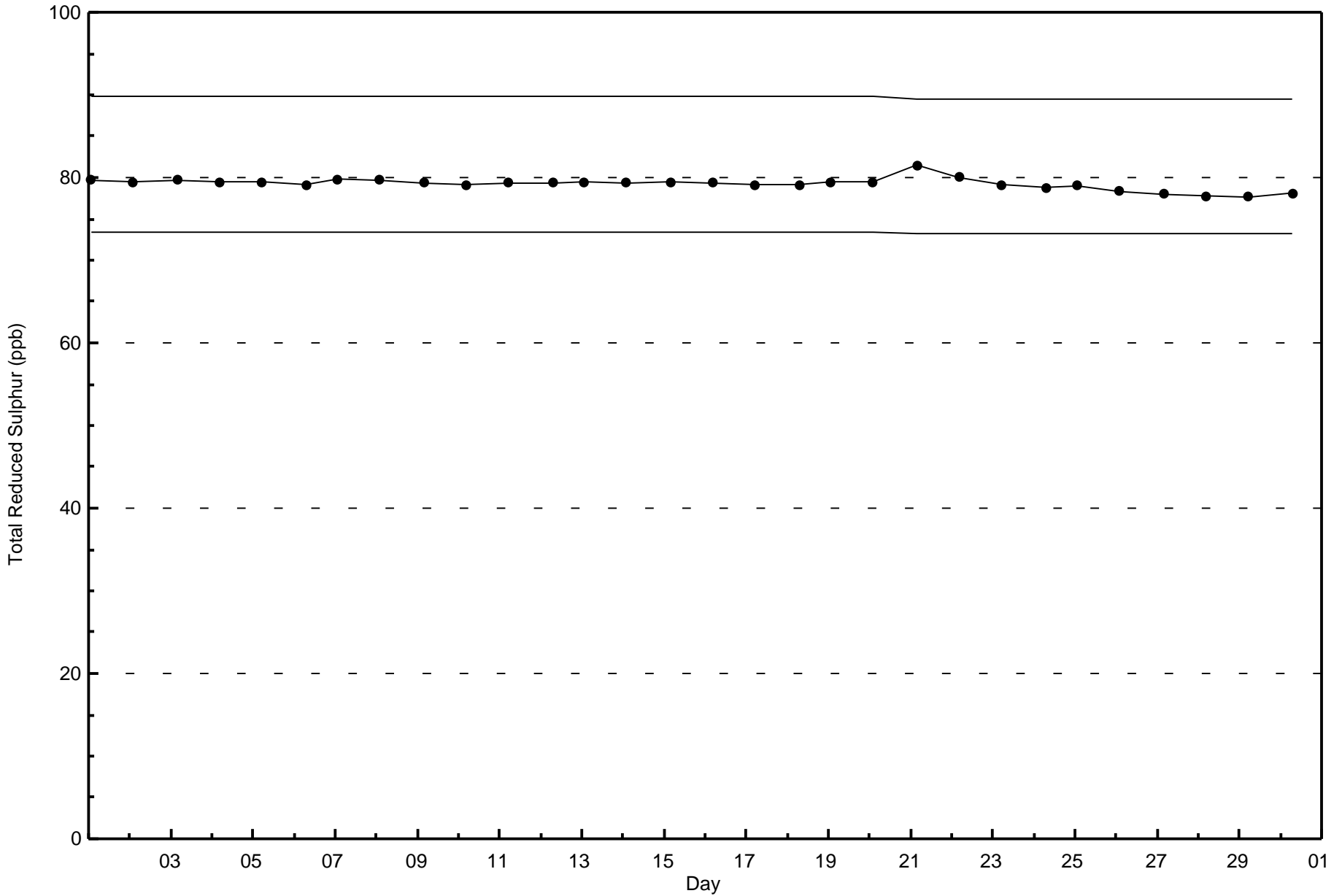


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Reduced Sulphur (TRS) - ppb
Janvier (AMS 22)



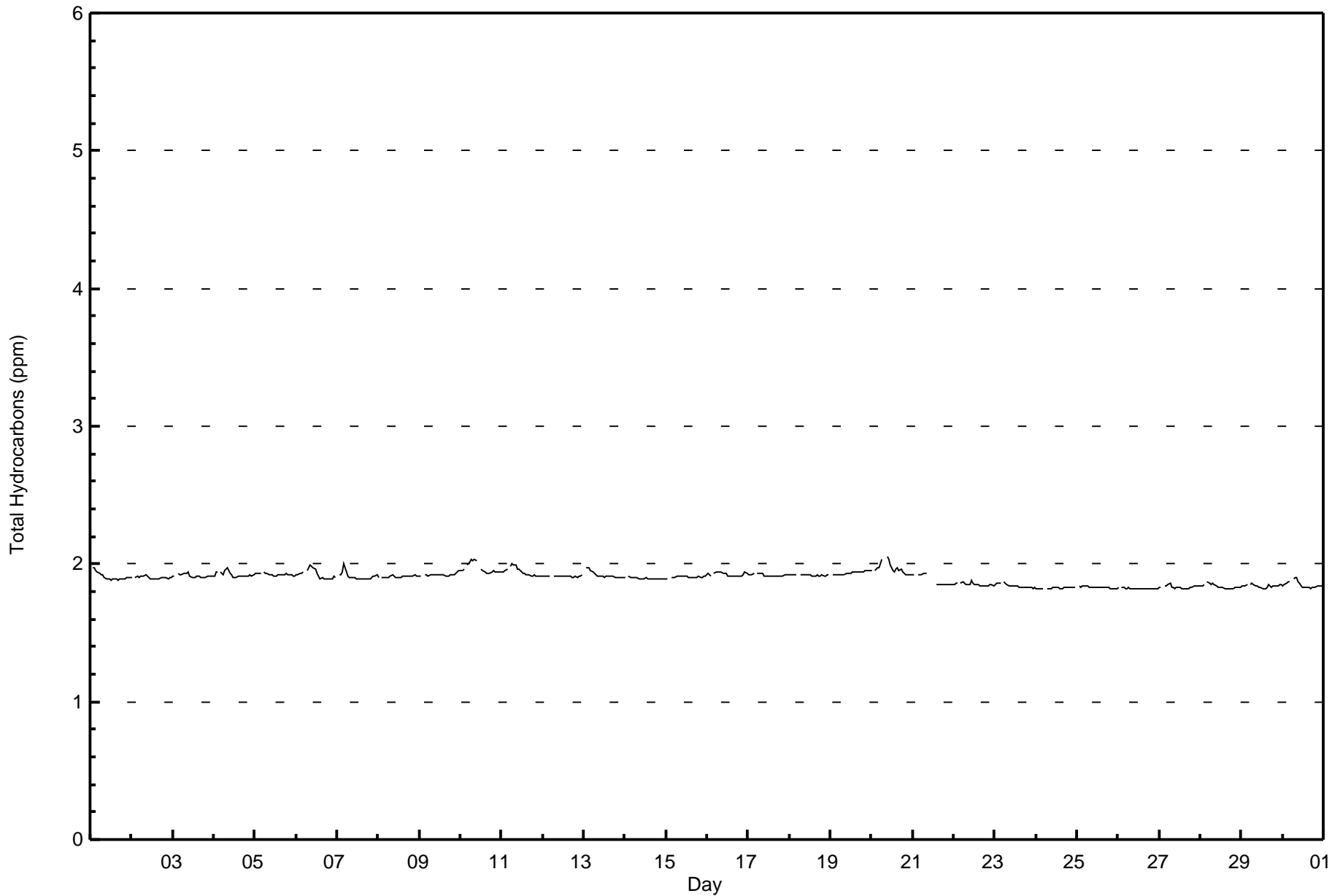






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	680	99.85	99.85
2.1 - 3.0	1	0.15	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	54	158	75	39	22	26	36	66	80	55	18	15	16	5	6	9	680
2.1 - 3.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	158	75	39	22	26	36	66	81	55	18	15	16	5	6	9	681

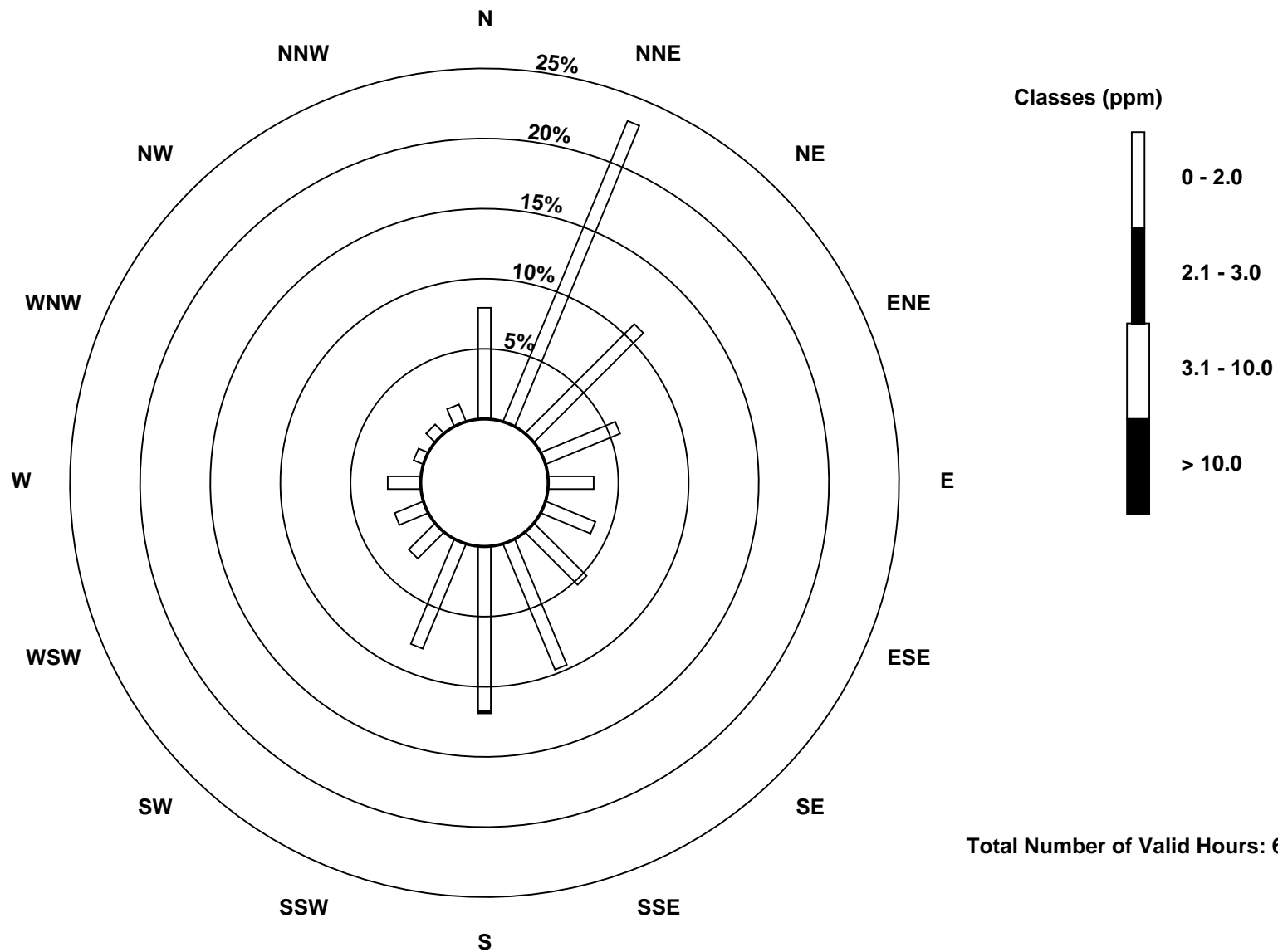
Total Number of Valid Hours: 681

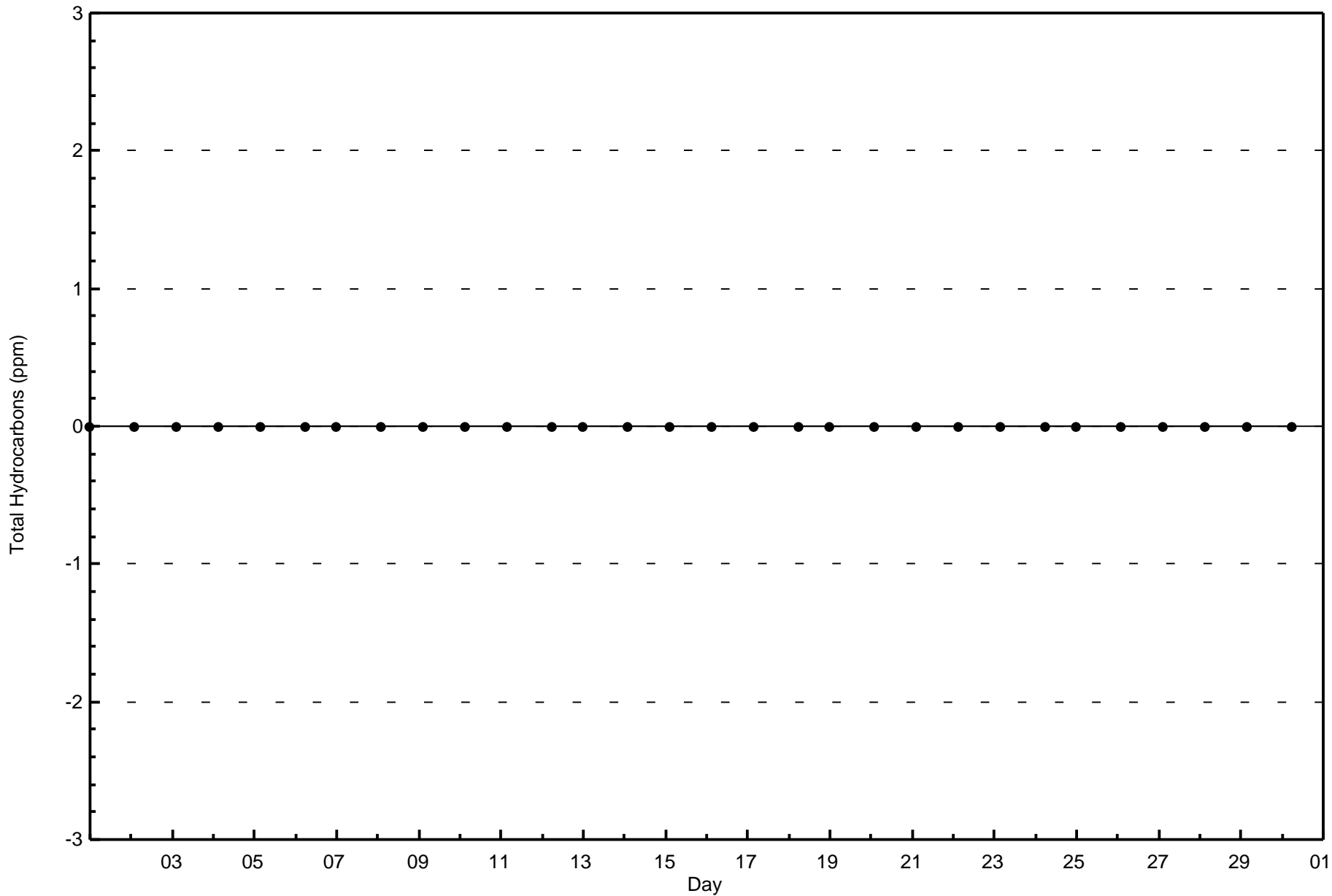
Total Number of Hours: 720

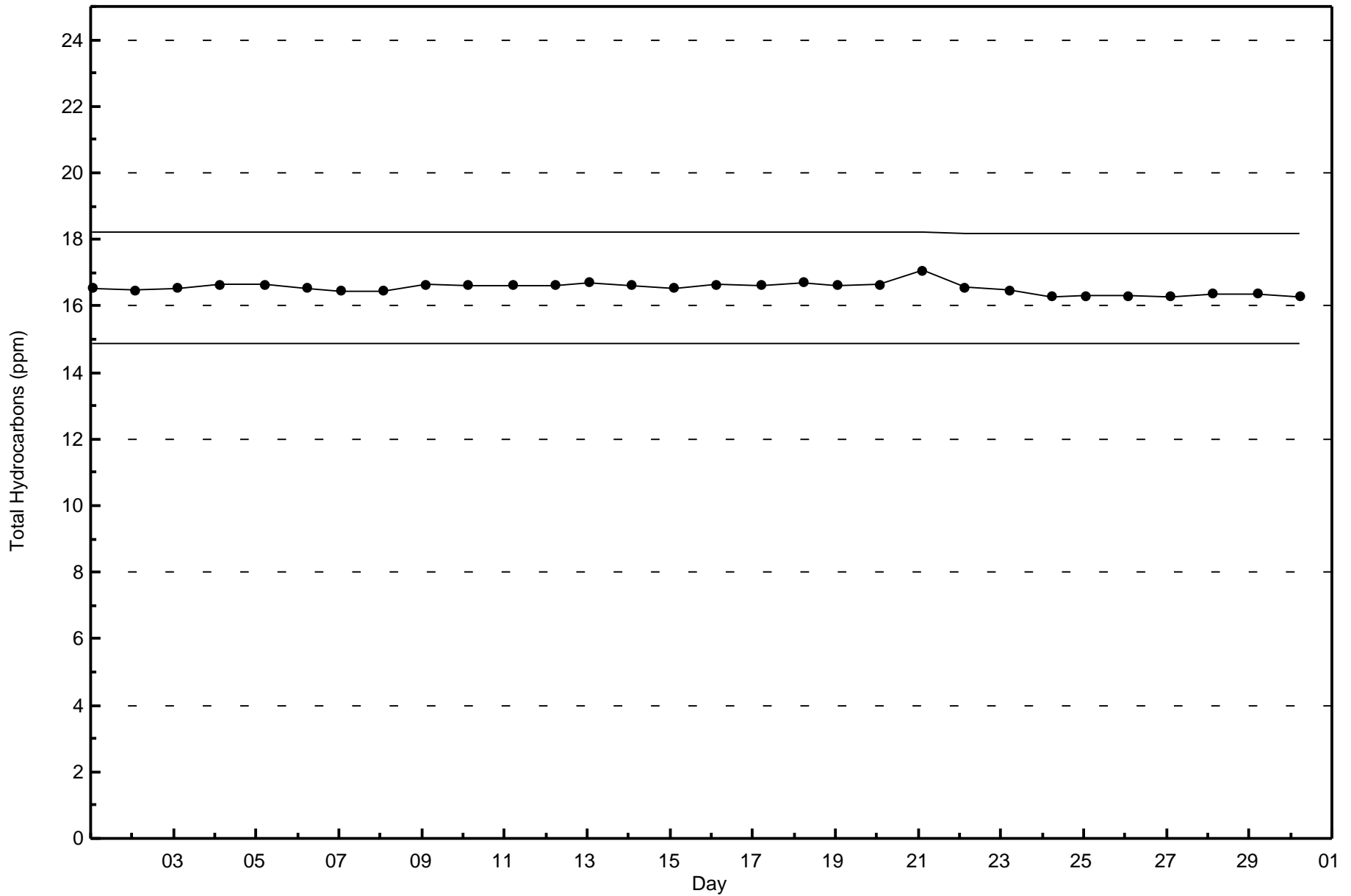


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Total Hydrocarbons (THC) - ppm
Janvier (AMS 22)





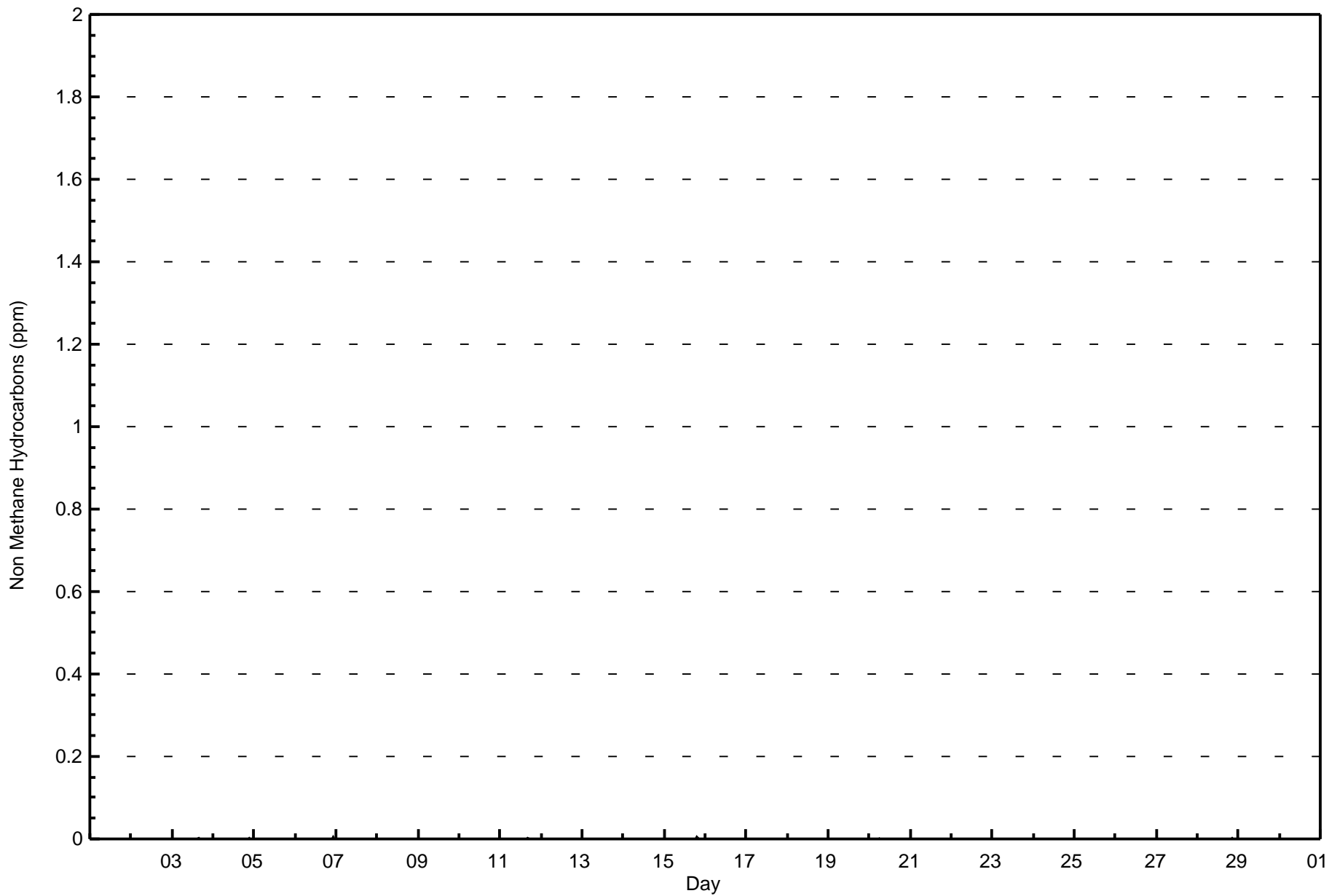




Summary of Hour Averages

Janvier - April 2017

Maximum Value: 0.007 ppm on Apr 15 20:00		Maximum Daily Average: 0.000 ppm on Apr 15		Hours in Service:	720																							
Minimum Value: 0.000 ppm on Apr 1 02:00		Minimum Daily Average: 0.000 ppm on Apr 1		Hours of Data:	681																							
Maximum Diurnal Average: 0.000 ppm at hour 20		Minimum Diurnal Average: 0.000 ppm at hour 1		Hours of Missing Data:	39																							
Monthly Average: 0.000 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0		Hours of Calibration:	35																							
				Percent Operational Time:	99.4																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
4-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.005
5-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.006
7-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
12-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
15-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.007
16-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.004	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
21-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25-Apr	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26-Apr	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27-Apr	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Apr	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.003
29-Apr	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30-Apr	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration M - Maintenance																												





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Janvier - April 2017**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	679	99.71	99.71
0.006 - 0.05	2	0.29	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



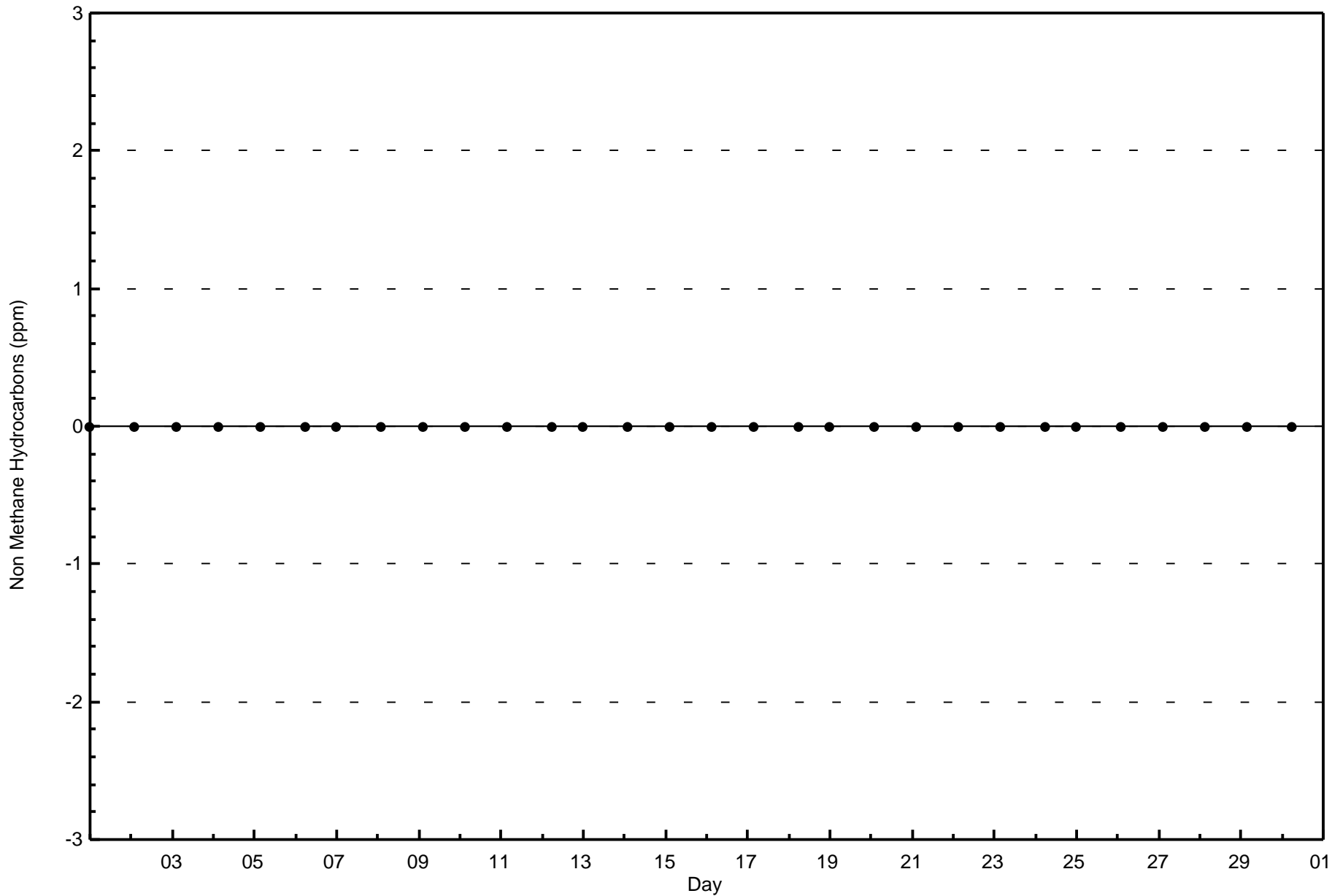
Wood Buffalo Environmental Association
Frequency Distribution

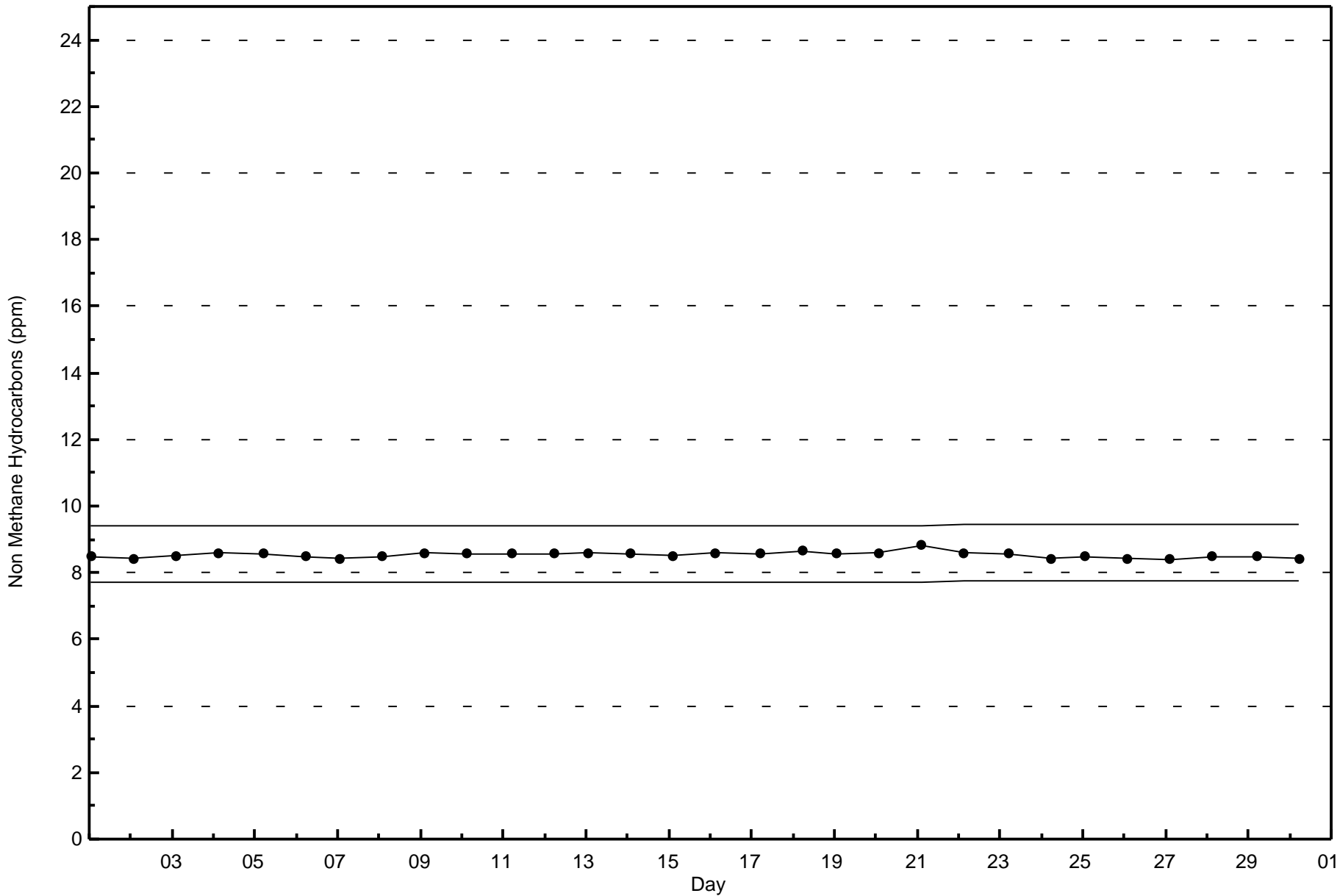
Non Methane Hydrocarbons (NMHC) - ppm
Janvier - April 2017

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	54	157	74	39	22	26	36	66	81	55	18	15	16	5	6	9	679
0.006 - 0.05	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	158	75	39	22	26	36	66	81	55	18	15	16	5	6	9	681

Total Number of Valid Hours: 681

Total Number of Hours: 720

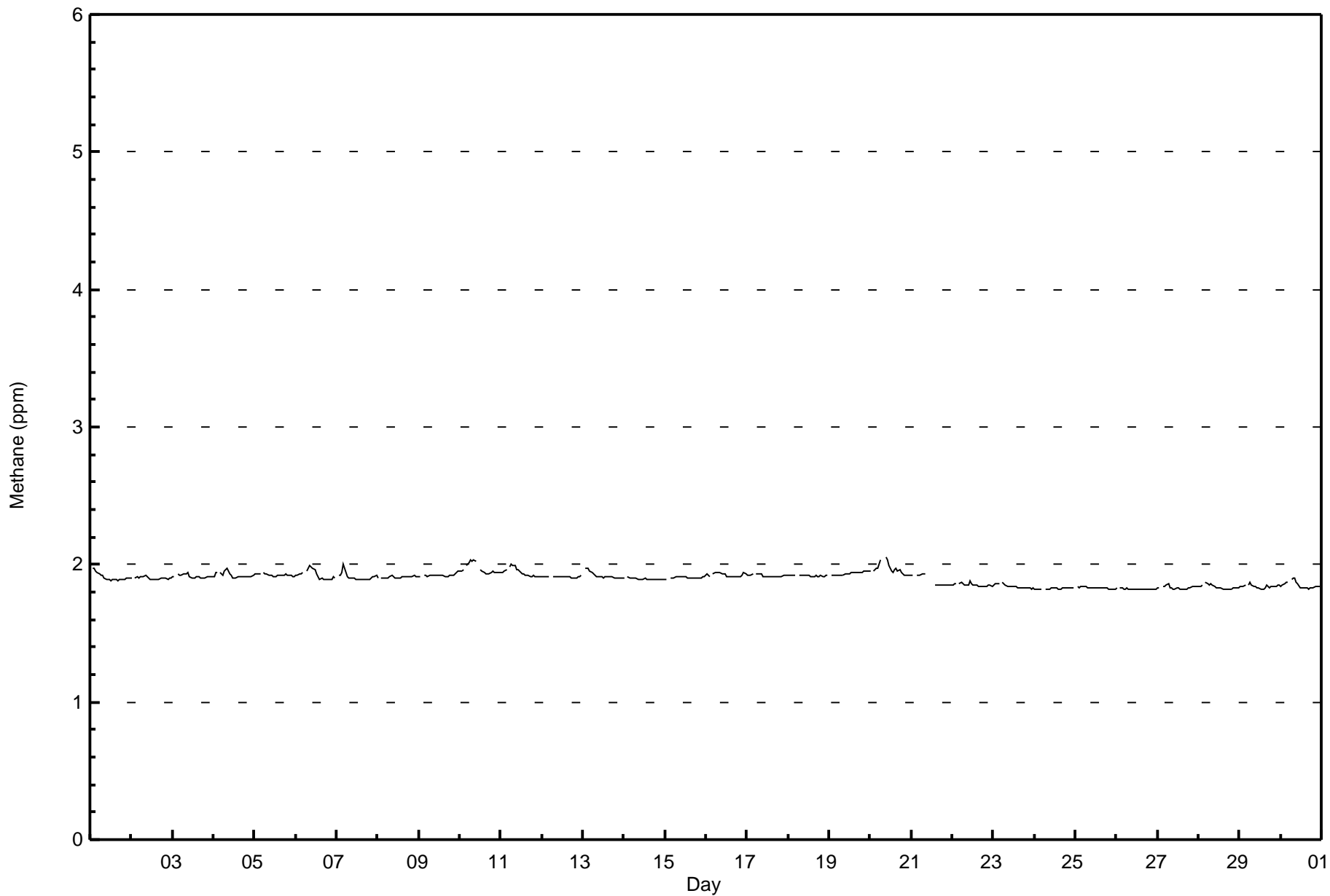






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Janvier - April 2017

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	680	99.85	99.85
2.1 - 3.0	1	0.15	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Janvier - April 2017**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	54	158	75	39	22	26	36	66	80	55	18	15	16	5	6	9	680
2.1 - 3.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	158	75	39	22	26	36	66	81	55	18	15	16	5	6	9	681

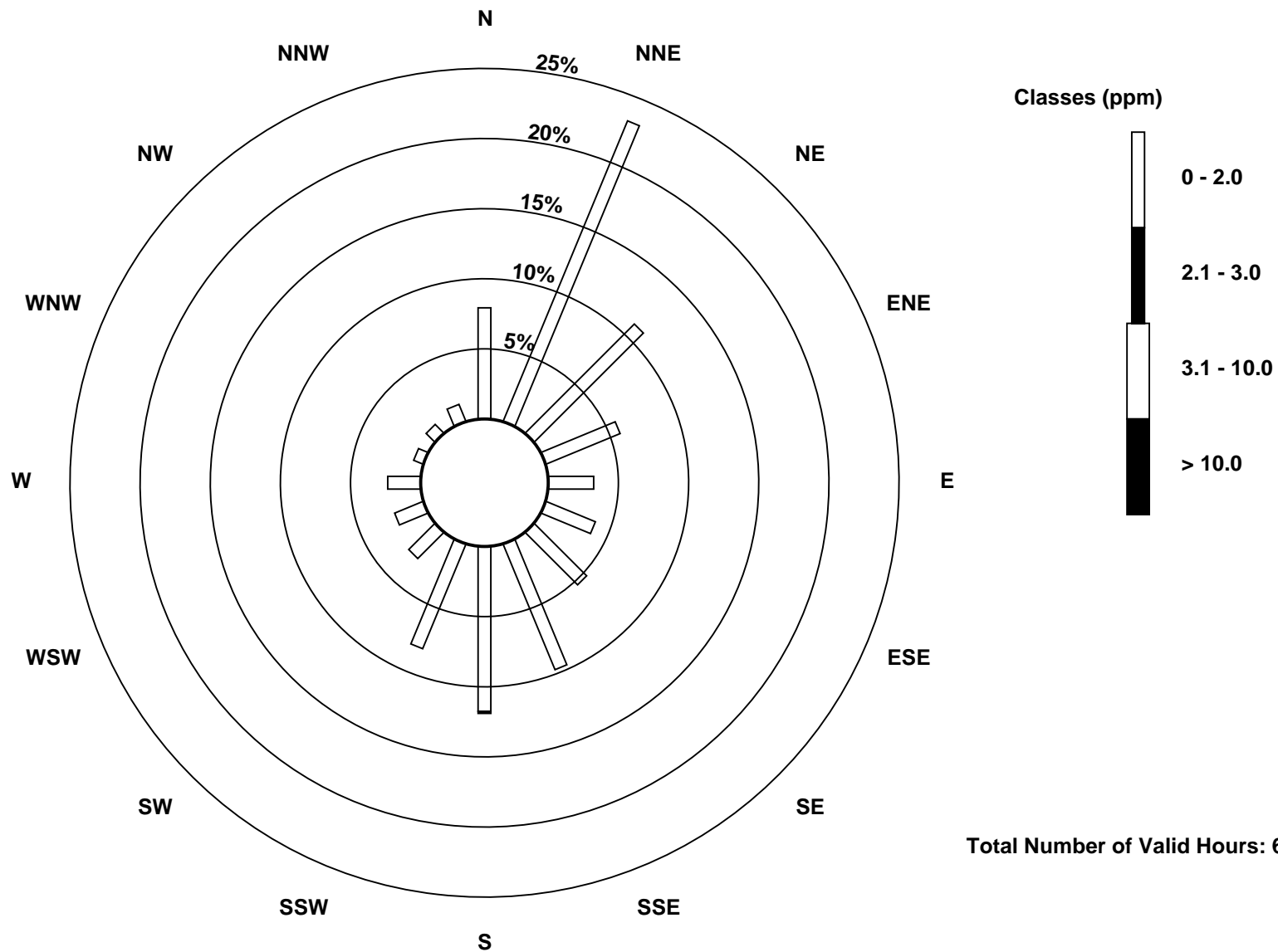
Total Number of Valid Hours: 681

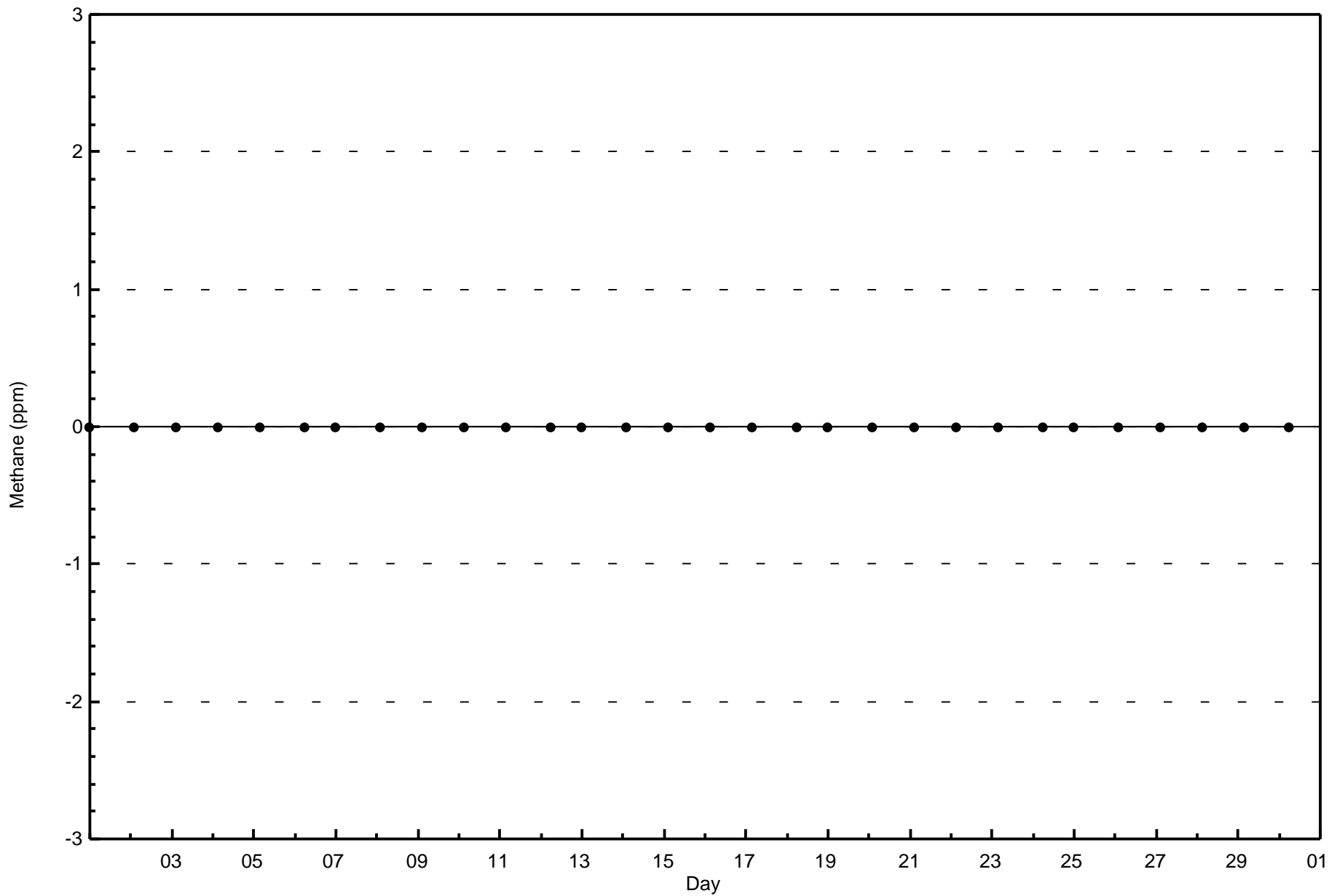
Total Number of Hours: 720

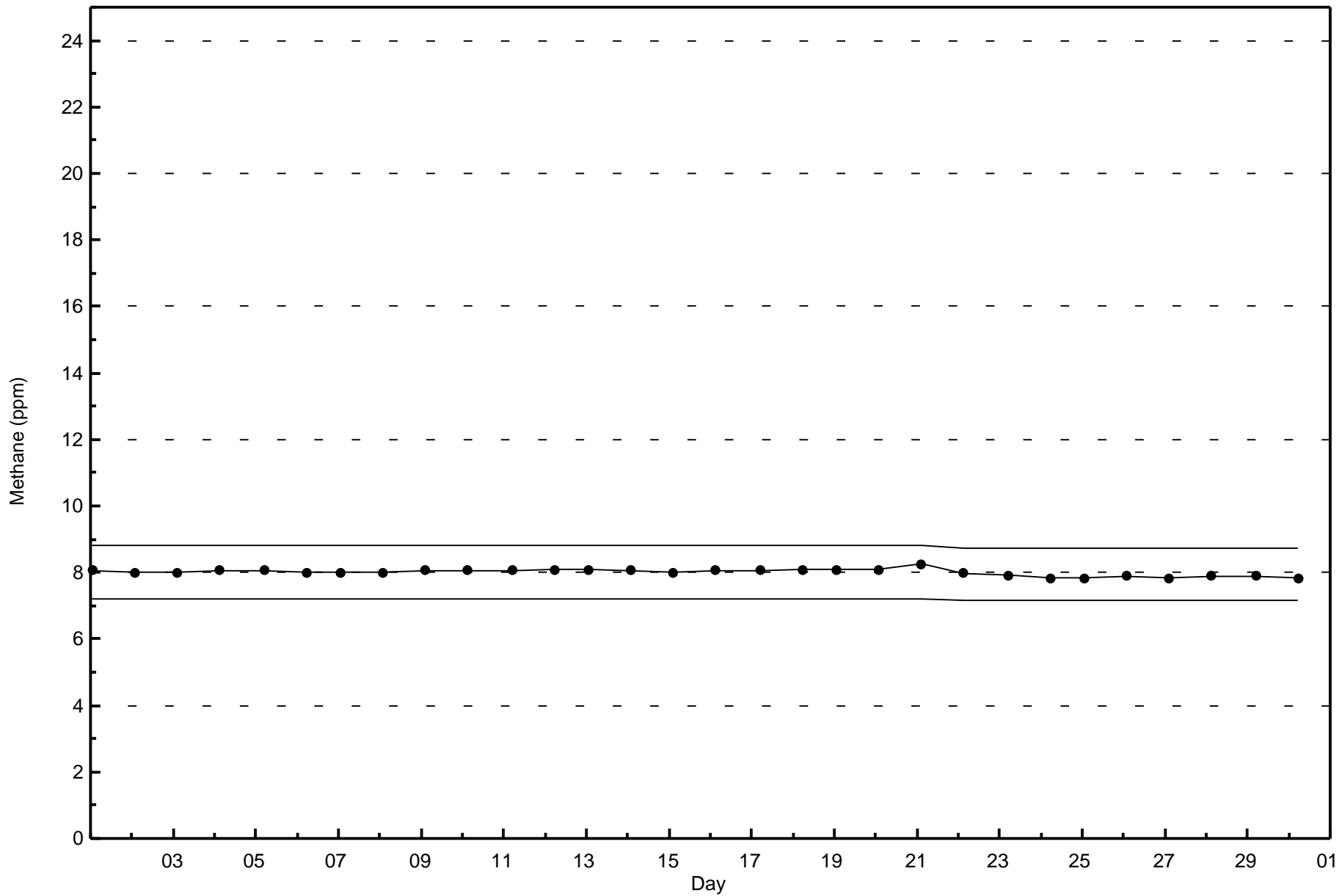


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Methane (CH₄) - ppm
Janvier (AMS 22)









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Janvier - April 2017

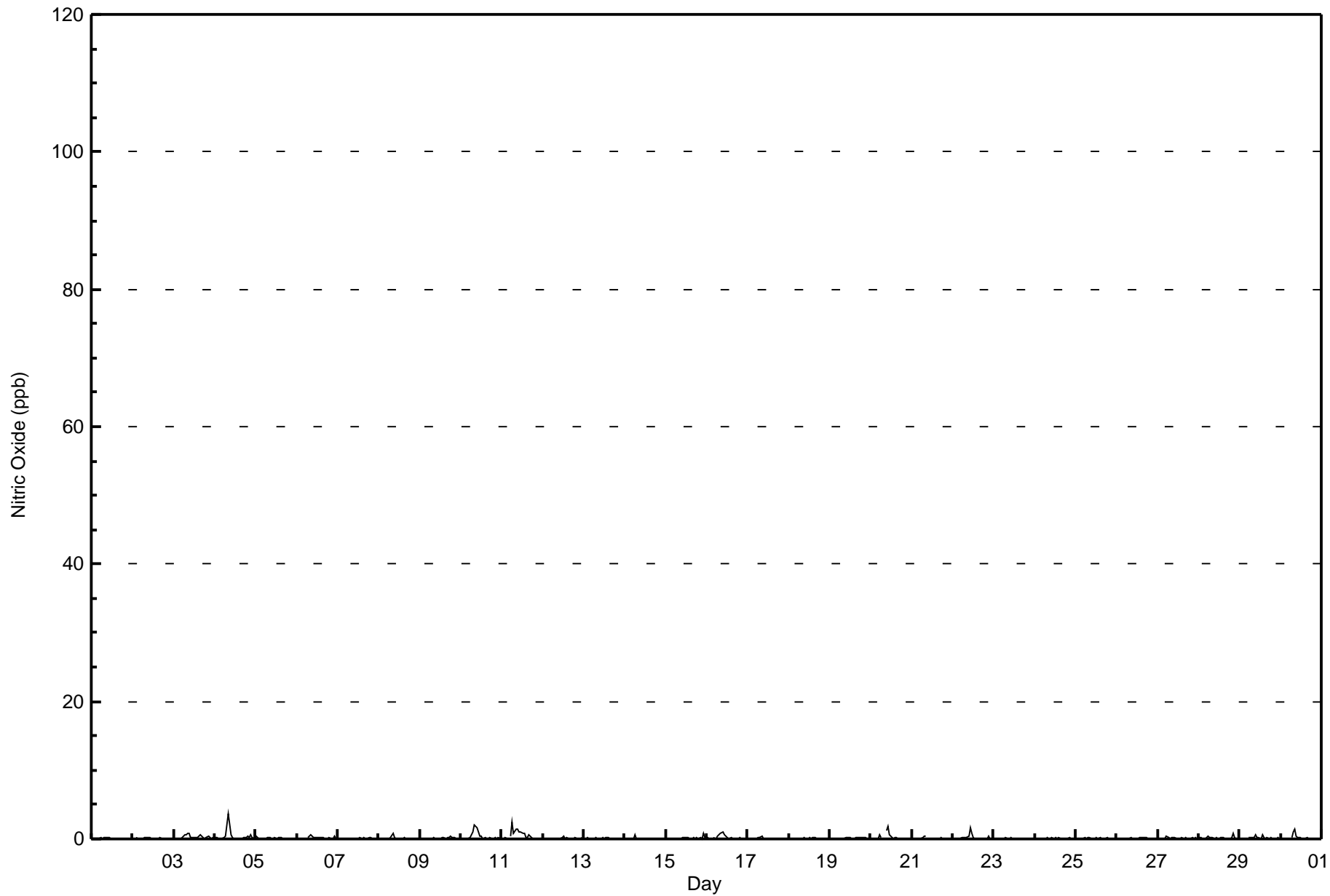
Maximum Value: 4 ppb on Apr 4 09:00		Maximum Daily Average: 0.5 ppb on Apr 11		Hours in Service: 720																							
Minimum Value: 0 ppb on Apr 8 23:00		Minimum Daily Average: 0.0 ppb on Apr 23		Hours of Data: 683																							
Maximum Diurnal Average: 0.5 ppb at hour 9		Minimum Diurnal Average: 0.0 ppb at hour 4		Hours of Missing Data: 37																							
Monthly Average: 0.1 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 2		Hours of Calibration: 35																							
				Percent Operational Time: 99.7																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
2-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
3-Apr	0	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.3	1
4-Apr	0	0	0	Z	0	0	0	2	4	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.4	4
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Apr	0	0	0	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
7-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
8-Apr	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
9-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
10-Apr	0	0	0	Z	0	0	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
11-Apr	0	0	0	0	Z	0	2	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0.5	2
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
14-Apr	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	1
16-Apr	0	0	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
17-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
19-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
20-Apr	0	Z	0	0	0	1	0	M	M	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
21-Apr	0	0	Z	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.1	0
22-Apr	0	0	0	Z	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
27-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.1	1
29-Apr	0	0	0	0	Z	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
30-Apr	0	0	0	0	0	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
																								Diurnal Average			
																								Diurnal Maximum			
																								0.0	0.0		
																								0	0		
																								0.0	0.0		
																								0	0		
																								0.0	0.0		
																								0	0		
																								0.2	0.2		
																								1	2		
																								0.3	0.3		
																								2	2		
																								0.5	0.3		
																								4	2		
																								0.3	0.3		
																								2	2		
																								0.2	0.1		
																								1	1		
																								0.1	0.1		
																								1	1		
																								0.1	0.1		
																								0	0		
																								0.1	0.1		
																								1	1		
																								0.1	0.1		
																								0	0		
																								0.1	0.1		
																								0	0		
																								0.1	0.1		
																								1	1		
																								0.0	0.0		
																								1	1		
																								0.0	0.0		
																								0	0		

Z - zerospan C - Calibration M - Maintenance



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	683

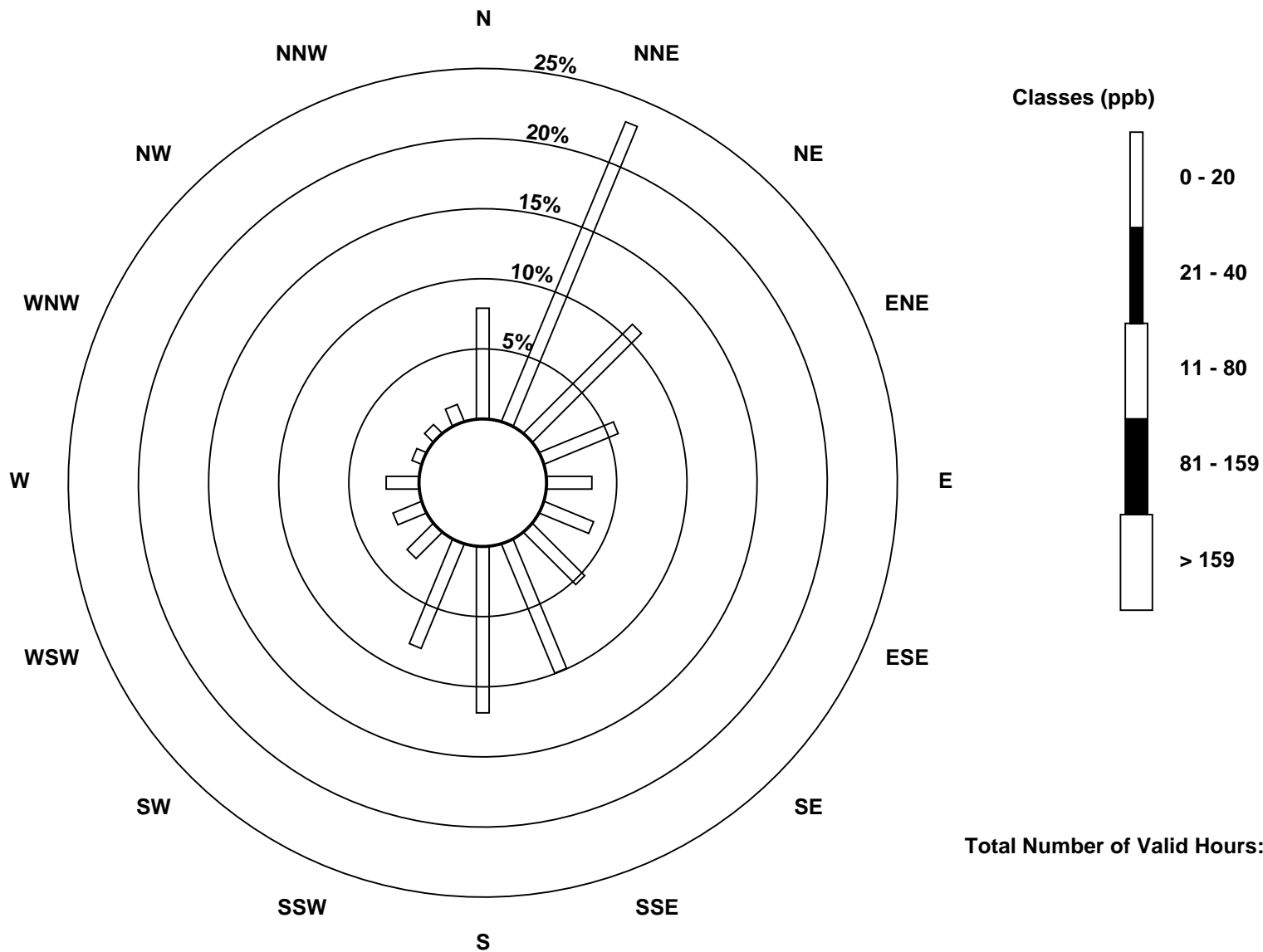
Total Number of Valid Hours: 683

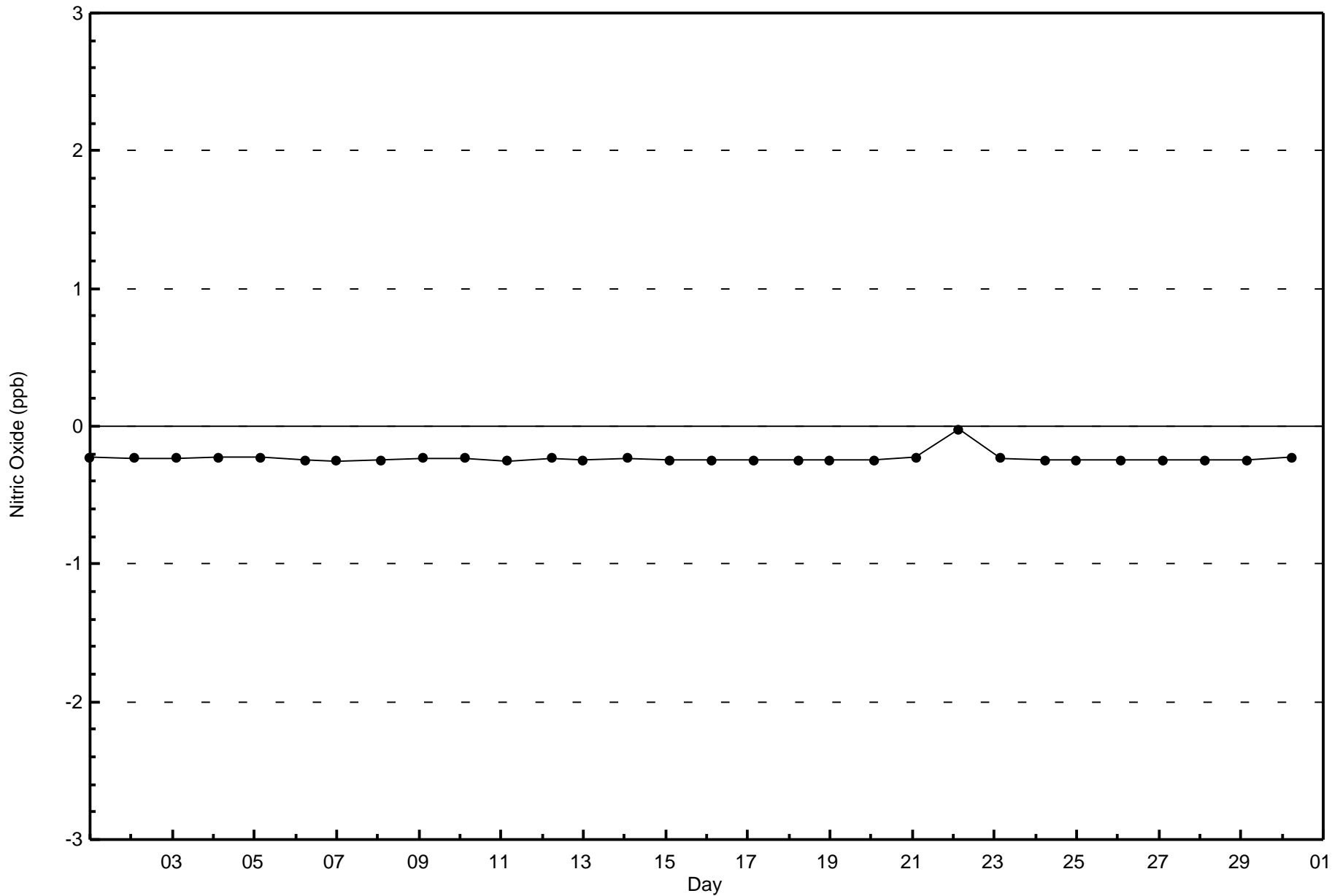
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitric Oxide (NO) - ppb
Janvier (AMS 22)

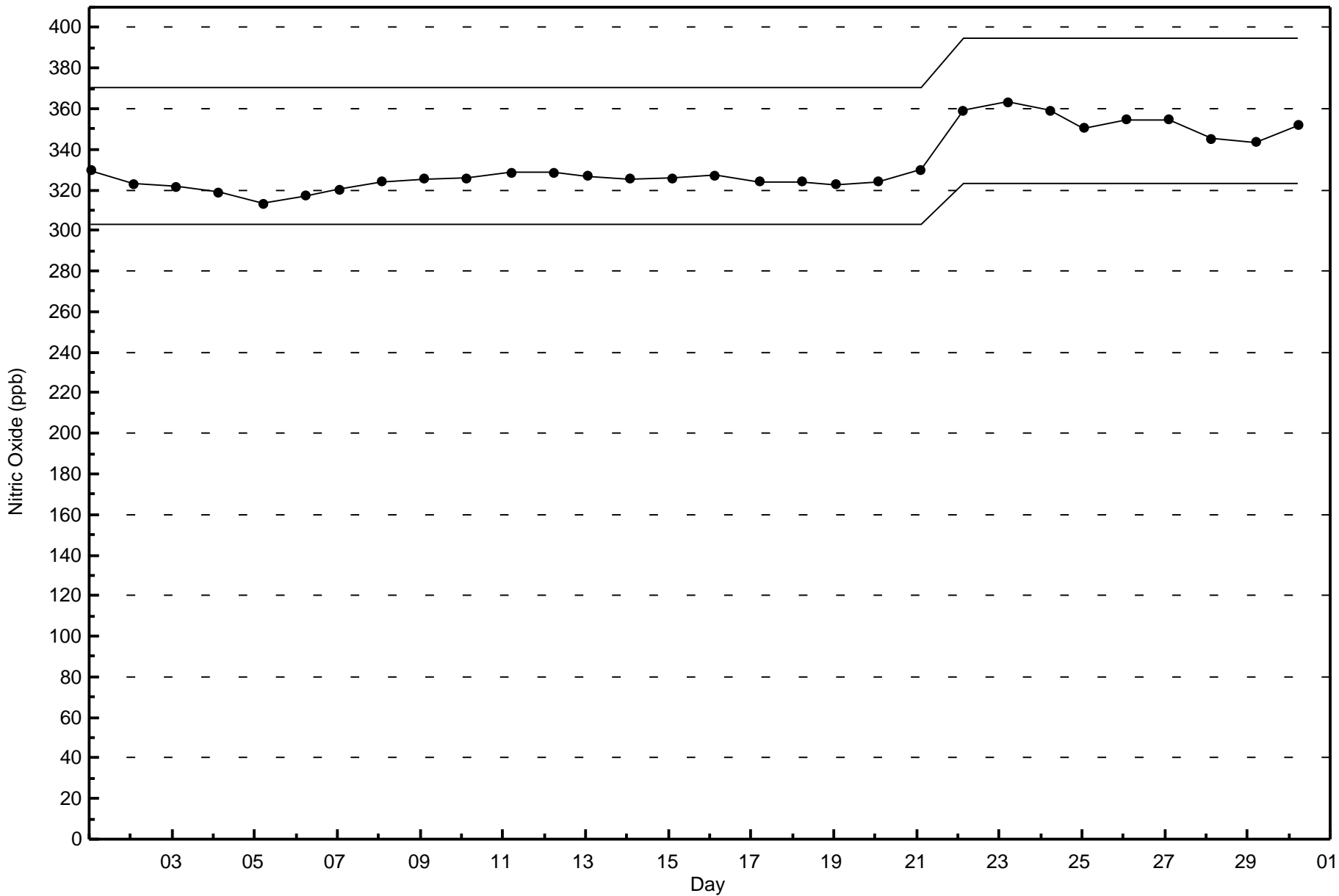






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Janvier - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 6 ppb on Apr 4 09:00	Maximum Daily Average: 2.1 ppb on Apr 10		Hours of Data:	683
Minimum Value: 0 ppb on Apr 12 13:00	Minimum Daily Average: 0.3 ppb on Apr 14		Hours of Missing Data:	37
Maximum Diurnal Average: 1.2 ppb at hour 9	Minimum Diurnal Average: 0.5 ppb at hour 14		Hours of Calibration:	35
Monthly Average: 0.8 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 3		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0.8	2
2-Apr	1	Z	2	2	2	1	1	2	1	1	1	0	0	0	0	0	2	0	1	1	1	0	0	1	0.8	2
3-Apr	1	1	Z	1	1	1	2	2	2	2	1	1	1	1	3	3	2	0	1	2	1	1	1	1.2	3	
4-Apr	1	3	6	Z	2	1	2	4	6	1	1	0	1	1	1	1	1	2	1	3	1	2	1	1	1.7	6
5-Apr	1	1	1	1	Z	2	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.7	2	
6-Apr	1	1	1	1	2	Z	2	3	2	2	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1.3	3
7-Apr	Z	1	2	1	1	1	1	1	1	1	0	1	0	1	0	1	0	0	1	2	1	1	0	0	0.7	2
8-Apr	0	Z	0	0	0	0	0	1	2	1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0.4	2
9-Apr	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2	0.6	2
10-Apr	2	3	4	Z	3	3	4	3	4	3	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2.1	4
11-Apr	1	1	2	1	Z	2	2	2	3	3	2	2	2	2	1	1	3	2	2	1	0	0	0	0	1.5	3
12-Apr	0	0	0	0	0	Z	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	2	0.5	2
13-Apr	Z	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
14-Apr	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	1	0	1	3	1	0.6	3
16-Apr	1	1	1	Z	3	2	2	1	1	1	1	1	0	1	0	1	1	1	1	1	1	2	2	1	1.1	3
17-Apr	1	1	1	1	Z	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
18-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
19-Apr	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	0.8	2
20-Apr	1	Z	1	1	1	3	1	M	M	3	2	2	1	1	1	1	1	1	1	1	1	0	0	0	1.1	3
21-Apr	0	0	Z	0	0	0	0	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0	1	0.4	1
22-Apr	1	1	1	Z	1	2	1	1	1	1	4	2	1	1	0	0	0	0	0	0	1	1	0	0	0.9	4
23-Apr	1	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
24-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
25-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0.3	1
26-Apr	0	Z	0	0	1	1	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.4	1
27-Apr	0	0	Z	1	1	2	2	0	1	0	0	0	0	0	0	1	0	0	1	1	1	1	2	1	0.7	2
28-Apr	1	1	1	Z	1	2	1	1	1	1	1	1	0	1	1	1	1	1	1	1	2	2	1	1	0.9	2
29-Apr	1	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1
30-Apr	1	1	1	1	1	Z	1	3	3	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1.2	3

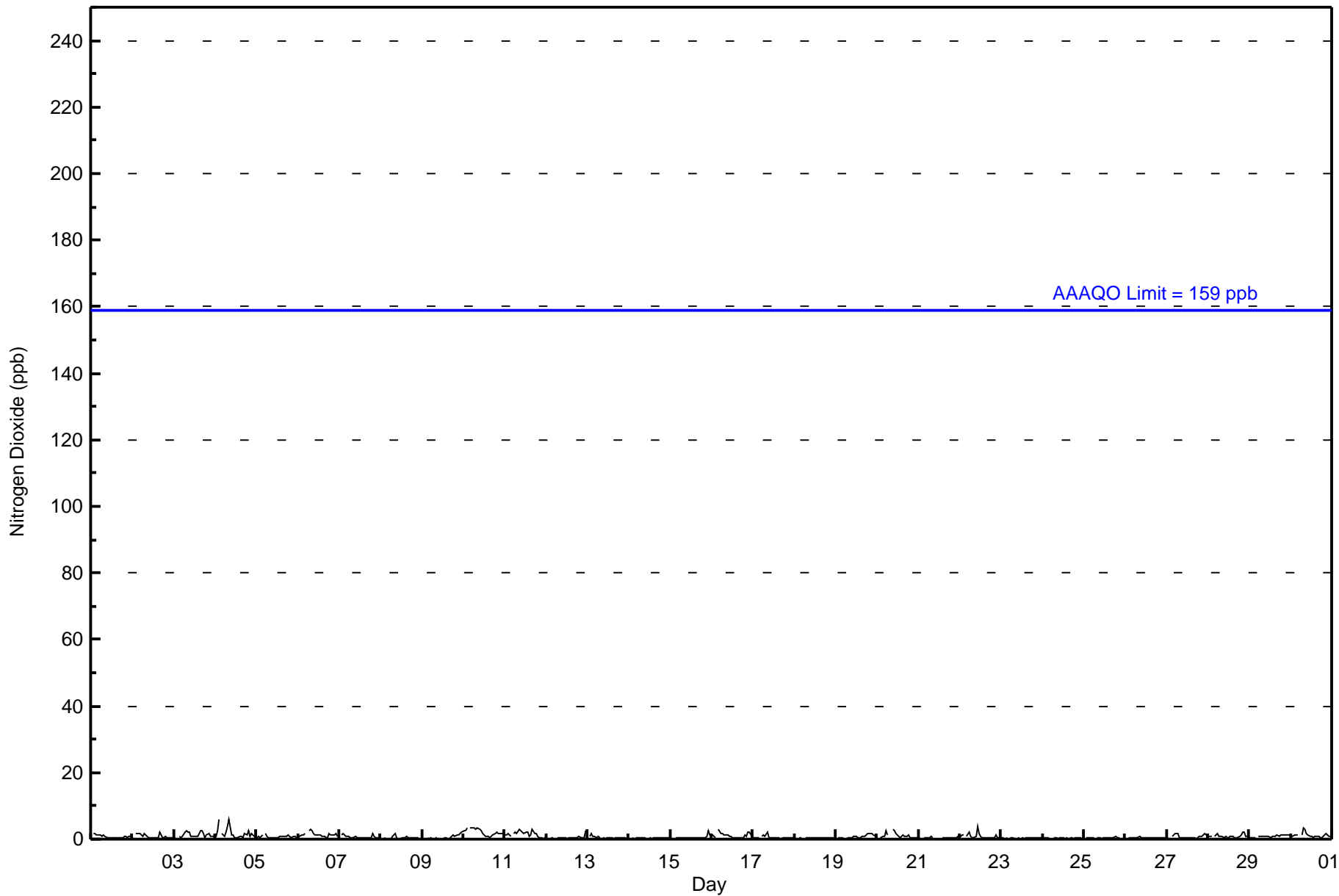
0.6	0.8	1.1	0.6	0.9	1.1	1.0	1.1	1.1	1.2	0.9	0.8	0.6	0.6	0.5	0.6	0.6	0.7	0.6	0.7	0.9	0.8	0.8	0.8	0.7	Diurnal Average
2	3	6	2	3	3	4	4	4	6	3	4	2	2	2	1	3	3	2	2	3	2	2	3	2	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	683

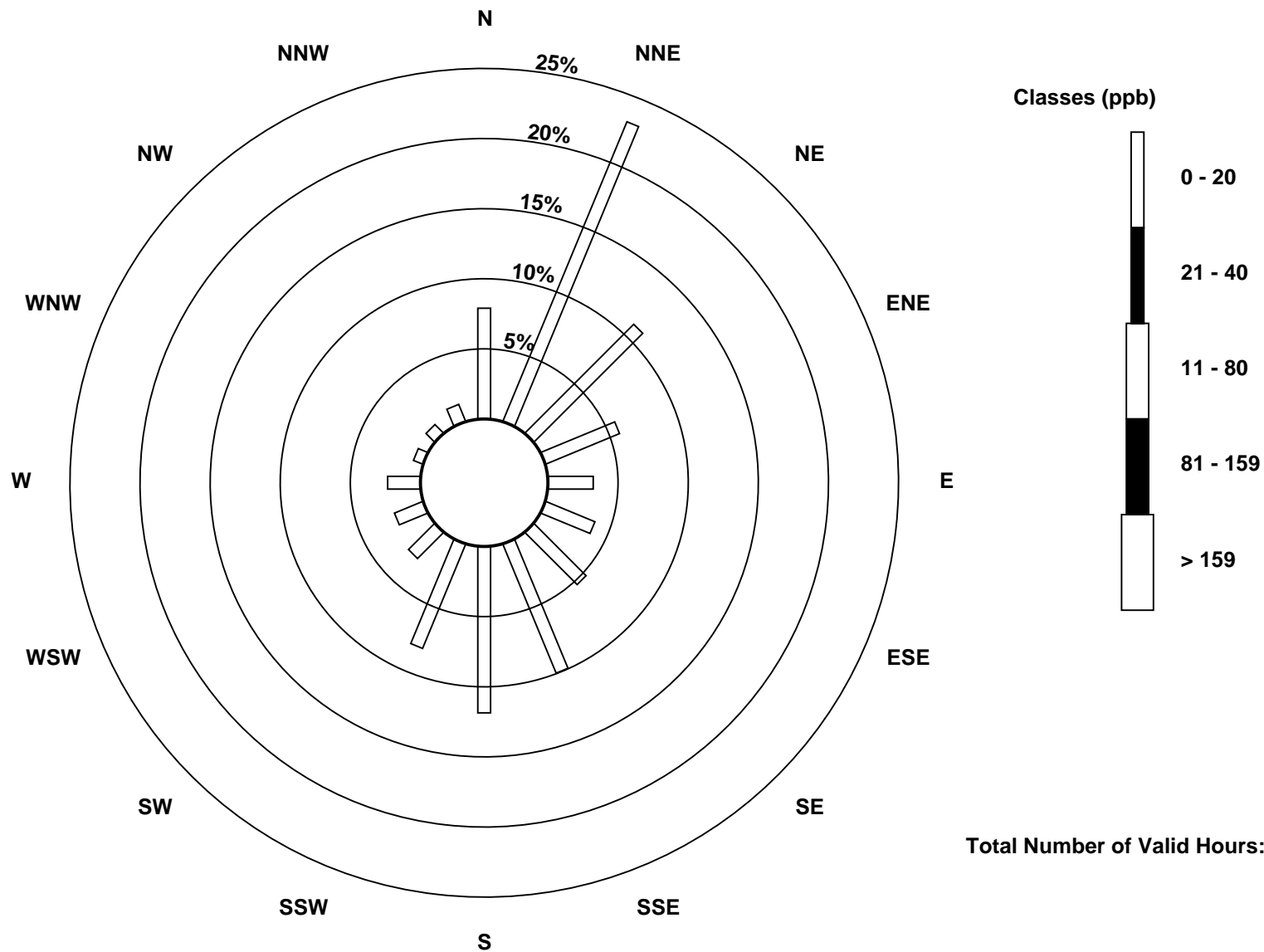
Total Number of Valid Hours: 683

Total Number of Hours: 720

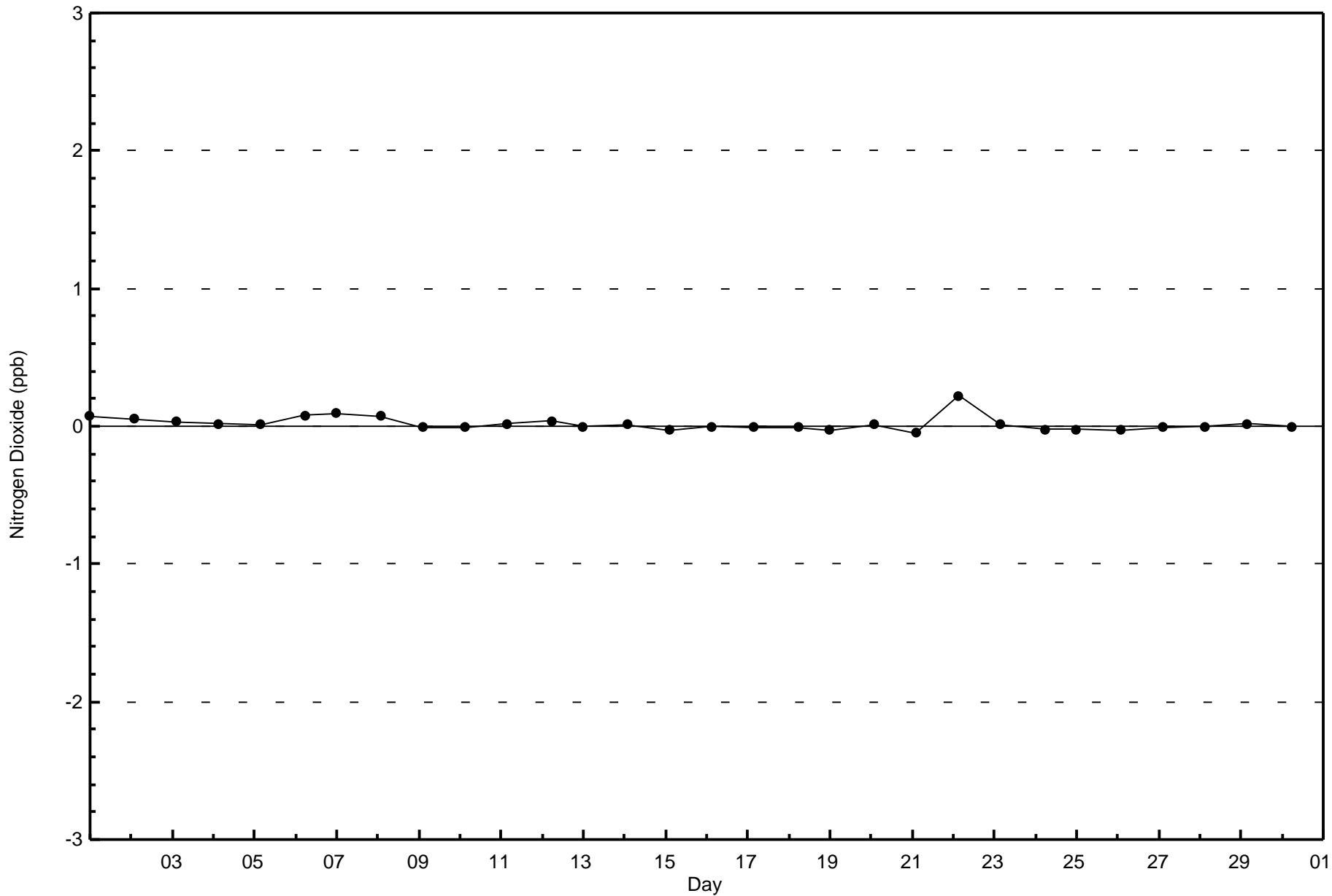


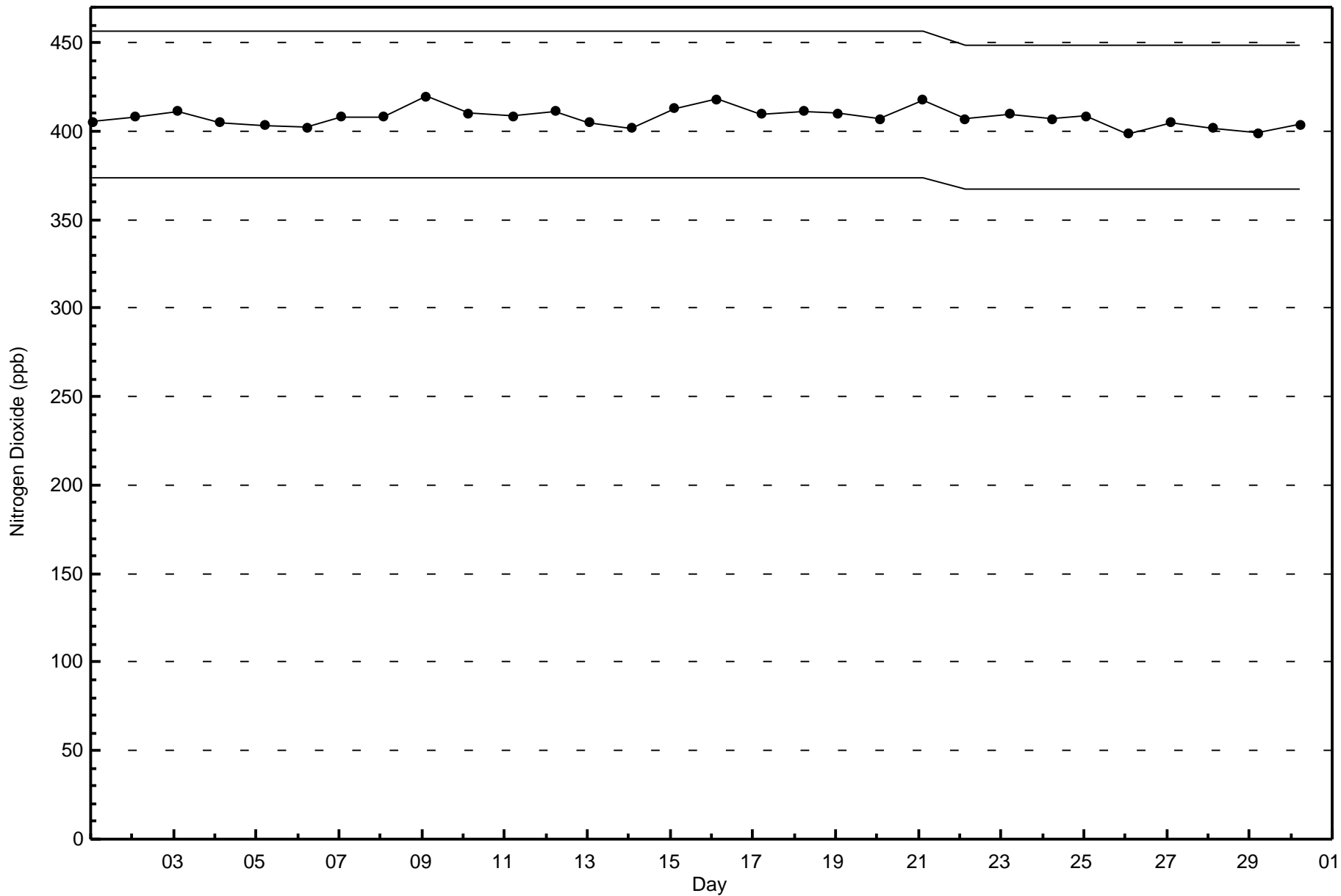
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Janvier (AMS 22)



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association
Summary of Hour Averages

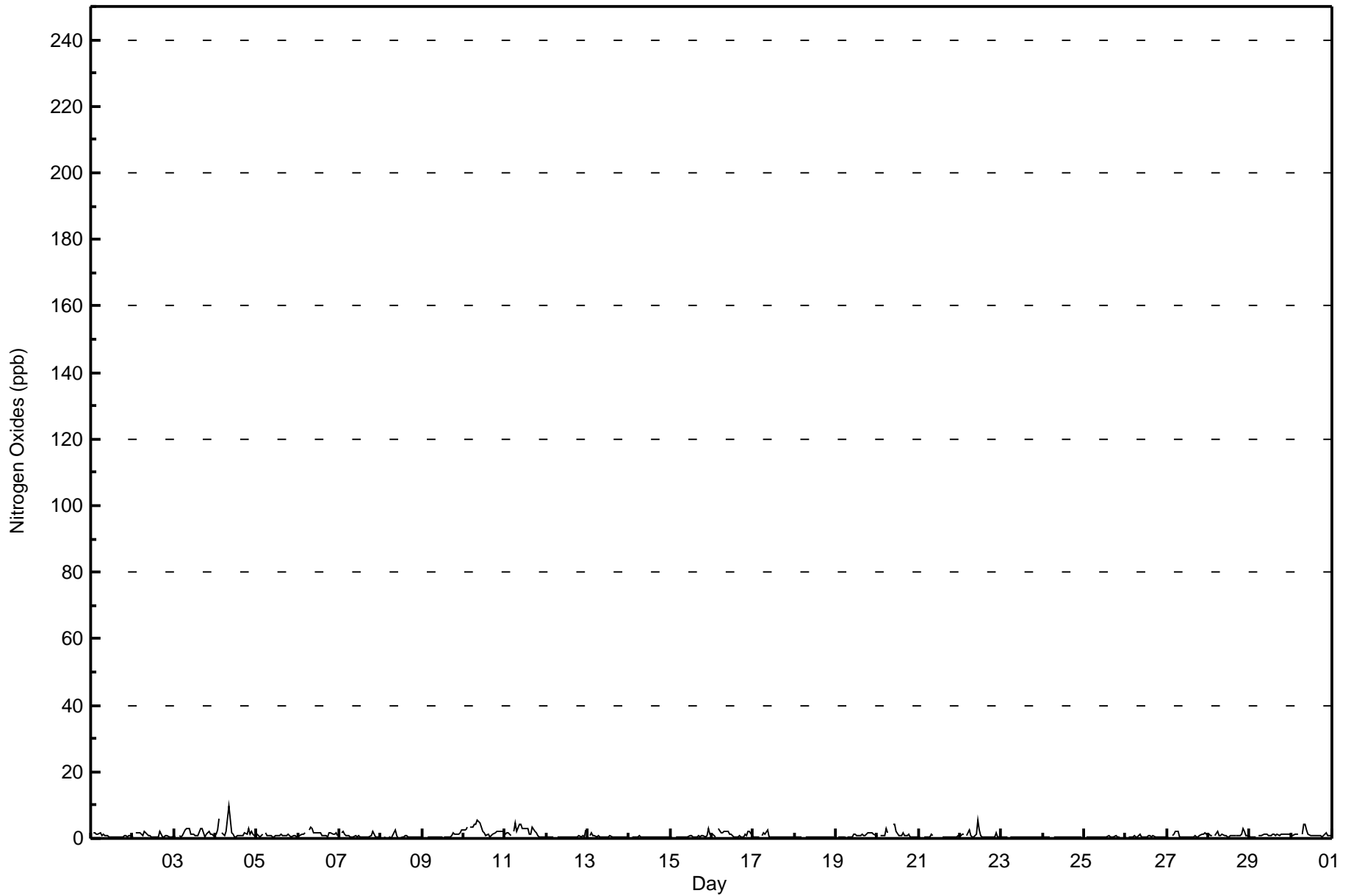
Nitrogen Oxides (NO_x) - ppb
Janvier - April 2017

Maximum Value: 10 ppb on Apr 4 09:00		Maximum Daily Average: 2.5 ppb on Apr 10		Hours in Service: 720																																													
Minimum Value: 0 ppb on Apr 8 05:00		Minimum Daily Average: 0.3 ppb on Apr 14		Hours of Data: 683																																													
Maximum Diurnal Average: 1.7 ppb at hour 9		Minimum Diurnal Average: 0.7 ppb at hour 4		Hours of Missing Data: 37																																													
Monthly Average: 0.9 ppb		Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 5		Hours of Calibration: 35																																													
				Percent Operational Time: 99.7																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	Z	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0.8	2																							
2-Apr	1	Z	2	2	1	1	1	2	1	1	1	0	0	0	0	0	2	0	0	1	1	0	0	1	0.9	2																							
3-Apr	1	0	Z	1	1	1	3	3	3	3	1	1	1	1	1	3	3	2	0	1	2	1	1	1	1.5	3																							
4-Apr	1	3	6	Z	2	1	2	6	10	2	1	1	1	1	1	1	1	2	1	3	1	2	1	1	2.2	10																							
5-Apr	1	1	1	1	Z	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1																							
6-Apr	1	1	1	1	2	Z	3	3	3	2	2	2	2	2	1	1	1	1	2	1	1	1	2	1	1.5	3																							
7-Apr	Z	2	2	1	1	1	0	1	1	1	1	1	1	0	1	0	0	0	1	2	1	1	0	0	0.8	2																							
8-Apr	0	Z	0	0	0	0	0	1	3	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0.5	3																							
9-Apr	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	2	1	1	1	2	2	0.7	2																							
10-Apr	2	3	3	Z	3	4	4	4	6	5	3	2	2	1	1	1	1	1	2	2	2	2	2	2	2.5	6																							
11-Apr	1	1	2	1	Z	2	5	2	4	4	3	3	3	1	1	3	2	2	1	0	0	0	0	0	2.0	5																							
12-Apr	0	0	0	0	0	Z	0	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1	0	3	0.5	3																							
13-Apr	Z	1	2	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.5	2																							
14-Apr	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1																							
15-Apr	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	1	1	0	1	3	1	0.6	3																							
16-Apr	1	1	0	Z	3	2	2	2	2	2	1	1	1	0	1	1	1	1	1	1	1	2	2	1	1.3	3																							
17-Apr	1	0	0	1	Z	1	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2																							
18-Apr	0	0	0	0	0	Z	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0.4	1																							
19-Apr	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	0.9	2																							
20-Apr	1	Z	1	1	1	3	1	M	M	4	4	2	1	1	1	1	1	1	1	1	0	0	0	0	1.3	4																							
21-Apr	0	0	Z	0	0	0	1	1	1	C	C	C	C	C	1	0	0	1	0	0	0	0	0	1	0.5	1																							
22-Apr	1	1	1	Z	1	2	1	1	1	1	5	2	1	1	0	0	0	0	0	0	1	2	1	0	1.1	5																							
23-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.4	1																							
24-Apr	0	0	0	0	0	Z	0	1	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0.4	1																							
25-Apr	Z	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0.4	1																							
26-Apr	0	Z	0	0	1	1	0	0	1	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0.5	1																							
27-Apr	0	0	Z	1	1	2	2	0	1	1	1	0	0	0	0	0	1	0	0	1	1	1	2	1	0.8	2																							
28-Apr	1	1	1	Z	1	2	1	1	1	1	1	0	1	1	1	1	1	1	1	1	3	2	1	1	1.1	3																							
29-Apr	1	1	1	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1																							
30-Apr	1	1	1	1	1	Z	1	4	4	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1.3	4																							
																								0.7	0.9	1.1	0.7	0.9	1.2	1.2	1.4	1.7	1.3	1.2	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.9	0.9	0.9	0.9	0.8	Diurnal Average	
																								2	3	6	2	3	4	5	6	10	5	5	3	3	3	1	3	3	2	2	3	3	2	3	3	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	158	75	39	22	26	36	68	81	55	18	15	16	5	6	9	683

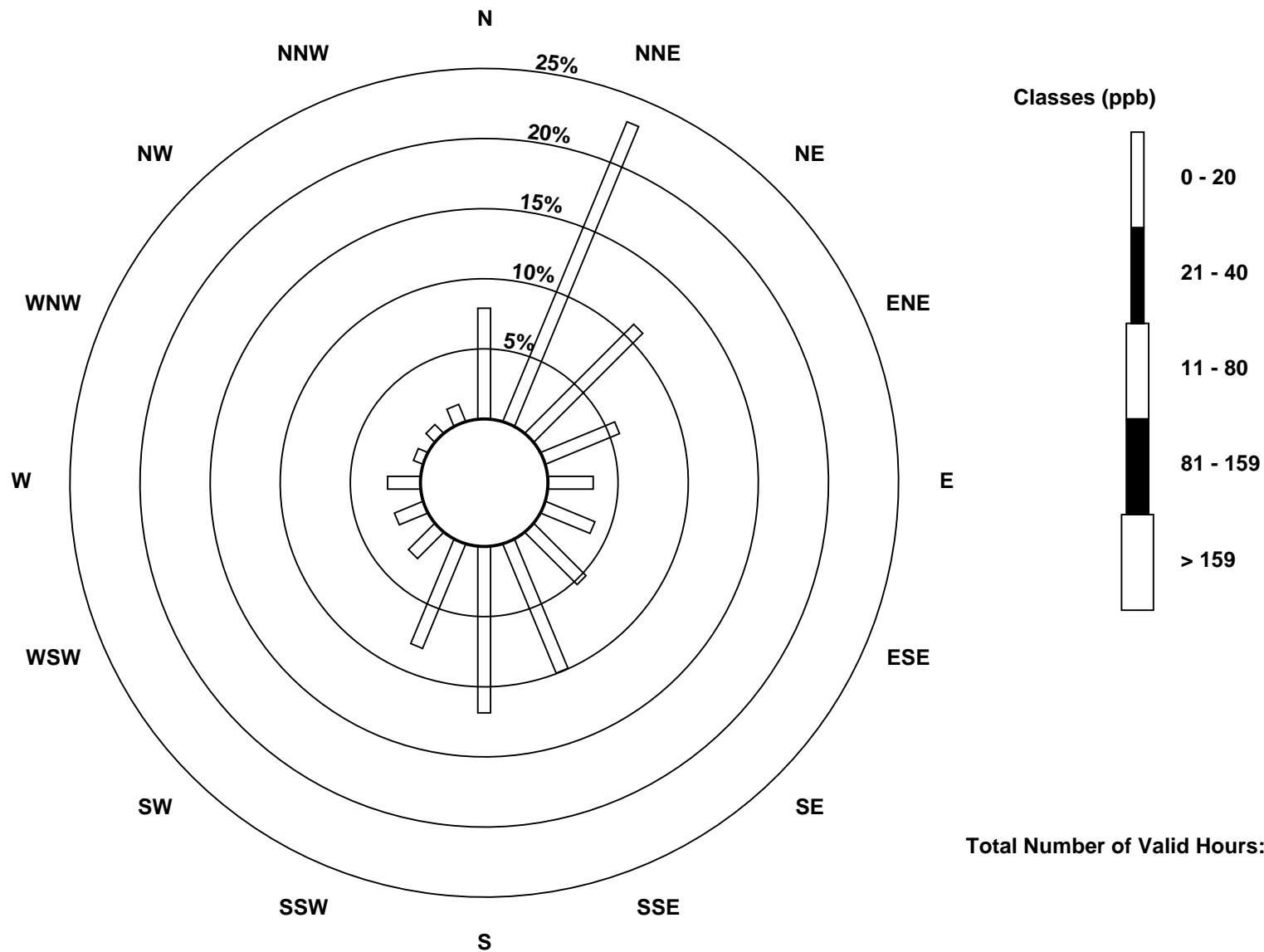
Total Number of Valid Hours: 683

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

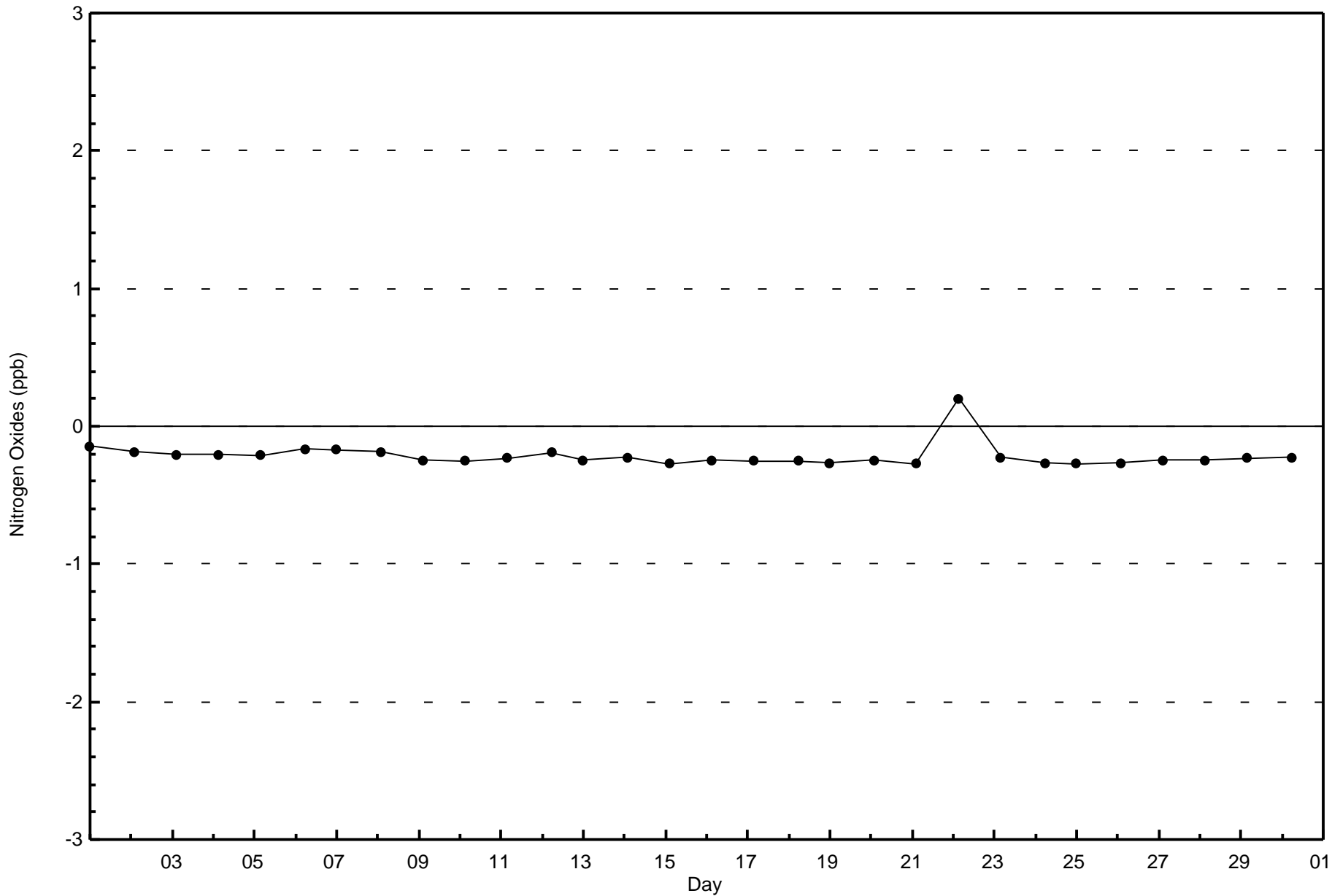
Nitrogen Oxides (NO_x) - ppb
Janvier (AMS 22)

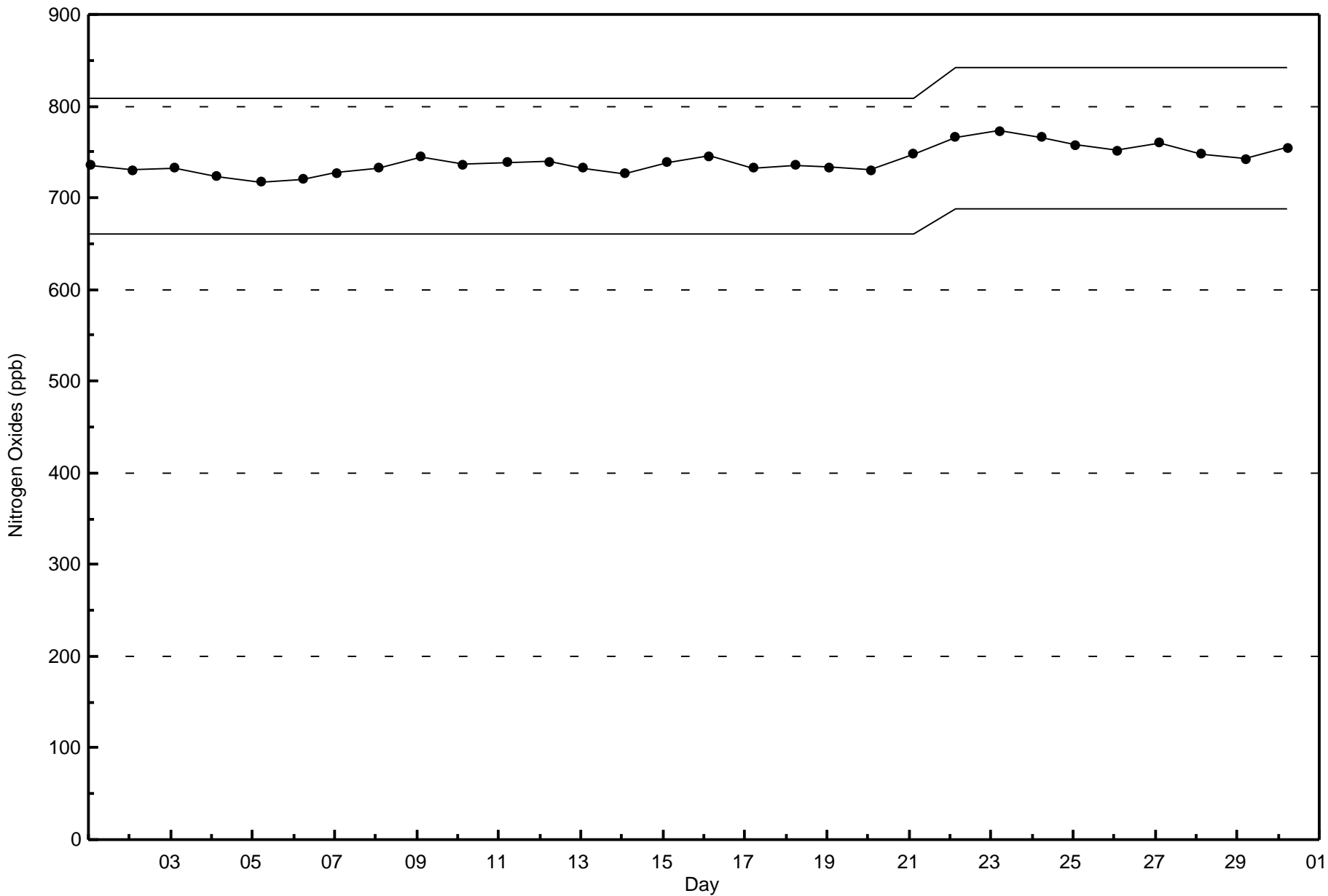




Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_x) - ppb
Janvier - April 2017







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Janvier - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 62 ppb on Apr 28 18:00	Maximum Daily Average: 51.9 ppb on Apr 29		Hours of Data:	684
Minimum Value: 12 ppb on Apr 11 06:00	Minimum Daily Average: 34.8 ppb on Apr 11		Hours of Missing Data:	36
Maximum Diurnal Average: 50.7 ppb at hour 17	Minimum Diurnal Average: 36.0 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 44.6 ppb	Percentiles: P ₁ = 20 P ₁₀ = 33 Q ₁ = 40 Median = 45 Q ₃ = 50 P ₉₀ = 54 P ₉₉ = 60		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	41	42	Z	44	45	43	44	44	46	49	51	52	54	54	55	55	55	54	53	52	51	50	49	50	49.2	55
2-Apr	49	45	41	Z	44	43	43	41	42	46	48	53	54	54	54	55	53	54	53	53	52	52	50	49	49.1	55
3-Apr	47	43	39	37	Z	31	30	31	35	41	50	52	53	53	51	50	51	51	49	46	41	42	40	31	43.3	53
4-Apr	26	20	19	20	23	Z	30	24	23	37	41	50	51	50	51	52	49	49	48	40	40	35	33	24	36.4	52
5-Apr	25	24	21	31	33	35	Z	37	42	44	51	54	56	57	58	58	62	60	58	57	55	54	52	46.8	62	
6-Apr	52	51	49	49	47	46	42	Z	44	47	47	48	51	54	54	56	58	59	58	57	59	57	50	51	51.7	59
7-Apr	49	47	Z	37	37	42	49	51	49	47	48	49	47	49	50	52	52	52	51	46	45	45	43	43	46.9	52
8-Apr	45	44	43	Z	44	43	43	42	40	41	42	45	44	46	45	42	42	41	38	36	33	33	35	38	41.1	46
9-Apr	38	38	39	39	Z	40	40	40	40	40	40	41	41	42	43	45	45	44	43	42	42	40	39	38	40.8	45
10-Apr	36	35	33	31	31	Z	30	31	30	32	35	43	46	50	52	52	51	46	41	39	40	38	38	38	39.0	52
11-Apr	29	28	20	14	13	12	Z	24	31	36	39	42	45	43	44	43	43	40	40	40	43	43	44	45	34.8	45
12-Apr	46	45	46	46	46	45	47	Z	50	53	53	54	54	55	56	58	58	58	57	54	53	51	47	38	50.9	58
13-Apr	33	37	Z	33	33	33	35	40	44	47	48	48	48	48	48	48	48	48	48	50	51	49	47	45	44.0	51
14-Apr	44	44	43	Z	43	44	44	45	46	46	46	46	46	47	48	49	49	51	53	54	55	54	55	55	48.1	55
15-Apr	56	55	55	54	Z	52	52	51	51	51	50	50	51	52	52	53	53	53	52	50	49	46	39	39	50.7	56
16-Apr	39	37	33	32	34	Z	35	39	42	42	45	47	49	51	52	52	54	55	55	52	48	45	46	49	44.9	55
17-Apr	49	49	48	47	46	44	Z	47	37	42	44	45	47	45	46	46	47	47	47	47	46	45	44	44	45.6	49
18-Apr	43	42	42	43	43	43	42	Z	42	43	43	43	44	45	45	46	46	46	45	46	45	45	43	43	43.8	46
19-Apr	43	44	Z	44	43	42	41	41	40	40	40	41	44	45	46	46	45	42	37	35	33	32	30	29	40.2	46
20-Apr	27	25	20	Z	19	22	22	26	27	M	M	48	54	55	54	55	53	48	38	41	43	46	49	52	39.2	55
21-Apr	53	52	51	50	Z	49	45	45	48	48	48	48	48	49	49	48	49	49	49	48	48	49	47	43	48.4	53
22-Apr	37	37	37	35	33	Z	39	43	46	48	43	46	46	46	46	46	45	45	45	44	43	42	42	41	42.4	48
23-Apr	35	32	32	32	31	31	Z	37	41	42	45	45	45	45	46	49	50	51	50	50	50	48	48	48	42.8	51
24-Apr	48	48	48	45	42	40	40	Z	40	40	38	38	37	38	38	39	38	37	37	37	36	36	35	33	39.4	48
25-Apr	32	33	Z	28	25	30	32	33	38	C	C	C	C	41	43	43	44	44	44	44	44	45	45	45	38.5	45
26-Apr	45	45	45	Z	48	47	45	46	47	45	47	47	48	49	48	47	48	47	47	48	48	46	45	43	46.6	49
27-Apr	42	39	40	33	Z	30	28	45	49	51	51	50	49	49	50	53	54	54	53	50	43	43	44	41	45.3	54
28-Apr	40	30	36	36	29	Z	40	43	46	53	56	57	58	60	61	61	62	62	60	58	53	51	52	51	50.2	62
29-Apr	51	49	47	42	45	38	Z	47	51	56	58	59	60	59	58	59	60	59	57	55	52	49	45	41	51.9	60
30-Apr	41	34	31	27	22	20	26	Z	43	50	56	59	57	57	59	58	58	54	54	48	44	47	50	47	45.4	59

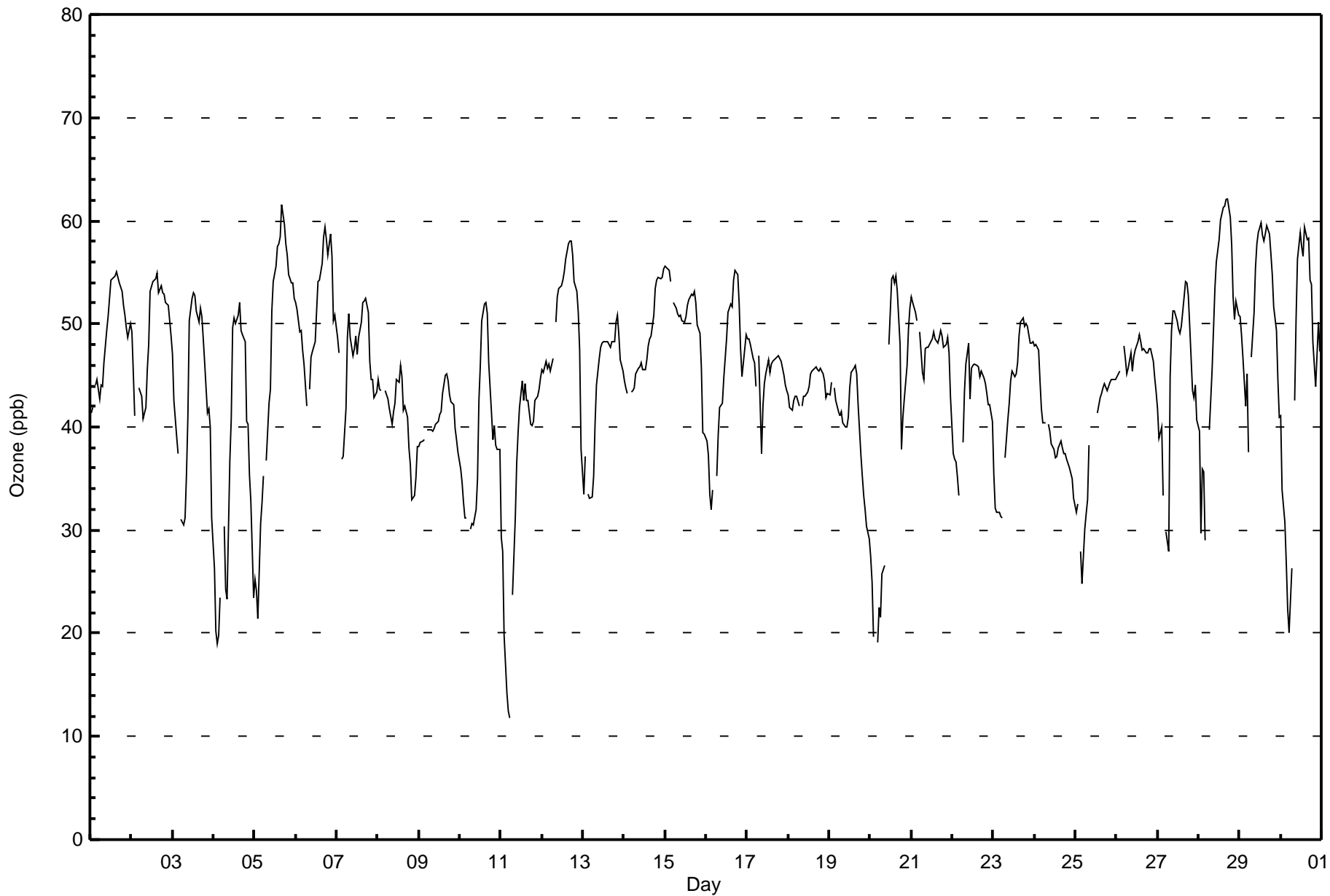
41.4	39.8	38.3	37.1	36.0	37.8	38.5	39.7	41.7	44.9	46.6	48.3	49.2	49.6	50.1	50.5	50.7	50.1	48.7	47.3	46.1	45.2	44.3	42.8	Diurnal Average	
56	55	55	54	48	52	52	51	51	56	58	59	60	60	61	61	62	62	60	58	59	57	54	55	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Janvier - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	10	1.46	1.46
21 - 50	510	74.56	76.02
51 - 82	164	23.98	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Janvier - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	0	0	0	0	0	2	4	1	2	1	0	0	0	0	0	0	10
21 - 50	54	126	58	33	15	20	28	56	50	38	15	4	3	3	0	7	510
51 - 82	4	31	16	7	7	5	3	12	24	17	3	11	13	2	6	3	164
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	157	74	40	22	27	35	69	76	56	18	15	16	5	6	10	684

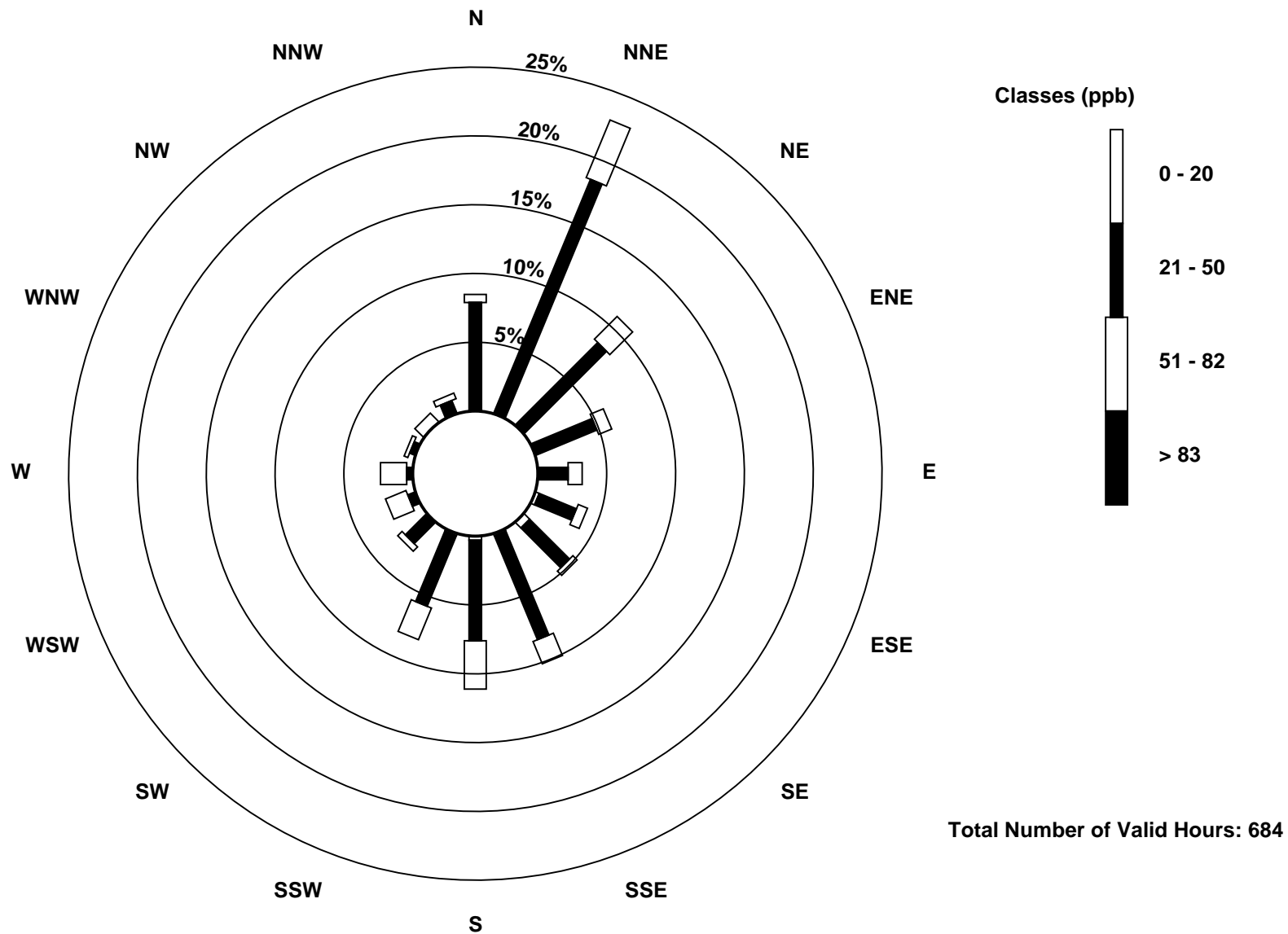
Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

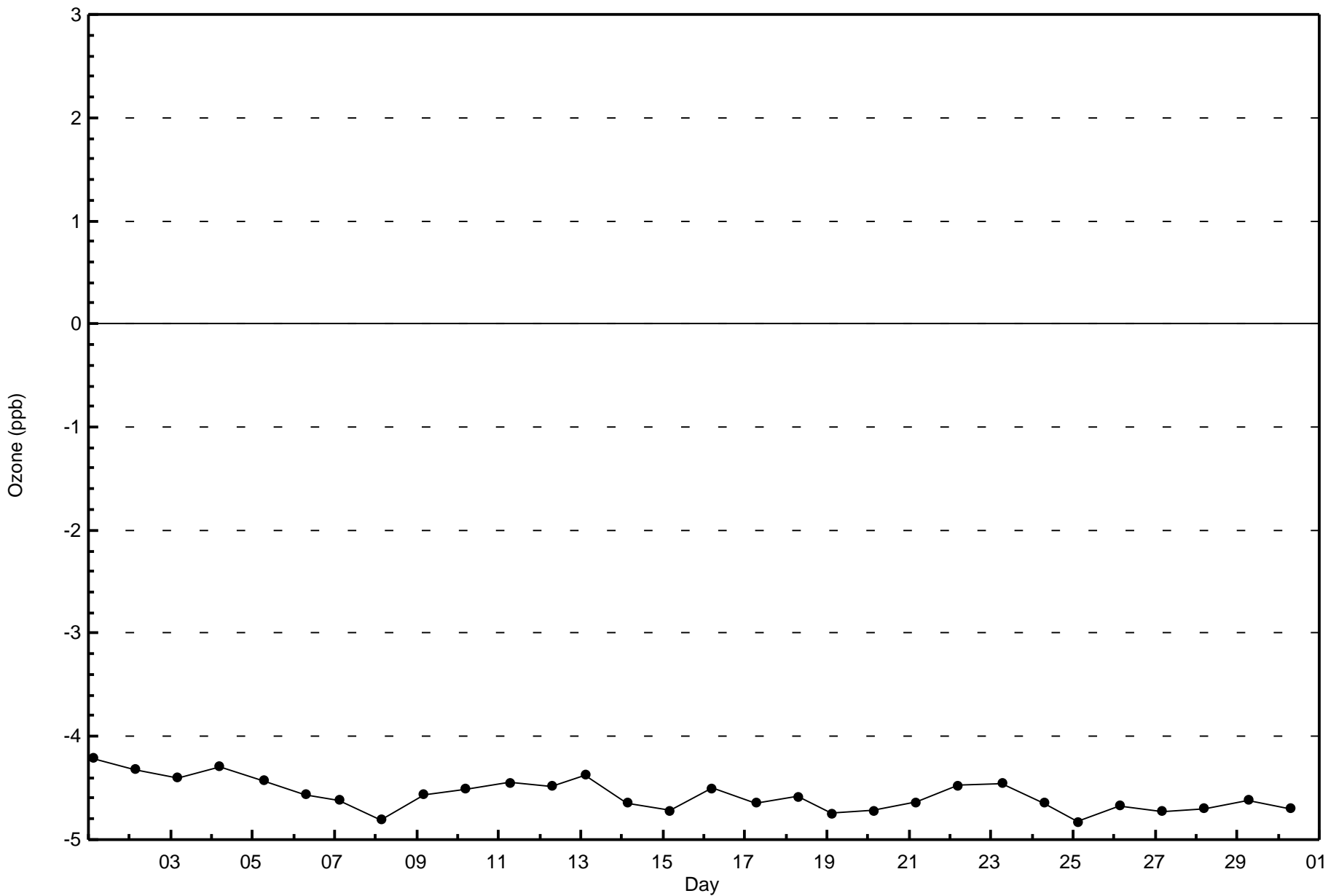
Ozone (O₃) - ppb
Janvier (AMS 22)





Wood Buffalo Environmental Association
Zero Responses

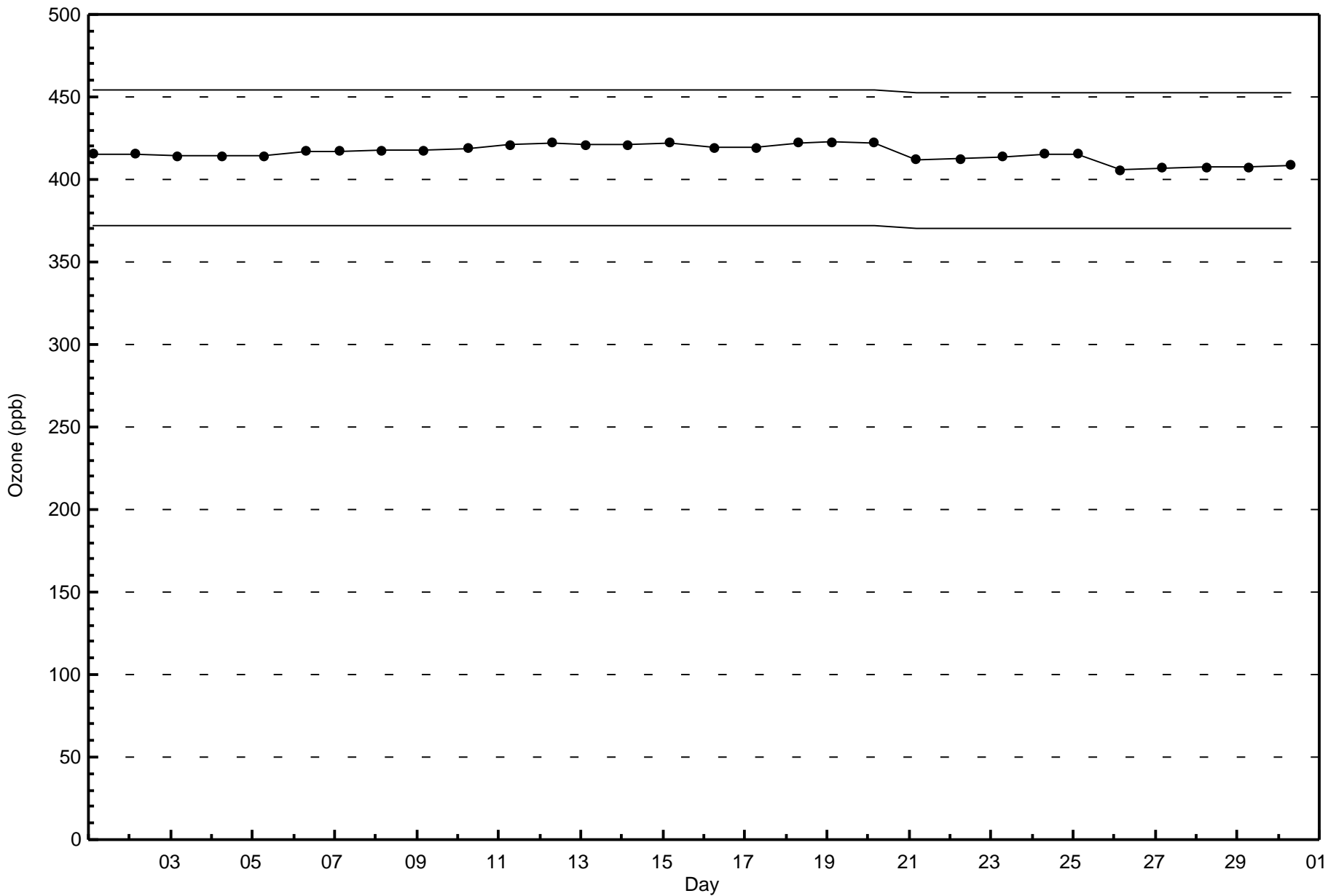
Ozone (O₃) - ppb
Janvier - April 2017





Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Janvier - April 2017





Summary of Hour Averages

Janvier - April 2017

Number of Exceedences (AAAQO):	24-hr: 0	Hours in Service:	720
Maximum Value: 37.2 µg/m ³ on Apr 22 02:00	Maximum Daily Average: 5.8 µg/m ³ on Apr 11	Hours of Data:	691
Minimum Value: 0.1 µg/m ³ on Apr 1 14:00	Minimum Daily Average: 1.4 µg/m ³ on Apr 5	Hours of Missing Data:	29
Maximum Diurnal Average: 4.8 µg/m ³ at hour 2	Minimum Diurnal Average: 1.6 µg/m ³ at hour 13	Hours of Calibration:	5
Monthly Average: 2.89 µg/m ³	Percentiles: P ₁ = 0.3 P ₁₀ = 1.1 Q ₁ = 1.6 Median = 2.2 Q ₃ = 3.4 P ₉₀ = 5.3 P ₉₉ = 10.0	Percent Operational Time:	96.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	0.1	0.1	0.1	0.3	0.3	0.4	0.5	1.6	1.5	1.0	1.0	--	1.6
2-Apr	2.1	1.2	1.6	1.9	1.7	1.6	1.7	2.2	2.7	1.6	1.2	0.6	0.6	0.5	0.4	1.2	4.7	0.8	0.9	1.5	2.4	1.6	2.0	2.4	1.6	4.7
3-Apr	2.4	2.4	2.5	2.5	2.5	2.7	2.6	2.6	1.9	1.3	0.7	2.0	0.3	1.6	0.4	4.5	4.0	0.7	0.5	2.2	2.9	2.0	2.0	1.9	2.0	4.5
4-Apr	2.2	3.2	4.0	2.5	2.0	2.0	1.8	1.6	1.4	1.2	0.9	1.3	1.0	1.3	1.3	2.4	1.7	1.9	1.7	10.9	5.5	3.9	1.3	3.2	2.5	10.9
5-Apr	1.3	1.6	1.6	2.4	2.5	2.7	2.2	2.0	2.5	1.6	1.0	1.0	0.8	0.8	0.8	0.8	0.8	1.0	0.9	0.9	1.2	1.2	1.3	1.5	1.4	2.7
6-Apr	1.5	1.8	1.9	2.1	2.2	2.8	3.8	3.6	2.0	1.7	1.7	1.6	1.5	1.1	6.7	4.8	0.2	0.3	2.5	1.6	2.9	1.5	3.6	3.2	2.4	6.7
7-Apr	8.3	3.0	3.5	7.0	7.2	5.0	4.3	3.7	3.5	3.3	2.5	1.9	2.2	2.2	2.0	2.3	1.7	1.6	2.2	1.9	1.8	2.2	2.3	3.2	3.2	8.3
8-Apr	1.8	1.7	1.8	1.8	1.8	1.9	2.1	2.0	1.6	0.9	0.9	1.2	1.7	2.4	2.8	2.2	2.1	1.8	2.3	1.7	1.9	2.1	2.1	2.2	1.9	2.8
9-Apr	2.2	2.1	2.5	2.6	2.7	2.9	2.8	2.6	2.4	1.7	1.6	1.4	0.8	1.5	0.9	0.9	0.9	1.0	1.7	2.2	2.5	2.1	2.0	2.1	1.9	2.9
10-Apr	4.2	4.4	4.4	4.9	6.1	5.7	5.0	3.8	3.2	2.0	1.9	2.6	2.5	2.4	2.6	2.4	1.4	3.6	7.3	7.3	6.4	9.0	5.2	4.5	4.3	9.0
11-Apr	5.3	7.4	26.6	6.2	7.9	6.4	6.9	4.3	2.7	2.2	1.7	2.0	5.1	6.6	2.8	3.0	8.6	7.2	8.8	6.0	3.1	3.0	2.7	2.6	5.8	26.6
12-Apr	2.9	3.3	3.3	3.3	4.1	4.1	3.3	3.4	2.8	2.2	1.7	1.3	1.1	1.3	1.1	1.3	1.5	1.3	1.4	1.7	2.4	2.4	4.2	6.8	2.6	6.8
13-Apr	9.3	6.5	7.1	5.9	3.8	3.3	2.8	2.4	2.1	1.2	1.1	1.0	1.0	1.7	2.3	2.3	1.8	1.7	2.0	2.1	4.2	3.5	3.6	3.3	3.2	9.3
14-Apr	3.4	3.7	3.4	3.0	3.0	3.1	2.7	2.5	2.8	3.0	3.3	2.7	2.8	2.9	2.6	2.5	2.0	1.8	1.8	1.8	1.8	2.0	2.1	2.2	2.6	3.7
15-Apr	2.5	3.3	3.6	4.0	3.4	3.3	3.1	3.1	2.7	2.5	2.0	2.0	1.8	2.0	1.8	1.8	1.8	1.8	1.8	2.4	3.8	31.3	15.2	4.3	4.4	31.3
16-Apr	13.1	1.7	0.8	0.8	1.4	0.9	1.0	0.7	0.9	0.6	0.7	0.6	0.8	1.3	1.6	1.9	2.1	1.6	2.1	3.4	5.2	4.0	4.2	3.6	2.3	13.1
17-Apr	3.2	2.8	2.7	2.7	3.0	3.0	3.3	1.8	3.2	1.9	1.3	1.2	1.4	1.4	1.5	1.9	2.0	1.9	2.2	2.3	2.4	2.2	2.6	2.2	2.2	3.3
18-Apr	2.1	2.6	3.0	3.1	3.0	3.0	2.5	2.3	2.1	2.0	1.6	1.5	1.6	1.5	1.7	1.9	2.2	2.0	2.3	2.2	2.1	2.1	2.3	2.2	2.2	3.1
19-Apr	2.5	3.1	3.2	3.4	3.5	3.0	3.1	2.6	2.3	2.5	3.3	3.1	2.0	1.5	M	2.6	2.9	1.9	3.4	4.7	5.3	6.5	9.5	5.2	3.5	9.5
20-Apr	5.9	6.0	5.5	9.0	6.3	4.6	5.4	5.5	4.7	7.5	3.1	1.0	1.0	0.9	2.0	1.6	2.0	3.9	4.7	4.2	3.5	2.5	2.3	2.2	4.0	9.0
21-Apr	3.9	3.6	3.3	3.2	2.8	2.7	2.6	2.4	1.9	1.5	1.4	1.2	0.8	0.9	1.0	1.5	1.4	1.6	1.8	1.9	2.2	2.1	2.2	3.3	2.1	3.9
22-Apr	13.3	37.2	3.9	4.4	3.3	5.2	4.7	1.2	0.6	0.6	1.6	1.5	1.3	1.6	1.7	1.3	1.1	1.1	1.4	AF	AF	AF	AF	AF	4.6	37.2
23-Apr	AF	AF	AF	AF	AF	AF	AF	AF	C	C	1.5	1.7	1.6	1.7	1.8	2.0	2.0	2.9	3.7	3.7	3.7	4.0	4.1	5.4	--	5.4
24-Apr	3.5	3.5	3.3	3.3	3.2	3.0	2.8	2.5	2.2	1.8	1.6	1.5	1.3	1.3	1.2	0.9	1.0	1.3	1.3	1.6	2.0	2.1	1.9	1.9	2.1	3.5
25-Apr	1.9	1.9	1.8	1.8	1.8	1.9	2.1	2.2	2.1	2.0	1.9	2.0	2.1	2.0	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.3
26-Apr	2.1	2.0	2.0	1.9	2.1	2.4	2.1	2.1	2.7	2.1	2.0	2.1	2.1	1.9	1.5	1.4	1.3	1.4	1.6	2.0	2.9	3.6	4.2	4.1	2.2	4.2
27-Apr	5.6	6.8	7.0	6.3	6.7	6.2	5.1	2.2	1.4	1.2	1.1	1.0	1.0	0.8	0.8	1.0	1.1	1.4	1.7	2.7	4.6	3.5	4.0	4.0	3.2	7.0
28-Apr	4.8	6.1	5.8	5.3	4.9	5.1	4.0	2.3	1.7	1.3	1.1	1.3	1.4	1.7	2.1	2.3	1.8	2.3	2.8	3.9	7.7	6.2	5.3	4.7	3.6	7.7
29-Apr	5.1	4.3	4.0	4.2	4.0	6.0	6.5	2.4	2.3	2.0	1.6	2.0	1.7	2.9	3.0	2.9	3.4	3.5	4.0	4.3	6.7	5.9	5.6	6.7	4.0	6.7
30-Apr	10.6	7.7	8.3	6.8	6.4	8.2	5.3	4.3	2.8	2.0	2.1	2.0	2.3	2.4	2.6	4.2	4.1	3.7	3.4	3.8	4.3	4.6	3.7	3.8	4.6	10.6

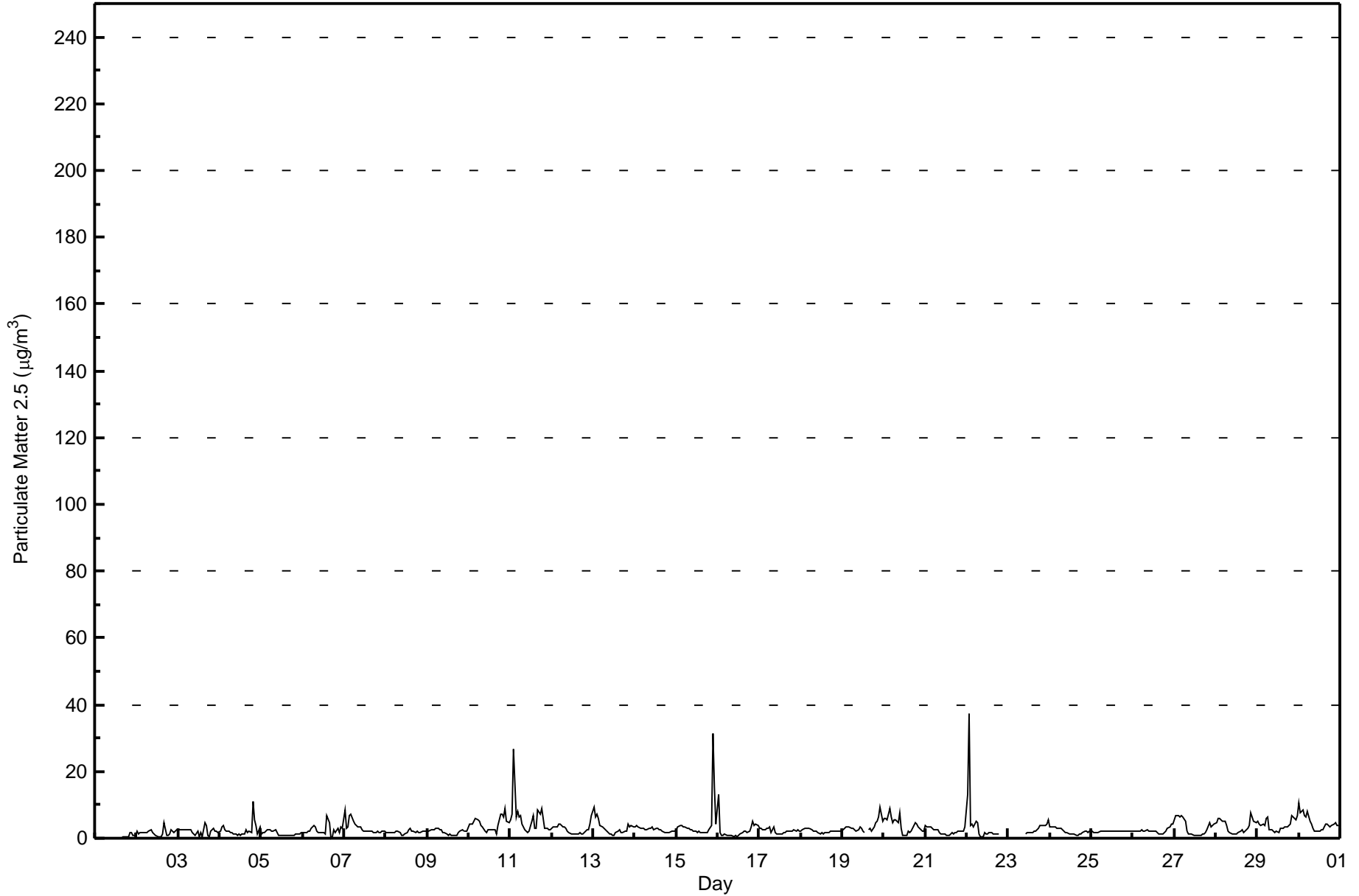
4.5	4.8	4.4	3.8	3.7	3.7	3.4	2.6	2.3	2.0	1.7	1.6	1.6	1.7	1.8	2.0	2.1	2.0	2.5	3.0	3.4	4.2	3.6	3.3	Diurnal Average	
13.3	37.2	26.6	9.0	7.9	8.2	6.9	5.5	4.7	7.5	3.3	3.1	5.1	6.6	6.7	4.8	8.6	7.2	8.8	10.9	7.7	31.3	15.2	6.8	Diurnal Maximum	

C - Calibration M - Maintenance AF - Analyzer Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 µg/m³



Wood Buffalo Environmental Association
Hourly Averages

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier - April 2017

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
1 - 5	569	82.34	82.34
6 - 15	59	8.54	90.88
16 - 25	0	0.00	90.88
26 - 80	3	0.43	91.32
> 81.0	0	0.00	91.32

Total Number of Valid Hours: 691

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Janvier - April 2017

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
1 - 5	45	150	67	35	21	24	33	54	55	45	14	8	4	4	4	6	569
6 - 15	8	9	1	1	1	4	7	12	12	3	0	0	1	0	0	0	59
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	159	69	36	22	28	40	66	69	48	14	8	5	4	4	6	631

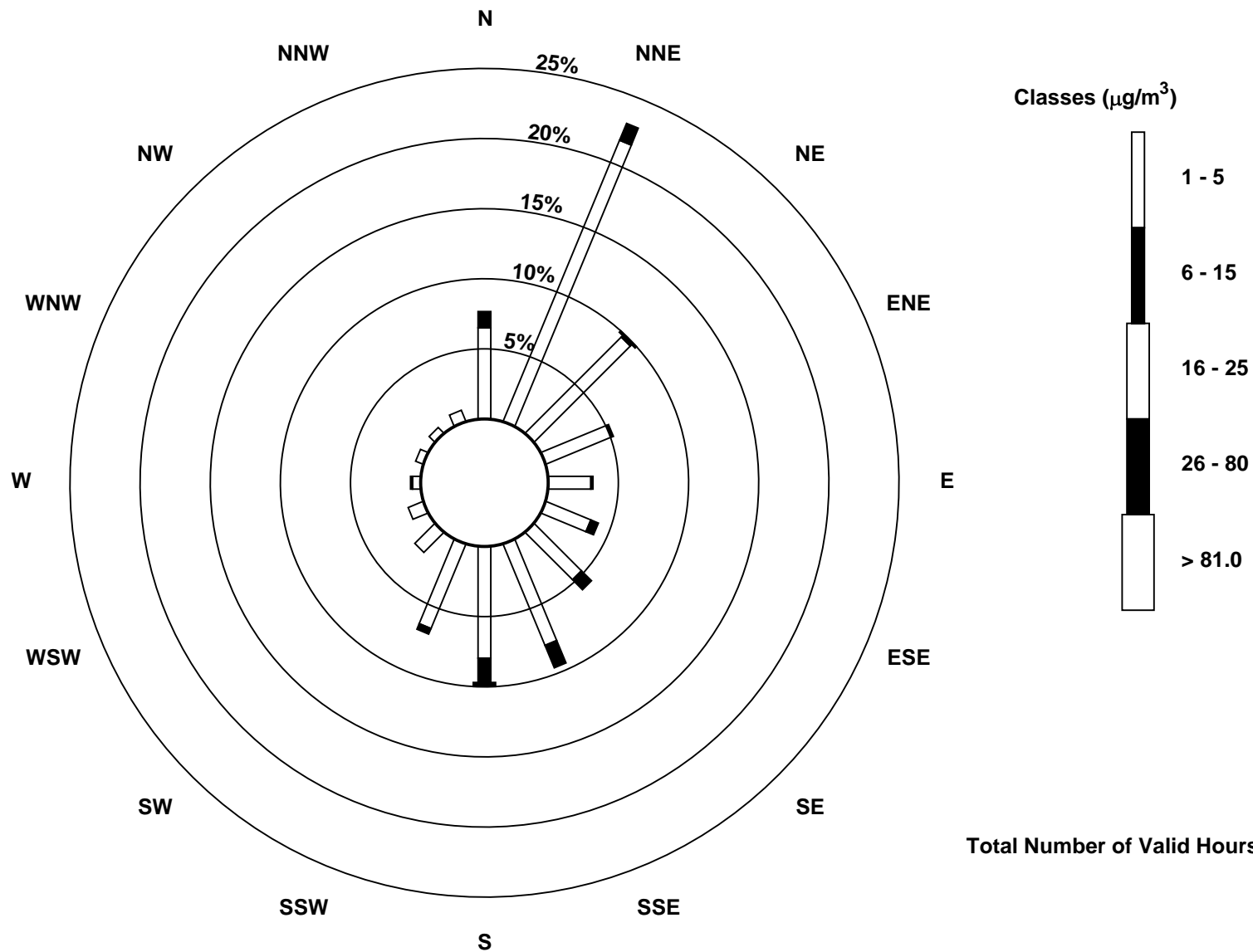
Total Number of Valid Hours: 691

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier (AMS 22)





Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

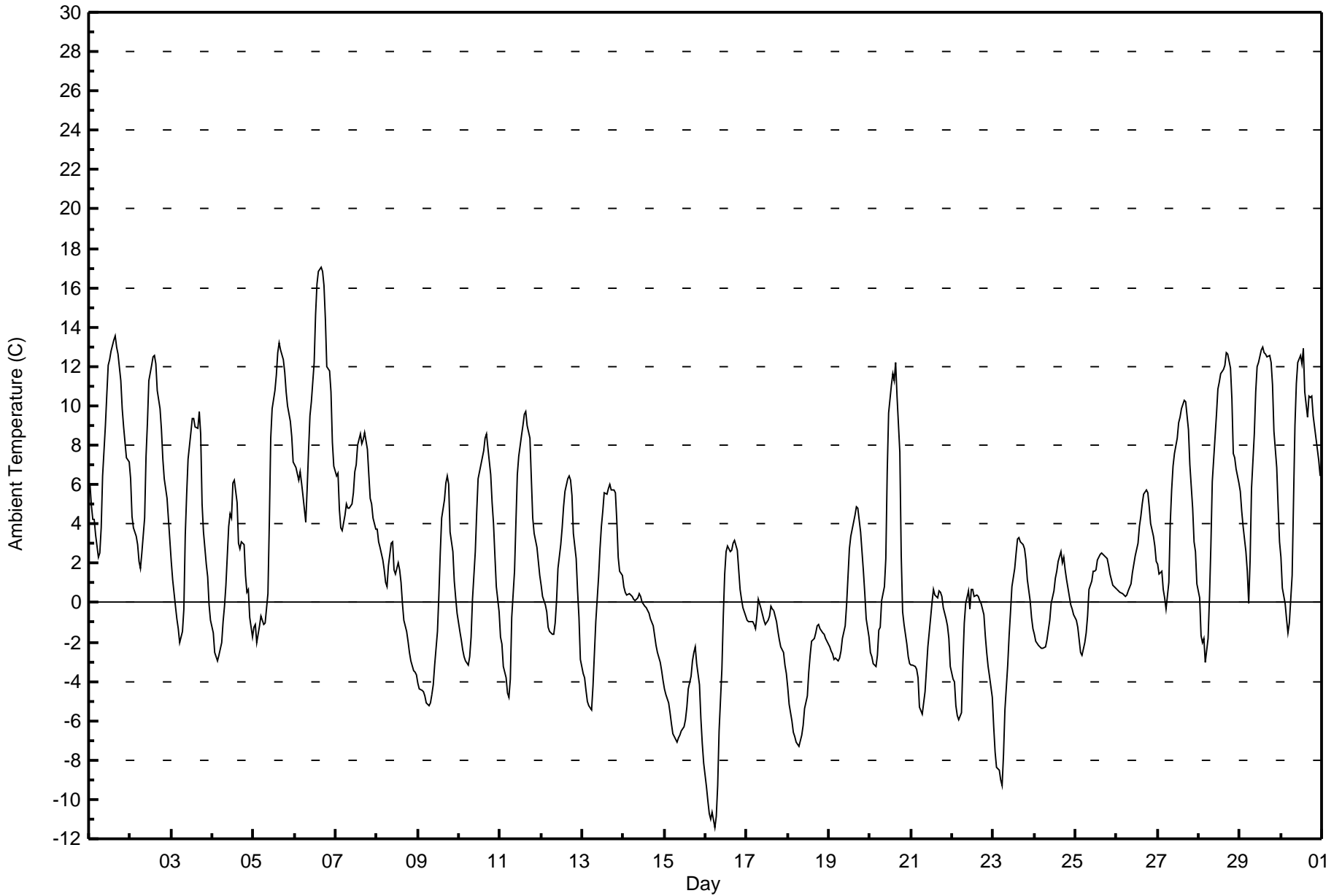
Janvier - April 2017

Maximum Value: 17.1 C on Apr 6 16:00																	Maximum Daily Average: 10.4 C on Apr 6																	Hours in Service: 720	
Minimum Value: -11.4 C on Apr 16 06:00																	Minimum Daily Average: -5.4 C on Apr 15																	Hours of Data: 720	
Maximum Diurnal Average: 6.1 C at hour 16																	Minimum Diurnal Average: -2.3 C at hour 6																	Hours of Missing Data: 0	
Monthly Average: 2.08 C																	Percentiles: P ₁ = -9.3 P ₁₀ = -4.2 Q ₁ = -1.7 Median = 1.2 Q ₃ = 5.7 P ₉₀ = 9.8 P ₉₉ = 14.2																	Hours of Calibration: 0	
																																		Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Apr	6.0	5.0	4.2	4.3	3.4	2.3	2.5	3.8	6.5	9.0	10.6	12.0	12.4	12.8	13.3	13.5	13.0	12.6	11.3	9.8	8.9	8.2	7.4	7.1	8.3	13.5									
2-Apr	6.3	4.4	3.8	3.4	3.0	2.1	1.7	2.5	4.3	7.4	9.2	11.3	12.1	12.5	12.5	12.1	10.8	9.9	8.8	7.3	6.3	5.3	4.2	3.1	6.8	12.5									
3-Apr	2.1	1.1	-0.2	-0.8	-1.3	-2.0	-1.4	-0.3	3.4	5.5	7.3	8.6	9.3	9.4	9.0	8.9	9.7	8.6	5.0	3.6	1.9	1.3	-0.1	-0.9	3.6	9.7									
4-Apr	-1.6	-2.5	-2.7	-3.0	-2.7	-2.0	-1.0	-0.2	0.9	3.9	4.5	4.3	6.1	6.2	5.1	3.0	2.8	3.1	3.0	1.4	0.5	0.7	-0.8	-1.7	1.1	6.2									
5-Apr	-1.2	-1.1	-2.0	-1.2	-0.7	-0.9	-1.1	-1.1	0.4	4.1	8.4	9.9	10.8	11.5	12.7	13.2	12.8	12.4	11.7	10.7	10.0	9.2	8.4	7.2	6.0	13.2									
6-Apr	7.0	6.9	6.2	6.6	6.1	5.4	4.1	5.8	7.7	9.5	10.2	12.2	14.6	16.2	16.8	17.1	16.9	16.1	14.4	12.0	11.8	10.7	8.1	6.9	10.4	17.1									
7-Apr	6.5	6.6	4.7	3.8	3.6	4.5	5.0	4.8	4.8	5.0	5.6	6.6	7.0	8.0	8.6	8.1	8.3	8.6	7.8	6.5	5.3	5.0	4.3	3.7	6.0	8.6									
8-Apr	3.7	3.1	2.8	2.2	1.6	1.0	0.8	1.9	3.0	3.1	1.6	1.4	2.0	1.6	1.0	-0.1	-0.9	-1.5	-2.0	-2.5	-3.0	-3.4	-3.6	-3.7	0.4	3.7									
9-Apr	-4.1	-4.4	-4.5	-4.6	-4.8	-5.1	-5.2	-5.1	-4.7	-4.2	-3.2	-1.4	0.4	2.5	4.3	5.2	6.1	6.4	6.0	3.6	2.6	1.1	0.2	-0.5	-0.6	6.4									
10-Apr	-1.4	-1.9	-2.4	-2.8	-3.0	-3.1	-2.7	-1.8	0.2	2.6	4.6	6.3	6.7	7.0	7.7	8.4	8.6	7.9	6.5	5.1	4.0	2.3	0.8	-0.5	2.5	8.6									
11-Apr	-1.7	-2.1	-3.2	-3.8	-4.6	-4.8	-3.9	-0.7	1.6	4.1	6.5	7.4	8.5	9.0	9.6	9.7	9.0	8.3	6.3	4.3	3.5	2.8	2.1	1.3	2.9	9.7									
12-Apr	0.9	0.4	-0.1	-0.5	-1.2	-1.5	-1.6	-1.6	-1.1	0.1	1.7	2.9	3.8	4.9	5.6	6.3	6.4	6.2	5.4	3.5	2.3	0.6	-0.8	-2.9	1.7	6.4									
13-Apr	-3.6	-3.8	-4.5	-5.0	-5.2	-5.5	-4.3	-2.6	-1.0	1.3	2.7	3.9	4.6	5.6	5.5	5.8	6.0	5.7	5.7	5.6	4.2	2.3	1.6	1.4	1.1	6.0									
14-Apr	0.8	0.5	0.4	0.4	0.4	0.3	0.2	0.1	0.3	0.4	0.3	0.0	-0.2	-0.4	-0.5	-0.8	-1.2	-1.7	-2.2	-2.2	-2.6	-3.1	-3.4	-4.0	-0.7	0.8									
15-Apr	-4.4	-4.7	-5.1	-5.6	-6.2	-6.6	-7.0	-7.1	-6.9	-6.7	-6.5	-6.3	-5.9	-5.3	-4.4	-3.7	-3.0	-2.5	-2.2	-3.1	-4.1	-5.9	-7.2	-8.1	-5.4	-2.2									
16-Apr	-9.3	-10.1	-10.7	-11.0	-10.7	-11.4	-10.8	-9.3	-6.5	-3.4	-0.7	1.5	2.6	2.9	2.6	2.7	3.0	3.2	2.7	1.7	0.6	0.2	-0.2	-0.6	-3.0	3.2									
17-Apr	-0.9	-1.0	-1.0	-1.0	-1.1	-1.3	-0.7	0.2	-0.3	-0.6	-0.9	-1.1	-0.9	-0.7	-0.2	-0.3	-0.4	-1.0	-1.5	-1.9	-2.2	-2.5	-3.2	-3.6	-1.2	0.2									
18-Apr	-4.3	-5.2	-6.1	-6.6	-6.8	-7.1	-7.3	-7.0	-6.7	-6.2	-5.4	-4.7	-3.5	-2.7	-2.0	-1.8	-1.6	-1.2	-1.1	-1.3	-1.5	-1.6	-1.8	-1.9	-4.0	-1.1									
19-Apr	-2.2	-2.5	-2.6	-2.9	-2.8	-3.0	-2.8	-2.4	-1.8	-1.2	-0.1	1.3	2.7	3.4	4.1	4.4	4.9	4.8	3.6	2.6	1.6	0.4	-0.8	-1.7	0.3	4.9									
20-Apr	-2.5	-2.7	-3.1	-3.3	-2.7	-1.4	-1.3	0.1	0.8	2.2	6.7	9.7	11.0	11.6	11.3	12.2	10.5	7.6	2.4	-0.5	-1.1	-2.1	-2.8	-3.1	2.5	12.2									
21-Apr	-3.2	-3.2	-3.2	-3.4	-3.8	-5.3	-5.7	-5.1	-4.5	-3.4	-2.2	-0.8	0.1	0.7	0.4	0.3	0.6	0.5	0.3	-0.2	-0.9	-1.2	-1.8	-3.2	-2.0	0.7									
22-Apr	-3.9	-4.0	-5.2	-5.8	-6.0	-5.6	-3.0	-1.1	0.0	0.6	-0.4	0.7	0.7	0.3	0.4	0.3	0.1	0.0	-0.6	-1.7	-2.5	-3.2	-3.7	-4.8	-2.0	0.7									
23-Apr	-6.3	-7.6	-8.4	-8.5	-9.0	-9.3	-7.7	-5.4	-3.1	-1.7	-0.5	0.8	1.8	2.5	3.2	3.3	3.1	2.9	2.8	2.2	1.1	0.1	-0.8	-1.3	-1.9	3.3									
24-Apr	-1.6	-1.9	-2.2	-2.2	-2.3	-2.3	-2.2	-1.9	-1.4	-0.9	-0.1	0.6	1.2	1.6	2.1	2.6	2.0	2.3	1.6	1.1	0.3	-0.1	-0.3	-0.6	-0.2	2.6									
25-Apr	-0.9	-1.2	-1.9	-2.5	-2.7	-2.0	-1.5	-0.7	0.7	1.1	1.6	1.6	1.7	2.2	2.4	2.6	2.5	2.4	2.2	1.9	1.5	1.1	0.9	0.7	0.6	2.6									
26-Apr	0.7	0.6	0.5	0.5	0.4	0.3	0.4	0.6	1.0	1.5	2.0	2.4	3.0	3.8	4.4	5.0	5.5	5.7	5.6	4.9	4.0	3.4	2.9	2.1	2.5	5.7									
27-Apr	1.9	1.4	1.6	0.7	0.2	-0.3	1.0	4.0	5.7	6.9	7.6	8.4	9.1	9.4	9.9	10.3	10.2	9.5	8.8	7.0	4.8	3.1	2.6	1.0	5.2	10.3									
28-Apr	0.2	-1.7	-2.0	-1.8	-3.0	-1.8	0.2	2.9	6.1	8.4	9.6	10.9	11.2	11.6	11.8	12.0	12.7	12.6	11.9	10.4	7.6	7.3	6.8	6.1	6.3	12.7									
29-Apr	5.7	4.7	3.9	2.6	1.6	0.0	2.2	5.8	8.6	10.7	12.0	12.2	12.9	13.0	12.7	12.6	12.5	12.5	12.2	11.1	8.7	6.9	4.9	3.1	8.0	13.0									
30-Apr	2.3	0.8	0.0	-0.9	-1.5	-1.1	1.4	5.3	9.0	11.1	12.2	12.6	12.1	12.9	10.7	9.4	10.5	10.5	10.5	9.5	8.4	7.8	7.2	6.4	7.0	12.9									
																								Diurnal Average											
																								Diurnal Maximum											



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Janvier - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Janvier - April 2017**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	284	39.44	39.44
0 - 10	365	50.69	90.14
10 - 20	71	9.86	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

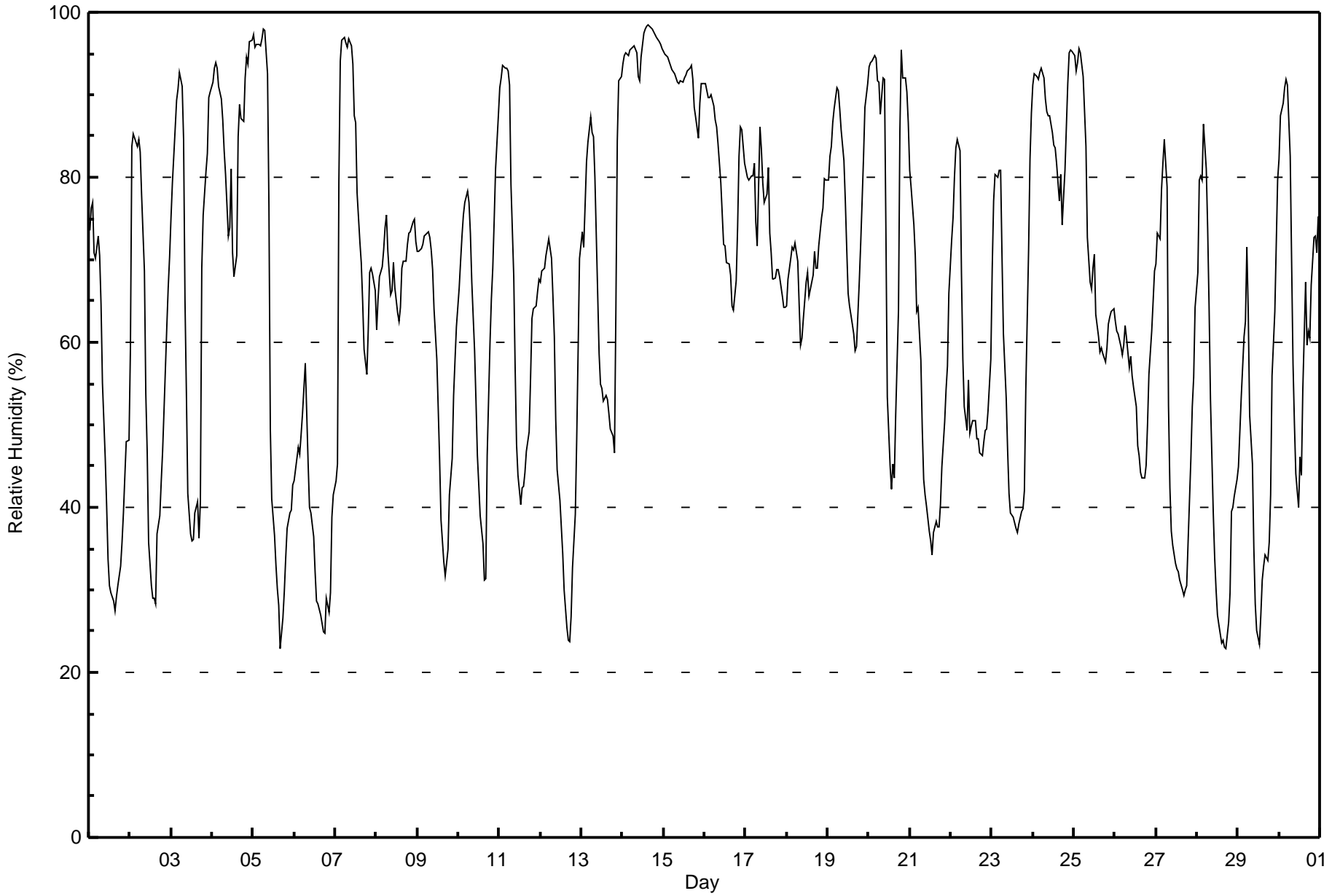
Janvier - April 2017

Maximum Value: 98 % on Apr 14 16:00 Maximum Daily Average: 96.0 % on Apr 14																	Hours in Service: 720 Hours of Data: 720									
Minimum Value: 23 % on Apr 5 17:00 Minimum Daily Average: 37.9 % on Apr 6 Maximum Diurnal Average: 82.6 % at hour 6 Minimum Diurnal Average: 50.6 % at hour 17 Monthly Average: 65.7 % Percentiles: P ₁ = 24 P ₁₀ = 36 Q ₁ = 48 Median = 68 Q ₃ = 84 P ₉₀ = 93 P ₉₉ = 98																	Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	74	76	77	71	70	73	70	65	55	46	40	34	30	30	29	27	29	31	33	36	39	44	48	48	48.9	77
2-Apr	59	84	85	84	84	85	83	78	69	54	47	36	30	29	29	28	37	39	43	47	52	62	67	70	57.5	85
3-Apr	75	79	86	89	91	93	91	85	65	54	42	37	36	36	39	41	36	41	69	75	81	83	90	90	66.8	93
4-Apr	92	93	94	93	91	89	87	83	80	73	74	81	71	68	71	85	89	87	87	92	95	94	96	97	85.9	97
5-Apr	97	96	96	96	96	97	98	98	93	77	49	41	37	33	30	28	23	27	30	34	37	39	40	43	59.8	98
6-Apr	43	45	47	46	49	51	57	52	45	40	39	36	32	29	28	27	26	25	25	29	27	30	39	42	37.9	57
7-Apr	43	45	80	94	97	97	96	96	97	96	94	87	87	78	72	70	65	59	56	61	68	69	68	66	76.7	97
8-Apr	62	65	68	69	71	74	75	71	66	66	70	67	64	63	64	69	70	70	72	73	73	75	75	72	69.3	75
9-Apr	71	71	71	72	73	73	73	73	71	69	64	58	52	46	39	33	32	33	35	42	46	54	58	62	57.1	73
10-Apr	67	70	73	75	77	78	77	73	67	59	53	46	43	39	36	31	31	46	60	65	69	75	81	87	61.6	87
11-Apr	91	92	94	93	93	93	91	79	68	57	48	44	40	42	43	44	47	49	56	63	64	64	66	68	66.2	94
12-Apr	67	69	69	71	72	72	70	66	61	51	45	41	38	34	30	25	24	24	27	33	39	48	59	70	50.1	72
13-Apr	73	72	77	82	84	87	85	85	80	66	59	55	54	53	54	53	51	49	49	47	64	84	92	92	68.6	92
14-Apr	94	95	95	95	95	96	96	96	95	92	92	95	97	98	98	98	98	98	98	97	97	96	96	96	96.0	98
15-Apr	95	95	95	94	94	93	93	92	92	91	92	91	92	92	93	93	94	92	88	87	85	89	91	91	91.9	95
16-Apr	91	91	90	90	90	89	87	86	84	79	76	72	72	70	69	68	64	64	67	74	83	86	86	82	79.5	91
17-Apr	81	80	80	80	80	82	75	72	86	83	79	77	78	81	73	71	68	68	69	69	68	66	64	64	74.7	86
18-Apr	64	68	70	72	71	72	70	65	60	61	63	67	68	66	66	68	71	69	69	72	75	76	80	80	69.2	80
19-Apr	80	83	84	87	88	91	90	88	86	82	77	71	66	64	62	61	59	60	67	72	77	82	88	91	77.4	91
20-Apr	93	94	94	95	94	92	92	88	92	92	74	53	45	42	45	44	51	64	86	95	92	92	90	87	78.6	95
21-Apr	81	79	74	71	64	64	58	49	43	42	40	37	36	34	37	38	38	38	40	45	50	54	57	66	51.5	81
22-Apr	72	75	80	84	85	83	68	58	52	49	55	49	50	50	50	48	48	47	46	48	49	50	52	58	58.7	85
23-Apr	69	77	80	80	81	81	70	61	53	47	42	39	39	38	37	37	38	40	40	42	54	71	82	88	57.8	88
24-Apr	91	93	92	92	93	93	92	90	88	87	87	85	84	84	82	77	80	74	78	81	91	95	95	95	87.5	95
25-Apr	95	93	94	96	95	92	88	84	73	67	66	69	71	63	61	59	59	59	58	59	62	63	64	64	73.0	96
26-Apr	63	61	61	60	58	60	62	60	57	58	56	55	52	47	46	44	44	44	45	50	56	61	65	69	55.6	69
27-Apr	70	73	73	79	82	85	79	52	42	37	35	33	33	32	31	30	29	30	31	36	46	52	56	64	50.4	85
28-Apr	69	80	80	80	86	81	74	64	53	39	34	30	27	26	24	24	23	23	26	30	40	40	41	43	47.3	86
29-Apr	45	49	53	61	63	72	64	51	45	35	28	25	23	27	31	33	34	34	36	42	56	64	72	80	46.7	80
30-Apr	82	87	89	91	92	91	82	70	57	50	44	40	46	44	54	67	60	61	60	67	73	73	71	75	67.8	92
	75.0	77.6	80.0	81.3	81.9	82.6	79.8	74.3	69.2	63.3	58.8	55.1	53.1	51.3	50.8	50.8	50.6	51.4	54.8	58.7	63.6	67.7	70.9	73.3	Diurnal Average	
	97	96	96	96	97	97	98	98	97	96	94	95	97	98	98	98	98	98	98	97	97	96	96	97	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Janvier - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Janvier - April 2017

Maximum Speed: 22 km/h on Apr 5 12:00	Maximum Daily Speed Average: 16.3 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 4 02:00	Minimum Daily Speed Average: 0.8 km/h on Apr 19	Hours of Data: 720
Maximum Diurnal Speed Average: 3.0 km/h at hour 10	Minimum Diurnal Speed Average: 1.6 km/h at hour 3	Hours of Missing Data: 0
Monthly Average Velocity: 2.3 km/h 59.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 20	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SSW10	SSW9	SSW10	SSW11	S8	S8	S9	SSW10	SW10	SW13	SW14	WSW14	W15	W14	WSW12	W12	W12	WSW10	WSW8	WSW5	W7	WNW3	WNW3	WSW5	SW8.4	W15	
2-Apr	W6	SSW4	S6	SSW5	SSW6	SSW6	SSW8	SSW8	SW5	WSW8	SW8	WSW8	W12	W12	NW8	NW7	NW7	W8	W9	WNW3	WSW4	SSW6	S5	SSW3	WSW5.2	W12	
3-Apr	E1	SW2	S4	S6	S4	S4	S4	SSW4	WNW1	NNE4	N9	N9	N8	NNW6	NNW6	NNW6	N9	NW6	W7	NNE2	SE2	ESE3	SSE2	SE2	NNW1.2	N9	
4-Apr	ESE2	SSW0	SE1	SE1	SSE3	SE4	SSE5	SSW3	SW5	S8	S5	E4	ENE10	ESE5	SW8	NW5	NNE3	S4	ESE3	E2	ESE3	SE3	E1	SSE2	SSE1.9	ENE10	
5-Apr	ENE3	ESE2	SSE1	SE3	SE2	ESE4	ESE7	SE5	ESE4	ENE5	SSE18	SSE22	S19	S17	S20	S18	S18	S16	SSE9	SSE11	SSE11	SSE10	S8	S8	SSE9.2	SSE22	
6-Apr	S7	SSW5	S2	SSE5	SSE4	SSE5	SSW4	S7	SSW9	SSW9	SW9	SW10	WSW9	WSW10	W8	W9	W5	W2	WNW1	SSE1	NNE2	NNE4	NNE1	NW1	SW3.6	SW10	
7-Apr	N2	NNE1	S2	N2	NNE4	N3	NNE8	NNE8	N5	N6	N5	NNE7	NNE8	NNE13	NE13	ENE9	ENE9	NE8	NE7	NNE6	NNE6	NNE7	N6	NNE7	NNE5.8	NNE13	
8-Apr	NNE7	N7	N7	N8	N8	N9	N9	N10	NNE14	N15	N12	N13	N13	N12	N10	N8	N8	N9	NNE9	N9	NNE11	NNE10	NNE8	NNE10	N9.8	N15	
9-Apr	NNE9	NE7	NNE6	NNE6	NNE7	ENE7	NNE5	NNE5	NE5	ESE5	ESE5	SSE4	ENE3	E7	SSE7	S9	S10	SE7	SE5	ESE6	SE8	S9	S10	S10	ESE3.3	S10	
10-Apr	S7	S7	S4	SSE5	S5	SSE5	SSE6	S7	S5	SW1	SSE3	SSE7	SSE6	SE9	ESE5	SE5	S3	S5	S8	SSE5	SE5	SSE3	SSE3	SE3	SSE4.7	SE9	
11-Apr	S2	SE2	S2	SE1	ESE1	ESE1	N2	N3	NNE8	NNE9	NNE7	NNE12	NNE12	NNE13	NNE13	N11	NNE13	NNE14	N11	NNE10	NNE14	NNE12	NE10	NE9	NNE7.3	NNE14	
12-Apr	NE7	NNE7	NNE8	NNE8	NNE8	NNE8	NNE9	NNE7	NNE9	NNE9	NNE8	NE7	E8	E10	ENE10	ENE8	NE9	NE9	NE11	NE8	ENE6	ENE5	NE3	N2	NE7.1	NE11	
13-Apr	N2	N3	N2	N2	N2	N3	NNE7	NE9	NE11	ENE11	NE12	NE12	ENE12	NE14	NE14	NE16	NE13	NE11	NE12	ENE13	E14	NE11	NE13	NE14	NE9.3	NE16	
14-Apr	NNE14	NNE14	NNE14	NNE13	NNE14	NNE13	NNE12	NE14	NE15	NE16	NNE17	NNE17	NNE16	NNE17	NNE20	NNE20	NNE20	NNE20	NNE18	NNE18	NNE20	NNE17	NNE16	NNE18	NNE16.3	NNE20	
15-Apr	NNE16	NNE16	NNE17	NNE19	NNE19	NNE19	NNE17	NNE18	NNE17	NNE15	NNE15	NNE15	NNE16	NNE15	NNE15	NNE13	NE8	NNE10	NE7	NE4	E3	NE1	S2	SSE1	NNE12.2	NNE19	
16-Apr	SSW2	S2	S3	S5	S7	SSW6	SSW8	S11	SSW8	SSW10	SSW10	SSW10	SSW10	SSW10	SW13	S14	SSW13	SSW13	S14	S12	S11	S10	S11	S12	SSW11	SSW9.3	S14
17-Apr	SSW10	S10	S9	SSW6	SSW5	NNW1	SSE1	NNW2	N9	NNE11	NNE11	N11	NNE11	NNE11	NNE12	N11	NNE13	NNE10	NNE12	NNE11	NNE9	NNE9	NNE11	NNE5.6	NNE13		
18-Apr	NNE14	NNE13	NNE14	NNE13	NNE13	NNE12	NNE12	NE11	NNE10	NNE11	NNE10	NNE9	ENE6	ENE8	ENE7	ENE7	NNE6	NE5	NE4	ENE4	NNE4	NNE4	N3	NNE5	NE8.2	NNE14	
19-Apr	NNE4	NNE6	NNE4	NNE5	N4	NNE4	N3	NNE1	N1	WSW2	SSW4	SW4	WSW4	SW6	SW5	SSW7	SW6	W3	N4	N2	NNE3	NE2	ENE1	SSE1	NW0.8	SSW7	
20-Apr	SSE1	SSE2	SSE2	S2	SE2	SSE1	SW1	SSW4	SSW3	S3	SE5	ESE8	SSE11	S10	SSE5	ESE1	NNE9	N11	N10	NNE11	N10	NNE11	NNE12	NNE11	NE2.0	NNE12	
21-Apr	NNE11	NNE9	N8	N6	N8	NNE11	NNE12	NNE11	NNE13	N7	NNE6	N5	N7	N7	N9	N8	N6	ENE5	ENE5	NE6	NE6	NE6	NE4	NE3	NNE7.2	NNE13	
22-Apr	SSE1	S1	NNE1	ENE1	SSE2	NNE1	NE1	SW1	NW1	NNE11	NNE14	NNE11	NNE14	NNE13	NNE16	NNE13	NNE11	NNE11	NNE12	NNE9	NNE7	NE6	NE6	NE5	NNE6.6	NNE16	
23-Apr	NNE3	NNW2	N1	N4	NNW3	N2	NNE5	NNE7	NE9	NE11	NE11	NE12	NE13	NE12	NE12	NE10	E8	E8	E8	ESE7	SSE8	S8	E4	ENE5	ENE5.8	NE13	
24-Apr	NE7	NE9	NE9	NE9	NE8	NE8	NE8	ENE10	NE9	NE9	NE10	ENE10	ENE10	ENE11	ENE10	ENE10	ENE10	E8	ENE7	ENE6	NE5	ENE5	E4	ENE8.1	ENE11		
25-Apr	ENE3	E3	ENE3	ENE2	NE2	E3	ESE5	ESE6	SE7	SE8	SE9	SE11	S9	SSE11	SSE12	SSE11	SSE10	S9	S9	SSE6	SSE8	SE7	SE8	SE8	SSE6.3	SSE12	
26-Apr	SSE7	SE6	SE6	SSE6	SSE5	SE5	SSE9	SSE9	SSE10	SE9	SSE10	SE11	SSE10	SSE10	SE10	SE9	ESE8	ESE7	SSE7	SSE7	SSE6	SSE7	SSE7	SE4	SSE7.5	SE11	
27-Apr	SE3	E2	ESE2	NNE3	NNE3	NNE2	E2	ESE7	E7	ESE9	E10	ENE9	ENE10	NE9	NE9	NE10	E10	E8	ESE6	SSE4	S4	S5	SSW6	S5	E4.4	NE10	
28-Apr	SSE4	SSE3	SSW3	SE4	SSW3	S6	SSW6	SW7	S4	SW1	NE4	NE3	SSE2	ESE7	S7	NE2	WSW9	WSW7	S7	S5	S4	S6	S8	SSW8	S3.4	WSW9	
29-Apr	SSW9	SSW6	S5	S4	SSE3	S3	SSW5	S8	SSW6	SSW8	SSW12	SSW15	S14	SSW15	SSW16	SSW14	S12	S11	SSE8	S8	S6	SSE4	S2	S2	SSW8.0	SSW16	
30-Apr	SE3	SSE3	S1	SSE3	SE2	S1	SSW2	S4	SSE2	E3	SE6	SE7	NE8	NNE8	SSE1	S3	NE8	NNW2	NE3	N1	NNW1	NNE3	NNE2	NE2	E1.5	NNE8	

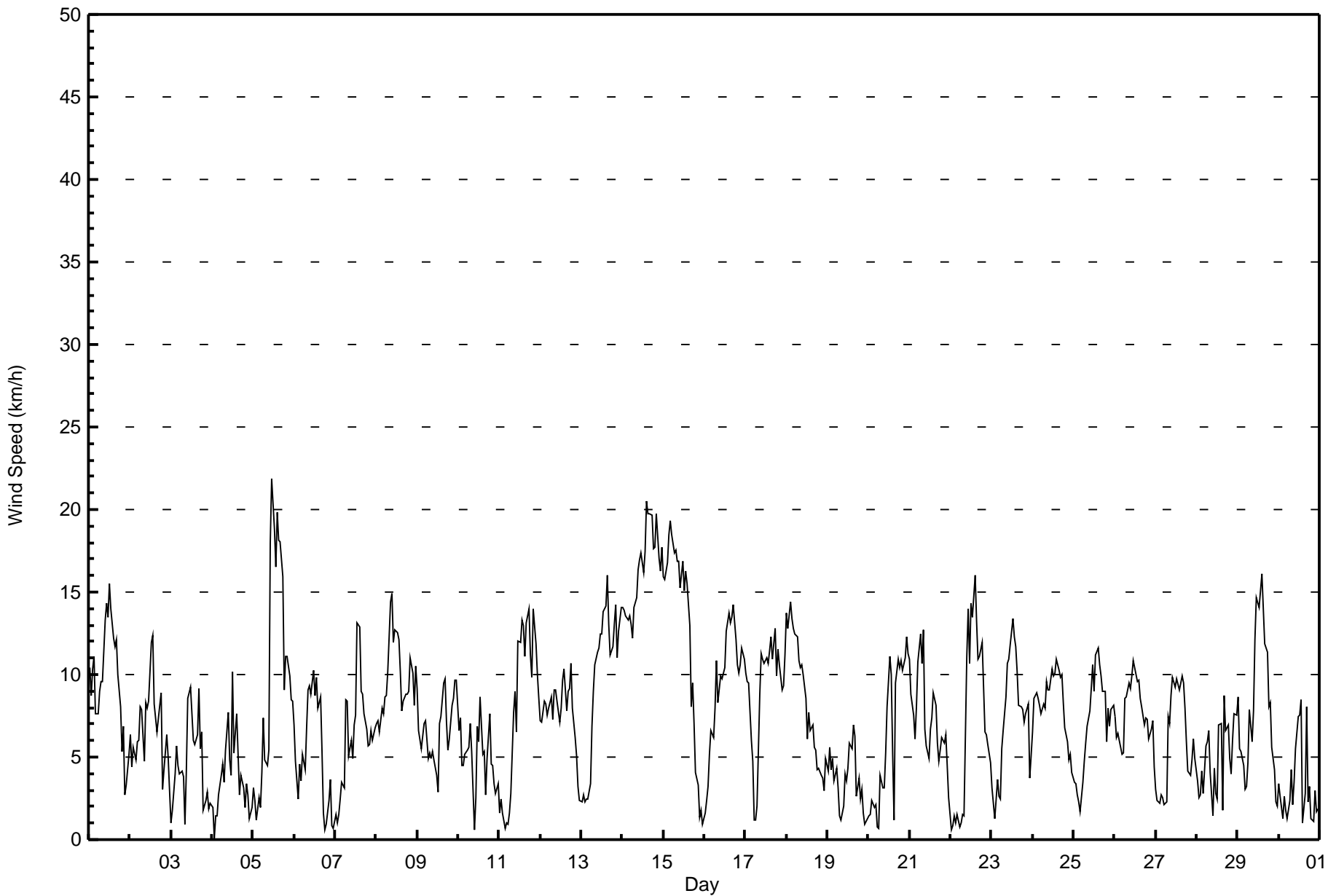
ENE1.8	ENE1.7	ENE1.6	NE1.7	NE1.8	NE2.1	ENE1.9	ENE1.8	NE2.4	NE3.0	ENE2.6	ENE2.9	NE2.7	NE2.9	ENE2.6	NE2.5	NE2.7	NE2.3	ENE2.6	ENE2.9	ENE2.8	ENE2.2	ENE1.7	ENE1.8	Diurnal Average		
NNE1.6	NNE1.6	NNE1.7	NNE1.9	NNE1.9	NNE1.9	NNE1.7	NNE1.8	NNE1.7	NNE1.7	SSE1.8	SSE2.2	S19	NNE1.7	NNE2.0	NNE2.0	NNE2.0	NNE2.0	NNE2.0	NNE1.8	NNE1.8	NNE2.0	NNE1.7	NNE1.6	NNE1.8	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Janvier - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Janvier - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	259	35.97	35.97
6 - 11	337	46.81	82.78
12 - 19	117	16.25	99.03
20 - 28	7	0.97	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Janvier - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	25	28	17	15	11	17	23	39	36	18	8	5	3	5	2	7	259
6 - 11	32	70	43	24	10	11	17	30	38	32	8	8	7	0	4	3	337
12 - 19	5	62	16	2	1	0	0	2	9	10	2	2	6	0	0	0	117
20 - 28	0	5	0	0	0	0	0	1	1	0	0	0	0	0	0	0	7
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	165	76	41	22	28	40	72	84	60	18	15	16	5	6	10	720

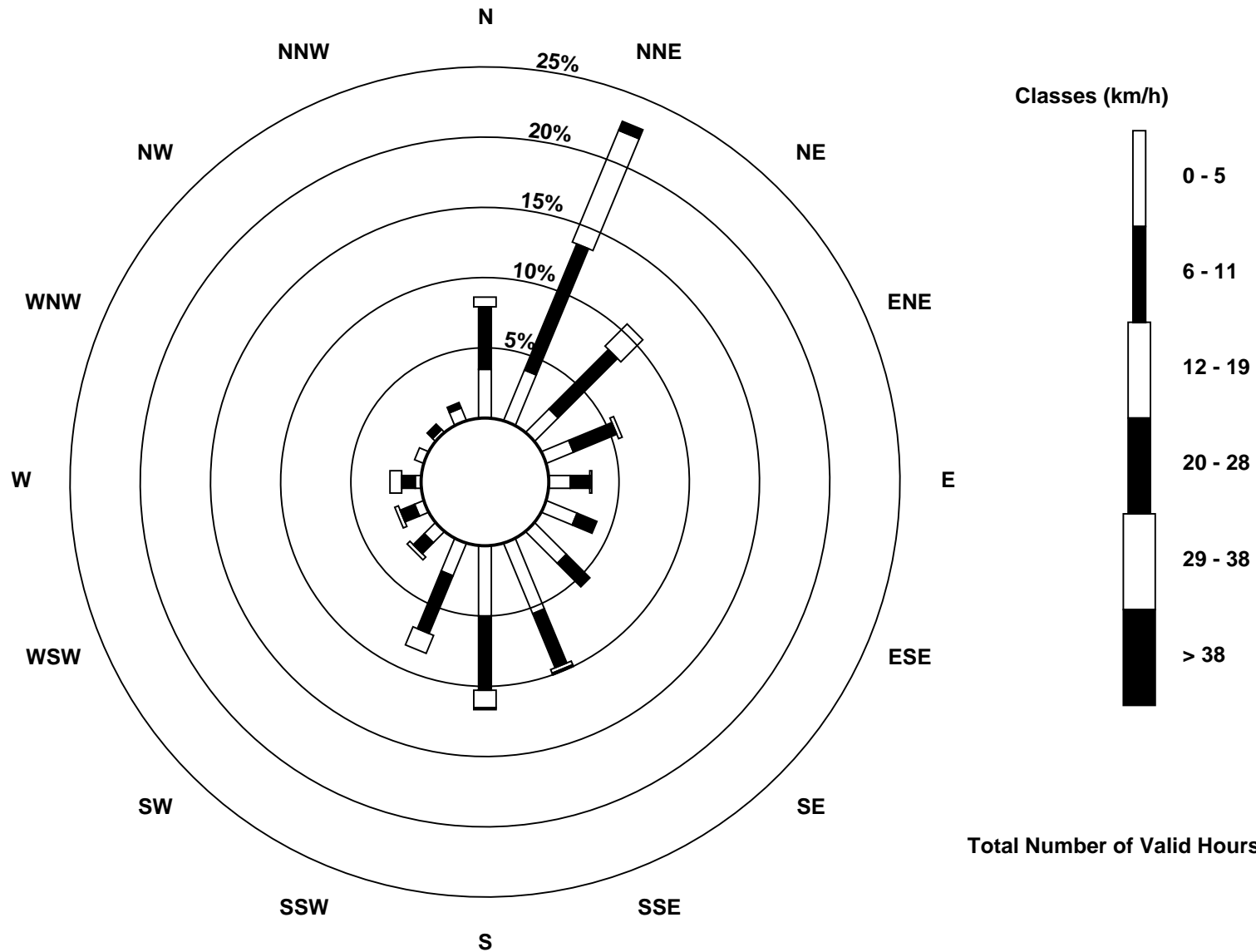
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Janvier (AMS 22)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Janvier - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Apr 5 12:00 Minimum Value: 0 km/h on Apr 16 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	2	2	2	3	2	2	2	3	4	4	5	6	4	5	4	4	3	3	2	3	2	2	2	6
2-Apr	2	1	2	2	1	2	2	2	2	3	3	3	4	5	4	4	4	3	3	2	2	2	2	1	5
3-Apr	1	1	1	1	2	1	1	1	1	2	4	4	3	3	3	5	4	4	3	1	1	2	1	1	5
4-Apr	1	1	1	1	1	1	1	1	2	2	2	3	3	4	4	3	1	1	1	1	1	1	1	1	4
5-Apr	1	2	1	2	1	2	2	2	2	2	7	7	6	5	6	6	5	5	3	3	3	3	2	7	
6-Apr	2	2	2	1	2	2	1	2	3	3	2	3	3	4	4	4	3	2	1	1	1	2	1	1	4
7-Apr	1	1	2	1	2	1	3	2	2	2	2	3	2	3	3	3	3	2	2	2	1	2	2	2	3
8-Apr	2	2	2	3	3	3	3	4	5	6	4	5	5	4	4	3	3	3	3	3	4	3	3	4	6
9-Apr	3	3	2	2	3	2	2	3	2	3	3	3	3	3	3	4	3	3	2	2	2	2	2	2	4
10-Apr	2	2	1	1	2	1	2	2	2	2	2	3	3	3	3	3	3	4	2	1	1	1	1	1	4
11-Apr	1	1	1	1	1	1	1	2	2	2	3	4	4	5	5	4	5	5	4	3	3	3	3	2	5
12-Apr	2	2	2	2	2	2	2	2	3	3	4	4	3	3	4	3	3	3	2	2	2	1	1	1	4
13-Apr	1	1	1	1	1	1	2	3	3	4	3	3	4	4	4	4	4	3	3	5	5	3	3	4	5
14-Apr	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	4	6	4	4	4	4	6
15-Apr	4	4	5	5	5	5	4	4	4	4	3	4	4	4	4	3	2	2	2	1	1	1	1	1	5
16-Apr	1	0	1	2	1	2	2	3	2	3	3	3	3	4	4	4	4	4	3	2	3	3	3	3	4
17-Apr	2	2	3	4	2	1	1	2	3	3	3	3	3	3	3	4	3	4	3	4	4	3	3	3	4
18-Apr	3	3	3	3	3	2	3	3	2	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	3
19-Apr	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	2
20-Apr	1	1	1	1	1	1	1	2	1	1	2	4	4	4	3	2	3	4	4	4	3	3	4	4	4
21-Apr	4	3	3	2	4	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	1	4
22-Apr	1	1	1	1	1	1	1	2	2	4	4	5	4	4	5	4	4	3	3	3	1	2	2	1	5
23-Apr	1	1	1	1	1	1	1	2	3	3	3	4	3	3	3	3	3	3	3	2	3	3	2	1	4
24-Apr	2	2	2	2	2	2	2	2	3	2	2	3	3	3	4	3	3	3	2	2	2	1	1	1	4
25-Apr	1	1	1	1	1	1	1	2	3	3	3	3	3	3	4	3	3	3	3	2	3	2	3	2	4
26-Apr	2	2	2	2	2	2	3	3	3	3	4	3	4	3	4	3	3	2	2	2	2	2	2	1	4
27-Apr	2	1	1	1	1	1	1	2	3	4	4	4	3	3	4	3	3	2	3	2	2	1	2	1	4
28-Apr	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	2	3	3	3	2	1	1	1	2	3
29-Apr	2	1	1	1	2	1	3	2	2	3	4	6	6	5	5	4	4	4	3	3	1	1	1	1	6
30-Apr	1	2	1	1	1	1	1	1	2	3	2	4	2	4	4	5	2	2	1	1	1	1	1	1	5
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Summary of Hour Averages

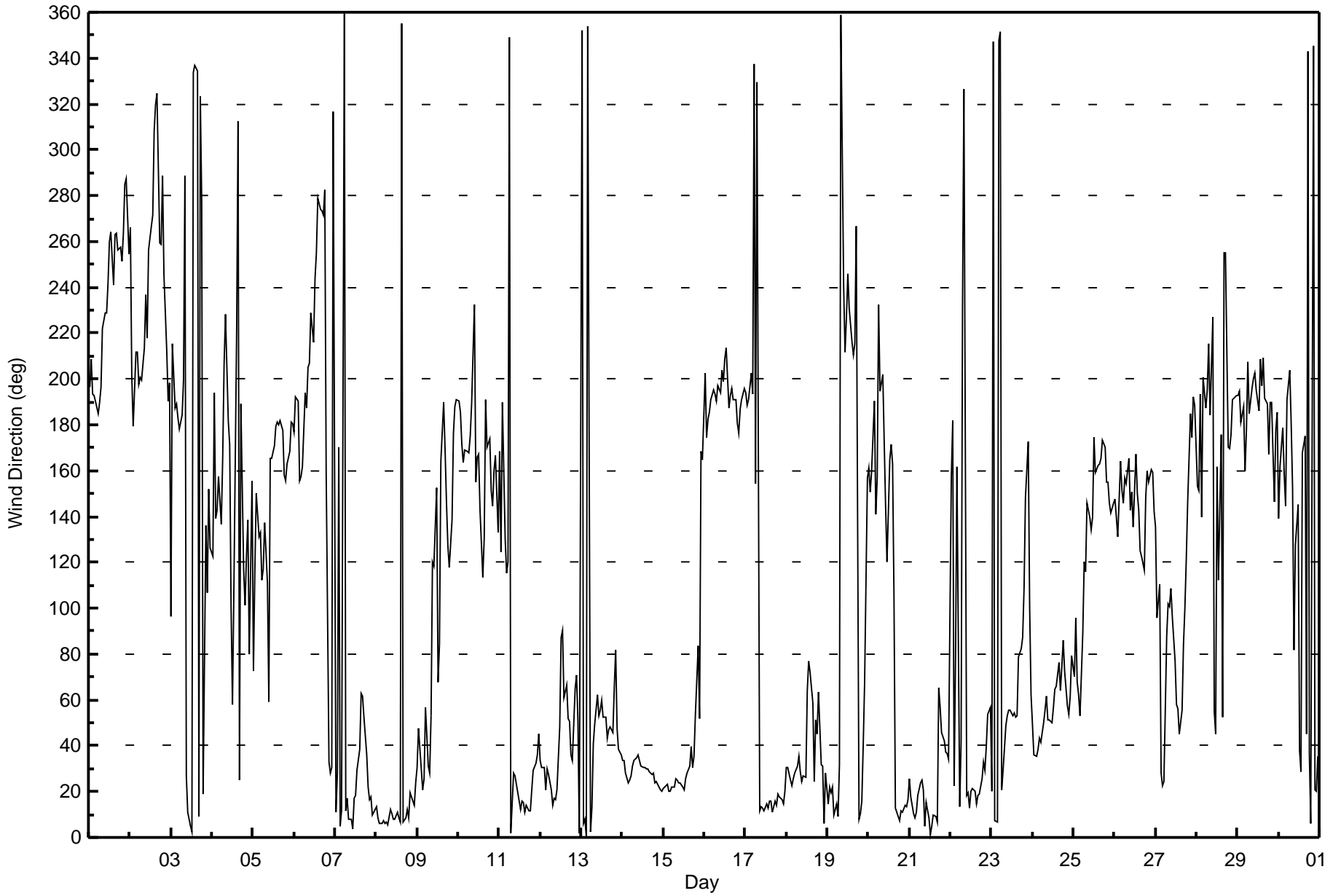
Wind Direction (WD) - deg
Janvier - April 2017

Direction of Maximum Speed: 165 deg on Apr 5 12:00 Direction of Maximum Daily Speed Average: 28.4 deg on Apr 14	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 194 deg on Apr 4 02:00 Direction of Minimum Daily Speed Average: 0.8 deg on Apr 19	Percent Operational Time: 100.0
Monthly Average Direction: 180.4 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	196	209	193	193	190	185	190	196	222	229	229	242	260	264	241	263	263	256	257	251	264	285	287	254	232.7
2-Apr	266	202	179	212	212	198	201	200	214	237	218	256	267	272	308	320	325	259	259	289	245	213	190	198	242.4
3-Apr	96	215	188	189	183	178	184	200	289	27	11	5	3	334	337	335	9	323	277	19	136	107	152	127	344.8
4-Apr	123	194	139	143	157	137	166	206	228	182	172	101	58	108	222	313	25	189	117	101	123	138	80	156	149.4
5-Apr	72	117	150	131	133	112	117	137	111	59	165	165	171	179	181	180	182	177	158	156	163	168	181	181	164.8
6-Apr	177	192	191	156	157	162	194	187	205	207	229	216	243	255	279	274	273	272	282	159	33	28	31	317	220.6
7-Apr	11	28	170	5	12	360	12	17	8	8	3	17	18	30	38	63	62	52	36	22	16	18	10	12	25.8
8-Apr	13	9	6	6	8	6	7	6	12	11	8	8	11	8	7	355	7	9	12	9	20	16	14	24	9.9
9-Apr	31	47	30	21	26	57	31	28	53	120	118	153	68	84	164	190	170	146	127	118	139	176	188	191	115.0
10-Apr	190	186	171	163	169	168	168	175	189	232	155	166	167	143	114	131	191	170	174	151	144	160	167	133	164.1
11-Apr	169	125	190	130	115	120	349	2	28	27	23	19	12	16	15	11	14	12	11	21	29	33	36	45	22.5
12-Apr	34	31	31	21	30	28	21	14	17	17	21	48	88	90	61	67	52	51	36	34	65	71	51	2	41.0
13-Apr	352	6	8	1	354	3	13	41	49	62	53	56	60	52	52	43	47	48	46	65	82	48	39	36	47.7
14-Apr	33	33	28	24	25	27	31	34	35	36	33	31	31	30	30	30	29	27	28	24	25	22	21	20	28.4
15-Apr	21	22	23	20	20	22	22	25	25	24	24	22	21	25	28	31	40	30	35	54	84	52	169	164	25.7
16-Apr	203	175	183	185	191	195	193	191	197	194	204	199	209	214	187	193	196	191	191	181	176	187	191	196	193.2
17-Apr	194	188	191	203	193	338	154	330	11	13	13	11	15	13	16	16	11	16	14	19	18	16	15	20	14.9
18-Apr	30	30	25	22	26	28	31	35	28	25	27	26	64	77	72	59	24	51	45	64	32	31	6	28	34.4
19-Apr	15	22	20	22	10	15	9	31	359	241	212	227	246	230	216	211	216	267	8	11	16	40	68	157	310.5
20-Apr	161	150	160	191	141	157	232	195	202	173	145	120	165	172	163	105	13	9	7	12	11	14	13	16	49.5
21-Apr	25	18	11	8	11	18	24	25	21	5	15	8	1	5	10	9	7	65	57	45	42	37	37	34	20.7
22-Apr	157	182	23	78	162	13	42	231	326	18	20	13	20	21	20	14	18	19	25	33	29	40	53	56	23.6
23-Apr	20	347	7	7	348	352	21	29	49	53	55	56	53	54	52	53	79	82	87	108	148	173	100	62	61.0
24-Apr	49	36	35	39	43	41	50	56	62	51	51	50	57	64	66	76	64	75	86	73	58	54	61	79	57.2
25-Apr	70	96	68	62	53	89	120	116	146	140	134	140	175	159	163	163	165	173	170	155	155	146	141	146	146.5
26-Apr	148	140	131	164	151	146	157	155	165	143	151	135	167	150	143	125	123	117	148	160	155	160	159	142	147.4
27-Apr	136	96	110	28	23	24	88	102	101	109	96	77	58	56	45	55	84	100	121	147	185	174	192	188	92.7
28-Apr	153	151	194	140	201	187	195	215	184	227	55	45	162	112	176	53	255	255	170	169	175	191	191	193	184.0
29-Apr	193	195	181	188	160	177	207	185	196	200	203	196	186	209	197	209	191	189	167	190	190	147	177	185	192.4
30-Apr	139	162	179	159	145	191	204	180	152	82	128	145	38	29	168	175	45	343	37	6	345	21	20	35	91.0
	63.3	61.8	61.7	49.5	47.7	52.7	58.1	75.3	51.1	49.3	67.0	68.2	51.4	55.3	60.8	47.0	46.3	55.0	60.5	65.4	72.6	72.4	71.1	64.7	

Diurnal Average

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Janvier - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 107 deg on Apr 10 10:00 Minimum Value: 4 deg on Apr 30 20:00 Percentiles: P ₁ = 10 P ₁₀ = 15 Q ₁ = 19 Median = 25 Q ₃ = 37 P ₉₀ = 59 P ₉₉ = 94																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	16	18	13	13	15	13	11	18	25	25	24	31	25	25	29	29	26	23	18	17	28	58	65	24	65
2-Apr	26	24	21	25	17	23	17	17	28	27	24	41	28	37	56	56	58	23	19	64	53	22	24	46	64
3-Apr	90	70	17	10	14	21	10	23	91	53	41	49	59	58	62	59	40	68	32	49	30	52	51	10	91
4-Apr	67	92	65	60	40	19	22	41	24	21	29	48	26	58	55	57	55	25	29	42	30	35	82	57	92
5-Apr	49	74	62	52	53	26	16	31	40	48	26	25	27	24	20	21	18	18	23	25	23	24	24	15	74
6-Apr	18	35	69	22	23	22	28	13	24	23	29	26	33	38	50	44	64	92	81	84	26	22	88	86	92
7-Apr	59	94	101	35	64	54	28	15	20	20	20	24	20	17	21	24	23	23	23	16	14	13	17	20	101
8-Apr	19	25	37	28	28	25	29	32	25	35	36	32	37	36	44	54	48	38	26	33	21	20	23	21	54
9-Apr	18	31	31	31	19	24	54	51	55	55	61	80	91	53	51	37	31	29	25	14	20	18	14	13	91
10-Apr	12	12	19	19	19	16	20	18	54	107	81	44	58	34	62	60	94	83	20	20	18	32	22	10	107
11-Apr	30	35	49	49	66	62	46	62	16	21	53	24	28	30	31	38	24	27	23	16	15	14	20	18	66
12-Apr	18	16	14	15	14	13	20	22	23	30	51	46	49	38	35	49	34	26	17	14	23	23	24	15	51
13-Apr	21	12	20	11	12	16	14	26	25	24	26	23	25	24	22	19	21	21	20	25	29	22	17	17	29
14-Apr	15	16	14	14	15	16	15	17	17	17	15	15	15	15	15	15	15	14	16	14	14	14	14	14	17
15-Apr	14	14	14	15	16	15	15	14	14	15	15	16	15	15	16	16	21	17	19	24	21	40	7	70	70
16-Apr	29	17	16	11	11	11	12	14	24	18	25	23	28	27	20	21	23	18	17	16	16	13	14	15	29
17-Apr	14	14	16	65	19	61	74	80	27	21	23	23	21	27	20	23	23	19	22	18	19	16	17	15	80
18-Apr	12	15	15	13	13	14	16	18	18	16	21	31	39	28	35	26	26	30	26	24	25	23	23	17	39
19-Apr	20	21	15	15	26	19	27	38	73	66	38	51	58	29	34	24	22	68	21	40	25	51	42	59	73
20-Apr	10	76	22	28	57	94	82	34	46	29	42	45	32	38	48	97	21	33	38	23	22	21	19	20	97
21-Apr	16	19	24	28	22	19	15	18	15	46	57	86	50	41	30	36	46	38	31	19	24	18	19	13	86
22-Apr	72	49	24	62	40	48	64	87	92	32	20	36	20	21	21	25	25	19	16	16	13	19	22	27	92
23-Apr	21	24	71	33	24	46	25	21	24	24	26	27	26	24	23	23	33	34	32	35	30	18	51	23	71
24-Apr	22	16	15	18	18	19	21	26	21	22	23	21	26	26	27	27	24	25	24	23	21	22	20	20	27
25-Apr	22	22	33	40	26	29	26	23	35	32	34	31	26	28	25	24	26	21	19	33	23	24	23	22	40
26-Apr	25	24	24	24	26	25	27	27	28	31	34	30	29	34	34	33	36	28	26	24	23	21	22	24	36
27-Apr	24	33	28	19	9	12	40	29	47	40	41	45	34	37	35	37	32	29	25	23	33	23	13	9	47
28-Apr	22	27	34	19	14	16	17	23	54	105	76	104	92	50	44	95	29	44	37	21	19	8	11	14	105
29-Apr	12	16	12	14	45	30	18	20	31	45	40	30	33	29	27	28	29	25	26	20	15	15	47	50	50
30-Apr	14	43	62	33	47	62	32	29	92	81	59	49	28	44	102	80	21	59	34	4	54	23	50	52	102
	90	94	101	65	66	94	82	87	92	107	81	104	92	58	102	97	94	92	81	84	54	58	88	86	
	Diurnal Maximum																								



Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	April 21, 2017	Last Cal Date:	March 14, 2017
Start time (MST):	9:28	End time (MST):	13:59
Reason:	Routine	Calibrator replaced.	

Calibration Standards

Cal Gas Concentration	<u>49.7</u>	ppm	Cal Gas Exp Date	September 8, 2018
Cal Gas Cylinder #	<u>LL107937</u>			
Calibrator Make/Model	API T700		Serial Number	2447
ZAG Make/Model	API T701		Serial Number	135

Analyzer Information

Analyzer make:	Thermo 43i	Analyzer serial #:	1152430006
	<u>Start</u>	<u>Finish</u>	
Analyzer Range	0 - 1000 ppb	PMT voltage	-637
Calculated slope	1.000070	Lamp voltage	780
Calculated intercept	-0.178672	Pressure	717.6
Analyzer Background	15.7	Flow	0.509
Analyzer Coefficient	0.989	Intensity	90
			<u>Finish</u>
			-637
			779
			714.9
			0.505
			91

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5006	0.0	0.0	-0.4	----
as found span	4931	78.7	780.8	812.7	0.961
calibrator zero	5006	0.0	0.0	-0.4	----
high point	4931	78.7	780.8	784.1	0.996
second point	4974	39.4	390.6	391.6	0.997
third point	4990	19.7	195.4	196.0	0.997
as left zero	5009	0.0	0.0	0.1	----
as left span	4828	78.6	796.2	782.7	1.017
Average Correction Factor					0.997
Corrected As found	813.16	Previous response	780.89	*% change	-4.0%

* = > +/-5% change initiates investigation

Notes: *As founds also performed with previous calibrator API T700P S/N- 2447 before removal- Baseline at -0.44 ppb and span at 795.9 ppb*. Span adjusted after as founds.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

SO₂ Calibration Summary

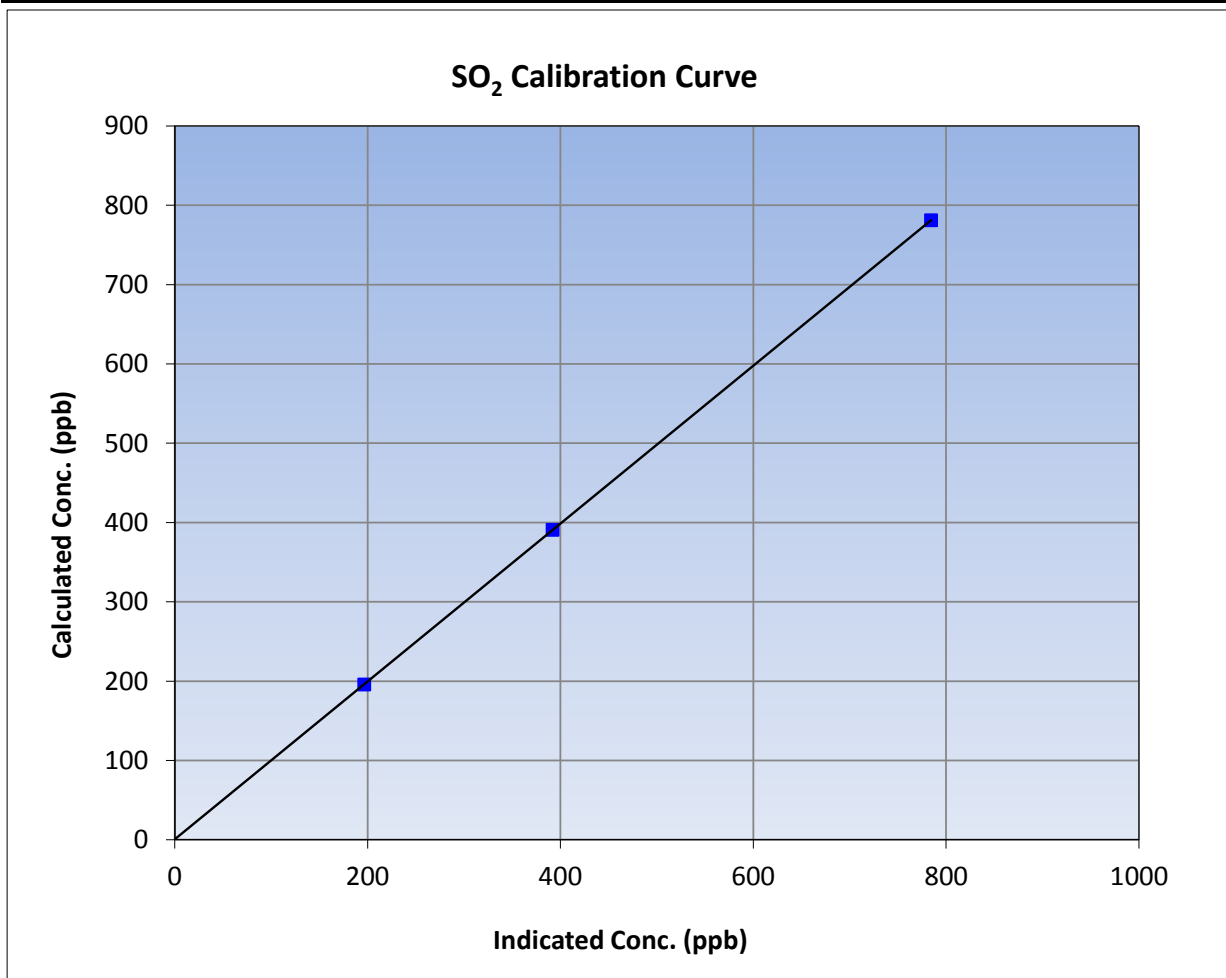
Version-03-2017

Station Information

Calibration Date	April 21, 2017	Previous Calibration	March 14, 2017
Station Name	Janvier	Station Number	AMS 22
Start Time (MST)	9:28	End Time (MST)	13:59
Analyzer make	Thermo 43i	Analyzer serial #	1152430006

Calibration Data

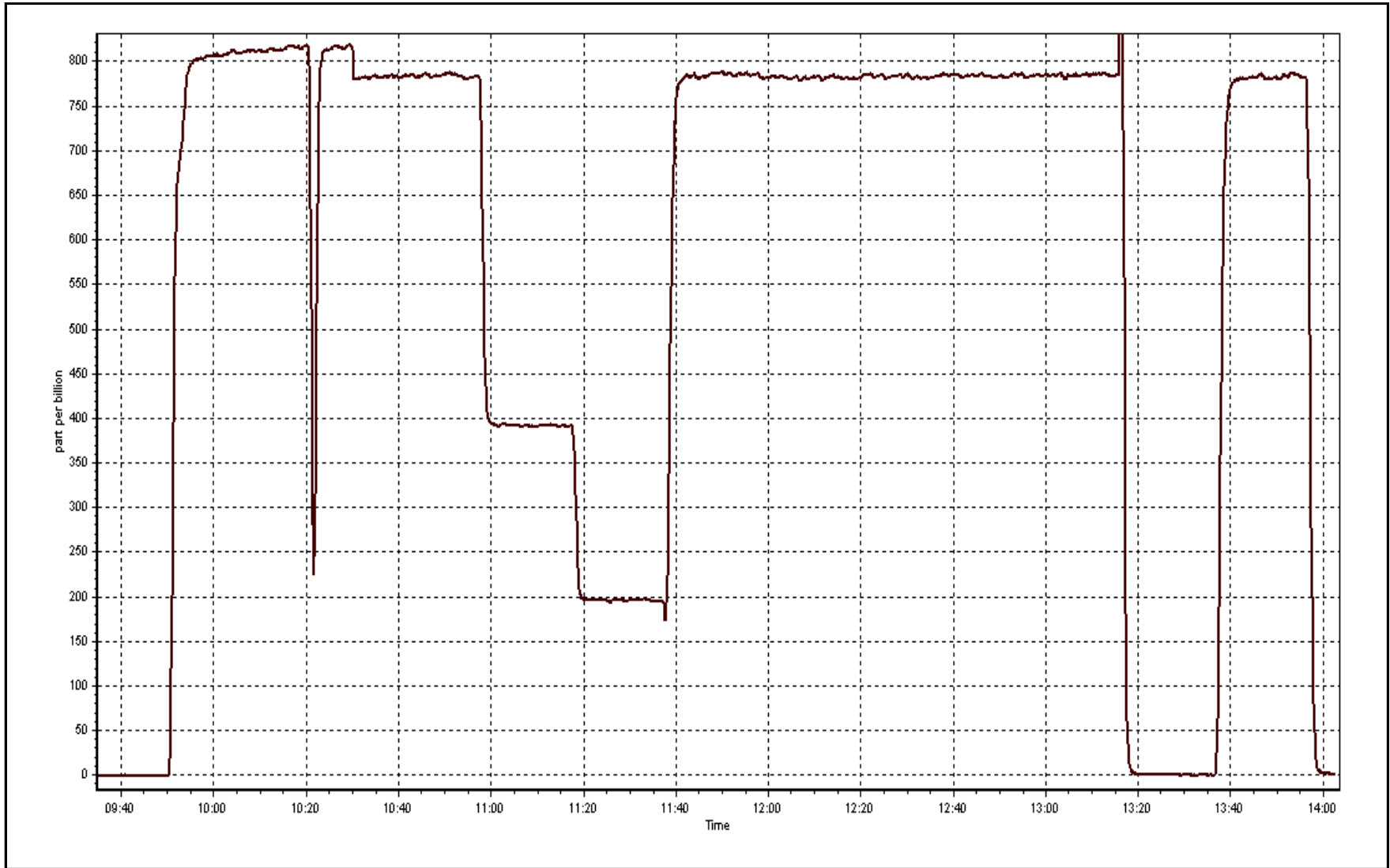
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	-0.4	----	Correlation Coefficient	≥0.995
780.8	784.1	0.9957		
390.6	391.6	0.9975	Slope	0.90 - 1.10
195.4	196.0	0.9971		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 21, 2017

Location: Janvier





Wood Buffalo Environmental Association

TRS Calibration Report

Version-03-2017

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	April 20, 2017	Last Cal Date:	March 15, 2017
Start time (MST):	12:15	End time (MST):	14:33
Reason:	Routine Calibrator replaced with API 700 S/N- 2657		

Calibration Standards

Cal Gas Concentration	<u>5.35</u>	ppm	Cal Gas Exp Date	February 13, 2018
Cal Gas Cylinder #	<u>LL36481</u>			
Calibrator Make/Model	API T700		Serial Number	2657
ZAG Make/Model	API T701		Serial Number	135

Analyzer Information

Analyzer make: Thermo 43i- TLE Analyzer serial #: 1151680031

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	-647.5	-647.9
Calculated slope	1.000421	0.998230	Lamp voltage	999	998
Calculated intercept	-0.304125	-0.224431	Pressure	674.0	670.4
Analyzer Background	3.68	3.49	Flow	0.424	0.422
Analyzer Coefficient	1.245	1.179	Intensity	90	90

TRS Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) Limit = 0.95-1.05
as found zero	5007	0.0	0.0	0.1	----
as found span	4938	74.9	79.9	84.0	0.952
calibrator zero	5007	0.0	0.0	0.1	----
high point	4938	74.9	79.9	80.2	0.997
second point	4974	37.5	40.0	40.5	0.988
third point	4992	18.8	20.1	20.4	0.984
as left zero	5008	0.0	0.0	0.2	----
as left span	4938	74.9	79.9	81.4	0.982
Average Correction Factor					0.990
Corrected As found	83.91	Previous response	80.21	*% change	-4.4%

* = > +/-5% change initiates investigation

Notes: Baseline at 0.1 ppb and span at 81.28 ppb after performing "as founds" with calibrator API T700p s/n- 2447 before removal.
 Performed as founds with new API T700P S/N- 2657 for comparison. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

TRS Calibration Summary

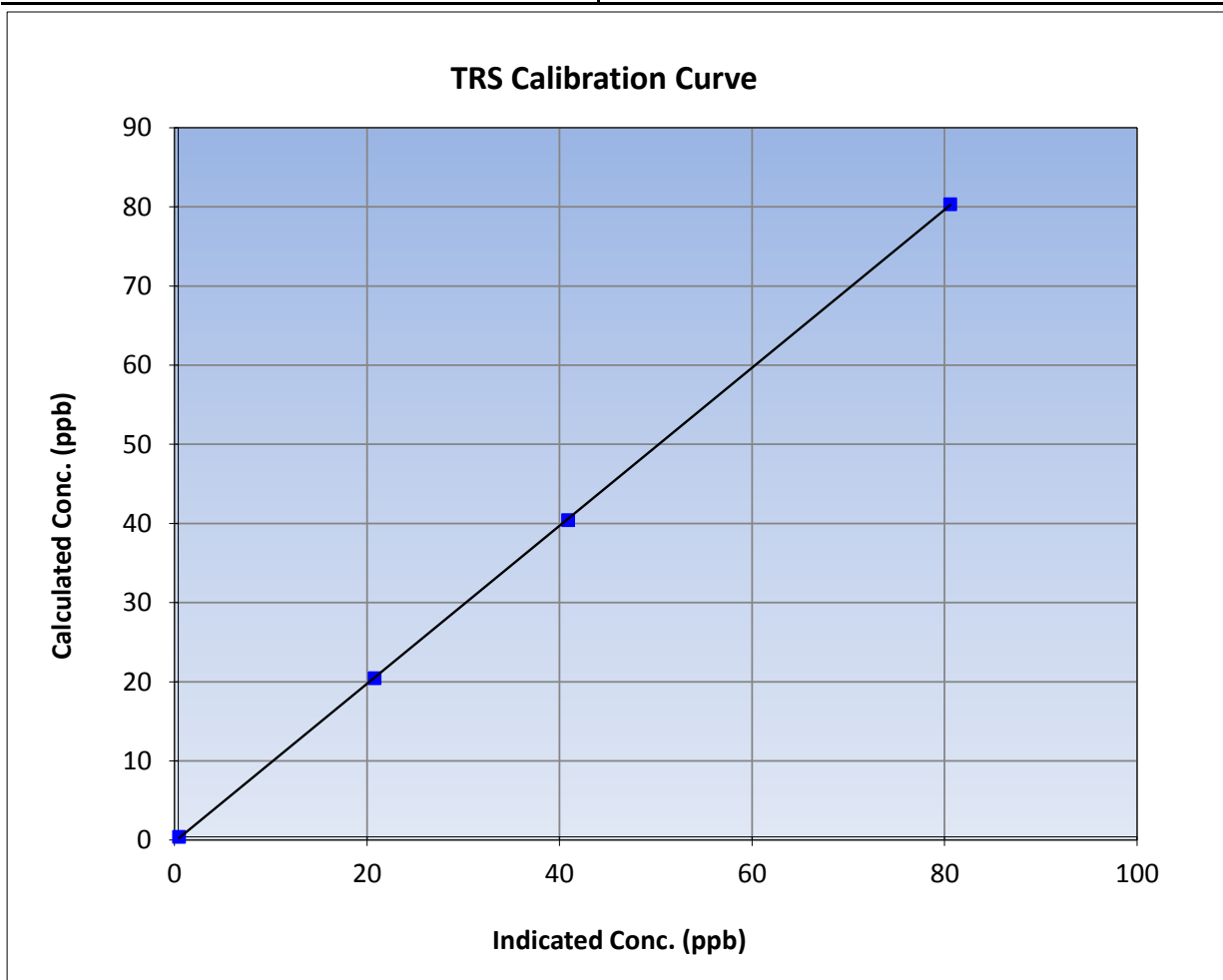
Version-03-2017

Station Information

Calibration Date	April 20, 2017	Previous Calibration	March 15, 2017
Station Name	Janvier	Station Number	AMS 22
Start Time (MST)	12:15	End Time (MST)	14:33
Analyzer make	Thermo 43i- TLE	Analyzer serial #	1151680031

Calibration Data

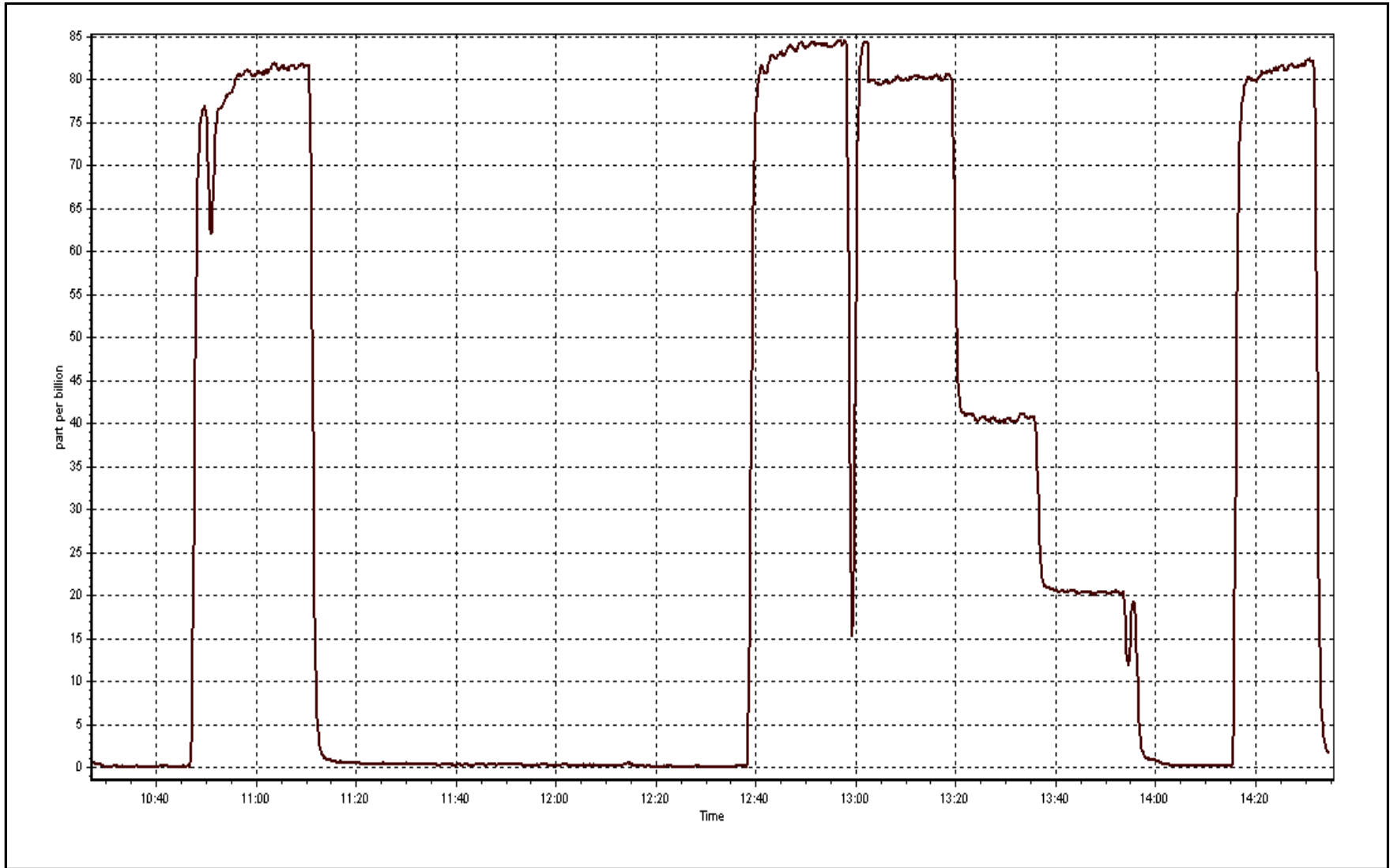
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	0.1	----	Correlation Coefficient	≥0.995
79.9	80.2	0.9967		
40.0	40.5	0.9885	Slope	0.90 - 1.10
20.1	20.4	0.9840		
			Intercept	+/-3



TRS Calibration Plot

Date: April 20, 2017

Location: Janvier





Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-03-2017

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	April 21, 2017	Last Cal Date:	March 14, 2017
Start time (MST):	9:28	End time (MST):	13:59
Reason:	Routine Calibrator replaced.		

Calibration Standards

Gas Cert Reference	LL107937	Cal Gas Expiry Date	September-08-18
CH4 Cal Gas Conc.	<u>509.0</u> ppm	CH4 Equiv Conc.	1056.3 ppm
C3H8 Cal Gas Conc.	<u>199.0</u> ppm	Station temp.	21 Deg C
Calibrator Model	Teledyne API 700	Serial Number	2447
ZAG make/model	Teledyne API 701	Serial Number	135

Analyzer Information

Analyzer make: Thermo 55i

Analyzer serial #: 1501663728

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
THC Range (ppm)	0 - 50 ppm		Column Temp	75.1	75.0
NMHC Range (ppm)	0 - 25 ppm		Detector Temp	174.8	174.9
CH4 SP Ratio	N/A	0.000184	Flame Temp	405.0	405.0
CH4 Retention time	N/A	12.4	Carrier Pressure	36.7	36.7
NMHC SP Ratio	N/A	4.22E-05	Fuel Pressure	44.9	44.9
NMHC Peak Area	N/A	203750	Air Pressure	33.7	33.7

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
THC Cal Slope	1.004024	0.999659
THC Cal Offset	0.030235	0.052745
CH4 Cal Slope	0.992702	0.999843
CH4 Cal Offset	0.042289	0.046724
NMHC Cal Slope	1.014681	0.999547
NMHC Cal Offset	-0.012268	0.008301

Notes: *As founds performed with previous calibrator API T700P S/N- 2447 before removal- Baseline at 0.0 ppm and THC span at 16.60 ppm* Span adjusted after as founds.

Calibration Performed By:

Aswin Sasi Kumar



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Version-02-2017

THC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5006	0.0	0.00	0.00	----
as found span	4933	78.7	16.59	17.19	0.965
calibrator zero	5006	0.0	0.00	0.00	----
high point	4933	78.7	16.59	16.58	1.000
second point	4974	39.4	8.30	8.18	1.015
third point	4990	19.7	4.15	4.08	1.018
as left zero	5009	0.0	0.00	0.00	----
as left span	4828	78.6	16.92	16.47	1.027
Average Correction Factor					1.011
Corrected As found	17.19	Prev response	16.49	*% change	-4.1%

NMHC Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5006	0	0.00	0.00	----
as found span	4933	78.7	8.59	8.87	0.969
calibrator zero	5006	0	0.00	0.00	----
high point	4933	78.7	8.59	8.60	0.999
second point	4974	39.4	4.30	4.27	1.007
third point	4990	19.7	2.15	2.15	1.001
as left zero	5009	0	0.00	0.00	----
as left span	4828	78.6	8.77	8.51	1.030
Average Correction Factor					1.002
Corrected As found	8.87	Prev response	8.48	*% change	-4.4%

CH4 Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit= 0.95-1.05</i>
as found zero	5006	0.0	0.00	0.00	----
as found span	4933	78.7	7.99	8.32	0.961
calibrator zero	5006	0.0	0.00	0.00	----
high point	4933	78.7	7.99	7.98	1.002
second point	4974	39.4	4.00	3.90	1.026
third point	4990	19.7	2.00	1.93	1.037
as left zero	5009	0.0	0.00	0.00	----
as left span	4828	78.6	8.15	7.85	1.039
Average Correction Factor					1.021
Corrected As found	8.32	Prev response	8.01	*% change	-3.7%

* = > +/-5% change initiates investigation



Wood Buffalo Environmental Association

THC Calibration Summary

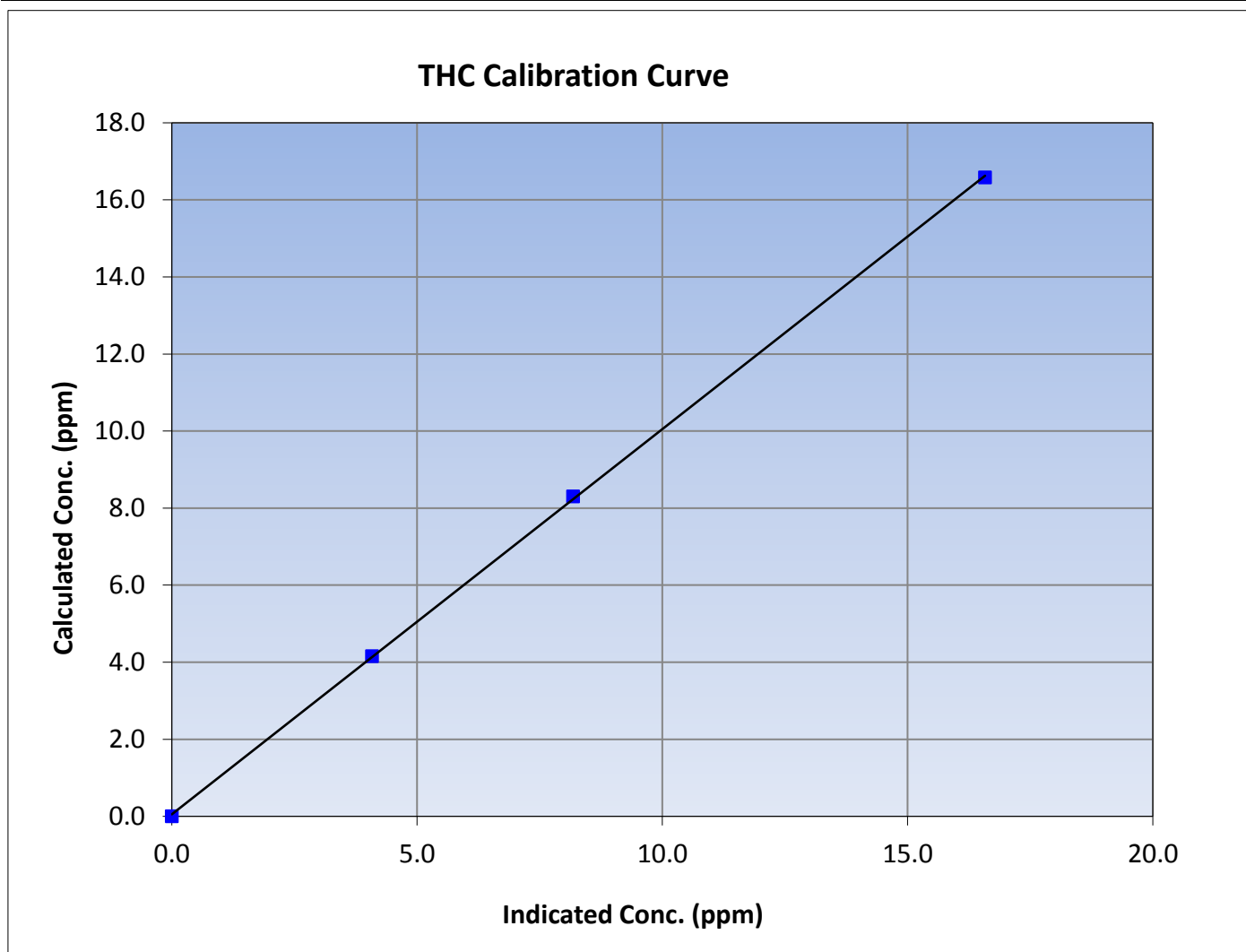
Version-02-2017

Station Information

Calibration Date	April 21, 2017	Previous Calibration	AMS 22
Station Name	Janvier	Station Number	42808
Start Time (MST)	9:28	End Time (MST)	13:59
Analyzer make	Thermo 55i	Analyzer serial #	1501663728

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999934	≥ 0.995			
16.59	16.58	1.0004						
8.30	8.18	1.0148				Slope	0.999659	0.90 - 1.10
4.15	4.08	1.0180						
			Intercept	0.052745	± 0.5			





Wood Buffalo Environmental Association

CH₄ Calibration Summary

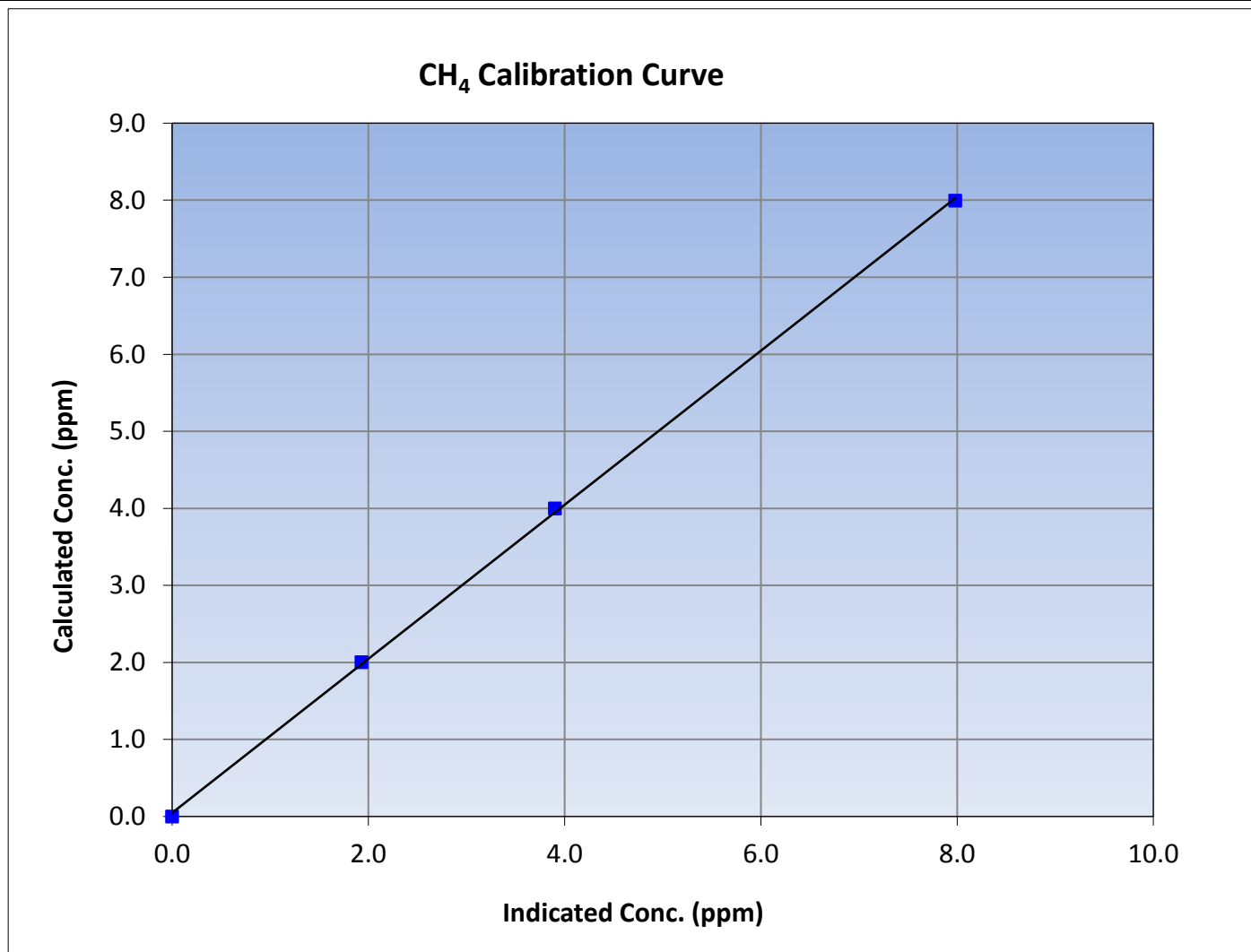
Version-02-2017

Station Information

Calibration Date	April 21, 2017	Previous Calibration	AMS 22
Station Name	Janvier	Station Number	42808
Start Time (MST)	9:28	End Time (MST)	13:59
Analyzer make	Thermo 55i	Analyzer serial #	1501663728

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>
0.00	0.00	----	Correlation Coefficient	0.999805	≥ 0.995
7.99	7.98	1.0016			
4.00	3.90	1.0257			
2.00	1.93	1.0371			
			Slope	0.999843	0.90 - 1.10
			Intercept	0.046724	+/-0.5





Wood Buffalo Environmental Association

NMHC Calibration Summary

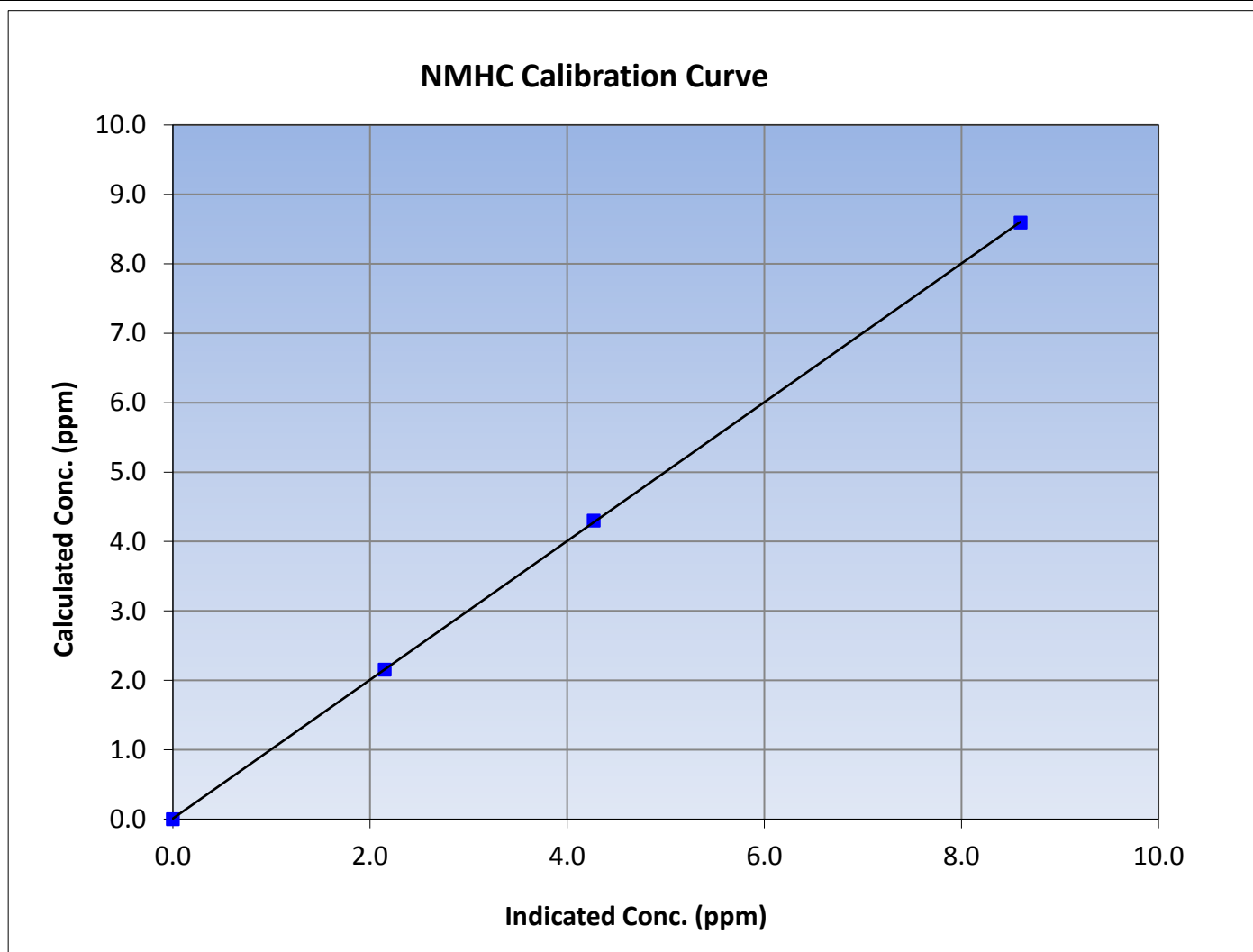
Version-02-2017

Station Information

Calibration Date	April 21, 2017	Previous Calibration	AMS 22
Station Name	Janvier	Station Number	42808
Start Time (MST)	9:28	End Time (MST)	13:59
Analyzer make	Thermo 55i	Analyzer serial #	1501663728

Calibration Data

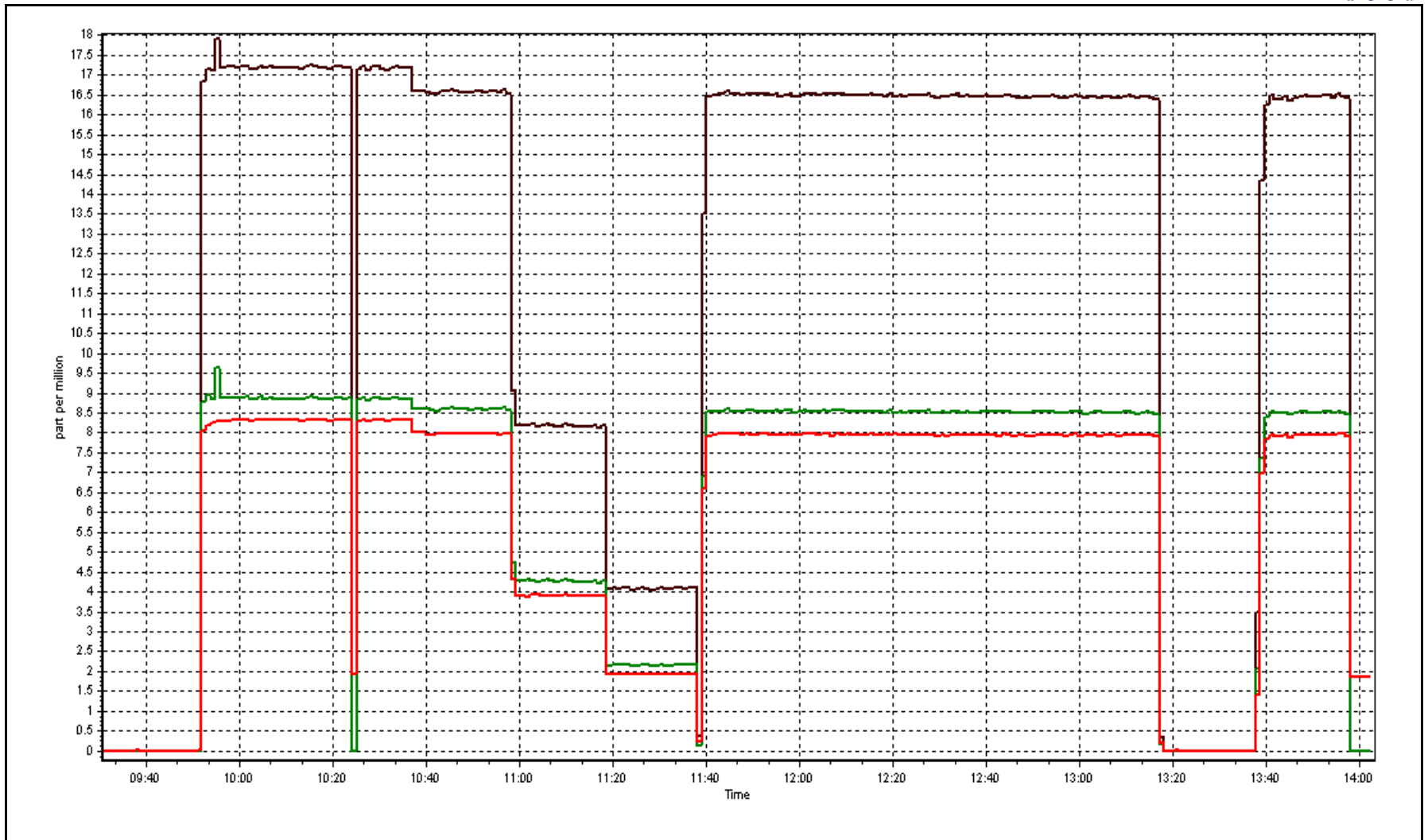
Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation		<u>Limits</u>			
0.00	0.00	----	Correlation Coefficient	0.999980	≥ 0.995			
8.59	8.60	0.9993						
4.30	4.27	1.0072				Slope	0.999547	0.90 - 1.10
2.15	2.15	1.0009						
			Intercept	0.008301	± 0.5			



NMHC Calibration Plot

Date: April 21, 2017

Location: Janvier





Wood Buffalo Environmental Association

O₃ Calibration Report

Version-03-2017

Station Information

Station Name: Janvier Station number: AMS 22
 Calibration Date: April 25, 2017 Last Cal Date: March 15, 2017
 Start time (MST): 9:15 End time (MST): 12:41
 Reason: Routine Calibrator replaced.

Calibration Standards

O₃ generation mode: Photometer O₃ reference Date: April 25, 2017
 Calibrator Make/Model: Teledyne API T700 Serial Number: 2657
 ZAG Make/Model: Teledyne API T701 Serial Number: 135

Analyzer Information

Analyzer make: Thermo 49i Analyzer serial #: 1227254861

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 500 ppb		Pressure	698.8	696.1
Calculated slope	1.008758	0.995024	Flow cell A	0.771	0.769
Calculated intercept	-3.812804	-1.517313	Flow cell B	0.745	0.744
Analyzer Background	-2.6	-2.6	Cell A Intensity	88867	88912
Analyzer Coefficient	1.088	1.060	Cell B Intensity	82089	82050

O₃ Calibration Data

Set Point	Total air flow rate (sccm)	Calibrator Lamp Voltage Drive	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5008	800.0	0.0	-0.2	----
as found span	4900	1068.7	400.0	415.4	0.963
calibrator zero	5008	800.0	0.0	-0.2	----
high point	4899	1070.3	400.0	402.6	0.994
second point	4900	852.7	200.0	203.5	0.983
third point	4900	732.2	100.0	103.7	0.964
as left zero	5008	800.0	0.0	-1.2	----
as left span	4829	1071.0	400.0	406.4	0.984
Average Correction Factor					0.980

Corrected As found 415.60 Previous response 400.34 *% change -3.7%

* = > +/-8% change initiates investigation

Notes: *As founds also performed with previous calibrator API T700P S/N- 2447 before removal- Baseline at -0.3 ppb and span at 418.2 ppb*. Span adjusted.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

O₃ Calibration Summary

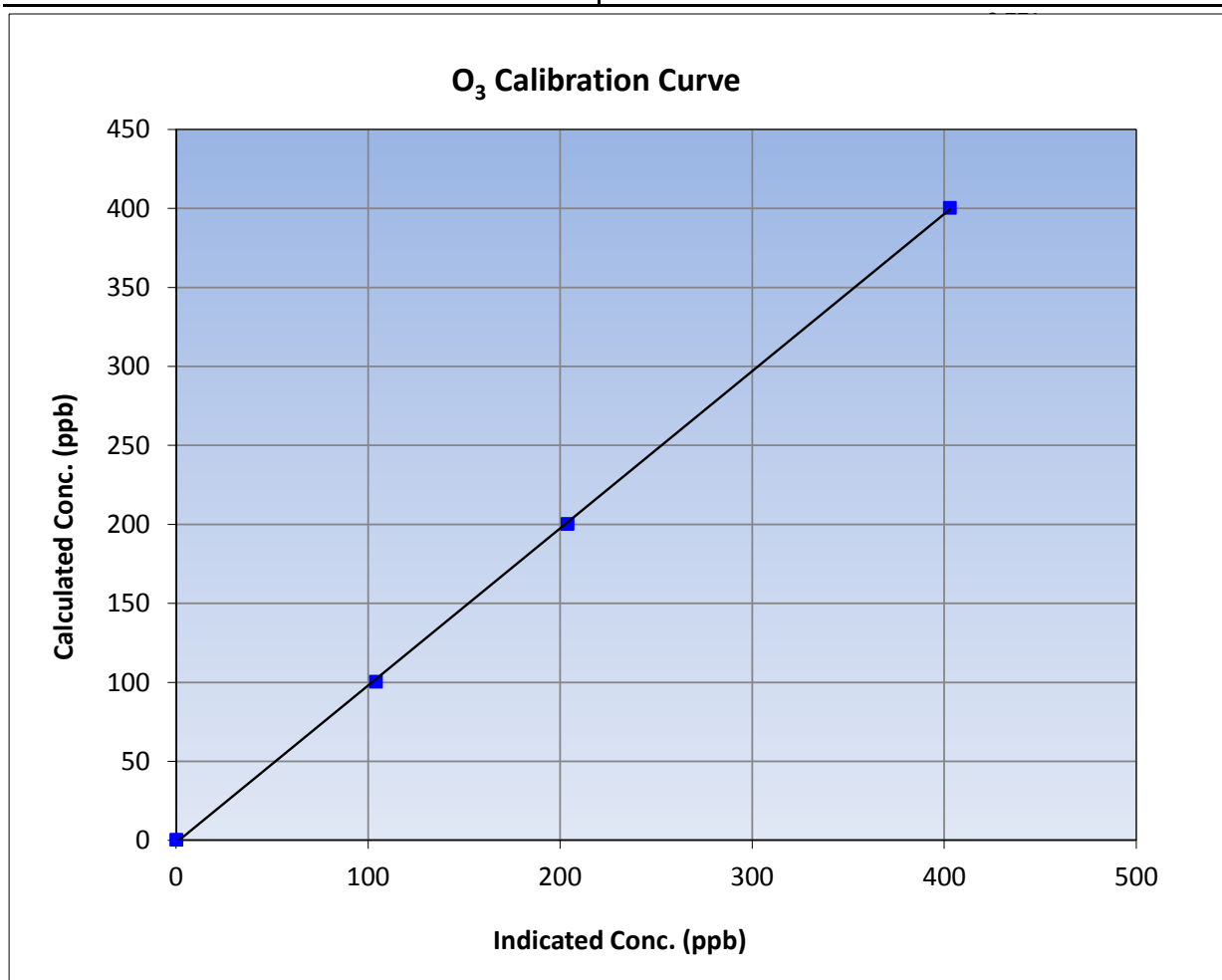
Version-03-2017

Station Information

Calibration Date	April 25, 2017	Previous Calibration	March 15, 2017
Station Name	Janvier	Station Number	AMS 22
Start Time (MST)	9:15	End Time (MST)	12:41
Analyzer make	Thermo 49i	Analyzer serial #	1227254861

Calibration Data

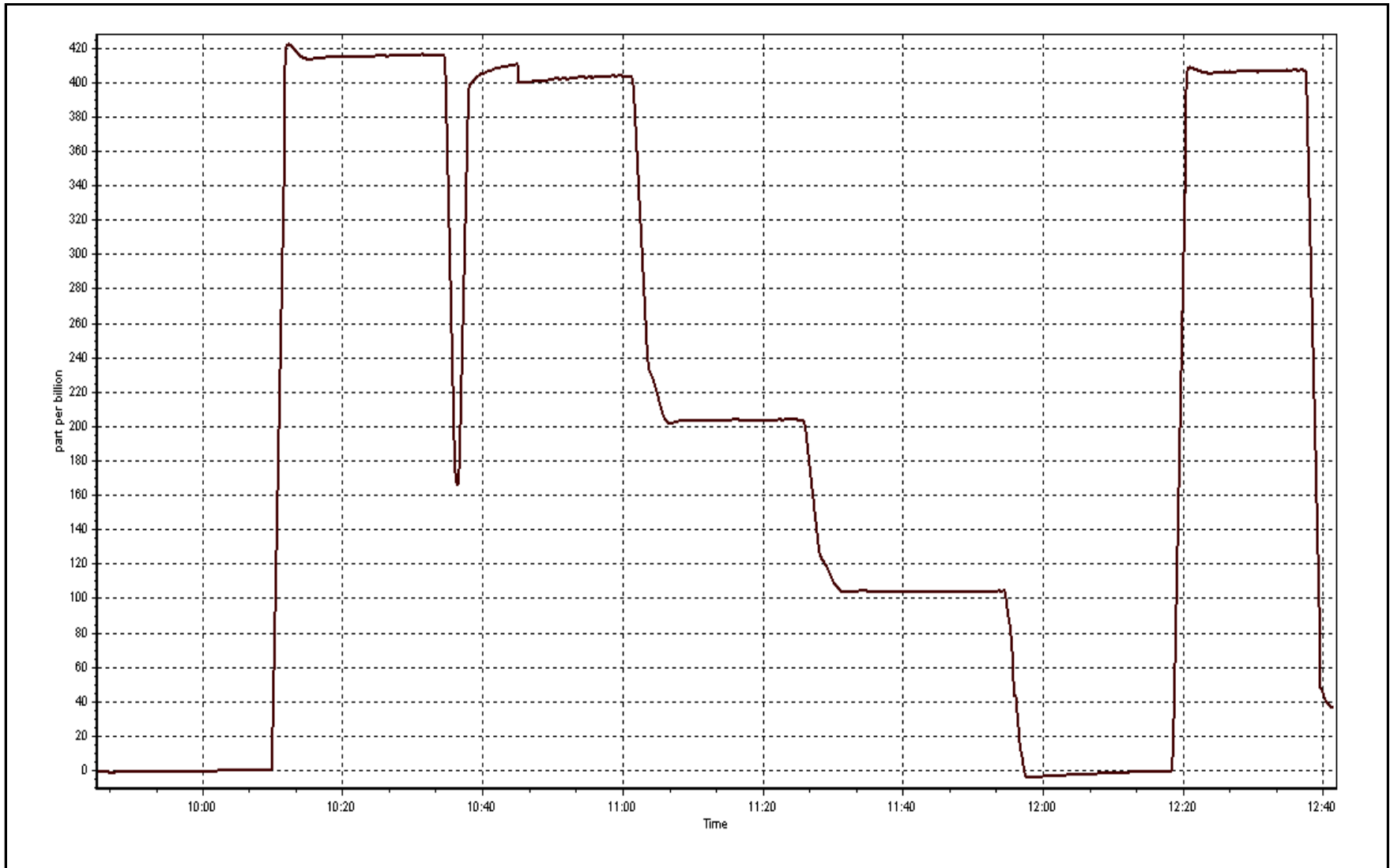
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>
0.0	-0.2	----	Correlation Coefficient	≥0.995
400.0	402.6	0.9935		
200.0	203.5	0.9828	Slope	0.90 - 1.10
100.0	103.7	0.9643		
			Intercept	+/- 10



O₃ Calibration Plot

Date: April 25, 2017

Location: Janvier





Wood Buffalo Environmental Association

SHARP PM_{2.5} CALIBRATION

Version-08-2016

Station Information

Station Name:	Janvier	Station number:	AMS 22
Calibration Date:	April 1, 2017	Last Cal Date:	March 25, 2017
Start time (MST):	9:16	End time (MST):	12:23
Sharp Model:	Thermo 5030 SHARP	S/N:	E-803
Particulate Fraction:	PM2.5	C14 Source S/N:	4173
Flow Standard Model:	Delta-Cal	S/N:	954
Temp/RH standard:	Delta-Cal	S/N:	954

Monthly Calibration Test

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	<u>Tolerance</u>
T1 (°C)	8.9	12	12	<input checked="" type="checkbox"/>	+/- 2 °C
P3 (hPa)	951	947.25	951	<input type="checkbox"/>	+/- 13 hPa
flow (LPH)	1000	1140.6	1000	<input checked="" type="checkbox"/>	+/- 50 LPH
Nephelometer zero	1.4	0	0	<input checked="" type="checkbox"/>	+/- 0.5 ug/m3
Instrument Clock:	Verified <input checked="" type="checkbox"/>	3			
Cyclone cleaning:	PM10 Cyclone <input checked="" type="checkbox"/>		PM2.5 Cyclone <input checked="" type="checkbox"/>		
Filter Tape Installed:	<input type="checkbox"/>				

Quarterly Calibration Test

				<u>Tolerance</u>
Leak Test:	Date of check: <u>Nov 17 2016</u>	Last Cal Date: <u>NA</u>		
	Flow w/o adaptor: <u>16.53</u>	Flow w/ adaptor: <u>16.4</u>		0.4 LPM

Annual Calibration Test

Foil Calibration	Foil Mass: <u>1202</u>	S/N: <u>5332</u>
	Date of check: <u>Nov 17 2016</u>	Last Cal Date: <u>NA</u>
	New Correction Factor: <u>7065</u>	<u>7036</u>

<u>Parameter</u>	<u>As found</u>	<u>Measured</u>	<u>As left</u>	<u>Adjusted</u>	<u>Tolerance</u>
T2 (°C)	16	NA	16	<input type="checkbox"/>	+/- 2 °C
T3 (°C)	18	NA	18	<input type="checkbox"/>	+/- 2 °C
T4 (°C)	12	NA	12	<input type="checkbox"/>	+/- 2 °C
RH (%)	10	NA	10	<input type="checkbox"/>	+/- 10%

Notes: Replaced SHARP S/N: E-1333 with SHARP E-803. Adjusted T1, flow and nephelometer zero.

Calibration by: Aswin Sasi Kumar



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS 500
CENOVUS
CHRISTINA LAKE
APRIL 2017**

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CENOVUS CHRISTINA LAKE (AMS 500)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	35	35	100	10	0	2	0
H2S (ppb) Average	686	33	34	99.86	2	0	0	0
NO2 (ppb) Average	685	35	35	100	12	0	4	-
NO (ppb) Average	685	35	35	100	5	-	1	-
NOX (ppb) Average	685	35	35	100	17	-	5	-
Temperature 2 m (C) Average	720	0	0	100	15.9	-	9.9	-
Relative Humidity (%) Average	720	0	0	100	98	-	97	-
Wind Speed 10 m (km/h) Average	720	0	0	100	28	-	19	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CENOVUS CHRISTINA LAKE (AMS 500)
 APRIL 2017

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.3	1	-	0	0	0	0	0	1	10
H2S (ppb) Average	686	0.1	0	-	0	0	0	0	0	0	2
NO2 (ppb) Average	685	1.4	2	-	0	0	0	1	2	4	12
NO (ppb) Average	685	0.3	1	-	0	0	0	0	0	1	5
NOX (ppb) Average	685	1.7	2	-	0	0	0	1	2	4	17
Temperature 2 m (C) Average	720	1.69	5.1	-	-15.4	-4.1	-1.8	1	5.2	9.2	15.9
Relative Humidity (%) Average	720	69.6	19	-	29	41	55	73	85	93	98
Wind Speed 10 m (km/h) Average	720	10.7	5	-	0	4	6	11	14	17	28
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CENOVUS CHRISTINA LAKE (AMS 500)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	12 Apr 2017 15:00	12 Apr 2017 15:00	1	Maintenance - sample manifold cleaned



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Christina Lake - April 2017

Number of Exceedences (AAAO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 10 ppb on Apr 3 15:00	Maximum Daily Average: 2.0 ppb on Apr 3		Hours of Data:	685
Minimum Value: 0 ppb on Apr 1 05:00	Minimum Daily Average: 0.0 ppb on Apr 18		Hours of Missing Data:	35
Maximum Diurnal Average: 0.8 ppb at hour 15	Minimum Diurnal Average: 0.1 ppb at hour 5		Hours of Calibration:	35
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 5		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.2	4
2-Apr	3	2	0	Z	0	0	0	0	0	2	7	4	2	5	6	4	3	0	0	0	0	1	0	0	1.7	7
3-Apr	0	3	1	0	Z	0	0	2	1	1	1	3	2	4	10	3	1	1	8	0	1	1	1	0	2.0	10
4-Apr	0	0	0	0	0	Z	0	0	0	1	2	1	0	0	0	0	0	0	2	0	0	0	0	0	0.3	2
5-Apr	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	3	2	0	0	0	0	0	0	0.6	3
6-Apr	0	Z	0	0	1	1	2	1	1	1	0	0	3	4	3	1	1	0	0	0	0	0	0	0	0.9	4
7-Apr	0	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
8-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
9-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0.3	5
10-Apr	0	0	0	0	0	Z	0	1	6	5	2	0	0	0	0	0	2	0	1	0	0	0	0	0	0.7	6
11-Apr	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1
12-Apr	0	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0.0	0
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16-Apr	0	0	0	0	0	Z	0	0	0	1	1	1	0	0	0	0	0	0	0	3	1	0	1	1	0.4	3
17-Apr	Z	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
20-Apr	0	0	0	Z	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
22-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
23-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
26-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28-Apr	0	0	0	0	0	Z	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
29-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	1	Z	2	1	0	0	0	3	1	0	0	0	0	0	1	1	7	2	1	0	0	0	0	0	0.9	7

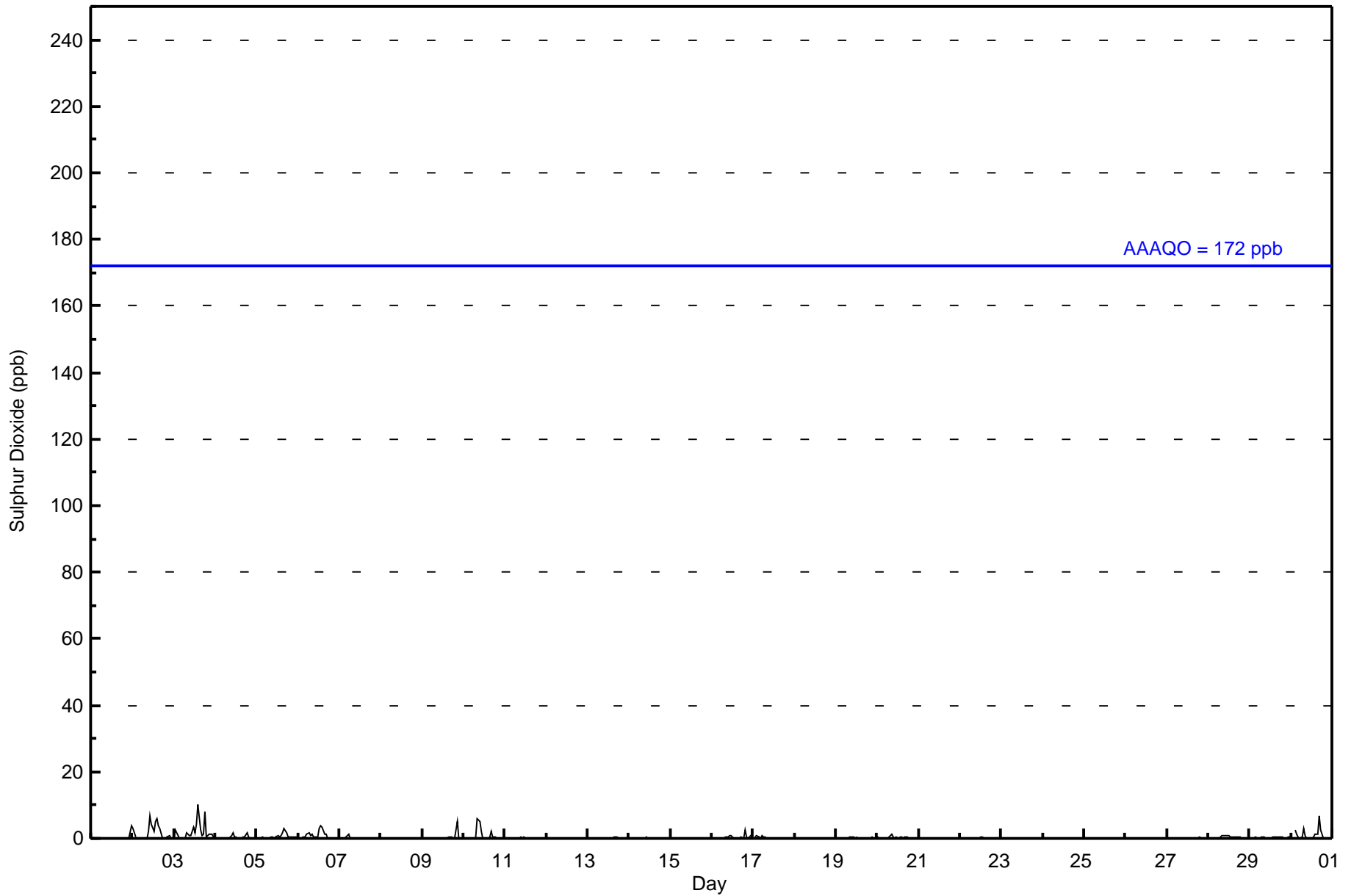
0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.5	0.4	0.4	0.6	0.8	0.4	0.6	0.3	0.5	0.2	0.3	0.1	0.1	0.2	Diurnal Average	
3	3	2	1	1	1	1	2	3	6	5	7	4	3	5	10	4	7	2	8	3	5	1	1	4	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Christina Lake - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Christina Lake - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	685	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Christina Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 10	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685

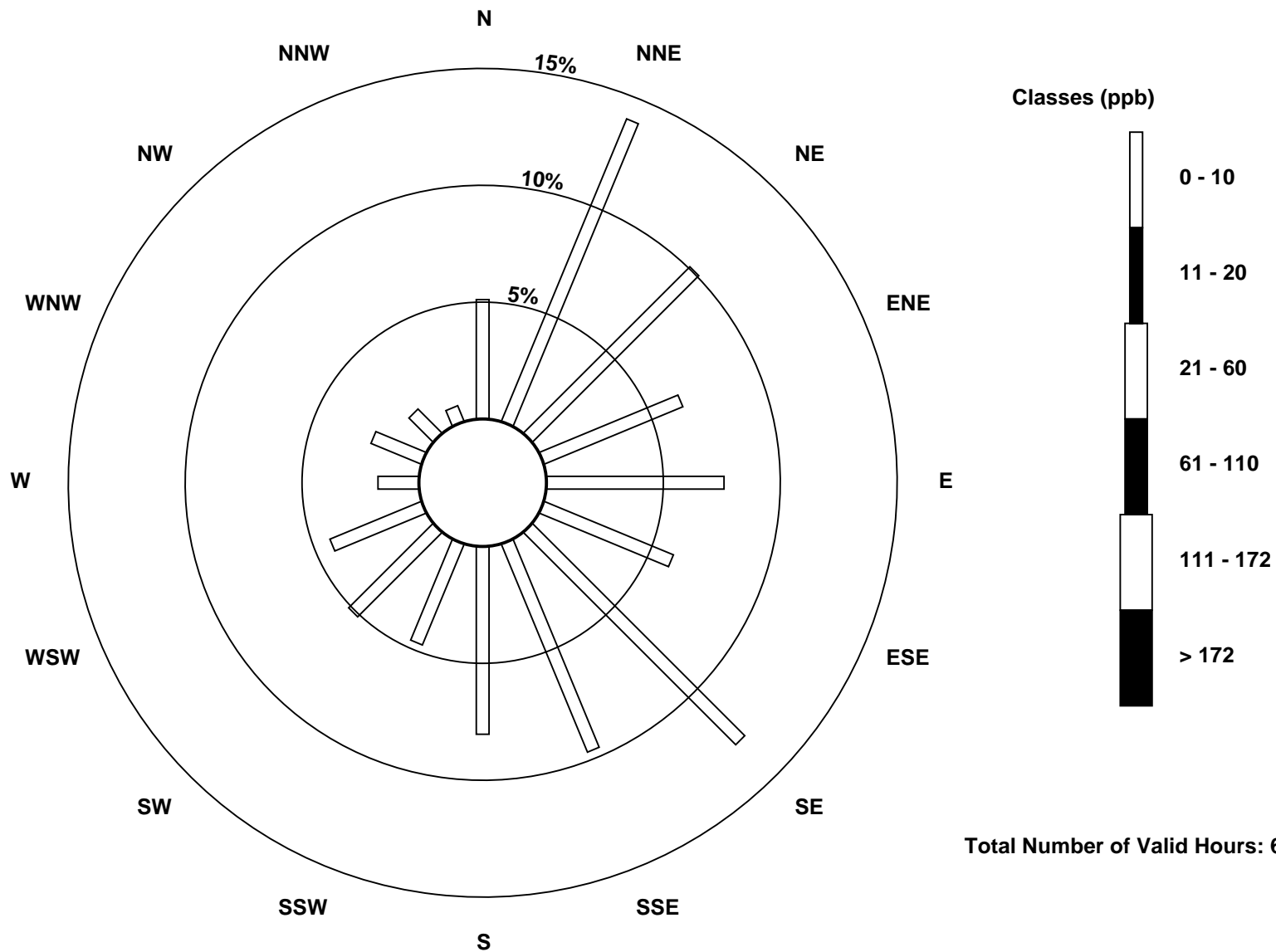
Total Number of Valid Hours: 685

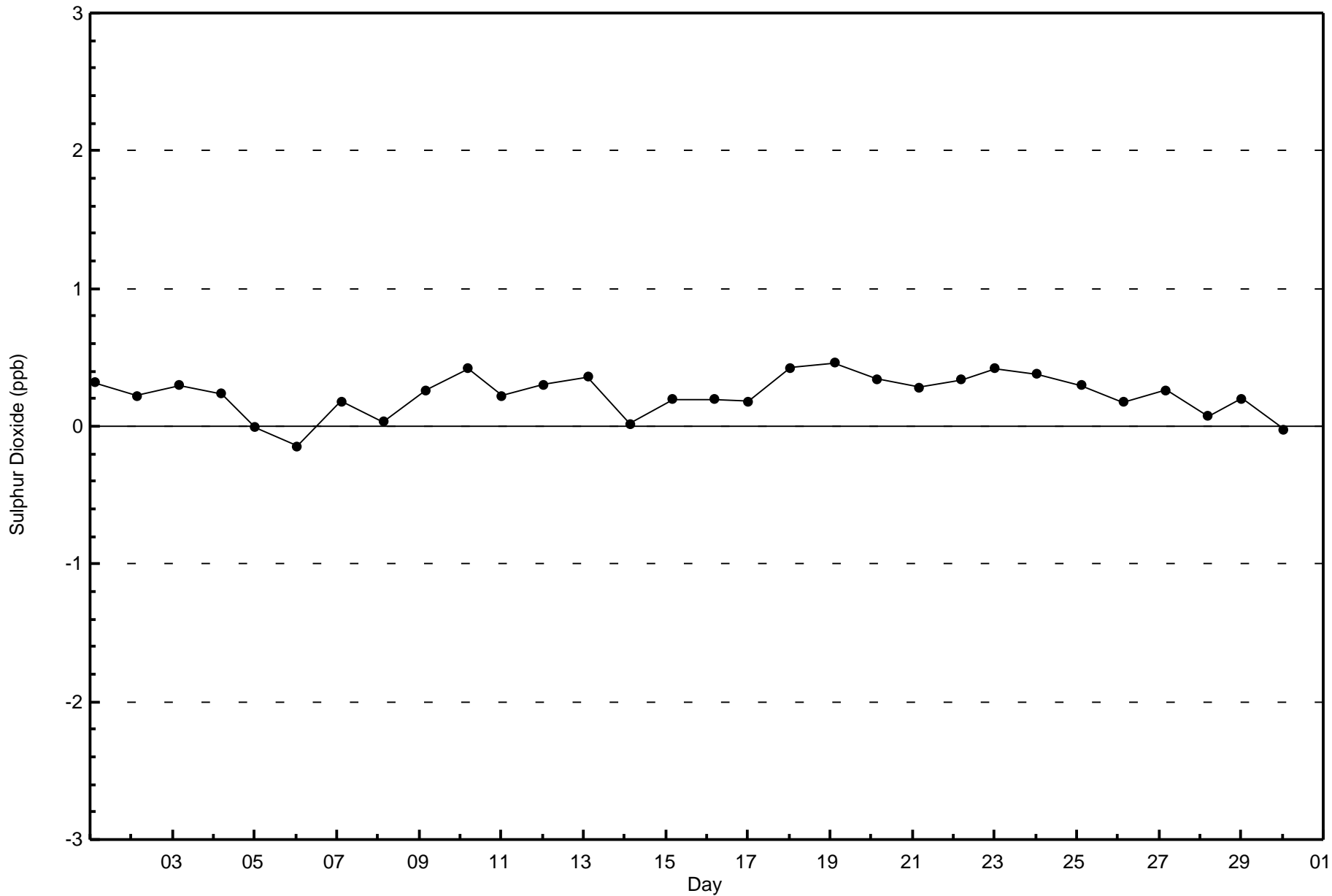
Total Number of Hours: 720

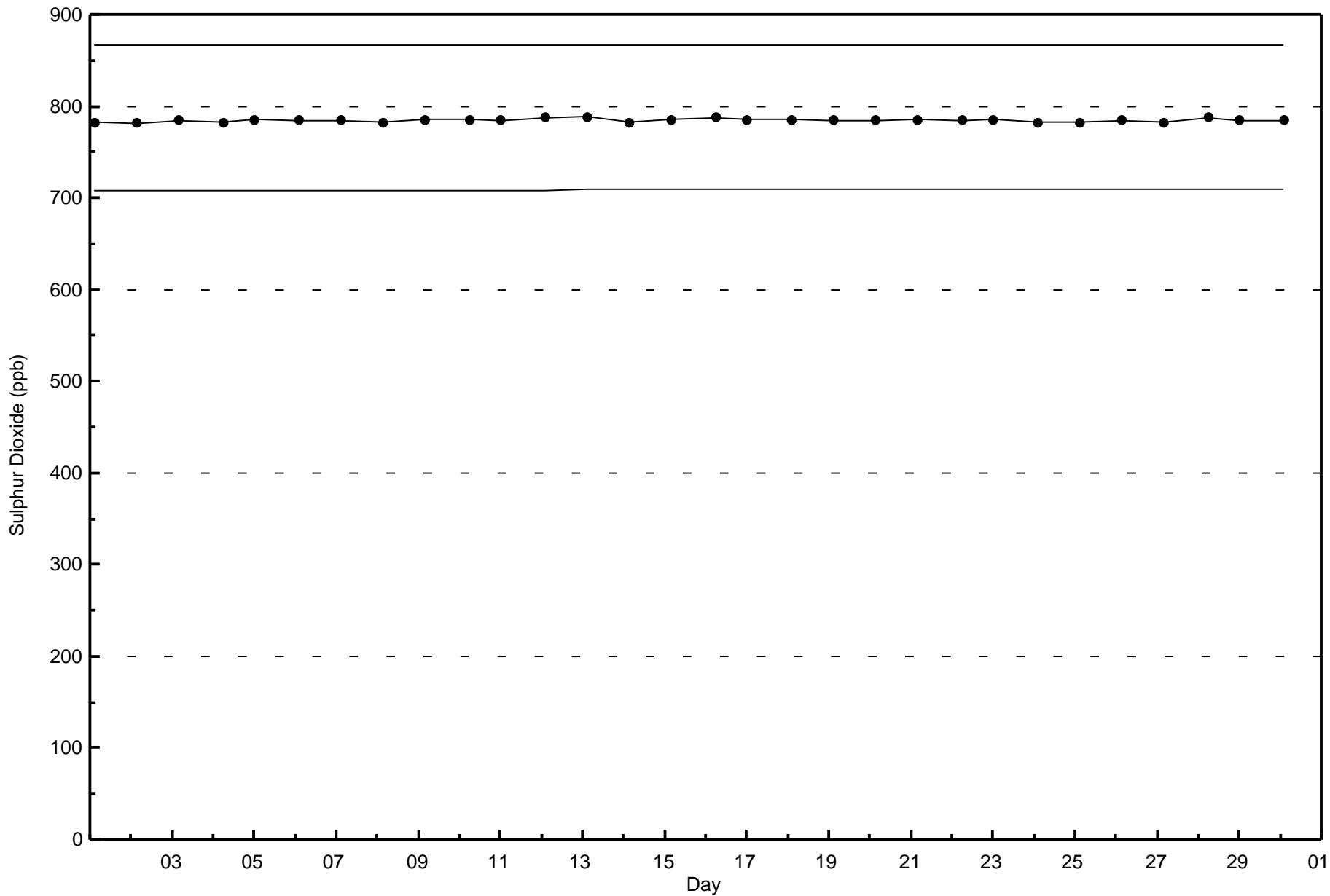


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Christina Lake (AMS500)









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2 ppb on Apr 7 22:00	Maximum Daily Average: 0.5 ppb on Apr 7		Hours of Data:	686
Minimum Value: 0 ppb on Apr 13 01:00	Minimum Daily Average: 0.0 ppb on Apr 14		Hours of Missing Data:	34
Maximum Diurnal Average: 0.2 ppb at hour 22	Minimum Diurnal Average: 0.1 ppb at hour 13		Hours of Calibration:	33
Monthly Average: 0.1 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
2-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
3-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
4-Apr	0	1	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
5-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
6-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0.2	2
7-Apr	0	0	0	Z	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0.5	2
8-Apr	0	1	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
10-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
11-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
12-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	M	C	C	C	0	0	0	0	0	0	0	0.1	0
13-Apr	0	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
14-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
15-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
17-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.2	1
18-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	1
19-Apr	0	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
20-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
21-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
22-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
23-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
26-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
30-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0.2	1

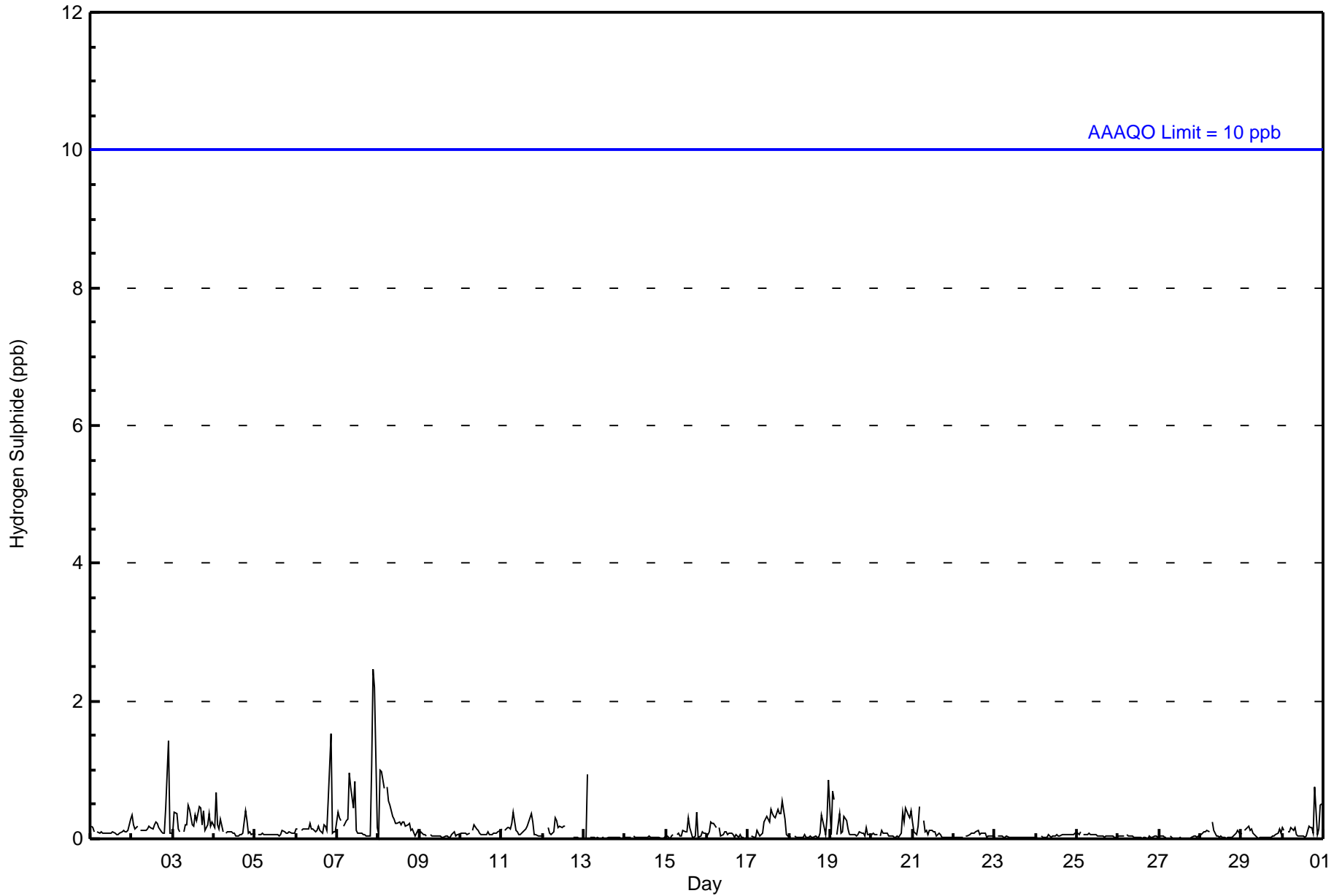
0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	Diurnal Average
0	1	1	1	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	2	2	2	1	Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Christina Lake - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Christina Lake - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	686	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	37	97	68	43	52	40	87	69	56	30	35	29	12	16	10	5	686
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	97	68	43	52	40	87	69	56	30	35	29	12	16	10	5	686

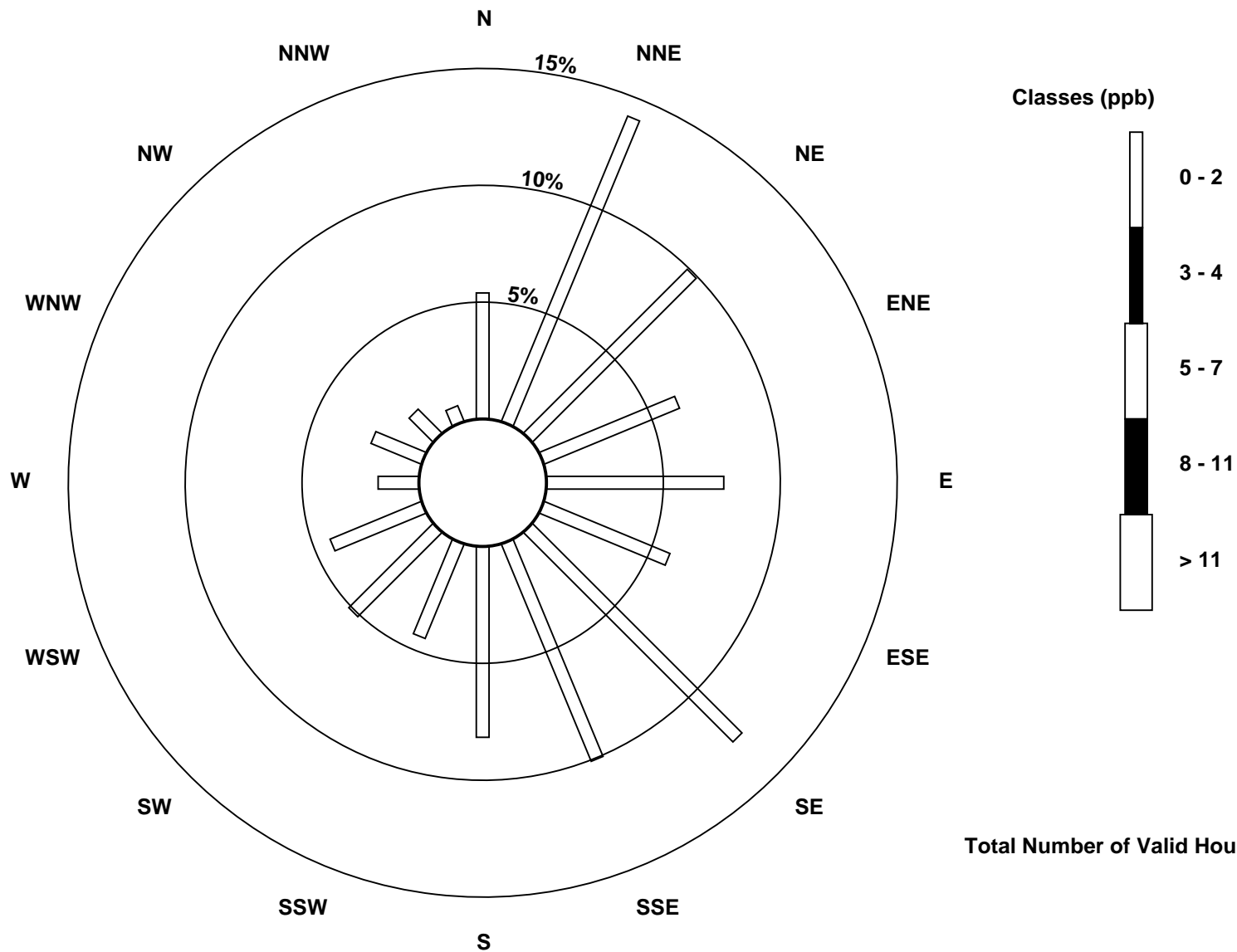
Total Number of Valid Hours: 686

Total Number of Hours: 720

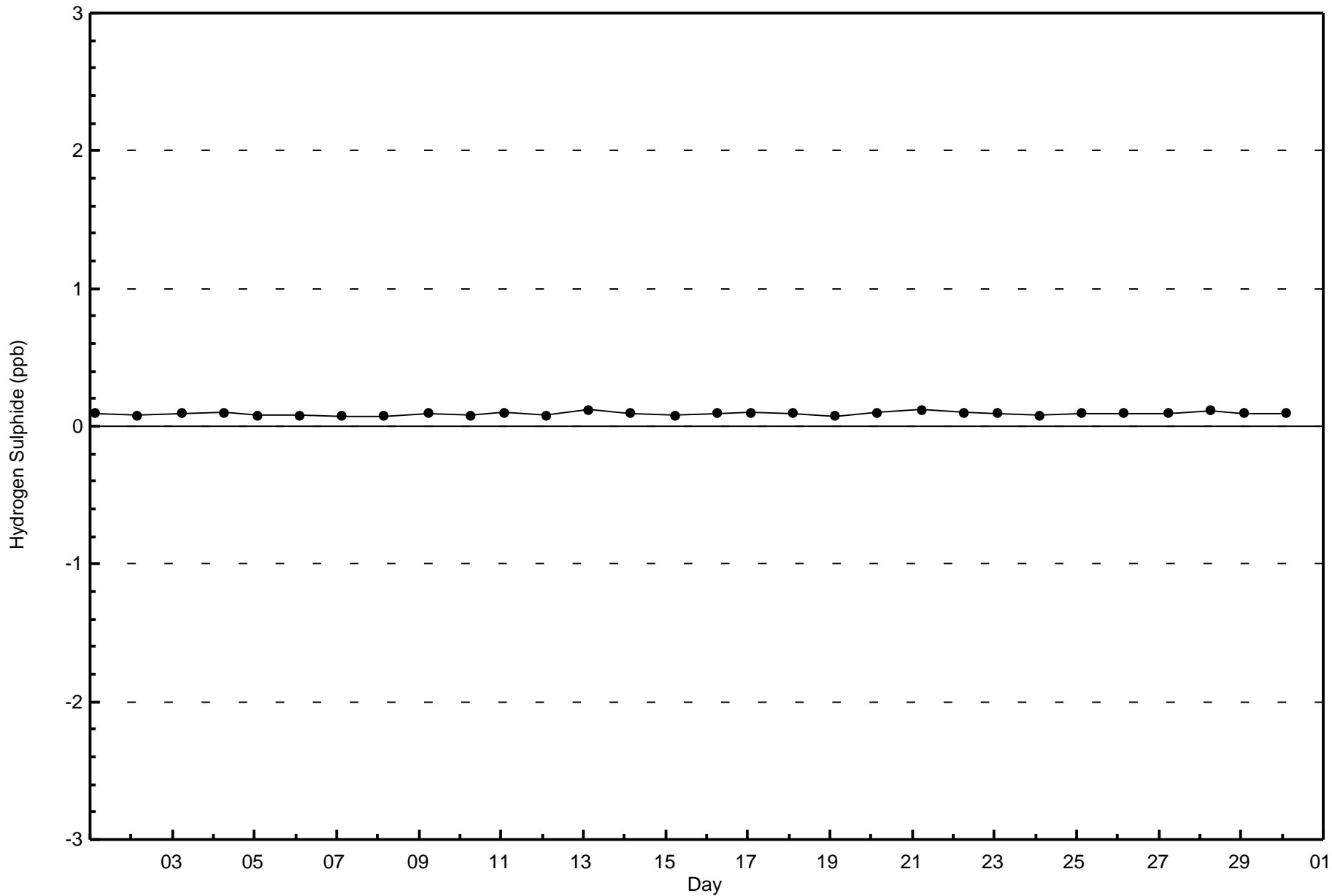


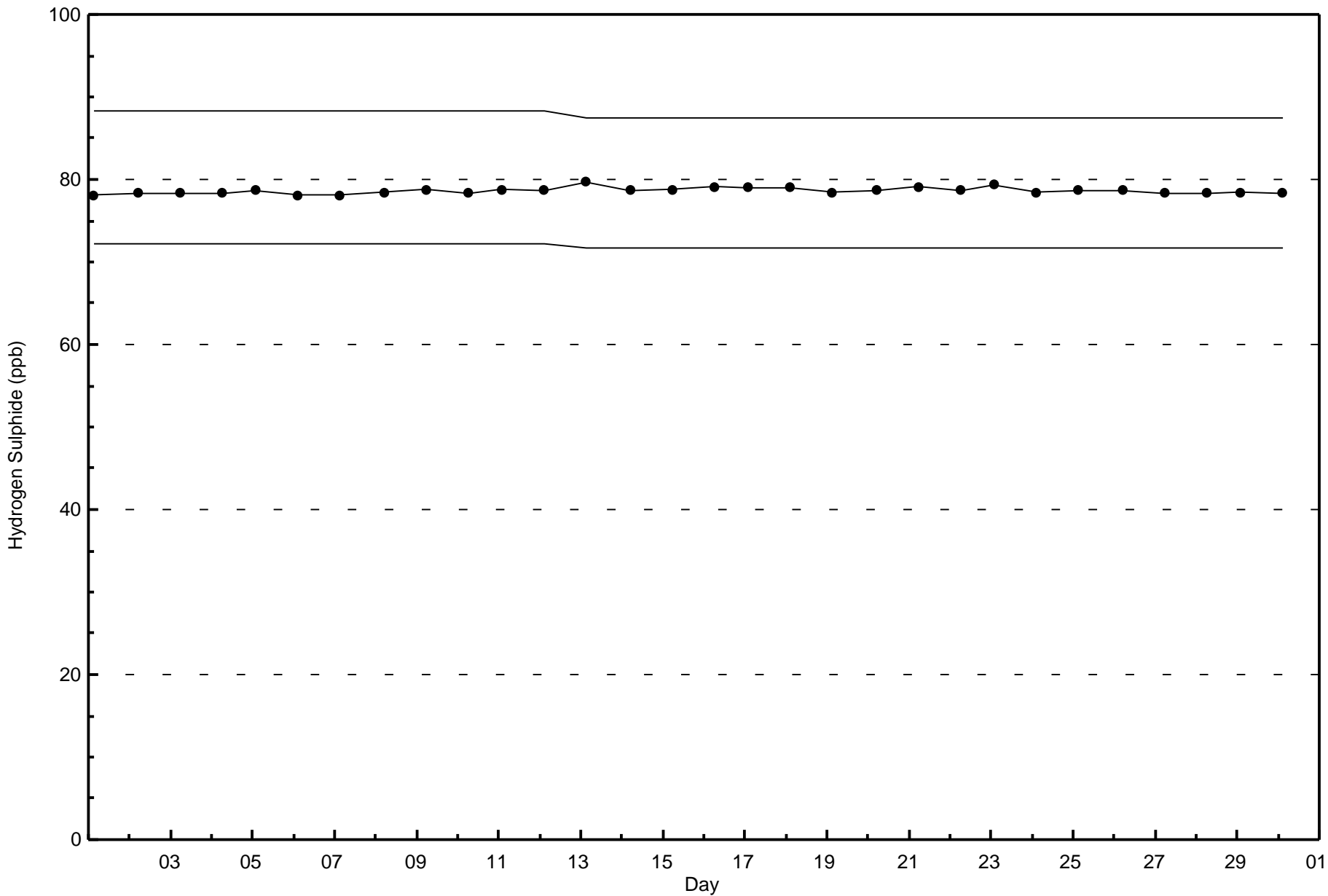
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Christina Lake (AMS500)



Total Number of Valid Hours: 686







Wood Buffalo Environmental Association
Summary of Hour Averages

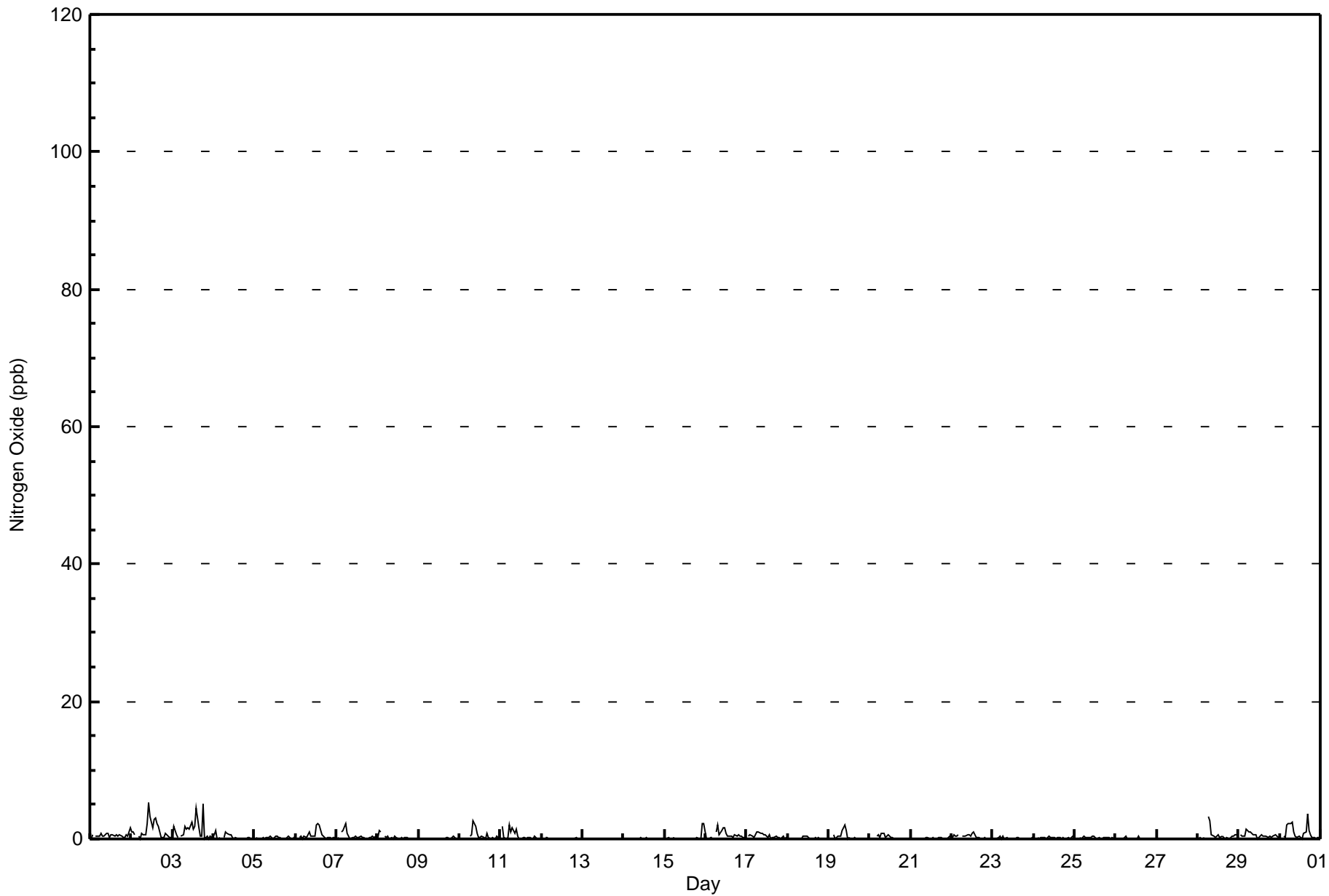
Nitrogen Oxide (NO) - ppb
Christina Lake - April 2017

Maximum Value: 5 ppb on Apr 2 11:00 Maximum Daily Average: 1.3 ppb on Apr 2																	Hours in Service: 720 Hours of Data: 685									
Minimum Value: 0 ppb on Apr 3 20:00 Minimum Daily Average: 0.0 ppb on Apr 27 Maximum Diurnal Average: 0.6 ppb at hour 8 Minimum Diurnal Average: 0.1 ppb at hour 20 Monthly Average: 0.3 ppb Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 3																	Hours of Missing Data: 35 Hours of Calibration: 35 Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	0	1	Z	0	0	0	1	0	0	1	1	0	1	1	0	1	0	1	0	0	0	1	0	2	0.5	2
2-Apr	1	1	1	Z	0	0	1	1	1	2	5	3	2	3	3	2	2	0	0	0	1	0	0	1.3	5	
3-Apr	0	2	1	0	Z	0	1	2	2	2	1	2	1	2	5	2	0	0	5	0	0	0	0	1.3	5	
4-Apr	1	1	0	0	0	Z	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	
5-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
6-Apr	0	Z	0	0	0	0	0	1	1	0	0	0	2	2	2	1	0	0	0	0	0	0	0	0.6	2	
7-Apr	0	0	Z	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2	
8-Apr	0	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
9-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
10-Apr	0	0	0	0	0	Z	0	1	3	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0.4	3	
11-Apr	Z	2	0	0	0	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2	
12-Apr	0	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0.1	0	
13-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
14-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
15-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0.2	2	
16-Apr	0	0	0	0	0	Z	1	2	1	1	2	2	1	1	0	0	0	1	0	1	0	0	0	0.6	2	
17-Apr	Z	0	1	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0.4	1	
18-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
19-Apr	0	0	Z	1	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2	
20-Apr	0	0	0	Z	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
21-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
22-Apr	0	1	0	0	1	Z	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0.3	1	
23-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
24-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
25-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
26-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
27-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	
28-Apr	0	0	0	0	0	Z	3	3	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0.5	3	
29-Apr	Z	1	1	0	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0.5	1	
30-Apr	0	Z	0	0	2	2	2	2	1	0	0	0	0	0	1	1	4	1	1	0	0	0	0	0.9	4	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxide (NO) - ppb
Christina Lake - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxide (NO) - ppb
Christina Lake - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxide (NO) - ppb
Christina Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685

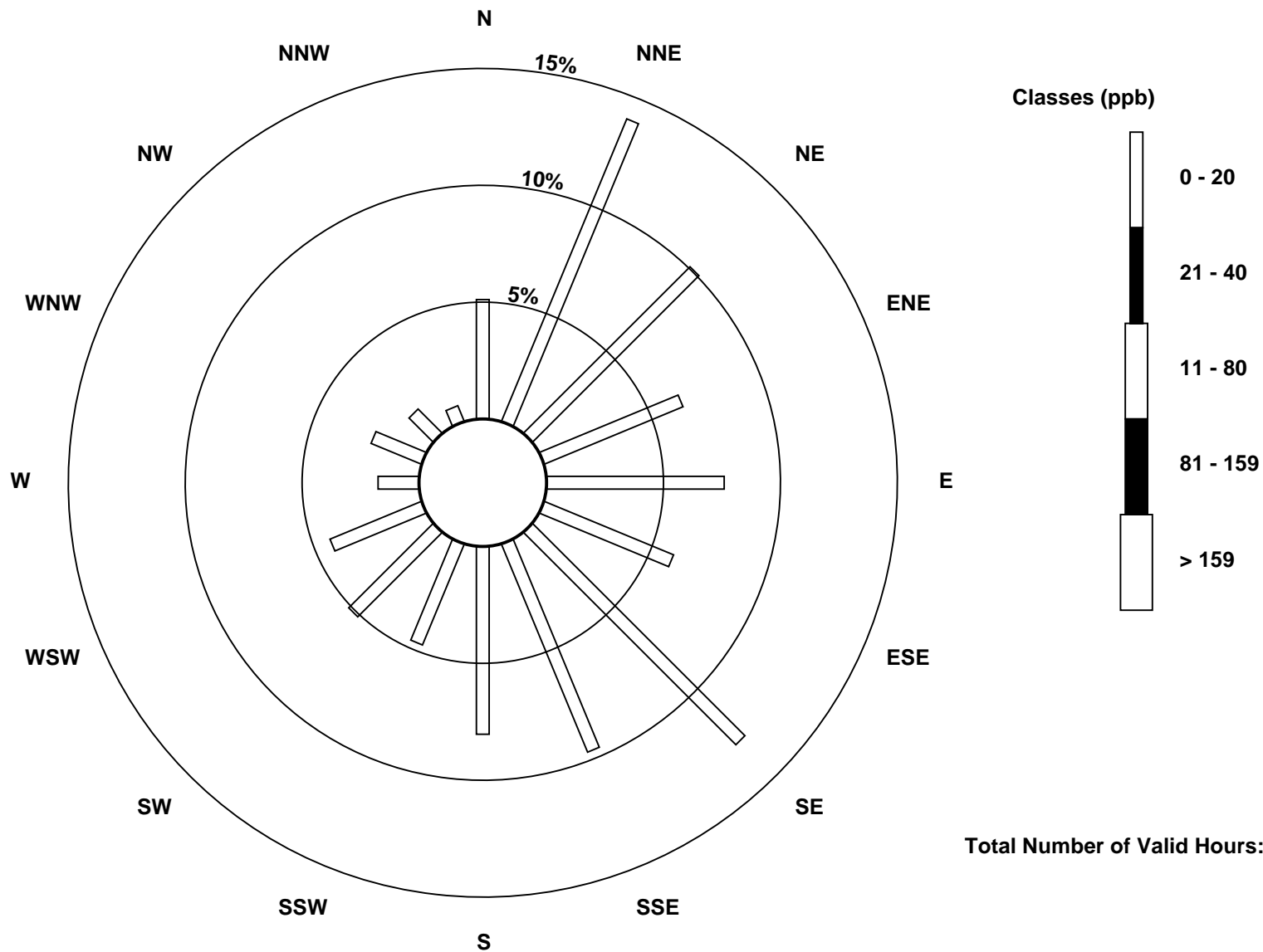
Total Number of Valid Hours: 685

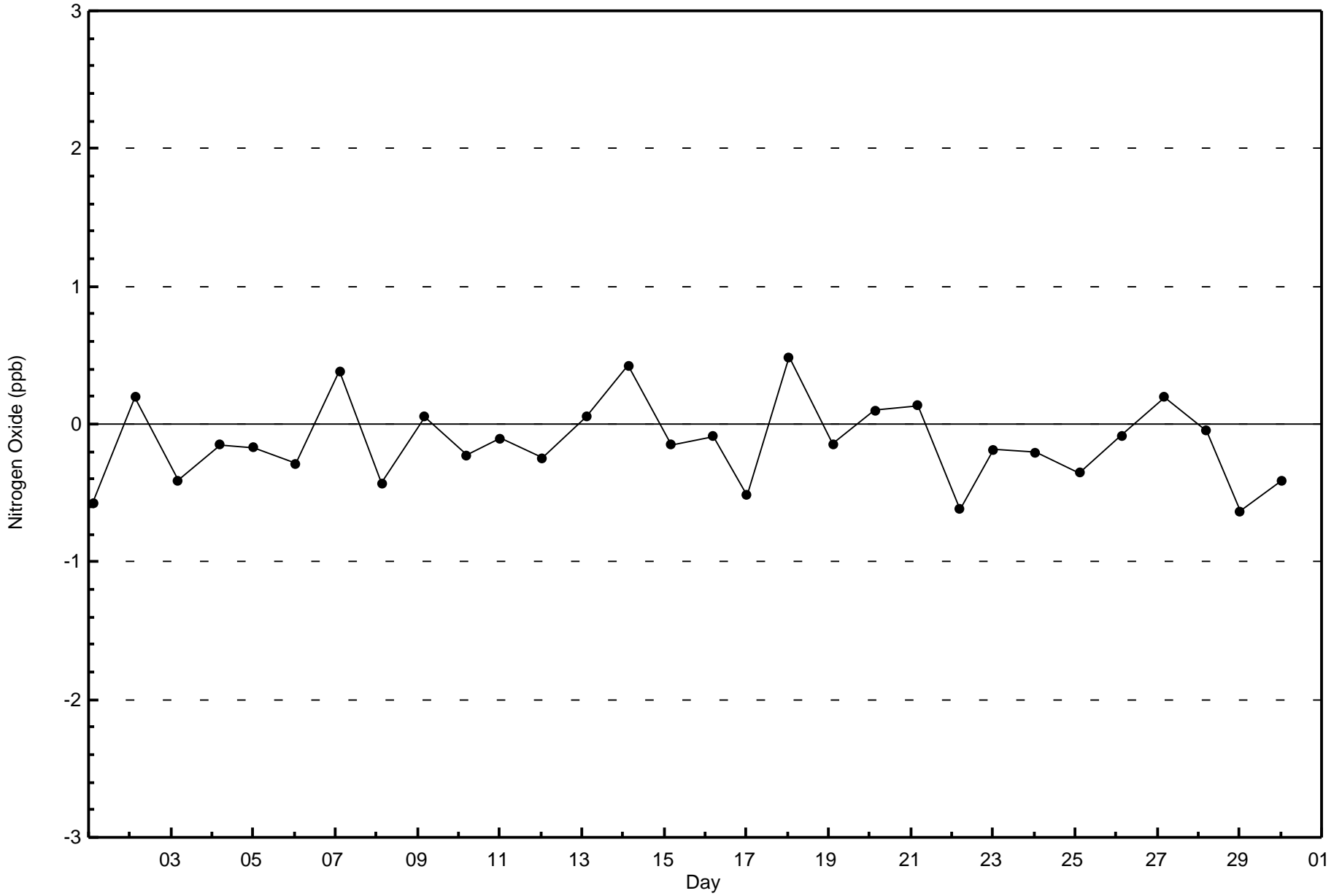
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxide (NO) - ppb
Christina Lake (AMS500)

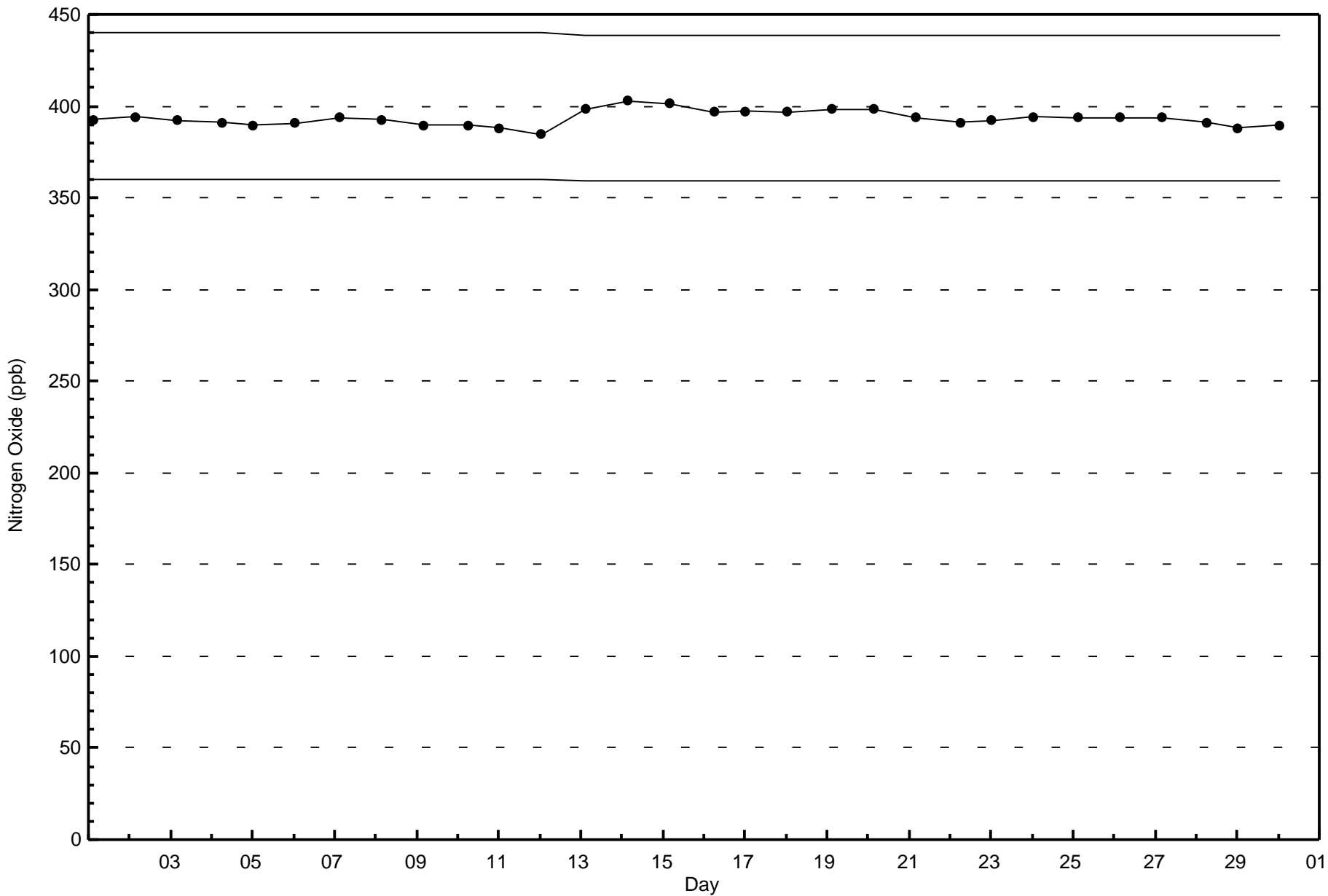






Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxide (NO) - ppb
Christina Lake - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

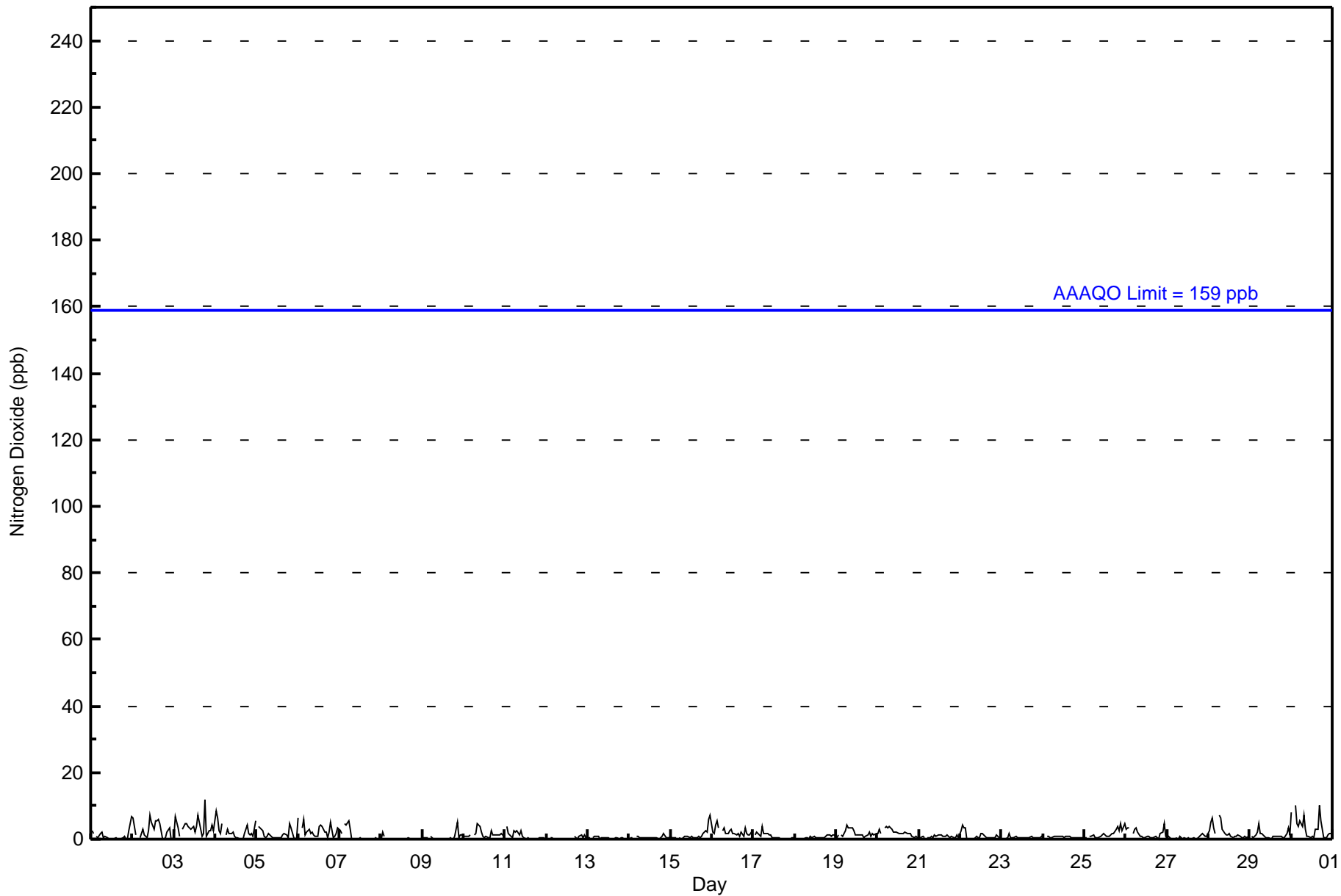
Christina Lake - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 12 ppb on Apr 3 19:00	Maximum Daily Average: 3.5 ppb on Apr 3		Hours of Data:	685
Minimum Value: 0 ppb on Apr 1 11:00	Minimum Daily Average: 0.2 ppb on Apr 8		Hours of Missing Data:	35
Maximum Diurnal Average: 2.2 ppb at hour 2	Minimum Diurnal Average: 0.9 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 1.4 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 7		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	2	2	Z	1	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	2	7	1.0	7	
2-Apr	6	4	1	Z	1	2	3	1	1	3	7	5	3	5	5	6	5	0	0	0	2	4	0	0	2.8	7	
3-Apr	1	7	4	1	Z	3	5	5	4	3	3	4	2	4	7	3	1	2	12	1	3	3	4	2	3.5	12	
4-Apr	8	6	3	2	5	Z	1	3	2	2	2	1	1	0	0	0	0	2	4	2	1	2	1	5	2.3	8	
5-Apr	Z	4	3	3	1	1	1	2	1	1	1	0	1	1	0	1	2	1	0	5	3	1	0	1	1.3	5	
6-Apr	6	Z	4	6	1	2	3	2	2	1	1	1	4	4	4	2	2	0	2	5	1	1	2	4	2.6	6	
7-Apr	2	2	Z	5	4	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1.0	6	
8-Apr	0	2	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2	
9-Apr	0	0	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	5	1	1	1	0.5	5	
10-Apr	1	1	1	1	1	Z	1	2	5	4	2	1	0	1	1	1	3	1	1	1	1	1	2	1	1.4	5	
11-Apr	Z	4	2	1	1	2	2	3	1	3	1	1	0	0	0	0	0	0	0	0	1	1	0	0	1.0	4	
12-Apr	1	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	1	0	0	1	1	1	1	1	0.4	1	
13-Apr	0	1	Z	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	
14-Apr	0	0	0	Z	1	1	1	0	1	0	0	1	0	1	0	0	0	0	0	1	2	1	1	0	0.5	2	
15-Apr	1	1	1	0	Z	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	6	7	1.3	7
16-Apr	2	2	4	6	3	Z	2	4	2	2	3	3	2	2	1	2	1	2	1	4	2	1	1	2	2.3	6	
17-Apr	Z	1	2	1	1	4	2	2	2	1	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0.9	4	
18-Apr	0	Z	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	0.6	1	
19-Apr	1	1	Z	1	1	3	4	3	3	3	2	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1.7	4
20-Apr	2	3	2	Z	3	4	4	4	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2.0	4	
21-Apr	0	1	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	0.8	1	
22-Apr	3	4	4	3	0	Z	0	0	0	1	1	0	2	2	1	0	0	0	0	1	0	1	1	0	1.0	4	
23-Apr	Z	0	0	0	2	1	0	0	1	1	0	0	0	1	1	1	0	1	1	1	1	0	0	1	0.5	2	
24-Apr	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0.6	1	
25-Apr	1	0	Z	1	1	1	0	1	1	1	1	1	2	1	1	1	1	2	2	3	4	2	5	3	5	1.6	5
26-Apr	3	3	3	Z	2	3	3	2	1	1	1	1	1	1	1	1	1	1	1	0	2	2	5	1	1.6	5	
27-Apr	1	1	0	0	Z	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	2	1	1	1	0.5	2	
28-Apr	3	5	6	3	2	Z	7	6	3	2	1	1	2	1	1	1	1	1	1	1	0	1	1	1	2.2	7	
29-Apr	Z	1	1	1	2	5	2	2	1	1	0	0	0	1	1	1	1	1	1	1	1	2	4	1	1.2	5	
30-Apr	8	Z	10	5	4	6	4	7	3	1	1	1	1	1	3	3	10	5	3	0	1	1	2	2	3.5	10	

2.1	2.2	2.1	1.7	1.4	1.9	1.8	1.7	1.3	1.2	1.2	1.0	0.9	1.0	1.1	1.0	1.2	0.9	1.2	1.2	1.2	1.2	1.1	1.4	1.6	Diurnal Average	
8	7	10	6	5	6	7	7	5	4	7	5	4	5	7	6	10	5	12	5	5	5	5	6	7	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685

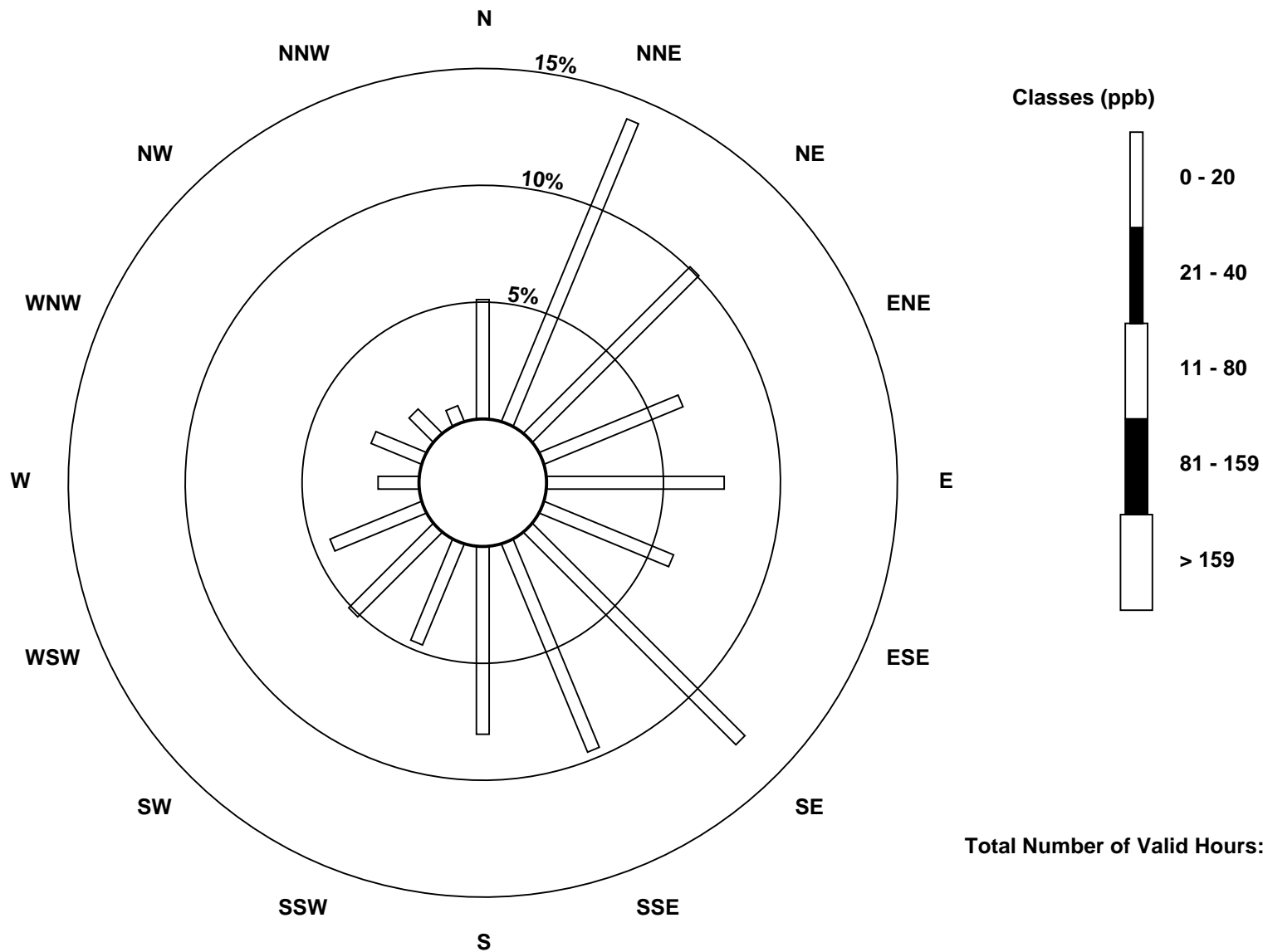
Total Number of Valid Hours: 685

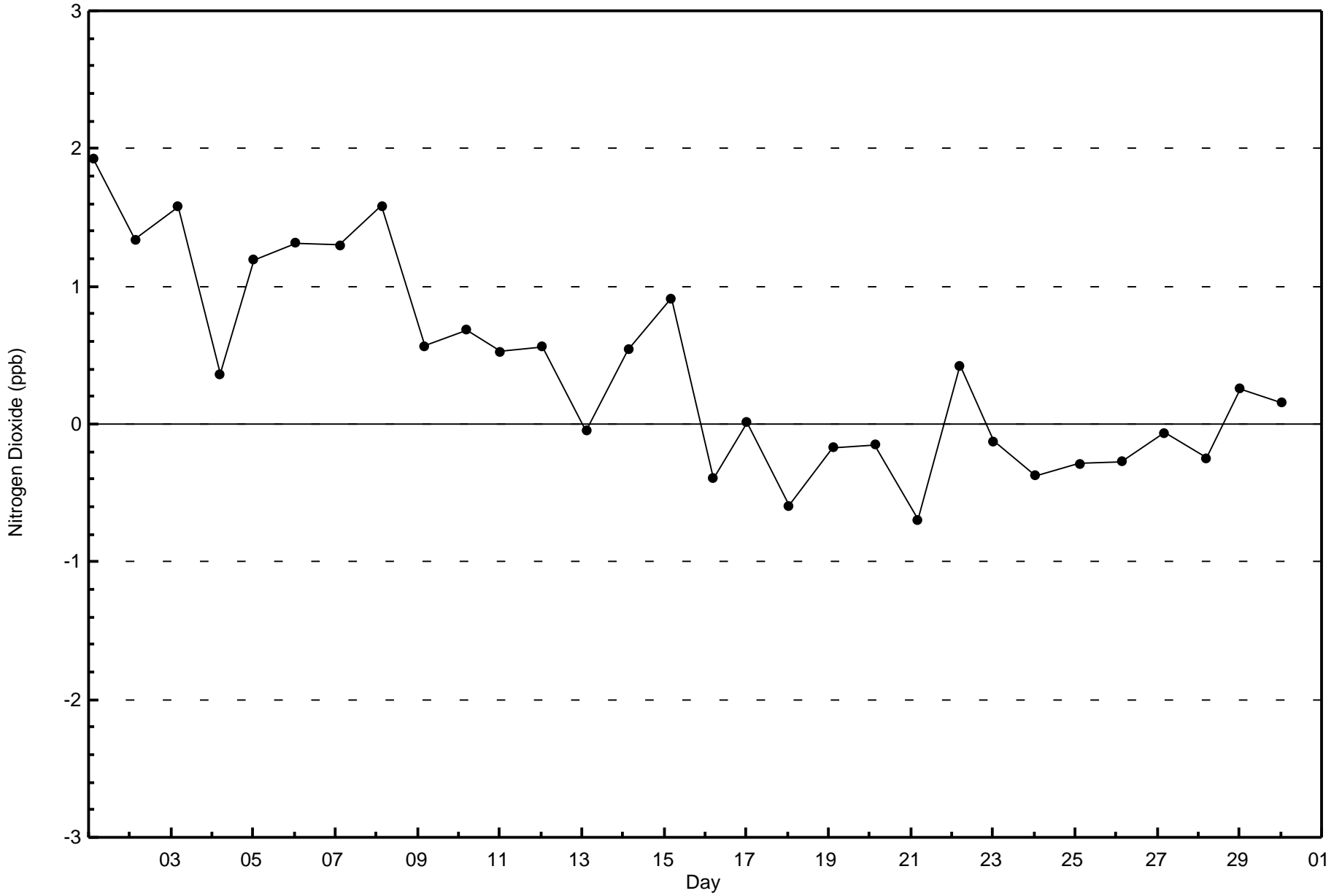
Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Christina Lake (AMS500)

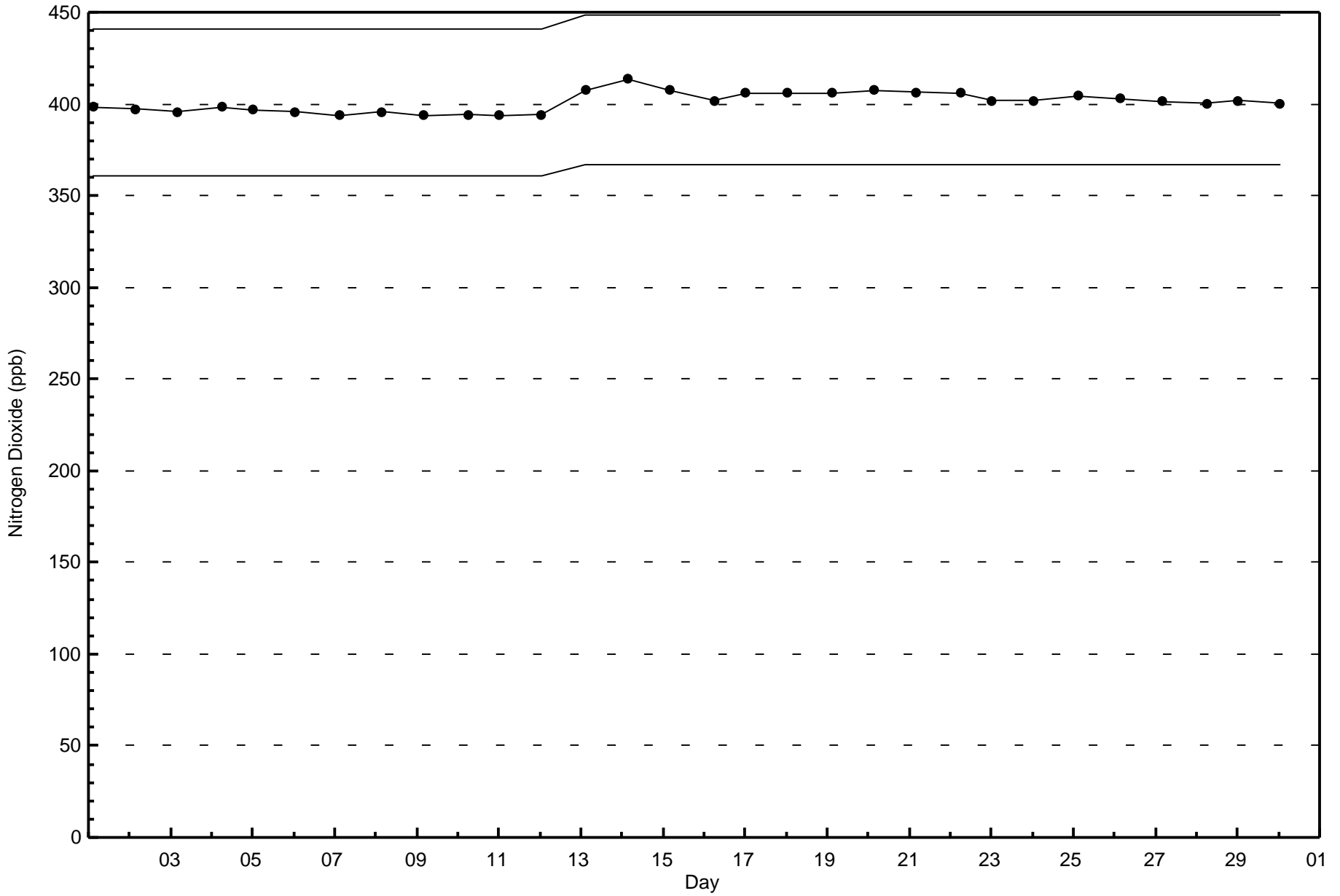






Wood Buffalo Environmental Association
Span Responses

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - April 2017





Wood Buffalo Environmental Association
Summary of Hour Averages

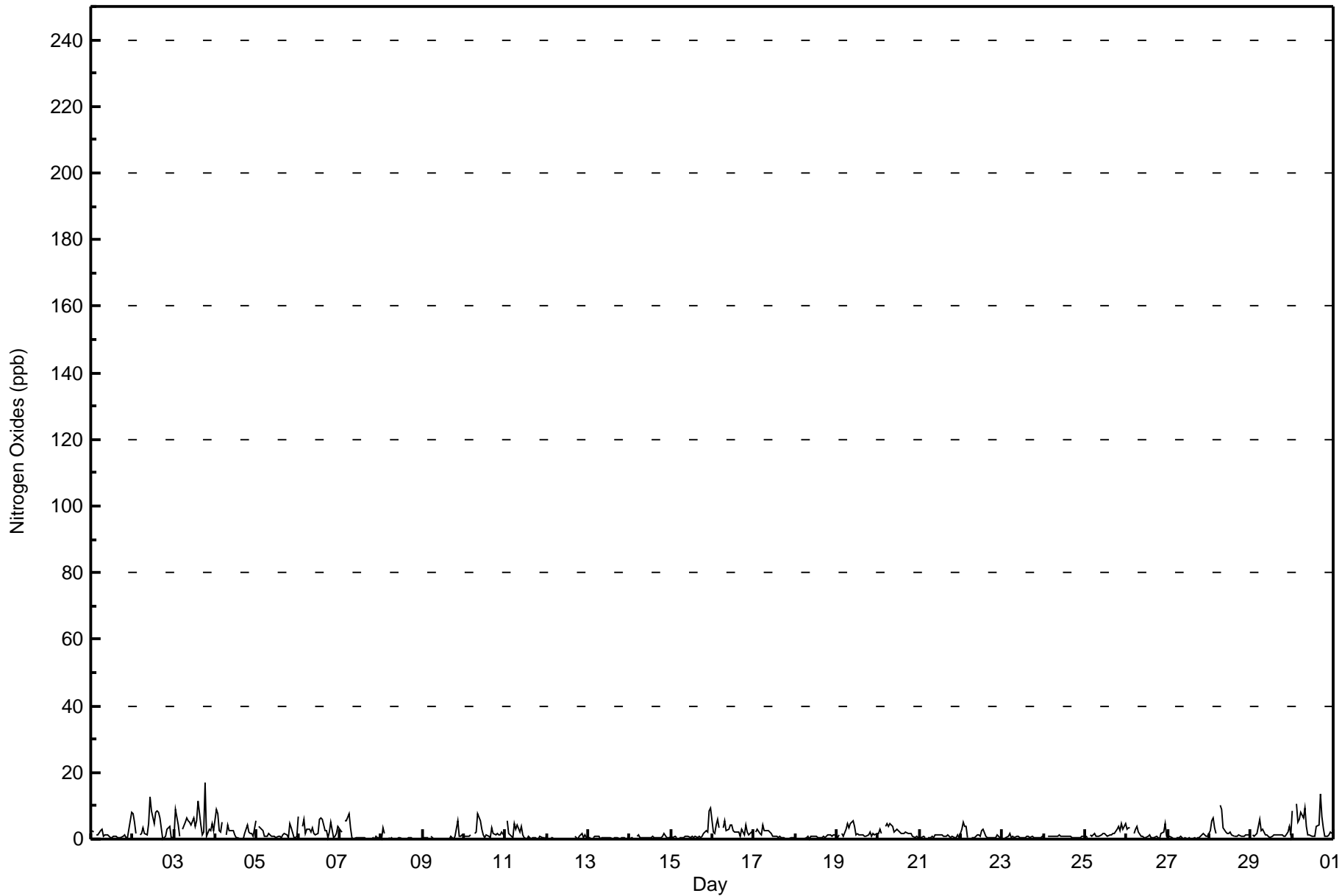
Nitrogen Oxides (NO_x) - ppb
Christina Lake - April 2017

Maximum Value: 17 ppb on Apr 3 19:00																	Maximum Daily Average: 4.8 ppb on Apr 3							Hours in Service: 720			
Minimum Value: 0 ppb on Apr 7 19:00																	Minimum Daily Average: 0.3 ppb on Apr 13							Hours of Data: 685			
Maximum Diurnal Average: 2.6 ppb at hour 2																	Minimum Diurnal Average: 1.1 ppb at hour 18							Hours of Missing Data: 35			
Monthly Average: 1.7 ppb																	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 9							Hours of Calibration: 35			
																	Percent Operational Time: 100.0										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	3	2	Z	1	1	2	3	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	3	8	1.5	8	
2-Apr	7	5	2	Z	1	2	4	2	1	5	13	8	5	8	8	8	7	0	0	1	3	4	0	0	4.1	13	
3-Apr	1	9	4	1	Z	3	5	6	5	5	4	6	4	6	12	4	1	2	17	1	3	3	5	3	4.8	17	
4-Apr	9	7	3	2	5	Z	1	4	3	2	3	1	1	1	0	0	0	2	4	2	2	1	5	2.6	9		
5-Apr	Z	4	3	3	1	1	1	2	1	1	1	0	1	1	1	1	2	1	0	5	3	1	0	1	1.5	5	
6-Apr	7	Z	4	6	2	3	3	2	3	2	1	2	6	7	6	3	3	1	2	5	1	1	2	4	3.1	7	
7-Apr	2	2	Z	6	5	8	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1.4	8	
8-Apr	0	3	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0.4	3	
9-Apr	0	0	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	5	1	1	1	0.5	5	
10-Apr	1	1	1	1	1	Z	2	2	7	6	3	1	1	1	1	1	3	2	1	2	1	1	2	1	1.8	7	
11-Apr	Z	6	2	1	1	5	3	4	2	4	1	1	0	1	0	0	0	0	0	0	1	0	0	0	1.4	6	
12-Apr	1	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	1	0	0	1	2	0	1	1	0.5	2	
13-Apr	0	0	Z	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	
14-Apr	0	0	0	Z	1	1	1	0	1	0	1	1	0	1	0	0	0	0	0	1	2	1	1	0	0.5	2	
15-Apr	1	0	1	0	Z	1	0	0	1	1	1	0	1	1	1	1	1	1	1	2	3	2	8	9	1.5	9	
16-Apr	2	2	4	6	3	Z	4	6	3	3	4	4	2	2	2	2	1	3	1	4	2	1	2	3	2.9	6	
17-Apr	Z	2	3	2	1	4	3	3	2	2	2	1	1	1	0	1	0	0	0	0	0	0	0	0	1.3	4	
18-Apr	1	Z	0	0	0	0	0	1	0	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0.7	1	
19-Apr	1	1	Z	2	1	3	5	4	4	5	4	1	2	1	1	1	1	1	1	2	1	2	1	2	2.0	5	
20-Apr	2	3	2	Z	4	5	4	5	4	2	3	3	2	2	2	2	2	2	2	2	1	1	1	1	2.2	5	
21-Apr	0	1	1	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0.8	1	
22-Apr	3	5	4	4	1	Z	0	0	0	1	1	1	2	3	1	0	1	0	0	1	0	1	1	0	1.4	5	
23-Apr	Z	0	0	1	2	1	1	0	1	1	1	0	0	0	1	1	0	1	1	1	1	0	0	1	0.6	2	
24-Apr	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0.7	1	
25-Apr	1	0	Z	1	1	2	1	1	1	1	2	2	1	1	1	1	1	2	2	3	4	2	4	3	5	1.8	5
26-Apr	3	3	3	Z	2	3	4	2	1	1	0	0	1	1	1	1	0	1	1	0	2	2	5	1	1.6	5	
27-Apr	1	1	0	0	Z	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	2	1	1	1	0.5	2	
28-Apr	3	5	6	3	2	Z	10	9	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2.7	10	
29-Apr	Z	1	1	2	4	6	3	3	1	1	1	0	1	1	1	1	1	1	1	1	1	2	4	1	1.7	6	
30-Apr	9	Z	10	5	6	8	6	9	4	1	1	1	1	1	4	4	14	7	3	1	1	1	2	2	4.4	14	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Christina Lake - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	96	69	44	52	41	88	66	55	32	35	29	12	16	10	5	685

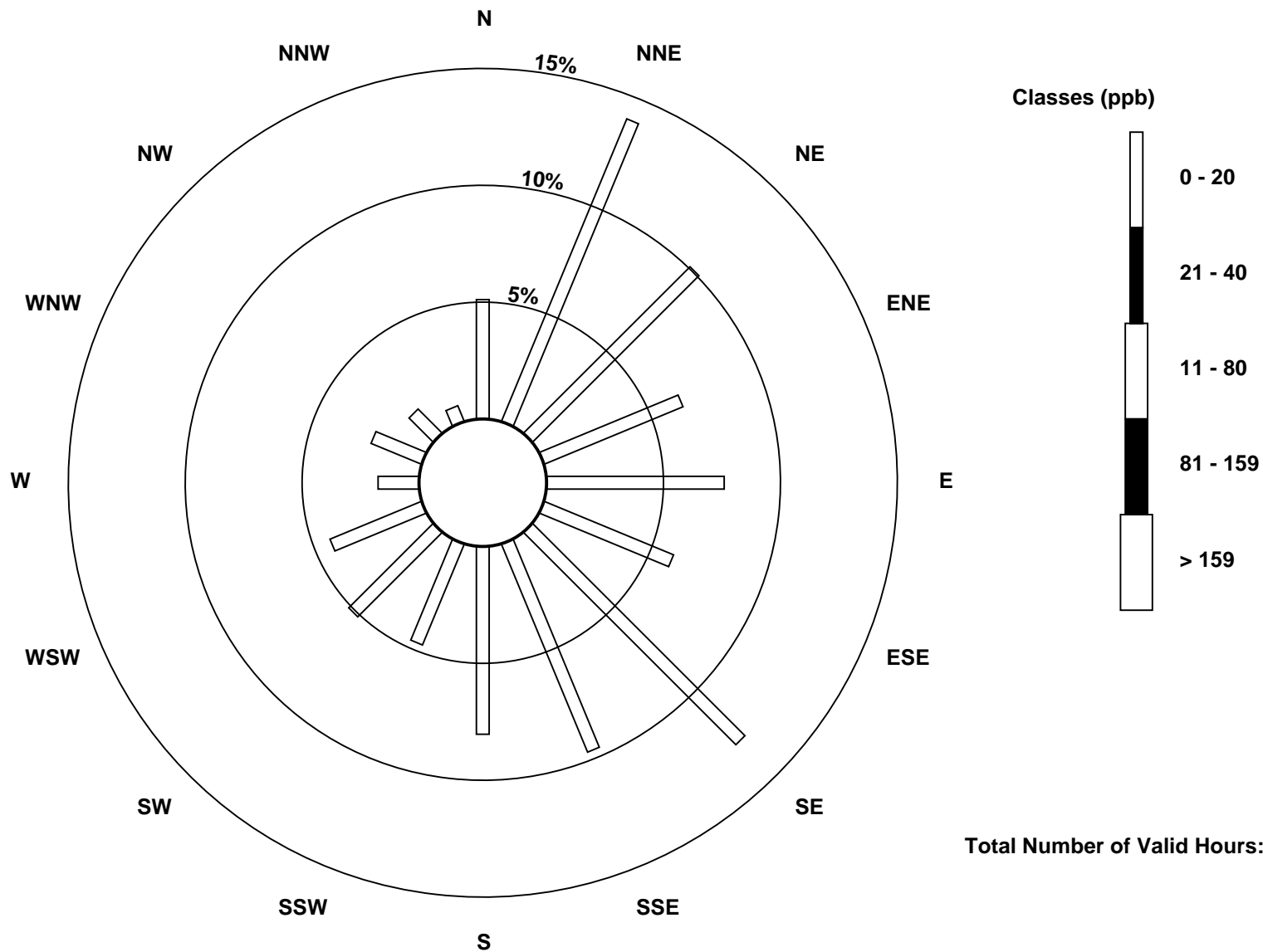
Total Number of Valid Hours: 685

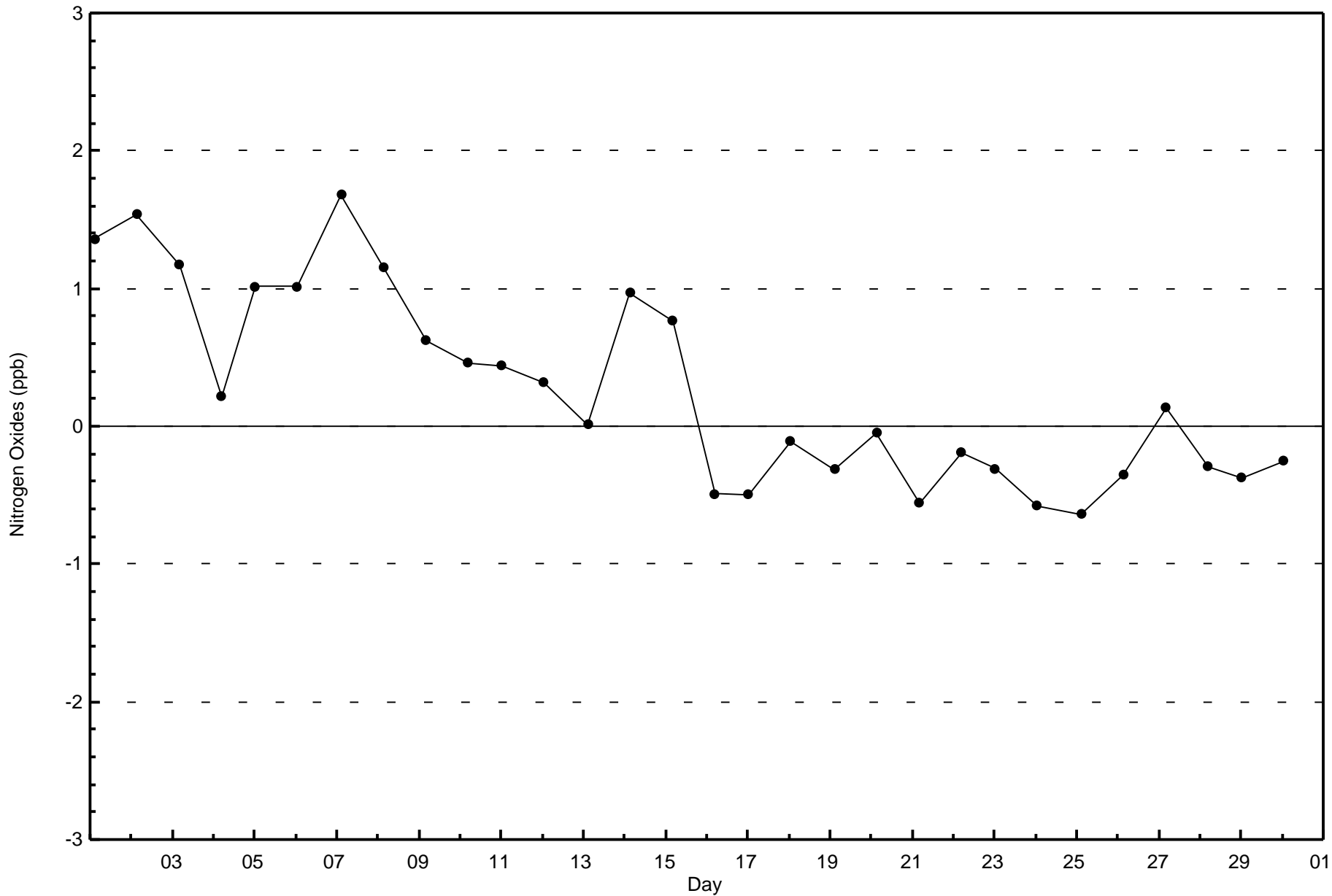
Total Number of Hours: 720

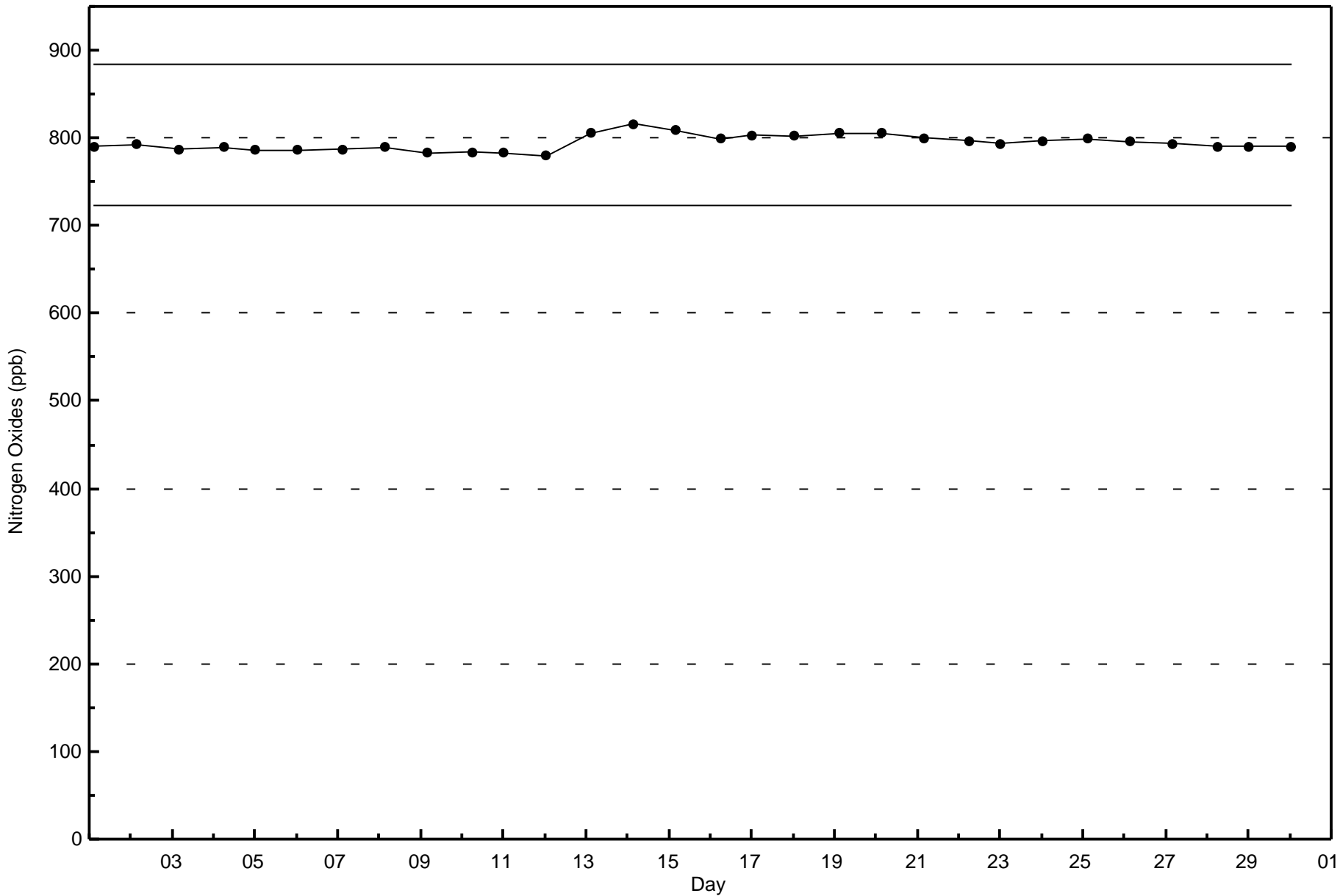


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Christina Lake (AMS500)





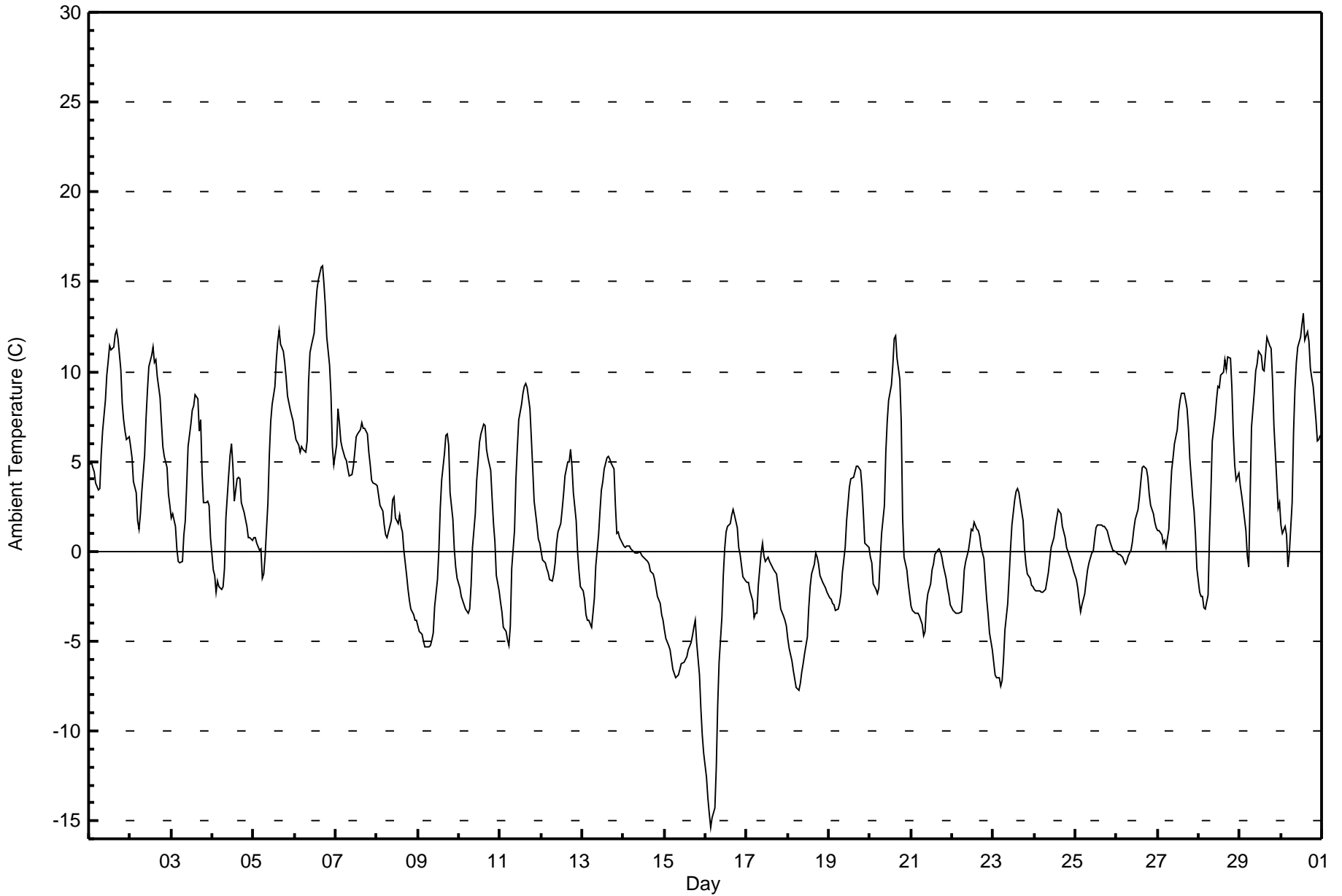




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Christina Lake - April 2017

Maximum Value: 15.9 C on Apr 6 17:00		Maximum Daily Average: 9.9 C on Apr 6		Hours in Service: 720																						
Minimum Value: -15.4 C on Apr 16 04:00		Minimum Daily Average: -6.2 C on Apr 15		Hours of Data: 720																						
Maximum Diurnal Average: 5.7 C at hour 16		Minimum Diurnal Average: -2.2 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 1.69 C		Percentiles: P₁ = -11.5 P₁₀ = -4.1 Q₁ = -1.8 Median = 1.0 Q₃ = 5.2 P₉₀ = 9.2 P₉₉ = 13.4		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	4.8	4.9	4.6	4.4	3.8	3.4	3.5	5.3	6.7	8.4	9.8	10.6	11.4	11.2	11.4	12.1	12.3	11.8	10.1	8.2	7.3	6.7	6.2	6.4	7.7	12.3
2-Apr	5.8	5.2	3.9	3.3	1.7	1.3	2.1	3.4	5.3	7.4	9.0	10.2	10.9	11.4	10.5	10.7	9.7	8.6	7.2	5.9	5.3	4.6	3.2	2.6	6.2	11.4
3-Apr	1.8	2.1	1.4	0.2	-0.5	-0.6	-0.5	0.9	1.7	3.6	5.8	7.1	7.9	8.1	8.7	8.5	6.7	7.3	4.4	2.7	2.7	2.8	2.6	0.7	3.6	8.7
4-Apr	-1.0	-1.3	-2.3	-1.7	-2.0	-2.1	-2.0	-0.9	1.9	4.2	5.4	6.0	4.7	2.8	4.0	4.1	4.0	2.7	2.2	1.8	1.4	0.8	0.7	0.6	1.4	6.0
5-Apr	0.8	0.8	0.5	0.0	0.1	-1.5	-1.3	-0.3	2.7	5.4	7.2	8.1	9.2	10.7	11.7	12.3	11.5	11.1	10.5	9.6	8.6	7.9	7.6	7.2	5.9	12.3
6-Apr	6.7	6.2	5.9	5.6	5.9	5.7	5.5	6.1	9.4	11.1	11.4	12.1	13.5	14.5	15.1	15.8	15.9	14.9	13.6	11.9	10.4	8.7	5.9	4.8	9.9	15.9
7-Apr	5.9	8.0	7.2	6.1	5.7	5.2	5.0	4.6	4.2	4.3	4.7	5.5	6.3	6.5	6.7	7.1	6.9	6.8	6.5	5.5	4.8	4.0	3.8	3.7	5.6	8.0
8-Apr	3.6	3.1	2.5	2.2	1.4	1.0	0.7	1.1	1.7	2.9	3.0	1.9	1.6	2.0	1.4	1.1	0.1	-1.3	-2.1	-2.7	-3.2	-3.5	-3.9	-3.9	0.4	3.6
9-Apr	-4.2	-4.4	-4.6	-5.0	-5.3	-5.4	-5.3	-5.3	-4.9	-4.5	-3.0	-1.6	0.1	2.4	4.0	5.4	6.5	6.5	5.9	3.3	1.8	0.1	-0.8	-1.5	-0.8	6.5
10-Apr	-2.1	-2.5	-2.8	-3.0	-3.2	-3.4	-3.2	-1.9	0.2	2.1	3.9	5.0	6.0	6.5	7.1	7.0	5.6	5.2	4.5	2.9	1.5	0.5	-1.3	-2.2	1.4	7.1
11-Apr	-2.9	-3.4	-4.2	-4.4	-5.0	-5.3	-4.2	-0.9	1.2	4.0	5.7	7.3	8.2	8.8	9.2	9.4	9.1	8.0	6.3	4.6	2.8	1.4	0.7	0.5	2.4	9.4
12-Apr	-0.1	-0.5	-0.6	-0.9	-1.2	-1.6	-1.7	-1.2	-0.7	0.5	1.1	1.5	2.3	3.2	4.2	5.0	5.0	5.7	4.8	3.3	1.7	0.0	-1.1	-1.9	1.1	5.7
13-Apr	-2.2	-2.6	-3.6	-3.8	-3.8	-4.3	-3.4	-2.6	-0.8	0.9	2.3	3.4	3.9	4.6	5.2	5.3	5.1	4.9	4.6	2.6	1.0	1.0	0.7	0.4	0.8	5.3
14-Apr	0.3	0.2	0.3	0.3	0.2	0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.2	-0.4	-0.4	-0.5	-0.7	-1.1	-1.2	-1.5	-2.0	-2.5	-2.9	-3.6	-3.9	-0.8	0.3
15-Apr	-4.4	-4.8	-5.2	-5.5	-6.0	-6.6	-7.0	-6.9	-6.9	-6.5	-6.2	-6.2	-6.0	-5.9	-5.5	-5.1	-4.7	-4.2	-3.8	-5.0	-6.9	-8.8	-10.3	-11.2	-6.2	-3.8
16-Apr	-12.6	-13.7	-14.6	-15.4	-14.8	-14.3	-12.0	-8.6	-6.1	-3.7	-1.3	0.1	1.1	1.4	1.6	2.0	2.3	2.0	1.3	0.2	-0.2	-0.8	-1.5	-1.7	-4.5	2.3
17-Apr	-1.7	-1.8	-2.2	-2.8	-3.6	-3.5	-3.4	-1.9	-0.1	0.4	-0.2	-0.6	-0.4	-0.6	-0.7	-0.8	-1.1	-1.3	-1.9	-2.6	-3.2	-3.6	-3.9	-4.1	-1.9	0.4
18-Apr	-4.9	-5.4	-6.1	-6.7	-7.1	-7.6	-7.7	-7.3	-6.7	-6.3	-5.7	-4.8	-3.1	-2.0	-1.3	-0.7	-0.1	-0.3	-0.7	-1.3	-1.8	-1.9	-2.0	-2.3	-3.9	-0.1
19-Apr	-2.6	-2.6	-2.9	-3.0	-3.3	-3.2	-2.9	-2.4	-1.2	0.2	1.7	2.6	3.5	4.1	4.1	4.4	4.7	4.8	4.5	3.6	2.1	0.4	0.4	0.2	0.7	4.8
20-Apr	-0.3	-0.6	-1.8	-2.1	-2.3	-2.1	-0.4	1.0	2.5	5.5	7.3	8.4	9.2	10.3	11.8	12.0	10.8	9.6	7.3	1.9	-0.3	-1.0	-1.8	-2.4	3.4	12.0
21-Apr	-3.0	-3.3	-3.5	-3.4	-3.4	-3.6	-4.1	-4.7	-4.5	-3.0	-2.3	-1.8	-1.1	-0.7	-0.2	0.0	0.1	0.0	-0.4	-0.8	-1.5	-2.0	-2.5	-3.0	-2.2	0.1
22-Apr	-3.3	-3.4	-3.5	-3.4	-3.4	-3.4	-2.4	-1.0	-0.6	0.0	0.6	1.2	1.2	1.6	1.2	1.1	0.8	0.2	-0.4	-1.6	-2.7	-3.6	-4.5	-5.4	-1.4	1.6
23-Apr	-6.2	-6.9	-7.0	-7.0	-7.5	-7.2	-6.0	-4.4	-2.9	-1.4	0.1	1.5	2.9	3.3	3.5	3.3	2.7	1.7	0.1	-0.8	-1.3	-1.5	-1.9	-2.0	-1.9	3.5
24-Apr	-2.1	-2.2	-2.2	-2.2	-2.2	-2.3	-2.1	-1.7	-1.2	-0.5	0.3	0.8	1.4	1.8	2.3	2.1	1.4	1.1	0.8	0.2	-0.2	-0.5	-0.8	-1.1	-0.4	2.3
25-Apr	-1.5	-2.0	-2.7	-3.4	-3.0	-2.4	-1.7	-1.0	-0.6	-0.1	0.0	0.7	1.3	1.5	1.4	1.5	1.4	1.4	1.1	0.8	0.5	0.3	0.1	0.0	-0.3	1.5
26-Apr	-0.1	-0.2	-0.1	-0.3	-0.6	-0.7	-0.6	-0.3	0.1	0.5	1.2	1.7	2.3	3.0	3.9	4.7	4.8	4.6	4.1	3.2	2.6	2.1	1.6	1.3	1.6	4.8
27-Apr	1.2	1.2	0.9	0.5	0.6	0.2	1.2	3.0	4.5	5.2	6.0	6.8	7.8	8.4	8.8	8.8	8.4	7.9	6.9	5.1	3.0	2.2	0.9	-0.9	4.1	8.8
28-Apr	-2.3	-2.5	-2.5	-3.1	-3.2	-2.4	0.7	3.2	6.1	7.5	8.4	9.1	9.1	9.8	10.0	10.7	10.1	10.8	10.8	9.1	6.5	4.8	3.9	4.4	5.0	10.8
29-Apr	3.7	3.1	2.5	1.2	-0.3	-0.9	2.9	6.9	8.9	10.0	10.4	11.1	10.9	10.1	10.1	11.0	11.9	11.5	11.3	9.6	7.0	4.0	2.4	2.7	6.7	11.9
30-Apr	1.4	1.0	1.4	0.9	-0.9	-0.1	2.7	6.6	9.0	10.5	11.3	11.9	12.6	13.3	11.7	12.2	11.7	10.2	9.6	9.2	7.3	6.2	6.2	6.4	7.2	13.3
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Christina Lake - April 2017

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	294	40.83	40.83
0 - 10	368	51.11	91.94
10 - 20	58	8.06	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

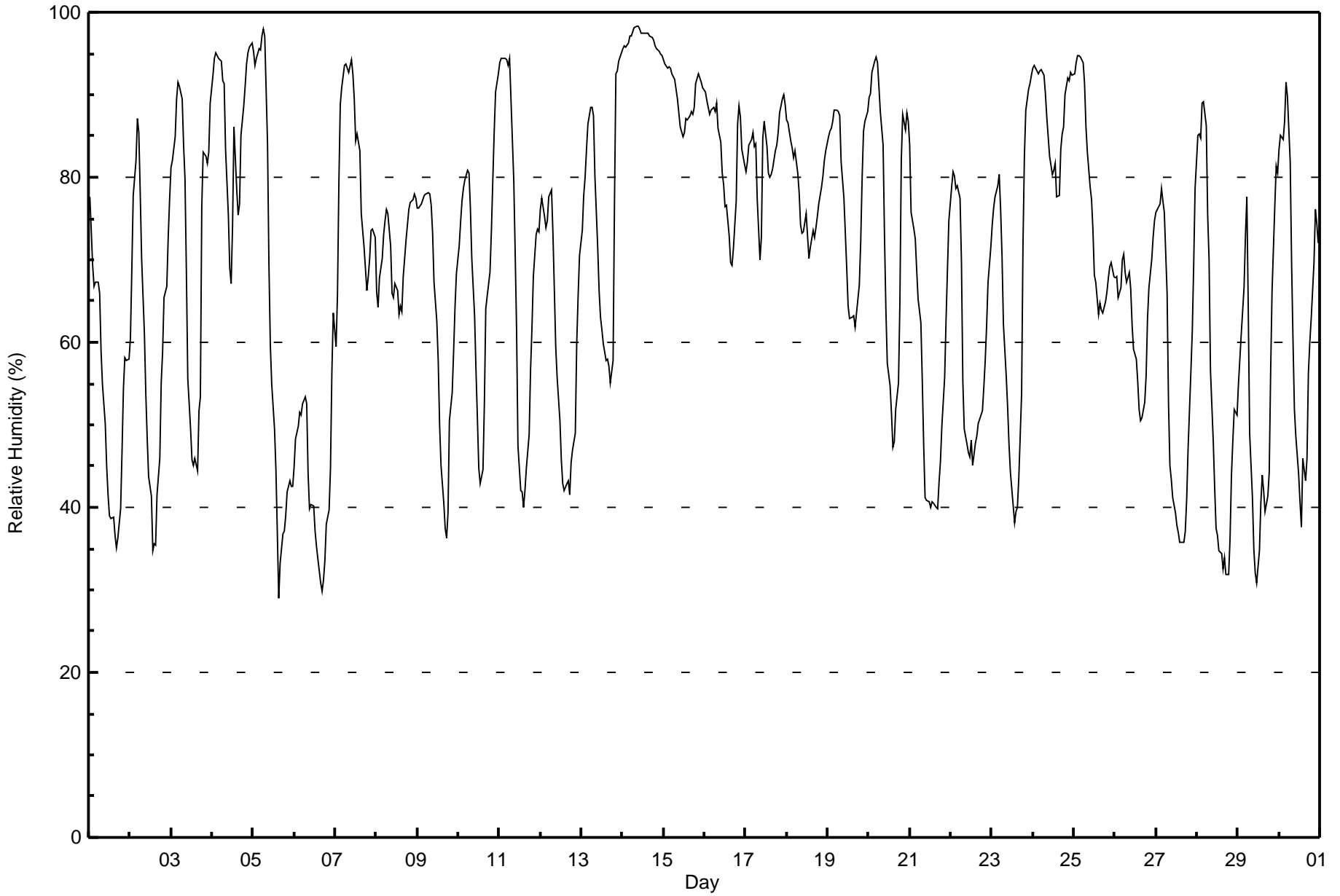
Christina Lake - April 2017

Maximum Value: 98 % on Apr 14 09:00																	Maximum Daily Average: 96.8 % on Apr 14																	Hours in Service: 720																
Minimum Value: 29 % on Apr 5 16:00																	Minimum Daily Average: 43.4 % on Apr 6																	Hours of Data: 720																
Maximum Diurnal Average: 83.6 % at hour 5																	Minimum Diurnal Average: 54.1 % at hour 16																	Hours of Missing Data: 0																
Monthly Average: 69.6 %																	Percentiles: P ₁ = 32 P ₁₀ = 41 Q ₁ = 55 Median = 73 Q ₃ = 85 P ₉₀ = 93 P ₉₉ = 97																	Hours of Calibration: 0																
																																		Percent Operational Time: 100.0																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Apr	78	74	69	67	67	67	66	59	55	50	45	42	39	39	39	37	35	36	40	47	54	58	58	58	53.2	78																								
2-Apr	61	69	78	82	87	85	78	70	61	54	48	44	41	35	36	35	41	46	55	59	65	67	73	77	60.3	87																								
3-Apr	81	82	85	90	92	91	89	84	80	68	56	49	46	45	46	44	52	53	76	83	83	82	83	89	72.0	92																								
4-Apr	92	94	95	95	94	94	92	91	83	75	69	67	74	86	78	75	77	85	89	91	94	95	96	96	86.7	96																								
5-Apr	95	94	94	96	95	97	98	97	84	69	60	55	49	45	37	29	33	37	37	39	42	43	43	43	63.0	98																								
6-Apr	45	48	50	52	51	53	53	53	44	40	40	40	37	35	34	31	30	31	34	38	40	45	56	63	43.4	63																								
7-Apr	59	66	79	89	91	94	94	93	93	94	92	89	84	85	83	76	74	72	66	68	70	73	74	73	80.5	94																								
8-Apr	66	64	68	70	73	75	76	76	72	66	65	67	66	63	64	64	68	72	74	76	77	77	78	77	70.7	78																								
9-Apr	76	76	77	77	78	78	78	78	77	73	67	63	58	50	45	41	38	36	39	50	54	59	64	68	62.5	78																								
10-Apr	72	75	77	79	80	81	80	76	70	63	57	51	45	43	44	53	64	66	68	73	80	86	90	93	69.4	93																								
11-Apr	94	94	94	94	94	93	94	89	80	71	62	47	42	42	40	42	45	49	57	62	68	73	74	73	69.8	94																								
12-Apr	76	78	75	74	75	78	78	73	66	60	56	50	46	43	42	43	43	41	45	47	49	60	66	71	59.8	78																								
13-Apr	74	78	80	83	86	89	88	88	80	72	66	63	62	60	58	58	57	55	58	77	92	93	94	95	75.2	95																								
14-Apr	96	96	96	96	97	97	98	98	98	98	98	98	97	97	97	98	97	97	97	96	96	95	95	95	96.8	98																								
15-Apr	94	94	93	93	93	93	92	91	90	88	86	85	85	87	87	87	88	88	89	91	93	92	92	91	90.0	94																								
16-Apr	90	89	89	88	88	88	88	89	86	84	81	79	77	77	73	70	69	71	77	87	89	87	83	81	82.5	90																								
17-Apr	81	82	84	85	85	84	84	77	70	73	85	87	84	80	80	80	81	83	84	85	88	89	90	89	82.9	90																								
18-Apr	87	87	84	84	82	83	81	78	74	73	73	76	73	70	72	74	73	74	75	77	79	80	82	83	78.1	87																								
19-Apr	85	86	86	87	88	88	88	88	82	77	73	69	64	63	63	63	62	64	67	72	80	86	87	88	77.3	88																								
20-Apr	90	90	93	94	95	94	91	88	84	73	64	57	55	51	47	48	52	55	65	82	88	86	88	87	75.6	95																								
21-Apr	84	76	74	73	69	65	62	55	48	41	41	41	40	41	41	40	40	43	46	50	56	63	69	75	55.4	84																								
22-Apr	79	81	80	79	79	77	70	55	49	48	47	46	48	45	48	49	50	51	52	55	58	62	67	72	60.2	81																								
23-Apr	74	76	78	79	80	76	71	62	56	52	48	44	40	38	39	40	44	54	72	83	88	91	91	92	65.4	92																								
24-Apr	93	94	93	93	93	92	90	87	85	83	80	81	82	78	78	83	85	86	90	92	92	93	92	92	87.8	94																								
25-Apr	92	94	95	95	95	94	91	86	83	79	77	74	68	67	63	65	64	65	66	68	69	70	68	68	77.1	95																								
26-Apr	68	68	65	67	70	71	68	67	68	67	62	59	58	55	52	50	51	53	56	63	67	70	73	75	63.4	75																								
27-Apr	76	76	77	79	77	76	66	53	45	43	41	39	38	37	36	36	36	37	41	47	57	61	69	79	55.0	79																								
28-Apr	85	85	85	89	89	86	75	70	57	48	42	37	37	35	34	33	34	32	32	36	44	48	52	51	54.9	89																								
29-Apr	55	58	61	67	73	78	64	49	41	35	32	31	35	40	44	42	40	41	44	56	66	77	81	81	53.8	81																								
30-Apr	83	85	85	87	92	90	82	69	60	52	49	44	41	38	46	43	46	56	60	63	70	76	74	72	65.1	92																								
																								79.4	80.2	81.3	82.6	83.6	83.6	81.0	76.4	70.8	65.7	62.2	59.1	57.0	55.8	54.9	54.1	55.5	57.6	61.5	67.0	71.4	74.5	76.8	78.2	Diurnal Average		
																								96	96	96	96	97	97	98	98	98	98	98	98	98	97	97	97	97	97	97	97	96	96	95	96	96	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Christina Lake - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Christina Lake - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	55	7.64	7.64
40 - 60	169	23.47	31.11
60 - 80	243	33.75	64.86
80 - 100	253	35.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Christina Lake - April 2017

Maximum Speed: 28 km/h on Apr 5 12:00	Maximum Daily Speed Average: 19.2 km/h on Apr 14	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 4 19:00	Minimum Daily Speed Average: 1.3 km/h on Apr 30	Hours of Data: 720
Maximum Diurnal Speed Average: 4.7 km/h at hour 10	Minimum Diurnal Speed Average: 2.5 km/h at hour 23	Hours of Missing Data: 0
Monthly Average Velocity: 3.4 km/h 80.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 11 Q ₃ = 14 P ₉₀ = 17 P ₉₉ = 23	Percent Operational Time: 100.0

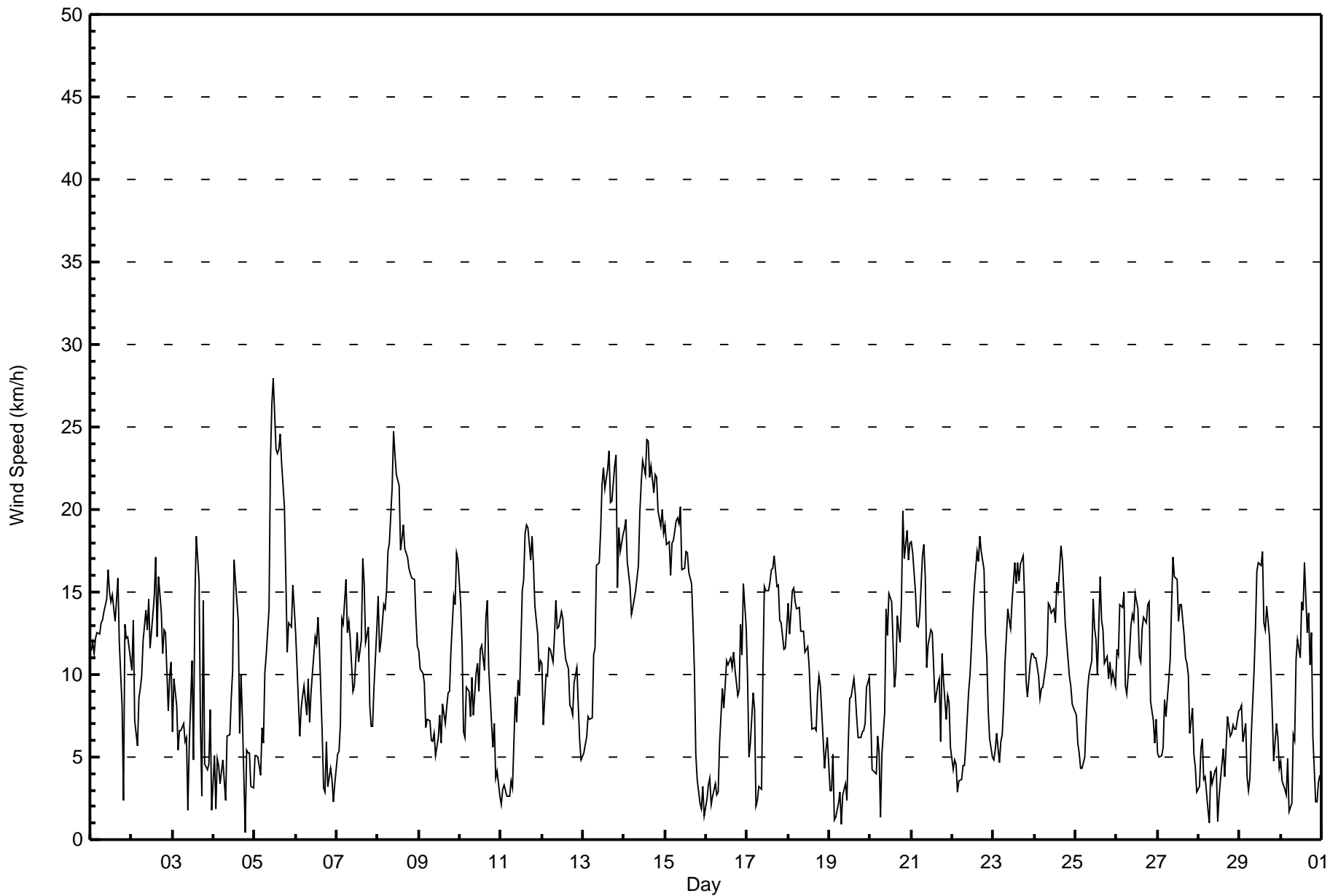
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	SSW11	SW12	SW11	SW12	SW13	SW12	SW13	WSW13	WSW14	WSW15	WSW16	WSW15	WSW14	WSW15	SW13	SW14	WSW16	WSW12	SW8	SSW2	WSW13	WSW12	WSW12	W11	SW12.2	WSW16	
2-Apr	W10	WNW13	W7	SW6	SW9	SW9	WSW10	WSW12	W14	W13	WNW15	WNW12	WNW14	WNW15	NW17	WNW12	W16	WSW14	WSW11	WSW13	WSW13	W8	WSW10	WSW11	W10.7	NW17	
3-Apr	WSW6	WNW10	W8	SW5	SW7	SW7	SW7	W6	WNW6	N2	NNW6	NW11	NW5	NW15	WNW18	NNW16	NE7	WSW3	WNW15	SW5	WSW4	W5	WNW8	SE2	WNW5.6	WNW18	
4-Apr	SE5	S2	SSE5	S4	ESE3	E5	E4	SE2	SSE6	S6	SE9	SE10	SSE17	ESE16	SSE13	SSE6	SSE10	S7	WNW0	SSW5	S5	E5	SE3	SSE3	SE5.8	SSE17	
5-Apr	SSE5	SE5	SE5	ESE4	E7	ESE6	SE10	SE11	SE14	SSE23	SSE26	SSE28	SSE24	SSE23	SSE24	S25	SSE23	SSE20	SSE16	SE11	SE13	SSE13	SSE15	SE14	SSE14.6	SSE28	
6-Apr	SE13	SE11	SE6	SE8	SSE9	SSE9	S8	S10	SSW7	SW9	SW10	WSW12	WSW12	WNW13	WNW12	WNW6	W3	S3	SW6	NNW3	NE4	ESE4	SSE2	SSW3	SSW3.8	WNW13	
7-Apr	SSW5	ENE5	NNW7	NNW13	NW13	NW16	NNW13	N13	NNE12	NNE9	N9	NE11	ENE13	NE11	NE12	ENE17	NE15	NE12	NE13	ENE8	NNE7	N7	NNE9	NNE13	NNE8.6	ENE17	
8-Apr	NNE15	NNE11	N12	N14	N14	N15	N17	N18	NNE21	NNE25	N23	N22	N21	N18	N18	N19	N18	N17	N16	NNE16	NNE16	NE16	NNE13	NNE12	N16.8	NNE25	
9-Apr	NE11	NNE10	NNE10	NE9	NE7	NNE7	NE7	E6	E6	E6	E5	E6	ENE8	SE6	SE8	SE7	S8	S9	S9	SSE11	S15	S14	S17	S17	SE4.7	S17	
10-Apr	S14	S12	SSE6	SSE6	S9	S9	S7	S10	SSE8	S10	SSE11	SE9	SSE11	SE12	SE10	SSE13	SSE14	S10	SSE7	SSE6	SSE7	SSE4	SSE4	SSE3	SSE8.6	SSE14	
11-Apr	SSE2	SSW3	SE3	S3	SSE3	SE3	S4	NNE3	NNE9	NE7	ENE10	NE9	NNE15	N16	NNE19	N19	N19	N17	NNE18	NNE17	NNE14	NE12	NE10	NE11	NNE8.3	N19	
12-Apr	NE11	NE7	NNE10	NNE10	NNE12	NNE12	NNE11	NNE12	N14	NNE13	N13	N14	NNE13	NNE12	NNE11	NNE10	NE8	E8	ENE8	NE9	NE10	E8	ENE6	ENE5	NNE9.5	N14	
13-Apr	E5	ENE6	NNE6	NE7	NE7	NE7	ENE11	ENE12	ENE17	ENE17	NE19	NE22	ENE23	ENE21	ENE22	ENE24	ENE20	NE21	ENE23	E23	ENE15	ENE19	ENE17	NE19	ENE15.7	ENE24	
14-Apr	NE19	NE19	ENE17	NE15	NE14	NE14	NE15	NE15	NE17	ENE20	NE22	NE23	NE22	NE24	NE24	NE22	NE23	NE21	NE22	NE22	NNE20	NNE19	NNE20	NNE19	NE19.2	NE24	
15-Apr	NNE19	NNE18	NNE18	NNE16	NNE18	NNE18	NNE19	NNE20	NNE19	NNE20	NNE16	NNE16	NNE17	NNE17	NNE14	NE16	NE16	NE13	NE10	NNE5	SSE4	SW2	SSW2	SW3	SSW1	NNE12.6	NNE20
16-Apr	S2	SSE3	S4	SSW2	S3	S3	SSW3	SSE3	SSE6	SSE9	SSW8	SSW9	SSW11	SW11	SW11	SSW10	S11	SSW10	S9	SSE9	S13	S11	S16	SSW13	S7.6	S16	
17-Apr	SSW10	SSW5	S6	S9	SSW8	SE2	ESE2	ESE3	NE3	N10	NNE15	NNE15	NNE15	N16	NNE16	NNE16	NNE17	NNE15	NNE15	NNE13	N13	NNE12	NNE12	NNE13	NNE7.5	NNE17	
18-Apr	NNE14	NE12	NE15	NE15	NE14	NE14	NE14	NE13	NE13	NE13	NE11	NE12	ENE10	NE8	ENE7	NE7	ENE7	NE9	NNE10	NNE9	NNE6	NE4	NNE5	NNE6	NE10.2	NE15	
19-Apr	ENE3	N3	NNE5	NE1	E1	NE2	SW3	E1	NE3	NE3	ESE2	SW6	SW9	SW9	SW10	SW9	SW7	SSW6	SSW6	S7	SSE7	S7	S9	S10	SSW3.2	S10	
20-Apr	S8	S4	ESE4	ESE4	E6	SE5	E1	SE5	SE8	SSE14	SSE12	SE15	SE14	SSE12	S9	SW10	WSW14	WSW12	N15	N20	N17	NNE19	NNE17	N18	ESE2.0	N20	
21-Apr	NNE18	NNE17	NNE15	NNE13	N13	NNE14	NNE17	NNE18	NNE16	N10	NNE12	N13	NNE13	NNE10	NE8	NNE9	NE10	E6	NE11	NE10	E7	SE9	SE8	ESE6	NNE10.0	NNE18	
22-Apr	SE4	SE5	SE5	ESE3	E4	E4	ENE5	ENE4	ENE6	NNE9	N10	NNE12	NNE14	N15	NNE17	NNE17	NNE18	NNE17	NNE16	NNE12	NNE11	NE8	ENE6	E5	NNE8.0	NNE18	
23-Apr	E5	ESE5	E6	E5	ENE6	E6	E8	E11	E14	E13	E13	E14	E17	E15	ESE17	ESE16	ESE17	SE17	SE15	ESE10	E9	E11	ENE11	ENE11	E10.9	SE17	
24-Apr	ENE11	ENE11	ENE10	ENE9	ENE9	E9	E10	E11	E14	E14	E14	E14	E13	ENE16	E15	E18	ESE17	ESE15	E13	E12	E10	E9	E8	ESE8	E11.9	E18	
25-Apr	ESE8	E6	E5	E4	ESE4	E5	ESE7	ESE9	ESE10	SE11	SSE15	SSE13	SSE12	SE10	SSE16	SE13	SE13	SE11	SE11	SE10	SE11	SE10	SE10	SE9	SE9.2	SSE16	
26-Apr	SE11	SE11	SE14	SE14	SSE15	SE9	SE9	SE10	SE13	SE14	SE13	SE15	SE14	SE11	ESE11	SE13	SE13	SE13	SE14	SSE14	SE8	SSE7	SE6	SE7	SE11.6	SSE15	
27-Apr	SE5	ESE5	ESE5	SE6	SE8	ESE7	ESE10	SE11	ESE14	ESE17	ESE16	ESE16	ESE13	SE14	SE14	SE12	ESE11	SE11	SE10	S6	SSE8	S5	S4	SE3	SE9.1	ESE17	
28-Apr	SE3	SSE5	S6	SSE4	S4	SSE2	SE1	ENE4	NE3	E4	SSE4	NW1	ESE3	SSE4	SSE6	SE4	S6	SSW7	SW6	SSW6	SSW7	SSW7	SW7	SW8	S3.4	SW8	
29-Apr	SSW8	SSW8	SSW6	S7	SSE4	SE3	SE4	SSW6	SSW10	SSW13	S16	S17	SSW17	SSW17	SSE13	SSE13	S14	S12	SW10	SW8	SSE5	SSE7	S6	S4	S9.0	SSW17	
30-Apr	SE5	SSE4	SE3	SE3	E5	ESE2	E2	SE6	ESE6	SE11	SE12	SSE11	SE14	SSE14	NW17	NW13	WNW14	W11	NW13	NNE6	ESE2	SW2	W4	WSW4	SSE1.3	NW17	
E3.1 ENE2.7 ENE3.0 ENE2.6 E2.9 ENE2.7 ENE3.2 ENE3.6 ENE4.6 E4.7 E4.3 E4.2 E4.6 ENE3.7 ENE3.4 ENE4.2 E3.3 ESE2.9 ENE3.2 ENE3.8 E2.9 E3.1 ESE2.5 E2.5																								Diurnal Average			
NNE19 NE19 NNE18 NNE16 NNE18 NNE18 NNE19 NNE20 NNE21 NNE25 SSE26 SSE28 SSE24 NE24 NE24 S25 SSE23 NE21 ENE23 E23 NNE20 NNE19 NNE20 NNE19																								Diurnal Maximum			

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Christina Lake - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	140	19.44	19.44
6 - 11	270	37.50	56.94
12 - 19	271	37.64	94.58
20 - 28	39	5.42	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	5	7	6	19	16	24	20	15	10	6	3	3	1	2	1	140
6 - 11	5	24	28	21	22	14	40	23	29	20	25	5	7	4	1	2	270
12 - 19	27	68	26	11	14	12	27	19	12	4	7	21	2	11	7	3	271
20 - 28	4	6	12	7	1	0	0	8	1	0	0	0	0	0	0	0	39
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	103	73	45	56	42	91	70	57	34	38	29	12	16	10	6	720

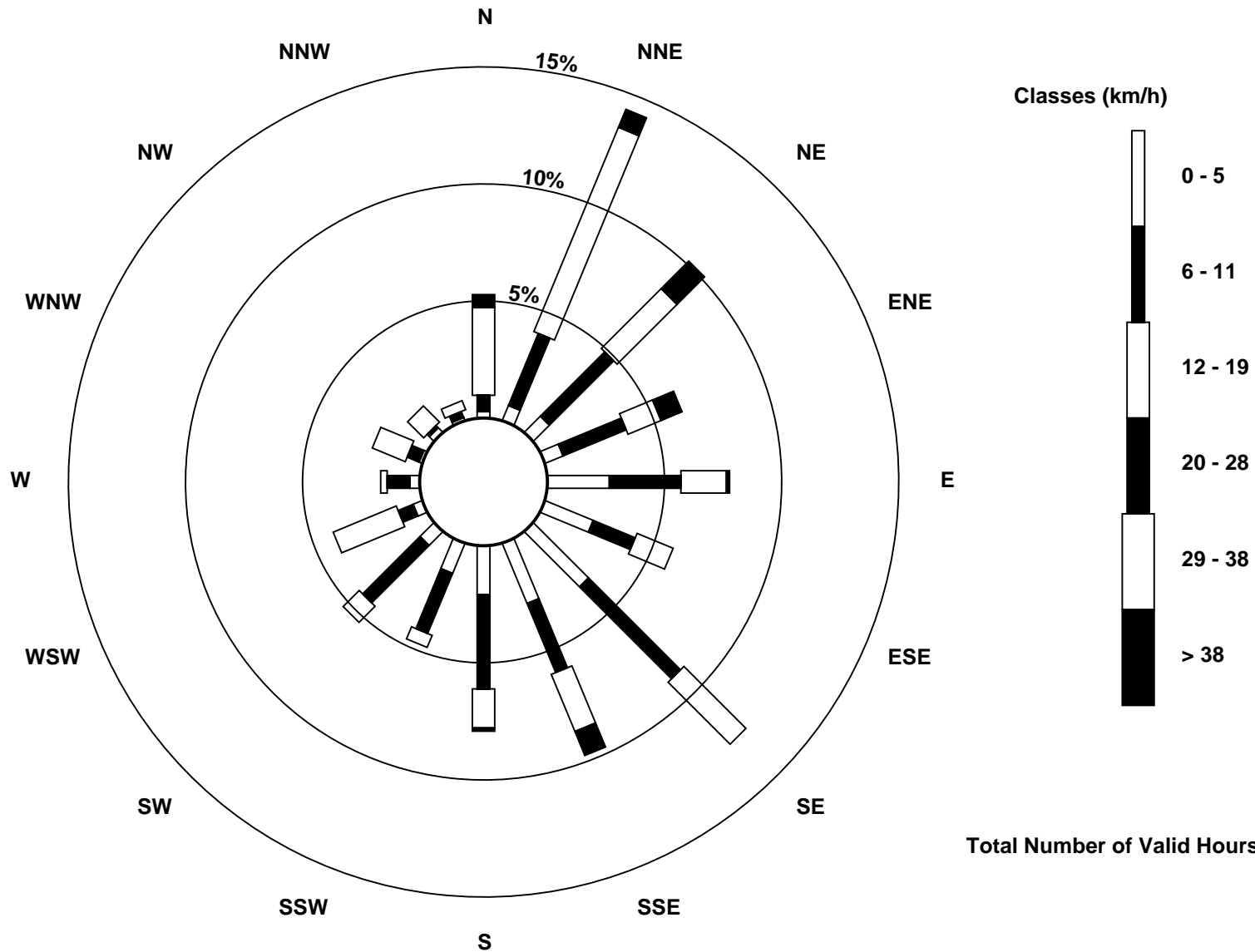
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Christina Lake (AMS500)





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Christina Lake - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Apr 5 11:00 Minimum Value: 1 km/h on Apr 25 03:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	3	3	2	3	3	3	3	4	4	4	5	4	4	4	4	4	4	3	3	2	4	3	4	3	5
2-Apr	3	4	3	2	2	2	3	3	4	4	5	5	4	5	6	5	5	4	3	3	4	3	2	2	6
3-Apr	3	3	4	3	4	3	2	2	2	3	5	3	4	5	4	3	5	6	4	2	3	4	1	6	
4-Apr	1	2	1	2	1	1	1	1	2	2	2	3	6	4	4	3	3	1	1	1	2	2	1	6	
5-Apr	1	1	2	2	1	2	3	2	4	6	7	5	5	5	6	7	6	4	4	3	2	2	3	7	
6-Apr	2	2	2	2	3	2	2	2	2	2	3	4	4	4	5	5	3	2	1	2	2	1	1	2	5
7-Apr	3	3	4	4	3	4	3	3	3	2	2	2	3	3	4	4	4	3	3	2	1	1	2	2	4
8-Apr	2	2	2	3	3	3	4	4	4	5	5	4	4	4	4	4	4	3	3	4	3	4	3	3	5
9-Apr	2	3	2	2	2	3	3	3	2	2	3	3	4	4	4	4	3	3	2	2	3	3	4	4	4
10-Apr	3	4	2	2	2	3	2	2	2	3	2	2	3	4	3	6	4	3	2	1	1	1	1	2	6
11-Apr	2	2	1	2	1	1	1	2	2	3	3	4	4	5	4	4	4	3	3	3	3	3	2	2	5
12-Apr	4	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	3	4	2	2	2	2	1	1	4
13-Apr	1	1	2	2	1	2	2	2	4	3	3	4	4	4	4	5	4	4	5	6	4	4	3	3	6
14-Apr	3	4	4	3	3	3	3	3	3	4	4	4	5	5	5	5	5	4	5	5	3	3	3	3	5
15-Apr	4	4	4	3	3	3	3	3	3	4	3	3	3	4	3	3	2	2	1	1	1	2	1	2	4
16-Apr	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	2	2	3	3	4	4	4
17-Apr	4	2	1	2	3	2	2	1	2	3	2	3	3	3	3	3	3	3	3	2	2	2	2	2	4
18-Apr	2	3	3	2	2	3	3	2	2	2	2	2	3	3	2	2	2	3	2	1	1	1	1	1	3
19-Apr	2	2	1	2	1	1	1	1	1	1	2	2	2	2	3	3	2	2	1	1	1	1	2	2	3
20-Apr	2	2	1	1	1	2	3	3	3	3	3	4	4	4	4	3	4	3	7	4	4	4	3	4	7
21-Apr	4	4	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	4
22-Apr	1	1	1	1	1	1	1	2	3	3	4	5	5	4	4	3	4	3	2	3	2	2	1	1	5
23-Apr	1	1	1	1	2	1	2	2	3	3	3	4	4	4	4	4	4	4	3	2	2	3	2	2	4
24-Apr	2	2	2	1	2	2	2	3	3	3	3	3	3	3	3	4	3	3	3	2	2	2	1	2	4
25-Apr	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3
26-Apr	2	2	4	2	3	2	2	2	3	3	4	3	3	3	3	3	3	3	3	4	2	2	1	1	4
27-Apr	1	1	1	1	1	1	2	3	4	4	4	5	5	5	5	4	3	2	3	2	1	1	2	2	5
28-Apr	2	2	2	2	1	1	1	1	1	2	3	3	2	2	3	3	2	2	2	1	1	1	1	1	3
29-Apr	2	2	2	1	1	1	1	3	3	4	5	5	4	5	4	4	4	3	3	3	1	1	1	2	5
30-Apr	2	1	1	2	1	1	2	2	2	3	3	4	5	4	5	3	6	3	3	2	1	1	2	2	6
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Christina Lake - April 2017

Direction of Maximum Speed: 161 deg on Apr 5 12:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 47.1 deg on Apr 14	Hours of Data: 720
Direction of Minimum Speed: 282 deg on Apr 4 19:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.3 deg on Apr 30	Percent Operational Time: 100.0
Monthly Average Direction: 174.4 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	206	221	217	221	221	220	225	239	243	246	248	242	248	245	224	229	246	244	233	202	245	245	246	272	236.2
2-Apr	278	288	263	214	218	236	237	248	259	270	284	290	282	293	308	287	265	240	241	244	253	274	237	243	264.0
3-Apr	243	283	267	218	218	231	228	264	294	350	347	308	310	313	300	336	39	251	298	224	247	272	303	130	288.7
4-Apr	124	179	166	176	106	98	97	126	166	174	141	132	147	114	155	159	149	183	282	197	174	97	139	157	145.7
5-Apr	159	125	132	112	94	116	126	134	132	152	151	161	167	159	167	171	168	163	155	143	146	151	155	145	153.0
6-Apr	135	140	128	139	153	155	178	183	213	227	234	246	257	288	296	299	281	181	216	332	34	111	164	201	206.0
7-Apr	192	63	343	335	324	307	338	6	15	20	7	37	66	40	45	61	52	54	51	58	30	2	12	25	22.1
8-Apr	25	12	2	360	2	3	2	9	16	14	356	1	11	8	3	10	8	6	10	22	15	38	21	29	10.4
9-Apr	41	24	32	42	50	27	36	86	93	92	86	86	78	142	129	146	180	178	172	160	175	181	181	180	124.2
10-Apr	179	179	163	163	172	178	176	174	154	183	149	129	148	142	135	154	167	183	163	157	160	155	156	165	162.4
11-Apr	161	207	144	186	165	146	180	21	29	52	62	37	12	9	17	5	7	9	12	23	24	40	51	41	25.0
12-Apr	37	39	21	24	24	28	27	12	9	16	6	4	13	15	24	29	47	87	70	41	45	82	78	78	29.7
13-Apr	90	64	29	41	54	37	57	63	74	65	56	55	59	67	72	66	59	52	77	81	68	60	57	52	62.5
14-Apr	55	54	57	51	52	54	54	53	55	57	54	54	52	49	49	50	49	45	44	39	32	27	26	24	47.1
15-Apr	25	25	28	23	21	19	21	20	27	27	22	23	24	16	23	36	33	34	23	154	222	196	217	202	24.8
16-Apr	176	154	171	193	178	189	195	156	167	168	213	204	192	216	214	197	185	195	174	166	175	184	186	192	187.9
17-Apr	192	195	179	183	193	133	104	113	37	8	20	19	17	9	12	14	17	13	14	16	11	18	25	30	20.4
18-Apr	25	41	49	43	46	43	51	52	39	41	46	47	57	52	59	51	58	43	29	17	33	48	22	15	42.5
19-Apr	70	7	22	53	85	40	216	99	46	56	109	226	217	217	221	225	222	208	195	180	167	170	179	181	193.9
20-Apr	184	172	117	119	87	127	93	137	140	153	152	133	140	156	184	217	238	239	352	358	4	14	16	7	103.0
21-Apr	17	25	24	18	8	17	14	22	19	10	20	3	13	27	34	17	35	85	49	53	101	134	139	123	29.2
22-Apr	126	137	143	122	83	80	59	66	65	25	1	18	25	6	14	26	17	21	22	30	32	54	74	87	33.3
23-Apr	90	104	79	94	68	85	79	91	99	88	93	95	93	93	102	109	114	128	126	113	92	81	75	72	97.0
24-Apr	67	72	75	77	78	80	86	87	98	94	96	98	97	75	101	99	110	102	101	92	91	98	96	108	91.9
25-Apr	102	97	91	98	108	90	106	113	117	137	147	150	154	127	154	129	144	145	140	138	142	139	146	136	133.1
26-Apr	141	138	138	141	154	143	142	137	129	138	134	140	135	127	122	130	134	137	140	149	143	147	129	125	137.7
27-Apr	130	117	110	124	127	118	122	139	119	106	107	112	105	132	126	124	103	126	143	174	166	190	171	134	124.9
28-Apr	132	149	189	163	175	156	142	63	52	92	148	310	122	156	164	145	184	208	221	200	201	205	214	215	178.2
29-Apr	207	207	199	186	155	136	141	202	194	193	188	180	198	199	166	162	184	176	215	228	152	162	169	186	186.4
30-Apr	133	152	141	144	96	117	95	140	110	124	134	149	145	164	304	325	302	272	315	29	109	226	260	255	167.6

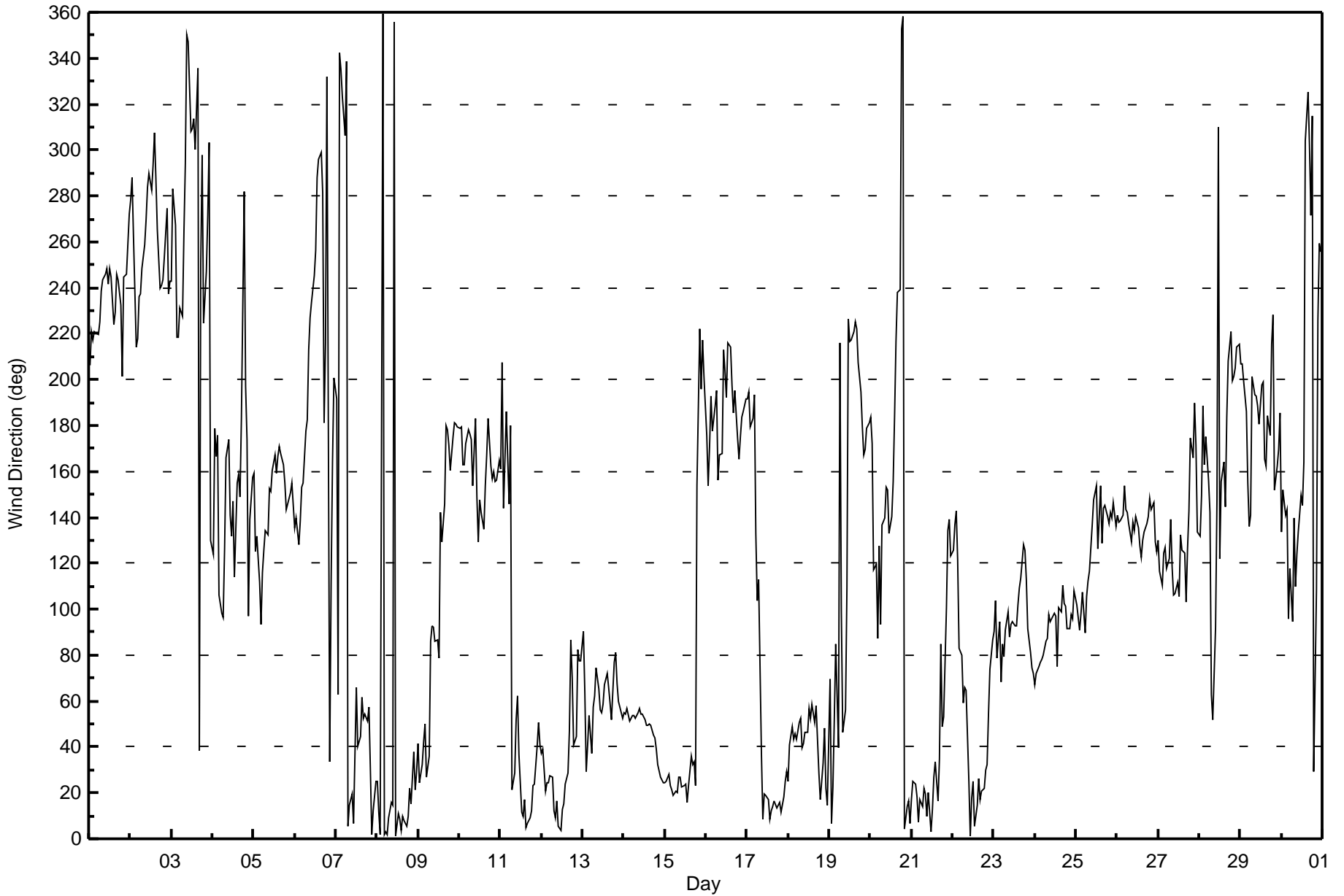
92.3	77.7	72.6	76.9	79.0	64.9	65.5	74.3	74.6	84.2	83.3	81.6	86.4	73.7	70.5	72.1	85.7	106.8	68.1	75.9	85.8	90.4	102.4	88.9
Diurnal Average																							

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Christina Lake - April 2017





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Christina Lake - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Apr 28 12:00 Minimum Value: 7 deg on Apr 29 04:00 Percentiles: P ₁ = 8 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 25 P ₉₀ = 42 P ₉₉ = 86		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	19	16	14	15	15	15	16	18	19	22	23	23	23	22	21	23	21	18	27	85	19	16	16	30	85
2-Apr	22	30	37	36	17	16	18	17	18	27	23	43	29	29	14	26	20	19	17	15	22	24	14	15	43
3-Apr	68	27	32	48	57	63	21	34	30	89	49	43	75	28	20	32	38	90	21	75	77	53	63	65	90
4-Apr	39	86	38	30	18	14	18	21	24	31	25	25	22	12	20	36	26	37	95	21	21	21	42	28	95
5-Apr	23	14	24	32	16	23	14	15	17	14	15	14	17	16	18	14	13	14	11	11	11	10	10	10	32
6-Apr	11	12	21	26	12	14	15	14	28	26	26	22	33	30	37	62	86	71	11	68	29	20	18	15	86
7-Apr	51	68	60	17	19	17	21	17	15	15	17	18	16	15	12	14	14	13	10	11	19	12	10	10	68
8-Apr	10	13	16	15	15	17	16	17	14	16	21	20	18	20	19	16	19	17	15	20	15	12	17	20	21
9-Apr	26	20	18	22	34	25	33	46	59	41	59	51	42	77	38	63	41	22	13	8	11	13	12	12	77
10-Apr	13	16	20	18	14	17	20	15	18	18	16	27	24	26	28	29	18	18	10	9	8	19	23	24	29
11-Apr	87	25	25	42	15	13	19	64	15	32	31	42	24	26	18	18	17	16	15	10	9	12	10	11	87
12-Apr	12	19	12	10	11	12	13	18	16	20	23	22	21	22	32	34	29	39	10	11	10	16	18	20	39
13-Apr	11	11	14	15	12	11	12	14	14	13	12	12	13	14	14	11	11	12	14	12	10	10	10	10	15
14-Apr	10	10	11	10	10	10	9	11	11	10	11	10	10	10	10	11	11	10	11	10	10	10	10	10	11
15-Apr	11	11	11	11	10	11	10	10	10	11	15	12	13	13	14	11	11	12	18	27	47	63	26	39	63
16-Apr	31	17	21	44	26	13	16	14	15	14	25	22	20	21	22	23	17	18	10	13	12	16	14	16	44
17-Apr	20	23	13	11	21	84	69	28	69	18	14	14	16	16	16	14	14	13	13	12	12	11	9	9	84
18-Apr	10	11	9	10	10	11	12	12	13	13	14	10	20	22	24	25	21	14	18	10	17	22	18	13	25
19-Apr	43	32	16	90	54	75	33	59	33	24	69	29	23	22	20	19	21	18	15	13	8	10	10	11	90
20-Apr	12	36	25	22	17	20	87	47	22	13	18	18	18	19	33	29	19	21	51	18	17	15	14	17	87
21-Apr	14	14	12	14	15	13	15	16	18	32	25	23	23	26	29	26	29	31	12	14	25	12	11	16	32
22-Apr	10	14	13	26	16	18	17	42	43	32	42	33	23	21	18	22	17	13	15	9	12	14	13	17	43
23-Apr	16	17	15	23	18	14	14	16	18	19	20	22	20	23	22	25	16	16	16	16	15	11	11	10	25
24-Apr	10	9	9	11	10	10	13	14	12	14	14	13	18	15	23	14	15	15	13	11	11	11	12	12	23
25-Apr	11	11	12	12	12	10	14	13	15	22	12	19	15	24	15	14	14	16	12	11	11	11	11	13	24
26-Apr	12	11	12	12	11	12	13	18	15	17	18	18	17	22	22	18	17	14	14	11	10	11	9	9	22
27-Apr	13	12	8	12	10	11	12	20	22	18	23	25	35	27	28	26	26	15	19	14	9	10	12	30	35
28-Apr	43	27	13	31	21	29	89	26	45	61	75	101	74	65	59	71	36	32	32	11	7	8	13	12	101
29-Apr	14	13	17	7	48	38	15	26	27	28	21	24	21	19	27	23	20	17	34	19	22	13	12	59	59
30-Apr	26	16	46	41	8	61	31	20	31	26	26	26	23	20	30	24	21	25	14	34	62	72	50	46	72
	87	86	60	90	57	84	89	64	69	89	75	101	75	77	59	71	86	90	95	85	77	72	63	65	
	Diurnal Maximum																								



Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name: Christina Lake Station number: AMS 500
 Calibration Date: April 12, 2017 Last Cal Date: March 8, 2017
 Start time (MST): 11:40 End time (MST): 15:25
 Reason: Routine

Calibration Standards

Cal Gas Concentration 50 ppm Cal Gas Exp Date September 8, 2018
 Calibrator Make/Model Teledyne API T700 Serial Number 1221
 ZAG Make/Model Teledyne APT 701 Serial Number 4604

Analyzer Information

Analyzer make: Thermo 43i Analyzer serial #: 1118148497

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 1000 ppb		PMT voltage	-698	-698
Calculated slope	1.003317	0.992830	Lamp voltage	844	845
Calculated intercept	0.183436	1.842094	Pressure	658.9	688.2
Analyzer Background	13.3	13.2	Flow	0.595	0.596
Analyzer Coefficient	1.039	1.039	Intensity	90	90

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	-0.1	----
as found span	4927	79.4	793.0	793.4	0.999
calibrator zero	5000	0.0	0.0	-0.1	----
high point	4927	79.4	793.0	797.9	0.994
second point	4962	39.7	396.9	396.6	1.001
third point	4985	19.8	197.8	195.9	1.010
as left zero	6000	0.0	0.0	0.4	----
as left span	4927	79.4	793.0	794.1	0.999
Average Correction Factor					1.001

Corrected As found 793.54 Previous response 790.18 *% change -0.4%

* = > +/-5% change initiates investigation

Notes:

Sample inlet filter replaced after as founds. No adjustments made.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

SO₂ Calibration Summary

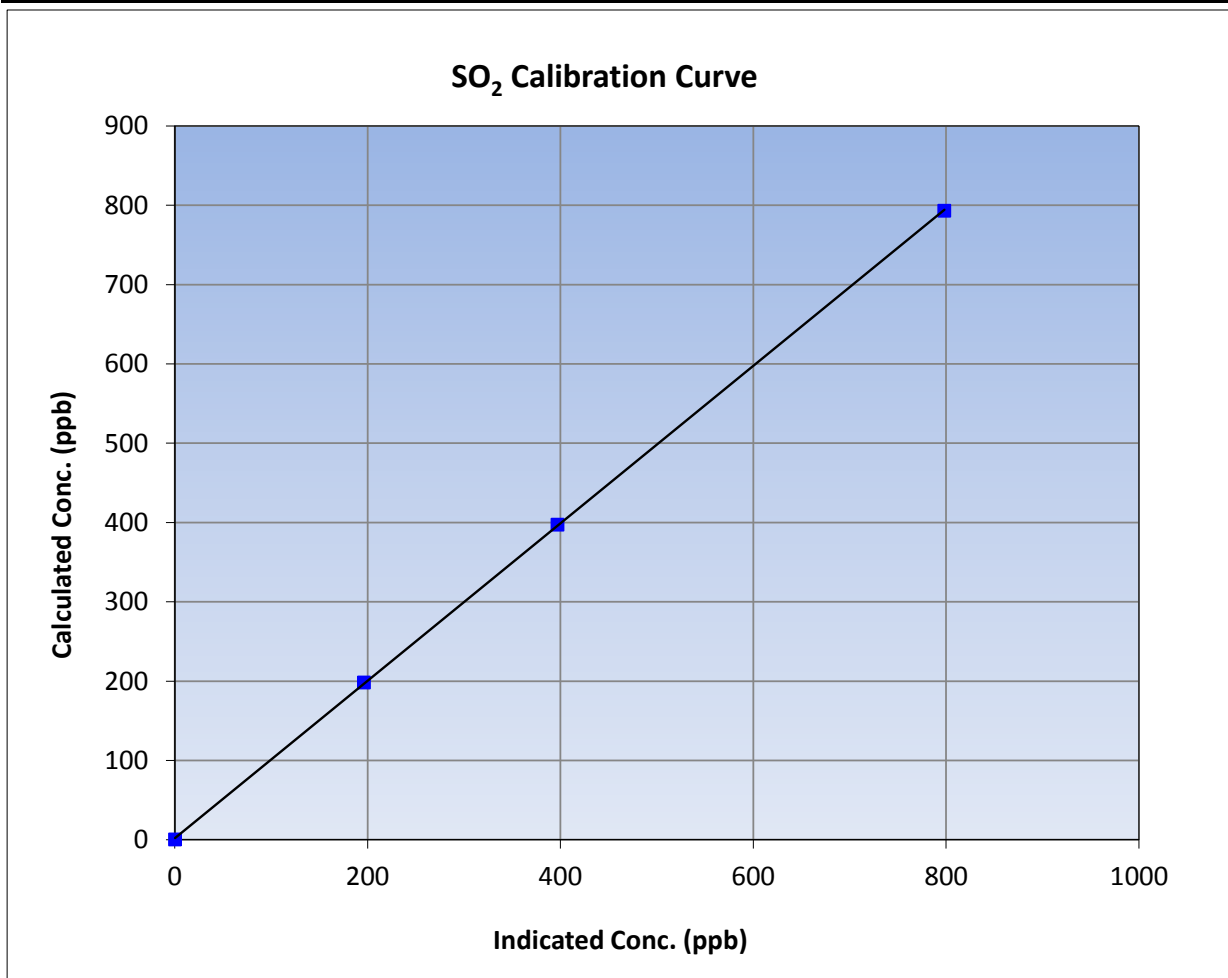
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 8, 2017
Station Name	Christina Lake	Station Number	AMS 500
Start Time (MST)	11:40	End Time (MST)	15:25
Analyzer make	Thermo 43i	Analyzer serial #	1118148497

Calibration Data

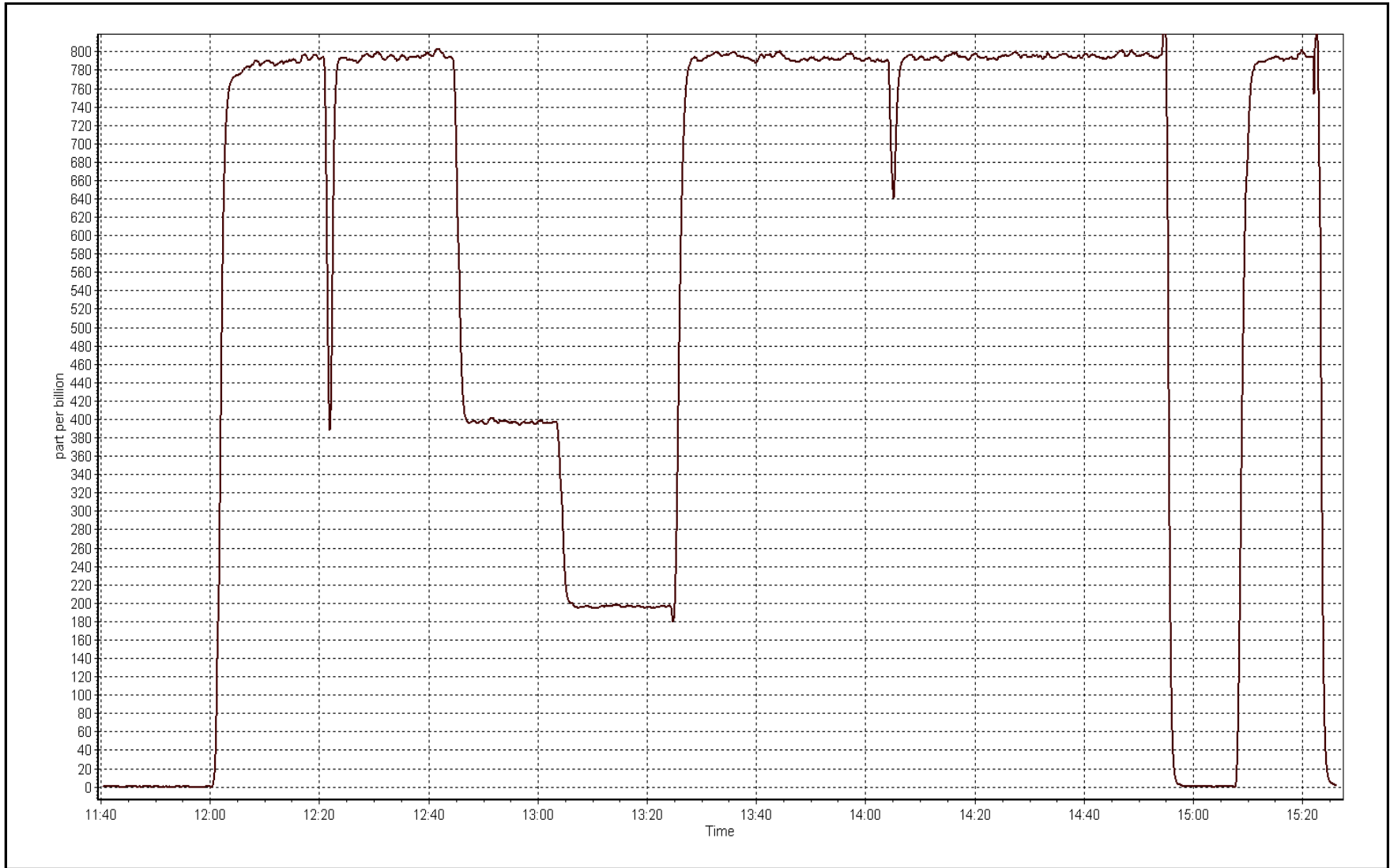
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits
0.0	-0.1	----	Correlation Coefficient	≥0.995
793.0	797.9	0.9939		
396.9	396.6	1.0006	Slope	0.90 - 1.10
197.8	195.9	1.0098		
			Intercept	+/-30



SO2 Calibration Plot

Date: April 12, 2017

Location: Christina Lake





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name: Christina Lake Station number: AMS 500
 Calibration Date: April 12, 2017 Last Cal Date: March 8, 2017
 Start time (MST): 15:22 End time (MST): 17:20
 Reason: Routine

Calibration Standards

Cal Gas Concentration 5.10 ppm Cal Gas Exp Date February 12, 2019
 Calibrator Make/Model Teledyne API T700 Serial Number 1221
 ZAG Make/Model Teledyne API 701 Serial Number 4604

Analyzer Information

Analyzer make: Thermo 43i-TLE Analyzer serial #: 1008841400

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	-680	-681
Calculated slope	0.994527	1.002098	Lamp voltage	981	980
Calculated intercept	-0.053598	-0.081148	Pressure	665.0	667.1
Analyzer Background	1.56	1.52	Flow	0.442	0.445
Analyzer Coefficient	0.867	0.867	Intensity	91	91

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.1	----
as found span	4923	78.5	80.0	80.0	1.001
calibrator zero	5000	0.0	0.0	0.1	----
high point	4923	78.5	80.0	80.0	1.001
second point	4962	39.4	40.2	40.2	0.999
third point	4982	19.7	20.1	20.1	1.002
as left zero	6000	0.0	0.0	0.2	----
as left span	4923	78.5	80.0	80.6	0.994
Average Correction Factor					1.001

Corrected As found	79.84	Previous response	80.54	% change	0.9%
--------------------	-------	-------------------	-------	----------	------

** = > +/-5% change initiates investigation*

Notes:

Sample inlet filter replaced after as founds. No adjustments made.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

H₂S Calibration Summary

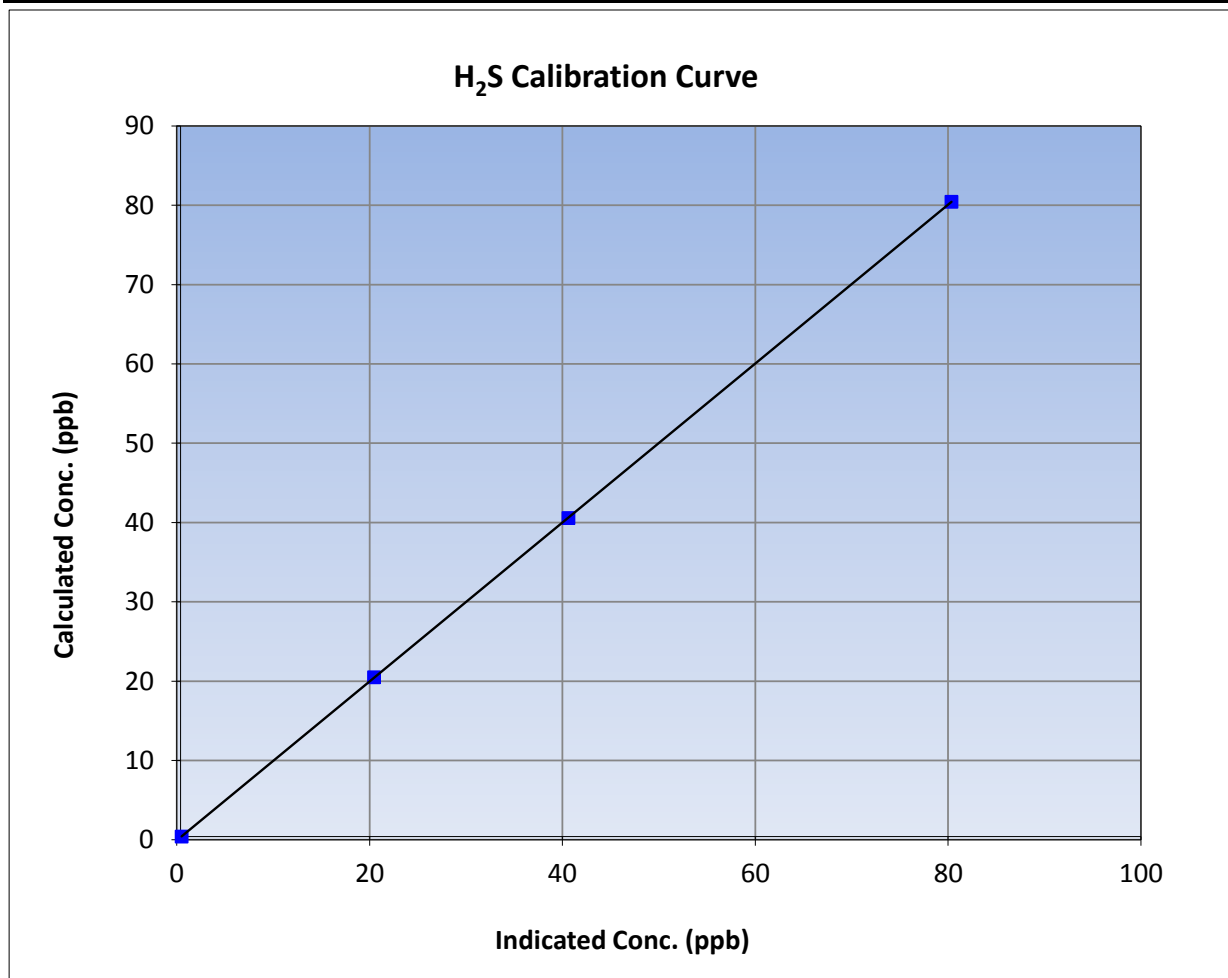
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 8, 2017
Station Name	Christina Lake	Station Number	AMS 500
Start Time (MST)	15:22	End Time (MST)	17:20
Analyzer make	Thermo 43i-TLE	Analyzer serial #	1008841400

Calibration Data

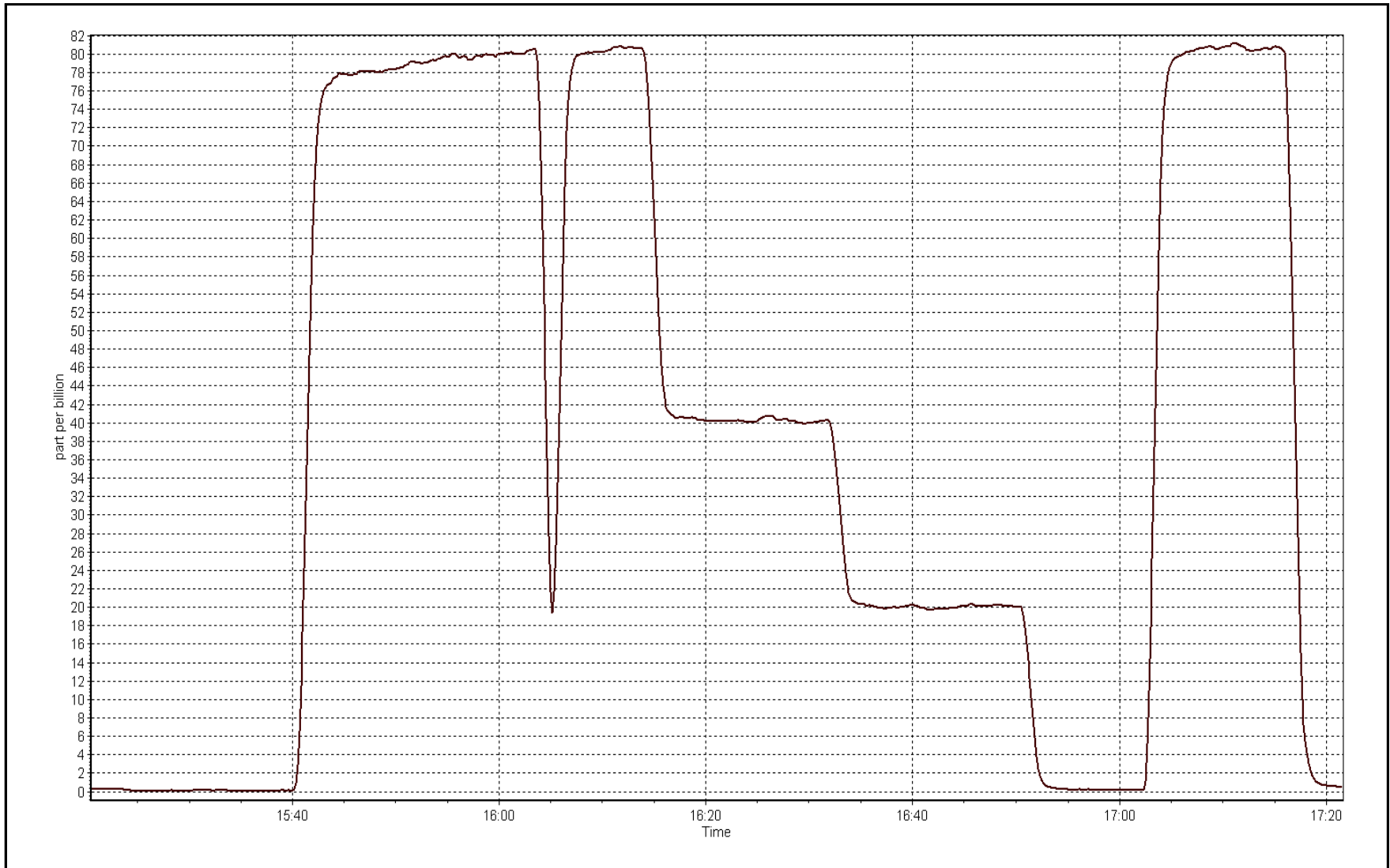
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.1	----	Correlation Coefficient	0.999997	≥0.995
80.0	80.0	1.0012			
40.2	40.2	0.9987	Slope	1.002098	0.90 - 1.10
20.1	20.1	1.0019			
			Intercept	-0.081148	+/-3



H₂S Calibration Plot

Date: April 12, 2017

Location: Christina Lake





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Christina Lake	Station number:	AMS 500
Calibration Date:	April 12, 2017	Last Cal Date:	March 8, 2017
Start time (MST):	11:40	End time (MST):	15:25
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL107928	Cal Gas Expiry Date	September 8, 2018
NOX Cal Gas Conc.	<u>50.8</u> ppb	NO Cal Gas Conc.	<u>50.5</u> ppb
Calibrator Model	Teledyne API T700	Serial Number	1221
ZAG make/model	Teledyne API 701	Serial Number	4604

Analyzer Information

Analyzer make: Teledyne API T200

Analyzer serial #: 723

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
NO coefficient	1.105	1.158	NOX Range (ppb)	0 - 1000 ppb	
NOX coefficient	1.113	1.146	PMT Temperature	6.9	6.9
NO ₂ coefficient	1.000	1.000	Reaction cell Press	6.7	6.3
NO bkgrnd	0.4	0.4	Sample Flow	0.495	0.500
NOX bkgrnd	1.4	1.4	PMT Voltage	826.0	826.0

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.997736	0.994844
NO _x Cal Offset	1.429163	1.594249
NO Cal Slope	1.000677	0.999585
NO Cal Offset	0.065459	1.636640
NO ₂ Cal Slope	0.997368	0.991088
NO ₂ Cal Offset	-0.446117	-1.418377



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5000	0.0	0.0	0.0	0.0	-0.7	-0.4	-0.3	----	----
as found span	4927	79.4	805.7	800.9	4.8	776.2	769.1	7.1	1.0379	1.0414
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.7	-0.4	-0.3	----	----
high point	4927	79.4	805.7	800.9	4.8	808.9	800.3	8.6	0.9960	1.0007
second point	4962	39.7	403.2	400.8	2.4	402.6	398.4	4.1	1.0016	1.0060
third point	4985	19.8	201.0	199.8	1.2	200.0	197.2	2.8	1.0051	1.0133
as left zero	6000	0.0	0.0	0.0	0.0	-0.2	0.8	-0.7	----	----
as left span	4927	79.4	805.7	403.0	402.7	801.5	400.7	400.9	1.0052	1.0058
Average Correction Factor									1.0009	1.0067

Corrected As found	NO _x = 776.9 ppb	NO = 769.4 ppb		*Percent Change	NO _x = 3.8%
Previous Response	NO _x = 806.1 ppb	NO = 800.3 ppb		*Percent Change	NO = 4.0%
<i>* = > +/-5% change initiates investigation</i>					

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		4.8	809.4	798.6	10.7	0.9954	1.0028	----	----
1st NO2 (400 ppb O3)	403.0	400.4	807.1	403.0	404.2	0.9982	----	0.9907	100.9%
2nd NO2 (200 ppb O3)	600.9	202.5	808.6	600.9	207.7	0.9964	----	0.9750	102.6%
3rd NO2 (100 ppb O3)	700.0	103.4	806.8	700.0	106.9	0.9986	----	0.9676	103.3%
2nd NO ref point	----	4.8	807.6	801.0	6.6	0.9977	0.9999	----	----
Average Correction Factor						0.9977	1.0014	0.9778	102.3%

Notes: Sample inlet filter replaced after as founds. Adjusted span.

Calibration Performed By: Asad Hidayat



Wood Buffalo Environmental Association

NO_x Calibration Summary

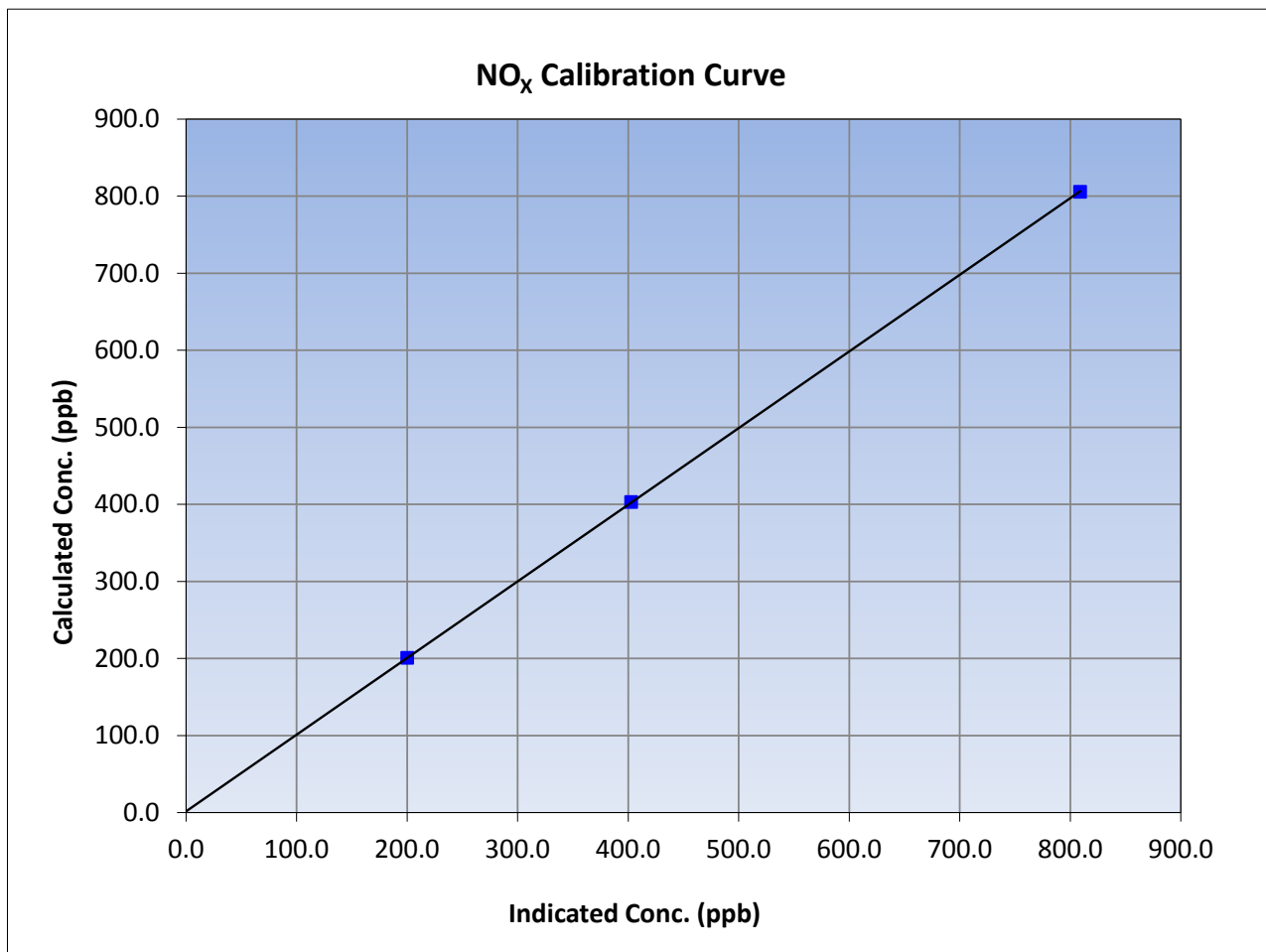
Version-03-2017

Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 8, 2017
Station Name	Christina Lake	Station Number	AMS 500
Start Time (MST)	11:40	End Time (MST)	15:25
Analyzer make	Teledyne API T200	Analyzer serial #	723

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.7	----	Correlation Coefficient	≥0.995	
805.7	808.9	0.9960			
403.2	402.6	1.0016			
201.0	200.0	1.0051			
			Slope	0.994844	0.90 - 1.10
			Intercept	1.594249	+/-20





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

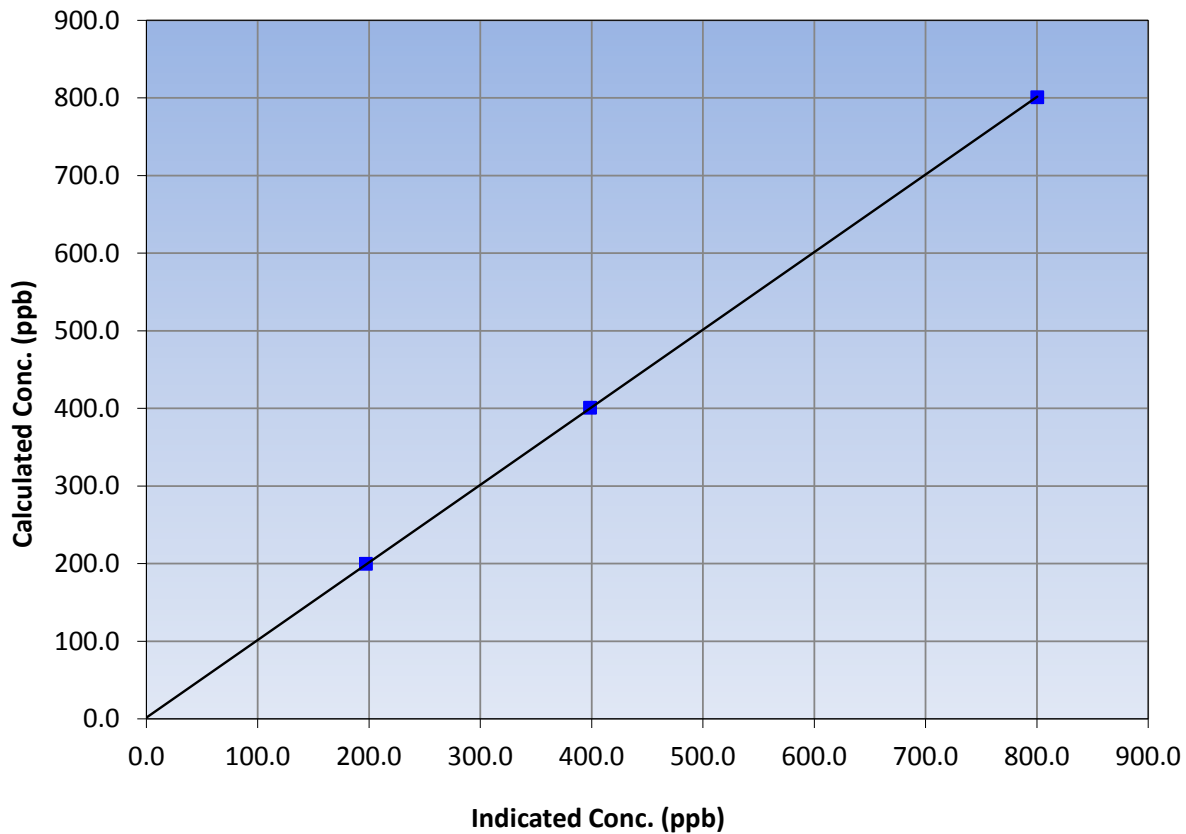
Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 8, 2017
Station Name	Christina Lake	Station Number	AMS 500
Start Time (MST)	11:40	End Time (MST)	15:25
Analyzer make	Teledyne API T200	Analyzer serial #	723

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<u>Limits</u>	
0.0	-0.4	----	Correlation Coefficient	≥0.995	
800.9	800.3	1.0007			
400.8	398.4	1.0060			
199.8	197.2	1.0133			
			Slope	0.999585	0.90 - 1.10
			Intercept	1.636640	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

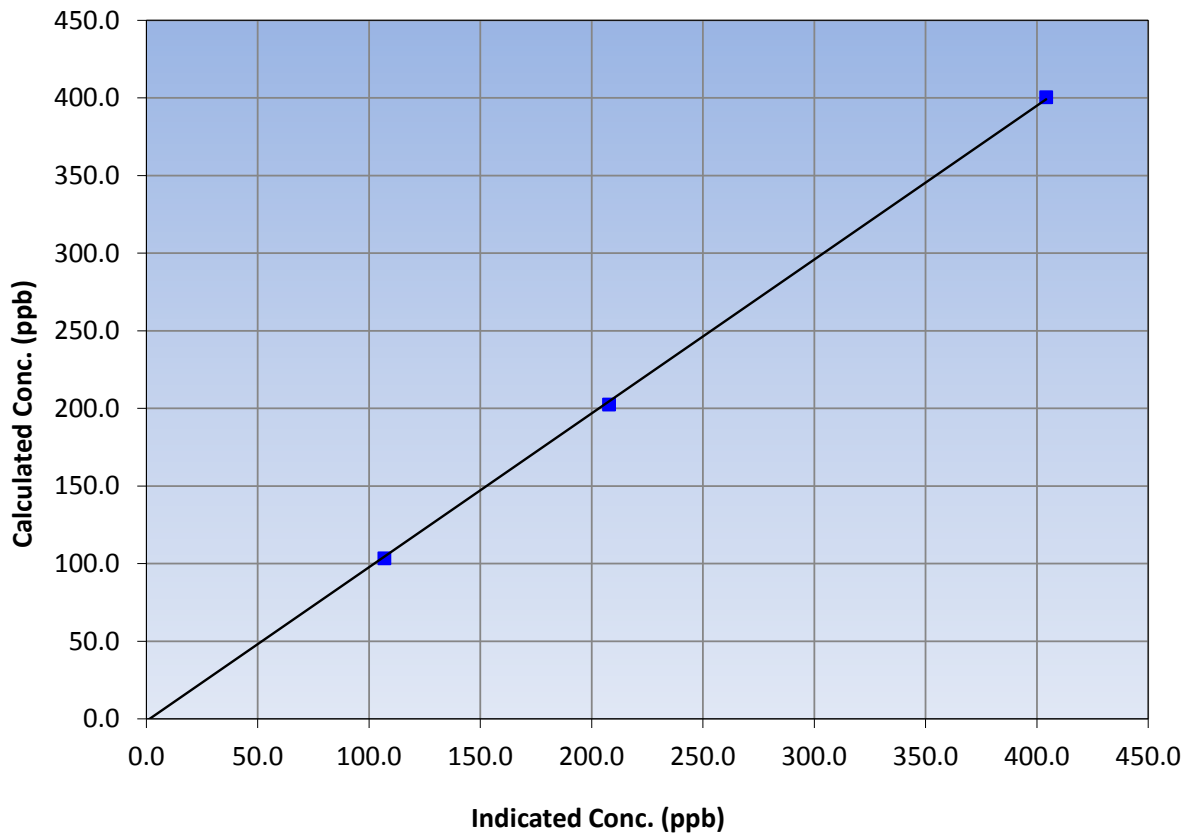
Station Information

Calibration Date	April 12, 2017	Previous Calibration	March 8, 2017
Station Name	Christina Lake	Station Number	AMS 500
Start Time (MST)	11:40	End Time (MST)	15:25
Analyzer make	Teledyne API T200	Analyzer serial #	723

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.3	----	Correlation Coefficient	≥0.995	
400.4	404.2	0.9907			
202.5	207.7	0.9750			
103.4	106.9	0.9676			
			Slope	0.991088	0.90 - 1.10
			Intercept	-1.418377	+/-20

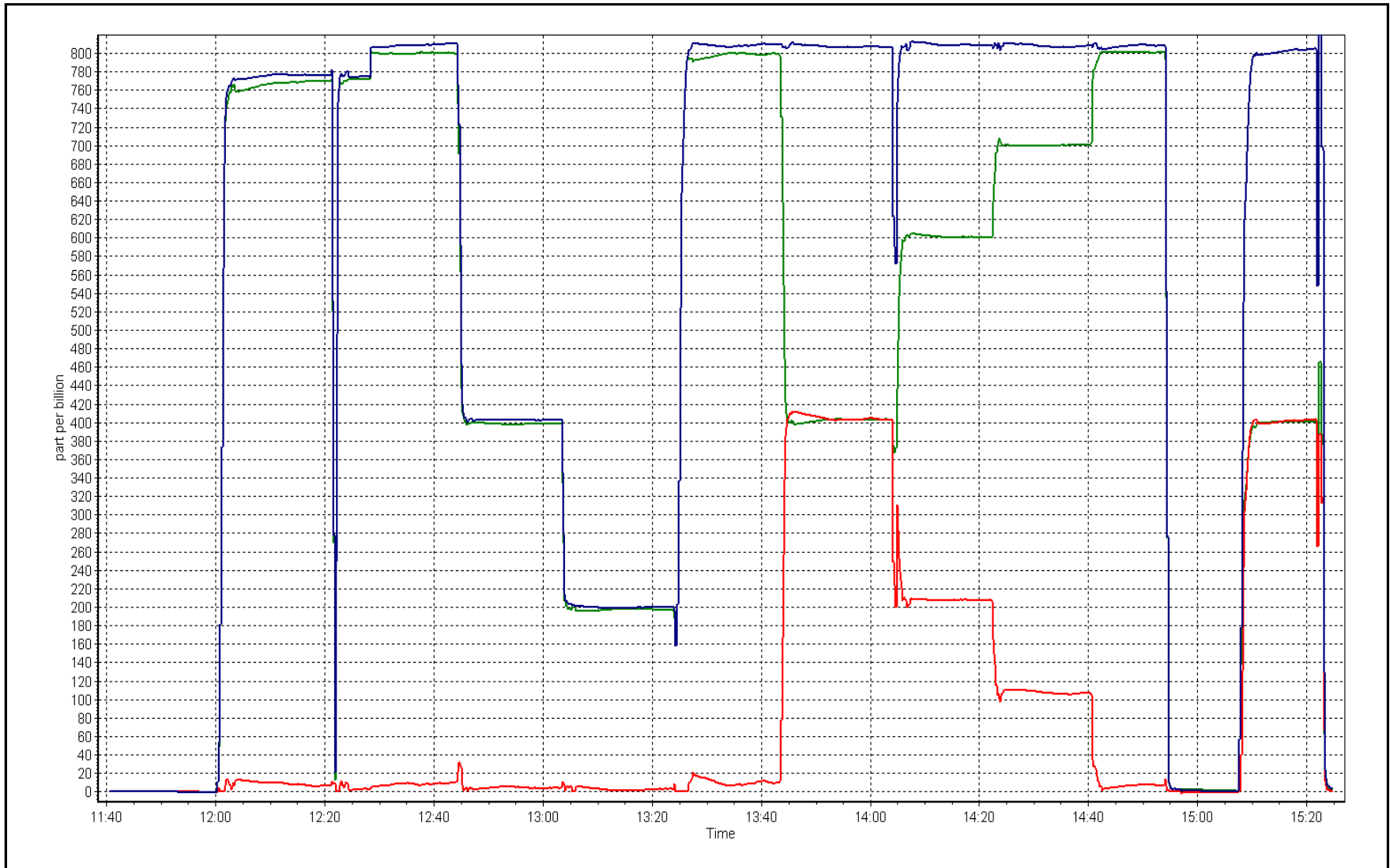
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 12, 2017

Location: Christina Lake





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY MONITORING PROGRAM MONTHLY REPORT

AMS 502 SURMONT APRIL 2017

Operations, Data Collection,
QA/QC, Data Validation and Reporting by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

May 29, 2017

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT (AMS 502)
APRIL 2017

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	16 Apr 2017 01:00	26 Apr 2017 10:00	250	Analyzer Failure - Sample Manifold Broken
SO2	26 Apr 2017 16:00	27 Apr 2017 12:00	21	Analyzer Failure - Sample Manifold Broken
H2S	16 Apr 2017 01:00	27 Apr 2017 09:00	273	Analyzer Failure - Sample Manifold Broken
NO2, NO, NOX	16 Apr 2017 01:00	26 Apr 2017 10:00	250	Analyzer Failure - Sample Manifold Broken
NO2, NO, NOX	26 Apr 2017 16:00	27 Apr 2017 12:00	21	Analyzer Failure - Sample Manifold Broken
Wind Speed, Wind Direction	05 Apr 2017 03:00	05 Apr 2017 10:00	8	Flat line in sensor output signal
Wind Speed, Wind Direction	14 Apr 2017 05:00	14 Apr 2017 16:00	12	Flat line in sensor output signal
Wind Speed, Wind Direction	19 Apr 2017 09:00	19 Apr 2017 10:00	2	Flat line in sensor output signal

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT (AMS 502)
 APRIL 2017

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	426	23	294	62.36	6	0	1	0
H2S (ppb) Average	426	21	294	62.08	3	0	1	0
NO2 (ppb) Average	426	23	294	62.36	12	0	4	-
NO (ppb) Average	426	23	294	62.36	5	-	2	-
NOX (ppb) Average	426	23	294	62.36	14	-	6	-
Temperature 2 m (C) Average	720	0	0	100	15	-	10	-
Relative Humidity (%) Average	720	0	0	100	100	-	97	-
Wind Speed 10 m (km/h) Average	698	0	22	96.94	25	-	19	-
Wind Direction 10 m (deg) Average	698	0	22	96.94	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Surmont - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 6 ppb on Apr 3 15:00	Maximum Daily Average: 1.3 ppb on Apr 3		Hours of Data:	426
Minimum Value: 0 ppb on Apr 1 11:00	Minimum Daily Average: 0.0 ppb on Apr 11		Hours of Missing Data:	294
Maximum Diurnal Average: 0.9 ppb at hour 16	Minimum Diurnal Average: 0.3 ppb at hour 24		Hours of Calibration:	23
Monthly Average: 0.4 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 1 P ₉₉ = 4		Percent Operational Time:	62.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	2	0	0	0	1	1	1	1	0.5	3
2-Apr	1	Z	0	1	0	0	0	0	0	0	1	2	1	1	5	5	2	0	0	0	0	0	0	0	1.0	5
3-Apr	0	0	Z	0	0	0	1	1	1	1	1	1	2	3	6	4	3	1	0	0	0	0	1	1	1.3	6
4-Apr	1	1	1	Z	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1
5-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	2	1	1	2	1	0	1	1	0	1	1	1	0.6	2
6-Apr	1	1	1	1	1	Z	1	0	0	1	1	0	2	4	2	0	0	0	0	0	0	0	0	0	0.8	4
7-Apr	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
8-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	0	0.3	1
9-Apr	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	1
10-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
11-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
12-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
13-Apr	Z	0	0	0	1	0	0	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0.6	1
14-Apr	0	Z	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
17-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
18-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
19-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
20-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
21-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
22-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
23-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
24-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
25-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
26-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
27-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0	0	0	0	1	0	0	0	1	0	0	0	--	1
28-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0.4	1
29-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	0	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1

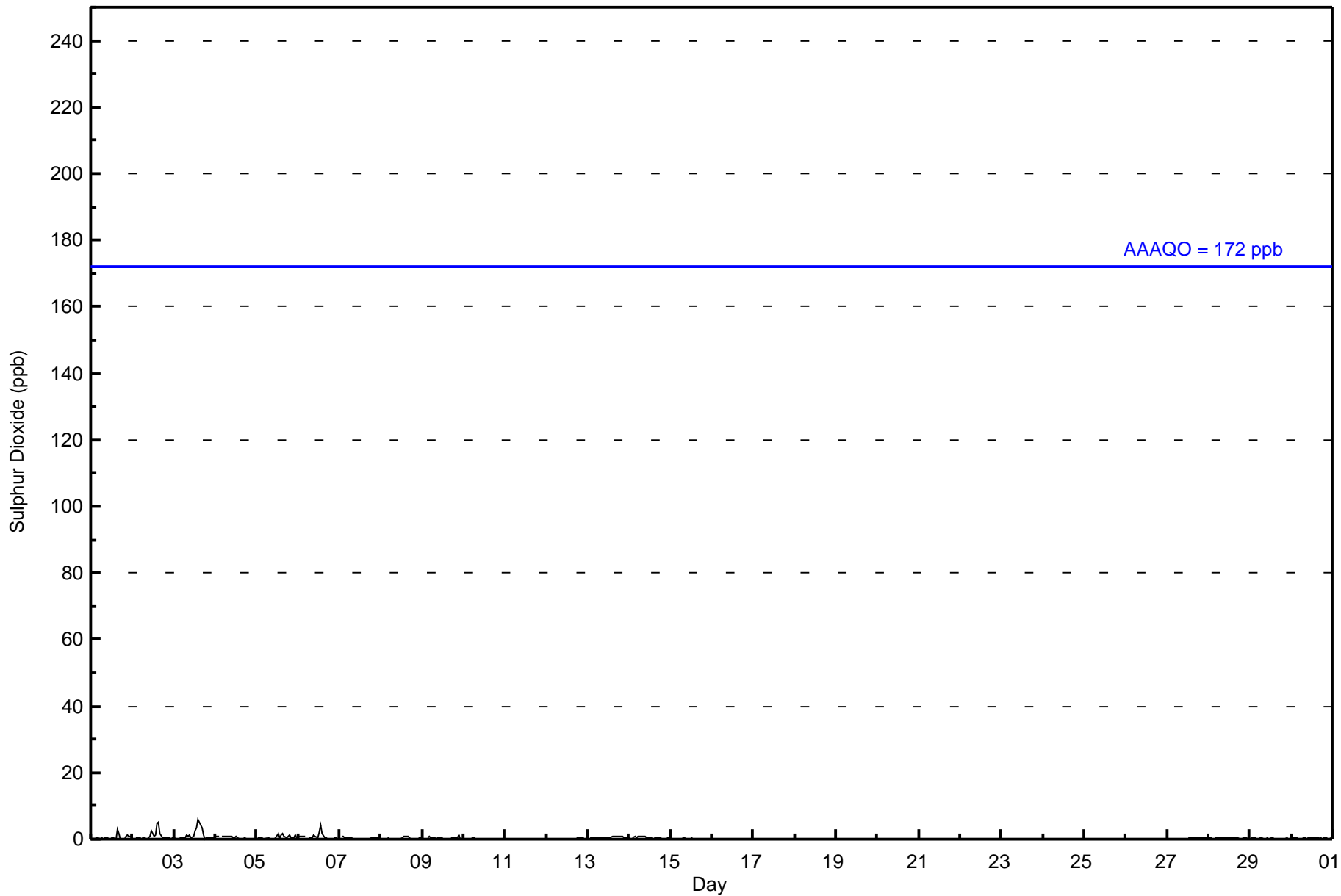
0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.6	0.7	0.9	0.9	0.6	0.3	0.3	0.3	0.3	0.4	0.3	0.3	Diurnal Average
1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4	6	5	3	1	1	1	1	1	1	1	Diurnal Maximum

Z - zeronspan C - Calibration AF - Analyzer Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	426	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 426

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Surmont - April 2017**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407

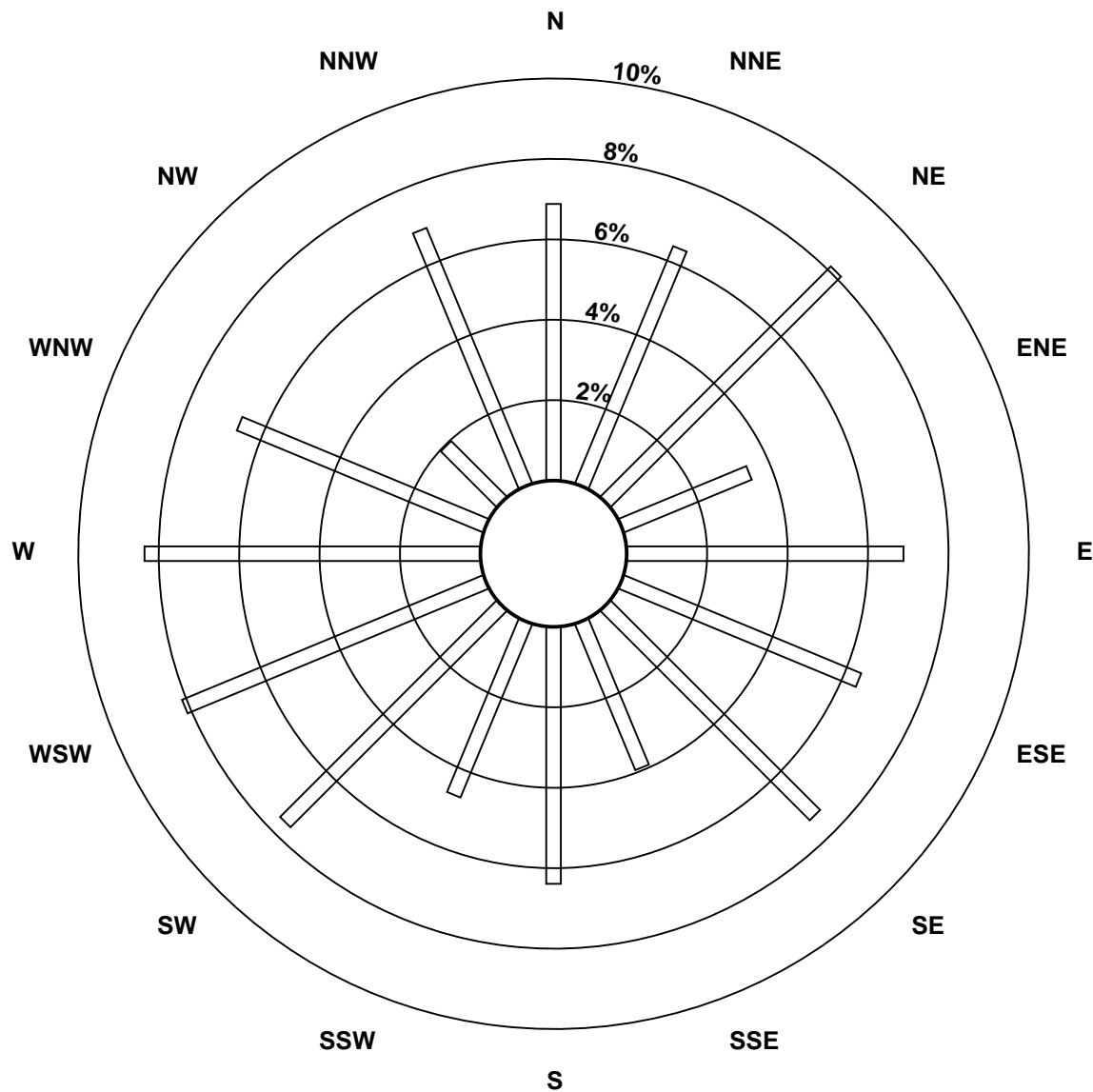
Total Number of Valid Hours: 407

Total Number of Hours: 720

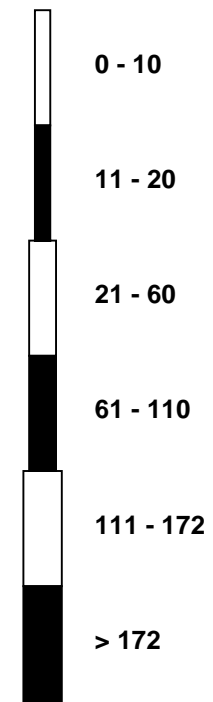


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Sulphur Dioxide (SO₂) - ppb
Surmont (AMS502)



Classes (ppb)

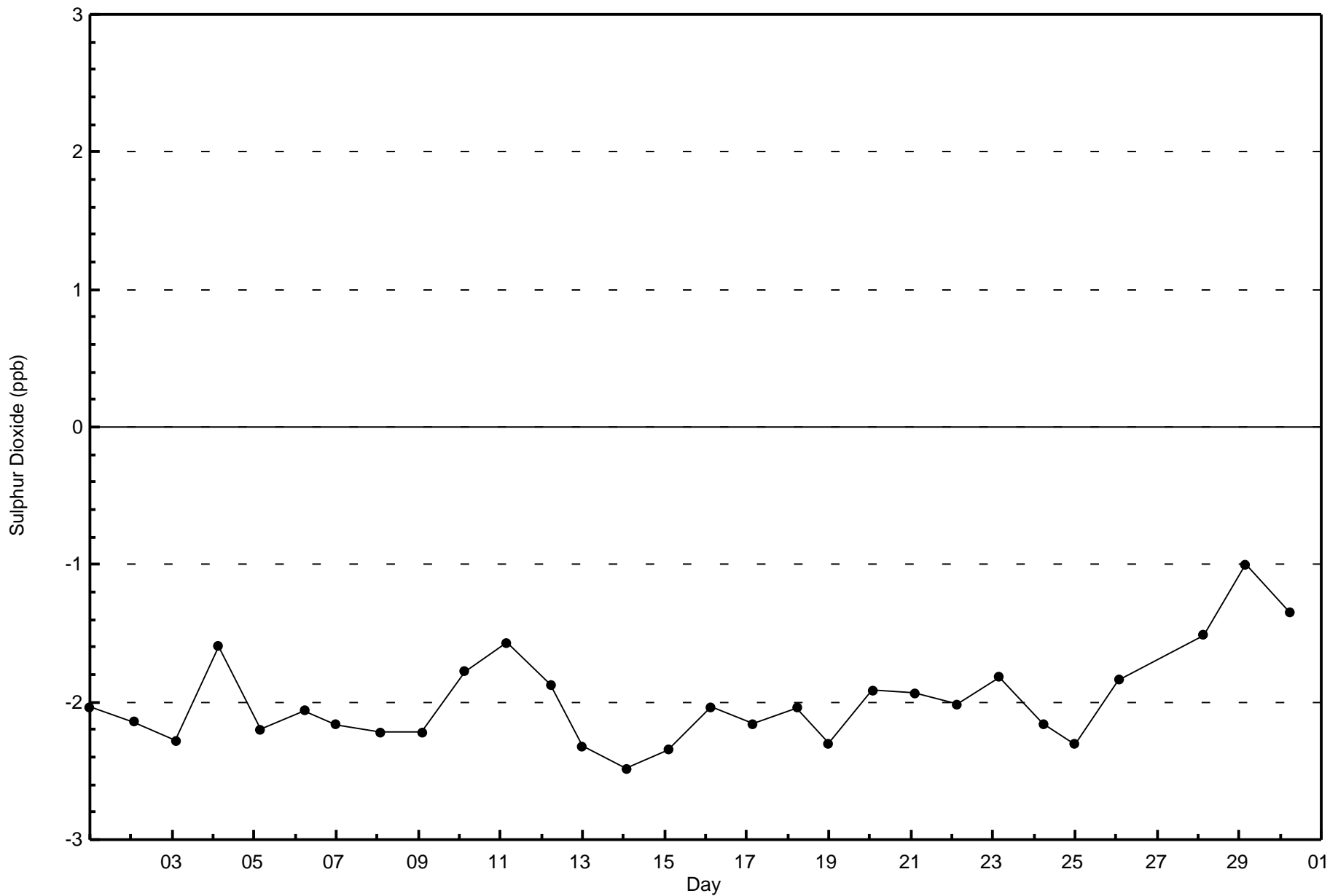


Total Number of Valid Hours: 407



Wood Buffalo Environmental Association
Zero Responses

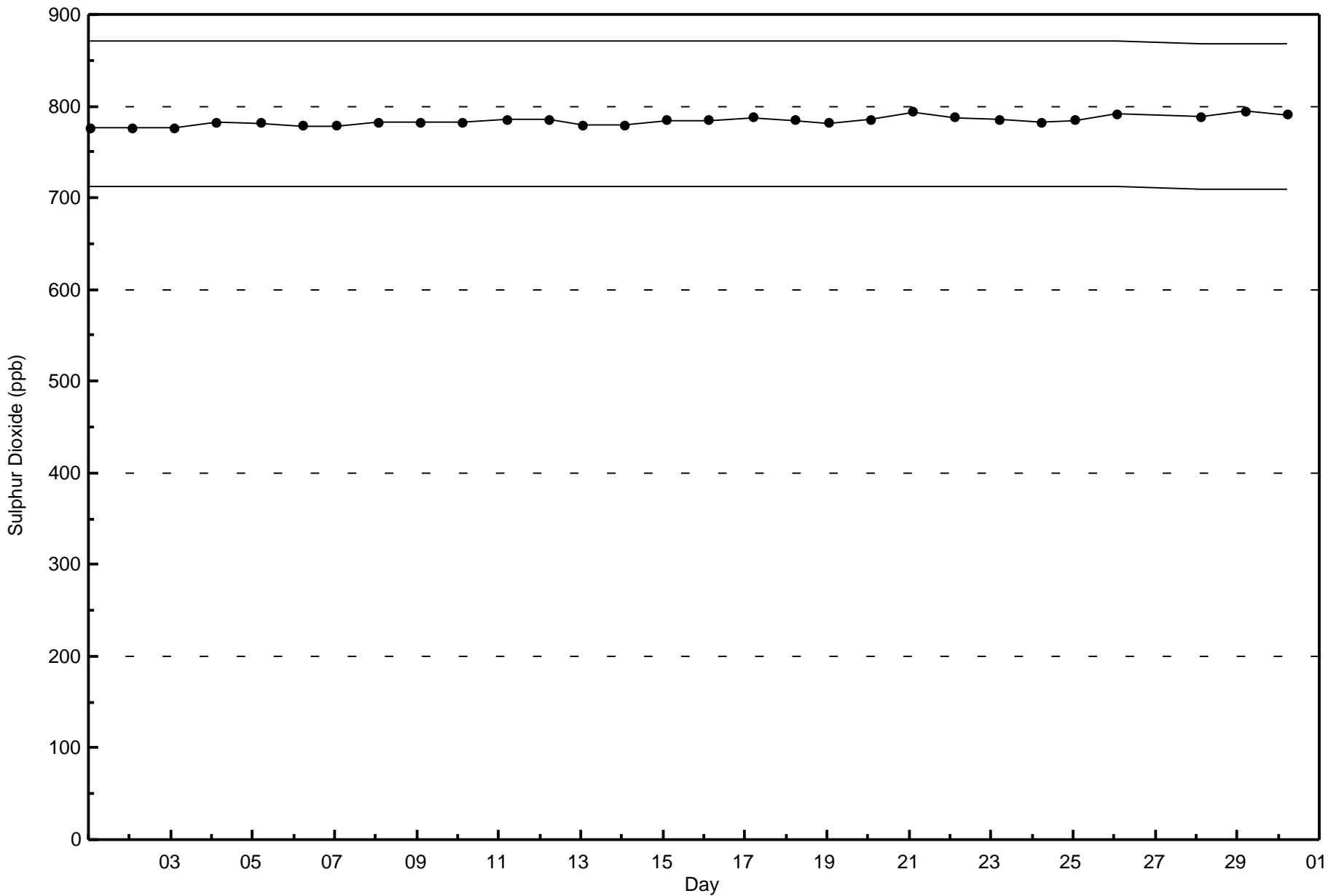
Sulphur Dioxide (SO₂) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Surmont - April 2017





Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3 ppb on Apr 6 23:00	Maximum Daily Average: 0.6 ppb on Apr 8		Hours of Data:	426
Minimum Value: 0 ppb on Apr 12 15:00	Minimum Daily Average: 0.1 ppb on Apr 28		Hours of Missing Data:	294
Maximum Diurnal Average: 0.4 ppb at hour 5	Minimum Diurnal Average: 0.2 ppb at hour 11		Hours of Calibration:	21
Monthly Average: 0.3 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 0 Q ₃ = 0 P ₉₀ = 0 P ₉₉ = 1		Percent Operational Time:	62.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1		
2-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	
3-Apr	0	0	0	Z	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0.3	1	
4-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
5-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
6-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0.5	3	
7-Apr	1	Z	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.5	1	
8-Apr	0	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.6	1	
9-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
10-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
11-Apr	0	0	0	0	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	
12-Apr	0	0	1	1	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	
13-Apr	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	
14-Apr	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
15-Apr	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
17-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
18-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
19-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
20-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
21-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
22-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
23-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
24-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
25-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
26-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
27-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	--	0
28-Apr	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
29-Apr	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
30-Apr	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0

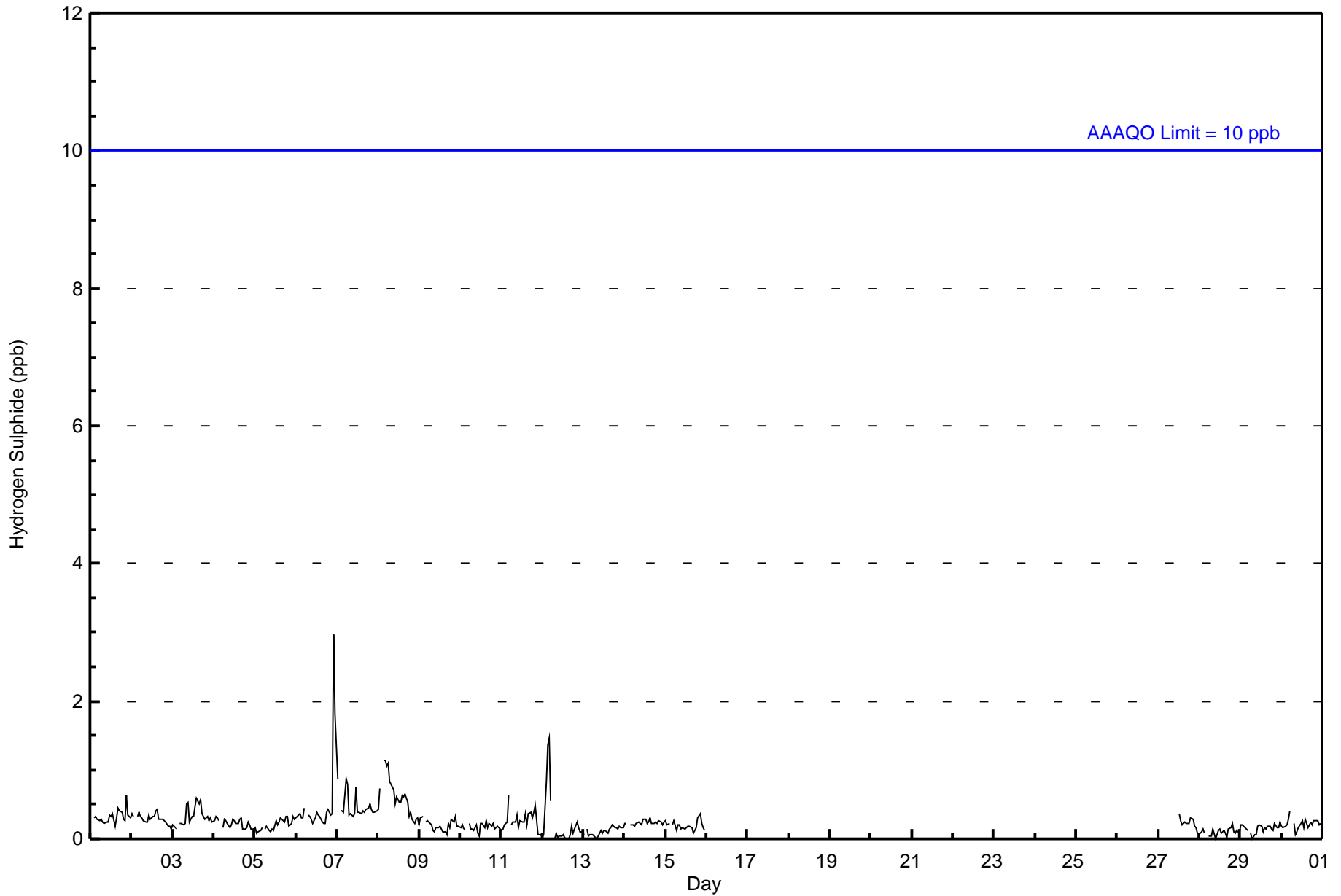
0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.3	Diurnal Average
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	3	2	Diurnal Maximum

Z - zerospan C - Calibration AF - Analyzer Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	425	99.77	99.77
3 - 4	1	0.23	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 426

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	31	25	32	13	29	26	30	16	26	18	33	31	35	27	7	27	406
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	25	32	13	29	26	30	16	26	18	33	31	35	27	8	27	407

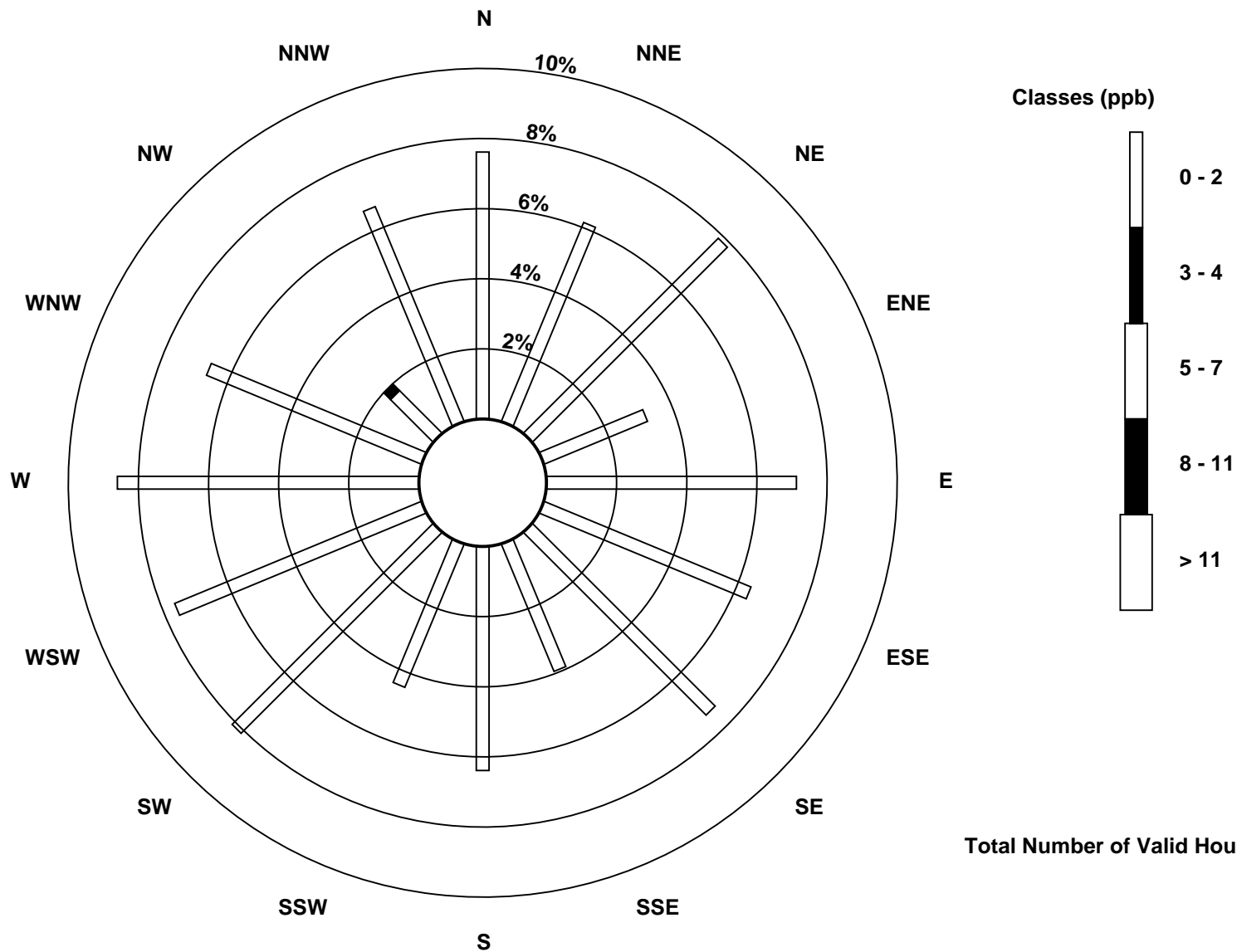
Total Number of Valid Hours: 407

Total Number of Hours: 720

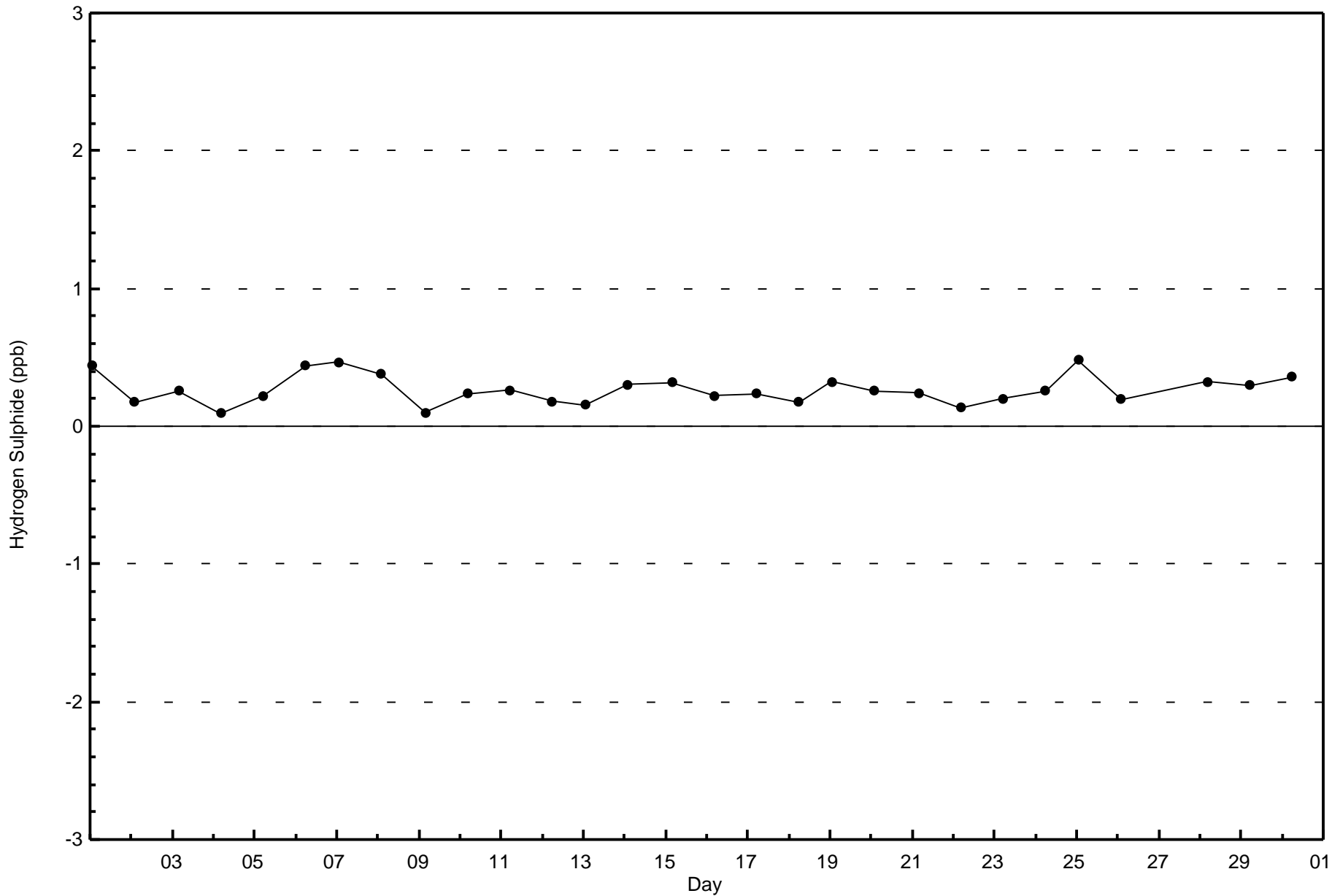


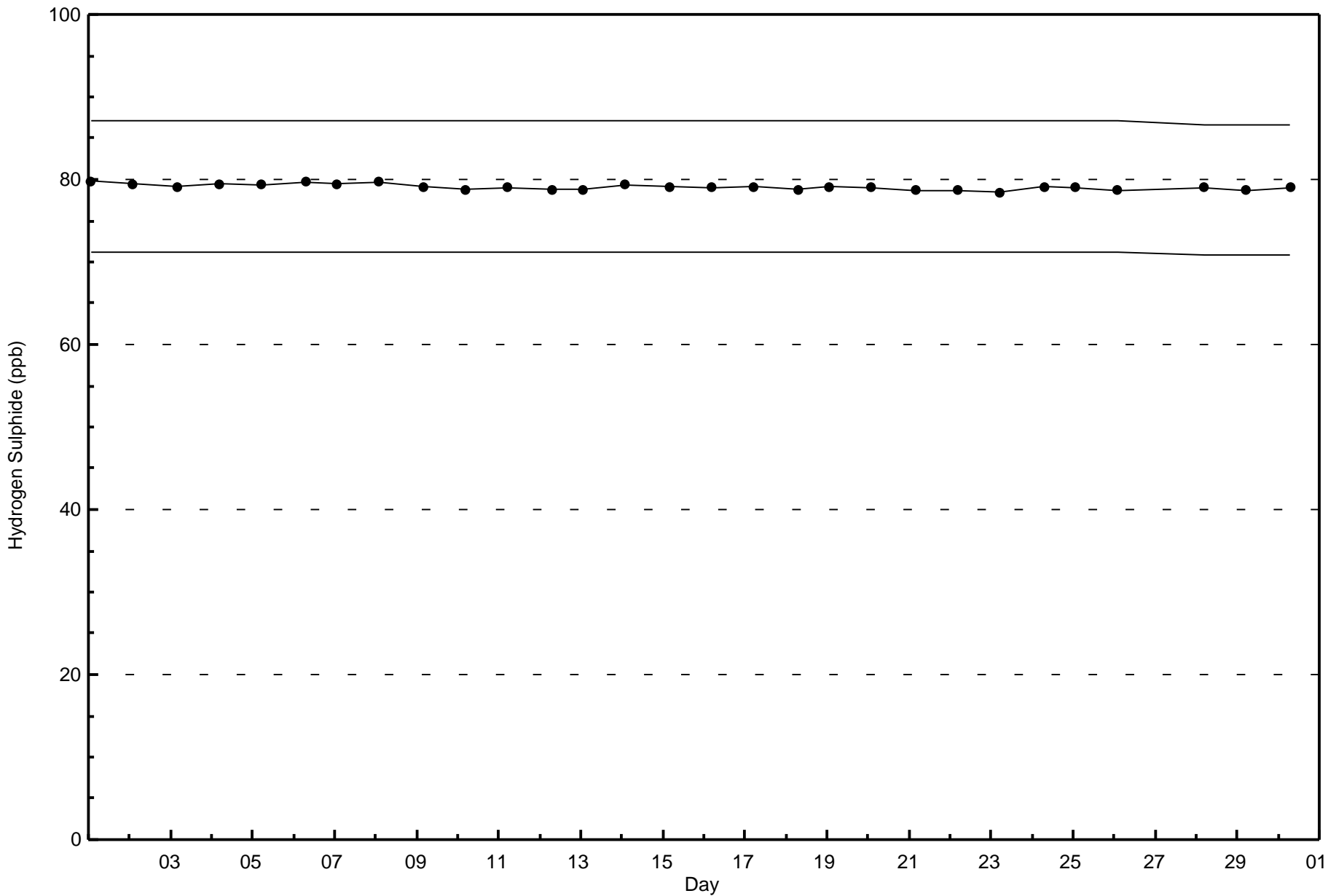
Wood Buffalo Environmental Association
Wind Rose Apr 2017

Hydrogen Sulphide (H₂S) - ppb
Surmont (AMS502)



Total Number of Valid Hours: 407







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

Surmont - April 2017

Maximum Value: 5 ppb on Apr 5 13:00	Maximum Daily Average: 1.6 ppb on Apr 11	Hours in Service: 720
Minimum Value: 0 ppb on Apr 1 02:00	Minimum Daily Average: 0.3 ppb on Apr 8	Hours of Data: 426
Maximum Diurnal Average: 1.5 ppb at hour 13	Minimum Diurnal Average: 0.3 ppb at hour 2	Hours of Missing Data: 294
Monthly Average: 0.8 ppb	Percentiles: P ₁ = 0 P ₁₀ = 0 Q ₁ = 0 Median = 1 Q ₃ = 1 P ₉₀ = 2 P ₉₉ = 4	Hours of Calibration: 23
		Percent Operational Time: 62.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	0	0	0	0	0	0	1	0	1	0	0	1	0	0	2	1	0	1	0	1	1	1	0	0.5	2
2-Apr	1	Z	0	0	0	0	0	0	0	0	1	2	1	1	3	3	1	0	0	0	0	0	0	0	0.7	3
3-Apr	0	0	Z	0	0	0	0	1	1	1	1	0	0	1	1	3	1	0	0	0	0	0	0	0	0.4	3
4-Apr	0	0	0	Z	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
5-Apr	1	0	0	0	Z	0	0	2	1	2	3	1	5	1	4	3	1	1	1	1	0	0	1	0	1.4	5
6-Apr	0	1	0	0	0	Z	0	0	0	1	1	0	1	2	1	0	0	0	0	1	0	0	0	0	0.4	2
7-Apr	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1	0	1	1	1	0	0	0	0.4	1
8-Apr	0	Z	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Apr	0	0	Z	0	0	0	1	1	1	2	1	3	1	1	2	2	1	2	1	3	1	2	1	1	1.1	3
10-Apr	0	1	0	Z	1	2	2	1	2	2	2	1	2	5	3	3	2	4	1	0	0	0	0	1	1.5	5
11-Apr	0	0	0	1	Z	2	3	4	4	3	3	3	2	2	3	2	1	0	0	0	0	0	0	0	1.6	4
12-Apr	0	0	1	2	1	Z	1	2	1	1	1	1	1	2	1	1	3	2	1	0	1	0	1	0	1.0	3
13-Apr	Z	1	0	0	1	1	0	2	1	2	2	0	1	2	1	1	1	1	0	1	0	0	0	0	0.8	2
14-Apr	0	Z	0	0	0	1	1	1	1	1	0	1	1	0	1	0	1	0	1	3	0	0	0	1	0.7	3
15-Apr	1	1	Z	0	0	0	0	0	0	2	0	1	1	1	1	2	2	2	0	1	2	1	2	2	1.0	2
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
17-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
18-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
19-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
20-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
21-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
22-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
23-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
24-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
25-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
26-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
27-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	3	1	2	1	1	2	1	0	0	0	0	0	--	3
28-Apr	0	0	0	Z	0	1	1	2	2	1	1	1	1	1	1	1	1	1	3	1	0	1	0	1	0.9	3
29-Apr	0	0	0	0	Z	0	0	0	2	1	2	2	1	0	1	1	1	0	0	0	0	0	0	1	0.7	2
30-Apr	0	0	0	0	1	Z	1	0	1	1	2	1	2	1	1	1	1	1	1	2	0	1	0	0	0.8	2

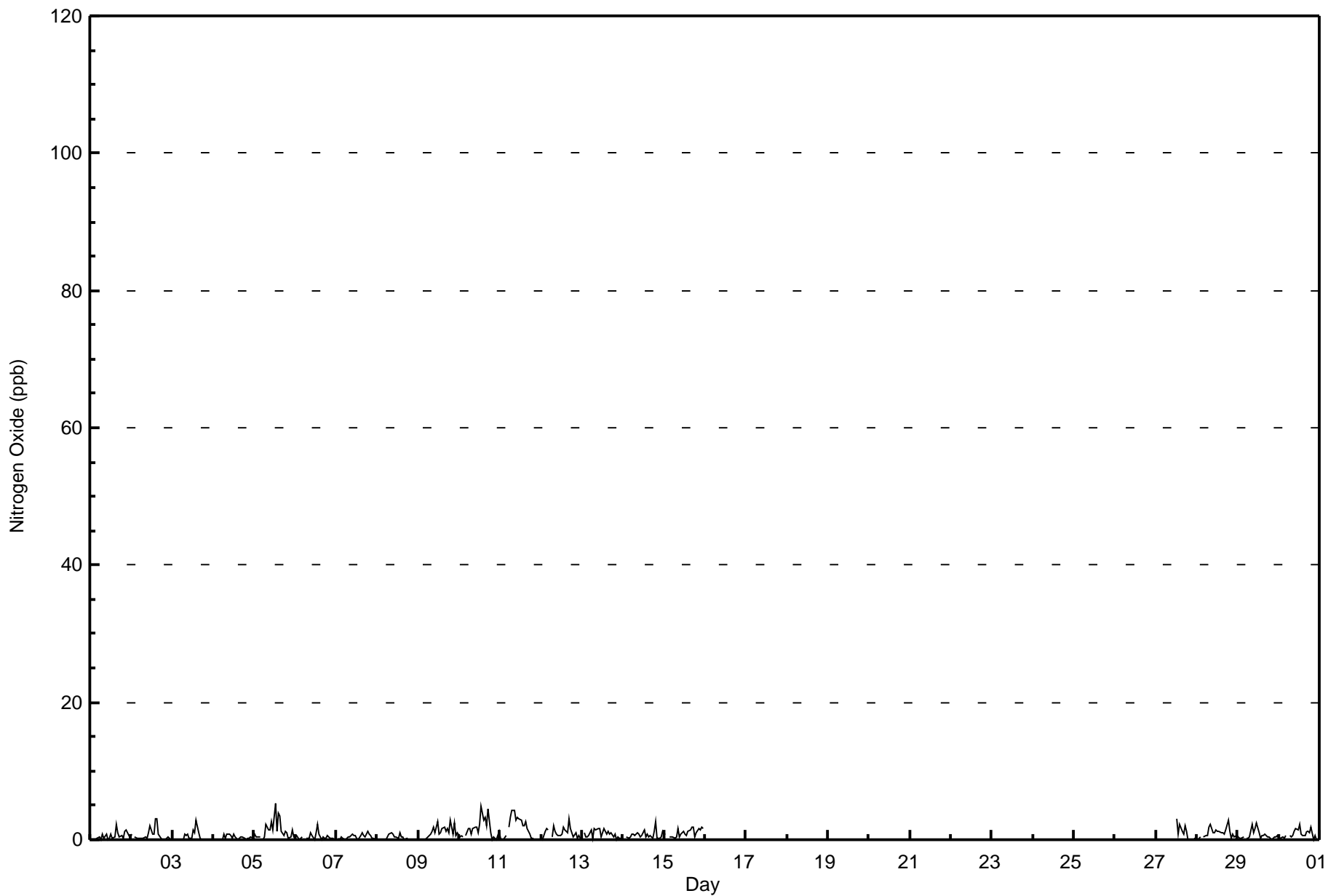
0.3	0.3	0.3	0.3	0.4	0.5	0.6	1.1	1.2	1.1	1.1	1.1	1.1	1.5	1.2	1.4	1.4	1.0	1.0	0.7	0.7	0.4	0.5	0.4	0.4	Diurnal Average
1	1	1	2	1	2	3	4	4	3	3	3	3	5	5	4	3	3	4	3	3	2	2	2	2	Diurnal Maximum

Z - zerospan C - Calibration AF - Analyzer Failure



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxide (NO) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxide (NO) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	426	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 426

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxide (NO) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407

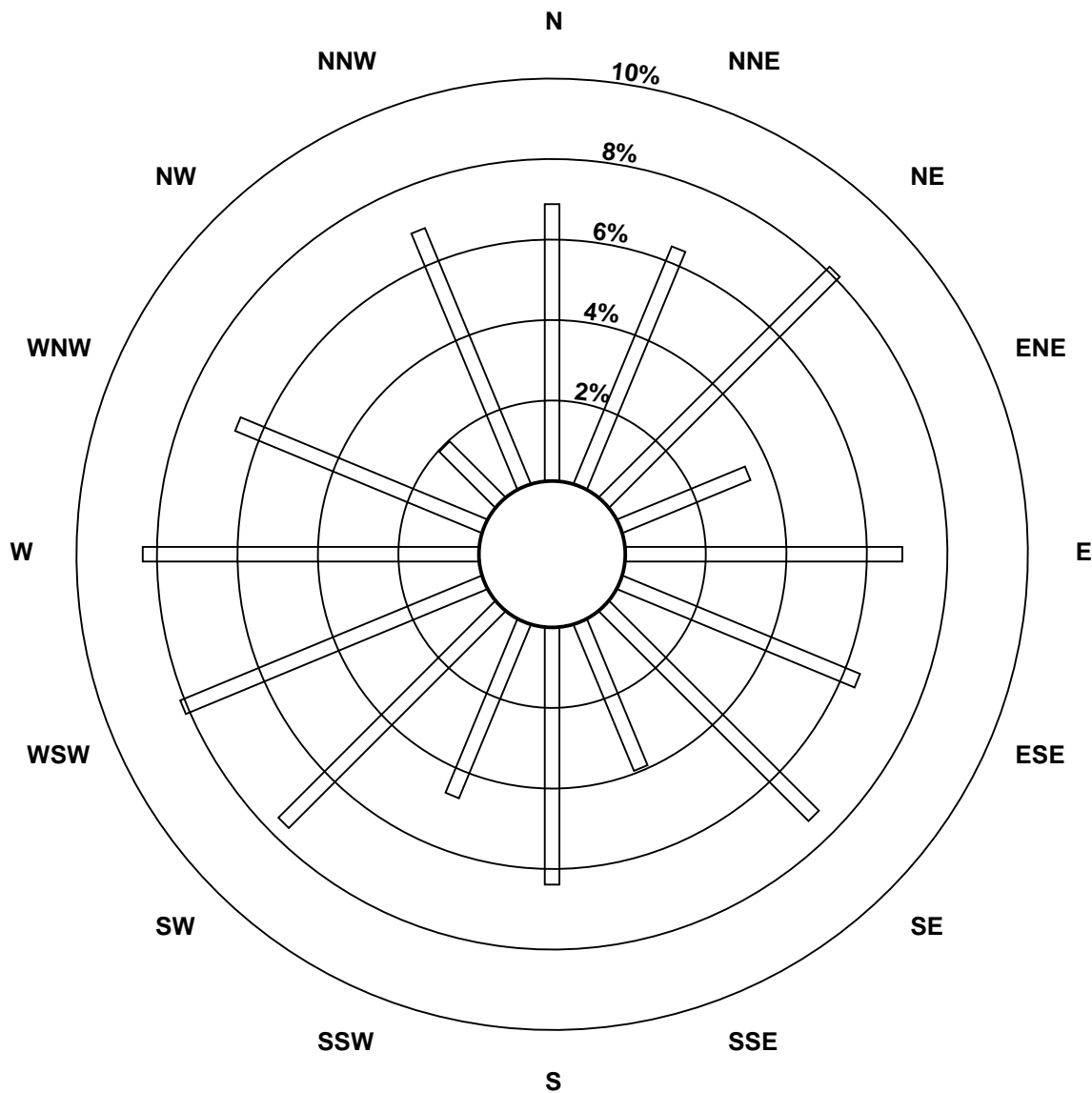
Total Number of Valid Hours: 407

Total Number of Hours: 720

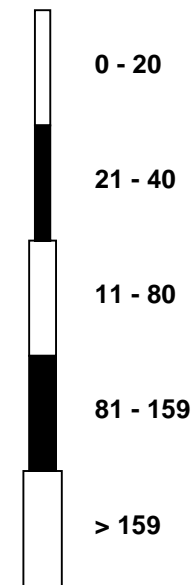


Wood Buffalo Environmental Association
Wind Rose Apr 2017

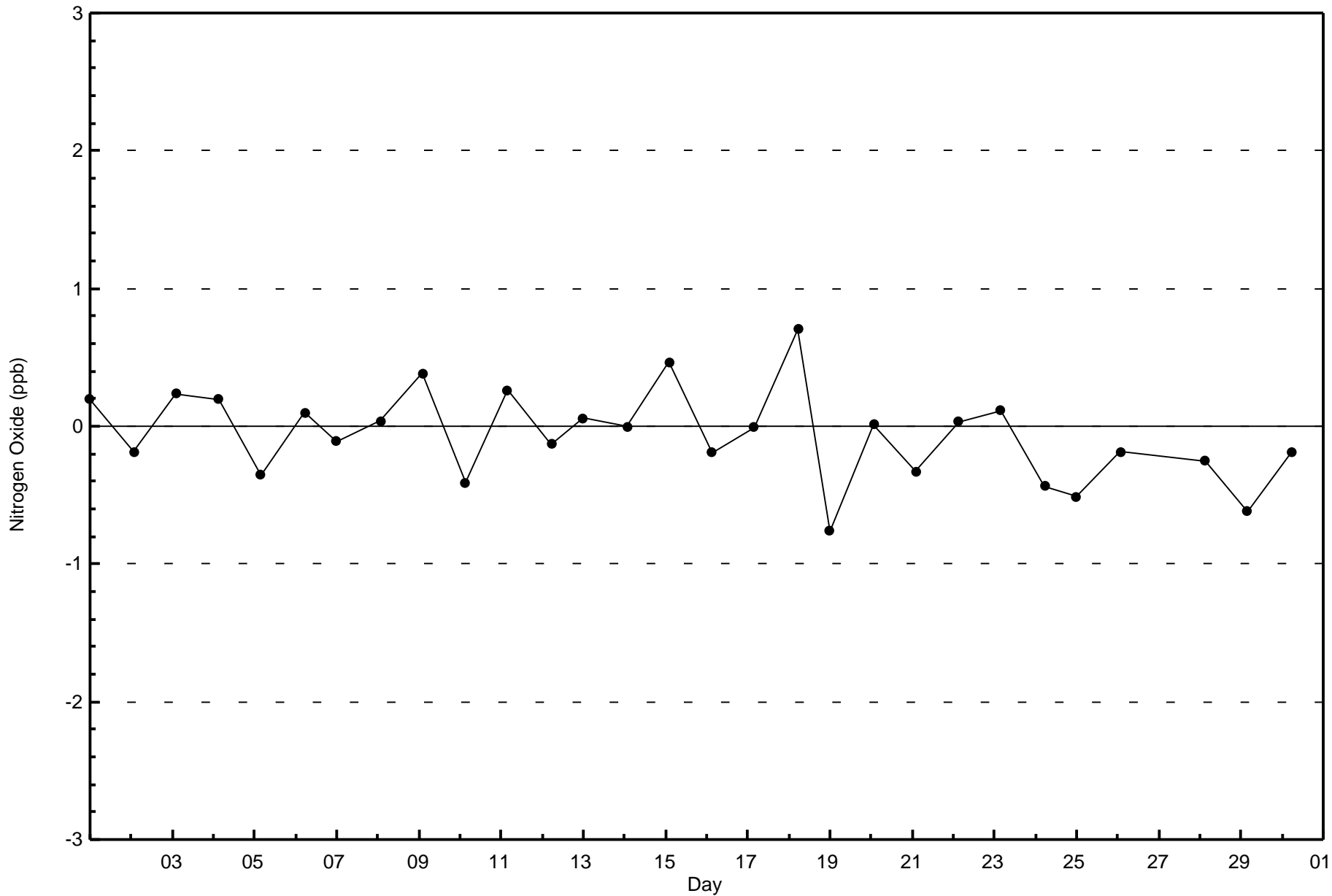
Nitrogen Oxide (NO) - ppb
Surmont (AMS502)



Classes (ppb)



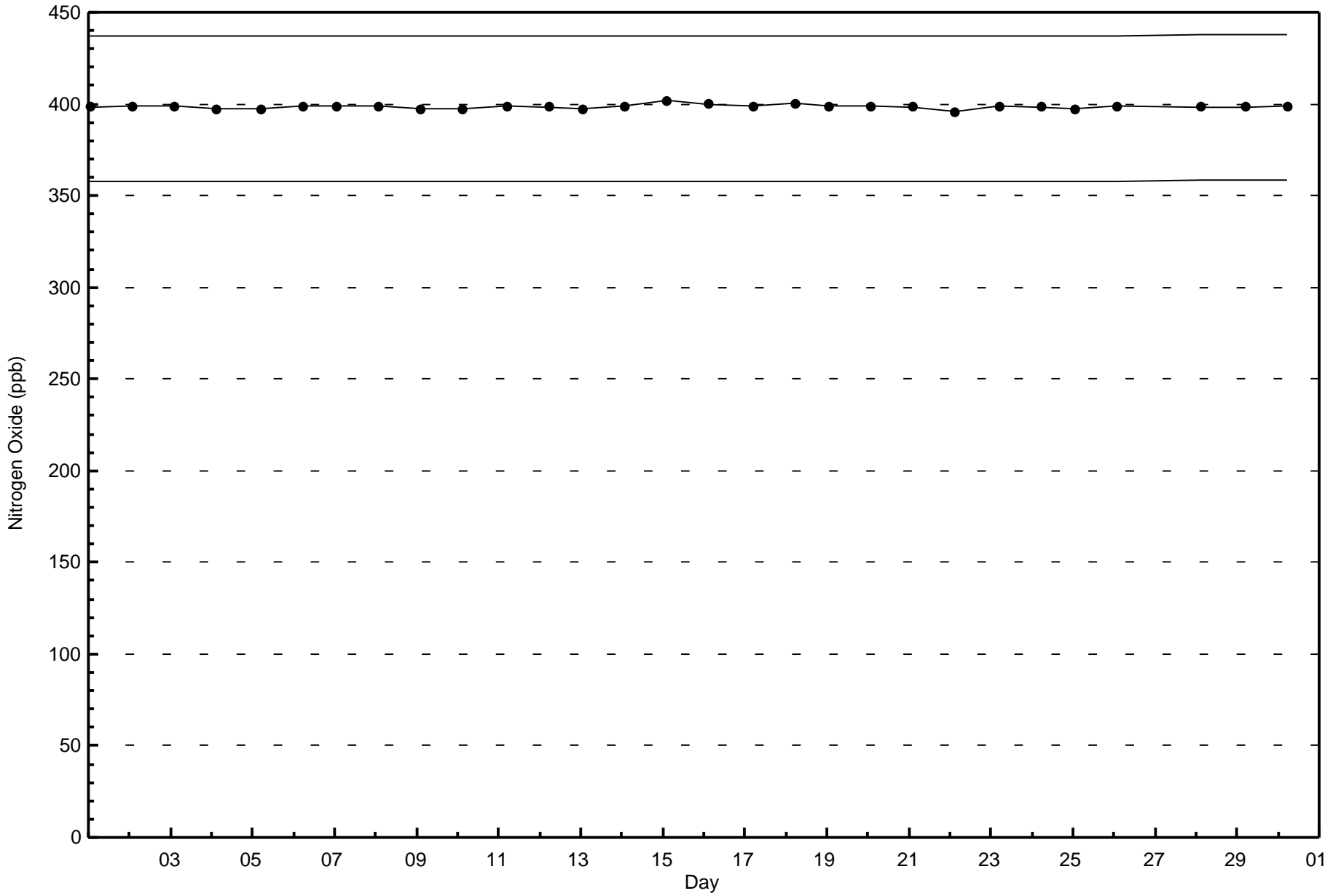
Total Number of Valid Hours: 407





Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxide (NO) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Surmont - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 12 ppb on Apr 30 20:00	Maximum Daily Average: 4.4 ppb on Apr 11		Hours of Data:	426
Minimum Value: 0 ppb on Apr 9 01:00	Minimum Daily Average: 1.2 ppb on Apr 2		Hours of Missing Data:	294
Maximum Diurnal Average: 2.6 ppb at hour 20	Minimum Diurnal Average: 1.1 ppb at hour 1		Hours of Calibration:	23
Monthly Average: 1.9 ppb	Percentiles: P ₁ = 0 P ₁₀ = 1 O ₁ = 1 Median = 2 O ₃ = 2 P ₉₀ = 4 P ₉₉ = 10		Percent Operational Time:	62.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	Z	2	2	1	1	1	1	1	1	1	1	1	1	1	3	2	1	1	1	2	3	2	2	1.3	3	
2-Apr	1	Z	1	1	1	1	1	1	1	1	1	2	1	1	4	4	2	1	1	1	1	1	1	1.2	4	
3-Apr	1	1	Z	2	2	3	3	4	3	3	2	1	2	3	5	3	3	2	0	1	1	1	2	2.0	5	
4-Apr	1	1	1	Z	2	2	4	2	2	2	1	1	3	1	1	2	3	2	2	2	2	2	1	1.7	4	
5-Apr	1	2	1	1	Z	2	2	4	3	2	3	2	8	3	7	8	5	2	5	6	2	2	8	3.5	8	
6-Apr	3	5	2	3	3	Z	4	3	2	3	3	2	3	5	2	1	1	1	1	1	1	1	1	2.1	5	
7-Apr	Z	3	2	1	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	2	3	1	1	1.7	3	
8-Apr	1	Z	1	1	1	2	5	4	4	3	2	2	2	3	2	2	2	2	2	1	1	1	1	1.8	5	
9-Apr	0	1	Z	0	1	1	1	1	1	2	2	1	1	1	2	2	2	3	2	2	2	6	3	1.6	6	
10-Apr	2	2	1	Z	2	5	5	2	2	1	3	2	3	4	4	3	3	6	2	1	2	2	2	2.5	6	
11-Apr	1	2	5	9	Z	10	10	10	8	5	5	5	5	4	4	5	4	4	1	1	1	1	1	4.4	10	
12-Apr	1	1	5	7	7	Z	2	2	2	1	1	1	1	1	1	1	1	2	1	3	3	1	1	2.1	7	
13-Apr	Z	1	1	1	2	3	1	1	2	1	2	1	1	1	1	3	1	1	1	1	1	1	1	1.2	3	
14-Apr	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	1	2	2	1.3	6	
15-Apr	2	2	Z	1	2	2	2	1	2	2	1	2	1	1	1	2	1	4	3	7	3	2	3	2.0	7	
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
17-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
18-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
19-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
20-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
21-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
22-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
23-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
24-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
25-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
26-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
27-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1	1	2	2	0	3	2	1	1	0	0	1	--	3
28-Apr	1	1	1	Z	6	1	1	2	3	1	1	1	2	2	1	2	2	2	2	2	1	1	1	1.6	6	
29-Apr	1	1	1	1	Z	1	1	1	3	2	2	2	1	1	1	2	2	1	2	2	2	2	1	1.4	3	
30-Apr	1	1	1	1	1	Z	1	1	1	1	2	2	1	1	1	2	4	5	6	12	2	1	0	2.1	12	

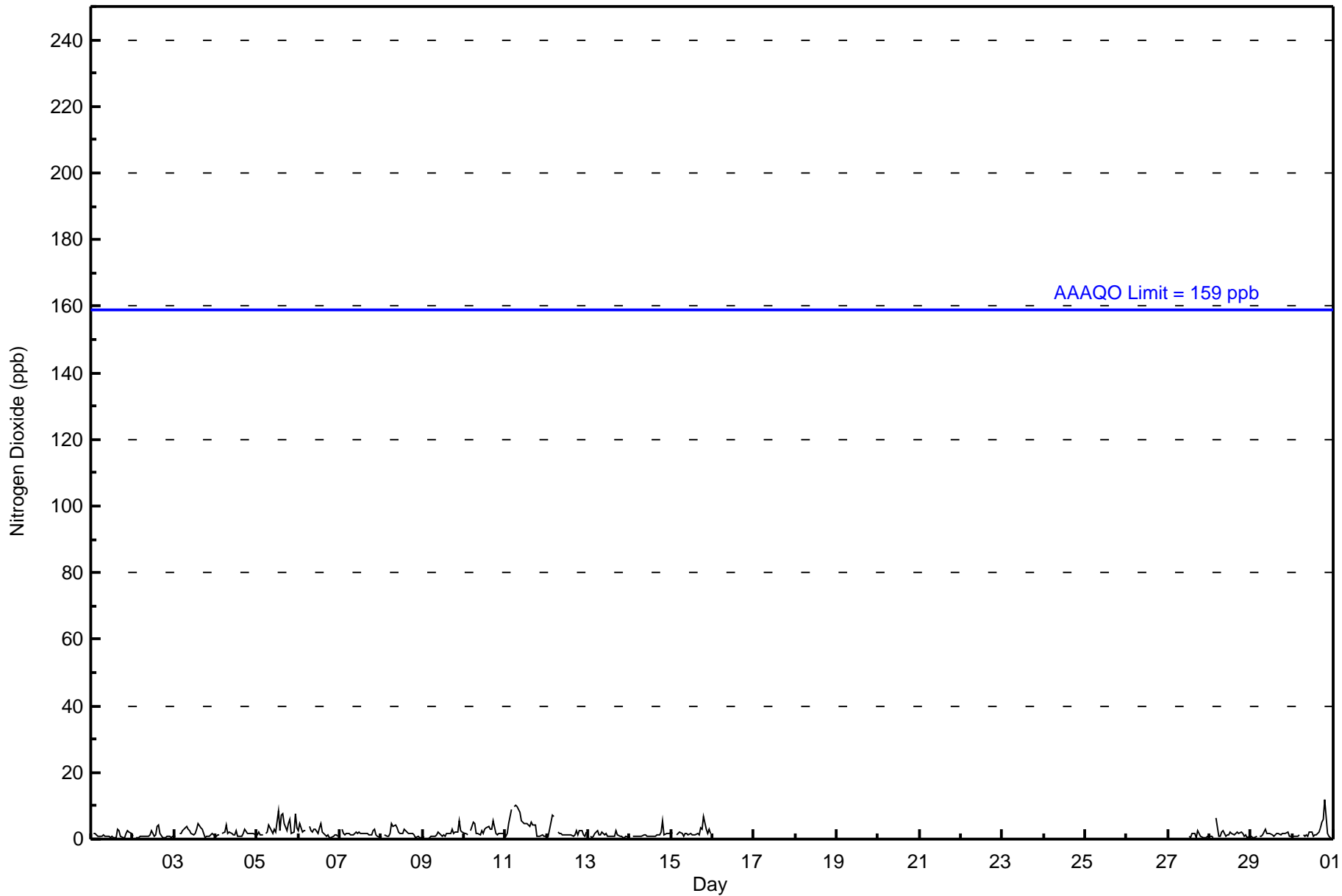
1.1	1.5	1.6	2.0	2.1	2.3	2.5	2.3	2.3	1.9	1.9	1.7	2.1	1.8	2.3	2.3	2.1	2.3	1.8	2.6	1.5	1.6	1.6	1.2	Diurnal Average	
3	5	5	9	7	10	10	10	10	8	5	5	5	8	5	7	8	5	6	6	12	3	6	8	3	Diurnal Maximum

Z - zerospan C - Calibration AF - Analyzer Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	426	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 426

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407

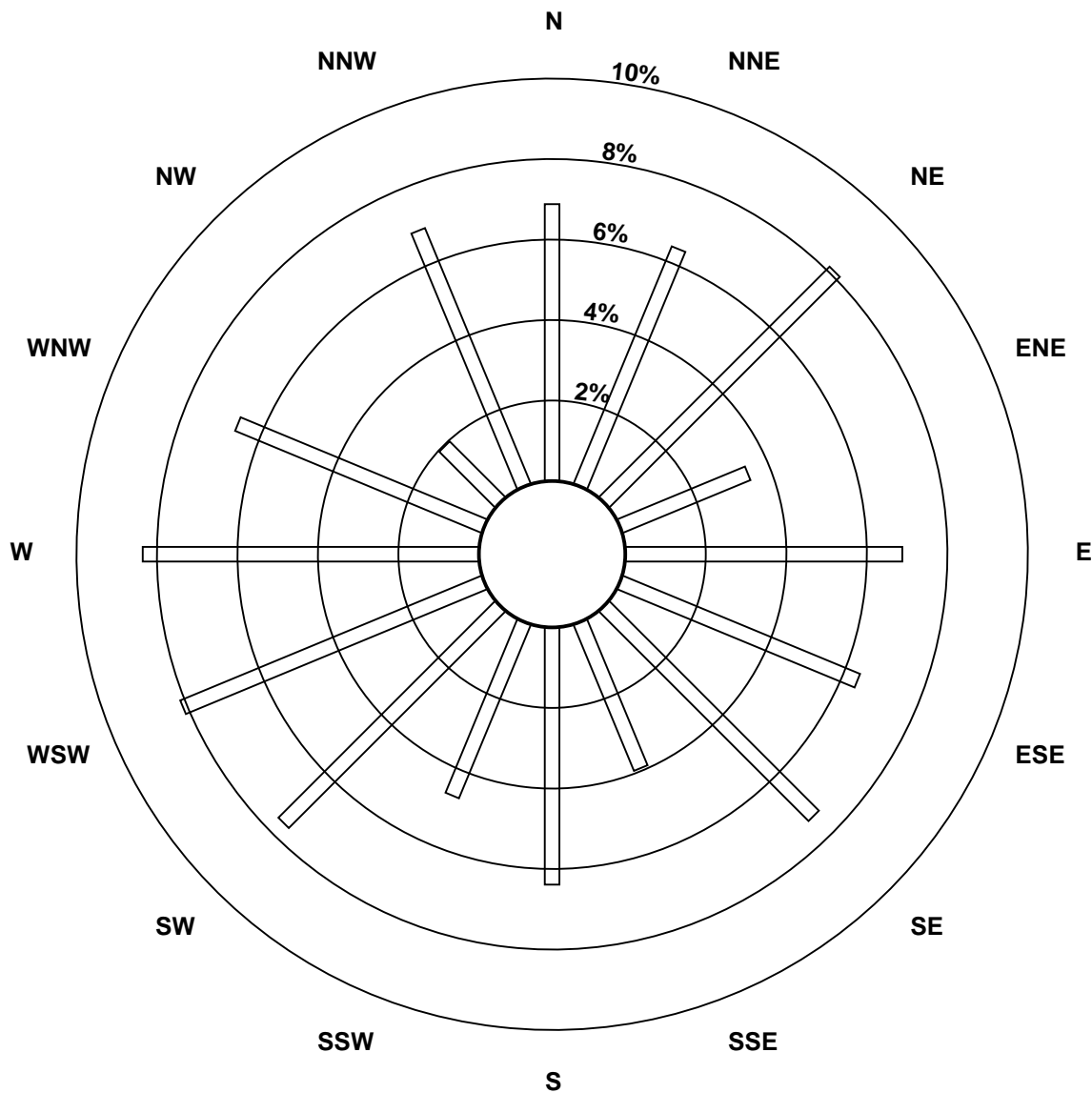
Total Number of Valid Hours: 407

Total Number of Hours: 720

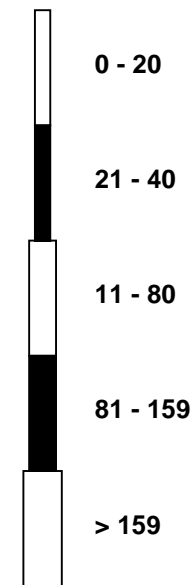


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Dioxide (NO₂) - ppb
Surmont (AMS502)



Classes (ppb)



Total Number of Valid Hours: 407

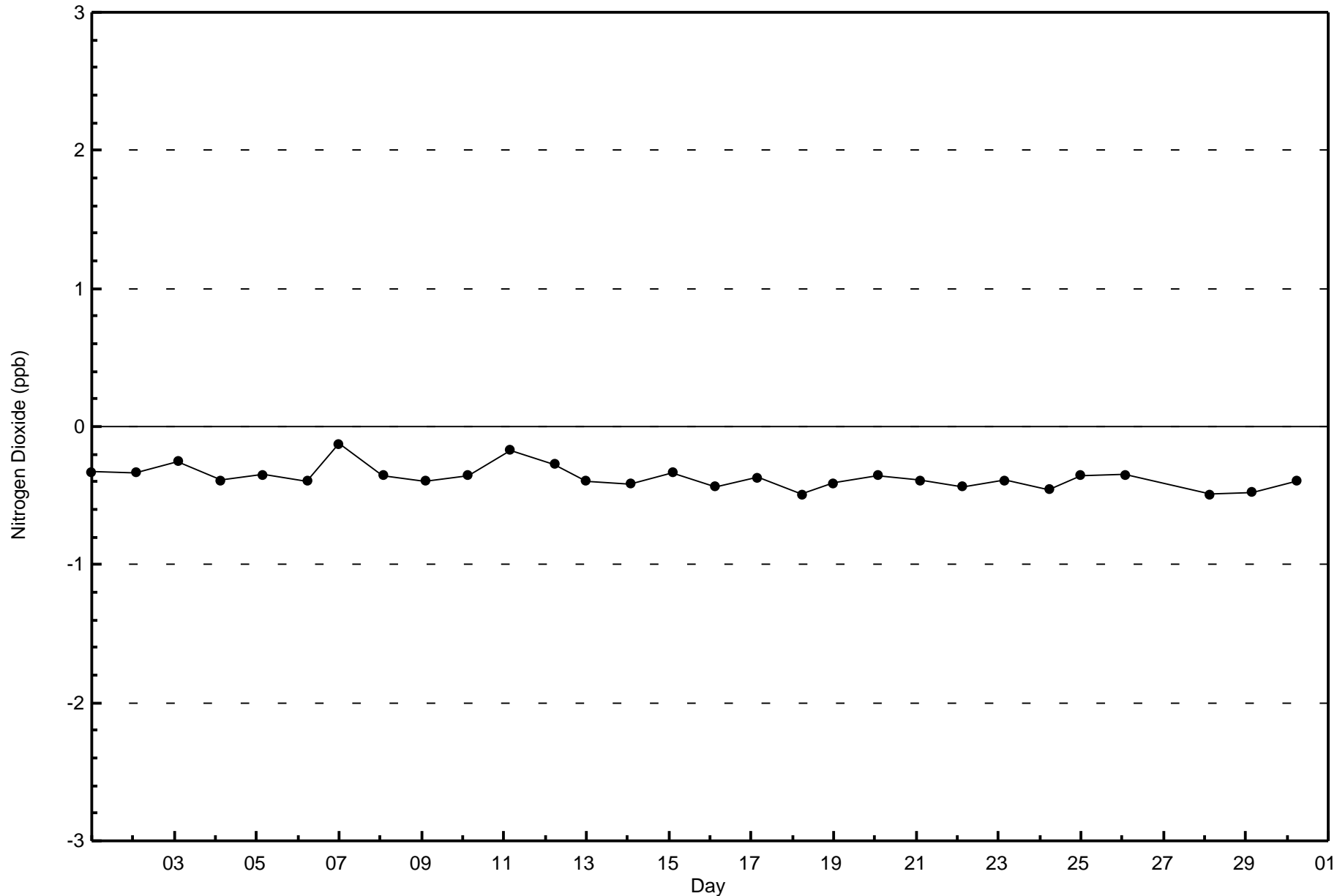


Wood Buffalo Environmental Association

Zero Responses

Nitrogen Dioxide (NO₂) - ppb

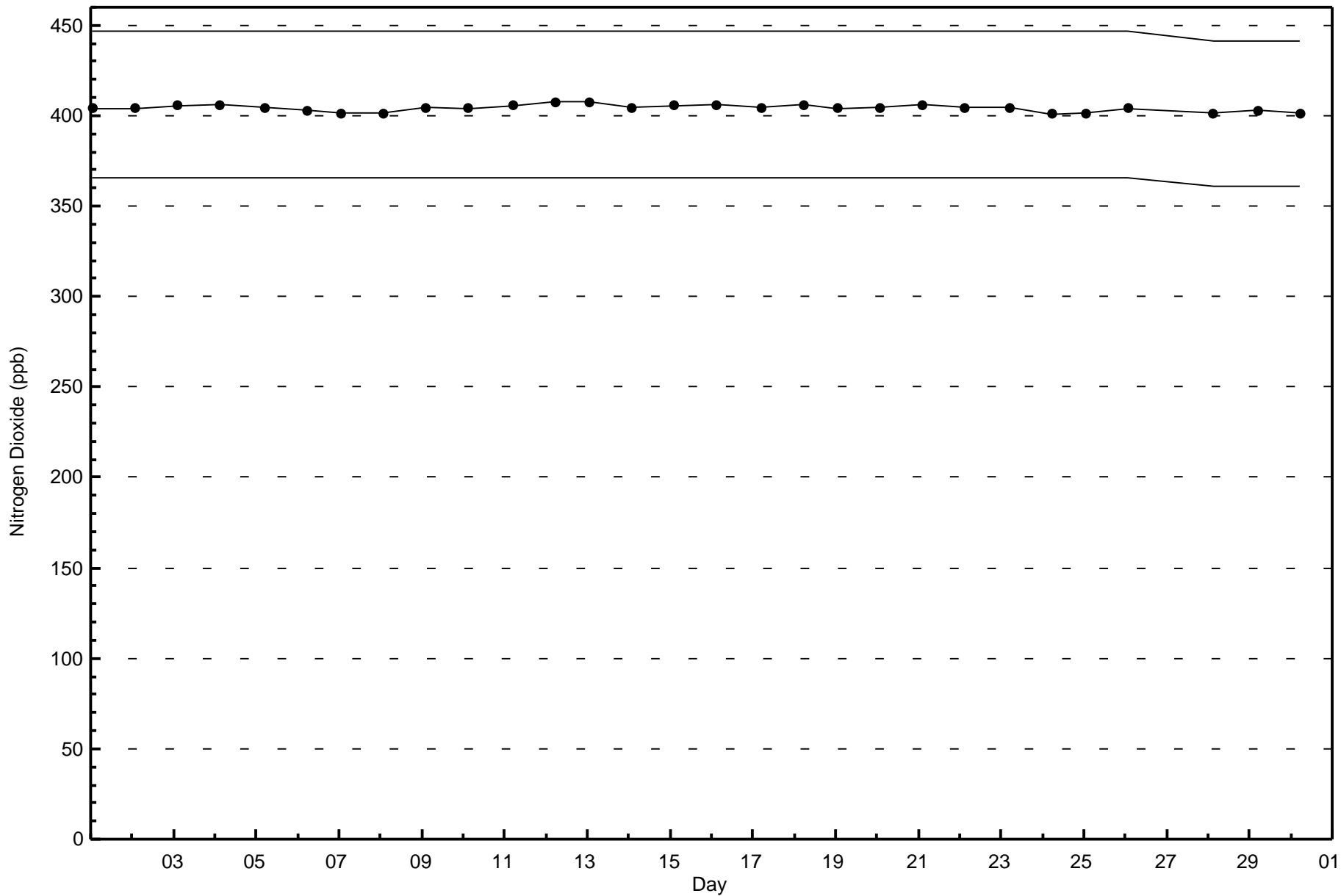
Surmont - April 2017





Wood Buffalo Environmental Association
Span Responses

Nitrogen Dioxide (NO₂) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

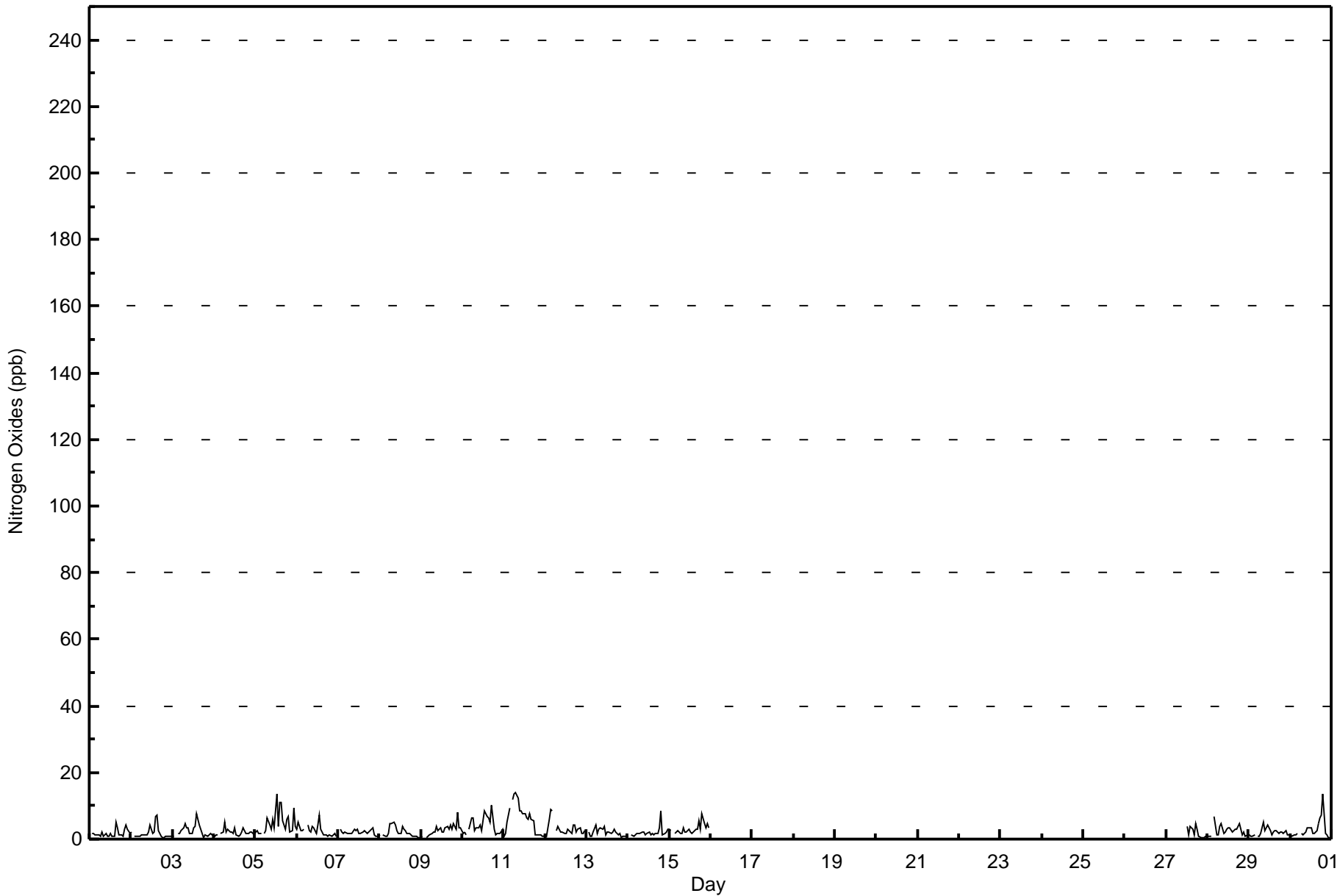
Surmont - April 2017

Maximum Value: 14 ppb on Apr 11 08:00		Maximum Daily Average: 6.0 ppb on Apr 11		Hours in Service: 720																																													
Minimum Value: 0 ppb on May 1 00:00		Minimum Daily Average: 1.8 ppb on Apr 1		Hours of Data: 426																																													
Maximum Diurnal Average: 3.7 ppb at hour 16		Minimum Diurnal Average: 1.4 ppb at hour 1		Hours of Missing Data: 294																																													
Monthly Average: 2.8 ppb		Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 13		Hours of Calibration: 23																																													
				Percent Operational Time: 62.4																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Apr	Z	2	2	1	1	1	1	2	1	2	1	1	2	1	1	5	3	1	1	1	3	4	3	2	1.8	5																							
2-Apr	2	Z	1	1	1	1	1	1	1	1	2	4	2	2	7	7	3	1	1	0	1	1	1	1	1.8	7																							
3-Apr	1	1	Z	2	2	2	3	5	3	3	2	2	3	4	8	4	3	1	0	1	1	1	2	1	2.4	8																							
4-Apr	1	1	1	Z	2	2	5	2	3	2	2	2	3	1	1	2	3	2	2	2	2	2	1	1	2.0	5																							
5-Apr	2	3	2	2	Z	2	3	6	4	3	6	3	14	4	11	11	6	3	6	7	2	3	9	4	4.9	14																							
6-Apr	3	5	2	3	3	Z	4	3	2	4	3	2	4	7	3	1	1	1	1	1	1	1	1	1	2.6	7																							
7-Apr	Z	3	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	3	3	3	1	1	1	2.1	3																							
8-Apr	1	Z	1	1	1	2	5	5	5	4	2	2	4	3	2	2	2	2	1	1	1	1	1	0	2.1	5																							
9-Apr	0	1	Z	0	1	1	1	2	2	4	3	3	2	2	3	4	3	4	3	5	3	8	3	3	2.7	8																							
10-Apr	2	2	1	Z	3	6	6	2	4	3	4	3	5	9	7	6	5	10	3	1	2	2	2	3	4.0	10																							
11-Apr	1	2	5	9	Z	12	13	14	12	8	8	8	8	6	6	8	6	5	1	1	1	1	1	1	6.0	14																							
12-Apr	1	1	6	9	8	Z	3	4	3	2	2	2	2	3	3	2	4	4	2	3	3	2	1	2	3.2	9																							
13-Apr	Z	2	1	1	2	4	2	3	3	3	4	1	2	2	2	3	2	2	1	2	1	1	1	1	2.0	4																							
14-Apr	1	Z	1	1	1	2	2	2	2	2	1	2	2	1	2	2	1	2	2	4	8	1	2	2	2.0	8																							
15-Apr	3	3	Z	2	2	3	2	1	3	2	2	3	2	2	2	3	3	5	3	8	5	3	5	3	3.0	8																							
16-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
17-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
18-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
19-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
20-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
21-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
22-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
23-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
24-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
25-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
26-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
27-Apr	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	4	1	4	3	1	5	3	1	1	0	0	1	--	5																						
28-Apr	1	1	1	Z	7	1	1	4	5	2	2	3	3	3	2	3	3	3	5	3	1	2	1	1	2.5	7																							
29-Apr	1	1	1	1	Z	1	1	2	5	3	3	4	2	1	2	3	2	2	2	2	2	2	1	1	2.0	5																							
30-Apr	1	1	1	1	2	Z	2	1	2	2	3	3	3	2	2	2	5	6	7	14	2	1	0	0	2.8	14																							
																								Diurnal Average																									
																								Diurnal Maximum																									
																								1.4	1.8	1.9	2.3	2.5	2.8	3.1	3.3	3.5	3.0	3.0	2.8	3.6	3.0	3.7	3.7	3.2	3.3	2.5	3.4	1.8	2.1	2.0	1.6		
																								3	5	6	9	8	12	13	14	12	8	8	8	14	9	11	11	6	10	7	14	5	8	9	4		
																								Z - zerspan	C - Calibration				AF - Analyzer Failure																				



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	426	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 426

Total Number of Hours: 720



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Surmont - April 2017

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	28	26	33	14	28	26	30	16	26	19	31	33	34	27	8	28	407

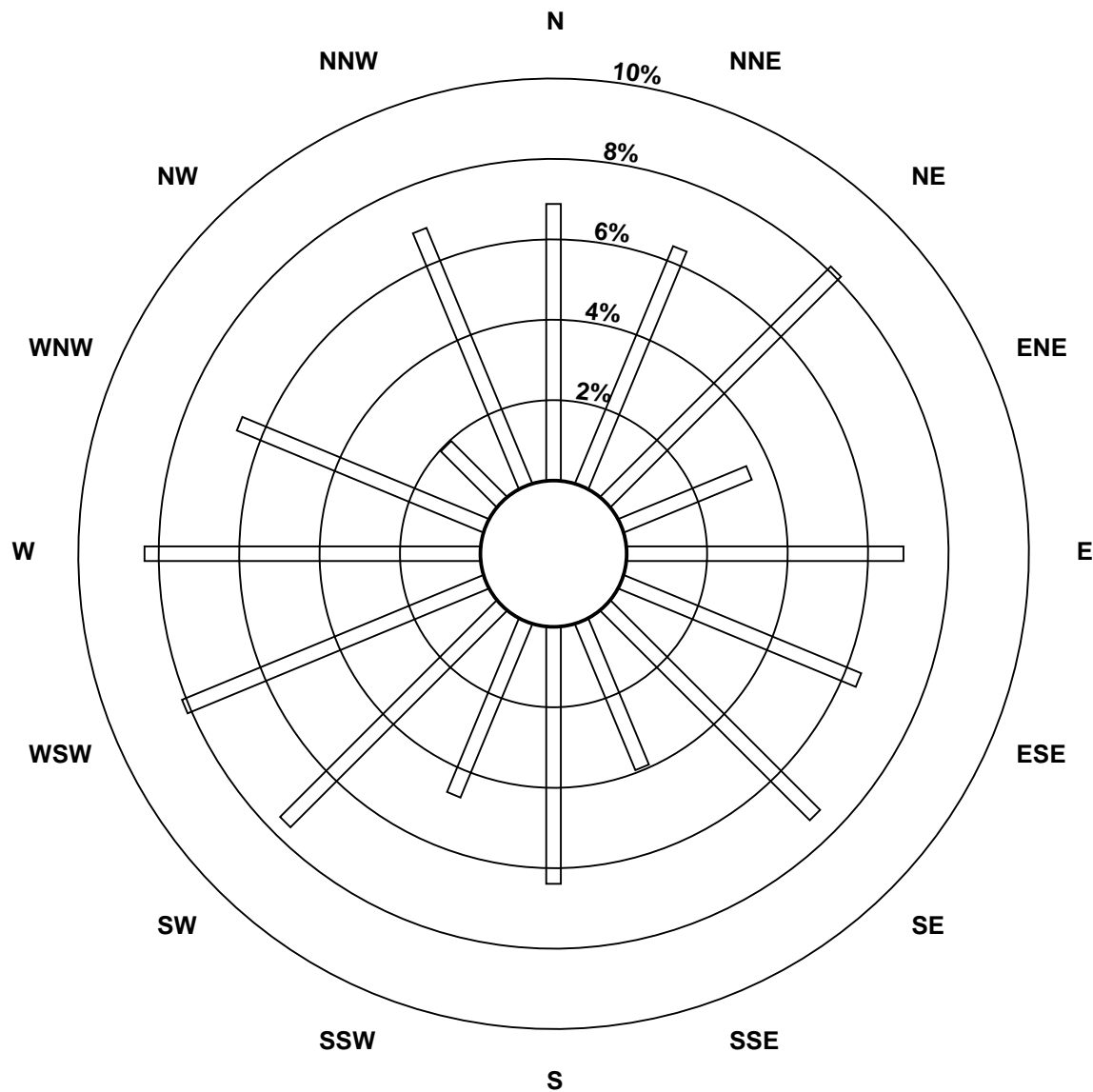
Total Number of Valid Hours: 407

Total Number of Hours: 720

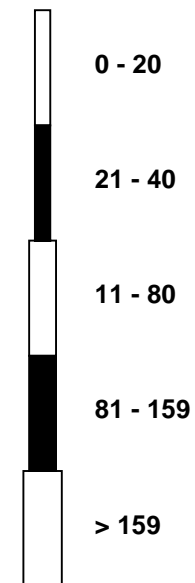


Wood Buffalo Environmental Association
Wind Rose Apr 2017

Nitrogen Oxides (NO_x) - ppb
Surmont (AMS502)



Classes (ppb)

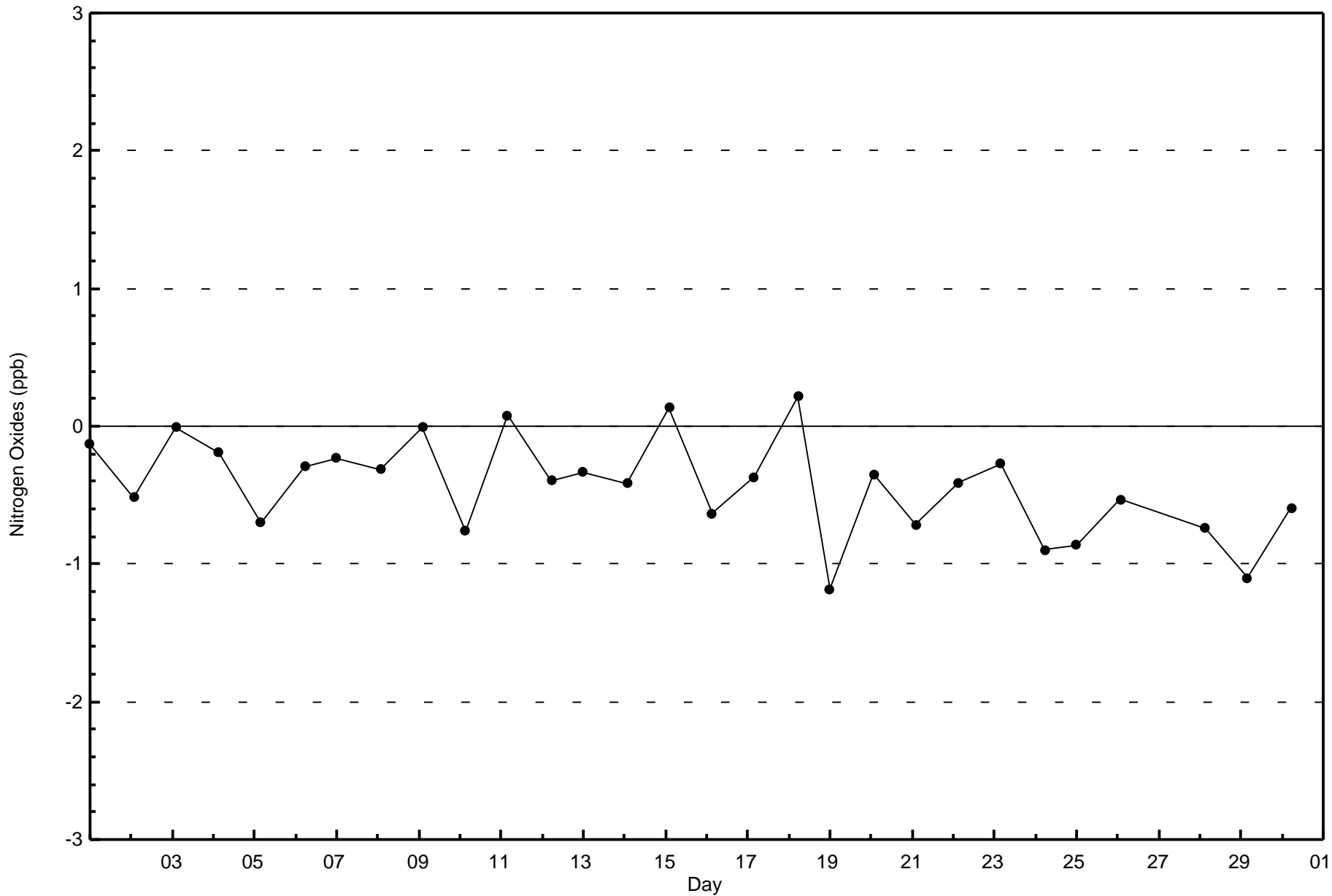


Total Number of Valid Hours: 407



Wood Buffalo Environmental Association
Zero Responses

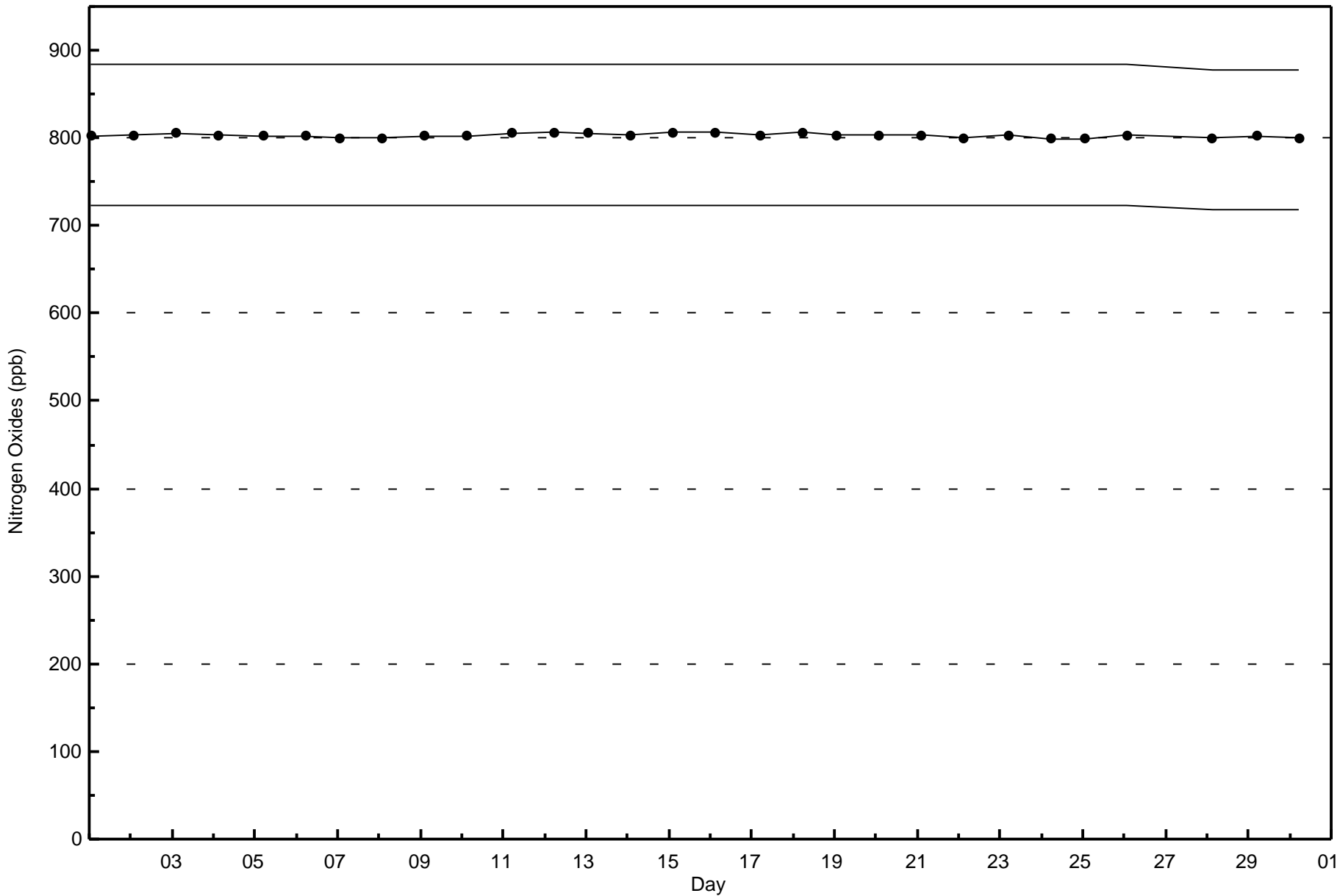
Nitrogen Oxides (NO_x) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
Surmont - April 2017





Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

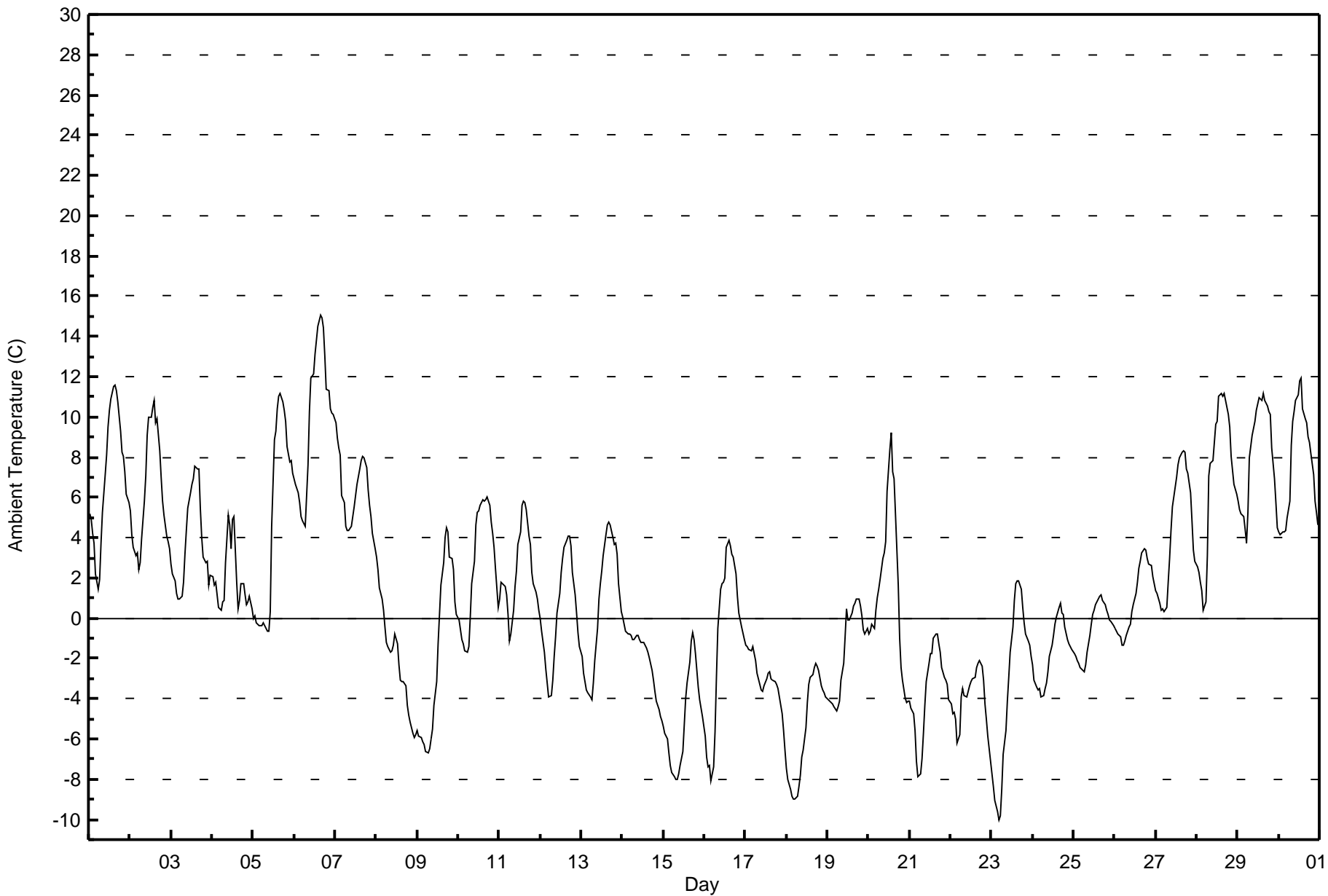
Surmont - April 2017

Maximum Value: 15.0 C on Apr 6 16:00		Maximum Daily Average: 10.0 C on Apr 6		Hours in Service: 720																						
Minimum Value: -10.1 C on Apr 23 05:00		Minimum Daily Average: -5.5 C on Apr 18		Hours of Data: 720																						
Maximum Diurnal Average: 4.3 C at hour 17		Minimum Diurnal Average: -1.8 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: 1.33 C		Percentiles: P ₁ = -8.9 P ₁₀ = -4.9 Q ₁ = -2.4 Median = 0.7 Q ₃ = 4.9 P ₉₀ = 8.9 P ₉₉ = 13.0		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Apr	5.2	4.9	4.2	3.7	2.2	1.4	1.9	3.7	5.3	7.1	8.1	9.5	10.3	10.9	11.5	11.6	11.3	10.8	9.3	8.2	8.0	7.3	6.2	5.8	7.0	11.6
2-Apr	5.3	4.2	3.5	3.1	3.2	2.4	2.7	3.9	5.8	7.0	9.1	10.0	10.0	10.5	10.9	9.7	9.9	8.3	7.0	5.8	5.1	4.1	3.8	3.5	6.2	10.9
3-Apr	2.7	2.2	1.8	1.2	0.9	1.0	1.1	1.8	3.2	4.3	5.4	6.2	6.6	6.9	7.5	7.4	7.4	5.5	4.0	3.0	2.8	2.8	1.6	2.1	3.7	7.5
4-Apr	2.1	1.7	1.8	1.2	0.6	0.4	0.8	0.9	2.7	5.1	4.7	3.5	4.9	5.0	1.8	0.4	0.9	1.7	1.7	1.1	0.7	0.8	1.1	0.5	1.9	5.1
5-Apr	-0.1	0.1	-0.2	-0.4	-0.4	-0.4	-0.2	-0.4	-0.6	-0.6	0.4	4.6	8.9	9.3	10.4	11.0	11.2	10.8	10.4	9.8	8.5	7.8	7.9	7.2	4.8	11.2
6-Apr	6.9	6.7	6.2	5.8	5.1	4.9	4.6	6.1	7.6	10.3	11.9	12.1	13.1	13.8	14.5	15.0	14.9	14.4	13.0	11.4	11.3	10.4	10.2	10.1	10.0	15.0
7-Apr	9.7	8.9	8.4	8.1	6.1	5.7	4.5	4.3	4.3	4.6	5.0	5.6	6.1	6.7	7.4	7.8	8.0	8.0	7.5	6.3	5.6	5.1	4.2	3.4	6.3	9.7
8-Apr	3.1	2.4	1.5	1.0	0.4	-0.4	-1.2	-1.4	-1.7	-1.7	-1.4	-0.8	-1.3	-2.3	-3.1	-3.1	-3.1	-3.4	-4.3	-4.8	-5.2	-5.7	-5.9	-5.8	-2.0	3.1
9-Apr	-5.6	-5.9	-5.9	-6.1	-6.3	-6.6	-6.7	-6.5	-6.0	-5.5	-4.4	-3.2	-1.2	0.2	1.6	2.8	4.0	4.5	4.3	3.1	3.0	2.4	0.8	0.2	-1.8	4.5
10-Apr	-0.1	-0.5	-1.1	-1.2	-1.6	-1.7	-1.4	0.1	1.7	2.8	4.6	5.3	5.3	5.6	5.9	5.8	5.9	6.0	5.6	4.8	4.2	3.6	2.5	0.5	2.6	6.0
11-Apr	1.0	1.8	1.7	1.6	1.2	0.2	-1.1	-0.8	0.4	1.6	2.4	3.7	4.3	5.6	5.8	5.7	5.4	4.1	3.7	2.3	1.7	1.3	0.9	0.4	2.3	5.8
12-Apr	0.0	-0.6	-1.7	-2.5	-3.2	-3.9	-3.8	-3.1	-1.9	-0.9	0.2	1.3	2.3	2.9	3.5	3.9	4.1	4.1	3.6	2.3	1.2	0.2	-0.7	-1.4	0.2	4.1
13-Apr	-1.9	-2.7	-3.2	-3.6	-3.7	-3.9	-4.0	-3.2	-2.1	-0.5	1.0	1.7	2.4	3.1	4.1	4.7	4.8	4.6	4.0	3.7	3.7	3.1	1.7	0.3	0.6	4.8
14-Apr	0.0	-0.3	-0.6	-0.8	-0.8	-0.8	-1.0	-1.0	-0.8	-0.9	-1.1	-1.2	-1.2	-1.4	-1.5	-1.7	-1.9	-2.6	-3.0	-3.6	-4.1	-4.5	-4.9	-5.1	-1.9	0.0
15-Apr	-5.4	-5.7	-6.0	-6.7	-7.3	-7.7	-7.9	-8.0	-8.0	-7.7	-7.3	-6.6	-5.3	-4.0	-3.2	-2.2	-1.1	-0.7	-1.1	-1.8	-3.4	-4.1	-4.4	-4.9	-5.0	-0.7
16-Apr	-5.9	-6.9	-7.4	-7.3	-8.1	-7.4	-5.6	-3.0	-0.5	1.4	1.7	1.8	2.0	3.5	3.9	3.6	3.2	3.0	2.2	1.1	0.3	-0.1	-0.4	-1.0	-1.1	3.9
17-Apr	-1.3	-1.4	-1.5	-1.6	-1.4	-1.8	-2.1	-2.7	-3.3	-3.6	-3.7	-3.4	-3.0	-2.7	-2.7	-3.0	-3.1	-3.1	-3.3	-3.5	-3.9	-4.8	-5.6	-6.6	-3.0	-1.3
18-Apr	-7.4	-8.0	-8.5	-8.8	-9.0	-9.0	-8.9	-8.4	-7.8	-6.9	-6.5	-5.4	-4.2	-3.3	-3.0	-2.8	-2.5	-2.3	-2.4	-2.6	-3.3	-3.6	-3.7	-3.9	-5.5	-2.3
19-Apr	-4.0	-4.2	-4.2	-4.3	-4.4	-4.6	-4.4	-4.1	-3.0	-2.3	-0.9	0.5	-0.1	-0.1	0.2	0.6	0.7	1.0	0.9	0.6	0.1	-0.6	-0.8	-0.5	-1.6	1.0
20-Apr	-0.8	-0.7	-0.3	-0.5	0.4	1.0	1.4	1.9	3.0	3.2	3.8	6.3	8.4	9.3	7.3	6.9	5.2	1.7	-1.0	-2.5	-3.1	-4.0	-4.2	-4.1	1.6	9.3
21-Apr	-4.1	-4.5	-4.7	-5.6	-7.1	-7.9	-7.8	-7.0	-5.7	-4.3	-3.1	-2.3	-1.8	-1.7	-1.0	-0.8	-0.8	-1.3	-1.7	-2.4	-2.9	-3.0	-3.3	-4.1	-3.7	-0.8
22-Apr	-4.3	-4.7	-4.7	-5.0	-6.2	-5.8	-3.9	-3.5	-3.9	-3.9	-3.7	-3.3	-3.1	-3.0	-2.9	-2.4	-2.2	-2.1	-2.4	-3.1	-4.2	-5.1	-5.8	-7.1	-4.0	-2.1
23-Apr	-7.7	-8.4	-9.1	-9.6	-10.1	-9.8	-8.5	-6.8	-5.6	-4.1	-3.0	-1.7	-0.5	0.9	1.7	1.8	1.8	1.4	0.6	-0.2	-0.8	-1.1	-1.3	-1.9	-3.4	1.8
24-Apr	-2.3	-3.1	-3.5	-3.6	-3.5	-3.9	-3.8	-3.5	-3.2	-2.7	-1.9	-1.3	-0.9	-0.3	0.0	0.5	0.8	0.2	0.2	-0.4	-1.1	-1.2	-1.4	-1.6	-1.7	0.8
25-Apr	-1.8	-1.9	-2.1	-2.2	-2.4	-2.6	-2.7	-2.3	-1.7	-0.9	-0.3	0.2	0.4	0.6	0.9	1.1	1.2	0.9	0.6	0.4	0.2	-0.1	-0.2	-0.4	-0.6	1.2
26-Apr	-0.5	-0.6	-0.8	-0.9	-1.3	-1.3	-1.1	-0.8	-0.4	-0.3	0.3	0.7	1.3	1.8	2.5	2.8	3.2	3.4	3.4	3.0	2.7	2.6	2.1	1.7	1.0	3.4
27-Apr	1.4	1.2	0.7	0.4	0.5	0.3	0.6	1.8	2.9	4.4	5.5	6.5	7.0	7.6	8.0	8.2	8.3	8.3	7.4	7.2	6.2	4.9	3.4	2.8	4.4	8.3
28-Apr	2.6	2.2	1.8	1.4	0.4	0.8	3.1	7.1	7.7	7.8	8.7	9.7	9.8	11.0	11.1	11.0	11.2	10.8	10.2	9.5	8.0	7.3	6.7	6.1	6.9	11.2
29-Apr	5.8	5.4	5.2	5.1	4.4	3.7	5.2	8.0	9.1	9.4	9.8	10.4	11.0	10.9	10.8	11.2	10.8	10.5	10.3	10.1	8.5	6.9	5.7	4.5	8.0	11.2
30-Apr	4.3	4.1	4.3	4.3	4.3	5.0	5.8	8.6	9.8	10.2	10.8	11.1	11.8	11.9	10.4	9.9	9.7	9.0	8.7	8.2	7.1	5.8	5.3	4.7	7.7	11.9
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Surmont - April 2017

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	314	43.61	43.61
0 - 10	357	49.58	93.19
10 - 20	49	6.81	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

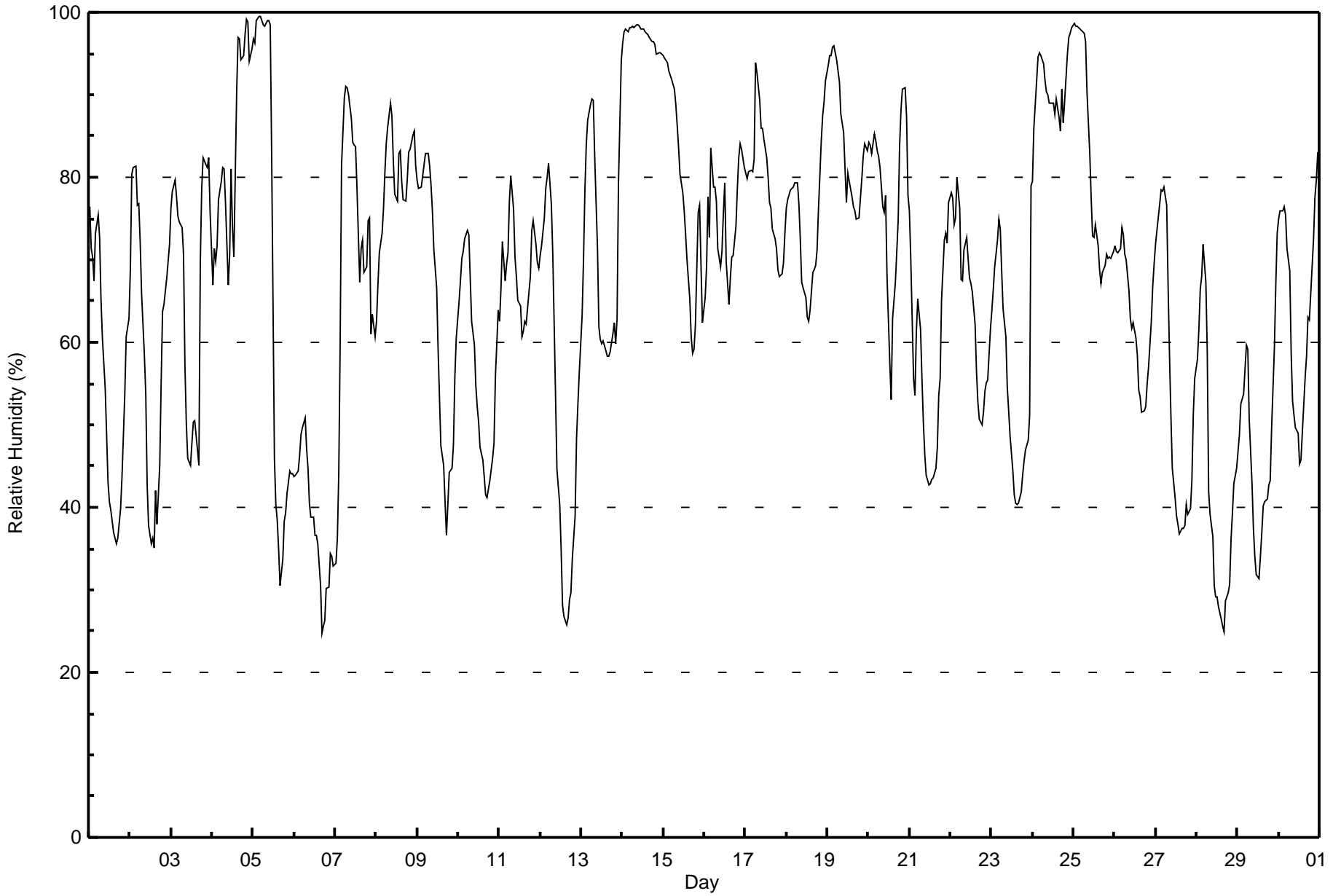
Surmont - April 2017

Maximum Value: 100 % on Apr 5 05:00 Maximum Daily Average: 97.2 % on Apr 14																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Minimum Value: 25 % on Apr 6 17:00 Minimum Daily Average: 38.1 % on Apr 6 Maximum Diurnal Average: 79.6 % at hour 6 Minimum Diurnal Average: 55.6 % at hour 17 Monthly Average: 67.3 % Percentiles: P ₁ = 26 P ₁₀ = 40 Q ₁ = 53 Median = 70 Q ₃ = 81 P ₉₀ = 93 P ₉₉ = 99																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	76	71	70	68	73	75	73	65	61	54	49	43	41	40	37	36	36	36	40	44	49	54	61	63	54.7	76	
2-Apr	69	80	81	81	77	77	72	66	59	54	43	38	36	36	35	42	38	45	55	64	65	68	70	72	59.2	81	
3-Apr	76	78	80	78	75	75	74	71	57	50	46	45	48	50	51	47	45	70	79	82	81	81	82	76	66.5	82	
4-Apr	67	71	70	72	77	79	81	81	77	67	71	81	74	70	90	97	97	94	95	97	99	99	94	96	83.2	99	
5-Apr	97	96	99	99	100	99	98	98	99	99	98	83	46	40	38	35	31	34	38	39	42	44	44	44	68.4	100	
6-Apr	44	44	44	46	49	50	51	47	45	40	39	39	37	37	36	30	25	26	26	30	30	34	34	33	38.1	51	
7-Apr	33	36	44	60	82	90	91	91	90	87	84	84	84	79	67	71	72	69	69	75	75	61	63	61	71.6	91	
8-Apr	63	67	71	73	76	81	84	86	89	87	82	78	77	83	83	79	77	77	80	83	83	85	86	81	79.7	89	
9-Apr	80	79	79	80	82	83	83	81	79	76	71	67	59	53	47	45	41	37	40	44	45	48	56	61	63.1	83	
10-Apr	65	68	70	71	73	74	73	68	63	60	55	52	50	47	46	44	42	41	43	45	46	48	56	64	56.7	74	
11-Apr	62	67	72	67	69	71	77	80	76	70	68	65	64	61	61	62	62	66	68	74	75	72	70	69	68.7	80	
12-Apr	71	72	75	79	80	82	77	71	62	53	45	40	35	28	27	26	27	29	30	34	39	48	53	57	51.5	82	
13-Apr	63	70	78	84	87	89	90	89	82	71	62	60	60	59	58	58	59	61	62	60	63	79	94	94	70.8	94	
14-Apr	96	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	96	96	96	96	95	95	95	95	95	97.2	98
15-Apr	95	94	94	93	92	92	91	89	86	83	80	78	76	73	70	65	61	59	59	62	76	77	69	62	78.2	95	
16-Apr	65	69	78	73	84	79	79	77	71	69	71	76	79	70	65	68	70	71	74	79	82	84	83	81	74.9	84	
17-Apr	81	80	81	81	81	82	94	93	89	86	86	85	82	80	77	76	74	73	71	69	68	68	70	73	79.1	94	
18-Apr	76	77	79	79	79	79	79	77	73	67	67	65	63	63	64	68	69	69	71	76	84	87	89	92	74.7	92	
19-Apr	94	95	95	96	96	94	93	91	88	85	81	77	81	80	78	76	76	75	75	78	80	83	84	83	84.6	96	
20-Apr	84	84	83	85	84	83	83	81	76	76	78	68	57	53	63	65	67	75	84	88	91	91	87	78	77.7	91	
21-Apr	76	70	56	54	61	65	62	56	50	46	44	43	43	43	44	45	47	54	56	65	72	73	72	77	57.2	77	
22-Apr	78	78	74	75	80	76	68	68	71	73	70	68	67	66	62	57	53	51	50	51	54	55	55	62	65.1	80	
23-Apr	64	66	69	72	75	74	69	64	61	55	52	49	44	42	40	40	41	42	44	46	47	48	51	79	55.5	79	
24-Apr	79	86	92	95	95	95	94	92	90	90	89	89	88	89	87	86	91	87	89	95	97	97	98	98	90.7	98	
25-Apr	99	98	98	98	98	98	97	96	90	83	77	73	73	74	72	69	67	68	69	71	70	70	71	71	81.3	99	
26-Apr	72	71	71	71	74	73	71	70	66	63	62	62	61	58	54	53	51	52	52	55	57	63	67	70	63.3	74	
27-Apr	72	74	77	79	78	79	77	67	58	51	45	41	39	38	37	37	38	38	40	39	40	43	51	56	53.9	79	
28-Apr	58	62	66	68	72	67	59	42	39	36	31	29	29	28	26	26	25	29	30	31	36	39	43	45	42.3	72	
29-Apr	47	49	52	54	57	60	59	51	43	37	34	32	31	34	37	40	41	41	43	43	50	59	67	73	47.2	73	
30-Apr	75	76	76	76	75	71	69	59	53	51	50	49	45	46	49	56	58	63	63	66	73	78	80	83	64.1	83	
72.5 74.2 75.7 76.8 79.3 79.6 78.8 75.5 71.4 67.4 64.2 61.9 58.9 57.3 56.7 56.7 55.6 57.5 59.6 62.6 65.3 67.2 69.3 71.6																								Diurnal Average			
99 98 99 99 100 99 98 98 99 99 98 98 98 98 98 97 97 96 96 97 99 99 97 98																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Surmont - April 2017





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Surmont - April 2017

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	71	9.86	9.86
40 - 60	162	22.50	32.36
60 - 80	298	41.39	73.75
80 - 100	189	26.25	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Surmont - April 2017

Maximum Speed: 25 km/h on Apr 20 19:00	Maximum Daily Speed Average: 18.0 km/h on Apr 8	Hours in Service: 720
Minimum Speed Value: 0 km/h on Apr 22 01:00	Minimum Daily Speed Average: 3.2 km/h on Apr 30	Hours of Data: 698
Maximum Diurnal Speed Average: 3.5 km/h at hour 17	Minimum Diurnal Speed Average: 0.7 km/h at hour 24	Hours of Missing Data: 22
Monthly Average Velocity: 1.0 km/h 57.7 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 8 Median = 11 Q ₃ = 15 P ₉₀ = 18 P ₉₉ = 24	Percent Operational Time: 96.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Apr	WSW19	WSW18	WSW16	WSW17	SW10	SW8	SW10	WSW19	W18	W20	W25	W23	W21	W20	W18	WNW18	WNW17	W14	W12	W14	WNW15	NNW15	WNW11	WNW12	W15.1	W25	
2-Apr	WNW12	SW7	WSW13	WSW20	WSW24	WSW22	W20	W17	W18	W14	WNW15	WNW17	W19	WNW19	WNW16	NNW13	W15	W17	W18	W17	WSW17	W20	W17	WNW15	W15.8	WSW24	
3-Apr	WNW13	WNW12	WNW14	WNW10	WNW9	WNW8	WNW9	WNW10	N9	NNW13	N16	N17	N16	NNW14	NNW15	NNW17	N15	WNW18	WNW13	W11	W9	WNW7	SE4	SE6	NNW9.3	WNW18	
4-Apr	SE10	SSW10	S12	SSW10	SSW6	SSE6	S7	SSW9	SW11	WSW13	WSW13	WNW5	ESE9	E14	W16	WSW9	N2	SW4	SSE5	SSE8	SSE7	S8	SSW8	SW5	SSW5.5	W16	
5-Apr	SW3	SSE3	AF	AF	AF	AF	AF	AF	AF	AF	AF	SE12	SE14	S25	S20	S20	S21	S20	S20	S16	SSE16	SE18	SE8	S15	S17	----	S25
6-Apr	S18	S12	S13	S13	SSW12	SSW13	SSW13	SW9	WSW10	WNW3	W8	W16	WNW16	WNW16	WNW16	W16	W15	W11	W10	W11	W10	NW5	NW6	NNW7	WSW8.2	S18	
7-Apr	NNW7	NW6	ESE3	SE8	SE4	N8	N10	ENE10	ENE8	E7	ESE7	NNE7	NNE9	NNE8	NNE7	ESE7	E7	E8	ESE7	ENE4	E7	NE9	NNE11	NNE13	NE5.2	NNE13	
8-Apr	N13	N15	NNW18	NNW19	NNW19	NNW19	NNW19	NNW22	NNW24	N24	N22	NNW24	N24	NNW24	NNW21	NNW20	N19	N17	NNE17	N15	NNE15	NNE13	NNE12	NE11	N18.0	N24	
9-Apr	NNE9	NE8	N4	NE6	NNE7	E6	E5	ESE7	SE9	SE9	SSE9	SE10	S8	SE12	SSE13	SSE13	S11	S10	S8	SE12	SSE13	S14	SSW12	SW15	SSE6.5	SW15	
10-Apr	SW16	SW14	SW16	SW14	SW15	SW14	SW13	SW11	SSW8	S8	SE7	SE13	SE14	SE11	SE12	SE11	SE7	ESE7	ESE5	ENE4	ESE4	ESE4	SW2	WSW5	S7.2	SW16	
11-Apr	W6	WNW5	NW6	NW7	NW8	NNW10	NNW11	NNW11	NNW13	NNW15	N15	N14	N17	N16	N19	NNW20	NNW22	NNW18	N17	N16	N12	NE9	NE11	NE11	N11.8	NNW22	
12-Apr	NE8	NNE10	N12	NNW12	N10	N9	NNE9	NE11	NE14	NE15	NE13	NNE12	ENE12	ENE10	ENE10	NE8	NE9	NE10	NE9	NE6	E5	ESE9	SE9	ESE7	NE8.2	NE15	
13-Apr	ESE9	ESE8	ESE9	ESE9	ESE10	ESE9	E9	ESE11	ESE14	E16	E17	E16	E18	E15	E19	E19	E17	E16	E14	ENE12	E18	ESE21	E19	E19	E14.0	ESE21	
14-Apr	E19	E16	ENE15	ENE15	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NE23	
15-Apr	NNE17	NNE19	NNE20	NNE20	NNE20	NE19	NE20	NE18	NE17	NE17	NE19	NNE19	NE18	NNE18	NNE20	NNE18	NE17	NE15	NE9	NE5	SE10	SSE9	SSE8	S7	NE13.8	NNE20	
16-Apr	SSW6	SW7	SSW8	SW10	SW13	SW13	SW14	SW14	SW10	SSW7	S11	SSE12	SE14	S12	SSW13	S14	S15	SSW13	S14	S12	SSW13	SSW12	SW16	SW14	SSW11.0	SW16	
17-Apr	SW14	SW16	SW8	WSW5	NW9	W5	NNW17	N18	N19	NNE18	N17	N16	N15	N17	N17	N17	N17	N16	N15	NNE13	NNE13	NE15	NNE16	NNE15	N10.6	N19	
18-Apr	NNE15	NNE14	NNE12	NNE11	NNE11	NE9	ENE9	NE9	NE9	ENE9	E9	E8	NE7	E7	ENE7	NE7	NE7	ENE6	ESE8	ESE7	NNE6	NNE5	NNE5	NNE6	NE7.6	NNE15	
19-Apr	NNE6	NE4	NNE4	NNE7	NNE6	N5	NNW3	N2	AF	AF	SSW3	ENE4	NE8	NNE9	NNE7	NE6	NE7	NE5	ENE5	ENE4	ENE3	ESE3	SE5	SE9	NE3.8	NNE9	
20-Apr	SSE5	SSW9	SSW11	SSW6	WSW11	WSW9	SSW6	SSW8	SE4	ESE5	SE6	SSE12	SE9	SE8	N11	N16	NNW23	NNW24	N25	N23	N20	N20	NNE18	N15	N4.4	N25	
21-Apr	N15	N18	N14	N14	N14	N11	NNE10	NNE9	NE9	NE6	NE6	NE10	ENE9	E8	NNE7	NNE7	NE8	NE9	NE7	NE9	NE8	NE6	ENE1	WSW2	NNE8.2	N18	
22-Apr	ESE0	SE0	SSE0	SW3	WSW6	SW8	WSW7	NNW12	N17	N16	N15	N15	N16	N15	NNE14	N12	N11	N11	N11	N10	NNW8	NNW6	N8	ENE6	N7.7	N17	
23-Apr	E6	ESE7	ESE6	ESE6	ESE5	SE7	SE10	SE11	SE10	ESE14	E12	E12	E13	E12	ENE12	ENE14	E15	E15	E13	E12	ESE9	ESE8	SE9	SE6	ESE9.7	E15	
24-Apr	ESE9	ESE9	E9	E9	E9	ENE9	E11	E12	E12	ESE12	E13	E12	E13	E13	E12	E12	E12	E11	ESE11	SE11	ESE10	ESE11	ESE11	SE11	ESE10.7	E13	
25-Apr	SE10	SE10	SE11	SE11	SE11	SE10	SE11	SSE10	SE11	SE10	SE12	SE13	SE14	SSE15	SSE15	SSE13	SSE13	S13	S12	SE13	SE14	SSE11	S12	S11	SSE11.4	SSE15	
26-Apr	S10	S10	S9	SSE8	SE9	SE9	SE10	SE12	SSE16	SSE16	SSE15	SSE19	SSE18	SSE18	SSE14	SE14	SE12	SE11	ESE9	ESE7	SE10	S12	S13	S12	SSE11.5	SSE19	
27-Apr	S10	S9	SE9	SE10	SE11	SE11	SE10	SE10	SE11	SE12	SE12	ESE11	ESE7	E9	E10	E10	ENE9	E7	ESE7	SE9	S5	SW8	SW9	WSW11	SE7.1	SE12	
28-Apr	WSW15	WSW15	WSW13	W9	WSW2	WSW9	WSW6	SSW1	SE6	SE8	ESE6	ESE2	N3	ENE4	ESE3	SE3	ENE2	E7	ESE3	SW2	WSW4	SW7	WSW12	WSW14	SW3.2	WSW15	
29-Apr	WSW17	WSW16	WSW17	WSW14	WSW13	WSW14	WSW12	WSW10	SW9	S12	S16	S16	SSW15	SSW15	SW16	SSW15	SSW13	S14	SSW9	SSW7	SW8	SW7	SW7	SW10	SW11.5	WSW17	
30-Apr	SW7	SW8	SW9	SSW8	SW8	SW8	SSW7	SW6	SSE6	SE9	SE11	SSE11	SE11	SE14	SW13	NW13	N9	N9	N9	NNW9	NW7	W8	WSW6	WNW6	SW3.2	SE14	

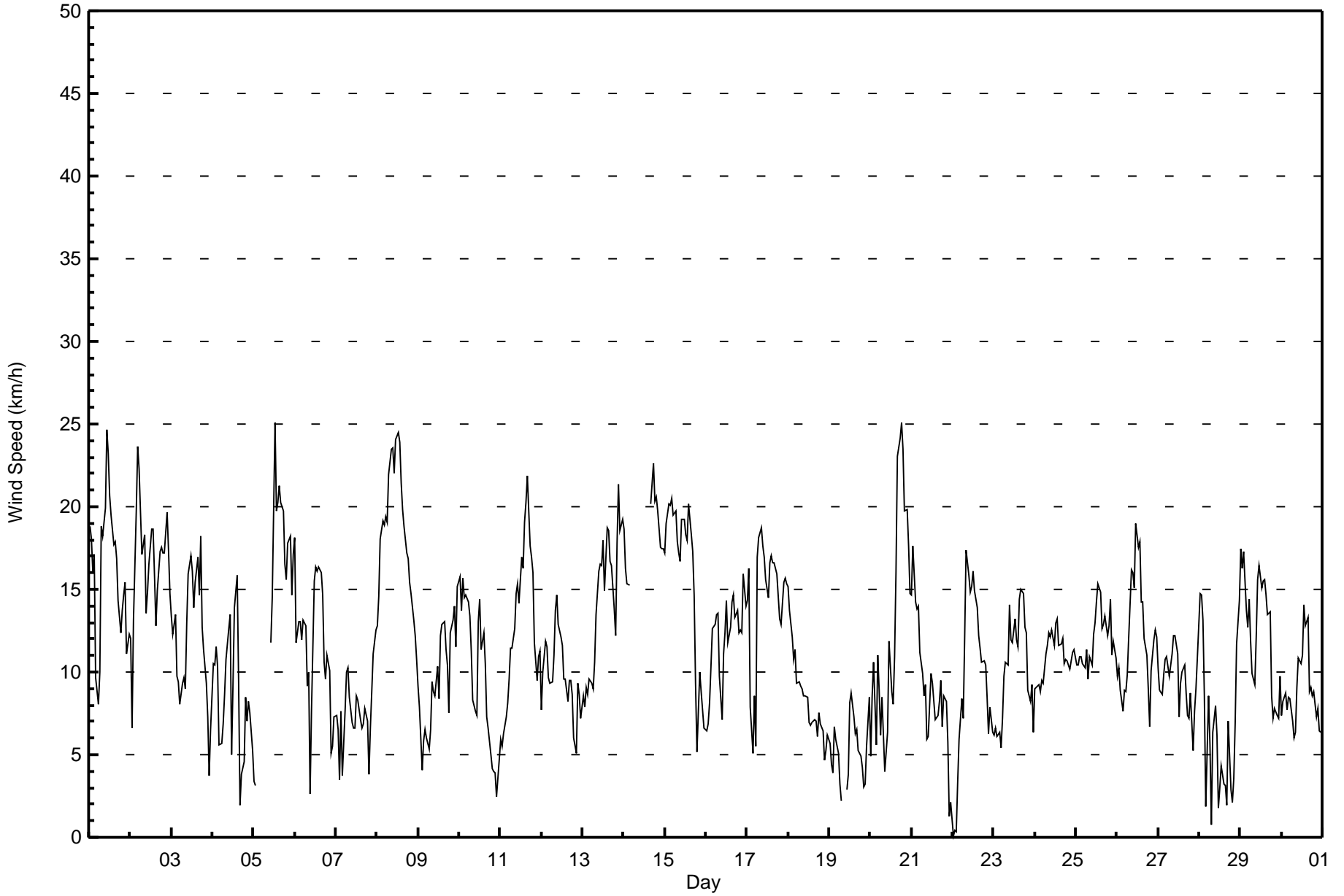
SSW1.2	SW1.7	WSW1.6	WSW1.2	W1.5	WSW1.5	W0.7	NNW0.9	NE1.6	ENE2.9	ENE2.7	ENE2.9	ENE3.1	ENE3.0	NNE2.0	NNE2.7	NNE3.5	NE2.4	NE2.6	NE2.4	E1.9	ESE1.7	SE1.0	S0.7	Diurnal Average
WSW19	NNE19	NNE20	NNE20	WSW24	WSW22	NE20	NNW22	NNW24	N24	W25	NNW24	S25	NNW24	NNW21	S21	NNW23	NNW24	N25	N23	N20	ESE21	E19	E19	Diurnal Maximum

AF - Analyzer Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Surmont - April 2017





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont - April 2017**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	63	9.03	9.03
6 - 11	303	43.41	52.44
12 - 19	288	41.26	93.70
20 - 28	44	6.30	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 698

Total Number of Hours: 720



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont - April 2017**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	5	2	9	2	11	6	4	1	2	6	5	1	3	1	1	63
6 - 11	15	23	33	14	19	34	50	13	13	20	24	12	10	7	8	8	303
12 - 19	43	24	11	7	33	3	20	18	24	12	18	21	18	18	1	17	288
20 - 28	7	4	6	0	0	1	0	0	6	0	0	3	7	0	0	10	44
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	56	52	30	54	49	76	35	44	34	48	41	36	28	10	36	698

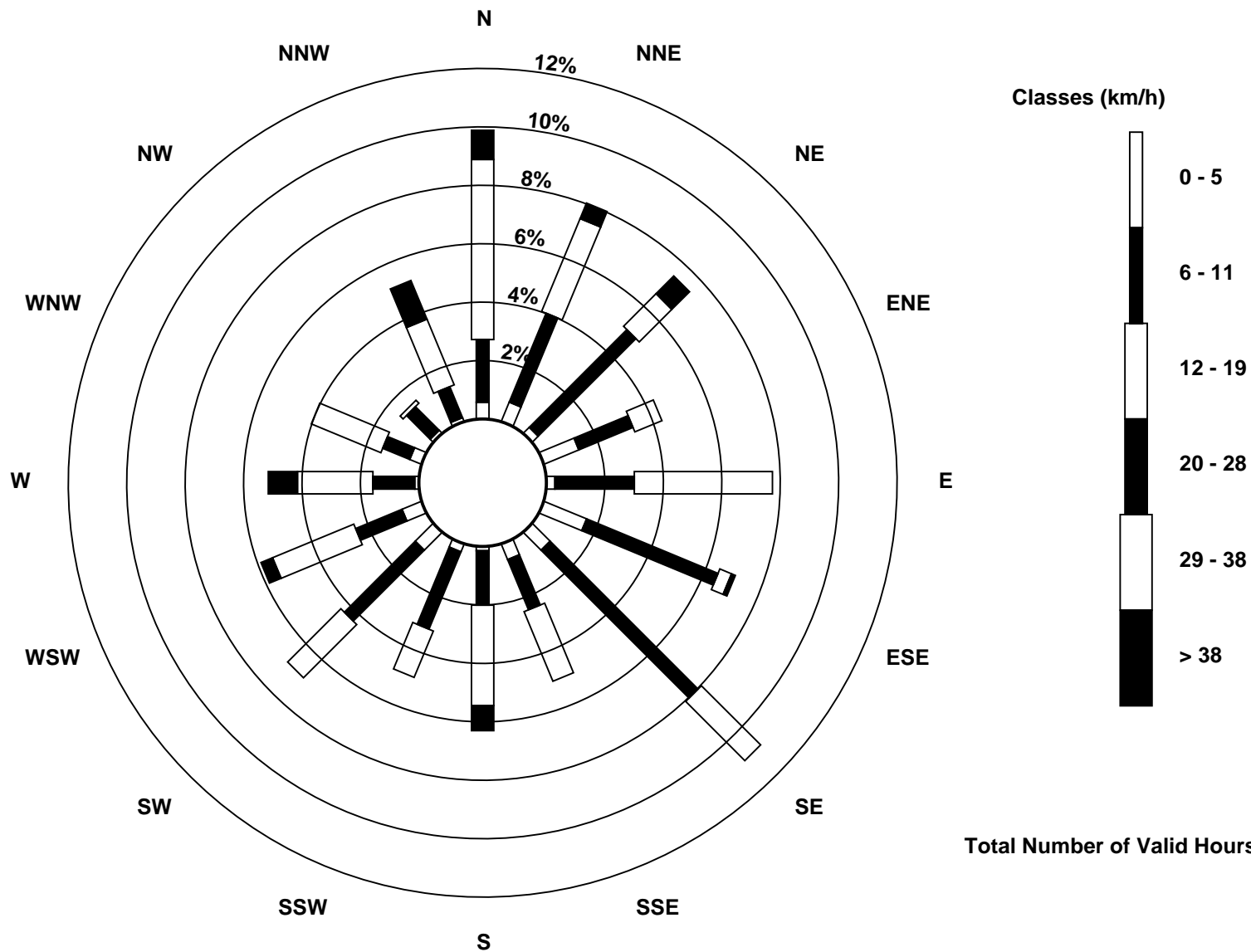
Total Number of Valid Hours: 698

Total Number of Hours: 720



Wood Buffalo Environmental Association
Wind Rose Apr 2017

Wind Speed (WS) - km/h
Surmont (AMS502)



Total Number of Valid Hours: 698



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Surmont - April 2017

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 9 km/h on Apr 13 21:00			Hours of Data:	698
Minimum Value: 0 km/h on Apr 22 01:00			Hours of Missing Data:	22
			Hours of Calibration:	0
			Percent Operational Time:	96.9
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6				

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	6	4	3	4	2	2	4	4	5	5	6	5	4	5	4	5	4	3	1	2	3	5	3	2	6
2-Apr	2	2	3	3	3	4	3	4	3	3	3	6	4	5	6	6	5	3	5	6	4	3	3	3	6
3-Apr	2	3	2	2	1	1	1	2	2	4	3	4	4	4	4	4	4	4	2	2	2	2	3	1	4
4-Apr	2	2	3	2	2	1	2	2	3	3	3	4	4	4	3	4	5	2	2	3	2	2	2	1	5
5-Apr	3	2	AF	AF	AF	AF	AF	AF	AF	AF	3	6	7	6	6	6	6	5	4	3	3	3	4	4	7
6-Apr	4	4	3	3	3	3	3	3	2	2	5	4	4	4	4	4	3	3	1	1	2	2	1	1	5
7-Apr	2	2	4	2	4	3	2	3	2	2	2	2	2	2	3	3	2	2	2	1	2	2	3	2	4
8-Apr	2	3	3	3	3	3	3	4	4	5	5	5	6	4	5	4	4	4	4	3	3	3	3	3	6
9-Apr	2	3	3	2	3	3	3	3	2	3	3	3	3	3	4	4	4	4	3	3	5	3	3	3	5
10-Apr	3	3	3	3	3	3	3	4	2	2	2	3	3	2	3	3	2	2	1	1	2	2	2	2	4
11-Apr	1	1	1	1	2	2	2	2	2	3	3	4	4	4	4	4	4	4	4	4	2	2	2	2	4
12-Apr	2	2	2	2	2	2	2	2	3	3	4	4	5	4	4	5	3	3	2	2	2	2	1	5	
13-Apr	2	1	2	2	2	2	3	3	4	4	4	4	4	4	5	4	4	4	4	3	9	5	5	4	9
14-Apr	5	4	4	4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	6	5	4	4	5	3	3	3	6
15-Apr	3	4	4	4	4	3	4	4	4	4	4	3	4	3	3	4	4	3	3	1	2	1	3	3	4
16-Apr	2	1	2	1	2	2	2	2	3	2	2	3	3	4	4	4	4	3	3	3	3	3	4	3	4
17-Apr	4	5	5	2	2	1	4	4	4	3	3	3	4	4	4	4	3	3	3	3	2	3	3	3	5
18-Apr	3	3	3	2	2	2	2	2	2	3	2	2	3	3	2	2	2	2	1	1	2	1	1	1	3
19-Apr	1	1	2	1	1	1	2	1	AF	AF	2	2	1	2	1	1	1	1	1	1	1	1	2	1	2
20-Apr	3	2	2	3	2	3	3	2	3	1	2	3	2	3	3	4	4	5	5	5	4	4	3	3	5
21-Apr	3	3	3	3	3	2	3	3	3	3	3	3	4	4	4	4	3	2	3	2	2	2	2	2	4
22-Apr	0	1	1	2	1	1	2	5	3	4	3	4	4	4	4	4	3	3	2	2	1	1	2	2	5
23-Apr	1	1	1	1	1	1	2	2	2	3	3	4	3	4	5	4	4	4	3	3	2	2	2	3	5
24-Apr	4	2	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	3	2	2	2	2	2	2	4
25-Apr	3	2	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	3	4	3	2	2	3	3	4
26-Apr	3	3	3	2	1	2	2	3	4	4	4	4	4	5	4	4	3	2	2	1	2	3	3	3	5
27-Apr	2	3	2	1	1	1	2	2	3	3	5	4	3	3	4	3	3	3	2	3	3	2	2	3	5
28-Apr	2	2	3	3	2	1	2	2	3	3	3	3	4	4	4	3	3	2	3	2	2	2	2	3	4
29-Apr	3	2	2	2	2	3	3	3	3	4	4	5	5	4	5	5	4	4	3	2	1	2	3	2	5
30-Apr	1	1	1	1	1	1	2	2	3	3	4	4	4	5	4	4	3	2	2	1	1	1	1	1	5
Diurnal Maximum																									
6 5 5 4 4 4 4 5 5 5 6 6 7 6 6 6 6 5 5 6 9 5 5 4																									

AF - Analyzer Failure



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Surmont - April 2017

Direction of Maximum Speed: 355 deg on Apr 20 19:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 353.4 deg on Apr 8	Hours of Data: 698
Direction of Minimum Speed: 116 deg on Apr 22 01:00	Hours of Missing Data: 22
Direction of Minimum Daily Speed Average: 3.2 deg on Apr 30	Percent Operational Time: 96.9
Monthly Average Direction: 250.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	239	246	251	256	235	217	233	253	270	266	273	275	279	272	272	286	286	272	264	267	295	327	300	297	269.3
2-Apr	303	236	243	252	255	258	266	276	276	280	290	294	277	284	295	329	274	259	268	278	257	264	276	292	273.3
3-Apr	289	286	295	290	297	290	286	307	358	347	359	1	354	346	344	347	351	290	287	276	279	286	124	127	319.6
4-Apr	145	204	191	205	203	165	170	196	232	255	257	287	112	100	272	256	11	215	156	158	164	191	201	231	202.8
5-Apr	235	164	AF	AF	AF	AF	AF	AF	AF	AF	139	145	172	187	177	179	184	185	180	153	144	146	174	183	--
6-Apr	182	181	187	189	194	198	207	235	255	302	265	268	291	297	283	281	274	277	268	261	273	312	320	338	251.1
7-Apr	337	306	112	127	142	352	6	57	71	97	115	16	27	27	28	109	94	90	119	71	87	56	27	25	53.9
8-Apr	6	351	342	341	343	343	344	345	347	351	0	347	349	340	342	344	350	1	13	2	17	32	23	39	353.4
9-Apr	30	53	3	42	33	82	93	121	128	130	149	146	170	142	154	147	171	188	175	144	159	180	200	216	148.5
10-Apr	217	216	219	219	220	219	215	222	194	169	137	134	145	131	135	139	136	118	118	77	121	120	215	254	181.2
11-Apr	271	283	308	313	315	330	333	342	342	348	349	355	350	0	355	345	340	346	4	2	5	34	40	43	349.8
12-Apr	43	29	351	343	351	9	26	37	35	39	34	18	59	64	57	34	54	49	50	48	97	112	127	119	40.6
13-Apr	114	119	111	106	106	111	96	103	106	101	86	85	83	80	87	79	88	79	76	97	106	100	90	90	93.6
14-Apr	91	81	74	74	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	56	48	38	38	48	39	36	32	--
15-Apr	32	29	33	33	32	36	42	47	54	56	44	33	35	31	31	24	34	36	38	41	132	148	165	170	41.6
16-Apr	199	217	213	214	226	232	230	234	225	193	171	155	143	186	205	189	189	195	188	190	199	205	217	219	201.5
17-Apr	219	232	223	237	321	272	344	352	357	12	7	11	5	5	1	357	360	7	10	24	26	34	33	26	359.9
18-Apr	27	30	32	25	31	46	59	46	42	64	84	87	51	79	62	49	52	78	114	115	27	25	23	27	50.1
19-Apr	30	34	18	23	26	1	344	351	AF	AF	212	73	34	31	19	34	37	52	78	69	78	117	136	145	45.3
20-Apr	165	198	198	196	237	238	207	213	144	118	133	148	144	139	351	2	347	342	355	8	4	6	16	10	357.6
21-Apr	3	5	3	357	6	7	16	24	48	50	37	54	65	79	12	19	35	41	52	39	34	35	58	251	25.0
22-Apr	116	133	168	225	249	236	241	342	351	354	353	350	354	9	17	9	359	354	9	353	337	345	357	67	351.8
23-Apr	98	113	108	115	111	129	135	137	130	104	96	85	89	86	76	78	82	87	89	93	113	116	126	136	101.8
24-Apr	103	115	101	93	85	77	96	97	100	102	99	90	88	96	95	96	91	99	114	125	119	115	120	126	101.5
25-Apr	124	126	131	132	130	130	139	150	138	141	133	142	146	147	152	166	167	185	169	142	145	157	185	188	149.1
26-Apr	181	184	180	166	131	128	127	141	149	166	154	149	151	154	158	145	141	137	123	113	132	170	189	190	153.5
27-Apr	190	184	141	127	133	133	134	139	134	129	129	110	113	89	98	88	73	101	105	135	184	225	230	242	134.9
28-Apr	248	253	257	262	246	237	238	204	126	126	120	116	359	70	123	130	78	89	107	220	256	236	245	245	227.6
29-Apr	247	247	253	248	244	246	246	251	218	175	188	190	195	212	215	209	195	187	200	210	215	215	218	223	219.3
30-Apr	222	229	214	212	223	218	208	223	151	136	137	152	136	135	226	308	3	355	355	336	311	259	253	289	220.1

213.4 227.5 236.3 246.2 270.8 250.1 266.7 328.2 52.6 72.0 77.1 68.7 71.9 71.9 15.8 22.9 31.5 37.6 51.7 53.9 85.3 106.0 144.8 174.8

Diurnal Average

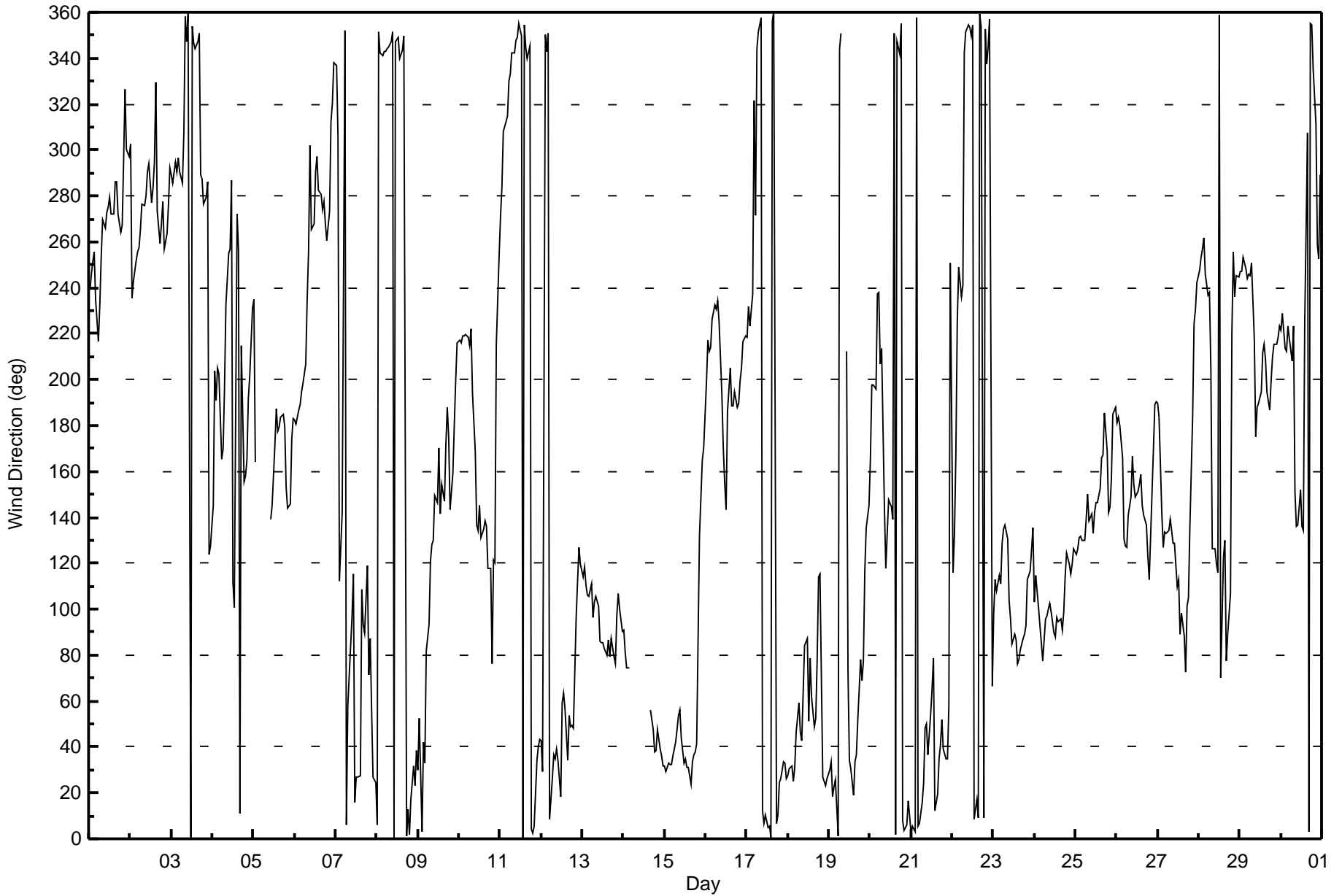
AF - Analyzer Failure

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Surmont - April 2017





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Surmont - April 2017

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 89 deg on Apr 7 03:00	Hours of Data: 698
Minimum Value: 6 deg on Apr 6 20:00	Hours of Missing Data: 22
Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 13 Median = 16 Q ₃ = 22 P ₉₀ = 33 P ₉₉ = 77	Hours of Calibration: 0
	Percent Operational Time: 96.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Apr	16	9	14	13	14	16	22	12	16	15	13	14	18	18	19	21	18	10	7	13	13	24	13	12	24
2-Apr	27	52	9	7	8	9	9	13	11	15	16	22	15	17	32	30	37	8	30	33	8	10	9	16	52
3-Apr	10	10	8	9	9	6	11	24	19	17	19	19	29	28	28	24	19	16	9	7	8	45	41	11	45
4-Apr	16	15	15	16	35	19	17	18	21	19	17	74	28	16	50	49	74	57	39	18	29	28	23	23	74
5-Apr	37	59	AF	AF	AF	AF	AF	AF	AF	AF	13	16	22	19	20	18	16	17	20	15	9	11	18	14	59
6-Apr	14	20	14	14	15	13	14	23	14	71	78	16	19	19	22	17	19	17	8	6	7	43	32	12	78
7-Apr	13	23	89	21	82	22	24	14	14	17	22	29	25	17	27	31	23	20	20	10	12	22	10	10	89
8-Apr	14	15	10	10	10	10	11	11	14	16	18	17	16	13	13	16	17	21	17	20	21	24	17	20	24
9-Apr	20	30	45	34	39	31	58	33	20	23	37	33	38	18	25	22	27	23	20	9	18	15	17	14	58
10-Apr	13	13	13	13	13	14	14	16	30	17	28	19	14	18	23	21	27	18	15	9	32	24	38	21	38
11-Apr	12	14	12	11	12	13	12	16	13	15	19	23	20	24	21	17	14	14	16	16	16	11	13	11	24
12-Apr	14	11	18	9	16	12	18	14	17	19	24	28	33	37	38	37	34	32	16	16	10	11	10	10	38
13-Apr	12	13	12	12	11	14	12	16	15	17	17	17	15	17	16	15	15	14	13	12	18	14	13	13	18
14-Apr	14	14	14	14	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	14	12	12	13	13	13	12	11	14
15-Apr	10	11	11	11	11	11	11	12	13	15	13	13	14	13	15	14	13	13	10	13	20	10	30	29	30
16-Apr	23	7	11	11	10	11	11	13	16	18	15	15	13	28	24	19	17	19	16	16	17	16	15	16	28
17-Apr	18	17	43	55	26	31	12	16	17	15	16	19	19	16	18	17	17	18	17	14	11	10	11	12	55
18-Apr	11	11	13	11	12	13	16	19	21	29	26	26	31	33	34	25	29	37	15	12	22	19	17	13	37
19-Apr	13	14	15	10	11	13	39	48	AF	AF	58	56	16	14	17	18	16	25	14	13	26	16	15	9	58
20-Apr	31	16	13	31	17	27	40	19	59	28	19	14	26	27	33	18	16	15	18	17	18	17	16	15	59
21-Apr	16	17	16	15	15	14	15	19	19	54	45	40	37	42	45	58	42	17	35	18	14	18	21	31	58
22-Apr	40	18	61	42	14	9	12	39	16	19	20	22	19	22	21	22	25	30	20	17	11	20	20	20	61
23-Apr	11	10	11	15	14	10	11	13	13	18	21	19	20	22	29	19	17	15	14	13	15	13	19	23	29
24-Apr	14	12	14	12	13	13	12	13	13	13	13	17	14	14	16	18	19	12	13	11	10	11	11	13	19
25-Apr	13	13	12	12	12	11	12	18	13	16	15	13	12	12	21	22	24	19	23	10	10	15	18	17	24
26-Apr	18	17	21	18	13	12	11	13	15	26	27	15	18	18	23	17	16	15	16	9	14	18	19	16	27
27-Apr	17	22	16	8	9	8	10	14	17	23	27	28	45	25	25	30	32	19	20	12	41	19	11	12	45
28-Apr	8	7	8	31	81	15	20	64	28	28	31	82	76	49	77	60	79	19	42	29	24	12	10	9	82
29-Apr	8	8	8	8	8	8	9	13	29	28	24	23	27	22	23	29	21	17	19	17	15	14	13	13	29
30-Apr	11	10	11	14	11	10	32	21	37	24	24	27	26	36	26	29	31	15	15	16	12	9	12	14	37
	40	59	89	55	82	31	58	64	59	71	78	82	76	49	77	60	79	57	42	33	41	45	41	31	
	Diurnal Maximum																								

AF - Analyzer Failure



Wood Buffalo Environmental Association

SO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Surmont	Station number:	AMS 502
Calibration Date:	April 26, 2017	Last Cal Date:	March 21, 2017
Start time (MST):	9:43	End time (MST):	14:46
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>48.3</u>	ppm	Cal Gas Exp Date	February 12, 2018
Cal Gas Cylinder #	<u>LL104215</u>			
Calibrator Make/Model	API T700		Serial Number	622
ZAG Make/Model	API 701		Serial Number	196

Analyzer Information

Analyzer make:	Thermo 43i	Analyzer serial #:	1160290011
Analyzer Range	<u>Start</u> 0 - 1000 ppb	PMT voltage	<u>Start</u> -619
Calculated slope	0.998229	Lamp voltage	775
Calculated intercept	2.186287	Pressure	688.4
Analyzer Background	17.6	Flow	0.412
Analyzer Coefficient	1.033	Intensity	88
	<u>Finish</u> 16.9		<u>Finish</u> 91

SO₂ Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (lc)	Correction factor (Cc/lc) <i>Limit = 0.95-1.05</i>
as found zero	5007	0.0	0.0	-1.9	----
as found span	4930	83.2	801.6	796.5	1.006
calibrator zero	5007	0.0	0.0	-0.8	----
high point	4930	83.2	801.6	801.3	1.000
second point	4973	41.6	400.7	396.4	1.011
third point	4991	20.9	201.4	197.9	1.018
as left zero	5009	0.0	0.0	-0.9	----
as left span	4812	83.2	820.9	802.5	1.023
Average Correction Factor					1.010

Corrected As found	798.36	Previous response	800.83	*% change	0.3%
--------------------	--------	-------------------	--------	-----------	------

** = > +/-5% change initiates investigation*

Notes:

Baseline adjusted after as founds.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

SO₂ Calibration Summary

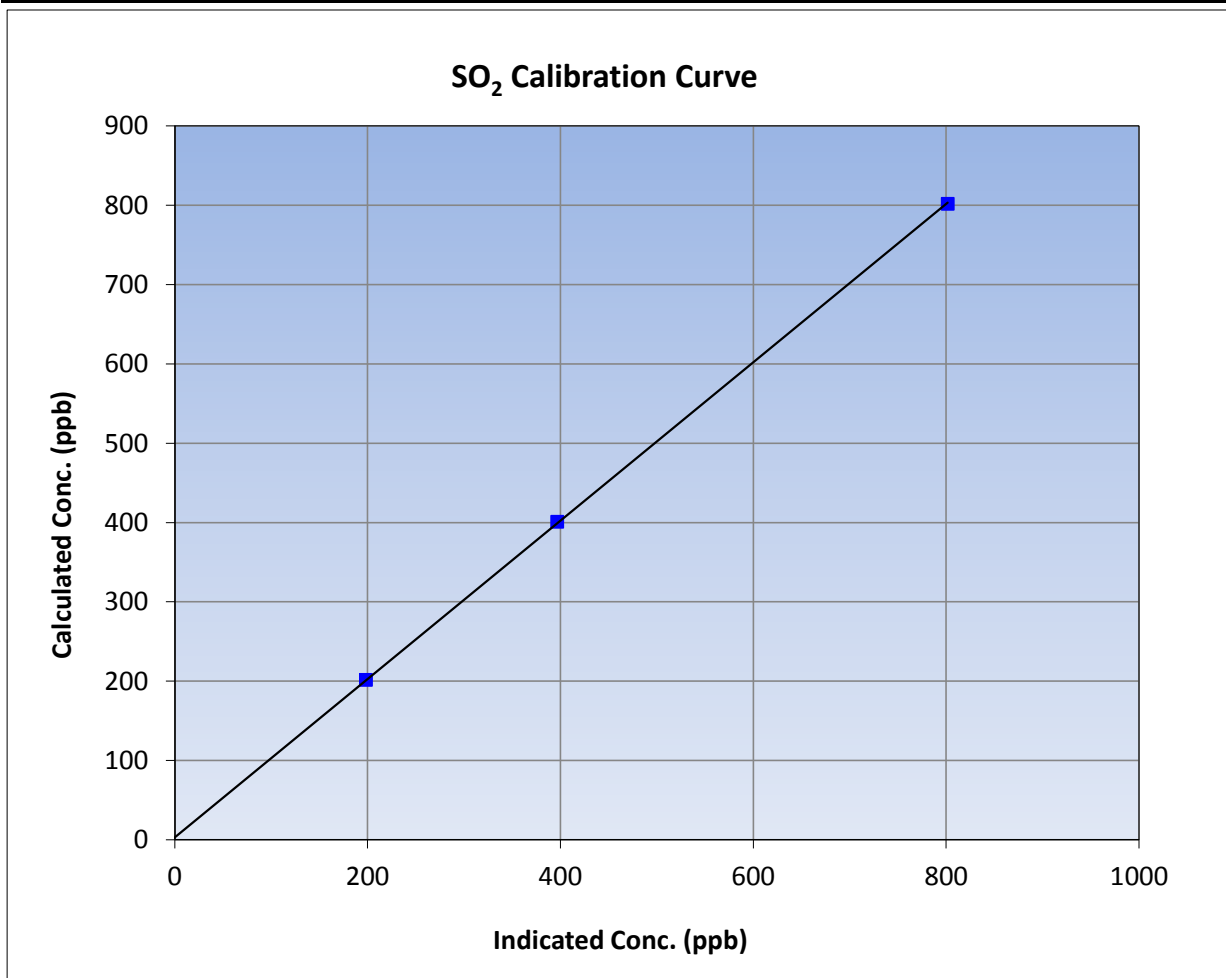
Version-03-2017

Station Information

Calibration Date	April 26, 2017	Previous Calibration	March 21, 2017
Station Name	Surmont	Station Number	AMS 502
Start Time (MST)	9:43	End Time (MST)	14:46
Analyzer make	Thermo 43i	Analyzer serial #	1160290011

Calibration Data

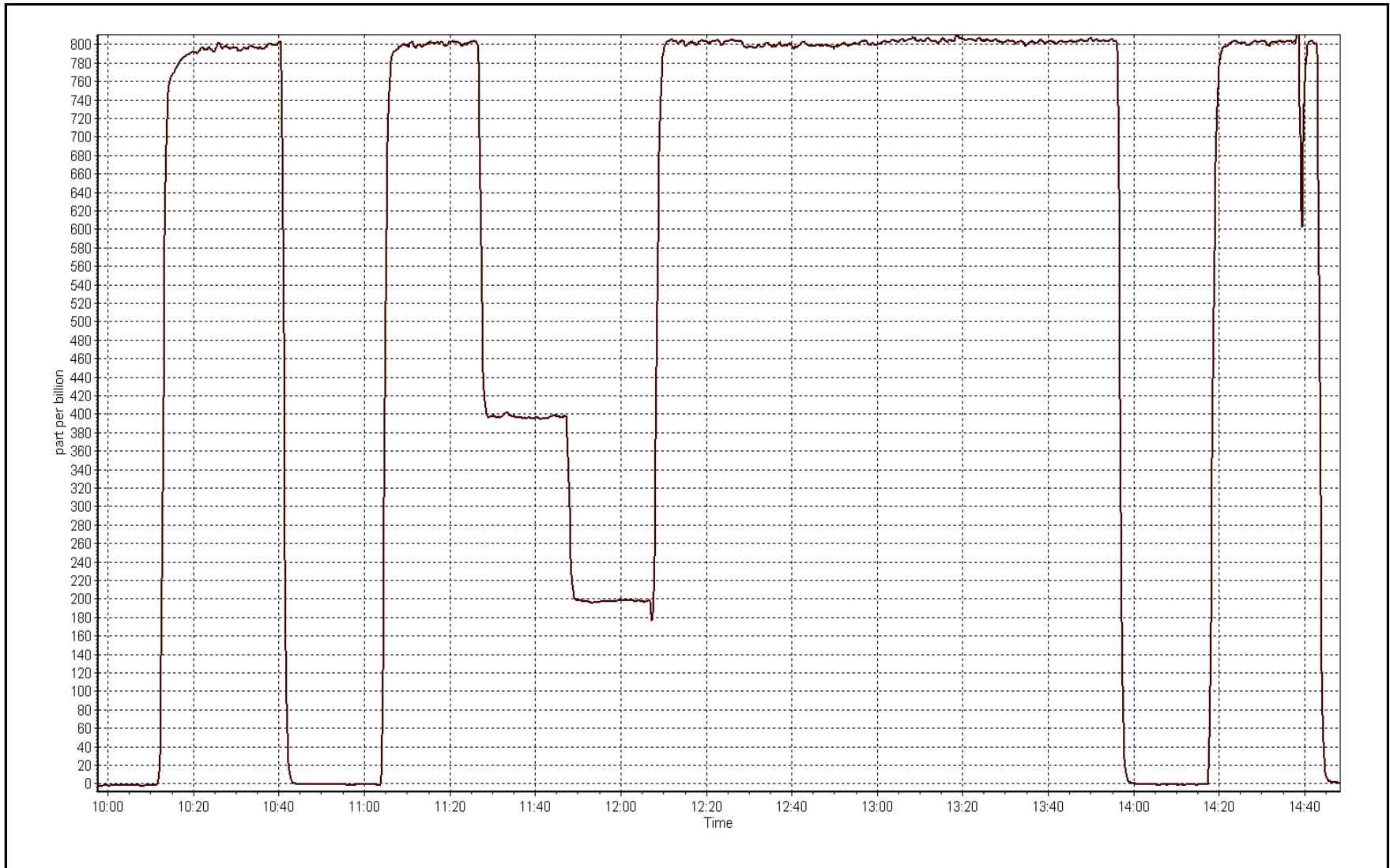
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	-0.8	----	Correlation Coefficient	0.999968	≥0.995
801.6	801.3	1.0004			
400.7	396.4	1.0109	Slope	0.998722	0.90 - 1.10
201.4	197.9	1.0177			
			Intercept	2.687169	+/-30



SO2 Calibration Plot

Date: April 26, 2017

Location: Surmont





Wood Buffalo Environmental Association

H₂S Calibration Report

Version-03-2017

Station Information

Station Name:	Surmont	Station number:	AMS 502
Calibration Date:	April 27, 2017	Last Cal Date:	March 22, 2017
Start time (MST):	9:30	End time (MST):	12:11
Reason:	Routine		

Calibration Standards

Cal Gas Concentration	<u>10.40</u>	ppm	Cal Gas Exp Date	May 30, 2016
Cal Gas Cylinder #	<u>LL34303</u>			
Calibrator Make/Model	APT T700		Serial Number	622
ZAG Make/Model	API 701		Serial Number	196

Analyzer Information

Analyzer make: API T101

Analyzer serial #: 197

	<u>Start</u>	<u>Finish</u>		<u>Start</u>	<u>Finish</u>
Analyzer Range	0 - 100 ppb		PMT voltage	496	497
Calculated slope	1.006896	1.005718	Lamp voltage	2232	2233
Calculated intercept	-0.093218	-0.018936	Pressure	23.3	23.1
Analyzer Background	21.2	21.2	Flow	0.615	0.608
Analyzer Coefficient	0.982	0.982	Intensity	49	50

H₂S Calibration Data

Set Point	Dilution air flow rate (sccm)	Source gas flow rate (sccm)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5007	0.0	0.0	0.3	----
as found span	4975	38.5	79.9	79.6	1.004
calibrator zero	5007	0.0	0.0	0.3	----
high point	4975	38.5	79.9	79.6	1.003
second point	4994	19.3	40.0	39.7	1.010
third point	5002	12.1	25.1	24.7	1.016
as left zero	5008	0.0	0.0	0.4	----
as left span	4975	38.5	79.9	79.7	1.002

Average Correction Factor				1.010
Corrected As found	79.23	Previous response	79.41	*% change 0.2%

* = > +/-5% change initiates investigation

Notes:

No adjustments required.

Calibration Performed By:

Aswin Sasi Kumar



Wood Buffalo Environmental Association

H₂S Calibration Summary

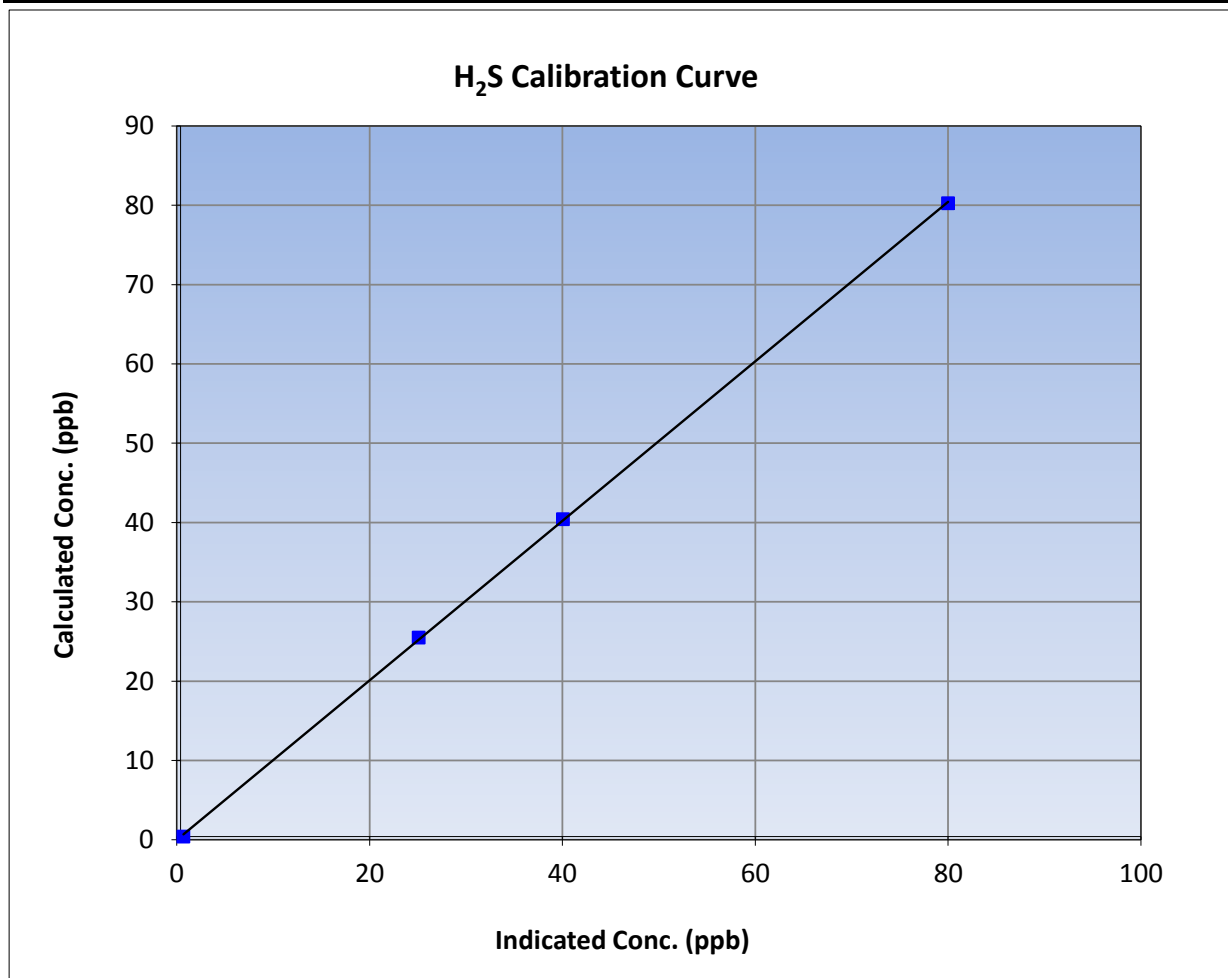
Version-03-2017

Station Information

Calibration Date	April 27, 2017	Previous Calibration	March 22, 2017
Station Name	Surmont	Station Number	AMS 502
Start Time (MST)	9:30	End Time (MST)	12:11
Analyzer make	API T101	Analyzer serial #	197

Calibration Data

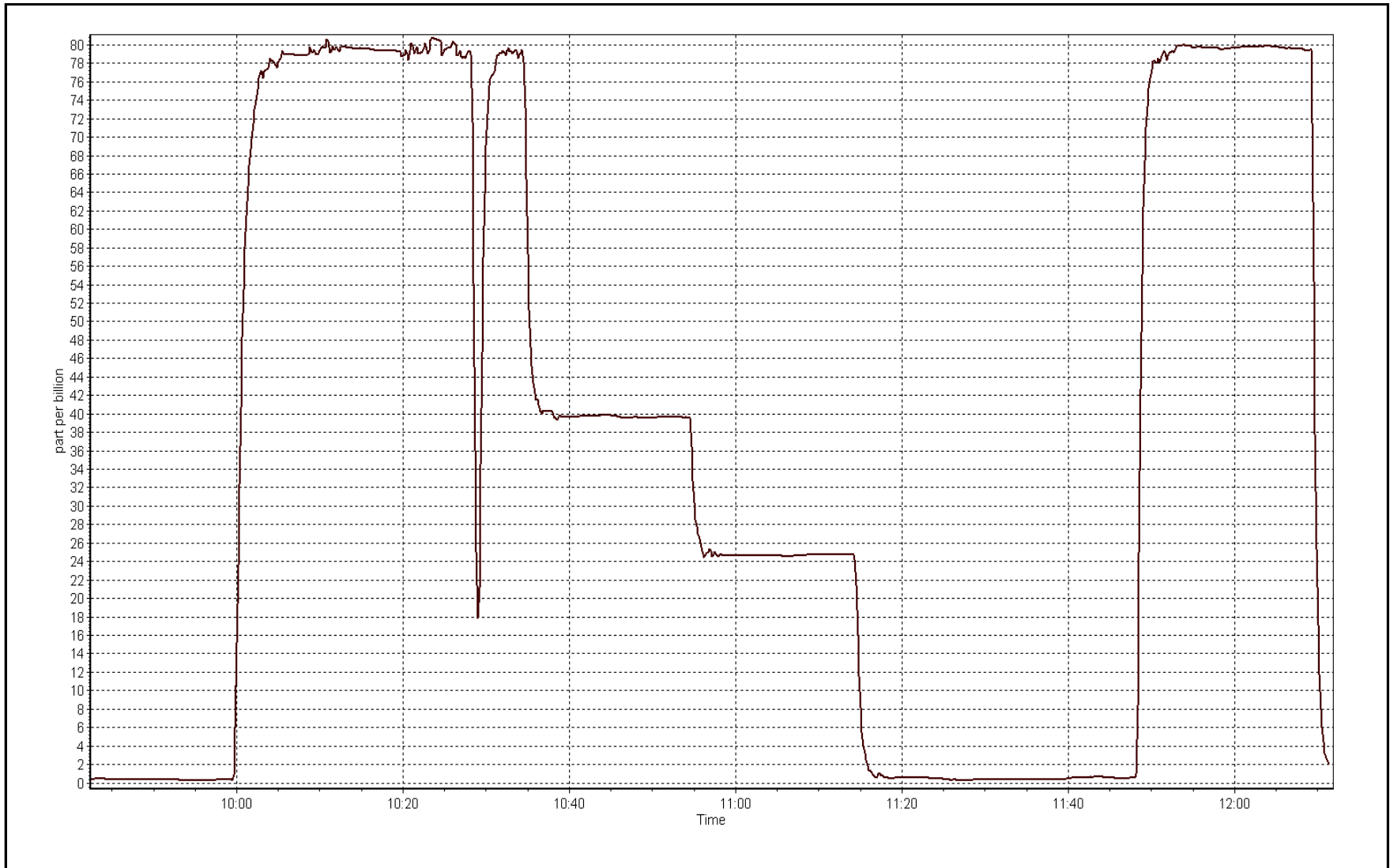
Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	Limits	
0.0	0.3	----	Correlation Coefficient	0.999935	≥0.995
79.9	79.6	1.0033			
40.0	39.7	1.0095	Slope	1.005718	0.90 - 1.10
25.1	24.7	1.0165			
			Intercept	-0.018936	+/-3



H₂S Calibration Plot

Date: April 27, 2017

Location: Surmont





Wood Buffalo Environmental Association

NO_x - NO - NO₂ Calibration Report

Version-03-2017

Station Information

Station Name:	Surmont	Station number:	AMS 502
Calibration Date:	April 26, 2017	Last Cal Date:	March 22, 2017
Start time (MST):	9:43	End time (MST):	14:46
Reason:	Routine		

Calibration Standards

NO Gas Cylinder #	LL104215	Cal Gas Expiry Date	February-12-18
NOX Cal Gas Conc.	<u>48.1</u> ppb	NO Cal Gas Conc.	<u>48.1</u> ppb
Calibrator Model	API T700	Serial Number	622
ZAG make/model	Teledyne API T701	Serial Number	196

Analyzer Information

Analyzer make:	Thermo 42i	Analyzer serial #:	1218153356	
	<u>Start</u>	<u>Finish</u>	<u>Start</u>	<u>Finish</u>
NO coefficient	0.969	0.969	NOX Range (ppb)	0 - 1000 ppb
NOX coefficient	1.000	1.000	PMT Temperature	-2.9 -2.7
NO2 coefficient	1.000	1.000	Reaction cell Press	160.3 158.2
NO bkgrnd	5.4	5.4	Sample Flow	0.674 0.663
NOX bkgrnd	5.9	5.9	PMT Voltage	-866.9 -866.9

Calibration Statistics

	<u>Start</u>	<u>Finish</u>
NO _x Cal Slope	0.991022	1.001884
NO _x Cal Offset	2.145800	2.513467
NO Cal Slope	0.991468	1.001709
NO Cal Offset	1.937096	2.353853
NO ₂ Cal Slope	1.002361	1.005371
NO ₂ Cal Offset	0.079748	-1.048029



Wood Buffalo Environmental Association

NOX-NO-NO2 Calibration Report

Version-03-2017

Dilution Calibration Data

Set Point	Dilution flow rate (sccm)	Source gas flow rate (sccm)	Calculated NOx concentration (ppb) (Cc)	Calculated NO concentration (ppb) (Cc)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>
as found zero	5007	0.0	0.0	0.0	0.0	-0.4	-0.4	-0.1	----	----
as found span	4930	83.2	798.3	798.3	0.0	795.4	795.6	-0.2	1.0036	1.0033
calibrator zero	5008	0.0	0.0	0.0	0.0	-0.4	-0.4	-0.1	----	----
high point	4930	83.2	798.3	798.3	0.0	795.4	795.6	-0.2	1.0036	1.0033
second point	4973	41.6	399.0	399.0	0.0	394.4	394.7	-0.3	1.0117	1.0110
third point	4991	20.9	200.6	200.6	0.0	195.8	196.1	-0.3	1.0243	1.0226
as left zero	5009	0.0	0.0	0.0	0.0	-0.5	-0.2	-0.4	----	----
as left span	4812	83.2	817.5	398.4	419.2	797.9	399.8	398.1	1.0245	0.9963
Average Correction Factor									1.0132	1.0123

Corrected As found	NO _x = 795.8 ppb	NO = 796.0 ppb	*Percent Change	NO _x = 0.9%
Previous Response	NO _x = 803.4 ppb	NO = 803.2 ppb	*Percent Change	NO = 0.9%

* = > +/-5% change initiates investigation

GPT Calibration Data

O3 Setpoint (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 concentration (ppb) (Cc)	Indicated NOx concentration (ppb) (Ic)	Indicated NO concentration (ppb) (Ic)	Indicated NO2 concentration (ppb) (Ic)	NOx Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	NO2 Correction factor (Cc/Ic) <i>Limit = 0.95-1.05</i>	Converter Efficiency <i>Limit = 96-104%</i>
1st NO ref point		0.0	796.1	795.6	0.6	1.0027	1.0034	----	----
1st NO2 (400 ppb O3)	398.4	397.3	794.0	398.4	395.7	1.0054	----	1.0040	99.6%
2nd NO2 (200 ppb O3)	587.4	208.2	795.8	587.4	208.4	1.0031	----	0.9990	100.1%
3rd NO2 (100 ppb O3)	686.0	109.6	797.4	686.0	111.4	1.0011	----	0.9838	101.6%
2nd NO ref point	----	0.0	797.7	796.5	1.2	1.0008	1.0023	----	----
Average Correction Factor						1.0026	1.0028	0.9956	100.4%

Notes:

No adjustments required.

Calibration Performed By: Aswin Sasi Kumar



Wood Buffalo Environmental Association

NO_x Calibration Summary

Version-03-2017

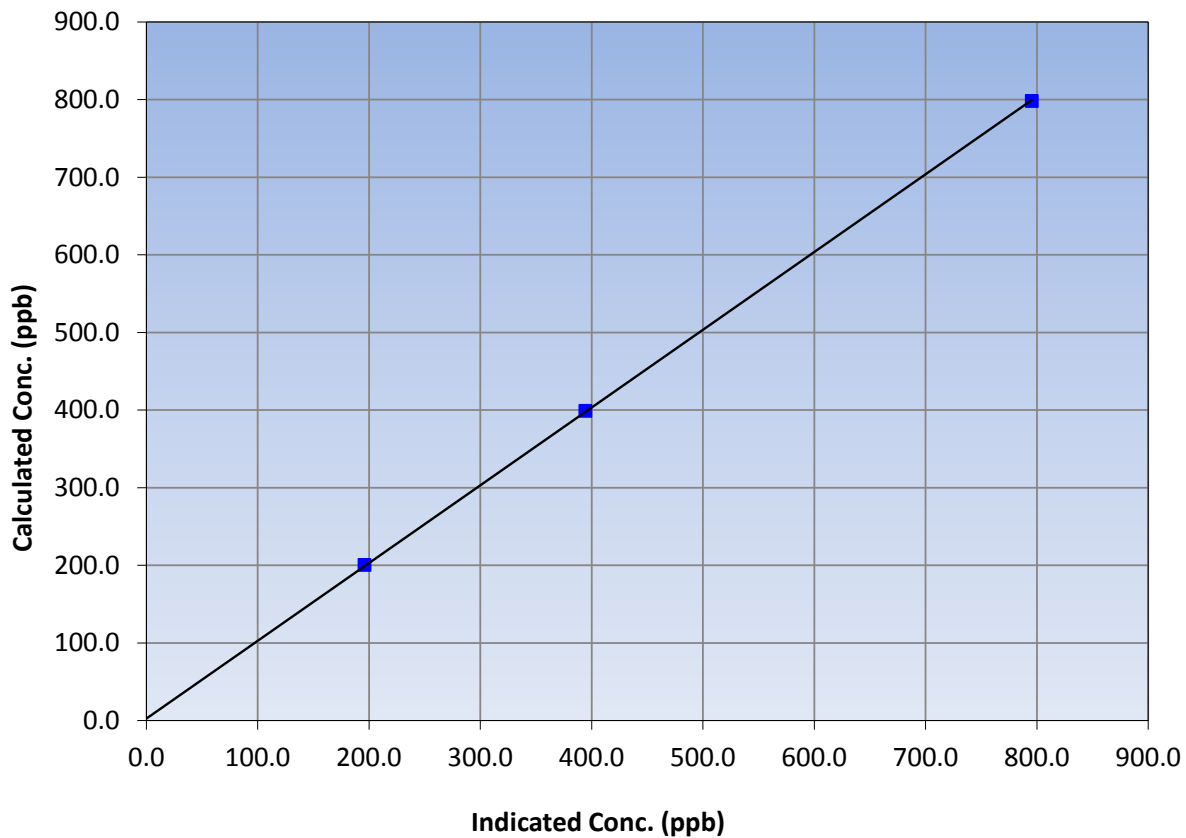
Station Information

Calibration Date	April 26, 2017	Previous Calibration	March 22, 2017
Station Name	Surmont	Station Number	AMS 502
Start Time (MST)	9:43	End Time (MST)	14:46
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.4	----	Correlation Coefficient	0.999969	≥0.995
798.3	795.4	1.0036			
399.0	394.4	1.0117	Slope	1.001884	0.90 - 1.10
200.6	195.8	1.0243			
			Intercept	2.513467	+/-20

NO_x Calibration Curve





Wood Buffalo Environmental Association

NO Calibration Summary

Version-03-2017

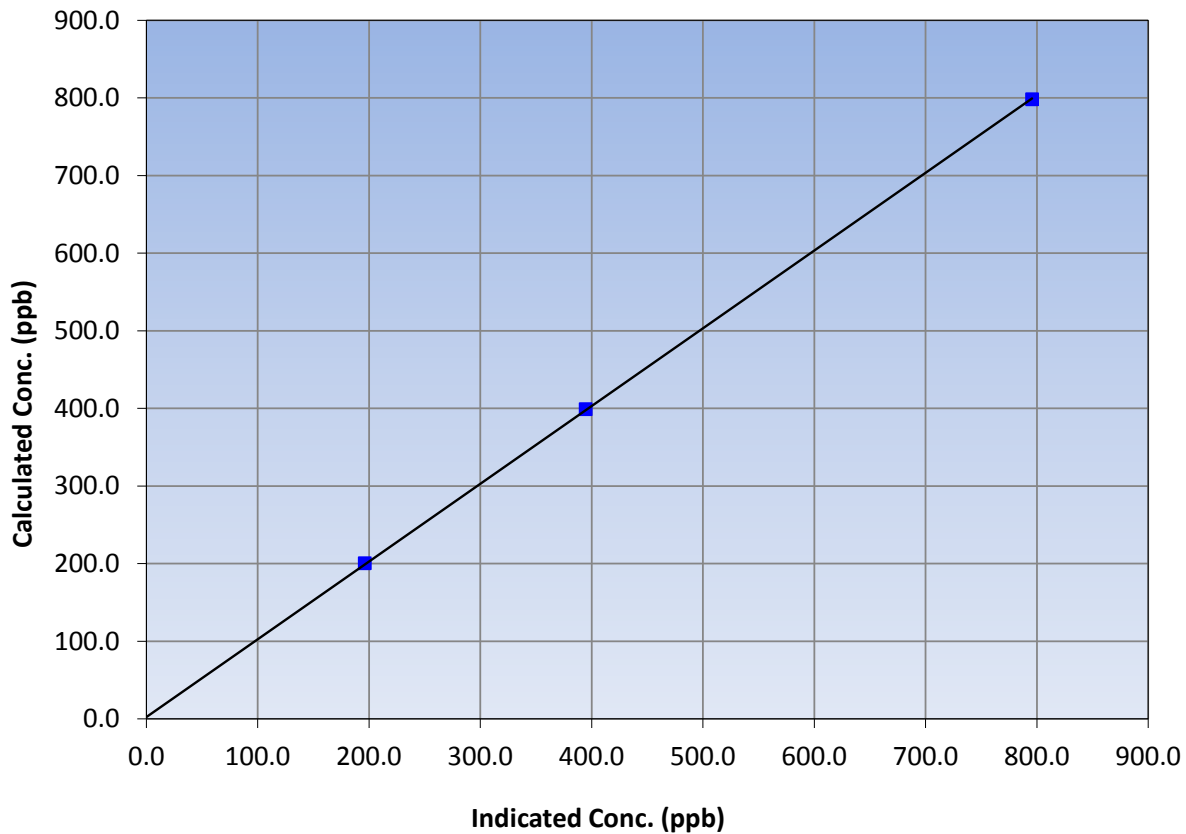
Station Information

Calibration Date	April 26, 2017	Previous Calibration	March 22, 2017
Station Name	Surmont	Station Number	AMS 502
Start Time (MST)	9:43	End Time (MST)	14:46
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>	
0.0	-0.4	----	Correlation Coefficient	0.999972	≥0.995
798.3	795.6	1.0033			
399.0	394.7	1.0110	Slope	1.001709	0.90 - 1.10
200.6	196.1	1.0226			
			Intercept	2.353853	+/-20

NO Calibration Curve





Wood Buffalo Environmental Association

NO₂ Calibration Summary

Version-03-2017

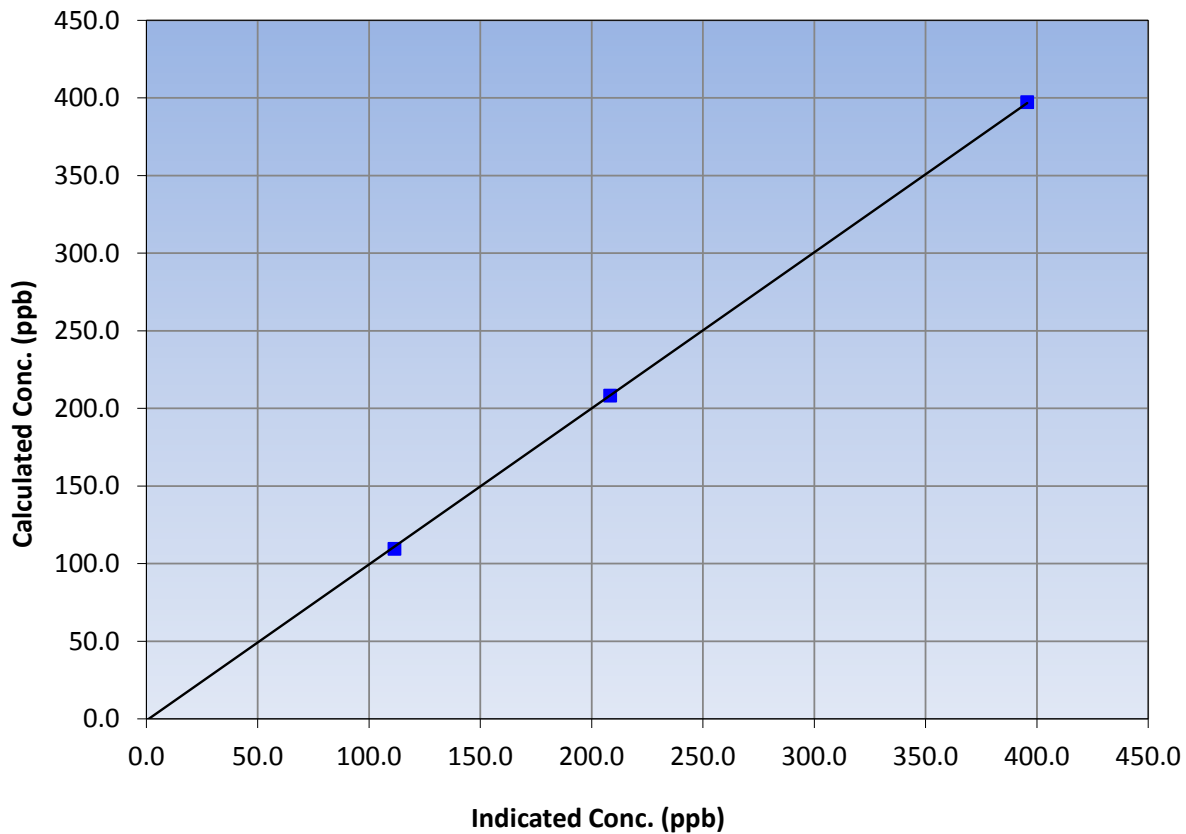
Station Information

Calibration Date	April 26, 2017	Previous Calibration	March 22, 2017
Station Name	Surmont	Station Number	AMS 502
Start Time (MST)	9:43	End Time (MST)	14:46
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	<i>Limits</i>
0.0	-0.1	----	Correlation Coefficient	≥0.995
397.3	395.7	1.0040		
208.2	208.4	0.9990	Slope	0.90 - 1.10
109.6	111.4	0.9838		
			Intercept	+/-20

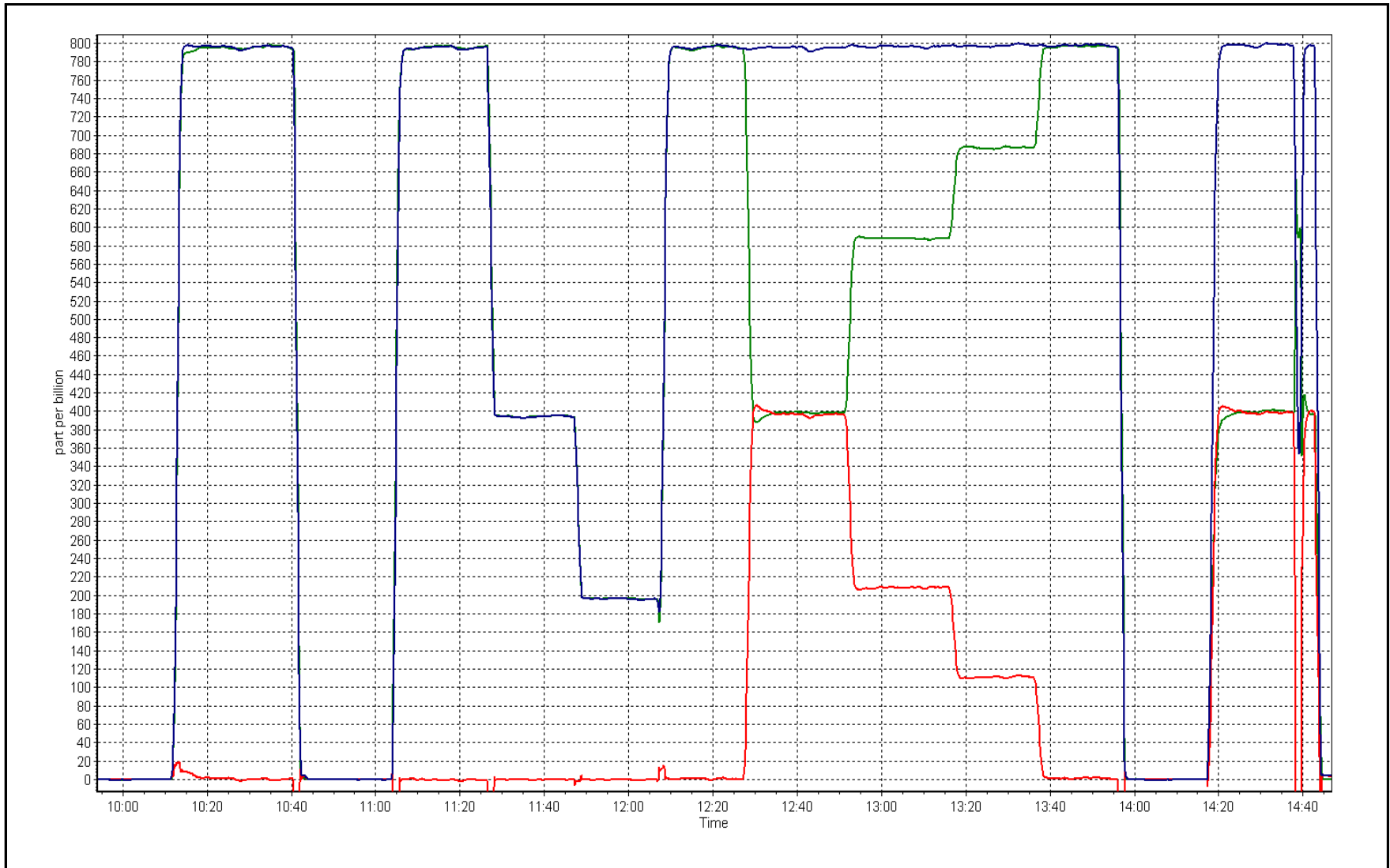
NO₂ Calibration Curve



NO_x Calibration Plot

Date: April 26, 2017

Location: Surmont





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

Passive Measurements: Maxxam Analytics Ltd
Edmonton, Alberta

VOCs: InnoTech Alberta, Inc.
Vegreville, Alberta

Particulate Matter: Atmospheric Research & Analysis, Inc.
Morrisville, NC

PAHs: Airzone One Ltd
Mississauga, Ontario

Precipitation: InnoTech Alberta, Inc.
Vegreville, Alberta



This page intentionally left blank



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

HNO₃, NH₃, NO₂, O₃ AND SO₂ PASSIVE MEASUREMENTS DATA SUMMARY FEBRUARY - MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

Passive measurements: Maxxam Analytics Ltd
Edmonton, Alberta



FILE CONTENTS DESCRIPTION	Passive Measurements of SO ₂ , NO ₂ , O ₃ , NH ₃ and HNO ₃
SAMPLING INTERVAL	Bimonthly
SAMPLING FREQUENCY OF DATA	Bimonthly
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection
UNITS	ppbv or µg/m ³
OBSERVATION TYPE	Gas
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Diffusion
MEDIUM	Filter
ANALYTICAL METHODS	IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI water extraction
ANALYTICAL LABORATORY	MAXXAM Analytics Inc
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Concentrations are calculated by equations developed by lab
SAMPLING INSTRUMENT TYPE	SO ₂ all-season SO ₂ passive sampling system NO ₂ all-season NO ₂ passive sampling system O ₃ all-season O ₃ passive sampling system NH ₃ Ogawa passive sampler HNO ₃ Ogawa passive sampler
FLAGS USED	
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Wood Buffalo Environmental Association

Site ID	Start Date/Time	End Date/Time	Passive Measurements				Remote sites			
			Ammonia ppb	Nitric Acid µg/m ³	Nitrogen Dioxide ppb	Ozone ppb	Sulfur Dioxide ppb	RH %	Temp K	Wind Speed cm/sec
AS103	2017/02/03 12:30	03/04/2017 16:05	0.7	0.7	0.8	35	0.9	67	265	130
AS103	2017/02/03 12:30	03/04/2017 16:05	0.7	0.4	0.8	33.3	0.8	67	265	130
AS107	2017/02/03 10:55	31/03/2017 16:25	1.4	0.7	1.5	32.4	1.4	67	265	130
AS107	2017/02/03 10:55	31/03/2017 16:25	1.3	0.4	1.2	35	1.4	67	265	130
JP101	2017/02/03 10:20	01/04/2017 16:15	0.7	0.9	0.7	46	0.9	67	265	130
JP101	2017/02/04 10:20	01/04/2017 16:15	0.5	0.7	0.7	37.7	0.9	67	265	130
JP102	2017/02/03 11:30	31/03/2017 15:45	0.8	0.8	3	32.5	1.8	66	264	130
JP102	2017/02/03 11:30	31/03/2017 15:45	0.7	0.7	3	31.7	1.8	66	264	130
JP104	2017/01/27 13:00	30/03/2017 15:45	0.8	1	3.6	28.5	1.7	67	263	130
JP104	2017/01/27 13:00	30/03/2017 15:45	0.8	1	4.3	31	1.7	67	263	130
JP107	2017/01/30 13:30	31/03/2017 10:05	0.5	0.6	0.9	37.4	0.9	74	261	130
JP107	2017/01/30 13:30	31/03/2017 10:05	0.6	0.4	1.1	38.5	0.8	74	261	130
JP108	2017/02/02 10:40	03/04/2017 12:00	0.6	0.5	0.2	36.8	0.4	73	261	130
JP108	2017/02/02 10:40	03/04/2017 12:00	0.5	0.5	0.2	33.8	0.4	73	261	130
JP201	2017/02/01 12:30	01/04/2017 14:30	0.5	2	0.5	37.4	0.6	67	265	130
JP201	2017/02/01 12:30	01/04/2017 14:30	0.7	0.4	0.5	38.2	0.7	67	265	130
JP205	2017/01/30 14:30	01/04/2017 8:05	0.7	0.3	0.3	48.5	0.6	74	261	130
JP205	2017/01/30 14:30	01/04/2017 8:05	0.7	0.6	0.2	48.8	0.6	74	261	130
JP210	2017/02/02 13:00	03/04/2017 15:00	1	0.8	0.4	33.7	0.6	70	266	130
JP210	2017/02/02 13:00	03/04/2017 15:00	0.7	0.6	0.3	47.3	0.6	70	266	130
JP213	2017/02/02 09:55	03/04/2017 10:10	0.8	0.5	<0.1	38.2	0.4	73	261	130
JP213	2017/02/02 09:55	03/04/2017 10:10	0.9	0.4	0.1	34.1	0.3	73	261	130
JP309	2017/02/01 15:10	31/03/2017 13:20	0.5	0.9	2.2	27.9	1.7	66	264	130
JP309	2017/02/01 15:10	31/03/2017 13:20	0.6	0.7	2.5	28.5	1.7	66	264	130
JP311	2017/02/03 09:50	01/04/2017 16:45	0.6	0.8	1	36.6	1.3	67	265	130
JP311	2017/02/03 09:50	01/04/2017 16:45	0.6	0.5	0.9	38.1	1.4	67	265	130
JP316	2017/02/02 11:45	03/04/2017 14:20	0.9	0.3	0.3	36.2	0.5	70	266	130
JP316	2017/02/02 11:45	03/04/2017 14:20	0.7	0.5	0.2	34	0.5	70	266	130
BM7	2017/01/30 12:40	31/03/2017 11:10	0.8	0.7	<0.1	36.3	0.7	74	261	130
BM10	2017/02/01 14:05	31/03/2017 12:40	0.6	0.5	0.6	29.5	1.1	67	265	130
BM11	2017/01/30 12:10	31/03/2017 11:50	0.6	0.5	0.3	32.1	1	74	261	130
JE306	2017/01/30 15:00	01/04/2017 9:05	0.6	0.8	0.5	28.8	0.8	74	261	130
JE308	2017/02/01 13:30	01/04/2017 16:30	0.6	0.4	0.4	33.1	0.9	67	265	130
JE312	2017/02/02 09:05	03/04/2017 7:50	0.6	0.5	<0.1	29.4	0.6	70	266	130
JE316	2017/02/02 12:15	03/04/2017 14:20	0.7	1	<0.1	33.2	0.4	70	266	130
JE323	2017/02/03 12:05	01/04/2017 12:00	0.6	0.4	0.3	26.4	0.6	67	265	130
JP212	2017/02/01 16:40	01/04/2017 11:10	0.7	0.4	2.1	22.1	0.8	66	264	130
NE7	2017/02/01 16:20	01/04/2017 10:15	0.7	0.6	0.2	36	0.9	66	264	130
NE10	2017/02/02 11:10	03/04/2017 13:55	M1	M1	<0.1	27.7	0.4	70	266	130
NE11	2017/01/30 15:30	01/04/2017 9:50	0.8	0.3	0.8	24.9	1	67	264	130
R2	2017/01/27 14:15	30/03/2017 17:10	0.8	0.9	1.8	22.9	1.2	67	263	130
SM7	2017/02/02 14:00	04/04/2017 11:50	M2	0.3	<0.1	37.2	0.6	77	257	130
SM8	2017/02/02 14:20	04/04/2017 12:50	0.7	0.8	<0.1	32.1	0.7	77	257	130
WF4	2017/02/01 14:25	31/03/2017 15:35	0.7	1	1.1	24.2	1.3	66	264	130
BLANK	21/03/2017		0.9	0.5	0.2	<0.1	<0.1	67	265	130
BLANK	21/03/2017		0.8	0.4	0.1	<0.1	<0.1	67	265	130
BLANK	21/03/2017		0.6	0.4	0.1	<0.1	<0.1	67	265	130



Wood Buffalo Environmental Association

Passive Measurements Ambient Air Monitoring Stations

Site ID	Site Name	Start Date/Time	End Date/Time	Species			Passive Measurements		Ambient Air Monitoring Stations		
				Ammonia ppb	Nitric Acid $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide ppb	Ozone ppb	Sulfur Dioxide ppb	RH %	Temp K	Wind Speed cm/sec
AMS 1	Fort McKay-Bertha Ganter	2017/01/27 11:40	03/04/2017 12:30	<0.1	0.9	5.5	23.4	2.1	70	265	130
AMS 1	Fort McKay-Bertha Ganter	2017/01/27 11:40	03/04/2017 12:30	<0.1	1	4.9	23.2	2.4	70	265	130
AMS 1	Fort McKay-Bertha Ganter	2017/01/27 11:40	03/04/2017 12:30	0.2	0.7	4.6	20.4	2.4	70	265	130
AMS 2	Mildred Lake	2017/01/27 10:15	30/03/2017 10:45	1.7	0.5	5.5	25.2	3.6	70	265	130
AMS 2	Mildred Lake	2017/01/27 10:15	30/03/2017 10:45	1.7	M2	6.3	25.1	3.5	70	265	130
AMS 2	Mildred Lake	2017/01/27 10:15	30/03/2017 10:45	1.7	0.7	5.7	23.7	3.9	70	265	130



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

VOLATILE ORGANIC COMPOUNDS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

VOCs: InnoTech Alberta, Inc.
Vegreville, Alberta



FILE CONTENTS DESCRIPTION	VOC - Speciated Volatile Organic Compounds
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	ppbv (parts per billion volume)
OBSERVATION TYPE	Gas
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Evacuated canister
ANALYTICAL METHODS	GC/MS - Gas chromatography/mass spectrometer
ANALYTICAL LABORATORY	InnoTech Alberta Inc
USER NOTE 1	Data are not blank corrected
SAMPLING INSTRUMENT TYPE	Tisch TE123
FLOW RATE	10.0 cc/min (cubic centimeters per minute)
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Station Name Station # Sample Date	Bertha Ganter - Fort McKay AMS 1 02-Mar			Patricia McInnes AMS 6 02-Mar	
	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
	Compound Name				
1,2,4-Trimethylbenzene	0.03	0.13	V0	0.15	V0
1,3,5-Trimethylbenzene	0.02	0.1	V0	0.12	V0
1,3-Butadiene	0.02	0.03	V0	0.03	V0
1-Butene	0.02	0.25	V0	0.18	V0
1-Pentene	0.01	0.1	V0	0.09	V0
2,2,4-Trimethylpentane	0.01	0.13	V0	0.16	V0
2,2-Dimethylbutane	0.01	0.23	V0	0.14	V0
2,3,4-Trimethylpentane	0.01	0.12	V0	0.12	V0
2,3-Dimethylbutane	0.02	0.31	V0	0.19	V0
2,3-Dimethylpentane	0.02	0.18	V0	0.21	V0
2,4-Dimethylpentane	0.01	0.12	V0	0.12	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.16	V0	0.25	V0
2-Methylhexane	0.01	0.16	V0	0.19	V0
2-Methylpentane	0.01	0.3	V0	0.19	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.13	V0	0.16	V0
3-Methylhexane	0.02	0.19	V0	0.25	V0
3-Methylpentane	0.01	0.41	V0	0.25	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.4	V0	1.4	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.4	V0	0.36	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	0.12	V0	0.12	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	0.1	V0	0.1	V0
Cyclohexane	0.02	0.18	V0	0.17	V0
Cyclopentane	0.01	0.27	V0	0.16	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	1.3	V0	1.7	V0
Ethylbenzene	0.01	0.13	V0	0.14	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.66	V0	0.6	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	1.12	V0	0.87	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	0.09	V0	0.08	V0
m,p-Xylene	0.03	0.18	V0	0.25	V0
Methanol	3	6	V0	10	V0
Methylcyclohexane	0.01	0.17	V0	0.25	V0
Methylcyclopentane	0.02	0.25	V0	0.25	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	1.25	V0	1.17	V0
n-Decane	0.06	0.09	V0	0.08	V0
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.27	V0	0.42	V0
n-Hexane	0.01	0.49	V0	0.42	V0
n-Nonane	0.01	0.14	V0	0.17	V0
n-Octane	0.02	0.2	V0	0.33	V0
n-Pentane	0.1	1.1	V0	0.7	V0
n-Propylbenzene	0.05	0.09	V0	0.09	V0
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.13	V0	0.16	V0
Styrene	0.04	0.11	V0	0.09	V0
Toluene	0.01	0.38	V0	0.48	V0
trans-2-Butene	0.01	0.12	V0	0.11	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	0.09	V0	0.09	V0



Station Name	Athabasca Valley			Anzac	
Station #	AMS 7			AMS 14	
Sample Date	02-Mar			02-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.07	V0	0.04	V0
1,3,5-Trimethylbenzene	0.02	0.08	V0	0.04	V0
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.12	V0	0.08	V0
1-Pentene	0.01	0.05	V0	0.05	V0
2,2,4-Trimethylpentane	0.01	0.09	V0	0.07	V0
2,2-Dimethylbutane	0.01	0.09	V0	0.06	V0
2,3,4-Trimethylpentane	0.01	0.07	V0	0.06	V0
2,3-Dimethylbutane	0.02	0.12	V0	0.07	V0
2,3-Dimethylpentane	0.02	0.13	V0	0.09	V0
2,4-Dimethylpentane	0.01	0.07	V0	0.06	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.18	V0	0.07	V0
2-Methylhexane	0.01	0.15	V0	0.09	V0
2-Methylpentane	0.01	0.11	V0	0.07	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.11	V0	0.06	V0
3-Methylhexane	0.02	0.21	V0	0.11	V0
3-Methylpentane	0.01	0.19	V0	0.12	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.5	V0	1.6	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.28	V0	0.3	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	0.07	V0	0.07	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	0.06	V0	0.05	V0
Cyclohexane	0.02	0.12	V0	0.1	V0
Cyclopentane	0.01	0.11	V0	0.11	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	1.4	V0	0.6	V0
Ethylbenzene	0.01	0.08	V0	0.05	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.43	V0	0.43	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.63	V0	0.56	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	0.05	V0	0.04	V0
m,p-Xylene	0.03	0.13	V0	0.05	V0
Methanol	3	10	V0	5	V0
Methylcyclohexane	0.01	0.18	V0	0.1	V0
Methylcyclopentane	0.02	0.2	V0	0.15	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.9	V0	0.91	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.39	V0	0.15	V0
n-Hexane	0.01	0.38	V0	0.28	V0
n-Nonane	0.01	0.12	V0	0.06	V0
n-Octane	0.02	0.27	V0	0.09	V0
n-Pentane	0.1	0.5	V0	0.5	V0
n-Propylbenzene	0.05	0.05	V0	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.09	V0	0.05	V0
Styrene	0.04	0.06	V0	0.05	V0
Toluene	0.01	0.32	V0	0.23	V0
trans-2-Butene	0.01	0.07	V0	0.07	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	0.05	V0	0.05	V0



Station Name Station # Sample Date	Barge Landing AMS 9 02-Mar	Fort McKay South AMS 13 02-Mar			
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.12	V0	0.12	V0
1,3,5-Trimethylbenzene	0.02	0.1	V0	0.1	V0
1,3-Butadiene	0.02	0.03	V0	< 0.02	V1
1-Butene	0.02	0.2	V0	0.19	V0
1-Pentene	0.01	0.1	V0	0.1	V0
2,2,4-Trimethylpentane	0.01	0.11	V0	0.11	V0
2,2-Dimethylbutane	0.01	0.37	V0	0.22	V0
2,3,4-Trimethylpentane	0.01	0.12	V0	0.11	V0
2,3-Dimethylbutane	0.02	0.47	V0	0.29	V0
2,3-Dimethylpentane	0.02	0.19	V0	0.16	V0
2,4-Dimethylpentane	0.01	0.12	V0	0.12	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.19	V0	0.16	V0
2-Methylhexane	0.01	0.2	V0	0.15	V0
2-Methylpentane	0.01	0.46	V0	0.28	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.14	V0	0.13	V0
3-Methylhexane	0.02	0.24	V0	0.18	V0
3-Methylpentane	0.01	0.67	V0	0.39	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.8	V0	1.4	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.45	V0	0.36	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	0.12	V0	0.12	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	0.11	V0	0.11	V0
Cyclohexane	0.02	0.2	V0	0.17	V0
Cyclopentane	0.01	0.41	V0	0.27	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	1.3	V0	5.2	V0
Ethylbenzene	0.01	0.12	V0	0.12	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.59	V0	0.58	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	1.85	V0	1.04	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	0.09	V0	0.1	V0
m,p-Xylene	0.03	0.17	V0	0.13	V0
Methanol	3	7	V0	7	V0
Methylcyclohexane	0.01	0.2	V0	0.17	V0
Methylcyclopentane	0.02	0.31	V0	0.23	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.96	V0	1.07	V0
n-Decane	0.06	0.1	V0	0.09	V0
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.35	V0	0.26	V0
n-Hexane	0.01	0.69	V0	0.46	V0
n-Nonane	0.01	0.17	V0	0.15	V0
n-Octane	0.02	0.24	V0	0.2	V0
n-Pentane	0.1	1.8	V0	1	V0
n-Propylbenzene	0.05	0.09	V0	0.09	V0
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.16	V0	0.12	V0
Styrene	0.04	0.09	V0	0.11	V0
Toluene	0.01	0.37	V0	0.29	V0
trans-2-Butene	0.01	0.11	V0	0.13	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	0.09	V0	0.09	V0



Station Name Station # Sample Date	Horizon AMS 15 02-Mar		
Compound Name	MDL (ppbv)	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.12	V0
1,3,5-Trimethylbenzene	0.02	0.12	V0
1,3-Butadiene	0.02	< 0.02	V1
1-Butene	0.02	0.18	V0
1-Pentene	0.01	0.1	V0
2,2,4-Trimethylpentane	0.01	0.11	V0
2,2-Dimethylbutane	0.01	0.22	V0
2,3,4-Trimethylpentane	0.01	0.13	V0
2,3-Dimethylbutane	0.02	0.38	V0
2,3-Dimethylpentane	0.02	0.3	V0
2,4-Dimethylpentane	0.01	0.13	V0
2-Methyl-1-pentene	0.3	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1
2-Methylheptane	0.01	0.31	V0
2-Methylhexane	0.01	0.22	V0
2-Methylpentane	0.01	0.37	V0
3-Methyl-1-butene	0.3	< 0.3	V1
3-Methylheptane	0.02	0.17	V0
3-Methylhexane	0.02	0.33	V0
3-Methylpentane	0.01	0.46	V0
4-Methyl-1-pentene	0.3	< 0.3	V1
Acetaldehyde	3	< 3	V1
Acetone	0.4	1.6	V0
alpha-Pinene	0.3	< 0.3	V1
Benzene	0.01	0.29	V0
beta-Pinene	0.3	< 0.3	V1
cis-2-Butene	0.02	0.11	V0
cis-2-Hexene	0.3	< 0.3	V1
cis-2-Pentene	0.02	0.1	V0
Cyclohexane	0.02	0.56	V0
Cyclopentane	0.01	0.28	V0
Cyclopentene	0.3	< 0.3	V1
Ethanol	0.3	0.5	V0
Ethylbenzene	0.01	0.13	V0
Formaldehyde	3	< 3	V1
Isobutane	0.02	1.2	V0
Isobutylene	0.3	< 0.3	V1
Isopentane	0.03	1.78	V0
Isoprene	0.01	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1
Isopropylbenzene	0.01	0.09	V0
m,p-Xylene	0.03	0.17	V0
Methanol	3	4	V0
Methylcyclohexane	0.01	0.49	V0
Methylcyclopentane	0.02	0.5	V0
Methylethylketone	0.3	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1
n-Butane	0.03	2.07	V0
n-Decane	0.06	0.1	V0
n-Dodecane	0.4	< 0.4	V1
n-Heptane	0.01	0.58	V0
n-Hexane	0.01	0.43	V0
n-Nonane	0.01	0.19	V0
n-Octane	0.02	0.38	V0
n-Pentane	0.1	0.8	V0
n-Propylbenzene	0.05	0.09	V0
n-Undecane	0.5	< 0.5	V1
Naphthalene	0.5	< 0.5	V1
o-Xylene	0.01	0.13	V0
Styrene	0.04	0.09	V0
Toluene	0.01	0.43	V0
trans-2-Butene	0.01	0.12	V0
trans-2-Hexene	0.3	< 0.3	V1
trans-2-Pentene	0.02	0.08	V0



Station Name Station # Sample Date	Bertha Ganter - Fort McKay AMS 1 08-Mar			Patricia McInnes AMS 6 08-Mar	
	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.04	V0	0.12	V0
1,3,5-Trimethylbenzene	0.02	0.03	V0	0.09	V0
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.08	V0	0.15	V0
1-Pentene	0.01	< 0.01	V1	0.08	V0
2,2,4-Trimethylpentane	0.01	0.02	V0	0.12	V0
2,2-Dimethylbutane	0.01	0.07	V0	0.14	V0
2,3,4-Trimethylpentane	0.01	0.02	V0	0.1	V0
2,3-Dimethylbutane	0.02	0.12	V0	0.18	V0
2,3-Dimethylpentane	0.02	0.06	V0	0.16	V0
2,4-Dimethylpentane	0.01	0.02	V0	0.1	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.04	V0	0.17	V0
2-Methylhexane	0.01	0.03	V0	0.14	V0
2-Methylpentane	0.01	0.11	V0	0.18	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	0.13	V0
3-Methylhexane	0.02	0.06	V0	0.18	V0
3-Methylpentane	0.01	0.15	V0	0.21	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.2	V0	1	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.21	V0	0.29	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	0.11	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	0.09	V0
Cyclohexane	0.02	0.14	V0	0.16	V0
Cyclopentane	0.01	0.07	V0	0.14	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	0.6	V0	0.7	V0
Ethylbenzene	0.01	0.02	V0	0.11	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.6	V0	0.44	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.71	V0	0.57	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	0.08	V0
m,p-Xylene	0.03	0.05	V0	0.15	V0
Methanol	3	5	V0	4	V0
Methylcyclohexane	0.01	0.08	V0	0.18	V0
Methylcyclopentane	0.02	0.1	V0	0.2	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.79	V0	0.71	V0
n-Decane	0.06	< 0.06	V1	0.08	V0
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.09	V0	0.3	V0
n-Hexane	0.01	0.07	V0	0.31	V0
n-Nonane	0.01	0.03	V0	0.13	V0
n-Octane	0.02	0.05	V0	0.22	V0
n-Pentane	0.1	0.2	V0	0.4	V0
n-Propylbenzene	0.05	< 0.05	V1	0.08	V0
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.02	V0	0.11	V0
Styrene	0.04	< 0.04	V1	0.09	V0
Toluene	0.01	0.15	V0	0.29	V0
trans-2-Butene	0.01	0.01	V0	0.11	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	0.08	V0



Station Name Station # Sample Date	Athabasca Valley AMS 7 08-Mar			Anzac AMS 14 08-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.09	V0	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	0.07	V0	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.13	V0	0.05	V0
1-Pentene	0.01	0.08	V0	< 0.01	V1
2,2,4-Trimethylpentane	0.01	0.09	V0	0.03	V0
2,2-Dimethylbutane	0.01	0.12	V0	0.03	V0
2,3,4-Trimethylpentane	0.01	0.09	V0	< 0.01	V1
2,3-Dimethylbutane	0.02	0.17	V0	0.04	V0
2,3-Dimethylpentane	0.02	0.12	V0	0.03	V0
2,4-Dimethylpentane	0.01	0.09	V0	0.01	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.11	V0	< 0.01	V1
2-Methylhexane	0.01	0.11	V0	0.02	V0
2-Methylpentane	0.01	0.15	V0	0.04	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.1	V0	< 0.02	V1
3-Methylhexane	0.02	0.13	V0	0.02	V0
3-Methylpentane	0.01	0.15	V0	0.06	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.3	V0	0.8	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.26	V0	0.19	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	0.1	V0	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	0.09	V0	< 0.02	V1
Cyclohexane	0.02	0.12	V0	0.03	V0
Cyclopentane	0.01	0.12	V0	0.03	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	0.8	V0	< 0.3	V1
Ethylbenzene	0.01	0.09	V0	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.37	V0	0.28	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.45	V0	0.45	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	0.08	V0	< 0.01	V1
m,p-Xylene	0.03	0.09	V0	< 0.03	V1
Methanol	3	5	V0	5	V0
Methylcyclohexane	0.01	0.12	V0	0.02	V0
Methylcyclopentane	0.02	0.14	V0	0.03	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.6	V0	0.56	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.17	V0	0.04	V0
n-Hexane	0.01	0.21	V0	0.08	V0
n-Nonane	0.01	0.1	V0	< 0.01	V1
n-Octane	0.02	0.14	V0	< 0.02	V1
n-Pentane	0.1	0.4	V0	0.4	V0
n-Propylbenzene	0.05	0.07	V0	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.09	V0	< 0.01	V1
Styrene	0.04	0.08	V0	0.04	V0
Toluene	0.01	0.19	V0	0.07	V0
trans-2-Butene	0.01	0.1	V0	0.01	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	0.07	V0	< 0.02	V1



Station Name Station # Sample Date	Barge Landing AMS 9 08-Mar	Fort McKay South AMS 13 08-Mar			
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.04	V0	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	0.03	V0	< 0.02	V1
1,3-Butadiene	0.02	0.02	V0	< 0.02	V1
1-Butene	0.02	0.07	V0	0.04	V0
1-Pentene	0.01	< 0.01	V1	< 0.01	V1
2,2,4-Trimethylpentane	0.01	0.02	V0	< 0.01	V1
2,2-Dimethylbutane	0.01	0.08	V0	0.07	V0
2,3,4-Trimethylpentane	0.01	0.02	V0	0.01	V0
2,3-Dimethylbutane	0.02	0.12	V0	0.11	V0
2,3-Dimethylpentane	0.02	0.04	V0	0.04	V0
2,4-Dimethylpentane	0.01	0.02	V0	0.01	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.03	V0	0.03	V0
2-Methylhexane	0.01	0.02	V0	0.02	V0
2-Methylpentane	0.01	0.11	V0	0.11	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	< 0.02	V1
3-Methylhexane	0.02	0.04	V0	0.04	V0
3-Methylpentane	0.01	0.15	V0	0.14	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.7	V0	1	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.23	V0	0.2	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.08	V0	0.11	V0
Cyclopentane	0.01	0.07	V0	0.08	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	0.9	V0	0.9	V0
Ethylbenzene	0.01	0.02	V0	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.42	V0	0.46	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.62	V0	0.65	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	0.04	V0	< 0.03	V1
Methanol	3	5	V0	4	V0
Methylcyclohexane	0.01	0.05	V0	0.07	V0
Methylcyclopentane	0.02	0.07	V0	0.08	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.54	V0	0.53	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.07	V0	0.07	V0
n-Hexane	0.01	0.09	V0	0.07	V0
n-Nonane	0.01	0.03	V0	0.02	V0
n-Octane	0.02	0.04	V0	0.03	V0
n-Pentane	0.1	0.3	V0	0.3	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.1	V0	< 0.01	V1
Styrene	0.04	0.05	V0	< 0.04	V1
Toluene	0.01	0.11	V0	0.07	V0
trans-2-Butene	0.01	0.02	V0	< 0.01	V1
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Horizon AMS 15 08-Mar		
Compound Name	MDL (ppbv)	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.04	V0
1,3,5-Trimethylbenzene	0.02	0.02	V0
1,3-Butadiene	0.02	< 0.02	V1
1-Butene	0.02	0.09	V0
1-Pentene	0.01	< 0.01	V1
2,2,4-Trimethylpentane	0.01	< 0.01	V1
2,2-Dimethylbutane	0.01	0.08	V0
2,3,4-Trimethylpentane	0.01	0.02	V0
2,3-Dimethylbutane	0.02	0.19	V0
2,3-Dimethylpentane	0.02	0.11	V0
2,4-Dimethylpentane	0.01	0.03	V0
2-Methyl-1-pentene	0.3	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1
2-Methylheptane	0.01	0.07	V0
2-Methylhexane	0.01	0.04	V0
2-Methylpentane	0.01	0.18	V0
3-Methyl-1-butene	0.3	< 0.3	V1
3-Methylheptane	0.02	0.02	V0
3-Methylhexane	0.02	0.1	V0
3-Methylpentane	0.01	0.24	V0
4-Methyl-1-pentene	0.3	< 0.3	V1
Acetaldehyde	3	< 3	V1
Acetone	0.4	1.5	V0
alpha-Pinene	0.3	< 0.3	V1
Benzene	0.01	0.19	V0
beta-Pinene	0.3	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1
Cyclohexane	0.02	0.33	V0
Cyclopentane	0.01	0.11	V0
Cyclopentene	0.3	< 0.3	V1
Ethanol	0.3	0.5	V0
Ethylbenzene	0.01	0.02	V0
Formaldehyde	3	< 3	V1
Isobutane	0.02	1.08	V0
Isobutylene	0.3	< 0.3	V1
Isopentane	0.03	1.38	V0
Isoprene	0.01	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1
m,p-Xylene	0.03	0.03	V0
Methanol	3	3	V0
Methylcyclohexane	0.01	0.21	V0
Methylcyclopentane	0.02	0.24	V0
Methylethylketone	0.3	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1
n-Butane	0.03	1.09	V0
n-Decane	0.06	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1
n-Heptane	0.01	0.15	V0
n-Hexane	0.01	0.07	V0
n-Nonane	0.01	0.05	V0
n-Octane	0.02	0.08	V0
n-Pentane	0.1	0.3	V0
n-Propylbenzene	0.05	< 0.05	V1
n-Undecane	0.5	< 0.5	V1
Naphthalene	0.5	< 0.5	V1
o-Xylene	0.01	0.02	V0
Styrene	0.04	< 0.04	V1
Toluene	0.01	0.09	V0
trans-2-Butene	0.01	0.01	V0
trans-2-Hexene	0.3	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1



Station Name Station # Sample Date	Bertha Ganter -			Patricia McInnes	
	Fort McKay			AMS 6	
	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
		AMS 1 14-Mar		AMS 6 14-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.07	V0	0.05	V0
1,3,5-Trimethylbenzene	0.02	0.04	V0	0.03	V0
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.17	V0	0.1	V0
1-Pentene	0.01	0.03	V0	0.02	V0
2,2,4-Trimethylpentane	0.01	< 0.01	V1	0.1	V0
2,2-Dimethylbutane	0.01	0.18	V0	0.01	V0
2,3,4-Trimethylpentane	0.01	0.04	V0	0.03	V0
2,3-Dimethylbutane	0.02	0.27	V0	0.05	V0
2,3-Dimethylpentane	0.02	0.15	V0	0.09	V0
2,4-Dimethylpentane	0.01	0.04	V0	0.04	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.48	V0	0.02	V0
2-Methylhexane	0.01	0.27	V0	0.06	V0
2-Methylpentane	0.01	0.81	V0	0.15	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.19	V0	< 0.02	V1
3-Methylhexane	0.02	0.4	V0	0.07	V0
3-Methylpentane	0.01	0.49	V0	0.09	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	3	V0	2.5	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.33	V0	0.22	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.21	V0	0.03	V0
Cyclopentane	0.01	0.23	V0	0.04	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	1.6	V0	2.5	V0
Ethylbenzene	0.01	0.15	V0	0.03	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	1.55	V0	1.47	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	1.82	V0	0.96	V0
Isoprene	0.01	0.02	V0	0.01	V0
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	0.01	V0	< 0.01	V1
m,p-Xylene	0.03	0.36	V0	0.11	V0
Methanol	3	8	V0	45	V0
Methylcyclohexane	0.01	0.48	V0	0.05	V0
Methylcyclopentane	0.02	0.44	V0	0.08	V0
Methylethylketone	0.3	0.5	V0	0.5	V0
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	3.29	V0	3.03	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.97	V0	0.07	V0
n-Hexane	0.01	0.92	V0	0.15	V0
n-Nonane	0.01	0.25	V0	0.01	V0
n-Octane	0.02	0.75	V0	0.02	V0
n-Pentane	0.1	1.9	V0	0.6	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.14	V0	0.05	V0
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.67	V0	0.18	V0
trans-2-Butene	0.01	0.02	V0	0.01	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	0.03	V0



Station Name	Athabasca Valley			Anzac	
Station #	AMS 7			AMS 14	
Sample Date	14-Mar			14-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.06	V0	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	0.03	V0	< 0.02	V1
1,3-Butadiene	0.02	0.02	V0	< 0.02	V1
1-Butene	0.02	0.14	V0	0.05	V0
1-Pentene	0.01	0.02	V0	< 0.01	V1
2,2,4-Trimethylpentane	0.01	0.06	V0	< 0.01	V1
2,2-Dimethylbutane	0.01	0.02	V0	0.01	V0
2,3,4-Trimethylpentane	0.01	0.02	V0	< 0.01	V1
2,3-Dimethylbutane	0.02	0.04	V0	0.02	V0
2,3-Dimethylpentane	0.02	0.07	V0	< 0.02	V1
2,4-Dimethylpentane	0.01	0.03	V0	< 0.01	V1
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.02	V0	< 0.01	V1
2-Methylhexane	0.01	0.07	V0	0.02	V0
2-Methylpentane	0.01	0.15	V0	0.12	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	< 0.02	V1
3-Methylhexane	0.02	0.1	V0	0.04	V0
3-Methylpentane	0.01	0.09	V0	0.07	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	2.9	V0	2.5	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.23	V0	0.18	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.04	V0	0.04	V0
Cyclopentane	0.01	0.03	V0	0.05	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	2.5	V0	0.9	V0
Ethylbenzene	0.01	0.04	V0	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	1.84	V0	1.3	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.86	V0	0.66	V0
Isoprene	0.01	0.02	V0	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	0.12	V0	< 0.03	V1
Methanol	3	109	V4	7	V0
Methylcyclohexane	0.01	0.05	V0	0.05	V0
Methylcyclopentane	0.02	0.08	V0	0.08	V0
Methylethylketone	0.3	0.6	V0	0.6	V0
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	4.35	V0	2.34	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.07	V0	0.05	V0
n-Hexane	0.01	0.15	V0	0.16	V0
n-Nonane	0.01	0.02	V0	< 0.01	V1
n-Octane	0.02	0.02	V0	< 0.02	V1
n-Pentane	0.1	0.5	V0	0.6	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.05	V0	0.01	V0
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.18	V0	0.12	V0
trans-2-Butene	0.01	0.04	V0	0.01	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Barge Landing AMS 9 14-Mar	Fort McKay South AMS 13 14-Mar			
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.05	V0	0.1	V0
1,3,5-Trimethylbenzene	0.02	0.03	V0	0.06	V0
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.11	V0	0.25	V0
1-Pentene	0.01	0.03	V0	0.04	V0
2,2,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,2-Dimethylbutane	0.01	0.55	V0	0.28	V0
2,3,4-Trimethylpentane	0.01	0.03	V0	0.1	V0
2,3-Dimethylbutane	0.02	0.63	V0	0.45	V0
2,3-Dimethylpentane	0.02	0.09	V0	0.35	V0
2,4-Dimethylpentane	0.01	0.04	V0	0.07	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.24	V0	1.72	V4
2-Methylhexane	0.01	0.16	V0	0.58	V0
2-Methylpentane	0.01	2.16	V0	1.25	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.09	V0	0.68	V0
3-Methylhexane	0.02	0.2	V0	1	V0
3-Methylpentane	0.01	1.28	V0	0.8	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	2.8	V0	2.4	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.49	V0	0.54	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	0.03	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.2	V0	0.58	V0
Cyclopentane	0.01	0.6	V0	0.37	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	1.3	V0	1	V0
Ethylbenzene	0.01	0.08	V0	0.48	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	1.36	V0	2.05	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	4.11	V0	2.24	V0
Isoprene	0.01	< 0.01	V1	0.01	V0
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	0.03	V0
m,p-Xylene	0.03	0.19	V0	1.09	V0
Methanol	3	8	V0	6	V0
Methylcyclohexane	0.01	0.28	V0	1.65	V4
Methylcyclopentane	0.02	0.39	V0	0.97	V0
Methylethylketone	0.3	0.5	V0	0.5	V0
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	2.57	V0	4.38	V0
n-Decane	0.06	< 0.06	V1	0.1	V0
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.42	V0	2.82	V4
n-Hexane	0.01	0.89	V0	1.56	V0
n-Nonane	0.01	0.12	V0	0.73	V0
n-Octane	0.02	0.35	V0	2.73	V4
n-Pentane	0.1	4.4	V0	2.5	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.08	V0	0.41	V0
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.43	V0	2.08	V4
trans-2-Butene	0.01	0.02	V0	0.06	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Horizon AMS 15 14-Mar		
Compound Name	MDL (ppbv)	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	0.04	V0
1,3,5-Trimethylbenzene	0.02	0.03	V0
1,3-Butadiene	0.02	< 0.02	V1
1-Butene	0.02	0.1	V0
1-Pentene	0.01	0.02	V0
2,2,4-Trimethylpentane	0.01	< 0.01	V1
2,2-Dimethylbutane	0.01	0.08	V0
2,3,4-Trimethylpentane	0.01	0.04	V0
2,3-Dimethylbutane	0.02	0.13	V0
2,3-Dimethylpentane	0.02	0.1	V0
2,4-Dimethylpentane	0.01	0.03	V0
2-Methyl-1-pentene	0.3	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1
2-Methylheptane	0.01	0.42	V0
2-Methylhexane	0.01	0.19	V0
2-Methylpentane	0.01	0.28	V0
3-Methyl-1-butene	0.3	< 0.3	V1
3-Methylheptane	0.02	0.16	V0
3-Methylhexane	0.02	0.27	V0
3-Methylpentane	0.01	0.2	V0
4-Methyl-1-pentene	0.3	< 0.3	V1
Acetaldehyde	3	< 3	V1
Acetone	0.4	3.1	V0
alpha-Pinene	0.3	< 0.3	V1
Benzene	0.01	0.22	V0
beta-Pinene	0.3	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1
Cyclohexane	0.02	0.18	V0
Cyclopentane	0.01	0.08	V0
Cyclopentene	0.3	< 0.3	V1
Ethanol	0.3	1.4	V0
Ethylbenzene	0.01	0.11	V0
Formaldehyde	3	< 3	V1
Isobutane	0.02	1.2	V0
Isobutylene	0.3	< 0.3	V1
Isopentane	0.03	0.98	V0
Isoprene	0.01	0.01	V0
Isopropylalcohol	0.4	< 0.4	V1
Isopropylbenzene	0.01	0.01	V0
m,p-Xylene	0.03	0.23	V0
Methanol	3	5	V0
Methylcyclohexane	0.01	0.44	V0
Methylcyclopentane	0.02	0.27	V0
Methylethylketone	0.3	0.5	V0
Methylisobutylketone	0.4	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1
n-Butane	0.03	2.11	V0
n-Decane	0.06	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1
n-Heptane	0.01	0.66	V0
n-Hexane	0.01	0.39	V0
n-Nonane	0.01	0.16	V0
n-Octane	0.02	0.62	V0
n-Pentane	0.1	0.8	V0
n-Propylbenzene	0.05	< 0.05	V1
n-Undecane	0.5	< 0.5	V1
Naphthalene	0.5	< 0.5	V1
o-Xylene	0.01	0.09	V0
Styrene	0.04	< 0.04	V1
Toluene	0.01	0.48	V0
trans-2-Butene	0.01	0.02	V0
trans-2-Hexene	0.3	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1



Station Name Station # Sample Date	Bertha Ganter -			Patricia McInnes	
	Fort McKay			AMS 6	
	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.05	V0	0.05	V0
1-Pentene	0.01	< 0.01	V1	< 0.01	V1
2,2,4-Trimethylpentane	0.01	< 0.01	V1	0.02	V0
2,2-Dimethylbutane	0.01	0.05	V0	0.03	V0
2,3,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,3-Dimethylbutane	0.02	0.07	V0	0.04	V0
2,3-Dimethylpentane	0.02	0.02	V0	0.04	V0
2,4-Dimethylpentane	0.01	< 0.01	V1	0.01	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.03	V0	0.05	V0
2-Methylhexane	0.01	0.03	V0	0.04	V0
2-Methylpentane	0.01	0.24	V0	0.13	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	0.02	V0
3-Methylhexane	0.02	0.04	V0	0.06	V0
3-Methylpentane	0.01	0.12	V0	0.07	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.5	V0	1.4	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.18	V0	0.17	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	0.03	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.03	V0	0.04	V0
Cyclopentane	0.01	0.07	V0	0.04	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	< 0.3	V1	0.3	V0
Ethylbenzene	0.01	< 0.01	V1	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.24	V0	0.32	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.57	V0	0.37	V0
Isoprene	0.01	0.01	V0	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	< 0.03	V1	< 0.03	V1
Methanol	3	< 3	V1	5	V0
Methylcyclohexane	0.01	0.05	V0	0.06	V0
Methylcyclopentane	0.02	0.05	V0	0.05	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.5	V0	0.76	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.07	V0	0.1	V0
n-Hexane	0.01	0.05	V0	0.03	V0
n-Nonane	0.01	0.02	V0	0.02	V0
n-Octane	0.02	0.06	V0	0.08	V0
n-Pentane	0.1	0.6	V0	0.3	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	< 0.01	V1	< 0.01	V1
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.1	V0	0.12	V0
trans-2-Butene	0.01	0.02	V0	0.02	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Athabasca Valley AMS 7 20-Mar			Anzac AMS 14 20-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.04	V0	< 0.02	V1
1-Pentene	0.01	< 0.01	V1	< 0.01	V1
2,2,4-Trimethylpentane	0.01	0.01	V0	< 0.01	V1
2,2-Dimethylbutane	0.01	0.04	V0	0.02	V0
2,3,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,3-Dimethylbutane	0.02	0.05	V0	0.02	V0
2,3-Dimethylpentane	0.02	0.02	V0	< 0.02	V1
2,4-Dimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.02	V0	0.01	V0
2-Methylhexane	0.01	0.03	V0	0.01	V0
2-Methylpentane	0.01	0.16	V0	0.08	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	< 0.02	V1
3-Methylhexane	0.02	0.03	V0	0.02	V0
3-Methylpentane	0.01	0.08	V0	0.03	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.2	V0	1.1	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.17	V0	0.13	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.02	V0	< 0.02	V1
Cyclopentane	0.01	0.04	V0	0.03	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	0.6	V0	< 0.3	V1
Ethylbenzene	0.01	< 0.01	V1	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.3	V0	0.23	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.39	V0	0.27	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	< 0.03	V1	< 0.03	V1
Methanol	3	14	V0	< 3	V1
Methylcyclohexane	0.01	0.03	V0	0.03	V0
Methylcyclopentane	0.02	0.04	V0	< 0.02	V1
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.62	V0	0.49	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.05	V0	0.03	V0
n-Hexane	0.01	0.03	V0	< 0.01	V1
n-Nonane	0.01	< 0.01	V1	< 0.01	V1
n-Octane	0.02	0.03	V0	< 0.02	V1
n-Pentane	0.1	0.3	V0	0.2	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	< 0.01	V1	< 0.01	V1
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.07	V0	0.04	V0
trans-2-Butene	0.01	0.01	V0	< 0.01	V1
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Barge Landing AMS 9 20-Mar	Fort McKay South AMS 13 20-Mar			
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.04	V0	0.04	V0
1-Pentene	0.01	< 0.01	V1	< 0.01	V1
2,2,4-Trimethylpentane	0.01	0.01	V0	< 0.01	V1
2,2-Dimethylbutane	0.01	0.08	V0	0.05	V0
2,3,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,3-Dimethylbutane	0.02	0.12	V0	0.07	V0
2,3-Dimethylpentane	0.02	0.03	V0	0.02	V0
2,4-Dimethylpentane	0.01	0.01	V0	< 0.01	V1
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.03	V0	0.05	V0
2-Methylhexane	0.01	0.04	V0	0.03	V0
2-Methylpentane	0.01	0.51	V0	0.25	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	< 0.02	V1
3-Methylhexane	0.02	0.04	V0	0.05	V0
3-Methylpentane	0.01	0.27	V0	0.13	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	1.6	V0	1.3	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.24	V0	0.19	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.04	V0	0.04	V0
Cyclopentane	0.01	0.14	V0	0.07	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	1.7	V0	< 0.3	V1
Ethylbenzene	0.01	< 0.01	V1	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.24	V0	0.25	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	1.13	V0	0.58	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	< 0.03	V1	< 0.03	V1
Methanol	3	32	V0	< 3	V1
Methylcyclohexane	0.01	0.04	V0	0.05	V0
Methylcyclopentane	0.02	0.11	V0	0.06	V0
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.59	V0	0.49	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.06	V0	0.09	V0
n-Hexane	0.01	0.23	V0	0.07	V0
n-Nonane	0.01	0.02	V0	0.02	V0
n-Octane	0.02	0.05	V0	0.08	V0
n-Pentane	0.1	1.3	V0	0.6	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	< 0.01	V1	< 0.01	V1
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.1	V0	0.11	V0
trans-2-Butene	0.01	0.01	V0	0.01	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Horizon AMS 15 20-Mar		
Compound Name	MDL (ppbv)	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1
1-Butene	0.02	0.04	V0
1-Pentene	0.01	< 0.01	V1
2,2,4-Trimethylpentane	0.01	< 0.01	V1
2,2-Dimethylbutane	0.01	0.07	V0
2,3,4-Trimethylpentane	0.01	< 0.01	V1
2,3-Dimethylbutane	0.02	0.12	V0
2,3-Dimethylpentane	0.02	0.04	V0
2,4-Dimethylpentane	0.01	0.01	V0
2-Methyl-1-pentene	0.3	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1
2-Methylheptane	0.01	0.03	V0
2-Methylhexane	0.01	0.03	V0
2-Methylpentane	0.01	0.32	V0
3-Methyl-1-butene	0.3	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1
3-Methylhexane	0.02	0.05	V0
3-Methylpentane	0.01	0.23	V0
4-Methyl-1-pentene	0.3	< 0.3	V1
Acetaldehyde	3	< 3	V1
Acetone	0.4	1.5	V0
alpha-Pinene	0.3	< 0.3	V1
Benzene	0.01	0.18	V0
beta-Pinene	0.3	< 0.3	V1
cis-2-Butene	0.02	0.02	V0
cis-2-Hexene	0.3	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1
Cyclohexane	0.02	0.12	V0
Cyclopentane	0.01	0.12	V0
Cyclopentene	0.3	< 0.3	V1
Ethanol	0.3	0.3	V0
Ethylbenzene	0.01	< 0.01	V1
Formaldehyde	3	< 3	V1
Isobutane	0.02	0.45	V0
Isobutylene	0.3	< 0.3	V1
Isopentane	0.03	1.01	V0
Isoprene	0.01	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1
m,p-Xylene	0.03	< 0.03	V1
Methanol	3	< 3	V1
Methylcyclohexane	0.01	0.07	V0
Methylcyclopentane	0.02	0.1	V0
Methylethylketone	0.3	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1
n-Butane	0.03	0.6	V0
n-Decane	0.06	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1
n-Heptane	0.01	0.07	V0
n-Hexane	0.01	0.06	V0
n-Nonane	0.01	0.01	V0
n-Octane	0.02	0.03	V0
n-Pentane	0.1	0.8	V0
n-Propylbenzene	0.05	< 0.05	V1
n-Undecane	0.5	< 0.5	V1
Naphthalene	0.5	< 0.5	V1
o-Xylene	0.01	< 0.01	V1
Styrene	0.04	< 0.04	V1
Toluene	0.01	0.04	V0
trans-2-Butene	0.01	0.02	V0
trans-2-Hexene	0.3	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1



Station Name Station # Sample Date	Bertha Ganter -		Flag	Patricia McInnes	
	Fort McKay			AMS 6	
	AMS 1			AMS 6	
	26-Mar			26-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1	< 0.02	V1
1,3-Butadiene	0.02	0.03	V0	< 0.02	V1
1-Butene	0.02	0.16	V0	0.05	V0
1-Pentene	0.01	0.04	V0	< 0.01	V1
2,2,4-Trimethylpentane	0.01	< 0.01	V1	0.02	V0
2,2-Dimethylbutane	0.01	0.1	V0	< 0.01	V1
2,3,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,3-Dimethylbutane	0.02	0.14	V0	< 0.02	V1
2,3-Dimethylpentane	0.02	0.06	V0	0.03	V0
2,4-Dimethylpentane	0.01	0.02	V0	0.01	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.16	V0	< 0.01	V1
2-Methylhexane	0.01	0.08	V0	0.02	V0
2-Methylpentane	0.01	0.59	V0	0.06	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.06	V0	< 0.02	V1
3-Methylhexane	0.02	0.14	V0	0.04	V0
3-Methylpentane	0.01	0.31	V0	0.02	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	2.1	V0	4.4	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.23	V0	0.13	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	0.02	V0	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.08	V0	< 0.02	V1
Cyclopentane	0.01	0.13	V0	0.01	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	0.5	V0	2.2	V0
Ethylbenzene	0.01	0.03	V0	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.32	V0	0.35	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	1.14	V0	0.42	V0
Isoprene	0.01	0.02	V0	< 0.01	V1
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	0.09	V0	< 0.03	V1
Methanol	3	20	V0	20	V0
Methylcyclohexane	0.01	0.17	V0	0.01	V0
Methylcyclopentane	0.02	0.15	V0	< 0.02	V1
Methylethylketone	0.3	< 0.3	V1	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.82	V0	1.01	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.27	V0	0.02	V0
n-Hexane	0.01	0.29	V0	< 0.01	V1
n-Nonane	0.01	0.07	V0	< 0.01	V1
n-Octane	0.02	0.23	V0	< 0.02	V1
n-Pentane	0.1	1.3	V0	0.2	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	0.03	V0	< 0.01	V1
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.31	V0	0.06	V0
trans-2-Butene	0.01	0.02	V0	0.02	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name	Athabasca Valley			Anzac	
Station #	AMS 7			AMS 14	
Sample Date	26-Mar			26-Mar	
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.04	V0	0.04	V0
1-Pentene	0.01	< 0.01	V1	< 0.01	V1
2,2,4-Trimethylpentane	0.01	0.02	V0	< 0.01	V1
2,2-Dimethylbutane	0.01	< 0.01	V1	0.01	V0
2,3,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,3-Dimethylbutane	0.02	< 0.02	V1	< 0.02	V1
2,3-Dimethylpentane	0.02	0.03	V0	< 0.02	V1
2,4-Dimethylpentane	0.01	0.01	V0	< 0.01	V1
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	< 0.01	V1	< 0.01	V1
2-Methylhexane	0.01	< 0.01	V1	0.02	V0
2-Methylpentane	0.01	0.07	V0	0.09	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1	< 0.02	V1
3-Methylhexane	0.02	0.03	V0	0.03	V0
3-Methylpentane	0.01	0.02	V0	0.03	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	2.8	V0	2.3	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.16	V0	0.13	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	0.03	V0
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	< 0.02	V1	< 0.02	V1
Cyclopentane	0.01	0.01	V0	0.03	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	2.7	V0	0.4	V0
Ethylbenzene	0.01	< 0.01	V1	< 0.01	V1
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.36	V0	0.39	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	0.46	V0	0.53	V0
Isoprene	0.01	< 0.01	V1	< 0.01	V1
Isopropylalcohol	0.4	0.5	V0	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	< 0.03	V1	< 0.03	V1
Methanol	3	33	V0	7	V0
Methylcyclohexane	0.01	0.01	V0	0.02	V0
Methylcyclopentane	0.02	< 0.02	V1	0.03	V0
Methylethylketone	0.3	0.4	V0	0.4	V0
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	1.83	V0	1.25	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.02	V0	0.03	V0
n-Hexane	0.01	< 0.01	V1	0.03	V0
n-Nonane	0.01	0.02	V0	< 0.01	V1
n-Octane	0.02	< 0.02	V1	< 0.02	V1
n-Pentane	0.1	0.2	V0	0.5	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	< 0.01	V1	< 0.01	V1
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.11	V0	0.09	V0
trans-2-Butene	0.01	0.02	V0	0.03	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Barge Landing AMS 9 26-Mar	Fort McKay South AMS 13 26-Mar			
Compound Name	MDL (ppbv)	Results (ppbv)	Flag	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1	< 0.02	V1
1,3-Butadiene	0.02	< 0.02	V1	< 0.02	V1
1-Butene	0.02	0.09	V0	0.14	V0
1-Pentene	0.01	0.02	V0	0.04	V0
2,2,4-Trimethylpentane	0.01	< 0.01	V1	< 0.01	V1
2,2-Dimethylbutane	0.01	0.12	V0	0.06	V0
2,3,4-Trimethylpentane	0.01	< 0.01	V1	0.01	V0
2,3-Dimethylbutane	0.02	0.14	V0	0.08	V0
2,3-Dimethylpentane	0.02	0.04	V0	0.05	V0
2,4-Dimethylpentane	0.01	0.01	V0	0.01	V0
2-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1	< 0.3	V1
2-Methylheptane	0.01	0.1	V0	0.19	V0
2-Methylhexane	0.01	0.07	V0	0.12	V0
2-Methylpentane	0.01	0.66	V0	0.27	V0
3-Methyl-1-butene	0.3	< 0.3	V1	< 0.3	V1
3-Methylheptane	0.02	0.04	V0	0.07	V0
3-Methylhexane	0.02	0.09	V0	0.14	V0
3-Methylpentane	0.01	0.36	V0	0.14	V0
4-Methyl-1-pentene	0.3	< 0.3	V1	< 0.3	V1
Acetaldehyde	3	< 3	V1	< 3	V1
Acetone	0.4	2.1	V0	1.6	V0
alpha-Pinene	0.3	< 0.3	V1	< 0.3	V1
Benzene	0.01	0.22	V0	0.17	V0
beta-Pinene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Butene	0.02	< 0.02	V1	< 0.02	V1
cis-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1	< 0.02	V1
Cyclohexane	0.02	0.07	V0	0.06	V0
Cyclopentane	0.01	0.14	V0	0.06	V0
Cyclopentene	0.3	< 0.3	V1	< 0.3	V1
Ethanol	0.3	0.4	V0	< 0.3	V1
Ethylbenzene	0.01	0.01	V0	0.04	V0
Formaldehyde	3	< 3	V1	< 3	V1
Isobutane	0.02	0.36	V0	0.27	V0
Isobutylene	0.3	< 0.3	V1	< 0.3	V1
Isopentane	0.03	1.35	V0	0.64	V0
Isoprene	0.01	< 0.01	V1	0.02	V0
Isopropylalcohol	0.4	< 0.4	V1	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1	< 0.01	V1
m,p-Xylene	0.03	0.03	V0	0.09	V0
Methanol	3	9	V0	9	V0
Methylcyclohexane	0.01	0.1	V0	0.17	V0
Methylcyclopentane	0.02	0.13	V0	0.12	V0
Methylethylketone	0.3	0.3	V0	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1	< 0.3	V1
n-Butane	0.03	0.7	V0	0.76	V0
n-Decane	0.06	< 0.06	V1	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1	< 0.4	V1
n-Heptane	0.01	0.19	V0	0.32	V0
n-Hexane	0.01	0.25	V0	0.16	V0
n-Nonane	0.01	0.05	V0	0.08	V0
n-Octane	0.02	0.15	V0	0.28	V0
n-Pentane	0.1	1.3	V0	0.6	V0
n-Propylbenzene	0.05	< 0.05	V1	< 0.05	V1
n-Undecane	0.5	< 0.5	V1	< 0.5	V1
Naphthalene	0.5	< 0.5	V1	< 0.5	V1
o-Xylene	0.01	< 0.01	V1	0.03	V0
Styrene	0.04	< 0.04	V1	< 0.04	V1
Toluene	0.01	0.18	V0	0.31	V0
trans-2-Butene	0.01	0.02	V0	0.02	V0
trans-2-Hexene	0.3	< 0.3	V1	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1	< 0.02	V1



Station Name Station # Sample Date	Horizon AMS 15 26-Mar		
Compound Name	MDL (ppbv)	Results (ppbv)	Flag
1,2,4-Trimethylbenzene	0.03	< 0.03	V1
1,3,5-Trimethylbenzene	0.02	< 0.02	V1
1,3-Butadiene	0.02	0.02	V0
1-Butene	0.02	0.08	V0
1-Pentene	0.01	0.01	V0
2,2,4-Trimethylpentane	0.01	< 0.01	V1
2,2-Dimethylbutane	0.01	0.36	V0
2,3,4-Trimethylpentane	0.01	0.03	V0
2,3-Dimethylbutane	0.02	0.59	V0
2,3-Dimethylpentane	0.02	0.13	V0
2,4-Dimethylpentane	0.01	0.05	V0
2-Methyl-1-pentene	0.3	< 0.3	V1
2-Methyl-2-butene	0.3	< 0.3	V1
2-Methylheptane	0.01	0.05	V0
2-Methylhexane	0.01	0.07	V0
2-Methylpentane	0.01	2.15	V0
3-Methyl-1-butene	0.3	< 0.3	V1
3-Methylheptane	0.02	< 0.02	V1
3-Methylhexane	0.02	0.1	V0
3-Methylpentane	0.01	1.28	V0
4-Methyl-1-pentene	0.3	< 0.3	V1
Acetaldehyde	3	< 3	V1
Acetone	0.4	2.7	V0
alpha-Pinene	0.3	0.9	V0
Benzene	0.01	0.46	V0
beta-Pinene	0.3	< 0.3	V1
cis-2-Butene	0.02	0.02	V0
cis-2-Hexene	0.3	< 0.3	V1
cis-2-Pentene	0.02	< 0.02	V1
Cyclohexane	0.02	0.42	V0
Cyclopentane	0.01	0.54	V0
Cyclopentene	0.3	< 0.3	V1
Ethanol	0.3	0.6	V0
Ethylbenzene	0.01	< 0.01	V1
Formaldehyde	3	< 3	V1
Isobutane	0.02	1.3	V0
Isobutylene	0.3	< 0.3	V1
Isopentane	0.03	4.22	V0
Isoprene	0.01	0.01	V0
Isopropylalcohol	0.4	< 0.4	V1
Isopropylbenzene	0.01	< 0.01	V1
m,p-Xylene	0.03	< 0.03	V1
Methanol	3	6	V0
Methylcyclohexane	0.01	0.19	V0
Methylcyclopentane	0.02	0.42	V0
Methylethylketone	0.3	< 0.3	V1
Methylisobutylketone	0.4	< 0.4	V1
Methylvinylketone	0.3	< 0.3	V1
n-Butane	0.03	0.73	V0
n-Decane	0.06	< 0.06	V1
n-Dodecane	0.4	< 0.4	V1
n-Heptane	0.01	0.09	V0
n-Hexane	0.01	0.74	V0
n-Nonane	0.01	0.03	V0
n-Octane	0.02	0.04	V0
n-Pentane	0.1	4.2	V0
n-Propylbenzene	0.05	< 0.05	V1
n-Undecane	0.5	< 0.5	V1
Naphthalene	0.5	< 0.5	V1
o-Xylene	0.01	< 0.01	V1
Styrene	0.04	< 0.04	V1
Toluene	0.01	0.12	V0
trans-2-Butene	0.01	0.03	V0
trans-2-Hexene	0.3	< 0.3	V1
trans-2-Pentene	0.02	< 0.02	V1



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
 Volatile Organic Compounds (VOCs) - Summary

2017
 Indicated Sites and Dates

Station Name Station # Sample Date	Bertha Ganter - Fort McKay AMS 1 Mar 02 - Mar 26 Average	Bertha Ganter - Fort McKay AMS 1 Mar 02 - Mar 26 Std Dev	Bertha Ganter - Fort McKay AMS 1 Mar 02 - Mar 26 Total Samples (#)	Bertha Ganter - Fort McKay AMS 1 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.05	0.05	6	4
1,3,5-Trimethylbenzene	0.03	0.04	6	4
1,3-Butadiene	0.01	0.02	6	2
1-Butene	0.13	0.07	6	6
1-Pentene	0.03	0.04	6	4
2,2,4-Trimethylpentane	0.03	0.05	6	2
2,2-Dimethylbutane	0.11	0.08	6	6
2,3,4-Trimethylpentane	0.03	0.05	6	4
2,3-Dimethylbutane	0.16	0.11	6	6
2,3-Dimethylpentane	0.09	0.06	6	6
2,4-Dimethylpentane	0.04	0.04	6	5
2-Methyl-1-pentene	0.00	0.00	6	0
2-Methyl-2-butene	0.00	0.00	6	0
2-Methylheptane	0.21	0.19	6	6
2-Methylhexane	0.12	0.09	6	6
2-Methylpentane	0.36	0.29	6	6
3-Methyl-1-butene	0.00	0.00	6	0
3-Methylheptane	0.09	0.08	6	4
3-Methylhexane	0.17	0.13	6	6
3-Methylpentane	0.26	0.17	6	6
4-Methyl-1-pentene	0.00	0.00	6	0
Acetaldehyde	0.00	0.00	6	0
Acetone	1.87	0.66	6	6
alpha-Pinene	0.00	0.00	6	0
Benzene	0.26	0.09	6	6
beta-Pinene	0.00	0.00	6	0
cis-2-Butene	0.02	0.05	6	2
cis-2-Hexene	0.00	0.00	6	0
cis-2-Pentene	0.02	0.04	6	1
Cyclohexane	0.12	0.07	6	6
Cyclopentane	0.13	0.10	6	6
Cyclopentene	0.00	0.00	6	0
Ethanol	0.82	0.58	6	5
Ethylbenzene	0.08	0.07	6	5
Formaldehyde	0.00	0.00	6	0
Isobutane	0.64	0.47	6	6
Isobutylene	0.00	0.00	6	0
Isopentane	0.94	0.55	6	6
Isoprene	0.01	0.01	6	3
Isopropylalcohol	0.00	0.00	6	0
Isopropylbenzene	0.02	0.04	6	3
m,p-Xylene	0.19	0.18	6	5
Methanol	7.67	6.65	6	5
Methylcyclohexane	0.21	0.16	6	6
Methylcyclopentane	0.19	0.14	6	6
Methylethylketone	0.08	0.20	6	1
Methylisobutylketone	0.00	0.00	6	0
Methylvinylketone	0.00	0.00	6	0
n-Butane	1.23	1.04	6	6
n-Decane	0.02	0.04	6	1
n-Dodecane	0.00	0.00	6	0
n-Heptane	0.37	0.34	6	6
n-Hexane	0.34	0.33	6	6
n-Nonane	0.14	0.12	6	6
n-Octane	0.33	0.31	6	6
n-Pentane	0.88	0.67	6	6
n-Propylbenzene	0.02	0.04	6	1
n-Undecane	0.00	0.00	6	0
Naphthalene	0.00	0.00	6	0
o-Xylene	0.08	0.07	6	5
Styrene	0.02	0.04	6	1
Toluene	0.39	0.26	6	6
trans-2-Butene	0.04	0.04	6	6
trans-2-Hexene	0.00	0.00	6	0
trans-2-Pentene	0.02	0.04	6	1



Station Name Station # Sample Date	Patricia McInnes AMS 6 Mar 02 - Mar 26 Average	Patricia McInnes AMS 6 Mar 02 - Mar 26 Std Dev	Patricia McInnes AMS 6 Mar 02 - Mar 26 Total Samples (#)	Patricia McInnes AMS 6 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.06	0.07	5	3
1,3,5-Trimethylbenzene	0.05	0.05	5	3
1,3-Butadiene	0.01	0.01	5	1
1-Butene	0.11	0.06	5	5
1-Pentene	0.04	0.04	5	3
2,2,4-Trimethylpentane	0.08	0.06	5	5
2,2-Dimethylbutane	0.06	0.07	5	4
2,3,4-Trimethylpentane	0.05	0.06	5	3
2,3-Dimethylbutane	0.09	0.09	5	4
2,3-Dimethylpentane	0.11	0.08	5	5
2,4-Dimethylpentane	0.06	0.05	5	5
2-Methyl-1-pentene	0.00	0.00	5	0
2-Methyl-2-butene	0.00	0.00	5	0
2-Methylheptane	0.10	0.11	5	4
2-Methylhexane	0.09	0.07	5	5
2-Methylpentane	0.14	0.05	5	5
3-Methyl-1-butene	0.00	0.00	5	0
3-Methylheptane	0.06	0.08	5	3
3-Methylhexane	0.12	0.09	5	5
3-Methylpentane	0.13	0.10	5	5
4-Methyl-1-pentene	0.00	0.00	5	0
Acetaldehyde	0.00	0.00	5	0
Acetone	2.14	1.38	5	5
alpha-Pinene	0.00	0.00	5	0
Benzene	0.23	0.09	5	5
beta-Pinene	0.00	0.00	5	0
cis-2-Butene	0.05	0.06	5	3
cis-2-Hexene	0.00	0.00	5	0
cis-2-Pentene	0.04	0.05	5	2
Cyclohexane	0.08	0.08	5	4
Cyclopentane	0.08	0.07	5	5
Cyclopentene	0.00	0.00	5	0
Ethanol	1.48	0.95	5	5
Ethylbenzene	0.06	0.07	5	3
Formaldehyde	0.00	0.00	5	0
Isobutane	0.64	0.48	5	5
Isobutylene	0.00	0.00	5	0
Isopentane	0.64	0.27	5	5
Isoprene	0.00	0.00	5	1
Isopropylalcohol	0.00	0.00	5	0
Isopropylbenzene	0.03	0.04	5	2
m,p-Xylene	0.10	0.11	5	3
Methanol	16.80	16.99	5	5
Methylcyclohexane	0.11	0.10	5	5
Methylcyclopentane	0.12	0.11	5	4
Methylethylketone	0.10	0.22	5	1
Methylisobutylketone	0.00	0.00	5	0
Methylvinylketone	0.00	0.00	5	0
n-Butane	1.34	0.97	5	5
n-Decane	0.03	0.04	5	2
n-Dodecane	0.00	0.00	5	0
n-Heptane	0.18	0.17	5	5
n-Hexane	0.18	0.18	5	4
n-Nonane	0.07	0.08	5	4
n-Octane	0.13	0.14	5	4
n-Pentane	0.44	0.21	5	5
n-Propylbenzene	0.03	0.05	5	2
n-Undecane	0.00	0.00	5	0
Naphthalene	0.00	0.00	5	0
o-Xylene	0.06	0.07	5	3
Styrene	0.04	0.05	5	2
Toluene	0.23	0.17	5	5
trans-2-Butene	0.05	0.05	5	5
trans-2-Hexene	0.00	0.00	5	0
trans-2-Pentene	0.04	0.04	5	3



Station Name Station # Sample Date	Athabasca Valley AMS 7 Mar 02 - Mar 26 Average	Athabasca Valley AMS 7 Mar 02 - Mar 26 Std Dev	Athabasca Valley AMS 7 Mar 02 - Mar 26 Total Samples (#)	Athabasca Valley AMS 7 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.04	0.04	5	3
1,3,5-Trimethylbenzene	0.04	0.04	5	3
1,3-Butadiene	0.00	0.01	5	1
1-Butene	0.09	0.05	5	5
1-Pentene	0.03	0.03	5	3
2,2,4-Trimethylpentane	0.05	0.04	5	5
2,2-Dimethylbutane	0.05	0.05	5	4
2,3,4-Trimethylpentane	0.04	0.04	5	3
2,3-Dimethylbutane	0.08	0.07	5	4
2,3-Dimethylpentane	0.07	0.05	5	5
2,4-Dimethylpentane	0.04	0.04	5	4
2-Methyl-1-pentene	0.00	0.00	5	0
2-Methyl-2-butene	0.00	0.00	5	0
2-Methylheptane	0.07	0.08	5	4
2-Methylhexane	0.07	0.06	5	4
2-Methylpentane	0.13	0.04	5	5
3-Methyl-1-butene	0.00	0.00	5	0
3-Methylheptane	0.04	0.06	5	2
3-Methylhexane	0.10	0.08	5	5
3-Methylpentane	0.11	0.07	5	5
4-Methyl-1-pentene	0.00	0.00	5	0
Acetaldehyde	0.00	0.00	5	0
Acetone	1.94	0.84	5	5
alpha-Pinene	0.00	0.00	5	0
Benzene	0.22	0.05	5	5
beta-Pinene	0.00	0.00	5	0
cis-2-Butene	0.03	0.05	5	2
cis-2-Hexene	0.00	0.00	5	0
cis-2-Pentene	0.03	0.04	5	2
Cyclohexane	0.06	0.06	5	4
Cyclopentane	0.06	0.05	5	5
Cyclopentene	0.00	0.00	5	0
Ethanol	1.60	0.96	5	5
Ethylbenzene	0.04	0.04	5	3
Formaldehyde	0.00	0.00	5	0
Isobutane	0.66	0.66	5	5
Isobutylene	0.00	0.00	5	0
Isopentane	0.56	0.19	5	5
Isoprene	0.00	0.01	5	1
Isopropylalcohol	0.10	0.22	5	1
Isopropylbenzene	0.03	0.04	5	2
m,p-Xylene	0.07	0.06	5	3
Methanol	34.20	43.14	5	5
Methylcyclohexane	0.08	0.07	5	5
Methylcyclopentane	0.09	0.08	5	4
Methylethylketone	0.20	0.28	5	2
Methylisobutylketone	0.00	0.00	5	0
Methylvinylketone	0.00	0.00	5	0
n-Butane	1.66	1.58	5	5
n-Decane	0.00	0.00	5	0
n-Dodecane	0.00	0.00	5	0
n-Heptane	0.14	0.15	5	5
n-Hexane	0.15	0.15	5	4
n-Nonane	0.05	0.05	5	4
n-Octane	0.09	0.11	5	4
n-Pentane	0.38	0.13	5	5
n-Propylbenzene	0.02	0.03	5	2
n-Undecane	0.00	0.00	5	0
Naphthalene	0.00	0.00	5	0
o-Xylene	0.05	0.05	5	3
Styrene	0.03	0.04	5	2
Toluene	0.17	0.10	5	5
trans-2-Butene	0.05	0.04	5	5
trans-2-Hexene	0.00	0.00	5	0
trans-2-Pentene	0.02	0.03	5	2



Station Name Station # Sample Date	Anzac AMS 14 Mar 02 - Mar 26 Average	Anzac AMS 14 Mar 02 - Mar 26 Std Dev	Anzac AMS 14 Mar 02 - Mar 26 Total Samples (#)	Anzac AMS 14 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.01	0.02	5	1
1,3,5-Trimethylbenzene	0.01	0.02	5	1
1,3-Butadiene	0.00	0.00	5	0
1-Butene	0.04	0.03	5	4
1-Pentene	0.01	0.02	5	1
2,2,4-Trimethylpentane	0.02	0.03	5	2
2,2-Dimethylbutane	0.03	0.02	5	5
2,3,4-Trimethylpentane	0.01	0.03	5	1
2,3-Dimethylbutane	0.03	0.03	5	4
2,3-Dimethylpentane	0.02	0.04	5	2
2,4-Dimethylpentane	0.01	0.03	5	2
2-Methyl-1-pentene	0.00	0.00	5	0
2-Methyl-2-butene	0.00	0.00	5	0
2-Methylheptane	0.02	0.03	5	2
2-Methylhexane	0.03	0.03	5	5
2-Methylpentane	0.08	0.03	5	5
3-Methyl-1-butene	0.00	0.00	5	0
3-Methylheptane	0.01	0.03	5	1
3-Methylhexane	0.04	0.04	5	5
3-Methylpentane	0.06	0.04	5	5
4-Methyl-1-pentene	0.00	0.00	5	0
Acetaldehyde	0.00	0.00	5	0
Acetone	1.66	0.74	5	5
alpha-Pinene	0.00	0.00	5	0
Benzene	0.19	0.07	5	5
beta-Pinene	0.00	0.00	5	0
cis-2-Butene	0.02	0.03	5	2
cis-2-Hexene	0.00	0.00	5	0
cis-2-Pentene	0.01	0.02	5	1
Cyclohexane	0.03	0.04	5	3
Cyclopentane	0.05	0.03	5	5
Cyclopentene	0.00	0.00	5	0
Ethanol	0.38	0.39	5	3
Ethylbenzene	0.01	0.02	5	1
Formaldehyde	0.00	0.00	5	0
Isobutane	0.53	0.44	5	5
Isobutylene	0.00	0.00	5	0
Isopentane	0.49	0.15	5	5
Isoprene	0.00	0.00	5	0
Isopropylalcohol	0.00	0.00	5	0
Isopropylbenzene	0.01	0.02	5	1
m,p-Xylene	0.01	0.02	5	1
Methanol	4.80	2.86	5	4
Methylcyclohexane	0.04	0.03	5	5
Methylcyclopentane	0.06	0.06	5	4
Methylethylketone	0.20	0.28	5	2
Methylisobutylketone	0.00	0.00	5	0
Methylvinylketone	0.00	0.00	5	0
n-Butane	1.11	0.75	5	5
n-Decane	0.00	0.00	5	0
n-Dodecane	0.00	0.00	5	0
n-Heptane	0.06	0.05	5	5
n-Hexane	0.11	0.11	5	4
n-Nonane	0.01	0.03	5	1
n-Octane	0.02	0.04	5	1
n-Pentane	0.44	0.15	5	5
n-Propylbenzene	0.00	0.00	5	0
n-Undecane	0.00	0.00	5	0
Naphthalene	0.00	0.00	5	0
o-Xylene	0.01	0.02	5	2
Styrene	0.02	0.02	5	2
Toluene	0.11	0.07	5	5
trans-2-Butene	0.02	0.03	5	4
trans-2-Hexene	0.00	0.00	5	0
trans-2-Pentene	0.01	0.02	5	1



Station Name Station # Sample Date	Barge Landing AMS 9 Mar 02 - Mar 26 Average	Barge Landing AMS 9 Mar 02 - Mar 26 Std Dev	Barge Landing AMS 9 Mar 02 - Mar 26 Total Samples (#)	Barge Landing AMS 9 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.04	0.05	5	3
1,3,5-Trimethylbenzene	0.03	0.04	5	3
1,3-Butadiene	0.01	0.01	5	2
1-Butene	0.10	0.06	5	5
1-Pentene	0.03	0.04	5	3
2,2,4-Trimethylpentane	0.03	0.05	5	3
2,2-Dimethylbutane	0.24	0.21	5	5
2,3,4-Trimethylpentane	0.03	0.05	5	3
2,3-Dimethylbutane	0.30	0.24	5	5
2,3-Dimethylpentane	0.08	0.07	5	5
2,4-Dimethylpentane	0.04	0.05	5	5
2-Methyl-1-pentene	0.00	0.00	5	0
2-Methyl-2-butene	0.00	0.00	5	0
2-Methylheptane	0.12	0.09	5	5
2-Methylhexane	0.10	0.08	5	5
2-Methylpentane	0.78	0.80	5	5
3-Methyl-1-butene	0.00	0.00	5	0
3-Methylheptane	0.05	0.06	5	3
3-Methylhexane	0.12	0.09	5	5
3-Methylpentane	0.55	0.45	5	5
4-Methyl-1-pentene	0.00	0.00	5	0
Acetaldehyde	0.00	0.00	5	0
Acetone	2.00	0.48	5	5
alpha-Pinene	0.00	0.00	5	0
Benzene	0.33	0.13	5	5
beta-Pinene	0.00	0.00	5	0
cis-2-Butene	0.02	0.05	5	1
cis-2-Hexene	0.00	0.00	5	0
cis-2-Pentene	0.02	0.05	5	1
Cyclohexane	0.12	0.08	5	5
Cyclopentane	0.27	0.22	5	5
Cyclopentene	0.00	0.00	5	0
Ethanol	1.12	0.49	5	5
Ethylbenzene	0.05	0.05	5	4
Formaldehyde	0.00	0.00	5	0
Isobutane	0.59	0.45	5	5
Isobutylene	0.00	0.00	5	0
Isopentane	1.81	1.36	5	5
Isoprene	0.00	0.00	5	0
Isopropylalcohol	0.00	0.00	5	0
Isopropylbenzene	0.02	0.04	5	1
m,p-Xylene	0.09	0.09	5	4
Methanol	12.20	11.17	5	5
Methylcyclohexane	0.13	0.10	5	5
Methylcyclopentane	0.20	0.14	5	5
Methylethylketone	0.16	0.23	5	2
Methylisobutylketone	0.00	0.00	5	0
Methylvinylketone	0.00	0.00	5	0
n-Butane	1.07	0.85	5	5
n-Decane	0.02	0.04	5	1
n-Dodecane	0.00	0.00	5	0
n-Heptane	0.22	0.16	5	5
n-Hexane	0.43	0.34	5	5
n-Nonane	0.08	0.06	5	5
n-Octane	0.17	0.13	5	5
n-Pentane	1.82	1.54	5	5
n-Propylbenzene	0.02	0.04	5	1
n-Undecane	0.00	0.00	5	0
Naphthalene	0.00	0.00	5	0
o-Xylene	0.07	0.07	5	3
Styrene	0.03	0.04	5	2
Toluene	0.24	0.15	5	5
trans-2-Butene	0.04	0.04	5	5
trans-2-Hexene	0.00	0.00	5	0
trans-2-Pentene	0.02	0.04	5	1



Station Name Station # Sample Date	Fort McKay South AMS 13 Mar 02 - Mar 26 Average	Fort McKay South AMS 13 Mar 02 - Mar 26 Std Dev	Fort McKay South AMS 13 Mar 02 - Mar 26 Total Samples (#)	Fort McKay South AMS 13 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.04	0.06	5	2
1,3,5-Trimethylbenzene	0.03	0.05	5	2
1,3-Butadiene	0.00	0.00	5	0
1-Butene	0.13	0.09	5	5
1-Pentene	0.04	0.04	5	3
2,2,4-Trimethylpentane	0.02	0.05	5	1
2,2-Dimethylbutane	0.14	0.11	5	5
2,3,4-Trimethylpentane	0.05	0.05	5	4
2,3-Dimethylbutane	0.20	0.17	5	5
2,3-Dimethylpentane	0.12	0.14	5	5
2,4-Dimethylpentane	0.04	0.05	5	4
2-Methyl-1-pentene	0.00	0.00	5	0
2-Methyl-2-butene	0.00	0.00	5	0
2-Methylheptane	0.43	0.72	5	5
2-Methylhexane	0.18	0.23	5	5
2-Methylpentane	0.43	0.46	5	5
3-Methyl-1-butene	0.00	0.00	5	0
3-Methylheptane	0.18	0.29	5	3
3-Methylhexane	0.28	0.41	5	5
3-Methylpentane	0.32	0.29	5	5
4-Methyl-1-pentene	0.00	0.00	5	0
Acetaldehyde	0.00	0.00	5	0
Acetone	1.54	0.53	5	5
alpha-Pinene	0.00	0.00	5	0
Benzene	0.29	0.16	5	5
beta-Pinene	0.00	0.00	5	0
cis-2-Butene	0.03	0.05	5	2
cis-2-Hexene	0.00	0.00	5	0
cis-2-Pentene	0.02	0.05	5	1
Cyclohexane	0.19	0.22	5	5
Cyclopentane	0.17	0.14	5	5
Cyclopentene	0.00	0.00	5	0
Ethanol	1.42	2.17	5	3
Ethylbenzene	0.13	0.20	5	3
Formaldehyde	0.00	0.00	5	0
Isobutane	0.72	0.75	5	5
Isobutylene	0.00	0.00	5	0
Isopentane	1.03	0.70	5	5
Isoprene	0.01	0.01	5	2
Isopropylalcohol	0.00	0.00	5	0
Isopropylbenzene	0.03	0.04	5	2
m,p-Xylene	0.26	0.47	5	3
Methanol	5.20	3.42	5	4
Methylcyclohexane	0.42	0.69	5	5
Methylcyclopentane	0.29	0.38	5	5
Methylethylketone	0.10	0.22	5	1
Methylisobutylketone	0.00	0.00	5	0
Methylvinylketone	0.00	0.00	5	0
n-Butane	1.45	1.66	5	5
n-Decane	0.04	0.05	5	2
n-Dodecane	0.00	0.00	5	0
n-Heptane	0.71	1.18	5	5
n-Hexane	0.46	0.63	5	5
n-Nonane	0.20	0.30	5	5
n-Octane	0.66	1.16	5	5
n-Pentane	1.00	0.87	5	5
n-Propylbenzene	0.02	0.04	5	1
n-Undecane	0.00	0.00	5	0
Naphthalene	0.00	0.00	5	0
o-Xylene	0.11	0.17	5	3
Styrene	0.02	0.05	5	1
Toluene	0.57	0.85	5	5
trans-2-Butene	0.04	0.05	5	4
trans-2-Hexene	0.00	0.00	5	0
trans-2-Pentene	0.02	0.04	5	1



Station Name Station # Sample Date	Horizon AMS 15 Mar 02 - Mar 26 Average	Horizon AMS 15 Mar 02 - Mar 26 Std Dev	Horizon AMS 15 Mar 02 - Mar 26 Total Samples (#)	Horizon AMS 15 Mar 02 - Mar 26 Total ≥ MDL (#)
Compound Name	ppbv	ppbv		
1,2,4-Trimethylbenzene	0.04	0.05	5	3
1,3,5-Trimethylbenzene	0.03	0.05	5	3
1,3-Butadiene	0.00	0.01	5	1
1-Butene	0.10	0.05	5	5
1-Pentene	0.03	0.04	5	3
2,2,4-Trimethylpentane	0.02	0.05	5	1
2,2-Dimethylbutane	0.16	0.13	5	5
2,3,4-Trimethylpentane	0.04	0.05	5	4
2,3-Dimethylbutane	0.28	0.20	5	5
2,3-Dimethylpentane	0.14	0.10	5	5
2,4-Dimethylpentane	0.05	0.05	5	5
2-Methyl-1-pentene	0.00	0.00	5	0
2-Methyl-2-butene	0.00	0.00	5	0
2-Methylheptane	0.18	0.18	5	5
2-Methylhexane	0.11	0.09	5	5
2-Methylpentane	0.66	0.84	5	5
3-Methyl-1-butene	0.00	0.00	5	0
3-Methylheptane	0.07	0.09	5	3
3-Methylhexane	0.17	0.12	5	5
3-Methylpentane	0.48	0.46	5	5
4-Methyl-1-pentene	0.00	0.00	5	0
Acetaldehyde	0.00	0.00	5	0
Acetone	2.08	0.76	5	5
alpha-Pinene	0.18	0.40	5	1
Benzene	0.27	0.12	5	5
beta-Pinene	0.00	0.00	5	0
cis-2-Butene	0.03	0.05	5	3
cis-2-Hexene	0.00	0.00	5	0
cis-2-Pentene	0.02	0.04	5	1
Cyclohexane	0.32	0.18	5	5
Cyclopentane	0.23	0.19	5	5
Cyclopentene	0.00	0.00	5	0
Ethanol	0.66	0.43	5	5
Ethylbenzene	0.05	0.06	5	3
Formaldehyde	0.00	0.00	5	0
Isobutane	1.05	0.34	5	5
Isobutylene	0.00	0.00	5	0
Isopentane	1.87	1.35	5	5
Isoprene	0.00	0.01	5	2
Isopropylalcohol	0.00	0.00	5	0
Isopropylbenzene	0.02	0.04	5	2
m,p-Xylene	0.09	0.11	5	3
Methanol	3.60	2.30	5	4
Methylcyclohexane	0.28	0.18	5	5
Methylcyclopentane	0.31	0.16	5	5
Methylethylketone	0.10	0.22	5	1
Methylisobutylketone	0.00	0.00	5	0
Methylvinylketone	0.00	0.00	5	0
n-Butane	1.32	0.73	5	5
n-Decane	0.02	0.04	5	1
n-Dodecane	0.00	0.00	5	0
n-Heptane	0.31	0.29	5	5
n-Hexane	0.34	0.28	5	5
n-Nonane	0.09	0.08	5	5
n-Octane	0.23	0.26	5	5
n-Pentane	1.38	1.59	5	5
n-Propylbenzene	0.02	0.04	5	1
n-Undecane	0.00	0.00	5	0
Naphthalene	0.00	0.00	5	0
o-Xylene	0.05	0.06	5	3
Styrene	0.02	0.04	5	1
Toluene	0.23	0.21	5	5
trans-2-Butene	0.04	0.05	5	5
trans-2-Hexene	0.00	0.00	5	0
trans-2-Pentene	0.02	0.04	5	1



Wood Buffalo Environmental Association

VOC (ppb) summary

2017 March

Compound	% Det	N	N < Det.	Min.	10%	25%	50%	60%	75%	80%	90%	95%	99%	Max.	Mean	Std. Dev.	Median	Outlier Test
1,2,4-Trimethylbenzene	52.8%	36	17	0.00	0.00	0.00	0.04	0.04	0.07	0.09	0.12	0.13	0.15	0.15	0.04	0.05	0.04	0.28
1,3,5-Trimethylbenzene	52.8%	36	17	0.00	0.00	0.00	0.03	0.03	0.06	0.07	0.10	0.12	0.12	0.12	0.03	0.04	0.03	0.23
1,3-Butadiene	19.4%	36	29	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.01	0.01	0.00	0.06
1-Butene	97.2%	36	1	0.00	0.04	0.05	0.09	0.10	0.15	0.16	0.19	0.25	0.25	0.25	0.10	0.06	0.09	0.42
1-Pentene	55.6%	36	16	0.00	0.00	0.00	0.02	0.03	0.05	0.05	0.10	0.10	0.10	0.10	0.03	0.04	0.02	0.21
2,2,4-Trimethylpentane	52.8%	36	17	0.00	0.00	0.00	0.01	0.02	0.09	0.09	0.11	0.13	0.16	0.16	0.04	0.05	0.01	0.28
2,2-Dimethylbutane	94.4%	36	2	0.00	0.01	0.03	0.08	0.08	0.14	0.18	0.28	0.37	0.55	0.55	0.11	0.12	0.08	0.72
2,3,4-Trimethylpentane	61.1%	36	14	0.00	0.00	0.00	0.02	0.03	0.07	0.09	0.12	0.12	0.13	0.13	0.04	0.04	0.02	0.26
2,3-Dimethylbutane	91.7%	36	3	0.00	0.02	0.05	0.12	0.13	0.19	0.27	0.45	0.59	0.63	0.63	0.16	0.16	0.12	0.98
2,3-Dimethylpentane	91.7%	36	3	0.00	0.02	0.03	0.07	0.09	0.13	0.15	0.19	0.30	0.35	0.35	0.09	0.08	0.07	0.50
2,4-Dimethylpentane	83.3%	36	6	0.00	0.00	0.01	0.02	0.03	0.07	0.07	0.12	0.12	0.13	0.13	0.04	0.04	0.02	0.25
2-Methyl-1-pentene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
2-Methyl-2-butene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
2-Methylheptane	86.1%	36	5	0.00	0.00	0.03	0.07	0.11	0.19	0.19	0.39	0.48	1.72	1.72	0.16	0.30	0.07	1.64
2-Methylhexane	97.2%	36	1	0.00	0.02	0.03	0.07	0.09	0.15	0.16	0.20	0.27	0.58	0.58	0.10	0.11	0.07	0.64
2-Methylpentane	100.0%	36	0	0.04	0.07	0.11	0.18	0.25	0.37	0.46	0.81	2.15	2.16	2.16	0.37	0.50	0.18	2.89
3-Methyl-1-butene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
3-Methylheptane	52.8%	36	17	0.00	0.00	0.00	0.02	0.06	0.13	0.13	0.16	0.19	0.68	0.68	0.07	0.12	0.02	0.68
3-Methylhexane	100.0%	36	0	0.02	0.03	0.04	0.10	0.13	0.19	0.20	0.27	0.40	1.00	1.00	0.14	0.17	0.10	1.02
3-Methylpentane	100.0%	36	0	0.02	0.03	0.09	0.15	0.21	0.36	0.39	0.67	1.28	1.28	1.28	0.27	0.31	0.15	1.80
4-Methyl-1-pentene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Acetaldehyde	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Acetone	100.0%	36	0	0.80	1.10	1.40	1.60	1.80	2.50	2.50	2.90	3.10	4.40	4.40	1.89	0.77	1.60	5.72
alpha-Pinene	2.8%	36	35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.03	0.15	0.00	0.77
Benzene	100.0%	36	0	0.13	0.16	0.18	0.22	0.23	0.30	0.33	0.45	0.49	0.54	0.54	0.26	0.11	0.22	0.78
beta-Pinene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
cis-2-Butene	41.7%	36	21	0.00	0.00	0.00	0.00	0.02	0.07	0.07	0.12	0.12	0.12	0.12	0.03	0.05	0.00	0.26
cis-2-Hexene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
cis-2-Pentene	25.0%	36	27	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.10	0.11	0.11	0.11	0.02	0.04	0.00	0.23
Cyclohexane	88.9%	36	4	0.00	0.00	0.04	0.10	0.12	0.18	0.18	0.33	0.56	0.58	0.58	0.13	0.14	0.10	0.84
Cyclopentane	100.0%	36	0	0.01	0.03	0.04	0.11	0.12	0.16	0.23	0.37	0.54	0.60	0.60	0.14	0.14	0.11	0.86
Cyclopentene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Ethanol	86.1%	36	5	0.00	0.00	0.50	0.90	0.90	1.40	1.60	2.50	2.70	5.20	5.20	1.06	1.02	0.90	6.17
Ethylbenzene	61.1%	36	14	0.00	0.00	0.00	0.03	0.04	0.11	0.12	0.14	0.17	0.48	0.48	0.06	0.09	0.03	0.51
Formaldehyde	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Isobutane	100.0%	36	0	0.23	0.25	0.35	0.45	0.58	1.20	1.20	1.47	1.84	2.05	2.05	0.69	0.51	0.45	3.22
Isobutylene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Isopentane	100.0%	36	0	0.25	0.39	0.56	0.71	0.96	1.14	1.35	1.85	4.11	4.22	4.22	1.05	0.90	0.71	5.57
Isoprene	25.0%	36	27	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.00	0.01	0.00	0.04
Isopropylalcohol	2.8%	36	35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.01	0.08	0.00	0.43
Isopropylbenzene	36.1%	36	23	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.09	0.09	0.10	0.10	0.02	0.03	0.00	0.20
m,p-Xylene	61.1%	36	14	0.00	0.00	0.00	0.05	0.09	0.17	0.17	0.25	0.46	1.09	1.09	0.12	0.20	0.05	1.11
Methanol	88.9%	36	4	0.00	0.00	5.00	7.00	7.00	10.00	10.00	32.00	45.00	109.00	109.00	11.94	19.24	7.00	108.14
Methylcyclohexane	100.0%	36	0	0.01	0.02	0.05	0.10	0.17	0.20	0.21	0.44	0.49	1.65	1.65	0.18	0.28	0.10	1.60
Methylcyclopentane	91.7%	36	3	0.00	0.03	0.07	0.13	0.15	0.25	0.25	0.42	0.50	0.97	0.97	0.18	0.19	0.13	1.12
Methylethylketone	27.8%	36	26	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.50	0.60	0.60	0.60	0.13	0.22	0.00	1.25
Methylisobutylketone	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Methylvinylketone	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
n-Butane	100.0%	36	0	0.49	0.53	0.62	0.90	1.01	1.83	2.07	3.03	4.35	4.38	4.38	1.31	1.05	0.90	6.56
n-Decane	19.4%	36	29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.10	0.10	0.10	0.02	0.04	0.00	0.20
n-Dodecane	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
n-Heptane	100.0%	36	0	0.02	0.03	0.07	0.15	0.19	0.35	0.39	0.58	0.97	2.82	2.82	0.29	0.48	0.15	2.71
n-Hexane	91.7%	36	3	0.00	0.03	0.07	0.21	0.25	0.42	0.43	0.74	0.92	1.56	1.56	0.29	0.33	0.21	1.93
n-Nonane	83.3%	36	6	0.00	0.00	0.02	0.05	0.07	0.14	0.15	0.19	0.30	0.73	0.73	0.09	0.13	0.05	0.76
n-Octane	83.3%	36	6	0.00	0.00	0.03	0.08	0.15	0.27	0.28	0.62	0.75	2.73	2.73	0.24	0.47	0.08	2.59
n-Pentane	100.0%	36	0	0.20	0.20	0.30	0.60	0.60	1.10	1.30	1.90	4.20	4.40	4.40	0.91	0.99	0.60	5.85
n-Propylbenzene	22.2%	36	28	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.09	0.09	0.09	0.02	0.03	0.00	0.19
n-Undecane	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Naphthalene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
o-Xylene	61.1%	36	14	0.00	0.00	0.00	0.03	0.05	0.11	0.12	0.16	0.17	0.41	0.41	0.06	0.08	0.03	0.48
Styrene	30.6%	36	25	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.09	0.11	0.11	0.11	0.02	0.04	0.00	0.22
Toluene	100.0%	36	0	0.04	0.07	0.10	0.18	0.23	0.37	0.38	0.48	0.74	2.08	2.08	0.28	0.35	0.18	2.05
trans-2-Butene	94.4%	36	2	0.00	0.01	0.01	0.02	0.02	0.07	0.07	0.11	0.12	0.13	0.13	0.04	0.04	0.02	0.24
trans-2-Hexene	0.0%	36	36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
trans-2-Pentene	27.8%	36	26	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.09	0.09	0.09	0.09	0.02	0.03	0.00	0.19



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PARTICULATE MATTER - IONS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: Atmospheric Research & Analysis, Inc.
Morrisville, NC



This page intentionally left blank



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PARTICULATE MATTER (PM_{2.5}) - IONS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: Atmospheric Research & Analysis, Inc.
Morrisville, NC



FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $\text{PM}_{2.5}$
PARTICLE DIAMETER	$< 2.5 \mu\text{m}$ or $< 10 \mu\text{m}$
MEDIUM	47 mm Teflon Filter
ANALYTICAL METHODS	MASS by Microbalance ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS) IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler For $\text{PM}_{2.5}$ FRM Partisol $\text{PM}_{2.5}$ sampler
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	02-Mar			02-Mar		02-Mar	
Particulate Size	PM2.5			PM2.5			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	10.94	V0	5.94	V0	0.25	V0
Calcium	0.16	0.18	V0	0.10	V0	0.01	V0
Magnesium	0.03	0.04	V0	0.01	V0	0.00	V0
Potassium	0.09	0.01	V0	0.02	V0	0.00	V1
Sodium	0.05	0.09	V0	0.14	V0	0.00	V1
Chloride	0.12	0.03	V0	0.03	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.01	V0	0.00	V1
Nitrate	0.20	0.24	V0	0.64	V0	0.04	V0
Sulphate	0.25	1.98	V0	1.53	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.30	V0	0.48	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		02-Mar	
Sample Date	02-Mar			02-Mar		02-Mar	
Particulate Size	PM2.5			PM2.5		PM2.5	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	5.15	V0	2.54	V0	0.25	V0
Calcium	0.16	0.05	V0	0.08	V0	0.01	V0
Magnesium	0.03	0.02	V0	0.01	V0	0.00	V0
Potassium	0.09	0.01	V0	0.01	V0	0.00	V1
Sodium	0.05	0.28	V0	0.06	V0	0.00	V1
Chloride	0.12	0.23	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.00	V1	0.00	V1
Nitrate	0.20	0.50	V0	0.15	V0	0.04	V0
Sulphate	0.25	1.04	V0	0.64	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.32	V0	0.17	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	08-Mar			08-Mar		08-Mar	
Particulate Size	PM2.5			PM2.5			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	4.52	V0	6.44	V0	0.11	V0
Calcium	0.16	0.13	V0	0.10	V0	0.00	V1
Magnesium	0.03	0.06	V0	0.08	V0	0.00	V1
Potassium	0.09	0.01	V0	0.02	V0	0.00	V1
Sodium	0.05	0.23	V0	0.34	V0	0.00	V1
Chloride	0.12	0.28	V0	0.39	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.01	V0	0.00	V1
Nitrate	0.20	0.17	V0	0.29	V0	0.02	V0
Sulphate	0.25	0.72	V0	1.40	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.12	V0	0.31	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		08-Mar	
Sample Date	08-Mar			08-Mar		08-Mar	
Particulate Size	PM2.5			PM2.5		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	7.47	V0	4.75	V0	0.11	V0
Calcium	0.16	0.10	V0	0.06	V0	0.00	V1
Magnesium	0.03	0.06	V0	0.06	V0	0.00	V1
Potassium	0.09	0.03	V0	0.02	V0	0.00	V1
Sodium	0.05	0.53	V0	0.26	V0	0.00	V1
Chloride	0.12	0.70	V0	0.31	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.00	V1	0.00	V1
Nitrate	0.20	0.25	V0	0.22	V0	0.02	V0
Sulphate	0.25	1.24	V0	0.93	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.26	V0	0.16	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	14-Mar			14-Mar		14-Mar	
Particulate Size	PM2.5			PM2.5			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	11.44	V4	6.96	V0	0.11	V0
Calcium	0.16	0.04	V0	0.05	V0	0.00	V1
Magnesium	0.03	0.05	V0	0.03	V0	0.00	V0
Potassium	0.09	0.05	V0	0.05	V0	0.00	V1
Sodium	0.05	0.09	V0	0.13	V0	0.00	V1
Chloride	0.12	0.01	V0	0.02	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.01	V0	0.00	V1
Nitrate	0.20	0.39	V0	0.61	V0	0.00	V1
Sulphate	0.25	3.30	V0	1.25	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.98	V0	0.41	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		14-Mar	
Sample Date	14-Mar			14-Mar		14-Mar	
Particulate Size	PM2.5			PM2.5		24	
Total Air Volume (m ³)	23.5			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	10.41	V0	3.52	V0	0.11	V0
Calcium	0.16	0.05	V0	0.04	V0	0.00	V1
Magnesium	0.03	0.05	V0	0.02	V0	0.00	V0
Potassium	0.09	0.09	V0	0.02	V0	0.00	V1
Sodium	0.05	0.39	V0	0.06	V0	0.00	V1
Chloride	0.12	0.27	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.01	V0	0.00	V1
Nitrate	0.20	0.87	V0	0.13	V0	0.00	V1
Sulphate	0.25	1.31	V0	1.10	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.41	V0	0.30	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	20-Mar			20-Mar		20-Mar	
Particulate Size	PM2.5			PM2.5			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	7.05	V0	5.26	V0	0.10	V0
Calcium	0.16	0.05	V0	0.09	V0	0.00	V1
Magnesium	0.03	0.05	V0	0.03	V0	0.00	V1
Potassium	0.09	0.02	V0	0.03	V0	0.00	V1
Sodium	0.05	0.18	V0	0.17	V0	0.00	V1
Chloride	0.12	0.13	V0	0.09	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.13	V0	0.27	V0	0.00	V1
Sulphate	0.25	1.61	V0	1.79	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.31	V0	0.48	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		20-Mar	
Sample Date	20-Mar			20-Mar		20-Mar	
Particulate Size	PM2.5			PM2.5		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	5.44	V0	4.09	V0	0.10	V0
Calcium	0.16	0.05	V0	0.08	V0	0.00	V1
Magnesium	0.03	0.04	V0	0.04	V0	0.00	V1
Potassium	0.09	0.03	V0	0.01	V0	0.00	V1
Sodium	0.05	0.24	V0	0.08	V0	0.00	V1
Chloride	0.12	0.21	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.18	V0	0.08	V0	0.00	V1
Sulphate	0.25	1.68	V0	1.56	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.39	V0	0.27	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	26-Mar			26-Mar		26-Mar	
Particulate Size	PM2.5			PM2.5			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	9.64	V0	5.56	V0	0.05	V0
Calcium	0.16	0.06	V0	0.04	V0	0.01	V0
Magnesium	0.03	0.03	V0	0.01	V0	0.00	V0
Potassium	0.09	0.03	V0	0.03	V0	0.00	V1
Sodium	0.05	0.02	V0	0.02	V0	0.00	V1
Chloride	0.12	0.01	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.51	V0	0.59	V0	0.00	V1
Sulphate	0.25	3.62	V0	1.43	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	1.32	V0	0.60	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		26-Mar	
Sample Date	26-Mar			26-Mar		26-Mar	
Particulate Size	PM2.5			PM2.5		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	5.51	V0	4.23	V0	0.05	V0
Calcium	0.16	0.03	V0	0.00	V1	0.01	V0
Magnesium	0.03	0.01	V0	0.01	V0	0.00	V0
Potassium	0.09	0.02	V0	0.02	V0	0.00	V1
Sodium	0.05	0.08	V0	0.02	V0	0.00	V1
Chloride	0.12	0.02	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.53	V0	0.10	V0	0.00	V1
Sulphate	0.25	1.47	V0	1.50	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.60	V0	0.46	V0	0.00	V0



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Particulate Matter (PM2.5) - IONS - Summary

2017

Indicated Sites and Dates

Station Name	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay
Station #	AMS 1	AMS 1	AMS 1	AMS 1
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m³	Std Dev µg/m³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	8.72	2.90	5	5
Calcium	0.09	0.06	5	5
Magnesium	0.05	0.01	5	5
Potassium	0.02	0.02	5	5
Sodium	0.12	0.08	5	5
Chloride	0.09	0.12	5	5
Fluoride	0.00	0.00	5	1
Nitrate	0.29	0.16	5	5
Sulphate	2.24	1.21	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.61	0.52	5	5



Station Name	Patricia McInnes	Patricia McInnes	Patricia McInnes	Patricia McInnes
Station #	AMS 6	AMS 6	AMS 6	AMS 6
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	6.03	0.68	5	5
Calcium	0.08	0.03	5	5
Magnesium	0.03	0.03	5	5
Potassium	0.03	0.01	5	5
Sodium	0.16	0.11	5	5
Chloride	0.11	0.16	5	5
Fluoride	0.00	0.00	5	3
Nitrate	0.48	0.18	5	5
Sulphate	1.48	0.20	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.46	0.11	5	5



Station Name	Athabasca Valley	Athabasca Valley	Athabasca Valley	Athabasca Valley
Station #	AMS 7	AMS 7	AMS 7	AMS 7
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	6.80	2.22	5	5
Calcium	0.06	0.03	5	5
Magnesium	0.03	0.02	5	5
Potassium	0.04	0.03	5	5
Sodium	0.30	0.17	5	5
Chloride	0.29	0.25	5	5
Fluoride	0.01	0.01	5	3
Nitrate	0.47	0.27	5	5
Sulphate	1.35	0.24	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.40	0.13	5	5



Station Name	Anzac	Anzac	Anzac	Anzac
Station #	AMS 14	AMS 14	AMS 14	AMS 14
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	3.82	0.84	5	5
Calcium	0.05	0.03	5	4
Magnesium	0.03	0.02	5	5
Potassium	0.01	0.00	5	5
Sodium	0.09	0.10	5	5
Chloride	0.07	0.14	5	5
Fluoride	0.00	0.00	5	1
Nitrate	0.14	0.06	5	5
Sulphate	1.14	0.39	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.27	0.12	5	5



Wood Buffalo Environmental Association

PM2.5 Ion Summary

2017 March

Compound	% Det	N	N < Det.	Min.	10%	25%	50%	60%	75%	80%	90%	95%	99%	Max.	Mean	Std. Dev.	Median	Outlier Test
Particulate Matter	100.0%	20	0	61	98	114	133	155	179	231	263	275	275	275	152	60	133	451
Calcium	95.0%	20	1	0.15	0.90	1.20	1.50	1.80	2.40	2.40	3.00	4.20	4.20	4.20	1.63	0.93	1.50	6.27
Magnesium	100.0%	20	0	0.18	0.21	0.36	0.90	1.02	1.29	1.50	1.53	1.89	1.89	1.89	0.85	0.52	0.90	3.47
Potassium	100.0%	20	0	0.15	0.27	0.36	0.54	0.63	0.81	0.81	1.17	2.16	2.16	2.16	0.61	0.46	0.54	2.92
Sodium	100.0%	20	0	0.36	0.54	1.89	3.45	4.23	6.24	6.66	9.09	12.78	12.78	12.78	4.07	3.28	3.45	20.46
Chloride	100.0%	20	0	0.12	0.18	0.33	0.78	3.21	6.42	6.78	9.24	16.80	16.80	16.80	3.33	4.36	0.78	25.14
Fluoride	40.0%	20	12	0.03	0.03	0.06	0.12	0.15	0.18	0.18	0.21	0.30	0.30	0.30	0.12	0.08	0.12	0.49
Nitrate	100.0%	20	0	2.01	3.12	3.99	6.51	9.27	12.72	14.25	15.24	20.43	20.43	20.43	8.20	5.28	6.51	34.61
Sulphate	100.0%	20	0	15.27	22.35	29.64	35.34	36.60	40.26	42.99	79.08	86.94	86.94	86.94	37.26	17.66	35.34	125.57
Phosphate	0.0%	20	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
Ammonium (as N)	100.0%	20	0	2.91	4.17	7.17	9.46	9.92	11.58	14.35	23.57	31.77	31.77	31.77	10.40	6.81	9.46	44.46



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PARTICULATE MATTER (PM₁₀) - IONS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: Atmospheric Research & Analysis, Inc.
Morrisville, NC



FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $\text{PM}_{2.5}$
PARTICLE DIAMETER	$< 2.5 \mu\text{m}$ or $< 10 \mu\text{m}$
MEDIUM	47 mm Teflon Filter
ANALYTICAL METHODS	MASS by Microbalance ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS) IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler For $\text{PM}_{2.5}$ FRM Partisol $\text{PM}_{2.5}$ sampler
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	02-Mar			02-Mar		02-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	69.73	V0	23.65	V0	0.12	V0
Calcium	0.16	1.79	V0	0.34	V0	0.00	V1
Magnesium	0.03	0.11	V0	0.07	V0	0.00	V1
Potassium	0.09	0.04	V0	0.06	V0	0.00	V1
Sodium	0.05	0.40	V0	1.88	V0	0.00	V1
Chloride	0.12	0.43	V0	2.73	V0	0.00	V1
Fluoride	0.15	0.02	V0	0.01	V0	0.00	V1
Nitrate	0.20	1.04	V0	0.94	V0	0.00	V1
Sulphate	0.25	2.50	V0	1.54	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.48	V0	0.41	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		02-Mar	
Sample Date	02-Mar			02-Mar		02-Mar	
Particulate Size	PM10			PM10		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	27.30	V0	5.69	V0	0.12	V0
Calcium	0.16	0.54	V0	0.06	V0	0.00	V1
Magnesium	0.03	0.08	V0	0.02	V0	0.00	V1
Potassium	0.09	0.07	V0	0.01	V0	0.00	V1
Sodium	0.05	3.41	V0	0.12	V0	0.00	V1
Chloride	0.12	5.16	V0	0.06	V0	0.00	V1
Fluoride	0.15	0.02	V0	0.01	V0	0.00	V1
Nitrate	0.20	0.69	V0	0.33	V0	0.00	V1
Sulphate	0.25	1.16	V0	0.63	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.25	V0	0.17	V0	0.00	V0



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15			
Sample Date	02-Mar			02-Mar		02-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	47.30	V0	42.00	V0	0.12	V0
Calcium	0.16	1.31	V0	0.75	V0	0.00	V1
Magnesium	0.03	0.09	V0	0.08	V0	0.00	V1
Potassium	0.09	0.03	V0	0.03	V0	0.00	V1
Sodium	0.05	0.43	V0	0.24	V0	0.00	V1
Chloride	0.12	0.47	V0	0.16	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.01	V0	0.00	V1
Nitrate	0.20	0.62	V0	0.93	V0	0.00	V1
Sulphate	0.25	1.79	V0	2.62	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.33	V0	0.64	V0	0.00	V0



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			02-Mar	
Sample Date	02-Mar			02-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	86.42	V0	0.12	V0
Calcium	0.16	2.89	V0	0.00	V1
Magnesium	0.03	0.14	V0	0.00	V1
Potassium	0.09	0.08	V0	0.00	V1
Sodium	0.05	0.54	V0	0.00	V1
Chloride	0.12	0.64	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.00	V1
Nitrate	0.20	1.09	V0	0.00	V1
Sulphate	0.25	1.68	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.35	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	08-Mar			08-Mar		08-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	32.26	V0	36.84	V0	0.32	V0
Calcium	0.16	0.50	V0	0.80	V0	0.01	V0
Magnesium	0.03	0.13	V0	0.15	V0	0.00	V1
Potassium	0.09	0.04	V0	0.05	V0	0.00	V1
Sodium	0.05	0.52	V0	1.14	V0	0.00	V1
Chloride	0.12	0.76	V0	1.65	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.01	V0	0.01	V0
Nitrate	0.20	0.31	V0	0.42	V0	0.08	V0
Sulphate	0.25	0.82	V0	1.53	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.12	V0	0.30	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		08-Mar	
Sample Date	08-Mar			08-Mar		08-Mar	
Particulate Size	PM10			PM10		PM10	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	60.38	V0	25.03	V0	0.32	V0
Calcium	0.16	2.01	V0	0.68	V0	0.01	V0
Magnesium	0.03	0.21	V0	0.14	V0	0.00	V1
Potassium	0.09	0.11	V0	0.03	V0	0.00	V1
Sodium	0.05	3.10	V0	0.55	V0	0.00	V1
Chloride	0.12	4.74	V0	0.81	V0	0.00	V1
Fluoride	0.15	0.02	V0	0.01	V0	0.01	V0
Nitrate	0.20	0.52	V0	0.45	V0	0.08	V0
Sulphate	0.25	1.37	V0	1.00	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.24	V0	0.15	V0	0.00	V0



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15			
Sample Date	08-Mar			08-Mar		08-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	19.45	V0	30.77	V0	0.32	V0
Calcium	0.16	0.39	V0	0.13	V0	0.01	V0
Magnesium	0.03	0.09	V0	0.11	V0	0.00	V1
Potassium	0.09	0.03	V0	0.03	V0	0.00	V1
Sodium	0.05	0.44	V0	0.39	V0	0.00	V1
Chloride	0.12	0.66	V0	0.54	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.00	V1	0.01	V0
Nitrate	0.20	0.21	V0	0.22	V0	0.08	V0
Sulphate	0.25	0.80	V0	0.86	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.09	V0	0.11	V0	0.00	V0



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			08-Mar	
Sample Date	08-Mar			08-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	39.05	V0	0.32	V0
Calcium	0.16	0.60	V0	0.01	V0
Magnesium	0.03	0.14	V0	0.00	V1
Potassium	0.09	0.05	V0	0.00	V1
Sodium	0.05	0.84	V0	0.00	V1
Chloride	0.12	1.24	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.01	V0
Nitrate	0.20	0.29	V0	0.08	V0
Sulphate	0.25	0.95	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.16	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	14-Mar			14-Mar		14-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	34.53	V0	13.28	V0	0.12	V0
Calcium	0.16	0.61	V0	0.08	V0	0.00	V1
Magnesium	0.03	0.12	V0	0.06	V0	0.00	V1
Potassium	0.09	0.05	V0	0.08	V0	0.00	V1
Sodium	0.05	0.29	V0	1.04	V0	0.00	V1
Chloride	0.12	0.21	V0	1.29	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.01	V0	0.00	V1
Nitrate	0.20	1.14	V0	0.97	V0	0.00	V1
Sulphate	0.25	3.66	V0	1.34	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	1.02	V0	0.38	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		14-Mar	
Sample Date	14-Mar			14-Mar		14-Mar	
Particulate Size	PM10			PM10		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	34.62	V0	4.72	V0	0.12	V0
Calcium	0.16	0.54	V0	0.08	V0	0.00	V1
Magnesium	0.03	0.18	V0	0.02	V0	0.00	V1
Potassium	0.09	0.22	V0	0.02	V0	0.00	V1
Sodium	0.05	4.39	V0	0.11	V0	0.00	V1
Chloride	0.12	6.46	V0	0.03	V0	0.00	V1
Fluoride	0.15	0.02	V0	0.00	V1	0.00	V1
Nitrate	0.20	1.26	V0	0.28	V0	0.00	V1
Sulphate	0.25	1.49	V0	1.03	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.36	V0	0.29	V0	0.00	V0



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15		14-Mar	
Sample Date	14-Mar			14-Mar		14-Mar	
Particulate Size	PM10			PM10		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	22.23	V0	13.40	V0	0.12	V0
Calcium	0.16	0.16	V0	0.05	V0	0.00	V1
Magnesium	0.03	0.08	V0	0.05	V0	0.00	V1
Potassium	0.09	0.05	V0	0.05	V0	0.00	V1
Sodium	0.05	0.29	V0	0.18	V0	0.00	V1
Chloride	0.12	0.19	V0	0.05	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.00	V1	0.00	V1
Nitrate	0.20	0.83	V0	0.71	V0	0.00	V1
Sulphate	0.25	4.05	V0	1.89	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	1.16	V0	0.56	V0	0.00	V0



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			14-Mar	
Sample Date	14-Mar			14-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	25.76	V0	0.12	V0
Calcium	0.16	0.24	V0	0.00	V1
Magnesium	0.03	0.09	V0	0.00	V1
Potassium	0.09	0.04	V0	0.00	V1
Sodium	0.05	0.19	V0	0.00	V1
Chloride	0.12	0.07	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1
Nitrate	0.20	0.95	V0	0.00	V1
Sulphate	0.25	2.97	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.81	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	20-Mar			20-Mar		20-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	55.33	V0	19.60	V0	0.13	V0
Calcium	0.16	1.90	V0	0.34	V0	0.00	V1
Magnesium	0.03	0.22	V0	0.09	V0	0.00	V0
Potassium	0.09	0.05	V0	0.05	V0	0.00	V1
Sodium	0.05	0.45	V0	0.95	V0	0.00	V1
Chloride	0.12	0.57	V0	1.27	V0	0.00	V1
Fluoride	0.15	0.01	V0	0.00	V1	0.00	V1
Nitrate	0.20	0.36	V0	0.41	V0	0.09	V0
Sulphate	0.25	1.89	V0	1.90	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.35	V0	0.46	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		20-Mar	
Sample Date	20-Mar			20-Mar		20-Mar	
Particulate Size	PM10			PM10		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	28.30	V0	10.78	V0	0.13	V0
Calcium	0.16	0.64	V0	0.09	V0	0.00	V1
Magnesium	0.03	0.15	V0	0.05	V0	0.00	V0
Potassium	0.09	0.09	V0	0.02	V0	0.00	V1
Sodium	0.05	1.90	V0	0.16	V0	0.00	V1
Chloride	0.12	2.72	V0	0.10	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.36	V0	0.22	V0	0.09	V0
Sulphate	0.25	1.83	V0	1.63	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.38	V0	0.26	V0	0.00	V0



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15		20-Mar	
Sample Date	20-Mar			20-Mar		20-Mar	
Particulate Size	PM10			PM10		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	31.00	V0	58.17	V0	0.13	V0
Calcium	0.16	1.01	V0	1.03	V0	0.00	V1
Magnesium	0.03	0.17	V0	0.21	V0	0.00	V0
Potassium	0.09	0.03	V0	0.04	V0	0.00	V1
Sodium	0.05	0.42	V0	0.42	V0	0.00	V1
Chloride	0.12	0.49	V0	0.51	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.01	V0	0.00	V1
Nitrate	0.20	0.27	V0	0.32	V0	0.09	V0
Sulphate	0.25	2.02	V0	1.34	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.34	V0	0.13	V0	0.00	V0



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			20-Mar	
Sample Date	20-Mar			20-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	46.90	V0	0.13	V0
Calcium	0.16	1.13	V0	0.00	V1
Magnesium	0.03	0.21	V0	0.00	V0
Potassium	0.09	0.04	V0	0.00	V1
Sodium	0.05	0.41	V0	0.00	V1
Chloride	0.12	0.51	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1
Nitrate	0.20	0.26	V0	0.09	V0
Sulphate	0.25	1.30	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.21	V0	0.00	V0



Bertha Ganter - Fort							
Station Name	McKay			Patricia McInnes		Travel Blank	
Station #	AMS 1			AMS 6			
Sample Date	26-Mar			26-Mar		26-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	11.97	V0	7.13	V0	0.17	V0
Calcium	0.16	0.09	V0	0.06	V0	0.00	V1
Magnesium	0.03	0.04	V0	0.02	V0	0.00	V1
Potassium	0.09	0.18	V0	0.03	V0	0.00	V1
Sodium	0.05	0.04	V0	0.14	V0	0.00	V1
Chloride	0.12	0.13	V0	0.08	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.73	V0	0.77	V0	0.00	V1
Sulphate	0.25	3.94	V0	1.49	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	1.44	V0	0.57	V0	0.00	V0



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		26-Mar	
Sample Date	26-Mar			26-Mar		26-Mar	
Particulate Size	PM10			PM10		24	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	9.01	V0	5.43	V0	0.17	V0
Calcium	0.16	0.05	V0	0.02	V0	0.00	V1
Magnesium	0.03	0.04	V0	0.02	V0	0.00	V1
Potassium	0.09	0.04	V0	0.01	V0	0.00	V1
Sodium	0.05	0.41	V0	0.03	V0	0.00	V1
Chloride	0.12	0.39	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.72	V0	0.26	V0	0.00	V1
Sulphate	0.25	1.65	V0	1.60	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.52	V0	0.48	V0	0.00	V0



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15			
Sample Date	26-Mar			26-Mar		26-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	10.70	V0	7.78	V0	0.17	V0
Calcium	0.16	0.04	V0	0.03	V0	0.00	V1
Magnesium	0.03	0.02	V0	0.02	V0	0.00	V1
Potassium	0.09	0.02	V0	0.01	V0	0.00	V1
Sodium	0.05	0.03	V0	0.03	V0	0.00	V1
Chloride	0.12	0.01	V0	0.01	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1	0.00	V1
Nitrate	0.20	0.69	V0	0.67	V0	0.00	V1
Sulphate	0.25	3.75	V0	1.89	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1	0.00	V1
Ammonium (as N)	0.02	1.31	V0	0.68	V0	0.00	V0



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			26-Mar	
Sample Date	26-Mar			26-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	7.62	V0	0.17	V0
Calcium	0.16	0.03	V0	0.00	V1
Magnesium	0.03	0.02	V0	0.00	V1
Potassium	0.09	0.02	V0	0.00	V1
Sodium	0.05	0.03	V0	0.00	V1
Chloride	0.12	0.01	V0	0.00	V1
Fluoride	0.15	0.00	V1	0.00	V1
Nitrate	0.20	0.52	V0	0.00	V1
Sulphate	0.25	2.16	V0	0.00	V1
Phosphate	0.26	0.00	V1	0.00	V1
Ammonium (as N)	0.02	0.72	V0	0.00	V0



Station Name	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay
Station #	AMS 1	AMS 1	AMS 1	AMS 1
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m³	Std Dev µg/m³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	40.76	22.32	5	5
Calcium	0.98	0.81	5	5
Magnesium	0.12	0.07	5	5
Potassium	0.07	0.06	5	5
Sodium	0.34	0.19	5	5
Chloride	0.42	0.26	5	5
Fluoride	0.01	0.01	5	4
Nitrate	0.71	0.38	5	5
Sulphate	2.56	1.28	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.68	0.54	5	5



Station Name	Patricia McInnes	Patricia McInnes	Patricia McInnes	Patricia McInnes
Station #	AMS 6	AMS 6	AMS 6	AMS 6
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	20.10	11.27	5	5
Calcium	0.32	0.30	5	5
Magnesium	0.08	0.05	5	5
Potassium	0.06	0.02	5	5
Sodium	1.03	0.62	5	5
Chloride	1.40	0.95	5	5
Fluoride	0.01	0.01	5	3
Nitrate	0.70	0.27	5	5
Sulphate	1.56	0.21	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.42	0.10	5	5



Station Name	Athabasca Valley	Athabasca Valley	Athabasca Valley	Athabasca Valley
Station #	AMS 7	AMS 7	AMS 7	AMS 7
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average	Std Dev	Total Samples (#)	Total ≥ MDL (#)
	µg/m³	µg/m³		
Particulate Matter	31.92	18.55	5	5
Calcium	0.76	0.74	5	5
Magnesium	0.13	0.07	5	5
Potassium	0.11	0.07	5	5
Sodium	2.64	1.53	5	5
Chloride	3.89	2.38	5	5
Fluoride	0.01	0.01	5	3
Nitrate	0.71	0.34	5	5
Sulphate	1.50	0.26	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.35	0.11	5	5



Station Name	Anzac	Anzac	Anzac	Anzac
Station #	AMS 14	AMS 14	AMS 14	AMS 14
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	10.33	8.56	5	5
Calcium	0.18	0.28	5	5
Magnesium	0.05	0.05	5	5
Potassium	0.02	0.01	5	5
Sodium	0.19	0.20	5	5
Chloride	0.20	0.34	5	5
Fluoride	0.00	0.00	5	2
Nitrate	0.31	0.09	5	5
Sulphate	1.18	0.43	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.27	0.13	5	5



Station Name	Fort McKay South	Fort McKay South	Fort McKay South	Fort McKay South
Station #	AMS 13	AMS 13	AMS 13	AMS 13
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	26.13	13.87	5	5
Calcium	0.58	0.55	5	5
Magnesium	0.09	0.05	5	5
Potassium	0.03	0.01	5	5
Sodium	0.32	0.17	5	5
Chloride	0.36	0.26	5	5
Fluoride	0.00	0.00	5	3
Nitrate	0.53	0.27	5	5
Sulphate	2.48	1.38	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.65	0.55	5	5



Station Name	Horizon	Horizon	Horizon	Horizon
Station #	AMS 15	AMS 15	AMS 15	AMS 15
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	30.42	20.66	5	5
Calcium	0.40	0.46	5	5
Magnesium	0.09	0.07	5	5
Potassium	0.03	0.01	5	5
Sodium	0.25	0.16	5	5
Chloride	0.25	0.25	5	5
Fluoride	0.00	0.00	5	2
Nitrate	0.57	0.29	5	5
Sulphate	1.72	0.66	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.42	0.28	5	5



Station Name	Muskeg River	Muskeg River	Muskeg River	Muskeg River
Station #	AMS 16	AMS 16	AMS 16	AMS 16
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	41.15	29.36	5	5
Calcium	0.98	1.15	5	5
Magnesium	0.12	0.07	5	5
Potassium	0.04	0.02	5	5
Sodium	0.40	0.31	5	5
Chloride	0.49	0.50	5	5
Fluoride	0.00	0.01	5	1
Nitrate	0.62	0.38	5	5
Sulphate	1.81	0.79	5	5
Phosphate	0.00	0.00	5	0
Ammonium (as N)	0.45	0.30	5	5



Wood Buffalo Environmental Association

PM10 Ion Summary

2017 March

Compound	% Det	N	N < Det.	Min.	10%	25%	50%	60%	75%	80%	90%	95%	99% Max.	Mean	Std. Dev.	Median	Outlier Test	
Particulate Matter	100.0%	35	0	113	171	259	618	744	937	1126	1396	1674	2074	2074	689	483	618	3102
Calcium	100.0%	35	0	0.42	0.90	1.80	9.30	14.40	19.20	24.60	42.90	48.30	69.30	69.30	14.37	16.39	9.30	96.31
Magnesium	100.0%	35	0	0.36	0.42	0.93	2.13	2.61	3.42	3.63	5.04	5.10	5.28	5.28	2.33	1.52	2.13	9.90
Potassium	100.0%	35	0	0.15	0.39	0.60	0.93	1.17	1.29	1.74	2.13	4.20	5.22	5.22	1.23	1.03	0.93	6.40
Sodium	100.0%	35	0	0.69	0.81	3.75	9.81	10.59	20.16	25.02	45.48	81.87	105.33	105.33	17.74	24.44	9.81	139.93
Chloride	100.0%	35	0	0.18	0.33	1.92	11.70	13.65	29.67	31.05	65.49	123.87	155.01	155.01	24.10	37.29	11.70	210.55
Fluoride	51.4%	35	17	0.03	0.03	0.09	0.15	0.15	0.24	0.27	0.36	0.36	0.39	0.39	0.16	0.10	0.15	0.68
Nitrate	100.0%	35	0	5.04	6.15	7.38	12.42	16.62	20.01	22.59	24.87	27.27	30.15	30.15	14.23	7.39	12.42	51.18
Sulphate	100.0%	35	0	15.21	20.52	31.23	39.15	43.83	48.42	59.94	87.84	94.53	97.23	97.23	43.92	21.57	39.15	151.78
Phosphate	0.0%	35	35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	
Ammonium (as N)	100.0%	35	0	2.24	3.07	5.66	8.64	11.00	13.77	16.31	24.60	31.52	34.66	34.66	11.13	8.12	8.64	51.74



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PARTICULATE MATTER - METALS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM ions: Atmospheric Research & Analysis, Inc.
Morrisville, NC



This page intentionally left blank



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PARTICULATE MATTER (PM_{2.5}) - METALS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM metals: Atmospheric Research & Analysis, Inc.
Morrisville, NC



FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $\text{PM}_{2.5}$
PARTICLE DIAMETER	$< 2.5 \mu\text{m}$ or $< 10 \mu\text{m}$
MEDIUM	47 mm Teflon Filter
ANALYTICAL METHODS	MASS by Microbalance ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS) IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler For $\text{PM}_{2.5}$ FRM Partisol $\text{PM}_{2.5}$ sampler
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	02-Mar		02-Mar			02-Mar
Particulate Size	PM2.5		PM2.5				
Total Air Volume (m ³)		24		24		24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	11.04	V0	5.96	V0	0.12	V0
Aluminum	0.1380326	0.2019082	V0	0.0232922	V0	0.0132243	V0
Antimony	0.0001784	0.0000801	V0	0.0000851	V0	0.0000000	V1
Arsenic	0.0001060	0.0003245	V0	0.0001360	V0	0.0000000	V1
Barium	0.0092847	0.0018081	V0	0.0005577	V0	0.0000000	V1
Beryllium	0.0000946	0.0000109	V0	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000315	V0	0.0000076	V0	0.0000023	V0
Cadmium	0.0000174	0.0000265	V0	0.0000172	V0	0.0000000	V1
Calcium	0.4112124	0.2314567	V0	0.0454126	V0	0.0000000	V1
Cerium	0.0000174	0.0002380	V0	0.0000305	V0	0.0000042	V0
Cesium	0.0000100	0.0000174	V0	0.0000034	V0	0.0000000	V1
Chromium	0.0022262	0.0009339	V0	0.0002497	V0	0.0000000	V1
Cobalt	0.0000273	0.0002960	V0	0.0000552	V0	0.0000017	V0
Copper	0.0017171	0.0009021	V0	0.0005508	V0	0.0000000	V1
Iron	0.0393063	0.2092777	V0	0.0299376	V0	0.0000000	V1
Lanthanum	0.0000130	0.0001135	V0	0.0000127	V0	0.0000000	V1
Lead	0.0008577	0.0008598	V0	0.0006476	V0	0.0000000	V1
Lithium	0.0000374	0.0002895	V0	0.0000322	V0	0.0000070	V0
Magnesium	0.0091409	0.0413720	V0	0.0131399	V0	0.0004126	V0
Manganese	0.0006949	0.0043181	V0	0.0007919	V0	0.0000000	V1
Molybdenum	0.0007116	0.0012225	V0	0.0001432	V0	0.0000322	V0
Neodymium	0.0000140	0.0001021	V0	0.0000112	V0	0.0000017	V0
Nickel	0.0005429	0.0013469	V0	0.0002585	V0	0.0000408	V0
Niobium	0.0000202	0.0000305	V0	0.0000041	V0	0.0000000	V1
Palladium	0.0000632	0.0000101	V0	0.0000084	V0	0.0000055	V0
Phosphorus	0.0459574	0.0162030	V0	0.0119865	V0	0.0096862	V0
Platinum	0.0000088	0.0000015	V0	0.0000019	V0	0.0000022	V0
Potassium	0.0061261	0.0771120	V0	0.0297737	V0	0.0006228	V0
Praseodymium	0.0000070	0.0000265	V0	0.0000032	V0	0.0000004	V0
Rubidium	0.0000184	0.0002791	V0	0.0000677	V0	0.0000011	V0
Samarium	0.0000133	0.0000182	V0	0.0000019	V0	0.0000000	V1
Selenium	0.0003366	0.0003047	V0	0.0000564	V0	0.0000000	V1
Silicon	0.7676322	0.6839775	V0	0.1095026	V0	0.0448651	V0
Silver	0.0000100	0.0000040	V0	0.0000023	V0	0.0000000	V1
Sodium	0.0169447	0.0861525	V0	0.1113906	V0	0.0008996	V0
Strontium	0.0003375	0.0007798	V0	0.0001883	V0	0.0000000	V1
Tantalum	0.0000394	0.0000021	V0	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000054	V0	0.0000024	V0	0.0000005	V0
Thorium	0.0000059	0.0000322	V0	0.0000037	V0	0.0000011	V0
Tin	0.0004414	0.0001628	V0	0.0000958	V0	0.0000290	V0
Titanium	0.0015201	0.0113934	V0	0.0015817	V0	0.0006619	V0
Tungsten	0.0000938	0.0001240	V0	0.0000847	V0	0.0000000	V1
Uranium	0.0000048	0.0000130	V0	0.0000013	V0	0.0000005	V0
Vanadium	0.0007697	0.0063966	V0	0.0003108	V0	0.0000697	V0
Zinc	0.0055897	0.0055395	V0	0.0028778	V0	0.0000000	V1



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 02-Mar PM2.5 24	AMS 7 02-Mar PM2.5 24	QC Flag	AMS 14 02-Mar PM2.5 24	QC Flag	AMS 14 02-Mar PM2.5 24	QC Flag
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	5.16	V0	2.67	V0	0.12	V0
Aluminum	0.1380326	0.0312631	V0	0.0139384	V0	0.0132243	V0
Antimony	0.0001784	0.0001063	V0	0.0000411	V0	0.0000000	V1
Arsenic	0.0001060	0.0001467	V0	0.0001177	V0	0.0000000	V1
Barium	0.0092847	0.0010234	V0	0.0004796	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000169	V0	0.0000142	V0	0.0000023	V0
Cadmium	0.0000174	0.0000173	V0	0.0000173	V0	0.0000000	V1
Calcium	0.4112124	0.0898972	V0	0.0357193	V0	0.0000000	V1
Cerium	0.0000174	0.0000450	V0	0.0000122	V0	0.0000042	V0
Cesium	0.0000100	0.0000041	V0	0.0000025	V0	0.0000000	V1
Chromium	0.0022262	0.0003293	V0	0.0002237	V0	0.0000000	V1
Cobalt	0.0000273	0.0000477	V0	0.0000233	V0	0.0000017	V0
Copper	0.0017171	0.0008332	V0	0.0003601	V0	0.0000000	V1
Iron	0.0393063	0.0502184	V0	0.0465545	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000191	V0	0.0000074	V0	0.0000000	V1
Lead	0.0008577	0.0007149	V0	0.0004937	V0	0.0000000	V1
Lithium	0.0000374	0.0000355	V0	0.0000148	V0	0.0000070	V0
Magnesium	0.0091409	0.0184756	V0	0.0141684	V0	0.0004126	V0
Manganese	0.0006949	0.0011009	V0	0.0007387	V0	0.0000000	V1
Molybdenum	0.0007116	0.0001308	V0	0.0000729	V0	0.0000322	V0
Neodymium	0.0000140	0.0000163	V0	0.0000050	V0	0.0000017	V0
Nickel	0.0005429	0.0002455	V0	0.0001775	V0	0.0000408	V0
Niobium	0.0000202	0.0000055	V0	0.0000022	V0	0.0000000	V1
Palladium	0.0000632	0.0000088	V0	0.0000000	V1	0.0000055	V0
Phosphorus	0.0459574	0.0134950	V0	0.0119211	V0	0.0096862	V0
Platinum	0.0000088	0.0000016	V0	0.0000014	V0	0.0000022	V0
Potassium	0.0061261	0.0319630	V0	0.0214413	V0	0.0006228	V0
Praseodymium	0.0000070	0.0000044	V0	0.0000013	V0	0.0000004	V0
Rubidium	0.0000184	0.0000641	V0	0.0000408	V0	0.0000011	V0
Samarium	0.0000133	0.0000028	V0	0.0000011	V0	0.0000000	V1
Selenium	0.0003366	0.0000685	V0	0.0000358	V0	0.0000000	V1
Silicon	0.7676322	0.1296061	V0	0.0770654	V0	0.0448651	V0
Silver	0.0000100	0.0000026	V0	0.0000019	V0	0.0000000	V1
Sodium	0.0169447	0.2649933	V0	0.0623830	V0	0.0008996	V0
Strontium	0.0003375	0.0002997	V0	0.0001433	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000027	V0	0.0000023	V0	0.0000005	V0
Thorium	0.0000059	0.0000054	V0	0.0000018	V0	0.0000011	V0
Tin	0.0004414	0.0001038	V0	0.0001441	V0	0.0000290	V0
Titanium	0.0015201	0.0016692	V0	0.0008535	V0	0.0006619	V0
Tungsten	0.0000938	0.0000923	V0	0.0000495	V0	0.0000000	V1
Uranium	0.0000048	0.0000019	V0	0.0000009	V0	0.0000005	V0
Vanadium	0.0007697	0.0003886	V0	0.0001227	V0	0.0000697	V0
Zinc	0.0055897	0.0036471	V0	0.0023398	V0	0.0000000	V1



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay			Patricia McInnes		Travel Blank
	Station #	AMS 1		AMS 6			
	Sample Date	08-Mar		08-Mar		08-Mar	
Particulate Size	PM2.5		PM2.5				
Total Air Volume (m ³)	24		24			24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	5.01	V0	6.52	V0	0.13	V0
Aluminum	0.1380326	0.0816019	V0	0.0666311	V0	0.0000000	V1
Antimony	0.0001784	0.0000483	V0	0.0000626	V0	0.0000000	V1
Arsenic	0.0001060	0.0001669	V0	0.0002261	V0	0.0000000	V1
Barium	0.0092847	0.0011229	V0	0.0006932	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000162	V0	0.0000102	V0	0.0000006	V0
Cadmium	0.0000174	0.0000208	V0	0.0000274	V0	0.0000000	V1
Calcium	0.4112124	0.0924152	V0	0.1329175	V0	0.0000000	V1
Cerium	0.0000174	0.0000963	V0	0.0000812	V0	0.0000000	V1
Cesium	0.0000100	0.0000080	V0	0.0000076	V0	0.0000000	V1
Chromium	0.0022262	0.0007560	V0	0.0003642	V0	0.0001283	V0
Cobalt	0.0000273	0.0000655	V0	0.0000850	V0	0.0000018	V0
Copper	0.0017171	0.0005881	V0	0.0005007	V0	0.0001300	V0
Iron	0.0393063	0.0804857	V0	0.0849050	V0	0.0018470	V0
Lanthanum	0.0000130	0.0000438	V0	0.0000385	V0	0.0000000	V1
Lead	0.0008577	0.0007594	V0	0.0009874	V0	0.0000000	V1
Lithium	0.0000374	0.0001013	V0	0.0000784	V0	0.0000026	V0
Magnesium	0.0091409	0.0520773	V0	0.0687314	V0	0.0012273	V0
Manganese	0.0006949	0.0015395	V0	0.0019749	V0	0.0000000	V1
Molybdenum	0.0007116	0.0000608	V0	0.0001819	V0	0.0000000	V1
Neodymium	0.0000140	0.0000393	V0	0.0000351	V0	0.0000000	V1
Nickel	0.0005429	0.0004706	V0	0.0004675	V0	0.0000859	V0
Niobium	0.0000202	0.0000127	V0	0.0000100	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000000	V1	0.0000000	V1
Phosphorus	0.0459574	0.0122973	V0	0.0146619	V0	0.0098471	V0
Platinum	0.0000088	-9999	M2	0.0000019	V0	0.0000016	V0
Potassium	0.0061261	0.0464735	V0	0.0572801	V0	0.0008210	V0
Praseodymium	0.0000070	0.0000105	V0	0.0000090	V0	0.0000000	V1
Rubidium	0.0000184	0.0001230	V0	0.0001204	V0	0.0000014	V0
Samarium	0.0000133	0.0000066	V0	0.0000060	V0	0.0000000	V1
Selenium	0.0003366	0.0001040	V0	0.0001199	V0	0.0000146	V0
Silicon	0.7676322	0.3485523	V0	0.3183734	V0	0.0000000	V1
Silver	0.0000100	0.0000044	V0	0.0000020	V0	0.0000000	V1
Sodium	0.0169447	0.1883391	V0	0.3126797	V0	0.0019946	V0
Strontium	0.0003375	0.0005069	V0	0.0006132	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000033	V0	0.0000040	V0	0.0000000	V1
Thorium	0.0000059	0.0000130	V0	0.0000111	V0	0.0000000	V1
Tin	0.0004414	0.0002021	V0	0.0002026	V0	0.0000000	V1
Titanium	0.0015201	0.0035133	V0	0.0031868	V0	0.0003403	V0
Tungsten	0.0000938	0.0000787	V0	0.0000881	V0	0.0000000	V1
Uranium	0.0000048	0.0000034	V0	0.0000042	V0	0.0000000	V1
Vanadium	0.0007697	0.0002427	V0	0.0010718	V0	0.0000710	V0
Zinc	0.0055897	0.0028825	V0	0.0028845	V0	0.0003184	V0



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 08-Mar PM2.5	AMS 14 08-Mar PM2.5	AMS 7 08-Mar PM2.5	AMS 14 08-Mar PM2.5	AMS 7 08-Mar PM2.5	AMS 14 08-Mar PM2.5	AMS 7 08-Mar PM2.5
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	7.54	V0	4.90	V0	0.13	V0
Aluminum	0.1380326	0.1102613	V0	0.0487636	V0	0.0000000	V1
Antimony	0.0001784	0.0000941	V0	0.0000666	V0	0.0000000	V1
Arsenic	0.0001060	0.0002002	V0	0.0001760	V0	0.0000000	V1
Barium	0.0092847	0.0014715	V0	0.0016213	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000139	V0	0.0000119	V0	0.0000006	V0
Cadmium	0.0000174	0.0000235	V0	0.0000312	V0	0.0000000	V1
Calcium	0.4112124	0.2371580	V0	0.1060367	V0	0.0000000	V1
Cerium	0.0000174	0.0001359	V0	0.0000596	V0	0.0000000	V1
Cesium	0.0000100	0.0000104	V0	0.0000063	V0	0.0000000	V1
Chromium	0.0022262	0.0004936	V0	0.0003547	V0	0.0001283	V0
Cobalt	0.0000273	0.0001143	V0	0.0000274	V0	0.0000018	V0
Copper	0.0017171	0.0007348	V0	0.0003915	V0	0.0001300	V0
Iron	0.0393063	0.1542543	V0	0.0561159	V0	0.0018470	V0
Lanthanum	0.0000130	0.0000634	V0	0.0000270	V0	0.0000000	V1
Lead	0.0008577	0.0008491	V0	0.0009140	V0	0.0000000	V1
Lithium	0.0000374	0.0001120	V0	0.0000516	V0	0.0000026	V0
Magnesium	0.0091409	0.0695474	V0	0.0583876	V0	0.0012273	V0
Manganese	0.0006949	0.0029988	V0	0.0013246	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003205	V0	0.0001556	V0	0.0000000	V1
Neodymium	0.0000140	0.0000586	V0	0.0000243	V0	0.0000000	V1
Nickel	0.0005429	0.0006338	V0	0.0003025	V0	0.0000859	V0
Niobium	0.0000202	0.0000150	V0	0.0000072	V0	0.0000000	V1
Palladium	0.0000632	0.0000038	V0	0.0000000	V1	0.0000000	V1
Phosphorus	0.0459574	0.0143892	V0	0.0123726	V0	0.0098471	V0
Platinum	0.0000088	0.0000022	V0	0.0000039	V0	0.0000016	V0
Potassium	0.0061261	0.0767836	V0	0.0457207	V0	0.0008210	V0
Praseodymium	0.0000070	0.0000150	V0	0.0000066	V0	0.0000000	V1
Rubidium	0.0000184	0.0001952	V0	0.0000999	V0	0.0000014	V0
Samarium	0.0000133	0.0000100	V0	0.0000051	V0	0.0000000	V1
Selenium	0.0003366	0.0001422	V0	0.0000817	V0	0.0000146	V0
Silicon	0.7676322	0.4764647	V0	0.2114633	V0	0.0000000	V1
Silver	0.0000100	0.0000018	V0	0.0000102	V0	0.0000000	V1
Sodium	0.0169447	0.4347703	V0	0.2304276	V0	0.0019946	V0
Strontium	0.0003375	0.0008151	V0	0.0005244	V0	0.0000000	V1
Tantalum	0.0000394	0.0000017	V0	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000039	V0	0.0000034	V0	0.0000000	V1
Thorium	0.0000059	0.0000183	V0	0.0000078	V0	0.0000000	V1
Tin	0.0004414	0.0002702	V0	0.0001833	V0	0.0000000	V1
Titanium	0.0015201	0.0044888	V0	0.0025555	V0	0.0003403	V0
Tungsten	0.0000938	0.0001201	V0	0.0000401	V0	0.0000000	V1
Uranium	0.0000048	0.0000056	V0	0.0000026	V0	0.0000000	V1
Vanadium	0.0007697	0.0012247	V0	0.0005714	V0	0.0000710	V0
Zinc	0.0055897	0.0038806	V0	0.0025212	V0	0.0003184	V0



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	14-Mar		14-Mar			14-Mar
Particulate Size	PM2.5		PM2.5				
Total Air Volume (m ³)	24		24			24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	QC Flag
Particulate Matter	1.00	11.78	V4	7.04	V0	0.09	V0
Aluminum	0.1380326	0.0534373	V0	0.0208414	V0	0.0000000	V1
Antimony	0.0001784	0.0021461	V0	0.0001845	V0	0.0000000	V1
Arsenic	0.0001060	0.0001585	V0	0.0002199	V0	0.0000000	V1
Barium	0.0092847	0.0010861	V0	0.0016739	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000147	V0	0.0000115	V0	0.0000000	V1
Cadmium	0.0000174	0.0000296	V0	0.0000240	V0	0.0000000	V1
Calcium	0.4112124	0.1158684	V0	0.0531700	V0	0.0000000	V1
Cerium	0.0000174	0.0000691	V0	0.0000387	V0	0.0000000	V1
Cesium	0.0000100	0.0000054	V0	0.0000032	V0	0.0000000	V1
Chromium	0.0022262	0.0006519	V0	0.0004732	V0	0.0000000	V1
Cobalt	0.0000273	0.0000550	V0	0.0000593	V0	0.0000022	V0
Copper	0.0017171	0.0014633	V0	0.0011929	V0	0.0000000	V1
Iron	0.0393063	0.0691268	V0	0.0383952	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000694	V0	0.0000408	V0	0.0000000	V1
Lead	0.0008577	0.0015720	V0	0.0005186	V0	0.0000000	V1
Lithium	0.0000374	0.0000719	V0	0.0000260	V0	0.0000025	V0
Magnesium	0.0091409	0.0318979	V0	0.0219637	V0	0.0005082	V0
Manganese	0.0006949	0.0022558	V0	0.0009098	V0	0.0000000	V1
Molybdenum	0.0007116	0.0005714	V0	0.0001397	V0	0.0000394	V0
Neodymium	0.0000140	0.0000284	V0	0.0000109	V0	0.0000000	V1
Nickel	0.0005429	0.0010330	V0	0.0009403	V0	0.0000328	V0
Niobium	0.0000202	0.0000119	V0	0.0000046	V0	0.0000000	V1
Palladium	0.0000632	0.0000034	V0	0.0000069	V0	0.0000000	V1
Phosphorus	0.0459574	0.0142710	V0	0.0138352	V0	0.0110563	V0
Platinum	0.0000088	0.0000013	V0	0.0000013	V0	0.0000030	V0
Potassium	0.0061261	0.0655476	V0	0.0560319	V0	0.0006065	V0
Praseodymium	0.0000070	0.0000075	V0	0.0000032	V0	0.0000000	V1
Rubidium	0.0000184	0.0001256	V0	0.0000924	V0	0.0000009	V0
Samarium	0.0000133	0.0000048	V0	0.0000016	V0	0.0000000	V1
Selenium	0.0003366	0.0001409	V0	0.0000922	V0	0.0000000	V1
Silicon	0.7676322	0.2267820	V0	0.1455298	V0	0.0967147	V0
Silver	0.0000100	0.0000073	V0	0.0000054	V0	0.0000000	V1
Sodium	0.0169447	0.0996614	V0	0.1234680	V0	0.0008824	V0
Strontium	0.0003375	0.0004091	V0	0.0002923	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000028	V0	0.0000022	V0	0.0000000	V1
Thorium	0.0000059	0.0000094	V0	0.0000033	V0	0.0000000	V1
Tin	0.0004414	0.0003073	V0	0.0003072	V0	0.0000000	V1
Titanium	0.0015201	0.0028307	V0	0.0016542	V0	0.0002869	V0
Tungsten	0.0000938	0.0000744	V0	0.0000826	V0	0.0000000	V1
Uranium	0.0000048	0.0000053	V0	0.0000023	V0	0.0000000	V1
Vanadium	0.0007697	0.0027964	V0	0.0001245	V0	0.0000000	V1
Zinc	0.0055897	0.0124869	V0	0.0046939	V0	0.0000000	V1



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 14-Mar PM2.5 24	Results (µg/m ³)	QC Flag	AMS 14 14-Mar PM2.5 24	Results (µg/m ³)	QC Flag	24 Results (µg/m ³) QC Flag
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	10.28	V0	3.52	V0	0.09	V0
Aluminum	0.1380326	0.0554583	V0	0.0165218	V0	0.0000000	V1
Antimony	0.0001784	0.0003977	V0	0.0000464	V0	0.0000000	V1
Arsenic	0.0001060	0.0001497	V0	0.0000859	V0	0.0000000	V1
Barium	0.0092847	0.0045826	V0	0.0004592	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000190	V0	0.0000089	V0	0.0000000	V1
Cadmium	0.0000174	0.0000293	V0	0.0000145	V0	0.0000000	V1
Calcium	0.4112124	0.1514916	V0	0.0363750	V0	0.0000000	V1
Cerium	0.0000174	0.0000987	V0	0.0000221	V0	0.0000000	V1
Cesium	0.0000100	0.0000063	V0	0.0000023	V0	0.0000000	V1
Chromium	0.0022262	0.0005692	V0	0.0004087	V0	0.0000000	V1
Cobalt	0.0000273	0.0000784	V0	0.0000215	V0	0.0000022	V0
Copper	0.0017171	0.0029061	V0	0.0004187	V0	0.0000000	V1
Iron	0.0393063	0.1254754	V0	0.0146610	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000592	V0	0.0000353	V0	0.0000000	V1
Lead	0.0008577	0.0006278	V0	0.0003576	V0	0.0000000	V1
Lithium	0.0000374	0.0000594	V0	0.0000157	V0	0.0000025	V0
Magnesium	0.0091409	0.0378829	V0	0.0152717	V0	0.0005082	V0
Manganese	0.0006949	0.0029014	V0	0.0005875	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003026	V0	0.0001965	V0	0.0000394	V0
Neodymium	0.0000140	0.0000326	V0	0.0000081	V0	0.0000000	V1
Nickel	0.0005429	0.0006733	V0	0.0002683	V0	0.0000328	V0
Niobium	0.0000202	0.0000125	V0	0.0000036	V0	0.0000000	V1
Palladium	0.0000632	0.0000121	V0	0.0000000	V1	0.0000000	V1
Phosphorus	0.0459574	0.0130453	V0	0.0139214	V0	0.0110563	V0
Platinum	0.0000088	0.0000020	V0	0.0000023	V0	0.0000030	V0
Potassium	0.0061261	0.1139889	V0	0.0186788	V0	0.0006065	V0
Praseodymium	0.0000070	0.0000091	V0	0.0000021	V0	0.0000000	V1
Rubidium	0.0000184	0.0001904	V0	0.0000320	V0	0.0000009	V0
Samarium	0.0000133	0.0000055	V0	0.0000014	V0	0.0000000	V1
Selenium	0.0003366	0.0001305	V0	0.0000825	V0	0.0000000	V1
Silicon	0.7676322	0.2460352	V0	0.1939169	V0	0.0967147	V0
Silver	0.0000100	0.0000076	V0	0.0000017	V0	0.0000000	V1
Sodium	0.0169447	0.3642983	V0	0.0538775	V0	0.0008824	V0
Strontium	0.0003375	0.0006843	V0	0.0001619	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000029	V0	0.0000013	V0	0.0000000	V1
Thorium	0.0000059	0.0000092	V0	0.0000025	V0	0.0000000	V1
Tin	0.0004414	0.0003798	V0	0.0001174	V0	0.0000000	V1
Titanium	0.0015201	0.0039800	V0	0.0034599	V0	0.0002869	V0
Tungsten	0.0000938	0.0001701	V0	0.0000147	V0	0.0000000	V1
Uranium	0.0000048	0.0000039	V0	0.0000013	V0	0.0000000	V1
Vanadium	0.0007697	0.0002150	V0	0.0001169	V0	0.0000000	V1
Zinc	0.0055897	0.0080217	V0	0.0027102	V0	0.0000000	V1



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	20-Mar		20-Mar		20-Mar	
Particulate Size	PM2.5		PM2.5				
Total Air Volume (m ³)	24		24		24		
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	7.08	V0	5.64	V0	0.33	V0
Aluminum	0.1380326	0.0690712	V0	0.0236425	V0	0.0000000	V1
Antimony	0.0001784	0.0000261	V0	0.0000551	V0	0.0000000	V1
Arsenic	0.0001060	0.0000698	V0	0.0000837	V0	0.0000000	V1
Barium	0.0092847	0.0006472	V0	0.0006237	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000054	V0	0.0000072	V0	0.0000000	V1
Cadmium	0.0000174	0.0000120	V0	0.0000158	V0	0.0000000	V1
Calcium	0.4112124	0.0940906	V0	0.0436930	V0	0.0000000	V1
Cerium	0.0000174	0.0000856	V0	0.0000313	V0	0.0000000	V1
Cesium	0.0000100	0.0000060	V0	0.0000033	V0	0.0000000	V1
Chromium	0.0022262	0.0002064	V0	0.0001852	V0	0.0000000	V1
Cobalt	0.0000273	0.0000264	V0	0.0000144	V0	0.0000015	V0
Copper	0.0017171	0.0003362	V0	0.0006168	V0	0.0000000	V1
Iron	0.0393063	0.0718661	V0	0.0329464	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000414	V0	0.0000143	V0	0.0000000	V1
Lead	0.0008577	0.0002789	V0	0.0004000	V0	0.0000000	V1
Lithium	0.0000374	0.0000858	V0	0.0000328	V0	0.0000020	V0
Magnesium	0.0091409	0.0262586	V0	0.0192660	V0	0.0000000	V1
Manganese	0.0006949	0.0013827	V0	0.0007638	V0	0.0000000	V1
Molybdenum	0.0007116	0.0001462	V0	0.0001506	V0	0.0000856	V0
Neodymium	0.0000140	0.0000364	V0	0.0000121	V0	0.0000000	V1
Nickel	0.0005429	0.0002847	V0	0.0001711	V0	0.0000374	V0
Niobium	0.0000202	0.0000106	V0	0.0000034	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000000	V1	0.0000042	V0
Phosphorus	0.0459574	0.0130703	V0	0.0126519	V0	0.0129987	V0
Platinum	0.0000088	0.0000028	V0	0.0000037	V0	0.0000029	V0
Potassium	0.0061261	0.0293100	V0	0.0963121	V0	0.0003855	V0
Praseodymium	0.0000070	0.0000094	V0	0.0000033	V0	0.0000000	V1
Rubidium	0.0000184	0.0000983	V0	0.0000664	V0	0.0000009	V0
Samarium	0.0000133	0.0000070	V0	0.0000020	V0	0.0000000	V1
Selenium	0.0003366	0.0000867	V0	0.0000593	V0	0.0000000	V1
Silicon	0.7676322	0.4934667	V0	0.1828392	V0	0.1219583	V0
Silver	0.0000100	0.0000024	V0	0.0000016	V0	0.0000000	V1
Sodium	0.0169447	0.0979582	V0	0.1368210	V0	0.0008088	V0
Strontium	0.0003375	0.0003712	V0	0.0002434	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000022	V0	0.0000023	V0	0.0000000	V1
Thorium	0.0000059	0.0000111	V0	0.0000037	V0	0.0000000	V1
Tin	0.0004414	0.0001717	V0	0.0001098	V0	0.0000384	V0
Titanium	0.0015201	0.0035621	V0	0.0012354	V0	0.0011234	V0
Tungsten	0.0000938	0.0000155	V0	0.0000146	V0	0.0000000	V1
Uranium	0.0000048	0.0000032	V0	0.0000015	V0	0.0000000	V1
Vanadium	0.0007697	0.0006586	V0	0.0005173	V0	0.0000000	V1
Zinc	0.0055897	0.0011337	V0	0.0018888	V0	0.0000000	V1



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³) Compound Name	Athabasca Valley AMS 7 20-Mar PM2.5 24			Anzac AMS 14 20-Mar PM2.5 24		Travel Blank 20-Mar 24	
	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	6.52	V0	4.17	V0	0.33	V0
Aluminum	0.1380326	0.0363500	V0	0.0216123	V0	0.0000000	V1
Antimony	0.0001784	0.0000710	V0	0.0000370	V0	0.0000000	V1
Arsenic	0.0001060	0.0001096	V0	0.0001074	V0	0.0000000	V1
Barium	0.0092847	0.0008155	V0	0.0000000	V1	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000084	V0	0.0000096	V0	0.0000000	V1
Cadmium	0.0000174	0.0000208	V0	0.0000162	V0	0.0000000	V1
Calcium	0.4112124	0.0650278	V0	0.0474513	V0	0.0000000	V1
Cerium	0.0000174	0.0000495	V0	0.0000216	V0	0.0000000	V1
Cesium	0.0000100	0.0000047	V0	0.0000031	V0	0.0000000	V1
Chromium	0.0022262	0.0002462	V0	0.0002476	V0	0.0000000	V1
Cobalt	0.0000273	0.0000212	V0	0.0000119	V0	0.0000015	V0
Copper	0.0017171	0.0005562	V0	0.0003118	V0	0.0000000	V1
Iron	0.0393063	0.0483295	V0	0.0198028	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000234	V0	0.0000106	V0	0.0000000	V1
Lead	0.0008577	0.0004818	V0	0.0004236	V0	0.0000000	V1
Lithium	0.0000374	0.0000423	V0	0.0000235	V0	0.0000020	V0
Magnesium	0.0091409	0.0260029	V0	0.0157602	V0	0.0000000	V1
Manganese	0.0006949	0.0009984	V0	0.0004736	V0	0.0000000	V1
Molybdenum	0.0007116	0.0002739	V0	0.0001555	V0	0.0000856	V0
Neodymium	0.0000140	0.0000193	V0	0.0000093	V0	0.0000000	V1
Nickel	0.0005429	0.0002607	V0	0.0001793	V0	0.0000374	V0
Niobium	0.0000202	0.0000056	V0	0.0000034	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000083	V0	0.0000042	V0
Phosphorus	0.0459574	0.0128240	V0	0.0119606	V0	0.0129987	V0
Platinum	0.0000088	0.0000028	V0	0.0000022	V0	0.0000029	V0
Potassium	0.0061261	0.0407904	V0	0.0218116	V0	0.0003855	V0
Praseodymium	0.0000070	0.0000049	V0	0.0000024	V0	0.0000000	V1
Rubidium	0.0000184	0.0000807	V0	0.0000448	V0	0.0000009	V0
Samarium	0.0000133	0.0000036	V0	0.0000016	V0	0.0000000	V1
Selenium	0.0003366	0.0000865	V0	0.0000721	V0	0.0000000	V1
Silicon	0.7676322	0.2240617	V0	0.1558628	V0	0.1219583	V0
Silver	0.0000100	-9999	M2	-9999	M2	0.0000000	V1
Sodium	0.0169447	0.2262238	V0	0.0721767	V0	0.0008088	V0
Strontium	0.0003375	0.0003381	V0	0.0002012	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000029	V0	0.0000024	V0	0.0000000	V1
Thorium	0.0000059	0.0000057	V0	0.0000031	V0	0.0000000	V1
Tin	0.0004414	0.0002209	V0	-9999	M2	0.0000384	V0
Titanium	0.0015201	0.0023927	V0	0.0013838	V0	0.0011234	V0
Tungsten	0.0000938	0.0000249	V0	0.0000051	V0	0.0000000	V1
Uranium	0.0000048	0.0000025	V0	0.0000013	V0	0.0000000	V1
Vanadium	0.0007697	0.0012442	V0	0.0007209	V0	0.0000000	V1
Zinc	0.0055897	0.0022831	V0	0.0016076	V0	0.0000000	V1



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay			Patricia McInnes		Travel Blank
	Station #	AMS 1		AMS 6			
	Sample Date	26-Mar		26-Mar		26-Mar	
Particulate Size	PM2.5		PM2.5				
Total Air Volume (m ³)	24		24			24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	9.70	V0	5.58	V0	0.04	V0
Aluminum	0.1380326	0.0167308	V0	0.0122814	V0	0.0000000	V1
Antimony	0.0001784	0.0000625	V0	0.0001078	V0	0.0000000	V1
Arsenic	0.0001060	0.0001192	V0	0.0001160	V0	0.0000000	V1
Barium	0.0092847	0.0000000	V1	0.0007167	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000062	V0	0.0000071	V0	0.0000008	V0
Cadmium	0.0000174	0.0000162	V0	0.0002146	V0	0.0000000	V1
Calcium	0.4112124	0.0244512	V0	0.0228084	V0	0.0000000	V1
Cerium	0.0000174	0.0000211	V0	0.0000235	V0	0.0000000	V1
Cesium	0.0000100	0.0000022	V0	0.0000020	V0	0.0000000	V1
Chromium	0.0022262	0.0002216	V0	0.0002142	V0	0.0000000	V1
Cobalt	0.0000273	0.0000106	V0	0.0000069	V0	0.0000024	V0
Copper	0.0017171	0.0006162	V0	0.0006216	V0	0.0001152	V0
Iron	0.0393063	0.0198056	V0	0.0176856	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000133	V0	0.0000159	V0	0.0000000	V1
Lead	0.0008577	0.0003891	V0	0.0005668	V0	0.0000000	V1
Lithium	0.0000374	0.0000173	V0	0.0000145	V0	0.0000042	V0
Magnesium	0.0091409	0.0072889	V0	0.0072823	V0	0.0000000	V1
Manganese	0.0006949	0.0013793	V0	0.0005438	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003507	V0	0.0000658	V0	0.0000368	V0
Neodymium	0.0000140	0.0000079	V0	0.0000063	V0	0.0000010	V0
Nickel	0.0005429	0.0003641	V0	0.0001055	V0	0.0000473	V0
Niobium	0.0000202	0.0000037	V0	0.0000027	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000000	V1	0.0000284	V0
Phosphorus	0.0459574	0.0143559	V0	0.0133443	V0	0.0108788	V0
Platinum	0.0000088	0.0000019	V0	0.0000028	V0	0.0000031	V0
Potassium	0.0061261	0.0291049	V0	0.0834767	V0	0.0014158	V0
Praseodymium	0.0000070	0.0000019	V0	0.0000017	V0	0.0000005	V0
Rubidium	0.0000184	0.0000469	V0	0.0000613	V0	0.0000011	V0
Samarium	0.0000133	0.0000011	V0	0.0000009	V0	0.0000008	V0
Selenium	0.0003366	0.0001270	V0	0.0001028	V0	0.0000000	V1
Silicon	0.7676322	0.0650367	V0	0.0395426	V0	0.0741125	V0
Silver	0.0000100	0.0000013	V0	0.0000019	V0	0.0000017	V0
Sodium	0.0169447	0.0228205	V0	0.0285409	V0	0.0007219	V0
Strontium	0.0003375	0.0000993	V0	0.0001097	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000019	V0	0.0000020	V0	0.0000007	V0
Thorium	0.0000059	0.0000023	V0	0.0000019	V0	0.0000006	V0
Tin	0.0004414	-9999	M2	0.0002055	V0	0.0000000	V1
Titanium	0.0015201	0.0011564	V0	0.0010212	V0	0.0003597	V0
Tungsten	0.0000938	0.0000096	V0	0.0000155	V0	0.0000083	V0
Uranium	0.0000048	0.0000024	V0	0.0000013	V0	0.0000006	V0
Vanadium	0.0007697	0.0014130	V0	0.0000593	V0	0.0000000	V1
Zinc	0.0055897	0.0032411	V0	0.0027365	V0	0.0000000	V1



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 26-Mar PM2.5 24	Results (µg/m ³)	QC Flag	AMS 14 26-Mar PM2.5 24	Results (µg/m ³)	QC Flag	26-Mar 24 Results (µg/m ³) QC Flag
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	5.38	V0	4.13	V0	0.04	V0
Aluminum	0.1380326	0.0202276	V0	0.0123233	V0	0.0000000	V1
Antimony	0.0001784	0.0002152	V0	0.0000627	V0	0.0000000	V1
Arsenic	0.0001060	0.0001032	V0	0.0000695	V0	0.0000000	V1
Barium	0.0092847	0.0017454	V0	0.0000000	V1	0.0000000	V1
Beryllium	0.0000946	0.0000061	V0	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000108	V0	0.0000060	V0	0.0000008	V0
Cadmium	0.0000174	0.0000227	V0	0.0000132	V0	0.0000000	V1
Calcium	0.4112124	0.0312263	V0	0.0287047	V0	0.0000000	V1
Cerium	0.0000174	0.0000317	V0	0.0000197	V0	0.0000000	V1
Cesium	0.0000100	0.0000031	V0	0.0000021	V0	0.0000000	V1
Chromium	0.0022262	0.0002216	V0	0.0002829	V0	0.0000000	V1
Cobalt	0.0000273	0.0000134	V0	0.0000088	V0	0.0000024	V0
Copper	0.0017171	0.0012863	V0	-9999	M2	0.0001152	V0
Iron	0.0393063	0.0311166	V0	0.0158602	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000229	V0	0.0000140	V0	0.0000000	V1
Lead	0.0008577	0.0005793	V0	0.0003520	V0	0.0000000	V1
Lithium	0.0000374	0.0000250	V0	0.0000138	V0	0.0000042	V0
Magnesium	0.0091409	0.0105310	V0	0.0065349	V0	0.0000000	V1
Manganese	0.0006949	0.0007107	V0	0.0004123	V0	0.0000000	V1
Molybdenum	0.0007116	0.0001538	V0	0.0000524	V0	0.0000368	V0
Neodymium	0.0000140	0.0000098	V0	0.0000124	V0	0.0000010	V0
Nickel	0.0005429	0.0001236	V0	0.0001617	V0	0.0000473	V0
Niobium	0.0000202	0.0000054	V0	0.0000023	V0	0.0000000	V1
Palladium	0.0000632	0.0000094	V0	-9999	M2	0.0000284	V0
Phosphorus	0.0459574	0.0180596	V0	0.0125660	V0	0.0108788	V0
Platinum	0.0000088	0.0000022	V0	0.0000024	V0	0.0000031	V0
Potassium	0.0061261	0.0353363	V0	0.0241683	V0	0.0014158	V0
Praseodymium	0.0000070	0.0000029	V0	0.0000026	V0	0.0000005	V0
Rubidium	0.0000184	0.0000627	V0	0.0000342	V0	0.0000011	V0
Samarium	0.0000133	0.0000016	V0	0.0000026	V0	0.0000008	V0
Selenium	0.0003366	0.0001161	V0	0.0000710	V0	0.0000000	V1
Silicon	0.7676322	0.3267832	V0	0.0518373	V0	0.0741125	V0
Silver	0.0000100	0.0000032	V0	0.0000031	V0	0.0000017	V0
Sodium	0.0169447	0.0505683	V0	0.0197912	V0	0.0007219	V0
Strontium	0.0003375	0.0001865	V0	0.0000826	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000025	V0	0.0000018	V0	0.0000007	V0
Thorium	0.0000059	0.0000032	V0	0.0000020	V0	0.0000006	V0
Tin	0.0004414	0.0003272	V0	0.0001878	V0	0.0000000	V1
Titanium	0.0015201	0.0030531	V0	0.0009132	V0	0.0003597	V0
Tungsten	0.0000938	0.0000227	V0	0.0000067	V0	0.0000083	V0
Uranium	0.0000048	0.0000019	V0	0.0000015	V0	0.0000006	V0
Vanadium	0.0007697	0.0000939	V0	0.0000521	V0	0.0000000	V1
Zinc	0.0055897	0.0029729	V0	0.0023622	V0	0.0000000	V1



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Particulate Matter (PM2.5) - METALS - Summary

2017

Indicated Sites and Dates

Station Name	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay
Station #	AMS 1	AMS 1	AMS 1	AMS 1
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	8.92	2.83	5	5
Aluminum	0.0845499	0.0699798	5	5
Antimony	0.0004726	0.0009357	5	5
Arsenic	0.0001678	0.0000956	5	5
Barium	0.0009329	0.0006666	5	4
Beryllium	0.0000022	0.0000049	5	1
Bismuth	0.0000148	0.0000105	5	5
Cadmium	0.0000210	0.0000072	5	5
Calcium	0.1116564	0.0752552	5	5
Cerium	0.0001020	0.0000813	5	5
Cesium	0.0000078	0.0000058	5	5
Chromium	0.0005539	0.0003264	5	5
Cobalt	0.0000907	0.0001169	5	5
Copper	0.0007812	0.0004308	5	5
Iron	0.0901124	0.0707273	5	5
Lanthanum	0.0000563	0.0000376	5	5
Lead	0.0007718	0.0005093	5	5
Lithium	0.0001132	0.0001035	5	5
Magnesium	0.0317789	0.0168397	5	5
Manganese	0.0021751	0.0012514	5	5
Molybdenum	0.0004703	0.0004645	5	5
Neodymium	0.0000428	0.0000353	5	5
Nickel	0.0006998	0.0004656	5	5
Niobium	0.0000139	0.0000099	5	5
Palladium	0.0000027	0.0000044	5	2
Phosphorus	0.0140395	0.0014840	5	5
Platinum	0.0000019	0.0000007	4	4
Potassium	0.0495096	0.0215215	5	5
Praseodymium	0.0000112	0.0000092	5	5
Rubidium	0.0001346	0.0000867	5	5
Samarium	0.0000075	0.0000064	5	5
Selenium	0.0001527	0.0000875	5	5
Silicon	0.3635630	0.2385334	5	5
Silver	0.0000039	0.0000023	5	5
Sodium	0.0989863	0.0590580	5	5
Strontium	0.0004332	0.0002457	5	5
Tantalum	0.0000004	0.0000009	5	1
Thallium	0.0000031	0.0000014	5	5
Thorium	0.0000136	0.0000111	5	5
Tin	0.0002110	0.0000664	4	4
Titanium	0.0044911	0.0039793	5	5
Tungsten	0.0000605	0.0000479	5	5
Uranium	0.0000054	0.0000044	5	5
Vanadium	0.0023015	0.0024871	5	5
Zinc	0.0050567	0.0044400	5	5



Station Name	Patricia McInnes	Patricia McInnes	Patricia McInnes	Patricia McInnes
Station #	AMS 6	AMS 6	AMS 6	AMS 6
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	6.15	0.62	5	5
Aluminum	0.0293377	0.0213476	5	5
Antimony	0.0000990	0.0000520	5	5
Arsenic	0.0001563	0.0000637	5	5
Barium	0.0008530	0.0004631	5	5
Beryllium	0.0000000	0.0000000	5	0
Bismuth	0.0000087	0.0000020	5	5
Cadmium	0.0000598	0.0000867	5	5
Calcium	0.0596003	0.0424992	5	5
Cerium	0.0000410	0.0000231	5	5
Cesium	0.0000039	0.0000021	5	5
Chromium	0.0002973	0.0001195	5	5
Cobalt	0.0000442	0.0000328	5	5
Copper	0.0006966	0.0002819	5	5
Iron	0.0407740	0.0258117	5	5
Lanthanum	0.0000244	0.0000140	5	5
Lead	0.0006241	0.0002220	5	5
Lithium	0.0000368	0.0000244	5	5
Magnesium	0.0260767	0.0245118	5	5
Manganese	0.0009968	0.0005625	5	5
Molybdenum	0.0001362	0.0000428	5	5
Neodymium	0.0000151	0.0000114	5	5
Nickel	0.0003886	0.0003373	5	5
Niobium	0.0000050	0.0000029	5	5
Palladium	0.0000031	0.0000042	5	2
Phosphorus	0.0132960	0.0010354	5	5
Platinum	0.0000023	0.0000009	5	5
Potassium	0.0645749	0.0259897	5	5
Praseodymium	0.0000041	0.0000028	5	5
Rubidium	0.0000816	0.0000248	5	5
Samarium	0.0000025	0.0000020	5	5
Selenium	0.0000861	0.0000277	5	5
Silicon	0.1591575	0.1035248	5	5
Silver	0.0000026	0.0000016	5	5
Sodium	0.1425800	0.1040553	5	5
Strontium	0.0002894	0.0001933	5	5
Tantalum	0.0000000	0.0000000	5	0
Thallium	0.0000026	0.0000008	5	5
Thorium	0.0000047	0.0000036	5	5
Tin	0.0001842	0.0000856	5	5
Titanium	0.0017358	0.0008510	5	5
Tungsten	0.0000571	0.0000384	5	5
Uranium	0.0000021	0.0000013	5	5
Vanadium	0.0004167	0.0004073	5	5
Zinc	0.0030163	0.0010247	5	5



Station Name	Athabasca Valley	Athabasca Valley	Athabasca Valley	Athabasca Valley
Station #	AMS 7	AMS 7	AMS 7	AMS 7
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	6.98	2.08	5	5
Aluminum	0.0507120	0.0356458	5	5
Antimony	0.0001768	0.0001353	5	5
Arsenic	0.0001419	0.0000388	5	5
Barium	0.0019277	0.0015284	5	5
Beryllium	0.0000012	0.0000027	5	1
Bismuth	0.0000138	0.0000043	5	5
Cadmium	0.0000227	0.0000044	5	5
Calcium	0.1149602	0.0812398	5	5
Cerium	0.0000722	0.0000438	5	5
Cesium	0.0000057	0.0000029	5	5
Chromium	0.0003720	0.0001532	5	5
Cobalt	0.0000550	0.0000418	5	5
Copper	0.0012633	0.0009571	5	5
Iron	0.0818788	0.0544142	5	5
Lanthanum	0.0000376	0.0000218	5	5
Lead	0.0006506	0.0001393	5	5
Lithium	0.0000549	0.0000343	5	5
Magnesium	0.0324880	0.0230381	5	5
Manganese	0.0017420	0.0011126	5	5
Molybdenum	0.0002363	0.0000878	5	5
Neodymium	0.0000273	0.0000194	5	5
Nickel	0.0003874	0.0002491	5	5
Niobium	0.0000088	0.0000046	5	5
Palladium	0.0000068	0.0000048	5	4
Phosphorus	0.0143626	0.0021520	5	5
Platinum	0.0000022	0.0000004	5	5
Potassium	0.0597724	0.0352123	5	5
Praseodymium	0.0000073	0.0000049	5	5
Rubidium	0.0001186	0.0000681	5	5
Samarium	0.0000047	0.0000033	5	5
Selenium	0.0001087	0.0000307	5	5
Silicon	0.2805902	0.1300830	5	5
Silver	0.0000038	0.0000026	4	4
Sodium	0.2681708	0.1467280	5	5
Strontium	0.0004647	0.0002700	5	5
Tantalum	0.0000003	0.0000008	5	1
Thallium	0.0000030	0.0000006	5	5
Thorium	0.0000083	0.0000059	5	5
Tin	0.0002604	0.0001060	5	5
Titanium	0.0031168	0.0011458	5	5
Tungsten	0.0000860	0.0000633	5	5
Uranium	0.0000032	0.0000016	5	5
Vanadium	0.0006333	0.0005588	5	5
Zinc	0.0041611	0.0022464	5	5



Station Name	Anzac	Anzac	Anzac	Anzac
Station #	AMS 14	AMS 14	AMS 14	AMS 14
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM2.5	PM2.5	PM2.5	PM2.5
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	3.88	0.84	5	5
Aluminum	0.0226319	0.0150257	5	5
Antimony	0.0000508	0.0000132	5	5
Arsenic	0.0001113	0.0000407	5	5
Barium	0.0005120	0.0006631	5	3
Beryllium	0.0000000	0.0000000	5	0
Bismuth	0.0000101	0.0000031	5	5
Cadmium	0.0000185	0.0000073	5	5
Calcium	0.0508574	0.0315674	5	5
Cerium	0.0000270	0.0000186	5	5
Cesium	0.0000033	0.0000018	5	5
Chromium	0.0003035	0.0000768	5	5
Cobalt	0.0000186	0.0000079	5	5
Copper	0.0003705	0.0000459	4	4
Iron	0.0305989	0.0193229	5	5
Lanthanum	0.0000189	0.0000118	5	5
Lead	0.0005082	0.0002340	5	5
Lithium	0.0000239	0.0000160	5	5
Magnesium	0.0220246	0.0206686	5	5
Manganese	0.0007073	0.0003668	5	5
Molybdenum	0.0001266	0.0000612	5	5
Neodymium	0.0000118	0.0000074	5	5
Nickel	0.0002179	0.0000632	5	5
Niobium	0.0000037	0.0000020	5	5
Palladium	0.0000021	0.0000041	4	1
Phosphorus	0.0125484	0.0008148	5	5
Platinum	0.0000024	0.0000009	5	5
Potassium	0.0263641	0.0109946	5	5
Praseodymium	0.0000030	0.0000021	5	5
Rubidium	0.0000503	0.0000282	5	5
Samarium	0.0000024	0.0000016	5	5
Selenium	0.0000686	0.0000191	5	5
Silicon	0.1380291	0.0706747	5	5
Silver	0.0000042	0.0000040	4	4
Sodium	0.0877312	0.0821715	5	5
Strontium	0.0002227	0.0001740	5	5
Tantalum	0.0000000	0.0000000	5	0
Thallium	0.0000022	0.0000008	5	5
Thorium	0.0000035	0.0000025	5	5
Tin	0.0001581	0.0000335	4	4
Titanium	0.0018332	0.0011375	5	5
Tungsten	0.0000232	0.0000203	5	5
Uranium	0.0000015	0.0000006	5	5
Vanadium	0.0003168	0.0003065	5	5
Zinc	0.0023082	0.0004189	5	5



Wood Buffalo Environmental Association

PM2.5 Metal Summary

2017 March

Compound	% Det	N	N < Det.	Min.	10%	25%	50%	60%	75%	80%	90%	95%	99%	Max.	Mean	Std. Dev.	Median	Outlier Test	
Particulate Matter	100.0%	20	0	64	99	120	143	157	181	233	265	283	283	283	156	60	143	456	
Aluminium	100.0%	20	0	0.2948	0.3345	0.4855	0.7503	1.1703	1.5991	1.6577	2.6463	4.8458	4.8458	4.8458	1.1234	1.0880	0.7503	6.5632	
Antimony	100.0%	20	0	0.0006	0.0010	0.0013	0.0017	0.0020	0.0026	0.0044	0.0095	0.0515	0.0515	0.0515	0.0048	0.0112	0.0017	0.0607	
Arsenic	100.0%	20	0	0.0017	0.0020	0.0026	0.0033	0.0036	0.0042	0.0048	0.0054	0.0078	0.0078	0.0078	0.0035	0.0015	0.0033	0.0110	
Barium	85.0%	20	3	0.0074	0.0078	0.0134	0.0196	0.0261	0.0389	0.0402	0.0434	0.1100	0.1100	0.1100	0.0265	0.0231	0.0196	0.1418	
Beryllium	10.0%	20	18	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0003	0.0003	0.0001	0.0001	0.0001	0.0004	
Bismuth	100.0%	20	0	0.0001	0.0001	0.0002	0.0003	0.0003	0.0004	0.0004	0.0005	0.0008	0.0008	0.0008	0.0003	0.0001	0.0003	0.0010	
Cadmium	100.0%	20	0	0.0003	0.0003	0.0004	0.0005	0.0006	0.0007	0.0007	0.0007	0.0007	0.0052	0.0052	0.0052	0.0007	0.0010	0.0005	0.0060
Calcium	100.0%	20	0	0.5474	0.6889	0.8730	1.5607	2.2180	2.7808	3.1900	5.5550	5.6918	5.6918	5.6918	2.0224	1.5313	1.5607	9.6789	
Cerium	100.0%	20	0	0.0003	0.0005	0.0006	0.0011	0.0014	0.0021	0.0023	0.0033	0.0057	0.0057	0.0057	0.0015	0.0013	0.0011	0.0079	
Cesium	100.0%	20	0	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0004	0.0004	0.0004	0.0001	0.0001	0.0001	0.0006	
Chromium	100.0%	20	0	0.0044	0.0051	0.0054	0.0079	0.0087	0.0118	0.0137	0.0181	0.0224	0.0224	0.0224	0.0092	0.0050	0.0079	0.0340	
Cobalt	100.0%	20	0	0.0002	0.0003	0.0003	0.0007	0.0013	0.0016	0.0019	0.0027	0.0071	0.0071	0.0071	0.0013	0.0016	0.0007	0.0090	
Copper	100.0%	20	0	0.0075	0.0086	0.0120	0.0148	0.0176	0.0233	0.0286	0.0351	0.0697	0.0697	0.0697	0.0194	0.0142	0.0148	0.0902	
Iron	100.0%	20	0	0.3519	0.4245	0.7185	1.1599	1.3468	1.9317	2.0377	3.7021	5.0227	5.0227	5.0227	1.4602	1.2200	1.1599	7.5601	
Lanthanum	100.0%	20	0	0.0002	0.0003	0.0003	0.0006	0.0009	0.0011	0.0014	0.0017	0.0027	0.0027	0.0027	0.0008	0.0006	0.0006	0.0040	
Lead	100.0%	20	0	0.0067	0.0086	0.0102	0.0139	0.0155	0.0204	0.0206	0.0237	0.0377	0.0377	0.0377	0.0153	0.0072	0.0139	0.0513	
Lithium	100.0%	20	0	0.0003	0.0004	0.0006	0.0009	0.0012	0.0019	0.0021	0.0027	0.0069	0.0069	0.0069	0.0014	0.0015	0.0009	0.0089	
Magnesium	100.0%	20	0	0.1568	0.1749	0.3400	0.5271	0.6302	0.9929	1.2499	1.6496	1.6691	1.6691	1.6691	0.6742	0.4843	0.5271	3.0960	
Manganese	100.0%	20	0	0.0099	0.0131	0.0177	0.0264	0.0331	0.0474	0.0541	0.0720	0.1036	0.1036	0.1036	0.0337	0.0245	0.0264	0.1563	
Molybdenum	100.0%	20	0	0.0013	0.0016	0.0034	0.0037	0.0044	0.0073	0.0077	0.0137	0.0293	0.0293	0.0293	0.0058	0.0063	0.0037	0.0372	
Neodymium	100.0%	20	0	0.0001	0.0002	0.0002	0.0004	0.0006	0.0008	0.0009	0.0014	0.0024	0.0024	0.0024	0.0006	0.0006	0.0004	0.0034	
Nickel	100.0%	20	0	0.0025	0.0039	0.0043	0.0068	0.0087	0.0152	0.0162	0.0248	0.0323	0.0323	0.0323	0.0102	0.0082	0.0068	0.0509	
Niobium	100.0%	20	0	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003	0.0003	0.0004	0.0007	0.0007	0.0007	0.0002	0.0002	0.0001	0.0010	
Palladium	50.0%	20	10	0.0000	0.0000	0.0001	0.0001	0.0002	0.0002	0.0002	0.0003	0.0006	0.0006	0.0006	0.0001	0.0001	0.0001	0.0008	
Phosphorus	100.0%	20	0	0.2861	0.2877	0.3016	0.3203	0.3320	0.3445	0.3453	0.3889	0.4334	0.4334	0.4334	0.3255	0.0366	0.3203	0.5083	
Platinum	100.0%	20	0	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0003	0.0003	0.0001	0.0001	0.0003	
Potassium	100.0%	20	0	0.4483	0.5235	0.7034	1.0973	1.3448	1.8428	1.8507	2.3115	2.7357	2.7357	2.7357	1.2013	0.6591	1.0973	4.4971	
Praseodymium	100.0%	20	0	0.0000	0.0000	0.0001	0.0001	0.0002	0.0002	0.0002	0.0004	0.0006	0.0006	0.0006	0.0002	0.0001	0.0001	0.0009	
Rubidium	100.0%	20	0	0.0008	0.0010	0.0015	0.0019	0.0024	0.0030	0.0030	0.0047	0.0067	0.0067	0.0067	0.0023	0.0015	0.0019	0.0099	
Samarium	100.0%	20	0	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0004	0.0004	0.0001	0.0001	0.0001	0.0006	
Selenium	100.0%	20	0	0.0009	0.0014	0.0017	0.0022	0.0025	0.0030	0.0031	0.0034	0.0073	0.0073	0.0073	0.0025	0.0013	0.0022	0.0092	
Silicon	100.0%	20	0	0.9490	1.5609	3.1105	5.0751	5.4428	7.8428	8.3653	11.8432	16.4155	16.4155	16.4155	5.6480	3.9968	5.0751	25.6321	
Silver	100.0%	20	0	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0007	0.0007	0.0007	0.0001	0.0001	0.0008	
Sodium	100.0%	20	0	0.4750	0.6850	1.4972	2.6734	3.2837	5.5303	6.3598	8.7432	10.4345	10.4345	10.4345	3.5848	2.8762	2.6734	17.9657	
Strontium	100.0%	20	0	0.0020	0.0026	0.0045	0.0072	0.0089	0.0126	0.0147	0.0187	0.0196	0.0196	0.0196	0.0085	0.0055	0.0072	0.0360	
Tantalum	10.0%	20	18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	
Thallium	100.0%	20	0	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0002	
Thorium	100.0%	20	0	0.0000	0.0000	0.0001	0.0001	0.0002	0.0003	0.0003	0.0004	0.0008	0.0008	0.0008	0.0002	0.0002	0.0001	0.0011	
Tin	100.0%	20	0	0.0023	0.0026	0.0039	0.0049	0.0053	0.0065	0.0074	0.0079	0.0091	0.0091	0.0091	0.0051	0.0019	0.0049	0.0147	
Titanium	100.0%	20	0	0.0205	0.0245	0.0332	0.0613	0.0733	0.0843	0.0855	0.1077	0.2734	0.2734	0.2734	0.0671	0.0556	0.0613	0.3448	
Tungsten	100.0%	20	0	0.0001	0.0002	0.0004	0.0012	0.0019	0.0021	0.0022	0.0030	0.0041	0.0041	0.0041	0.0014	0.0011	0.0012	0.0071	
Uranium	100.0%	20	0	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0003	0.0003	0.0001	0.0001	0.0001	0.0004	
Vanadium	100.0%	20	0	0.0012	0.0023	0.0030	0.0124	0.0158	0.0294	0.0299	0.0671	0.1535	0.1535	0.1535	0.0220	0.0349	0.0124	0.1963	
Zinc	100.0%	20	0	0.0272	0.0453	0.0567	0.0692	0.0714	0.0931	0.1127	0.1925	0.2997	0.2997	0.2997	0.0873	0.0618	0.0692	0.3965	



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PARTICULATE MATTER (PM₁₀) - METALS DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PM metals: Atmospheric Research & Analysis, Inc.
Morrisville, NC



FILE CONTENTS DESCRIPTION	Partisol Sampler Measurements of Mass, Ions by IC and Metals by ICP-MS
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection - Method Detection Limits (MDL) are provided with each observation
UNITS	$\mu\text{g}/\text{m}^3$ (microgram per cubic meter)
OBSERVATION TYPE	Particles
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	Filtration with PM_{10} Inlet for PM_{10} and with PM_{10} Inlet/Very Sharp Cut Cyclone for $\text{PM}_{2.5}$
PARTICLE DIAMETER	$< 2.5 \mu\text{m}$ or $< 10 \mu\text{m}$
MEDIUM	47 mm Teflon Filter
ANALYTICAL METHODS	MASS by Microbalance ELEMENTS by Inductively Coupled Plasma Mass Spectrometry (ICP/MS) IONS by Ion Chromatography (IC)
SAMPLE PREPARATION	DI Water extraction for IC analysis and Acid Digestion for ICP/MS Analysis
ANALYTICAL LABORATORY	Atmospheric Research & Analysis Inc
USER NOTE 1	Data are not blank corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration ($\mu\text{g}/\text{m}^3$) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions (since 01-Jan-2011)
SAMPLING INSTRUMENT TYPE	For PM_{10} FRM Partisol PM_{10} sampler For $\text{PM}_{2.5}$ FRM Partisol $\text{PM}_{2.5}$ sampler
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay			Patricia McInnes		Travel Blank
	Station #	AMS 1		AMS 6			
	Sample Date	02-Mar		02-Mar			02-Mar
Particulate Size	PM10		PM10				
Total Air Volume (m ³)	24		24			24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	QC Flag
Particulate Matter	1.00	68.43	V0	25.26	V0	0.11	V0
Aluminum	0.1380326	3.4288894	V0	0.6572743	V0	0.0000000	V1
Antimony	0.0001784	0.0001739	V0	0.0002966	V0	0.0000000	V1
Arsenic	0.0001060	0.0008223	V0	0.0002608	V0	0.0000000	V1
Barium	0.0092847	0.0274002	V0	0.0071161	V0	0.0000000	V1
Beryllium	0.0000946	0.0001016	V0	0.0000202	V0	0.0000000	V1
Bismuth	0.0000093	0.0000320	V0	0.0000398	V0	0.0000000	V1
Cadmium	0.0000174	0.0000376	V0	0.0000232	V0	0.0000000	V1
Calcium	0.4112124	3.3749648	V0	0.9931456	V0	0.0000000	V1
Cerium	0.0000174	0.0040433	V0	0.0008452	V0	0.0000000	V1
Cesium	0.0000100	0.0002591	V0	0.0000479	V0	0.0000000	V1
Chromium	0.0022262	0.0045043	V0	0.0010846	V0	0.0000000	V1
Cobalt	0.0000273	0.0009321	V0	0.0002228	V0	0.0000014	V0
Copper	0.0017171	0.0026738	V0	0.0019534	V0	0.0000000	V1
Iron	0.0393063	2.6506572	V0	0.6036982	V0	0.0000000	V1
Lanthanum	0.0000130	0.0020550	V0	0.0003625	V0	0.0000000	V1
Lead	0.0008577	0.0019652	V0	0.0010952	V0	0.0000000	V1
Lithium	0.0000374	0.0041969	V0	0.0006896	V0	0.0000000	V1
Magnesium	0.0091409	0.5482883	V0	0.1725659	V0	0.0004894	V0
Manganese	0.0006949	0.0442408	V0	0.0106004	V0	0.0000000	V1
Molybdenum	0.0007116	0.0017730	V0	0.0003200	V0	0.0000738	V0
Neodymium	0.0000140	0.0017539	V0	0.0003236	V0	0.0000000	V1
Nickel	0.0005429	0.0047746	V0	0.0009148	V0	0.0000740	V0
Niobium	0.0000202	0.0006205	V0	0.0000904	V0	0.0000000	V1
Palladium	0.0000632	0.0000802	V0	0.0000181	V0	0.0000056	V0
Phosphorus	0.0459574	0.0412551	V0	0.0188933	V0	0.0109947	V0
Platinum	0.0000088	0.0000036	V0	0.0000023	V0	0.0000025	V0
Potassium	0.0061261	1.0291320	V0	0.2634924	V0	0.0006336	V0
Praseodymium	0.0000070	0.0004643	V0	0.0000861	V0	0.0000000	V1
Rubidium	0.0000184	0.0042200	V0	0.0009118	V0	0.0000011	V0
Samarium	0.0000133	0.0003194	V0	0.0000596	V0	0.0000000	V1
Selenium	0.0003366	0.0026374	V0	0.0004787	V0	0.0000000	V1
Silicon	0.7676322	9.5406802	V0	2.3594159	V0	0.0437855	V0
Silver	0.0000100	0.0000201	V0	0.0000068	V0	0.0000000	V1
Sodium	0.0169447	0.5090398	V0	1.8345559	V0	0.0012423	V0
Strontium	0.0003375	0.0106402	V0	0.0027446	V0	0.0000000	V1
Tantalum	0.0000394	0.0000380	V0	0.0000072	V0	0.0000000	V1
Thallium	0.0000090	0.0000363	V0	0.0000094	V0	0.0000000	V1
Thorium	0.0000059	0.0005511	V0	0.0001050	V0	0.0000000	V1
Tin	0.0004414	0.0003120	V0	0.0002615	V0	0.0000370	V0
Titanium	0.0015201	0.1516781	V0	0.0289568	V0	0.0006805	V0
Tungsten	0.0000938	0.0008962	V0	0.0003486	V0	0.0000000	V1
Uranium	0.0000048	0.0001541	V0	0.0000313	V0	0.0000000	V1
Vanadium	0.0007697	0.0148663	V0	0.0018937	V0	0.0001057	V0
Zinc	0.0055897	0.0110218	V0	0.0056675	V0	0.0003890	V0



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 02-Mar PM10 24	Results (µg/m ³)	QC Flag	AMS 14 02-Mar PM10 24	Results (µg/m ³)	QC Flag	02-Mar 24
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	30.50	V0	4.61	V0	0.11	V0
Aluminum	0.1380326	0.5053719	V0	0.0933592	V0	0.0000000	V1
Antimony	0.0001784	0.0003152	V0	0.0000475	V0	0.0000000	V1
Arsenic	0.0001060	0.0002147	V0	0.0001326	V0	0.0000000	V1
Barium	0.0092847	0.0072354	V0	0.0011797	V0	0.0000000	V1
Beryllium	0.0000946	0.0000199	V0	0.0000042	V0	0.0000000	V1
Bismuth	0.0000093	0.0000207	V0	0.0000130	V0	0.0000000	V1
Cadmium	0.0000174	0.0000195	V0	0.0000152	V0	0.0000000	V1
Calcium	0.4112124	0.9895799	V0	0.1777664	V0	0.0000000	V1
Cerium	0.0000174	0.0006050	V0	0.0000952	V0	0.0000000	V1
Cesium	0.0000100	0.0000375	V0	0.0000075	V0	0.0000000	V1
Chromium	0.0022262	0.0015903	V0	0.0026368	V0	0.0000000	V1
Cobalt	0.0000273	0.0003257	V0	0.0000608	V0	0.0000014	V0
Copper	0.0017171	0.0026603	V0	0.0004203	V0	0.0000000	V1
Iron	0.0393063	0.5791394	V0	0.0856848	V0	0.0000000	V1
Lanthanum	0.0000130	0.0002917	V0	0.0000502	V0	0.0000000	V1
Lead	0.0008577	0.0008108	V0	0.0004500	V0	0.0000000	V1
Lithium	0.0000374	0.0005273	V0	0.0000771	V0	0.0000000	V1
Magnesium	0.0091409	0.1652716	V0	0.0310744	V0	0.0004894	V0
Manganese	0.0006949	0.0103785	V0	0.0017874	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003600	V0	0.0001280	V0	0.0000738	V0
Neodymium	0.0000140	0.0002627	V0	0.0000420	V0	0.0000000	V1
Nickel	0.0005429	0.0013335	V0	0.0005534	V0	0.0000740	V0
Niobium	0.0000202	0.0000745	V0	0.0000137	V0	0.0000000	V1
Palladium	0.0000632	0.0000219	V0	0.0000060	V0	0.0000056	V0
Phosphorus	0.0459574	0.0190060	V0	0.0127891	V0	0.0109947	V0
Platinum	0.0000088	0.0000034	V0	0.0000019	V0	0.0000025	V0
Potassium	0.0061261	0.2362557	V0	0.0454192	V0	0.0006336	V0
Praseodymium	0.0000070	0.0000683	V0	0.0000108	V0	0.0000000	V1
Rubidium	0.0000184	0.0007388	V0	0.0001372	V0	0.0000011	V0
Samarium	0.0000133	0.0000473	V0	0.0000071	V0	0.0000000	V1
Selenium	0.0003366	0.0003964	V0	0.0000959	V0	0.0000000	V1
Silicon	0.7676322	2.2997815	V0	0.3460704	V0	0.0437855	V0
Silver	0.0000100	0.0000043	V0	0.0000020	V0	0.0000000	V1
Sodium	0.0169447	2.9504628	V0	0.1187902	V0	0.0012423	V0
Strontium	0.0003375	0.0026652	V0	0.0004993	V0	0.0000000	V1
Tantalum	0.0000394	0.0000060	V0	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000078	V0	0.0000027	V0	0.0000000	V1
Thorium	0.0000059	0.0000782	V0	0.0000130	V0	0.0000000	V1
Tin	0.0004414	0.0002528	V0	0.0000770	V0	0.0000370	V0
Titanium	0.0015201	0.0220316	V0	0.0035111	V0	0.0006805	V0
Tungsten	0.0000938	0.0005189	V0	0.0000646	V0	0.0000000	V1
Uranium	0.0000048	0.0000239	V0	0.0000040	V0	0.0000000	V1
Vanadium	0.0007697	0.0016803	V0	0.0003035	V0	0.0001057	V0
Zinc	0.0055897	0.0067907	V0	0.0021711	V0	0.0003890	V0



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15		02-Mar	
Sample Date	02-Mar			02-Mar		02-Mar	
Particulate Size	PM10			PM10		PM10	
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	53.86	V0	41.62	V0	0.11	V0
Aluminum	0.1380326	2.2073208	V0	1.4087361	V0	0.0000000	V1
Antimony	0.0001784	0.0001236	V0	0.0000689	V0	0.0000000	V1
Arsenic	0.0001060	0.0006507	V0	0.0003685	V0	0.0000000	V1
Barium	0.0092847	0.0177770	V0	0.0108997	V0	0.0000000	V1
Beryllium	0.0000946	0.0000652	V0	0.0000412	V0	0.0000000	V1
Bismuth	0.0000093	0.0000260	V0	0.0000142	V0	0.0000000	V1
Cadmium	0.0000174	0.0000251	V0	0.0000192	V0	0.0000000	V1
Calcium	0.4112124	2.7386850	V0	1.4260927	V0	0.0000000	V1
Cerium	0.0000174	0.0023444	V0	0.0015692	V0	0.0000000	V1
Cesium	0.0000100	0.0001618	V0	0.0001044	V0	0.0000000	V1
Chromium	0.0022262	0.0028703	V0	0.0018016	V0	0.0000000	V1
Cobalt	0.0000273	0.0007060	V0	0.0003931	V0	0.0000014	V0
Copper	0.0017171	0.0020095	V0	0.0011397	V0	0.0000000	V1
Iron	0.0393063	2.0465530	V0	1.1621377	V0	0.0000000	V1
Lanthanum	0.0000130	0.0011424	V0	0.0007216	V0	0.0000000	V1
Lead	0.0008577	0.0014024	V0	0.0010378	V0	0.0000000	V1
Lithium	0.0000374	0.0024197	V0	0.0014797	V0	0.0000000	V1
Magnesium	0.0091409	0.3934850	V0	0.2475510	V0	0.0004894	V0
Manganese	0.0006949	0.0343185	V0	0.0193994	V0	0.0000000	V1
Molybdenum	0.0007116	0.0010148	V0	0.0006338	V0	0.0000738	V0
Neodymium	0.0000140	0.0010390	V0	0.0006459	V0	0.0000000	V1
Nickel	0.0005429	0.0030926	V0	0.0017713	V0	0.0000740	V0
Niobium	0.0000202	0.0002862	V0	0.0001663	V0	0.0000000	V1
Palladium	0.0000632	0.0000398	V0	0.0000260	V0	0.0000056	V0
Phosphorus	0.0459574	0.0341079	V0	0.0252563	V0	0.0109947	V0
Platinum	0.0000088	0.0000035	V0	0.0000037	V0	0.0000025	V0
Potassium	0.0061261	0.6948570	V0	0.4203929	V0	0.0006336	V0
Praseodymium	0.0000070	0.0002689	V0	0.0001687	V0	0.0000000	V1
Rubidium	0.0000184	0.0027736	V0	0.0017491	V0	0.0000011	V0
Samarium	0.0000133	0.0001943	V0	0.0001223	V0	0.0000000	V1
Selenium	0.0003366	0.0016072	V0	0.0009755	V0	0.0000000	V1
Silicon	0.7676322	7.8468273	V0	6.0181078	V0	0.0437855	V0
Silver	0.0000100	0.0000150	V0	0.0000076	V0	0.0000000	V1
Sodium	0.0169447	0.4825990	V0	0.2255522	V0	0.0012423	V0
Strontium	0.0003375	0.0071328	V0	0.0044136	V0	0.0000000	V1
Tantalum	0.0000394	0.0000217	V0	0.0000118	V0	0.0000000	V1
Thallium	0.0000090	0.0000254	V0	0.0000151	V0	0.0000000	V1
Thorium	0.0000059	0.0003360	V0	0.0002089	V0	0.0000000	V1
Tin	0.0004414	0.0002705	V0	0.0001392	V0	0.0000370	V0
Titanium	0.0015201	0.0925870	V0	0.0512836	V0	0.0006805	V0
Tungsten	0.0000938	0.0007280	V0	0.0003484	V0	0.0000000	V1
Uranium	0.0000048	0.0001013	V0	0.0000585	V0	0.0000000	V1
Vanadium	0.0007697	0.0089948	V0	0.0056976	V0	0.0001057	V0
Zinc	0.0055897	0.0084537	V0	0.0043031	V0	0.0003890	V0



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			02-Mar	
Sample Date	02-Mar			02-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	88.66	V0	0.11	V0
Aluminum	0.1380326	4.5236511	V0	0.0000000	V1
Antimony	0.0001784	0.0001503	V0	0.0000000	V1
Arsenic	0.0001060	0.0009162	V0	0.0000000	V1
Barium	0.0092847	0.0325395	V0	0.0000000	V1
Beryllium	0.0000946	0.0001230	V0	0.0000000	V1
Bismuth	0.0000093	0.0000304	V0	0.0000000	V1
Cadmium	0.0000174	0.0000363	V0	0.0000000	V1
Calcium	0.4112124	6.0341895	V0	0.0000000	V1
Cerium	0.0000174	0.0052861	V0	0.0000000	V1
Cesium	0.0000100	0.0003274	V0	0.0000000	V1
Chromium	0.0022262	0.0050736	V0	0.0000000	V1
Cobalt	0.0000273	0.0010870	V0	0.0000014	V0
Copper	0.0017171	0.0026663	V0	0.0000000	V1
Iron	0.0393063	3.7980055	V0	0.0000000	V1
Lanthanum	0.0000130	0.0026031	V0	0.0000000	V1
Lead	0.0008577	0.0023530	V0	0.0000000	V1
Lithium	0.0000374	0.0053811	V0	0.0000000	V1
Magnesium	0.0091409	0.7916359	V0	0.0004894	V0
Manganese	0.0006949	0.0666753	V0	0.0000000	V1
Molybdenum	0.0007116	0.0010153	V0	0.0000738	V0
Neodymium	0.0000140	0.0022783	V0	0.0000000	V1
Nickel	0.0005429	0.0042557	V0	0.0000740	V0
Niobium	0.0000202	0.0006347	V0	0.0000000	V1
Palladium	0.0000632	0.0000822	V0	0.0000056	V0
Phosphorus	0.0459574	0.0472423	V0	0.0109947	V0
Platinum	0.0000088	0.0000057	V0	0.0000025	V0
Potassium	0.0061261	1.3297930	V0	0.0006336	V0
Praseodymium	0.0000070	0.0005989	V0	0.0000000	V1
Rubidium	0.0000184	0.0055070	V0	0.0000011	V0
Samarium	0.0000133	0.0004155	V0	0.0000000	V1
Selenium	0.0003366	0.0033779	V0	0.0000000	V1
Silicon	0.7676322	11.4132776	V0	0.0437855	V0
Silver	0.0000100	0.0000209	V0	0.0000000	V1
Sodium	0.0169447	0.6876109	V0	0.0012423	V0
Strontium	0.0003375	0.0138197	V0	0.0000000	V1
Tantalum	0.0000394	0.0000474	V0	0.0000000	V1
Thallium	0.0000090	0.0000443	V0	0.0000000	V1
Thorium	0.0000059	0.0007915	V0	0.0000000	V1
Tin	0.0004414	0.0002760	V0	0.0000370	V0
Titanium	0.0015201	0.1850902	V0	0.0006805	V0
Tungsten	0.0000938	0.0009559	V0	0.0000000	V1
Uranium	0.0000048	0.0002022	V0	0.0000000	V1
Vanadium	0.0007697	0.0105237	V0	0.0001057	V0
Zinc	0.0055897	0.0113644	V0	0.0003890	V0



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	08-Mar		08-Mar			08-Mar
Particulate Size		PM10		PM10			
Total Air Volume (m ³)		24		24		24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	25.81	V0	45.55	V0	0.12	V0
Aluminum	0.1380326	1.1954464	V0	2.0362566	V0	0.0000000	V1
Antimony	0.0001784	0.0000830	V0	0.0001945	V0	0.0000000	V1
Arsenic	0.0001060	0.0003092	V0	0.0004954	V0	0.0000000	V1
Barium	0.0092847	0.0088664	V0	0.0158696	V0	0.0000000	V1
Beryllium	0.0000946	0.0000341	V0	0.0000545	V0	0.0000000	V1
Bismuth	0.0000093	0.0000250	V0	0.0000207	V0	0.0000000	V1
Cadmium	0.0000174	0.0000260	V0	0.0000373	V0	0.0000000	V1
Calcium	0.4112124	0.6783089	V0	2.3192166	V0	0.0000000	V1
Cerium	0.0000174	0.0011668	V0	0.0022613	V0	0.0000000	V1
Cesium	0.0000100	0.0000879	V0	0.0001419	V0	0.0000000	V1
Chromium	0.0022262	0.0016245	V0	0.0024853	V0	0.0000000	V1
Cobalt	0.0000273	0.0003517	V0	0.0005298	V0	0.0000000	V1
Copper	0.0017171	0.0010159	V0	0.0018148	V0	0.0000798	V0
Iron	0.0393063	0.8155956	V0	1.5780973	V0	0.0000000	V1
Lanthanum	0.0000130	0.0005650	V0	0.0011093	V0	0.0000000	V1
Lead	0.0008577	0.0011454	V0	0.0017908	V0	0.0000000	V1
Lithium	0.0000374	0.0014031	V0	0.0021338	V0	0.0000026	V0
Magnesium	0.0091409	0.2288413	V0	0.4775555	V0	0.0005181	V0
Manganese	0.0006949	0.0144065	V0	0.0268765	V0	0.0000000	V1
Molybdenum	0.0007116	0.0001257	V0	0.0006248	V0	0.0000473	V0
Neodymium	0.0000140	0.0005047	V0	0.0009662	V0	0.0000000	V1
Nickel	0.0005429	0.0011196	V0	0.0025215	V0	0.0000539	V0
Niobium	0.0000202	0.0001441	V0	0.0002446	V0	0.0000000	V1
Palladium	0.0000632	0.0000312	V0	0.0000361	V0	0.0000000	V1
Phosphorus	0.0459574	0.0220955	V0	0.0297974	V0	0.0104912	V0
Platinum	0.0000088	0.0000034	V0	0.0000024	V0	0.0000019	V0
Potassium	0.0061261	0.3861790	V0	0.6366563	V0	0.0006387	V0
Praseodymium	0.0000070	0.0001344	V0	0.0002561	V0	0.0000000	V1
Rubidium	0.0000184	0.0014195	V0	0.0024946	V0	0.0000011	V0
Samarium	0.0000133	0.0000964	V0	0.0001773	V0	0.0000000	V1
Selenium	0.0003366	0.0007415	V0	0.0013743	V0	0.0000159	V0
Silicon	0.7676322	4.2273718	V0	5.7537709	V0	0.0000000	V1
Silver	0.0000100	0.0000064	V0	0.0000109	V0	0.0000000	V1
Sodium	0.0169447	0.4493295	V0	1.4513670	V0	0.0018436	V0
Strontium	0.0003375	0.0034317	V0	0.0068411	V0	0.0000000	V1
Tantalum	0.0000394	0.0000107	V0	0.0000186	V0	0.0000000	V1
Thallium	0.0000090	0.0000132	V0	0.0000216	V0	0.0000000	V1
Thorium	0.0000059	0.0001698	V0	0.0003131	V0	0.0000000	V1
Tin	0.0004414	0.0001693	V0	0.0004003	V0	0.0000000	V1
Titanium	0.0015201	0.0463466	V0	0.0743340	V0	0.0011272	V0
Tungsten	0.0000938	0.0002855	V0	0.0006603	V0	0.0000000	V1
Uranium	0.0000048	0.0000472	V0	0.0000795	V0	0.0000000	V1
Vanadium	0.0007697	0.0023597	V0	0.0067001	V0	0.0000403	V0
Zinc	0.0055897	0.0048505	V0	0.0071534	V0	0.0000000	V1



Compound Name	Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
		MDL (µg/sample)	AMS 7 08-Mar PM10 24 Results (µg/m ³)	QC Flag	AMS 14 08-Mar PM10 24 Results (µg/m ³)	QC Flag	08-Mar 24 Results (µg/m ³)	QC Flag
Particulate Matter	1.00	60.07	V0	26.21	V0	0.12	V0	
Aluminum	0.1380326	2.1008420	V0	0.7826908	V0	0.0000000	V1	
Antimony	0.0001784	0.0003812	V0	0.0000755	V0	0.0000000	V1	
Arsenic	0.0001060	0.0005586	V0	0.0003389	V0	0.0000000	V1	
Barium	0.0092847	0.0209356	V0	0.0065953	V0	0.0000000	V1	
Beryllium	0.0000946	0.0000659	V0	0.0000253	V0	0.0000000	V1	
Bismuth	0.0000093	0.0000378	V0	0.0000295	V0	0.0000000	V1	
Cadmium	0.0000174	0.0000357	V0	0.0000287	V0	0.0000000	V1	
Calcium	0.4112124	3.8842524	V0	1.4462719	V0	0.0000000	V1	
Cerium	0.0000174	0.0025274	V0	0.0008662	V0	0.0000000	V1	
Cesium	0.0000100	0.0001446	V0	0.0000558	V0	0.0000000	V1	
Chromium	0.0022262	0.0029013	V0	0.0012422	V0	0.0000000	V1	
Cobalt	0.0000273	0.0007446	V0	0.0002732	V0	0.0000000	V1	
Copper	0.0017171	0.0030843	V0	0.0008542	V0	0.0000798	V0	
Iron	0.0393063	2.1442474	V0	0.7476717	V0	0.0000000	V1	
Lanthanum	0.0000130	0.0012056	V0	0.0004226	V0	0.0000000	V1	
Lead	0.0008577	0.0017526	V0	0.0010911	V0	0.0000000	V1	
Lithium	0.0000374	0.0020107	V0	0.0007188	V0	0.0000026	V0	
Magnesium	0.0091409	0.5638290	V0	0.2270236	V0	0.0005181	V0	
Manganese	0.0006949	0.0385141	V0	0.0134141	V0	0.0000000	V1	
Molybdenum	0.0007116	0.0006969	V0	0.0002994	V0	0.0000473	V0	
Neodymium	0.0000140	0.0010780	V0	0.0003803	V0	0.0000000	V1	
Nickel	0.0005429	0.0027438	V0	0.0011150	V0	0.0000539	V0	
Niobium	0.0000202	0.0002621	V0	0.0001012	V0	0.0000000	V1	
Palladium	0.0000632	0.0000420	V0	0.0000314	V0	0.0000000	V1	
Phosphorus	0.0459574	0.0336321	V0	0.0183776	V0	0.0104912	V0	
Platinum	0.0000088	0.0000043	V0	0.0000023	V0	0.0000019	V0	
Potassium	0.0061261	0.7854003	V0	0.2876447	V0	0.0006387	V0	
Praseodymium	0.0000070	0.0002791	V0	0.0001007	V0	0.0000000	V1	
Rubidium	0.0000184	0.0027454	V0	0.0010240	V0	0.0000011	V0	
Samarium	0.0000133	0.0002010	V0	0.0000695	V0	0.0000000	V1	
Selenium	0.0003366	0.0015663	V0	0.0006034	V0	0.0000159	V0	
Silicon	0.7676322	6.8444502	V0	3.2128413	V0	0.0000000	V1	
Silver	0.0000100	0.0000114	V0	0.0000132	V0	0.0000000	V1	
Sodium	0.0169447	3.0232478	V0	0.4713819	V0	0.0018436	V0	
Strontium	0.0003375	0.0087844	V0	0.0031538	V0	0.0000000	V1	
Tantalum	0.0000394	0.0000221	V0	0.0000079	V0	0.0000000	V1	
Thallium	0.0000090	0.0000247	V0	0.0000107	V0	0.0000000	V1	
Thorium	0.0000059	0.0003275	V0	0.0001174	V0	0.0000000	V1	
Tin	0.0004414	0.0003856	V0	0.0001485	V0	0.0000000	V1	
Titanium	0.0015201	0.0835234	V0	0.0313362	V0	0.0011272	V0	
Tungsten	0.0000938	0.0013168	V0	0.0002931	V0	0.0000000	V1	
Uranium	0.0000048	0.0000892	V0	0.0000352	V0	0.0000000	V1	
Vanadium	0.0007697	0.0066604	V0	0.0023189	V0	0.0000403	V0	
Zinc	0.0055897	0.0108936	V0	0.0042001	V0	0.0000000	V1	



Compound Name	Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Fort McKay South			Horizon		Travel Blank	
		AMS 13 08-Mar PM10 24	Results (µg/m ³)	QC Flag	AMS 15 08-Mar PM10 24	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	18.25	V0	25.50	V0	0.12	V0	
Aluminum	0.1380326	0.9113448	V0	1.0183821	V0	0.0000000	V1	
Antimony	0.0001784	0.0001005	V0	0.0000494	V0	0.0000000	V1	
Arsenic	0.0001060	0.0003259	V0	0.0002920	V0	0.0000000	V1	
Barium	0.0092847	0.0066930	V0	0.0081039	V0	0.0000000	V1	
Beryllium	0.0000946	0.0000284	V0	0.0000320	V0	0.0000000	V1	
Bismuth	0.0000093	0.0000180	V0	0.0000115	V0	0.0000000	V1	
Cadmium	0.0000174	0.0000273	V0	0.0000245	V0	0.0000000	V1	
Calcium	0.4112124	0.5791366	V0	0.4127217	V0	0.0000000	V1	
Cerium	0.0000174	0.0009011	V0	0.0010004	V0	0.0000000	V1	
Cesium	0.0000100	0.0000644	V0	0.0000787	V0	0.0000000	V1	
Chromium	0.0022262	0.0012959	V0	0.0014208	V0	0.0000000	V1	
Cobalt	0.0000273	0.0002584	V0	0.0002885	V0	0.0000000	V1	
Copper	0.0017171	0.0008822	V0	0.0010527	V0	0.0000798	V0	
Iron	0.0393063	0.6659373	V0	0.7863336	V0	0.0000000	V1	
Lanthanum	0.0000130	0.0004374	V0	0.0004737	V0	0.0000000	V1	
Lead	0.0008577	0.0011479	V0	0.0010490	V0	0.0000000	V1	
Lithium	0.0000374	0.0011043	V0	0.0010334	V0	0.0000026	V0	
Magnesium	0.0091409	0.1814390	V0	0.1991109	V0	0.0005181	V0	
Manganese	0.0006949	0.0113856	V0	0.0136138	V0	0.0000000	V1	
Molybdenum	0.0007116	0.0001628	V0	0.0002312	V0	0.0000473	V0	
Neodymium	0.0000140	0.0003945	V0	0.0004369	V0	0.0000000	V1	
Nickel	0.0005429	0.0008976	V0	0.0012218	V0	0.0000539	V0	
Niobium	0.0000202	0.0001201	V0	0.0001149	V0	0.0000000	V1	
Palladium	0.0000632	0.0000149	V0	0.0000154	V0	0.0000000	V1	
Phosphorus	0.0459574	0.0201238	V0	0.0206867	V0	0.0104912	V0	
Platinum	0.0000088	0.0000021	V0	0.0000030	V0	0.0000019	V0	
Potassium	0.0061261	0.2820253	V0	0.3217094	V0	0.0006387	V0	
Praseodymium	0.0000070	0.0001038	V0	0.0001136	V0	0.0000000	V1	
Rubidium	0.0000184	0.0010735	V0	0.0012533	V0	0.0000011	V0	
Samarium	0.0000133	0.0000731	V0	0.0000821	V0	0.0000000	V1	
Selenium	0.0003366	0.0006460	V0	0.0006423	V0	0.0000159	V0	
Silicon	0.7676322	2.9984091	V0	3.8952570	V0	0.0000000	V1	
Silver	0.0000100	0.0000061	V0	0.0000055	V0	0.0000000	V1	
Sodium	0.0169447	0.4411748	V0	0.3224644	V0	0.0018436	V0	
Strontium	0.0003375	0.0027151	V0	0.0029930	V0	0.0000000	V1	
Tantalum	0.0000394	0.0000083	V0	0.0000087	V0	0.0000000	V1	
Thallium	0.0000090	0.0000102	V0	0.0000121	V0	0.0000000	V1	
Thorium	0.0000059	0.0001319	V0	0.0001411	V0	0.0000000	V1	
Tin	0.0004414	0.0001459	V0	0.0001487	V0	0.0000000	V1	
Titanium	0.0015201	0.0383848	V0	0.0357830	V0	0.0011272	V0	
Tungsten	0.0000938	0.0003108	V0	0.0001504	V0	0.0000000	V1	
Uranium	0.0000048	0.0000369	V0	0.0000410	V0	0.0000000	V1	
Vanadium	0.0007697	0.0018639	V0	0.0032273	V0	0.0000403	V0	
Zinc	0.0055897	0.0038727	V0	0.0027907	V0	0.0000000	V1	



Compound Name	MDL (µg/sample)	Muskeg River		Travel Blank	
		Results (µg/m³)	QC Flag	Results (µg/m³)	QC Flag
Particulate Matter	1.00	47.59	V0	0.12	V0
Aluminum	0.1380326	2.4412256	V0	0.0000000	V1
Antimony	0.0001784	0.0000937	V0	0.0000000	V1
Arsenic	0.0001060	0.0004819	V0	0.0000000	V1
Barium	0.0092847	0.0148549	V0	0.0000000	V1
Beryllium	0.0000946	0.0000665	V0	0.0000000	V1
Bismuth	0.0000093	0.0000179	V0	0.0000000	V1
Cadmium	0.0000174	0.0000335	V0	0.0000000	V1
Calcium	0.4112124	1.6730545	V0	0.0000000	V1
Cerium	0.0000174	0.0024923	V0	0.0000000	V1
Cesium	0.0000100	0.0001659	V0	0.0000000	V1
Chromium	0.0022262	0.0028660	V0	0.0000000	V1
Cobalt	0.0000273	0.0005264	V0	0.0000000	V1
Copper	0.0017171	0.0014247	V0	0.0000798	V0
Iron	0.0393063	1.5381308	V0	0.0000000	V1
Lanthanum	0.0000130	0.0012032	V0	0.0000000	V1
Lead	0.0008577	0.0016481	V0	0.0000000	V1
Lithium	0.0000374	0.0032719	V0	0.0000026	V0
Magnesium	0.0091409	0.3444633	V0	0.0005181	V0
Manganese	0.0006949	0.0284445	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003273	V0	0.0000473	V0
Neodymium	0.0000140	0.0010663	V0	0.0000000	V1
Nickel	0.0005429	0.0019440	V0	0.0000539	V0
Niobium	0.0000202	0.0003313	V0	0.0000000	V1
Palladium	0.0000632	0.0000414	V0	0.0000000	V1
Phosphorus	0.0459574	0.0304142	V0	0.0104912	V0
Platinum	0.0000088	0.0000091	V0	0.0000019	V0
Potassium	0.0061261	0.6892558	V0	0.0006387	V0
Praseodymium	0.0000070	0.0002817	V0	0.0000000	V1
Rubidium	0.0000184	0.0027086	V0	0.0000011	V0
Samarium	0.0000133	0.0001990	V0	0.0000000	V1
Selenium	0.0003366	0.0015690	V0	0.0000159	V0
Silicon	0.7676322	7.0989799	V0	0.0000000	V1
Silver	0.0000100	0.0000113	V0	0.0000000	V1
Sodium	0.0169447	0.8530220	V0	0.0018436	V0
Strontium	0.0003375	0.0066612	V0	0.0000000	V1
Tantalum	0.0000394	0.0000224	V0	0.0000000	V1
Thallium	0.0000090	0.0000235	V0	0.0000000	V1
Thorium	0.0000059	0.0003535	V0	0.0000000	V1
Tin	0.0004414	0.0001754	V0	0.0000000	V1
Titanium	0.0015201	0.0943384	V0	0.0011272	V0
Tungsten	0.0000938	0.0003788	V0	0.0000000	V1
Uranium	0.0000048	0.0000965	V0	0.0000000	V1
Vanadium	0.0007697	0.0043165	V0	0.0000403	V0
Zinc	0.0055897	0.0063454	V0	0.0000000	V1



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	14-Mar		14-Mar			14-Mar
Particulate Size	PM10		PM10				
Total Air Volume (m ³)	24		24			24	
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	33.36	V0	12.58	V0	0.14	V0
Aluminum	0.1380326	0.6792449	V0	0.1484832	V0	0.0000000	V1
Antimony	0.0001784	0.0022448	V0	0.0007548	V0	0.0000000	V1
Arsenic	0.0001060	0.0003330	V0	0.0002886	V0	0.0000000	V1
Barium	0.0092847	0.0071781	V0	0.0077976	V0	0.0000000	V1
Beryllium	0.0000946	0.0000263	V0	0.0000071	V0	0.0000000	V1
Bismuth	0.0000093	0.0000170	V0	0.0000292	V0	0.0000034	V0
Cadmium	0.0000174	0.0000341	V0	0.0000333	V0	0.0000000	V1
Calcium	0.4112124	1.9265445	V0	0.3677173	V0	0.0000000	V1
Cerium	0.0000174	0.0008372	V0	0.0002274	V0	0.0000017	V0
Cesium	0.0000100	0.0000448	V0	0.0000121	V0	0.0000000	V1
Chromium	0.0022262	0.0012941	V0	0.0012254	V0	0.0000000	V1
Cobalt	0.0000273	0.0003023	V0	0.0000956	V0	0.0000020	V0
Copper	0.0017171	0.0022421	V0	0.0044162	V0	0.0002605	V0
Iron	0.0393063	0.8189623	V0	0.2489710	V0	0.0000000	V1
Lanthanum	0.0000130	0.0004596	V0	0.0001513	V0	0.0000000	V1
Lead	0.0008577	0.0018380	V0	0.0007885	V0	0.0000000	V1
Lithium	0.0000374	0.0006553	V0	0.0001328	V0	0.0000027	V0
Magnesium	0.0091409	0.2087947	V0	0.0981653	V0	0.0007192	V0
Manganese	0.0006949	0.0161684	V0	0.0045519	V0	0.0000000	V1
Molybdenum	0.0007116	0.0010897	V0	0.0002836	V0	0.0000458	V0
Neodymium	0.0000140	0.0003515	V0	0.0000829	V0	0.0000006	V0
Nickel	0.0005429	0.0045769	V0	0.0005367	V0	0.0001152	V0
Niobium	0.0000202	0.0000927	V0	0.0000255	V0	0.0000000	V1
Palladium	0.0000632	0.0000153	V0	0.0000332	V0	0.0000032	V0
Phosphorus	0.0459574	0.0226412	V0	0.0197220	V0	0.0113226	V0
Platinum	0.0000088	0.0000016	V0	0.0000026	V0	0.0000027	V0
Potassium	0.0061261	0.2664739	V0	0.1324985	V0	0.0021300	V0
Praseodymium	0.0000070	0.0000949	V0	0.0000224	V0	0.0000000	V1
Rubidium	0.0000184	0.0008993	V0	0.0002842	V0	0.0000019	V0
Samarium	0.0000133	0.0000671	V0	0.0000138	V0	0.0000000	V1
Selenium	0.0003366	0.0006468	V0	0.0002038	V0	0.0000000	V1
Silicon	0.7676322	2.0554689	V0	0.7216274	V0	0.0995194	V0
Silver	0.0000100	0.0000109	V0	0.0000083	V0	0.0000013	V0
Sodium	0.0169447	0.3180936	V0	1.1331230	V0	0.0041918	V0
Strontium	0.0003375	0.0032871	V0	0.0014533	V0	0.0000152	V0
Tantalum	0.0000394	0.0000069	V0	0.0000021	V0	0.0000000	V1
Thallium	0.0000090	0.0000090	V0	0.0000042	V0	0.0000000	V1
Thorium	0.0000059	0.0001180	V0	0.0000254	V0	0.0000003	V0
Tin	0.0004414	0.0002766	V0	0.0005625	V0	0.0000259	V0
Titanium	0.0015201	0.0262953	V0	0.0079515	V0	0.0007806	V0
Tungsten	0.0000938	0.0003502	V0	0.0002332	V0	0.0000000	V1
Uranium	0.0000048	0.0000337	V0	0.0000094	V0	0.0000000	V1
Vanadium	0.0007697	0.0106228	V0	0.0005113	V0	0.0000000	V1
Zinc	0.0055897	0.0152000	V0	0.0087763	V0	0.0000000	V1



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 14-Mar PM10 24	Results (µg/m ³)	QC Flag	AMS 14 14-Mar PM10 24	Results (µg/m ³)	QC Flag	14-Mar 24 Results (µg/m ³) QC Flag
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	34.20	V0	4.59	V0	0.14	V0
Aluminum	0.1380326	0.4936368	V0	0.0467772	V0	0.0000000	V1
Antimony	0.0001784	0.0014073	V0	0.0000460	V0	0.0000000	V1
Arsenic	0.0001060	0.0002851	V0	0.0000732	V0	0.0000000	V1
Barium	0.0092847	0.0198682	V0	0.0009140	V0	0.0000000	V1
Beryllium	0.0000946	0.0000204	V0	0.0000041	V0	0.0000000	V1
Bismuth	0.0000093	0.0000573	V0	0.0000057	V0	0.0000034	V0
Cadmium	0.0000174	0.0000398	V0	0.0000118	V0	0.0000000	V1
Calcium	0.4112124	1.4684810	V0	0.0681187	V0	0.0000000	V1
Cerium	0.0000174	0.0007670	V0	0.0001561	V0	0.0000017	V0
Cesium	0.0000100	0.0000341	V0	0.0000036	V0	0.0000000	V1
Chromium	0.0022262	0.0018185	V0	0.0002042	V0	0.0000000	V1
Cobalt	0.0000273	0.0003515	V0	0.0000243	V0	0.0000020	V0
Copper	0.0017171	0.0274012	V4	0.0004443	V0	0.0002605	V0
Iron	0.0393063	0.9381702	V0	0.0316232	V0	0.0000000	V1
Lanthanum	0.0000130	0.0003915	V0	0.0000542	V0	0.0000000	V1
Lead	0.0008577	0.0011417	V0	0.0003443	V0	0.0000000	V1
Lithium	0.0000374	0.0004284	V0	0.0000301	V0	0.0000027	V0
Magnesium	0.0091409	0.3012538	V0	0.0247335	V0	0.0007192	V0
Manganese	0.0006949	0.0160926	V0	0.0011142	V0	0.0000000	V1
Molybdenum	0.0007116	0.0005120	V0	0.0000894	V0	0.0000458	V0
Neodymium	0.0000140	0.0002928	V0	0.0000159	V0	0.0000006	V0
Nickel	0.0005429	0.0010189	V0	0.0001826	V0	0.0001152	V0
Niobium	0.0000202	0.0000836	V0	0.0000058	V0	0.0000000	V1
Palladium	0.0000632	0.0000632	V0	0.0000000	V1	0.0000032	V0
Phosphorus	0.0459574	0.0238401	V0	0.0149610	V0	0.0113226	V0
Platinum	0.0000088	0.0000051	V0	0.0000018	V0	0.0000027	V0
Potassium	0.0061261	0.4053428	V0	0.0261436	V0	0.0021300	V0
Praseodymium	0.0000070	0.0000815	V0	0.0000043	V0	0.0000000	V1
Rubidium	0.0000184	0.0008221	V0	0.0000593	V0	0.0000019	V0
Samarium	0.0000133	0.0000510	V0	0.0000029	V0	0.0000000	V1
Selenium	0.0003366	0.0005439	V0	0.0000668	V0	0.0000000	V1
Silicon	0.7676322	1.9134832	V0	0.2840656	V0	0.0995194	V0
Silver	0.0000100	0.0000139	V0	0.0000019	V0	0.0000013	V0
Sodium	0.0169447	4.6079031	V0	0.0904203	V0	0.0041918	V0
Strontium	0.0003375	0.0048891	V0	0.0003030	V0	0.0000152	V0
Tantalum	0.0000394	0.0000079	V0	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000093	V0	0.0000016	V0	0.0000000	V1
Thorium	0.0000059	0.0000864	V0	0.0000053	V0	0.0000003	V0
Tin	0.0004414	0.0010962	V0	0.0000915	V0	0.0000259	V0
Titanium	0.0015201	0.0270878	V0	0.0022457	V0	0.0007806	V0
Tungsten	0.0000938	0.0011287	V0	0.0000313	V0	0.0000000	V1
Uranium	0.0000048	0.0000277	V0	0.0000028	V0	0.0000000	V1
Vanadium	0.0007697	0.0012922	V0	0.0001914	V0	0.0000000	V1
Zinc	0.0055897	0.0260145	V0	0.0022739	V0	0.0000000	V1



Compound Name	Station Name	Fort McKay South		Horizon		Travel Blank	
	Station #	AMS 13		AMS 15		14-Mar	
	Sample Date	14-Mar		14-Mar		14-Mar	
	Particulate Size	PM10		PM10		PM10	
	Total Air Volume (m ³)	24		24		24	
	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	22.32	V0	13.09	V0	0.14	V0
Aluminum	0.1380326	0.2470111	V0	0.1945755	V0	0.0000000	V1
Antimony	0.0001784	0.0020199	V0	0.0000594	V0	0.0000000	V1
Arsenic	0.0001060	0.0002038	V0	0.0001326	V0	0.0000000	V1
Barium	0.0092847	0.0031492	V0	0.0022645	V0	0.0000000	V1
Beryllium	0.0000946	0.0000132	V0	0.0000085	V0	0.0000000	V1
Bismuth	0.0000093	0.0000191	V0	0.0000079	V0	0.0000034	V0
Cadmium	0.0000174	0.0000260	V0	0.0000179	V0	0.0000000	V1
Calcium	0.4112124	0.6779901	V0	0.1860622	V0	0.0000000	V1
Cerium	0.0000174	0.0003104	V0	0.0002181	V0	0.0000017	V0
Cesium	0.0000100	0.0000177	V0	0.0000152	V0	0.0000000	V1
Chromium	0.0022262	0.0008665	V0	0.0004838	V0	0.0000000	V1
Cobalt	0.0000273	0.0001440	V0	0.0000703	V0	0.0000020	V0
Copper	0.0017171	0.0014900	V0	0.0008058	V0	0.0002605	V0
Iron	0.0393063	0.3272514	V0	0.1669716	V0	0.0000000	V1
Lanthanum	0.0000130	0.0001864	V0	0.0001453	V0	0.0000000	V1
Lead	0.0008577	0.0014259	V0	0.0004388	V0	0.0000000	V1
Lithium	0.0000374	0.0002779	V0	0.0002127	V0	0.0000027	V0
Magnesium	0.0091409	0.0841606	V0	0.0518892	V0	0.0007192	V0
Manganese	0.0006949	0.0072712	V0	0.0034709	V0	0.0000000	V1
Molybdenum	0.0007116	0.0009031	V0	0.0002066	V0	0.0000458	V0
Neodymium	0.0000140	0.0001328	V0	0.0000953	V0	0.0000006	V0
Nickel	0.0005429	0.0025559	V0	0.0006381	V0	0.0001152	V0
Niobium	0.0000202	0.0000462	V0	0.0000302	V0	0.0000000	V1
Palladium	0.0000632	0.0000060	V0	0.0000093	V0	0.0000032	V0
Phosphorus	0.0459574	0.0172685	V0	0.0165912	V0	0.0113226	V0
Platinum	0.0000088	0.0000027	V0	0.0000022	V0	0.0000027	V0
Potassium	0.0061261	0.1213355	V0	0.0824843	V0	0.0021300	V0
Praseodymium	0.0000070	0.0000352	V0	0.0000248	V0	0.0000000	V1
Rubidium	0.0000184	0.0003675	V0	0.0002823	V0	0.0000019	V0
Samarium	0.0000133	0.0000245	V0	0.0000166	V0	0.0000000	V1
Selenium	0.0003366	0.0003058	V0	0.0002114	V0	0.0000000	V1
Silicon	0.7676322	1.1375817	V0	0.9403869	V0	0.0995194	V0
Silver	0.0000100	0.0000071	V0	0.0000069	V0	0.0000013	V0
Sodium	0.0169447	0.2387336	V0	0.1427948	V0	0.0041918	V0
Strontium	0.0003375	0.0014046	V0	0.0008572	V0	0.0000152	V0
Tantalum	0.0000394	0.0000030	V0	0.0000019	V0	0.0000000	V1
Thallium	0.0000090	0.0000051	V0	0.0000031	V0	0.0000000	V1
Thorium	0.0000059	0.0000405	V0	0.0000292	V0	0.0000003	V0
Tin	0.0004414	0.0002011	V0	0.0001380	V0	0.0000259	V0
Titanium	0.0015201	0.0115090	V0	0.0086292	V0	0.0007806	V0
Tungsten	0.0000938	0.0002177	V0	0.0000924	V0	0.0000000	V1
Uranium	0.0000048	0.0000165	V0	0.0000099	V0	0.0000000	V1
Vanadium	0.0007697	0.0061142	V0	0.0013307	V0	0.0000000	V1
Zinc	0.0055897	0.0127296	V0	0.0045330	V0	0.0000000	V1



Compound Name	MDL (µg/sample)	Muskeg River		Travel Blank	
		Results (µg/m³)	QC Flag	Results (µg/m³)	QC Flag
Particulate Matter	1.00	24.26	V0	0.14	V0
Aluminum	0.1380326	0.7412577	V0	0.0000000	V1
Antimony	0.0001784	0.0002102	V0	0.0000000	V1
Arsenic	0.0001060	0.0002131	V0	0.0000000	V1
Barium	0.0092847	0.0060301	V0	0.0000000	V1
Beryllium	0.0000946	0.0000202	V0	0.0000000	V1
Bismuth	0.0000093	0.0000156	V0	0.0000034	V0
Cadmium	0.0000174	0.0000231	V0	0.0000000	V1
Calcium	0.4112124	1.0321167	V0	0.0000000	V1
Cerium	0.0000174	0.0008800	V0	0.0000017	V0
Cesium	0.0000100	0.0000517	V0	0.0000000	V1
Chromium	0.0022262	0.0014645	V0	0.0000000	V1
Cobalt	0.0000273	0.0001957	V0	0.0000020	V0
Copper	0.0017171	0.0012028	V0	0.0002605	V0
Iron	0.0393063	0.5881837	V0	0.0000000	V1
Lanthanum	0.0000130	0.0004805	V0	0.0000000	V1
Lead	0.0008577	0.0007847	V0	0.0000000	V1
Lithium	0.0000374	0.0008585	V0	0.0000027	V0
Magnesium	0.0091409	0.1522210	V0	0.0007192	V0
Manganese	0.0006949	0.0119298	V0	0.0000000	V1
Molybdenum	0.0007116	0.0005748	V0	0.0000458	V0
Neodymium	0.0000140	0.0003722	V0	0.0000006	V0
Nickel	0.0005429	0.0019755	V0	0.0001152	V0
Niobium	0.0000202	0.0001137	V0	0.0000000	V1
Palladium	0.0000632	0.0000146	V0	0.0000032	V0
Phosphorus	0.0459574	0.0213660	V0	0.0113226	V0
Platinum	0.0000088	0.0000057	V0	0.0000027	V0
Potassium	0.0061261	0.2197196	V0	0.0021300	V0
Praseodymium	0.0000070	0.0000981	V0	0.0000000	V1
Rubidium	0.0000184	0.0009351	V0	0.0000019	V0
Samarium	0.0000133	0.0000678	V0	0.0000000	V1
Selenium	0.0003366	0.0006443	V0	0.0000000	V1
Silicon	0.7676322	2.0826676	V0	0.0995194	V0
Silver	0.0000100	0.0000114	V0	0.0000013	V0
Sodium	0.0169447	0.2134157	V0	0.0041918	V0
Strontium	0.0003375	0.0025994	V0	0.0000152	V0
Tantalum	0.0000394	0.0000069	V0	0.0000000	V1
Thallium	0.0000090	0.0000083	V0	0.0000000	V1
Thorium	0.0000059	0.0001160	V0	0.0000003	V0
Tin	0.0004414	0.0001554	V0	0.0000259	V0
Titanium	0.0015201	0.0306713	V0	0.0007806	V0
Tungsten	0.0000938	0.0001328	V0	0.0000000	V1
Uranium	0.0000048	0.0000319	V0	0.0000000	V1
Vanadium	0.0007697	0.0035078	V0	0.0000000	V1
Zinc	0.0055897	0.0078944	V0	0.0000000	V1



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	20-Mar		20-Mar		20-Mar	
Particulate Size	PM10		PM10				
Total Air Volume (m ³)	24		24		24		
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	44.00	V0	23.16	V0	0.12	V0
Aluminum	0.1380326	1.5079524	V0	0.5192605	V0	0.0000000	V1
Antimony	0.0001784	0.0000643	V0	0.0002068	V0	0.0000000	V1
Arsenic	0.0001060	0.0003957	V0	0.0002281	V0	0.0000000	V1
Barium	0.0092847	0.0121661	V0	0.0063520	V0	0.0000000	V1
Beryllium	0.0000946	0.0000441	V0	0.0000161	V0	0.0000000	V1
Bismuth	0.0000093	0.0000147	V0	0.0000138	V0	0.0000008	V0
Cadmium	0.0000174	0.0000230	V0	0.0000218	V0	0.0000000	V1
Calcium	0.4112124	2.7997607	V0	0.9429755	V0	0.0000000	V1
Cerium	0.0000174	0.0018348	V0	0.0006327	V0	0.0000000	V1
Cesium	0.0000100	0.0001087	V0	0.0000385	V0	0.0000000	V1
Chromium	0.0022262	0.0018829	V0	0.0008843	V0	0.0000000	V1
Cobalt	0.0000273	0.0004277	V0	0.0001777	V0	0.0000013	V0
Copper	0.0017171	0.0012158	V0	0.0016150	V0	0.0002063	V0
Iron	0.0393063	1.4285586	V0	0.6145206	V0	0.0000000	V1
Lanthanum	0.0000130	0.0009044	V0	0.0003066	V0	0.0000000	V1
Lead	0.0008577	0.0009360	V0	0.0006680	V0	0.0000000	V1
Lithium	0.0000374	0.0017726	V0	0.0005395	V0	0.0000016	V0
Magnesium	0.0091409	0.3121495	V0	0.1511257	V0	0.0004228	V0
Manganese	0.0006949	0.0233374	V0	0.0106554	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003756	V0	0.0003398	V0	0.0000471	V0
Neodymium	0.0000140	0.0007902	V0	0.0002696	V0	0.0000000	V1
Nickel	0.0005429	0.0018960	V0	0.0009395	V0	0.0000359	V0
Niobium	0.0000202	0.0001995	V0	0.0000643	V0	0.0000000	V1
Palladium	0.0000632	0.0000524	V0	0.0000226	V0	0.0000000	V1
Phosphorus	0.0459574	0.0256526	V0	0.0184943	V0	0.0112931	V0
Platinum	0.0000088	0.0000037	V0	0.0000049	V0	0.0000015	V0
Potassium	0.0061261	0.4627591	V0	0.2105460	V0	0.0012970	V0
Praseodymium	0.0000070	0.0002099	V0	0.0000709	V0	0.0000000	V1
Rubidium	0.0000184	0.0019515	V0	0.0007484	V0	0.0000013	V0
Samarium	0.0000133	0.0001429	V0	0.0000491	V0	0.0000000	V1
Selenium	0.0003366	0.0011605	V0	0.0004280	V0	0.0000000	V1
Silicon	0.7676322	5.6419774	V0	1.9703063	V0	0.0837318	V0
Silver	0.0000100	0.0000109	V0	0.0000054	V0	0.0000000	V1
Sodium	0.0169447	0.3764301	V0	0.8994588	V0	0.0014248	V0
Strontium	0.0003375	0.0060899	V0	0.0024463	V0	0.0000000	V1
Tantalum	0.0000394	0.0000140	V0	0.0000051	V0	0.0000000	V1
Thallium	0.0000090	0.0000179	V0	0.0000084	V0	0.0000000	V1
Thorium	0.0000059	0.0002501	V0	0.0000797	V0	0.0000000	V1
Tin	0.0004414	0.0001660	V0	0.0002100	V0	0.0000187	V0
Titanium	0.0015201	0.0550796	V0	0.0191127	V0	0.0003406	V0
Tungsten	0.0000938	0.0002522	V0	0.0001912	V0	0.0000052	V0
Uranium	0.0000048	0.0000654	V0	0.0000241	V0	0.0000000	V1
Vanadium	0.0007697	0.0042825	V0	0.0023202	V0	0.0000000	V1
Zinc	0.0055897	0.0038858	V0	0.0052230	V0	0.0000000	V1



Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
	AMS 7 20-Mar PM10 24	Results (µg/m ³)	QC Flag	AMS 14 20-Mar PM10 24	Results (µg/m ³)	QC Flag	20-Mar 24
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	26.44	V0	10.24	V0	0.12	V0
Aluminum	0.1380326	0.5407317	V0	0.2615686	V0	0.0000000	V1
Antimony	0.0001784	0.0001857	V0	0.0000429	V0	0.0000000	V1
Arsenic	0.0001060	0.0002239	V0	0.0001378	V0	0.0000000	V1
Barium	0.0092847	0.0062638	V0	0.0022290	V0	0.0000000	V1
Beryllium	0.0000946	0.0000170	V0	0.0000063	V0	0.0000000	V1
Bismuth	0.0000093	0.0000125	V0	0.0000078	V0	0.0000008	V0
Cadmium	0.0000174	0.0000212	V0	0.0000189	V0	0.0000000	V1
Calcium	0.4112124	1.1510107	V0	0.2926812	V0	0.0000000	V1
Cerium	0.0000174	0.0006392	V0	0.0002849	V0	0.0000000	V1
Cesium	0.0000100	0.0000401	V0	0.0000199	V0	0.0000000	V1
Chromium	0.0022262	0.0008985	V0	0.0004113	V0	0.0000000	V1
Cobalt	0.0000273	0.0001926	V0	0.0000759	V0	0.0000013	V0
Copper	0.0017171	0.0016031	V0	0.0005628	V0	0.0002063	V0
Iron	0.0393063	0.6558532	V0	0.2149421	V0	0.0000000	V1
Lanthanum	0.0000130	0.0003105	V0	0.0001377	V0	0.0000000	V1
Lead	0.0008577	0.0006286	V0	0.0005360	V0	0.0000000	V1
Lithium	0.0000374	0.0005365	V0	0.0002722	V0	0.0000016	V0
Magnesium	0.0091409	0.1736737	V0	0.0613474	V0	0.0004228	V0
Manganese	0.0006949	0.0113831	V0	0.0042005	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003446	V0	0.0002119	V0	0.0000471	V0
Neodymium	0.0000140	0.0002803	V0	0.0001250	V0	0.0000000	V1
Nickel	0.0005429	0.0008959	V0	0.0005323	V0	0.0000359	V0
Niobium	0.0000202	0.0000649	V0	0.0000339	V0	0.0000000	V1
Palladium	0.0000632	0.0000123	V0	0.0000070	V0	0.0000000	V1
Phosphorus	0.0459574	0.0187270	V0	0.0151270	V0	0.0112931	V0
Platinum	0.0000088	0.0000038	V0	0.0000023	V0	0.0000015	V0
Potassium	0.0061261	0.2393685	V0	0.0910578	V0	0.0012970	V0
Praseodymium	0.0000070	0.0000708	V0	0.0000328	V0	0.0000000	V1
Rubidium	0.0000184	0.0007777	V0	0.0003493	V0	0.0000013	V0
Samarium	0.0000133	0.0000500	V0	0.0000243	V0	0.0000000	V1
Selenium	0.0003366	0.0004573	V0	0.0002264	V0	0.0000000	V1
Silicon	0.7676322	2.3752329	V0	0.9962601	V0	0.0837318	V0
Silver	0.0000100	0.0000045	V0	0.0000030	V0	0.0000000	V1
Sodium	0.0169447	1.3219893	V0	0.1524543	V0	0.0014248	V0
Strontium	0.0003375	0.0026933	V0	0.0009774	V0	0.0000000	V1
Tantalum	0.0000394	0.0000053	V0	0.0000023	V0	0.0000000	V1
Thallium	0.0000090	0.0000084	V0	0.0000049	V0	0.0000000	V1
Thorium	0.0000059	0.0000802	V0	0.0000374	V0	0.0000000	V1
Tin	0.0004414	0.0001898	V0	0.0001052	V0	0.0000187	V0
Titanium	0.0015201	0.0190509	V0	0.0103157	V0	0.0003406	V0
Tungsten	0.0000938	0.0002821	V0	0.0000467	V0	0.0000052	V0
Uranium	0.0000048	0.0000236	V0	0.0000123	V0	0.0000000	V1
Vanadium	0.0007697	0.0025689	V0	0.0015798	V0	0.0000000	V1
Zinc	0.0055897	0.0052717	V0	0.0020585	V0	0.0000000	V1



Compound Name	Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Fort McKay South			Horizon		Travel Blank	
		AMS 13 20-Mar PM10 24	Results (µg/m ³)	QC Flag	AMS 15 20-Mar PM10 24	Results (µg/m ³)	QC Flag	20-Mar 24 Results (µg/m ³) QC Flag
Particulate Matter	1.00	32.05	V0	57.92	V0	0.12	V0	
Aluminum	0.1380326	0.9047350	V0	3.0304854	V0	0.0000000	V1	
Antimony	0.0001784	0.0000517	V0	0.0000731	V0	0.0000000	V1	
Arsenic	0.0001060	0.0002623	V0	0.0006830	V0	0.0000000	V1	
Barium	0.0092847	0.0079464	V0	0.0242397	V0	0.0000000	V1	
Beryllium	0.0000946	0.0000281	V0	0.0000797	V0	0.0000000	V1	
Bismuth	0.0000093	0.0000124	V0	0.0000203	V0	0.0000008	V0	
Cadmium	0.0000174	0.0000192	V0	0.0000301	V0	0.0000000	V1	
Calcium	0.4112124	1.6634216	V0	2.6059832	V0	0.0000000	V1	
Cerium	0.0000174	0.0011502	V0	0.0035538	V0	0.0000000	V1	
Cesium	0.0000100	0.0000651	V0	0.0002152	V0	0.0000000	V1	
Chromium	0.0022262	0.0012724	V0	0.0032521	V0	0.0000000	V1	
Cobalt	0.0000273	0.0002876	V0	0.0007421	V0	0.0000013	V0	
Copper	0.0017171	0.0009234	V0	0.0017206	V0	0.0002063	V0	
Iron	0.0393063	0.9614961	V0	3.0100896	V0	0.0000000	V1	
Lanthanum	0.0000130	0.0005266	V0	0.0017715	V0	0.0000000	V1	
Lead	0.0008577	0.0007299	V0	0.0014141	V0	0.0000000	V1	
Lithium	0.0000374	0.0010573	V0	0.0033916	V0	0.0000016	V0	
Magnesium	0.0091409	0.2031935	V0	0.5347884	V0	0.0004228	V0	
Manganese	0.0006949	0.0160689	V0	0.0455283	V0	0.0000000	V1	
Molybdenum	0.0007116	0.0004038	V0	0.0003268	V0	0.0000471	V0	
Neodymium	0.0000140	0.0004710	V0	0.0015455	V0	0.0000000	V1	
Nickel	0.0005429	0.0015366	V0	0.0028109	V0	0.0000359	V0	
Niobium	0.0000202	0.0001124	V0	0.0003914	V0	0.0000000	V1	
Palladium	0.0000632	0.0000158	V0	0.0000574	V0	0.0000000	V1	
Phosphorus	0.0459574	0.0207591	V0	0.0406167	V0	0.0112931	V0	
Platinum	0.0000088	0.0000028	V0	0.0000041	V0	0.0000015	V0	
Potassium	0.0061261	0.3002092	V0	0.8952510	V0	0.0012970	V0	
Praseodymium	0.0000070	0.0001221	V0	0.0004064	V0	0.0000000	V1	
Rubidium	0.0000184	0.0012208	V0	0.0037601	V0	0.0000013	V0	
Samarium	0.0000133	0.0000844	V0	0.0002840	V0	0.0000000	V1	
Selenium	0.0003366	0.0006791	V0	0.0021957	V0	0.0000000	V1	
Silicon	0.7676322	3.8639942	V0	8.8033049	V0	0.0837318	V0	
Silver	0.0000100	0.0000050	V0	0.0000152	V0	0.0000000	V1	
Sodium	0.0169447	0.3516922	V0	0.5125482	V0	0.0014248	V0	
Strontium	0.0003375	0.0038569	V0	0.0092195	V0	0.0000000	V1	
Tantalum	0.0000394	0.0000075	V0	0.0000272	V0	0.0000000	V1	
Thallium	0.0000090	0.0000124	V0	0.0000329	V0	0.0000000	V1	
Thorium	0.0000059	0.0001398	V0	0.0005092	V0	0.0000000	V1	
Tin	0.0004414	0.0001103	V0	0.0001691	V0	0.0000187	V0	
Titanium	0.0015201	0.0360989	V0	0.1098650	V0	0.0003406	V0	
Tungsten	0.0000938	0.0001752	V0	0.0003730	V0	0.0000052	V0	
Uranium	0.0000048	0.0000395	V0	0.0001302	V0	0.0000000	V1	
Vanadium	0.0007697	0.0040475	V0	0.0062640	V0	0.0000000	V1	
Zinc	0.0055897	0.0030977	V0	0.0058965	V0	0.0000000	V1	



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16				
Sample Date	20-Mar			20-Mar	
Particulate Size	PM10				
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	40.45	V0	0.12	V0
Aluminum	0.1380326	1.5368695	V0	0.0000000	V1
Antimony	0.0001784	0.0000502	V0	0.0000000	V1
Arsenic	0.0001060	0.0002972	V0	0.0000000	V1
Barium	0.0092847	0.0114043	V0	0.0000000	V1
Beryllium	0.0000946	0.0000461	V0	0.0000000	V1
Bismuth	0.0000093	0.0000146	V0	0.0000008	V0
Cadmium	0.0000174	0.0000220	V0	0.0000000	V1
Calcium	0.4112124	1.7579166	V0	0.0000000	V1
Cerium	0.0000174	0.0019379	V0	0.0000000	V1
Cesium	0.0000100	0.0000975	V0	0.0000000	V1
Chromium	0.0022262	0.0019933	V0	0.0000000	V1
Cobalt	0.0000273	0.0004292	V0	0.0000013	V0
Copper	0.0017171	0.0010325	V0	0.0002063	V0
Iron	0.0393063	1.4613828	V0	0.0000000	V1
Lanthanum	0.0000130	0.0009460	V0	0.0000000	V1
Lead	0.0008577	0.0009494	V0	0.0000000	V1
Lithium	0.0000374	0.0018237	V0	0.0000016	V0
Magnesium	0.0091409	0.3023639	V0	0.0004228	V0
Manganese	0.0006949	0.0250851	V0	0.0000000	V1
Molybdenum	0.0007116	0.0002251	V0	0.0000471	V0
Neodymium	0.0000140	0.0008271	V0	0.0000000	V1
Nickel	0.0005429	0.0016382	V0	0.0000359	V0
Niobium	0.0000202	0.0002410	V0	0.0000000	V1
Palladium	0.0000632	0.0000378	V0	0.0000000	V1
Phosphorus	0.0459574	0.0266201	V0	0.0112931	V0
Platinum	0.0000088	0.0000024	V0	0.0000015	V0
Potassium	0.0061261	0.4598793	V0	0.0012970	V0
Praseodymium	0.0000070	0.0002177	V0	0.0000000	V1
Rubidium	0.0000184	0.0017824	V0	0.0000013	V0
Samarium	0.0000133	0.0001541	V0	0.0000000	V1
Selenium	0.0003366	0.0012685	V0	0.0000000	V1
Silicon	0.7676322	5.7152531	V0	0.0837318	V0
Silver	0.0000100	0.0000096	V0	0.0000000	V1
Sodium	0.0169447	0.3763835	V0	0.0014248	V0
Strontium	0.0003375	0.0052248	V0	0.0000000	V1
Tantalum	0.0000394	0.0000167	V0	0.0000000	V1
Thallium	0.0000090	0.0000172	V0	0.0000000	V1
Thorium	0.0000059	0.0002558	V0	0.0000000	V1
Tin	0.0004414	0.0001361	V0	0.0000187	V0
Titanium	0.0015201	0.0653375	V0	0.0003406	V0
Tungsten	0.0000938	0.0002834	V0	0.0000052	V0
Uranium	0.0000048	0.0000681	V0	0.0000000	V1
Vanadium	0.0007697	0.0031837	V0	0.0000000	V1
Zinc	0.0055897	0.0036534	V0	0.0000000	V1



Compound Name	Bertha Ganter - Fort						
	Station Name	McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1		AMS 6			
	Sample Date	26-Mar		26-Mar		26-Mar	
Particulate Size	PM10		PM10				
Total Air Volume (m ³)	24		24		24		
MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	
Particulate Matter	1.00	11.35	V0	7.21	V0	0.08	V0
Aluminum	0.1380326	0.0570732	V0	0.0287049	V0	0.0000000	V1
Antimony	0.0001784	0.0000791	V0	0.0001683	V0	0.0000000	V1
Arsenic	0.0001060	0.0001496	V0	0.0000942	V0	0.0000000	V1
Barium	0.0092847	0.0009248	V0	0.0015121	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000064	V0	0.0000092	V0	0.0000000	V1
Cadmium	0.0000174	0.0000168	V0	0.0001254	V4	0.0000000	V1
Calcium	0.4112124	0.1546127	V0	0.0864274	V0	0.0000000	V1
Cerium	0.0000174	0.0000853	V0	0.0000422	V0	0.0000009	V0
Cesium	0.0000100	0.0000055	V0	0.0000027	V0	0.0000000	V1
Chromium	0.0022262	0.0002915	V0	0.0003280	V0	0.0000988	V0
Cobalt	0.0000273	0.0000265	V0	0.0000152	V0	0.0000015	V0
Copper	0.0017171	0.0007016	V0	0.0017488	V0	0.0001016	V0
Iron	0.0393063	0.0712816	V0	0.0490958	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000458	V0	0.0000255	V0	0.0000000	V1
Lead	0.0008577	0.0004164	V0	0.0003676	V0	0.0000000	V1
Lithium	0.0000374	0.0000542	V0	0.0000235	V0	0.0000019	V0
Magnesium	0.0091409	0.0249495	V0	0.0181564	V0	0.0000000	V1
Manganese	0.0006949	0.0025249	V0	0.0012417	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003742	V0	0.0000703	V0	0.0000538	V0
Neodymium	0.0000140	0.0000364	V0	0.0000146	V0	0.0000000	V1
Nickel	0.0005429	0.0005242	V0	0.0002233	V0	0.0000408	V0
Niobium	0.0000202	0.0000108	V0	0.0000050	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000089	V0	0.0000119	V0
Phosphorus	0.0459574	0.0151447	V0	0.0152137	V0	0.0107199	V0
Platinum	0.0000088	0.0000021	V0	0.0000035	V0	0.0000015	V0
Potassium	0.0061261	0.0750279	V0	0.0378603	V0	0.0002927	V0
Praseodymium	0.0000070	0.0000100	V0	0.0000041	V0	0.0000000	V1
Rubidium	0.0000184	0.0001090	V0	0.0000688	V0	0.0000000	V1
Samarium	0.0000133	0.0000072	V0	0.0000025	V0	0.0000000	V1
Selenium	0.0003366	0.0002145	V0	0.0001180	V0	0.0000000	V1
Silicon	0.7676322	0.1674120	V0	0.1999724	V0	0.0547816	V0
Silver	0.0000100	0.0000015	V0	0.0000014	V0	0.0000008	V0
Sodium	0.0169447	0.0439691	V0	0.0823875	V0	0.0007409	V0
Strontium	0.0003375	0.0003346	V0	0.0002516	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000025	V0	0.0000014	V0	0.0000000	V1
Thorium	0.0000059	0.0000131	V0	0.0000054	V0	0.0000000	V1
Tin	0.0004414	0.0001201	V0	0.0001722	V0	0.0000000	V1
Titanium	0.0015201	0.0028410	V0	0.0018119	V0	0.0006795	V0
Tungsten	0.0000938	0.0000302	V0	0.0000179	V0	0.0000000	V1
Uranium	0.0000048	0.0000050	V0	0.0000022	V0	0.0000000	V1
Vanadium	0.0007697	0.0017371	V0	0.0000930	V0	0.0000000	V1
Zinc	0.0055897	0.0035924	V0	0.0023074	V0	0.0000000	V1



Compound Name	Station Name Station # Sample Date Particulate Size Total Air Volume (m ³)	Athabasca Valley			Anzac		Travel Blank	
		MDL (µg/sample)	AMS 7 26-Mar PM10 24 Results (µg/m ³)	QC Flag	AMS 14 26-Mar PM10 24 Results (µg/m ³)	QC Flag	26-Mar 24 Results (µg/m ³)	QC Flag
Particulate Matter	1.00	8.69	V0	5.24	V0	0.08	V0	
Aluminum	0.1380326	0.0768076	V0	0.0427919	V0	0.0000000	V1	
Antimony	0.0001784	0.0003722	V0	0.0000649	V0	0.0000000	V1	
Arsenic	0.0001060	0.0000855	V0	0.0001088	V0	0.0000000	V1	
Barium	0.0092847	0.0036096	V0	0.0008958	V0	0.0000000	V1	
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1	
Bismuth	0.0000093	0.0000140	V0	0.0000051	V0	0.0000000	V1	
Cadmium	0.0000174	0.0000170	V0	0.0000172	V0	0.0000000	V1	
Calcium	0.4112124	0.1987322	V0	0.0827196	V0	0.0000000	V1	
Cerium	0.0000174	0.0001052	V0	0.0000414	V0	0.0000009	V0	
Cesium	0.0000100	0.0000064	V0	0.0000043	V0	0.0000000	V1	
Chromium	0.0022262	0.0003372	V0	0.0002147	V0	0.0000988	V0	
Cobalt	0.0000273	0.0000374	V0	0.0000167	V0	0.0000015	V0	
Copper	0.0017171	0.0022156	V0	0.0003882	V0	0.0001016	V0	
Iron	0.0393063	0.1210263	V0	0.0588578	V0	0.0000000	V1	
Lanthanum	0.0000130	0.0000589	V0	0.0000322	V0	0.0000000	V1	
Lead	0.0008577	0.0004255	V0	0.0003989	V0	0.0000000	V1	
Lithium	0.0000374	0.0000679	V0	0.0000312	V0	0.0000019	V0	
Magnesium	0.0091409	0.0427938	V0	0.0246212	V0	0.0000000	V1	
Manganese	0.0006949	0.0023645	V0	0.0013435	V0	0.0000000	V1	
Molybdenum	0.0007116	0.0001346	V0	0.0000697	V0	0.0000538	V0	
Neodymium	0.0000140	0.0000407	V0	0.0000169	V0	0.0000000	V1	
Nickel	0.0005429	0.0002409	V0	0.0001523	V0	0.0000408	V0	
Niobium	0.0000202	0.0000150	V0	0.0000063	V0	0.0000000	V1	
Palladium	0.0000632	0.0000115	V0	0.0000066	V0	0.0000119	V0	
Phosphorus	0.0459574	0.0098900	V0	0.0120878	V0	0.0107199	V0	
Platinum	0.0000088	0.0000018	V0	0.0000020	V0	0.0000015	V0	
Potassium	0.0061261	0.0605502	V0	0.0437193	V0	0.0002927	V0	
Praseodymium	0.0000070	0.0000114	V0	0.0000046	V0	0.0000000	V1	
Rubidium	0.0000184	0.0001306	V0	0.0000794	V0	0.0000000	V1	
Samarium	0.0000133	0.0000067	V0	0.0000028	V0	0.0000000	V1	
Selenium	0.0003366	0.0001347	V0	0.0001493	V0	0.0000000	V1	
Silicon	0.7676322	0.2125104	V0	0.1253864	V0	0.0547816	V0	
Silver	0.0000100	0.0000190	V0	0.0000018	V0	0.0000008	V0	
Sodium	0.0169447	0.3052388	V0	0.0374129	V0	0.0007409	V0	
Strontium	0.0003375	0.0005948	V0	0.0002336	V0	0.0000000	V1	
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1	
Thallium	0.0000090	0.0000026	V0	0.0000023	V0	0.0000000	V1	
Thorium	0.0000059	0.0000122	V0	0.0000058	V0	0.0000000	V1	
Tin	0.0004414	0.0002613	V0	0.0000972	V0	0.0000000	V1	
Titanium	0.0015201	0.0074180	V0	0.0021139	V0	0.0006795	V0	
Tungsten	0.0000938	0.0000714	V0	0.0000125	V0	0.0000000	V1	
Uranium	0.0000048	0.0000050	V0	0.0000029	V0	0.0000000	V1	
Vanadium	0.0007697	0.0002252	V0	0.0001217	V0	0.0000000	V1	
Zinc	0.0055897	0.0030885	V0	0.0022790	V0	0.0000000	V1	



Station Name	Fort McKay South			Horizon		Travel Blank	
Station #	AMS 13			AMS 15			
Sample Date	26-Mar			26-Mar		26-Mar	
Particulate Size	PM10			PM10			
Total Air Volume (m ³)	24			24		24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	10.74	V0	7.52	V0	0.08	V0
Aluminum	0.1380326	0.0473356	V0	0.0437897	V0	0.0000000	V1
Antimony	0.0001784	0.0000768	V0	0.0000567	V0	0.0000000	V1
Arsenic	0.0001060	0.0001328	V0	0.0001156	V0	0.0000000	V1
Barium	0.0092847	0.0007928	V0	0.0005693	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000062	V0	0.0000046	V0	0.0000000	V1
Cadmium	0.0000174	0.0000147	V0	0.0000127	V0	0.0000000	V1
Calcium	0.4112124	0.1025229	V0	0.0749424	V0	0.0000000	V1
Cerium	0.0000174	0.0000587	V0	0.0000457	V0	0.0000009	V0
Cesium	0.0000100	0.0000045	V0	0.0000041	V0	0.0000000	V1
Chromium	0.0022262	0.0002428	V0	0.0004370	V0	0.0000988	V0
Cobalt	0.0000273	0.0000238	V0	0.0000190	V0	0.0000015	V0
Copper	0.0017171	0.0006010	V0	0.0004912	V0	0.0001016	V0
Iron	0.0393063	0.0604786	V0	0.0523972	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000312	V0	0.0000256	V0	0.0000000	V1
Lead	0.0008577	0.0003793	V0	0.0002869	V0	0.0000000	V1
Lithium	0.0000374	0.0000431	V0	0.0000424	V0	0.0000019	V0
Magnesium	0.0091409	0.0201606	V0	0.0185436	V0	0.0000000	V1
Manganese	0.0006949	0.0021683	V0	0.0014406	V0	0.0000000	V1
Molybdenum	0.0007116	0.0003299	V0	0.0002138	V0	0.0000538	V0
Neodymium	0.0000140	0.0000240	V0	0.0000195	V0	0.0000000	V1
Nickel	0.0005429	0.0004918	V0	0.0002536	V0	0.0000408	V0
Niobium	0.0000202	0.0000089	V0	0.0000069	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000000	V1	0.0000119	V0
Phosphorus	0.0459574	0.0145809	V0	0.0167994	V0	0.0107199	V0
Platinum	0.0000088	0.0000017	V0	0.0000016	V0	0.0000015	V0
Potassium	0.0061261	0.0394423	V0	0.0336958	V0	0.0002927	V0
Praseodymium	0.0000070	0.0000070	V0	0.0000050	V0	0.0000000	V1
Rubidium	0.0000184	0.0000869	V0	0.0000774	V0	0.0000000	V1
Samarium	0.0000133	0.0000043	V0	0.0000035	V0	0.0000000	V1
Selenium	0.0003366	0.0001409	V0	0.0001345	V0	0.0000000	V1
Silicon	0.7676322	0.1665940	V0	0.1736386	V0	0.0547816	V0
Silver	0.0000100	0.0000118	V0	0.0000016	V0	0.0000008	V0
Sodium	0.0169447	0.0396788	V0	0.0308269	V0	0.0007409	V0
Strontium	0.0003375	0.0002546	V0	0.0002153	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000019	V0	0.0000020	V0	0.0000000	V1
Thorium	0.0000059	0.0000077	V0	0.0000067	V0	0.0000000	V1
Tin	0.0004414	0.0001310	V0	0.0000951	V0	0.0000000	V1
Titanium	0.0015201	0.0025023	V0	0.0021343	V0	0.0006795	V0
Tungsten	0.0000938	0.0000165	V0	0.0000447	V0	0.0000000	V1
Uranium	0.0000048	0.0000036	V0	0.0000029	V0	0.0000000	V1
Vanadium	0.0007697	0.0013857	V0	0.0006793	V0	0.0000000	V1
Zinc	0.0055897	0.0027306	V0	0.0038018	V0	0.0000000	V1



Station Name	Muskeg River			Travel Blank	
Station #	AMS 16			26-Mar	
Sample Date	26-Mar			26-Mar	
Particulate Size	PM10			24	
Total Air Volume (m ³)	24			24	
Compound Name	MDL (µg/sample)	Results (µg/m ³)	QC Flag	Results (µg/m ³)	QC Flag
Particulate Matter	1.00	8.05	V0	0.08	V0
Aluminum	0.1380326	0.0567705	V0	0.0000000	V1
Antimony	0.0001784	0.0000588	V0	0.0000000	V1
Arsenic	0.0001060	0.0001004	V0	0.0000000	V1
Barium	0.0092847	0.0007495	V0	0.0000000	V1
Beryllium	0.0000946	0.0000000	V1	0.0000000	V1
Bismuth	0.0000093	0.0000067	V0	0.0000000	V1
Cadmium	0.0000174	0.0000139	V0	0.0000000	V1
Calcium	0.4112124	0.0945132	V0	0.0000000	V1
Cerium	0.0000174	0.0000711	V0	0.0000009	V0
Cesium	0.0000100	0.0000051	V0	0.0000000	V1
Chromium	0.0022262	0.0004162	V0	0.0000988	V0
Cobalt	0.0000273	0.0000226	V0	0.0000015	V0
Copper	0.0017171	0.0005594	V0	0.0001016	V0
Iron	0.0393063	0.0648343	V0	0.0000000	V1
Lanthanum	0.0000130	0.0000396	V0	0.0000000	V1
Lead	0.0008577	0.0003185	V0	0.0000000	V1
Lithium	0.0000374	0.0000667	V0	0.0000019	V0
Magnesium	0.0091409	0.0223388	V0	0.0000000	V1
Manganese	0.0006949	0.0019080	V0	0.0000000	V1
Molybdenum	0.0007116	0.0002689	V0	0.0000538	V0
Neodymium	0.0000140	0.0000301	V0	0.0000000	V1
Nickel	0.0005429	0.0002914	V0	0.0000408	V0
Niobium	0.0000202	0.0000117	V0	0.0000000	V1
Palladium	0.0000632	0.0000000	V1	0.0000119	V0
Phosphorus	0.0459574	0.0147535	V0	0.0107199	V0
Platinum	0.0000088	0.0000013	V0	0.0000015	V0
Potassium	0.0061261	0.0408694	V0	0.0002927	V0
Praseodymium	0.0000070	0.0000079	V0	0.0000000	V1
Rubidium	0.0000184	0.0000919	V0	0.0000000	V1
Samarium	0.0000133	0.0000049	V0	0.0000000	V1
Selenium	0.0003366	0.0001131	V0	0.0000000	V1
Silicon	0.7676322	0.2088205	V0	0.0547816	V0
Silver	0.0000100	0.0000013	V0	0.0000008	V0
Sodium	0.0169447	0.0402247	V0	0.0007409	V0
Strontium	0.0003375	0.0002584	V0	0.0000000	V1
Tantalum	0.0000394	0.0000000	V1	0.0000000	V1
Thallium	0.0000090	0.0000019	V0	0.0000000	V1
Thorium	0.0000059	0.0000098	V0	0.0000000	V1
Tin	0.0004414	0.0001243	V0	0.0000000	V1
Titanium	0.0015201	0.0030801	V0	0.0006795	V0
Tungsten	0.0000938	0.0000157	V0	0.0000000	V1
Uranium	0.0000048	0.0000041	V0	0.0000000	V1
Vanadium	0.0007697	0.0009946	V0	0.0000000	V1
Zinc	0.0055897	0.0031895	V0	0.0000000	V1



Station Name	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay	Bertha Ganter - Fort McKay
Station #	AMS 1	AMS 1	AMS 1	AMS 1
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	36.59	21.40	5	5
Aluminum	1.3737212	1.2737126	5	5
Antimony	0.0005290	0.0009601	5	5
Arsenic	0.0004020	0.0002519	5	5
Barium	0.0113071	0.0098808	5	5
Beryllium	0.0000412	0.0000375	5	4
Bismuth	0.0000190	0.0000098	5	5
Cadmium	0.0000275	0.0000084	5	5
Calcium	1.7868383	1.3657116	5	5
Cerium	0.0015935	0.0015073	5	5
Cesium	0.0001012	0.0000968	5	5
Chromium	0.0019195	0.0015661	5	5
Cobalt	0.0004081	0.0003298	5	5
Copper	0.0015698	0.0008451	5	5
Iron	1.1570111	0.9636346	5	5
Lanthanum	0.0008060	0.0007625	5	5
Lead	0.0012602	0.0006445	5	5
Lithium	0.0016164	0.0015885	5	5
Magnesium	0.2646046	0.1901087	5	5
Manganese	0.0201356	0.0154111	5	5
Molybdenum	0.0007476	0.0006769	5	5
Neodymium	0.0006873	0.0006554	5	5
Nickel	0.0025783	0.0019768	5	5
Niobium	0.0002135	0.0002379	5	5
Palladium	0.0000358	0.0000315	5	4
Phosphorus	0.0253578	0.0096843	5	5
Platinum	0.0000029	0.0000010	5	5
Potassium	0.4439144	0.3583750	5	5
Praseodymium	0.0001827	0.0001731	5	5
Rubidium	0.0017199	0.0015542	5	5
Samarium	0.0001266	0.0001185	5	5
Selenium	0.0010801	0.0009332	5	5
Silicon	4.3265820	3.5841170	5	5
Silver	0.0000100	0.0000069	5	5
Sodium	0.3393724	0.1802545	5	5
Strontium	0.0047567	0.0038686	5	5
Tantalum	0.0000139	0.0000144	5	4
Thallium	0.0000158	0.0000128	5	5
Thorium	0.0002204	0.0002039	5	5
Tin	0.0002088	0.0000814	5	5
Titanium	0.0564481	0.0569113	5	5
Tungsten	0.0003629	0.0003215	5	5
Uranium	0.0000611	0.0000565	5	5
Vanadium	0.0067737	0.0057307	5	5
Zinc	0.0077101	0.0051678	5	5



Station Name	Patricia McInnes	Patricia McInnes	Patricia McInnes	Patricia McInnes
Station #	AMS 6	AMS 6	AMS 6	AMS 6
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	22.75	14.76	5	5
Aluminum	0.6779959	0.8019447	5	5
Antimony	0.0003242	0.0002455	5	5
Arsenic	0.0002734	0.0001448	5	5
Barium	0.0077295	0.0051768	5	5
Beryllium	0.0000196	0.0000210	5	4
Bismuth	0.0000225	0.0000122	5	5
Cadmium	0.0000482	0.0000437	5	5
Calcium	0.9418965	0.8603992	5	5
Cerium	0.0008018	0.0008757	5	5
Cesium	0.0000486	0.0000553	5	5
Chromium	0.0012015	0.0007947	5	5
Cobalt	0.0002082	0.0001965	5	5
Copper	0.0023096	0.0011839	5	5
Iron	0.6188766	0.5877572	5	5
Lanthanum	0.0003911	0.0004228	5	5
Lead	0.0009420	0.0005414	5	5
Lithium	0.0007038	0.0008457	5	5
Magnesium	0.1835138	0.1748262	5	5
Manganese	0.0107852	0.0098604	5	5
Molybdenum	0.0003277	0.0001979	5	5
Neodymium	0.0003314	0.0003772	5	5
Nickel	0.0010272	0.0008860	5	5
Niobium	0.0000860	0.0000947	5	5
Palladium	0.0000238	0.0000111	5	5
Phosphorus	0.0204242	0.0055129	5	5
Platinum	0.0000031	0.0000011	5	5
Potassium	0.2562107	0.2290517	5	5
Praseodymium	0.0000879	0.0000999	5	5
Rubidium	0.0009016	0.0009534	5	5
Samarium	0.0000605	0.0000695	5	5
Selenium	0.0005206	0.0005004	5	5
Silicon	2.2010186	2.1733126	5	5
Silver	0.0000066	0.0000036	5	5
Sodium	1.0801785	0.6591502	5	5
Strontium	0.0027474	0.0024876	5	5
Tantalum	0.0000066	0.0000073	5	4
Thallium	0.0000090	0.0000077	5	5
Thorium	0.0001057	0.0001227	5	5
Tin	0.0003213	0.0001602	5	5
Titanium	0.0264334	0.0287325	5	5
Tungsten	0.0002902	0.0002385	5	5
Uranium	0.0000293	0.0000303	5	5
Vanadium	0.0023037	0.0026266	5	5
Zinc	0.0058255	0.0024102	5	5



Station Name	Athabasca Valley	Athabasca Valley	Athabasca Valley	Athabasca Valley
Station #	AMS 7	AMS 7	AMS 7	AMS 7
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	31.98	18.50	5	5
Aluminum	0.7434780	0.7821617	5	5
Antimony	0.0005323	0.0004953	5	5
Arsenic	0.0002736	0.0001751	5	5
Barium	0.0115825	0.0081684	5	5
Beryllium	0.0000246	0.0000245	5	4
Bismuth	0.0000285	0.0000190	5	5
Cadmium	0.0000266	0.0000104	5	5
Calcium	1.5384112	1.3922909	5	5
Cerium	0.0009287	0.0009285	5	5
Cesium	0.0000525	0.0000532	5	5
Chromium	0.0015092	0.0009730	5	5
Cobalt	0.0003304	0.0002631	5	5
Copper	0.0073929	0.0111984	5	5
Iron	0.8876873	0.7612834	5	5
Lanthanum	0.0004516	0.0004393	5	5
Lead	0.0009518	0.0005193	5	5
Lithium	0.0007141	0.0007495	5	5
Magnesium	0.2493644	0.1981493	5	5
Manganese	0.0157465	0.0136511	5	5
Molybdenum	0.0004096	0.0002094	5	5
Neodymium	0.0003909	0.0003978	5	5
Nickel	0.0012466	0.0009267	5	5
Niobium	0.0001000	0.0000944	5	5
Palladium	0.0000302	0.0000222	5	5
Phosphorus	0.0210190	0.0086633	5	5
Platinum	0.0000037	0.0000012	5	5
Potassium	0.3453835	0.2745396	5	5
Praseodymium	0.0001022	0.0001026	5	5
Rubidium	0.0010429	0.0009928	5	5
Samarium	0.0000712	0.0000749	5	5
Selenium	0.0006197	0.0005507	5	5
Silicon	2.7290917	2.4619148	5	5
Silver	0.0000106	0.0000063	5	5
Sodium	2.4417684	1.6664102	5	5
Strontium	0.0039254	0.0031120	5	5
Tantalum	0.0000082	0.0000083	5	4
Thallium	0.0000106	0.0000083	5	5
Thorium	0.0001169	0.0001215	5	5
Tin	0.0004372	0.0003752	5	5
Titanium	0.0318223	0.0297907	5	5
Tungsten	0.0006636	0.0005385	5	5
Uranium	0.0000339	0.0000322	5	5
Vanadium	0.0024854	0.0024808	5	5
Zinc	0.0104118	0.0091766	5	5



Station Name	Anzac	Anzac	Anzac	Anzac
Station #	AMS 14	AMS 14	AMS 14	AMS 14
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	10.18	9.27	5	5
Aluminum	0.2454375	0.3132732	5	5
Antimony	0.0000553	0.0000142	5	5
Arsenic	0.0001583	0.0001042	5	5
Barium	0.0023627	0.0024281	5	5
Beryllium	0.0000080	0.0000100	5	4
Bismuth	0.0000122	0.0000101	5	5
Cadmium	0.0000183	0.0000063	5	5
Calcium	0.4135116	0.5842707	5	5
Cerium	0.0002888	0.0003353	5	5
Cesium	0.0000182	0.0000220	5	5
Chromium	0.0009418	0.0010389	5	5
Cobalt	0.0000902	0.0001052	5	5
Copper	0.0005339	0.0001908	5	5
Iron	0.2277559	0.2990215	5	5
Lanthanum	0.0001394	0.0001635	5	5
Lead	0.0005641	0.0003030	5	5
Lithium	0.0002259	0.0002930	5	5
Magnesium	0.0737600	0.0870116	5	5
Manganese	0.0043720	0.0052023	5	5
Molybdenum	0.0001597	0.0000952	5	5
Neodymium	0.0001160	0.0001543	5	5
Nickel	0.0005071	0.0003884	5	5
Niobium	0.0000322	0.0000402	5	5
Palladium	0.0000102	0.0000122	5	4
Phosphorus	0.0146685	0.0024620	5	5
Platinum	0.0000021	0.0000002	5	5
Potassium	0.0987969	0.1082643	5	5
Praseodymium	0.0000307	0.0000409	5	5
Rubidium	0.0003298	0.0004047	5	5
Samarium	0.0000213	0.0000284	5	5
Selenium	0.0002284	0.0002183	5	5
Silicon	0.9929248	1.2846756	5	5
Silver	0.0000044	0.0000049	5	5
Sodium	0.1740919	0.1714569	5	5
Strontium	0.0010334	0.0012204	5	5
Tantalum	0.0000021	0.0000034	5	2
Thallium	0.0000044	0.0000037	5	5
Thorium	0.0000358	0.0000475	5	5
Tin	0.0001039	0.0000270	5	5
Titanium	0.0099045	0.0124470	5	5
Tungsten	0.0000896	0.0001153	5	5
Uranium	0.0000114	0.0000139	5	5
Vanadium	0.0009031	0.0009923	5	5
Zinc	0.0025965	0.0009009	5	5



Station Name	Fort McKay South	Fort McKay South	Fort McKay South	Fort McKay South
Station #	AMS 13	AMS 13	AMS 13	AMS 13
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	27.45	16.65	5	5
Aluminum	0.8635495	0.8449892	5	5
Antimony	0.0004745	0.0008643	5	5
Arsenic	0.0003151	0.0002007	5	5
Barium	0.0072717	0.0065215	5	5
Beryllium	0.0000270	0.0000244	5	4
Bismuth	0.0000163	0.0000074	5	5
Cadmium	0.0000224	0.0000053	5	5
Calcium	1.1523513	1.0527798	5	5
Cerium	0.0009530	0.0008931	5	5
Cesium	0.0000627	0.0000617	5	5
Chromium	0.0013096	0.0009710	5	5
Cobalt	0.0002839	0.0002579	5	5
Copper	0.0011812	0.0005643	5	5
Iron	0.8123433	0.7693454	5	5
Lanthanum	0.0004648	0.0004270	5	5
Lead	0.0010171	0.0004533	5	5
Lithium	0.0009805	0.0009307	5	5
Magnesium	0.1764877	0.1421161	5	5
Manganese	0.0142425	0.0123383	5	5
Molybdenum	0.0005629	0.0003740	5	5
Neodymium	0.0004123	0.0003954	5	5
Nickel	0.0017149	0.0010955	5	5
Niobium	0.0001148	0.0001065	5	5
Palladium	0.0000153	0.0000152	5	4
Phosphorus	0.0213680	0.0075348	5	5
Platinum	0.0000025	0.0000007	5	5
Potassium	0.2875738	0.2526235	5	5
Praseodymium	0.0001074	0.0001020	5	5
Rubidium	0.0011044	0.0010463	5	5
Samarium	0.0000761	0.0000739	5	5
Selenium	0.0006758	0.0005682	5	5
Silicon	3.2026813	2.9803363	5	5
Silver	0.0000090	0.0000043	5	5
Sodium	0.3107757	0.1781046	5	5
Strontium	0.0030728	0.0026435	5	5
Tantalum	0.0000081	0.0000083	5	4
Thallium	0.0000110	0.0000090	5	5
Thorium	0.0001312	0.0001280	5	5
Tin	0.0001718	0.0000647	5	5
Titanium	0.0362164	0.0351050	5	5
Tungsten	0.0002896	0.0002672	5	5
Uranium	0.0000396	0.0000375	5	5
Vanadium	0.0044812	0.0031488	5	5
Zinc	0.0061769	0.0043240	5	5



Station Name Station # Sample Date Particulate Size Compound Name	Horizon AMS 15 Mar 02 - Mar 26 PM10 Average µg/m ³	Horizon AMS 15 Mar 02 - Mar 26 PM10 Std Dev µg/m ³	Horizon AMS 15 Mar 02 - Mar 26 PM10 Total Samples (#)	Horizon AMS 15 Mar 02 - Mar 26 PM10 Total ≥ MDL (#)
Particulate Matter	29.13	20.75	5	5
Aluminum	1.1391938	1.1996298	5	5
Antimony	0.0000615	0.0000095	5	5
Arsenic	0.0003183	0.0002301	5	5
Barium	0.0092154	0.0093924	5	5
Beryllium	0.0000323	0.0000314	5	4
Bismuth	0.0000117	0.0000060	5	5
Cadmium	0.0000209	0.0000067	5	5
Calcium	0.9411604	1.0731436	5	5
Cerium	0.0012774	0.0014127	5	5
Cesium	0.0000835	0.0000848	5	5
Chromium	0.0014790	0.0011541	5	5
Cobalt	0.0003026	0.0002898	5	5
Copper	0.0010420	0.0004553	5	5
Iron	1.0355860	1.1935198	5	5
Lanthanum	0.0006275	0.0006957	5	5
Lead	0.0008453	0.0004688	5	5
Lithium	0.0012320	0.0013434	5	5
Magnesium	0.2103766	0.2053473	5	5
Manganese	0.0166906	0.0177182	5	5
Molybdenum	0.0003224	0.0001806	5	5
Neodymium	0.0005486	0.0006126	5	5
Nickel	0.0013391	0.0010046	5	5
Niobium	0.0001420	0.0001535	5	5
Palladium	0.0000216	0.0000221	5	4
Phosphorus	0.0239901	0.0099425	5	5
Platinum	0.0000029	0.0000010	5	5
Potassium	0.3507067	0.3444796	5	5
Praseodymium	0.0001437	0.0001612	5	5
Rubidium	0.0014244	0.0014755	5	5
Samarium	0.0001017	0.0001128	5	5
Selenium	0.0008319	0.0008349	5	5
Silicon	3.9661390	3.5760316	5	5
Silver	0.0000074	0.0000050	5	5
Sodium	0.2468373	0.1832076	5	5
Strontium	0.0035397	0.0035906	5	5
Tantalum	0.0000099	0.0000108	5	4
Thallium	0.0000130	0.0000125	5	5
Thorium	0.0001790	0.0002022	5	5
Tin	0.0001380	0.0000271	5	5
Titanium	0.0415390	0.0431054	5	5
Tungsten	0.0002018	0.0001501	5	5
Uranium	0.0000485	0.0000510	5	5
Vanadium	0.0034398	0.0025093	5	5
Zinc	0.0042650	0.0011317	5	5



Station Name	Muskeg River	Muskeg River	Muskeg River	Muskeg River
Station #	AMS 16	AMS 16	AMS 16	AMS 16
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Particulate Size	PM10	PM10	PM10	PM10
Compound Name	Average µg/m ³	Std Dev µg/m ³	Total Samples (#)	Total ≥ MDL (#)
Particulate Matter	41.80	30.32	5	5
Aluminum	1.8599549	1.7349708	5	5
Antimony	0.0001126	0.0000672	5	5
Arsenic	0.0004018	0.0003195	5	5
Barium	0.0131157	0.0121075	5	5
Beryllium	0.0000512	0.0000474	5	4
Bismuth	0.0000170	0.0000086	5	5
Cadmium	0.0000257	0.0000091	5	5
Calcium	2.1183581	2.2878930	5	5
Cerium	0.0021335	0.0019956	5	5
Cesium	0.0001295	0.0001255	5	5
Chromium	0.0023627	0.0017560	5	5
Cobalt	0.0004522	0.0004060	5	5
Copper	0.0013771	0.0007877	5	5
Iron	1.4901074	1.4295449	5	5
Lanthanum	0.0010545	0.0009736	5	5
Lead	0.0012107	0.0007972	5	5
Lithium	0.0022804	0.0021052	5	5
Magnesium	0.3226046	0.2915767	5	5
Manganese	0.0268085	0.0246800	5	5
Molybdenum	0.0004823	0.0003273	5	5
Neodymium	0.0009148	0.0008612	5	5
Nickel	0.0020210	0.0014265	5	5
Niobium	0.0002665	0.0002391	5	5
Palladium	0.0000352	0.0000313	5	4
Phosphorus	0.0280792	0.0122214	5	5
Platinum	0.0000048	0.0000031	5	5
Potassium	0.5479034	0.5009661	5	5
Praseodymium	0.0002409	0.0002264	5	5
Rubidium	0.0022050	0.0020865	5	5
Samarium	0.0001683	0.0001574	5	5
Selenium	0.0013946	0.0012435	5	5
Silicon	5.3037998	4.3889689	5	5
Silver	0.0000109	0.0000070	5	5
Sodium	0.4341314	0.3342656	5	5
Strontium	0.0057127	0.0051552	5	5
Tantalum	0.0000187	0.0000183	5	4
Thallium	0.0000190	0.0000163	5	5
Thorium	0.0003053	0.0003018	5	5
Tin	0.0001734	0.0000605	5	5
Titanium	0.0757035	0.0702179	5	5
Tungsten	0.0003533	0.0003645	5	5
Uranium	0.0000806	0.0000765	5	5
Vanadium	0.0045053	0.0035820	5	5
Zinc	0.0064894	0.0033426	5	5



Wood Buffalo Environmental Association

PM10 Metal Summary

2017 March

Compound	% Det	N	N < Det.	Min.	10%	25%	50%	60%	75%	80%	90%	95%	99% Max.	Mean	Std. Dev.	Median	Outlier Test	
Particulate Matter	100.0%	35	0	110	173	258	612	732	999	1093	1390	1642	2128	2128	685	488	612	3125
Aluminum	100.0%	35	0	0.6889	1.1227	2.2406	15.7746	21.7136	36.1909	48.8702	58.5894	82.2933	108.5676	108.5676	23.6686	26.2997	15.7746	155.1671
Antimony	100.0%	35	0	0.0010	0.0012	0.0014	0.0022	0.0040	0.0050	0.0076	0.0181	0.0485	0.0539	0.0539	0.0072	0.0126	0.0022	0.0701
Arsenic	100.0%	35	0	0.0018	0.0024	0.0032	0.0063	0.0071	0.0088	0.0116	0.0156	0.0197	0.0220	0.0220	0.0073	0.0050	0.0063	0.0325
Barium	100.0%	35	0	0.0137	0.0215	0.0535	0.1708	0.1907	0.2920	0.3809	0.5025	0.6576	0.7809	0.7809	0.2146	0.1968	0.1708	1.1985
Beryllium	80.0%	35	7	0.0000	0.0000	0.0001	0.0005	0.0007	0.0011	0.0013	0.0016	0.0024	0.0030	0.0030	0.0007	0.0007	0.0005	0.0043
Bismuth	100.0%	35	0	0.0001	0.0001	0.0002	0.0004	0.0004	0.0006	0.0007	0.0008	0.0010	0.0014	0.0014	0.0004	0.0003	0.0004	0.0018
Cadmium	100.0%	35	0	0.0003	0.0004	0.0004	0.0006	0.0006	0.0008	0.0008	0.0009	0.0010	0.0030	0.0030	0.0007	0.0005	0.0006	0.0029
Calcium	100.0%	35	0	1.6348	2.0743	4.4655	23.7499	34.2262	42.1900	55.6612	67.1943	93.2221	144.8205	144.8205	30.4887	31.7835	23.7499	189.4062
Cerium	100.0%	35	0	0.0010	0.0014	0.0037	0.0201	0.0216	0.0440	0.0543	0.0607	0.0970	0.1269	0.1269	0.0273	0.0302	0.0201	0.1783
Cesium	100.0%	35	0	0.0001	0.0001	0.0002	0.0011	0.0015	0.0025	0.0034	0.0040	0.0062	0.0079	0.0079	0.0017	0.0019	0.0011	0.0112
Chromium	100.0%	35	0	0.0049	0.0070	0.0105	0.0311	0.0382	0.0478	0.0633	0.0696	0.1081	0.1218	0.1218	0.0368	0.0287	0.0311	0.1803
Cobalt	100.0%	35	0	0.0004	0.0005	0.0015	0.0062	0.0073	0.0103	0.0126	0.0178	0.0224	0.0261	0.0261	0.0071	0.0067	0.0062	0.0404
Copper	100.0%	35	0	0.0093	0.0118	0.0193	0.0292	0.0388	0.0482	0.0538	0.0642	0.1060	0.6576	0.6576	0.0528	0.1074	0.0292	0.5898
Iron	100.0%	35	0	0.7590	1.4126	2.9046	15.7405	19.5743	34.2854	36.9151	51.4619	72.2422	91.1521	91.1521	21.3578	22.1137	15.7405	131.9266
Lanthanum	100.0%	35	0	0.0006	0.0008	0.0014	0.0094	0.0114	0.0217	0.0266	0.0289	0.0493	0.0625	0.0625	0.0135	0.0149	0.0094	0.0879
Lead	100.0%	35	0	0.0069	0.0088	0.0105	0.0225	0.0262	0.0337	0.0342	0.0430	0.0472	0.0565	0.0565	0.0233	0.0131	0.0225	0.0889
Lithium	100.0%	35	0	0.0006	0.0010	0.0019	0.0157	0.0248	0.0425	0.0483	0.0785	0.1007	0.1291	0.1291	0.0266	0.0313	0.0157	0.1830
Magnesium	100.0%	35	0	0.4358	0.5361	1.0271	4.1682	5.0111	7.2567	8.2671	12.8349	13.5319	18.9993	18.9993	5.0767	4.5678	4.1682	27.9156
Manganese	100.0%	35	0	0.0267	0.0346	0.0606	0.2733	0.3458	0.5601	0.6450	0.9243	1.0927	1.6002	1.6002	0.3730	0.3678	0.2733	2.2121
Molybdenum	100.0%	35	0	0.0017	0.0030	0.0051	0.0079	0.0086	0.0138	0.0152	0.0244	0.0262	0.0426	0.0426	0.0103	0.0086	0.0079	0.0535
Neodymium	100.0%	35	0	0.0004	0.0005	0.0010	0.0078	0.0095	0.0190	0.0232	0.0259	0.0421	0.0547	0.0547	0.0117	0.0131	0.0078	0.0772
Nickel	100.0%	35	0	0.0037	0.0058	0.0128	0.0268	0.0369	0.0474	0.0613	0.0742	0.1098	0.1146	0.1146	0.0358	0.0302	0.0268	0.1866
Niobium	100.0%	35	0	0.0001	0.0002	0.0004	0.0022	0.0027	0.0048	0.0059	0.0080	0.0149	0.0152	0.0152	0.0033	0.0038	0.0022	0.0224
Palladium	85.7%	35	5	0.0000	0.0001	0.0002	0.0004	0.0006	0.0009	0.0010	0.0014	0.0019	0.0020	0.0020	0.0006	0.0005	0.0004	0.0032
Phosphorus	100.0%	35	0	0.2374	0.3499	0.3651	0.4733	0.5128	0.6157	0.7151	0.8186	0.9901	1.1338	1.1338	0.5311	0.2094	0.4733	1.5784
Platinum	100.0%	35	0	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0000	0.0001	0.0003
Potassium	100.0%	35	0	0.6274	0.9466	1.8007	6.3238	7.2050	11.0371	15.2798	18.8496	24.6992	31.9150	31.9150	7.9902	7.6057	6.3238	46.0189
Praseodymium	100.0%	35	0	0.0001	0.0001	0.0003	0.0021	0.0025	0.0050	0.0061	0.0068	0.0111	0.0144	0.0144	0.0031	0.0034	0.0021	0.0203
Rubidium	100.0%	35	0	0.0014	0.0019	0.0033	0.0216	0.0258	0.0428	0.0599	0.0666	0.1013	0.1322	0.1322	0.0299	0.0317	0.0216	0.1885
Samarium	100.0%	35	0	0.0001	0.0001	0.0002	0.0014	0.0018	0.0034	0.0043	0.0048	0.0077	0.0100	0.0100	0.0021	0.0024	0.0014	0.0142
Selenium	100.0%	35	0	0.0016	0.0028	0.0049	0.0131	0.0155	0.0279	0.0330	0.0386	0.0633	0.0811	0.0811	0.0183	0.0187	0.0131	0.1116
Silicon	100.0%	35	0	3.0093	4.1673	8.3057	55.1948	77.1082	137.1661	144.4346	188.3239	228.9763	273.9187	273.9187	77.9048	74.3894	55.1948	449.8520
Silver	100.0%	35	0	0.0000	0.0000	0.0001	0.0002	0.0003	0.0003	0.0003	0.0004	0.0005	0.0005	0.0005	0.0002	0.0001	0.0002	0.0009
Sodium	100.0%	35	0	0.7398	0.9654	3.4271	9.0332	11.3132	20.4725	27.1950	44.0293	72.5579	110.5897	110.5897	17.2360	23.9477	9.0332	136.9745
Strontium	100.0%	35	0	0.0052	0.0061	0.0143	0.0652	0.0789	0.1254	0.1599	0.2108	0.2554	0.3317	0.3317	0.0850	0.0805	0.0652	0.4875
Tantalum	74.3%	35	9	0.0000	0.0000	0.0000	0.0002	0.0002	0.0003	0.0004	0.0005	0.0009	0.0011	0.0011	0.0002	0.0003	0.0002	0.0016
Thallium	100.0%	35	0	0.0000	0.0000	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0009	0.0011	0.0011	0.0003	0.0003	0.0002	0.0016
Thorium	100.0%	35	0	0.0001	0.0002	0.0003	0.0025	0.0032	0.0060	0.0075	0.0085	0.0132	0.0190	0.0190	0.0038	0.0044	0.0025	0.0255
Tin	100.0%	35	0	0.0018	0.0023	0.0031	0.0041	0.0046	0.0063	0.0066	0.0093	0.0135	0.0263	0.0263	0.0053	0.0044	0.0041	0.0273
Titanium	100.0%	35	0	0.0435	0.0539	0.1780	0.6501	0.8588	1.3219	1.7840	2.2641	3.6403	4.4422	4.4422	0.9534	1.0582	0.6501	6.2445
Tungsten	100.0%	35	0	0.0003	0.0004	0.0015	0.0061	0.0070	0.0090	0.0125	0.0215	0.0271	0.0316	0.0316	0.0077	0.0079	0.0061	0.0474
Uranium	100.0%	35	0	0.0001	0.0001	0.0001	0.0008	0.0009	0.0016	0.0019	0.0024	0.0037	0.0049	0.0049	0.0010	0.0011	0.0008	0.0067
Vanadium	100.0%	35	0	0.0022	0.0054	0.0310	0.0557	0.0775	0.1367	0.1503	0.2159	0.2549	0.3568	0.3568	0.0853	0.0837	0.0557	0.5036
Zinc	100.0%	35	0	0.0494	0.0547	0.0743	0.1088	0.1360	0.1895	0.2106	0.2727	0.3648	0.6243	0.6243	0.1491	0.1149	0.1088	0.7237



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

**INTEGRATED MONITORING PROGRAM
MONTHLY REPORT**

**POLYCYCLIC AROMATIC HYDROCARBONS
DATA SUMMARY
MARCH 2017**

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

PAHs: Airzone One Ltd
Mississauga, Ontario



FILE CONTENTS DESCRIPTION	PAH - Speciated PAH Gas + Particle Phase Measurements
SAMPLING INTERVAL	24 hour
SAMPLING FREQUENCY OF DATA	Once every 6 days
UNITS	ng/m ³ (nanogram per cubic meter)
OBSERVATION TYPE	Particles + gas
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	filtration and adsorbent
PARTICLE DIAMETER	TSP (total suspended particle)
MEDIUM	a glass fiber filter + PUF/XAD-2/PUF
ANALYTICAL METHOD	Gas Chromatograph/Mass Spectrometer (GC/MS)
SAMPLE PREPARATION	Solvent Extraction
ANALYTICAL LABORATORY	AIRZONE One Inc.
USER NOTE 1	Data are recovery corrected
USER NOTE 2	Volume is given at actual conditions of temperature and pressure during sampling as measured by the sampler
USER NOTE 3	Blank sample concentration (ng/m ³) is calculated using expected actual volume of sampler
VOLUME STANDARDIZATION	Actual Volume at Ambient Conditions
SAMPLING INSTRUMENT TYPE	Tisch TE-1000 High-Volume Sampler
FLAGS USED	
V0	Valid value
V1	Valid value but comprised wholly or partially of below detection limit data
V4	Valid value despite failing to meet some QC or statistical criteria
V5	Valid value but qualified because of possible contamination
V6	Valid value but qualified due to non-standard sampling conditions
M1	Missing value because no value is available
M2	Missing value because invalidated by Data Originator



Station Name	Bertha Ganter -				Travel Blank			
	Station #	Fort McKay	AMS 1	AMS 6	AMS 6	AMS 6	AMS 6	AMS 6
Sample Date		02-Mar	02-Mar	02-Mar	02-Mar	02-Mar	02-Mar	02-Mar
Total Air Volume (m ³)		315.99	315.99	315.99	315.99	315.99	316	316
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	
Naphthalene	0.008	28.068	V0	4.178	V0	0.041	V0	
Acenaphthylene	0.011	2.927	V0	2.014	V0	0.022	V0	
Acenaphthene	0.006	0.593	V0	0.588	V0	0.033	V0	
Fluorene	0.007	0.703	V0	1.325	V0	0.028	V0	
Phenanthrene	0.007	1.095	V0	1.153	V0	0.020	V0	
Anthracene	0.017	0.282	V0	0.307	V0	0.017	V1	
Acridine	0.019	0.309	V0	0.326	V0	0.005	V1	
Fluoranthene	0.007	0.577	V0	0.575	V0	0.010	V0	
Pyrene	0.008	0.928	V0	0.849	V0	0.008	V1	
Benzo(c)phenanthrene	0.015	0.902	V0	0.104	V0	0.003	V1	
Benz(a)anthracene	0.014	0.587	V0	0.313	V0	0.004	V1	
Chrysene	0.013	0.898	V0	0.580	V0	0.004	V1	
7,12-Dimethylbenz(a)anthracene	0.013	0.024	V0	0.057	V0	0.003	V1	
Benzo(b)fluoranthene	0.020	0.262	V0	0.188	V0	0.003	V1	
Benzo(k)fluoranthene	0.013	0.263	V0	0.188	V0	0.003	V1	
Benzo(a)pyrene	0.016	0.045	V0	0.035	V0	0.002	V1	
3-Methylcholanthrene	0.022	0.040	V0	0.029	V0	0.002	V1	
Indeno(123-cd)pyrene	0.017	0.137	V0	0.102	V0	0.002	V1	
Dibenz(a,h)anthracene	0.020	0.078	V0	0.086	V0	0.002	V1	
Benzo(ghi)perylene	0.020	0.126	V0	0.116	V0	0.003	V1	
Dibenzo(a,l)pyrene	0.024	0.031	V0	0.026	V0	0.001	V1	
Dibenzo(a,i)pyrene	0.025	0.048	V0	0.054	V0	0.002	V1	
Dibenzo(a,h)pyrene	0.020	0.052	V0	0.064	V0	0.002	V1	



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		02-Mar	
Sample Date	02-Mar			02-Mar		02-Mar	
Total Air Volume (m ³)	316.02			316		316	
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	10.414	V0	3.467	V0	0.041	V0
Acenaphthylene	0.011	1.150	V0	0.631	V0	0.022	V0
Acenaphthene	0.006	1.749	V0	0.462	V0	0.033	V0
Fluorene	0.007	1.782	V0	0.524	V0	0.028	V0
Phenanthrene	0.007	0.509	V0	0.494	V0	0.020	V0
Anthracene	0.017	0.031	V0	0.058	V0	0.017	V1
Acridine	0.019	0.036	V0	0.042	V0	0.005	V1
Fluoranthene	0.007	0.184	V0	0.307	V0	0.010	V0
Pyrene	0.008	0.407	V0	0.246	V0	0.008	V1
Benzo(c)phenanthrene	0.015	0.087	V0	0.332	V0	0.003	V1
Benz(a)anthracene	0.014	1.095	V0	0.464	V0	0.004	V1
Chrysene	0.013	1.854	V0	0.309	V0	0.004	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.069	V0	0.062	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.329	V0	0.224	V0	0.003	V1
Benzo(k)fluoranthene	0.013	0.348	V0	0.227	V0	0.003	V1
Benzo(a)pyrene	0.016	0.068	V0	0.059	V0	0.002	V1
3-Methylcholanthrene	0.022	0.045	V0	0.037	V0	0.002	V1
Indeno(123-cd)pyrene	0.017	0.083	V0	0.089	V0	0.002	V1
Dibenz(a,h)anthracene	0.020	0.105	V0	0.147	V0	0.002	V1
Benzo(ghi)perylene	0.020	0.147	V0	0.132	V0	0.003	V1
Dibenzo(a,l)pyrene	0.024	0.031	V0	0.048	V0	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.071	V0	0.062	V0	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.058	V0	0.055	V0	0.002	V1



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Polycyclic Aromatic Hydrocarbons (PAHs)

2017

Indicated Sites and Dates

Compound Name	Bertha Ganter -						
	Station Name	Fort McKay		Patricia McInnes		Travel Blank	
	Station #	AMS 1	AMS 6	AMS 6	AMS 6	08-Mar	08-Mar
	Sample Date	08-Mar	08-Mar	08-Mar	08-Mar	08-Mar	08-Mar
Total Air Volume (m ³)	316.01	316	316	316	316	316	316
MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	QC Flag
Naphthalene	0.008	21.154	V0	18.040	V0	0.042	V0
Acenaphthylene	0.011	0.410	V0	1.391	V0	0.023	V0
Acenaphthene	0.006	0.768	V0	0.560	V0	0.029	V0
Fluorene	0.007	0.429	V0	0.528	V0	0.025	V0
Phenanthrene	0.007	0.345	V0	0.579	V0	0.016	V0
Anthracene	0.017	0.052	V0	0.061	V0	0.012	V1
Acridine	0.019	0.174	V0	0.016	V1	0.007	V1
Fluoranthene	0.007	0.476	V0	0.911	V0	0.006	V1
Pyrene	0.008	0.296	V0	0.409	V0	0.008	V1
Benzo(c)phenanthrene	0.015	0.157	V0	0.023	V0	0.002	V1
Benz(a)anthracene	0.014	0.179	V0	0.182	V0	0.004	V1
Chrysene	0.013	0.355	V0	0.441	V0	0.006	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.044	V0	0.098	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.141	V0	0.092	V0	0.002	V1
Benzo(k)fluoranthene	0.013	0.141	V0	0.092	V0	0.002	V1
Benzo(a)pyrene	0.016	0.076	V0	0.051	V0	0.002	V1
3-Methylcholanthrene	0.022	0.015	V1	0.021	V1	0.002	V1
Indeno(123-cd)pyrene	0.017	0.111	V0	0.137	V0	0.001	V1
Dibenz(a,h)anthracene	0.020	0.125	V0	0.120	V0	0.002	V1
Benzo(ghi)perylene	0.020	0.130	V0	0.080	V0	0.002	V1
Dibenzo(a,l)pyrene	0.024	0.009	V1	0.041	V0	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.053	V0	0.032	V0	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.016	V1	0.025	V0	0.001	V1



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14			
Sample Date	08-Mar			08-Mar		08-Mar	
Total Air Volume (m ³)	316.02			316		316	
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	8.933	V0	17.515	V0	0.042	V0
Acenaphthylene	0.011	0.650	V0	0.855	V0	0.023	V0
Acenaphthene	0.006	0.373	V0	0.305	V0	0.029	V0
Fluorene	0.007	0.761	V0	0.644	V0	0.025	V0
Phenanthrene	0.007	0.409	V0	0.346	V0	0.016	V0
Anthracene	0.017	0.052	V0	0.068	V0	0.012	V1
Acridine	0.019	0.032	V0	0.020	V0	0.007	V1
Fluoranthene	0.007	0.318	V0	0.245	V0	0.006	V1
Pyrene	0.008	0.509	V0	0.280	V0	0.008	V1
Benzo(c)phenanthrene	0.015	0.025	V0	0.100	V0	0.002	V1
Benz(a)anthracene	0.014	0.223	V0	0.114	V0	0.004	V1
Chrysene	0.013	0.284	V0	0.344	V0	0.006	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.088	V0	0.069	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.191	V0	0.112	V0	0.002	V1
Benzo(k)fluoranthene	0.013	0.191	V0	0.112	V0	0.002	V1
Benzo(a)pyrene	0.016	0.079	V0	0.052	V0	0.002	V1
3-Methylcholanthrene	0.022	0.034	V0	0.038	V0	0.002	V1
Indeno(123-cd)pyrene	0.017	0.061	V0	0.099	V0	0.001	V1
Dibenz(a,h)anthracene	0.020	0.075	V0	0.085	V0	0.002	V1
Benzo(ghi)perylene	0.020	0.089	V0	0.032	V0	0.002	V1
Dibenzo(a,l)pyrene	0.024	0.056	V0	0.052	V0	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.012	V1	0.022	V1	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.066	V0	0.055	V0	0.001	V1



Station Name	Bertha Ganter -						
	Station #	Fort McKay			Patricia McInnes		Travel Blank
Sample Date	AMS 1	AMS 6			AMS 6		14-Mar
Total Air Volume (m ³)	14-Mar	14-Mar			14-Mar		14-Mar
	315.99	315.99			315.99		316
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	14.685	V0	14.178	V0	0.065	V0
Acenaphthylene	0.011	2.052	V0	1.445	V0	0.037	V0
Acenaphthene	0.006	2.514	V0	1.652	V0	0.045	V0
Fluorene	0.007	2.644	V0	2.714	V0	0.053	V0
Phenanthrene	0.007	8.283	V0	7.239	V0	0.016	V0
Anthracene	0.017	0.592	V0	0.528	V0	0.005	V1
Acridine	0.019	0.043	V0	0.012	V1	0.004	V1
Fluoranthene	0.007	1.252	V0	2.071	V0	0.011	V0
Pyrene	0.008	1.916	V0	2.130	V0	0.009	V0
Benzo(c)phenanthrene	0.015	0.096	V0	0.087	V0	0.003	V1
Benz(a)anthracene	0.014	0.672	V0	0.250	V0	0.010	V1
Chrysene	0.013	0.609	V0	0.622	V0	0.008	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.132	V0	0.092	V0	0.004	V1
Benzo(b)fluoranthene	0.020	0.439	V0	0.352	V0	0.002	V1
Benzo(k)fluoranthene	0.013	0.437	V0	0.350	V0	0.002	V1
Benzo(a)pyrene	0.016	0.095	V0	0.084	V0	0.002	V1
3-Methylcholanthrene	0.022	0.022	V0	0.013	V1	0.001	V1
Indeno(123-cd)pyrene	0.017	0.084	V0	0.058	V0	0.003	V1
Dibenz(a,h)anthracene	0.020	0.091	V0	0.023	V0	0.002	V1
Benzo(ghi)perylene	0.020	0.092	V0	0.088	V0	0.001	V1
Dibenzo(a,l)pyrene	0.024	0.013	V1	0.011	V1	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.044	V0	0.034	V0	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.031	V0	0.017	V1	0.001	V1



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		14-Mar	
Sample Date	14-Mar			14-Mar		14-Mar	
Total Air Volume (m ³)	316			315.99		316	
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	16.329	V0	5.574	V0	0.065	V0
Acenaphthylene	0.011	0.991	V0	0.570	V0	0.037	V0
Acenaphthene	0.006	1.761	V0	1.158	V0	0.045	V0
Fluorene	0.007	1.979	V0	1.153	V0	0.053	V0
Phenanthrene	0.007	5.641	V0	1.836	V0	0.016	V0
Anthracene	0.017	0.344	V0	0.120	V0	0.005	V1
Acridine	0.019	0.032	V0	0.017	V1	0.004	V1
Fluoranthene	0.007	1.224	V0	0.347	V0	0.011	V0
Pyrene	0.008	1.509	V0	0.201	V0	0.009	V0
Benzo(c)phenanthrene	0.015	0.074	V0	0.020	V0	0.003	V1
Benz(a)anthracene	0.014	0.137	V0	0.031	V0	0.010	V1
Chrysene	0.013	0.501	V0	0.065	V0	0.008	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.117	V0	0.062	V0	0.004	V1
Benzo(b)fluoranthene	0.020	0.201	V0	0.096	V0	0.002	V1
Benzo(k)fluoranthene	0.013	0.208	V0	0.096	V0	0.002	V1
Benzo(a)pyrene	0.016	0.063	V0	0.044	V0	0.002	V1
3-Methylcholanthrene	0.022	0.021	V1	0.011	V1	0.001	V1
Indeno(123-cd)pyrene	0.017	0.053	V0	0.020	V0	0.003	V1
Dibenz(a,h)anthracene	0.020	0.028	V0	0.020	V0	0.002	V1
Benzo(ghi)perylene	0.020	0.077	V0	0.027	V0	0.001	V1
Dibenzo(a,l)pyrene	0.024	0.011	V1	0.013	V1	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.034	V0	0.033	V0	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.017	V1	0.024	V0	0.001	V1



Compound Name	Bertha Ganter -						
	Station Name	Fort McKay			Patricia McInnes		Travel Blank
	Station #	AMS 1		AMS 6			
	Sample Date	20-Mar		20-Mar		20-Mar	
Total Air Volume (m ³)		316		315.99		316	
	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	10.930	V0	19.303	V0	0.066	V0
Acenaphthylene	0.011	1.063	V0	0.971	V0	0.052	V0
Acenaphthene	0.006	1.355	V0	1.067	V0	0.030	V0
Fluorene	0.007	0.727	V0	0.916	V0	0.041	V0
Phenanthrene	0.007	2.610	V0	2.168	V0	0.018	V0
Anthracene	0.017	0.197	V0	0.174	V0	0.006	V1
Acridine	0.019	0.090	V0	0.031	V0	0.004	V1
Fluoranthene	0.007	0.729	V0	0.639	V0	0.007	V1
Pyrene	0.008	1.063	V0	0.731	V0	0.008	V1
Benzo(c)phenanthrene	0.015	0.101	V0	0.061	V0	0.002	V1
Benz(a)anthracene	0.014	0.540	V0	0.254	V0	0.008	V1
Chrysene	0.013	0.851	V0	0.493	V0	0.009	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.253	V0	0.126	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.294	V0	0.209	V0	0.004	V1
Benzo(k)fluoranthene	0.013	0.292	V0	0.208	V0	0.004	V1
Benzo(a)pyrene	0.016	0.160	V0	0.104	V0	0.002	V1
3-Methylcholanthrene	0.022	0.050	V0	0.026	V0	0.001	V1
Indeno(123-cd)pyrene	0.017	0.084	V0	0.055	V0	0.001	V1
Dibenz(a,h)anthracene	0.020	0.071	V0	0.037	V0	0.001	V1
Benzo(ghi)perylene	0.020	0.147	V0	0.115	V0	0.003	V1
Dibenzo(a,l)pyrene	0.024	0.013	V1	0.017	V1	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.031	V0	0.039	V0	0.001	V1
Dibenzo(a,h)pyrene	0.020	0.019	V1	0.020	V0	0.002	V1



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		20-Mar	
Sample Date	20-Mar			20-Mar		20-Mar	
Total Air Volume (m ³)	316			316.01		316	
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	9.803	V0	10.153	V0	0.066	V0
Acenaphthylene	0.011	0.800	V0	0.483	V0	0.052	V0
Acenaphthene	0.006	1.034	V0	0.635	V0	0.030	V0
Fluorene	0.007	0.786	V0	0.745	V0	0.041	V0
Phenanthrene	0.007	1.919	V0	1.203	V0	0.018	V0
Anthracene	0.017	0.138	V0	0.100	V0	0.006	V1
Acridine	0.019	0.014	V1	0.012	V1	0.004	V1
Fluoranthene	0.007	0.536	V0	0.218	V0	0.007	V1
Pyrene	0.008	0.547	V0	0.216	V0	0.008	V1
Benzo(c)phenanthrene	0.015	0.030	V0	0.017	V0	0.002	V1
Benz(a)anthracene	0.014	0.147	V0	0.101	V0	0.008	V1
Chrysene	0.013	0.347	V0	0.174	V0	0.009	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.125	V0	0.083	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.153	V0	0.094	V0	0.004	V1
Benzo(k)fluoranthene	0.013	0.152	V0	0.094	V0	0.004	V1
Benzo(a)pyrene	0.016	0.064	V0	0.057	V0	0.002	V1
3-Methylcholanthrene	0.022	0.019	V1	0.023	V0	0.001	V1
Indeno(123-cd)pyrene	0.017	0.035	V0	0.028	V0	0.001	V1
Dibenz(a,h)anthracene	0.020	0.022	V0	0.023	V0	0.001	V1
Benzo(ghi)perylene	0.020	0.059	V0	0.029	V0	0.003	V1
Dibenzo(a,l)pyrene	0.024	0.015	V1	0.019	V1	0.001	V1
Dibenzo(a,i)pyrene	0.025	0.041	V0	0.026	V0	0.001	V1
Dibenzo(a,h)pyrene	0.020	0.018	V1	0.031	V0	0.002	V1



Station Name	Bertha Ganter -						
	Station #	Fort McKay			Patricia McInnes		Travel Blank
Sample Date	AMS 1	AMS 6			AMS 6		26-Mar
Total Air Volume (m ³)	26-Mar	26-Mar			26-Mar		26-Mar
	315.98	315.99			315.99		316
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	12.927	V0	22.885	V0	0.060	V0
Acenaphthylene	0.011	1.212	V0	0.822	V0	0.050	V0
Acenaphthene	0.006	1.895	V0	1.107	V0	0.036	V0
Fluorene	0.007	1.696	V0	1.178	V0	0.045	V0
Phenanthrene	0.007	4.493	V0	2.642	V0	0.013	V0
Anthracene	0.017	0.256	V0	0.195	V0	0.008	V1
Acridine	0.019	0.062	V0	0.028	V0	0.004	V1
Fluoranthene	0.007	0.579	V0	0.870	V0	0.012	V0
Pyrene	0.008	0.573	V0	0.654	V0	0.014	V0
Benzo(c)phenanthrene	0.015	0.042	V0	0.025	V0	0.003	V1
Benz(a)anthracene	0.014	0.099	V0	0.068	V0	0.009	V1
Chrysene	0.013	0.268	V0	0.164	V0	0.009	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.074	V0	0.050	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.090	V0	0.074	V0	0.005	V1
Benzo(k)fluoranthene	0.013	0.091	V0	0.075	V0	0.005	V1
Benzo(a)pyrene	0.016	0.041	V0	0.038	V0	0.003	V1
3-Methylcholanthrene	0.022	0.018	V1	0.015	V1	0.003	V1
Indeno(123-cd)pyrene	0.017	0.028	V0	0.025	V0	0.003	V1
Dibenz(a,h)anthracene	0.020	0.026	V0	0.019	V1	0.001	V1
Benzo(ghi)perylene	0.020	0.022	V0	0.027	V0	0.002	V1
Dibenzo(a,l)pyrene	0.024	0.018	V1	0.016	V1	0.002	V1
Dibenzo(a,i)pyrene	0.025	0.026	V0	0.017	V1	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.021	V0	0.021	V0	0.002	V1



Station Name	Athabasca Valley			Anzac		Travel Blank	
Station #	AMS 7			AMS 14		26-Mar	
Sample Date	26-Mar			26-Mar		26-Mar	
Total Air Volume (m ³)	316			315.98		316	
Compound Name	MDL (ng/m ³)	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag	Results (ng/m ³)	QC Flag
Naphthalene	0.008	16.450	V0	5.126	V0	0.060	V0
Acenaphthylene	0.011	0.836	V0	0.370	V0	0.050	V0
Acenaphthene	0.006	1.299	V0	3.107	V0	0.036	V0
Fluorene	0.007	1.018	V0	1.942	V0	0.045	V0
Phenanthrene	0.007	2.206	V0	2.880	V0	0.013	V0
Anthracene	0.017	0.114	V0	0.198	V0	0.008	V1
Acridine	0.019	0.024	V0	0.041	V0	0.004	V1
Fluoranthene	0.007	0.483	V0	0.379	V0	0.012	V0
Pyrene	0.008	0.468	V0	0.182	V0	0.014	V0
Benzo(c)phenanthrene	0.015	0.017	V0	0.008	V1	0.003	V1
Benz(a)anthracene	0.014	0.031	V0	0.044	V0	0.009	V1
Chrysene	0.013	0.100	V0	0.068	V0	0.009	V1
7,12-Dimethylbenz(a)anthracene	0.013	0.045	V0	0.048	V0	0.003	V1
Benzo(b)fluoranthene	0.020	0.069	V0	0.052	V0	0.005	V1
Benzo(k)fluoranthene	0.013	0.064	V0	0.052	V0	0.005	V1
Benzo(a)pyrene	0.016	0.036	V0	0.027	V0	0.003	V1
3-Methylcholanthrene	0.022	0.020	V1	0.019	V1	0.003	V1
Indeno(123-cd)pyrene	0.017	0.028	V0	0.024	V0	0.003	V1
Dibenz(a,h)anthracene	0.020	0.020	V0	0.019	V1	0.001	V1
Benzo(ghi)perylene	0.020	0.028	V0	0.019	V1	0.002	V1
Dibenzo(a,l)pyrene	0.024	0.014	V1	0.012	V1	0.002	V1
Dibenzo(a,i)pyrene	0.025	0.016	V1	0.017	V1	0.002	V1
Dibenzo(a,h)pyrene	0.020	0.022	V0	0.021	V0	0.002	V1



Station Name	Bertha Ganter - Fort McKay AMS 1	Bertha Ganter - Fort McKay AMS 1	Bertha Ganter - Fort McKay AMS 1	Bertha Ganter - Fort McKay AMS 1
Station #				
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Compound Name	Average ng/m ³	Std Dev ng/m ³	Total Samples (#)	Total ≥ MDL (#)
Naphthalene	17.553	7.018	5	5
Acenaphthylene	1.533	0.974	5	5
Acenaphthene	1.425	0.796	5	5
Fluorene	1.240	0.921	5	5
Phenanthrene	3.365	3.174	5	5
Anthracene	0.276	0.198	5	5
Acridine	0.136	0.109	5	5
Fluoranthene	0.723	0.309	5	5
Pyrene	0.955	0.616	5	5
Benzo(c)phenanthrene	0.259	0.361	5	5
Benz(a)anthracene	0.415	0.258	5	5
Chrysene	0.596	0.284	5	5
7,12-Dimethylbenz(a)anthracene	0.105	0.092	5	5
Benzo(b)fluoranthene	0.245	0.137	5	5
Benzo(k)fluoranthene	0.245	0.136	5	5
Benzo(a)pyrene	0.083	0.049	5	5
3-Methylcholanthrene	0.029	0.015	5	3
Indeno(123-cd)pyrene	0.089	0.041	5	5
Dibenz(a,h)anthracene	0.078	0.036	5	5
Benzo(ghi)perylene	0.103	0.049	5	5
Dibenzo(a,l)pyrene	0.017	0.008	5	1
Dibenzo(a,i)pyrene	0.040	0.011	5	5
Dibenzo(a,h)pyrene	0.028	0.015	5	3



Station Name	Patricia McInnes	Patricia McInnes	Patricia McInnes	Patricia McInnes
Station #	AMS 6	AMS 6	AMS 6	AMS 6
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Compound Name	Average ng/m ³	Std Dev ng/m ³	Total Samples (#)	Total ≥ MDL (#)
Naphthalene	15.717	7.162	5	5
Acenaphthylene	1.328	0.467	5	5
Acenaphthene	0.995	0.448	5	5
Fluorene	1.332	0.830	5	5
Phenanthrene	2.756	2.635	5	5
Anthracene	0.253	0.177	5	5
Acridine	0.083	0.136	5	3
Fluoranthene	1.013	0.609	5	5
Pyrene	0.955	0.677	5	5
Benzo(c)phenanthrene	0.060	0.036	5	5
Benz(a)anthracene	0.213	0.093	5	5
Chrysene	0.460	0.180	5	5
7,12-Dimethylbenz(a)anthracene	0.085	0.031	5	5
Benzo(b)fluoranthene	0.183	0.111	5	5
Benzo(k)fluoranthene	0.183	0.110	5	5
Benzo(a)pyrene	0.062	0.030	5	5
3-Methylcholanthrene	0.021	0.007	5	2
Indeno(123-cd)pyrene	0.075	0.044	5	5
Dibenz(a,h)anthracene	0.057	0.044	5	4
Benzo(ghi)perylene	0.085	0.036	5	5
Dibenzo(a,l)pyrene	0.022	0.012	5	2
Dibenzo(a,i)pyrene	0.035	0.013	5	4
Dibenzo(a,h)pyrene	0.029	0.019	5	4



Station Name	Athabasca Valley	Athabasca Valley	Athabasca Valley	Athabasca Valley
Station #	AMS 7	AMS 7	AMS 7	AMS 7
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Compound Name	Average ng/m ³	Std Dev ng/m ³	Total Samples (#)	Total ≥ MDL (#)
Naphthalene	12.386	3.693	5	5
Acenaphthylene	0.885	0.191	5	5
Acenaphthene	1.243	0.576	5	5
Fluorene	1.265	0.575	5	5
Phenanthrene	2.137	2.120	5	5
Anthracene	0.136	0.124	5	5
Acridine	0.027	0.009	5	4
Fluoranthene	0.549	0.402	5	5
Pyrene	0.688	0.462	5	5
Benzo(c)phenanthrene	0.047	0.031	5	5
Benz(a)anthracene	0.326	0.435	5	5
Chrysene	0.617	0.706	5	5
7,12-Dimethylbenz(a)anthracene	0.089	0.033	5	5
Benzo(b)fluoranthene	0.188	0.094	5	5
Benzo(k)fluoranthene	0.193	0.103	5	5
Benzo(a)pyrene	0.062	0.016	5	5
3-Methylcholanthrene	0.028	0.011	5	2
Indeno(123-cd)pyrene	0.052	0.022	5	5
Dibenz(a,h)anthracene	0.050	0.038	5	5
Benzo(ghi)perylene	0.080	0.044	5	5
Dibenzo(a,l)pyrene	0.025	0.019	5	2
Dibenzo(a,i)pyrene	0.035	0.024	5	3
Dibenzo(a,h)pyrene	0.036	0.024	5	3



Station Name	Anzac	Anzac	Anzac	Anzac
Station #	AMS 14	AMS 14	AMS 14	AMS 14
Sample Date	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26	Mar 02 - Mar 26
Compound Name	Average ng/m ³	Std Dev ng/m ³	Total Samples (#)	Total ≥ MDL (#)
Naphthalene	8.367	5.683	5	5
Acenaphthylene	0.582	0.182	5	5
Acenaphthene	1.133	1.149	5	5
Fluorene	1.002	0.576	5	5
Phenanthrene	1.352	1.041	5	5
Anthracene	0.109	0.056	5	5
Acridine	0.027	0.014	5	3
Fluoranthene	0.299	0.068	5	5
Pyrene	0.225	0.039	5	5
Benzo(c)phenanthrene	0.095	0.138	5	4
Benz(a)anthracene	0.151	0.178	5	5
Chrysene	0.192	0.131	5	5
7,12-Dimethylbenz(a)anthracene	0.065	0.013	5	5
Benzo(b)fluoranthene	0.116	0.064	5	5
Benzo(k)fluoranthene	0.116	0.066	5	5
Benzo(a)pyrene	0.048	0.013	5	5
3-Methylcholanthrene	0.025	0.012	5	3
Indeno(123-cd)pyrene	0.052	0.039	5	5
Dibenz(a,h)anthracene	0.059	0.057	5	4
Benzo(ghi)perylene	0.048	0.047	5	4
Dibenzo(a,l)pyrene	0.029	0.019	5	2
Dibenzo(a,i)pyrene	0.032	0.018	5	3
Dibenzo(a,h)pyrene	0.037	0.017	5	5



Wood Buffalo Environmental Association

PAH (ng/m³) Summary

2017 February

Compound	% Det	N	N < Det.	Min.	10%	25%	50%	60%	75%	80%	90%	95%	99% Max.	Mean	Std. Dev.	Median	Outlier Test
3-Methylcholanthrene	50.0%	20	10	0.0109	0.0147	0.0193	0.0218	0.0260	0.0366	0.0376	0.0447	0.0495	0.0495	0.0257	0.0111	0.0218	0.0811
7,12-Dimethylbenz(a)anthracene	100.0%	20	0	0.0245	0.0453	0.0573	0.0741	0.0876	0.1170	0.1249	0.1322	0.2527	0.2527	0.0859	0.0497	0.0741	0.3344
Acenaphthene	100.0%	20	0	0.3050	0.4617	0.5928	1.1066	1.2987	1.7494	1.7613	2.5135	3.1075	3.1075	1.1991	0.7415	1.1066	4.9065
Acenaphthylene	100.0%	20	0	0.3698	0.4829	0.6501	0.9706	1.0633	1.3907	1.4452	2.0522	2.9267	2.9267	1.0821	0.6371	0.9706	4.2675
Acridine	75.0%	20	5	0.0120	0.0136	0.0203	0.0322	0.0410	0.0622	0.0900	0.3093	0.3259	0.3259	0.0681	0.0928	0.0322	0.5323
Anthracene	100.0%	20	0	0.0308	0.0523	0.0679	0.1743	0.1970	0.2825	0.3071	0.5284	0.5921	0.5921	0.1934	0.1557	0.1743	0.9720
Benz(a)anthracene	100.0%	20	0	0.0312	0.0436	0.1007	0.1820	0.2498	0.4635	0.5404	0.6720	1.0947	1.0947	0.2764	0.2708	0.1820	1.6305
Benzo(a)pyrene	100.0%	20	0	0.0266	0.0359	0.0442	0.0595	0.0645	0.0787	0.0835	0.1039	0.1605	0.1605	0.0638	0.0308	0.0595	0.2178
Benzo(b)fluoranthene	100.0%	20	0	0.0519	0.0743	0.0945	0.1880	0.2008	0.2624	0.2938	0.3517	0.4385	0.4385	0.1830	0.1072	0.1880	0.7193
Benzo(c)phenanthrene	95.0%	20	1	0.0080	0.0173	0.0249	0.0742	0.0873	0.1009	0.1043	0.3322	0.9016	0.9016	0.1154	0.1989	0.0742	1.1099
Benzo(ghi)perylene	95.0%	20	1	0.0187	0.0267	0.0294	0.0876	0.0921	0.1260	0.1297	0.1467	0.1474	0.1474	0.0791	0.0458	0.0876	0.3080
Benzo(k)fluoranthene	100.0%	20	0	0.0518	0.0753	0.0943	0.1884	0.2079	0.2627	0.2924	0.3502	0.4371	0.4371	0.1842	0.1086	0.1884	0.7274
Chrysene	100.0%	20	0	0.0646	0.0996	0.2681	0.3548	0.4930	0.6091	0.6219	0.8977	1.8544	1.8544	0.4664	0.4034	0.3548	2.4832
Dibenz(a,h)anthracene	90.0%	20	2	0.0193	0.0198	0.0227	0.0715	0.0776	0.0910	0.1050	0.1250	0.1470	0.1470	0.0610	0.0421	0.0715	0.2715
Dibenzo(a,h)pyrene	75.0%	20	5	0.0161	0.0170	0.0205	0.0244	0.0306	0.0546	0.0552	0.0639	0.0665	0.0665	0.0326	0.0179	0.0244	0.1221
Dibenzo(a,i)pyrene	75.0%	20	5	0.0115	0.0170	0.0259	0.0338	0.0392	0.0477	0.0532	0.0618	0.0714	0.0714	0.0356	0.0161	0.0338	0.1162
Dibenzo(a,l)pyrene	35.0%	20	13	0.0088	0.0112	0.0131	0.0171	0.0193	0.0311	0.0415	0.0516	0.0556	0.0556	0.0233	0.0148	0.0171	0.0973
Fluoranthene	100.0%	20	0	0.1840	0.2445	0.3471	0.5750	0.5787	0.8705	0.9108	1.2515	2.0712	2.0712	0.6460	0.4520	0.5750	2.9060
Fluorene	100.0%	20	0	0.4287	0.5283	0.7269	1.0181	1.1780	1.7821	1.9420	2.6443	2.7144	2.7144	1.2097	0.6923	1.0181	4.6710
Indeno(123-cd)pyrene	100.0%	20	0	0.0197	0.0251	0.0284	0.0609	0.0835	0.0994	0.1017	0.1368	0.1374	0.1374	0.0670	0.0378	0.0609	0.2561
Naphthalene	100.0%	20	0	3.4673	5.1262	9.8035	14.1782	16.3286	18.0400	19.3025	22.8851	28.0680	28.0680	13.5056	6.6116	14.1782	46.5634
Phenanthrene	100.0%	20	0	0.3445	0.4092	0.5793	1.9188	2.2057	2.8798	4.4934	7.2391	8.2832	8.2832	2.4025	2.3114	1.9188	13.9597
Pyrene	100.0%	20	0	0.1818	0.2165	0.2959	0.5470	0.6537	0.9276	1.0631	1.9165	2.1303	2.1303	0.7057	0.5613	0.5470	3.5121



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

INTEGRATED MONITORING PROGRAM MONTHLY REPORT

PRECIPITATION DATA SUMMARY MARCH 2017

Prepared
May 29, 2017

SAMPLE COLLECTION AND DATA COMPILATION BY:

Wood Buffalo Environmental Association
Fort McMurray, Alberta

LABORATORY ANALYSIS BY:

Precipitation: InnoTech Alberta, Inc.
Vegreville, Alberta



FILE CONTENTS DESCRIPTION	Precipitation Measurement of ions, pH and conductivity	
SAMPLING INTERVAL	A week	
SAMPLING FREQUENCY OF DATA	Weekly	
EXPLANATION OF ZERO VALUES	Zero values are contained in this file and should be treated as values below detection	
UNITS	mg/L (milligram per liter)	
OBSERVATION TYPE	Wet Precipitation Measurement of ions, pH and conductivity	
FIELD SAMPLING OR MEASUREMENT PRINCIPLE	moveable cover with precipitation sensors	
MEDIUM	Polyethylene Collection bucket	
ANALYTICALMETHODS	pH by pH meter Conductivity by Conductivity meter IONS by Ion Chromatography (IC)	
ANALYTICAL LABORATORY	InnoTech Alberta Inc	
USER NOTE 1	Data are not blank corrected	
SAMPLING INSTRUMENT TYPE	2000-2016 March	MIC precipitation collector
	2016 March- 2016 Sep	NTN Precip N-CON Sampler Total Precipitation Collector (TPC-3000)
	2016 Sep- current	
FLAGS USED		
M1	Missing value because no value is available	
M2	Missing value because invalidated by Data Originator	



Wood Buffalo Environmental Association
Precipitation summary

														2017 March		
		Compound	Acidity	Ammonium	Bicarbonate	Calcium	Chloride	Conductivity (25°C)	Magnesium	Nitrate	pH	Phosphate	Potassium	Sodium	Sulfate	
		unit	µeq/L	mg/L	µeq/L	mg/L	mg/L	µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	
START DATE	END DATE	DRY WEEK	PRECIP													
28-Feb-17	06-Mar-17		X	M1	0.466	113	5.49	1.29	M1	0.513	3.3	7.35	<0.04	0.244	1.14	2.64
06-Mar-17	13-Mar-17		X	M1	0.073	155	6.86	4.25	M1	0.566	1.45	7.48	<0.04	0.272	2.92	3.6
13-Mar-17	21-Mar-17		X	18	0.07	87.9	2.95	0.983	21	0.156	1.29	7.24	<0.04	0.3	0.66	1.45
21-Mar-17	28-Mar-17		X	16	1.31	70.8	3.55	0.598	33	0.332	4.39	7.14	<0.04	0.173	0.434	4.64
28-Mar-17	03-Apr-17	X		M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1	M1



This page intentionally left blank