WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

JANUARY 2014 MONTHLY REPORT

CONTINUOUS MONITORING
INTEGRATED MONITORING
February 28, 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc
Calgary, Alberta

AURORA
ATMOSPHERICS

February 28, 2014

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

RE: Monthly Ambient Air Quality Monitoring Report January 2014
Wood Buffalo Environmental Association

Enclosed is the January 2014 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 12 - Millennium Mine
AMS 13 – Fort McKay South
AMS 14 - Anzac
AMS 15 - CNRL Horizon
AMS 16 - Shell Muskeg River
AMS 17 – Wapasu
AMS 500 – Cenovus Christina Lake
MAMS – WBEA Mobile

In early January 2014, WBEA commissioned a portable air monitoring station at the Cenovus Energy Christina Lake facility. The survey at this location will be conducted from January to June, 2014 to fulfill Alberta Environment's Environmental Protection and Enhancement Act facility approval number 48522-01-00. This station is equipped with ambient air quality analyzers for SO_2, H_2S, NO, NO_2, NO_X and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

Aurora Atmospherics Inc.
15295 Sequoia Drive
Surrey, BC, V3S 8N4
Tel: 604.593.5501
Fax: 604.597.5015

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 SO_2, H_2S, CO, NO_2, NH_3, $PM_{2.5}$ and O_3.

Concentrations reported in near real-time were estimates, and 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 the reporting precision. The final 24-hour data values were calculated from final 1-hour values.

After data processing and validation, NO_2 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 NO_2 concentration. In cases where the NO_X and/or NO values exceeded the operating range of the analyzer, values reported for NO_2 were determined as the largest of either the difference between baseline-corrected NO_X and NO values, or the NO_2 value reported by the data acquisition system with baseline correction applied.

2.0 Operational Status

2.1 Continuous Monitoring

In January 2014, there were no incidents resulting in a compliance monitoring instrument operating less than 90 % of the time.

There were four incidents of monitoring instruments not required for air quality compliance operating less than 90 % of the time in January 2014.

1. The ambient temperature and relative humidity sensors at the 75 and 90 m elevations at AMS 5, Mannix Meteorological Tower, experienced periods of flat-lining in the output signals during freezing temperatures and snow fall. Data during these periods are reported as invalid. The sensors were operational for 88 % of the time during the month.

2. The sonic wind sensors at the 75 and 90 m elevations at AMS 5, Mannix Meteorological Tower, experienced periods of flat-lining in the output signal during freezing temperatures and snow fall. Data during these periods are reported as invalid. The sensors were operational for 88 and 87 % of the time, respectively.

2.2 Intermittent Monitoring

The results for passive and integrated monitoring of VOC, RSC, PAH, precipitation, $PM_{2.5}$ and PM_{10} samples were not available in time for submission with this monthly report and will be submitted at a later date.

3.0 Monitoring Notes

General Network Notes

The Ammonia (NH_3) analyzer currently operates on a 0 to 2500 ppb operating range with a detection level of 25 ppb in the WBEA network. In data processing, values less than 10.5 ppb have been considered below detection levels and are reported as zero.

The effects of freezing temperatures and snow fall in the region affected the normal operations of the wind sensors at all air monitoring stations. Resulting downtimes are provided for each individual station.

The global solar radiation sensor observations suggest that the sensors at the stations may have been covered in snow during this reporting period.

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

Station 1, Fort McKay

A power spike at the station on January 9 affected the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

The automatic daily zero and span system checks for the air quality analyzers failed to occur on January 9, 2014. The daily QA checks were re-initiated remotely to confirm analyzer responses for SO_2, THC, O_3, NO_2, and NH_3 parameters, which resulted in 1 to 3 hours of downtime.

A power failure at the station on January 16 affected the normal operations of all parameters for 15 hours. The NO_2 and THC analyzers required a manual reset resulting in 11 and 13 hours of additional downtime, respectively.

The NH_3 analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily span period. Additional time for stabilization after spanning is an inherent behavior in the NH_3 analyzer operations resulting from the properties of the NH_3 gas. Data for one hour following the daily spans have been reported as invalid for a total of 30 hours this month.

There were two issues associated with operation of the NH_3 analyzer resulting in 21 hours of invalid data. Replacement of the NH_3 analyzer and a follow-up calibration of the analyzer on January 13 affected normal operations for 16 hours. Maintenance performed on the analyzer on January 16 interrupted the normal operations of the analyzer for 5 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on January 17 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

The effects of freezing temperatures and snow fall in the region resulted in a flat-line of the output signals of the wind sensors for 11 hours this month.

The temperature sensors at 2 and 10 m are identical but 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

The automatic daily zero and span system checks on the SO_2 and THC analyzers failed to occur on January 9, 2014. The daily QA checks were re-initiated remotely to confirm analyzer responses for these parameters resulting in 1 hour of downtime for each analyzer.

Station 3, Lower Camp B - Meteorology

Flat-lines in the output signals of the 100 and 167 m elevation temperature and relative humidity sensors resulted in 11 and 36 hours of invalid data this reporting period, respectively.

The effects of freezing temperatures and snow fall in the region resulted in a flat-line of the output signals of the 100 and 167 m elevation wind sensors for 10 and 32 hours this month, respectively.

Station 4, Buffalo Viewpoint

A power failure at the station interrupted the normal operations of all parameters from January 15 to February 12, 2014. The WBEA mobile air monitoring van was deployed to the site on January 17 to monitor for ambient air while power issues at the station were resolved. The mobile van is equipped with ambient air quality analyzers for SO_2, H_2S, THC and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

The period between the power failure on January 15 and commencement of data collection by the WBEA mobile van was flagged as downtime. This resulted in 59 hours of downtime for the SO_2 and THC analyzers and the meteorological sensors. The H_2S parameter was flagged for 68 hours of downtime. Subsequently, the combined hours of monitoring at the site between the station and the WBEA mobile van did not result in operational time of less than 90% for this reporting period.

The effects of freezing temperatures and snow fall in the region resulted in a flat-line of the output signals of the wind sensors for 6 hours this month.

Station 5, Mannix

The automatic daily zero and span system checks on the SO_2 and THC analyzers failed to occur on January 9, 2014. The daily QA checks were re-initiated remotely to confirm analyzer responses for these parameters resulting in 1 hour of downtime.

The ambient temperature, relative humidity and wind sensors at all elevations at AMS 5, Mannix Meteorological Tower, experienced periods of flat-lining in the output signals during freezing temperatures and snow fall. Data during these periods are reported as invalid. The sensors were operational for 87 to 93 % of the time during the month.

Station 6, Patricia McInnes

The NH_3 analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily span period. Additional time for stabilization after spanning is an inherent behavior in the NH_3 analyzer operations resulting from the properties of the NH_3 gas. Data for one hour following the daily span have been reported as invalid for a total of 31 hours this month.

Replacement of the thermal converter and a follow-up calibration of the H_2S analyzer on January 1st affected the normal operations of the analyzer for 13 hours.

Depletion and replacement of the fuel gas cylinder at the station on January 6 affected the normal operations of the THC analyzer for 2 hours.

The THC analyzer experienced a single episode of unstable operations on January 15 resulting in 1 hour of invalid data.

Maintenance to the sample inlet, flow audits and zero reference checks on January 15 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

Station 7, Athabasca Valley

The THC analyzer experienced a single episode of unstable operations on January 9 resulting in 1 hour of invalid data.

Maintenance to the sample inlet, flow audits and zero reference checks on January 9 interrupted the normal operation of the $PM_{2.5}$ analyzer for 1 hour.

The $PM_{2.5}$ analyzer experienced two episodes of unstable operations on January 9 and 22 resulting in 2 hours of invalid data.

Depletion and replacement of the fuel gas cylinder at the station on January 23 affected the normal operations of the THC analyzer for 1 hour.

Station 8, Fort Chipewyan

A power spike at the station on January 2 affected the normal operations of the SO_2 and NO_2 analyzers for 12 hours.

Maintenance to the sample inlet and flow and zero reference checks on January 8 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

The automatic daily zero and span system checks on the SO_2, NO_2 and O_3 analyzers failed to occur on January 15, 2014. The daily QA checks were re-initiated remotely to confirm analyzer responses for these parameters, which resulted in 2 hours of downtime.

A power spike at the station on January 21 affected the normal operations of all air quality analyzers for one hour.

The effects of freezing temperatures and snow fall in the region resulted in a flat-line of the output signals of the wind sensors for 3 hours this month.

Station 9, Barge Landing

Station operator activities on January 14 interrupted the normal operations of the TRS and THC analyzers for 1 and 17 hours, respectively.

The effects of freezing temperatures and snow fall in the region resulted in a flat-line of the output signals of the wind sensors for 3 hours this month.

Station 11, Lower Camp

A power spike at the station on January 11 affected the normal operation of the THC analyzers for 1 hour.

The THC analyzer experienced a single episode of unstable operations on January 12 resulting in 18 hours of invalid data.

The effects of freezing temperatures and heavy snow fall in the region resulted in a flat-line of the output signals of the wind sensors for 4 hours this month.

Station 12, Millennium Mine

Station operator activities on January 15 interrupted the communications to the $PM_{2.5}$ analyzer for 24 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on January 16 interrupted the normal operation of the $PM_{2.5}$ analyzer for 1 hour.

Station 13, Syncrude UE 1

Maintenance to the sample inlet and flow audits and zero reference checks on January 15 interrupted the normal operation of the $PM_{2.5}$ analyzer for 1 hour.

The effects of freezing temperatures and snow fall in the region resulted in flat-lines of the output signals of the wind sensors for 57 hours this month.

Replacement of the wind speed and direction sensors at the station on January 20 interrupted the normal operations of these parameters for 1 hour.

Station 14, Anzac

A power spike at the station on January 9 affected the normal operations of the $PM_{2.5}$ analyzer and temperature and relative humidity sensors for 1 hour.

A power failure at the station on January 15 affected the normal operations of all parameters for 2 hours.

There were two issues associated with operation of the THC analyzer resulting in 16 hours of invalid data. Excessive baseline drift resulting from systematic peak elution capture in the output signals of the THC analyzer resulted in 5 hours of downtime. Maintenance to the analyzer sample column on January 13 interrupted the normal operations of the analyzer for 11 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on January 10 and 23 interrupted the normal operations of the $PM_{2.5}$ analyzer for 3 hours.

The effects of freezing temperatures and snow fall in the region resulted in flat-lines of the output signals of the wind sensors for 3 hours this month.

Station 15, CNRL Horizon

Maintenance and cleaning of the glass manifold on January 3 interrupted the normal operation of the TRS analyzer for 1 hour.

Maintenance to the sample inlet, flow audits and zero reference checks on January 24 interrupted the normal operations of the $PM_{2.5}$ analyzer for 2 hours.

Depletion and replacement of the fuel gas cylinder at the station on January 24 affected the normal operations of the THC analyzer for 2 hours.

Station 16, Albian Muskeg River

The data acquisition system failed to record data on January 1st resulting in the absence of data for 1 hour for all parameters.

Replacement of the sample flow sensor and a follow-up calibration of the SO_2 analyzer on January 22 interrupted the normal operations of the analyzer for 3 hours.

Maintenance to the sample inlet, flow audits and zero reference checks on January 21 interrupted the normal operations of the $PM_{2.5}$ analyzer for 1 hour.

A flat-line in the output signals of the wind sensors resulted in 1 hour of invalid data this reporting period.

Station 17, Wapasu

The $PM_{2.5}$ analyzer experienced eight episodes of baseline drift this reporting report resulting in 30 hours of invalid data.

The automatic daily zero and span system checks on the SO_2, NO_2 and THC analyzers failed to occur on January 26, 2014. The daily QA checks were re-initiated remotely to confirm analyzer responses for these parameters which resulted in 1 hour of downtime.

Maintenance to the sample inlet, flow audits and zero reference checks on January 8 interrupted the normal operation of the $PM_{2.5}$ analyzer for 1 hour.

Replacement of the in-situ calibrator on January 31 and confirmation of the H_2S analyzer response to daily span checks interrupted the normal operations of the analyzer for 1 hour.

The effects of freezing temperature and snow fall in the region resulted in a flat-line of the output signals of the wind sensors for 7 hours this month.

Station 500, Cenovus Christina Lake

In early January 2014, WBEA commissioned a portable air monitoring station at the Cenovus Energy Christina Lake facility. The survey at this location will be conducted from January to June, 2014 to fulfill Alberta Environment's Environmental Protection and Enhancement Act facility approval number 48522-01-00. This station is equipped with ambient air quality analyzers for SO_2, H_2S, NO, NO_2, NO_X and meteorological sensors for ambient temperature, relative humidity, and wind speed and direction.

During the initial setup of the analyzers at the site and configuration of the automatic daily span and zero checks, the SO_2 and NO_2 analyzer required additional time for stabilization after spanning. Data for one hour following the daily span have been reported as invalid on 2 days for each analyzer.

The H_2S analyzer commenced data collection after the calibration on January 2, 2014. The initial 39 hours of data for this parameter was flagged as downtime.

Maintenance on the in-situ calibrator and confirmation of the SO_2 analyzer's response to a daily span check on January 3 interrupted the normal operations of the analyzer for 1 hour.

The SO_2 and H_2S analyzers experienced single episodes of unstable operations during this reporting period resulting in one hour of invalid data, respectively.

The ambient temperature and relative humidity sensors experienced six instances of intermittent unstable operations and flat-lines in sensor output signals, resulting in 41 hours of invalid data.

The effects of freezing temperatures and snow fall in the region resulted in a flat-line in the output signals of the wind sensors on January 18 and 21 resulting in 30 hours of invalid data this reporting period.

MAMS, WBEA Mobile

A power failure to the mobile van on January 29 interrupted the normal operations of SO_2, H_2S and THC analyzers for 4 to 5 hours.

Station operator activities on January 31 interrupted the normal operations of the H_2S analyzer for 1 hour.

Data for the meteorological sensors were invalidated for 2 hours on January 17 during tower deployment and setup.

Station 101, Portable

Not in operation during this reporting period.

Station 102, Portable

Not in operation during this reporting period.

If additional information is required, please contact either Sanjay Prasad at (403) 703 8931 or the Wood Buffalo Environmental Association at (780) 799 4420.

Yours sincerely,

Aurora Atmospherics Inc.

Sanjay Prasad
Air Quality Scientist

R00_1401_L01_V1.DOC

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

JANUARY 2014

prepared 27Feb14:00:14

APPROVAL NUMBERS	REPORT DATE MONTH	REPORT DATE YEAR
289664-00-00	1	2014
254465-00-00		
149968-00-01		
48522-01-00		
240008-00-03		
48263-00-00		
224816-00-03		
189942-00-02		
206355-00-00		
46586-00-00		
216466-00-04		
137467-00-00		
20809-01-00		
24859-00-00		
094-02-00		
305529-00-00		
026-02-00		
228044-00-00		
73203-01-00		

CONTINUOUS AMBIENT MONITORING

PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE MAXIMUM CONCENTRATION	ONE-HOUR AVERAGE NO. READINGS > REGULATION	24-HOUR AVERAGE MAXIMUM CONCENTRATION	24-HOUR AVERAGE NO. READINGS > REGULATION
SO2(ppb)	1	97.72	0.009	0	0.003	0
SO2(ppb)	2	99.87	0.033	0	0.005	0
SO2(ppb)	4*	85.36	0.006	0	0.001	0
SO2(ppb)	5	99.87	0.162	0	0.011	0
SO2(ppb)	6	100.00	0.015	0	0.003	0
SO2(ppb)	7	100.00	0.010	0	0.002	0
SO2(ppb)	8	97.98	0.007	0	0.003	0
SO2(ppb)	11	100.00	0.032	0	0.004	0
SO2(ppb)	12	100.00	0.068	0	0.003	0
SO2(ppb)	13	100.00	0.010	0	0.002	0
SO2(ppb)	14	99.73	0.010	0	0.002	0
SO2(ppb)	15	100.00	0.071	0	0.006	0
SO2(ppb)	16	99.46	0.090	0	0.013	0
SO2(ppb)	17	99.87	0.113	0	0.020	0
SO2(ppb)	500	99.46	0.011	0	0.005	0
SO2(ppb)	MAMS*	98.85	0.003	0	0.001	0
H2S(ppb)	2	100.00	0.004	0	0.001	0
H2S(ppb)	4*	83.50	0.003	0	0.001	0
H2S(ppb)	5	100.00	0.003	0	0.001	0
H2S(ppb)	11	100.00	0.005	0	0.002	0
H2S(ppb)	17	99.87	0.005	0	0.002	0
H2S(ppb)	500	94.62	0.003	0	0.001	0
H2S(ppb)	MAMS*	98.50	0.005	0	0.001	0
TRS(ppb)	1	97.98	0.003	0	0.001	0
TRS(ppb)	6	98.25	0.001	0	0.000	0
TRS(ppb)	7	100.00	0.001	0	0.001	0
TRS(ppb)	9	99.87	0.003	0	0.001	0
TRS(ppb)	12	100.00	0.003	0	0.001	0
TRS(ppb)	13	100.00	0.003	0	0.001	0
TRS(ppb)	14	99.73	0.009	0	0.001	0
TRS(ppb)	15	99.87	0.001	0	0.001	0
THC(ppm)	1	96.10	3.8	-	2.5	-
THC(ppm)	2	99.87	6.2	-	3.1	-
THC(ppm)	4*	85.36	3.9	-	2.8	-
THC(ppm)	5	99.87	4.6	-	2.6	-
THC(ppm)	6	99.60	3.1	-	2.3	-
THC(ppm)	7	99.73	2.6	-	2.4	-
THC(ppm)	9	97.72	4.3	-	3.1	-
THC(ppm)	11	97.45	4.4	-	2.9	-
THC(ppm)	12	100.00	5.6	-	3.3	-
THC(ppm)	13	100.00	4.7	-	2.9	-
THC(ppm)	14	97.58	2.5	-	2.2	-
THC(ppm)	15	99.73	4.8	-	3.2	-
THC(ppm)	16	99.87	4.6	-	2.9	-
THC(ppm)	17	99.87	2.7	-	2.5	-
THC(ppm)	MAMS*	98.57	6.2	-	2.6	-
O3(ppb)	1	97.85	0.0	0	0.0	-
O3(ppb)	6	100.00	0.042	0	0.037	-
O3(ppb)	7	100.00	0.043	0	0.031	-
O3(ppb)	8	99.60	0.041	0	0.038	-
O3(ppb)	13	100.00	0.042	0	0.033	-

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

prepared 27Feb14:00:14

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289664-00-00	1	2014
254465-00-00		
149968-00-01		
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224816-00-03		
189942-00-02		
206355-00-00		
46586-00-00		
216466-00-04		
137467-00-00		
20809-01-00		
24859-00-00		
094-02-00		
305529-00-00		
026-02-00		
228044-00-00		
73203-01-00		

CONTINUOUS AMBIENT MONITORING

PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE MAXIMUM CONCENTRATION	ONE-HOUR AVERAGE NO. READINGS > REGULATION	24-HOUR AVERAGE MAXIMUM CONCENTRATION	24-HOUR AVERAGE NO. READINGS > REGULATION
O3(ppb)	14	99.73	0.043	0	0.038	-
O3(ppb)	17	100.00	0.041	0	0.035	-
NO2(ppb)	1	96.37	0.047	0	0.033	-
NO2(ppb)	6	100.00	0.043	0	0.025	-
NO2(ppb)	7	100.00	0.070	0	0.044	-
NO2(ppb)	8	97.98	0.018	0	0.006	-
NO2(ppb)	12	100.00	0.056	0	0.036	-
NO2(ppb)	13	100.00	0.044	0	0.024	-
NO2(ppb)	14	99.73	0.027	0	0.012	-
NO2(ppb)	15	100.00	0.038	0	0.026	-
NO2(ppb)	16	99.87	0.049	0	0.034	-
NO2(ppb)	17	99.87	0.032	0	0.015	-
NO2(ppb)	500	99.73	0.036	0	0.016	-
CO(ppm)	7	100.00	1.000	0	0.400	-
NH3(ppb)	1	90.86	0.000	0	0.000	-
NH3(ppb)	6	95.83	0.000	0	0.000	-
PM2.5(ug/m3)	1	97.72	58.3	-	16.9	0
PM2.5(ug/m3)	6	99.73	26.5	-	12.5	0
PM2.5(ug/m3)	7	99.60	124.6	-	14.8	0
PM2.5(ug/m3)	8	99.60	14.2	-	6	0
PM2.5(ug/m3)	12	96.64	81.6	-	15	0
PM2.5(ug/m3)	13	99.87	34.3	-	13.4	0
PM2.5(ug/m3)	14	99.19	22.1	-	10.6	0
PM2.5(ug/m3)	15	99.73	108.9	-	21.5	0
PM2.5(ug/m3)	16	99.73	34.9	-	15.5	0
PM2.5(ug/m3)	17	95.83	28.6	-	9.6	0
WIND	1	96.51	35	-	9	0
WIND	2	100.00	-	-	-	-
WIND	4*	83.87	-	-	-	-
WIND	5	92.34	-	-	-	-
WIND	6	100.00	-	-	-	-
WIND	7	100.00	-	-	-	-
WIND	8	99.60	-	-	-	-
WIND	9	99.60	-	-	-	-
WIND	11	99.46	-	-	-	-
WIND	12	100.00	-	-	-	-
WIND	13	92.20	-	-	-	-
WIND	14	99.60	-	-	-	-
WIND	15	100.00	-	-	-	-
WIND	16	99.73	-	-	-	-
WIND	17	99.06	-	-	-	-
WIND	500	95.97	-	-	-	-
WIND	MAMS*	99.42	-	-	-	-

SIGNATURE OF ASSOCIATION REPRESENTATIVE

FOR ALBERTA ENVIRONMENT USE ONLY

Note: * AMS 4 and MAMS combined hours of monitoring at Buffalo Viewpoint exceeds the minimum 90% operational time for this reporting period.

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 1
BERTHA GANTER FORT MCKAY
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY - BERTHA GANTER (AMS 1)
JANUARY 2014

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	691	36	53	97.72	9	0	3	0
TRS(ppb) Average	695	34	49	97.98	3	0	1	0
THC(ppm) Average	681	34	63	96.10	3.8	-	2.5	-
NMHC(ppm) Average	681	34	63	96.10	1.021	-	0.156	-
CH4(ppm) Average	681	34	63	96.10	2.8	-	2.4	-
O3 (ppb) Average	693	35	51	97.85	39	0	33	-
NO2 (ppb) Average	681	36	63	96.37	47	0	33	-
NO (ppb) Average	681	36	63	96.37	103	-	40	-
NOX (ppb) Average	681	36	63	96.37	151	-	72	-
NH3 (ppb) Average	633	43	111	90.86	0	0	0	-
PM2.5 (ug/m3) Average	727	0	17	97.72	58.3	-	16.9	0
Wind Speed 10 m (km/h) Average	718	0	26	96.51	35	-	-	-
Wind Direction 10 m (deg) Average	718	0	26	96.51	-	-	-	-
Temperature 2 m (C) Average	729	0	15	97.98	8.3	-	1.1	-
Temperature 10 m (C) Average	729	0	15	97.98	8.4	-	1.4	-
Relative Humidity (%) Average	729	0	15	97.98	95	-	93	-
Precipitation (mm) Total	729	0	15	97.98	0.5	-	-	-
Surface Wetness (% of range) Average	729	0	15	97.98	8	-	-	-
Global Solar Radiation (W/m2) Average	729	0	15	97.98	114	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT McKAY (AMS 1)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	691	1	1	-	0	0	0	1	1	2	9
TRS (ppb) Average	695	0.5	0	-	0	0	0	0	1	1	3
THC (ppm) Average	681	2.04	0.3	-	1.8	1.8	1.9	1.9	2.1	2.5	3.8
NMHC(ppm) Average	681	0.044	0.109	-	0	0	0	0	0	0.2	1.021
CH4(ppm) Average	681	2	0.2	-	1.8	1.8	1.9	1.9	2.1	2.3	2.8
O3 (ppb) Average	693	16	12	-	0	1	5	14	27	33	39
NO2 (ppb) Average	681	13.8	10	-	0	1	3	14	22	28	47
NO (ppb) Average	681	5.7	12	-	0	0	0	0	5	19	103
NOX (ppb) Average	681	19.5	20	-	0	1	3	15	29	44	151
NH3 (ppb) Average	633	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	727	7.01	5.4	-	1.4	2.6	3.8	5.6	8.3	12.3	58.3
Wind Speed 10 m (km/h) Average	718	5.9	4	-	0	2	3	5	8	11	35
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	729	-15.73	9.4	-	-36.5	-27.2	-22.4	-16	-9	-3.2	8.3
Temperature 10 m (C) Average	729	-15.4	9.2	-	-35.6	-26.4	-22.1	-16	-9	-3.2	8.4
Relative Humidity (%) Average	729	76.9	9	-	43	65	72	77	83	89	95
Precipitation (mm) Total	729	-	-	1.02	0	0	0	0	0	0	0.5
Surface Wetness (% of range) Average	729	0.1	1	-	0	0	0	0	0	0	8
Global Solar Radiation (W/m2) Average	729	9.5	22	-	0	0	0	0	3	41	114

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER Fort McKAY (AMS 1)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	15 Jan 2014 10:00	16 Jan 2014 00:00	15	Station power failure
SO2	09 Jan 2014 09:00	09 Jan 2014 10:00	2	Maintenance - remotely initiated daily QA check
NMHC, CH4, THC	09 Jan 2014 09:00	09 Jan 2014 09:00	1	Maintenance - remotely initiated daily QA check
NMHC, CH4, THC	15 Jan 2014 10:00	16 Jan 2014 13:00	28	Station power failure
O3	09 Jan 2014 10:00	09 Jan 2014 10:00	1	Maintenance - remotely initiated daily QA check
NO2, NO, NOX	09 Jan 2014 09:00	09 Jan 2014 09:00	1	Maintenance - remotely initiated daily QA check
NO2, NO, NOX	15 Jan 2014 10:00	16 Jan 2014 11:00	26	Station power failure
NH3	01 Jan 2014 03:00	31 Jan 2014 03:00	30	Stabilization after daily span
NH3	09 Jan 2014 09:00	09 Jan 2014 11:00	3	Maintenance - remotely initiated daily QA check
NH3	13 Jan 2014 20:00	14 Jan 2014 11:00	16	New analyzer installed, stabilization period
NH3	16 Jan 2014 11:00	16 Jan 2014 15:00	5	Maintenance - analyzer response verified
PM2.5	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Power spike
PM2.5	17 Jan 2014 12:00	17 Jan 2014 12:00	1	Flow and zero reference checks, sample head cleaning
Wind Speed, Wind Direction	08 Jan 2014 18:00	08 Jan 2014 18:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	08 Jan 2014 20:00	08 Jan 2014 20:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	09 Jan 2014 02:00	09 Jan 2014 03:00	2	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	10 Jan 2014 17:00	10 Jan 2014 19:00	3	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2014 00:00	11 Jan 2014 00:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2014 02:00	11 Jan 2014 02:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	14 Jan 2014 01:00	14 Jan 2014 01:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	24 Jan 2014 20:00	24 Jan 2014 20:00	1	Flatline in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 ppb on Jan 27 15:00 Maximum Daily Average: 3.2 ppb on Jan 14

Minimum Value: 0 ppb on Jan 29 21:00 Minimum Daily Average: 0.3 ppb on Jan 29
Maximum Diurnal Average: 1.4 ppb at hour 14 Minimum Diurnal Average: 0.8 ppb at hour 9
Monthly Average: 1.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 7$

Hours in Service:	744
Hours of Data:	691
Hours of Missing Data:	53
Hours of Calibration:	36
Percent Operational Time:	97.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	2	3	0.8	3
2-Jan	6	Z	2	1	1	6	3	4	2	1	1	2	2	3	3	2	1	1	1	1	1	1	1	1	2.1	6
3-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0.5	1
4-Jan	1	Z	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0.5	1
5-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0.5	1
6-Jan	1	Z	1	1	3	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1.2	4
7-Jan	0	Z	0	1	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	1	0.8	2
8-Jan	1	Z	1	2	2	2	1	4	2	3	2	2	2	2	2	2	1	1	1	1	1	2	2	2	1.9	4
9-Jan	2	Z	1	2	1	1	1	1	M	M	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	2
10-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0.6	1
11-Jan	0	Z	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0.5	1
12-Jan	0	Z	0	0	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
13-Jan	1	Z	6	4	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0.9	6
14-Jan	0	Z	0	0	0	1	1	3	2	3	3	6	8	7	7	7	7	6	5	3	2	1	1	1	3.2	8
15-Jan	1	Z	1	1	1	1	1	1	1	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	1
16-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	1	1	1	1	1	2	2	1.0	2
17-Jan	2	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0.8	2
18-Jan	0	Z	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
19-Jan	1	Z	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
20-Jan	0	Z	0	0	1	1	1	2	2	5	2	2	1	1	1	1	1	2	2	1	1	1	1	0	1.2	5
21-Jan	0	Z	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Jan	1	Z	2	2	2	2	1	1	0	0	1	1	4	3	1	1	3	5	7	3	4	2	1	1	2.1	7
23-Jan	2	Z	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	3
24-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0.7	1
25-Jan	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
26-Jan	1	Z	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0.5	1
27-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	7	9	4	4	2	1	1	3	6	8	5	2.5	9
28-Jan	7	Z	3	6	3	1	1	1	1	1	2	2	2	1	1	1	2	1	0	1	0	0	0	0	1.7	7
29-Jan	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
30-Jan	1	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	1
31-Jan	0	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.5	1
	1.1	--	1.0	1.0	0.9	1.0	0.8	1.0	0.8	1.0	0.9	1.0	1.2	1.4	1.4	1.1	1.2	1.1	1.0	0.8	0.8	0.9	1.0	0.9	Diurnal Average	
	7	--	6	6	3	6	3	4	2	5	3	6	8	7	9	7	7	6	7	3	4	6	8	5	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

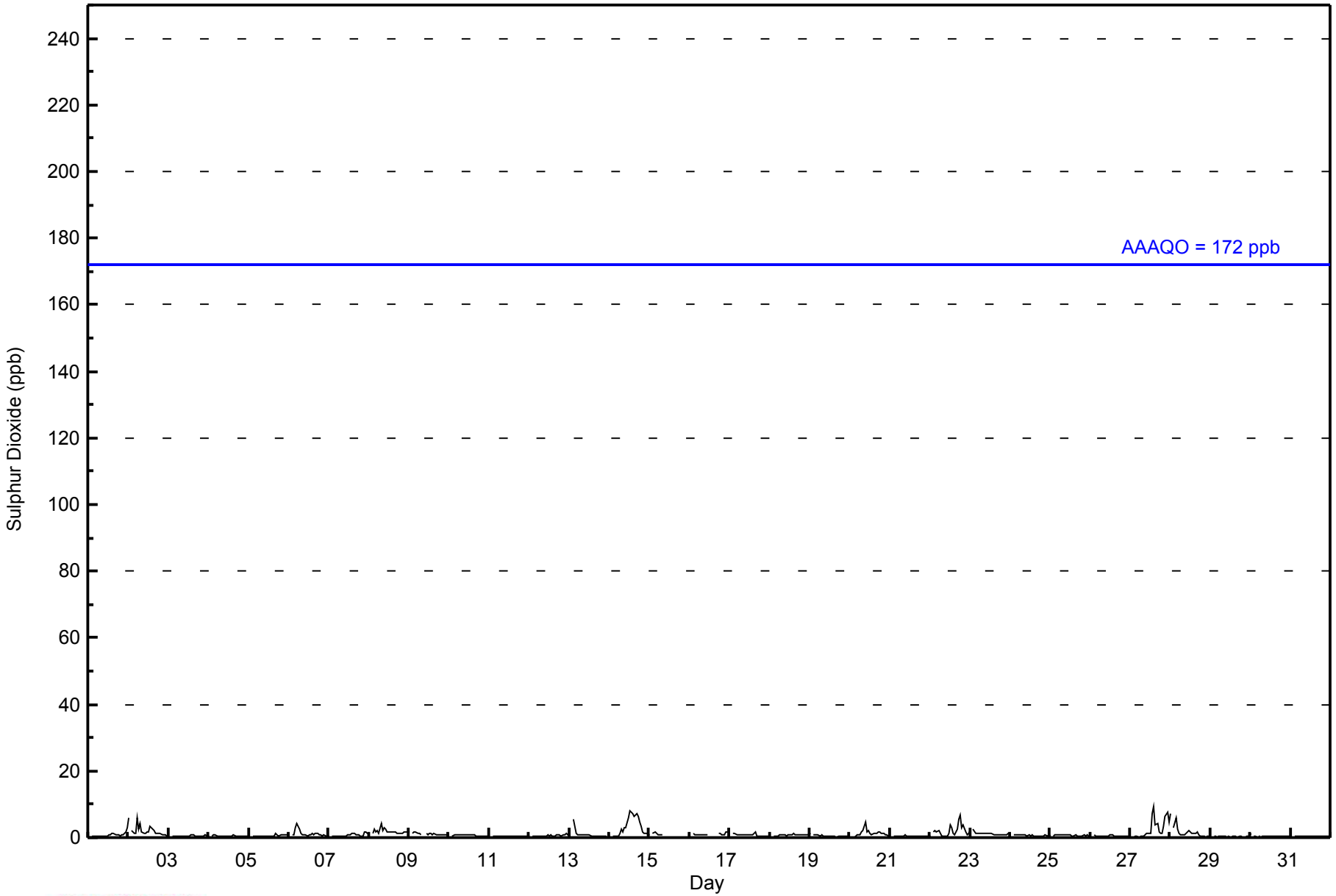
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	691	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: 691

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	128	47	15	14	5	5	8	30	151	81	32	25	24	45	27	45	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	128	47	15	14	5	5	8	30	151	81	32	25	24	45	27	45	682

Total Number of Valid Hours: 682

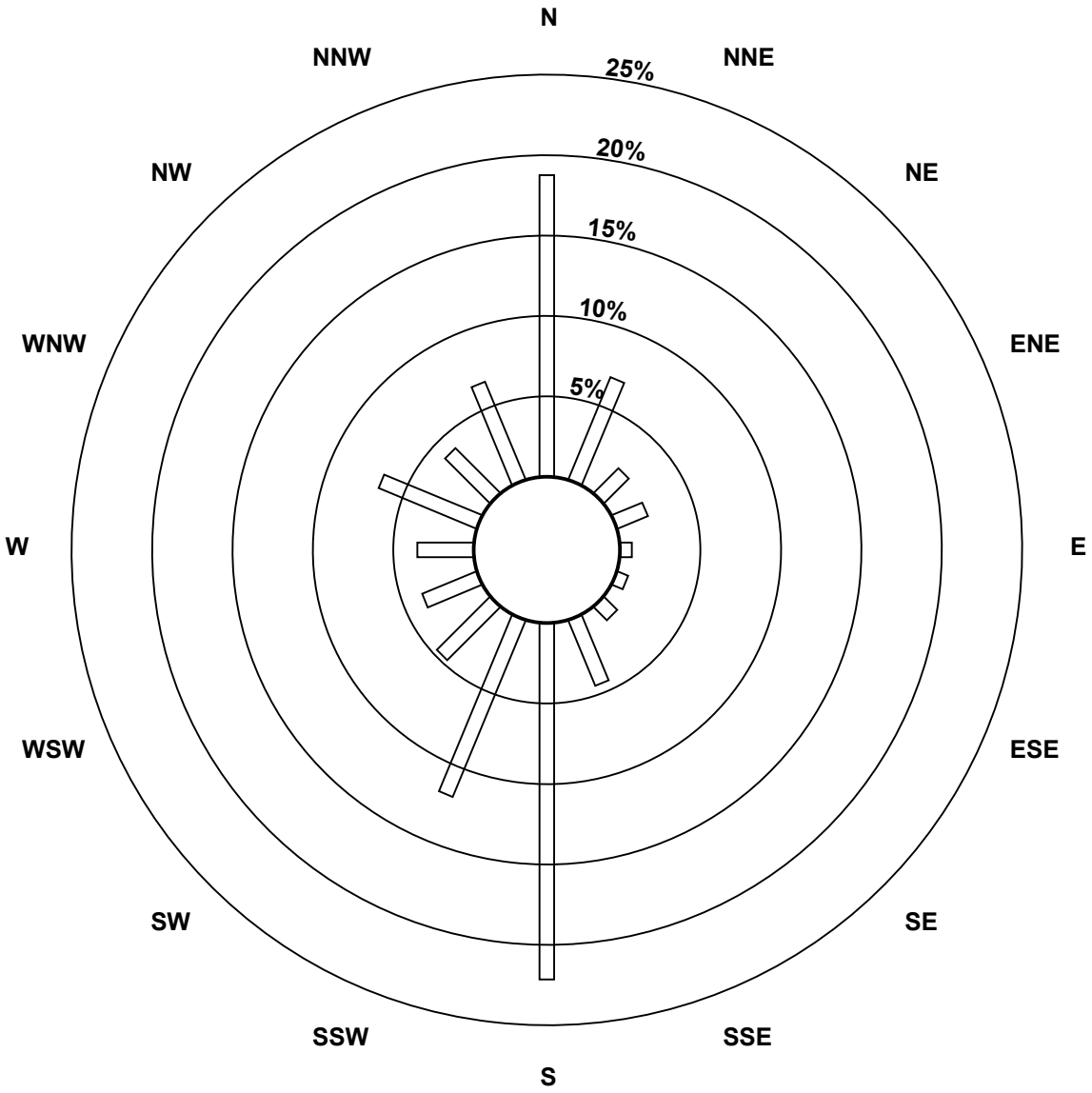
Total Number of Hours: 744

Wood Buffalo Environmental Association

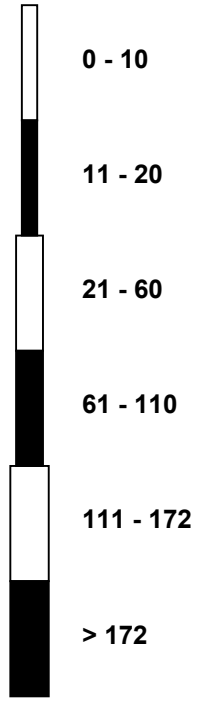
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



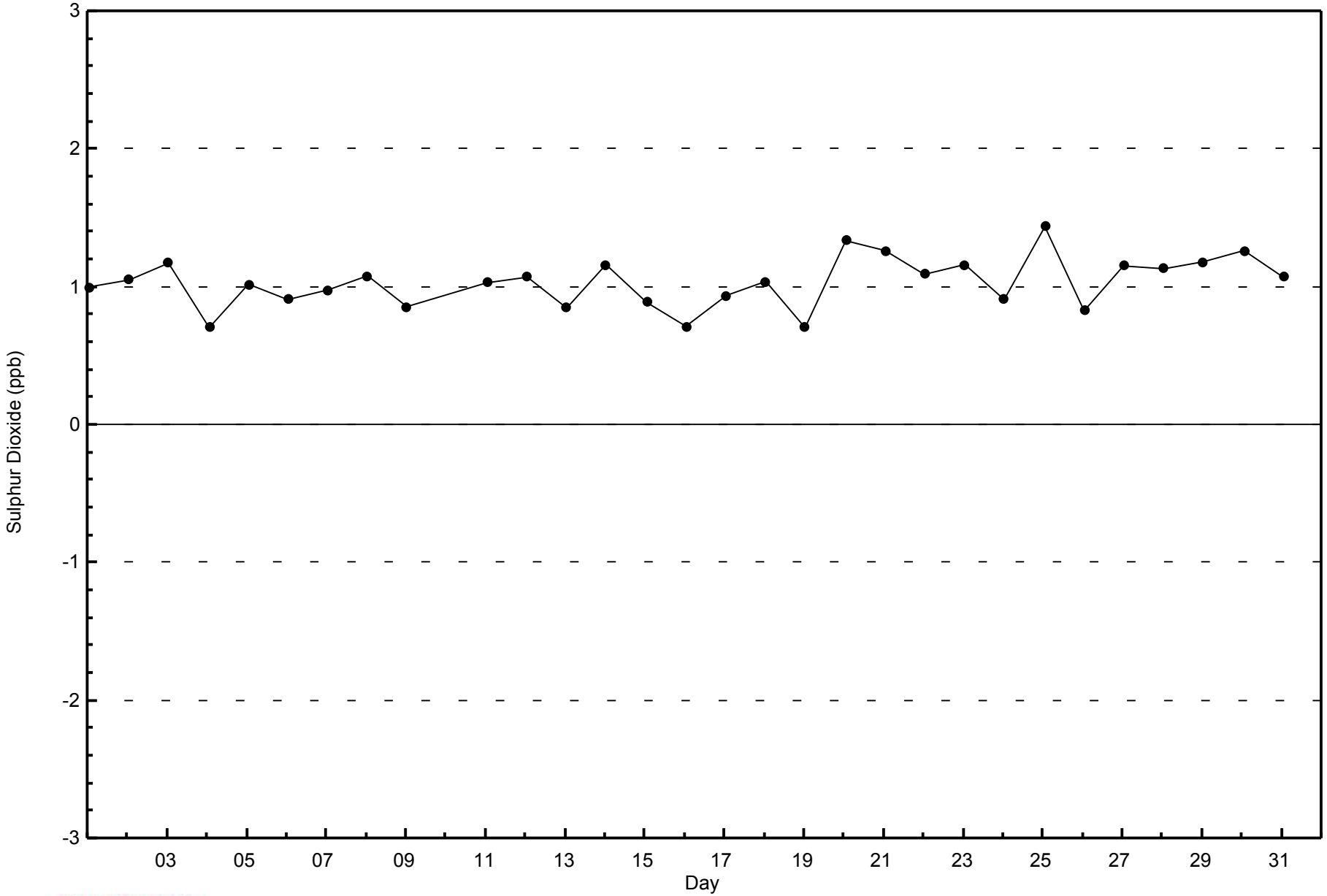
Total Number of Valid Hours: 682

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2014



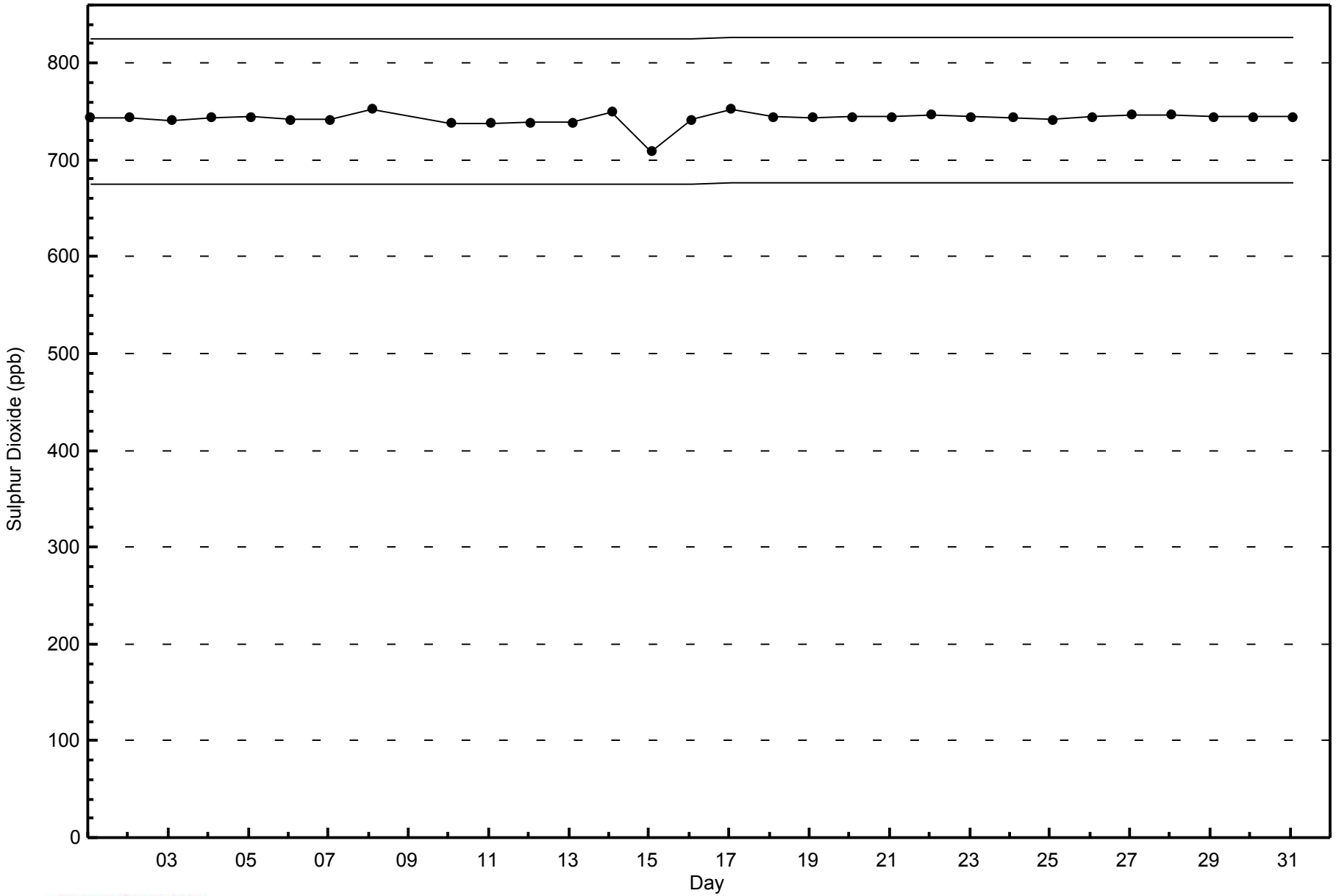
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 3 ppb on Jan 2 19:00 Maximum Daily Average: 1.3 ppb on Jan 16

Minimum Value: 0 ppb on Jan 17 12:00 Minimum Daily Average: 0.2 ppb on Jan 4

Maximum Diurnal Average: 0.6 ppb at hour 17 Minimum Diurnal Average: 0.4 ppb at hour 10

Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	695
Hours of Missing Data:	49
Hours of Calibration:	34
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	1	Z	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
2-Jan	1	1	Z	1	1	1	1	1	0	0	0	0	1	1	1	1	2	2	3	2	2	1	1	0	1.2	3
3-Jan	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
4-Jan	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
5-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1
6-Jan	1	1	Z	1	1	2	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0.6	2
7-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
8-Jan	1	1	Z	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.6	1
9-Jan	1	1	Z	1	1	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0.6	1
10-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.4	1
11-Jan	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
12-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0.4	1
13-Jan	1	1	Z	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
14-Jan	0	0	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.8	1
15-Jan	0	0	Z	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0
16-Jan	1	2	Z	2	1	1	1	1	0	0	0	1	1	2	2	2	2	2	2	1	1	1	1	1	1.3	2
17-Jan	1	2	Z	1	1	0	0	0	0	0	0	0	C	C	C	0	0	0	0	0	0	0	0	0	0.4	2
18-Jan	0	0	Z	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.6	1
19-Jan	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	0	Z	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0.6	1
21-Jan	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
22-Jan	0	0	Z	1	1	1	1	0	0	0	0	0	1	1	0	0	1	1	1	1	1	2	1	1	0.7	2
23-Jan	1	1	Z	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
24-Jan	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
25-Jan	0	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
26-Jan	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-Jan	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
28-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0.7	1
29-Jan	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
30-Jan	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
31-Jan	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
	0.5	0.5	--	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	Diurnal Average	
	1	2	--	2	1	2	1	1	1	1	1	1	1	2	2	2	2	2	3	2	2	2	1	1	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure

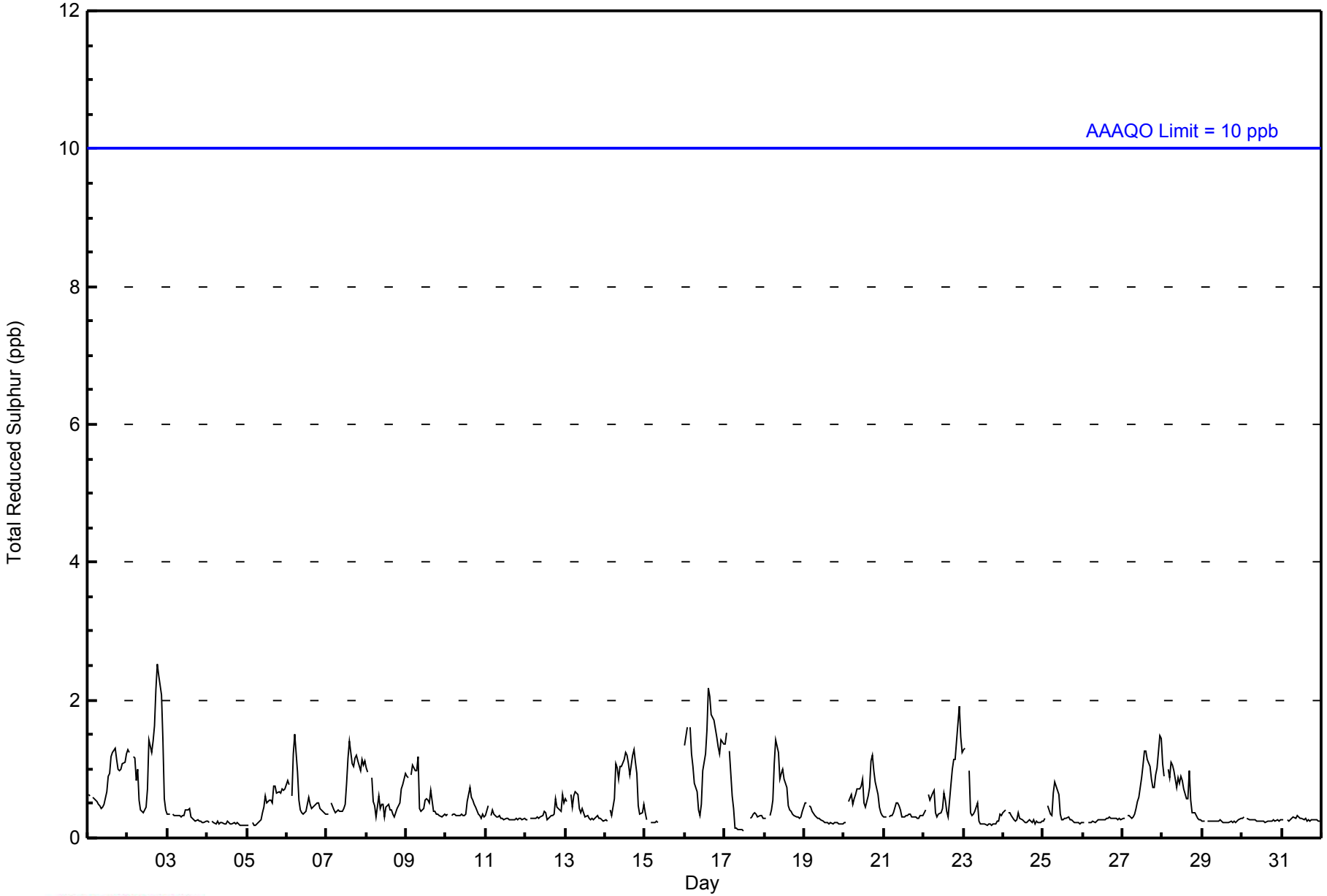
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	694	99.86	99.86
3 - 4	1	0.14	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: 695

Total Number of Hours: 744

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	126	48	14	15	5	5	8	31	155	82	28	27	26	45	27	42	684
3 - 4	0	0	0	0	0	0	0	0	0	1	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	126	48	14	15	5	5	8	31	155	83	28	27	26	45	27	42	685

Total Number of Valid Hours: 685

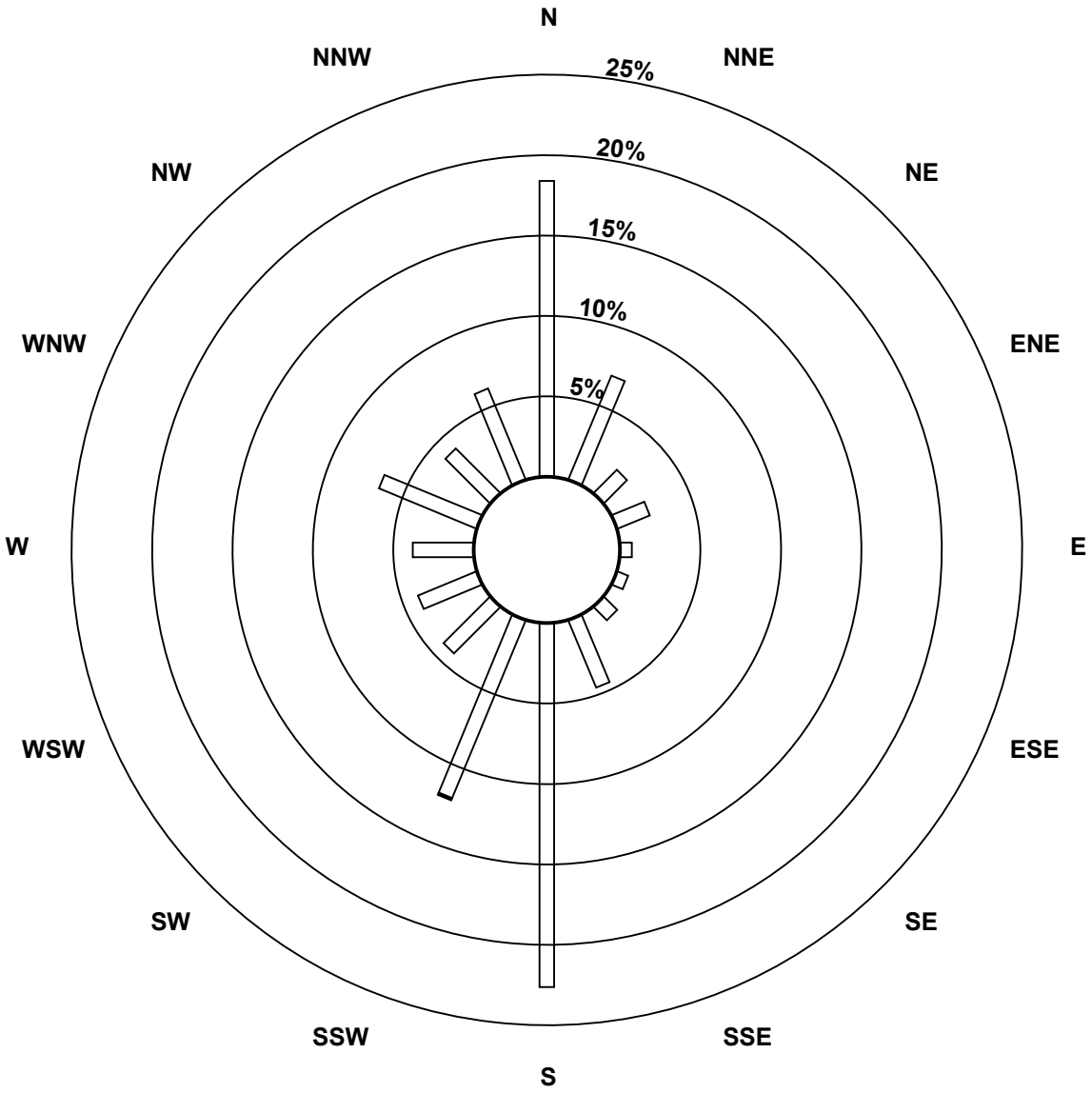
Total Number of Hours: 744

Wood Buffalo Environmental Association

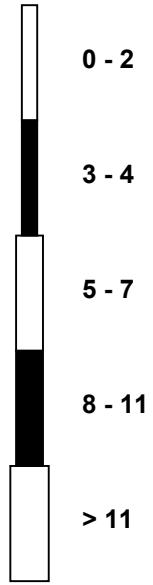
Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



0 - 2

3 - 4

5 - 7

8 - 11

> 11

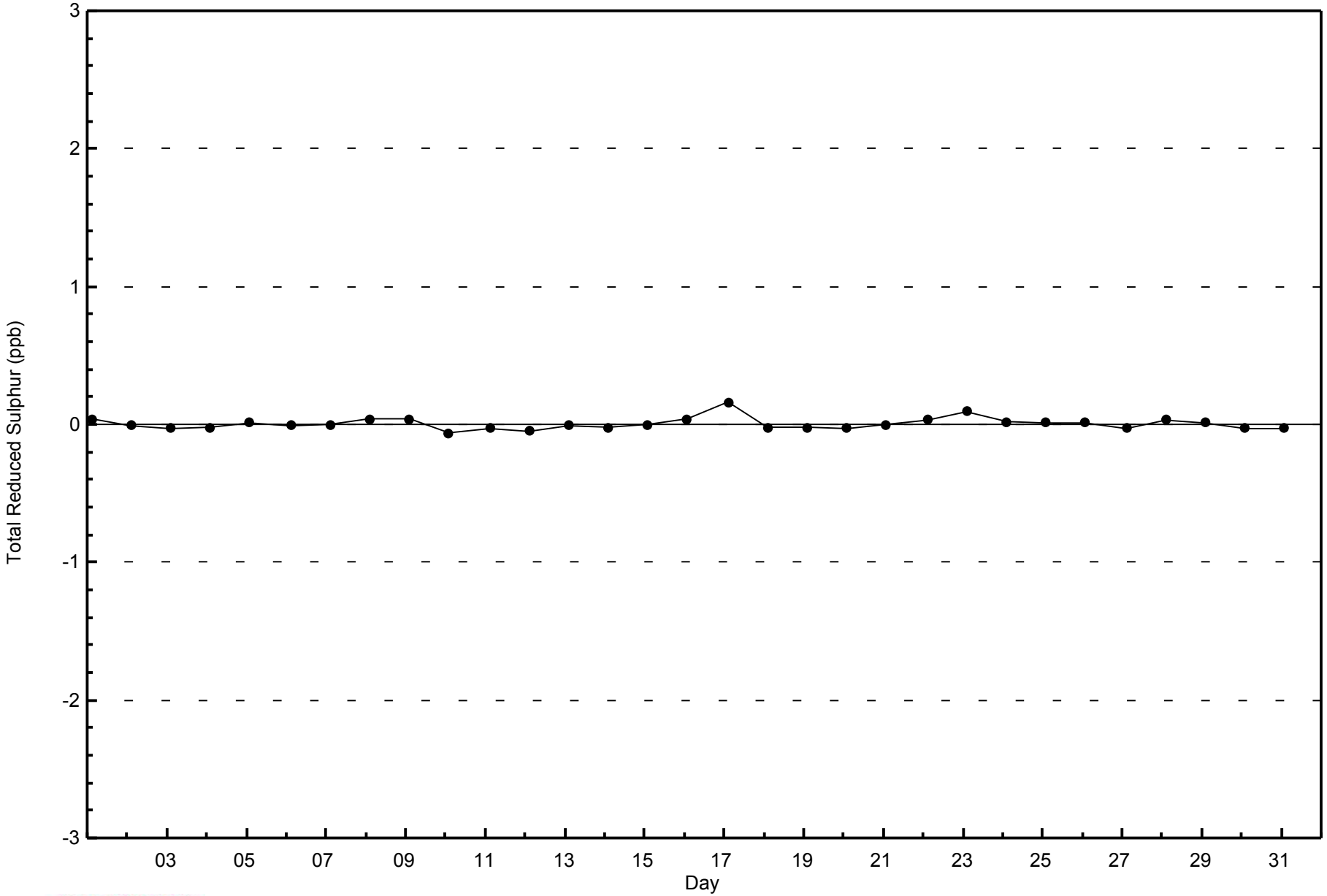
Total Number of Valid Hours: 685

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2014



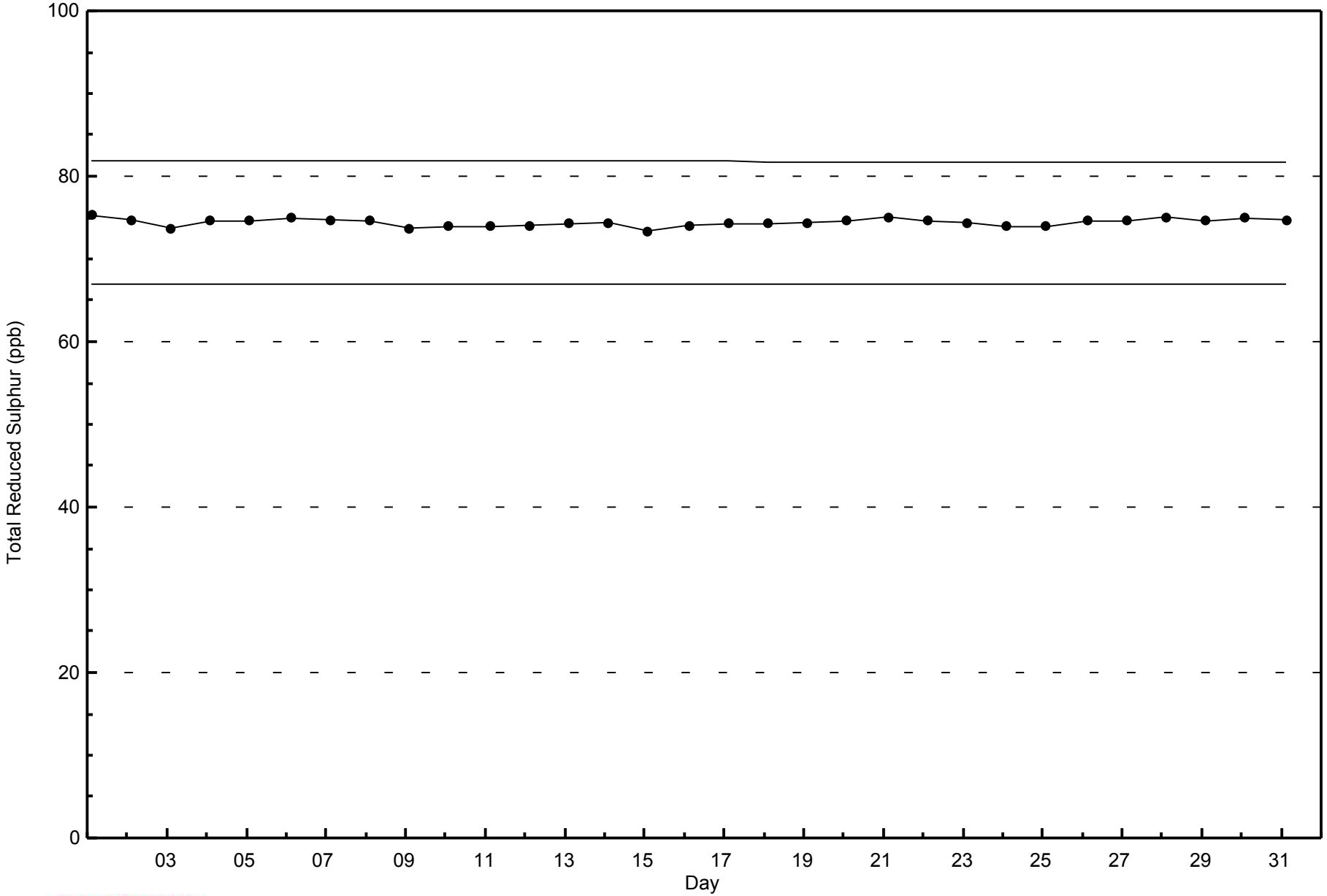
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2014

Maximum Value: 3.8 ppm on Jan 22 21:00

Maximum Daily Average: 2.5 ppm on Jan 2

Minimum Value: 1.8 ppm on Jan 17 11:00

Minimum Daily Average: 1.8 ppm on Jan 30

Maximum Diurnal Average: 2.1 ppm at hour 21

Minimum Diurnal Average: 2.0 ppm at hour 24

Monthly Average: 2.04 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.1 P_{90} = 2.5 P_{99} = 3.0

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	34
Percent Operational Time:	96.1

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.3	Z	2.5	2.5	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.4	2.6
2-Jan	2.2	Z	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.3	2.5	2.4	2.5	2.9	2.8	3.1	3.2	2.9	2.8	2.9	3.0	2.7	2.1	2.0	2.5	3.2
3-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2	2.1	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	2.2
4-Jan	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
5-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.3	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.4
6-Jan	2.1	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	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
7-Jan	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.1	2.3	2.4	2.6	2.8	3.0	2.9	2.7	2.7	2.7	2.6	2.4	2.4	2.4	3.0
8-Jan	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.5	2.0	2.2	2.3	2.1	2.3	2.2	2.3	2.4	2.4	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.3	2.7
9-Jan	2.7	Z	2.8	2.7	2.8	2.8	2.8	2.8	M	2.3	2.5	2.5	2.5	2.5	2.8	3.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9	2.5	3.3
10-Jan	1.9	Z	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	2.1	2.1	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.1
11-Jan	2.0	Z	2.0	2.0	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	1.9	1.9	1.9	1.9	1.9	2.1
12-Jan	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	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.0	1.9	1.9	1.9	2.1
13-Jan	2.0	Z	2.2	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.2	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.2
14-Jan	2.0	Z	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2
15-Jan	2.0	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	2.0
16-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	C	C	C	C	2.5	2.5	2.5	2.5	2.5	2.3	2.2	--	2.5
17-Jan	2.5	Z	2.5	2.5	2.1	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	1.8	1.8	2.0	1.9	1.8	2.0	2.5
18-Jan	1.9	Z	1.9	1.9	1.9	2.0	2.2	2.5	2.6	2.4	2.4	2.4	2.3	2.6	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.9	2.1	2.6
19-Jan	1.9	Z	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0
20-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2	1.9	1.9	1.9	2.0	2.7	2.7	2.4	2.3	2.1	1.9	1.9	1.9	2.0	2.7
21-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.0	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
22-Jan	1.9	Z	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	2.3	2.8	2.8	3.8	3.4	2.3	2.4	2.2	3.8
23-Jan	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.2	1.9	2.2
24-Jan	2.1	Z	2.1	1.9	1.9	1.8	1.9	1.8	1.8	1.9	1.9	1.9	1.8	1.9	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.1
25-Jan	1.8	Z	2.1	2.3	2.1	2.0	2.6	2.5	2.4	2.4	2.0	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0	2.6
26-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
27-Jan	1.9	Z	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
28-Jan	2.0	Z	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	2.2	2.7	2.1	1.8	1.8	1.8	1.9	1.9	1.8	2.0	2.7
29-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
30-Jan	1.8	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9
31-Jan	1.9	Z	1.8	1.8	1.9	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.9	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	Diurnal Average	
	2.7	--	2.8	2.7	2.8	2.8	2.8	2.8	2.6	2.5	2.5	2.5	2.5	2.9	2.8	3.3	3.2	2.9	2.8	2.9	3.8	3.4	2.6	2.7	Diurnal Maximum	

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

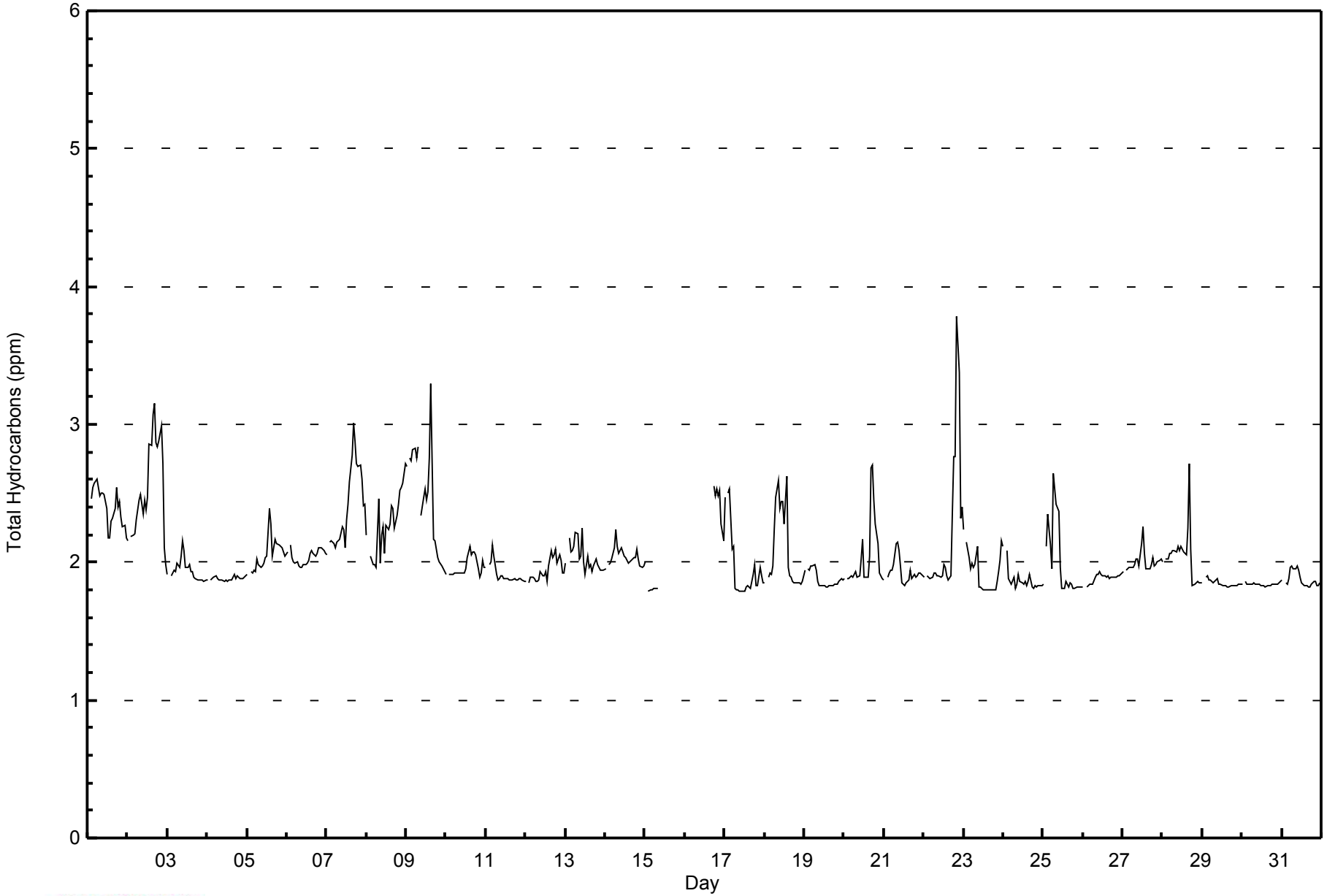
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	467	68.58	68.58
2.1 - 3.0	209	30.69	99.27
3.1 - 10.0	5	0.73	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2014

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	105	44	12	12	4	3	6	15	81	30	20	15	19	41	23	34	464
2.1 - 3.0	22	3	3	2	1	2	2	15	64	44	12	9	5	4	4	11	203
3.1 - 10.0	1	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	128	47	15	14	5	5	8	30	148	75	32	24	24	45	27	45	672

Total Number of Valid Hours: 672

Total Number of Hours: 744

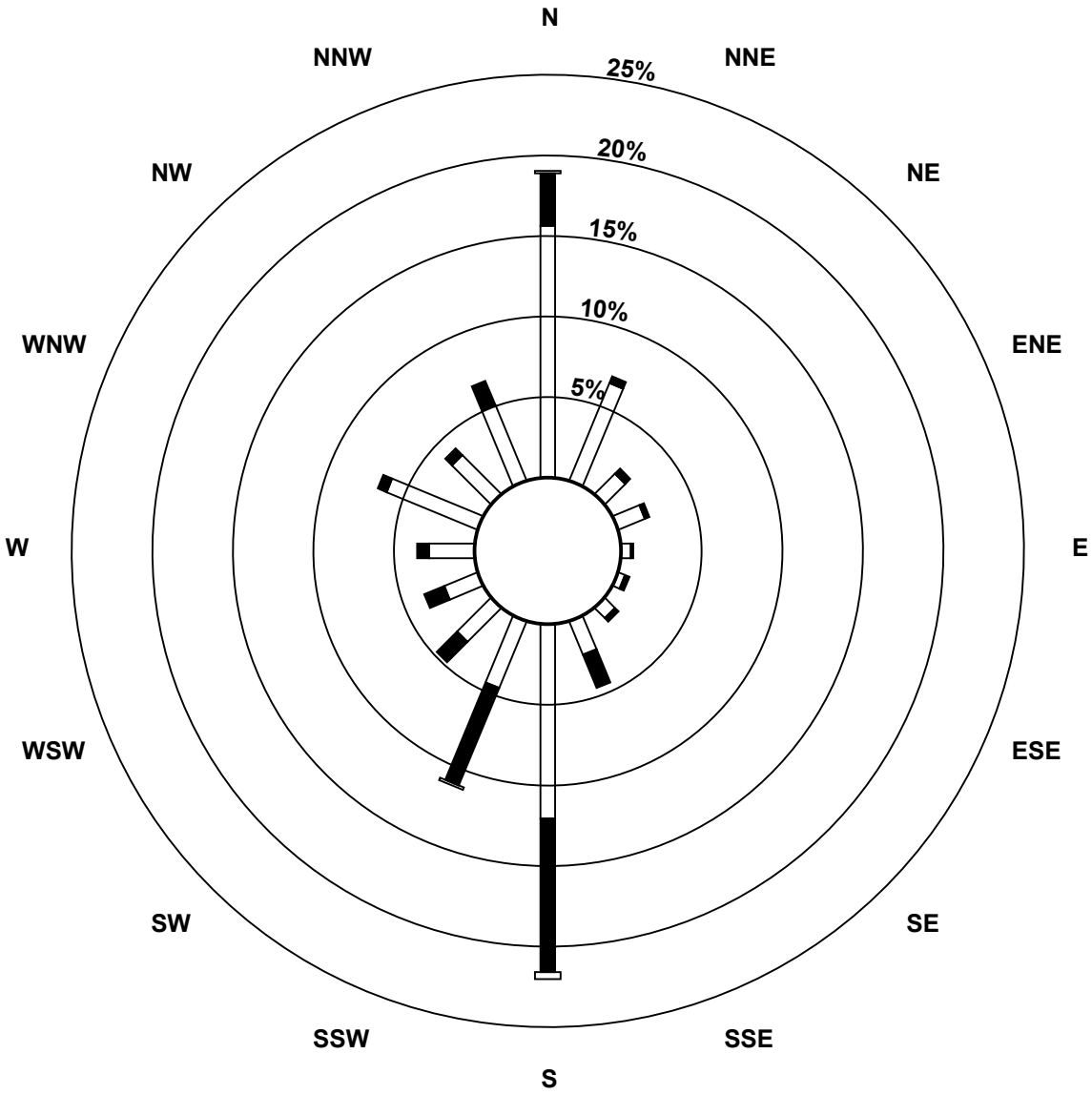
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

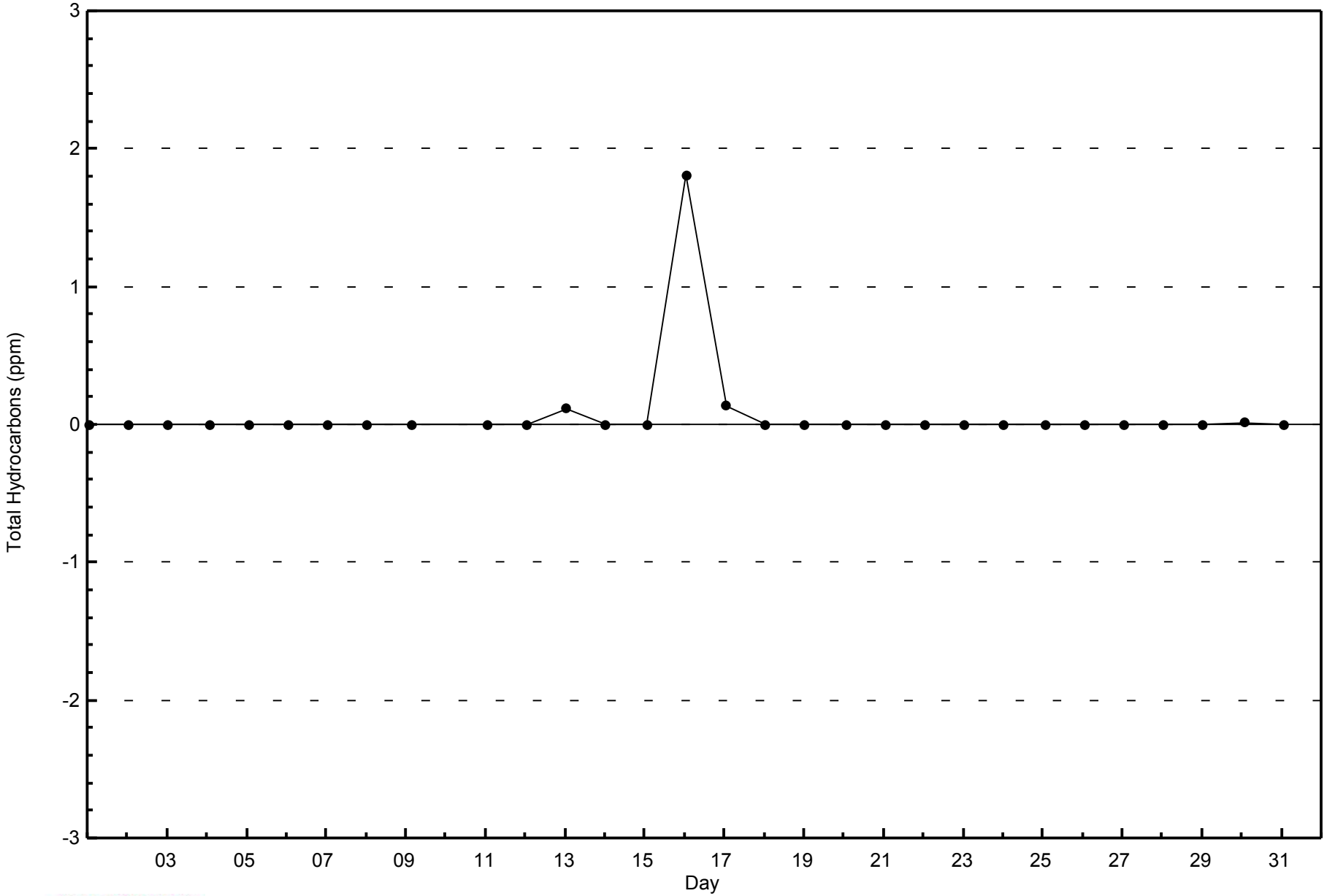
Total Number of Valid Hours: 672

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2014



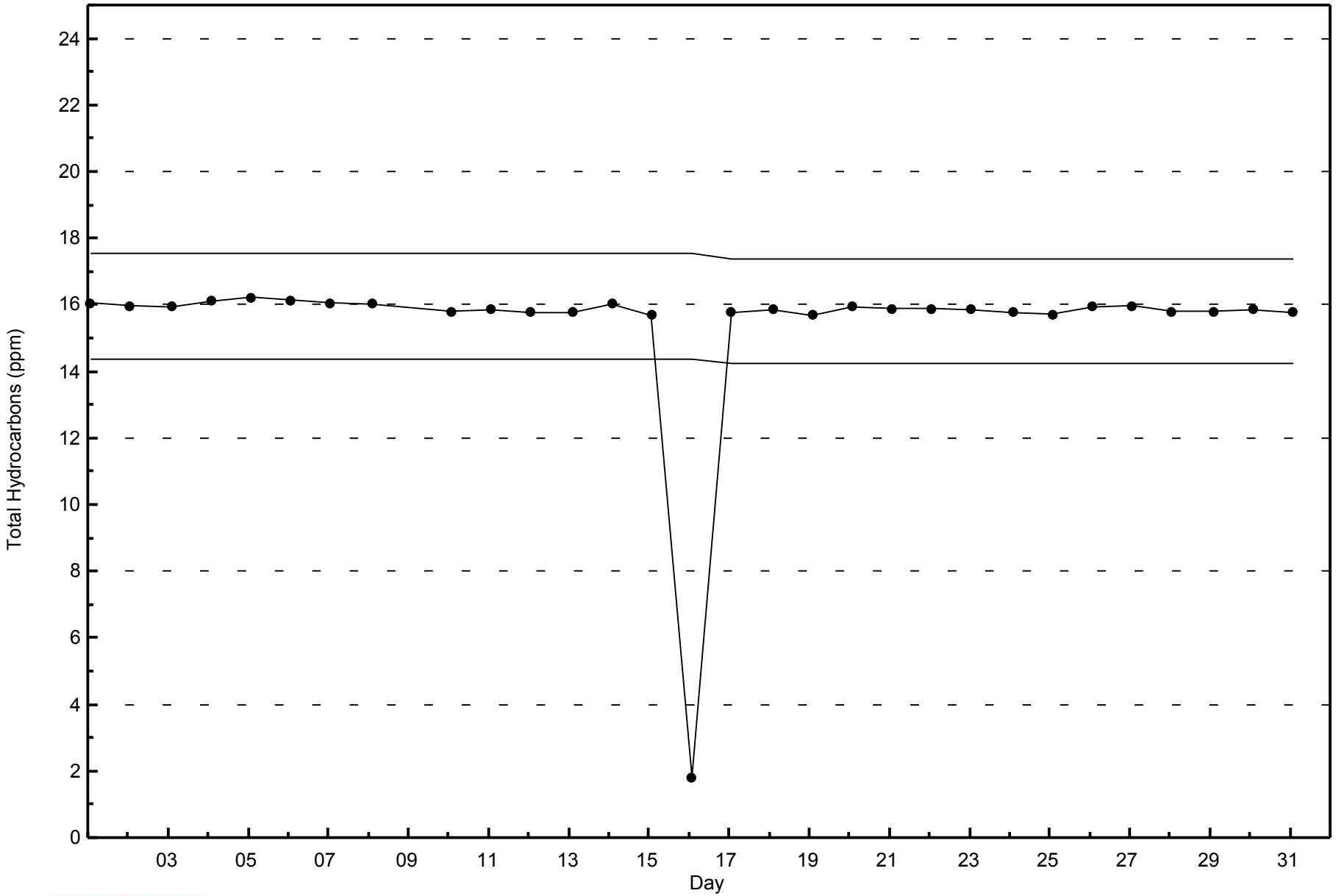
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2014

Maximum Value: 1.021 ppm on Jan 22 21:00

Maximum Daily Average: 0.156 ppm on Jan 1

Minimum Value: 0.000 ppm on Jan 2 01:00

Minimum Daily Average: 0.000 ppm on Jan 30

Maximum Diurnal Average: 0.082 ppm at hour 18

Minimum Diurnal Average: 0.018 ppm at hour 6

Monthly Average: 0.044 ppm

Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.0 Median = 0.0 Q_3 = 0.0 P_{90} = 0.2 P_{99} = 0.5

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	34
Percent Operational Time:	96.1

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.123	Z	0.222	0.262	0.283	0.282	0.220	0.173	0.166	0.161	0.163	0.140	0.002	0.002	0.122	0.121	0.166	0.276	0.196	0.204	0.128	0.074	0.088	0.004	0.156	0.283
2-Jan	0.000	Z	0.001	0.000	0.002	0.016	0.040	0.037	0.002	0.001	0.001	0.001	0.098	0.248	0.222	0.442	0.541	0.383	0.358	0.409	0.461	0.296	0.015	0.000	0.155	0.541
3-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.139	0.101	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.139
4-Jan	0.000	Z	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
5-Jan	0.000	Z	0.000	0.000	0.001	0.000	0.015	0.019	0.000	0.000	0.000	0.000	0.000	0.106	0.161	0.001	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.161
6-Jan	0.000	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002
7-Jan	0.000	Z	0.003	0.000	0.001	0.000	0.000	0.001	0.020	0.101	0.104	0.000	0.114	0.159	0.170	0.280	0.419	0.389	0.320	0.313	0.319	0.268	0.173	0.185	0.145	0.419
8-Jan	0.049	Z	0.002	0.000	0.000	0.000	0.000	0.298	0.000	0.111	0.123	0.000	0.072	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.097	0.120	0.093	0.233	0.053	0.298
9-Jan	0.220	Z	0.253	0.246	0.228	0.230	0.279	0.358	M	0.000	0.028	0.064	0.001	0.098	0.256	0.469	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.125	0.469
10-Jan	0.000	Z	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	0.002	0.000	0.007	0.000	0.000	0.057	0.000	0.003	0.057
11-Jan	0.000	Z	0.000	0.001	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	0.002
12-Jan	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.001	0.000	0.002	0.049
13-Jan	0.000	Z	0.165	0.045	0.000	0.000	0.000	0.000	0.000	0.044	0.182	0.034	0.000	0.108	0.050	0.057	0.012	0.078	0.066	0.005	0.000	0.000	0.000	0.000	0.037	0.182
14-Jan	0.000	Z	0.000	0.001	0.000	0.004	0.057	0.006	0.007	0.009	0.027	0.006	0.008	0.003	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.003	0.007	0.057
15-Jan	0.004	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0.004
16-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	C	C	C	C	0.334	0.278	0.301	0.264	0.269	0.155	0.068	--	0.334
17-Jan	0.224	Z	0.283	0.294	0.055	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.023	0.123	0.000	0.000	0.003	0.017	0.000	0.045	0.294
18-Jan	0.000	Z	0.000	0.000	0.000	0.002	0.173	0.353	0.274	0.129	0.302	0.297	0.218	0.434	0.029	0.000	0.010	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.097	0.434
19-Jan	0.002	Z	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
20-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.015	0.032	0.000	0.000	0.084	0.198	0.008	0.000	0.000	0.090	0.565	0.585	0.407	0.270	0.152	0.005	0.000	0.000	0.105	0.585
21-Jan	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.004	0.001	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.006	0.010	0.038	0.000	0.000	0.001	0.001	0.000	0.003	0.038
22-Jan	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.047	0.026	0.000	0.000	0.000	0.272	0.526	0.527	1.021	0.789	0.119	0.191	0.153	1.021
23-Jan	0.122	Z	0.006	0.000	0.000	0.001	0.000	0.012	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.083	0.135	0.021	0.135
24-Jan	0.077	Z	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.077
25-Jan	0.000	Z	0.130	0.226	0.082	0.000	0.194	0.233	0.189	0.167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053	0.233
26-Jan	0.000	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
27-Jan	0.007	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121	0.189	0.068	0.000	0.000	0.000	0.003	0.002	0.000	0.004	0.000	0.000	0.000	0.017	0.189
28-Jan	0.000	Z	0.003	0.000	0.001	0.002	0.002	0.000	0.002	0.026	0.001	0.008	0.001	0.001	0.003	0.126	0.440	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.440
29-Jan	0.002	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	0.001	0.000	0.000	0.000	0.000	0.002
30-Jan	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
31-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.001	0.012
	0.028	--	0.038	0.036	0.022	0.018	0.033	0.051	0.027	0.031	0.039	0.030	0.026	0.044	0.035	0.055	0.076	0.082	0.079	0.069	0.082	0.062	0.027	0.027	Diurnal Average	
	0.224	--	0.283	0.294	0.283	0.282	0.279	0.358	0.274	0.167	0.302	0.297	0.218	0.434	0.256	0.469	0.565	0.585	0.526	0.527	1.021	0.789	0.173	0.233	Diurnal Maximum	

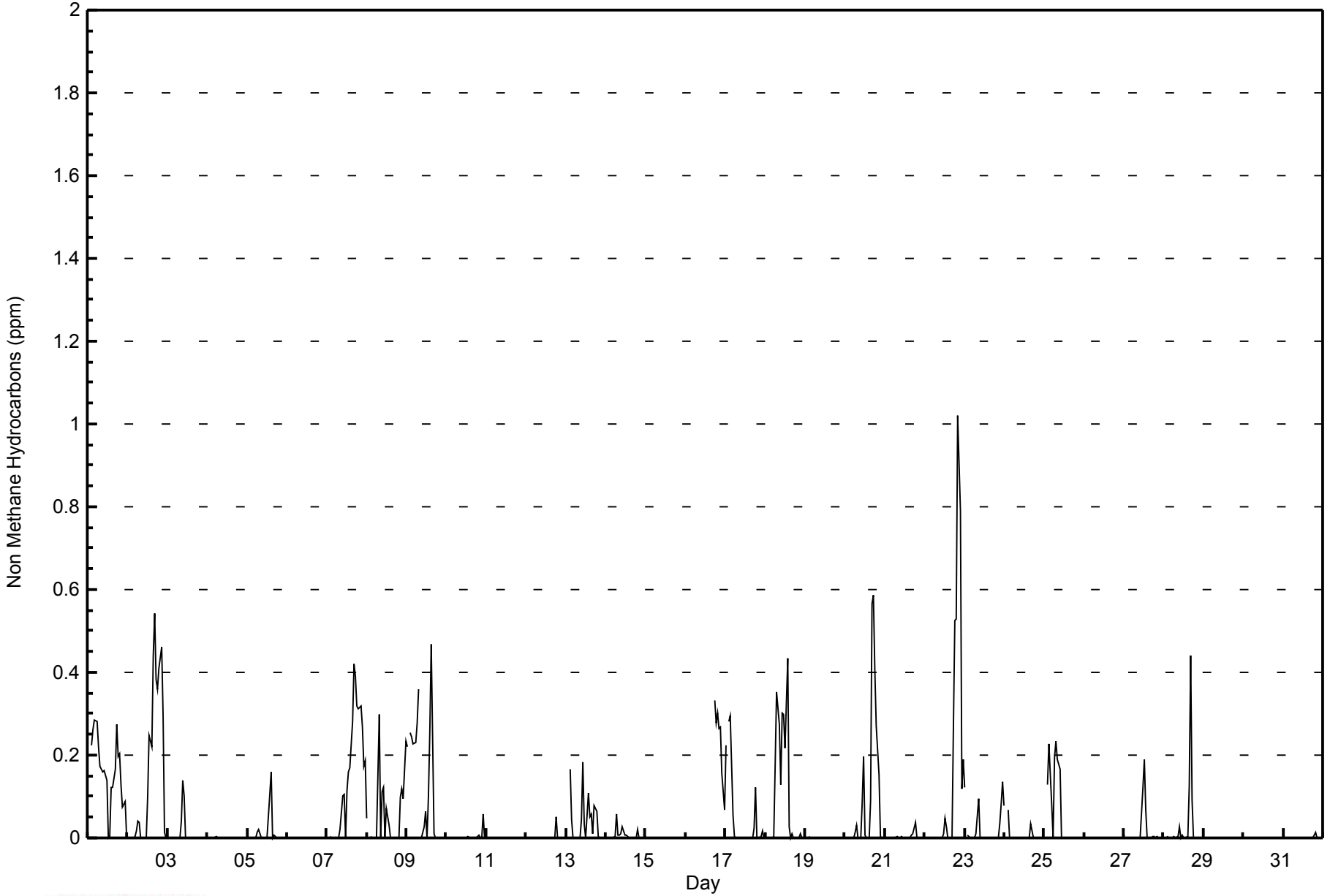
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	504	74.01	74.01
0.006 - 0.05	49	7.20	81.20
0.06 - 0.1	46	6.75	87.96
> 0.1	82	12.04	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - January 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	115	41	7	13	5	4	6	14	91	36	24	15	21	42	25	37	496
0.006 - 0.05	3	5	4	0	0	0	1	4	14	9	3	3	1	1	0	1	49
0.06 - 0.1	4	0	3	1	0	0	0	6	16	10	1	2	0	1	1	1	46
> 0.1	6	1	1	0	0	1	1	6	27	20	4	4	2	1	1	6	81
Totals	128	47	15	14	5	5	8	30	148	75	32	24	24	45	27	45	672

Total Number of Valid Hours: 672

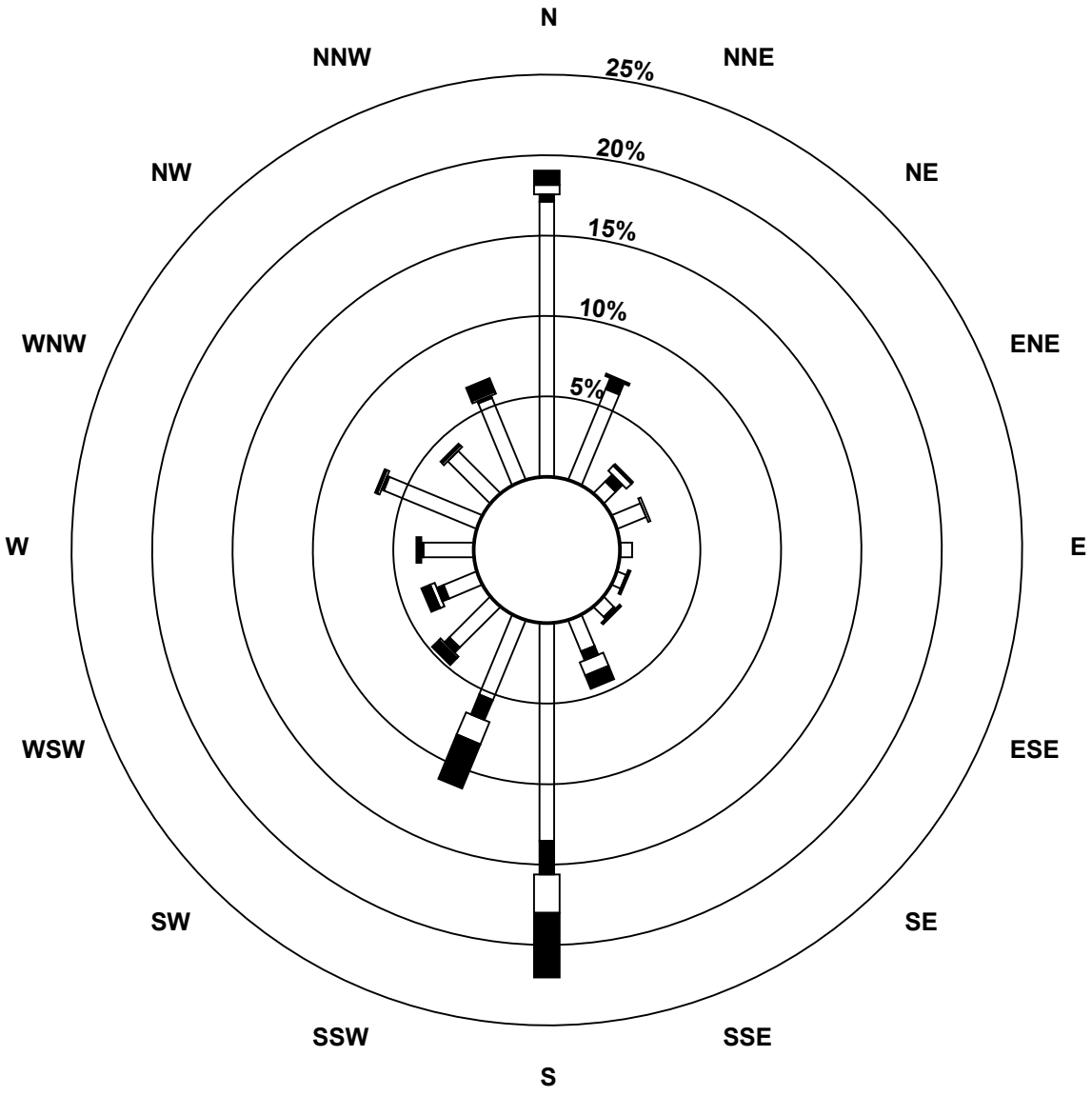
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)

0 - 0.005

0.006 - 0.05

0.06 - 0.1

> 0.1

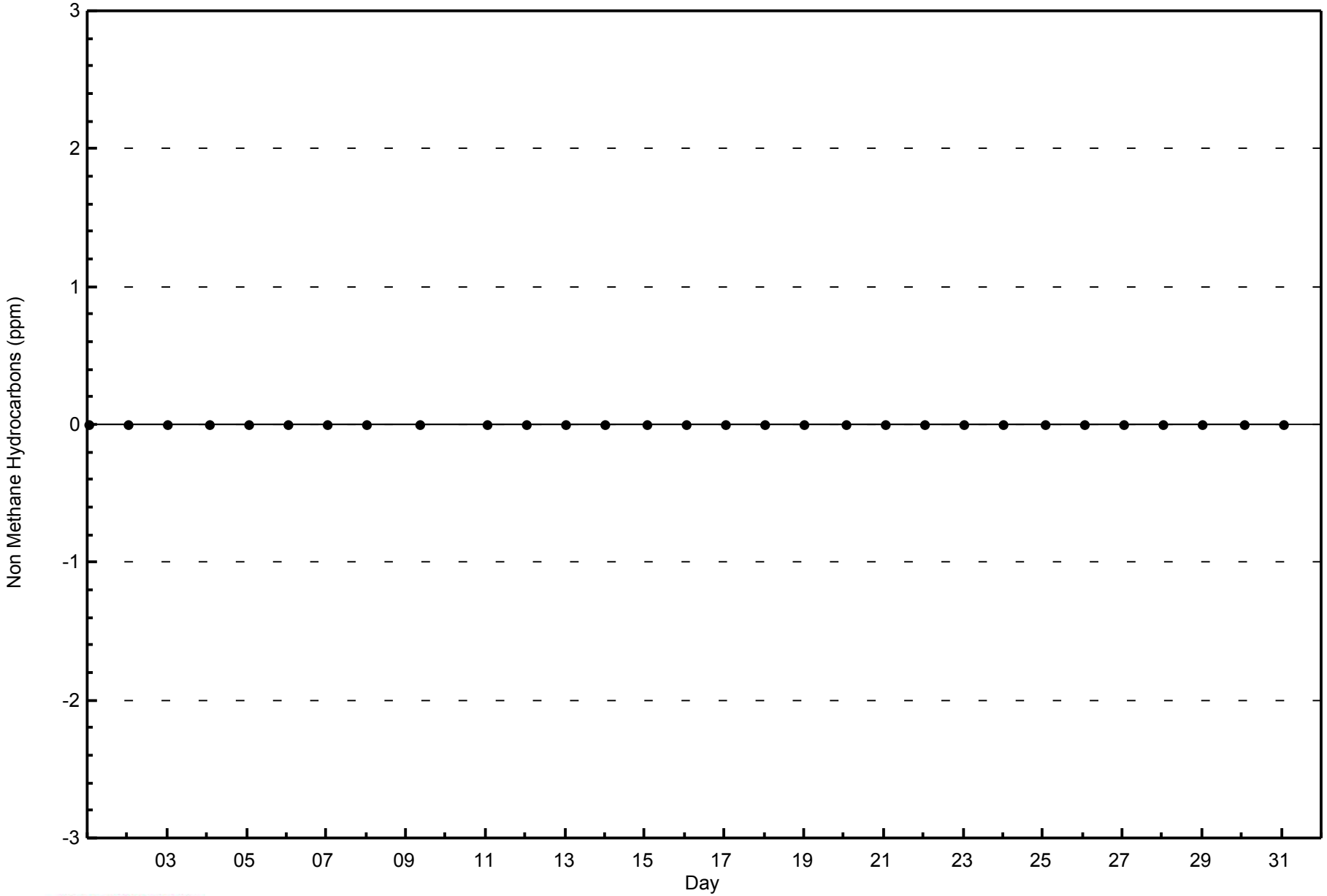
Total Number of Valid Hours: 672

WBEA NETWORK

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2014



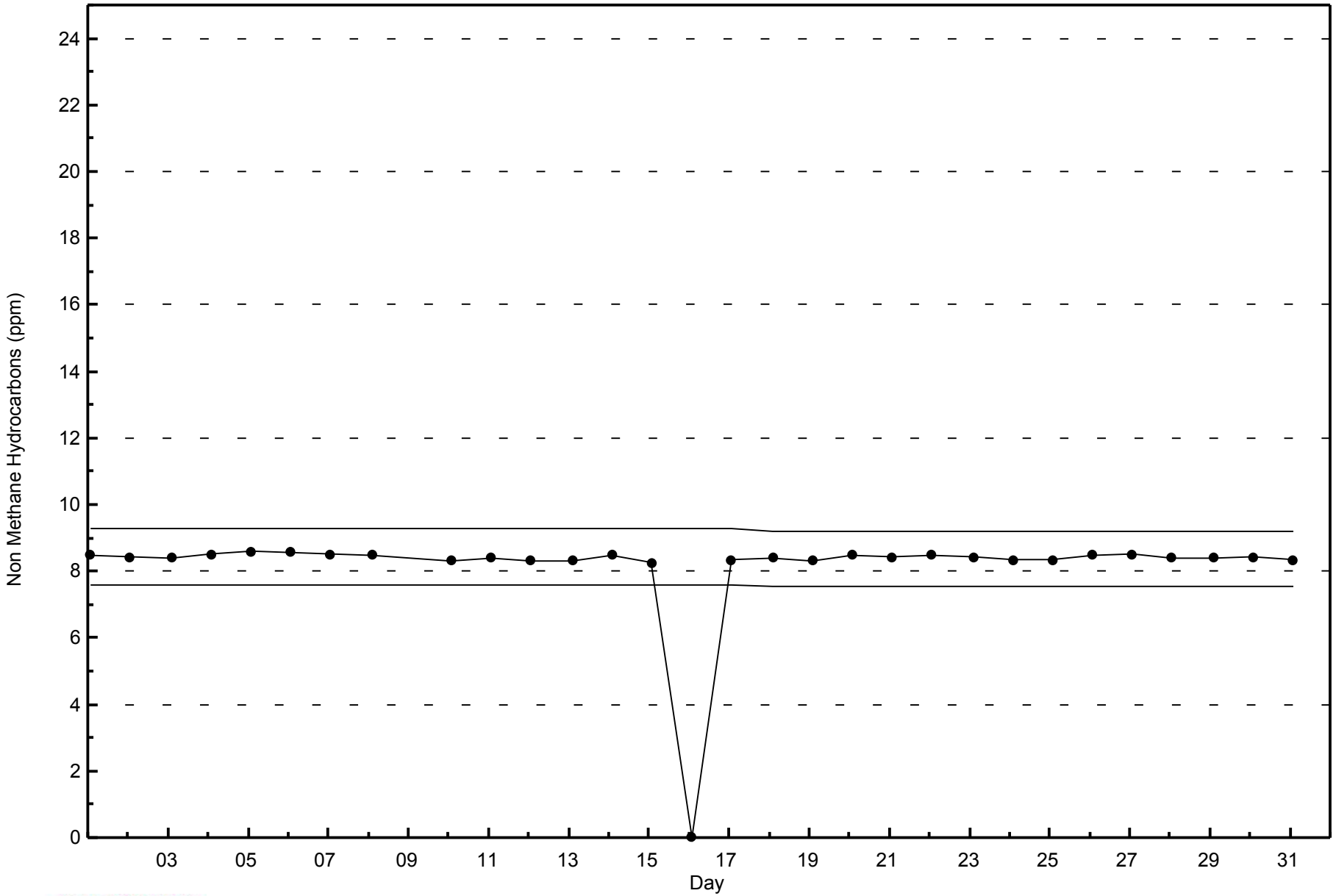
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.8 ppm on Jan 9 16:00 Maximum Daily Average: 2.4 ppm on Jan 2

Minimum Value: 1.8 ppm on Jan 17 11:00 Minimum Daily Average: 1.8 ppm on Jan 30
Maximum Diurnal Average: 2.0 ppm at hour 16 Minimum Diurnal Average: 2.0 ppm at hour 24
Monthly Average: 2.00 ppm Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.9 Median = 1.9 Q_3 = 2.1 P_{90} = 2.3 P_{99} = 2.6

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	34
Percent Operational Time:	96.1

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.2	Z	2.2	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	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
2-Jan	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.3	2.5	2.4	2.4	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.1	2.0	2.4	2.6
3-Jan	1.9	Z	1.9	1.9	1.9	1.9	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	2.0
4-Jan	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
5-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.3
6-Jan	2.1	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	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
7-Jan	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.2	2.3	2.4	2.5	2.6	2.5	2.4	2.4	2.4	2.3	2.2	2.2	2.3	2.6
8-Jan	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.2	2.5
9-Jan	2.5	Z	2.5	2.5	2.6	2.6	2.5	2.5	M	2.3	2.4	2.5	2.4	2.4	2.5	2.8	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9	2.3	2.8
10-Jan	1.9	Z	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	2.1	2.1	2.1	2.1	1.9	1.9	1.9	2.0	2.0	2.0	2.1
11-Jan	2.0	Z	2.0	2.0	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	1.9	1.9	1.9	1.9	1.9	2.1
12-Jan	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	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.0	1.9	1.9	1.9	2.1
13-Jan	2.0	Z	2.0	2.0	2.1	2.1	2.2	2.2	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.2
14-Jan	2.0	Z	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2
15-Jan	2.0	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	2.0
16-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	C	C	C	C	2.2	2.2	2.2	2.2	2.3	2.1	2.1	--	2.3
17-Jan	2.2	Z	2.2	2.2	2.0	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.8	2.0	1.9	1.8	1.9	2.2
18-Jan	1.9	Z	1.9	1.9	1.9	2.0	2.1	2.1	2.3	2.3	2.1	2.1	2.1	2.2	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	2.0	2.3
19-Jan	1.9	Z	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0
20-Jan	1.9	Z	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	2.0	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.1
21-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.0	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1
22-Jan	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	2.1	2.2	2.2	2.8	2.6	2.2	2.2	2.0	2.8
23-Jan	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	1.9	2.1
24-Jan	2.0	Z	2.0	1.9	1.9	1.8	1.9	1.8	1.8	1.9	1.9	1.9	1.8	1.9	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0
25-Jan	1.8	Z	2.0	2.1	2.0	2.0	2.5	2.3	2.2	2.2	2.0	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.5
26-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
27-Jan	1.9	Z	1.9	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	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
28-Jan	2.0	Z	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	2.3	2.0	1.8	1.8	1.8	1.9	1.9	1.8	2.0	2.3
29-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
30-Jan	1.8	Z	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9
31-Jan	1.9	Z	1.8	1.8	1.9	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.5	--	2.5	2.5	2.6	2.6	2.5	2.5	2.5	2.3	2.5	2.5	2.4	2.6	2.6	2.8	2.6	2.5	2.5	2.5	2.8	2.6	2.5	2.5	Diurnal Maximum	

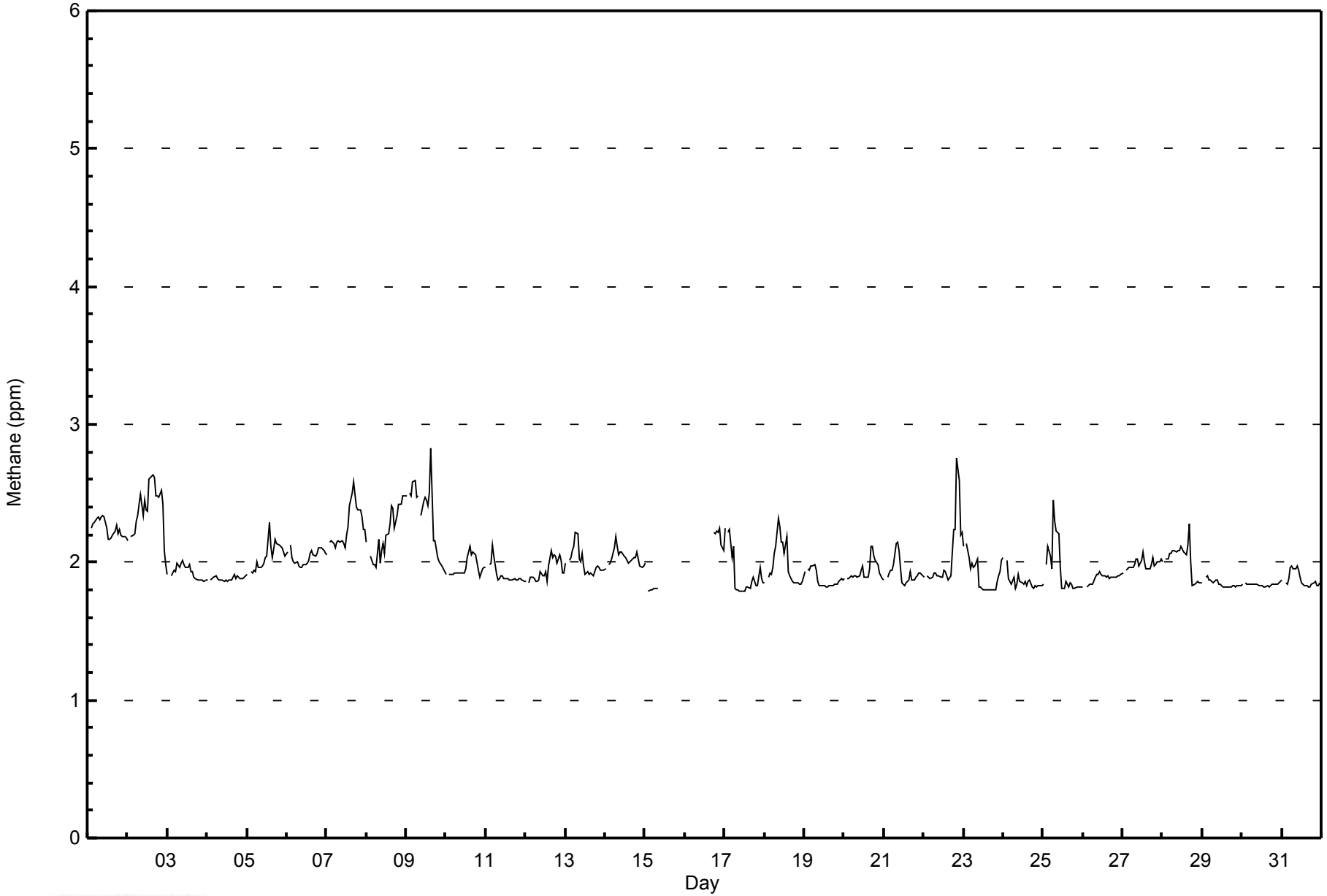
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	486	71.37	71.37
2.1 - 3.0	195	28.63	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: 744

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	107	44	12	12	4	3	6	17	85	33	22	17	19	41	24	37	483
2.1 - 3.0	21	3	3	2	1	2	2	13	63	42	10	7	5	4	3	8	189
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	128	47	15	14	5	5	8	30	148	75	32	24	24	45	27	45	672

Total Number of Valid Hours: 672

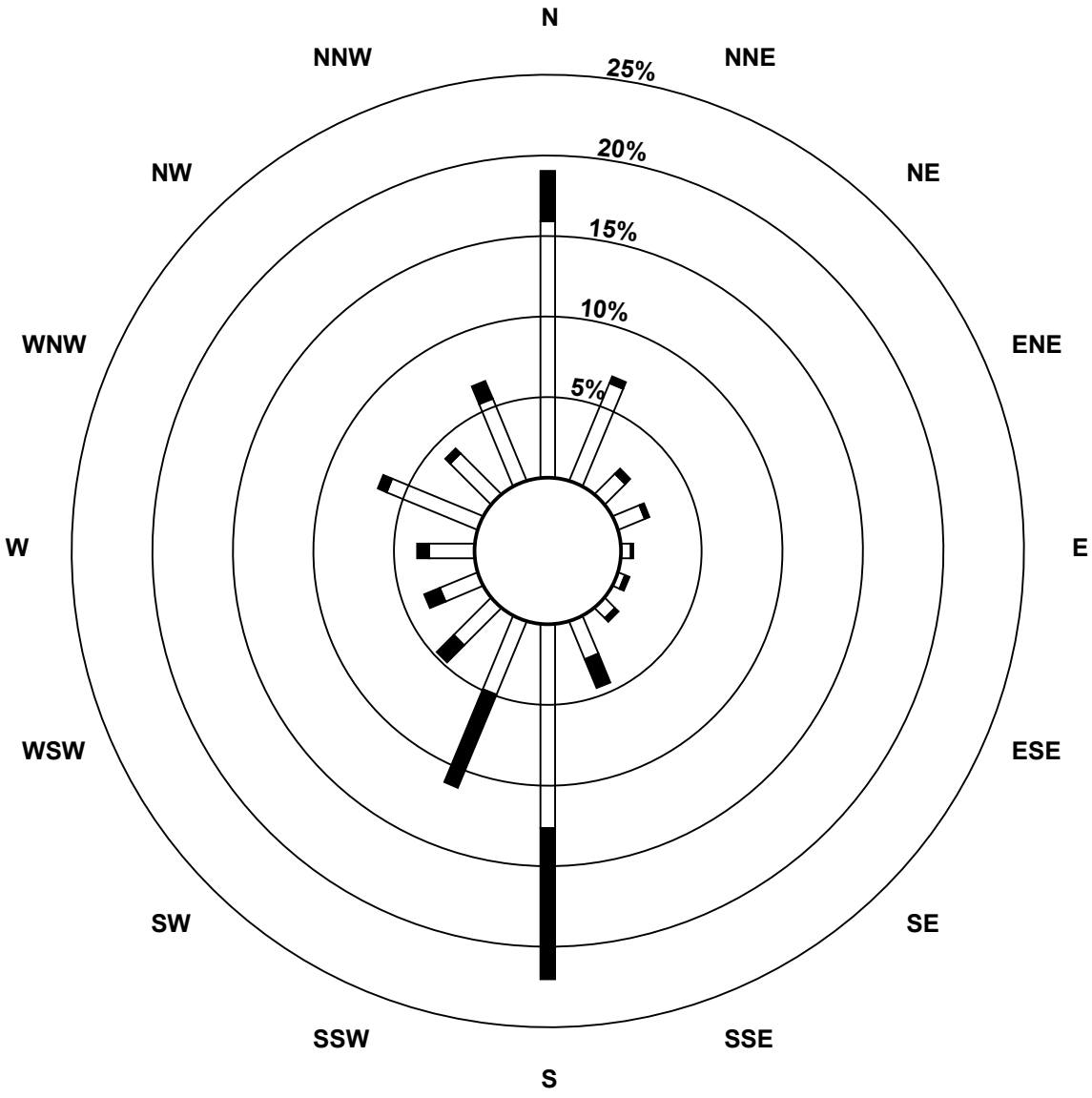
Total Number of Hours: 744

Wood Buffalo Environmental Association

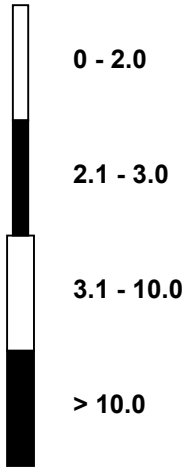
Wind Rose Jan 2014

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppm)



0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

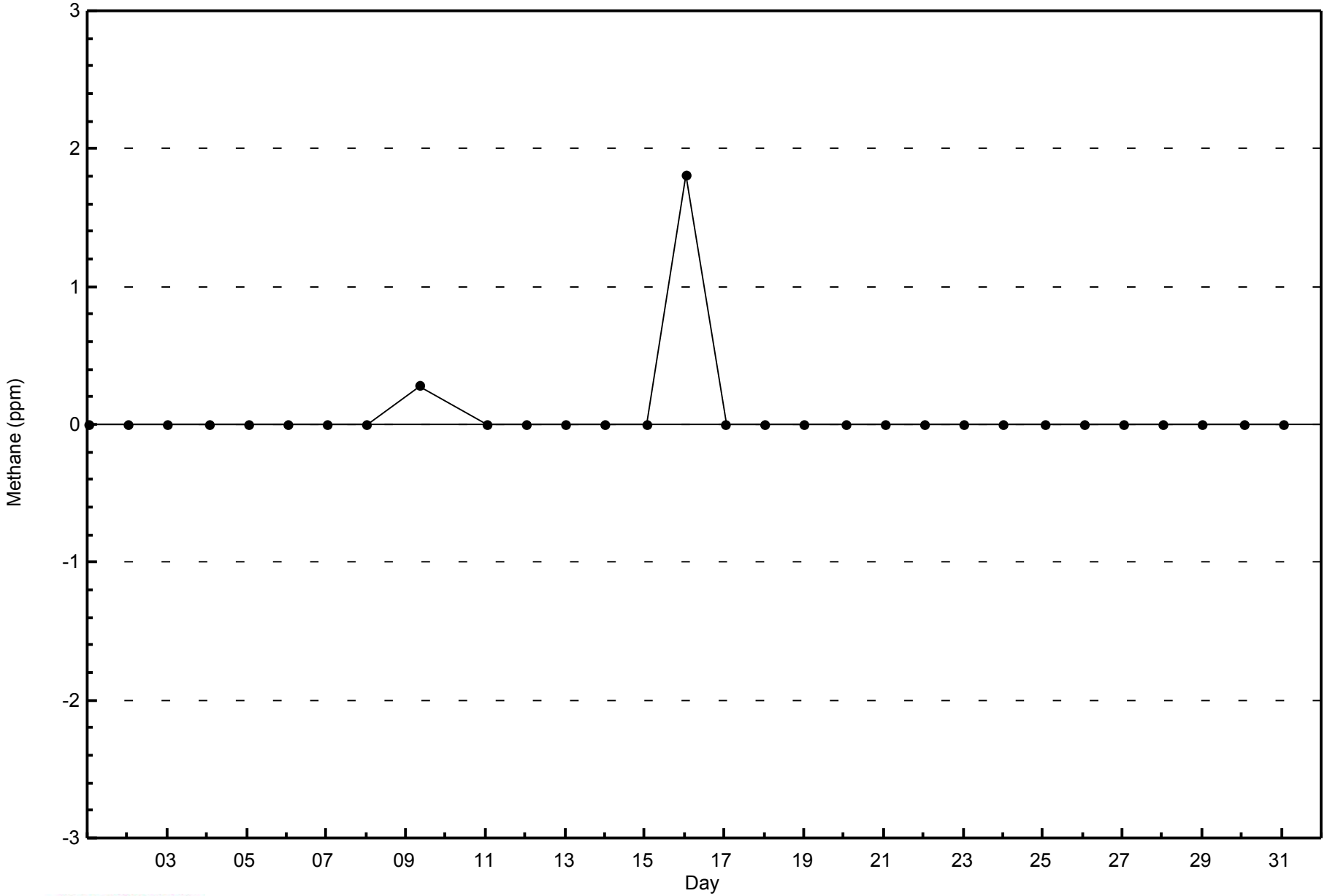
Total Number of Valid Hours: 672

WBEA NETWORK

Zero Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2014



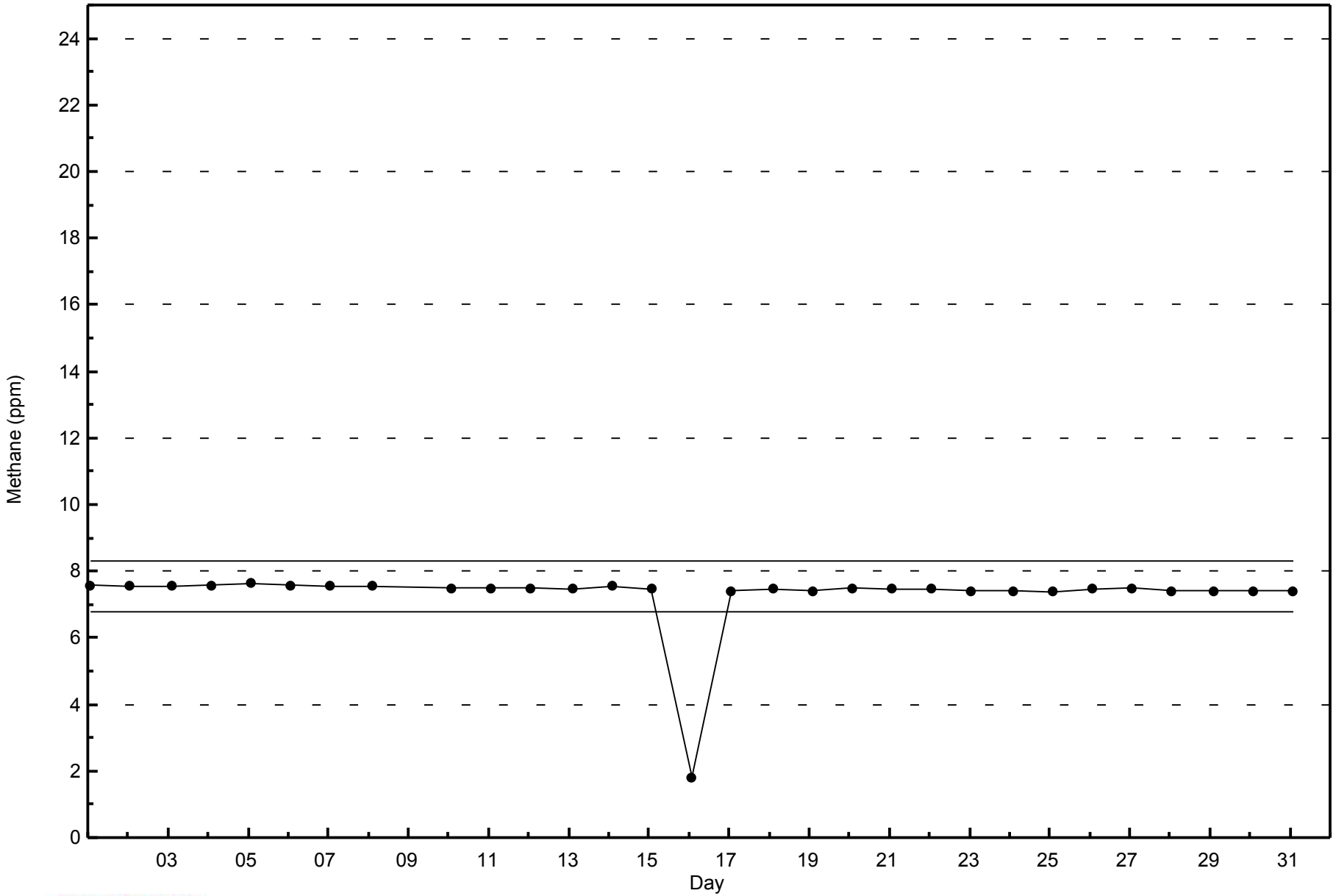
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Methane (CH_4) - ppm

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 103 ppb on Jan 7 16:00

Maximum Daily Average: 39.9 ppb on Jan 7

Minimum Value: 0 ppb on Jan 3 01:00

Minimum Daily Average: 0.0 ppb on Jan 4

Maximum Diurnal Average: 9.8 ppb at hour 13

Minimum Diurnal Average: 2.3 ppb at hour 3

Monthly Average: 5.7 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 5$ $P_{90} = 19$ $P_{99} = 60$

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	36
Percent Operational Time:	96.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	6	Z	10	11	14	21	22	22	24	25	31	37	25	20	18	18	19	32	27	32	24	23	22	15	21.6	37
2-Jan	11	Z	10	12	10	5	17	8	3	2	8	13	7	7	10	8	6	6	6	10	18	13	0	0	8.2	18
3-Jan	0	Z	0	0	0	0	0	1	0	2	3	9	16	17	1	0	0	0	0	0	0	0	0	0	2.2	17
4-Jan	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
5-Jan	0	Z	0	0	0	0	0	2	7	10	24	25	22	23	10	6	11	19	11	9	6	3	1	0	8.3	25
6-Jan	1	Z	1	0	0	0	0	0	0	1	2	3	4	5	4	2	1	0	0	1	3	1	3	2	1.5	5
7-Jan	0	Z	3	5	2	1	7	11	13	17	31	40	62	68	95	103	97	79	56	52	49	56	35	34	39.9	103
8-Jan	15	Z	3	1	0	0	0	0	0	1	3	4	4	4	28	32	14	3	12	16	20	16	27	31	10.2	32
9-Jan	31	Z	32	30	35	39	20	1	M	18	27	31	35	16	20	42	0	0	0	0	0	0	0	0	17.1	42
10-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	1	5	8	3	1	0	1	0	0	0	1	2	1.0	8
11-Jan	4	Z	1	0	9	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	9
12-Jan	0	Z	0	0	0	0	0	0	0	2	1	2	4	0	6	9	6	8	1	1	0	0	0	0	1.8	9
13-Jan	0	Z	0	1	1	9	18	17	2	2	4	4	5	3	1	1	0	0	0	0	0	0	0	0	3.0	18
14-Jan	0	Z	1	1	3	16	36	27	19	23	31	26	24	16	10	8	8	4	3	1	0	0	0	0	11.1	36
15-Jan	0	Z	0	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0
16-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	C	C	C	C	C	C	6	4	10	3	2	2	4	--	10
17-Jan	2	Z	0	1	1	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	22
18-Jan	0	Z	0	0	0	1	16	24	61	43	14	16	19	22	5	1	0	0	0	0	0	0	0	0	9.6	61
19-Jan	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-Jan	0	Z	0	1	1	0	1	2	1	5	10	11	7	5	4	5	3	2	1	0	0	0	0	0	2.6	11
21-Jan	0	Z	0	0	0	0	2	24	29	21	10	1	0	1	1	1	0	0	0	0	0	0	1	2	4.1	29
22-Jan	0	Z	0	1	0	0	2	1	1	2	5	5	9	8	4	3	3	2	1	1	1	2	1	1	2.3	9
23-Jan	0	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
24-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.3	1
25-Jan	0	Z	1	8	2	4	51	13	6	12	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4.3	51
26-Jan	0	Z	0	0	0	0	0	0	0	1	2	4	3	3	4	5	2	0	0	0	0	0	0	0	1.1	5
27-Jan	2	Z	4	6	6	3	5	13	29	31	21	23	19	12	11	6	2	3	7	2	2	1	0	1	9.1	31
28-Jan	1	Z	0	1	1	1	5	7	6	13	16	18	14	11	6	7	13	1	0	0	0	0	0	0	5.3	18
29-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
30-Jan	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
31-Jan	0	Z	0	0	0	0	0	2	1	4	5	3	2	0	0	0	0	0	0	1	0	0	0	0	0.8	5
	2.5	--	2.3	2.6	2.9	4.2	6.8	5.9	7.1	8.1	8.7	9.5	9.8	8.6	8.6	9.0	6.4	5.6	4.4	4.5	4.2	3.9	3.1	3.1	Diurnal Average	
	31	--	32	30	35	39	51	27	61	43	31	40	62	68	95	103	97	79	56	52	49	56	35	34	Diurnal Maximum	

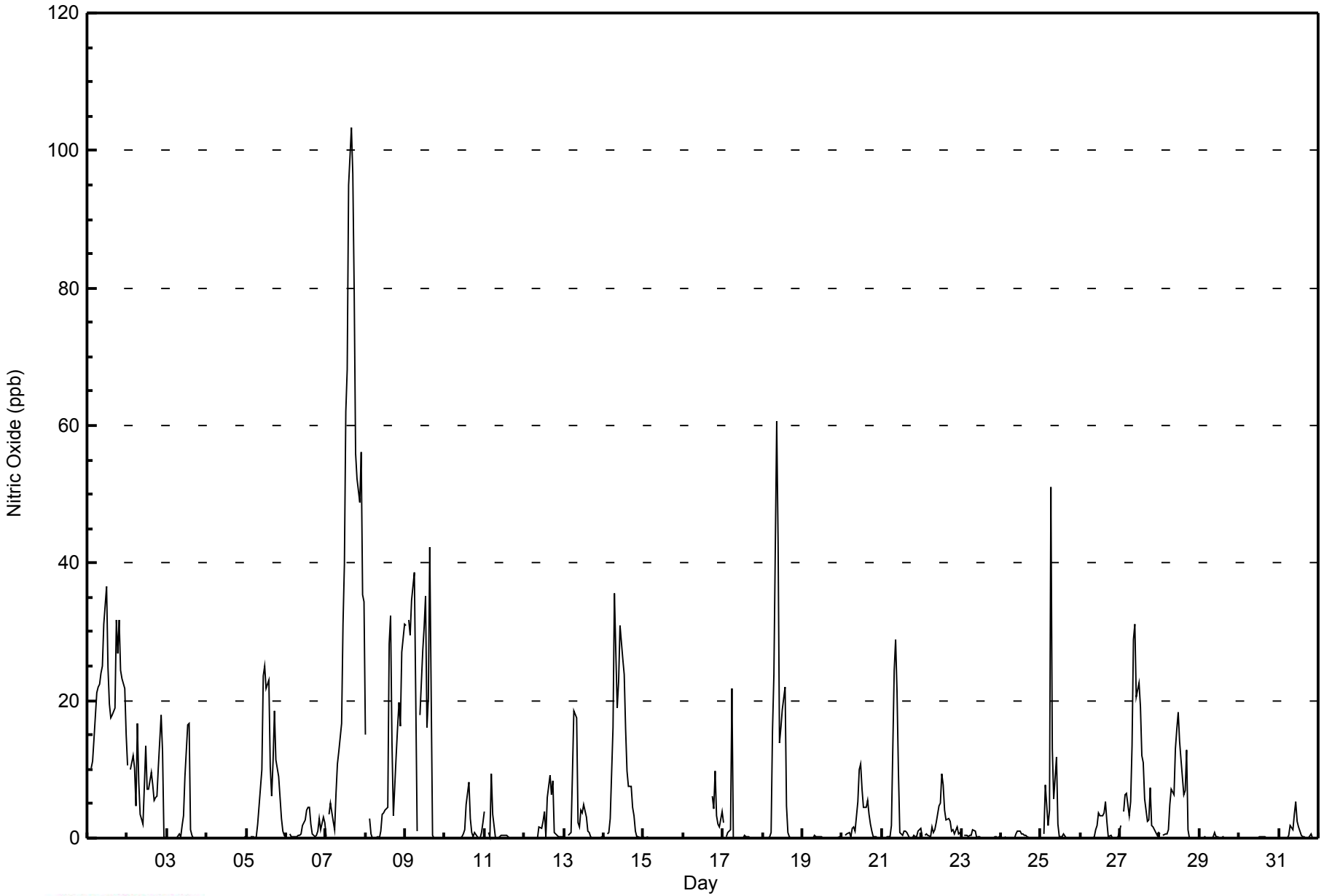
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	617	90.60	90.60
21 - 40	50	7.34	97.94
11 - 80	11	1.62	99.56
81 - 159	3	0.44	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	126	46	14	14	5	5	7	22	131	57	26	20	23	44	25	44	609
21 - 40	1	1	1	0	0	0	1	7	14	11	4	4	1	1	2	1	49
11 - 80	1	0	0	0	0	0	0	1	2	5	2	0	0	0	0	0	11
81 - 159	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	128	47	15	14	5	5	8	30	148	75	32	24	24	45	27	45	672

Total Number of Valid Hours: 672

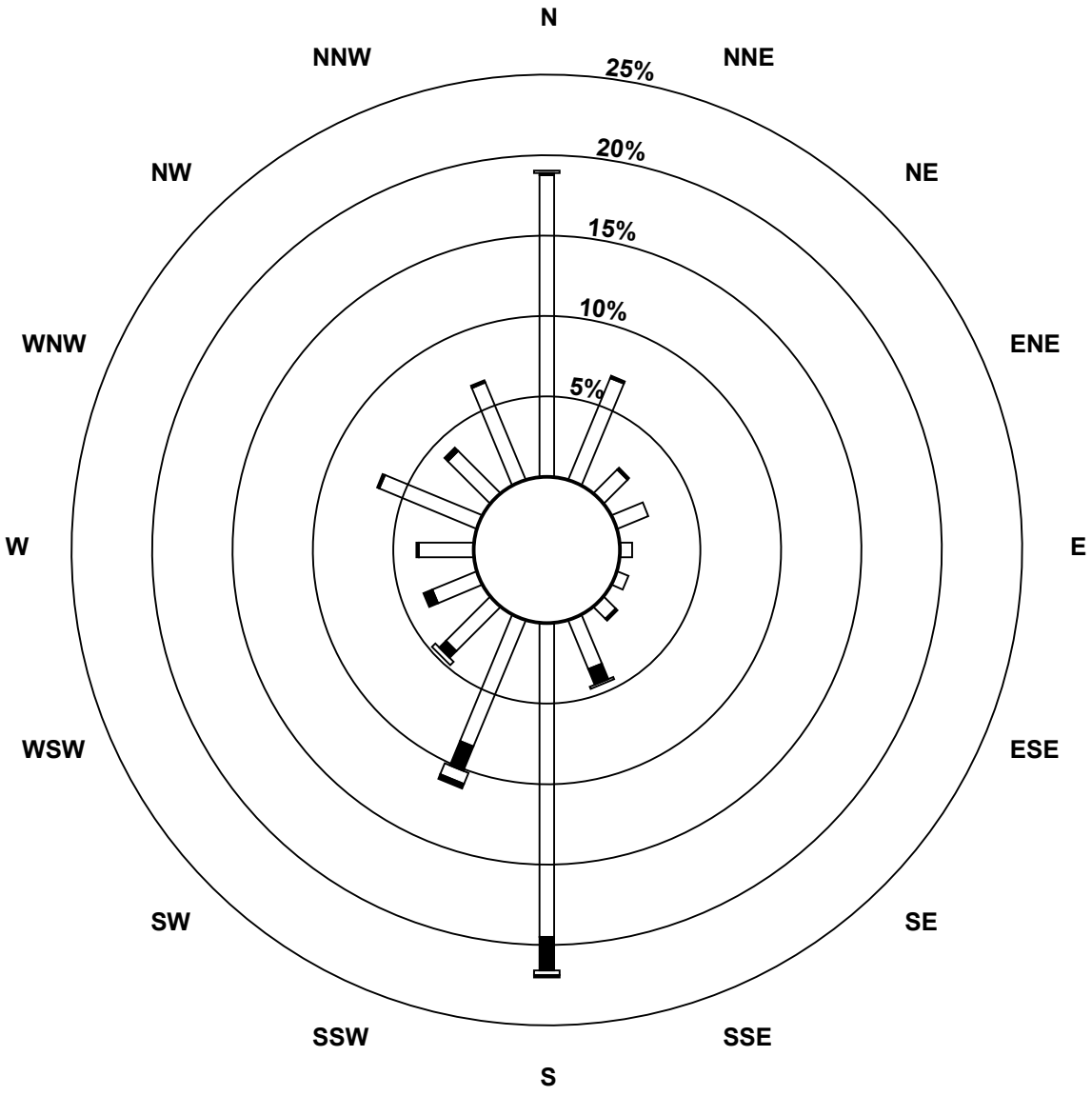
Total Number of Hours: 744

Wood Buffalo Environmental Association

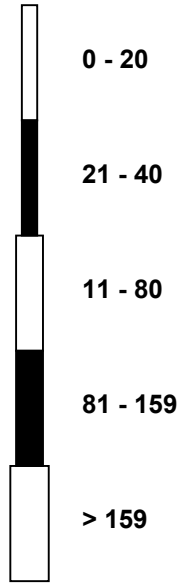
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



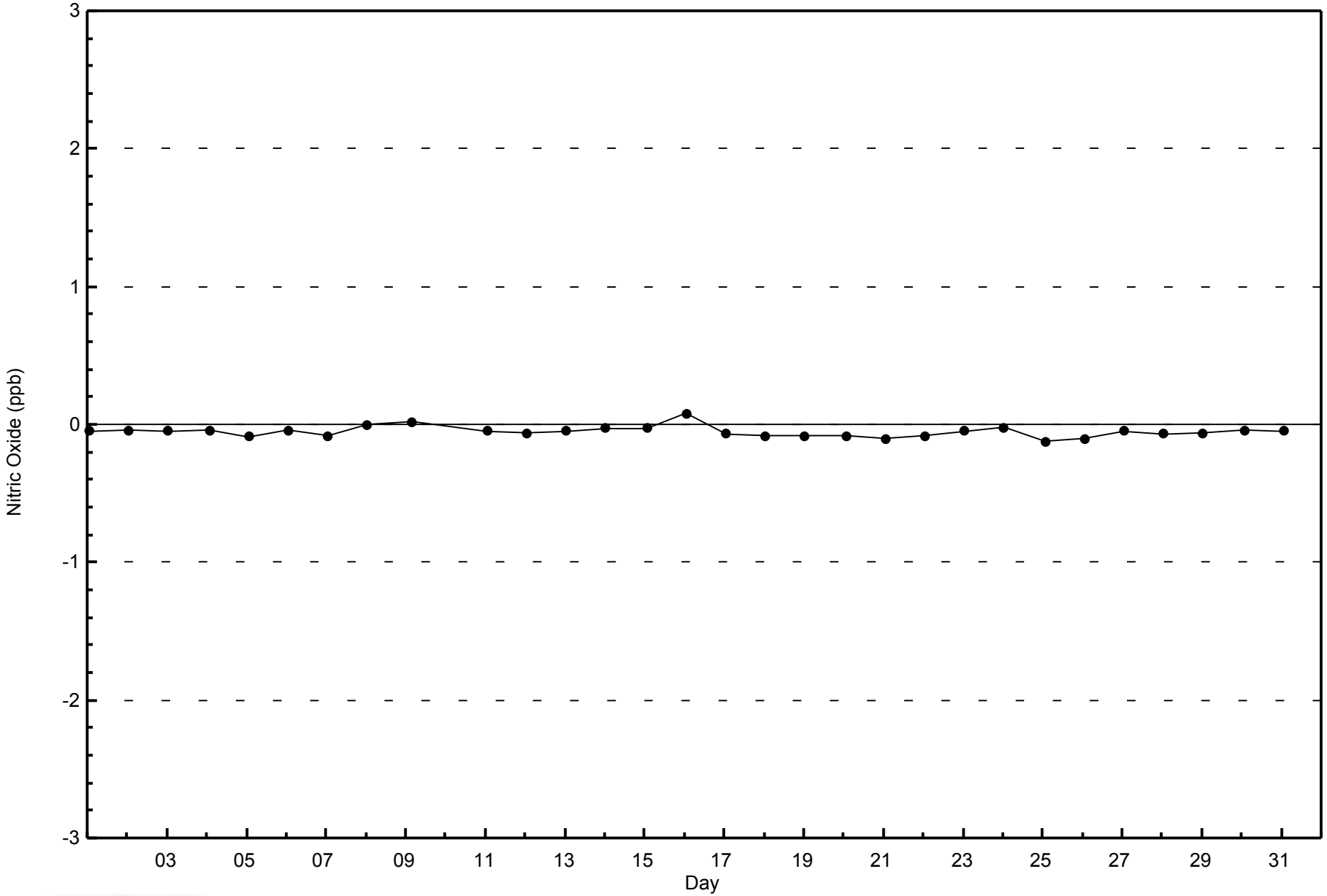
Total Number of Valid Hours: 672

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - January 2014



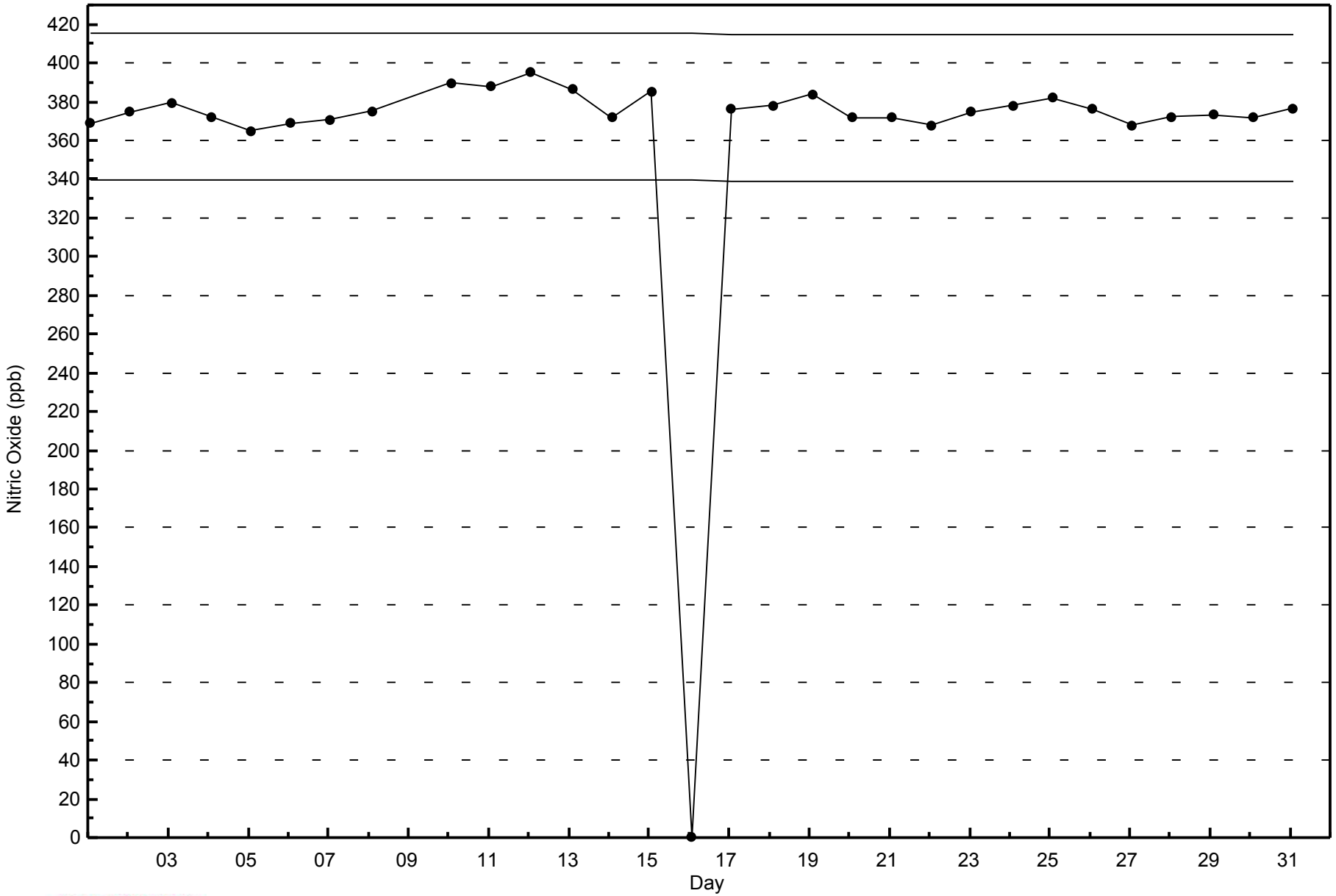
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 47 ppb on Jan 7 16:00 Maximum Daily Average: 32.5 ppb on Jan 7

Minimum Value: 0 ppb on Jan 17 11:00 Minimum Daily Average: 1.4 ppb on Jan 30
Maximum Diurnal Average: 16.1 ppb at hour 18 Minimum Diurnal Average: 11.1 ppb at hour 12
Monthly Average: 13.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 14 $Q_3 = 22$ $P_{90} = 28$ $P_{99} = 38$

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	36
Percent Operational Time:	96.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	20	Z	19	18	18	19	18	18	17	16	16	17	15	15	18	19	21	23	23	24	22	22	22	21	19.1	24
2-Jan	21	Z	20	19	19	21	24	23	16	12	14	17	15	15	17	20	23	24	25	26	26	23	10	5	18.8	26
3-Jan	2	Z	1	2	4	4	8	12	10	13	11	12	18	19	8	7	1	2	1	1	1	1	0	1	6.0	19
4-Jan	4	Z	4	3	3	6	3	1	1	1	0	1	1	1	0	2	4	1	4	2	1	1	1	5	2.1	6
5-Jan	5	Z	8	9	9	5	12	17	25	23	21	21	21	25	23	25	34	35	35	34	33	32	26	23	21.7	35
6-Jan	25	Z	25	20	19	23	20	19	18	16	18	15	14	13	16	17	21	26	25	26	31	29	30	27	21.4	31
7-Jan	22	Z	25	26	24	24	27	26	26	23	22	24	34	37	45	47	47	45	40	38	36	39	36	35	32.5	47
8-Jan	34	Z	26	20	12	12	10	15	12	15	17	13	13	16	31	32	29	22	28	28	29	30	31	30	21.9	34
9-Jan	29	Z	29	29	27	28	26	18	M	22	21	23	24	20	22	29	9	7	6	4	3	3	3	3	17.4	29
10-Jan	3	Z	2	3	2	2	2	3	3	3	3	5	7	15	23	17	21	19	17	10	3	6	16	18	8.8	23
11-Jan	21	Z	13	14	25	16	5	3	4	5	6	5	5	4	4	4	4	3	2	1	2	1	1	1	6.5	25
12-Jan	2	Z	1	4	4	4	3	3	8	17	9	7	9	1	14	27	33	37	23	19	19	15	14	11	12.4	37
13-Jan	15	Z	24	24	23	29	30	27	13	13	16	14	16	12	7	9	11	9	21	19	17	15	16	18	17.2	30
14-Jan	17	Z	16	18	19	25	33	33	32	31	29	27	25	23	22	25	29	29	27	23	17	12	11	12	23.1	33
15-Jan	15	Z	2	1	1	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	15
16-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	C	C	C	C	C	C	34	33	32	29	30	29	31	--	34
17-Jan	29	Z	22	22	17	27	1	0	1	0	0	0	0	2	2	2	5	8	4	3	3	18	8	5	7.8	29
18-Jan	6	Z	9	13	14	20	29	32	34	24	20	20	21	25	14	8	7	6	6	3	3	1	1	3	13.9	34
19-Jan	8	Z	8	7	10	13	17	13	6	4	2	1	1	1	1	1	1	1	2	1	1	3	7	6	5.0	17
20-Jan	7	Z	15	20	19	15	22	21	18	19	17	15	14	13	15	20	24	26	25	22	20	11	9	6	17.0	26
21-Jan	5	Z	7	12	15	16	21	26	27	26	17	4	2	3	5	7	11	9	12	21	21	21	24	24	14.6	27
22-Jan	18	Z	20	20	17	20	24	18	21	12	11	11	14	13	10	12	23	27	26	25	22	26	21	21	18.7	27
23-Jan	18	Z	22	17	13	20	16	20	17	2	2	1	1	1	1	1	1	1	1	1	13	13	12	13	8.8	22
24-Jan	13	Z	10	9	7	4	8	2	5	14	11	6	5	5	5	9	10	4	4	9	7	7	10	10	7.5	14
25-Jan	10	Z	17	27	19	19	33	27	23	24	14	2	2	3	5	2	5	5	1	0	0	0	1	0	10.4	33
26-Jan	0	Z	1	1	1	2	3	9	12	12	9	10	10	10	15	22	24	25	24	18	16	17	19	21	12.1	25
27-Jan	26	Z	26	27	25	24	25	25	28	26	19	19	18	15	17	17	21	30	35	29	31	29	25	26	24.5	35
28-Jan	23	Z	18	22	22	25	30	32	30	26	23	21	19	19	18	23	32	19	1	1	1	3	3	5	18.1	32
29-Jan	5	Z	6	7	5	4	5	5	5	10	3	2	1	1	1	1	1	1	2	1	0	1	1	1	2.9	10
30-Jan	1	Z	4	2	1	1	3	2	1	1	1	1	1	1	1	2	2	3	1	1	2	1	1	1	1.4	4
31-Jan	3	Z	4	3	4	8	14	22	17	17	15	11	7	3	2	3	3	3	3	6	7	2	3	3	7.1	22
	13.5	--	13.4	13.9	13.1	14.4	15.6	15.7	14.8	14.8	12.6	11.1	11.3	11.4	12.4	14.0	15.7	16.1	15.2	14.2	13.9	13.7	13.0	12.8	Diurnal Average	
	34	--	29	29	27	29	33	33	34	31	29	27	34	37	45	47	47	45	40	38	36	39	36	35	Diurnal Maximum	

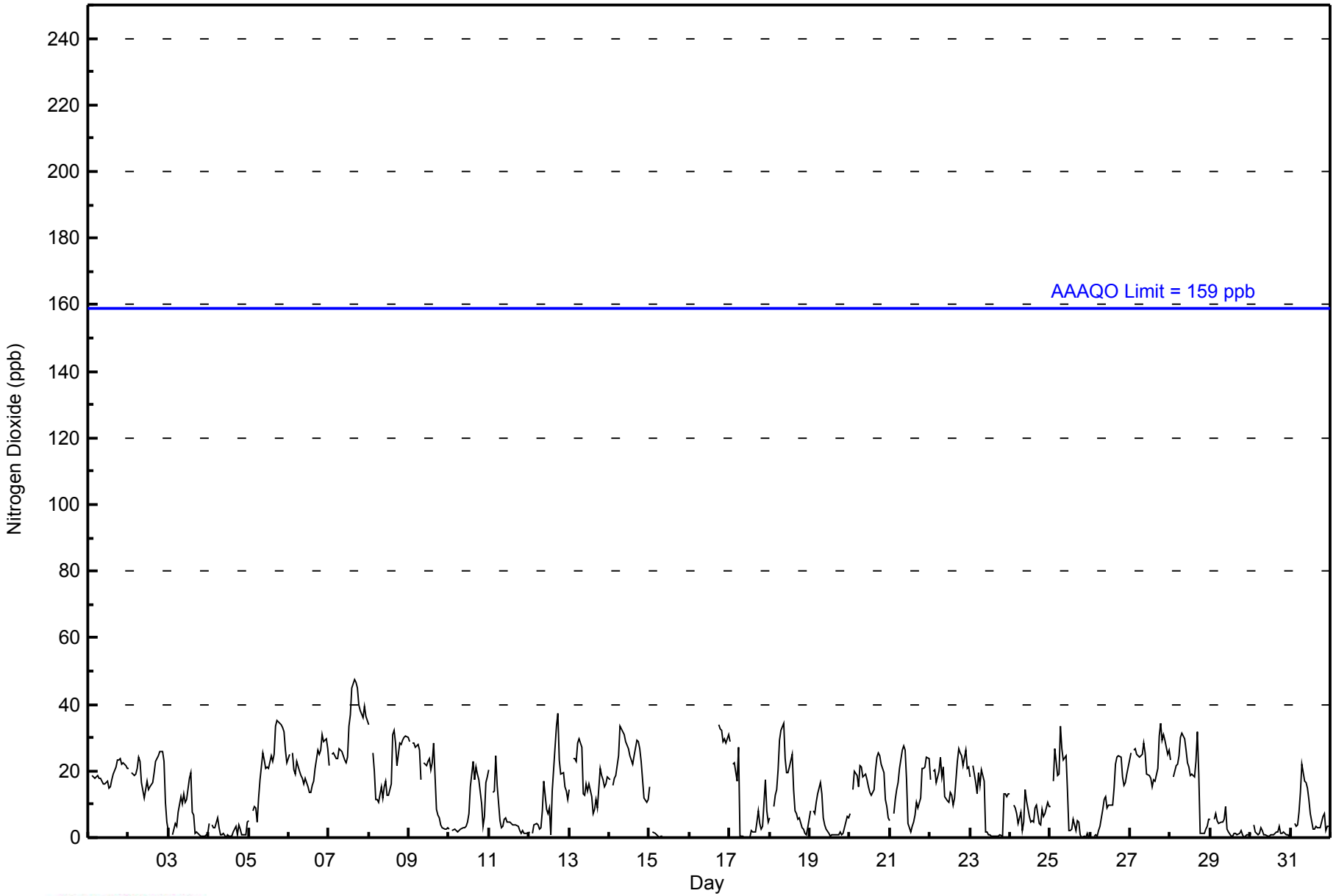
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	476	69.90	69.90
21 - 40	201	29.52	99.41
11 - 80	4	0.59	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: 744

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	109	44	11	12	3	5	5	14	73	30	20	19	20	43	24	39	471
21 - 40	19	3	4	2	2	0	3	16	74	43	11	5	4	2	3	6	197
11 - 80	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	4
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	128	47	15	14	5	5	8	30	148	75	32	24	24	45	27	45	672

Total Number of Valid Hours: 672

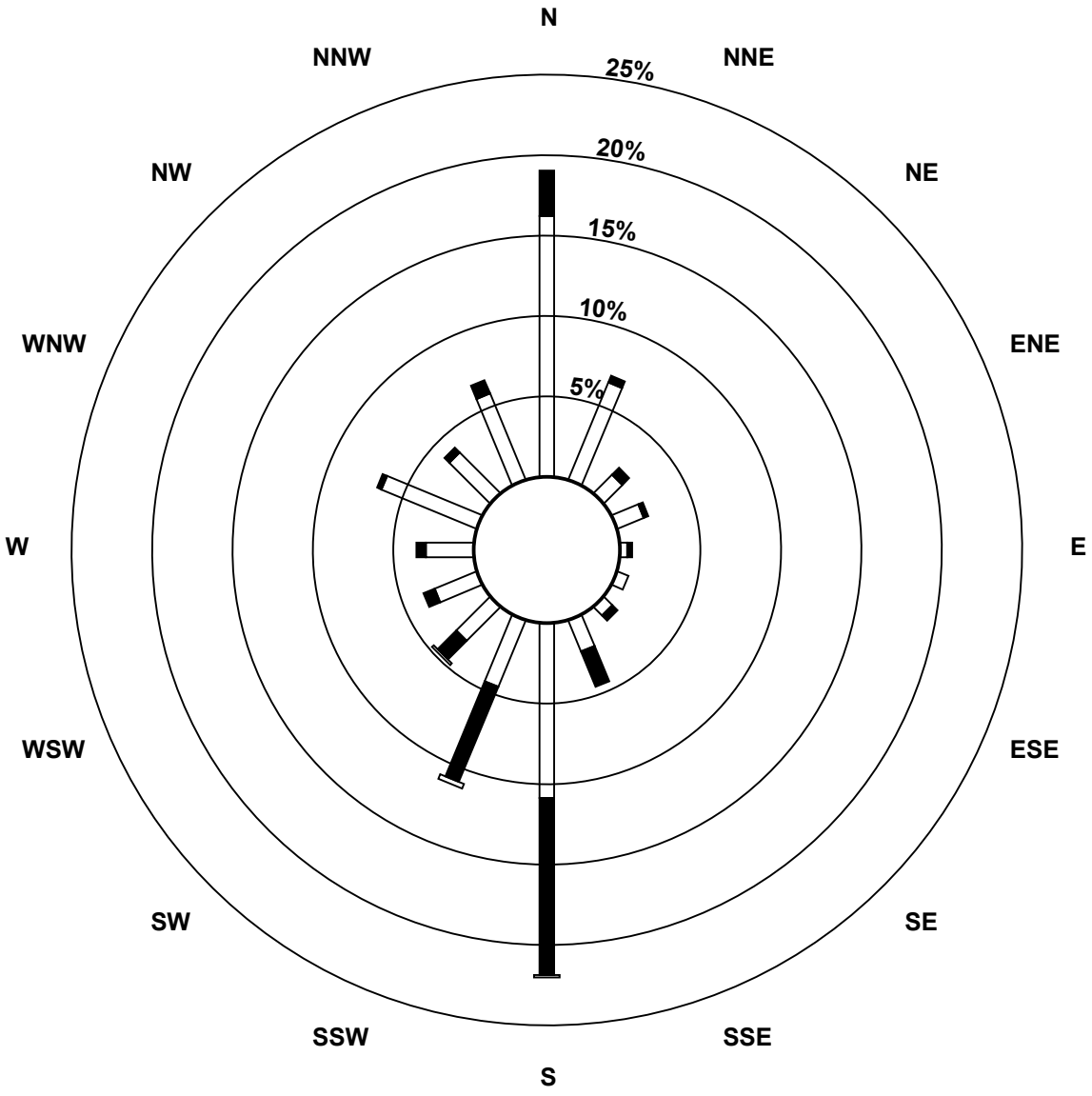
Total Number of Hours: 744

Wood Buffalo Environmental Association

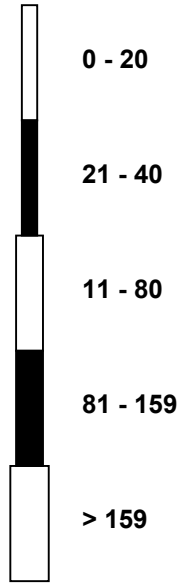
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



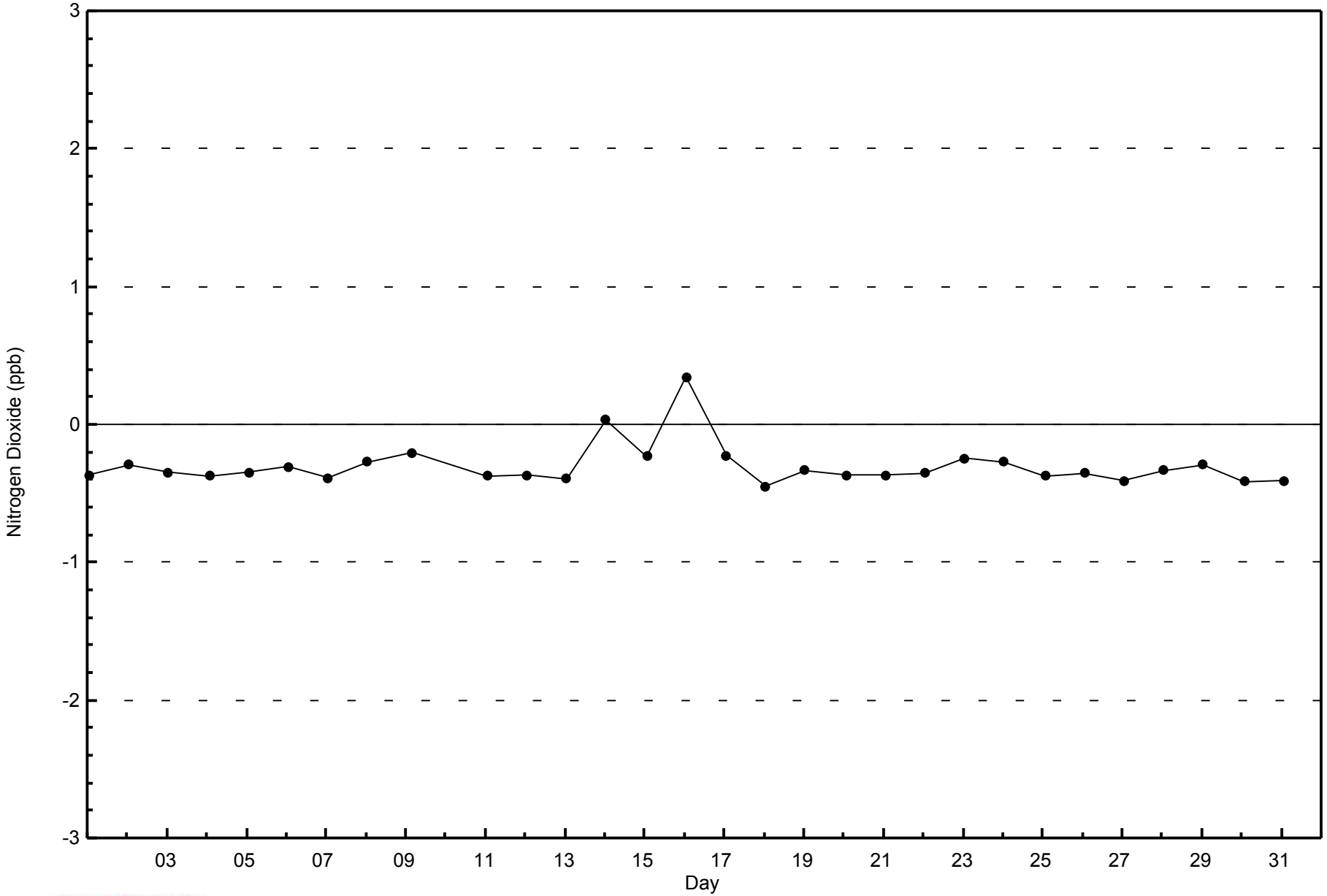
Total Number of Valid Hours: 672

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2014



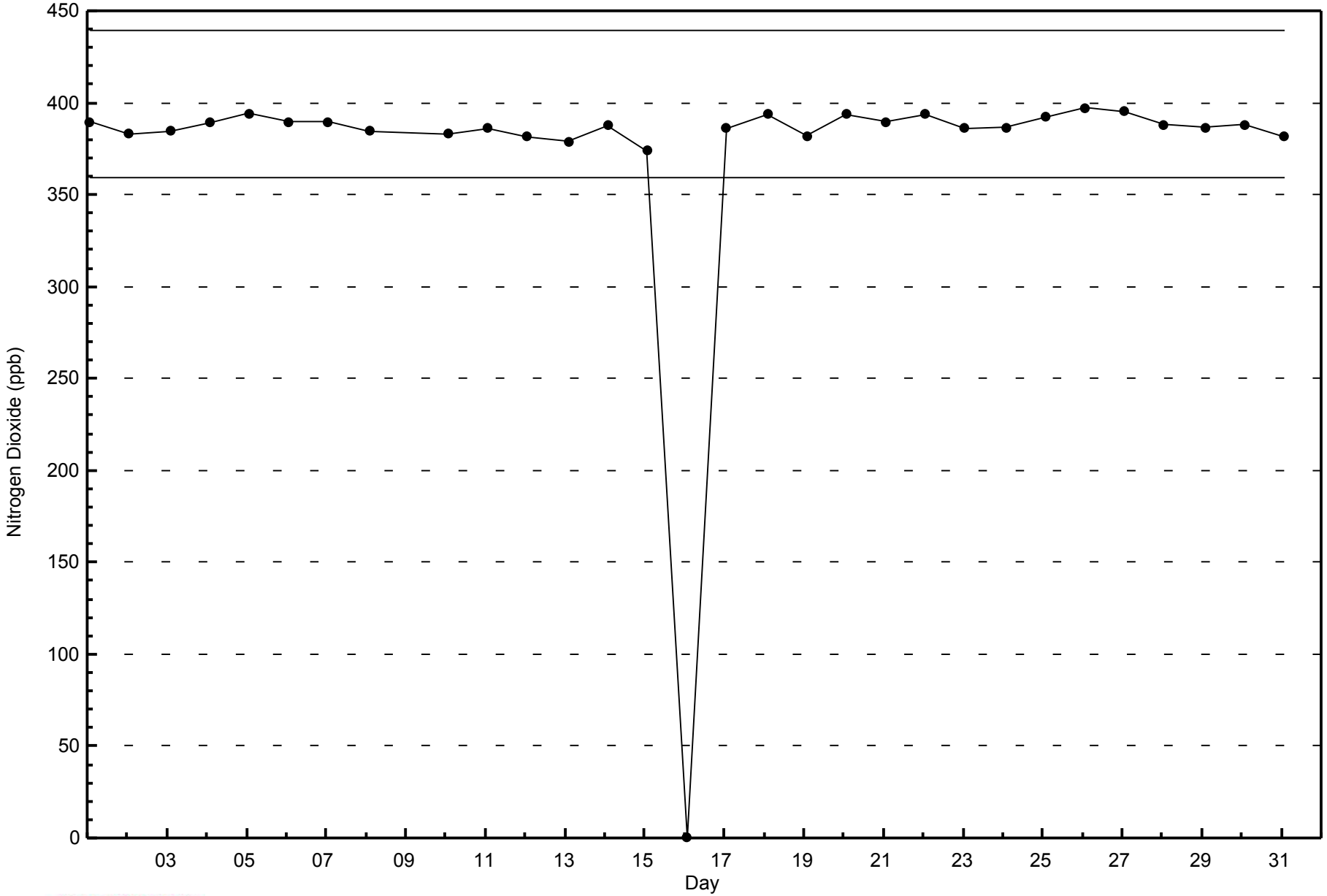
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2014

Maximum Value: 151 ppb on Jan 7 16:00

Maximum Daily Average: 72.4 ppb on Jan 7

Minimum Value: 0 ppb on Jan 25 20:00

Minimum Daily Average: 1.5 ppb on Jan 30

Maximum Diurnal Average: 23.1 ppb at hour 16

Minimum Diurnal Average: 15.7 ppb at hour 3

Monthly Average: 19.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 15 $Q_3 = 29$ $P_{90} = 44$ $P_{99} = 95$

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	36
Percent Operational Time:	96.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	26	Z	29	29	32	40	40	40	41	41	47	54	39	35	35	37	40	55	50	55	46	46	44	36	40.7	55
2-Jan	31	Z	29	31	29	25	41	31	20	14	22	30	22	22	26	27	29	30	31	36	44	36	11	5	27.0	44
3-Jan	2	Z	1	2	4	4	8	13	10	15	14	21	34	36	9	7	1	1	1	1	1	1	0	1	8.1	36
4-Jan	4	Z	4	3	3	6	3	1	1	2	0	1	1	1	0	2	4	1	4	2	1	1	1	5	2.1	6
5-Jan	5	Z	8	9	9	5	12	19	33	33	44	46	43	48	33	31	45	54	46	43	39	34	27	23	30.0	54
6-Jan	25	Z	26	21	19	23	20	19	18	17	20	18	18	18	20	19	21	26	26	27	34	30	33	29	22.9	34
7-Jan	22	Z	29	31	26	25	33	37	38	40	54	64	96	105	140	151	143	124	96	90	85	95	72	69	72.4	151
8-Jan	49	Z	28	21	12	12	10	16	12	16	20	16	17	21	59	64	42	25	40	44	49	46	58	61	32.1	64
9-Jan	60	Z	60	58	62	67	47	19	M	40	49	54	59	36	43	71	9	7	6	4	3	3	3	3	34.5	71
10-Jan	2	Z	2	3	2	1	2	3	3	3	4	5	8	20	31	20	22	19	18	10	3	6	17	21	9.8	31
11-Jan	24	Z	14	14	34	19	5	3	3	6	6	5	5	5	4	4	4	3	2	1	2	1	1	1	7.3	34
12-Jan	2	Z	1	4	4	4	3	3	8	18	10	10	13	1	20	36	40	45	24	19	20	16	14	11	14.2	45
13-Jan	15	Z	24	25	24	38	48	44	15	15	20	18	21	15	8	9	12	9	21	19	17	15	16	19	20.3	48
14-Jan	17	Z	16	19	22	41	69	60	51	54	59	53	48	39	32	32	37	33	30	24	18	12	11	12	34.2	69
15-Jan	15	Z	2	1	1	1	0	0	0	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	15
16-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	C	C	C	C	C	C	40	37	42	32	32	30	35	--	42
17-Jan	31	Z	22	23	18	49	1	0	0	0	0	0	0	3	2	2	5	8	4	3	3	18	8	5	9.0	49
18-Jan	6	Z	9	13	14	21	45	56	95	67	33	36	40	47	19	9	7	6	6	3	3	1	1	3	23.4	95
19-Jan	8	Z	8	7	11	13	17	13	6	4	3	2	1	1	1	1	1	1	2	1	1	3	7	6	5.0	17
20-Jan	7	Z	15	21	19	15	23	22	19	25	27	26	21	17	19	26	28	28	26	22	20	12	9	6	19.7	28
21-Jan	5	Z	7	12	15	17	23	51	56	47	27	5	2	4	6	7	11	9	12	21	21	22	25	25	18.7	56
22-Jan	18	Z	20	21	17	20	26	19	23	14	16	16	23	20	14	14	26	29	27	26	22	28	21	22	20.9	29
23-Jan	18	Z	22	17	13	20	16	22	18	2	2	1	1	1	1	0	0	1	1	0	13	13	12	13	9.0	22
24-Jan	13	Z	10	9	7	4	8	2	5	15	12	7	5	6	5	9	10	4	4	9	6	7	10	9	7.8	15
25-Jan	10	Z	17	34	20	23	84	40	29	36	16	2	2	3	6	2	5	5	1	0	0	0	1	0	14.7	84
26-Jan	0	Z	0	1	1	2	3	9	12	14	10	13	13	13	18	27	26	25	24	18	16	17	19	22	13.2	27
27-Jan	27	Z	30	33	31	28	30	38	57	57	40	41	37	27	28	23	23	33	42	31	33	30	26	27	33.6	57
28-Jan	24	Z	18	22	23	26	35	39	36	40	38	39	33	30	25	30	45	20	1	1	1	3	3	5	23.4	45
29-Jan	5	Z	6	8	5	4	4	5	6	10	3	2	1	0	2	1	1	1	2	1	0	1	1	1	3.0	10
30-Jan	1	Z	4	2	1	1	3	2	1	1	1	1	1	1	1	2	2	3	1	1	2	1	1	1	1.5	4
31-Jan	3	Z	4	3	4	7	14	24	18	20	20	14	9	3	3	3	3	3	3	7	7	2	3	3	7.9	24
	15.9	--	15.7	16.5	16.1	18.7	22.4	21.7	21.9	22.9	21.3	20.6	21.1	19.9	21.0	23.1	22.1	21.6	19.5	18.8	18.1	17.7	16.2	16.0	Diurnal Average	
	60	--	60	58	62	67	84	60	95	67	59	64	96	105	140	151	143	124	96	90	85	95	72	69	Diurnal Maximum	

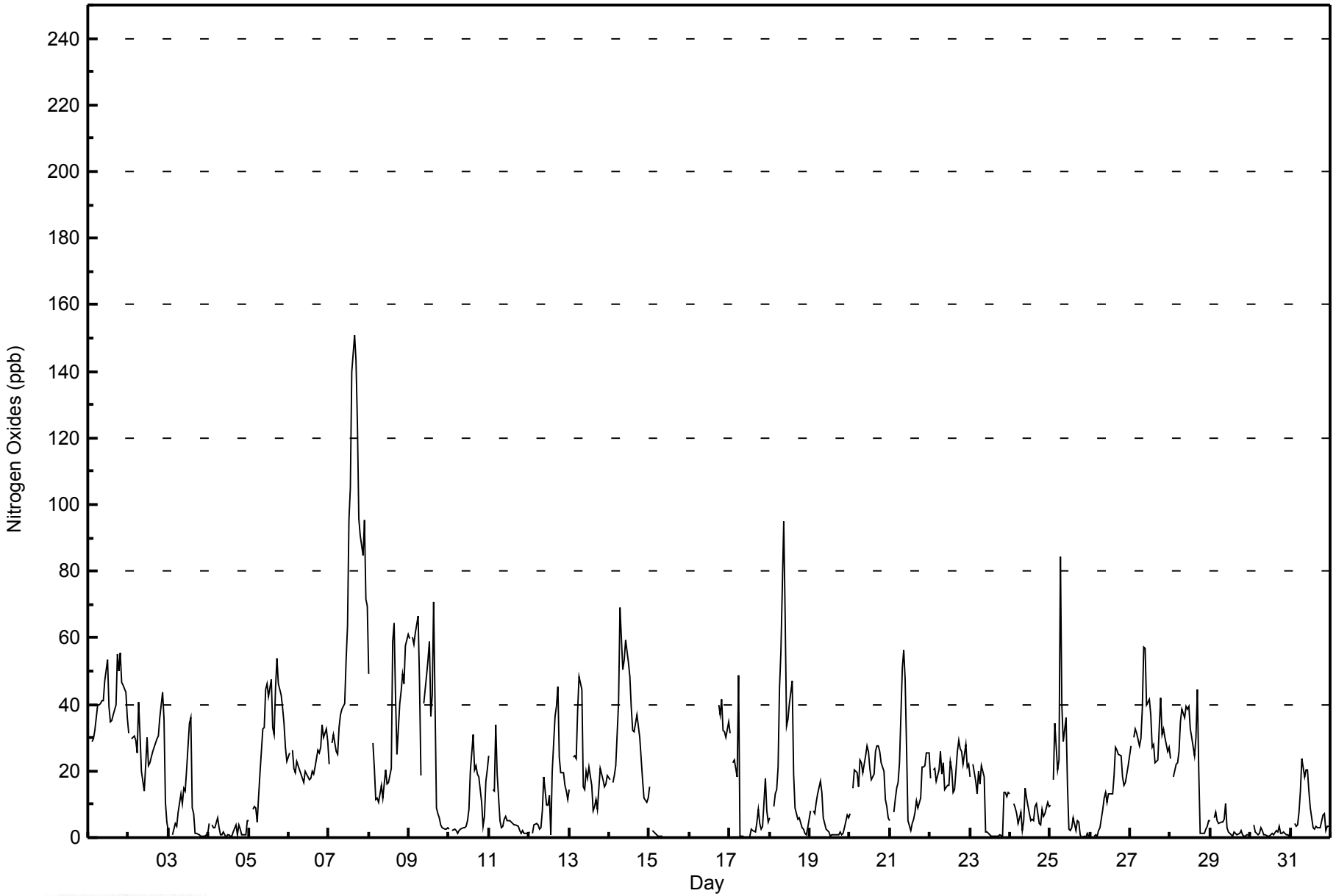
Z - zerospan C - Calibration M - Maintenance PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	419	61.53	61.53
21 - 40	181	26.58	88.11
11 - 80	69	10.13	98.24
81 - 159	12	1.76	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	107	43	10	11	3	2	4	9	50	25	17	15	18	41	24	36	415
21 - 40	16	3	4	3	2	3	3	13	74	25	8	7	5	3	1	8	178
11 - 80	5	1	1	0	0	0	1	7	21	19	5	2	1	1	2	1	67
81 - 159	0	0	0	0	0	0	0	1	3	6	2	0	0	0	0	0	12
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	128	47	15	14	5	5	8	30	148	75	32	24	24	45	27	45	672

Total Number of Valid Hours: 672

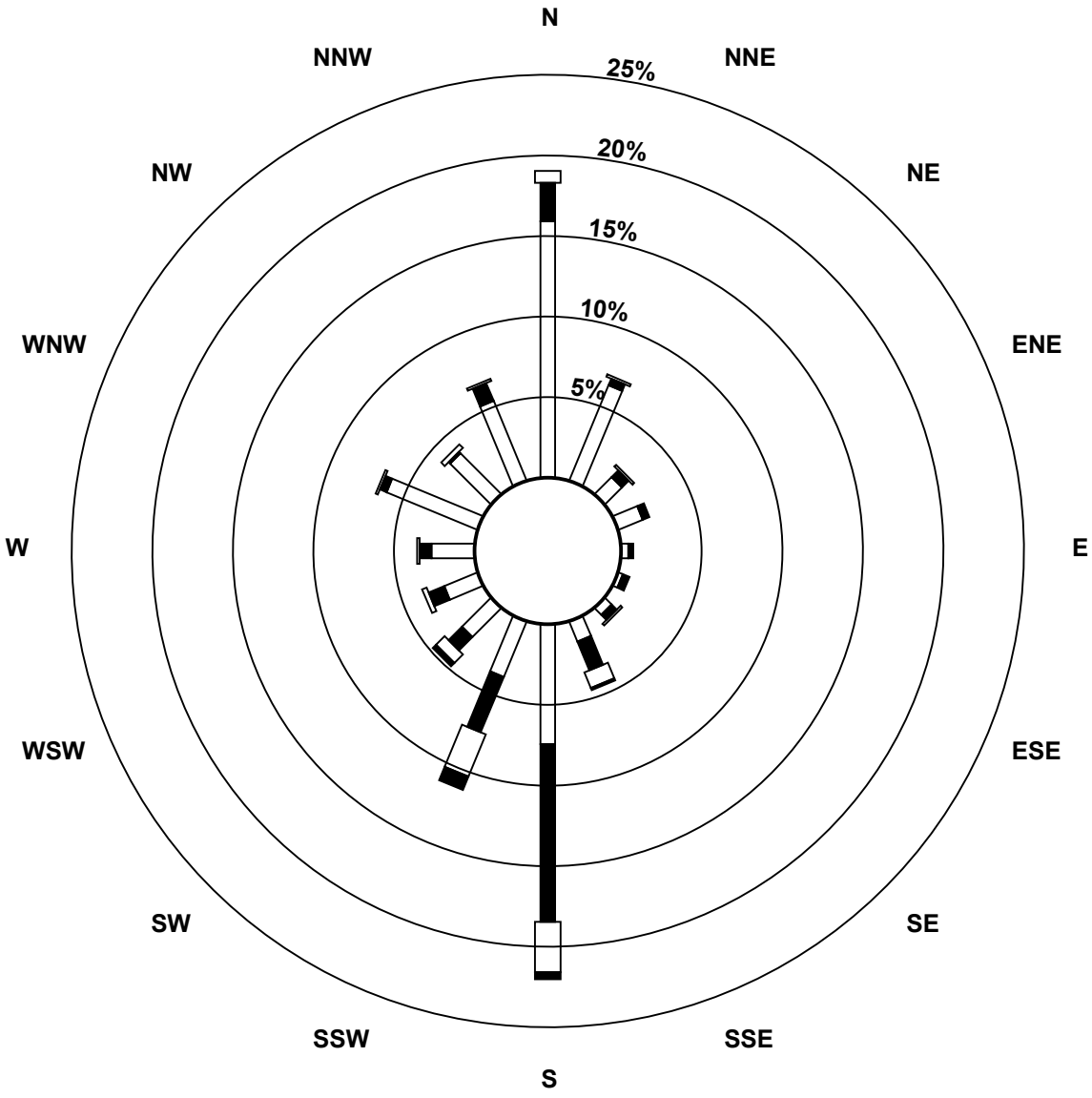
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)

0 - 20

21 - 40

11 - 80

81 - 159

> 159

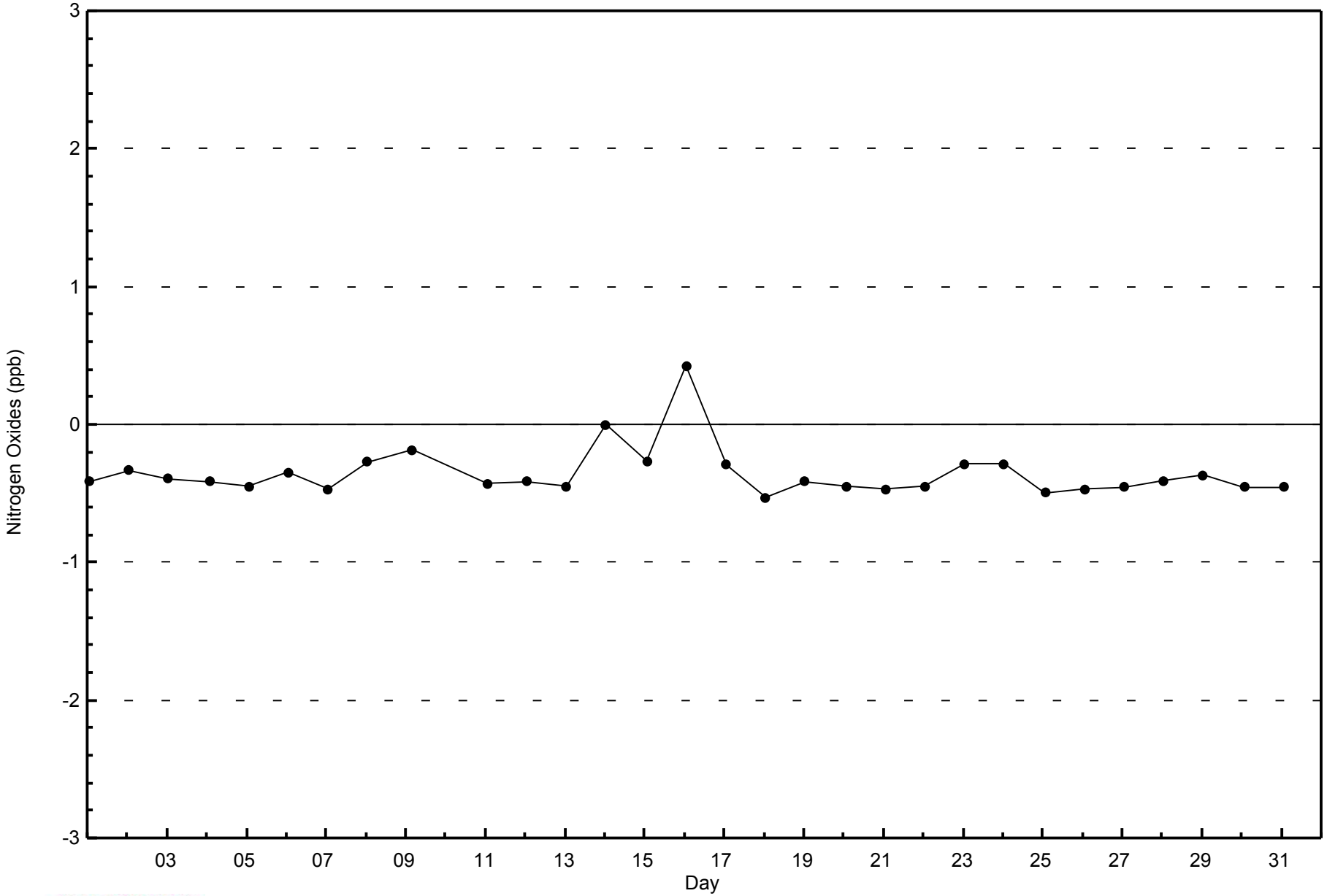
Total Number of Valid Hours: 672

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2014



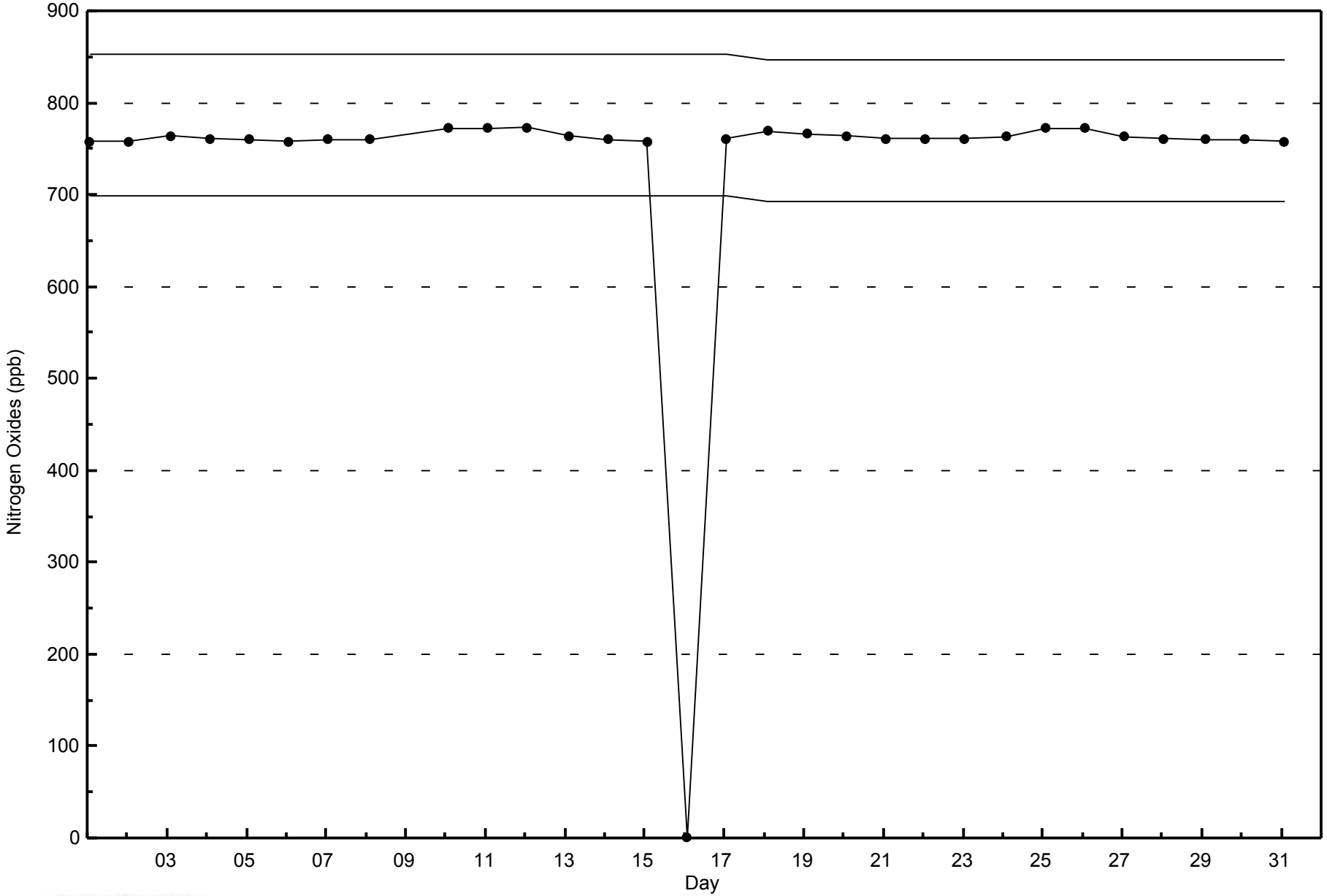
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 39 ppb on Jan 17 16:00 Maximum Daily Average: 33.0 ppb on Jan 30

Minimum Value: 0 ppb on Jan 13 07:00 Minimum Daily Average: 1.6 ppb on Jan 1
Maximum Diurnal Average: 20.1 ppb at hour 15 Minimum Diurnal Average: 12.9 ppb at hour 8
Monthly Average: 16.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 5$ Median = 14 $Q_3 = 27$ $P_{90} = 33$ $P_{99} = 39$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	35
Percent Operational Time:	97.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	0	0	1	3	5	6	6	5	3	1	1	1	1	1	1	1	1	1.6	6
2-Jan	1	Z	1	1	1	1	1	1	5	7	6	5	7	8	8	5	1	0	1	0	1	2	13	20	4.1	20
3-Jan	24	Z	26	25	23	22	17	13	13	9	11	11	10	11	26	25	30	30	31	31	31	32	33	32	22.5	33
4-Jan	30	Z	29	29	28	26	30	33	33	32	34	34	34	32	32	29	27	29	26	27	28	27	26	22	29.5	34
5-Jan	21	Z	16	15	14	17	9	4	1	3	6	9	11	11	12	9	1	0	0	1	1	1	6	8	7.7	21
6-Jan	6	Z	6	11	12	9	12	13	14	15	12	14	16	17	16	15	11	6	5	3	1	3	3	3	9.7	17
7-Jan	5	Z	1	1	2	2	0	0	0	2	5	6	6	4	3	2	1	1	1	1	1	1	1	1	2.0	6
8-Jan	1	Z	9	14	22	22	24	19	22	18	16	20	20	15	3	2	2	5	1	1	1	0	1	1	10.3	24
9-Jan	0	Z	1	1	1	1	1	6	2	M	4	4	3	4	4	1	12	14	15	18	19	20	21	22	7.9	22
10-Jan	23	Z	23	22	23	23	22	21	21	21	22	22	20	14	8	10	7	5	6	16	22	18	8	3	16.5	23
11-Jan	1	Z	7	8	2	10	22	26	26	25	24	25	25	25	25	25	25	25	27	27	27	28	29	30	21.4	30
12-Jan	29	Z	31	29	28	28	29	28	24	16	24	24	23	33	22	11	5	2	12	16	14	17	17	19	20.9	33
13-Jan	15	Z	6	5	6	2	0	1	11	11	9	16	18	21	26	25	22	25	14	13	13	12	11	8	12.6	26
14-Jan	9	Z	7	4	3	1	0	1	1	2	4	6	8	9	8	6	1	1	1	6	7	11	11	11	5.0	11
15-Jan	8	Z	37	39	39	39	39	39	38	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	39
16-Jan	3	Z	0	1	1	1	1	1	5	10	5	6	8	9	11	7	2	1	2	1	3	3	3	1	3.7	11
17-Jan	3	Z	7	6	13	7	33	34	34	35	C	C	C	C	39	39	33	27	31	33	31	18	25	28	25.0	39
18-Jan	24	Z	16	14	12	5	1	1	1	9	10	11	11	10	18	24	23	25	26	29	29	30	30	27	16.8	30
19-Jan	21	Z	18	18	14	11	10	13	25	30	33	35	34	33	30	27	26	26	26	28	27	24	20	18	23.8	35
20-Jan	15	Z	8	7	8	12	7	7	8	8	11	13	15	15	13	8	4	1	2	5	6	14	17	20	9.8	20
21-Jan	20	Z	14	10	7	6	3	0	1	2	10	26	30	29	28	26	21	21	18	9	6	5	3	4	13.0	30
22-Jan	11	Z	10	10	13	10	7	12	9	18	20	20	18	19	22	20	10	7	8	9	12	5	12	10	12.7	22
23-Jan	12	Z	9	13	15	10	14	10	13	29	30	31	34	36	37	39	37	37	34	37	18	16	16	16	23.5	39
24-Jan	13	Z	11	20	24	29	27	34	31	21	24	28	30	30	31	29	28	34	33	27	27	26	23	22	26.2	34
25-Jan	20	Z	6	1	7	8	1	2	2	3	16	29	30	30	27	31	28	29	36	39	37	38	36	39	21.5	39
26-Jan	39	Z	38	35	35	32	30	25	22	22	25	24	25	25	20	13	11	9	7	11	12	10	8	5	21.1	39
27-Jan	2	Z	1	1	1	1	1	1	1	4	10	13	15	19	17	17	13	5	1	5	3	5	8	7	6.5	19
28-Jan	9	Z	12	9	8	6	2	2	3	7	11	13	14	13	13	8	2	15	32	31	31	30	29	25	14.1	32
29-Jan	24	Z	19	17	19	18	20	19	18	20	30	32	35	35	34	34	35	35	33	34	35	34	33	34	28.1	35
30-Jan	34	Z	28	30	31	31	30	31	33	34	35	35	35	35	35	34	34	33	34	34	33	34	34	34	33.0	35
31-Jan	31	Z	29	30	27	21	14	6	7	10	15	23	26	32	32	32	33	32	30	25	23	32	31	29	24.7	33
	14.7	--	13.8	13.7	14.1	13.3	13.2	12.9	13.7	14.6	15.9	18.6	19.5	20.0	20.1	18.4	16.2	16.0	16.5	17.2	16.7	16.6	16.9	16.7	Diurnal Average	
	39	--	38	39	39	39	39	39	38	35	35	35	35	36	39	39	37	37	36	39	37	38	36	39	Diurnal Maximum	

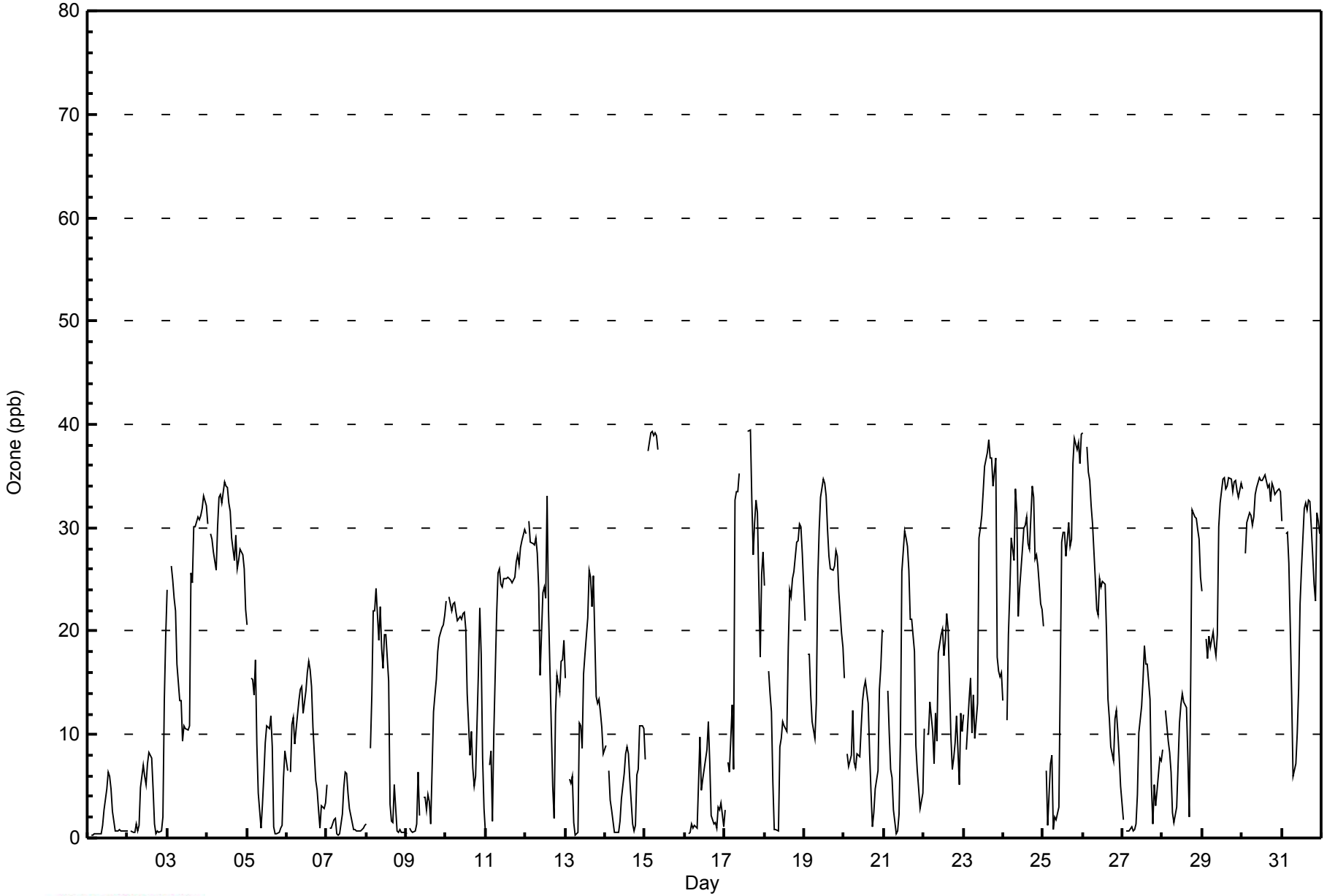
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	428	61.76	61.76
21 - 50	265	38.24	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	50	9	7	7	3	4	5	25	145	71	24	19	11	11	10	19	420
21 - 50	78	38	8	7	2	1	3	5	12	10	8	6	13	32	16	25	264
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	128	47	15	14	5	5	8	30	157	81	32	25	24	43	26	44	684

Total Number of Valid Hours: 684

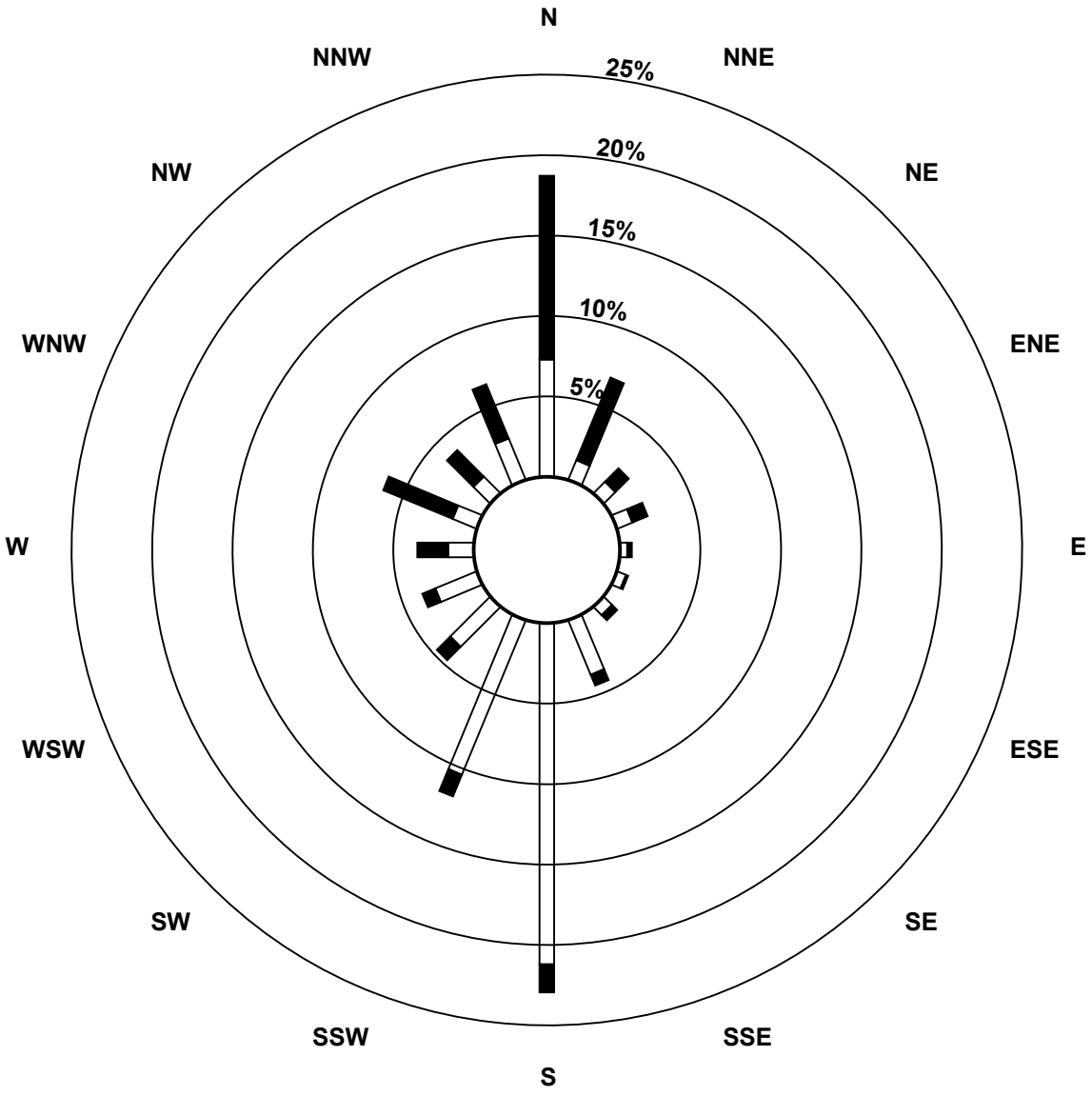
Total Number of Hours: 744

Wood Buffalo Environmental Association

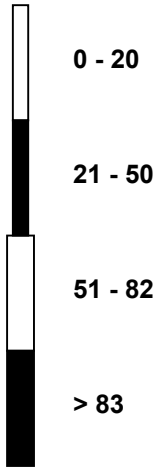
Wind Rose Jan 2014

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter (AMS 1)



Classes (ppb)



0 - 20

21 - 50

51 - 82

> 83

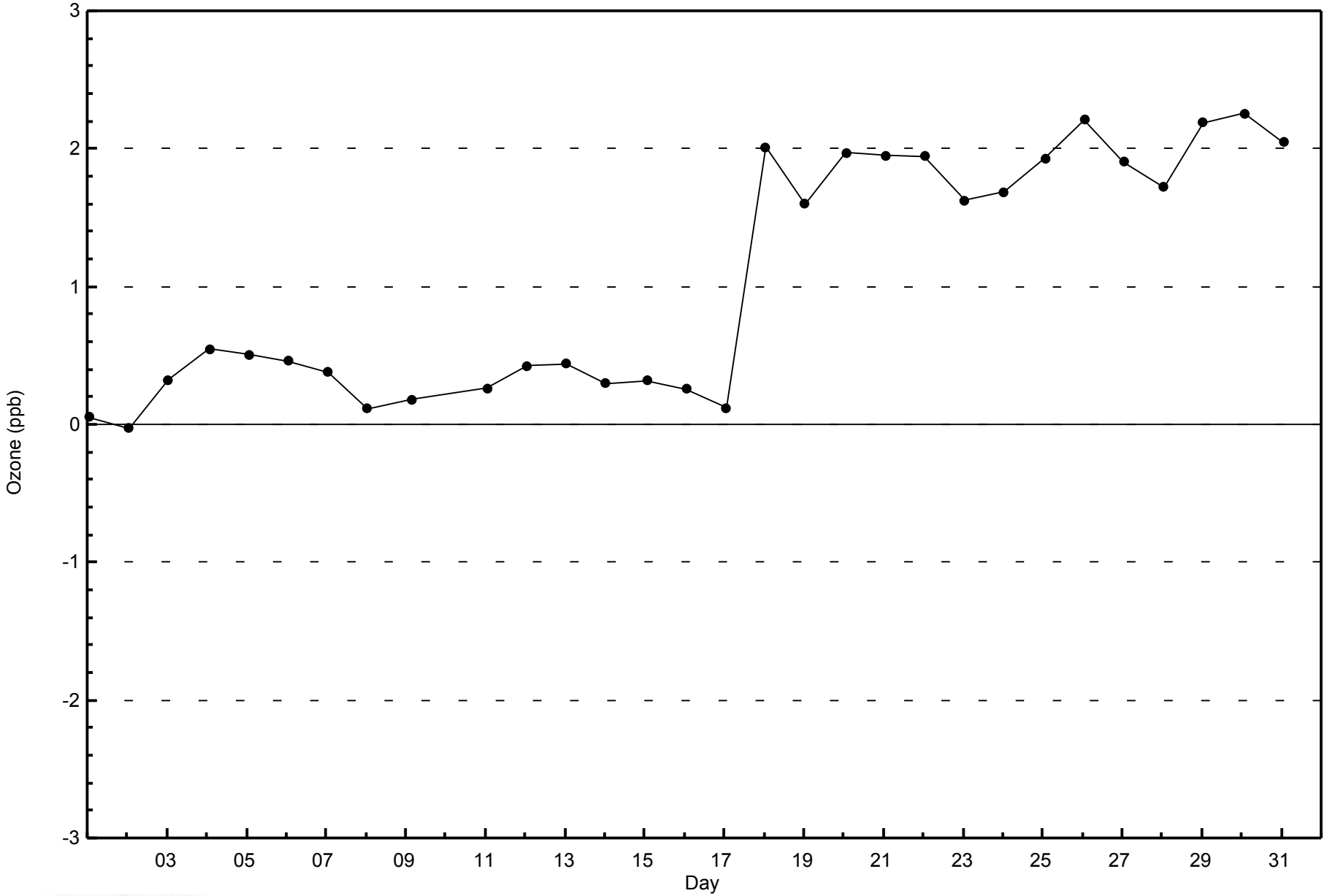
Total Number of Valid Hours: 684

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2014



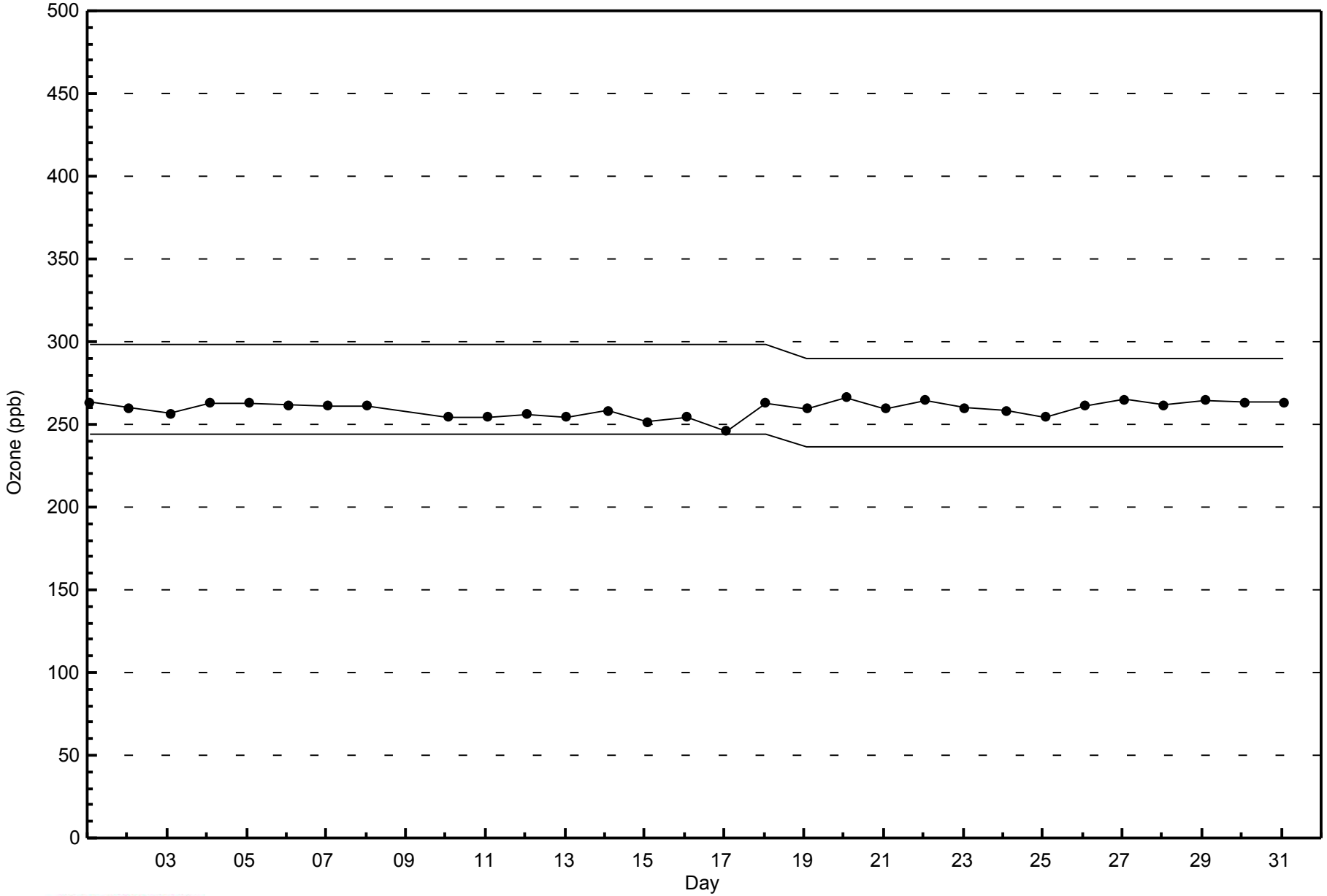
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 58.3 $\mu g/m^3$ on Jan 19 01:00

Maximum Daily Average: 16.9 $\mu g/m^3$ on Jan 9

Minimum Value: 1.4 $\mu g/m^3$ on Jan 23 20:00

Minimum Daily Average: 2.1 $\mu g/m^3$ on Jan 30

Maximum Diurnal Average: 8.9 $\mu g/m^3$ at hour 4

Minimum Diurnal Average: 5.4 $\mu g/m^3$ at hour 14

Monthly Average: 7.01 $\mu g/m^3$

Percentiles: $P_1 = 1.6$ $P_{10} = 2.6$ $Q_1 = 3.8$ Median = 5.6 $Q_3 = 8.3$ $P_{90} = 12.3$ $P_{99} = 26.9$

Hours in Service:	744
Hours of Data:	727
Hours of Missing Data:	17
Hours of Calibration:	0
Percent Operational Time:	97.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	6.6	6.6	6.6	6.4	7.0	6.9	6.7	6.8	8.0	5.6	6.6	8.7	5.9	5.8	6.9	8.6	8.7	11.8	11.5	14.1	10.6	8.0	8.5	7.4	7.9	14.1
2-Jan	7.4	7.4	5.9	5.2	5.2	5.3	5.0	4.8	3.9	3.6	4.0	5.2	5.3	6.9	12.2	8.6	6.1	6.1	8.0	7.4	9.2	8.6	4.9	3.5	6.2	12.2
3-Jan	3.6	3.7	4.1	3.8	3.8	4.1	4.5	5.6	7.0	9.1	8.5	5.0	5.2	4.6	2.6	4.0	3.0	3.5	3.4	2.7	3.5	3.7	2.9	3.0	4.4	9.1
4-Jan	5.6	4.3	4.4	6.4	4.4	5.0	3.9	3.5	4.2	3.8	3.2	5.4	3.0	3.5	2.9	3.3	5.5	5.0	8.1	7.4	4.8	4.0	3.7	4.2	4.6	8.1
5-Jan	3.9	3.7	4.4	4.4	4.5	4.5	5.5	5.3	5.1	5.1	6.1	6.3	4.5	5.0	5.0	5.3	6.3	9.7	8.2	7.0	6.2	5.7	5.0	5.2	5.5	9.7
6-Jan	6.1	6.0	6.0	5.4	6.0	6.1	5.6	4.9	4.7	4.3	4.2	4.1	3.8	3.9	3.9	3.6	3.9	4.7	4.8	5.0	4.9	5.0	6.1	5.5	4.9	6.1
7-Jan	5.1	5.5	6.7	7.6	7.5	6.2	6.2	6.0	6.5	7.7	6.9	7.7	9.5	10.1	16.8	19.1	21.7	18.1	13.7	13.6	12.4	12.5	10.6	23.9	10.9	23.9
8-Jan	10.0	7.9	5.8	6.5	5.2	5.3	4.5	6.5	5.4	6.5	8.3	5.8	7.0	8.2	10.3	8.7	7.6	8.2	8.8	10.2	12.3	10.3	11.4	10.9	8.0	12.3
9-Jan	12.5	PF	24.3	23.5	20.8	22.0	16.9	21.5	18.6	24.5	25.6	21.1	20.3	17.4	17.4	20.9	10.7	9.7	11.1	12.3	11.3	10.0	9.1	7.4	16.9	25.6
10-Jan	5.5	5.2	5.2	4.7	5.2	5.5	5.6	5.7	5.7	5.9	5.6	5.2	5.1	5.0	5.1	5.4	7.4	7.1	6.9	4.9	4.3	4.8	7.3	5.5	5.6	7.4
11-Jan	5.3	6.2	7.2	10.3	9.8	7.6	5.2	3.4	3.2	7.5	16.0	6.4	8.0	9.6	5.1	4.9	5.1	5.1	3.8	3.4	3.5	3.3	3.0	3.1	6.1	16.0
12-Jan	3.2	2.6	2.7	2.6	2.6	2.5	2.6	2.6	3.5	4.7	3.2	3.5	3.5	2.1	3.0	3.0	3.4	4.7	4.0	5.9	3.8	4.5	6.2	3.7	3.5	6.2
13-Jan	3.5	4.2	6.8	7.2	7.7	7.5	8.3	7.5	5.2	5.4	7.0	5.3	4.0	2.6	2.2	2.4	3.0	3.9	5.0	4.7	4.5	4.1	4.0	4.1	5.0	8.3
14-Jan	6.0	6.1	5.6	5.6	5.7	6.8	8.4	7.0	5.8	5.9	6.5	5.8	6.1	6.9	7.2	7.3	8.5	8.0	7.3	5.5	4.6	4.2	4.0	4.8	6.2	8.5
15-Jan	6.5	4.1	1.7	1.6	1.8	2.2	2.3	3.0	2.5	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	6.5
16-Jan	15.8	14.6	12.7	9.9	8.0	8.3	8.1	7.6	4.7	8.5	7.3	10.3	7.4	7.6	7.9	7.6	8.6	9.1	8.6	11.2	8.2	7.1	6.9	6.2	8.8	15.8
17-Jan	6.2	6.0	5.8	6.0	3.9	4.1	2.1	2.1	2.1	1.9	1.8	M	2.1	3.4	2.6	1.9	2.2	2.9	2.2	2.2	2.2	3.0	2.5	5.1	3.2	6.2
18-Jan	10.5	9.8	15.0	22.7	9.4	8.6	11.2	13.4	12.9	9.7	5.7	4.6	3.8	3.9	3.1	8.6	8.5	4.5	5.8	4.1	3.8	5.7	11.4	24.5	9.2	24.5
19-Jan	58.3	40.8	25.6	32.5	33.9	26.4	13.0	7.5	4.1	3.3	3.3	3.4	3.7	4.0	5.1	5.7	6.2	6.3	5.9	5.5	5.4	5.2	5.5	5.2	13.2	58.3
20-Jan	5.5	6.1	6.0	7.9	7.4	7.6	8.3	7.9	7.0	6.8	10.6	11.5	6.6	5.5	5.7	7.2	8.4	8.5	13.5	20.4	16.4	7.6	6.6	5.6	8.5	20.4
21-Jan	5.1	5.1	5.4	6.0	6.3	6.6	7.3	8.6	11.6	17.6	12.6	4.4	3.0	2.8	2.4	2.5	3.0	3.2	3.9	5.0	4.7	5.4	6.1	5.5	6.0	17.6
22-Jan	4.8	4.7	5.1	4.8	4.3	5.0	5.0	4.0	4.3	4.2	3.6	4.6	7.7	6.4	3.2	4.5	6.9	14.3	14.8	19.0	36.4	15.8	26.9	21.1	9.6	36.4
23-Jan	11.3	10.6	11.1	18.1	9.6	7.6	7.2	7.7	6.9	4.2	3.7	3.1	2.5	1.9	1.7	1.6	1.6	1.7	1.9	1.4	2.0	6.8	16.6	17.2	6.6	18.1
24-Jan	13.1	26.9	14.2	5.7	5.2	5.1	4.7	3.5	4.0	3.3	3.3	3.7	3.2	3.1	3.2	3.4	3.5	3.3	3.3	3.7	3.6	4.0	5.6	6.6	5.8	26.9
25-Jan	10.5	10.8	10.1	24.2	13.3	6.8	13.3	11.4	9.8	9.9	6.7	2.7	2.7	2.5	4.2	3.0	2.7	3.3	3.5	2.9	3.5	2.8	2.9	3.5	7.0	24.2
26-Jan	3.7	4.7	6.1	8.4	10.2	10.9	10.8	11.4	11.2	9.9	8.8	9.0	10.9	11.0	8.7	9.0	8.7	8.9	11.5	9.0	8.7	8.6	8.7	8.8	9.1	11.5
27-Jan	13.0	11.4	17.3	9.4	14.5	10.1	8.5	18.6	21.9	13.0	8.5	9.4	8.2	6.9	6.4	5.2	6.5	8.2	8.6	7.7	8.0	6.9	7.8	26.9	11.0	26.9
28-Jan	12.2	12.8	16.3	11.5	21.3	20.9	11.5	8.5	6.9	7.8	7.5	9.4	7.6	6.3	5.7	5.7	7.6	5.4	5.8	7.0	4.8	9.9	9.0	4.3	9.4	21.3
29-Jan	3.8	3.6	3.8	4.3	4.5	4.5	4.4	4.1	4.6	4.8	3.1	2.5	1.8	1.6	1.7	1.6	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.6	2.8	4.8
30-Jan	1.6	1.7	2.0	1.7	1.6	1.6	1.7	1.8	1.7	1.7	5.5	1.7	1.7	1.7	1.6	1.7	1.6	1.8	2.2	3.0	2.8	2.7	3.0	3.2	2.1	5.5
31-Jan	5.2	4.0	2.8	2.7	5.7	7.9	7.3	7.2	6.7	6.2	5.9	4.0	2.9	2.2	2.0	2.1	2.1	2.2	2.5	3.0	2.8	2.0	2.8	3.5	4.0	7.9
	8.8	8.2	8.3	8.9	8.3	7.7	7.0	7.1	6.8	7.1	7.0	6.2	5.6	5.4	5.5	5.9	6.0	6.4	6.7	7.0	7.0	6.1	7.0	8.0	Diurnal Average	
	58.3	40.8	25.6	32.5	33.9	26.4	16.9	21.5	21.9	24.5	25.6	21.1	20.3	17.4	17.4	20.9	21.7	18.1	14.8	20.4	36.4	15.8	26.9	26.9	Diurnal Maximum	

M - Maintenance PF - Power Failure

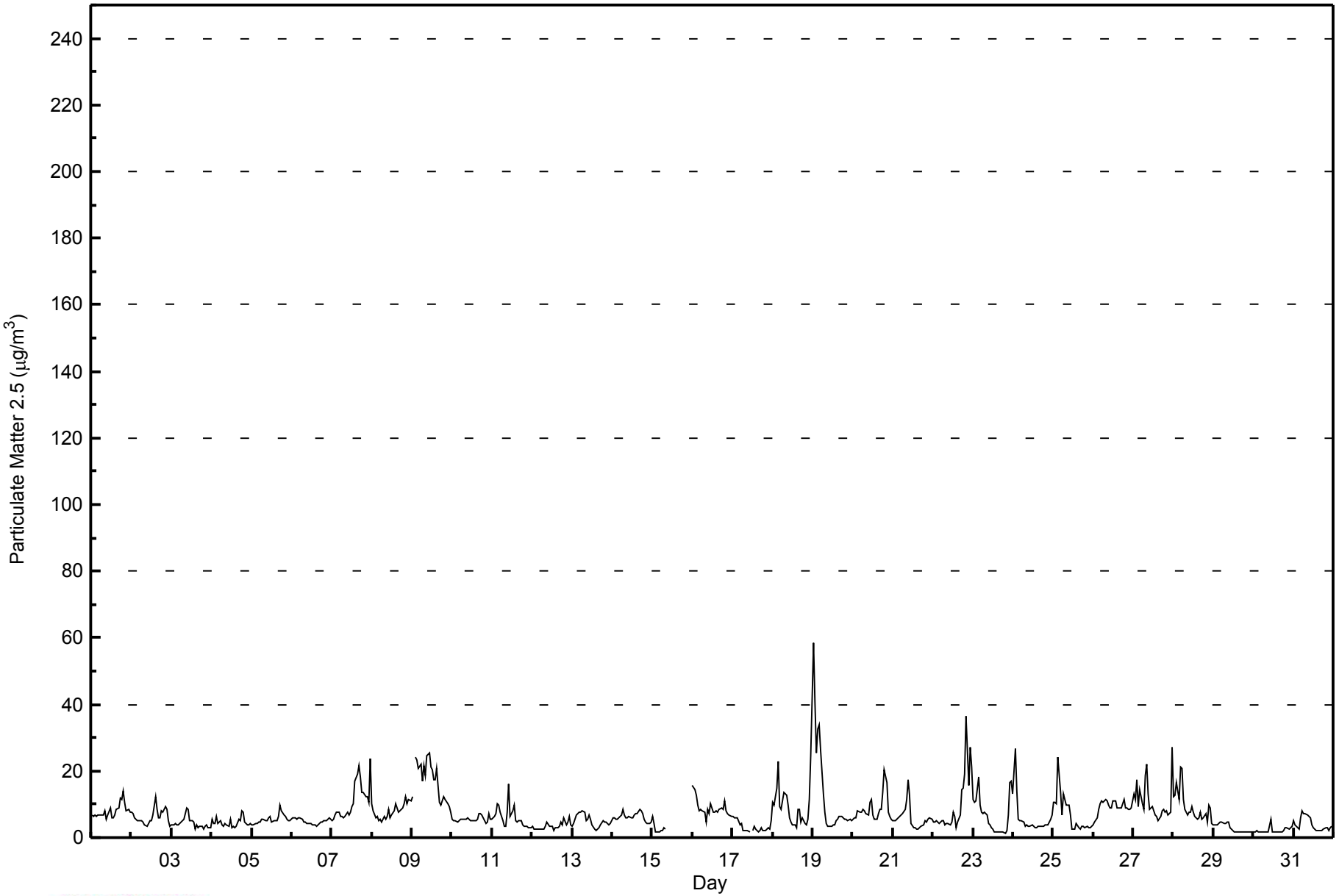
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	348	47.87	47.87
6 - 15	330	45.39	93.26
16 - 25	38	5.23	98.49
26 - 80	11	1.51	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 727

Total Number of Hours: 744

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

Fort McKay - Bertha Ganter - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	77	37	12	14	5	3	1	8	42	16	18	14	18	37	17	27	346
6 - 15	50	11	1	1	0	2	7	20	105	58	11	13	8	8	10	18	323
16 - 25	5	0	1	0	0	0	0	2	15	7	3	1	0	1	1	1	37
26 - 80	1	0	1	0	0	0	0	1	2	3	1	0	0	0	0	2	11
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	133	48	15	15	5	5	8	31	164	84	33	28	26	46	28	48	717

Total Number of Valid Hours: 717

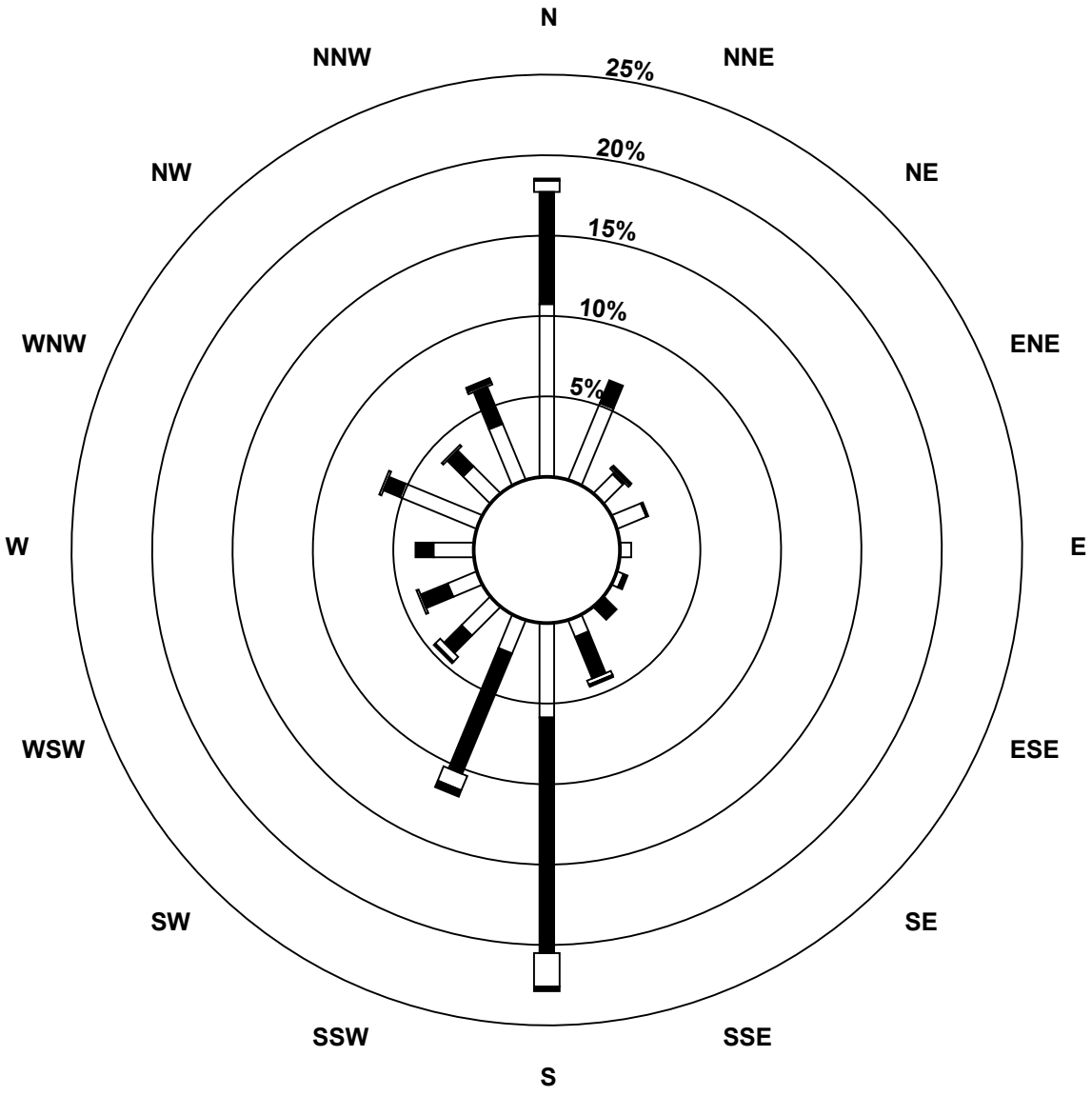
Total Number of Hours: 744

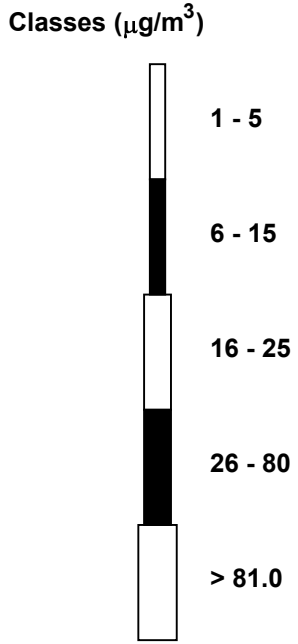
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Fort McKay - Bertha Ganter (AMS 1)





Total Number of Valid Hours: 717

Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2014

Number of Exceedences (AAAQO): 1-hr: 0
Maximum Value: 0 ppb on Jan 1 01:00 Maximum Daily Average: 0.0 ppb on Jan 1

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 1
Maximum Diurnal Average: 0.0 ppb at hour 1 Minimum Diurnal Average: 0.0 ppb at hour 1
Monthly Average: 0.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 0$

Hours in Service:	744
Hours of Data:	633
Hours of Missing Data:	111
Hours of Calibration:	43
Percent Operational Time:	90.9

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

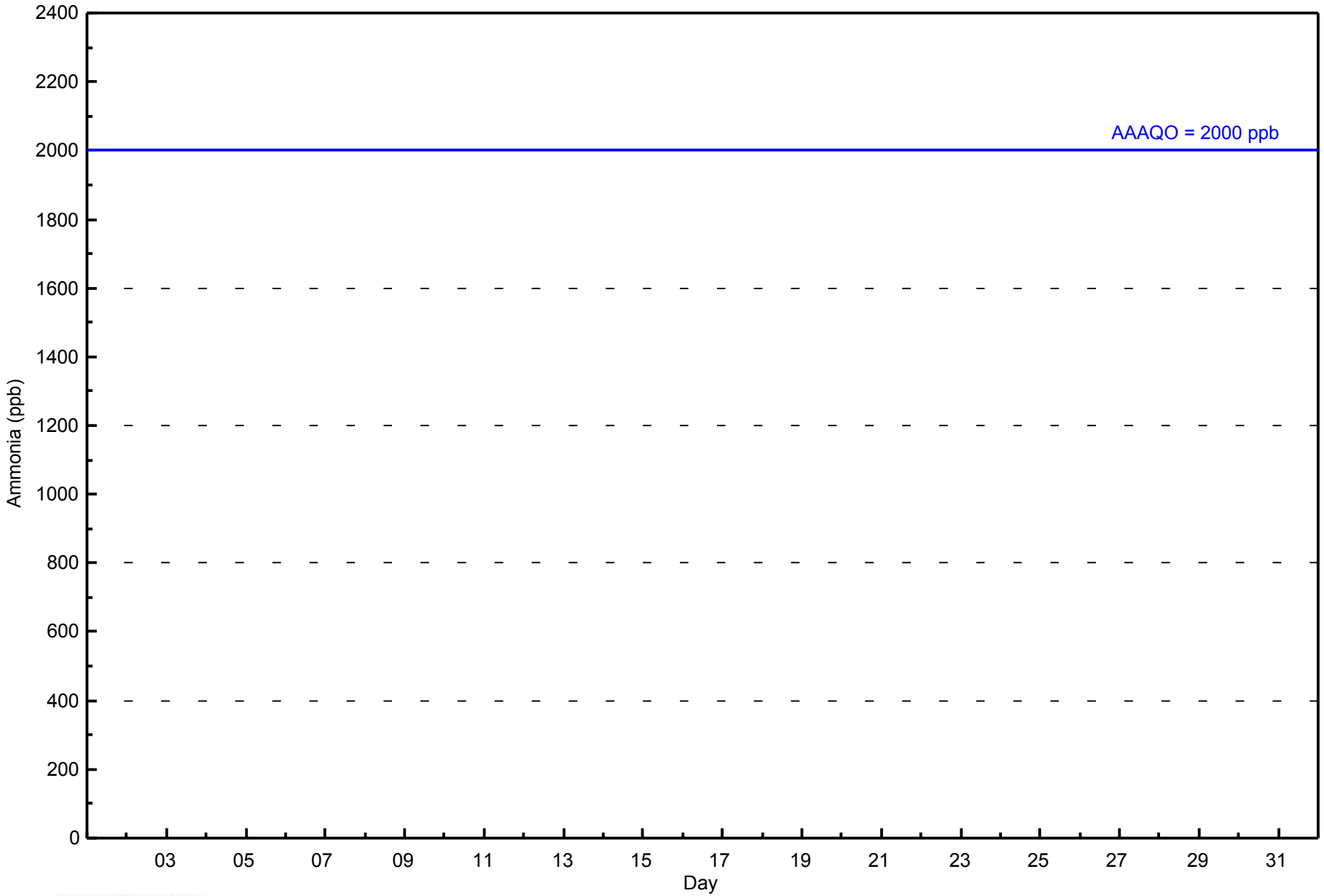
Z - zerospan C - Calibration M - Maintenance PF - Power Failure RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb

WBEA NETWORK

Hourly Averages

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	633	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: 633

Total Number of Hours: 744

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	120	46	8	14	5	5	7	26	138	75	27	24	24	42	24	40	625
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	120	46	8	14	5	5	7	26	138	75	27	24	24	42	24	40	625

Total Number of Valid Hours: 625

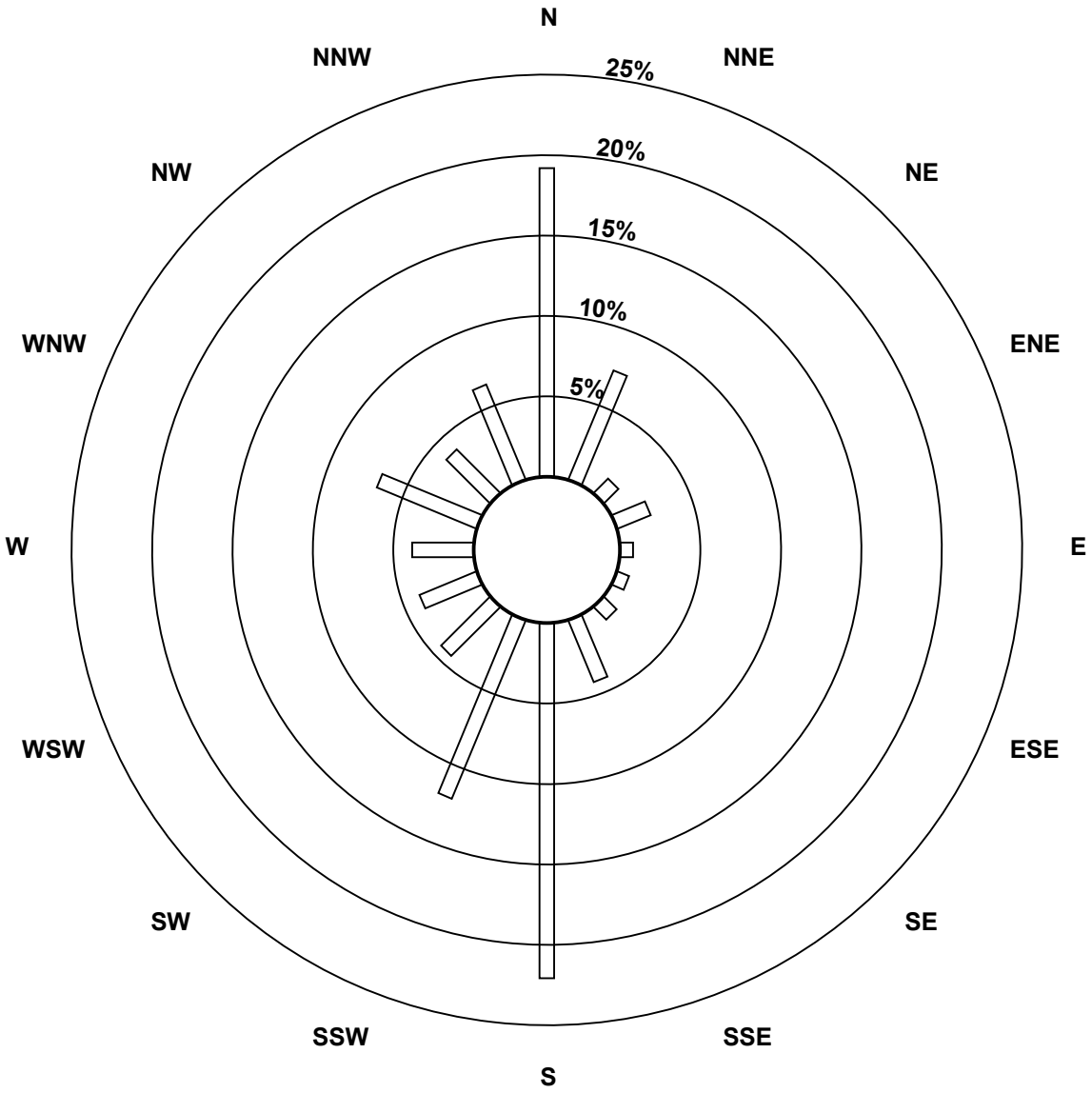
Total Number of Hours: 744

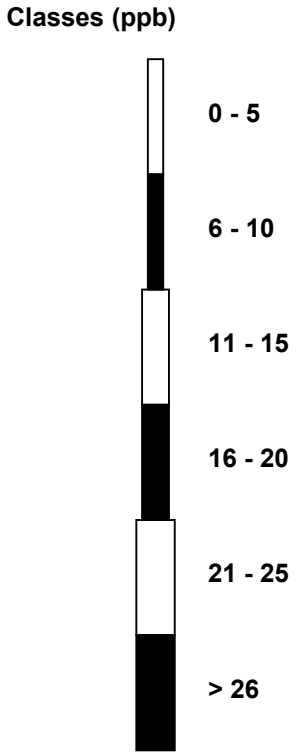
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter (AMS 1)





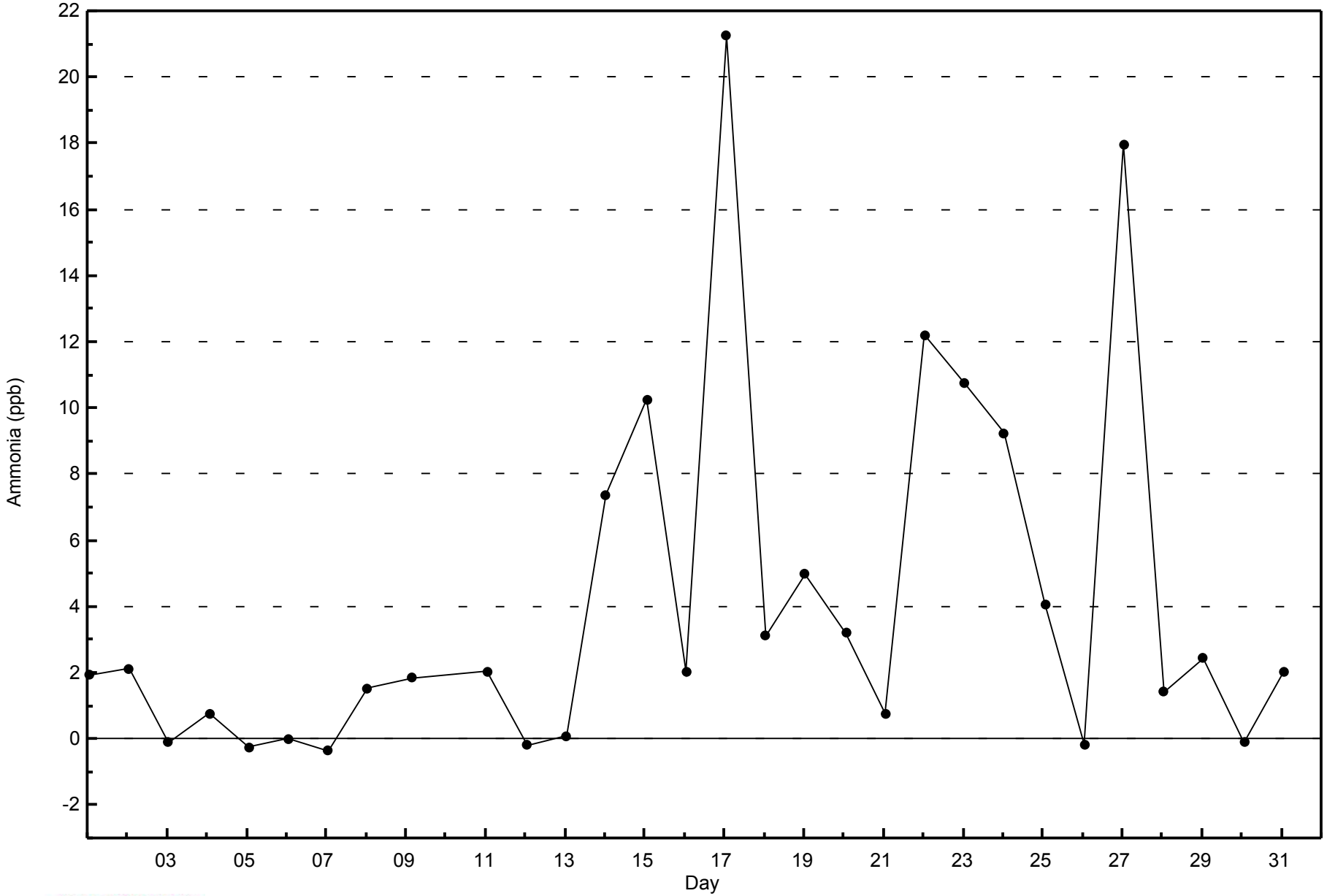
Total Number of Valid Hours: 625

WBEA NETWORK

Zero Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2014



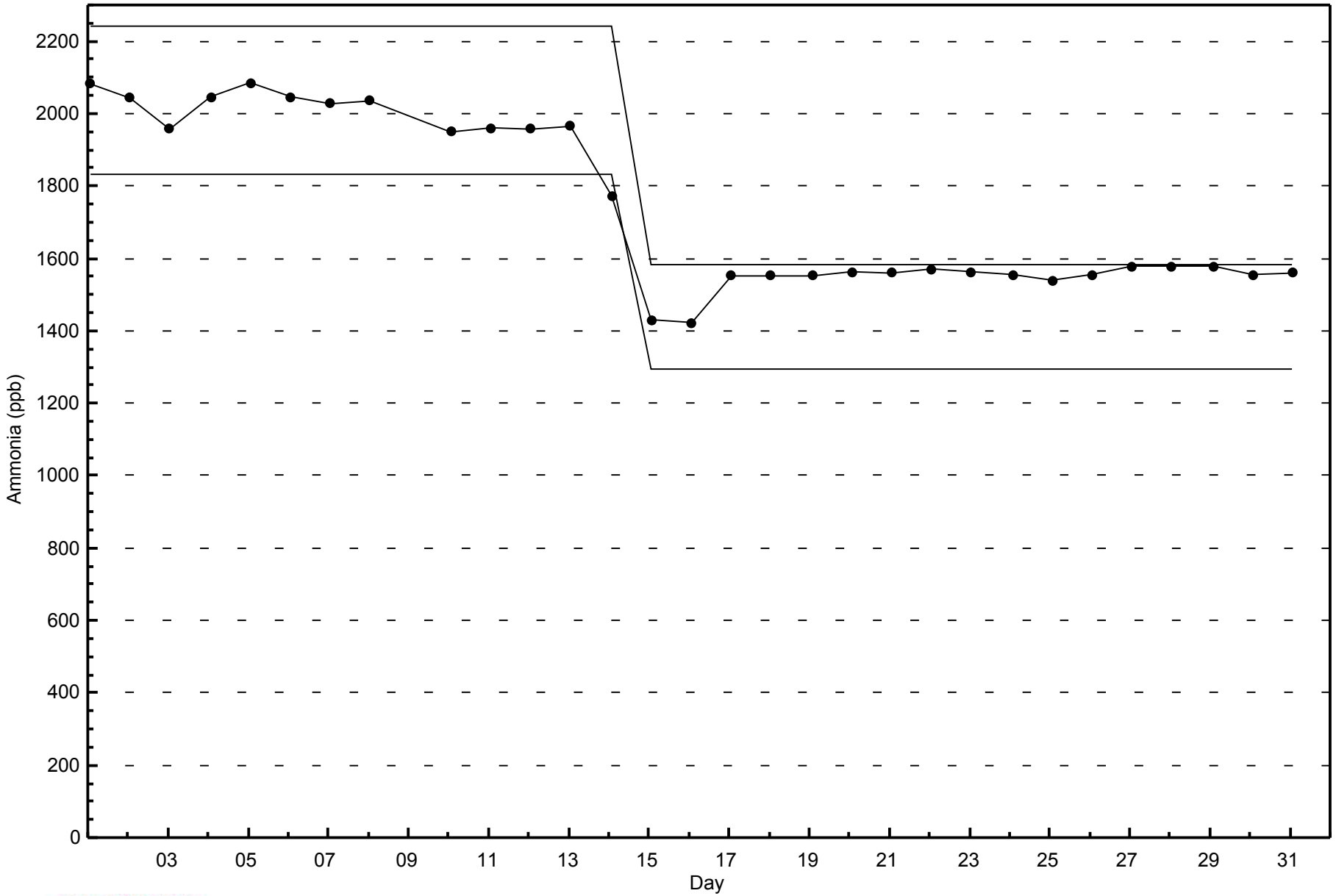
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ammonia (NH_3) - ppb

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 8.4 C on Jan 17 13:00

Maximum Daily Average: 1.4 C on Jan 17

Minimum Value: -35.6 C on Jan 1 09:00

Minimum Daily Average: -30.9 C on Jan 1

Maximum Diurnal Average: -13.1 C at hour 15

Minimum Diurnal Average: -16.7 C at hour 4

Monthly Average: -15.40 C

Percentiles: P_1 = -33.8 P_{10} = -26.4 Q_1 = -22.1 Median = -16.0 Q_3 = -9.0 P_{90} = -3.2 P_{99} = 7.6

Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.3	-32.2	-32.6	-33.4	-34.0	-34.8	-34.7	-35.2	-35.6	-35.4	-33.4	-31.6	-29.9	-29.0	-28.0	-27.9	-28.4	-28.6	-28.4	-28.6	-28.3	-27.4	-26.7	-25.3	-30.9	-25.3
2-Jan	-23.6	-22.3	-21.4	-20.4	-18.7	-15.6	-15.0	-13.1	-13.2	-13.4	-12.3	-10.0	-8.9	-8.4	-7.8	-7.8	-7.7	-7.8	-8.3	-8.5	-10.0	-8.9	-8.5	-8.8	-12.5	-7.7
3-Jan	-10.3	-13.4	-15.4	-16.7	-18.3	-19.3	-20.2	-20.7	-22.6	-23.3	-22.4	-21.9	-19.6	-16.9	-15.9	-16.9	-17.7	-18.0	-18.8	-19.6	-20.3	-20.9	-21.5	-21.9	-18.9	-10.3
4-Jan	-22.3	-23.4	-23.9	-25.1	-24.6	-24.2	-24.5	-24.2	-23.7	-23.4	-22.3	-21.9	-22.0	-23.8	-24.2	-24.8	-25.8	-26.5	-27.0	-27.3	-27.7	-28.3	-28.9	-29.5	-25.0	-21.9
5-Jan	-29.9	-30.4	-31.2	-31.1	-32.9	-33.6	-34.0	-33.5	-32.6	-31.9	-30.8	-29.0	-27.4	-26.6	-26.0	-25.9	-26.0	-26.0	-25.8	-25.3	-24.7	-24.7	-24.4	-24.0	-28.6	-24.0
6-Jan	-23.9	-23.5	-23.1	-22.8	-22.2	-21.6	-21.1	-20.7	-20.3	-20.1	-19.9	-19.2	-18.6	-17.9	-17.4	-17.7	-18.0	-18.2	-18.4	-18.7	-18.9	-19.8	-20.5	-21.2	-20.1	-17.4
7-Jan	-21.1	-20.3	-21.0	-21.5	-22.4	-23.9	-24.5	-26.1	-27.3	-27.4	-25.4	-24.1	-22.4	-21.9	-20.5	-20.9	-22.1	-22.8	-23.8	-25.0	-25.8	-24.5	-23.9	-23.8	-23.4	-20.3
8-Jan	-22.8	-21.5	-18.9	-17.7	-16.4	-15.6	-14.3	-13.3	-12.4	-11.9	-10.8	-9.9	-9.1	-8.6	-8.2	-7.8	-7.8	-7.6	-7.6	-7.6	-7.6	-7.3	-7.2	-6.8	-11.6	-6.8
9-Jan	-7.0	-6.9	-6.6	-6.3	-6.2	-5.9	-5.7	-6.1	-6.7	-7.5	-7.7	-7.4	-6.8	-6.3	-5.9	-5.5	-6.2	-7.1	-7.6	-8.0	-8.2	-8.4	-8.6	-8.8	-7.0	-5.5
10-Jan	-9.1	-9.4	-9.7	-9.6	-9.5	-9.6	-9.6	-9.5	-9.4	-9.3	-9.3	-9.8	-11.3	-12.6	-12.5	-12.4	-12.7	-13.1	-13.1	-12.4	-13.1	-14.3	-15.5	-15.1	-11.3	-9.1
11-Jan	-14.8	-14.3	-15.0	-15.5	-15.2	-14.6	-14.7	-15.5	-15.9	-16.0	-15.9	-15.7	-15.3	-15.0	-14.7	-14.6	-14.4	-14.4	-14.7	-15.1	-15.3	-15.8	-16.4	-16.9	-15.2	-14.3
12-Jan	-17.1	-17.6	-18.5	-18.9	-19.1	-19.4	-19.5	-19.6	-19.5	-19.5	-19.2	-18.9	-18.3	-16.2	-16.5	-17.1	-18.1	-18.8	-19.5	-19.7	-19.3	-18.5	-18.2	-18.2	-18.5	-16.2
13-Jan	-18.0	-17.5	-16.5	-16.0	-15.3	-15.2	-15.5	-16.0	-15.7	-15.2	-14.7	-14.1	-14.1	-14.4	-15.1	-16.2	-17.7	-19.1	-20.0	-20.6	-22.1	-23.2	-24.4	-26.0	-17.6	-14.1
14-Jan	-27.1	-27.6	-28.6	-28.9	-27.7	-26.9	-25.3	-24.2	-23.1	-21.8	-20.7	-18.7	-16.9	-15.2	-13.9	-12.6	-12.1	-11.2	-9.9	-7.8	-9.4	-9.3	-9.5	-9.8	-18.3	-7.8
15-Jan	-8.9	-0.1	5.4	6.6	7.0	7.7	8.4	8.2	5.7	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	8.4
16-Jan	-5.2	-5.2	-5.6	-5.1	-4.3	-4.8	-3.9	-3.0	-1.8	-1.8	-4.7	-4.6	-2.9	-1.9	-1.1	-1.2	-1.1	-1.2	-1.2	-1.2	-0.6	-0.3	-0.3	-0.4	-2.6	-0.3
17-Jan	-0.2	-0.3	-0.2	-0.1	0.8	1.5	4.6	4.5	4.1	5.2	6.8	8.0	8.4	8.3	8.3	7.5	2.5	-0.6	-2.2	-4.3	-6.0	-6.7	-7.8	-8.2	1.4	8.4
18-Jan	-8.8	-9.4	-10.3	-10.3	-10.2	-10.5	-9.8	-9.6	-9.3	-6.1	-3.3	-2.3	0.0	-0.3	-3.4	-5.4	-6.6	-7.6	-8.2	-8.7	-9.2	-9.6	-9.9	-9.6	-7.4	0.0
19-Jan	-9.4	-9.3	-9.2	-9.0	-8.9	-9.5	-9.8	-10.9	-11.1	-11.2	-11.8	-13.0	-14.7	-16.3	-18.0	-19.6	-20.7	-21.8	-22.6	-23.1	-23.7	-24.3	-24.8	-25.7	-15.8	-8.9
20-Jan	-26.3	-26.6	-26.7	-26.0	-25.7	-24.7	-23.3	-22.5	-22.8	-22.3	-20.3	-18.8	-17.9	-16.6	-15.4	-14.1	-13.6	-13.6	-13.7	-13.7	-13.5	-13.3	-14.0	-14.4	-19.2	-13.3
21-Jan	-14.6	-14.7	-15.6	-16.4	-16.7	-16.3	-16.2	-15.7	-15.5	-15.1	-14.0	-12.7	-12.6	-12.5	-13.0	-14.0	-15.5	-16.6	-17.3	-18.5	-19.7	-21.4	-22.2	-22.0	-16.2	-12.5
22-Jan	-21.9	-22.3	-21.9	-21.9	-22.3	-22.5	-22.9	-23.1	-23.6	-22.6	-21.6	-20.8	-19.0	-17.3	-15.9	-14.5	-14.2	-13.3	-13.5	-13.6	-13.2	-13.3	-13.4	-12.4	-18.4	-12.4
23-Jan	-11.0	-10.0	-9.6	-7.9	-6.1	-4.8	-3.9	-3.1	-2.1	0.8	1.3	3.1	5.3	6.5	7.2	6.7	5.6	5.4	5.1	5.4	3.7	3.6	3.2	3.6	0.3	7.2
24-Jan	3.3	3.3	4.3	1.3	-0.1	-0.6	-0.8	-1.4	-2.2	-2.9	-3.2	-3.3	-3.7	-3.9	-4.1	-4.5	-5.1	-5.5	-5.7	-5.8	-5.8	-5.9	-5.8	-5.7	-2.7	4.3
25-Jan	-5.7	-6.1	-6.8	-7.1	-7.4	-6.7	-6.0	-5.4	-5.2	-4.8	-2.6	-3.3	-3.6	-3.4	-3.4	-4.2	-5.2	-6.0	-6.0	-7.3	-9.0	-11.3	-13.6	-15.4	-6.5	-2.6
26-Jan	-17.5	-19.4	-20.8	-22.1	-23.4	-24.4	-25.4	-26.1	-26.5	-26.4	-26.3	-25.7	-25.3	-24.8	-24.2	-23.6	-23.3	-23.6	-24.5	-25.7	-26.7	-27.9	-28.9	-30.1	-24.7	-17.5
27-Jan	-31.3	-31.7	-32.3	-32.6	-32.9	-33.3	-33.6	-33.8	-32.8	-31.4	-29.5	-27.1	-24.2	-22.0	-20.2	-18.6	-18.0	-18.4	-19.5	-19.0	-18.9	-18.4	-18.2	-18.3	-25.7	-18.0
28-Jan	-18.2	-17.8	-18.2	-19.1	-19.8	-20.2	-20.7	-21.0	-21.1	-20.1	-18.3	-16.5	-15.1	-14.0	-12.9	-12.5	-12.4	-11.8	-15.0	-16.6	-18.0	-19.4	-20.2	-20.8	-17.5	-11.8
29-Jan	-21.3	-21.9	-24.2	-25.1	-24.1	-23.3	-22.7	-22.7	-22.9	-21.0	-19.9	-20.2	-21.0	-21.8	-21.6	-21.3	-21.2	-21.2	-21.3	-21.3	-21.4	-21.5	-21.3	-21.0	-21.9	-19.9
30-Jan	-21.2	-21.8	-22.2	-22.9	-23.1	-22.7	-23.0	-22.8	-21.8	-21.3	-20.4	-19.8	-18.4	-16.7	-15.2	-14.8	-14.3	-14.2	-14.0	-14.1	-13.9	-14.0	-14.5	-15.1	-18.4	-13.9
31-Jan	-15.8	-15.9	-16.2	-16.9	-18.0	-19.3	-20.7	-20.6	-19.7	-18.5	-16.3	-14.5	-13.8	-13.0	-12.8	-12.8	-13.0	-13.3	-13.5	-14.0	-13.8	-13.3	-13.2	-13.0	-15.5	-12.8
	-16.5	-16.4	-16.5	-16.7	-16.7	-16.6	-16.4	-16.3	-16.3	-16.5	-15.6	-14.8	-14.0	-13.4	-13.1	-13.2	-13.7	-14.1	-14.5	-14.9	-15.3	-15.6	-16.0	-16.2	Diurnal Average	
	3.3	3.3	5.4	6.6	7.0	7.7	8.4	8.2	5.7	5.2	6.8	8.0	8.4	8.3	8.3	7.5	5.6	5.4	5.1	5.4	3.7	3.6	3.2	3.6	Diurnal Maximum	

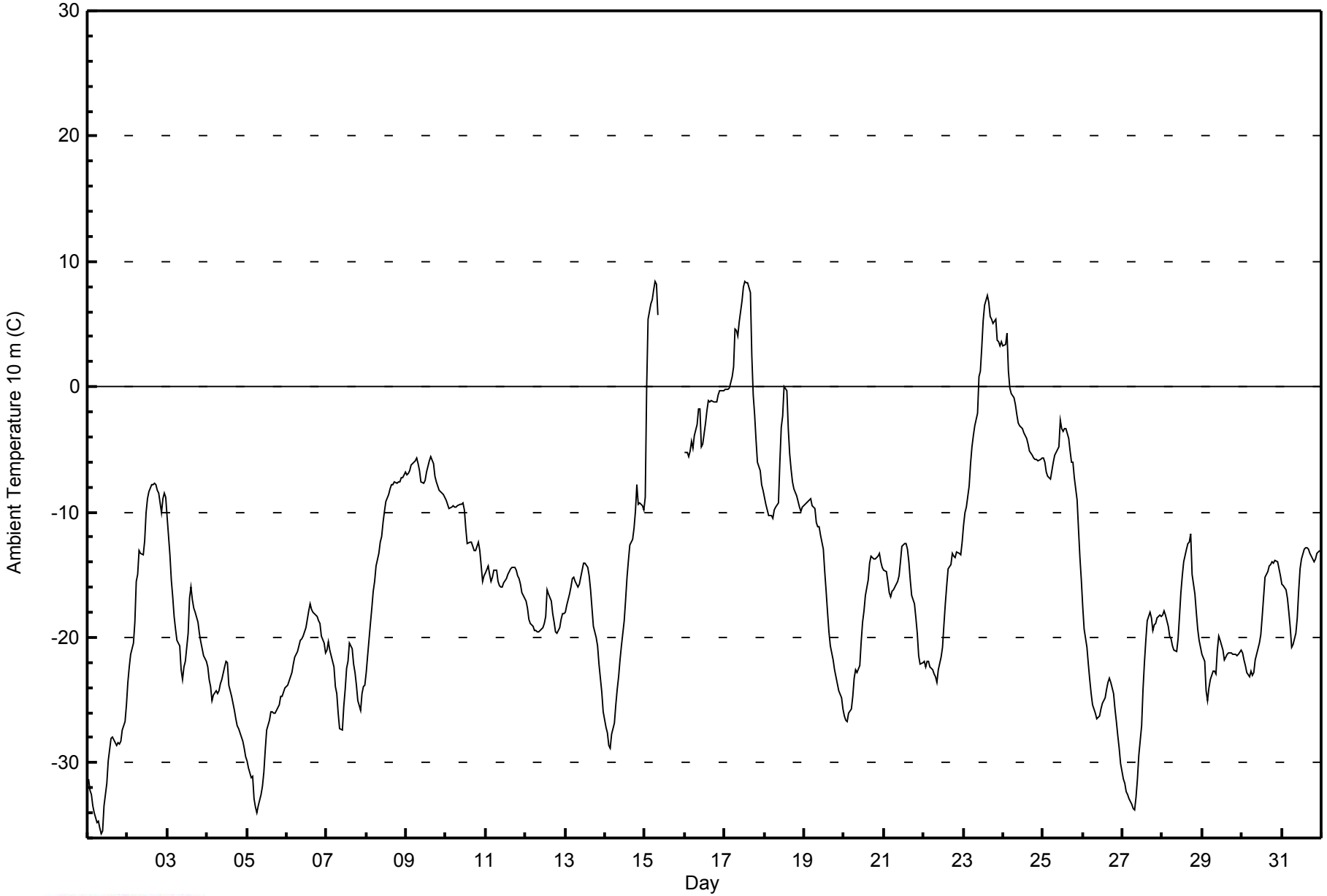
PF - Power Failure

WBEA NETWORK

Hourly Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	255	34.98	34.98
-20 - 0	435	59.67	94.65
0 - 10	39	5.35	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 729

Total Number of Hours: 744

Maximum Value: 8.3 C on Jan 17 13:00

Maximum Daily Average: 1.1 C on Jan 17

Minimum Value: -36.5 C on Jan 1 09:00

Minimum Daily Average: -31.3 C on Jan 1

Maximum Diurnal Average: -12.7 C at hour 15

Minimum Diurnal Average: -17.3 C at hour 4

Monthly Average: -15.73 C

Percentiles: P_1 = -34.8 P_{10} = -27.2 Q_1 = -22.4 Median = -16.0 Q_3 = -9.0 P_{90} = -3.2 P_{99} = 7.2

Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-32.8	-33.5	-34.3	-34.8	-35.3	-35.7	-36.1	-36.3	-36.5	-36.3	-33.8	-31.4	-29.3	-28.3	-27.5	-28.4	-29.4	-29.6	-29.4	-29.4	-27.8	-26.6	-25.6	-24.2	-31.3	-24.2
2-Jan	-22.5	-21.9	-21.5	-20.6	-19.2	-16.4	-15.4	-13.0	-12.8	-12.7	-11.7	-9.4	-8.2	-7.6	-7.3	-8.3	-9.2	-11.0	-11.5	-11.5	-12.4	-12.2	-8.9	-8.8	-13.1	-7.3
3-Jan	-10.2	-13.2	-15.2	-16.7	-18.7	-20.9	-22.6	-23.8	-24.9	-25.0	-23.0	-22.0	-19.9	-17.0	-16.1	-18.5	-19.2	-19.2	-20.1	-21.5	-22.4	-23.2	-23.4	-24.9	-20.1	-10.2
4-Jan	-25.9	-27.1	-27.1	-26.8	-26.8	-26.2	-26.0	-24.5	-23.6	-23.0	-22.2	-21.7	-21.8	-23.5	-24.2	-24.9	-26.0	-26.7	-27.7	-28.3	-28.9	-29.6	-30.5	-31.1	-26.0	-21.7
5-Jan	-32.3	-32.8	-33.7	-34.0	-34.5	-35.0	-34.7	-33.7	-33.0	-32.5	-31.6	-28.6	-26.8	-25.7	-25.1	-25.5	-25.9	-26.3	-25.0	-24.5	-24.1	-24.4	-23.9	-23.3	-29.0	-23.3
6-Jan	-23.2	-22.6	-22.2	-21.7	-21.2	-20.7	-20.2	-19.9	-19.5	-19.6	-19.6	-18.9	-18.2	-17.5	-17.2	-17.7	-18.0	-18.1	-18.8	-19.9	-21.4	-21.4	-22.4	-22.0	-20.1	-17.2
7-Jan	-21.1	-20.3	-21.3	-23.4	-24.7	-25.9	-26.8	-27.8	-28.8	-29.0	-27.1	-24.7	-22.3	-21.5	-21.4	-22.8	-24.8	-26.0	-26.6	-27.1	-27.4	-27.2	-26.0	-25.7	-25.0	-20.3
8-Jan	-22.8	-20.8	-18.4	-17.0	-15.8	-14.9	-13.8	-12.8	-12.0	-11.5	-10.2	-9.2	-8.4	-7.8	-7.5	-7.3	-7.4	-7.4	-7.3	-7.4	-7.2	-6.9	-6.8	-6.6	-11.1	-6.6
9-Jan	-6.8	-6.7	-6.4	-6.1	-5.9	-5.6	-5.5	-5.7	-6.4	-7.7	-7.5	-6.3	-6.1	-5.9	-5.5	-5.2	-5.9	-6.8	-7.4	-7.8	-8.0	-8.2	-8.4	-8.6	-6.7	-5.2
10-Jan	-8.9	-9.2	-9.6	-9.5	-9.3	-9.5	-9.5	-9.2	-9.1	-9.1	-8.9	-9.3	-10.7	-12.0	-11.9	-12.1	-12.6	-13.5	-13.6	-13.6	-14.9	-16.8	-16.4	-15.5	-11.4	-8.9
11-Jan	-14.6	-14.2	-14.7	-15.3	-15.0	-14.4	-14.5	-15.2	-15.6	-15.8	-15.7	-15.4	-15.0	-14.7	-14.5	-14.4	-14.3	-14.2	-14.5	-14.9	-15.0	-15.6	-16.2	-16.7	-15.0	-14.2
12-Jan	-17.0	-17.5	-18.5	-18.7	-19.0	-19.3	-19.3	-19.2	-18.9	-18.8	-18.3	-17.7	-18.3	-16.2	-16.4	-17.5	-19.2	-20.7	-20.6	-20.7	-20.2	-18.7	-17.8	-17.6	-18.6	-16.2
13-Jan	-17.3	-17.1	-16.1	-15.4	-14.6	-15.4	-17.4	-17.1	-15.6	-14.9	-14.3	-13.6	-13.6	-13.8	-14.6	-15.9	-17.9	-19.6	-21.5	-23.5	-24.8	-25.6	-26.0	-27.3	-18.0	-13.6
14-Jan	-28.5	-29.2	-29.5	-29.9	-29.1	-28.2	-24.9	-23.5	-22.1	-21.0	-19.6	-17.8	-15.8	-14.0	-12.7	-11.8	-11.5	-10.9	-10.3	-8.0	-8.8	-9.0	-9.8	-9.9	-18.2	-8.0
15-Jan	-9.6	-1.8	5.0	6.2	6.6	7.5	8.1	8.1	5.7	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	8.1
16-Jan	-6.8	-7.0	-7.3	-7.4	-7.0	-7.3	-6.7	-6.0	-6.3	-5.5	-6.5	-5.9	-3.1	-2.2	-1.3	-1.6	-2.0	-2.2	-2.3	-2.4	-1.9	-1.3	-0.7	-0.4	-4.2	-0.4
17-Jan	-0.4	-0.4	-0.2	-0.1	0.4	1.0	4.1	4.0	3.5	4.7	6.5	7.7	8.3	8.2	8.2	7.3	2.6	-0.6	-2.3	-4.6	-6.1	-7.1	-9.0	-9.8	1.1	8.3
18-Jan	-10.2	-10.7	-11.2	-10.6	-10.6	-10.9	-10.4	-9.6	-9.8	-7.3	-4.3	-2.9	-0.5	-0.3	-3.3	-5.4	-6.9	-7.8	-8.1	-8.5	-9.0	-9.4	-9.7	-9.4	-7.8	-0.3
19-Jan	-9.0	-8.7	-8.8	-8.8	-8.8	-10.1	-11.2	-12.4	-11.1	-11.0	-11.6	-12.7	-14.5	-16.0	-17.7	-19.3	-20.5	-21.7	-22.5	-23.1	-24.1	-25.4	-25.9	-26.8	-15.9	-8.7
20-Jan	-27.2	-27.4	-27.6	-26.7	-26.2	-23.7	-22.1	-21.6	-21.9	-21.3	-19.4	-17.8	-16.7	-15.6	-14.5	-13.4	-13.1	-13.7	-13.7	-13.5	-13.3	-13.2	-13.8	-14.2	-18.8	-13.1
21-Jan	-14.4	-14.9	-16.4	-18.3	-17.5	-16.1	-15.9	-15.5	-15.3	-14.8	-13.7	-12.5	-12.4	-12.5	-12.9	-13.8	-16.0	-18.5	-20.0	-21.2	-22.8	-24.0	-24.7	-24.6	-17.0	-12.4
22-Jan	-24.2	-24.7	-22.6	-22.0	-22.4	-22.6	-23.6	-23.3	-24.6	-22.6	-21.1	-20.0	-18.1	-16.6	-15.0	-14.5	-14.4	-13.5	-13.7	-13.8	-13.3	-13.3	-13.7	-12.9	-18.6	-12.9
23-Jan	-11.3	-10.4	-9.9	-8.5	-6.5	-5.3	-4.3	-3.9	-4.3	-0.6	0.8	2.9	5.2	6.4	7.1	6.5	5.1	4.8	3.7	4.7	3.0	2.6	2.5	2.7	-0.3	7.1
24-Jan	2.4	2.1	1.8	1.3	-0.1	-0.5	-0.8	-1.3	-2.0	-2.7	-2.9	-3.0	-3.4	-3.6	-3.8	-4.2	-4.9	-5.3	-5.4	-5.5	-5.5	-5.4	-5.2	-5.1	-2.6	2.4
25-Jan	-5.5	-7.0	-7.9	-8.6	-9.0	-7.0	-5.7	-5.3	-6.1	-5.3	-2.6	-3.1	-3.4	-3.2	-3.2	-4.0	-5.0	-6.0	-6.0	-7.4	-9.1	-11.3	-13.5	-15.4	-6.7	-2.6
26-Jan	-17.5	-19.3	-20.7	-22.1	-23.3	-24.4	-25.4	-26.1	-26.4	-26.2	-26.0	-24.5	-23.6	-22.9	-22.6	-22.3	-22.4	-24.3	-26.9	-28.2	-29.2	-30.2	-31.0	-31.7	-24.9	-17.5
27-Jan	-32.4	-32.9	-33.3	-34.0	-34.1	-34.7	-34.7	-34.8	-34.7	-32.2	-28.6	-26.2	-23.3	-21.2	-19.3	-18.4	-18.0	-19.7	-19.9	-18.7	-18.4	-17.9	-17.7	-17.8	-26.0	-17.7
28-Jan	-17.5	-17.4	-18.5	-19.4	-20.3	-20.3	-20.7	-20.6	-20.7	-19.8	-17.8	-15.5	-13.9	-12.3	-12.6	-12.3	-12.4	-11.8	-14.8	-16.5	-17.9	-19.3	-20.4	-22.4	-17.3	-11.8
29-Jan	-23.8	-25.0	-25.9	-26.4	-24.6	-23.1	-22.5	-22.5	-22.8	-21.0	-19.7	-20.0	-20.7	-21.5	-21.3	-21.1	-21.1	-21.1	-21.3	-21.3	-21.3	-21.4	-21.4	-21.0	-22.2	-19.7
30-Jan	-21.2	-22.2	-22.9	-23.5	-23.4	-23.3	-24.3	-23.1	-21.6	-21.3	-20.2	-19.2	-17.5	-16.0	-14.6	-14.7	-14.1	-14.0	-13.8	-13.8	-13.7	-14.4	-15.2	-16.0	-18.5	-13.7
31-Jan	-17.0	-16.6	-17.3	-19.0	-21.0	-21.9	-21.8	-20.6	-19.5	-18.0	-15.9	-14.2	-13.5	-12.7	-12.5	-12.6	-12.8	-13.2	-13.8	-14.5	-14.4	-13.6	-13.6	-13.5	-16.0	-12.5
	-17.1	-17.1	-17.2	-17.3	-17.3	-17.1	-16.9	-16.7	-16.7	-16.7	-15.6	-14.4	-13.5	-12.9	-12.7	-13.1	-13.9	-14.6	-15.2	-15.5	-16.0	-16.3	-16.5	-16.7	Diurnal Average	
	2.4	2.1	5.0	6.2	6.6	7.5	8.1	8.1	5.7	4.7	6.5	7.7	8.3	8.2	8.2	7.3	5.1	4.8	3.7	4.7	3.0	2.6	2.5	2.7	Diurnal Maximum	

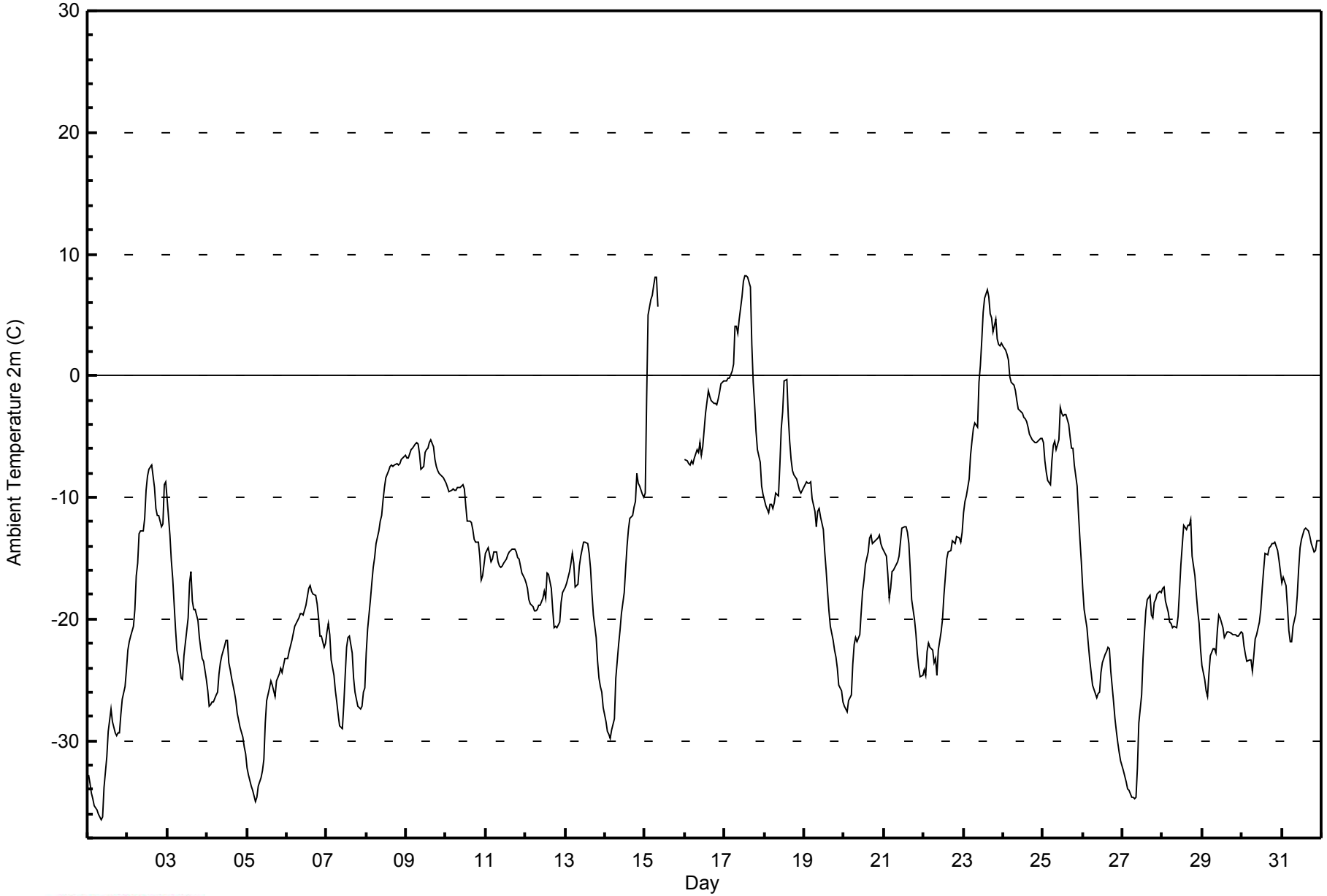
PF - Power Failure

WBEA NETWORK

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort McKay - Bertha Ganter - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	261	35.80	35.80
-20 - 0	430	58.98	94.79
0 - 10	38	5.21	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 729

Total Number of Hours: 744

Maximum Value: 95 % on Jan 9 01:00

Maximum Daily Average: 92.8 % on Jan 9

Minimum Value: 43 % on Jan 15 07:00

Minimum Daily Average: 64.5 % on Jan 26

Maximum Diurnal Average: 79.3 % at hour 3

Minimum Diurnal Average: 72.2 % at hour 15

Monthly Average: 76.9 %

Percentiles: P_1 = 54 P_{10} = 65 Q_1 = 72 Median = 77 Q_3 = 83 P_{90} = 89 P_{99} = 94

Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	74	73	73	72	72	71	71	71	71	71	71	71	72	73	74	75	76	76	75	75	76	76	77	77	73.4	77
2-Jan	79	79	80	81	82	85	86	87	86	85	85	85	85	87	88	89	91	92	92	92	91	92	91	90	86.7	92
3-Jan	87	84	80	78	77	78	79	80	79	79	79	78	76	74	71	73	74	74	74	74	74	72	72	71	76.5	87
4-Jan	71	73	73	74	74	72	74	73	72	72	68	69	65	72	68	64	64	64	65	65	66	67	68	70	69.4	74
5-Jan	72	72	72	72	73	72	72	72	73	73	72	71	70	70	71	73	75	77	77	77	77	78	78	78	73.6	78
6-Jan	78	78	78	76	77	78	78	80	80	81	81	81	81	80	80	80	81	82	82	82	81	81	82	81	79.9	82
7-Jan	81	81	81	81	81	80	79	78	77	76	75	75	75	77	76	78	81	81	80	79	78	80	80	80	78.8	81
8-Jan	81	81	82	82	84	84	84	86	85	85	85	84	83	82	83	84	85	85	87	88	89	89	90	92	84.9	92
9-Jan	95	94	94	94	94	94	94	94	93	92	92	92	93	93	94	94	93	92	91	90	91	92	91	91	92.8	95
10-Jan	91	90	89	89	89	88	89	88	88	88	87	84	84	83	83	84	86	87	86	82	83	86	86	86	86.5	91
11-Jan	86	86	86	86	86	86	86	85	85	87	87	87	86	86	86	86	86	85	85	85	84	84	84	82	85.5	87
12-Jan	82	81	79	77	76	76	76	78	78	81	80	79	79	70	71	73	76	79	81	81	80	78	79	79	78.0	82
13-Jan	82	84	84	85	83	83	85	84	83	83	84	80	77	77	77	77	78	78	78	78	79	80	79	78	80.7	85
14-Jan	77	77	76	77	77	78	79	79	80	80	81	82	82	82	85	87	88	89	89	90	89	89	90	91	83.1	91
15-Jan	93	89	82	65	58	47	43	50	76	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	93
16-Jan	91	91	92	90	88	88	85	83	77	76	77	77	74	73	71	73	73	74	75	76	75	75	75	76	79.3	92
17-Jan	77	79	80	81	80	81	71	69	70	65	60	57	55	55	54	53	70	76	74	71	72	73	73	72	69.4	81
18-Jan	75	78	82	82	82	83	84	86	87	87	77	73	70	71	70	73	77	81	84	81	81	86	91	91	80.4	91
19-Jan	90	92	90	90	89	91	91	90	88	87	85	80	73	70	70	67	65	67	68	69	71	73	75	77	79.6	92
20-Jan	78	78	77	78	78	77	77	76	76	76	74	73	71	71	71	73	74	74	74	73	73	72	71	72	74.4	78
21-Jan	73	74	76	79	81	79	79	78	77	75	78	75	70	67	66	69	72	73	74	77	80	82	81	81	75.7	82
22-Jan	81	80	79	79	79	79	79	78	78	76	73	73	72	70	66	65	69	72	75	78	81	83	84	84	76.5	84
23-Jan	84	85	86	88	86	84	84	84	82	76	73	67	60	56	54	55	60	62	64	63	71	73	76	75	72.9	88
24-Jan	76	78	76	80	84	86	87	84	83	81	80	80	80	78	78	80	84	83	81	83	83	84	84	84	81.6	87
25-Jan	85	87	90	92	91	89	89	89	88	89	84	82	83	83	80	77	73	75	68	61	55	51	57	51	77.9	92
26-Jan	55	58	58	60	62	64	65	67	68	67	65	63	64	64	64	62	59	61	64	67	71	73	74	74	64.5	74
27-Jan	74	73	73	73	73	72	72	72	73	72	72	71	69	67	64	61	60	61	64	62	63	62	63	64	67.9	74
28-Jan	64	65	66	68	69	70	72	72	72	71	67	64	61	59	57	57	59	65	71	69	68	69	71	73	66.6	73
29-Jan	75	77	77	78	78	78	77	78	78	78	74	67	65	65	66	66	66	68	68	69	70	71	70	67	71.8	78
30-Jan	66	67	68	71	72	71	73	74	72	69	64	63	61	60	59	59	58	59	61	64	65	65	67	69	65.8	74
31-Jan	72	74	78	80	82	82	82	81	81	82	81	77	73	70	71	74	76	75	77	80	78	73	72	72	76.8	82
	78.8	79.2	79.3	79.2	79.2	78.9	78.7	78.8	79.2	78.8	77.1	75.4	73.7	72.9	72.2	72.7	74.3	75.6	76.1	76.1	76.4	77.0	77.7	77.7	Diurnal Average	
	95	94	94	94	94	94	94	94	93	92	92	92	93	93	94	94	93	92	92	92	91	92	91	92	Diurnal Maximum	

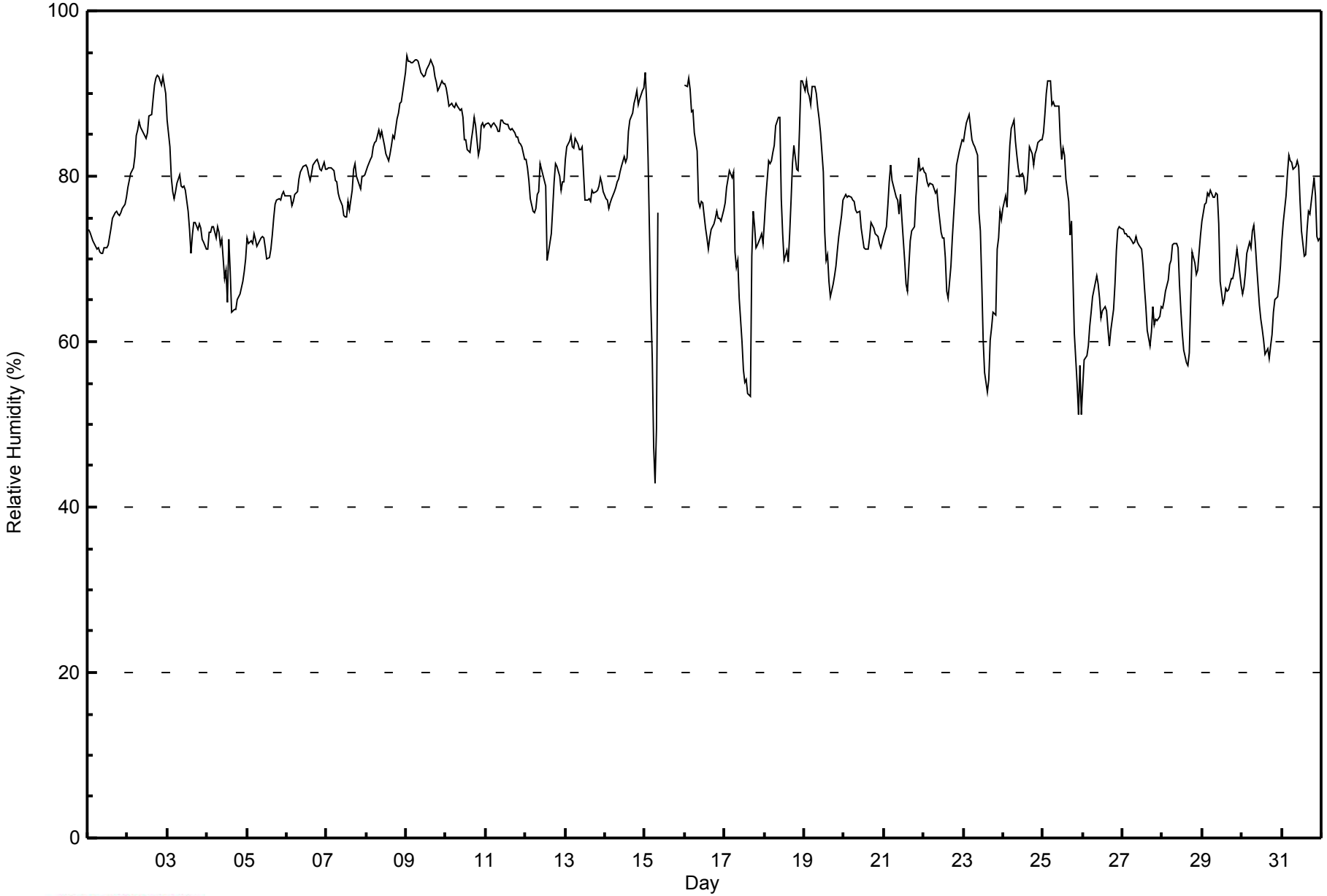
PF - Power Failure

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 0.5 mm on Jan 15 03:00

Maximum Daily Total: 0.0 mm on Jan 1

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 0.5 mm at hour 3

Minimum Diurnal Total: 0.0 mm at hour 1

Monthly Total: 1.02 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} = 0.0

Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.3	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0.5
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	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	Diurnal Average	
	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	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	Diurnal Maximum	

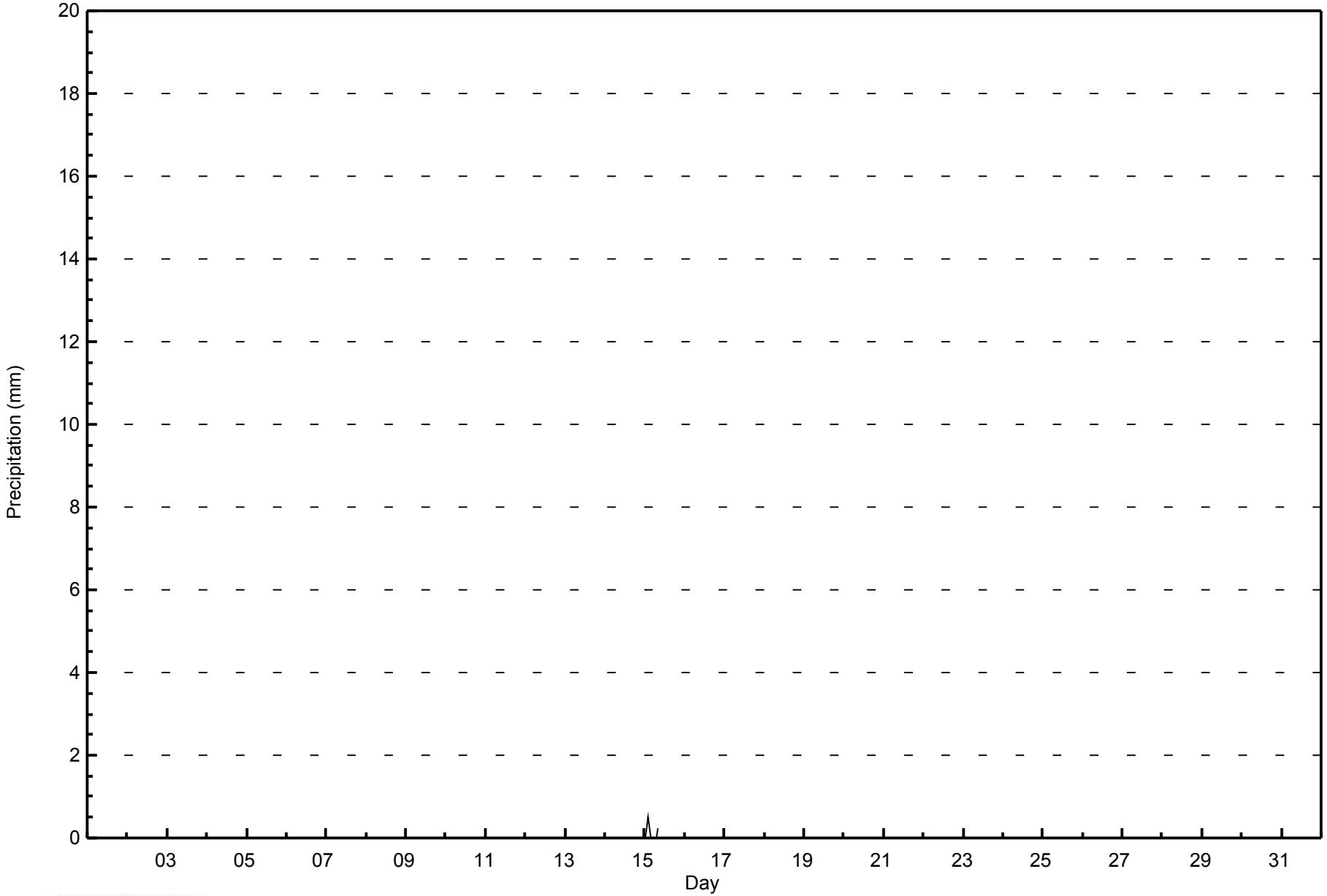
PF - Power Failure

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - January 201



AURORA ATMOSPHERICS INC.

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	728	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: 729

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - January 2014

Maximum Value: 114 W/m2 on Jan 27 13:00

Maximum Daily Average: 22.9 W/m2 on Jan 27

Minimum Value: 0 W/m2 on Jan 9 06:00

Minimum Daily Average: 0.6 W/m2 on Jan 11

Maximum Diurnal Average: 48.8 W/m2 at hour 13

Minimum Diurnal Average: 0.1 W/m2 at hour 2

Monthly Average: 9.5 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 3$ $P_{90} = 41$ $P_{99} = 91$

Hours in Service:	744
Hours of Data:	729
Hours of Missing Data:	15
Hours of Calibration:	0
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	0	0	0	0	0	0	3	12	36	35	10	6	2	0	0	0	0	0	0	0	0	4.4	36
2-Jan	0	0	0	0	0	0	0	0	0	1	2	4	3	5	10	1	0	0	0	0	0	0	0	0	1.1	10
3-Jan	0	0	0	0	0	0	0	0	0	10	9	16	39	36	21	2	0	0	0	0	0	0	0	0	5.6	39
4-Jan	0	0	0	0	0	0	0	0	0	1	3	5	6	5	12	3	0	0	0	0	0	0	0	0	1.5	12
5-Jan	0	0	0	0	0	0	0	0	0	4	37	46	34	18	6	2	0	0	0	0	0	0	0	0	6.1	46
6-Jan	0	0	0	0	0	0	0	0	0	0	1	3	7	11	13	1	0	0	0	0	0	0	0	0	1.5	13
7-Jan	0	0	0	0	0	0	0	0	0	14	40	46	44	9	22	2	0	0	0	0	0	0	0	0	7.4	46
8-Jan	0	0	0	0	0	0	0	0	0	2	5	6	8	3	2	1	0	0	0	0	0	0	0	0	1.1	8
9-Jan	0	0	0	0	0	0	0	0	0	2	7	5	4	3	3	1	0	0	0	0	0	0	0	0	1.0	7
10-Jan	0	0	0	0	0	0	0	0	0	1	2	2	2	3	2	1	0	0	0	0	0	0	0	0	0.7	3
11-Jan	0	0	0	0	0	0	0	0	0	1	2	3	3	2	2	1	0	0	0	0	0	0	0	0	0.6	3
12-Jan	0	0	0	0	0	0	0	0	0	1	3	7	16	41	33	2	0	0	0	0	0	0	0	0	4.4	41
13-Jan	0	0	0	0	0	0	0	0	0	1	2	4	5	5	4	3	0	0	0	0	0	0	0	0	1.1	5
14-Jan	0	0	0	0	0	0	0	0	0	1	3	5	7	5	3	1	0	0	0	0	0	0	0	0	1.1	7
15-Jan	0	0	0	0	0	0	0	0	0	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0
16-Jan	0	0	0	0	0	0	0	0	1	47	37	64	82	61	46	18	1	0	0	0	0	0	0	0	15.0	82
17-Jan	0	0	0	0	0	0	0	0	1	20	51	77	59	72	58	22	3	0	0	0	0	0	0	0	15.2	77
18-Jan	0	0	0	0	0	0	0	0	1	25	75	86	89	71	56	10	2	0	0	0	0	0	0	0	17.4	89
19-Jan	0	0	0	0	0	0	0	0	1	6	19	47	66	52	34	18	6	0	0	0	0	0	0	0	10.5	66
20-Jan	0	0	0	0	0	0	0	0	1	15	53	77	65	47	35	18	3	0	0	0	0	0	0	0	13.1	77
21-Jan	0	0	0	0	0	0	0	0	1	12	36	54	78	82	63	28	3	0	0	0	0	0	0	0	15.0	82
22-Jan	0	0	0	0	0	0	0	0	3	31	67	63	93	80	70	27	4	0	0	0	0	0	0	0	18.3	93
23-Jan	0	0	0	0	0	0	0	0	1	18	48	91	103	84	75	30	4	0	0	0	0	0	0	0	19.0	103
24-Jan	0	0	0	0	0	0	0	0	1	9	24	45	52	75	43	16	2	0	0	0	0	0	0	0	11.2	75
25-Jan	0	0	0	0	0	0	0	0	2	11	22	38	42	41	34	11	2	0	0	0	0	0	0	0	8.6	42
26-Jan	0	0	0	0	0	0	0	0	5	20	44	87	69	70	38	23	6	0	0	0	0	0	0	0	15.2	87
27-Jan	0	0	0	0	0	0	0	0	4	39	75	104	114	99	72	29	8	0	0	0	0	0	0	0	22.9	114
28-Jan	0	0	0	0	0	0	0	0	3	29	63	90	88	72	46	20	3	0	0	0	0	0	0	0	17.4	90
29-Jan	0	0	0	0	0	0	0	0	3	22	35	83	87	76	60	37	9	0	0	0	0	0	0	0	17.3	87
30-Jan	0	0	0	0	0	0	0	0	3	42	71	94	97	91	69	28	7	0	0	0	0	0	0	0	21.0	97
31-Jan	0	0	0	0	0	0	0	0	2	17	40	53	66	73	49	25	8	0	0	0	0	0	0	0	14.0	73
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	13.5	29.6	44.6	48.8	43.4	32.8	12.7	2.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0	0	0	0	0	0	0	0	5	47	75	104	114	99	75	37	9	0	0	0	0	0	0	0	Diurnal Maximum	

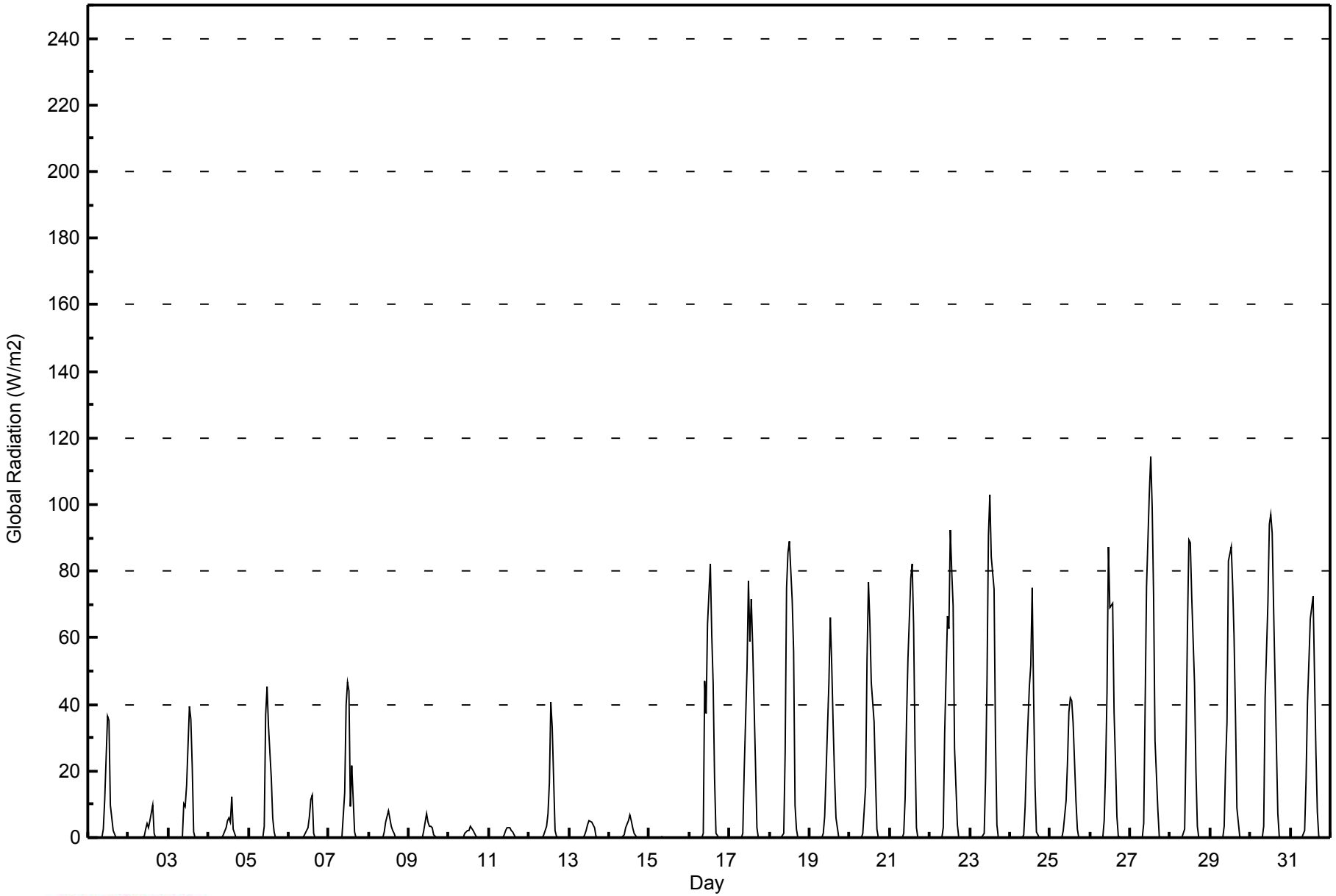
PF - Power Failure

WBEA NETWORK

Hourly Averages

Global Radiation (GR) - W/m2

Fort McKay - Bertha Ganter - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	620	85.05	85.05
21 - 100	106	14.54	99.59
101 - 300	3	0.41	100.00
301 - 600	0	0.00	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 729

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - January 2014

Maximum Speed: 35 km/h on Jan 15 08:00

Maximum Daily Speed Average: 8.4 km/h on Jan 22

Minimum Speed Value: 0 km/h on Jan 31 08:00

Minimum Daily Speed Average: 0.5 km/h on Jan 6

Maximum Diurnal Speed Average: 2.4 km/h at hour 7

Minimum Diurnal Speed Average: 0.3 km/h at hour 4

Monthly Average Velocity: 1.0 km/h 289.9 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 3 Median = 5 Q_3 = 8 P_{90} = 11 P_{99} = 20

Hours in Service: 744

Hours of Data: 718

Hours of Missing Data: 26

Percent Operational Time: 96.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	WNW2	NNW1	NNW3	WNW1	W1	WSW1	W2	WSW2	SW2	WSW1	SSW2	S3	S5	SSW4	S4	S4	S4	S4	SSW4	SSW2	S4	SSW4	SSE3	SSE3	SSW2.2	S5
2-Jan	SSW4	ENE1	NNW3	NNW2	SW1	SW4	SSW3	SW5	WSW5	WSW6	SW8	S10	S9	S10	S10	S8	SSW7	SSW3	SSW4	SSW6	SSW4	NNW4	N7	NNE8	SSW3.3	S10
3-Jan	N12	NNE12	N11	N6	N4	NNW3	SW1	SW3	WSW3	WSW2	NW1	ESE1	WSW1	ENE1	N6	NW6	WNW8	NW7	NW8	WNW8	WNW7	WNW9	WNW7	W5	NW4.2	NNE12
4-Jan	WSW4	WSW3	SW5	SW3	W3	SSW4	WSW5	W6	SW6	WSW6	NW12	NW12	NNW15	N13	N11	NNW9	NW11	NW10	NW9	NW8	WNW8	WNW5	WNW5	WSW1	NW5.4	NNW15
5-Jan	SSW1	WSW1	WSW3	S1	WSW1	SW1	SSW2	S3	SSW3	W0	S2	SSE4	SSE4	S6	S4	S4	SSW3	S3	S4	SSW5	S4	S4	S7	S5	S2.9	S7
6-Jan	S5	SSW5	S5	S6	S6	S5	S6	S3	S4	E2	NNW3	NNE3	N4	N5	N4	N4	N4	N3	N2	NE2	ENE1	N3	SSW3	NNE2	SE0.5	S6
7-Jan	N2	NNW2	N2	N3	WNW2	NNW0	W2	WSW1	W2	SSW2	SSW2	S3	SSE3	SSW2	SSW2	S2	SSW2	SW3	SSW0	SW1	SSW1	SSW3	SSW5	S4	SSW1.2	SSW5
8-Jan	S5	SSE4	S6	S8	S6	S7	S8	S7	S11	SSW8	SSW4	SSW6	S6	SSW6	SW4	WNW2	W1	AF	S1	AF	SSW3	S2	SSW3	SSW1	S4.6	S11
9-Jan	N1	AF	AF	SSW1	WSW2	S3	S4	SSE7	S6	S5	SSE3	SSE4	NE1	N5	N4	N5	N8	N8	N8	N8	N7	N7	N7	N7	N1.9	N8
10-Jan	N6	N7	N7	NNW5	NNW6	N5	NNW4	NNW4	N4	N4	N5	ENE1	ENE3	ENE2	E1	ENE1	AF	AF	AF	SW3	S2	SSW2	SSE2	AF	N2.6	N7
11-Jan	N1	AF	N4	N4	N4	N6	N7	N8	N7	N7	N8	N7	N8	N9	N9	N8	N9	N11	N10	N10	N9	NNE10	N11	N11	N7.6	N11
12-Jan	N10	N11	N9	NNE9	NNE7	N5	N3	ENE2	ESE3	ESE4	SSE6	SSE6	S6	SW8	S9	S10	S7	S6	S7	S6	S6	SSW8	S6	S6	SSE1.9	N11
13-Jan	S3	WNW2	SW1	SSW3	S5	S5	SW2	N3	NNW4	WNW4	NNW2	NE4	NE5	NE5	NE6	NE6	NNE3	NE3	N3	NW2	WNW3	NNW3	NW2	NW2	N1.2	NE6
14-Jan	AF	W2	SW2	SSW3	SSW3	SSW4	S5	S4	SSW4	SSW3	SSE4	S2	SE2	SSE3	SSE3	S3	SSW3	S3	SSW3	SSW6	WNW5	W5	WNW5	WNW6	SSW2.5	SSW6
15-Jan	SSE2	W13	WNW22	NE29	WNW27	WNW32	WNW30	NW35	NW24	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	----	NW35
16-Jan	S5	S5	S6	SSW5	SSW5	SSW6	SSW6	SSW5	WSW3	SSW4	S3	S6	S9	S8	S8	S8	S8	S6	S5	S3	S7	S5	S7	S6	S5.7	S9
17-Jan	S6	S5	S6	S8	SSW7	SW6	W13	W12	W10	WNW14	WNW15	WNW14	NW16	NW16	NNW15	NNW15	NNE9	NE6	ENE5	E7	ENE4	ENE3	SSE5	S4	WNW4.0	NW16
18-Jan	S3	SSW2	S1	S1	SSW4	SSW1	S6	S7	S5	SSW6	ESE3	SSE2	NE3	NNE9	NNE10	N8	N7	N8	N8	N9	NNW8	NNW7	NW3	WNW4	NNW1.8	NNE10
19-Jan	SSW2	S4	NE1	NNW4	NNW2	N4	N3	N4	N6	N8	N11	N13	N16	NNE14	NNE15	NNE13	N12	N11	N9	N5	NNE3	NNW2	WSW4	SW3	N5.9	N16
20-Jan	SSW3	SSW4	SSW3	S5	S6	S9	S8	S10	S12	S9	S9	SSE10	S12	S11	S9	SSE2	SE1	NNW3	NNW5	NNW5	N5	N8	N6	NNW5	S3.5	S12
21-Jan	NNE1	N1	N3	NW1	NNW1	N2	N4	NNW3	NW3	NW4	N6	NNE11	NNE11	NNE9	NNE7	NE5	NNE3	NNE3	NNE3	E1	ENE1	S1	S3	S5	NNE2.9	NNE11
22-Jan	S5	S5	S8	S7	S7	S7	S6	S7	S5	S9	S11	S13	S11	S11	S9	SSW11	SSW9	SSW10	SSW9	S8	S9	S10	SSW7	SSW10	S8.4	S13
23-Jan	S13	S12	S13	SSW11	S9	S10	S9	S7	WSW4	WNW6	WNW10	WNW9	WNW9	WNW10	WNW10	WNW10	NW8	NNW4	WNW2	WNW5	SSE3	SSW3	S3	S4	SW4.5	S13
24-Jan	SW1	SW3	NNW5	N12	N7	N7	N8	N9	NNE8	NNE6	NNE7	NNE7	N9	N8	N7	ENE6	NE4	ENE5	E4	AF	ENE1	SE3	SSE5	S4	NNE4.2	N12
25-Jan	S2	WNW2	S3	S2	SW4	S8	S7	SSE4	NW2	N7	N6	NNE10	NNE9	NNE6	NNE8	NNE8	NNE8	NNE10	N13	N16	NNW19	N18	N12	N20	N5.7	N20
26-Jan	N17	N15	N14	N12	N11	N8	NNE5	NNE7	NNE5	NNE4	NNW4	SE2	SSE4	SE5	SE6	SE6	SSE3	NE0	N4	N2	NW1	WNW1	W1	WSW3	NNE3.7	N17
27-Jan	WSW2	WSW2	SW2	SW2	SW2	WSW2	SSW2	SSW3	SW4	SSW4	S9	SSE10	SSE12	S14	S11	S10	S10	S5	S6	S8	S8	S9	S9	SSW7	S6.0	S14
28-Jan	S8	S7	S7	S6	S6	SSW6	S6	S9	S10	S7	SSE4	SSE4	ESE3	SE3	NNE2	N3	N5	N9	NNE13	NNE11	NNE12	NNE8	NNE5	NNW4	SE0.9	NNE13
29-Jan	NNW4	NNW4	SW2	W4	W3	SW1	WNW2	NNW2	N4	N5	N9	N12	N15	N13	NNE10	N10	N11	N10	N7	NNW5	NNW5	NW5	NW5	NNW9	N5.8	N15
30-Jan	NNW7	NW4	WNW4	WNW4	WNW5	W4	W4	W5	W8	W8	WSW9	SW11	SW11	SSW11	SSW9	SSW9	SSW12	S10	SSW9	SSW9	SSW3	W6	WNW7	WNW9	WSW5.7	SSW12
31-Jan	N6	N7	NNW6	NW5	WNW5	WNW3	WSW3	NNE0	N1	W1	NW2	N6	N5	N7	N5	NNE5	NNE5	NNW3	W2	WSW3	W4	W4	SW2	SW3	NNW2.9	N7
	W0.6	WNW1.1	WNW1.4	N0.3	WSW2.0	WSW1.9	WSW2.4	WSW2.2	WSW2.1	WSW1.6	WNW1.4	W0.3	N0.8	N0.6	N1.1	N1.1	NNW1.2	N1.8	NNW1.7	NW1.5	NW1.5	NW1.5	W1.1	WNW1.5	Diurnal Average	
	N17	N15	WNW22	NE29	WNW27	WNW32	WNW30	NW35	NW24	WNW14	WNW15	WNW14	N16	NNW16	NNW15	NNW15	SSW12	N11	N13	NNW16	NNW19	N18	N12	N20	Diurnal Maximum	

AF - Analyzer Failure PF - Power Failure

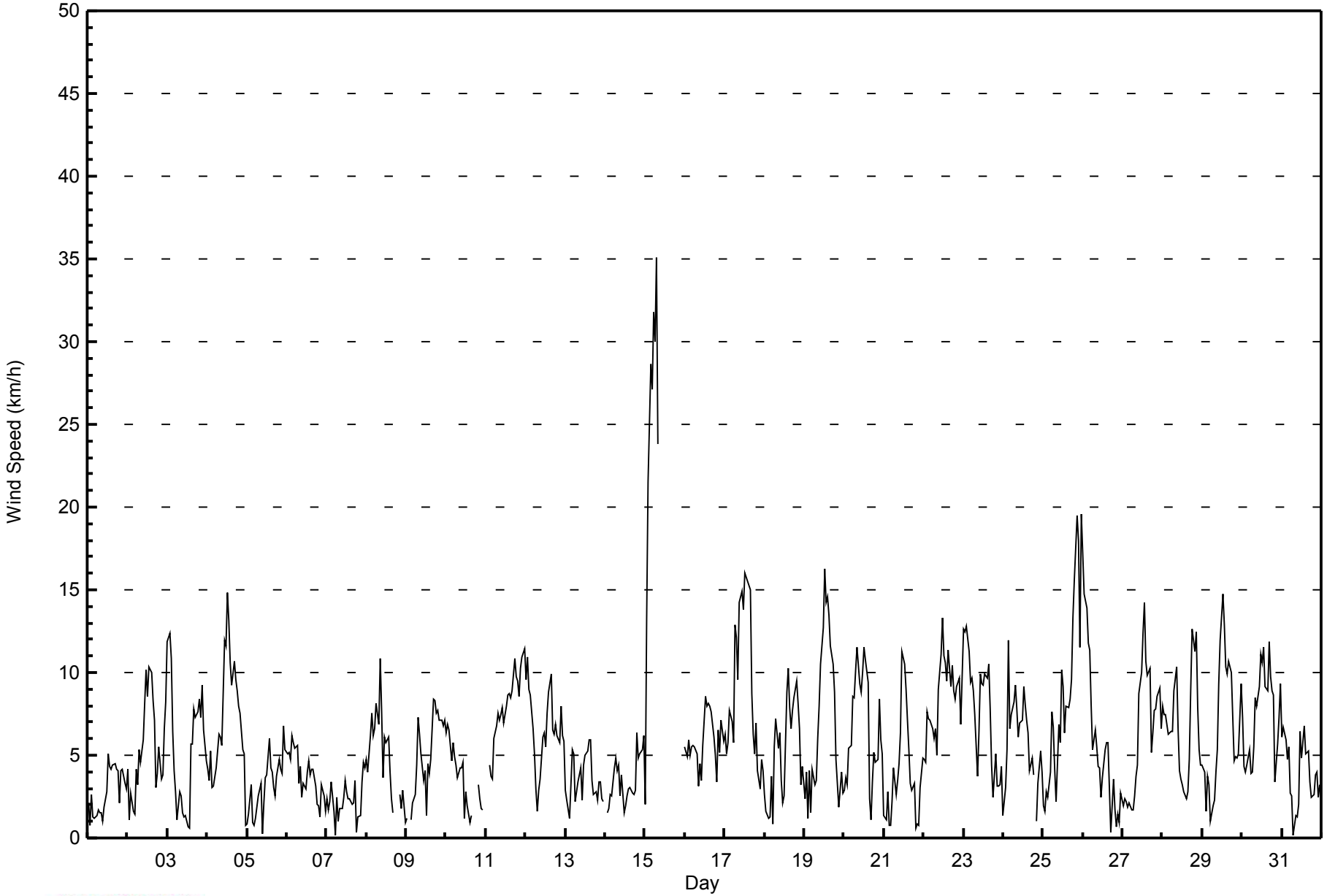
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	393	54.74	54.74
6 - 11	271	37.74	92.48
12 - 19	46	6.41	98.89
20 - 28	4	0.56	99.44
29 - 38	4	0.56	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	45	16	11	14	4	5	6	25	65	58	27	25	19	23	15	35	393
6 - 11	71	26	3	1	1	0	2	5	92	25	6	3	5	16	8	7	271
12 - 19	16	6	0	0	0	0	0	1	7	1	0	0	2	4	3	6	46
20 - 28	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	4
29 - 38	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	0	4
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	133	48	15	15	5	5	8	31	164	84	33	28	26	47	28	48	718

Total Number of Valid Hours: 718

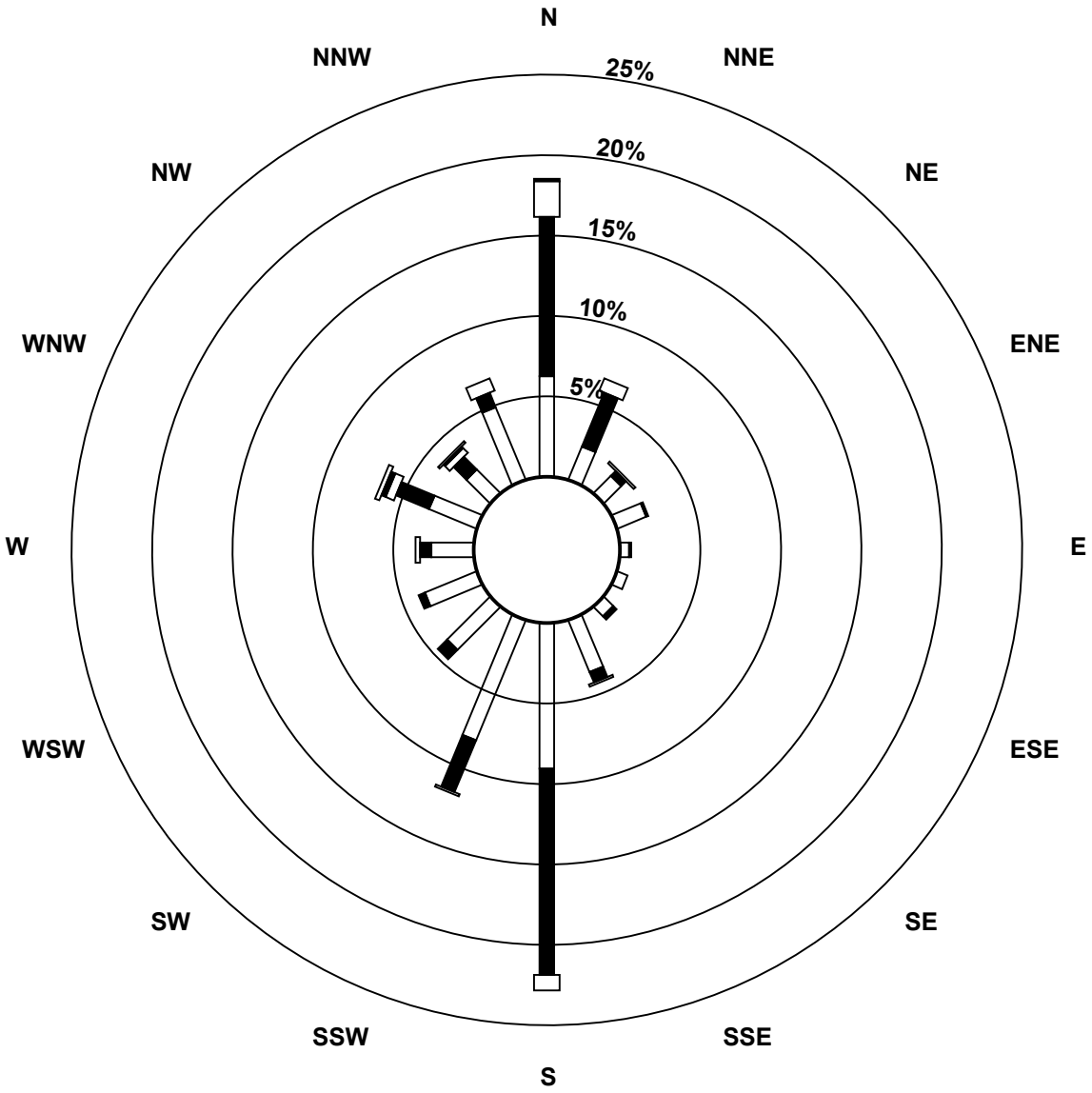
Total Number of Hours: 744

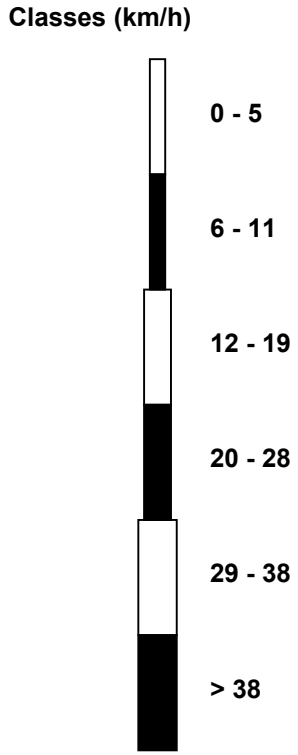
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Fort McKay - Bertha Ganter (AMS 1)





Total Number of Valid Hours: 718

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 14 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 29 02:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 2 P_{90} = 4 P_{99} = 8

Hours in Service:	744
Hours of Data:	718
Hours of Missing Data:	26
Hours of Calibration:	0
Percent Operational Time:	96.5

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

AF - Analyzer Failure PF - Power Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - January 2014

Direction of Maximum Speed: 305 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 186.0 deg on Jan 22

Direction of Minimum Speed: 15 deg on Jan 31 08:00
Direction of Minimum Daily Speed Average: 0.5 deg on Jan 6

Monthly Average Direction: 259.8 deg

Hours in Service:	744
Hours of Data:	718
Hours of Missing Data:	26
Percent Operational Time:	96.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	296	333	338	286	266	253	263	242	228	257	194	176	182	194	190	183	177	183	207	199	185	192	163	160	198.2
2-Jan	197	69	343	340	228	225	203	221	240	238	214	190	177	179	182	186	193	197	206	208	206	336	2	13	204.9
3-Jan	11	12	7	357	353	343	236	225	245	252	324	119	253	57	353	312	295	307	304	299	303	301	296	280	324.7
4-Jan	245	245	233	218	263	206	243	266	223	256	312	324	346	8	353	335	319	313	306	306	301	296	292	243	305.1
5-Jan	203	252	240	177	253	235	207	180	198	280	170	161	162	179	169	174	192	174	186	192	187	181	178	188	185.8
6-Jan	188	192	174	173	186	175	172	175	169	92	345	14	10	10	8	360	4	359	358	37	74	1	193	20	138.4
7-Jan	4	345	355	352	284	340	281	243	264	212	193	170	151	195	202	191	201	225	202	223	211	192	194	179	212.1
8-Jan	184	167	185	180	187	182	181	185	184	193	213	196	189	204	215	291	279	AF	170	AF	210	187	201	206	191.2
9-Jan	8	AF	AF	198	251	182	180	165	189	175	152	158	46	2	8	360	4	6	3	2	1	360	353	2	7.4
10-Jan	358	359	358	345	344	349	347	340	353	1	354	58	58	63	91	62	AF	AF	AF	232	190	198	154	AF	356.7
11-Jan	350	AF	8	6	4	359	354	352	355	360	356	353	359	353	357	357	2	4	355	7	5	14	7	6	0.7
12-Jan	4	4	10	22	17	6	350	74	114	123	165	167	174	220	175	184	182	180	175	179	188	196	185	178	165.5
13-Jan	175	297	218	202	189	185	222	356	336	288	338	46	49	56	49	40	23	37	10	309	299	347	316	322	2.9
14-Jan	AF	262	224	210	209	201	191	190	198	193	161	191	134	149	165	181	194	189	196	198	283	272	287	284	211.8
15-Jan	164	279	298	51	299	301	299	305	311	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
16-Jan	189	183	184	200	201	199	198	213	248	192	177	187	182	175	181	184	186	179	174	184	183	186	182	182	187.5
17-Jan	185	187	184	183	203	222	270	281	273	296	295	297	316	326	339	346	29	51	70	86	58	59	155	176	301.0
18-Jan	177	202	189	181	204	199	186	182	183	212	112	151	40	18	15	359	355	356	356	350	336	343	313	300	345.6
19-Jan	210	178	48	343	345	9	357	354	355	358	1	10	10	13	18	18	10	6	2	3	12	328	251	228	5.0
20-Jan	212	200	192	189	178	188	181	169	175	183	178	168	171	170	187	153	139	343	348	336	350	358	6	347	181.2
21-Jan	21	11	351	318	340	349	356	335	319	325	354	13	20	29	27	46	25	26	26	96	61	169	189	184	12.2
22-Jan	181	173	177	175	176	183	183	183	185	186	172	189	185	180	174	193	192	203	197	187	188	181	202	202	186.0
23-Jan	180	182	189	192	182	172	182	189	245	282	285	290	289	293	293	293	304	333	293	292	167	201	176	180	232.2
24-Jan	214	225	332	354	353	358	7	5	18	31	22	21	8	11	6	61	51	65	80	AF	59	141	156	185	18.1
25-Jan	183	287	172	170	219	173	186	165	322	8	6	22	20	28	28	17	30	14	358	349	345	357	7	358	4.9
26-Jan	4	3	4	5	5	5	17	13	12	15	346	126	155	139	146	144	149	34	9	6	306	288	265	249	13.5
27-Jan	249	243	219	236	234	237	206	213	216	197	181	165	168	174	173	172	175	178	176	178	174	179	183	195	182.3
28-Jan	190	180	189	172	183	196	185	188	180	183	166	148	119	139	23	3	358	5	19	16	13	23	16	347	129.5
29-Jan	339	336	233	262	267	233	290	334	355	3	5	10	2	4	12	6	3	2	353	344	327	306	324	334	350.8
30-Jan	328	304	291	288	288	281	261	270	278	267	251	230	217	207	212	204	201	190	199	211	210	276	292	300	243.1
31-Jan	355	360	347	315	299	284	255	15	359	265	326	355	2	353	7	21	14	343	266	256	281	279	219	228	331.5
	265.4	283.0	284.6	3.5	258.6	245.9	244.2	252.0	255.1	258.7	285.2	274.9	4.4	6.5	10.9	354.2	342.3	350.5	341.8	311.2	310.9	310.6	262.0	288.4	
	Diurnal Average																								

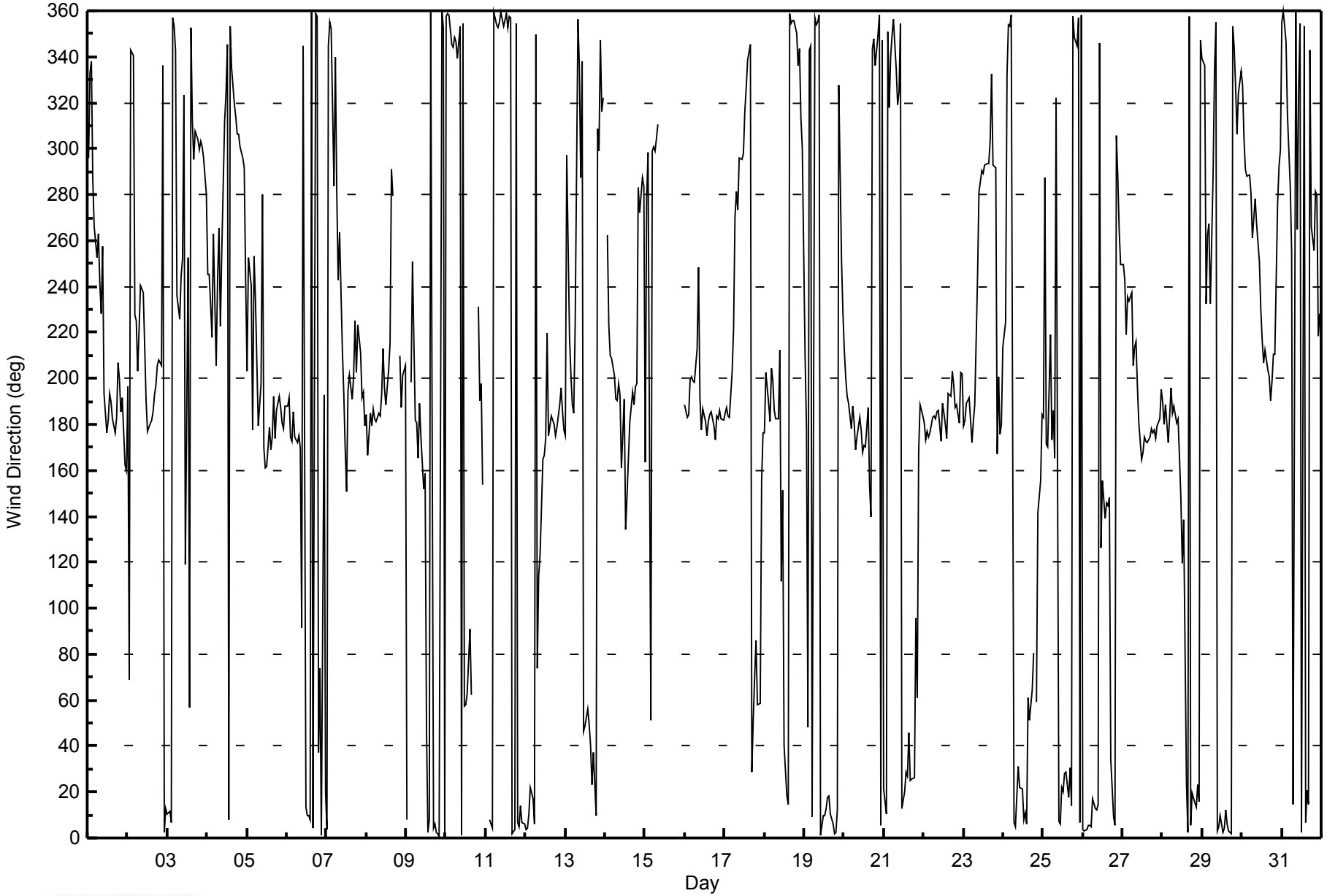
AF - Analyzer Failure PF - Power Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Fort McKay - Bertha Ganter - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 102 deg on Jan 3 13:00

Minimum Value: 5 deg on Jan 25 04:00

Percentiles: P_1 = 11 P_{10} = 15 Q_1 = 19 Median = 27 Q_3 = 38 P_{90} = 57 P_{99} = 87

Hours in Service:	744
Hours of Data:	718
Hours of Missing Data:	26
Hours of Calibration:	0
Percent Operational Time:	96.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	65	78	27	61	72	68	43	35	61	80	67	27	21	19	21	16	15	19	22	26	27	23	26	34	80
2-Jan	23	70	43	54	82	39	39	30	34	30	28	15	16	15	14	12	13	37	60	23	47	74	25	30	82
3-Jan	34	34	30	26	22	16	82	21	28	54	57	73	102	82	26	23	12	13	13	10	12	10	13	23	102
4-Jan	24	34	16	56	37	19	28	34	26	39	18	21	26	29	27	22	16	14	12	12	12	13	16	75	75
5-Jan	61	90	45	57	71	55	17	34	28	77	61	27	20	18	26	25	28	26	18	19	21	23	20	16	90
6-Jan	16	20	23	16	32	25	21	29	22	55	28	32	31	29	24	21	21	45	37	43	83	63	23	67	83
7-Jan	15	23	28	18	48	64	69	75	44	25	18	23	24	40	25	27	29	18	91	55	57	28	19	24	91
8-Jan	17	26	19	16	17	19	17	23	18	17	31	17	22	26	41	35	60	AF	57	AF	20	60	38	91	91
9-Jan	52	AF	AF	47	35	41	26	16	20	25	17	18	65	27	31	25	28	29	30	29	27	29	27	27	65
10-Jan	25	28	28	22	24	23	23	28	26	31	25	55	40	49	39	59	AF	AF	AF	29	47	54	27	AF	59
11-Jan	57	AF	25	21	25	21	23	24	24	26	24	27	23	24	25	24	27	31	28	33	38	34	30	30	57
12-Jan	30	30	35	44	40	37	29	61	16	17	17	17	23	35	17	13	20	14	13	16	21	17	20	18	61
13-Jan	42	43	75	32	28	25	59	22	37	22	59	44	39	38	43	42	34	55	32	40	29	12	48	51	75
14-Jan	AF	45	44	18	27	25	23	27	22	52	25	84	51	32	38	39	32	32	31	19	35	24	23	28	84
15-Jan	53	46	45	27	22	20	21	21	21	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	53
16-Jan	14	16	14	21	14	14	13	24	31	22	17	12	13	16	15	13	11	16	18	22	19	18	19	18	31
17-Jan	23	17	17	23	22	48	35	26	35	17	17	18	21	23	26	29	45	41	31	22	37	46	24	13	48
18-Jan	8	67	62	85	44	73	29	12	35	53	53	68	68	34	32	26	19	21	22	23	21	26	31	30	85
19-Jan	42	21	76	33	72	23	25	21	24	26	28	33	34	35	37	35	32	31	28	33	39	83	17	24	83
20-Jan	26	26	20	15	24	16	15	18	15	15	16	16	14	13	16	55	87	20	27	23	31	23	36	28	87
21-Jan	44	53	38	76	69	48	24	24	28	24	26	36	36	41	43	43	43	50	27	79	74	40	23	18	79
22-Jan	21	22	15	17	16	14	16	16	20	14	16	16	16	17	16	16	14	21	17	12	15	13	26	19	26
23-Jan	16	15	13	12	13	13	16	20	68	28	24	18	20	20	22	20	26	48	61	31	31	27	41	36	68
24-Jan	69	49	40	24	25	27	30	33	42	45	44	46	33	34	34	36	50	33	30	AF	62	22	11	20	69
25-Jan	59	52	8	5	40	16	22	47	66	28	38	38	37	35	39	38	40	32	30	24	24	29	33	29	66
26-Jan	32	32	31	30	30	29	35	31	35	34	39	79	31	20	24	22	27	88	19	51	59	32	47	39	88
27-Jan	67	42	39	27	41	55	39	32	20	16	16	12	12	15	14	15	14	12	14	15	16	15	15	19	67
28-Jan	15	16	17	14	20	15	21	13	15	25	26	17	33	31	29	30	24	27	40	37	34	42	35	21	42
29-Jan	14	15	65	9	18	63	48	36	22	23	32	39	30	34	31	32	25	26	23	20	19	14	18	20	65
30-Jan	22	16	17	16	15	19	27	35	30	37	44	29	26	21	33	27	19	17	19	23	61	32	20	13	61
31-Jan	21	17	16	19	14	72	64	97	42	53	49	26	36	30	37	35	33	32	18	20	25	33	62	23	97
	69	90	76	85	82	73	82	97	68	80	67	84	102	82	43	59	87	88	91	79	83	83	62	91	
	Diurnal Maximum																								

AF - Analyzer Failure PF - Power Failure

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 16, 2014	Previous Calibration	December 10, 2013
Station Name	Bertha Ganter	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	12:20	End Time (MST)	16:10
Barometric Pressure	735 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11571008
Old Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	May 29th 2014
Old Gas Cert Reference	LL107923		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403
DACS voltage range	5000mV	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-689	-689
Analyzer Range (mv)	5000	5000	Lamp voltage	736	736
Calculated slope	0.998443	1.006090	Chamber temp	43.4	43.0
Calculated intercept	0.288087	-0.336516	Pressure	715.4	705.7
Analyzer Background	36.7	37.0	Flow (lpm)	0.500	0.496
Analyzer Coefficient	0.780	0.780	Intensity	35700	35700

Analyzer make	Thermo 43C	Analyzer serial #	50911

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0.0	0.0	0.9	NA
as found span	5500	81.5	755.7	751.3	1.006
calibrator zero	5500	0.0	0.0	0.9	NA
high point	5500	81.5	755.7	751.3	1.006
second point	5500	45.7	423.8	422.4	1.003
third point	5500	22.8	211.4	209.2	1.011
calibrator zero	5500	0.0	0.0	1.4	N/A
as left zero	5500	0.0	0.0	1.4	N/A
as left span	5500	81.5	755.7	761.6	0.992
				Average Correction Factor	1.007

Corrected As found	750.5	Previous response	754.3	% change	0.5%

Notes:

no adjustments required.

as found span used as high point.

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

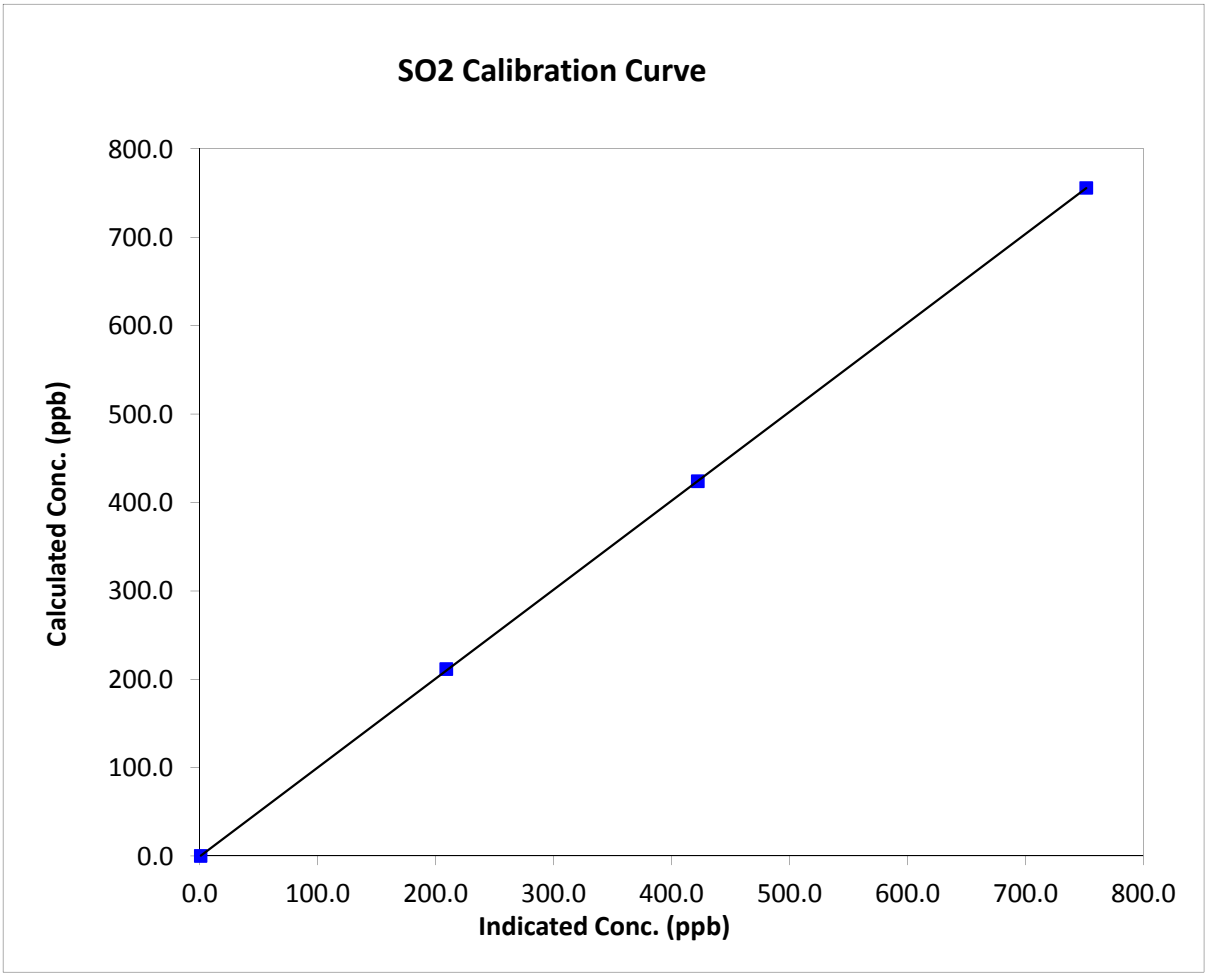
SO_2 Calibration Summary

Station Information

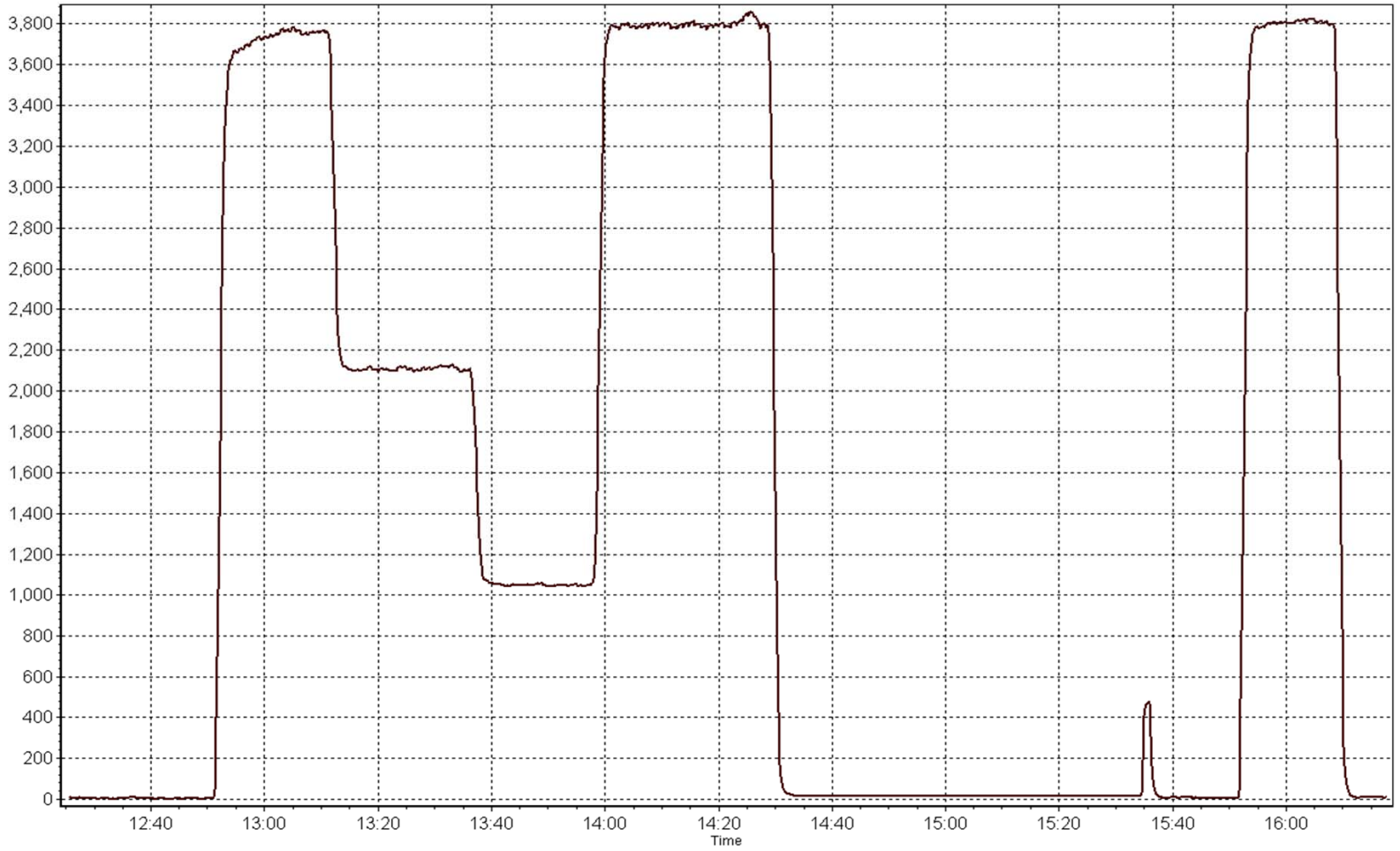
Calibration Date	Thursday, January 16, 2014	Previous Calibration	December 10, 2013
Station Name	Bertha Ganter	Station Number	AMS 1
Start Time (MST)	12:20	End Time (MST)	16:10
Analyzer make	Thermo 43C	Analyzer serial #	50911

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.9	N/A	Correlation Coefficient	0.999991
755.7	751.3	1.0058		
423.8	422.4	1.0031	Slope	1.006090
211.4	209.2	1.0106		
			Intercept	-0.336516



SO_2 Calibration Plot **Date:** January 16, 2014 AMS 01



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	Friday, January 17, 2014	Previous Calibration	Thursday, December 19, 2013
Station Name	Bertha Ganter	Station Number	AMS 1

Reason:	Routine	Install	Removal	Other:

Start Time (MST)	12:20	End Time (MST)	14:40
Barometric Pressure	735 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11571008
Cal Gas Concentration	10.6 ppm	Cal Gas Expiry Date	Dec 21 2012
Gas Cert Reference	LL27480	SO2 gas conc.	51.0 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403
DACS voltage range	5000	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-859	-859
Analyzer Range (mv)	5000	5000	Lamp voltage	1157	1165
Calculated slope	0.999763	1.011330	Chamber temp.	45.0	45.3
Calculated intercept	0.109876	-0.006279	Pressure	665	662
Analyzer Background	1.84	1.84	Flow (lpm)	0.418	0.417
Analyzer Coefficient	1.021	1.021	Intensity	80	80
			Converter temp.	800	800

Analyzer make/model	TEI 43i-TLE	Analyzer serial #	1218153461
Converter make/model	cdn-101	Converter serial #	305

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6500	0.00	0.0	0.01	N/A
as found span	6500	46.00	75.0	74.2	1.012
SO2 scrubber check 1	5500	22.80	211.4	0.53	N/A
calibrator zero	6500	0.00	0.0	0.01	N/A
high point	6500	46.00	75.0	74.2	1.012
second point	6500	24.60	40.1	39.7	1.010
third point	6500	12.30	20.1	19.8	1.013
calibrator zero	6500	0.00	0.0	0.1	N/A
as left zero	6500	0.00	0.0	0.1	N/A
as left span	6500	46.00	75.0	74.7	1.004
				Average Correction Factor	1.011

Corrected As found	74.2	Previous response	74.9	% change	1.0%

Notes:

No adjustments required. Used as found span as high point.

scrubber check performed between as found zero and span.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

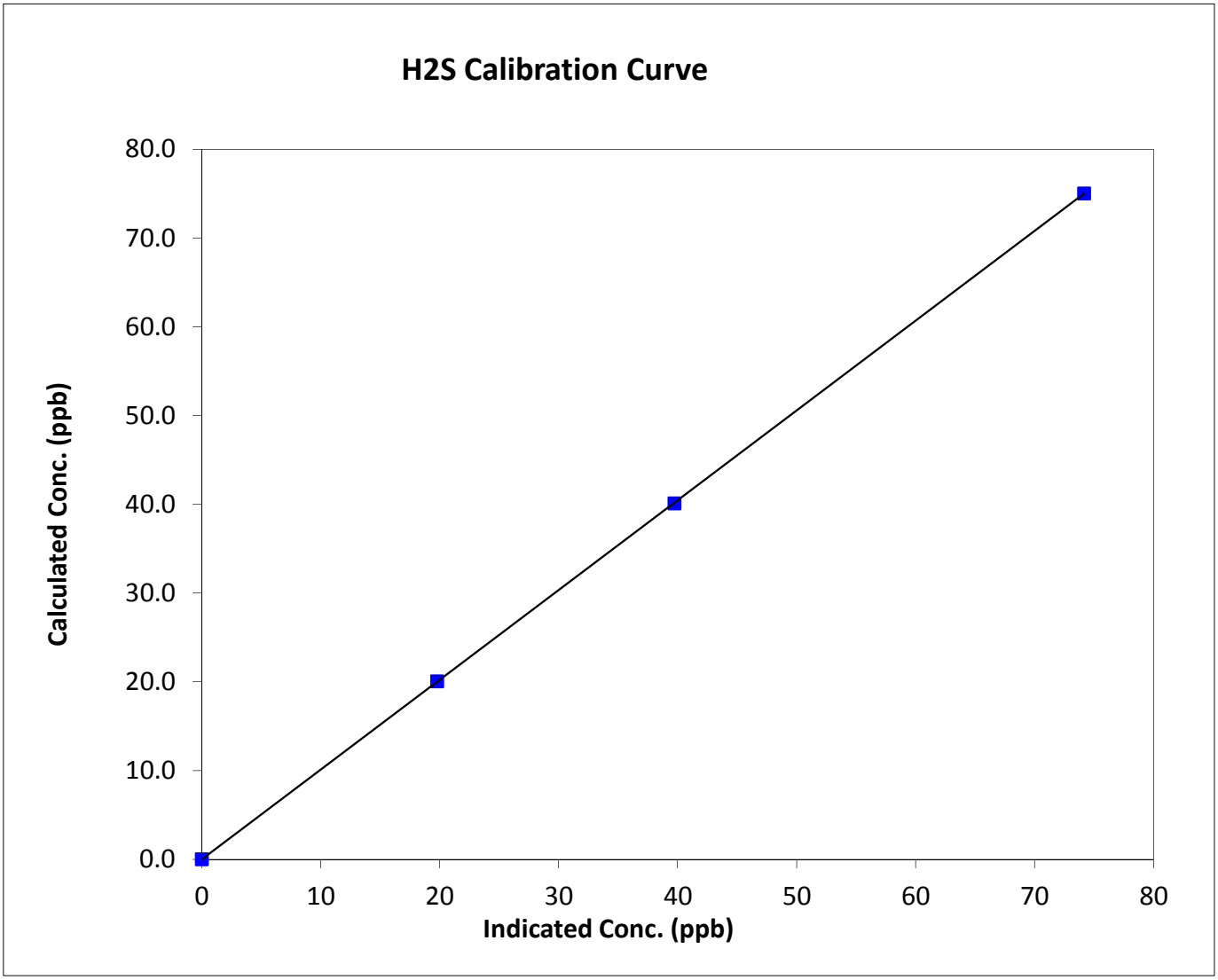
TRS Calibration Summary

Station Information

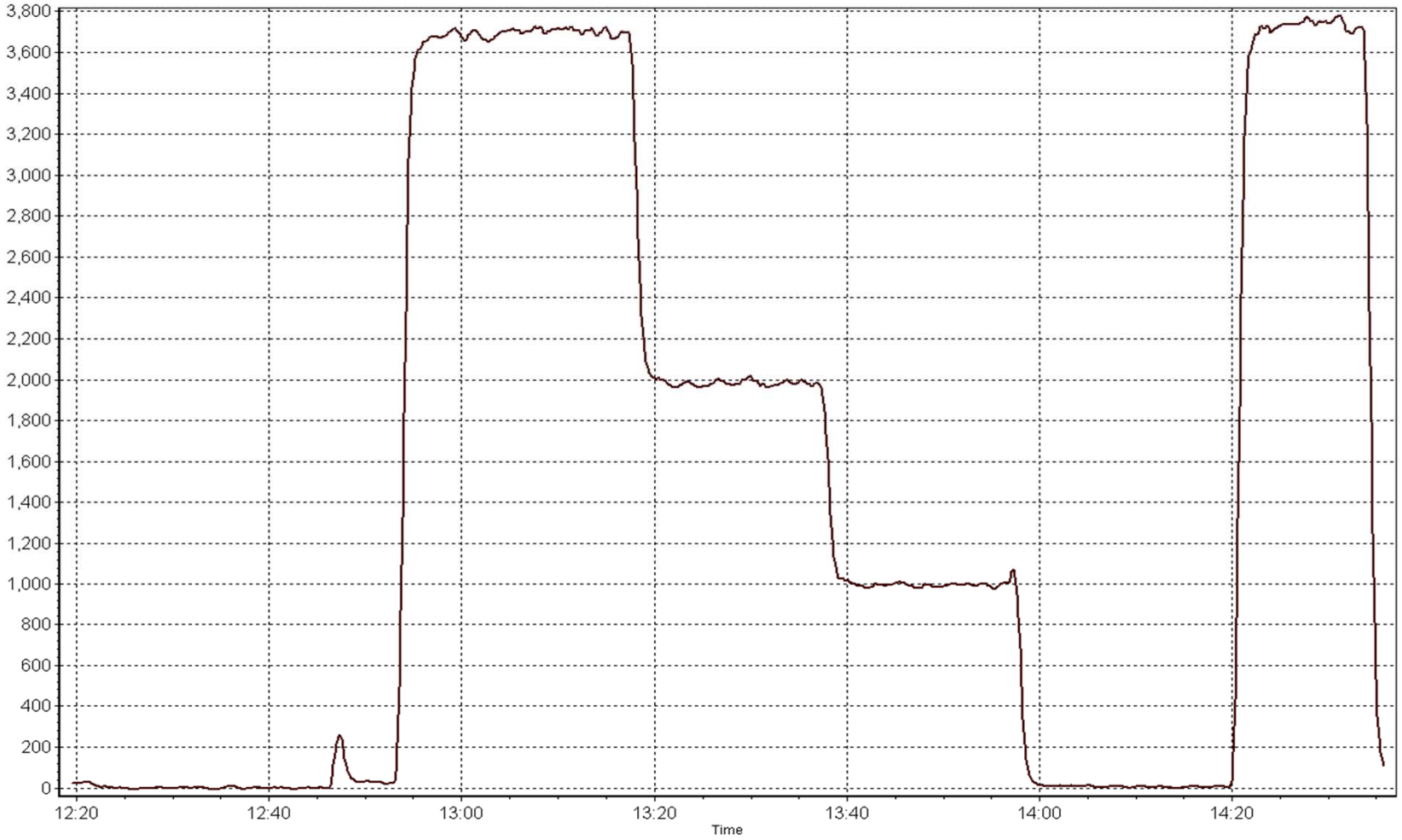
Calibration Date	Friday, January 17, 2014	Previous Calibration	December 19, 2013
Station Name	Bertha Ganter	Station Number	AMS 1
Start Time (MST)	12:20:00	End Time (MST)	14:40:00
Analyzer make	TEI 43i-TLE	Analyzer serial #	1218153461

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999998
75.0	74.2	1.0115		
40.1	39.7	1.0097	Slope	1.011330
20.1	19.8	1.0129		
			Intercept	-0.006279



Lcoation: AMS 01 Date: Oct 1 2012



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Thursday, January 16, 2014	Previous Calibration	Tuesday, December 10, 2013
Station Name	Bertha Ganter	Station Number	1

Reason:	Routine	Install	Removal	Other:

Start Time (MST)	12:20	End Time (MST)	16:10
Barometric Pressure	735 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11571008
Gas Cert Reference	LL107923	Cal Gas Expiry Date	May 29th 2014
CH4 Cal Gas Conc.	510.0 ppm	CH4 Equiv Conc.	1076.5 ppm
C3H8 Cal Gas Conc.	206.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	33.9	32.5
THC Range (mv)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Fuel Pressure	45.0	45.0
NMHC Range (mv)	50	50	Air Pressure	29.3	29.3
THC Calc slope	0.991132	1.007169	Carrier Pressure	34.6	34.6
THC Calc intercept	0.017784	0.002544			
NMHC Calc slope	0.988394	0.999569			
NMHC Calc intercept	0.007763	0.001665			

Analyzer make	TEC 55i	Analyzer serial #	1118148495

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0.0	0.00	0.00	NA
as found span	5500	81.5	15.95	15.84	1.007
calibrator zero	5500	0.0	0.00	0.00	NA
high point	5500	81.5	15.95	15.84	1.007
second point	5500	45.7	8.94	8.87	1.008
third point	5500	22.8	4.46	4.43	1.007
calibrator zero	5500	0.0	0.00	0.00	NA
as left zero	5500	0.0	0.00	0.00	N/A
as left span	5500	81.5	15.95	15.81	1.009
				Average Correction Factor	1.008

Corrected As found	15.84	Previous response	15.79	% change	-0.3%

Notes:

no adjustments required. Used as found span as high point.

changed inlet filter

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0	0.00	0.00	N/A
as found span	5500	81.5	8.39	8.40	0.999
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	8.39	8.40	0.999
second point	5500	45.7	4.71	4.70	1.002
third point	5500	22.8	2.35	2.35	0.999
calibrator zero	5500	0.0	0.00	0.00	N/A
as left zero	5500	0.0	0.00	0.00	N/A
as left span	5500	81.5	8.39	8.37	1.003
				Average Correction Factor	1.000

Corrected As found	8.40	Previous response	8.29	% change	-1.3%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0	0.00	0.00	N/A
as found span	5500	81.5	7.56	7.44	1.016
calibrator zero	5500	0.0	0.00	0.00	N/A
high point	5500	81.5	7.56	7.44	1.016
second point	5500	45.7	4.24	4.17	1.016
third point	5500	22.8	2.11	2.08	1.016
calibrator zero	5500	0.0	0.00	0.00	N/A
as left zero	5500	0.0	0.00	0.00	N/A
as left span	5500	81.5	7.56	7.44	1.016
				Average Correction Factor	1.016

Corrected As found	7.44	Previous response	7.50	% change	0.8%

Wood Buffalo Environmental Association

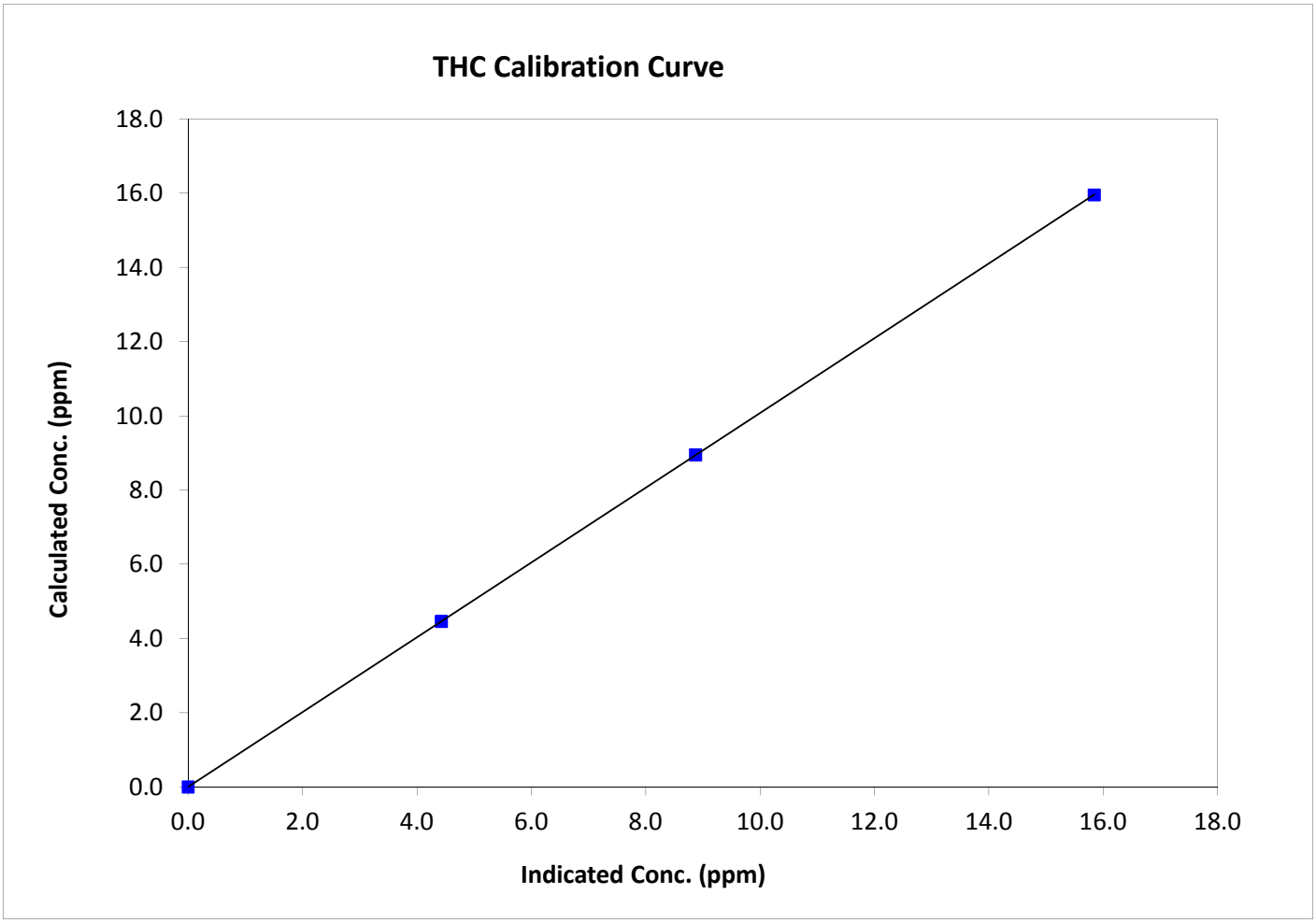
THC Calibration Summary

Station Information

Calibration Date	January 16, 2014	Previous Calibration	December 10, 2013
Station Name	Bertha Ganter	Station Number	1
Start Time (MST)	12:20	End Time (MST)	16:10
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999999
15.95	15.84	1.0071		
8.94	8.87	1.0084	Slope	1.007169
4.46	4.43	1.0074		
			Intercept	0.002544



Wood Buffalo Environmental Association

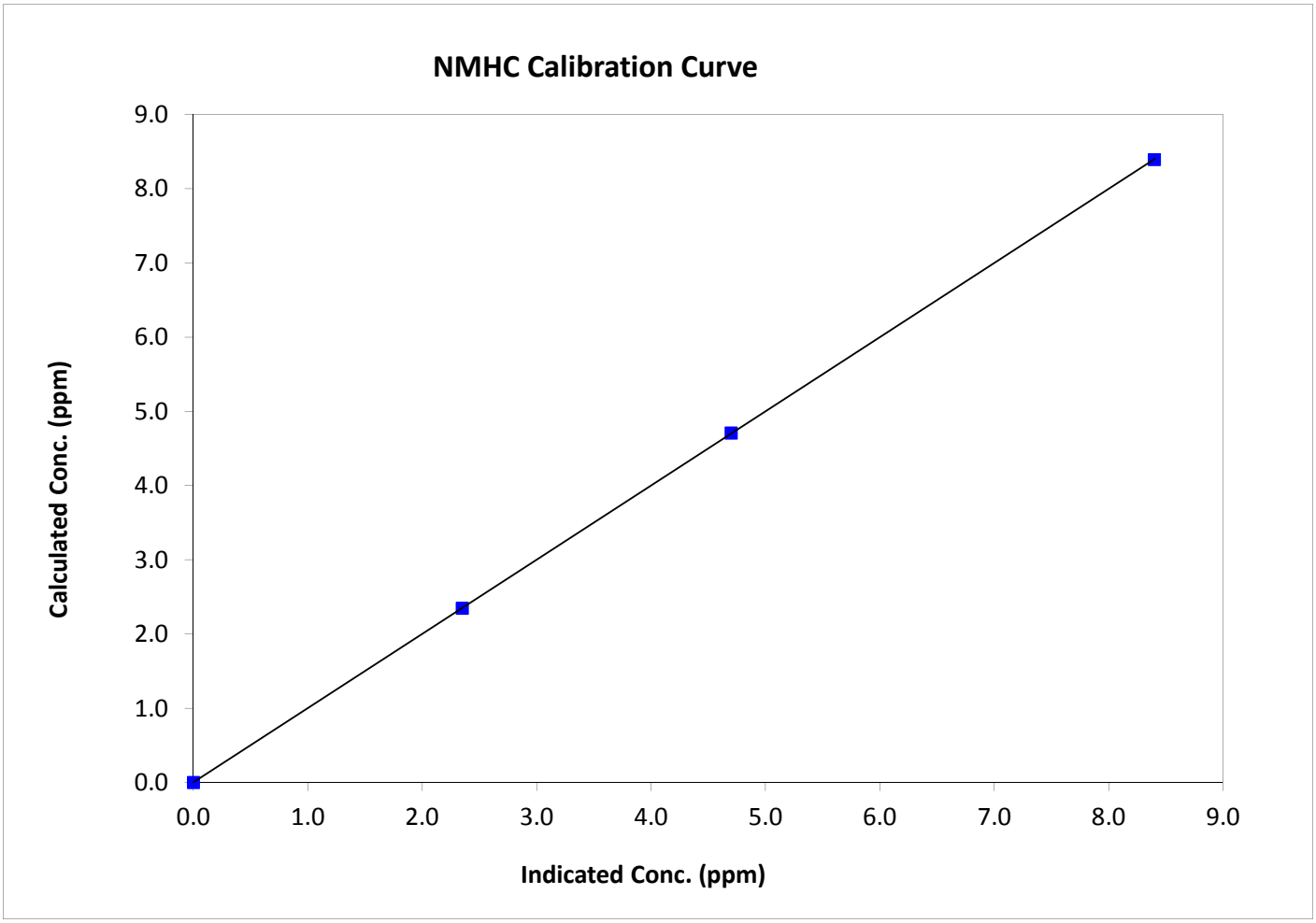
NMHC Calibration Summary

Station Information

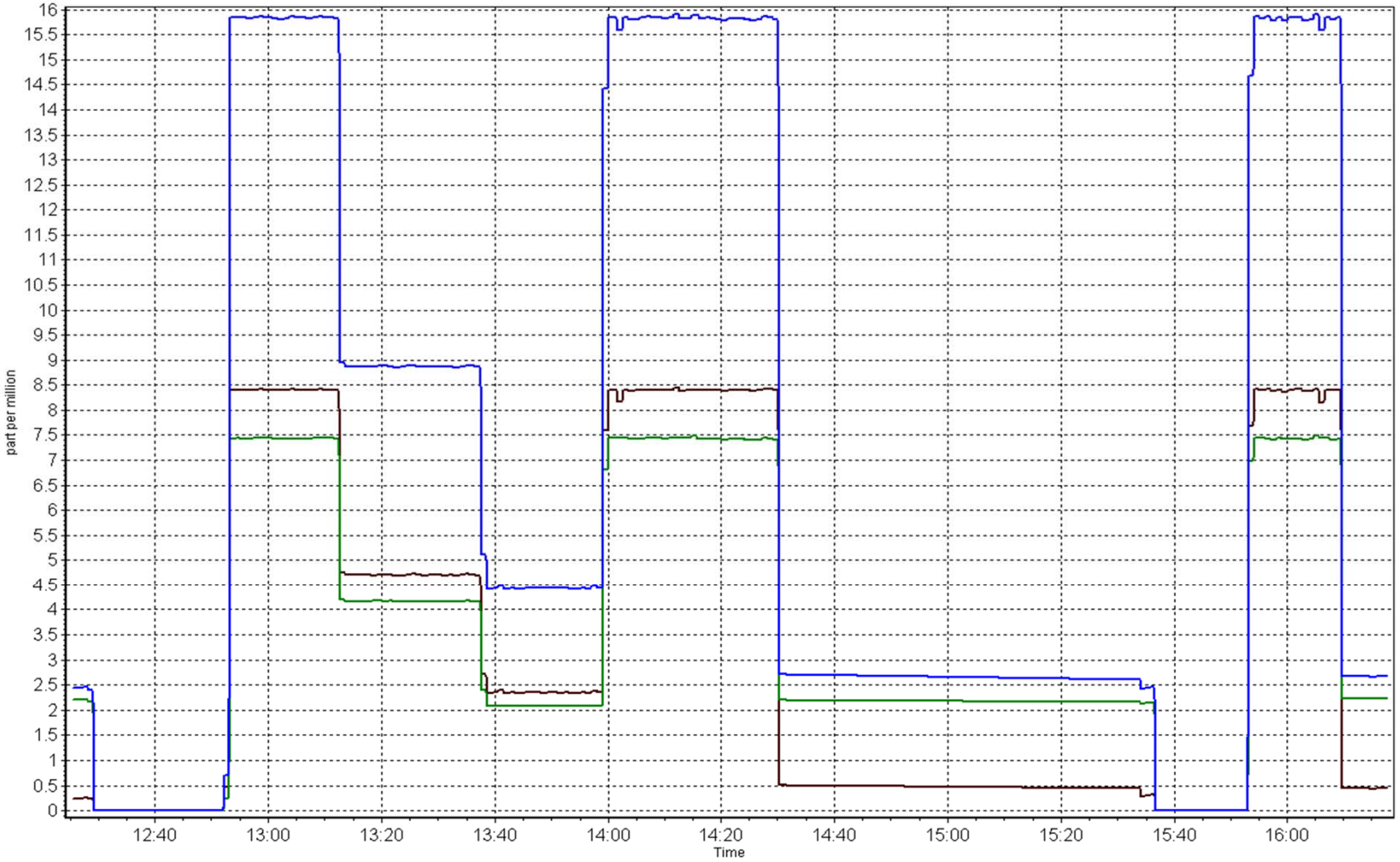
Calibration Date	January 16, 2014	Previous Calibration	December 10, 2013
Station Name	Bertha Ganter	Station Number	1
Start Time (MST)	12:20	End Time (MST)	16:10
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999998
8.39	8.40	0.9993		
4.71	4.70	1.0015	Slope	0.999569
2.35	2.35	0.9993		
			Intercept	0.001665



Date: Thursday, January 16, 2014 Location: AMS 01



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 17, 2014	Previous Calibration	December 10, 2013
Station Name	Bertha Ganter	Station Number	AMS 1
Reason:	Routine		
Start Time (MST)	10:00	End Time (MST)	13:00
Barometric Pressure	735 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11571008
NO2 calibration used	Thursday, January 16, 2014	Transfer Standard	na
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403
DACS voltage range	5000	DACS channel #	Diff 7

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	30.0	29.5
Analyzer Range (mv)	5000	5000	O3 Lamp temp.	71.5	71.5
Calculated slope	0.998354	1.003130	Bench Lamp temp	56.8	56.8
Calculated intercept	0.669573	-3.374803	Pressure	728.6	699.1
Analyzer Background	0.2	-1.6	Flow cell A	0.892	0.879
Analyzer Coefficient	1.106	1.127	Flow cell B	0.762	0.748
			Cell A Intensity	49460	50000
			Cell B Intensity	54350	55000

Analyzer make	Thermo 49C	Analyzer serial #	49C-60861-328

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Expected Concentration (ppb)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5500	0.00	0.0	-1.2	N/A
as found span	5000	0.982	380.9	392.5	0.971
calibrator zero	5500	0.00	0.0	0.8	N/A
high point	5000	1.095	380.9	381.2	0.999
second point	5000	0.602	188.0	193.7	0.970
third point	5000	0.348	98.1	102.6	0.956
calibrator zero	5500	0.00	0.0	1.9	N/A
as left zero	NA	0.00	0.0	1.9	N/A
as left span	NA	Level 1	NA	266.3	NA
				Average Correction Factor	0.975

Corrected As found	393.6	Previous response	379.6	% change	-3.6%

Notes:

adjusted zero and span

changed inlet filter

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

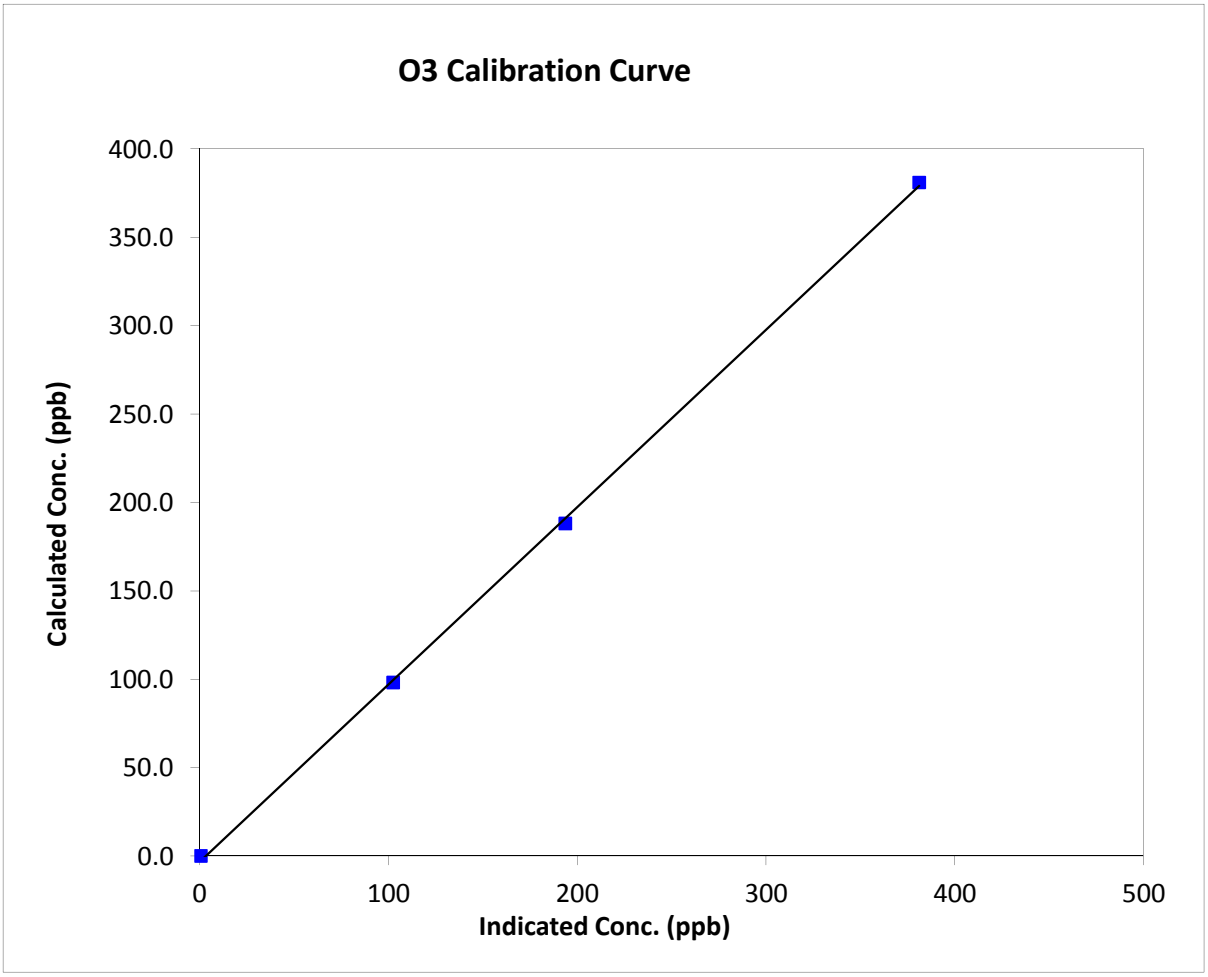
O_3 Calibration Summary

Station Information

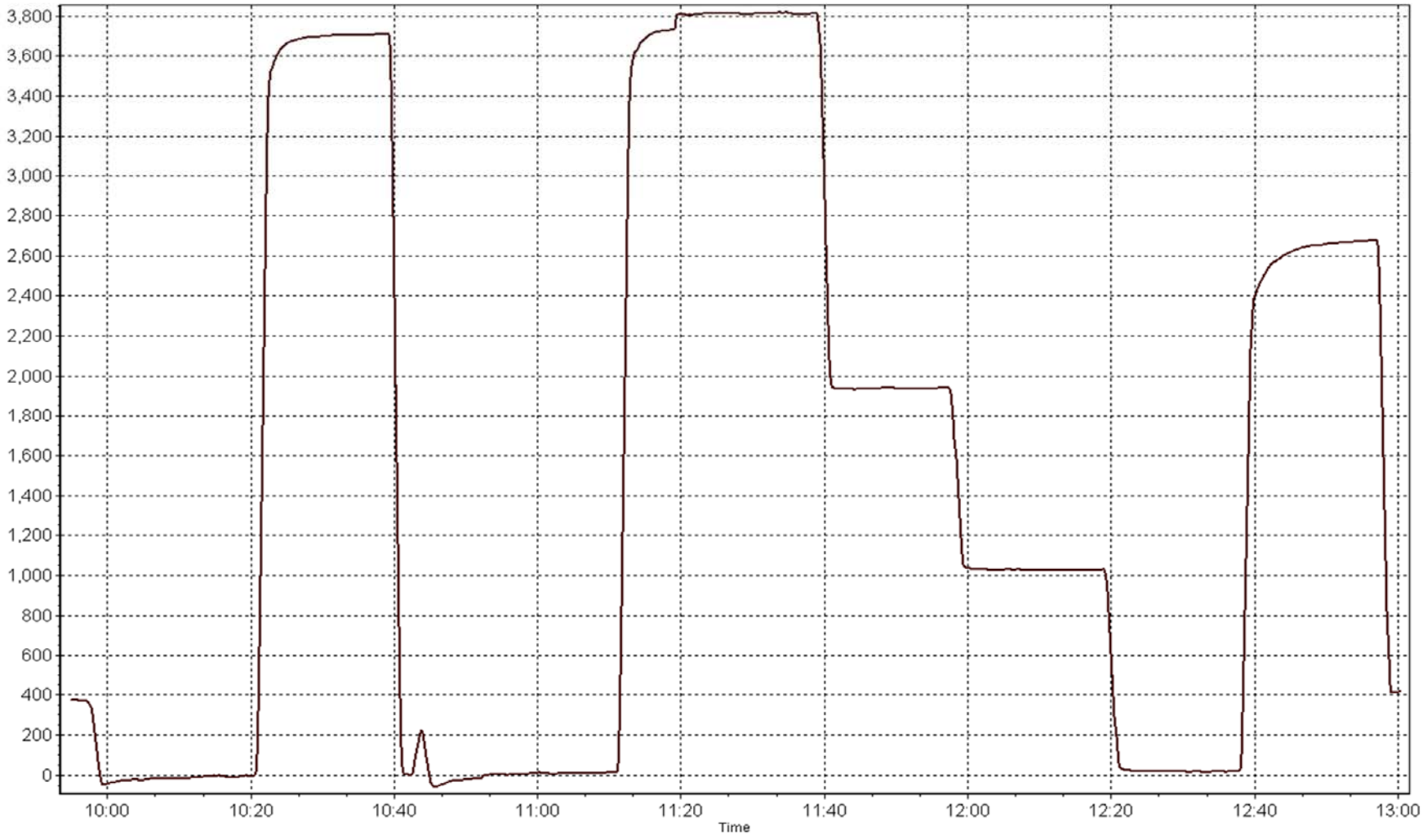
Calibration Date	Friday, January 17, 2014	Previous Calibration	December 10, 2013
Station Name	Bertha Ganter	Station Number	AMS 1
Start Time (MST)	10:00	End Time (MST)	13:00
Analyzer make	Thermo 49C	Analyzer serial #	49C-60861-328

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.8	N/A	Correlation Coefficient	0.999735
380.9	381.2	0.9992		
188.0	193.7	0.9704	Slope	1.003130
98.1	102.6	0.9560		
			Intercept	-3.374803



O3 Calibration Plot **Date:** January 17, 2014 AMS 01



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 16, 2014	Previous Calibration	December 9, 2013
Station Name	Bertha Ganter	Station Number	AMS 1

Reason: Routine Other

Start Time (MST)	12:20	End Time (MST)	16:10
Barometric Pressure	735 mmHg	Station Temperature	23.0 Deg C
Calibrator	Sabio 4010	Serial Number	11571008
NO Cal Gas Conc	50.6 ppm	Cal Gas Expiry Date	May 29th 2014
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	LL107923

DACS Information

DACS make & model: Campbell Scientific CR3000 DACS serial No.: 2403

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	5000	5000	5000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.999513	0.998621	1.003768
	Data Offset	1.002461	1.414351	-1.002198
After	Data Slope	0.999960	0.996811	0.995353
	Data Offset	1.218611	0.783622	-2.766136
Channel #				
Voltage Range		0-5000mv	0-5000mv	0-5000mv

NOTE: Data aquired digitally

Analyzer Information

Analyzer make/model: Thermo 42i NO/NO2/NOx Analyzer Analyzer serial #: 1218153357

Test Point	before		after	
Concentration range	0 - 1000	ppb	0 - 1000	ppb
NO coefficient	0.866		0.866	
NOX coefficient	0.999		0.999	
NO2 coefficient	1.000		1.000	
NO bkgrnd	5.9		5.8	
NOX bkgrnd	6.5		6.5	
Chamber Temp	50.2	Deg C	50.3	Deg C
NO2 Converter Temp	326.0	Deg C	325.3	Deg C
Cooler Temp	-2.8	Deg C	-2.8	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	197.2	mmHg	200.1	mmHg
Sample Flow	0.484	ccm	0.491	ccm
PMT Voltage	-850.0	V	-850.0	V

Notes: no adjustments required. Used as found span as first high point.
changed inlet filter

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 16, 2014 Station Number: AMS 1

Calibration Data

Set Point	O3 Lamp Current	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction Factor
as found zero	N/A	5500	0.0	0.0	0.0	0.0	0.6	-0.1	0.7	NA	NA	NA
as found span	N/A	5500	81.5	749.8	749.8	0.0	752.5	749.4	3.0	0.996	1.001	NA
calibrator zero	N/A	5500	0.0	0.0	0.0	0.0	0.6	-0.1	0.7	NA	NA	NA
high point	N/A	5500	81.5	749.8	749.8	0.0	752.5	749.4	3.0	0.996	1.001	NA
second point	N/A	5500	45.7	420.4	420.4	0.0	419.7	418.3	1.5	1.002	1.005	NA
third point	N/A	5500	22.8	209.8	209.8	0.0	208.5	207.6	0.9	1.006	1.011	NA
									Average Correction Factor	1.001	1.005	N/A

Corrcted As found NO_X= 751.8 NO= 749.5 Percent Change NO_X= -0.4% NO= -0.3%

Previous Response NO_X= 748.4 NO= 747.4

GPT Calibration Data

Dilution Flow 5500 ccm Source Gas Flow 81.50 ccm

O3 Setpoint (ppb)	Ozone Lamp Current Setting	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero	N/A	N/A	N/A	0.0	0.6	-0.1	0.7	N/A	N/A	N/A	N/A
1st NO2	1.095	N/A	366.4	380.9	750.5	366.4	384.1	0.984	1.000	0.992	100.8%
2nd NO2	0.602	N/A	559.3	188.0	752.9	559.3	193.6	0.981	1.000	0.971	103.0%
3rd NO2	0.348	N/A	649.3	98.1	752.1	649.3	102.8	0.982	1.000	0.954	104.8%
4th NO2 (0)	na	747.4	N/A	1.0	748.3	747.4	1.0	0.987	1.000	N/A	N/A
						Average Correction Factor		0.984	1.000	0.972	102.9%

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

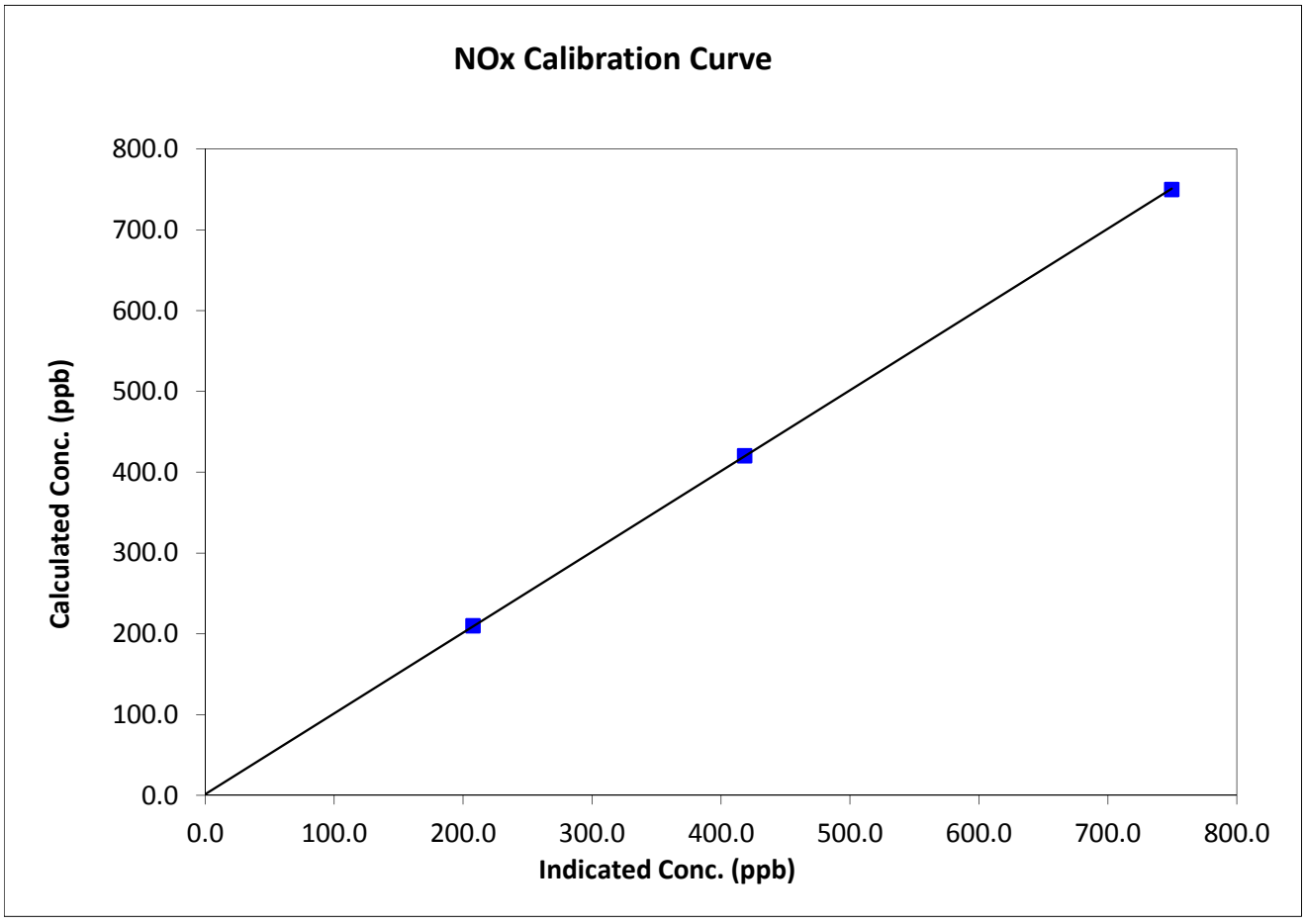
NO_X Calibration Summary

Station Information

Calibration Date	January 16, 2014	Previous Calibration	December 9, 2013
Station Number	Bertha Ganter	Station Number	AMS 1
Start Time (MST)	12:20	End Time (MST)	16:10
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999988
749.8	749.4	1.0005		
420.4	418.3	1.0052	Slope	0.999960
209.8	207.6	1.0105		
			Intercept	1.218611



Wood Buffalo Environmental Association

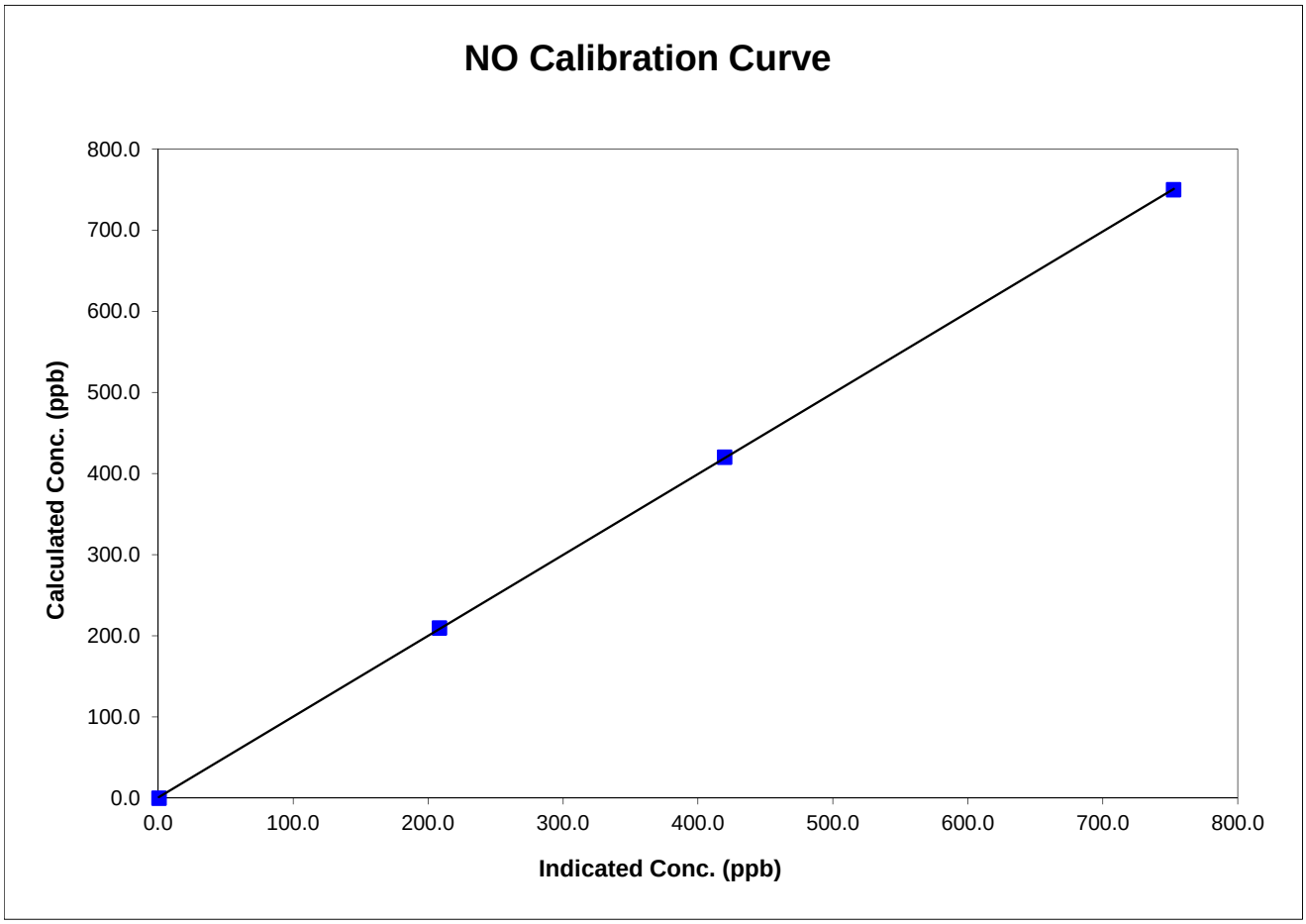
NO Calibration Summary

Station Information

Calibration Date	January 16, 2014	Previous Calibration	December 9, 2013
Station Number	Bertha Ganter	Station Number	AMS 1
Start Time (MST)	12:20	End Time (MST)	16:10
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.6	N/A	Correlation Coefficient	0.999980
749.8	752.5	0.9965		
420.4	419.7	1.0017	Slope	0.996811
209.8	208.5	1.0063		
			Intercept	0.783622



Wood Buffalo Environmental Association

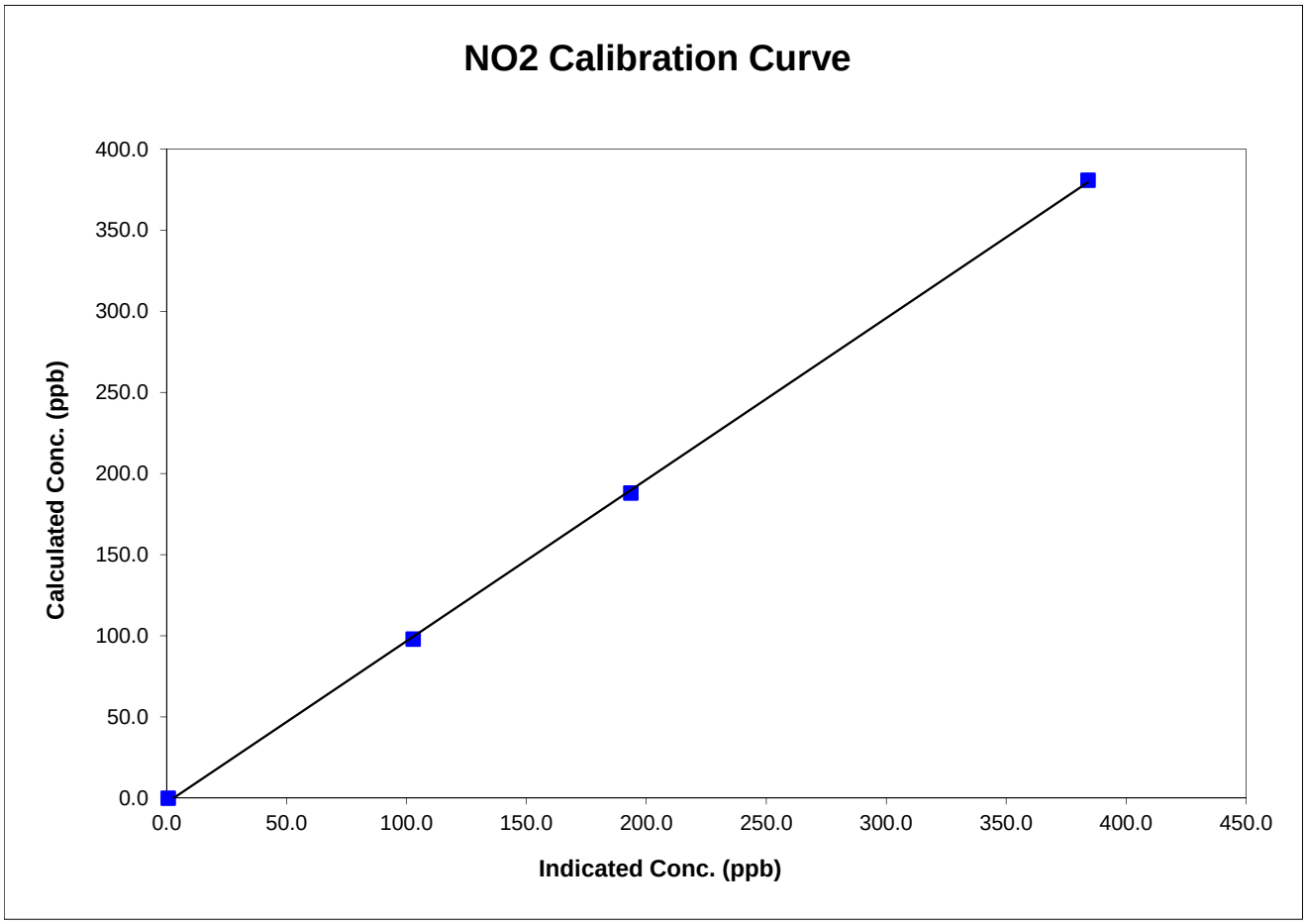
NO_2 Calibration Summary

Station Information

Calibration Date	January 16, 2014	Previous Calibration	December 9, 2013
Station Number	Bertha Ganter	Station Number	AMS 1
Start Time (MST)	12:20	End Time (MST)	16:10
Analyzer make	Thermo 42i NO/NO2/NOx Analyzer	Analyzer serial #	1218153357

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.7	N/A	Correlation Coefficient	0.999849
380.9	384.1	0.9917		
188.0	193.6	0.9711	Slope	0.995353
98.1	102.8	0.9541		
			Intercept	-2.766136

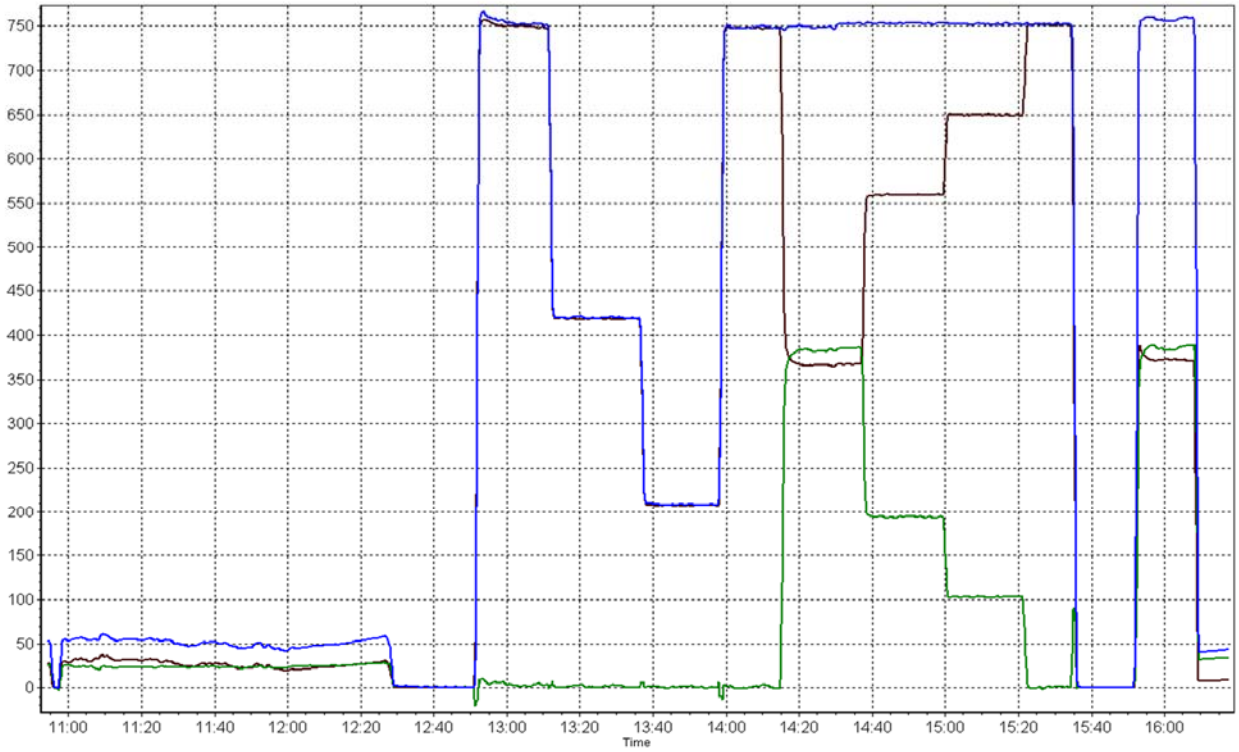


Wood Buffalo Environmental Association

Nox Calibration Plot

Calibration Date: January 16, 2014 **Start Time:** 12:20 **End Time:** 16:10

Station Name Bertha Ganter **Station Number:** AMS 1



Calibration Performed by: Mike Martineau

Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Name	Bertha Ganter	Station Number	1
Reason:	Removal		
Start Time (MST)	11:00	End Time (MST)	13:55
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	224632
NH3 Cal Gas Conc	192 ppm	Cal Gas Expiry Date	March 3rd 2012
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	LL156612

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.: 2403

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.994904	1.003496	0.993691
	Data Offset	11.501652	0.386576	8.799503
After	Data Slope	1.027437	1.010553	1.028413
	Data Offset	19.386876	9.170889	10.360366
Channel #		NA	7	6
Voltage Range		0-5000 mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model Thermo 17c — **Analyzer serial #** 92243695 — **Converter serial #** 622817829

Test Point	before		after	
Concentration range	0-2500	ppb	0-2500	ppb
Nt coefficient	1.066	ppb	1.066	ppb
NOX coefficient	1.084	ppb	1.084	ppb
NH3 coefficient	1.000		1.000	
NO coefficient	1.051		1.051	
NO2 coefficient	1.000	ppb	1.000	ppb
No bkgrnd	27.0		27.1	
Nt bkgrnd	34.9		35.1	
NOX bkgrnd	33.8		33.9	
NhH3 conv temp	838	DegC	839	Deg C
Chamber Temp	50.1	Deg C	49.6	Deg C
Moly Temp	323.0	Deg C	323.0	Deg C
PMT Temp	-8.4	Deg C	-8.4	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	143.3	mmHg	142.3	mmHg
PMT Voltage	-893.0	v	-893.0	v
Sample Flow 1 NO	459.0	ccm	426.0	ccm
Sample Flow 2 Nox	n/a	ccm	n/a	ccm
Sample Flow 3 Nt	n/a	ccm	n/a	ccm

Notes: Removal calibration for equipment upgrade.

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: January 13, 2014 Station Number: 1

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero	5500	0.0	0.0	0.0	0.0	-10.3	-9.1	-1.2	NA	NA
as found span	6500	67.7	1999.8	0.0	1999.8	742.2	734.0	8.3	2.694	0.004
calibrator zero	5500	0.0	0.0	0.0	0.0	-10.3	-9.1	-1.2	NA	NA
high NO point	5500	81.5	749.8	749.8	0.0	742.2	734.0	8.3	1.010	NA
NO/O3 point	5500	81.5	749.8	749.8	0.0	742.8	731.8	11.0	1.009	NA
High NH3 point	6500	67.7	1999.8	0.0	1999.8	1933.4	-7.1	1940.4	1.034	0.970
second NH3	6500	33.9	1001.4	0.0	1001.4	946.3	-7.7	954.0	1.058	0.953
third NH3	6500	16.9	499.2	0.0	499.2	462.0	-8.1	470.1	1.080	0.942
								Average Correction Factor	1.0180	0.9549

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

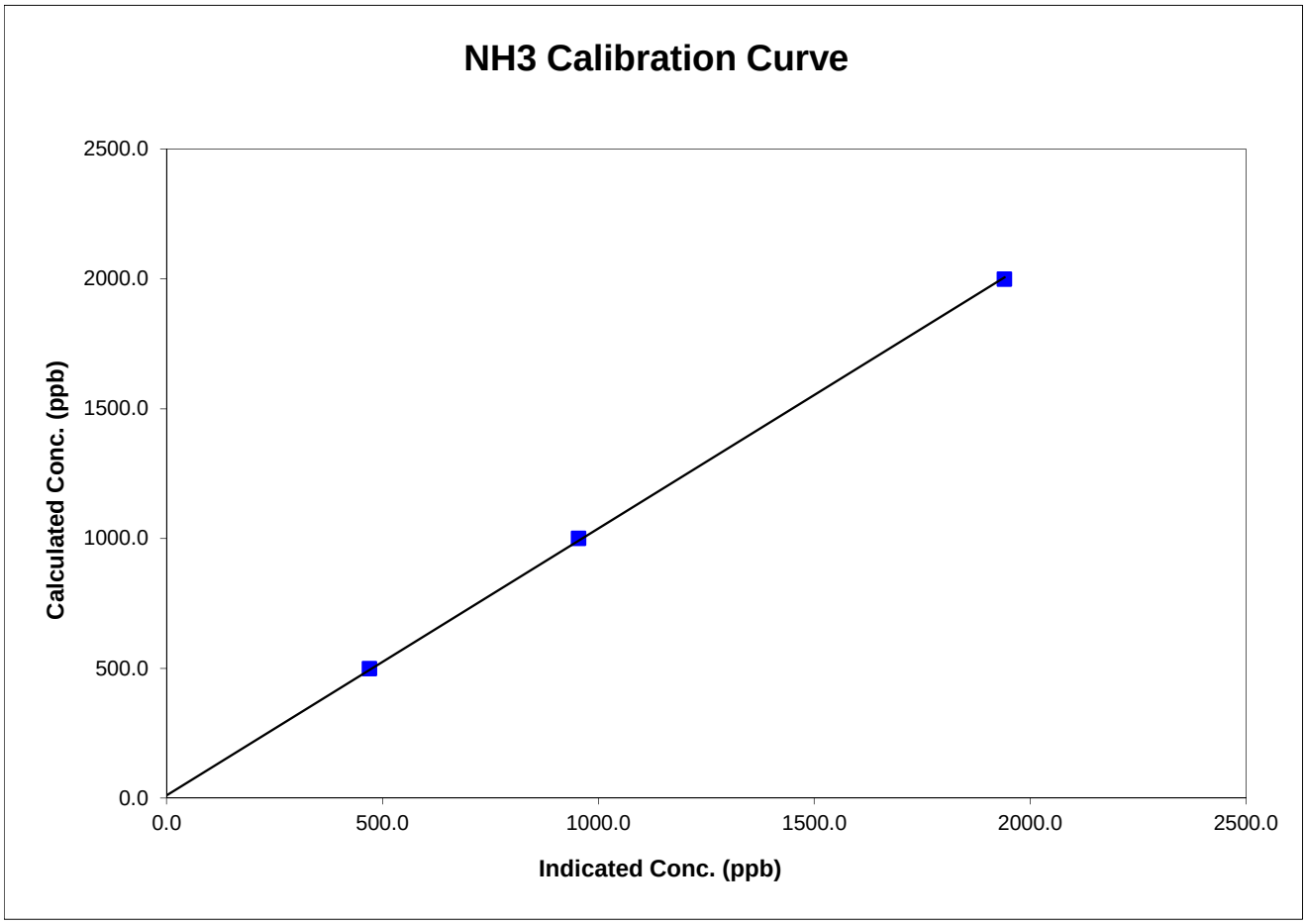
NH3 Calibration Summary

Station Information

Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	11:00	End Time (MST)	13:55
Analyzer make	Thermo 17c	Analyzer serial #	92243695

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.2	N/A	Correlation Coefficient	0.999887
1999.8	1940.4	1.0306		
1001.4	954.0	1.0496	Slope	1.028413
499.2	470.1	1.0619		
			Intercept	10.360366



Wood Buffalo Environmental Association

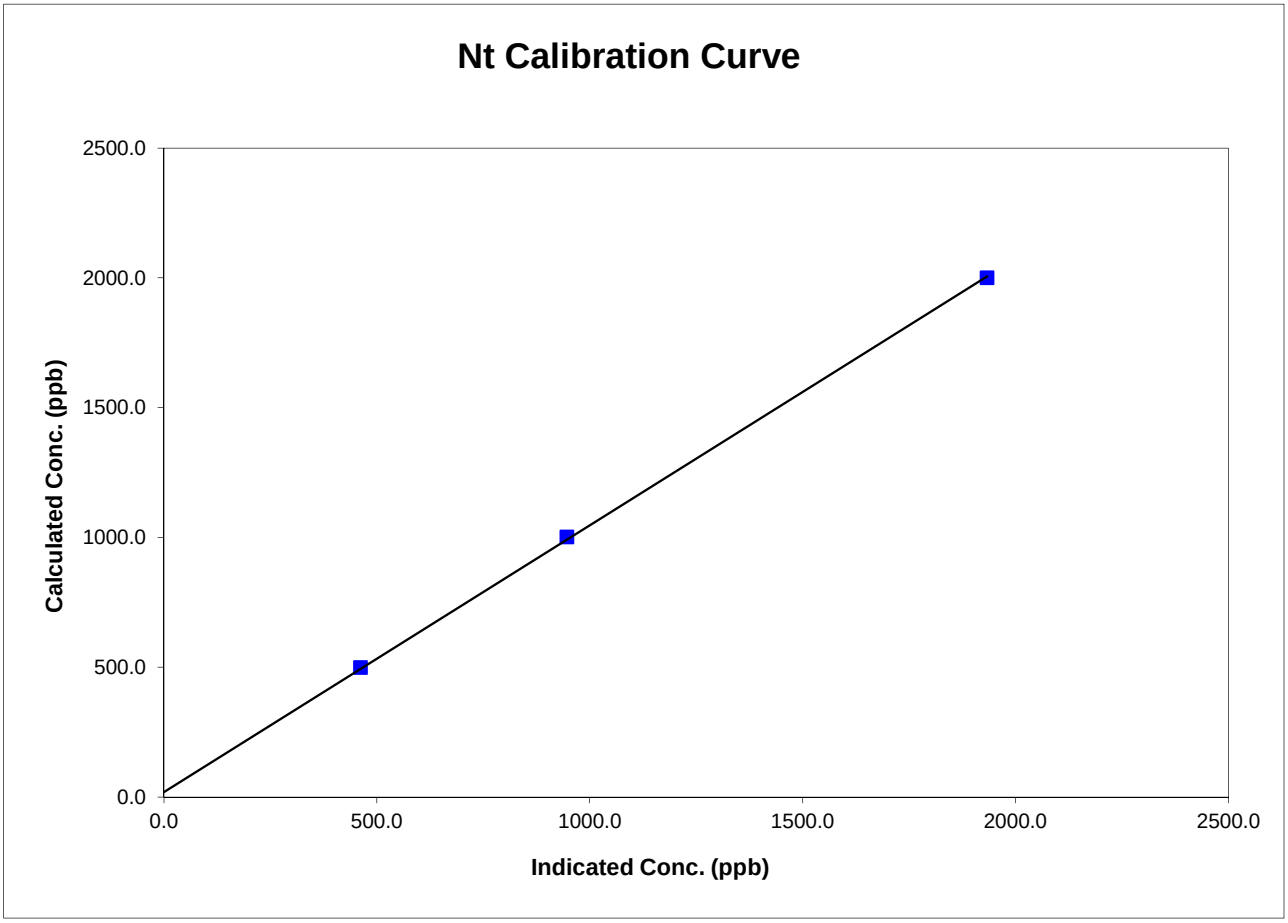
Nt Calibration Summary

Station Information

Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	11:00	End Time (MST)	13:55
Analyzer make	Thermo 17c	Analyzer serial #	92243695

Nt Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-10.3	N/A	Correlation Coefficient	0.999893
1999.8	1933.4	1.0343		
1001.4	946.3	1.0582	Slope	1.027437
499.2	462.0	1.0804		
			Intercept	19.386876



Wood Buffalo Environmental Association

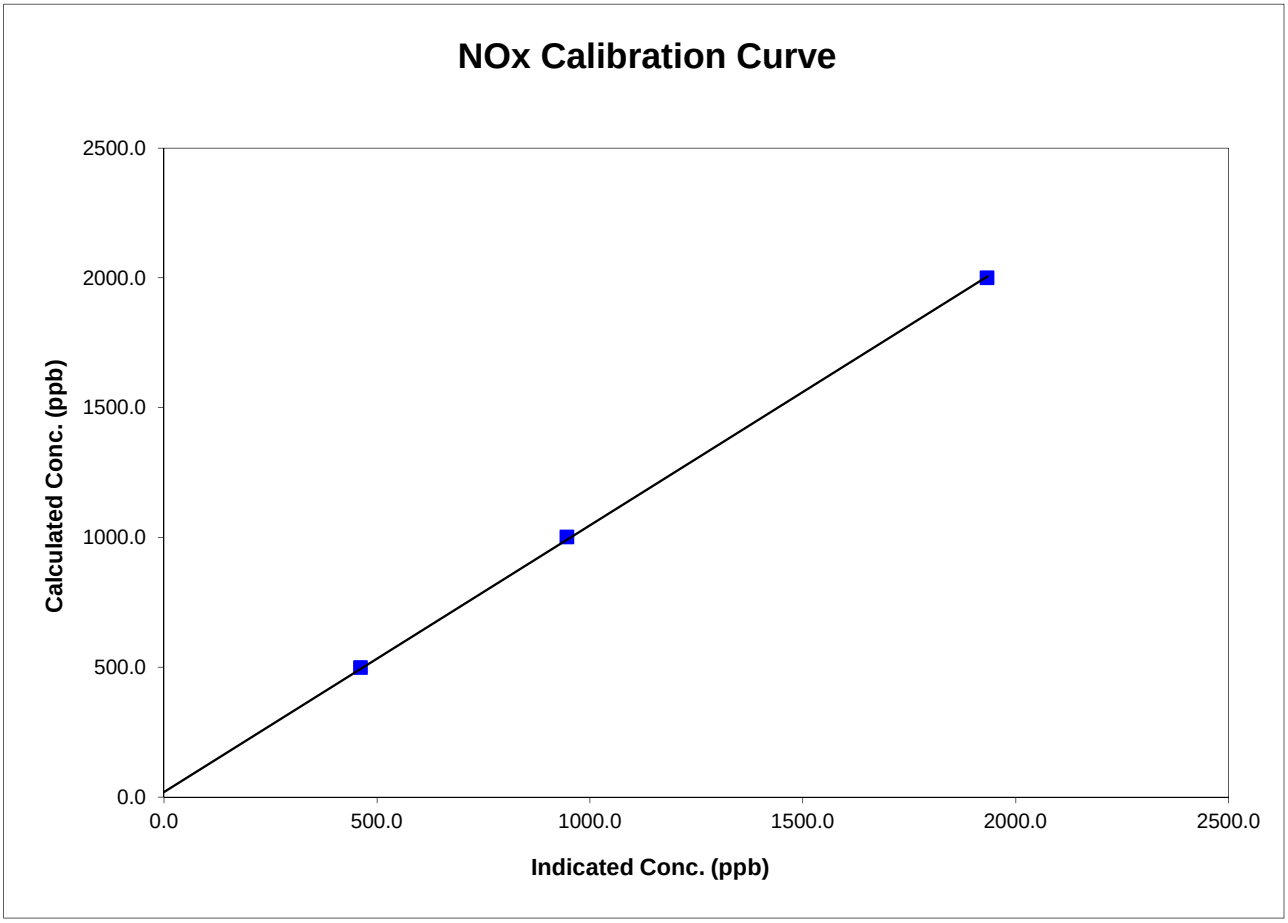
NOx Calibration Summary

Station Information

Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	11:00	End Time (MST)	13:55
Analyzer make	Thermo 17c	Analyzer serial #	92243695

Nt Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-9.1	N/A	Correlation Coefficient	0.999994
749.8	734.0	1.0216		
749.8	731.8	1.0246	Slope	1.010553
			Intercept	9.170889



Nt, NOx & NH_3 Calibration Plot **Date:** **January 13, 2014** #VALUE!

Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	January 14, 2014	Previous Calibration	n/a
Station Name	Bertha Ganter	Station Number	1
Reason:	Install		
Start Time (MST)	10:30	End Time (MST)	14:00
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	224632
NH3 Cal Gas Conc	192 ppm	Cal Gas Expiry Date	March 3rd 2012
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	LL156612

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.: 2403

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	NA	NA	NA
	Data Offset	NA	NA	NA
After	Data Slope	1.087014	1.001670	1.091355
	Data Offset	-3.335470	0.196978	-1.849981
Channel #		NA	7	6
Voltage Range		0-5000 mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model: **API T201** — **Analyzer serial #:** **152** — **Converter serial #:** **147**

Test Point	before		after	
Concentration range	NA	ppb	0-2500	ppb
Nt coefficient	NA	ppb	1.158	ppb
NOX coefficient	NA	ppb	1.159	ppb
NH3 coefficient	NA		1.000	
NO coefficient	NA		1.157	
NO2 coefficient	NA	ppb	1.000	ppb
No bkgrnd	NA		-1.6	
Nt bkgrnd	NA		-1.2	
NOX bkgrnd	NA		-1.7	
NhH3 conv temp	NA	DegC	825	Deg C
Chamber Temp	NA	Deg C	50.1	Deg C
Moly Temp	NA	Deg C	314.1	Deg C
PMT Temp	NA	Deg C	7.0	Deg C
O3 flow	NA	ccm	85.0	ccm
R Cell Press	NA	inHg	4.1	inHg
PMT Voltage	NA	v		v
Sample Flow 1 NO	NA	ccm	516.0	ccm
Sample Flow 2 Nox	NA	ccm	n/a	ccm
Sample Flow 3 Nt	NA	ccm	n/a	ccm

Notes: Installation calibration for equipment upgrade.
zero and span adjusted (Nox/Nt)

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: January 14, 2014 Station Number: 1

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero				0.0		-0.6	-0.2	-0.4	NA	NA
as found span				0.0		#VALUE!				#VALUE!
calibrator zero	5500	0.0	0.0	0.0	0.0	-0.6	-0.2	-0.4	NA	NA
high NO point	5500	81.5	749.8	749.8	0.0	749.7	748.8	0.9	1.000	NA
NO/O3 point	5500	81.5	749.8	749.8	0.0	748.5	747.9	0.6	1.002	NA
High NH3 point	6500	54.2	1601.0	0.0	1601.0	1475.2	5.5	1469.7	1.085	0.918
second NH3	6500	27.1	800.5	0.0	800.5	737.8	5.8	732.0	1.085	0.914
third NH3	6500	13.5	398.8	0.0	398.8	375.9	6.7	369.3	1.061	0.926
								Average Correction Factor	1.0290	0.9195

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

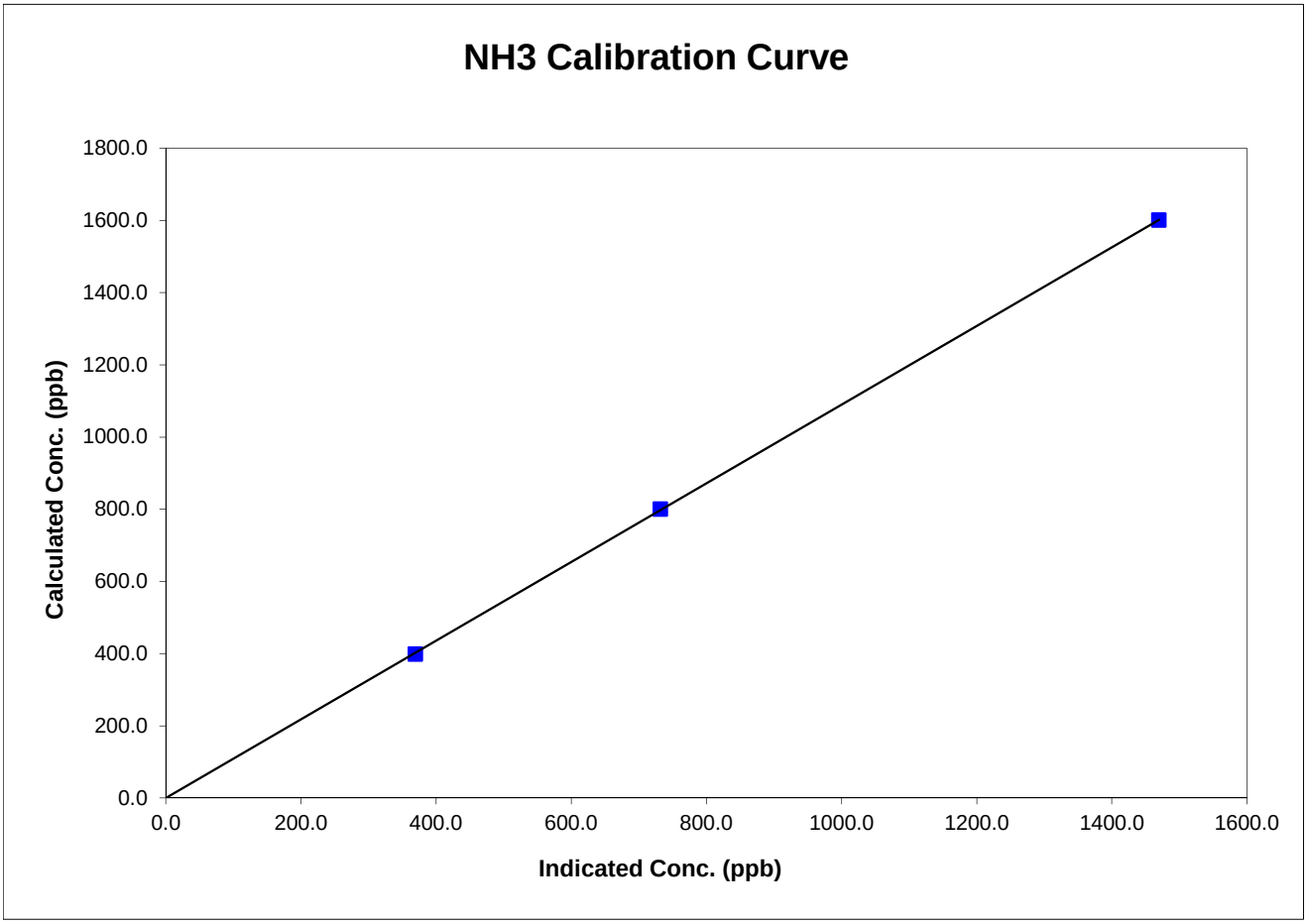
NH3 Calibration Summary

Station Information

Calibration Date	January 14, 2014	Previous Calibration	
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	10:30	End Time (MST)	14:00
Analyzer make	API T201	Analyzer serial #	152

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
	-0.4		Correlation Coefficient	0.999974
1601.0	1469.7	1.0893		
800.5	732.0	1.0936	Slope	1.091355
398.8	369.3	1.0799		
			Intercept	-1.849981



Wood Buffalo Environmental Association

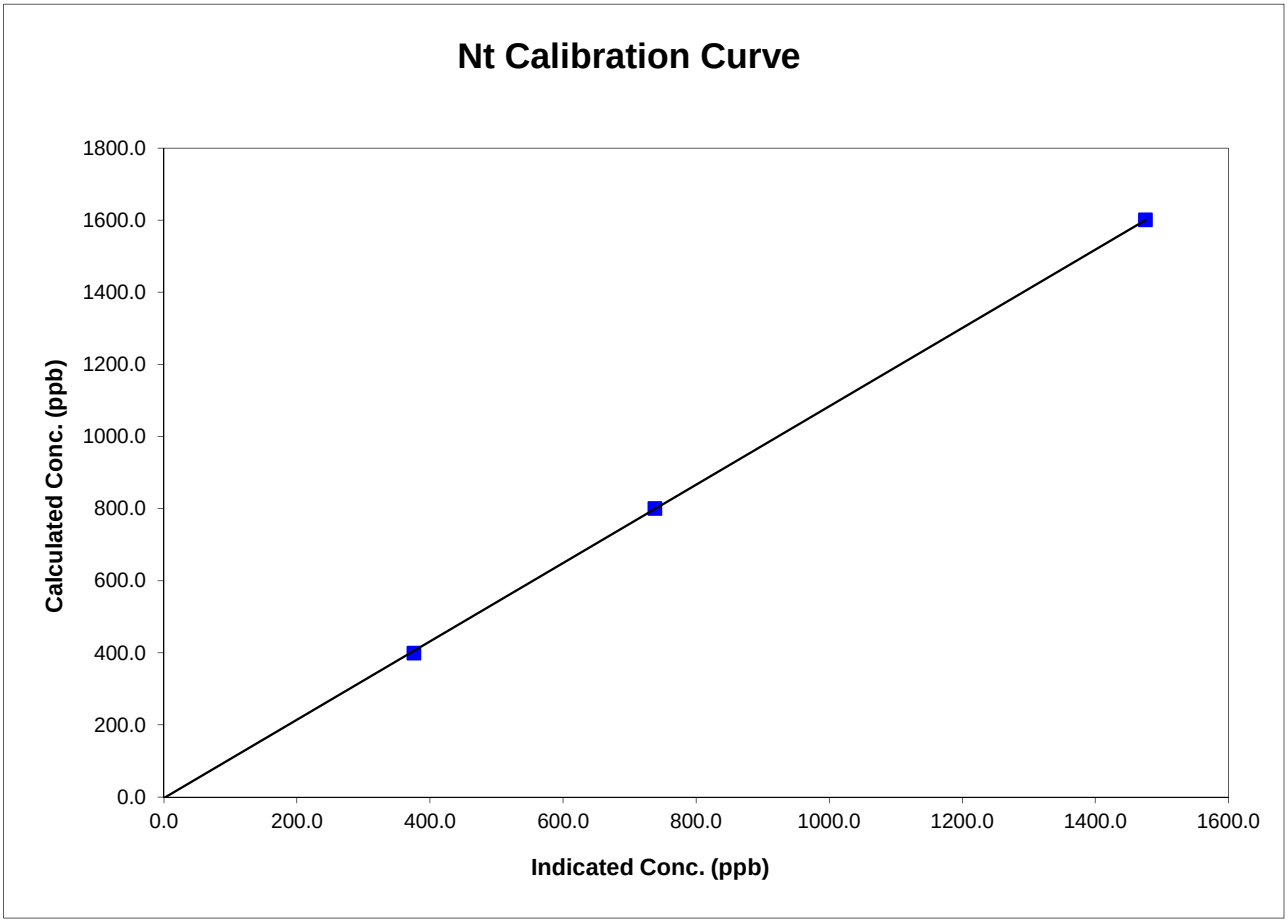
Nt Calibration Summary

Station Information

Calibration Date	January 14, 2014	Previous Calibration	
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	10:30	End Time (MST)	14:00
Analyzer make	API T201	Analyzer serial #	152

Nt Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999956
1601.0	1475.2	1.0853		
800.5	737.8	1.0850	Slope	1.087014
398.8	375.9	1.0608		
			Intercept	-3.335470



Wood Buffalo Environmental Association

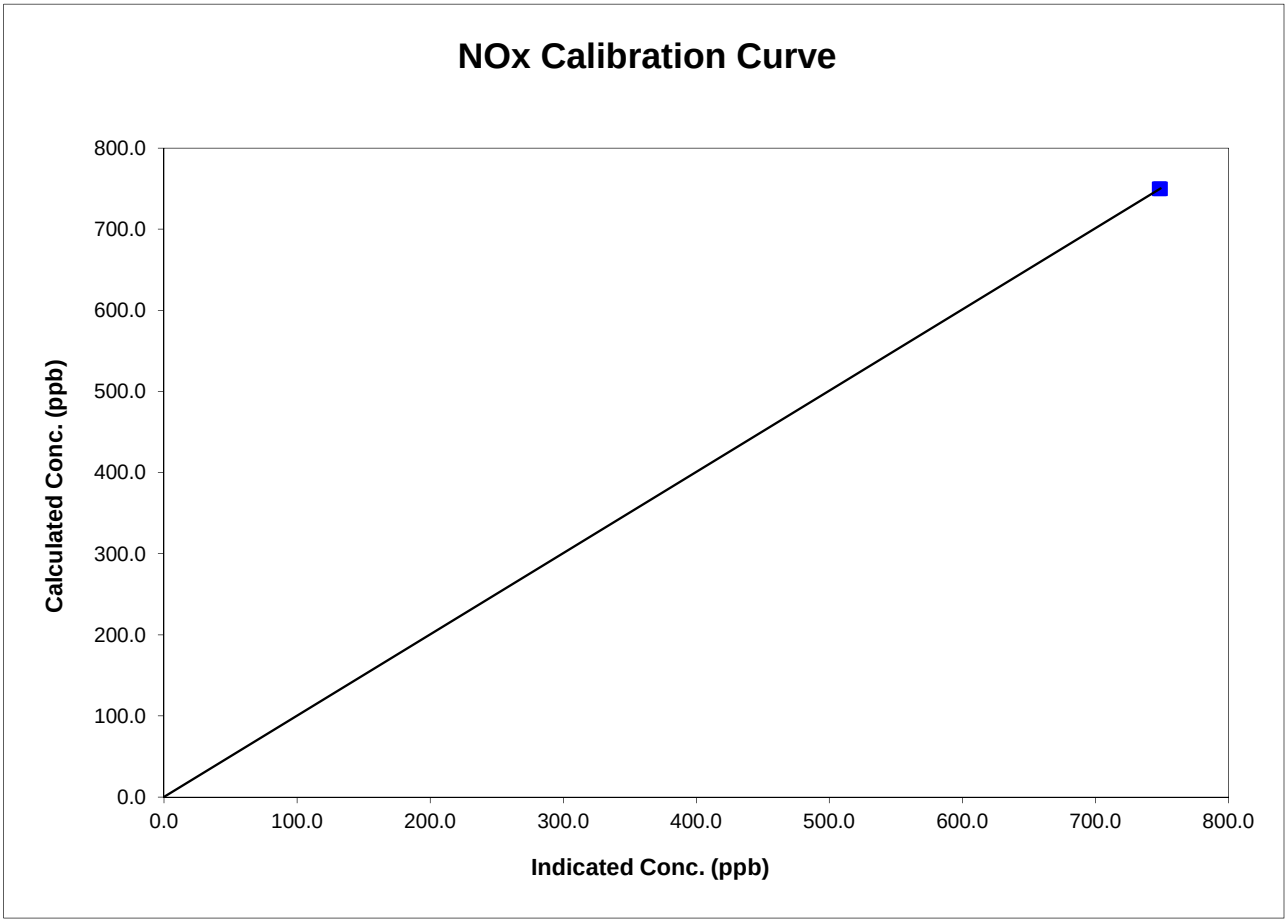
NOx Calibration Summary

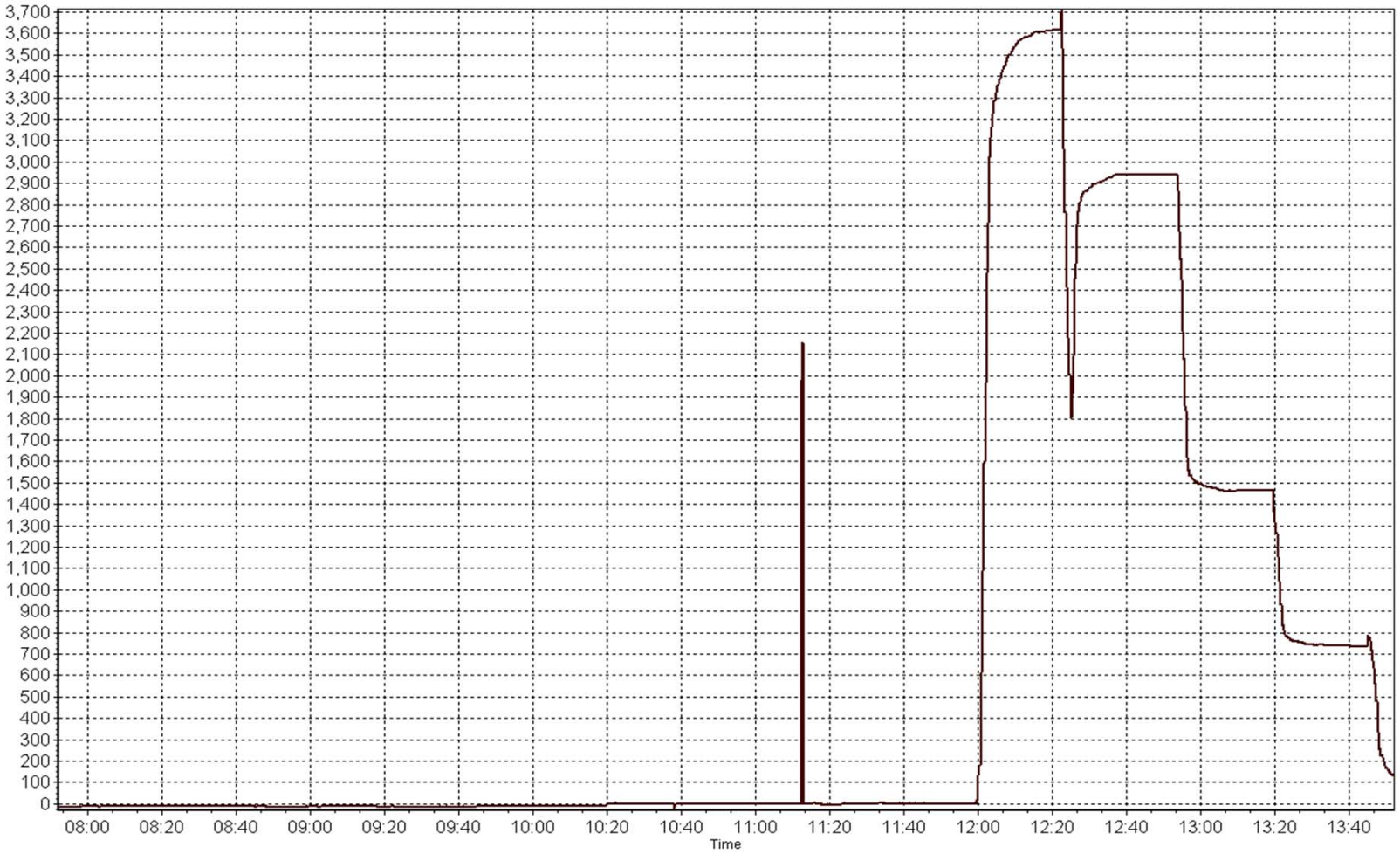
Station Information

Calibration Date	January 14, 2014	Previous Calibration	
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	10:30	End Time (MST)	14:00
Analyzer make	API T201	Analyzer serial #	152

Nt Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999999
749.8	748.8	1.0013		
749.8	747.9	1.0026	Slope	1.001670
			Intercept	0.196978

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Time

Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	January 16, 2014	Previous Calibration	January 14, 2014
Station Name	Bertha Ganter	Station Number	1
Reason:	Routine		
Start Time (MST)	11:00	End Time (MST)	14:00
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	224632
NH3 Cal Gas Conc	192 ppm	Cal Gas Expiry Date	March 3rd 2012
NOx Cal Gas Conc	50.6 ppm	Cal Gas Serial #	LL156612

DACS Information

DACS make & model: Campbell Scientific CR3000 — DACS serial No.: 2403

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	1.087014	1.001670	1.091355
	Data Offset	-3.335470	0.196978	-1.849981
After	Data Slope	NA	NA	0.984307
	Data Offset	NA	NA	1.210697
Channel #		NA	7	6
Voltage Range		0-5000 mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model **API T201** — **Analyzer serial #** **152** — **Converter serial #** **147**

Test Point	before		after	
Concentration range	0-2500	ppb	0-2500	ppb
Nt coefficient	1.158	ppb	1.158	ppb
NOX coefficient	1.159	ppb	1.159	ppb
NH3 coefficient	1.000		0.910	
NO coefficient	1.157		1.157	
NO2 coefficient	1.000	ppb	1.000	ppb
No bkgrnd	-1.6		-1.6	
Nt bkgrnd	-1.2		-1.2	
NOX bkgrnd	-1.7		-1.7	
NhH3 conv temp	825	DegC	825	Deg C
Chamber Temp	50.1	Deg C	50.1	Deg C
Moly Temp	314.1	Deg C	315.1	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	85.0	ccm	85.0	ccm
R Cell Press	4.1	inHg	4.0	inHg
HVPS		v	644.0	v
Sample Flow 1 NO	516.0	ccm	518.0	ccm
Sample Flow 2 Nox	n/a	ccm	n/a	ccm
Sample Flow 3 Nt	n/a	ccm	n/a	ccm

Notes: this is only to adjust NH3 converter efficiency factor.
NH3 span adjusted by changing NH3 converter efficiency factor to 0.91

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: January 16, 2014 Station Number: 1

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero	5500	0.0	0.0	0.0	0.0	-1.9	-0.7	-1.2	NA	NA
as found span	6500	67.7	1999.8	0.0	1999.8	1431.2	1.2	1430.0	1.397	0.715
calibrator zero	5500	0.0	0.0	0.0	0.0	-1.9	-0.7	-1.2	NA	NA
high NO point										NA
NO/O3 point										NA
High NH3 point	6500	54.2	1601.0	0.0	1601.0	1628.8	3.5	1625.3	0.983	1.015
second NH3										
third NH3										
								Average Correction Factor		

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

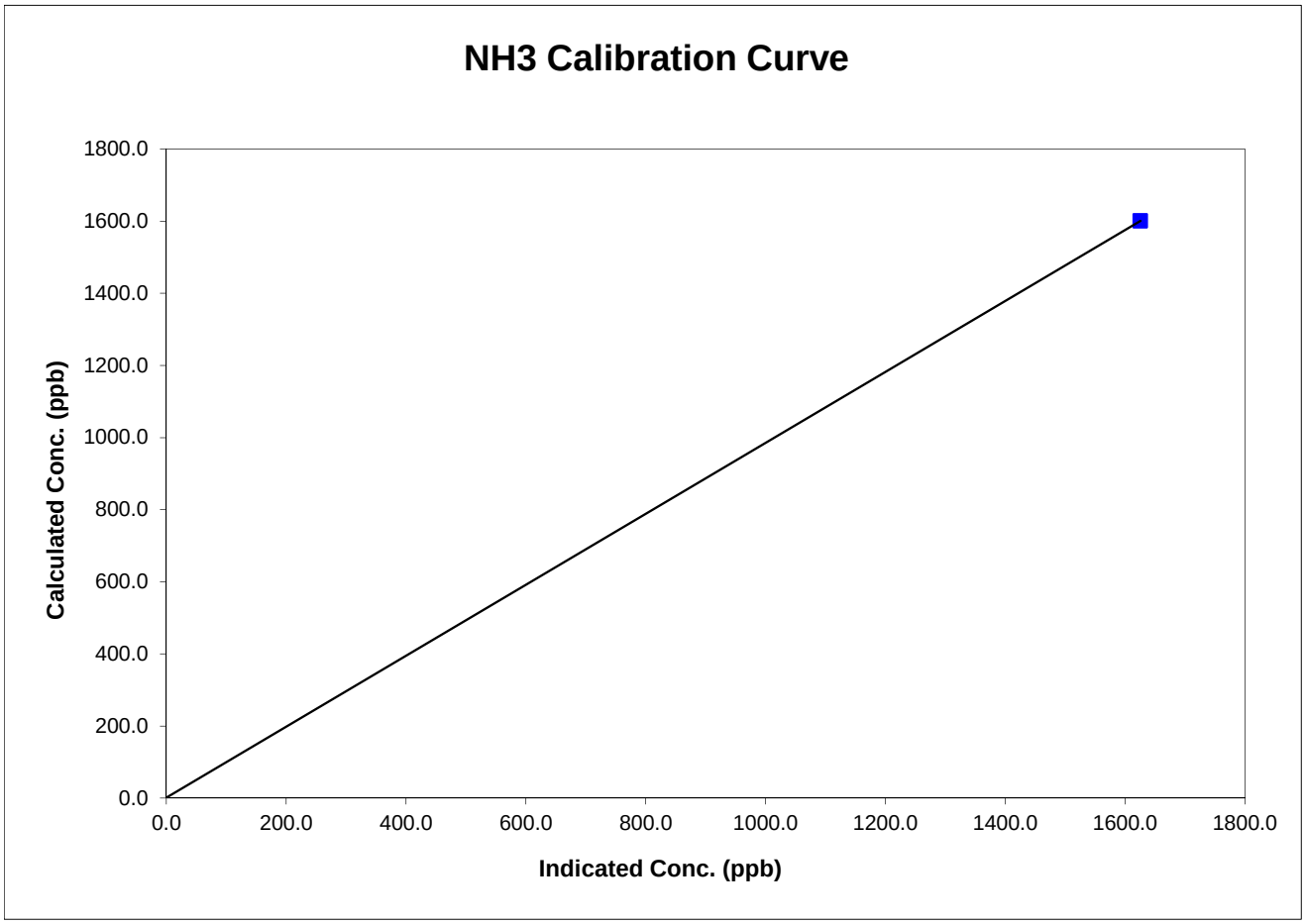
NH3 Calibration Summary

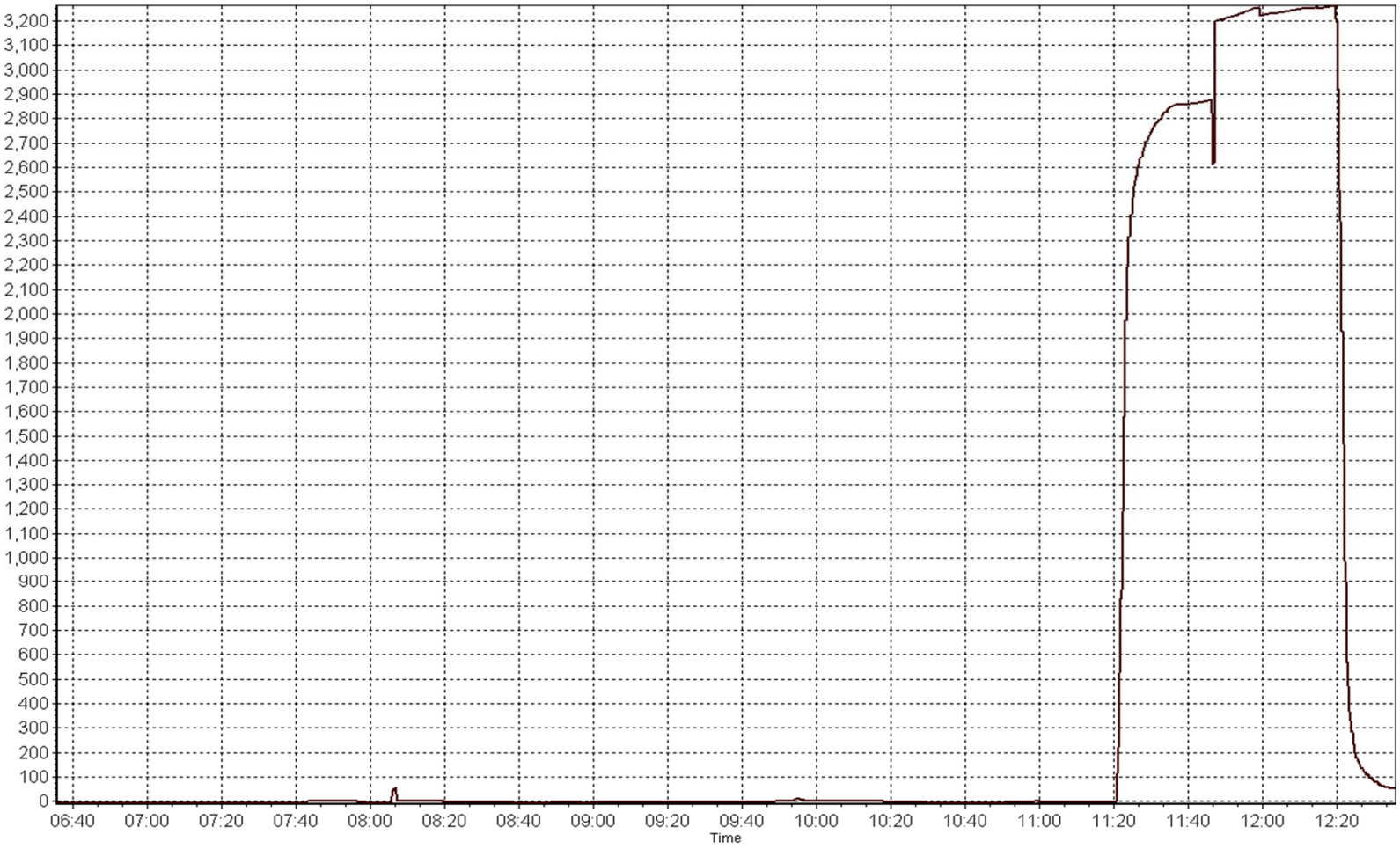
Station Information

Calibration Date	January 16, 2014	Previous Calibration	January 14, 2014
Station Number	Bertha Ganter	Station Number	1
Start Time (MST)	11:00	End Time (MST)	14:00
Analyzer make	API T201	Analyzer serial #	152

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.2	N/A	Correlation Coefficient	1.000000
1601.0	1625.3	0.9851		
			Slope	0.984307
			Intercept	1.210697

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 2
MILDRED LAKE
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
JANUARY 2014

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	707	36	37	99.87	33	0	5	0
H2S (ppb) Average	709	35	35	100.00	4	0	1	0
THC (ppm) Average	707	36	37	99.87	6.2	-	3.1	-
Temperature (C) Average	744	0	0	100.00	6.3	-	0.8	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	43	-	-	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	1.4	3	-	0	0	0	1	1	3	33
H2S (ppb) Average	709	0.5	0	-	0	0	0	0	1	1	4
THC (ppm) Average	707	2.43	0.5	-	1.9	2	2.1	2.2	2.6	3.1	6.2
Temperature 2 m (C) Average	744	-16.21	9.5	-	-36.1	-27.8	-23.2	-16.4	-10.3	-2.1	6.3
Wind Speed 10 m (km/h) Average	744	9.4	6	-	0	4	6	8	12	16	43
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS 2)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	09 Jan 2014 09:00	09 Jan 2014 09:00	1	Maintenance - remotely initiated daily QA check
THC	09 Jan 2014 09:00	09 Jan 2014 09:00	1	Maintenance - remotely initiated daily QA check

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 33 ppb on Jan 15 01:00 Maximum Daily Average: 5.2 ppb on Jan 17

Minimum Value: 0 ppb on Jan 11 23:00 Minimum Daily Average: 0.2 ppb on Jan 12
Maximum Diurnal Average: 28.2 ppb at hour 2 Minimum Diurnal Average: 0.7 ppb at hour 20
Monthly Average: 1.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 21$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	3	3	2	2	1	1	1	3	1	2	4	2	3	3	1	1	1	1	3	2	1	3	1.9	4
2-Jan	3	Z	10	21	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	2.8	21
3-Jan	0	Z	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0.4	1
4-Jan	1	Z	1	0	0	0	0	7	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	12
5-Jan	0	Z	0	0	0	0	0	0	1	0	1	2	1	1	4	2	1	1	1	1	1	1	1	1	0.8	4
6-Jan	1	Z	1	3	2	2	1	1	2	4	8	3	5	10	8	8	2	1	1	1	1	1	0	0	2.8	10
7-Jan	0	Z	0	0	0	1	1	2	1	1	C	C	C	C	C	2	2	1	2	1	0	0	1	0	0.9	2
8-Jan	1	Z	1	1	1	1	1	1	1	1	1	2	2	3	2	2	2	3	3	3	3	3	4	2	1.9	4
9-Jan	2	Z	3	2	1	1	1	1	M	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	3
10-Jan	1	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	0	0.6	2
11-Jan	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
12-Jan	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
13-Jan	0	Z	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
14-Jan	0	Z	1	1	1	2	2	3	7	4	2	5	2	2	2	1	1	2	2	1	2	2	1	1	2.1	7
15-Jan	33	28	Z	2	3	2	1	1	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	3.4	33
16-Jan	1	Z	0	1	6	3	1	2	2	1	1	4	2	4	4	1	1	1	1	1	1	2	4	2	2.0	6
17-Jan	2	Z	1	1	1	12	19	21	29	22	1	5	1	1	1	1	0	0	0	0	0	0	0	0	5.2	29
18-Jan	0	Z	1	1	1	0	0	0	0	0	1	1	2	3	1	1	1	0	1	0	0	0	0	0	0.7	3
19-Jan	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	Z	1	2	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	3	2	2	1	1	1.2	3
21-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	3	0.7	3
22-Jan	4	Z	4	4	3	1	1	1	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1.2	4
23-Jan	1	Z	1	1	1	1	1	1	16	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.8	16
24-Jan	1	Z	1	1	1	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0.6	1
25-Jan	1	Z	0	0	0	1	1	1	1	1	1	1	0	1	1	0	1	0	0	0	1	0	1	1	0.6	1
26-Jan	0	Z	1	0	0	0	0	0	0	1	0	0	1	3	3	5	8	8	4	2	1	1	1	2	1.9	8
27-Jan	2	Z	1	2	3	2	2	3	2	1	4	2	4	4	2	2	2	1	1	1	1	2	2	2	2.1	4
28-Jan	2	Z	5	2	1	1	1	1	1	1	2	2	1	2	1	1	1	1	1	0	1	1	0	0	1.3	5
29-Jan	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.4	1
30-Jan	1	Z	1	1	1	0	1	1	3	4	5	1	1	1	0	1	1	0	1	1	1	25	1	1	2.2	25
31-Jan	1	Z	1	0	0	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0.5	1
	2.0	28.2	1.3	1.6	1.1	1.3	1.4	1.8	3.0	2.0	1.3	1.3	1.2	1.5	1.3	1.2	1.0	1.0	0.9	0.7	0.8	1.6	0.8	0.9	Diurnal Average	
	33	28	10	21	6	12	19	21	29	22	8	5	5	10	8	8	8	8	4	3	3	25	4	3	Diurnal Maximum	

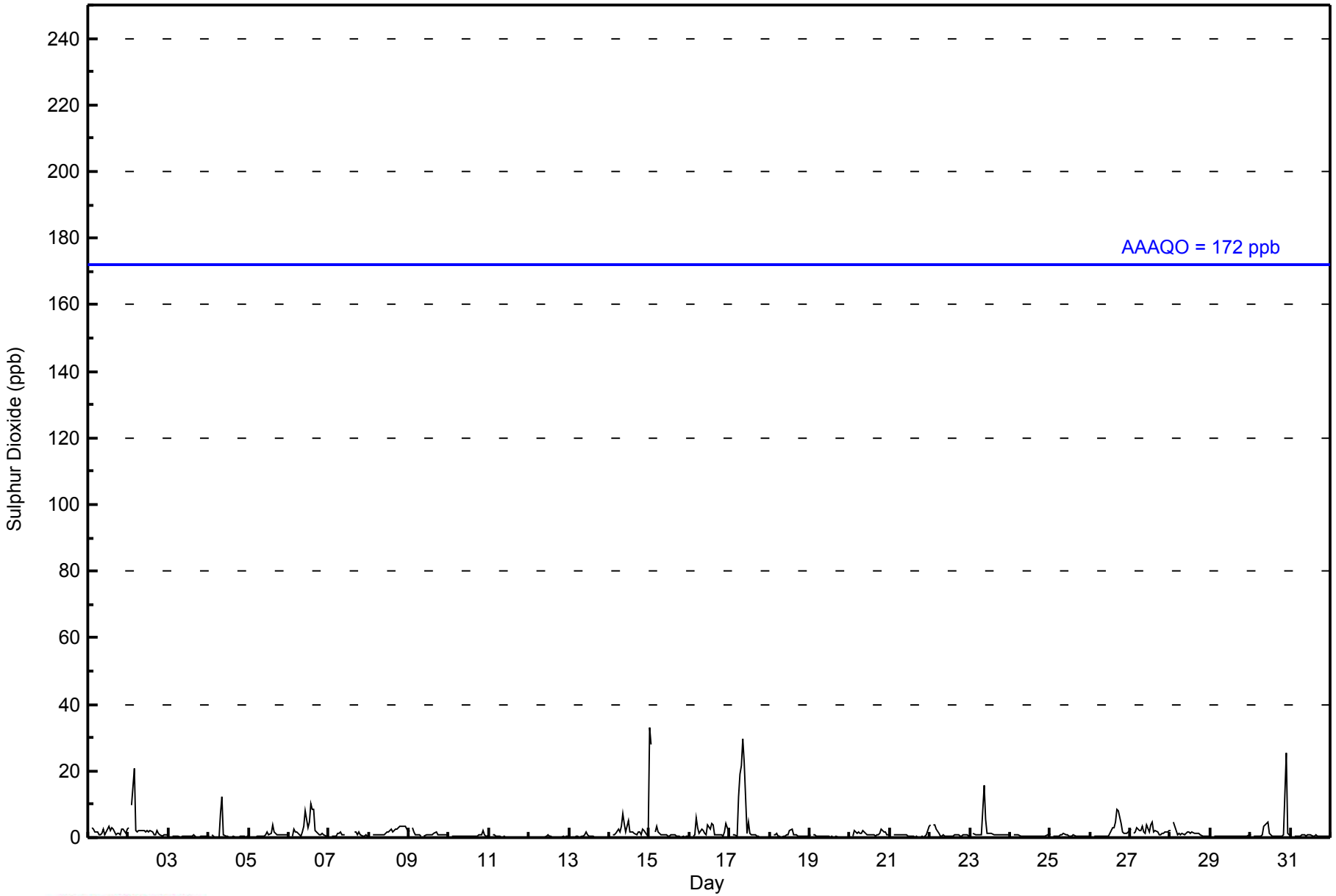
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	696	98.44	98.44
11 - 20	4	0.57	99.01
21 - 60	7	0.99	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: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	100	95	34	3	13	18	32	80	108	56	33	15	6	34	32	37	696
11 - 20	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	4
21 - 60	0	0	0	0	0	0	0	1	0	0	0	1	2	3	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	100	95	34	3	13	18	32	81	108	56	33	17	9	39	32	37	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

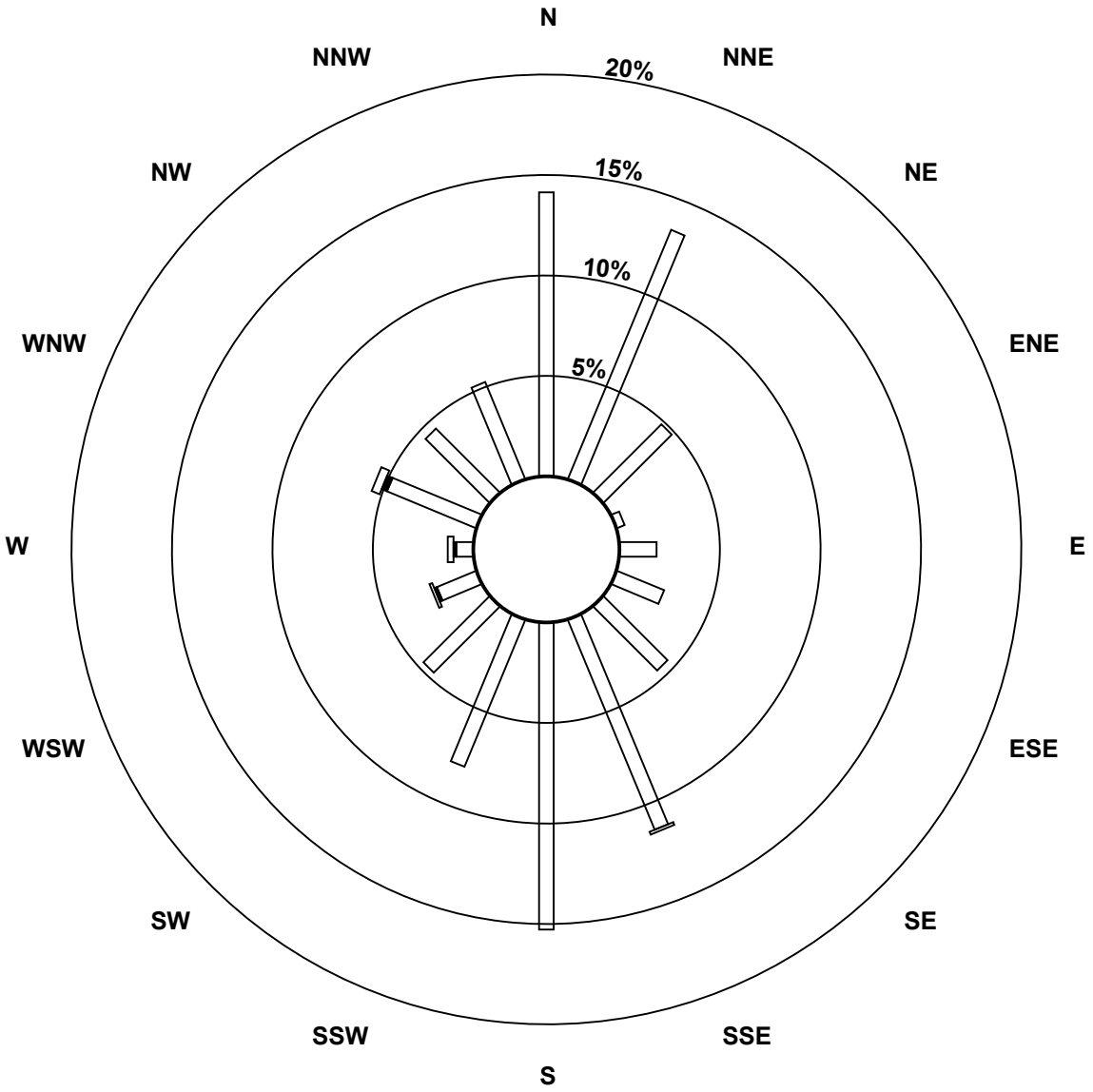
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

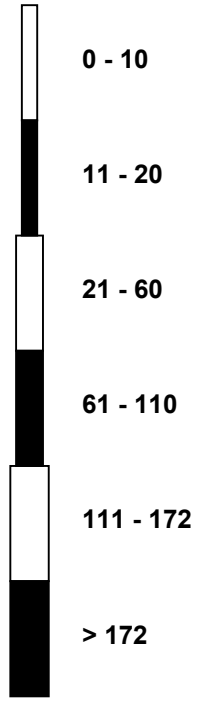
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Mildred Lake (AMS 2)



Classes (ppb)



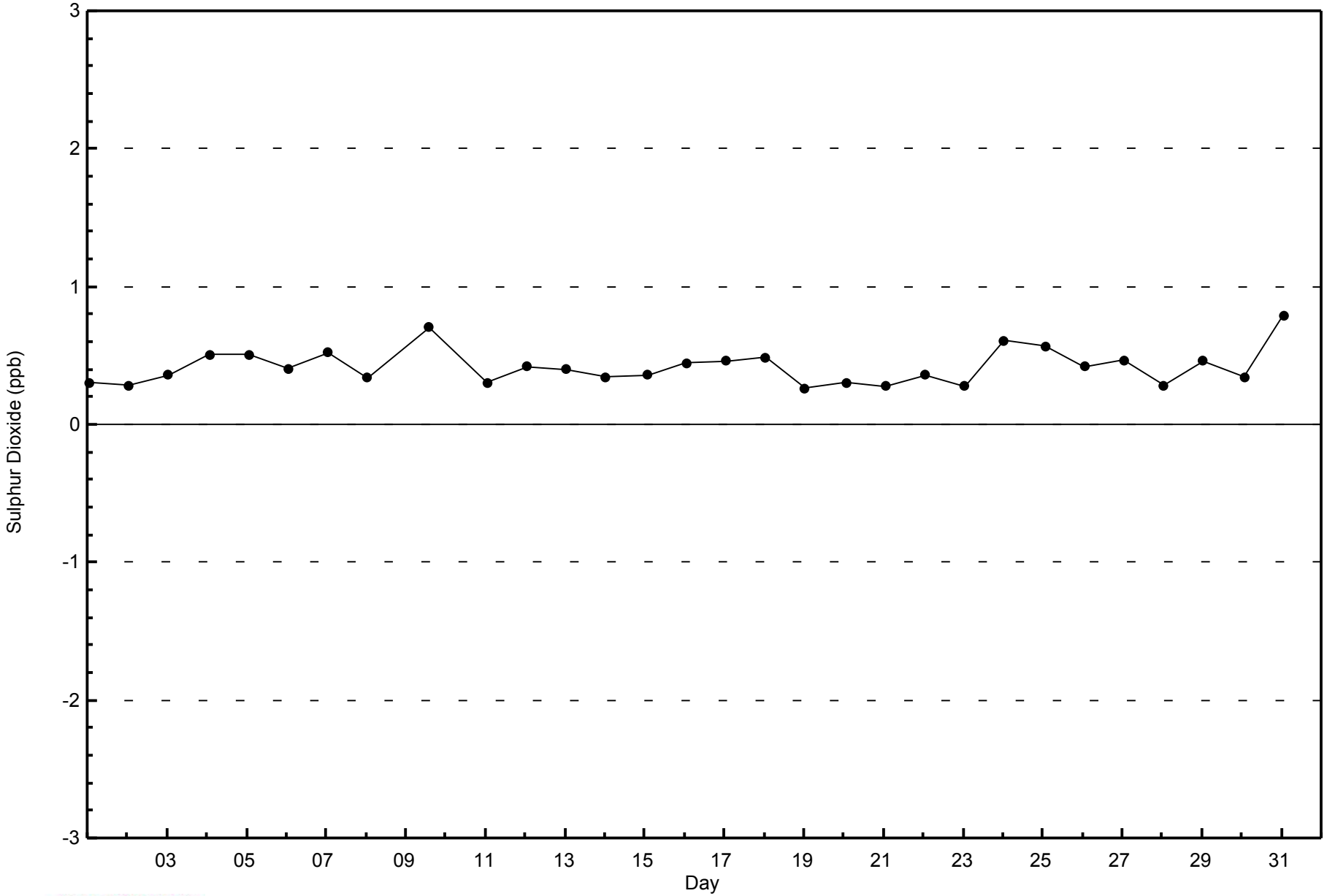
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2014



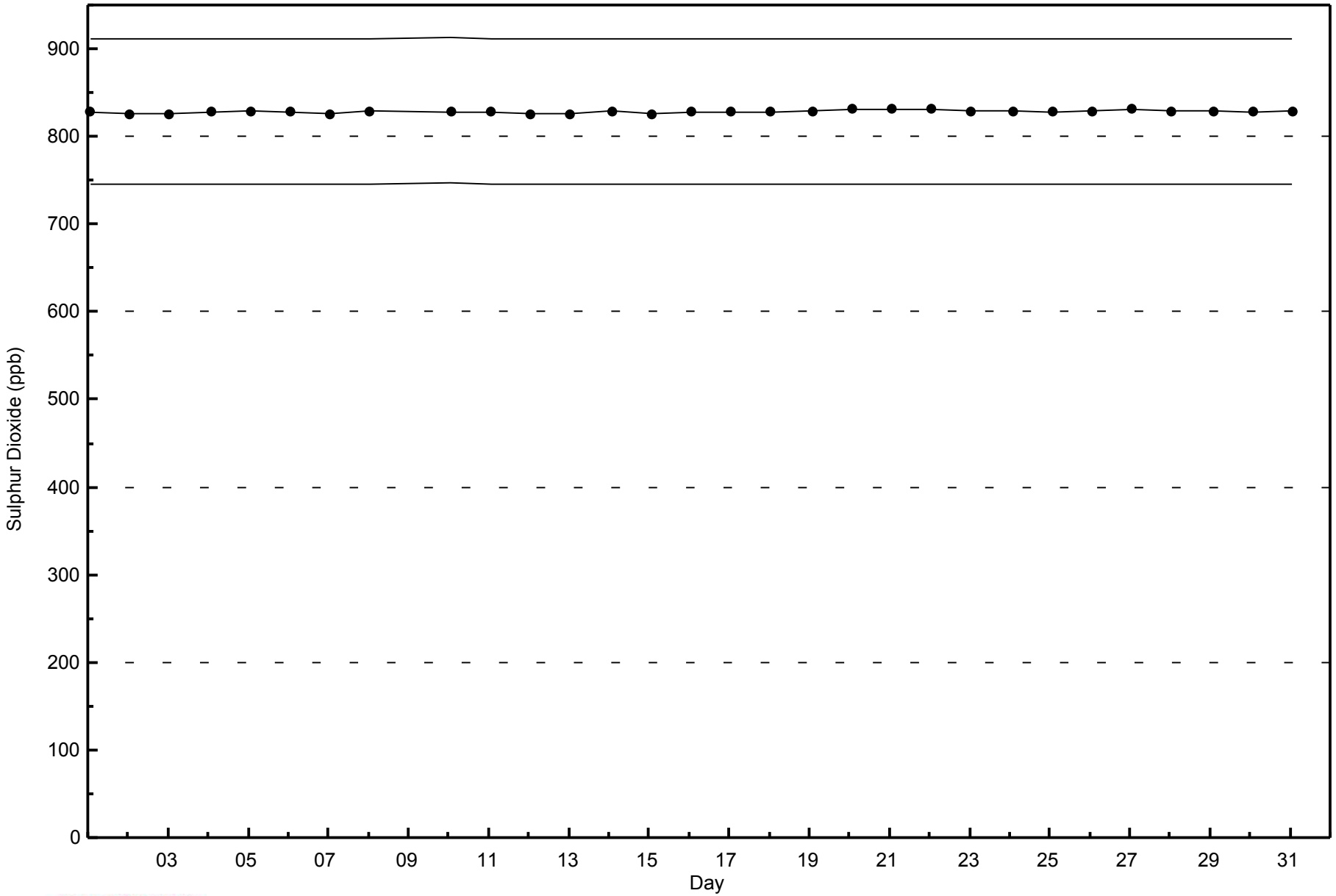
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 4 ppb on Jan 16 08:00 Maximum Daily Average: 1.1 ppb on Jan 7

Minimum Value: 0 ppb on Jan 7 01:00 Minimum Daily Average: 0.2 ppb on Jan 24
Maximum Diurnal Average: 0.8 ppb at hour 3 Minimum Diurnal Average: 0.4 ppb at hour 20
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	1	Z	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0.8	1
2-Jan	1	1	Z	1	1	0	0	0	0	0	0	0	0	1	1	1	1	3	1	0	0	1	1	0	0.7	3
3-Jan	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
4-Jan	1	2	Z	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
5-Jan	1	0	Z	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0.5	1
6-Jan	1	0	Z	1	1	1	0	0	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0	0	0.5	1
7-Jan	0	0	Z	0	0	2	2	2	1	1	1	1	1	2	1	1	2	1	2	1	1	0	1	1	1.1	2
8-Jan	0	0	Z	0	0	0	0	0	0	0	C	C	C	C	1	1	1	2	1	1	2	1	1	1	0.8	2
9-Jan	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1
10-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0.3	1
11-Jan	1	1	Z	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1
13-Jan	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
14-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0.9	1
15-Jan	2	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
16-Jan	0	0	Z	0	1	1	0	4	2	1	0	2	2	2	2	1	0	0	0	0	0	1	2	1	1.0	4
17-Jan	1	0	Z	0	0	2	4	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	4
18-Jan	0	0	Z	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.6	1
19-Jan	1	1	Z	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Jan	1	0	Z	1	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0.6	1
21-Jan	0	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0.5	1
22-Jan	1	1	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
23-Jan	0	1	Z	0	0	0	0	0	2	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0.5	2
24-Jan	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	1
25-Jan	0	1	Z	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0.5	1
27-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0.7	1
28-Jan	1	0	Z	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0.6	1
29-Jan	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
30-Jan	0	0	Z	0	0	0	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.6	3
31-Jan	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
	0.5	0.5	0.8	0.6	0.5	0.5	0.6	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	Diurnal Average	
	2	2	1	1	1	2	4	4	3	2	1	2	2	2	2	1	2	3	2	1	2	1	2	1	Diurnal Maximum	

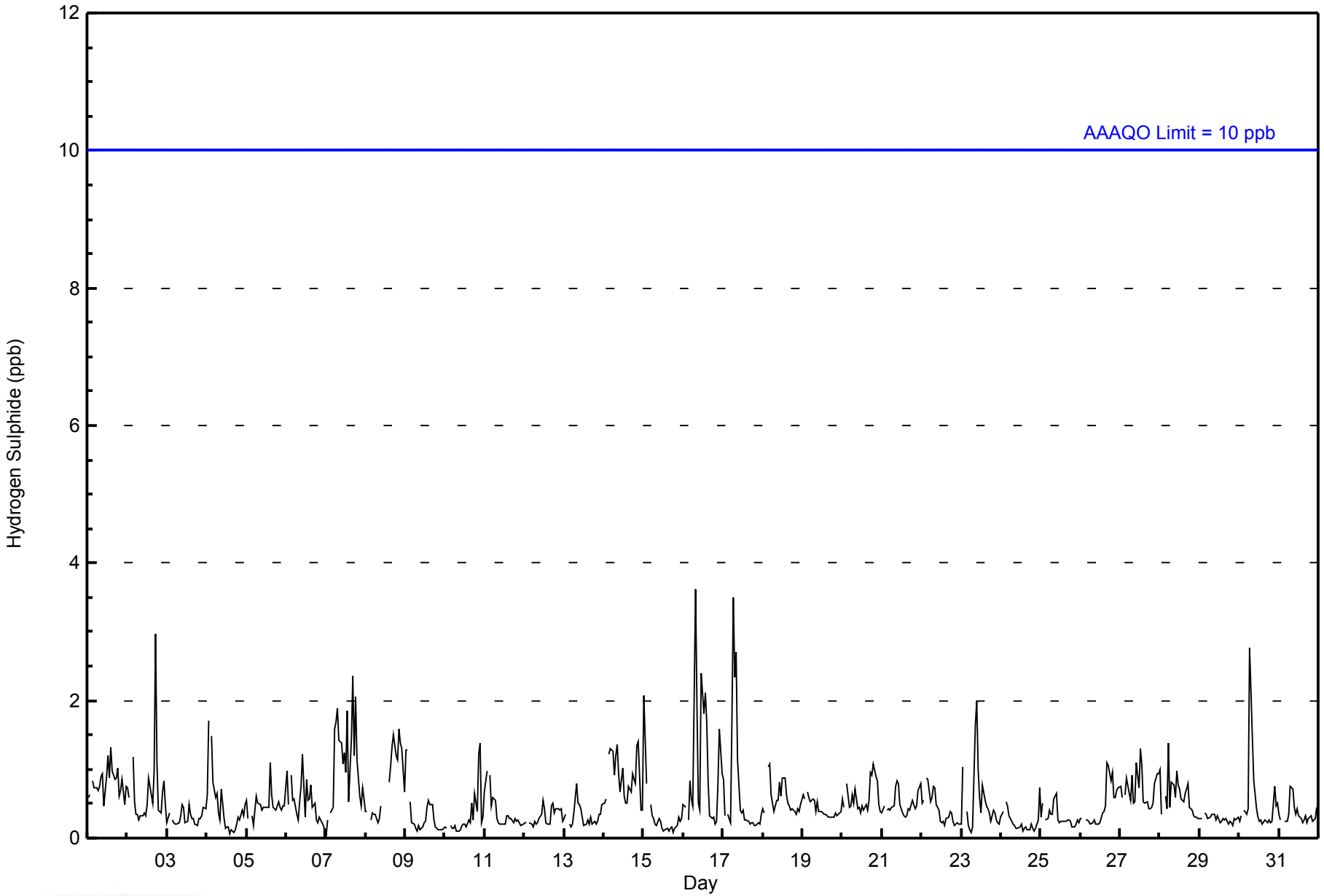
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	704	99.29	99.29
3 - 4	5	0.71	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: 709

Total Number of Hours: 744

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2014

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
	Wind Direction																
0 - 2	101	98	33	4	11	19	31	80	111	57	32	14	7	39	31	36	704
3 - 4	0	0	0	0	0	0	0	0	1	0	0	1	2	1	0	0	5
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	101	98	33	4	11	19	31	80	112	57	32	15	9	40	31	36	709

Total Number of Valid Hours: 709

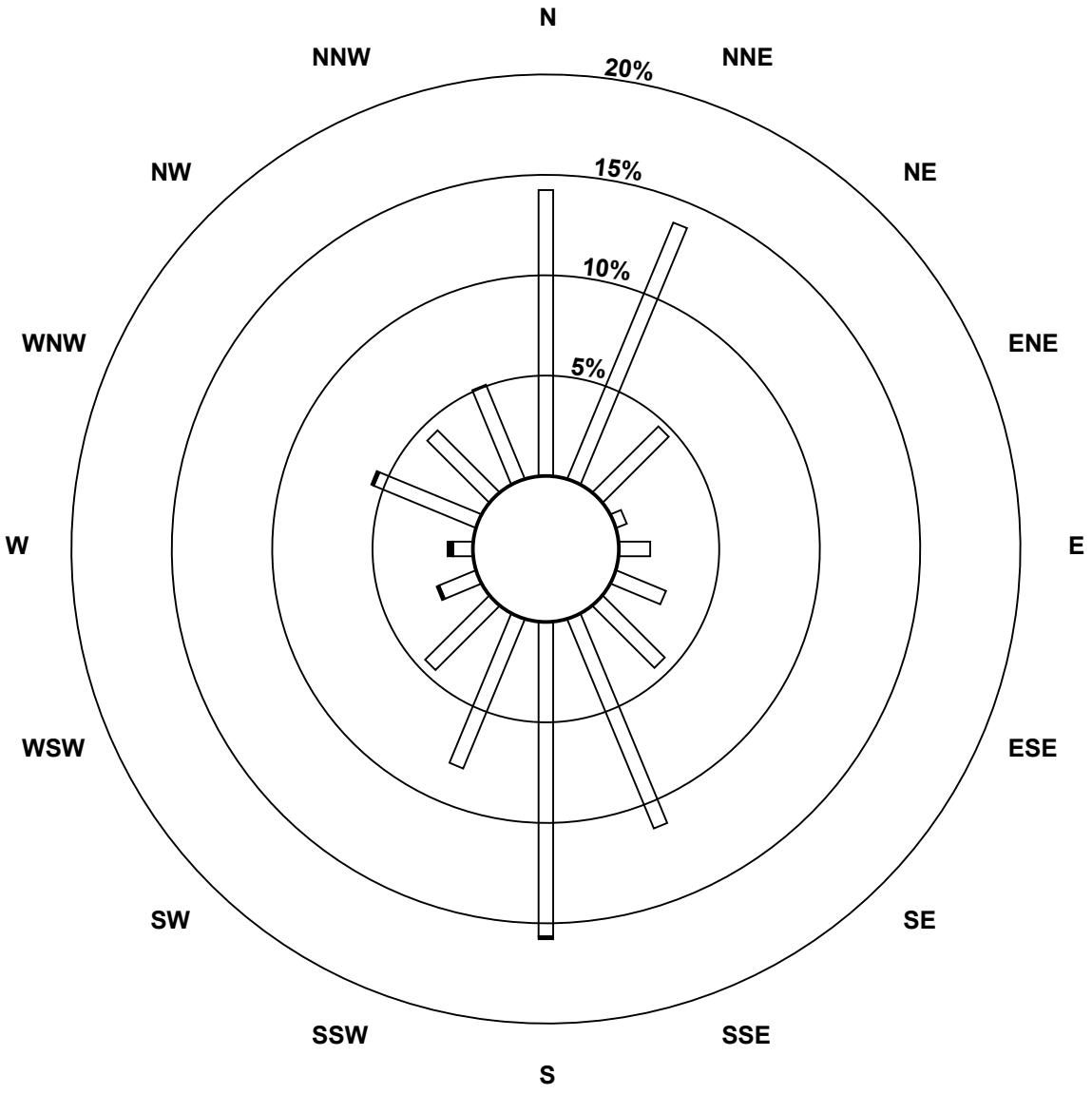
Total Number of Hours: 744

Wood Buffalo Environmental Association

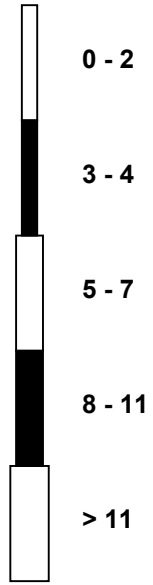
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake (AMS 2)



Classes (ppb)



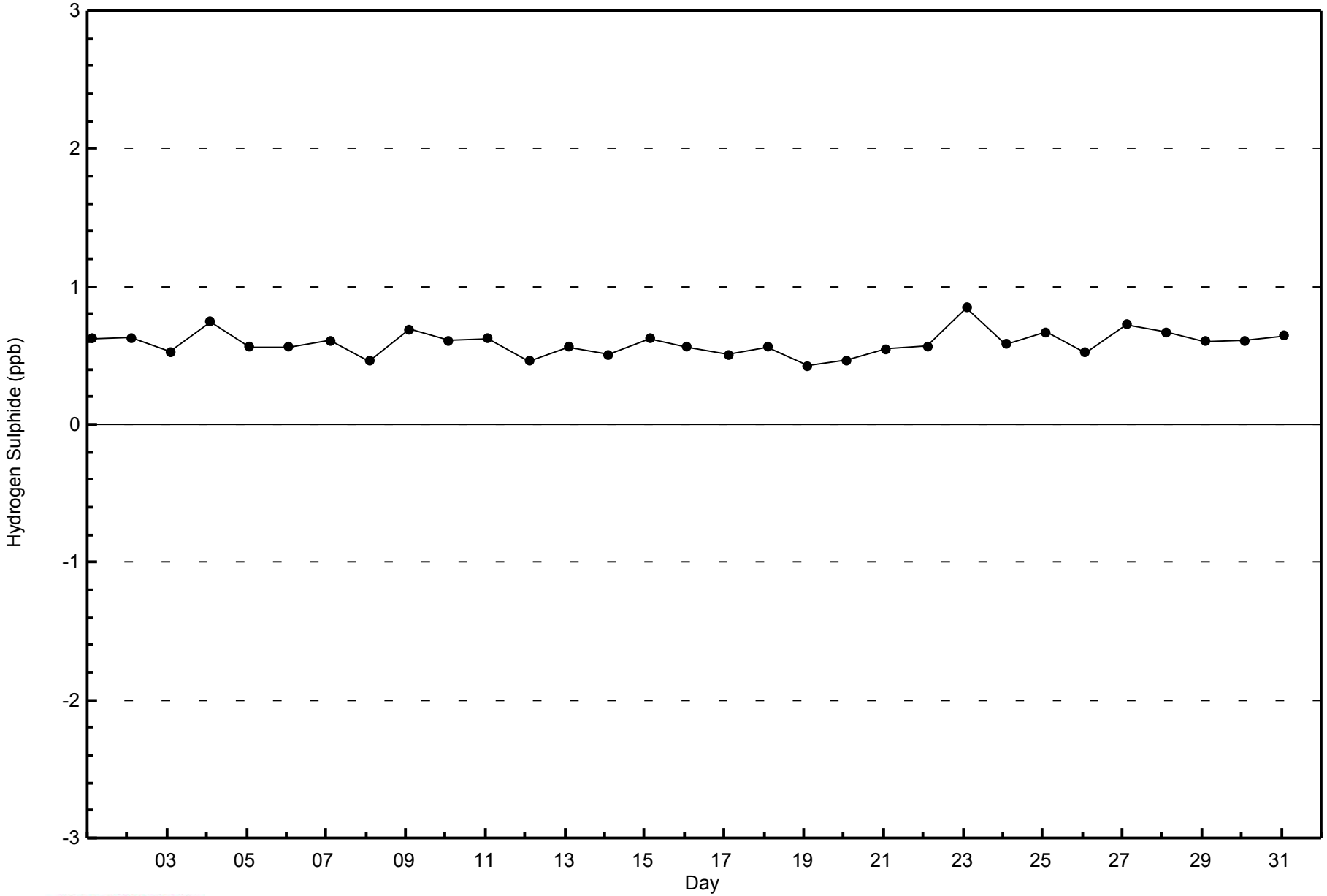
Total Number of Valid Hours: 709

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2014



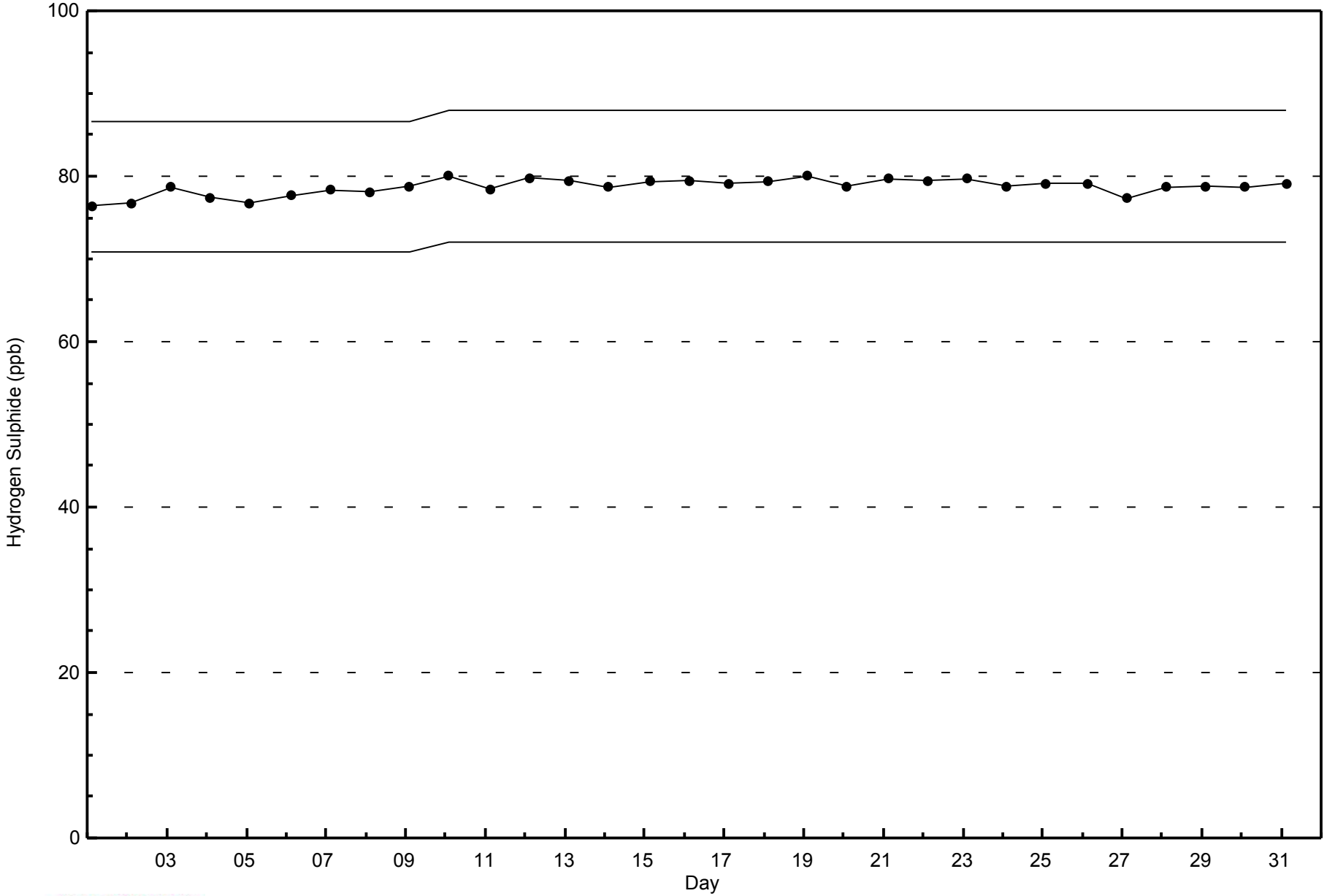
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2014

Maximum Value: 6.2 ppm on Jan 24 03:00

Maximum Daily Average: 3.1 ppm on Jan 23

Minimum Value: 1.9 ppm on Jan 10 06:00

Minimum Daily Average: 2.1 ppm on Jan 29

Maximum Diurnal Average: 2.6 ppm at hour 3

Minimum Diurnal Average: 2.3 ppm at hour 7

Monthly Average: 2.43 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.0 Q_1 = 2.1 Median = 2.2 Q_3 = 2.6 P_{90} = 3.1 P_{99} = 4.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.4	Z	2.7	2.6	2.6	2.5	2.5	2.4	2.5	2.5	2.3	2.5	2.7	2.5	2.5	2.7	2.6	2.5	2.7	2.4	2.8	2.8	2.8	2.4	2.6	2.8
2-Jan	2.4	Z	2.5	2.5	2.7	3.0	2.7	2.5	2.5	2.5	2.5	2.5	3.3	4.2	4.2	2.5	3.9	3.5	2.8	3.0	3.7	3.3	3.0	2.2	2.9	4.2
3-Jan	2.1	Z	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.3	2.3	2.0	2.1	2.2	2.2	2.2	3.0	2.1	2.1	3.4	2.8	3.8	4.0	3.9	2.4	4.0
4-Jan	3.2	Z	2.6	2.6	2.2	2.4	2.6	2.1	2.1	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6	3.3	3.2	3.1	3.1	2.7	2.5	3.3
5-Jan	2.7	Z	2.2	2.5	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.8	2.5	2.5	2.5	2.5	2.3	2.2	2.2	2.3	2.4	2.3	2.8
6-Jan	2.2	Z	2.1	2.2	2.1	2.1	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.1	2.3	2.3	2.0	2.0	2.1	2.3
7-Jan	2.0	Z	2.4	2.2	2.1	2.1	2.2	2.4	2.6	2.6	C	C	C	C	C	3.3	3.2	2.7	3.7	2.7	2.3	3.1	3.5	2.4	2.6	3.7
8-Jan	3.0	Z	3.2	2.2	2.7	2.1	2.1	2.1	2.2	2.7	2.2	2.1	3.7	4.0	3.8	3.4	2.6	3.8	2.9	3.0	3.5	3.2	3.0	3.5	2.9	4.0
9-Jan	2.5	Z	3.1	2.6	2.2	2.1	2.1	2.1	M	2.1	2.6	2.5	2.3	2.5	2.8	2.8	2.8	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.4	3.1
10-Jan	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.5	2.3	2.7	2.1	2.6	3.0	2.4	2.3	2.2	3.0
11-Jan	2.5	Z	3.1	2.9	2.6	2.6	2.6	2.2	2.3	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3	3.1
12-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.2	2.5	2.1	2.1	3.5	2.2	2.6	2.8	2.7	3.0	2.8	2.2	2.4	3.5
13-Jan	2.6	Z	2.3	2.2	2.2	2.2	2.3	2.8	2.5	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.8
14-Jan	2.3	Z	3.7	3.0	2.9	2.8	2.6	2.5	2.5	2.6	2.6	2.5	2.7	2.5	2.5	2.5	2.4	2.4	2.5	2.9	2.8	2.7	3.7	3.9	2.7	3.9
15-Jan	3.8	2.6	Z	2.9	2.1	2.3	2.2	2.6	2.8	3.2	2.5	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.1	5.3	4.3	2.8	2.6	5.3
16-Jan	2.6	Z	4.0	4.0	3.0	2.5	2.4	4.2	2.7	2.2	2.5	2.9	3.8	3.4	3.2	3.1	3.2	2.8	2.7	2.5	2.4	2.5	2.6	2.7	3.0	4.2
17-Jan	2.5	Z	2.1	2.3	2.2	3.3	3.2	2.8	3.3	2.3	2.6	2.1	3.2	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	3.3
18-Jan	2.1	Z	2.6	2.9	2.5	2.2	2.4	2.3	2.1	2.2	2.3	2.3	2.3	2.5	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	3.1	2.3	3.1
19-Jan	3.1	Z	2.5	2.2	2.2	2.3	2.4	2.3	2.1	2.2	2.2	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	2.2	3.1
20-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.3	2.1	2.1	2.2	2.2	2.4	2.7	2.5	2.4	2.2	2.1	2.2	2.7
21-Jan	2.2	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.4	2.8	2.7	2.2	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.8
22-Jan	2.2	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.1	2.1	2.2	2.2	2.4	3.1	2.5	3.2	3.6	2.4	3.6
23-Jan	3.8	Z	4.0	4.4	2.5	2.3	2.2	2.2	2.5	2.3	2.8	4.5	4.8	5.9	3.5	2.6	2.6	2.6	2.2	4.5	2.7	2.2	2.1	2.1	3.1	5.9
24-Jan	2.1	Z	6.2	3.4	2.4	2.2	2.1	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.3	2.3	6.2
25-Jan	2.3	Z	2.1	2.1	2.8	3.1	2.3	2.5	3.2	3.8	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	2.1	2.3	3.8
26-Jan	2.1	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.5	2.2	2.5
27-Jan	2.5	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.7	2.4	2.5	2.4	2.7	2.6	2.2	2.6	2.8	2.4	2.5	2.4	2.4	2.8
28-Jan	2.5	Z	2.4	2.9	2.3	2.5	2.1	2.4	2.3	2.3	3.0	2.7	2.8	2.3	2.3	2.4	2.5	2.7	2.2	2.0	2.1	2.1	2.1	2.1	2.4	3.0
29-Jan	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
30-Jan	2.1	Z	2.2	2.9	3.0	2.4	2.4	2.3	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.3	2.8	4.2	2.4	4.2
31-Jan	2.9	Z	2.2	2.1	2.1	2.1	2.1	2.6	2.8	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.5	2.7	2.3	2.3	2.9
	2.5	2.6	2.6	2.5	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.5	2.5	2.4	2.3	2.4	2.4	2.3	2.5	2.5	2.6	2.6	2.6	Diurnal Average	
	3.8	2.6	6.2	4.4	3.0	3.3	3.2	4.2	3.3	3.8	3.0	4.5	4.8	5.9	4.2	3.4	3.9	3.8	3.7	4.5	3.7	5.3	4.3	4.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

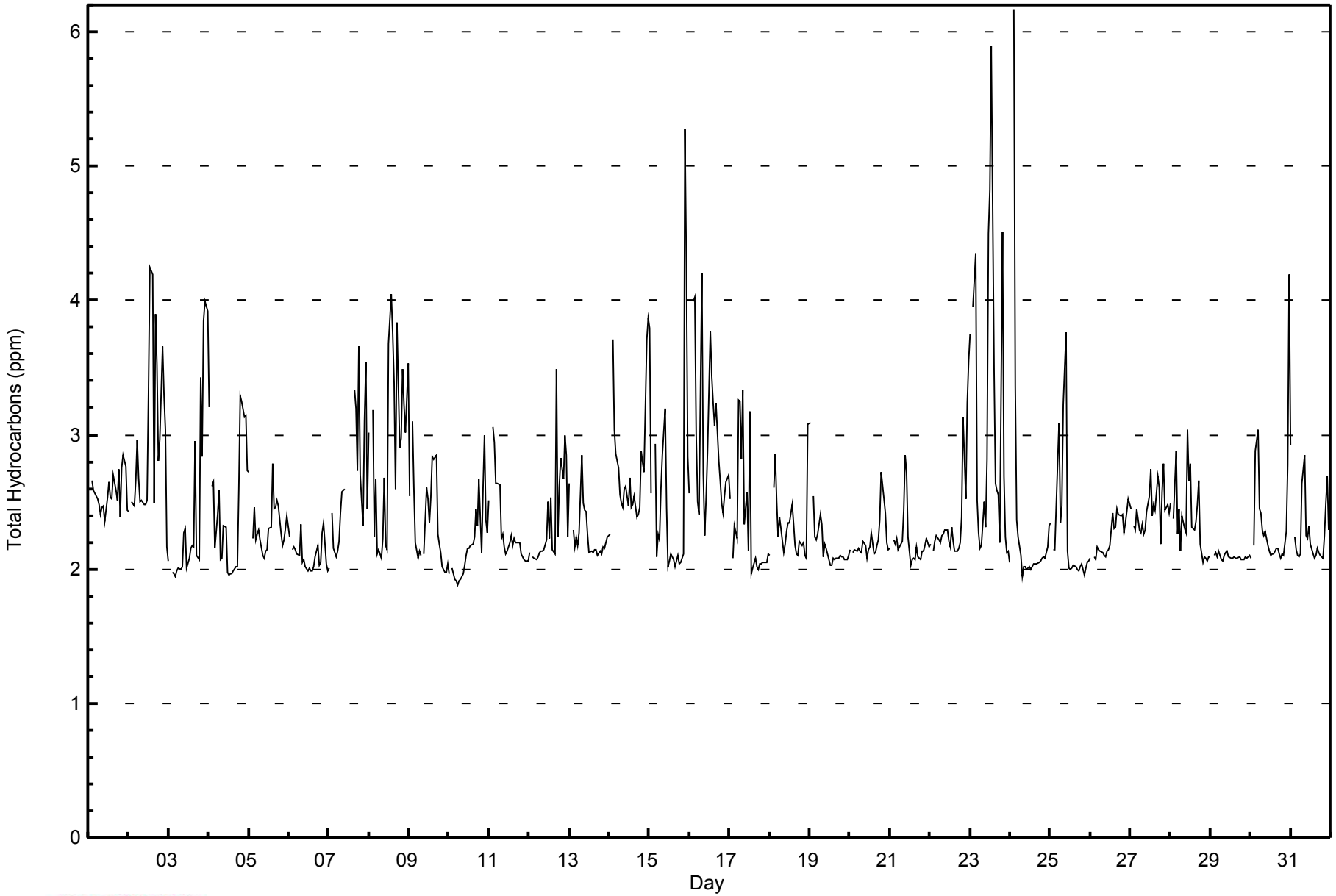
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	78	11.03	11.03
2.1 - 3.0	558	78.93	89.96
3.1 - 10.0	71	10.04	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

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	16	29	12	0	1	4	5	2	0	0	0	0	0	0	2	7	78
2.1 - 3.0	82	65	22	3	11	12	23	70	90	52	29	14	5	32	19	29	558
3.1 - 10.0	2	1	0	0	1	2	4	9	18	4	4	3	4	7	11	1	71
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	100	95	34	3	13	18	32	81	108	56	33	17	9	39	32	37	707

Total Number of Valid Hours: 707

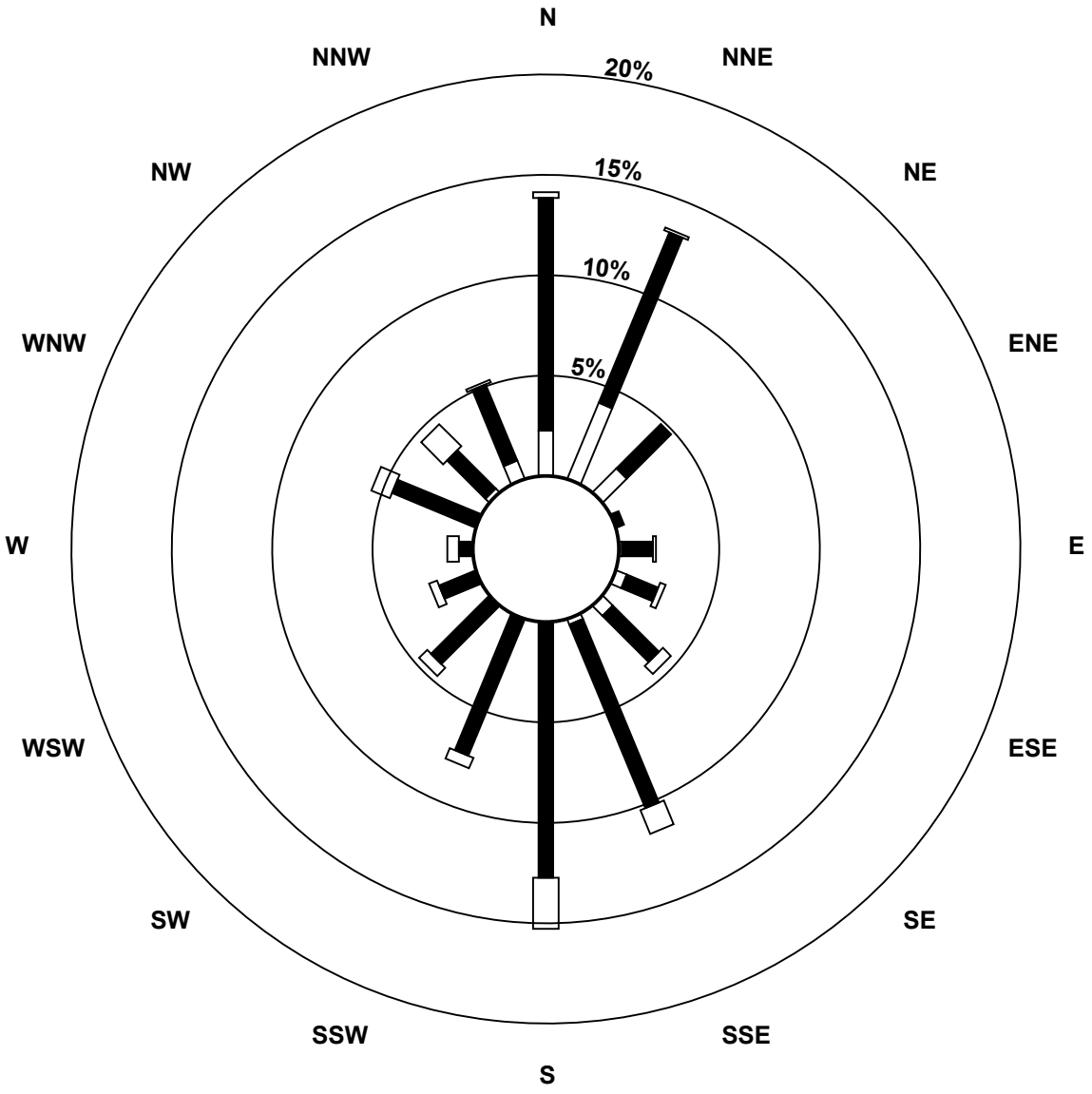
Total Number of Hours: 744

Wood Buffalo Environmental Association

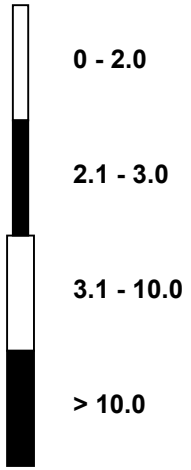
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Mildred Lake (AMS 2)



Classes (ppm)



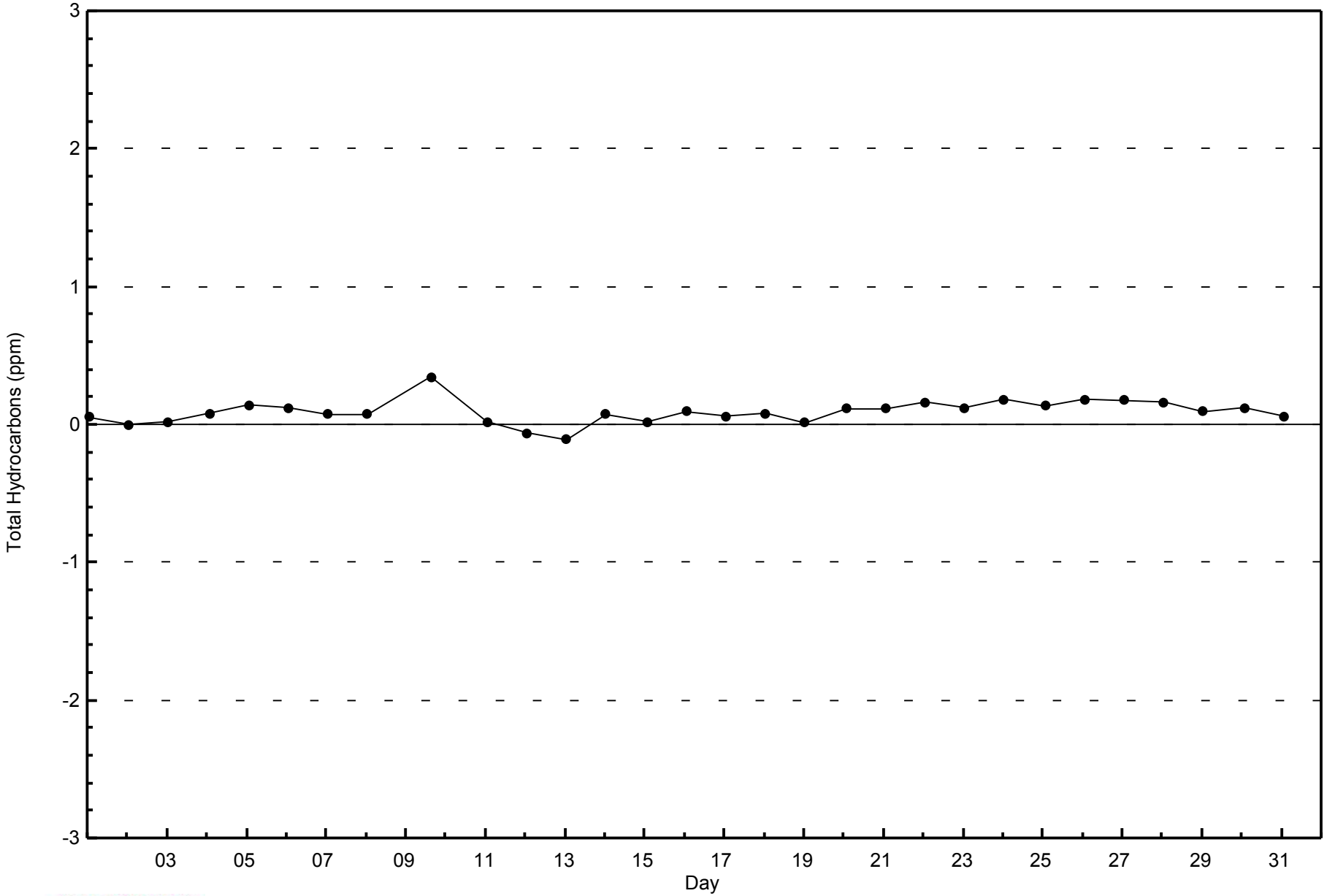
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2014



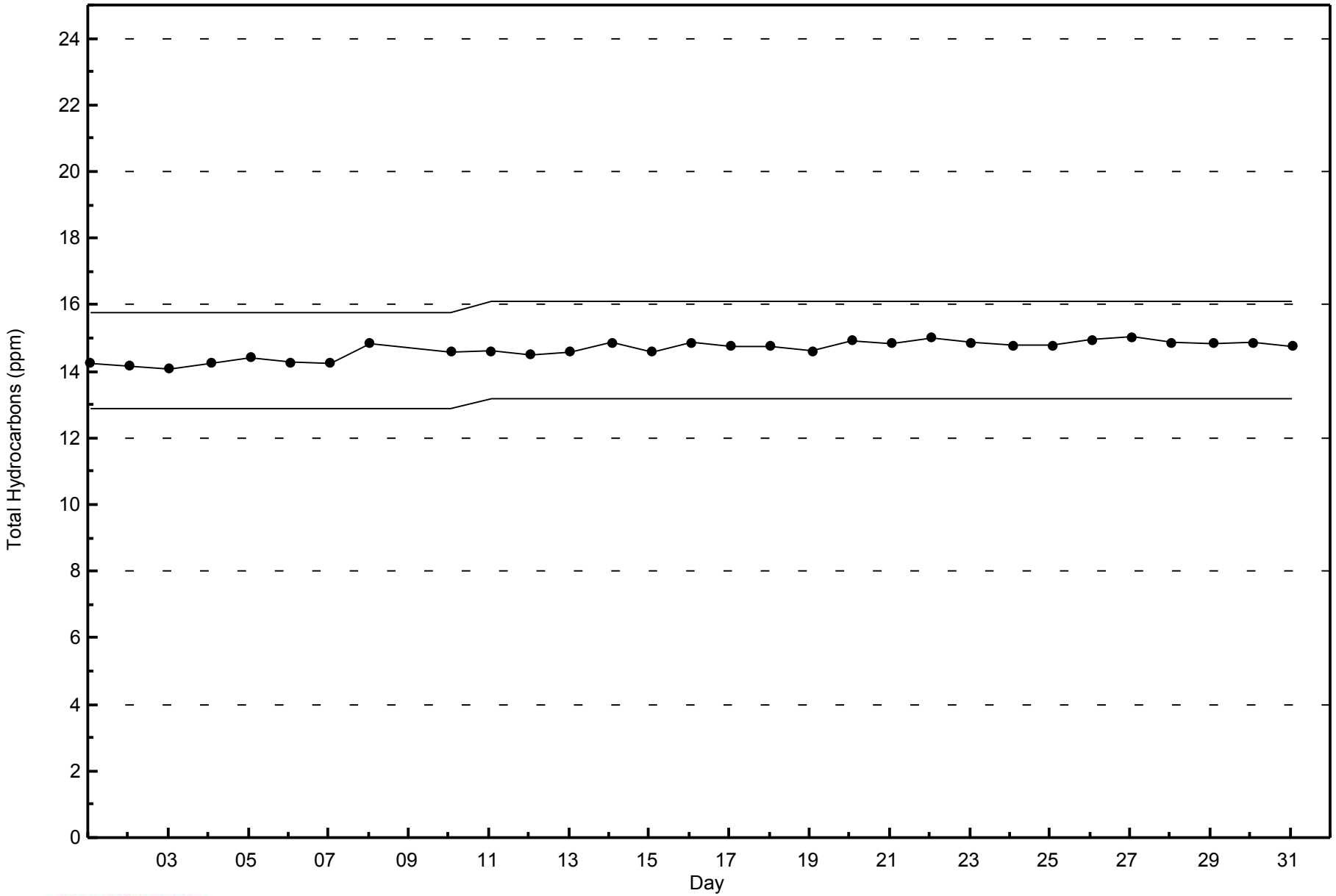
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 6.3 C on Jan 17 15:00

Maximum Daily Average: 0.8 C on Jan 15

Minimum Value: -36.1 C on Jan 1 09:00

Minimum Daily Average: -31.6 C on Jan 1

Maximum Diurnal Average: -14.0 C at hour 15

Minimum Diurnal Average: -17.6 C at hour 5

Monthly Average: -16.21 C

Percentiles: P_1 = -34.1 P_{10} = -27.8 Q_1 = -23.2 Median = -16.4 Q_3 = -10.3 P_{90} = -2.1 P_{99} = 5.3

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

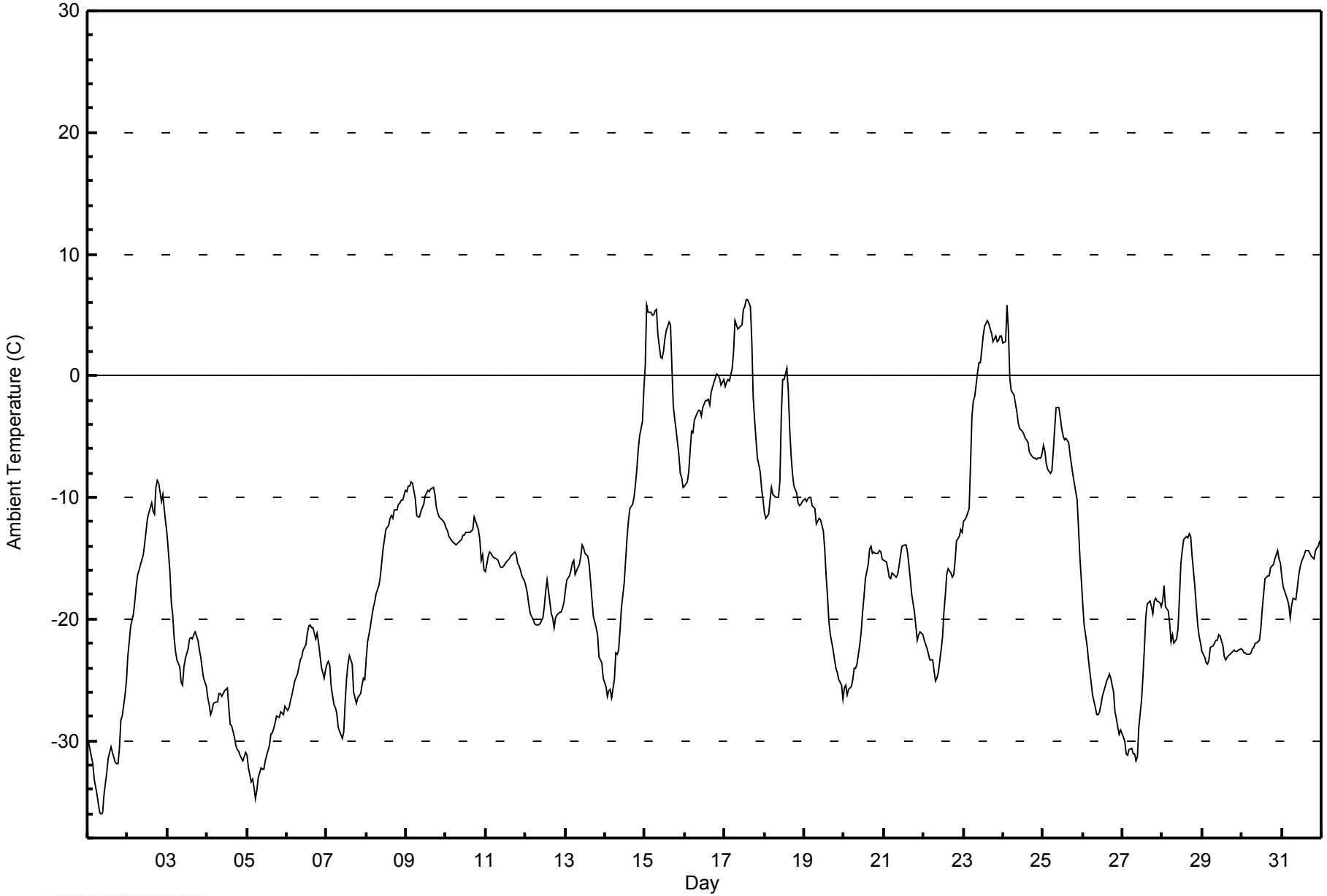
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-30.1	-30.8	-31.3	-31.8	-33.1	-34.4	-35.2	-35.9	-36.1	-35.9	-34.5	-32.6	-31.5	-31.0	-30.5	-31.0	-31.8	-31.9	-31.9	-30.6	-28.3	-27.9	-26.3	-25.1	-31.6	-25.1
2-Jan	-23.0	-21.8	-20.6	-19.5	-18.5	-17.2	-16.4	-16.0	-15.5	-14.7	-13.8	-12.8	-11.7	-11.3	-10.5	-11.1	-11.4	-9.2	-8.7	-8.8	-10.4	-9.8	-11.0	-12.1	-14.0	-8.7
3-Jan	-13.1	-16.1	-18.7	-19.7	-21.5	-22.7	-23.4	-23.9	-25.2	-25.5	-23.9	-23.2	-22.5	-21.6	-21.5	-21.6	-21.3	-21.1	-21.7	-22.5	-23.1	-24.0	-24.8	-25.6	-22.0	-13.1
4-Jan	-26.5	-27.1	-27.9	-27.5	-27.0	-26.9	-26.8	-26.2	-26.2	-26.3	-25.9	-25.8	-25.7	-27.3	-28.6	-28.8	-29.7	-30.3	-30.8	-30.9	-31.2	-31.7	-31.3	-31.0	-28.2	-25.7
5-Jan	-31.2	-32.3	-33.3	-33.2	-33.8	-34.8	-34.1	-33.0	-32.2	-32.3	-32.3	-31.7	-31.2	-30.4	-29.5	-29.3	-29.0	-28.6	-28.0	-28.1	-27.6	-27.8	-27.8	-27.1	-30.8	-27.1
6-Jan	-27.5	-27.3	-26.7	-26.2	-25.7	-25.1	-24.5	-24.0	-23.4	-23.1	-22.6	-22.1	-21.2	-20.6	-20.4	-20.7	-20.7	-21.6	-21.2	-22.0	-22.9	-24.0	-24.8	-24.2	-23.4	-20.4
7-Jan	-23.7	-23.5	-23.9	-25.5	-27.0	-27.3	-27.7	-28.9	-29.2	-29.8	-29.2	-26.9	-24.8	-23.7	-23.0	-23.7	-26.1	-26.5	-26.9	-26.5	-26.1	-25.4	-24.8	-25.0	-26.0	-23.0
8-Jan	-23.3	-21.9	-20.6	-19.7	-19.1	-18.7	-18.0	-17.2	-16.6	-15.4	-14.2	-13.5	-12.7	-12.3	-11.7	-11.5	-11.7	-11.0	-11.0	-10.6	-10.5	-10.2	-10.2	-9.5	-14.6	-9.5
9-Jan	-9.5	-9.1	-9.1	-8.7	-8.9	-10.1	-11.4	-11.7	-11.6	-11.1	-10.6	-9.9	-9.6	-9.4	-9.5	-9.3	-9.2	-9.7	-10.8	-11.3	-11.6	-11.8	-12.0	-12.2	-10.3	-8.7
10-Jan	-12.5	-12.8	-13.2	-13.5	-13.7	-13.8	-13.9	-13.8	-13.6	-13.5	-13.2	-13.1	-12.9	-12.9	-12.8	-12.7	-12.7	-11.6	-12.0	-12.6	-13.4	-15.2	-14.8	-16.0	-13.3	-11.6
11-Jan	-16.1	-14.8	-14.5	-14.6	-14.8	-15.0	-15.0	-15.2	-15.6	-15.7	-15.7	-15.7	-15.3	-15.2	-15.1	-14.8	-14.7	-14.4	-14.7	-15.4	-15.6	-16.0	-16.4	-16.9	-15.3	-14.4
12-Jan	-17.3	-17.9	-18.9	-19.6	-20.1	-20.3	-20.5	-20.5	-20.5	-20.4	-19.9	-19.0	-17.7	-16.8	-17.7	-19.5	-20.0	-20.8	-19.9	-19.7	-19.5	-19.5	-19.2	-18.6	-19.3	-16.8
13-Jan	-17.7	-16.8	-16.4	-16.0	-15.4	-15.2	-16.3	-15.7	-15.5	-14.9	-13.9	-14.2	-14.6	-14.9	-15.5	-16.9	-18.4	-19.8	-20.7	-21.3	-23.2	-23.3	-23.6	-24.9	-17.7	-13.9
14-Jan	-25.5	-26.3	-25.9	-25.8	-26.5	-25.0	-22.8	-22.9	-22.5	-20.9	-19.1	-17.0	-15.2	-13.4	-12.0	-10.9	-10.6	-10.0	-9.0	-7.7	-6.1	-5.0	-3.8	-1.1	-16.0	-1.1
15-Jan	0.9	5.8	5.2	5.2	5.0	5.0	5.3	5.4	3.4	1.6	1.4	2.0	3.1	3.8	4.4	4.2	0.7	-2.5	-3.6	-4.4	-6.5	-8.0	-8.4	-9.2	0.8	5.8
16-Jan	-9.0	-8.7	-7.9	-6.2	-4.6	-4.7	-3.6	-3.1	-2.8	-2.9	-3.3	-2.6	-2.0	-2.1	-1.9	-2.3	-1.3	-0.6	-0.2	0.1	0.0	-0.2	-0.8	-0.3	-3.0	0.1
17-Jan	-0.9	-0.5	-0.3	-0.4	0.6	2.0	4.5	4.1	3.8	3.9	4.1	5.5	5.7	6.3	6.3	5.6	2.8	-1.8	-3.6	-5.3	-6.8	-8.0	-9.2	-10.2	0.3	6.3
18-Jan	-11.2	-11.7	-11.4	-10.2	-9.2	-9.7	-9.9	-10.0	-10.0	-8.7	-3.4	-0.3	-0.3	0.6	-1.2	-4.3	-6.6	-8.1	-9.0	-9.7	-10.5	-10.7	-10.6	-10.3	-7.8	0.6
19-Jan	-10.2	-10.3	-10.1	-10.0	-10.0	-10.7	-10.9	-12.1	-11.9	-11.7	-11.8	-12.7	-14.3	-16.5	-18.2	-20.2	-21.3	-22.6	-23.4	-24.0	-24.4	-24.9	-25.5	-26.6	-16.4	-10.0
20-Jan	-25.7	-25.4	-26.2	-25.8	-25.6	-24.9	-24.0	-24.1	-23.8	-22.1	-21.1	-19.5	-18.2	-16.7	-15.5	-14.3	-14.0	-14.6	-14.5	-14.6	-14.6	-14.4	-14.5	-15.0	-19.5	-14.0
21-Jan	-15.2	-15.2	-15.8	-16.6	-16.7	-16.2	-16.4	-16.6	-16.4	-15.7	-14.8	-14.0	-13.9	-13.9	-14.5	-15.6	-16.6	-18.0	-19.5	-20.6	-21.8	-21.2	-21.0	-21.3	-17.0	-13.9
22-Jan	-21.7	-22.1	-22.4	-22.9	-23.4	-23.4	-24.3	-25.1	-24.8	-24.3	-22.6	-21.6	-19.4	-18.1	-16.4	-15.9	-16.2	-16.5	-16.3	-15.2	-13.6	-13.2	-12.6	-12.8	-19.4	-12.6
23-Jan	-11.9	-11.8	-11.6	-11.0	-7.2	-3.3	-2.1	-1.6	0.2	1.1	1.0	2.2	3.2	4.1	4.5	4.3	3.8	3.5	2.9	3.2	2.8	3.0	3.2	3.2	-0.6	4.5
24-Jan	2.7	2.8	5.8	3.7	-0.2	-1.2	-1.6	-2.2	-3.0	-3.8	-4.3	-4.6	-4.8	-5.2	-5.3	-5.6	-6.3	-6.6	-6.8	-6.7	-6.9	-6.8	-6.8	-6.4	-3.3	5.8
25-Jan	-5.7	-6.2	-7.2	-7.7	-8.0	-7.8	-6.2	-4.3	-2.6	-2.6	-3.5	-4.3	-5.0	-5.2	-5.2	-5.5	-6.5	-7.3	-8.2	-8.8	-10.2	-12.5	-14.9	-16.8	-7.2	-2.6
26-Jan	-18.7	-20.5	-22.0	-23.3	-24.3	-25.3	-26.3	-27.2	-27.9	-27.9	-27.7	-27.0	-26.4	-25.5	-25.1	-24.9	-24.5	-24.8	-26.0	-27.7	-28.3	-28.9	-29.5	-29.1	-25.8	-18.7
27-Jan	-29.7	-30.0	-31.1	-31.2	-30.7	-30.6	-31.1	-31.1	-31.7	-31.3	-28.9	-26.6	-24.6	-22.4	-19.8	-18.8	-18.5	-19.0	-19.5	-18.5	-18.3	-18.5	-18.6	-19.0	-25.0	-18.3
28-Jan	-18.5	-17.2	-18.9	-19.4	-20.4	-21.9	-21.3	-22.0	-21.7	-20.8	-18.2	-15.4	-14.4	-13.4	-13.2	-13.4	-12.9	-13.2	-14.9	-17.3	-19.0	-20.5	-21.4	-22.0	-18.0	-12.9
29-Jan	-22.7	-23.2	-23.6	-23.7	-23.3	-22.3	-22.2	-22.0	-21.8	-21.8	-21.3	-21.4	-22.2	-23.2	-23.4	-23.2	-23.0	-22.7	-22.7	-22.6	-22.7	-22.7	-22.5	-22.4	-22.6	-21.3
30-Jan	-22.6	-22.8	-22.8	-22.9	-23.0	-22.8	-22.4	-22.4	-22.0	-21.9	-21.8	-20.9	-19.2	-17.9	-16.7	-16.5	-16.4	-15.8	-15.6	-15.5	-15.0	-14.4	-15.0	-15.5	-19.2	-14.4
31-Jan	-16.5	-17.4	-18.0	-18.4	-18.8	-19.9	-18.9	-18.3	-18.4	-17.5	-16.4	-15.8	-15.3	-14.8	-14.4	-14.4	-14.4	-14.5	-14.8	-15.1	-14.4	-14.1	-14.1	-13.6	-16.2	-13.6
	-17.2	-17.2	-17.4	-17.5	-17.6	-17.5	-17.3	-17.3	-17.3	-17.0	-16.2	-15.3	-14.7	-14.2	-14.0	-14.3	-14.8	-15.2	-15.6	-15.8	-16.1	-16.4	-16.6	-16.7	Diurnal Average	
	2.7	5.8	5.8	5.2	5.0	5.0	5.3	5.4	3.8	3.9	4.1	5.5	5.7	6.3	6.3	5.6	3.8	3.5	2.9	3.2	2.8	3.0	3.2	3.2	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Mildred Lake - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	288	38.71	38.71
-20 - 0	403	54.17	92.88
0 - 10	53	7.12	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Mildred Lake - January 2014

Maximum Speed: 43 km/h on Jan 15 09:00

Maximum Daily Speed Average: 20.3 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 31 09:00

Minimum Daily Speed Average: 1.4 km/h on Jan 12

Maximum Diurnal Speed Average: 3.3 km/h at hour 18

Minimum Diurnal Speed Average: 0.2 km/h at hour 1

Monthly Average Velocity: 1.4 km/h 334.9 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 6 Median = 8 Q_3 = 12 P_{90} = 16 P_{99} = 32

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	S6	SSE6	SE4	S4	SSW4	SE3	S3	SE3	SE4	SSW6	S6	SE5	S6	SE5	S4	SSW4	SSW5	SSE4	S4	SSW7	S8	SSW7	S8	SSE9	S5.0	SSE9
2-Jan	SSE12	SSE15	SSE17	SSE15	SSE13	S9	SSW10	SSW10	SSW9	SSW10	SSW10	SSW12	S8	SSE10	S11	S8	S9	S9	SSW7	SW7	SW6	W7	N15	NNE15	S7.4	SSE17
3-Jan	NNE19	NNE22	NNE20	NNE16	NNE13	NNE9	NNE8	NE7	NNE1	SW3	E1	E3	N3	N7	N7	NNW7	NW14	NW15	NW17	NW16	NW15	NW12	WNW10	WNW8	N8.3	NNE22
4-Jan	W7	WNW8	WSW6	WNW9	WNW11	WNW9	WNW12	WNW19	WNW18	WNW15	NW15	NW16	NNW22	NNE21	NNE17	N13	NNW14	NNW14	NW10	NW9	NW10	WNW8	NW11	NW10	NW11.0	NNW22
5-Jan	NW7	NNE5	WSW3	SW4	S2	S2	S2	SSE4	S5	S4	S4	S3	ESE6	SE6	SSE5	SSE5	SSE5	SSE6	SSE6	SSE4	S6	SSE5	SSE6	SSE7	SSE3.4	NW7
6-Jan	SE5	S6	S8	SSE7	S8	SSE9	SSE10	SSE8	SSE11	SSE14	SSE19	SSE21	SE13	SE12	SE13	SE8	E3	NE5	ESE8	SE7	SSE7	ENE4	ESE6	ESE6	SE8.1	SSE21
7-Jan	SE3	S2	ESE2	NNE3	N3	NE1	WNW1	S1	SSW3	S3	S3	SSW5	S4	S3	S4	SSE3	ESE4	SE4	S6	S7	S9	S8	S8	S8	S3.3	S9
8-Jan	S10	S11	S12	S11	S10	S10	SSW12	SSW10	SSE13	S10	S9	S9	SSE8	SSE9	S8	ESE4	ESE4	SE3	ESE4	ESE2	SE4	SE3	SSE7	SSE6	S7.3	SSE13
9-Jan	ESE5	SE4	SE6	SSE8	S9	SSW9	SSW9	SSW7	SSW5	SSW7	SW4	NW1	NE3	NNE5	N8	N7	N8	NNE13	NNE13	NNE12	N10	N10	N10	N10	NNE1.9	NNE13
10-Jan	N9	N9	N9	N10	N9	N8	N7	NNW8	N7	N5	N6	N7	N6	NNE4	SSE1	SE2	WSW0	NW13	WNW8	W7	WNW7	SW4	SSW5	SE2	NNW4.6	WNW13
11-Jan	ENE3	ENE1	E2	NE4	N6	N8	N11	N13	N13	NNE12	N13	N15	N13	N15	N15	N15	N15	N14	N18	NNE16	NNE17	NNE16	NNE16	NNE16	NNE11.8	N18
12-Jan	NNE15	N14	NNE15	NNE16	NNE14	NNE9	N8	NE3	ESE4	SE4	SE6	SSE5	W6	SW9	SSW8	SSW7	S8	S8	S11	SSE13	SSE11	S10	S10	S9	SE1.4	NNE16
13-Jan	S12	SSW8	SW8	SSW8	SSW6	SSW5	SSE3	NNW4	N10	NW6	N7	NNE8	NE7	NE8	NE10	NE10	NNE8	NNE9	NNE9	NNE7	N4	NNE5	NNE5	N4	NNE2.8	S12
14-Jan	N5	SSE1	SSW5	SSE4	S4	SSE8	SSE9	SSE9	SSE7	S8	S9	SSE6	S10	SSW9	S8	S10	S13	SSE14	S14	SSE11	SSE13	SSE15	SSE18	SSE14	SSE8.8	SSE18
15-Jan	WSW13	WNW32	WNW41	WNW34	WNW28	WNW27	WNW31	NW42	NW43	NW27	NW28	NNW23	NNW25	NW32	NW33	NW33	N15	N10	NNE11	NE6	SW2	SW4	SSW5	SSW5	NW20.3	NW43
16-Jan	SSW7	SSW7	SSW7	SW6	WSW5	SW6	WSW7	WSW7	WSW7	SW6	SSW8	S7	S8	SSE8	SSE7	S4	SW7	SSW8	SSW6	SW8	SSW7	SE5	SSE7	SSE8	SSW5.8	SSE8
17-Jan	SSW8	S10	S7	SSW8	SW9	WSW9	W21	W23	W18	WNW17	WNW18	WNW20	NW14	NNW14	NNW21	NNW19	NE14	NE17	NE11	NE12	NE10	NE8	ESE3	E3	NW6.1	W23
18-Jan	ESE2	ESE5	SSE4	S8	SSE6	SW6	SW6	SSW8	S6	SW9	W11	S3	E6	NE6	NNE14	NNE17	N16	NNE12	N10	N9	NNW7	N7	NNW4	NW6	N2.1	NNE17
19-Jan	N2	ESE2	E1	NNE5	NNE5	NNE6	NNE5	N3	N8	N11	NNE15	NNE19	NNE24	NNE24	NNE24	NNE20	NNE14	NNE12	NNE11	NNE10	NE9	NNE5	WSW1	S2	NNE9.5	NNE24
20-Jan	SSW6	S7	SSW6	S10	S6	SSE9	S11	SSE11	SSE15	S15	SSW14	S13	S13	S13	S13	S10	E1	WNW1	N8	N9	NNW8	NNW10	NNE11	N9	S4.8	S15
21-Jan	N5	NNE4	NE4	NE4	NE4	NE3	N7	N7	N9	NNW7	N9	NNE14	NNE15	NE12	NE10	NE8	NE6	NE4	NE5	E5	E7	SE7	SSE12	SSE12	NE5.1	NNE15
22-Jan	SSE14	SSE13	SSE12	SSE11	SSE12	SSE15	S9	S5	S8	S10	S11	S12	S15	SSE17	S14	SSW12	SSW11	SSW9	S10	S8	S13	S13	S9	S8	S11.0	SSE17
23-Jan	S10	SSE9	S7	S7	SSW10	SW13	SW12	SW10	WNW9	WNW15	WNW11	NW16	NW15	WNW12	WNW13	WNW14	WNW13	N8	NNW7	NNW5	S4	WSW5	SW5	SW4	W6.1	NW16
24-Jan	SE2	NNW4	NW13	N15	N15	N9	NNE14	NNE16	NNE14	NNE14	NNE11	NNE13	NE13	NE12	NNE10	NE10	NNE8	NE7	NNE6	NNW3	N4	SE2	SE4	S2	NNE7.9	NNE16
25-Jan	S8	SSW7	SSW5	SW4	SW6	SSW6	SSW6	SW7	WNW4	NNE12	NNE12	NNE16	NNE12	NNE12	NNE11	NNE16	NNE14	NNE15	NNE17	N20	N19	N30	NNE24	N28	N8.8	N30
26-Jan	N30	N28	N23	N21	N16	NNE9	NNE8	NNE8	NNE8	NNE11	NNE9	NE3	SE3	NNE1	ESE3	ESE6	SE5	ESE5	E4	ENE4	E5	E4	ESE4	SE5	NNE7.1	N30
27-Jan	S5	SSW5	S4	S3	S3	S8	S7	S8	SSW9	S8	S8	S9	SSE9	SSE10	SSE12	SSE11	SSE10	S8	S9	SSE11	SSE11	SSE8	S8	SSE6	S7.7	SSE12
28-Jan	SSE7	S9	SSE8	S8	S6	S4	SSW8	S5	SSW9	S6	SE3	SSW3	NNW3	N5	N6	N6	N10	N10	NNE17	NNE18	NNE16	NNE15	NNE9	NNE8	NNE2.1	NNE18
29-Jan	N5	N5	NNW5	NNW4	NNE4	N5	N6	N9	N8	N9	N12	NNE16	N23	N20	NNE16	NNE15	NNE13	N14	N13	N9	NNW10	NNW10	NNW9	NNW12	N10.3	N23
30-Jan	NNW13	NNW10	NNW9	NW9	NW10	WNW9	WNW11	WNW14	WNW13	WSW12	WSW13	WSW13	WSW12	SW12	SW12	SW13	SW12	SW12	SW11	SW12	WSW10	WNW13	NW11	WNW11	W9.2	WNW14
31-Jan	NNW9	N8	NNW6	N8	N8	NNW6	NNW7	W1	SSE0	N6	N9	N10	NNW11	NNW11	N10	NNE8	N9	N8	NNW6	NNW5	NNW10	NW8	NW4	WNW7	NNW6.9	NNW11
	ESE0.2	WSW0.3	WSW1.0	WNW0.9	W1.2	WSW1.9	W2.7	WNW3.1	WNW2.8	W2.3	WNW2.1	NNW1.8	N2.8	N2.8	N2.7	N3.1	N3.0	N3.3	NNE3.1	N2.1	N1.1	N1.5	NE0.5	NNE0.7	Diurnal Average	
	N30	WNW32	WNW41	WNW34	WNW28	WNW27	WNW31	NW42	NW43	NW27	NW28	NNW23	NNW25	NW32	NW33	NW33	N16	NE17	N18	N20	N19	N30	NNE24	N28	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 14 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 5 12:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 8

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

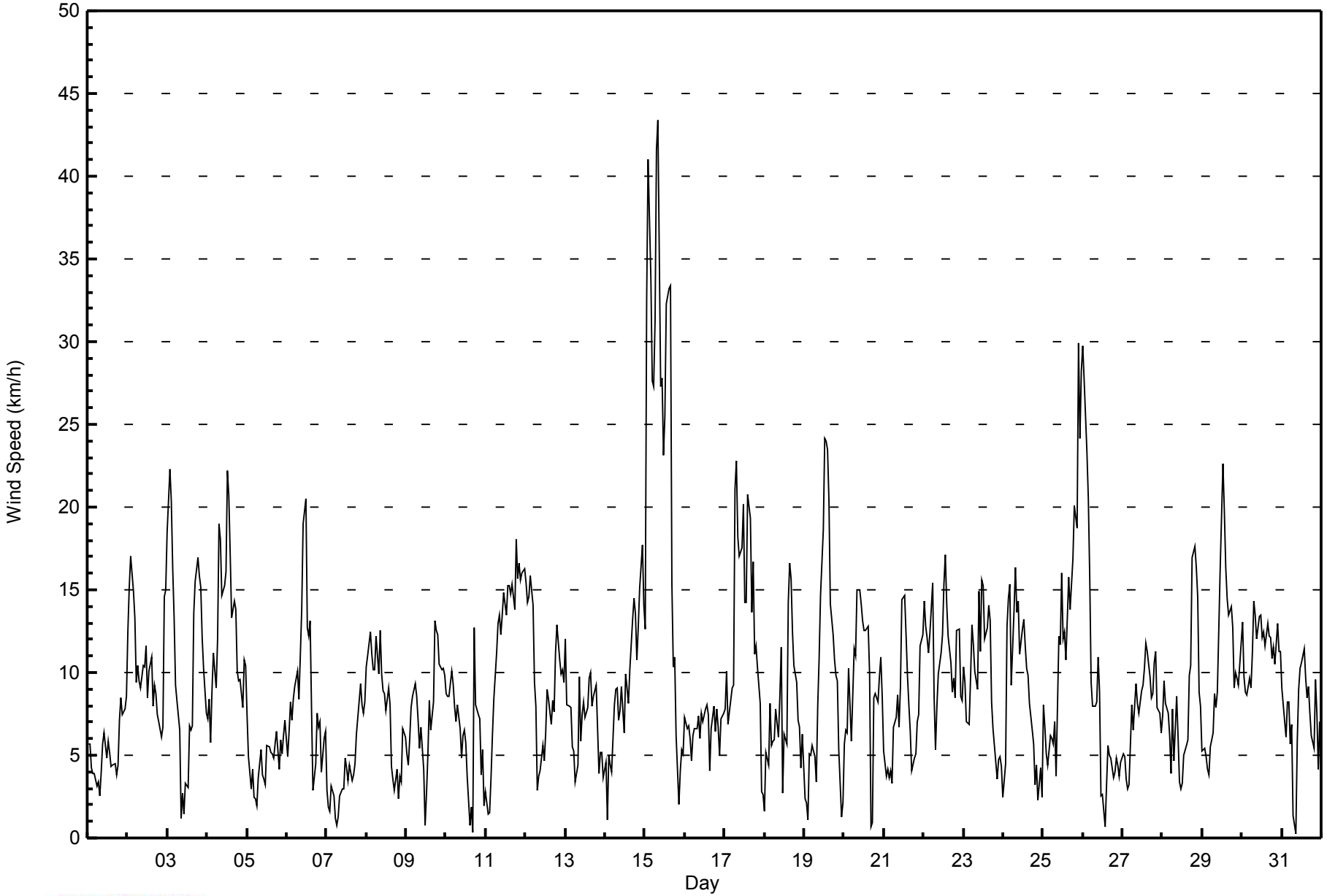
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	1	1	1	2	1	1	1	2	1	1	2	1	1	1	1	2	2	1	2	2	2	2
2-Jan	3	3	4	6	5	2	2	2	3	2	2	2	2	2	2	1	2	2	1	1	1	2	4	4	6
3-Jan	6	6	5	4	3	2	2	2	3	1	1	1	1	1	1	3	3	3	4	4	4	3	3	2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

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	183	24.60	24.60
6 - 11	353	47.45	72.04
12 - 19	170	22.85	94.89
20 - 28	27	3.63	98.52
29 - 38	8	1.08	99.60
> 38	3	0.40	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Mildred Lake - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	14	14	12	4	11	15	24	15	31	14	9	5	1	3	2	9	183
6 - 11	59	27	16	0	2	5	6	44	75	44	17	6	5	16	11	20	353
12 - 19	22	50	6	0	0	0	3	26	12	4	7	6	1	15	12	6	170
20 - 28	6	9	0	0	0	0	0	1	0	0	0	0	2	3	2	4	27
29 - 38	2	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	8
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3
Totals	103	100	34	4	13	20	33	86	118	62	33	17	9	41	32	39	744

Total Number of Valid Hours: 744

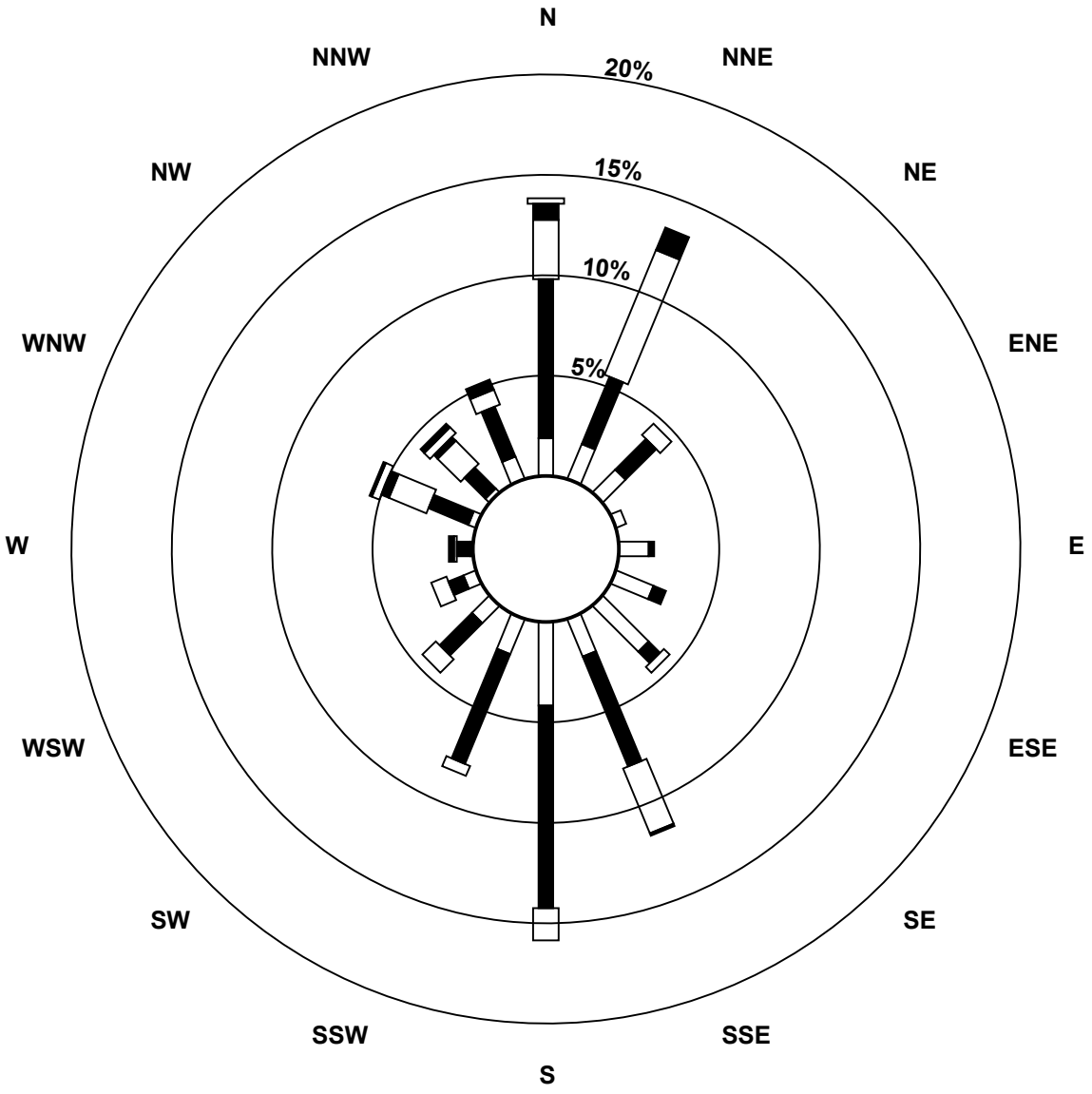
Total Number of Hours: 744

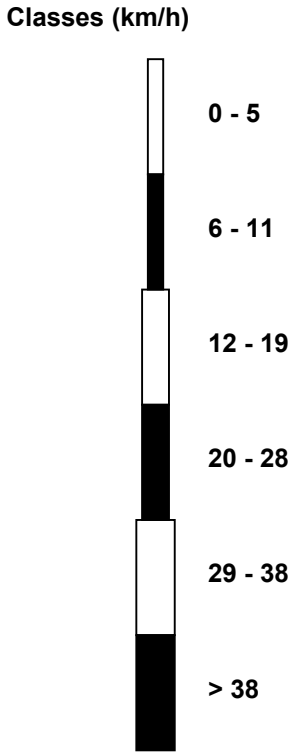
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Mildred Lake (AMS 2)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 315 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 310.2 deg on Jan 15

Direction of Minimum Speed: 150 deg on Jan 31 09:00

Direction of Minimum Daily Speed Average: 1.4 deg on Jan 12

Monthly Average Direction: 239.0 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	176	165	141	179	193	144	189	135	141	197	190	144	179	145	186	197	192	162	175	193	172	192	175	164	174.1
2-Jan	167	165	152	155	166	188	192	200	197	197	196	194	173	161	189	190	176	173	208	227	224	267	358	21	181.8
3-Jan	23	28	26	27	20	25	31	36	15	229	84	85	5	359	357	337	315	322	322	312	314	305	298	292	352.0
4-Jan	279	283	247	283	294	290	295	292	290	294	309	324	348	13	14	350	332	333	323	310	307	301	305	304	315.9
5-Jan	312	13	250	221	187	176	176	149	178	188	175	169	119	128	165	155	158	168	162	168	175	153	157	158	166.5
6-Jan	144	186	184	149	184	154	156	158	152	149	154	159	139	139	142	137	83	39	106	131	160	60	107	103	145.8
7-Jan	137	187	104	12	8	56	297	183	206	188	182	210	174	183	171	167	121	131	188	188	187	178	181	182	175.9
8-Jan	170	175	171	179	178	190	193	202	168	176	183	186	160	164	171	112	110	137	115	123	130	129	147	151	169.3
9-Jan	123	133	146	166	188	200	206	210	213	201	221	322	48	14	1	7	9	13	17	16	11	7	7	5	16.6
10-Jan	360	1	2	353	359	353	351	347	354	2	355	349	4	17	153	128	239	304	298	267	284	220	203	145	338.8
11-Jan	70	61	85	40	8	3	10	9	7	14	7	5	10	3	5	7	6	11	4	13	14	18	24	21	11.6
12-Jan	13	11	13	17	22	15	360	41	105	127	137	152	271	224	210	201	177	185	170	164	161	169	179	190	126.7
13-Jan	174	206	221	200	211	201	156	347	356	323	6	23	43	37	41	35	31	24	27	32	11	12	12	4	22.6
14-Jan	5	161	206	153	185	154	159	163	154	178	174	164	186	193	187	174	171	161	169	160	160	155	157	167	167.1
15-Jan	257	283	292	300	291	293	294	308	315	314	321	332	328	323	321	325	2	10	33	39	234	225	210	199	310.2
16-Jan	199	192	208	222	244	232	242	255	253	232	198	186	181	164	164	186	221	211	201	215	201	137	168	150	202.0
17-Jan	193	188	191	202	215	242	275	277	272	287	296	295	316	331	341	337	34	44	51	44	40	48	110	79	310.8
18-Jan	107	112	159	172	164	218	220	195	191	228	261	184	90	48	19	22	10	15	8	4	347	1	339	326	5.9
19-Jan	360	104	89	20	17	23	27	3	2	8	14	17	16	15	17	24	22	24	24	26	39	29	237	178	19.5
20-Jan	195	177	197	189	184	163	188	167	162	172	194	180	180	180	184	190	96	287	357	350	340	344	16	6	182.2
21-Jan	359	17	52	37	47	44	10	1	354	340	1	21	33	44	46	54	46	44	52	83	94	130	158	151	43.9
22-Jan	154	148	155	161	154	164	173	183	177	189	179	178	169	167	169	193	197	201	178	186	174	170	178	180	172.2
23-Jan	176	163	177	176	197	236	232	232	285	293	298	307	304	302	298	295	301	353	346	334	185	245	228	235	270.4
24-Jan	132	347	305	351	7	1	13	20	14	21	16	32	35	34	30	43	24	34	32	347	10	136	127	171	17.9
25-Jan	182	203	200	215	221	198	202	222	300	16	29	25	13	15	18	13	21	15	12	6	357	7	12	8	8.6
26-Jan	10	11	10	8	10	14	31	29	28	22	12	53	124	25	115	117	144	118	87	66	90	99	122	141	28.7
27-Jan	190	202	186	185	178	191	191	190	204	181	184	185	154	154	165	165	166	183	189	163	168	167	169	168	176.2
28-Jan	163	187	152	187	186	187	196	173	202	171	131	195	329	352	359	352	356	356	23	22	25	24	22	13	31.9
29-Jan	359	2	339	335	16	360	1	350	351	1	9	17	9	7	15	15	12	7	4	354	344	339	338	344	1.7
30-Jan	336	336	333	315	308	301	296	295	287	258	248	243	238	233	225	233	221	231	236	232	237	282	306	302	269.2
31-Jan	342	2	336	351	351	339	335	271	150	9	7	356	348	334	359	16	10	8	348	348	329	319	316	297	347.4
	104.1	258.6	257.3	284.4	276.8	245.3	264.7	281.6	284.0	279.3	299.5	338.5	5.7	10.0	6.8	1.6	10.0	10.0	15.4	6.8	0.1	3.9	43.8	25.0	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Jan 26 14:00

Minimum Value: 8 deg on Jan 11 06:00

Percentiles: P_1 = 9 P_{10} = 11 Q_1 = 13 Median = 16 Q_3 = 21 P_{90} = 33 P_{99} = 83

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

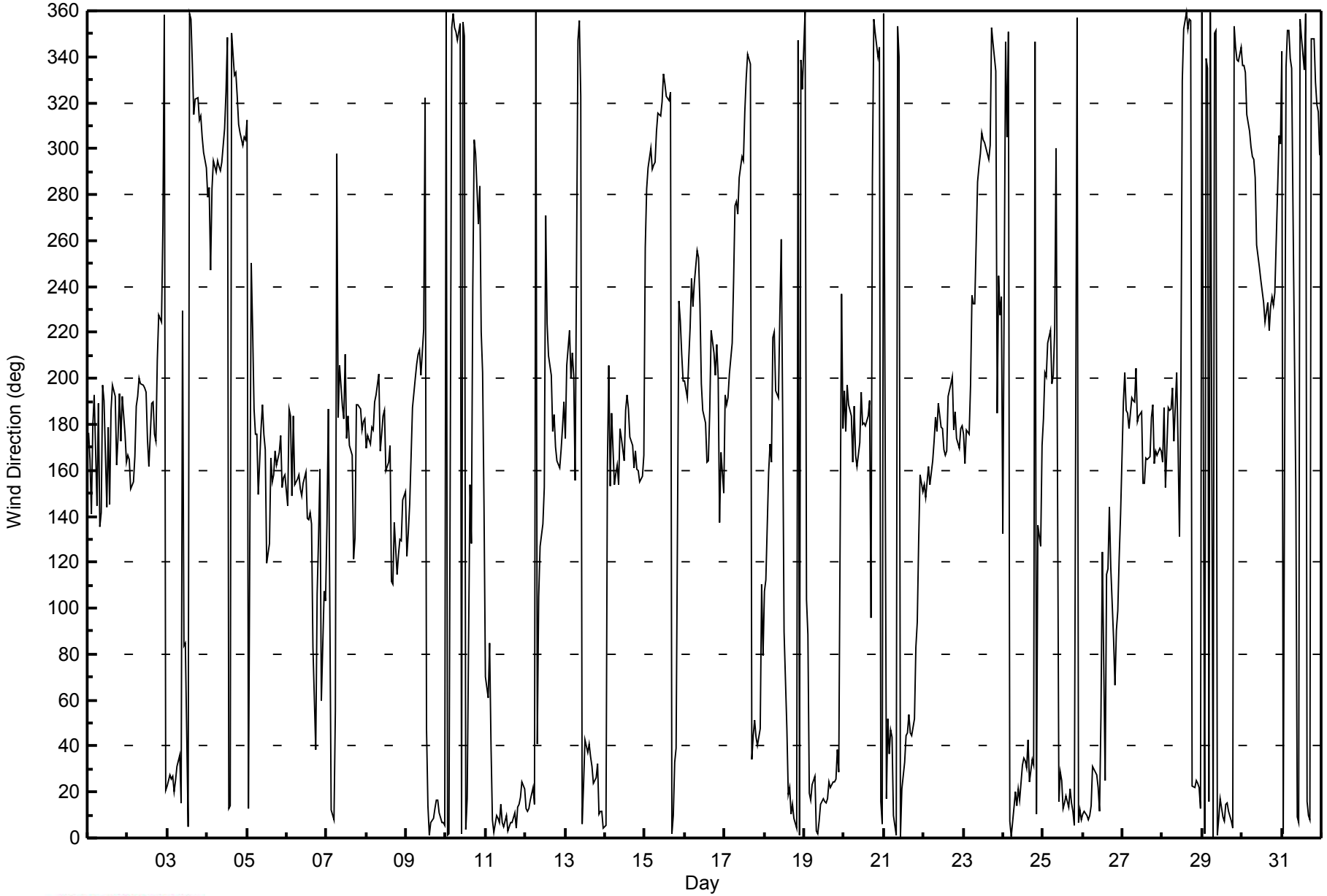
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	17	14	27	29	18	22	21	32	25	12	25	23	20	24	15	13	10	28	27	17	12	20	24	14	32
2-Jan	12	12	14	18	12	17	13	14	14	11	11	11	19	16	12	11	14	20	11	15	12	17	27	16	27
3-Jan	15	16	15	15	14	14	14	13	71	14	73	27	59	11	11	13	16	13	13	15	15	15	16	18	73
4-Jan	28	15	24	21	15	21	19	15	16	15	16	13	13	17	14	13	9	9	16	15	15	14	13	13	28
5-Jan	21	33	50	20	40	23	38	21	17	21	22	21	13	16	13	22	17	13	12	34	17	24	22	13	50
6-Jan	14	27	15	19	21	16	15	18	16	15	14	13	18	17	16	17	54	41	12	21	15	30	12	11	54
7-Jan	26	47	58	17	40	87	65	44	38	29	30	13	20	30	17	19	20	25	19	9	9	13	18	14	87
8-Jan	14	15	13	14	14	16	13	16	12	16	15	14	11	9	12	32	25	30	18	50	15	36	30	29	50
9-Jan	14	19	19	22	13	15	13	15	26	23	20	90	33	21	10	11	12	12	14	14	14	12	12	12	90
10-Jan	11	11	15	10	11	11	12	11	11	15	15	13	15	31	71	54	93	16	19	20	23	41	18	69	93
11-Jan	52	69	46	41	11	8	9	9	8	12	10	8	10	9	9	9	9	12	9	12	13	13	14	15	69
12-Jan	14	14	14	16	18	19	16	51	18	17	20	26	28	22	14	16	21	14	12	9	13	12	15	18	51
13-Jan	16	18	17	14	19	18	37	50	14	22	20	19	20	20	17	16	16	13	12	17	13	12	14	14	50
14-Jan	10	82	16	24	24	17	13	15	17	20	19	27	17	14	17	16	13	12	13	18	16	16	13	12	82
15-Jan	36	18	17	17	17	17	17	19	16	15	16	13	12	13	14	13	19	12	18	48	73	12	14	22	73
16-Jan	14	12	23	25	33	24	21	20	20	35	20	16	15	14	15	31	23	19	16	17	20	32	20	18	35
17-Jan	25	15	16	19	20	34	18	17	19	20	17	17	20	12	12	10	25	15	25	16	17	22	51	14	51
18-Jan	75	13	39	18	24	22	15	13	15	19	14	66	26	39	16	14	11	14	12	13	22	20	27	17	75
19-Jan	47	40	88	30	26	18	19	21	14	11	13	15	15	14	17	16	16	16	15	14	15	24	54	66	88
20-Jan	16	16	20	12	38	14	16	29	14	14	10	16	15	15	16	17	84	75	14	11	12	11	19	13	84
21-Jan	17	36	17	22	15	26	9	10	9	15	11	17	19	20	21	17	16	16	14	10	14	16	12	14	36
22-Jan	13	15	13	11	14	10	13	19	15	13	16	15	11	11	13	12	12	15	13	17	13	10	14	13	19
23-Jan	14	13	13	12	19	27	26	25	33	16	16	15	15	16	15	16	18	25	14	68	51	23	29	38	68
24-Jan	48	42	14	24	9	18	17	16	14	16	16	18	20	19	18	23	19	18	23	16	34	27	18	60	60
25-Jan	15	16	28	16	12	24	22	24	71	22	19	19	16	15	20	13	16	14	13	15	13	14	15	12	71
26-Jan	13	15	13	12	14	15	22	18	18	15	19	53	59	94	52	28	19	10	21	11	10	17	15	29	94
27-Jan	12	17	18	38	51	10	22	16	13	25	18	15	14	16	16	14	16	15	17	13	12	16	15	18	51
28-Jan	21	14	18	17	22	39	16	19	16	41	32	40	71	22	13	12	10	12	17	16	17	16	17	14	71
29-Jan	13	13	21	21	17	16	16	13	11	11	13	18	16	14	17	16	13	12	12	12	11	9	9	10	21
30-Jan	10	10	9	15	16	15	15	16	19	25	22	24	22	22	21	21	18	22	23	22	24	26	17	14	26
31-Jan	21	19	10	9	10	13	12	78	84	14	14	11	14	12	21	16	13	11	13	15	13	19	18	16	84
	75	82	88	41	51	87	65	78	84	41	73	90	71	94	71	54	93	75	27	68	73	41	54	69	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Mildred Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	10:45	End Time (MST)	14:05
Barometric Pressure	n/a mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11541008
Cal Gas Concentration	59.4 ppm	Cal Gas Expiry Date	3/26/2012
Gas Cert Reference	cc307191		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5000mV	DACS channel #	SE1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage (v)	-616	-616
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	902	903
Calculated slope	1.000728	0.999761	Chamber temp. (Deg C)	44.2	44.2
Calculated intercept	-0.020743	0.326112	Pressure (mmHg)	711.9	710.5
Analyzer Background	25.7	25.7	Flow (lpm)	0.543	0.542
Analyzer Coefficient	0.918	0.918	Intensity (%)	29000	29000

Analyzer make	TEI 43C	Analyzer serial #	43c-77879-387

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.28	N/A
as found span	5000	69.9	830.4	830.5	1.000
calibrator zero	5000	0.0	0.0	0.28	N/A
high point	5000	69.9	830.4	830.6	1.000
second point	5000	35.4	420.6	420.0	1.001
third point	5000	17.7	210.3	209.4	1.004
calibrator zero					
as left zero	5000	0.0	0.0	0.8	N/A
as left span	5000	69.9	830.4	834.6	0.995
				Average Correction Factor	1.002

Corrected As found	830.3	Previous response	831.0	% change	0.1%

Notes: As Founds used as Calibrator Zero and High Point
No adjustments, good cal
Filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

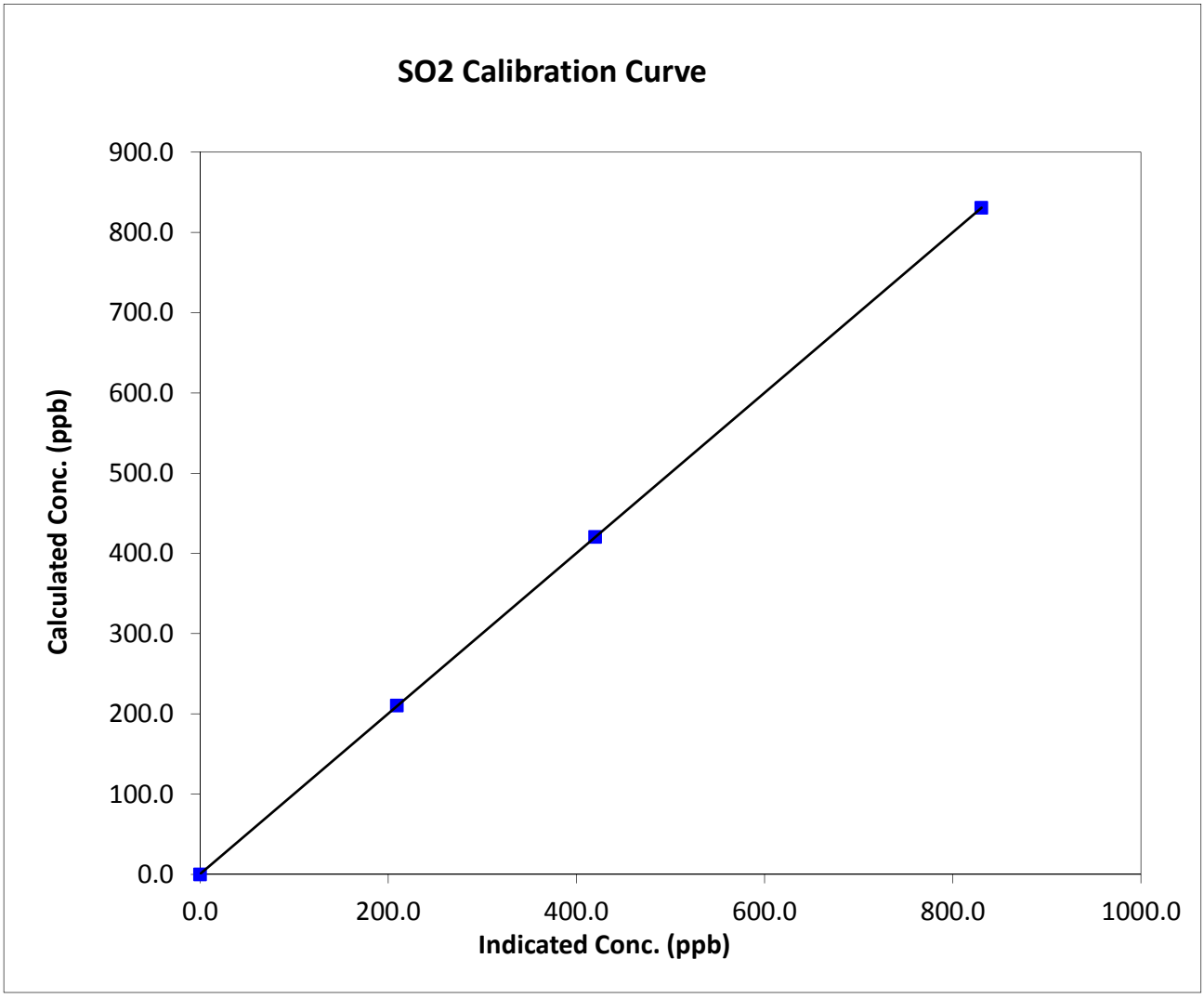
SO_2 Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:45	End Time (MST)	14:05
Analyzer make	TEI 43C	Analyzer serial #	43c-77879-387

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999998
830.4	830.6	0.9998		
420.6	420.0	1.0013	Slope	0.999761
210.3	209.4	1.0042		
			Intercept	0.326112



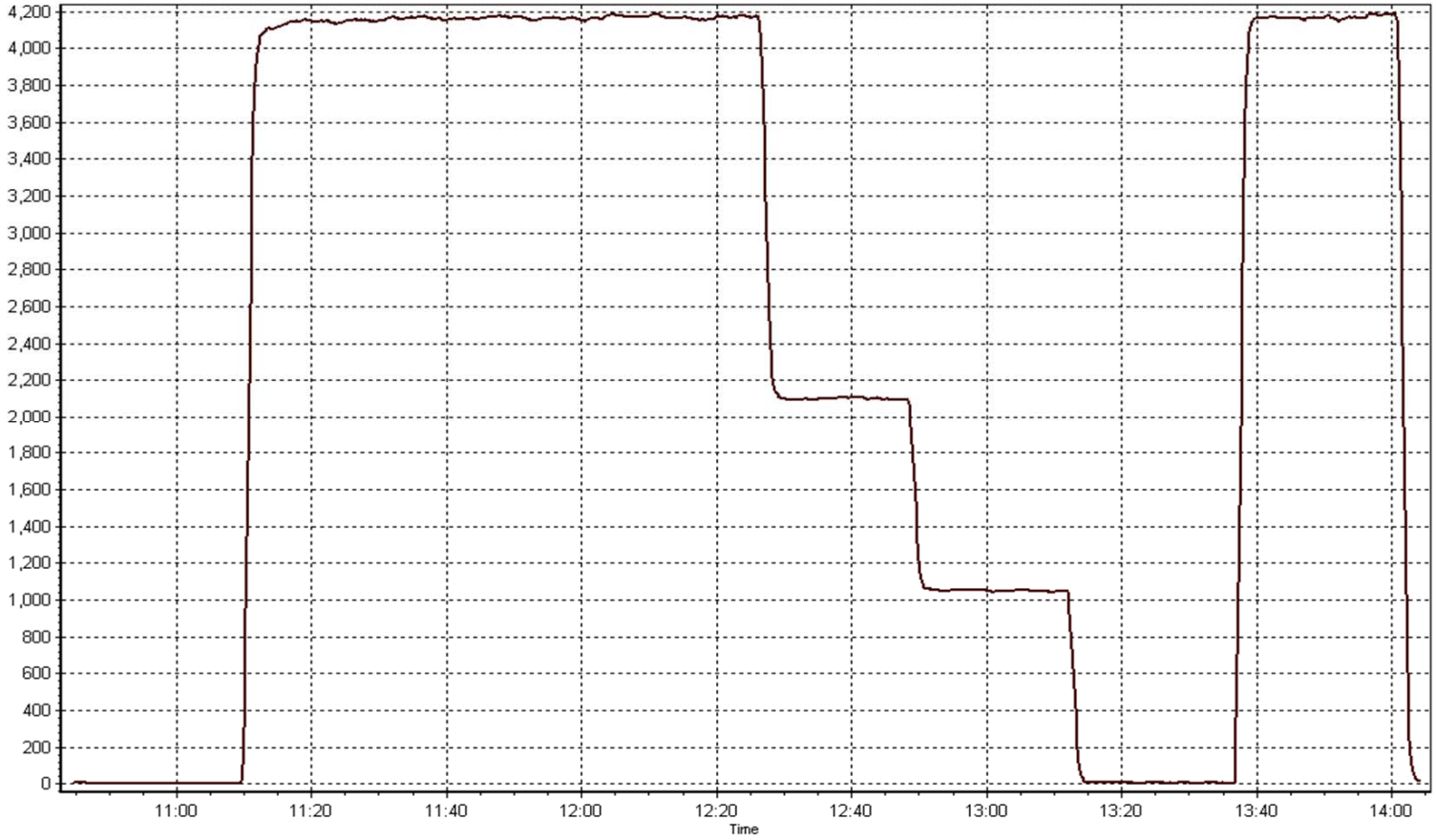
Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

SO_2 Calibration Plot

Calibration Date: January 7, 2014 Start Time (MST) 10:45 End Time: 14:05

Station Name: Mildred Lake Station Number: AMS 2



Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 9, 2013
Station Name	Mildred Lake	Station Number	AMS 2

Reason: Routine

Start Time (MST)	10:40	End Time (MST)	13:26
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11541008
Cal Gas Concentration	5.59 ppm	Cal Gas Expiry Date	3/11/2009
Gas Cert Reference	cc243460	SO2 Cal Gas Concentration	59.4 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5000mV	DACS channel #	SE2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage (v)	-600	-600
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	777	777
Calculated slope	1.008567	1.006777	Chamber temp. (Deg C)	45	45
Calculated intercept	-0.503924	-0.531551	Pressure (mmHg)	532.9	540.8
Analyzer Background	12.1	12	Flow (lpm)	0.990	1.005
Analyzer Coefficient	0.876	0.876	Intensity (%)	88	88
			Converter Temp (Deg C)	328	327

Analyzer make	TEI 450i	Analyzer serial #	815129107
Converter Make	n/a	Converter Serial #	n/a

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	4000	0.0	0.0	0.5	N/A
as found span	4000	57.2	79.9	79.9	1.000
SO2 Scrubber	5000	17.7	210.3	0.7	N/A
calibrator zero	4000	0.0	0.0	0.5	N/A
high point	4000	57.2	79.9	79.9	1.000
second point	4000	28.6	40.0	40.2	0.994
third point	4000	14.3	20.0	20.4	0.979
calibrator zero	5000	0.0	0.0		N/A
as left zero	5000	0.0	0.0	0.7	N/A
as left span	4000	57.2	79.9	80.4	0.994
				Average Correction Factor	0.991

Corrected As found	79.4	Previous response	81.1	% change	2.1%

Notes: No adjustments needed, As Founds used as Zero and High Point
Scrubber check complete after third point
Filter changed

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

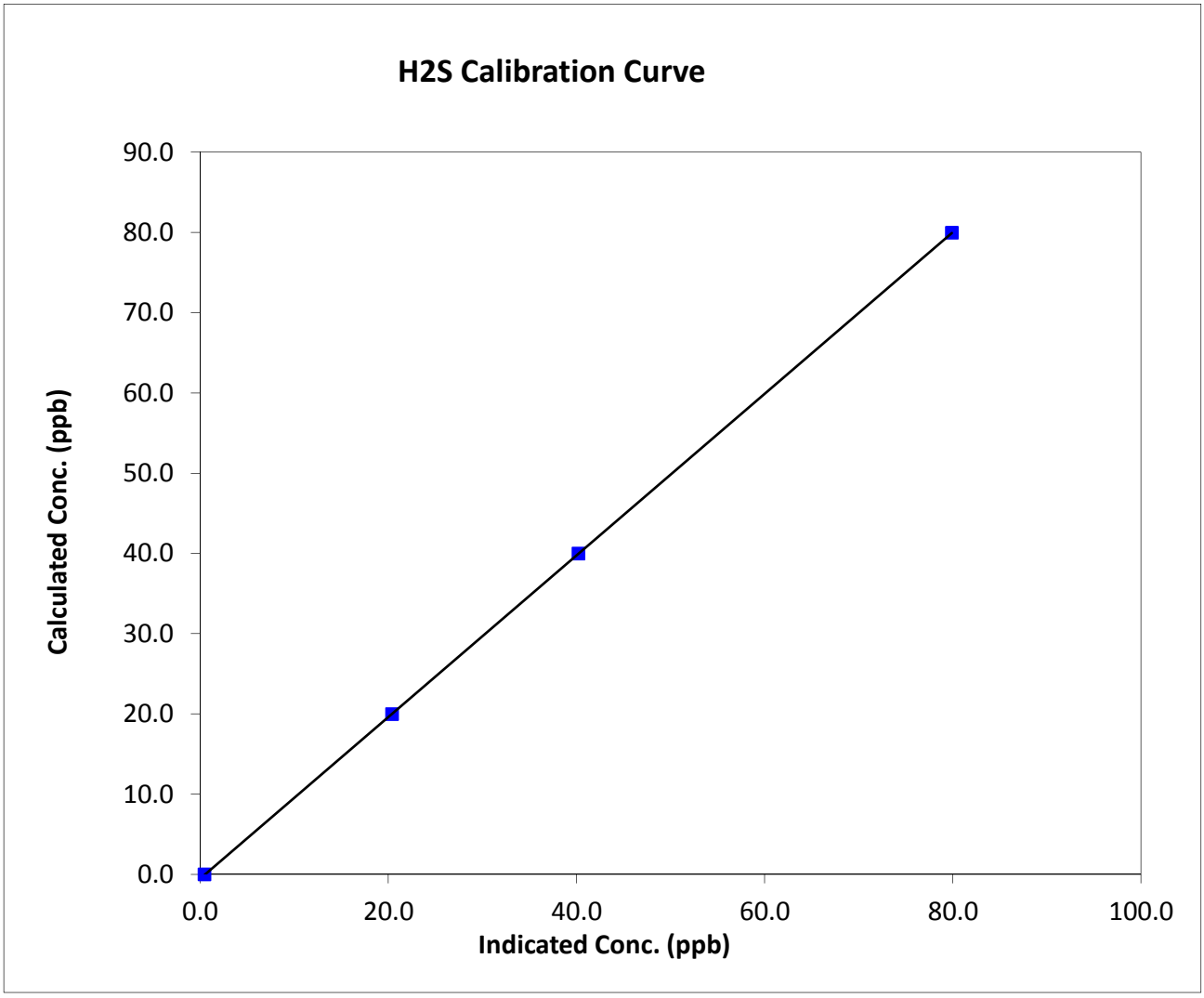
H2S Calibration Summary

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 9, 2013
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:40	End Time (MST)	13:26
Analyzer make	TEI 450i	Analyzer serial #	815129107
		Converter Serial #	n/a

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.5	N/A	Correlation Coefficient	0.999999
79.9	79.9	1.0002		
40.0	40.2	0.9937	Slope	1.006777
20.0	20.4	0.9787		
			Intercept	-0.531551



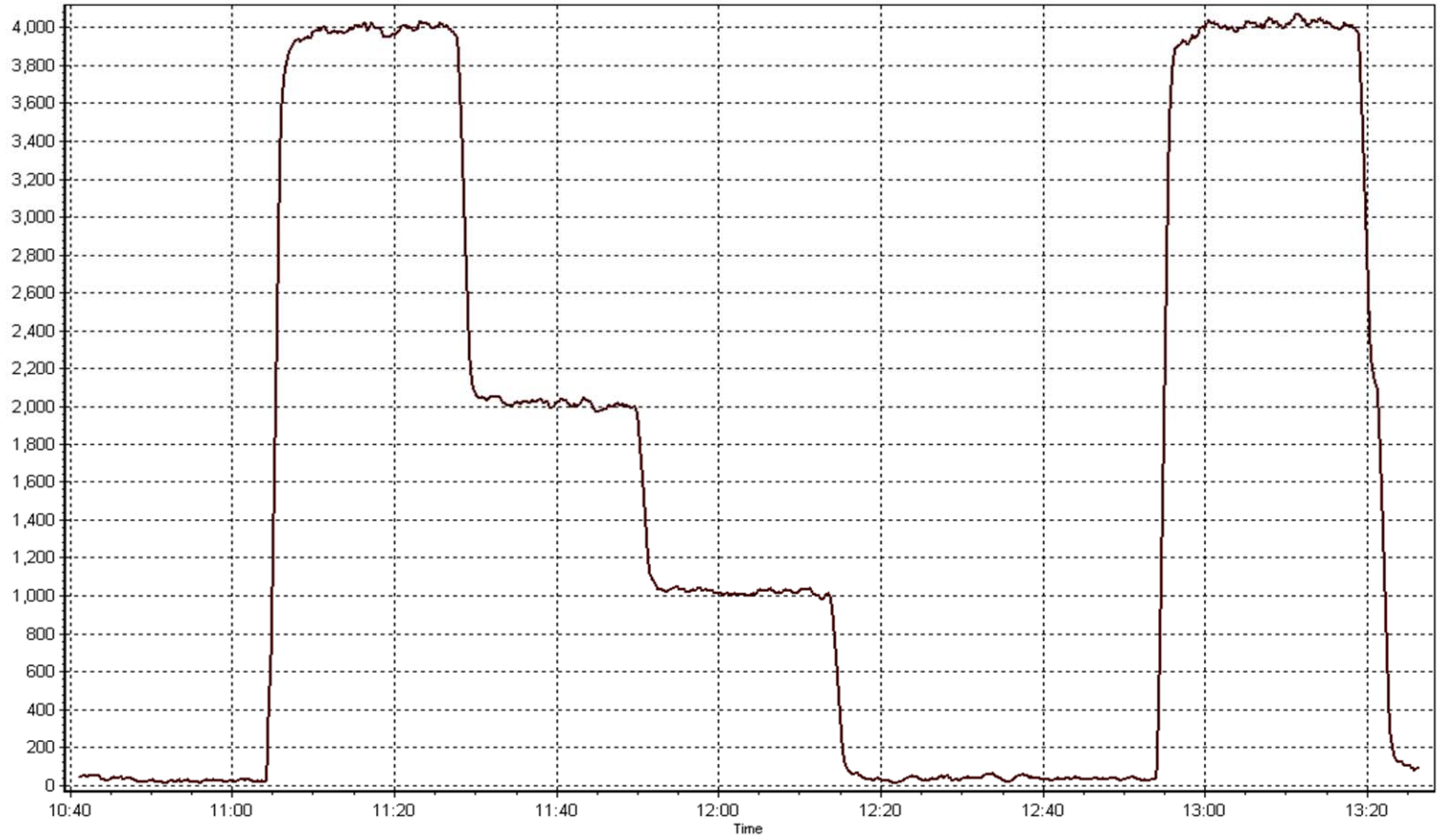
Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

H_2S Calibration Plot

Calibration Date: January 8, 2014 Start Time (MST) 10:40 End Time: 13:26

Station Name: Mildred Lake Station Number: AMS 2



Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 11, 2013
Station Name	Mildred Lake	Station Number	AMS 2
Reason:	Routine		
Start Time (MST)	10:45	End Time (MST)	14:05
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11541008
CH4 Gas Concentration	505 ppm	Cal Gas Expiry Date	3/26/2012
C3H8 Gas Concentration	202 ppm		
Gas Cert Reference	cc307191	CH4 Equivalent	1061 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2589
DACS voltage range	0-5000mV	DACS channel #	SE3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	25	25	Air pressure	39.8	39.8
Analyzer Range (mv)	5000	5000	Fuel Pressure	25.6	25.6
Calculated slope	1.056721	1.001114	Sample Pressure	8.2	8.2
Calculated intercept	-0.021134	-0.097914	Flame Temp	154.0	153.8
Bkg	2.31	2.42			
Coef	4.740	4.970			

Analyzer make	51i_LT	Analyzer serial #	1300156231

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.10	N/A
as found span	5000	69.9	14.83	14.07	1.054
calibrator zero	5000	0.0	0.00	0.11	N/A
high point	5000	69.9	14.83	14.90	0.995
2nd point	5000	35.4	7.51	7.63	0.985
3rd point	5000	17.7	3.75	3.82	0.983
calibrator zero		0.0			
as left zero	5000	0.0	0.00	0.11	N/A
as left span	5000	69.9	14.83	14.80	1.002
				Average Correction Factor	0.987

Corrected As found	14.0	Previous response	14.1	% change	0.6%

Notes: As Found zero used as calibrator zero
Span adjusted
Filter changed after 3rd point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

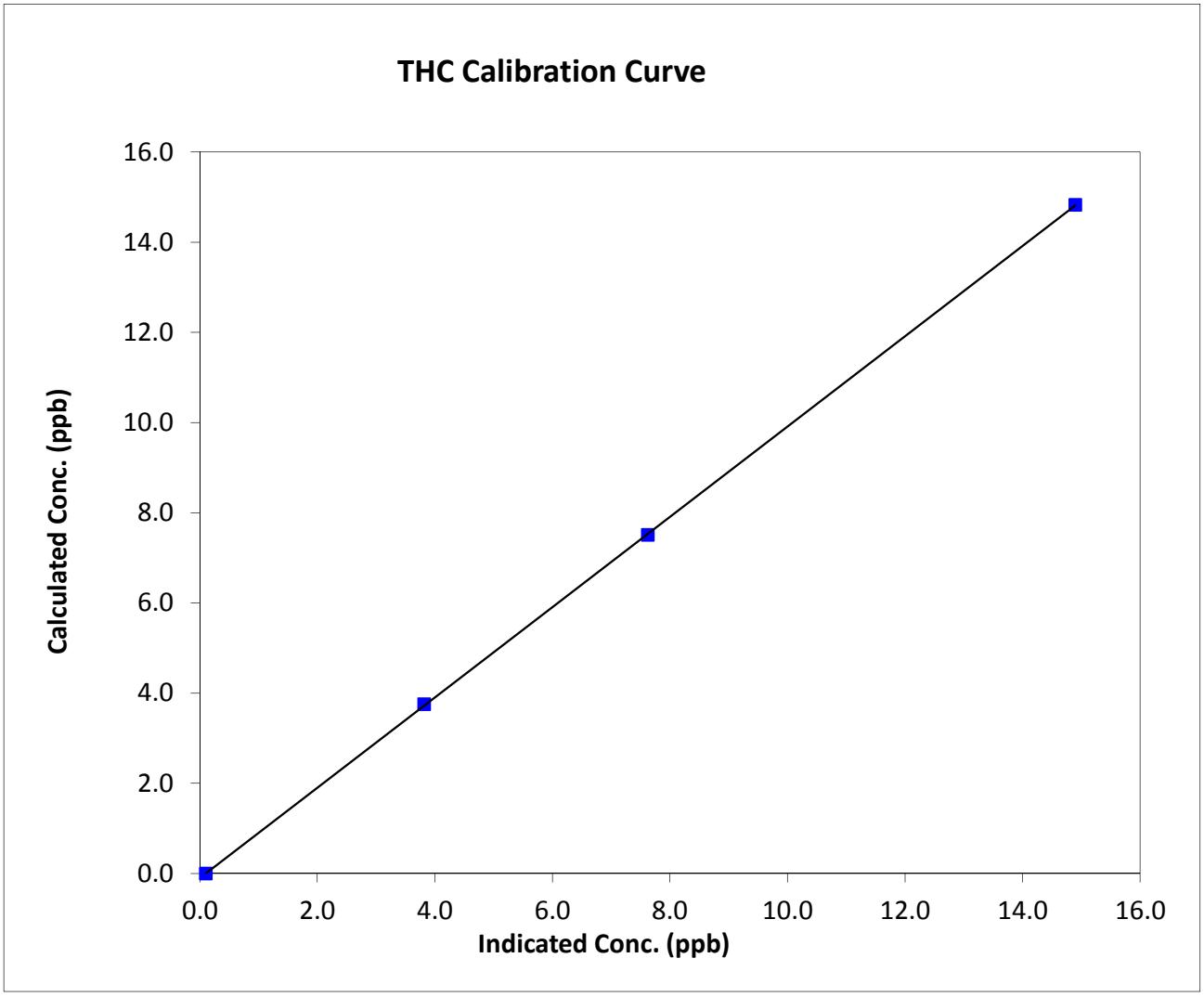
THC Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 11, 2013
Station Name	Mildred Lake	Station Number	AMS 2
Start Time (MST)	10:45	End Time (MST)	14:05
Analyzer make	51i_LT	Analyzer serial #	1300156231

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999986
14.8	14.9	0.9950		
7.5	7.6	0.9846	Slope	1.001114
3.8	3.8	0.9828		
			Intercept	-0.097914



Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

THC Calibration Plot

Calibration Date: January 7, 2014 Start Time (MST) 10:45 End Time: 14:05
Station Name: Mildred Lake Station Number: AMS 2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 3
LOWER CAMP METEOROLOGY
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
JANUARY 2014

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	744	0	0	100.00	7.5	-	1.2	-
Temperature 45 m (C) Average	744	0	0	100.00	7.3	-	1.4	-
Temperature 100 m (C) Average	733	0	11	98.52	7	-	1.7	-
Temperature 167 m (C) Average	708	0	36	95.16	7.5	-	1.5	-
Relative Humidity 20 m (%) Average	744	0	0	100.00	90	-	85.0	-
Relative Humidity 45 m (%) Average	744	0	0	100.00	90	-	86.0	-
Relative Humidity 100 m (%) Average	733	0	11	98.52	93	-	87.0	-
Relative Humidity 167 m (%) Average	708	0	36	95.16	93	-	81.0	-
Wind Speed 20 m (km/h) Average	744	0	0	100.00	41	-	-	-
Wind Speed 45 m (km/h) Average	744	0	0	100.00	53	-	-	-
Wind Speed 100 m (km/h) Average	734	0	10	98.66	73	-	-	-
Wind Speed 167 m (km/h) Average	712	0	32	95.70	86	-	-	-
Wind Direction 20 m (deg) Average	744	0	0	100.00	-	-	-	-
Wind Direction 45 m (deg) Average	744	0	0	100.00	-	-	-	-
Wind Direction 100 m (deg) Average	734	0	10	98.66	-	-	-	-
Wind Direction 167 m (deg) Average	712	0	32	95.70	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	0	0	100.00	1.1	-	-	-
Vertical Wind Speed 45 m (km/h) Average	744	0	0	100.00	2.5	-	-	-
Vertical Wind Speed 100 m (km/h) Average	734	0	10	98.66	2.5	-	-	-
Vertical Wind Speed 167 m (km/h) Average	712	0	32	95.70	3.4	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
Temperature 20 m (C) Average	744	-16.7	9.6	-	-36.9	-28.2	-23.7	-16.8	-10.7	-3.3	7.5
Temperature 45 m (C) Average	744	-16.54	9.6	-	-35.6	-28.1	-23.4	-16.7	-10.6	-3.3	7.3
Temperature 100 m (C) Average	733	-15.91	9.6	-	-34.7	-27.2	-23.2	-16.6	-9.7	-1.7	7
Temperature 167 m (C) Average	708	-15.77	9.7	-	-32.5	-26.9	-23.4	-16.8	-9.1	-0.8	7.5
Relative Humidity 20 m (%) Average	744	72.2	8	-	44	61	67	72	79	83	90
Relative Humidity 45 m (%) Average	744	72.2	8	-	44	62	67	72	79	83	90
Relative Humidity 100 m (%) Average	733	71.5	9	-	44	61	66	71	78	83	93
Relative Humidity 167 m (%) Average	708	70.7	9	-	44	59	66	71	77	83	93
Wind Speed 20 m (km/h) Average	744	7.9	6	-	0	2	4	7	11	15	41
Wind Speed 45 m (km/h) Average	744	10.6	7	-	0	2	5	9	14	19	53
Wind Speed 100 m (km/h) Average	734	15.2	10	-	0	5	9	13	20	27	73
Wind Speed 167 m (km/h) Average	712	19.1	12	-	0	6	11	18	24	32	86
Wind Direction 20 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	734	-	-	-	-	-	-	-	-	-	-
Wind Direction 167 m (deg) Average	712	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	-0.18	0.4	-	-2.3	-0.6	-0.4	-0.2	0	0.2	1.1
Vertical Wind Speed 45 m (km/h) Average	744	0.06	0.7	-	-3.2	-0.5	-0.3	0	0.4	0.9	2.5
Vertical Wind Speed 100 m (km/h) Average	734	0.17	0.5	-	-1.8	-0.2	-0.1	0.1	0.4	0.7	2.5
Vertical Wind Speed 167 m (km/h) Average	712	0.26	0.7	-	-2.1	-0.4	-0.1	0.1	0.6	1.1	3.4

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS 3)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Temperature, Relative Humidity 100 m	10 Jan 2014 00:00	10 Jan 2014 10:00	11	Flatline in sensor output signal
Temperature, Relative Humidity 167 m	09 Jan 2014 10:00	10 Jan 2014 21:00	36	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 100 m	10 Jan 2014 01:00	10 Jan 2014 10:00	10	Flatline in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	09 Jan 2014 10:00	09 Jan 2014 16:00	7	Flatline in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	09 Jan 2014 19:00	09 Jan 2014 19:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed. Wind Direction, Vertical Wind Speed 167 m	09 Jan 2014 22:00	10 Jan 2014 21:00	24	Flatline in sensor output signal - Sensor frozen

Maximum Value: 7.5 C on Jan 17 14:00

Maximum Daily Average: 1.2 C on Jan 15

Minimum Value: -36.9 C on Jan 5 07:00

Minimum Daily Average: -32.7 C on Jan 1

Maximum Diurnal Average: -14.2 C at hour 15

Minimum Diurnal Average: -18.1 C at hour 6

Monthly Average: -16.70 C

Percentiles: P_1 = -35.0 P_{10} = -28.2 Q_1 = -23.7 Median = -16.8 Q_3 = -10.7 P_{90} = -3.3 P_{99} = 6.1

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

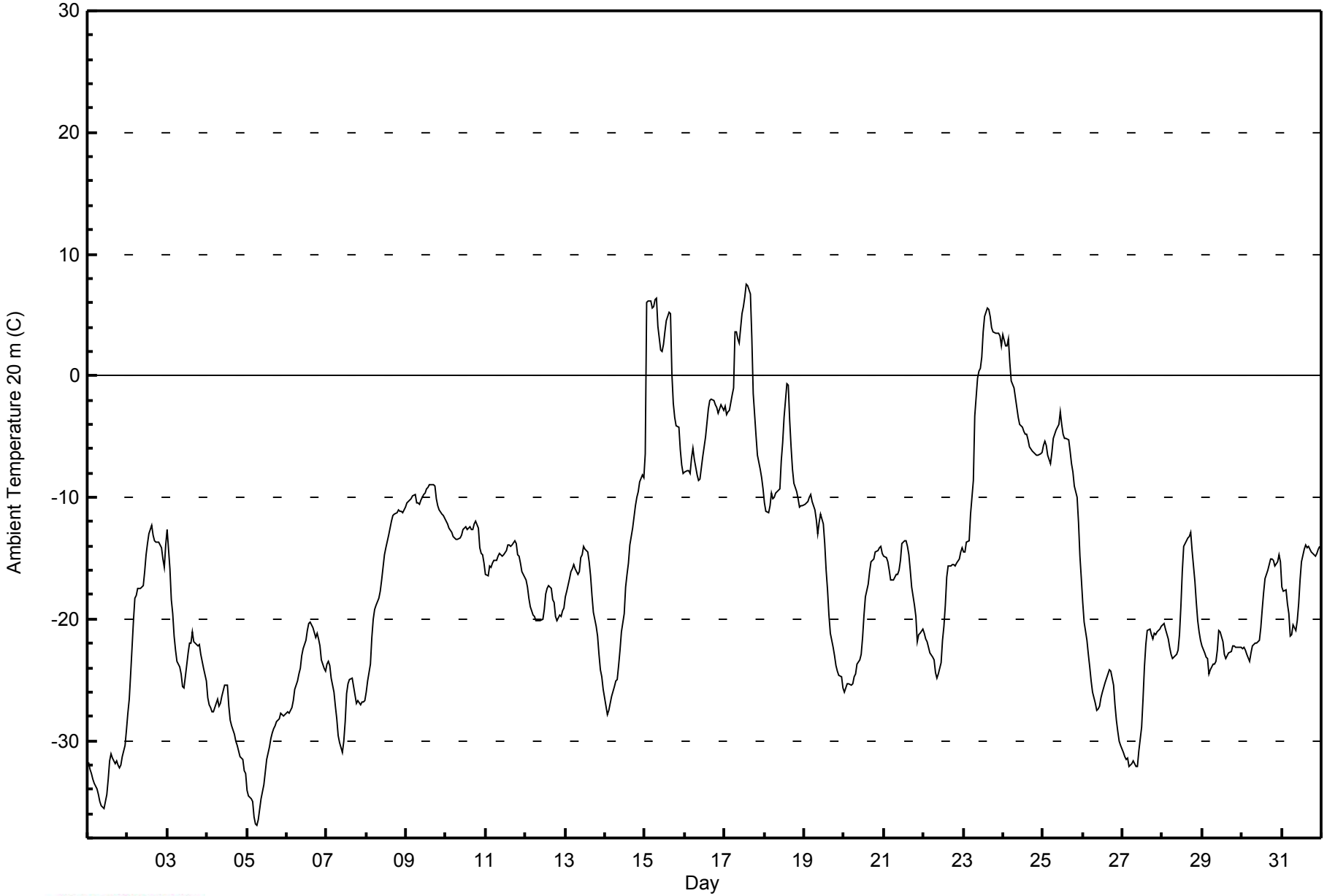
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.8	-32.3	-32.7	-33.1	-33.5	-34.0	-34.5	-35.0	-35.3	-35.4	-35.6	-34.5	-33.1	-31.7	-31.1	-31.4	-31.9	-31.7	-32.0	-32.2	-32.0	-31.3	-30.4	-29.1	-32.7	-29.1
2-Jan	-27.8	-26.6	-24.6	-20.1	-18.3	-18.0	-17.5	-17.5	-17.5	-17.2	-16.1	-14.7	-13.8	-13.0	-12.3	-13.1	-13.6	-13.7	-13.7	-13.7	-14.1	-15.1	-15.8	-13.9	-16.7	-12.3
3-Jan	-12.7	-15.9	-18.4	-19.6	-21.4	-22.5	-23.5	-23.9	-24.5	-25.5	-25.7	-24.7	-22.8	-22.0	-22.0	-21.1	-21.9	-22.0	-22.2	-22.1	-22.9	-23.5	-24.0	-25.1	-22.1	-12.7
4-Jan	-26.4	-27.1	-27.2	-27.7	-27.6	-26.9	-26.6	-27.1	-27.0	-26.3	-25.4	-25.4	-25.4	-27.1	-28.3	-28.8	-29.4	-30.1	-30.4	-30.9	-31.3	-31.5	-32.4	-32.7	-28.3	-25.4
5-Jan	-34.1	-34.5	-34.7	-35.0	-36.3	-36.8	-36.9	-36.6	-34.8	-34.2	-33.6	-32.6	-31.6	-30.5	-29.8	-29.4	-29.1	-28.8	-28.4	-28.2	-27.7	-27.9	-28.0	-27.8	-32.0	-27.7
6-Jan	-27.7	-27.8	-27.6	-27.3	-26.7	-25.8	-25.0	-24.5	-24.1	-23.0	-22.4	-21.7	-21.0	-20.3	-20.2	-20.5	-20.7	-21.6	-21.2	-21.6	-22.2	-23.3	-24.1	-24.3	-23.5	-20.2
7-Jan	-23.7	-23.5	-23.9	-24.9	-26.0	-27.1	-28.2	-29.6	-30.1	-31.0	-30.1	-28.4	-26.1	-25.3	-24.9	-24.9	-25.6	-26.3	-26.9	-26.8	-27.1	-26.8	-26.8	-26.7	-26.7	-23.5
8-Jan	-26.0	-25.0	-23.7	-21.5	-20.0	-19.2	-18.8	-18.3	-17.8	-16.8	-15.7	-14.7	-14.1	-13.1	-12.5	-12.0	-11.5	-11.4	-11.2	-11.1	-11.2	-11.2	-11.3	-10.8	-15.8	-10.8
9-Jan	-10.4	-10.3	-10.2	-10.1	-9.9	-9.8	-10.5	-10.4	-10.5	-10.2	-9.8	-9.7	-9.3	-9.2	-9.0	-8.9	-8.9	-9.1	-10.2	-10.6	-11.1	-11.4	-11.5	-11.7	-10.1	-8.9
10-Jan	-11.9	-12.2	-12.6	-12.9	-13.2	-13.3	-13.5	-13.4	-13.3	-13.1	-12.7	-12.5	-12.4	-12.6	-12.5	-12.6	-12.7	-12.2	-11.9	-12.5	-14.2	-14.6	-14.7	-15.4	-13.0	-11.9
11-Jan	-16.3	-16.4	-15.7	-15.7	-15.4	-15.1	-15.2	-14.8	-14.6	-14.8	-14.8	-14.7	-14.4	-13.9	-13.9	-14.0	-13.9	-13.6	-13.8	-14.7	-14.8	-15.4	-16.1	-16.5	-14.9	-13.6
12-Jan	-16.8	-17.4	-18.3	-19.0	-19.7	-19.8	-20.1	-20.2	-20.1	-20.1	-20.0	-19.2	-17.9	-17.5	-17.2	-17.5	-18.4	-18.6	-19.8	-20.1	-19.7	-19.7	-19.3	-19.1	-19.0	-16.8
13-Jan	-18.1	-17.7	-16.7	-16.1	-15.9	-15.5	-15.9	-16.3	-16.1	-15.0	-14.7	-14.0	-14.2	-14.5	-15.3	-16.5	-18.1	-19.5	-20.6	-21.4	-22.9	-24.2	-24.8	-25.8	-17.9	-14.0
14-Jan	-27.2	-27.8	-27.5	-27.0	-26.4	-25.6	-25.1	-25.0	-23.9	-22.5	-21.1	-19.5	-17.4	-16.3	-15.4	-13.9	-12.5	-11.6	-10.7	-10.0	-9.6	-8.7	-8.1	-8.4	-18.4	-8.1
15-Jan	-6.4	6.1	6.2	6.2	5.5	5.7	6.2	6.4	4.1	2.1	2.0	2.5	3.6	4.5	5.2	5.1	0.1	-2.3	-3.4	-4.1	-4.2	-6.1	-7.3	-8.0	1.2	6.4
16-Jan	-7.9	-7.8	-7.8	-8.1	-6.8	-6.0	-6.9	-8.2	-8.6	-8.5	-7.6	-6.6	-5.1	-3.8	-2.7	-2.0	-1.9	-2.0	-2.4	-2.6	-3.0	-2.7	-2.4	-2.9	-5.2	-1.9
17-Jan	-2.5	-3.2	-3.0	-2.9	-1.6	-1.0	3.7	3.6	3.0	2.6	5.1	5.7	6.5	7.5	7.4	6.7	3.1	-1.4	-3.2	-5.0	-6.5	-7.6	-8.4	-9.3	0.0	7.5
18-Jan	-10.4	-11.2	-11.3	-10.7	-9.6	-10.1	-10.0	-9.7	-9.4	-9.3	-6.9	-5.6	-3.4	-0.6	-0.7	-3.6	-5.9	-7.7	-8.9	-9.6	-10.1	-10.8	-10.7	-10.7	-8.2	-0.6
19-Jan	-10.5	-10.4	-10.3	-10.0	-9.7	-10.4	-11.0	-11.8	-13.0	-12.0	-11.3	-12.2	-13.8	-16.0	-17.6	-19.6	-21.1	-22.3	-23.1	-23.8	-24.3	-24.6	-24.7	-25.6	-16.2	-9.7
20-Jan	-26.0	-25.7	-25.3	-25.4	-25.5	-25.3	-24.7	-24.6	-23.7	-23.3	-22.9	-21.5	-19.7	-18.2	-17.1	-16.1	-15.3	-15.2	-15.0	-14.5	-14.4	-14.2	-14.0	-14.5	-20.1	-14.0
21-Jan	-14.9	-15.0	-15.3	-15.9	-16.8	-16.8	-16.8	-16.4	-16.3	-16.0	-15.2	-13.8	-13.6	-13.6	-14.1	-14.7	-16.0	-17.4	-18.9	-19.8	-21.8	-21.2	-21.2	-20.9	-16.8	-13.6
22-Jan	-21.2	-21.6	-21.9	-22.3	-22.8	-23.1	-23.3	-24.4	-24.9	-24.5	-23.6	-21.7	-20.7	-18.8	-16.6	-15.6	-15.7	-15.6	-15.5	-15.6	-15.4	-15.1	-14.5	-14.2	-19.5	-14.2
23-Jan	-14.5	-14.5	-13.7	-13.6	-11.4	-10.0	-8.6	-3.3	-0.2	0.4	0.7	1.5	3.7	4.9	5.6	5.4	4.8	3.9	3.6	3.4	3.5	3.4	3.2	2.5	-1.6	5.6
24-Jan	3.4	2.5	2.5	3.1	1.1	-0.4	-1.0	-1.8	-2.6	-3.4	-4.0	-4.3	-4.5	-4.8	-4.8	-5.2	-5.9	-6.2	-6.3	-6.4	-6.5	-6.5	-6.5	-6.3	-3.1	3.4
25-Jan	-5.8	-5.3	-5.7	-6.5	-7.2	-6.3	-5.1	-4.8	-4.4	-4.0	-2.9	-4.0	-4.8	-5.1	-5.1	-5.2	-6.2	-7.2	-8.0	-9.0	-10.0	-12.1	-14.9	-16.7	-6.9	-2.9
26-Jan	-18.6	-20.3	-21.8	-22.9	-24.0	-25.0	-26.1	-27.0	-27.6	-27.4	-27.1	-26.5	-26.0	-25.2	-24.9	-24.5	-24.2	-24.2	-25.4	-27.0	-28.4	-29.2	-30.1	-30.4	-25.6	-18.6
27-Jan	-31.0	-31.4	-31.5	-31.4	-32.1	-31.9	-31.7	-31.9	-32.1	-32.1	-30.8	-28.9	-26.5	-24.0	-22.1	-21.0	-20.8	-21.3	-21.6	-21.1	-21.3	-21.0	-20.8	-20.6	-26.6	-20.6
28-Jan	-20.5	-20.4	-20.9	-21.6	-22.3	-22.9	-23.2	-23.2	-22.9	-22.5	-21.2	-18.9	-16.1	-14.1	-13.5	-13.3	-13.2	-12.8	-14.4	-17.0	-18.7	-20.1	-21.1	-21.7	-19.0	-12.8
29-Jan	-22.2	-22.8	-23.2	-23.2	-24.6	-24.1	-23.7	-23.7	-23.4	-22.6	-20.9	-21.1	-21.8	-22.9	-23.3	-23.0	-22.8	-22.6	-22.2	-22.2	-22.3	-22.3	-22.3	-22.3	-22.7	-20.9
30-Jan	-22.4	-22.3	-22.5	-22.9	-23.5	-22.8	-22.2	-22.1	-22.0	-21.9	-21.8	-20.7	-19.2	-17.8	-16.7	-16.0	-15.6	-15.1	-15.1	-15.2	-15.6	-15.2	-14.7	-15.3	-19.1	-14.7
31-Jan	-17.4	-17.7	-17.6	-18.8	-19.6	-21.4	-21.3	-20.4	-21.0	-20.1	-18.8	-16.8	-15.3	-14.2	-13.9	-14.1	-14.0	-14.2	-14.5	-14.7	-14.8	-14.6	-14.2	-14.0	-16.8	-13.9
	-18.1	-17.9	-18.0	-18.0	-18.1	-18.1	-18.0	-17.9	-17.9	-17.7	-16.9	-16.1	-15.2	-14.5	-14.2	-14.2	-14.8	-15.3	-15.7	-16.1	-16.6	-16.9	-17.2	-17.4	Diurnal Average	
	3.4	6.1	6.2	6.2	5.5	5.7	6.2	6.4	4.1	2.6	5.1	5.7	6.5	7.5	7.4	6.7	4.8	3.9	3.6	3.4	3.5	3.4	3.2	2.5	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature 20 m (AT20m) - C

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	309	41.53	41.53
-20 - 0	388	52.15	93.68
0 - 10	47	6.32	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 7.3 C on Jan 17 14:00

Maximum Daily Average: 1.4 C on Jan 15

Minimum Value: -35.6 C on Jan 1 11:00

Minimum Daily Average: -32.8 C on Jan 1

Maximum Diurnal Average: -14.3 C at hour 16

Minimum Diurnal Average: -17.8 C at hour 6

Monthly Average: -16.54 C

Percentiles: P_1 = -34.6 P_{10} = -28.1 Q_1 = -23.4 Median = -16.7 Q_3 = -10.6 P_{90} = -3.3 P_{99} = 6.2

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

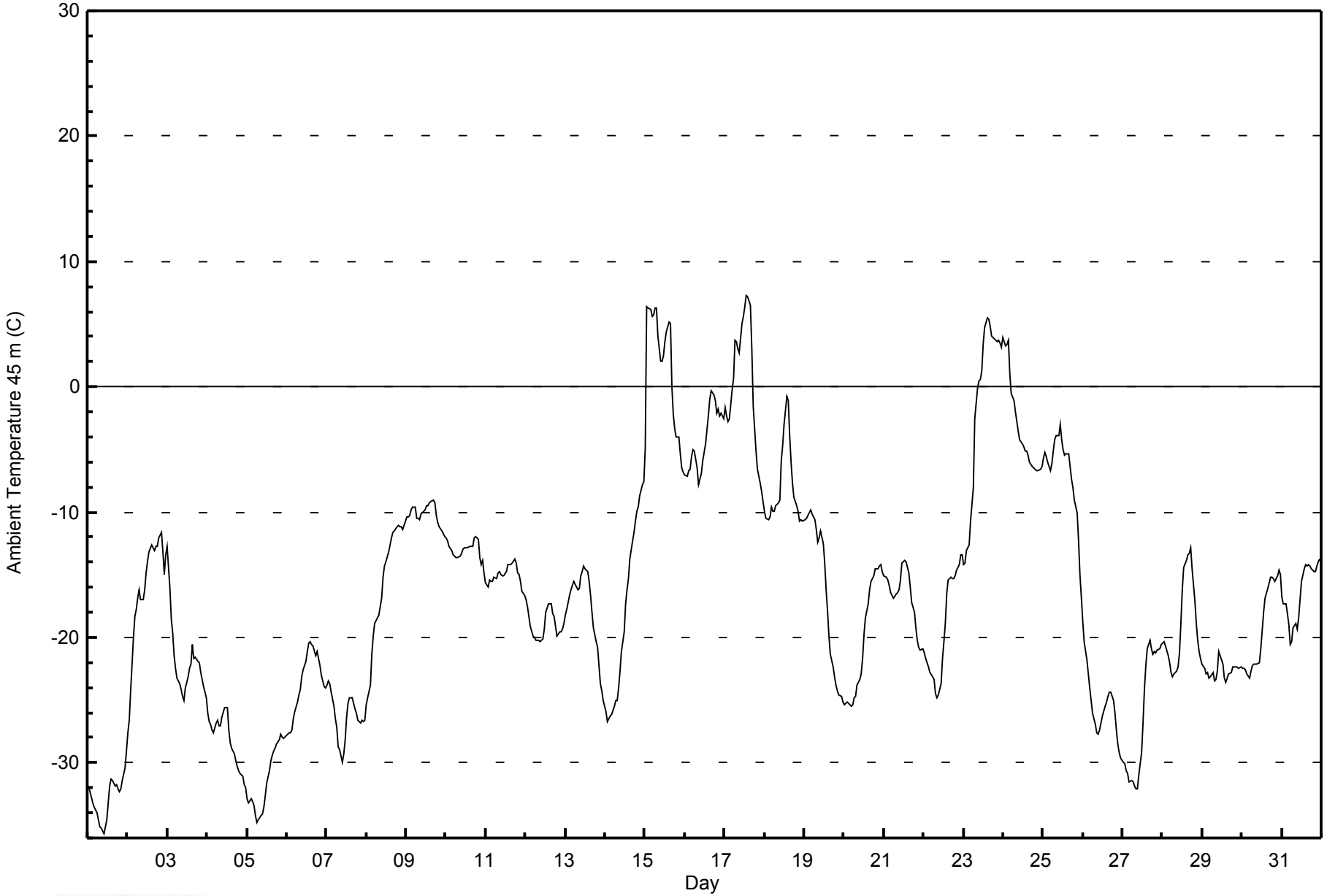
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.9	-32.3	-32.8	-33.2	-33.6	-34.0	-34.6	-35.1	-35.2	-35.5	-35.6	-34.6	-33.2	-31.8	-31.3	-31.5	-31.9	-31.8	-32.1	-32.3	-32.1	-31.4	-30.4	-29.1	-32.8	-29.1
2-Jan	-27.7	-26.6	-24.3	-20.0	-18.4	-17.7	-16.9	-16.2	-17.0	-17.0	-16.2	-14.9	-14.0	-13.2	-12.6	-12.8	-13.1	-12.7	-12.7	-12.0	-11.6	-13.2	-14.9	-13.4	-16.2	-11.6
3-Jan	-12.8	-16.1	-18.6	-19.7	-21.4	-22.4	-23.2	-23.7	-24.1	-24.7	-25.0	-24.1	-23.1	-22.5	-22.1	-20.6	-21.6	-21.6	-21.9	-22.0	-22.8	-23.3	-23.9	-24.9	-21.9	-12.8
4-Jan	-26.1	-26.7	-26.9	-27.4	-27.6	-26.8	-26.6	-27.1	-27.1	-26.4	-25.6	-25.6	-25.5	-27.4	-28.4	-28.8	-29.3	-29.9	-30.3	-30.7	-30.9	-31.1	-31.8	-32.0	-28.2	-25.5
5-Jan	-32.9	-33.2	-32.9	-33.1	-33.5	-34.2	-34.8	-34.6	-34.2	-34.1	-33.5	-32.7	-31.6	-30.6	-29.9	-29.4	-29.0	-28.8	-28.5	-28.2	-27.7	-27.9	-28.0	-27.9	-31.3	-27.7
6-Jan	-27.7	-27.6	-27.6	-27.4	-26.5	-25.9	-25.1	-24.6	-24.1	-23.1	-22.5	-21.9	-21.1	-20.5	-20.3	-20.6	-20.7	-21.5	-21.2	-21.7	-22.3	-23.1	-23.9	-24.0	-23.5	-20.3
7-Jan	-23.8	-23.5	-23.7	-24.3	-25.5	-26.4	-27.1	-28.7	-29.0	-29.9	-29.3	-28.2	-26.4	-25.3	-24.8	-24.8	-25.2	-25.7	-26.0	-26.6	-26.8	-26.6	-26.7	-26.6	-26.3	-23.5
8-Jan	-25.4	-24.9	-23.8	-21.3	-19.9	-18.9	-18.6	-18.2	-17.6	-16.8	-15.2	-14.3	-14.0	-13.2	-12.6	-12.1	-11.6	-11.5	-11.2	-11.0	-11.2	-11.2	-11.4	-10.7	-15.7	-10.7
9-Jan	-10.4	-10.4	-10.3	-9.8	-9.6	-9.6	-10.5	-10.5	-10.6	-10.2	-9.9	-9.8	-9.4	-9.5	-9.3	-9.2	-9.0	-9.3	-10.3	-10.8	-11.2	-11.6	-11.7	-11.9	-10.2	-9.0
10-Jan	-12.1	-12.3	-12.7	-13.1	-13.4	-13.5	-13.6	-13.6	-13.5	-13.3	-13.0	-12.8	-12.8	-12.8	-12.7	-12.7	-12.8	-12.1	-11.9	-12.2	-13.7	-14.2	-13.8	-14.9	-13.1	-11.9
11-Jan	-15.7	-16.0	-15.4	-15.6	-15.5	-15.2	-15.3	-14.9	-14.7	-14.9	-15.1	-15.1	-14.7	-14.1	-14.2	-14.2	-14.0	-13.7	-14.0	-14.9	-15.0	-15.6	-16.3	-16.7	-15.0	-13.7
12-Jan	-17.0	-17.5	-18.4	-19.1	-19.9	-20.0	-20.2	-20.3	-20.2	-20.3	-20.1	-19.3	-18.0	-17.7	-17.3	-17.3	-18.1	-18.3	-19.1	-19.8	-19.6	-19.6	-19.3	-18.9	-19.0	-17.0
13-Jan	-18.2	-17.8	-16.7	-16.2	-15.8	-15.5	-15.8	-16.2	-16.1	-15.0	-14.8	-14.3	-14.5	-14.8	-15.5	-16.6	-18.0	-19.2	-20.4	-20.7	-22.3	-23.7	-24.3	-25.1	-17.8	-14.3
14-Jan	-25.9	-26.7	-26.5	-26.3	-26.2	-25.5	-25.1	-25.0	-24.0	-22.6	-21.2	-19.5	-17.3	-16.1	-15.3	-13.7	-12.3	-11.6	-10.7	-9.9	-9.6	-8.7	-7.8	-7.5	-18.1	-7.5
15-Jan	-4.9	6.4	6.3	6.2	5.6	5.7	6.2	6.3	4.0	2.0	2.0	2.5	3.6	4.4	5.1	5.0	0.0	-2.3	-3.4	-4.0	-4.0	-5.3	-6.5	-6.8	1.4	6.4
16-Jan	-7.0	-7.2	-6.7	-6.6	-5.6	-5.0	-5.2	-6.4	-7.8	-7.4	-6.9	-5.9	-4.6	-3.5	-2.4	-1.0	-0.3	-0.7	-1.1	-2.2	-1.7	-2.3	-2.1	-2.5	-4.3	-0.3
17-Jan	-1.7	-2.4	-2.8	-2.6	-0.2	0.7	3.7	3.6	3.1	2.7	5.1	5.6	6.4	7.3	7.2	6.6	3.0	-1.5	-3.3	-5.1	-6.6	-7.7	-8.3	-9.1	0.2	7.3
18-Jan	-9.9	-10.5	-10.6	-10.4	-9.6	-10.0	-9.9	-9.5	-9.2	-9.0	-5.9	-4.7	-3.0	-0.8	-1.1	-3.9	-6.0	-7.7	-8.8	-9.5	-10.0	-10.7	-10.7	-10.7	-8.0	-0.8
19-Jan	-10.6	-10.5	-10.3	-10.1	-9.8	-10.1	-10.6	-11.3	-12.4	-12.0	-11.5	-12.5	-14.1	-16.2	-17.9	-19.9	-21.3	-22.4	-23.1	-23.8	-24.3	-24.6	-24.7	-25.2	-16.2	-9.8
20-Jan	-25.3	-25.3	-25.1	-25.3	-25.5	-25.4	-24.9	-24.7	-23.8	-23.4	-22.9	-21.7	-19.8	-18.4	-17.3	-16.2	-15.5	-15.3	-15.1	-14.6	-14.5	-14.3	-14.1	-14.7	-20.1	-14.1
21-Jan	-15.0	-15.1	-15.4	-15.9	-16.4	-16.6	-16.8	-16.5	-16.5	-16.2	-15.5	-14.1	-13.8	-13.9	-14.4	-14.9	-15.9	-17.2	-18.0	-19.3	-20.3	-20.8	-21.0	-20.9	-16.7	-13.8
22-Jan	-21.2	-21.7	-22.0	-22.4	-22.8	-23.1	-23.4	-24.5	-24.8	-24.5	-23.7	-21.6	-20.3	-18.9	-16.6	-15.4	-15.2	-15.3	-15.3	-15.1	-14.6	-14.2	-13.4	-13.4	-19.3	-13.4
23-Jan	-14.2	-14.1	-13.0	-12.7	-10.7	-9.4	-8.0	-2.6	-0.1	0.4	0.6	1.3	3.4	4.7	5.5	5.4	4.9	4.1	3.9	3.7	3.6	3.7	3.5	3.1	-1.4	5.5
24-Jan	3.9	3.3	3.4	3.8	1.0	-0.5	-1.1	-2.0	-2.8	-3.6	-4.3	-4.6	-4.8	-5.1	-5.1	-5.5	-6.1	-6.4	-6.5	-6.6	-6.7	-6.7	-6.6	-6.4	-3.2	3.9
25-Jan	-5.7	-5.2	-5.6	-6.0	-6.7	-6.1	-5.2	-4.2	-3.9	-3.9	-3.0	-4.2	-5.0	-5.4	-5.3	-5.4	-6.3	-7.4	-8.1	-9.1	-10.0	-12.2	-15.0	-16.8	-6.9	-3.0
26-Jan	-18.7	-20.3	-21.8	-22.9	-24.1	-25.1	-26.1	-27.0	-27.6	-27.7	-27.4	-26.8	-26.2	-25.5	-25.2	-24.7	-24.3	-24.3	-25.1	-26.1	-27.4	-28.5	-29.2	-29.6	-25.5	-18.7
27-Jan	-29.9	-30.1	-30.6	-30.9	-31.5	-31.4	-31.5	-31.8	-32.0	-32.1	-31.0	-29.1	-26.8	-24.2	-22.2	-20.9	-20.3	-20.9	-21.4	-21.2	-21.2	-21.0	-20.9	-20.5	-26.4	-20.3
28-Jan	-20.5	-20.4	-20.7	-21.5	-22.0	-22.8	-23.1	-22.9	-22.7	-22.4	-21.3	-18.8	-16.2	-14.4	-13.8	-13.4	-13.3	-12.9	-14.6	-17.1	-18.8	-20.2	-21.1	-21.6	-19.0	-12.9
29-Jan	-22.1	-22.5	-22.9	-22.8	-23.3	-23.2	-22.8	-23.5	-23.4	-22.7	-21.1	-21.4	-22.2	-23.2	-23.6	-23.2	-23.0	-22.8	-22.3	-22.3	-22.4	-22.4	-22.4	-22.4	-22.7	-21.1
30-Jan	-22.5	-22.4	-22.6	-22.9	-23.3	-22.7	-22.2	-22.2	-22.1	-22.1	-22.0	-20.9	-19.5	-18.0	-16.9	-16.1	-15.7	-15.2	-15.2	-15.3	-15.6	-15.1	-14.6	-15.0	-19.2	-14.6
31-Jan	-16.7	-17.3	-17.3	-18.1	-19.0	-20.6	-20.3	-19.2	-18.9	-19.3	-18.4	-16.9	-15.6	-14.5	-14.2	-14.3	-14.2	-14.3	-14.5	-14.8	-14.7	-14.3	-14.0	-13.7	-16.5	-13.7
	-17.7	-17.6	-17.7	-17.7	-17.8	-17.8	-17.7	-17.6	-17.7	-17.6	-16.9	-16.2	-15.3	-14.7	-14.3	-14.3	-14.7	-15.2	-15.6	-16.0	-16.3	-16.7	-16.9	-17.1	Diurnal Average	
	3.9	6.4	6.3	6.2	5.6	5.7	6.2	6.3	4.0	2.7	5.1	5.6	6.4	7.3	7.2	6.6	4.9	4.1	3.9	3.7	3.6	3.7	3.5	3.1	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	305	40.99	40.99
-20 - 0	392	52.69	93.68
0 - 10	47	6.32	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 7.0 C on Jan 17 14:00
Maximum Daily Average: 1.7 C on Jan 15

Minimum Value: -34.7 C on Jan 1 09:00
Minimum Daily Average: -31.2 C on Jan 1
Maximum Diurnal Average: -14.1 C at hour 16
Minimum Diurnal Average: -17.2 C at hour 6
Monthly Average: -15.91 C
Percentiles: P_1 = -33.2 P_{10} = -27.2 Q_1 = -23.2 Median = -16.6 Q_3 = -9.7 P_{90} = -1.7 P_{99} = 6.1

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Hours of Calibration:	0
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.0	-30.9	-31.8	-32.3	-33.1	-33.8	-33.4	-34.4	-34.7	-34.7	-34.5	-33.5	-32.3	-31.6	-30.3	-30.3	-30.7	-29.8	-29.8	-29.1	-28.0	-29.3	-26.4	-24.1	-31.2	-24.1
2-Jan	-22.9	-22.6	-20.6	-19.4	-18.6	-17.2	-16.0	-15.5	-15.2	-14.6	-14.2	-13.4	-12.6	-12.0	-9.9	-8.3	-7.0	-5.5	-5.4	-6.6	-7.1	-8.3	-10.5	-12.4	-13.2	-5.4
3-Jan	-13.1	-16.6	-19.1	-20.1	-21.8	-22.8	-23.4	-23.9	-24.2	-24.1	-23.9	-23.7	-23.0	-22.6	-21.2	-20.8	-21.5	-21.3	-21.9	-22.2	-22.8	-23.2	-23.6	-24.2	-21.9	-13.1
4-Jan	-25.0	-25.5	-26.3	-26.8	-27.0	-26.6	-26.7	-26.5	-26.9	-26.6	-26.2	-26.2	-26.1	-28.0	-29.0	-29.3	-29.5	-30.1	-30.5	-30.7	-30.9	-30.9	-31.1	-31.3	-28.1	-25.0
5-Jan	-31.4	-32.0	-31.7	-32.0	-32.5	-32.4	-32.4	-32.3	-32.0	-32.2	-31.9	-31.6	-31.2	-30.5	-29.5	-29.3	-28.8	-28.5	-28.3	-27.9	-27.4	-27.6	-27.3	-27.2	-30.3	-27.2
6-Jan	-27.0	-27.1	-27.0	-26.9	-25.9	-25.8	-25.0	-24.7	-24.1	-23.4	-22.9	-22.3	-21.6	-21.0	-20.7	-20.8	-21.1	-21.2	-21.4	-22.1	-22.6	-23.0	-23.5	-23.8	-23.5	-20.7
7-Jan	-24.0	-23.9	-23.9	-24.0	-24.1	-24.6	-24.8	-25.6	-26.3	-26.6	-26.3	-26.1	-25.7	-24.6	-24.4	-24.1	-24.3	-24.3	-24.2	-24.7	-24.4	-23.8	-23.5	-22.5	-24.6	-22.5
8-Jan	-22.2	-21.9	-22.2	-20.1	-19.2	-18.6	-17.4	-16.6	-16.0	-14.4	-13.8	-13.4	-12.9	-12.3	-11.8	-11.1	-11.0	-10.8	-10.4	-10.1	-10.3	-9.9	-10.0	-9.3	-14.4	-9.3
9-Jan	-9.4	-8.9	-8.9	-9.0	-9.2	-9.9	-10.7	-10.7	-10.5	-10.4	-10.3	-10.3	-10.0	-9.9	-9.7	-9.6	-9.4	-9.7	-10.9	-11.4	-11.8	-12.0	-12.2	AF	-10.2	-8.9
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-13.7	-13.5	-13.4	-13.4	-13.3	-13.2	-12.9	-12.1	-12.0	-12.1	-12.7	-13.6	-13.2	-13.6	--	-12.0
11-Jan	-14.4	-14.8	-14.8	-15.0	-14.5	-15.0	-14.6	-15.0	-15.1	-15.4	-15.6	-15.6	-15.2	-14.7	-14.7	-14.6	-14.5	-14.1	-14.5	-15.4	-15.5	-16.1	-16.8	-17.2	-15.1	-14.1
12-Jan	-17.5	-18.0	-18.9	-19.7	-20.4	-20.5	-20.7	-20.8	-20.8	-20.8	-20.7	-19.7	-18.4	-17.8	-17.6	-17.2	-17.5	-17.7	-17.5	-19.0	-19.0	-18.6	-18.6	-18.2	-19.0	-17.2
13-Jan	-18.2	-17.0	-16.6	-16.2	-15.8	-15.4	-15.3	-15.2	-15.4	-15.2	-14.6	-14.7	-15.2	-15.4	-16.1	-17.1	-18.3	-19.4	-20.6	-20.9	-21.1	-21.4	-22.3	-23.0	-17.5	-14.6
14-Jan	-23.6	-24.3	-24.5	-24.2	-24.2	-23.9	-23.1	-23.4	-23.3	-21.9	-20.6	-16.7	-15.2	-13.7	-12.8	-11.5	-10.6	-11.0	-9.6	-8.6	-8.0	-6.0	-2.7	2.0	-15.9	2.0
15-Jan	2.5	6.7	6.1	6.0	5.3	5.5	6.0	6.0	3.6	1.6	1.7	2.3	3.3	4.0	4.7	4.6	-0.3	-2.5	-3.7	-4.3	-4.3	-4.3	-4.3	-4.3	1.7	6.7
16-Jan	-4.8	-4.7	-4.2	-3.8	-2.7	-2.4	-2.5	-3.4	-3.8	-3.7	-2.8	-2.4	-2.0	-1.8	0.1	0.7	0.8	0.9	0.8	0.7	1.2	1.1	0.1	-0.3	-1.6	1.2
17-Jan	0.5	0.8	0.5	0.9	1.2	2.1	4.0	4.0	4.1	3.1	5.1	5.7	6.4	7.0	6.7	6.2	2.5	-2.0	-3.8	-5.6	-7.1	-8.1	-8.7	-9.1	0.7	7.0
18-Jan	-9.2	-9.4	-9.3	-8.9	-8.8	-8.4	-8.4	-7.7	-6.9	-5.9	-3.2	-1.4	0.0	1.1	-1.0	-4.3	-6.5	-8.1	-9.2	-9.7	-10.2	-10.9	-11.0	-10.8	-7.0	1.1
19-Jan	-10.8	-10.8	-10.3	-10.1	-10.2	-10.2	-10.4	-10.8	-11.6	-12.2	-12.1	-13.1	-14.8	-16.8	-18.5	-20.5	-21.9	-22.9	-23.6	-24.1	-24.6	-25.0	-25.2	-25.1	-16.5	-10.1
20-Jan	-25.1	-24.8	-24.8	-25.1	-25.3	-25.3	-24.7	-24.6	-23.9	-22.0	-20.0	-20.0	-18.9	-17.8	-17.4	-15.6	-15.5	-14.7	-14.8	-15.0	-15.0	-14.8	-14.7	-15.3	-19.8	-14.7
21-Jan	-15.5	-15.6	-15.9	-16.3	-16.5	-16.4	-16.4	-16.4	-16.8	-16.3	-15.9	-14.5	-14.4	-14.6	-15.0	-15.4	-16.3	-17.0	-17.7	-18.6	-19.5	-19.9	-20.5	-21.0	-16.8	-14.4
22-Jan	-21.3	-21.9	-22.2	-22.6	-22.9	-23.2	-23.7	-24.5	-24.2	-24.0	-23.6	-21.9	-20.1	-18.6	-16.7	-15.5	-14.7	-14.1	-13.8	-12.3	-11.6	-11.3	-10.2	-8.9	-18.5	-8.9
23-Jan	-9.5	-10.7	-9.0	-7.4	-6.2	-5.5	-3.0	-1.0	0.7	1.4	1.0	1.7	3.2	4.4	5.1	5.1	4.7	4.0	3.9	4.1	3.7	3.6	4.1	4.3	0.1	5.1
24-Jan	4.1	4.6	6.5	4.7	0.6	-0.8	-1.6	-2.5	-3.4	-4.2	-4.9	-5.2	-5.5	-5.8	-5.8	-6.1	-6.6	-6.9	-7.0	-7.1	-7.2	-7.2	-6.9	-6.2	-3.3	6.5
25-Jan	-5.7	-5.1	-5.1	-5.6	-5.5	-5.5	-5.6	-3.9	-2.3	-2.6	-3.6	-4.8	-5.7	-6.0	-5.9	-5.9	-6.9	-8.0	-8.6	-9.4	-10.4	-12.6	-15.5	-17.3	-7.0	-2.3
26-Jan	-19.2	-20.8	-22.3	-23.4	-24.5	-25.6	-26.5	-27.4	-28.1	-28.3	-28.1	-27.4	-26.8	-26.2	-25.7	-25.3	-24.9	-24.8	-24.8	-25.1	-25.5	-26.1	-27.0	-27.1	-25.4	-19.2
27-Jan	-27.2	-27.7	-28.3	-29.7	-29.9	-29.8	-30.1	-30.4	-30.7	-30.9	-29.6	-28.3	-26.7	-23.5	-21.0	-18.5	-17.5	-17.3	-17.9	-18.2	-17.9	-18.2	-18.0	-18.3	-24.4	-17.3
28-Jan	-17.6	-16.5	-16.3	-16.4	-18.9	-19.7	-20.6	-20.9	-19.6	-19.6	-18.1	-15.7	-15.5	-15.1	-14.1	-13.6	-13.4	-13.2	-15.1	-17.7	-19.4	-20.7	-21.5	-22.0	-17.5	-13.2
29-Jan	-22.4	-22.6	-23.1	-23.0	-23.0	-22.9	-22.7	-22.5	-22.3	-22.4	-21.6	-22.1	-22.9	-23.9	-24.2	-23.9	-23.5	-23.3	-22.8	-22.9	-22.9	-22.9	-22.9	-22.9	-22.9	-21.6
30-Jan	-22.9	-22.9	-23.0	-23.1	-23.2	-22.8	-22.5	-22.5	-22.6	-22.7	-22.6	-21.6	-20.1	-18.6	-17.5	-16.5	-16.1	-15.7	-15.7	-15.7	-15.4	-14.9	-14.9	-15.1	-19.5	-14.9
31-Jan	-15.9	-17.0	-17.4	-17.7	-17.9	-17.9	-17.5	-17.7	-17.3	-17.5	-16.9	-16.7	-16.1	-15.2	-14.8	-14.9	-14.7	-14.8	-14.9	-15.1	-14.6	-14.3	-14.1	-13.7	-16.0	-13.7
	-16.7	-16.7	-16.8	-16.9	-17.2	-17.2	-17.0	-17.0	-17.0	-16.9	-16.3	-15.7	-15.1	-14.7	-14.3	-14.1	-14.4	-14.7	-15.0	-15.4	-15.6	-15.8	-15.9	-15.9	Diurnal Average	
	4.1	6.7	6.5	6.0	5.3	5.5	6.0	6.0	4.1	3.1	5.1	5.7	6.4	7.0	6.7	6.2	4.7	4.0	3.9	4.1	3.7	3.6	4.1	4.3	Diurnal Maximum	

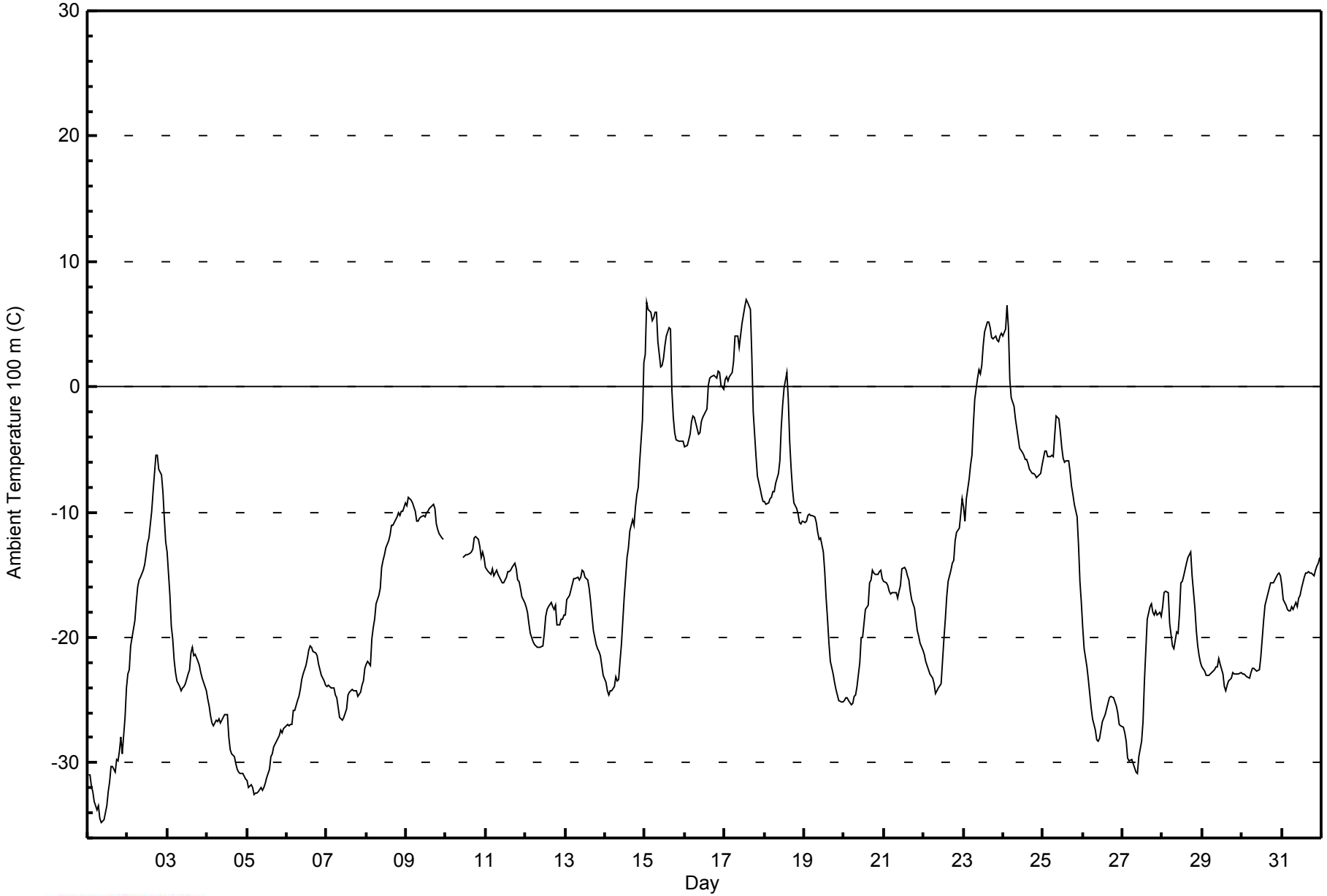
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Ambient Temperature 100 m (AT100m) - C

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	286	39.02	39.02
-20 - 0	382	52.11	91.13
0 - 10	65	8.87	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744

Maximum Value: 7.5 C on Jan 24 03:00

Maximum Daily Average: 1.5 C on Jan 15

Minimum Value: -32.5 C on Jan 1 10:00

Minimum Daily Average: -29.9 C on Jan 5

Maximum Diurnal Average: -14.3 C at hour 16

Minimum Diurnal Average: -16.8 C at hour 5

Monthly Average: -15.77 C

Percentiles: P_1 = -31.7 P_{10} = -26.9 Q_1 = -23.4 Median = -16.8 Q_3 = -9.1 P_{90} = -0.8 P_{99} = 5.6

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	0
Percent Operational Time:	95.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-29.7	-29.6	-29.8	-30.7	-31.5	-31.8	-31.7	-31.6	-32.2	-32.5	-32.4	-31.5	-30.9	-29.0	-28.1	-27.1	-26.7	-26.0	-25.8	-26.3	-25.9	-25.1	-24.0	-22.8	-28.9	-22.8
2-Jan	-22.0	-21.1	-20.3	-19.4	-18.7	-17.0	-16.0	-15.3	-14.9	-13.5	-13.8	-12.9	-11.3	-9.4	-7.1	-5.3	-5.8	-4.0	-4.3	-4.7	-4.8	-5.2	-9.1	-12.8	-12.0	-4.0
3-Jan	-13.7	-17.2	-19.7	-20.7	-22.4	-23.4	-23.9	-24.2	-24.5	-24.3	-24.0	-23.4	-22.5	-22.4	-21.0	-21.3	-21.4	-21.4	-22.1	-22.6	-23.1	-23.5	-24.0	-24.5	-22.1	-13.7
4-Jan	-25.1	-25.7	-26.2	-26.7	-26.8	-26.9	-27.0	-26.6	-26.9	-26.8	-26.7	-26.8	-26.7	-28.5	-29.5	-29.8	-29.9	-30.4	-30.7	-30.7	-30.9	-30.8	-30.6	-31.0	-28.2	-25.1
5-Jan	-31.1	-31.6	-31.0	-30.6	-31.5	-31.7	-31.9	-32.0	-31.9	-31.7	-31.6	-31.4	-30.6	-30.0	-29.4	-29.1	-28.7	-28.6	-28.2	-27.8	-27.1	-27.0	-26.9	-26.9	-29.9	-26.9
6-Jan	-26.9	-27.1	-26.9	-26.2	-25.7	-25.3	-24.7	-24.3	-23.8	-23.4	-23.1	-22.5	-22.0	-21.4	-21.0	-21.0	-21.5	-21.6	-21.8	-22.5	-23.0	-23.4	-23.9	-24.3	-23.6	-21.0
7-Jan	-24.4	-24.3	-24.3	-24.1	-24.1	-24.4	-24.6	-24.6	-25.6	-25.4	-25.1	-25.2	-25.2	-24.7	-24.3	-23.8	-23.3	-22.4	-23.0	-23.3	-22.9	-23.0	-22.4	-22.1	-24.0	-22.1
8-Jan	-21.8	-21.2	-20.8	-19.8	-19.1	-18.6	-17.2	-16.3	-15.6	-14.3	-13.7	-13.4	-13.2	-12.6	-12.1	-11.5	-11.0	-10.6	-10.4	-10.0	-10.0	-9.7	-9.5	-9.0	-14.2	-9.0
9-Jan	-8.9	-8.6	-8.3	-9.1	-9.4	-10.2	-10.8	-10.8	-10.7	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-8.3
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-12.9	-13.4	-13.5	--	-12.9
11-Jan	-13.5	-13.6	-13.7	-14.5	-14.3	-14.0	-14.1	-14.3	-15.4	-15.7	-15.8	-15.8	-15.4	-15.0	-14.7	-14.4	-14.3	-14.4	-14.9	-15.6	-15.9	-16.7	-17.3	-17.8	-15.0	-13.5
12-Jan	-18.1	-18.6	-19.5	-20.3	-21.0	-21.1	-21.3	-21.3	-21.2	-21.3	-20.8	-19.9	-18.9	-18.3	-18.1	-17.7	-17.8	-17.6	-16.8	-18.0	-18.0	-17.9	-17.8	-17.5	-19.1	-16.8
13-Jan	-17.3	-16.3	-16.9	-16.5	-16.2	-15.7	-15.3	-14.6	-15.3	-15.4	-15.0	-15.1	-15.6	-15.8	-16.6	-17.7	-18.9	-19.9	-21.0	-21.1	-21.3	-21.4	-21.9	-22.3	-17.6	-14.6
14-Jan	-22.7	-22.3	-22.8	-22.5	-22.2	-22.3	-21.5	-21.3	-20.3	-19.0	-17.2	-15.5	-13.8	-12.4	-11.5	-10.6	-9.9	-9.8	-8.0	-6.5	-4.4	-2.7	0.9	2.2	-14.0	2.2
15-Jan	4.1	6.7	5.8	5.7	5.0	5.2	5.6	5.5	3.0	1.0	1.2	1.8	2.8	3.5	4.2	4.1	0.0	-1.8	-3.9	-4.7	-4.7	-4.8	-4.8	-4.6	1.5	6.7
16-Jan	-3.5	-2.7	-2.6	-2.5	-2.1	-1.5	-1.6	-1.8	-1.6	-2.2	-2.0	-1.7	-1.1	-0.5	0.3	0.5	0.8	1.0	1.1	1.2	1.2	1.4	1.6	1.3	-0.7	1.6
17-Jan	1.9	2.1	1.7	1.4	1.6	2.3	4.4	4.7	4.5	3.6	5.0	5.8	6.3	6.5	6.2	5.7	2.0	-2.6	-4.4	-6.2	-7.7	-8.7	-9.3	-9.2	0.7	6.5
18-Jan	-8.6	-8.8	-8.6	-7.8	-6.9	-5.2	-5.3	-3.4	-2.1	-1.7	-2.0	-1.3	0.8	1.4	-0.7	-4.6	-6.9	-8.6	-9.7	-10.1	-10.6	-11.2	-11.1	-10.9	-6.0	1.4
19-Jan	-10.9	-10.8	-10.4	-10.3	-10.5	-10.6	-10.8	-11.3	-11.6	-12.4	-12.6	-13.8	-15.4	-17.4	-19.1	-21.0	-22.5	-23.5	-24.2	-24.7	-25.2	-25.6	-25.7	-25.7	-16.9	-10.3
20-Jan	-25.5	-25.1	-25.1	-25.2	-25.4	-25.0	-24.6	-24.4	-23.8	-21.2	-19.2	-18.9	-18.2	-16.6	-16.3	-15.1	-14.5	-14.3	-14.4	-15.0	-15.3	-15.2	-15.2	-15.8	-19.5	-14.3
21-Jan	-16.0	-16.1	-16.3	-16.4	-16.4	-15.9	-15.6	-14.9	-15.0	-15.3	-16.1	-14.9	-14.9	-15.0	-15.5	-15.8	-16.9	-17.4	-17.9	-18.3	-19.1	-19.8	-20.7	-21.0	-16.7	-14.9
22-Jan	-21.2	-21.9	-22.4	-22.6	-22.9	-23.2	-23.8	-24.0	-23.5	-23.3	-22.8	-22.1	-20.3	-19.1	-17.4	-15.7	-14.6	-13.8	-13.0	-11.3	-10.9	-9.8	-8.9	-8.5	-18.2	-8.5
23-Jan	-9.1	-7.7	-7.3	-5.4	-5.2	-3.5	-1.8	-0.8	1.4	2.4	1.9	1.9	3.1	4.2	4.7	4.8	4.5	3.7	3.7	3.8	3.6	3.6	3.9	4.1	0.6	4.8
24-Jan	4.5	6.1	7.5	4.7	0.2	-1.2	-2.1	-3.1	-3.9	-4.7	-5.4	-5.7	-6.0	-6.3	-6.3	-6.6	-7.1	-7.4	-7.5	-7.5	-7.7	-7.5	-7.1	-6.3	-3.6	7.5
25-Jan	-5.9	-5.0	-5.0	-5.3	-5.2	-5.3	-5.8	-3.3	-1.0	-1.8	-4.1	-5.4	-6.2	-6.5	-6.5	-6.5	-7.4	-8.5	-9.1	-10.0	-10.9	-13.2	-16.1	-17.8	-7.2	-1.0
26-Jan	-19.8	-21.4	-22.9	-23.9	-25.1	-26.1	-27.1	-28.0	-28.7	-28.8	-28.6	-27.9	-27.3	-26.8	-26.1	-25.8	-25.4	-25.2	-25.1	-25.4	-25.6	-25.6	-26.2	-26.5	-25.8	-19.8
27-Jan	-26.6	-26.8	-26.9	-27.3	-27.8	-28.2	-28.8	-28.8	-29.2	-29.7	-27.2	-26.0	-24.1	-21.9	-20.3	-18.2	-16.6	-16.2	-16.8	-17.3	-17.3	-16.5	-16.7	-17.5	-23.0	-16.2
28-Jan	-16.0	-15.6	-15.2	-15.4	-15.4	-16.8	-17.2	-17.5	-15.2	-15.8	-16.3	-16.5	-16.0	-15.1	-13.6	-13.6	-13.4	-13.5	-15.6	-18.3	-20.0	-21.2	-22.0	-22.5	-16.6	-13.4
29-Jan	-22.7	-22.9	-23.4	-23.4	-23.2	-23.0	-23.0	-22.9	-22.8	-22.5	-22.2	-22.6	-23.4	-24.4	-24.7	-24.4	-24.1	-23.8	-23.4	-23.4	-23.5	-23.5	-23.4	-23.4	-23.3	-22.2
30-Jan	-23.4	-23.5	-23.6	-23.5	-23.5	-23.2	-22.9	-22.8	-23.0	-23.3	-23.2	-22.2	-20.7	-19.2	-18.1	-17.0	-16.6	-16.2	-16.2	-16.2	-15.7	-15.3	-15.2	-15.2	-20.0	-15.2
31-Jan	-15.6	-17.1	-17.7	-17.7	-18.0	-18.1	-17.8	-17.6	-17.7	-17.2	-17.0	-16.8	-16.3	-15.7	-15.4	-15.4	-15.3	-15.4	-15.5	-15.5	-14.9	-14.7	-14.5	-14.1	-16.3	-14.1
	-16.3	-16.3	-16.4	-16.5	-16.8	-16.7	-16.6	-16.4	-16.3	-16.4	-16.2	-15.8	-15.3	-14.8	-14.4	-14.3	-14.6	-14.8	-15.1	-15.4	-15.6	-15.6	-15.7	-15.9	Diurnal Average	
	4.5	6.7	7.5	5.7	5.0	5.2	5.6	5.5	4.5	3.6	5.0	5.8	6.3	6.5	6.2	5.7	4.5	3.7	3.7	3.8	3.6	3.6	3.9	4.1	Diurnal Maximum	

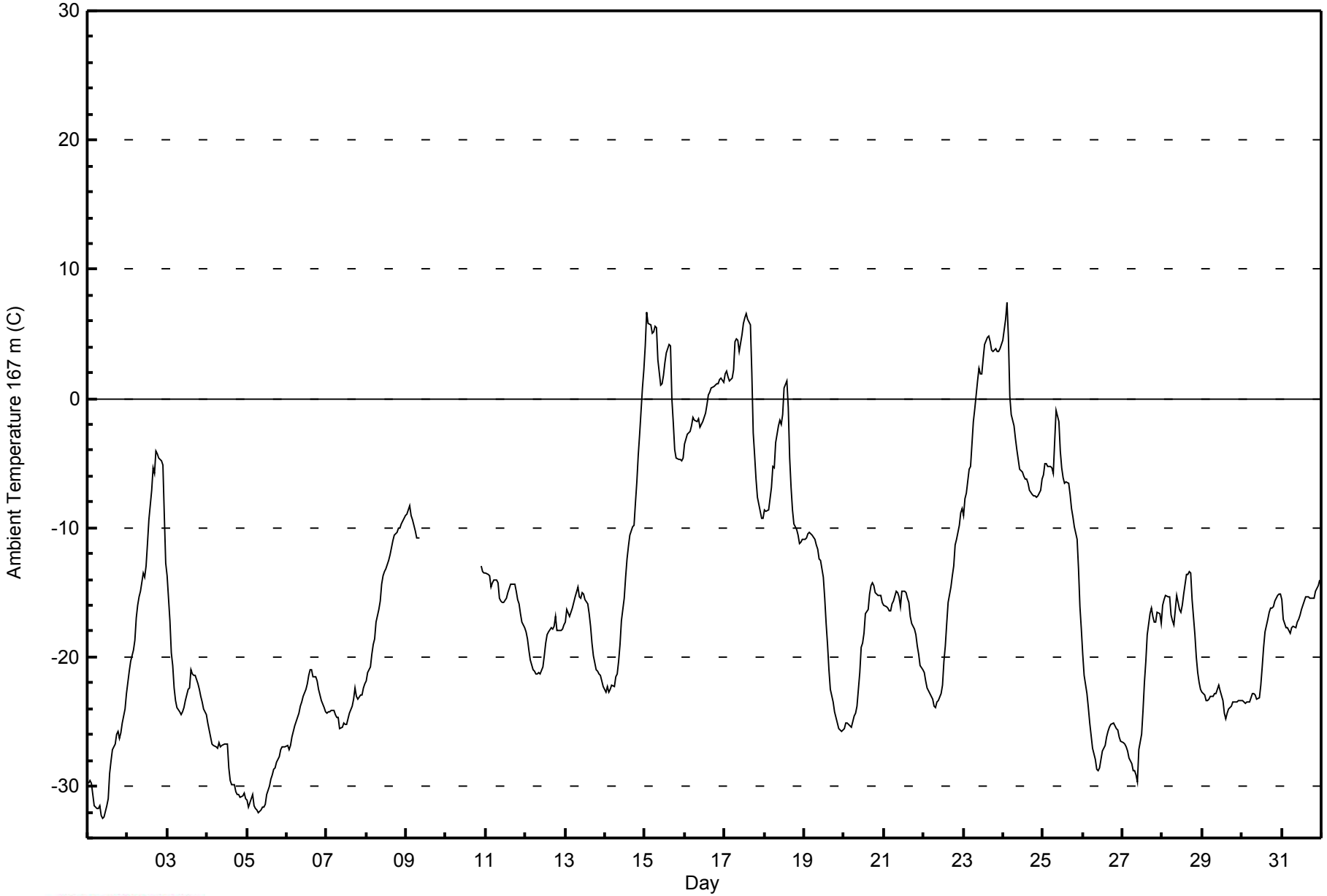
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Ambient Temperature 167 m (AT167m) - C

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	283	39.97	39.97
-20 - 0	357	50.42	90.40
0 - 10	68	9.60	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Maximum Value: 90 % on Jan 14 23:00

Maximum Daily Average: 85.2 % on Jan 9

Minimum Value: 44 % on Jan 25 22:00

Minimum Daily Average: 60.7 % on Jan 26

Maximum Diurnal Average: 74.8 % at hour 10

Minimum Diurnal Average: 67.7 % at hour 16

Monthly Average: 72.2 %

Percentiles: P_1 = 52 P_{10} = 61 Q_1 = 67 Median = 72 Q_3 = 79 P_{90} = 83 P_{99} = 87

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

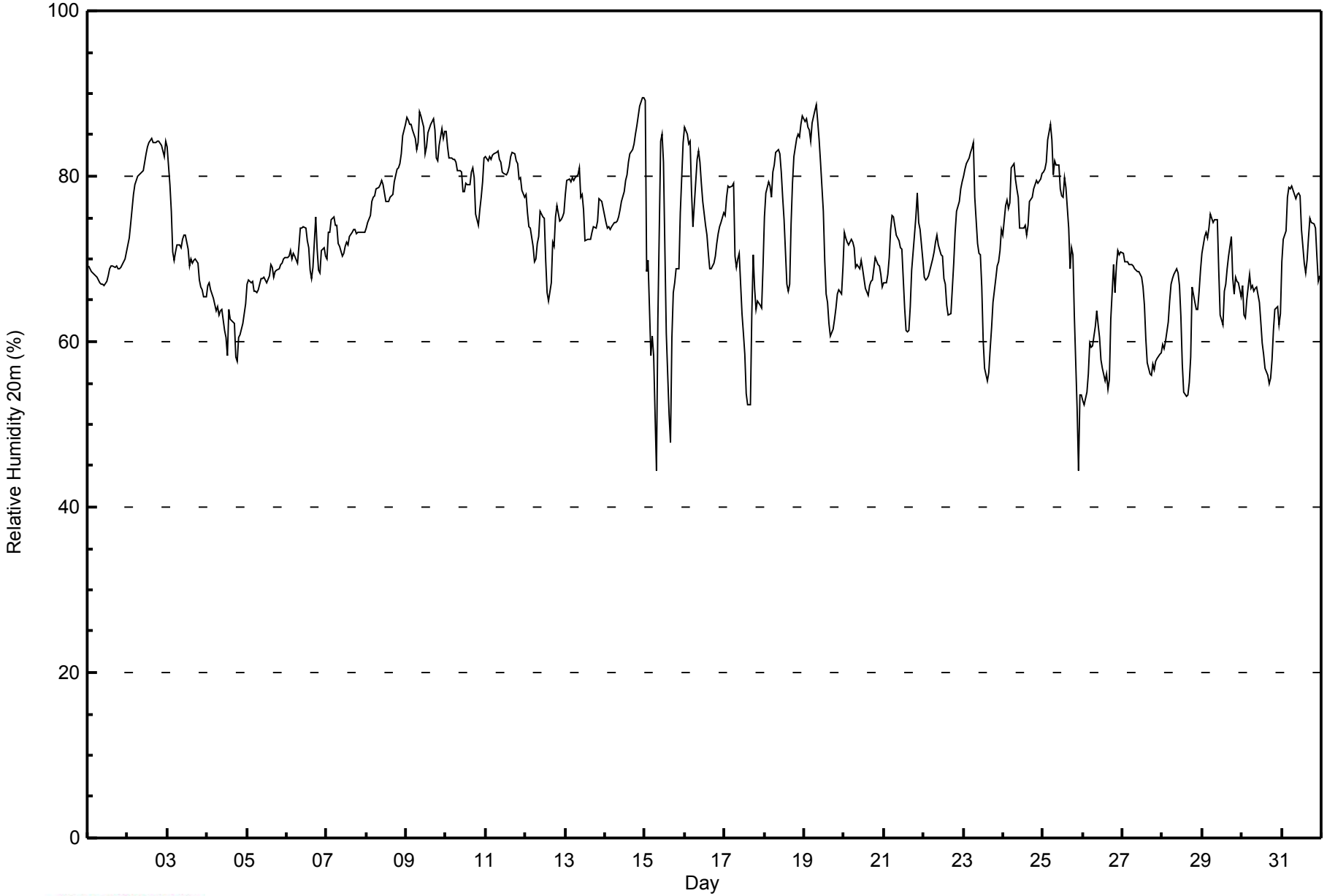
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	69	69	69	68	68	68	68	67	67	67	67	67	68	69	69	69	69	69	69	69	69	69	70	71	68.5	71
2-Jan	72	73	74	78	79	80	80	80	80	81	82	83	84	84	85	84	84	84	84	84	84	83	82	84	81.1	85
3-Jan	84	79	76	71	70	71	72	72	71	72	73	73	71	69	70	70	70	70	70	67	67	66	65	65	71.0	84
4-Jan	67	67	66	66	65	64	64	63	64	64	61	61	58	64	63	63	62	58	58	61	61	62	63	65	62.9	67
5-Jan	67	67	67	67	66	66	66	66	68	68	68	67	67	68	69	69	68	68	69	69	69	70	70	70	67.9	70
6-Jan	70	70	71	70	71	70	70	71	74	74	74	74	72	71	69	68	69	75	71	69	68	71	71	70	71.0	75
7-Jan	70	73	73	75	75	74	74	72	71	70	71	71	72	72	73	73	74	74	73	73	73	73	73	73	72.8	75
8-Jan	74	74	75	77	77	78	79	79	79	80	79	78	77	77	77	78	78	79	81	81	82	83	85	86	78.8	86
9-Jan	87	87	86	86	86	85	83	84	88	87	86	83	84	85	86	86	87	86	82	82	84	86	85	85	85.2	88
10-Jan	85	84	82	82	82	82	82	81	81	81	78	78	79	79	79	80	81	80	75	74	76	78	79	82	80.0	85
11-Jan	82	82	82	82	83	83	83	83	82	82	81	80	80	80	81	82	83	83	82	81	80	80	78	77	81.4	83
12-Jan	78	76	74	74	72	70	70	72	73	76	75	75	70	66	65	67	72	72	75	76	75	75	75	76	72.7	78
13-Jan	78	79	80	79	80	79	80	80	81	77	78	76	72	72	72	72	73	74	74	75	77	77	77	76	76.7	81
14-Jan	74	74	74	74	74	74	74	75	75	76	77	78	79	80	82	83	83	84	85	86	87	89	90	89	79.8	90
15-Jan	89	68	70	58	61	58	51	44	63	84	85	82	71	61	51	48	60	66	67	69	69	76	80	84	67.3	89
16-Jan	86	85	84	84	78	74	77	82	83	82	79	77	74	73	71	69	69	69	70	72	73	74	74	76	76.4	86
17-Jan	75	77	79	79	79	79	70	69	70	71	63	61	58	54	52	52	63	70	66	64	65	64	64	69	67.3	79
18-Jan	75	78	79	79	77	81	81	83	83	83	81	77	75	67	66	67	74	79	82	85	85	85	86	87	79.0	87
19-Jan	87	87	86	86	84	87	88	89	87	84	82	76	70	66	65	62	61	62	63	64	66	66	66	69	75.0	89
20-Jan	73	73	72	72	72	72	71	69	69	69	70	69	68	66	66	67	67	67	69	70	69	69	68	67	69.3	73
21-Jan	67	67	68	70	74	75	75	73	72	72	71	71	64	61	61	61	64	69	73	75	78	74	73	70	70.0	78
22-Jan	68	68	68	68	69	70	71	72	73	72	71	70	68	67	64	63	63	67	69	73	76	77	78	79	70.1	79
23-Jan	80	81	81	82	83	83	84	77	72	71	70	67	60	57	55	56	59	62	65	68	69	70	71	74	70.7	84
24-Jan	73	76	77	76	77	81	82	80	78	77	74	74	74	74	73	74	77	78	78	79	79	79	80	80	77.1	82
25-Jan	81	81	82	84	86	84	80	82	81	81	78	78	77	80	79	74	69	71	71	63	52	44	54	54	73.6	86
26-Jan	53	52	54	56	60	59	60	62	64	62	60	58	57	55	56	54	55	63	69	66	69	71	71	71	60.7	71
27-Jan	71	70	70	70	69	69	69	69	69	68	68	68	67	64	60	57	56	56	57	57	58	58	58	59	64.0	71
28-Jan	60	59	60	62	65	67	68	68	69	68	67	63	57	54	53	54	55	58	67	65	64	64	66	69	62.5	69
29-Jan	71	73	73	73	74	75	74	75	75	75	69	63	62	66	67	69	70	73	68	66	68	67	67	65	69.9	75
30-Jan	67	63	63	65	68	66	67	66	66	67	65	62	60	58	57	56	55	56	58	61	64	64	62	63	62.5	68
31-Jan	70	72	73	77	79	79	79	78	77	78	78	78	74	69	68	70	73	75	74	74	74	70	67	68	73.9	79
	74.2	73.7	73.8	73.9	74.2	74.3	73.9	73.6	74.4	74.8	73.5	72.2	70.0	68.7	67.9	67.7	69.2	70.8	71.4	71.5	71.9	72.1	72.6	73.4	Diurnal Average	
	89	87	86	86	86	87	88	89	88	87	86	83	84	85	86	86	87	86	85	86	87	89	90	89	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity 20m (RH20m) - %

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	58	7.80	7.80
60 - 80	537	72.18	79.97
80 - 100	149	20.03	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 90 % on Jan 15 00:00

Maximum Daily Average: 85.8 % on Jan 9

Minimum Value: 44 % on Jan 25 22:00

Minimum Daily Average: 60.6 % on Jan 26

Maximum Diurnal Average: 74.9 % at hour 10

Minimum Diurnal Average: 67.8 % at hour 16

Monthly Average: 72.2 %

Percentiles: P_1 = 53 P_{10} = 62 Q_1 = 67 Median = 72 Q_3 = 79 P_{90} = 83 P_{99} = 88

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

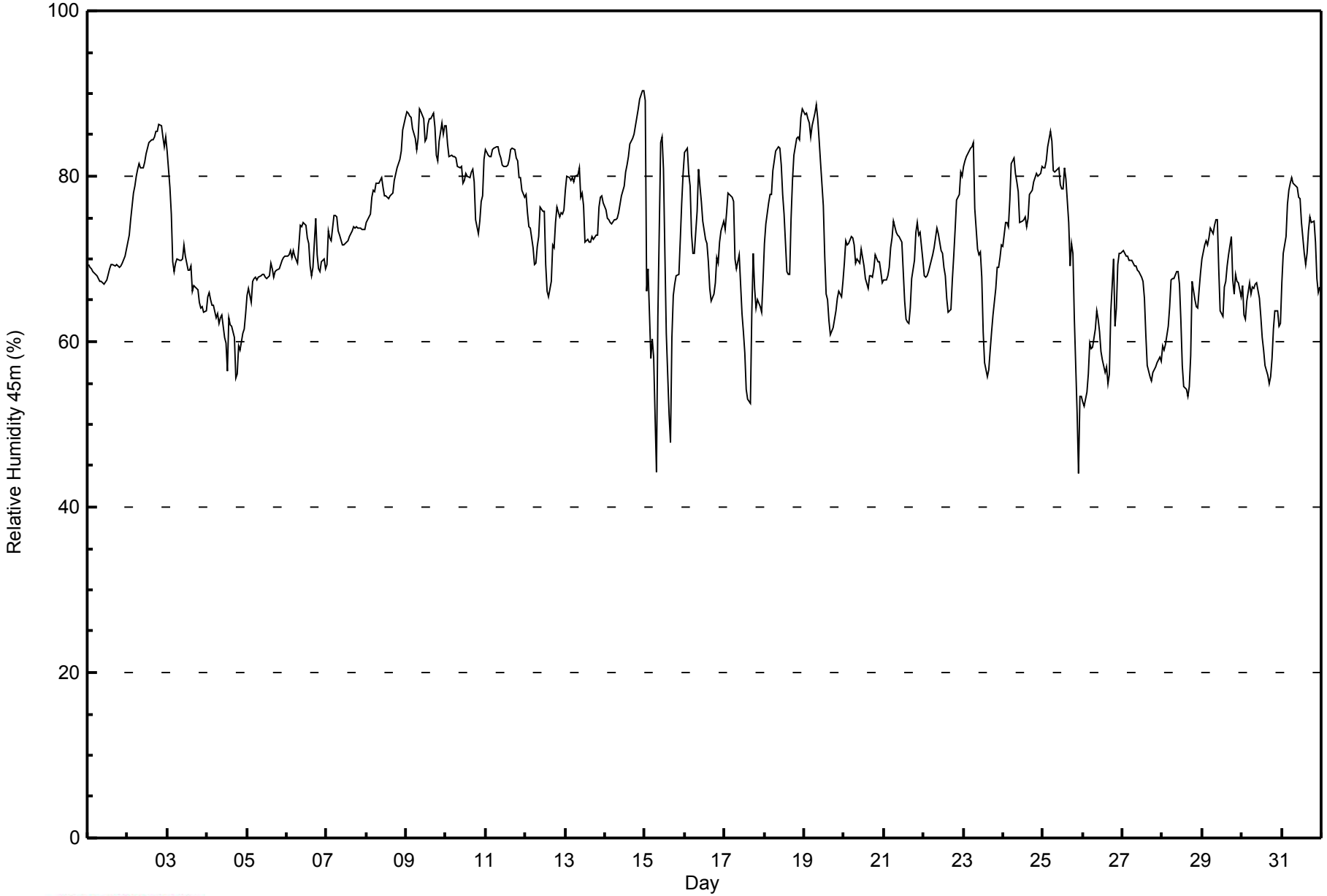
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	69	69	69	68	68	68	68	67	67	67	67	67	68	69	69	69	69	69	69	69	69	70	70	71	68.7	71
2-Jan	72	73	75	78	79	80	81	82	81	81	82	83	83	84	84	84	85	85	86	86	86	85	84	85	81.8	86
3-Jan	83	79	75	70	68	69	70	70	70	70	72	70	69	69	69	66	67	67	66	65	64	64	64	64	69.1	83
4-Jan	66	66	65	64	64	63	63	62	63	63	61	60	56	63	62	62	60	56	56	60	59	61	62	63	61.7	66
5-Jan	66	66	65	67	68	68	67	68	68	68	68	68	68	68	70	69	68	68	69	69	69	70	70	70	68.1	70
6-Jan	70	71	71	70	71	70	70	72	74	74	74	74	73	72	69	68	69	75	70	69	69	70	70	69	71.0	75
7-Jan	69	73	73	72	75	75	75	73	73	72	72	72	72	72	73	73	74	74	74	74	74	74	74	74	73.1	75
8-Jan	74	75	75	77	78	78	79	79	79	80	79	78	78	77	78	78	78	80	81	81	82	83	86	87	79.2	87
9-Jan	88	88	87	87	86	85	83	85	88	88	87	84	85	86	87	87	88	86	82	82	84	86	85	86	85.8	88
10-Jan	86	84	82	83	82	82	82	81	81	81	79	79	80	80	80	80	81	79	75	73	75	77	78	82	80.1	86
11-Jan	83	83	82	82	83	83	84	84	83	82	81	81	81	81	82	83	83	83	82	82	80	80	78	78	81.9	84
12-Jan	78	76	74	74	71	69	70	71	73	76	76	76	69	66	65	67	72	71	74	76	75	76	76	76	72.8	78
13-Jan	78	80	80	80	80	79	80	80	81	77	78	76	72	72	72	72	73	72	73	73	76	77	78	77	76.6	81
14-Jan	76	75	75	74	74	75	75	75	76	77	78	79	81	81	82	84	85	85	86	87	88	89	90	90	80.7	90
15-Jan	89	66	69	58	60	58	51	44	63	84	85	81	71	61	51	48	61	66	67	68	68	72	77	80	66.6	89
16-Jan	83	83	80	79	73	71	71	76	81	79	77	75	72	72	70	66	65	66	67	70	70	72	73	75	73.5	83
17-Jan	74	76	78	78	77	77	70	69	70	71	63	61	59	54	53	53	64	71	66	64	65	64	64	68	66.9	78
18-Jan	72	74	77	78	78	81	82	83	84	83	81	78	75	69	68	68	75	80	83	85	85	84	87	88	79.0	88
19-Jan	87	88	87	86	85	86	88	89	87	84	82	76	70	66	65	62	61	62	63	64	65	66	65	67	75.1	89
20-Jan	69	72	72	72	73	73	72	70	70	69	71	70	69	68	67	68	68	68	69	71	70	70	69	67	69.8	73
21-Jan	68	67	68	69	71	73	75	73	73	73	72	72	65	63	62	62	64	68	70	73	74	73	73	70	69.6	75
22-Jan	68	68	68	68	69	70	71	73	74	73	71	71	69	68	65	64	64	67	70	74	77	78	81	80	70.9	81
23-Jan	81	82	82	83	83	84	84	76	71	71	71	68	61	57	56	57	59	61	63	66	69	69	70	72	70.7	84
24-Jan	72	74	74	74	77	82	82	80	79	78	74	75	75	75	74	75	78	78	79	80	80	80	80	81	77.4	82
25-Jan	81	81	82	84	85	84	81	81	81	81	79	78	78	81	80	74	69	72	71	63	51	44	53	53	73.7	85
26-Jan	53	52	54	56	60	59	59	62	64	63	61	59	58	56	57	55	56	64	70	62	64	69	71	71	60.6	71
27-Jan	71	71	70	70	70	70	70	69	69	69	68	68	67	65	61	57	56	55	56	57	57	57	58	58	64.1	71
28-Jan	60	59	60	62	64	67	68	68	68	69	67	62	57	55	54	53	55	58	67	65	64	64	66	68	62.5	69
29-Jan	70	72	72	72	73	74	73	74	75	75	69	64	63	67	67	69	71	73	67	66	68	67	67	65	69.7	75
30-Jan	67	63	63	65	67	66	67	66	67	67	65	63	60	59	57	56	55	56	58	62	64	64	62	62	62.5	67
31-Jan	67	71	73	77	78	79	80	79	79	79	78	77	74	71	69	71	73	75	74	75	72	68	66	67	73.8	80
	73.9	73.4	73.5	73.5	74.0	74.1	73.8	73.5	74.5	74.9	73.8	72.4	70.3	69.2	68.4	67.8	69.1	70.6	71.1	71.2	71.4	71.7	72.4	73.0	Diurnal Average	
	89	88	87	87	86	86	88	89	88	88	87	84	85	86	87	87	88	86	86	87	88	89	90	90	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity 45m (RH45m) - %

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	61	8.20	8.20
60 - 80	525	70.56	78.76
80 - 100	158	21.24	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 100m (RH100m) - %

Lower Camp Met Tower - January 2014

Maximum Value: 93 % on Jan 14 23:00

Maximum Daily Average: 87.3 % on Jan 9

Minimum Value: 44 % on Jan 25 22:00

Minimum Daily Average: 60.7 % on Jan 26

Maximum Diurnal Average: 74.1 % at hour 10

Minimum Diurnal Average: 68.1 % at hour 16

Monthly Average: 71.5 %

Percentiles: P_1 = 51 P_{10} = 61 Q_1 = 66 Median = 71 Q_3 = 78 P_{90} = 83 P_{99} = 89

Hours in Service:	744
Hours of Data:	733
Hours of Missing Data:	11
Hours of Calibration:	0
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	70	70	69	69	68	68	68	67	67	67	67	68	68	69	70	70	70	70	70	71	72	71	73	75	69.4	75
2-Jan	75	76	77	77	78	80	82	82	82	82	82	83	83	84	84	84	83	79	74	76	78	79	85	83	80.3	85
3-Jan	80	77	73	66	66	68	68	68	69	69	68	68	68	67	65	64	66	64	64	64	62	61	60	61	66.9	80
4-Jan	62	64	65	65	64	64	64	61	61	64	60	60	56	63	62	62	58	54	55	60	58	59	61	61	60.9	65
5-Jan	61	62	62	65	66	66	66	66	67	67	67	66	66	68	69	69	69	69	69	70	68	70	70	72	67.0	72
6-Jan	71	70	70	70	70	70	68	72	74	74	74	73	73	73	70	69	70	72	69	69	69	69	67	67	70.5	74
7-Jan	68	73	73	71	69	73	74	75	74	74	74	73	73	72	73	73	73	73	74	75	75	75	76	76	73.3	76
8-Jan	76	77	76	78	79	79	80	81	81	82	78	77	76	75	77	77	78	80	81	82	83	84	88	89	79.7	89
9-Jan	89	89	89	89	88	88	86	87	88	87	87	87	88	88	88	88	88	88	85	85	86	86	86	AF	87.3	89
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	82	82	82	83	82	81	80	77	74	71	72	76	76	79	--	83
11-Jan	81	82	81	81	82	84	84	84	84	83	83	83	83	83	83	84	84	84	83	83	82	80	79	78	82.4	84
12-Jan	79	76	75	75	73	70	70	72	73	77	76	76	69	66	66	67	70	70	69	75	79	79	79	76	73.2	79
13-Jan	80	81	81	81	80	79	79	79	78	78	78	76	73	74	74	73	73	72	73	74	74	75	76	76	76.5	81
14-Jan	77	78	77	76	76	76	76	76	76	77	78	81	82	84	85	86	87	87	88	89	90	91	93	77	81.7	93
15-Jan	76	63	68	57	60	58	50	44	64	86	85	80	70	61	51	48	60	65	67	69	69	70	70	70	64.9	86
16-Jan	73	71	68	66	63	60	60	64	66	66	64	64	64	67	61	59	60	61	63	63	62	62	67	71	64.4	73
17-Jan	69	70	74	74	76	75	67	65	63	67	63	59	58	54	53	53	65	72	67	65	66	65	64	65	65.4	76
18-Jan	65	70	74	75	80	83	84	84	85	85	81	77	74	69	69	70	77	81	84	86	86	85	88	88	79.3	88
19-Jan	87	87	88	87	87	87	87	87	86	84	84	78	72	67	66	64	62	63	64	64	66	67	66	66	75.7	88
20-Jan	66	70	70	69	71	72	69	71	74	70	66	70	73	72	70	70	69	69	70	72	71	71	70	69	70.2	74
21-Jan	69	68	68	70	71	70	72	72	74	72	74	74	67	65	65	64	65	66	68	69	72	72	74	71	69.6	74
22-Jan	69	69	69	70	71	72	73	74	75	75	75	76	71	69	66	63	65	70	74	75	73	74	74	74	71.4	76
23-Jan	77	84	82	79	79	80	76	72	67	66	68	66	61	57	56	56	59	61	63	63	67	69	68	68	68.5	84
24-Jan	71	70	65	70	78	83	84	82	81	80	76	77	77	77	76	77	80	80	81	82	82	82	82	82	78.1	84
25-Jan	82	81	82	83	83	82	82	81	80	79	81	81	81	83	82	76	70	74	71	63	51	44	54	53	74.1	83
26-Jan	53	53	54	57	61	60	60	62	65	64	63	61	59	58	58	57	57	65	62	62	64	66	68	68	60.7	68
27-Jan	67	68	68	70	70	70	70	70	70	69	69	69	70	69	66	59	52	47	52	58	53	54	57	55	63.6	70
28-Jan	57	51	59	53	63	68	65	69	64	66	65	58	58	56	52	52	55	61	70	67	66	65	67	69	61.5	70
29-Jan	71	71	73	73	73	73	73	72	71	74	69	65	64	67	68	70	71	73	68	67	69	68	68	66	69.8	74
30-Jan	67	63	62	65	68	65	67	67	68	68	67	64	62	60	58	56	55	56	59	62	63	63	62	63	62.9	68
31-Jan	65	70	74	77	78	78	78	77	75	74	76	77	76	72	71	72	75	76	74	74	68	65	65	66	73.0	78
	71.8	71.8	72.2	71.9	72.9	73.4	72.8	72.8	73.4	74.1	73.6	72.6	70.8	70.1	68.9	68.1	69.1	70.2	70.5	71.1	70.8	70.9	72.0	71.1	Diurnal Average	
	89	89	89	89	88	88	87	87	88	87	87	87	88	88	88	88	88	88	88	89	90	91	93	89	Diurnal Maximum	

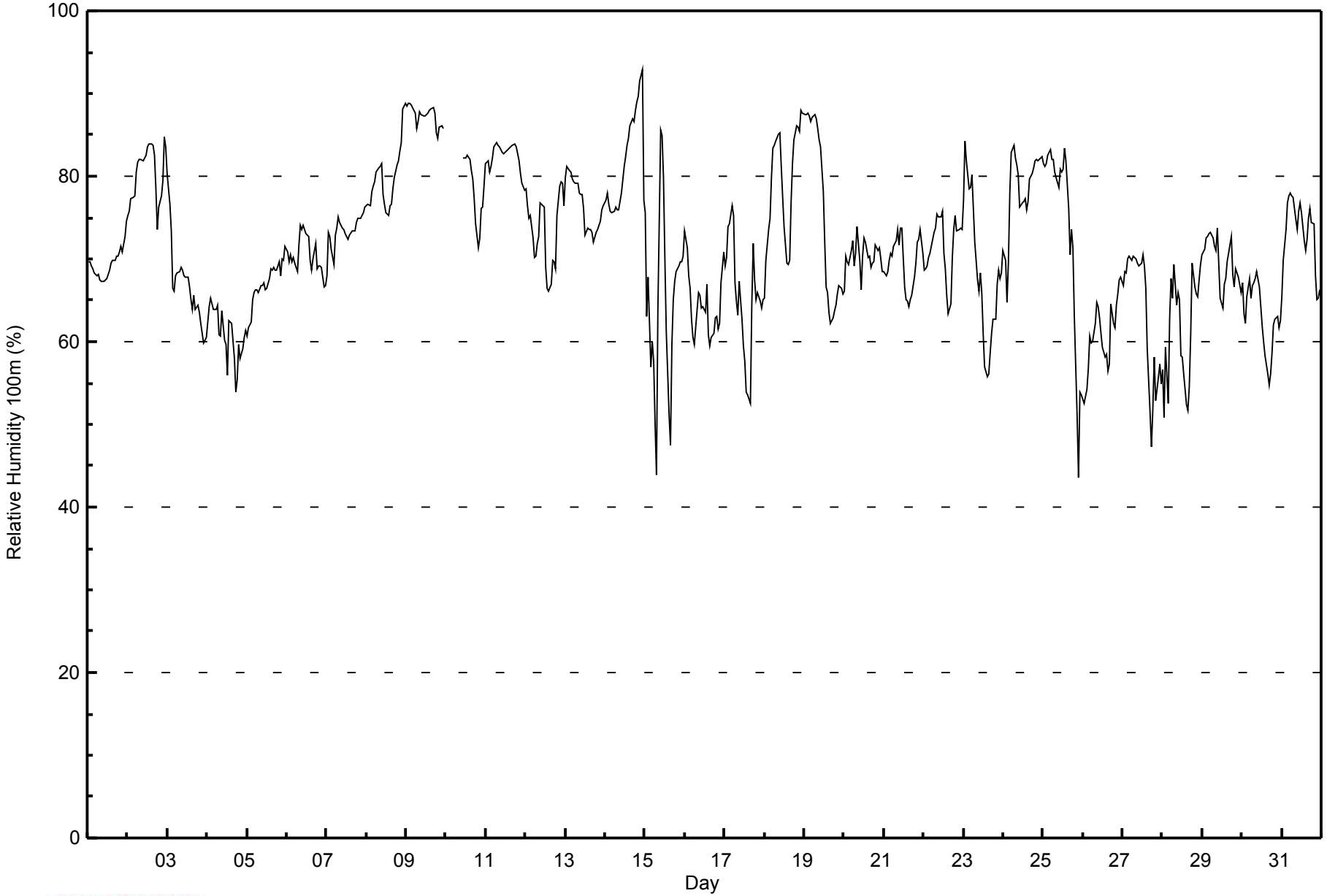
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Relative Humidity 100m (RH100m) - %

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	65	8.87	8.87
60 - 80	523	71.35	80.22
80 - 100	145	19.78	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 167m (RH167m) - %

Lower Camp Met Tower - January 2014

Maximum Value: 93 % on Jan 14 22:00

Maximum Daily Average: 81.5 % on Jan 14

Minimum Value: 44 % on Jan 27 18:00

Minimum Daily Average: 58.2 % on Jan 28

Maximum Diurnal Average: 72.8 % at hour 6

Minimum Diurnal Average: 67.3 % at hour 16

Monthly Average: 70.7 %

Percentiles: P_1 = 47 P_{10} = 59 Q_1 = 66 Median = 71 Q_3 = 77 P_{90} = 83 P_{99} = 88

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	0
Percent Operational Time:	95.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	70	70	70	69	69	69	69	69	68	68	68	68	69	70	71	71	72	72	72	72	72	73	74	75	70.4	75
2-Jan	75	76	77	77	78	80	81	81	82	83	83	83	84	83	80	75	76	72	68	70	70	73	81	84	78.0	84
3-Jan	81	78	74	67	67	69	69	69	69	69	68	67	65	66	64	64	63	62	63	62	61	58	58	59	66.3	81
4-Jan	61	63	66	67	67	66	66	66	66	64	60	61	57	63	63	63	57	53	54	55	55	55	54	58	60.9	67
5-Jan	59	62	60	67	67	67	67	66	66	65	66	66	66	68	70	69	70	69	69	70	67	67	68	68	66.7	70
6-Jan	71	71	72	70	70	69	68	70	72	72	73	72	72	72	69	69	71	71	69	70	70	70	68	68	70.4	73
7-Jan	69	72	72	70	69	71	72	73	74	74	73	73	72	72	73	73	71	76	75	75	75	75	75	76	73.0	76
8-Jan	76	76	77	77	78	79	80	80	81	82	82	80	78	78	78	79	79	81	83	83	84	86	88	88	80.6	88
9-Jan	88	88	88	88	87	86	86	86	86	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	88
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	75	77	78	--	78
11-Jan	78	79	79	81	81	81	82	82	84	83	82	82	82	82	83	83	83	83	82	82	81	81	80	80	81.4	84
12-Jan	79	79	78	77	75	73	72	73	73	76	76	76	70	68	68	68	70	69	68	72	76	77	80	80	73.8	80
13-Jan	80	81	80	81	81	81	81	81	79	79	79	76	74	75	75	75	74	73	74	74	75	75	74	69	77.0	81
14-Jan	72	73	76	77	78	76	77	77	77	78	80	81	83	84	85	86	86	87	88	90	92	93	85	76	81.5	93
15-Jan	71	62	68	56	59	56	49	44	65	88	87	81	70	61	51	48	58	62	66	69	70	71	70	70	64.7	88
16-Jan	67	63	62	61	59	56	56	56	57	60	60	60	59	59	58	59	59	59	60	60	60	59	59	63	59.7	67
17-Jan	63	66	70	73	74	73	63	60	60	64	61	58	56	54	54	53	65	73	68	66	67	66	65	65	64.0	74
18-Jan	66	69	72	72	80	82	83	82	79	79	79	78	72	69	68	70	78	83	86	87	87	86	86	86	78.3	87
19-Jan	86	86	86	86	86	86	86	85	85	84	84	83	77	68	67	65	64	65	65	66	67	68	68	67	76.2	86
20-Jan	67	71	70	68	69	68	67	71	74	67	65	68	70	71	71	70	70	71	71	72	74	74	71	70	69.9	74
21-Jan	70	70	69	70	71	70	69	68	68	70	75	74	67	65	66	65	66	66	67	68	71	73	75	77	69.6	77
22-Jan	77	75	73	75	75	75	75	75	75	75	75	75	77	78	76	67	65	71	74	71	72	71	72	74	73.6	78
23-Jan	77	78	78	77	77	76	73	70	64	62	65	64	60	56	56	56	58	61	62	62	65	67	67	68	66.6	78
24-Jan	69	64	61	68	78	84	85	84	83	82	78	78	78	78	77	78	81	82	83	83	83	83	84	83	78.5	85
25-Jan	82	81	81	81	81	82	83	79	76	76	82	82	82	85	83	77	72	75	72	64	52	44	55	55	74.2	85
26-Jan	54	54	55	58	62	61	61	64	66	65	64	62	61	60	60	57	59	65	64	62	68	68	68	67	62.0	68
27-Jan	60	63	64	63	63	67	70	71	70	70	71	71	73	74	73	60	48	44	44	46	47	46	47	50	60.7	74
28-Jan	50	49	50	48	48	65	55	54	53	56	58	61	60	55	49	51	59	65	72	68	67	67	69	71	58.2	72
29-Jan	72	72	74	74	74	73	73	73	73	75	70	66	64	67	67	70	71	72	69	68	70	70	69	67	70.5	75
30-Jan	68	64	63	66	69	66	67	69	68	69	68	65	63	61	59	57	55	57	60	63	63	62	62	63	63.8	69
31-Jan	64	70	75	78	78	79	79	78	75	73	75	76	75	73	72	74	76	77	75	74	66	66	66	67	73.4	79
	70.8	70.8	71.3	71.5	72.4	72.8	72.1	71.9	72.3	72.7	72.7	72.0	70.2	69.4	68.4	67.3	68.2	69.4	69.9	69.8	69.9	69.9	70.6	70.6	Diurnal Average	
	88	88	88	88	87	86	86	86	86	88	87	83	84	85	85	86	86	87	88	90	92	93	88	88	Diurnal Maximum	

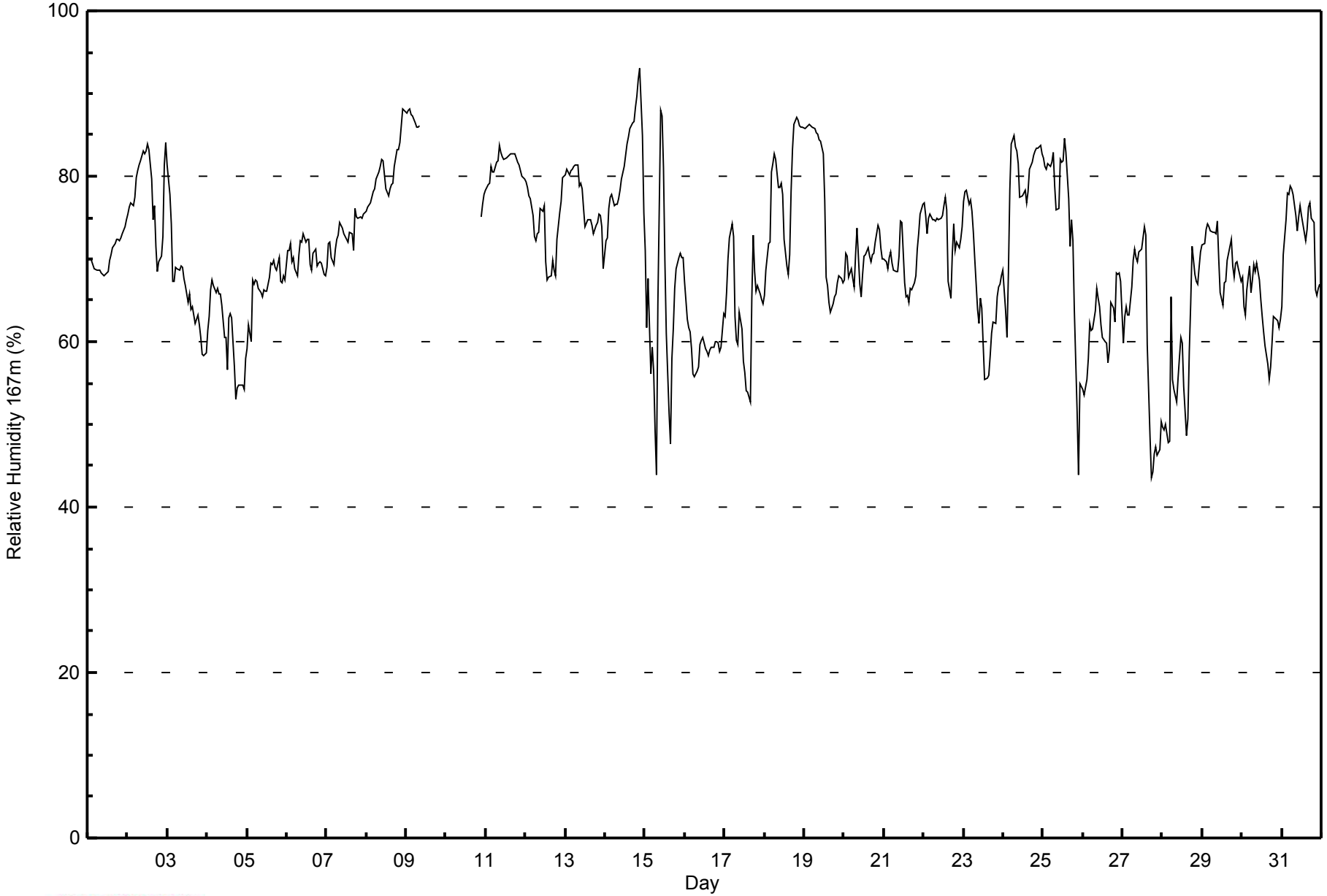
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Relative Humidity 167m (RH167m) - %

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	89	12.57	12.57
60 - 80	496	70.06	82.63
80 - 100	123	17.37	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - January 2014

Maximum Speed: 41 km/h on Jan 15 03:00

Maximum Daily Speed Average: 17.9 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 23 21:00

Minimum Daily Speed Average: 0.2 km/h on Jan 9

Maximum Diurnal Speed Average: 2.2 km/h at hour 9

Minimum Diurnal Speed Average: 0.3 km/h at hour 11

Monthly Average Velocity: 0.4 km/h 104.9 deg

Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 11$ $P_{90} = 15$ $P_{99} = 30$

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSE6	SSE7	SSE7	SSE5	SSE5	SSE4	SSE6	SSE5	SSE6	SSE9	SSE7	SSE8	SSE8	SE8	SSE5	SSE8	SSE6	SE6	SSE7	SSE7	SE10	SSE6	SE6	SE5	SSE6.6	SE10
2-Jan	SE5	ESE2	ESE4	SE11	SSE12	SSE8	SSE11	SE10	SE9	SE12	SE10	SE11	SE9	SE10	SE12	SE15	SE15	SE17	SE17	SE17	SE16	SE11	W1	NNW7	SE9.7	SE17
3-Jan	N13	N18	N14	N14	N10	N7	N6	N5	W3	NW1	NW3	WNW1	WNW1	W1	W2	WNW4	NNW5	NNW6	NNW6	WNW12	NW9	WNW12	WNW10	W8	NNW6.1	N18
4-Jan	W8	WSW8	WSW10	WSW6	W5	W5	W8	W17	W20	W15	WNW16	NW16	NNW17	N15	N13	NNW7	NW6	NNW6	NW8	NNW5	NW6	NNW5	N2	W2	WNW7.5	W20
5-Jan	NW1	WNW2	WNW2	NNE1	ESE1	SE3	E2	SE3	SE7	SE5	SSE7	SE7	SE7	SSE6	SE6	SE8	SE5	SE6	SE6	SE9	SE9	SE9	SE8	SE6	SE4.7	SE9
6-Jan	SSE7	SE9	SE6	SSE8	SSE7	SE6	SSE6	S4	SSE5	SE14	SE14	SE12	SE14	SE10	SE8	S2	NE2	NNW3	E3	SSE3	SSE4	N3	SE1	N1	SE5.6	SE14
7-Jan	W2	NNE1	NNW1	NNW3	WNW3	NW2	W2	WSW1	SW1	SW0	S2	SW3	S1	S1	S1	SSE2	SSE2	S2	ESE1	SE4	SE8	SE8	SE10	SE11	SSE1.7	SE11
8-Jan	SE14	SE10	SSE2	SSE8	SSE11	SSE8	SSE12	SE10	SE9	SE9	SE10	SE12	SE11	SE7	SE9	SE8	SE6	SE2	SE4	SE7	SE7	SE7	SE7	SE6	SE8.1	SE14
9-Jan	SE5	SE5	SE7	SE9	SE13	S8	S8	SSW4	SW4	SW4	SSE2	SE2	ENE1	N3	NNW4	NNW4	NNW4	NNW8	NNW8	NNW8	NNW7	NNW6	NNW6	NNW6	NNE0.2	SE13
10-Jan	NNW7	NNW6	NNW7	NW7	NW7	NW6	NW5	NW5	NNW6	NW3	NNW4	NNW4	NNW5	NW5	NW2	NNE1	ESE0	WNW2	W8	WSW8	W4	S2	SE5	SE3	NW3.2	W8
11-Jan	NNW1	WNW1	NW2	N1	NNW3	NNW3	N7	NNW7	NNW8	NNW7	NNW7	NNW6	NNW7	NNW6	NNW4	NNW4	NNW5	NNW7	NNW7	NNW10	N10	N10	N10	N11	NNW5.9	N11
12-Jan	N10	N12	N12	NNW9	N9	NNW6	NNW5	NNW3	ENE1	ESE2	SE4	SE5	SW5	SW8	SSE7	S6	SSE9	SSE11	SE15	ESE5	SE8	SE8	SSE7	SSE7	SE1.3	SE15
13-Jan	SE3	N2	NE1	SE3	SE3	SE4	SE6	N1	NW4	NW4	N2	N4	N5	NNE5	NNE6	NNE7	N4	N5	NW4	NNW3	NW3	NW3	NW2	NW2	N1.9	NNE7
14-Jan	NNW3	NW1	SSW1	SE4	SE7	SE10	SE8	SE8	SE5	SE3	SSE3	SSE5	SSE7	SE8	SE6	SE8	SSE9	SSE7	SE8	SSE11	SE8	ESE8	SE13	SE25	SE6.9	SE25
15-Jan	SE13	W31	W41	WNW33	W24	W25	WNW29	WNW39	NW37	NW23	NW23	NW21	NW20	NW28	NW30	NW29	N11	NNW8	N7	NW3	WSW4	W1	SSW2	SE1	WNW17.9	W41
16-Jan	SE7	SE12	SE15	SE13	SE10	SSE8	SE11	SE15	SE15	SE13	SE11	SE13	SE12	SE11	SE13	SE16	SE18	SE16	SE19	SE15	SE16	SE12	SE11	SE10	SE13.1	SE19
17-Jan	SE11	SE17	SE14	SE16	SE16	SE10	W20	W26	W25	W17	WNW11	W20	WNW13	NW13	NW18	NNW12	NNE11	NNE11	NNE8	NNE9	NNE6	N4	N1	WNW0	WNW3.6	W26
18-Jan	N1	SE1	SE3	SE6	SE6	SE1	WSW2	SSE10	SE11	SSE14	SE10	SE13	SSE10	SE1	NNW11	NNW11	NNW10	NNW7	NNW6	NNW4	NW4	NNW3	NW3	N3	ESE1.2	SSE14
19-Jan	ENE1	NE0	NNE1	NW4	N4	NNW3	WNW2	NW3	NNW4	NNW5	N12	N16	N17	NNE17	N17	N17	N13	N11	NNW10	N6	N5	NNW3	WNW3	ENE1	N6.9	NNE17
20-Jan	S2	SE6	SE6	ESE6	E5	SE9	SE11	SE13	SE11	SE10	SE16	SE12	ESE6	ESE6	ESE5	ESE6	NNW2	NW1	NNW4	NNW4	NW6	NNW6	N6	NNW6	ESE4.0	SE16
21-Jan	NW4	NNW4	N3	N2	NNW3	NNW3	NNW5	NNW4	NNW5	N5	NW6	N9	N12	NNE11	NE9	NNE7	NNE5	NNW1	NNW2	NW2	N1	SE3	SE6	SE14	N3.2	SE14
22-Jan	SE17	SE12	SE10	SE10	SE11	SE6	SSE11	SE7	SE6	SE6	SSE9	SSE10	SSE16	SSE10	SSE9	SSE13	SSE11	SSE9	SSE10	SE13	SE21	SE25	SE23	SE15	SE12.0	SE25
23-Jan	SE12	SE11	SE17	SE21	SE18	SE13	SE12	SSW9	WSW18	W15	WNW6	NNW5	NW9	WNW16	WNW18	WNW16	WNW9	NNW5	WSW3	W5	WNW0	SSE2	SSE7	SE8	SSW3.6	SE21
24-Jan	SE4	SE2	E1	NNW8	NNW10	NW6	N9	N11	NNW11	N10	N9	NNE10	N11	NNE9	N8	N8	N7	N5	NNW4	NW4	NNW3	NNW1	NW1	NW2	N5.6	N11
25-Jan	SE3	S3	SSW3	WNW1	SW3	S5	S4	SE9	ESE2	N7	N8	N11	N11	N9	N9	N15	N11	N11	N15	N13	N19	N30	N18	N19	N7.4	N30
26-Jan	N22	N21	N19	N16	N11	NNW10	N6	NNW5	N4	N8	NNW6	NNE2	W1	NNW2	NE2	ENE1	SE4	SE4	NE2	N4	NNW2	NNW3	NNW3	NNW2	N6.0	N22
27-Jan	NNW1	SE0	S1	SSW0	SSE2	SE7	SE11	SE12	SE11	SE13	SE8	SE10	SE7	SE8	SE7	SE8	SE15	SE15	SE12	SE8	SE11	SE13	SE11	SE12	SE8.3	SE15
28-Jan	SE13	SE12	SE12	SE9	SE13	SE9	SE9	SE9	SE12	SE10	SSE10	SSE6	ESE1	NW1	N3	NW3	NNW5	NNW7	N15	NNE11	N12	N9	N9	NW7	ESE2.9	N15
29-Jan	NW6	NW5	WNW4	WNW4	NNW3	WNW2	NW2	NW3	NW3	NW5	N11	N12	N16	N15	N11	N9	N11	N7	N12	NNW9	NW8	NW8	NW7	NW7	NNW7.0	N16
30-Jan	NW5	NW8	NW7	NNW4	NNW4	NW6	WNW8	W13	W15	WSW17	WSW18	WSW16	WSW11	SW11	SW10	SW11	SSW12	SSW8	SSW7	S7	SE7	S2	WNW5	NNW3	WSW6.6	WSW18
31-Jan	NNW5	NW7	NW5	NNW3	NNW5	NNW1	WSW0	SSW1	NW1	WNW2	NNW2	NNW3	NNW4	NW8	NNW8	N6	N4	N5	NNW3	WNW1	N2	NNW1	E1	SW1	NNW3.0	NNW8
	ESE1.7	SE0.3	SSW0.4	SE1.0	SE1.7	SSE1.5	SSW1.7	SW2.0	WSW2.2	SW1.3	SSW0.3	ESE0.4	NNE1.3	N1.9	N2.1	N1.4	NE1.3	NE1.3	NE1.2	ENE0.8	E1.5	E1.3	ESE1.6	ESE1.7	Diurnal Average	
	N22	W31	W41	WNW33	W24	W25	WNW29	WNW39	NW37	NW23	NW23	NW21	NW20	NW28	NW30	NW29	SE18	SE17	SE19	SE17	SE21	N30	SE23	SE25	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 15 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 27 04:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 9

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

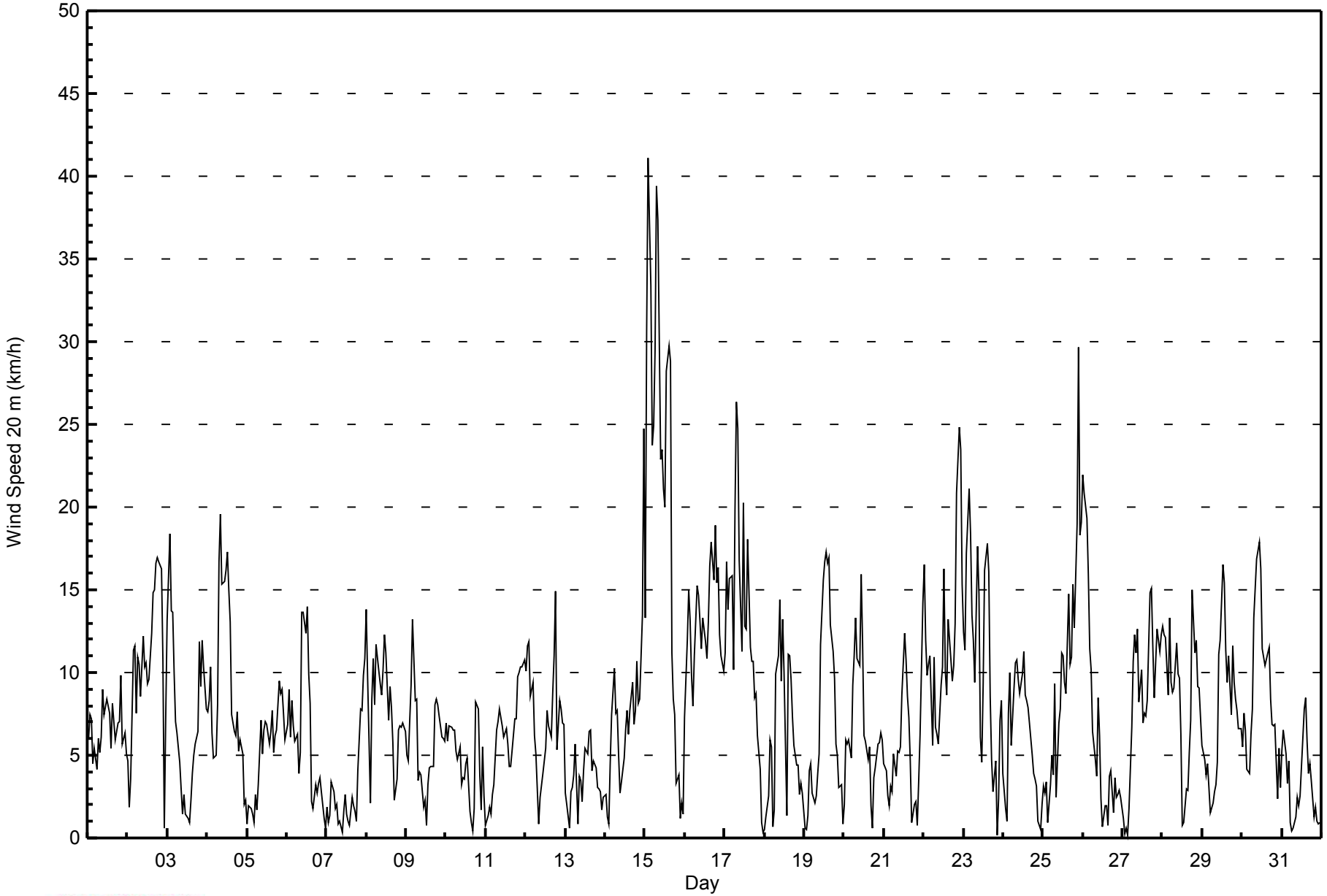
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	3	4	3	3	3	2	3	3	3	3	3	4	4	2	2	2	2	2	2	2	2	2	2	2	4
2-Jan	2	2	2	5	5	3	2	2	3	3	3	4	3	3	3	3	4	4	4	4	4	4	3	4	5
3-Jan	5	7	6	5	3	3	2	2	2	1	1	1	1	1	2	2	2	2	3	4	4	4	3	3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

WBEA NETWORK

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	283	38.04	38.04
6 - 11	311	41.80	79.84
12 - 19	122	16.40	96.24
20 - 28	19	2.55	98.79
29 - 38	7	0.94	99.73
> 38	2	0.27	100.00

Total Number of Valid Hours: 744

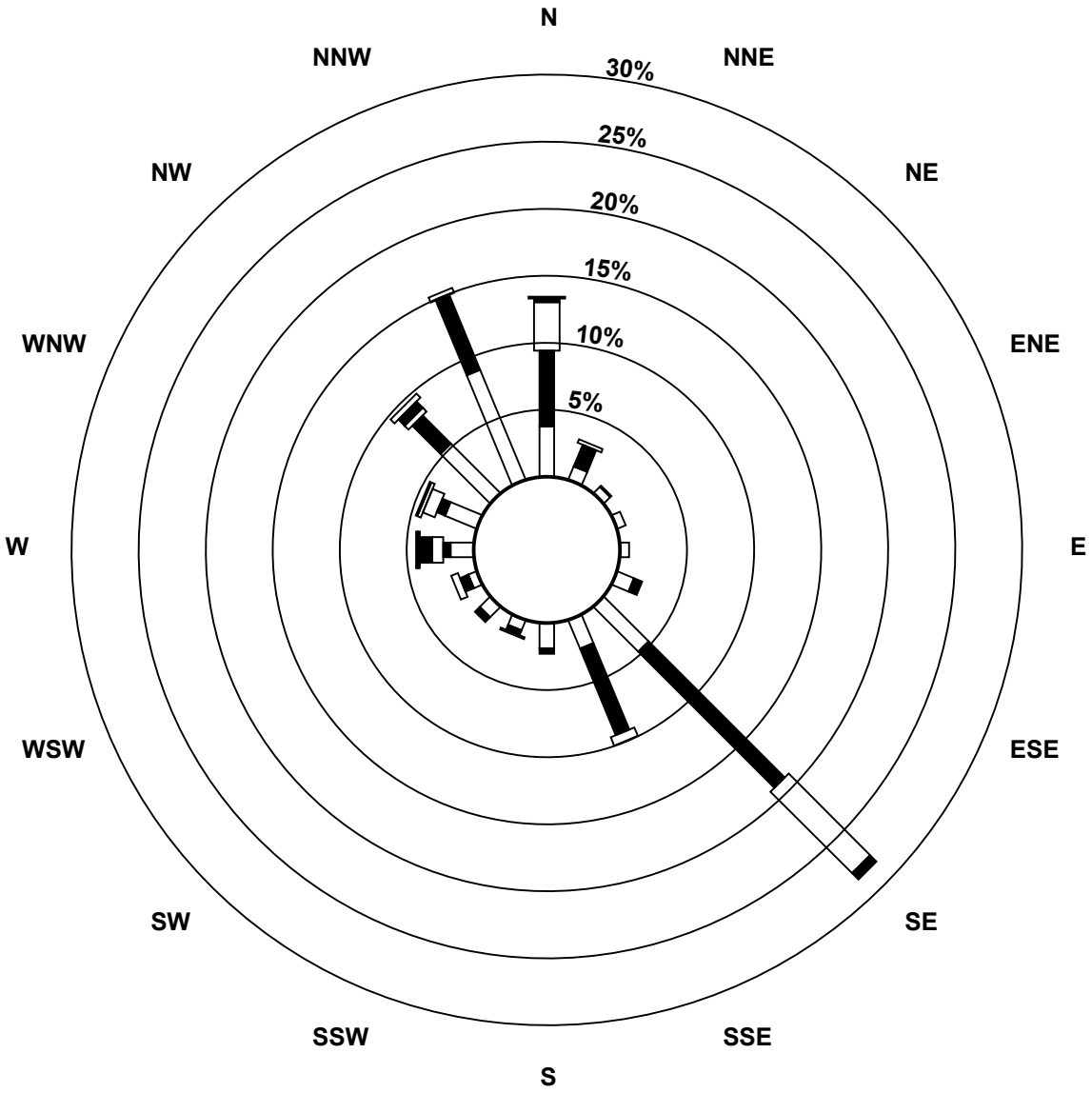
Total Number of Hours: 744

Wood Buffalo Environmental Association

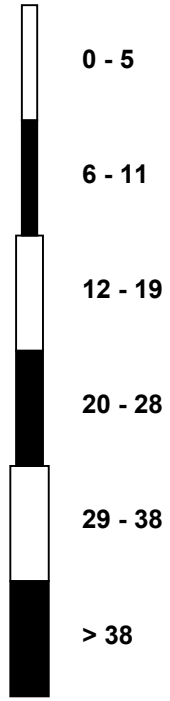
Wind Rose Jan 2014

Wind Speed 20 m (WS20m) - km/h

Lower Camp Met Tower (AMS 3)



Classes (km/h)



Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - January 2014

Maximum Speed: 53 km/h on Jan 15 03:00

Maximum Daily Speed Average: 22.7 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 18 00:00

Minimum Daily Speed Average: 0.8 km/h on Jan 9

Maximum Diurnal Speed Average: 3.1 km/h at hour 15

Minimum Diurnal Speed Average: 0.1 km/h at hour 2

Monthly Average Velocity: 0.4 km/h 39.1 deg

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 5$ Median = 9 $Q_3 = 14$ $P_{90} = 19$ $P_{99} = 36$

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSE8	SSE10	SSE9	SSE6	SSE7	SSE5	SSE8	SSE7	SSE9	SSE9	SSE8	SSE10	SSE9	SE9	SSE7	SSE10	SSE8	SE8	SSE9	SSE9	SE12	SSE6	SE8	SE7	SSE8.2	SE12
2-Jan	SE6	ESE4	ESE6	SE17	SSE16	SSE10	SSE14	SE10	SE10	SE16	SE12	SE13	SE12	SE13	SE17	SE20	SE21	SE21	SE20	SE19	SE16	SE11	W2	NNW12	SE12.2	SE21
3-Jan	N19	N26	N21	N20	N14	N11	N10	N8	W3	NW3	NW3	WNW2	WNW2	W1	W3	WNW6	NNW8	NNW9	NNW10	WNW16	NW12	WNW17	WNW15	W13	NNW9.0	N26
4-Jan	W14	WSW15	WSW18	WSW14	W9	W9	W13	W24	W27	W21	WNW20	NW20	NNW23	N22	N19	NNW11	NW9	NNW9	NW10	NNW8	NW9	NNW8	N5	W5	WNW11.1	W27
5-Jan	NW1	WNW1	WNW4	NNE1	ESE2	SE5	E6	SE8	SE10	SE7	SSE9	SE9	SE10	SSE7	SE9	SE10	SE7	SE8	SE9	SE11	SE11	SE12	SE10	SE8	SE6.7	SE12
6-Jan	SSE10	SE10	SE7	SSE10	SSE8	SE8	SSE8	S5	SSE7	SE19	SE19	SE18	SE18	SE13	SE11	S3	NE2	NNW4	E5	SSE5	SSE5	N4	SE4	N3	SE7.5	SE19
7-Jan	W1	NNE0	NNW1	NNW4	WNW3	NW3	W2	WSW1	SW2	SW1	S5	SW3	S3	S1	S2	SSE4	SSE4	S4	ESE4	SE6	SE10	SE10	SE14	SE15	SSE2.9	SE15
8-Jan	SE17	SE12	SSE3	SSE11	SSE14	SSE10	SSE14	SE12	SE11	SE12	SE14	SE15	SE14	SE9	SE12	SE9	SE8	SE3	SE6	SE8	SE9	SE8	SE11	SE8	SE10.4	SE17
9-Jan	SE7	SE5	SE9	SE11	SE14	S9	S10	SSW5	SW5	SW5	SSE2	SE3	ENE1	N4	NNW6	NNW6	NNW7	NNW12	NNW11	NNW11	NNW10	NNW8	NNW8	NNW9	NNW0.8	SE14
10-Jan	NNW9	NNW8	NNW10	NW9	NW9	NW8	NW7	NW6	NNW8	NW4	NNW4	NNW4	NNW6	NW5	NW2	NNE1	ESE1	WNW3	W11	WSW12	W8	S2	SE7	SE5	NW4.3	WSW12
11-Jan	NNW1	WNW2	NW2	N2	NNW4	NNW5	N10	NNW10	NNW11	NNW11	NNW10	NNW9	NNW10	NNW8	NNW6	NNW6	NNW8	NNW11	NNW11	NNW14	N14	N15	N15	N15	NNW8.6	N15
12-Jan	N14	N17	N17	NNW12	N14	NNW8	NNW7	NNW4	ENE2	ESE3	SE5	SE6	SW10	SW12	SSE8	S8	SSE11	SSE14	SE20	ESE9	SE11	SE9	SSE9	SSE8	ESE1.3	SE20
13-Jan	SE4	N2	NE0	SE4	SE4	SE5	SE7	N1	NW6	NW5	N3	N6	N8	NNE8	NNE10	NNE11	N7	N7	NW5	NNW5	NW4	NW4	NW2	NW2	N2.9	NNE11
14-Jan	NNW5	NW2	SSW2	SE8	SE10	SE12	SE9	SE9	SE7	SE4	SSE5	SSE7	SSE9	SE9	SE7	SE10	SSE12	SSE8	SE11	SSE12	SE11	ESE12	SE21	SE29	SE8.8	SE29
15-Jan	SE13	W41	W53	WNW42	W30	W32	WNW38	WNW49	NW46	NW28	NW29	NW26	NW25	NW34	NW36	NW35	N16	NNW12	N11	NW5	WSW3	W3	SSW3	SE4	WNW22.7	W53
16-Jan	SE10	SE15	SE16	SE13	SE6	SSE5	SE7	SE16	SE16	SE15	SE12	SE14	SE15	SE14	SE17	SE17	SE13	SE14	SE18	SE16	SE16	SE14	SE12	SE12	SE13.5	SE18
17-Jan	SE12	SE20	SE15	SE18	SE13	SE8	W27	W35	W34	W23	WNW15	W27	WNW17	NW16	NW22	NNW16	NNE16	NNE16	NNE13	NNE13	NNE9	N6	N2	WNW0	WNW5.7	W35
18-Jan	N0	SE4	SE7	SE9	SE8	SE3	WSW2	SSE13	SE15	SSE17	SE10	SE14	SSE11	SE1	NNW15	NNW15	NNW13	NNW10	NNW8	NNW7	NW6	NNW4	NW5	N4	ESE1.4	SSE17
19-Jan	ENE1	NE1	NNE2	NW5	N7	NNW5	WNW3	NW3	NNW7	NNW8	N16	N23	N26	NNE28	N25	N23	N19	N15	NNW14	N9	N8	NNW4	WNW4	ENE0	N10.2	NNE28
20-Jan	S3	SE8	SE7	ESE8	E7	SE11	SE16	SE17	SE14	SE14	SE21	SE16	ESE9	ESE8	ESE7	ESE7	NNW2	NW1	NNW6	NNW6	NW8	NNW8	N9	NNW8	ESE5.3	SE21
21-Jan	NW6	NNW6	N4	N3	NNW4	NNW4	NNW7	NNW5	NNW7	N7	NW7	N14	N19	NNE16	NE13	NNE12	NNE9	NNW2	NNW3	NW1	N3	SE7	SE11	SE20	NNE4.8	SE20
22-Jan	SE23	SE16	SE13	SE13	SE14	SE9	SSE13	SE8	SE8	SE8	SSE11	SSE11	SSE17	SSE11	SSE10	SSE14	SSE13	SSE12	SSE14	SE19	SE25	SE30	SE30	SE25	SE15.2	SE30
23-Jan	SE20	SE14	SE20	SE26	SE23	SE16	SE14	SSW13	WSW26	W21	WNW10	NNW7	NW13	WNW21	WNW22	WNW21	WNW12	NNW8	WSW4	W8	WNW2	SSE2	SSE7	SE7	SW4.7	SE26
24-Jan	SE4	SE2	E1	NNW13	NNW14	NW8	N13	N17	NNW15	N14	N13	NNE15	N18	NNE13	N12	N12	N10	N7	NNW5	NW4	NNW4	NNW1	NW0	NW1	N8.3	N18
25-Jan	SE5	S5	SSW5	WNW2	SW6	S6	S5	SE8	ESE4	N11	N12	N17	N16	N15	N12	N19	N15	N16	N23	N20	N26	N41	N29	N29	N10.9	N41
26-Jan	N34	N31	N28	N23	N17	NNW14	N10	NNW7	N5	N11	NNW8	NNE3	W1	NNW2	NE2	ENE1	SE4	SE5	NE3	N4	NNW3	NNW3	NNW2	NNW1	N8.4	N34
27-Jan	NNW0	SE1	S3	SSW2	SSE5	SE10	SE14	SE14	SE12	SE15	SE11	SE13	SE10	SE11	SE11	SE14	SE19	SE19	SE16	SE12	SE15	SE18	SE16	SE16	SE11.4	SE19
28-Jan	SE17	SE17	SE19	SE15	SE16	SE10	SE11	SE9	SE14	SE12	SSE11	SSE8	ESE1	NW1	N4	NW4	NNW8	NNW10	N21	NNE17	N18	N15	N13	NW9	E3.6	N21
29-Jan	NW8	NW8	WNW6	WNW7	NNW6	WNW2	NW3	NW5	NW5	NW7	N16	N18	N24	N23	N17	N14	N16	N11	N16	NNW13	NW10	NW10	NW8	NW9	NNW10.2	N24
30-Jan	NW8	NW10	NW9	NNW6	NNW6	NW9	WNW11	W18	W20	WSW23	WSW24	WSW22	WSW14	SW13	SW13	SW14	SSW14	SSW11	SSW9	S8	SE8	S3	WNW8	NNW5	WSW8.7	WSW24
31-Jan	NNW9	NW10	NW7	NNW5	NNW9	NNW2	WSW1	SSW1	NW2	WNW3	NNW2	NNW4	NNW5	NW9	NNW11	N9	N6	N7	NNW5	WNW2	N3	NNW4	E1	SW3	NNW4.5	NNW11
	ESE1.9	ESE0.1	WSW0.6	SE1.0	SE1.3	S1.4	SSW1.8	SW2.6	WSW3.1	SW1.6	WSW0.3	NE0.6	NNE2.3	N3.0	N3.1	N2.4	NNE2.1	NNE2.1	NNE2.1	NE1.3	ENE1.7	ENE1.6	ESE2.1	ESE2.0	Diurnal Average	
	N34	W41	W53	WNW42	W30	W32	WNW38	WNW49	NW46	NW28	NW29	W27	N26	NW34	NW36	NW35	SE21	SE21	N23	N20	N26	N41	SE30	SE29	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 16 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 27 01:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 6$ $P_{99} = 9$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

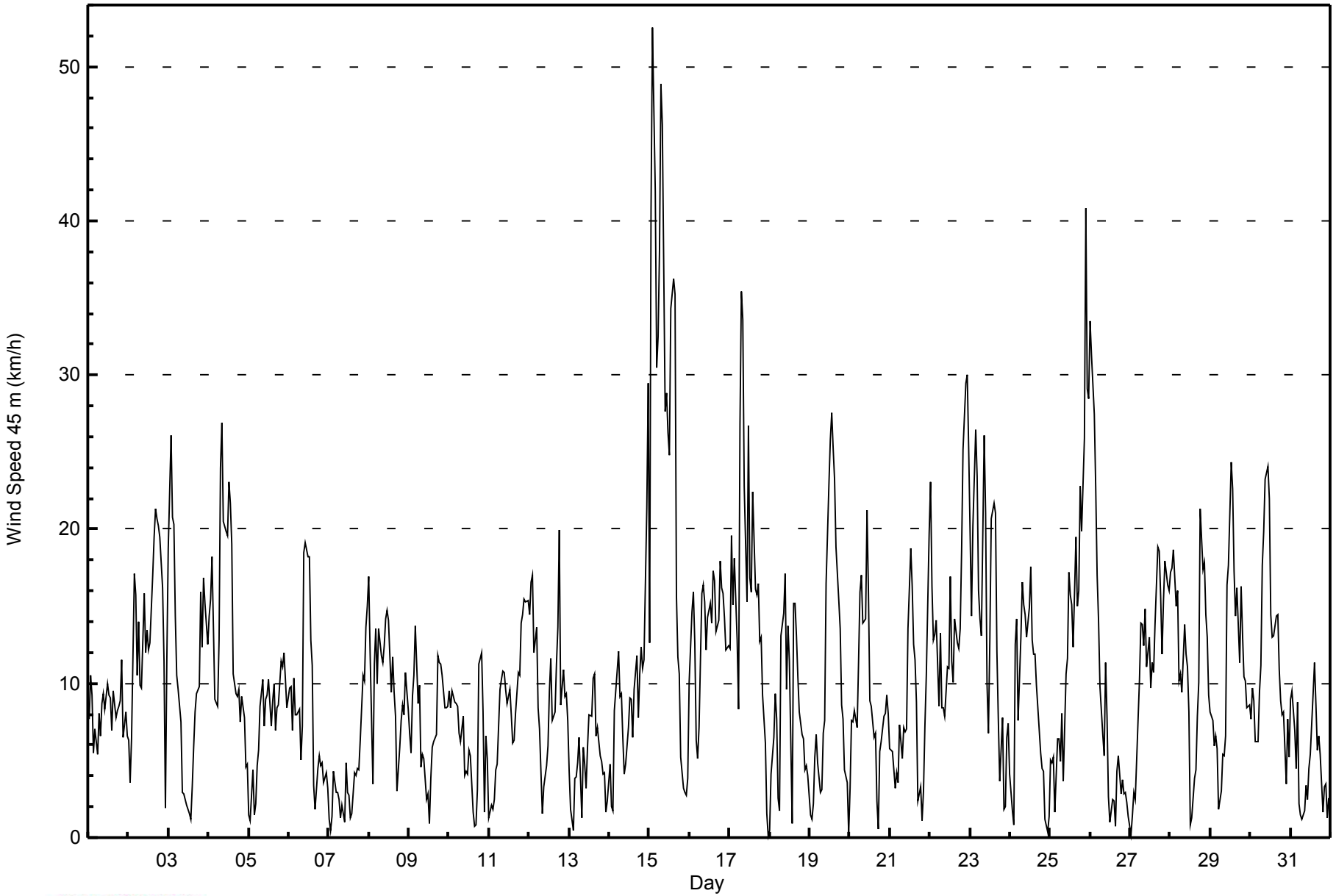
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	2	3	2	2	2	1	2	2	1	2	2	3	2	2	2	2	2	2	2	2	2	2	3	3
2-Jan	2	2	3	5	6	3	2	3	3	2	3	4	3	4	3	2	3	3	2	3	3	2	4	6	6
3-Jan	6	8	7	6	3	3	2	2	2	1	1	1	1	1	2	2	2	3	3	4	4	4	3	4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

WBEA NETWORK

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	197	26.48	26.48
6 - 11	274	36.83	63.31
12 - 19	196	26.34	89.65
20 - 28	55	7.39	97.04
29 - 38	16	2.15	99.19
> 38	6	0.81	100.00

Total Number of Valid Hours: 744

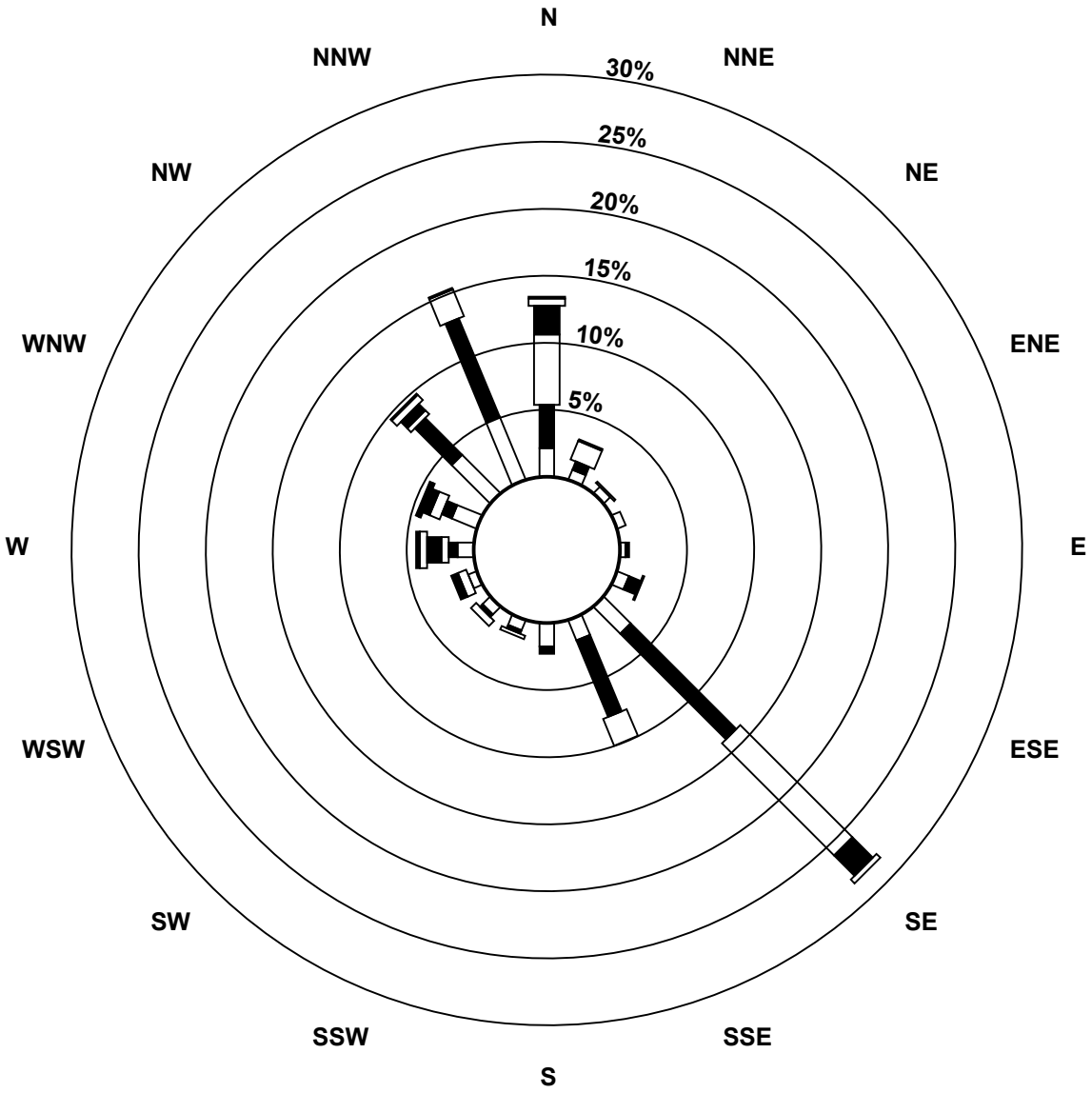
Total Number of Hours: 744

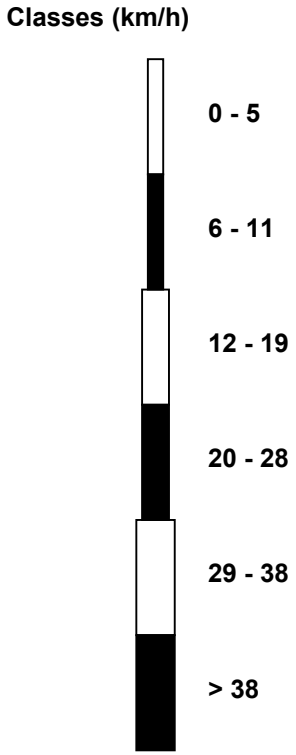
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 45 m (WS45m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - January 2014

Maximum Speed: 73 km/h on Jan 15 03:00

Maximum Daily Speed Average: 32.4 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 10 16:00

Minimum Daily Speed Average: 1.5 km/h on Jan 18

Maximum Diurnal Speed Average: 6.2 km/h at hour 8

Minimum Diurnal Speed Average: 0.8 km/h at hour 2

Monthly Average Velocity: 1.5 km/h 302.7 deg

Percentiles: P_1 = 1 P_{10} = 5 Q_1 = 9 Median = 13 Q_3 = 20 P_{90} = 27 P_{99} = 52

Hours in Service: 744

Hours of Data: 734

Hours of Missing Data: 10

Percent Operational Time: 98.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	S4	SSE7	SSE13	SSE4	SSE4	SE5	S5	SSE6	SSE7	SSE6	SSE6	SSE11	SSE9	SSE10	S5	SSE8	SSE8	SSE11	SSE7	S8	SSE11	SSE13	SSE18	SSE23	SSE8.6	SSE23
2-Jan	SSE25	SSE27	SSE33	SSE37	SE29	SSE14	SSE14	S12	SSW8	S11	S10	S15	SSE13	SSE15	S11	S13	S11	S8	WSW11	WSW12	WSW15	WSW10	N15	N22	S11.2	SSE37
3-Jan	NNE28	NNE38	NNE32	NNE28	N21	N15	NNE15	NNE12	NNE5	WNW2	NNW3	N2	ENE3	N6	NNW14	NNW9	NW17	NW20	NW21	NW27	NW25	WNW29	WNW28	WNW23	NNW14.7	NNE38
4-Jan	W19	W17	W21	W20	W18	W16	W21	W36	W37	WNW29	WNW27	NW26	NNW32	N29	N27	NNW18	NW18	NW18	NW16	NW16	NW18	NW18	NW15	WNW8	WNW18.2	W37
5-Jan	NW5	NNE4	W8	WSW13	WSW9	WSW9	WSW9	SW5	S7	S4	SSW5	SSE4	SE12	SE11	SSE9	SSE9	SSE12	SSE13	SSE14	SSE14	S10	SSE14	SSE14	SSE14	S6.7	SSE14
6-Jan	SSE16	SSE10	SSE7	SSE20	SSE14	SE18	SE20	SSE15	SE21	SE34	SE31	SE33	SE26	SE19	SE21	SE10	SE3	E6	ESE12	SE11	SSE11	ESE9	ESE13	ESE12	SE15.9	SE34
7-Jan	SE5	WSW2	N2	NNE2	NE4	NNW2	NW2	WNW2	SSE1	SE6	SSE7	SSE4	SSE8	SSW5	SE2	SSE4	SSE8	SSE13	SSE9	S11	S8	SSE12	SSE21	SSE19	SSE5.4	SSE21
8-Jan	SSE20	SSE22	SSE15	SSE21	SSE22	SSE13	SSE15	S13	S13	SSE19	S18	S14	SSE12	S9	S9	S6	SSE5	SSE3	SE9	SSE7	SE11	SSE9	SSE17	SSE11	SSE12.9	SSE22
9-Jan	SE9	SE9	SSE12	S10	S12	SSW11	SSW12	S6	SW11	SSW8	SSE3	ESE3	E1	N3	NNW7	N9	N11	N17	N16	N16	N15	N13	N13	N13	N1.7	N17
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	N6	NNW5	N7	NNW5	NW2	WSW0	WSW2	W10	W17	WSW17	WSW18	WSW9	SSW5	SSE9	----	WSW18
11-Jan	SE6	E2	SE5	NE3	NNE6	N10	N13	N17	N16	N15	N14	N14	N14	N14	N14	N14	N16	NNE17	N17	N20	N22	NNE22	NNE21	N22	N12.9	NNE22
12-Jan	N21	N24	N24	N18	N21	N12	N10	NNW7	ENE4	ESE3	SE7	SSE7	WSW15	WSW18	SSW10	S12	S17	S22	S23	SSE19	SSE20	SSE14	SSE14	S10	SSE2.0	N24
13-Jan	SSE11	SSE8	SW8	SSW6	SSW4	SSW4	S4	WNW4	N14	NW9	NNW9	NNE11	NNE10	NE10	NE12	NNE13	NNE10	NNE11	NNE9	NNE8	N6	N10	N6	N4	NNE4.3	N14
14-Jan	NNW5	NW2	SSE3	SSE11	SSE15	SSE18	SSE19	SSE16	SE15	SE15	SE14	SSE21	SSE16	S10	SSE9	SSE15	SSE22	SSE18	SSE23	SSE21	SSE23	SSE28	SSE32	S26	SSE15.9	SSE32
15-Jan	WSW19	W60	WNW73	WNW59	W43	WNW44	WNW52	WNW68	NW65	NW40	NW41	NW40	NW37	NW49	NW50	NW50	N22	N17	NNE14	NNE9	N3	WNW1	SSE2	S5	WNW32.4	WNW73
16-Jan	S7	SSW7	SW11	WSW14	WSW22	W24	WSW19	WSW12	SW7	S4	S6	SSE11	SSE13	SSE16	S13	SSW10	SW12	SW12	SW10	SW10	SW9	SSE12	SSE14	SSE19	SSW9.6	W24
17-Jan	S13	S15	S10	SSW10	SW13	WSW16	W44	W54	W54	W38	WNW25	W42	NW28	NW25	NW33	NNW25	NE22	NNE22	NNE17	NE18	NNE14	NNE10	NE3	NNW0	WNW13.0	W54
18-Jan	NW0	SE9	SSE15	SSE17	SSE16	SSE10	S5	S9	S9	SSW8	SW6	SE7	SE8	NE5	N20	N20	N19	N16	N15	NNW13	NNW11	NNW11	NW6	NW6	NNE1.5	N20
19-Jan	N3	NE1	W2	N7	N10	NNE8	N6	NNW7	N14	N15	N22	N30	NNE35	NNE37	NNE35	N31	N25	N20	N19	N13	NNE12	NNE8	NNW4	NNW2	N14.9	NNE37
20-Jan	SSW4	SSE8	S8	SSE14	SSE14	SSE14	SSE25	SSE19	SSE19	SSE21	S22	SSE18	SSE15	SSE14	SE11	SSE8	E2	NW2	NNW9	NNW11	NNW13	NNW14	N13	NNW11	SSE6.6	SSE25
21-Jan	NNW7	NNW8	NNE7	NE6	ENE3	E4	NNE7	N9	NNW11	NW10	NNW11	N20	NNE23	NNE19	NE15	NNE14	NE13	NE11	ENE12	ESE10	SE12	SE16	SSE23	SE32	NE6.6	SE32
22-Jan	SE37	SE28	SSE23	SSE22	SSE23	SSE17	SSE20	SSE17	SSE20	SSE18	SSE20	S11	S13	SSE13	S11	S12	S12	SSE18	SSE15	SSE27	SSE29	SSE30	SSE31	S22	SSE20.2	SE37
23-Jan	SSE23	SSE25	SSE18	S14	S16	S12	SW12	WSW26	W35	W37	W25	NW16	NW25	WNW33	WNW33	WNW33	WNW21	NNW11	WNW9	WNW9	WSW9	WSW9	SW10	WSW12	W12.8	W37
24-Jan	WSW6	WNW7	WNW22	NNW23	N21	N13	N20	N23	N21	NNE19	NNE17	NNE18	NNE22	NNE16	NNE15	NNE15	N11	NNE8	NNE6	NNW4	N5	E1	SE4	SSE6	N11.3	N23
25-Jan	SSE11	SSE12	S8	SSW6	SW13	SW13	SW9	SW11	W7	NNE17	NNE17	NNE22	N21	N20	N16	N26	N21	NNE23	N33	N29	N36	N56	NNE41	N41	N14.4	N56
26-Jan	N47	N45	N40	N32	N25	N21	NNE16	NNE11	N8	N14	NNW9	N3	WNW1	NNW3	NNE2	ENE2	SE5	SE6	SE9	ESE7	SE8	SE8	SE9	SSE10	NNE10.1	N47
27-Jan	SSE8	SSE8	SSE8	SE10	SSE10	SSE6	SSE11	SSE11	S9	SSE12	SSE9	SSE16	SSE18	SE22	SSE20	SSE21	SSE21	S16	SSE19	SSE20	SSE22	SSE20	SSE22	SSE18	SSE14.8	SE22
28-Jan	SSE17	S17	SSE25	SSE18	SSE16	SSE10	SSE9	S6	S11	SSE12	SSE6	S1	NNW2	NNW5	NNW7	NNW10	NNW16	N16	N27	NNE23	NNE24	NNE22	NNE21	N15	NE2.6	N27
29-Jan	N14	N14	N9	NNW9	N10	N5	NNW8	NNW12	NNW12	N16	N23	NNE24	N33	N30	NNE23	N20	N22	N17	N24	NNW21	NNW17	NNW16	NNW13	NNW14	N16.3	N33
30-Jan	NNW14	NW16	NNW15	NW12	NW13	WNW20	WNW20	W26	W27	WSW28	WSW26	WSW25	SW15	SW16	SW17	SW19	SW24	SW18	SW13	SW13	SW6	W12	WNW15	NW10	W14.4	WSW28
31-Jan	NNW14	N17	NNW11	NNW14	NNW18	NNW14	NW11	WNW5	WNW5	N8	N11	NNW12	NNW8	NNW13	N14	N12	N9	N10	NNW9	NNW6	NW11	NW12	NW8	WNW11	NNW10.3	NNW18
	SE1.9	S0.8	SW2.1	SW1.8	SSW2.1	WSW3.1	WSW4.6	W6.2	W6.1	W3.7	WNW2.6	NNW2.0	N3.3	N4.0	NNW5.1	NNW4.8	N3.2	N3.2	N3.2	N1.6	NW1.4	NNW1.3	SE1.6	SE1.7	Diurnal Average	
	N47	W60	WNW73	WNW59	W43	WNW44	WNW52	WNW68	NW65	NW40	NW41	W42	NW37	NW49	NW50	NW50	N25	NNE23	N33	N29	N36	N56	NNE41	N41	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 - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 18 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 18 00:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 11

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	2	2	3	2	2	2	1	1	2	2	2	3	3	3	2	2	1	2	2	2	3	3	5	5	5
2-Jan	4	4	2	3	9	5	3	3	4	3	3	4	3	2	2	2	2	3	2	3	3	7	6	3	9
3-Jan	5	5	6	4	3	2	2	2	3	1	1	1	1	2	3	3	3	4	5	4	4	3	2	3	6
4-Jan	2	2	2	2	2	3	7	4	3	4	5	4	7	7	4	4	5	3	3	3	3	3	3	2	7
5-Jan	3	1	3	3	2	2	2	1	2	2	1	3	1	1	2	4	3	2	3	4	2	4	3	2	4
6-Jan	2	5	4	3	6	5	5	4	5	4	4	4	6	4	3	5	2	2	2	3	3	3	4	3	6
7-Jan	2	1	1	1	1	1	1	1	1	2	1	1	3	2	1	1	3	2	2	4	2	3	5	3	5
8-Jan	5	6	3	3	4	3	3	4	3	5	3	3	2	2	2	2	2	2	2	3	1	3	4	2	6
9-Jan	2	1	3	2	3	3	5	3	4	2	2	2	1	3	1	1	2	3	2	2	2	2	2	3	5
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1	1	1	1	1	1	2	5	3	2	3	3	2	3	5
11-Jan	2	2	2	2	1	2	2	1	1	1	2	2	1	2	2	3	2	2	3	2	4	4	3	3	4
12-Jan	4	4	5	3	3	3	2	1	1	1	1	2	5	2	2	3	3	4	4	5	3	3	6	2	6
13-Jan	3	4	3	2	2	2	1	2	5	4	2	3	3	2	2	2	2	2	3	2	1	1	2	1	5
14-Jan	1	2	1	5	2	5	3	4	4	4	4	5	5	2	4	5	5	4	5	4	5	6	7	8	8
15-Jan	13	11	16	11	9	9	11	18	15	9	8	5	6	9	9	10	5	3	2	4	2	1	1	2	18
16-Jan	2	2	3	4	4	3	4	4	3	2	2	3	3	2	3	2	2	3	2	2	3	4	3	2	4
17-Jan	3	3	2	3	3	7	8	6	5	5	9	6	6	5	6	5	5	6	3	4	3	3	2	0	9
18-Jan	1	3	3	3	3	2	2	2	2	5	7	2	4	2	2	3	4	2	3	3	2	2	2	2	7
19-Jan	1	1	1	4	4	1	2	2	3	2	4	5	6	7	6	6	4	3	3	2	3	2	2	1	7
20-Jan	3	2	2	3	4	3	4	5	6	4	4	4	4	4	3	2	2	1	3	2	2	2	5	3	6
21-Jan	2	1	1	1	1	1	4	2	2	3	3	7	4	4	3	2	1	1	2	4	5	2	6	3	7
22-Jan	3	4	4	4	3	5	4	3	4	5	3	3	3	3	3	3	4	6	6	4	5	5	6	5	6
23-Jan	4	3	3	2	3	5	7	4	7	9	7	4	7	3	3	7	8	3	3	3	3	4	3	4	9
24-Jan	3	3	6	4	4	3	4	5	3	3	5	3	4	3	2	3	1	1	2	1	2	1	2	2	6
25-Jan	3	4	3	3	2	2	4	4	3	8	4	5	3	4	3	4	4	5	5	6	6	14	6	6	14
26-Jan	7	8	6	6	5	3	4	3	3	2	3	2	1	2	1	1	1	1	1	1	1	1	1	2	8
27-Jan	2	3	2	1	2	1	3	4	2	4	3	2	2	3	2	2	4	3	4	4	4	2	3	3	4
28-Jan	3	4	4	4	2	4	3	3	3	2	2	1	1	2	2	1	3	2	5	5	4	4	4	3	5
29-Jan	2	2	2	2	1	2	2	1	1	3	4	4	6	4	4	3	3	4	4	4	3	2	1	1	6
30-Jan	2	2	1	1	2	2	3	4	4	4	3	3	3	3	4	7	5	4	4	3	3	5	5	3	7
31-Jan	3	3	1	2	1	2	1	2	1	2	2	2	2	3	3	2	3	2	1	3	2	2	1	3	3
	13	11	16	11	9	9	11	18	15	9	9	7	7	9	9	10	8	6	6	6	6	14	7	8	
	Diurnal Maximum																								

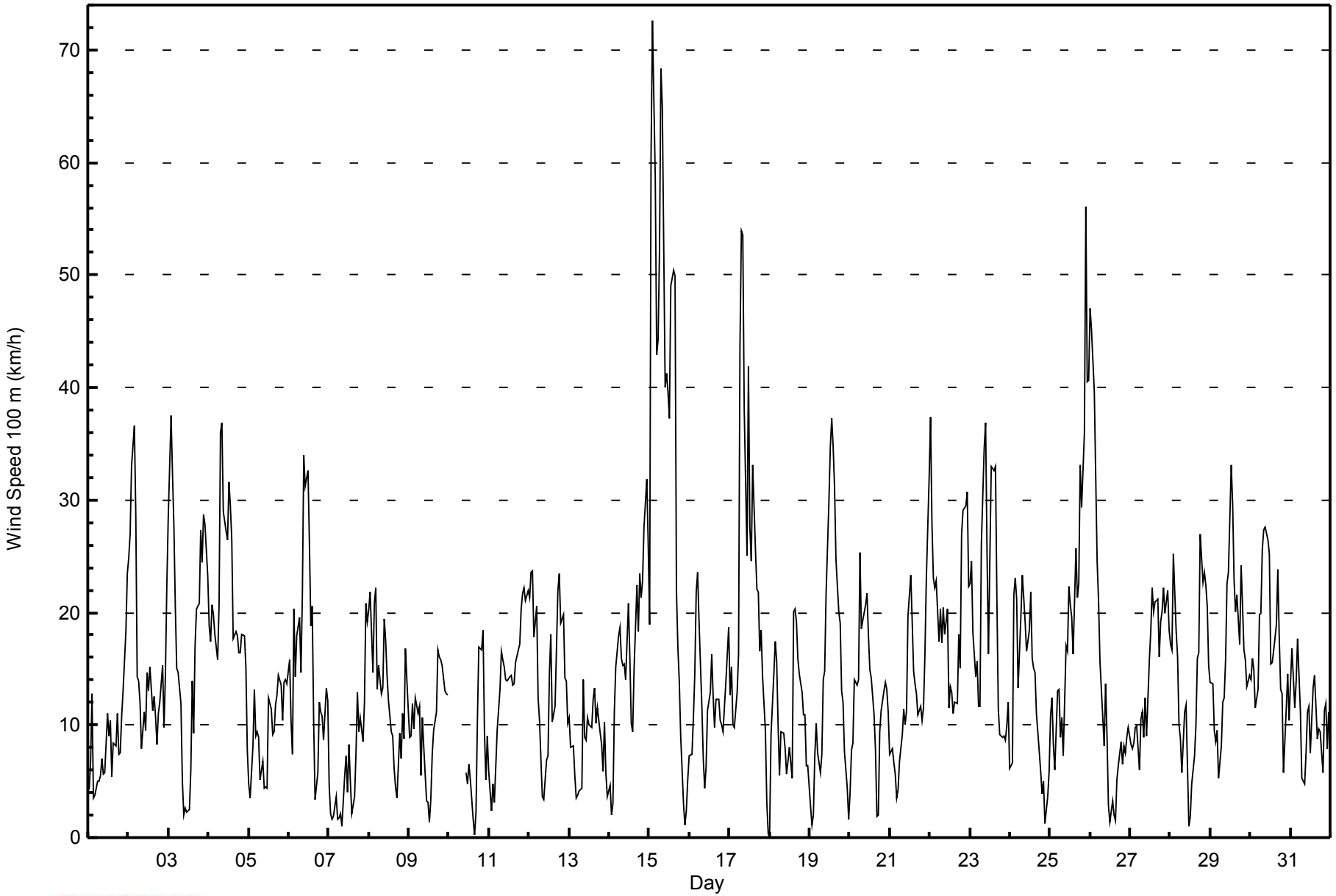
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	92	12.53	12.53
6 - 11	214	29.16	41.69
12 - 19	238	32.43	74.11
20 - 28	127	17.30	91.42
29 - 38	39	5.31	96.73
> 38	24	3.27	100.00

Total Number of Valid Hours: 734

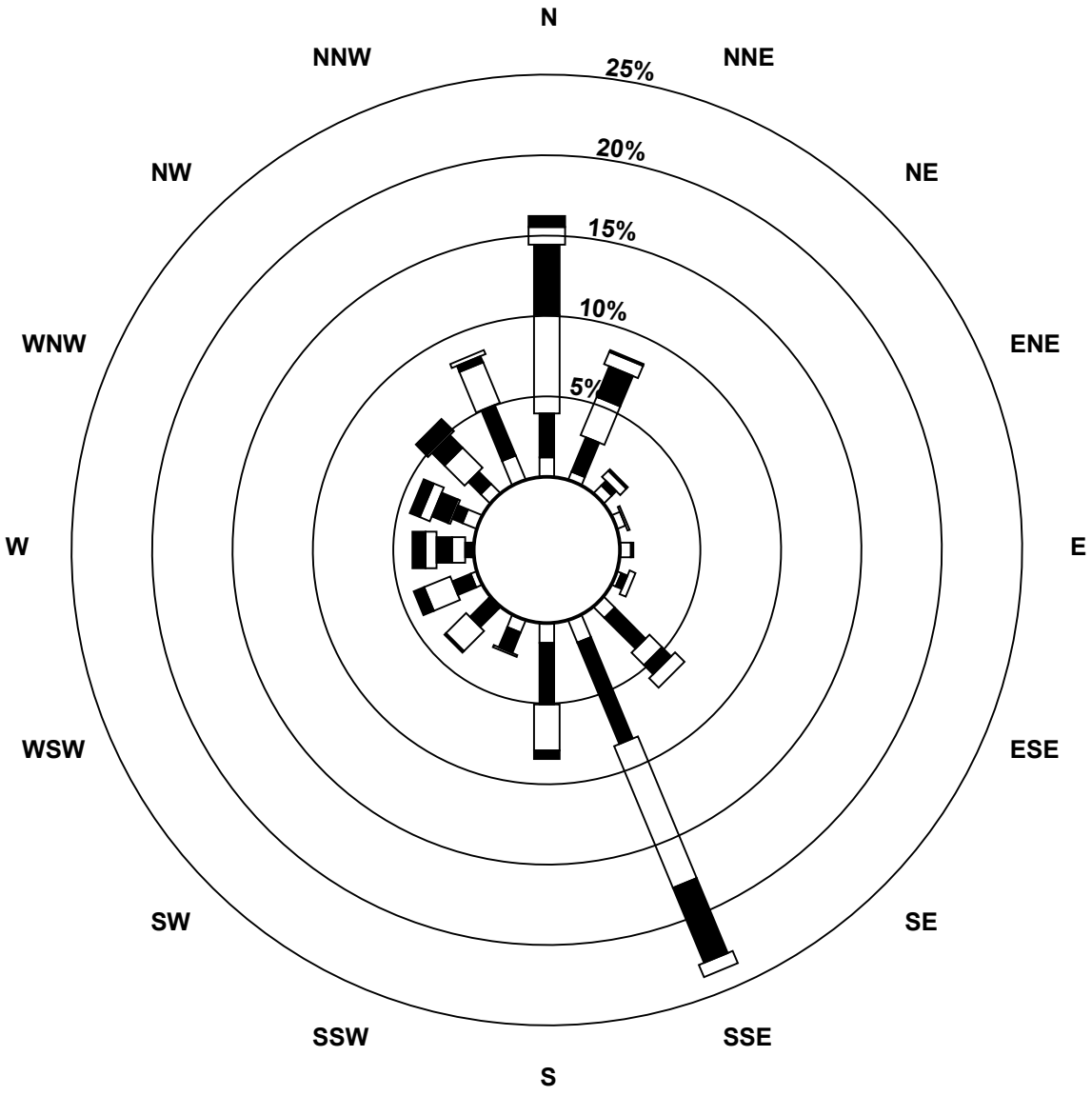
Total Number of Hours: 744

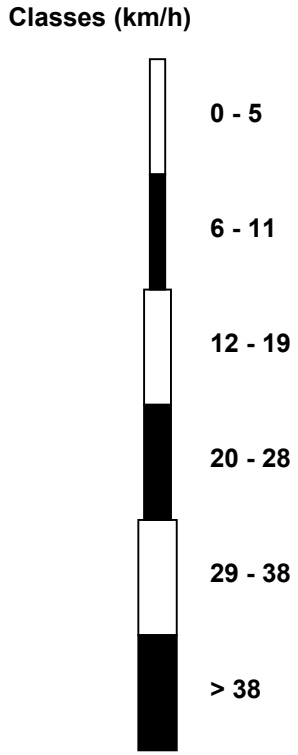
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 734

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower - January 2014

Maximum Speed: 86 km/h on Jan 15 03:00

Maximum Daily Speed Average: 38.5 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 7 03:00

Minimum Daily Speed Average: 0.8 km/h on Jan 28

Maximum Diurnal Speed Average: 8.2 km/h at hour 8

Minimum Diurnal Speed Average: 1.3 km/h at hour 20

Monthly Average Velocity: 2.9 km/h 278.0 deg

Percentiles: P_1 = 2 P_{10} = 6 Q_1 = 11 Median = 18 Q_3 = 24 P_{90} = 32 P_{99} = 62

Hours in Service:	744
Hours of Data:	712
Hours of Missing Data:	32
Percent Operational Time:	95.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	S12	S14	SSE11	S8	S8	S9	S13	S10	SSE8	S8	S13	S12	S13	SSE12	S15	S15	S15	SSE17	SE18	SSE19	SE23	SE26	SE30	SE32	SSE14.6	SSE32
2-Jan	SSE35	SSE36	SE42	SE42	SE35	SSE20	SSE18	S19	S15	S22	S18	S18	SSW14	SSW11	SSW17	SW22	SW17	WSW18	WSW25	WSW26	W28	W25	N20	NNE26	S13.7	SE42
3-Jan	NNE30	NNE38	NNE35	NNE30	NNE24	NNE19	NNE21	NE20	NE13	NNE5	NNE5	NNE6	N4	NNW14	NNW20	NNW12	NW29	NW28	NW30	NW37	NW34	NW34	NW31	NW27	NNW18.9	NNE38
4-Jan	WNW22	WNW19	W19	W22	WNW24	W20	W23	W36	W35	WNW32	WNW30	NW29	NNW36	N31	N29	NNW22	NW24	NW25	NW23	NW25	NW26	NW23	NW21	WNW18	NW22.9	NNW36
5-Jan	WNW16	NNW11	WNW13	WNW13	W13	W10	W10	WSW8	SW9	SW9	WSW10	SW7	SE5	SE7	S5	SSE10	SSE11	S12	S13	S12	SSW13	SSW12	S15	SSE15	SW6.4	WNW16
6-Jan	SSE16	SSE13	SSE13	SE28	SSE19	SE29	SE27	SE28	SE35	SE40	SE36	SE38	SE31	SE24	SE26	SE17	SE8	ESE9	ESE13	SE15	SE15	ESE10	ESE12	ESE13	SE21.1	SE40
7-Jan	SE6	SW2	N0	E3	ENE5	E3	ESE1	SW3	NW1	WSW1	S3	S6	SSE8	S8	SSE5	S7	SSW11	SSE16	SSE16	SSE22	SSE17	SSE18	SSE28	SSE23	SSE8.0	SSE28
8-Jan	SSE24	SSE24	SSE17	SSE21	SSE24	SSE17	SSE19	S20	S23	S28	SSW20	SSW17	SSW12	SSW9	SSW10	SSW5	SSW5	WSW6	S3	S5	SSE9	S11	SSE16	S11	S14.0	S28
9-Jan	SSE10	SSE10	SSE13	S13	SSW13	SSW12	SSW12	SSW10	SW12	AF	AF	AF	AF	AF	AF	AF	NNE12	NNE13	AF	NNE17	N16	AF	AF	AF	----	NNE17
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	WSW20	WSW11	SSW5	----	WSW20
11-Jan	S3	ENE3	ESE5	E7	ENE10	ENE8	NE9	NNE14	NNE15	NNE13	NNE13	N14	NNE13	N15	NNE17	NNE17	NNE19	NNE20	N20	NNE21	NNE23	NNE23	NNE21	N23	NNE13.2	N23
12-Jan	N23	N25	N25	N19	N24	N15	N13	N8	NNE4	E2	SSE6	SSW8	WSW19	WSW20	SSW11	SSW15	S20	SSW26	S24	S25	SSE23	SSE20	SSE20	SSE17	S2.7	SSW26
13-Jan	SSE21	SSE18	SSW10	S8	SSW6	SSW6	SW9	WNW13	NNW19	NNW10	N13	NNE12	NNE10	NE10	NE13	NNE15	NNE13	NNE15	NE16	ENE14	ENE6	NNE10	NE9	E7	NE4.7	SSE21
14-Jan	E6	SE5	S6	SSE11	S16	SSE20	SSE17	SSE19	SE26	SSE26	SSE29	SE26	SSE26	SSE20	SSE18	SSE23	SSE30	SSE29	SSE36	SSE28	S34	S37	S37	SSW27	SSE22.0	S37
15-Jan	WSW38	W75	W86	WNW70	W54	WNW54	WNW63	WNW78	NW75	NW48	NW49	NW47	NW43	NW58	NW58	NW56	NNW28	N24	NNE19	NE15	NE7	NE4	ESE3	S5	WNW38.5	W86
16-Jan	SW12	WSW22	WSW27	WSW29	W31	W32	W30	WSW29	WSW24	WSW18	WSW12	SW11	SSW12	SSW13	SSW13	SW15	WSW20	WSW21	WSW23	WSW20	WSW16	S8	S14	SSE19	WSW17.9	W32
17-Jan	S18	SSW17	SW17	WSW18	WSW24	WSW28	W58	W64	W59	W45	WNW35	WNW48	NW36	NW29	NNW37	NNW30	NE26	NNE25	NE18	NNE22	NNE18	NNE12	NE4	ESE3	WNW17.7	W64
18-Jan	SSW5	SSE9	SSE14	SSE21	SSE19	S19	S15	SSW15	SW20	WSW28	WSW23	WSW8	WSW7	NNE7	NNE19	NNE20	N21	N17	N17	N16	N12	NNW11	NW5	WNW8	W2.5	WSW28
19-Jan	W4	SW4	W6	NNW7	N11	NNE10	NE8	N7	N11	N18	N22	N31	NNE37	NNE42	NNE38	N32	NNE26	N22	N21	N15	NNE16	NNE12	NNE5	N2	N15.9	NNE42
20-Jan	S5	S9	SSW11	S16	S14	SSE19	S23	S15	SSE24	S31	S30	S27	S24	S22	S17	S14	S6	SW4	NNW7	N11	NNW12	NNW16	N15	N10	S10.0	S31
21-Jan	NNW6	NNW5	NNE6	NE5	ENE4	ENE3	NE5	NNE10	N9	NNW12	N14	NNE23	NNE25	NNE19	NE15	NNE14	NE13	NE12	ENE14	ESE15	SE18	SE21	SSE24	SSE30	ENE7.2	SSE30
22-Jan	SSE33	SSE32	SSE29	SSE23	SSE24	SSE25	SSE20	SSE18	SSE24	SSE23	SSE24	S15	S17	S15	S15	S18	S20	SSE23	S24	S30	S28	SSW24	SSW23	SSW22	SSE22.0	SSE33
23-Jan	SSW20	S20	SSW15	SW21	SW18	WSW19	WSW27	WSW34	W42	W40	WNW28	WNW28	NW34	WNW37	WNW37	WNW39	WNW28	NW17	WNW14	WNW13	W15	WSW19	WSW19	WSW22	W21.1	W42
24-Jan	W13	NW21	WNW37	NNW27	N23	N17	N21	N25	N22	NNE19	NNE17	NNE19	NNE23	NNE16	NNE15	NNE15	NNE9	NNE7	NE6	NW2	NNW4	S2	SE7	SSE10	N11.8	WNW37
25-Jan	SSE14	SSE19	S14	S13	SSW14	SW13	WSW15	WSW23	W21	N22	NNE20	NNE23	N22	N20	N18	N27	NNE24	NNE26	N37	N33	N40	N60	N45	N44	N15.0	N60
26-Jan	N52	N50	N44	N35	N28	N24	NNE19	NNE15	NNE12	NNE14	N9	NNW3	WNW2	NW4	N2	E3	SE5	SE5	SE7	SE7	SE9	SE10	SSE10	SSE10	NNE11.0	N52
27-Jan	S10	SSW8	SSW7	S10	S13	S10	SSW9	S14	S13	S10	SSW7	SSW7	SSE11	SSE18	SSE20	SSE22	S21	S22	S27	S27	S22	SSW19	S19	S18	S14.9	S27
28-Jan	S19	S19	S21	S21	S22	SSE17	S20	S19	S18	SSW15	SW9	WSW7	NW4	NNW8	NNW10	NNW13	NNW19	N20	N27	NNE24	NNE26	NNE26	NNE25	NNE20	N0.8	NNE27
29-Jan	N20	NNE21	NNE16	N14	N13	N11	N13	N14	NNW15	N21	N26	NNE24	N35	N30	N24	N22	N24	N21	N27	N24	NNW21	NNW20	NNW17	NNW18	N20.0	N35
30-Jan	NNW18	NNW19	NNW17	NW16	WNW20	WNW25	WNW24	W27	W33	WSW32	WSW32	WSW31	SW18	SW18	SW18	SW21	SW28	SW22	SW17	SW19	WSW13	W19	W22	WNW19	W18.4	W33
31-Jan	NNW22	NNE25	N17	N18	N20	N14	NNW13	NNW7	NW5	NNE13	N16	N13	NNW11	NNW15	N15	N13	N10	N11	N10	NNW10	NW18	NW17	NW11	WNW15	NNW13.3	NNE25
	SSW2.3	SW2.2	WSW4.2	WSW3.5	SW3.5	SW4.6	WSW6.7	WSW8.2	W8.0	W5.7	W4.7	WNW4.2	NW4.5	NNW5.0	NNW5.2	NW4.7	NNW3.5	N3.1	N2.5	NNW1.3	NW2.0	WNW2.6	S1.4	SSW1.9	Diurnal Average	
	N52	W75	W86	WNW70	W54	WNW54	WNW63	WNW78	NW75	NW48	NW49	WNW48	NW43	NW58	NW58	NW56	SSE30	SSE29	N37	NW37	N40	N60	N45	N44	Diurnal Maximum	

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
Maximum Value: 19 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 7 05:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 11

Hours in Service:	744
Hours of Data:	712
Hours of Missing Data:	32
Hours of Calibration:	0
Percent Operational Time:	95.7

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

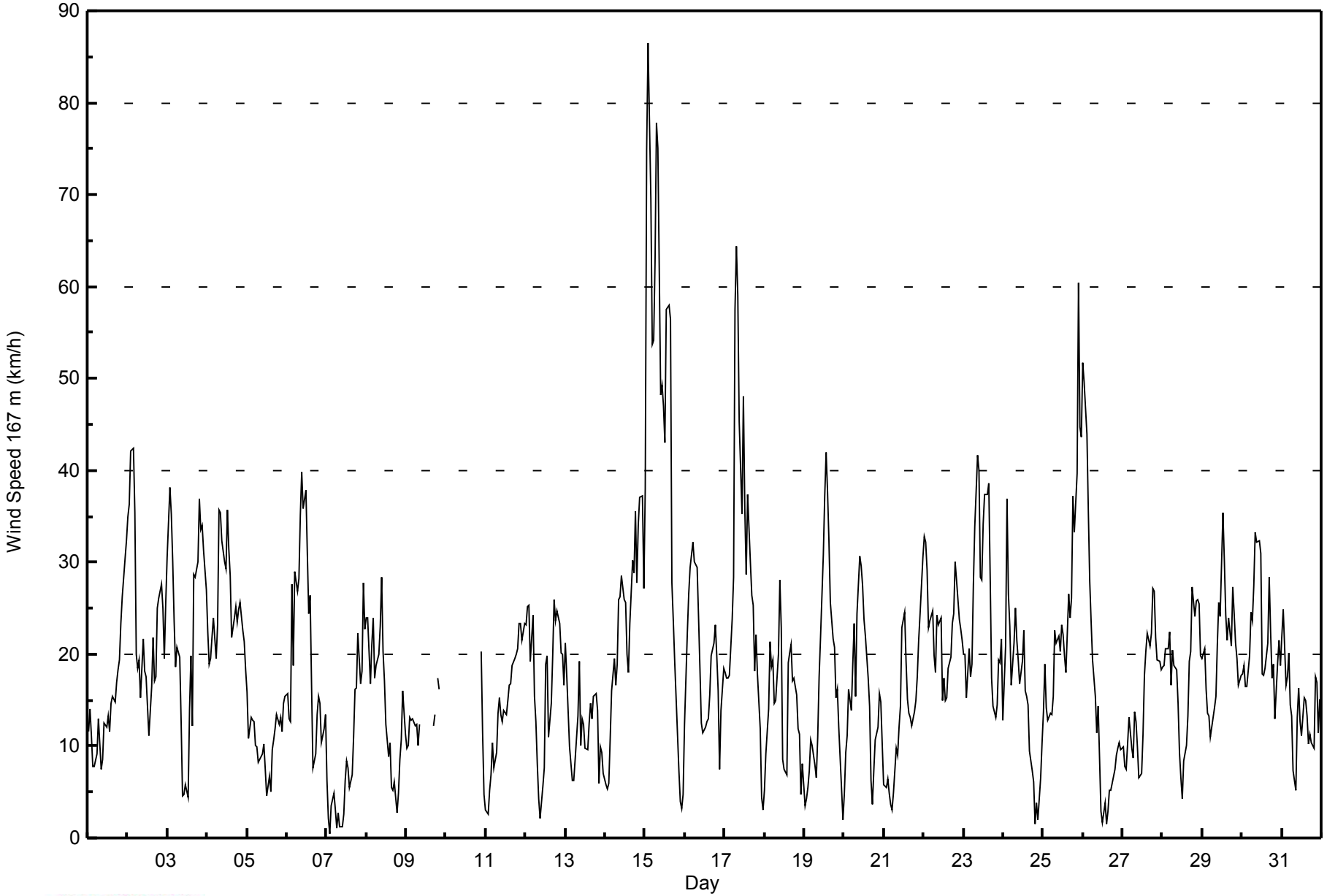
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	57	8.01	8.01
6 - 11	122	17.13	25.14
12 - 19	236	33.15	58.29
20 - 28	192	26.97	85.25
29 - 38	71	9.97	95.22
> 38	34	4.78	100.00

Total Number of Valid Hours: 712

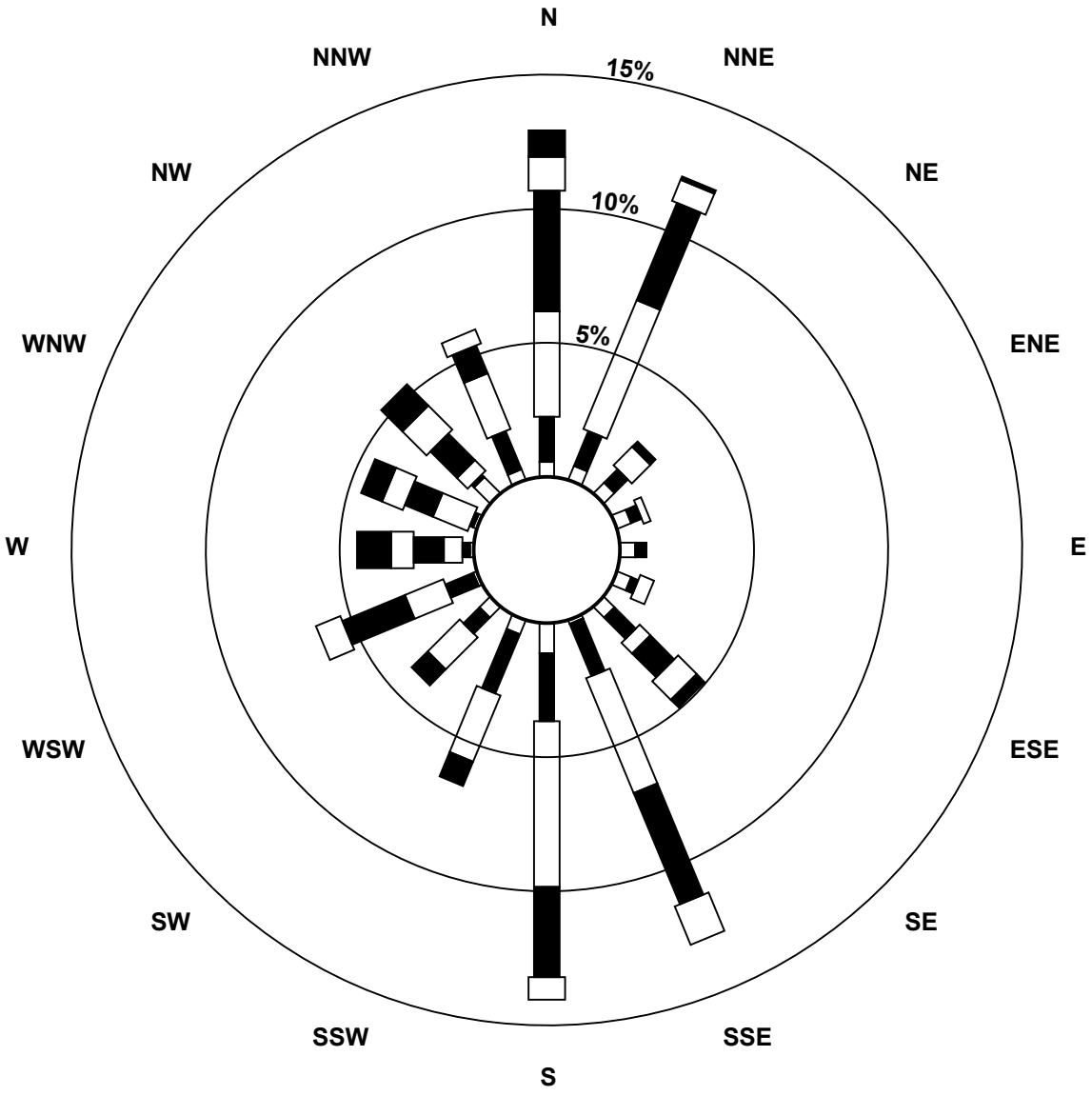
Total Number of Hours: 744

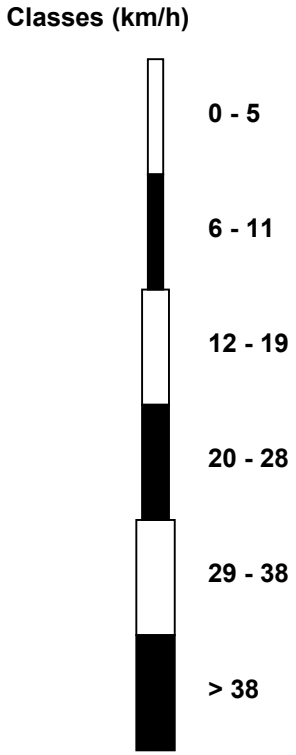
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 167 m (WS167m) - km/h

Lower Camp Met Tower (AMS 3)





Total Number of Valid Hours: 712

Direction of Maximum Speed: 281 deg on Jan 15 03:00
Direction of Maximum Daily Speed Average: 300.5 deg on Jan 15

Direction of Minimum Speed: 301 deg on Jan 23 21:00

Direction of Minimum Daily Speed Average: 0.2 deg on Jan 9

Monthly Average Direction: 324.2 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	158	157	152	156	163	151	163	165	152	152	149	150	147	146	147	151	155	144	149	147	146	156	141	144	151.3
2-Jan	135	114	120	139	150	149	152	141	134	139	138	145	139	135	140	142	143	142	141	136	137	133	273	346	139.4
3-Jan	357	358	2	0	352	349	352	354	266	313	316	290	292	276	270	285	346	346	339	302	312	296	291	278	331.7
4-Jan	260	252	244	250	267	269	262	261	259	274	296	311	334	3	353	336	322	333	312	333	324	328	351	264	297.0
5-Jan	325	296	285	29	117	127	100	136	139	139	148	140	131	151	138	140	139	141	132	146	139	137	138	137	138.8
6-Jan	148	146	145	149	155	146	157	170	165	137	130	138	127	132	137	172	52	343	93	148	148	11	127	358	139.1
7-Jan	260	26	331	336	293	323	271	258	235	217	174	225	186	178	181	162	163	178	112	138	139	144	140	145	159.4
8-Jan	142	145	154	153	153	153	149	146	144	143	141	140	141	140	134	130	141	135	143	133	142	137	141	142	142.9
9-Jan	130	142	141	139	144	169	182	206	220	216	155	129	61	358	335	327	338	344	345	347	339	338	338	338	29.4
10-Jan	341	346	338	324	323	323	319	323	328	318	342	330	346	309	322	23	105	301	273	246	272	170	130	130	317.7
11-Jan	340	298	313	8	348	343	356	347	347	344	341	335	341	333	334	332	347	346	329	346	354	359	352	351	345.1
12-Jan	349	356	351	344	354	340	331	327	75	104	139	126	236	234	167	176	152	163	143	115	134	146	157	151	129.5
13-Jan	133	7	38	141	129	125	138	9	323	318	2	356	10	22	26	14	359	349	313	330	311	318	308	312	4.3
14-Jan	339	308	200	144	144	144	135	135	138	132	163	149	155	143	146	146	156	151	139	154	130	117	128	133	140.4
15-Jan	141	274	281	295	279	280	288	301	311	310	311	314	317	313	310	313	349	347	352	326	253	271	209	139	300.5
16-Jan	143	145	139	137	142	147	138	135	139	142	143	142	143	142	139	139	139	138	137	136	136	140	140	141	139.7
17-Jan	140	140	138	140	140	146	268	264	264	272	289	276	301	317	320	332	24	24	21	24	17	10	6	299	284.8
18-Jan	360	141	144	144	137	144	245	151	144	148	126	143	147	137	346	344	346	340	339	331	314	332	304	359	112.1
19-Jan	72	48	13	323	351	341	295	318	337	337	349	1	11	16	6	350	359	353	348	352	354	331	299	60	355.2
20-Jan	191	130	128	113	98	138	130	129	135	136	142	135	121	112	105	119	340	312	334	332	326	329	355	329	121.0
21-Jan	321	330	6	354	340	337	347	335	335	350	325	1	8	24	36	22	29	329	327	322	10	130	134	143	10.0
22-Jan	137	135	145	145	143	144	157	141	135	140	155	155	150	149	150	153	152	155	154	143	141	143	141	137	145.4
23-Jan	145	144	143	142	144	140	140	206	247	269	288	334	323	293	287	285	295	344	249	272	301	147	148	139	206.0
24-Jan	142	146	83	341	343	326	352	1	347	7	9	13	7	19	6	7	353	350	348	319	344	348	308	326	358.1
25-Jan	142	172	209	299	220	188	177	140	110	352	0	11	355	1	353	351	353	358	359	2	350	352	7	358	358.5
26-Jan	2	2	355	355	352	347	352	345	349	356	336	22	279	343	35	73	132	125	45	351	343	333	342	330	357.0
27-Jan	347	146	186	210	158	145	141	145	144	144	140	141	137	138	144	133	138	139	140	131	139	140	141	143	140.5
28-Jan	142	138	139	141	144	143	143	144	145	140	148	151	112	313	354	324	330	335	358	14	11	1	355	321	107.3
29-Jan	319	319	300	292	341	295	322	319	321	318	0	7	355	360	7	5	358	2	349	336	319	321	316	321	343.2
30-Jan	325	318	321	347	346	316	285	263	263	256	253	249	237	228	218	221	208	209	209	187	134	174	292	334	250.8
31-Jan	334	315	311	332	327	335	254	198	305	286	335	339	327	322	346	356	349	352	338	282	360	342	90	227	331.2
	116.3	130.4	210.2	129.0	143.8	166.7	196.6	218.5	237.1	217.1	200.3	102.0	19.1	356.1	355.0	351.7	55.5	49.0	38.7	65.8	90.8	81.8	114.2	117.7	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Jan 21 21:00

Minimum Value: 4 deg on Jan 16 17:00

Percentiles: P_1 = 6 P_{10} = 11 Q_1 = 15 Median = 20 Q_3 = 32 P_{90} = 59 P_{99} = 90

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

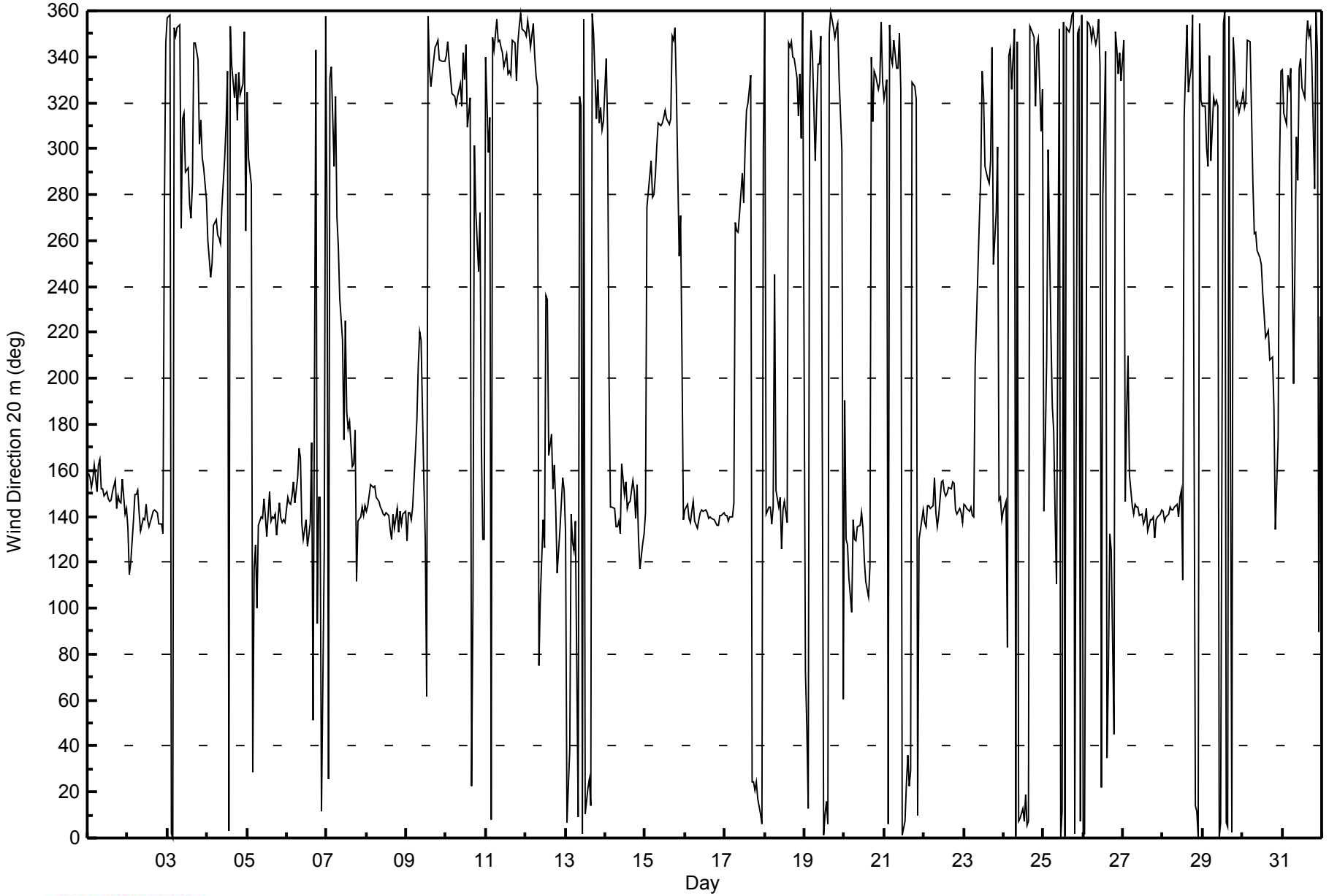
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	32	27	27	51	42	51	37	44	36	22	25	25	23	13	15	8	10	13	13	17	11	15	17	17	51
2-Jan	19	83	36	20	20	14	7	9	14	12	11	17	14	15	11	10	11	10	9	10	9	15	87	39	87
3-Jan	23	23	25	19	16	15	11	17	44	53	19	66	50	70	47	12	25	23	22	17	18	15	16	20	70
4-Jan	30	21	14	26	34	58	67	15	13	20	18	15	18	22	20	17	15	16	12	15	15	20	82	67	82
5-Jan	68	58	66	62	84	30	78	56	7	18	12	11	12	9	12	15	22	19	14	12	9	14	11	16	84
6-Jan	14	8	11	12	15	18	24	28	25	19	20	20	16	18	19	45	68	44	47	33	29	46	94	89	94
7-Jan	44	51	41	23	33	38	68	58	84	74	32	29	58	62	58	37	34	33	89	24	11	10	15	14	89
8-Jan	12	24	61	13	9	15	8	11	17	17	12	8	11	17	13	12	13	29	20	18	14	16	28	19	61
9-Jan	17	15	14	11	6	27	35	32	34	26	53	52	81	50	17	16	23	20	16	19	18	21	19	21	81
10-Jan	18	19	18	17	16	15	15	18	14	29	31	30	24	24	36	59	63	92	14	15	76	55	35	46	92
11-Jan	91	54	29	49	53	32	16	16	17	19	20	20	20	22	28	22	28	21	20	17	22	20	18	18	91
12-Jan	19	21	18	18	24	23	21	30	58	25	24	19	54	16	21	14	19	14	10	55	23	17	19	11	58
13-Jan	46	56	89	29	33	23	12	88	24	39	40	34	27	32	29	24	30	21	23	25	40	37	80	38	89
14-Jan	44	76	52	25	12	11	12	17	24	65	46	23	19	11	10	10	11	32	26	18	29	59	42	8	76
15-Jan	53	17	16	16	18	17	16	19	16	15	14	15	13	14	15	16	16	16	19	43	28	89	30	65	89
16-Jan	8	8	6	12	17	20	13	8	6	7	5	5	11	9	12	6	4	7	5	6	6	10	11	14	20
17-Jan	10	10	7	7	9	40	17	15	14	17	27	16	23	14	14	16	25	22	25	23	31	28	73	87	87
18-Jan	88	55	56	19	20	87	61	15	8	7	27	8	10	87	18	16	17	19	19	22	36	39	22	33	88
19-Jan	86	81	71	22	38	36	30	35	24	20	15	19	21	22	21	19	19	16	16	17	17	48	28	83	86
20-Jan	30	17	14	22	42	24	29	16	19	13	12	23	33	46	40	20	57	90	21	18	15	15	28	20	90
21-Jan	19	27	27	34	23	17	15	25	18	19	20	28	21	23	22	21	18	67	34	39	100	65	37	16	100
22-Jan	16	17	16	16	15	34	13	16	16	23	12	11	5	11	13	6	7	16	10	31	6	6	8	19	34
23-Jan	30	18	8	7	8	8	12	49	11	25	45	48	32	15	14	17	36	23	45	27	97	52	15	19	97
24-Jan	43	75	79	27	18	22	23	23	18	24	22	21	21	25	24	21	17	20	25	29	31	59	72	28	79
25-Jan	61	44	44	79	42	28	39	14	78	38	21	25	21	20	21	17	20	23	18	21	16	16	20	18	79
26-Jan	20	20	18	18	20	19	25	26	31	16	29	60	84	80	66	81	20	13	58	15	20	22	19	12	84
27-Jan	43	90	65	86	71	12	9	8	8	8	13	12	20	23	23	26	8	8	13	19	12	13	16	13	90
28-Jan	13	13	18	26	14	14	12	8	9	14	9	12	73	80	30	24	17	17	20	22	21	27	20	16	80
29-Jan	15	13	15	27	25	49	48	27	28	27	20	22	19	19	21	22	18	22	19	19	14	12	13	12	49
30-Jan	14	13	11	21	18	20	28	16	17	18	14	17	15	16	16	11	15	16	18	28	52	64	35	30	64
31-Jan	17	12	13	21	18	82	90	82	50	26	46	35	25	21	20	21	24	19	20	55	41	85	78	84	90
	91	90	89	86	84	87	90	88	84	74	53	66	84	87	66	81	68	92	89	55	100	89	94	89	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Direction of Maximum Speed: 283 deg on Jan 15 03:00
Direction of Maximum Daily Speed Average: 302.8 deg on Jan 15

Direction of Minimum Speed: 92 deg on Jan 18 00:00

Direction of Minimum Daily Speed Average: 0.8 deg on Jan 9

Monthly Average Direction: 328.1 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	144	145	146	143	149	145	147	149	145	150	144	145	145	147	145	150	154	144	148	146	145	155	138	137	146.2
2-Jan	133	123	132	142	147	153	157	159	138	141	140	145	141	139	143	141	143	141	138	136	142	138	355	351	140.9
3-Jan	7	7	11	11	359	354	0	3	294	260	322	302	298	295	307	302	344	338	335	301	311	296	293	276	337.3
4-Jan	255	247	243	247	261	265	261	262	260	275	297	312	338	10	1	342	324	334	317	328	320	316	342	268	294.4
5-Jan	250	341	260	308	95	148	137	145	142	141	146	137	132	145	139	141	141	143	137	148	142	139	141	141	142.5
6-Jan	146	149	142	147	156	144	148	159	151	139	136	141	130	132	137	155	71	2	103	144	148	60	113	87	137.0
7-Jan	234	354	18	342	308	351	290	260	233	191	160	181	162	153	154	153	138	154	130	140	142	142	143	147	149.8
8-Jan	147	145	150	152	152	157	149	147	147	142	148	142	140	142	139	132	142	134	148	133	141	134	143	142	144.3
9-Jan	131	136	141	143	150	184	189	206	222	208	154	128	57	1	341	333	345	353	353	354	346	345	344	344	6.3
10-Jan	347	354	344	330	329	328	325	331	333	326	352	335	352	316	330	23	118	287	273	245	264	173	136	140	319.8
11-Jan	138	338	315	355	353	346	1	355	353	351	348	344	350	342	346	343	356	356	337	352	2	8	2	358	353.5
12-Jan	358	4	358	349	3	347	339	336	76	106	137	130	241	236	173	177	157	169	149	123	138	151	154	158	122.0
13-Jan	133	39	219	148	133	132	134	86	328	319	8	4	19	33	34	24	12	354	336	346	336	326	312	328	17.0
14-Jan	334	346	169	143	143	142	138	137	134	132	155	145	150	143	141	145	155	148	139	153	132	128	137	133	140.2
15-Jan	149	275	283	297	279	282	289	302	313	313	314	317	321	316	314	315	354	351	1	351	275	254	215	151	302.8
16-Jan	142	141	139	141	169	179	156	139	135	135	136	137	140	141	140	146	151	146	141	135	139	137	140	137	141.3
17-Jan	148	144	136	140	149	170	268	265	263	271	290	278	303	321	323	337	30	28	26	29	24	18	22	92	293.3
18-Jan	11	140	142	145	138	128	191	149	143	147	127	136	145	106	352	349	352	347	345	340	322	338	313	355	94.4
19-Jan	53	73	37	336	352	352	323	321	338	344	355	8	15	20	13	356	5	358	353	357	359	352	313	86	2.2
20-Jan	186	136	135	127	116	142	136	134	138	138	146	141	131	122	115	124	352	353	342	336	331	334	4	337	126.2
21-Jan	329	338	18	16	355	343	350	341	339	351	329	8	14	29	41	26	33	25	9	354	98	127	139	142	23.6
22-Jan	139	136	144	146	143	141	156	144	142	147	152	161	154	152	155	156	157	153	152	144	145	146	146	142	147.2
23-Jan	144	140	141	143	146	139	138	222	249	268	276	332	320	294	291	288	296	353	284	272	278	179	162	151	219.5
24-Jan	152	171	350	343	350	334	0	8	354	13	14	18	14	23	13	13	359	359	359	327	354	357	7	325	4.4
25-Jan	148	166	204	205	223	200	190	155	110	358	8	18	3	7	359	357	359	7	8	10	356	358	13	6	5.1
26-Jan	10	9	2	2	1	355	2	356	354	1	343	11	297	341	35	59	134	129	96	4	9	351	359	357	5.6
27-Jan	325	168	150	142	149	144	141	143	143	142	142	142	138	140	141	138	141	140	140	136	140	142	144	143	141.6
28-Jan	143	141	142	143	141	139	141	141	142	136	145	149	122	328	345	326	335	338	4	18	16	12	3	333	95.8
29-Jan	331	329	312	299	347	297	313	342	343	334	8	13	2	7	13	11	5	8	356	342	325	326	320	325	351.2
30-Jan	328	320	324	346	343	311	284	264	263	257	254	251	239	230	220	223	211	212	212	199	143	229	292	340	255.1
31-Jan	345	329	321	318	337	335	341	209	32	300	324	336	331	326	351	1	359	357	342	308	342	317	313	279	336.3
	110.4	87.6	174.2	125.4	134.0	178.5	204.6	232.6	244.4	222.1	165.5	54.8	24.9	10.4	9.7	2.4	41.9	38.2	39.7	51.2	73.8	67.3	107.2	111.9	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Jan 20 00:00

Minimum Value: 3 deg on Jan 23 04:00

Percentiles: P_1 = 4 P_{10} = 8 Q_1 = 11 Median = 14 Q_3 = 23 P_{90} = 46 P_{99} = 88

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

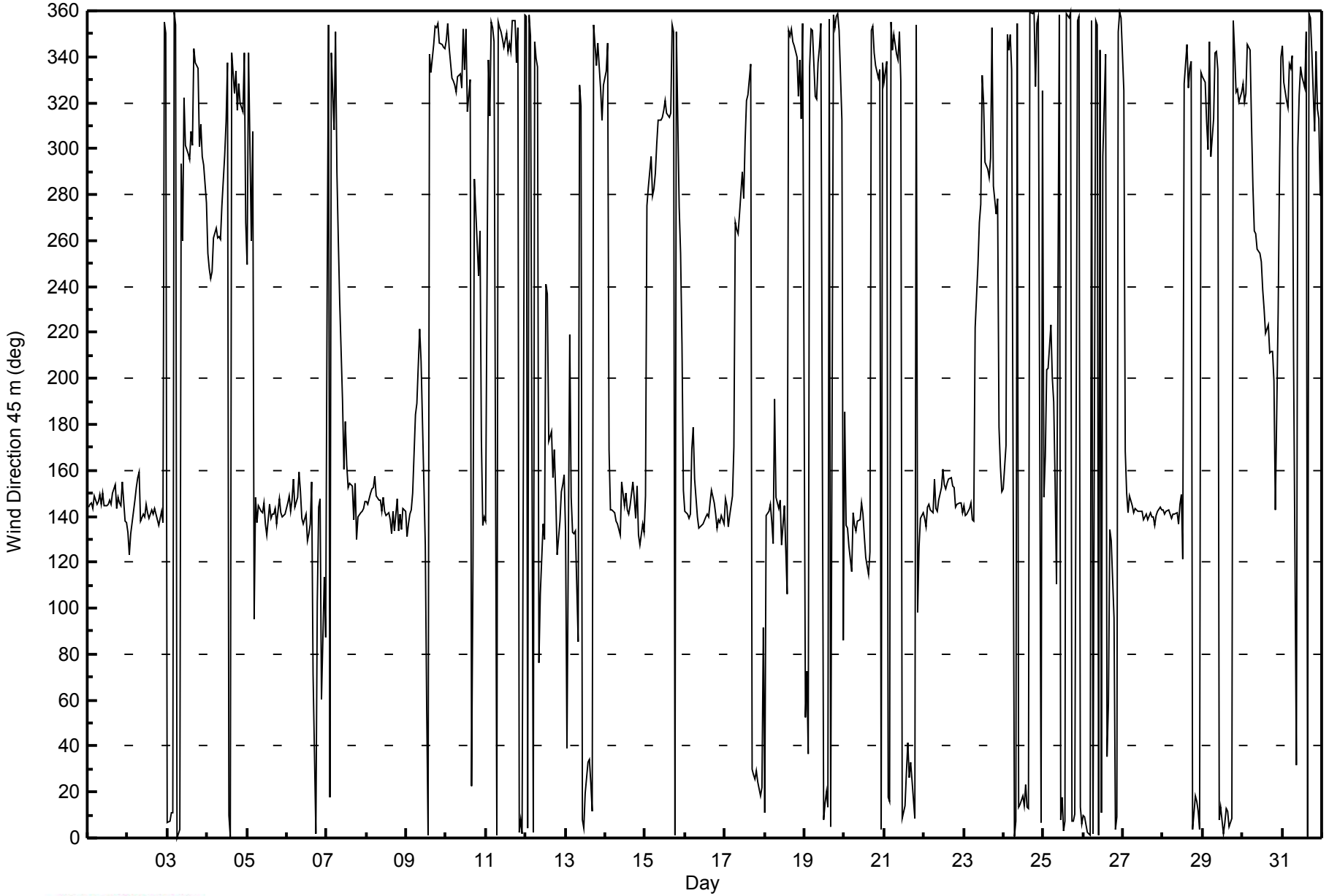
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	10	8	10	14	11	16	11	11	9	9	13	10	10	9	10	6	8	11	12	13	10	13	13	13	16
2-Jan	15	63	19	13	15	9	5	12	12	7	9	14	10	11	7	4	6	5	4	6	7	13	88	24	88
3-Jan	17	16	17	15	12	11	10	11	46	34	22	23	45	52	31	10	19	19	19	13	15	10	10	13	52
4-Jan	19	8	7	11	20	24	50	8	8	14	13	12	15	17	15	14	11	12	11	14	11	16	56	30	56
5-Jan	79	71	25	86	35	16	14	5	5	9	6	6	5	8	10	11	14	11	11	9	6	9	10	12	86
6-Jan	10	7	11	9	13	15	20	22	21	14	12	14	13	14	15	40	59	56	20	24	25	36	37	32	59
7-Jan	69	85	51	20	23	31	47	54	22	52	10	20	21	77	44	29	11	13	18	17	7	8	8	9	85
8-Jan	9	15	33	7	6	10	6	9	10	10	8	6	5	10	8	6	8	19	10	14	9	10	15	14	33
9-Jan	14	12	10	11	8	20	32	28	28	13	41	42	85	44	12	11	18	16	12	13	14	17	14	15	85
10-Jan	14	15	15	12	11	12	12	15	11	20	27	23	21	21	39	73	53	88	10	9	55	58	26	14	88
11-Jan	86	60	34	53	24	23	10	12	13	12	14	15	13	16	22	17	18	15	16	13	17	14	14	14	86
12-Jan	14	16	14	13	18	19	18	23	45	16	22	12	47	12	18	6	13	10	8	40	18	12	13	11	47
13-Jan	33	60	97	24	22	19	9	73	16	36	36	28	18	23	19	15	23	15	21	16	34	35	66	45	97
14-Jan	17	73	27	8	8	9	9	12	16	46	38	17	12	9	8	7	8	24	17	14	19	52	26	4	73
15-Jan	58	13	13	13	13	13	13	17	13	13	12	13	11	12	12	14	14	12	13	33	36	50	35	40	58
16-Jan	7	4	5	12	33	35	25	9	3	4	4	3	5	5	6	7	7	11	5	5	7	8	10	8	35
17-Jan	13	6	6	4	13	40	12	11	10	13	19	11	20	13	12	13	20	18	19	18	19	21	55	98	98
18-Jan	74	15	19	12	15	48	69	9	4	6	23	8	10	97	15	12	13	14	14	17	24	27	16	26	97
19-Jan	60	59	65	20	23	17	28	43	16	15	11	14	14	15	15	15	15	12	14	12	14	38	34	100	100
20-Jan	35	19	11	17	32	19	19	11	13	10	5	14	27	26	25	13	53	87	16	14	12	13	28	16	87
21-Jan	16	23	18	18	17	12	10	19	14	13	16	22	15	17	19	15	12	44	26	74	59	16	14	11	74
22-Jan	11	13	14	14	11	23	11	13	13	16	11	11	4	9	10	5	6	9	7	14	3	3	3	8	23
23-Jan	18	12	4	3	4	6	11	42	6	19	29	44	27	11	10	13	25	15	42	17	77	60	17	28	77
24-Jan	44	88	88	22	12	17	21	16	13	18	16	15	14	17	18	15	13	14	19	26	30	46	88	71	88
25-Jan	28	28	31	59	20	22	33	19	70	23	17	19	18	13	17	12	16	19	13	15	12	14	13	14	70
26-Jan	13	14	14	14	16	15	19	22	24	12	28	55	76	73	57	76	16	11	56	18	17	19	17	22	76
27-Jan	94	24	14	11	24	5	4	5	5	5	8	9	14	13	13	10	4	4	6	12	6	6	8	8	94
28-Jan	7	8	8	12	10	14	9	10	6	11	6	9	78	70	28	17	12	14	17	16	16	18	17	14	78
29-Jan	12	10	13	16	17	54	46	12	17	21	15	16	15	14	14	15	12	14	15	15	12	10	10	10	54
30-Jan	12	12	8	19	20	15	23	10	10	10	8	11	9	14	15	11	14	14	17	26	23	59	24	24	59
31-Jan	14	9	9	14	11	82	74	79	29	27	45	24	20	19	17	16	20	14	14	54	27	25	75	81	82
	94	88	97	86	35	82	74	79	70	52	45	55	85	97	57	76	59	88	56	74	77	60	88	100	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - January 2014

Direction of Maximum Speed: 282 deg on Jan 15 03:00
Direction of Maximum Daily Speed Average: 302.8 deg on Jan 15

Direction of Minimum Speed: 239 deg on Jan 10 16:00

Direction of Minimum Daily Speed Average: 1.5 deg on Jan 18

Monthly Average Direction: 270.3 deg

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	173	162	150	164	155	138	173	148	151	160	160	147	160	149	170	161	154	157	168	182	167	149	157	157	157.6
2-Jan	157	155	149	147	145	164	168	187	195	186	182	169	165	153	180	180	177	187	247	237	245	254	351	7	170.1
3-Jan	12	12	14	14	8	9	17	27	22	302	348	1	66	358	334	328	313	317	315	304	308	303	302	295	340.5
4-Jan	278	272	260	260	271	271	266	271	270	284	300	312	338	11	4	347	323	325	314	307	308	305	305	303	300.4
5-Jan	315	15	273	254	245	247	246	222	173	182	201	164	127	143	155	154	155	157	154	160	173	156	162	152	175.8
6-Jan	149	165	165	148	159	145	144	148	144	144	143	145	137	138	139	140	134	86	119	139	149	110	111	111	140.6
7-Jan	137	256	354	14	48	341	307	282	154	142	152	168	148	196	128	164	155	147	160	170	175	167	156	158	158.3
8-Jan	157	152	149	153	154	164	165	173	175	166	175	173	168	169	175	169	168	149	141	162	143	160	151	151	160.6
9-Jan	134	142	155	175	181	201	208	185	218	212	165	123	83	1	347	355	2	3	2	5	356	356	353	355	356.9
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	350	335	354	332	321	239	248	274	270	251	258	251	204	155	--
11-Jan	138	97	133	43	23	349	6	2	8	6	359	358	4	357	359	1	3	12	352	1	11	12	12	7	6.6
12-Jan	3	7	5	356	8	359	350	347	66	102	136	154	246	239	192	190	174	184	173	153	153	160	160	174	159.1
13-Jan	150	159	220	193	194	203	188	287	352	317	339	14	24	35	37	30	25	16	19	30	351	354	11	355	12.9
14-Jan	343	323	160	154	155	152	154	154	143	146	146	151	159	176	165	161	157	152	150	152	150	147	159	172	154.6
15-Jan	251	272	282	296	280	282	288	301	310	310	315	318	321	316	314	317	357	0	21	26	3	294	165	187	302.8
16-Jan	184	200	226	242	257	259	256	245	230	186	176	162	165	161	171	200	223	227	226	224	221	156	161	149	208.9
17-Jan	179	184	182	205	228	244	263	262	263	268	293	279	304	325	326	338	35	32	31	34	30	20	43	340	290.8
18-Jan	324	139	152	156	155	160	178	174	174	213	224	127	139	43	359	2	358	359	353	348	340	341	322	314	27.1
19-Jan	5	50	278	359	357	23	7	342	350	358	1	10	15	20	15	4	10	6	2	6	14	21	341	347	7.7
20-Jan	203	163	171	156	149	155	156	150	153	164	169	164	164	157	146	167	92	321	341	342	330	332	5	348	157.4
21-Jan	335	343	22	42	70	88	14	5	343	326	334	10	18	33	42	31	37	45	70	106	133	142	149	146	49.0
22-Jan	146	144	148	150	147	147	156	153	155	155	153	172	170	166	171	174	177	162	166	162	167	167	165	169	158.4
23-Jan	164	157	164	176	176	171	232	246	263	271	269	310	306	296	293	289	294	334	301	293	256	246	235	243	260.4
24-Jan	247	300	301	341	359	355	5	10	359	16	18	21	16	26	18	19	8	12	28	335	355	96	127	156	3.3
25-Jan	155	157	175	205	224	226	222	230	268	12	13	17	3	7	1	1	8	12	10	10	358	359	13	6	2.7
26-Jan	10	10	5	6	7	4	12	20	10	7	348	357	299	331	19	74	139	136	140	121	131	133	136	147	18.5
27-Jan	150	158	157	146	153	167	160	164	170	158	162	147	147	146	153	158	163	171	164	162	165	162	162	161	158.5
28-Jan	166	172	161	168	157	161	168	169	171	159	163	179	331	345	334	329	343	349	9	18	16	16	13	359	52.4
29-Jan	354	357	350	342	2	359	345	334	336	356	10	14	3	6	12	10	7	9	359	347	335	333	327	329	356.3
30-Jan	331	325	329	321	309	302	283	269	264	257	254	250	236	231	226	231	224	224	226	224	219	266	282	313	263.2
31-Jan	337	2	342	333	340	331	322	284	286	1	354	339	333	333	352	1	356	2	348	329	316	309	310	301	336.5
	143.2	179.9	232.9	218.0	211.3	241.3	248.3	263.8	266.4	260.3	291.6	331.4	357.5	356.5	348.3	340.0	359.3	9.2	6.1	356.5	320.3	346.0	135.0	144.3	
	Diurnal Average																								

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

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 93 deg on Jan 18 11:00

Minimum Value: 2 deg on Jan 2 04:00

Percentiles: P_1 = 3 P_{10} = 6 Q_1 = 7 Median = 9 Q_3 = 15 P_{90} = 26 P_{99} = 72

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	17	11	9	29	25	22	10	11	11	13	24	11	13	15	18	11	8	9	11	19	9	8	9	4	29
2-Jan	6	5	3	2	5	16	6	8	12	7	16	9	10	9	6	5	7	21	11	11	8	31	33	6	33
3-Jan	8	8	7	8	8	8	8	12	41	37	21	29	41	15	6	16	11	7	9	7	7	4	3	7	41
4-Jan	8	9	6	5	15	14	11	3	4	9	9	8	13	12	9	9	7	6	9	8	7	6	7	21	21
5-Jan	27	38	18	7	9	5	10	27	15	24	17	39	4	8	13	15	8	8	9	13	9	14	8	6	39
6-Jan	4	15	15	3	12	8	6	10	7	4	3	3	7	8	5	21	33	53	8	12	9	18	7	5	53
7-Jan	20	37	46	23	37	51	35	35	40	8	8	16	10	18	28	11	11	10	11	9	8	6	7	5	51
8-Jan	6	7	6	5	6	11	6	13	9	6	6	7	6	11	8	14	16	20	10	12	6	14	11	8	20
9-Jan	6	6	13	10	8	13	16	28	17	9	40	30	55	39	8	10	9	10	9	8	9	12	8	9	55
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	12	17	11	14	36	84	35	15	8	4	6	15	32	10	84
11-Jan	26	53	17	44	20	10	6	4	5	6	7	7	6	8	9	8	7	11	9	6	10	7	7	8	53
12-Jan	8	9	8	9	11	14	14	17	25	15	10	23	15	8	14	8	11	7	6	12	5	5	9	9	25
13-Jan	14	25	10	21	28	22	23	47	12	15	19	16	9	15	12	10	18	12	16	16	14	10	17	20	47
14-Jan	20	68	19	6	5	9	5	9	7	7	10	7	11	7	12	9	7	10	7	7	8	9	12	9	68
15-Jan	30	9	10	9	10	10	9	13	10	8	9	9	7	8	8	10	7	8	12	16	40	73	40	12	73
16-Jan	9	18	13	15	5	6	10	20	25	35	14	8	10	6	14	13	8	10	10	9	16	8	12	7	35
17-Jan	16	4	9	24	13	14	6	5	4	8	13	6	15	8	8	9	16	11	13	12	13	14	40	70	70
18-Jan	79	11	13	10	5	9	19	8	9	24	93	24	23	42	13	8	7	8	7	7	14	7	10	13	93
19-Jan	36	61	55	21	15	8	17	7	12	6	6	8	8	8	8	9	10	8	8	8	11	27	29	52	61
20-Jan	28	20	12	11	17	10	7	9	10	7	5	8	8	10	12	15	66	78	16	6	6	7	20	10	78
21-Jan	10	18	9	11	27	23	17	13	7	12	8	15	10	12	14	10	8	10	10	11	6	4	5	4	27
22-Jan	3	5	8	8	5	7	6	7	6	8	6	8	8	9	11	9	13	8	9	5	4	5	6	6	13
23-Jan	7	5	9	6	11	23	19	6	4	5	6	17	11	5	4	8	15	14	17	14	13	18	14	19	23
24-Jan	33	23	6	23	6	11	12	10	7	11	8	9	7	12	13	9	8	10	18	16	13	39	31	12	39
25-Jan	8	12	16	27	6	9	18	15	28	29	11	12	10	7	12	8	12	13	7	8	9	9	7	8	29
26-Jan	7	8	7	8	8	9	15	15	20	9	23	42	71	73	58	61	9	8	4	8	4	5	4	9	73
27-Jan	7	10	8	9	9	9	10	11	9	12	11	3	3	5	7	4	8	5	6	7	4	7	5	9	12
28-Jan	8	6	3	5	11	15	19	16	7	14	15	72	53	23	8	5	5	8	11	10	10	10	9	10	72
29-Jan	8	7	12	17	10	15	19	4	5	15	9	11	9	7	8	8	6	8	8	10	9	6	6	6	19
30-Jan	7	6	4	7	10	5	15	6	5	6	4	8	7	9	10	6	7	8	11	13	35	23	18	18	35
31-Jan	18	7	7	5	5	4	6	33	28	13	9	6	12	13	14	11	11	9	10	26	8	9	8	13	33
	79	68	55	44	37	51	35	47	41	37	93	72	71	73	58	84	66	78	18	26	40	73	40	70	
	Diurnal Maximum																								

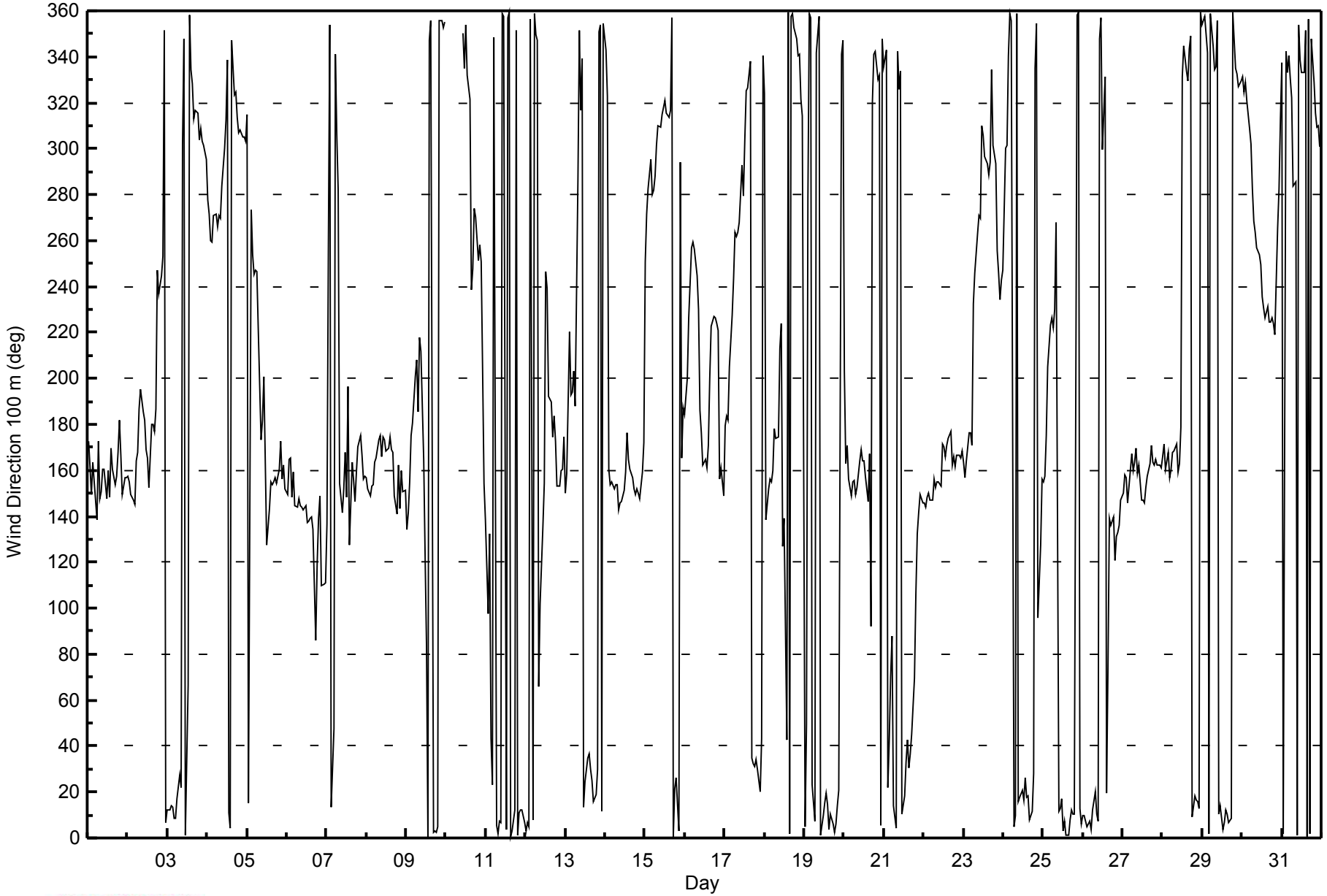
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Direction 100 m (WD100m) - deg

Lower Camp Met Tower - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 1.1 km/h on Jan 1 02:00

Maximum Daily Average: 0.4 km/h on Jan 1

Minimum Value: -2.3 km/h on Jan 15 08:00

Minimum Daily Average: -1.0 km/h on Jan 15

Maximum Diurnal Average: -0.1 km/h at hour 6

Minimum Diurnal Average: -0.3 km/h at hour 15

Monthly Average: -0.18 km/h

Percentiles: P_1 = -1.5 P_{10} = -0.6 Q_1 = -0.4 Median = -0.2 Q_3 = 0.0 P_{90} = 0.2 P_{99} = 0.7

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.6	1.1	0.6	0.3	0.8	0.2	0.9	0.4	0.5	0.2	0.3	0.3	0.5	0.4	0.3	0.5	0.3	0.4	0.4	0.3	0.6	0.2	0.2	0.1	0.4	1.1
2-Jan	0.1	0.0	-0.1	0.5	0.5	0.3	0.6	0.7	0.5	0.6	0.1	0.0	0.3	0.1	0.4	0.5	0.3	0.7	0.9	0.9	0.8	0.1	-0.2	-0.6	0.3	0.9
3-Jan	-0.8	-1.1	-0.7	-0.8	-0.5	-0.3	-0.5	-0.4	-0.2	-0.1	-0.2	-0.1	0.0	-0.1	-0.2	-0.2	-0.4	-0.4	-0.3	-0.7	-0.5	-0.7	-0.6	-0.5	-0.4	0.0
4-Jan	-0.3	-0.4	-0.2	-0.1	-0.3	-0.3	-0.3	-0.7	-1.0	-0.8	-0.8	-0.9	-1.0	-0.8	-0.7	-0.2	-0.4	-0.4	-0.5	-0.5	-0.4	-0.4	-0.2	-0.1	-0.5	-0.1
5-Jan	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.0	-0.1	0.0	0.2
6-Jan	0.0	0.2	0.1	-0.1	0.0	0.0	-0.1	-0.1	0.2	0.2	-0.2	0.1	-0.2	-0.3	-0.1	0.0	-0.2	-0.3	-0.1	0.0	0.0	-0.2	0.0	-0.1	-0.1	0.2
7-Jan	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.2	0.0	0.0	0.0	-0.1	0.0	-0.2	0.1	0.2	0.1	0.2	-0.1	0.2
8-Jan	0.5	0.2	-0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.2	-0.1	0.0	-0.1	-0.1	0.1	0.0	0.0	0.0	-0.1	0.1	-0.3	0.0	0.1	0.5
9-Jan	-0.1	-0.1	-0.1	0.2	0.3	0.2	0.0	-0.1	-0.2	-0.1	-0.1	0.0	-0.1	-0.5	-0.3	-0.2	-0.2	-0.6	-0.6	-0.6	-0.4	-0.4	-0.4	-0.2	-0.2	0.3
10-Jan	-0.5	-0.2	-0.4	-0.4	-0.2	-0.4	-0.2	-0.3	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.2	-0.1	-0.1	-0.3	-0.5	-0.4	-0.2	-0.1	0.1	0.0	-0.2	0.1
11-Jan	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.6	-0.6	-0.5	-0.4	-0.5	-0.3	-0.5	-0.3	-0.3	-0.1	-0.4	-0.6	-0.1	-0.6	-0.6	-0.4	-0.6	-0.6	-0.4	-0.1
12-Jan	-0.5	-0.7	-0.7	-0.5	-0.5	-0.4	-0.2	-0.3	-0.1	-0.2	0.0	-0.1	-0.2	-0.4	0.2	0.0	0.3	0.6	0.2	-0.4	-0.2	0.0	0.2	0.1	-0.1	0.6
13-Jan	-0.1	-0.2	0.0	0.1	0.0	0.1	0.2	-0.2	-0.2	-0.2	-0.1	-0.3	-0.3	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	0.2
14-Jan	-0.2	-0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.2	0.1	0.1	-0.1	0.0	-0.2	0.0	-0.5	-0.6	-0.4	0.1	-0.1	0.2
15-Jan	0.2	-1.7	-1.8	-1.5	-1.4	-1.1	-1.5	-2.3	-1.5	-1.1	-1.6	-1.1	-0.9	-1.8	-1.7	-1.4	-0.7	-0.4	-0.4	-0.3	-0.1	-0.1	-0.1	0.0	-1.0	0.2
16-Jan	0.2	0.3	0.5	0.4	0.4	0.2	0.1	0.6	0.5	0.5	0.4	0.2	0.0	-0.2	0.0	0.6	0.8	0.6	0.7	0.6	0.6	0.0	-0.1	-0.4	0.3	0.8
17-Jan	0.1	0.2	0.3	0.4	0.5	0.4	-1.1	-1.4	-1.1	-0.9	-0.5	-0.7	-0.6	-0.5	-1.0	-0.5	-0.4	-0.3	-0.4	-0.4	-0.2	-0.4	-0.2	-0.1	-0.4	0.5
18-Jan	-0.1	0.0	0.0	0.1	-0.1	-0.1	-0.2	0.1	0.0	0.2	0.3	0.3	0.3	-0.1	-0.6	-0.5	-0.5	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.1	0.3
19-Jan	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.5	-0.6	-0.6	-0.3	-0.6	-0.8	-0.4	-0.6	-0.4	-0.3	-0.3	-0.4	-0.3	0.0	-0.3	0.0
20-Jan	-0.1	0.2	0.0	-0.2	-0.4	-0.2	-0.1	-0.3	-0.3	-0.3	0.0	-0.2	-0.3	-0.3	-0.3	-0.1	-0.1	-0.1	-0.2	0.0	-0.3	-0.2	-0.2	-0.3	-0.2	0.2
21-Jan	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	-0.3	-0.1	-0.2	-0.4	-0.2	-0.2	-0.6	-0.3	-0.4	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	0.0	0.1	-0.2	0.1
22-Jan	0.0	-0.2	-0.2	-0.2	-0.1	-0.2	0.2	-0.1	-0.2	-0.1	-0.2	0.0	0.2	0.0	-0.1	0.2	0.3	0.1	0.2	0.0	0.2	0.2	-0.1	0.1	0.0	0.3
23-Jan	-0.3	-0.5	0.0	0.1	-0.1	0.1	0.3	0.0	-0.5	-0.5	-0.3	-0.4	-0.5	-0.8	-1.0	-0.8	-0.4	-0.3	-0.2	-0.4	-0.1	0.0	0.1	0.3	-0.3	0.3
24-Jan	-0.1	-0.1	0.0	-0.3	-0.4	-0.2	-0.3	-0.4	-0.6	-0.5	-0.4	-0.5	-0.3	-0.2	-0.4	-0.4	-0.5	-0.4	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.3	0.0
25-Jan	-0.1	0.0	-0.2	-0.1	-0.2	0.0	-0.1	0.2	-0.1	-0.3	-0.4	-0.3	-0.6	-0.3	-0.3	-0.8	-0.4	-0.3	-0.5	-0.4	-0.9	-1.9	-0.4	-0.5	-0.4	0.2
26-Jan	-0.4	-0.5	-1.1	-0.7	-0.4	-0.6	-0.2	-0.2	-0.2	-0.5	-0.4	0.0	0.1	0.2	-0.2	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.3	0.2
27-Jan	-0.1	0.0	0.0	-0.1	0.0	0.1	0.1	0.2	0.3	0.0	0.1	0.0	0.1	0.0	-0.5	-0.3	-0.2	-0.1	-0.5	-0.2	-0.1	0.2	-0.1	-0.1	-0.1	0.3
28-Jan	-0.2	0.4	0.0	-0.2	-0.4	0.1	0.1	0.3	0.0	0.1	0.0	0.0	0.3	0.0	-0.2	-0.2	-0.1	-0.3	-0.7	-0.3	-0.5	-0.2	-0.5	-0.3	-0.1	0.4
29-Jan	-0.2	-0.3	-0.3	-0.3	-0.3	-0.1	-0.3	-0.2	-0.2	-0.2	-0.5	-0.4	-0.7	-0.6	-0.3	-0.3	-0.6	-0.3	-0.5	-0.1	-0.4	-0.4	-0.4	-0.4	-0.3	-0.1
30-Jan	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.4	-0.8	-0.8	-0.7	-0.9	-0.5	-0.3	-0.4	-0.5	-0.4	-0.4	-0.2	-0.2	0.0	0.1	0.1	-0.4	-0.3	-0.4	0.1
31-Jan	-0.4	-0.5	-0.3	-0.3	-0.4	-0.1	-0.1	0.0	-0.1	-0.2	-0.3	-0.1	-0.3	-0.5	-0.6	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.1	0.0	-0.2	-0.2	0.0
	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.1	Diurnal Average	
	0.6	1.1	0.6	0.5	0.8	0.4	0.9	0.7	0.5	0.6	0.4	0.3	0.5	0.4	0.4	0.6	0.8	0.7	0.9	0.9	0.8	0.2	0.2	0.3	Diurnal Maximum	

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7.0 km/h on Jan 15 08:00

Minimum Value: 0.1 km/h on Jan 7 10:00

Percentiles: P_1 = 0.1 P_{10} = 0.3 Q_1 = 0.6 Median = 1.1 Q_3 = 1.7 P_{90} = 2.6 P_{99} = 4.6

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1.8	1.9	1.7	1.6	1.7	1.7	1.9	1.8	1.8	1.9	1.8	2.0	1.4	0.9	0.6	0.7	0.5	0.7	0.8	0.8	1.0	0.7	0.8	0.7	2.0
2-Jan	0.5	0.5	0.8	2.1	2.4	0.8	0.9	1.3	1.1	1.8	1.4	2.0	1.6	1.9	2.0	1.8	2.0	1.9	1.6	1.8	2.0	1.4	0.9	1.5	2.4
3-Jan	3.0	4.1	3.4	3.0	1.8	1.2	0.8	0.7	0.5	0.2	0.2	0.2	0.4	0.3	0.4	0.3	0.8	1.0	1.2	2.2	1.7	1.9	1.7	1.4	4.1
4-Jan	1.4	1.4	1.4	1.4	1.2	1.1	1.7	2.5	2.8	2.6	2.7	2.8	3.3	3.4	2.7	1.6	1.1	1.0	1.0	0.8	0.9	0.9	0.5	0.4	3.4
5-Jan	0.2	0.2	0.3	0.5	0.4	0.4	0.4	0.3	0.5	0.5	0.5	0.8	0.8	0.5	0.8	0.9	0.5	0.6	1.0	1.1	0.9	1.3	1.0	1.0	1.3
6-Jan	1.2	0.8	0.7	1.1	0.8	1.2	1.4	0.9	1.3	2.9	2.8	2.8	2.5	1.9	1.8	0.7	0.5	0.7	0.7	0.6	0.6	0.5	0.4	0.3	2.9
7-Jan	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.1	0.2	0.2	0.2	0.2	0.8	0.7	0.9	1.7	1.7	1.7
8-Jan	1.7	1.5	0.6	0.9	1.1	0.8	1.0	1.1	1.1	1.3	1.3	1.4	1.6	1.1	1.4	0.9	0.8	0.3	0.5	0.8	1.0	0.8	1.7	0.9	1.7
9-Jan	0.7	0.6	1.1	1.0	0.9	0.8	0.9	0.7	0.8	0.5	0.4	0.7	0.6	0.7	0.8	0.9	0.9	1.6	1.6	1.7	1.5	1.2	1.2	1.3	1.7
10-Jan	1.4	1.2	1.3	1.2	1.2	1.1	0.9	0.9	1.0	0.7	1.0	0.8	1.0	0.8	0.5	0.2	0.2	0.8	1.2	1.0	1.1	0.6	0.5	0.3	1.4
11-Jan	0.3	0.3	0.2	0.3	0.7	0.7	1.2	1.4	1.5	1.5	1.5	1.5	1.5	1.3	1.1	1.0	1.4	1.6	1.6	1.9	2.3	2.5	2.2	2.2	2.5
12-Jan	2.2	2.5	2.4	1.8	2.1	1.4	1.1	0.6	0.3	0.6	0.8	0.8	1.3	1.1	0.7	0.6	0.9	1.3	1.6	1.3	1.4	0.7	0.7	0.6	2.5
13-Jan	0.8	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.8	0.7	0.6	1.2	1.5	1.5	1.8	1.7	0.8	0.7	0.6	0.4	0.3	0.3	0.2	0.2	1.8
14-Jan	0.2	0.1	0.1	0.5	0.9	1.2	0.9	1.0	1.0	0.7	0.9	1.0	1.0	0.9	0.7	0.8	1.0	1.2	1.6	1.4	1.7	2.5	3.1	2.6	3.1
15-Jan	1.9	5.5	6.6	5.6	4.2	4.4	5.0	7.0	6.3	3.8	3.7	3.4	3.3	4.8	4.8	4.8	2.0	1.4	1.3	0.7	0.3	0.3	0.3	0.1	7.0
16-Jan	0.3	0.8	1.0	1.4	1.5	1.3	1.6	1.3	0.9	0.8	0.6	1.0	1.3	1.1	1.3	1.2	1.2	1.3	1.4	1.2	1.3	1.1	1.2	1.5	1.6
17-Jan	1.1	1.7	1.2	1.2	1.8	1.4	3.5	4.1	3.8	2.8	2.5	3.6	2.3	2.2	3.1	2.3	2.5	2.6	1.9	2.1	1.7	1.1	0.4	0.2	4.1
18-Jan	0.2	0.1	0.3	0.9	0.9	0.4	0.3	1.0	1.0	1.3	1.5	1.4	1.1	0.6	1.9	2.0	1.8	1.3	1.2	0.8	0.5	0.4	0.3	0.4	2.0
19-Jan	0.2	0.2	0.3	0.6	0.9	0.3	0.2	0.2	0.5	1.0	2.3	3.4	3.9	4.1	3.9	3.4	2.8	2.2	1.8	1.0	0.9	0.6	0.4	0.2	4.1
20-Jan	0.3	0.4	0.7	1.0	1.2	1.3	2.5	2.0	1.9	1.6	2.3	2.3	1.7	1.7	1.4	1.0	0.5	0.3	0.6	0.9	1.1	1.1	1.5	1.1	2.5
21-Jan	0.8	0.8	0.5	0.2	0.4	0.4	0.9	0.8	0.9	1.0	1.2	2.3	2.8	2.6	2.0	1.6	0.9	0.3	0.2	0.2	0.3	0.5	1.4	2.7	2.8
22-Jan	3.1	2.3	1.8	1.5	1.5	1.2	1.4	1.0	1.1	1.0	1.4	0.9	1.2	1.2	1.1	0.9	0.9	1.0	0.9	1.5	1.6	2.1	2.3	2.7	3.1
23-Jan	3.0	2.0	1.5	2.1	2.0	1.1	1.2	2.0	2.3	2.6	1.8	1.1	2.2	2.7	2.7	2.9	1.8	0.9	0.4	0.6	0.5	0.7	0.7	1.0	3.0
24-Jan	0.7	0.3	0.5	1.5	1.9	1.2	1.9	2.7	2.2	2.3	2.1	2.3	2.8	2.2	1.8	1.9	1.3	1.0	0.9	0.7	0.8	0.4	0.3	0.3	2.8
25-Jan	0.6	0.7	0.7	0.3	0.5	0.7	0.8	0.9	0.7	1.6	1.8	2.6	2.4	2.2	1.8	2.7	2.3	2.4	3.5	2.9	3.6	5.8	4.4	4.1	5.8
26-Jan	5.0	4.8	3.7	3.2	2.6	2.2	1.5	1.0	0.9	1.7	1.5	1.1	0.9	1.1	0.9	0.7	0.6	0.4	0.2	0.3	0.2	0.2	0.2	0.2	5.0
27-Jan	0.1	0.1	0.1	0.1	0.3	0.6	1.1	1.2	1.0	1.2	1.2	1.6	1.6	1.7	1.5	1.7	1.4	1.6	1.9	1.5	1.6	1.9	2.1	1.5	2.1
28-Jan	2.0	1.9	1.8	2.1	1.6	1.0	1.0	0.7	1.1	1.2	1.0	0.8	0.6	0.9	0.6	0.5	1.0	1.3	3.0	2.7	2.6	2.5	2.0	1.2	3.0
29-Jan	0.8	0.7	0.5	0.5	0.3	0.2	0.3	0.4	0.5	1.0	2.6	2.9	3.6	3.3	2.8	2.3	2.3	1.7	2.3	2.1	1.4	1.3	1.0	1.1	3.6
30-Jan	0.9	1.3	1.0	0.6	0.5	1.3	1.6	2.1	2.5	2.6	2.6	2.5	1.6	1.4	1.2	1.1	1.4	1.2	1.0	1.0	0.9	0.9	1.3	0.6	2.6
31-Jan	0.5	0.7	0.5	0.4	0.5	0.3	0.1	0.2	0.1	0.2	0.4	0.7	0.9	1.5	1.6	1.2	0.9	0.9	0.6	0.3	0.3	0.4	0.4	0.7	1.6
	5.0	5.5	6.6	5.6	4.2	4.4	5.0	7.0	6.3	3.8	3.7	3.6	3.9	4.8	4.8	4.8	2.8	2.6	3.5	2.9	3.6	5.8	4.4	4.1	
	Diurnal Maximum																								

Vertical Wind Speed 45 m (VW45m) - km/h

Lower Camp Met Tower - January 2014

Maximum Value: 2.5 km/h on Jan 2 20:00

Maximum Daily Average: 1.0 km/h on Jan 1

Minimum Value: -3.2 km/h on Jan 15 08:00

Minimum Daily Average: -1.4 km/h on Jan 15

Maximum Diurnal Average: 0.2 km/h at hour 24

Minimum Diurnal Average: -0.1 km/h at hour 15

Monthly Average: 0.06 km/h

Percentiles: P_1 = -2.1 P_{10} = -0.5 Q_1 = -0.3 Median = 0.0 Q_3 = 0.4 P_{90} = 0.9 P_{99} = 1.7

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.8	1.1	1.0	0.6	0.8	0.5	1.0	0.8	1.1	1.2	0.9	1.1	1.1	1.1	0.9	1.4	1.0	1.2	1.2	1.3	1.7	0.7	0.9	0.7	1.0	1.7
2-Jan	0.5	0.2	0.4	1.0	0.7	0.4	0.8	0.9	1.1	1.6	0.5	0.3	0.7	0.5	1.2	1.5	1.8	2.2	2.4	2.5	2.0	0.8	-0.1	-0.5	1.0	2.5
3-Jan	-0.6	-1.0	-0.4	-0.5	-0.3	-0.3	-0.4	-0.4	-0.2	0.0	-0.1	-0.1	0.0	0.0	-0.2	-0.3	-0.5	-0.6	-0.3	-1.0	-0.6	-1.1	-0.7	-0.3	-0.4	0.0
4-Jan	-0.1	-0.1	0.3	0.4	-0.1	-0.2	-0.1	-0.8	-1.2	-0.9	-1.2	-1.4	-1.6	-0.8	-0.6	-0.3	-0.4	-0.4	-0.7	-0.7	-0.6	-0.4	-0.1	-0.1	-0.5	0.4
5-Jan	0.0	0.0	-0.1	0.1	0.2	0.4	0.5	0.6	1.0	0.6	0.8	0.7	0.3	0.4	0.5	0.4	0.4	0.4	0.2	0.5	0.7	0.9	0.7	0.4	0.4	1.0
6-Jan	0.5	0.6	0.5	0.2	0.2	0.4	0.5	0.0	0.6	1.0	0.7	1.0	0.5	0.3	0.5	0.2	-0.1	-0.3	0.2	0.3	0.2	0.0	0.2	0.1	0.4	1.0
7-Jan	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.2	-0.1	-0.1	0.0	0.1	0.3	0.2	0.1	0.2	-0.1	0.7	0.9	0.8	1.0	0.2	1.0
8-Jan	1.3	0.7	0.1	0.7	0.8	0.6	0.9	0.8	0.8	0.9	1.0	0.9	0.9	0.6	0.7	0.4	0.6	0.3	0.4	0.5	0.4	0.6	0.4	0.4	0.7	1.3
9-Jan	0.3	0.3	0.5	0.7	0.9	0.3	0.3	-0.1	-0.2	0.1	0.1	0.3	0.1	-0.2	-0.2	-0.2	-0.2	-0.5	-0.5	-0.4	-0.3	-0.3	-0.2	-0.3	0.0	0.9
10-Jan	-0.3	-0.3	-0.3	-0.4	-0.2	-0.4	-0.3	-0.3	-0.3	-0.1	-0.1	-0.1	-0.2	-0.3	0.0	0.0	0.0	-0.2	-0.7	-0.2	-0.1	0.0	0.6	0.3	-0.2	0.6
11-Jan	0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.5	-0.5	-0.5	-0.3	-0.3	-0.3	-0.3	0.0	0.0	0.1	-0.2	-0.4	-0.2	-0.4	-0.3	-0.4	-0.4	-0.3	-0.2	0.1
12-Jan	-0.5	-0.5	-0.7	-0.3	-0.4	-0.3	-0.1	-0.1	0.0	0.1	0.2	0.3	0.1	-0.1	0.3	0.0	0.8	1.0	1.5	0.1	0.2	0.2	0.6	0.3	0.1	1.5
13-Jan	0.0	-0.1	0.1	0.4	0.4	0.4	0.6	0.0	-0.2	-0.1	0.0	-0.1	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4	-0.2	-0.2	-0.3	-0.1	-0.1	0.0	0.6
14-Jan	-0.2	0.0	0.0	0.5	0.8	0.6	0.4	0.4	0.2	0.2	0.0	0.1	0.2	0.8	0.4	0.7	0.0	0.1	0.0	0.3	-0.3	0.1	0.9	1.8	0.3	1.8
15-Jan	0.9	-2.3	-2.9	-3.0	-2.1	-2.2	-2.5	-3.2	-2.1	-1.8	-1.9	-1.6	-1.5	-2.4	-2.1	-1.9	-0.5	-0.3	-0.3	-0.2	-0.1	0.0	0.1	0.2	-1.4	0.9
16-Jan	0.6	1.3	1.5	1.1	0.3	0.1	0.3	1.5	1.2	1.4	0.9	0.8	0.8	0.2	1.0	1.6	0.9	1.2	1.5	1.5	1.5	0.7	0.4	0.1	0.9	1.6
17-Jan	0.6	1.4	0.9	1.3	0.8	0.8	-1.4	-1.7	-1.5	-1.5	-0.8	-1.5	-1.1	-0.9	-1.3	-0.6	0.1	0.2	-0.1	-0.1	0.0	-0.2	-0.1	0.1	-0.3	1.4
18-Jan	0.1	0.2	0.3	0.4	0.2	0.2	0.0	0.7	0.9	1.1	0.9	1.0	0.8	0.1	-0.3	-0.5	-0.3	0.0	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	0.2	1.1
19-Jan	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.3	-0.1	-0.4	-0.6	-0.3	0.1	0.0	-0.6	-0.3	-0.6	-0.3	-0.2	-0.3	-0.4	-0.2	0.1	-0.2	0.1
20-Jan	0.0	0.7	0.2	0.2	0.0	0.0	0.3	0.4	0.2	0.4	1.1	0.5	0.1	0.2	0.0	0.2	-0.1	-0.1	-0.2	-0.1	-0.4	-0.2	0.0	-0.3	0.1	1.1
21-Jan	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.3	-0.1	-0.1	-0.3	-0.2	-0.1	-0.6	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.3	0.9	-0.1	0.9
22-Jan	1.2	0.6	0.2	0.2	0.5	0.1	0.4	0.1	-0.1	0.0	0.1	0.1	0.6	0.1	0.2	0.4	0.7	0.5	0.8	0.9	1.1	1.3	1.4	1.9	0.6	1.9
23-Jan	0.6	0.0	0.8	1.6	0.9	0.9	1.0	0.4	-0.2	-0.3	-0.1	-0.3	-0.4	-1.2	-1.6	-1.2	-0.6	-0.2	-0.3	-0.4	-0.1	0.1	0.3	0.6	0.0	1.6
24-Jan	0.1	0.1	0.0	-0.5	-0.3	-0.1	-0.1	-0.3	-0.5	-0.2	-0.1	-0.2	-0.4	-0.1	-0.2	-0.2	-0.4	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.2	0.1
25-Jan	0.1	0.2	0.1	0.0	0.0	-0.1	0.0	0.5	0.3	-0.2	-0.3	0.0	-0.4	-0.3	-0.3	-0.4	-0.3	-0.1	-0.1	-0.2	-0.7	-1.5	-0.3	-0.3	-0.2	0.5
26-Jan	-0.5	-0.5	-0.4	-0.6	-0.3	-0.4	-0.1	-0.1	0.0	-0.3	-0.3	0.3	0.2	0.4	-0.1	0.1	0.0	0.2	0.2	0.0	0.1	0.0	0.0	0.0	-0.1	0.4
27-Jan	0.0	0.0	0.1	0.1	0.3	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.4	0.4	-0.2	0.1	0.7	0.7	0.2	0.2	0.7	1.1	0.7	0.7	0.5	1.1
28-Jan	0.5	1.3	1.1	0.5	0.0	0.6	0.7	0.5	0.7	0.7	0.5	0.3	0.4	0.2	-0.1	-0.1	-0.2	-0.3	-0.6	-0.2	-0.2	0.0	-0.3	-0.2	0.2	1.3
29-Jan	-0.2	-0.2	-0.4	-0.4	-0.3	-0.1	-0.3	-0.1	-0.1	-0.2	-0.5	-0.2	-0.6	-0.4	-0.3	-0.2	-0.5	-0.1	-0.3	-0.1	-0.5	-0.5	-0.5	-0.5	-0.3	-0.1
30-Jan	-0.3	-0.5	-0.6	-0.1	-0.1	-0.4	-0.6	-0.9	-0.8	-0.6	-0.8	-0.3	0.0	-0.2	-0.4	-0.2	-0.2	0.0	-0.1	0.1	0.5	0.0	-0.4	-0.4	-0.3	0.5
31-Jan	-0.5	-0.6	-0.4	-0.3	-0.5	-0.1	-0.1	0.0	0.1	-0.1	-0.1	-0.1	-0.3	-0.4	-0.4	-0.2	-0.1	-0.2	-0.1	0.0	-0.2	-0.2	-0.1	-0.1	-0.2	0.1
	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	Diurnal Average	
	1.3	1.4	1.5	1.6	0.9	0.9	1.0	1.5	1.2	1.6	1.1	1.1	1.1	1.1	1.2	1.6	1.8	2.2	2.4	2.5	2.0	1.3	1.4	1.9	Diurnal Maximum	

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1
Maximum Value: 7.8 km/h on Jan 15 09:00

Minimum Value: 0.1 km/h on Jan 7 02:00

Percentiles: P_1 = 0.1 P_{10} = 0.4 Q_1 = 0.7 Median = 1.1 Q_3 = 1.7 P_{90} = 2.6 P_{99} = 5.4

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.6	0.8	0.8	0.5	0.7	0.7	0.8	0.6	0.6	0.7	0.8	0.9	0.9	1.0	0.7	0.8	0.7	0.9	0.9	0.9	1.0	0.9	1.0	0.8	1.0
2-Jan	0.8	0.7	1.2	2.7	2.7	1.1	0.8	1.1	1.1	1.4	1.4	2.2	1.5	1.9	1.6	1.1	1.6	1.3	1.0	1.4	1.6	1.3	1.0	1.7	2.7
3-Jan	3.3	4.3	3.8	3.1	2.0	1.3	0.8	0.8	0.5	0.3	0.1	0.2	0.4	0.3	0.5	0.5	1.0	1.1	1.6	2.3	2.0	1.9	1.9	1.5	4.3
4-Jan	1.2	1.2	1.0	1.2	1.4	1.3	1.7	2.4	2.6	2.8	3.0	2.8	3.6	3.4	2.7	1.8	1.3	1.3	1.2	0.9	1.1	1.2	0.7	0.5	3.6
5-Jan	0.3	0.2	0.3	0.7	0.7	0.7	0.9	0.4	0.4	0.5	0.5	0.6	0.6	0.4	0.7	0.7	0.6	0.7	1.0	1.1	0.7	1.2	0.9	1.0	1.2
6-Jan	1.1	0.7	0.8	1.0	0.9	1.4	1.5	1.2	1.7	2.9	2.7	3.0	2.6	2.0	1.9	0.9	0.6	0.7	1.0	0.8	0.8	0.6	0.5	0.5	3.0
7-Jan	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.4	0.2	0.4	0.2	0.4	0.4	1.2	0.8	0.9	1.7	1.6	1.7
8-Jan	1.4	1.5	0.7	1.0	1.1	0.9	0.9	1.0	1.1	1.1	1.2	1.0	1.2	1.0	1.0	0.7	0.7	0.3	0.5	0.6	0.7	0.6	1.6	1.0	1.6
9-Jan	0.7	0.6	0.9	1.0	0.9	0.8	1.1	0.7	1.0	0.6	0.5	0.7	0.6	0.6	0.9	0.9	0.9	1.5	1.7	1.7	1.7	1.4	1.4	1.4	1.7
10-Jan	1.4	1.3	1.5	1.4	1.4	1.3	1.0	1.0	1.2	0.8	1.0	0.9	0.9	0.9	0.5	0.2	0.2	1.0	1.2	0.9	1.3	0.7	0.7	0.4	1.5
11-Jan	0.3	0.4	0.1	0.3	0.6	0.6	1.1	1.4	1.6	1.6	1.5	1.5	1.6	1.4	1.4	1.2	1.4	1.6	1.9	2.1	2.4	2.5	2.4	2.3	2.5
12-Jan	2.2	2.7	2.3	1.9	2.3	1.5	1.3	0.7	0.3	0.6	0.8	0.7	1.2	1.0	0.8	0.7	1.0	1.6	1.3	1.4	1.7	1.0	1.0	0.8	2.7
13-Jan	1.0	0.6	0.8	0.7	0.5	0.5	0.3	0.5	0.9	0.9	0.6	1.3	1.5	1.5	1.5	1.6	0.9	0.8	0.8	0.6	0.4	0.4	0.2	0.1	1.6
14-Jan	0.2	0.1	0.2	0.5	0.8	1.3	0.9	1.0	1.0	0.8	1.1	1.1	1.1	0.8	0.6	0.8	1.2	1.4	1.8	1.6	1.8	2.7	2.7	1.6	2.7
15-Jan	2.4	6.0	7.6	6.3	4.8	4.8	5.6	7.5	7.8	4.6	4.3	3.8	3.9	5.4	5.5	5.6	1.8	1.4	1.2	0.8	0.4	0.3	0.4	0.3	7.8
16-Jan	0.3	0.7	1.0	1.6	1.7	1.7	1.8	1.7	0.8	0.7	0.5	0.6	1.0	0.8	1.0	1.0	1.2	1.2	1.2	1.0	1.1	0.8	1.1	1.1	1.8
17-Jan	1.1	1.5	0.9	0.8	1.7	1.6	3.7	4.2	3.9	3.1	3.0	3.8	2.7	2.6	3.6	2.8	2.5	2.6	2.0	2.3	1.8	1.1	0.5	0.2	4.2
18-Jan	0.2	0.2	0.5	1.1	1.0	0.5	0.4	0.8	0.7	1.1	1.7	1.0	0.9	0.5	1.6	2.1	2.0	1.5	1.4	0.9	0.6	0.5	0.3	0.3	2.1
19-Jan	0.2	0.2	0.2	0.7	0.9	0.4	0.3	0.3	0.6	1.1	2.1	3.4	4.1	4.1	4.0	3.5	2.7	2.1	2.0	1.0	0.9	0.8	0.5	0.3	4.1
20-Jan	0.3	0.5	0.9	1.1	1.4	1.3	2.6	1.8	1.8	1.4	1.6	2.0	2.0	1.9	1.3	0.9	0.5	0.3	0.6	1.0	1.2	1.4	1.5	1.3	2.6
21-Jan	1.0	0.8	0.4	0.2	0.3	0.4	0.8	0.8	1.0	0.9	1.3	2.3	2.7	2.4	1.8	1.5	0.8	0.4	0.3	0.3	0.5	0.6	1.4	2.6	2.7
22-Jan	2.8	2.5	2.1	1.7	1.5	1.3	1.5	1.2	1.3	1.4	1.6	1.1	0.9	1.1	1.2	1.0	0.8	1.1	0.9	1.2	1.1	1.2	1.4	2.1	2.8
23-Jan	3.4	1.9	1.2	1.3	1.5	1.0	1.4	2.3	1.7	2.8	2.4	1.4	2.6	2.9	2.7	3.3	2.3	1.0	0.6	0.6	0.8	0.9	0.8	1.1	3.4
24-Jan	0.9	0.4	0.8	1.8	2.0	1.3	2.0	2.6	2.2	2.4	2.0	2.2	2.6	2.0	1.9	1.9	1.1	1.0	0.8	0.7	0.8	0.4	0.3	0.3	2.6
25-Jan	0.7	0.8	1.0	0.4	0.6	0.7	1.0	1.0	0.9	1.7	2.0	2.7	2.4	2.2	1.8	2.7	2.4	2.6	3.6	3.0	3.5	5.8	4.5	4.3	5.8
26-Jan	5.2	5.0	3.9	3.4	2.7	2.3	1.8	1.2	1.1	1.5	1.5	1.3	1.2	1.3	1.0	0.8	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	5.2
27-Jan	0.1	0.2	0.3	0.2	0.5	0.6	0.9	0.9	0.9	1.0	1.0	1.3	1.6	1.7	1.5	1.5	0.9	1.1	1.4	1.5	1.2	1.3	1.8	1.2	1.8
28-Jan	1.6	1.4	1.5	2.0	1.4	1.2	0.9	0.6	0.9	1.1	0.9	0.8	0.7	1.0	0.5	0.6	1.2	1.3	2.8	2.5	2.7	2.6	2.1	1.5	2.8
29-Jan	1.0	0.9	0.5	0.6	0.4	0.2	0.3	0.5	0.6	1.1	2.6	2.8	3.5	3.3	2.5	2.2	2.1	1.7	2.5	2.3	1.6	1.5	1.2	1.2	3.5
30-Jan	1.0	1.5	1.0	0.7	0.6	1.6	1.9	2.1	2.5	2.4	2.4	2.3	1.5	1.6	1.4	1.3	1.7	1.5	1.2	1.2	1.0	1.1	1.8	0.9	2.5
31-Jan	0.5	1.0	0.6	0.4	0.5	0.3	0.1	0.3	0.2	0.2	0.5	0.7	1.1	1.7	1.5	1.2	1.0	0.9	0.7	0.4	0.4	0.6	0.5	0.8	1.7
	5.2	6.0	7.6	6.3	4.8	4.8	5.6	7.5	7.8	4.6	4.3	3.8	4.1	5.4	5.5	5.6	2.7	2.6	3.6	3.0	3.5	5.8	4.5	4.3	
	Diurnal Maximum																								

Wood Buffalo Environmental Association

Summary of Hour Averages

Vertical Wind Speed 100 m (VW100m) - km/h

Lower Camp Met Tower - January 2014

Maximum Value: 2.5 km/h on Jan 14 22:00

Maximum Daily Average: 0.6 km/h on Jan 6

Minimum Value: -1.8 km/h on Jan 15 08:00

Minimum Daily Average: -0.6 km/h on Jan 15

Maximum Diurnal Average: 0.4 km/h at hour 23

Minimum Diurnal Average: 0.0 km/h at hour 21

Monthly Average: 0.17 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.2 Q_1 = -0.1 Median = 0.1 Q_3 = 0.4 P_{90} = 0.7 P_{99} = 1.7

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.1	0.1	0.4	0.0	0.2	0.3	0.1	0.3	0.4	0.2	0.3	0.3	0.2	0.5	0.2	0.4	0.2	0.3	0.1	0.0	-0.1	-0.1	0.6	1.1	0.3	1.1
2-Jan	0.2	0.5	0.6	0.5	1.4	-0.5	0.4	-0.1	0.1	0.1	-0.1	0.1	0.3	0.3	0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.2	0.1	0.0	0.1	1.4
3-Jan	0.6	0.7	0.8	0.1	0.1	0.0	-0.3	-0.2	0.2	0.0	0.0	-0.1	-0.1	-0.3	0.0	-0.2	-0.3	-0.4	0.6	-0.3	0.5	-0.4	-0.1	-0.1	0.0	0.8
4-Jan	0.1	0.4	0.8	1.6	1.3	1.1	1.1	0.6	0.2	0.2	-0.8	-0.7	-0.2	0.2	0.8	0.1	-0.1	0.0	-0.7	-1.0	-0.6	0.0	0.0	-0.2	0.2	1.6
5-Jan	-0.1	0.0	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.3	0.1	-0.1	0.2	0.1	-0.3	-0.3	-0.1	0.7	0.4	0.4	0.1	0.7
6-Jan	0.9	-0.1	-0.1	-0.2	0.1	0.5	1.1	-0.3	1.5	1.8	1.5	1.2	0.9	0.8	1.0	1.0	-0.3	0.0	0.5	0.5	0.5	0.2	0.4	0.4	0.6	1.8
7-Jan	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.2	-0.1	-0.1	0.0	0.2	0.5	0.0	-0.3	0.0	0.2	1.5	2.2	0.2	2.2
8-Jan	1.4	1.3	0.5	1.1	0.6	0.0	0.6	0.3	0.1	0.8	0.2	0.0	0.3	0.3	0.2	0.1	0.1	0.1	0.4	0.1	0.2	0.2	1.2	0.4	0.4	1.4
9-Jan	0.1	0.3	0.5	0.1	-0.3	0.0	0.0	-0.1	0.2	0.0	0.2	0.2	0.0	-0.1	0.0	0.1	0.1	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.1	0.5
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.4	0.2	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.5	1.0	-0.2	0.1	0.4	--	1.0
11-Jan	0.1	0.0	0.1	0.0	-0.1	-0.1	-0.4	0.2	0.3	0.4	0.4	0.3	0.4	0.5	0.3	0.5	0.4	0.6	0.5	0.3	0.6	0.1	0.3	0.5	0.3	0.6
12-Jan	0.4	0.1	0.1	0.2	0.5	0.1	0.0	0.0	-0.1	-0.1	0.1	0.2	0.8	0.7	-0.1	-0.1	0.4	0.5	0.9	0.8	-0.2	-0.2	0.5	-0.5	0.2	0.9
13-Jan	-0.2	-0.1	0.0	-0.1	-0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.1	0.1	0.0	0.0	-0.2	-0.1	0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.3
14-Jan	0.1	-0.1	0.0	0.4	0.7	-0.3	-0.3	0.1	0.3	0.1	-0.7	0.2	-0.2	0.0	0.0	0.3	0.0	0.1	-0.3	-0.1	-1.5	2.5	2.2	0.7	0.2	2.5
15-Jan	-0.3	-0.6	-0.7	-1.4	-0.7	-0.5	-0.9	-1.8	-1.0	-1.1	-0.7	-0.6	-0.6	-1.0	-1.0	-0.9	0.0	0.1	0.1	0.2	-0.2	0.1	0.0	-0.1	-0.6	0.2
16-Jan	-0.2	-0.2	0.0	0.4	0.6	0.4	-0.1	0.1	0.0	0.2	-0.1	0.2	0.4	0.0	0.1	0.0	0.2	0.4	0.2	0.0	0.0	0.3	0.0	0.4	0.1	0.6
17-Jan	-0.2	-0.5	-0.3	-0.1	-0.2	0.3	0.7	1.0	0.7	-0.2	0.2	-1.1	-0.3	-0.1	-0.1	-0.2	0.6	0.2	-0.2	0.0	0.0	-0.1	0.0	0.0	0.0	1.0
18-Jan	0.1	0.2	0.4	0.7	0.4	0.3	-0.1	0.0	0.0	-0.1	-0.1	0.4	0.5	0.1	0.1	0.4	0.3	0.3	0.2	0.0	0.0	0.0	-0.1	-0.2	0.2	0.7
19-Jan	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.3	0.5	0.6	0.4	0.2	-0.3	-0.1	0.3	-0.3	-0.2	-0.1	0.0	0.1	0.6
20-Jan	0.0	0.1	-0.4	-0.1	-0.2	-0.9	1.2	0.0	-0.3	0.9	0.7	1.0	1.1	0.9	0.0	-0.3	0.1	-0.1	0.0	0.2	-0.2	-0.1	0.4	-0.1	0.2	1.2
21-Jan	-0.1	-0.1	-0.1	-0.2	-0.1	0.0	0.0	-0.2	0.0	-0.3	0.2	0.1	-0.4	-0.1	-0.2	0.0	0.1	0.2	0.2	0.3	0.1	0.7	1.0	2.4	0.1	2.4
22-Jan	1.8	1.3	0.9	0.2	0.7	0.7	0.7	0.0	-0.7	-0.5	0.4	-0.3	-0.1	-0.2	-0.3	-0.1	0.0	0.5	0.5	1.4	0.1	0.0	0.5	1.4	0.4	1.8
23-Jan	0.8	0.8	0.6	0.3	-0.2	0.1	0.2	1.7	0.4	1.4	2.0	0.4	0.8	-0.4	-0.5	-0.1	0.0	0.2	-0.3	-0.2	0.0	0.3	0.4	0.5	0.4	2.0
24-Jan	-0.1	-0.2	-0.2	0.3	0.4	0.3	0.4	0.5	0.4	0.6	0.3	-0.1	-0.2	0.1	-0.4	-0.1	0.0	0.0	0.2	0.0	0.0	-0.1	0.0	0.1	0.1	0.6
25-Jan	-0.1	0.1	0.1	0.0	0.5	0.1	-0.4	-0.2	-0.2	0.3	0.1	0.3	0.1	-0.3	-0.1	0.3	0.1	0.3	0.8	0.7	0.2	0.8	0.8	1.0	0.2	1.0
26-Jan	1.2	1.5	1.3	1.1	0.8	0.3	0.2	0.0	0.2	0.0	0.4	0.4	0.1	0.5	0.0	0.3	-0.1	0.0	0.4	0.2	0.1	0.2	0.2	0.3	0.4	1.5
27-Jan	0.3	0.2	0.3	0.4	0.4	0.1	0.2	0.2	0.1	0.0	0.0	-0.1	0.4	1.1	0.9	1.0	0.6	0.2	0.5	0.2	0.6	1.0	1.0	0.4	0.4	1.1
28-Jan	0.2	0.6	1.4	1.4	-0.8	0.0	0.3	0.1	0.0	0.4	0.2	0.1	0.1	0.2	-0.1	0.0	0.1	-0.1	0.2	0.4	0.2	0.8	0.8	-0.1	0.3	1.4
29-Jan	0.0	0.1	-0.1	-0.1	-0.3	0.0	-0.2	-0.1	-0.1	0.1	0.2	0.2	0.3	0.0	0.0	0.7	0.3	0.4	0.7	0.0	-0.3	-0.2	-0.4	-0.4	0.0	0.7
30-Jan	0.0	-0.3	-0.4	-0.1	0.0	0.0	0.1	-0.2	0.3	1.2	0.6	0.9	0.5	0.3	0.3	0.7	0.7	0.4	0.4	0.3	0.2	0.1	0.3	-0.5	0.2	1.2
31-Jan	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.0	-0.3	0.2	-0.1	-0.1	0.0	0.0	0.1	-0.1	-0.2	-0.3	-0.1	-0.1	0.2
	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.4	0.3	Diurnal Average	
	1.8	1.5	1.4	1.6	1.4	1.1	1.2	1.7	1.5	1.8	2.0	1.2	1.1	1.1	1.0	1.0	0.7	0.6	0.9	1.4	1.0	2.5	2.2	2.4	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1
Maximum Value: 7.7 km/h on Jan 15 03:00

Minimum Value: 0.1 km/h on Jan 7 09:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.7 Median = 1.1 Q_3 = 1.6 P_{90} = 2.4 P_{99} = 4.9

Hours in Service:	744
Hours of Data:	734
Hours of Missing Data:	10
Hours of Calibration:	0
Percent Operational Time:	98.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.5	0.6	0.8	0.3	0.4	0.4	0.5	0.4	0.6	0.5	0.7	0.6	0.7	0.8	0.6	0.7	0.5	0.8	0.7	0.7	0.7	0.9	1.2	1.4	1.4
2-Jan	1.4	1.6	1.2	1.4	2.2	1.5	1.1	1.1	0.7	0.7	0.9	1.2	1.0	0.9	0.8	0.7	0.8	0.9	1.3	1.5	1.2	1.5	1.2	1.5	2.2
3-Jan	2.8	3.8	3.3	2.7	2.0	1.4	1.4	1.3	0.9	0.6	0.3	0.2	0.5	0.5	0.7	0.6	1.6	1.5	2.1	2.4	1.9	1.1	0.9	0.9	3.8
4-Jan	1.2	1.1	0.9	1.1	1.4	2.1	2.3	1.1	1.4	2.1	2.7	2.8	4.0	3.4	2.6	1.9	1.3	1.5	1.3	1.6	1.7	1.5	1.2	1.1	4.0
5-Jan	0.9	0.4	0.4	1.1	1.1	0.6	0.8	0.6	0.5	0.6	0.4	0.5	0.3	0.3	0.6	0.6	0.8	0.8	1.2	1.0	0.8	1.0	1.0	0.8	1.2
6-Jan	1.0	1.0	0.8	1.2	1.2	2.1	1.6	2.4	2.1	1.9	1.2	1.6	2.3	2.0	1.5	0.9	0.8	0.9	0.9	1.2	1.2	0.6	0.5	0.5	2.4
7-Jan	0.4	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.6	0.2	0.3	0.4	0.7	0.6	1.2	0.8	0.8	1.9	1.5	1.9
8-Jan	1.2	1.5	1.3	1.3	1.5	1.3	1.1	1.1	1.1	1.4	1.1	1.1	0.8	0.8	1.0	0.8	0.5	0.3	0.5	0.6	0.6	0.6	1.1	1.2	1.5
9-Jan	0.7	0.4	0.7	1.3	0.9	0.9	1.1	1.1	1.1	0.8	0.7	0.5	0.4	0.3	0.5	0.6	0.5	1.1	1.4	1.3	1.5	1.3	1.1	1.2	1.5
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.1	0.9	0.7	0.8	0.5	0.2	0.3	1.4	1.0	0.8	1.0	1.5	0.9	0.5	1.5
11-Jan	0.4	0.2	0.3	0.3	0.3	0.4	0.4	0.7	0.8	1.0	1.2	1.2	1.0	1.5	1.5	1.3	1.2	1.3	1.6	1.3	2.2	2.3	2.0	2.0	2.3
12-Jan	1.8	2.3	2.1	1.7	2.2	1.9	1.3	0.5	0.4	0.4	0.6	0.8	1.1	0.7	0.7	0.9	1.1	1.0	1.0	2.0	1.6	1.1	1.2	0.8	2.3
13-Jan	1.6	1.3	1.1	0.9	0.7	0.6	0.5	0.6	0.7	0.8	0.6	1.4	1.3	1.4	1.6	1.6	1.1	1.2	1.5	1.1	0.3	0.3	0.2	0.3	1.6
14-Jan	0.4	0.3	0.3	0.6	0.9	1.5	1.4	1.3	1.4	1.4	1.6	1.4	1.2	0.8	0.8	1.0	1.4	2.0	2.1	1.9	2.3	2.4	1.7	2.1	2.4
15-Jan	2.8	5.9	7.7	6.1	5.0	5.3	5.9	7.1	7.5	4.4	3.7	3.2	3.4	5.0	5.2	5.2	1.4	0.8	1.6	1.4	0.8	0.4	0.5	0.5	7.7
16-Jan	0.5	0.8	1.1	2.0	1.5	1.7	2.0	2.3	1.5	1.2	0.7	0.8	0.9	0.8	1.1	0.9	0.7	0.8	1.0	0.9	0.6	0.8	0.9	1.1	2.3
17-Jan	1.4	1.0	0.8	0.7	1.6	1.8	3.0	3.2	2.1	2.0	3.2	2.8	2.3	2.5	3.3	2.7	2.9	3.1	2.2	2.6	2.2	1.6	0.9	0.1	3.3
18-Jan	0.2	0.3	0.8	1.2	1.0	0.8	0.8	0.7	0.7	1.0	2.3	1.2	1.1	0.4	1.2	1.6	1.6	1.2	1.2	0.9	0.6	0.6	0.3	0.5	2.3
19-Jan	0.2	0.3	0.3	0.3	0.3	0.5	0.7	0.4	0.3	0.8	1.5	2.9	3.6	4.2	3.9	3.3	2.7	2.1	2.0	1.0	1.2	1.1	0.9	0.3	4.2
20-Jan	0.4	0.7	1.1	1.4	1.7	1.5	2.4	1.9	2.3	1.6	1.4	1.5	1.3	1.5	1.3	1.0	0.6	0.3	0.3	0.5	0.8	1.1	1.5	1.0	2.4
21-Jan	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.6	0.7	0.8	1.3	2.3	2.6	2.7	2.4	1.7	0.7	0.4	0.4	0.6	0.6	0.6	1.6	2.2	2.7
22-Jan	2.1	2.1	2.3	2.2	1.6	1.3	1.6	1.5	1.7	1.9	1.7	1.3	1.1	1.3	1.5	1.3	1.1	1.4	1.1	1.7	1.4	1.3	1.5	1.6	2.3
23-Jan	2.2	2.2	1.1	1.0	1.3	1.3	2.1	2.0	0.9	1.8	1.8	2.2	2.5	1.4	1.7	2.6	2.4	1.5	0.9	0.8	0.8	1.4	1.1	1.4	2.6
24-Jan	1.2	0.8	1.4	1.5	1.6	1.5	1.8	2.4	1.6	2.1	1.9	2.2	2.1	2.2	1.6	1.6	0.8	0.6	0.8	0.5	0.4	0.2	0.2	0.7	2.4
25-Jan	1.1	1.4	0.9	1.0	0.6	0.7	1.3	1.6	1.4	1.9	2.3	2.8	1.9	1.4	1.7	2.4	2.7	3.1	3.0	3.1	3.2	5.2	4.1	3.9	5.2
26-Jan	4.0	4.9	3.7	3.2	2.5	2.2	1.9	1.7	1.6	1.3	1.4	1.4	1.4	1.6	1.1	1.0	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.4	4.9
27-Jan	0.4	0.4	0.5	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.5	0.7	1.4	1.5	1.3	1.0	1.0	0.9	1.2	1.7	1.3	1.0	1.2	1.0	1.7
28-Jan	0.9	1.2	1.5	1.0	1.0	1.1	1.0	0.7	0.7	1.2	0.9	0.5	0.4	0.8	0.4	0.5	0.7	1.0	2.6	2.9	3.0	2.8	2.4	1.7	3.0
29-Jan	1.2	1.0	1.0	1.2	0.6	0.3	0.3	0.3	0.5	1.3	2.5	2.6	3.1	2.6	2.2	2.2	1.8	1.8	2.5	2.4	1.8	1.1	0.8	0.9	3.1
30-Jan	0.9	1.3	0.7	0.7	0.9	1.3	1.5	1.4	2.1	1.8	1.9	2.4	2.4	1.7	1.7	1.3	1.8	2.0	1.4	1.6	1.4	1.4	2.3	1.5	2.4
31-Jan	0.9	1.1	0.7	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.6	1.2	1.9	1.4	1.0	1.0	1.0	0.3	0.7	0.9	0.8	0.7	0.9	1.9
	4.0	5.9	7.7	6.1	5.0	5.3	5.9	7.1	7.5	4.4	3.7	3.2	4.0	5.0	5.2	5.2	2.9	3.1	3.0	3.1	3.2	5.2	4.1	3.9	
	Diurnal Maximum																								

AF - Analyzer Failure

Maximum Value: 3.4 km/h on Jan 6 10:00

Maximum Daily Average: 1.3 km/h on Jan 6

Minimum Value: -2.1 km/h on Jan 15 15:00

Minimum Daily Average: -0.9 km/h on Jan 15

Maximum Diurnal Average: 0.4 km/h at hour 23

Minimum Diurnal Average: 0.0 km/h at hour 21

Monthly Average: 0.26 km/h

Percentiles: P_1 = -1.8 P_{10} = -0.4 Q_1 = -0.1 Median = 0.1 Q_3 = 0.6 P_{90} = 1.1 P_{99} = 2.5

Hours in Service:	744
Hours of Data:	712
Hours of Missing Data:	32
Hours of Calibration:	0
Percent Operational Time:	95.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	-0.1	0.4	0.2	0.1	0.1	-0.2	0.0	0.2	0.1	0.0	0.1	0.0	0.5	0.0	-0.1	-0.2	0.5	-0.2	-1.9	-1.8	-1.3	-0.9	0.2	-0.2	0.5
2-Jan	0.5	1.3	1.9	1.7	2.6	0.2	1.1	0.2	0.1	0.4	-0.6	-0.1	1.0	0.4	1.1	1.1	0.4	0.1	0.1	0.2	-0.1	-0.3	0.1	-0.2	0.6	2.6
3-Jan	0.4	0.4	0.8	-0.2	-0.2	-0.2	-0.2	-0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.5	-0.4	-0.4	-0.3	-0.6	0.7	-0.5	0.1	-1.0	-0.6	-0.3	-0.1	0.8
4-Jan	-0.2	-0.4	0.2	0.9	1.0	1.4	1.2	0.4	-0.2	0.1	-1.2	-1.2	-0.6	0.0	0.4	0.1	-0.3	-0.3	-1.1	-1.3	-0.8	-0.5	-0.1	-0.2	-0.1	1.4
5-Jan	-0.2	-0.2	-0.2	0.0	-0.1	-0.1	-0.1	0.1	0.4	0.3	0.3	0.1	0.1	0.2	0.1	0.4	0.3	0.0	-0.3	0.1	0.9	0.5	0.2	0.5	0.1	0.9
6-Jan	1.1	0.0	0.1	0.9	0.8	1.5	2.3	0.5	2.9	3.4	2.6	2.2	1.8	1.8	1.9	1.8	-0.2	0.4	1.0	1.2	1.1	0.8	0.7	0.9	1.3	3.4
7-Jan	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.3	0.0	0.1	0.2	0.5	0.9	0.7	0.9	1.0	1.1	2.4	2.5	0.5	2.5
8-Jan	2.4	2.2	0.9	2.3	1.7	0.7	1.2	0.6	0.6	1.0	1.3	1.1	0.5	0.4	0.8	0.1	0.2	0.0	0.1	0.1	0.2	0.3	1.3	0.1	0.8	2.4
9-Jan	0.4	0.4	0.4	0.1	0.4	0.9	1.0	0.4	0.3	AF	AF	AF	AF	AF	AF	AF	1.3	1.9	AF	-0.1	0.1	AF	AF	AF	--	1.9
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.2	0.3	0.2	--	0.3
11-Jan	0.2	-0.1	0.2	0.3	0.1	0.1	-0.4	0.3	0.4	0.6	0.2	0.0	0.4	0.3	0.1	0.5	0.3	0.5	0.5	0.3	0.6	-0.2	0.4	0.3	0.2	0.6
12-Jan	0.2	-0.3	-0.3	0.1	0.0	-0.1	-0.3	-0.2	-0.1	-0.1	0.2	0.1	1.0	1.0	0.8	1.1	0.7	2.0	0.7	1.0	-0.5	-0.6	1.0	0.4	0.3	2.0
13-Jan	0.7	0.5	0.4	0.1	0.1	0.3	0.2	-0.1	0.1	-0.1	0.0	0.3	-0.1	0.1	0.1	0.1	-0.1	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.1	0.7
14-Jan	0.0	0.2	0.2	0.2	0.1	0.2	-0.1	0.7	1.4	1.4	0.3	1.2	0.4	0.8	0.6	1.5	0.9	1.4	1.3	0.4	-1.7	2.0	1.5	1.0	0.7	2.0
15-Jan	0.5	-0.1	-0.8	-1.4	-0.2	-0.2	-1.3	-2.1	-2.0	-1.7	-1.7	-1.6	-0.9	-1.9	-2.1	-2.1	-0.4	-0.2	0.1	0.1	-0.3	-0.2	0.0	0.0	-0.9	0.5
16-Jan	0.7	0.6	0.6	1.1	0.7	1.0	0.3	1.2	0.5	0.4	0.2	0.1	0.6	0.5	0.6	0.7	0.6	0.8	0.7	0.7	0.4	0.1	-0.1	0.9	0.6	1.2
17-Jan	0.6	1.2	0.9	0.4	0.5	1.1	2.0	1.1	-0.1	0.2	0.0	-0.8	-0.7	-0.8	-1.0	-0.5	0.7	0.2	-0.5	0.6	0.4	-0.3	-0.1	0.0	0.2	2.0
18-Jan	0.1	0.4	0.3	1.0	0.5	0.4	0.0	0.9	1.0	0.4	0.0	0.1	0.1	0.0	0.0	0.4	0.4	0.1	0.0	0.0	0.0	-0.1	-0.2	-0.2	0.2	1.0
19-Jan	0.0	0.1	-0.1	-0.1	-0.3	0.0	0.1	0.0	0.0	0.0	-0.1	-0.3	0.1	0.7	0.3	0.2	-0.4	-0.6	-0.5	0.0	-0.4	-0.1	-0.2	0.0	-0.1	0.7
20-Jan	0.2	0.2	0.0	-0.4	-0.1	-0.9	0.7	-0.2	-0.9	0.6	0.0	1.2	1.1	0.8	0.3	-0.3	0.0	0.1	-0.1	0.1	0.0	-0.2	0.4	-0.1	0.1	1.2
21-Jan	0.0	-0.1	0.0	0.0	0.1	0.1	0.0	-0.1	0.0	-0.5	0.0	0.3	-0.9	-0.3	-0.5	0.0	0.1	0.3	0.7	1.1	1.1	1.2	1.7	2.6	0.3	2.6
22-Jan	2.2	2.7	1.8	0.5	1.3	1.7	1.0	0.3	-0.3	0.2	1.2	0.0	0.3	-0.2	-0.3	0.1	0.2	1.1	1.0	0.3	0.4	0.9	1.4	1.7	0.8	2.7
23-Jan	1.0	0.0	0.9	1.7	1.0	0.5	1.2	2.4	0.1	1.4	1.5	0.2	0.9	-0.9	-1.2	-0.4	0.2	0.0	-0.2	-0.4	0.4	0.9	0.8	1.0	0.5	2.4
24-Jan	0.2	-0.6	-0.4	0.1	0.2	0.2	0.2	0.5	0.3	0.5	0.0	-0.3	-0.6	-0.2	-0.8	-0.3	0.0	0.0	0.2	0.0	-0.1	0.1	0.2	0.1	0.0	0.5
25-Jan	0.0	0.9	0.3	0.1	0.8	0.4	-0.2	0.1	0.1	0.0	-0.1	0.2	-0.3	-0.5	-0.5	-0.4	0.2	0.3	0.8	0.9	0.1	0.5	0.7	0.7	0.2	0.9
26-Jan	1.0	0.9	1.0	0.8	0.7	0.3	0.1	0.3	0.2	-0.2	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.2	0.4	0.4	0.3	0.5	0.5	0.2	0.3	1.0
27-Jan	-0.1	0.3	0.3	0.0	-0.3	0.2	0.6	0.1	0.0	0.0	0.2	0.1	0.3	1.3	2.1	1.7	0.3	0.0	0.4	-0.4	0.5	1.4	0.8	0.2	0.4	2.1
28-Jan	0.0	0.6	0.4	0.6	-1.0	0.7	0.2	0.1	0.6	0.9	0.2	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.4	0.1	0.5	-0.4	1.4	0.7	-0.2	0.2	1.4
29-Jan	-0.1	0.2	0.0	-0.4	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	-0.2	-0.5	-0.3	0.6	0.0	0.4	0.6	-0.3	-0.5	-0.4	-0.6	-0.6	-0.1	0.6
30-Jan	-0.2	-0.6	-0.6	-0.3	-0.3	-0.3	0.3	0.0	0.7	1.8	1.1	1.3	0.7	0.9	1.1	1.1	1.7	1.4	1.2	1.2	0.8	0.6	1.2	-0.9	0.6	1.8
31-Jan	-0.5	-0.2	-0.1	-0.1	-0.1	-0.1	-0.3	0.0	-0.1	0.1	-0.1	0.0	-0.5	-0.6	0.2	-0.2	-0.1	-0.2	-0.2	0.2	-0.3	-0.5	-0.4	-0.1	-0.2	0.2
	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.0	0.2	0.4	0.4	Diurnal Average	
	2.4	2.7	1.9	2.3	2.6	1.7	2.3	2.4	2.9	3.4	2.6	2.2	1.8	1.8	2.1	1.8	1.7	2.0	1.3	1.2	1.1	2.0	2.4	2.6	Diurnal Maximum	

AF - Analyzer Failure

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1
Maximum Value: 7.9 km/h on Jan 15 09:00

Minimum Value: 0.1 km/h on Jan 7 10:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.7 Median = 1.0 Q_3 = 1.6 P_{90} = 2.6 P_{99} = 5.3

Hours in Service:	744
Hours of Data:	712
Hours of Missing Data:	32
Hours of Calibration:	0
Percent Operational Time:	95.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.4	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.6	0.4	0.4	0.5	0.6	1.4	1.3	1.1	1.4	1.4	2.1	2.1
2-Jan	1.8	1.0	0.7	1.5	1.9	1.5	1.0	0.7	0.7	0.5	0.8	0.9	0.7	0.7	0.8	0.9	1.1	1.5	1.0	0.5	0.5	0.9	1.3	2.0	2.0
3-Jan	3.0	4.2	3.5	2.9	2.4	1.6	1.4	0.9	1.1	0.7	0.3	0.3	0.8	0.5	0.5	0.8	1.5	1.5	1.8	2.0	1.7	1.1	0.9	0.8	4.2
4-Jan	1.5	1.5	1.1	1.2	1.5	2.6	3.0	1.5	1.6	2.0	2.8	2.7	3.8	3.1	2.8	1.8	1.2	1.7	1.2	1.1	1.4	1.2	0.8	1.4	3.8
5-Jan	0.9	0.5	0.4	0.5	0.6	0.6	0.5	0.4	0.4	1.0	0.3	0.3	0.4	0.3	0.3	0.6	0.6	0.6	0.9	0.9	0.7	0.7	0.6	0.8	1.0
6-Jan	0.9	1.0	0.8	1.4	1.5	2.0	1.1	2.6	1.7	1.6	1.1	1.6	2.2	2.1	1.2	1.1	1.2	0.9	0.8	1.1	1.2	0.7	0.6	0.5	2.6
7-Jan	0.6	0.2	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.5	0.7	0.5	0.3	0.4	0.6	0.9	0.9	1.4	1.2	1.0	1.6	1.7	1.7
8-Jan	1.9	2.2	1.8	2.2	1.7	1.3	1.2	1.0	0.9	0.8	0.8	0.7	0.6	0.7	0.7	0.5	0.4	0.4	0.4	0.3	0.5	0.5	0.9	0.7	2.2
9-Jan	0.7	0.6	0.6	0.9	0.7	0.9	0.7	1.1	2.1	AF	AF	AF	AF	AF	AF	AF	1.6	1.5	AF	3.0	2.1	AF	AF	AF	3.0
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.0	0.8	0.3	1.0
11-Jan	0.4	0.3	0.4	0.3	0.4	0.5	0.6	0.7	0.8	1.0	0.8	0.7	0.8	1.0	0.9	0.8	0.9	1.3	1.3	1.3	2.3	2.3	2.3	2.4	2.4
12-Jan	2.1	2.5	2.3	1.7	2.6	2.2	1.5	0.6	0.3	0.4	0.7	1.0	1.4	0.9	0.7	0.7	1.3	0.8	0.9	1.1	1.7	1.6	1.5	1.1	2.6
13-Jan	1.6	1.6	0.9	0.6	0.7	0.6	0.6	0.7	0.6	1.2	0.8	1.6	1.4	1.4	1.6	1.5	1.0	1.4	1.6	1.2	0.4	0.4	0.3	0.3	1.6
14-Jan	0.4	0.4	0.3	0.4	0.4	0.9	0.7	1.0	1.4	1.4	1.7	1.1	1.3	1.2	1.0	1.1	1.4	1.5	1.7	1.9	1.5	3.1	1.3	1.9	3.1
15-Jan	3.1	4.7	6.8	6.8	4.9	5.0	5.9	6.8	7.9	4.9	3.6	3.3	3.9	5.0	5.5	5.3	1.6	0.8	1.9	1.4	1.0	0.8	0.7	0.4	7.9
16-Jan	0.6	0.5	0.8	1.0	0.9	0.9	0.9	1.4	0.9	1.1	1.2	0.9	0.8	0.9	1.1	1.1	0.8	1.1	1.0	0.8	0.8	0.7	0.8	0.9	1.4
17-Jan	1.1	1.0	1.2	1.0	0.9	1.5	1.9	2.4	1.3	1.4	3.6	1.9	2.2	2.8	3.3	2.4	2.6	2.8	2.2	2.7	2.2	1.8	1.1	0.3	3.6
18-Jan	0.3	0.5	0.7	1.0	1.0	0.7	1.0	0.8	1.1	0.8	3.0	1.6	1.0	0.3	1.1	1.7	1.5	1.2	0.9	0.7	0.7	0.5	0.5	0.7	3.0
19-Jan	0.3	0.5	0.4	0.3	0.5	0.6	1.2	0.4	0.2	0.7	1.5	3.4	3.8	4.0	4.4	3.5	2.9	2.4	2.2	1.4	1.2	1.4	1.2	0.4	4.4
20-Jan	0.5	0.6	0.8	1.0	1.1	1.3	1.4	1.2	2.4	1.3	0.7	1.0	1.0	1.2	1.1	0.7	0.5	0.4	0.4	0.3	0.5	1.0	1.3	0.6	2.4
21-Jan	0.5	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.9	1.3	1.2	2.6	2.6	2.6	2.4	1.8	0.6	0.3	0.4	0.5	0.7	0.9	2.0	2.6	2.6
22-Jan	2.3	2.1	2.4	1.9	1.5	1.7	1.6	1.1	1.4	1.5	1.5	1.0	0.7	1.0	1.1	0.8	0.8	1.5	1.1	0.9	0.7	0.7	1.2	0.8	2.4
23-Jan	1.4	1.3	1.2	1.1	1.4	1.9	2.6	1.4	0.8	1.8	1.5	2.7	2.9	0.9	1.6	2.2	2.5	2.1	1.1	1.1	0.9	1.3	1.1	1.5	2.9
24-Jan	1.5	1.2	0.9	1.3	1.3	1.4	2.1	2.3	1.4	2.2	1.8	2.1	2.1	2.4	1.5	1.5	0.8	0.6	0.7	0.3	0.3	0.3	0.4	0.7	2.4
25-Jan	1.2	1.5	0.9	0.8	0.6	0.8	1.4	1.3	1.4	2.3	2.9	3.1	1.9	1.5	1.9	2.6	3.0	3.3	3.2	3.1	3.2	5.3	3.9	4.2	5.3
26-Jan	4.6	5.3	4.1	3.3	2.8	2.6	2.1	1.9	1.7	1.5	1.3	1.4	1.3	1.8	0.9	0.7	0.5	0.4	0.4	0.3	0.3	0.5	0.5	0.5	5.3
27-Jan	0.4	0.4	0.4	0.3	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.9	1.3	1.3	0.8	0.9	0.6	0.7	1.3	0.8	0.9	0.9	0.9	1.3
28-Jan	0.7	1.2	0.9	0.7	0.9	0.9	0.7	0.5	0.7	1.0	1.3	0.7	0.3	0.8	0.4	0.5	0.8	1.2	2.9	3.2	3.3	3.0	2.7	2.2	3.3
29-Jan	1.5	1.3	1.1	1.4	0.7	0.8	0.4	0.4	0.7	1.7	2.8	2.8	3.5	2.9	2.3	2.2	1.9	1.9	2.5	2.3	1.9	0.9	0.7	0.7	3.5
30-Jan	0.6	1.1	0.7	0.5	0.7	0.9	1.2	1.2	1.6	1.6	1.1	1.8	2.1	1.5	1.6	1.3	1.6	2.2	1.7	1.8	1.8	1.3	2.4	1.4	2.4
31-Jan	1.1	1.5	1.0	0.6	0.5	0.3	0.3	0.4	0.5	0.5	0.7	0.6	1.2	1.8	1.7	0.9	1.1	1.1	0.3	1.0	1.1	0.9	0.8	1.1	1.8
	4.6	5.3	6.8	6.8	4.9	5.0	5.9	6.8	7.9	4.9	3.6	3.4	3.9	5.0	5.5	5.3	3.0	3.3	3.2	3.2	3.3	5.3	3.9	4.2	
	Diurnal Maximum																								

AF - Analyzer Failure

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 4
BUFFALO VIEWPOINT
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
JANUARY 2014

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	326	18	77	85.36	6	0	1	0
H2S (ppb) Average	323	21	89	83.50	3	0	1	0
THC (ppm) Average	324	20	79	85.36	3.9	-	2.8	-
Temperature (C) Average	344	0	59	85.36	6.5	-	-10.5	-
Wind Speed 10 m (km/h) Average	338	0	65	83.87	57	-	-	-
Wind Direction 10 m (deg) Average	338	0	65	83.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	326	0.4	1	-	0	0	0	0	0	1	6
H2S (ppb) Average	323	0.4	0	-	0	0	0	0	0	1	3
THC (ppm) Average	324	2.38	0.3	-	2.1	2.2	2.2	2.3	2.5	2.7	3.9
Temperature 2 m (C) Average	344	-19.89	8.5	-	-37.7	-31.1	-26.6	-20.1	-13.7	-10.6	6.5
Wind Speed 10 m (km/h) Average	338	10.9	7	-	0	4	7	9	13	19	57
Wind Direction 10 m (deg) Average	338	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS 4)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	15 Jan 2014 09:00	17 Jan 2014 19:00	59	Analyzer Failure - Station power failure
SO2	17 Jan 2014 20:00	01 Feb 2014 00:00	341	Not in Service - Station power diables, MAMS monitoring
H2S	15 Jan 2014 09:00	18 Jan 2014 04:00	68	Analyzer Failure - Station power failure
H2S	18 Jan 2014 05:00	01 Feb 2014 00:00	332	Not in Service - Station power diables, MAMS monitoring
THC	15 Jan 2014 09:00	17 Jan 2014 19:00	59	Analyzer Failure - Station power failure
THC	17 Jan 2014 20:00	01 Feb 2014 00:00	341	Not in Service - Station power diables, MAMS monitoring
Temperature 2 m	15 Jan 2014 09:00	17 Jan 2014 19:00	59	Analyzer Failure - Station power failure
Temperature 2 m	17 Jan 2014 20:00	01 Feb 2014 00:00	341	Not in Service - Station power diables, MAMS monitoring
Wind Speed, Wind Direction	03 Jan 2014 10:00	03 Jan 2014 11:00	2	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 05:00	07 Jan 2014 06:00	2	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	10 Jan 2014 15:00	10 Jan 2014 16:00	2	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2014 09:00	17 Jan 2014 19:00	59	Analyzer Failure - Station power failure
Wind Speed, Wind Direction	17 Jan 2014 20:00	01 Feb 2014 00:00	341	Not in Service - Station power diables, MAMS monitoring

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6 ppb on Jan 13 11:00 Maximum Daily Average: 1.0 ppb on Jan 2

Minimum Value: 0 ppb on Jan 4 09:00 Minimum Daily Average: 0.0 ppb on Jan 5
Maximum Diurnal Average: 0.9 ppb at hour 11 Minimum Diurnal Average: 0.2 ppb at hour 21
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 0$

Hours in Service:	403
Hours of Data:	326
Hours of Missing Data:	77
Hours of Calibration:	18
Percent Operational Time:	85.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	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-Jan	0	Z	1	1	1	1	2	2	2	2	1	2	1	1	1	1	1	1	1	1	0	1	0	0	1.0	2
3-Jan	0	Z	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
4-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0.2	2
5-Jan	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
6-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0.4	1
7-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
8-Jan	0	Z	1	1	1	1	1	1	1	1	1	1	1	C	C	C	1	1	1	1	1	1	1	1	0.8	1
9-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	1	1	0	0	0	0	0	0.5	2
10-Jan	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
11-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
12-Jan	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
13-Jan	0	Z	0	0	0	0	0	0	0	4	6	1	0	0	0	0	0	0	0	0	0	0	0	1	0.7	6
14-Jan	1	Z	0	0	0	0	0	0	1	1	1	2	2	2	2	1	1	1	1	1	0	0	0	0	0.8	2
15-Jan	0	Z	0	0	0	0	0	0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0
16-Jan	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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NS	NS	NS	NS	NS	--	--
18-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
31-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
	0.3	--	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.9	0.6	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	Diurnal Average	
	1	--	1	1	1	1	2	2	2	4	6	2	2	2	2	1	2	1	1	1	1	1	1	1	Diurnal Maximum	

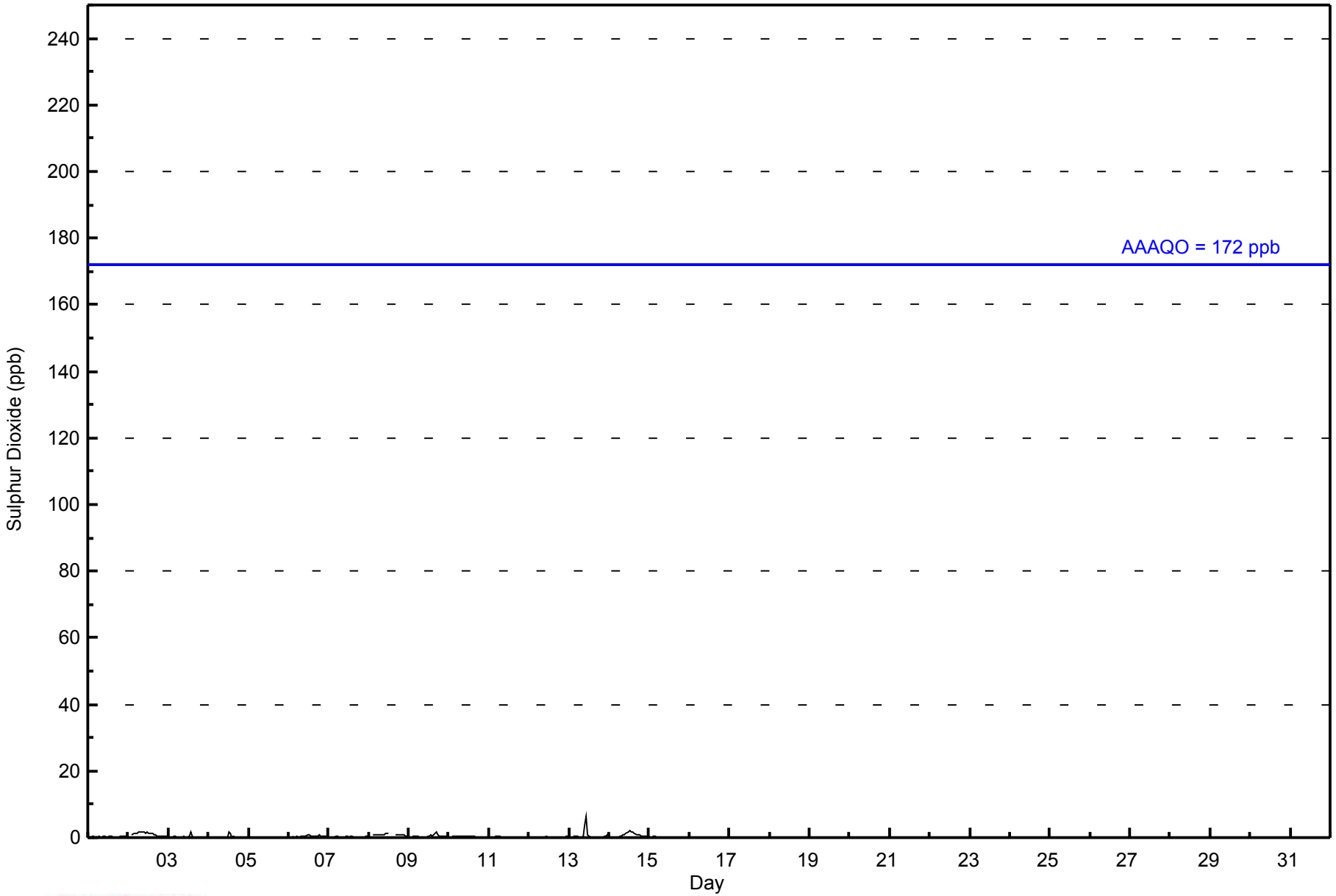
Z - zerospan C - Calibration AF - Analyzer Failure NS - Not in Service
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	326	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: 326

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	54	11	0	1	7	7	77	76	12	4	7	10	9	14	17	14	320
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	54	11	0	1	7	7	77	76	12	4	7	10	9	14	17	14	320

Total Number of Valid Hours: 320

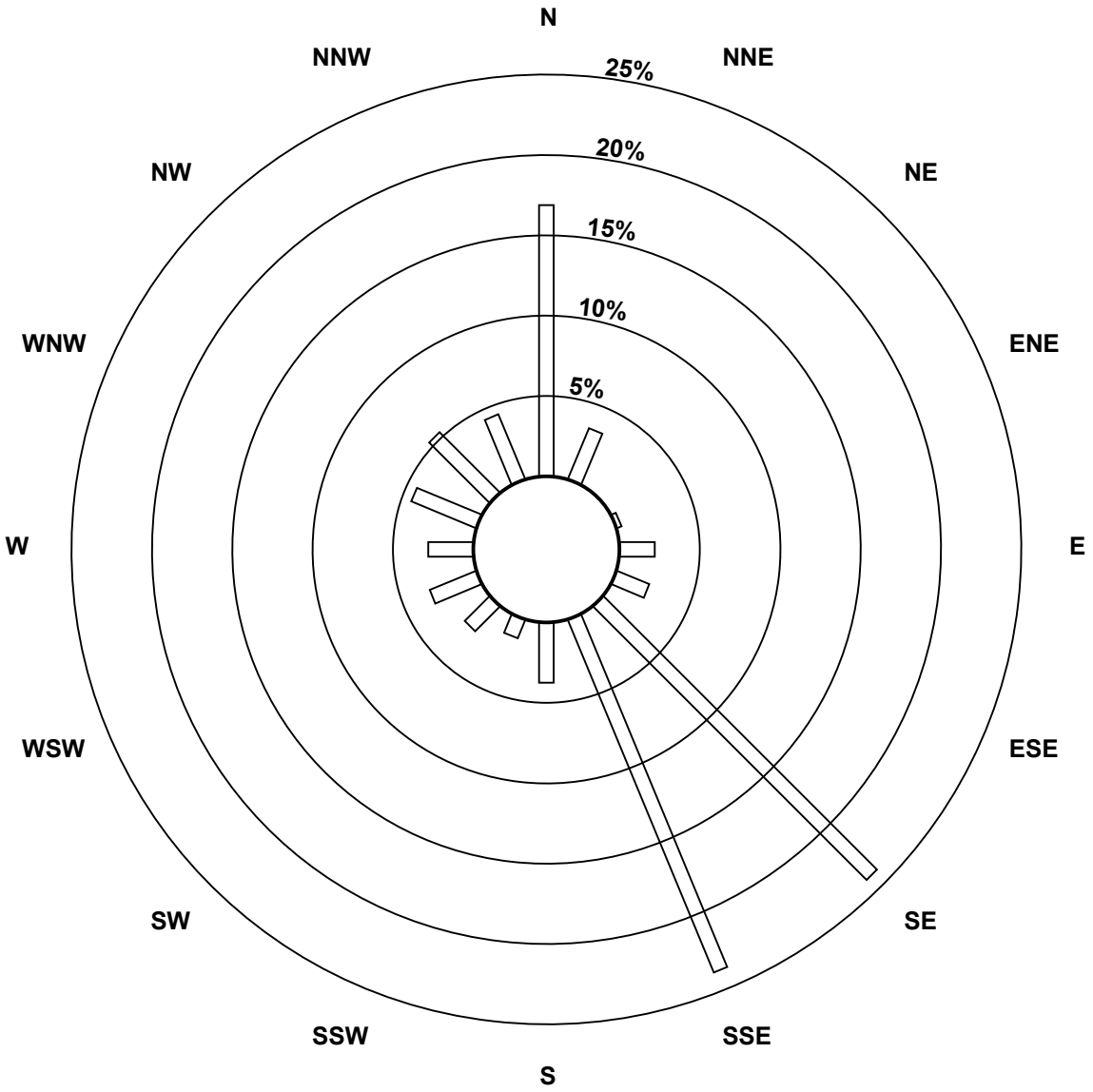
Total Number of Hours: 744

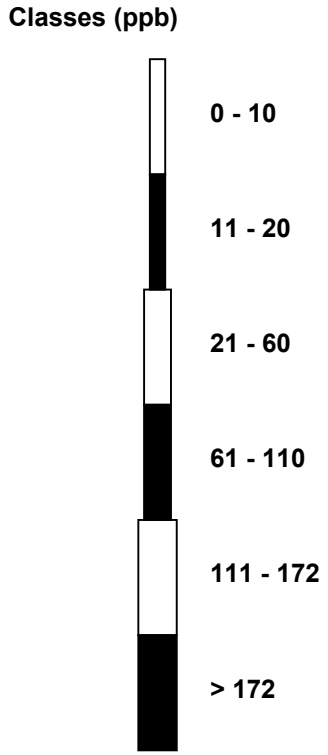
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint (AMS 4)





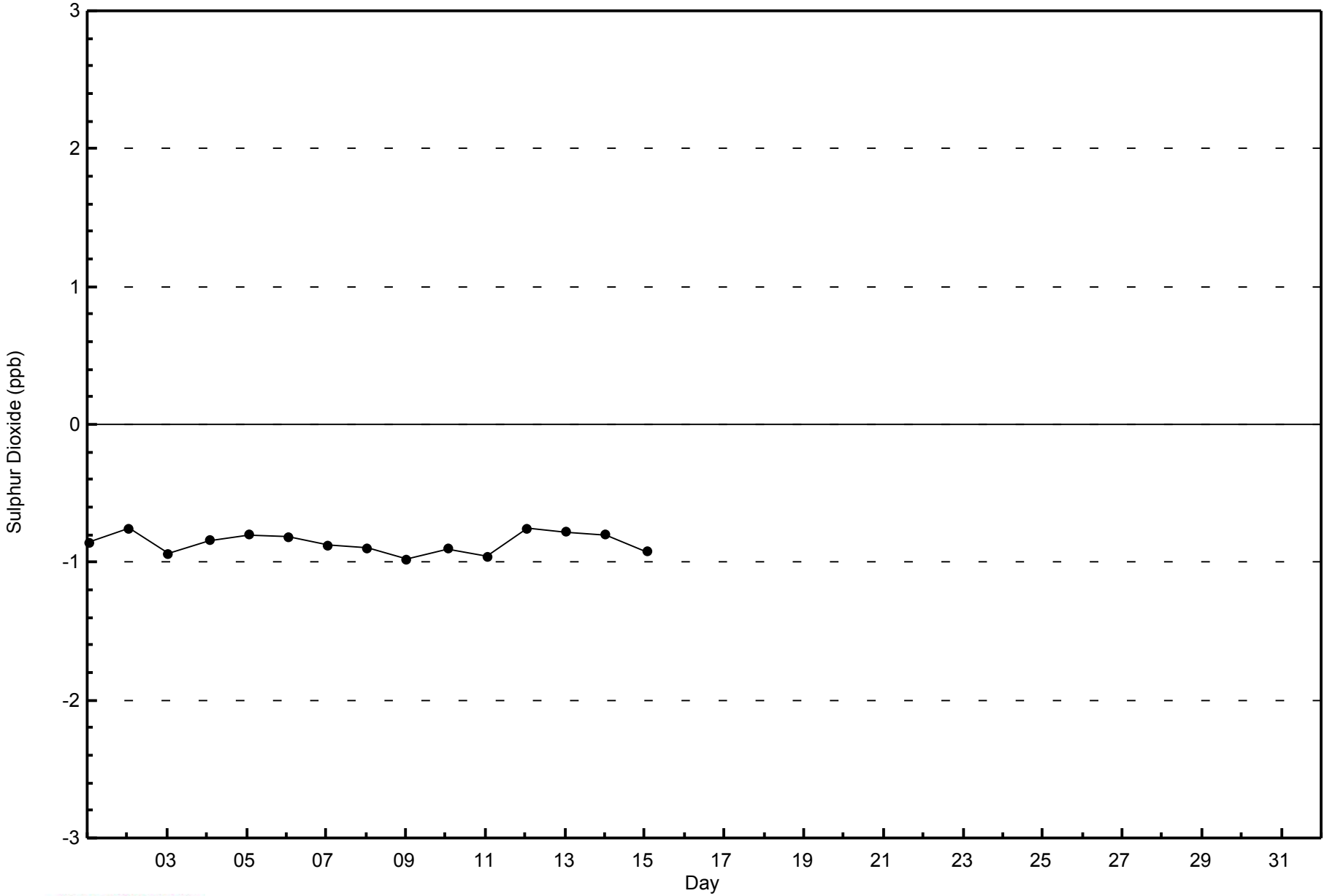
Total Number of Valid Hours: 320

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2014



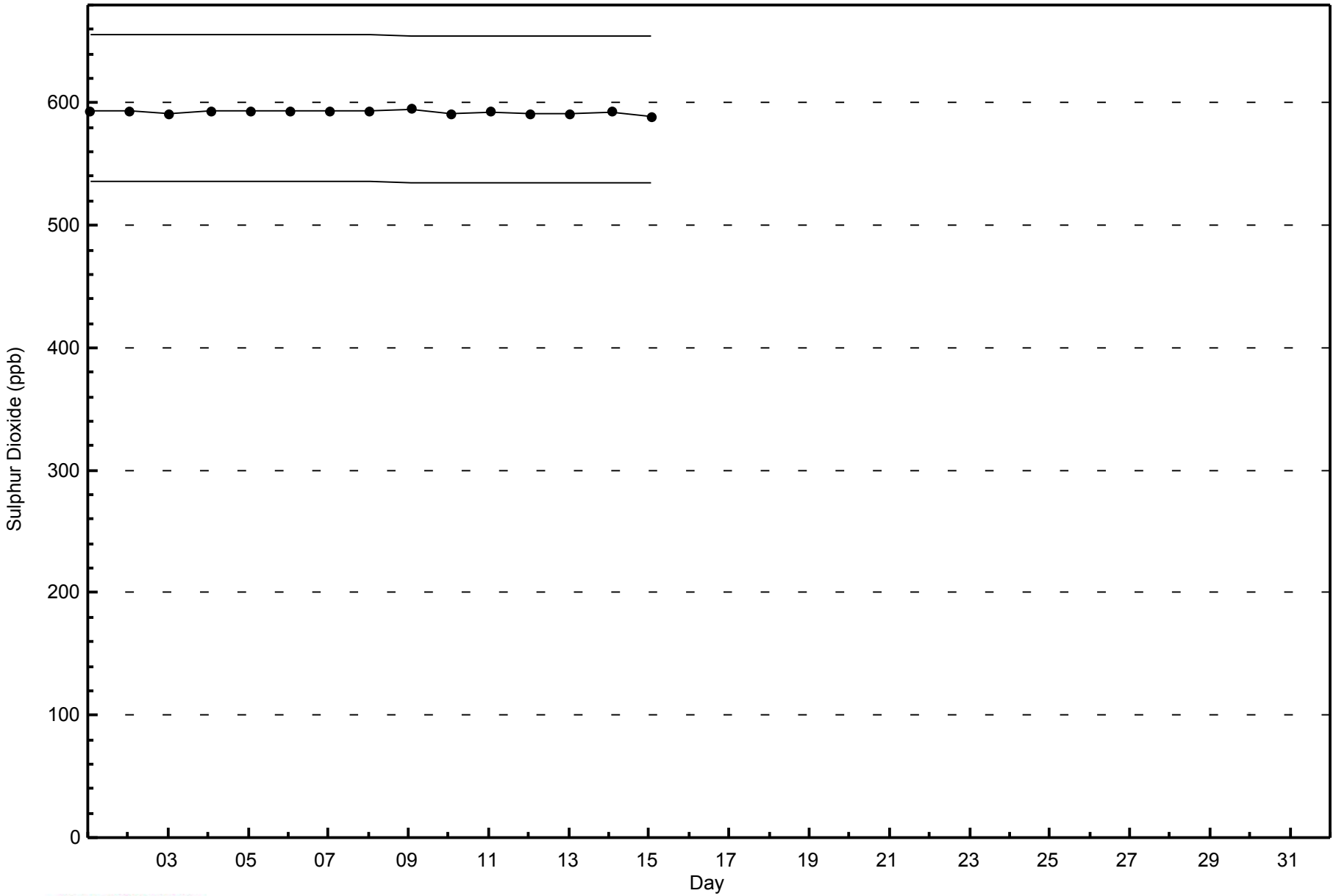
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 10 06:00 Maximum Daily Average: 0.7 ppb on Jan 10

Minimum Value: 0 ppb on Jan 8 07:00 Minimum Daily Average: 0.2 ppb on Jan 4
Maximum Diurnal Average: 0.5 ppb at hour 6 Minimum Diurnal Average: 0.3 ppb at hour 2
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	412
Hours of Data:	323
Hours of Missing Data:	89
Hours of Calibration:	21
Percent Operational Time:	83.5

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

Z - zerospan C - Calibration AF - Analyzer Failure NS - Not in Service
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

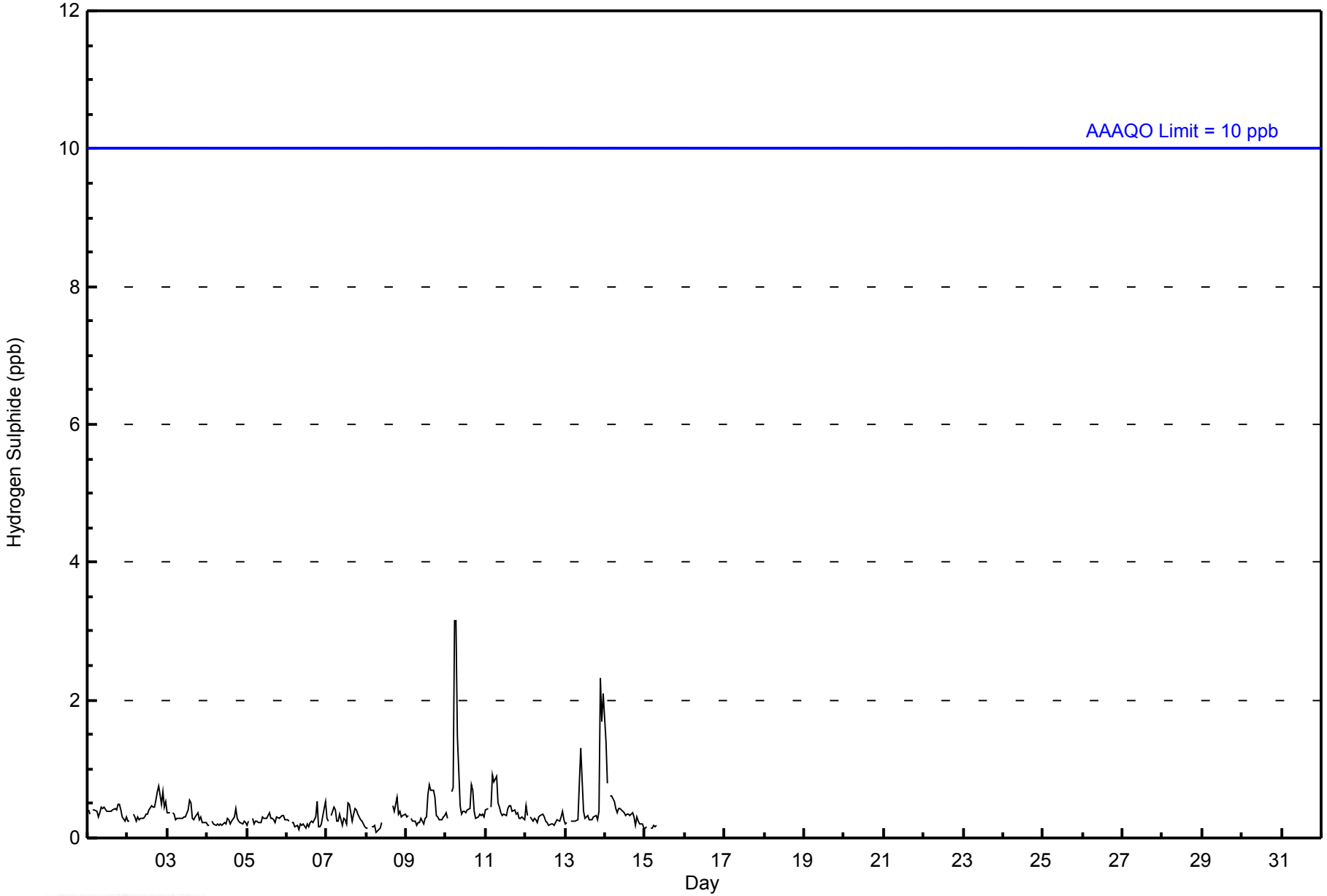
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	321	99.38	99.38
3 - 4	2	0.62	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: 323

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	56	11	0	1	7	6	75	74	12	5	7	11	7	15	15	13	315
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	56	11	0	1	7	6	75	74	12	5	7	11	7	15	17	13	317

Total Number of Valid Hours: 317

Total Number of Hours: 744

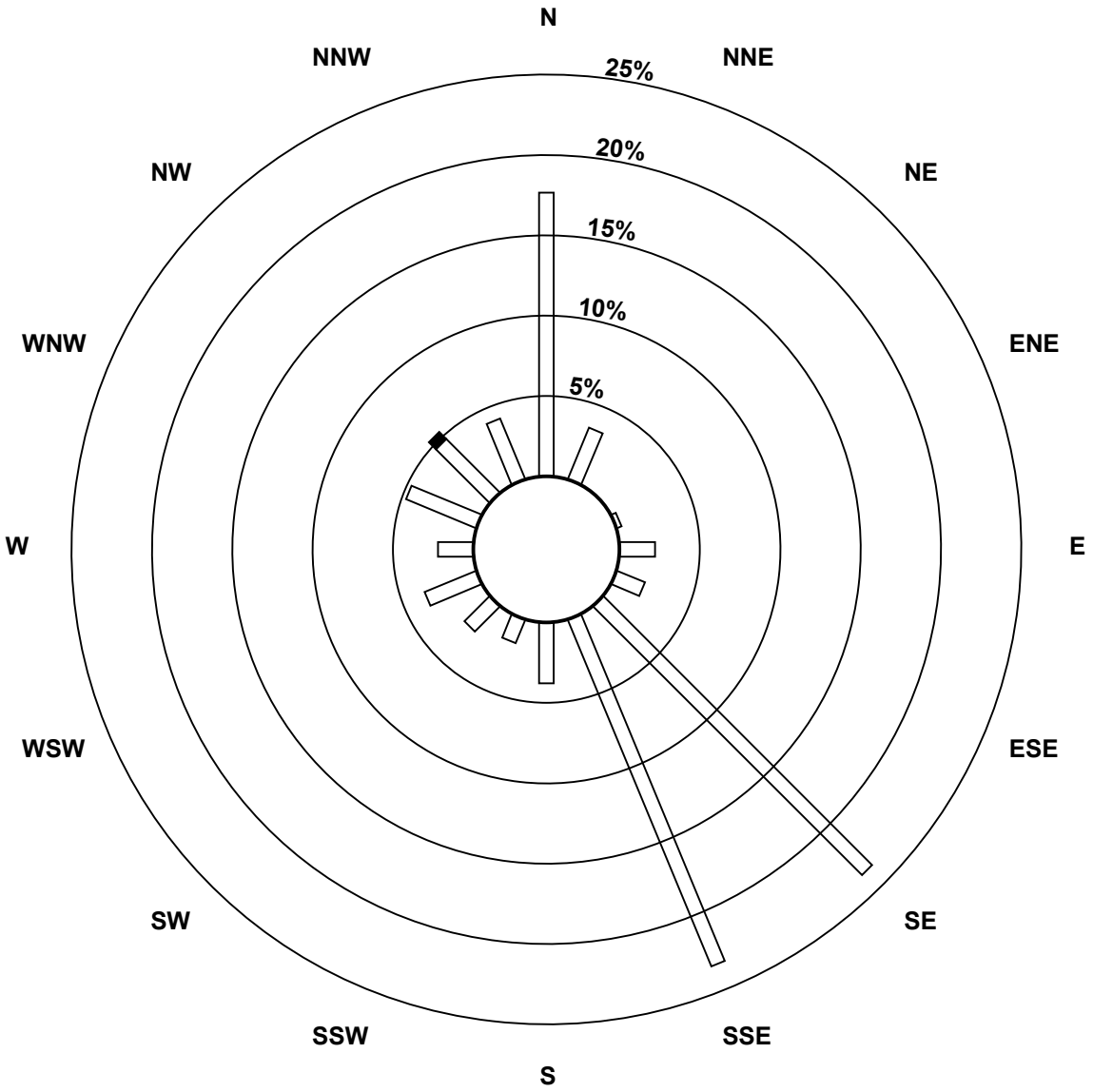
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

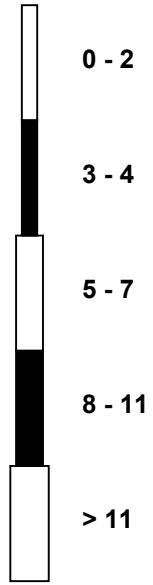
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint (AMS 4)



Classes (ppb)



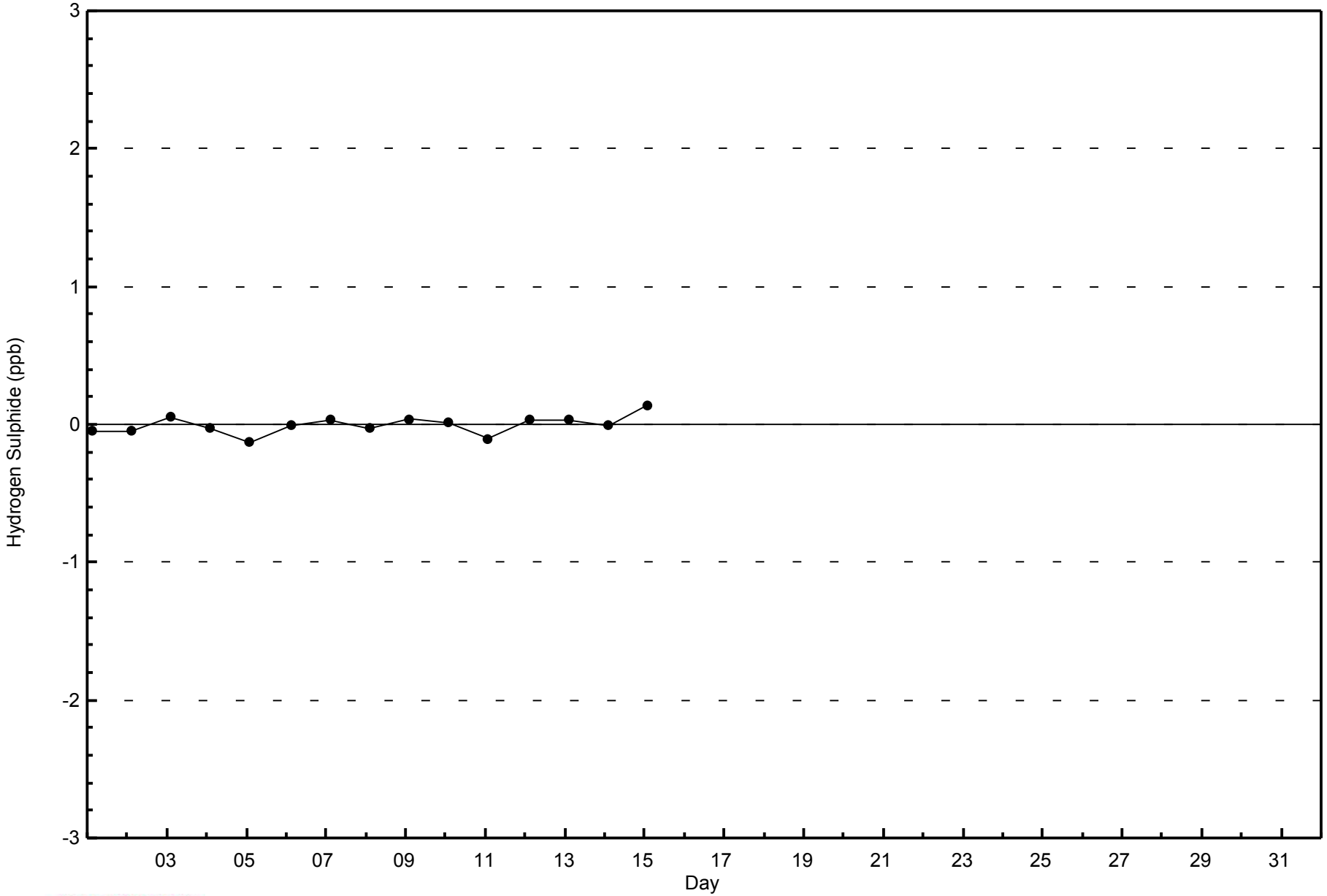
Total Number of Valid Hours: 317

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2014



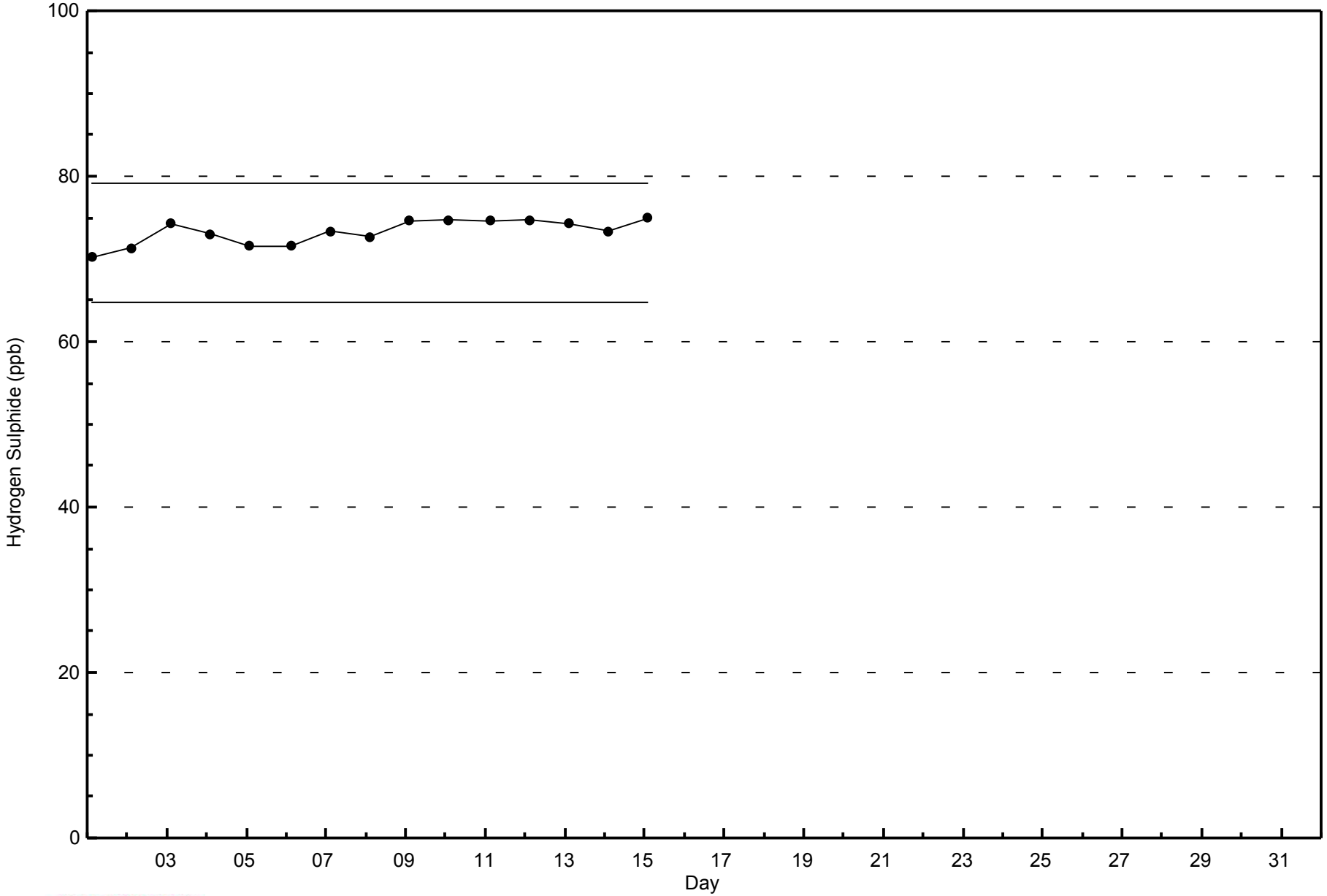
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2014

Maximum Value: 3.9 ppm on Jan 9 13:00

Maximum Daily Average: 2.8 ppm on Jan 9

Minimum Value: 2.1 ppm on Jan 15 01:00

Minimum Daily Average: 2.2 ppm on Jan 12

Maximum Diurnal Average: 2.5 ppm at hour 14

Minimum Diurnal Average: 2.3 ppm at hour 3

Monthly Average: 2.38 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} = 3.7

Hours in Service:	403
Hours of Data:	324
Hours of Missing Data:	79
Hours of Calibration:	20
Percent Operational Time:	85.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.3	Z	2.4	2.3	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	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.5
2-Jan	2.4	Z	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.5	2.4	2.6	2.5	2.6	2.7
3-Jan	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.3	2.8	2.6	2.3	2.2	2.4	2.5	2.2	2.2	2.2	2.2	2.2	2.3	2.8
4-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.2	2.5	2.3	2.7	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7
5-Jan	2.2	Z	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	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3
6-Jan	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	2.1	2.2	2.2	2.2	2.4	2.4	2.1	2.1	2.7	3.0	2.4	2.2	3.0
7-Jan	2.3	Z	2.2	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	3.0	2.5	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	3.0
8-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	C	C	C	C	C	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.3	2.6
9-Jan	2.5	Z	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	3.0	3.9	3.2	3.5	3.3	3.2	3.0	2.6	2.6	2.5	2.4	2.4	2.4	2.8	3.9
10-Jan	2.4	Z	2.4	3.0	2.9	2.8	3.0	2.7	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.6	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	3.0
11-Jan	2.3	Z	2.5	2.7	3.2	2.8	2.8	2.4	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.4	3.2
12-Jan	2.2	Z	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
13-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.5	3.2	3.7	2.8	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.6	3.5	3.4	3.8	2.6	3.8
14-Jan	3.8	Z	2.6	2.6	2.5	2.5	2.4	2.4	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	2.2	2.2	2.2	2.4	3.8
15-Jan	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	2.2
16-Jan	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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NS	NS	NS	NS	NS	--	--
18-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
31-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
	2.4	--	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	Diurnal Average	
	3.8	--	2.6	3.0	3.2	2.8	3.0	2.7	3.2	3.7	2.8	3.0	3.9	3.2	3.5	3.3	3.2	3.0	2.6	2.6	2.6	3.5	3.4	3.8	Diurnal Maximum	

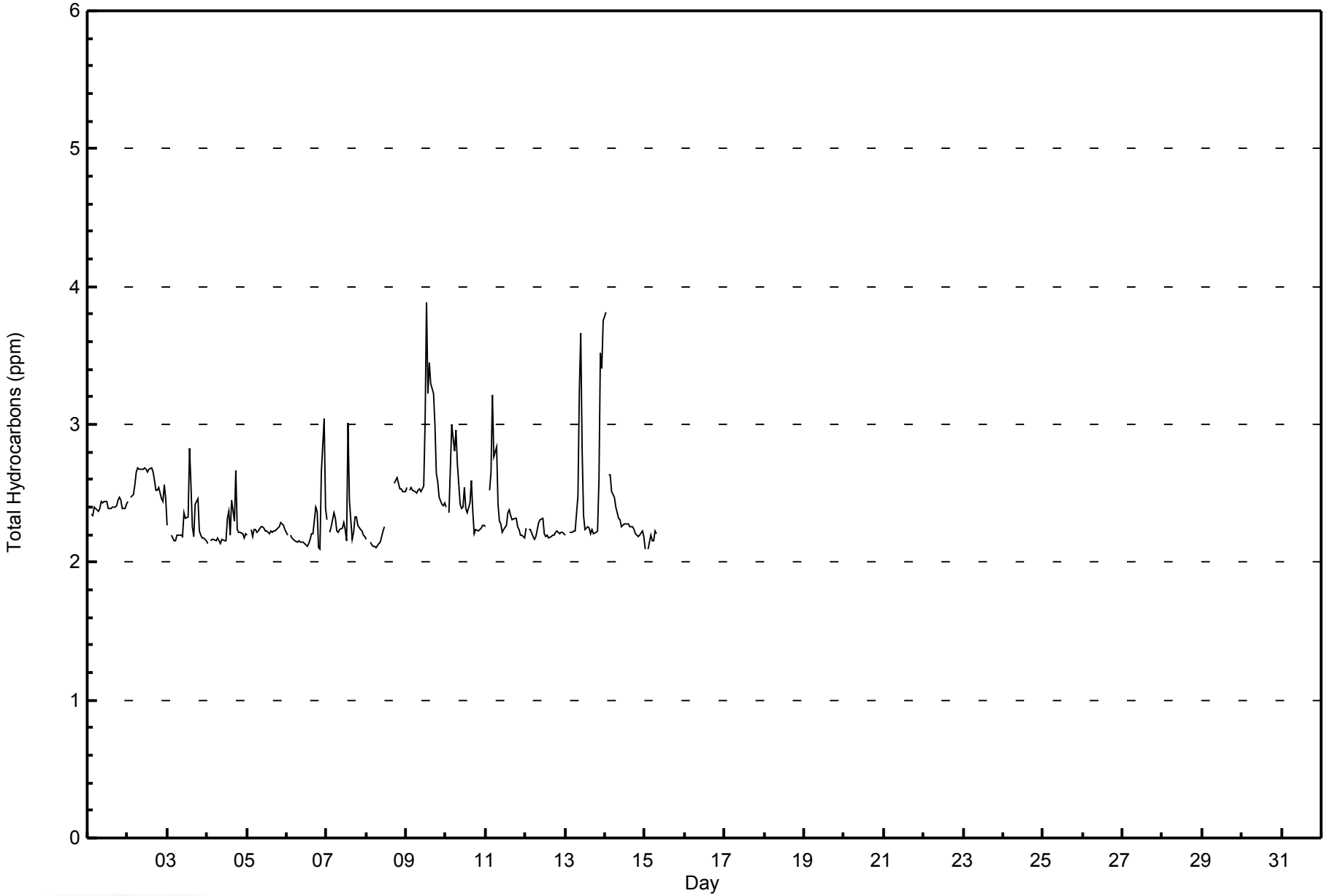
Z - zerospan C - Calibration AF - Analyzer Failure NS - Not in Service

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	312	96.30	96.30
3.1 - 10.0	12	3.70	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 324

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2014

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	47	11	0	1	7	7	76	75	12	4	7	10	9	14	15	11	306
3.1 - 10.0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	11	0	1	7	7	76	75	12	4	7	10	9	14	17	14	318

Total Number of Valid Hours: 318

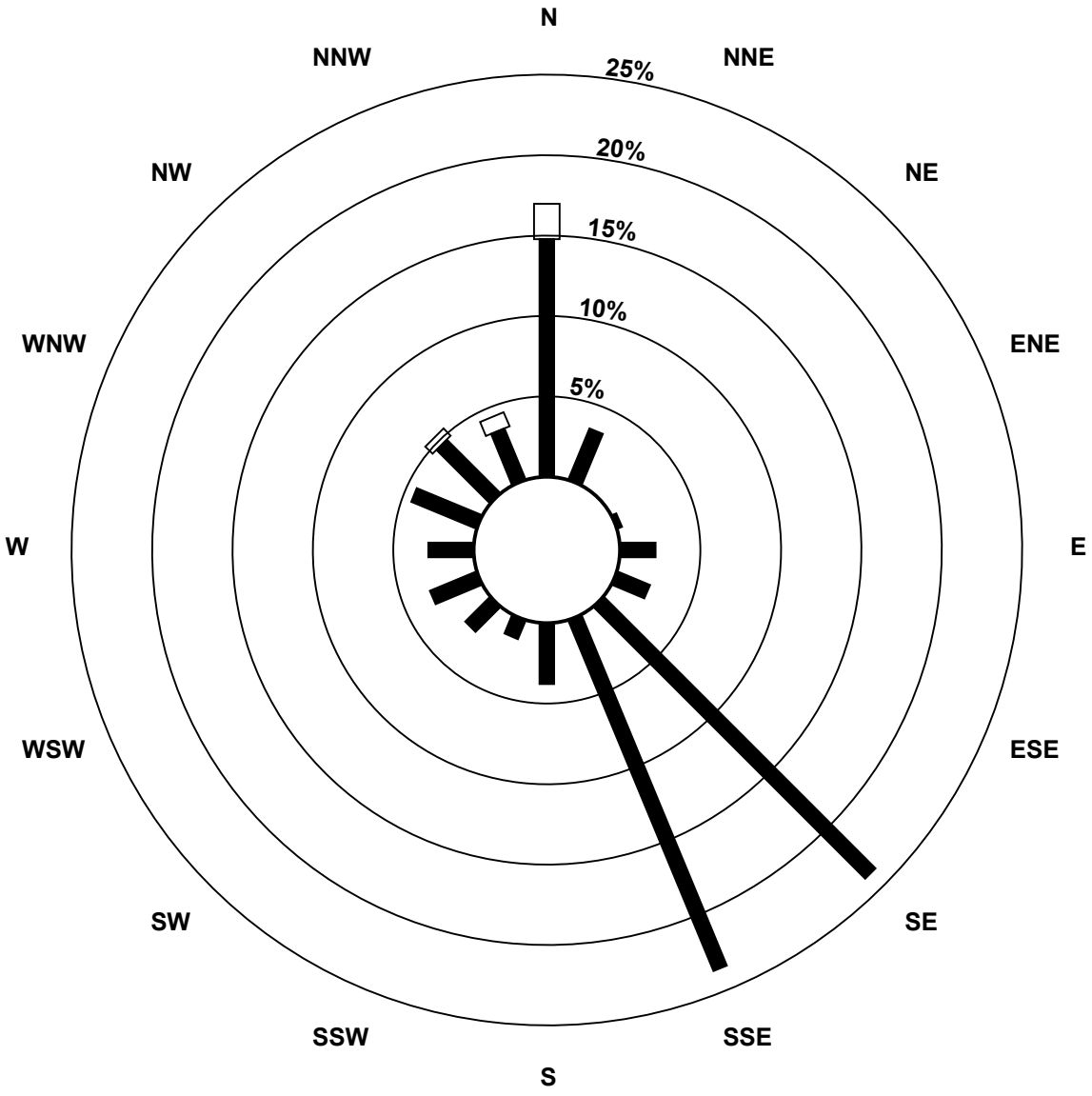
Total Number of Hours: 744

Wood Buffalo Environmental Association

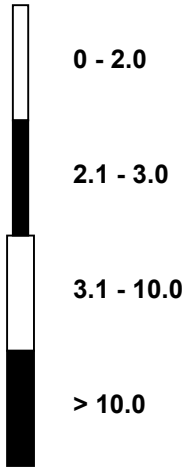
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint (AMS 4)



Classes (ppm)



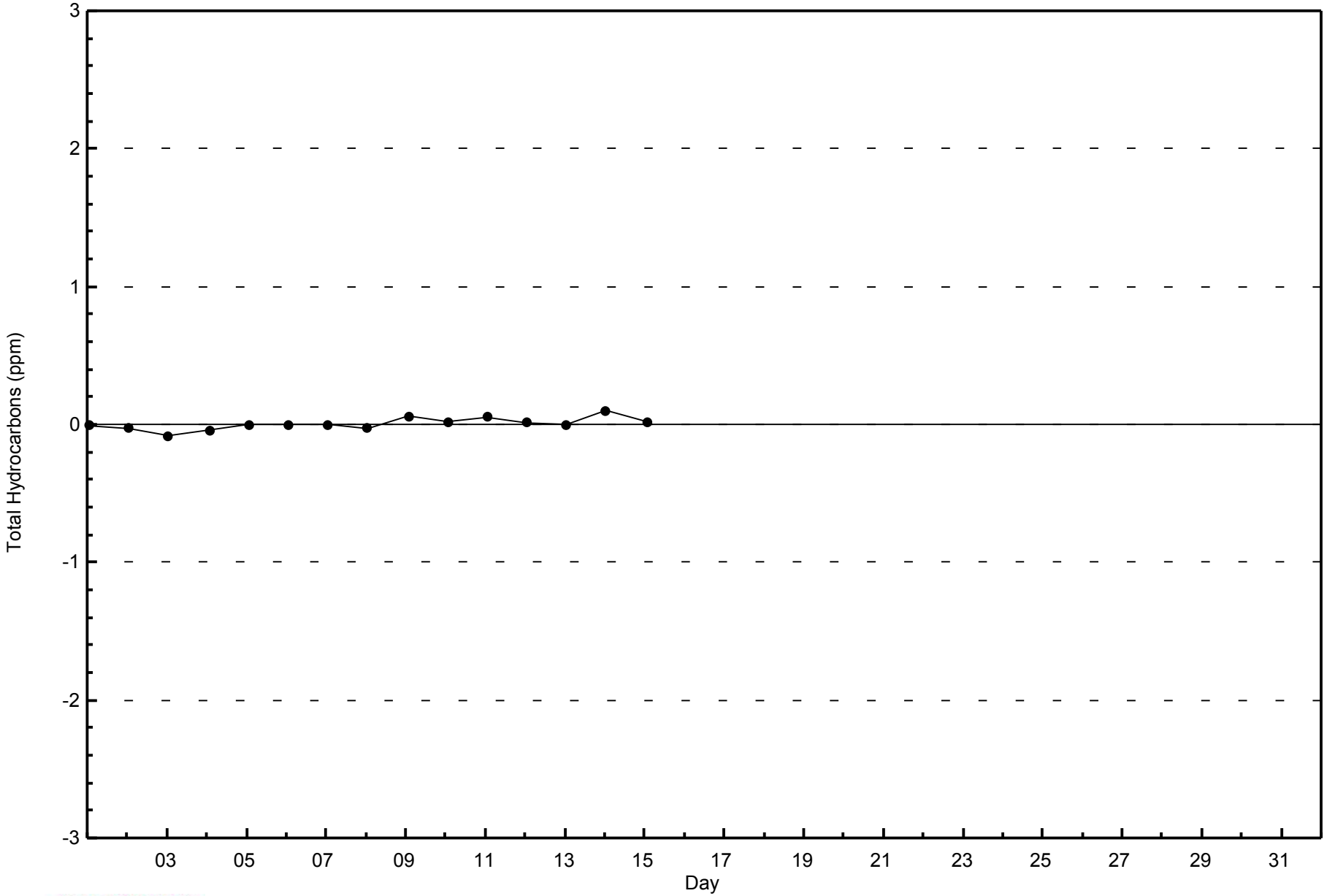
Total Number of Valid Hours: 318

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2014



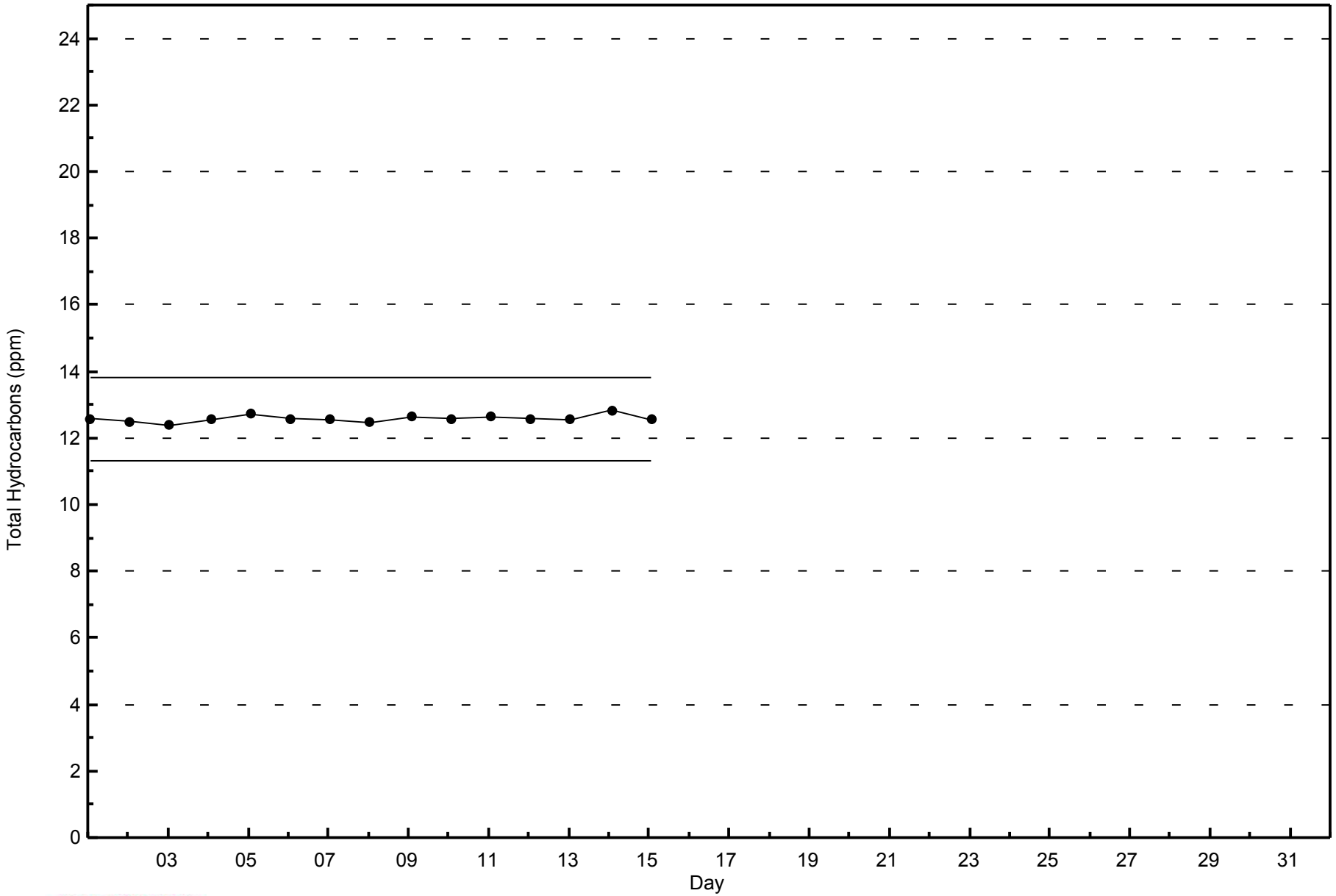
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 6.5 C on Jan 15 02:00

Maximum Daily Average: -10.5 C on Jan 9

Minimum Value: -37.7 C on Jan 1 10:00

Minimum Daily Average: -32.9 C on Jan 1

Maximum Diurnal Average: -18.2 C at hour 15

Minimum Diurnal Average: -22.2 C at hour 9

Monthly Average: -19.89 C

Percentiles: P_1 = -36.8 P_{10} = -31.1 Q_1 = -26.6 Median = -20.1 Q_3 = -13.7 P_{90} = -10.6 P_{99} = 5.3

Hours in Service:	403
Hours of Data:	344
Hours of Missing Data:	59
Hours of Calibration:	0
Percent Operational Time:	85.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-33.1	-34.0	-34.4	-34.5	-35.9	-36.2	-36.8	-37.3	-37.6	-37.7	-35.8	-32.6	-31.1	-30.4	-30.8	-31.1	-32.0	-32.6	-32.4	-32.2	-30.1	-28.6	-27.2	-26.0	-32.9	-26.0
2-Jan	-24.4	-23.0	-21.5	-20.0	-18.6	-17.5	-16.9	-16.3	-15.6	-15.0	-14.1	-12.8	-11.2	-10.7	-10.2	-10.5	-11.0	-11.1	-10.8	-11.2	-11.6	-10.9	-10.5	-12.4	-14.5	-10.2
3-Jan	-13.0	-15.9	-18.6	-19.8	-22.2	-23.5	-24.0	-24.8	-25.1	-24.1	-23.1	-23.1	-22.0	-21.6	-20.9	-21.5	-22.1	-21.6	-21.9	-23.0	-23.8	-25.0	-25.9	-26.2	-22.2	-13.0
4-Jan	-27.3	-27.5	-27.6	-28.4	-28.5	-28.2	-29.0	-27.6	-27.3	-27.1	-26.4	-26.0	-25.8	-27.1	-28.5	-28.9	-29.8	-30.7	-31.0	-31.4	-31.5	-31.6	-32.2	-32.3	-28.8	-25.8
5-Jan	-32.6	-32.4	-32.4	-32.5	-32.4	-32.5	-32.7	-34.6	-34.8	-34.2	-32.9	-31.1	-30.0	-29.9	-29.3	-29.2	-29.3	-29.2	-28.6	-28.3	-28.1	-28.2	-28.1	-27.8	-30.9	-27.8
6-Jan	-27.8	-27.8	-27.2	-26.5	-26.1	-25.8	-25.3	-24.7	-24.1	-23.6	-23.0	-22.3	-21.3	-20.3	-20.5	-21.1	-21.0	-21.1	-21.3	-22.1	-23.4	-23.8	-24.7	-24.5	-23.7	-20.3
7-Jan	-24.3	-24.0	-24.1	-24.5	-24.8	-26.0	-28.3	-29.1	-30.7	-31.1	-29.8	-27.1	-24.2	-24.6	-22.9	-22.9	-25.2	-27.3	-28.0	-28.9	-27.6	-26.9	-25.7	-24.6	-26.4	-22.9
8-Jan	-23.6	-22.4	-21.1	-20.4	-20.0	-19.3	-18.6	-17.7	-16.7	-15.8	-14.6	-13.8	-12.1	-11.5	-11.2	-10.3	-11.1	-11.0	-10.7	-10.5	-10.3	-10.1	-9.9	-9.8	-14.7	-9.8
9-Jan	-9.4	-9.2	-8.9	-9.0	-9.4	-10.9	-11.6	-12.0	-11.8	-11.6	-10.8	-9.8	-9.6	-9.4	-9.4	-9.6	-9.4	-9.6	-10.7	-11.3	-11.6	-11.9	-12.1	-12.3	-10.5	-8.9
10-Jan	-12.6	-12.9	-13.3	-13.4	-13.5	-13.8	-13.9	-13.8	-13.8	-13.6	-13.0	-12.7	-12.7	-12.5	-12.5	-12.5	-12.1	-11.8	-12.5	-12.7	-13.8	-14.7	-15.7	-16.2	-13.3	-11.8
11-Jan	-17.1	-16.6	-16.9	-16.4	-15.3	-14.8	-15.0	-15.1	-15.5	-15.7	-15.6	-15.7	-15.3	-15.2	-15.0	-14.9	-14.9	-14.5	-14.8	-15.4	-15.6	-16.0	-16.4	-16.9	-15.6	-14.5
12-Jan	-17.4	-17.9	-19.1	-19.7	-20.0	-20.2	-20.6	-20.7	-20.3	-20.1	-19.3	-18.4	-18.0	-17.6	-16.8	-17.0	-19.0	-20.0	-20.5	-20.6	-20.4	-20.3	-19.7	-19.1	-19.3	-16.8
13-Jan	-18.2	-17.4	-16.6	-16.1	-15.6	-15.6	-16.1	-15.8	-14.9	-14.0	-13.8	-13.7	-14.4	-14.6	-15.2	-16.5	-18.5	-19.7	-21.5	-21.7	-21.8	-22.2	-22.6	-23.5	-17.5	-13.7
14-Jan	-24.4	-26.5	-28.3	-28.8	-28.1	-25.9	-23.6	-22.9	-21.8	-20.9	-19.2	-17.4	-15.4	-13.3	-11.8	-11.1	-10.5	-9.7	-8.8	-7.6	-6.3	-5.3	-5.1	-3.4	-16.5	-3.4
15-Jan	4.8	6.5	5.2	4.9	4.6	4.6	5.3	5.4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	6.5
16-Jan	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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NS	NS	NS	NS	NS	--	--
18-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
31-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
	-20.0	-20.1	-20.3	-20.3	-20.4	-20.4	-20.5	-20.5	-22.2	-21.8	-20.8	-19.7	-18.8	-18.5	-18.2	-18.4	-19.0	-19.3	-19.5	-19.8	-19.7	-19.7	-19.7	-19.6	Diurnal Average	
	4.8	6.5	5.2	4.9	4.6	4.6	5.3	5.4	-11.8	-11.6	-10.8	-9.8	-9.6	-9.4	-9.4	-9.6	-9.4	-9.6	-8.8	-7.6	-6.3	-5.3	-5.1	-3.4	Diurnal Maximum	

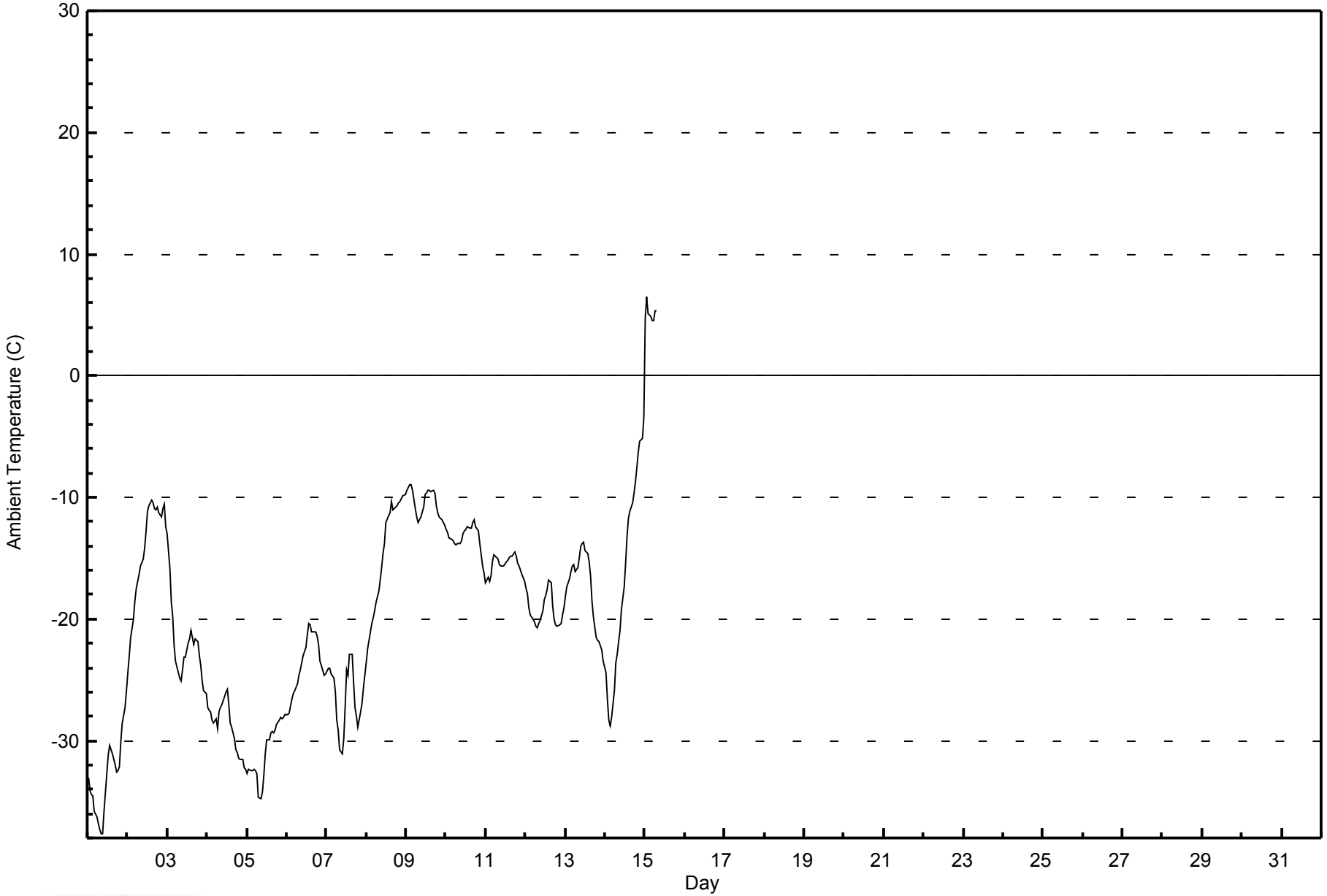
AF - Analyzer Failure NS - Not in Service

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Buffalo Viewpoint - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	174	50.58	50.58
-20 - 0	162	47.09	97.67
0 - 10	8	2.33	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 344

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - January 2014

Maximum Speed: 57 km/h on Jan 15 08:00

Maximum Daily Speed Average: 14.2 km/h on Jan 11

Minimum Speed Value: 0 km/h on Jan 3 13:00

Minimum Daily Speed Average: 0.9 km/h on Jan 12

Maximum Diurnal Speed Average: 3.4 km/h at hour 8

Minimum Diurnal Speed Average: 0.8 km/h at hour 21

Monthly Average Velocity: 0.1 km/h 92.0 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 7 Median = 9 Q_3 = 13 P_{90} = 19 P_{99} = 49

Hours in Service: 403

Hours of Data: 338

Hours of Missing Data: 65

Percent Operational Time: 83.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SE10	SE10	SE10	SSE7	SSE8	SE8	SSE8	SE8	SE9	SSE9	SE9	SE4	SE5	SE6	SE6	SE6	SE8	SE10	SE9	SE9	SE10	SSE10	SSE11	SSE10	SE8.3	SSE11
2-Jan	SSE10	SE8	SE11	SE9	SSE8	SSE7	SSE8	SSE9	SSE7	SSE8	SSE8	SSE9	SSE8	SE9	SSE10	SSE8	SSE10	SE12	SE7	S7	S7	SW3	NNW13	N23	SSE6.2	N23
3-Jan	N29	N34	N24	N19	N15	NNW7	N7	NNE7	NW3	AF	AF	E1	NNE0	NNE2	NW13	NW16	NW16	NW19	NW22	NW19	NW17	WNW14	WNW10	W8	NNW11.9	N34
4-Jan	SW7	SSW7	SW9	SW7	WSW8	WSW9	SSE7	WSW19	WSW18	W17	WNW19	WNW18	NNW27	N31	N27	NNW21	NW20	NW18	NW17	WNW14	WNW15	WNW12	WNW9	WNW10	WNW11.3	N31
5-Jan	WNW10	WNW8	W3	SSW6	SW5	WSW7	WSW6	SE7	SSE8	SE6	SSE5	SSE5	ESE6	SE8	SE8	SE9	SE9	SE9	SE8	SSE7	SSE6	SE7	SE8	SE8	SSE4.7	WNW10
6-Jan	SSE9	SSE9	SSE10	SE11	SSE9	SSE8	SSE7	SE9	SE9	SE10	SE12	SE11	SE9	SE8	ESE11	ESE9	E9	E8	E5	SE11	SE8	ENE8	E7	ESE5	SE8.3	SE12
7-Jan	SSE3	SW1	ESE2	ESE3	AF	AF	S4	S3	SE5	SE6	SE7	SSE5	SE5	E4	SE4	SSE5	SE6	SE7	SSE9	SE11	SE11	SE11	SSE12	SSE13	SE6.0	SSE13
8-Jan	SSE15	SSE15	SSE13	SSE11	SSE9	SSE9	SSE11	SSE10	SE10	SSE10	SSE8	SSE9	SSE8	SE5	SSE5	SSE4	SE6	SE4	SE5	SSE4	SE5	SE7	SE9	SE9	SSE8.2	SSE15
9-Jan	SE7	SE9	SE9	SSE7	S8	SSW7	S7	SSW6	SSW7	SE4	SSE3	NNE1	N5	N6	N7	N8	N10	N16	N18	N17	N16	N15	N16	NNW14	N3.5	N18
10-Jan	N15	N14	N15	NNW13	NNW10	NW9	NW8	NW8	N7	N5	N5	N5	N6	N2	AF	AF	W8	W12	W10	SW7	SW6	S3	SE7	SSE7	NW4.9	NNW15
11-Jan	SE4	N3	SSE3	E2	N5	N6	N9	N14	N15	N17	N16	N15	N16	N19	N18	N20	N20	N19	N23	N21	N23	N22	N24	N22	N14.2	N24
12-Jan	N24	N22	N24	N21	N19	N16	N10	NNE5	SE3	SSE5	SSE5	WSW9	WSW11	SW10	S9	S9	SSE10	SSE11	SSE13	SSE12	SSE13	SSE11	SSE10	SSE10	NE0.9	N24
13-Jan	SE11	SSE8	S4	S5	S4	SSE5	SSE6	WNW5	N13	NNW10	NNW9	N8	NNE10	NNE9	NNE11	NNE13	NNE10	N13	NNE9	NNW4	NW5	NNW4	NNW4	NW4	N3.6	NNE13
14-Jan	NW5	S3	SE8	SE9	SSE12	SE14	SE12	SE12	SE11	SSE12	SSE12	SE10	SSE9	SSE8	SE8	SSE10	SSE12	SSE15	SSE15	SSE16	SSE18	SE17	SE17	SE12	SE11.1	SSE18
15-Jan	WSW32	WSW49	W49	WNW46	W36	W30	WNW43	WNW57	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	WNW57
16-Jan	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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NS	NS	NS	NS	NS	----	----
18-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
19-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
20-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
21-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
22-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
23-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
24-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
25-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
26-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
27-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
28-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
29-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
30-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
31-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
	W1.0	W2.0	WNW1.5	WNW1.4	WSW2.4	SW2.4	SW2.4	W3.4	SSE2.0	SSE2.6	SE2.2	SE0.9	NE1.7	NE3.1	NE3.4	NNE2.1	NE1.5	NNE1.6	N1.3	SE0.9	SE0.8	E1.2	E1.9	ENE1.4	Diurnal Average	
	WSW32	WSW49	W49	WNW46	W36	W30	WNW43	WNW57	WSW18	W17	WNW19	WNW18	NNW27	N31	N27	NNW21	NW20	NW19	N23	N21	N23	N22	N24	N23	Diurnal Maximum	

AF - Analyzer Failure NS - Not in Service

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 14 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 1 16:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 11

Hours in Service:	403
Hours of Data:	338
Hours of Missing Data:	65
Hours of Calibration:	0
Percent Operational Time:	83.9

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

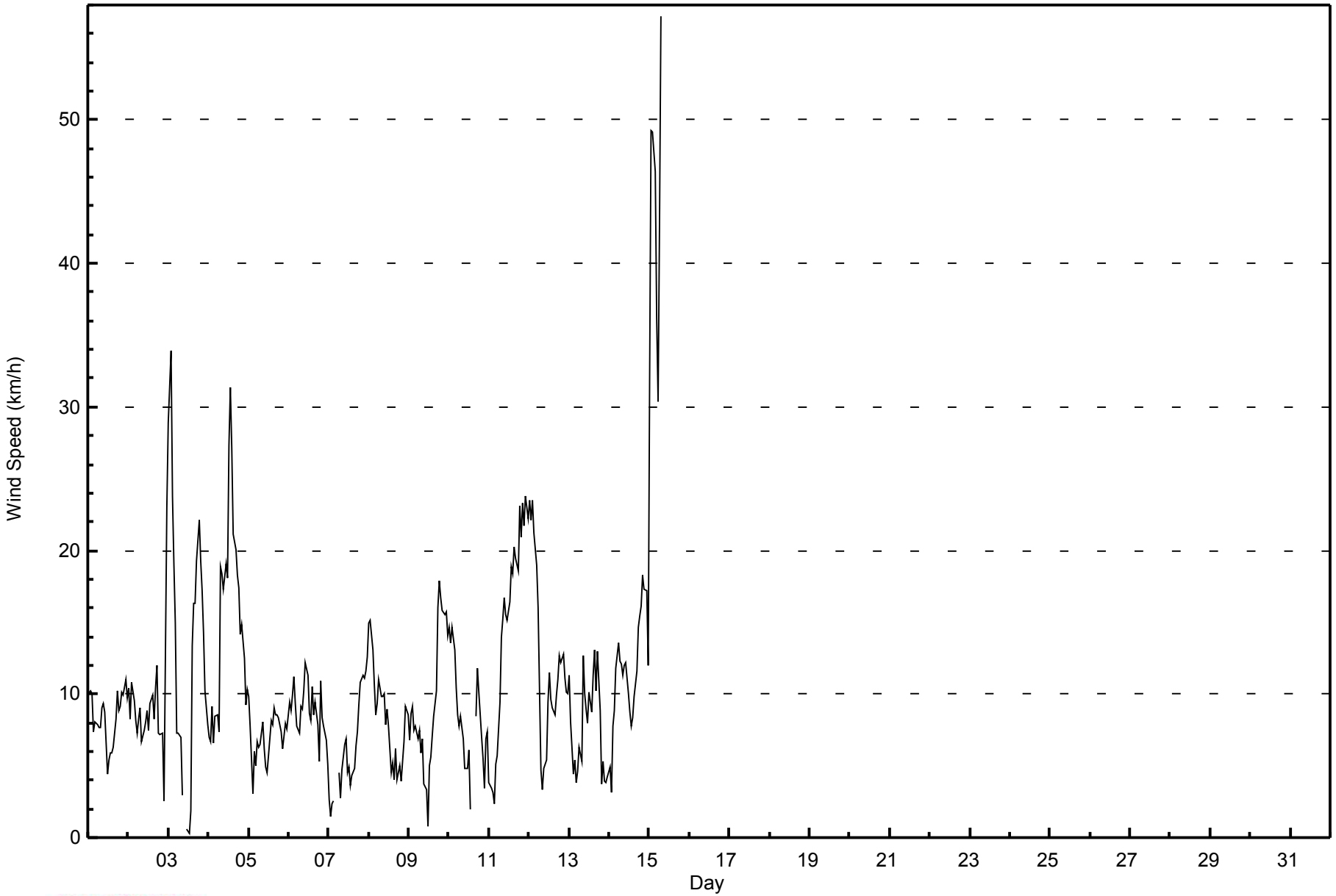
AF - Analyzer Failure NS - Not in Service

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Buffalo Viewpoint - January 2014



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ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	62	18.34	18.34
6 - 11	176	52.07	70.41
12 - 19	70	20.71	91.12
20 - 28	19	5.62	96.75
29 - 38	6	1.78	98.52
> 38	5	1.48	100.00

Total Number of Valid Hours: 338

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Buffalo Viewpoint - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	7	4	0	0	4	4	11	13	7	0	2	1	1	1	4	3	62
6 - 11	11	6	0	1	3	3	61	53	6	5	6	6	3	5	3	4	176
12 - 19	22	1	0	0	0	0	8	16	0	0	0	2	2	6	8	5	70
20 - 28	15	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	19
29 - 38	3	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	6
> 38	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0	0	5
Totals	58	11	0	1	7	7	80	82	13	5	8	11	9	15	17	14	338

Total Number of Valid Hours: 338

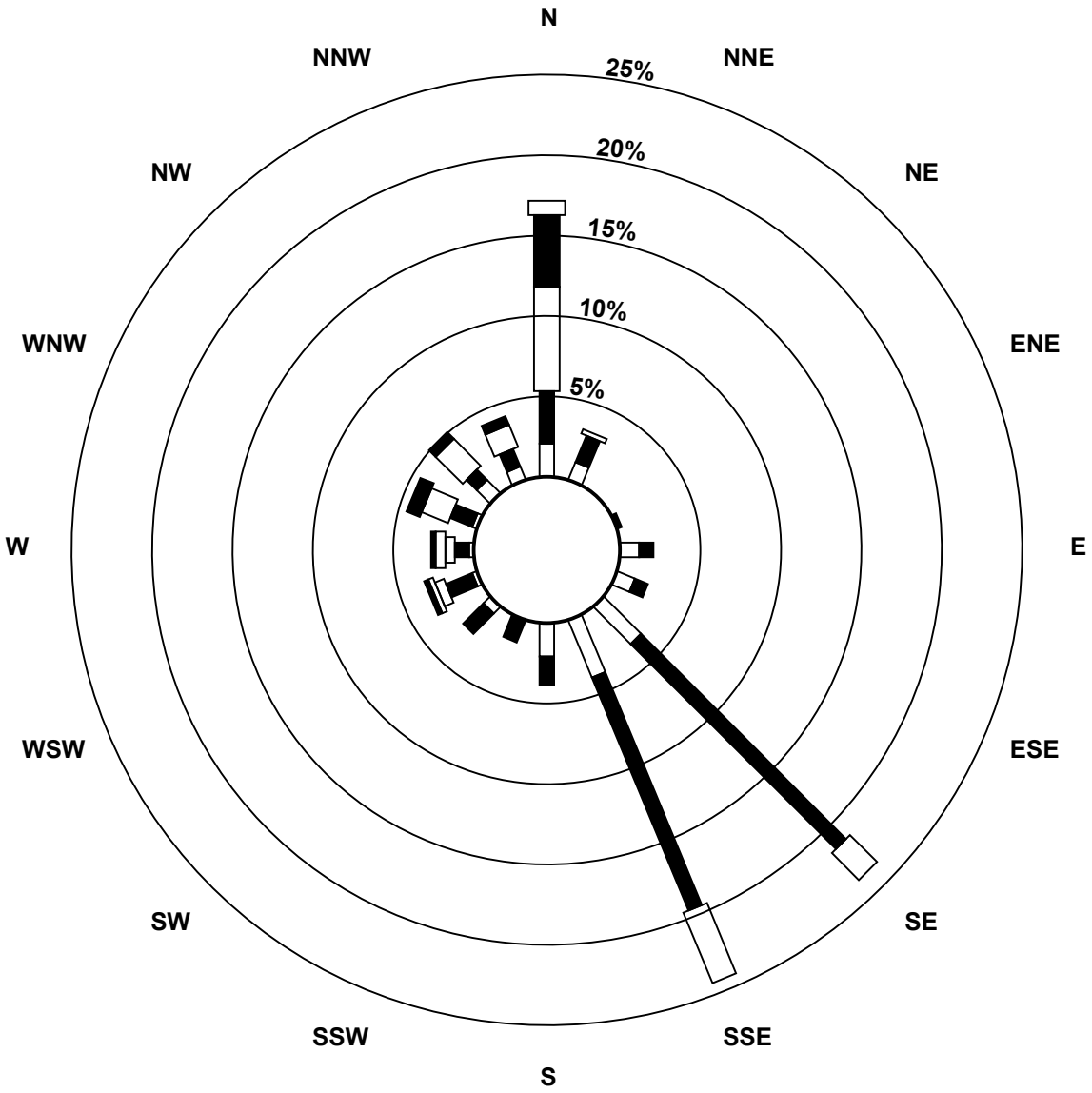
Total Number of Hours: 744

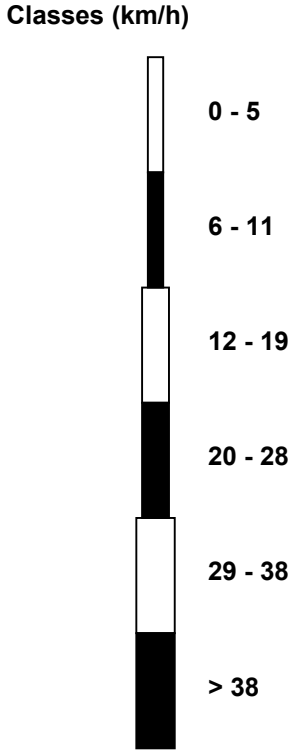
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Buffalo Viewpoint (AMS 4)





Total Number of Valid Hours: 338

Direction of Maximum Speed: 295 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 5.5 deg on Jan 11

Direction of Minimum Speed: 24 deg on Jan 3 13:00
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 12

Monthly Average Direction: 197.8 deg

Hours in Service:	403
Hours of Data:	338
Hours of Missing Data:	65
Percent Operational Time:	83.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	136	136	128	158	154	146	149	142	145	151	142	145	141	127	134	145	136	136	140	142	137	150	147	147	142.2
2-Jan	148	146	142	143	152	165	163	163	159	163	157	155	162	141	150	151	152	132	135	176	173	219	342	3	148.1
3-Jan	2	7	8	4	354	348	6	13	317	AF	AF	83	24	13	312	304	306	314	314	309	307	301	293	260	333.6
4-Jan	223	204	232	216	242	242	161	254	257	268	290	303	330	356	4	336	319	313	305	300	301	296	284	285	299.4
5-Jan	283	283	268	211	236	244	238	142	151	146	148	154	122	127	138	136	139	146	144	155	148	138	139	143	161.0
6-Jan	151	162	148	146	151	148	149	144	144	134	131	139	125	127	110	107	101	95	100	127	131	70	99	104	129.0
7-Jan	167	228	119	102	AF	AF	174	187	145	138	141	152	128	98	124	151	126	144	149	141	145	144	148	152	143.7
8-Jan	154	155	155	159	161	155	160	167	145	153	163	149	150	135	148	152	129	131	137	147	145	136	141	138	150.7
9-Jan	130	133	142	151	174	194	182	200	198	144	159	24	8	8	353	350	4	355	360	359	353	351	353	347	5.2
10-Jan	349	351	349	347	341	319	319	325	349	359	358	356	0	357	AF	AF	273	269	262	221	236	171	139	154	324.5
11-Jan	129	9	165	88	3	1	4	5	6	6	7	5	9	4	9	1	2	1	357	5	6	7	10	0	5.5
12-Jan	351	354	355	357	1	2	354	31	145	147	152	246	250	219	183	171	152	148	147	152	153	162	161	158	46.5
13-Jan	145	159	186	169	190	161	159	282	358	334	344	6	32	33	26	19	20	10	13	340	314	328	330	305	10.8
14-Jan	306	188	139	140	148	134	141	140	140	148	147	146	149	147	143	151	152	151	156	155	147	140	140	139	146.1
15-Jan	249	257	279	289	264	271	283	295	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
16-Jan	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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NS	NS	NS	NS	NS	--
18-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
19-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
20-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
21-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
22-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
23-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
24-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
25-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
26-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
27-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
28-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
29-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
30-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
31-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
	264.5	275.8	288.2	283.8	245.5	232.2	223.4	267.2	154.5	148.7	140.1	143.5	36.6	49.7	52.3	30.6	47.7	29.5	9.7	140.6	136.1	94.6	91.0	75.3	
	Diurnal Average																								

AF - Analyzer Failure NS - Not in Service
All monthly, daily, and diurnal averages have been calculated using vector methods

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 92 deg on Jan 3 13:00

Minimum Value: 5 deg on Jan 1 01:00

Percentiles: P_1 = 6 P_{10} = 8 Q_1 = 10 Median = 15 Q_3 = 18 P_{90} = 30 P_{99} = 83

Hours in Service:	403
Hours of Data:	338
Hours of Missing Data:	65
Hours of Calibration:	0
Percent Operational Time:	83.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	5	9	9	12	11	12	16	13	9	11	13	24	18	20	11	13	10	6	13	14	11	14	15	15	24
2-Jan	15	20	18	17	18	21	17	17	15	18	15	17	16	15	11	15	15	15	25	29	30	68	43	7	68
3-Jan	9	9	10	8	8	8	12	9	24	AF	AF	84	92	49	8	9	7	10	11	9	9	9	7	33	92
4-Jan	18	17	15	27	30	24	35	11	12	14	12	12	13	14	8	17	8	8	8	8	9	9	10	10	35
5-Jan	8	25	60	28	18	15	13	16	17	18	28	24	19	13	16	11	9	10	12	15	19	16	15	13	60
6-Jan	15	15	15	16	20	18	18	16	17	17	17	17	18	19	15	16	16	20	32	15	17	12	18	17	32
7-Jan	31	65	50	38	AF	AF	15	41	12	11	9	19	23	48	35	15	14	16	9	11	11	12	14	14	65
8-Jan	16	15	15	16	16	17	14	18	15	16	18	16	18	23	24	28	10	19	25	19	13	15	26	15	28
9-Jan	12	10	14	14	23	15	15	15	14	31	36	87	13	10	11	10	6	8	7	7	8	8	7	8	87
10-Jan	8	8	10	11	12	9	10	11	13	7	9	11	8	21	AF	AF	16	14	14	21	55	51	24	9	55
11-Jan	55	64	50	60	14	12	7	6	8	7	8	9	8	7	7	6	6	6	6	7	9	7	8	9	64
12-Jan	8	7	7	9	7	9	12	20	36	18	21	33	12	16	17	16	14	11	12	11	13	13	14	16	36
13-Jan	17	23	29	18	52	32	17	33	11	21	23	13	12	13	11	11	11	8	12	29	19	32	31	26	52
14-Jan	21	51	10	17	10	9	12	15	16	16	16	17	20	19	18	15	15	14	16	16	12	14	15	20	51
15-Jan	19	12	16	15	14	15	14	15	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	19
16-Jan	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-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	NS	NS	NS	NS	NS	--
18-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
19-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
20-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
21-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
22-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
23-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
24-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
25-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
26-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
27-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
28-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
29-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
30-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
31-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
	55	65	60	60	52	32	35	41	36	31	36	87	92	49	35	28	16	20	32	29	55	68	43	33	
	Diurnal Maximum																								

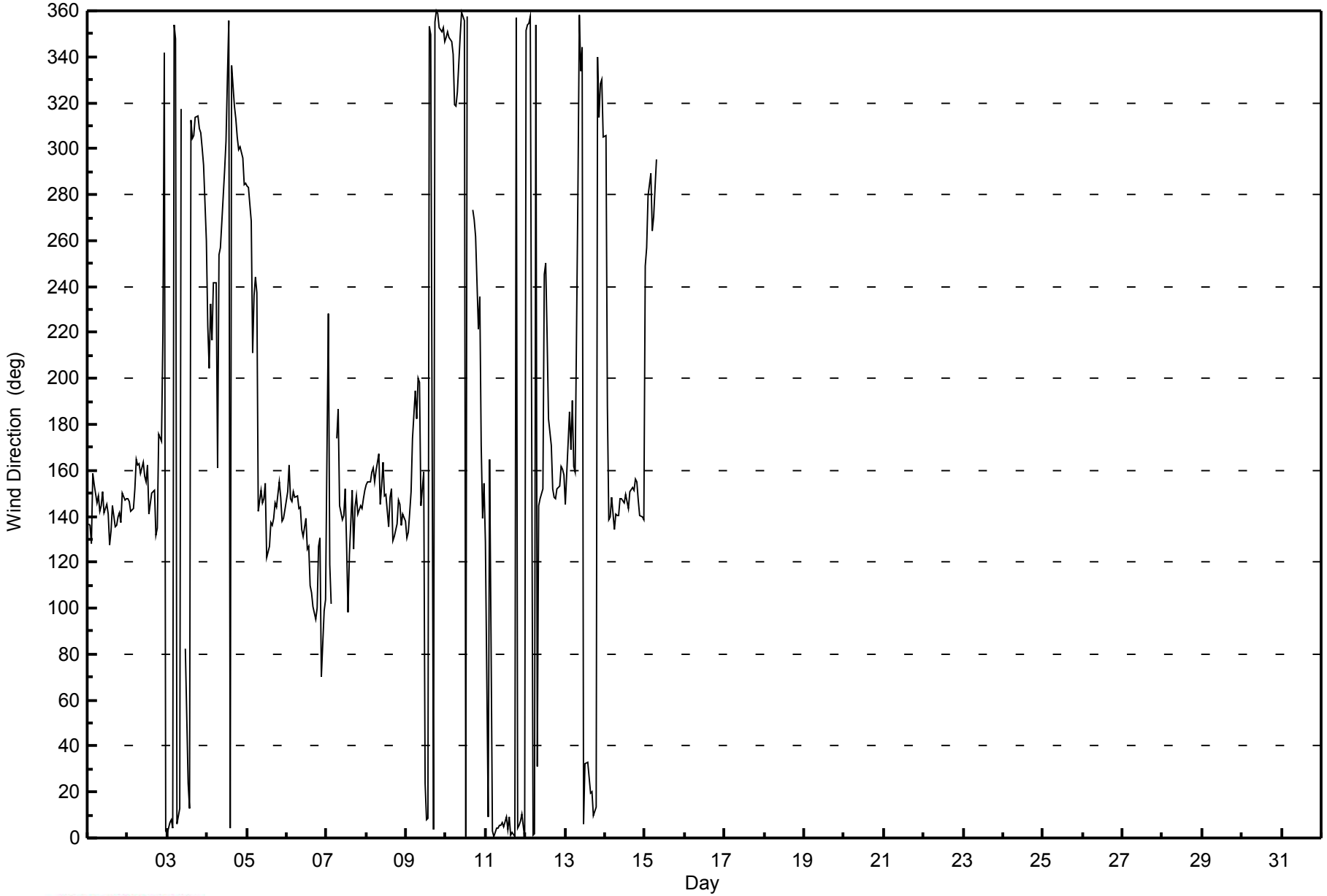
AF - Analyzer Failure NS - Not in Service

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Buffalo Viewpoint - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Buffalo Viewpoint	Station Number	AMS 4

Reason: Routine

Start Time (MST)	13:00	End Time (MST)	16:05
Barometric Pressure	N/A mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	11/23/2009
Gas Cert Reference	LL107926		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	11

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	634	634
Analyzer Range (mv)	5000	5000	Lamp voltage	874	874
Calculated slope	1.000702	1.000756	Chamber temp.	44.9	45.3
Calculated intercept	0.259186	0.432115	Pressure (mmHg)	700.4	683.6
Analyzer Background	7.7	7.7	Flow (lpm)	0.468	0.458
Analyzer Coefficient	0.999	0.999	Intensity	90%	90%

Analyzer make	TEI 43i	Analyzer serial #	1008841399

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.8	N/A
as found span	5000	58.8	599.8	597.2	1.004
calibrator zero	5000	0.0	0.0	-0.5	N/A
high point	5000	58.8	599.8	598.4	1.002
second point	5000	29.4	299.9	300.5	0.998
third point	5000	14.7	149.9	148.6	1.009
calibrator zero	5000	0.0	0.0	-0.5	N/A
as left zero	5000	0.0	0.0	-0.7	N/A
as left span	5000	58.8	599.8	596.6	1.005
				Average Correction Factor	1.003

Corrected As found	598.0	Previous response	599.9	% change	0.3%

Notes: Changed filter after as founds

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

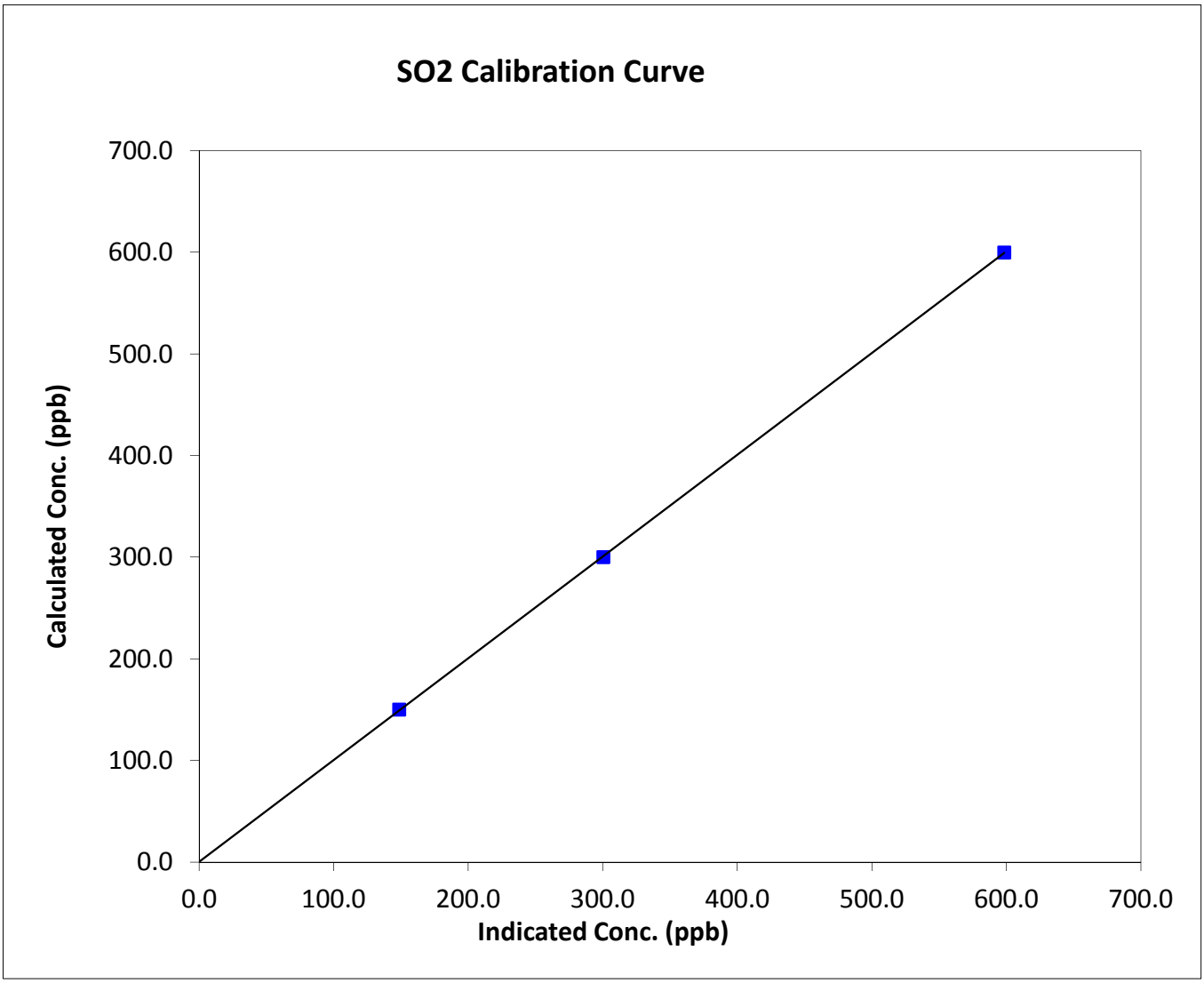
SO_2 Calibration Summary

Station Information

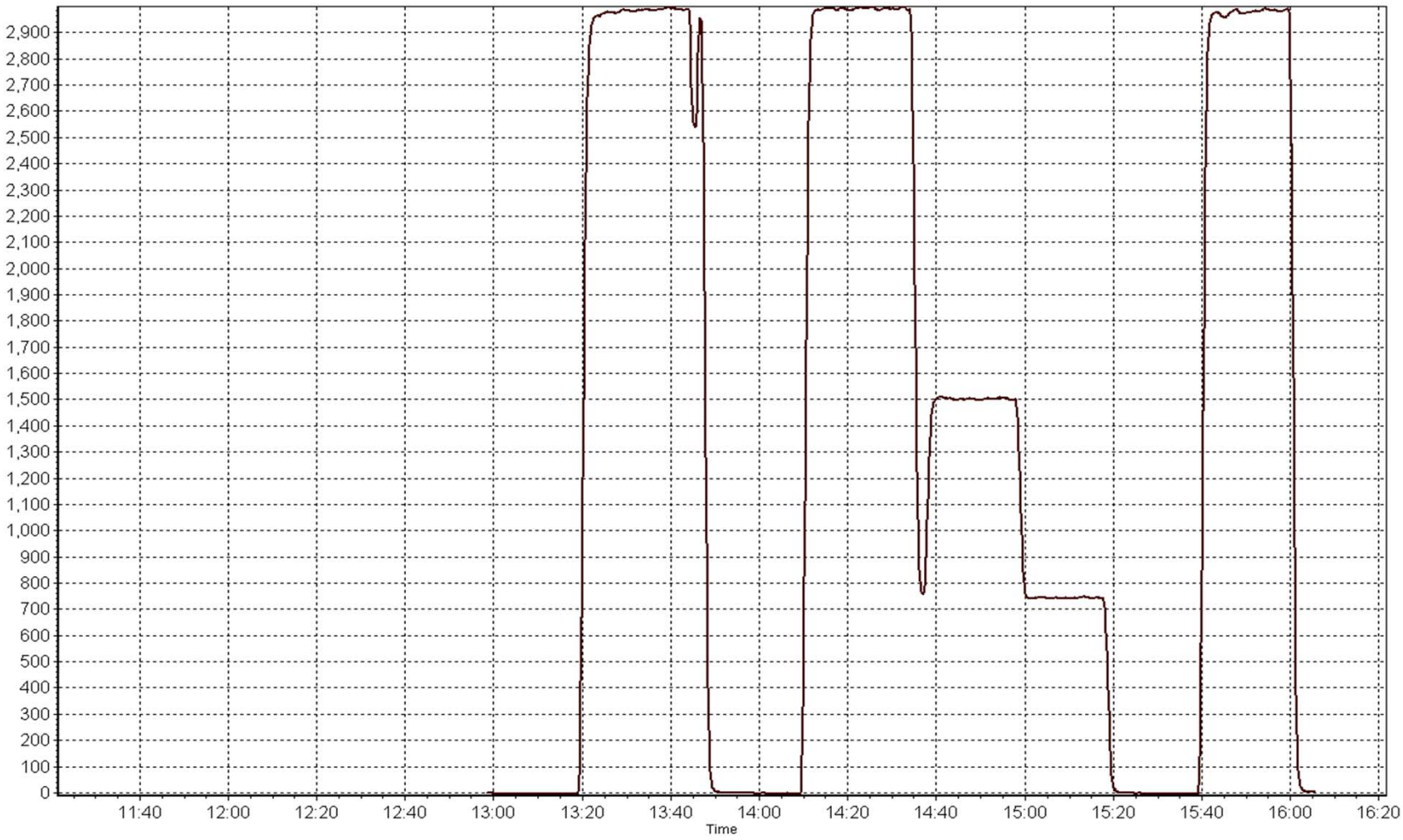
Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	13:00	End Time (MST)	16:05
Analyzer make	TEI 43i	Analyzer serial #	1008841399

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999987
599.8	598.4	1.0023		
299.9	300.5	0.9978	Slope	1.000756
149.9	148.6	1.0087		
			Intercept	0.432115



SO_2 Calibration Plot **Date:** January 8, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	10:10	End Time (MST)	13:00
Barometric Pressure	N/A mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11571008
Cal Gas Concentration	9.75 ppm H2S	Cal Gas Expiry Date	2/22/2016
Gas Cert Reference	LL101590	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	12

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-573	-573
Analyzer Range (mv)	5000	5000	Lamp voltage	926	926
Calculated slope	0.996687	0.996954	Chamber temp.	45	45
Calculated intercept	0.085296	0.084670	Pressure	530.4	517.4
Analyzer Background	12.7	13	Flow	0.942	0.920
Analyzer Coefficient	1.185	1.185	Intensity	85%	85%
			Converter temp.	336	336

Analyzer make/model	TEI 450i	Analyzer serial #	815129098
Converter make/model	N/A	Converter serial #	N/A

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.1	N/A
as found span	5998	46.1	74.9	75.1	0.998
SO2 scrubber check	5000	14.7	149.9	1.1	N/A
calibrator zero	6000	0.0	0.0	-0.1	N/A
high point	5998	46.1	74.9	75.1	0.998
second point	5998	25.8	41.9	42.0	0.999
third point	5994	15.4	25.1	25.1	0.999
calibrator zero	5000	0.0	0.0	-0.1	N/A
as left zero	5000	0.0	0.0	0.1	N/A
as left span	6000	46.2	75.1	75.1	0.999
				Average Correction Factor	0.999

Corrected As found	75.2	Previous response	74.6	% change	-0.7%

Notes: Changed filter

No adjustments

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

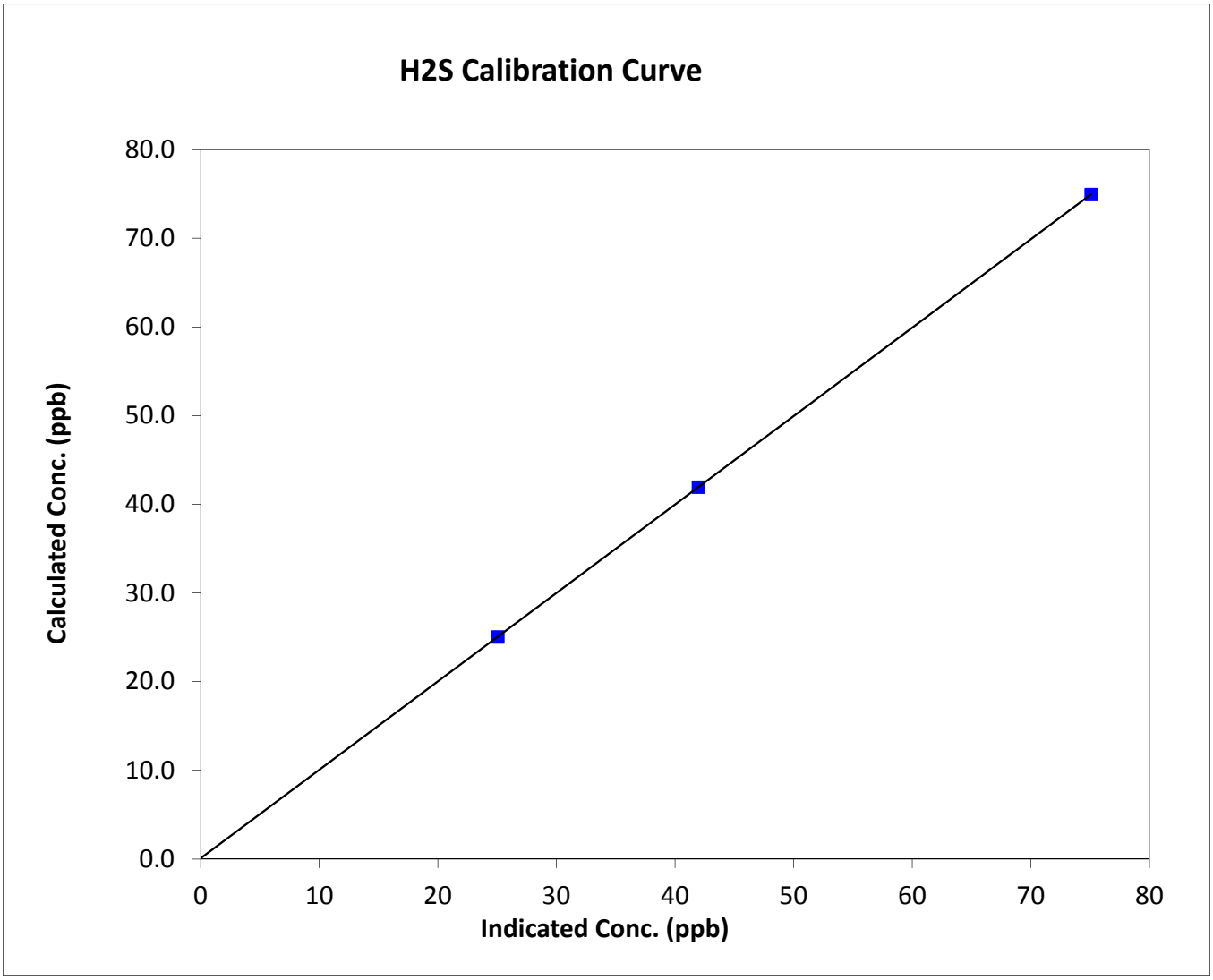
H2S Calibration Summary

Station Information

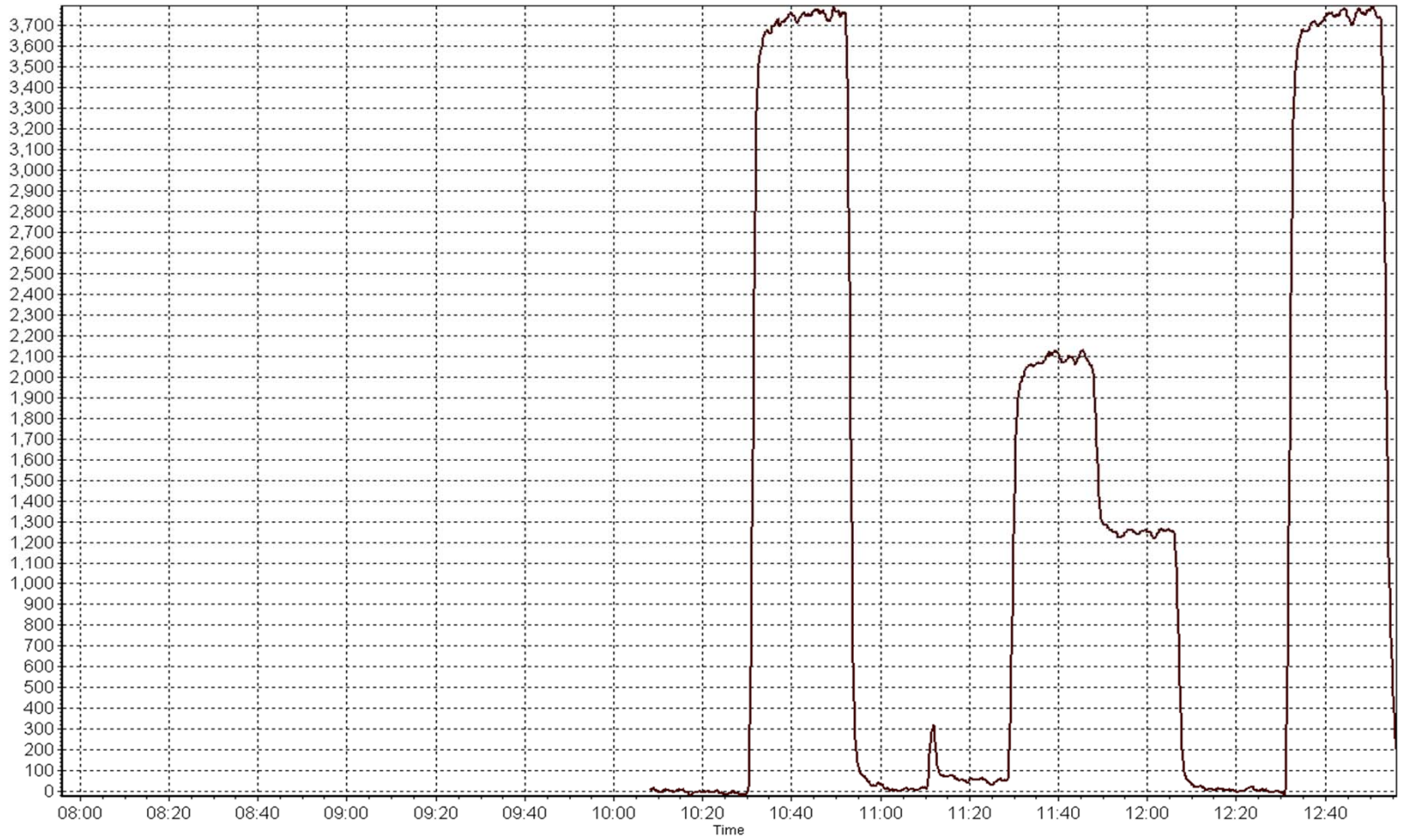
Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	10:10	End Time (MST)	13:00
Analyzer make	TEI 450i	Analyzer serial #	815129098

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	1.000000
74.9	75.1	0.9981		
41.9	42.0	0.9992	Slope	0.996954
25.1	25.1	0.9994		
			Intercept	0.084670



H2S Calibration Plot Date: Wednesday, January 08, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Wednesday, January 08, 2014	Previous Calibration	Tuesday, December 10, 2013
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Reason:	Routine		
Start Time (MST)	13:00	End Time (MST)	16:10
Barometric Pressure	N/A mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Gas Cert Reference	LL107926	Cal Gas Expiry Date	11/23/2009
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1067.8 ppm
C3H8 Cal Gas Conc.	201 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2586
DACS voltage range	0-5V	DACS channel #	19

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Flame Temp	136.3	136.3
Analyzer Range (mv)	5000	5000	Sample Pressure	8.5	8.5
Calculated slope	1.007854	0.999351	Fuel Pressure	19.9	19.9
Calculated intercept	-0.056049	-0.052750	Air Pressure	30.4	30.4
Background	2.31	2.24			
Coefficient	4.129	4.203			

Analyzer make	TEI 51i-LT	Analyzer serial #	1201650671

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0	-0.08	N/A
as found span	4997	58.8	12.56	12.17	1.032
calibrator zero	5000	0.0	0.00	0.01	N/A
high point	5000	58.8	12.56	12.58	0.998
second point	5000	29.4	6.28	6.40	0.980
third point	5000	14.7	3.14	3.20	0.981
calibrator zero	5000	0.0	0.00	0.02	N/A
as left zero	5000	0.0	0.00	0.05	N/A
as left span	5000	58.8	12.56	12.64	0.993
				Average Correction Factor	0.986

Corrected As found	12.25	Previous response	12.72	% change	3.8%

Notes: Changed filter after as founds
Adjusted zero and span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

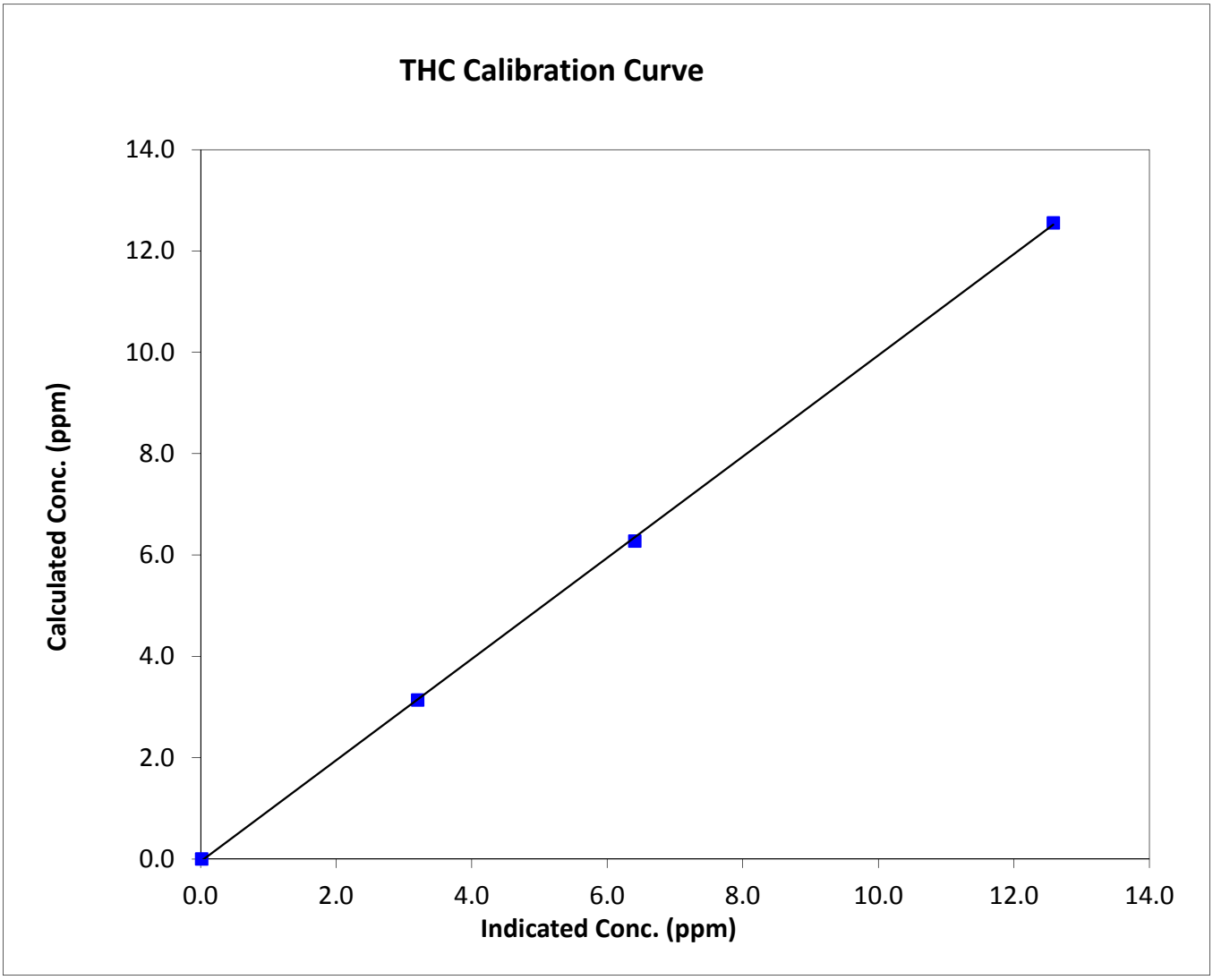
THC Calibration Summary

Station Information

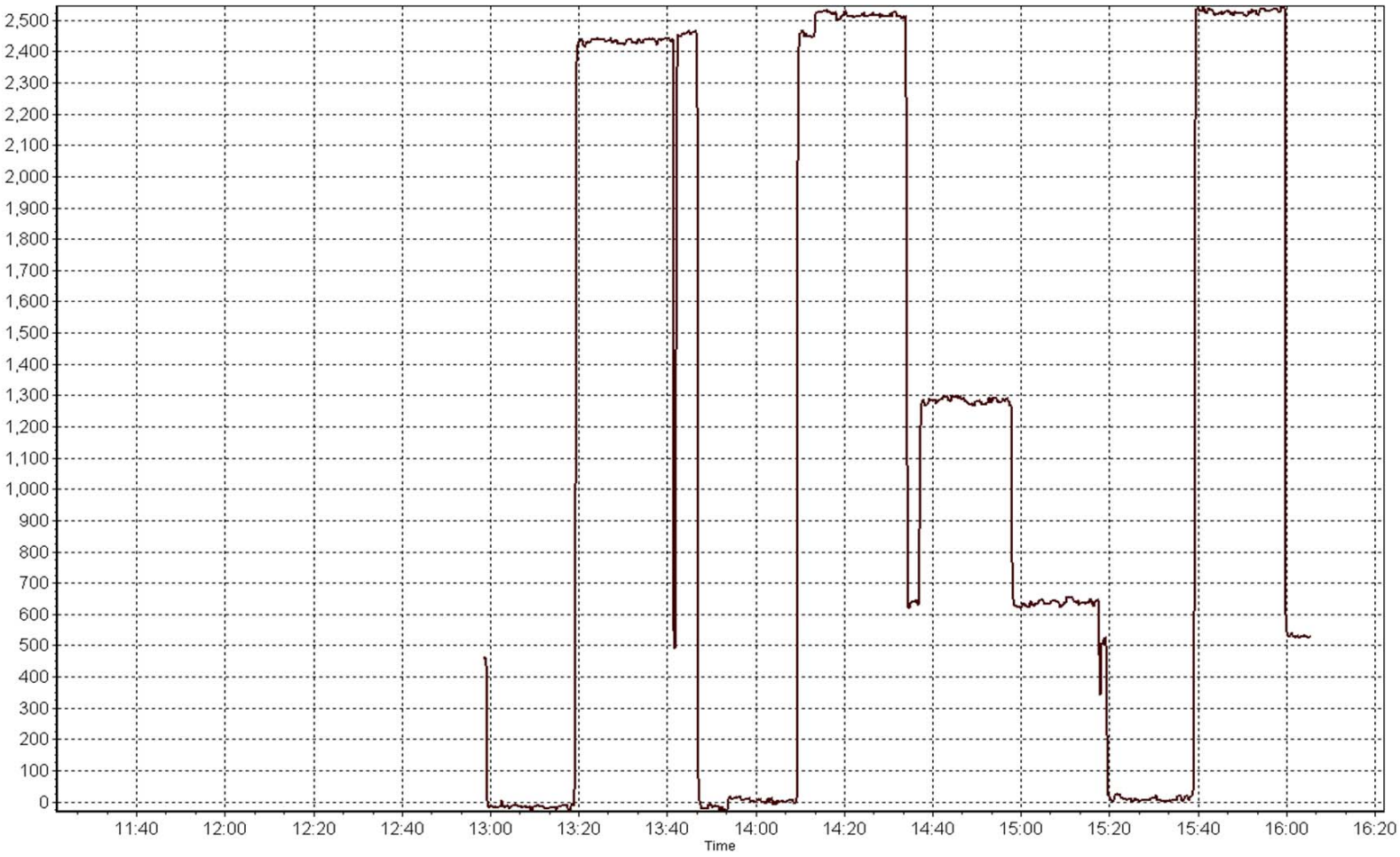
Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Buffalo Viewpoint	Station Number	AMS 4
Start Time (MST)	13:00	End Time (MST)	16:10
Analyzer make	TEI 51i-LT	Analyzer serial #	1201650671

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.01	N/A	Correlation Coefficient	0.999912
12.56	12.58	0.9981		
6.28	6.40	0.9804	Slope	0.999351
3.14	3.20	0.9806		
			Intercept	-0.052750



THC Calibration Plot **Date:** January 8, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 5
MANNIX
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2014

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	707	36	37	99.87	162	0	11	0
H2S (ppb) Average	708	36	36	100.00	3	0	1	0
THC (ppm) Average	709	34	35	99.87	4.6	-	2.6	-
Temperature 2 m (C) Average	688	0	56	92.47	6	-	0.7	-
Temperature 20 m (C) Average	688	0	56	92.47	6.7	-	1.5	-
Temperature 45 m (C) Average	687	0	57	92.34	6.8	-	1.6	-
Temperature 75 m (C) Average	655	0	89	88.04	6.9	-	1.6	-
Temperature 90 m (C) Average	652	0	92	87.63	7.1	-	1.5	-
Relative Humidity 2 m (%) Average	688	0	56	92.47	94	-	85	-
Relative Humidity 20 m (%) Average	688	0	56	92.47	95	-	85	-
Relative Humidity 45 m (%) Average	687	0	57	92.34	96	-	85	-
Relative Humidity 75 m (%) Average	655	0	89	88.04	94	-	85	-
Relative Humidity 90 m (%) Average	654	0	90	87.90	95	-	86	-
Wind Speed 20 m (km/h) Average	687	0	57	92.34	62	-	-	-
Wind Speed 45 m (km/h) Average	686	0	58	92.20	76	-	-	-
Wind Speed 75 m (km/h) Average	654	0	90	87.90	82	-	-	-
Wind Speed 90 m (km/h) Average	649	0	95	87.23	82	-	-	-
Wind Direction 20 m (deg) Average	687	0	57	92.34	-	-	-	-
Wind Direction 45 m (deg) Average	686	0	58	92.20	-	-	-	-
Wind Direction 75 m (deg) Average	654	0	90	87.90	-	-	-	-
Wind Direction 90 m (deg) Average	649	0	95	87.23	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	687	0	57	92.34	1.1	-	-	-
Vertical Wind Speed 45 m (km/h) Average	686	0	58	92.20	1.3	-	-	-
Vertical Wind Speed 75 m (km/h) Average	654	0	90	87.90	1.1	-	-	-
Vertical Wind Speed 90 m (km/h) Average	649	0	95	87.23	9.0	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	2.3	8	-	0	0	0	1	1	5	162
H2S (ppb) Average	708	0.5	0	-	0	0	0	0	1	1	3
THC (ppm) Average	709	2.36	0.3	-	2	2.1	2.2	2.3	2.4	2.7	4.6
Temperature 2 m (C) Average	688	-16.84	9.8	-	-36.5	-28.3	-24.1	-17.9	-10.6	-2	6
Temperature 20 m (C) Average	688	-16.45	9.9	-	-35.6	-28.1	-24	-17.8	-10	-1.2	6.7
Temperature 45 m (C) Average	687	-16.22	10	-	-34.7	-27.7	-23.9	-17.8	-9.5	-0.8	6.8
Temperature 75 m (C) Average	655	-15.86	10.2	-	-32.2	-27.5	-23.9	-17.3	-8.6	0.6	6.9
Temperature 90 m (C) Average	652	-15.75	10.1	-	-32.1	-27.2	-23.9	-17.1	-8.3	0.9	7.1
Relative Humidity 2 m (%) Average	688	75.3	8	-	50	66	70	76	81	86	94
Relative Humidity 20 m (%) Average	688	74.2	9	-	46	64	69	74	79	86	95
Relative Humidity 45 m (%) Average	687	73.5	9	-	45	61	68	73	79	86	96
Relative Humidity 75 m (%) Average	655	73	9	-	45	60	67	73	80	85	94
Relative Humidity 90 m (%) Average	654	73.6	10	-	45	60	68	74	80	86	95
Wind Speed 20 m (km/h) Average	687	11.5	8	-	0	4	7	10	14	20	62
Wind Speed 45 m (km/h) Average	686	16.3	9	-	1	6	10	15	20	27	76
Wind Speed 75 m (km/h) Average	654	19.7	11	-	1	6	12	19	25	32	82
Wind Speed 90 m (km/h) Average	649	20.9	11	-	1	7	13	20	27	33	82
Wind Direction 20 m (deg) Average	687	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	686	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	654	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	649	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	687	-0.02	0.3	-	-1.4	-0.4	-0.2	0	0.2	0.4	1.1
Vertical Wind Speed 45 m (km/h) Average	686	0.09	0.5	-	-1.9	-0.6	-0.2	0.1	0.5	0.7	1.3
Vertical Wind Speed 75 m (km/h) Average	654	0.11	0.3	-	-1.1	-0.3	-0.1	0.1	0.3	0.6	1.1
Vertical Wind Speed 90 m (km/h) Average	649	0.99	1.2	-	-1.5	-0.1	0.3	0.8	1.3	2.5	9

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	09 Jan 2014 09:00	09 Jan 2014 09:00	1	Maintenance - remotely initiated daily QA check
THC	09 Jan 2014 09:00	09 Jan 2014 09:00	1	Maintenance - remotely initiated daily QA check
Temperature, Relative Humidity 2m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 2m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 2m	09 Jan 2014 08:00	10 Jan 2014 09:00	26	DAS collection error - data not recorded
Temperature, Relative Humidity 2m	10 Jan 2014 15:00	11 Jan 2014 11:00	21	DAS collection error - data not recorded
Temperature, Relative Humidity 2m	11 Jan 2014 23:00	12 Jan 2014 01:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 20 m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 20 m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 20 m	09 Jan 2014 08:00	10 Jan 2014 09:00	26	DAS collection error - data not recorded
Temperature, Relative Humidity 20 m	10 Jan 2014 15:00	11 Jan 2014 11:00	21	DAS collection error - data not recorded
Temperature, Relative Humidity 20 m	11 Jan 2014 23:00	12 Jan 2014 01:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 45 m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 45 m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 45 m	09 Jan 2014 07:00	09 Jan 2014 08:00	2	Flatline in sensor output signal
Temperature, Relative Humidity 45 m	09 Jan 2014 09:00	10 Jan 2014 09:00	25	DAS collection error - data not recorded
Temperature, Relative Humidity 45 m	10 Jan 2014 15:00	11 Jan 2014 11:00	21	DAS collection error - data not recorded
Temperature, Relative Humidity 45 m	11 Jan 2014 23:00	12 Jan 2014 01:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 75 m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 75 m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Temperature, Relative Humidity 75 m	09 Jan 2014 07:00	09 Jan 2014 08:00	2	Flatline in sensor output signal
Temperature, Relative Humidity 75 m	09 Jan 2014 09:00	10 Jan 2014 09:00	25	DAS collection error - data not recorded
Temperature, Relative Humidity 75 m	10 Jan 2014 10:00	10 Jan 2014 15:00	6	Flatline in sensor output signal
Temperature, Relative Humidity 75 m	10 Jan 2014 16:00	11 Jan 2014 11:00	20	DAS collection error - data not recorded
Temperature, Relative Humidity 75 m	11 Jan 2014 12:00	12 Jan 2014 17:00	30	Flatline in sensor output signal
Temperature, Relative Humidity 90 m	02 Jan 2014 08:00	02 Jan 2014 15:00	8	Flatline in sensor output signal
Temperature, Relative Humidity 90 m	09 Jan 2014 07:00	09 Jan 2014 08:00	2	Flatline in sensor output signal
Temperature, Relative Humidity 90 m	09 Jan 2014 09:00	10 Jan 2014 09:00	25	DAS collection error - data not recorded
Temperature, Relative Humidity 90 m	10 Jan 2014 10:00	10 Jan 2014 15:00	6	Flatline in sensor output signal
Temperature, Relative Humidity 90 m	10 Jan 2014 16:00	11 Jan 2014 11:00	20	DAS collection error - data not recorded
Temperature, Relative Humidity 90 m	11 Jan 2014 12:00	12 Jan 2014 18:00	31	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	09 Jan 2014 08:00	10 Jan 2014 09:00	26	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	10 Jan 2014 15:00	11 Jan 2014 11:00	21	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	11 Jan 2014 23:00	11 Jan 2014 23:00	1	Unstable operation - spikes in output signal
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	12 Jan 2014 00:00	12 Jan 2014 01:00	2	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 20 m	15 Jan 2014 11:00	15 Jan 2014 11:00	1	Flatline in sensor output signal

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS 5)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	09 Jan 2014 08:00	10 Jan 2014 09:00	26	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	10 Jan 2014 15:00	11 Jan 2014 11:00	21	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	11 Jan 2014 23:00	12 Jan 2014 01:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 45 m	15 Jan 2014 10:00	15 Jan 2014 11:00	2	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	02 Jan 2014 09:00	02 Jan 2014 11:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	02 Jan 2014 13:00	02 Jan 2014 15:00	3	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	09 Jan 2014 07:00	12 Jan 2014 17:00	83	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 75 m	15 Jan 2014 11:00	15 Jan 2014 11:00	1	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	02 Jan 2014 07:00	02 Jan 2014 07:00	1	DAS collection error - data not recorded
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	02 Jan 2014 08:00	02 Jan 2014 15:00	8	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	09 Jan 2014 07:00	12 Jan 2014 18:00	84	Flatline in sensor output signal
Wind Speed. Wind Direction, Vertical Wind Speed 90 m	15 Jan 2014 10:00	15 Jan 2014 11:00	2	Flatline in sensor output signal

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 162 ppb on Jan 3 00:00 Maximum Daily Average: 10.8 ppb on Jan 11

Minimum Value: 0 ppb on Jan 4 05:00 Minimum Daily Average: 0.1 ppb on Jan 5
Maximum Diurnal Average: 8.3 ppb at hour 24 Minimum Diurnal Average: 0.8 ppb at hour 9
Monthly Average: 2.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 5$ $P_{99} = 27$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.4	1
2-Jan	0	Z	1	1	1	2	2	2	2	C	C	C	C	C	1	1	1	1	1	1	1	0	7	162	10.3	162
3-Jan	3	Z	12	8	3	3	2	0	0	1	1	2	2	1	1	1	0	2	6	0	0	0	0	0	2.1	12
4-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	3	1	1	1	0	2	2	1	0	0	0	0	0.5	3
5-Jan	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
6-Jan	0	Z	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
7-Jan	0	Z	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
8-Jan	0	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1
9-Jan	1	Z	0	0	0	0	0	0	M	0	0	0	0	0	1	3	5	6	4	31	6	3	2	2	3.0	31
10-Jan	2	Z	2	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.5	2
11-Jan	0	Z	1	1	1	1	1	3	2	1	1	3	4	6	13	8	15	4	8	15	19	76	34	31	10.8	76
12-Jan	22	Z	12	18	3	58	19	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	6.2	58
13-Jan	1	Z	0	0	0	1	1	1	1	2	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0.8	5
14-Jan	0	Z	0	0	0	0	0	0	1	0	1	1	1	2	1	1	1	1	1	0	1	0	0	1	0.6	2
15-Jan	0	Z	1	1	1	1	0	0	0	0	4	12	16	18	8	14	10	3	2	0	0	2	1	1	4.2	18
16-Jan	1	Z	1	0	0	1	1	1	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0.5	1
17-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	5	9	0.8	9
18-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	1	1	3	11	2	8	3	4	1	0	0	0	1.7	11
19-Jan	0	Z	1	1	2	2	0	1	1	1	7	11	16	24	18	10	9	4	4	4	1	0	8	4	5.6	24
20-Jan	1	Z	1	2	1	1	1	1	1	0	0	0	0	0	0	0	1	0	1	3	3	3	3	3	1.2	3
21-Jan	1	Z	1	1	1	1	1	3	3	1	14	6	1	0	0	0	0	0	0	0	0	0	0	0	1.5	14
22-Jan	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
23-Jan	0	Z	0	0	0	0	1	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0.4	1
24-Jan	0	Z	0	0	5	16	4	16	2	4	0	0	1	0	0	0	0	0	0	1	1	0	0	0	2.2	16
25-Jan	0	Z	0	0	0	0	0	0	0	5	3	6	2	0	2	6	14	5	8	3	0	0	10	7	3.2	14
26-Jan	3	Z	3	2	4	5	3	0	1	6	3	2	3	5	5	5	3	3	2	3	5	6	4	4	3.5	6
27-Jan	4	Z	3	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	1.2	4
28-Jan	0	Z	0	0	0	0	1	1	1	1	1	1	1	3	7	2	2	2	1	1	3	13	9	28	3.4	28
29-Jan	16	Z	20	13	5	1	3	2	1	3	3	6	1	2	2	2	1	1	0	1	0	0	0	1	3.7	20
30-Jan	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
31-Jan	1	Z	7	1	1	0	1	1	1	2	7	3	1	1	1	1	1	1	1	1	1	1	5	1	1.7	7
	2.0	--	2.3	1.8	1.1	3.1	1.5	1.2	0.8	1.2	1.9	2.2	1.9	2.5	2.3	2.3	2.3	1.5	1.6	2.3	1.5	3.5	3.0	8.3	Diurnal Average	
	22	--	20	18	5	58	19	16	3	6	14	12	16	24	18	14	15	8	8	31	19	76	34	162	Diurnal Maximum	

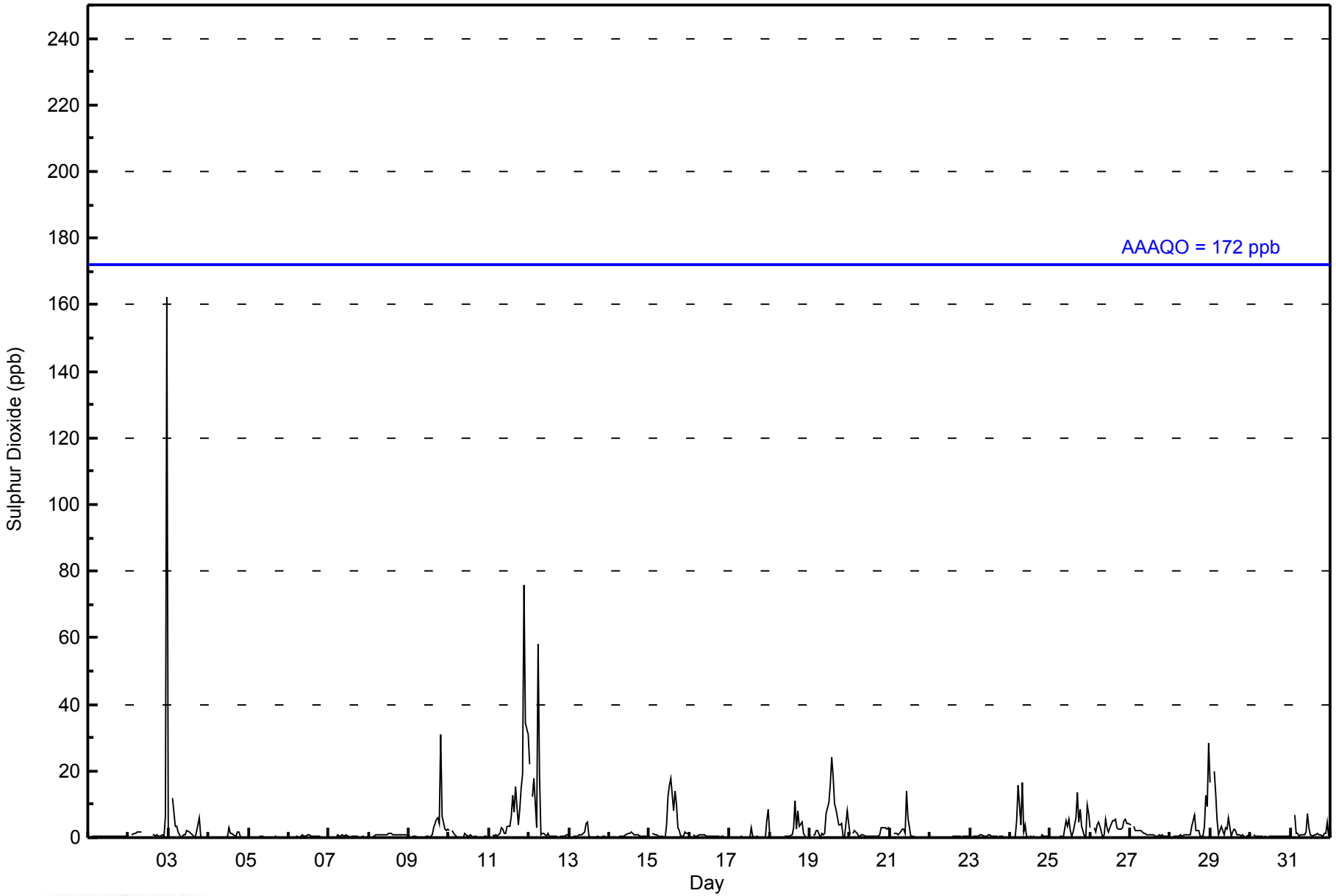
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	674	95.33	95.33
11 - 20	24	3.39	98.73
21 - 60	7	0.99	99.72
61 - 110	1	0.14	99.86
111 - 172	1	0.14	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	54	56	2	2	3	10	37	215	29	17	12	19	53	41	34	44	628
11 - 20	14	4	0	0	0	0	0	0	0	0	0	0	0	2	2	2	24
21 - 60	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
61 - 110	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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	72	61	2	2	3	10	37	215	29	17	12	19	53	43	36	46	657

Total Number of Valid Hours: 657

Total Number of Hours: 744

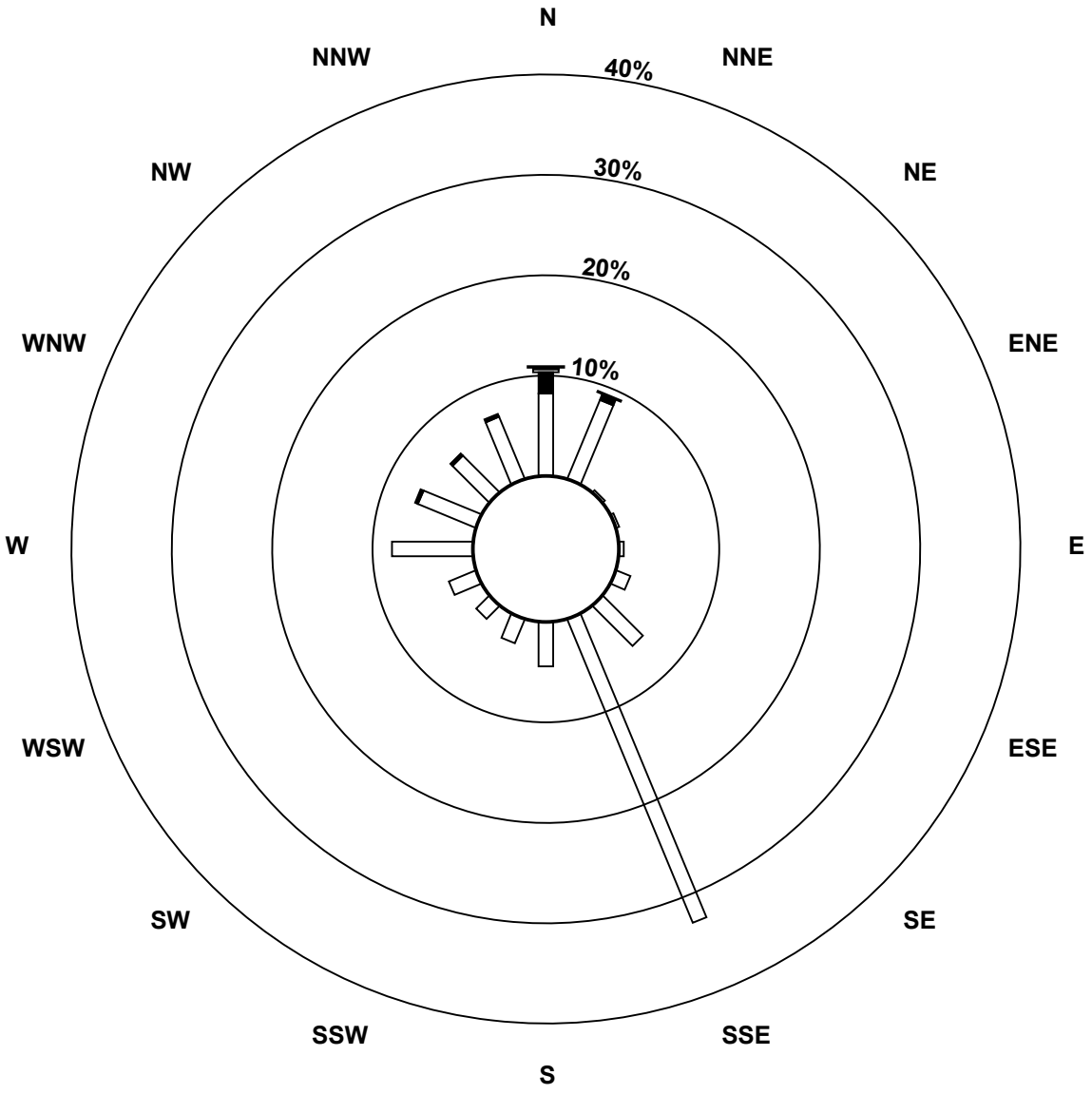
AURORA
ATMOSPHERICS INC.

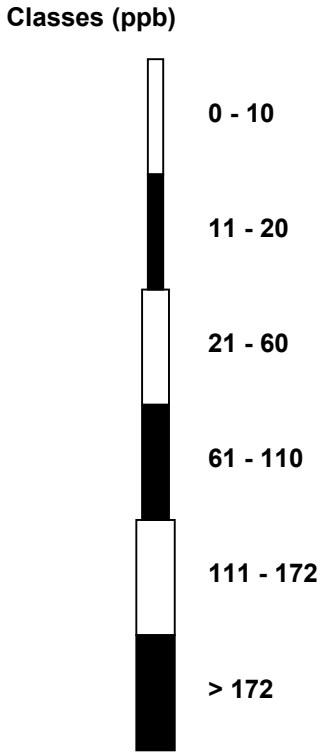
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Mannix (AMS 5)





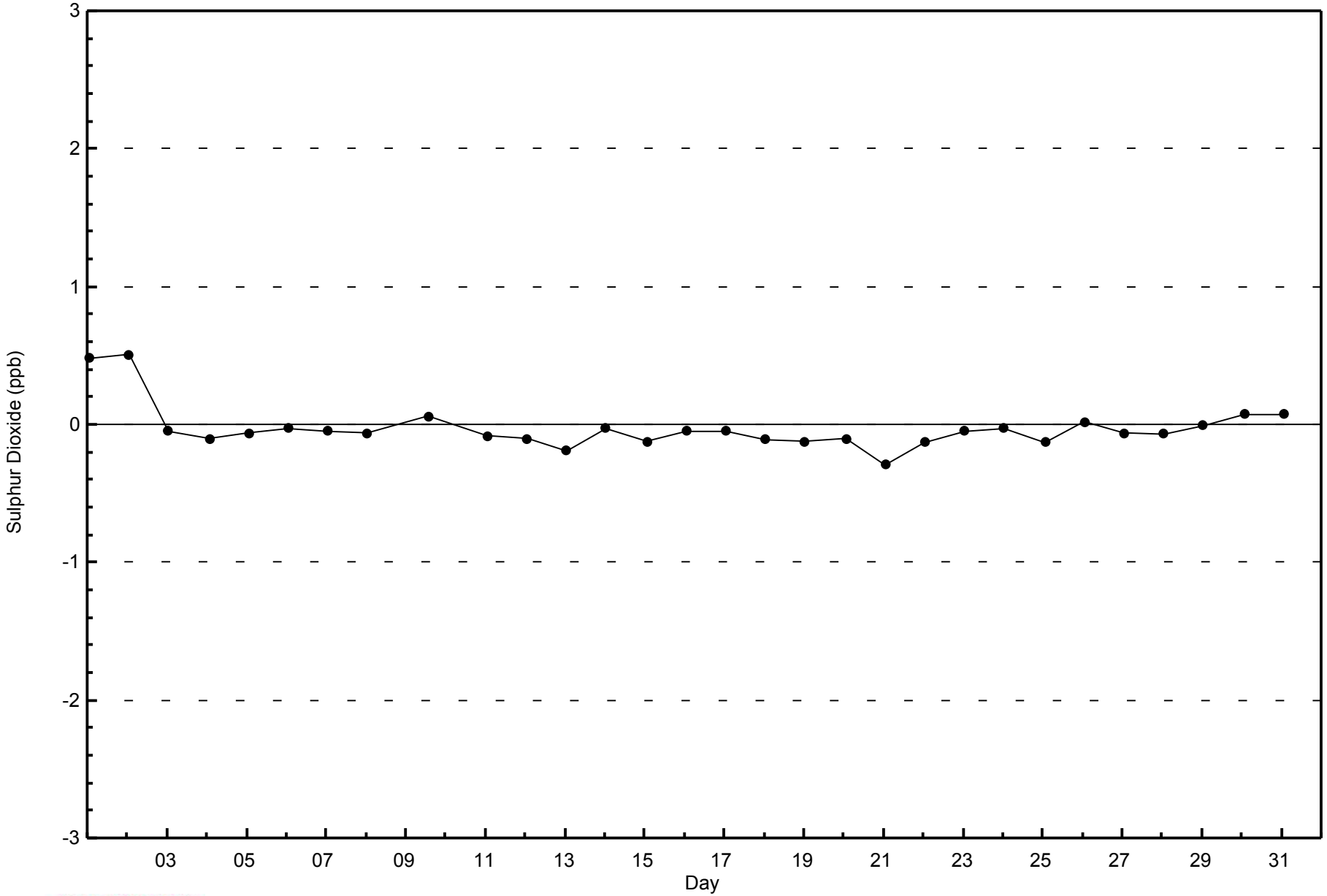
Total Number of Valid Hours: 657

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2014



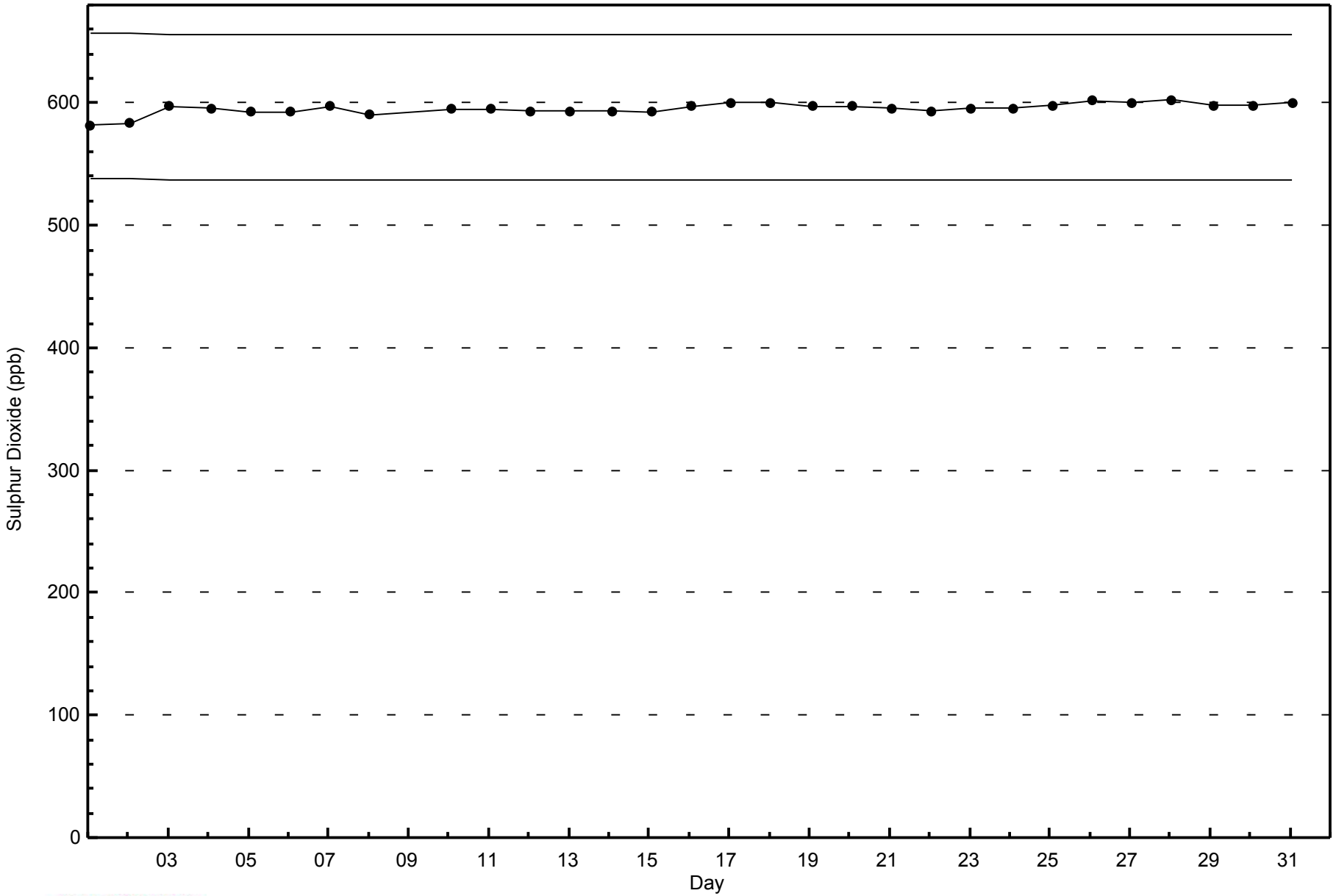
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 18 14:00 Maximum Daily Average: 1.0 ppb on Jan 11

Minimum Value: 0 ppb on Jan 3 06:00 Minimum Daily Average: 0.2 ppb on Jan 30
Maximum Diurnal Average: 0.6 ppb at hour 20 Minimum Diurnal Average: 0.5 ppb at hour 4
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
2-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0.4	2
3-Jan	0	0	Z	0	0	0	0	0	0	C	C	C	C	C	1	1	0	0	1	0	0	0	0	0	0.3	1
4-Jan	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
5-Jan	0	0	Z	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
6-Jan	0	0	Z	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
7-Jan	0	0	Z	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0.7	1
8-Jan	0	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.5	1
9-Jan	0	0	Z	0	0	0	0	0	0	0	1	0	0	1	1	2	1	1	1	2	1	1	0	0	0.7	2
10-Jan	0	0	Z	1	1	0	0	0	1	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0.5	1
11-Jan	0	1	Z	1	1	1	1	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1.0	2
12-Jan	1	1	Z	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
13-Jan	0	0	Z	0	0	0	1	1	1	1	1	1	0	1	1	0	0	1	0	0	1	1	0	1	0.5	1
14-Jan	1	1	Z	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	0	0	0	0	0	0.6	1
15-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0.5	1
16-Jan	1	1	Z	0	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0.6	1
17-Jan	0	0	Z	1	0	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	1	1	0.6	2
18-Jan	1	1	Z	0	1	0	1	1	1	1	1	1	1	3	2	2	2	1	1	1	1	1	1	1	1.0	3
19-Jan	1	1	Z	0	1	2	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0.6	2
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	1	1	0.5	2
21-Jan	1	1	Z	1	1	1	1	2	1	1	1	1	1	1	1	1	1	0	1	2	1	1	0	0	1.0	2
22-Jan	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0.4	1
23-Jan	0	0	Z	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
24-Jan	0	1	Z	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0.5	1
25-Jan	0	0	Z	0	0	0	1	1	1	2	1	1	0	0	0	0	1	0	1	1	0	0	0	1	0.5	2
26-Jan	0	1	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	0	1	1	0.5	1
27-Jan	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.5	1
28-Jan	0	0	Z	0	0	0	1	0	1	1	1	0	1	2	2	1	1	1	1	1	0	1	1	1	0.8	2
29-Jan	1	1	Z	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
30-Jan	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
31-Jan	0	1	Z	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
	0.5	0.5	--	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	Diurnal Average	
	1	1	--	1	1	2	1	2	1	2	1	1	1	3	2	2	2	1	1	2	1	2	1	2	Diurnal Maximum	

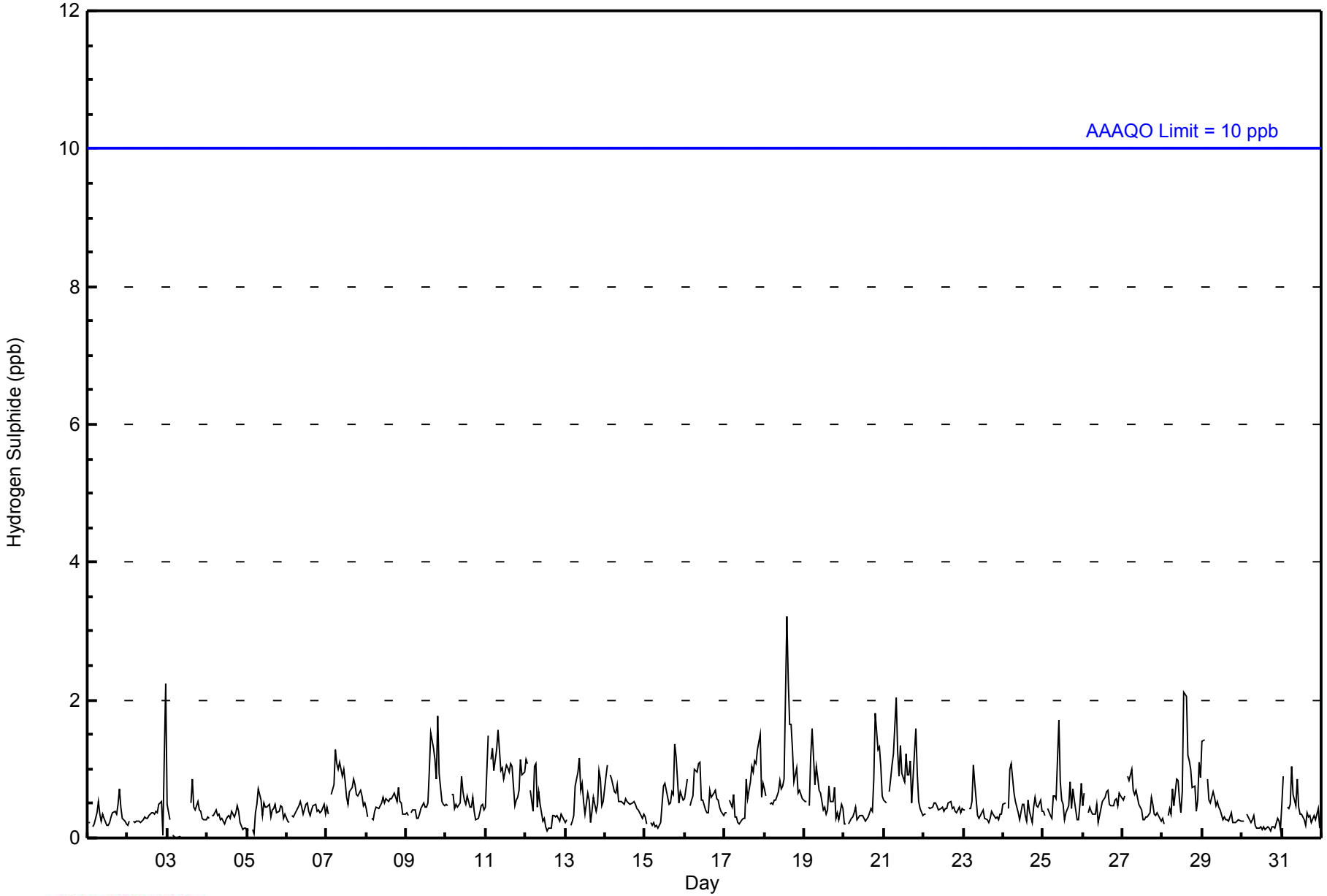
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	99.86	99.86
3 - 4	1	0.14	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: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	73	59	2	1	3	9	37	216	30	17	11	22	49	45	32	46	652
3 - 4	0	0	0	1	0	0	0	0	0	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	73	59	2	2	3	9	37	216	30	17	11	22	49	45	32	46	653

Total Number of Valid Hours: 653

Total Number of Hours: 744

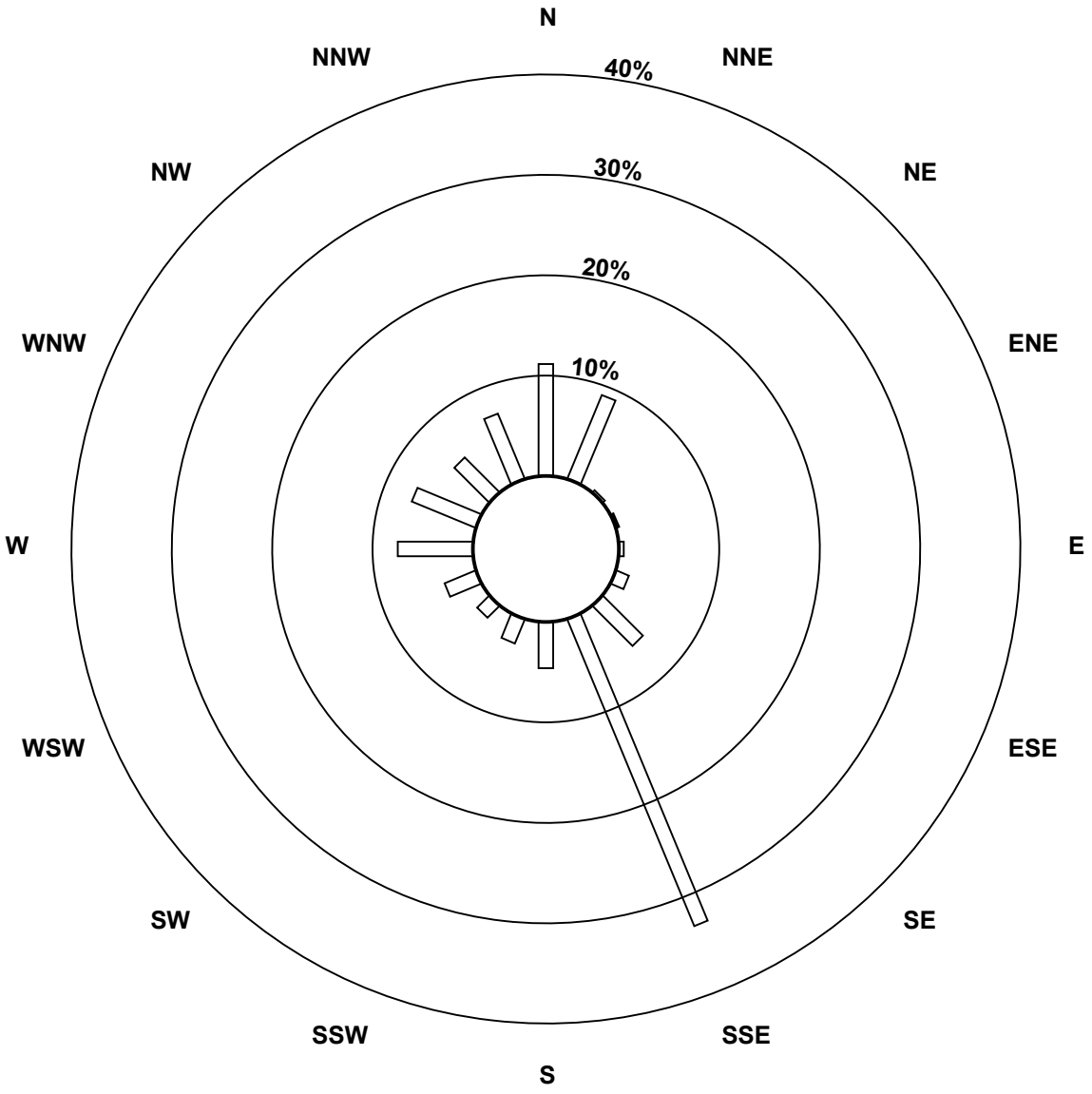
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

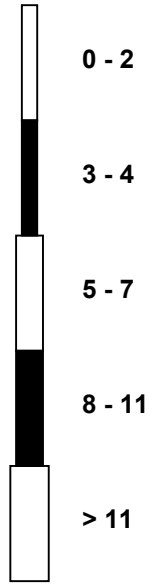
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

Mannix (AMS 5)



Classes (ppb)



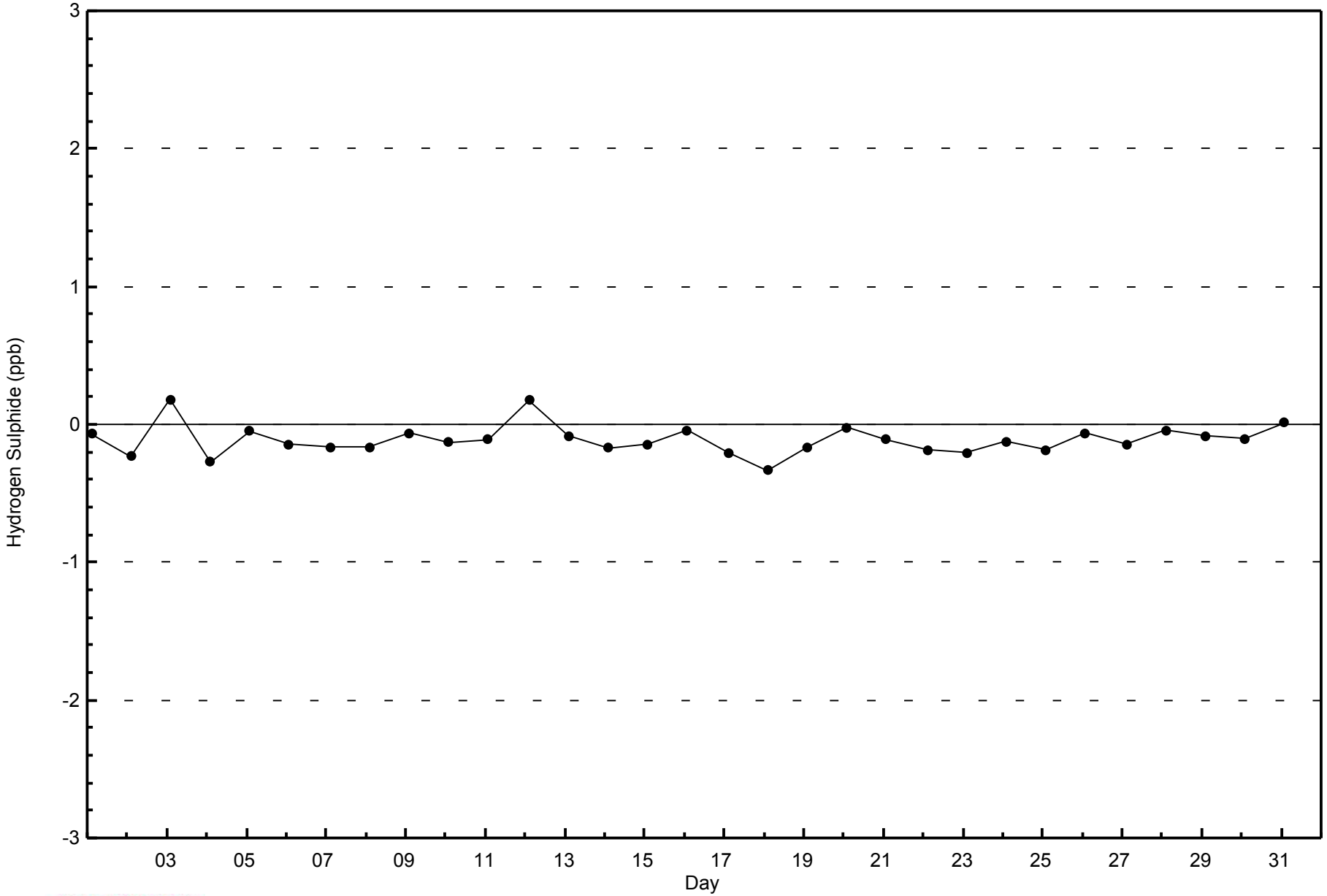
Total Number of Valid Hours: 653

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2014



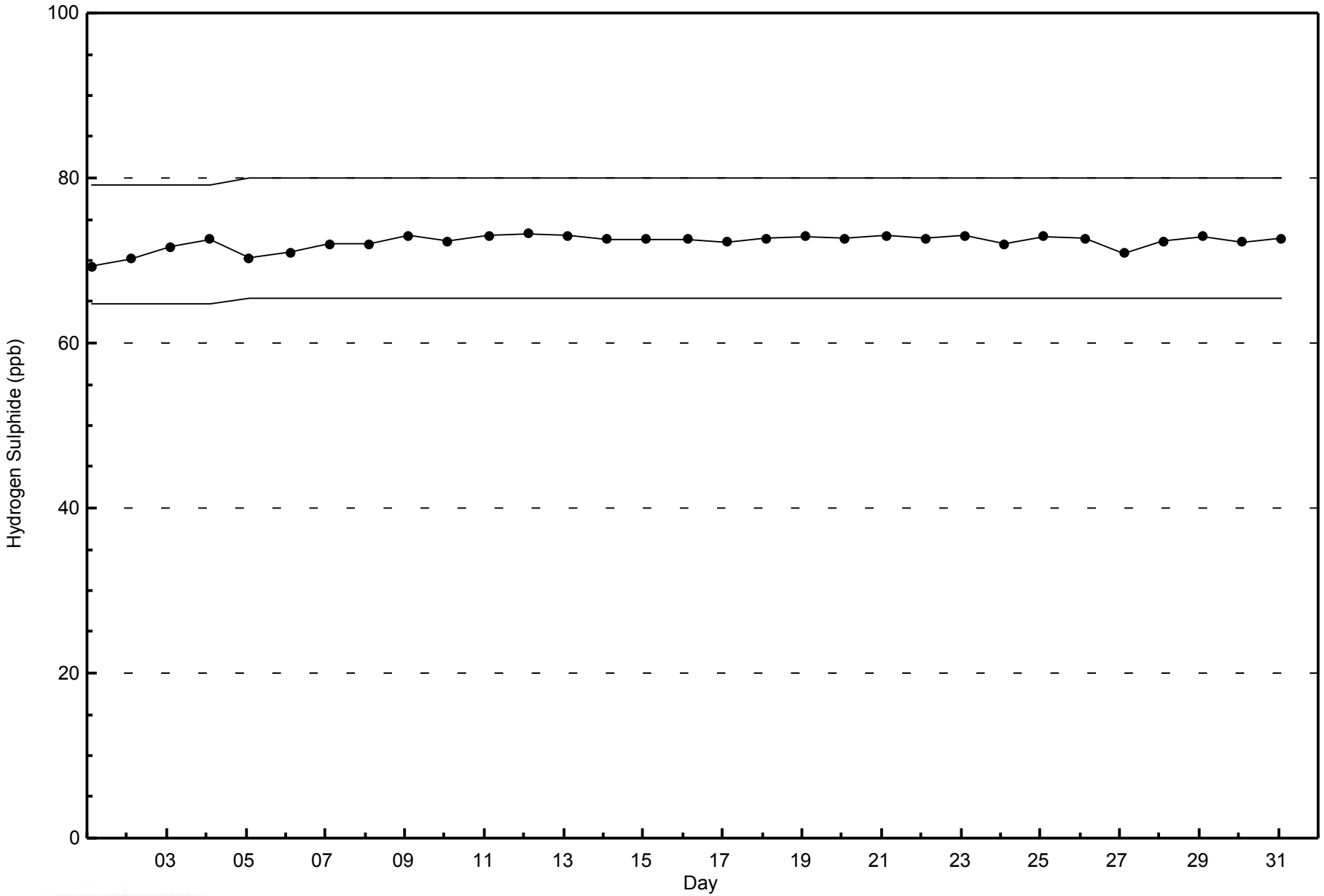
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - January 2014

Maximum Value: 4.6 ppm on Jan 28 15:00

Maximum Daily Average: 2.6 ppm on Jan 10

Minimum Value: 2.0 ppm on Jan 17 09:00

Minimum Daily Average: 2.1 ppm on Jan 25

Maximum Diurnal Average: 2.5 ppm at hour 15

Minimum Diurnal Average: 2.3 ppm at hour 24

Monthly Average: 2.36 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.4 P_{90} = 2.7 P_{99} = 3.2

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	34
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.3	Z	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5
2-Jan	2.4	Z	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.4	C	C	C	2.7	2.6	2.6	2.6	2.7	2.5	2.9	2.4	2.3	3.3	2.5	2.6	3.3
3-Jan	2.4	Z	2.3	2.4	2.3	2.3	2.2	2.3	2.2	2.4	2.4	2.5	2.5	2.9	3.4	2.9	2.6	2.8	2.8	2.4	2.5	2.2	2.2	2.2	2.5	3.4
4-Jan	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.4	3.7	2.5	2.3	2.2	2.2	2.2	2.2	2.3	3.7
5-Jan	2.2	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.8	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.8
6-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.3	2.3	2.2	2.1	2.4	2.7	2.4	2.2	2.7
7-Jan	2.5	Z	2.4	2.5	2.5	2.6	2.6	2.3	2.4	2.4	2.4	2.3	2.5	2.3	2.4	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.6
8-Jan	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4
9-Jan	2.4	Z	2.2	2.2	2.2	2.3	2.2	2.2	M	2.2	2.2	2.2	2.5	2.3	2.7	3.2	2.9	2.9	2.4	2.4	2.3	2.2	2.1	2.1	2.4	3.2
10-Jan	2.2	Z	2.2	2.8	2.7	2.9	2.8	2.7	3.0	2.9	2.9	2.7	2.9	3.1	2.9	2.5	2.5	2.2	2.1	2.1	2.2	2.4	2.3	2.3	2.6	3.1
11-Jan	2.3	Z	3.7	2.9	3.1	3.0	2.9	2.8	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.5	3.7
12-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.4	2.5	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.5
13-Jan	2.2	Z	2.1	2.1	2.2	2.1	2.2	2.2	2.8	2.8	2.6	2.3	2.2	2.2	2.3	2.2	2.3	2.4	2.3	2.3	3.0	2.8	2.3	2.6	2.4	3.0
14-Jan	2.7	Z	2.7	2.8	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.4	2.8
15-Jan	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.9	3.0	2.7	2.2	2.5	2.5	2.3	2.4	2.5	2.3	2.3	2.3	2.3	2.3	3.0
16-Jan	2.3	Z	2.3	2.5	2.6	2.3	2.6	2.8	2.3	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.5	2.6	2.3	2.4	2.3	2.3	2.3	2.4	2.8
17-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.4	2.8	2.9	2.5	2.4	2.4	2.4	2.4	2.4	2.2	2.3	2.3	3.4
18-Jan	2.3	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.4	2.4	2.5	3.3	3.0	2.5	3.0	2.3	2.2	2.5	2.5	3.0	3.0	2.4	2.5	3.3
19-Jan	2.5	Z	2.3	2.5	2.6	2.7	2.7	2.7	2.5	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.4	2.3	2.2	2.3	2.4	2.7
20-Jan	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.9	3.3	3.2	2.7	2.4	2.3	3.3
21-Jan	2.6	Z	2.3	2.4	2.5	2.8	2.9	2.6	2.8	2.8	2.5	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.5	2.7	2.6	2.3	2.2	2.2	2.5	2.9
22-Jan	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	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.2	2.4
23-Jan	2.4	Z	2.3	2.3	2.4	2.3	2.6	2.4	2.2	2.1	2.1	2.2	2.4	2.1	2.1	2.2	2.1	2.4	2.4	2.1	2.1	2.2	2.2	2.3	2.3	2.6
24-Jan	2.4	Z	2.1	2.4	2.6	2.3	2.5	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.4	2.6	2.9	2.8	2.5	2.4	2.4	2.9
25-Jan	2.3	Z	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.3	2.4	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.4
26-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.5	2.5	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.5	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.4	2.7
27-Jan	2.3	Z	2.3	2.3	2.4	2.4	2.3	2.3	2.3	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	2.2	2.3	2.3	2.4
28-Jan	2.3	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.4	3.1	4.6	4.1	3.1	2.7	2.3	2.4	2.3	2.3	2.2	2.2	2.5	4.6
29-Jan	2.2	Z	2.2	2.2	2.2	2.5	2.3	2.4	2.5	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	2.3	2.3	2.5
30-Jan	2.3	Z	2.4	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4
31-Jan	2.6	Z	2.2	2.5	2.5	2.4	2.5	2.5	2.3	2.5	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.2	2.4	2.6
	2.3	--	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	Diurnal Average	
	2.7	--	3.7	2.9	3.1	3.0	2.9	2.8	3.0	2.9	2.9	2.9	3.0	3.4	4.6	4.1	3.1	3.7	2.8	2.9	3.3	3.2	3.3	2.6	Diurnal Maximum	

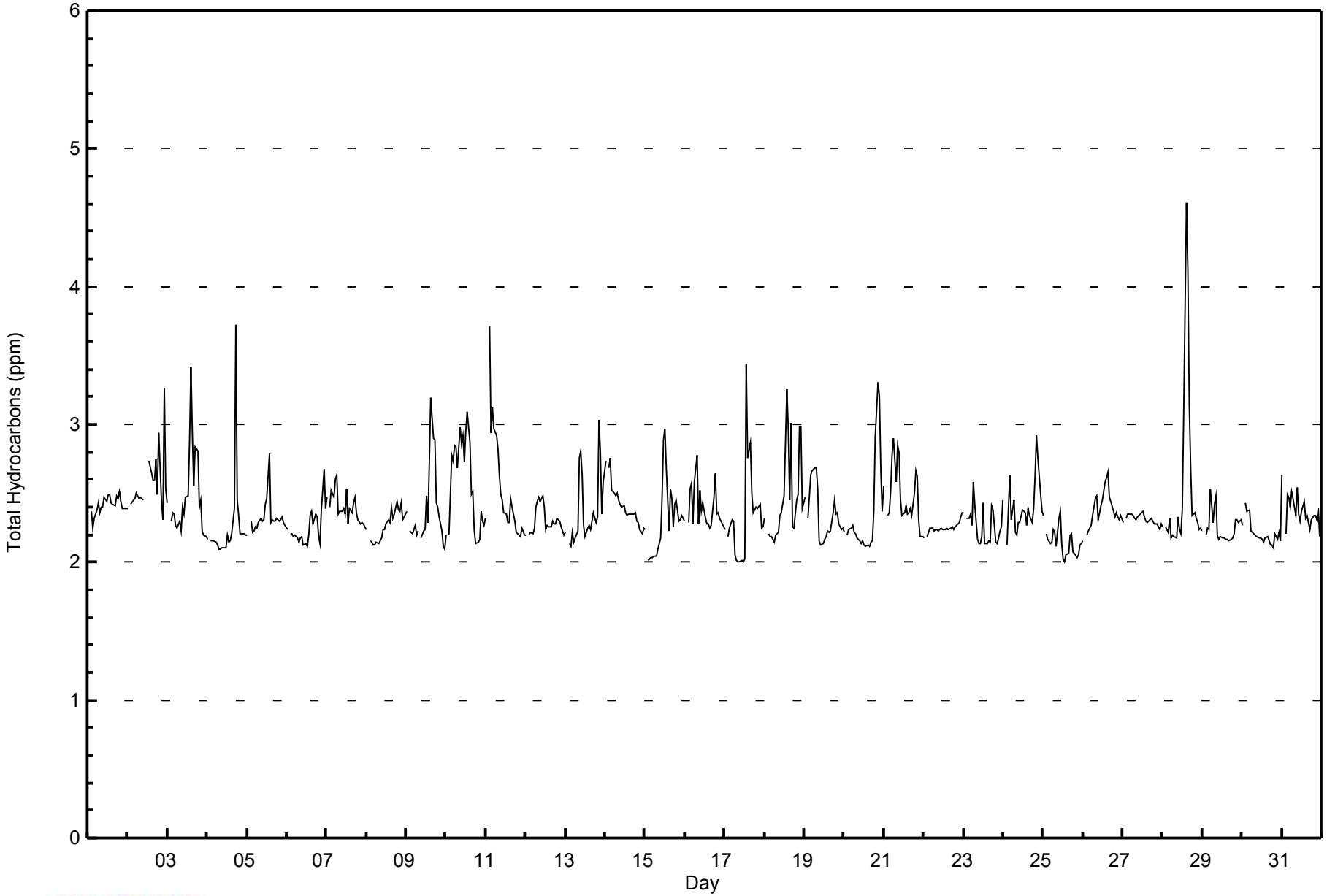
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	16	2.26	2.26
2.1 - 3.0	678	95.63	97.88
3.1 - 10.0	15	2.12	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Mannix - January 2014

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	1	0	0	0	0	0	0	0	0	0	0	0	12	1	0	2	16
2.1 - 3.0	71	60	2	1	3	10	37	215	29	17	12	19	41	41	28	43	629
3.1 - 10.0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	8	1	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	61	2	2	3	10	37	215	29	17	12	19	53	43	36	46	657

Total Number of Valid Hours: 657

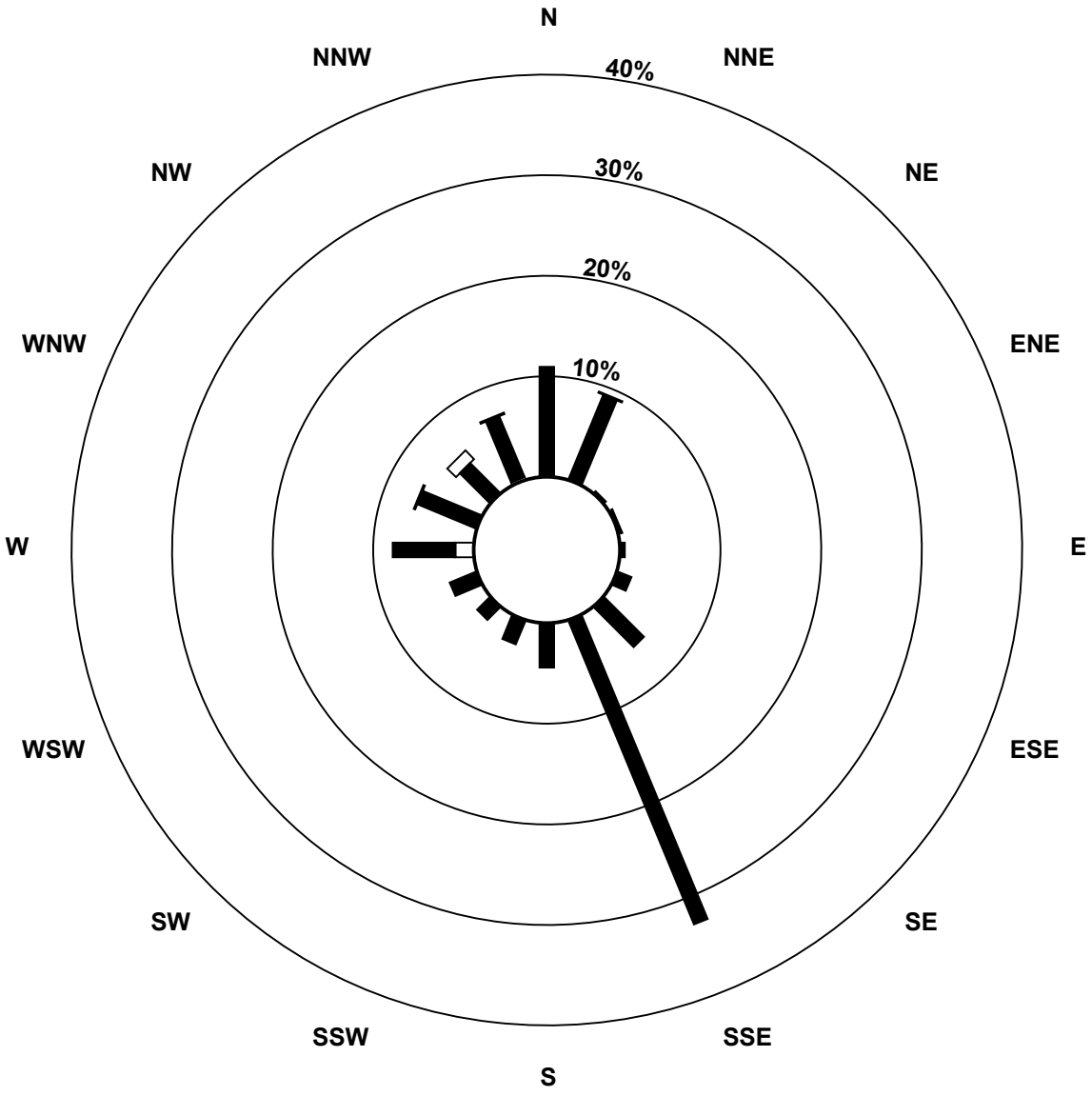
Total Number of Hours: 744

Wood Buffalo Environmental Association

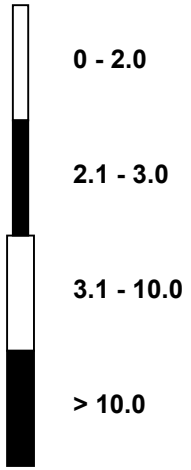
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Mannix (AMS 5)



Classes (ppm)



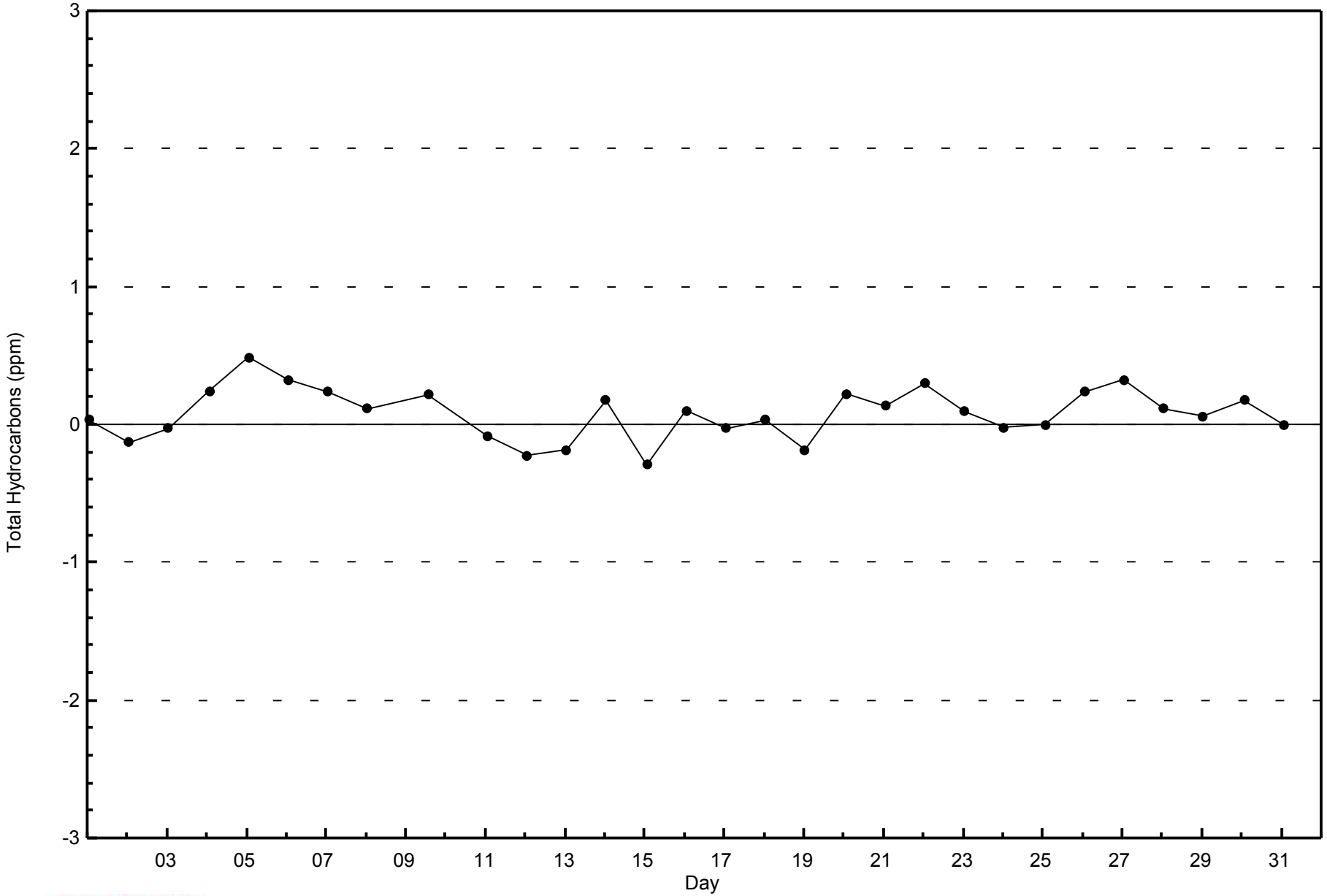
Total Number of Valid Hours: 657

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Mannix - January 2014



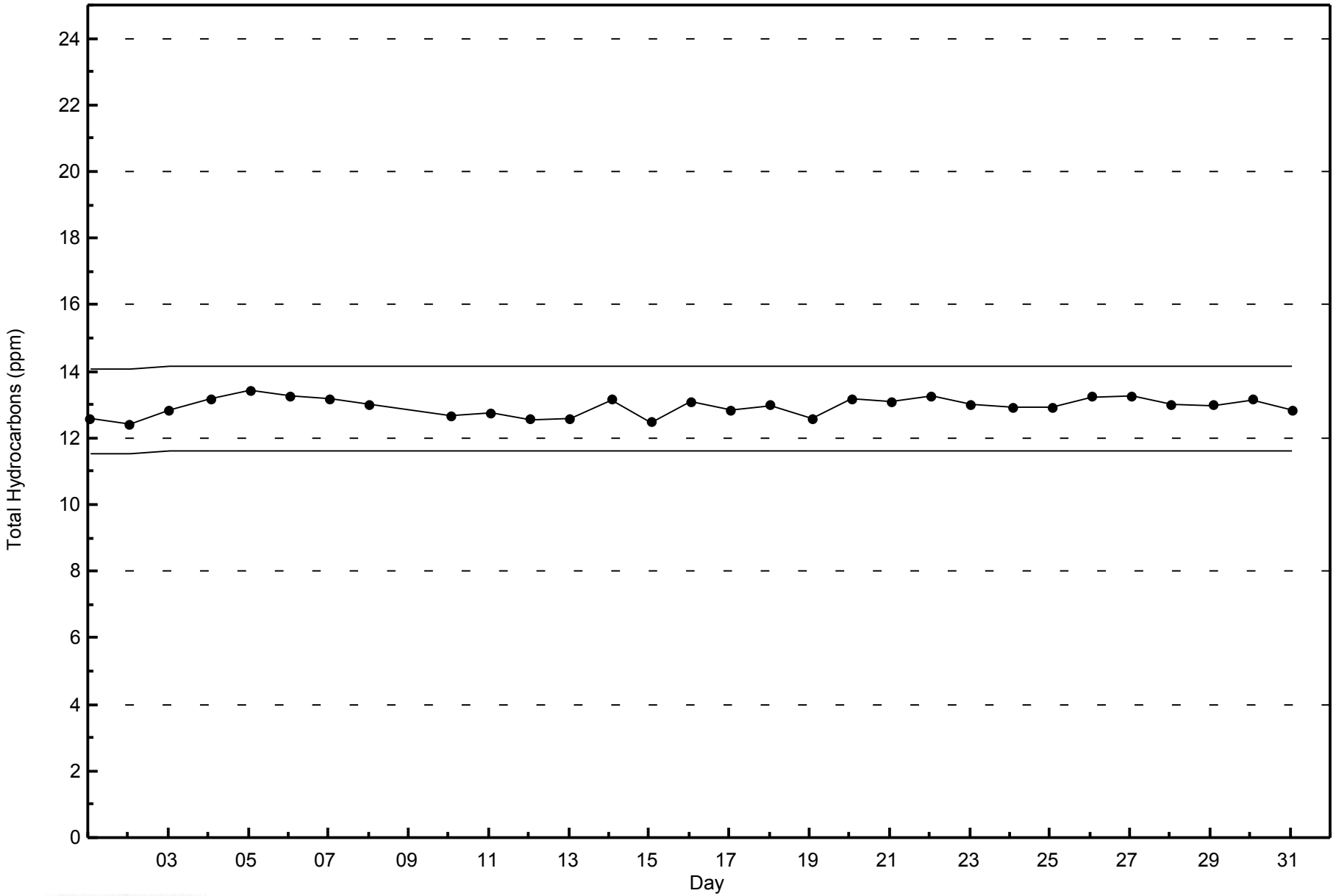
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 6.0 C on Jan 15 02:00

Maximum Daily Average: 0.7 C on Jan 15

Minimum Value: -36.5 C on Jan 1 10:00

Minimum Daily Average: -33.0 C on Jan 1

Maximum Diurnal Average: -14.6 C at hour 15

Minimum Diurnal Average: -18.4 C at hour 5

Monthly Average: -16.84 C

Percentiles: P_1 = -34.8 P_{10} = -28.3 Q_1 = -24.1 Median = -17.9 Q_3 = -10.6 P_{90} = -2.0 P_{99} = 4.8

Hours in Service:	744
Hours of Data:	688
Hours of Missing Data:	56
Hours of Calibration:	0
Percent Operational Time:	92.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-33.1	-33.7	-33.6	-34.5	-34.8	-35.5	-35.7	-36.1	-36.4	-36.5	-34.9	-34.0	-32.7	-32.3	-31.4	-32.1	-32.7	-32.3	-32.6	-31.6	-30.8	-29.8	-27.7	-26.3	-33.0	-26.3
2-Jan	-24.7	-23.3	-20.8	-19.5	-18.3	-17.3	-16.5	-15.6	MS	MS	MS	-13.9	MS	MS	MS	-11.2	-11.9	-13.2	-12.1	-12.6	-12.5	-11.9	-12.9	-12.2	-15.6	-11.2
3-Jan	-12.9	-15.3	-18.5	-19.9	-21.8	-23.1	-23.7	-24.4	-24.7	-24.9	-23.8	-23.2	-22.9	-22.3	-22.1	-22.0	-22.1	-21.6	-21.8	-22.9	-23.8	-24.6	-26.1	-27.3	-22.3	-12.9
4-Jan	-27.0	-27.6	-27.9	-28.2	-28.5	-28.6	-28.2	-27.9	-27.1	-27.0	-26.6	-26.2	-25.9	-27.3	-28.6	-29.5	-29.9	-30.2	-31.1	-31.4	-31.6	-31.6	-32.5	-32.5	-28.9	-25.9
5-Jan	-32.5	-32.7	-32.9	-33.3	-33.0	-33.6	-33.4	-33.1	-33.6	-33.7	-32.3	-31.4	-31.3	-30.6	-29.7	-29.5	-29.6	-29.1	-28.6	-28.4	-28.2	-28.4	-28.3	-27.8	-31.0	-27.8
6-Jan	-28.1	-27.9	-27.3	-27.5	-26.9	-26.1	-25.8	-24.8	-24.3	-24.0	-23.1	-22.2	-21.2	-20.8	-21.1	-21.3	-21.3	-21.4	-21.7	-22.7	-24.1	-23.9	-24.4	-24.2	-24.0	-20.8
7-Jan	-24.1	-23.9	-24.0	-25.4	-26.2	-26.7	-27.0	-28.2	-28.8	-29.7	-26.6	-25.1	-25.7	-24.8	-24.4	-24.9	-26.0	-26.4	-25.8	-27.0	-26.7	-26.7	-26.0	-25.9	-26.1	-23.9
8-Jan	-24.8	-23.0	-21.7	-20.4	-19.8	-19.0	-18.1	-17.2	-16.6	-15.9	-14.7	-13.9	-13.5	-13.0	-12.3	-11.7	-11.4	-10.9	-11.1	-10.6	-10.7	-10.6	-10.7	-10.0	-15.1	-10.0
9-Jan	-10.1	-10.1	-10.0	-9.8	-10.8	-11.9	-10.7	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-9.8
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	-13.6	-13.1	-13.1	-12.5	-12.7	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-12.5
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-14.2	-14.2	-13.9	-13.7	-13.3	-13.4	-13.3	-13.7	-14.4	-14.7	-15.5	MS	MS	--	-13.3
12-Jan	MS	-17.6	-18.6	-19.2	-19.9	-20.1	-20.4	-20.6	-20.5	-20.4	-20.1	-18.9	-17.9	-18.0	-18.4	-19.1	-20.1	-21.7	-20.7	-20.0	-20.3	-20.4	-19.8	-19.2	-19.6	-17.6
13-Jan	-18.4	-17.2	-16.6	-16.1	-15.9	-15.6	-17.0	-16.9	-14.8	-14.5	-13.8	-14.0	-14.5	-15.0	-15.5	-16.6	-18.4	-19.4	-20.5	-21.2	-21.4	-21.1	-21.8	-23.0	-17.5	-13.8
14-Jan	-24.4	-26.5	-27.1	-26.3	-26.0	-25.0	-24.5	-24.4	-23.3	-22.0	-20.1	-18.1	-15.8	-14.0	-12.5	-12.1	-11.6	-11.0	-10.4	-8.9	-7.3	-6.7	-5.3	-3.3	-16.9	-3.3
15-Jan	-0.8	6.0	5.1	4.7	4.5	4.3	4.9	5.0	3.3	1.3	0.8	1.9	2.7	3.4	3.9	3.8	1.4	-1.9	-3.8	-4.5	-5.2	-6.7	-7.9	-8.4	0.7	6.0
16-Jan	-8.7	-9.1	-9.6	-9.4	-9.4	-6.2	-6.8	-7.9	-7.2	-7.7	-5.4	-4.0	-2.6	-2.0	-1.7	-1.9	-2.5	-2.7	-2.6	-2.3	-1.8	-1.3	-1.4	-0.7	-4.8	-0.7
17-Jan	-1.4	-1.6	-1.2	-1.7	-1.7	-1.2	3.3	3.9	3.5	3.4	4.1	4.7	4.8	5.1	5.4	4.7	2.6	-1.8	-3.9	-5.6	-7.2	-8.3	-9.2	-10.0	-0.4	5.4
18-Jan	-11.0	-10.7	-10.8	-9.9	-9.4	-9.6	-9.1	-9.2	-8.7	-8.7	-5.6	-5.3	-2.4	-0.9	0.0	-3.0	-5.9	-7.8	-9.3	-10.1	-10.6	-11.3	-11.1	-10.7	-8.0	0.0
19-Jan	-10.3	-10.4	-9.9	-9.3	-9.7	-10.6	-11.0	-11.9	-12.3	-11.4	-11.2	-12.1	-13.8	-16.1	-18.0	-19.5	-21.3	-22.6	-23.3	-23.9	-24.4	-24.9	-25.0	-25.5	-16.2	-9.3
20-Jan	-26.3	-26.9	-27.2	-26.9	-26.5	-26.1	-25.1	-25.1	-24.4	-23.2	-22.2	-21.1	-19.2	-17.9	-16.6	-15.1	-14.4	-14.3	-14.0	-14.0	-14.3	-13.9	-14.1	-14.6	-20.1	-13.9
21-Jan	-14.9	-15.1	-15.5	-16.7	-16.9	-15.8	-15.1	-15.2	-15.4	-15.5	-14.1	-13.8	-14.1	-14.6	-14.9	-15.4	-16.8	-17.9	-18.4	-18.9	-19.6	-20.0	-21.1	-21.7	-16.6	-13.8
22-Jan	-22.1	-22.5	-23.1	-23.5	-24.1	-24.1	-24.8	-25.3	-25.5	-24.7	-23.4	-21.4	-19.7	-18.6	-16.9	-15.9	-15.8	-15.7	-15.4	-15.1	-14.9	-13.8	-12.8	-12.9	-19.7	-12.8
23-Jan	-12.4	-11.8	-12.1	-10.8	-9.7	-8.5	-8.1	-5.2	-0.2	0.4	0.3	1.1	2.8	3.5	3.7	3.9	3.3	3.4	3.0	2.9	2.7	2.4	2.2	2.0	-1.7	3.9
24-Jan	1.3	1.9	4.3	4.1	1.5	0.2	-1.0	-1.8	-2.6	-3.7	-4.4	-4.7	-4.9	-5.2	-5.0	-5.4	-5.9	-6.2	-6.4	-6.5	-6.5	-6.5	-6.3	-6.0	-3.2	4.3
25-Jan	-5.8	-6.3	-7.1	-7.4	-7.7	-7.4	-6.1	-5.6	-3.7	-1.4	-3.1	-4.2	-4.9	-5.2	-5.5	-5.6	-6.6	-7.9	-8.5	-9.5	-10.8	-12.6	-15.2	-17.1	-7.3	-1.4
26-Jan	-19.0	-20.6	-22.2	-23.3	-24.4	-25.4	-26.3	-27.2	-27.8	-27.8	-27.3	-26.8	-26.5	-25.7	-25.0	-24.8	-24.7	-25.3	-26.2	-26.4	-26.7	-27.5	-28.3	-28.6	-25.6	-19.0
27-Jan	-29.3	-29.7	-30.2	-31.1	-31.7	-31.8	-31.9	-32.1	-32.3	-31.7	-30.3	-28.3	-26.0	-22.9	-20.5	-19.4	-19.6	-20.3	-20.2	-20.0	-19.8	-19.5	-19.1	-18.9	-25.7	-18.9
28-Jan	-19.0	-18.4	-20.6	-21.7	-21.9	-22.0	-22.2	-22.5	-22.1	-22.0	-19.0	-16.8	-15.1	-14.2	-12.8	-12.7	-12.7	-12.9	-14.4	-17.5	-19.2	-20.5	-21.4	-21.7	-18.5	-12.7
29-Jan	-22.1	-22.2	-22.5	-22.6	-22.7	-22.5	-21.9	-21.9	-21.7	-21.5	-21.1	-21.3	-21.7	-22.9	-23.4	-23.3	-23.4	-23.2	-22.9	-22.8	-22.7	-22.7	-22.7	-22.6	-22.4	-21.1
30-Jan	-22.7	-22.8	-23.0	-23.0	-23.0	-23.0	-23.3	-23.1	-22.8	-22.4	-21.8	-20.7	-19.0	-17.8	-16.8	-16.7	-16.6	-16.6	-16.6	-16.3	-16.2	-16.5	-16.8	-16.6	-19.8	-16.2
31-Jan	-16.8	-16.7	-17.2	-17.8	-18.1	-19.5	-19.4	-18.8	-18.5	-17.6	-16.3	-15.5	-14.9	-14.8	-14.5	-14.4	-14.5	-14.7	-14.9	-15.1	-15.1	-14.5	-14.2	-14.2	-16.2	-14.2
	-17.9	-17.8	-18.0	-18.2	-18.4	-18.3	-18.1	-18.3	-18.1	-17.7	-16.8	-15.9	-15.3	-14.9	-14.6	-14.6	-15.2	-15.8	-16.1	-16.5	-16.7	-16.9	-17.1	-17.1	Diurnal Average	
	1.3	6.0	5.1	4.7	4.5	4.3	4.9	5.0	3.5	3.4	4.1	4.7	4.8	5.1	5.4	4.7	3.3	3.4	3.0	2.9	2.7	2.4	2.2	2.0	Diurnal Maximum	

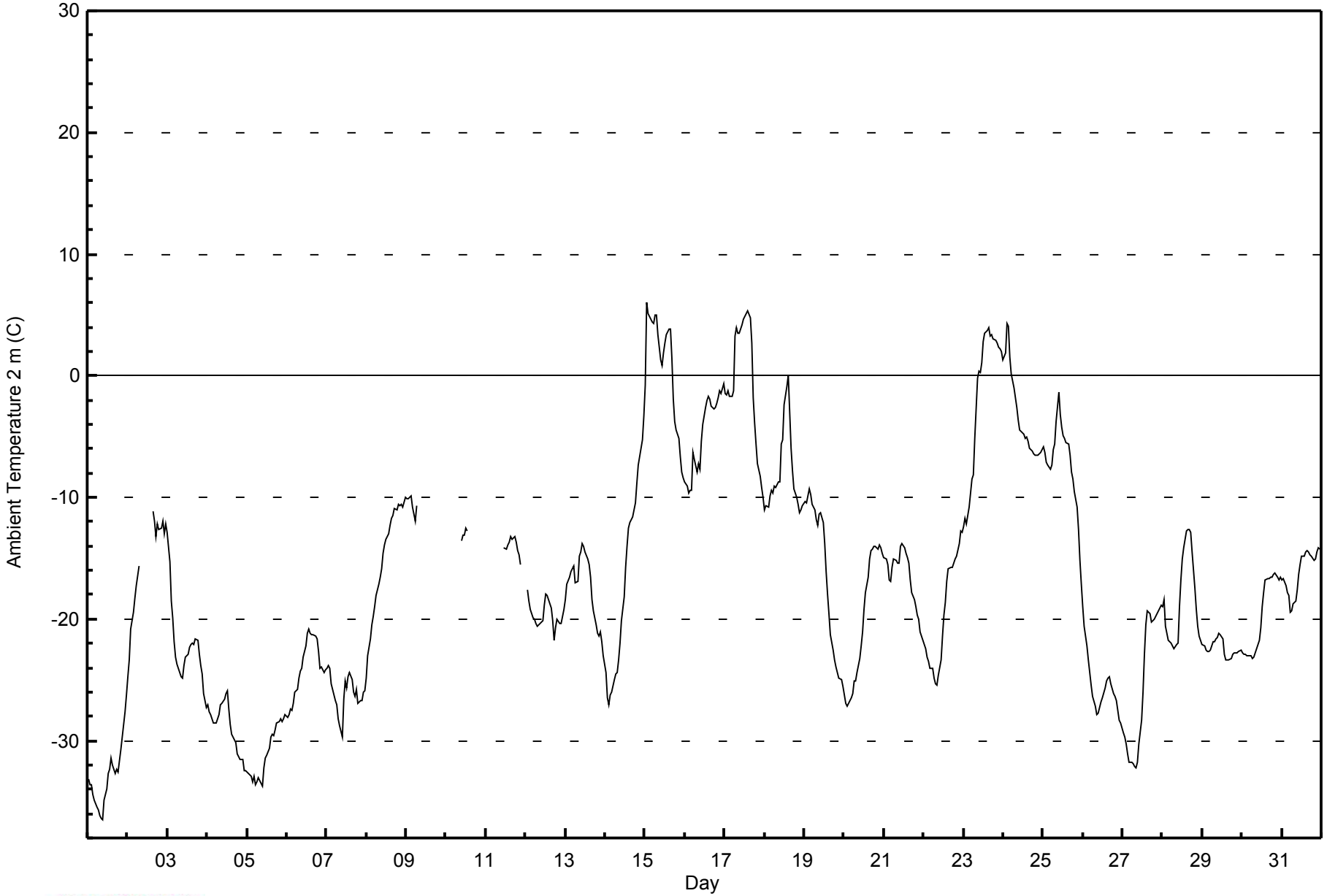
MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature 2 m (AT2m) - C

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	297	43.17	43.17
-20 - 0	343	49.85	93.02
0 - 10	48	6.98	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744

Ambient Temperature 20 m (AT20m) - C

Mannix - January 2014

Maximum Value: 6.7 C on Jan 15 02:00

Maximum Daily Average: 1.5 C on Jan 15

Minimum Value: -35.6 C on Jan 1 10:00

Minimum Daily Average: -32.1 C on Jan 1

Maximum Diurnal Average: -14.4 C at hour 16

Minimum Diurnal Average: -17.8 C at hour 8

Monthly Average: -16.45 C

Percentiles: P_1 = -33.7 P_{10} = -28.1 Q_1 = -24.0 Median = -17.8 Q_3 = -10.0 P_{90} = -1.2 P_{99} = 5.5

Hours in Service:	744
Hours of Data:	688
Hours of Missing Data:	56
Hours of Calibration:	0
Percent Operational Time:	92.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.7	-32.8	-33.0	-33.4	-33.6	-34.0	-34.3	-35.1	-35.2	-35.6	-34.7	-34.1	-32.5	-31.7	-30.6	-31.2	-31.3	-31.1	-31.2	-30.1	-30.4	-29.3	-27.6	-26.3	-32.1	-26.3
2-Jan	-24.8	-23.4	-20.9	-19.7	-18.4	-17.4	-16.6	-15.8	MS	MS	MS	-14.3	MS	MS	MS	-10.1	-9.7	-10.0	-8.8	-8.8	-8.4	-6.7	-9.9	-12.0	-14.2	-6.7
3-Jan	-12.9	-15.5	-18.7	-20.0	-21.8	-22.9	-23.5	-24.1	-24.2	-24.4	-24.0	-23.4	-22.6	-21.9	-21.5	-21.2	-21.6	-21.4	-21.6	-22.6	-23.4	-24.2	-25.4	-26.3	-22.0	-12.9
4-Jan	-26.5	-27.0	-27.2	-27.3	-28.0	-28.0	-27.8	-27.7	-27.2	-27.2	-26.8	-26.4	-26.2	-27.8	-29.0	-29.5	-29.7	-30.0	-30.8	-31.2	-31.4	-31.3	-31.8	-31.9	-28.7	-26.2
5-Jan	-31.9	-31.9	-32.1	-32.5	-32.3	-32.4	-32.4	-32.5	-33.1	-33.4	-32.6	-31.5	-31.0	-30.5	-29.9	-29.5	-29.2	-29.0	-28.7	-28.6	-28.3	-28.4	-28.2	-27.9	-30.8	-27.9
6-Jan	-28.1	-28.1	-27.6	-27.8	-27.2	-26.4	-26.0	-25.1	-24.5	-24.2	-23.3	-22.4	-21.5	-21.0	-21.2	-21.3	-21.5	-21.5	-21.8	-22.6	-23.2	-23.6	-24.0	-24.3	-24.1	-21.0
7-Jan	-24.2	-24.1	-24.0	-24.2	-24.2	-24.6	-25.1	-25.9	-26.4	-26.8	-26.1	-25.3	-25.1	-23.8	-23.2	-23.8	-24.2	-24.5	-24.4	-25.4	-24.7	-25.0	-24.7	-24.3	-24.8	-23.2
8-Jan	-24.4	-23.1	-21.7	-20.6	-20.0	-19.2	-18.3	-17.3	-16.7	-15.9	-14.8	-14.0	-13.4	-13.2	-12.6	-11.8	-11.5	-10.9	-10.9	-10.4	-10.5	-10.6	-10.8	-10.0	-15.1	-10.0
9-Jan	-10.1	-10.1	-10.0	-9.8	-10.4	-10.9	-10.6	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-9.8
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	-13.9	-13.7	-13.5	-13.3	-13.3	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-13.3
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-14.6	-14.7	-14.3	-14.0	-13.5	-13.7	-13.5	-14.0	-14.6	-14.9	-15.7	MS	MS	--	-13.5
12-Jan	MS	-17.8	-18.6	-19.4	-20.2	-20.3	-20.5	-20.7	-20.6	-20.6	-20.4	-19.3	-18.2	-17.8	-17.4	-17.5	-18.5	-19.2	-19.0	-19.5	-20.1	-20.4	-19.8	-19.3	-19.4	-17.4
13-Jan	-18.6	-17.4	-16.9	-16.4	-16.1	-15.8	-15.9	-15.7	-14.6	-14.6	-14.1	-14.4	-14.9	-15.4	-15.9	-16.8	-18.1	-19.0	-20.2	-20.7	-20.9	-21.0	-21.6	-22.3	-17.4	-14.1
14-Jan	-23.2	-24.0	-24.2	-24.8	-25.0	-24.7	-24.4	-24.5	-23.5	-22.2	-20.4	-18.3	-16.0	-14.4	-12.9	-12.3	-11.7	-11.1	-10.5	-8.9	-7.3	-6.6	-4.2	-2.6	-16.6	-2.6
15-Jan	2.0	6.7	5.9	5.2	4.9	4.7	5.4	5.5	3.6	1.4	0.8	2.0	3.0	3.7	4.2	4.2	1.7	-1.5	-3.5	-4.2	-4.5	-4.5	-4.7	-4.7	1.5	6.7
16-Jan	-5.2	-5.6	-5.3	-3.7	-3.4	-2.6	-3.0	-4.4	-3.6	-4.0	-4.1	-3.6	-2.4	-1.7	-1.2	-1.0	-0.5	-0.2	-0.5	-0.1	-0.4	-0.5	-0.7	-0.4	-2.4	-0.1
17-Jan	-0.3	-0.4	-0.2	-1.0	0.1	1.1	4.0	4.3	3.9	4.0	4.6	5.3	5.5	5.7	6.0	5.3	3.0	-1.7	-3.8	-5.6	-7.1	-8.1	-8.4	-8.7	0.3	6.0
18-Jan	-8.9	-9.4	-9.6	-9.4	-9.0	-8.7	-7.9	-8.3	-7.8	-7.2	-3.4	-3.3	-1.4	0.2	0.5	-2.9	-5.8	-7.6	-9.0	-9.6	-10.2	-10.8	-10.9	-10.7	-7.1	0.5
19-Jan	-10.4	-10.5	-10.0	-9.5	-9.9	-10.3	-10.6	-10.9	-11.5	-11.8	-11.7	-12.5	-14.2	-16.4	-18.3	-19.9	-21.6	-22.7	-23.5	-24.1	-24.5	-25.0	-24.9	-25.2	-16.2	-9.5
20-Jan	-25.6	-25.7	-26.2	-26.2	-26.2	-26.2	-25.4	-25.3	-24.6	-23.4	-22.4	-21.4	-19.6	-18.2	-17.0	-15.3	-14.5	-14.4	-14.2	-14.2	-14.5	-14.1	-14.4	-14.8	-20.2	-14.1
21-Jan	-15.1	-15.3	-15.5	-16.0	-16.1	-15.7	-15.2	-15.3	-15.5	-15.6	-14.5	-14.3	-14.4	-14.7	-14.9	-15.4	-16.6	-17.3	-17.7	-18.3	-19.0	-19.9	-20.9	-21.6	-16.4	-14.3
22-Jan	-22.1	-22.4	-23.0	-23.4	-23.9	-24.0	-24.5	-25.0	-25.2	-24.6	-23.7	-21.9	-20.0	-18.6	-16.6	-15.4	-14.9	-15.1	-14.7	-14.4	-13.9	-13.3	-12.4	-12.3	-19.4	-12.3
23-Jan	-11.9	-11.2	-10.6	-9.5	-8.6	-7.0	-6.4	-2.5	0.3	0.8	0.9	1.6	3.0	3.9	4.3	4.4	3.9	3.9	3.5	3.6	3.6	3.5	3.1	3.2	-0.8	4.4
24-Jan	2.9	4.2	5.6	5.1	1.6	0.1	-1.2	-2.1	-2.9	-4.0	-4.8	-5.1	-5.3	-5.6	-5.6	-5.7	-6.2	-6.5	-6.7	-6.7	-6.8	-6.7	-6.5	-6.2	-3.1	5.6
25-Jan	-6.0	-5.6	-5.7	-5.8	-6.2	-6.7	-5.6	-4.8	-2.5	-1.1	-3.3	-4.5	-5.5	-5.8	-5.9	-5.9	-6.8	-8.1	-8.6	-9.4	-10.5	-12.5	-15.2	-17.2	-7.0	-1.1
26-Jan	-19.1	-20.7	-22.2	-23.3	-24.4	-25.4	-26.4	-27.3	-28.0	-28.2	-27.8	-27.4	-26.8	-26.1	-25.5	-25.2	-24.9	-25.1	-25.3	-25.2	-25.4	-26.0	-26.7	-27.3	-25.4	-19.1
27-Jan	-27.7	-28.2	-28.8	-29.9	-30.7	-31.0	-31.7	-31.9	-31.9	-31.8	-30.5	-28.7	-26.1	-22.8	-20.3	-19.0	-18.9	-18.6	-19.2	-19.8	-19.5	-19.3	-19.0	-18.6	-25.2	-18.6
28-Jan	-18.8	-18.3	-19.7	-20.2	-20.8	-21.2	-21.3	-21.9	-21.1	-21.4	-19.2	-17.1	-15.1	-14.3	-13.1	-12.8	-12.8	-13.0	-14.7	-17.7	-19.4	-20.6	-21.4	-21.7	-18.2	-12.8
29-Jan	-21.9	-22.1	-22.5	-22.6	-22.8	-22.7	-22.1	-22.1	-21.9	-21.9	-21.6	-21.8	-22.5	-23.7	-24.1	-23.9	-23.7	-23.4	-23.1	-23.0	-22.9	-22.9	-22.8	-22.7	-22.7	-21.6
30-Jan	-22.8	-22.9	-23.1	-23.1	-23.2	-23.2	-23.4	-23.3	-23.0	-22.7	-22.2	-21.1	-19.8	-18.4	-17.2	-16.6	-16.5	-16.5	-16.4	-16.2	-16.1	-16.4	-15.7	-15.7	-19.8	-15.7
31-Jan	-16.0	-16.5	-17.0	-17.4	-17.7	-19.2	-18.9	-18.7	-18.5	-17.8	-16.6	-16.1	-15.5	-15.3	-15.0	-14.7	-14.7	-14.9	-15.0	-15.2	-15.0	-14.6	-14.2	-14.3	-16.2	-14.2
	-17.3	-17.2	-17.3	-17.5	-17.7	-17.7	-17.6	-17.8	-17.6	-17.4	-16.8	-16.1	-15.4	-14.9	-14.6	-14.4	-14.8	-15.3	-15.7	-16.0	-16.2	-16.4	-16.6	-16.6	Diurnal Average	
	2.9	6.7	5.9	5.2	4.9	4.7	5.4	5.5	3.9	4.0	4.6	5.3	5.5	5.7	6.0	5.3	3.9	3.9	3.5	3.6	3.6	3.5	3.1	3.2	Diurnal Maximum	

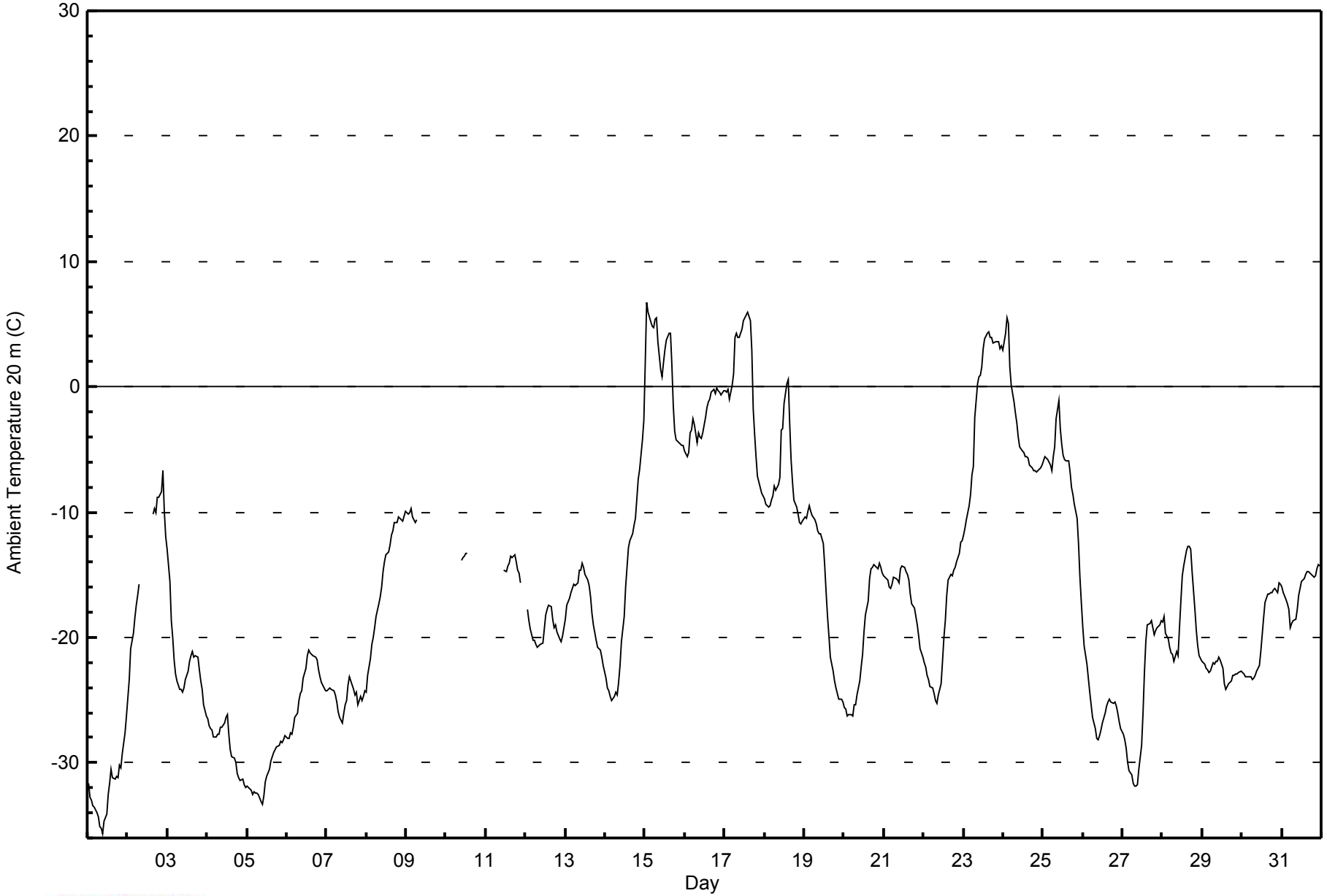
MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature 20 m (AT20m) - C

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	291	42.30	42.30
-20 - 0	343	49.85	92.15
0 - 10	54	7.85	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744

Maximum Value: 6.8 C on Jan 15 02:00
Maximum Daily Average: 1.6 C on Jan 15

Minimum Value: -34.7 C on Jan 1 11:00
Minimum Daily Average: -30.8 C on Jan 1
Maximum Diurnal Average: -14.3 C at hour 16
Minimum Diurnal Average: -17.5 C at hour 7
Monthly Average: -16.22 C
Percentiles: P_1 = -32.9 P_{10} = -27.7 Q_1 = -23.9 Median = -17.8 Q_3 = -9.5 P_{90} = -0.8 P_{99} = 5.4

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Hours of Calibration:	0
Percent Operational Time:	92.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.1	-32.2	-32.4	-31.7	-32.7	-33.2	-33.2	-33.3	-33.9	-34.5	-34.7	-34.0	-32.6	-31.3	-29.4	-28.5	-28.6	-28.6	-27.8	-28.0	-27.9	-27.5	-26.3	-25.0	-30.8	-25.0
2-Jan	-24.0	-23.0	-20.9	-19.8	-18.4	-17.5	-16.7	-15.9	MS	MS	MS	-14.1	MS	MS	MS	-7.7	-7.4	-7.1	-5.2	-5.1	-5.5	-5.7	-8.8	-12.1	-13.1	-5.1
3-Jan	-13.2	-15.8	-18.9	-20.2	-21.9	-23.0	-23.6	-24.2	-24.3	-24.4	-24.1	-23.6	-22.5	-21.9	-21.5	-21.1	-21.5	-21.5	-21.8	-22.6	-23.4	-24.1	-25.1	-25.8	-22.1	-13.2
4-Jan	-26.2	-26.8	-26.9	-27.0	-27.6	-27.7	-27.4	-27.6	-27.3	-27.4	-27.0	-26.7	-26.4	-28.0	-29.2	-29.7	-29.8	-30.1	-30.8	-31.1	-31.3	-31.3	-31.6	-31.7	-28.6	-26.2
5-Jan	-31.7	-31.8	-31.8	-32.1	-32.1	-32.1	-32.3	-32.3	-32.0	-31.9	-31.6	-31.2	-31.0	-30.6	-30.0	-29.6	-29.2	-29.0	-28.9	-28.7	-28.4	-28.5	-28.0	-27.7	-30.5	-27.7
6-Jan	-27.7	-28.0	-27.7	-27.5	-27.1	-26.4	-25.9	-25.0	-24.5	-24.3	-23.5	-22.7	-21.7	-21.2	-21.4	-21.5	-21.7	-21.7	-22.0	-22.8	-23.3	-23.7	-24.1	-24.5	-24.2	-21.2
7-Jan	-24.4	-24.3	-24.2	-24.2	-24.1	-24.3	-24.2	-24.6	-25.2	-25.2	-24.9	-25.3	-25.1	-24.3	-23.6	-23.7	-23.6	-23.8	-23.9	-24.3	-23.9	-23.9	-23.5	-23.2	-24.2	-23.2
8-Jan	-23.2	-22.5	-21.4	-20.5	-19.9	-19.2	-18.0	-17.2	-16.7	-15.6	-14.7	-14.1	-13.6	-13.3	-12.5	-11.8	-11.2	-10.6	-10.4	-10.0	-9.9	-10.3	-10.3	-9.8	-14.9	-9.8
9-Jan	-9.7	-9.8	-9.5	-9.5	-10.0	-10.6	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-9.5
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	-14.1	-13.9	-13.8	-13.5	-13.5	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-13.5
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-14.6	-14.9	-14.3	-14.2	-13.7	-13.8	-13.6	-14.1	-14.8	-15.2	-15.9	MS	MS	--	-13.6
12-Jan	MS	-18.0	-18.9	-19.6	-20.4	-20.5	-20.8	-21.0	-20.9	-20.8	-20.6	-19.5	-18.5	-18.0	-17.8	-17.6	-18.3	-18.7	-18.8	-19.4	-20.0	-20.5	-19.8	-19.2	-19.5	-17.6
13-Jan	-18.7	-17.5	-17.0	-16.6	-16.3	-16.0	-15.5	-15.1	-14.7	-14.8	-14.4	-14.7	-15.2	-15.7	-16.2	-17.1	-18.3	-19.2	-20.3	-20.8	-20.8	-20.8	-21.7	-22.1	-17.5	-14.4
14-Jan	-22.7	-23.1	-23.3	-23.9	-24.2	-24.3	-24.1	-24.1	-23.2	-21.8	-19.9	-18.0	-15.9	-14.1	-12.8	-12.1	-11.3	-10.5	-10.0	-8.2	-6.8	-5.7	-2.8	-1.1	-16.0	-1.1
15-Jan	3.6	6.8	5.8	5.2	4.9	4.7	5.4	5.5	3.5	1.3	0.8	1.8	2.9	3.6	4.2	4.2	1.7	-1.4	-3.6	-4.3	-4.5	-4.3	-4.6	-4.5	1.6	6.8
16-Jan	-4.2	-3.6	-2.8	-2.4	-2.4	-1.8	-1.7	-2.0	-1.6	-2.0	-2.3	-2.7	-2.3	-1.6	-0.9	0.1	0.8	0.9	0.9	1.3	0.9	-0.1	0.2	0.3	-1.2	1.3
17-Jan	0.6	0.5	0.4	0.5	1.6	2.4	4.2	4.4	4.0	4.1	4.7	5.4	5.7	5.8	6.0	5.3	2.8	-2.0	-4.0	-5.8	-7.3	-8.2	-8.5	-8.6	0.6	6.0
18-Jan	-8.5	-9.1	-8.9	-9.3	-8.6	-7.2	-7.1	-7.7	-5.6	-2.0	-0.9	-1.2	-0.1	0.5	0.4	-3.1	-6.0	-7.8	-9.1	-9.7	-10.2	-10.8	-10.9	-10.8	-6.4	0.5
19-Jan	-10.5	-10.5	-10.0	-9.5	-10.0	-10.4	-10.6	-10.8	-11.1	-11.9	-11.9	-12.8	-14.6	-16.7	-18.6	-20.2	-21.8	-23.0	-23.8	-24.3	-24.7	-25.2	-25.1	-25.2	-16.4	-9.5
20-Jan	-25.3	-25.2	-25.6	-25.9	-26.1	-26.3	-25.5	-25.5	-24.8	-23.3	-22.3	-21.5	-19.6	-18.0	-16.8	-15.4	-14.7	-14.5	-14.2	-14.4	-14.7	-14.2	-14.6	-15.1	-20.2	-14.2
21-Jan	-15.3	-15.5	-15.6	-16.0	-16.1	-15.8	-15.4	-15.2	-15.3	-15.6	-14.7	-14.5	-14.7	-15.0	-15.3	-15.7	-16.7	-17.3	-17.7	-18.4	-19.0	-20.1	-21.0	-21.7	-16.6	-14.5
22-Jan	-22.2	-22.5	-23.0	-23.4	-24.0	-24.1	-24.4	-24.6	-24.9	-24.7	-23.9	-22.2	-20.3	-18.9	-16.9	-15.5	-14.9	-14.7	-14.3	-13.7	-13.3	-12.4	-12.2	-11.9	-19.3	-11.9
23-Jan	-11.4	-10.8	-9.3	-7.3	-6.6	-3.8	-3.5	-1.1	0.4	0.9	1.1	1.8	3.0	3.8	4.4	4.5	4.1	4.0	3.7	3.8	3.8	3.7	3.8	4.1	-0.1	4.5
24-Jan	3.8	5.3	6.3	5.5	1.5	0.0	-1.4	-2.3	-3.2	-4.2	-5.1	-5.4	-5.6	-5.9	-5.9	-6.0	-6.5	-6.8	-6.9	-7.0	-7.0	-6.9	-6.7	-6.3	-3.2	6.3
25-Jan	-6.1	-5.2	-5.2	-5.3	-5.7	-5.5	-4.9	-3.8	-1.2	-0.7	-3.5	-4.8	-5.8	-6.0	-6.2	-6.1	-7.0	-8.3	-8.8	-9.5	-10.7	-12.7	-15.4	-17.4	-6.9	-0.7
26-Jan	-19.3	-20.9	-22.4	-23.5	-24.6	-25.6	-26.6	-27.6	-28.3	-28.4	-28.1	-27.7	-27.1	-26.3	-25.8	-25.4	-25.2	-25.3	-25.3	-25.2	-25.4	-25.8	-26.3	-26.6	-25.5	-19.3
27-Jan	-26.9	-27.1	-27.6	-28.7	-29.6	-30.5	-31.6	-31.8	-31.9	-32.1	-30.6	-28.7	-26.1	-23.1	-20.5	-18.9	-18.4	-18.0	-18.9	-19.4	-18.9	-18.6	-18.8	-18.3	-24.8	-18.0
28-Jan	-17.9	-17.8	-18.4	-19.0	-19.2	-18.9	-20.3	-20.4	-17.9	-19.6	-18.5	-17.2	-15.3	-14.2	-13.3	-12.9	-12.9	-13.1	-15.0	-18.0	-19.7	-20.9	-21.6	-21.9	-17.7	-12.9
29-Jan	-22.1	-22.3	-22.7	-22.8	-22.9	-22.9	-22.3	-22.3	-22.1	-22.1	-21.8	-22.1	-22.8	-24.0	-24.4	-24.2	-23.9	-23.7	-23.3	-23.2	-23.2	-23.1	-23.1	-23.0	-22.9	-21.8
30-Jan	-23.1	-23.2	-23.3	-23.4	-23.4	-23.4	-23.5	-23.4	-23.3	-22.9	-22.5	-21.4	-20.1	-18.7	-17.6	-16.7	-16.6	-16.6	-16.5	-16.4	-16.2	-16.1	-15.3	-15.3	-19.9	-15.3
31-Jan	-15.6	-16.6	-17.1	-17.4	-17.7	-18.9	-18.4	-18.0	-17.6	-17.8	-16.9	-16.4	-15.8	-15.6	-15.3	-15.0	-15.0	-15.1	-15.2	-15.4	-15.2	-14.7	-14.4	-14.4	-16.2	-14.4
	-16.9	-16.9	-17.0	-17.1	-17.4	-17.3	-17.5	-17.4	-17.2	-17.0	-16.6	-16.1	-15.5	-15.1	-14.7	-14.3	-14.7	-15.1	-15.4	-15.7	-15.9	-16.2	-16.3	-16.4	Diurnal Average	
	3.8	6.8	6.3	5.5	4.9	4.7	5.4	5.5	4.0	4.1	4.7	5.4	5.7	5.8	6.0	5.3	4.1	4.0	3.7	3.8	3.8	3.7	3.8	4.1	Diurnal Maximum	

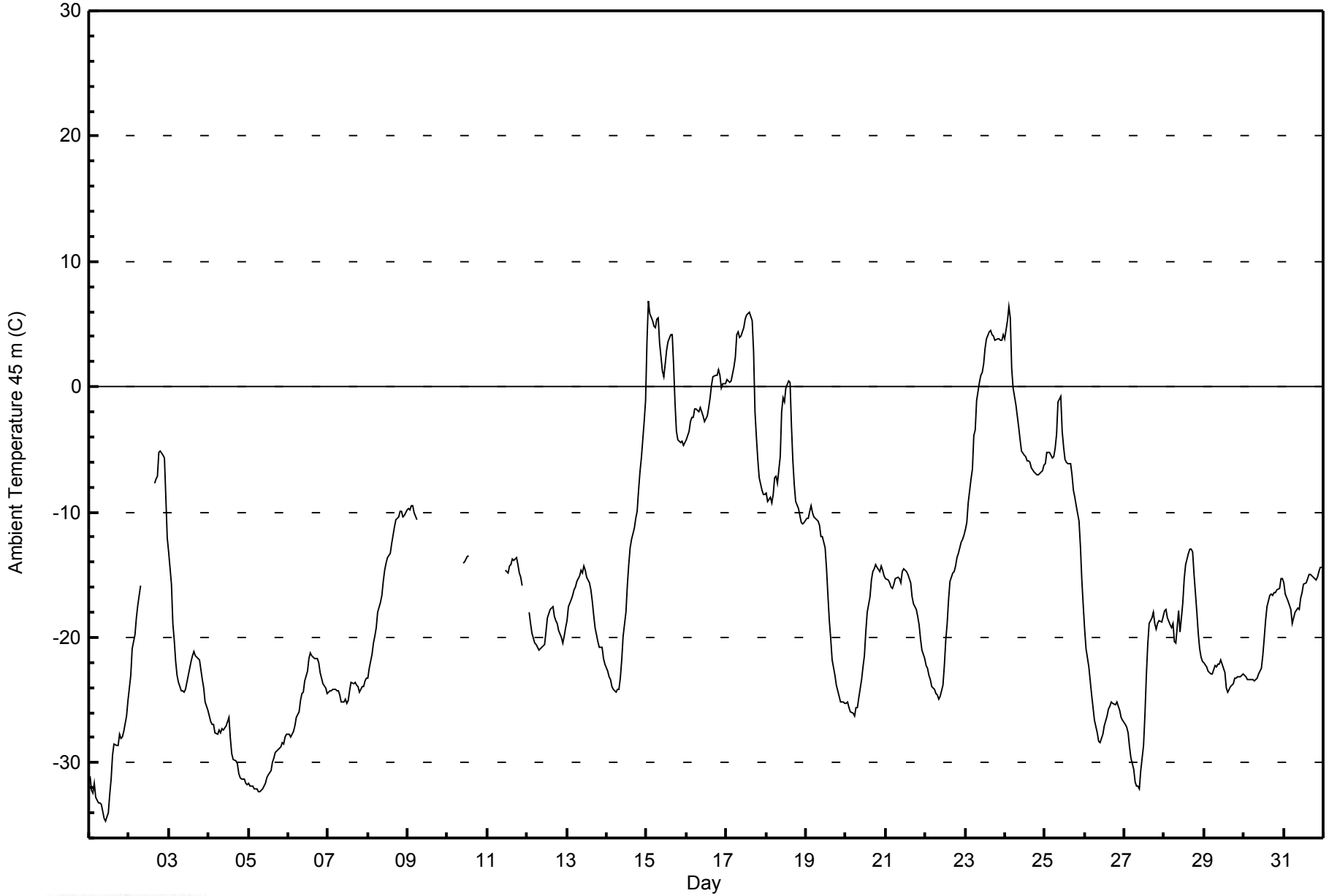
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature 45 m (AT45m) - C

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	290	42.21	42.21
-20 - 0	332	48.33	90.54
0 - 10	65	9.46	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 744

Maximum Value: 6.9 C on Jan 24 03:00

Maximum Daily Average: 1.6 C on Jan 15

Minimum Value: -32.2 C on Jan 1 09:00

Minimum Daily Average: -30.2 C on Jan 5

Maximum Diurnal Average: -14.0 C at hour 16

Minimum Diurnal Average: -16.8 C at hour 7

Monthly Average: -15.86 C

Percentiles: P_1 = -31.7 P_{10} = -27.5 Q_1 = -23.9 Median = -17.3 Q_3 = -8.6 P_{90} = 0.6 P_{99} = 5.8

Hours in Service:	744
Hours of Data:	655
Hours of Missing Data:	89
Hours of Calibration:	0
Percent Operational Time:	88.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-29.7	-29.9	-30.3	-30.5	-30.9	-31.5	-31.4	-31.1	-32.2	-31.6	-31.5	-31.3	-30.1	-28.8	-27.5	-26.0	-25.7	-25.5	-26.5	-26.7	-26.6	-26.1	-25.1	-23.9	-28.8	-23.9
2-Jan	-22.5	-21.8	-20.6	-19.7	-18.2	-17.3	-16.5	-15.9	MS	MS	MS	-12.9	MS	MS	MS	-5.3	-5.4	-3.9	-3.8	-4.5	-5.3	-5.5	-8.0	-12.3	-12.2	-3.8
3-Jan	-13.5	-16.1	-19.2	-20.5	-22.2	-23.3	-23.8	-24.4	-24.4	-24.5	-24.3	-24.0	-22.8	-22.0	-21.4	-21.1	-21.6	-21.6	-22.0	-22.7	-23.4	-24.0	-25.0	-25.4	-22.2	-13.5
4-Jan	-26.1	-26.5	-26.8	-26.9	-27.7	-27.5	-27.2	-27.7	-27.5	-27.6	-27.3	-27.0	-26.8	-28.4	-29.5	-30.0	-30.0	-30.3	-30.9	-31.2	-31.3	-31.3	-31.6	-31.6	-28.7	-26.1
5-Jan	-31.5	-31.8	-31.6	-30.8	-31.7	-32.0	-32.1	-32.1	-31.9	-31.6	-31.5	-31.1	-30.8	-30.4	-29.7	-29.2	-29.0	-28.9	-28.6	-28.5	-27.9	-27.9	-27.5	-27.2	-30.2	-27.2
6-Jan	-27.4	-27.5	-27.2	-27.1	-26.6	-26.2	-25.5	-24.8	-24.4	-24.3	-23.7	-23.0	-22.1	-21.6	-21.7	-21.8	-22.0	-22.0	-22.3	-23.1	-23.5	-23.9	-24.3	-24.7	-24.2	-21.6
7-Jan	-24.6	-24.5	-24.4	-24.3	-24.2	-24.2	-24.2	-24.4	-25.0	-25.2	-25.0	-25.1	-25.1	-24.4	-23.6	-23.3	-23.2	-23.0	-23.3	-23.6	-23.0	-22.6	-22.8	-22.8	-24.0	-22.6
8-Jan	-22.2	-21.1	-20.7	-20.1	-19.7	-18.9	-17.6	-16.8	-16.3	-14.8	-14.5	-14.0	-13.4	-13.0	-12.0	-11.6	-10.8	-10.5	-10.4	-10.0	-9.9	-9.9	-9.8	-9.5	-14.5	-9.5
9-Jan	-9.1	-9.0	-8.9	-9.3	-10.0	-10.7	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-8.9
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-18.7	-18.7	-19.0	-19.0	-20.2	-19.3	-18.9	--	-18.7
13-Jan	-18.5	-17.4	-17.0	-16.8	-16.4	-16.1	-15.4	-14.7	-14.7	-15.1	-14.7	-15.1	-15.6	-16.0	-16.5	-17.4	-18.5	-19.4	-20.5	-20.9	-21.0	-20.9	-21.6	-21.9	-17.6	-14.7
14-Jan	-22.4	-22.8	-22.3	-22.3	-22.1	-22.4	-22.1	-21.8	-21.8	-20.2	-18.2	-16.8	-15.2	-13.7	-12.5	-11.8	-11.1	-9.3	-8.5	-6.3	-4.5	-3.6	-0.5	0.8	-14.6	0.8
15-Jan	4.2	6.8	5.8	5.1	4.7	4.5	5.3	5.3	3.3	1.1	0.6	1.7	2.7	3.4	4.0	4.0	1.7	-0.5	-3.4	-4.3	-4.5	-4.4	-4.8	-4.6	1.6	6.8
16-Jan	-3.9	-2.8	-2.3	-2.0	-2.0	-1.4	-1.0	-1.6	-1.0	-1.4	-1.5	-1.4	-1.2	-0.8	0.3	0.8	1.1	1.1	1.3	1.6	1.3	1.1	1.1	1.3	-0.5	1.6
17-Jan	1.5	1.4	1.4	1.5	1.9	2.8	4.2	4.4	4.0	4.0	4.6	5.2	5.6	6.0	6.0	5.4	2.7	-2.2	-4.3	-6.0	-7.6	-8.5	-8.7	-8.7	0.7	6.0
18-Jan	-8.6	-8.7	-8.3	-8.7	-7.0	-5.8	-5.4	-4.7	-1.3	-0.1	0.4	-0.3	1.3	1.1	0.4	-3.1	-6.1	-7.9	-9.2	-9.8	-10.3	-10.9	-10.9	-10.7	-5.6	1.3
19-Jan	-10.7	-10.5	-10.0	-9.5	-9.9	-10.3	-10.8	-10.9	-11.1	-12.0	-12.1	-13.1	-14.9	-17.0	-18.9	-20.5	-22.1	-23.3	-24.1	-24.6	-25.0	-25.5	-25.4	-25.4	-16.6	-9.5
20-Jan	-25.5	-25.3	-25.1	-25.2	-25.6	-25.4	-25.5	-25.5	-24.7	-22.4	-20.7	-20.6	-18.5	-16.5	-14.6	-14.6	-14.7	-14.3	-14.0	-14.5	-14.7	-14.4	-14.9	-15.4	-19.7	-14.0
21-Jan	-15.6	-15.7	-15.7	-16.0	-15.9	-15.7	-15.5	-15.1	-15.3	-15.5	-15.0	-14.8	-15.1	-15.3	-15.6	-16.0	-16.9	-17.5	-17.9	-18.5	-19.1	-20.2	-21.2	-21.9	-16.7	-14.8
22-Jan	-22.3	-22.6	-23.0	-23.4	-23.9	-24.2	-24.4	-24.3	-24.4	-24.6	-24.0	-22.4	-20.5	-18.9	-16.9	-15.3	-14.6	-14.3	-13.5	-12.5	-12.2	-11.9	-11.4	-10.3	-19.0	-10.3
23-Jan	-9.0	-8.4	-7.3	-5.6	-4.7	-2.8	-1.9	-0.6	0.3	1.0	1.2	1.8	2.9	3.7	4.2	4.4	4.2	4.0	3.8	3.8	3.7	3.7	4.0	4.4	0.4	4.4
24-Jan	4.2	6.0	6.9	5.8	1.5	-0.2	-1.7	-2.6	-3.5	-4.5	-5.4	-5.8	-5.9	-6.3	-6.2	-6.3	-6.8	-7.1	-7.2	-7.3	-7.3	-7.1	-6.8	-6.1	-3.3	6.9
25-Jan	-5.9	-5.0	-5.0	-5.2	-5.5	-5.2	-4.7	-2.9	-0.1	-0.5	-3.8	-5.1	-6.1	-6.3	-6.4	-6.4	-7.2	-8.6	-9.0	-9.8	-10.9	-13.0	-15.7	-17.7	-6.9	-0.1
26-Jan	-19.6	-21.2	-22.7	-23.8	-24.9	-25.9	-26.9	-27.9	-28.6	-28.7	-28.4	-28.0	-27.4	-26.6	-26.1	-25.7	-25.4	-25.6	-25.5	-25.3	-25.5	-25.8	-26.3	-26.4	-25.8	-19.6
27-Jan	-26.5	-26.7	-26.6	-27.5	-27.7	-27.6	-29.0	-29.3	-30.0	-31.2	-28.7	-26.4	-25.2	-22.6	-20.2	-18.2	-16.7	-17.3	-17.9	-17.7	-17.9	-17.6	-17.6	-17.6	-23.5	-16.7
28-Jan	-16.7	-16.4	-17.4	-16.5	-15.3	-15.3	-15.7	-15.8	-15.5	-16.6	-16.6	-16.3	-15.4	-14.3	-13.3	-13.1	-13.2	-13.3	-15.3	-18.4	-20.0	-21.1	-21.9	-22.2	-16.5	-13.1
29-Jan	-22.3	-22.5	-22.9	-23.0	-23.1	-23.0	-22.5	-22.6	-22.4	-22.4	-22.2	-22.5	-23.2	-24.3	-24.7	-24.5	-24.2	-23.9	-23.6	-23.5	-23.5	-23.5	-23.4	-23.3	-23.2	-22.2
30-Jan	-23.4	-23.5	-23.6	-23.7	-23.7	-23.6	-23.6	-23.6	-23.5	-23.2	-22.9	-21.8	-20.5	-19.1	-17.9	-16.9	-16.7	-16.8	-16.7	-16.6	-16.2	-15.8	-15.3	-15.1	-20.1	-15.1
31-Jan	-15.2	-16.8	-17.2	-17.4	-17.7	-18.7	-18.3	-17.9	-17.5	-17.7	-17.1	-16.7	-16.1	-15.9	-15.6	-15.3	-15.2	-15.4	-15.5	-15.6	-15.3	-14.9	-14.7	-14.5	-16.3	-14.5
	-16.5	-16.4	-16.5	-16.5	-16.7	-16.7	-16.8	-16.6	-16.5	-16.5	-16.2	-15.8	-15.4	-14.9	-14.5	-14.0	-14.4	-14.9	-15.3	-15.6	-15.7	-15.9	-16.1	-16.1	Diurnal Average	
	4.2	6.8	6.9	5.8	4.7	4.5	5.3	5.3	4.0	4.0	4.6	5.2	5.6	6.0	6.0	5.4	4.2	4.0	3.8	3.8	3.7	3.7	4.0	4.4	Diurnal Maximum	

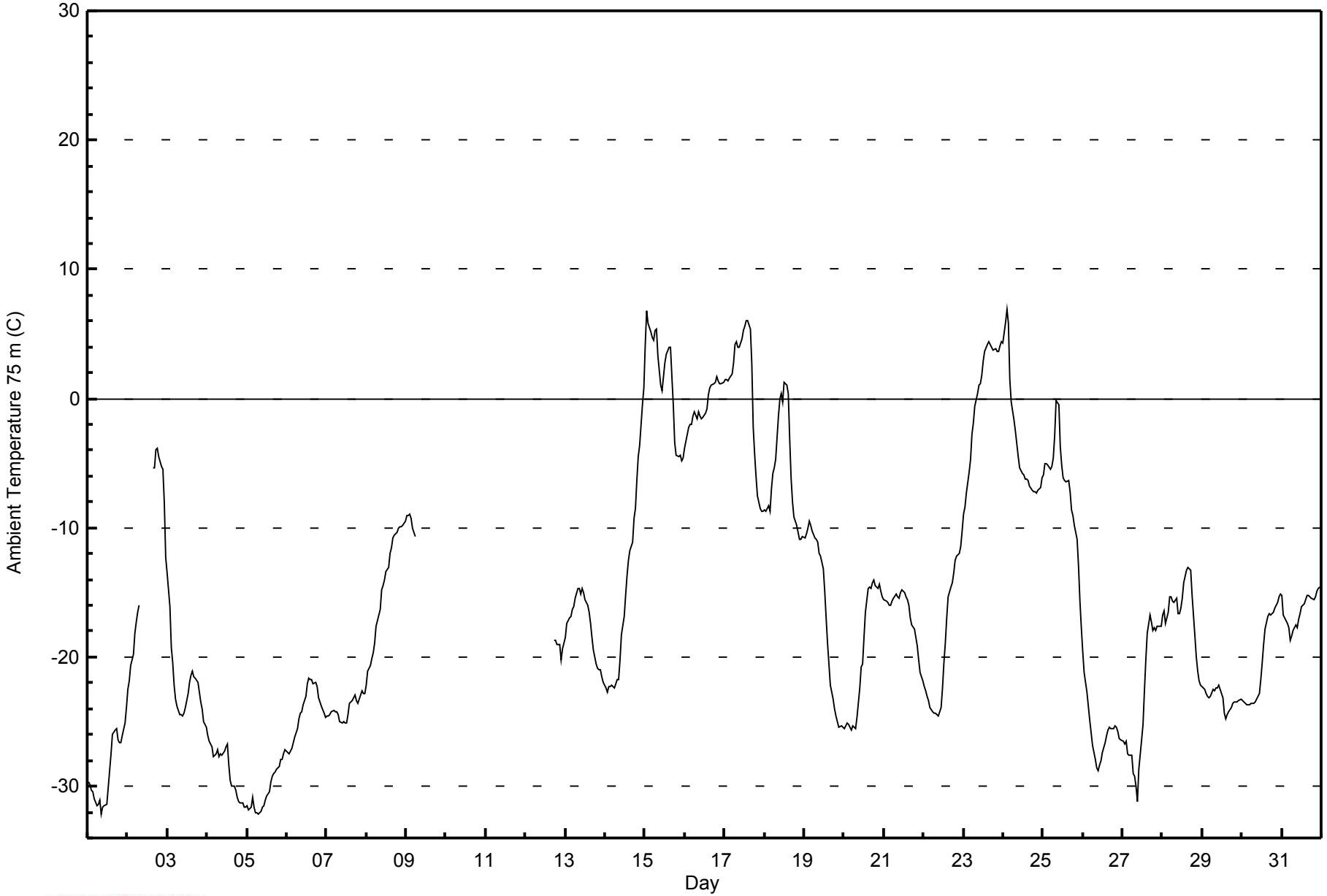
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature 75 m (AT75m) - C

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	281	42.90	42.90
-20 - 0	304	46.41	89.31
0 - 10	70	10.69	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 655

Total Number of Hours: 744

Maximum Value: 7.1 C on Jan 24 03:00 — Maximum Daily Average: 1.5 C on Jan 15

Minimum Value: -32.1 C on Jan 5 08:00 — Minimum Daily Average: -30.0 C on Jan 5

Maximum Diurnal Average: -14.0 C at hour 16 — Minimum Diurnal Average: -16.6 C at hour 5

Monthly Average: -15.75 C — Percentiles: P_1 = -31.5 P_{10} = -27.2 Q_1 = -23.9 Median = -17.1 Q_3 = -8.3 P_{90} = 0.9 P_{99} = 5.7

Hours in Service:	744
Hours of Data:	652
Hours of Missing Data:	92
Hours of Calibration:	0
Percent Operational Time:	87.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-29.3	-29.3	-29.5	-30.1	-30.7	-30.8	-31.1	-30.6	-31.5	-31.1	-30.5	-30.3	-29.2	-27.7	-26.6	-25.6	-25.1	-24.9	-25.9	-26.4	-26.4	-25.8	-25.1	-23.8	-28.2	-23.8
2-Jan	-22.3	-21.5	-20.5	-19.7	-18.1	-17.3	-16.5	AF	AF	AF	AF	AF	AF	AF	AF	-5.0	-4.9	-3.6	-3.5	-4.4	-5.2	-5.3	-7.8	-12.3	--	-3.5
3-Jan	-13.6	-16.2	-19.3	-20.6	-22.3	-23.3	-23.9	-24.5	-24.5	-24.6	-24.4	-24.0	-22.8	-22.0	-21.4	-21.2	-21.6	-21.7	-22.1	-22.8	-23.4	-23.9	-24.9	-25.3	-22.3	-13.6
4-Jan	-26.1	-26.4	-26.8	-26.9	-27.6	-27.4	-27.2	-27.6	-27.5	-27.7	-27.4	-27.1	-26.9	-28.5	-29.7	-30.1	-30.0	-30.3	-30.9	-31.1	-31.3	-31.3	-31.6	-31.5	-28.7	-26.1
5-Jan	-31.3	-31.7	-31.4	-30.3	-31.2	-31.9	-32.0	-32.1	-32.0	-31.5	-31.4	-30.9	-30.6	-29.8	-29.4	-29.0	-28.6	-28.6	-28.2	-28.2	-27.5	-27.7	-27.4	-27.1	-30.0	-27.1
6-Jan	-27.3	-27.4	-27.0	-26.9	-26.6	-26.2	-25.3	-24.7	-24.2	-24.2	-23.8	-23.1	-22.1	-21.7	-21.8	-21.9	-22.1	-22.1	-22.5	-23.2	-23.6	-24.0	-24.4	-24.8	-24.2	-21.7
7-Jan	-24.7	-24.7	-24.5	-24.4	-24.2	-24.3	-24.3	-24.4	-25.0	-25.3	-24.8	-25.0	-25.1	-24.5	-23.5	-23.2	-22.9	-22.6	-23.2	-23.4	-22.8	-22.4	-22.3	-22.6	-23.9	-22.3
8-Jan	-22.0	-21.0	-20.6	-20.1	-19.6	-18.9	-17.6	-16.6	-16.1	-14.7	-14.4	-13.9	-13.4	-12.9	-12.0	-11.5	-10.9	-10.6	-10.4	-10.1	-9.9	-9.8	-9.6	-9.3	-14.4	-9.3
9-Jan	-9.0	-8.8	-8.7	-9.2	-10.0	-10.7	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	-8.7
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-18.5	-18.7	-18.6	-19.7	-19.1	-18.8	--	-18.5
13-Jan	-18.3	-17.3	-16.9	-16.8	-16.3	-15.9	-15.3	-14.3	-14.5	-15.2	-14.8	-15.2	-15.8	-16.2	-16.7	-17.5	-18.7	-19.5	-20.6	-20.9	-21.0	-20.9	-21.5	-21.9	-17.6	-14.3
14-Jan	-22.2	-22.2	-22.1	-21.9	-21.4	-21.3	-21.4	-20.7	-20.9	-19.8	-17.8	-16.5	-14.9	-13.3	-12.4	-11.6	-11.0	-9.0	-7.9	-5.7	-3.7	-3.0	0.0	1.1	-14.1	1.1
15-Jan	4.3	6.8	5.7	5.1	4.6	4.5	5.2	5.3	3.2	1.0	0.4	1.7	2.7	3.3	3.9	3.9	1.7	-0.1	-3.2	-4.4	-4.6	-4.5	-4.9	-4.7	1.5	6.8
16-Jan	-3.7	-2.4	-2.2	-1.9	-1.8	-1.3	-0.9	-1.4	-0.9	-1.3	-1.3	-1.2	-0.9	-0.6	0.5	0.9	1.1	1.1	1.4	1.7	1.4	1.3	1.2	1.5	-0.4	1.7
17-Jan	1.5	1.5	1.8	1.7	1.9	2.9	4.2	4.3	4.0	3.9	4.5	5.2	5.6	6.1	6.0	5.5	2.7	-2.4	-4.4	-6.2	-7.7	-8.6	-8.8	-8.7	0.7	6.1
18-Jan	-8.7	-8.7	-8.0	-8.2	-6.4	-5.4	-3.7	-2.6	-0.6	0.2	0.6	0.2	1.7	1.5	0.4	-3.0	-6.0	-8.0	-9.1	-9.8	-10.3	-10.9	-10.9	-10.5	-5.3	1.7
19-Jan	-10.8	-10.5	-10.0	-9.5	-9.7	-10.1	-10.8	-10.9	-11.2	-12.0	-12.2	-13.2	-15.1	-17.1	-19.0	-20.6	-22.3	-23.4	-24.2	-24.7	-25.2	-25.6	-25.5	-25.5	-16.6	-9.5
20-Jan	-25.6	-25.4	-25.2	-25.0	-25.2	-24.6	-25.1	-25.3	-24.3	-21.9	-20.0	-19.7	-18.1	-16.2	-14.4	-13.8	-14.3	-14.2	-13.9	-14.6	-14.6	-14.4	-15.0	-15.5	-19.4	-13.8
21-Jan	-15.6	-15.7	-15.8	-16.0	-15.8	-15.5	-15.4	-15.1	-15.3	-15.3	-15.1	-14.9	-15.2	-15.5	-15.7	-16.1	-17.0	-17.5	-17.9	-18.5	-19.2	-20.3	-21.3	-21.9	-16.7	-14.9
22-Jan	-22.3	-22.6	-23.0	-23.3	-23.8	-24.2	-24.3	-24.2	-24.5	-24.5	-23.8	-22.4	-20.5	-18.9	-16.9	-15.3	-14.5	-14.1	-13.3	-12.4	-12.0	-11.7	-11.1	-9.5	-18.9	-9.5
23-Jan	-8.5	-8.0	-6.9	-5.3	-4.2	-2.6	-1.7	-0.6	0.3	1.1	1.2	1.8	2.9	3.6	4.2	4.3	4.2	4.0	3.7	3.8	3.6	3.7	4.0	4.4	0.5	4.4
24-Jan	4.3	6.1	7.1	5.9	1.5	-0.3	-1.8	-2.7	-3.6	-4.7	-5.5	-5.9	-6.0	-6.4	-6.4	-6.5	-6.9	-7.2	-7.3	-7.3	-7.4	-7.1	-6.9	-6.0	-3.4	7.1
25-Jan	-5.8	-5.1	-5.0	-5.2	-5.5	-5.2	-4.5	-2.5	0.2	-0.4	-3.9	-5.3	-6.2	-6.4	-6.6	-6.5	-7.3	-8.7	-9.2	-9.9	-11.0	-13.1	-15.8	-17.8	-6.9	0.2
26-Jan	-19.7	-21.3	-22.8	-23.9	-25.0	-26.0	-27.0	-28.0	-28.7	-28.9	-28.5	-28.1	-27.5	-26.7	-26.2	-25.8	-25.6	-25.6	-25.5	-25.3	-25.5	-25.7	-26.2	-26.4	-25.8	-19.7
27-Jan	-26.3	-26.4	-26.4	-27.1	-27.2	-26.4	-26.9	-27.4	-27.0	-28.5	-26.9	-24.8	-23.5	-22.0	-20.1	-18.1	-16.6	-17.0	-17.4	-17.1	-17.3	-16.9	-17.1	-17.3	-22.6	-16.6
28-Jan	-16.6	-16.0	-16.9	-16.1	-14.9	-14.9	-15.1	-15.0	-15.1	-15.2	-15.8	-16.1	-15.4	-14.3	-13.1	-13.2	-13.2	-13.3	-15.4	-18.5	-20.2	-21.3	-22.0	-22.3	-16.2	-13.1
29-Jan	-22.4	-22.6	-23.0	-23.1	-23.2	-23.1	-22.5	-22.7	-22.5	-22.5	-22.4	-22.6	-23.3	-24.5	-24.9	-24.6	-24.3	-24.0	-23.7	-23.7	-23.6	-23.6	-23.5	-23.4	-23.3	-22.4
30-Jan	-23.5	-23.6	-23.8	-23.8	-23.8	-23.7	-23.6	-23.7	-23.6	-23.3	-23.0	-21.9	-20.6	-19.2	-18.0	-17.0	-16.8	-16.8	-16.7	-16.7	-16.3	-15.8	-15.3	-15.1	-20.2	-15.1
31-Jan	-15.1	-16.8	-17.3	-17.4	-17.8	-18.7	-18.3	-17.9	-17.6	-17.7	-17.1	-16.7	-16.2	-16.1	-15.7	-15.4	-15.3	-15.5	-15.6	-15.7	-15.4	-15.0	-14.8	-14.6	-16.4	-14.6
	-16.5	-16.3	-16.4	-16.4	-16.6	-16.5	-16.5	-16.4	-16.3	-16.3	-16.1	-15.8	-15.3	-14.8	-14.4	-14.0	-14.3	-14.7	-15.2	-15.5	-15.7	-15.8	-16.0	-16.1	Diurnal Average	
	4.3	6.8	7.1	5.9	4.6	4.5	5.2	5.3	4.0	3.9	4.5	5.2	5.6	6.1	6.0	5.5	4.2	4.0	3.7	3.8	3.6	3.7	4.0	4.4	Diurnal Maximum	

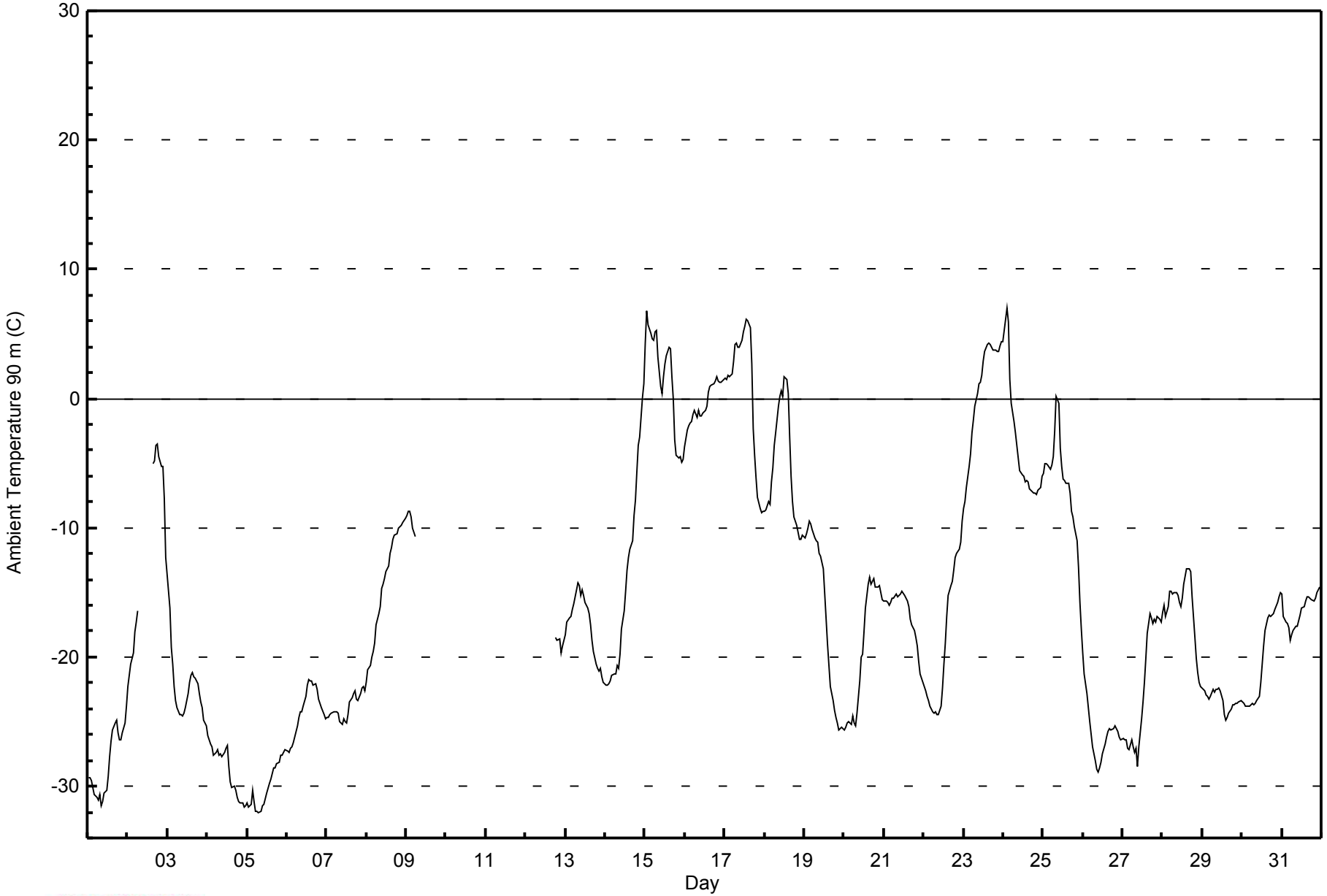
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature 90 m (AT90m) - C

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	278	42.64	42.64
-20 - 0	300	46.01	88.65
0 - 10	74	11.35	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 652

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mannix - January 2014

Maximum Value: 94 % on Jan 14 23:00

Maximum Daily Average: 85.1 % on Jan 2

Minimum Value: 50 % on Jan 15 08:00

Minimum Daily Average: 65.2 % on Jan 27

Maximum Diurnal Average: 78.1 % at hour 5

Minimum Diurnal Average: 71.0 % at hour 15

Monthly Average: 75.3 %

Percentiles: P_1 = 57 P_{10} = 66 Q_1 = 70 Median = 76 Q_3 = 81 P_{90} = 86 P_{99} = 91

Hours in Service:	744
Hours of Data:	688
Hours of Missing Data:	56
Hours of Calibration:	0
Percent Operational Time:	92.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	72	71	71	70	70	70	70	69	69	69	70	70	71	71	72	72	72	72	72	73	73	74	75	76	71.4	76
2-Jan	77	78	80	80	82	83	84	85	MS	MS	MS	86	MS	MS	MS	88	89	88	89	88	89	89	88	88	85.1	89
3-Jan	86	83	80	76	74	75	76	76	76	77	76	76	76	76	76	75	74	73	71	71	70	69	71	73	75.3	86
4-Jan	72	71	70	71	71	72	70	69	67	67	67	66	64	66	69	68	64	61	63	63	63	62	64	66	66.9	72
5-Jan	66	68	70	70	69	69	71	71	71	71	71	68	69	69	69	69	71	71	71	71	72	73	73	72	70.1	73
6-Jan	73	73	72	72	73	74	74	75	76	77	77	77	78	76	74	73	72	72	71	71	74	74	74	72	74.0	78
7-Jan	72	72	72	76	77	77	77	76	75	74	76	73	73	71	71	73	76	77	77	77	77	77	77	77	75.0	77
8-Jan	78	78	78	78	80	81	82	82	83	83	83	81	79	79	81	82	83	84	84	86	86	88	90	90	82.5	90
9-Jan	90	90	90	90	89	89	90	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	90
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	85	84	84	82	83	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	85
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	86	85	85	86	86	86	86	86	85	85	84	MS	MS	--	86
12-Jan	MS	82	80	80	78	77	76	76	77	79	80	78	73	74	76	77	79	81	81	79	79	79	79	80	78.3	82
13-Jan	81	83	83	84	83	84	83	85	84	82	80	79	78	78	77	77	78	79	78	79	81	80	79	80	80.6	85
14-Jan	79	78	77	79	78	79	79	79	79	80	82	83	84	85	86	87	88	89	90	91	92	92	94	91	84.1	94
15-Jan	85	69	76	65	66	67	57	50	65	86	93	85	76	67	58	55	61	69	72	72	75	81	85	87	71.7	93
16-Jan	88	88	90	90	90	82	81	84	81	83	77	72	69	69	69	72	75	76	76	77	76	75	76	73	78.8	90
17-Jan	78	80	81	81	84	85	71	67	68	68	66	64	65	64	61	62	67	75	72	69	70	69	71	76	71.4	85
18-Jan	81	80	78	79	81	85	88	89	90	88	83	76	78	78	74	73	78	84	87	90	90	89	90	90	83.2	90
19-Jan	90	90	90	90	89	89	89	89	89	88	88	83	77	73	71	69	68	67	68	68	70	70	72	76	79.8	90
20-Jan	76	77	76	76	76	76	74	74	73	72	71	70	69	70	70	72	72	73	74	76	77	77	75	73	73.7	77
21-Jan	74	74	75	78	79	76	75	77	77	77	76	77	72	70	67	67	70	72	74	74	77	76	77	77	74.5	79
22-Jan	76	76	76	78	78	77	77	77	77	76	73	70	70	69	67	66	69	71	75	78	80	80	80	81	74.9	81
23-Jan	82	84	86	87	87	88	86	86	72	71	72	70	66	64	63	63	65	67	69	72	73	75	75	76	74.9	88
24-Jan	79	80	75	75	80	82	86	83	83	80	78	78	79	79	77	78	80	82	83	84	84	84	84	84	80.6	86
25-Jan	84	85	88	90	91	91	89	88	85	80	82	83	82	83	84	80	75	76	78	70	59	51	59	60	78.8	91
26-Jan	58	60	60	62	66	67	65	66	67	69	70	66	68	67	66	67	64	66	67	68	69	70	72	71	66.3	72
27-Jan	73	73	74	74	73	73	73	72	72	71	70	67	66	63	57	54	55	59	59	57	57	58	57	57	65.2	74
28-Jan	59	57	61	65	67	66	69	69	71	71	66	61	60	61	64	61	62	67	73	72	71	70	72	74	66.3	74
29-Jan	76	76	77	77	77	77	77	77	76	77	74	70	67	69	69	69	72	75	75	72	72	72	71	69	73.4	77
30-Jan	69	68	70	70	72	71	73	72	72	71	68	64	62	61	60	60	62	64	66	67	68	70	72	70	67.5	73
31-Jan	71	73	77	79	81	81	82	82	81	81	79	76	74	73	74	74	76	76	76	80	78	71	72	72	76.6	82
	76.7	76.5	77.1	77.3	78.1	78.0	77.4	76.6	76.2	76.8	76.1	74.6	72.8	72.2	71.0	71.4	72.5	74.1	75.1	75.1	75.3	75.1	75.8	76.2	Diurnal Average	
	90	90	90	90	91	91	90	89	90	88	93	86	85	85	86	88	89	89	90	91	92	92	94	91	Diurnal Maximum	

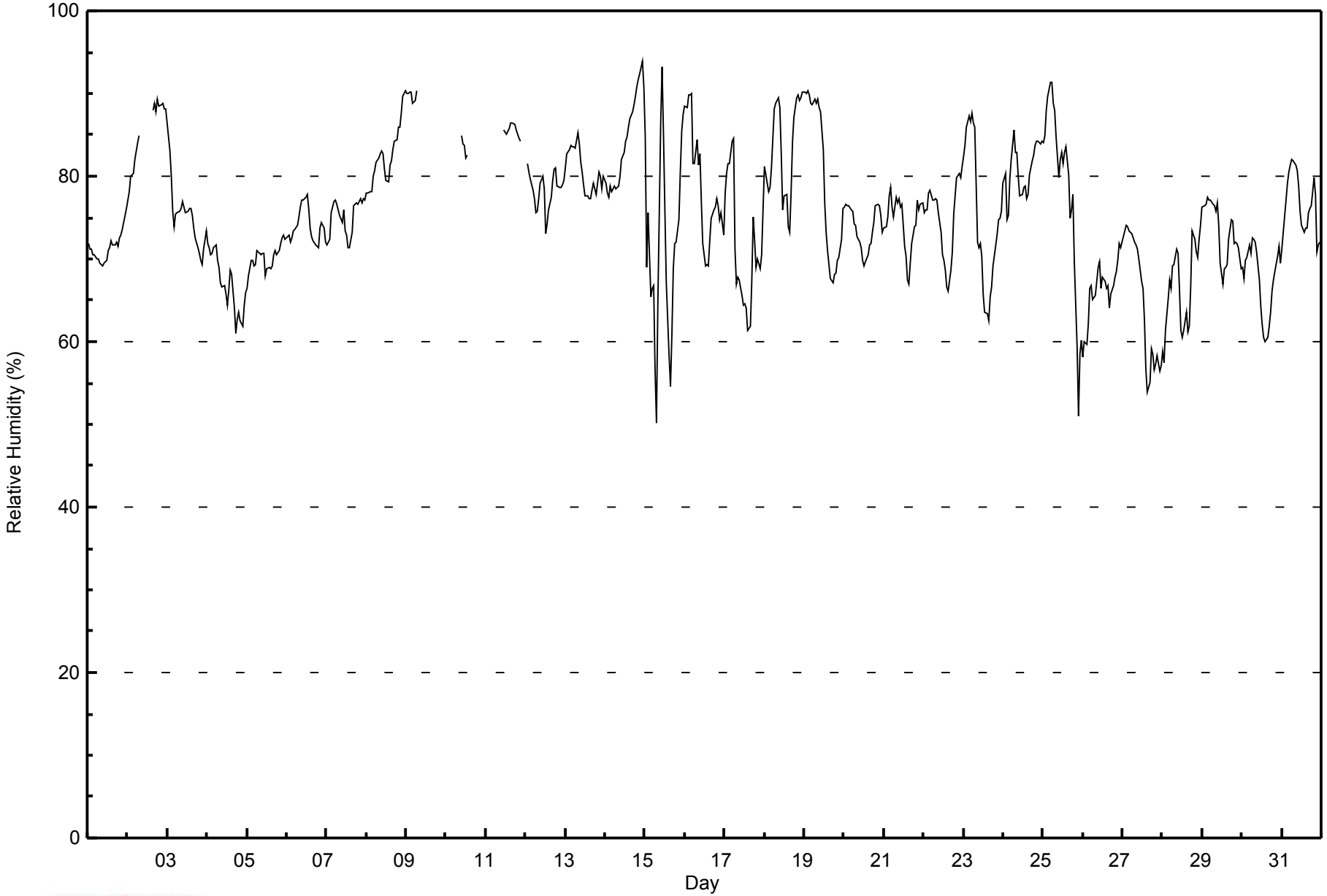
MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	23	3.34	3.34
60 - 80	481	69.91	73.26
80 - 100	184	26.74	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744

Maximum Value: 95 % on Jan 14 23:00

Maximum Daily Average: 85.1 % on Jan 2

Minimum Value: 46 % on Jan 15 08:00

Minimum Daily Average: 62.9 % on Jan 27

Maximum Diurnal Average: 76.5 % at hour 6

Minimum Diurnal Average: 70.0 % at hour 15

Monthly Average: 74.2 %

Percentiles: P_1 = 53 P_{10} = 64 Q_1 = 69 Median = 74 Q_3 = 79 P_{90} = 86 P_{99} = 91

Hours in Service:	744
Hours of Data:	688
Hours of Missing Data:	56
Hours of Calibration:	0
Percent Operational Time:	92.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	73	72	72	72	71	71	71	70	70	70	70	70	71	71	73	72	73	73	73	74	73	74	75	76	72.1	76
2-Jan	77	79	80	81	82	83	84	85	MS	MS	MS	86	MS	MS	MS	88	89	90	89	89	89	83	87	87	85.1	90
3-Jan	84	81	78	71	70	72	73	74	73	75	75	75	73	72	71	70	69	68	67	68	67	67	70	72	72.3	84
4-Jan	71	70	69	69	69	69	68	68	66	66	66	65	63	65	68	67	62	59	61	62	62	61	63	64	65.6	71
5-Jan	65	67	68	68	66	67	67	69	70	70	70	68	68	68	69	70	70	71	71	71	72	73	73	73	69.4	73
6-Jan	73	73	72	73	74	74	74	75	77	78	78	78	79	77	74	73	72	72	72	72	73	73	73	72	74.1	79
7-Jan	71	72	72	75	76	77	78	78	78	77	76	76	74	69	67	70	74	75	76	77	78	78	79	78	75.0	79
8-Jan	78	78	78	78	80	81	82	82	83	83	83	81	79	80	82	82	83	84	85	85	86	89	91	91	82.6	91
9-Jan	91	91	91	91	90	90	90	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	91
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	86	86	86	85	86	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	86
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	87	86	87	87	87	87	87	86	86	85	84	MS	MS	--	87
12-Jan	MS	81	80	79	78	76	74	74	76	79	81	79	72	72	70	72	76	78	78	78	78	79	79	79	76.9	81
13-Jan	81	83	83	84	84	84	84	84	83	82	80	79	78	78	77	77	78	78	78	79	80	80	79	80	80.5	84
14-Jan	81	81	80	79	79	79	79	79	79	80	82	83	85	86	87	88	89	89	90	91	93	93	95	93	85.0	95
15-Jan	80	66	72	62	64	65	53	46	62	85	93	84	74	64	54	50	57	65	70	71	72	73	74	74	68.0	93
16-Jan	76	78	76	68	66	63	65	70	66	68	69	69	67	66	66	68	66	65	67	67	68	69	70	70	68.5	78
17-Jan	72	74	76	79	79	77	67	65	65	64	63	61	61	61	58	58	65	74	71	68	69	68	67	69	68.0	79
18-Jan	71	73	74	76	81	84	87	88	88	88	83	75	75	74	71	73	78	84	88	90	91	90	90	90	81.7	91
19-Jan	90	90	90	91	90	90	90	90	89	89	89	85	77	73	71	70	68	67	68	69	70	70	72	76	80.2	91
20-Jan	75	74	75	76	76	76	74	74	73	72	72	71	70	70	71	71	72	73	74	77	77	76	75	73	73.6	77
21-Jan	74	74	75	75	75	74	74	78	77	78	78	78	72	70	67	67	69	70	71	73	75	76	77	77	73.9	78
22-Jan	76	76	76	79	79	78	78	78	78	76	74	73	70	68	65	64	66	70	74	77	79	80	80	81	74.6	81
23-Jan	82	84	85	85	85	85	85	78	70	69	69	68	64	61	60	59	62	63	66	68	68	69	70	71	71.9	85
24-Jan	73	72	70	71	79	82	86	83	84	80	78	79	80	80	79	78	81	83	84	85	85	85	85	85	80.2	86
25-Jan	84	84	85	86	88	90	86	85	81	78	82	84	83	85	85	80	75	76	77	68	56	48	57	59	77.6	90
26-Jan	57	59	58	61	66	66	65	66	68	69	70	67	68	68	67	67	64	65	63	62	64	64	62	65	64.7	70
27-Jan	64	66	70	73	73	73	73	72	72	71	70	68	66	61	55	52	52	52	53	54	55	55	54	54	62.9	73
28-Jan	55	55	58	60	63	63	65	68	68	68	66	62	60	61	63	60	61	66	74	73	71	70	73	75	64.8	75
29-Jan	77	77	77	78	77	77	77	77	76	78	74	70	68	69	69	70	72	75	74	71	71	72	71	68	73.5	78
30-Jan	68	67	69	70	72	71	73	73	72	71	69	65	64	62	60	60	60	61	64	66	67	69	68	67	67.0	73
31-Jan	69	73	77	79	80	82	83	83	82	81	79	77	76	74	75	75	76	76	77	80	77	70	71	72	76.8	83
	74.7	74.8	75.4	75.4	76.3	76.5	76.0	75.4	75.0	76.1	75.9	74.9	72.6	71.6	70.0	70.3	71.2	72.8	73.8	74.1	74.2	73.7	74.2	74.6	Diurnal Average	
	91	91	91	91	90	90	90	90	89	89	93	87	86	87	87	88	89	90	90	91	93	93	95	93	Diurnal Maximum	

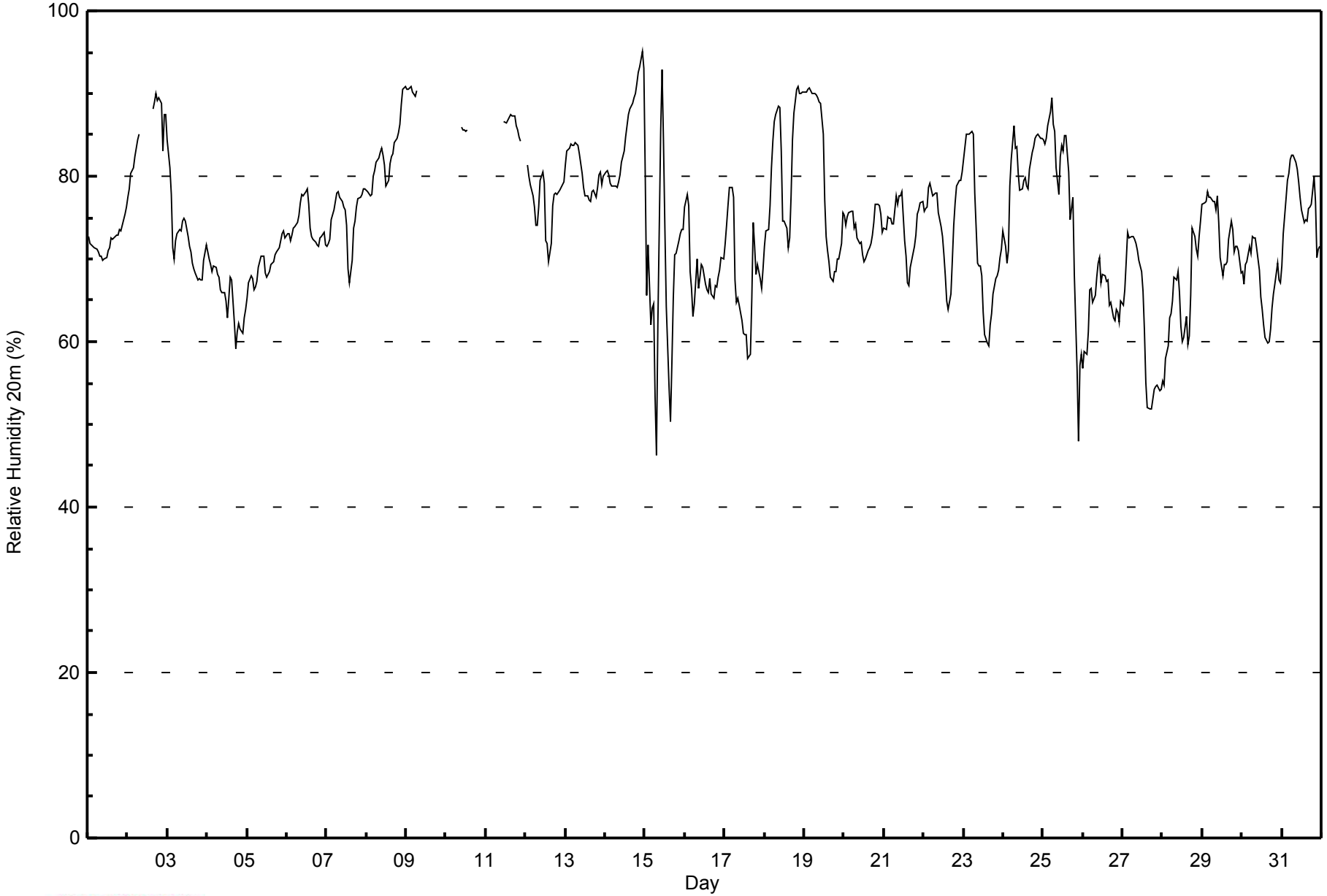
MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity 20m (RH20m) - %

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	35	5.09	5.09
60 - 80	488	70.93	76.02
80 - 100	165	23.98	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744

Maximum Value: 96 % on Jan 14 23:00

Maximum Daily Average: 85.0 % on Jan 14

Minimum Value: 45 % on Jan 15 08:00

Minimum Daily Average: 60.8 % on Jan 27

Maximum Diurnal Average: 75.6 % at hour 6

Minimum Diurnal Average: 70.1 % at hour 16

Monthly Average: 73.5 %

Percentiles: P_1 = 52 P_{10} = 61 Q_1 = 68 Median = 73 Q_3 = 79 P_{90} = 86 P_{99} = 91

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Hours of Calibration:	0
Percent Operational Time:	92.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	73	72	72	72	71	71	71	71	71	70	70	70	70	71	73	74	74	74	75	75	75	75	76	77	72.7	77
2-Jan	78	79	80	81	82	83	84	85	MS	MS	MS	86	MS	MS	MS	86	86	86	78	77	78	77	84	88	82.2	88
3-Jan	85	81	78	71	70	72	73	74	73	75	74	75	72	71	70	68	68	68	67	67	67	67	69	70	71.8	85
4-Jan	70	69	68	67	67	68	67	67	66	66	66	65	63	65	68	68	61	59	61	61	61	60	62	63	64.8	70
5-Jan	65	67	68	66	65	65	66	68	69	68	68	67	68	69	70	69	69	70	71	72	72	73	72	72	68.8	73
6-Jan	73	72	72	73	74	74	74	75	77	78	78	78	79	77	74	73	72	72	72	72	72	73	73	72	74.2	79
7-Jan	72	72	72	75	77	77	76	78	79	78	77	74	72	70	69	71	72	74	76	77	77	77	79	78	75.0	79
8-Jan	78	77	77	77	80	80	81	82	83	83	83	82	80	80	82	83	83	84	85	84	86	89	91	91	82.6	91
9-Jan	91	90	91	91	90	90	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	91
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	87	87	87	87	87	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	87
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	86	86	87	87	87	87	87	87	86	86	85	MS	MS	--	87
12-Jan	MS	83	81	80	79	78	76	76	77	80	81	80	73	72	70	72	76	76	77	77	78	79	79	79	77.3	83
13-Jan	82	84	84	85	84	84	83	83	83	82	81	79	78	78	78	78	79	79	78	79	80	81	79	79	80.7	85
14-Jan	81	81	81	80	79	79	79	79	79	80	82	83	85	86	87	88	89	90	90	91	93	94	96	89	85.0	96
15-Jan	75	64	72	61	63	64	52	45	62	85	91	84	73	63	53	49	56	64	70	70	72	71	72	72	66.7	91
16-Jan	71	68	65	62	62	59	58	59	58	59	61	64	65	65	64	62	60	60	60	59	61	66	66	67	62.6	71
17-Jan	68	71	74	76	75	73	66	63	64	63	61	59	59	59	56	57	65	75	72	68	69	67	66	67	66.4	76
18-Jan	67	70	70	75	82	85	86	88	88	82	78	75	73	73	71	73	78	85	89	91	91	90	90	90	80.8	91
19-Jan	90	90	90	90	90	90	90	90	89	89	88	87	79	73	71	70	68	68	69	69	71	71	72	75	80.4	90
20-Jan	75	72	73	74	75	75	73	74	73	71	72	71	70	71	71	71	72	73	73	77	77	77	76	74	73.4	77
21-Jan	74	74	76	75	75	74	75	77	76	78	78	79	73	70	67	67	69	69	72	73	75	76	77	77	74.1	79
22-Jan	76	76	77	79	79	78	78	78	78	76	74	73	71	69	66	64	66	70	74	76	78	78	79	80	74.7	80
23-Jan	82	83	84	81	82	78	79	73	68	68	67	66	62	59	58	58	60	61	63	65	67	67	67	68	69.5	84
24-Jan	71	68	66	69	78	82	87	84	84	81	79	79	80	81	80	79	82	84	84	85	86	86	85	85	80.2	87
25-Jan	84	83	83	84	86	86	84	82	77	76	83	84	84	86	86	81	75	77	78	68	56	47	57	59	76.9	86
26-Jan	57	59	59	62	67	67	65	66	69	70	70	68	69	68	68	68	65	65	63	62	63	62	60	58	64.5	70
27-Jan	59	60	63	66	68	72	73	72	72	71	70	68	66	62	55	51	50	49	51	52	52	52	52	52	60.8	73
28-Jan	52	52	54	56	56	57	61	63	58	64	64	61	60	61	62	59	61	66	75	73	72	71	73	76	62.8	76
29-Jan	77	77	78	79	78	78	77	78	77	79	75	71	68	69	70	70	73	75	74	71	72	72	71	69	74.0	79
30-Jan	69	67	70	70	72	71	73	73	73	72	69	66	64	62	61	60	59	61	64	66	66	67	66	65	66.8	73
31-Jan	68	74	78	80	81	83	83	83	80	80	79	78	76	75	75	75	77	77	77	79	76	70	71	71	76.9	83
	73.7	73.7	74.3	74.3	75.4	75.6	74.7	74.4	74.1	75.4	75.2	74.9	72.5	71.7	70.1	70.1	70.8	72.3	73.2	73.3	73.4	73.2	73.6	73.6	Diurnal Average	
	91	90	91	91	90	90	90	90	89	89	91	87	87	87	87	88	89	90	90	91	93	94	96	91	Diurnal Maximum	

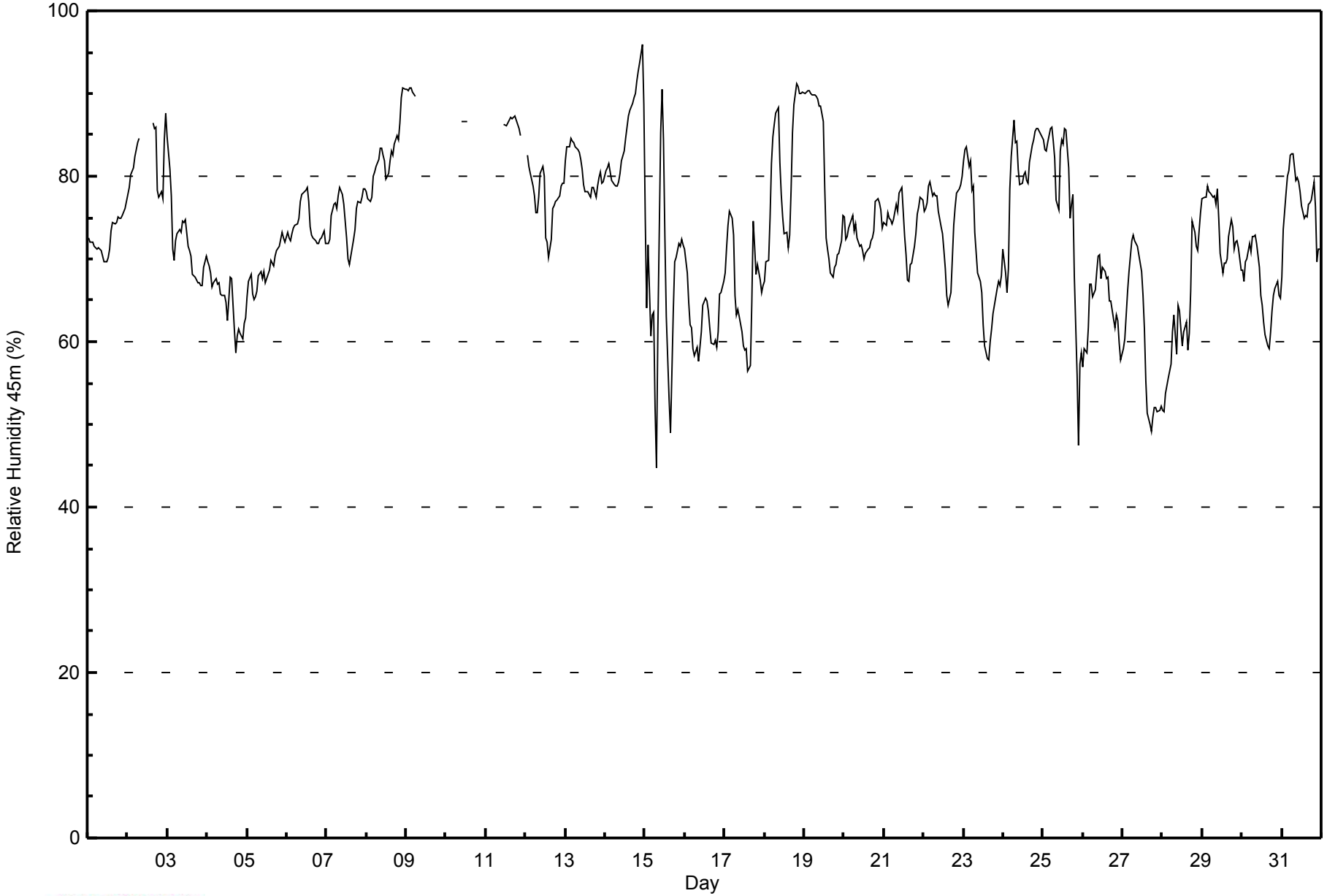
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity 45m (RH45m) - %

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	54	7.86	7.86
60 - 80	474	69.00	76.86
80 - 100	159	23.14	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 744

Maximum Value: 94 % on Jan 14 21:00

Maximum Daily Average: 85.3 % on Jan 14

Minimum Value: 45 % on Jan 15 08:00

Minimum Daily Average: 58.4 % on Jan 27

Maximum Diurnal Average: 74.9 % at hour 6

Minimum Diurnal Average: 69.5 % at hour 16

Monthly Average: 73.0 %

Percentiles: P_1 = 48 P_{10} = 60 Q_1 = 67 Median = 73 Q_3 = 80 P_{90} = 85 P_{99} = 91

Hours in Service:	744
Hours of Data:	655
Hours of Missing Data:	89
Hours of Calibration:	0
Percent Operational Time:	88.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	73	72	72	72	72	72	72	73	72	74	73	72	72	73	75	76	76	77	76	76	76	76	77	78	74.0	78
2-Jan	79	80	80	81	83	83	84	85	MS	MS	MS	86	MS	MS	MS	79	80	75	72	74	76	76	82	88	80.1	88
3-Jan	86	82	78	72	71	73	74	74	74	75	75	76	74	71	70	68	68	68	68	67	67	66	68	69	72.2	86
4-Jan	69	68	67	66	67	67	66	67	66	66	66	65	63	65	68	68	61	59	61	62	62	61	62	62	64.8	69
5-Jan	65	67	68	63	63	65	66	67	68	69	69	68	67	68	69	69	69	69	71	71	71	72	71	70	68.1	72
6-Jan	72	73	72	73	74	74	74	75	77	78	78	78	79	78	75	74	73	73	73	73	73	73	74	73	74.4	79
7-Jan	73	73	73	76	77	77	76	75	77	77	76	74	72	70	70	72	72	74	76	76	76	77	78	79	74.9	79
8-Jan	78	76	76	77	80	81	81	82	84	83	82	82	80	81	82	83	82	84	86	86	87	91	91	91	82.8	91
9-Jan	91	91	91	91	90	90	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	91
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	MS	--	--
12-Jan	MS	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	82	82	81	79	80	80	81	--	82
13-Jan	83	84	84	85	85	85	85	85	85	84	84	82	81	81	80	80	80	80	78	80	81	81	79	77	82.0	85
14-Jan	79	81	80	82	82	81	81	81	81	82	83	84	85	86	87	88	89	90	91	93	94	94	89	83	85.3	94
15-Jan	73	64	71	61	64	64	52	45	62	86	93	84	73	63	53	49	55	60	69	70	72	72	73	72	66.7	93
16-Jan	70	65	62	60	60	57	55	57	55	57	59	60	61	61	59	59	59	59	59	58	59	61	63	64	60.0	70
17-Jan	66	69	72	74	74	71	65	63	64	63	62	60	59	58	56	56	65	75	72	69	70	68	67	67	66.0	75
18-Jan	67	68	68	73	82	84	86	88	80	77	75	75	70	71	72	74	79	87	90	91	91	90	90	90	79.8	91
19-Jan	90	90	90	90	90	90	90	89	89	89	88	87	83	74	72	71	70	69	70	71	72	72	73	75	81.0	90
20-Jan	75	73	71	70	72	70	71	74	72	70	70	71	70	72	73	72	73	73	75	78	78	78	77	75	73.1	78
21-Jan	76	75	76	77	78	76	77	75	76	78	80	80	74	71	68	68	70	70	72	74	76	77	78	77	75.0	80
22-Jan	76	76	78	79	79	78	78	78	77	76	74	74	72	69	66	65	67	71	74	75	77	78	78	79	74.8	79
23-Jan	80	81	81	79	79	76	75	72	68	67	67	66	62	60	58	58	59	61	63	65	67	67	66	67	68.5	81
24-Jan	71	66	64	67	78	83	88	85	86	82	80	80	82	82	81	80	83	85	86	87	87	86	86	85	80.8	88
25-Jan	84	83	83	84	85	86	84	81	75	75	84	86	85	87	87	82	76	78	79	69	57	48	58	60	77.3	87
26-Jan	58	60	60	63	68	68	67	67	70	72	71	69	70	70	68	68	66	66	63	63	63	62	61	57	65.4	72
27-Jan	59	58	57	61	62	64	69	72	71	72	70	65	64	61	55	50	47	47	48	48	50	49	49	51	58.4	72
28-Jan	50	49	51	50	48	47	49	52	54	59	60	59	60	62	59	59	62	68	75	74	72	72	74	77	60.2	77
29-Jan	78	79	78	79	79	79	79	79	79	79	77	72	69	70	70	71	73	75	74	72	73	73	72	70	75.0	79
30-Jan	69	68	70	71	73	72	73	73	74	73	70	67	66	63	62	60	59	61	64	66	66	66	65	64	67.4	74
31-Jan	67	75	79	81	81	83	83	83	81	80	80	79	77	76	76	76	78	78	78	80	76	70	72	72	77.6	83
	73.4	73.1	73.4	73.4	74.8	74.9	74.1	74.0	73.7	74.7	74.9	74.1	71.9	71.0	69.7	69.5	70.0	72.0	73.0	73.2	73.2	72.8	73.4	73.3	Diurnal Average	
	91	91	91	91	90	90	90	89	89	89	93	87	85	87	87	88	89	90	91	93	94	94	91	91	Diurnal Maximum	

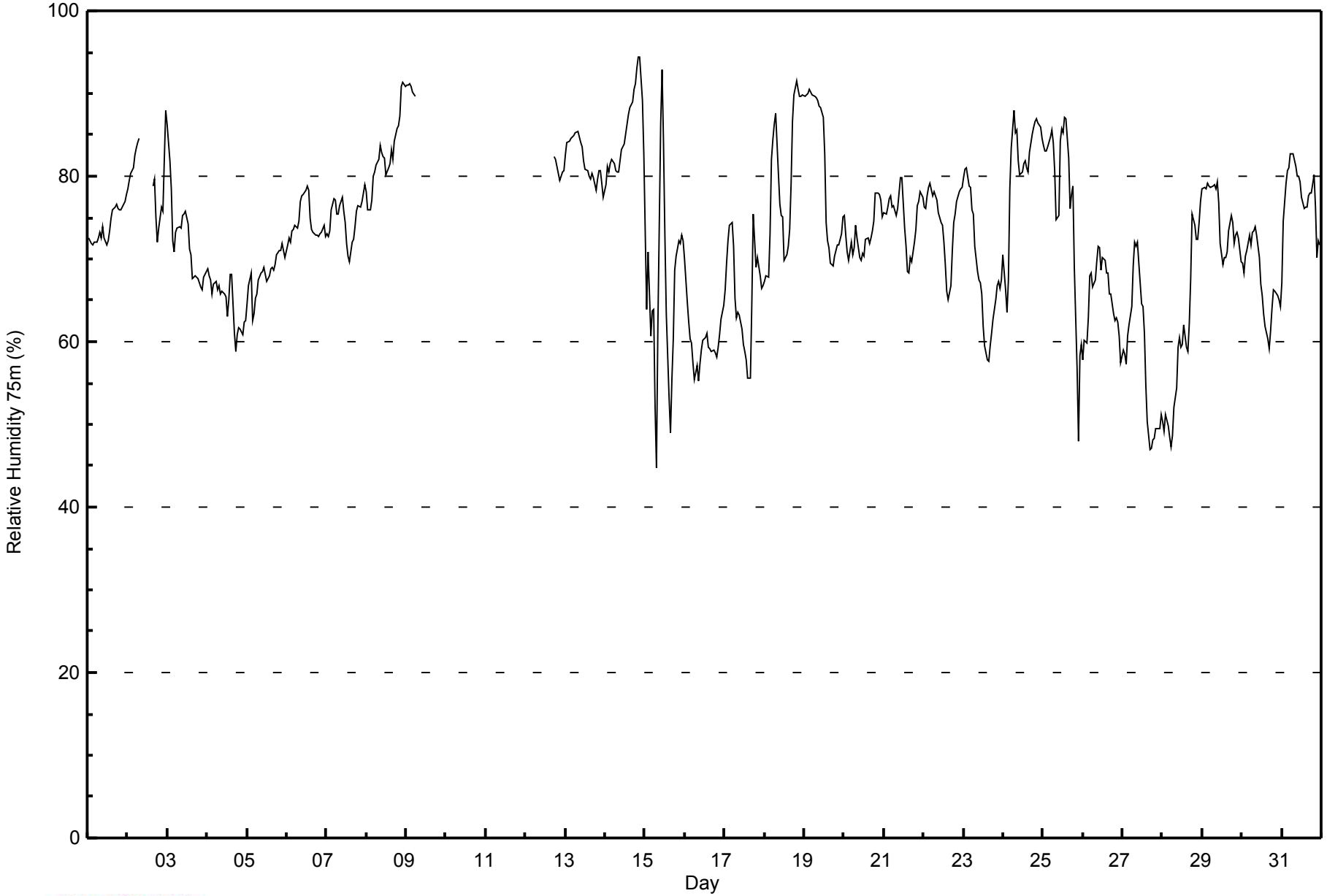
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity 75m (RH75m) - %

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	64	9.77	9.77
60 - 80	437	66.72	76.49
80 - 100	154	23.51	100.00

Total Number of Valid Hours: 655

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 90m (RH90m) - %

Mannix - January 2014

Maximum Value: 95 % on Jan 14 22:00

Maximum Daily Average: 86.1 % on Jan 14

Minimum Value: 45 % on Jan 15 08:00

Minimum Daily Average: 57.2 % on Jan 27

Maximum Diurnal Average: 75.4 % at hour 6

Minimum Diurnal Average: 70.3 % at hour 16

Monthly Average: 73.6 %

Percentiles: P_1 = 48 P_{10} = 60 Q_1 = 68 Median = 74 Q_3 = 80 P_{90} = 86 P_{99} = 92

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	73	73	73	73	74	74	74	75	74	74	74	73	74	75	76	77	77	78	77	77	77	77	78	79	75.2	79
2-Jan	80	80	81	82	83	84	85	85	MS	MS	MS	85	MS	MS	MS	78	78	74	71	74	76	75	82	89	80.1	89
3-Jan	87	83	80	73	72	74	75	75	74	76	76	76	75	72	71	69	68	68	68	68	67	66	68	68	73.0	87
4-Jan	69	68	68	66	68	68	67	67	66	67	66	66	64	66	69	69	61	59	62	62	63	62	63	63	65.4	69
5-Jan	64	66	68	63	63	66	66	68	69	70	70	69	68	67	69	69	69	70	71	71	71	72	71	70	68.4	72
6-Jan	71	73	73	74	74	75	74	75	78	78	78	79	79	79	76	75	74	74	74	74	74	74	75	74	75.2	79
7-Jan	74	74	74	77	78	78	77	77	77	77	75	74	73	72	71	73	74	76	77	77	77	78	79	79	75.7	79
8-Jan	79	77	77	78	81	81	82	83	84	84	83	83	81	82	82	84	83	85	87	87	88	92	92	91	83.5	92
9-Jan	91	92	92	91	91	90	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	92
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	--
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	84	83	83	83	83	83	--	84
13-Jan	84	85	85	85	85	86	86	87	87	86	86	86	85	85	85	84	83	83	82	82	82	82	81	81	84.3	87
14-Jan	81	81	81	81	81	82	81	82	82	83	84	85	86	87	88	89	90	91	92	94	95	95	91	83	86.1	95
15-Jan	73	64	72	61	64	64	53	45	63	87	92	85	73	64	54	49	55	59	68	71	73	73	74	73	67.0	92
16-Jan	70	64	62	60	60	57	55	57	55	57	59	60	60	61	59	59	59	59	59	58	60	61	62	64	59.8	70
17-Jan	67	70	72	74	75	72	65	63	64	64	62	60	59	58	56	55	65	76	73	70	71	69	67	67	66.4	76
18-Jan	68	69	68	74	82	85	85	84	78	77	75	75	70	70	72	74	80	88	91	92	92	91	91	91	80.0	92
19-Jan	90	90	91	91	91	91	90	90	90	89	89	88	84	76	73	72	71	70	72	73	73	73	74	76	81.9	91
20-Jan	76	74	71	70	71	68	70	74	72	70	70	71	71	74	74	73	73	74	76	79	79	79	78	76	73.4	79
21-Jan	77	77	77	79	80	78	77	76	77	78	81	81	75	73	70	69	71	71	73	75	77	78	79	78	76.1	81
22-Jan	77	77	78	79	79	78	79	78	78	77	75	75	73	71	67	66	68	72	75	76	77	79	79	79	75.5	79
23-Jan	80	81	81	79	78	76	75	72	69	67	67	66	62	60	58	58	60	61	63	65	67	68	67	68	68.8	81
24-Jan	71	66	63	67	79	84	89	86	87	83	81	82	83	83	82	82	84	86	87	88	88	87	87	85	81.6	89
25-Jan	84	84	84	84	85	86	84	80	74	75	85	87	86	88	88	83	77	79	80	70	57	49	59	61	77.9	88
26-Jan	59	61	61	64	69	69	68	68	71	73	72	70	71	71	69	69	67	66	64	63	64	62	62	59	66.3	73
27-Jan	57	57	57	60	61	62	65	70	68	70	68	63	61	60	55	51	47	47	47	48	49	48	49	51	57.2	70
28-Jan	52	51	51	50	50	48	49	52	55	57	59	60	60	63	57	59	63	69	76	75	73	74	76	78	60.7	78
29-Jan	80	80	79	80	79	79	80	80	80	80	79	75	71	71	71	72	74	76	75	73	74	74	74	71	76.0	80
30-Jan	70	69	71	72	74	73	74	74	75	74	71	68	67	65	63	61	60	62	65	67	67	66	66	65	68.3	75
31-Jan	68	76	80	82	82	83	83	83	83	81	81	80	78	77	77	77	79	79	79	81	77	71	73	73	78.5	83
	74.0	73.6	74.0	73.9	75.3	75.4	74.4	74.3	74.2	75.1	75.4	74.8	72.7	71.9	70.5	70.3	70.8	72.4	73.8	74.0	74.0	73.5	74.2	74.1	Diurnal Average	
	91	92	92	91	91	91	90	90	90	89	92	88	86	88	88	89	90	91	92	94	95	95	92	91	Diurnal Maximum	

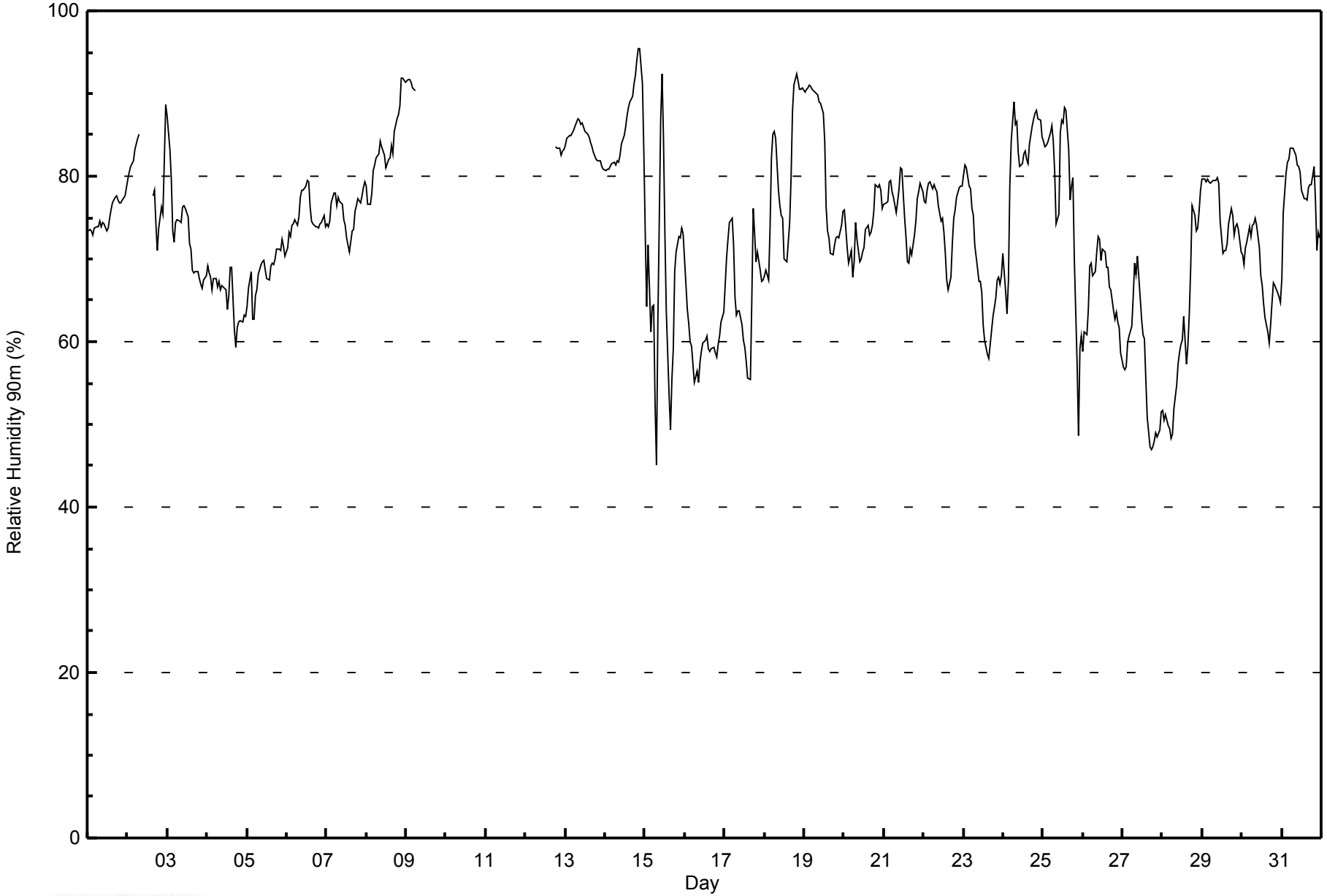
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity 90m (RH90m) - %

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	63	9.63	9.63
60 - 80	423	64.68	74.31
80 - 100	168	25.69	100.00

Total Number of Valid Hours: 654

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - January 2014

Maximum Speed: 62 km/h on Jan 15 09:00

Maximum Daily Speed Average: 28.0 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 7 04:00

Minimum Daily Speed Average: 0.8 km/h on Jan 18

Maximum Diurnal Speed Average: 5.3 km/h at hour 9

Minimum Diurnal Speed Average: 0.5 km/h at hour 21

Monthly Average Velocity: 1.4 km/h 281.9 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 7 Median = 10 Q_3 = 14 P_{90} = 20 P_{99} = 41

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Percent Operational Time:	92.3

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-Jan	SSE6	SSE8	SE8	SSE9	SSE4	SSE5	SSE7	SSE8	SSE8	SSE8	SSE4	SSE6	SSE6	SE6	SSE7	SSE7	SSE8	SSE7	SSE8	S7	SSE10	SSE10	SSE11	SSE9	SSE7.4	SSE11
2-Jan	SSE13	SE12	SE19	SE15	SSE13	SSE10	SSE11	S10	MS	MS	MS	SSE14	MS	MS	MS	SSE11	SE8	SE8	SSE12	SSE8	S6	WSW11	NW6	N22	SSE7.9	N22
3-Jan	NNE18	N28	NNE26	NNE23	NNE21	N12	N12	NNE10	N8	W2	NW1	NNE1	NW1	NW7	NW8	NW12	WNW14	WNW17	WNW20	WNW21	WNW19	WNW22	W17	W16	NNW10.5	N28
4-Jan	W17	W18	W19	W18	WSW13	W13	W18	W20	W24	W25	W24	WNW19	NW23	N23	N20	NNW13	NW15	NW16	WNW15	WNW14	WNW15	WNW15	W14	W11	WNW15.3	W25
5-Jan	W9	WNW8	W10	WSW11	W10	W5	WSW4	SSE3	SSE7	SSE7	S5	SSE4	SE3	SE4	SSE7	SSE8	SSE9	SSE10	SSE10	SSE9	SSE9	SSE9	SSE9	SSE8	S4.8	WSW11
6-Jan	SSE8	S9	SSE9	SSE11	S8	SSE10	SSE9	SSE10	SSE10	SE12	SE16	SE15	SE13	ESE11	ESE11	ESE9	ESE9	ESE6	SE8	SE10	SSE8	E8	ESE5	ESE7	SE9.0	SE16
7-Jan	SSE3	SW1	ESE1	SE0	NNE2	E1	SW3	WSW6	W2	W1	SE2	S4	SE4	S5	SSE5	S4	SSE5	SE6	SSE9	SSE11	SSE11	SSE11	SSE11	SSE10	SSE4.2	SSE11
8-Jan	SSE12	SSE17	SSE16	SSE13	SSE12	SSE10	SSE11	SSE13	SSE11	SSE12	S8	SSE10	SSE7	SSE7	SSE9	SE5	SSE6	SSE3	SE5	SSE6	SSE7	SSE6	SSE8	SSE5	SSE9.1	SSE17
9-Jan	SSE6	SSE3	SSE8	SSE8	SSE11	SSW8	S8	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	----	SSE11
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	NW5	NW5	WNW6	NNW5	NW4	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	----	WNW6
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	N7	N9	NNW8	N11	N13	N14	N15	NNW15	N15	N18	N20	UO	MS	----	N20
12-Jan	MS	N11	N15	N14	NNW15	N12	NNW9	NNW5	NNE2	SSE3	SE5	S5	WSW9	SW9	SSW8	S8	SSE10	S12	SSE13	SE13	SE13	SSE12	SSE13	SSE13	SSE2.0	NNW15
13-Jan	SSE11	SSE10	SW5	SSW4	S2	SSE3	S5	SSW3	NNW7	WNW8	NNW6	N9	NNE8	NNE9	NNE10	NNE12	NNE9	NNE11	NNE13	NNE7	NW4	NNW5	NNE8	WNW1	N3.1	NNE13
14-Jan	WNW3	WSW2	SW4	SSE7	SSE11	SSE12	SSE10	SSE11	SSE12	SSE10	SSE12	SSE11	SSE11	SSE12	SSE10	SSE11	SSE13	SSE14	SSE12	SSE16	SSE16	SSE16	SSE17	SSE15	SSE10.7	SSE17
15-Jan	WSW18	WSW48	W61	W47	W40	W37	W49	WNW57	WNW62	WNW36	AF	NW34	NW35	WNW42	WNW42	WNW42	NNW20	N14	NNE13	NNE15	N4	NW4	WSW3	SSW7	WNW28.0	WNW62
16-Jan	S8	SSE8	SSE8	SW6	W7	W6	SW1	SSE8	S8	SSE7	SSE8	SE8	SSE9	SSE12	SSE10	SSE10	SSE8	SSE7	SSE6	SSE8	SSE8	SSE8	SSE9	SSE12	SSE7.0	SSE12
17-Jan	S10	SSE10	S9	SSE7	SSW7	SSW7	W27	W34	W31	W26	W27	W28	W21	NW20	NW21	NW19	N18	NNE22	NNE14	NNE15	NNE10	NNE7	NNW3	WSW3	WNW9.0	W34
18-Jan	SSW3	SE5	SSE9	SSE13	SSE10	SSE9	S8	SSE7	SSE9	SSE7	SW9	SE4	ESE4	ENE6	N7	N13	NW12	NNW9	NNW9	NNW7	NW8	NW5	W6	WNW6	S0.8	N13
19-Jan	W2	WSW3	W5	NNW5	N11	NNE7	NNE5	WNW3	WNW6	NNW9	N12	NNE19	N27	NNE32	NNE29	N21	N20	NNE19	NNE16	NNE16	NNE13	N7	N4	SW1	N11.2	NNE32
20-Jan	SSW5	S7	S7	SSE11	SSE10	SSE11	SSE17	SSE14	SSE18	SSE14	SSE16	SSE14	SSE14	SSE13	S13	SSE12	SSE3	W4	NW4	NNW4	NW10	NW10	N11	NNW7	SSE6.3	SSE18
21-Jan	WNW5	WNW6	N4	N4	NNE3	NE2	N4	N6	WNW6	WNW7	NNW10	N11	NNE18	NNE17	NNE12	NNE10	NNE5	N5	NE5	ENE6	ESE7	SE10	SE11	SE11	NNE4.3	NNE18
22-Jan	SE11	SE10	SE10	SE10	SE9	SE10	SSE10	SSE11	SSE13	SSE12	SSE12	SSE11	SSE15	SSE15	SSE14	SSE15	SSE13	SSE14	SSE14	SSE12	SSE14	SSE22	SSE18	SSE18	SSE12.9	SSE22
23-Jan	SSE15	SSE14	SSE13	SSE12	SSE9	SSE12	SSE8	WSW10	W27	W26	W22	WNW19	WNW22	WNW19	W20	W24	WNW18	WNW18	WNW11	W14	WSW7	SSW3	SE5	SSW3	WSW9.2	W27
24-Jan	SE3	WNW6	WNW16	NW15	N17	N13	N11	N15	N11	NNE15	NNE14	NNE14	NNE14	NNE13	N9	NNE11	NNE8	N7	NNE4	W5	WNW4	S2	SSE5	SSE6	N7.4	N17
25-Jan	SSE8	SSE8	SSE8	S7	SW6	SSW6	SSW3	SW6	W9	NNW15	NNE22	N19	N15	NNW14	N14	N17	NNE21	NNE23	N21	N25	NNW26	NNW38	N30	NNW32	N11.7	NNW38
26-Jan	N34	N32	NNW31	NNW25	N21	N17	N15	NNE11	NNE14	N11	NW5	N5	E3	NNE2	NNE3	SSE2	SSE4	SSE5	SSE7	SE6	SE8	SSE8	SSE8	SSE7	N7.2	N34
27-Jan	S7	S6	SSE7	S5	SSE7	SSE8	SSE10	SSE11	SSE11	SSE9	SSE6	SSE5	SSE7	SE10	SSE12	SSE12	SSE14	SSE12	SSE12	SSE12	SSE14	SSE14	SSE17	SSE13	SSE9.9	SSE17
28-Jan	SSE13	SSE15	SSE11	S8	SSE8	SSE12	SSE9	SSE10	SSE11	SSE7	SSE8	S4	WNW2	NNE3	WNW6	NW7	NNW9	NNW14	NNE22	NNE22	NNE24	N21	N17	N17	NE3.0	NNE24
29-Jan	N12	N14	N13	N9	NNW8	WNW5	NNW5	NNW6	NNW9	N10	N14	N14	NNW22	N24	NNW18	N15	NNW14	NNW13	NNW19	NNW17	NW13	NW14	NW14	NW14	NNW12.7	N24
30-Jan	NNW15	NNW14	NW11	WNW10	WNW13	W12	W11	W13	WSW15	WSW18	WSW15	WSW14	SW11	SW12	SSW10	WSW5	SSW11	S9	SSW9	SSW10	S5	SSE2	W7	WNW15	WSW8.5	WSW18
31-Jan	NW12	N14	N12	NNW11	NNW11	W4	W7	WSW8	WSW5	NNE3	NNE13	NNW10	NNW11	NW15	NNW12	N11	N12	N10	NW8	W5	WNW6	WNW10	NW8	WSW7	NW7.7	NW15
	SSW1.9	WSW1.5	WSW2.6	WSW2.1	WSW1.7	SSW2.5	SW3.6	WSW4.3	WSW5.3	W3.7	W1.7	NW2.0	NNW3.4	NNW3.7	NNW3.6	NNW3.2	N2.4	N2.8	NNE2.3	N1.2	NNW0.5	WNW0.5	S1.3	SSW1.4	Diurnal Average	
	N34	WSW48	W61	W47	W40	W37	W49	WNW57	WNW62	WNW36	W27	NW34	NW35	WNW42	WNW42	WNW42	NNE21	NNE23	NNE22	N25	NNW26	NNW38	N30	NNW32	Diurnal Maximum	

AF - Analyzer Failure UO - Unstable Operation MS - Missing

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 16 km/h on Jan 15 09:00

Minimum Value: 1 km/h on Jan 3 12:00

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 10

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Hours of Calibration:	0
Percent Operational Time:	92.3

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

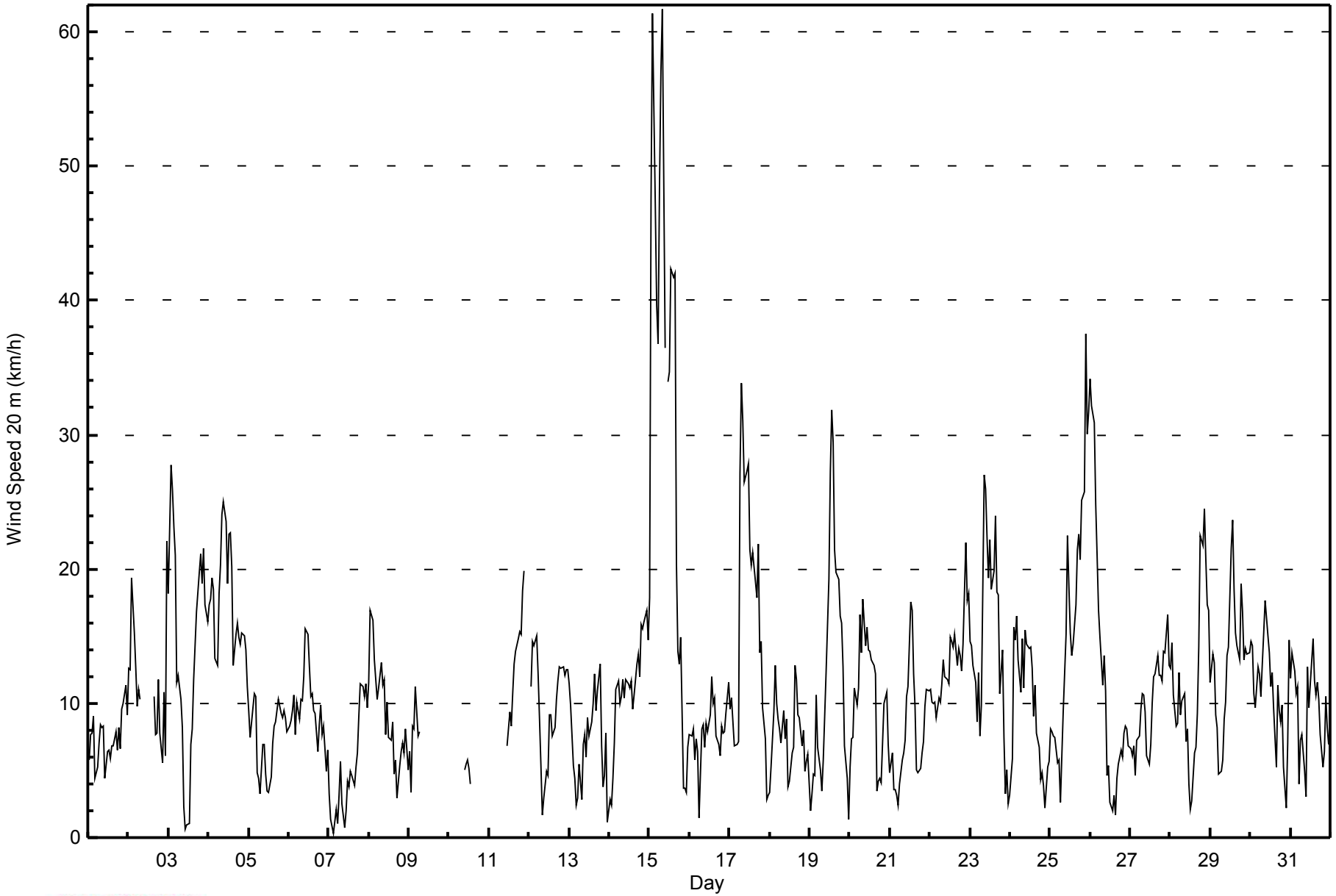
AF - Analyzer Failure UO - Unstable Operation MS - Missing

WBEA NETWORK

Hourly Averages

Wind Speed 20 m (WS20m) - km/h

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	122	17.76	17.76
6 - 11	294	42.79	60.55
12 - 19	198	28.82	89.37
20 - 28	49	7.13	96.51
29 - 38	14	2.04	98.54
> 38	10	1.46	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed 20 m (WS20m) - km/h

Mannix - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	6	12	2	0	2	3	12	21	10	7	6	7	10	7	10	7	122
6 - 11	21	15	0	2	1	7	20	131	20	10	6	8	11	14	10	18	294
12 - 19	34	22	0	0	0	0	8	72	2	0	1	6	12	15	11	15	198
20 - 28	13	10	0	0	0	0	0	1	0	0	0	0	14	4	3	4	49
29 - 38	3	2	0	0	0	0	0	0	0	0	0	0	3	1	2	3	14
> 38	0	0	0	0	0	0	0	0	0	0	0	1	4	5	0	0	10
Totals	77	61	2	2	3	10	40	225	32	17	13	22	54	46	36	47	687

Total Number of Valid Hours: 687

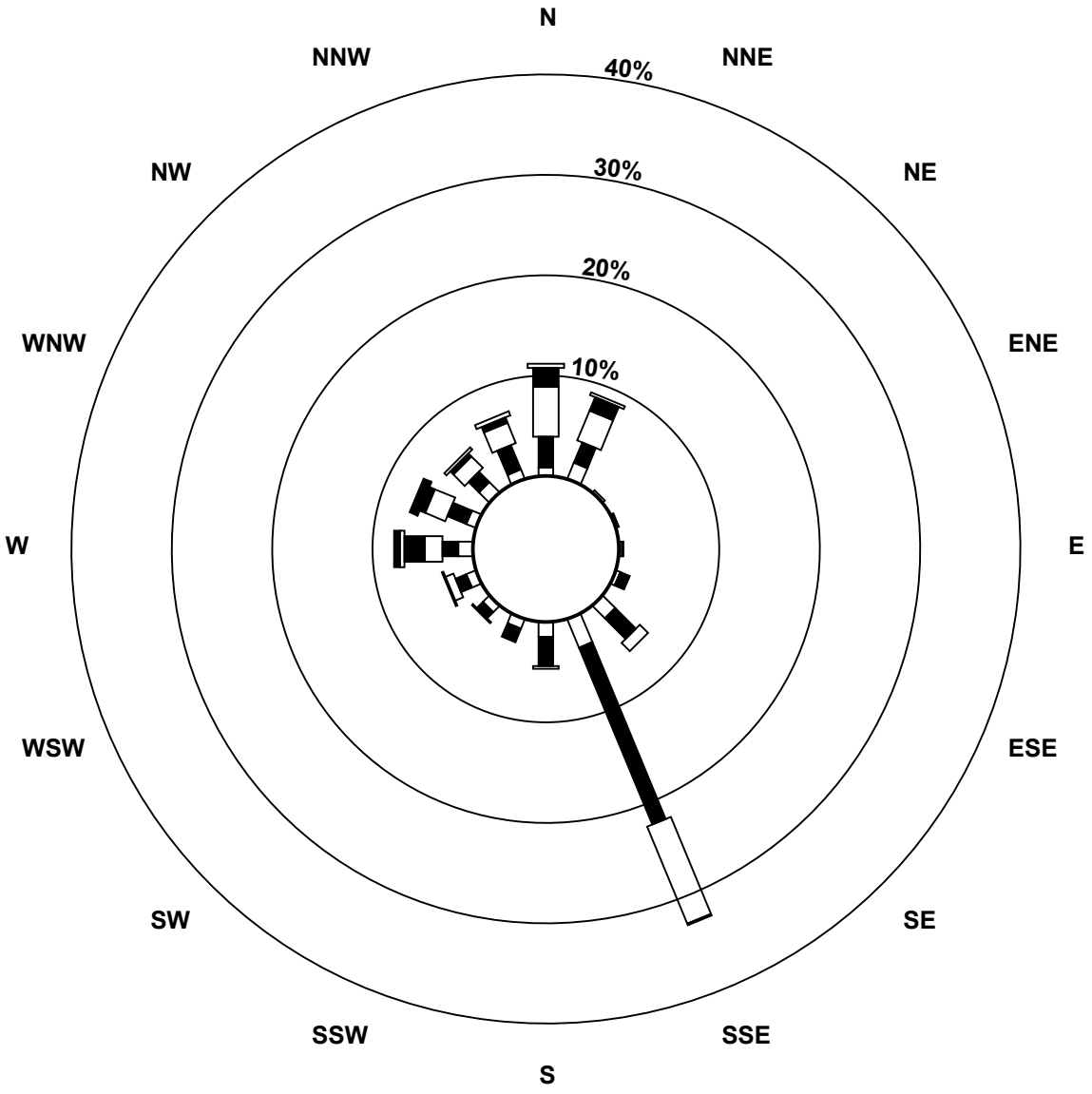
Total Number of Hours: 744

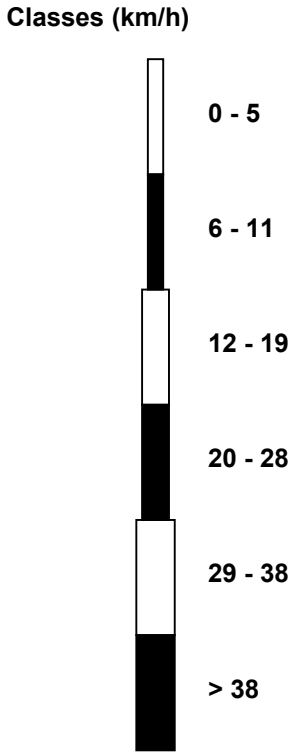
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 20 m (WS20m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 687

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2014

Maximum Speed: 76 km/h on Jan 15 09:00

Maximum Daily Speed Average: 33.2 km/h on Jan 15

Minimum Speed Value: 1 km/h on Jan 7 09:00

Minimum Daily Speed Average: 1.9 km/h on Jan 18

Maximum Diurnal Speed Average: 6.6 km/h at hour 9

Minimum Diurnal Speed Average: 0.3 km/h at hour 21

Monthly Average Velocity: 1.5 km/h 257.3 deg

Percentiles: P_1 = 2 P_{10} = 6 Q_1 = 10 Median = 15 Q_3 = 20 P_{90} = 27 P_{99} = 52

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSE13	SSE16	SSE15	SSE13	S9	SSE11	SSE14	SSE17	SSE15	SSE16	S11	SSE11	SSE10	SSE12	S15	SSE17	S18	SSE18	SSE18	S18	SSE19	SE17	SE20	SE17	SSE14.8	SE20
2-Jan	SE21	SE20	SE28	SE22	SSE19	SSE15	SSE16	S15	MS	MS	MS	SSE21	MS	MS	MS	S20	S15	S17	S12	SSW10	SW12	WSW17	NNW14	N30	SSE11.1	N30
3-Jan	NNE25	N37	NNE34	NNE31	NNE28	N17	N17	NNE14	NNE12	NNW2	N2	N1	NW3	NW10	NW12	NW17	WNW21	WNW22	NW25	WNW29	WNW26	WNW28	W22	W21	NNW14.7	N37
4-Jan	W23	W23	W25	W24	WSW17	W17	W24	W26	W28	W29	W27	WNW23	NNW29	N30	N28	NNW18	NW21	NW22	WNW21	WNW21	WNW22	WNW21	W18	W15	WNW19.9	N30
5-Jan	W14	WNW12	W13	W16	W15	W10	W10	S3	S9	S11	SSW6	S4	SE4	SE6	SSE9	SSE13	SSE13	SSE14	SSE14	SSE14	SSE13	SSE14	SSE15	SE11	SSW6.5	W16
6-Jan	SE12	S14	SSE13	SE15	SSE12	SSE14	SE13	SSE15	SE14	SE16	SE21	SE20	SE16	ESE14	ESE13	ESE12	ESE12	ESE8	SE11	SE13	SSE10	E10	ESE7	ESE9	SE12.6	SE21
7-Jan	SE5	SSE1	ESE2	ENE2	NE3	E3	SE2	SW4	NW1	SSE1	SE4	SSE7	SSE6	S7	SSE5	S9	S10	SE13	SE16	SSE21	SSE20	SSE20	SSE20	SSE19	SSE7.7	SSE21
8-Jan	SSE21	SSE25	SSE24	SSE20	SSE17	SSE15	SSE17	SSE19	SSE16	SSE17	S14	SSE14	SSE11	SSE10	SSE13	SSE7	SSE10	S6	SE7	SSE10	SSE12	SSE12	SSE15	SSE10	SSE14.2	SSE25
9-Jan	SE10	SE7	SSE14	S14	S16	SSW15	S13	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	----	S16
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	NW6	NW6	WNW6	NNW6	NW5	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	----	NW6
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	N10	N14	N12	N16	N18	N20	NNE22	N21	N22	N26	N27	MS	MS	----	N27
12-Jan	MS	N15	N19	N19	NNW19	N16	NNW12	NNW7	NNE2	SSE3	SE5	S5	WSW11	SW12	SSW13	S14	S17	S20	SSE19	SSE20	SE19	SSE17	SSE18	SSE17	SSE3.6	S20
13-Jan	SE16	SE15	SSW8	S7	S4	S5	S6	W5	NNW10	NW9	NNW7	NNE11	NNE9	NNE10	NNE13	NNE16	NNE13	NNE15	NNE18	NNE10	N4	N6	NNE10	N3	NNE4.2	NNE18
14-Jan	NNW3	SSW1	SSE6	SSE12	SSE19	SSE19	SSE16	SSE18	SE17	SE16	SSE18	SE17	SSE16	SSE16	SSE14	SSE16	SSE20	SSE23	SSE18	SSE24	SSE25	SSE27	SSE27	SSE26	SSE16.9	SSE27
15-Jan	WSW28	WSW58	W68	W55	W45	W43	W55	WNW68	WNW76	AF	AF	NW44	NW44	NW52	WNW52	WNW52	NNW27	N21	NNE18	NNE21	NNE7	N6	NW1	SSW6	WNW33.2	WNW76
16-Jan	S12	SSW10	SSW9	WSW14	W15	W13	W8	SSW7	SW13	SSW11	S12	SSE13	SSE14	SSE17	SSE16	S14	SSW10	S9	S9	S12	SSE13	SSE15	SSE18	SSE21	S10.2	SSE21
17-Jan	S20	S18	S17	SSW12	SW13	SW14	WSW34	WSW43	W38	W31	W31	W32	WNW27	NW28	NW29	NW27	N24	NNE28	NNE18	NNE19	NNE13	NNE11	N4	W2	WNW11.7	WSW43
18-Jan	S4	SE10	SSE18	SSE19	SSE17	SSE19	S16	SSE14	S17	SW16	WSW20	SSW6	SE7	E9	N10	N19	NNW15	N14	NNW13	NNW10	NW11	NNW8	WNW7	WNW9	S1.9	WSW20
19-Jan	WNW3	W5	W7	NW7	N13	NNE11	NNE8	NNW5	NW8	N13	N16	NNE26	N36	NNE42	NNE38	N28	N26	NNE24	NNE21	NNE20	NNE16	NNE9	N6	N1	N15.1	NNE42
20-Jan	SSW6	S13	S16	SSE18	S16	SSE16	SSE22	SSE18	SSE23	SSE19	SSE21	SSE19	SSE19	SSE19	SSE18	SSE17	S6	WSW4	NW5	NW6	NW13	NNW13	N14	NNW9	SSE9.4	SSE23
21-Jan	NW6	WNW7	NNE4	NNE4	NNE3	ENE3	NNE4	N9	NW7	NW10	N14	N15	NNE23	NNE22	NNE15	NNE12	NNE8	NNE8	NE8	E9	ESE9	SE14	SE15	SE16	NNE6.1	NNE23
22-Jan	SE16	SE15	SE15	SE15	SE13	SE16	SSE16	SSE17	SE20	SE18	SE16	SSE13	SSE18	SSE18	SSE17	SSE21	SSE20	SSE21	SSE21	SSE21	SSE24	SSE30	SSE27	SSE26	SSE18.6	SSE30
23-Jan	SSE23	SSE23	SSE21	S18	S17	S20	SSW12	WSW19	W32	W31	W28	WNW26	WNW31	WNW24	W25	W30	WNW26	WNW25	WNW17	W20	WSW12	WSW6	SE8	WSW6	WSW13.8	W32
24-Jan	WSW2	WNW15	WNW24	NW21	N24	N19	N15	N20	N14	NNE20	NNE18	NNE18	NNE18	NNE16	N11	NNE14	NNE10	N8	NNE5	W5	WNW4	SSE3	SE7	SSE10	N9.8	N24
25-Jan	SSE12	SE13	SSE14	S14	SSW11	SW11	WSW7	WSW14	W18	NNW21	NNE29	N25	N20	NNW18	N19	N23	NNE28	NNE29	N27	N33	N34	NNW50	N40	N41	N14.9	NNW50
26-Jan	N45	N43	N40	N32	N28	N23	N19	NNE14	NNE16	N13	NW6	N6	E2	N2	NNE3	SSE2	SSE5	S7	SSE8	SE9	SE10	SSE11	SSE11	SSE12	N9.2	N45
27-Jan	SSE11	S11	SSE12	S11	S16	S13	SSE14	SSE17	SSE17	SSE13	SSE7	SE6	SE8	SE14	SSE17	SSE19	SSE22	SSE20	SSE19	SSE21	SSE23	SSE23	SSE26	SSE20	SSE15.7	SSE26
28-Jan	SSE22	SSE22	SSE19	S18	SSE18	SE20	SSE18	SSE20	SSE23	SSE18	SSE14	S5	NW5	NNW5	NW7	NW8	NNW13	NNW20	NNE28	NNE27	NNE32	N26	N23	N22	E3.5	NNE32
29-Jan	N16	N19	N18	N13	N12	NW7	N7	NNW8	NNW12	N13	N18	N19	N28	N30	N24	N20	NNW19	NNW17	NNW26	NNW22	NNW17	NNW17	NNW17	NW17	NNW16.8	N30
30-Jan	NNW19	NNW18	NW13	WNW12	WNW16	WNW16	W15	W16	WSW19	WSW20	WSW18	WSW17	SW15	SW16	SW14	WSW8	SW18	SSW15	SSW13	SSW16	SSW9	SSW3	W12	WNW21	WSW11.5	WNW21
31-Jan	NW19	N19	N18	NNW17	NNW17	WNW8	WNW10	W11	W8	NNE5	NNE16	NNW14	NNW15	NW17	NNW15	N14	N16	N13	NW10	W6	WNW9	WNW14	NW10	W10	NNW11.2	N19
	S3.2	SSW2.3	SW3.6	SW3.2	SW2.6	SSW3.8	SW5.0	SW5.8	WSW6.6	WSW3.7	W2.2	NW2.3	NNW4.3	NNW4.5	NNW4.2	NNW3.4	NNW2.3	NNE2.6	NNE2.7	NNE0.8	S0.3	SSW0.3	SSE2.5	S2.5	Diurnal Average	
	N45	WSW58	W68	W55	W45	W43	W55	WNW68	WNW76	W31	W31	NW44	NW44	NW52	WNW52	WNW52	NNE28	NNE29	NNE28	N33	N34	NNW50	N40	N41	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 17 km/h on Jan 15 01:00

Minimum Value: 1 km/h on Jan 7 09:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 3 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 10$

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Hours of Calibration:	0
Percent Operational Time:	92.2

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

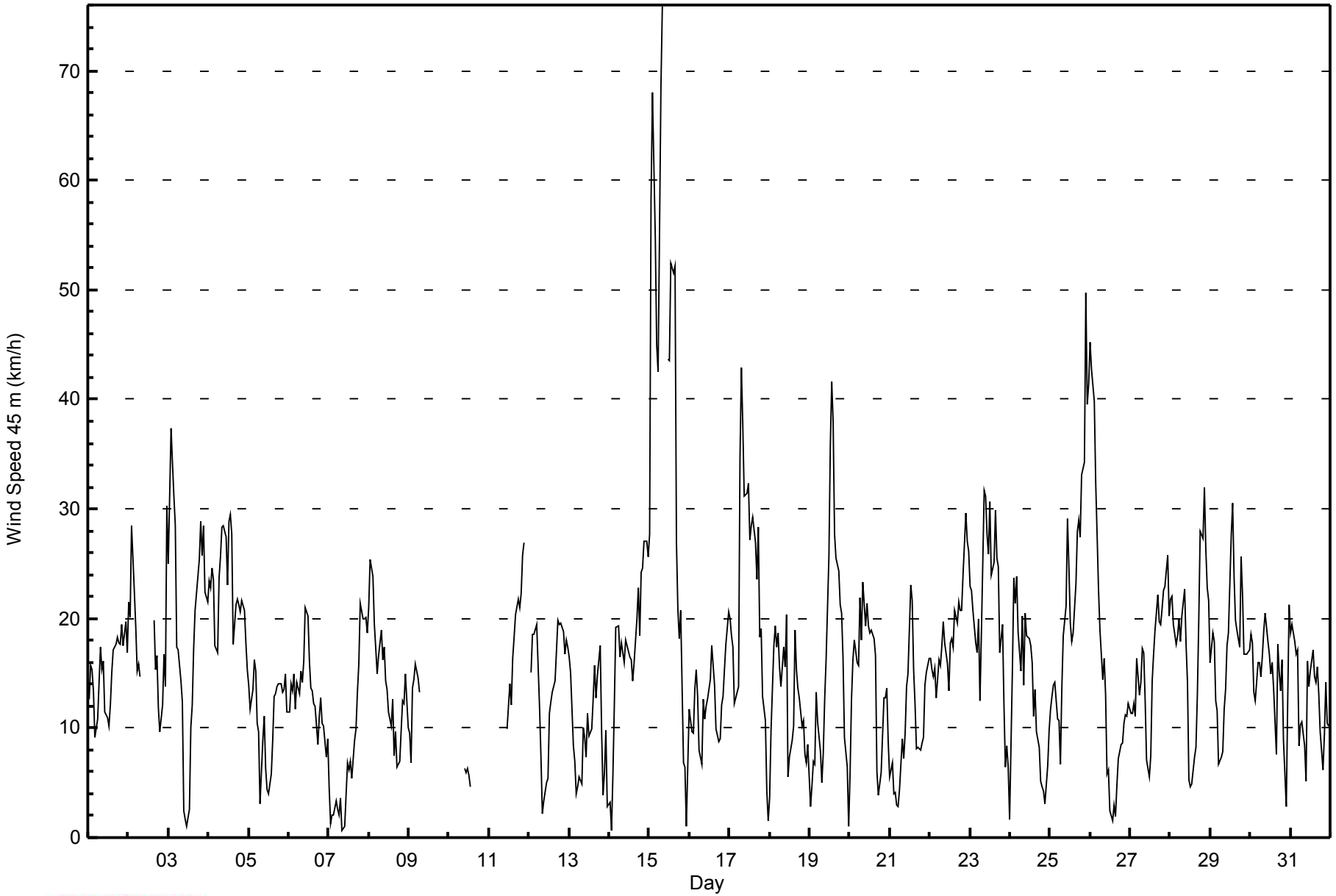
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	61	8.89	8.89
6 - 11	140	20.41	29.30
12 - 19	298	43.44	72.74
20 - 28	138	20.12	92.86
29 - 38	28	4.08	96.94
> 38	21	3.06	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	7	8	1	2	2	1	4	8	7	2	1	2	4	2	6	4	61
6 - 11	10	13	1	0	3	4	14	20	16	13	1	5	8	7	17	8	140
12 - 19	36	22	0	0	0	4	30	99	31	7	10	9	13	7	6	24	298
20 - 28	23	15	0	0	0	0	9	43	4	0	0	3	13	16	6	6	138
29 - 38	8	6	0	0	0	0	0	1	0	0	0	1	8	2	1	1	28
> 38	5	1	0	0	0	0	0	0	0	0	0	2	5	4	3	1	21
Totals	89	65	2	2	5	9	57	171	58	22	12	22	51	38	39	44	686

Total Number of Valid Hours: 686

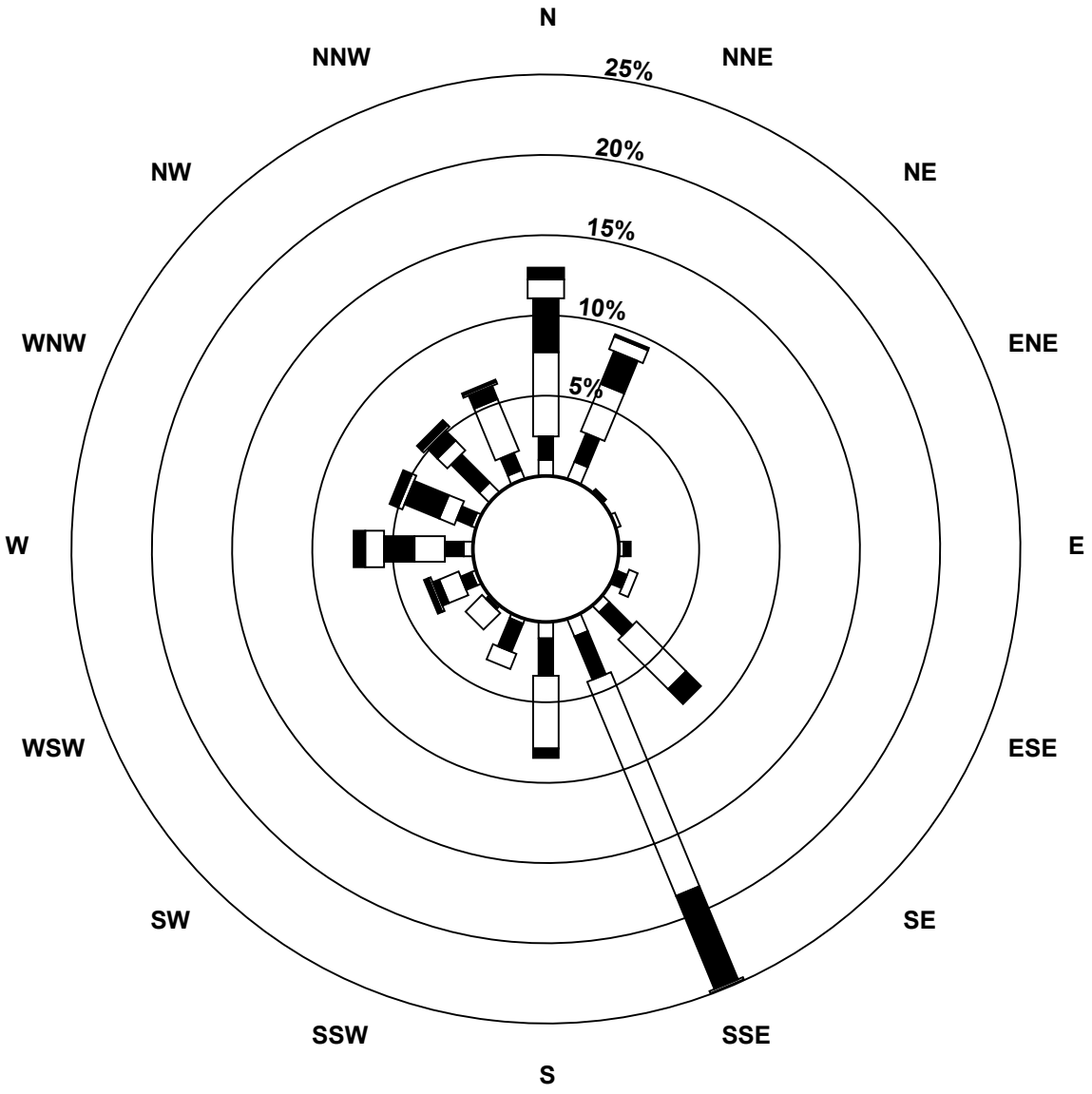
Total Number of Hours: 744

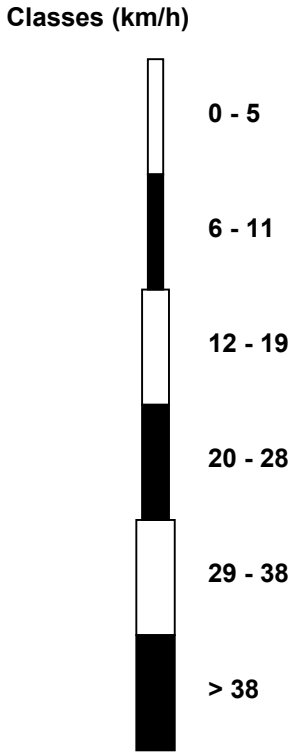
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 45 m (WS45m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 686

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2014

Maximum Speed: 82 km/h on Jan 15 09:00

Maximum Daily Speed Average: 37.2 km/h on Jan 15

Minimum Speed Value: 1 km/h on Jan 26 14:00

Minimum Daily Speed Average: 3.2 km/h on Jan 18

Maximum Diurnal Speed Average: 8.2 km/h at hour 9

Minimum Diurnal Speed Average: 0.8 km/h at hour 20

Monthly Average Velocity: 2.1 km/h 242.6 deg

Percentiles: P_1 = 2 P_{10} = 6 Q_1 = 12 Median = 19 Q_3 = 25 P_{90} = 32 P_{99} = 57

Hours in Service: 744

Hours of Data: 654

Hours of Missing Data: 90

Percent Operational Time: 87.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSE19	SSE21	SSE20	SSE17	SSE17	SSE16	SSE17	SSE14	SE15	SSE15	SSE22	SSE19	SSE19	SSE19	SSE21	SSE22	SSE20	SE22	SE19	SSE19	SE21	SE23	SE24	SE21	SSE18.8	SE24
2-Jan	SE28	SE25	SE32	SE27	SE27	SSE21	SSE21	SSE19	MS	MS	MS	S26	MS	MS	MS	SSW21	SSW20	SW20	WSW11	WSW11	WSW16	W22	NW18	NNE34	S11.6	NNE34
3-Jan	NNE30	NNE42	NNE38	NNE35	NNE34	NNE21	NNE21	NNE19	NNE16	N4	NNE2	NNW3	NW6	NNW14	NW16	NW20	WNW25	NW27	NW28	WNW33	WNW31	WNW34	WNW27	W25	NNW18.0	NNE42
4-Jan	W28	W27	W29	W26	W19	WNW22	W28	W31	W32	W31	WNW30	WNW25	NNW32	N33	N32	NNW21	NW27	NW26	NW25	WNW24	WNW25	WNW25	W22	W21	WNW23.3	N33
5-Jan	WNW20	WNW16	WNW17	W20	W19	W16	W14	WSW6	SSW7	SW11	WSW7	SW5	SSE4	SE6	SSE11	SSE17	SSE17	SSE19	SSE19	S19	S18	SSE18	SSE22	SSE16	SSW8.4	SSE22
6-Jan	SE15	SSE16	SSE19	SE14	SE14	SE15	SE15	SE20	SE17	SE15	SE20	SE19	SE15	SE11	ESE10	ESE9	ESE9	ESE7	SE9	SE12	SE12	E9	ESE6	ESE6	SE12.8	SE20
7-Jan	SE4	ESE2	E3	E4	ENE5	E3	SE2	S4	SSW2	S2	SE5	SSE9	SSE10	S10	SSE7	S12	S15	SE16	SE23	SE24	SSE25	SSE27	SE21	SE20	SSE10.0	SSE27
8-Jan	SE22	SE32	SE31	SE26	SE24	SSE20	SE22	SSE26	SSE23	SSE25	S20	S18	S16	S13	S14	S8	S9	SSW6	SE4	SSE8	SSE11	SSE14	SSE19	SSE16	SSE17.3	SE32
9-Jan	SE12	SE7	SSE14	S20	S19	SSW18	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	S20
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	S25	SSE27	SSE28	SE27	SE22	SE24	SE23	----	SSE28
13-Jan	SE21	SE18	S11	S9	S5	S8	WSW6	WNW12	NNW13	NW10	NNW8	NNE13	NNE10	NNE10	NNE14	NNE17	NNE15	NNE18	NNE21	NE12	NNE4	NNE6	NE10	NNE5	NNE4.9	SE21
14-Jan	N4	SSE1	SSE8	SSE14	SSE24	SSE30	SSE26	SE21	SE14	SE21	SE23	SE20	SE20	SE17	SE15	SE16	SE20	SE26	SE20	SSE30	SSE35	SSE38	SSE39	S32	SSE20.7	SSE39
15-Jan	WSW37	WSW66	W73	W59	W49	W46	W59	WNW74	WNW82	WNW54	AF	NW49	NW48	NW57	WNW56	NW56	NNW33	NNW29	NNE22	NNE25	NNE11	NNE9	NE2	S4	WNW37.2	WNW82
16-Jan	SSW10	WSW14	WSW14	W21	W23	W19	W15	WSW10	WSW18	SW14	SW13	S11	S16	S19	S16	SSW14	SW12	SW10	SW8	SW13	SSW10	SSE18	SSE22	SSE23	SSW12.2	SSE23
17-Jan	S25	S25	SSW21	SW16	WSW18	WSW20	WSW41	W50	W43	W35	W35	W36	WNW31	NW35	NW36	NNW34	N28	NNE33	NNE22	NNE23	NNE16	NNE14	N6	ENE1	WNW14.4	WSW50
18-Jan	SSE4	SE10	SSE21	SSE27	SSE27	SSE25	S21	S22	SSW21	WSW23	WSW31	WSW15	SSW4	ENE9	NNE13	N23	NNW18	N17	N16	N13	NNW12	NNW8	WNW7	WNW10	SW3.2	WSW31
19-Jan	W3	WSW6	W9	NW9	N15	NNE14	NNE11	N7	NNW8	N14	N19	NNE30	N40	NNE47	NNE43	N31	N29	NNE27	NNE25	NNE23	NNE20	NNE12	N7	NE3	N17.4	NNE47
20-Jan	S5	S13	S21	S25	S23	SSE23	SSE27	SSE22	SSE29	SSE28	SSE29	SSE26	SSE27	SSE28	SSE27	SSE21	SSE10	SSW2	NNW5	NW6	NNW14	NNW14	N16	NNW9	SSE13.2	SSE29
21-Jan	NW6	NW6	N3	NE3	NE1	E3	NE4	NNE12	NNW7	NNW13	N16	N17	NNE26	NNE25	NNE17	NNE14	NNE11	NNE12	ENE10	E10	ESE6	SE14	SE19	SE20	NE7.2	NNE26
22-Jan	SE21	SE19	SE17	SE19	SE16	SE21	SSE20	SSE21	SE23	SE25	SE21	SSE16	SSE20	SSE22	SSE20	SSE26	SSE25	SSE28	SSE28	SSE29	SSE33	S34	S33	S29	SSE23.0	S34
23-Jan	S26	S26	SSW21	SSW21	SSW21	SSW22	WSW18	WSW25	W36	W36	W32	WNW30	WNW36	WNW27	W28	W33	WNW30	WNW29	WNW21	W24	W15	WSW11	SSE5	WSW11	W19.3	W36
24-Jan	W8	WNW23	WNW30	NW27	N28	N23	N19	N24	N16	NNE24	NNE21	NNE21	NNE19	NNE17	N12	NNE15	NNE10	NNE8	NNE5	W4	WNW3	SSE5	SE8	SSE15	N11.1	WNW30
25-Jan	SSE17	SE17	SSE19	SSE18	S14	SW12	WSW13	WSW22	W27	NNW25	NNE33	NNE28	N22	NNW20	N21	N27	NNE32	NNE33	N31	N38	N40	NNW57	N44	N46	N16.6	NNW57
26-Jan	N51	N48	N45	N37	N31	N26	N21	NNE17	NNE19	N14	NNW6	N6	E2	N1	N3	SSE2	SSE5	S8	SSE9	SSE9	SE11	SE10	SE11	SSE13	N10.6	N51
27-Jan	SSE12	S11	SSE13	SSE14	SSE18	S17	S18	SSE22	SSE23	SSE17	SSE9	SE7	SE13	SE21	SSE23	SSE27	SSE27	SSE26	SSE27	SSE32	S29	S28	S31	S27	SSE20.2	SSE32
28-Jan	S29	SSE31	SSE26	SSE25	SSE27	SSE26	SSE28	S26	S28	S26	S12	SSW3	NW7	NNW7	NW8	NNW11	NNW16	N24	NNE32	NNE31	NNE36	N30	N26	N24	ESE3.7	NNE36
29-Jan	N19	N21	N21	N14	N14	NNW9	N10	NNW9	NNW14	N16	N20	N21	N30	N34	N26	N22	N22	N20	N29	NNW25	NNW19	NNW18	NNW18	NNW19	N19.1	N34
30-Jan	NNW21	NNW19	NW14	WNW14	WNW18	WNW19	W18	W20	WSW22	WSW22	WSW20	WSW19	SW17	SW18	SW16	WSW10	SW22	SSW18	SW17	SSW19	SSW12	WSW6	W17	WNW25	WSW14.0	WNW25
31-Jan	NW24	N22	N22	N22	N22	NW11	NW11	WNW9	WNW8	N8	NNE19	N17	NNW17	NW18	NNW16	N17	N18	N15	NNW11	WNW6	WNW12	WNW17	NW12	W13	NNW13.6	NW24
	S3.8	SSW3.7	SSW4.9	SW4.5	SSW4.4	SSW6.0	SW6.5	SW7.3	WSW8.2	WSW5.9	WSW2.9	WNW2.9	NNW4.1	N4.8	NNW4.8	NW4.0	NNW3.3	N2.5	NNE2.9	E0.8	S1.3	SSW1.6	SSE3.3	S3.1	Diurnal Average	
	N51	WSW66	W73	W59	W49	W46	W59	WNW74	WNW82	WNW54	W35	NW49	NW48	NW57	WNW56	NW56	NNW33	NNE33	NNE32	N38	N40	NNW57	N44	N46	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 18 km/h on Jan 15 01:00

Minimum Value: 1 km/h on Jan 7 08:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 10

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

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

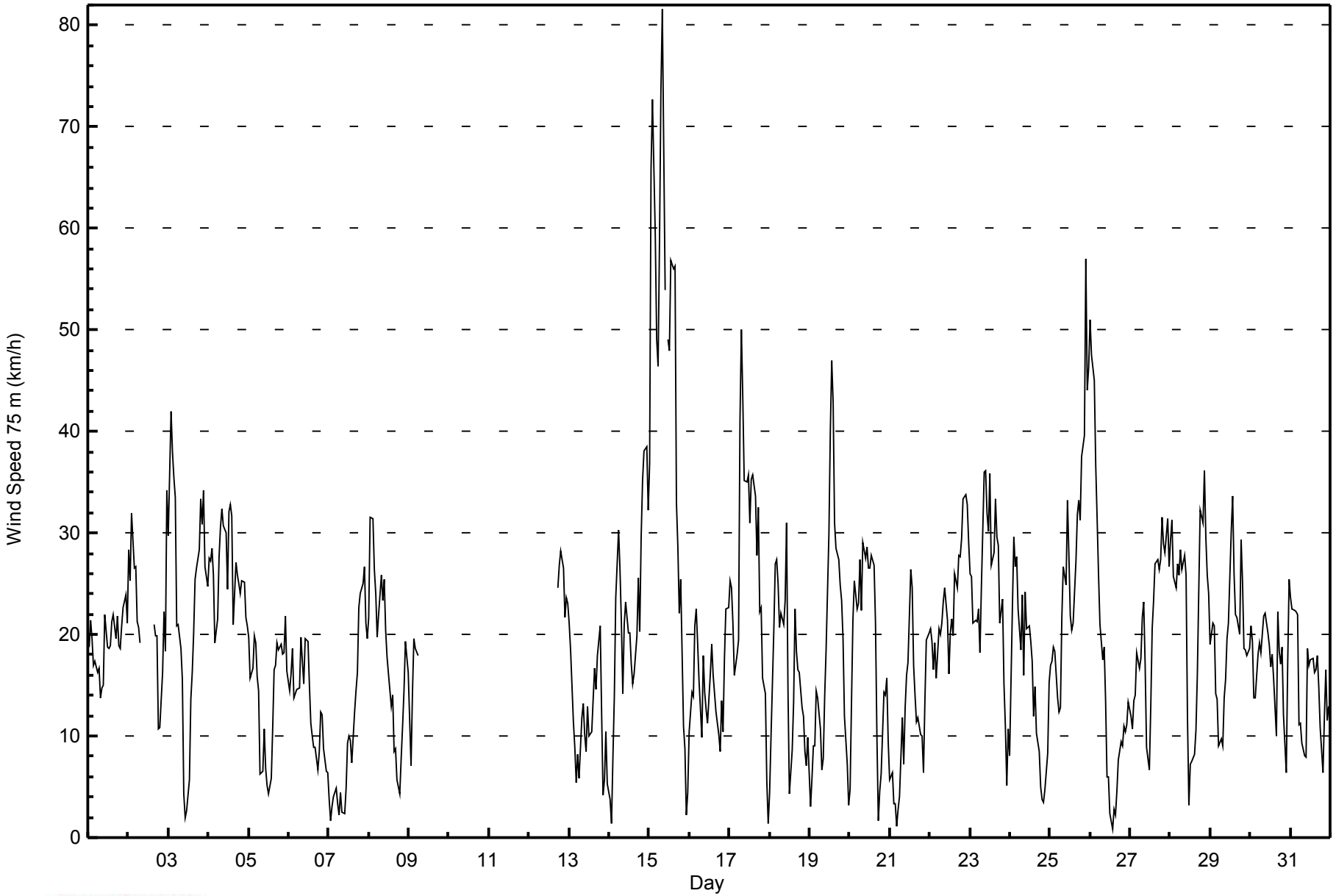
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	48	7.34	7.34
6 - 11	103	15.75	23.09
12 - 19	189	28.90	51.99
20 - 28	211	32.26	84.25
29 - 38	74	11.31	95.57
> 38	29	4.43	100.00

Total Number of Valid Hours: 654

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	5	4	5	2	5	1	4	7	5	4	1	0	2	1	0	2	48
6 - 11	6	9	1	2	2	7	10	11	9	4	3	11	2	5	10	11	103
12 - 19	21	22	1	0	0	0	28	38	16	6	9	9	10	8	5	16	189
20 - 28	25	17	0	0	0	0	39	55	18	8	2	7	15	12	8	5	211
29 - 38	11	13	0	0	0	0	3	11	6	0	0	2	11	10	2	5	74
> 38	7	3	0	0	0	0	0	1	0	0	0	3	6	4	4	1	29
Totals	75	68	7	4	7	8	84	123	54	22	15	32	46	40	29	40	654

Total Number of Valid Hours: 654

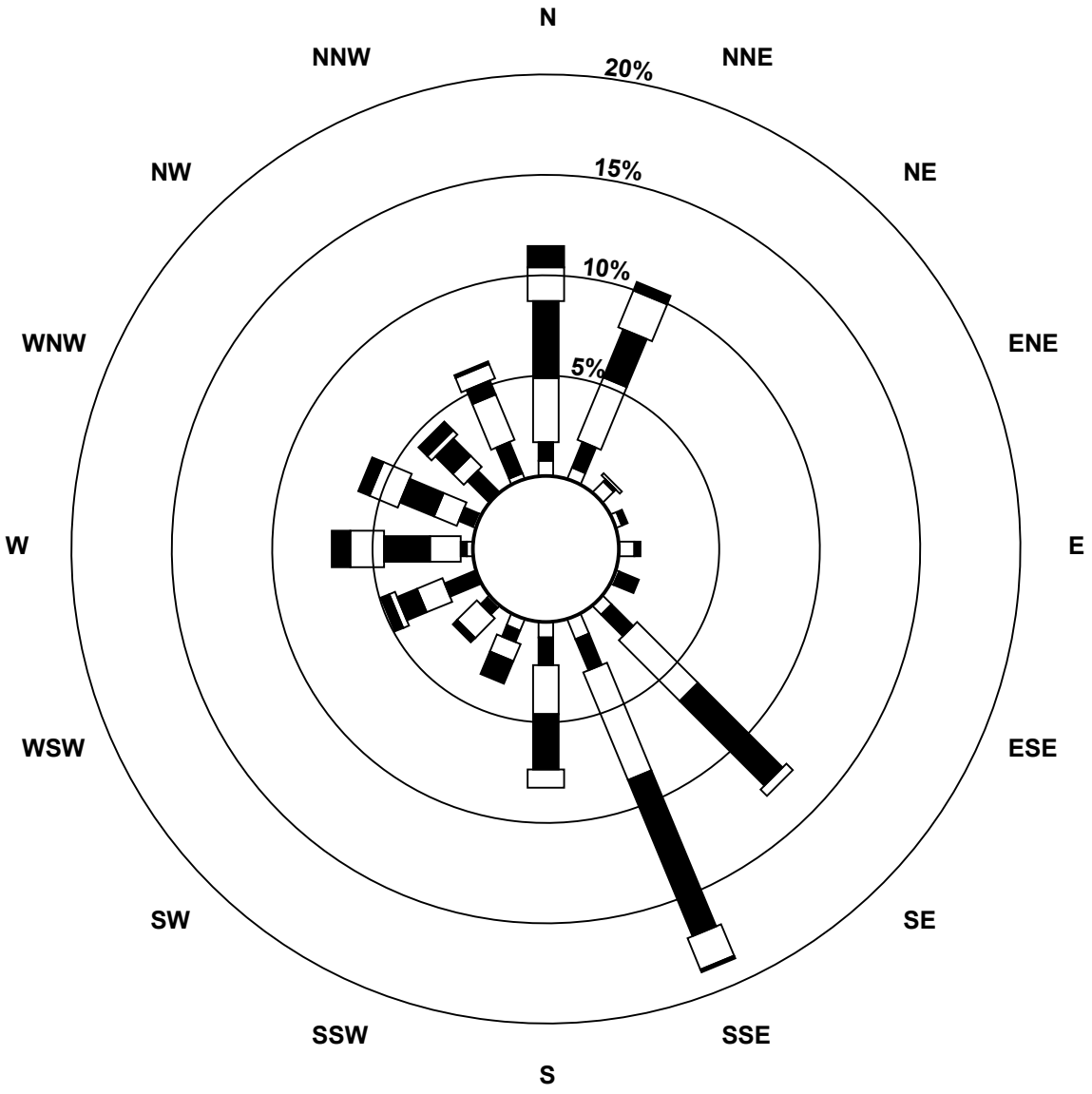
Total Number of Hours: 744

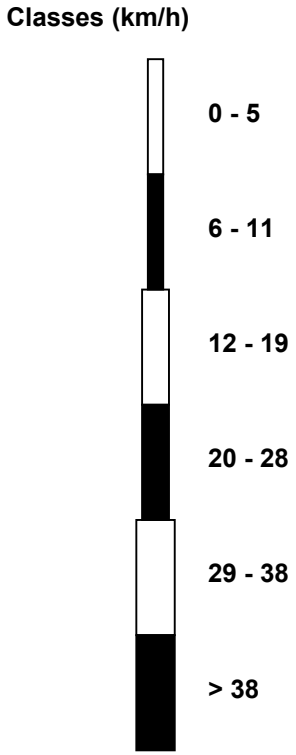
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 75 m (WS75m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 654

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - January 2014

Maximum Speed: 82 km/h on Jan 15 09:00

Maximum Daily Speed Average: 37.4 km/h on Jan 15

Minimum Speed Value: 1 km/h on Jan 26 14:00

Minimum Daily Speed Average: 1.9 km/h on Jan 28

Maximum Diurnal Speed Average: 8.5 km/h at hour 9

Minimum Diurnal Speed Average: 0.5 km/h at hour 20

Monthly Average Velocity: 2.3 km/h 245.1 deg

Percentiles: P_1 = 2 P_{10} = 7 Q_1 = 13 Median = 20 Q_3 = 27 P_{90} = 33 P_{99} = 58

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Percent Operational Time:	87.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSE18	SSE19	SSE18	SSE17	SSE15	SSE15	SSE14	SSE10	SSE15	SSE17	SSE20	SSE17	SSE18	SSE19	SSE22	SSE24	SE22	SE24	SE21	SE20	SE22	SE25	SE25	SE25	SSE18.7	SE25
2-Jan	SE30	SE27	ESE32	SE29	SE30	SE24	MS	AF	AF	AF	AF	AF	AF	AF	AF	SSW23	SW23	SW22	WSW13	WSW13	WSW19	W24	NW20	N35	----	N35
3-Jan	N31	N43	N39	N37	N35	N23	N23	NNE21	N17	N5	N2	NNW4	NW8	NW16	NW18	NW21	WNW27	WNW28	WNW29	WNW34	WNW32	WNW35	W28	W25	NNW19.5	N43
4-Jan	W27	W27	W28	W26	W20	W23	W28	W32	W33	W31	W31	WNW25	NW33	N34	N33	NNW23	NW29	NW27	WNW26	WNW25	WNW26	WNW25	W23	W23	WNW24.3	N34
5-Jan	W22	WNW17	W18	W18	W19	W17	W16	WSW9	SSW7	SW9	WSW8	WSW7	S4	SE4	SSE9	SSE17	SSE16	SSE20	S19	S20	S20	S17	SSE22	SE19	SSW8.8	W22
6-Jan	SE17	SE19	SE21	ESE13	SE16	ESE14	ESE17	SE22	ESE18	ESE19	ESE24	SE23	ESE19	ESE16	ESE18	ESE16	ESE15	ESE12	ESE12	SE15	SE13	E12	E9	ESE13	ESE16.0	ESE24
7-Jan	ESE5	E2	E4	ENE5	ENE5	E4	ESE3	SSE4	S3	SSE4	SE6	SSE10	SSE12	SSE9	SE9	SSE13	SSE16	SE18	SE25	SE27	SE28	SE30	SE25	SE21	SE11.5	SE30
8-Jan	SE23	SE34	SE33	SE29	SE27	SE22	SE24	SE29	SSE27	SSE28	SSE23	S20	S18	S13	S14	S9	SSW9	SW5	ESE4	SSE7	SSE10	SSE13	SSE19	SSE18	SSE18.3	SE34
9-Jan	SE13	SE11	SE16	SSE20	S20	S19	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	SSE20
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	----
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	SSE28	SSE31	SE30	SE25	SE27	SE25	----	SSE31
13-Jan	SE23	SE19	S13	S10	SSE7	S10	WSW8	W16	NNW15	NW11	NNW9	N14	NNE10	NNE11	NNE14	NNE17	NNE16	NNE19	NNE22	NNE14	NNE5	NNE6	NNE9	NNE5	NNE5.1	SE23
14-Jan	N4	SE2	SSE10	SSE15	SSE23	SSE33	SSE29	SE26	SE20	SE24	SE24	SE22	SE23	SE16	SE15	SE17	SE19	SE28	SE25	SE33	SSE39	SSE43	SSE43	S34	SE22.5	SSE43
15-Jan	WSW40	WSW67	W73	W60	W49	W47	W59	W74	WNW82	AF	AF	NW50	WNW49	WNW58	WNW57	WNW57	NW35	NNW32	N23	NNE27	NNE13	N10	NE3	S3	WNW37.4	WNW82
16-Jan	SSW10	WSW18	WSW17	WSW23	WSW25	WSW22	W18	WSW13	WSW20	SW17	SW15	SSW11	S15	S18	S16	SW15	SW14	SW12	SW10	SW14	SSW10	SSE15	SSE21	SSE20	SW13.4	WSW25
17-Jan	S25	S25	SSW20	SW18	WSW20	WSW22	WSW43	WSW51	WSW45	W36	W36	W37	W32	NW37	NW38	NW36	N29	NNE34	NNE24	NNE24	NNE17	NNE16	N6	ENE2	WNW15.9	WSW51
18-Jan	SSE5	SE13	SSE21	SSE31	SSE31	SSE24	S22	S22	SW23	WSW26	WSW33	WSW19	WSW7	NE7	N15	N24	NNW20	N18	N18	N14	NNW12	NNW9	WNW7	WNW10	SW4.0	WSW33
19-Jan	W3	WSW6	W10	WNW11	N15	NNE16	NNE12	N7	NNW7	N14	N19	N31	N41	N49	N45	N32	N30	N29	NNE26	N24	N22	N14	N8	NNE4	N18.3	N49
20-Jan	SSE5	SSE14	S23	S28	S27	SSE27	SSE31	SSE25	SSE33	SSE32	SSE33	SSE31	SE30	SE30	SE29	SE24	SSE12	SE2	NNW5	NW7	NNW15	NNW15	N17	NNW10	SSE15.2	SSE33
21-Jan	NW6	NW6	N3	NNE3	WSW1	E2	NE4	N13	NNW8	NNW15	N17	N19	NNE28	NNE26	NNE18	NNE15	NNE13	NNE13	NE11	E12	ESE12	SE17	SE22	SE23	NE7.8	NNE28
22-Jan	SE24	SE22	SE19	SE21	SE18	SE24	SE21	SE23	SE25	SE28	SE26	SSE17	SSE22	SSE23	SSE22	SSE27	SSE26	SE31	SE31	SSE32	SSE36	S36	S34	S27	SSE24.9	S36
23-Jan	S25	S24	SSW23	SSW25	SSW25	SW24	WSW21	WSW27	W37	W38	W34	WNW31	WNW37	WNW28	W29	W34	W31	WNW30	W22	W25	WSW16	WSW13	S5	WSW13	WSW21.5	W38
24-Jan	W11	WNW25	WNW31	NW28	N29	N24	N20	N25	N17	N25	N21	NNE22	NNE20	NNE18	N12	NNE15	NNE10	N9	NNE5	WSW3	WNW3	SSE6	SE10	SSE17	N11.6	WNW31
25-Jan	SE19	SE20	SSE21	SSE20	S15	SSW13	WSW16	WSW25	W29	NNW26	N35	N29	NNW23	NNW21	N22	N29	N33	N35	N33	N39	NNW42	NNW59	N46	NNW48	NNW17.4	NNW59
26-Jan	N53	N49	NNW47	NNW38	N33	N27	N22	NNE19	NNE20	N14	NW6	NNW6	E2	NW1	NNW3	SSE2	SSE5	S8	SSE9	SSE9	SE11	SE11	SE11	SSE14	N11.0	N53
27-Jan	SSE13	SSE11	SSE15	SSE15	SSE17	S16	S14	SSE16	SSE16	SSE13	S5	SSE4	SE13	SE22	SE26	SSE28	SSE27	SSE28	SSE31	SSE33	S32	S29	S33	S30	SSE19.8	SSE33
28-Jan	SSE30	SSE32	SSE29	SSE27	S26	SSE27	S30	S25	S25	S24	S7	WSW4	WNW9	NW8	NW10	NNW12	NNW18	NNW27	N34	NNE32	N38	N31	N27	N25	ESE1.9	N38
29-Jan	N20	N22	N22	N15	NNW14	NNW11	N11	NNW10	NNW15	N17	N20	N22	NNW31	NNW35	NNW27	NNW23	NNW23	NNW21	NNW31	NNW26	NW20	NW19	NW18	NW19	NNW20.1	NNW35
30-Jan	NW21	NW20	NW14	WNW14	WNW19	W20	W20	W21	WSW23	WSW22	WSW21	WSW19	SW17	SW19	SSW17	WSW11	SW24	SSW20	SSW19	SSW20	SSW14	WSW9	W19	W27	WSW15.1	W27
31-Jan	NW25	N24	N24	NNW25	NNW23	NW13	NW12	NW10	WNW8	N9	N19	NNW18	NNW19	NW18	NNW17	N18	N19	N15	NNW11	WNW7	WNW13	WNW17	WNW12	W14	NNW14.7	NW25
	S3.6	SSW3.7	SSW4.9	SSW4.7	SSW4.6	SSW6.2	SW7.2	WSW8.0	WSW8.5	WSW4.9	W3.1	WNW4.3	NW4.5	NNW5.2	NNW5.0	NW4.2	NW3.8	N3.9	NNE2.9	E0.5	S1.6	SSW1.6	SSE3.5	S3.1	Diurnal Average	
	N53	WSW67	W73	W60	W49	W47	W59	W74	WNW82	W38	W36	NW50	WNW49	WNW58	WNW57	WNW57	NW35	N35	N34	N39	NNW42	NNW59	N46	NNW48	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 17 km/h on Jan 15 01:00

Minimum Value: 0 km/h on Jan 25 00:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 10

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Hours of Calibration:	0
Percent Operational Time:	87.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	2	1	1	2	1	1	2	1	1	2	3	1	2	2	1	1	1	2	3	2	4	4	3	2	4
2-Jan	6	3	5	5	2	6	MS	AF	AF	AF	AF	AF	AF	AF	AF	2	2	3	2	4	2	2	3	3	6
3-Jan	5	4	6	5	5	4	3	3	5	4	2	1	3	4	3	3	4	3	3	4	3	2	3	2	6
4-Jan	1	2	1	3	2	3	2	3	3	3	4	3	7	5	5	4	7	5	2	1	2	2	2	2	7
5-Jan	2	3	4	2	2	1	2	2	2	2	4	3	1	1	3	2	2	2	1	2	1	2	1	2	4
6-Jan	1	2	2	2	3	2	3	2	3	3	5	5	4	3	4	3	3	4	4	3	3	3	2	3	5
7-Jan	2	1	2	1	1	3	1	1	1	1	2	1	1	1	2	2	1	4	2	2	1	2	2	2	4
8-Jan	3	4	3	2	2	2	2	2	2	2	4	2	2	2	1	2	1	2	2	1	2	2	2	2	4
9-Jan	4	3	2	2	1	2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	4
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	3	2	2	2	2	3	3
13-Jan	5	3	2	1	4	2	2	4	6	3	4	4	3	2	3	2	2	4	2	4	2	3	3	3	6
14-Jan	1	2	2	3	4	1	2	3	3	4	5	4	3	4	2	3	4	3	4	5	2	3	5	6	6
15-Jan	17	11	13	9	8	7	10	15	16	AF	AF	6	7	7	8	8	11	4	3	4	4	2	4	2	17
16-Jan	2	2	2	3	3	2	4	3	1	3	2	1	2	2	1	2	2	2	2	2	3	2	4	2	4
17-Jan	3	1	3	2	4	4	7	6	5	5	5	5	4	4	4	3	4	5	5	5	3	2	4	1	7
18-Jan	1	3	3	3	2	2	3	2	2	3	2	5	3	3	4	3	2	3	3	2	1	2	2	4	5
19-Jan	2	3	2	3	2	2	3	2	2	1	3	9	7	7	7	7	5	5	5	3	5	3	3	2	9
20-Jan	3	3	3	2	2	4	3	3	3	2	2	2	2	2	1	3	4	2	2	3	2	2	3	3	4
21-Jan	2	1	2	2	1	1	3	2	1	3	4	6	5	4	4	3	3	4	5	3	3	4	3	4	6
22-Jan	2	3	1	1	4	3	1	1	3	2	3	3	3	2	1	2	2	2	2	3	2	2	2	2	4
23-Jan	2	2	2	3	2	2	2	4	4	5	3	3	4	4	3	4	3	5	3	4	2	4	2	6	6
24-Jan	4	6	1	3	3	8	4	6	5	4	3	4	3	4	2	3	1	1	3	1	1	1	4	0	8
25-Jan	3	3	2	2	1	3	5	3	3	7	5	7	3	5	5	6	5	5	7	6	6	10	10	7	10
26-Jan	10	10	10	7	7	5	6	4	4	4	2	2	2	2	2	1	1	2	1	2	1	1	1	1	10
27-Jan	1	1	1	1	1	1	2	3	3	3	3	2	3	3	2	1	3	1	3	1	1	1	1	3	3
28-Jan	2	1	2	1	2	1	1	4	3	4	3	2	2	2	2	3	5	3	4	5	5	6	5	5	6
29-Jan	4	3	3	4	4	3	3	3	4	4	5	5	9	5	5	5	4	4	5	4	4	3	3	4	9
30-Jan	3	4	2	2	3	3	2	2	3	3	3	4	3	4	5	6	4	4	3	2	6	3	5	1	6
31-Jan	3	4	5	4	6	2	2	1	1	4	3	5	3	2	2	3	3	3	4	1	4	2	4	3	6
	17	11	13	9	8	8	10	15	16	7	5	9	9	7	8	8	11	5	7	6	6	10	10	7	
	Diurnal Maximum																								

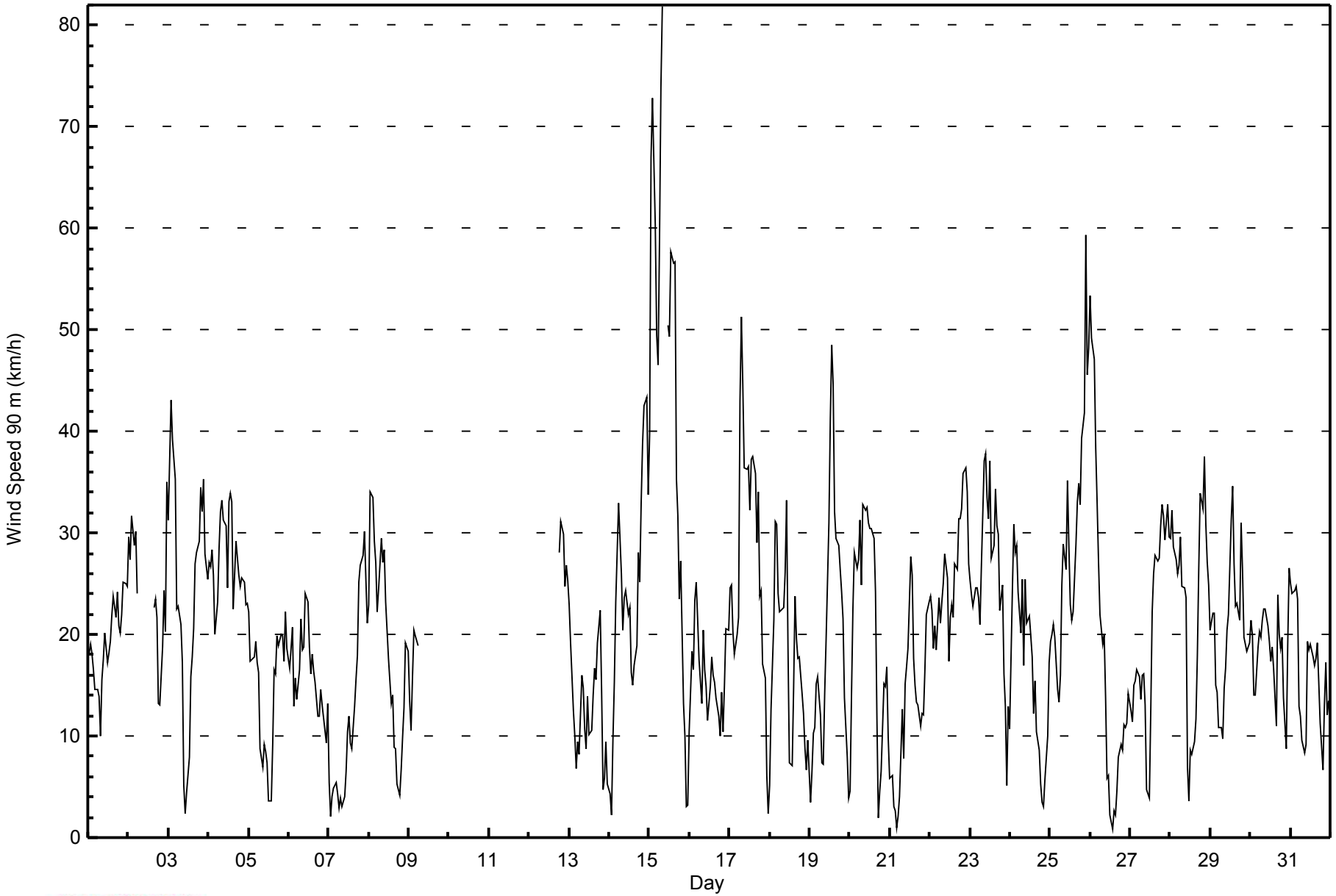
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Speed 90 m (WS90m) - km/h

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	47	7.24	7.24
6 - 11	80	12.33	19.57
12 - 19	184	28.35	47.92
20 - 28	205	31.59	79.51
29 - 38	100	15.41	94.92
> 38	33	5.08	100.00

Total Number of Valid Hours: 649

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed 90 m (WS90m) - km/h

Mannix - January 2014

Wind Speed	**Wind Direction**																
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	4	5	2	3	5	3	3	7	5	0	1	3	1	1	1	3	47
6 - 11	7	5	2	0	0	1	7	12	5	5	2	8	2	6	9	9	80
12 - 19	23	17	0	0	2	14	20	34	12	5	9	12	9	6	8	13	184
20 - 28	23	11	0	0	0	1	49	29	18	7	5	13	19	10	7	13	205
29 - 38	20	4	0	0	0	1	15	18	7	0	0	1	15	8	6	5	100
> 38	9	0	0	0	0	0	0	3	0	0	0	5	6	5	1	4	33
Totals	86	42	4	3	7	20	94	103	47	17	17	42	52	36	32	47	649

Total Number of Valid Hours: 649

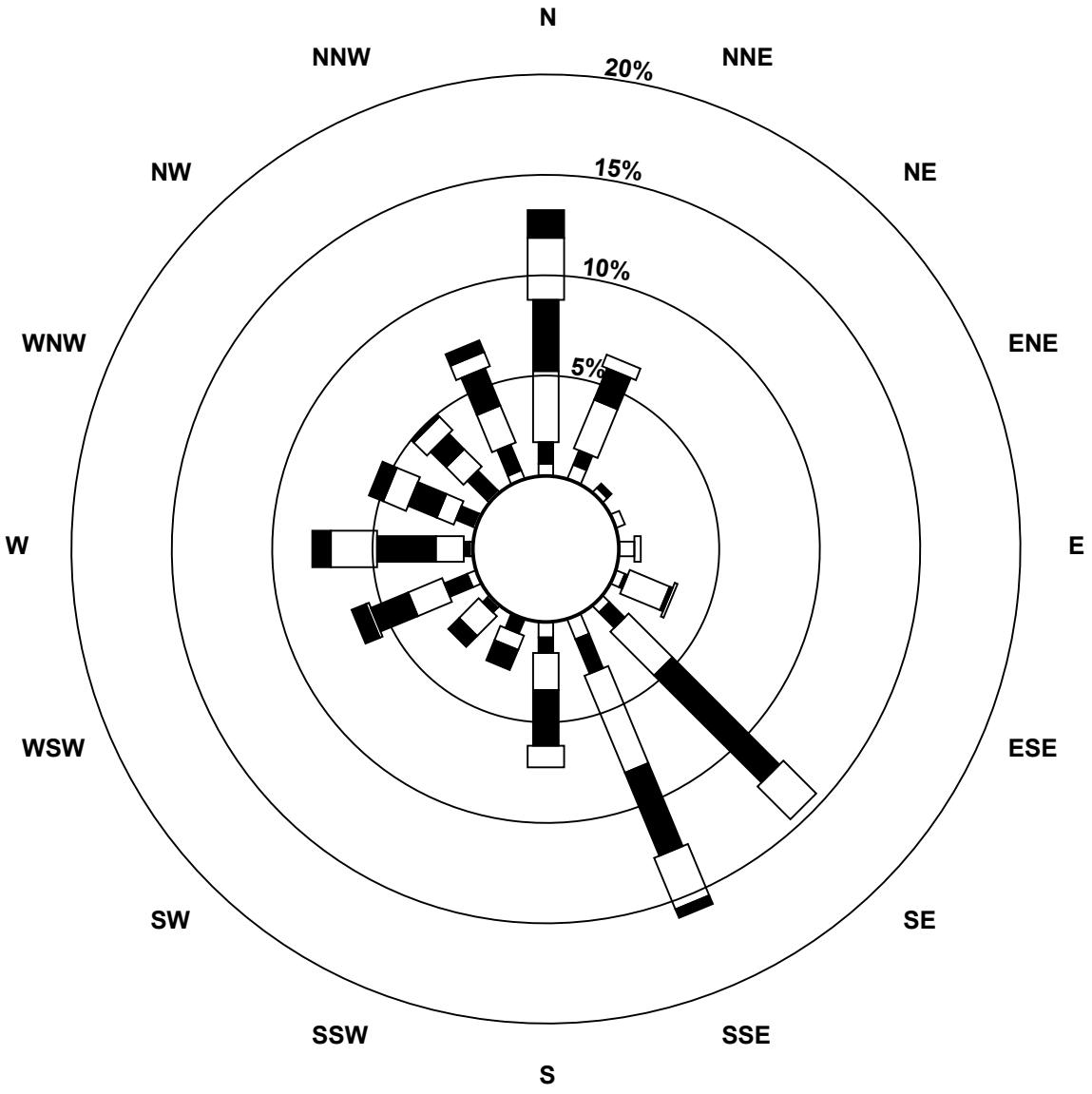
Total Number of Hours: 744

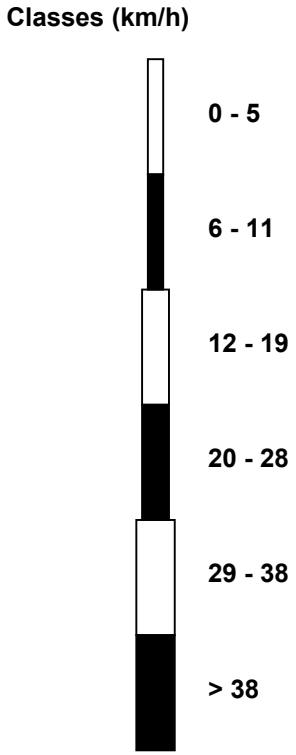
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed 90 m (WS90m) - km/h

Mannix (AMS 5)





Total Number of Valid Hours: 649

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Mannix - January 2014

Direction of Maximum Speed: 296 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 288.2 deg on Jan 15

Direction of Minimum Speed: 132 deg on Jan 7 04:00

Direction of Minimum Daily Speed Average: 0.8 deg on Jan 18

Monthly Average Direction: 256.0 deg

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Percent Operational Time:	92.3

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	156	147	145	162	158	153	158	152	149	167	155	149	154	143	160	152	155	149	159	175	160	158	154	157	155.5
2-Jan	148	141	136	139	152	159	159	171	MS	MS	MS	161	MS	MS	MS	157	141	145	161	162	183	240	306	10	152.2
3-Jan	15	11	13	14	14	4	8	13	4	279	314	30	323	320	324	307	292	297	303	291	287	283	272	267	329.8
4-Jan	265	269	270	262	243	263	267	272	272	275	278	288	325	1	351	343	321	309	298	290	288	284	272	265	288.3
5-Jan	271	292	267	256	264	261	252	159	165	163	172	154	136	133	161	158	156	157	155	159	159	153	155	151	184.0
6-Jan	163	175	162	156	170	155	157	158	147	134	128	131	131	122	110	113	122	116	127	140	154	92	109	115	137.2
7-Jan	150	218	120	132	12	90	229	257	275	259	143	170	144	174	166	183	164	142	147	154	160	154	154	166	163.1
8-Jan	164	160	159	158	158	165	165	162	160	158	171	161	152	150	161	142	164	156	143	162	154	153	148	151	158.5
9-Jan	152	164	166	168	162	195	190	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	316	318	300	329	321	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	353	6	347	2	7	6	10	347	2	2	9	UO	MS	--
12-Jan	MS	350	352	355	345	9	345	346	20	147	144	169	247	226	197	174	163	169	155	146	144	150	153	161	154.5
13-Jan	147	152	222	195	179	167	169	210	332	293	335	8	13	25	21	13	17	18	15	13	305	335	16	282	10.4
14-Jan	295	241	217	147	158	153	154	147	150	156	155	147	157	161	155	154	152	153	149	158	154	155	161	152	155.7
15-Jan	242	257	268	277	265	264	274	284	296	297	AF	309	306	303	301	302	328	349	21	24	358	316	243	208	288.2
16-Jan	177	158	162	223	261	269	220	161	177	154	155	145	153	160	158	163	162	157	149	163	156	149	155	151	164.9
17-Jan	176	167	176	164	204	206	259	259	262	269	269	269	281	310	315	322	8	26	28	25	29	30	331	246	286.6
18-Jan	212	137	155	151	149	151	174	165	155	165	226	133	119	77	11	349	323	346	334	338	316	323	280	283	182.1
19-Jan	281	253	263	335	9	22	17	297	298	344	351	12	9	13	13	2	4	18	22	16	16	11	353	234	5.5
20-Jan	212	171	175	162	162	153	161	151	159	160	158	153	161	160	169	167	162	269	306	336	320	320	352	339	166.5
21-Jan	300	293	7	1	23	35	11	351	288	301	347	354	24	33	26	27	28	10	38	70	104	133	144	135	25.0
22-Jan	136	134	134	137	138	137	149	149	148	149	147	166	165	165	167	163	164	154	156	157	158	162	159	160	153.9
23-Jan	156	154	158	155	149	166	163	243	268	271	274	283	296	286	279	281	288	294	294	279	245	208	138	206	258.5
24-Jan	124	293	285	312	358	356	350	3	350	12	13	18	17	16	3	22	13	6	12	276	299	173	148	167	356.5
25-Jan	152	158	168	174	216	208	209	220	270	340	20	9	349	340	349	352	13	16	357	349	347	344	354	347	351.9
26-Jan	351	357	348	348	355	354	8	21	23	7	320	6	90	12	29	163	163	166	156	146	144	151	155	153	5.5
27-Jan	169	178	167	170	163	159	154	156	162	149	152	152	149	144	149	153	157	162	157	154	158	160	159	158	157.3
28-Jan	158	159	147	172	149	155	156	154	167	149	161	174	290	15	299	312	339	340	18	22	17	11	6	11	50.6
29-Jan	359	4	2	4	344	293	343	329	331	353	358	0	346	351	348	349	343	346	342	336	326	326	324	324	344.4
30-Jan	328	327	304	295	291	279	260	262	257	253	242	243	217	219	211	240	212	190	206	196	180	149	267	285	254.7
31-Jan	306	359	351	336	335	275	275	253	257	23	13	346	335	311	332	1	356	360	322	266	301	288	307	257	326.0
	202.9	237.2	248.3	241.5	251.5	211.2	230.5	238.8	254.6	264.0	271.2	305.8	329.7	339.2	333.3	332.1	351.8	7.8	16.4	9.5	339.8	298.7	183.3	203.8	
	Diurnal Average																								

AF - Analyzer Failure UO - Unstable Operation MS - Missing

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Jan 7 04:00

Minimum Value: 4 deg on Jan 4 03:00

Percentiles: P_1 = 6 P_{10} = 8 Q_1 = 10 Median = 13 Q_3 = 18 P_{90} = 31 P_{99} = 76

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Hours of Calibration:	0
Percent Operational Time:	92.3

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	15	9	16	8	21	19	16	10	10	10	26	16	13	22	10	15	9	11	16	23	16	12	11	11	26
2-Jan	11	11	10	11	10	18	9	11	MS	MS	MS	9	MS	MS	MS	11	14	10	8	14	15	18	49	11	49
3-Jan	13	12	10	12	12	16	14	11	15	58	70	46	59	15	9	18	9	13	8	8	8	7	7	7	70
4-Jan	8	4	4	10	7	15	5	6	6	6	8	9	16	18	13	12	11	11	8	7	8	6	5	6	18
5-Jan	5	26	11	5	4	21	33	25	19	16	21	34	23	19	11	14	11	10	11	15	11	12	11	11	34
6-Jan	7	11	11	10	16	13	10	8	11	13	13	12	12	15	13	16	16	17	17	14	14	11	21	12	21
7-Jan	32	50	87	95	35	77	51	8	41	85	24	13	25	14	14	16	22	15	14	8	7	8	8	11	95
8-Jan	10	8	8	8	8	10	8	9	10	7	13	9	12	11	12	13	13	31	27	10	9	17	18	56	56
9-Jan	14	27	8	11	8	15	14	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	27
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	22	15	12	24	18	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	24
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	22	13	21	17	12	13	13	12	15	12	12	UO	MS	22
12-Jan	MS	22	13	14	14	14	22	20	61	30	26	22	14	14	14	16	19	11	9	9	10	8	9	11	61
13-Jan	11	20	19	22	81	33	16	76	23	20	24	18	17	12	15	10	10	10	9	17	17	37	16	85	85
14-Jan	35	47	15	15	10	10	10	15	10	11	11	11	16	9	11	10	9	9	12	13	11	11	17	10	47
15-Jan	52	11	9	9	9	8	8	10	9	9	AF	8	8	8	8	8	25	15	11	9	31	39	49	17	52
16-Jan	21	13	15	18	18	16	65	10	9	11	10	9	11	9	11	6	9	8	15	8	11	14	12	9	65
17-Jan	22	10	14	23	35	27	12	10	7	8	7	7	10	10	10	10	25	12	15	11	14	15	40	53	53
18-Jan	44	12	16	10	12	11	14	12	11	14	27	29	21	12	35	18	12	18	13	22	20	28	14	19	44
19-Jan	50	47	33	29	11	19	26	37	28	12	12	14	13	11	11	14	13	11	11	11	20	26	45	72	72
20-Jan	19	15	11	7	14	13	8	12	9	8	8	9	8	12	8	9	45	30	30	31	11	12	24	22	45
21-Jan	19	14	37	22	28	18	16	25	20	18	19	26	15	11	17	16	25	49	52	12	21	14	9	11	52
22-Jan	9	12	9	9	12	12	11	8	9	10	11	9	9	7	7	6	9	9	8	10	7	6	8	7	12
23-Jan	9	9	7	10	9	12	22	24	6	7	6	11	8	8	7	7	8	10	10	10	11	45	16	62	62
24-Jan	28	71	6	26	11	20	20	17	17	12	12	14	14	13	15	12	15	12	23	17	17	36	14	16	71
25-Jan	13	14	20	12	24	29	82	26	44	42	10	13	15	13	18	19	14	11	14	11	12	13	13	12	82
26-Jan	12	13	13	12	13	13	15	14	13	17	26	28	44	57	34	71	20	15	11	12	10	8	10	13	71
27-Jan	10	10	6	13	8	9	11	10	8	14	15	15	13	11	10	9	8	8	7	9	8	9	8	12	15
28-Jan	8	7	14	17	18	9	13	11	7	34	14	23	71	40	16	24	20	14	20	11	11	15	13	11	71
29-Jan	13	11	13	13	29	35	39	21	17	15	16	18	15	13	13	15	14	13	13	12	13	11	12	12	39
30-Jan	16	15	12	9	11	14	10	8	9	11	10	13	16	14	18	45	16	20	20	16	34	50	68	8	68
31-Jan	24	13	15	15	21	32	20	7	10	33	10	16	16	10	18	17	14	18	19	11	18	13	16	13	33
	52	71	87	95	81	77	82	76	61	85	70	46	71	57	35	71	45	49	52	31	34	50	68	85	
	Diurnal Maximum																								

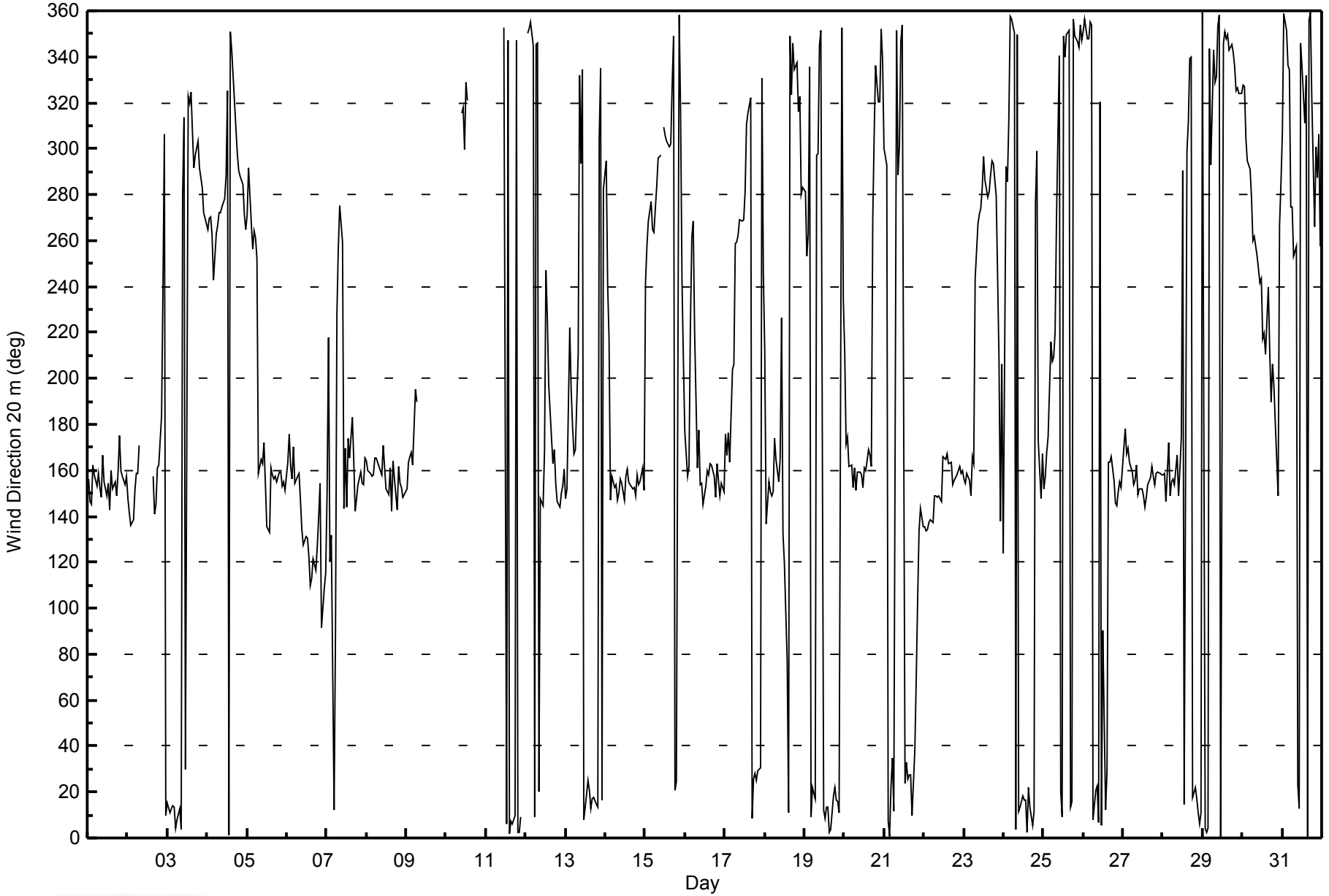
AF - Analyzer Failure UO - Unstable Operation MS - Missing

WBEA NETWORK

Hourly Averages

Wind Direction 20 m (WD20m) - deg

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Direction of Maximum Speed: 296 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 290.8 deg on Jan 15

Direction of Minimum Speed: 312 deg on Jan 7 09:00

Direction of Minimum Daily Speed Average: 1.9 deg on Jan 18

Monthly Average Direction: 263.2 deg

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	166	158	152	153	169	158	167	163	158	168	169	154	160	150	170	166	170	167	154	174	155	140	140	140	158.9
2-Jan	138	135	133	136	147	156	156	169	MS	MS	MS	163	MS	MS	MS	174	170	173	185	201	231	255	327	11	159.2
3-Jan	16	11	13	15	14	9	10	17	12	345	360	4	316	326	321	311	297	302	306	295	293	290	275	269	333.6
4-Jan	262	266	271	267	254	275	273	273	273	275	281	290	328	2	353	344	323	313	302	295	292	289	277	275	292.0
5-Jan	280	295	278	260	268	270	272	183	171	190	206	183	140	132	157	158	154	157	157	161	165	155	152	142	192.3
6-Jan	144	169	161	145	157	147	143	153	139	131	126	130	129	123	115	116	121	117	126	135	148	97	107	117	134.3
7-Jan	133	166	109	74	55	79	145	216	312	152	138	152	154	180	167	188	177	136	144	153	159	159	150	161	154.6
8-Jan	160	155	152	151	152	160	155	158	159	154	172	166	158	155	168	151	166	181	138	158	154	155	147	150	156.8
9-Jan	141	145	163	171	172	198	190	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	320	323	303	332	322	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	2	8	355	4	8	8	12	352	3	5	8	MS	MS	--
12-Jan	MS	354	356	358	348	10	348	342	15	157	146	183	248	228	196	179	169	171	158	148	143	149	150	154	156.8
13-Jan	144	145	210	191	188	181	188	270	333	305	338	12	15	27	21	15	17	18	17	23	352	353	24	355	17.0
14-Jan	337	212	167	151	158	156	159	152	139	142	148	139	153	155	151	148	149	152	147	159	158	156	161	164	153.4
15-Jan	244	258	269	279	266	264	275	284	296	AF	AF	312	308	304	302	303	329	349	20	23	18	359	321	200	290.8
16-Jan	179	204	212	254	266	267	274	194	221	197	177	158	157	160	161	179	197	187	174	189	167	152	157	155	186.6
17-Jan	174	175	182	194	232	236	258	258	262	269	271	270	283	314	320	324	9	25	26	25	27	28	350	271	285.2
18-Jan	191	132	152	155	149	148	171	164	174	221	256	211	135	79	11	356	332	352	343	346	326	331	297	292	189.5
19-Jan	283	260	268	323	8	21	23	348	326	349	357	13	9	13	13	3	5	19	22	19	16	13	356	5	6.9
20-Jan	203	172	178	167	169	155	164	157	159	159	161	155	155	154	161	166	169	254	312	326	326	327	355	343	165.8
21-Jan	308	300	12	24	32	64	26	4	315	323	350	359	24	31	27	29	30	25	46	81	109	132	142	136	33.3
22-Jan	138	134	136	140	135	137	153	149	143	146	143	166	166	166	168	165	162	151	152	154	158	167	162	161	153.6
23-Jan	160	156	166	176	172	191	207	254	268	272	276	286	297	290	280	281	286	293	289	279	255	244	146	241	255.8
24-Jan	242	289	287	315	1	0	355	6	354	14	15	20	18	18	7	24	14	9	19	270	301	161	143	164	355.9
25-Jan	153	144	162	170	204	221	250	246	274	336	20	11	350	344	353	356	14	16	358	353	349	346	357	351	351.5
26-Jan	354	358	351	351	357	356	10	22	22	8	325	3	89	352	23	160	166	169	157	145	140	148	151	150	8.3
27-Jan	160	173	168	172	169	171	159	158	164	152	148	146	143	145	147	153	159	160	158	158	165	165	162	165	160.1
28-Jan	159	165	160	171	156	140	159	156	167	166	161	183	306	334	307	324	342	345	15	22	17	11	7	11	90.0
29-Jan	1	5	4	4	349	317	352	333	334	354	359	3	349	353	351	353	347	348	346	338	328	329	327	326	347.4
30-Jan	330	330	307	297	295	282	266	264	258	253	242	245	221	221	214	247	216	194	212	202	192	201	277	285	255.3
31-Jan	314	1	354	341	342	299	291	276	276	17	12	348	341	315	336	1	357	359	326	280	300	290	308	264	330.0
	184.1	207.3	220.8	222.3	223.9	207.5	226.0	233.4	249.1	238.6	261.4	306.3	332.2	342.6	335.3	327.7	342.6	16.1	23.0	29.8	177.1	198.7	157.5	179.3	
	Diurnal Average																								

AF - Analyzer Failure MS - Missing

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

Mannix - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Jan 14 02:00

Minimum Value: 2 deg on Jan 5 05:00

Percentiles: P_1 = 3 P_{10} = 5 Q_1 = 7 Median = 9 Q_3 = 13 P_{90} = 23 P_{99} = 73

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Hours of Calibration:	0
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	8	5	8	6	13	10	8	6	6	5	13	12	11	13	3	5	4	8	7	9	11	8	6	6	13
2-Jan	6	6	6	7	7	15	6	5	MS	MS	MS	5	MS	MS	MS	6	11	4	12	23	9	9	43	6	43
3-Jan	9	7	7	8	8	10	10	9	10	55	50	70	74	10	8	17	6	11	7	6	6	4	6	7	74
4-Jan	6	3	3	7	4	10	4	5	5	5	7	8	13	16	10	8	9	9	5	4	4	4	5	7	16
5-Jan	4	17	9	4	2	5	8	42	17	14	24	34	14	12	13	12	8	8	9	12	7	12	8	8	42
6-Jan	5	9	8	8	13	9	9	7	8	8	8	8	9	10	9	11	11	13	13	10	11	12	18	9	18
7-Jan	20	51	62	35	18	40	34	14	73	90	9	12	10	10	19	8	18	5	11	3	3	4	6	6	90
8-Jan	6	5	5	6	6	7	7	7	8	5	7	6	8	7	8	8	8	16	15	8	5	9	9	12	16
9-Jan	7	10	12	6	6	10	7	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	12
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	17	15	9	22	15	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	22
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	15	7	13	9	8	7	10	9	9	8	8	MS	MS	15
12-Jan	MS	18	11	12	12	12	21	14	68	25	21	29	11	10	9	12	12	7	7	6	7	6	6	7	68
13-Jan	9	17	14	11	76	20	23	50	17	17	19	13	12	9	11	6	8	8	5	10	23	25	10	49	76
14-Jan	31	95	16	8	4	7	7	12	6	8	8	7	12	7	8	7	6	6	8	9	7	5	9	10	95
15-Jan	28	8	9	8	8	7	7	9	8	AF	AF	7	7	6	7	7	22	12	9	5	17	25	86	24	86
16-Jan	12	14	12	9	6	4	53	27	6	16	12	8	6	5	7	9	11	10	11	11	11	7	7	4	53
17-Jan	15	5	6	15	21	10	8	7	6	7	6	7	10	8	8	8	23	8	10	9	12	11	31	81	81
18-Jan	33	4	12	7	7	8	11	7	11	16	7	31	18	10	28	13	10	12	11	19	19	22	9	13	33
19-Jan	36	39	13	20	8	14	13	25	20	10	8	11	9	8	8	10	10	9	9	8	14	18	34	77	77
20-Jan	31	9	3	5	11	9	5	11	7	6	5	6	7	8	6	6	23	40	28	21	8	10	23	20	40
21-Jan	17	15	24	18	35	24	20	15	11	19	16	19	11	9	12	12	17	39	48	10	12	9	7	8	48
22-Jan	6	8	5	5	8	8	7	6	5	6	9	9	7	5	5	4	5	6	6	5	5	3	5	4	9
23-Jan	5	5	6	11	8	12	12	9	6	6	5	10	6	6	6	5	5	8	8	8	7	40	13	50	50
24-Jan	73	6	3	25	6	14	16	12	14	8	8	10	10	10	11	10	10	10	20	21	20	25	12	14	73
25-Jan	13	10	12	9	20	15	46	11	15	42	8	11	12	9	15	15	11	8	10	8	8	10	10	8	46
26-Jan	9	10	9	9	9	10	13	11	10	12	21	22	52	70	42	73	17	14	11	10	6	7	5	4	73
27-Jan	4	7	4	5	5	7	9	8	5	12	13	11	11	8	7	6	4	4	4	5	4	4	4	8	13
28-Jan	4	6	7	7	11	5	5	6	6	15	10	25	35	24	13	19	13	10	17	8	8	13	10	8	35
29-Jan	9	7	8	10	22	28	31	18	15	13	12	14	11	9	10	11	10	10	9	9	11	9	10	10	31
30-Jan	13	12	10	7	9	12	7	5	7	9	8	11	12	10	16	36	11	11	12	13	23	53	16	6	53
31-Jan	25	9	11	11	15	15	8	8	11	29	7	11	14	8	16	13	10	14	17	10	16	11	15	10	29
	73	95	62	35	76	40	53	50	73	90	50	70	74	70	42	73	23	40	48	23	23	53	86	81	
	Diurnal Maximum																								

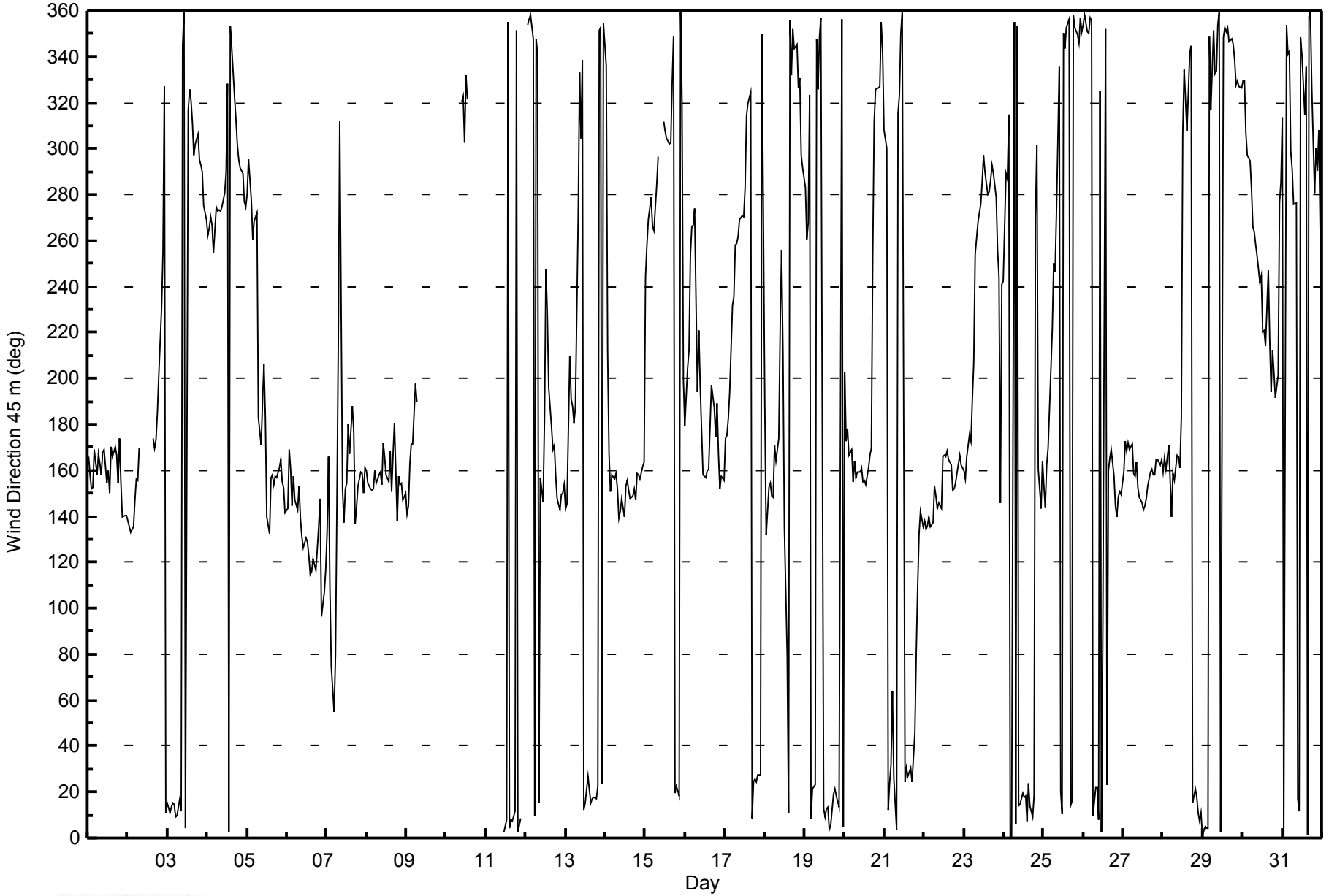
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Direction 45 m (WD45m) - deg

Mannix - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - January 2014

Direction of Maximum Speed: 297 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 292.9 deg on Jan 15

Direction of Minimum Speed: 349 deg on Jan 26 14:00
Direction of Minimum Daily Speed Average: 3.2 deg on Jan 18

Monthly Average Direction: 258.0 deg

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Percent Operational Time:	87.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	165	167	156	158	163	161	167	164	145	154	168	162	166	159	162	157	152	146	137	149	138	137	137	137	153.9
2-Jan	136	135	135	136	141	150	148	164	MS	MS	MS	173	MS	MS	MS	199	209	217	239	247	248	261	325	12	169.7
3-Jan	16	12	14	16	16	12	13	22	17	4	16	345	313	329	317	311	300	306	308	298	296	294	282	280	336.0
4-Jan	264	267	273	274	266	283	280	274	273	274	282	291	330	3	355	345	324	316	306	300	297	292	280	280	295.0
5-Jan	284	296	282	273	272	267	267	240	199	214	250	235	150	139	155	159	158	163	168	169	178	168	159	147	205.2
6-Jan	141	149	150	135	142	135	135	140	135	132	131	133	132	126	120	121	123	111	126	136	143	96	106	114	132.8
7-Jan	124	114	96	82	78	97	141	183	201	180	136	148	160	171	155	173	172	138	145	143	148	148	139	146	147.1
8-Jan	143	145	145	142	143	147	144	152	157	154	170	173	171	171	187	177	188	206	129	153	154	159	155	158	155.4
9-Jan	144	134	152	169	178	196	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	171	162	152	144	142	139	144	--
13-Jan	140	142	187	185	179	186	239	287	333	318	343	16	19	30	22	19	19	19	23	35	23	13	35	28	25.3
14-Jan	11	154	164	152	157	159	154	142	133	136	137	136	141	139	139	138	139	142	137	150	163	157	164	179	150.0
15-Jan	246	257	269	279	266	265	275	285	297	298	AF	314	309	305	303	304	329	343	17	24	26	15	45	184	292.9
16-Jan	192	241	243	259	264	261	270	237	239	227	215	189	172	169	184	210	226	223	216	217	194	159	163	165	213.5
17-Jan	178	184	197	224	244	245	257	259	261	269	272	271	285	316	322	328	9	26	25	25	27	25	3	61	286.5
18-Jan	166	137	152	158	152	158	180	183	210	247	258	247	212	74	13	4	343	359	355	356	337	336	300	292	217.9
19-Jan	279	256	267	310	4	23	28	5	335	355	2	14	10	13	13	4	6	19	21	19	18	16	0	35	8.3
20-Jan	182	169	179	174	176	164	167	165	159	158	159	156	149	150	149	156	162	205	337	316	336	337	358	346	161.6
21-Jan	319	311	8	35	52	89	47	14	342	341	356	4	24	30	28	30	33	32	57	89	114	134	143	138	37.9
22-Jan	141	139	142	144	138	139	151	147	138	141	140	163	164	161	165	161	156	148	148	154	163	173	170	174	154.0
23-Jan	178	173	194	208	205	213	241	255	267	272	277	288	298	292	281	280	282	290	284	277	261	258	165	258	259.8
24-Jan	272	289	291	317	5	4	359	8	356	15	17	20	19	21	11	26	19	15	31	260	303	158	142	161	356.7
25-Jan	152	142	157	162	185	214	257	258	274	335	19	12	352	348	355	359	14	16	359	355	350	347	359	353	352.2
26-Jan	356	360	354	354	359	358	11	23	21	8	327	357	96	349	357	155	166	174	158	152	141	143	144	152	9.1
27-Jan	165	174	165	164	165	183	173	162	167	160	158	143	142	145	148	155	168	163	157	166	170	174	170	172	163.9
28-Jan	169	168	159	155	168	157	166	171	176	180	169	207	309	327	322	333	345	351	16	22	18	11	8	11	116.3
29-Jan	3	7	7	5	353	334	355	338	338	355	1	4	350	354	353	354	350	352	349	341	331	332	330	327	350.2
30-Jan	330	330	310	298	296	285	270	264	258	253	242	242	220	220	216	248	219	201	216	208	204	249	277	285	255.9
31-Jan	322	2	358	349	351	321	310	299	289	8	12	353	345	318	339	3	359	360	332	293	300	292	310	270	336.3
	187.2	201.7	211.6	214.2	203.7	204.9	225.2	233.1	251.1	256.2	256.8	292.8	328.9	349.5	338.5	325.8	331.1	10.9	31.3	91.4	185.0	197.5	160.0	183.6	
	Diurnal Average																								

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

AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 92 deg on Jan 21 05:00

Minimum Value: 2 deg on Jan 20 03:00

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 5 Median = 8 Q_3 = 11 P_{90} = 19 P_{99} = 61

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	2	3	10	8	6	8	5	5	6	9	6	4	6	6	4	3	4	6	3	7	4	3	2	2	10
2-Jan	2	3	3	3	4	11	4	5	MS	MS	MS	2	MS	MS	MS	7	6	8	12	13	6	8	44	5	44
3-Jan	7	6	6	6	6	8	7	6	6	51	48	21	34	10	10	15	5	10	6	5	5	4	5	8	51
4-Jan	5	4	4	6	5	7	4	4	5	5	6	8	13	15	8	7	7	7	4	3	3	3	6	6	15
5-Jan	3	13	11	5	5	2	5	19	11	12	19	31	16	15	9	9	6	4	6	9	5	14	6	8	31
6-Jan	4	9	8	5	10	5	7	4	6	6	8	8	9	11	11	12	12	15	13	9	8	14	20	13	20
7-Jan	18	47	34	13	10	26	26	13	29	27	7	8	7	7	15	10	10	7	7	4	2	2	4	5	47
8-Jan	4	3	3	3	3	5	4	6	6	5	5	4	4	4	6	6	9	18	21	10	5	6	3	6	21
9-Jan	10	9	15	4	5	7	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	15
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	5	5	2	5	4	3	5	5
13-Jan	6	13	12	9	46	10	28	15	19	15	22	11	11	7	9	5	7	6	4	9	27	24	6	16	46
14-Jan	12	65	11	6	5	3	4	7	4	2	3	4	9	4	4	5	4	5	4	9	4	5	7	15	65
15-Jan	16	7	8	8	8	7	7	8	7	6	AF	6	7	6	6	6	20	12	11	4	8	13	90	39	90
16-Jan	16	7	8	5	5	3	6	11	2	12	11	14	7	6	9	10	8	9	13	12	21	7	5	2	21
17-Jan	10	3	5	16	8	5	7	5	5	7	6	6	11	6	6	6	22	6	8	7	9	9	23	79	79
18-Jan	19	6	8	4	4	8	8	5	14	9	2	7	53	7	17	9	9	9	10	16	18	20	10	10	53
19-Jan	37	33	8	11	11	10	9	17	16	9	6	8	8	7	7	9	9	8	7	7	12	15	26	35	37
20-Jan	33	7	2	3	8	4	4	10	5	4	4	5	5	4	3	4	15	74	30	12	12	12	22	20	74
21-Jan	17	19	19	30	92	24	29	9	11	15	15	15	9	6	9	9	11	10	31	11	14	9	5	6	92
22-Jan	5	6	4	4	7	5	6	3	3	3	6	9	6	5	5	4	6	5	5	3	5	2	2	4	9
23-Jan	5	5	8	7	5	9	8	7	6	6	4	10	4	5	5	5	5	8	8	6	6	14	31	36	36
24-Jan	23	5	2	24	4	11	14	10	12	6	6	8	8	8	10	9	8	10	21	23	30	17	8	11	30
25-Jan	13	8	7	6	17	17	12	7	6	41	6	8	10	7	13	13	9	7	9	6	7	9	8	7	41
26-Jan	7	8	8	7	8	8	12	9	9	11	22	20	54	91	61	56	21	14	11	11	4	5	5	6	91
27-Jan	4	6	5	3	2	7	11	8	3	8	14	8	6	4	3	5	4	2	2	3	2	3	2	6	14
28-Jan	3	3	4	6	8	3	5	4	3	8	9	47	16	12	14	13	9	8	15	7	6	10	8	7	47
29-Jan	7	5	6	9	16	20	18	17	13	12	12	14	11	8	9	10	9	8	7	8	10	8	9	9	20
30-Jan	11	11	10	6	8	8	6	5	6	8	6	9	10	9	20	27	8	8	8	10	9	33	6	7	33
31-Jan	21	8	9	8	9	13	7	12	16	24	6	8	13	8	14	11	8	12	17	9	15	9	16	10	24
	37	65	34	30	92	26	29	19	29	51	48	47	54	91	61	56	22	74	31	23	30	33	90	79	
	Diurnal Maximum																								

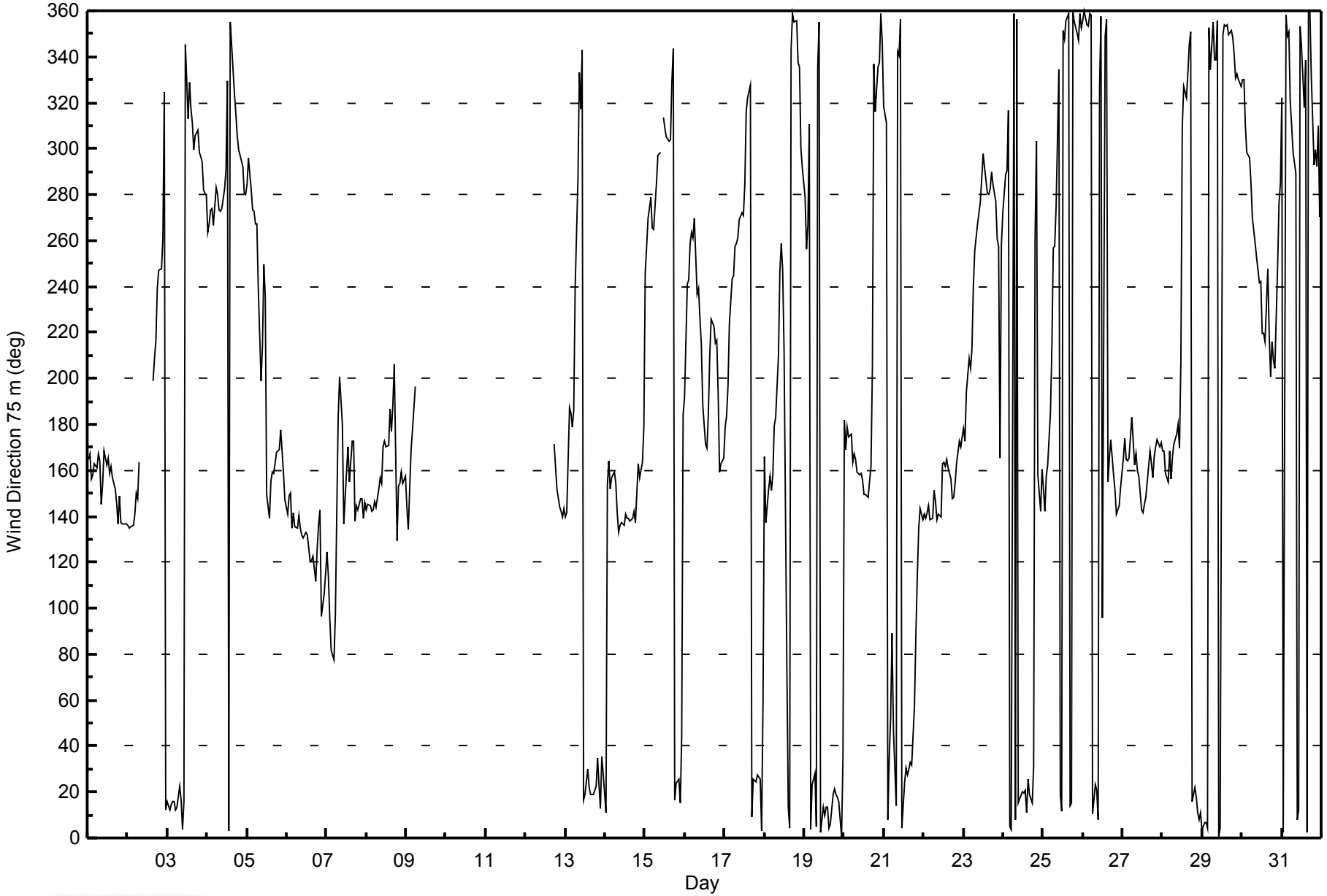
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Direction 75 m (WD75m) - deg

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 92 deg on Jan 26 14:00

Minimum Value: 1 deg on Jan 20 03:00

Percentiles: P_1 = 2 P_{10} = 3 Q_1 = 5 Median = 7 Q_3 = 10 P_{90} = 19 P_{99} = 57

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Hours of Calibration:	0
Percent Operational Time:	87.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	2	3	7	5	6	5	5	7	4	4	4	3	6	7	5	5	4	8	3	6	4	3	3	2	8
2-Jan	3	3	3	3	4	10	MS	AF	AF	AF	AF	AF	AF	AF	AF	5	4	8	8	9	5	7	43	4	43
3-Jan	6	5	5	5	5	7	6	5	5	44	48	14	10	10	10	13	5	9	6	4	4	3	4	7	48
4-Jan	5	5	4	5	5	5	4	4	4	5	6	8	12	15	8	6	6	6	4	3	3	3	6	5	15
5-Jan	3	10	11	4	7	3	5	9	9	18	11	12	34	37	7	8	4	3	7	9	5	15	5	5	37
6-Jan	7	6	7	3	9	3	4	4	4	4	5	6	7	7	6	7	6	9	10	8	7	14	18	6	18
7-Jan	17	33	31	11	10	26	27	17	28	18	8	9	6	8	12	9	11	5	6	4	2	2	4	4	33
8-Jan	3	3	3	3	2	4	4	5	4	4	4	4	3	4	6	5	10	23	26	12	6	7	5	6	26
9-Jan	13	6	10	5	5	6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	13
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	6	2	5	3	2	5	6
13-Jan	6	13	11	7	43	16	20	8	21	16	24	10	10	7	8	5	6	6	4	8	25	22	7	17	43
14-Jan	13	55	5	5	5	3	2	7	4	3	3	3	8	4	4	5	4	4	3	10	5	5	6	17	55
15-Jan	13	7	8	7	7	7	7	8	7	AF	AF	5	6	6	6	6	18	12	12	4	8	11	80	50	80
16-Jan	20	5	7	4	4	3	4	7	3	9	8	15	10	8	11	9	7	8	11	11	23	11	6	2	23
17-Jan	10	2	8	14	6	4	6	5	5	7	6	6	10	5	5	5	21	5	7	6	8	8	21	48	48
18-Jan	19	6	5	3	4	8	8	5	12	6	2	4	18	27	14	7	9	8	8	15	19	18	15	18	27
19-Jan	33	29	7	10	13	8	8	16	16	8	5	8	7	6	6	9	8	7	6	6	10	12	21	33	33
20-Jan	36	7	1	2	6	4	4	8	4	4	3	4	4	3	3	4	15	76	31	12	13	11	21	18	76
21-Jan	16	18	29	51	68	36	30	8	10	12	14	14	9	6	9	8	9	8	21	11	6	7	5	5	68
22-Jan	5	6	4	4	6	5	5	3	3	3	5	9	5	5	5	4	6	5	4	3	6	2	2	5	9
23-Jan	5	7	8	5	4	9	6	6	5	6	4	9	4	5	5	4	4	7	7	5	5	8	30	27	30
24-Jan	10	5	2	24	4	9	13	9	11	5	6	7	7	8	9	7	7	10	19	21	33	16	7	9	33
25-Jan	13	8	6	5	15	19	9	6	6	40	6	8	9	7	11	12	8	6	9	6	7	9	8	7	40
26-Jan	7	8	7	7	7	7	11	8	9	10	21	20	64	92	61	60	23	15	10	9	4	6	5	8	92
27-Jan	4	4	4	4	4	7	14	10	6	17	46	30	6	4	2	5	3	3	3	2	2	4	2	5	46
28-Jan	3	3	3	6	8	3	4	4	3	4	20	46	14	11	13	12	9	7	14	6	6	10	8	7	46
29-Jan	7	5	6	8	14	16	17	18	12	11	12	13	10	7	9	9	9	8	7	7	10	8	9	8	18
30-Jan	10	11	9	6	7	7	7	4	5	7	6	9	9	8	18	23	8	8	8	10	8	22	4	8	23
31-Jan	19	7	8	7	8	12	7	11	16	21	5	7	12	8	14	10	8	11	18	8	15	8	16	9	21
	36	55	31	51	68	36	30	18	28	44	48	46	64	92	61	60	23	76	31	21	33	22	80	50	
	Diurnal Maximum																								

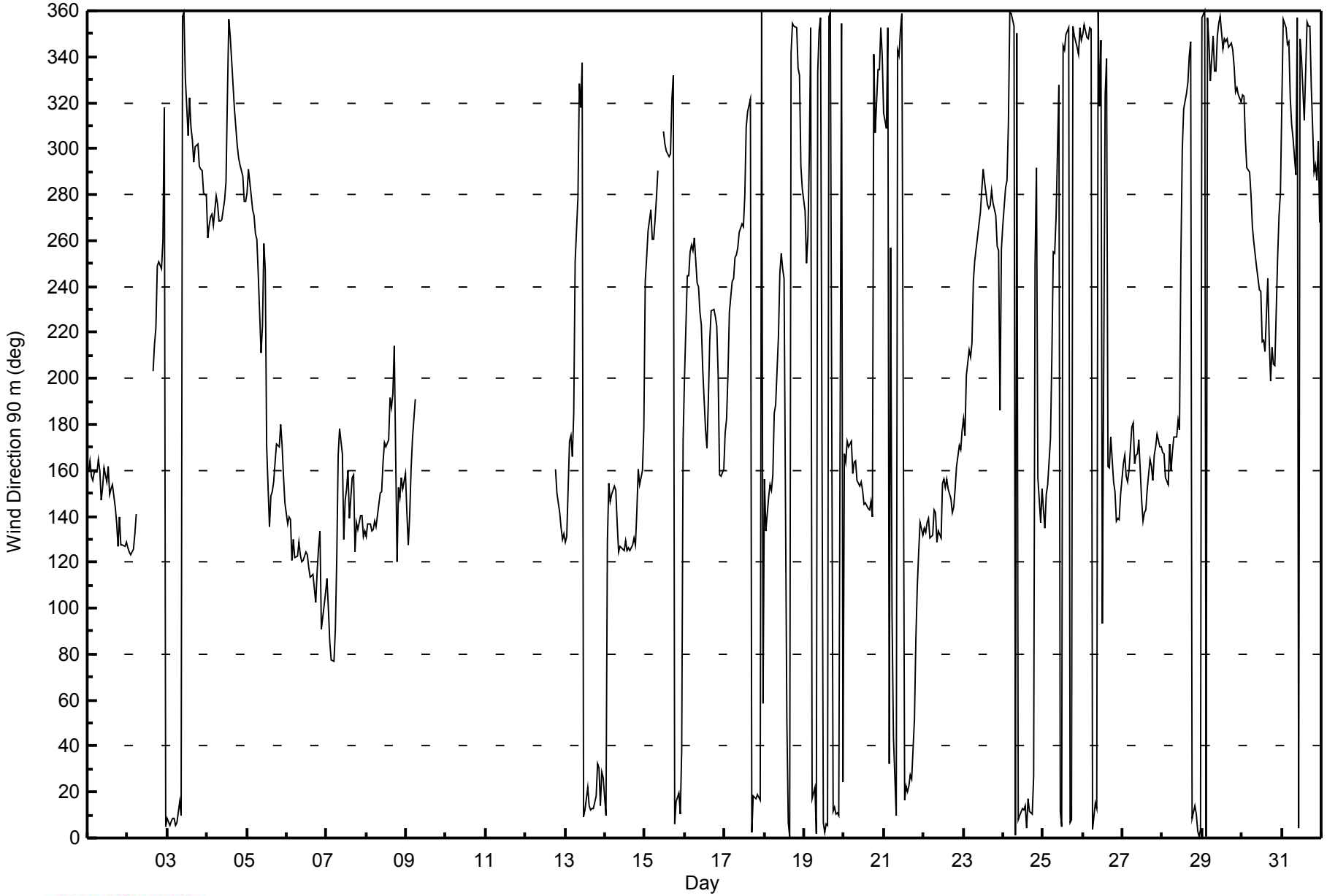
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Direction 90 m (WD90m) - deg

Mannix - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - January 2014

Maximum Value: 1.1 km/h on Jan 22 22:00

Maximum Daily Average: 0.4 km/h on Jan 22

Minimum Value: -1.4 km/h on Jan 26 01:00

Minimum Daily Average: -0.5 km/h on Jan 15

Maximum Diurnal Average: 0.1 km/h at hour 23

Minimum Diurnal Average: -0.1 km/h at hour 15

Monthly Average: -0.02 km/h

Percentiles: P_1 = -1.0 P_{10} = -0.4 Q_1 = -0.2 Median = 0.0 Q_3 = 0.2 P_{90} = 0.4 P_{99} = 0.7

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Hours of Calibration:	0
Percent Operational Time:	92.3

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.5	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.5
2-Jan	0.4	0.4	0.7	0.5	0.3	0.2	0.2	0.2	MS	MS	MS	0.6	MS	MS	MS	0.1	0.2	0.1	0.0	0.0	-0.1	-0.3	-0.4	-0.6	0.1	0.7
3-Jan	-0.1	-0.5	-0.6	-0.3	-0.5	-0.2	-0.2	-0.2	-0.3	-0.2	-0.1	0.1	0.1	-0.2	-0.4	-0.3	-0.3	-0.4	-0.5	-0.5	-0.4	-0.2	-0.1	-0.1	-0.3	0.1
4-Jan	-0.2	-0.1	-0.1	-0.3	-0.6	-0.3	-0.3	-0.2	-0.1	-0.1	-0.3	-0.3	-0.7	-0.7	-0.7	-0.5	-0.4	-0.2	-0.3	-0.3	-0.3	-0.2	-0.1	-0.2	-0.3	-0.1
5-Jan	-0.1	-0.2	-0.2	-0.3	-0.3	0.0	-0.1	0.0	-0.1	0.0	0.0	0.3	0.5	0.3	0.1	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.1	0.5
6-Jan	0.2	0.0	0.1	0.4	0.0	0.4	0.3	0.2	0.3	0.0	0.1	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.4	0.2	0.3	0.2	0.2	0.0	0.2	0.4
7-Jan	0.0	0.0	0.1	0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	0.2	0.1	0.2	0.0	0.1	0.0	0.1	0.2	0.3	0.5	0.4	0.4	0.5	0.2	0.1	0.5
8-Jan	0.3	0.5	0.4	0.3	0.3	0.2	0.2	0.4	0.3	0.3	0.1	0.4	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.5	0.3	0.3	0.3	0.3	0.5
9-Jan	0.2	0.0	0.3	0.2	0.5	-0.1	-0.1	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	0.5
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.0	0.1	0.0	0.0	0.1	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	0.1
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-0.1	-0.1	-0.1	-0.1	-0.4	-0.3	-0.3	-0.5	-0.2	-0.4	-0.5	UO	MS	--	-0.1
12-Jan	MS	-0.2	-0.4	-0.4	-0.4	-0.3	-0.2	-0.2	0.0	0.1	0.2	0.0	-0.1	-0.1	0.1	0.2	0.3	0.4	0.6	0.4	0.3	0.3	0.3	0.3	0.1	0.6
13-Jan	0.3	0.3	0.0	-0.1	0.0	0.1	0.0	0.0	-0.1	-0.2	-0.3	-0.2	0.0	0.2	0.0	-0.3	0.0	-0.1	-0.2	-0.1	0.0	0.0	-0.2	0.0	0.0	0.3
14-Jan	-0.1	0.0	-0.1	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.3	0.2	0.2	0.2	0.4	0.3	0.4	0.6	0.5	0.6	0.6	0.3	0.6
15-Jan	-0.4	-0.8	-0.8	-0.2	-0.5	-0.7	-0.4	-0.8	-1.2	-0.5	AF	-0.5	-0.6	-1.1	-0.8	-1.0	-0.5	-0.6	-0.2	0.0	-0.1	-0.2	-0.1	-0.2	-0.5	0.0
16-Jan	0.0	0.1	0.1	-0.1	-0.2	-0.3	0.0	0.0	-0.2	0.1	0.0	0.3	0.5	0.5	0.5	0.2	0.0	0.1	0.2	0.1	0.4	0.5	0.4	0.4	0.1	0.5
17-Jan	0.1	0.3	0.0	0.0	-0.2	-0.2	-0.6	-0.4	-0.5	-0.3	-0.3	-0.2	-0.4	-0.5	-0.5	-0.7	-0.3	0.0	-0.1	0.1	0.1	0.3	-0.1	-0.1	-0.2	0.3
18-Jan	0.0	0.3	0.3	0.5	0.4	0.3	0.1	0.2	0.2	0.1	-0.4	0.1	0.2	0.2	-0.1	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.5
19-Jan	0.0	0.0	-0.1	-0.1	-0.3	-0.1	-0.2	-0.1	0.0	-0.4	-0.5	-0.4	-0.3	-0.7	-0.6	-0.5	-0.5	0.0	0.1	-0.3	-0.1	-0.1	-0.1	-0.2	-0.2	0.1
20-Jan	-0.1	0.1	0.2	0.5	0.3	0.4	0.7	0.5	0.7	0.4	0.4	0.3	0.5	0.3	0.2	0.3	0.1	-0.1	0.0	0.0	-0.2	-0.2	-0.3	-0.1	0.2	0.7
21-Jan	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.2	0.1	0.0	-0.3	-0.2	0.0	0.2	-0.3	-0.1	0.1	-0.1	0.2	0.1	0.2	0.2	0.3	0.1	0.0	0.3
22-Jan	0.1	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.1	0.4	0.4	0.5	0.5	0.3	0.5	1.1	0.8	0.9	0.4	1.1
23-Jan	0.7	0.6	0.4	0.2	0.3	0.1	0.1	-0.3	-0.3	-0.4	-0.3	-0.2	-0.4	-0.3	-0.3	-0.4	-0.4	-0.3	-0.1	-0.1	-0.2	0.0	0.2	0.0	-0.1	0.7
24-Jan	0.1	-0.2	-0.3	-0.4	-0.6	-0.5	-0.4	-0.4	-0.5	-0.4	-0.4	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.1	0.2	0.0	-0.2	0.2
25-Jan	0.2	0.2	0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.6	-0.3	-0.4	-0.4	-0.3	-0.5	-0.4	-0.3	-0.4	-0.6	-1.2	-1.0	-1.2	-0.9	-1.3	-0.4	0.2
26-Jan	-1.4	-0.7	-1.3	-0.9	-0.8	-0.5	-0.4	0.1	0.2	-0.3	0.0	0.0	0.1	-0.1	0.3	0.1	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.3	-0.2	0.4
27-Jan	0.0	0.0	0.1	0.0	0.1	0.3	0.2	0.3	0.4	0.3	0.1	0.2	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.6	0.7	0.7	0.6	0.3	0.7
28-Jan	0.5	0.6	0.5	0.2	0.3	0.5	0.2	0.3	0.2	0.2	0.0	0.1	0.0	-0.1	0.0	-0.2	-0.2	-0.3	-0.3	-0.1	-0.4	-0.3	-0.4	-0.5	0.0	0.6
29-Jan	-0.4	-0.5	-0.5	-0.3	0.0	0.0	-0.1	-0.2	0.0	-0.3	-0.2	-0.2	-0.7	-0.9	-0.6	-0.3	-0.2	-0.5	-0.4	-0.5	-0.3	-0.5	-0.5	-0.3	-0.4	0.0
30-Jan	-0.5	-0.4	-0.1	-0.2	-0.3	-0.1	-0.3	-0.3	-0.4	-0.5	-0.3	-0.3	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	0.1	0.1	-0.1	-0.4	-0.2	0.1
31-Jan	-0.3	-0.4	-0.3	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.3	-0.4	-0.4	-0.3	-0.3	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	0.0
	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	Diurnal Average	
	0.7	0.6	0.7	0.5	0.5	0.5	0.7	0.5	0.7	0.4	0.4	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.5	0.6	1.1	0.8	0.9	Diurnal Maximum	

AF - Analyzer Failure UO - Unstable Operation MS - Missing

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5.7 km/h on Jan 15 09:00

Minimum Value: 0.2 km/h on Jan 7 06:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.7 Median = 1.1 Q_3 = 1.7 P_{90} = 2.4 P_{99} = 4.6

Hours in Service:	744
Hours of Data:	687
Hours of Missing Data:	57
Hours of Calibration:	0
Percent Operational Time:	92.3

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.6	0.9	1.0	0.7	0.4	0.4	0.5	0.6	0.8	0.7	0.8	0.9	0.8	0.9	0.5	0.7	0.5	0.8	0.7	0.8	1.0	0.8	1.1	0.8	1.1
2-Jan	1.5	1.6	2.8	2.2	1.6	1.3	1.0	1.1	MS	MS	MS	1.4	MS	MS	MS	0.8	0.8	0.7	0.8	0.9	0.7	0.5	0.9	3.1	3.1
3-Jan	2.8	3.7	3.2	3.1	2.8	1.9	1.9	1.3	1.1	0.5	0.4	0.4	0.4	0.8	0.8	1.1	1.3	1.6	1.7	2.0	1.7	1.6	0.8	0.7	3.7
4-Jan	1.2	0.7	0.8	1.0	0.9	0.6	0.8	1.4	1.8	1.7	1.9	1.9	2.9	3.1	2.9	1.8	1.9	1.7	1.3	1.2	1.3	1.1	0.4	0.4	3.1
5-Jan	0.3	0.4	0.5	0.5	0.3	0.4	0.5	0.3	0.6	0.6	0.6	0.7	0.8	0.9	0.7	1.0	0.8	1.0	1.1	1.1	0.9	1.1	0.9	0.8	1.1
6-Jan	0.5	0.9	1.0	1.1	0.9	1.2	0.9	1.0	1.3	1.8	2.9	2.4	2.1	2.2	1.9	1.7	1.9	1.1	1.6	1.4	0.8	0.7	0.8	1.3	2.9
7-Jan	0.6	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.8	0.6	0.9	0.6	0.5	0.4	0.7	0.9	1.0	0.7	0.8	0.9	0.6	1.0
8-Jan	0.8	1.4	1.4	1.3	1.1	0.9	0.8	1.1	1.2	0.9	0.9	0.9	1.0	0.9	0.9	0.7	0.6	0.3	0.5	0.4	0.6	0.9	0.9	0.7	1.4
9-Jan	0.7	0.6	0.6	0.8	0.8	0.9	1.2	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	1.2
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.7	0.8	0.7	0.7	0.5	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.8
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	1.1	1.5	1.3	1.8	1.8	1.9	2.0	2.1	2.3	2.7	2.7	UO	MS	2.7
12-Jan	MS	2.0	2.2	2.0	2.2	1.8	1.6	1.1	0.5	0.4	0.7	0.7	1.2	1.1	1.0	1.0	1.1	0.9	1.2	1.4	1.3	1.3	1.3	1.1	2.2
13-Jan	1.5	1.5	0.7	0.7	0.5	0.5	0.3	0.3	1.1	0.9	1.0	1.3	1.2	1.2	1.5	1.4	1.1	1.3	1.3	0.9	0.3	0.4	0.8	0.3	1.5
14-Jan	0.2	0.2	0.2	0.7	0.9	1.4	1.1	1.3	1.3	1.0	1.2	1.4	1.3	1.0	1.2	1.2	1.4	1.6	1.4	1.5	1.7	1.8	1.6	1.7	1.8
15-Jan	3.5	5.4	4.6	4.1	3.6	3.3	4.0	5.0	5.7	4.0	AF	3.4	3.0	3.7	3.7	3.6	2.5	1.7	1.4	1.6	0.6	0.6	0.3	0.3	5.7
16-Jan	0.4	0.4	0.4	0.5	0.7	0.5	0.4	0.4	0.5	0.4	0.5	0.9	1.0	1.1	0.9	0.7	0.4	0.4	0.4	0.4	0.8	1.0	0.7	1.1	1.1
17-Jan	0.9	0.8	0.8	0.5	0.6	0.6	3.0	3.6	2.7	2.1	1.9	2.0	1.7	2.0	2.2	2.2	2.2	2.7	2.0	2.0	1.4	1.2	0.5	0.3	3.6
18-Jan	0.2	0.6	0.8	1.4	1.2	0.9	0.7	0.6	0.7	0.5	1.0	0.5	0.5	0.4	1.1	1.8	1.4	1.3	1.3	1.0	0.8	0.6	0.4	0.6	1.8
19-Jan	0.4	0.4	0.4	0.5	1.0	0.9	0.6	0.4	0.5	1.2	1.7	2.7	3.8	3.9	3.7	3.0	2.8	2.4	2.2	2.0	1.9	1.3	0.7	0.4	3.9
20-Jan	0.5	0.6	0.7	0.9	1.1	1.2	1.5	1.6	1.8	1.3	1.4	1.7	1.3	1.4	1.1	1.1	0.7	0.4	0.5	0.5	0.9	1.1	1.7	1.0	1.8
21-Jan	0.5	0.4	0.4	0.2	0.4	0.3	0.4	0.7	0.6	0.9	1.8	2.0	2.5	2.2	1.7	1.5	1.0	0.8	0.7	0.7	1.0	1.4	1.4	1.6	2.5
22-Jan	1.4	1.5	1.1	1.2	1.2	1.4	1.1	1.0	1.4	1.5	1.6	1.1	1.4	1.3	1.2	1.2	1.1	1.3	1.2	1.1	1.2	1.6	1.7	1.5	1.7
23-Jan	1.5	1.5	1.0	0.9	0.8	0.9	0.5	1.3	1.8	1.6	1.2	1.5	2.3	1.7	1.4	1.7	1.5	1.8	1.1	1.0	0.7	0.5	0.7	0.7	2.3
24-Jan	0.4	0.7	1.0	1.5	2.1	2.2	1.8	2.4	1.7	2.1	1.9	2.1	1.9	1.7	1.3	1.5	1.0	0.9	0.7	0.5	0.4	0.4	0.6	0.7	2.4
25-Jan	0.9	0.6	0.7	0.4	0.3	0.6	0.6	0.6	0.8	2.3	2.8	2.6	2.1	1.9	2.0	2.7	2.8	2.9	3.0	3.3	3.5	4.9	4.2	4.1	4.9
26-Jan	4.8	4.6	4.0	3.4	3.1	2.6	2.1	1.8	1.8	1.6	1.0	1.1	1.0	1.1	1.0	0.8	0.8	0.6	0.5	0.6	0.8	0.6	0.6	0.6	4.8
27-Jan	0.3	0.4	0.2	0.3	0.5	0.7	1.0	1.2	1.1	1.2	0.9	0.9	1.1	1.4	1.5	1.3	1.1	0.9	1.0	1.3	1.3	1.3	1.7	1.3	1.7
28-Jan	1.1	1.2	1.0	0.7	1.0	1.0	0.9	0.9	0.7	0.9	0.9	0.8	0.7	0.6	0.6	0.9	1.3	2.0	2.8	2.7	3.3	2.7	2.4	2.2	3.3
29-Jan	1.8	1.9	1.9	1.4	1.4	0.9	1.1	1.1	1.4	1.7	2.3	2.3	3.1	3.0	2.6	2.4	2.2	2.0	2.7	2.1	1.8	1.6	1.5	1.6	3.1
30-Jan	1.7	1.8	1.0	1.0	1.3	1.3	1.0	1.1	1.8	1.8	1.8	1.9	1.7	1.6	1.5	1.0	1.6	1.4	1.2	1.3	1.0	0.3	0.7	0.9	1.9
31-Jan	1.2	2.0	1.9	1.6	1.7	0.9	0.7	0.7	0.7	0.7	1.6	1.5	1.7	1.3	1.6	1.5	1.7	1.4	1.1	0.5	0.8	1.0	1.0	0.8	2.0
	4.8	5.4	4.6	4.1	3.6	3.3	4.0	5.0	5.7	4.0	2.9	3.4	3.8	3.9	3.7	3.6	2.8	2.9	3.0	3.3	3.5	4.9	4.2	4.1	
	Diurnal Maximum																								

AF - Analyzer Failure UO - Unstable Operation MS - Missing

Wood Buffalo Environmental Association

Summary of Hour Averages

Vertical Wind Speed 45 m (VW45m) - km/h

Mannix - January 2014

Maximum Value: 1.3 km/h on Jan 28 06:00

Maximum Daily Average: 0.6 km/h on Jan 22

Minimum Value: -1.9 km/h on Jan 25 22:00

Minimum Daily Average: -0.7 km/h on Jan 15

Maximum Diurnal Average: 0.3 km/h at hour 23

Minimum Diurnal Average: 0.0 km/h at hour 15

Monthly Average: 0.09 km/h

Percentiles: P_1 = -1.3 P_{10} = -0.6 Q_1 = -0.2 Median = 0.1 Q_3 = 0.5 P_{90} = 0.7 P_{99} = 1.1

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Hours of Calibration:	0
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.4	0.7	0.6	0.5	0.2	0.4	0.2	0.6	0.8	0.3	0.2	0.5	0.3	0.6	0.3	0.7	0.5	0.8	1.1	0.7	1.0	0.6	0.9	0.8	0.6	1.1
2-Jan	0.9	0.9	1.2	1.0	0.8	0.4	0.5	0.3	MS	MS	MS	0.8	MS	MS	MS	-0.1	0.2	0.1	0.0	0.0	-0.3	-0.3	-0.5	-0.6	0.3	1.2
3-Jan	-0.1	-0.6	-0.4	-0.1	-0.2	0.2	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.1	-0.3	-0.4	-0.3	-0.4	-0.5	-0.6	-0.7	-0.6	-0.6	-0.3	-0.4	-0.3	0.2
4-Jan	-0.4	-0.5	-0.4	-0.6	-0.5	-0.5	-0.8	-0.5	-0.4	-0.4	-0.7	-0.5	-0.9	-0.7	-0.9	-0.6	-0.6	-0.5	-0.3	-0.4	-0.5	-0.6	-0.4	-0.5	-0.5	-0.3
5-Jan	-0.4	-0.5	-0.3	-0.5	-0.5	-0.1	-0.1	0.2	0.1	-0.1	0.0	0.2	0.6	0.6	0.3	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.7	0.7	0.2	0.7
6-Jan	0.8	0.2	0.3	0.9	0.3	0.7	0.7	0.4	0.6	0.5	0.6	0.6	0.4	0.8	0.6	0.7	0.6	0.5	0.8	0.5	0.4	0.5	0.4	0.1	0.5	0.9
7-Jan	0.4	0.2	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.3	0.5	0.1	0.2	0.1	0.3	0.7	0.8	1.1	0.8	0.9	1.2	0.6	0.4	1.2
8-Jan	0.9	0.8	0.6	0.6	0.5	0.4	0.5	0.5	0.5	0.6	0.4	0.5	0.6	0.4	0.4	0.7	0.4	0.2	0.3	0.5	1.0	0.6	0.8	0.6	0.5	1.0
9-Jan	0.6	0.4	0.5	0.3	0.3	-0.1	0.1	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	0.6
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.2	0.3	0.2	0.1	0.4	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	--	0.4
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-0.1	-0.2	0.2	0.0	-0.3	-0.2	-0.2	-0.4	-0.3	-0.3	-0.1	MS	MS	--	0.2
12-Jan	MS	-0.2	-0.3	0.1	-0.5	-0.1	-0.3	-0.2	0.1	0.3	0.4	0.2	0.0	-0.1	0.1	0.4	0.6	0.6	1.0	0.9	0.7	0.5	0.5	0.6	0.2	1.0
13-Jan	0.7	0.6	0.1	0.1	0.1	0.1	0.0	0.0	-0.3	-0.1	-0.5	0.0	0.4	0.6	0.3	-0.3	0.2	0.0	-0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.7
14-Jan	0.0	0.1	0.2	0.7	0.8	0.6	0.4	0.6	0.6	0.6	0.7	0.5	0.4	0.4	0.4	0.6	0.5	0.8	0.8	0.6	0.6	0.6	0.6	0.9	0.5	0.9
15-Jan	-0.7	-1.6	-1.3	-0.5	-0.8	-1.1	-0.9	-1.3	-1.6	AF	AF	-0.7	-1.0	-1.2	-0.9	-1.1	-0.6	-0.8	-0.1	0.0	0.0	0.0	0.1	0.1	-0.7	0.1
16-Jan	0.1	-0.1	0.0	-0.2	-0.3	-0.3	-0.2	0.1	-0.3	0.0	0.1	0.7	1.1	0.7	0.8	0.1	0.0	0.1	0.3	0.0	0.6	1.0	0.8	0.9	0.2	1.1
17-Jan	0.4	0.5	0.0	-0.1	-0.4	-0.4	-0.6	-0.8	-1.0	-0.7	-0.6	-0.6	-0.6	-0.9	-1.0	-1.1	-0.2	0.2	0.2	0.3	0.1	0.5	0.1	0.1	-0.3	0.5
18-Jan	0.2	0.6	0.6	0.9	0.8	0.8	0.3	0.3	0.0	-0.4	-0.7	0.1	0.3	0.3	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	0.1	0.0	0.1	0.9
19-Jan	0.1	0.1	-0.2	-0.2	-0.3	0.1	0.0	0.0	0.0	-0.2	-0.1	-0.2	-0.3	-0.5	-0.2	0.0	-0.1	0.2	0.4	0.0	0.3	0.1	0.0	0.1	0.0	0.4
20-Jan	0.1	0.3	0.4	0.5	0.5	0.7	0.9	0.7	0.8	0.6	0.6	0.5	0.7	0.7	0.5	0.4	0.3	0.1	0.1	0.0	-0.1	-0.2	-0.1	0.0	0.4	0.9
21-Jan	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.1	-0.2	-0.2	0.2	0.3	-0.1	0.3	0.4	0.2	0.4	0.4	0.4	0.5	0.6	0.6	0.2	0.6
22-Jan	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.6	0.3	0.5	0.3	0.2	0.3	0.5	0.7	0.7	0.7	0.6	1.0	1.0	1.1	0.6	1.1
23-Jan	1.0	1.2	0.5	0.1	0.3	-0.1	-0.1	-0.4	-0.7	-0.7	-0.6	-0.6	-0.5	-0.6	-0.5	-0.7	-0.8	-0.4	-0.2	-0.3	-0.2	0.1	0.6	0.0	-0.2	1.2
24-Jan	0.2	-0.4	-0.6	-0.6	-0.5	-0.2	0.1	0.1	-0.3	0.0	-0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.2	0.3	0.4	0.2	0.0	0.4
25-Jan	0.3	0.5	0.4	0.3	0.1	-0.1	-0.1	-0.4	-0.5	-0.7	-0.2	-0.3	-0.3	-0.4	-0.4	-0.3	-0.1	-0.1	-0.6	-1.3	-1.2	-1.9	-0.8	-1.5	-0.4	0.5
26-Jan	-1.5	-0.5	-1.4	-1.0	-0.7	-0.4	-0.2	0.2	0.6	-0.2	0.0	0.0	0.3	0.0	0.6	0.4	0.1	0.2	0.4	0.5	0.5	0.7	0.7	1.0	0.0	1.0
27-Jan	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.4	0.3	0.5	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.9	1.0	1.1	0.8	0.5	1.1
28-Jan	0.8	0.7	0.8	0.3	0.6	1.3	0.6	0.6	0.0	0.3	0.3	0.1	0.0	-0.1	0.0	-0.2	-0.2	-0.3	-0.1	0.2	-0.2	-0.1	-0.1	-0.2	0.2	1.3
29-Jan	-0.3	-0.5	-0.5	-0.1	0.1	0.2	0.1	-0.2	0.2	-0.3	0.2	0.4	-0.9	-1.1	-0.6	-0.3	-0.2	-0.4	-0.6	-0.7	-0.3	-0.6	-0.5	-0.3	-0.3	0.4
30-Jan	-0.6	-0.5	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.7	-0.7	-0.4	-0.3	0.2	0.0	0.0	-0.1	-0.1	0.1	-0.1	-0.1	0.3	0.2	-0.2	-0.6	-0.2	0.3
31-Jan	-0.6	-0.3	-0.1	0.0	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	-0.3	-0.1	-0.3	-0.6	-0.5	0.1	0.1	0.2	-0.1	0.0	0.2	-0.1	0.0	-0.1	-0.1	0.2
	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.2	Diurnal Average	
	1.0	1.2	1.2	1.0	0.8	1.3	0.9	0.7	0.8	0.6	0.7	0.8	1.1	0.8	0.8	0.7	0.7	0.8	1.1	1.1	1.0	1.0	1.2	1.1	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 6.1 km/h on Jan 15 09:00

Minimum Value: 0.1 km/h on Jan 7 10:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.7 Median = 1.1 Q_3 = 1.7 P_{90} = 2.6 P_{99} = 4.9

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Hours of Calibration:	0
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.4	0.8	1.0	0.5	0.4	0.4	0.4	0.5	0.7	0.4	0.7	1.0	0.7	0.9	0.3	0.6	0.4	0.8	0.5	0.7	0.7	0.7	0.9	0.8	1.0
2-Jan	1.5	1.5	2.4	1.9	1.7	1.3	1.0	0.9	MS	MS	MS	1.2	MS	MS	MS	0.5	0.7	0.4	0.7	0.7	0.6	0.4	1.2	2.6	2.6
3-Jan	2.8	3.1	2.9	3.1	2.8	2.2	2.0	1.5	1.0	0.5	0.4	0.4	0.5	1.1	1.0	1.0	1.4	1.7	1.8	1.9	1.6	1.5	0.6	0.5	3.1
4-Jan	0.9	0.8	0.7	0.5	0.5	0.6	0.7	1.5	1.9	1.9	1.8	2.0	3.3	2.9	3.1	1.9	2.3	2.2	1.2	0.9	0.9	1.0	0.5	0.5	3.3
5-Jan	0.5	0.6	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.6	0.7	0.9	0.8	1.0	0.9	1.0	1.1	1.1	0.8	1.1	0.9	0.9	1.1
6-Jan	0.6	0.5	1.1	1.1	0.8	1.3	1.1	1.0	1.6	1.6	2.7	2.2	2.0	2.2	2.0	1.6	1.9	1.1	1.6	1.4	0.9	0.8	0.8	1.3	2.7
7-Jan	0.8	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.6	0.7	0.8	0.7	0.6	0.4	0.7	0.7	0.7	0.5	0.4	0.7	0.5	0.8
8-Jan	0.6	1.3	1.4	1.3	1.2	0.8	0.6	1.1	1.2	1.0	0.7	0.8	1.1	0.8	0.7	0.8	0.6	0.5	0.6	0.4	0.5	0.8	0.8	1.0	1.4
9-Jan	0.8	0.7	0.5	0.6	0.5	0.7	0.9	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.9
10-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.8	1.0	0.8	0.8	0.7	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	1.0
11-Jan	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	0.8	1.2	1.3	1.6	1.6	1.5	1.8	1.9	2.0	2.3	2.4	MS	MS	2.4
12-Jan	MS	2.4	2.7	2.2	2.5	2.1	1.7	1.3	0.6	0.4	0.8	0.8	1.4	1.2	0.7	0.7	0.8	0.7	1.2	1.4	1.3	1.3	1.3	1.2	2.7
13-Jan	1.6	1.4	0.7	0.6	0.4	0.5	0.3	0.4	1.3	1.2	1.3	1.4	1.3	1.4	1.4	1.2	1.1	1.3	1.1	0.8	0.4	0.3	0.8	0.5	1.6
14-Jan	0.2	0.2	0.2	0.8	0.7	1.2	0.8	1.1	1.3	1.1	1.1	1.2	1.3	0.9	1.0	1.1	1.2	1.5	1.3	1.4	1.5	1.3	1.8	1.8	1.8
15-Jan	4.1	5.5	5.5	4.9	4.4	3.7	4.6	5.8	6.1	AF	AF	3.7	3.5	4.2	4.3	4.1	3.0	1.6	1.2	1.5	0.9	0.9	0.3	0.2	6.1
16-Jan	0.3	0.6	0.7	0.7	1.0	0.4	0.5	0.4	0.4	0.6	0.5	0.8	0.9	1.1	0.9	0.7	0.7	0.6	0.5	0.5	0.8	1.0	0.7	0.8	1.1
17-Jan	0.7	0.5	0.7	0.6	0.6	0.8	3.1	3.6	2.7	2.5	2.4	2.4	1.9	2.1	2.7	2.5	2.2	2.6	2.2	2.0	1.7	1.5	0.7	0.4	3.6
18-Jan	0.3	0.5	0.6	1.5	1.3	0.9	0.5	0.4	0.6	0.5	0.9	0.9	0.5	0.5	1.1	1.6	1.7	1.4	1.3	1.0	0.8	0.7	0.4	0.7	1.7
19-Jan	0.5	0.5	0.4	0.5	0.8	0.7	0.7	0.5	0.5	1.1	1.7	2.7	3.4	4.0	3.6	3.3	2.7	2.6	2.4	2.1	2.0	1.6	0.9	0.6	4.0
20-Jan	0.3	0.3	0.4	0.6	0.8	1.2	1.4	1.6	1.8	1.2	1.1	1.4	1.5	1.4	0.9	1.0	0.7	0.4	0.3	0.6	1.1	1.2	1.7	1.1	1.8
21-Jan	0.6	0.5	0.3	0.2	0.2	0.3	0.4	0.6	0.6	1.2	2.3	2.4	2.5	2.3	1.8	1.6	1.3	0.9	0.8	0.8	0.9	1.3	1.6	1.6	2.5
22-Jan	1.3	1.4	0.7	0.9	1.1	1.4	0.9	0.7	1.2	1.5	1.8	1.2	1.5	1.1	1.0	0.9	0.9	1.1	1.0	0.8	1.2	0.9	1.6	1.3	1.8
23-Jan	1.2	1.5	1.1	0.9	0.7	0.7	0.6	1.5	2.0	1.7	1.3	1.4	2.1	1.7	1.3	1.6	1.3	1.8	1.2	0.9	0.8	0.8	0.8	1.1	2.1
24-Jan	0.6	0.6	0.5	1.5	1.8	2.1	2.1	2.5	2.0	2.2	1.7	2.2	1.9	1.8	1.3	1.6	1.0	0.9	0.9	0.5	0.5	0.5	0.7	0.6	2.5
25-Jan	0.8	0.6	0.6	0.3	0.3	0.6	0.9	0.5	0.9	2.1	2.8	2.6	2.3	2.0	2.2	2.8	2.8	2.9	3.3	3.4	3.8	5.6	4.3	4.5	5.6
26-Jan	4.9	5.0	4.4	3.6	3.3	2.7	2.2	2.0	2.2	1.5	1.3	1.3	1.2	1.2	1.2	1.0	1.0	0.6	0.5	0.5	0.8	0.6	0.6	0.7	5.0
27-Jan	0.2	0.2	0.2	0.2	0.3	0.4	0.9	1.1	1.0	1.4	1.0	1.0	1.3	1.5	1.6	1.2	1.0	0.8	0.9	1.3	1.0	0.9	1.3	1.2	1.6
28-Jan	1.0	0.9	0.7	0.5	0.8	0.9	0.8	0.7	0.5	0.9	1.0	0.7	0.8	0.8	0.7	1.0	1.7	2.4	2.9	2.7	2.9	2.9	2.6	2.4	2.9
29-Jan	2.0	1.8	2.0	1.5	1.5	1.3	1.4	1.4	1.8	2.0	2.6	2.7	3.5	3.0	2.9	2.7	2.6	2.2	3.2	2.7	2.4	1.9	1.7	2.1	3.5
30-Jan	2.0	2.0	1.2	1.0	1.3	1.2	0.8	1.0	1.8	1.8	2.1	2.1	2.0	2.0	1.7	1.0	1.8	1.3	1.4	1.2	1.1	0.6	0.7	0.6	2.1
31-Jan	1.2	2.2	2.2	2.1	2.0	1.0	0.5	0.3	0.2	0.8	1.4	1.8	2.1	1.6	1.6	1.6	1.8	1.5	1.1	0.3	1.1	1.0	1.2	0.8	2.2
	4.9	5.5	5.5	4.9	4.4	3.7	4.6	5.8	6.1	2.5	2.8	3.7	3.5	4.2	4.3	4.1	3.0	2.9	3.3	3.4	3.8	5.6	4.3	4.5	
	Diurnal Maximum																								

AF - Analyzer Failure MS - Missing

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - January 2014

Maximum Value: 1.1 km/h on Jan 29 12:00

Maximum Daily Average: 0.4 km/h on Jan 27

Minimum Value: -1.1 km/h on Jan 15 02:00

Minimum Daily Average: -0.2 km/h on Jan 30

Maximum Diurnal Average: 0.2 km/h at hour 23

Minimum Diurnal Average: -0.1 km/h at hour 10

Monthly Average: 0.11 km/h

Percentiles: P_1 = -0.7 P_{10} = -0.3 Q_1 = -0.1 Median = 0.1 Q_3 = 0.3 P_{90} = 0.6 P_{99} = 0.8

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.7	0.8	0.4	0.4	0.4	0.3	0.4	0.5	0.3	0.3	0.3	0.6	0.4	0.5	0.8	0.9	0.6	0.7	0.0	0.5	0.0	-0.3	-0.1	-0.1	0.4	0.9
2-Jan	-0.2	-0.3	-0.2	0.0	0.0	0.1	0.2	0.1	MS	MS	MS	0.6	MS	MS	MS	-0.4	-0.4	-0.3	-0.2	-0.1	-0.4	-0.2	-0.2	-0.1	-0.1	0.6
3-Jan	0.4	-0.2	0.2	0.7	0.5	0.6	0.1	-0.2	0.1	-0.1	0.1	0.1	-0.1	-0.1	-0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.7
4-Jan	-0.2	-0.3	-0.1	-0.3	-0.3	-0.4	-0.4	-0.3	0.0	-0.1	-0.2	0.0	-0.1	-0.1	-0.5	-0.4	-0.3	0.2	0.3	0.2	0.0	-0.2	-0.2	-0.4	-0.2	0.3
5-Jan	-0.4	-0.3	-0.2	-0.4	-0.4	0.0	0.0	-0.1	-0.1	-0.2	-0.1	0.0	0.1	0.1	0.3	0.5	0.6	0.5	0.4	0.5	0.4	0.5	0.7	0.4	0.1	0.7
6-Jan	0.1	0.1	0.0	-0.1	-0.2	0.0	0.0	-0.1	-0.3	-0.6	-0.5	-0.3	-0.4	0.3	0.3	0.3	0.1	0.2	0.3	-0.2	0.0	0.2	0.3	0.4	0.0	0.4
7-Jan	0.3	0.1	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.1	0.1	0.2	0.3	0.0	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.4
8-Jan	0.3	0.0	-0.1	-0.2	-0.1	0.0	-0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.1	0.0	0.3	0.1	0.1	0.0	0.2	0.6	0.5	0.7	0.4	0.2	0.7
9-Jan	0.1	0.0	0.2	0.2	0.2	-0.2	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.2
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.3	0.6	0.8	0.2	0.0	-0.1	-0.1	--	0.8
13-Jan	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.1	-0.6	0.1	0.4	0.7	0.5	-0.1	0.4	0.4	-0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.7
14-Jan	0.1	0.1	0.2	0.4	0.7	0.8	0.8	0.1	-0.7	-0.3	-0.1	-0.3	-0.2	-0.1	0.0	-0.1	-0.1	0.1	0.0	0.3	0.9	0.9	0.6	0.4	0.2	0.9
15-Jan	-0.5	-1.1	-0.1	0.4	-0.1	-0.6	0.4	0.2	0.1	-0.1	AF	0.2	0.5	0.2	0.3	0.3	-0.1	-0.5	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.5
16-Jan	0.0	-0.3	-0.3	-0.1	-0.3	-0.3	-0.1	-0.2	-0.4	-0.1	-0.3	0.2	0.7	0.5	0.2	-0.1	-0.2	-0.2	-0.1	-0.3	0.2	0.8	0.7	0.5	0.0	0.8
17-Jan	0.2	0.1	-0.4	-0.4	-0.5	-0.3	-0.1	-0.2	-0.4	-0.5	-0.5	-0.3	-0.3	-0.2	-0.5	-0.6	0.0	0.5	0.5	0.7	0.4	0.4	0.0	0.1	-0.1	0.7
18-Jan	0.1	0.0	0.4	0.8	0.4	0.6	0.0	0.0	-0.4	-0.3	-0.4	-0.1	0.0	0.1	0.1	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.8
19-Jan	0.1	0.1	-0.2	-0.2	-0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.5	0.8	0.6	0.6	0.8	0.4	0.5	0.1	0.1	0.1	0.2	0.8
20-Jan	0.1	0.3	0.4	0.4	0.3	0.7	0.7	0.5	0.7	0.4	0.6	0.4	0.3	0.3	0.1	0.5	0.1	0.1	0.2	0.2	0.1	0.0	0.2	0.2	0.3	0.7
21-Jan	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.0	0.2	0.7	0.6	0.2	0.5	0.6	0.4	0.4	0.1	0.5	-0.2	0.1	-0.1	0.2	0.7
22-Jan	-0.1	-0.2	0.0	0.1	-0.1	0.0	0.4	0.1	0.0	-0.2	-0.1	0.1	0.3	0.4	0.2	0.4	0.4	0.1	0.2	0.4	0.6	0.4	0.7	0.8	0.2	0.8
23-Jan	0.5	0.6	-0.1	-0.4	-0.4	-0.5	-0.2	-0.5	-0.6	-0.4	-0.3	-0.1	0.3	-0.2	-0.1	-0.2	-0.3	0.1	0.2	0.0	-0.1	0.1	0.2	0.2	-0.1	0.6
24-Jan	0.0	0.0	-0.1	-0.1	-0.1	0.3	0.7	0.7	0.1	0.5	0.3	0.7	0.6	0.3	0.2	0.2	0.2	0.1	0.4	0.0	0.2	0.2	0.0	0.0	0.2	0.7
25-Jan	0.1	-0.1	0.3	0.4	0.1	-0.1	-0.2	-0.3	-0.3	-0.3	0.2	0.2	-0.1	0.0	0.1	0.2	0.3	0.5	-0.1	-0.9	-0.6	-1.1	0.2	-0.7	-0.1	0.5
26-Jan	-1.0	0.4	-0.7	-0.5	-0.1	0.2	0.2	0.3	0.6	-0.1	0.2	0.0	0.1	0.1	0.5	0.2	0.1	0.1	0.3	0.2	0.1	0.3	0.3	0.5	0.1	0.6
27-Jan	0.3	0.2	0.4	0.4	0.4	0.2	0.3	0.6	0.7	0.3	0.2	0.1	0.0	0.2	0.0	0.5	0.4	0.6	0.7	0.7	0.7	0.8	1.0	0.7	0.4	1.0
28-Jan	0.5	0.7	0.8	0.4	0.4	0.9	0.4	0.4	0.2	0.0	0.2	0.0	0.1	-0.2	0.0	-0.1	-0.2	0.1	0.3	0.8	0.3	0.4	0.5	0.3	0.3	0.9
29-Jan	0.2	-0.4	-0.5	0.2	0.5	0.2	0.3	0.1	0.5	0.2	0.7	1.1	-0.3	-0.7	-0.1	0.2	0.3	0.0	-0.6	-0.5	0.0	-0.4	-0.2	0.0	0.0	1.1
30-Jan	-0.3	-0.3	0.4	0.0	0.1	-0.1	-0.2	-0.4	-0.6	-0.6	-0.5	-0.4	0.1	-0.1	0.0	-0.1	-0.3	-0.2	0.0	-0.4	0.0	0.0	-0.2	-0.3	-0.2	0.4
31-Jan	-0.2	0.1	0.4	0.7	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	-0.2	-0.3	-0.3	0.4	0.5	0.6	0.0	0.0	0.4	0.2	0.3	0.1	0.1	0.7
	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	-0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	Diurnal Average	
	0.7	0.8	0.8	0.8	0.7	0.9	0.8	0.7	0.7	0.5	0.7	1.1	0.7	0.7	0.8	0.9	0.6	0.7	0.8	0.8	0.9	0.9	1.0	0.8	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Mannix - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1
Maximum Value: 6.4 km/h on Jan 15 09:00

Minimum Value: 0.1 km/h on Jan 7 08:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.6 Median = 0.9 Q_3 = 1.6 P_{90} = 2.5 P_{99} = 5.0

Hours in Service:	744
Hours of Data:	654
Hours of Missing Data:	90
Hours of Calibration:	0
Percent Operational Time:	87.9

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.3	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.6	0.5	0.6	0.3	0.3	0.3	0.5	0.8	0.4	0.8	0.8	0.9	0.8	0.9
2-Jan	1.2	1.4	2.0	1.7	1.2	0.9	0.6	1.0	MS	MS	MS	0.6	MS	MS	MS	0.5	0.9	0.7	1.1	1.1	0.9	0.5	1.0	2.3	2.3
3-Jan	2.6	2.5	2.7	2.7	2.5	2.2	2.0	1.4	1.1	0.6	0.3	0.3	0.5	1.2	1.0	1.0	1.4	1.6	1.8	1.8	1.5	1.2	0.7	0.5	2.7
4-Jan	0.7	0.7	0.6	0.6	0.6	0.7	0.8	1.5	1.9	2.0	1.8	2.1	3.2	2.9	2.7	1.7	2.0	1.9	1.1	0.8	0.7	0.7	0.6	0.6	3.2
5-Jan	0.6	0.5	0.3	0.3	0.3	0.4	0.3	0.5	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.5	0.6	0.6	0.7	0.5	0.6	0.5	0.5	0.7
6-Jan	0.5	0.4	0.9	1.0	0.8	1.1	1.2	1.1	1.4	1.4	2.3	2.1	1.9	2.2	2.4	2.0	2.0	1.7	1.8	1.2	0.9	1.3	1.3	1.7	2.4
7-Jan	1.0	0.6	0.6	0.5	0.4	0.4	0.4	0.1	0.2	0.1	0.5	0.4	0.6	0.5	0.6	0.6	0.3	1.0	0.6	0.4	0.3	0.3	0.7	0.5	1.0
8-Jan	0.5	0.7	0.8	0.8	0.9	0.7	0.6	0.8	0.8	0.7	0.6	0.7	0.7	0.4	0.5	0.4	0.3	0.4	0.7	0.3	0.3	0.5	0.5	0.9	0.9
9-Jan	0.8	0.8	0.6	0.4	0.6	0.6	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.8
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.7	0.9	0.6	0.9	0.8	0.8	1.1	1.1
13-Jan	1.4	1.3	0.6	0.5	0.4	0.4	0.5	0.5	1.3	1.3	1.3	1.4	1.2	1.3	1.4	1.0	1.0	1.1	1.0	0.9	0.4	0.3	0.5	0.5	1.4
14-Jan	0.2	0.2	0.2	0.3	0.4	0.7	0.5	0.8	1.1	1.0	1.0	1.2	1.5	0.9	0.8	0.9	0.9	0.9	1.1	1.7	1.3	1.0	2.2	1.7	2.2
15-Jan	4.2	5.7	6.3	5.2	4.8	4.3	5.2	6.1	6.4	4.0	AF	3.4	3.5	4.2	4.5	4.4	2.9	1.2	1.1	1.2	0.9	1.0	0.4	0.3	6.4
16-Jan	0.6	0.9	1.0	1.0	1.1	0.6	0.5	0.6	0.3	0.6	0.6	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.6	0.5	0.9	0.8	0.5	0.5	1.1
17-Jan	0.5	0.6	0.4	0.8	0.6	1.0	3.0	3.2	2.7	2.9	2.9	2.8	2.2	1.7	2.2	2.0	2.0	2.2	1.9	1.9	1.6	1.6	0.8	0.6	3.2
18-Jan	0.3	0.6	0.3	1.0	0.9	0.6	0.6	0.4	0.5	0.6	0.6	1.0	0.5	0.3	0.9	1.2	1.5	1.1	1.1	1.0	0.7	0.7	0.5	0.7	1.5
19-Jan	0.5	0.8	0.5	0.5	0.7	0.6	0.6	0.5	0.4	0.9	1.5	2.2	3.2	3.8	3.5	3.2	2.6	2.5	2.3	2.0	1.9	1.7	1.0	0.7	3.8
20-Jan	0.4	0.2	0.3	0.4	0.6	0.7	1.2	1.2	1.3	1.2	1.0	0.9	1.1	0.8	0.7	0.7	0.8	0.5	0.4	0.7	1.0	1.2	1.6	1.2	1.6
21-Jan	0.6	0.5	0.3	0.2	0.1	0.3	0.3	0.6	0.6	1.4	2.7	2.6	2.2	2.1	1.8	1.6	1.3	0.8	0.7	1.0	1.6	1.4	1.4	1.4	2.7
22-Jan	1.3	1.2	0.5	0.6	1.0	1.1	0.5	0.3	0.8	0.9	1.5	1.0	1.3	1.0	0.9	0.8	0.6	0.8	0.9	0.7	1.0	0.8	0.9	0.8	1.5
23-Jan	0.8	0.9	1.1	1.1	0.8	0.8	0.9	1.9	2.1	1.6	1.4	1.5	2.0	1.8	1.3	1.5	1.4	1.9	1.3	0.9	0.9	0.8	1.1	1.5	2.1
24-Jan	0.9	0.5	0.6	1.2	1.4	1.8	2.1	2.4	2.1	1.9	1.5	1.9	1.8	1.6	1.2	1.4	0.9	0.7	0.9	0.4	0.4	0.5	0.6	0.4	2.4
25-Jan	0.5	0.7	0.5	0.4	0.3	0.8	1.2	0.6	0.9	1.9	2.7	2.3	2.1	1.8	2.1	2.7	2.6	2.7	3.4	3.1	3.3	5.0	4.3	4.2	5.0
26-Jan	4.8	5.0	4.2	3.4	3.4	2.9	2.3	2.0	2.2	1.6	1.4	1.4	1.4	1.3	1.3	1.0	1.1	0.5	0.5	0.3	0.5	0.4	0.4	0.3	5.0
27-Jan	0.2	0.2	0.2	0.2	0.3	0.2	0.5	0.5	0.6	0.8	0.5	0.5	1.2	0.9	1.0	0.7	0.5	0.4	0.4	0.7	0.6	0.6	0.6	0.8	1.2
28-Jan	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.7	0.5	0.7	1.0	0.7	1.1	1.8	2.1	2.5	2.5	2.7	2.9	2.6	2.3	2.9
29-Jan	2.0	1.8	2.0	1.6	1.6	1.6	1.6	1.6	1.9	2.2	2.8	2.9	3.3	2.8	2.9	2.8	2.6	2.3	3.0	2.4	2.4	1.8	1.7	2.0	3.3
30-Jan	1.9	2.0	1.4	0.9	1.2	1.1	0.8	1.0	1.7	1.8	1.8	1.7	1.8	1.7	1.4	1.2	1.7	1.3	1.3	1.1	1.0	0.8	0.9	0.7	2.0
31-Jan	1.3	2.4	2.2	2.1	1.7	1.0	0.4	0.4	0.2	0.9	1.3	1.7	2.0	1.7	1.5	1.5	1.7	1.7	1.1	0.4	1.3	1.2	1.3	0.8	2.4
	4.8	5.7	6.3	5.2	4.8	4.3	5.2	6.1	6.4	4.0	2.9	3.4	3.5	4.2	4.5	4.4	2.9	2.7	3.4	3.1	3.3	5.0	4.3	4.2	
	Diurnal Maximum																								

AF - Analyzer Failure MS - Missing

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mannix - January 2014

Maximum Value: 9.0 km/h on Jan 15 09:00

Maximum Daily Average: 4.0 km/h on Jan 15

Minimum Value: -1.5 km/h on Jan 6 11:00

Minimum Daily Average: -0.5 km/h on Jan 6

Maximum Diurnal Average: 1.3 km/h at hour 9

Minimum Diurnal Average: 0.8 km/h at hour 19

Monthly Average: 0.99 km/h

Percentiles: P_1 = -0.9 P_{10} = -0.1 Q_1 = 0.3 Median = 0.8 Q_3 = 1.3 P_{90} = 2.5 P_{99} = 6.3

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Hours of Calibration:	0
Percent Operational Time:	87.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1.2	1.2	0.9	0.7	0.6	0.7	0.6	0.5	0.6	0.8	0.9	0.9	0.8	0.7	1.0	1.1	0.5	0.5	-0.5	0.5	-0.5	-0.9	-0.7	-0.3	0.5	1.2
2-Jan	-0.8	-0.8	-1.2	-0.5	0.3	0.5	MS	AF	AF	AF	AF	AF	AF	AF	AF	0.4	0.8	1.0	0.9	1.1	1.3	2.5	1.5	0.1	--	2.5
3-Jan	0.4	0.0	0.3	0.9	0.7	0.9	0.2	-0.4	0.1	-0.1	0.1	0.3	0.7	1.0	1.6	2.1	3.0	3.1	3.1	3.9	3.7	4.1	3.2	2.9	1.5	4.1
4-Jan	2.8	2.7	3.0	2.5	1.7	2.2	2.6	3.1	3.6	3.1	3.0	2.5	2.5	0.8	0.8	0.7	2.3	3.0	3.2	2.9	2.8	2.7	2.3	1.9	2.5	3.6
5-Jan	2.0	1.6	1.8	1.6	1.6	1.9	1.7	0.7	0.1	0.3	0.8	0.6	0.1	-0.1	0.4	0.8	1.0	1.1	0.9	1.1	1.1	1.0	1.4	0.8	1.0	2.0
6-Jan	0.3	0.4	0.1	-0.9	-0.4	-0.7	-0.7	-0.4	-1.1	-1.4	-1.5	-0.9	-0.9	-0.6	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.1	-0.3	-0.2	-0.4	-0.5	0.4
7-Jan	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.1	0.1	0.0	0.4	0.7	0.3	0.1	0.5	0.8	-0.6	0.5	0.6	0.8	0.9	0.1	0.3	0.2	0.9
8-Jan	0.1	0.9	0.7	0.1	0.2	0.4	0.3	0.8	1.1	1.1	1.3	0.9	0.8	0.4	0.4	0.4	0.3	0.2	-0.2	0.2	0.6	0.7	1.1	0.9	0.6	1.3
9-Jan	0.3	-0.3	0.4	1.1	0.9	0.8	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	1.1
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.5	1.5	0.8	0.3	-0.5	-0.2	--	2.5
13-Jan	-0.3	-0.4	0.6	0.4	0.2	0.4	0.5	1.7	0.7	0.6	-0.2	0.1	0.3	0.4	0.4	-0.2	0.4	0.5	-0.4	-0.2	0.0	0.0	0.0	0.1	0.2	1.7
14-Jan	0.0	0.1	0.4	0.6	1.1	1.8	1.6	0.5	-1.4	-1.0	-0.9	-0.9	-0.5	-0.8	-0.6	-0.7	-0.6	-0.1	-0.4	1.0	2.4	2.3	2.1	1.7	0.3	2.4
15-Jan	3.0	5.3	6.8	6.7	4.9	4.4	6.4	8.0	9.0	AF	AF	5.3	5.6	6.4	6.4	6.5	2.9	1.5	0.2	-0.2	-0.1	0.0	0.0	0.1	4.0	9.0
16-Jan	0.3	1.2	1.2	2.2	2.2	1.8	1.6	0.8	1.2	0.8	0.5	0.6	0.9	1.0	0.7	0.6	0.6	0.5	0.5	0.4	0.7	1.0	1.2	1.2	1.0	2.2
17-Jan	1.2	1.3	0.4	0.8	1.1	1.5	4.3	5.2	4.3	3.2	3.1	3.5	3.1	3.8	3.0	2.4	0.4	0.1	0.2	0.4	0.1	0.2	0.0	0.1	1.8	5.2
18-Jan	0.2	0.1	0.9	1.7	1.6	1.4	0.8	0.9	0.8	2.1	3.0	1.6	0.4	-0.1	0.1	0.8	1.3	0.6	0.8	0.5	0.7	0.7	0.8	1.2	0.9	3.0
19-Jan	0.3	0.6	0.8	0.9	-0.1	0.3	0.0	0.1	0.6	0.5	0.5	0.2	0.9	0.7	0.8	1.9	1.4	0.7	0.5	0.6	0.4	0.0	0.2	-0.1	0.5	1.9
20-Jan	0.1	0.5	0.8	1.3	1.3	1.6	1.8	1.2	1.6	1.3	1.6	1.4	1.1	1.2	0.8	0.8	0.3	0.1	0.3	0.8	1.0	0.8	0.9	0.5	1.0	1.8
21-Jan	0.6	0.6	0.0	0.0	0.1	-0.1	-0.1	0.3	0.5	1.0	0.6	0.7	0.5	0.2	-0.1	0.4	0.3	0.2	0.0	-0.3	-0.3	-0.5	0.3	0.0	0.2	1.0
22-Jan	0.1	-0.1	0.4	0.4	-0.2	0.1	0.8	0.7	-0.4	0.2	-0.2	0.6	0.8	0.8	0.8	1.0	0.9	0.7	0.9	1.3	1.7	1.6	1.8	1.6	0.7	1.8
23-Jan	1.3	1.2	0.6	0.7	0.6	0.7	1.7	2.2	3.3	3.6	3.0	3.4	4.1	2.8	3.1	3.4	3.0	3.2	2.7	2.6	1.6	1.3	0.2	1.4	2.2	4.1
24-Jan	1.2	2.9	3.5	2.6	0.4	1.0	1.5	1.2	0.7	0.6	0.4	0.7	0.5	0.2	0.3	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.1	0.6	0.8	3.5
25-Jan	0.3	0.0	0.8	0.9	0.7	0.6	1.2	2.1	2.8	1.7	0.1	0.6	0.9	1.1	1.0	1.2	0.5	0.7	1.0	0.6	1.2	2.1	1.8	1.2	1.0	2.8
26-Jan	1.1	2.0	1.1	1.1	1.1	1.1	0.5	0.0	0.5	0.0	0.5	0.2	0.0	0.1	0.5	0.1	0.1	0.2	0.4	0.4	0.4	0.3	0.4	0.8	0.5	2.0
27-Jan	0.6	0.5	0.8	0.8	0.9	0.8	0.7	0.9	1.0	0.5	0.2	0.0	0.1	0.7	0.6	1.3	1.5	1.5	1.5	1.8	1.7	1.8	2.0	1.7	1.0	2.0
28-Jan	1.5	1.9	1.7	1.4	1.3	1.7	1.4	1.2	1.0	1.1	0.3	0.3	0.8	0.4	0.6	0.5	0.6	1.3	0.5	0.6	0.2	0.8	1.2	0.7	1.0	1.9
29-Jan	0.7	-0.1	-0.4	0.5	1.2	0.8	0.7	0.7	1.5	1.0	1.6	1.8	1.2	0.5	1.0	1.1	1.2	1.0	0.8	1.0	1.3	0.9	1.1	1.5	0.9	1.8
30-Jan	1.3	1.1	1.7	1.4	2.0	2.2	1.8	1.7	1.6	1.5	1.2	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.4	0.6	0.7	1.8	2.6	1.3	2.6
31-Jan	2.0	0.7	1.3	1.9	1.3	1.0	0.9	0.9	1.0	0.3	0.2	1.0	0.8	1.1	0.7	1.0	1.2	1.1	0.7	0.7	1.8	2.1	1.6	1.5	1.1	2.1
	0.8	0.9	1.0	1.1	1.0	1.1	1.3	1.3	1.3	0.9	0.8	1.0	1.1	0.9	1.0	1.1	0.9	0.8	0.8	0.9	0.9	1.0	0.9	0.9	Diurnal Average	
	3.0	5.3	6.8	6.7	4.9	4.4	6.4	8.0	9.0	3.6	3.1	5.3	5.6	6.4	6.4	6.5	3.0	3.2	3.2	3.9	3.7	4.1	3.2	2.9	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 1

Maximum Value: 6.6 km/h on Jan 15 03:00

Minimum Value: 0.1 km/h on Jan 7 08:00

Percentiles: P_1 = 0.2 P_{10} = 0.4 Q_1 = 0.6 Median = 0.9 Q_3 = 1.7 P_{90} = 2.5 P_{99} = 5.3

Hours in Service:	744
Hours of Data:	649
Hours of Missing Data:	95
Hours of Calibration:	0
Percent Operational Time:	87.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	0.2	0.4	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.5	0.7	0.4	0.8	0.8	0.8	0.6	0.8
2-Jan	1.0	1.0	1.7	1.3	1.0	0.9	MS	AF	AF	AF	AF	AF	AF	AF	AF	0.5	1.0	0.8	1.2	1.3	1.1	0.6	1.9	2.4	2.4
3-Jan	2.4	2.6	2.6	2.8	2.5	2.2	2.0	1.4	1.1	0.6	0.4	0.4	0.7	1.2	1.2	1.1	1.4	1.6	1.7	1.7	1.5	1.1	0.8	0.7	2.8
4-Jan	0.9	0.8	0.7	0.7	0.8	0.8	1.0	1.6	2.0	2.0	1.9	2.0	3.1	3.1	2.8	1.6	1.9	1.8	1.1	0.7	0.6	0.6	0.6	0.7	3.1
5-Jan	0.7	0.6	0.5	0.3	0.3	0.5	0.5	0.7	0.4	0.4	0.7	0.6	0.4	0.5	0.4	0.6	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.7
6-Jan	0.5	0.4	0.6	0.8	0.8	0.8	1.0	0.9	1.2	1.2	2.1	2.0	1.7	2.0	1.9	1.5	1.6	1.0	1.6	1.2	0.8	0.7	0.9	1.0	2.1
7-Jan	0.8	0.6	0.6	0.5	0.3	0.2	0.3	0.1	0.2	0.2	0.6	0.3	0.4	0.5	0.6	0.7	0.4	0.8	0.6	0.5	0.3	0.4	0.6	0.6	0.8
8-Jan	0.5	0.8	0.8	0.8	0.8	0.6	0.7	0.9	0.7	0.6	0.6	0.8	0.6	0.4	0.4	0.3	0.3	0.5	0.6	0.3	0.3	0.4	0.5	0.9	0.9
9-Jan	0.9	0.7	0.6	0.6	0.6	0.7	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.9
10-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	1.9	0.7	0.9	0.7	0.5	1.0	1.9
13-Jan	1.2	1.3	0.6	0.6	0.4	0.6	0.7	0.8	1.6	1.4	1.4	1.4	1.2	1.3	1.4	0.9	0.9	1.0	1.1	1.0	0.5	0.3	0.3	0.5	1.6
14-Jan	0.2	0.2	0.2	0.3	0.4	0.6	0.4	0.8	1.0	0.9	0.9	1.1	1.7	0.9	0.7	0.9	0.9	0.9	0.9	2.0	1.3	1.0	2.4	1.9	2.4
15-Jan	4.9	6.2	6.6	5.3	5.2	4.7	5.3	5.9	6.1	AF	AF	3.2	3.5	4.1	4.2	4.3	3.5	1.3	1.2	1.1	0.9	1.1	0.5	0.4	6.6
16-Jan	0.6	1.0	1.1	1.1	1.1	0.7	0.6	0.7	0.4	0.7	0.6	0.6	0.7	0.8	1.0	1.0	1.0	1.1	0.8	0.6	1.0	0.8	0.5	0.3	1.1
17-Jan	0.5	0.6	0.4	1.0	0.9	1.3	3.5	3.4	2.9	3.0	3.0	2.9	2.2	1.7	2.3	2.1	2.2	2.1	1.8	1.7	1.6	1.7	0.8	0.6	3.5
18-Jan	0.3	0.4	0.3	0.8	0.9	0.6	0.7	0.6	0.6	1.1	0.8	1.3	0.6	0.3	0.8	1.0	1.5	1.1	1.2	1.0	0.9	0.8	0.6	0.9	1.5
19-Jan	0.5	1.1	0.7	0.7	0.9	0.7	0.6	0.5	0.4	0.9	1.5	2.2	3.3	4.0	3.6	3.3	2.7	2.5	2.3	2.1	1.8	1.8	1.0	0.7	4.0
20-Jan	0.5	0.3	0.3	0.3	0.6	0.7	1.1	1.1	1.1	1.1	1.0	0.7	0.8	0.7	0.7	0.7	0.8	0.5	0.5	0.8	1.1	1.4	1.7	1.3	1.7
21-Jan	0.6	0.6	0.3	0.2	0.1	0.2	0.3	0.6	0.7	1.6	2.9	2.7	2.1	1.9	1.7	1.6	1.2	0.8	0.7	0.6	1.1	1.2	1.3	1.2	2.9
22-Jan	1.2	1.0	0.6	0.6	0.9	1.0	0.4	0.3	0.6	0.7	1.1	1.0	1.3	0.9	0.8	0.7	0.6	0.9	0.9	0.7	0.9	0.7	0.7	0.8	1.3
23-Jan	0.9	1.0	1.1	1.1	0.9	1.0	1.3	2.3	2.3	1.8	1.6	1.5	1.8	1.8	1.4	1.6	1.5	2.0	1.4	1.2	1.0	0.9	1.2	1.8	2.3
24-Jan	1.1	0.9	0.6	1.6	1.5	2.0	2.0	2.5	2.1	1.9	1.5	2.0	1.8	1.7	1.4	1.3	0.8	0.8	0.8	0.4	0.4	0.5	0.5	0.3	2.5
25-Jan	0.6	0.7	0.5	0.4	0.4	1.1	1.4	0.8	1.2	2.7	2.8	2.3	2.0	1.6	2.1	2.7	2.8	2.6	3.4	3.0	3.1	5.1	4.7	4.4	5.1
26-Jan	5.0	5.2	4.2	3.5	3.6	2.9	2.5	2.0	2.2	1.6	1.4	1.4	1.3	1.2	1.3	1.0	1.1	0.5	0.4	0.3	0.3	0.3	0.3	0.3	5.2
27-Jan	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.4	0.3	0.8	0.7	0.7	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.7	0.8
28-Jan	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.8	1.0	0.8	1.2	1.8	1.9	2.5	2.4	2.6	3.1	2.8	2.5	3.1
29-Jan	2.2	1.8	2.0	1.8	1.6	1.7	1.8	1.8	2.0	2.3	2.8	2.9	3.3	2.9	2.9	2.9	2.8	2.3	2.8	2.2	2.5	1.9	1.8	2.0	3.3
30-Jan	1.9	2.0	1.4	0.9	1.2	1.1	0.9	1.1	1.8	1.9	1.8	1.9	1.9	1.7	1.6	1.3	1.7	1.5	1.4	1.1	1.1	1.0	1.1	0.9	2.0
31-Jan	1.7	2.5	2.4	2.1	1.7	1.2	0.7	0.6	0.3	1.1	1.3	1.7	2.0	1.7	1.5	1.5	1.8	1.7	1.1	0.5	1.4	1.1	1.5	0.9	2.5
	5.0	6.2	6.6	5.3	5.2	4.7	5.3	5.9	6.1	3.0	3.0	3.2	3.5	4.1	4.2	4.3	3.5	2.6	3.4	3.0	3.1	5.1	4.7	4.4	
	Diurnal Maximum																								

AF - Analyzer Failure MS - Missing

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 2, 2013	Previous Calibration	December 5, 2013
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	9:50	End Time (MST)	13:00
Barometric Pressure	720 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	May 29th 2014
Gas Cert Reference	LL107934		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2633
DACS voltage range	0-5V	DACS channel #	N/A

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-645	-645
Analyzer Range (mv)	5000	5000	Lamp voltage	808	805
Calculated slope	0.994777	0.991595	Chamber temp.	44.4	44.4
Calculated intercept	-0.162861	-0.644972	Pressure (mmHg)	689.6	691.1
Analyzer Background	15.7	16.5	Flow (lpm)	0.498	0.499
Analyzer Coefficient	0.812	0.823	Intensity	25xxx	25xxx

Analyzer make	TEI 43C	Analyzer serial #	613516797

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.3	N/A
as found span	5000	58.8	599.8	592.4	1.012
calibrator zero	5000	0.0	0.0	0.0	N/A
high point	5000	58.8	599.8	604.5	0.992
second point	5000	29.4	299.9	305.4	0.982
third point	5000	14.7	149.9	151.1	0.992
calibrator zero					
as left zero	5000	0.0	0.0	0.1	N/A
as left span	5000	58.8	599.8	609.2	0.985
				Average Correction Factor	0.989

Corrected As found	592.1	Previous response	596.8	% change	0.8%

Notes: Small adjustments made to Zero and Span
Filter changed after as founds

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

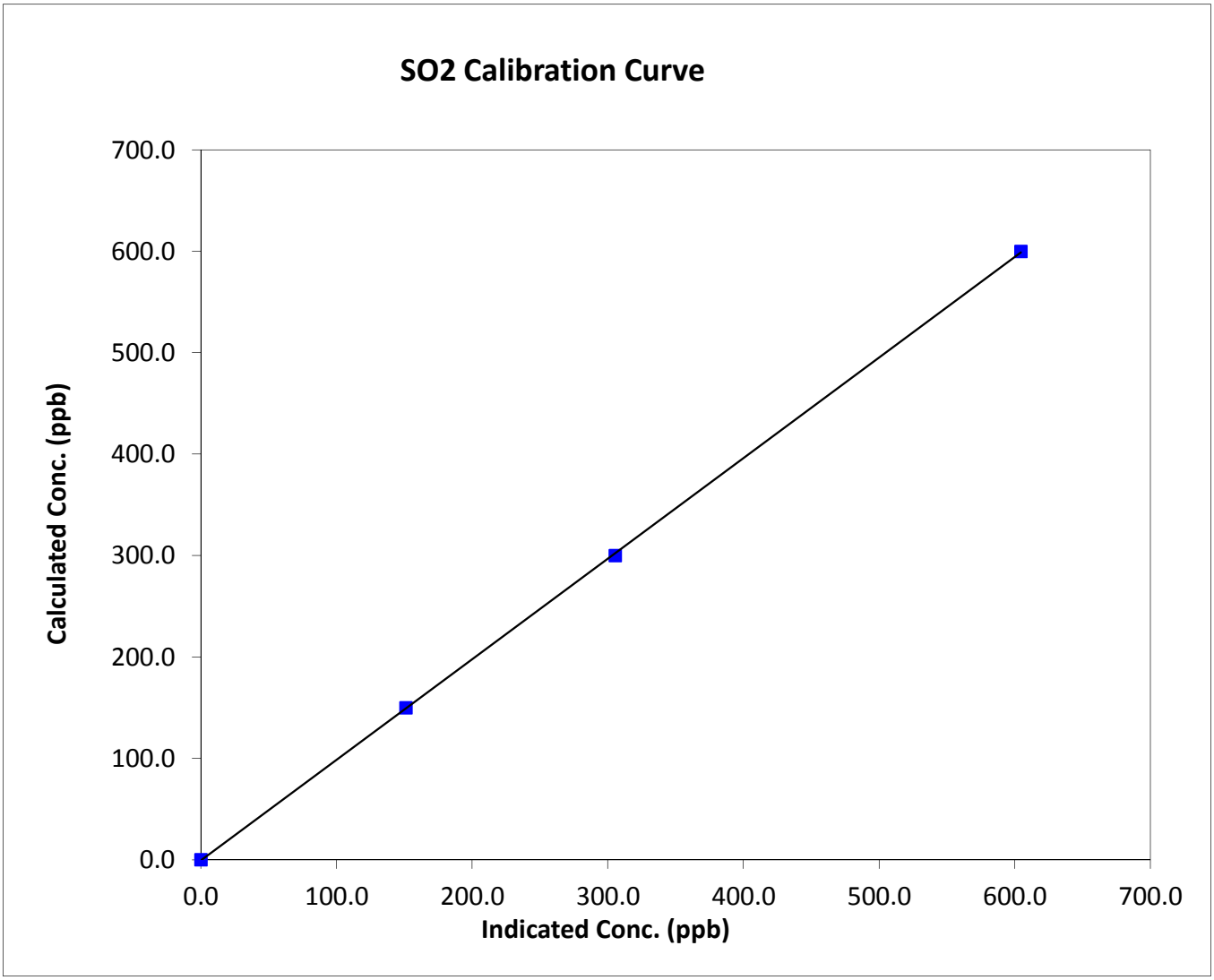
SO_2 Calibration Summary

Station Information

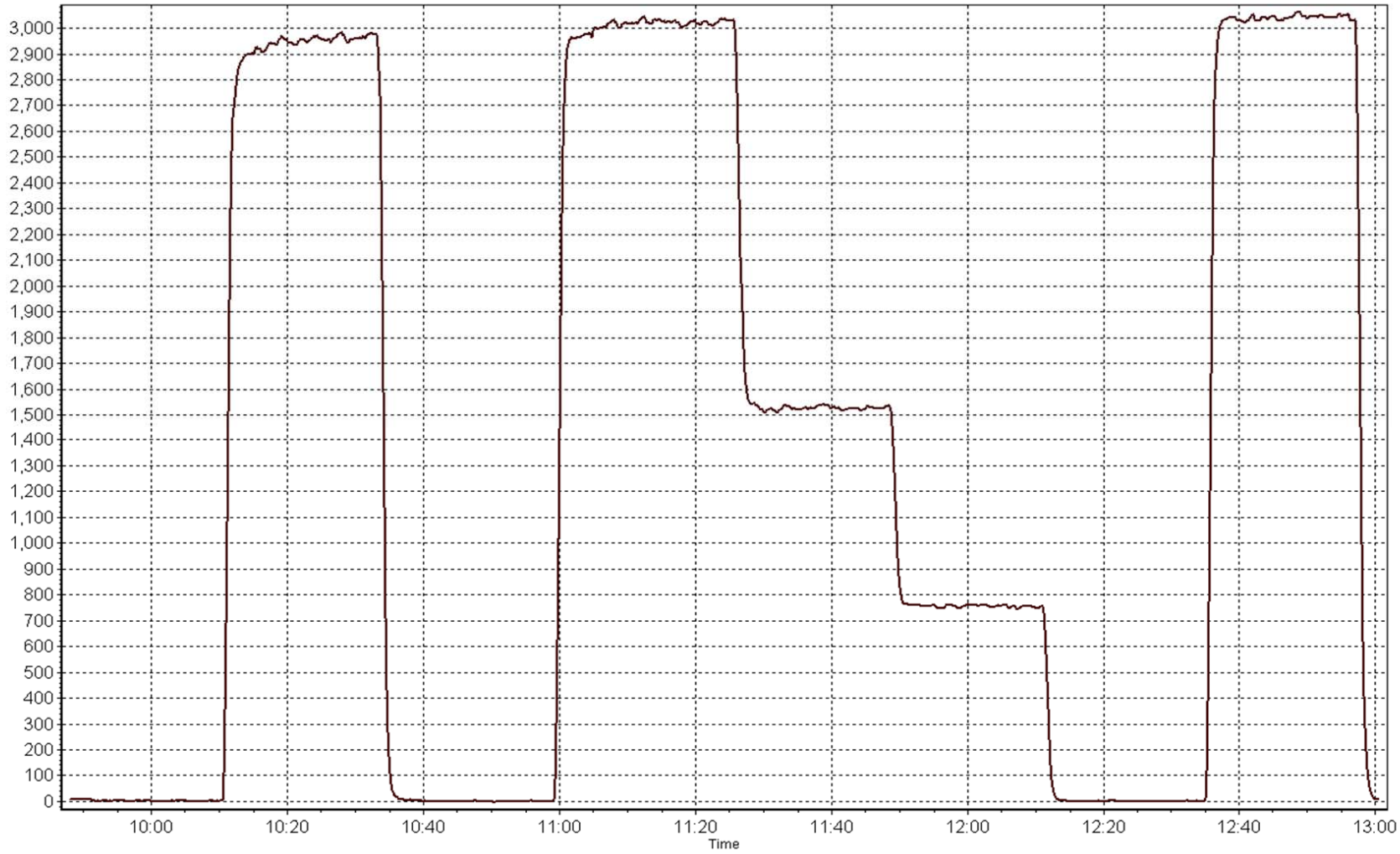
Calibration Date	January 2, 2013	Previous Calibration	December 5, 2013
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	9:50	End Time (MST)	13:00
Analyzer make	TEI 43C	Analyzer serial #	613516797

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999962
599.8	604.5	0.9922		
299.9	305.4	0.9818	Slope	0.991595
149.9	151.1	0.9921		
			Intercept	-0.644972



SO_2 Calibration Plot **Date:** January 2, 2013



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	Mannix	Station Number	AMS 5
Reason:	Repair		
Start Time (MST)	9:40	End Time (MST)	13:00
Barometric Pressure	732 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11061107
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	May 30th 2013
Gas Cert Reference	LL155272	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2633
DACS voltage range	0-5V	DACS channel #	28

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage (V)	-623.5	-623.5
Analyzer Range (mv)	5000	5000	Lamp voltage (V)	815.0	816.0
Calculated slope	0.988307	0.997551	Chamber temp.(Deg C)	44.9	45.2
Calculated intercept	-0.266760	-0.182536	Pressure (mmHg)	498.6	506.2
Analyzer Background	10.5	10.5	Flow (LPM)	0.984	0.996
Analyzer Coefficient	1.135	1.151	Intensity	91%	91%
			Converter temp.(Deg C)	323.6	324.0

Analyzer make/model	TEI 450i	Analyzer serial #	815129108
Converter make/model	N/A	Converter serial #	N/A

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.14	N/A
as found span	5000	36.8	75.1	74.0	1.014
SO2 scrubber check	5000	14.7	149.9	2.00	N/A
calibrator zero	5000	0.0	0.0	0.37	N/A
high point	5000	36.8	75.1	75.5	0.994
second point	5000	20.6	42.0	42.4	0.991
third point	5000	12.3	25.1	25.0	1.004
calibrator zero		0.0			
as left zero	5000	0.0	0.0	0.2	N/A
as left span	5000	36.8	75.1	75.2	0.999
				Average Correction Factor	0.996

Corrected As found 74.2 Previous response 74.5 % change 0.4%

Notes: Scrubber check performed after As Founds
Filter changed after As Founds

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

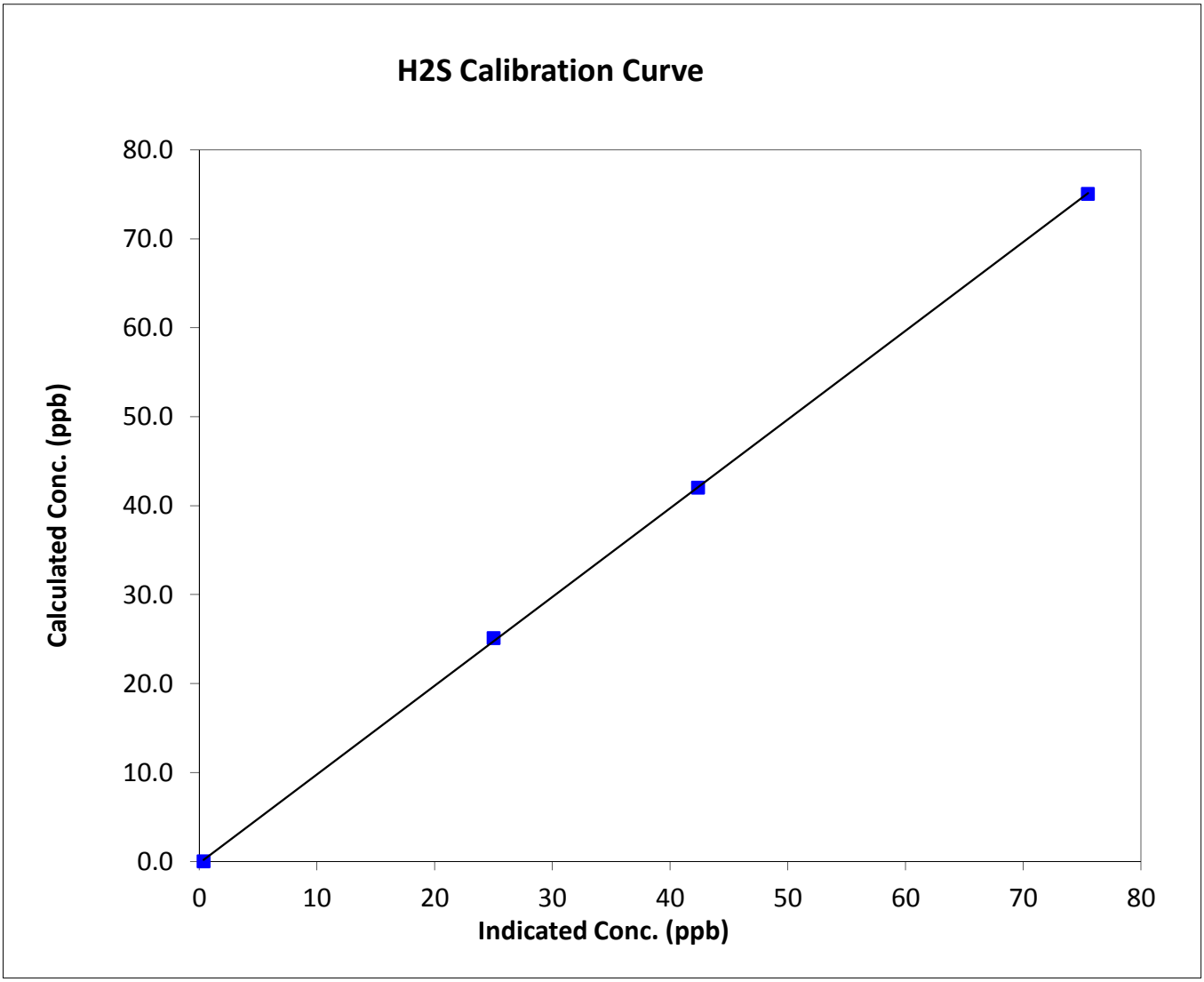
H2S Calibration Summary

Station Information

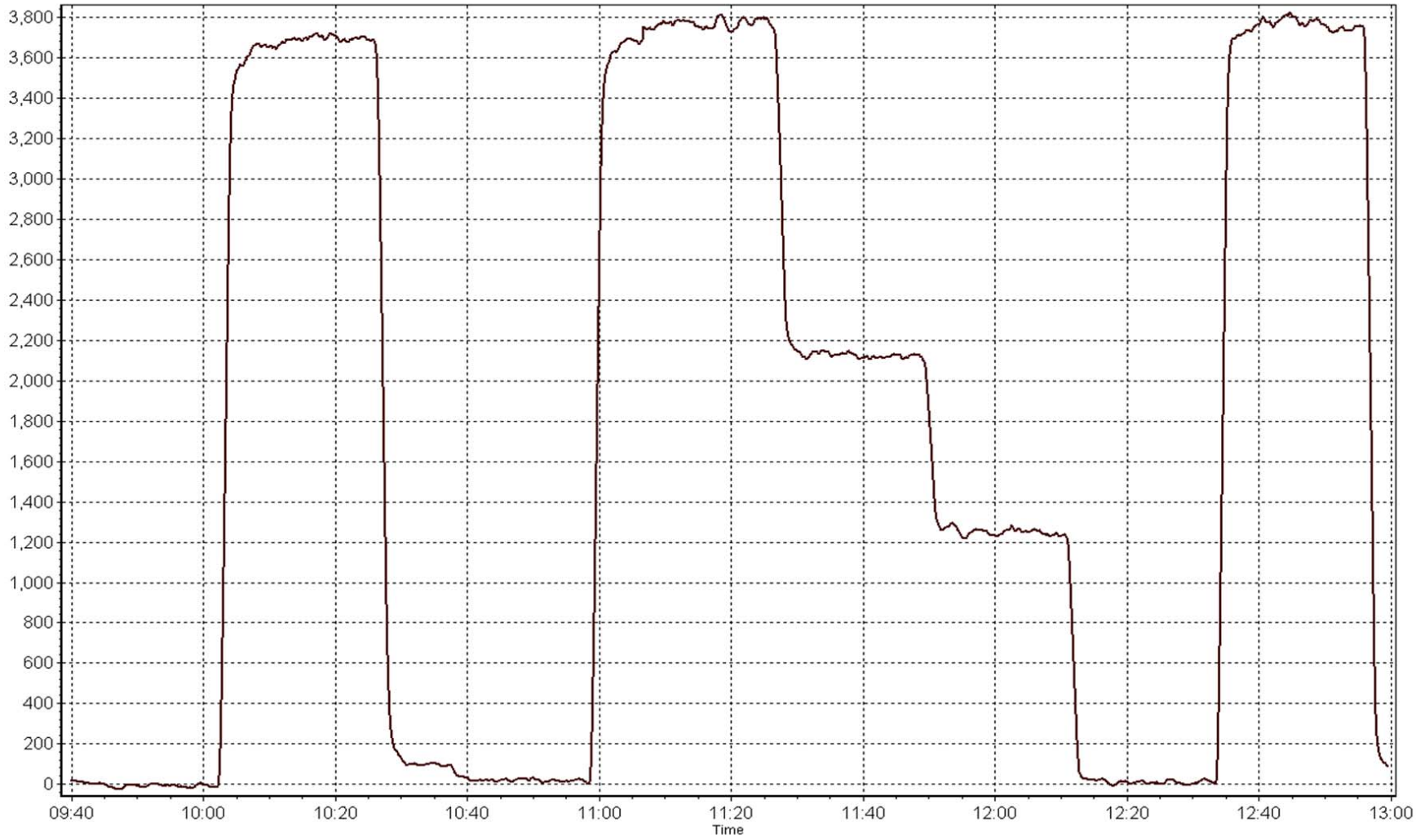
Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	9:40	End Time (MST)	13:00
Analyzer make	TEI 450i	Analyzer serial #	815129108

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.4	N/A	Correlation Coefficient	0.999947
75.1	75.5	0.9942		
42.0	42.4	0.9914	Slope	0.997551
25.1	25.0	1.0036		
			Intercept	-0.182536



H2S Calibration Plot Date: Friday, January 03, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, January 02, 2014	Previous Calibration	Thursday, December 05, 2013
Station Name	Mannix	Station Number	AMS 5
Reason:	Routine		
Start Time (MST)	9:50	End Time (MST)	13:00
Barometric Pressure	720 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11061107
Gas Cert Reference	LL107934	Cal Gas Expiry Date	May 29th 2014
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1081.5 ppm
C3H8 Cal Gas Conc.	206 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2633
DACS voltage range	0-5V	DACS channel #	N/A

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Flame Temp	178.0	177.0
Analyzer Range (mv)	5000	5000	Base Temp	125.7	125.0
Calculated slope	1.000576	0.996390	Sample Pressure	6.28	6.23
Calculated intercept	0.026419	0.065276	Fuel Pressure	11	11
			Air Pressure	17	17

Analyzer make	TEI 51C-LT	Analyzer serial #	330202750

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.36	NA
as found span	5000	58.8	12.72	12.17	1.045
calibrator zero	5000	0.0	0.00	-0.03	NA
high point	5000	58.8	12.72	12.71	1.001
second point	5000	29.4	6.36	6.32	1.006
third point	5000	14.7	3.18	3.07	1.035
calibrator zero				0.00	
as left zero	5000	0.0	0.00	-0.07	N/A
as left span	5000	58.8	12.72	12.73	0.999
				Average Correction Factor	1.014

Corrected As found	12.53	Previous response	12.70	% change	1.4%

Notes: Zero and Span both with small adjustments
Inline filter changed after as founds

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

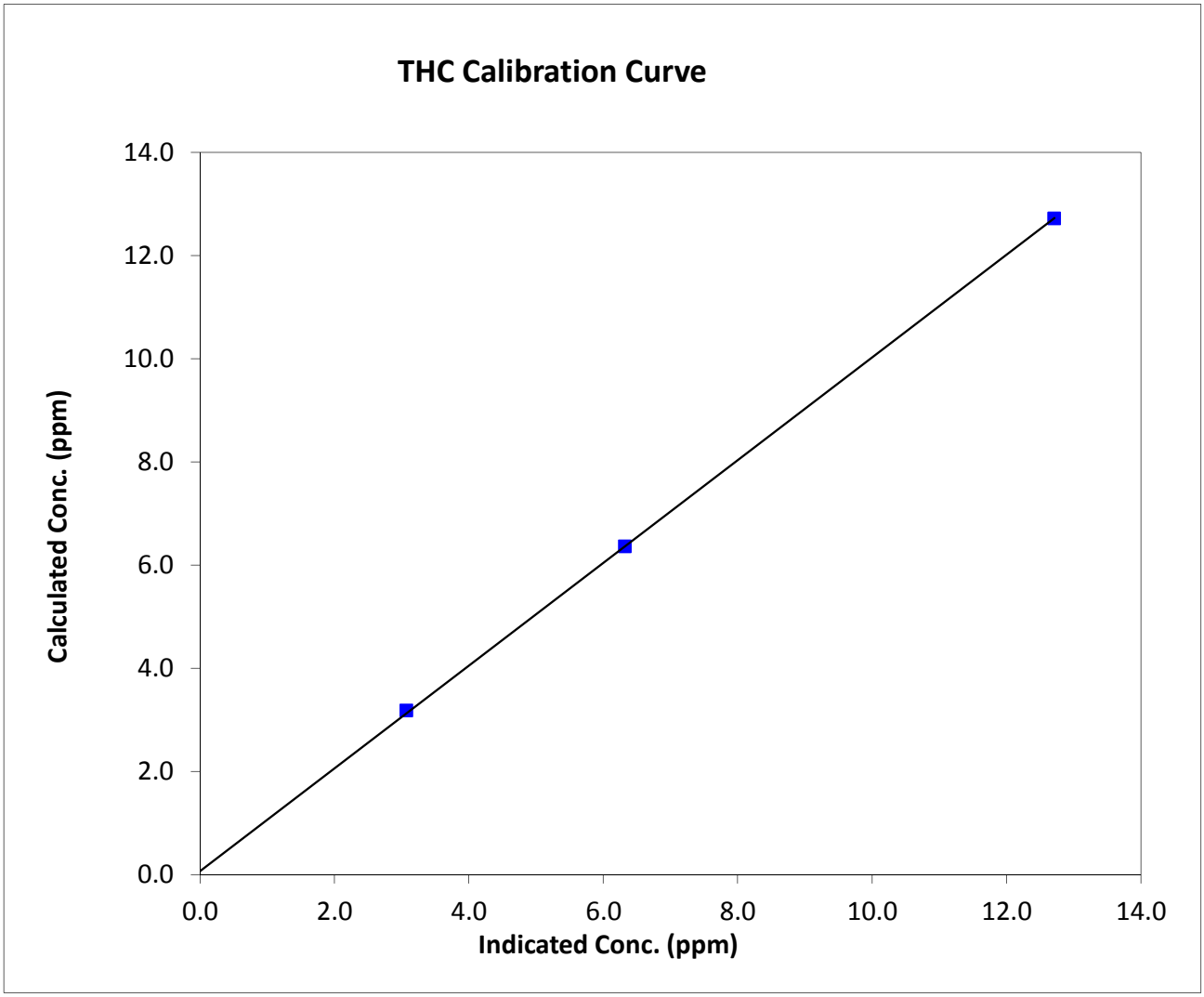
THC Calibration Summary

Station Information

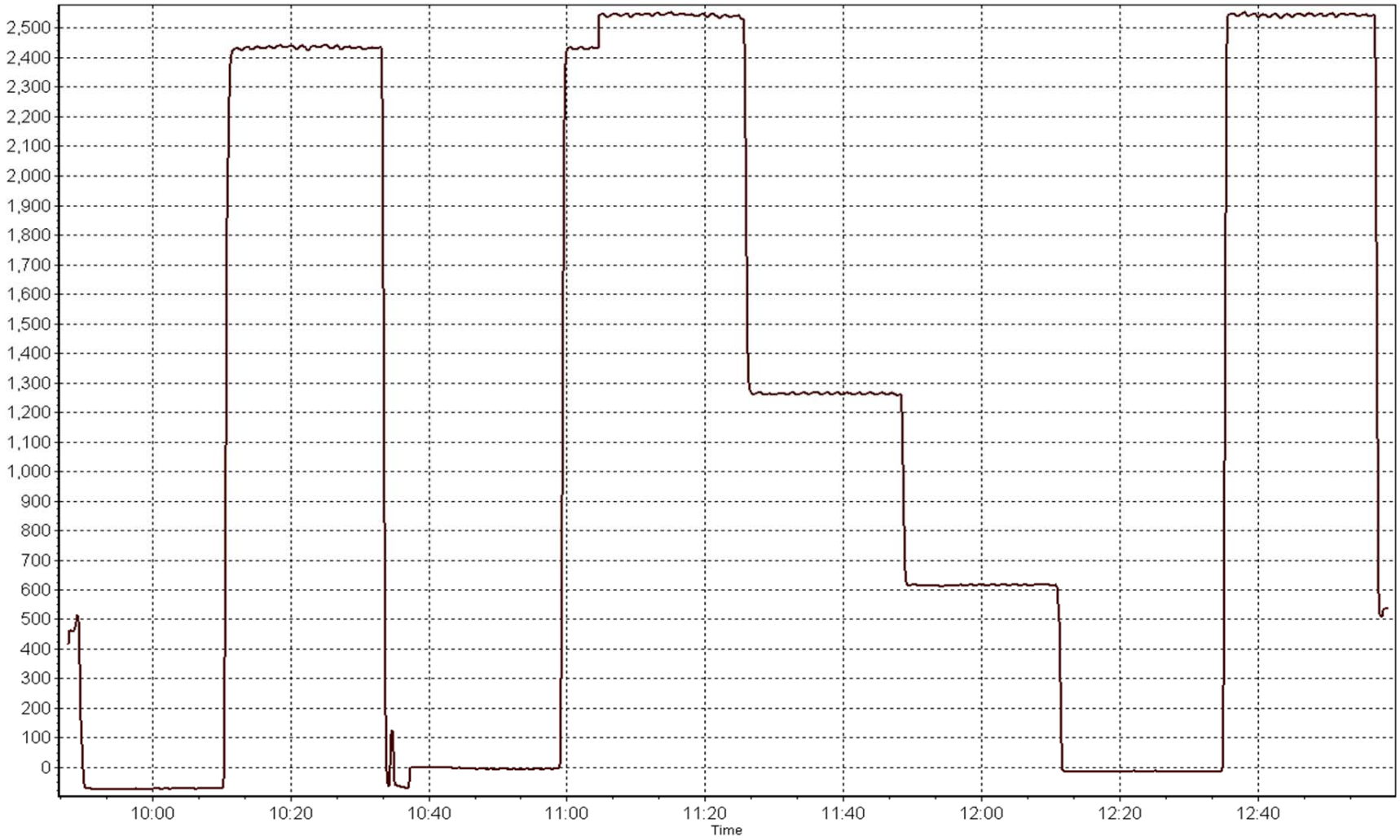
Calibration Date	January 2, 2014	Previous Calibration	December 5, 2013
Station Name	Mannix	Station Number	AMS 5
Start Time (MST)	9:50	End Time (MST)	13:00
Analyzer make	TEI 51C-LT	Analyzer serial #	330202750

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.03	N/A	Correlation Coefficient	0.999948
12.72	12.71	1.0006		
6.36	6.32	1.0063	Slope	0.996390
3.18	3.07	1.0352		
			Intercept	0.065276



THC Calibration Plot **Date:** January 2, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 6
PATRICIA MCINNES
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
JANUARY 2014

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	710	34	34	100.00	15	0	3	0
TRS (ppb) Average	694	37	50	98.25	1	0	0	0
THC (ppm) Average	707	34	37	99.60	3.1	-	2.3	-
NMHC(ppm) Average	707	34	37	99.60	0.499	-	0.132	-
CH4(ppm) Average	707	34	37	99.60	2.6	-	2.3	-
O3 (ppb) Average	710	34	34	100.00	42	0	37	-
NO2 (ppb) Average	705	39	39	100.00	43	0	25	-
NO (ppb) Average	705	39	39	100.00	76	-	18	-
NOX (ppb) Average	705	39	39	100.00	115	-	41	-
NH3 (ppb) Average	673	40	71	95.83	0	0	0	-
PM2.5 (ug/m3) Average	742	0	2	99.73	26.5	-	12.5	0
Temperature 2 m (C) Average	744	0	0	100.00	7.3	-	2.1	-
Relative Humidity (%) Average	744	0	0	100.00	92	-	88	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	50	-	-	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	1.3	2	-	0	0	0	0	1	4	15
TRS (ppb) Average	694	0.3	0	-	0	0	0	0	0	1	1
THC (ppm) Average	707	2	0.2	-	1.8	1.9	1.9	1.9	2	2.2	3.1
NMHC(ppm) Average	707	0.025	0.065	-	0	0	0	0	0	0.1	0.499
CH4(ppm) Average	707	1.97	0.1	-	1.8	1.9	1.9	1.9	2	2.1	2.6
O3 (ppb) Average	710	21	11	-	1	4	12	22	30	35	42
NO2 (ppb) Average	705	10.8	9	-	0	1	4	8	16	24	43
NO (ppb) Average	705	4.8	8	-	0	0	0	2	5	13	76
NOX (ppb) Average	705	15.5	16	-	0	1	5	10	22	37	115
NH3 (ppb) Average	673	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	742	4.57	3.8	-	0.6	1.3	2	3.2	5.8	10	26.5
Temperature 2 m (C) Average	744	-16.18	10.1	-	-36.9	-28.7	-23.8	-16.6	-9.8	-0.9	7.3
Relative Humidity (%) Average	744	74.7	9	-	46	63	69	75	81	86	92
Wind Speed 10 m (km/h) Average	744	10.4	8	-	1	3	5	9	13	19	50
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS 6)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	01 Jan 2014 03:00	01 Jan 2014 15:00	13	Analyzer failure - converter replaced
NMHC, CH4, THC	06 Jan 2014 15:00	06 Jan 2014 16:00	2	Maintenance - replaced fuel cylinder
NMHC, CH4, THC	15 Jan 2014 03:00	15 Jan 2014 03:00	1	Unstable Operation - excessive baseline drift
NH3	01 Jan 2014 03:00	31 Jan 2014 03:00	31	Stabilization after daily span
PM2.5	10 Jan 2014 13:00	10 Jan 2014 14:00	2	Flow and zero reference checks, sample head cleaning

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 15 ppb on Jan 11 23:00 Maximum Daily Average: 3.3 ppb on Jan 26

Minimum Value: 0 ppb on Jan 22 01:00 Minimum Daily Average: 0.1 ppb on Jan 30
Maximum Diurnal Average: 2.1 ppb at hour 2 Minimum Diurnal Average: 0.7 ppb at hour 4
Monthly Average: 1.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 4$ $P_{99} = 10$

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0.4	1
2-Jan	1	Z	1	1	2	2	3	2	2	2	2	2	2	1	1	1	1	1	1	1	0	0	0	7	1.5	7
3-Jan	13	Z	0	1	5	5	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1.6	13
4-Jan	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
5-Jan	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
6-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
7-Jan	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-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
9-Jan	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	3	3	14	11	10	10	2.6	14
10-Jan	7	Z	2	1	3	8	4	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1.6	8
11-Jan	0	Z	0	0	0	0	0	0	1	1	1	1	1	1	2	3	3	4	3	3	6	10	15	11	3.0	15
12-Jan	4	Z	2	2	3	8	6	5	9	8	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2.2	9
13-Jan	0	Z	0	0	0	0	1	1	1	1	4	6	9	2	2	2	1	0	0	1	1	1	1	0	1.6	9
14-Jan	0	Z	0	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1.0	2
15-Jan	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	5	2	2	0.9	5
16-Jan	6	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	6
17-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.3	1
18-Jan	1	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	2	4	7	6	5	5	6	7	5	2.3	7
19-Jan	5	Z	4	3	2	4	5	2	1	2	1	6	3	3	3	2	4	1	1	0	1	1	2	2	2.5	6
20-Jan	1	Z	1	2	1	1	0	1	0	0	0	C	C	C	0	0	0	0	0	0	1	1	5	6	1.2	6
21-Jan	7	4	Z	2	1	1	1	1	2	2	2	3	5	2	0	0	0	0	0	0	0	0	0	0	1.5	7
22-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0.3	1
23-Jan	1	Z	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
24-Jan	0	Z	0	0	1	3	3	3	6	5	7	4	1	0	0	3	1	0	0	0	0	0	0	0	1.7	7
25-Jan	0	Z	0	0	0	0	0	0	0	0	2	9	4	4	7	1	3	4	5	2	1	1	0	1	2.1	9
26-Jan	1	Z	4	1	2	3	7	2	1	2	4	5	6	7	7	5	4	4	5	3	2	1	1	1	3.3	7
27-Jan	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	0	0	0.7	1
28-Jan	0	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	6	5	2	0	0	1	5	6	1.5	6
29-Jan	4	Z	0	0	0	0	0	1	1	1	1	1	2	1	0	1	3	1	1	0	0	0	0	0	1.0	4
30-Jan	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
31-Jan	0	Z	2	0	1	1	0	0	0	0	1	4	12	7	1	7	6	3	1	1	1	0	0	0	2.1	12
	1.8	2.1	0.9	0.7	0.9	1.4	1.3	0.9	1.0	1.1	1.2	1.7	1.8	1.3	1.1	1.2	1.4	1.2	1.2	1.0	1.2	1.5	1.7	1.9	Diurnal Average	
	13	4	4	3	5	8	7	5	9	8	7	9	12	7	7	7	6	7	6	5	14	11	15	11	Diurnal Maximum	

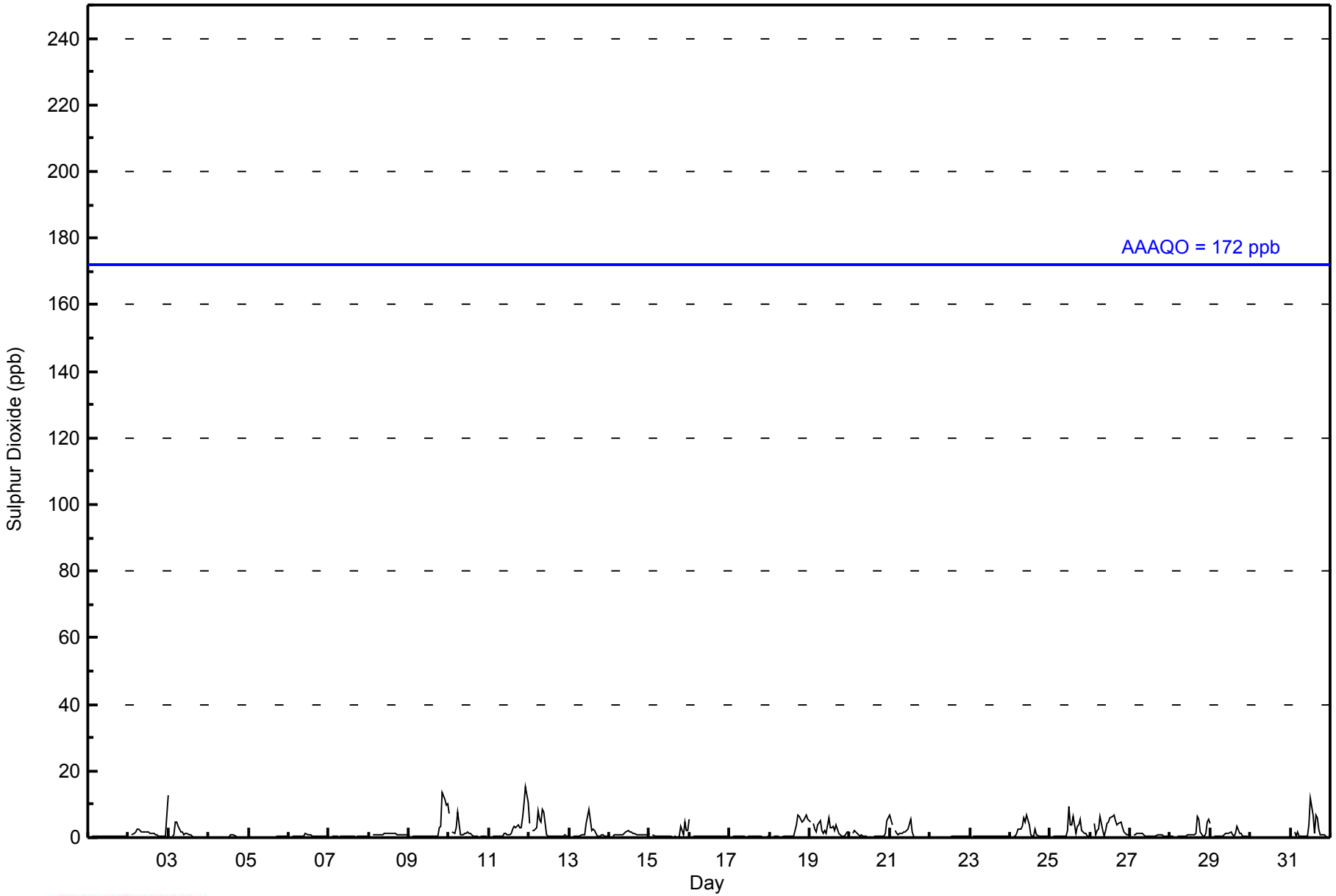
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	704	99.15	99.15
11 - 20	6	0.85	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: 710

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	91	17	2	9	6	29	104	60	29	39	66	43	36	54	43	76	704
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6
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	91	17	2	9	6	29	104	60	29	39	66	43	36	54	43	82	710

Total Number of Valid Hours: 710

Total Number of Hours: 744

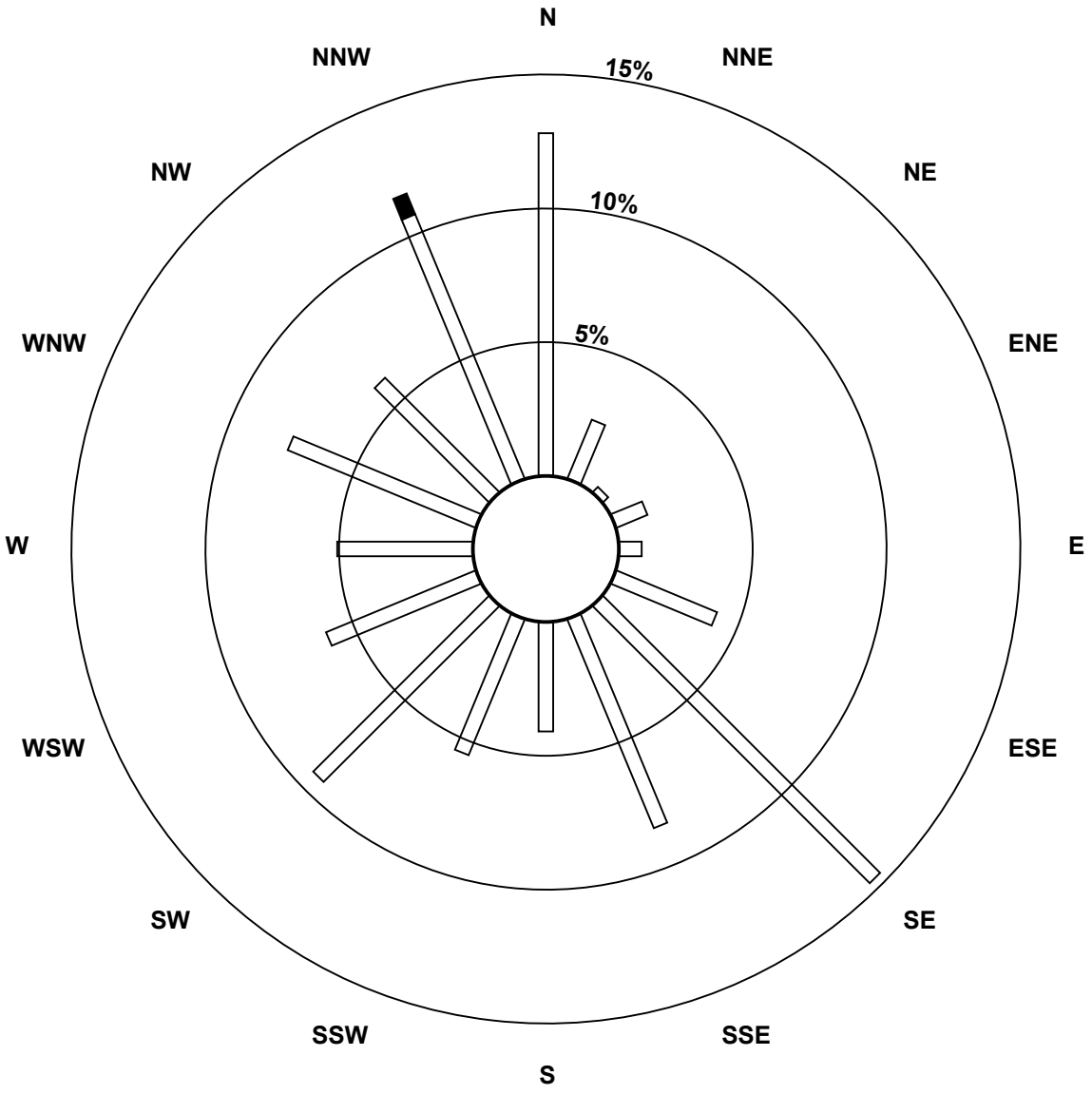
AURORA ATMOSPHERICS INC.

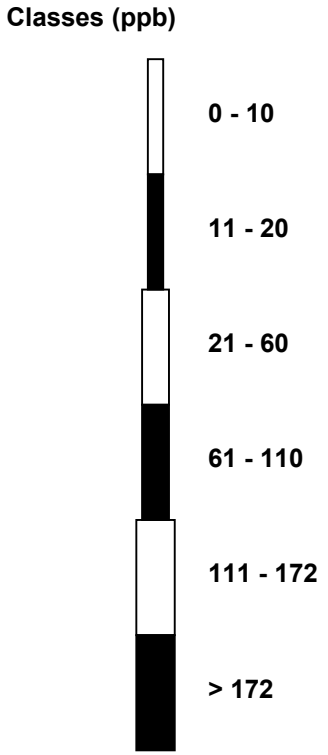
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes (AMS 6)





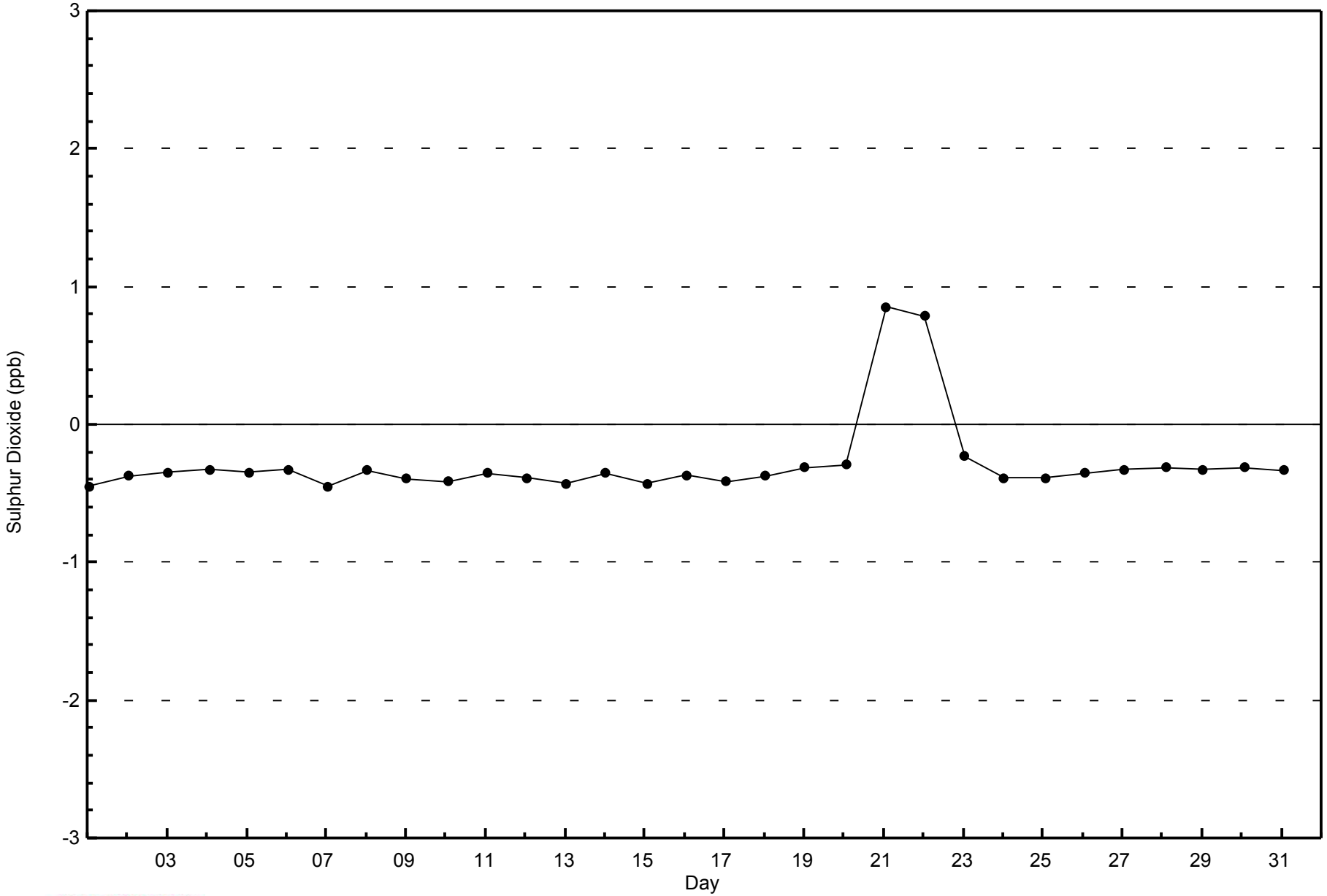
Total Number of Valid Hours: 710

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2014



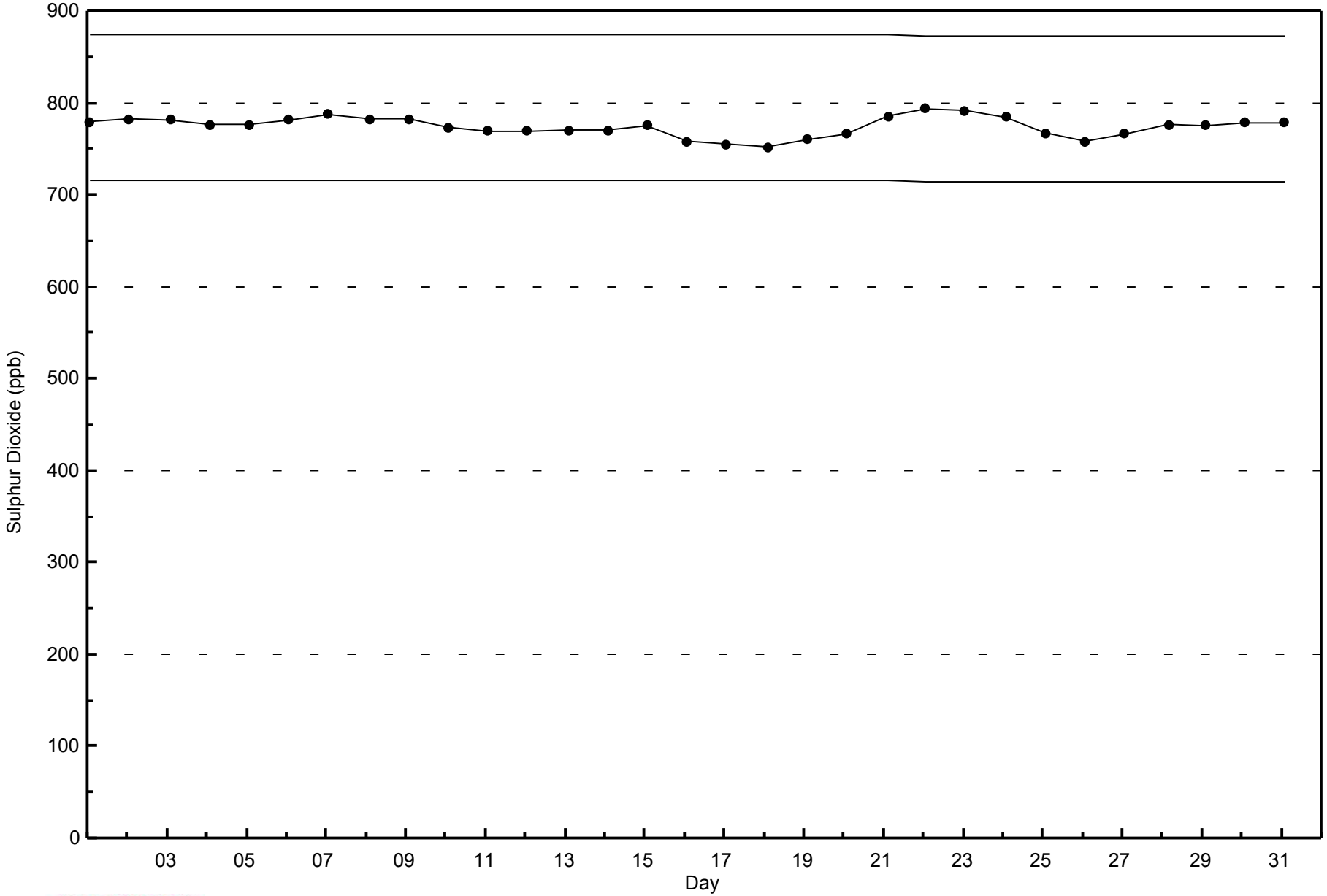
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 1 ppb on Jan 9 22:00 Maximum Daily Average: 0.5 ppb on Jan 11

Minimum Value: 0 ppb on Jan 29 23:00 Minimum Daily Average: 0.1 ppb on Jan 30
Maximum Diurnal Average: 0.4 ppb at hour 3 Minimum Diurnal Average: 0.2 ppb at hour 15
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	694
Hours of Missing Data:	50
Hours of Calibration:	37
Percent Operational Time:	98.3

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

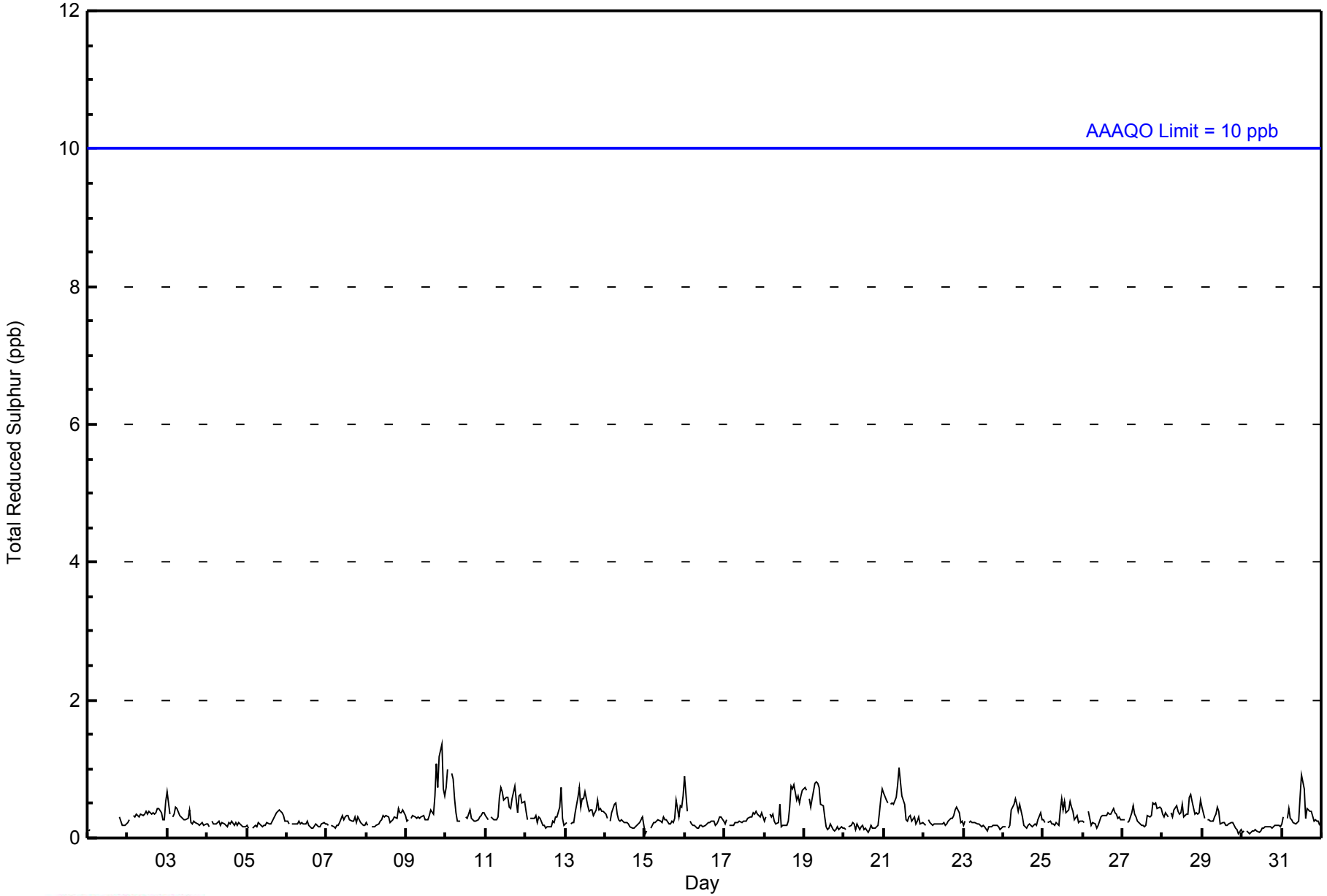
Z - zerospan C - Calibration AF - Analyzer Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	694	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: 694

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	89	16	2	9	6	28	102	54	27	37	65	47	34	54	41	83	694
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	89	16	2	9	6	28	102	54	27	37	65	47	34	54	41	83	694

Total Number of Valid Hours: 694

Total Number of Hours: 744

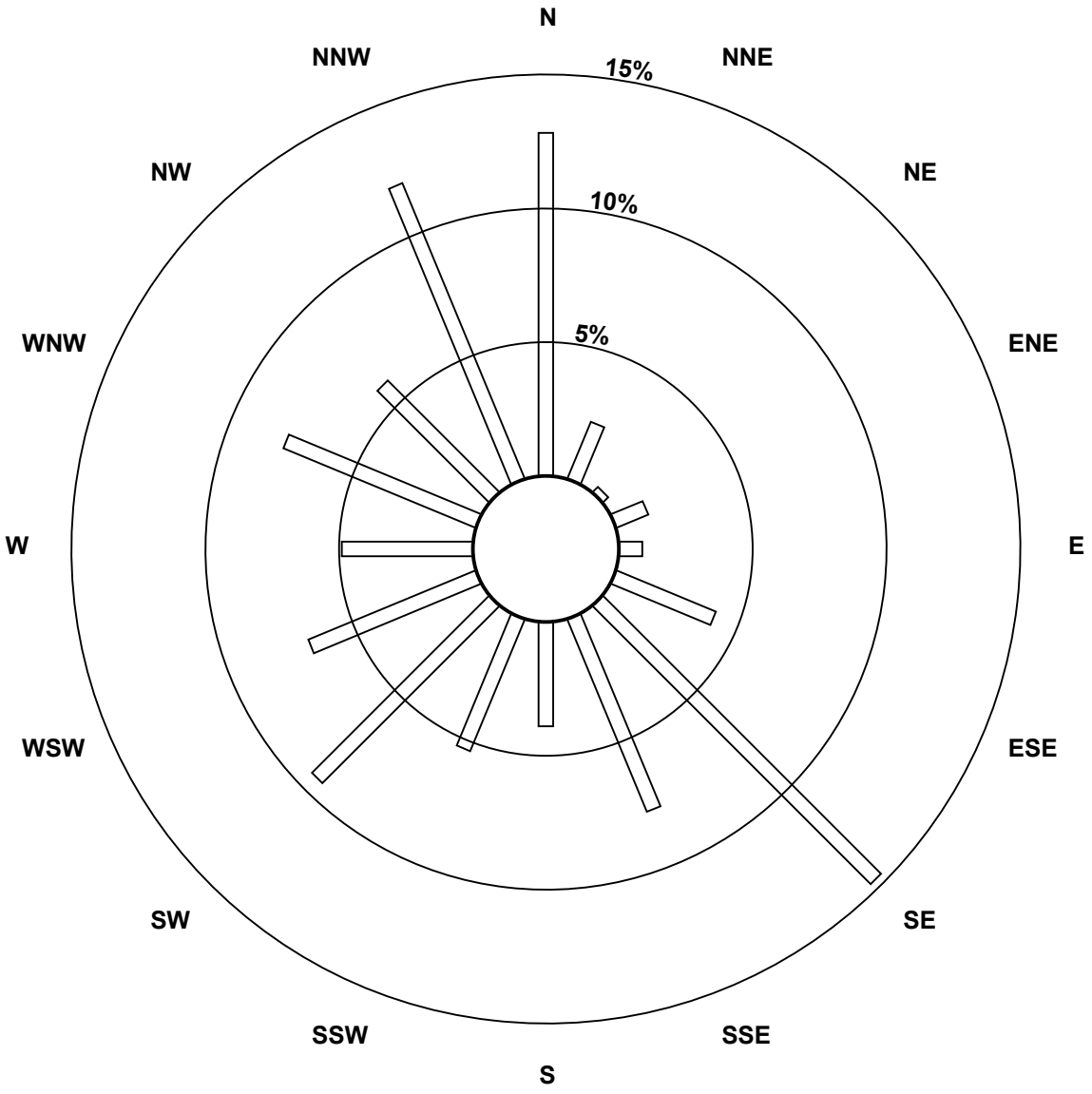
AURORA ATMOSPHERICS INC.

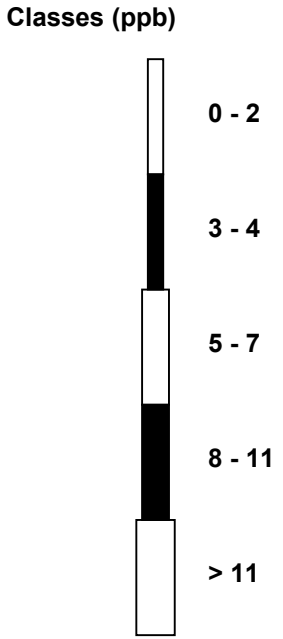
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes (AMS 6)





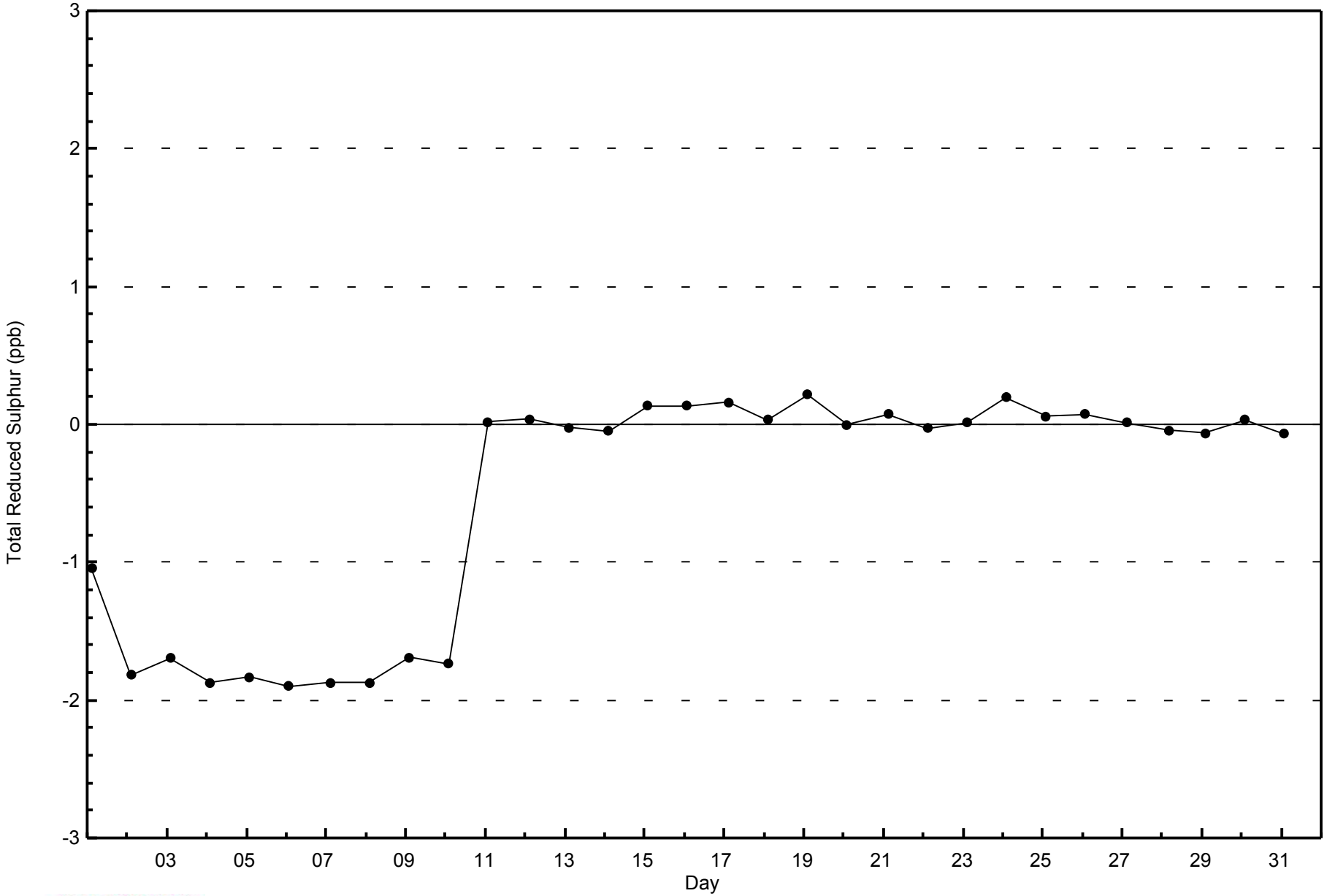
Total Number of Valid Hours: 694

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2014



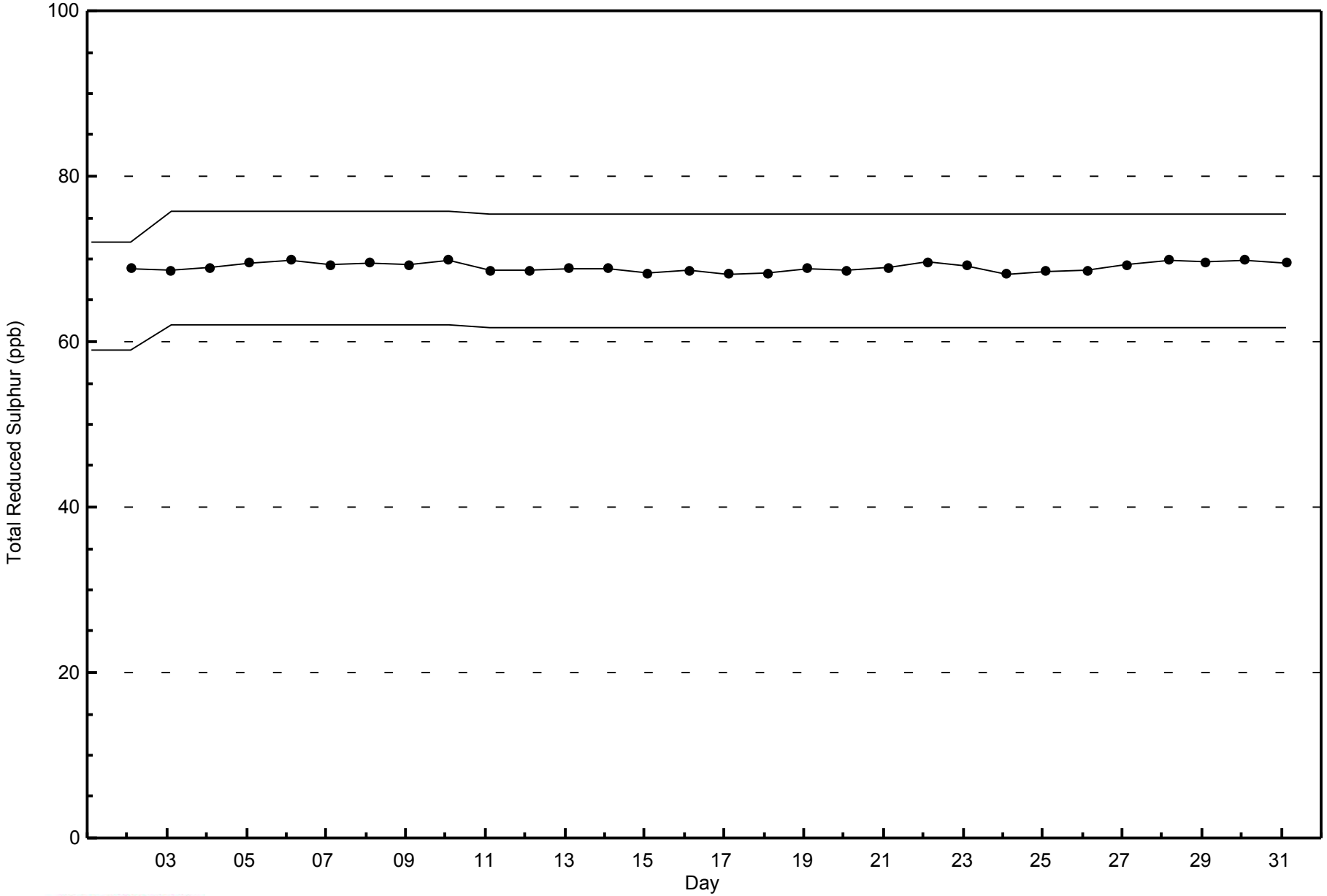
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Patricia McInnes - January 2014



AURORA
ATMOSPHERICS INC.

Maximum Value: 3.1 ppm on Jan 9 19:00

Maximum Daily Average: 2.3 ppm on Jan 9

Minimum Value: 1.8 ppm on Jan 15 01:00

Minimum Daily Average: 1.9 ppm on Jan 15

Maximum Diurnal Average: 2.1 ppm at hour 2

Minimum Diurnal Average: 2.0 ppm at hour 15

Monthly Average: 2.00 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.9 Q_1 = 1.9 Median = 1.9 Q_3 = 2.0 P_{90} = 2.2 P_{99} = 2.5

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4
2-Jan	2.2	Z	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	1.9	1.9	2.1	2.2	2.5
3-Jan	2.3	Z	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	1.9	2.3
4-Jan	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
5-Jan	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	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1
6-Jan	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	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
7-Jan	1.9	Z	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.1	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.1
8-Jan	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.1	2.3
9-Jan	2.2	Z	2.2	2.2	2.4	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.1	2.4	2.4	2.4	2.2	2.6	3.1	2.7	2.4	2.2	2.2	2.1	2.3	3.1
10-Jan	2.1	Z	2.3	2.2	2.4	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.5
11-Jan	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.3	2.5	2.4	2.4	2.4	2.2	2.1	2.0	2.2	2.4	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.5
12-Jan	1.9	Z	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	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0
13-Jan	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.3	2.4	2.1	2.3	2.2	2.1	2.0	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
14-Jan	2.0	Z	2.0	2.0	2.1	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	2.1	2.2	2.1	2.0	2.2
15-Jan	1.8	Z	UO	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	1.9	2.0
16-Jan	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	2.0	2.1	2.0	1.9	2.1
17-Jan	2.0	Z	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
18-Jan	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.8	1.8	2.1	2.1	2.3	2.2	2.3	2.0	2.1	2.0	2.2	2.4	2.0	2.4
19-Jan	2.5	Z	2.5	2.5	2.3	2.3	2.4	2.5	2.5	2.5	2.2	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	2.1	2.5
20-Jan	1.9	Z	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2	2.4	2.4	2.0	2.4
21-Jan	2.3	2.2	Z	2.3	2.3	2.3	2.2	2.3	2.4	2.5	2.3	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.5
22-Jan	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	2.0	2.1	2.1	2.1	2.0	1.9	2.1
23-Jan	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0
24-Jan	1.9	Z	1.8	1.8	1.9	2.2	2.2	2.1	1.9	1.9	1.9	1.9	1.9	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
25-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.8	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	2.0
26-Jan	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	2.0	1.9	1.9	2.0	1.9	2.0
27-Jan	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	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	2.1	2.1	2.2	2.0	2.2
28-Jan	2.2	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.2	1.9	1.9	1.9	1.9	1.9	2.1	2.2
29-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
30-Jan	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
31-Jan	1.9	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.2	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.2
	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.5	2.2	2.5	2.5	2.4	2.5	2.4	2.5	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.6	3.1	2.7	2.4	2.3	2.4	2.4	Diurnal Maximum	

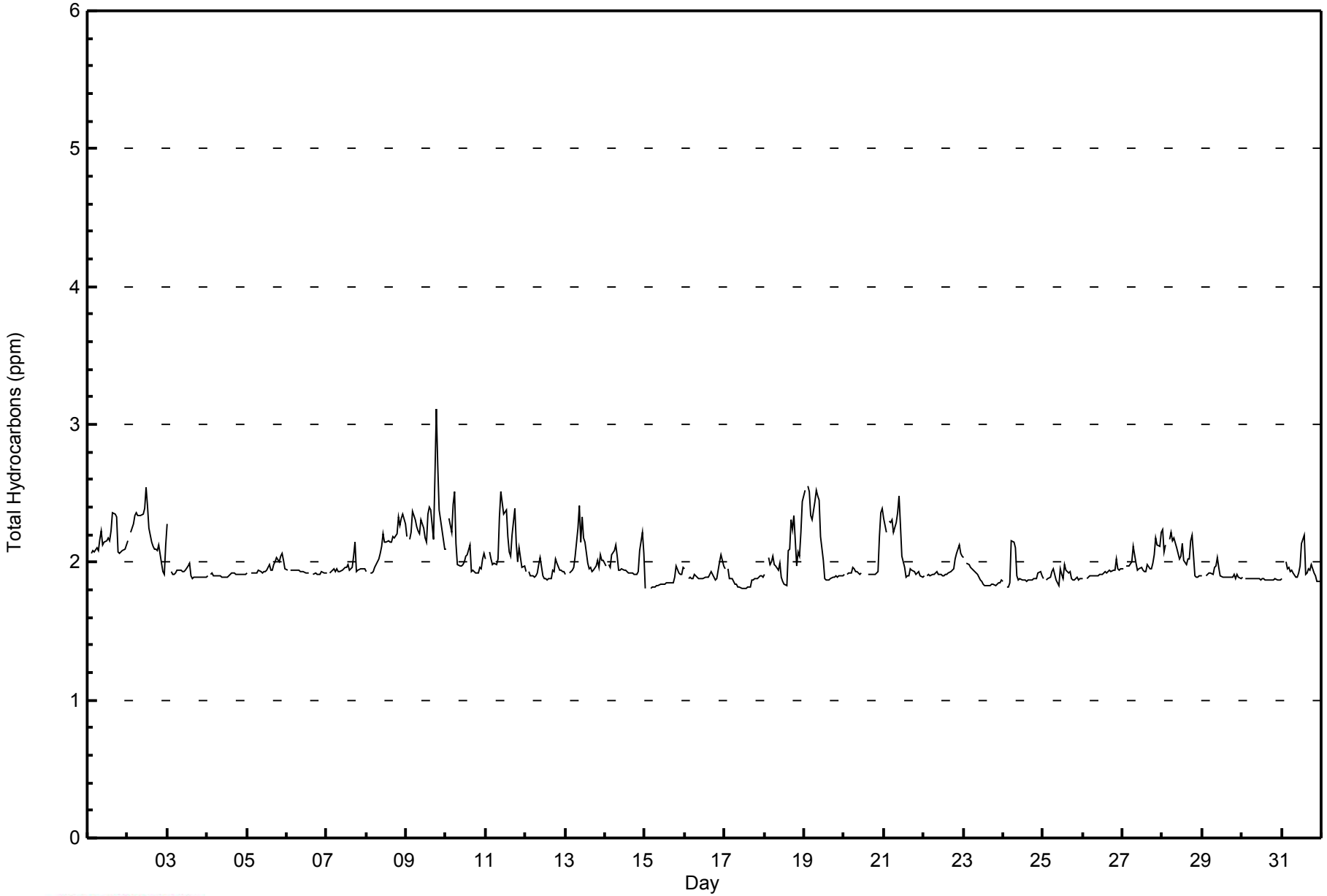
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	531	75.11	75.11
2.1 - 3.0	175	24.75	99.86
3.1 - 10.0	1	0.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2014

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	73	14	1	7	5	21	69	33	17	27	54	43	33	51	34	49	531
2.1 - 3.0	18	3	1	2	1	6	35	27	12	12	12	0	2	3	9	32	175
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	91	17	2	9	6	27	104	60	29	39	66	43	35	54	43	82	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

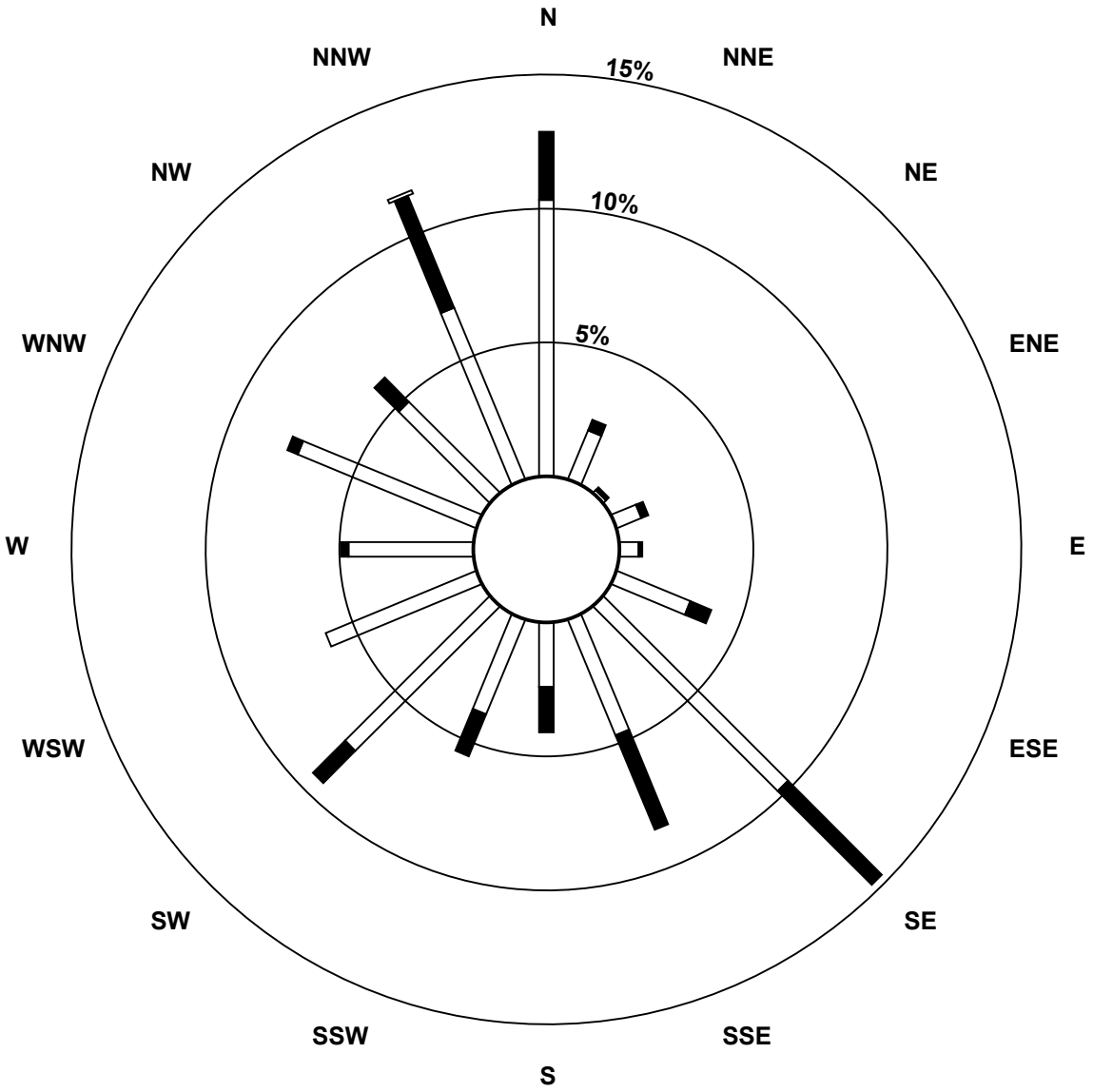
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

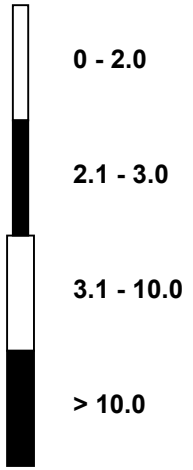
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Patricia McInnes (AMS 6)



Classes (ppm)



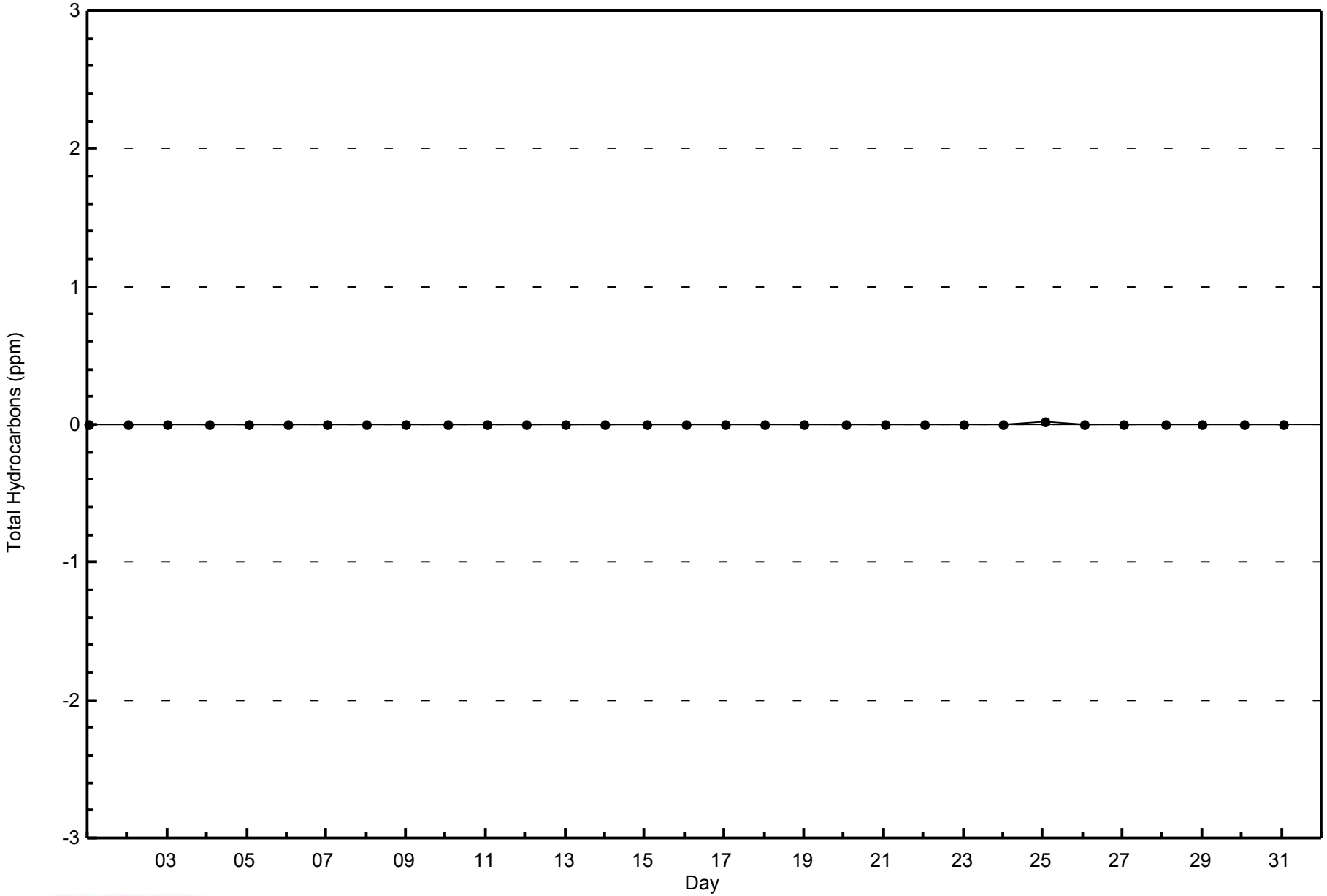
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2014



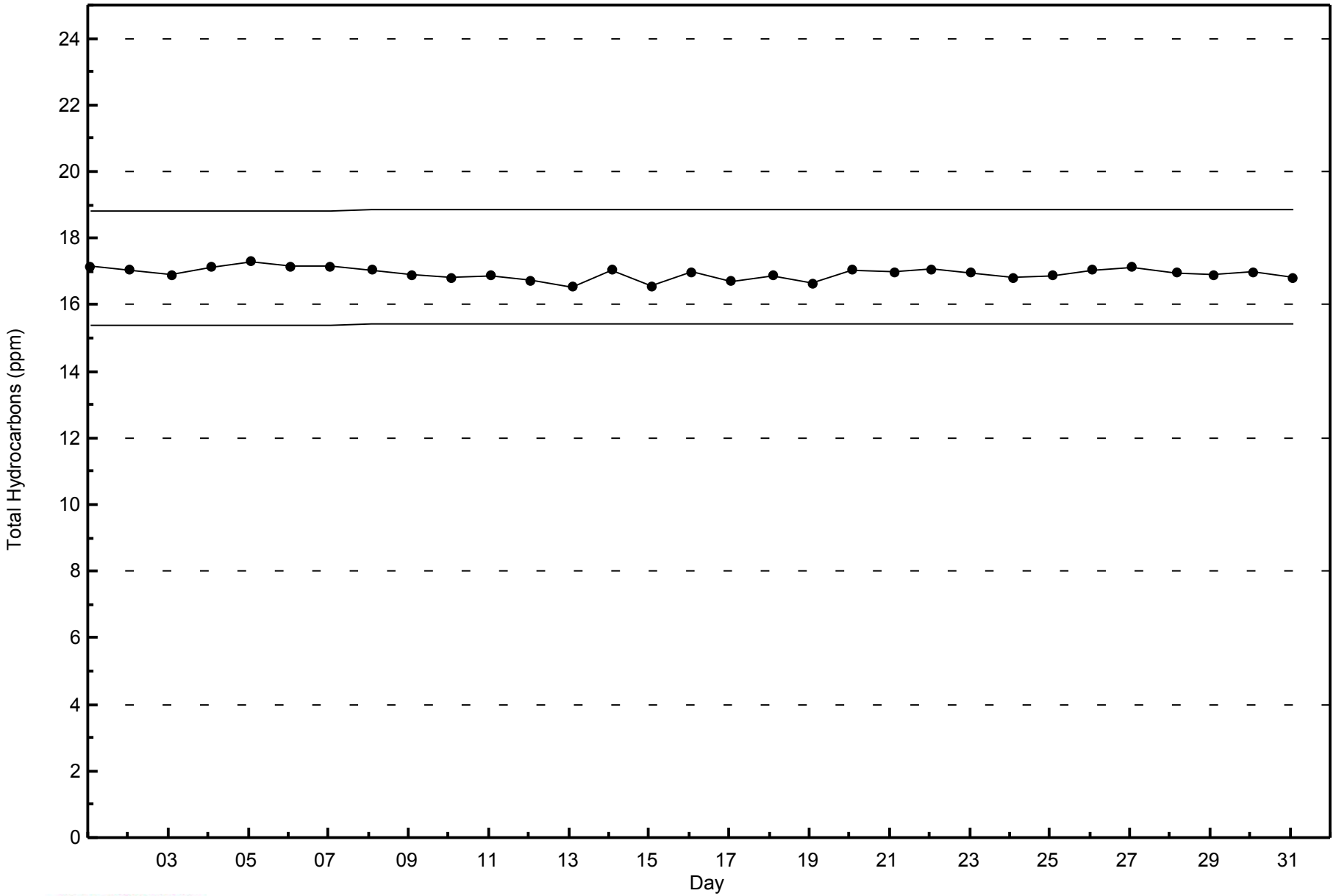
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2014

Maximum Value: 0.499 ppm on Jan 9 19:00

Maximum Daily Average: 0.132 ppm on Jan 19

Minimum Value: 0.000 ppm on Jan 1 01:00

Minimum Daily Average: 0.000 ppm on Jan 23

Maximum Diurnal Average: 0.088 ppm at hour 2

Minimum Diurnal Average: 0.014 ppm at hour 12

Monthly Average: 0.025 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 in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.000	Z	0.000	0.000	0.000	0.005	0.000	0.000	0.019	0.012	0.005	0.006	0.050	0.016	0.062	0.171	0.141	0.140	0.020	0.000	0.000	0.000	0.000	0.000	0.028	0.171
2-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.014	0.021	0.012	0.000	0.000	0.004	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.104	0.007	0.104
3-Jan	0.084	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.084
4-Jan	0.000	Z	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	0.000	0.000	0.000	0.000	0.000	0.002
5-Jan	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	0.033	0.000	0.000	0.013	0.006	0.006	0.000	0.005	0.000	0.000	0.000	0.003	0.033
6-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.002	0.002	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	0.004
7-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.090	0.170	0.000	0.000	0.007	0.000	0.000	0.000	0.013	0.170
8-Jan	0.000	Z	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.005	0.054	0.020	0.006	0.013	0.002	0.000	0.015	0.000	0.018	0.136	0.069	0.097	0.104	0.027	0.025	0.136
9-Jan	0.000	Z	0.007	0.001	0.078	0.004	0.008	0.000	0.000	0.067	0.019	0.000	0.006	0.187	0.062	0.095	0.023	0.197	0.499	0.322	0.097	0.003	0.000	0.000	0.073	0.499
10-Jan	0.016	Z	0.160	0.106	0.259	0.338	0.089	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.052	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.010	0.002	0.047	0.338
11-Jan	0.004	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.059	0.178	0.158	0.130	0.124	0.032	0.014	0.002	0.048	0.111	0.034	0.004	0.050	0.000	0.000	0.000	0.041	0.178
12-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.030	0.065	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.010	0.085	0.031	0.002	0.000	0.000	0.000	0.015	0.096
13-Jan	0.000	Z	0.004	0.006	0.000	0.000	0.000	0.139	0.270	0.061	0.185	0.125	0.084	0.002	0.000	0.033	0.000	0.004	0.018	0.027	0.000	0.083	0.049	0.034	0.049	0.270
14-Jan	0.002	Z	0.000	0.000	0.027	0.034	0.081	0.056	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.060	0.040	0.013	0.081
15-Jan	0.000	Z	UO	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.032	0.004	0.000	0.000	0.000	0.002	0.032
16-Jan	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.009	0.004	0.020	0.034	0.000	0.000	0.000	0.029	0.058	0.095	0.006	0.011	0.095
17-Jan	0.008	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	0.001	0.000	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.039
18-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.049	0.000	0.000	0.000	0.000	0.200	0.121	0.220	0.234	0.320	0.042	0.102	0.094	0.203	0.362	0.085	0.362
19-Jan	0.415	Z	0.437	0.387	0.266	0.202	0.246	0.315	0.309	0.295	0.139	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.132	0.437
20-Jan	0.000	Z	0.000	0.003	0.000	0.006	0.007	0.002	0.000	0.001	0.000	C	C	C	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.101	0.231	0.237	0.030	0.237
21-Jan	0.217	0.176	Z	0.200	0.199	0.211	0.155	0.171	0.175	0.379	0.253	0.057	0.004	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.096	0.379
22-Jan	0.000	Z	0.000	0.000	0.000	0.002	0.000	0.003	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.019	0.010	0.051	0.000	0.000	0.004	0.051
23-Jan	0.000	Z	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	0.000	0.000	0.000	0.000	0.001
24-Jan	0.000	Z	0.001	0.000	0.010	0.112	0.146	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.146
25-Jan	0.000	Z	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.002	0.003	0.000	0.092	0.051	0.000	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.092
26-Jan	0.000	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	0.002	0.007	0.002	0.007	0.006	0.089	0.016	0.000	0.003	0.006	0.089
27-Jan	0.000	Z	0.004	0.008	0.003	0.023	0.121	0.075	0.023	0.006	0.003	0.010	0.000	0.000	0.000	0.004	0.000	0.007	0.016	0.046	0.042	0.000	0.000	0.006	0.017	0.121
28-Jan	0.000	0.000	0.000	Z	0.007	0.013	0.019	0.064	0.017	0.007	0.002	0.002	0.014	0.008	0.000	0.013	0.007	0.102	0.134	0.000	0.000	0.000	0.000	0.000	0.018	0.134
29-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.006	0.012	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.040
30-Jan	0.000	Z	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	0.000	0.000	0.002
31-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.012	0.003	0.000	0.000	0.001	0.000	0.144	0.168	0.000	0.007	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.168
	0.024	0.088	0.021	0.024	0.027	0.031	0.029	0.033	0.031	0.039	0.027	0.014	0.016	0.019	0.015	0.016	0.024	0.032	0.038	0.022	0.017	0.016	0.024	0.026	Diurnal Average	
	0.415	0.176	0.437	0.387	0.266	0.338	0.246	0.315	0.309	0.379	0.253	0.130	0.144	0.187	0.200	0.171	0.220	0.234	0.499	0.322	0.102	0.101	0.231	0.362	Diurnal Maximum	

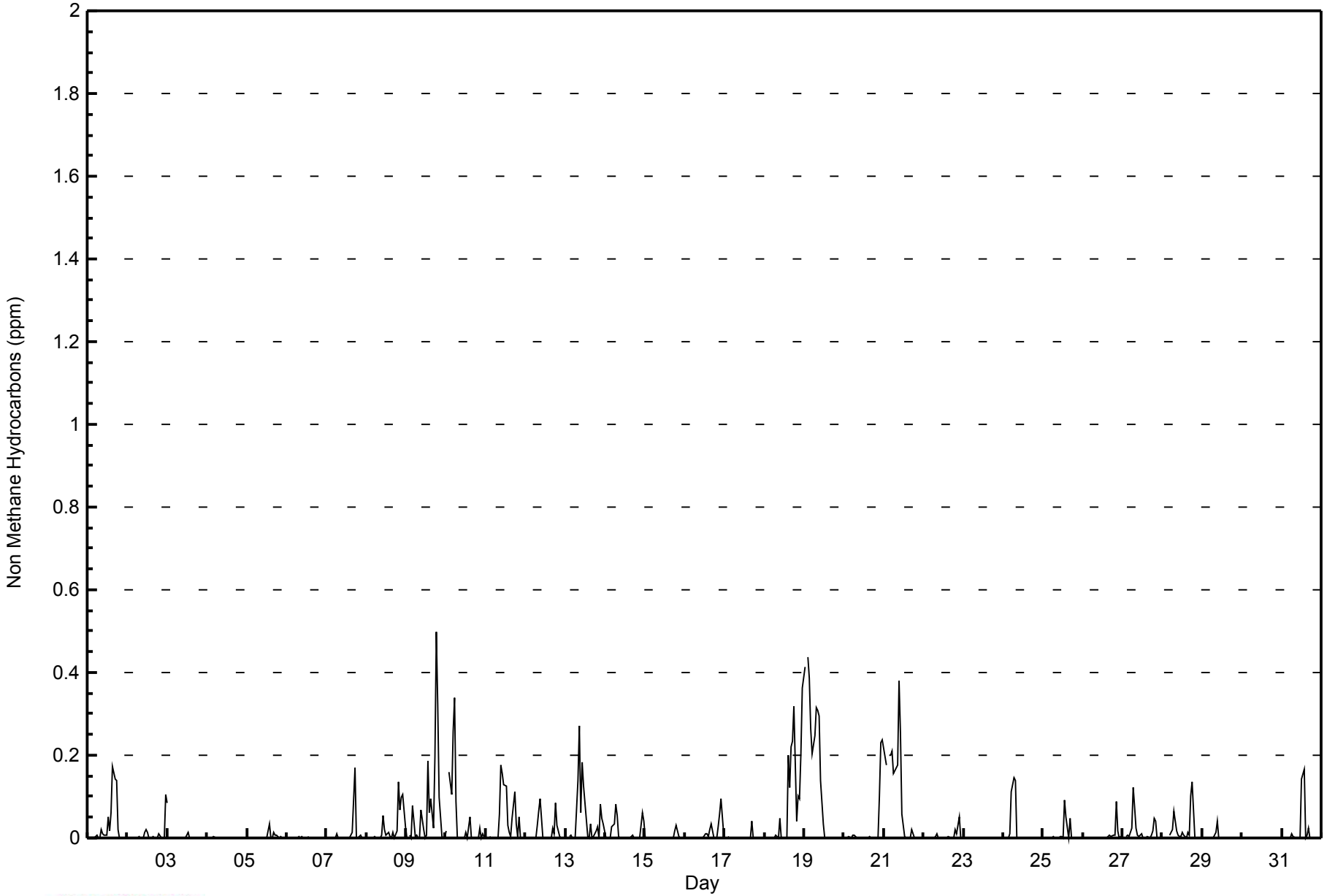
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

WBEA NETWORK

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2014



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ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	512	72.42	72.42
0.006 - 0.05	103	14.57	86.99
0.06 - 0.1	51	7.21	94.20
> 0.1	41	5.80	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	65	11	1	7	5	21	73	35	16	27	60	40	32	48	29	42	512
0.006 - 0.05	11	4	1	0	1	2	21	18	10	10	4	3	0	3	6	9	103
0.06 - 0.1	9	1	0	0	0	4	7	7	2	1	2	0	1	0	2	15	51
> 0.1	6	1	0	2	0	0	3	0	1	1	0	0	2	3	6	16	41
Totals	91	17	2	9	6	27	104	60	29	39	66	43	35	54	43	82	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

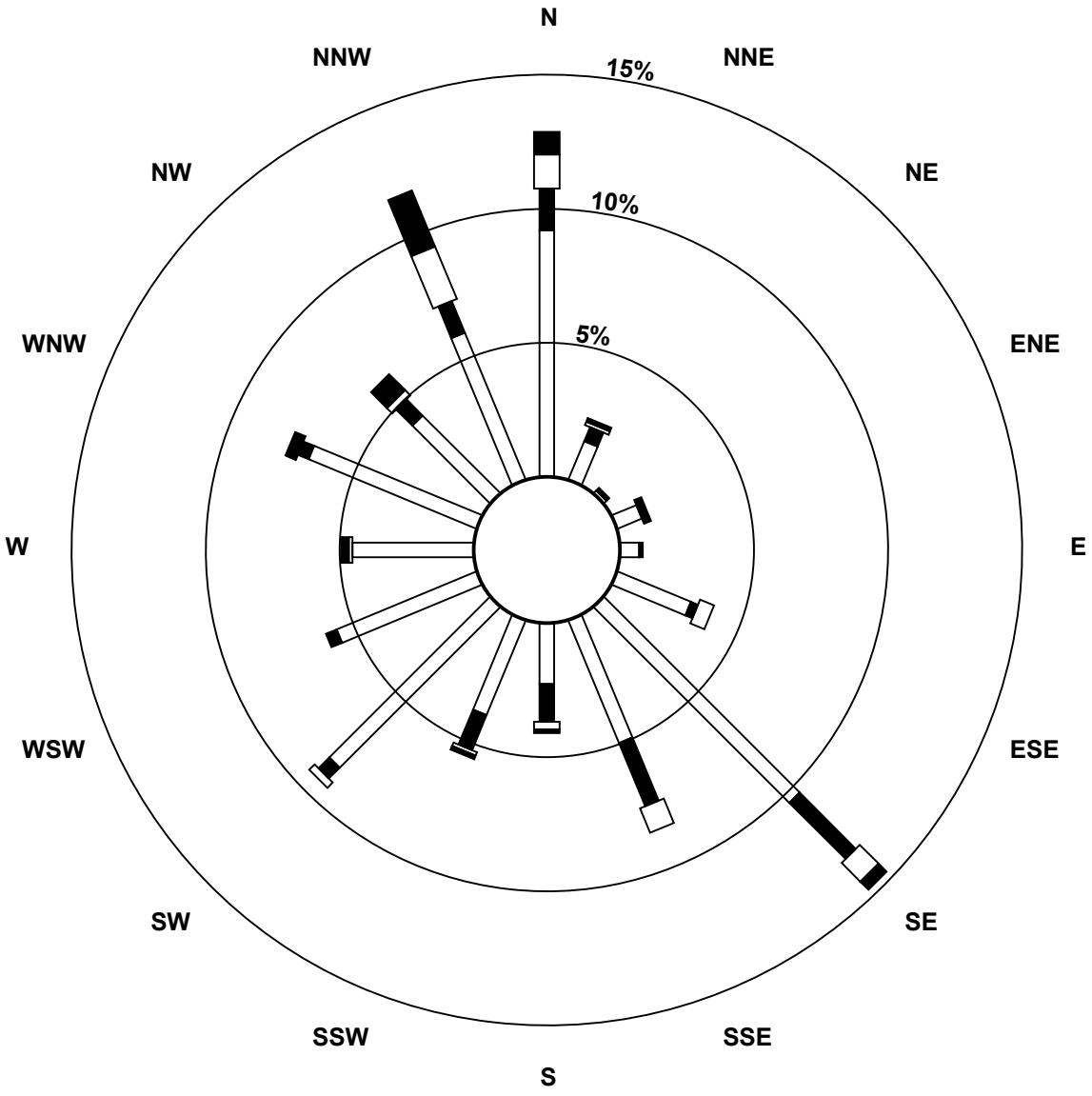
AURORA ATMOSPHERICS INC.

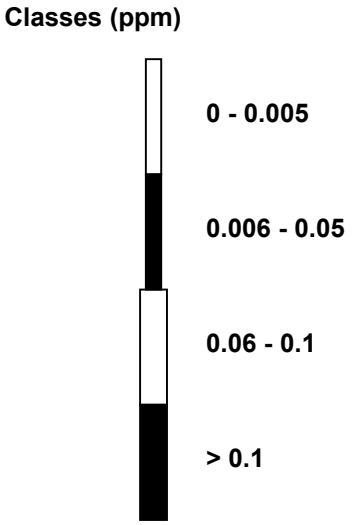
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes (AMS 6)





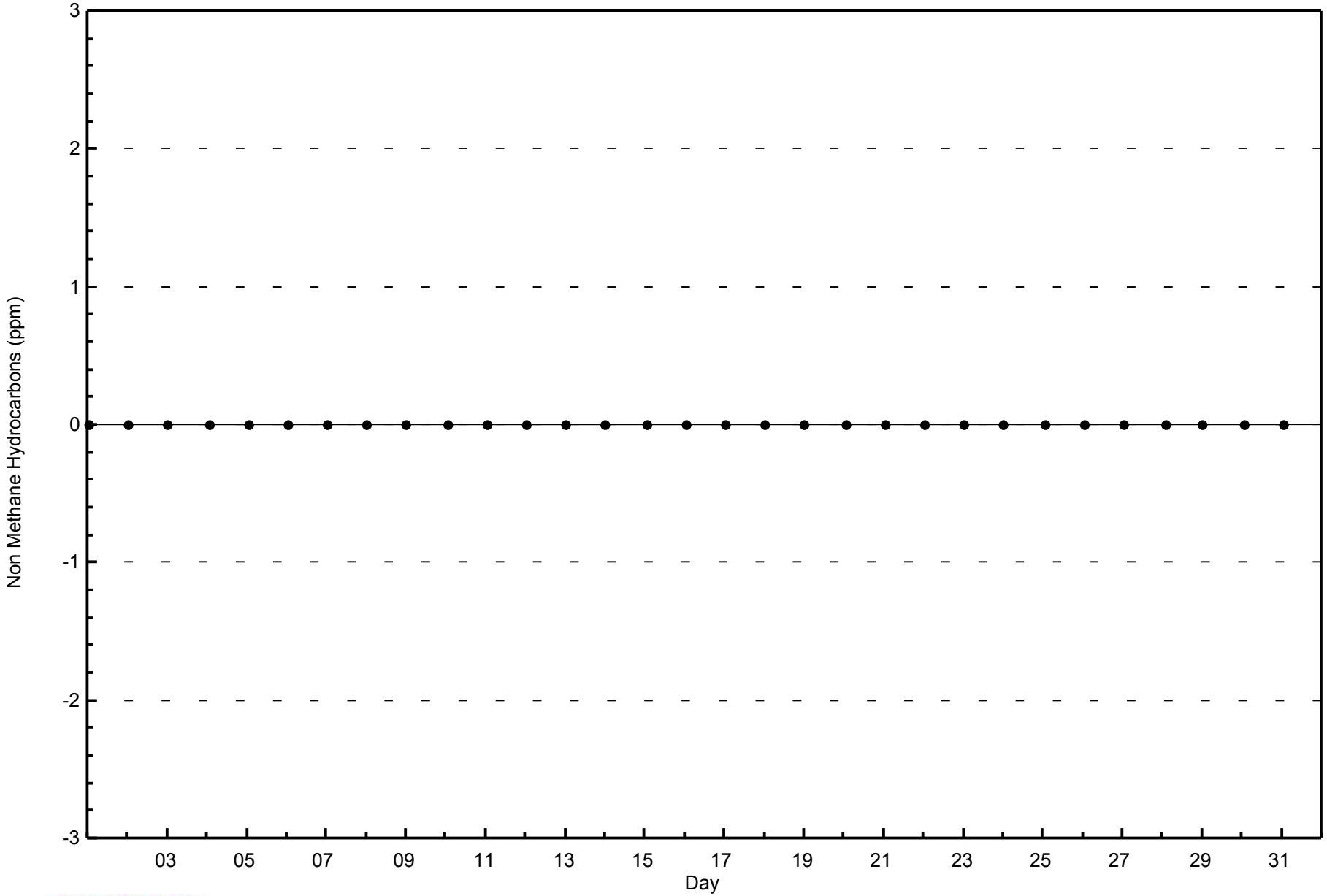
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2014



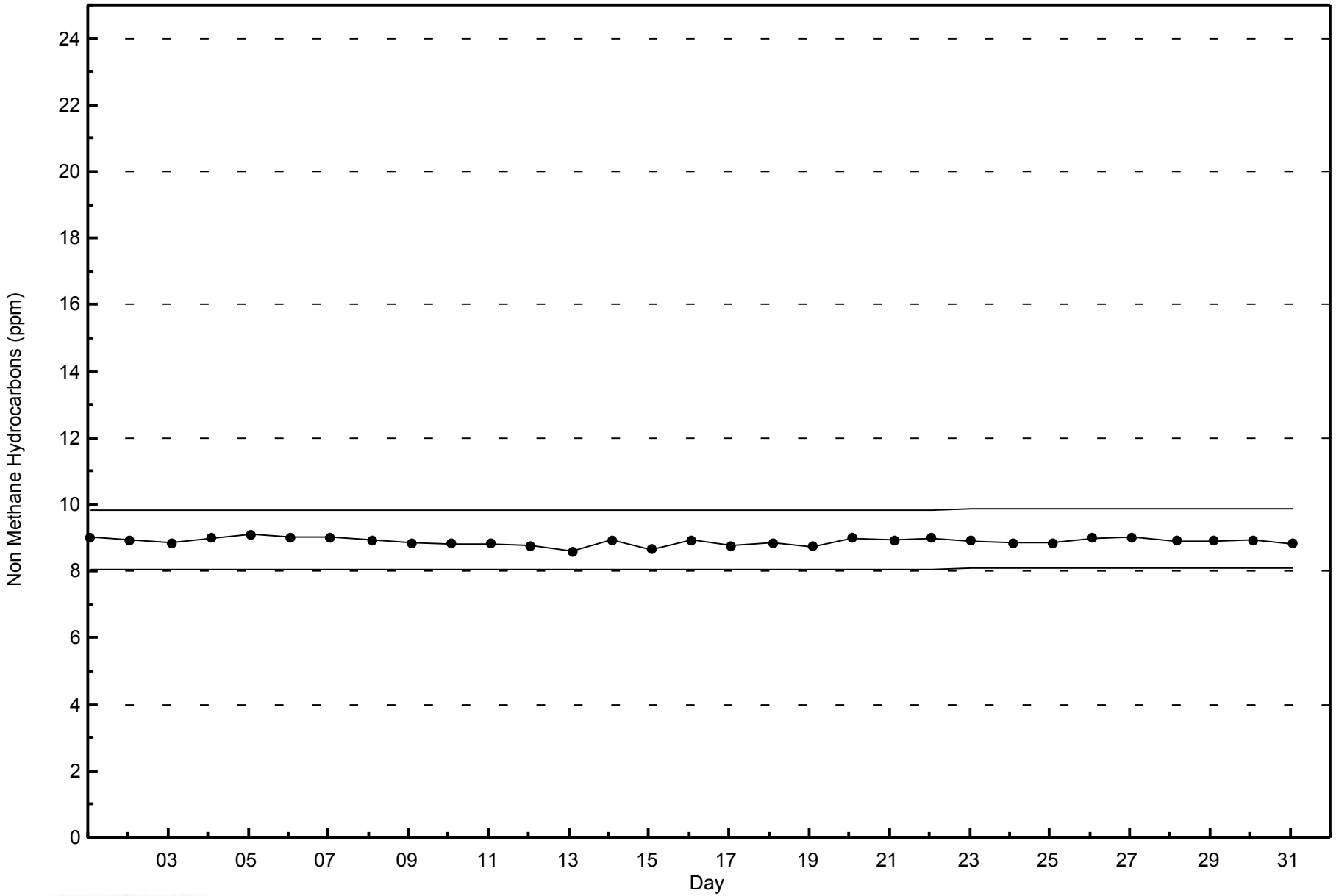
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.6 ppm on Jan 9 19:00 Maximum Daily Average: 2.3 ppm on Jan 9

Minimum Value: 1.8 ppm on Jan 15 01:00 Minimum Daily Average: 1.9 ppm on Jan 15
Maximum Diurnal Average: 2.1 ppm at hour 2 Minimum Diurnal Average: 1.9 ppm at hour 16
Monthly Average: 1.97 ppm Percentiles: P_1 = 1.8 P_{10} = 1.9 Q_1 = 1.9 Median = 1.9 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.1	Z	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	2.2	2.2	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2
2-Jan	2.2	Z	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	1.9	1.9	2.0	2.2	2.5
3-Jan	2.2	Z	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	1.9	2.2
4-Jan	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
5-Jan	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	2.1	2.0	2.0	2.0	2.1
6-Jan	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	M	M	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
7-Jan	1.9	Z	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0
8-Jan	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.1	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	2.3	2.1	2.3
9-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.1	2.4	2.6	2.4	2.3	2.2	2.2	2.1	2.3	2.6
10-Jan	2.1	Z	2.2	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.2
11-Jan	2.0	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.2	2.3	2.2	2.1	2.0	2.2	2.3	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.3
12-Jan	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	2.0
13-Jan	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	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
14-Jan	2.0	Z	2.0	2.0	2.0	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	2.1	2.2	2.0	2.0	2.2
15-Jan	1.8	Z	UO	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0
16-Jan	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	2.0	2.0	1.9	2.0
17-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
18-Jan	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.9	2.0	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.1
19-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	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	2.0	2.2
20-Jan	1.9	Z	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.1	2.0	2.1
21-Jan	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
22-Jan	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	2.0	2.1	2.1	2.1	2.0	1.9	2.1
23-Jan	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0
24-Jan	1.9	Z	1.8	1.8	1.8	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
25-Jan	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.8	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
26-Jan	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
27-Jan	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.0	2.2
28-Jan	2.2	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	1.9	1.9	1.9	1.9	1.9	2.0	2.2
29-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
30-Jan	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
31-Jan	1.9	Z	2.0	2.0	2.0	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	2.0	1.9	1.9	1.9	1.9	1.9	1.9	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	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.2	2.1	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.2	2.4	2.6	2.4	2.3	2.2	2.2	2.3	Diurnal Maximum	

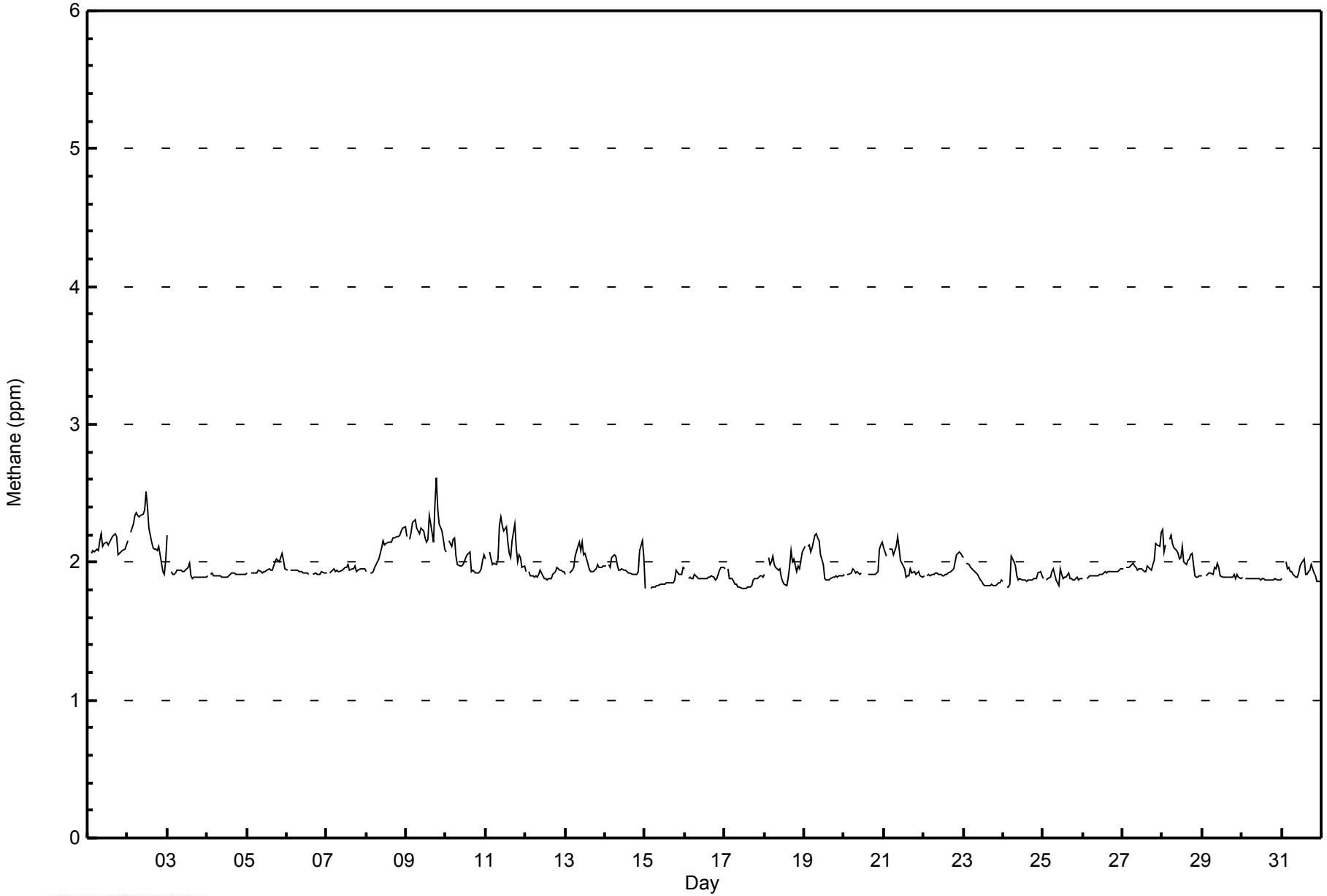
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

WBEA NETWORK

Hourly Averages

Methane (CH_4) - ppm

Patricia McInnes - January 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	556	78.64	78.64
2.1 - 3.0	151	21.36	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Methane (CH_4) - ppm

Patricia McInnes - January 2014

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	75	14	1	8	5	22	71	38	17	28	54	43	33	51	36	60	556
2.1 - 3.0	16	3	1	1	1	5	33	22	12	11	12	0	2	3	7	22	151
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	91	17	2	9	6	27	104	60	29	39	66	43	35	54	43	82	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

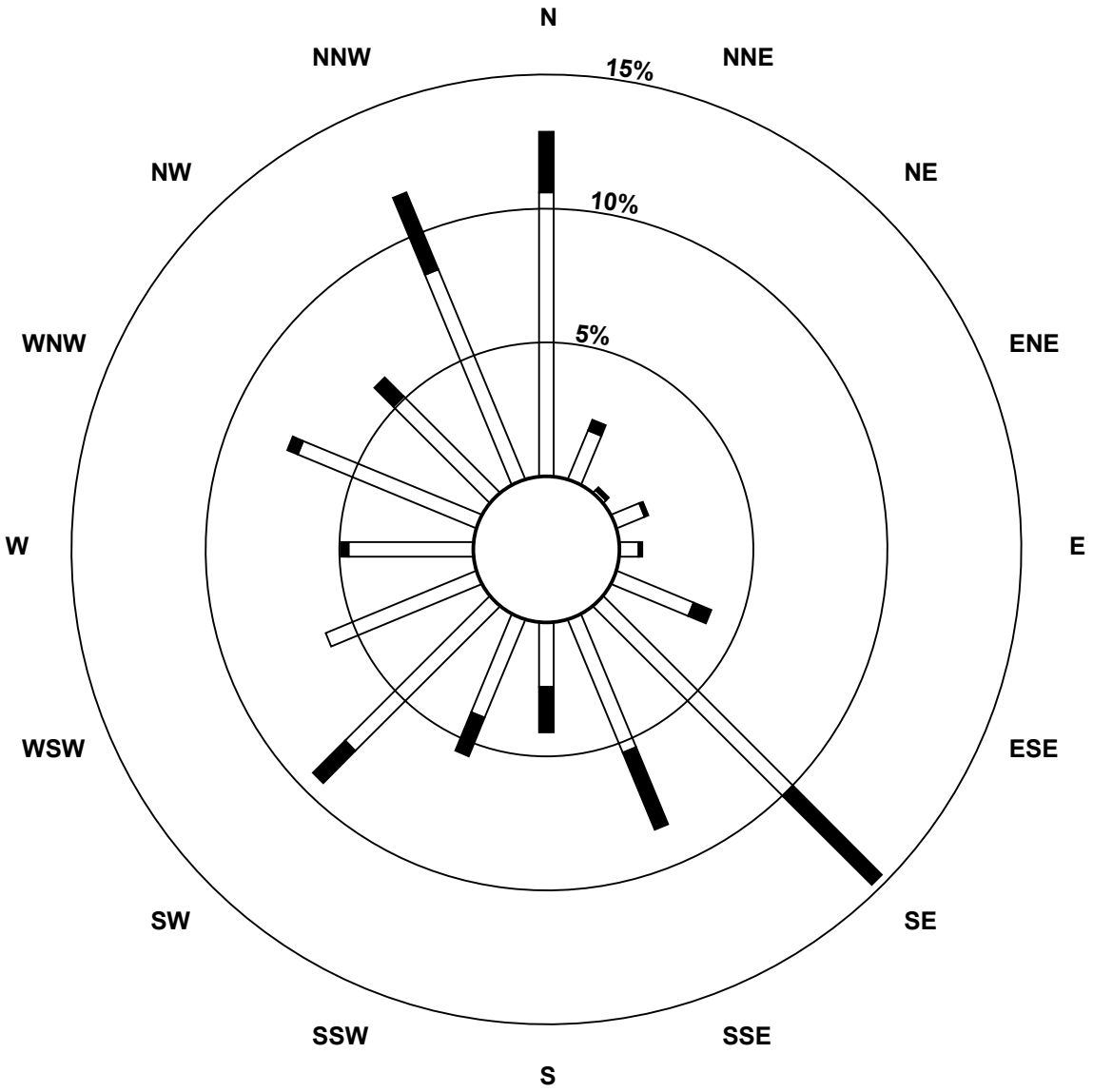
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

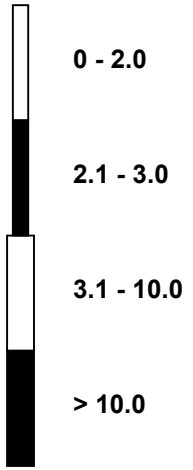
Wind Rose Jan 2014

Methane (CH_4) - ppm

Patricia McInnes (AMS 6)



Classes (ppm)



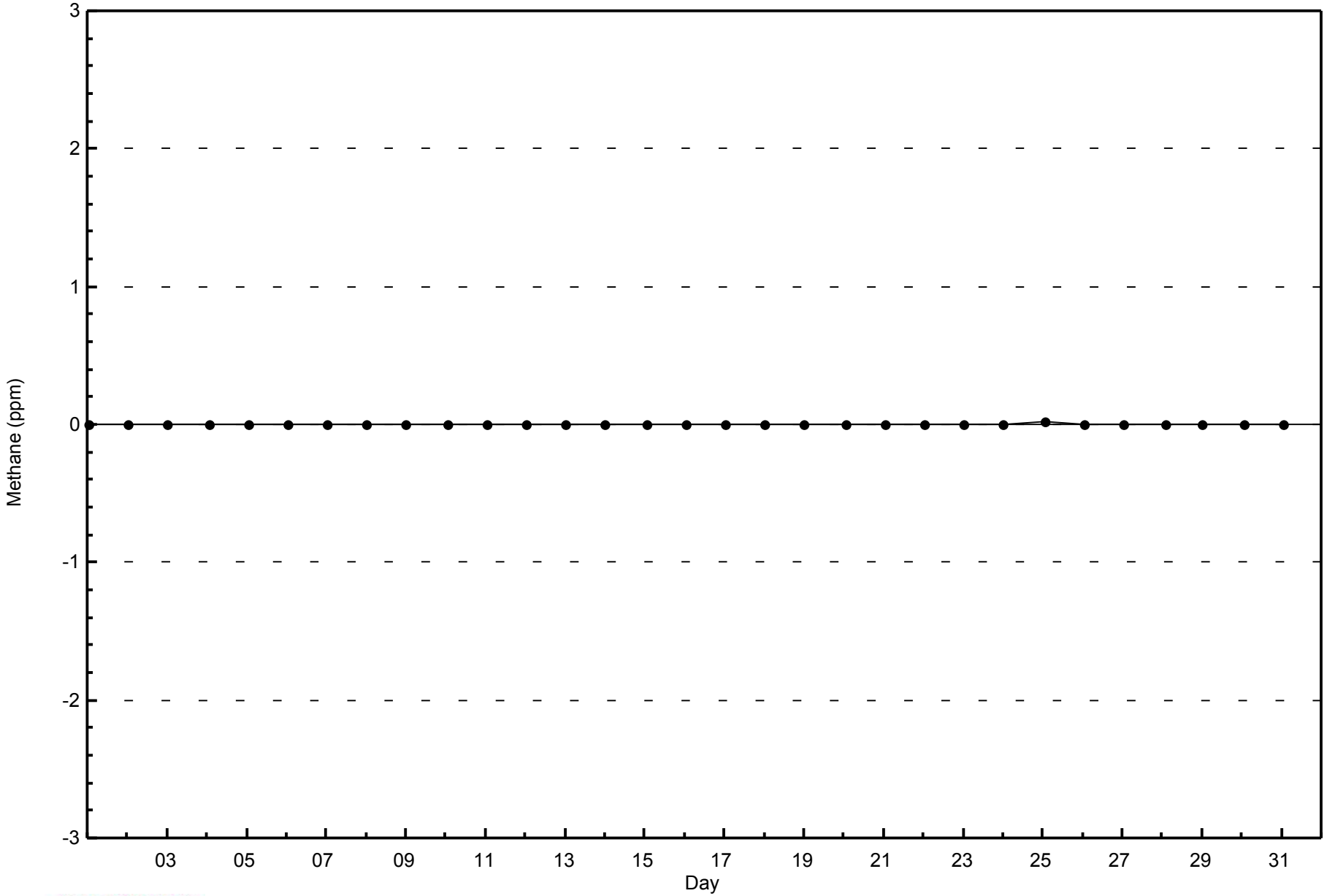
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Methane (CH_4) - ppm

Patricia McInnes - January 2014



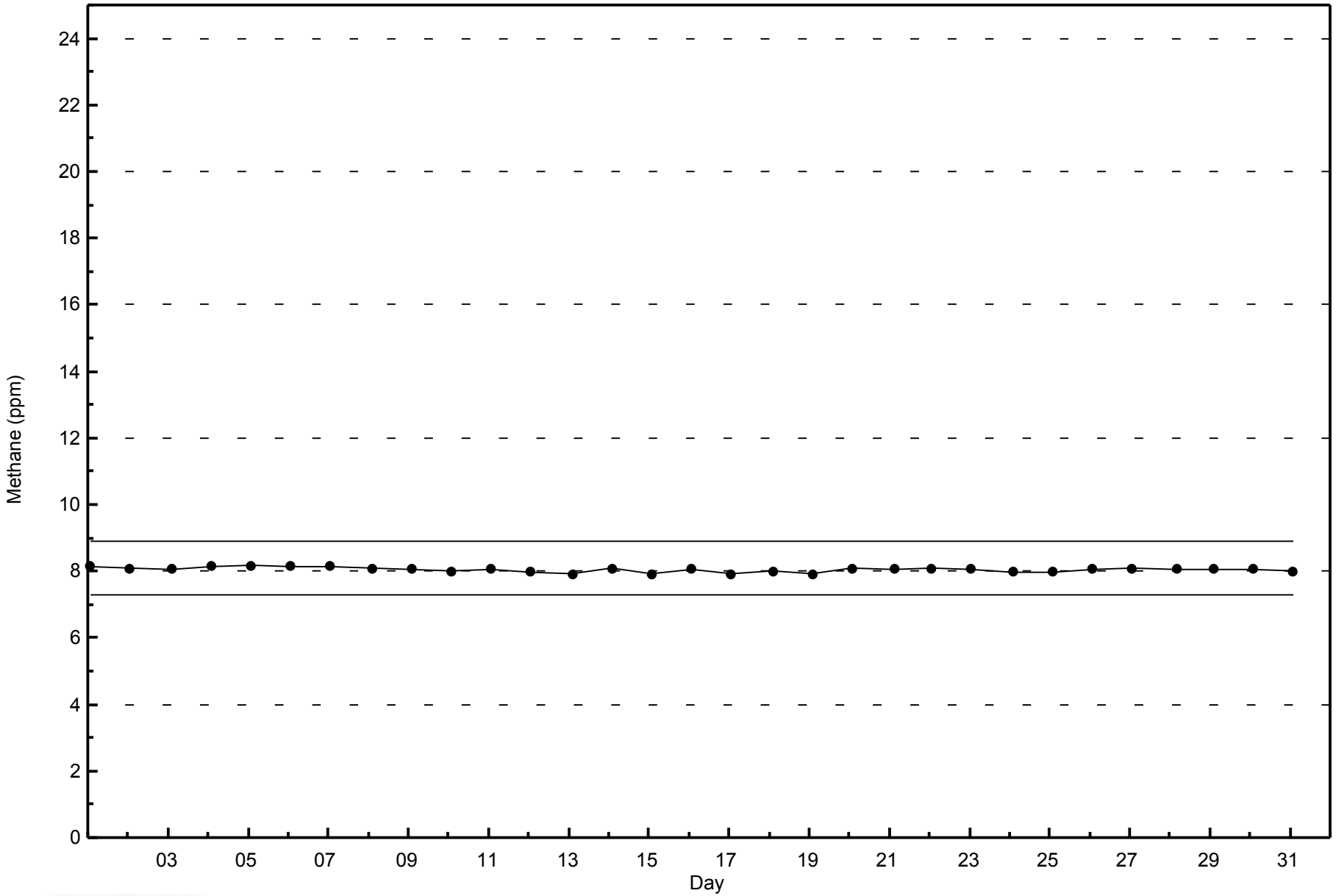
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Methane (CH_4) - ppm

Patricia McInnes - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 42 ppb on Jan 15 04:00 Maximum Daily Average: 36.6 ppb on Jan 15

Minimum Value: 1 ppb on Jan 21 05:00 Minimum Daily Average: 4.4 ppb on Jan 1
Maximum Diurnal Average: 26.1 ppb at hour 15 Minimum Diurnal Average: 2.9 ppb at hour 3
Monthly Average: 21.0 ppb Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 12$ Median = 22 $Q_3 = 30$ $P_{90} = 35$ $P_{99} = 42$

Hours in Service:	744
Hours of Data:	710
Hours of Missing Data:	34
Hours of Calibration:	34
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	1	Z	1	1	1	1	1	1	3	6	8	8	8	5	3	1	1	4	3	6	10	13	13	4.4	13
2-Jan	14	14	Z	14	14	14	13	13	10	8	8	8	8	12	16	17	17	14	12	7	18	27	30	21	14.3	30
3-Jan	12	21	Z	28	26	25	23	25	24	24	25	25	22	22	35	36	36	36	35	35	36	36	36	35	28.6	36
4-Jan	35	35	Z	30	32	33	32	32	33	36	36	36	36	35	31	29	30	30	31	31	31	31	30	30	32.4	36
5-Jan	29	29	Z	31	31	29	29	21	25	29	29	29	29	26	27	27	15	7	2	1	3	4	10	23	21.0	31
6-Jan	25	26	Z	26	26	26	25	26	24	26	27	28	28	29	30	28	27	23	26	28	30	23	25	28	26.4	30
7-Jan	29	30	Z	26	26	26	23	17	19	12	13	20	22	18	21	17	16	9	19	17	19	20	24	25	20.4	30
8-Jan	26	27	Z	30	30	29	25	20	20	15	13	17	15	17	24	23	22	21	10	1	2	2	1	3	17.2	30
9-Jan	12	15	Z	6	1	4	9	10	10	6	10	16	18	15	9	5	4	1	1	3	4	7	12	13	8.3	18
10-Jan	14	12	Z	15	11	4	13	22	23	22	21	20	17	16	16	25	25	26	27	25	22	18	5	7	17.7	27
11-Jan	11	12	Z	7	10	13	9	3	1	2	5	8	8	11	12	12	7	5	9	14	14	16	19	20	10.0	20
12-Jan	25	26	Z	28	29	28	30	29	25	21	30	33	35	35	34	32	13	21	13	7	15	22	26	26	25.4	35
13-Jan	27	26	Z	24	18	19	15	7	1	8	13	16	16	21	22	22	18	19	19	23	25	21	20	14	18.0	27
14-Jan	13	14	Z	13	3	1	1	4	15	17	18	19	20	21	21	20	20	20	20	19	9	5	1	20	13.6	21
15-Jan	39	41	Z	42	42	42	42	42	41	40	40	39	39	40	40	40	40	40	36	22	27	27	23	19	36.6	42
16-Jan	13	26	Z	31	31	33	29	33	34	33	34	33	33	33	30	26	21	24	32	28	15	3	4	16	25.8	34
17-Jan	18	9	Z	31	29	30	36	37	39	40	41	42	41	42	42	41	35	30	29	32	31	29	29	28	33.1	42
18-Jan	24	5	Z	5	6	3	11	7	9	12	28	30	31	33	22	9	6	10	12	17	15	13	10	10	14.2	33
19-Jan	5	7	Z	3	5	6	2	5	4	7	17	23	32	34	33	30	25	23	21	20	22	24	22	20	17.0	34
20-Jan	18	18	Z	16	11	4	2	10	6	15	16	14	17	18	18	16	14	10	12	16	11	1	1	1	11.5	18
21-Jan	1	2	1	Z	1	1	4	1	1	6	14	16	20	28	26	22	11	22	15	19	15	9	26	28	12.5	28
22-Jan	26	26	Z	23	22	23	19	19	17	21	C	C	C	24	24	22	15	14	10	4	4	6	18	27	18.2	27
23-Jan	27	27	Z	26	26	26	25	26	26	27	32	36	39	40	41	40	39	39	38	38	34	31	30	28	32.2	41
24-Jan	28	31	Z	36	32	12	17	22	29	34	30	32	33	33	37	35	33	35	33	33	32	14	11	21	28.3	37
25-Jan	27	31	Z	25	18	16	10	15	27	31	19	20	27	28	26	28	27	27	28	33	36	38	38	36	26.5	38
26-Jan	38	37	Z	36	33	32	28	29	28	29	28	28	27	24	23	20	16	13	12	10	11	11	10	10	23.1	38
27-Jan	9	6	Z	5	4	2	1	2	5	13	15	18	22	26	29	13	12	5	1	1	1	1	1	1	8.5	29
28-Jan	3	8	5	6	Z	3	6	5	3	10	12	11	9	19	14	11	14	10	10	29	30	29	26	27	12.9	30
29-Jan	28	30	Z	27	24	26	24	17	20	20	23	29	31	33	33	31	30	28	29	33	34	30	33	35	28.2	35
30-Jan	34	34	Z	36	35	32	32	31	34	35	36	36	36	36	36	36	35	35	35	35	35	36	36	36	34.8	36
31-Jan	36	31	Z	30	24	25	22	22	30	29	27	27	23	24	30	27	25	23	26	28	30	37	38	38	28.2	38
	20.9	21.2	2.9	21.9	20.0	18.2	18.0	17.9	18.7	20.4	22.2	23.9	24.8	25.8	26.1	24.0	20.8	20.0	19.5	19.7	19.8	18.7	19.7	21.2	Diurnal Average	
	39	41	5	42	42	42	42	42	41	40	41	42	41	42	42	41	40	40	38	38	36	38	38	38	Diurnal Maximum	

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

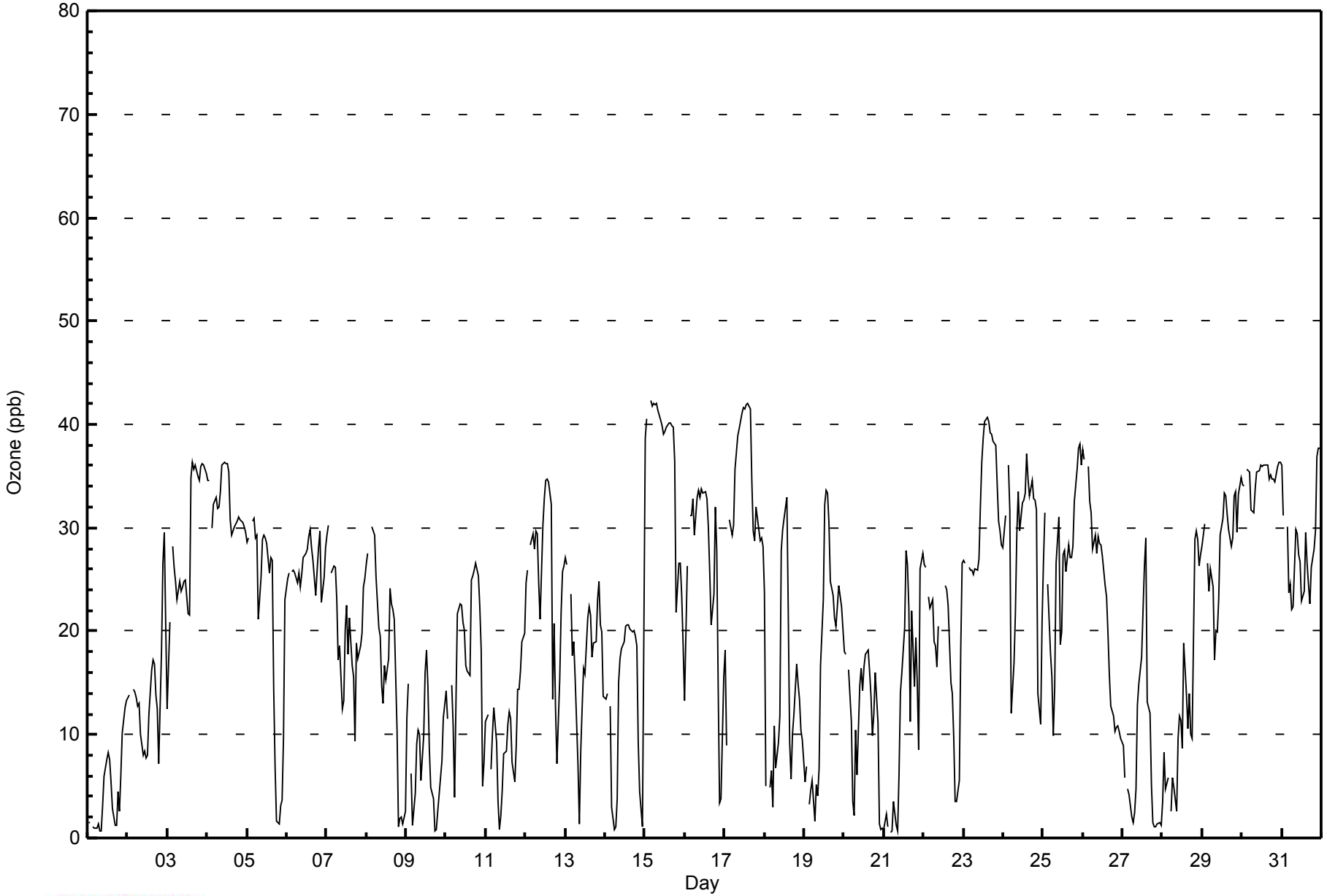
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	322	45.35	45.35
21 - 50	388	54.65	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Ozone (O_3) - ppb

Patricia McInnes - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	31	6	1	4	4	10	74	55	22	23	19	8	4	6	12	43	322
21 - 50	58	10	1	5	2	18	32	6	6	15	46	39	31	48	31	40	388
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	89	16	2	9	6	28	106	61	28	38	65	47	35	54	43	83	710

Total Number of Valid Hours: 710

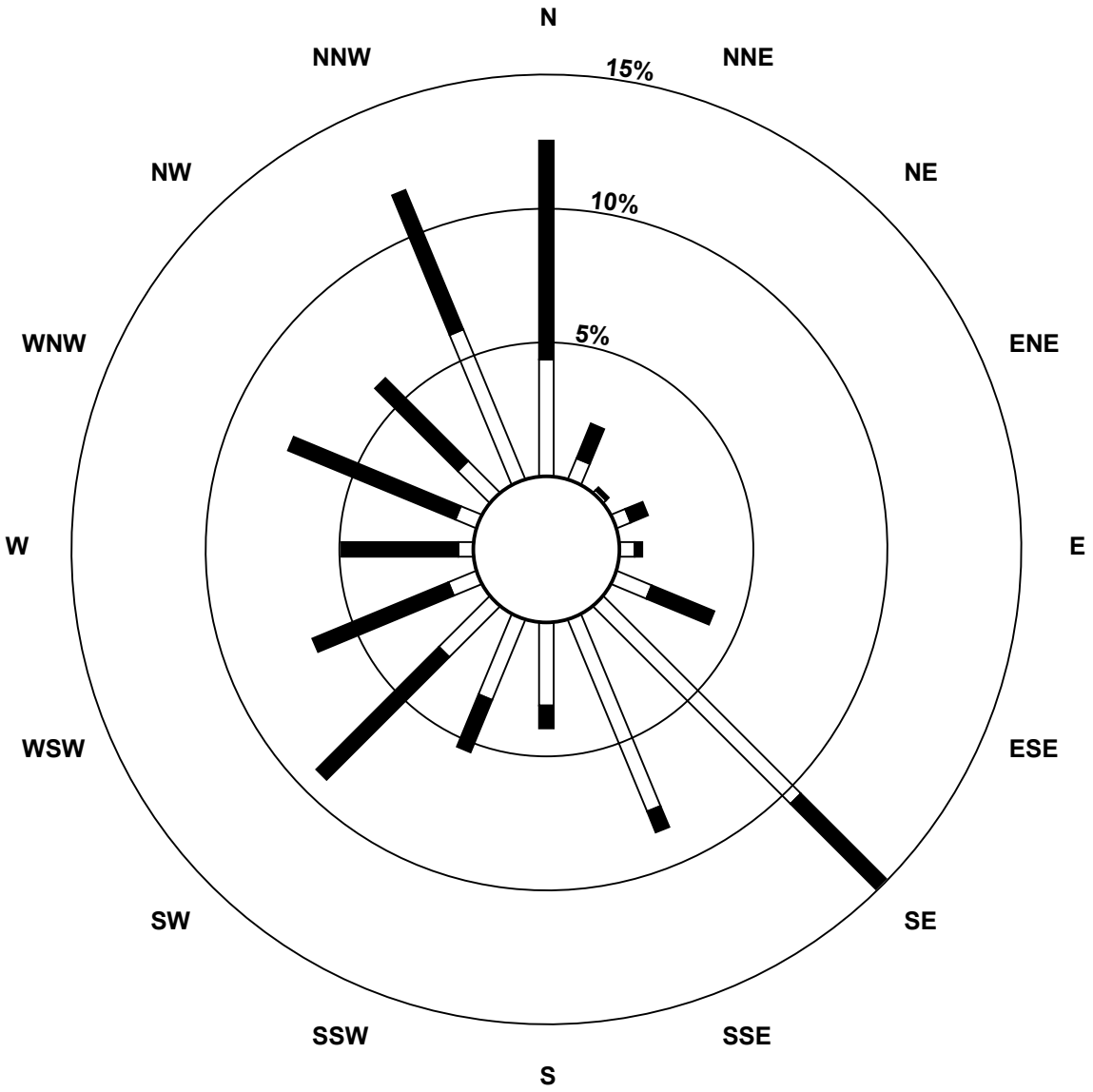
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ozone (O_3) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)

0 - 20

21 - 50

51 - 82

> 83

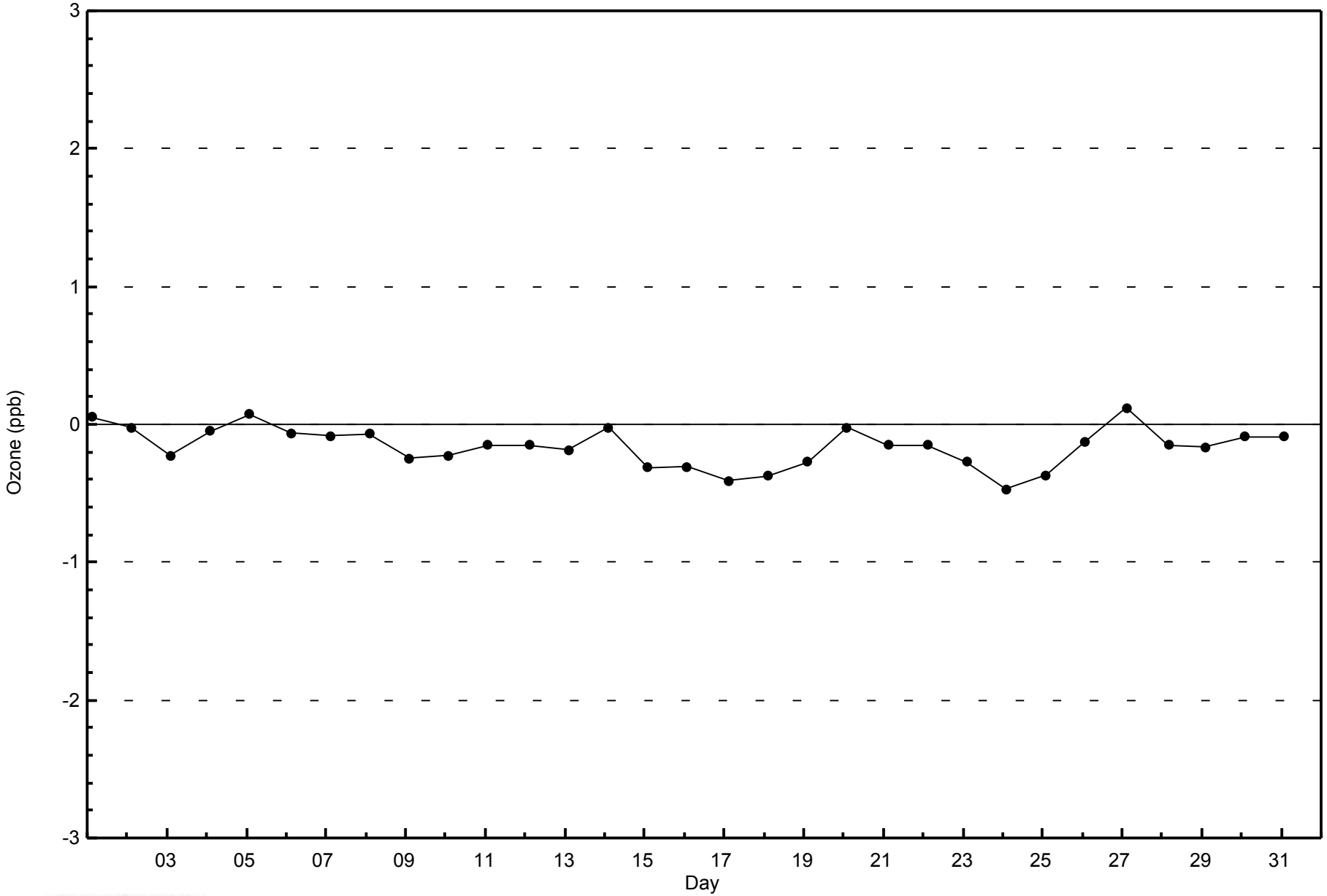
Total Number of Valid Hours: 710

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Patricia McInnes - January 2014



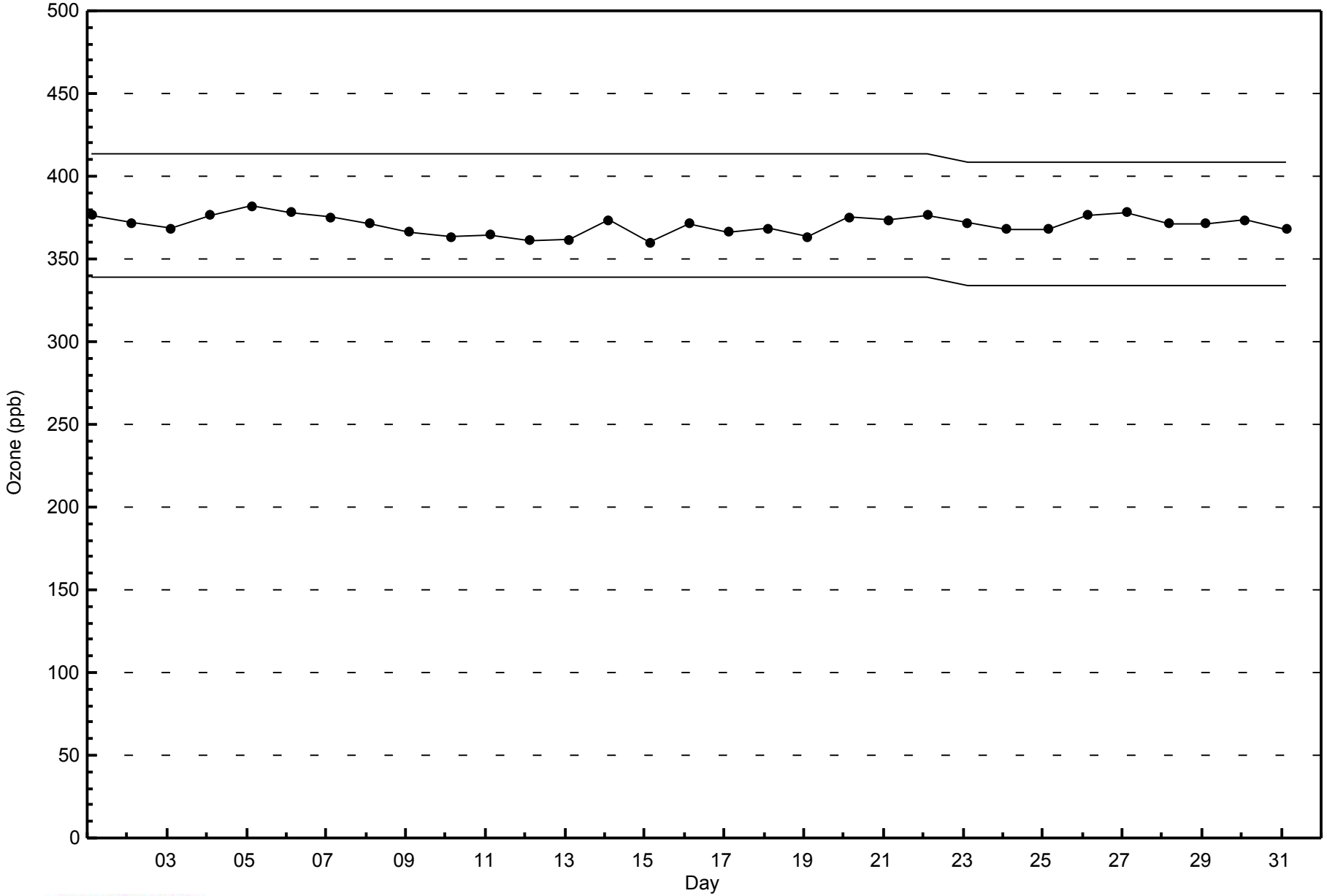
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2014

Maximum Value: 76 ppb on Jan 13 09:00

Maximum Daily Average: 18.4 ppb on Jan 1

Minimum Value: 0 ppb on Jan 3 16:00

Minimum Daily Average: 0.1 ppb on Jan 15

Maximum Diurnal Average: 8.4 ppb at hour 10

Minimum Diurnal Average: 1.6 ppb at hour 4

Monthly Average: 4.8 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 2 $Q_3 = 5$ $P_{90} = 13$ $P_{99} = 43$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	9	Z	8	11	5	14	6	21	22	16	22	27	26	26	28	35	50	48	14	14	12	5	2	1	18.4	50
2-Jan	1	Z	1	1	2	2	3	3	3	7	7	11	9	5	3	2	2	3	8	18	3	1	0	1	4.3	18
3-Jan	1	Z	0	0	0	0	1	0	0	0	1	3	7	7	1	0	0	0	0	0	0	0	0	0	1.0	7
4-Jan	0	Z	1	1	0	1	1	1	1	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0.4	1
5-Jan	0	Z	0	0	0	0	1	3	2	1	1	2	3	5	2	2	7	8	19	23	14	10	4	2	4.7	23
6-Jan	2	Z	1	1	2	3	4	2	4	4	2	2	3	3	3	4	4	7	6	3	3	4	2	2	3.1	7
7-Jan	1	Z	1	1	1	0	0	6	4	27	20	13	7	13	7	7	3	11	5	5	5	4	2	2	6.3	27
8-Jan	1	Z	1	1	2	2	2	3	4	7	13	12	17	9	2	2	1	1	9	32	16	16	21	9	7.9	32
9-Jan	2	Z	2	3	16	8	4	2	2	19	11	3	2	5	12	15	13	13	13	6	2	1	1	1	6.7	19
10-Jan	1	Z	1	1	1	1	2	0	0	0	1	1	5	4	5	0	0	0	0	0	1	2	9	4	1.7	9
11-Jan	2	Z	7	4	4	1	2	5	23	22	20	13	11	7	4	3	3	3	3	2	2	1	1	0	6.2	23
12-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	1	1	16	5	8	11	4	2	1	1	2.3	16
13-Jan	1	Z	1	1	1	1	3	38	76	20	7	7	10	7	6	4	6	3	8	3	1	2	1	2	9.1	76
14-Jan	2	Z	2	1	20	36	48	14	5	3	4	5	4	4	3	3	2	2	2	1	3	8	20	10	8.7	48
15-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0.1	1
16-Jan	1	Z	0	1	1	0	1	1	0	0	0	1	1	1	2	2	4	2	0	1	5	13	12	3	2.3	13
17-Jan	1	Z	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	1	0	0	0.4	2
18-Jan	0	Z	9	8	5	13	2	7	13	58	1	1	1	1	13	12	7	2	3	1	2	1	1	1	7.1	58
19-Jan	2	Z	2	3	5	5	4	5	11	8	3	3	1	1	1	1	1	1	1	1	1	0	0	0	2.6	11
20-Jan	1	Z	2	2	4	11	12	5	9	4	6	11	8	5	5	6	4	4	1	0	1	6	9	14	5.6	14
21-Jan	8	2	Z	3	3	8	5	18	C	C	C	C	C	C	C	C	7	1	6	0	4	8	1	1	--	18
22-Jan	2	Z	1	2	3	2	4	4	7	4	3	4	5	4	4	4	8	8	10	20	22	10	3	0	5.8	22
23-Jan	0	Z	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0.3	1
24-Jan	0	Z	0	0	0	1	2	1	0	0	1	1	1	1	0	0	1	0	0	0	0	2	3	1	0.6	3
25-Jan	1	Z	0	0	2	3	5	4	1	0	3	4	2	1	2	1	1	2	1	1	1	1	0	0	1.6	5
26-Jan	0	Z	0	0	1	1	1	1	3	1	2	3	3	5	4	4	4	2	3	3	1	1	0	1	1.9	5
27-Jan	1	Z	1	3	7	25	37	19	16	12	13	11	8	6	6	16	14	10	45	42	40	21	14	16	16.6	45
28-Jan	11	5	6	Z	11	23	15	19	37	32	19	27	48	14	11	13	4	4	6	2	1	1	1	1	13.5	48
29-Jan	0	Z	0	0	0	0	0	1	1	4	5	3	2	2	2	2	2	2	2	1	0	0	0	0	1.2	5
30-Jan	0	Z	0	0	0	1	1	1	0	0	0	0	1	1	1	0	1	1	1	1	0	0	0	0	0.4	1
31-Jan	0	Z	0	0	0	0	1	2	0	1	3	5	7	6	2	2	2	2	2	0	0	0	0	0	1.5	7
	1.7	3.3	1.6	1.6	3.1	5.3	5.4	5.9	8.2	8.4	5.7	5.7	6.4	4.8	4.3	4.7	5.4	4.7	5.7	6.3	4.6	3.9	3.6	2.3	Diurnal Average	
	11	5	9	11	20	36	48	38	76	58	22	27	48	26	28	35	50	48	45	42	40	21	21	16	Diurnal Maximum	

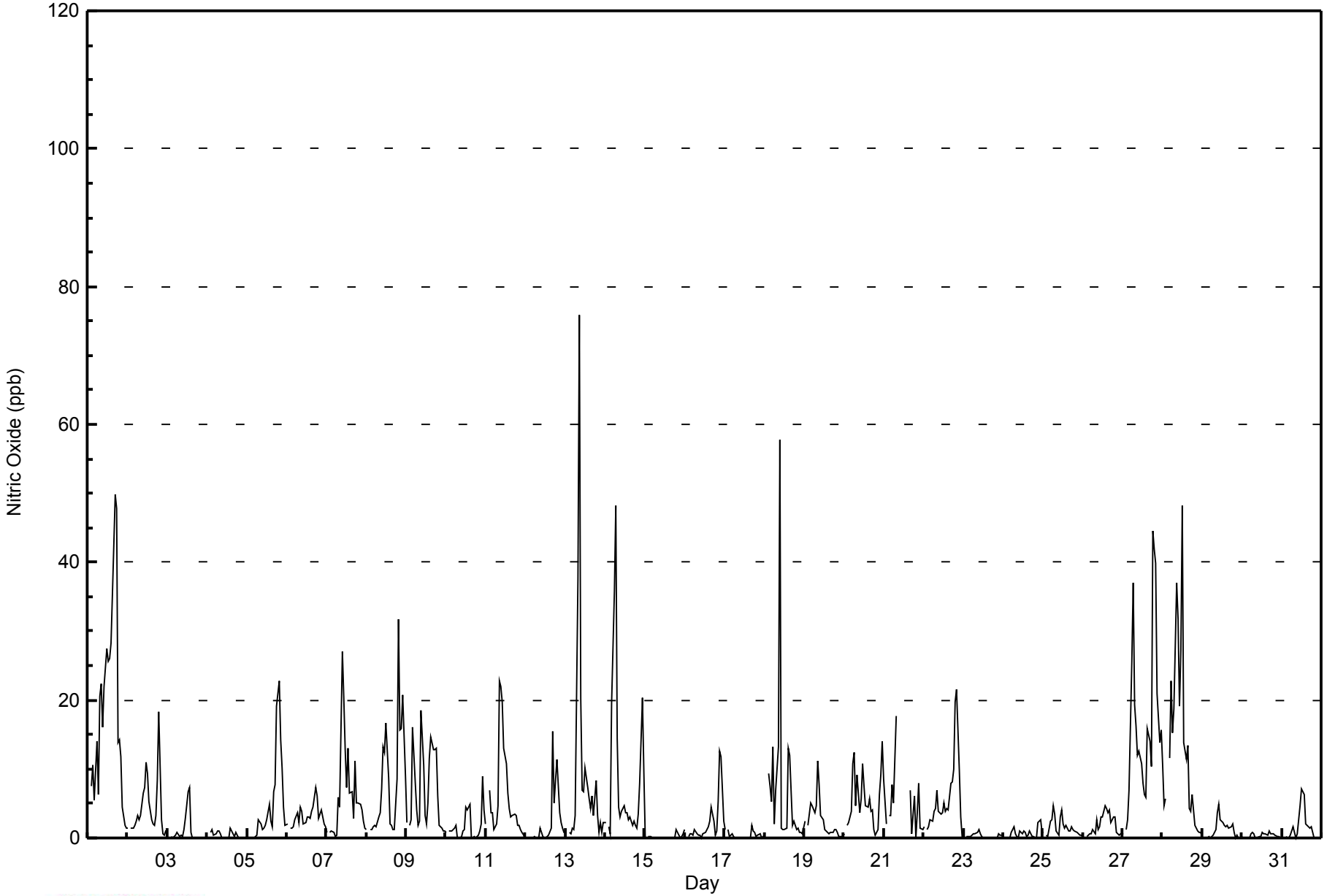
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	672	95.32	95.32
21 - 40	25	3.55	98.87
11 - 80	8	1.13	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	87	13	2	9	5	28	93	51	28	38	66	43	36	52	42	79	672
21 - 40	2	0	0	0	1	1	12	6	1	0	0	0	0	0	1	1	25
11 - 80	0	2	0	0	0	0	1	4	0	1	0	0	0	0	0	0	8
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	89	15	2	9	6	29	106	61	29	39	66	43	36	52	43	80	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

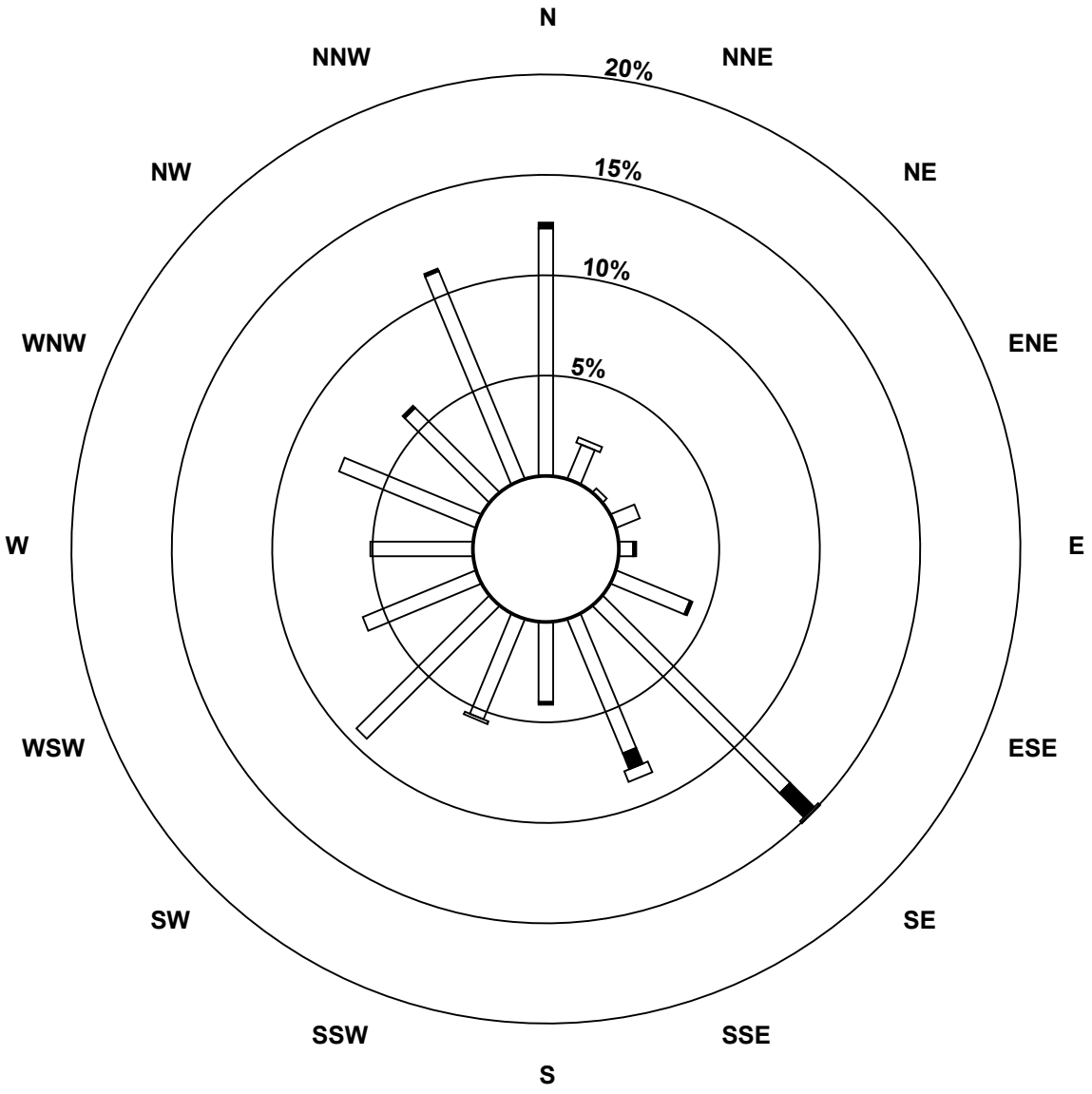
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

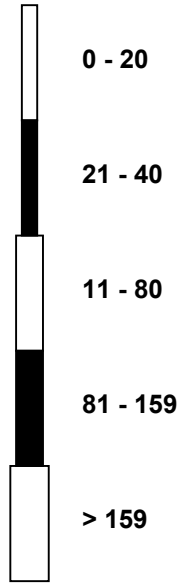
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



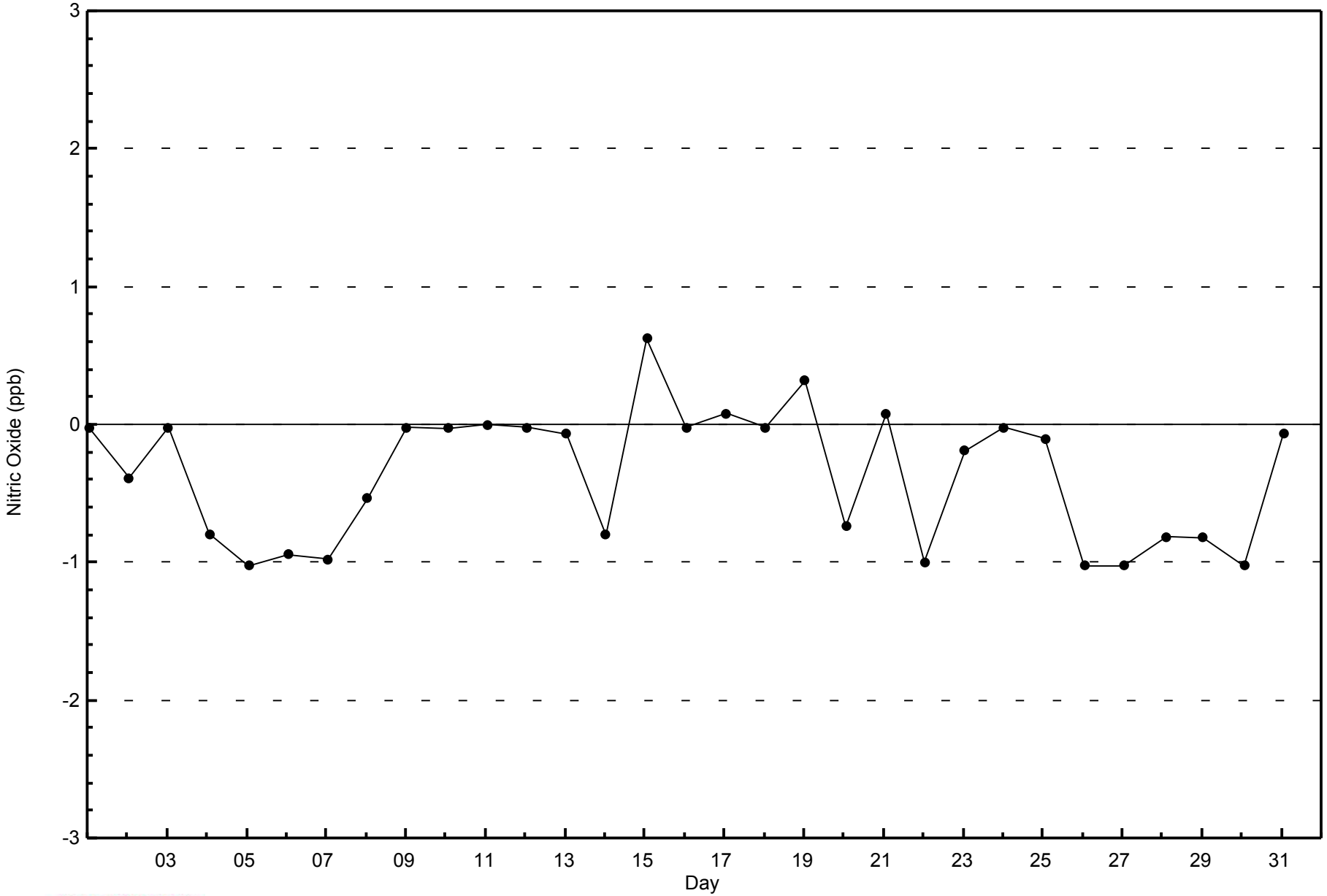
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2014



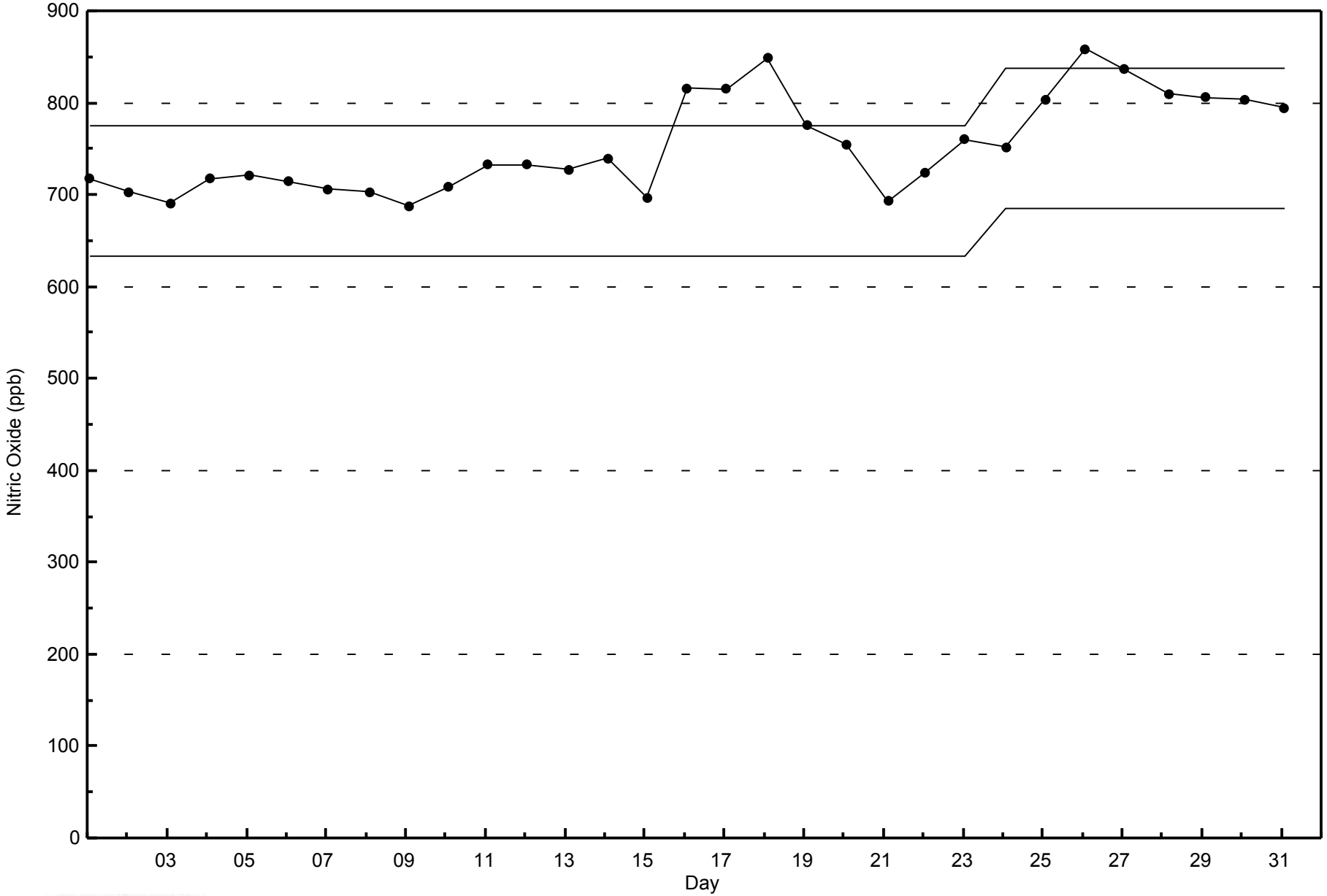
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 43 ppb on Jan 27 21:00 Maximum Daily Average: 24.5 ppb on Jan 27

Minimum Value: 0 ppb on Jan 15 03:00
Maximum Diurnal Average: 25.8 ppb at hour 2
Monthly Average: 10.8 ppb

Minimum Daily Average: 1.9 ppb on Jan 15
Minimum Diurnal Average: 7.3 ppb at hour 14
Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 4$ Median = 8 $Q_3 = 16$ $P_{90} = 24$ $P_{99} = 39$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	17	Z	15	19	15	16	14	17	21	13	13	14	13	14	16	19	22	22	16	18	14	9	6	5	15.1	22
2-Jan	5	Z	6	6	7	9	11	10	13	17	15	15	12	9	5	5	6	9	11	19	8	3	1	8	9.1	19
3-Jan	12	Z	2	2	5	6	7	5	6	3	4	8	11	12	2	1	1	1	1	1	1	1	1	1	3.9	12
4-Jan	1	Z	3	5	3	3	4	3	2	1	1	1	0	1	4	5	3	2	2	1	1	1	1	1	2.1	5
5-Jan	2	Z	1	1	1	3	3	12	8	3	3	3	5	8	6	7	21	30	37	39	33	31	23	9	12.5	39
6-Jan	7	Z	6	5	5	5	7	6	8	7	5	5	5	5	4	7	9	13	8	6	6	14	10	6	6.8	14
7-Jan	4	Z	3	7	3	1	2	9	12	25	18	15	11	17	12	18	16	23	16	17	15	14	9	7	11.9	25
8-Jan	7	Z	7	6	6	6	10	15	15	20	23	19	20	15	5	6	5	6	18	32	28	27	28	24	15.0	32
9-Jan	13	Z	13	16	23	18	12	9	9	16	12	6	4	9	15	19	21	24	23	19	15	13	9	10	14.2	24
10-Jan	9	Z	11	10	14	22	13	3	2	2	2	3	8	8	10	1	1	1	1	2	4	7	21	16	7.4	22
11-Jan	10	Z	19	17	13	9	11	18	23	22	20	16	16	15	14	15	19	21	17	12	13	12	9	9	15.2	23
12-Jan	6	Z	5	4	4	6	4	4	8	10	2	1	0	1	2	5	26	17	24	30	20	11	6	5	8.8	30
13-Jan	4	Z	3	5	11	8	11	24	39	22	16	14	15	11	11	12	17	15	16	11	7	9	6	11	12.9	39
14-Jan	10	Z	12	9	24	34	37	28	15	11	10	8	7	8	8	8	9	9	10	10	19	22	28	15	15.2	37
15-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	12	8	6	6	8	1.9	12
16-Jan	13	Z	3	4	5	3	6	3	2	2	1	2	2	3	6	11	15	13	4	8	22	33	31	17	9.1	33
17-Jan	14	Z	11	3	3	2	1	1	1	1	0	0	0	0	0	0	7	9	8	5	6	8	6	6	3.9	14
18-Jan	7	Z	28	27	23	27	15	19	18	29	3	2	2	3	15	24	26	21	19	15	15	16	18	17	16.9	29
19-Jan	22	Z	19	22	20	20	25	20	17	17	13	10	4	3	3	3	6	6	7	8	7	4	6	6	11.5	25
20-Jan	6	Z	9	10	15	24	26	15	20	11	9	12	10	8	9	12	14	19	15	8	12	25	28	29	15.0	29
21-Jan	27	25	Z	24	23	23	22	25	C	C	C	C	C	C	C	C	25	7	15	5	11	24	6	4	--	27
22-Jan	5	Z	5	7	9	7	12	13	15	10	6	5	6	6	7	10	20	22	27	36	36	31	16	5	13.6	36
23-Jan	4	Z	4	4	4	3	4	4	3	5	3	1	1	1	0	0	0	0	0	0	4	8	7	7	2.9	8
24-Jan	6	Z	0	0	3	20	18	14	10	6	10	6	5	5	3	7	9	7	8	7	7	25	27	16	9.5	27
25-Jan	9	Z	7	9	13	15	16	11	4	1	13	13	6	5	7	6	7	8	8	5	4	3	2	3	7.5	16
26-Jan	3	Z	6	3	5	6	9	7	9	6	7	7	8	12	13	17	22	24	25	23	19	16	14	14	12.0	25
27-Jan	14	Z	18	17	19	25	29	26	24	16	13	11	10	7	8	24	26	34	42	42	43	40	39	38	24.5	43
28-Jan	34	27	29	Z	25	29	25	28	37	28	21	20	29	14	20	24	24	28	29	6	4	5	8	7	21.7	37
29-Jan	6	Z	3	5	7	6	7	14	14	16	13	7	5	4	5	6	8	10	9	5	4	7	3	1	7.0	16
30-Jan	2	Z	2	1	1	5	4	4	2	1	1	1	1	1	2	2	3	3	3	3	3	1	1	1	2.1	5
31-Jan	2	Z	12	6	12	11	11	13	4	5	9	11	16	16	9	12	13	15	10	8	6	1	0	1	8.7	16
	9.1	25.8	8.7	8.4	10.3	12.0	12.1	12.2	12.0	10.8	8.9	7.8	7.7	7.3	7.4	9.4	12.9	13.4	13.8	13.3	12.6	13.6	12.1	9.9	Diurnal Average	
	34	27	29	27	25	34	37	28	39	29	23	20	29	17	20	24	26	34	42	42	43	40	39	38	Diurnal Maximum	

Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

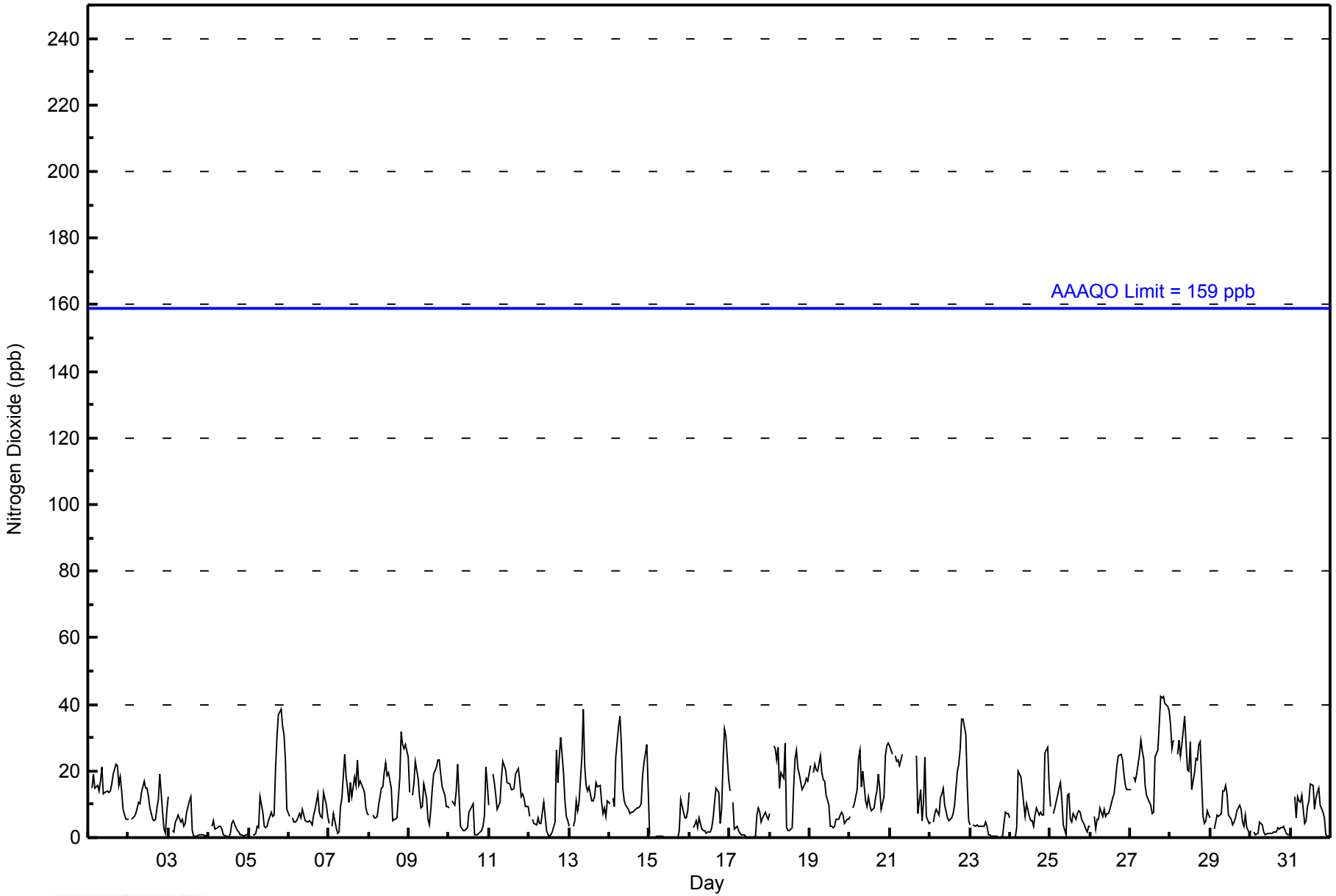
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	599	84.96	84.96
21 - 40	103	14.61	99.57
11 - 80	3	0.43	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	82	13	1	8	5	22	79	36	19	35	66	43	35	52	35	68	599
21 - 40	7	2	1	1	1	7	25	24	10	4	0	0	1	0	8	12	103
11 - 80	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	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	89	15	2	9	6	29	106	61	29	39	66	43	36	52	43	80	705

Total Number of Valid Hours: 705

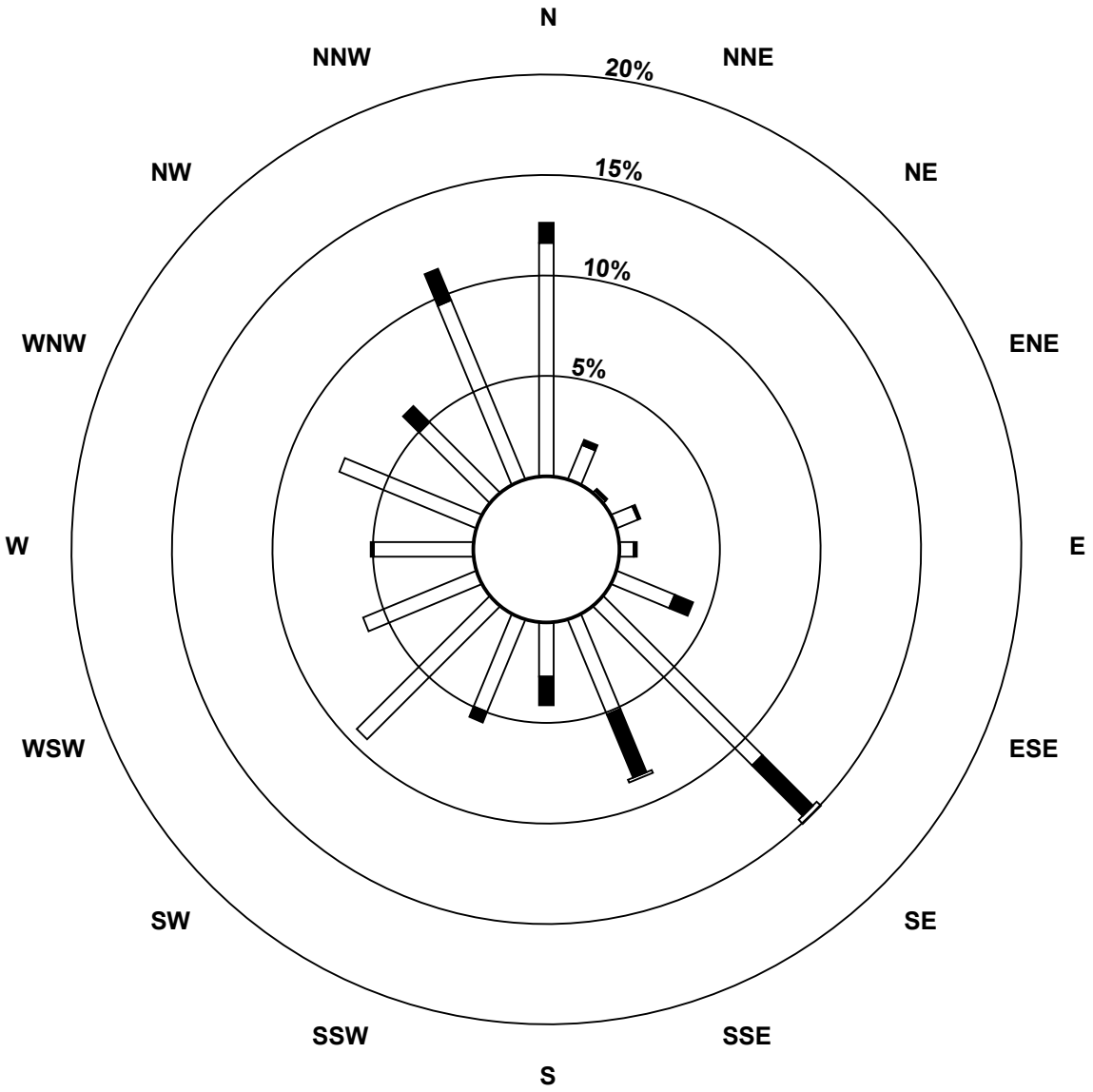
Total Number of Hours: 744

Wood Buffalo Environmental Association

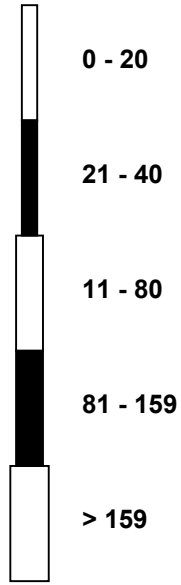
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes (AMS 6)



Classes (ppb)



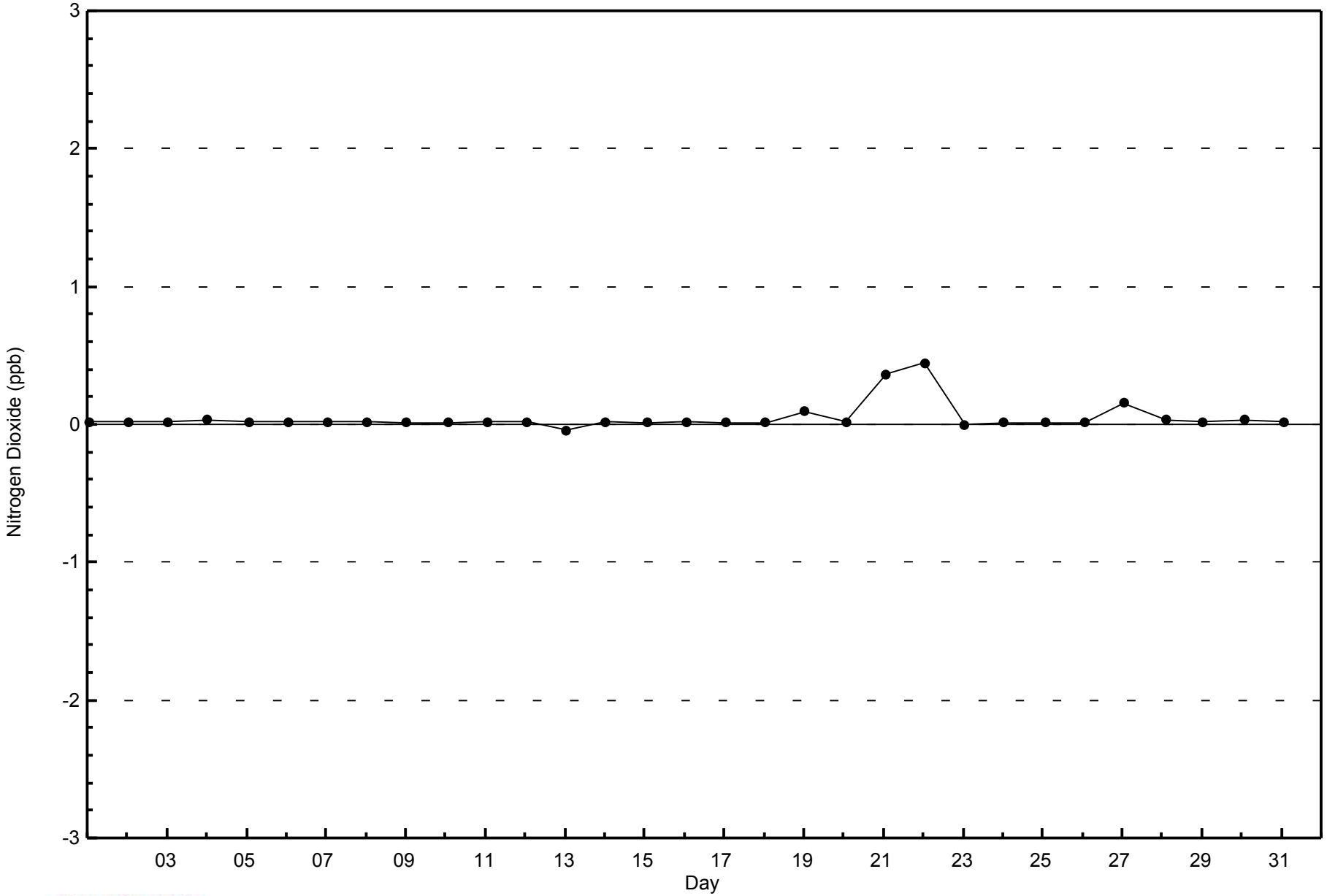
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2014



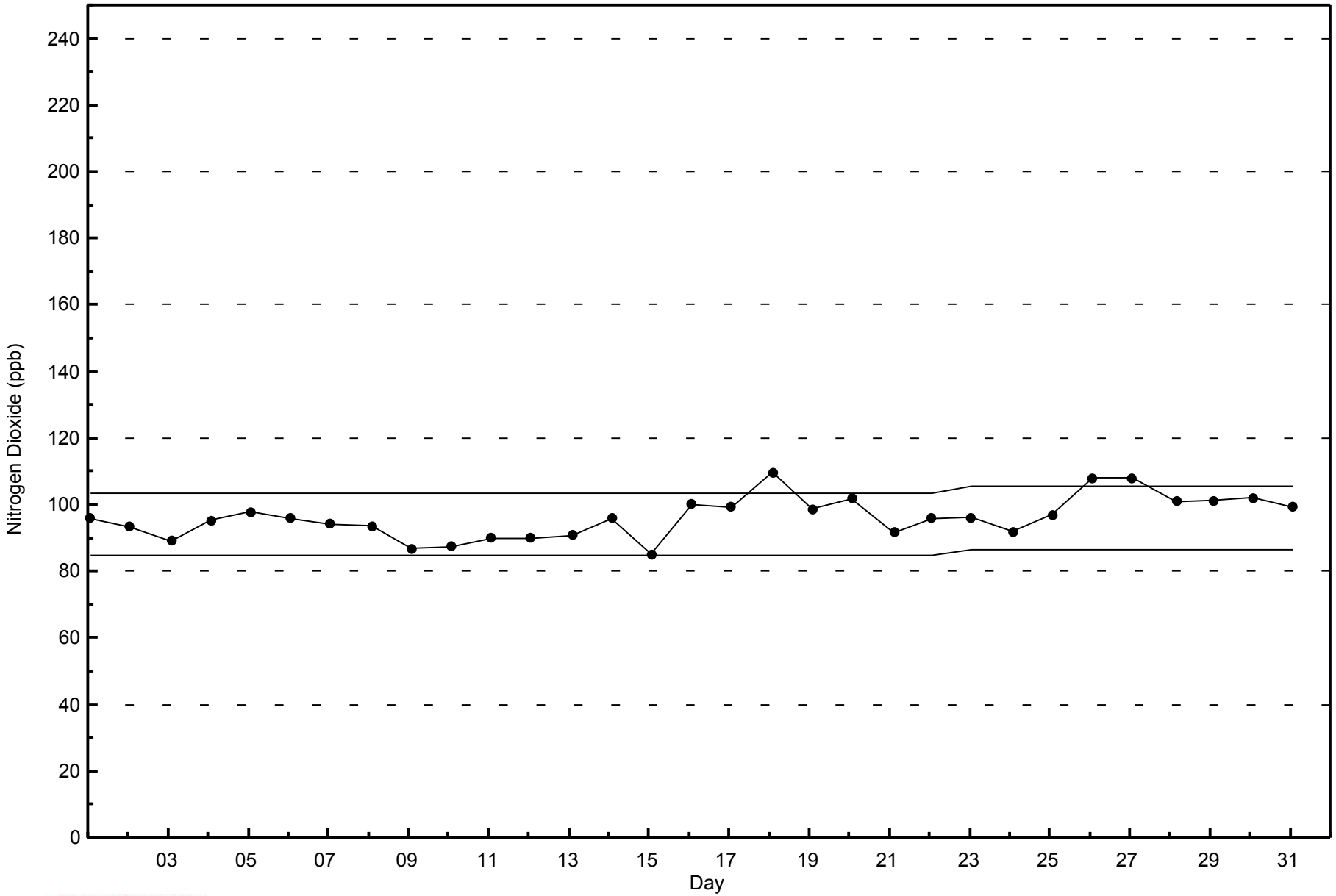
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2014

Maximum Value: 115 ppb on Jan 13 09:00

Maximum Daily Average: 41.1 ppb on Jan 27

Minimum Value: 0 ppb on Jan 15 11:00

Minimum Daily Average: 2.0 ppb on Jan 15

Maximum Diurnal Average: 29.1 ppb at hour 2

Minimum Diurnal Average: 10.0 ppb at hour 4

Monthly Average: 15.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 5$ Median = 10 $Q_3 = 22$ $P_{90} = 37$ $P_{99} = 74$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	26	Z	22	29	20	30	20	38	43	29	35	42	39	40	45	55	72	69	29	32	26	13	7	7	33.5	72
2-Jan	7	Z	7	8	9	11	14	13	17	23	22	26	22	14	8	7	8	12	20	37	10	3	2	9	13.4	37
3-Jan	14	Z	2	2	5	6	8	5	6	4	6	11	18	20	3	1	1	1	1	1	1	1	1	1	4.9	20
4-Jan	1	Z	4	6	3	3	5	4	3	1	1	1	0	1	6	6	3	3	2	1	1	1	1	1	2.5	6
5-Jan	2	Z	1	1	1	4	4	15	10	5	4	5	7	12	9	8	27	38	56	61	48	41	28	11	17.2	61
6-Jan	9	Z	7	6	6	8	11	8	13	11	7	7	8	8	7	10	13	21	14	9	9	18	12	8	9.9	21
7-Jan	5	Z	4	8	4	2	2	15	16	52	39	28	18	30	19	25	19	34	21	22	20	18	11	9	18.2	52
8-Jan	8	Z	8	7	8	8	11	18	19	27	36	31	36	24	7	8	7	7	26	63	44	42	49	33	22.9	63
9-Jan	16	Z	15	19	39	26	16	11	12	35	22	9	6	14	26	34	34	36	36	25	17	14	10	10	20.9	39
10-Jan	10	Z	12	10	15	24	15	3	2	2	3	4	12	12	15	1	1	1	1	3	5	9	30	20	9.1	30
11-Jan	12	Z	26	20	16	10	13	23	45	44	40	29	27	21	19	18	22	24	20	14	15	13	10	10	21.4	45
12-Jan	6	Z	5	4	4	6	4	4	8	12	2	1	0	1	2	6	42	21	32	41	23	13	8	6	11.0	42
13-Jan	4	Z	4	5	12	9	14	62	115	42	23	21	25	19	17	16	23	18	24	14	8	11	7	13	22.1	115
14-Jan	12	Z	13	10	44	69	85	42	20	14	14	13	11	11	10	11	10	11	11	12	22	30	48	24	23.9	85
15-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	13	8	6	6	9	2.0	13
16-Jan	15	Z	3	5	6	3	7	3	2	3	1	2	3	4	7	13	19	16	5	9	27	45	42	20	11.3	45
17-Jan	15	Z	12	3	4	2	1	1	1	1	0	0	0	0	0	0	9	10	9	5	6	8	6	6	4.3	15
18-Jan	8	Z	37	34	29	40	17	26	31	86	4	3	3	4	28	36	33	23	22	16	17	17	19	18	23.9	86
19-Jan	24	Z	21	26	25	25	28	24	29	25	16	12	5	4	4	4	7	6	8	9	8	4	6	6	14.1	29
20-Jan	7	Z	11	12	18	35	38	20	29	15	15	23	17	13	13	17	18	23	16	9	13	31	37	42	20.6	42
21-Jan	36	27	Z	28	26	31	27	43	C	C	C	C	C	C	C	C	32	8	21	5	14	32	8	5	--	43
22-Jan	6	Z	6	9	11	9	16	17	22	14	10	9	11	10	12	14	28	30	37	55	57	41	19	5	19.4	57
23-Jan	4	Z	4	4	4	4	4	4	4	6	4	1	1	1	0	0	0	0	0	0	5	9	8	8	3.2	9
24-Jan	6	Z	0	0	3	21	20	15	10	6	11	7	6	6	4	7	10	7	8	7	7	28	30	16	10.2	30
25-Jan	10	Z	8	9	15	18	21	15	5	1	16	17	7	6	9	7	8	10	9	6	5	3	2	4	9.2	21
26-Jan	4	Z	7	3	6	6	10	7	11	8	9	10	11	16	17	21	26	27	28	27	20	16	15	15	13.9	28
27-Jan	15	Z	19	19	26	50	66	45	40	28	25	21	17	14	13	40	40	44	87	84	82	61	53	54	41.1	87
28-Jan	45	31	35	Z	37	52	40	47	74	60	40	47	77	28	31	37	28	32	35	8	6	6	9	8	35.2	77
29-Jan	6	Z	3	5	7	6	8	15	15	19	18	9	8	6	6	8	9	11	10	5	4	7	3	1	8.3	19
30-Jan	2	Z	1	1	1	5	5	5	2	1	1	1	2	2	2	2	4	3	4	4	4	2	1	1	2.5	5
31-Jan	2	Z	12	6	12	11	12	14	4	6	12	16	23	22	11	14	15	16	11	8	6	1	0	1	10.2	23
	10.8	29.1	10.4	10.0	13.5	17.3	17.5	18.1	20.2	19.2	14.5	13.6	14.1	12.1	11.6	14.2	18.3	18.1	19.5	19.5	17.3	17.5	15.7	12.2	Diurnal Average	
	45	31	37	34	44	69	85	62	115	86	40	47	77	40	45	55	72	69	87	84	82	61	53	54	Diurnal Maximum	

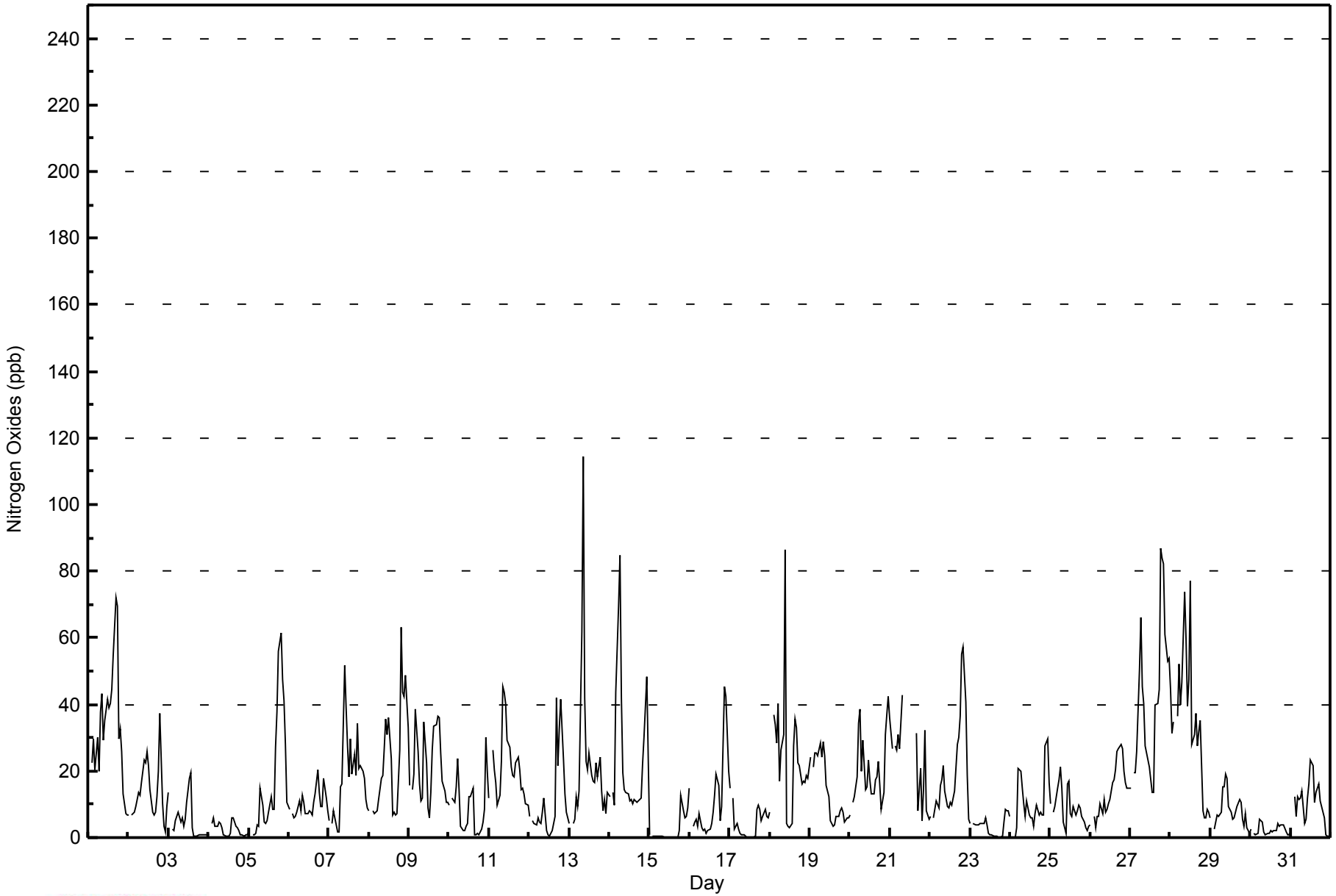
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	517	73.33	73.33
21 - 40	136	19.29	92.62
11 - 80	46	6.52	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	70	10	1	7	2	20	58	21	11	29	64	43	35	51	35	60	517
21 - 40	16	3	1	2	3	6	29	22	17	9	2	0	1	1	6	18	136
11 - 80	3	1	0	0	1	3	17	16	1	0	0	0	0	0	2	2	46
81 - 159	0	1	0	0	0	0	2	2	0	1	0	0	0	0	0	0	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	89	15	2	9	6	29	106	61	29	39	66	43	36	52	43	80	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

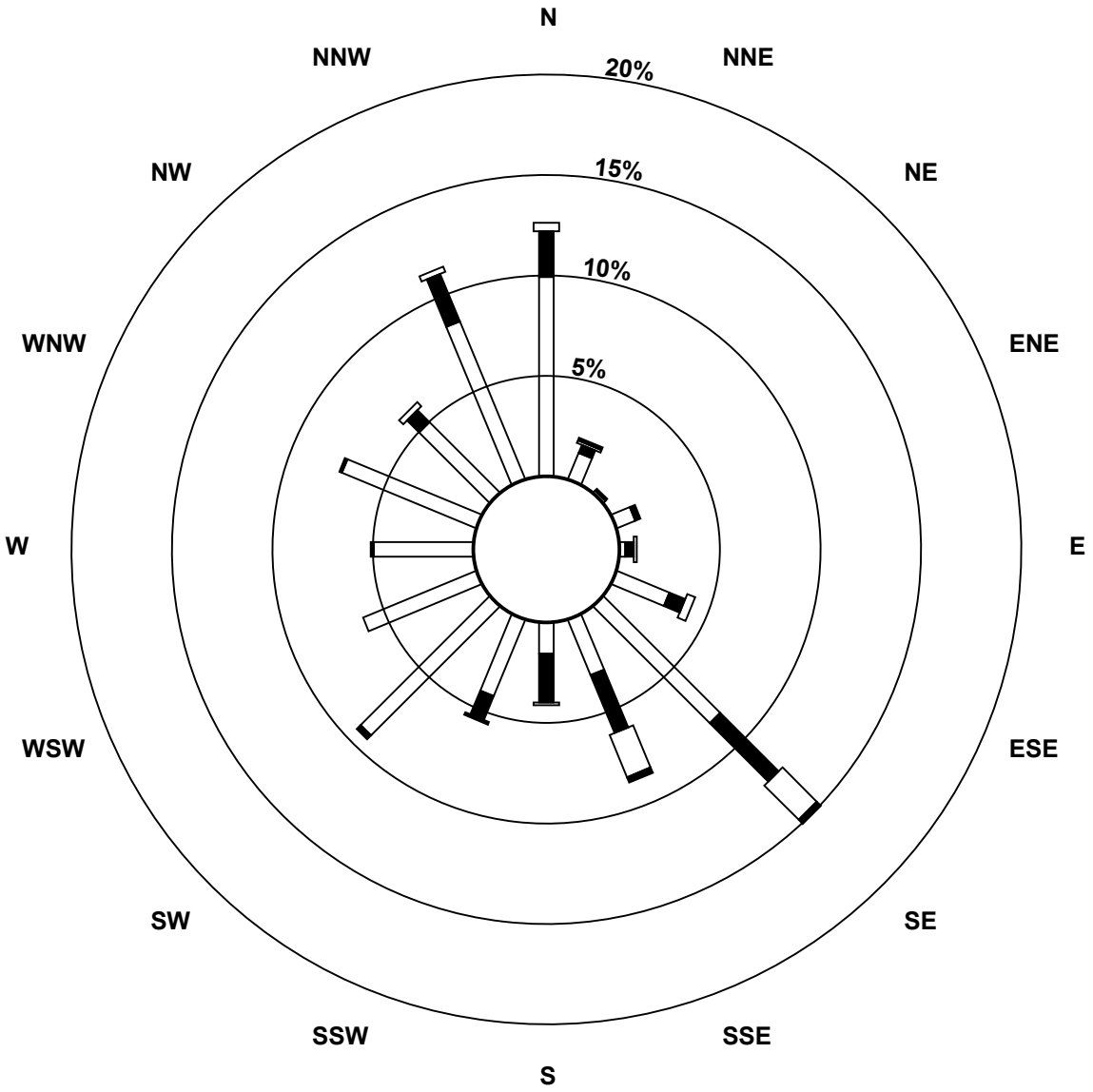
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

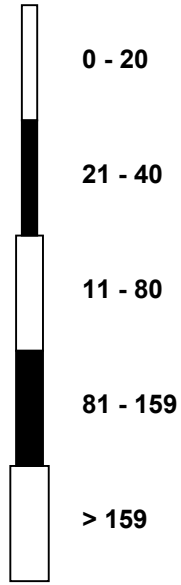
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes (AMS 6)



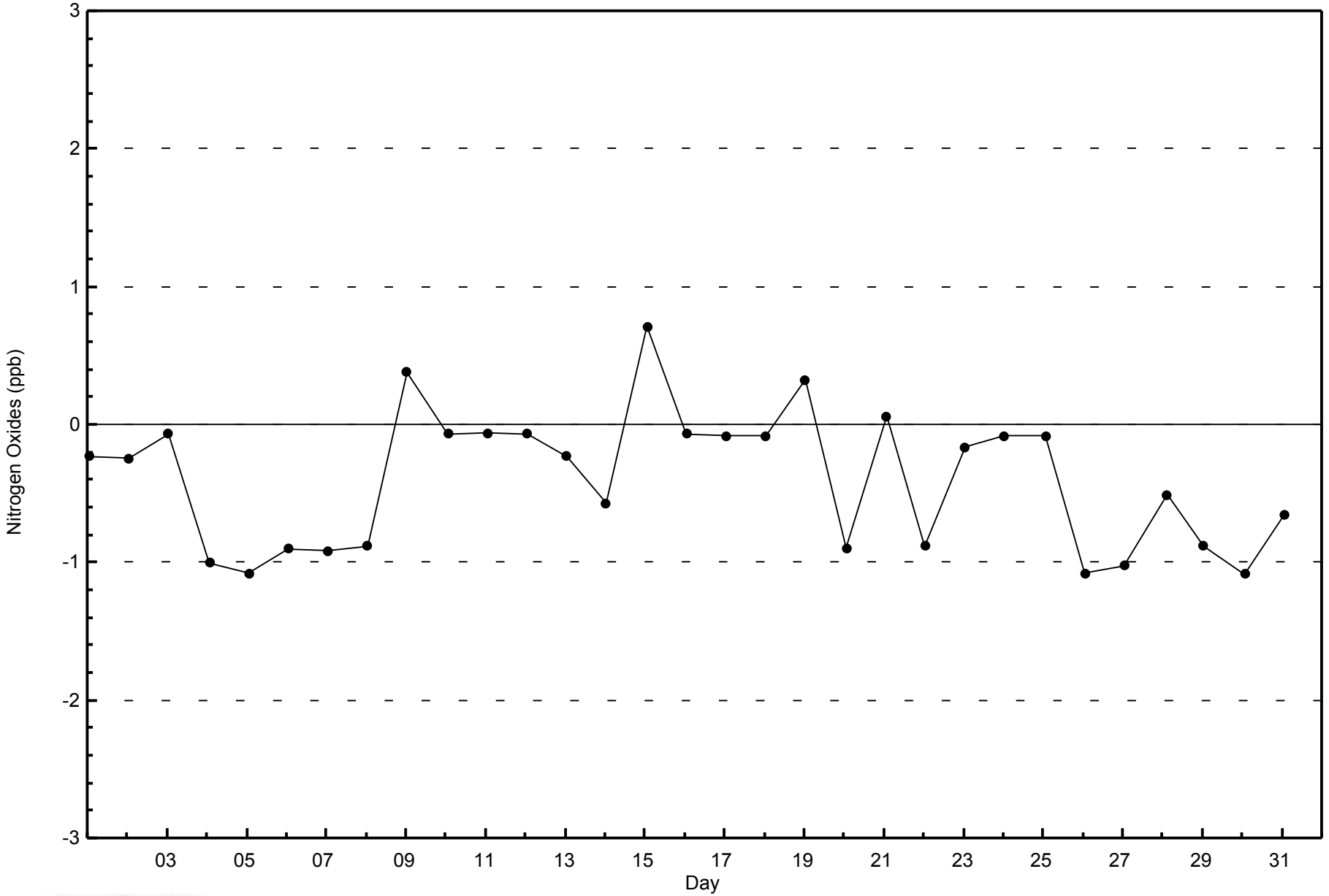
Classes (ppb)



Total Number of Valid Hours: 705

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Patricia McInnes - January 2014



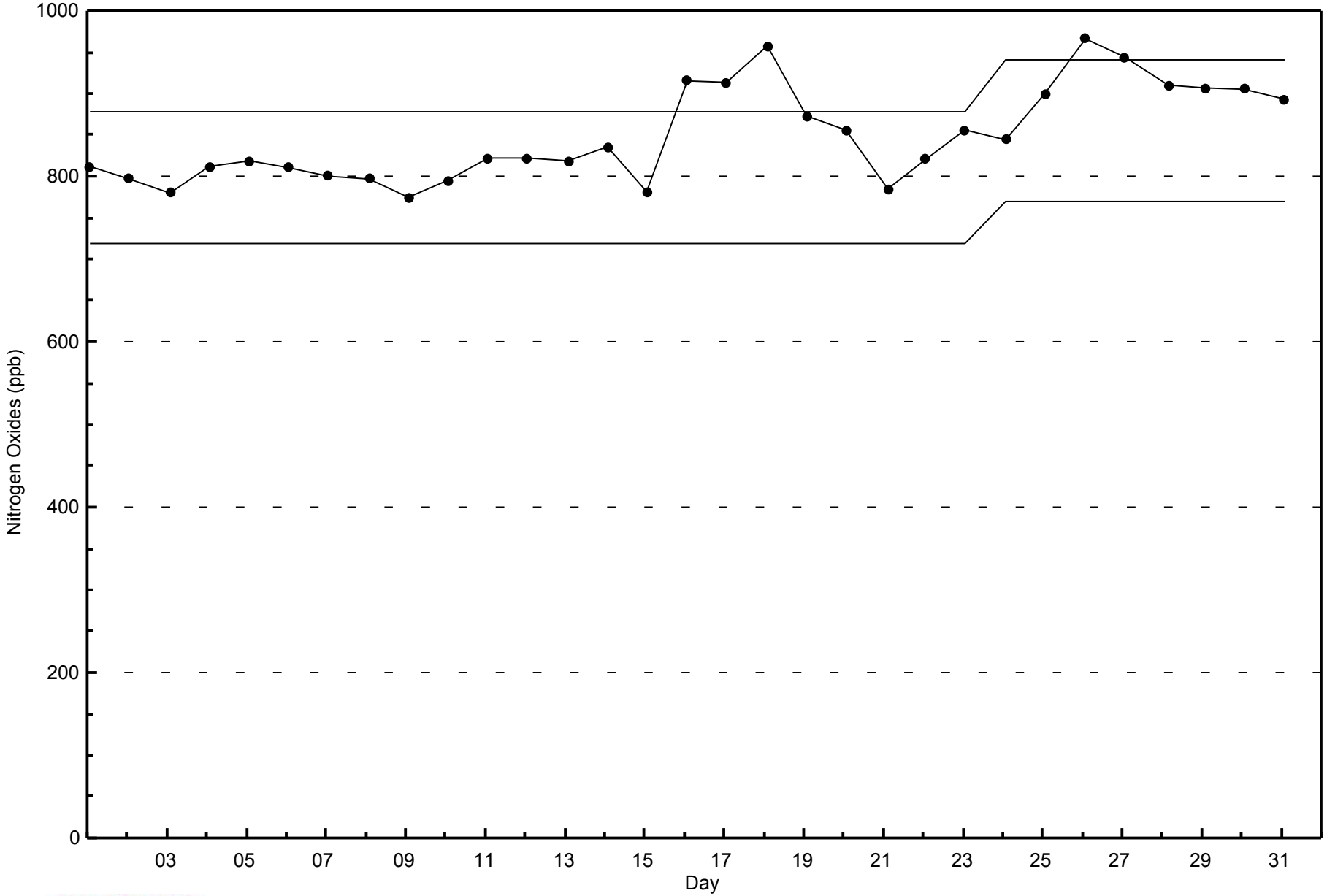
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0
Maximum Value: 0 ppb on Jan 1 01:00 Maximum Daily Average: 0.0 ppb on Jan 1

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 1
Maximum Diurnal Average: 0.0 ppb at hour 1 Minimum Diurnal Average: 0.0 ppb at hour 1
Monthly Average: 0.0 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 0$

Hours in Service:	744
Hours of Data:	673
Hours of Missing Data:	71
Hours of Calibration:	40
Percent Operational Time:	95.8

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

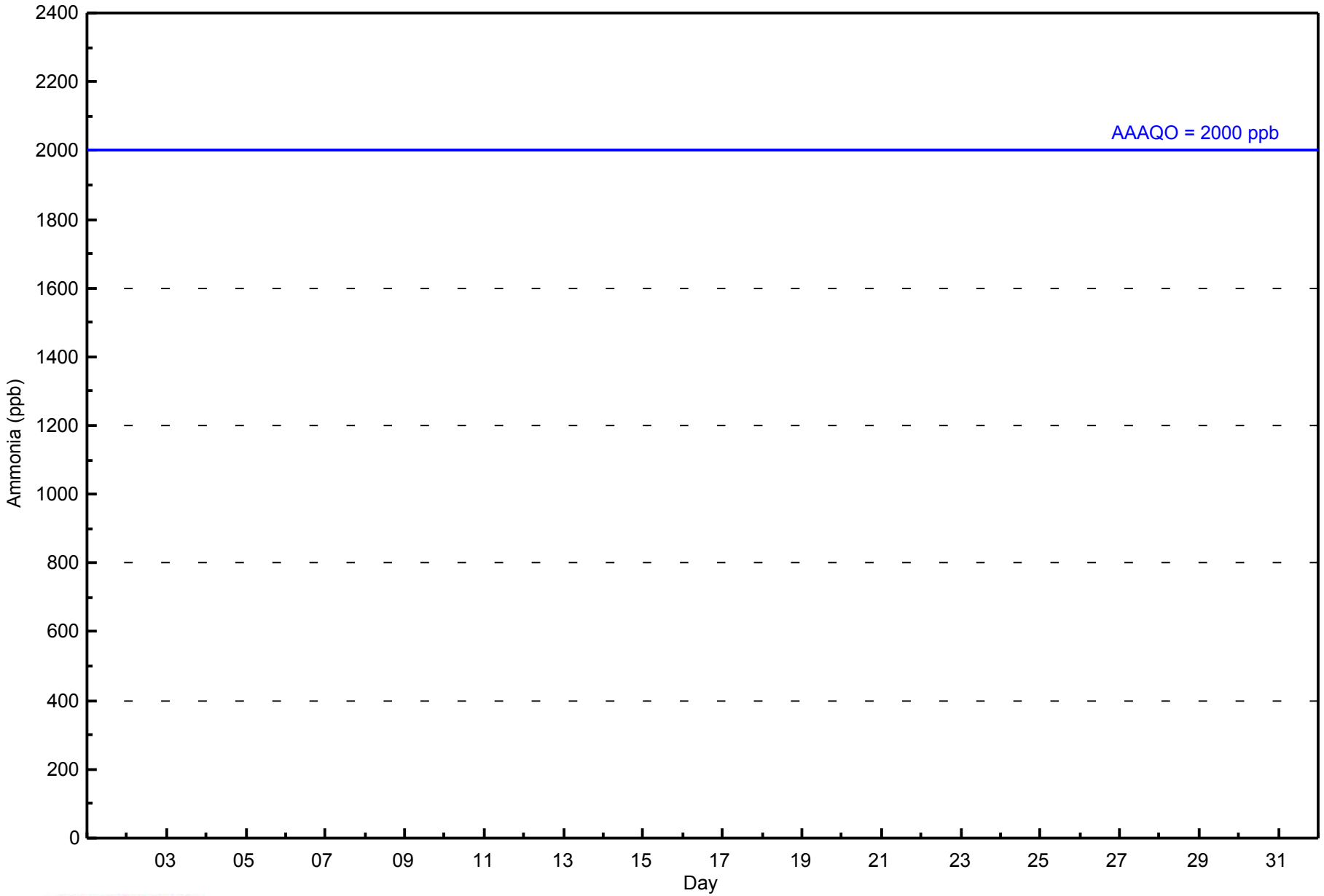
Z - zerospan C - Calibration RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb

WBEA NETWORK

Hourly Averages

Ammonia (NH_3) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	673	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: 673

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	85	14	2	9	5	28	102	58	26	37	62	42	33	50	43	77	673
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	85	14	2	9	5	28	102	58	26	37	62	42	33	50	43	77	673

Total Number of Valid Hours: 673

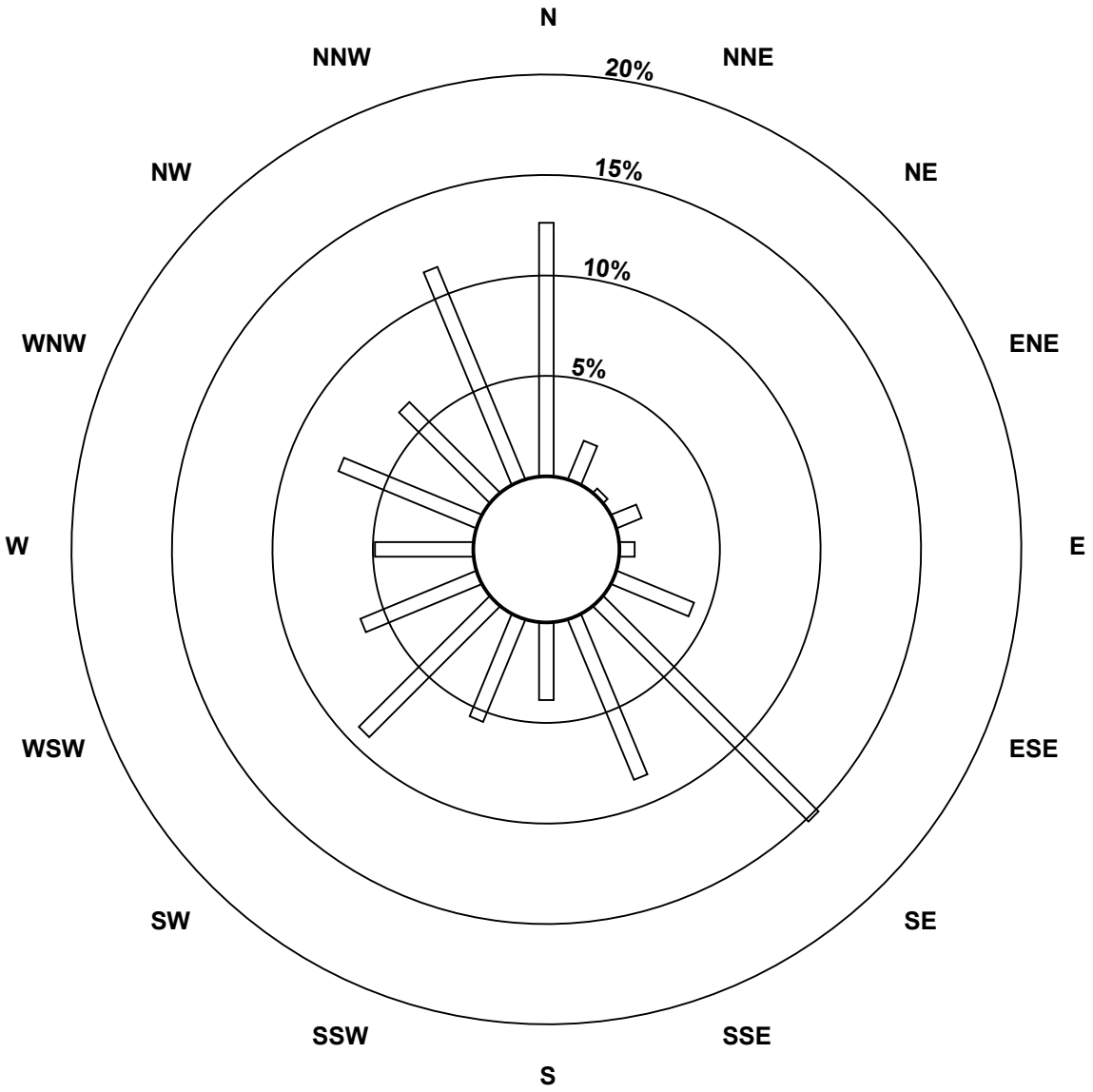
Total Number of Hours: 744

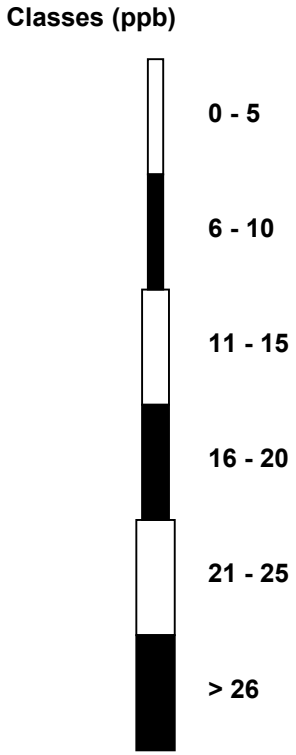
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ammonia (NH_3) - ppb

Patricia McInnes (AMS 6)





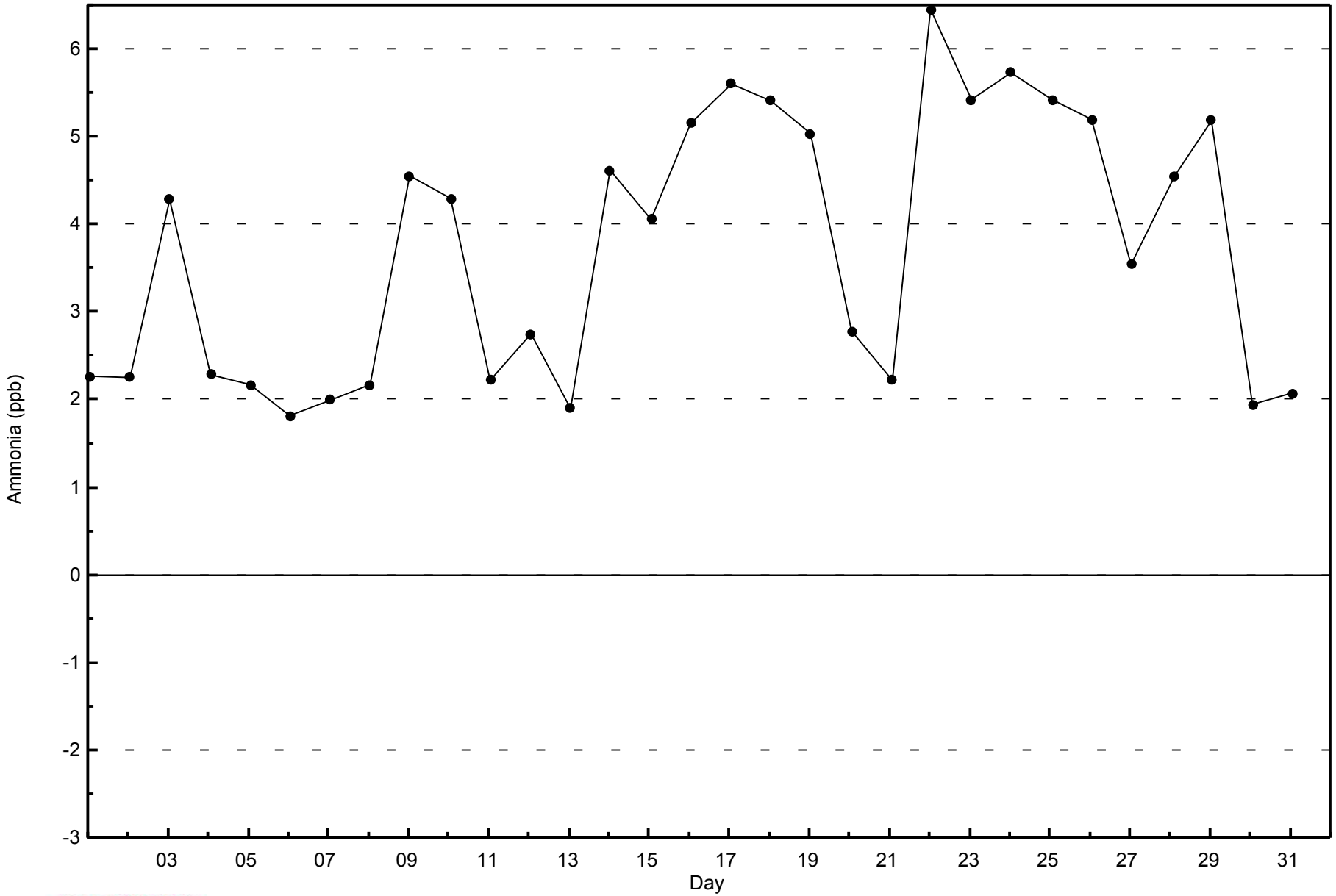
Total Number of Valid Hours: 673

WBEA NETWORK

Zero Responses

Ammonia (NH_3) - ppb

Patricia McInnes - January 2014



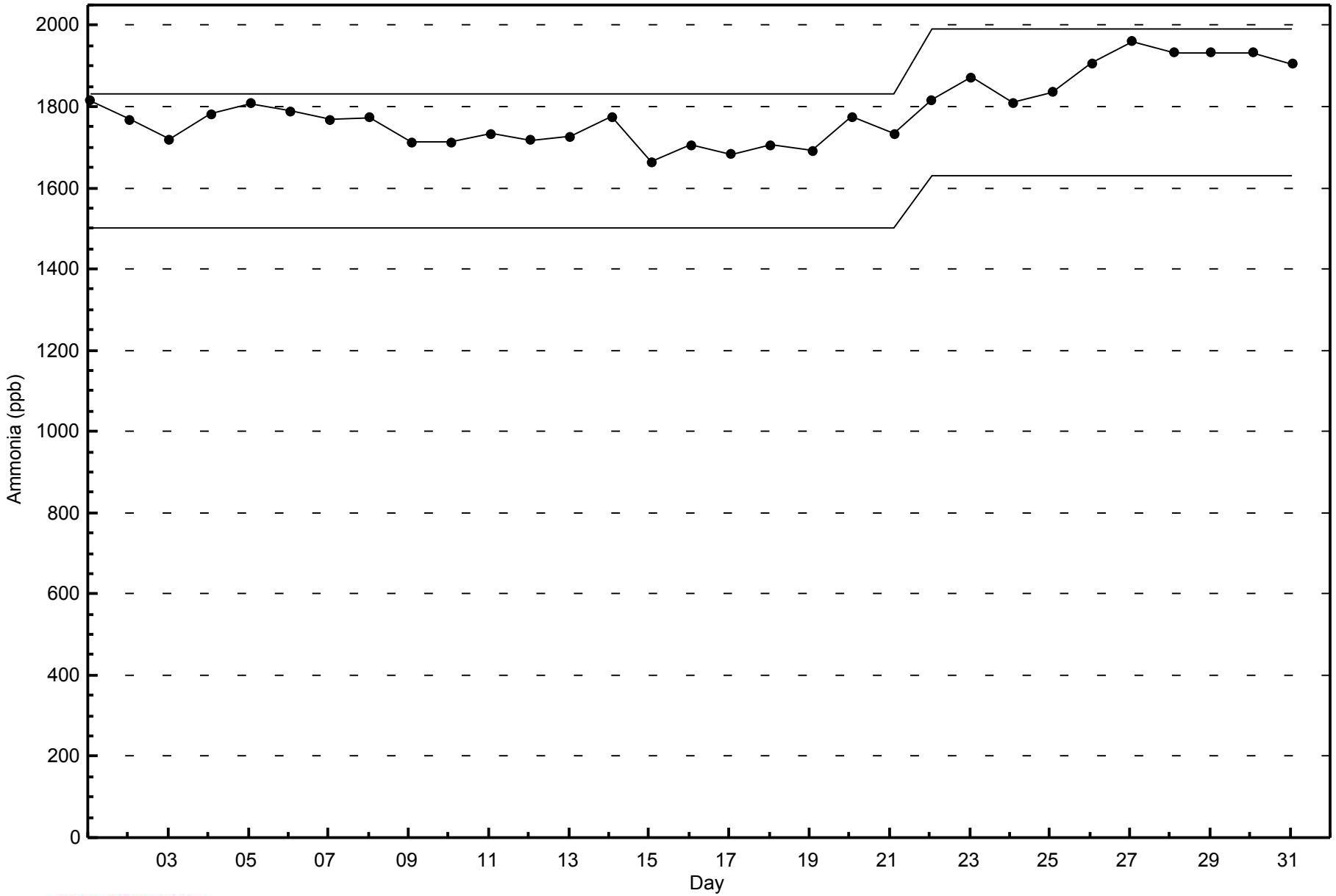
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ammonia (NH_3) - ppb

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 26.5 $\mu g/m^3$ on Jan 19 02:00

Maximum Daily Average: 12.5 $\mu g/m^3$ on Jan 9

Minimum Value: 0.6 $\mu g/m^3$ on Jan 30 04:00

Minimum Daily Average: 1.3 $\mu g/m^3$ on Jan 30

Maximum Diurnal Average: 5.6 $\mu g/m^3$ at hour 23

Minimum Diurnal Average: 3.6 $\mu g/m^3$ at hour 13

Monthly Average: 4.57 $\mu g/m^3$

Percentiles: P_1 = 0.8 P_{10} = 1.3 Q_1 = 2.0 Median = 3.2 Q_3 = 5.8 P_{90} = 10.0 P_{99} = 17.9

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	8.5	8.7	6.5	7.7	6.4	10.5	3.3	4.0	6.0	4.2	4.0	6.3	5.6	9.3	9.9	12.2	13.6	12.3	9.6	7.2	5.7	3.3	2.5	2.4	7.1	13.6
2-Jan	2.4	2.2	2.3	2.4	2.5	2.5	2.7	2.7	3.0	3.5	3.3	3.6	4.6	5.1	4.6	4.5	4.0	4.1	5.4	6.0	2.2	1.6	1.4	1.7	3.3	6.0
3-Jan	1.9	1.4	1.6	1.7	1.9	1.9	2.1	2.0	2.1	2.1	1.9	2.2	2.7	7.5	1.8	1.2	1.3	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.9	7.5
4-Jan	1.9	2.3	2.8	3.0	1.4	1.6	1.9	1.7	1.7	1.7	1.7	1.8	1.8	2.2	2.9	4.1	2.7	2.0	2.0	2.0	1.9	1.9	2.2	2.2	2.1	4.1
5-Jan	1.9	1.9	1.8	1.5	1.5	1.6	1.2	2.3	1.6	1.5	2.0	2.0	2.4	4.1	2.8	4.6	6.8	10.2	7.7	8.0	6.3	7.8	4.9	2.9	3.7	10.2
6-Jan	2.1	2.0	1.8	1.5	1.4	1.7	1.4	1.2	1.3	1.3	1.3	1.7	1.5	1.3	1.3	1.4	1.4	1.6	1.4	1.5	1.7	1.5	1.8	3.1	1.6	3.1
7-Jan	1.4	1.3	1.2	1.3	1.5	1.0	1.2	1.7	5.0	6.9	5.8	3.4	3.5	4.1	2.6	3.0	3.7	5.3	3.4	3.8	4.2	3.5	2.8	3.3	3.1	6.9
8-Jan	3.6	3.3	2.5	2.5	2.4	2.3	2.7	3.1	3.4	4.4	5.3	5.6	6.0	8.2	12.5	11.3	11.4	10.6	11.5	13.0	15.1	14.9	11.1	10.0	7.4	15.1
9-Jan	9.0	9.6	10.4	8.6	9.2	11.7	13.8	16.4	17.0	16.3	14.7	12.6	10.4	10.7	12.5	13.1	11.5	13.6	19.5	12.6	11.3	14.6	11.5	10.0	12.5	19.5
10-Jan	11.0	11.9	9.7	6.8	6.4	6.9	5.4	4.0	4.7	5.4	6.0	5.8	M	M	6.0	3.2	3.1	3.4	3.2	3.3	3.8	4.1	15.8	13.7	6.5	15.8
11-Jan	5.0	7.0	3.8	2.7	2.6	2.9	3.0	3.9	4.5	5.1	4.7	4.9	4.1	3.7	3.3	4.1	5.4	6.4	3.9	3.2	3.0	2.8	2.7	2.7	4.0	7.0
12-Jan	2.5	2.6	2.4	2.3	2.2	2.2	2.3	3.0	4.2	4.3	2.3	1.7	1.5	1.4	1.4	1.4	3.1	3.5	4.7	5.4	3.2	3.2	4.4	8.4	3.1	8.4
13-Jan	5.5	3.4	2.6	2.3	3.0	4.6	6.1	7.3	9.5	6.2	5.6	5.3	5.8	3.8	3.0	3.2	3.2	3.2	2.9	3.1	3.3	4.4	8.8	13.4	5.0	13.4
14-Jan	8.8	18.1	10.2	3.8	3.7	4.8	6.3	3.9	2.8	4.0	5.1	4.3	3.0	2.8	2.8	2.4	1.8	1.7	2.1	1.9	2.2	2.8	4.6	4.5	4.5	18.1
15-Jan	1.3	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.1	2.4	2.5	2.7	3.3	4.3	1.3	4.3
16-Jan	4.0	3.2	2.4	1.9	1.7	1.6	1.5	1.4	1.5	1.5	1.5	1.7	2.0	2.3	2.6	2.8	3.0	3.0	2.0	2.1	4.3	6.1	10.9	3.6	2.9	10.9
17-Jan	3.2	4.7	2.9	2.1	2.1	2.0	1.5	1.5	1.4	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.7	2.3	3.0	2.8	3.5	2.5	1.6	2.0	4.7
18-Jan	3.1	4.9	8.6	5.8	2.9	4.5	2.8	2.8	4.3	6.1	2.2	1.7	1.7	1.8	2.9	5.8	6.1	8.8	9.5	6.9	7.2	8.1	14.3	18.3	5.9	18.3
19-Jan	25.3	26.5	18.5	16.7	12.8	12.7	13.9	14.7	14.2	14.3	9.3	3.7	2.5	2.4	2.4	2.9	3.9	4.8	4.9	4.4	5.9	3.4	3.7	3.6	9.5	26.5
20-Jan	3.2	2.6	2.6	3.2	3.5	5.1	5.0	4.6	4.5	4.3	4.2	4.3	4.6	4.1	3.9	4.3	3.6	4.1	4.1	3.9	5.1	5.0	6.2	7.4	4.3	7.4
21-Jan	7.1	6.2	7.1	7.6	7.9	8.7	8.1	8.3	10.0	9.4	7.1	6.8	5.2	2.7	2.4	2.3	2.8	2.2	3.7	2.5	3.0	5.6	3.0	2.2	5.5	10.0
22-Jan	2.8	3.4	2.7	3.1	3.3	2.8	2.8	2.6	2.9	2.7	2.3	1.8	1.9	1.8	1.8	2.4	3.3	3.6	4.9	6.9	7.0	6.4	4.7	4.4	3.4	7.0
23-Jan	4.9	5.8	6.4	6.4	6.0	5.4	5.1	4.5	4.1	3.3	2.7	1.9	1.4	1.4	1.4	1.3	1.5	1.6	1.6	1.7	1.9	2.3	2.2	2.6	3.2	6.4
24-Jan	3.4	3.1	2.5	2.3	3.4	6.0	5.6	5.6	4.1	3.3	3.2	2.6	2.0	2.1	2.1	1.9	2.0	1.9	1.8	6.0	5.6	12.9	17.8	8.7	4.6	17.8
25-Jan	4.5	2.5	2.3	2.8	3.7	4.2	5.3	4.4	3.3	2.3	4.0	4.3	3.0	4.2	8.8	5.0	4.4	2.8	3.4	3.1	2.8	2.1	2.0	2.7	3.7	8.8
26-Jan	4.3	3.0	3.3	4.1	4.5	5.3	6.5	7.1	7.0	7.2	7.3	10.0	9.9	10.2	9.7	9.4	9.3	10.5	12.4	13.7	24.2	12.6	11.5	16.0	9.1	24.2
27-Jan	14.7	16.8	15.0	9.9	9.3	11.2	12.6	10.2	8.9	7.6	6.2	4.5	2.7	2.2	2.4	4.5	4.5	5.2	9.6	9.1	9.6	8.5	7.5	6.8	8.3	16.8
28-Jan	7.2	5.3	4.9	6.1	12.9	6.1	5.8	5.3	6.5	5.5	6.0	6.2	8.1	8.7	7.5	7.5	6.6	6.1	5.3	3.0	3.1	3.1	3.6	4.5	6.0	12.9
29-Jan	3.1	2.7	2.6	2.8	3.2	3.0	2.7	3.6	3.6	3.4	2.9	2.0	1.8	1.2	1.1	0.9	1.0	1.6	1.6	1.2	0.8	1.1	0.8	0.6	2.1	3.6
30-Jan	0.6	0.6	0.6	0.6	0.6	0.7	0.8	1.0	0.9	0.9	1.0	0.8	0.8	0.8	0.8	1.0	2.0	2.2	3.4	2.4	2.1	2.2	2.3	2.6	1.3	3.4
31-Jan	2.9	3.3	4.0	3.3	3.5	3.1	3.3	4.0	2.7	2.5	2.4	2.8	4.5	5.4	2.1	2.9	3.9	2.9	2.7	2.2	1.8	1.2	1.2	1.3	2.9	5.4
	5.2	5.5	4.7	4.1	4.1	4.5	4.4	4.5	4.8	4.6	4.1	3.8	3.6	3.9	3.9	4.1	4.3	4.6	4.9	4.7	5.0	5.0	5.6	5.5	Diurnal Average	
	25.3	26.5	18.5	16.7	12.9	12.7	13.9	16.4	17.0	16.3	14.7	12.6	10.4	10.7	12.5	13.1	13.6	13.6	19.5	13.7	24.2	14.9	17.8	18.3	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

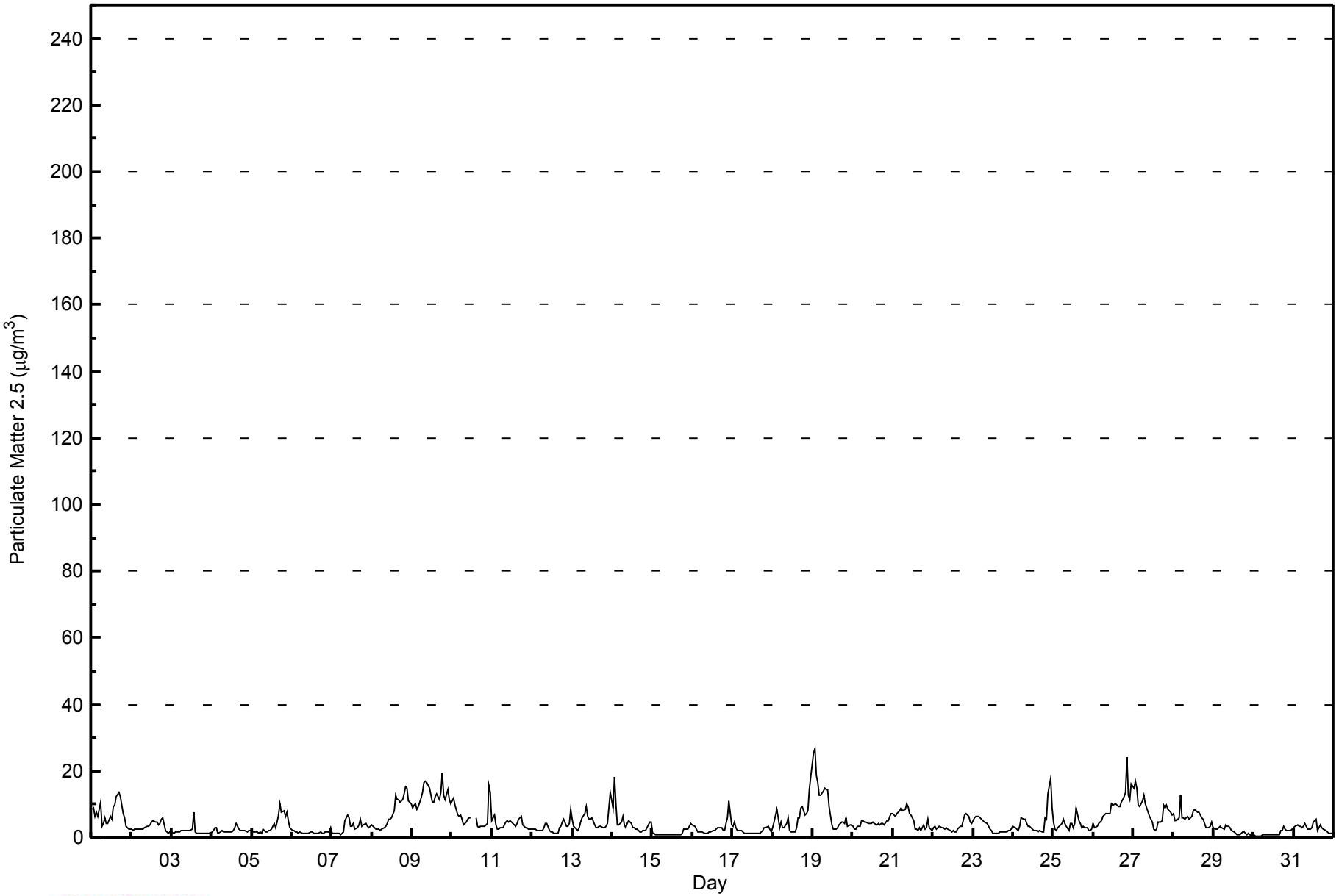
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

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

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	509	68.60	68.60
6 - 15	183	24.66	93.26
16 - 25	14	1.89	95.15
26 - 80	1	0.13	95.28
> 81.0	0	0.00	95.28

Total Number of Valid Hours: 742

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Patricia McInnes - January 2014

Concentration	**Wind Direction**																
Ranges ($\mu g/m^3$)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	73	10	0	8	4	19	86	33	19	27	50	35	28	41	25	51	509
6 - 15	15	6	2	0	3	9	27	30	10	13	12	4	2	4	12	34	183
16 - 25	1	0	0	1	0	1	0	1	2	0	4	1	2	0	0	1	14
26 - 80	0	0	0	0	0	0	0	0	0	0	0	1	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	89	16	2	9	7	29	113	64	31	40	66	41	32	45	37	86	707

Total Number of Valid Hours: 742

Total Number of Hours: 744

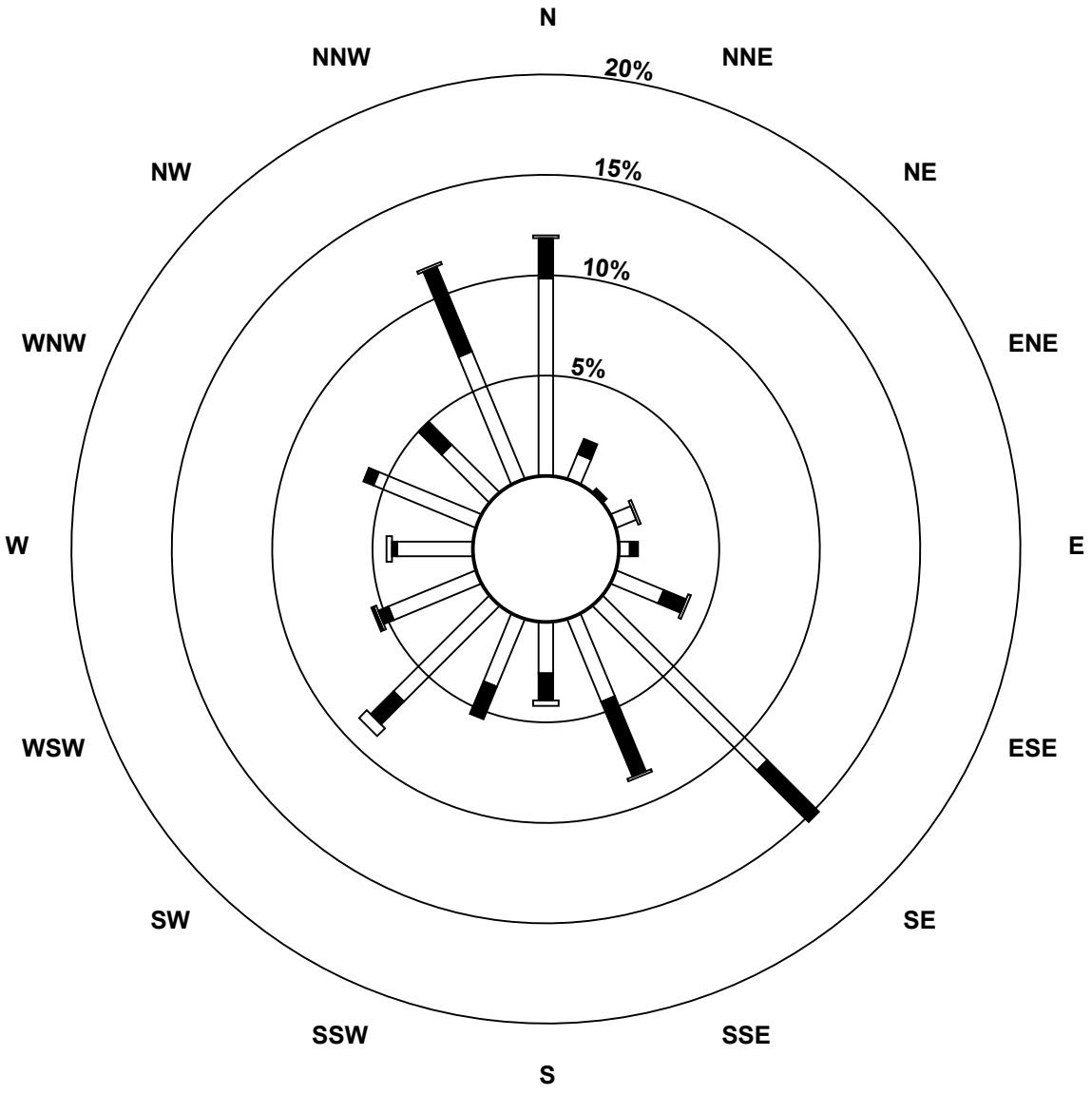
AURORA ATMOSPHERICS INC.

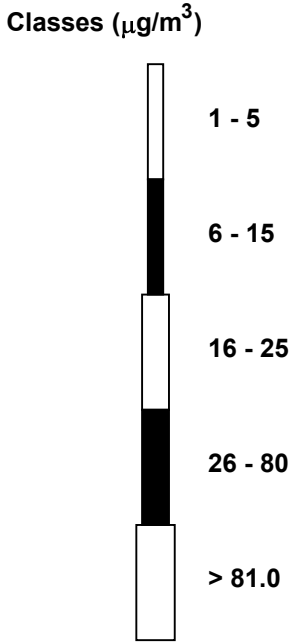
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Patricia McInnes (AMS 6)





Total Number of Valid Hours: 742

Maximum Value: 7.3 C on Jan 24 03:00

Maximum Daily Average: 2.1 C on Jan 15

Minimum Value: -36.9 C on Jan 1 10:00

Minimum Daily Average: -32.2 C on Jan 1

Maximum Diurnal Average: -13.1 C at hour 15

Minimum Diurnal Average: -18.1 C at hour 7

Monthly Average: -16.18 C

Percentiles: P_1 = -34.8 P_{10} = -28.7 Q_1 = -23.8 Median = -16.6 Q_3 = -9.8 P_{90} = -0.9 P_{99} = 6.2

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

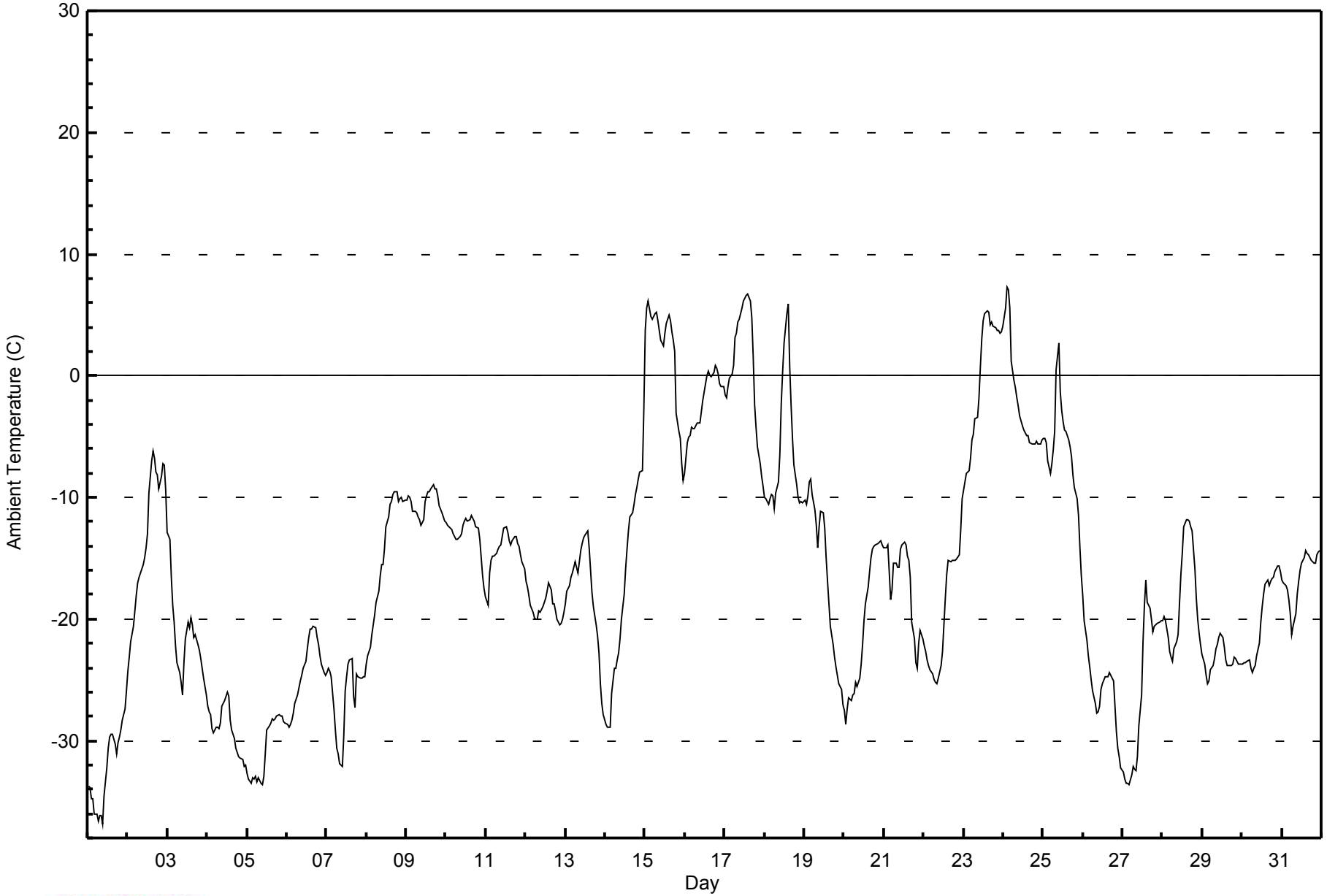
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-33.7	-33.9	-34.8	-34.8	-36.1	-36.1	-36.6	-36.1	-36.2	-36.9	-34.5	-32.2	-30.6	-29.7	-29.5	-29.5	-30.3	-31.1	-30.1	-29.7	-29.1	-28.3	-27.3	-25.9	-32.2	-25.9
2-Jan	-24.3	-23.2	-21.9	-20.6	-19.3	-18.1	-17.0	-16.6	-16.2	-15.6	-14.9	-14.1	-13.0	-9.6	-7.0	-6.2	-6.8	-7.9	-8.1	-9.3	-8.2	-7.2	-7.4	-9.4	-13.4	-6.2
3-Jan	-12.9	-13.4	-16.6	-18.9	-20.3	-22.2	-23.6	-24.4	-25.2	-26.2	-23.6	-21.7	-20.3	-20.8	-19.9	-20.5	-21.5	-21.3	-22.1	-22.6	-23.2	-24.0	-24.8	-26.3	-21.5	-12.9
4-Jan	-27.1	-27.6	-27.9	-29.0	-29.4	-28.9	-28.9	-29.0	-28.5	-27.1	-26.7	-26.3	-26.0	-26.3	-28.3	-29.1	-29.9	-30.6	-31.0	-31.3	-31.4	-31.6	-32.1	-32.0	-29.0	-26.0
5-Jan	-32.7	-33.1	-33.5	-33.0	-33.1	-32.9	-33.4	-33.0	-33.5	-33.6	-33.0	-31.1	-29.1	-28.8	-28.5	-28.2	-28.3	-28.2	-28.0	-27.9	-27.9	-28.0	-28.4	-28.5	-30.7	-27.9
6-Jan	-28.6	-28.8	-28.7	-28.3	-27.7	-26.9	-26.2	-25.6	-25.1	-24.6	-24.1	-23.4	-22.5	-21.6	-20.8	-20.9	-20.6	-20.7	-21.6	-22.1	-23.0	-23.7	-24.4	-24.6	-24.4	-20.6
7-Jan	-24.4	-24.1	-24.2	-24.8	-27.5	-29.1	-30.6	-31.0	-31.9	-32.1	-29.6	-25.9	-24.8	-23.7	-23.3	-23.2	-26.3	-27.2	-24.5	-24.8	-24.8	-24.9	-24.8	-24.7	-26.3	-23.2
8-Jan	-23.7	-23.0	-22.3	-21.2	-20.5	-19.6	-18.6	-17.7	-16.5	-15.5	-15.5	-14.3	-12.4	-11.6	-10.6	-10.3	-9.8	-9.6	-9.6	-10.4	-10.1	-10.0	-10.4	-10.2	-14.7	-9.6
9-Jan	-10.2	-9.9	-10.0	-10.4	-11.2	-11.1	-11.3	-11.6	-11.8	-12.3	-11.8	-10.4	-9.8	-9.5	-9.6	-9.3	-9.0	-9.3	-9.3	-9.8	-10.7	-11.3	-11.7	-12.0	-10.6	-9.0
10-Jan	-12.1	-12.3	-12.4	-12.7	-13.0	-13.3	-13.4	-13.4	-13.3	-12.9	-12.3	-11.9	-11.7	-12.0	-11.8	-11.5	-11.7	-11.9	-12.4	-12.5	-13.5	-14.9	-16.4	-17.5	-13.0	-11.5
11-Jan	-18.1	-18.9	-16.3	-15.1	-14.8	-14.8	-14.6	-14.2	-14.1	-14.0	-13.3	-12.5	-12.4	-12.8	-13.6	-13.9	-13.5	-13.2	-13.3	-13.8	-14.0	-14.8	-15.3	-15.9	-14.5	-12.4
12-Jan	-16.9	-17.4	-18.1	-18.9	-19.4	-19.9	-20.1	-20.0	-19.4	-19.4	-19.0	-18.6	-18.3	-17.7	-17.0	-17.6	-18.7	-18.8	-19.3	-20.1	-20.5	-20.3	-20.0	-19.5	-18.9	-16.9
13-Jan	-18.8	-17.7	-17.2	-16.6	-16.3	-15.8	-15.3	-16.2	-15.3	-14.4	-13.8	-13.3	-13.1	-12.8	-14.1	-16.0	-17.9	-19.0	-20.5	-21.4	-22.8	-25.3	-26.9	-27.8	-17.8	-12.8
14-Jan	-28.7	-28.9	-28.9	-28.9	-26.1	-24.1	-24.0	-23.4	-22.7	-21.6	-20.0	-18.0	-15.8	-14.2	-12.8	-11.6	-11.2	-10.6	-9.8	-9.2	-8.5	-7.9	-7.8	-2.8	-17.4	-2.8
15-Jan	3.7	5.6	6.2	4.9	4.6	4.8	5.1	5.2	4.5	3.0	2.6	2.5	3.5	4.3	4.9	4.5	3.6	2.9	2.0	-3.1	-4.6	-5.1	-7.3	-8.6	2.1	6.2
16-Jan	-8.0	-5.5	-5.0	-4.9	-4.2	-4.4	-4.4	-3.9	-3.8	-3.9	-3.0	-2.0	-0.7	0.0	0.4	0.1	-0.1	0.3	0.9	0.7	0.2	-0.7	-0.9	-0.9	-2.2	0.9
17-Jan	-1.6	-1.8	-0.9	-0.2	0.2	0.8	3.1	3.5	4.4	4.7	5.6	6.2	6.3	6.6	6.8	6.2	4.7	1.6	-2.4	-4.2	-5.9	-7.2	-8.3	-9.1	0.8	6.8
18-Jan	-10.0	-10.1	-10.6	-10.1	-9.8	-9.9	-10.9	-9.6	-8.7	-6.4	-2.2	0.4	2.7	5.1	5.9	0.8	-2.3	-5.1	-7.4	-9.0	-10.0	-10.4	-10.4	-10.5	-6.2	5.9
19-Jan	-10.2	-10.5	-9.8	-8.7	-8.5	-9.7	-11.1	-12.3	-14.1	-12.4	-11.1	-11.2	-12.5	-14.9	-16.9	-18.8	-20.6	-22.1	-23.2	-23.9	-24.6	-25.3	-25.8	-27.0	-16.1	-8.5
20-Jan	-27.5	-28.7	-27.4	-26.5	-26.7	-26.3	-26.1	-25.2	-25.5	-24.8	-23.7	-22.1	-20.2	-18.7	-17.4	-16.0	-14.9	-14.2	-14.1	-14.0	-13.8	-13.7	-13.6	-13.9	-20.6	-13.6
21-Jan	-14.1	-14.1	-13.9	-16.1	-18.4	-17.6	-15.4	-15.4	-15.7	-15.8	-14.3	-13.9	-13.7	-13.9	-14.8	-15.2	-16.6	-20.2	-21.6	-23.6	-24.1	-22.0	-21.0	-21.6	-17.2	-13.7
22-Jan	-22.2	-22.7	-23.3	-23.8	-24.2	-24.5	-25.0	-25.2	-25.3	-24.9	-23.8	-22.7	-20.5	-18.3	-16.4	-15.2	-15.3	-15.2	-15.2	-15.2	-15.1	-14.7	-12.7	-10.1	-19.6	-10.1
23-Jan	-9.4	-8.7	-8.1	-7.8	-6.7	-5.3	-4.8	-3.6	-3.5	-1.8	0.8	3.0	4.5	5.1	5.3	5.2	4.2	4.4	4.1	3.9	3.7	3.7	3.5	3.6	-0.2	5.3
24-Jan	4.1	5.6	7.3	7.1	5.5	1.2	-0.4	-1.0	-1.8	-2.5	-3.3	-4.1	-4.4	-4.7	-5.0	-5.0	-5.5	-5.6	-5.6	-5.6	-5.4	-5.6	-5.6	-5.3	-1.9	7.3
25-Jan	-5.1	-5.1	-5.5	-7.0	-8.0	-7.2	-6.0	-4.6	0.5	2.6	-1.4	-2.8	-3.8	-4.4	-4.6	-5.3	-5.8	-6.7	-8.1	-9.1	-10.1	-11.5	-14.1	-16.4	-6.2	2.6
26-Jan	-18.1	-20.1	-21.7	-23.0	-24.0	-25.0	-25.9	-26.9	-27.7	-27.6	-27.2	-25.8	-25.4	-24.7	-24.7	-24.8	-24.4	-24.6	-25.1	-27.1	-29.2	-30.7	-31.3	-32.2	-25.7	-18.1
27-Jan	-32.6	-33.2	-33.5	-33.5	-33.7	-32.8	-32.1	-32.3	-32.5	-31.3	-28.8	-26.3	-21.8	-18.9	-16.8	-18.7	-19.1	-20.1	-21.1	-20.5	-20.4	-20.4	-20.2	-20.2	-25.9	-16.8
28-Jan	-20.1	-19.8	-20.1	-21.6	-22.7	-23.1	-23.5	-22.5	-21.9	-21.3	-18.7	-16.3	-14.6	-12.4	-11.8	-11.8	-11.9	-12.5	-12.8	-15.8	-18.3	-20.0	-21.2	-22.1	-18.2	-11.8
29-Jan	-22.9	-23.7	-24.6	-25.3	-25.0	-24.2	-23.8	-23.3	-22.4	-22.0	-21.5	-21.1	-21.5	-22.3	-23.4	-23.8	-23.9	-23.8	-23.7	-23.2	-23.3	-23.4	-23.7	-23.7	-23.3	-21.1
30-Jan	-23.7	-23.6	-23.5	-23.4	-23.3	-24.0	-24.4	-24.1	-23.8	-23.1	-22.0	-20.2	-19.0	-17.9	-17.1	-16.8	-17.2	-17.0	-16.7	-16.6	-16.2	-15.7	-15.7	-16.1	-20.0	-15.7
31-Jan	-16.8	-17.0	-17.2	-17.6	-18.4	-19.5	-21.3	-20.6	-19.6	-18.0	-16.9	-16.0	-15.4	-14.9	-14.3	-14.6	-14.8	-15.0	-15.2	-15.4	-15.4	-14.7	-14.5	-14.4	-16.6	-14.3
	-17.6	-17.6	-17.6	-17.8	-18.0	-18.0	-18.1	-17.9	-17.6	-17.2	-16.2	-15.0	-14.1	-13.4	-13.1	-13.4	-14.0	-14.6	-15.0	-15.7	-16.1	-16.4	-16.8	-17.0	Diurnal Average	
	4.1	5.6	7.3	7.1	5.5	4.8	5.1	5.2	4.5	4.7	5.6	6.2	6.3	6.6	6.8	6.2	4.7	4.4	4.1	3.9	3.7	3.7	3.5	3.6	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Patricia McInnes - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	302	40.59	40.59
-20 - 0	375	50.40	90.99
0 - 10	67	9.01	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 92 % on Jan 18 22:00

Maximum Daily Average: 87.8 % on Jan 9

Minimum Value: 46 % on Jan 15 16:00

Minimum Daily Average: 64.3 % on Jan 15

Maximum Diurnal Average: 77.5 % at hour 6

Minimum Diurnal Average: 68.6 % at hour 15

Monthly Average: 74.7 %

Percentiles: P_1 = 52 P_{10} = 63 Q_1 = 69 Median = 75 Q_3 = 81 P_{90} = 86 P_{99} = 91

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

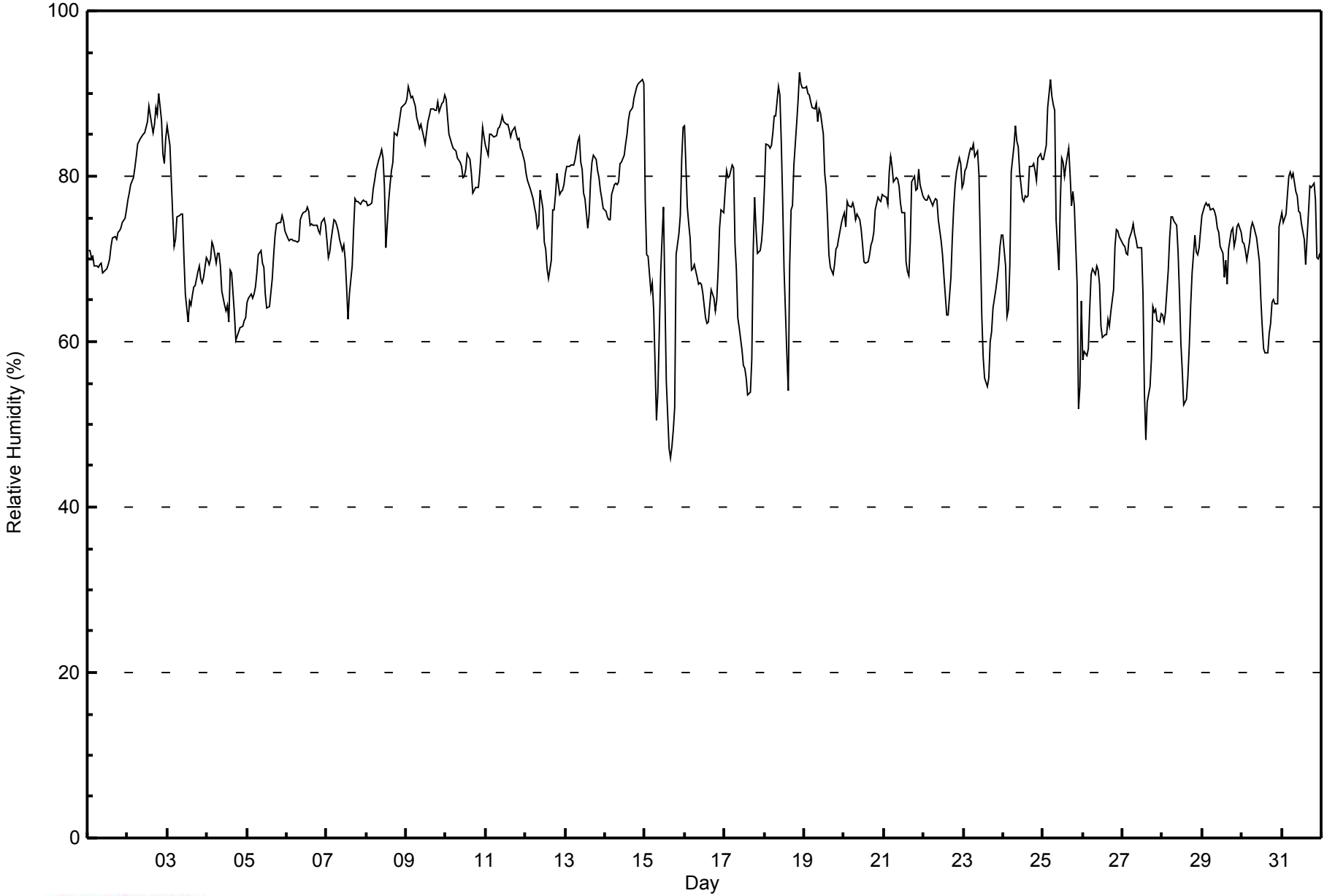
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	71	71	70	70	69	69	69	69	69	68	69	69	69	70	72	73	73	72	73	73	74	74	75	76	71.2	76
2-Jan	77	78	79	80	81	82	84	84	85	85	85	86	87	88	86	85	86	88	87	90	87	83	81	85	84.2	90
3-Jan	86	84	79	75	72	72	75	75	75	75	70	66	62	65	64	66	67	67	68	69	68	67	68	70	71.1	86
4-Jan	70	69	70	72	72	70	71	71	69	66	64	64	64	62	69	68	63	60	61	61	62	62	63	63	66.0	72
5-Jan	65	65	66	65	66	67	68	70	71	70	69	66	64	64	66	68	71	73	74	74	74	75	75	73	69.1	75
6-Jan	73	72	72	72	72	72	72	72	75	75	76	76	76	76	74	74	74	74	74	73	73	74	75	74	73.8	76
7-Jan	72	70	71	72	75	75	74	73	72	71	72	70	67	63	66	69	74	77	77	77	77	77	77	77	72.7	77
8-Jan	77	76	77	77	78	80	81	82	83	83	82	79	71	77	79	81	82	85	85	86	87	88	89	89	81.4	89
9-Jan	89	91	90	90	90	88	87	86	86	86	85	84	85	87	87	88	88	88	88	89	88	89	89	90	87.8	91
10-Jan	89	87	85	84	83	83	83	82	82	81	80	80	81	83	82	80	78	78	79	79	81	83	86	85	82.2	89
11-Jan	84	83	85	85	85	85	85	86	86	87	87	87	86	86	86	85	85	86	85	84	85	83	83	82	85.0	87
12-Jan	80	79	79	78	77	76	75	74	74	78	76	72	71	69	68	70	76	76	78	80	78	78	78	79	75.9	80
13-Jan	80	81	81	81	81	81	82	84	85	82	81	78	77	74	75	80	82	82	82	81	80	78	77	76	80.1	85
14-Jan	76	75	75	75	78	79	79	79	79	82	82	82	84	85	87	88	88	89	90	91	91	91	92	91	83.7	92
15-Jan	77	70	70	66	67	64	57	51	54	68	73	76	66	55	47	46	47	49	52	70	73	75	82	86	64.3	86
16-Jan	86	76	74	73	69	69	69	68	67	67	67	66	63	62	62	64	66	65	64	65	69	74	76	76	69.0	86
17-Jan	78	81	80	80	81	81	72	69	63	62	59	57	57	56	54	54	58	71	77	74	71	71	72	75	68.8	81
18-Jan	79	84	84	83	84	85	87	87	91	90	84	77	69	59	54	69	76	76	81	86	89	92	91	91	81.2	92
19-Jan	91	91	90	90	89	88	88	89	87	88	88	85	80	79	75	71	69	68	69	71	71	73	74	75	80.8	91
20-Jan	76	74	77	76	76	77	76	75	75	75	74	72	70	70	70	70	72	72	73	76	78	77	77	78	74.3	78
21-Jan	78	77	77	81	82	81	79	80	80	79	77	76	76	70	68	68	72	79	80	78	78	81	79	78	77.2	82
22-Jan	77	77	77	78	77	77	77	77	77	75	72	70	68	66	63	63	68	73	76	79	81	82	81	79	74.6	82
23-Jan	79	81	81	83	83	83	84	82	83	80	72	63	58	56	55	56	60	61	64	66	68	69	72	73	71.3	84
24-Jan	73	69	63	64	69	80	84	86	84	84	81	77	77	78	78	78	81	81	81	81	80	82	83	82	78.1	86
25-Jan	82	83	84	88	92	90	89	88	75	69	77	82	82	80	81	83	80	76	78	76	67	52	55	65	78.0	92
26-Jan	58	59	58	59	64	68	69	68	69	69	67	62	60	61	61	63	62	64	66	72	74	73	73	72	65.4	74
27-Jan	72	72	71	71	72	73	74	73	72	71	71	71	66	54	48	53	55	58	64	64	64	63	62	63	65.7	74
28-Jan	63	62	64	69	73	75	75	74	74	71	66	60	57	52	53	56	59	64	68	73	71	71	71	73	66.4	75
29-Jan	75	76	77	76	77	76	76	76	75	74	73	72	71	68	70	67	71	73	74	72	72	74	74	73	73.4	77
30-Jan	72	72	71	70	72	74	74	74	73	73	70	65	62	59	59	59	61	62	65	65	65	65	74	75	67.9	75
31-Jan	76	74	75	78	80	81	80	80	78	78	76	76	74	72	69	73	76	79	79	79	77	70	70	71	75.8	81
	76.8	76.1	75.9	76.2	77.0	77.5	77.3	77.0	76.4	76.1	74.9	73.1	71.0	69.1	68.6	69.8	71.6	73.2	74.7	76.0	75.8	75.7	76.6	77.2	Diurnal Average	
	91	91	90	90	92	90	89	89	91	90	88	87	87	88	87	88	88	89	90	91	91	92	92	91	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Patricia McInnes - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - January 2014

Maximum Speed: 50 km/h on Jan 15 09:00

Maximum Daily Speed Average: 30.6 km/h on Jan 15

Minimum Speed Value: 1 km/h on Jan 11 01:00

Minimum Daily Speed Average: 0.8 km/h on Jan 9

Maximum Diurnal Speed Average: 4.6 km/h at hour 16

Minimum Diurnal Speed Average: 1.4 km/h at hour 24

Monthly Average Velocity: 2.9 km/h 297.0 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 5 Median = 9 Q_3 = 13 P_{90} = 19 P_{99} = 43

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSW3	SSE3	SSE3	SSE2	SSE2	SSE2	SSW2	SE3	SE3	S3	SSE3	SE3	SE3	SE3	SE3	SE3	SSE3	SSE3	SSE6	S4	SE7	SE7	SE11	SE12	SSE3.8	SE12
2-Jan	SE13	SE17	ESE18	SE18	ESE18	SE12	SE10	SSE10	SSE5	SSE6	SSE7	SSE6	SSE7	SSW9	SW13	SW14	SW14	SW9	SW8	SW7	SW9	WSW11	W11	NNW14	S6.4	ESE18
3-Jan	NNW20	NNW22	N26	N24	N19	N14	NNW9	NW9	WNW9	WNW7	NNW4	NNE2	NNE5	NNE5	NW16	NW17	WNW14	WNW16	WNW14	WNW15	WNW16	WNW15	W13	WSW12	NW11.5	N26
4-Jan	WSW12	WSW12	SW10	SW9	WSW11	WSW11	SW11	SSW12	WSW11	WNW18	WNW19	WNW20	NW21	NNW27	N21	NNW19	NW13	NW12	NW13	WNW13	WNW12	WNW12	W9	W10	WNW10.6	NNW27
5-Jan	WSW10	WSW11	WSW11	W11	WSW8	WSW6	WSW7	S4	SSW8	SW7	SSW8	S4	S5	SE6	S7	S5	SE4	SSE4	SE5	SSE5	SSE5	SSE5	SE6	SE8	SSW4.4	WSW11
6-Jan	SE9	SE10	SE7	SE11	SE11	ESE12	ESE13	ESE13	ESE12	ESE15	ESE17	ESE17	ESE15	ESE15	ESE14	ESE10	ESE9	E10	ENE11	ESE9	ESE8	ENE7	ENE6	E7	ESE10.6	ESE17
7-Jan	ENE3	SE1	NNE5	N4	NNW4	W2	WNW4	WNW4	W2	NW2	SW2	SE5	SE6	SE4	SSE6	S5	SSW2	SE6	SE9	SE9	SE9	SE10	SE10	SE11	SE2.9	SE11
8-Jan	SE12	SE12	SE13	SE15	SE15	SE13	SE10	SE7	SE10	SE8	SE5	SSE5	SE4	SSW5	SSW9	SW8	SW8	SW7	SE3	ESE4	SE5	SSE5	SE5	ESE4	SE6.6	SE15
9-Jan	SE5	SSE6	S4	SSW5	S4	SSE5	SSW5	SW4	SW3	S4	S8	SSW7	SSW5	SE5	SE5	ESE3	NE5	NNW7	NNW11	NNW13	NNW12	NNW12	NNW11	NNW10	WNW0.8	NNW13
10-Jan	NNW10	NNW10	NNW9	NNW10	NNW10	NW8	NW7	NW6	NW5	W4	NW4	NW5	NNE6	N7	NW7	W9	W12	W12	WSW8	SW8	SW7	SW6	SSE4	SW2	WNW5.3	W12
11-Jan	SSW1	E2	E4	ENE4	ENE4	N7	N6	N6	N8	N9	N8	N7	NNE9	N10	N14	N14	N14	N12	NNW13	N15	N15	NNW18	N16	NNW17	N9.0	NNW18
12-Jan	NNW23	NNW20	NNW20	NNW20	NNW21	NNW16	NNW12	NW8	W2	SW4	WSW10	WSW11	WSW12	SW11	SSW10	SSW10	SSE8	S9	SE7	SE6	SE9	SE9	SE11	SE11	WNW2.9	NNW23
13-Jan	ESE14	SE15	SE12	SSE8	S5	SSW4	SW6	NNW2	NNE1	N10	NNW9	N8	N8	NNE9	N9	N8	NNW8	N8	NNW9	NNW7	NNW4	NNW4	WNW3	WSW3	N2.3	SE15
14-Jan	WSW3	W3	S2	SSW2	SSE3	SE4	SSE4	SE7	SE10	SE10	SE11	SSE12	SE13	SE11	SE11	SE11	SE12	SE12	SSE12	SSE9	S7	S6	SE6	SSW12	SSE7.4	SE13
15-Jan	WSW33	WSW40	W48	WNW42	W41	W37	W39	W44	WNW50	WNW45	WNW43	WNW36	NW43	NW42	NW45	NW42	WNW34	NW26	NW21	N13	NNW10	NW6	W5	WSW6	WNW30.6	WNW50
16-Jan	SW6	SW10	SW11	SW10	WSW11	SW12	SW10	WSW16	SW15	SW13	SW16	SW12	SSW9	SW10	SSW7	SSW6	SSW5	SW6	SW8	SW4	S5	ESE4	ESE5	E6	SW7.8	WSW16
17-Jan	SSE4	S6	SW9	SW12	SW10	SW12	WSW20	WSW24	W23	W25	WNW28	W28	W25	NW24	NW21	NW20	NW13	N15	N15	N15	NNE12	N8	NNW5	W3	WNW10.8	W28
18-Jan	SW3	SSE4	SSE4	S5	S5	SSE4	SW4	S4	SSW7	SSW8	SW16	SW13	SW12	WSW7	ENE1	N11	NNW15	NNW12	NNW11	NNW8	NNW9	NNW7	NNW4	W3	W2.6	SW16
19-Jan	S4	WSW4	N6	ENE1	N6	N8	NW5	WNW5	SSW2	N6	N13	NNW19	N28	N28	N29	N27	N23	N17	N12	N11	N9	NW6	WNW5	WSW3	N10.3	N29
20-Jan	SW3	SSW3	SSW5	S6	S3	SE6	SSE9	SSE8	SE8	SE10	SSE10	SE7	SSE10	SE10	SE11	SSE8	SSE6	SSE5	NW5	NNW5	NNW8	NW8	NNW12	NW10	SSE3.1	NNW12
21-Jan	NW6	NW5	WSW1	W1	NW2	NNW2	NNW3	NNW6	WNW6	WNW8	NNW14	NNW16	N16	N16	NNE12	NNE10	N5	NW5	N5	NNW3	ENE3	ESE6	ESE10	ESE11	N4.7	N16
22-Jan	SE8	SE9	SE9	SE7	ESE9	SE10	SE8	SE8	SE9	SE10	SE12	SE12	SE10	SE11	SE11	SSE11	SE8	SE9	SE8	SE7	SE8	SE9	S11	SSW13	SE9.0	SSW13
23-Jan	SW18	SW21	SW22	SW21	SW23	SW22	SW21	SW18	SW16	WSW9	W11	WNW16	WNW19	WNW17	WNW17	W15	W11	W17	W14	W14	WSW7	SW5	SSW5	SSW7	WSW13.2	SW23
24-Jan	SW6	W8	WNW16	WNW15	NW10	NNW14	NNW12	NNW15	NNW15	NNW16	N13	N15	N16	N14	N12	N12	N9	N8	NNE6	NW3	NNW2	E4	ESE5	SE7	NNW7.9	N16
25-Jan	SE6	SE8	SSE7	SSW2	S4	SSW7	SSW2	SW4	WNW15	WNW21	N25	N20	N17	N13	N13	NNW18	N18	N17	N20	N21	NNW25	NNW35	NNW35	N33	NNW12.4	NNW35
26-Jan	N32	N30	N24	NNW26	N18	N15	N13	N11	N9	NNW9	NNW6	N4	NW1	NE5	NNE5	ESE4	ESE3	SSW3	SSW4	SE3	SW2	WSW3	W1	WSW1	N7.9	N32
27-Jan	SW1	SW1	SSW2	SSE3	SSE3	SSE4	SSE5	SSE5	S6	SSE7	SSE5	SE6	SSE7	SSE9	S10	SE8	SE7	SSE4	SSE5	SE7	SE7	SE6	SE6	SSE6	SSE5.1	S10
28-Jan	SE6	SSE7	S5	S4	S4	SSE3	SSW4	SSE3	SSE5	S8	SSE6	E5	NNE4	NNE6	NNE6	N6	NNW13	NNW15	NNW15	N24	N26	N21	N16	NNW14	N4.5	N26
29-Jan	NW8	WNW7	W6	WNW7	WNW6	NW4	WSW6	WNW6	NNW8	NNW10	NNW14	NNE15	N17	N23	N23	N19	N14	N11	NNW9	NNW13	NW10	WNW9	WNW7	WNW8	NNW9.3	N23
30-Jan	WNW8	WNW8	WNW8	W9	W8	WSW7	WSW8	WSW9	WSW12	WSW16	WSW15	WSW15	SW18	SW20	SW20	SW13	SW16	SW18	SW15	SW14	SW13	WSW14	WSW14	W11	WSW11.9	SW20
31-Jan	WNW12	NNW11	NNW9	WNW8	WNW8	W8	WSW6	WSW7	WSW7	NW3	N7	NNW13	NNW14	NNW12	NNW11	N11	N10	NNW6	WNW5	WNW5	WNW6	WNW10	NW9	WNW7	NW7.0	NNW14
	W2.1	WSW2.3	W2.7	W3.1	W2.7	W2.6	WSW3.8	WSW4.0	W4.2	W4.4	WNW3.9	WNW3.8	NW4.1	NNW4.5	NNW4.4	NW4.6	NW4.1	NW4.0	NW3.5	NNW3.2	NNW2.8	NW2.9	NW1.8	WNW1.4	Diurnal Average	
	WSW33	WSW40	W48	WNW42	W41	W37	W39	W44	WNW50	WNW45	WNW43	WNW36	NW43	NW42	NW45	NW42	WNW34	NW26	NW21	N24	N26	NNW35	NNW35	N33	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

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 12 km/h on Jan 15 03:00

Minimum Value: 0 km/h on Jan 1 15:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 9

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

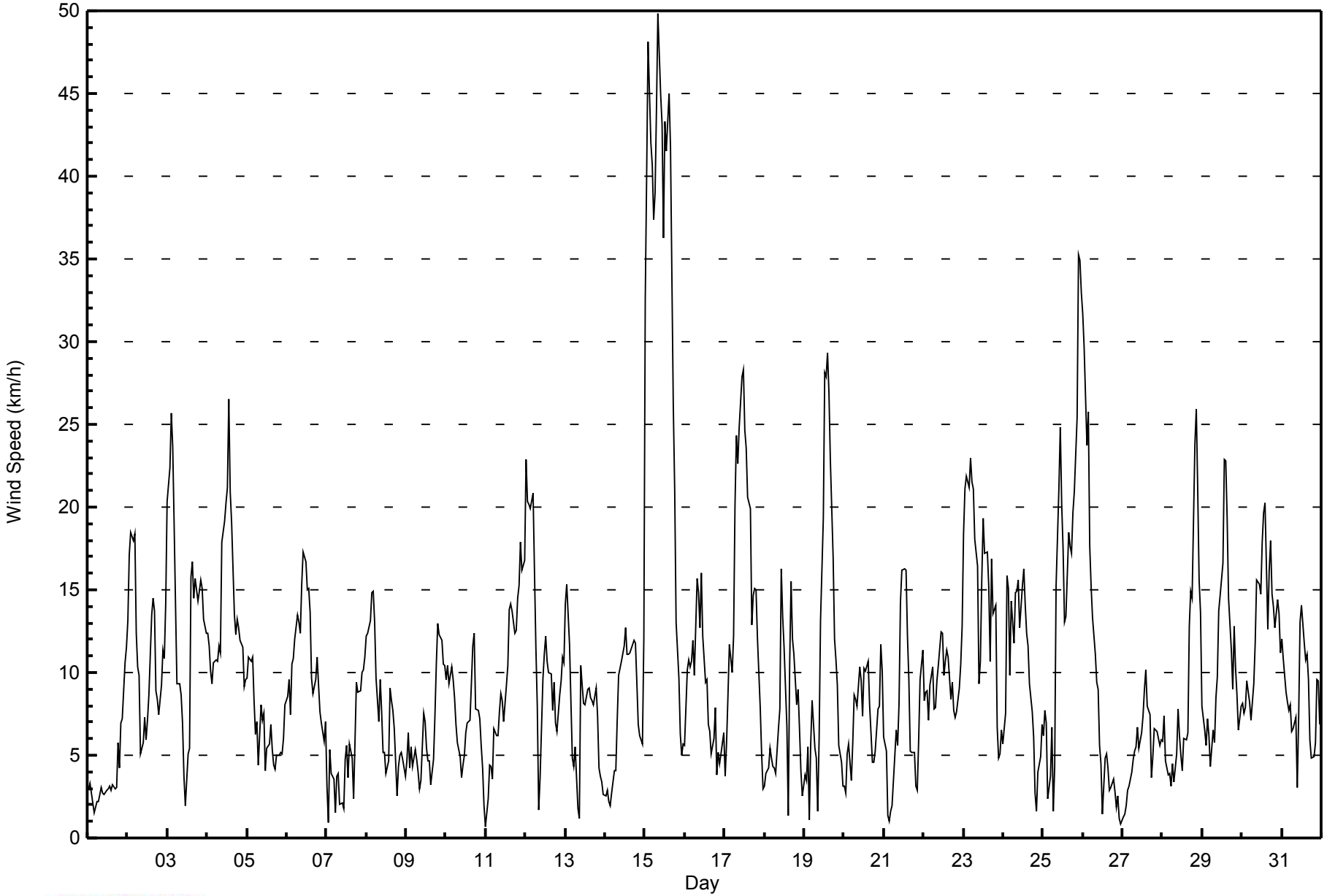
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	2	2	3	3	3
2-Jan	4	4	4	4	4	4	2	2	2	1	2	1	1	2	2	3	2	3	2	2	1	2	2	4	4
3-Jan	3	6	5	5	4	3	2	1	1	1	2	1	1	2	5	4	3	3	2	3	3	2	3	2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

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Patricia McInnes - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	194	26.08	26.08
6 - 11	306	41.13	67.20
12 - 19	171	22.98	90.19
20 - 28	50	6.72	96.91
29 - 38	10	1.34	98.25
> 38	13	1.75	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Patricia McInnes - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	4	7	2	6	4	8	22	37	20	23	12	7	10	7	13	12	194
6 - 11	32	7	0	3	3	8	73	25	11	14	28	25	13	20	14	30	306
12 - 19	35	3	0	0	0	13	18	2	0	3	21	12	6	20	6	32	171
20 - 28	17	0	0	0	0	0	0	0	0	0	8	2	4	3	6	10	50
29 - 38	4	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	10
> 38	0	0	0	0	0	0	0	0	0	0	0	1	4	4	4	0	13
Totals	92	17	2	9	7	29	113	64	31	40	69	48	38	56	43	86	744

Total Number of Valid Hours: 744

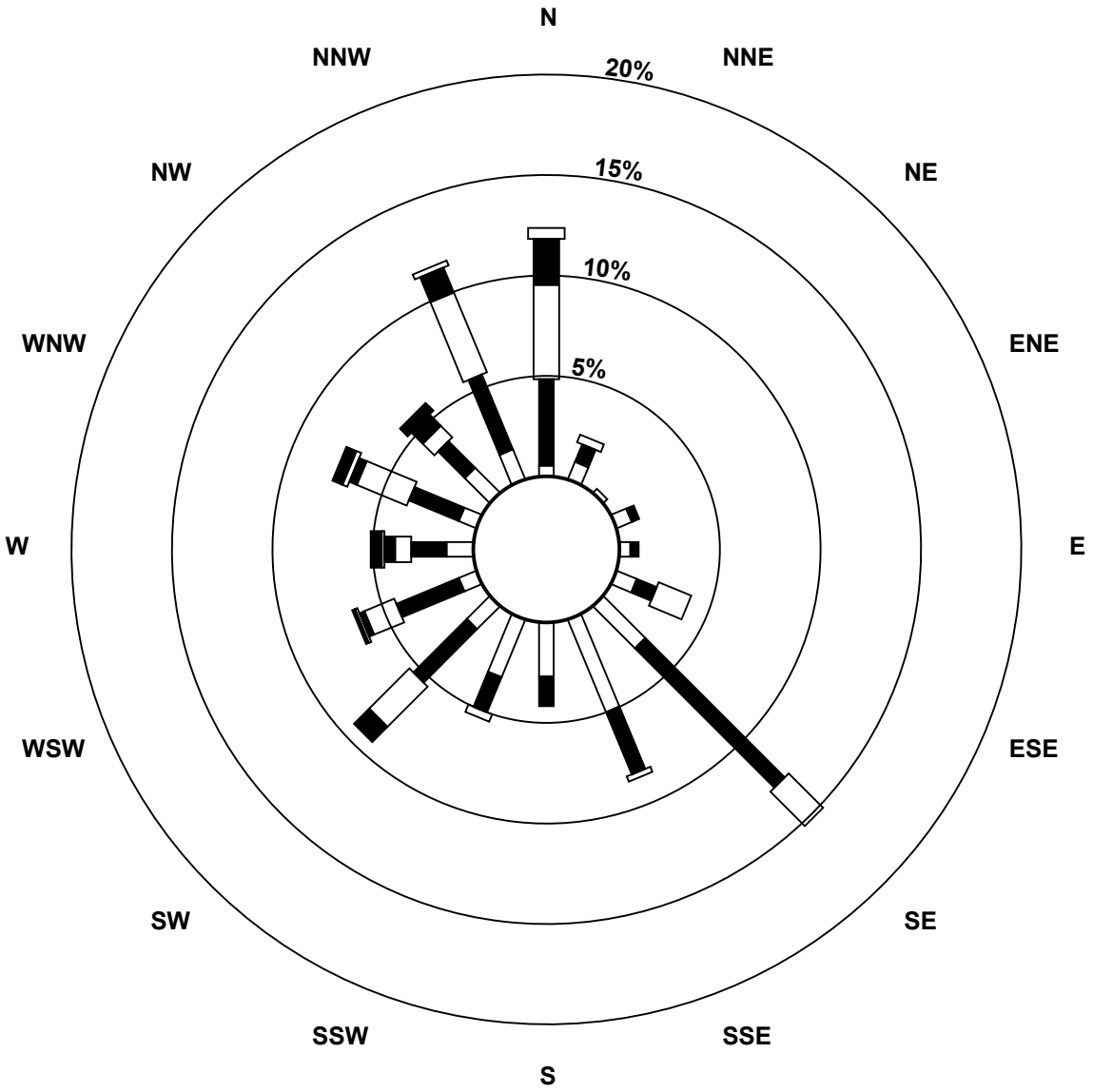
Total Number of Hours: 744

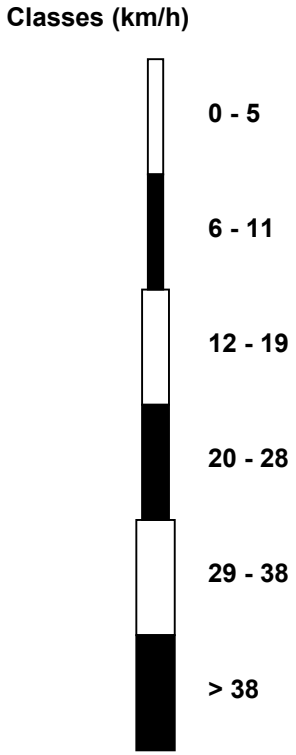
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Patricia McInnes (AMS 6)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 297 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 290.7 deg on Jan 15

Direction of Minimum Speed: 204 deg on Jan 11 01:00

Direction of Minimum Daily Speed Average: 0.8 deg on Jan 9

Monthly Average Direction: 286.2 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	201	164	152	154	157	163	200	128	133	169	161	142	145	129	146	127	163	157	159	171	134	137	136	129	147.0
2-Jan	126	126	123	126	120	128	132	149	153	161	161	159	162	193	221	225	225	227	218	222	231	258	273	339	171.7
3-Jan	341	348	2	356	356	354	336	325	301	284	338	31	26	21	316	311	299	296	299	297	298	283	281	257	323.4
4-Jan	251	252	226	215	249	241	223	213	240	284	294	297	310	332	8	348	326	310	309	299	294	293	272	274	290.0
5-Jan	250	248	256	259	258	255	240	178	206	218	205	190	169	125	170	171	141	150	127	156	148	149	126	131	200.5
6-Jan	127	136	126	126	136	115	115	121	116	114	117	121	115	119	112	115	107	81	78	105	117	62	58	94	112.5
7-Jan	65	129	14	11	341	274	299	295	260	319	220	137	135	144	155	185	200	130	130	132	137	132	130	132	134.5
8-Jan	132	128	130	128	128	133	142	127	132	134	128	149	135	193	210	217	231	235	145	122	145	151	127	123	145.2
9-Jan	131	151	172	194	172	167	201	230	215	186	191	198	196	143	125	109	41	338	346	344	339	341	342	336	296.0
10-Jan	340	338	333	335	335	322	324	317	314	276	313	314	23	357	321	275	273	268	256	231	230	218	162	219	303.6
11-Jan	204	83	80	68	76	350	356	354	352	359	7	8	14	358	356	352	356	352	338	356	352	345	349	339	356.6
12-Jan	340	340	340	341	339	345	331	323	263	215	245	244	248	235	205	200	165	172	139	134	131	131	130	134	301.7
13-Jan	123	130	133	156	183	194	220	330	19	352	346	355	6	12	7	355	347	349	329	330	328	330	295	240	7.9
14-Jan	248	276	185	211	155	126	158	144	140	142	136	148	146	142	141	138	145	145	150	154	173	176	145	194	151.7
15-Jan	240	252	273	282	271	273	279	279	297	300	301	302	307	309	308	305	301	304	317	357	340	309	275	237	290.7
16-Jan	225	217	220	215	238	233	224	237	235	234	236	230	213	215	201	201	195	215	229	225	169	110	114	95	219.4
17-Jan	153	179	220	230	216	234	245	256	270	275	282	278	279	307	322	319	326	8	9	7	12	3	347	265	289.8
18-Jan	214	156	154	177	179	159	227	182	208	210	220	229	225	241	65	356	343	347	345	348	339	329	345	267	267.9
19-Jan	186	242	354	70	10	355	324	301	198	351	351	343	354	2	358	2	5	360	358	5	350	325	294	257	352.9
20-Jan	220	205	199	190	169	126	155	156	127	146	151	144	151	140	145	148	159	164	313	331	343	321	329	321	158.0
21-Jan	314	317	255	266	308	338	337	342	289	292	343	348	352	7	14	21	7	311	351	335	77	111	123	119	355.4
22-Jan	125	126	128	132	121	131	129	136	132	136	135	141	143	142	134	147	137	129	142	136	144	135	176	213	140.0
23-Jan	219	221	224	223	229	231	225	234	234	238	263	283	303	302	300	277	275	275	267	264	242	221	207	207	248.7
24-Jan	218	278	291	289	310	340	328	337	344	343	3	0	6	6	355	6	2	358	12	315	337	94	111	144	342.4
25-Jan	139	130	149	199	180	199	208	214	286	298	357	354	350	354	352	343	350	354	360	356	340	337	345	355	344.0
26-Jan	354	355	350	346	1	3	1	352	352	348	329	358	322	38	27	113	118	200	197	134	217	245	260	241	354.8
27-Jan	215	229	197	166	168	165	159	150	173	168	148	135	149	165	184	126	129	152	166	141	139	141	143	150	154.5
28-Jan	140	168	186	180	170	161	206	160	166	187	150	87	21	17	32	357	340	341	344	8	1	1	357	345	3.6
29-Jan	325	288	279	283	303	307	250	285	327	333	347	12	5	352	354	3	7	357	337	342	318	301	286	296	336.3
30-Jan	302	297	290	280	280	250	245	245	245	249	242	240	229	231	224	232	217	221	225	223	221	248	256	265	242.0
31-Jan	288	333	340	302	288	266	248	242	248	314	8	344	344	332	345	352	354	337	299	286	292	299	304	287	315.0
	262.8	254.8	270.3	267.4	264.9	259.5	249.9	253.6	261.1	274.4	291.4	302.7	318.6	331.5	330.1	325.6	322.3	314.8	322.8	335.8	327.2	319.5	318.9	286.9	
	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

Patricia McInnes - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 94 deg on Jan 7 02:00

Minimum Value: 4 deg on Jan 5 03:00

Percentiles: P_1 = 7 P_{10} = 10 Q_1 = 12 Median = 14 Q_3 = 20 P_{90} = 33 P_{99} = 75

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

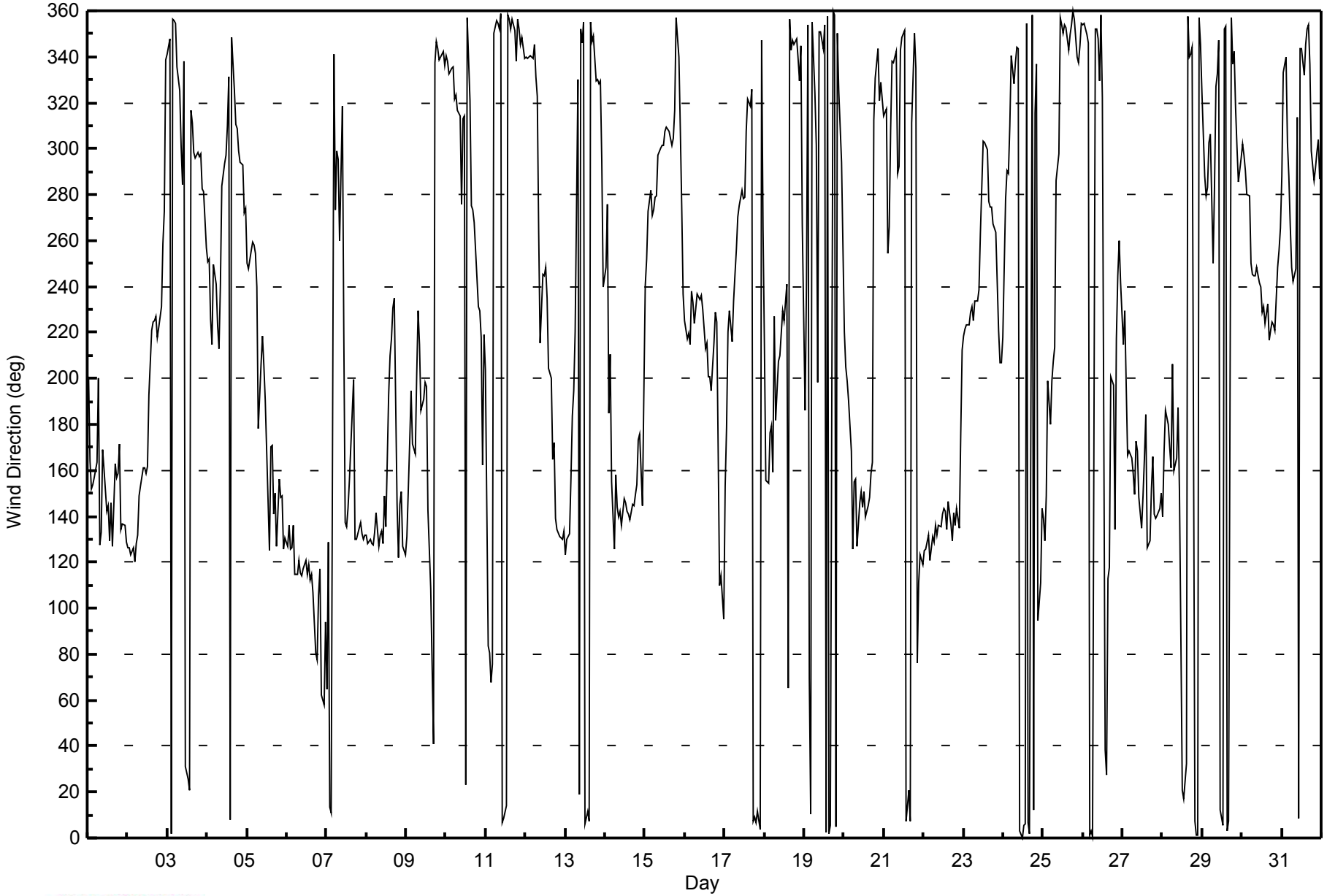
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	27	18	23	46	49	38	26	28	23	24	26	26	26	20	17	20	15	23	17	25	15	14	14	15	49
2-Jan	14	13	12	12	12	15	15	12	20	15	13	17	17	17	10	11	9	13	22	18	8	12	12	31	31
3-Jan	9	13	15	14	14	12	9	14	10	7	40	73	18	23	18	9	10	9	9	10	12	10	10	7	73
4-Jan	7	8	12	11	14	17	13	12	20	12	12	11	12	17	14	13	12	9	10	9	9	9	11	14	20
5-Jan	11	7	4	7	10	24	13	23	20	21	24	36	34	21	17	26	18	21	14	22	24	22	19	12	36
6-Jan	14	15	14	14	16	13	12	14	13	13	13	13	13	12	13	15	15	23	12	20	18	26	27	14	27
7-Jan	30	94	28	34	31	46	21	15	36	40	53	33	15	27	27	17	50	14	12	12	12	12	13	15	94
8-Jan	15	13	13	13	13	14	14	19	13	12	9	15	15	32	12	16	12	13	41	12	21	19	30	17	41
9-Jan	17	14	30	17	21	17	20	18	26	32	13	16	20	18	17	22	30	16	11	11	11	10	12	13	32
10-Jan	12	10	12	8	11	11	18	12	19	19	16	17	15	12	25	14	16	12	12	15	15	27	22	56	56
11-Jan	90	69	33	26	33	17	13	11	12	12	14	12	11	12	12	11	13	16	10	13	15	11	11	9	90
12-Jan	9	9	9	10	11	13	14	14	51	28	16	10	13	14	13	16	14	11	12	13	12	13	13	14	51
13-Jan	14	13	14	19	18	32	61	70	82	21	12	14	21	14	17	11	13	13	7	6	28	33	38	43	82
14-Jan	35	46	54	42	34	18	25	18	13	16	15	14	12	14	14	15	12	12	14	12	15	12	13	26	54
15-Jan	12	11	13	12	12	13	12	13	14	11	11	10	10	11	11	11	10	10	26	13	11	11	21	25	26
16-Jan	16	13	9	10	11	10	10	8	7	9	10	14	16	15	16	12	15	23	12	31	32	39	22	19	39
17-Jan	36	18	15	11	16	20	11	12	11	11	11	11	13	11	12	10	13	14	15	14	12	12	16	36	36
18-Jan	31	22	31	13	16	30	19	43	17	13	10	10	10	21	90	19	10	13	13	17	16	34	32	55	90
19-Jan	32	22	31	87	25	15	18	36	75	26	13	11	16	15	15	15	14	14	14	13	15	15	42	34	87
20-Jan	34	26	15	15	27	14	13	26	22	11	12	16	13	11	13	19	20	25	62	15	11	13	10	12	62
21-Jan	25	16	76	69	60	63	32	17	17	11	17	13	16	14	14	13	20	16	23	27	57	16	14	14	76
22-Jan	13	15	16	12	13	14	13	12	15	13	13	12	14	13	13	13	15	14	11	16	15	11	20	16	20
23-Jan	11	11	11	10	10	10	9	11	10	18	10	14	11	11	12	12	13	10	10	11	13	34	31	21	34
24-Jan	30	30	10	11	33	13	9	10	12	12	13	14	13	15	14	15	13	15	19	35	64	14	16	14	64
25-Jan	14	13	25	64	54	28	74	42	15	14	17	15	14	16	15	12	14	19	15	14	11	13	14	17	74
26-Jan	17	16	15	13	16	15	13	12	14	14	23	34	73	33	39	35	45	39	30	43	49	15	64	70	73
27-Jan	73	45	47	28	26	12	13	21	17	19	20	14	23	16	26	14	16	32	11	11	12	18	14	16	73
28-Jan	19	15	16	26	20	41	29	34	33	17	21	37	24	17	10	16	9	11	15	12	16	15	15	12	41
29-Jan	13	11	7	8	10	26	15	17	15	10	17	13	13	16	15	15	13	17	15	15	13	9	9	9	26
30-Jan	8	12	9	11	20	14	7	8	11	12	12	14	13	13	11	20	10	13	13	13	14	12	14	9	20
31-Jan	9	26	19	11	15	14	16	13	12	47	20	12	11	15	18	12	15	20	19	10	16	14	13	18	47
	90	94	76	87	60	63	74	70	82	47	53	73	73	33	90	35	50	39	62	43	64	39	64	70	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Patricia McInnes - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 20, 2014	Previous Calibration	December 12, 2013
Station Name	Patricia McInnes	Station Number	6
Reason:	Routine		
Start Time (MST)	11:20	End Time (MST)	13:45
Barometric Pressure	726 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11031107
SO2 Gas Concentration	51 ppm	Cal Gas Expiry Date	May 29th 2014
Gas Cert Reference	LL107929		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE 1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage (v)	-669	-670
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	757	760
Calculated slope	1.001052	1.013110	Chamber temp. (Deg C)	45.0	45.2
Calculated intercept	1.549438	2.665840	Pressure (mmHg)	702.1	694.0
Analyzer Background	5	5	Flow (lpm)	0.431	0.430
Analyzer Coefficient	1.198	1.198	Intensity (%)	93	93

Analyzer make	TEI 43i	Analyzer serial #	1008841397

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.4	N/A
as found span	5000	78.3	798.7	786.4	1.016
calibrator zero	5000	0.0	0.0	-0.4	N/A
high point	5000	78.3	798.7	786.4	1.016
second point	5000	39.1	398.8	391.0	1.020
third point	5000	19.6	199.9	191.8	1.042
calibrator zero	5000	0.0	0.0	-0.1	N/A
as left zero	5000	0.0	0.0	-0.1	N/A
as left span	5000	78.3	798.7	792.6	1.008
				Average Correction Factor	1.026

Corrected As found	786.8	Previous response	798.0	% change	1.4%

Notes:

no adjustments required

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

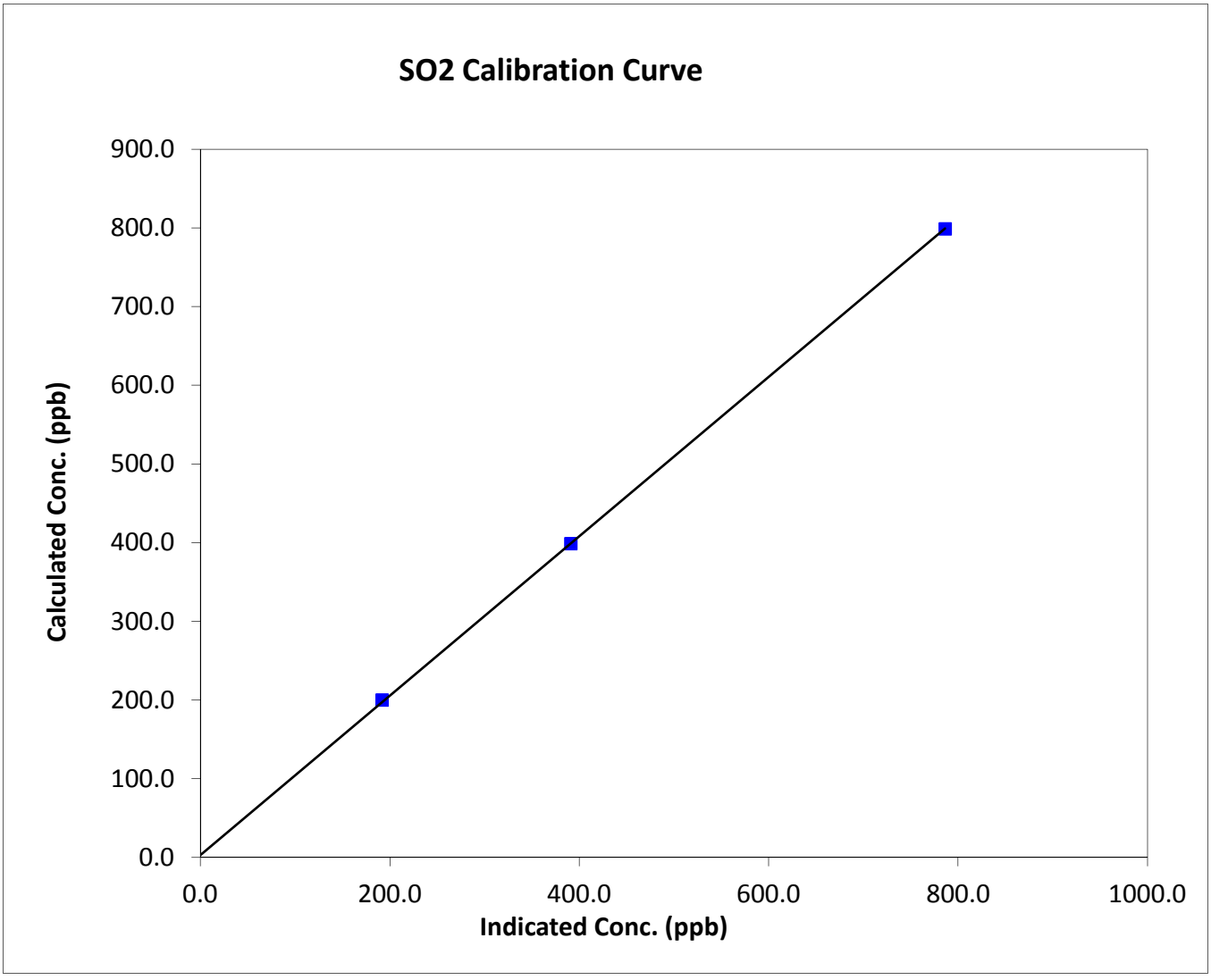
SO_2 Calibration Summary

Station Information

Calibration Date	January 20, 2014	Previous Calibration	December 12, 2013
Station Name	Patricia McInnes	Station Number	6
Start Time (MST)	11:20	End Time (MST)	13:45
Analyzer make	TEI 43i	Analyzer serial #	1008841397

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	0.999959
798.7	786.4	1.0156		
398.8	391.0	1.0199	Slope	1.013110
199.9	191.8	1.0425		
			Intercept	2.665840



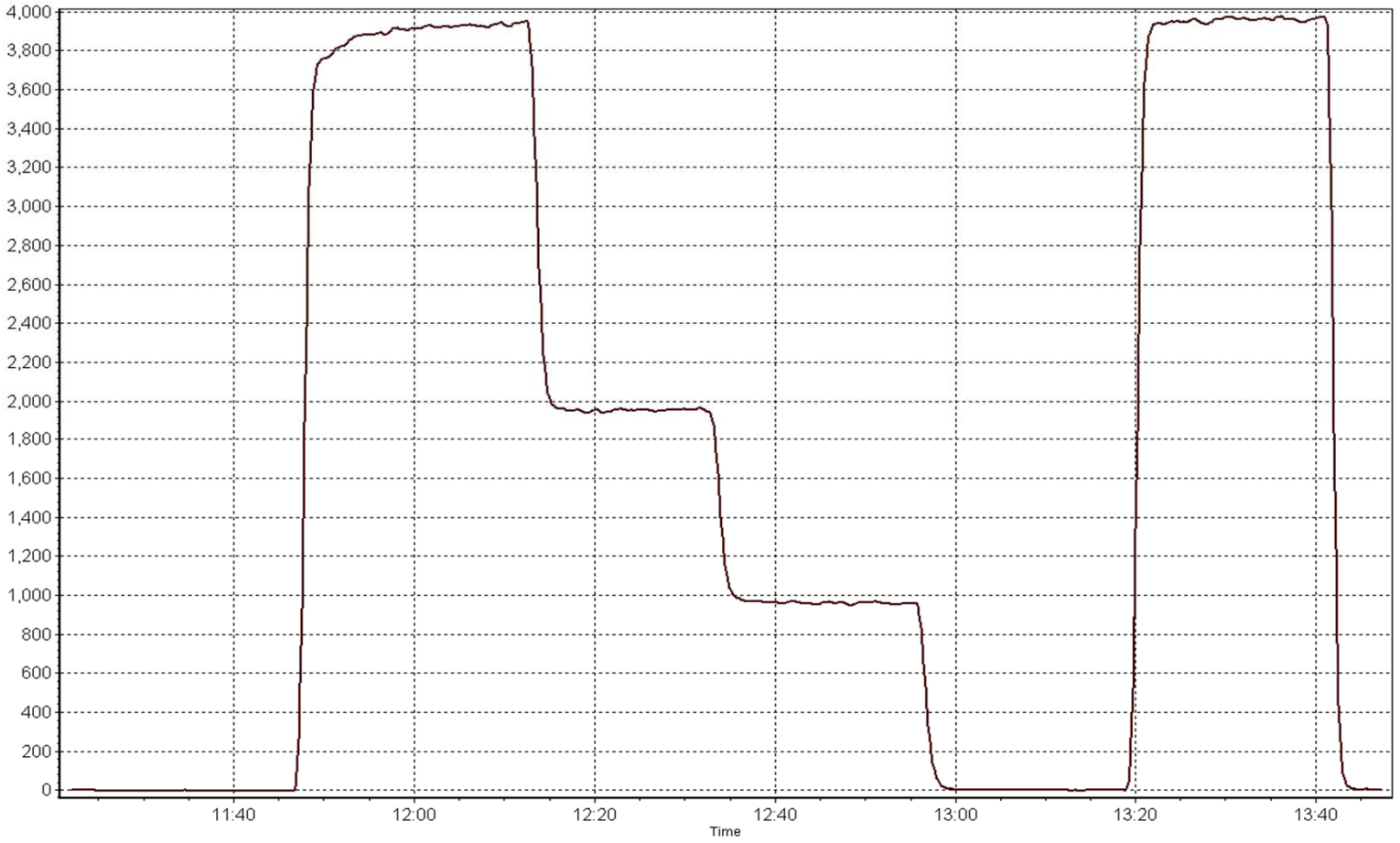
Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

SO_2 Calibration Plot

Calibration Date: January 20, 2014 Start Time (MST) 11:20 End Time: 15:18

Station Name: Patricia McInnes Station Number: 6



Calibration Performed By: Mike Martineau

TRS Calibration Report

Station Information

Calibration Date	January 1, 2013	Previous Calibration	December 13, 2013
Station Name	Patricia McInnes	Station Number	6

Reason: Routine

Start Time (MST)	16:00	End Time (MST)	18:45
Barometric Pressure	734 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11031107
Cal Gas Concentration	9.7 ppm	Cal Gas Expiry Date	June 12 2013
Gas Cert Reference	LL18921	SO2 cal gas Concentration	51.0 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE 2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage (v)	-657	-657
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	852	852
Calculated slope	1.003191	0.983703	Chamber temp. (Deg C)	45	45
Calculated intercept	0.434819	0.346519	Pressure (mmHg)	710.0	710.0
Analyzer Background	14.3	14.0	Flow (lpm)	0.490	0.490
Analyzer Coefficient	1.172	1.089	Intensity (%)	112	112
			Converter temp (Deg C)	850	850

Analyzer make	TEI 43i	Analyzer serial #	1008841398
Converter make	JC Andelle model 26	Converter serial #	20101-07

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
SO2 Scrubber	5000	19.6	199.9		N/A
calibrator zero	5000	0.0	0.0	-0.1	N/A
high point	5000	36.1	70.0	71.0	0.986
second point	5000	19.3	37.4	37.5	0.998
third point	5000	9.6	18.6	18.4	1.012
calibrator zero	5000	0.0	0.0	-1.0	N/A
as left zero	5000	0.0	0.0	-1.0	N/A
as left span	4000	28.8	69.8	69.7	1.002
				Average Correction Factor	0.999

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

replaced TRS converter with a new one, previous converter failed

adjusted zero and span, no as left completed

Calibration Performed By: Gary Cross

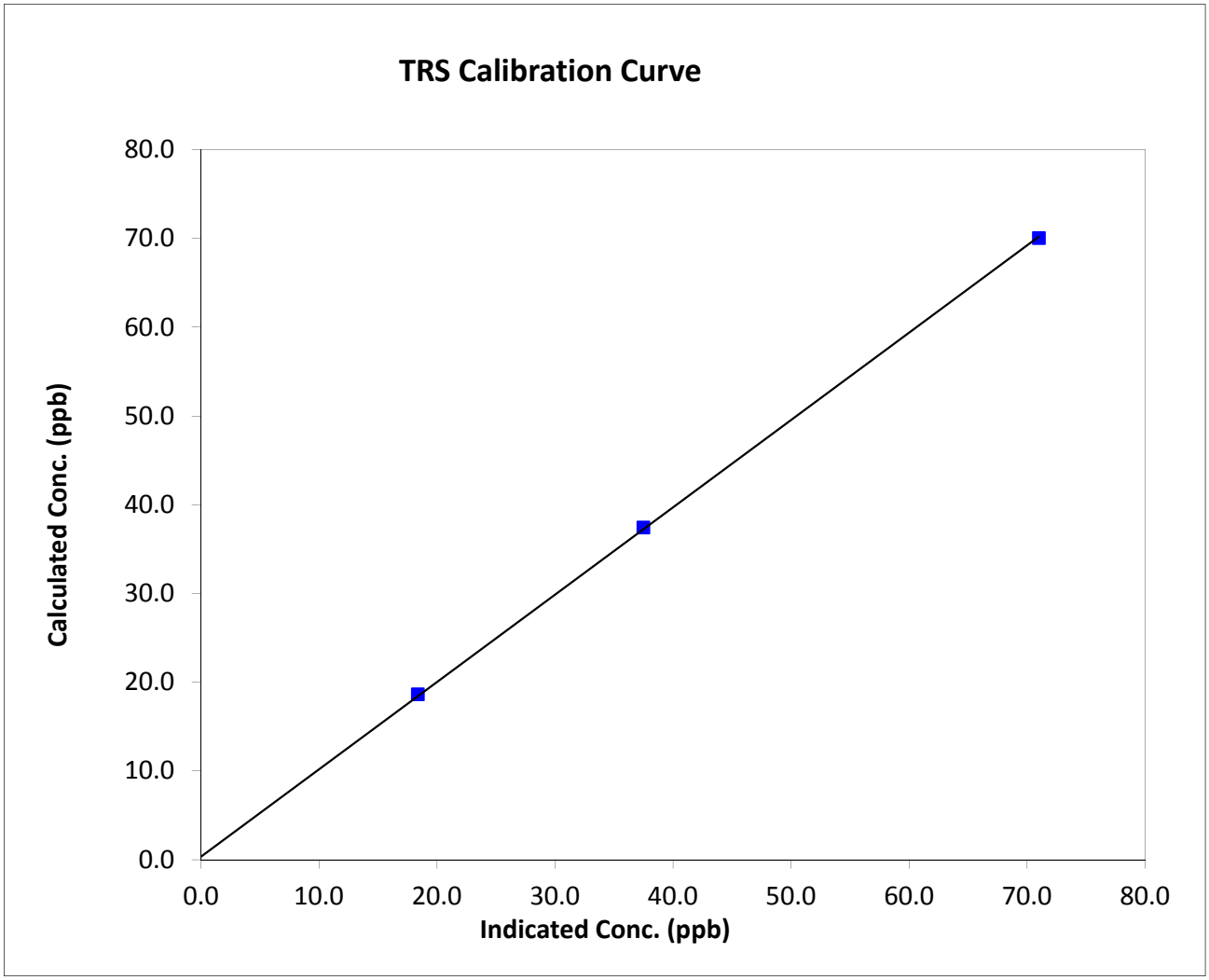
TRS Calibration Summary

Station Information

Calibration Date	January 1, 2013	Previous Calibration	December 13, 2013
Station Name	Patricia McInnes	Station Number	6
Start Time (MST)	16:00	End Time (MST)	18:45
Analyzer make	TEI 43i	Analyzer serial #	1008841398
		Converter Serial #	20101-07

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999944
70.0	71.0	0.9864		
37.4	37.5	0.9985	Slope	0.983703
18.6	18.4	1.0122		
			Intercept	0.346519



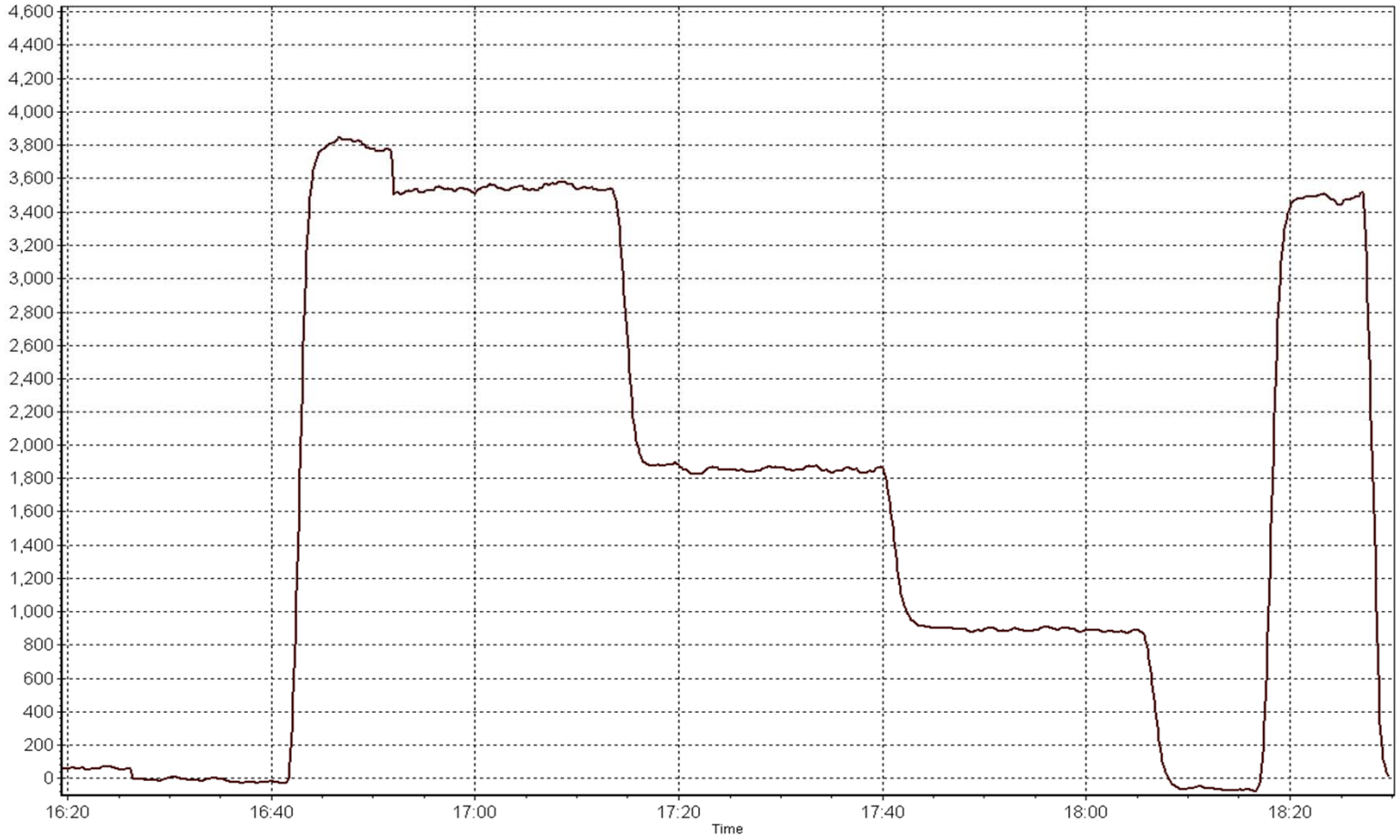
Calibration Performed By: Gary Cross

Wood Buffalo Environmental Association

TRS Calibration Plot

Calibration Date: January 1, 2013 Start Time (MST) 16:00 End Time: 18:45

Station Name: Patricia McInnes Station Number: 6



Calibration Performed By: Gary Cross

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Monday, January 20, 2014	Previous Calibration	Thursday, December 12, 2013
Station Name	Patricia McInnes	Station Number	6

Reason:	Routine	Install	Removal	Other:	

Start Time (MST)	11:20	End Time (MST)	13:45
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11571008
Gas Cert Reference	LL107929	Cal Gas Expiry Date	May 29th 2014
CH4 Cal Gas Conc.	515.0 ppm	CH4 Equiv Conc.	1078.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2403

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	38.7	40.1
THC Range (mv)	50	50	Flame Temp	389.2	385.9
NMHC Range (ppm)	50	50	Fuel Pressure	40.3	40.3
NMHC Range (mv)	50	50	Air Pressure	28.2	28.2
THC Calc slope	0.987554	0.996599	Carrier Pressure	33.8	33.8
THC Calc intercept	0.019816	0.032043			
NMHC Calc slope	0.987546	0.990677	Analyzer Background	NA	NA
NMHC Calc intercept	0.010256	0.007954	Analyzer Coefficient	NA	NA

Analyzer make	TEC 55i	Analyzer serial #	1118148495

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.0	N/A
as found span	5000	78.3	16.89	16.9	0.997
calibrator zero	5000	0.0	0.00	0.0	N/A
high point	5000	78.3	16.89	16.9	0.997
second point	5000	39.1	8.44	8.4	1.004
third point	5000	19.6	4.23	4.2	1.009
calibrator zero	5000	0.0	0.00	0.0	N/A
as left zero	5000	0.0	0.00	0.0	N/A
as left span	5000	78.3	16.89	16.9	0.999
				Average Correction Factor	1.004

Corrected As found	16.94	Previous response	16.66	% change	-1.6%

Notes:

no adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	8.83	8.91	0.991
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.83	8.91	0.991
second point	5000	39.1	4.41	4.43	0.995
third point	5000	19.6	2.21	2.22	0.995
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	8.83	8.90	0.992
				Average Correction Factor	0.994

Corrected As found	8.91	Previous response	8.71	% change	-2.3%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration CH4 (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	8.06	8.03	1.004
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.06	8.03	1.004
second point	5000	39.1	4.03	3.97	1.014
third point	5000	19.6	2.02	1.97	1.025
calibrator zero	5000	0.0	0.00	0.01	N/A
as left zero	5000	0.0	0.00	0.01	N/A
as left span	5000	78.3	8.06	8.02	1.006
				Average Correction Factor	1.015

Corrected As found	8.03	Previous response	7.96	% change	-0.9%

Wood Buffalo Environmental Association

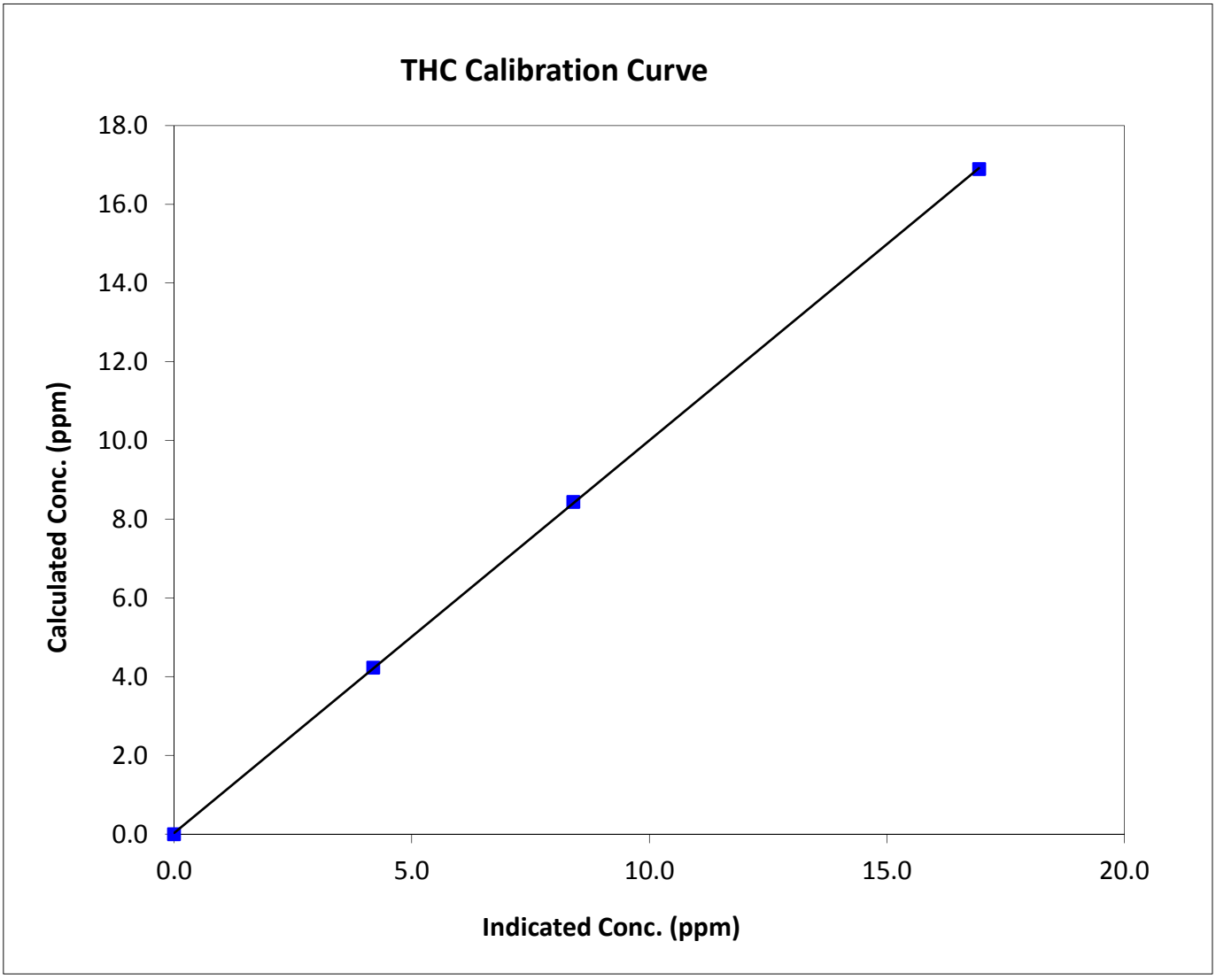
THC Calibration Summary

Station Information

Calibration Date	January 20, 2014	Previous Calibration	December 12, 2013
Station Name	Patricia McInnes	Station Number	6
Start Time (MST)	11:20	End Time (MST)	13:45
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999981
16.89	16.94	0.9972		
8.44	8.40	1.0043	Slope	0.996599
4.23	4.19	1.0092		
			Intercept	0.032043



Wood Buffalo Environmental Association

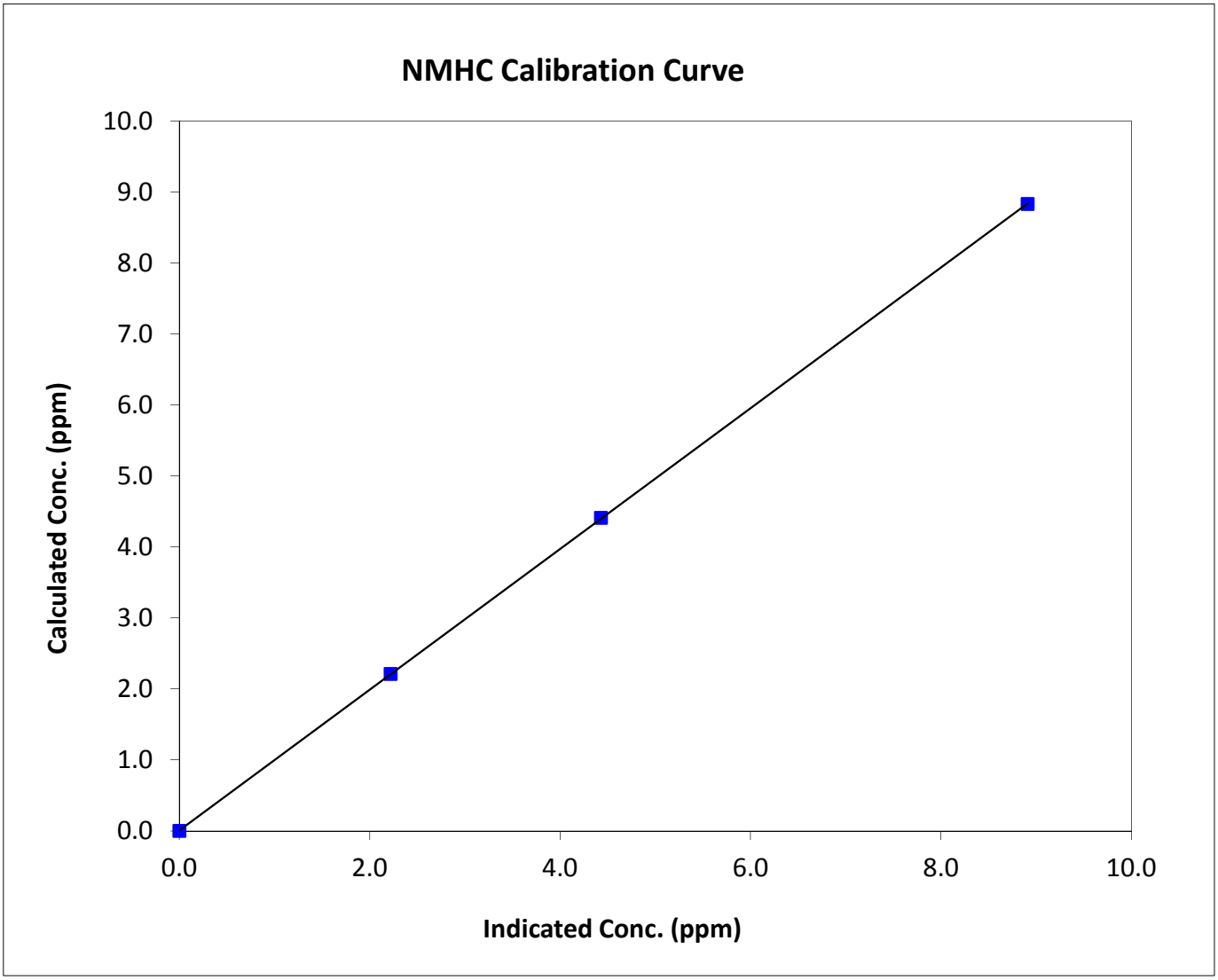
NMHC Calibration Summary

Station Information

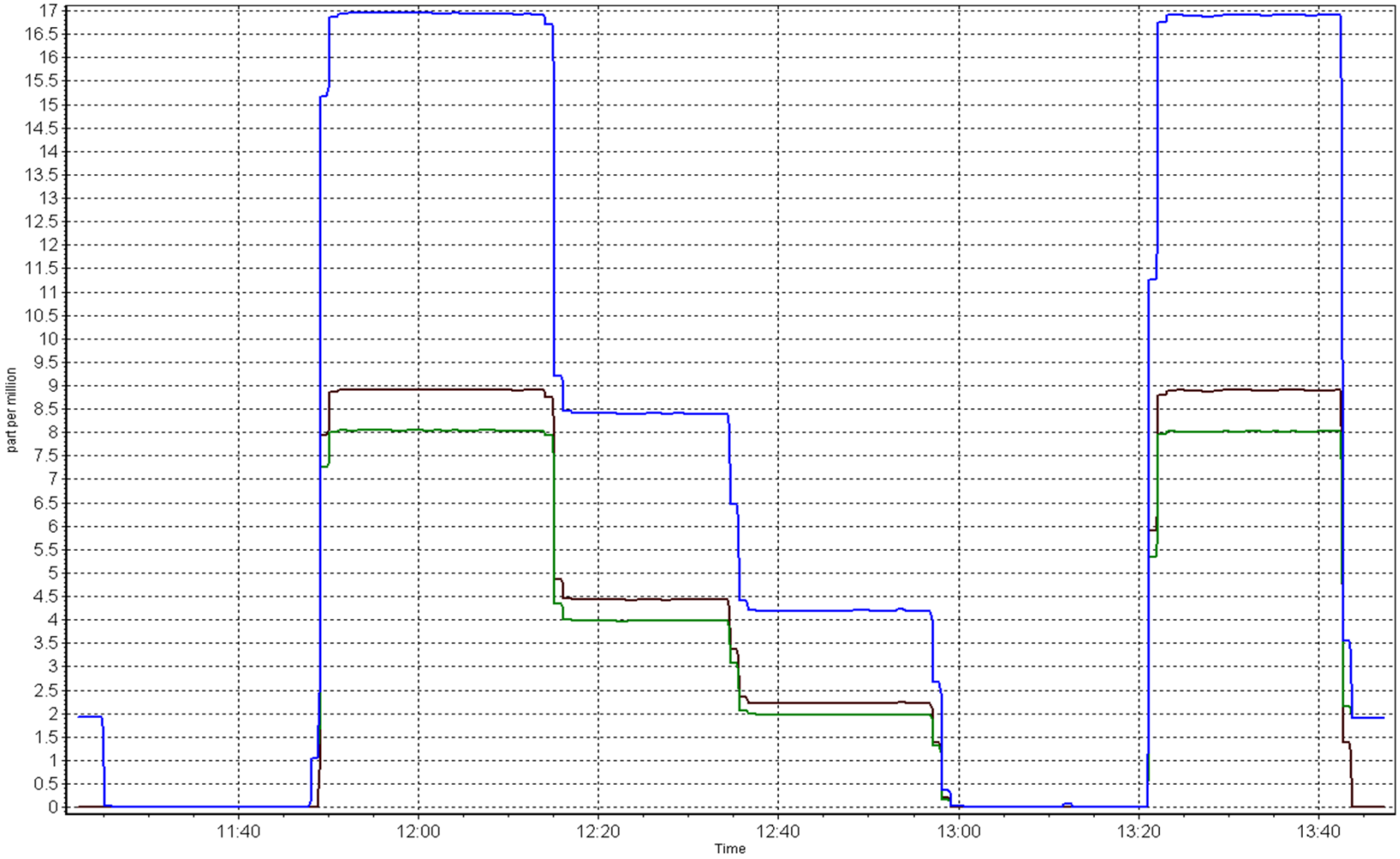
Calibration Date	January 20, 2014	Previous Calibration	December 12, 2013
Station Name	Patricia McInnes	Station Number	6
Start Time (MST)	11:20	End Time (MST)	13:45
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999994
8.83	8.91	0.9908		
4.41	4.43	0.9952	Slope	0.990677
2.21	2.22	0.9955		
			Intercept	0.007954



Station Name Patricia McInnes Calibration D Thursday, August 01, 2013



Wood Buffalo Environmental Association

O3 Calibration Report

Station Information

Calibration Date	January 22, 2014	Previous Calibration	December 13, 2013
Station Name	Patricia McInnes	Station Number	6
Reason:	Routine		
Start Time (MST)	10:00	End Time (MST)	12:10
Barometric Pressure	n/a mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	1102646948
O3 Gas Source	Sabio 4010	Gas Certified by GPT on NOX	May 27 2013
NOx cal. Date	January 21, 2014	SN of Nox used for Gas Certification	622817829
		Make / Mofrl of Nox Used for Gas Cert	Thermo / 17c
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE4

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	34.1	33.2
Analyzer Range (mv)	5000	5000	Bench Lamp temp.	53.6	53.5
Calculated slope	1.016761	1.015820	Pressure	670.0	670.0
Calculated intercept	1.694029	-1.730681	Flow cell A (LPM)	0.615	0.613
Analyzer Background	0.0	0.0	Flow cell B(LPM)	0.636	0.637
Analyzer Coefficient	1.009	1.009	Cell A Intensity	100400	98000
			Cell B Intensity	93400	90300

Analyzer make	TEI 49i	Analyzer serial #	1300156234

Calibration Data

Set Point	Total flow rate (cc/min)	Ozone Lamp Current	Expected concentration based on GPT (ppb)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	N/A	0.0	0.1	N/A
as found span	5000	0	383.2	378.1	1.013
calibrator zero	5000	N/A	0.0	0.1	N/A
high point	5000	0.952	383.2	378.1	1.013
second point	5000	0.543	188.3	187.9	1.002
third point	5000	0.326	92.8	94.7	0.980
calibrator zero	5000	N/A	0.0	0.1	N/A
as left zero	5000	N/A	0.0	0.1	N/A
as left span	5000	N/A	383.2	380.2	1.008
				Average Correction Factor	0.999

Corrected As found	378.0	Previous response	387.9	% change	2.6%

Notes:

no adjustments required

as found span used as high point.

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

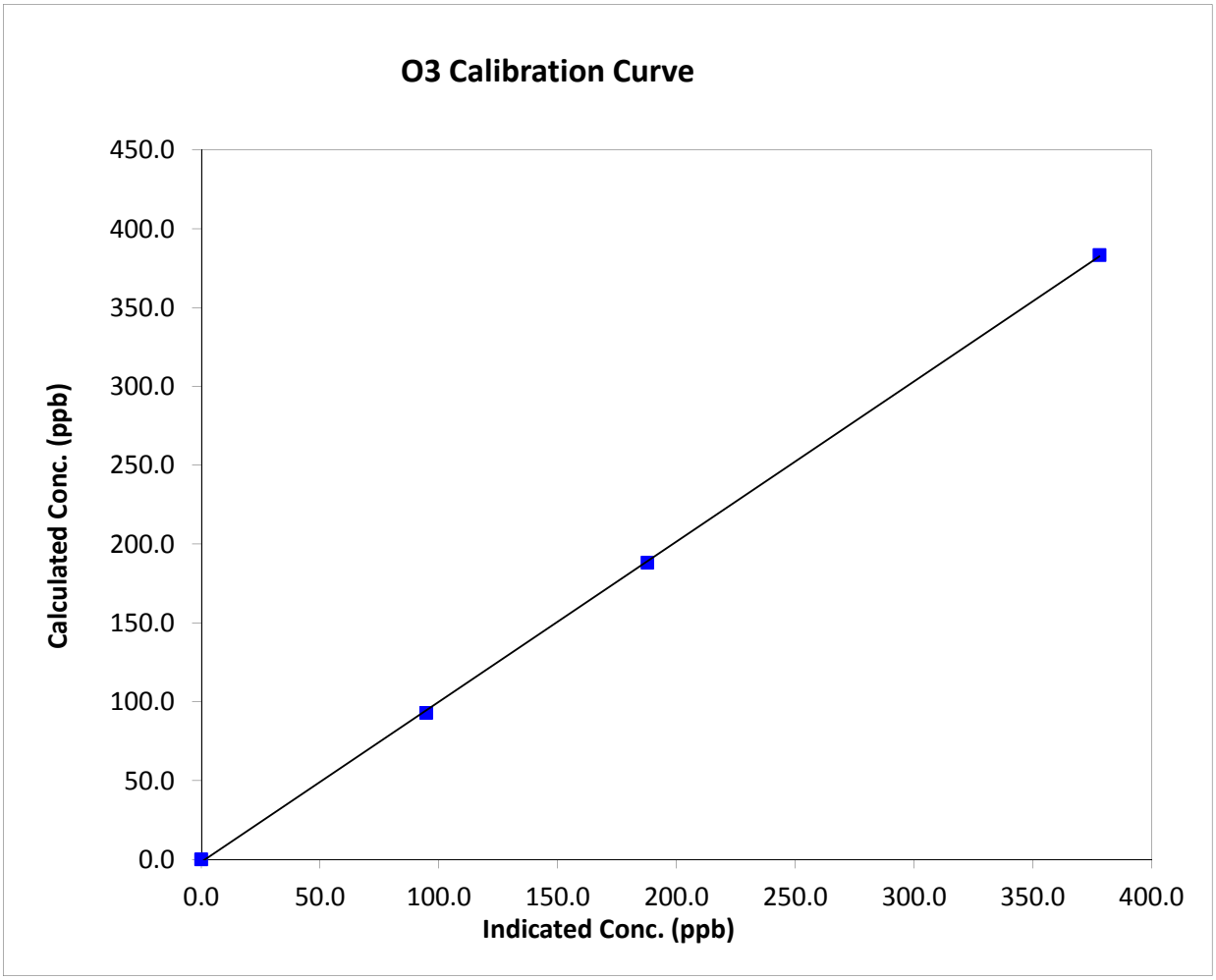
O3 Calibration Summary

Station Information

Calibration Date	January 22, 2014	Previous Calibration	December 13, 2013
Station Name	Patricia McInnes	Station Number	6
Start Time (MST)	10:00	End Time (MST)	12:10
Analyzer make	TEI 49i	Analyzer serial #	1300156234

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999915
383.2	378.1	1.0134		
188.3	187.9	1.0024	Slope	1.015820
92.8	94.7	0.9798		
			Intercept	-1.730681



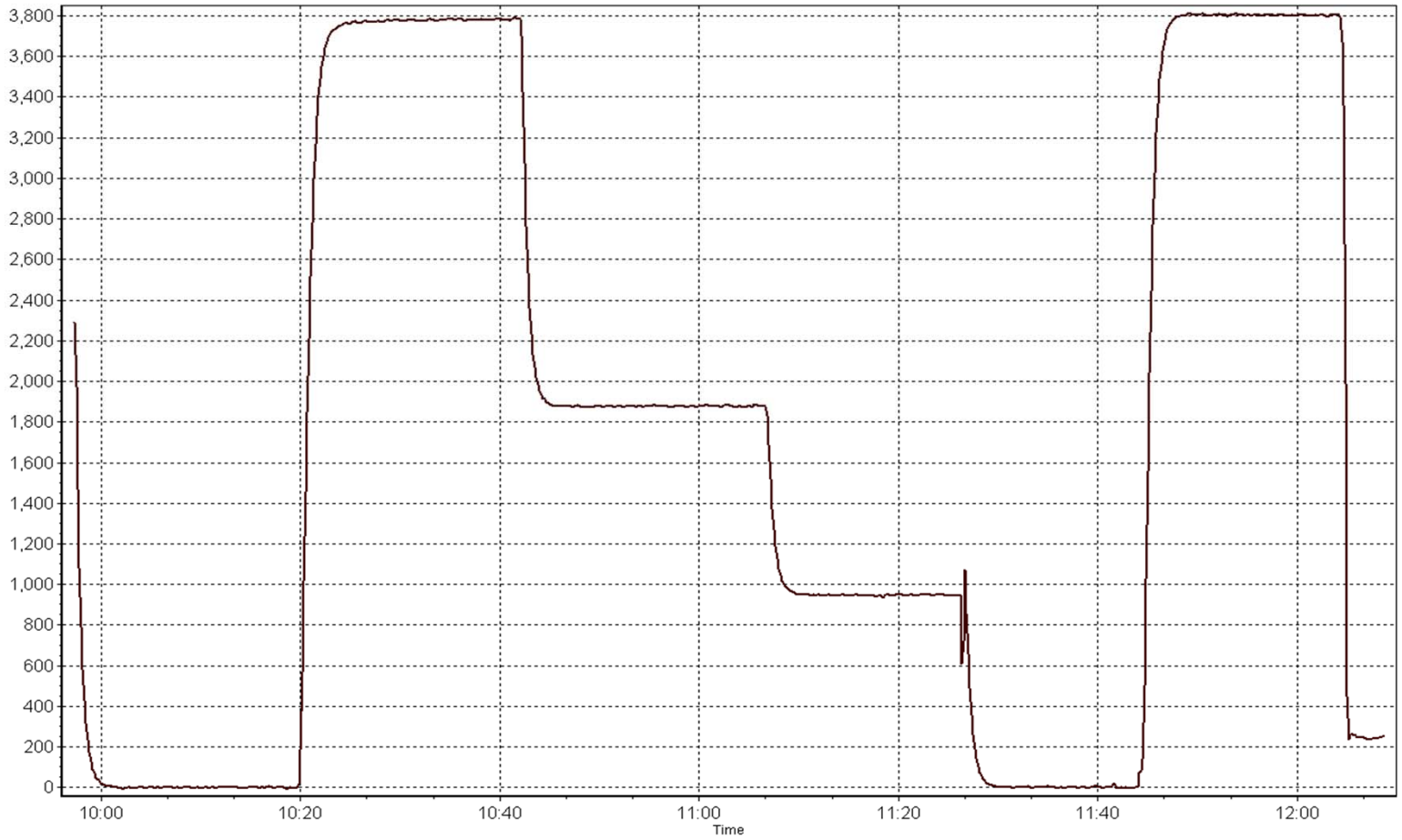
Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

O3 Calibration Plot

Calibration Date: January 22, 2014 Start Time (MST) 10:00 End Time: 12:10

Station Name: Patricia McInnes Station Number: 6



Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 12, 2013
Station Name	Patricia McInnes	Station Number	AMS 6

Reason: Routine | Other

Start Time (MST)	8:20		End Time (MST)	15:40	
Barometric Pressure	726	mmHg	Station Temperature	21.0	Deg C
Calibrator	Sabio 4010		Serial Number	11031107	
NO Cal Gas Conc	51.1	ppm	Cal Gas Expiry Date	May 29th 2014	
NOx Cal Gas Conc	51.1	ppm	Cal Gas Serial #	LL107929	

DACS Information

DACS make & model	Campbell Scientific CR3000
DACS serial No.	2582

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.997483	0.995861	1.002562
	Data Offset	4.221535	4.466620	1.207572
After	Data Slope	0.999371	0.999527	1.000265
	Data Offset	4.165114	4.457174	-1.860554
Channel #		7	6	5
Voltage Range		0-5000mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model	Thermo 17C NH3 Analyzer
Analyzer serial #	622817829

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	1.055		1.083	
NOX coefficient	0.848		0.846	
NO2 coefficient	1.000		1.000	
NH3 Coefficient	1.000		1.000	
Nt Coefficient	0.873		0.838	
NO bkgrnd	7.2		7.4	
NOX bkgrnd	5.9		6.0	
Nt Bkgrnd	6.9		6.7	
Chamber Temp	49.7	Deg C	50.2	Deg C
NO2 Converter Temp	322.0	Deg C	322.0	Deg C
NH3 Converter Temp	779.0	Deg C	778.0	
Cooler Temp	-8.6	Deg C	-8.6	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	138.0	mmHg	133.3	mmHg
Sample Flow	0.462	ccm	0.402	ccm
PMT Voltage	-838	V	-839	V

Notes: replaced pump and charcoal scrubber
adjusted span

Calibration Performed by: Michael Martineau

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 21, 2014 Station Number: AMS 6

Calibration Data

Set Point	O3 Lamp Current	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction Factor
as found zero	N/A	5000	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	N/A	N/A	N/A
as found span	N/A	5000	78.3	800.2	800.2	0.0	785.8	784.5	1.5	1.018	1.020	N/A
calibrator zero	N/A	5000	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	N/A	N/A	N/A
high point	N/A	5000	78.3	800.2	800.2	0.0	798.4	798.9	-0.2	1.002	1.002	N/A
second point	N/A	5000	39.1	399.6	399.6	0.0	392.8	392.7	0.2	1.017	1.018	N/A
third point	N/A	5000	19.6	200.3	200.3	0.0	191.9	192.8	-0.8	1.044	1.039	N/A
calibrator zero	N/A	5000	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	N/A	N/A	N/A
as left zero	N/A	5000	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	N/A	N/A	N/A
as left span	0.326	5000	78.3	800.2	709.8	92.8	795.4	702.4	93.4	1.006	0.990	1.006
									Average Correction Factor	1.021	1.019	N/A

Corrcted As found NO_X= 785.9 NO= 784.5 Percent Change NO_X= 1.0% NO= 1.0%

Previous Response NO_X= 794.0 NO= 792.4

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.30 ccm

O3 Setpoint (ppb)	Ozone Lamp Current Setting	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero	Cal Zero	N/A	N/A	0.0	-0.1	0.0	0.0	N/A	N/A	N/A	N/A
1st NO2 400	0.952	N/A	419.4	383.2	803.2	419.4	383.9	1.004	N/A	0.998	100.2%
2nd NO2 200	0.543	N/A	614.3	188.3	805.3	614.3	191.3	1.006	N/A	0.984	101.6%
3rd NO2 100	0.326	N/A	709.8	92.8	805.8	709.8	96.3	1.007	N/A	0.964	103.8%
4th NO2 (0)	na	802.6	N/A	-0.8	801.8	802.6	-0.4	1.003	N/A	N/A	N/A
						Average Correction Factor		1.005		0.982	101.9%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

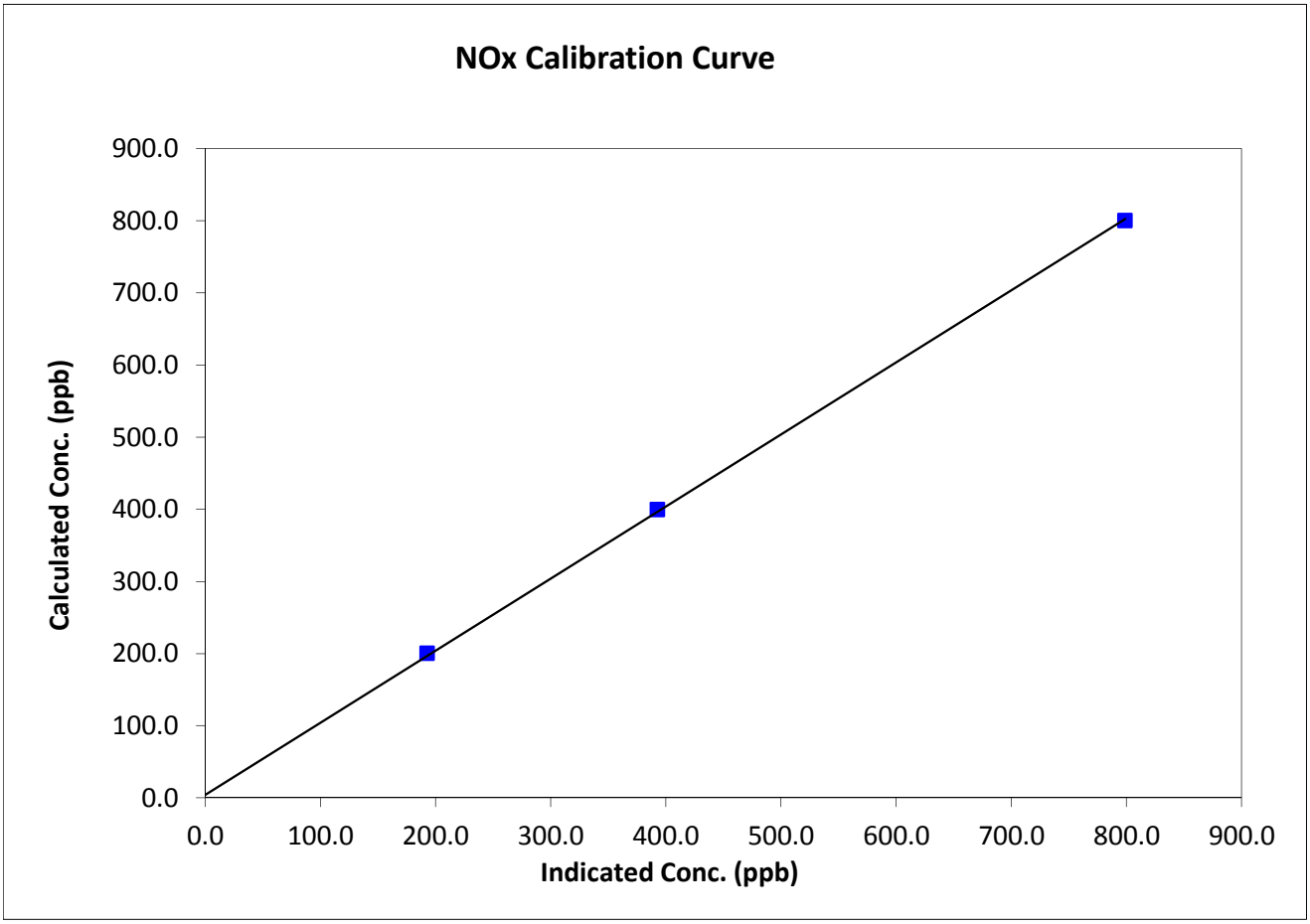
NO_X Calibration Summary

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 12, 2013
Station Number	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	15:40
Analyzer make	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999876
800.2	798.9	1.0017		
399.6	392.7	1.0176	Slope	0.999371
200.3	192.8	1.0390		
			Intercept	4.165114



Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

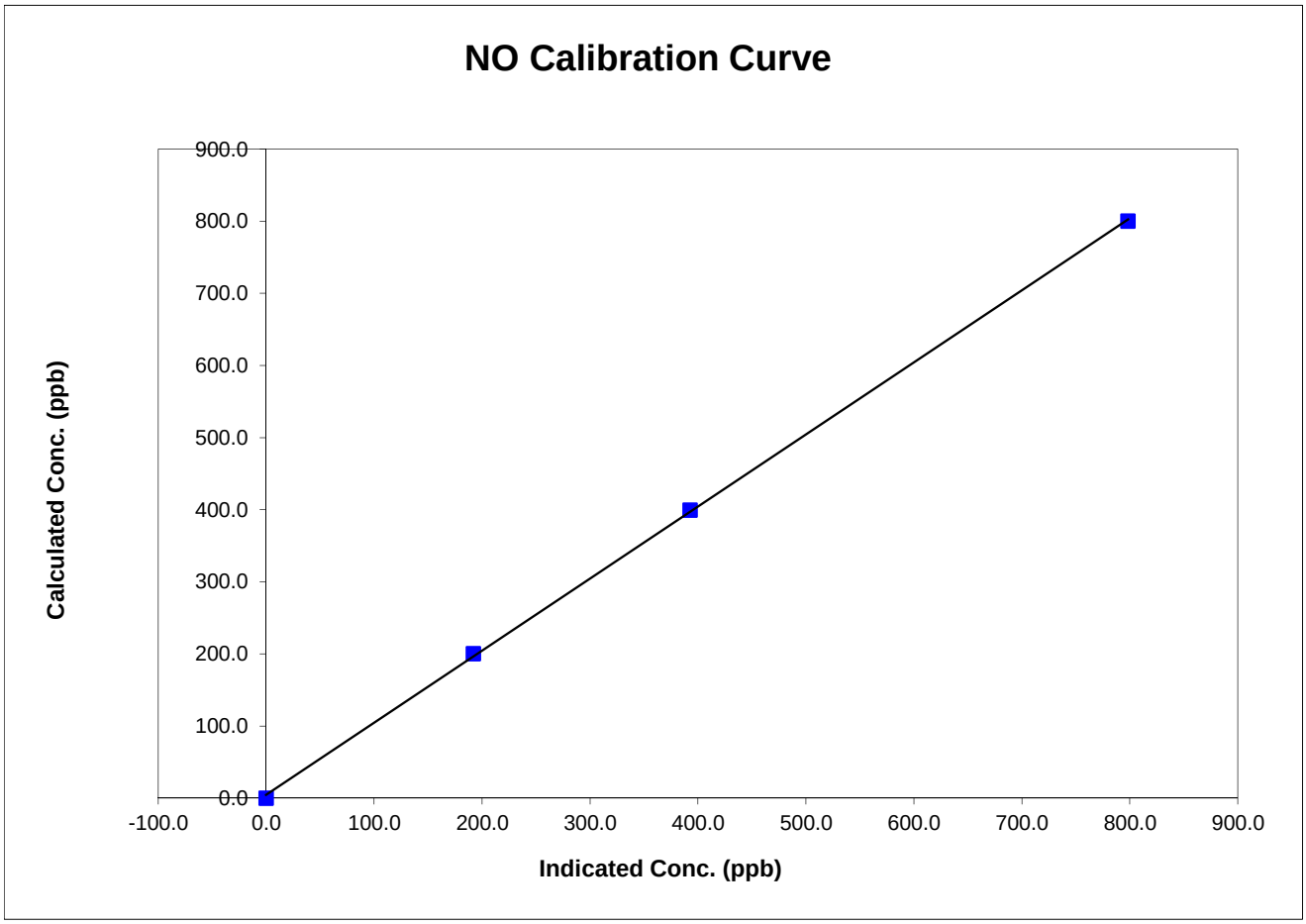
NO Calibration Summary

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 12, 2013
Station Number	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	15:40
Analyzer make	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999865
800.2	798.4	1.0023		
399.6	392.8	1.0174	Slope	0.999527
200.3	191.9	1.0439		
			Intercept	4.457174



Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

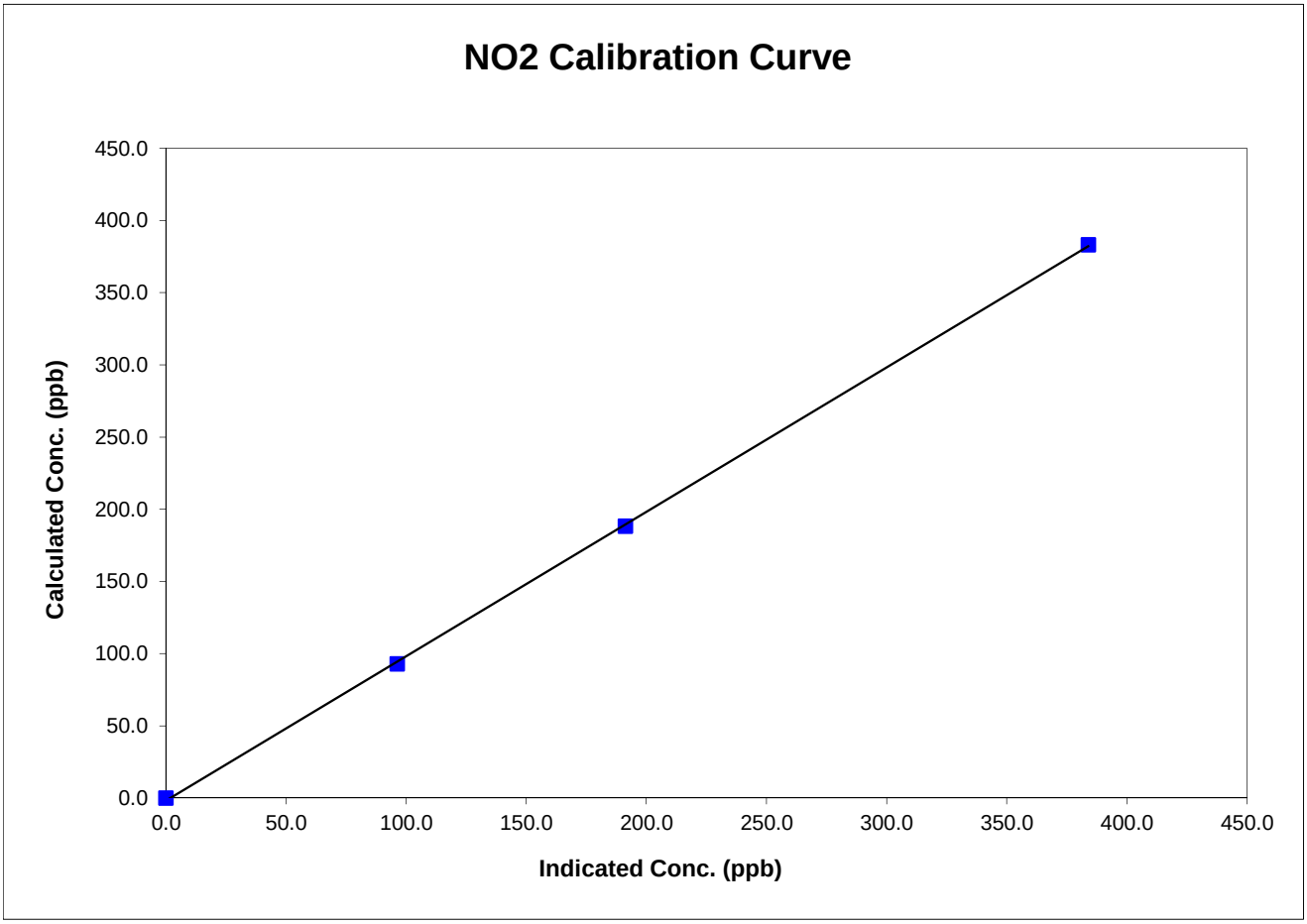
NO2 Calibration Summary

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 12, 2013
Station Number	Patricia McInnes	Station Number	AMS 6
Start Time (MST)	8:20	End Time (MST)	15:40
Analyzer make	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999894
383.2	383.9	0.9980		
188.3	191.3	0.9845	Slope	1.000265
92.8	96.3	0.9635		
			Intercept	-1.860554



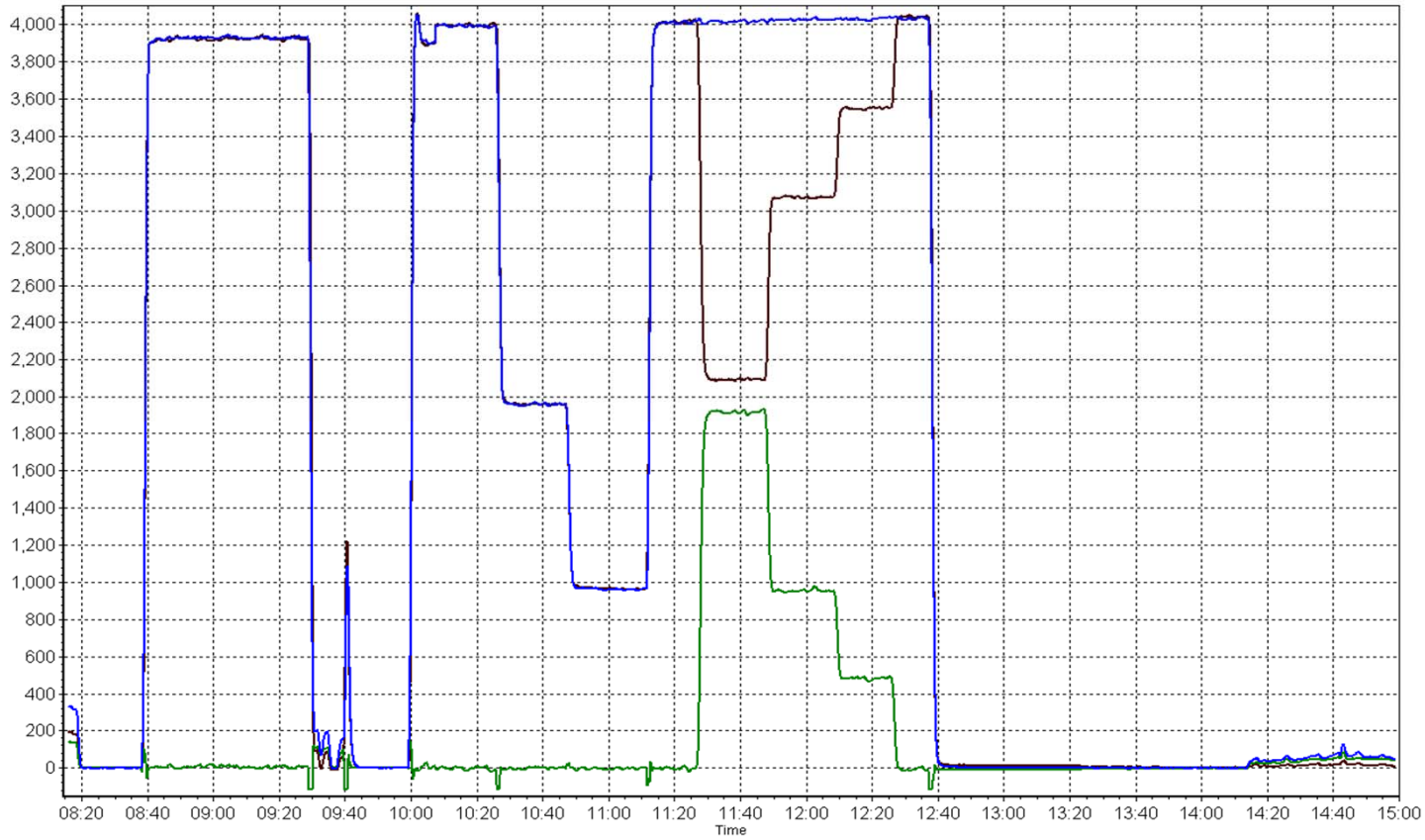
Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

Nox Calibration Plot

Calibration Date: January 21, 2014 **Start Time:** 8:20 **End Time:** 15:40

Station Name Patricia McInnes **Station Number:** AMS 6



Calibration Performed by: Michael Martineau

Wood Buffalo Environmental Association

$Nt\text{-}NO_X\text{-}NH_3$ Calibration Report

Station Information

Calibration Date	December 12, 2013	Previous Calibration	November 13, 2013
Station Name	Patricia McInnes	Station Number	6
Reason:	Routine		
Start Time (MST)	8:20	End Time (MST)	15:40
Barometric Pressure	NA mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 4010	Serial Number	11031107
NH3 Cal Gas Conc	190 ppm	Cal Gas Expiry Date	April 3, 2012
NOx Cal Gas Conc	51.1 ppm	Cal Gas Serial #	LL86349

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2580

Parameter		Nt	NOx	NH3
MV conversion	Analyzer Range (ppb)	2500	1000	2500
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.995313	1.003519	0.996186
	Data Offset	4.285865	0.909531	3.672409
After	Data Slope	1.014638	0.999261	1.015179
	Data Offset	4.433441	0.078665	4.200716
Channel #		NA	Diff 5	Diff 6
Voltage Range		0-5000 mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	1.055		1.083	
NOX coefficient	0.848		0.846	
NO2 coefficient	1.000		1.000	
NH3 Coefficient	1.000		1.000	
Nt Coefficient	0.873		0.838	
NO bkgrnd	7.2		7.4	
NOX bkgrnd	5.9		6.0	
Nt Bkgrnd	6.9		6.7	
Chamber Temp	49.7	Deg C	50.2	Deg C
NO2 Converter Temp	322.0	Deg C	322.0	Deg C
NH3 Converter Temp	779.0	Deg C	778.0	
Cooler Temp	-8.6	Deg C	-8.6	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	137.9	mmHg	133.3	mmHg
Sample Flow	0.462	ccm	0.402	ccm
PMT Voltage	-838	V	-839	V

Notes: Adjustment on NO high point required on Nt channel to bring NH3 to zero.
Pump and charcoal scrubber were replaced after as founds.

Wood Buffalo Environmental Association

$Nt\text{-}NO_x\text{-}NH_3$ Calibration Report

Station Information

Calibration Date: December 12, 2013 Station Number: 6

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated Nt conc (ppb)	Calculated NOx conc (ppb)	Calculated NH3 conc (ppb)	Indicated Nt conc (ppb)	Indicated NOx conc (ppb)	Indicated NH3 conc (ppb)	Nt Correction factor	NH3 Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	NA	NA
as found span	5000	52.6	1998.8	0.0	1998.8	1933.9	0.9	1933.0	1.034	0.967
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.2	0.000	NA
high NO point	5000	78.3	800.2	800.2	0.0	799.9	798.3	1.6	1.000	NA
NO/O3 point	5000	78.3	800.2	800.2	0.0	805.7	803.2	2.5	0.993	NA
High NH3 point	5000	52.6	1998.8	0.0	1998.8	1968.3	0.9	1967.4	1.016	0.984
second NH3	5000	26.3	999.4	0.0	999.4	976.6	0.2	976.4	1.023	0.977
third NH3	5000	13.2	501.6	0.0	501.6	487.2	-0.1	487.3	1.030	0.971
as left zero										
as left span										
								Average Correction Factor	1.0030	0.9776

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

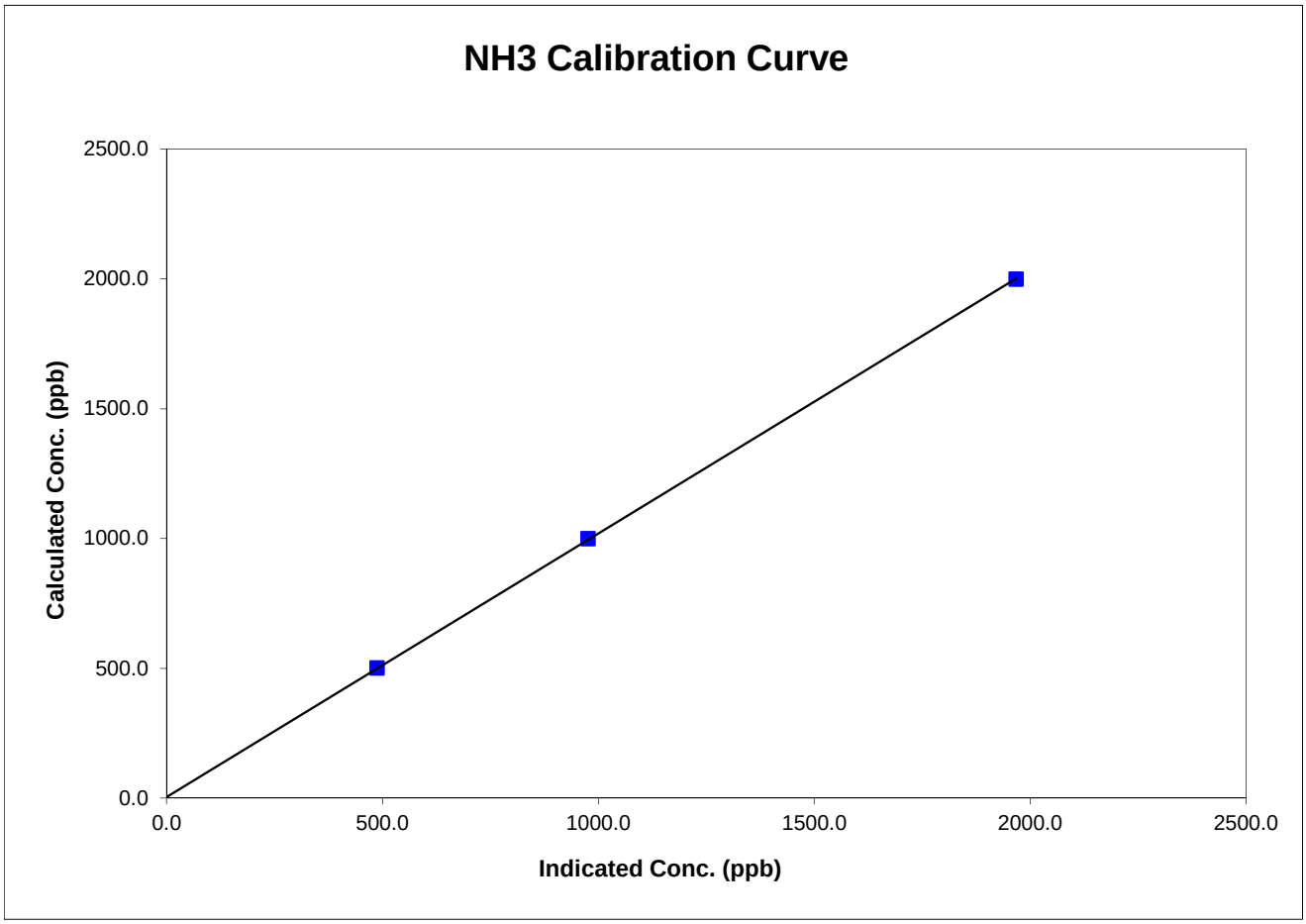
NH3 Calibration Summary

Station Information

Calibration Date	December 12, 2013	Previous Calibration	November 13, 2013
Station Number	Patricia McInnes	Station Number	6
Start Time (MST)	8:20	End Time (MST)	15:40
Analyzer make	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

NH3 Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999979
1998.8	1967.4	1.0160		
999.4	976.4	1.0235	Slope	1.015179
501.6	487.3	1.0294		
			Intercept	4.200716



Wood Buffalo Environmental Association

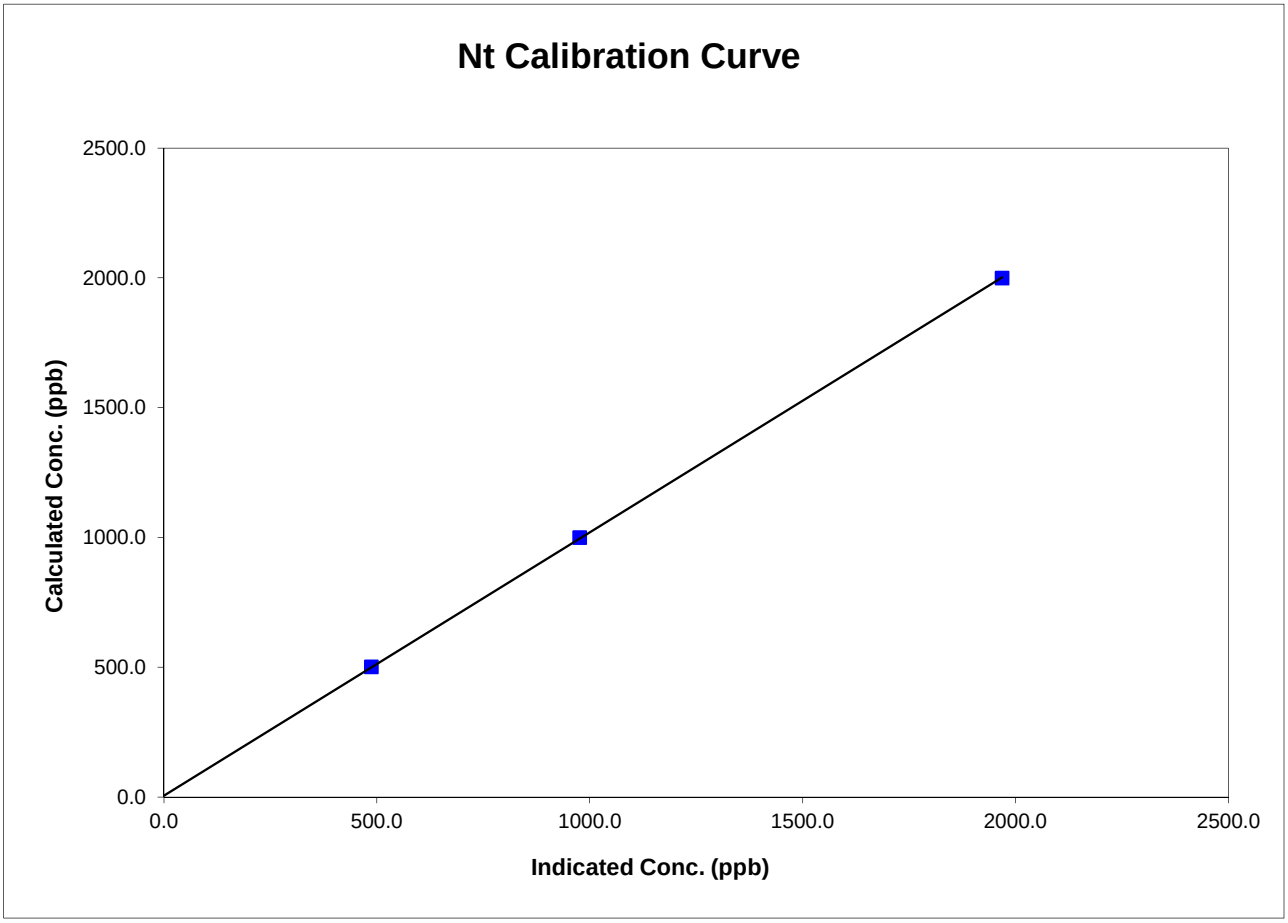
NH3 Calibration Summary

Station Information

Calibration Date	December 12, 2013	Previous Calibration	November 13, 2013
Station Number	Patricia McInnes	Station Number	6
Start Time (MST)	8:20	End Time (MST)	15:40
Analyzer make	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

Nt Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999977
1998.8	1968.3	1.0155		
999.4	976.6	1.0233	Slope	1.014638
501.6	487.2	1.0296		
			Intercept	4.433441



Wood Buffalo Environmental Association

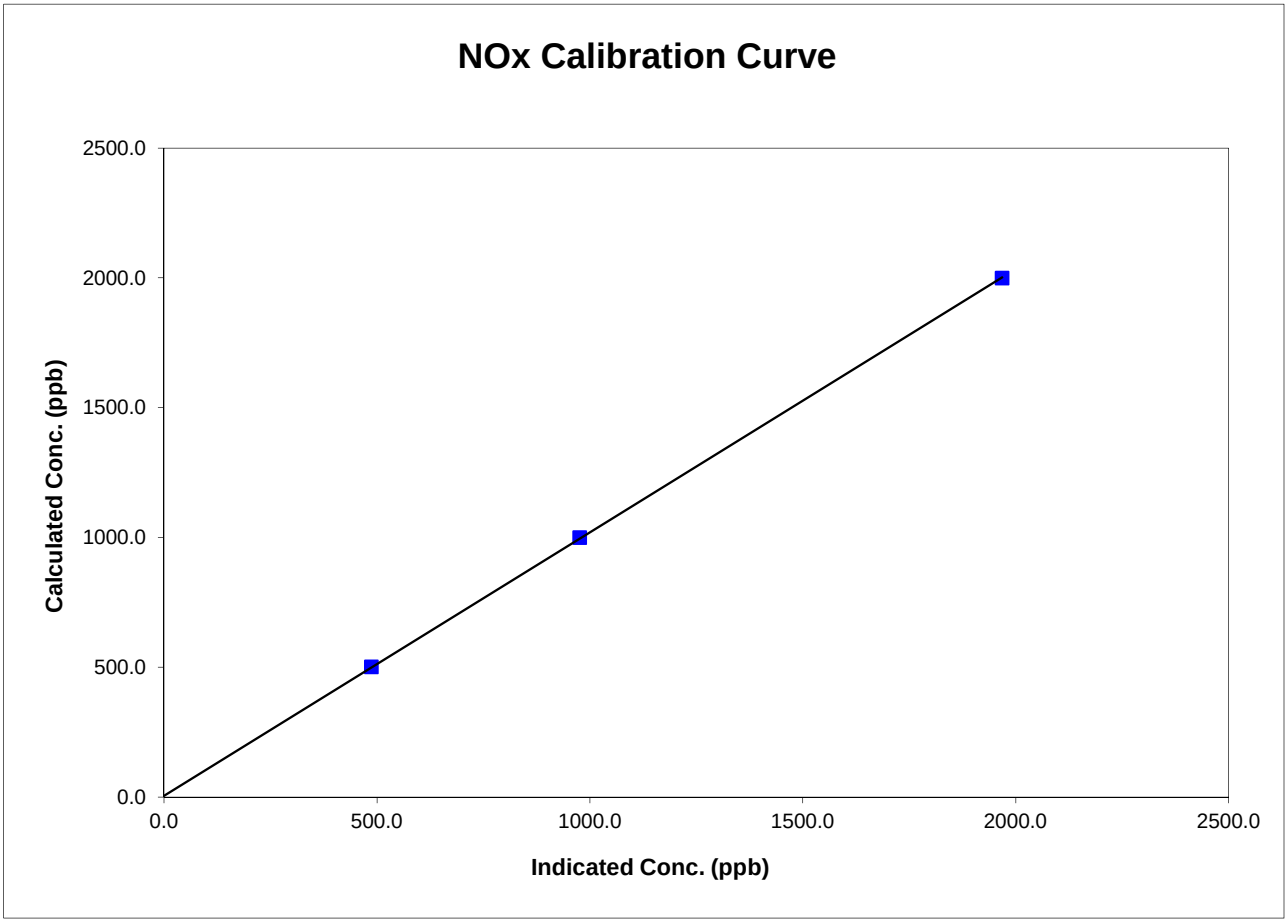
NH3 Calibration Summary

Station Information

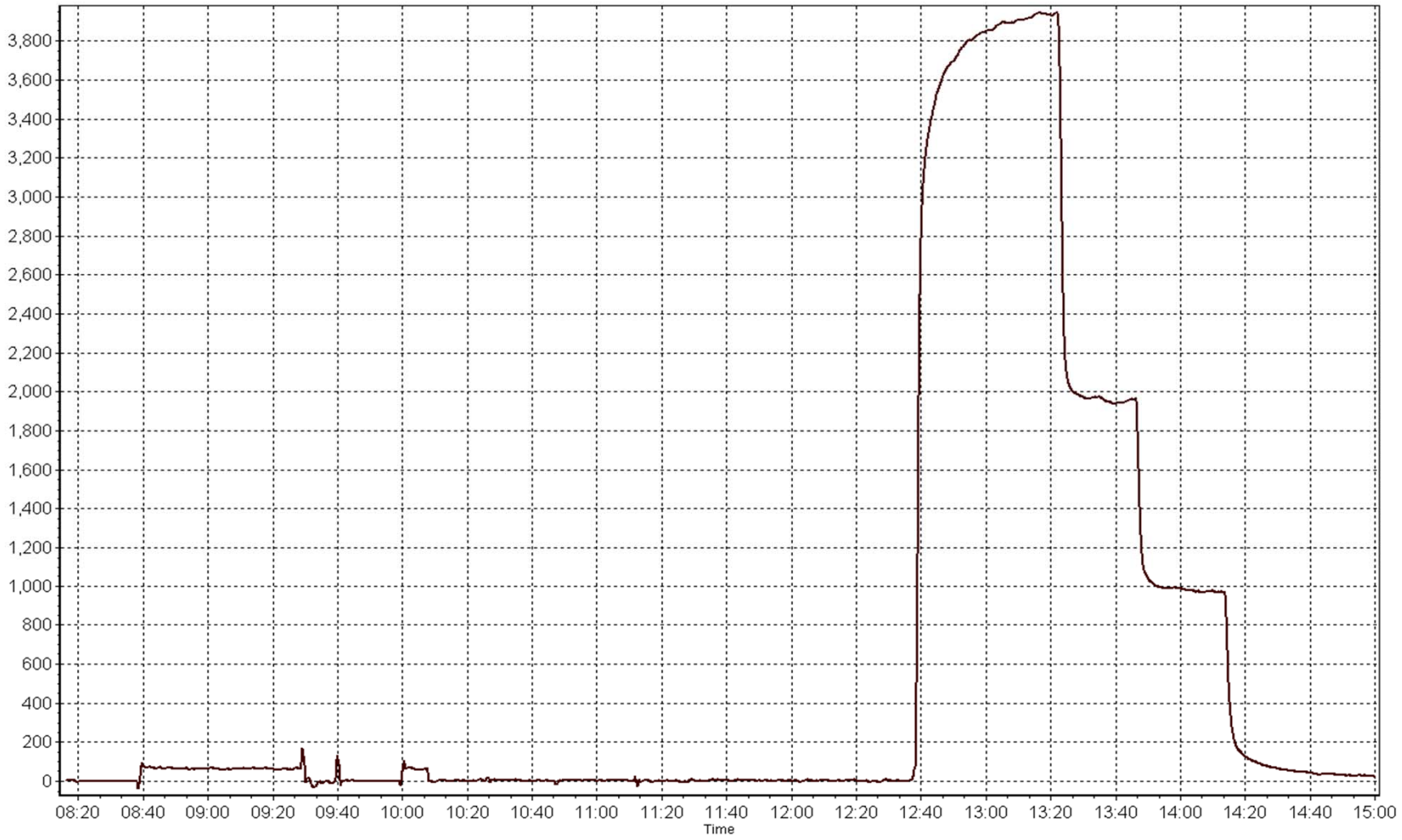
Calibration Date	December 12, 2013	Previous Calibration	November 13, 2013
Station Number	Patricia McInnes	Station Number	6
Start Time (MST)	8:20	End Time (MST)	15:40
Analyzer make	Thermo 17C NH3 Analyzer	Analyzer serial #	622817829

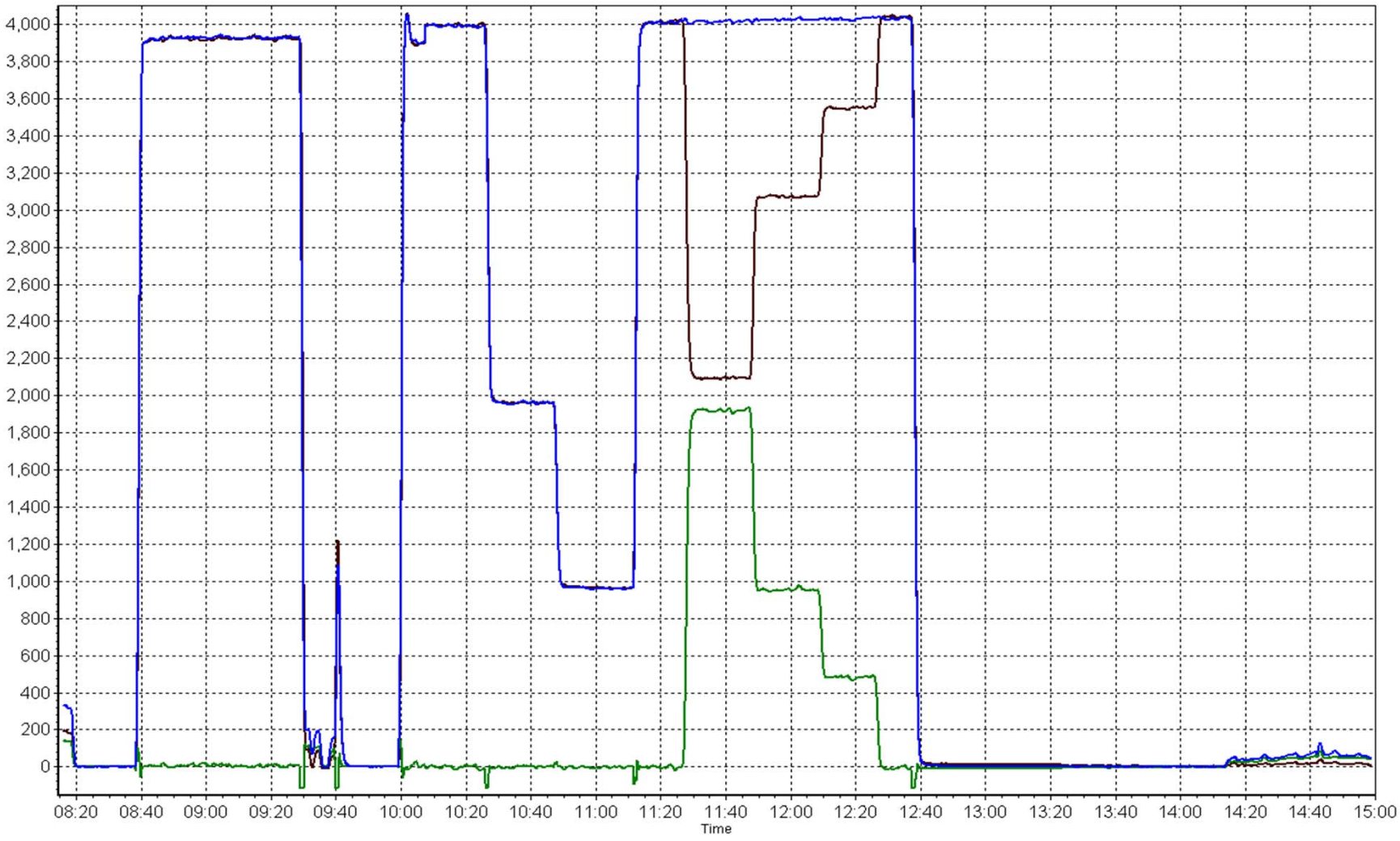
NOX Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999972
800.2	798.3	1.0024		
800.2	803.2	0.9963	Slope	0.999261
			Intercept	0.078665



Nt, NOx & NH_3 Calibration Plot **Date:** **December 12, 2013** #VALUE!

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1,600
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800
600
400
200
0
08:20
08:40
09:00
09:20
09:40
10:00
10:20
10:40
11:00
11:20
11:40
12:00
12:20
12:40
13:00
13:20
13:40
14:00
14:20
14:40
15:00
Time

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 7
ATHABASCA VALLEY
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
JANUARY 2014

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	707	37	37	100.00	10	0	2	0
TRS (ppb) Average	709	35	35	100.00	1	0	1	0
THC (ppm) Average	705	37	39	99.73	2.6	-	2.4	-
NMHC (ppm) Average	705	37	39	99.73	0.425	-	0.152	-
CH4(ppm) Average	705	37	39	99.73	2.6	-	2.3	-
O3 (ppb) Average	708	36	36	100.00	43	0	31	-
NO2 (ppb) Average	707	37	37	100.00	70	0	44	-
NO (ppb) Average	707	37	37	100.00	198	-	73	-
NOX (ppb) Average	707	37	37	100.00	263	-	115	-
PM2.5 (ug/m3) Average	741	0	3	99.60	124.6	-	14.8	0
CO(ppm) Average	709	35	35	100.00	1.0	0	0.4	-
Temperature 2 m (C) Average	744	0	0	100.00	7.4	-	2.1	-
Barometric Pressure (inHg) Average	744	0	0	100.00	29.9	-	29.8	-
Relative Humidity (%) Average	744	0	0	100.00	91	-	87	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	54	-	-	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	0.8	1	-	0	0	0	0	1	1	10
TRS (ppb) Average	709	0.4	0	-	0	0	0	0	1	1	1
THC (ppm) Average	705	2.01	0.1	-	1.8	1.9	1.9	2	2	2.2	2.6
NMHC (ppm) Average	705	0.015	0.047	-	0	0	0	0	0	0	0.425
CH4(ppm) Average	705	1.99	0.1	-	1.8	1.9	1.9	2	2	2.1	2.6
O3 (ppb) Average	708	15.8	11	-	0	2	7	14	24	32	43
NO2 (ppb) Average	707	21.7	13	-	1	5	11	21	30	39	70
NO (ppb) Average	707	23.9	29	-	0	1	5	14	32	60	198
NOX (ppb) Average	707	45.5	40	-	1	8	17	33	62	94	263
PM2.5 (ug/m3) Average	741	8.01	6.9	-	0.5	2.7	4.2	6.3	10.6	14.7	124.6
CO(ppm) Average	709	0.14	0.1	-	0	0	0.1	0.1	0.2	0.3	1
Temperature 2 m (C) Average	744	-16.99	9.6	-	-36.7	-29.3	-23.9	-17.4	-11.2	-4.2	7.4
Barometric Pressure (inHg) Average	744	29.04	0.4	-	28.1	28.5	28.7	29.1	29.3	29.6	29.9
Relative Humidity (%) Average	744	74.4	9	-	46	63	69	75	81	86	91
Wind Speed 10 m (km/h) Average	744	8.7	8	-	0	2	4	7	11	17	54
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS 7)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NMHC, CH4, THC	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Unstable operation - baseline drift
NMHC, CH4, THC	23 Jan 2014 14:00	23 Jan 2014 14:00	1	Maintenance - replace carrier gas
PM2.5	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Unstable operation - baseline drift
PM2.5	09 Jan 2014 14:00	09 Jan 2014 14:00	1	Flow and zero reference checks, sample head cleaning
PM2.5	22 Jan 2014 09:00	22 Jan 2014 09:00	1	Unstable operation - baseline drift

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 10 ppb on Jan 31 15:00 Maximum Daily Average: 2.2 ppb on Jan 26

Minimum Value: 0 ppb on Jan 28 22:00 Minimum Daily Average: 0.2 ppb on Jan 30
Maximum Diurnal Average: 1.3 ppb at hour 15 Minimum Diurnal Average: 0.5 ppb at hour 5
Monthly Average: 0.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 5$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	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-Jan	0	0	0	Z	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	0.6	1
3-Jan	1	0	0	Z	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.4	1
4-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0.3	1
5-Jan	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
6-Jan	0	0	0	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0.6	1
7-Jan	0	0	0	Z	0	0	0	0	0	C	C	C	C	C	C	1	1	0	0	0	0	0	1	1	--	1
8-Jan	1	1	1	Z	1	1	2	1	1	1	1	0	1	1	1	1	1	0	1	1	1	0	0	0	0.8	2
9-Jan	0	1	1	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	3	7	6	4	1.2	7
10-Jan	5	4	1	Z	1	2	3	1	1	1	1	1	1	2	2	2	1	0	0	0	0	0	0	0	1.4	5
11-Jan	0	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	2	1	1	0	3	1	0	0	0	0.7	3
12-Jan	3	7	4	Z	2	5	1	2	2	3	3	1	0	0	0	1	0	0	1	0	0	0	0	0	1.7	7
13-Jan	0	0	0	Z	0	0	0	1	0	1	1	1	2	2	3	2	1	1	0	0	0	0	0	0	0.8	3
14-Jan	0	0	1	Z	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0.6	1
15-Jan	0	1	2	Z	1	1	1	1	1	1	1	0	0	1	1	0	1	2	5	2	0	0	0	1	1.0	5
16-Jan	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0.6	1
17-Jan	0	0	0	Z	0	0	0	0	0	0	1	1	1	1	0	1	4	0	0	0	0	0	0	0	0.5	4
18-Jan	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	2	4	4	2	1	1	2	2	1.1	4
19-Jan	1	1	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
20-Jan	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0.4	2
21-Jan	3	2	2	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.8	3
22-Jan	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-Jan	0	0	0	Z	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.8	1
24-Jan	0	0	0	Z	1	1	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
25-Jan	0	0	0	Z	0	0	0	0	0	0	1	0	3	6	3	3	2	0	0	0	2	3	1	0	1.3	6
26-Jan	1	0	0	Z	0	0	0	0	0	0	3	4	5	6	7	5	4	3	3	2	2	1	1	2	2.2	7
27-Jan	1	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
28-Jan	1	1	1	Z	1	1	1	0	0	0	0	0	0	1	1	1	1	2	3	0	0	0	0	0	0.6	3
29-Jan	0	0	0	Z	0	0	0	0	1	1	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0.3	2
30-Jan	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
31-Jan	0	0	0	Z	1	1	0	0	0	0	0	0	3	5	10	4	4	2	1	1	1	1	0	0	1.5	10
	0.7	0.8	0.6	--	0.5	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.9	1.2	1.3	1.0	1.0	0.8	0.8	0.6	0.6	0.7	0.6	0.6	Diurnal Average	
	5	7	4	--	2	5	3	2	2	3	3	4	5	6	10	5	4	4	5	3	3	7	6	4	Diurnal Maximum	

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

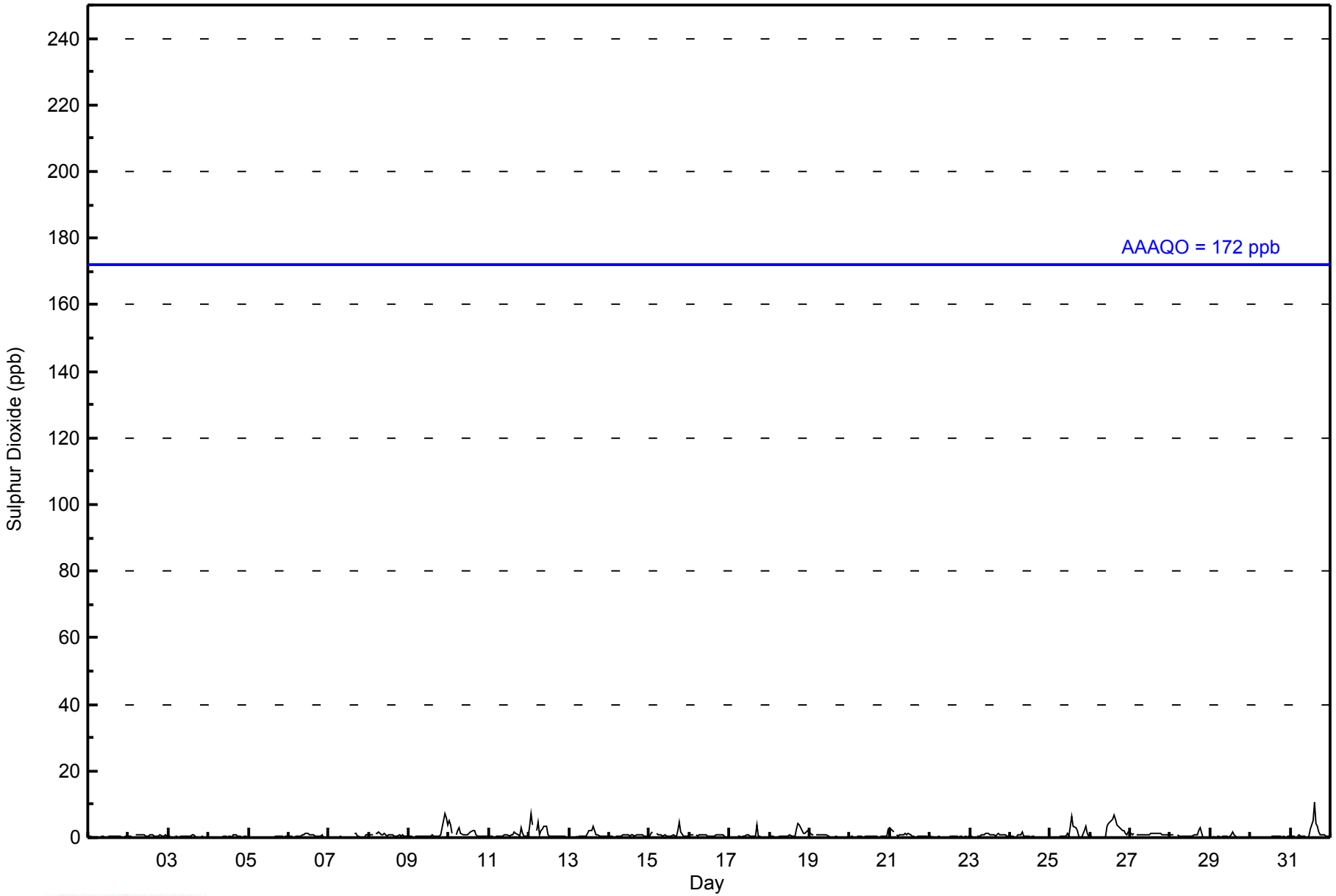
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	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: 707

Total Number of Hours: 744

Sulphur Dioxide (SO_2) - ppb
Athabasca Valley - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	61	10	6	3	5	19	193	52	17	11	47	44	38	29	41	131	707
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	61	10	6	3	5	19	193	52	17	11	47	44	38	29	41	131	707

Total Number of Valid Hours: 707

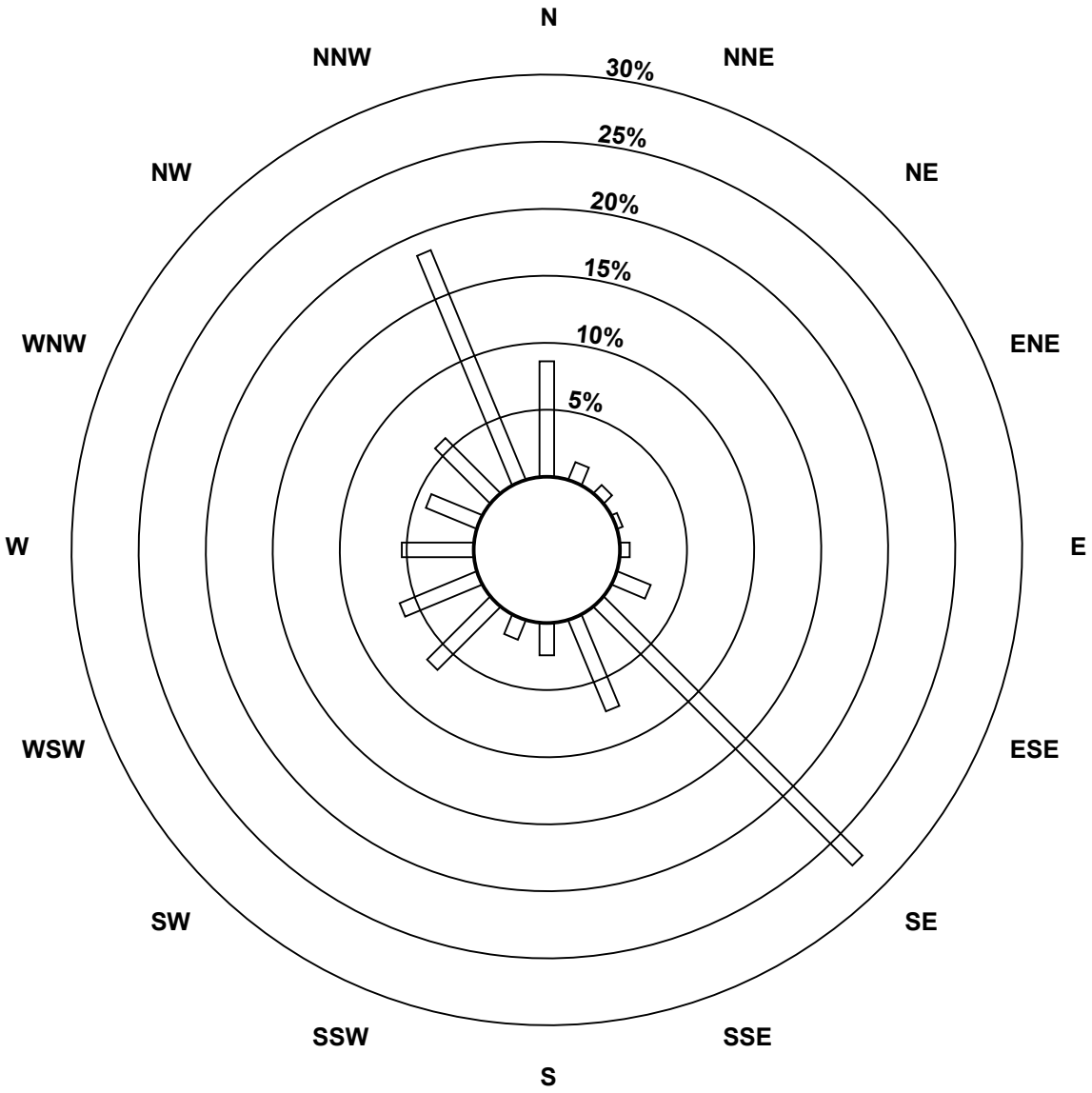
Total Number of Hours: 744

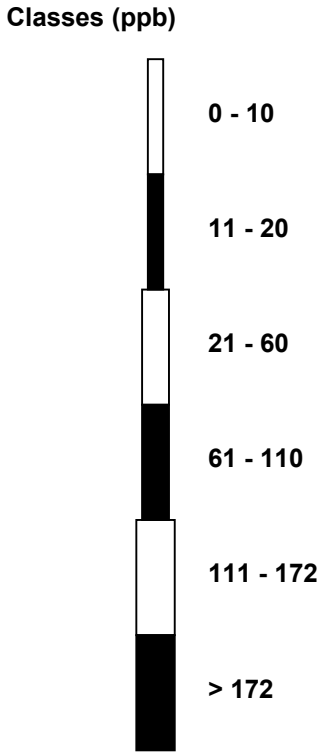
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley (AMS 7)





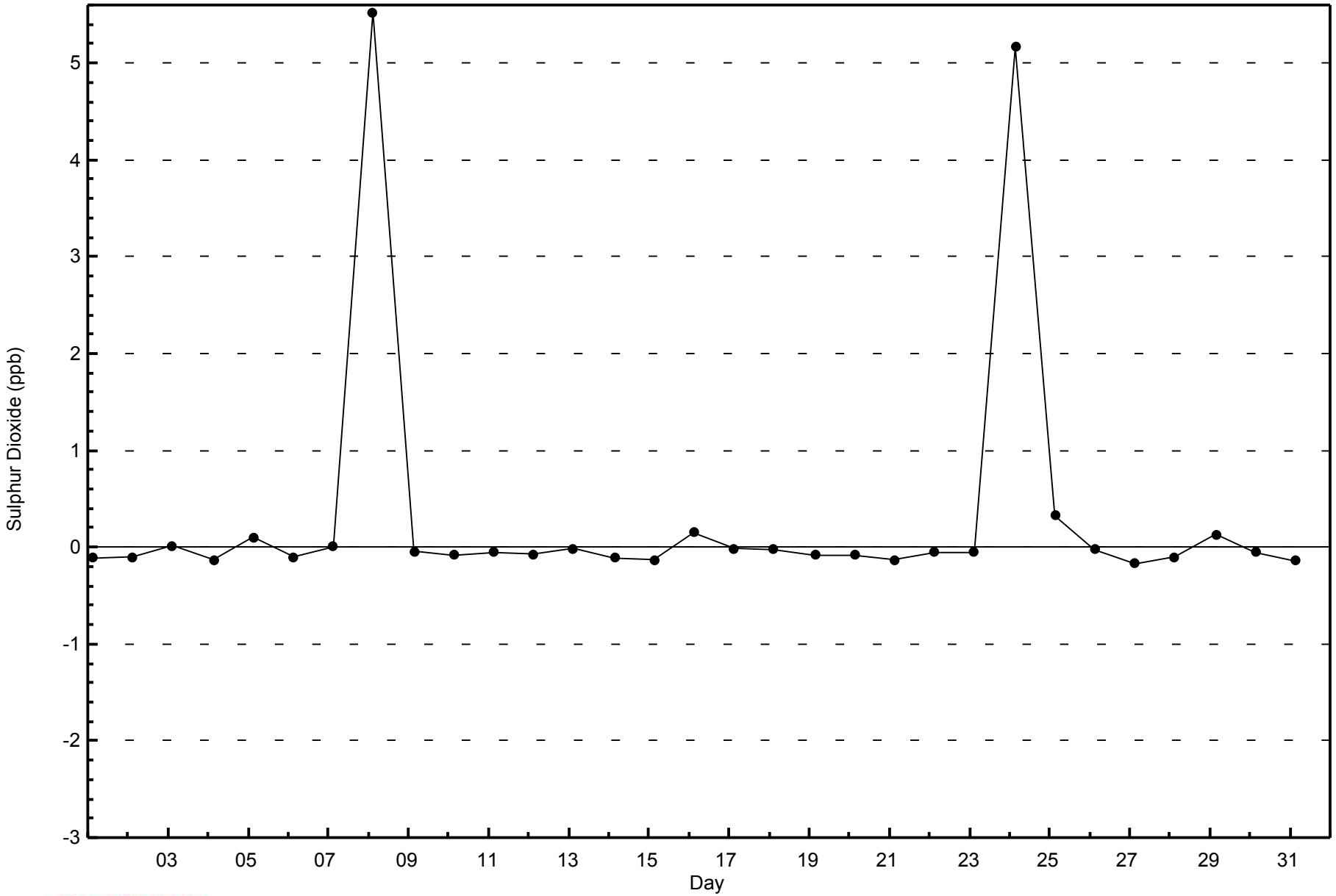
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2014



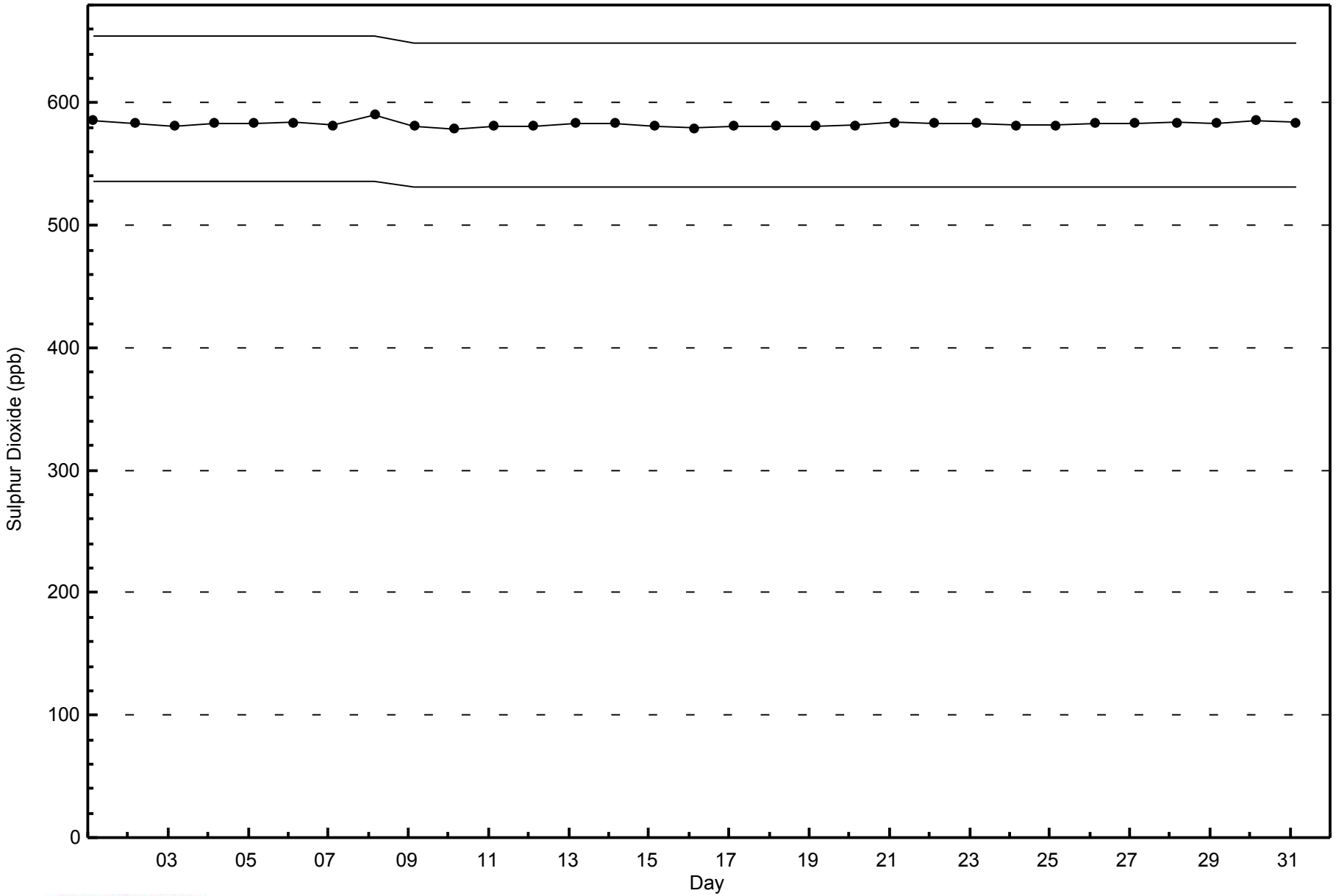
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1 ppb on Jan 19 10:00 Maximum Daily Average: 0.7 ppb on Jan 8

Minimum Value: 0 ppb on Jan 7 01:00 Minimum Daily Average: 0.2 ppb on Jan 30

Maximum Diurnal Average: 0.5 ppb at hour 11 Minimum Diurnal Average: 0.4 ppb at hour 3

Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

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

Z - zerospan C - Calibration

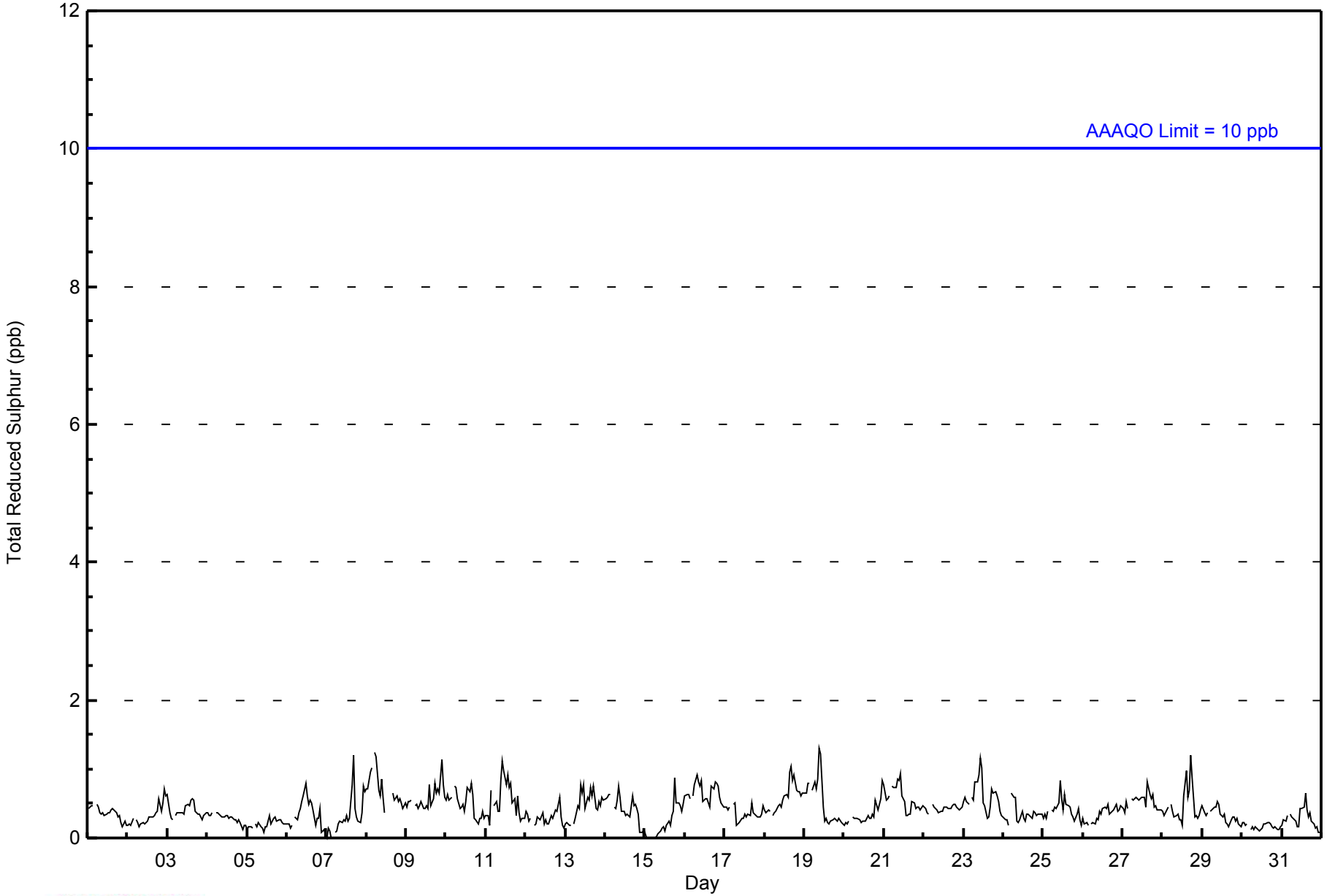
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	709	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: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	63	9	7	4	5	20	189	53	18	11	43	45	38	33	41	130	709
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	63	9	7	4	5	20	189	53	18	11	43	45	38	33	41	130	709

Total Number of Valid Hours: 709

Total Number of Hours: 744

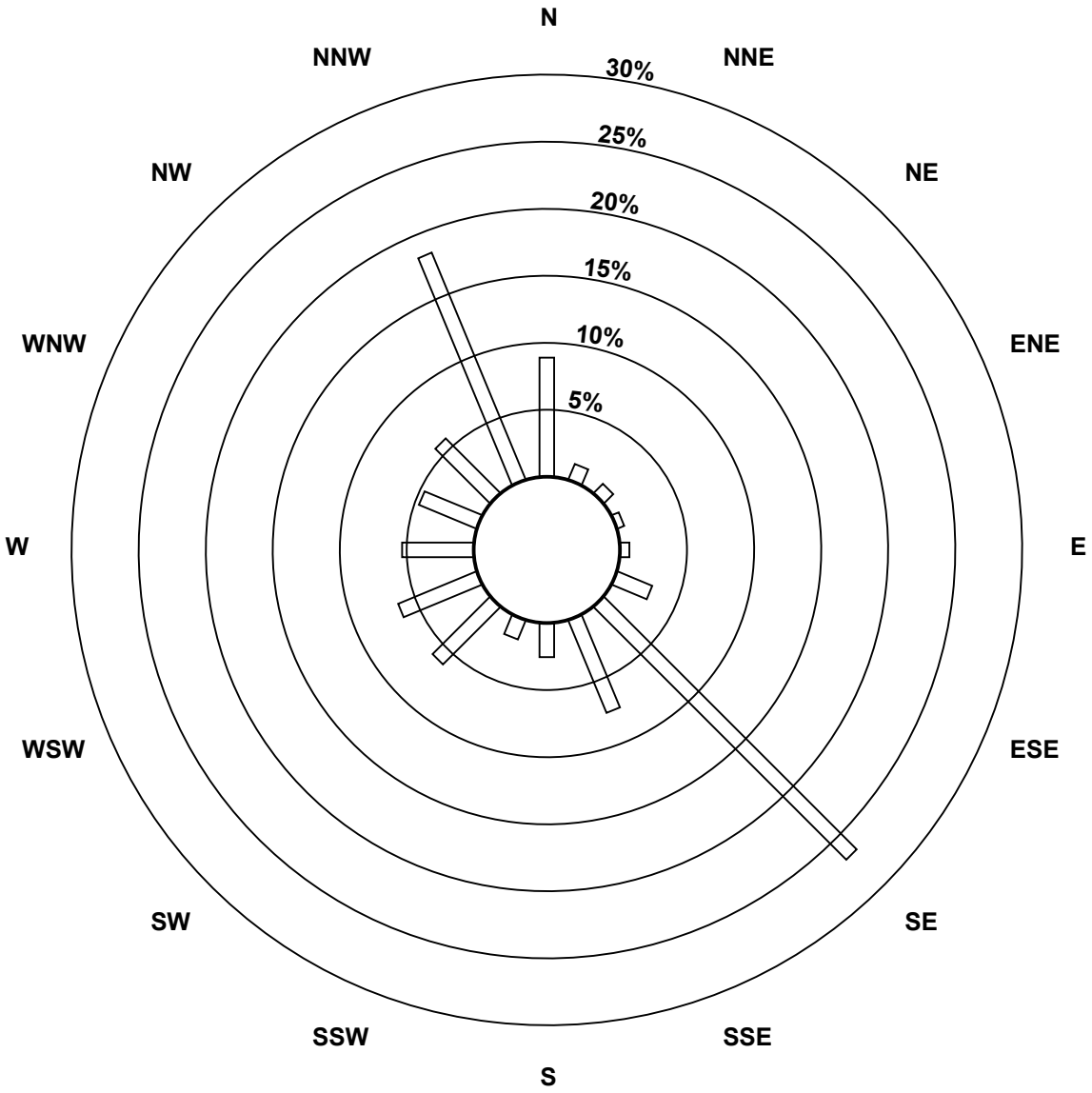
AURORA ATMOSPHERICS INC.

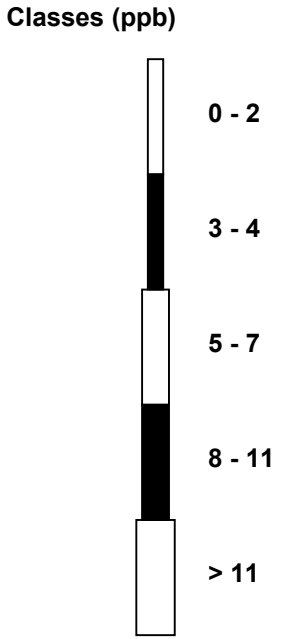
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley (AMS 7)





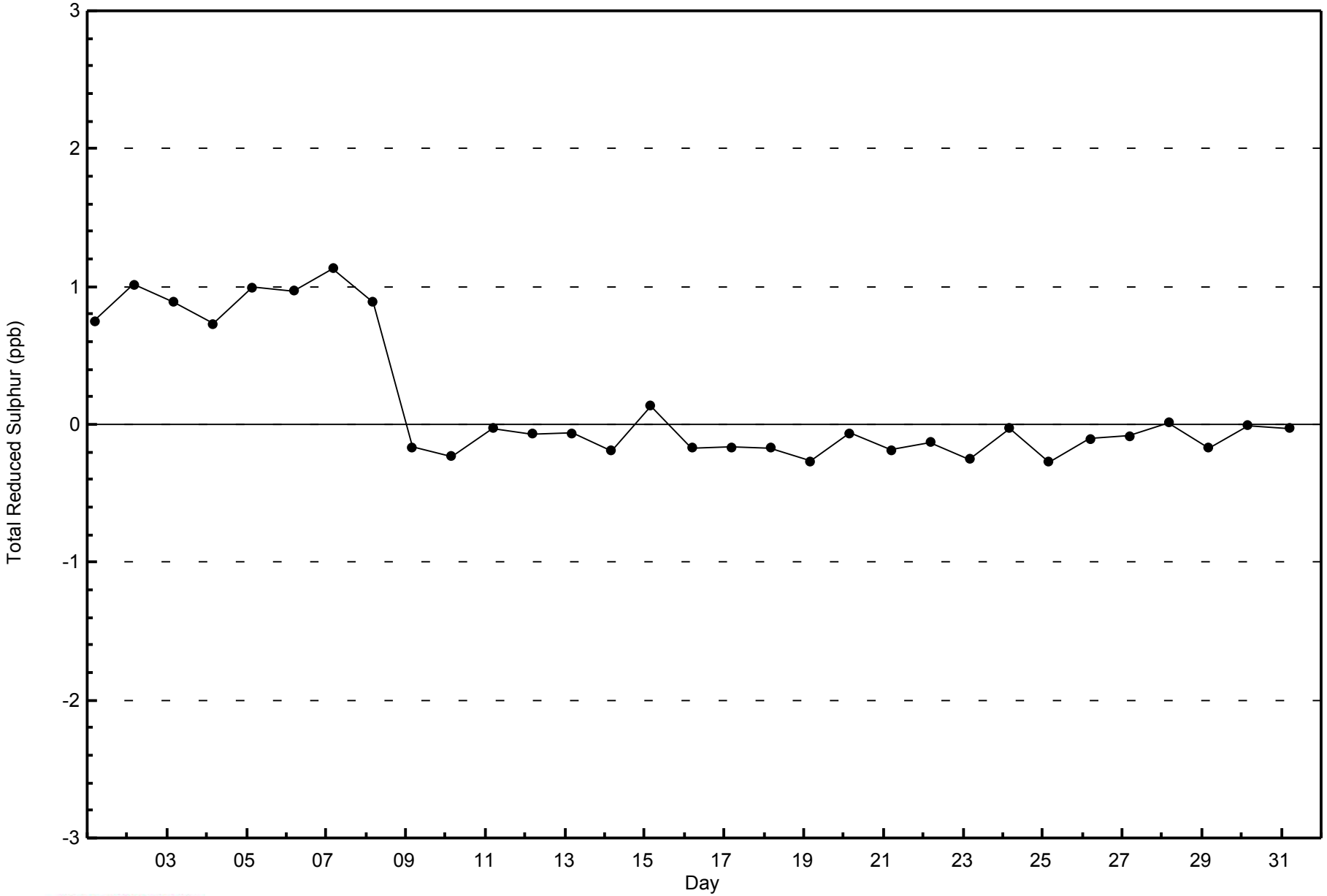
Total Number of Valid Hours: 709

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2014



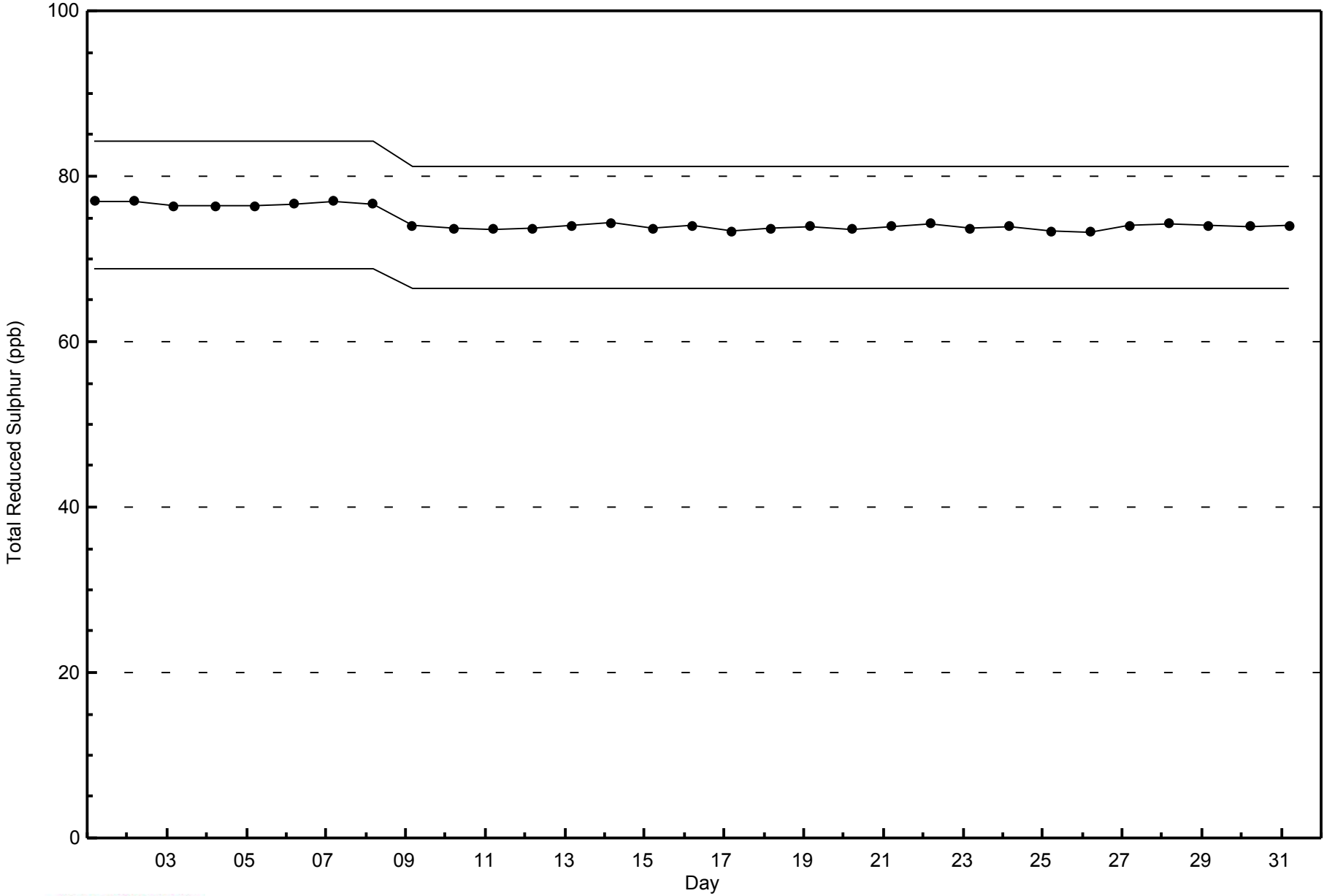
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2014

Maximum Value: 2.6 ppm on Jan 9 11:00

Maximum Daily Average: 2.4 ppm on Jan 9

Minimum Value: 1.8 ppm on Jan 15 03:00

Minimum Daily Average: 1.9 ppm on Jan 4

Maximum Diurnal Average: 2.0 ppm at hour 10

Minimum Diurnal Average: 2.0 ppm at hour 2

Monthly Average: 2.01 ppm

Percentiles: P_1 = 1.9 P_{10} = 1.9 Q_1 = 1.9 Median = 2.0 Q_3 = 2.0 P_{90} = 2.2 P_{99} = 2.5

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	37
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	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	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
2-Jan	2.0	2.1	2.1	Z	2.2	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	2.3	2.4	2.4	2.6	2.5	2.3	2.6
3-Jan	2.4	2.0	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4
4-Jan	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
5-Jan	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	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0
6-Jan	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0
7-Jan	1.9	1.9	1.9	Z	1.9	2.0	2.0	2.0	2.0	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	--	2.0
8-Jan	2.1	1.9	1.9	Z	1.9	2.0	2.0	2.0	2.1	2.3	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	2.3
9-Jan	2.1	UO	2.1	Z	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.5	2.4	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.4	2.6
10-Jan	2.1	2.1	2.1	Z	2.0	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.5	2.2	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.1	2.5
11-Jan	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.4	2.4	2.4	2.2	2.3	2.3	2.4	2.1	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.1	2.4
12-Jan	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	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0
13-Jan	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	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	2.1
14-Jan	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.1	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1
15-Jan	2.0	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0
16-Jan	2.0	2.1	2.1	Z	2.0	2.1	2.2	2.2	2.3	2.1	2.1	2.0	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3
17-Jan	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	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
18-Jan	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.1	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
19-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.3	2.3	2.2	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	2.3
20-Jan	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	2.0	1.9	2.0	2.0	2.0	2.0	2.2	2.0	2.2
21-Jan	2.1	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	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	2.1
22-Jan	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Jan	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.4	2.4	2.5	2.5	2.4	2.1	M	1.9	1.9	2.0	2.2	2.4	2.5	2.6	2.3	2.2	2.2	2.2	2.6
24-Jan	2.5	2.2	2.0	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	2.0	2.0	2.0	2.0	2.5
25-Jan	1.9	1.9	1.9	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	1.9	1.9	1.9	2.0
26-Jan	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	2.0	2.0	2.0	1.9	2.0	1.9	2.0
27-Jan	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	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	2.1
28-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.6	2.3	1.9	1.9	1.9	1.9	1.9	2.0	2.6
29-Jan	1.9	1.9	1.9	Z	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	2.0
30-Jan	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
31-Jan	1.9	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.5	2.2	2.1	--	2.2	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.5	2.4	2.4	2.5	2.3	2.6	2.4	2.5	2.6	2.4	2.6	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

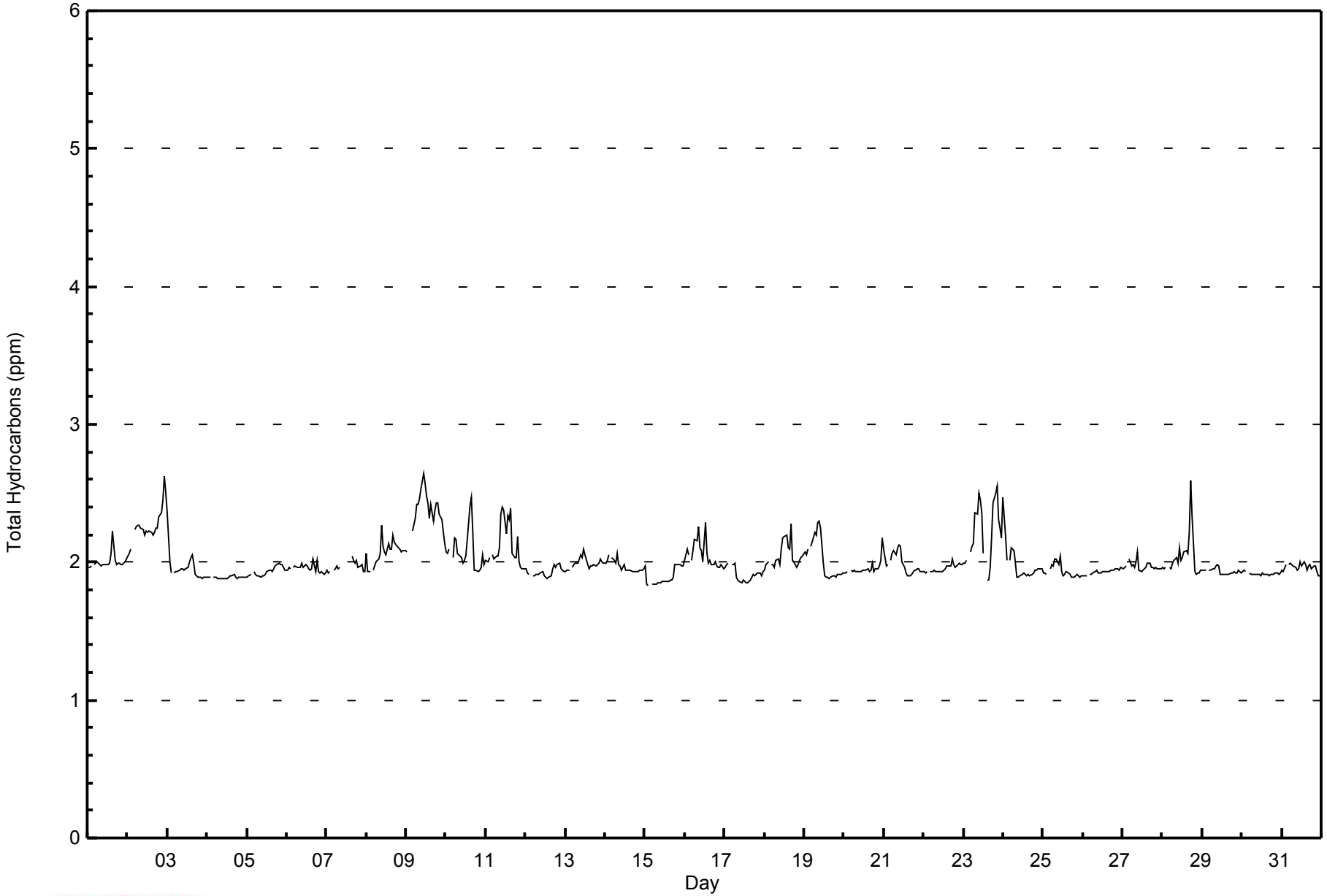
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	550	78.01	78.01
2.1 - 3.0	155	21.99	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2014

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	50	8	6	2	4	12	142	36	12	9	39	42	35	25	33	95	550
2.1 - 3.0	11	2	0	1	1	7	50	16	5	2	8	2	3	4	7	36	155
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	61	10	6	3	5	19	192	52	17	11	47	44	38	29	40	131	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

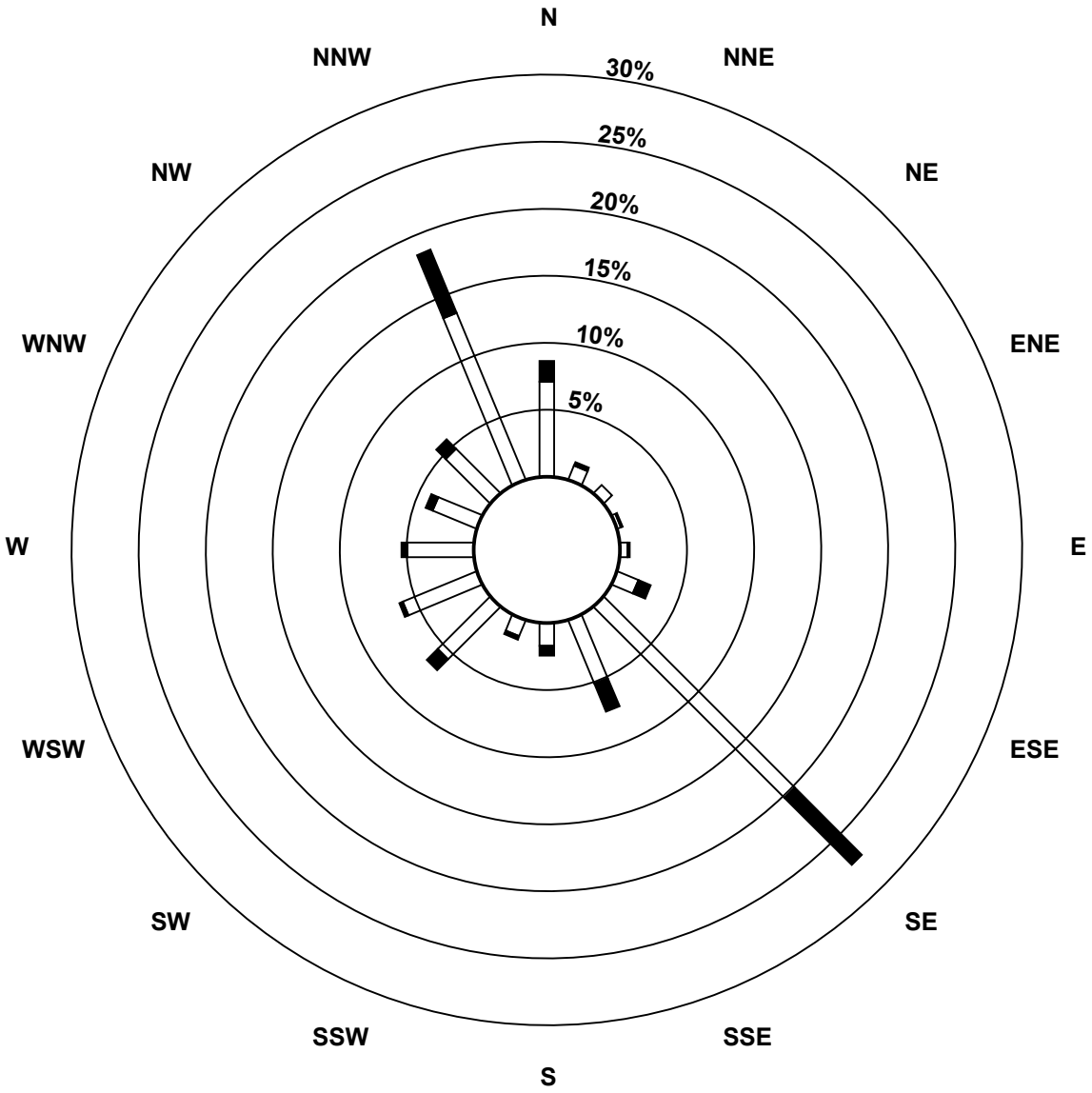
AURORA
ATMOSPHERICS INC.

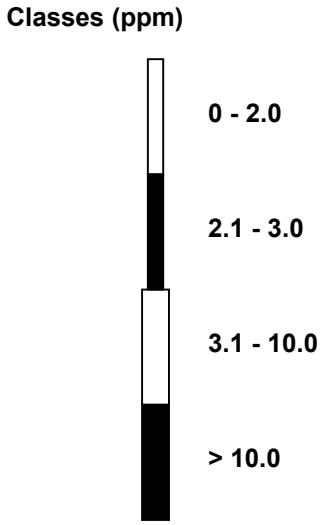
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Athabasca Valley (AMS 7)





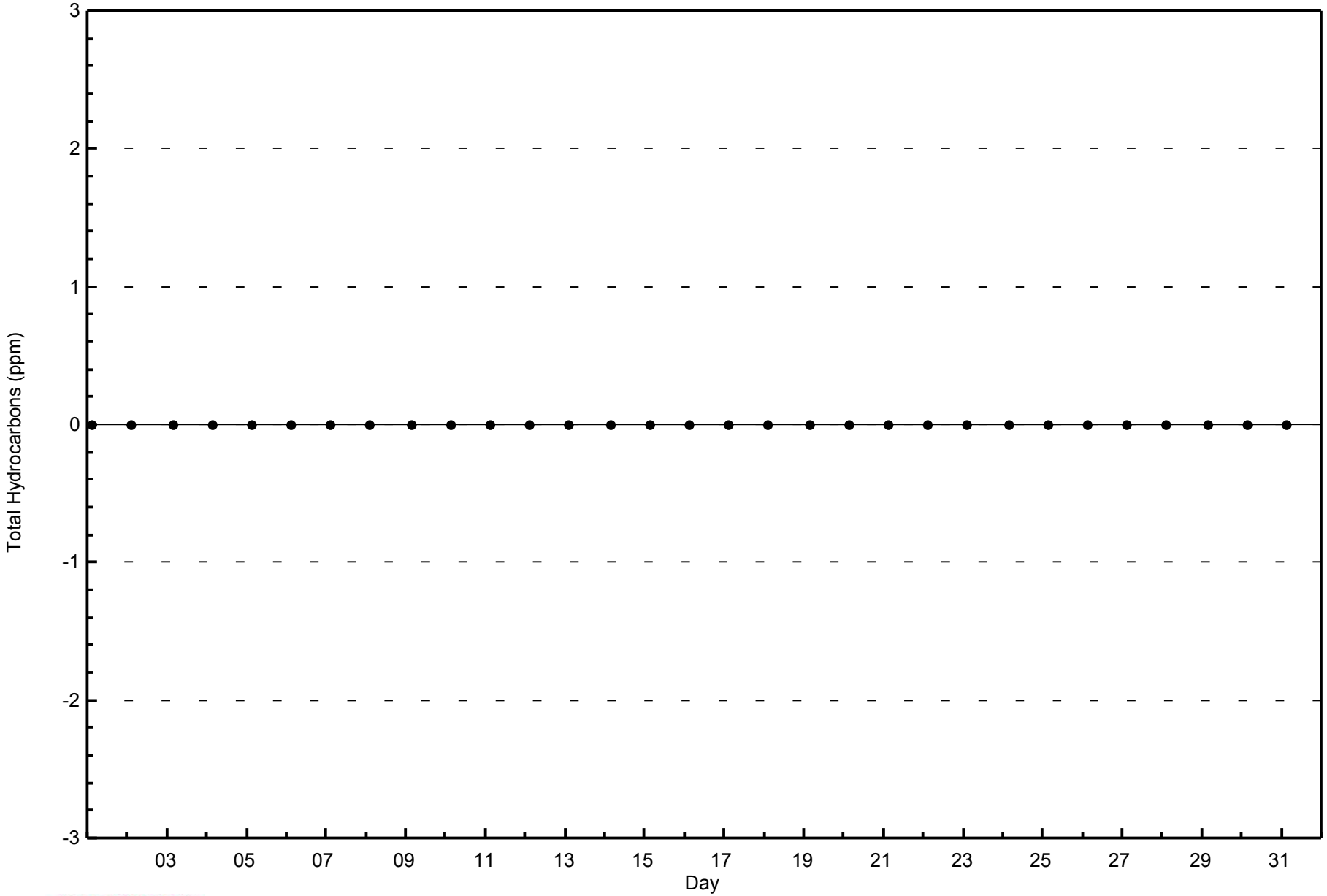
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2014



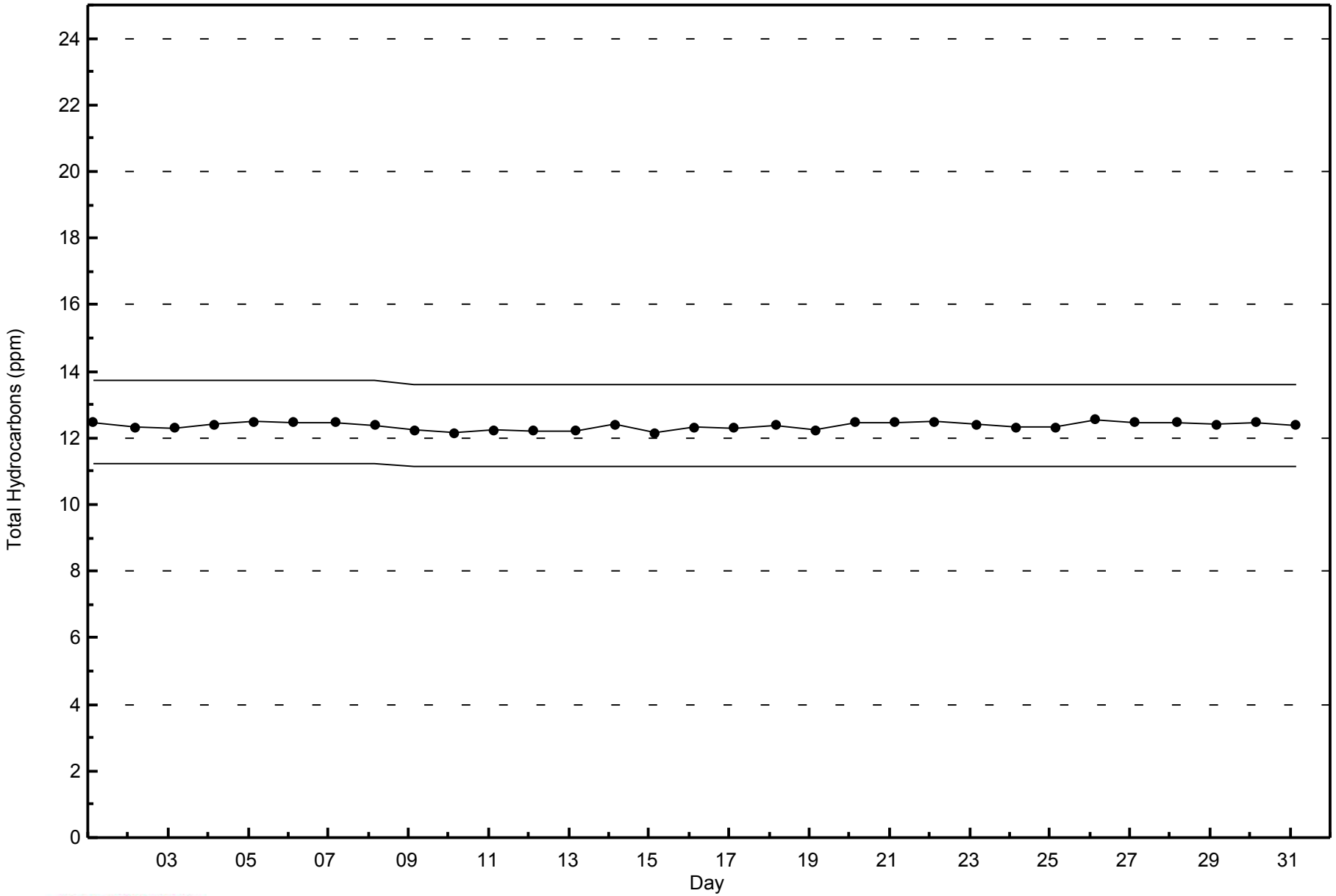
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2014

Maximum Value: 0.425 ppm on Jan 23 21:00

Maximum Daily Average: 0.152 ppm on Jan 23

Minimum Value: 0.000 ppm on Jan 1 01:00

Minimum Daily Average: 0.000 ppm on Jan 4

Maximum Diurnal Average: 0.030 ppm at hour 10

Minimum Diurnal Average: 0.001 ppm at hour 5

Monthly Average: 0.015 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} = 0.2

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	37
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.000	0.000	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.057	0.220	0.018	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.013	0.220
2-Jan	0.000	0.000	0.000	Z	0.002	0.004	0.003	0.005	0.003	0.009	0.004	0.037	0.014	0.016	0.031	0.008	0.016	0.027	0.010	0.057	0.058	0.080	0.149	0.055	0.026	0.149
3-Jan	0.003	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	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
4-Jan	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
5-Jan	0.000	0.000	0.001	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	0.001	0.002	0.005	0.003	0.003	0.001	0.000	0.001	0.005
6-Jan	0.000	0.001	0.000	Z	0.000	0.000	0.000	0.001	0.001	0.032	0.004	0.025	0.014	0.004	0.002	0.002	0.091	0.002	0.075	0.001	0.002	0.000	0.000	0.001	0.011	0.091
7-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.002	0.000	0.001	C	C	C	C	C	C	0.039	0.029	0.007	0.039	0.000	0.003	0.020	0.002	0.002	--	0.039
8-Jan	0.134	0.001	0.000	Z	0.000	0.002	0.002	0.001	0.020	0.180	0.006	0.002	0.000	0.068	0.006	0.002	0.102	0.049	0.013	0.004	0.009	0.003	0.004	0.001	0.026	0.180
9-Jan	0.001	UO	0.010	Z	0.006	0.015	0.025	0.030	0.040	0.038	0.041	0.036	0.036	0.044	0.068	0.068	0.060	0.064	0.053	0.050	0.023	0.006	0.003	0.000	0.033	0.068
10-Jan	0.001	0.000	0.000	Z	0.001	0.047	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.162	0.205	0.100	0.000	0.000	0.000	0.001	0.001	0.072	0.011	0.029	0.205
11-Jan	0.005	0.004	0.010	Z	0.001	0.000	0.000	0.000	0.003	0.043	0.010	0.035	0.006	0.000	0.040	0.023	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.001	0.008	0.043
12-Jan	0.013	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	0.008	0.033	0.004	0.000	0.004	0.001	0.000	0.000	0.003	0.033
13-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.008	0.002	0.011	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.002	0.018	0.006	0.000	0.003	0.018
14-Jan	0.003	0.001	0.004	Z	0.000	0.001	0.000	0.082	0.024	0.022	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.082
15-Jan	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002
16-Jan	0.005	0.009	0.001	Z	0.001	0.000	0.068	0.116	0.227	0.075	0.056	0.003	0.296	0.092	0.017	0.026	0.018	0.030	0.044	0.017	0.007	0.000	0.000	0.000	0.048	0.296
17-Jan	0.000	0.000	0.001	Z	0.000	0.000	0.000	0.000	0.001	0.004	0.001	0.020	0.019	0.002	0.001	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.020
18-Jan	0.003	0.000	0.001	Z	0.002	0.001	0.000	0.000	0.000	0.001	0.016	0.044	0.111	0.146	0.086	0.043	0.063	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.023	0.146
19-Jan	0.004	0.000	0.000	Z	0.001	0.000	0.000	0.008	0.055	0.056	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.056
20-Jan	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.004	0.002	0.004	0.005	0.000	0.000	0.008	0.000	0.001	0.037	0.000	0.000	0.000	0.000	0.000	0.030	0.004	0.037
21-Jan	0.004	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.002	0.000	0.000	0.001	0.001	0.016
22-Jan	0.006	0.001	0.001	Z	0.002	0.000	0.001	0.001	0.003	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.056	0.005	0.000	0.000	0.003	0.000	0.001	0.004	0.056
23-Jan	0.009	0.006	0.003	Z	0.001	0.004	0.025	0.164	0.159	0.322	0.247	0.220	0.118	M	0.004	0.002	0.084	0.192	0.373	0.424	0.425	0.260	0.194	0.107	0.152	0.425
24-Jan	0.351	0.078	0.008	Z	0.008	0.005	0.035	0.006	0.005	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.022	0.351
25-Jan	0.000	0.000	0.000	Z	0.001	0.000	0.003	0.053	0.021	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.053
26-Jan	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	0.001	0.000	0.000	0.000	0.000	0.001
27-Jan	0.000	0.000	0.000	Z	0.001	0.000	0.002	0.006	0.030	0.118	0.000	0.000	0.000	0.000	0.006	0.002	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.118
28-Jan	0.000	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.068	0.008	0.013	0.028	0.029	0.000	0.011	0.131	0.046	0.000	0.000	0.000	0.000	0.000	0.015	0.131
29-Jan	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
30-Jan	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	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001
31-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.025
	0.017	0.003	0.001	--	0.001	0.003	0.007	0.015	0.020	0.030	0.017	0.017	0.021	0.015	0.017	0.021	0.020	0.021	0.022	0.018	0.017	0.013	0.014	0.007	Diurnal Average	
	0.351	0.078	0.010	--	0.008	0.047	0.068	0.164	0.227	0.322	0.247	0.220	0.296	0.146	0.162	0.220	0.102	0.192	0.373	0.424	0.425	0.260	0.194	0.107	Diurnal Maximum	

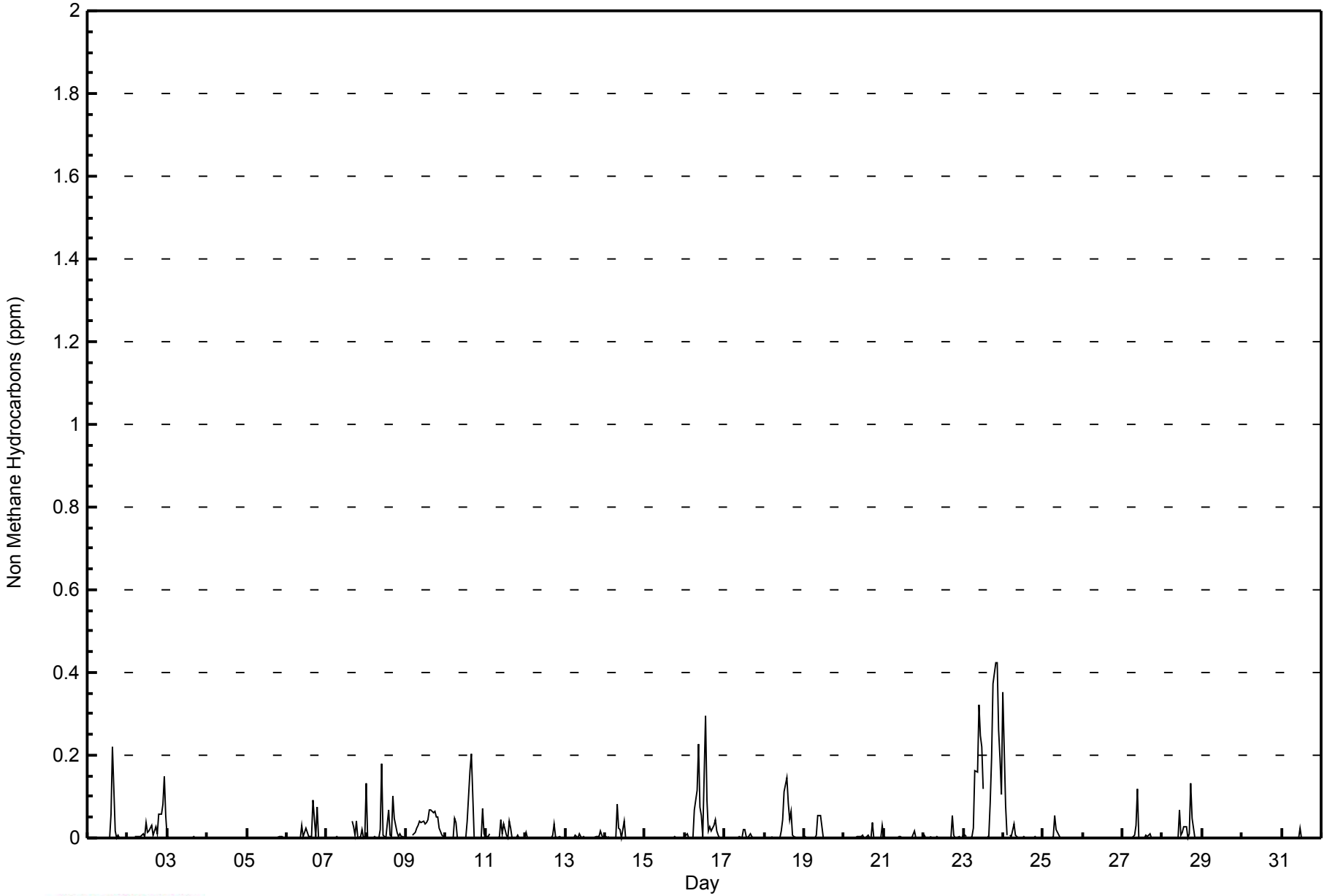
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

WBEA NETWORK

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	546	77.45	77.45
0.006 - 0.05	104	14.75	92.20
0.06 - 0.1	37	5.25	97.45
> 0.1	18	2.55	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	55	10	6	1	3	13	128	37	11	8	36	42	31	23	37	105	546
0.006 - 0.05	5	0	0	2	1	2	39	8	3	2	9	2	6	5	2	18	104
0.06 - 0.1	1	0	0	0	1	2	14	6	1	1	2	0	1	1	1	6	37
> 0.1	0	0	0	0	0	2	11	1	2	0	0	0	0	0	0	2	18
Totals	61	10	6	3	5	19	192	52	17	11	47	44	38	29	40	131	705

Total Number of Valid Hours: 705

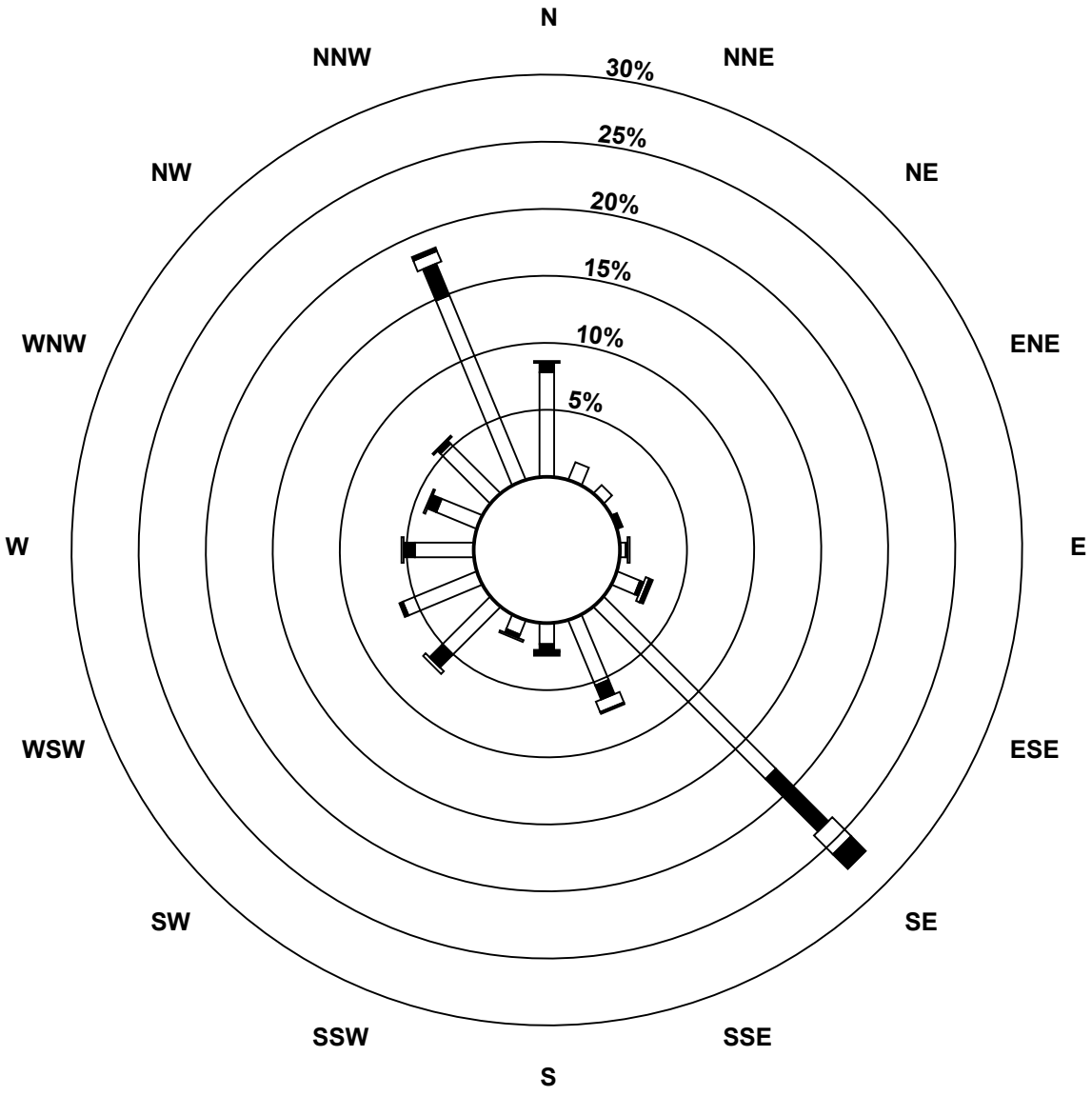
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)

0 - 0.005

0.006 - 0.05

0.06 - 0.1

> 0.1

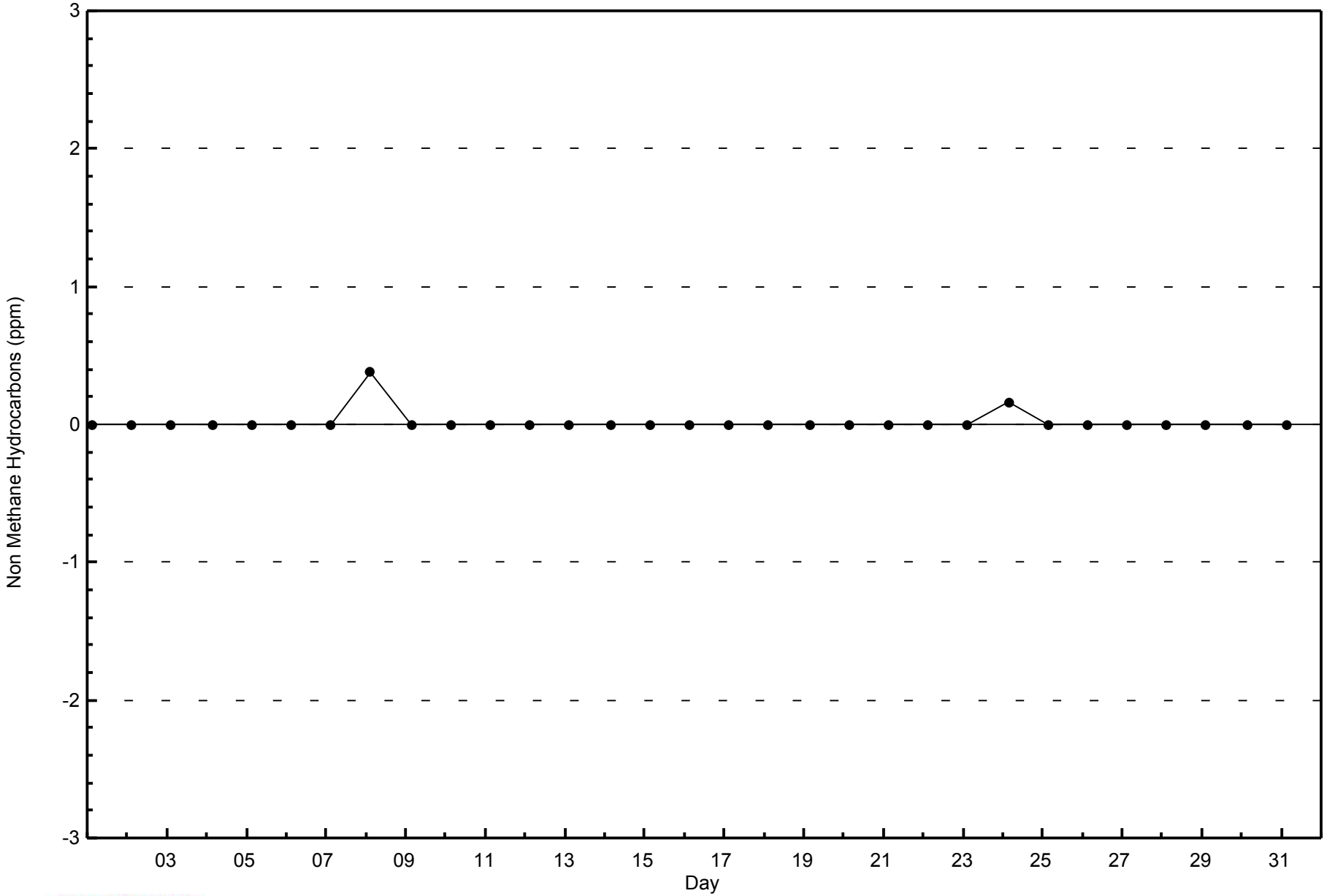
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2014



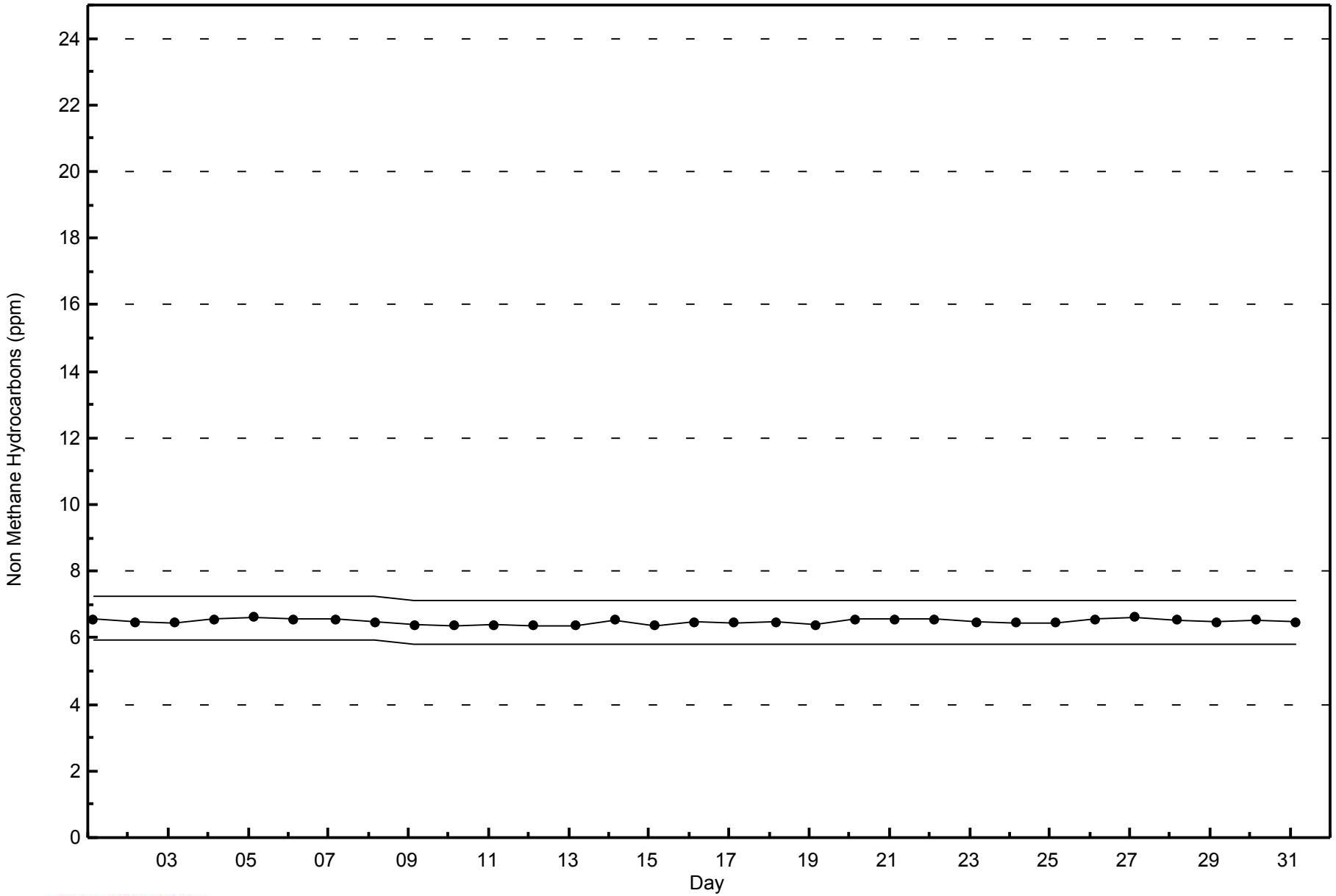
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Athabasca Valley - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 2.6 ppm on Jan 9 11:00 Maximum Daily Average: 2.3 ppm on Jan 9

Minimum Value: 1.8 ppm on Jan 15 03:00 Minimum Daily Average: 1.9 ppm on Jan 4
Maximum Diurnal Average: 2.0 ppm at hour 11 Minimum Diurnal Average: 2.0 ppm at hour 2
Monthly Average: 1.99 ppm Percentiles: P_1 = 1.8 P_{10} = 1.9 Q_1 = 1.9 Median = 2.0 Q_3 = 2.0 P_{90} = 2.1 P_{99} = 2.4

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	37
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	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-Jan	2.0	2.1	2.1	Z	2.2	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	2.3	2.3	2.4	2.5	2.5	2.2	2.5
3-Jan	2.4	2.0	1.9	Z	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4
4-Jan	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
5-Jan	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	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0
6-Jan	1.9	2.0	2.0	Z	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
7-Jan	1.9	1.9	1.9	Z	1.9	2.0	2.0	2.0	2.0	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	--	2.0
8-Jan	1.9	1.9	1.9	Z	1.9	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	2.1	2.1	2.1	2.1	2.0	2.1
9-Jan	2.1	UO	2.1	Z	2.2	2.3	2.4	2.4	2.4	2.5	2.6	2.5	2.4	2.4	2.3	2.4	2.2	2.3	2.4	2.4	2.3	2.3	2.2	2.1	2.3	2.6
10-Jan	2.1	2.1	2.1	Z	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.3
11-Jan	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.1	2.3	2.4	2.3	2.2	2.3	2.3	2.4	2.1	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.1	2.4
12-Jan	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	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0
13-Jan	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	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	2.1
14-Jan	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	1.9	1.9	1.9	1.9	1.9	2.0	2.0
15-Jan	2.0	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0
16-Jan	2.0	2.1	2.1	Z	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
17-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0
18-Jan	1.9	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
19-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	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	2.2
20-Jan	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	2.0	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.1
21-Jan	2.1	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	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	2.1
22-Jan	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
23-Jan	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	1.9	M	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2
24-Jan	2.1	2.1	2.0	Z	2.0	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	2.0	2.0	2.0	2.0	2.1
25-Jan	1.9	1.9	1.9	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	1.9	1.9	1.9	2.0
26-Jan	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	2.0	2.0	2.0	1.9	2.0	1.9	2.0
27-Jan	1.9	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
28-Jan	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	2.1	2.1	2.2	2.5	2.3	1.9	1.9	1.9	1.9	1.9	2.0	2.5
29-Jan	1.9	1.9	1.9	Z	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	2.0
30-Jan	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
31-Jan	1.9	1.9	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Diurnal Average	
	2.4	2.1	2.1	--	2.2	2.3	2.4	2.4	2.4	2.5	2.6	2.5	2.4	2.4	2.3	2.4	2.2	2.5	2.4	2.4	2.3	2.4	2.5	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation

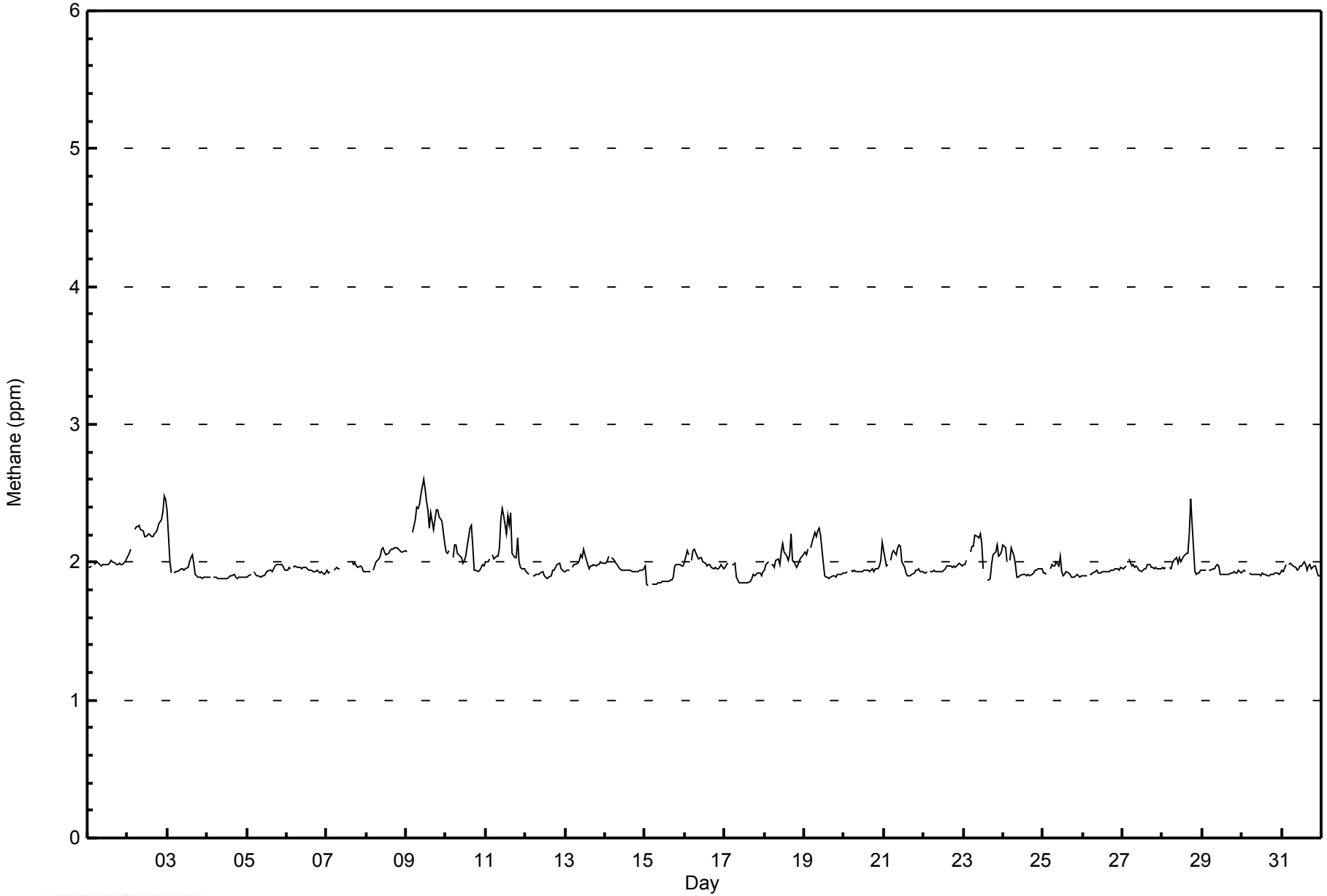
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Methane (CH_4) - ppm

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	573	81.28	81.28
2.1 - 3.0	132	18.72	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744

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	50	8	6	2	4	12	154	41	13	10	39	42	36	25	33	98	573
2.1 - 3.0	11	2	0	1	1	7	38	11	4	1	8	2	2	4	7	33	132
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	61	10	6	3	5	19	192	52	17	11	47	44	38	29	40	131	705

Total Number of Valid Hours: 705

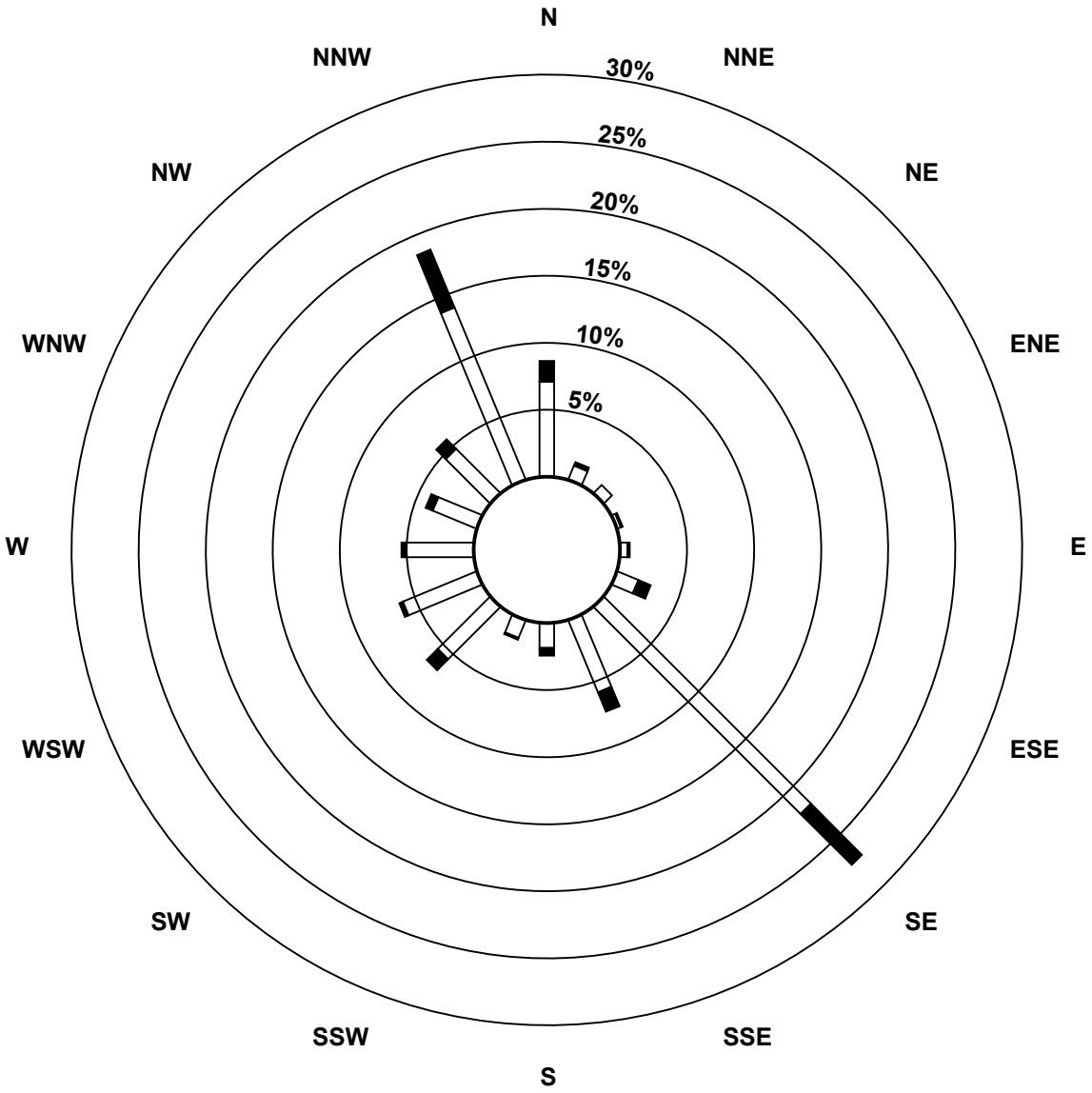
Total Number of Hours: 744

Wood Buffalo Environmental Association

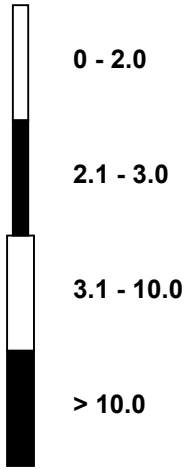
Wind Rose Jan 2014

Methane (CH_4) - ppm

Athabasca Valley (AMS 7)



Classes (ppm)



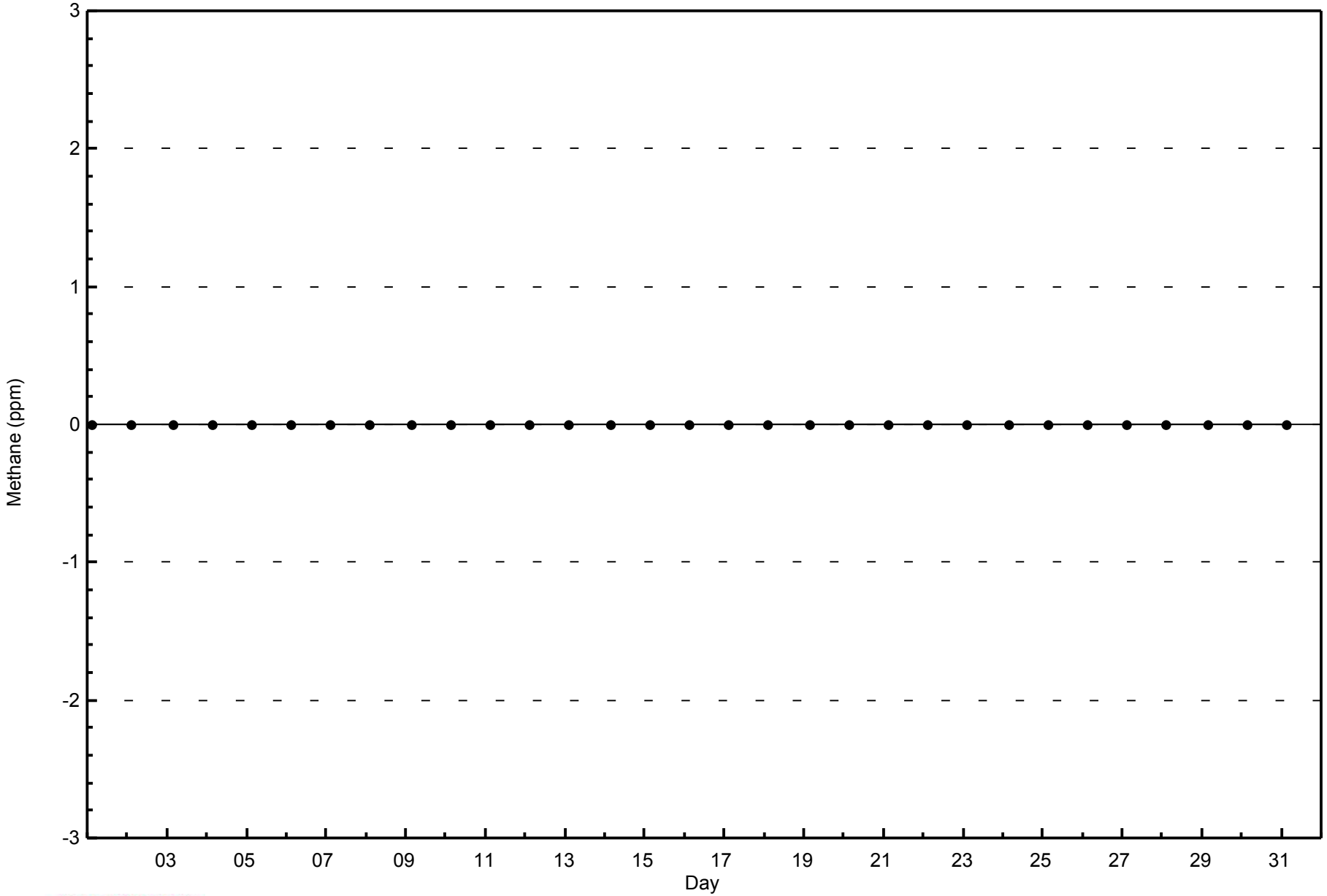
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Methane (CH_4) - ppm

Athabasca Valley - January 2014



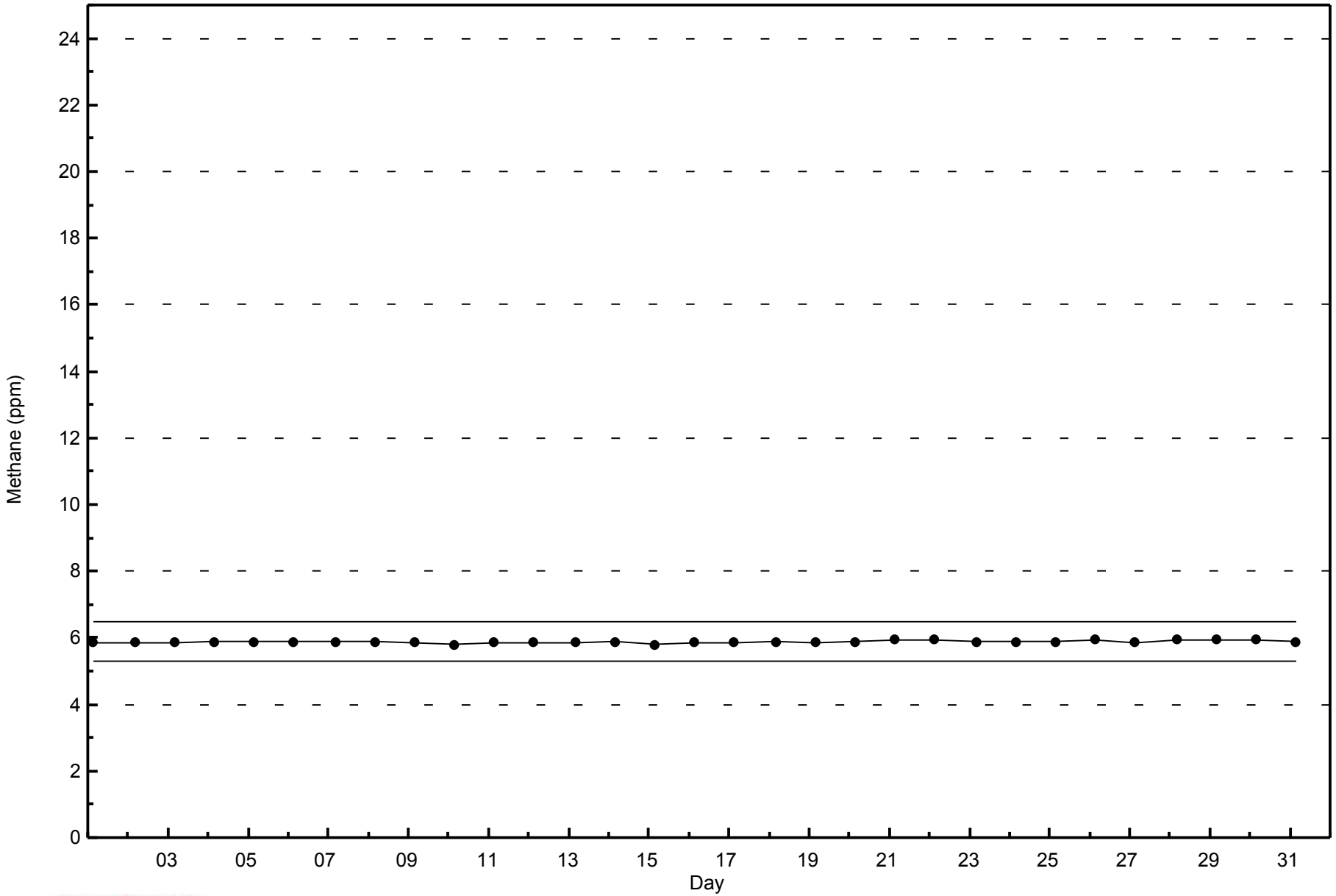
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Methane (CH_4) - ppm

Athabasca Valley - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Athabasca Valley - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 43 ppb on Jan 15 07:00 Maximum Daily Average: 31.2 ppb on Jan 30

Minimum Value: 0 ppb on Jan 24 03:00 Minimum Daily Average: 4.3 ppb on Jan 16
Maximum Diurnal Average: 20.2 ppb at hour 13 Minimum Diurnal Average: 12.7 ppb at hour 7
Monthly Average: 15.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 7$ Median = 14 $Q_3 = 24$ $P_{90} = 32$ $P_{99} = 41$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	11	11	11	Z	11	8	9	10	10	10	11	12	13	10	7	6	6	8	10	8	10	10	11	11	9.8	13
2-Jan	12	12	12	Z	11	10	7	7	8	9	12	13	12	9	11	11	6	3	3	2	1	2	2	1	7.6	13
3-Jan	1	19	26	Z	28	22	20	19	13	17	19	14	17	16	12	8	7	24	31	31	33	34	33	33	20.8	34
4-Jan	34	34	34	Z	32	25	32	33	34	33	35	35	35	34	32	31	21	26	27	27	26	26	27	28	30.5	35
5-Jan	28	27	25	Z	18	18	20	17	24	24	26	27	24	17	20	16	14	13	15	16	15	16	20	22	20.1	28
6-Jan	22	21	19	Z	19	18	17	15	13	14	14	15	15	17	16	12	16	16	15	15	14	18	29	21	17.1	29
7-Jan	19	16	14	Z	13	5	4	2	4	3	8	10	12	14	10	3	3	2	5	6	8	11	17	19	9.0	19
8-Jan	22	20	18	Z	17	15	13	14	11	14	C	C	C	C	C	8	9	3	10	11	12	14	15	16	13.6	22
9-Jan	17	16	13	Z	6	4	4	7	2	6	9	11	9	10	6	5	2	0	0	1	3	5	8	12	6.7	17
10-Jan	15	14	13	Z	15	7	2	6	11	14	15	18	13	8	8	7	10	21	22	25	15	7	6	7	12.2	25
11-Jan	5	6	2	Z	1	1	0	0	0	1	2	3	4	4	8	7	6	4	8	9	13	20	23	23	6.6	23
12-Jan	26	28	29	Z	30	31	27	28	26	26	24	31	33	33	30	21	8	5	6	9	12	15	23	25	22.7	33
13-Jan	24	23	23	Z	16	12	7	2	2	2	4	6	17	19	16	8	8	2	8	7	4	4	2	4	9.6	24
14-Jan	3	1	1	Z	1	6	7	15	16	17	19	20	20	20	19	18	13	16	18	17	19	23	24	23	14.7	24
15-Jan	17	38	41	Z	42	42	43	42	41	39	39	39	38	39	35	38	33	30	12	7	7	8	6	3	29.6	43
16-Jan	1	1	1	Z	1	0	2	2	2	2	2	7	9	9	6	4	3	3	4	6	7	7	7	12	4.3	12
17-Jan	8	5	6	Z	5	4	9	35	34	32	33	35	34	33	34	28	26	25	29	28	29	28	24	11	23.3	35
18-Jan	11	5	3	Z	7	8	2	3	5	5	5	7	5	5	5	2	2	8	10	12	12	11	10	5	6.3	12
19-Jan	4	4	3	Z	3	1	0	0	1	1	4	18	31	35	34	31	28	23	22	24	21	16	19	16	14.8	35
20-Jan	12	9	10	Z	10	12	12	11	11	13	15	15	15	14	12	12	9	6	11	1	1	1	2	1	9.3	15
21-Jan	3	15	12	Z	3	1	1	1	1	2	4	15	23	30	31	32	27	9	7	4	1	2	3	19	10.7	32
22-Jan	22	22	24	Z	23	18	18	14	17	17	20	21	21	19	17	15	11	13	15	10	11	12	15	20	17.1	24
23-Jan	20	19	14	Z	3	2	8	3	2	3	3	4	9	19	35	29	9	3	1	1	1	1	1	1	8.4	35
24-Jan	1	1	0	Z	3	3	7	14	32	35	32	28	29	31	27	29	26	29	25	22	21	17	10	13	19.0	35
25-Jan	23	26	29	Z	8	7	9	5	5	4	6	20	27	21	23	24	25	28	31	33	32	35	38	38	21.7	38
26-Jan	39	41	39	Z	35	31	31	27	24	27	28	28	26	23	24	22	25	22	14	9	6	6	3	6	23.3	41
27-Jan	3	3	7	Z	7	10	9	10	8	13	16	17	14	14	14	8	5	8	8	13	12	14	15	15	10.6	17
28-Jan	15	17	14	Z	14	14	11	8	5	9	11	14	14	11	4	4	1	1	2	28	31	30	27	23	13.4	31
29-Jan	18	27	25	Z	23	20	19	14	10	6	17	32	32	32	35	35	34	31	27	28	29	29	29	31	25.2	35
30-Jan	29	28	30	Z	32	31	32	30	31	34	34	34	34	32	31	31	29	29	31	33	33	34	33	22	31.2	34
31-Jan	19	13	14	Z	19	16	15	10	17	23	20	13	17	20	18	26	22	14	19	20	18	27	34	34	19.4	34
	15.6	16.9	16.6	--	14.7	12.9	12.7	13.1	13.5	14.7	16.2	18.7	20.2	20.0	19.3	17.2	14.3	13.8	14.3	14.8	14.8	15.5	16.6	16.6	Diurnal Average	
	39	41	41	--	42	42	43	42	41	39	39	39	38	39	35	38	34	31	31	33	33	35	38	38	Diurnal Maximum	

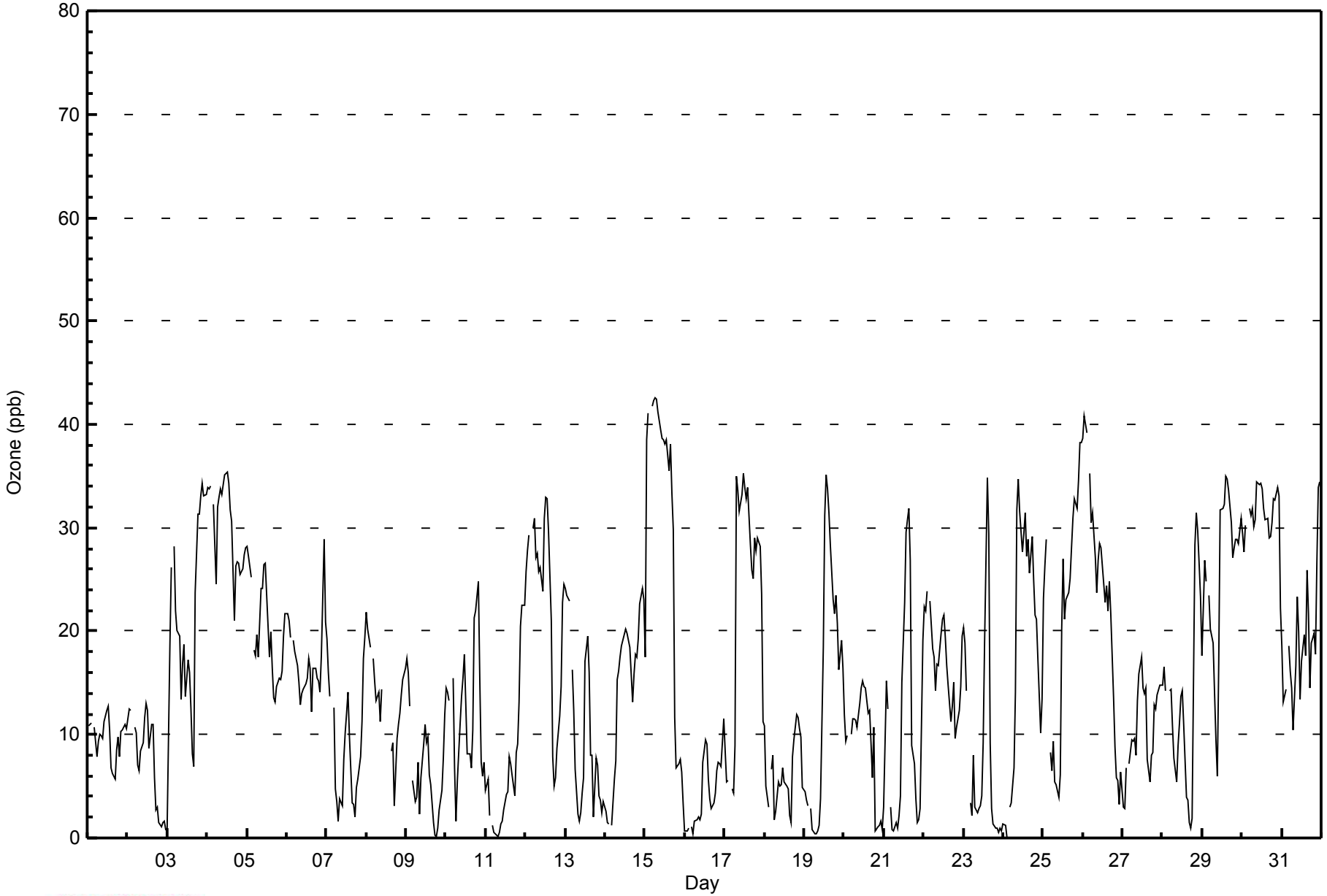
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	484	68.36	68.36
21 - 50	224	31.64	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	23	9	6	3	4	17	178	42	16	9	27	20	24	10	19	77	484
21 - 50	39	2	1	0	1	1	13	8	1	2	20	24	15	20	23	54	224
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	62	11	7	3	5	18	191	50	17	11	47	44	39	30	42	131	708

Total Number of Valid Hours: 708

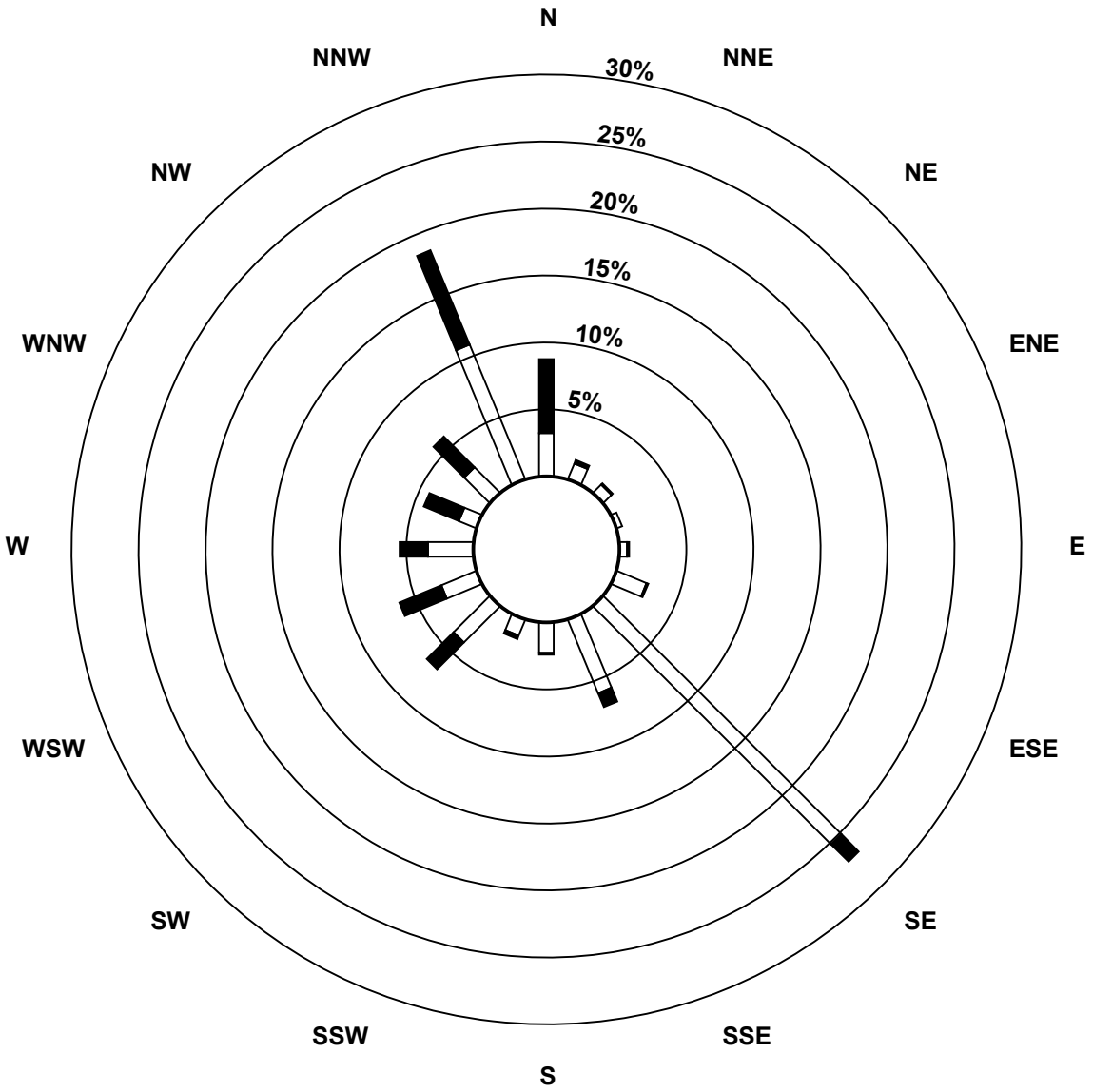
Total Number of Hours: 744

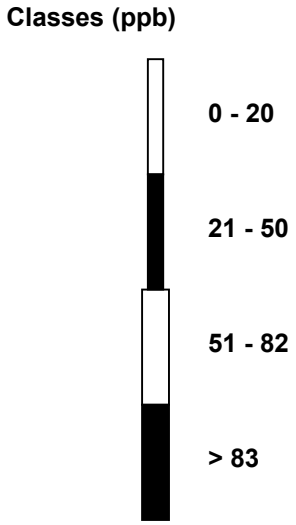
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ozone (O_3) - ppb

Athabasca Valley (AMS 7)





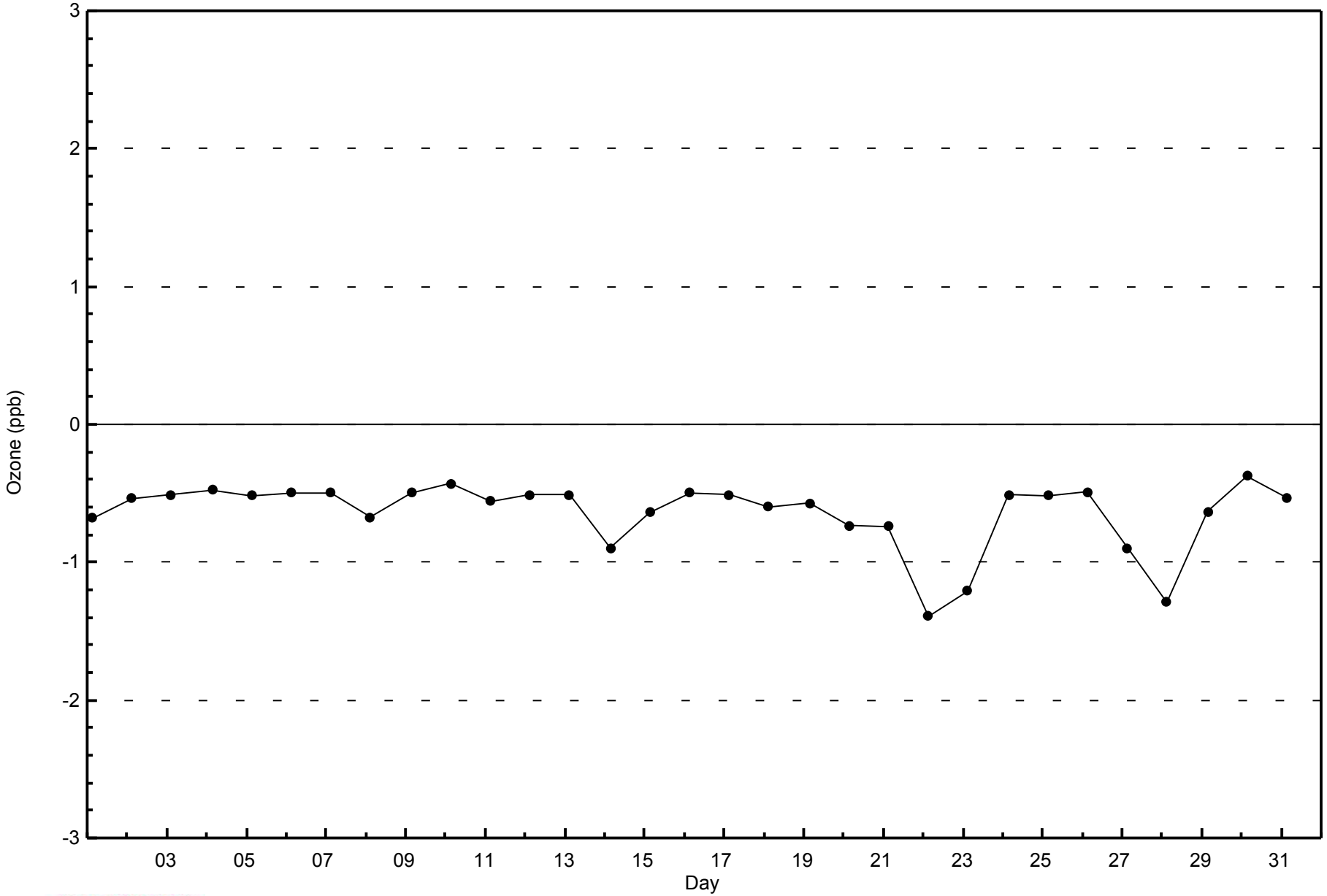
Total Number of Valid Hours: 708

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Athabasca Valley - January 2014



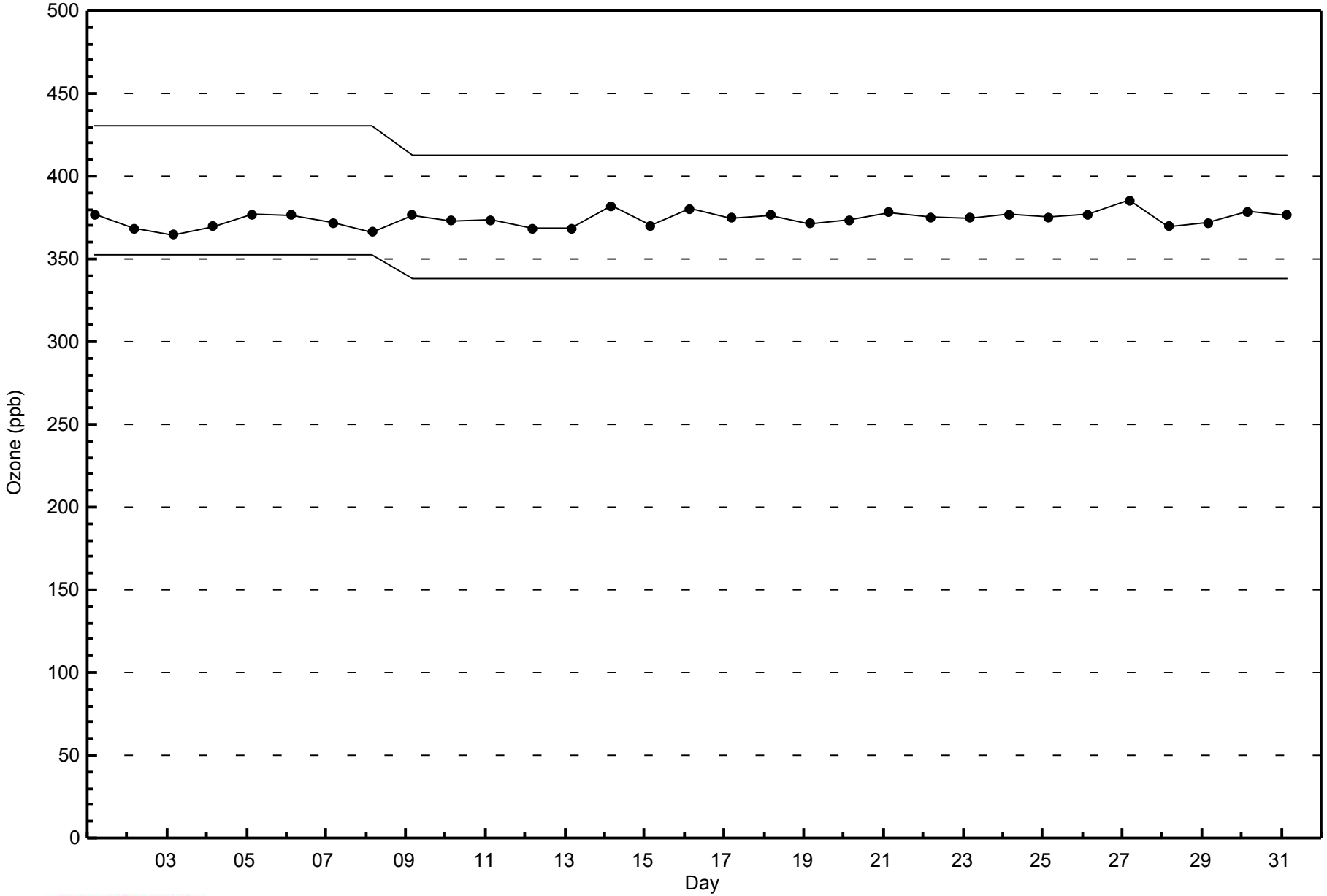
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 198 ppb on Jan 23 11:00

Maximum Daily Average: 72.8 ppb on Jan 23

Minimum Value: 0 ppb on Jan 3 03:00

Minimum Daily Average: 0.3 ppb on Jan 4

Maximum Diurnal Average: 33.3 ppb at hour 10

Minimum Diurnal Average: 15.3 ppb at hour 2

Monthly Average: 23.9 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 5$ Median = 14 $Q_3 = 32$ $P_{90} = 60$ $P_{99} = 140$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	4	7	8	Z	1	7	5	4	7	9	8	9	10	15	24	17	15	9	8	22	8	6	7	5	9.3	24
2-Jan	7	8	10	Z	12	11	10	8	9	13	12	11	15	18	20	14	16	26	23	64	29	47	73	37	21.5	73
3-Jan	33	0	0	Z	0	0	0	0	2	3	5	12	12	12	13	12	6	1	0	0	0	0	0	0	4.8	33
4-Jan	0	0	0	Z	0	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	4
5-Jan	0	1	0	Z	3	3	8	11	3	3	2	3	5	10	6	6	5	9	9	9	9	9	8	4	5.5	11
6-Jan	4	5	7	Z	9	7	10	27	47	67	90	107	76	62	73	64	47	19	39	31	67	6	4	4	38.0	107
7-Jan	2	0	1	Z	4	8	9	24	30	C	C	C	C	C	C	122	155	40	17	10	8	24	111	87	--	155
8-Jan	96	97	143	Z	147	182	180	73	57	90	44	18	36	46	52	31	45	36	56	33	52	31	28	22	69.3	182
9-Jan	13	23	57	Z	17	27	29	27	34	32	15	9	11	10	77	20	17	45	12	5	1	1	0	0	20.9	77
10-Jan	2	0	0	Z	0	1	4	1	2	2	17	4	53	58	34	19	11	2	1	1	14	23	26	12	12.5	58
11-Jan	15	8	12	Z	40	23	36	22	26	79	62	57	34	32	11	16	41	63	7	1	0	0	0	0	25.5	79
12-Jan	0	0	2	Z	1	1	6	1	2	6	5	7	3	14	8	36	27	22	45	42	36	18	3	2	12.4	45
13-Jan	2	3	3	Z	6	3	23	47	43	57	28	39	15	39	46	74	38	56	14	24	32	24	37	20	29.3	74
14-Jan	29	33	51	Z	32	9	12	43	80	58	14	9	8	8	8	11	89	69	64	71	54	2	2	2	32.9	89
15-Jan	4	3	2	Z	1	1	0	1	6	9	9	4	8	8	44	11	45	24	24	21	17	25	25	46	14.6	46
16-Jan	72	60	53	Z	46	53	90	120	103	81	97	28	21	21	24	20	97	82	100	93	90	42	7	3	61.1	120
17-Jan	4	6	7	Z	8	11	20	1	6	12	10	16	17	24	20	26	22	16	15	1	1	3	6	20	11.7	26
18-Jan	17	26	34	Z	14	11	36	37	31	43	38	48	63	61	62	60	38	12	12	14	11	7	6	6	29.9	63
19-Jan	6	6	14	Z	5	17	32	24	43	65	49	9	7	4	4	5	2	7	7	6	13	7	1	4	14.5	65
20-Jan	5	8	7	Z	12	31	31	29	9	13	16	18	22	13	17	16	18	16	5	26	13	14	20	24	16.7	31
21-Jan	11	5	24	Z	13	15	17	39	47	47	49	16	10	3	9	5	9	33	30	19	25	29	33	22	22.1	49
22-Jan	26	26	23	Z	25	30	21	20	17	10	10	12	22	19	22	19	19	10	17	10	7	13	14	19	17.9	30
23-Jan	27	30	22	Z	22	38	45	110	103	135	198	177	55	64	7	7	51	120	95	116	112	70	44	25	72.8	198
24-Jan	25	24	21	Z	29	52	35	31	10	4	9	18	5	9	22	14	17	11	19	4	2	2	3	4	16.0	52
25-Jan	2	2	3	Z	23	19	12	25	18	38	79	42	7	30	19	23	20	9	8	8	12	13	2	1	18.1	79
26-Jan	2	2	4	Z	3	10	5	8	7	21	7	4	4	13	9	16	4	5	13	13	30	14	20	32	10.5	32
27-Jan	22	9	22	Z	31	38	46	50	52	54	55	60	76	76	50	109	88	70	79	60	62	45	50	52	54.6	109
28-Jan	44	49	51	Z	48	53	40	29	40	23	22	27	16	43	79	36	41	43	29	1	1	1	4	11	31.8	79
29-Jan	10	0	0	Z	0	3	7	12	9	21	18	4	3	8	3	1	1	11	15	14	15	10	4	3	7.5	21
30-Jan	9	6	1	Z	1	1	2	2	1	1	2	6	8	28	30	14	15	14	17	6	6	1	1	18	8.3	30
31-Jan	12	25	2	Z	29	21	9	19	16	5	8	38	52	23	24	12	16	20	4	2	1	2	4	4	15.1	52
	16.3	15.3	18.9	--	18.7	22.2	25.2	27.3	27.7	33.3	32.6	27.1	22.5	25.6	27.2	26.9	32.8	29.1	25.3	23.5	23.5	15.7	17.5	15.7	Diurnal Average	
	96	97	143	--	147	182	180	120	103	135	198	177	76	76	79	122	155	120	100	116	112	70	111	87	Diurnal Maximum	

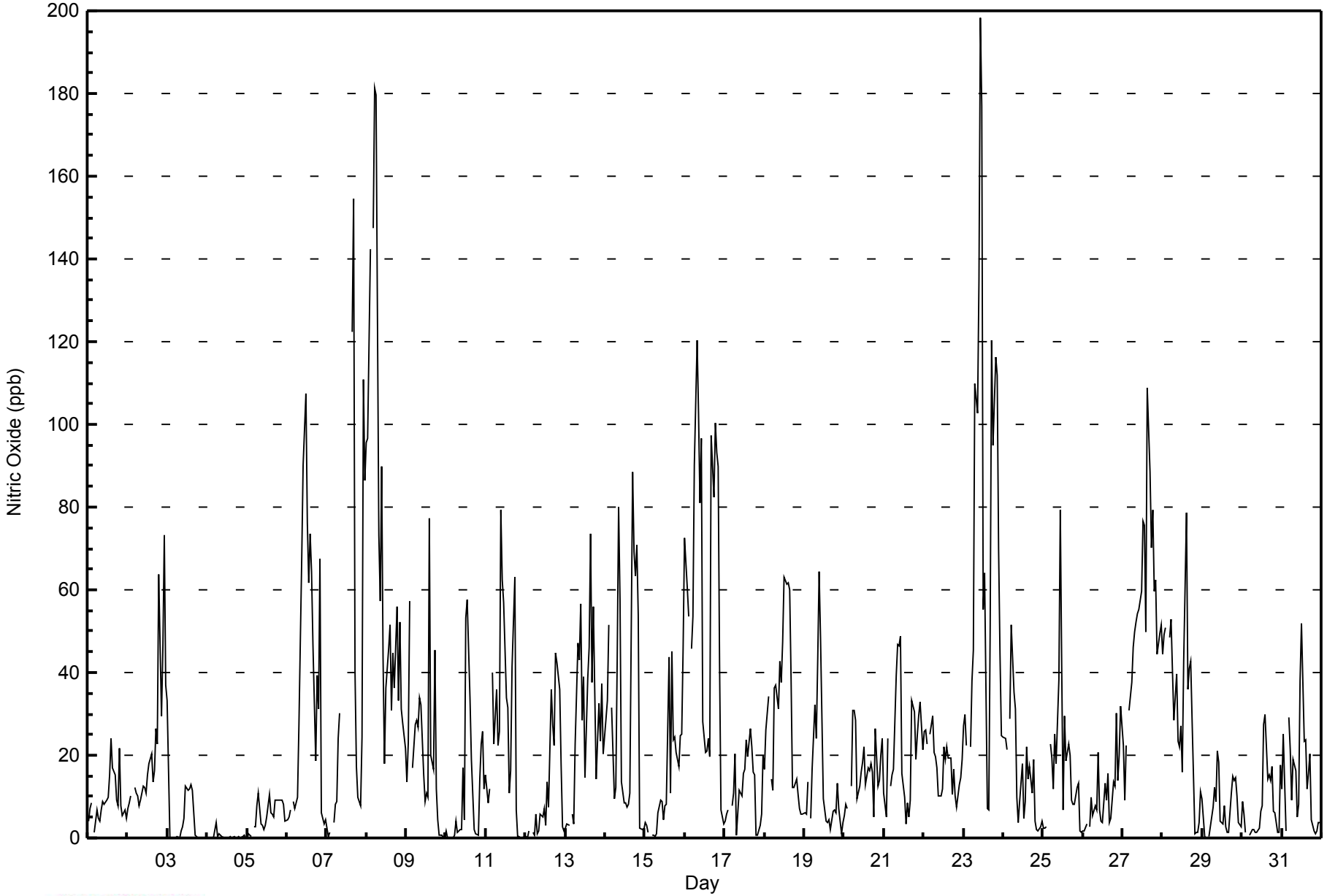
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	433	61.24	61.24
21 - 40	138	19.52	80.76
11 - 80	101	14.29	95.05
81 - 159	30	4.24	99.29
> 159	4	0.57	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	52	5	5	0	2	8	86	21	4	7	36	36	29	25	27	90	433
21 - 40	5	5	1	1	2	8	39	11	7	4	7	7	6	3	10	22	138
11 - 80	4	0	0	2	1	1	43	16	4	0	3	1	2	1	4	19	101
81 - 159	0	0	0	0	0	2	23	2	1	0	1	0	1	0	0	0	30
> 159	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	4
Totals	61	10	6	3	5	19	192	52	17	11	47	44	38	29	41	131	706

Total Number of Valid Hours: 707

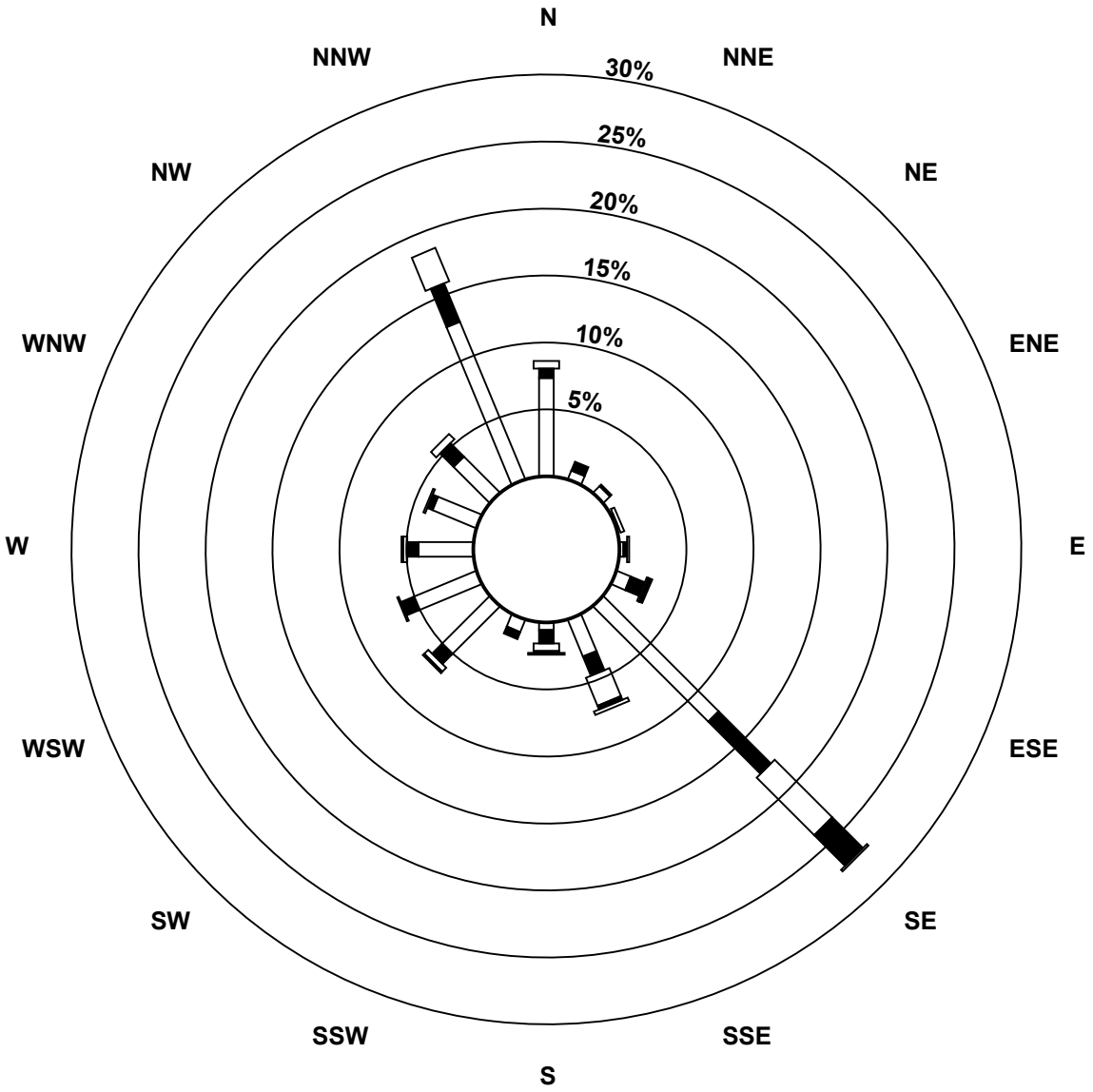
Total Number of Hours: 744

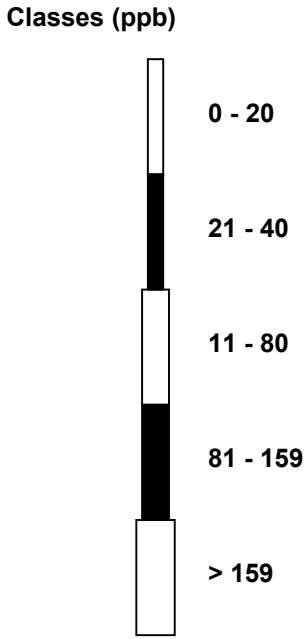
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Athabasca Valley (AMS 7)





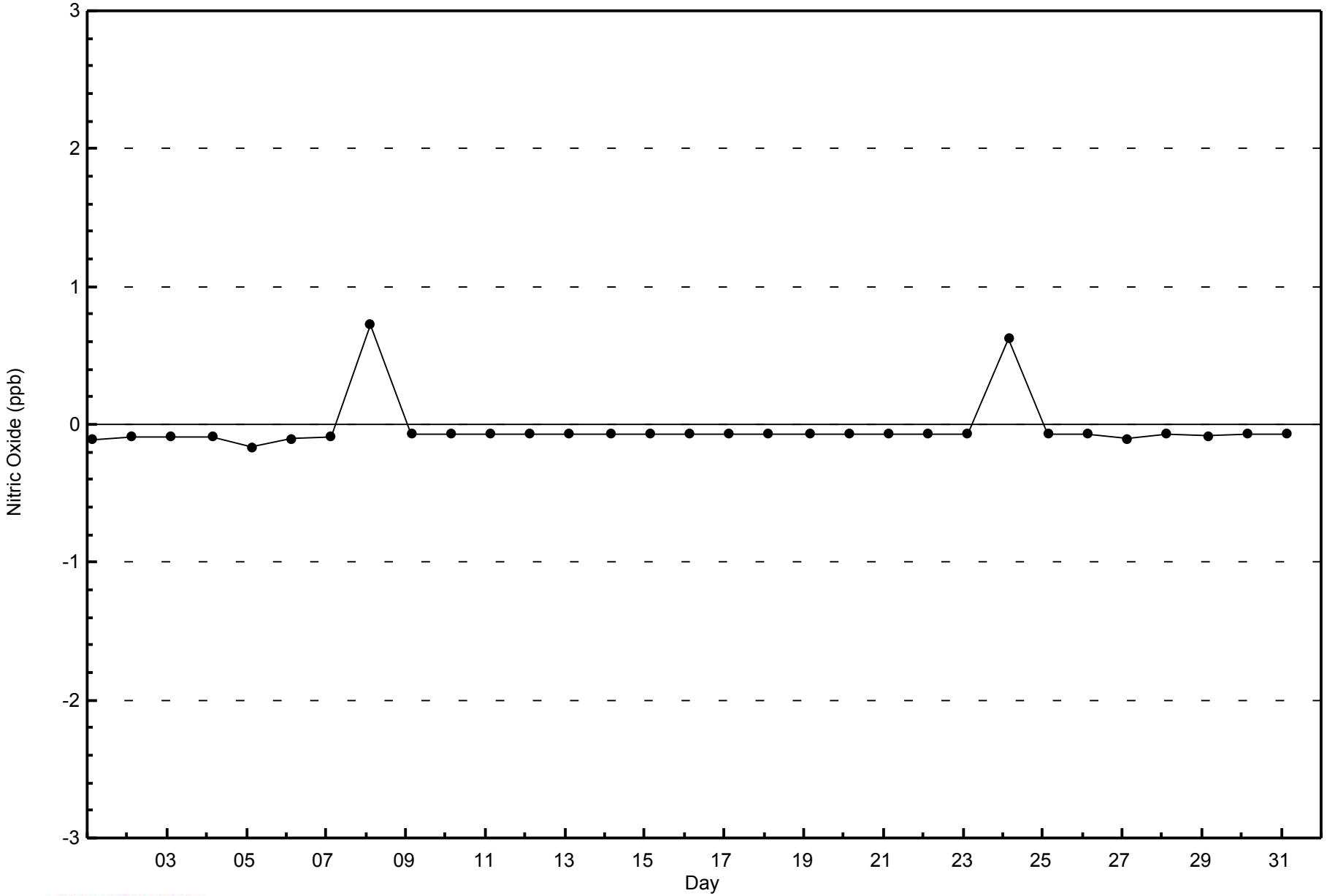
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2014



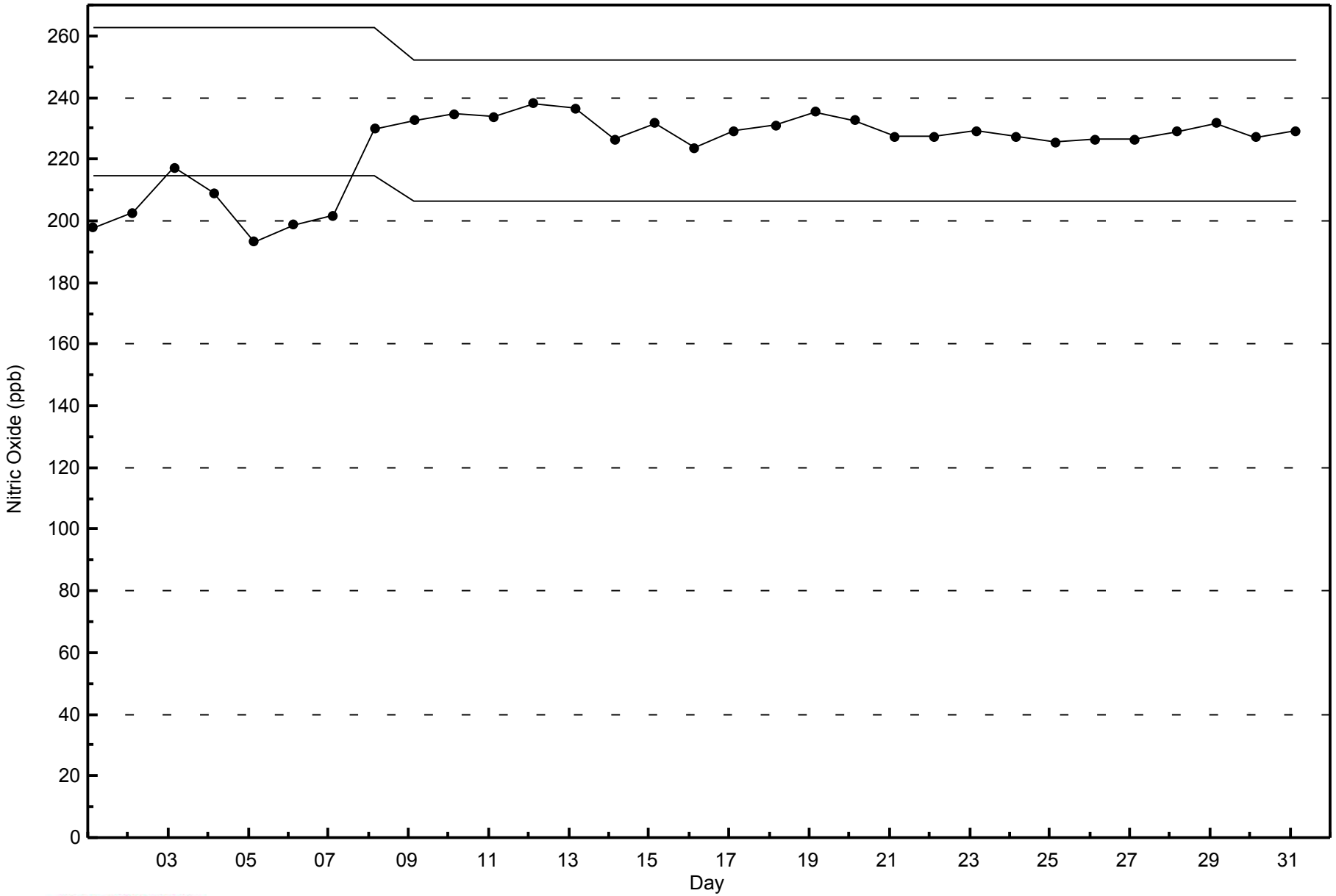
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 70 ppb on Jan 8 07:00 Maximum Daily Average: 44.5 ppb on Jan 8

Minimum Value: 1 ppb on Jan 4 03:00 Minimum Daily Average: 3.7 ppb on Jan 4
Maximum Diurnal Average: 26.7 ppb at hour 17 Minimum Diurnal Average: 17.3 ppb at hour 13
Monthly Average: 21.7 ppb Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 11$ Median = 21 $Q_3 = 30$ $P_{90} = 39$ $P_{99} = 59$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	11	13	13	Z	8	13	11	9	10	11	9	9	9	13	20	16	17	13	11	20	11	9	10	9	11.9	20
2-Jan	10	10	12	Z	16	17	20	17	18	18	15	16	19	21	22	19	23	30	29	36	25	31	34	25	20.9	36
3-Jan	28	7	2	Z	3	9	11	11	17	12	9	17	15	18	21	25	30	13	5	4	3	3	4	3	11.6	30
4-Jan	2	2	1	Z	1	9	2	3	2	3	2	2	2	3	3	3	13	6	5	5	6	5	4	2	3.7	13
5-Jan	2	4	4	Z	12	13	12	14	6	6	4	5	9	15	12	15	18	21	23	22	22	21	17	11	12.5	23
6-Jan	10	13	15	Z	18	17	20	28	36	45	50	67	61	45	58	48	55	30	51	39	38	19	7	17	34.2	67
7-Jan	13	16	18	Z	18	26	26	30	33	C	C	C	C	C	C	40	57	38	27	24	23	32	51	58	--	58
8-Jan	48	45	65	Z	63	65	70	40	38	45	49	21	30	36	47	37	50	45	44	44	44	37	32	30	44.5	70
9-Jan	20	28	37	Z	21	23	23	19	23	22	12	8	12	11	25	22	27	32	28	22	18	17	14	11	20.6	37
10-Jan	9	11	11	Z	11	21	28	22	16	13	12	9	20	28	25	25	21	8	9	4	17	27	27	20	17.1	28
11-Jan	21	17	22	Z	28	26	28	25	25	32	29	28	26	27	21	26	26	29	20	19	16	9	8	8	22.4	32
12-Jan	6	6	6	Z	5	4	11	8	10	9	12	4	3	8	10	32	36	38	39	43	37	24	12	9	16.2	43
13-Jan	9	9	9	Z	16	20	34	41	37	35	30	32	19	23	26	40	36	45	32	33	36	31	32	28	28.4	45
14-Jan	29	32	37	Z	31	25	25	38	58	38	18	14	14	13	14	16	33	33	42	33	24	8	7	9	25.6	58
15-Jan	15	4	3	Z	3	2	2	2	4	5	5	4	6	4	13	7	18	16	32	31	31	30	28	32	12.9	32
16-Jan	36	33	33	Z	28	30	42	56	48	41	39	27	23	22	25	22	33	33	42	30	34	26	16	11	31.6	56
17-Jan	14	17	16	Z	17	19	21	3	6	12	11	12	13	17	15	20	20	17	8	10	9	10	14	25	14.1	25
18-Jan	23	29	30	Z	23	22	29	28	22	24	26	27	30	31	32	34	39	28	26	23	22	22	21	26	26.7	39
19-Jan	24	24	25	Z	25	30	30	29	30	31	29	15	8	4	4	5	5	8	9	7	13	16	11	15	17.2	31
20-Jan	20	21	20	Z	21	27	31	25	18	15	16	14	16	16	18	18	24	27	18	32	28	27	27	29	22.1	32
21-Jan	29	14	18	Z	25	26	26	29	30	29	27	18	12	6	7	8	14	37	32	30	30	31	29	32	23.3	37
22-Jan	32	29	31	Z	33	32	35	34	25	19	14	16	29	26	27	30	29	28	32	23	20	26	22	33	27.2	35
23-Jan	45	51	40	Z	33	39	33	55	54	54	65	52	35	27	8	15	40	56	51	52	49	42	39	34	42.0	65
24-Jan	33	32	28	Z	26	33	32	25	10	7	9	12	10	9	18	13	18	14	16	18	17	19	26	26	19.6	33
25-Jan	16	14	11	Z	25	27	23	28	33	36	40	18	7	16	13	14	12	10	7	7	11	9	3	3	16.5	40
26-Jan	4	2	3	Z	4	9	6	11	13	14	10	10	10	16	16	22	12	16	25	27	34	28	30	31	15.3	34
27-Jan	29	25	31	Z	32	38	42	45	45	39	37	31	39	37	29	52	50	41	53	34	47	29	32	32	37.9	53
28-Jan	34	35	41	Z	41	41	40	31	32	25	20	21	13	27	40	34	37	42	39	8	4	5	9	15	27.5	42
29-Jan	21	8	10	Z	11	13	16	22	24	29	22	6	5	7	3	3	4	7	13	11	12	12	11	8	12.1	29
30-Jan	11	11	7	Z	6	6	5	6	6	3	4	5	5	7	18	7	14	14	12	8	8	5	6	22	8.5	22
31-Jan	22	26	22	Z	21	24	21	29	23	10	13	23	25	19	21	13	18	25	19	17	18	12	5	5	18.7	29
	20.2	18.9	20.0	--	20.1	22.7	24.3	24.5	24.2	22.7	21.3	18.0	17.3	18.4	20.4	21.9	26.7	25.8	25.6	23.1	22.7	20.0	18.9	19.9	Diurnal Average	
	48	51	65	--	63	65	70	56	58	54	65	67	61	45	58	52	57	56	53	52	49	42	51	58	Diurnal Maximum	

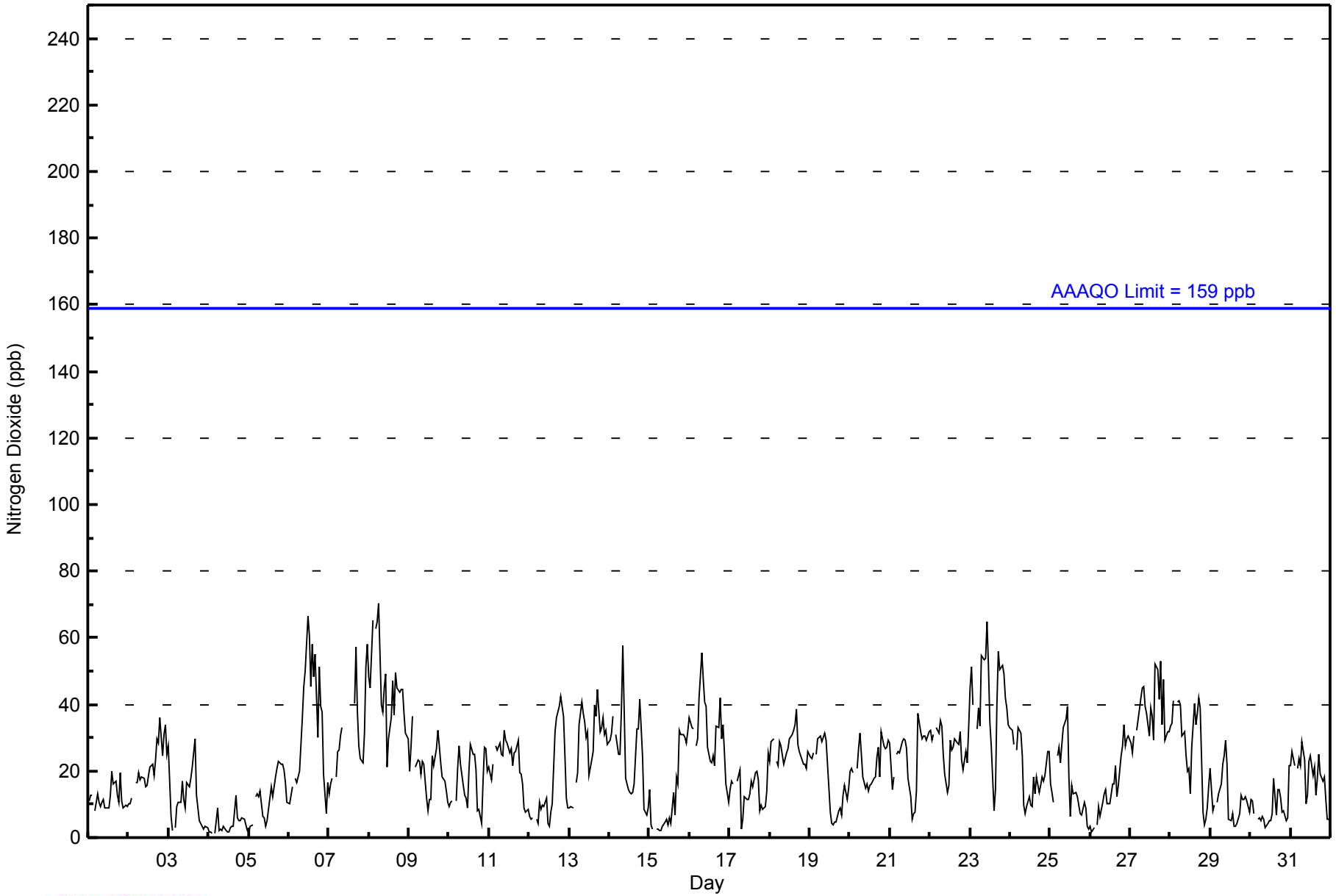
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	354	50.07	50.07
21 - 40	294	41.58	91.65
11 - 80	59	8.35	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	48	4	5	0	1	4	68	15	0	5	31	30	20	21	26	76	354
21 - 40	13	6	1	3	4	13	82	28	15	6	16	14	17	8	15	53	294
11 - 80	0	0	0	0	0	2	43	9	2	0	0	0	1	0	0	2	59
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	61	10	6	3	5	19	193	52	17	11	47	44	38	29	41	131	707

Total Number of Valid Hours: 707

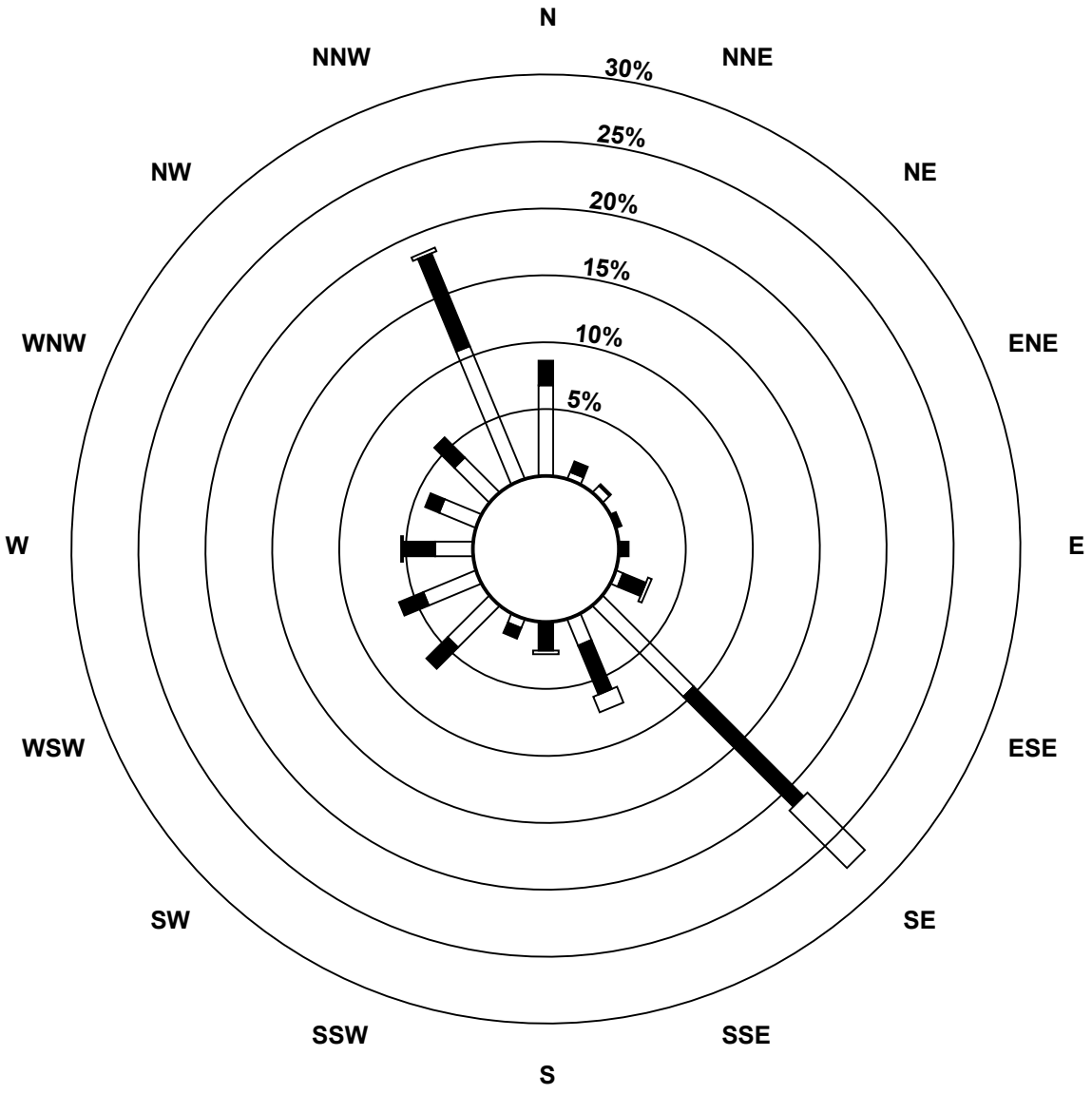
Total Number of Hours: 744

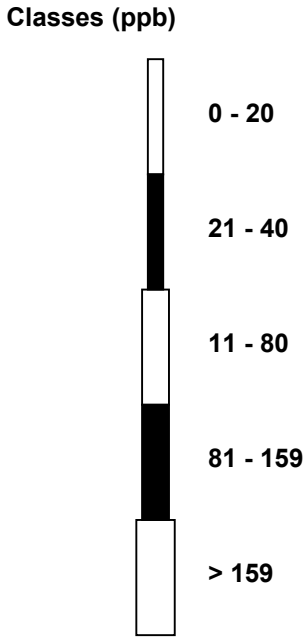
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley (AMS 7)





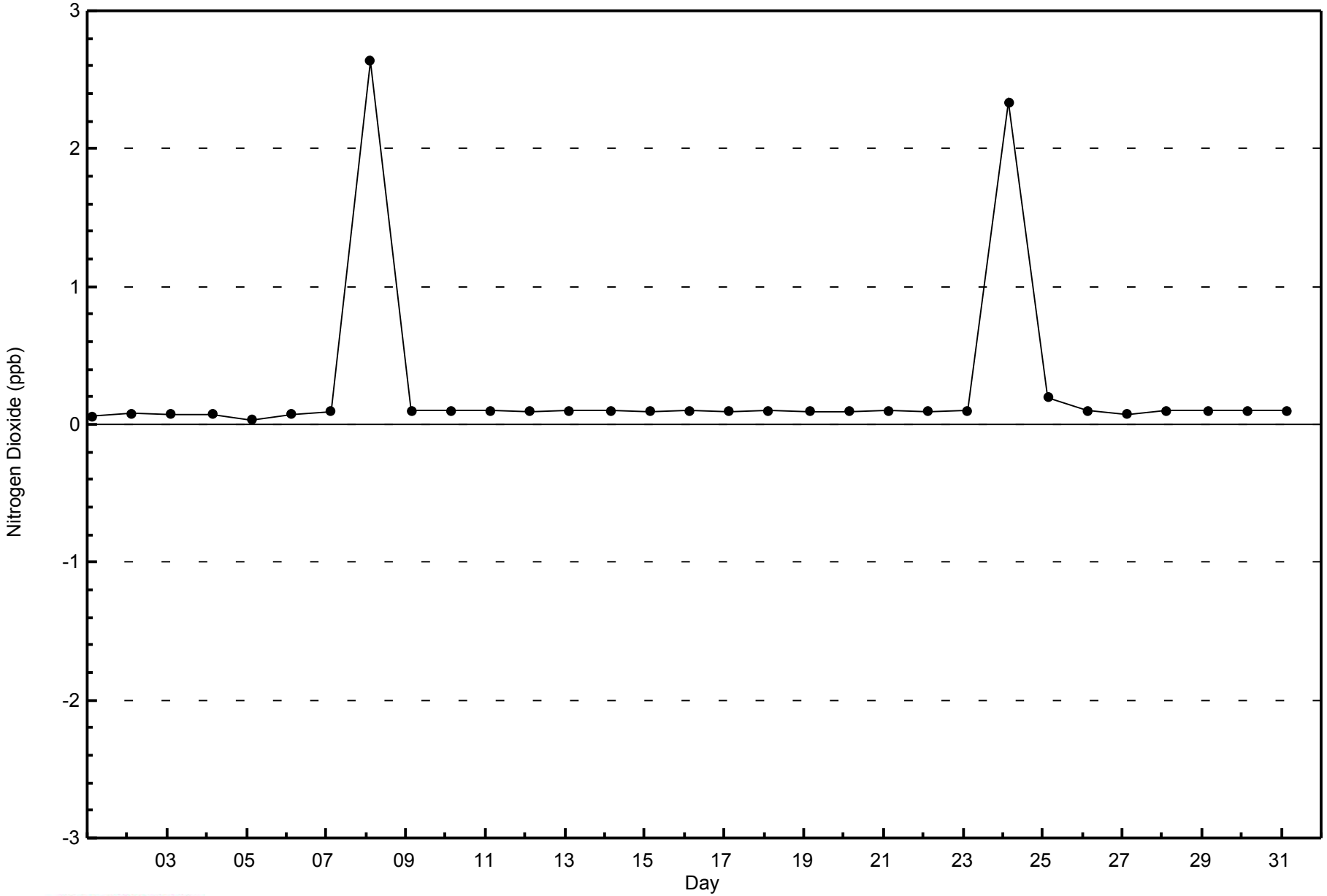
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2014



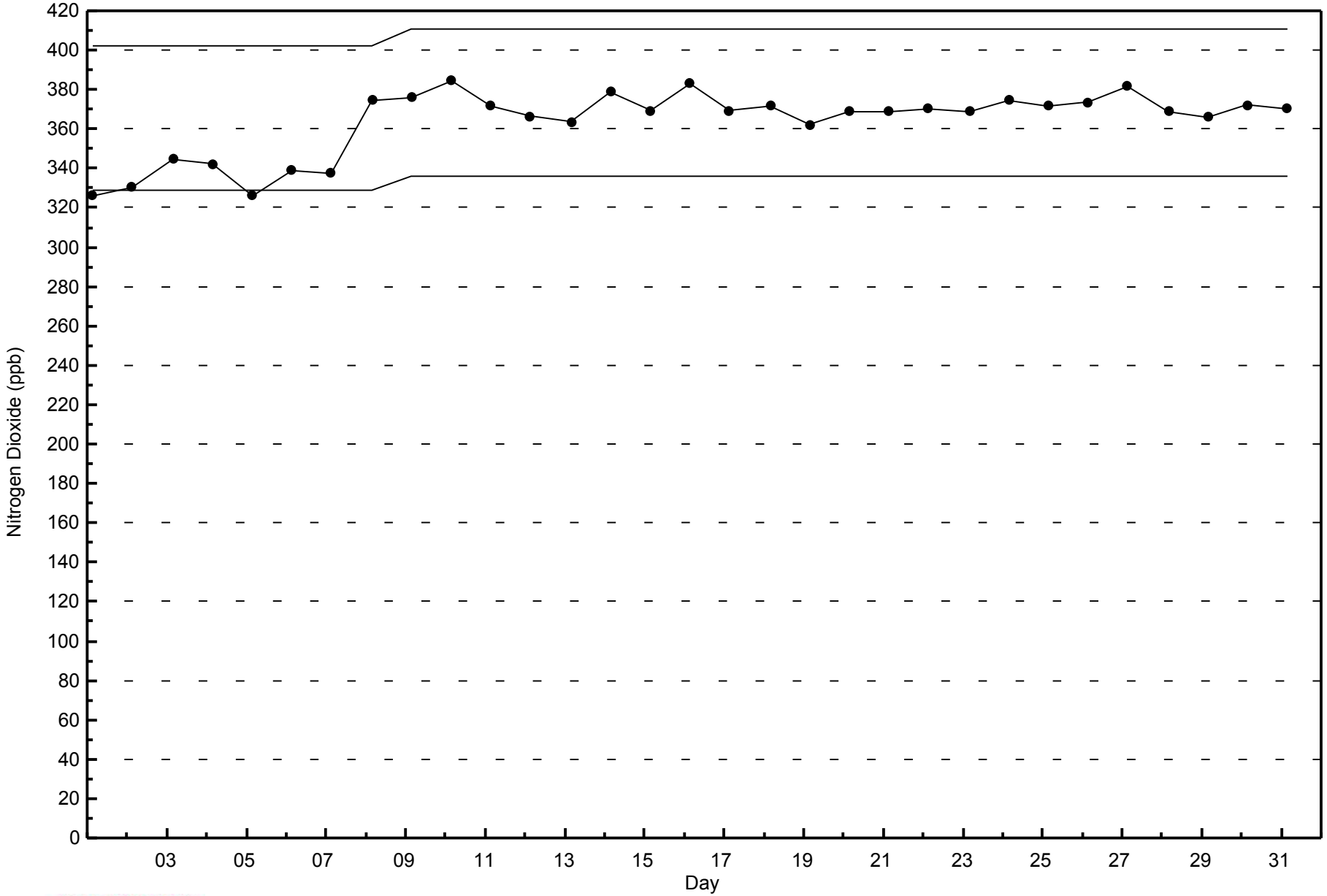
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2014

Maximum Value: 263 ppb on Jan 23 11:00

Maximum Daily Average: 114.8 ppb on Jan 23

Minimum Value: 1 ppb on Jan 4 03:00

Minimum Daily Average: 4.0 ppb on Jan 4

Maximum Diurnal Average: 59.5 ppb at hour 17

Minimum Diurnal Average: 34.2 ppb at hour 2

Monthly Average: 45.5 ppb

Percentiles: P_1 = 2 P_{10} = 8 Q_1 = 17 Median = 33 Q_3 = 62 P_{90} = 94 P_{99} = 206

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	15	20	21	Z	10	20	16	14	17	20	17	18	19	28	44	33	32	22	18	42	19	14	16	14	21.2	44
2-Jan	17	19	22	Z	29	27	30	25	27	30	28	26	34	39	42	32	40	56	51	100	54	78	107	62	42.4	107
3-Jan	61	7	2	Z	3	9	11	11	19	14	14	29	27	30	34	37	36	14	5	4	3	3	4	3	16.4	61
4-Jan	2	2	1	Z	1	13	2	3	3	4	2	2	1	3	3	3	13	6	5	6	6	5	4	2	4.0	13
5-Jan	2	5	4	Z	15	16	20	25	10	9	6	8	13	26	19	21	23	30	32	31	31	30	25	15	18.0	32
6-Jan	15	18	22	Z	26	24	30	55	84	113	141	174	137	107	131	113	102	49	91	70	105	25	11	21	72.3	174
7-Jan	15	16	19	Z	22	34	35	54	63	C	C	C	C	C	C	162	212	78	45	33	30	56	162	145	--	212
8-Jan	144	142	208	Z	210	246	250	113	95	135	93	39	66	82	99	68	94	81	100	78	97	68	59	51	113.8	250
9-Jan	33	51	94	Z	38	51	51	46	57	54	27	17	22	21	102	42	43	78	39	27	19	18	14	11	41.5	102
10-Jan	11	11	11	Z	11	21	31	23	18	15	29	13	73	86	59	44	31	10	10	5	31	50	53	32	29.5	86
11-Jan	37	26	34	Z	67	49	64	47	51	111	92	86	60	58	32	42	67	93	26	20	16	9	8	9	47.9	111
12-Jan	7	6	8	Z	7	5	16	9	11	15	17	11	6	21	18	68	64	60	84	85	73	42	14	11	28.6	85
13-Jan	11	13	12	Z	22	23	57	88	80	92	58	71	33	62	72	113	74	101	46	57	68	54	70	49	57.6	113
14-Jan	58	65	88	Z	62	34	37	82	138	96	31	23	22	21	22	27	121	102	105	104	78	11	9	11	58.5	138
15-Jan	19	7	4	Z	3	3	3	3	9	14	14	8	14	12	57	18	63	40	57	52	49	55	54	77	27.5	77
16-Jan	109	93	86	Z	73	83	132	176	150	121	136	55	43	43	49	42	131	115	143	123	124	68	23	14	92.7	176
17-Jan	19	23	23	Z	25	29	41	3	12	24	22	27	30	41	35	46	42	33	23	11	9	12	20	45	25.8	46
18-Jan	40	55	64	Z	37	33	65	64	53	66	63	75	93	92	94	94	77	40	38	38	32	29	27	32	56.6	94
19-Jan	30	30	39	Z	30	46	63	53	73	96	78	24	14	8	8	9	6	15	16	13	26	23	12	19	31.8	96
20-Jan	25	29	27	Z	33	57	62	54	28	27	32	32	38	29	35	35	42	43	23	58	40	41	47	53	38.7	62
21-Jan	39	19	42	Z	38	41	42	68	76	76	75	34	22	9	16	13	23	70	62	49	55	60	62	53	45.4	76
22-Jan	58	55	54	Z	58	61	56	53	42	29	24	27	51	45	49	49	48	38	48	33	28	39	37	52	45.1	61
23-Jan	72	81	62	Z	55	77	79	164	156	189	263	229	90	91	15	21	91	176	145	168	161	112	83	59	114.8	263
24-Jan	57	56	49	Z	55	85	67	56	20	11	18	30	14	18	40	27	36	24	34	22	19	20	28	30	35.6	85
25-Jan	19	16	13	Z	47	46	34	53	51	74	119	60	13	45	32	37	32	19	15	15	23	22	5	4	34.6	119
26-Jan	5	4	7	Z	7	19	12	18	20	35	17	14	14	29	25	37	16	20	38	40	64	41	49	62	25.8	64
27-Jan	51	35	53	Z	63	76	88	95	97	94	93	90	116	112	79	161	139	112	132	94	110	74	81	83	92.4	161
28-Jan	78	84	92	Z	89	94	80	59	72	48	42	48	29	70	119	70	78	85	68	9	5	7	13	27	59.3	119
29-Jan	30	8	10	Z	11	16	24	34	33	50	40	10	8	15	6	5	6	18	28	25	26	22	15	10	19.6	50
30-Jan	20	17	9	Z	6	7	7	8	7	4	7	11	13	35	47	21	30	28	29	14	14	6	7	39	16.8	47
31-Jan	33	51	23	Z	50	45	31	48	39	15	21	61	76	42	45	25	34	45	23	18	19	13	9	9	33.7	76
	36.5	34.2	38.8	--	38.8	44.9	49.5	51.8	52.0	56.0	53.9	45.1	39.8	44.0	47.6	48.8	59.5	54.8	51.0	46.5	46.3	35.7	36.4	35.6	Diurnal Average	
	144	142	208	--	210	246	250	176	156	189	263	229	137	112	131	162	212	176	145	168	161	112	162	145	Diurnal Maximum	

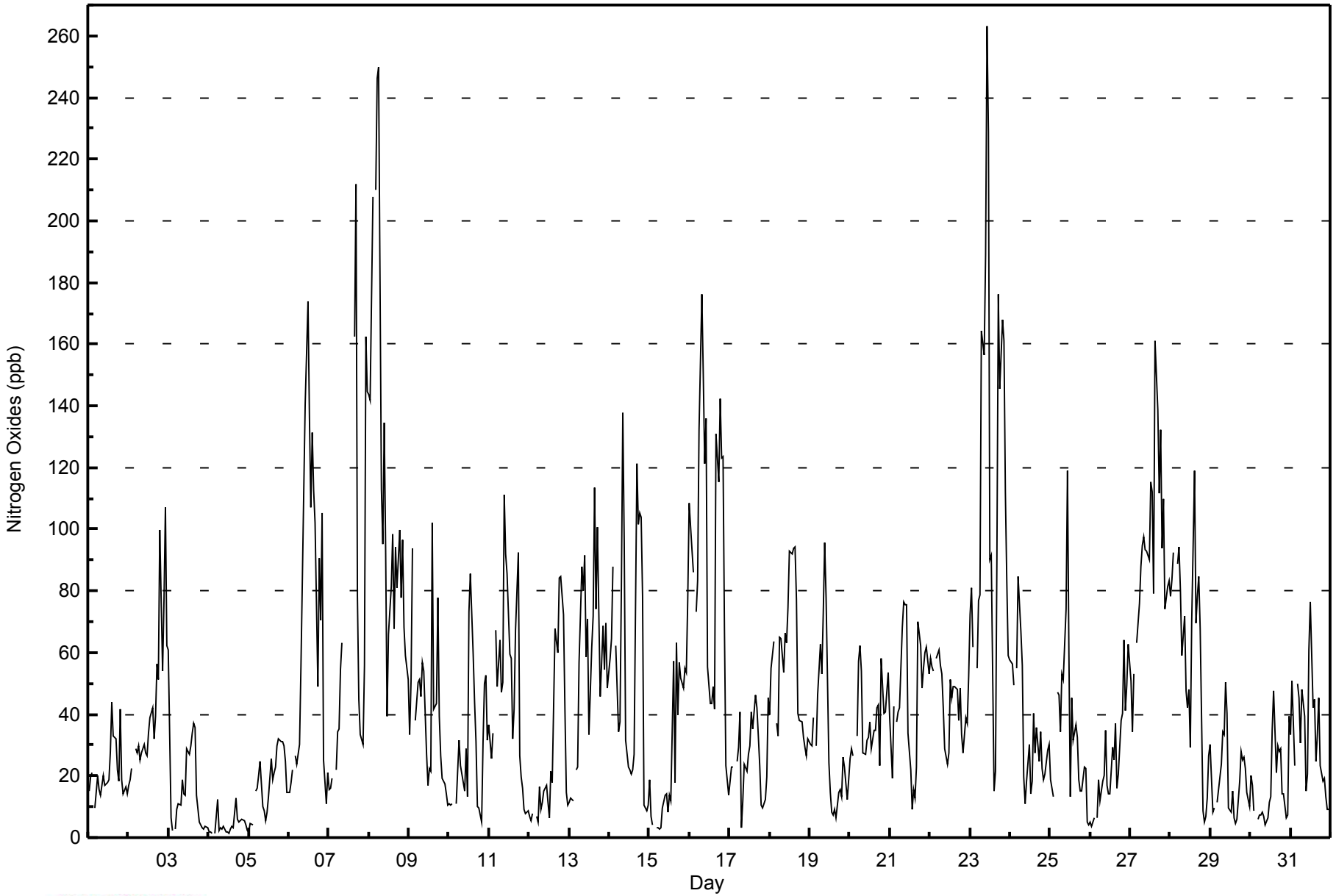
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Nitrogen Oxides (NO_X) - ppb
Athabasca Valley - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	222	31.40	31.40
21 - 40	182	25.74	57.14
11 - 80	191	27.02	84.16
81 - 159	92	13.01	97.17
> 159	17	2.40	99.58

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	40	3	2	0	0	4	27	5	0	1	19	27	15	18	16	45	222
21 - 40	10	2	3	0	2	2	53	11	3	5	16	7	10	6	9	43	182
11 - 80	8	5	1	2	2	10	47	18	10	5	10	10	11	5	15	32	191
81 - 159	3	0	0	1	1	2	55	14	2	0	1	0	1	0	1	11	92
> 159	0	0	0	0	0	1	8	4	2	0	1	0	1	0	0	0	17
Totals	61	10	6	3	5	19	190	52	17	11	47	44	38	29	41	131	704

Total Number of Valid Hours: 707

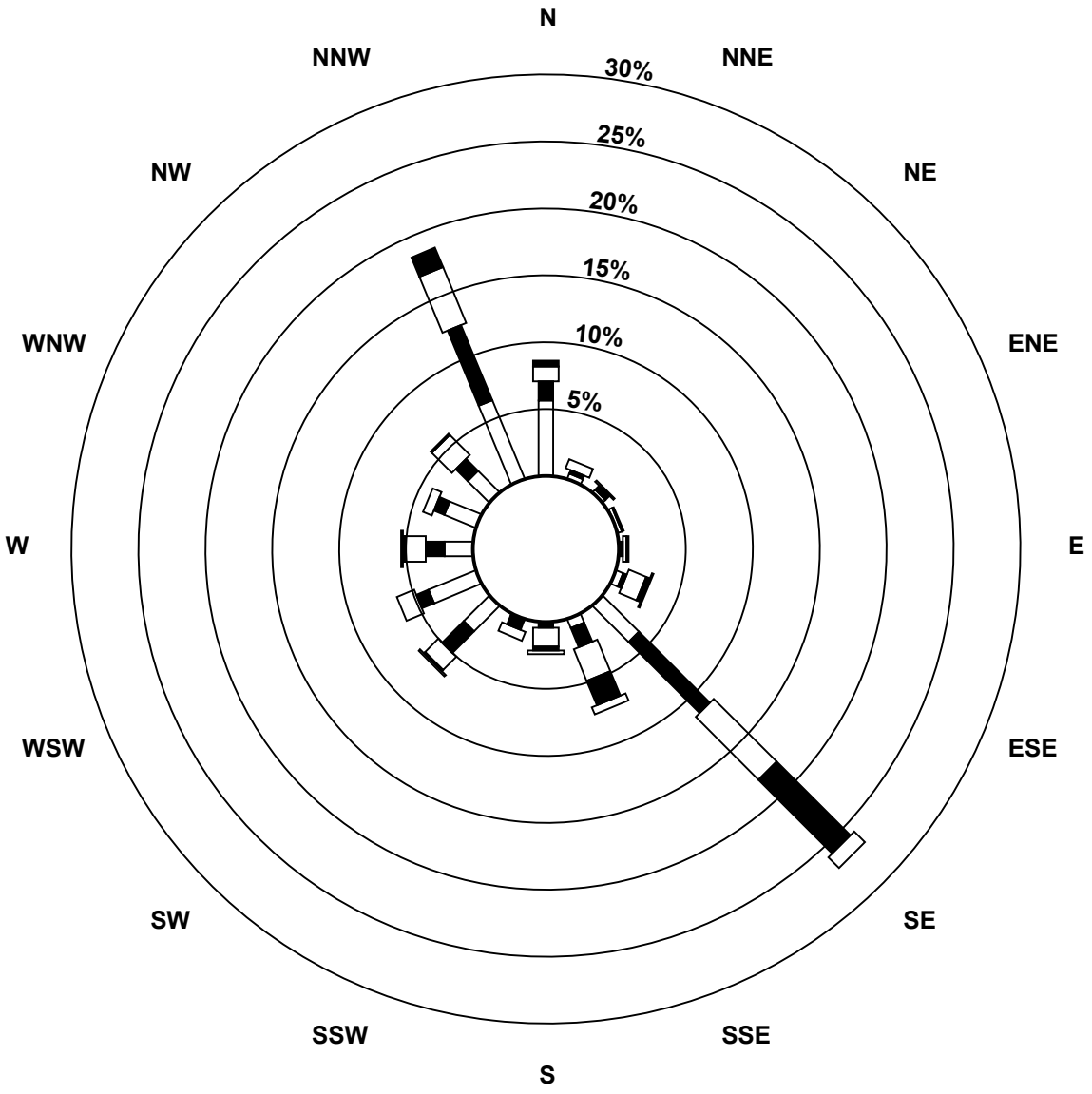
Total Number of Hours: 744

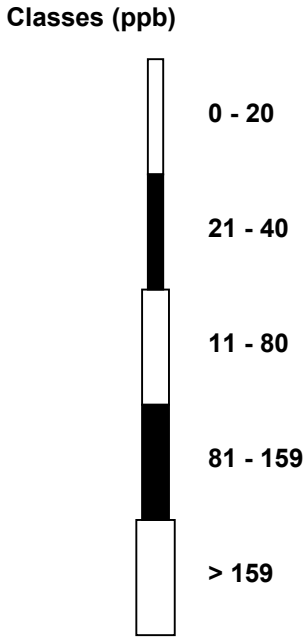
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley (AMS 7)

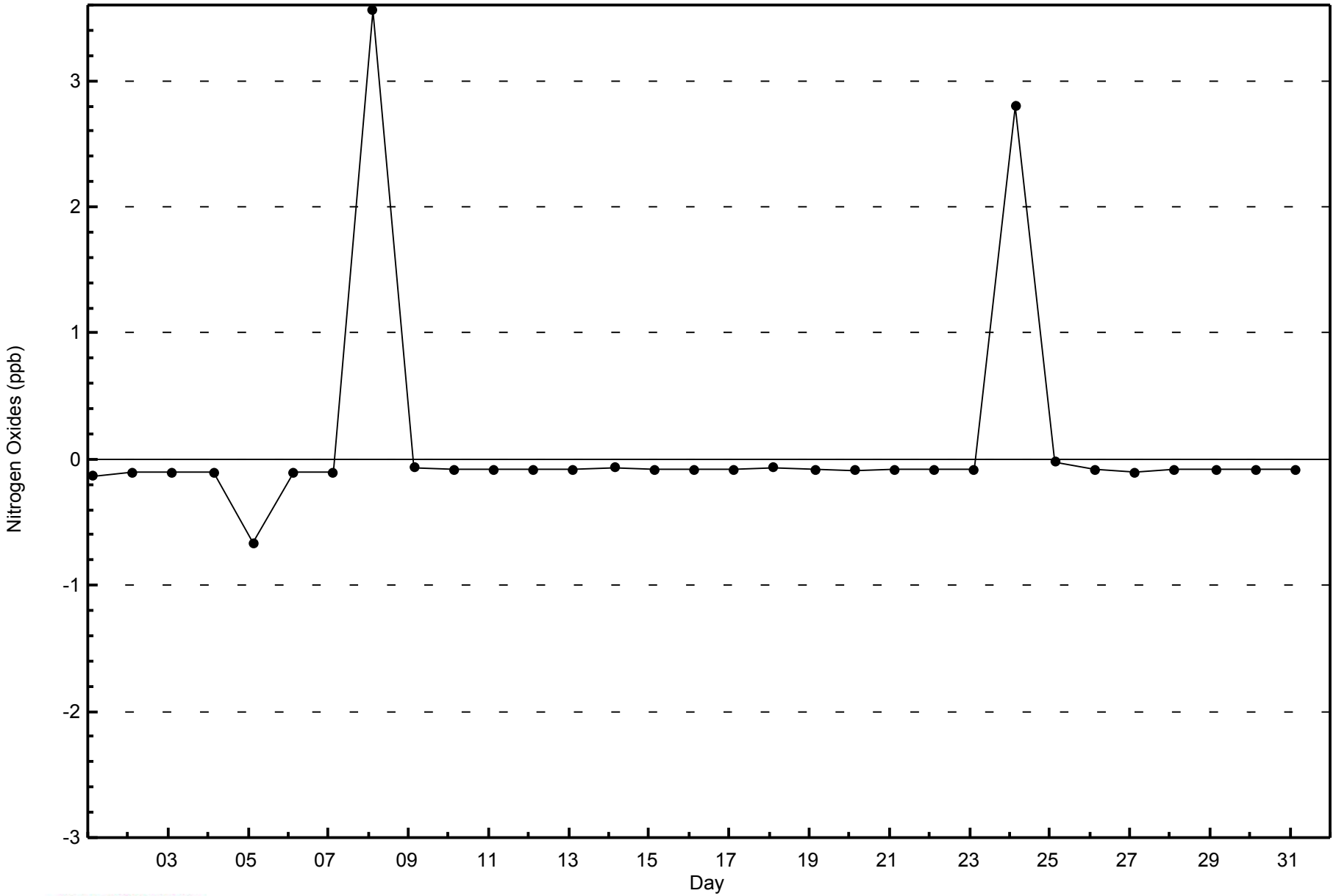




Total Number of Valid Hours: 707

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Athabasca Valley - January 2014



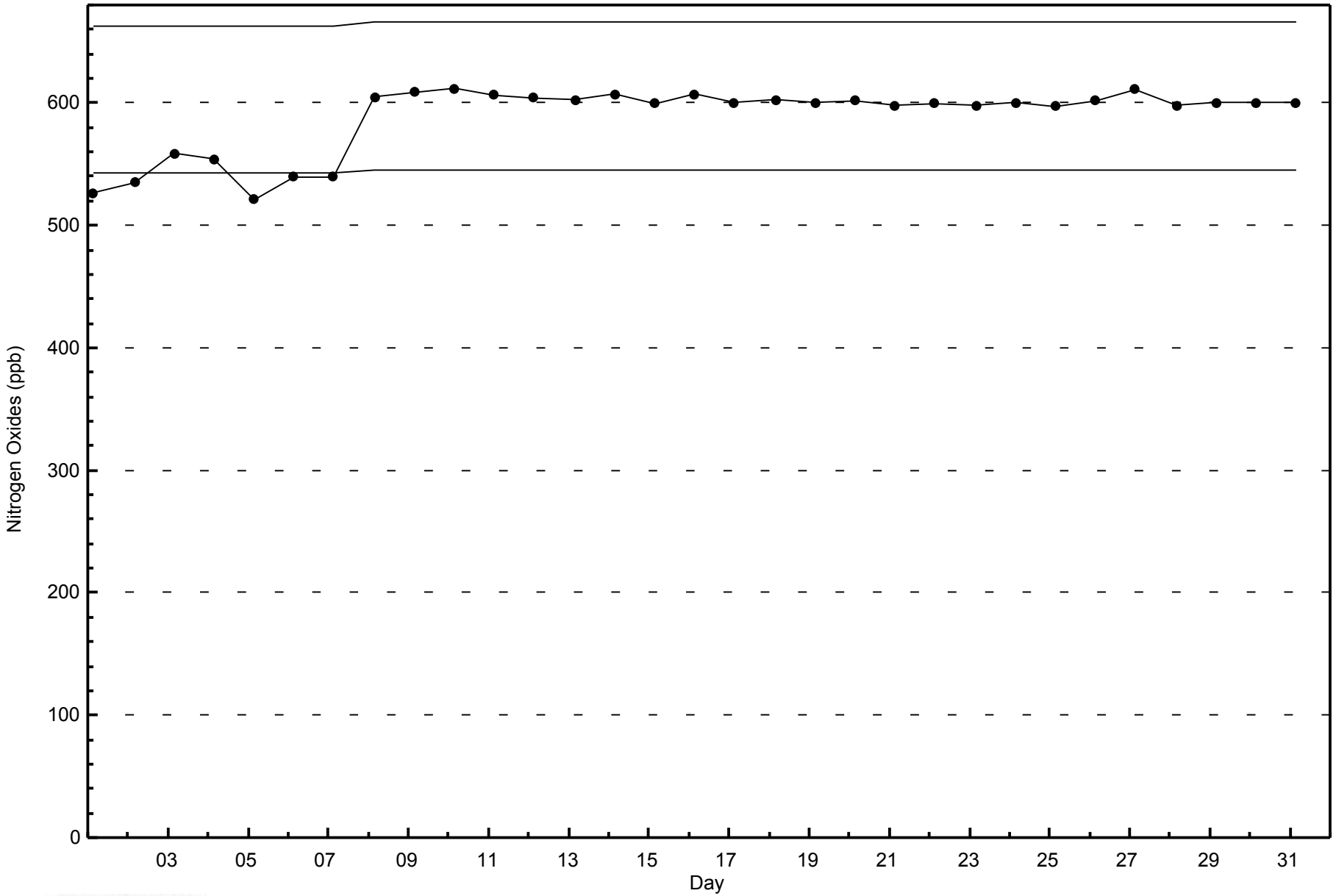
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 124.6 $\mu g/m^3$ on Jan 14 08:00

Maximum Daily Average: 14.8 $\mu g/m^3$ on Jan 23

Minimum Value: 0.5 $\mu g/m^3$ on Jan 14 00:00

Minimum Daily Average: 2.2 $\mu g/m^3$ on Jan 4

Maximum Diurnal Average: 11.5 $\mu g/m^3$ at hour 8

Minimum Diurnal Average: 6.0 $\mu g/m^3$ at hour 2

Monthly Average: 8.01 $\mu g/m^3$

Percentiles: P_1 = 1.1 P_{10} = 2.7 Q_1 = 4.2 Median = 6.3 Q_3 = 10.6 P_{90} = 14.7 P_{99} = 23.7

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	5.2	4.8	4.8	2.9	2.3	1.7	2.0	2.0	1.8	1.8	1.9	2.4	2.4	2.5	4.3	5.3	6.2	5.5	4.4	5.9	4.2	5.5	4.2	4.3	3.7	6.2
2-Jan	5.1	6.6	11.1	16.0	18.4	18.8	18.9	17.5	15.9	14.7	12.7	12.1	11.8	12.4	11.6	9.9	10.5	12.7	10.7	12.5	11.7	13.1	19.8	9.9	13.1	19.8
3-Jan	8.9	7.3	7.6	6.7	6.0	5.1	4.7	4.1	3.9	3.7	3.4	4.2	6.4	9.7	9.4	8.4	7.0	5.1	4.6	4.4	4.1	3.8	3.6	3.3	5.6	9.7
4-Jan	2.9	2.5	2.4	2.1	1.8	1.4	1.3	1.4	1.4	1.4	1.9	2.6	3.0	3.9	3.7	3.2	2.8	2.4	1.9	1.7	1.8	1.7	1.8	1.6	2.2	3.9
5-Jan	1.5	1.4	1.2	1.3	1.4	1.5	1.9	1.3	0.9	0.9	0.9	1.1	1.8	2.2	4.8	4.8	6.3	8.4	9.7	10.0	9.5	10.7	7.1	5.7	4.0	10.7
6-Jan	5.2	4.0	4.1	3.4	3.7	5.2	8.0	13.0	14.4	46.4	17.0	18.8	22.5	19.6	19.1	19.8	18.4	16.2	17.4	15.6	13.5	13.3	8.0	7.7	13.9	46.4
7-Jan	7.4	5.7	6.0	6.3	5.6	5.1	4.7	11.1	4.9	3.7	3.1	4.2	7.6	9.7	14.6	14.1	15.2	10.4	7.8	6.5	5.7	6.0	6.9	8.1	7.5	15.2
8-Jan	9.9	8.4	8.6	8.4	9.1	10.4	11.5	11.9	11.9	15.5	16.5	15.3	14.9	14.8	15.5	15.6	13.9	12.9	13.0	12.6	11.8	11.4	11.0	10.9	12.3	16.5
9-Jan	9.8	UO	12.6	13.0	12.3	11.9	11.1	11.6	13.1	13.6	13.0	13.2	14.5	M	14.3	15.7	16.8	17.9	17.2	15.9	12.0	15.9	14.1	11.7	13.7	17.9
10-Jan	11.7	11.6	10.5	7.8	5.7	6.7	7.0	6.3	5.8	5.9	7.4	7.9	9.0	9.9	10.9	11.1	8.0	4.9	4.9	4.3	4.7	5.6	6.8	6.1	7.5	11.7
11-Jan	6.7	5.6	5.2	5.2	5.9	5.6	6.3	6.2	6.6	7.9	8.4	9.1	8.3	7.6	7.1	7.5	7.7	8.2	7.0	7.0	5.5	4.6	4.0	3.8	6.6	9.1
12-Jan	3.7	3.5	3.1	3.0	2.5	2.4	2.4	2.4	2.4	2.5	3.2	2.4	2.1	2.4	3.1	6.4	7.0	6.4	6.3	6.3	5.1	3.8	6.8	8.3	4.1	8.3
13-Jan	6.7	5.6	4.6	4.5	5.1	5.1	8.1	7.7	7.8	7.8	7.8	9.2	6.3	5.5	5.5	6.9	5.4	6.2	3.6	3.5	3.0	2.2	1.5	0.5	5.4	9.2
14-Jan	0.8	1.0	3.3	3.3	3.5	2.6	2.1	124.6	6.2	3.5	3.8	4.2	4.7	5.4	5.7	5.5	5.3	4.9	4.9	5.7	5.2	5.1	4.8	4.9	9.2	124.6
15-Jan	5.0	3.7	5.2	5.8	6.0	5.6	5.1	4.6	4.9	4.9	4.8	4.3	3.6	3.5	3.8	3.7	5.2	4.8	6.2	4.6	4.0	3.7	3.8	3.9	4.6	6.2
16-Jan	4.9	6.3	6.0	5.4	5.2	5.6	7.5	7.9	9.4	10.5	11.4	8.9	9.2	7.0	7.7	8.2	7.4	7.2	8.3	6.6	6.5	6.3	5.4	4.6	7.2	11.4
17-Jan	4.8	5.0	4.7	4.9	4.9	4.7	4.7	3.9	4.7	5.4	5.0	4.9	4.8	4.8	4.7	5.0	7.4	5.4	4.4	3.4	2.8	2.4	2.4	2.5	4.5	7.4
18-Jan	2.8	4.1	4.5	4.0	3.7	3.6	3.9	3.9	4.2	4.3	5.2	6.5	8.8	9.7	11.4	13.6	12.8	9.0	8.2	6.4	6.0	6.4	7.0	8.5	6.6	13.6
19-Jan	8.5	9.1	15.8	17.1	23.1	18.2	17.8	18.9	20.0	19.4	18.7	7.9	4.8	4.3	4.0	4.5	4.6	4.6	4.2	3.5	5.3	4.6	2.7	3.0	10.2	23.1
20-Jan	3.1	2.8	2.9	3.3	3.0	3.9	3.3	3.5	2.7	3.7	6.5	14.8	11.2	10.3	10.8	10.9	11.4	11.2	9.4	10.0	9.9	9.6	9.7	11.7	7.5	14.8
21-Jan	10.8	7.9	9.9	11.2	9.7	9.9	9.7	10.8	12.4	13.3	13.2	9.1	6.6	4.9	4.6	4.5	4.8	6.1	16.1	3.8	3.3	3.4	3.9	3.9	8.1	16.1
22-Jan	5.8	7.0	7.1	8.7	8.2	8.4	10.3	8.1	UO	1.0	3.1	11.2	17.0	19.9	20.7	21.5	18.8	18.6	14.7	12.5	10.0	9.8	9.5	9.9	11.4	21.5
23-Jan	10.5	12.0	11.2	11.2	11.2	12.4	13.3	18.6	19.9	19.0	27.3	23.3	13.6	13.6	10.1	10.3	11.4	15.3	15.9	17.2	17.9	13.6	13.4	12.3	14.8	27.3
24-Jan	12.7	11.3	9.0	7.2	7.7	8.5	8.4	7.4	5.9	5.2	4.9	5.1	6.0	7.0	7.4	7.9	6.5	5.9	5.9	9.3	12.1	21.9	21.4	12.7	9.0	21.9
25-Jan	7.0	6.2	5.9	9.0	12.0	10.2	9.1	9.2	6.8	7.8	9.1	7.0	6.1	6.5	6.0	5.7	5.3	4.8	4.8	4.2	3.9	4.7	3.7	3.3	6.6	12.0
26-Jan	4.4	4.3	4.0	4.1	4.2	4.3	4.3	3.6	2.7	1.4	1.5	2.2	4.5	7.2	10.6	13.9	11.5	12.6	14.1	13.7	15.6	8.5	5.3	4.9	6.8	15.6
27-Jan	3.7	2.8	2.7	2.3	3.7	3.9	6.5	6.3	10.0	13.4	11.0	7.2	12.0	7.8	9.8	36.5	46.7	34.7	31.4	22.5	21.0	19.8	17.2	15.9	14.5	46.7
28-Jan	14.7	13.7	14.3	13.4	11.6	11.8	12.3	13.2	11.2	10.7	9.9	11.9	11.2	13.7	18.2	16.2	17.6	19.2	14.5	8.0	7.3	6.9	6.1	5.9	12.2	19.2
29-Jan	5.1	4.5	4.3	4.2	4.1	4.3	4.6	5.0	5.4	6.2	5.6	4.4	4.4	4.1	3.2	2.9	2.7	2.6	2.7	2.8	2.7	2.8	2.9	2.7	3.9	6.2
30-Jan	2.9	3.3	3.0	2.7	2.8	2.8	2.7	2.8	2.8	2.8	3.1	3.6	4.1	5.5	8.0	8.2	10.2	10.3	11.1	9.2	8.8	6.8	6.2	6.6	5.4	11.1
31-Jan	7.4	7.7	7.2	7.1	6.8	6.6	6.5	7.9	7.1	6.1	6.0	7.0	7.0	8.1	8.2	6.3	5.9	6.4	6.1	6.0	6.2	5.5	4.2	4.1	6.6	8.2
	6.4	6.0	6.5	6.6	6.8	6.7	7.1	11.5	7.6	8.5	8.0	7.9	8.1	8.1	9.0	10.1	10.3	9.7	9.4	8.2	7.8	7.7	7.3	6.6	Diurnal Average	
	14.7	13.7	15.8	17.1	23.1	18.8	18.9	124.6	20.0	46.4	27.3	23.3	22.5	19.9	20.7	36.5	46.7	34.7	31.4	22.5	21.0	21.9	21.4	15.9	Diurnal Maximum	

M - Maintenance UO - Unstable Operation

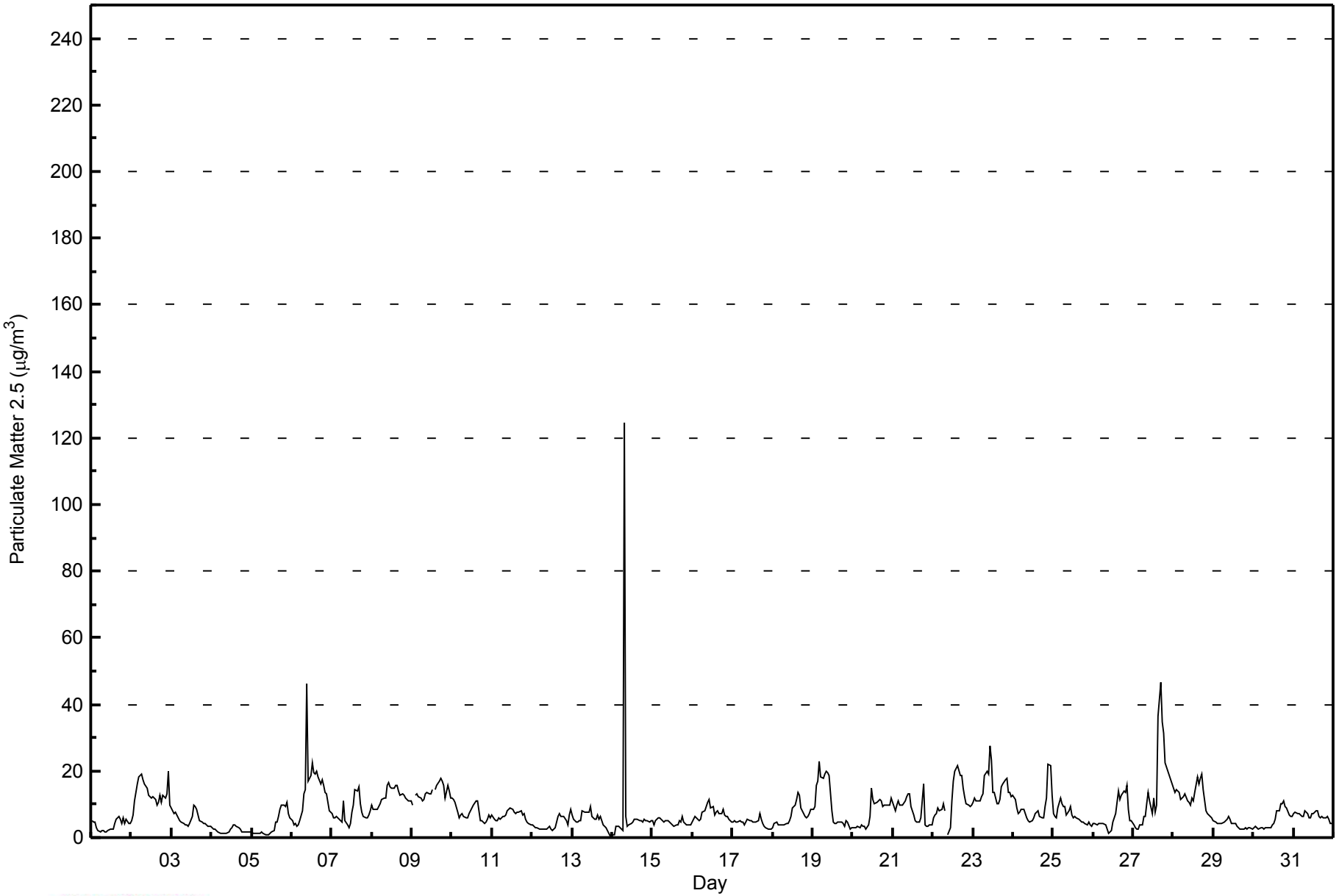
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	301	40.62	40.62
6 - 15	366	49.39	90.01
16 - 25	61	8.23	98.25
26 - 80	6	0.81	99.06
> 81.0	1	0.13	99.19

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Athabasca Valley - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	36	3	0	1	4	7	61	12	7	4	21	37	21	19	24	44	301
6 - 15	22	7	7	3	1	11	106	34	10	7	21	8	18	14	16	81	366
16 - 25	7	1	0	0	1	4	22	11	1	0	1	1	1	0	2	9	61
26 - 80	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
> 81.0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Totals	65	11	7	4	6	22	196	57	18	11	43	46	40	33	42	134	735

Total Number of Valid Hours: 741

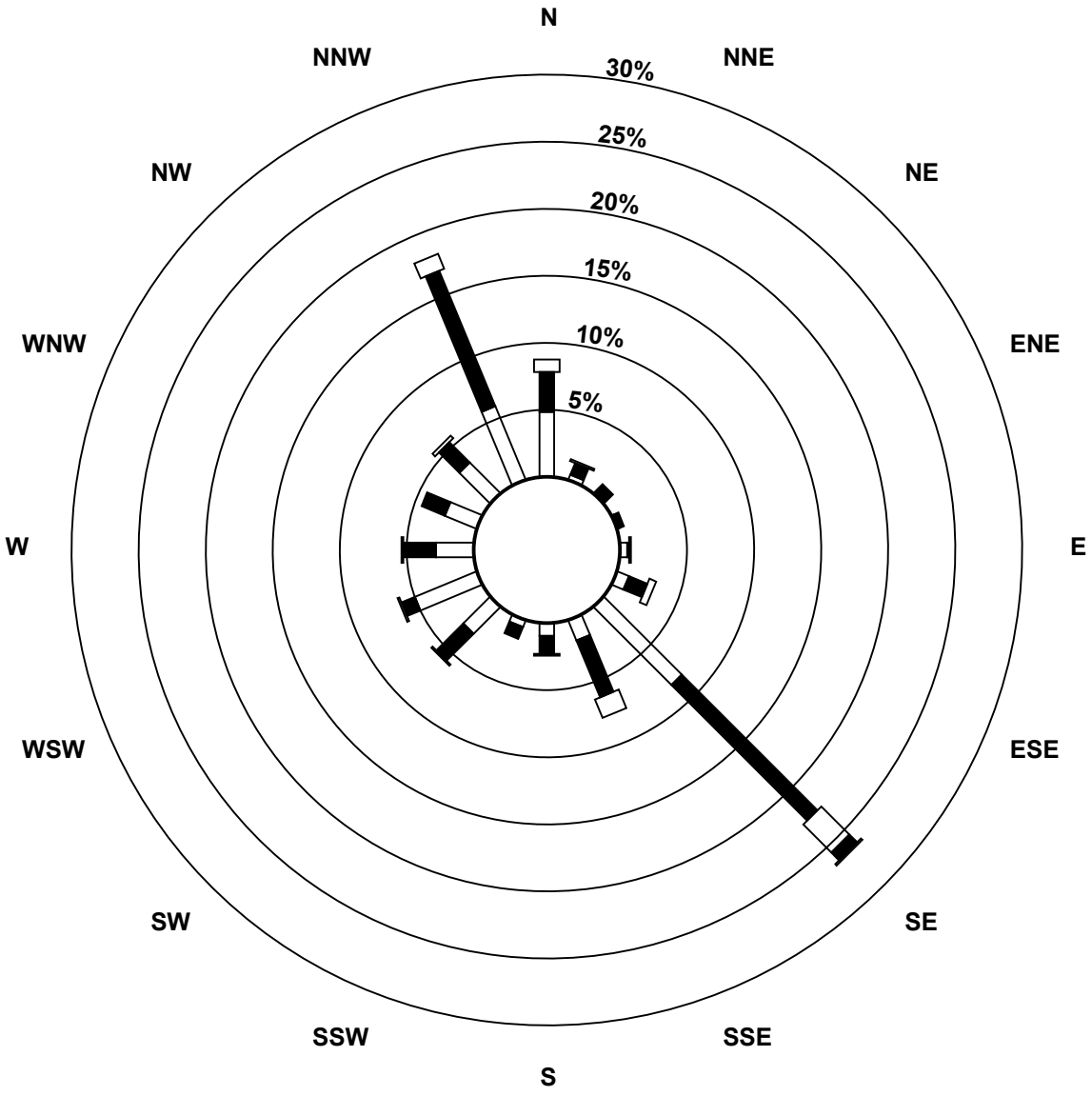
Total Number of Hours: 744

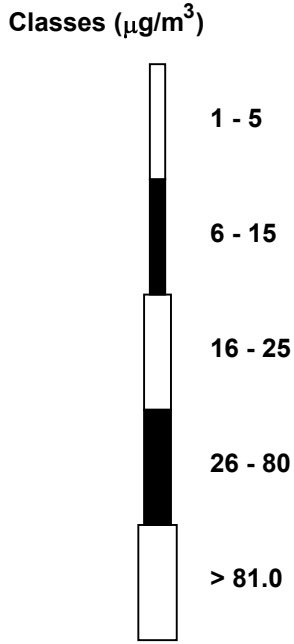
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Athabasca Valley (AMS 7)





Total Number of Valid Hours: 741

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 1.0 ppm on Jan 7 17:00 Maximum Daily Average: 0.4 ppm on Jan 23

Minimum Value: 0.0 ppm on Jan 19 16:00 Minimum Daily Average: 0.0 ppm on Jan 4

Maximum Diurnal Average: 0.2 ppm at hour 17 Minimum Diurnal Average: 0.1 ppm at hour 4

Monthly Average: 0.14 ppm Percentiles: P_1 = 0.0 P_{10} = 0.0 Q_1 = 0.1 Median = 0.1 Q_3 = 0.2 P_{90} = 0.3 P_{99} = 0.7

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	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	0.3
2-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.4	0.5	0.7	0.3	0.2	0.7
3-Jan	0.2	0.1	0.1	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
4-Jan	0.0	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	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1
5-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
6-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.3	0.3	0.6	0.4	0.4	0.4	0.3	0.5	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.6
7-Jan	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.5	1.0	0.2	0.1	0.0	0.1	0.1	0.3	0.2	0.2	1.0
8-Jan	0.2	0.2	0.3	0.3	0.3	Z	0.4	0.2	0.1	0.2	0.3	0.1	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4
9-Jan	0.1	0.2	0.2	0.2	0.1	Z	0.2	0.1	0.2	0.2	C	C	C	C	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3
10-Jan	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	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	0.3	0.2	0.1	0.3
11-Jan	0.2	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
12-Jan	0.1	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.3
13-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
14-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.4
15-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
16-Jan	0.2	0.2	0.1	0.1	0.1	Z	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.5
17-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.0	0.0	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
18-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4
19-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	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	0.1
20-Jan	0.0	0.0	0.0	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	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
22-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.3
23-Jan	0.3	0.3	0.2	0.1	0.1	Z	0.4	0.7	0.6	0.5	0.7	0.5	0.2	0.2	0.1	0.1	0.2	0.4	0.8	0.8	0.8	0.5	0.4	0.3	0.4	0.8
24-Jan	0.3	0.3	0.2	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.3
25-Jan	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2
26-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2
27-Jan	0.1	0.1	0.2	0.2	0.3	Z	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5
28-Jan	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
29-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
30-Jan	0.1	0.1	0.1	0.1	0.0	Z	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
31-Jan	0.1	0.1	0.0	0.1	0.1	Z	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	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	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0.3	0.3	0.3	0.3	0.3	--	0.4	0.7	0.6	0.5	0.7	0.6	0.4	0.4	0.4	0.5	1.0	0.4	0.8	0.8	0.8	0.5	0.7	0.3	Diurnal Maximum	

Z - zerospan C - Calibration

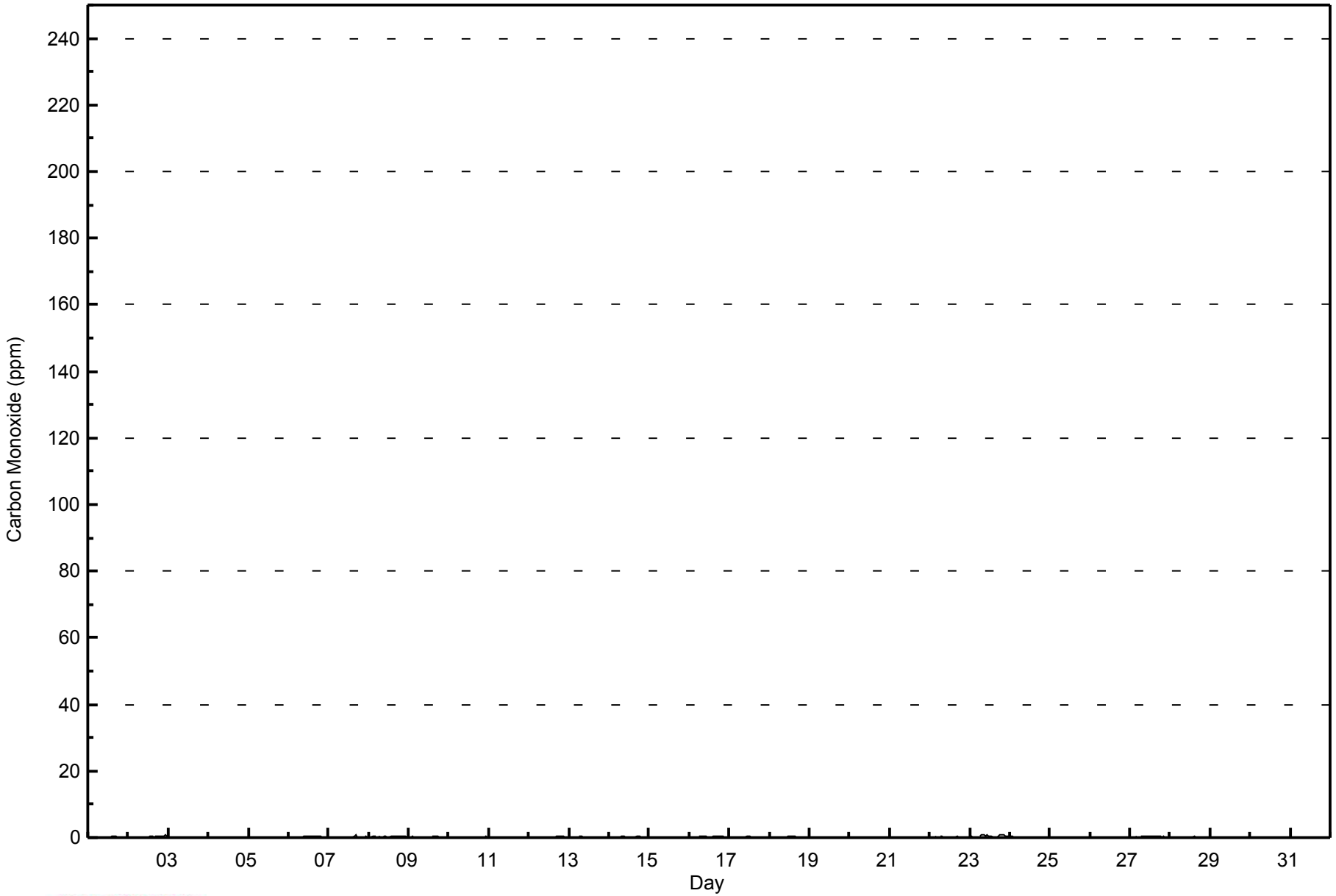
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm

WBEA NETWORK

Hourly Averages

Carbon Monoxide (CO) - ppm

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	670	94.50	94.50
0.4 - 0.5	30	4.23	98.73
0.6 - 0.7	5	0.71	99.44
0.8 - 1.4	4	0.56	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Carbon Monoxide (CO) - ppm

Athabasca Valley - January 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.3	64	10	7	4	5	19	168	46	12	10	42	42	38	33	41	129	670
0.4 - 0.5	0	0	0	0	0	0	18	7	4	0	1	0	0	0	0	0	30
0.6 - 0.7	0	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	5
0.8 - 1.4	0	0	0	0	0	1	2	0	0	0	0	0	1	0	0	0	4
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	64	10	7	4	6	21	190	54	16	10	43	42	39	33	41	129	709

Total Number of Valid Hours: 709

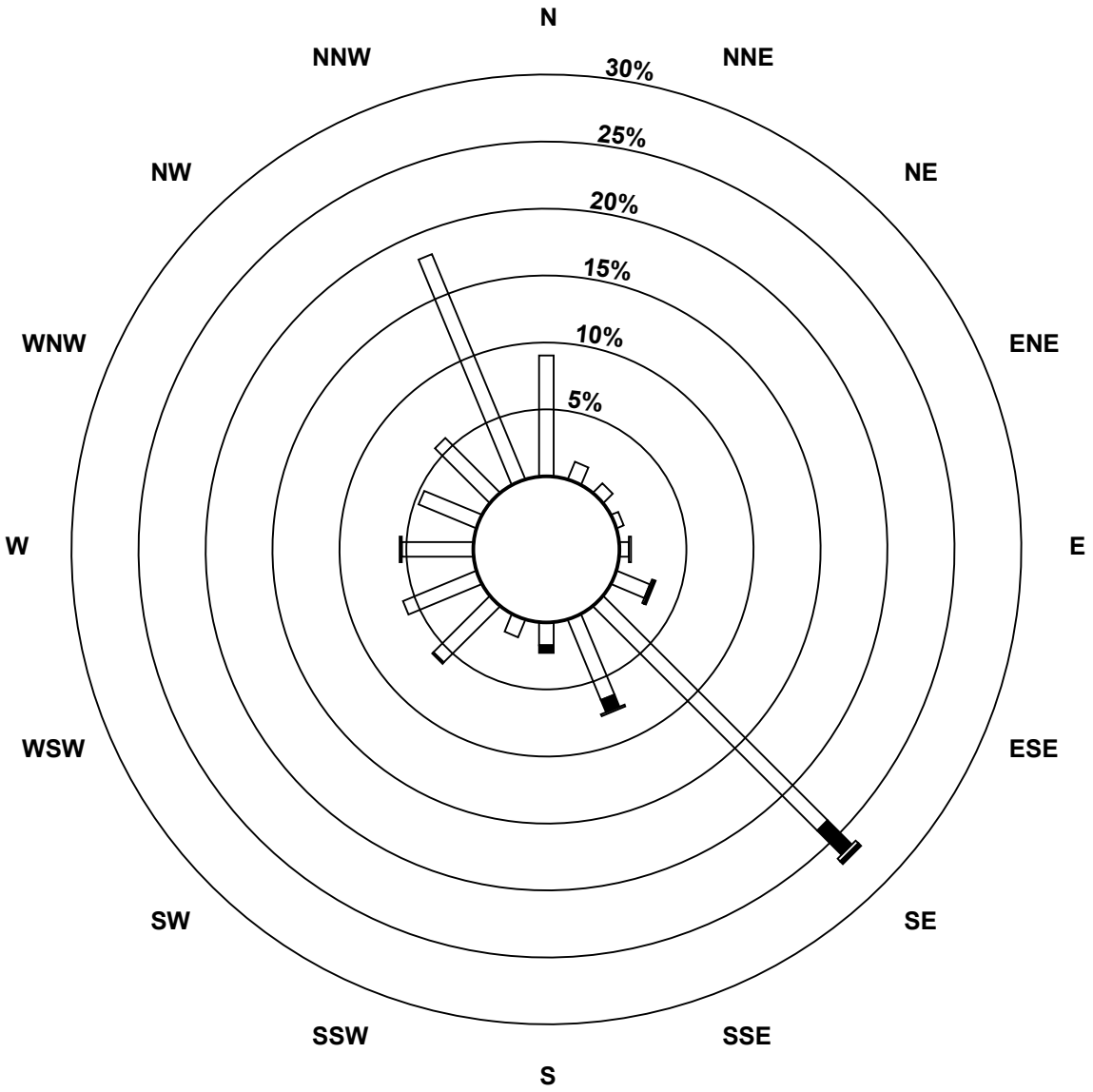
Total Number of Hours: 744

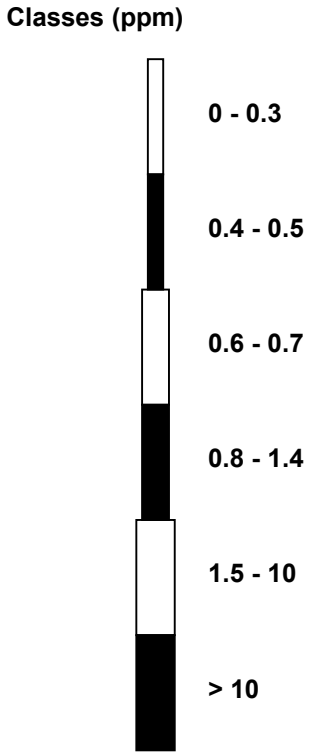
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Carbon Monoxide (CO) - ppm

Athabasca Valley (AMS 7)





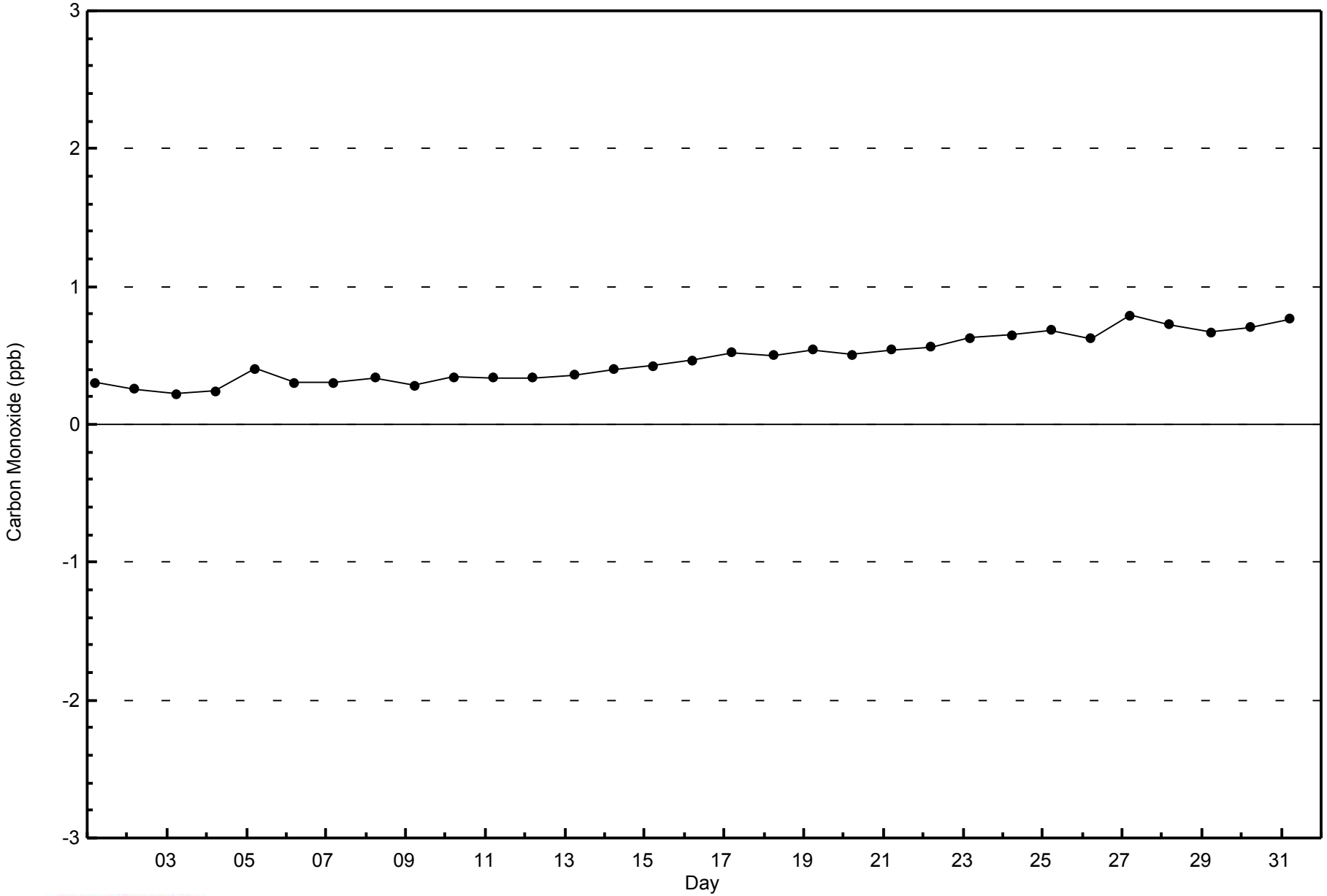
Total Number of Valid Hours: 709

WBEA NETWORK

Zero Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - January 2014



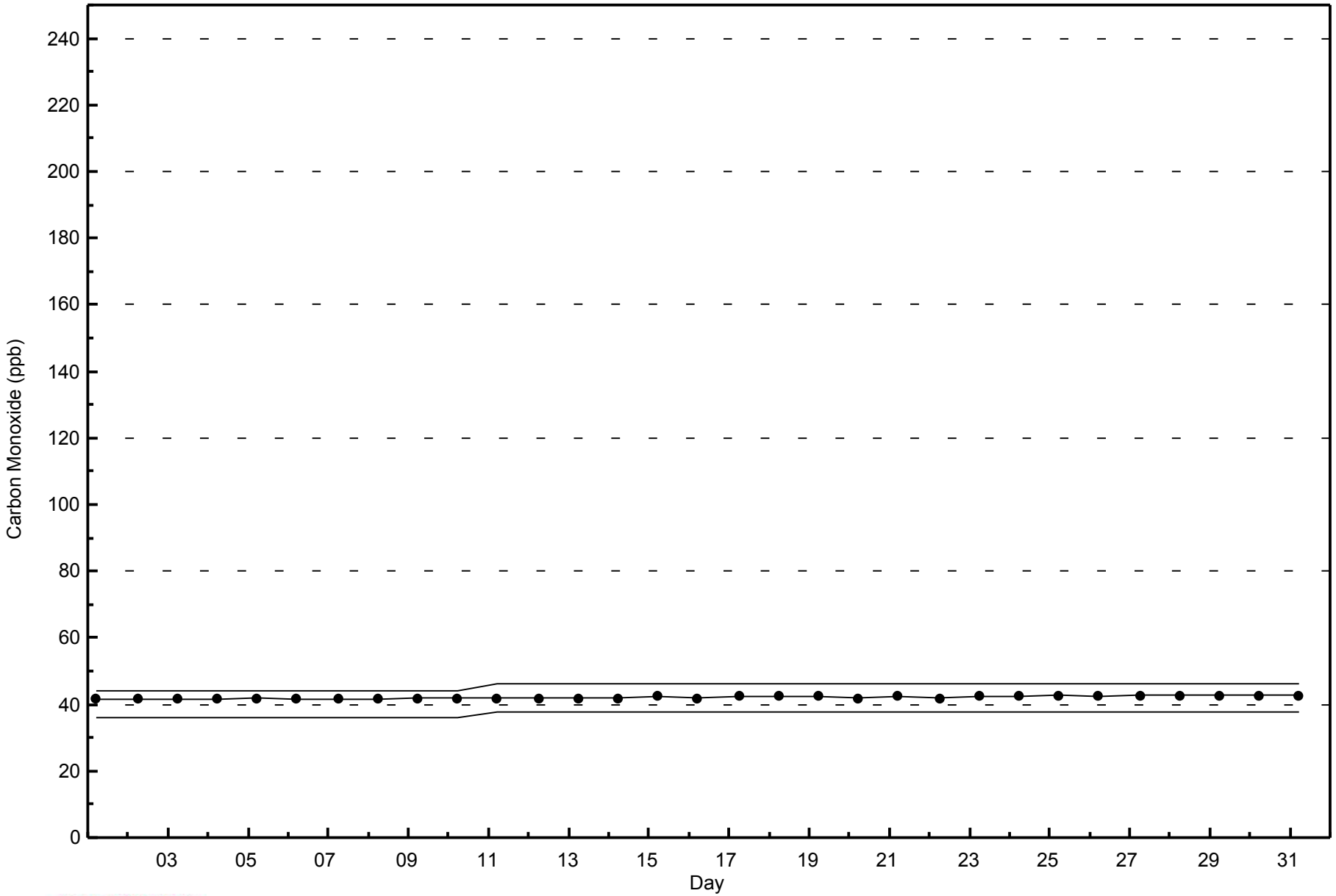
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Carbon Monoxide (CO) - ppb

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 7.4 C on Jan 17 15:00

Maximum Daily Average: 2.1 C on Jan 15

Minimum Value: -36.7 C on Jan 1 10:00

Minimum Daily Average: -34.0 C on Jan 1

Maximum Diurnal Average: -14.1 C at hour 15

Minimum Diurnal Average: -18.8 C at hour 5

Monthly Average: -16.99 C

Percentiles: P_1 = -35.6 P_{10} = -29.3 Q_1 = -23.9 Median = -17.4 Q_3 = -11.2 P_{90} = -4.2 P_{99} = 5.4

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

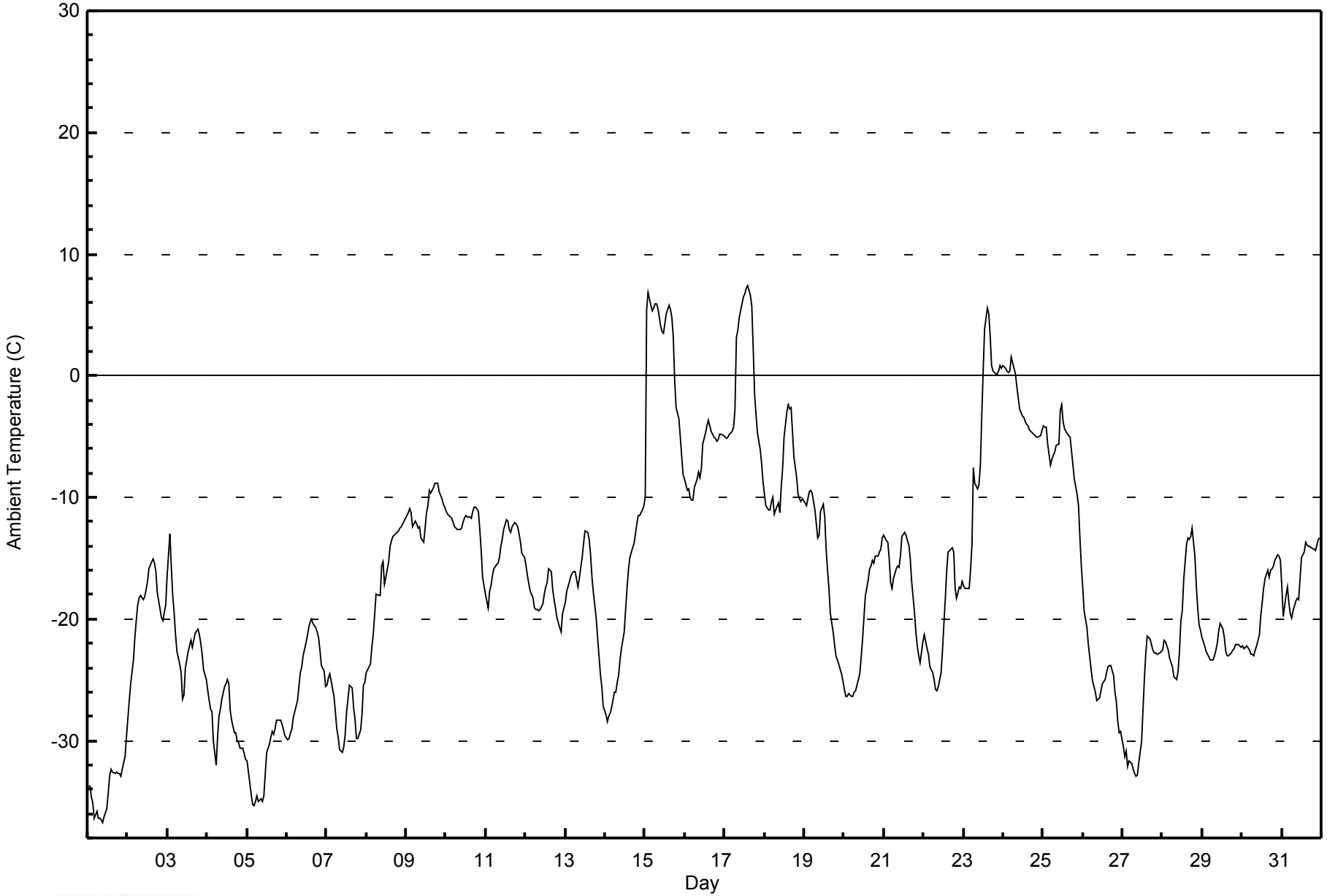
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-33.7	-33.7	-34.7	-35.1	-36.3	-35.8	-36.4	-36.3	-36.5	-36.7	-36.2	-35.6	-34.3	-32.9	-32.4	-32.6	-32.7	-32.6	-32.7	-32.7	-32.9	-32.4	-31.3	-29.7	-34.0	-29.7
2-Jan	-28.1	-26.7	-25.3	-23.3	-21.6	-20.1	-18.9	-18.2	-18.1	-18.4	-18.2	-17.6	-16.9	-15.9	-15.3	-15.1	-15.4	-16.1	-17.8	-18.6	-19.9	-20.1	-19.4	-18.8	-19.3	-15.1
3-Jan	-16.4	-13.0	-15.8	-18.1	-19.4	-21.3	-22.7	-23.7	-24.4	-26.6	-26.3	-24.1	-22.6	-22.2	-21.8	-22.3	-21.8	-21.2	-20.8	-21.2	-22.0	-22.9	-24.2	-25.0	-21.7	-13.0
4-Jan	-25.9	-26.7	-27.4	-27.6	-30.0	-32.0	-29.7	-28.0	-27.4	-26.6	-25.5	-25.3	-25.0	-25.3	-27.5	-28.3	-29.3	-29.3	-30.1	-30.2	-30.7	-30.6	-31.1	-31.5	-28.4	-25.0
5-Jan	-31.6	-32.6	-34.4	-35.2	-35.3	-35.0	-34.6	-35.0	-34.8	-35.0	-34.5	-32.7	-30.9	-30.2	-29.8	-29.3	-29.5	-29.0	-28.3	-28.3	-28.4	-28.7	-29.1	-29.6	-31.7	-28.3
6-Jan	-29.9	-29.8	-29.3	-29.0	-28.1	-27.6	-26.7	-25.5	-24.4	-23.9	-23.0	-22.0	-21.4	-20.7	-20.3	-20.0	-20.3	-20.7	-21.1	-21.6	-22.5	-23.9	-24.3	-25.6	-24.2	-20.0
7-Jan	-25.4	-24.9	-24.5	-25.1	-26.4	-27.6	-29.1	-29.7	-30.7	-31.0	-30.5	-29.5	-27.6	-26.6	-25.4	-25.7	-27.3	-28.2	-29.8	-29.8	-29.1	-27.9	-25.5	-25.2	-27.6	-24.5
8-Jan	-24.5	-24.2	-23.7	-22.3	-21.3	-19.7	-18.0	-18.0	-18.0	-15.6	-15.2	-17.1	-16.5	-15.3	-14.0	-13.5	-13.2	-13.1	-12.9	-12.7	-12.5	-12.4	-12.2	-11.7	-16.6	-11.7
9-Jan	-11.5	-11.2	-11.0	-11.3	-12.4	-12.0	-12.2	-12.5	-12.5	-13.4	-13.6	-12.5	-11.3	-10.7	-9.4	-9.6	-9.2	-8.8	-8.8	-8.9	-9.5	-10.1	-10.5	-10.8	-11.0	-8.8
10-Jan	-11.1	-11.3	-11.4	-11.7	-12.0	-12.4	-12.5	-12.6	-12.7	-12.5	-12.1	-11.8	-11.5	-11.6	-11.6	-11.7	-11.2	-10.8	-10.8	-11.2	-12.6	-14.4	-16.6	-17.2	-12.3	-10.8
11-Jan	-18.0	-19.1	-17.8	-17.3	-16.5	-15.9	-15.6	-15.4	-15.0	-14.1	-13.4	-12.7	-11.9	-12.0	-12.6	-12.9	-12.5	-12.1	-12.1	-12.4	-13.0	-13.7	-14.6	-15.0	-14.4	-11.9
12-Jan	-15.7	-16.5	-17.1	-17.8	-18.3	-19.0	-19.2	-19.2	-19.3	-19.3	-18.7	-17.9	-17.4	-17.0	-15.9	-16.1	-17.6	-18.4	-19.1	-19.9	-20.7	-21.0	-19.6	-19.2	-18.3	-15.7
13-Jan	-18.7	-17.8	-16.9	-16.5	-16.2	-16.1	-16.1	-17.3	-16.7	-15.8	-14.9	-13.8	-12.7	-12.9	-13.4	-14.7	-16.6	-17.8	-19.9	-21.5	-23.0	-24.5	-25.6	-27.2	-17.8	-12.7
14-Jan	-27.8	-28.4	-28.0	-27.8	-27.3	-26.0	-26.0	-25.2	-24.6	-23.4	-22.4	-21.0	-19.2	-17.5	-16.0	-14.9	-14.1	-13.8	-13.0	-12.1	-11.5	-11.5	-11.0	-10.7	-19.7	-10.7
15-Jan	-10.0	5.5	6.8	5.8	5.3	5.5	5.9	5.9	5.5	4.1	3.7	3.5	4.3	5.1	5.8	5.4	4.8	3.1	-0.4	-2.6	-3.6	-5.1	-6.7	-8.1	2.1	6.8
16-Jan	-8.5	-9.4	-9.3	-10.0	-10.2	-10.2	-9.2	-8.5	-8.0	-8.4	-7.7	-5.6	-4.7	-4.1	-3.6	-4.2	-4.6	-5.0	-5.2	-5.4	-5.3	-4.8	-4.8	-4.9	-6.7	-3.6
17-Jan	-5.1	-5.2	-5.0	-4.8	-4.5	-4.3	-2.7	3.1	3.8	4.7	5.9	6.5	6.7	7.2	7.4	6.6	5.6	2.2	-1.5	-3.2	-4.7	-6.1	-7.2	-8.7	-0.1	7.4
18-Jan	-9.8	-10.7	-11.0	-11.0	-10.4	-10.0	-11.4	-11.0	-10.5	-11.3	-9.0	-7.5	-5.1	-2.9	-2.4	-2.7	-2.6	-4.6	-6.7	-8.4	-9.7	-10.2	-10.3	-10.1	-8.3	-2.4
19-Jan	-10.5	-10.7	-10.1	-9.5	-9.4	-9.7	-11.0	-12.2	-13.4	-13.1	-11.1	-10.6	-11.6	-14.3	-16.0	-17.4	-19.5	-21.1	-22.1	-23.1	-23.3	-23.7	-24.5	-25.0	-15.5	-9.4
20-Jan	-25.8	-26.4	-26.3	-26.1	-26.4	-26.3	-26.0	-25.8	-25.4	-24.5	-23.1	-21.7	-19.8	-18.1	-16.8	-15.9	-15.6	-15.2	-15.4	-14.9	-14.8	-14.5	-14.3	-13.4	-20.5	-13.4
21-Jan	-13.1	-13.6	-13.7	-15.0	-17.0	-17.5	-16.6	-15.8	-15.6	-15.7	-14.8	-13.3	-12.8	-13.1	-13.5	-13.9	-15.0	-16.9	-19.4	-21.1	-22.2	-23.1	-23.6	-21.8	-16.6	-12.8
22-Jan	-21.2	-21.8	-22.4	-22.9	-23.9	-24.4	-25.0	-25.7	-25.9	-25.6	-24.4	-22.5	-20.4	-18.3	-16.0	-14.4	-14.2	-14.1	-14.5	-17.4	-18.3	-17.4	-17.4	-16.9	-20.2	-14.1
23-Jan	-17.2	-17.5	-17.5	-17.4	-16.0	-13.9	-7.6	-8.8	-9.3	-9.0	-7.4	-3.3	0.3	3.9	5.6	5.1	3.2	0.9	0.4	0.1	0.1	0.4	0.9	0.6	-5.1	5.6
24-Jan	0.8	0.6	0.4	0.2	0.4	1.5	0.7	0.2	-0.9	-1.8	-2.7	-3.3	-3.5	-3.8	-4.0	-4.1	-4.4	-4.7	-4.9	-5.0	-5.0	-5.0	-4.9	-4.5	-2.4	1.5
25-Jan	-4.1	-4.2	-4.2	-5.6	-7.3	-6.9	-6.5	-6.3	-5.7	-5.6	-2.8	-2.4	-3.7	-4.3	-4.6	-4.9	-5.1	-6.2	-7.3	-8.5	-9.7	-10.6	-13.4	-15.7	-6.5	-2.4
26-Jan	-17.4	-19.3	-20.7	-22.0	-23.1	-24.2	-25.0	-26.0	-26.7	-26.6	-26.5	-25.9	-25.4	-24.9	-24.4	-23.9	-23.8	-23.9	-24.6	-26.0	-26.8	-28.5	-29.4	-29.2	-24.8	-17.4
27-Jan	-30.5	-31.3	-30.9	-32.1	-31.6	-31.9	-32.4	-32.7	-32.9	-32.8	-31.8	-30.0	-27.4	-24.8	-22.8	-21.4	-21.6	-22.1	-22.6	-22.8	-22.8	-22.9	-22.8	-22.7	-27.4	-21.4
28-Jan	-22.5	-21.8	-21.8	-22.5	-23.3	-23.6	-24.0	-24.8	-25.0	-24.2	-22.7	-20.1	-19.3	-16.8	-13.9	-13.3	-13.5	-13.3	-12.6	-14.9	-17.3	-19.1	-20.4	-20.9	-19.7	-12.6
29-Jan	-21.6	-22.2	-22.6	-22.9	-23.1	-23.4	-23.3	-23.0	-22.6	-22.0	-21.0	-20.4	-20.8	-21.6	-22.7	-23.1	-23.0	-22.8	-22.5	-22.4	-22.1	-22.1	-22.2	-22.4	-22.3	-20.4
30-Jan	-22.2	-22.4	-22.4	-22.2	-22.6	-22.9	-23.0	-23.0	-22.6	-22.2	-21.3	-19.7	-18.6	-17.5	-16.6	-16.0	-16.5	-16.0	-15.9	-15.7	-15.2	-14.8	-14.8	-15.2	-19.1	-14.8
31-Jan	-17.3	-19.8	-18.1	-17.4	-18.6	-19.6	-19.9	-19.3	-18.5	-18.3	-18.4	-16.7	-15.0	-14.5	-13.7	-13.9	-14.0	-14.1	-14.2	-14.3	-14.4	-13.9	-13.4	-13.4	-16.3	-13.4
	-18.5	-18.3	-18.3	-18.5	-18.8	-18.8	-18.5	-18.4	-18.3	-18.2	-17.4	-16.3	-15.4	-14.6	-14.1	-14.1	-14.5	-15.0	-15.7	-16.3	-16.9	-17.3	-17.6	-17.7	Diurnal Average	
	0.8	5.5	6.8	5.8	5.3	5.5	5.9	5.9	5.5	4.7	5.9	6.5	6.7	7.2	7.4	6.6	5.6	3.1	0.4	0.1	0.1	0.4	0.9	0.6	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	302	40.59	40.59
-20 - 0	394	52.96	93.55
0 - 10	48	6.45	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 29.9 % on Jan 5 08:00

Maximum Daily Average: 29.8 % on Jan 5

Minimum Value: 28.1 % on Jan 15 02:00

Minimum Daily Average: 28.3 % on Jan 11

Maximum Diurnal Average: 29.1 % at hour 18

Minimum Diurnal Average: 29.0 % at hour 8

Monthly Average: 29.04 %

Percentiles: P_1 = 28.2 P_{10} = 28.5 Q_1 = 28.7 Median = 29.1 Q_3 = 29.3 P_{90} = 29.6 P_{99} = 29.9

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

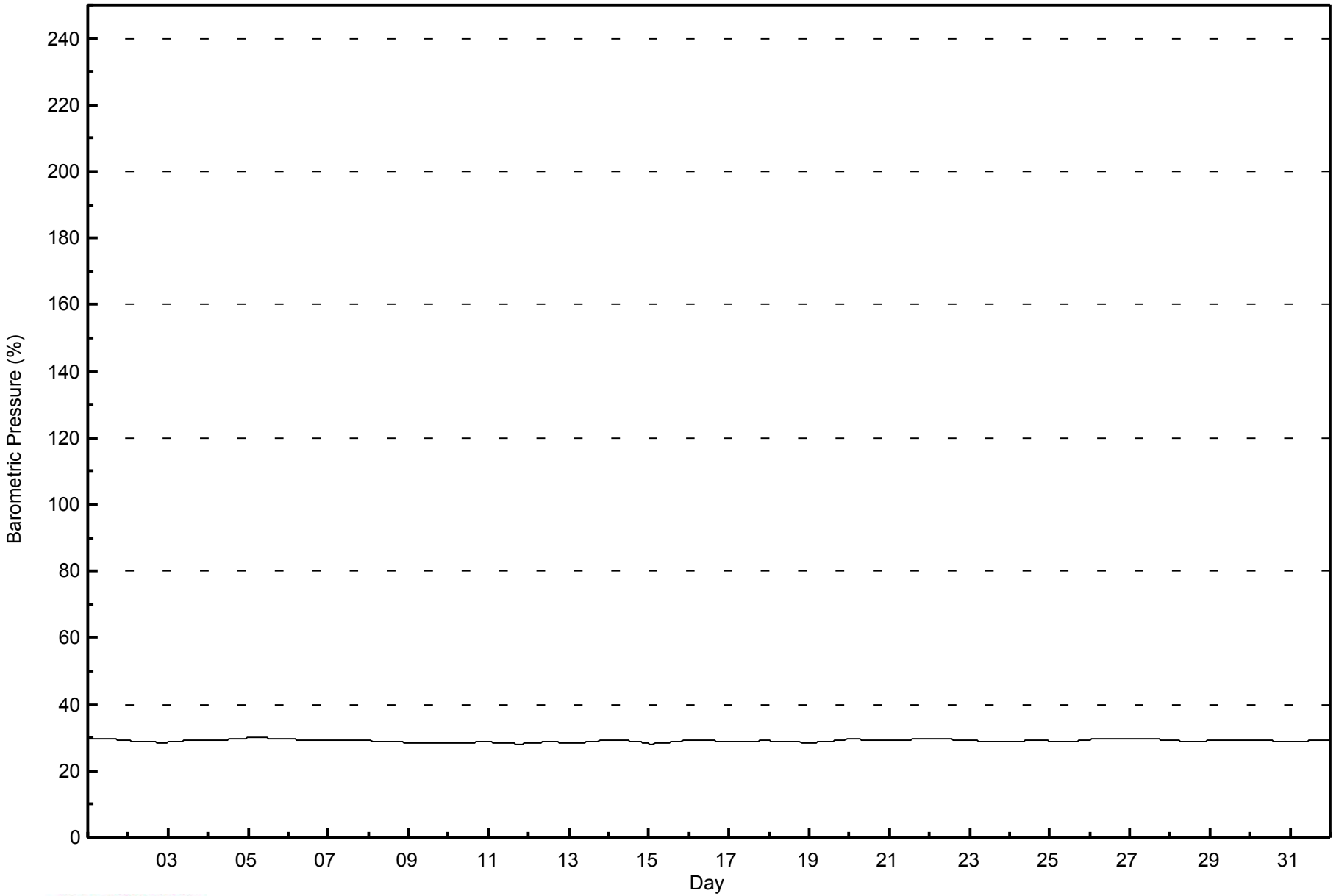
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.2	29.2	29.4	29.5
2-Jan	29.1	29.1	29.0	29.0	28.9	28.8	28.8	28.8	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	28.7	29.1
3-Jan	28.6	28.7	28.7	28.8	28.8	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.1	29.4
4-Jan	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.6	29.6	29.7	29.7	29.7	29.8	29.8	29.8	29.9	29.9	29.6	29.9
5-Jan	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.6	29.8	29.9
6-Jan	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.6
7-Jan	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	29.2	29.2	29.2	29.1	29.3	29.4
8-Jan	29.1	29.0	29.0	29.0	28.9	28.9	28.8	28.8	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	28.7	29.1
9-Jan	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	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.6
10-Jan	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.6
11-Jan	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.4	28.4	28.4	28.3	28.3	28.3	28.2	28.2	28.2	28.2	28.1	28.2	28.2	28.2	28.2	28.2	28.2	28.3	28.6
12-Jan	28.2	28.3	28.3	28.4	28.4	28.5	28.5	28.6	28.6	28.6	28.7	28.7	28.6	28.7	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.4	28.5	28.7
13-Jan	28.4	28.3	28.3	28.3	28.4	28.4	28.4	28.5	28.5	28.6	28.7	28.7	28.7	28.8	28.8	28.9	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	28.7	29.2
14-Jan	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.6	28.5	28.4	28.3	28.2	29.0	29.3
15-Jan	28.2	28.1	28.2	28.2	28.2	28.3	28.3	28.3	28.3	28.4	28.5	28.6	28.6	28.6	28.7	28.8	28.8	28.9	28.9	29.0	29.0	29.1	29.1	29.1	28.6	29.1
16-Jan	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	29.1	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.8	29.1	29.2
17-Jan	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.9	28.9	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	28.9	29.1
18-Jan	29.0	29.0	29.0	28.9	28.9	28.8	28.8	28.8	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	28.5	28.5	28.5	28.7	29.0
19-Jan	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.8	28.9	29.0	29.1	29.2	29.3	29.3	29.4	29.4	29.4	29.5	29.5	28.9	29.5
20-Jan	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.5
21-Jan	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.4	29.6
22-Jan	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.4	29.6
23-Jan	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	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.8	29.0	29.2
24-Jan	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.2
25-Jan	28.9	28.9	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.3	28.9	29.3
26-Jan	29.4	29.5	29.5	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.8
27-Jan	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.6	29.7
28-Jan	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.2
29-Jan	29.1	29.0	29.0	29.1	29.1	29.1	29.1	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	29.2	29.2	29.3	29.1	29.3
30-Jan	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.8	28.7	28.7	28.7	29.1	29.3
31-Jan	28.7	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	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	29.0	29.2
	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	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	Diurnal Average	
	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Barometric Pressure (BP) - %

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 91 inHg on Jan 19 00:00

Maximum Daily Average: 86.7 inHg on Jan 9

Minimum Value: 46 inHg on Jan 15 16:00

Minimum Daily Average: 62.4 inHg on Jan 26

Maximum Diurnal Average: 77.1 inHg at hour 6

Minimum Diurnal Average: 68.9 inHg at hour 15

Monthly Average: 74.4 inHg

Percentiles: P_1 = 53 P_{10} = 63 Q_1 = 69 Median = 75 Q_3 = 81 P_{90} = 86 P_{99} = 90

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

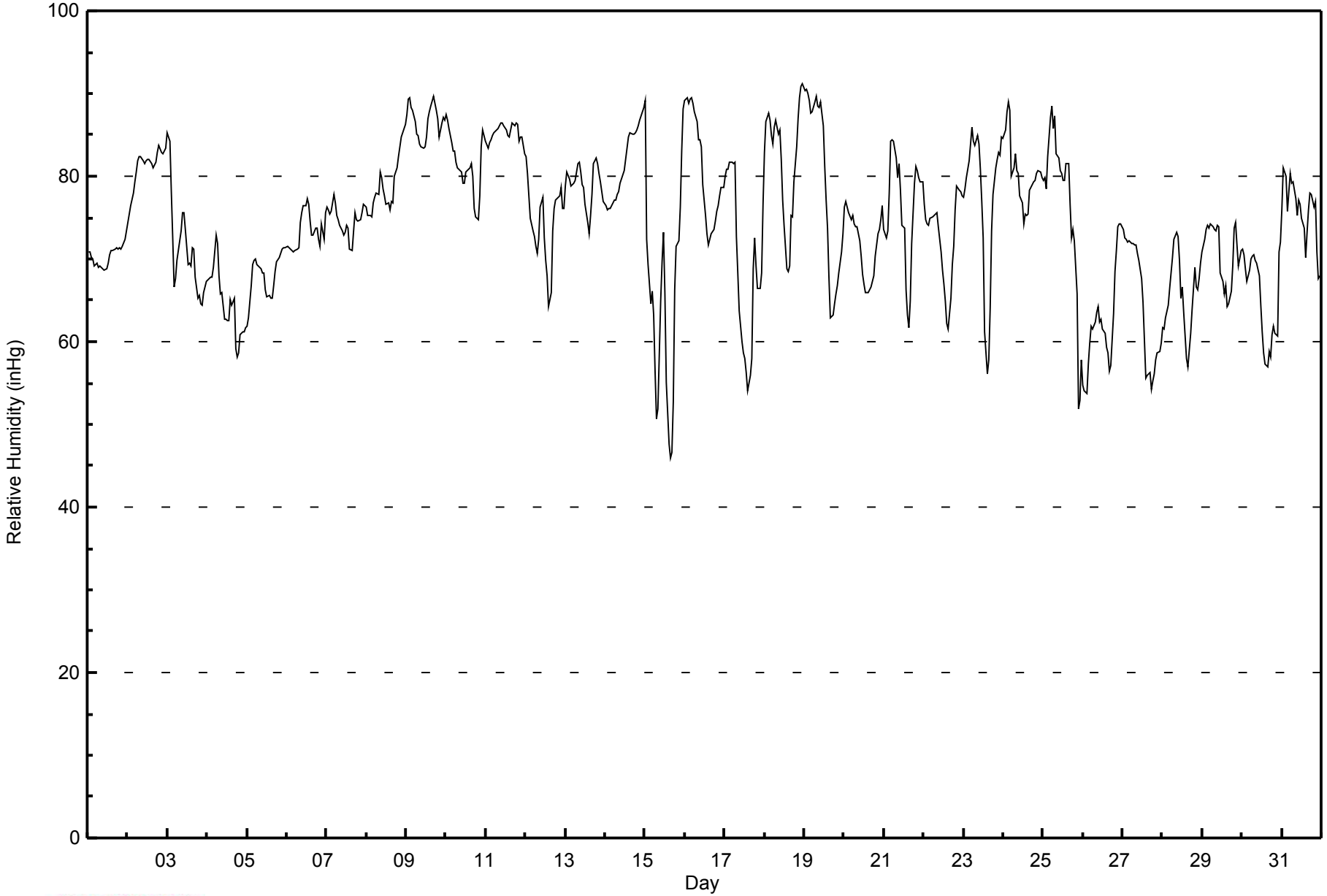
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	71	71	70	70	69	70	69	69	69	69	69	69	70	70	71	71	71	71	71	71	71	72	72	73	70.4	73
2-Jan	74	75	76	78	79	80	82	82	82	82	82	82	82	82	82	81	81	82	83	84	83	83	83	83	81.0	84
3-Jan	85	84	78	73	67	68	70	72	73	76	76	74	69	69	69	71	71	68	65	66	65	64	66	67	71.1	85
4-Jan	67	68	68	68	69	73	72	68	66	66	63	63	63	63	65	64	65	59	58	59	61	61	61	62	64.6	73
5-Jan	62	63	67	69	70	70	69	69	69	68	68	66	65	66	65	65	67	68	70	70	71	71	71	71	68.0	71
6-Jan	72	71	71	71	71	71	71	71	74	76	77	77	77	77	75	73	73	74	74	72	72	74	72	76	73.3	77
7-Jan	76	76	75	76	78	77	75	75	74	73	73	73	74	74	71	71	73	76	75	75	75	76	77	76	74.7	78
8-Jan	76	75	75	75	77	78	78	78	80	80	78	78	77	77	76	77	77	80	81	82	84	85	85	86	78.9	86
9-Jan	88	89	90	88	88	87	85	85	84	84	83	84	85	87	88	88	90	89	88	87	85	86	87	87	86.7	90
10-Jan	87	87	86	84	83	83	82	81	81	81	79	79	80	81	81	81	80	76	75	75	78	84	86	85	81.4	87
11-Jan	84	83	84	84	85	85	86	86	86	87	86	86	86	85	85	86	86	86	86	86	84	85	85	83	85.2	87
12-Jan	82	80	78	75	73	73	72	71	72	76	77	73	70	68	64	66	73	76	77	77	78	79	76	76	74.3	82
13-Jan	79	81	80	79	79	79	79	82	82	80	79	79	77	74	73	75	78	82	82	82	80	79	78	77	78.9	82
14-Jan	76	76	76	76	76	77	77	78	78	79	80	81	82	83	85	85	85	85	85	86	86	87	88	88	81.5	88
15-Jan	89	72	69	65	66	63	56	51	52	65	70	73	66	55	48	46	47	53	66	72	72	76	83	88	65.1	89
16-Jan	89	89	89	89	89	89	88	87	84	84	84	79	75	73	72	72	73	74	75	76	76	78	79	79	80.9	89
17-Jan	80	81	81	82	82	81	82	73	68	64	60	59	58	56	54	56	58	69	72	69	66	67	68	77	69.3	82
18-Jan	83	87	88	87	85	84	86	87	85	86	82	77	74	69	68	69	75	75	79	84	87	89	91	91	82.0	91
19-Jan	90	90	90	89	88	88	89	90	88	88	89	86	81	77	74	68	63	63	65	66	67	68	71	73	79.2	90
20-Jan	76	77	76	76	75	75	74	74	74	72	70	68	67	66	66	66	67	67	68	70	73	74	75	76	71.8	77
21-Jan	74	73	73	78	84	84	84	82	80	82	78	74	74	66	63	62	65	72	79	81	81	80	79	79	76.2	84
22-Jan	77	75	74	74	75	75	75	75	76	74	71	69	67	65	62	62	65	69	72	76	79	78	78	78	72.5	79
23-Jan	77	78	80	82	84	86	84	84	85	84	81	77	73	61	56	58	64	73	78	81	82	83	83	85	77.4	86
24-Jan	85	86	88	89	88	80	81	83	81	80	78	77	74	75	75	75	78	79	79	80	80	81	81	80	80.5	89
25-Jan	79	80	79	82	87	88	86	87	83	82	81	80	80	80	82	82	77	73	73	72	66	52	53	58	76.7	88
26-Jan	55	54	54	57	60	62	62	62	64	64	62	63	61	61	59	59	56	57	63	68	71	74	74	74	62.4	74
27-Jan	74	73	72	72	72	72	72	72	72	71	70	68	65	60	56	56	56	54	55	56	58	59	59	60	64.7	74
28-Jan	62	61	63	64	66	68	70	72	73	73	70	65	67	64	58	57	59	61	64	69	67	66	68	69	65.7	73
29-Jan	71	72	74	74	74	74	74	73	73	74	74	68	67	66	67	64	65	66	69	74	74	72	69	71	70.8	74
30-Jan	71	70	69	67	69	70	70	71	70	70	68	64	61	59	57	57	59	58	61	62	61	61	71	72	65.3	72
31-Jan	76	81	80	76	78	80	79	79	77	75	77	77	75	74	70	73	76	78	78	76	77	71	68	68	75.8	81
	77.0	76.8	76.5	76.4	77.0	77.1	76.7	76.4	76.0	76.2	75.3	73.7	72.3	70.4	68.9	68.9	70.1	71.4	73.2	74.3	74.5	74.6	75.3	76.4	Diurnal Average	
	90	90	90	89	89	89	89	90	88	88	89	86	86	87	88	88	90	89	88	87	87	89	91	91	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - inHg

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Athabasca Valley - January 2014

Maximum Speed: 54 km/h on Jan 15 09:00

Maximum Daily Speed Average: 29.6 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 7 09:00

Minimum Daily Speed Average: 0.8 km/h on Jan 7

Maximum Diurnal Speed Average: 4.7 km/h at hour 14

Minimum Diurnal Speed Average: 0.1 km/h at hour 23

Monthly Average Velocity: 1.5 km/h 312.0 deg

Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 11$ $P_{90} = 17$ $P_{99} = 43$

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	ESE4	SE6	SE4	ESE5	ESE3	SE5	ESE4	SE6	SE7	SE6	SE6	SE5	SE4	SE4	SSE4	SE4	SE5	SE7	SE8	SE7	SE9	SE9	SE9	SE8	SE5.8	SE9
2-Jan	SE12	SE19	SE20	SSE16	SE16	SE12	SE6	SE4	SE7	SE8	SE8	SE8	SE10	SE7	SE10	SE11	SE7	SE6	SE2	SSE1	SSE1	S1	E2	NNW8	SE7.8	SSE20
3-Jan	NNW8	NNW23	NNW26	N18	NNW17	NNW15	NW9	NW7	W4	WSW5	W2	N1	NNW4	NNW6	NNW4	NW3	N2	NW9	WNW16	WNW17	WNW18	WNW18	W12	WSW15	NW9.3	NNW26
4-Jan	WSW16	WSW16	WSW12	WSW12	WSW6	WSW4	WSW10	WSW14	WSW14	WSW12	WNW21	WNW21	NW23	NNW25	N17	NNW16	NNW8	NW13	NW9	NNW5	WNW3	W3	SW8	WSW7	WNW9.2	NNW25
5-Jan	SW7	SW5	SW3	SSE1	SW2	SW3	SW5	SW4	SW7	SW6	SW6	SW5	ESE1	W0	WSW4	SW2	SSE1	SSE4	SE7	SE7	SE7	SE8	SE10	SE9	S3.4	SE10
6-Jan	SE9	SE8	SE8	SE10	SE9	SE9	SE10	SSE10	SSE9	SE11	SE10	SSE9	SSE9	SSE10	SSE11	SSE8	SE7	ESE4	SE5	SE5	S5	NE3	NE3	E1	SE7.2	SSE11
7-Jan	NE2	NNW1	N1	E1	NNE1	W1	WSW2	WSW2	S0	N0	W1	WNW2	NE0	NNE1	NW0	SW1	W1	W0	SW3	SW3	SSW2	SE3	SSE11	SE9	S0.8	SSE11
8-Jan	SE10	SE13	SE16	SE17	SE17	SSE12	SSE12	SSE5	SSE4	SE10	SE7	ESE1	SSE2	SSE3	SE4	SE3	SE6	SE3	SE6	SE6	SE7	SE8	SE7	SE8	SE7.7	SE17
9-Jan	SE8	SE6	SE7	SSE4	SW1	SSW2	SW4	SW6	S1	SW4	SW6	SW7	WSW2	SW4	SSE2	NW1	N5	NNW6	NNW6	NNW11	NNW10	NNW11	NNW8	NNW9	WNW1.5	NNW11
10-Jan	NW9	NNW9	NNW7	NNW9	NNW8	NNW8	NNW7	NNW5	N4	N4	N5	N6	NNW8	NNW9	NNW8	NNW5	WNW8	W14	W9	WSW8	WSW1	SW1	SSW1	WNW1	NW5.3	W14
11-Jan	SE1	NE1	E1	N2	NNE3	NNE2	NE2	NNE1	NNE1	NNW9	N3	ENE1	N6	N14	N15	NNW17	NNW15	NNW17	N14	NNW17	NNW19	NNW19	NNW18	NNW17	N8.6	NNW19
12-Jan	NNW19	NNW19	NNW21	NNW21	NNW21	NNW16	NNW14	NNW7	N3	NNW2	SW2	SW10	WSW10	SW9	SSW5	S4	SSE5	SE6	SE7	SE7	SE6	ESE5	SE11	SE14	NNW2.9	NNW21
13-Jan	SSE13	SSE12	SSE9	SE7	SSE4	SE4	ESE4	ESE4	ENE2	N6	N3	NNW2	NNW7	NNW12	NNW11	NNW9	NNW6	NNW5	NNW6	NNW2	NW2	W2	W2	W3	N1.0	SSE13
14-Jan	WSW2	NW1	SSE1	ESE1	E1	SE7	SE6	SE10	SE11	SE12	SE13	SE13	SE13	SE13	SE13	SE13	SE13	SE15	SE15	SE15	SE14	SE15	SE19	SSE14	SE10.2	SE19
15-Jan	SE6	W29	W47	WNW36	W39	W41	WNW44	WNW43	NW54	NW53	NW46	NW40	NW45	NW46	NW44	NW47	NW32	NW21	NNW13	NNW13	NNW8	WNW2	WSW2	WSW0	WNW29.6	NW54
16-Jan	S1	SE3	SSE3	SSE3	SSE1	SSE3	SE4	SE4	SE7	SE4	SE4	SE9	SE11	SE10	SE10	SE11	SE11	SE8	SE10	SE11	SE12	SE10	SE10	SE13	SE7.1	SE13
17-Jan	SE7	SE6	SE7	SE7	SE8	SE8	SSW8	WSW26	WSW19	W14	W20	W30	WNW22	NW17	NW20	NW15	NW14	N12	N15	N12	N9	N6	N4	WSW1	WNW6.8	W30
18-Jan	S0	S1	SSW1	WSW2	SW3	S3	WSW1	S2	S4	SW1	SSE2	SSE1	SE2	SE4	NNW1	NNW6	NNW12	NNW10	NNW11	NNW6	NNW5	NNW4	NNW2	W1	NNW1.6	NNW12
19-Jan	NNW0	WNW1	NNW4	NNW1	N3	N5	NW2	WSW3	SW1	NNW4	NNW8	NNW18	NNW28	N27	N24	N23	N18	NNW16	NNW15	NNW11	NNW10	NNW5	W2	SW1	NNW9.2	NNW28
20-Jan	SSE0	WSW1	SSW2	SSE6	SE5	SE8	SE11	SE11	SSE10	SE11	SSE11	SE10	SE10	SE10	SSE10	SE9	SE7	SE6	NE2	NNW4	W3	W5	WSW3	WNW5	SSE5.0	SE11
21-Jan	NW7	N5	N2	W2	NW3	NW1	W1	NNW5	WNW3	W3	NW4	NNW13	N16	N12	N11	N8	N7	NW3	W1	W2	WSW2	ENE1	E2	SE8	NNW3.7	N16
22-Jan	SE8	SSE8	SE9	SE7	SE10	SSE9	SE7	SE6	SE10	SE8	SE9	SE11	SSE11	SSE9	SSE9	SSE8	SSE7	SE12	SSE8	SSW3	SSW6	SSE5	SSE7	SE10	SSE8.0	SE12
23-Jan	SE14	SE13	SE10	ESE8	ESE6	ESE6	S8	ESE4	SE7	SE4	SE5	S4	W3	NW8	WNW13	W9	SW5	S3	ESE2	SE2	SE4	SSE3	SE5	ESE4	SSE3.3	SE14
24-Jan	SE4	ESE2	WNW2	W2	NNW7	NNW16	NNW11	NNW14	NNW16	NNW14	NNW16	NNW15	N12	NNW14	NNW12	NNW11	NNW8	NNW7	NNW6	NNW4	N3	N1	NNE0	SE4	NNW7.5	NNW16
25-Jan	SE6	SE7	SSE8	S2	SW2	S4	S2	SSW2	SE4	ESE2	NNW16	NNW20	N18	NNW14	NNW13	NNW15	NNW16	N17	N19	N18	NNW20	NNW34	N28	N25	NNW9.8	NNW34
26-Jan	N25	N25	N21	N18	N14	NNW13	N13	N9	N7	NNW8	N8	NNE5	NNE4	NNW4	NW3	NW3	NNW3	WNW2	ESE1	SE1	ESE1	NW1	WNW1	SE3	N7.5	N25
27-Jan	NNE1	SW2	SE3	E1	SE6	SE6	SE8	SE8	SE7	SE12	SE11	SE12	SE11	SE12	SE11	SE8	SE7	SE8	SE8	SE11	SE8	SE9	SE10	SE9	SE7.8	SE12
28-Jan	SE8	SE9	SE7	SE9	SE7	SE9	SE5	SE2	SE2	ESE4	SSE3	S4	WNW2	NNW3	N8	N7	N7	NNW6	NNW9	N18	N22	N21	NNW10	NNW11	NNE3.0	N22
29-Jan	NNW6	WNW5	W6	WSW7	W5	WSW4	SW8	SW5	WSW4	W3	NNW8	N14	N15	NNW22	N19	N15	N12	NNW10	NNW10	NNW9	NNW11	NW11	WNW10	WNW7	NNW7.4	NNW22
30-Jan	NW11	WNW11	WNW9	W12	WSW10	WSW10	SW10	WSW10	WSW10	WSW14	WSW9	WSW11	SW13	SW13	SW16	SW9	SW8	SSW8	SW10	SW11	SW9	WSW4	W5	WNW2	WSW9.0	SW16
31-Jan	WSW4	NW3	W5	WNW4	W4	WSW6	W4	SW2	SW4	WSW5	WSW6	NW6	NNW10	NNW8	NNW10	NNW10	NNW8	NNW9	NW6	NNW3	W5	WNW8	NW8	WNW7	NW4.7	NNW10
	SE0.8	SW0.6	W1.1	WSW0.9	W0.9	WSW0.9	WSW2.0	WSW2.6	WSW1.9	W1.7	WNW2.3	WNW3.1	NW3.7	NNW4.7	NNW4.2	NNW4.0	NNW3.1	NNW2.7	NNW2.3	NNW2.2	NNW1.8	NNW1.9	ESE0.1	SE0.7	Diurnal Average		
	N25	W29	W47	WNW36	W39	W41	WNW44	WNW43	NW54	NW53	NW46	NW40	NW45	NW46	NW44	NW47	NW32	NW21	N19	N18	N22	NNW34	N28	N25	Diurnal Maximum		

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 13 km/h on Jan 15 09:00

Minimum Value: 1 km/h on Jan 7 03:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 9

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

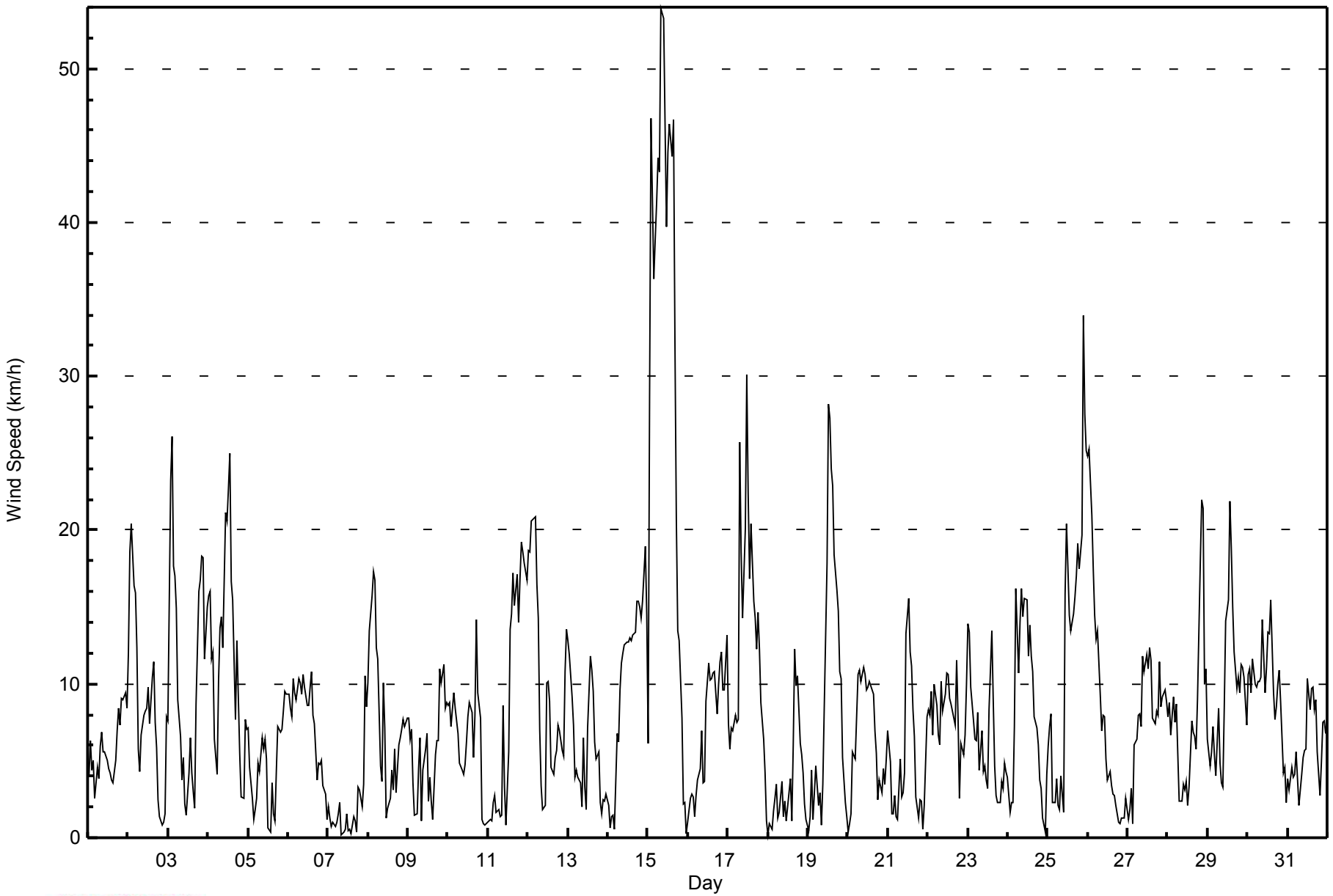
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	3	2	2	3	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	3	2	2	2	2	3
2-Jan	3	3	3	3	3	4	2	2	2	2	2	2	3	2	2	2	2	3	2	1	1	1	1	5	5
3-Jan	4	5	6	5	4	3	2	1	1	1	1	1	1	1	2	1	1	5	3	5	3	3	2	3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

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Athabasca Valley - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	286	38.44	38.44
6 - 11	286	38.44	76.88
12 - 19	125	16.80	93.68
20 - 28	29	3.90	97.58
29 - 38	5	0.67	98.25
> 38	13	1.75	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Athabasca Valley - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	18	11	7	4	6	19	39	25	17	8	27	22	28	15	14	26	286
6 - 11	14	0	0	0	0	3	129	25	1	3	17	14	3	7	12	58	286
12 - 19	24	0	0	0	0	0	31	6	0	0	3	10	4	5	4	38	125
20 - 28	9	0	0	0	0	0	0	1	0	0	0	1	1	3	3	11	29
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	5
> 38	0	0	0	0	0	0	0	0	0	0	0	0	3	2	8	0	13
Totals	65	11	7	4	6	22	199	57	18	11	47	47	41	33	42	134	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

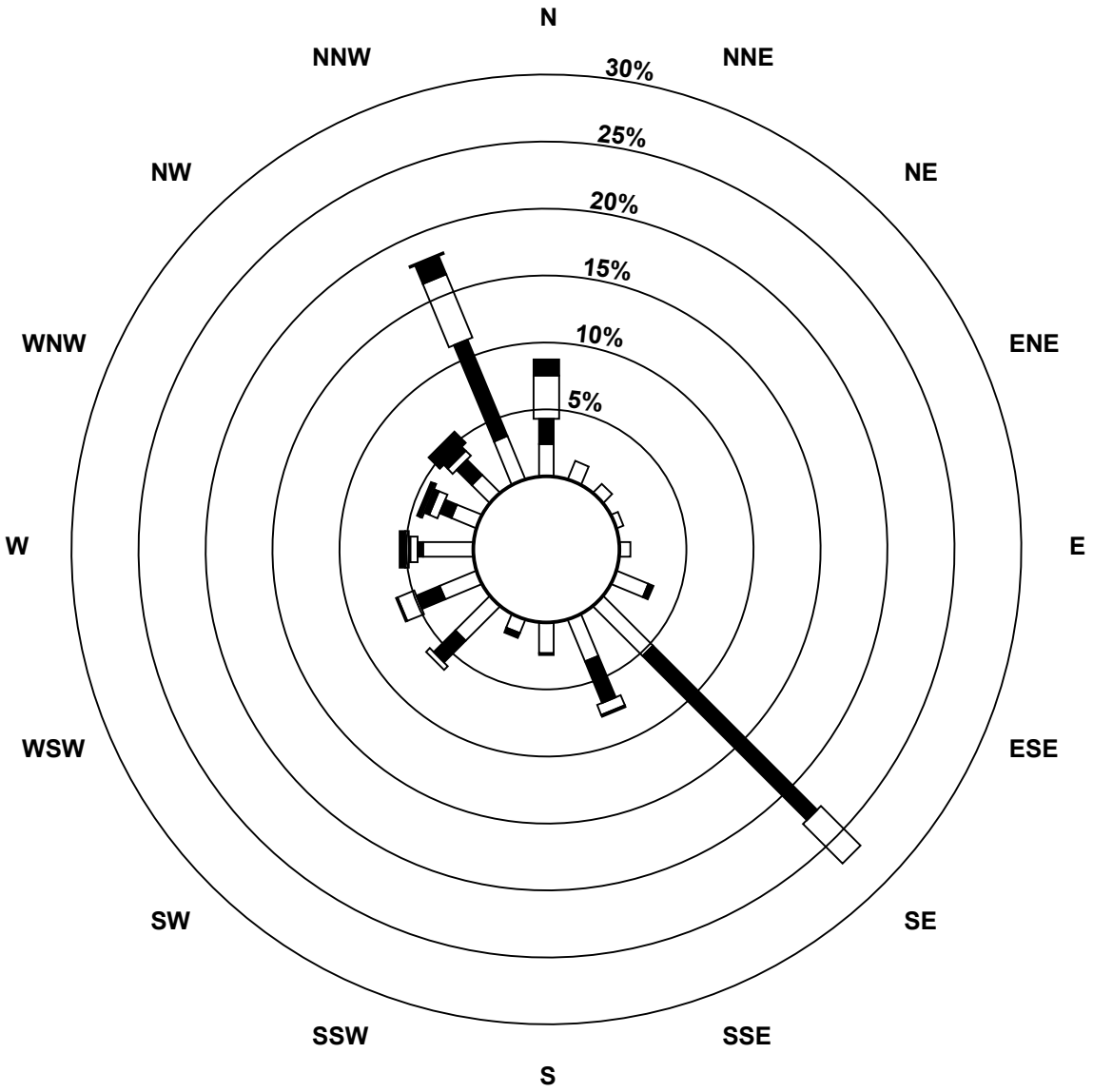
AURORA
ATMOSPHERICS INC.

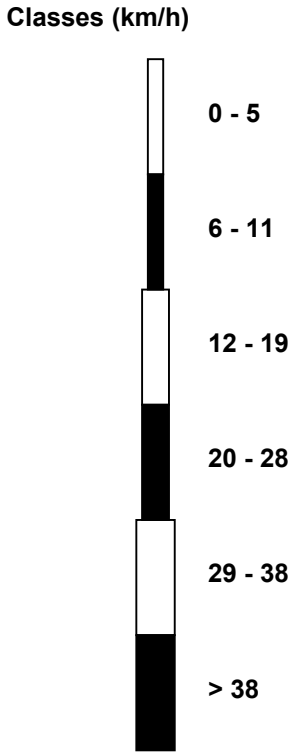
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Athabasca Valley (AMS 7)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 305 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 299.9 deg on Jan 15

Direction of Minimum Speed: 177 deg on Jan 7 09:00

Direction of Minimum Daily Speed Average: 0.8 deg on Jan 7

Monthly Average Direction: 304.7 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	123	132	129	123	106	133	113	127	135	131	129	135	126	141	147	137	138	132	136	140	133	128	135	127	131.5
2-Jan	137	144	146	151	146	142	128	132	129	137	136	137	143	141	146	141	137	136	143	157	153	169	101	346	140.4
3-Jan	344	342	346	356	345	341	317	305	275	241	266	351	340	330	334	326	355	308	296	301	302	283	273	258	317.0
4-Jan	255	252	253	251	257	238	238	240	243	258	285	298	306	337	8	348	333	310	322	345	300	261	232	238	286.1
5-Jan	232	232	234	150	220	215	218	219	226	224	230	224	123	276	239	232	149	147	143	143	142	140	141	134	184.5
6-Jan	133	136	139	139	145	144	144	156	163	145	143	155	157	153	148	156	134	110	137	135	172	45	38	101	143.6
7-Jan	47	336	10	79	15	263	258	245	177	1	272	287	44	32	310	229	263	271	232	228	211	141	149	136	177.1
8-Jan	146	136	144	143	143	147	148	153	163	136	136	121	166	152	143	139	137	131	137	135	137	133	133	130	141.1
9-Jan	126	133	141	163	216	200	221	219	188	220	224	228	241	230	159	323	349	344	346	347	341	339	337	329	298.0
10-Jan	323	335	332	329	330	329	337	341	360	11	355	10	347	342	337	336	293	275	264	245	251	230	193	298	321.8
11-Jan	127	46	80	7	16	27	44	33	31	347	5	76	359	350	352	345	348	345	351	344	343	347	343	343	349.7
12-Jan	347	347	344	343	342	346	333	345	8	343	226	233	237	234	207	184	161	138	141	139	135	121	139	140	336.7
13-Jan	149	154	157	140	152	132	118	105	64	355	4	343	342	340	342	337	338	335	344	343	312	274	266	261	11.1
14-Jan	253	309	147	110	91	130	130	135	138	137	136	135	135	139	134	140	141	139	140	140	139	144	146	148	139.2
15-Jan	139	260	281	289	281	280	287	287	305	308	309	306	311	312	315	309	310	319	333	332	336	285	252	237	299.9
16-Jan	184	145	155	151	162	150	142	138	135	133	133	138	143	139	137	136	134	127	131	132	134	129	132	129	135.8
17-Jan	137	133	142	145	138	140	207	247	254	265	279	277	282	311	318	323	325	358	351	7	6	355	351	240	293.2
18-Jan	181	190	209	239	223	174	243	170	177	234	156	167	127	142	344	337	345	348	342	335	341	333	344	275	329.9
19-Jan	340	289	334	327	358	351	325	244	232	334	342	344	344	351	352	349	2	346	341	346	334	329	276	228	344.3
20-Jan	162	245	202	157	145	138	142	139	148	142	147	144	142	145	147	138	130	134	48	343	273	263	256	299	147.2
21-Jan	322	359	351	281	322	309	277	332	290	262	322	346	350	10	1	3	355	309	276	267	246	62	82	133	344.5
22-Jan	145	148	141	145	142	149	132	132	139	134	144	146	153	149	158	157	156	144	153	196	205	165	155	139	148.5
23-Jan	141	139	131	120	108	110	170	122	131	124	135	181	280	312	301	270	233	181	112	146	145	155	132	118	147.9
24-Jan	144	116	296	262	335	336	332	331	343	348	344	342	357	347	339	342	341	346	348	344	9	355	24	138	342.6
25-Jan	140	141	160	191	226	190	175	196	129	104	333	338	350	343	342	346	348	349	350	350	344	342	355	356	347.9
26-Jan	357	357	353	350	354	348	354	350	1	346	352	16	24	345	318	319	348	301	108	127	109	305	287	124	353.4
27-Jan	28	220	127	97	135	138	139	136	140	140	141	140	143	139	132	145	139	134	137	136	136	134	134	133	137.4
28-Jan	134	136	137	141	133	137	131	124	133	110	162	176	295	337	349	352	350	342	342	359	352	352	347	331	16.5
29-Jan	330	285	263	258	262	245	225	220	248	279	340	353	357	346	352	359	1	348	341	340	336	309	297	289	327.0
30-Jan	307	298	283	273	250	242	235	243	246	243	241	249	223	224	224	228	228	213	222	231	218	244	263	286	243.7
31-Jan	246	304	275	299	273	254	269	233	224	240	251	326	337	339	345	347	345	339	324	336	266	282	305	294	305.4
	132.5	228.6	258.9	254.4	269.7	238.8	237.4	241.4	238.3	260.3	287.7	299.9	321.3	332.9	336.5	334.6	345.2	342.3	343.2	348.3	338.4	335.8	103.6	132.7	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Jan 14 05:00

Minimum Value: 7 deg on Jan 30 06:00

Percentiles: P_1 = 9 P_{10} = 11 Q_1 = 14 Median = 19 Q_3 = 36 P_{90} = 65 P_{99} = 94

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

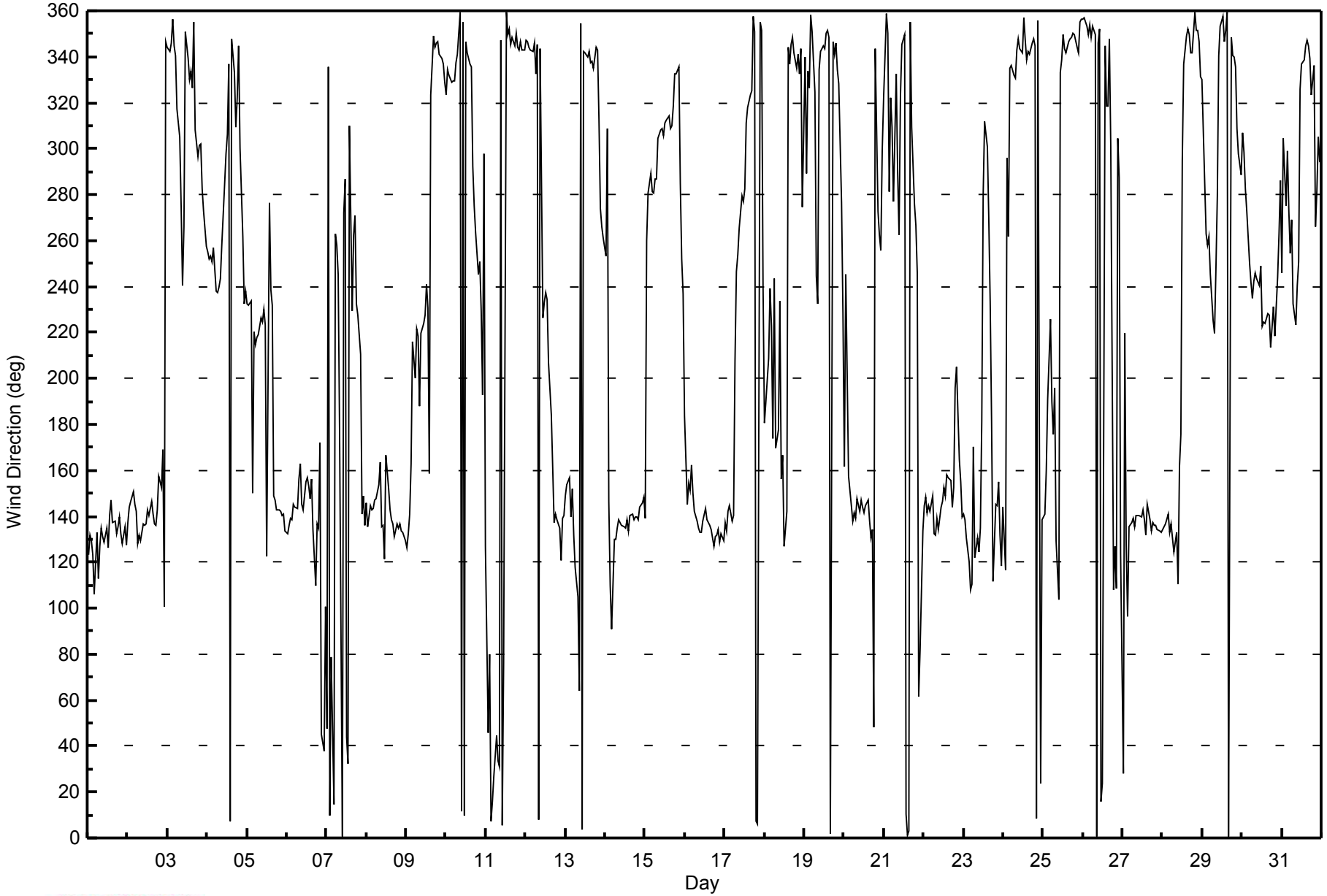
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	40	14	27	36	52	28	47	17	17	24	21	25	25	24	18	22	25	17	15	17	15	16	14	16	52
2-Jan	13	11	10	11	11	16	26	46	20	14	13	13	13	14	12	11	17	30	38	46	65	53	69	30	69
3-Jan	20	11	15	20	14	11	11	13	19	10	30	56	20	13	25	28	46	30	11	14	11	10	14	9	56
4-Jan	8	9	10	13	19	29	14	12	11	19	13	13	12	19	20	16	18	10	23	24	31	49	9	11	49
5-Jan	9	34	50	59	39	40	15	24	12	10	14	44	92	89	20	76	85	46	18	19	22	23	14	16	92
6-Jan	13	18	17	13	17	20	14	19	15	15	19	21	16	15	13	15	15	28	22	34	35	35	67	73	73
7-Jan	38	39	67	43	72	37	36	16	96	67	64	29	86	69	90	75	68	87	18	36	65	66	21	25	96
8-Jan	22	14	11	10	10	13	14	66	61	39	21	82	67	60	25	49	17	42	17	17	19	16	16	14	82
9-Jan	15	14	18	45	61	42	26	17	94	30	43	8	24	48	56	70	16	18	16	15	17	11	13	10	94
10-Jan	10	11	16	8	9	10	14	14	15	15	16	13	12	11	12	17	37	12	14	11	93	74	83	71	93
11-Jan	79	65	83	34	20	38	30	38	39	18	44	80	24	9	14	8	13	9	12	10	10	15	11	11	83
12-Jan	16	15	14	13	14	16	14	15	26	33	81	12	14	22	24	35	30	19	15	24	37	35	17	13	81
13-Jan	14	15	17	17	40	26	24	29	35	17	24	63	21	10	13	12	23	19	14	26	66	42	32	46	66
14-Jan	68	67	60	74	100	23	26	17	15	15	14	14	14	14	15	14	13	13	14	14	15	13	13	15	100
15-Jan	65	15	13	14	11	11	12	13	14	11	10	10	10	10	11	10	10	19	9	8	10	71	38	99	99
16-Jan	55	47	40	58	64	41	38	49	16	28	34	12	10	13	12	10	10	15	13	14	14	19	15	11	64
17-Jan	23	20	12	29	27	23	55	9	10	42	54	10	13	14	11	9	21	22	19	18	19	19	18	65	65
18-Jan	90	68	95	66	74	46	76	84	46	90	48	77	45	34	93	28	15	17	9	19	27	37	54	61	95
19-Jan	88	58	36	62	28	23	55	62	84	31	18	14	12	20	19	18	19	16	14	14	11	28	38	96	96
20-Jan	95	85	83	36	57	26	14	15	14	14	18	17	15	16	17	17	18	24	48	19	36	19	21	35	95
21-Jan	19	17	56	28	25	41	30	20	43	22	32	14	17	19	21	20	16	18	65	42	33	85	49	22	85
22-Jan	16	20	17	21	15	17	22	24	17	15	18	15	16	16	17	17	20	15	37	90	36	47	31	16	90
23-Jan	11	12	20	19	25	37	52	44	36	50	33	44	45	35	13	13	17	55	61	41	26	40	31	42	61
24-Jan	24	83	29	63	44	9	9	9	14	15	14	11	19	14	11	12	15	13	17	19	20	62	60	33	83
25-Jan	20	18	19	44	55	38	73	56	29	70	14	13	18	13	14	15	17	18	17	18	14	14	20	21	73
26-Jan	20	21	19	19	18	17	20	16	21	18	17	16	36	36	35	33	24	46	82	96	93	47	38	53	96
27-Jan	55	73	72	96	31	20	18	16	21	14	14	12	12	10	11	12	15	15	14	13	14	15	14	17	96
28-Jan	22	17	19	14	14	18	26	81	75	41	68	43	24	30	14	13	15	22	26	19	17	18	17	12	81
29-Jan	15	17	13	11	13	20	23	54	26	27	25	18	20	16	19	20	19	17	11	13	14	11	13	15	54
30-Jan	13	12	13	12	10	7	8	10	12	13	15	20	11	12	13	16	26	29	19	16	31	35	24	82	82
31-Jan	37	34	18	25	20	25	38	69	67	34	15	26	11	15	18	15	13	9	20	38	14	19	16	20	69
	95	85	95	96	100	46	76	84	96	90	81	82	92	89	93	76	85	87	82	96	93	85	83	99	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Athabasca Valley - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Name	Athabasca Valley	Station Number	AMS 7

Reason: Routine

Start Time (MST)	9:30	End Time (MST)	14:45
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Cal Gas Concentration	50.8 ppm	Cal Gas Expiry Date	10/10/2013
Gas Cert Reference	LL 105142		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563
DACS voltage range	0-5V	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-681	-681
Analyzer Range (mv)	5000	5000	Lamp voltage	800	807
Calculated slope	0.992454	0.997969	Chamber temp.	43.9	43.9
Calculated intercept	1.669638	1.252374	Pressure (mmHg)	719.9	718.2
Analyzer Background	10.3	10.4	Flow (lpm)	0.524	0.523
Analyzer Coefficient	0.814	0.814	Intensity	48500	48500

Analyzer make	TEI 43C	Analyzer serial #	607415781

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.2	N/A
as found span	5000	58.8	597.4	591.1	1.011
calibrator zero	5000	0.0	0.0	-0.2	N/A
high point	5000	58.8	597.4	597.9	0.999
second point	5000	29.4	298.7	297.6	1.004
third point	5000	14.7	149.4	147.3	1.014
calibrator zero	6000	0.0	0.0	0.2	N/A
as left zero	6000	0.0	0.0	0.2	N/A
as left span	5000	58.8	597.4	596.3	1.002
				Average Correction Factor	1.006

Corrected As found	591.3	Previous response	591.2	% change	0.0%

Notes:

no adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

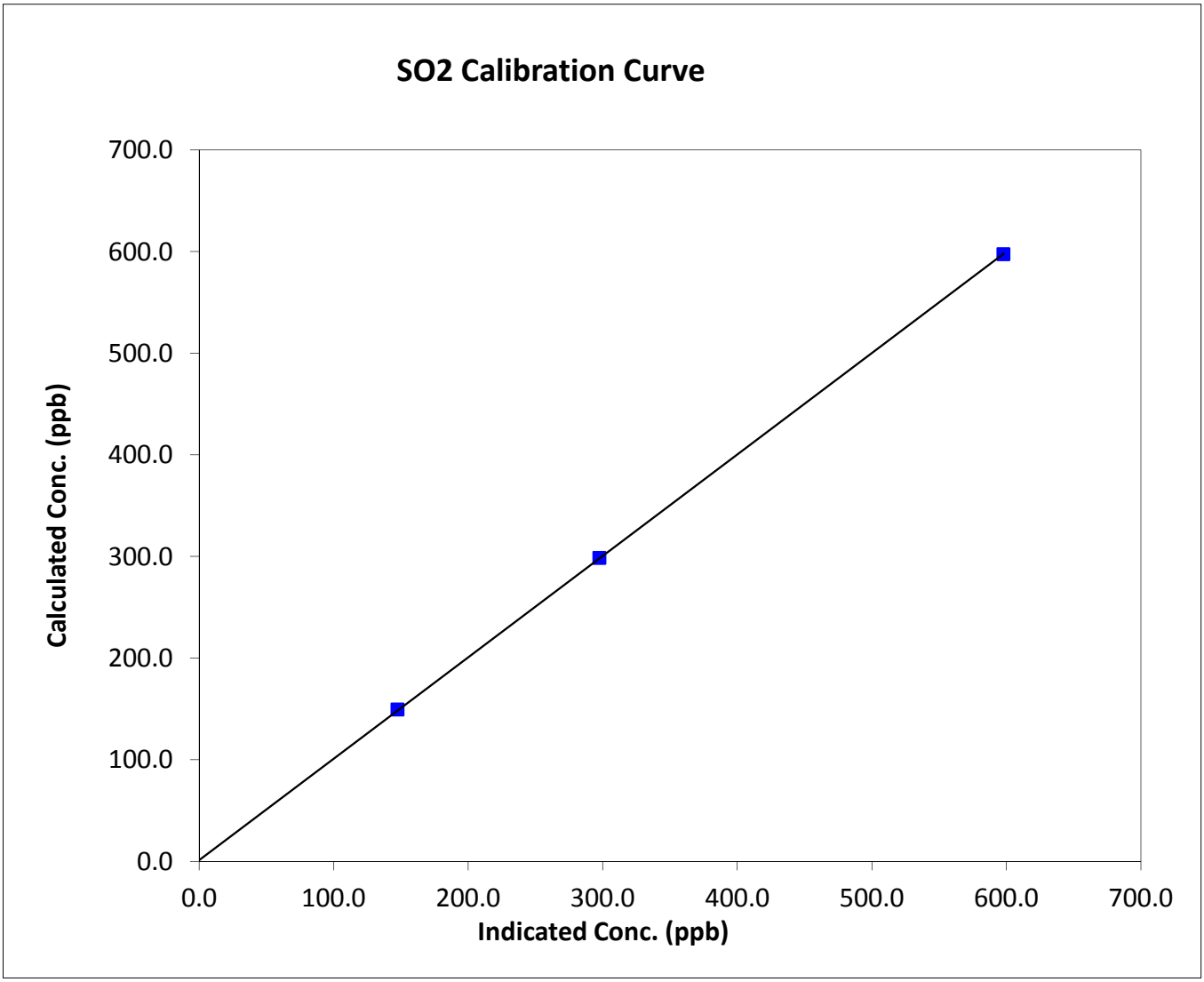
SO_2 Calibration Summary

Station Information

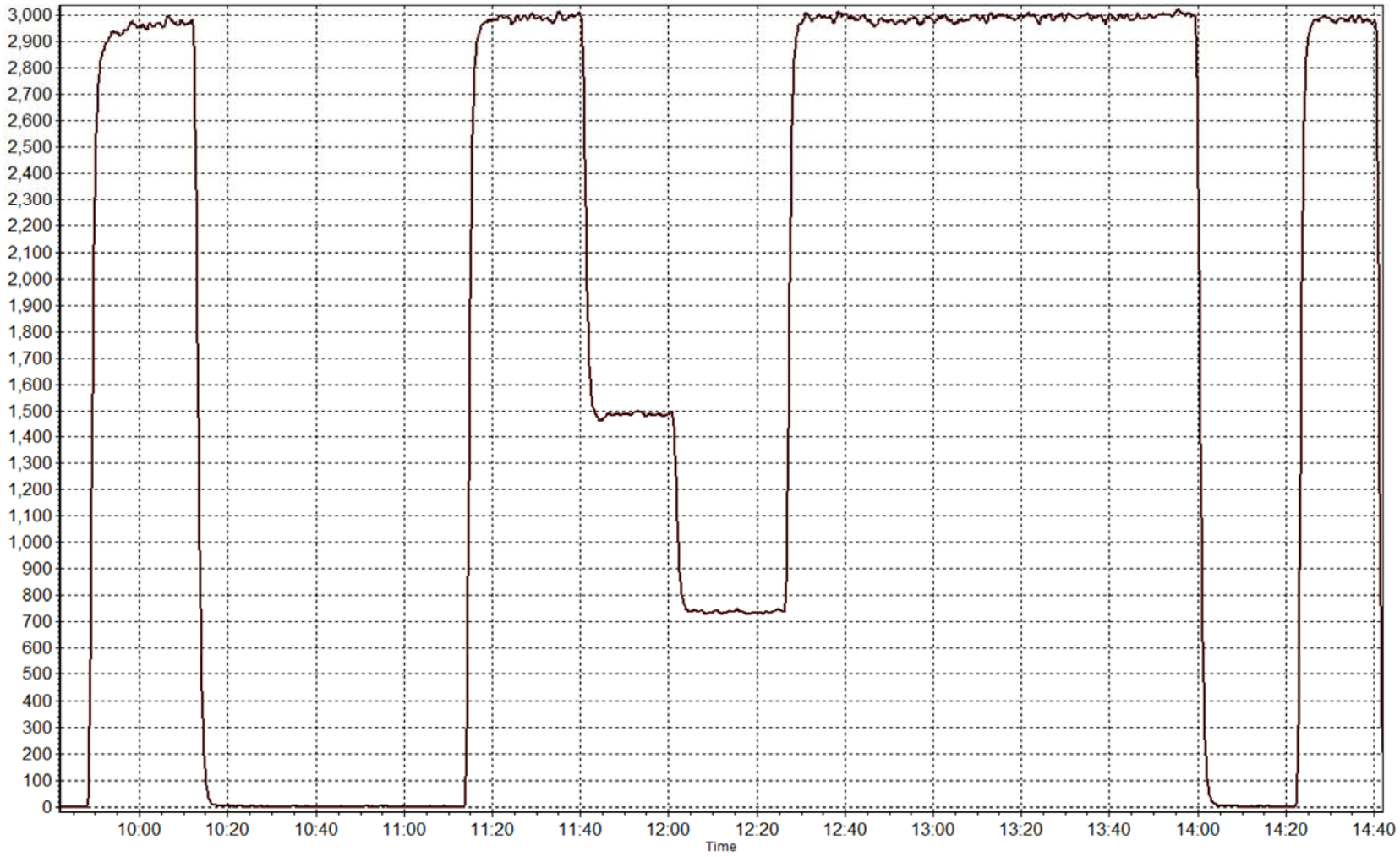
Calibration Date	Tuesday, January 07, 2014	Previous Calibration	December 4, 2013
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:30	End Time (MST)	14:45
Analyzer make	TEI 43C	Analyzer serial #	607415781

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999986
597.4	597.9	0.9992		
298.7	297.6	1.0038	Slope	0.997969
149.4	147.3	1.0138		
			Intercept	1.252374



SO_2 Calibration Plot **Date:** January 7, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 5, 2013
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	11:45	End Time (MST)	15:10
Barometric Pressure	734 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	8400311
Cal Gas Concentration	5.64 ppm H2S	Cal Gas Expiry Date	11/3/2009
Gas Cert Reference	CC 188098	SO2 gas conc.	50.8 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563
DACS voltage range	0-5V	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-619	-618
Analyzer Range (mv)	5000	5000	Lamp voltage	808	808
Calculated slope	0.986668	1.009072	Chamber temp.	44.1	44.1
Calculated intercept	-0.582635	0.107768	Pressure	689.6	677.7
Analyzer Background	15.6	16.4	Flow	0.648	0.731
Analyzer Coefficient	1.006	0.984	Intensity	43500	43500
			Converter temp.	800	800

Analyzer make/model	TEI 45C	Analyzer serial #	630718530
Converter make/model	CDN-101	Converter serial #	468

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.0	1.0	N/A
as found span	6000	79.8	75.0	77.1	0.973
SO2 scrubber check	5000	8.8	89.4	0.7	N/A
calibrator zero	6000	0.0	0.0	0.0	N/A
high point	6000	79.8	75.0	74.3	1.009
second point	6000	44.7	42.0	41.4	1.014
third point	6000	26.6	25.0	24.6	1.018
calibrator zero	6000	0.0	0.0	0.0	N/A
as left zero	6000	0.0	0.0	0.0	N/A
as left span	6000	79.8	75.0	74.5	1.007
				Average Correction Factor	1.014

Corrected As found	76.0	Previous response	74.6	% change	-1.9%

Notes:

zero and span adjusted.

scrubber check done.

Calibration Performed By: Mike Martineau

Wood Buffalo Environmental Association

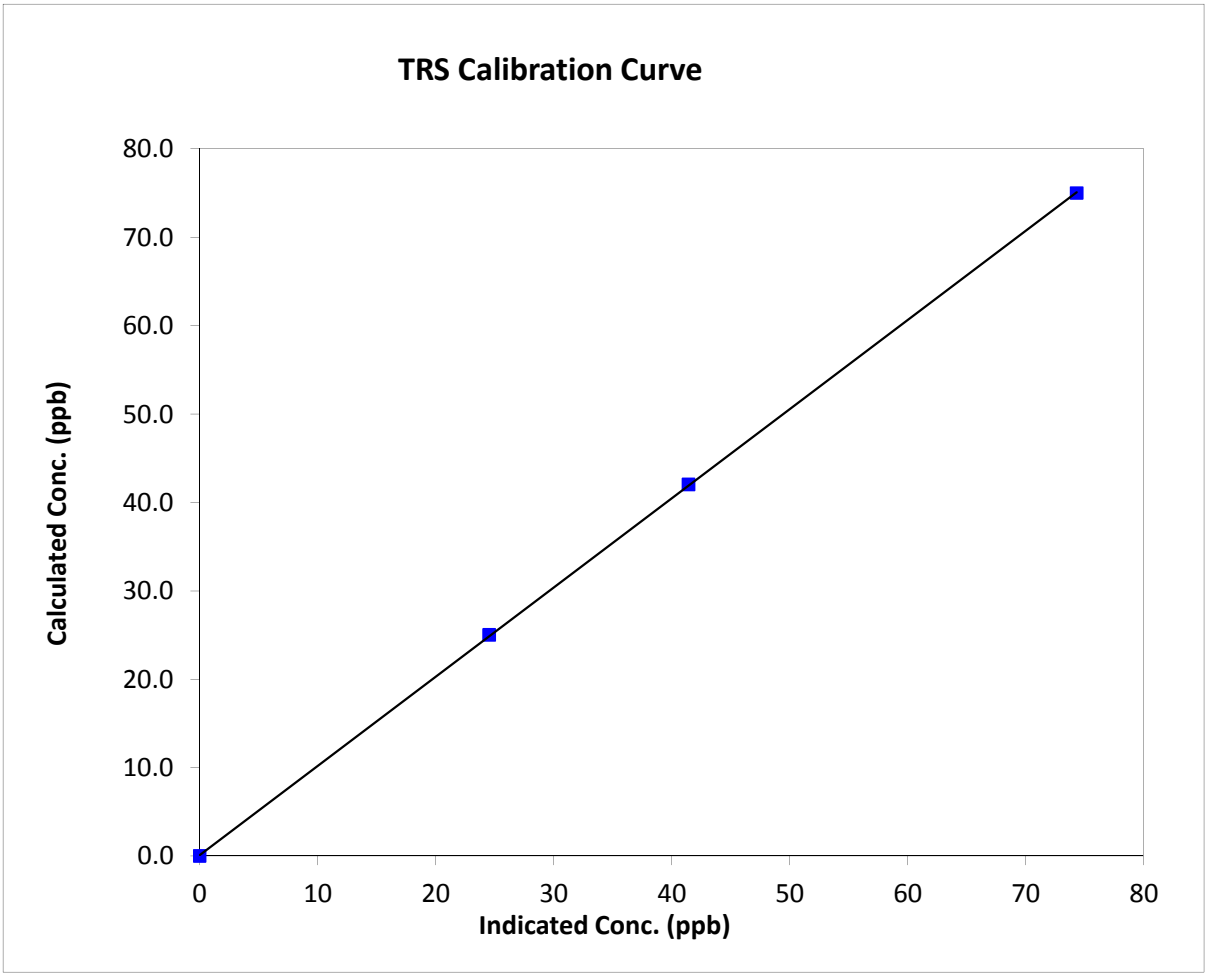
TRS Calibration Summary

Station Information

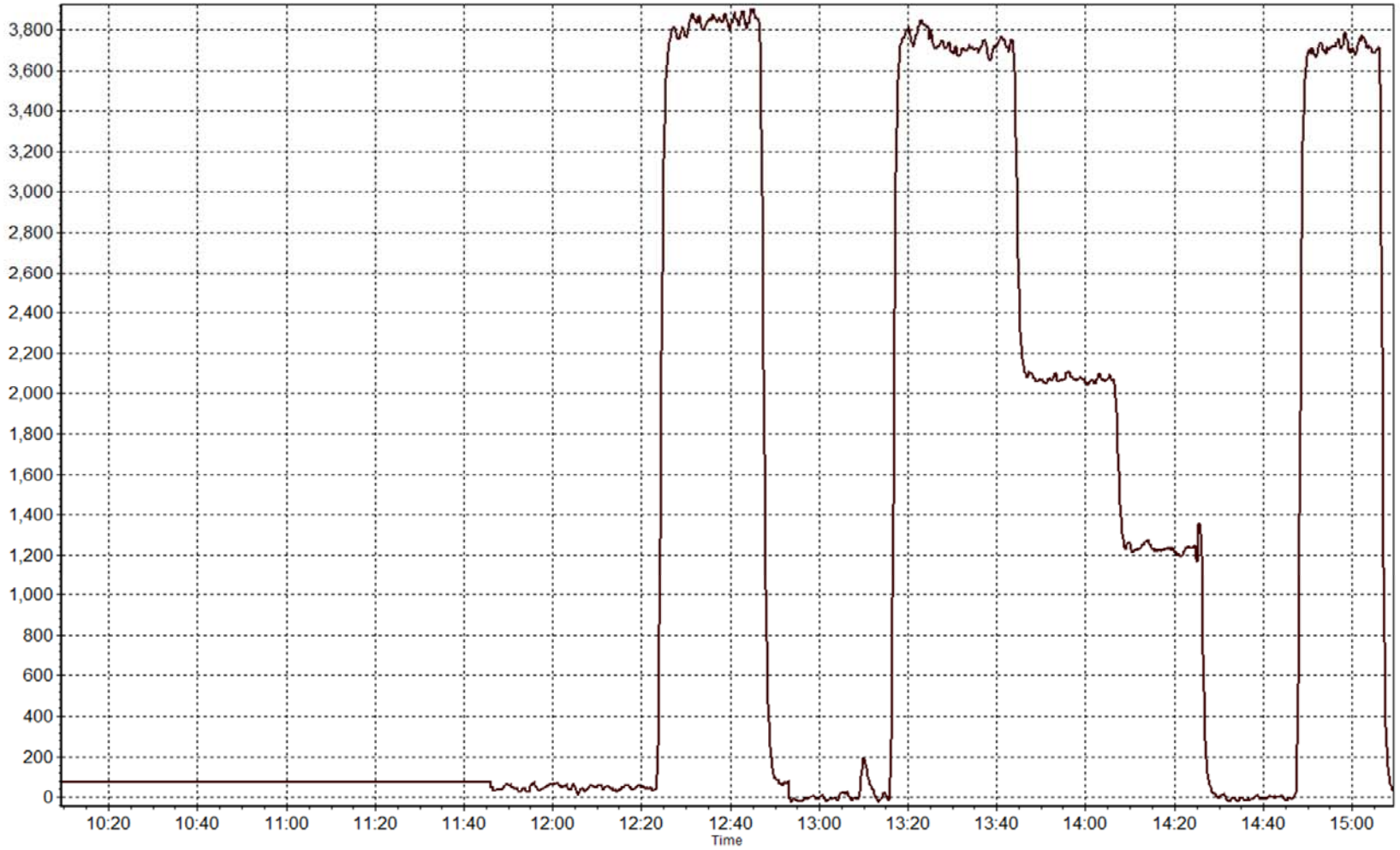
Calibration Date	January 8, 2014	Previous Calibration	December 5, 2013
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	11:45	End Time (MST)	12:50
Analyzer make	TEI 45C	Analyzer serial #	630718530

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999985
75.0	74.3	1.0093		
42.0	41.4	1.0139	Slope	1.009072
25.0	24.6	1.0181		
			Intercept	0.107768



TRS Calibration Plot **Date:** January 8, 2014



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Tuesday, January 07, 2014	Previous Calibration	Wednesday, December 04, 2013
Station Name	Athabasca Valley	Station Number	7

Reason:	Routine	Install	Removal	Other: Repair

Start Time (MST)	9:30	End Time (MST)	14:45
Barometric Pressure	n/a mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	LL 105142	Cal Gas Expiry Date	Thursday, October 10, 2013
CH4 Cal Gas Conc.	502.0 ppm	CH4 Equiv Conc.	1063.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	34.3	35.3
THC Range (mv)	50	50	Flame Temp	390.5	388.5
NMHC Range (ppm)	50	50	Carrier Pressure	32.1	32.1
NMHC Range (mv)	50	50	Fuel Pressure	41.4	41.4
THC Calc slope	0.998635	1.001837	Air Pressure	32.5	32.5
THC Calc intercept	0.024076	0.024153			
NMHC Calc slope	0.996964	1.004608			
NMHC Calc intercept	0.020074	0.018190			

Analyzer make	TEC 55i	Analyzer serial #	1218153354

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration THC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.00	N/A
as found span	5000	58.8	12.50	12.46	1.003
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	58.8	12.50	12.47	1.002
second point	5000	29.4	6.25	6.19	1.010
third point	5000	14.7	3.13	3.08	1.015
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	58.8	12.50	12.43	1.006
				Average Correction Factor	1.009

Corrected As found	12.46	Previous response	12.46	% change	0.0%

Notes:

no adjustments required.

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	58.8	6.60	6.57	1.004
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	58.8	6.60	6.56	1.006
second point	5000	29.4	3.30	3.25	1.015
third point	5000	14.7	1.65	1.61	1.024
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	58.8	6.60	6.53	1.010
				Average Correction Factor	1.015

Corrected As found	6.57	Previous response	6.56	% change	-0.2%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	58.8	5.90	5.89	1.002
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	58.8	5.90	5.90	1.001
second point	5000	29.4	2.95	2.94	1.004
third point	5000	14.7	1.48	1.47	1.004
calibrator zero	6000	0.0	0.00	0.00	N/A
as left zero	6000	0.0	0.00	0.00	N/A
as left span	5000	58.8	5.90	5.90	1.001
				Average Correction Factor	1.003

Corrected As found	5.89	Previous response	5.90	% change	0.2%

Wood Buffalo Environmental Association

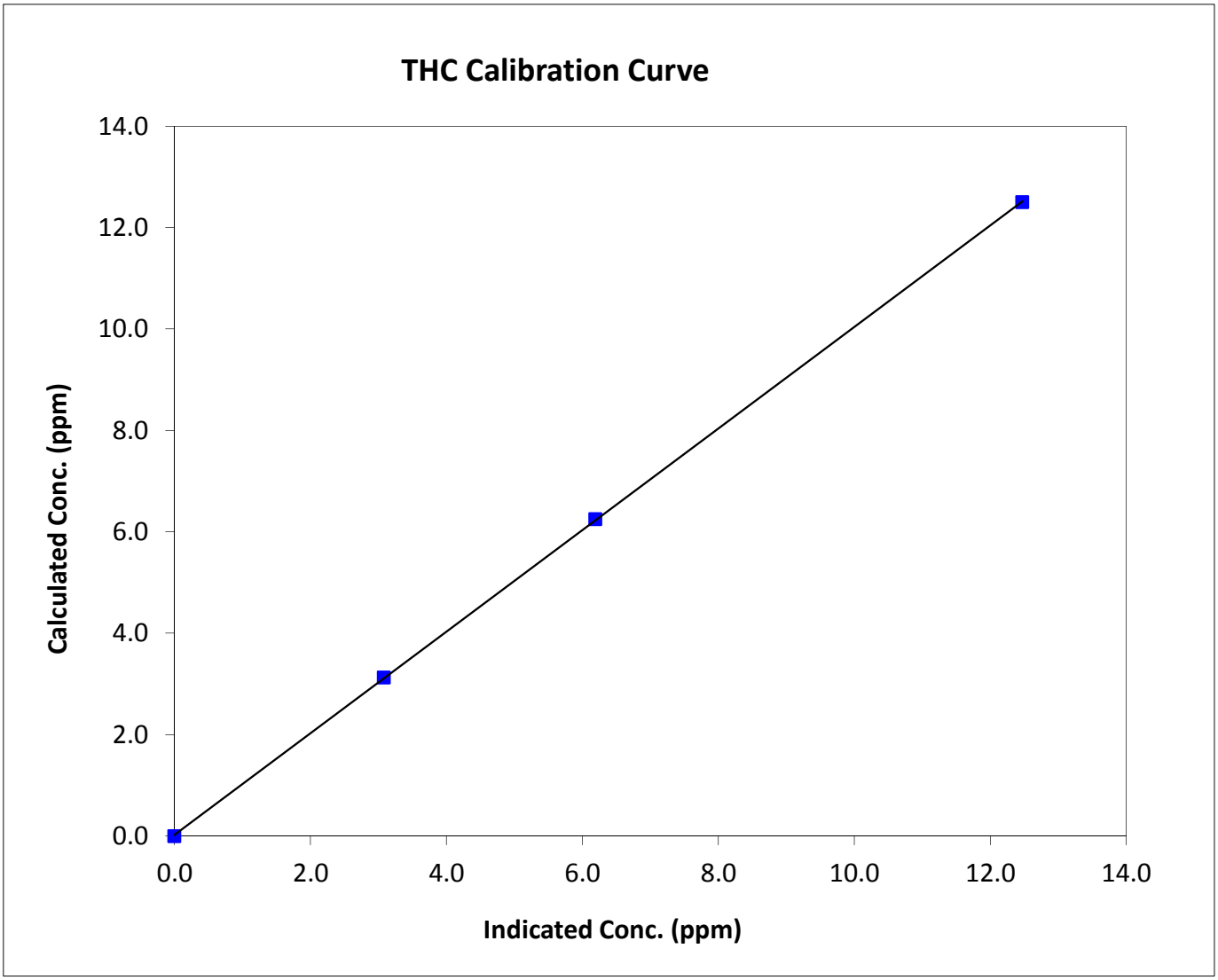
THC Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Name	Athabasca Valley	Station Number	7
Start Time (MST)	9:30	End Time (MST)	14:45
Analyzer make	TEC 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999980
12.50	12.47	1.0025		
6.25	6.19	1.0098	Slope	1.001837
3.13	3.08	1.0147		
			Intercept	0.024153



Wood Buffalo Environmental Association

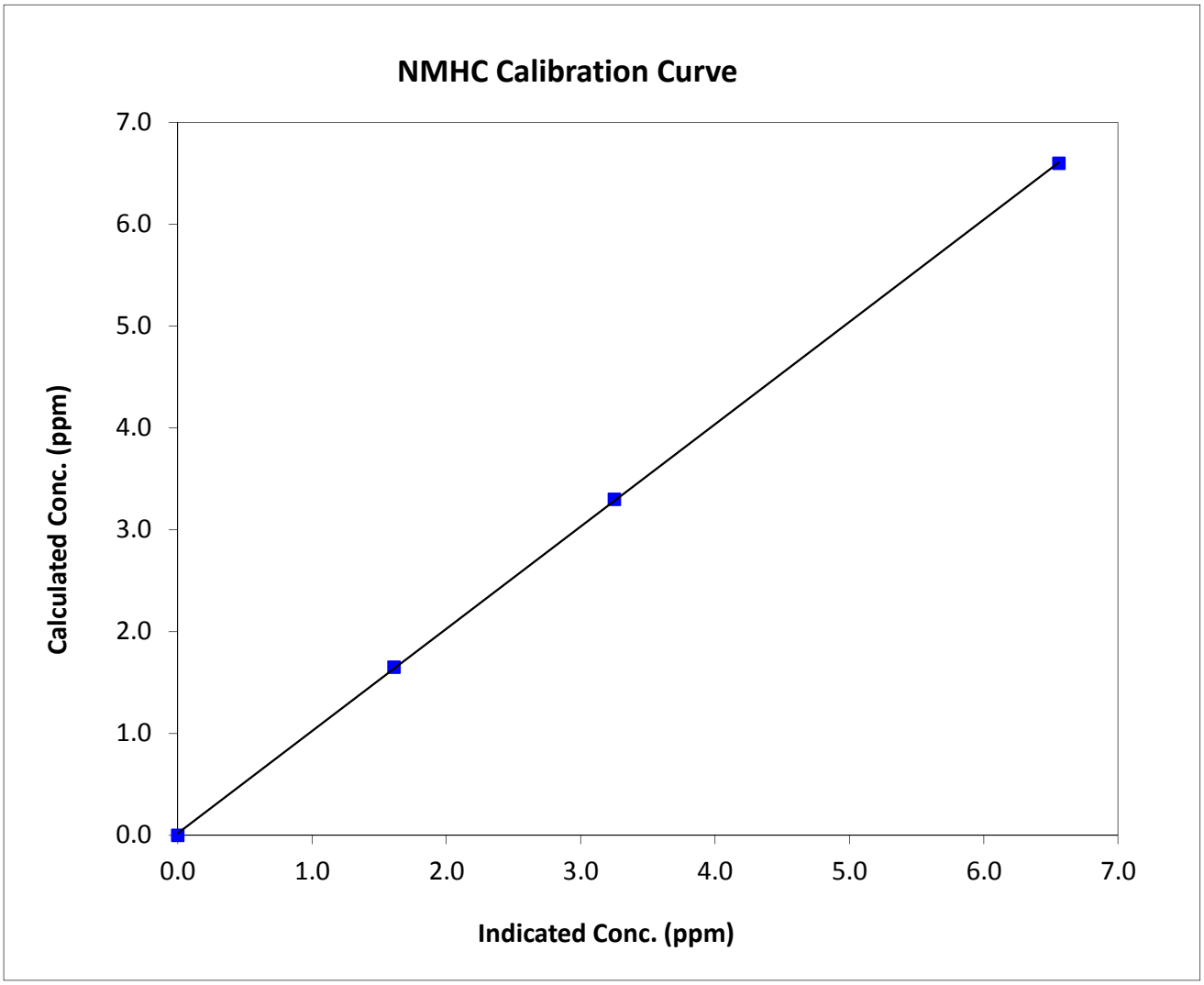
NMHC Calibration Summary

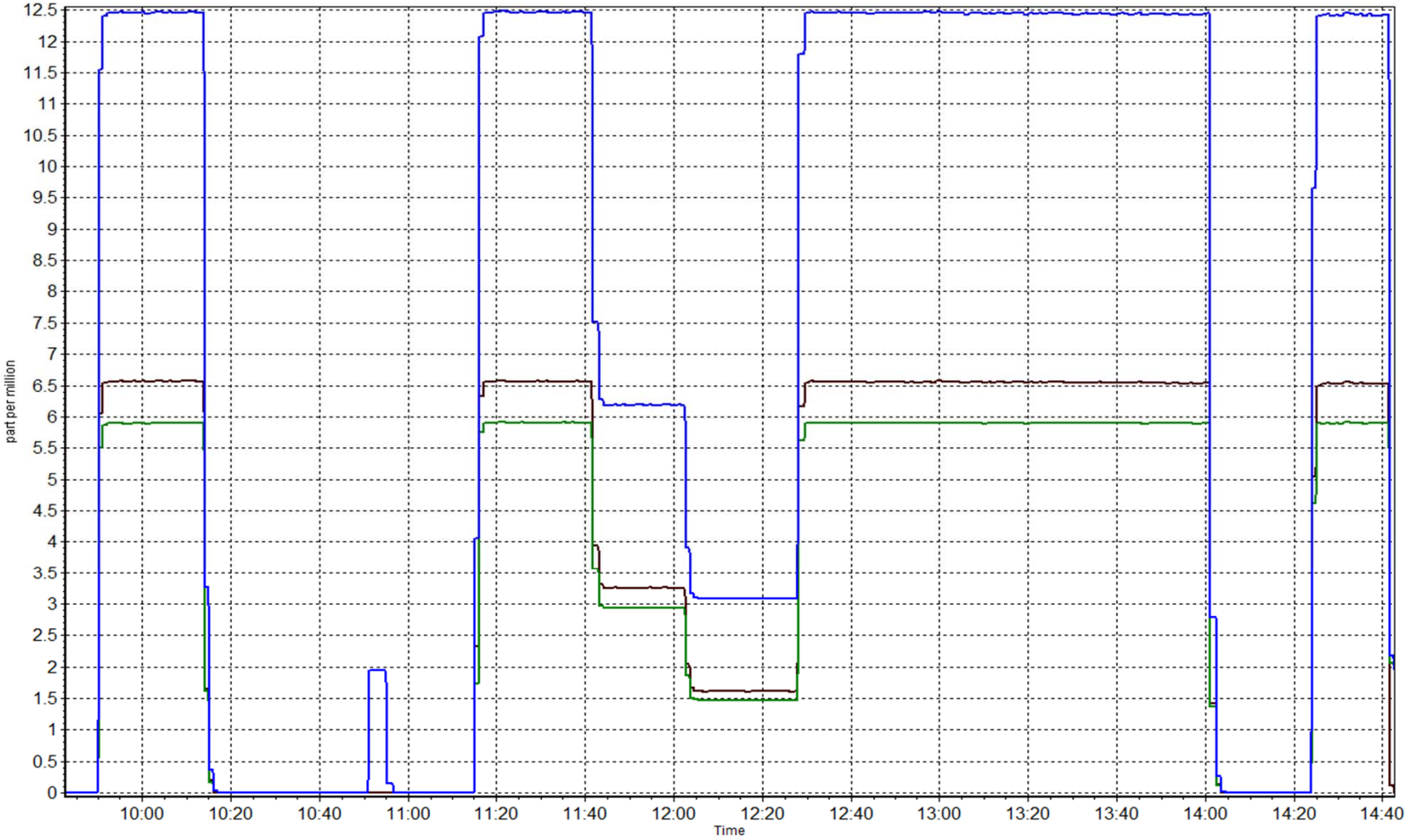
Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Name	Athabasca Valley	Station Number	7
Start Time (MST)	9:30	End Time (MST)	14:45
Analyzer make	TEC 55i	Analyzer serial #	1218153354

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999963
6.60	6.56	1.0057		
3.30	3.25	1.0150	Slope	1.004608
1.65	1.61	1.0244		
			Intercept	0.018190




part per million
12.5
12
11.5
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
10:00
10:20
10:40
11:00
11:20
11:40
12:00
12:20
12:40
13:00
13:20
13:40
14:00
14:20
14:40
Time

Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 18, 2013
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	9:45	End Time (MST)	12:25
Barometric Pressure	mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11021107
NO2 calibration used	January 7, 2014	Transfer Standard	N/A
DACS make/model	Campbell Scientific CR3000	DACS serial No.	5563
DACS voltage range	0-5V	DACS channel #	5

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	25.3	29.7
Analyzer Range (mv)	5000	5000	Lamp temp.	70.8	70.9
Calculated slope	0.998162	0.992085	Pressure	707.4	724.7
Calculated intercept	1.660924	0.566827	Flow cell A	0.672	0.683
Analyzer Background	0.4	0.5	Flow cell B	0.739	0.747
Analyzer Coefficient	1.072	1.102	Cell A Intensity	111400	112150
			Cell B Intensity	91350	92200

Analyzer make	TEI 49C	Analyzer serial #	607415760

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.000	0.0	-0.5	N/A
as found span	5000	1.216	376.0	364.1	1.033
calibrator zero	5000	0.000	0.0	-0.5	N/A
high point	5000	1.216	376.0	378.2	0.994
second point	5000	0.702	191.1	192.6	0.992
third point	5000	0.429	95.6	95.4	1.002
calibrator zero	5000	0.000	0.0	-0.6	N/A
as left zero	5000	0.000	0.0	-0.6	N/A
as left span	5000	1.216	376.0	373.7	1.006
				Average Correction Factor	0.996

Corrected As found	364.6	Previous response	373.7	% change	2.5%

Notes:

adjusted span.

changed inlet filter

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

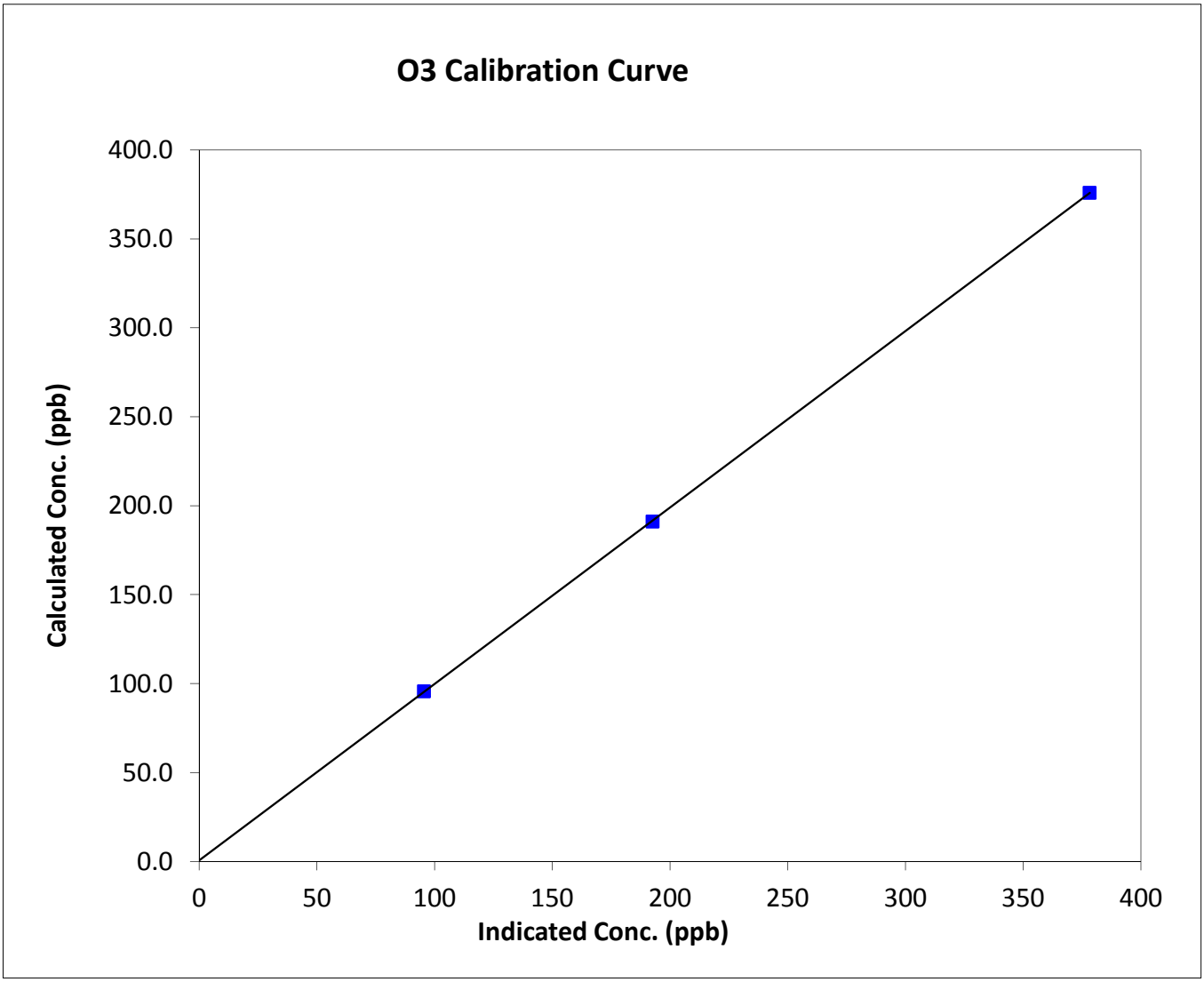
O_3 Calibration Summary

Station Information

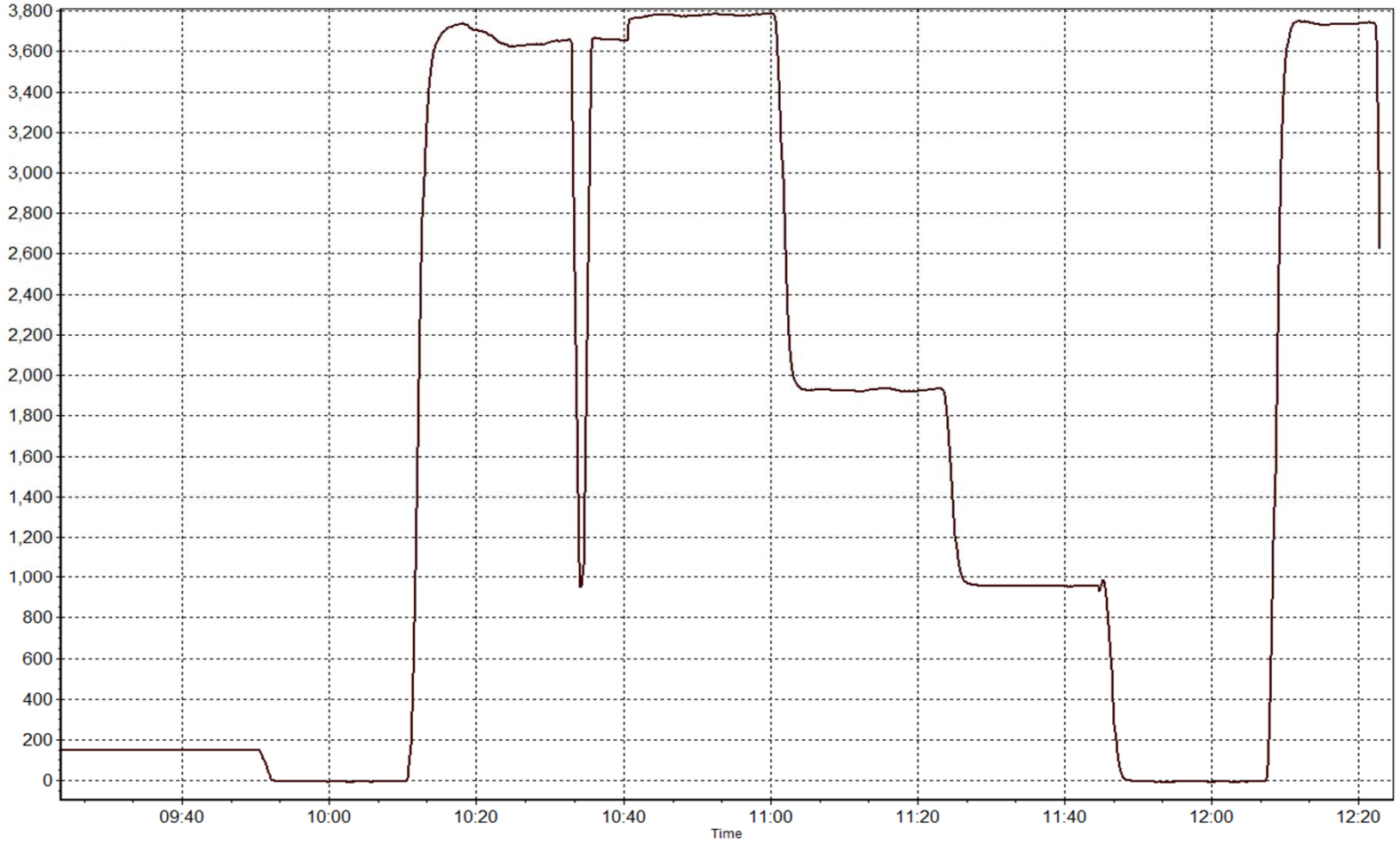
Calibration Date	Wednesday, January 08, 2014	Previous Calibration	December 18, 2013
Station Name	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:45	End Time (MST)	12:25
Analyzer make	TEI 49C	Analyzer serial #	607415760

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999994
376.0	378.2	0.9941		
191.1	192.6	0.9922	Slope	0.992085
95.6	95.4	1.0021		
			Intercept	0.566827



O3 Calibration Plot **Date:** January 8, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Name	Athabasca Valley	Station Number	AMS 7
Reason:	Routine		
Start Time (MST)	9:30	End Time (MST)	14:45
Barometric Pressure	N/A mmHg	Station Temperature	20.0 Deg C
Calibrator	Sabio 4010	Serial Number	11021107
NO Cal Gas Conc	51.2 ppm	Cal Gas Expiry Date	October 10, 2013
NOx Cal Gas Conc	51.2 ppm	Cal Gas Serial #	LL 105142

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	5563

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.987984	0.989803	1.002397
	Data Offset	2.563694	2.651992	0.341049
After	Data Slope	1.005138	1.002506	0.994531
	Data Offset	2.866057	2.753512	-1.015404
Channel #		4	5	6
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	TEI 42C	Analyzer serial #	601114773

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.836	ppb	0.757	ppb
NOX coefficient	0.999	ppb	1.003	ppb
NO2 coefficient	0.998	ppb	0.998	ppb
NO bkgrnd	3.6		3.2	
NOX bkgrnd	3.7		3.4	
PMT Voltage	-826.0	V	-826.0	V
Moly Temp	323.0	Deg C	323.0	Deg C
PMT Temp	-3.6	Deg C	-3.6	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	156.0	mmHg	138.5	mmHg
Sample Flow	787	ccm	820	ccm

Notes: replaced pump and charcoal scrubber after as founds.
adjusted span

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 7, 2014 Station Number: AMS 7

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
as found span	5000	58.8	602.1	602.1	0.0	538.3	538.9	-0.3	1.1186	1.1174
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
high point	5000	58.8	602.1	602.1	0.0	599.5	597.8	1.8	1.0044	1.0072
second point	5000	29.4	301.1	301.1	0.0	295.2	294.5	0.9	1.0197	1.0223
third point	5000	14.7	150.5	150.5	0.0	145.5	144.7	0.7	1.0348	1.0400
calibrator zero	6000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
as left zero	6000	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	N/A	N/A
as left span	5000	58.8	602.1	602.1	0.0	597.8	228.1	366.4	N/A	N/A
							Average Correction Factor		1.0196	1.0232

Corrcted As found NO_X= 538.4 NO= 539.0 Percent Change NO_X= 10.0% NO= 10.1%

Previous Response NO_X= 592.3 NO= 593.3

GPT Calibration Data

Dilution Flow 5000 Source Gas Flow 58.80 ccm

O3 Setpoint (lamp current)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.1			N/A	
1st NO2 (1.02A)	N/A	219.5	376.0	598.4	219.5	378.6	0.9946	1.0000	0.9932	100.7%
2nd NO2 (0.57A)	N/A	404.4	191.1	598.0	404.4	193.7	0.9951	1.0000	0.9868	101.3%
3rd NO2 (0.34A)	N/A	499.9	95.6	597.6	499.9	98.1	0.9958	1.0000	0.9743	102.6%
4th NO2 (0)	595.5	N/A	2.1	597.6	595.5	2.2	0.9959	1.0000	N/A	N/A
					Average Correction Factor		0.9954	1.0000	0.9848	101.6%

Calibration Performed By: Michael Martineau

Wood Buffalo Environmental Association

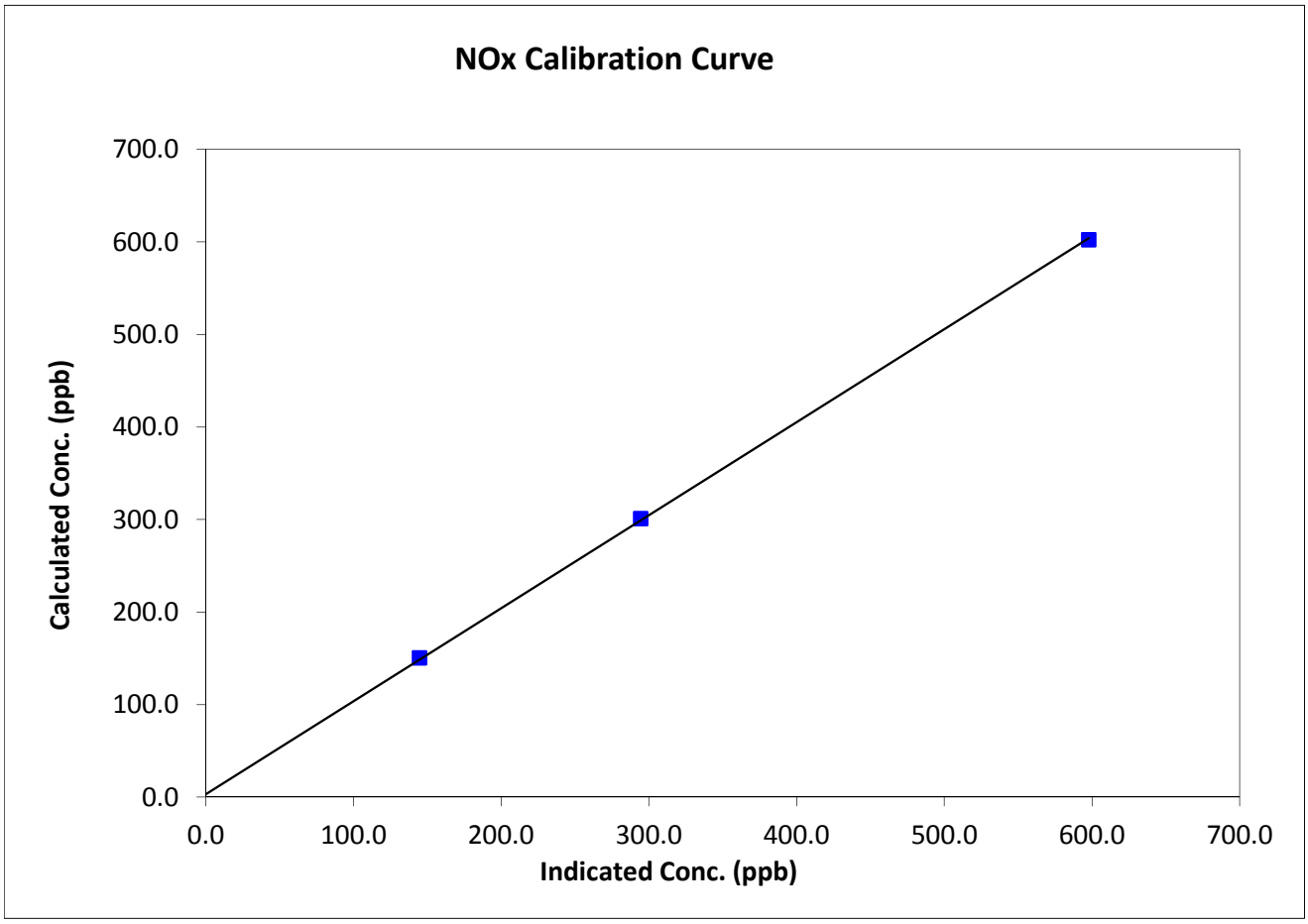
NO_X Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Number	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:30	End Time (MST)	14:45
Analyzer make	TEI 42C	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999900
602.1	597.8	1.0072		
301.1	294.5	1.0223	Slope	1.005138
150.5	144.7	1.0400		
			Intercept	2.866057



Wood Buffalo Environmental Association

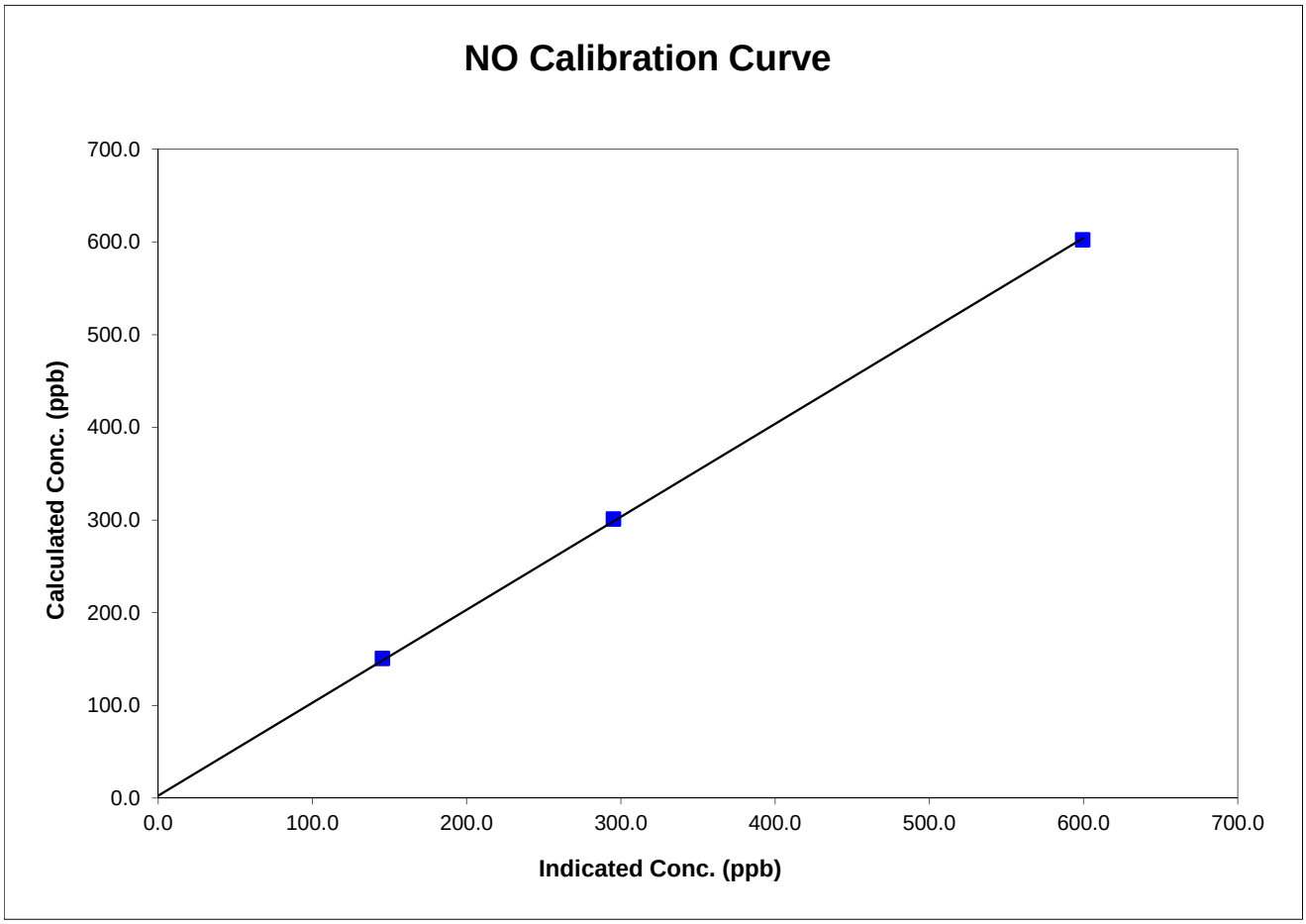
NO Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Number	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:30	End Time (MST)	14:45
Analyzer make	TEI 42C	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999905
602.1	599.5	1.0044		
301.1	295.2	1.0197	Slope	1.002506
150.5	145.5	1.0348		
			Intercept	2.753512



Wood Buffalo Environmental Association

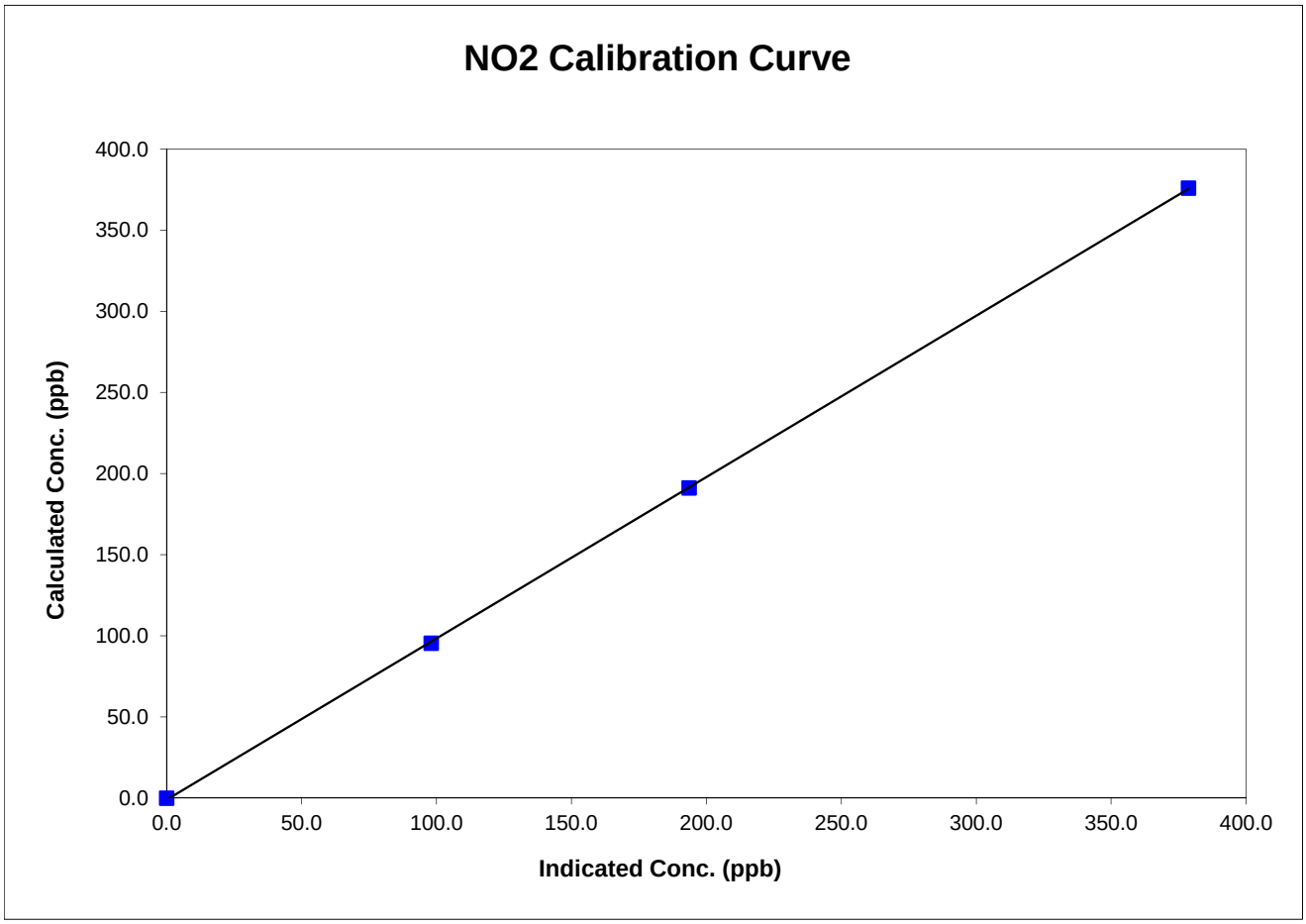
NO_2 Calibration Summary

Station Information

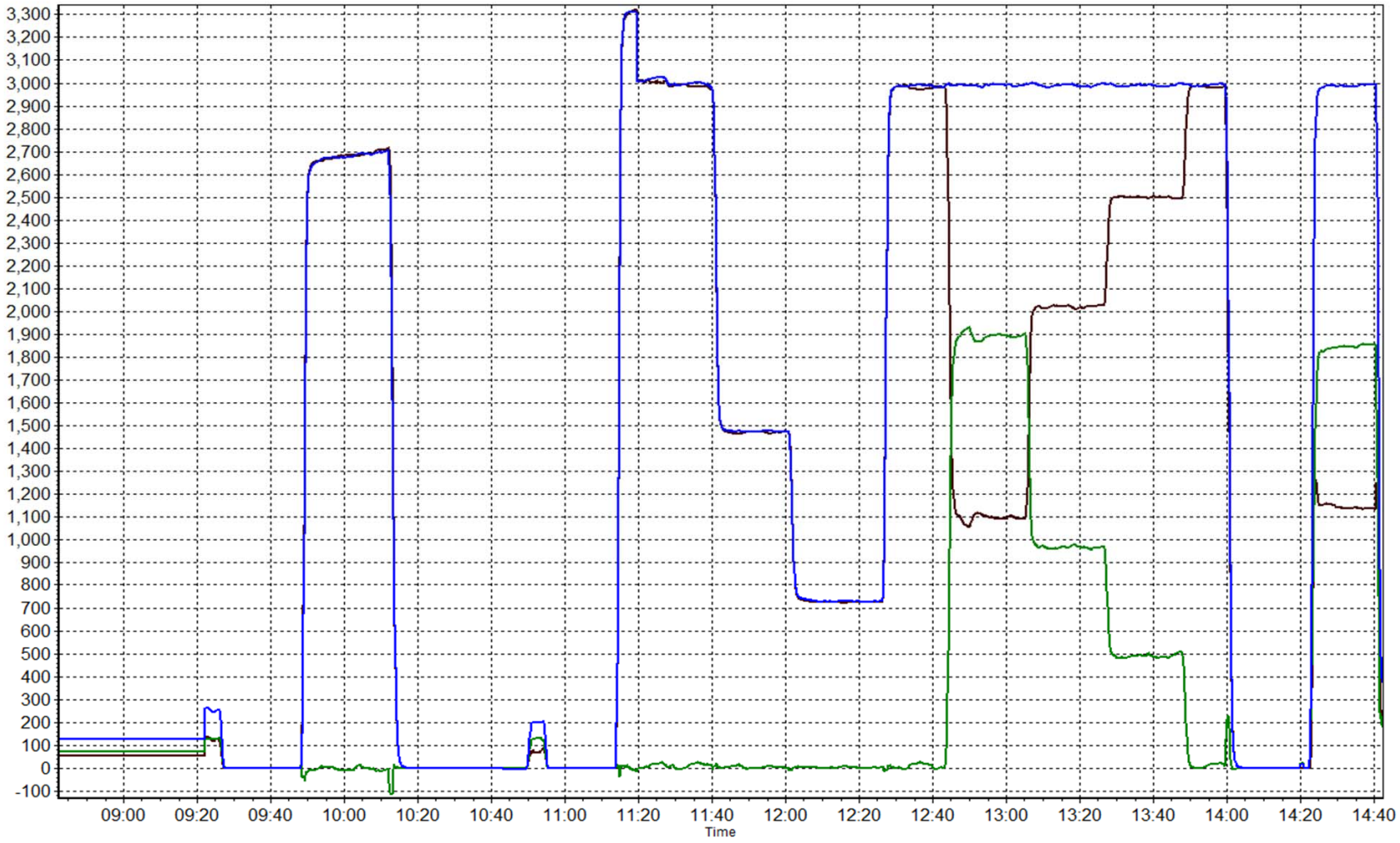
Calibration Date	January 7, 2014	Previous Calibration	December 4, 2013
Station Number	Athabasca Valley	Station Number	AMS 7
Start Time (MST)	9:30	End Time (MST)	14:45
Analyzer make	TEI 42C	Analyzer serial #	601114773

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999970
376.0	378.6	0.9932		
191.1	193.7	0.9868	Slope	0.994531
95.6	98.1	0.9743		
			Intercept	-1.015404



NOx, NO & NO_2 Calibration Plot **Date:** **January 7, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 8
FORT CHIPEWYAN
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
JANUARY 2014

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	694	35	50	97.98	7	0	3	0
O3(ppb) Average	707	34	37	99.60	41	0	38	0
NO2(ppb) Average	693	36	51	97.98	18	0	6	0
NO(ppb) Average	693	36	51	97.98	3	-	1	-
NOX(ppb) Average	693	36	51	97.98	19	-	7	-
PM2.5(ug/m3) Average	741	0	3	99.60	14.2	0	6.0	0
Wind Speed 10 m (km/h) Average	741	0	3	99.60	44	-	-	-
Wind Direction 10 m (deg) Average	741	0	3	99.60	-	-	-	-
Temperature 2 m (C) Average	744	0	0	100.00	2.7	-	-6.1	-
Relative Humidity (%) Average	744	0	0	100.00	94	-	86	-
Precipitation (mm) Total	744	0	0	100.00	0.8	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	185	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	694	0.5	1	-	0	0	0	0	0	2	7
O3(ppb) Average	707	31.9	6	-	7	24	30	33	35	37	41
NO2(ppb) Average	693	1.6	3	-	0	0	0	1	2	4	18
NO(ppb) Average	693	0.2	0	-	0	0	0	0	0	0	3
NOX(ppb) Average	693	1.8	3	-	0	0	0	1	2	5	19
PM2.5(ug/m3) Average	741	2.31	2	-	0.1	0.7	1.1	1.7	2.9	4.9	14.2
Wind Speed 10 m (km/h) Average	741	13.7	8	-	0	4	8	13	18	23	44
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-
Temperature 2 m (C) Average	744	-20.74	8	-	-41.5	-30.9	-26.4	-20.7	-15.3	-12.1	2.7
Relative Humidity (%) Average	744	76.2	7	-	59	68	71	76	81	85	94
Precipitation (mm) Total	744	-	-	2.2	0	0	0	0	0	0	0.8
Global Solar Radiation (W/m2) Average	744	16.9	33	-	0	0	0	0	16	69	185

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS 8)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	02 Jan 2014 04:00	02 Jan 2014 15:00	12	Power interruption resulting in analyzer re-set
SO2	15 Jan 2014 09:00	15 Jan 2014 10:00	2	Maintenance - remotely initiated daily QA check
SO2	21 Jan 2014 18:00	21 Jan 2014 18:00	1	Station power spike
O3	15 Jan 2014 10:00	15 Jan 2014 11:00	2	Maintenance - remotely initiated daily QA check
O3	21 Jan 2014 18:00	21 Jan 2014 18:00	1	Station power spike
NO2, NO, NOX	02 Jan 2014 04:00	02 Jan 2014 15:00	12	Power interruption resulting in analyzer re-set
NO2, NO, NOX	15 Jan 2014 09:00	15 Jan 2014 10:00	2	Maintenance - remotely initiated daily QA check
NO2, NO, NOX	21 Jan 2014 18:00	21 Jan 2014 18:00	1	Station power spike
PM2.5	08 Jan 2014 11:00	08 Jan 2014 12:00	2	Flow and zero reference checks, sample head cleaning
PM2.5	21 Jan 2014 18:00	21 Jan 2014 18:00	1	Station power spike
Wind Speed, Wind Direction	01 Jan 2014 05:00	01 Jan 2014 05:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	01 Jan 2014 14:00	01 Jan 2014 14:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 07:00	07 Jan 2014 07:00	1	Flatline in sensor output signal - Sensor frozen

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 ppb on Jan 8 11:00 Maximum Daily Average: 2.6 ppb on Jan 8

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 30
Maximum Diurnal Average: 2.8 ppb at hour 2 Minimum Diurnal Average: 0.3 ppb at hour 4
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 2$ $P_{99} = 6$

Hours in Service:	744
Hours of Data:	694
Hours of Missing Data:	50
Hours of Calibration:	35
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	2	4	6	7	5	5	1.5	7
2-Jan	5	4	4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	3	2	2	1	0	0	0	0	1	--	5
3-Jan	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
4-Jan	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
5-Jan	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
6-Jan	0	Z	1	3	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	4
7-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0.1	0
8-Jan	0	Z	0	0	0	2	3	5	6	6	7	6	6	4	2	1	2	2	1	1	1	1	1	1	2.6	7
9-Jan	0	Z	0	1	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
10-Jan	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
11-Jan	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
12-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	4	0.4	4
13-Jan	3	Z	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	3
14-Jan	0	Z	0	0	0	0	0	0	0	1	4	1	1	0	0	1	2	2	1	1	2	2	2	2	1.0	4
15-Jan	2	1	Z	0	0	0	0	0	M	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
16-Jan	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
17-Jan	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
18-Jan	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-Jan	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-Jan	0	Z	0	0	0	0	0	1	3	3	4	5	5	5	4	3	2	2	2	2	2	2	2	1	2.1	5
21-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	0	0	0	0	0	0	0.1	1
22-Jan	0	Z	0	0	0	0	0	0	0	1	2	1	1	1	1	2	3	5	4	5	4	3	3	2	1.6	5
23-Jan	1	Z	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
24-Jan	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-Jan	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
26-Jan	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-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	2	3	3	0.6	3
28-Jan	3	Z	3	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	3
29-Jan	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
30-Jan	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
31-Jan	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
	0.6	2.8	0.4	0.3	0.3	0.4	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.4	0.4	0.5	0.7	0.6	0.6	Diurnal Average	
	5	4	4	3	4	3	3	5	6	6	7	6	6	5	4	3	3	5	4	5	6	7	5	5	Diurnal Maximum	

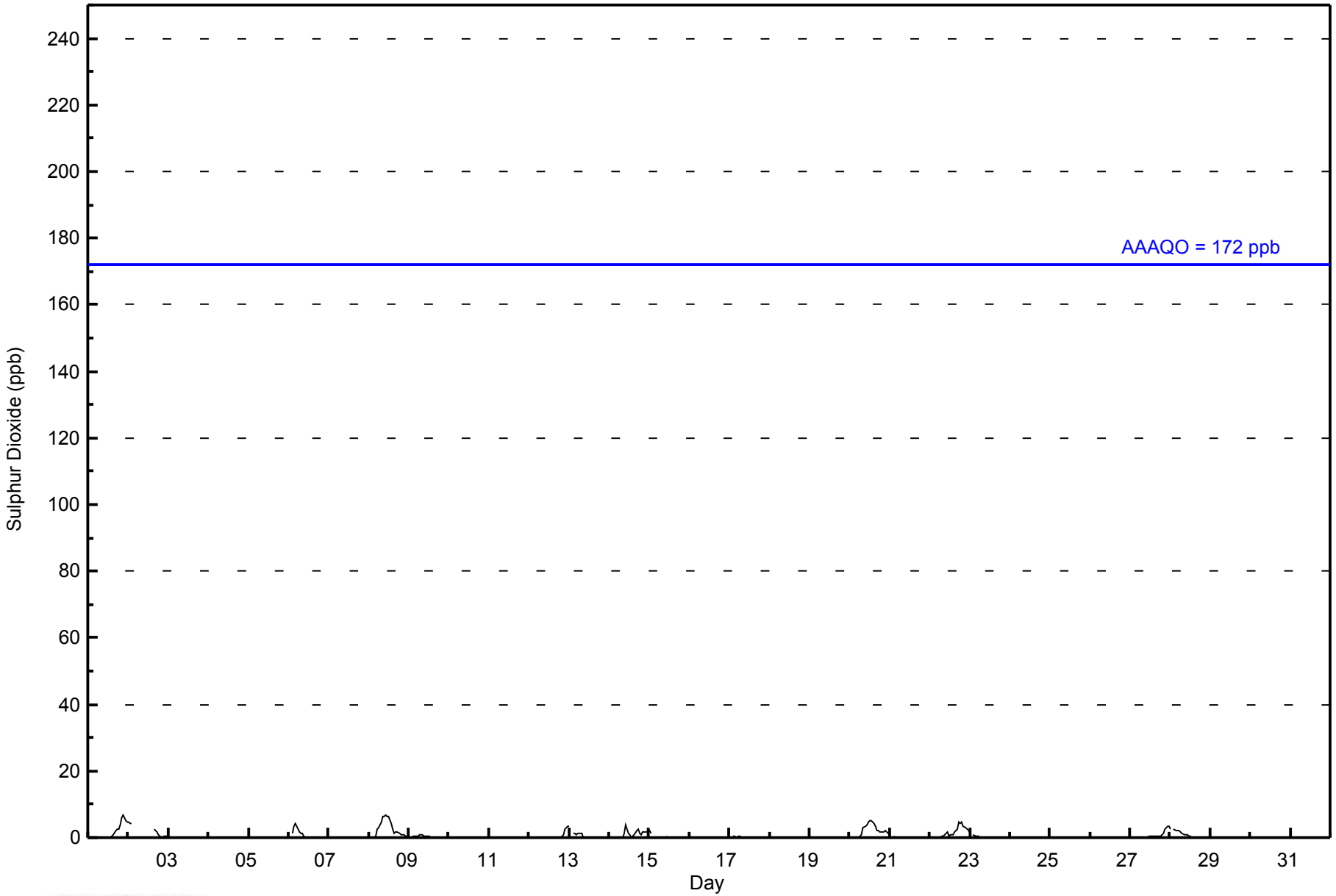
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	694	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: 694

Total Number of Hours: 744

Sulphur Dioxide (SO_2) - ppb
Fort Chipeywan - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	32	16	26	41	75	135	19	11	11	11	6	12	28	69	75	124	691
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	32	16	26	41	75	135	19	11	11	11	6	12	28	69	75	124	691

Total Number of Valid Hours: 691

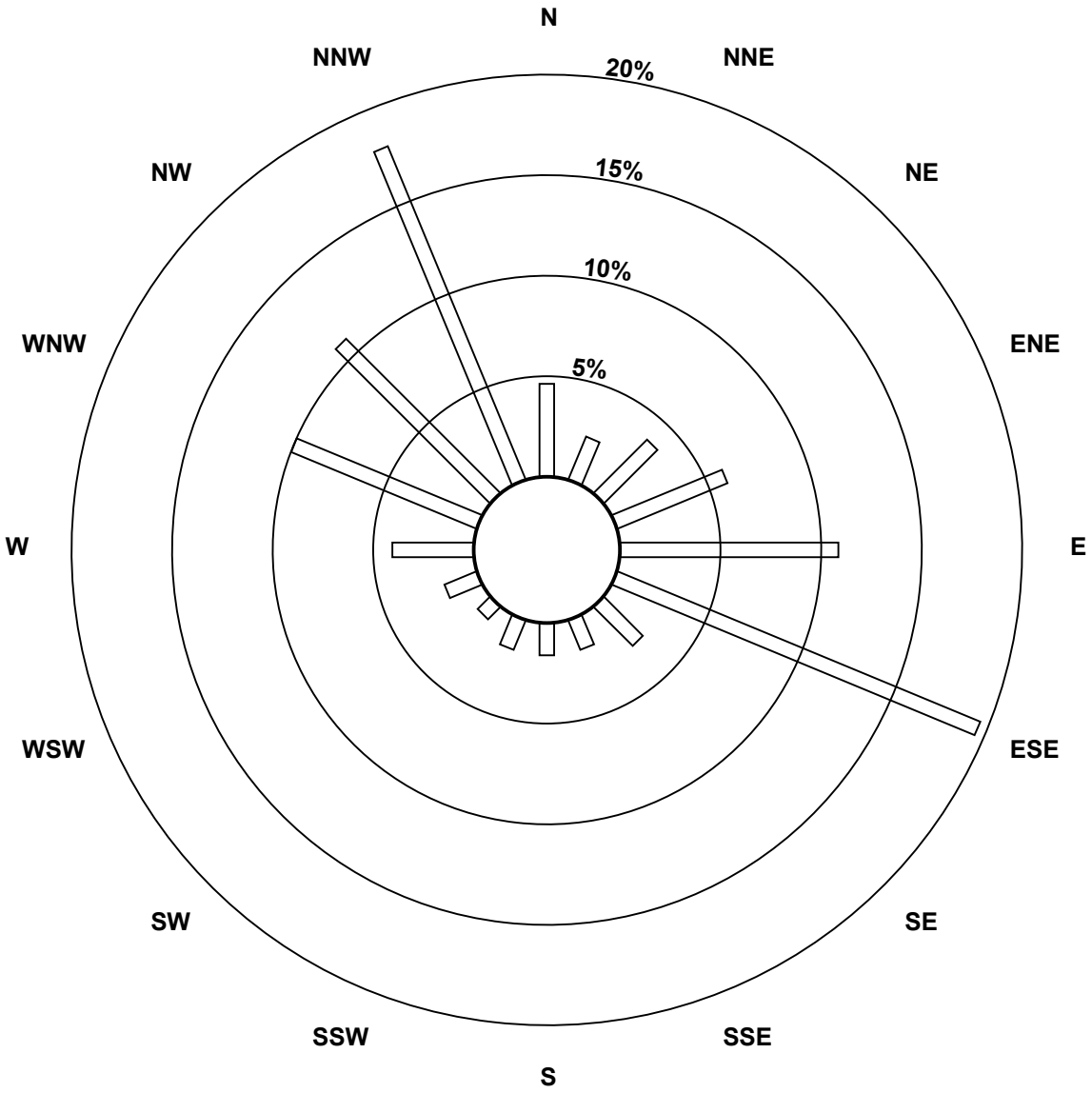
Total Number of Hours: 744

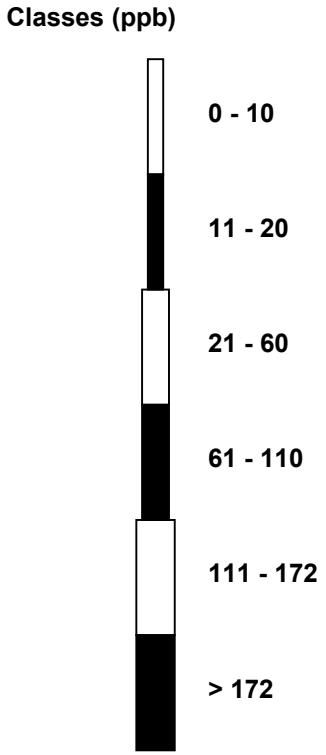
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan (AMS 8)





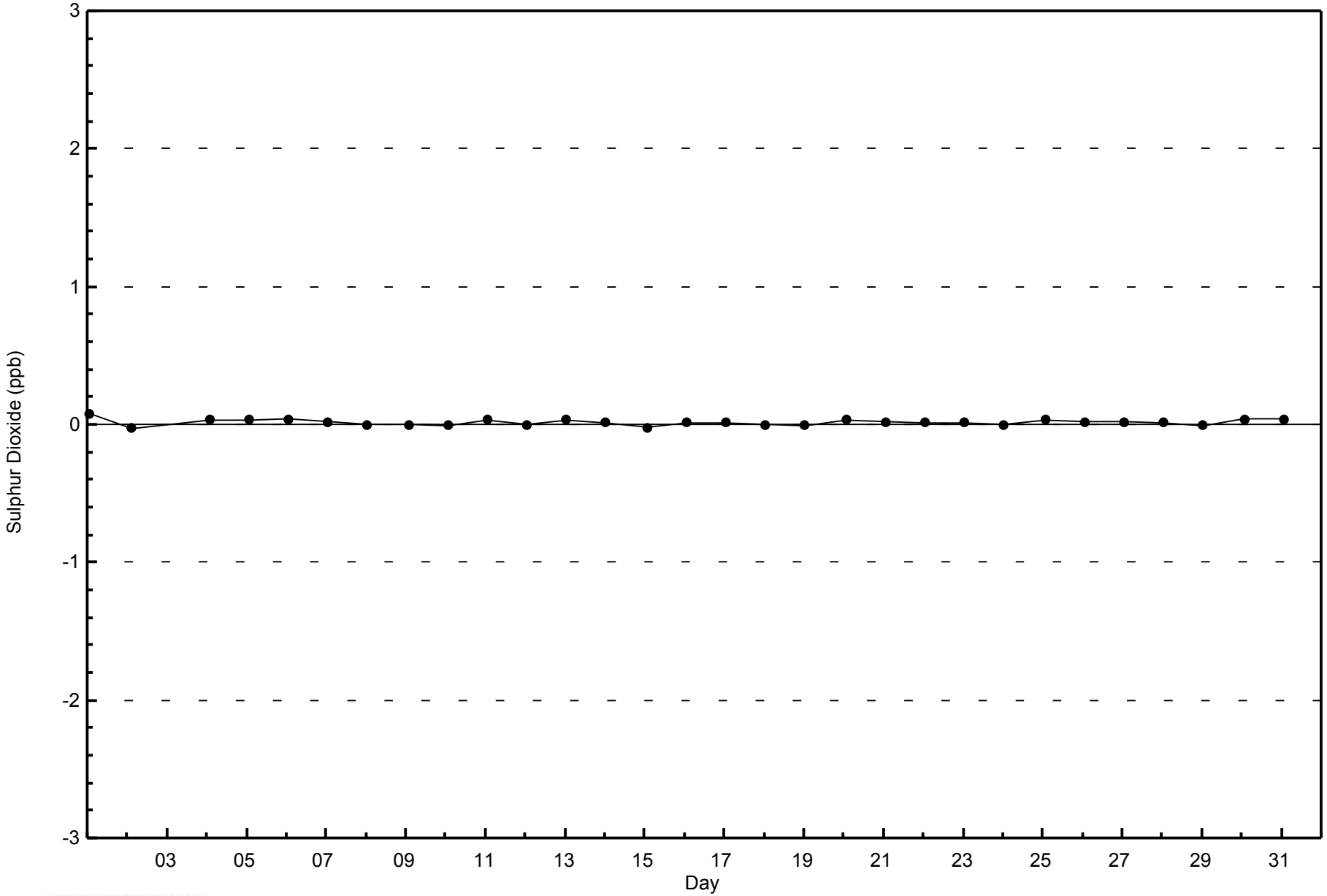
Total Number of Valid Hours: 691

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - January 2014



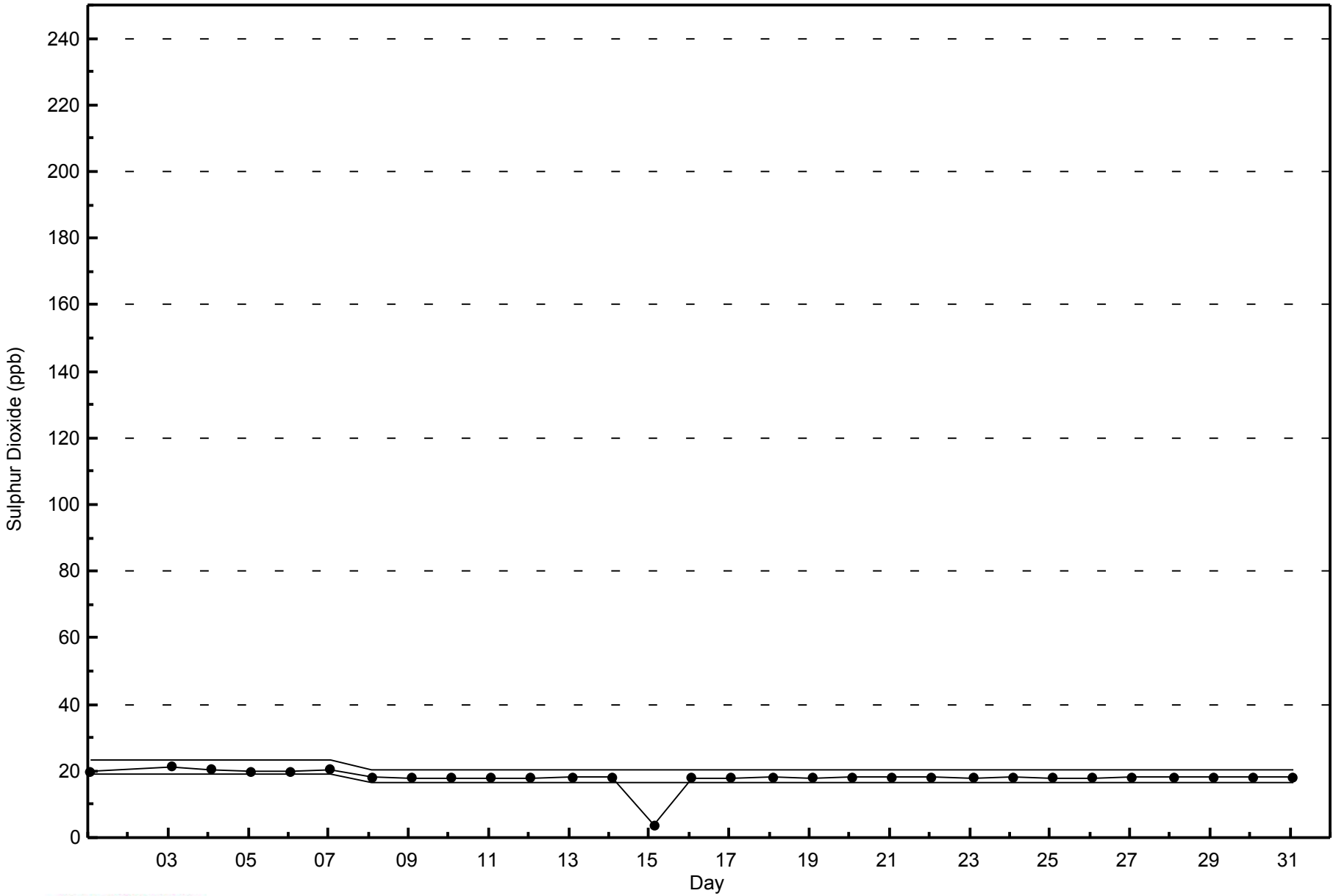
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 3 ppb on Jan 27 14:00 — Maximum Daily Average: 0.7 ppb on Jan 20

Minimum Value: 0 ppb on Jan 6 05:00 — Minimum Daily Average: 0.0 ppb on Jan 30

Maximum Diurnal Average: 0.5 ppb at hour 14 — Minimum Diurnal Average: 0.1 ppb at hour 3

Monthly Average: 0.2 ppb — Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	36
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	0	0	1	0	1	1	1	2	1	0	1	0	0	0	0	0	0	0.4	2
2-Jan	0	0	0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	3	1	1	0	1	0	0	0	0	--	3
3-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0.2	1
4-Jan	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
5-Jan	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
6-Jan	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
7-Jan	0	Z	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	--	0
8-Jan	0	Z	0	0	0	0	0	0	0	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0.4	2
9-Jan	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-Jan	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
11-Jan	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
12-Jan	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.1	1
13-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.2	1
14-Jan	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
15-Jan	0	0	Z	0	0	0	0	0	M	M	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.2	1
16-Jan	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
17-Jan	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
18-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
19-Jan	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-Jan	0	Z	0	0	0	0	0	0	0	2	3	3	3	3	2	0	0	0	0	0	0	0	0	0	0.7	3
21-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PF	0	0	0	0	0	0	0.1	0
22-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.3	1
23-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
24-Jan	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-Jan	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-Jan	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-Jan	0	Z	0	0	0	0	0	0	0	0	1	2	2	3	3	1	0	0	0	0	0	0	0	0	0.6	3
28-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
29-Jan	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
30-Jan	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
31-Jan	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
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0	0	0	0	0	1	0	0	0	2	3	3	3	3	3	3	1	1	0	1	0	0	0	0	Diurnal Maximum	

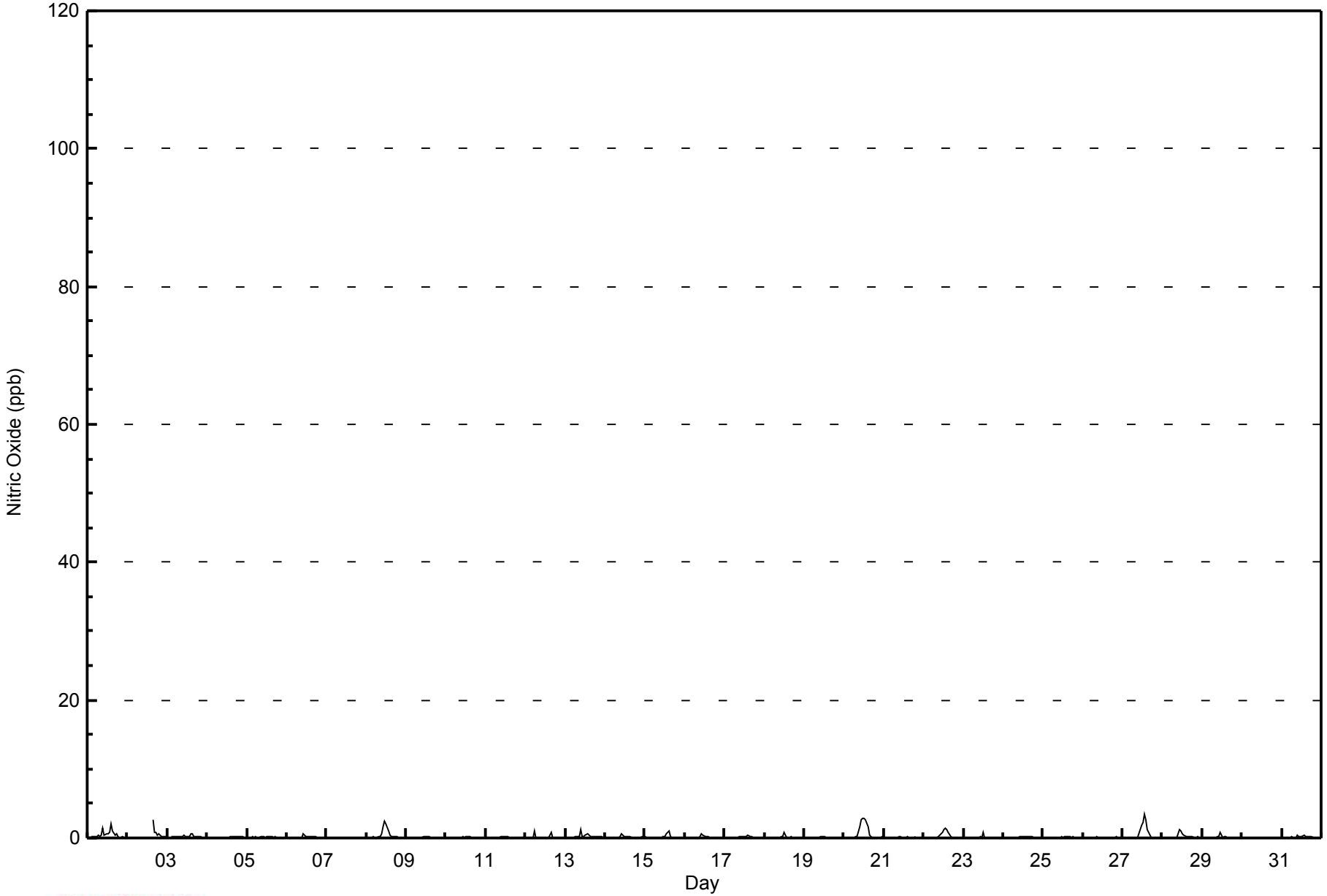
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	100.00	100.00
21 - 40	0	0.00	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: 693

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	32	16	26	41	75	134	19	11	11	11	6	12	28	69	75	124	690
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	32	16	26	41	75	134	19	11	11	11	6	12	28	69	75	124	690

Total Number of Valid Hours: 690

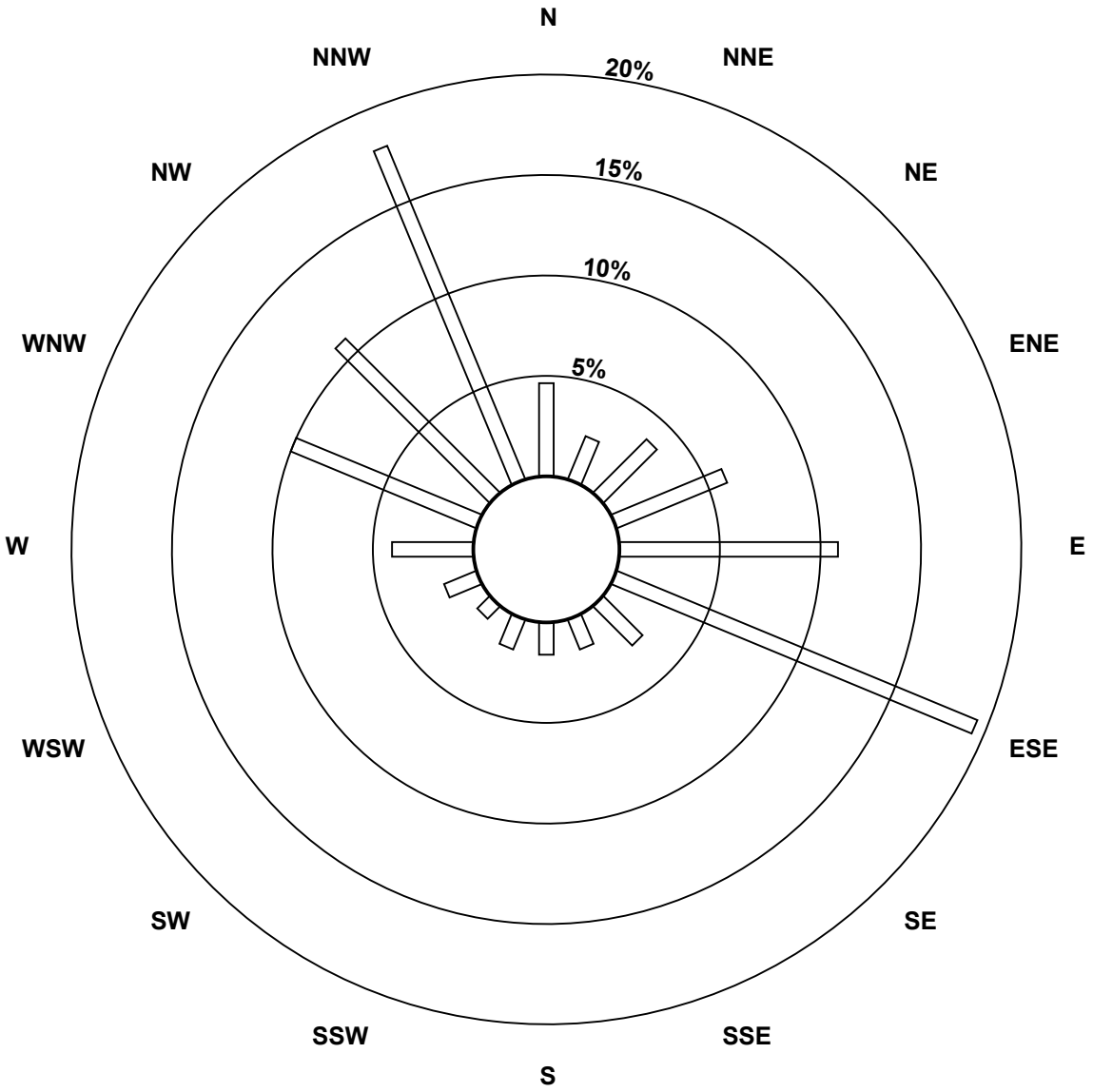
Total Number of Hours: 744

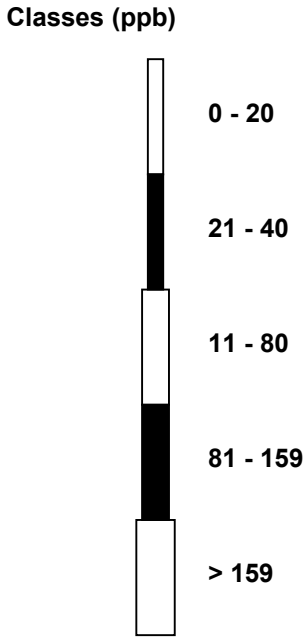
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Fort Chipeywan (AMS 8)





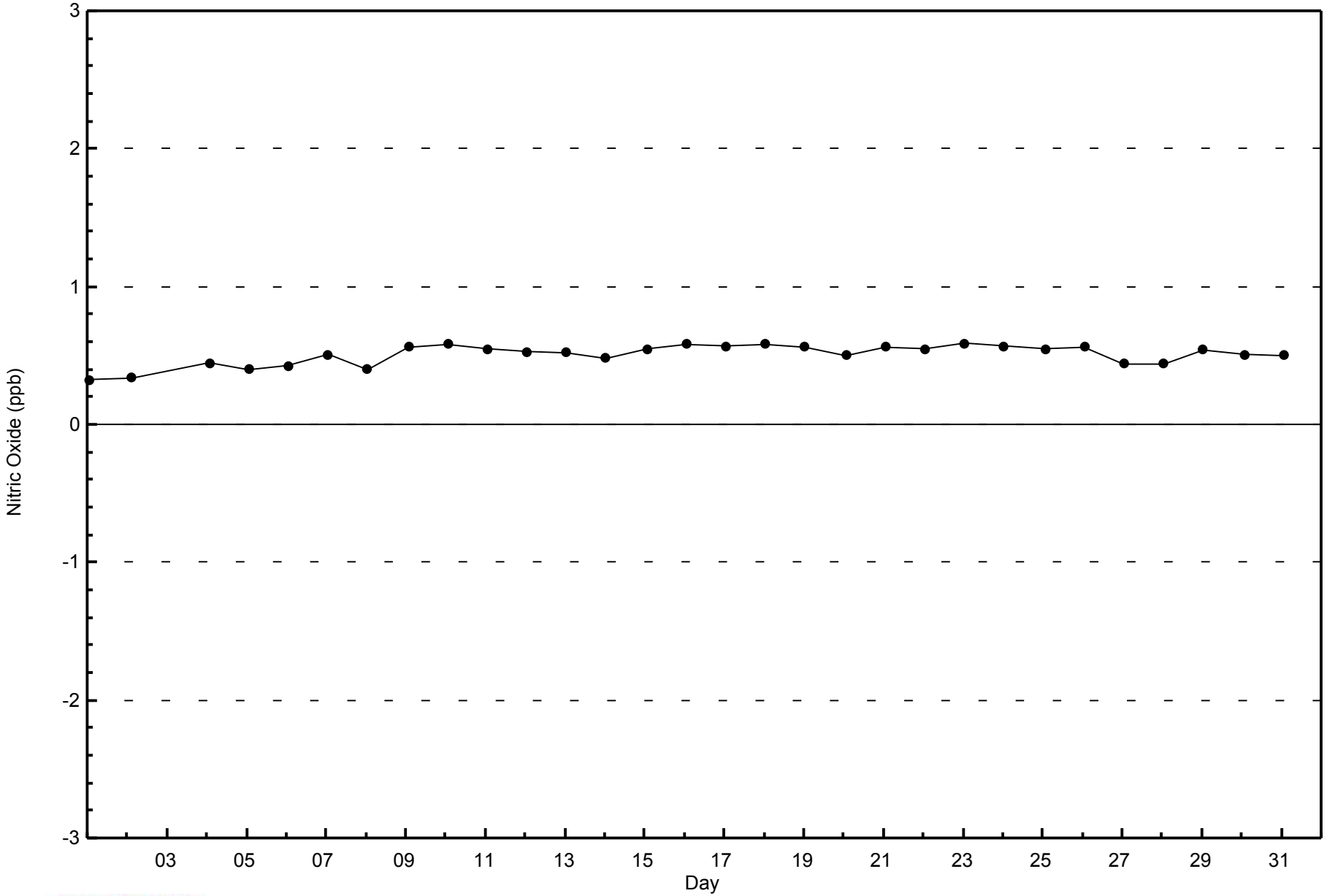
Total Number of Valid Hours: 690

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Fort Chipeywan - January 2014



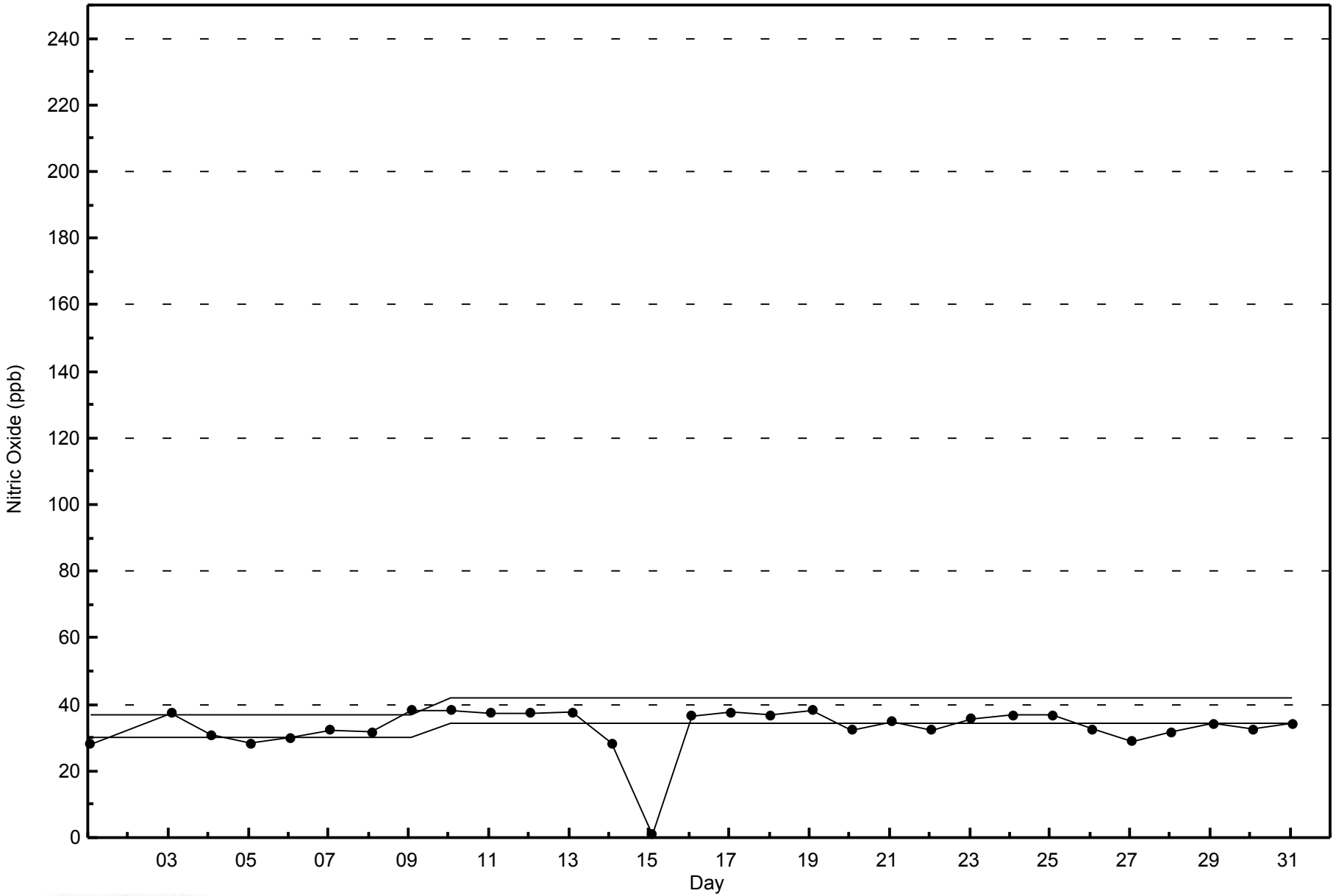
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 18 ppb on Jan 1 18:00 Maximum Daily Average: 6.3 ppb on Jan 1

Minimum Value: 0 ppb on Jan 12 03:00 Minimum Daily Average: 0.1 ppb on Jan 25
Maximum Diurnal Average: 5.4 ppb at hour 2 Minimum Diurnal Average: 1.0 ppb at hour 14
Monthly Average: 1.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 2$ $P_{90} = 4$ $P_{99} = 13$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	36
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	2	6	3	3	7	6	3	8	1	1	1	1	4	6	13	18	16	11	11	9	8	7	6.3	18
2-Jan	7	5	4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	14	16	13	5	3	1	1	1	1	--	16
3-Jan	1	Z	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0.4	1
4-Jan	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
5-Jan	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	1	1	4	8	6	1	0	1	3	4	1.4	8
6-Jan	2	Z	3	3	3	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	3
7-Jan	1	Z	3	3	3	7	4	4	1	0	0	C	C	C	C	C	C	0	0	1	1	1	1	0	--	7
8-Jan	1	Z	0	1	1	5	8	9	11	11	10	8	7	5	3	3	3	3	2	2	2	2	2	2	4.3	11
9-Jan	1	Z	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	0	0	1.2	2
10-Jan	0	Z	0	0	0	1	0	1	2	2	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0.6	2
11-Jan	0	Z	0	0	1	1	3	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	2	0.6	3
12-Jan	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	5	4	4	0.9	5
13-Jan	3	Z	2	2	2	2	2	2	1	2	0	0	1	1	1	1	0	0	0	0	1	1	1	0	1.0	3
14-Jan	1	Z	1	2	4	0	0	0	0	1	2	1	1	1	1	1	1	1	1	1	4	11	13	13	2.5	13
15-Jan	12	6	Z	1	0	0	0	0	M	M	1	0	0	1	1	1	0	0	0	0	1	1	2	1	1.4	12
16-Jan	1	Z	1	1	3	2	1	0	0	1	2	1	1	0	0	0	1	1	0	0	0	0	0	1	0.8	3
17-Jan	1	Z	1	1	1	2	2	1	0	1	1	0	0	1	1	1	0	0	0	0	1	0	0	1	0.7	2
18-Jan	0	Z	1	0	0	0	0	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0.3	1
19-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	2	3	1	7	4	0.9	7
20-Jan	2	Z	0	0	0	1	8	11	15	12	8	5	5	6	6	4	3	7	3	2	2	3	4	4	4.7	15
21-Jan	4	Z	3	1	1	1	0	0	0	0	0	0	0	0	1	0	0	PF	4	2	0	0	0	0	0.8	4
22-Jan	0	Z	0	0	0	0	1	1	1	2	2	1	2	3	3	4	6	10	11	11	9	9	9	8	4.1	11
23-Jan	7	Z	5	4	4	3	1	1	1	1	1	0	2	0	0	0	0	1	1	0	2	2	0	1	1.6	7
24-Jan	1	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0.3	1
25-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
26-Jan	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	8	4	2	4	1.0	8
27-Jan	5	Z	0	4	4	1	1	0	0	0	1	2	3	4	5	4	6	4	4	3	3	5	5	5	3.0	6
28-Jan	4	Z	4	4	4	4	3	2	1	2	4	4	3	1	1	1	2	1	1	0	0	0	0	0	2.0	4
29-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Jan	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
31-Jan	0	Z	0	0	0	0	1	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0.3	1
	1.8	5.4	1.2	1.3	1.3	1.2	1.5	1.5	1.5	1.7	1.4	1.1	1.0	1.0	1.1	1.5	2.1	2.4	2.0	1.5	1.8	1.9	2.1	2.0	Diurnal Average	
	12	6	5	6	4	7	8	11	15	12	10	8	7	6	6	14	16	18	16	11	11	11	13	13	Diurnal Maximum	

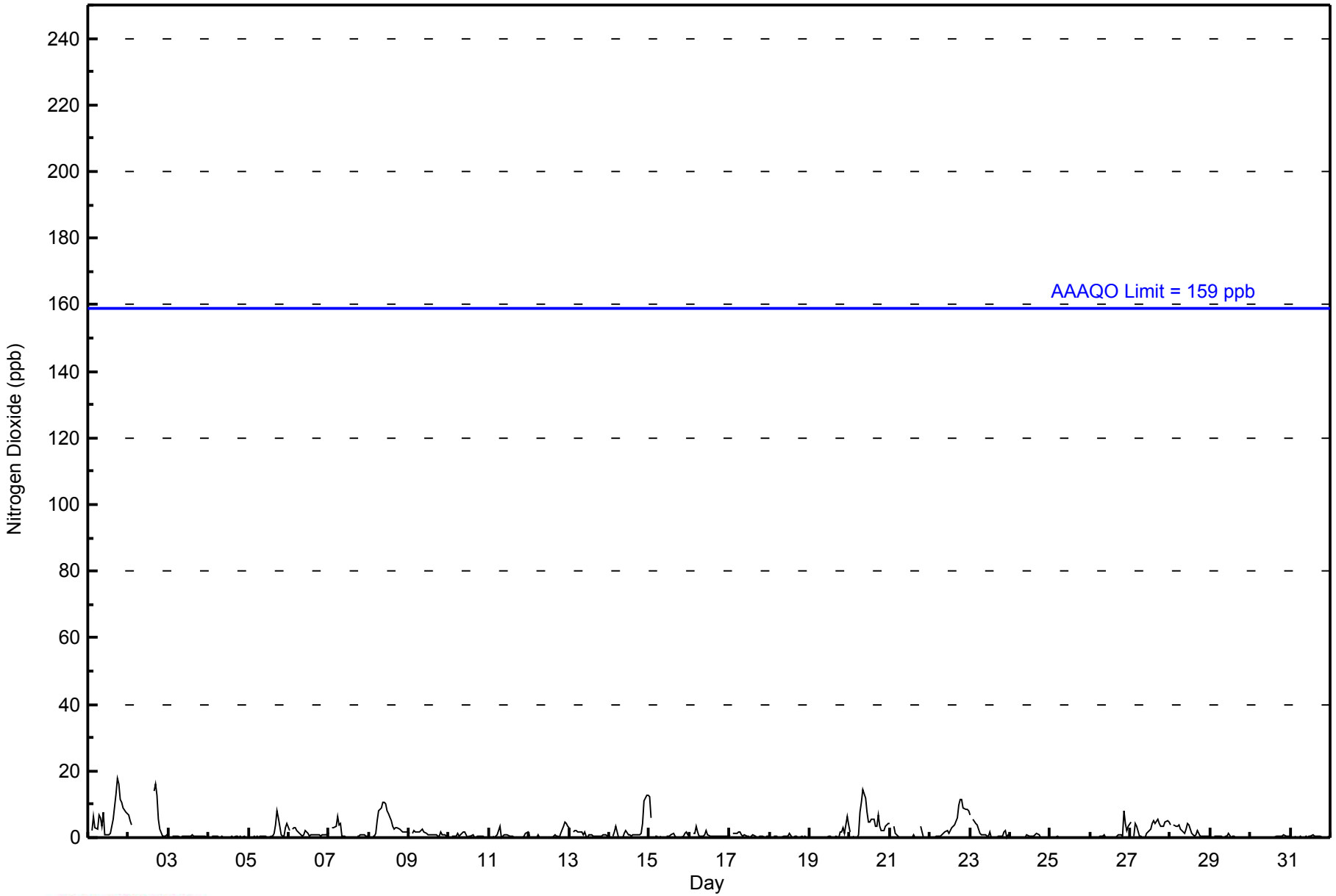
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Nitrogen Dioxide (NO_2) - ppb
Fort Chipeywan - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	100.00	100.00
21 - 40	0	0.00	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: 693

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	32	16	26	41	75	134	19	11	11	11	6	12	28	69	75	124	690
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	32	16	26	41	75	134	19	11	11	11	6	12	28	69	75	124	690

Total Number of Valid Hours: 690

Total Number of Hours: 744

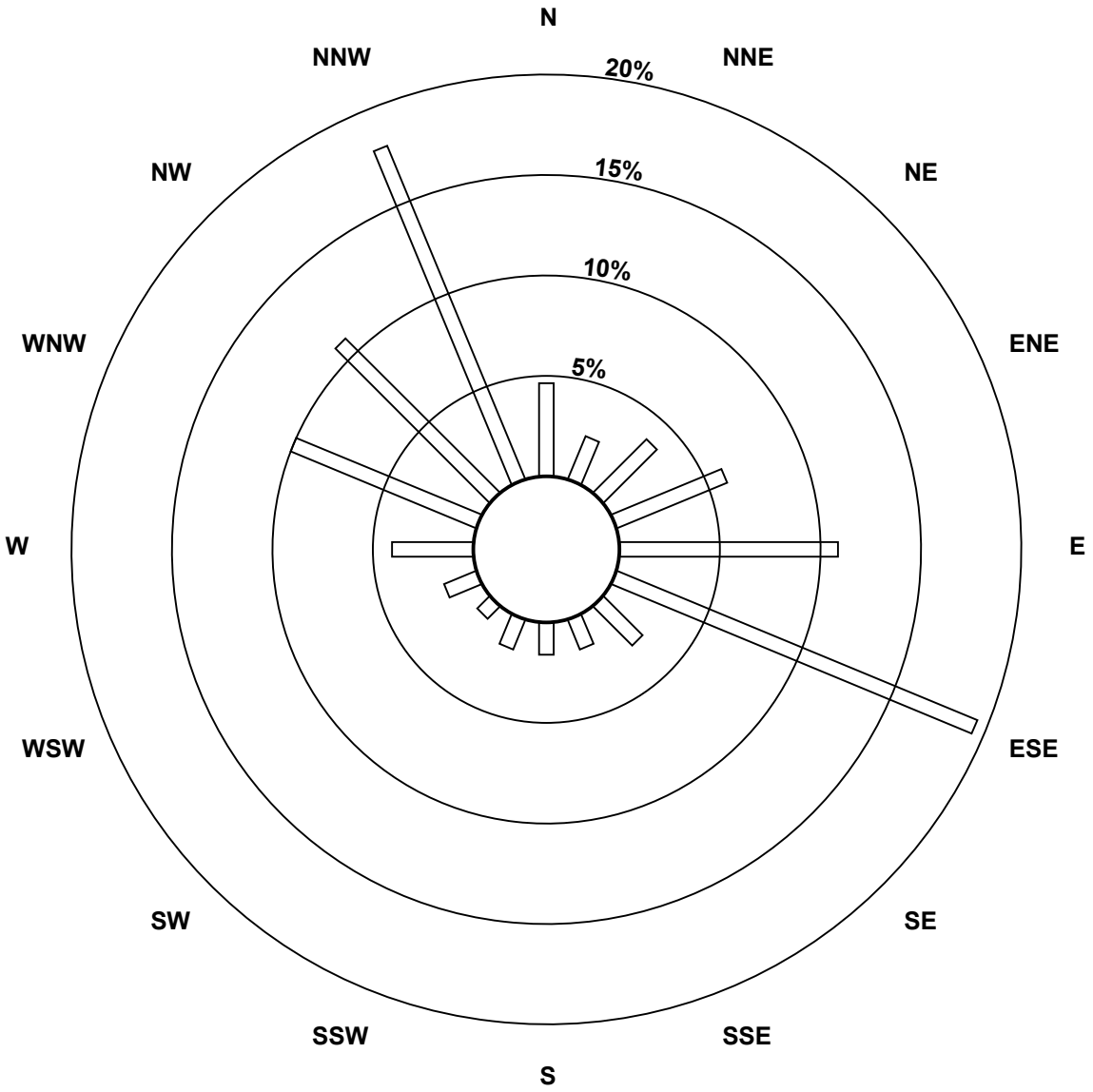
AURORA ATMOSPHERICS INC.

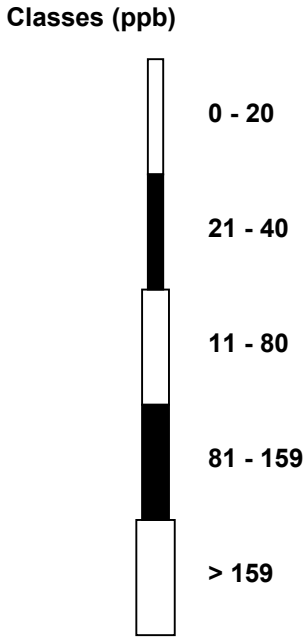
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan (AMS 8)





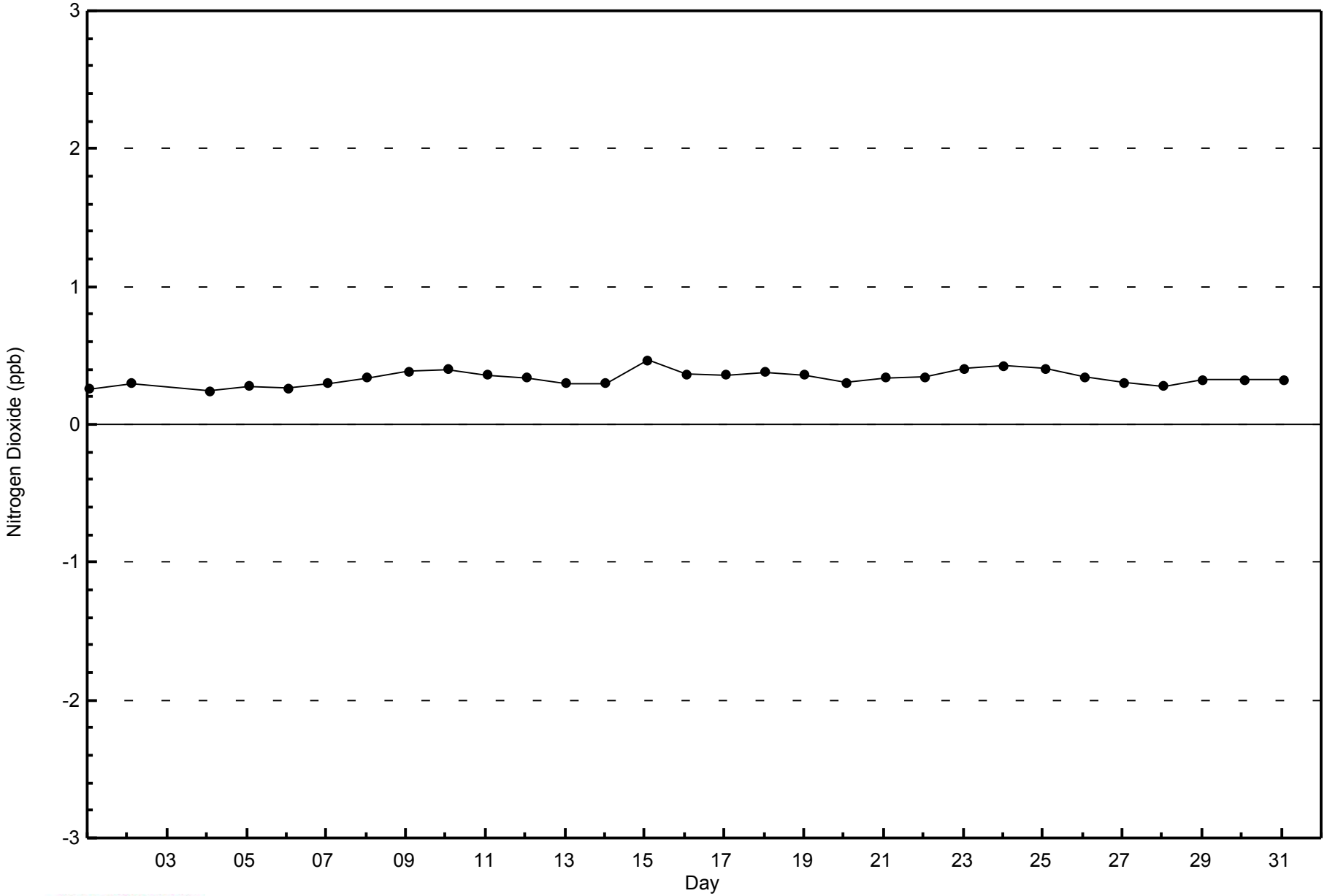
Total Number of Valid Hours: 690

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - January 2014



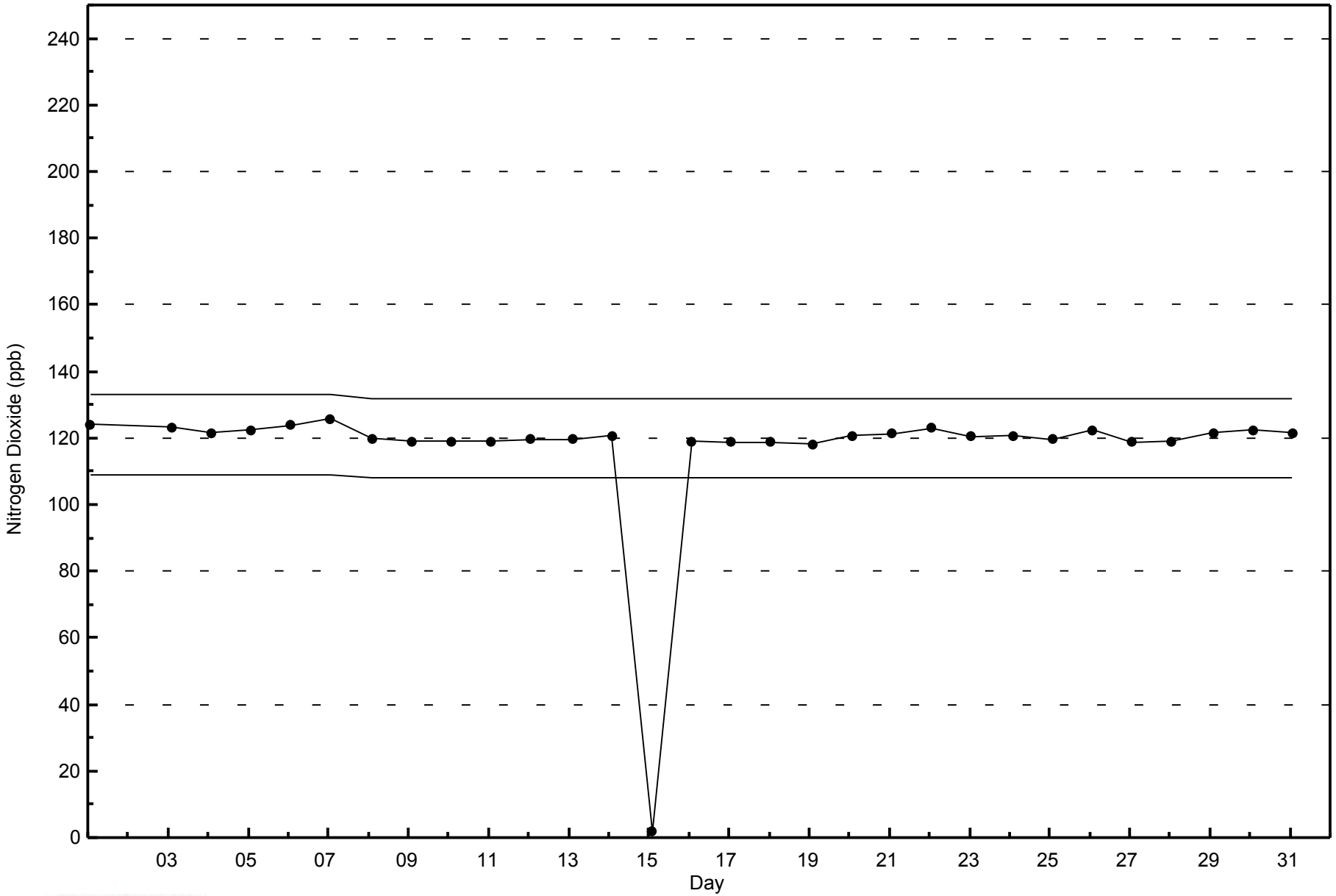
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan - January 2014

Maximum Value: 19 ppb on Jan 1 18:00

Maximum Daily Average: 6.7 ppb on Jan 1

Minimum Value: 0 ppb on Jan 22 03:00

Minimum Daily Average: 0.2 ppb on Jan 25

Maximum Diurnal Average: 5.5 ppb at hour 2

Minimum Diurnal Average: 1.2 ppb at hour 3

Monthly Average: 1.8 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 2$ $P_{90} = 5$ $P_{99} = 14$

Hours in Service:	744
Hours of Data:	693
Hours of Missing Data:	51
Hours of Calibration:	36
Percent Operational Time:	98.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	2	7	3	3	7	6	4	9	1	1	1	2	5	7	14	19	16	11	11	9	8	7	6.7	19
2-Jan	7	5	4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	17	17	14	6	3	1	1	1	1	--	17
3-Jan	1	Z	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0.6	1
4-Jan	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
5-Jan	0	Z	0	0	0	0	0	0	1	1	0	0	0	0	1	1	4	8	6	1	0	1	3	4	1.5	8
6-Jan	2	Z	3	3	3	2	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	3
7-Jan	1	Z	3	3	3	7	4	4	1	0	0	C	C	C	C	C	C	0	1	1	1	1	1	0	--	7
8-Jan	1	Z	1	1	1	5	8	9	11	11	12	11	9	6	4	3	3	3	3	2	2	2	2	2	4.8	12
9-Jan	1	Z	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	2	1	1	0	0	1.3	2
10-Jan	0	Z	0	0	0	1	0	1	2	2	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0.6	2
11-Jan	0	Z	1	0	1	1	3	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	2	0.7	3
12-Jan	0	Z	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	1	0	1	3	5	4	4	1.1	5
13-Jan	3	Z	2	2	2	2	2	2	1	3	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1.3	3
14-Jan	1	Z	1	2	4	0	0	0	0	1	3	1	1	1	1	1	1	1	1	1	4	11	13	13	2.6	13
15-Jan	12	6	Z	1	0	0	0	1	M	M	1	0	1	2	2	1	0	0	0	0	1	1	2	1	1.5	12
16-Jan	1	Z	1	1	3	2	1	0	0	1	3	1	1	1	1	0	0	1	0	0	0	0	0	0	0.9	3
17-Jan	1	Z	1	1	1	2	2	1	0	1	1	1	0	1	1	1	0	0	0	0	1	0	0	1	0.8	2
18-Jan	0	Z	1	0	0	0	0	0	1	1	0	1	2	0	0	1	1	0	0	0	0	0	0	0	0.5	2
19-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	2	3	1	7	4	1.0	7
20-Jan	2	Z	0	0	0	1	7	11	15	13	10	8	7	8	7	4	4	7	3	2	2	3	4	4	5.4	15
21-Jan	5	Z	3	1	1	1	0	0	0	0	0	0	0	0	1	0	0	PF	4	2	0	0	0	0	0.9	5
22-Jan	0	Z	0	0	0	0	1	1	1	2	3	2	3	4	5	5	6	10	11	11	9	9	9	8	4.4	11
23-Jan	7	Z	5	5	4	3	1	1	1	1	1	0	2	0	0	0	0	1	1	0	2	2	0	1	1.7	7
24-Jan	1	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0.4	1
25-Jan	0	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
26-Jan	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	8	4	2	4	1.1	8
27-Jan	5	Z	0	4	4	1	1	0	0	0	2	4	5	8	8	5	6	4	3	3	3	5	5	5	3.5	8
28-Jan	4	Z	4	3	4	4	3	2	1	3	5	5	3	2	1	1	2	1	1	0	0	0	0	0	2.2	5
29-Jan	0	Z	0	1	0	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0.4	2
30-Jan	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
31-Jan	0	Z	0	0	0	0	1	0	0	1	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0.5	1
	1.9	5.5	1.2	1.4	1.4	1.3	1.6	1.5	1.6	1.9	1.7	1.6	1.5	1.5	1.5	1.8	2.2	2.5	2.0	1.6	1.9	2.0	2.2	2.1	Diurnal Average	
	12	6	5	7	4	7	8	11	15	13	12	11	9	8	8	17	17	19	16	11	11	11	13	13	Diurnal Maximum	

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

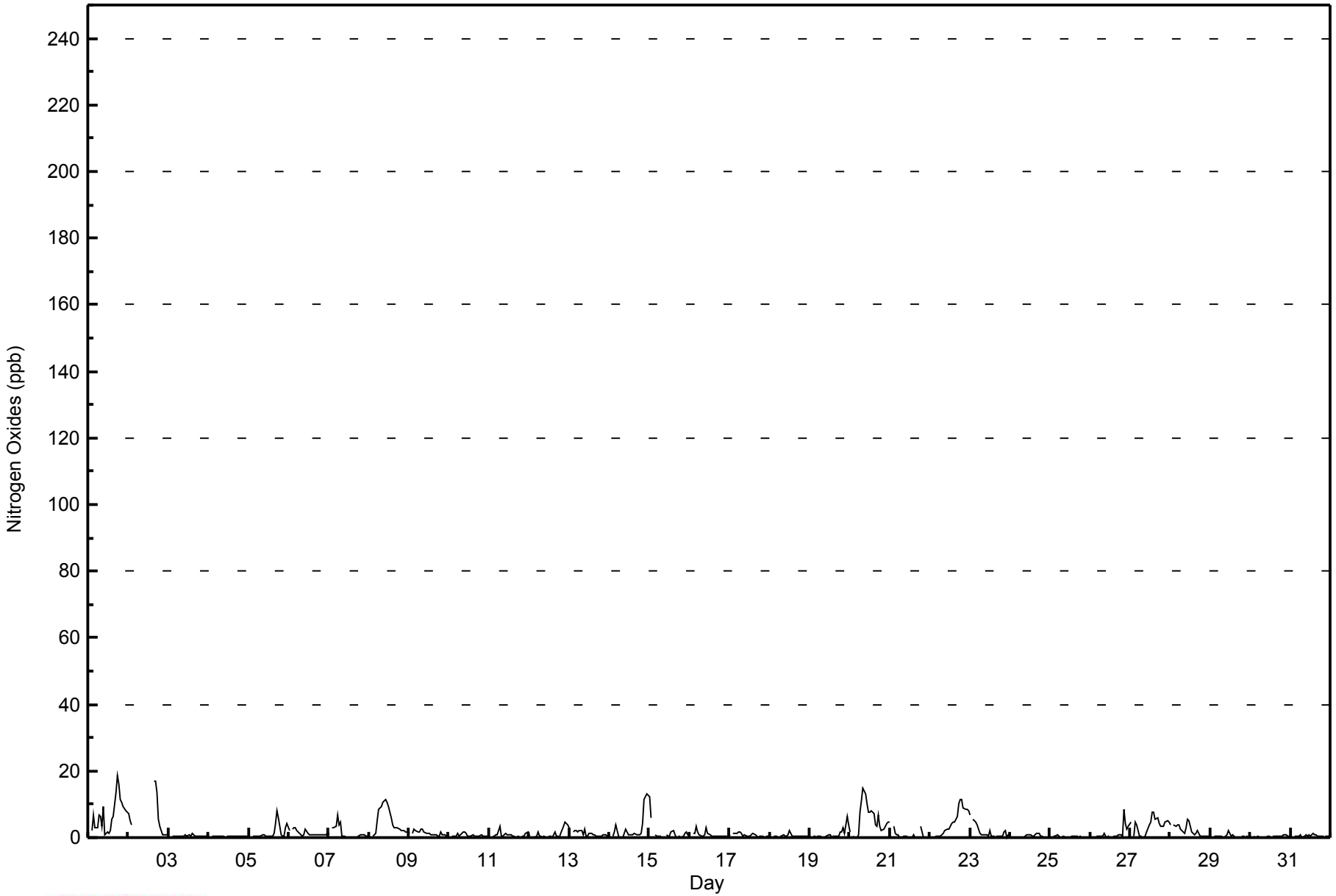
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	693	100.00	100.00
21 - 40	0	0.00	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: 693

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	32	16	26	41	75	134	19	11	11	11	6	12	28	69	75	124	690
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	32	16	26	41	75	134	19	11	11	11	6	12	28	69	75	124	690

Total Number of Valid Hours: 690

Total Number of Hours: 744

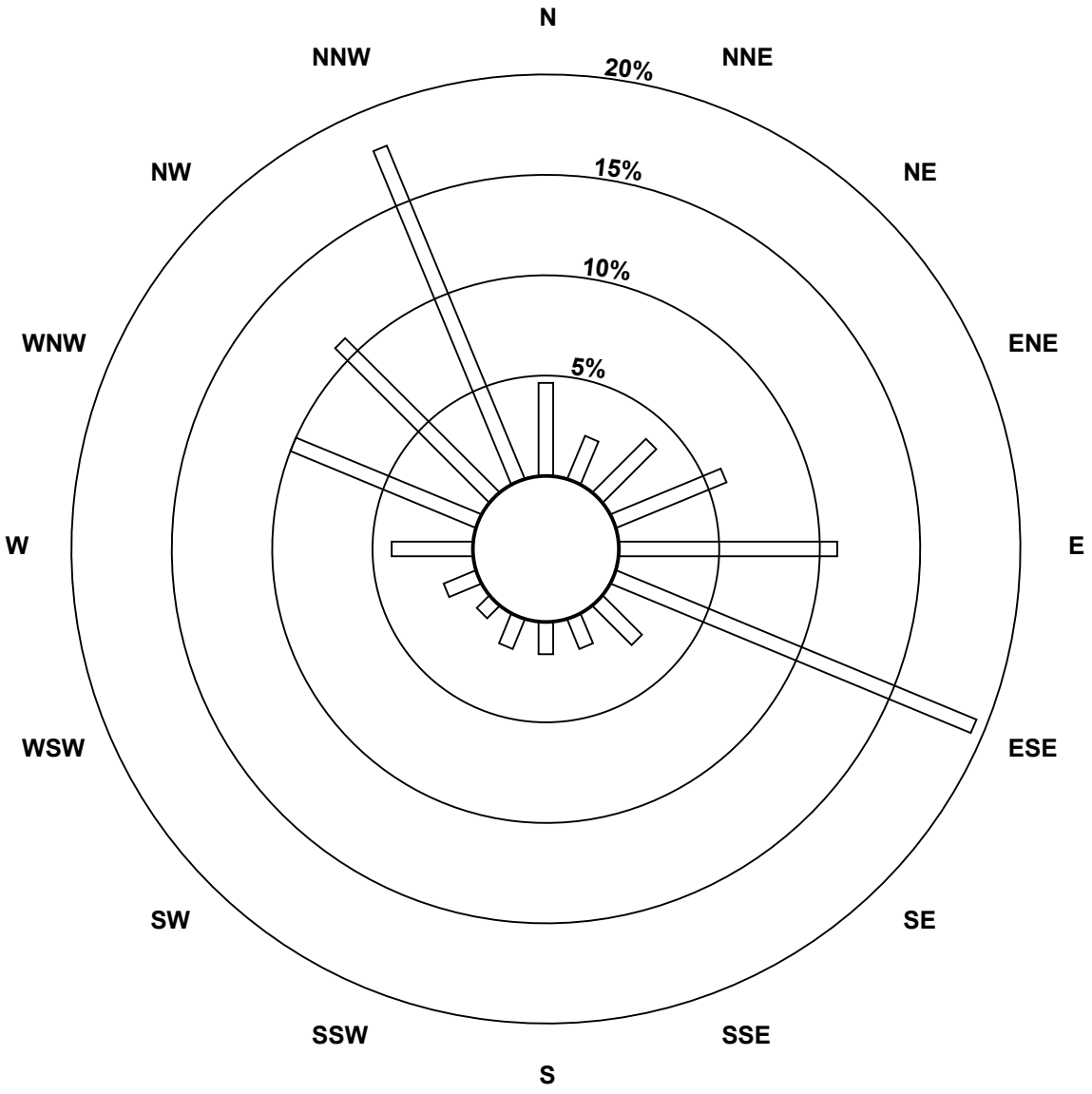
AURORA ATMOSPHERICS INC.

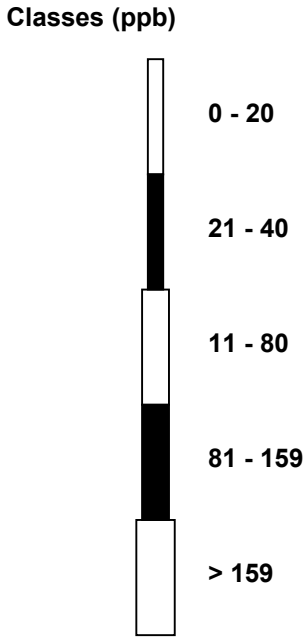
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan (AMS 8)

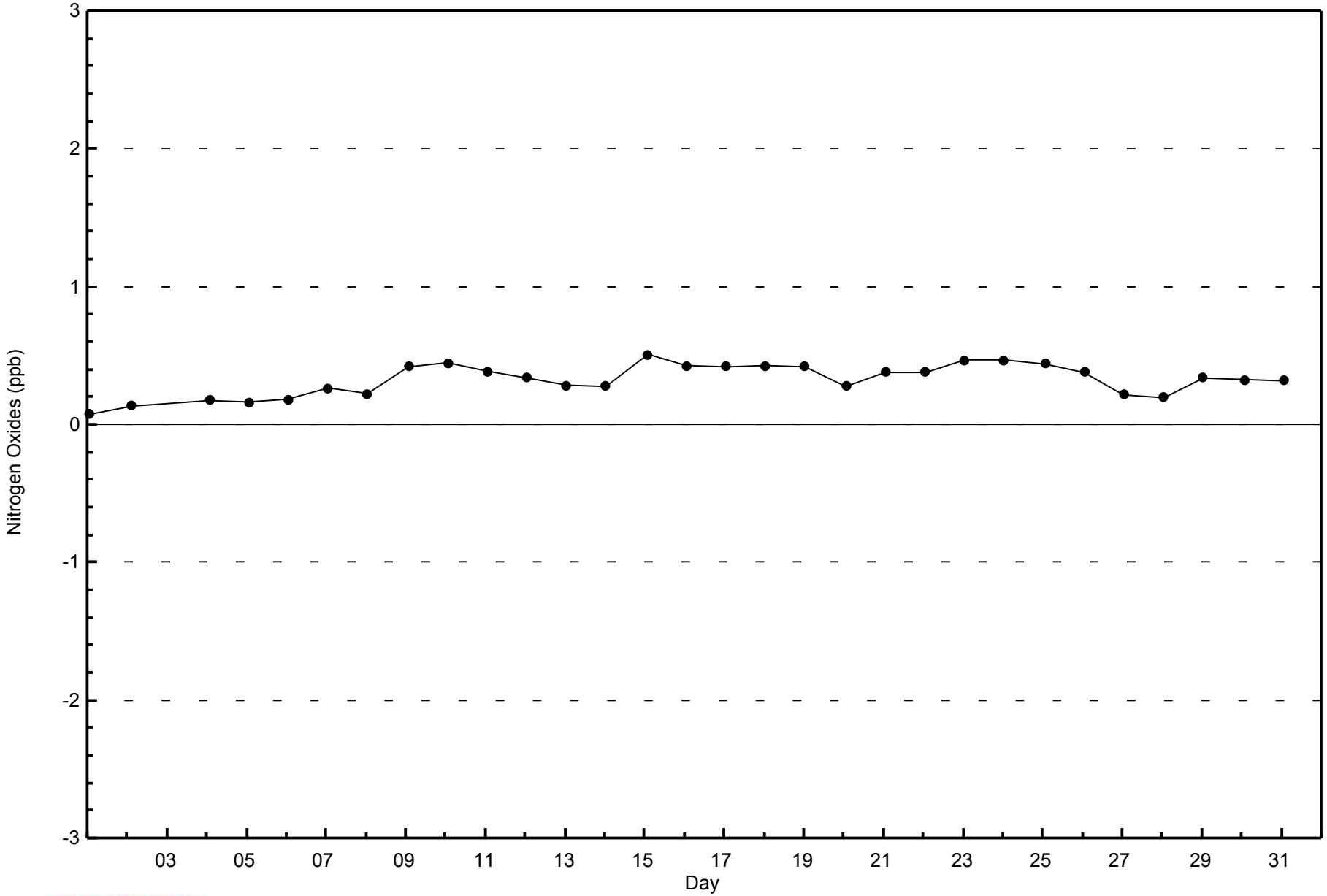




Total Number of Valid Hours: 690

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Fort Chipeywan - January 2014



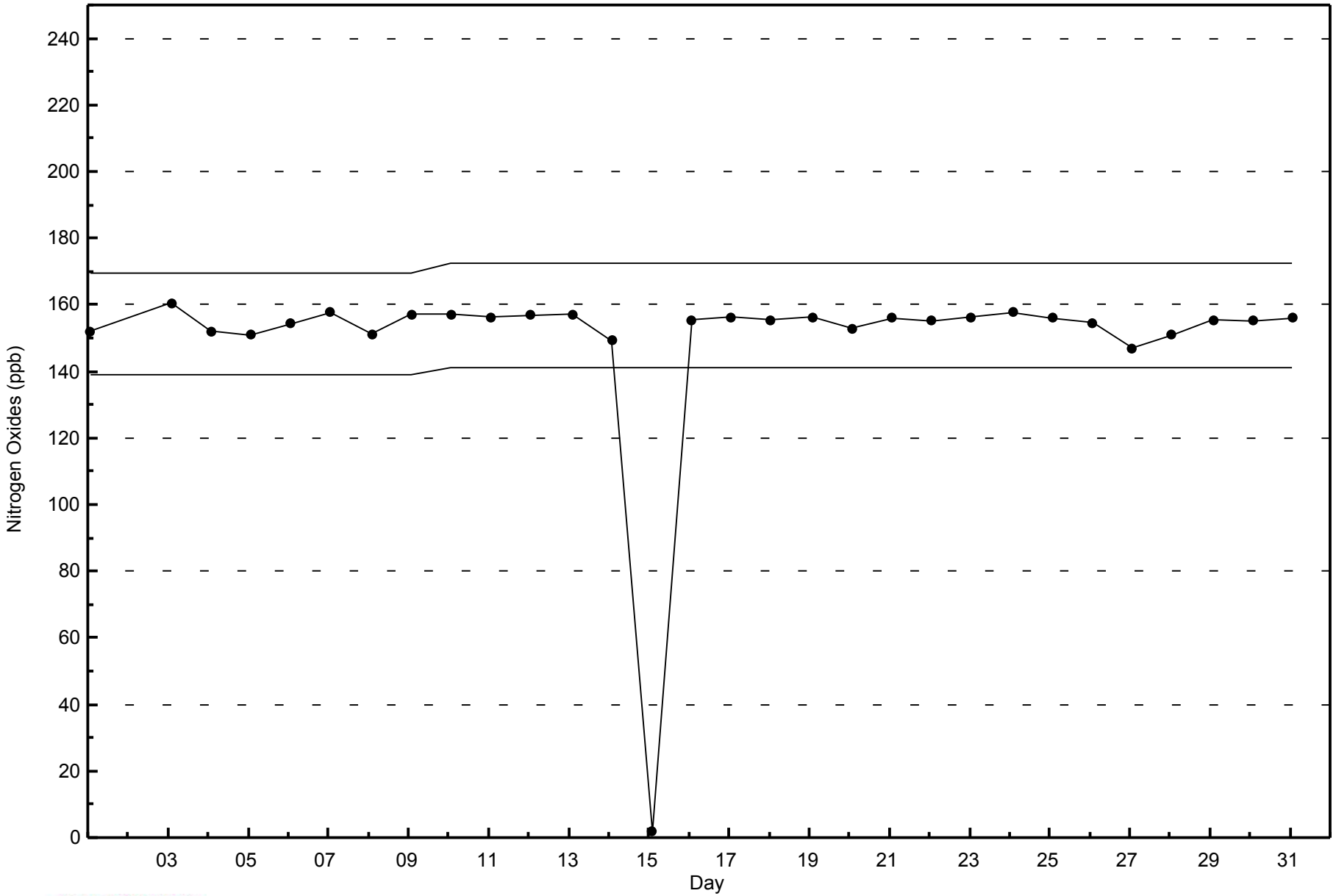
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort Chipeywan - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 41 ppb on Jan 24 21:00 Maximum Daily Average: 38.2 ppb on Jan 24

Minimum Value: 7 ppb on Jan 1 18:00 Minimum Daily Average: 19.0 ppb on Jan 1
Maximum Diurnal Average: 32.6 ppb at hour 13 Minimum Diurnal Average: 31.0 ppb at hour 10
Monthly Average: 31.9 ppb Percentiles: P_1 = 12 P_{10} = 24 Q_1 = 30 Median = 33 Q_3 = 35 P_{90} = 37 P_{99} = 40

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	34
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	27	28	Z	22	25	24	19	18	20	14	20	23	22	23	20	18	11	7	8	13	15	17	20	21	19.0	28
2-Jan	23	26	Z	29	29	27	22	17	12	12	13	14	15	14	12	10	8	12	20	24	29	30	29	31	19.9	31
3-Jan	31	31	Z	32	32	33	34	34	34	35	36	37	37	38	38	38	37	36	36	37	37	36	36	35	35.2	38
4-Jan	35	35	Z	35	35	35	35	34	34	34	34	33	33	32	32	32	32	32	32	32	32	32	32	32	33.1	35
5-Jan	32	32	Z	32	32	32	33	33	32	32	33	33	33	33	32	31	28	24	25	31	31	31	28	28	30.9	33
6-Jan	30	30	Z	30	31	33	34	35	36	36	34	35	35	35	36	36	35	35	35	35	35	35	36	35	34.2	36
7-Jan	35	35	Z	33	31	29	31	30	34	35	35	35	34	33	33	35	34	34	34	33	34	34	36	38	33.7	38
8-Jan	39	39	Z	39	38	32	27	26	24	23	C	C	C	25	26	25	25	24	24	25	25	25	24	25	28.0	39
9-Jan	25	25	Z	23	24	25	24	23	23	24	25	25	25	26	27	26	25	25	25	26	29	32	33	33	26.0	33
10-Jan	32	33	Z	34	33	34	34	34	34	34	35	36	36	36	35	34	34	33	33	33	33	33	33	34	33.9	36
11-Jan	35	35	Z	34	34	34	31	34	36	36	36	35	34	34	34	35	35	35	35	35	35	35	34	34	34.5	36
12-Jan	35	36	Z	34	34	33	34	34	34	33	33	34	36	37	38	37	36	35	35	34	31	29	29	29	34.0	38
13-Jan	30	31	Z	29	28	29	29	30	33	34	35	36	36	35	36	36	36	35	35	35	34	34	34	35	33.2	36
14-Jan	34	33	Z	32	30	33	33	34	34	33	32	33	33	34	35	35	35	34	34	33	28	20	18	19	31.4	35
15-Jan	19	27	Z	38	39	40	38	34	34	M	M	35	36	36	35	36	36	36	36	36	35	34	33	35	34.8	40
16-Jan	35	33	Z	32	29	31	31	32	32	32	29	31	32	32	33	33	33	34	34	35	35	35	34	34	32.7	35
17-Jan	33	32	Z	32	32	31	31	31	35	35	35	37	37	34	34	35	35	35	35	34	35	34	33	33	33.9	37
18-Jan	33	33	Z	33	34	34	34	34	34	34	35	35	35	36	36	36	36	37	37	38	39	38	39	39	35.5	39
19-Jan	39	39	Z	36	35	33	33	33	31	29	28	27	28	30	32	32	32	32	30	30	29	30	25	27	31.3	39
20-Jan	29	29	Z	29	29	30	23	19	15	18	22	25	26	25	25	27	28	24	27	28	27	25	24	23	25.1	30
21-Jan	22	21	Z	27	28	28	30	30	30	31	31	31	31	31	31	31	31	PF	28	30	31	31	30	30	29.3	31
22-Jan	31	31	Z	31	31	31	31	31	31	30	31	31	31	30	30	29	27	22	21	20	22	22	22	22	27.7	31
23-Jan	23	23	Z	24	25	27	31	32	33	33	34	34	36	39	39	38	37	36	36	35	33	32	37	36	32.8	39
24-Jan	36	34	Z	35	36	37	38	37	36	35	36	38	39	40	40	40	40	40	41	41	41	41	40	40	38.2	41
25-Jan	40	39	Z	38	38	37	38	38	38	38	38	38	37	36	36	37	37	37	38	38	38	39	39	38	37.9	40
26-Jan	37	36	Z	35	34	34	34	33	33	34	34	34	34	34	34	34	34	33	33	33	26	29	30	30	33.0	37
27-Jan	28	27	Z	25	26	29	30	32	31	31	31	30	29	28	28	29	27	29	30	31	31	29	29	29	29.1	32
28-Jan	30	30	Z	30	29	29	30	31	32	31	26	27	30	33	34	32	31	33	33	33	34	34	34	34	31.3	34
29-Jan	35	35	Z	34	35	35	35	35	36	36	35	35	36	36	36	37	36	37	37	37	37	37	37	37	36.0	37
30-Jan	37	37	Z	36	36	36	37	36	36	36	37	37	37	37	36	37	37	37	37	37	36	36	35	35	36.4	37
31-Jan	35	35	Z	34	34	34	33	34	33	33	34	34	35	35	36	36	37	37	38	38	38	38	38	38	35.5	38
	31.8	31.9	--	31.8	31.9	31.9	31.5	31.2	31.3	31.0	31.6	32.3	32.6	32.5	32.5	32.5	31.7	31.3	31.7	32.3	32.0	31.9	31.7	32.0	Diurnal Average	
	40	39	--	39	39	40	38	38	38	38	38	38	39	40	40	40	40	40	41	41	41	41	40	40	Diurnal Maximum	

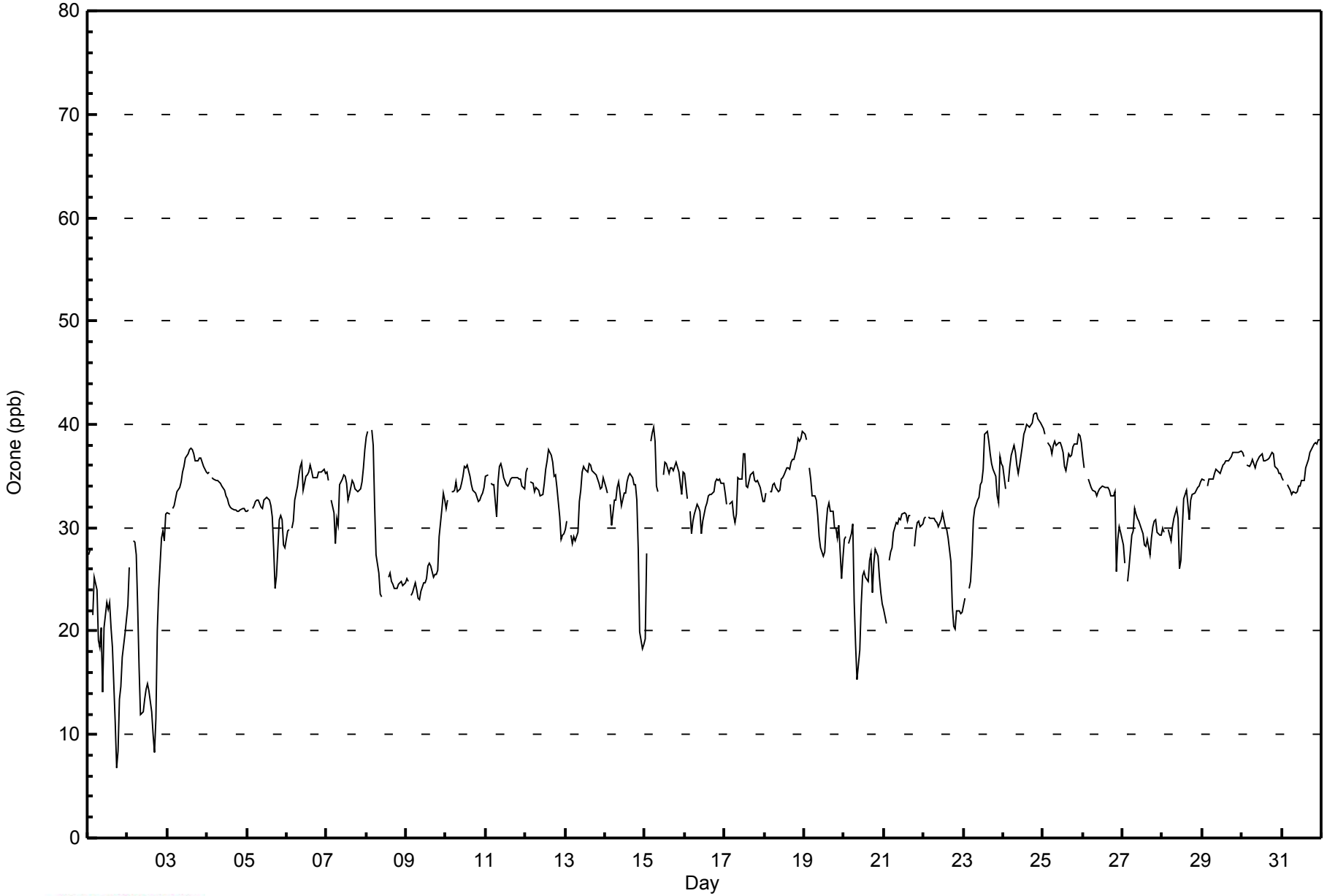
Z - zerospan C - Calibration M - Maintenance PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	34	4.81	4.81
21 - 50	673	95.19	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	0	0	0	1	3	8	1	1	3	7	4	1	3	0	1	1	34
21 - 50	32	16	27	41	69	133	19	12	8	9	7	8	24	71	73	121	670
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	32	16	27	42	72	141	20	13	11	16	11	9	27	71	74	122	704

Total Number of Valid Hours: 704

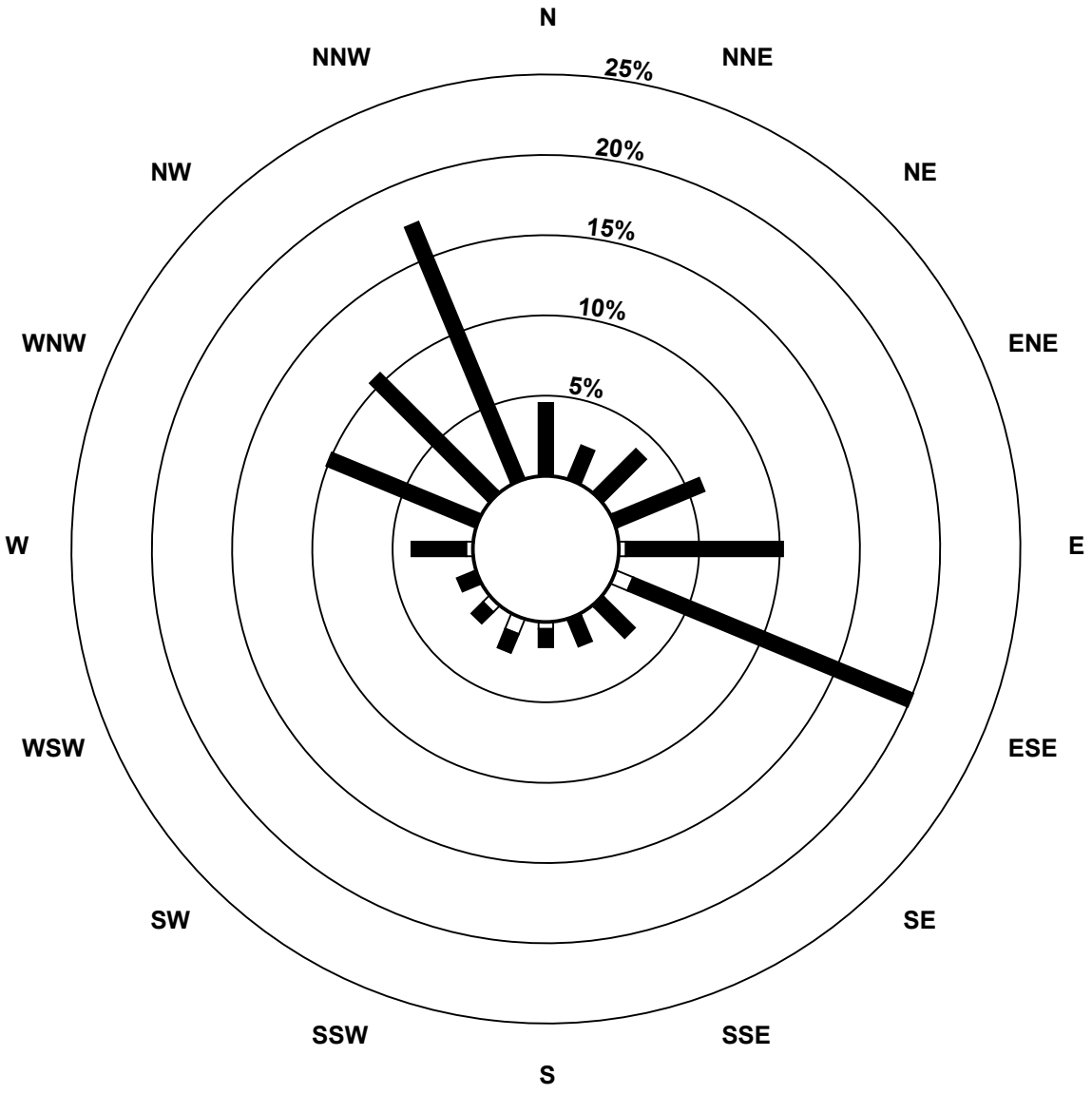
Total Number of Hours: 744

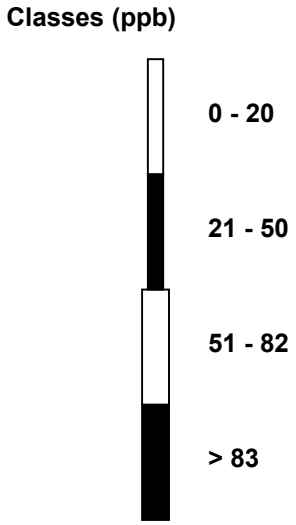
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ozone (O_3) - ppb

Fort Chipeywan (AMS 8)





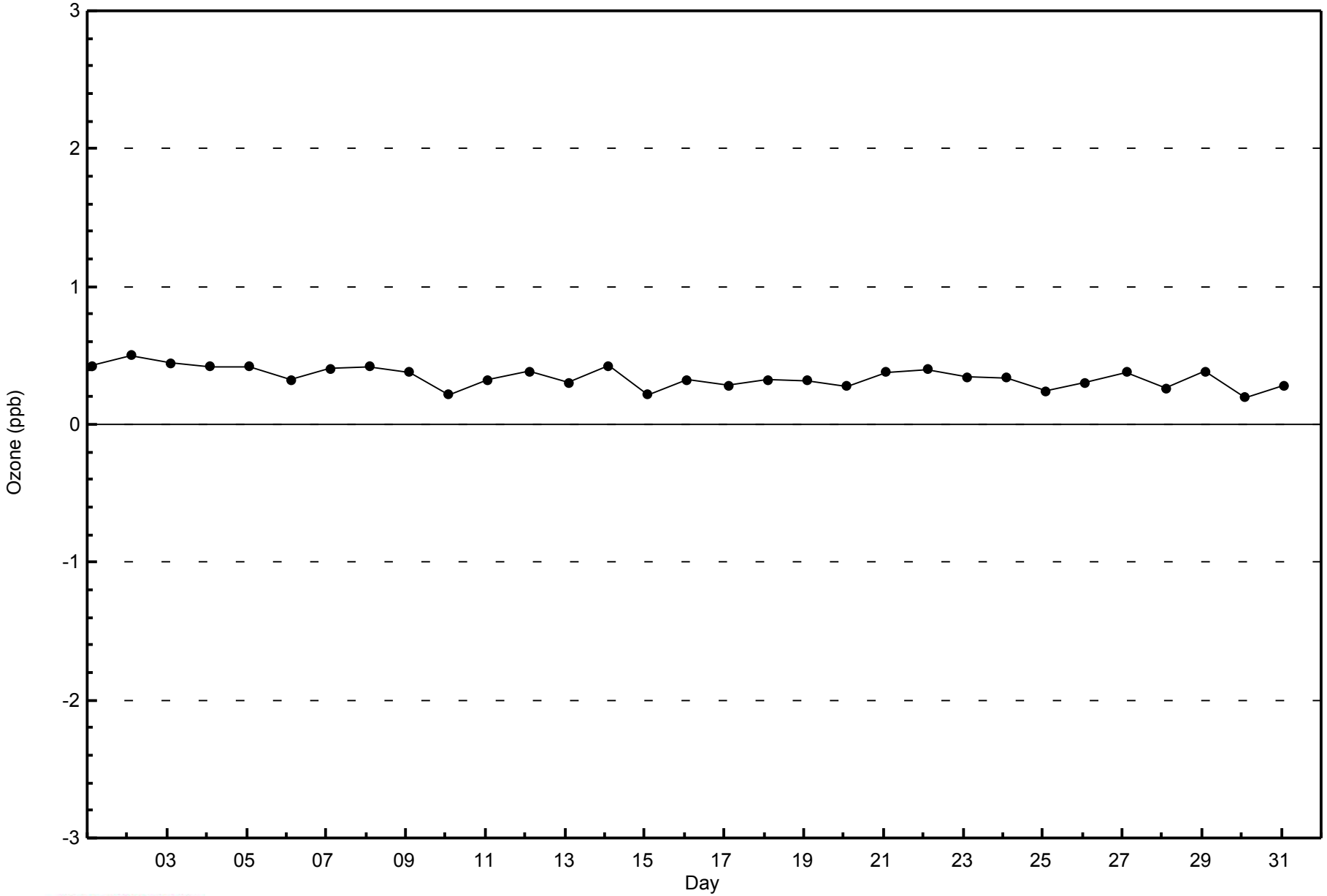
Total Number of Valid Hours: 704

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Fort Chipeywan - January 2014



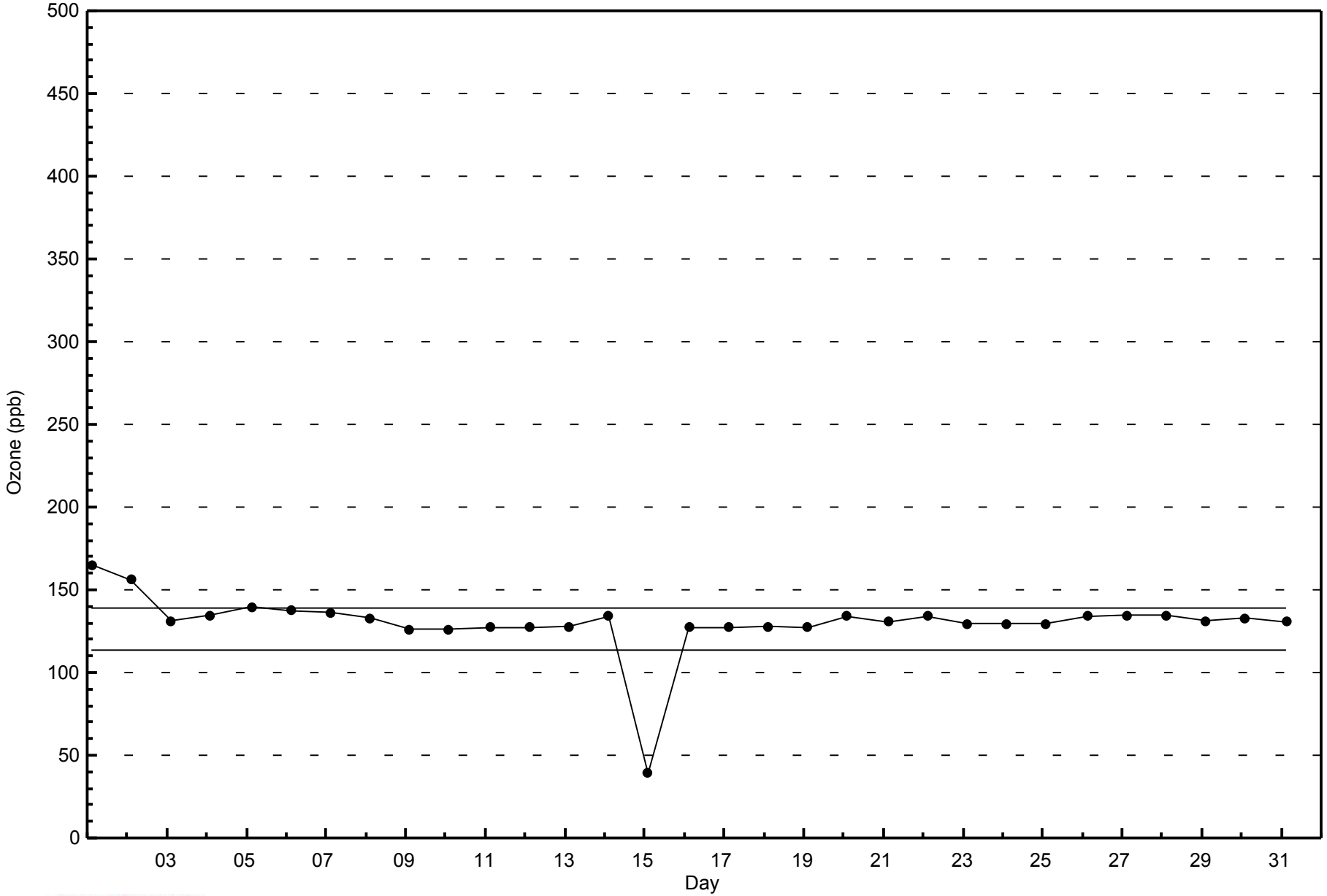
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Chipeywan - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 14.2 $\mu g/m^3$ on Jan 2 17:00

Maximum Daily Average: 6.0 $\mu g/m^3$ on Jan 2

Minimum Value: 0.1 $\mu g/m^3$ on Jan 30 04:00

Minimum Daily Average: 0.7 $\mu g/m^3$ on Jan 30

Maximum Diurnal Average: 3.0 $\mu g/m^3$ at hour 1

Minimum Diurnal Average: 2.0 $\mu g/m^3$ at hour 15

Monthly Average: 2.31 $\mu g/m^3$

Percentiles: P_1 = 0.1 P_{10} = 0.7 Q_1 = 1.1 Median = 1.7 Q_3 = 2.9 P_{90} = 4.9 P_{99} = 9.8

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.2	1.7	3.4	3.6	2.5	2.4	3.7	3.9	2.2	2.5	1.3	1.3	1.2	1.4	1.7	2.9	5.3	5.6	4.6	3.7	3.8	3.6	3.0	2.7	2.9	5.6
2-Jan	2.6	2.3	1.9	1.9	2.2	2.4	5.4	7.5	5.5	6.3	7.5	8.5	9.4	10.2	10.8	11.2	14.2	12.6	5.2	3.9	3.4	3.0	2.9	3.1	6.0	14.2
3-Jan	3.0	1.4	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.9	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.6	0.7	0.5	0.9	3.0
4-Jan	0.5	0.5	0.6	0.7	0.7	1.3	2.0	1.4	1.3	1.2	1.0	1.0	1.1	1.1	1.1	1.1	1.3	1.1	1.2	1.0	1.2	2.6	2.4	1.8	1.2	2.6
5-Jan	2.7	3.3	3.2	2.8	2.7	2.7	2.8	2.6	3.0	3.1	2.2	1.8	2.0	1.7	1.9	3.8	7.9	9.0	4.9	2.2	1.7	1.6	1.7	1.8	3.0	9.0
6-Jan	1.6	1.8	1.6	2.0	2.2	1.8	1.6	1.6	1.6	1.2	1.7	3.1	3.8	2.8	1.3	1.2	1.7	1.3	1.7	1.4	1.6	1.5	1.3	1.8	1.8	3.8
7-Jan	2.0	3.0	2.7	2.1	2.2	4.0	3.2	3.2	1.4	1.3	1.3	1.2	1.2	1.1	1.2	1.1	1.1	1.4	1.2	1.3	1.1	1.0	0.9	0.8	1.7	4.0
8-Jan	0.8	1.0	1.3	1.4	1.7	2.6	3.6	4.6	5.7	6.4	M	M	4.5	5.5	5.0	5.2	6.1	5.4	5.3	5.1	5.7	8.8	10.6	8.2	4.7	10.6
9-Jan	7.3	7.9	6.7	5.2	6.3	7.6	9.9	8.3	7.0	6.8	5.4	4.9	3.9	2.6	1.8	1.7	2.0	2.8	2.6	1.9	1.1	0.8	0.7	0.8	4.4	9.9
10-Jan	1.0	1.3	1.2	1.3	1.2	1.2	1.3	1.4	1.2	1.6	1.3	1.3	1.7	1.3	1.4	1.3	1.1	1.8	1.5	1.7	2.1	1.4	1.8	2.2	1.4	2.2
11-Jan	2.7	2.3	2.5	1.5	1.1	1.1	1.6	0.8	1.1	1.3	1.2	1.4	1.1	1.0	1.4	1.2	1.4	1.4	1.4	1.8	2.2	1.3	1.4	1.5	1.5	2.7
12-Jan	2.0	1.4	0.9	0.8	2.1	2.3	1.0	1.3	1.1	0.7	0.6	0.4	0.4	0.4	0.5	0.5	0.4	0.3	0.2	0.7	1.2	1.7	1.5	1.7	1.0	2.3
13-Jan	1.7	1.2	1.4	2.1	2.0	1.5	1.1	2.5	2.6	1.8	1.2	0.6	0.6	0.6	0.7	0.8	1.0	1.0	1.3	1.8	2.3	1.1	2.7	3.4	1.5	3.4
14-Jan	8.9	5.5	2.2	1.0	1.4	0.3	0.1	0.1	0.2	1.8	2.1	0.6	0.3	0.3	0.3	0.4	0.5	0.7	0.8	1.5	2.0	3.0	4.9	6.2	1.9	8.9
15-Jan	8.9	8.2	4.0	2.7	2.5	2.4	2.3	2.6	3.3	3.3	2.8	3.2	1.9	1.6	1.7	1.5	1.4	1.4	2.4	1.6	2.1	5.6	1.9	8.7	3.2	8.9
16-Jan	4.0	1.5	0.8	0.9	1.3	0.7	0.6	0.6	0.6	0.7	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	4.0
17-Jan	1.0	1.1	1.3	1.2	1.6	2.1	2.2	2.5	2.5	2.7	4.1	2.9	2.4	1.7	1.5	1.3	1.2	1.1	1.3	2.1	3.7	1.3	1.9	1.1	1.9	4.1
18-Jan	1.3	2.0	1.8	1.2	1.2	1.0	1.1	1.2	1.4	1.8	1.2	1.2	1.3	1.1	1.1	1.1	1.2	1.3	1.5	1.3	1.3	1.5	1.4	1.4	1.3	2.0
19-Jan	1.5	1.6	1.8	2.0	2.1	2.3	2.2	2.2	2.6	3.0	3.1	3.0	2.6	2.1	2.0	2.4	2.0	2.2	3.1	2.5	2.5	4.8	2.9	2.5	2.4	4.8
20-Jan	2.3	2.2	1.8	1.7	1.6	1.6	2.5	4.0	4.7	4.4	4.7	5.1	5.5	5.9	6.3	4.9	4.7	5.8	3.8	3.7	5.1	6.5	10.2	7.6	4.4	10.2
21-Jan	4.5	4.0	3.3	2.9	2.8	2.9	3.1	2.8	2.8	2.7	2.6	2.6	2.5	2.6	2.6	2.0	1.9	PF	4.8	3.8	1.3	1.0	0.9	0.7	2.7	4.8
22-Jan	1.0	0.8	0.6	0.5	0.4	0.4	0.5	0.8	0.9	1.3	1.1	1.1	1.4	1.1	1.1	1.4	2.4	4.1	4.9	5.2	4.7	4.4	4.1	4.3	2.0	5.2
23-Jan	4.7	5.3	5.1	4.9	4.8	4.8	4.0	3.7	3.5	3.2	2.7	2.4	2.0	1.7	1.3	1.3	2.1	1.7	1.4	1.7	1.6	1.4	1.2	1.4	2.8	5.3
24-Jan	1.6	1.2	1.2	1.3	1.1	1.4	1.0	1.0	1.0	1.0	1.4	1.4	1.2	1.1	0.9	1.1	1.0	1.1	0.8	0.8	0.7	0.7	0.8	0.8	1.1	1.6
25-Jan	0.9	1.0	1.0	1.1	1.2	1.1	1.0	0.9	0.9	1.1	1.0	1.1	1.2	1.2	1.4	1.2	1.2	1.0	0.9	0.8	0.8	0.8	0.9	1.1	1.0	1.4
26-Jan	1.8	2.2	2.3	2.5	2.4	2.3	2.5	2.2	2.3	2.3	2.4	2.7	2.9	3.0	3.0	3.1	3.0	4.5	4.5	4.9	10.1	6.2	5.6	6.5	3.6	10.1
27-Jan	12.5	8.0	3.5	7.6	5.8	3.0	2.8	2.6	2.6	2.4	2.3	2.5	2.5	3.2	3.5	3.4	3.7	3.5	3.5	3.3	3.1	3.0	2.9	2.9	3.9	12.5
28-Jan	2.7	2.6	2.4	2.3	2.5	2.5	2.9	3.0	3.4	3.7	3.5	2.8	3.7	2.9	2.3	2.2	2.9	2.8	2.9	3.2	2.8	4.0	2.8	2.1	2.9	4.0
29-Jan	2.5	2.0	1.5	1.6	4.8	1.6	0.9	0.3	0.1	0.3	0.2	0.1	0.3	0.8	0.2	0.2	0.4	0.2	0.1	0.1	0.2	0.2	1.2	0.4	0.8	4.8
30-Jan	0.3	1.4	0.5	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.7	0.5	0.5	0.4	0.5	0.7	0.7	0.5	0.7	1.0	2.1	2.3	1.9	0.7	2.3
31-Jan	1.7	1.8	1.5	1.1	1.1	1.2	1.2	1.5	0.4	0.5	0.6	0.7	1.1	2.8	3.0	3.4	4.5	4.3	4.8	2.7	1.8	1.8	3.0	1.7	2.0	4.8
	3.0	2.6	2.1	2.0	2.1	2.0	2.2	2.3	2.2	2.3	2.1	2.0	2.1	2.1	2.0	2.1	2.6	2.7	2.4	2.2	2.4	2.5	2.6	2.7	Diurnal Average	
	12.5	8.2	6.7	7.6	6.3	7.6	9.9	8.3	7.0	6.8	7.5	8.5	9.4	10.2	10.8	11.2	14.2	12.6	5.3	5.2	10.1	8.8	10.6	8.7	Diurnal Maximum	

M - Maintenance PF - Power Failure

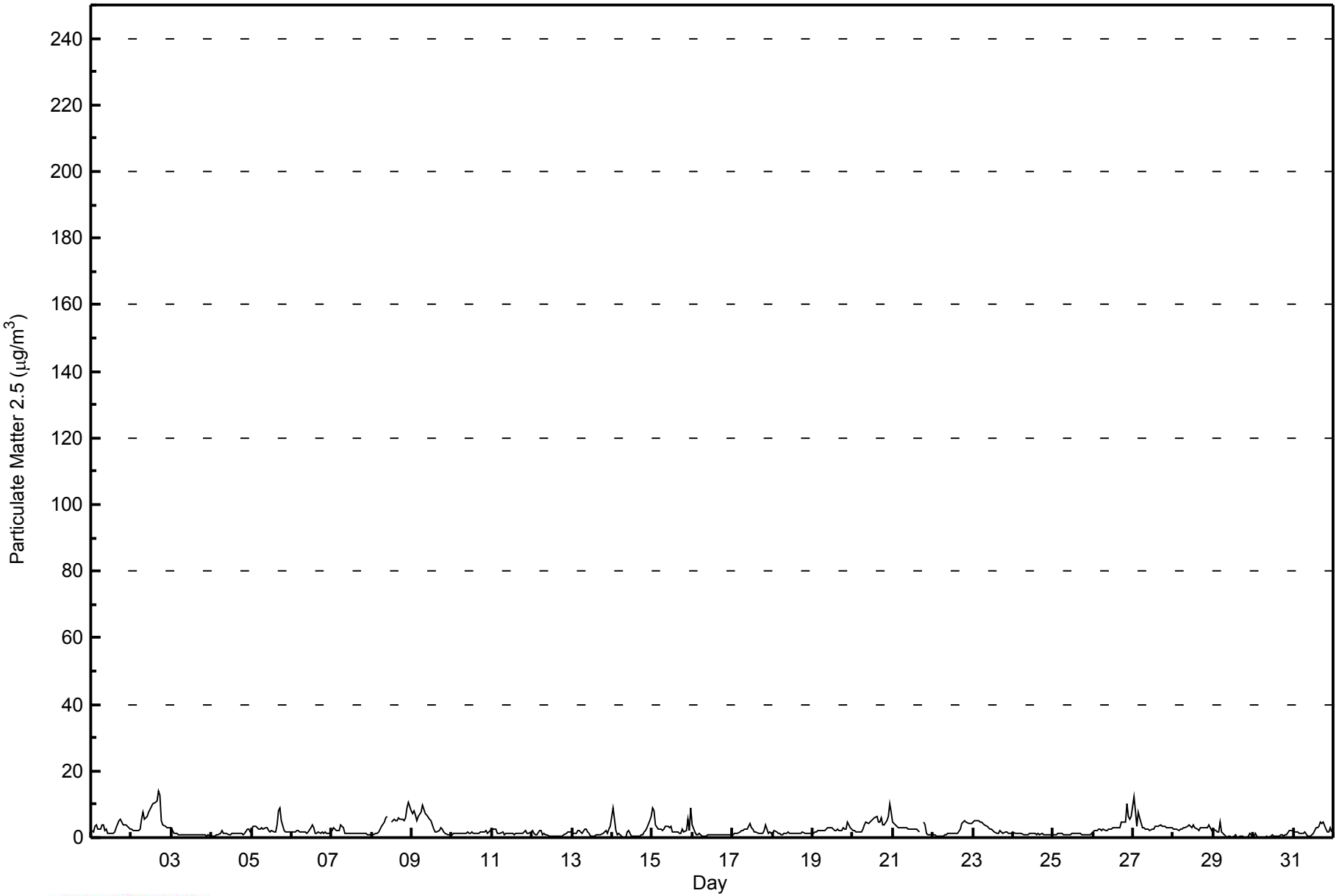
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	530	71.52	71.53
6 - 15	52	7.02	78.54
16 - 25	0	0.00	78.54
26 - 80	0	0.00	78.54
> 81.0	0	0.00	78.54

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Fort Chipeywan - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	24	14	25	38	52	96	15	14	10	9	6	7	14	50	53	100	527
6 - 15	1	0	2	2	9	9	2	0	0	7	5	3	2	5	3	2	52
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	25	14	27	40	61	105	17	14	10	16	11	10	16	55	56	102	579

Total Number of Valid Hours: 738

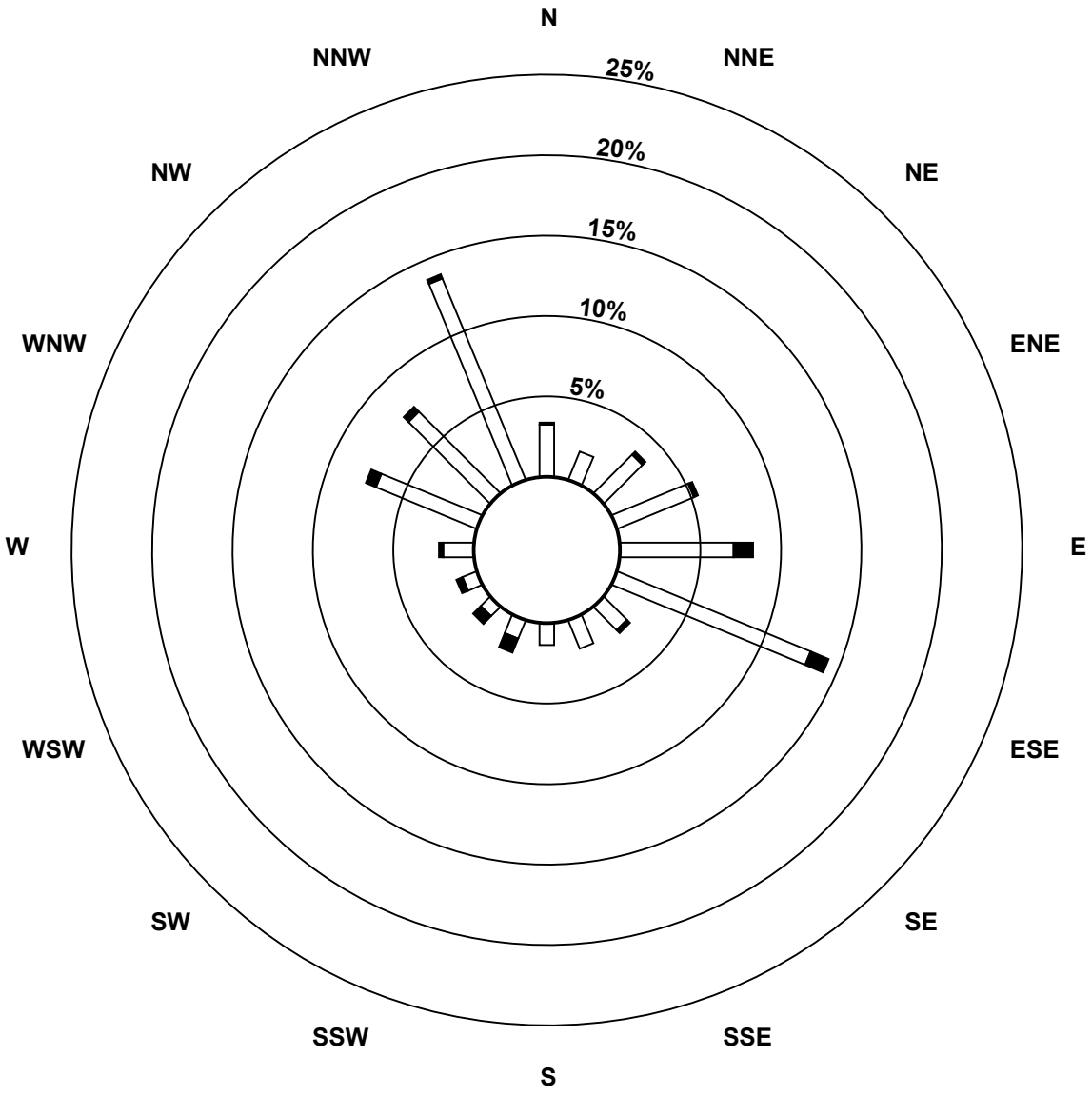
Total Number of Hours: 744

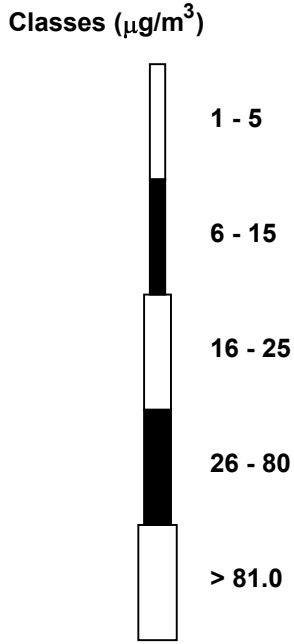
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Fort Chipeywan (AMS 8)





Total Number of Valid Hours: 738

Maximum Value: 2.7 C on Jan 15 05:00

Maximum Daily Average: -6.1 C on Jan 23

Minimum Value: -41.5 C on Jan 1 10:00

Minimum Daily Average: -37.5 C on Jan 1

Maximum Diurnal Average: -19.5 C at hour 15

Minimum Diurnal Average: -22.0 C at hour 2

Monthly Average: -20.74 C

Percentiles: P_1 = -39.1 P_{10} = -30.9 Q_1 = -26.4 Median = -20.7 Q_3 = -15.3 P_{90} = -12.1 P_{99} = 1.1

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

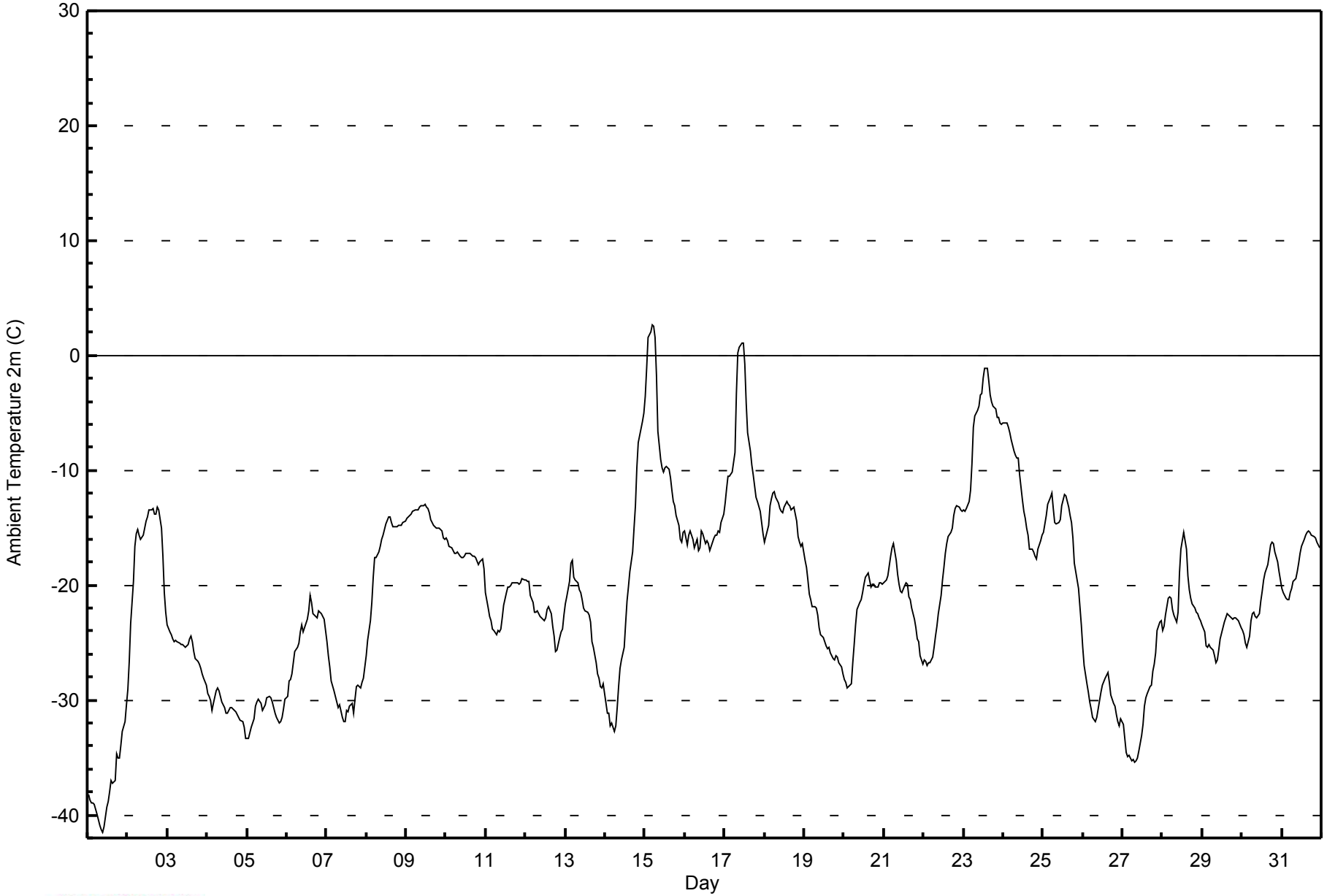
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-38.2	-38.7	-39.0	-38.9	-39.1	-39.9	-40.5	-40.9	-41.3	-41.5	-41.0	-39.4	-38.9	-38.0	-37.0	-37.3	-37.0	-34.7	-35.0	-35.0	-34.0	-32.7	-31.9	-30.4	-37.5	-30.4
2-Jan	-29.1	-26.6	-23.3	-19.7	-16.6	-15.5	-15.1	-15.7	-16.0	-15.7	-15.1	-14.4	-14.1	-13.5	-13.4	-13.3	-13.7	-13.8	-13.2	-13.4	-15.1	-17.4	-20.6	-22.4	-16.9	-13.2
3-Jan	-23.4	-24.1	-24.3	-24.6	-24.9	-24.8	-24.9	-25.1	-25.1	-25.2	-25.3	-25.4	-25.1	-24.7	-24.4	-24.9	-25.8	-26.4	-26.6	-26.9	-27.3	-27.7	-28.1	-28.7	-25.6	-23.4
4-Jan	-29.5	-29.7	-30.1	-30.9	-30.2	-29.2	-28.9	-29.2	-29.7	-30.1	-30.7	-31.1	-31.1	-30.9	-30.6	-30.6	-30.9	-31.0	-31.2	-31.5	-31.8	-31.9	-32.3	-33.3	-30.7	-28.9
5-Jan	-33.3	-33.3	-32.3	-32.1	-31.6	-30.6	-30.1	-29.9	-30.3	-30.9	-30.7	-30.4	-29.8	-29.7	-29.7	-30.1	-30.7	-31.1	-31.5	-32.0	-31.9	-31.5	-30.8	-30.0	-31.0	-29.7
6-Jan	-29.7	-28.3	-28.2	-27.7	-26.8	-25.7	-25.5	-25.0	-24.1	-23.4	-24.1	-23.3	-23.0	-22.2	-20.9	-21.6	-22.4	-22.7	-22.9	-22.3	-22.4	-22.5	-22.9	-23.9	-24.2	-20.9
7-Jan	-24.9	-26.1	-27.2	-28.3	-29.2	-29.7	-30.2	-30.6	-30.4	-31.5	-31.8	-31.9	-30.9	-31.0	-30.5	-30.2	-31.2	-29.9	-28.8	-28.7	-28.9	-28.5	-28.1	-27.1	-29.4	-24.9
8-Jan	-26.1	-24.7	-23.1	-21.5	-19.3	-17.6	-17.6	-17.1	-16.6	-16.0	-15.7	-15.1	-14.7	-14.0	-14.1	-14.6	-14.9	-15.0	-14.9	-14.8	-14.8	-14.7	-14.6	-14.4	-16.9	-14.0
9-Jan	-14.1	-14.1	-13.9	-13.8	-13.6	-13.5	-13.5	-13.4	-13.2	-13.1	-13.0	-12.9	-13.2	-13.3	-13.7	-14.3	-14.8	-14.9	-15.0	-15.0	-15.1	-15.3	-15.9	-16.0	-14.1	-12.9
10-Jan	-15.8	-16.1	-16.6	-16.8	-17.0	-17.2	-17.2	-17.1	-17.5	-17.6	-17.6	-17.4	-17.3	-17.2	-17.3	-17.4	-17.5	-17.5	-17.6	-18.2	-18.0	-17.9	-17.7	-18.6	-17.3	-15.8
11-Jan	-20.6	-22.0	-22.8	-23.1	-23.8	-24.0	-24.3	-23.9	-24.1	-23.8	-22.9	-21.7	-20.7	-20.2	-20.1	-20.1	-19.8	-19.7	-19.7	-19.8	-19.9	-19.7	-19.5	-19.5	-21.5	-19.5
12-Jan	-19.6	-19.6	-19.7	-20.9	-21.6	-22.3	-22.4	-22.2	-22.4	-22.7	-23.0	-23.1	-22.8	-22.0	-21.9	-22.5	-23.6	-24.4	-25.8	-25.6	-24.5	-24.0	-23.8	-22.6	-22.6	-19.6
13-Jan	-21.6	-21.0	-19.7	-18.1	-17.9	-19.3	-19.6	-19.8	-20.4	-20.6	-21.2	-21.9	-22.3	-22.3	-22.6	-23.2	-25.0	-25.4	-26.7	-27.7	-28.1	-28.8	-29.0	-28.6	-22.9	-17.9
14-Jan	-30.3	-31.1	-31.1	-32.3	-32.0	-32.8	-32.2	-30.6	-28.9	-27.2	-26.5	-25.5	-23.3	-21.4	-20.2	-18.8	-17.1	-15.0	-13.1	-9.8	-7.6	-6.9	-5.7	-5.1	-21.9	-5.1
15-Jan	-3.5	-1.2	1.6	2.0	2.7	2.6	1.6	-1.7	-6.6	-9.1	-9.8	-10.1	-9.8	-9.6	-9.9	-10.6	-11.7	-12.7	-13.1	-13.9	-14.8	-16.0	-16.2	-15.4	-7.7	2.7
16-Jan	-15.3	-16.4	-15.6	-15.3	-15.6	-16.0	-16.8	-16.0	-17.0	-16.7	-15.3	-15.5	-16.4	-16.1	-16.4	-17.0	-16.6	-15.9	-15.7	-15.6	-15.3	-15.4	-14.6	-13.9	-15.8	-13.9
17-Jan	-12.8	-11.6	-10.6	-10.5	-10.1	-9.2	-8.4	-3.4	0.3	0.7	1.1	1.1	-0.8	-4.2	-6.7	-8.3	-9.5	-10.4	-11.4	-12.3	-12.7	-13.6	-14.5	-15.5	-8.1	1.1
18-Jan	-16.3	-15.7	-14.8	-13.0	-12.4	-12.0	-11.8	-12.3	-12.9	-13.3	-13.5	-13.7	-13.2	-12.7	-13.0	-13.1	-13.4	-13.4	-13.2	-14.4	-15.7	-16.2	-16.6	-16.4	-13.9	-11.8
19-Jan	-17.8	-18.5	-19.6	-20.8	-21.3	-21.8	-21.8	-22.0	-22.6	-23.7	-24.3	-24.6	-25.0	-25.3	-25.5	-25.4	-25.9	-26.4	-26.5	-26.1	-26.3	-26.7	-27.2	-27.7	-23.9	-17.8
20-Jan	-28.2	-28.5	-29.0	-28.9	-28.6	-26.7	-25.1	-23.5	-22.1	-21.5	-21.2	-20.7	-20.0	-19.3	-18.9	-19.6	-20.2	-19.9	-19.9	-20.2	-20.1	-19.8	-19.8	-19.9	-22.6	-18.9
21-Jan	-19.8	-19.6	-19.2	-18.4	-17.4	-16.8	-16.4	-17.8	-19.1	-19.9	-20.5	-20.7	-20.1	-19.7	-20.0	-21.0	-21.3	-22.0	-23.0	-23.6	-24.7	-24.9	-26.1	-26.9	-20.8	-16.4
22-Jan	-26.5	-26.7	-27.0	-26.8	-26.7	-26.2	-25.4	-24.4	-23.6	-22.5	-20.8	-19.6	-18.4	-17.2	-16.4	-15.7	-15.4	-15.0	-14.0	-13.3	-13.1	-13.1	-13.5	-13.5	-19.8	-13.1
23-Jan	-13.5	-13.5	-13.3	-12.8	-11.8	-9.4	-6.3	-5.3	-4.7	-4.5	-3.5	-3.3	-2.0	-1.2	-1.1	-2.3	-3.4	-4.1	-4.4	-4.7	-5.4	-5.4	-5.8	-6.0	-6.1	-1.1
24-Jan	-5.9	-5.9	-5.9	-6.3	-6.8	-7.4	-8.3	-8.6	-8.9	-8.9	-10.4	-12.7	-13.6	-14.2	-15.0	-15.6	-16.9	-16.9	-17.1	-17.5	-17.7	-16.9	-16.2	-15.7	-12.1	-5.9
25-Jan	-15.4	-14.7	-13.9	-12.9	-12.4	-12.0	-13.3	-14.5	-14.6	-14.5	-14.3	-13.1	-12.6	-12.1	-12.2	-13.2	-14.0	-14.5	-15.9	-18.1	-19.5	-20.3	-21.9	-23.4	-15.1	-12.0
26-Jan	-25.4	-27.0	-28.5	-29.3	-30.2	-30.8	-31.5	-31.8	-31.5	-30.8	-30.0	-29.3	-28.6	-28.1	-27.8	-27.6	-28.5	-29.5	-30.3	-30.5	-31.3	-31.8	-32.3	-31.6	-29.8	-25.4
27-Jan	-32.1	-33.3	-34.6	-34.9	-34.8	-35.3	-35.2	-35.4	-35.3	-35.1	-34.4	-33.1	-32.1	-30.5	-29.8	-29.4	-28.8	-28.7	-27.5	-26.8	-25.9	-23.9	-23.2	-23.1	-31.0	-23.1
28-Jan	-23.9	-23.6	-22.6	-21.2	-21.0	-21.1	-22.1	-22.5	-23.2	-22.3	-19.0	-16.8	-16.2	-15.4	-16.9	-19.2	-20.4	-21.1	-21.6	-22.0	-22.3	-22.5	-22.9	-23.1	-20.9	-15.4
29-Jan	-23.5	-24.0	-25.3	-25.4	-25.1	-25.4	-25.7	-26.1	-26.7	-26.5	-25.6	-24.6	-23.8	-23.2	-22.8	-22.5	-22.6	-22.8	-22.9	-22.9	-22.8	-22.9	-23.1	-23.6	-24.2	-22.5
30-Jan	-24.0	-24.4	-25.0	-25.4	-24.5	-23.1	-22.5	-22.4	-22.8	-22.9	-22.4	-21.4	-20.5	-19.6	-19.0	-18.2	-17.3	-16.5	-16.2	-16.3	-17.1	-17.9	-18.8	-19.6	-20.7	-16.2
31-Jan	-20.2	-20.6	-21.1	-21.3	-21.2	-20.7	-20.2	-19.7	-19.4	-18.8	-18.0	-17.3	-16.6	-16.0	-15.7	-15.4	-15.3	-15.4	-15.6	-15.7	-15.9	-16.3	-16.5	-16.7	-17.9	-15.3
	-22.0	-22.0	-21.8	-21.6	-21.3	-21.1	-21.0	-20.9	-21.0	-21.0	-20.7	-20.3	-19.9	-19.5	-19.5	-19.8	-20.2	-20.2	-20.3	-20.5	-20.6	-20.7	-21.0	-21.1	Diurnal Average	
	-3.5	-1.2	1.6	2.0	2.7	2.6	1.6	-1.7	0.3	0.7	1.1	1.1	-0.8	-1.2	-1.1	-2.3	-3.4	-4.1	-4.4	-4.7	-5.4	-5.4	-5.7	-5.1	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Fort Chipeywan - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	395	53.09	53.09
-20 - 0	340	45.70	98.79
0 - 10	9	1.21	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 94 % on Jan 15 02:00

Maximum Daily Average: 85.8 % on Jan 9

Minimum Value: 59 % on Jan 26 16:00

Minimum Daily Average: 65.8 % on Jan 26

Maximum Diurnal Average: 77.5 % at hour 2

Minimum Diurnal Average: 73.5 % at hour 15

Monthly Average: 76.2 %

Percentiles: P_1 = 62 P_{10} = 68 Q_1 = 71 Median = 76 Q_3 = 81 P_{90} = 85 P_{99} = 92

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

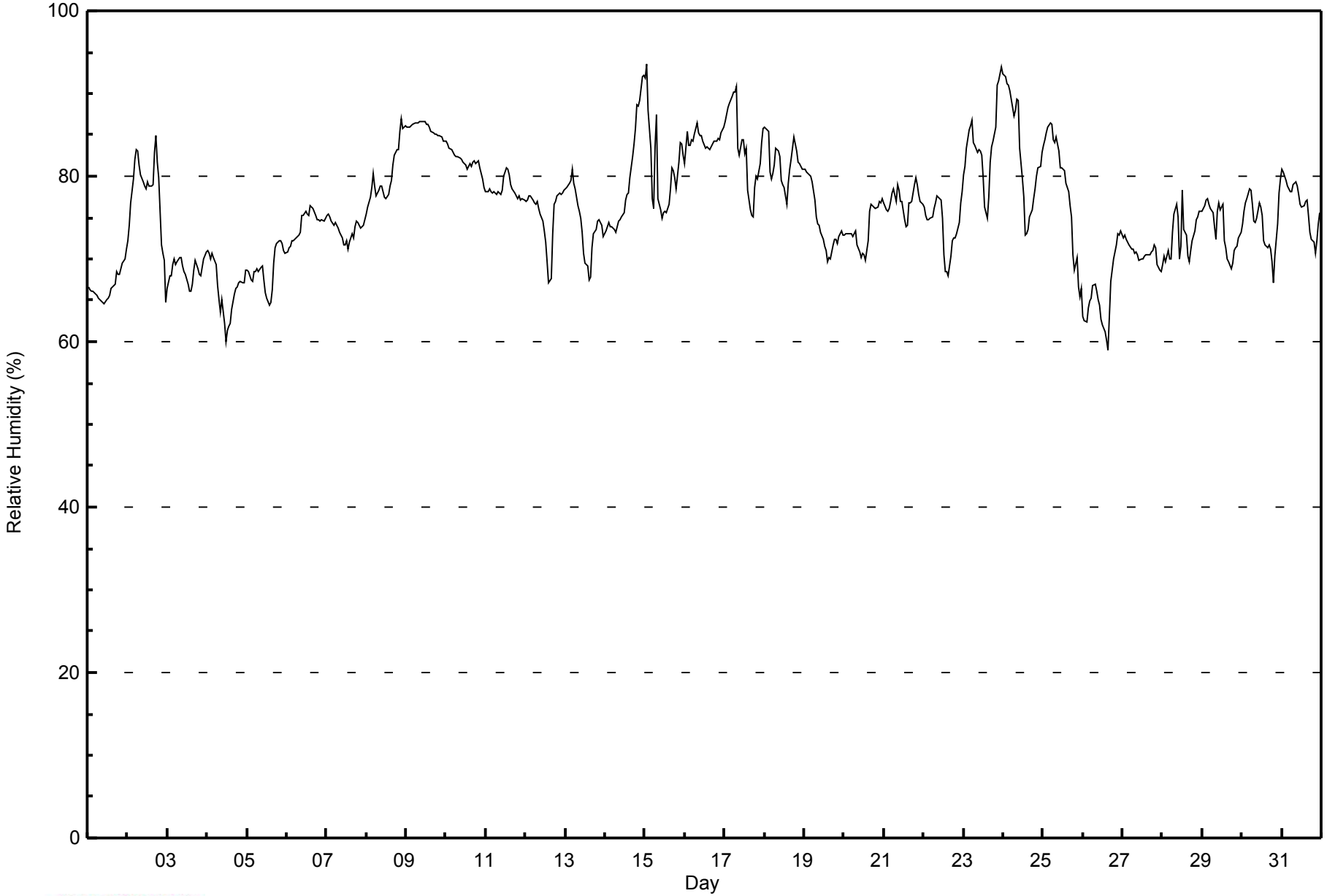
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	67	66	66	66	66	66	65	65	65	65	65	65	65	66	66	67	67	68	68	68	69	70	70	71	66.7	71
2-Jan	72	74	77	80	82	83	83	81	80	79	79	78	79	79	79	79	83	85	82	80	72	71	70	65	78.0	85
3-Jan	67	68	68	69	70	69	70	70	70	69	68	68	67	66	66	67	69	70	69	68	68	69	70	71	68.6	71
4-Jan	71	71	70	71	70	69	67	65	64	65	62	60	61	62	62	64	66	66	67	67	67	67	67	69	66.3	71
5-Jan	69	68	67	67	69	68	69	69	69	69	68	66	65	64	65	66	69	71	72	72	72	72	71	71	68.7	72
6-Jan	71	71	72	72	72	72	73	73	73	75	75	76	75	75	77	76	76	75	75	75	75	75	75	75	74.1	77
7-Jan	75	75	75	75	74	74	74	74	73	73	72	72	72	71	72	73	73	74	75	74	74	74	74	75	73.6	75
8-Jan	75	76	77	79	80	79	78	78	79	79	78	77	77	78	79	79	81	83	83	83	85	87	86	86	80.2	87
9-Jan	86	86	86	86	86	86	86	86	87	87	87	87	86	86	86	85	85	85	85	85	85	85	84	84	85.8	87
10-Jan	84	84	83	83	83	83	82	82	82	82	82	82	81	81	82	81	82	82	82	82	81	80	80	79	81.8	84
11-Jan	78	78	78	78	78	78	78	78	78	78	78	80	81	81	80	79	78	78	78	77	78	77	77	77	78.4	81
12-Jan	77	77	78	78	77	77	77	77	76	75	75	73	72	70	67	68	73	77	77	78	78	78	78	78	75.4	78
13-Jan	78	79	79	79	81	79	78	77	76	75	73	71	70	69	67	68	71	73	74	75	75	74	74	73	74.5	81
14-Jan	73	74	74	74	74	73	73	74	74	75	75	76	77	78	78	80	82	84	86	89	88	89	92	92	79.4	92
15-Jan	92	94	88	83	77	76	84	88	77	76	75	76	76	76	77	79	81	81	80	78	82	84	84	82	81.0	94
16-Jan	82	85	84	84	84	84	85	86	85	85	85	84	83	84	83	83	84	84	84	84	85	84	85	86	84.3	86
17-Jan	87	87	88	89	90	90	90	91	83	83	84	84	83	83	78	76	75	75	79	80	80	82	84	86	83.6	91
18-Jan	86	86	85	81	80	80	81	83	83	82	79	79	79	77	79	81	82	83	85	83	82	82	81	81	81.7	86
19-Jan	81	81	80	80	80	79	77	75	74	74	73	72	71	71	70	70	70	72	72	72	72	73	73	73	74.4	81
20-Jan	73	73	73	73	73	73	73	73	72	71	70	71	71	70	72	76	77	76	76	76	76	77	77	77	73.7	77
21-Jan	77	76	76	76	77	78	78	77	79	78	77	77	75	74	74	77	77	77	79	80	79	78	77	77	77.0	80
22-Jan	76	75	75	75	75	75	76	77	78	77	77	75	71	68	68	68	70	72	73	72	73	74	77	78	74.0	78
23-Jan	80	81	83	86	86	87	84	84	83	83	83	83	80	76	75	78	82	84	84	86	91	92	92	93	84.0	93
24-Jan	92	92	91	91	90	89	87	88	89	89	83	80	77	73	73	74	75	76	77	78	80	81	81	83	83.0	92
25-Jan	84	84	85	86	87	86	84	84	85	83	81	81	81	81	79	78	76	75	70	69	70	67	65	66	78.7	87
26-Jan	63	63	62	64	65	65	67	67	66	65	64	63	62	61	60	59	63	67	70	71	72	73	73	73	65.8	73
27-Jan	73	73	72	72	72	71	71	71	71	71	70	70	70	70	71	70	70	71	71	72	71	69	69	68	70.8	73
28-Jan	69	70	70	71	70	70	73	75	77	75	70	71	78	74	73	70	70	71	72	73	75	75	76	76	72.7	78
29-Jan	76	76	77	77	77	76	76	74	72	76	77	76	77	72	71	70	70	69	69	71	71	72	73	73	73.6	77
30-Jan	74	76	77	77	78	78	77	75	74	75	77	76	75	72	72	71	72	71	70	67	70	74	78	80	74.5	80
31-Jan	81	81	80	79	78	78	78	79	79	79	78	77	76	76	77	77	75	73	72	72	71	72	74	76	76.6	81
	77.0	77.5	77.4	77.4	77.5	77.3	77.3	77.3	76.6	76.4	75.5	75.0	74.7	73.7	73.5	73.8	75.0	75.8	75.9	76.1	76.3	76.6	77.0	77.2	Diurnal Average	
	92	94	91	91	90	90	90	91	89	89	87	87	86	86	86	85	85	85	86	89	91	92	92	93	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Fort Chipeywan - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	1	0.13	0.13
60 - 80	542	72.85	72.98
80 - 100	201	27.02	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 0.8 mm on Jan 15 02:00

Maximum Daily Total: 1.6 mm on Jan 15

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 0.9 mm at hour 2

Minimum Diurnal Total: 0.0 mm at hour 1

Monthly Total: 2.20 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} = 0.1

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

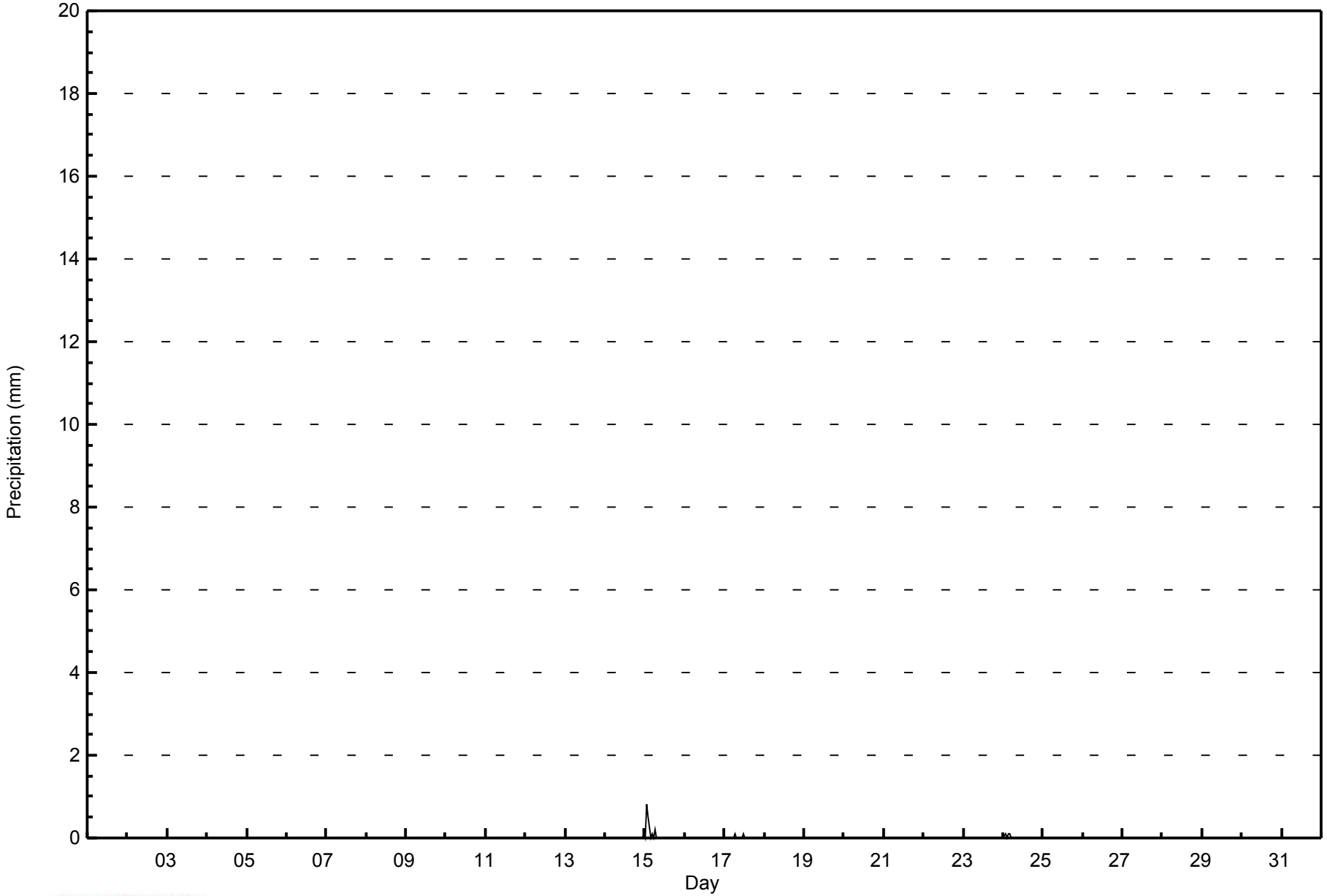
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1
15-Jan	0.0	0.8	0.5	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	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	0.8
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	0.2	0.1
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.1	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	0.3	0.1
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.9	0.5	0.1	0.2	0.0	0.3	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	0.1	Diurnal Average	
	0.0	0.8	0.5	0.1	0.1	0.0	0.2	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	0.1	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	742	99.73	99.73
0.4 - 0.5	1	0.13	99.87
0.6 - 0.7	0	0.00	99.87
0.8 - 1.4	1	0.13	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 185 W/m2 on Jan 27 13:00
Maximum Daily Average: 35.4 W/m2 on Jan 27

Minimum Value: 0 W/m2 on Jan 15 07:00
Minimum Daily Average: 7.3 W/m2 on Jan 11
Maximum Diurnal Average: 90.8 W/m2 at hour 13
Minimum Diurnal Average: 0.1 W/m2 at hour 21
Monthly Average: 16.9 W/m2
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 16$ $P_{90} = 69$ $P_{99} = 141$

Hours in Service: 744
Hours of Data: 744
Hours of Missing Data: 0
Hours of Calibration: 0
Percent Operational Time: 100.0

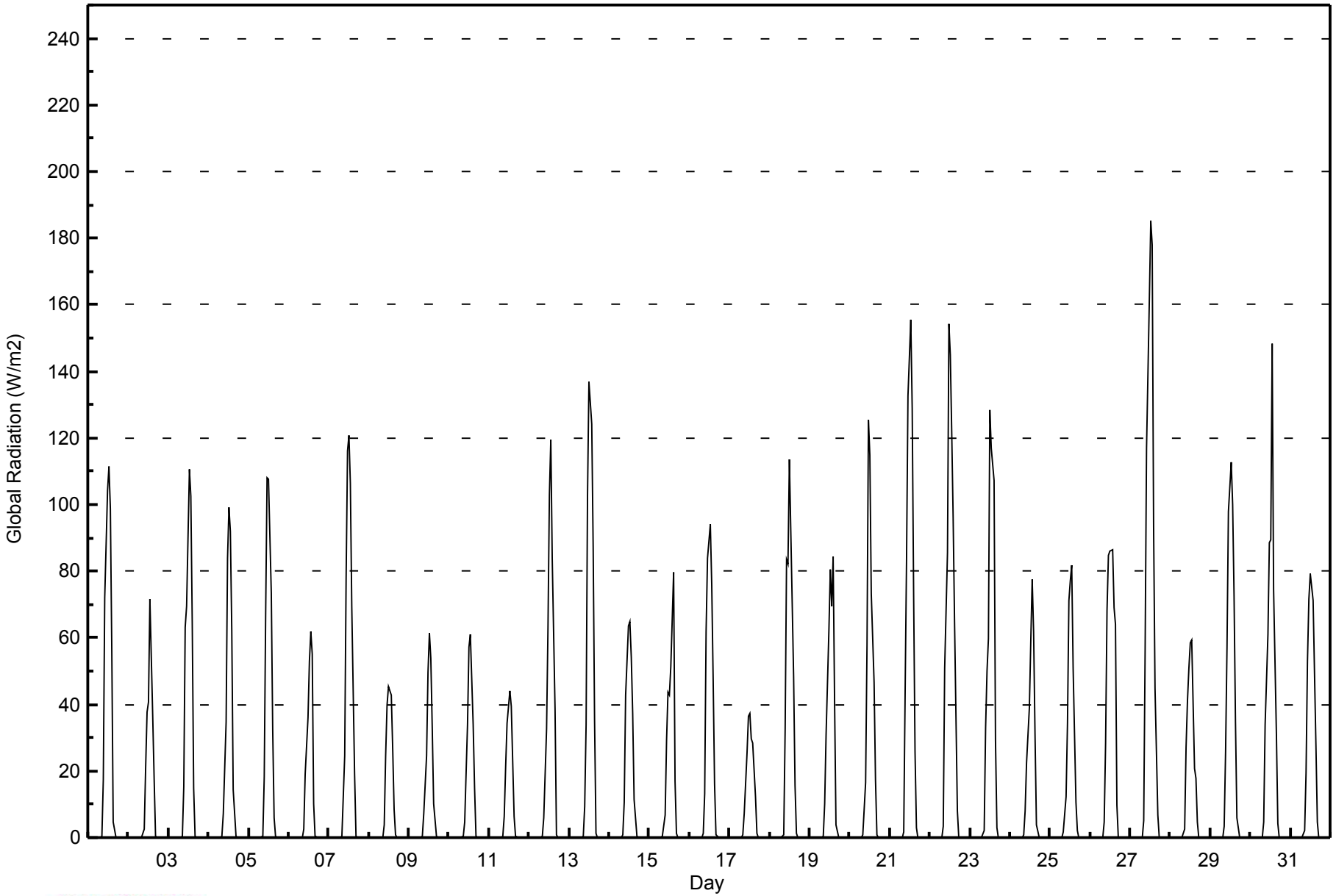
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	0	0	0	0	0	0	17	72	104	112	99	57	5	0	0	0	0	0	0	0	0	19.4	112
2-Jan	0	0	0	0	0	0	0	0	0	3	21	38	41	72	36	18	0	0	0	0	0	0	0	0	9.6	72
3-Jan	0	0	0	0	0	0	0	0	1	15	63	69	111	103	64	15	0	0	0	0	0	0	0	0	18.4	111
4-Jan	0	0	0	0	0	0	0	0	0	7	35	84	99	92	62	15	0	0	0	0	0	0	0	0	16.5	99
5-Jan	0	0	0	0	0	0	0	0	0	18	67	108	108	73	32	6	0	0	0	0	0	0	0	0	17.2	108
6-Jan	0	0	0	0	0	0	0	0	0	3	19	36	53	62	55	10	0	0	0	0	0	0	0	0	10.0	62
7-Jan	0	0	0	0	0	0	0	0	1	25	78	116	121	106	69	19	0	0	0	0	0	0	0	0	22.3	121
8-Jan	0	0	0	0	0	0	0	0	0	4	25	40	45	43	27	8	1	0	0	0	0	0	0	0	8.1	45
9-Jan	0	0	0	0	0	0	0	0	0	7	25	49	61	54	33	10	0	0	0	0	0	0	0	0	10.1	61
10-Jan	0	0	0	0	0	0	0	0	0	5	19	34	57	61	34	15	0	0	0	0	0	0	0	0	9.4	61
11-Jan	0	0	0	0	0	0	0	0	0	6	21	34	44	39	23	6	0	0	0	0	0	0	0	0	7.3	44
12-Jan	0	0	0	0	0	0	0	0	0	6	33	63	103	119	84	39	1	0	0	0	0	0	0	0	18.7	119
13-Jan	0	0	0	0	0	0	0	0	0	9	34	103	137	124	87	35	1	0	0	0	0	0	0	0	22.1	137
14-Jan	0	0	0	0	0	0	0	0	1	10	43	64	65	54	37	11	0	0	0	0	0	0	0	0	11.9	65
15-Jan	0	0	0	0	0	0	0	0	0	7	29	44	43	51	80	17	1	0	0	0	0	0	0	0	11.4	80
16-Jan	0	0	0	0	0	0	0	0	1	13	62	84	94	76	47	16	1	0	0	0	0	0	0	0	16.4	94
17-Jan	0	0	0	0	0	0	0	0	1	7	26	36	37	30	28	12	1	0	0	0	0	0	0	0	7.5	37
18-Jan	0	0	0	0	0	0	0	0	1	33	84	82	113	70	49	16	1	0	0	0	0	0	0	0	18.7	113
19-Jan	0	0	0	0	0	0	0	0	1	10	31	62	80	69	84	41	4	0	0	0	0	0	0	0	16.0	84
20-Jan	0	0	0	0	0	0	0	0	1	17	58	125	115	73	47	17	1	0	0	0	0	0	0	0	19.0	125
21-Jan	0	0	0	0	0	0	0	0	2	44	84	133	156	129	74	26	3	0	0	0	0	0	0	0	27.1	156
22-Jan	0	0	0	0	0	0	0	0	4	51	85	154	145	122	96	65	8	0	0	0	0	0	0	0	30.5	154
23-Jan	0	0	0	0	0	0	0	0	2	33	50	60	128	117	107	29	3	0	0	0	0	0	0	0	22.1	128
24-Jan	0	0	0	0	0	0	0	0	1	8	22	39	59	78	62	31	4	0	0	0	0	0	0	0	12.7	78
25-Jan	0	0	0	0	0	0	0	0	2	12	35	71	77	82	51	11	2	0	0	0	0	0	0	0	14.3	82
26-Jan	0	0	0	0	0	0	0	0	5	28	68	85	86	86	69	64	10	0	0	0	0	0	0	0	20.9	86
27-Jan	0	0	0	0	0	0	0	0	5	56	117	162	185	178	94	45	7	0	0	0	0	0	0	0	35.4	185
28-Jan	0	0	0	0	0	0	0	0	3	27	41	51	59	59	21	18	5	0	0	0	0	0	0	0	11.8	59
29-Jan	0	0	0	0	0	0	0	0	3	26	57	98	113	100	72	35	6	0	0	0	0	0	0	0	21.3	113
30-Jan	0	0	0	0	0	0	0	0	5	34	61	88	89	148	75	31	4	0	0	0	0	0	0	0	22.4	148
31-Jan	0	0	0	0	0	0	0	0	2	19	53	71	79	71	49	27	5	0	0	0	0	0	0	0	15.8	79
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.4	18.1	48.9	77.0	90.8	85.2	58.3	23.0	2.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
	0	0	0	0	0	0	0	0	5	56	117	162	185	178	107	65	10	0	0	0	0	0	0	0	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Global Radiation (GR) - W/m2

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	569	76.48	76.48
21 - 100	143	19.22	95.70
101 - 300	32	4.30	100.00
301 - 600	0	0.00	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort Chipeywan - January 2014

Maximum Speed: 44 km/h on Jan 19 01:00

Maximum Daily Speed Average: 25.8 km/h on Jan 6

Minimum Speed Value: 0 km/h on Jan 15 23:00

Minimum Daily Speed Average: 1.5 km/h on Jan 12

Maximum Diurnal Speed Average: 4.9 km/h at hour 1

Minimum Diurnal Speed Average: 1.6 km/h at hour 6

Monthly Average Velocity: 3.6 km/h 38.8 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 8 Median = 13 Q_3 = 18 P_{90} = 23 P_{99} = 39

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
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-Jan	SE3	SSE1	NNW1	E2	AF	WNW2	ENE1	W3	W2	E1	ESE1	ESE1	ESE3	AF	E7	ESE10	ESE10	E13	ESE16	ESE18	ESE20	ESE21	ESE23	ESE24	ESE7.5	ESE24
2-Jan	ESE25	ESE24	ESE23	ESE27	SE28	SSE17	SSW22	SSW23	SSW23	SSW19	SSW16	SW15	SW14	SW13	SW7	WSW5	W5	NW8	NNW12	NNW14	NNW16	NNW21	NNW21	NNW20	S3.8	SE28
3-Jan	NNW16	NW14	NW15	NW16	NW16	NW18	NW19	NW19	NW20	NW19	NW18	NW18	NW20	NW20	NW17	NW18	NW18	NW20	NW19	NW19	NW18	NW18	NW17	WNW16	NW17.6	NW20
4-Jan	WNW16	WNW18	WNW17	WNW17	WNW16	NW17	NW20	NNW22	NNW21	NNW15	NNW19	NNW20	NNW19	NNW19	NNW18	NNW20	NNW18	NNW20	NNW21	NNW23	NW19	NW19	NW15	WNW10	NW17.7	NNW23
5-Jan	WNW13	WNW16	NW16	NW11	WNW12	NW11	NW11	NW11	NW8	NW7	NW9	NNW11	NNW6	NNW4	WNW2	NW1	ESE2	ESE3	ESE5	ESE7	ESE8	ESE10	ESE11	SE14	NW3.8	NW16
6-Jan	ESE23	ESE21	E25	E27	ESE28	ESE26	ESE30	ESE34	ESE32	E34	E32	E32	E33	E30	E32	E31	E30	E25	E24	ENE22	E19	ENE17	E12	E12	E25.8	ESE34
7-Jan	ENE8	ENE3	E5	E6	NE1	SE2	AF	ESE7	ESE7	ESE10	ESE7	ESE11	ESE14	ESE10	ESE12	ESE17	ESE16	ESE16	ESE19	ESE20	ESE21	ESE20	ESE22	ESE20	ESE11.7	ESE22
8-Jan	ESE21	ESE20	ESE18	SE19	SSE16	SSW22	SSW17	SSW17	SSW15	SW11	WSW10	SW11	WSW11	W13	WNW10	WNW9	WNW8	WNW7	WNW8	W4	WNW3	WNW2	NW1	ESE2	SSW5.6	SSW22
9-Jan	SE7	SE9	ESE6	ENE7	ENE5	E9	E11	E7	NE4	N3	N5	N7	N6	NNE5	NE3	NNE3	N4	NNE5	NNE4	NE7	ENE8	ENE10	ENE10	ENE9	ENE4.9	E11
10-Jan	ENE11	ENE10	ENE10	ENE9	ENE8	NE5	ENE7	NNE3	NNE3	N2	NNE2	N2	NW1	W3	WNW2	WNW5	W4	WNW6	WNW6	WNW4	WNW5	WNW6	NW7	NNW8	N2.7	ENE11
11-Jan	NNW7	NNW5	NNW4	NNW4	NE1	NE2	E5	E12	E13	E12	E13	E12	E14	ENE13	ENE18	ENE16	ENE13	ENE15	ENE14	NE14	NE12	NE11	NE13	NE10	ENE9.2	ENE18
12-Jan	NE11	NE9	NNE8	NNW7	NNW10	NNW11	NNW11	NW8	WNW12	WNW10	WNW10	WNW10	W9	W10	WSW9	S5	SSE7	ESE11	ESE12	ESE14	ESE15	ESE16	ESE15	ESE14	NE1.5	ESE16
13-Jan	ESE19	ESE22	ESE16	ESE8	N5	NNW8	NW11	NNW16	NNW16	NW14	NNW18	NNW19	NW16	NW16	NW15	WNW12	WNW13	WNW10	WNW8	WNW8	WNW11	NW9	NW8	NW7	NNW7.7	ESE22
14-Jan	WNW10	WNW6	W2	SE3	ESE6	ESE11	ESE12	ESE17	ESE22	ESE26	ESE27	ESE28	E28	E28	E28	E29	E29	E27	E26	SE18	SSE17	S17	S17	SSW17	ESE15.4	E29
15-Jan	SW15	WSW19	WNW36	W40	WNW37	WNW37	WNW38	NNW40	NNW39	NNW38	NNW28	NNW26	NNW22	NNW18	NNW10	N8	N7	N7	N9	NNW7	WNW4	WNW6	W0	WSW4	NW17.8	NNW40
16-Jan	WSW4	SSE3	SE3	ESE3	ESE6	ESE8	ESE10	ESE9	ESE9	E8	E7	ESE10	ESE9	ESE10	ESE13	ESE12	ESE13	ESE15	ESE16	ESE18	ESE20	ESE20	ESE22	ESE24	ESE10.9	ESE24
17-Jan	ESE17	ESE15	ESE18	ESE21	ESE18	ESE8	SE2	WNW14	WNW18	NW17	NW14	NNW21	NNW27	NNW22	NNW22	NNW19	NW14	NW15	NW8	NW9	NW8	WNW10	WNW5	WNW7	NNW6.8	NNW27
18-Jan	W4	SW2	SSE4	SW1	ESE8	ESE14	ESE17	E17	ENE12	ENE11	ENE13	E14	E13	ENE15	ENE19	E20	E27	E30	E28	E34	E39	ENE37	ENE40	E42	E18.2	E42
19-Jan	E44	ENE40	ENE31	ENE31	ENE23	ENE29	ENE27	ENE23	ENE25	ENE23	NE18	NE19	NE20	NE18	NE18	NE13	NE10	NNE8	NE10	NE7	NNE6	NNE4	E5	SSE3	ENE18.1	E44
20-Jan	S4	SSE4	SSE4	ESE6	SE11	SE13	SSE11	S11	SSE13	SE20	SE20	ESE14	ESE9	E8	ENE7	ESE9	E9	NE4	N3	N3	NNW4	NNW4	NW6	NW6	SE5.6	SE20
21-Jan	WNW6	WNW13	NW13	WNW13	NW11	NW9	N14	N12	NNW8	N10	N14	N14	N10	NNE5	E7	ESE11	ESE12	SE9	SE4	ESE9	SE13	SSE14	SE14	ESE14	NNE2.8	SSE14
22-Jan	ESE17	ESE19	ESE19	ESE18	ESE14	ESE15	ESE17	SE15	SE13	SSE14	S15	S16	S17	S18	S18	S18	S19	SSW23	SSW23	SSW21	SSW14	SSW13	SW13	SSE13.0	SSW23
23-Jan	SW15	SW15	WSW13	WSW11	WSW12	W11	WNW11	WNW15	WNW18	NW15	NW13	WNW12	NW13	NNW17	NNW18	NNW13	NNW10	NW7	NNW3	W0	E6	E9	ESE10	E6	WNW6.6	NNW18
24-Jan	ENE4	NNE4	N5	NNE5	NNE8	NE10	NE9	NNE6	NNE7	NE6	E15	E16	E19	E21	E19	E16	E16	E16	E19	E20	E21	ESE22	E23	E26	E12.7	E26
25-Jan	E30	ESE30	E24	E22	E11	N4	N6	NNW7	NNW9	NNW14	NNW16	NNW19	NNW18	NNW16	NNW19	NNW23	NNW21	NNW24	NNW23	N28	N23	N26	N22	N16	N12.6	ESE30
26-Jan	N18	N14	NNW16	NNW14	NNW13	NNW9	NNW11	NNW9	NW7	WNW8	WNW9	WNW8	W7	WNW7	WNW7	W6	W8	WNW5	WSW5	WSW2	ESE1	ESE3	ESE3	E1	NW6.1	N18
27-Jan	E4	E7	E5	E6	E7	ESE8	ESE8	ESE8	ESE9	ESE9	ESE10	ESE10	ESE12	E14	ESE15	ESE14	ESE16	ESE21	ESE18	ESE19	ESE18	ESE18	ESE17	ESE19	ESE12.2	ESE21
28-Jan	ESE19	ESE18	ESE19	ESE14	ESE17	ESE13	ESE12	ESE9	SE8	WNW1	NW12	NNW14	NNW13	NNW16	NNW19	NNW19	NNW15	NNW16	NNW16	NNW15	NNW13	NNW14	NW10	NW15	NNE5.9	ESE19
29-Jan	NW13	NW10	WNW9	NW8	NNW12	NNW12	NNW10	N10	N10	NNW10	NNW11	NNW10	NNW11	NNW14	NNW15	N12	NNW13	NNW15	NNW14	NNW13	NNW13	NNW17	NNW15	NNW17	NNW11.8	NNW17
30-Jan	NNW16	NW11	NW11	WNW11	WNW16	WNW16	WNW18	WNW18	W22	WNW23	W22	W18	W19	W28	W22	W17	W15	W14	W13	WNW11	WNW7	NW10	NNW10	NNW10	WNW14.9	W28
31-Jan	NW11	NW10	NW13	NNW13	NNW10	NNW9	NNW12	NNW14	NNW14	NNW14	NNW12	NNW9	NNW10	NW11	NW11	NW10	NW14	NNW15	NNW12	NNW12	NNW13	NNW10	NNW8	NW9	NNW11.3	NNW15
	ENE4.9	E4.0	ENE3.4	ENE3.1	NE2.3	NE1.6	NNE2.8	N3.1	N3.3	N3.7	N4.2	N4.5	N4.6	N4.9	NNE4.7	NE4.5	NE4.3	NE4.4	NE4.4	NE4.7	ENE4.8	ENE4.7	ENE4.8	ENE4.4	Diurnal Average	
	E44	ENE40	WNW36	W40	WNW37	WNW37	WNW38	NNW40	NNW39	NNW38	E32	E32	E33	E30	E32	E31	E30	E30	E28	E34	ENE39	ENE37	ENE40	E42	Diurnal Maximum	

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
Maximum Value: 12 km/h on Jan 15 09:00

Minimum Value: 1 km/h on Jan 27 05:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 8

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

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

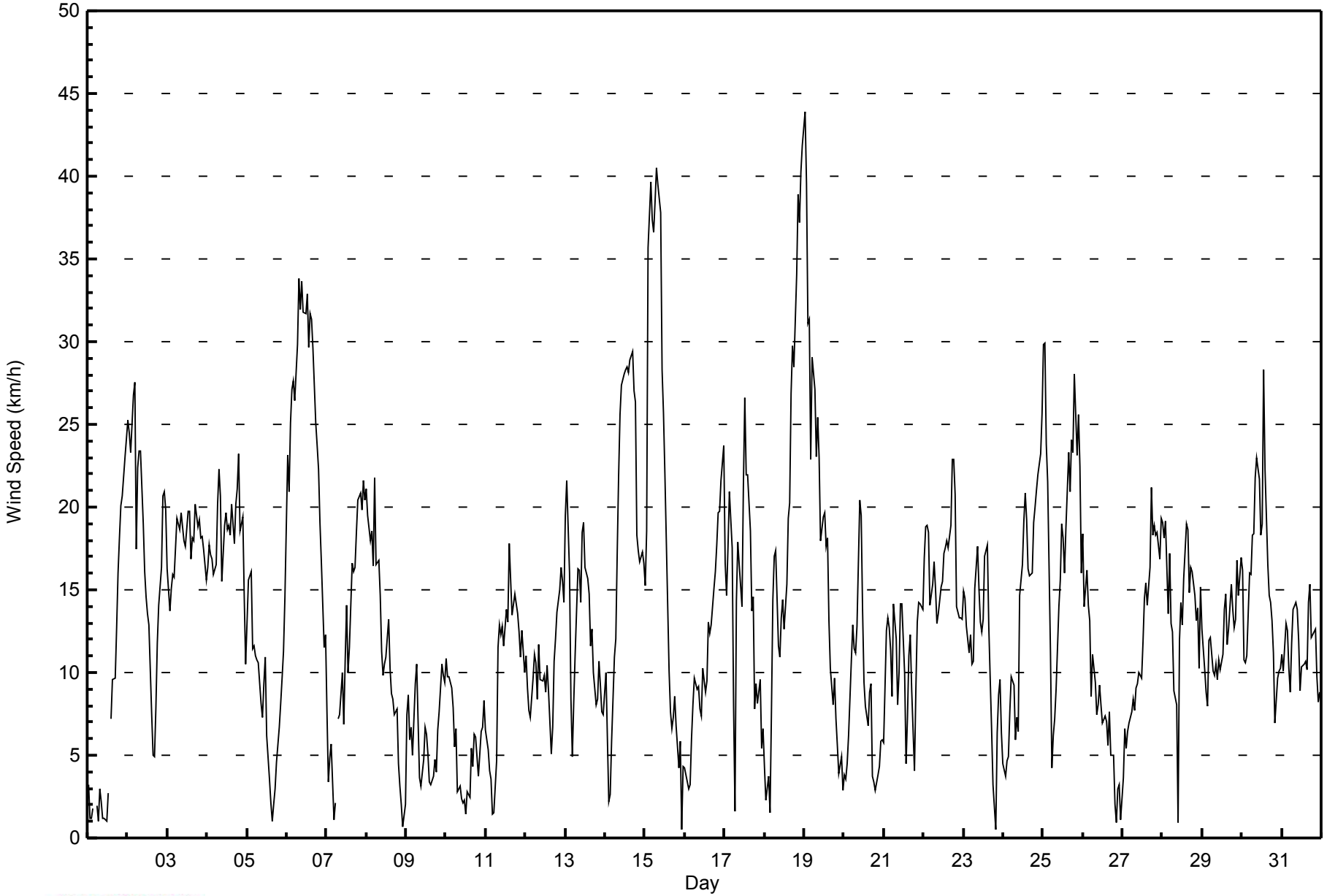
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Fort Chipeywan - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	105	14.17	14.17
6 - 11	219	29.55	43.72
12 - 19	281	37.92	81.65
20 - 28	102	13.77	95.41
29 - 38	26	3.51	98.92
> 38	8	1.08	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Fort Chipeywan - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	10	11	7	4	8	11	6	6	2	0	2	5	10	12	3	8	105
6 - 11	11	6	11	15	15	42	5	2	1	0	3	4	6	32	34	32	219
12 - 19	8	0	8	11	22	58	8	7	8	9	7	3	7	25	37	63	281
20 - 28	4	0	1	7	16	33	3	0	0	7	0	0	4	1	5	21	102
29 - 38	0	0	0	4	13	4	0	0	0	0	0	0	0	4	0	1	26
> 38	0	0	0	3	2	0	0	0	0	0	0	0	1	0	0	2	8
Totals	33	17	27	44	76	148	22	15	11	16	12	12	28	74	79	127	741

Total Number of Valid Hours: 741

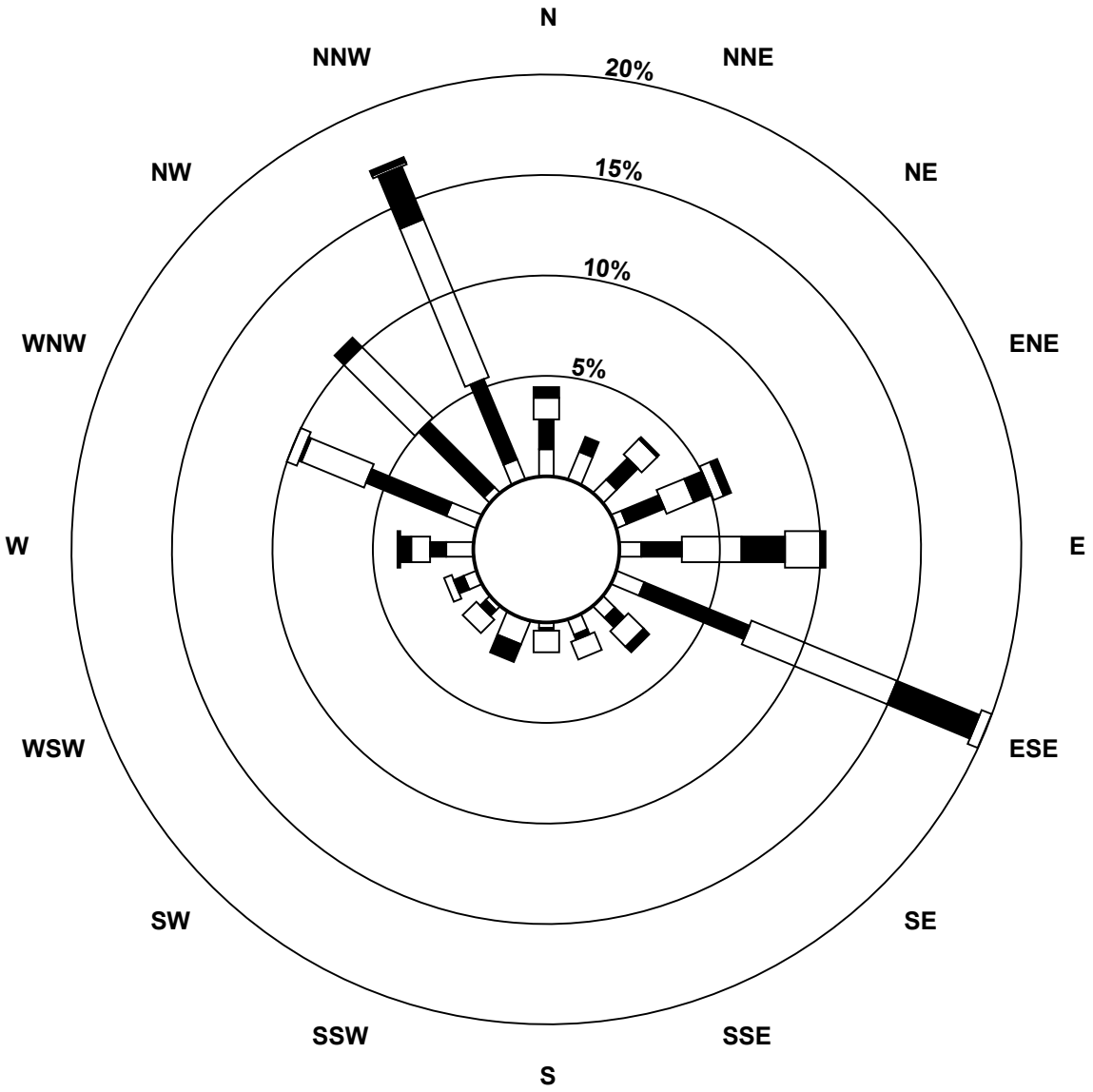
Total Number of Hours: 744

Wood Buffalo Environmental Association

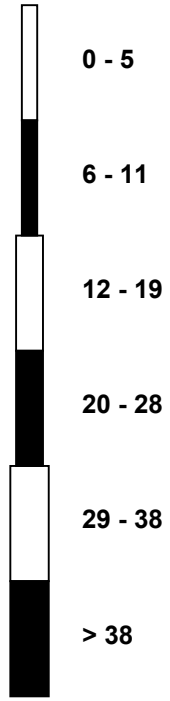
Wind Rose Jan 2014

Wind Speed (WS) - km/h

Fort Chipeywan (AMS 8)



Classes (km/h)



Total Number of Valid Hours: 741

Direction of Maximum Speed: 79 deg on Jan 19 01:00
Direction of Maximum Daily Speed Average: 93.6 deg on Jan 6

Direction of Minimum Speed: 266 deg on Jan 15 23:00

Direction of Minimum Daily Speed Average: 1.5 deg on Jan 12

Monthly Average Direction: 324.9 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	125	150	333	92	AF	291	61	261	272	101	102	102	116	AF	100	102	103	98	103	103	103	104	102	103	103.0
2-Jan	103	102	102	113	130	155	192	204	202	211	213	214	223	235	222	243	276	315	331	333	338	341	337	338	183.3
3-Jan	328	313	307	304	305	312	318	318	323	326	324	325	325	320	313	318	311	312	313	319	312	308	306	303	315.5
4-Jan	301	303	301	297	300	311	321	331	333	340	346	341	334	337	332	333	332	332	336	331	321	322	314	298	324.3
5-Jan	299	302	316	308	300	315	316	315	324	321	325	328	328	332	283	309	104	115	102	109	103	114	123	126	325.3
6-Jan	105	111	101	100	105	106	105	103	104	99	96	96	89	85	90	86	84	79	79	77	81	77	82	80	93.6
7-Jan	76	78	83	79	54	125	AF	112	112	107	121	116	113	117	105	105	106	104	102	104	105	111	111	119	106.9
8-Jan	116	115	118	128	164	195	203	211	206	218	238	230	245	273	286	292	297	283	289	277	289	299	318	118	201.7
9-Jan	140	142	113	77	70	96	90	83	48	9	2	356	4	23	35	23	4	16	25	48	74	75	67	64	64.3
10-Jan	68	68	71	68	66	47	59	26	24	351	12	4	317	261	291	293	281	294	293	295	300	300	312	332	6.4
11-Jan	338	342	327	334	51	53	80	99	98	98	88	81	79	77	78	63	63	63	57	56	55	54	50	46	65.8
12-Jan	45	36	21	343	336	333	341	320	301	294	283	283	280	264	252	176	152	114	104	113	113	110	118	117	40.9
13-Jan	103	104	104	102	350	348	325	331	331	326	329	327	319	319	314	300	302	301	296	293	302	305	320	320	330.4
14-Jan	300	290	261	125	109	102	105	114	108	104	103	102	101	101	97	98	99	99	101	131	157	172	182	192	112.9
15-Jan	214	257	283	281	283	285	303	327	329	331	331	329	332	331	342	353	6	360	349	337	298	286	266	256	309.0
16-Jan	239	156	136	120	105	107	102	107	106	99	101	104	109	111	112	111	104	112	111	108	108	106	107	106	108.9
17-Jan	103	107	105	104	105	106	126	293	296	304	317	331	332	342	332	327	321	322	307	305	306	291	282	289	335.5
18-Jan	264	222	155	231	117	119	103	95	73	61	76	89	89	63	73	79	79	85	90	81	79	75	77	83	83.2
19-Jan	79	78	72	70	61	73	70	63	63	57	48	46	41	36	40	42	35	30	40	34	33	33	93	168	60.7
20-Jan	177	154	155	123	125	146	147	175	166	137	126	117	105	96	74	106	96	46	4	7	335	327	323	326	124.5
21-Jan	293	282	307	301	321	315	354	7	348	350	351	357	5	27	86	113	120	132	126	118	139	149	128	122	25.8
22-Jan	112	110	107	113	118	117	123	128	135	153	169	173	171	169	169	177	182	195	204	211	213	210	223	233	163.2
23-Jan	231	234	238	242	241	262	290	300	302	306	314	296	324	332	336	347	338	315	331	272	96	98	116	85	296.7
24-Jan	70	15	9	27	28	50	47	21	21	34	79	85	81	82	82	82	80	89	97	96	97	102	100	101	80.8
25-Jan	100	102	97	90	79	7	351	347	341	346	340	336	336	333	328	332	328	330	337	352	352	358	356	5	3.2
26-Jan	3	5	347	341	340	330	334	331	321	290	297	290	268	291	288	272	278	285	242	252	110	108	106	86	322.7
27-Jan	100	101	95	95	101	104	102	109	109	103	109	111	104	100	106	106	106	106	107	104	102	103	107	110	105.0
28-Jan	107	108	105	113	107	110	116	123	125	303	308	328	327	344	338	343	346	346	341	334	337	333	314	323	12.9
29-Jan	321	315	292	307	327	331	343	1	356	344	336	338	338	333	343	349	348	345	344	343	339	344	338	339	337.5
30-Jan	331	323	309	293	296	290	287	286	280	283	280	278	278	267	272	271	265	261	276	284	295	316	333	330	286.8
31-Jan	325	305	314	331	329	330	331	342	345	338	346	338	331	324	319	311	325	327	327	329	329	335	327	308	328.2
	77.0	81.8	60.9	63.9	52.3	46.3	22.3	6.9	0.3	4.6	5.4	6.7	9.8	4.1	21.7	34.5	41.3	37.3	43.2	47.7	58.1	56.0	68.0	71.2	
	Diurnal Average																								

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
Maximum Value: 90 deg on Jan 15 23:00

Minimum Value: 3 deg on Jan 16 14:00

Percentiles: P_1 = 4 P_{10} = 5 Q_1 = 8 Median = 14 Q_3 = 20 P_{90} = 27 P_{99} = 70

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	26	25	53	13	AF	25	67	11	64	37	70	75	37	AF	5	5	7	7	5	5	7	6	5	5	75
2-Jan	4	4	5	11	5	12	11	8	8	8	8	7	14	7	9	18	28	20	17	18	21	22	20	22	28
3-Jan	17	16	14	13	15	15	14	15	16	16	16	16	15	14	15	14	14	15	15	15	15	13	13	12	17
4-Jan	12	13	12	11	13	13	14	16	19	22	20	21	18	20	17	15	16	15	16	14	15	14	17	15	22
5-Jan	12	12	14	14	13	16	15	15	14	13	16	16	31	23	30	66	14	15	14	8	7	6	9	6	66
6-Jan	10	7	5	5	6	4	5	4	4	6	5	6	6	7	6	8	7	8	8	9	8	7	12	8	12
7-Jan	21	36	31	9	70	41	AF	8	7	4	10	5	5	5	8	4	5	5	5	5	5	6	5	8	70
8-Jan	7	8	8	7	28	9	8	8	8	12	9	7	11	17	14	14	14	13	13	18	25	47	89	23	89
9-Jan	10	9	12	12	30	8	7	9	38	31	28	23	23	24	18	17	18	18	19	14	10	9	11	10	38
10-Jan	10	11	10	11	15	17	14	35	25	27	36	34	38	24	27	15	17	12	13	19	13	15	15	19	38
11-Jan	20	15	19	41	71	27	12	7	6	6	9	8	8	9	8	11	11	11	11	11	12	12	12	15	71
12-Jan	15	18	23	19	15	14	17	28	12	15	14	12	14	14	12	31	18	24	7	9	6	8	8	8	31
13-Jan	5	4	5	8	25	23	16	16	17	17	18	16	15	16	16	16	11	13	12	10	10	9	13	16	25
14-Jan	8	19	45	57	36	5	6	8	7	6	5	5	5	5	6	6	5	5	5	20	11	13	11	10	57
15-Jan	10	21	14	14	14	14	20	17	18	19	17	18	18	18	23	24	24	21	26	32	27	20	90	27	90
16-Jan	49	50	43	42	33	5	7	5	4	5	7	5	4	3	4	7	4	4	4	4	4	4	4	4	50
17-Jan	6	5	6	6	5	11	68	14	12	13	15	20	19	23	19	18	16	15	15	15	19	12	16	11	68
18-Jan	29	70	45	64	12	11	10	10	16	17	14	10	15	14	10	9	8	8	7	7	8	8	7	8	70
19-Jan	8	9	9	9	10	9	9	10	11	12	13	14	15	17	15	17	22	20	20	17	22	39	11	30	39
20-Jan	24	40	35	19	15	9	9	18	13	6	7	6	10	7	9	7	12	33	27	28	22	30	24	14	40
21-Jan	23	15	15	21	15	20	24	21	20	21	19	21	25	30	33	14	6	13	33	9	13	10	11	6	33
22-Jan	4	5	5	6	8	6	7	5	7	15	11	12	11	12	13	13	12	9	8	7	10	13	10	10	15
23-Jan	7	6	7	7	6	15	19	12	12	14	16	14	22	18	19	23	20	20	29	69	10	8	10	21	69
24-Jan	25	21	22	27	23	14	14	23	22	18	26	9	9	8	8	7	8	9	6	6	5	4	5	4	27
25-Jan	6	5	9	7	15	33	28	24	22	23	22	18	20	17	17	17	18	16	22	24	23	23	25	24	33
26-Jan	24	24	22	27	19	23	13	17	20	19	18	20	22	27	18	17	12	31	12	57	81	27	31	68	81
27-Jan	43	8	10	4	4	5	5	9	6	4	6	8	5	5	6	4	4	5	5	5	6	7	5	7	43
28-Jan	5	6	6	7	6	5	7	7	7	77	13	14	15	23	20	23	24	22	23	20	19	15	20	16	77
29-Jan	16	20	14	18	14	15	21	21	22	21	19	22	23	17	22	23	20	23	21	21	19	22	19	18	23
30-Jan	16	17	14	12	13	12	13	14	13	12	13	14	14	14	16	15	13	11	14	14	12	17	17	16	17
31-Jan	13	16	14	18	20	22	19	20	19	17	20	24	22	18	15	17	18	15	18	17	22	24	18	19	24
	49	70	53	64	71	41	68	35	64	77	70	75	38	30	33	66	28	33	33	69	81	47	90	68	
	Diurnal Maximum																								

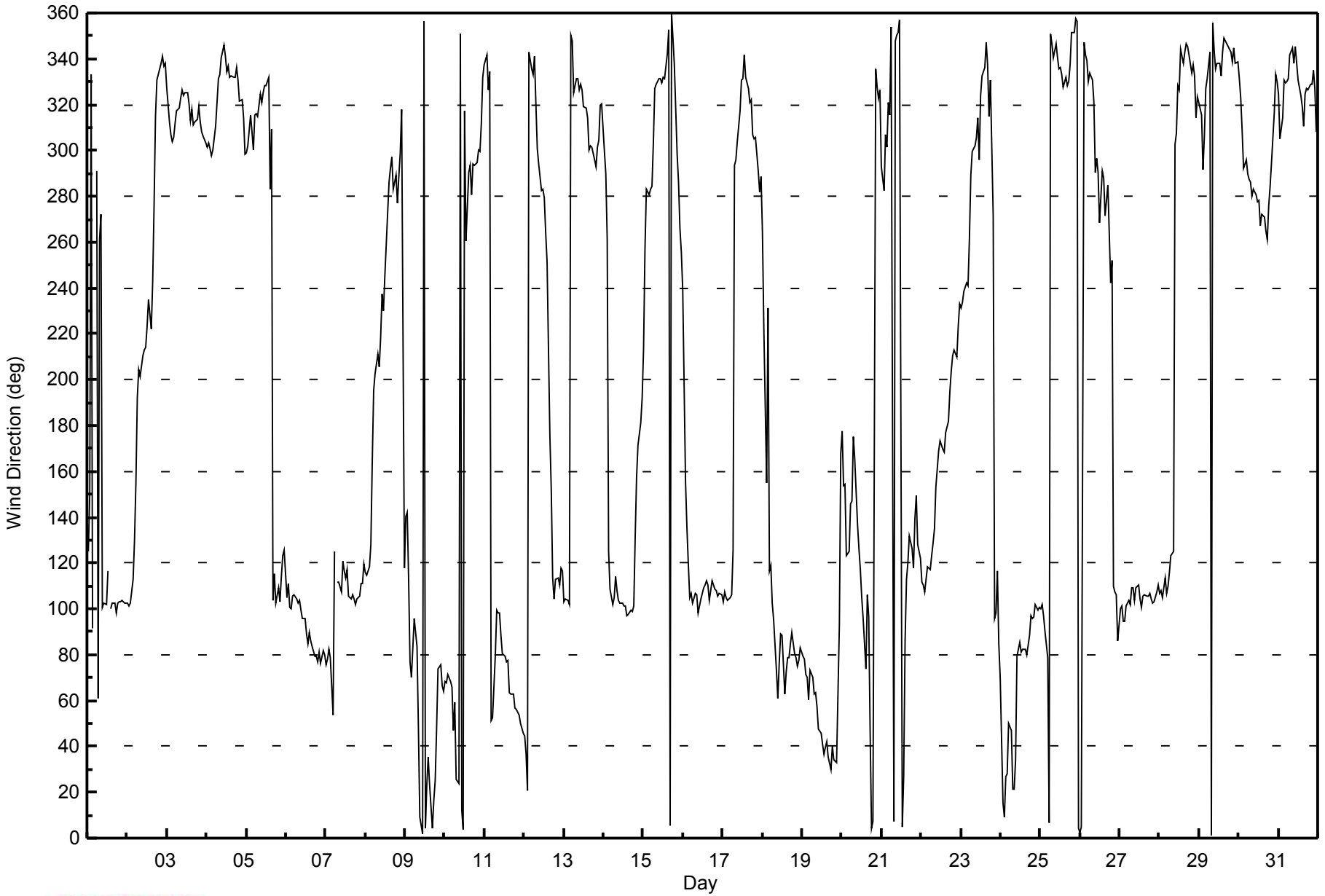
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Fort Chipeywan - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 3, 2013
Station Name	Fort Chipewyan	Station Number	AMS 8

Reason: routine

Start Time (MST)	11:45	End Time (MST)	16:35
Barometric Pressure	n/a mmHg	Station temp.	21 Deg C
Calibrator Make/Model	API T700	Serial Number	996
Cal Gas Concentration	2.42 ppm	Cal Gas Expiry Date	09_16_2016
Gas Cert Reference	LL104216		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2575
DACS voltage range	0-5V	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	20	20	PMT voltage	-826.0	-826.0
Analyzer Range (mv)	5000	5000	Lamp voltage	1005	1005
Calculated slope	0.853758	0.995787	Chamber temp.	44.9	44.9
Calculated intercept	-0.052250	-0.048254	Pressure (mmHg)	715.0	715.0
Analyzer Background	1.35	1.15	Flow (lpm)	0.440	0.440
Analyzer Coefficient	1.201	1.006	Intensity	91	91

Analyzer make	TEI 43i-TLE	Analyzer serial #	1136451241

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.04	N/A
as found span	5000	36.9	17.9	21.2	0.842
calibrator zero	5000	0.0	0.0	0.04	N/A
high point	5000	36.9	17.9	18.0	0.994
second point	5000	19.7	9.5	9.6	0.989
third point	5000	9.9	4.8	4.9	0.987
calibrator zero	5000	0.0	0.0	0.10	N/A
as left zero	4000	0.0	0.0	0.10	N/A
as left span	5000	36.9	17.9	17.6	1.015
				Average Correction Factor	0.990

Corrected As found	21.2	Previous response	21.0	% change	-0.9%

Notes: Span adjusted.

Calibration Performed By: Zach Eastman

Wood Buffalo Environmental Association

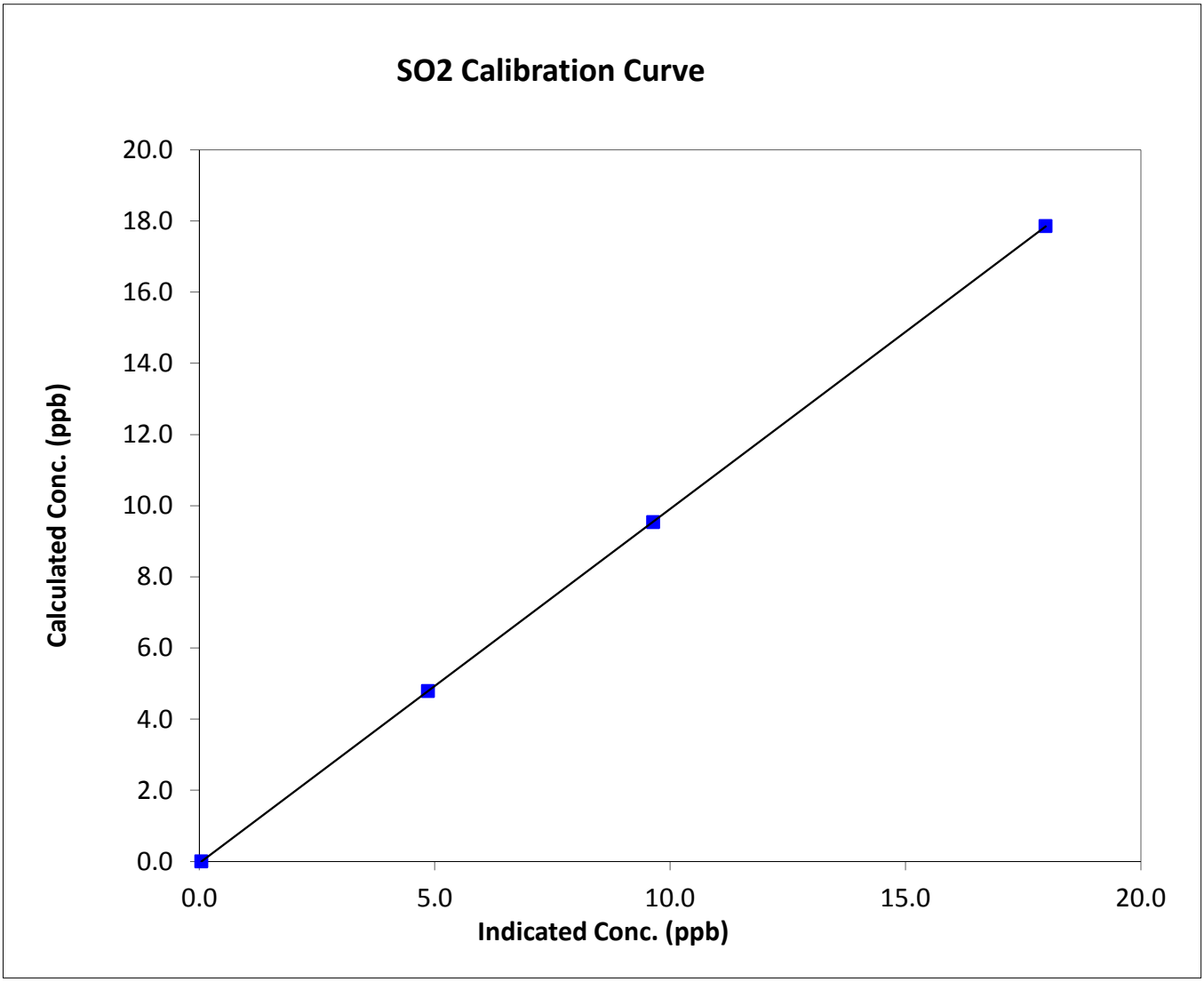
SO_2 Calibration Summary

Station Information

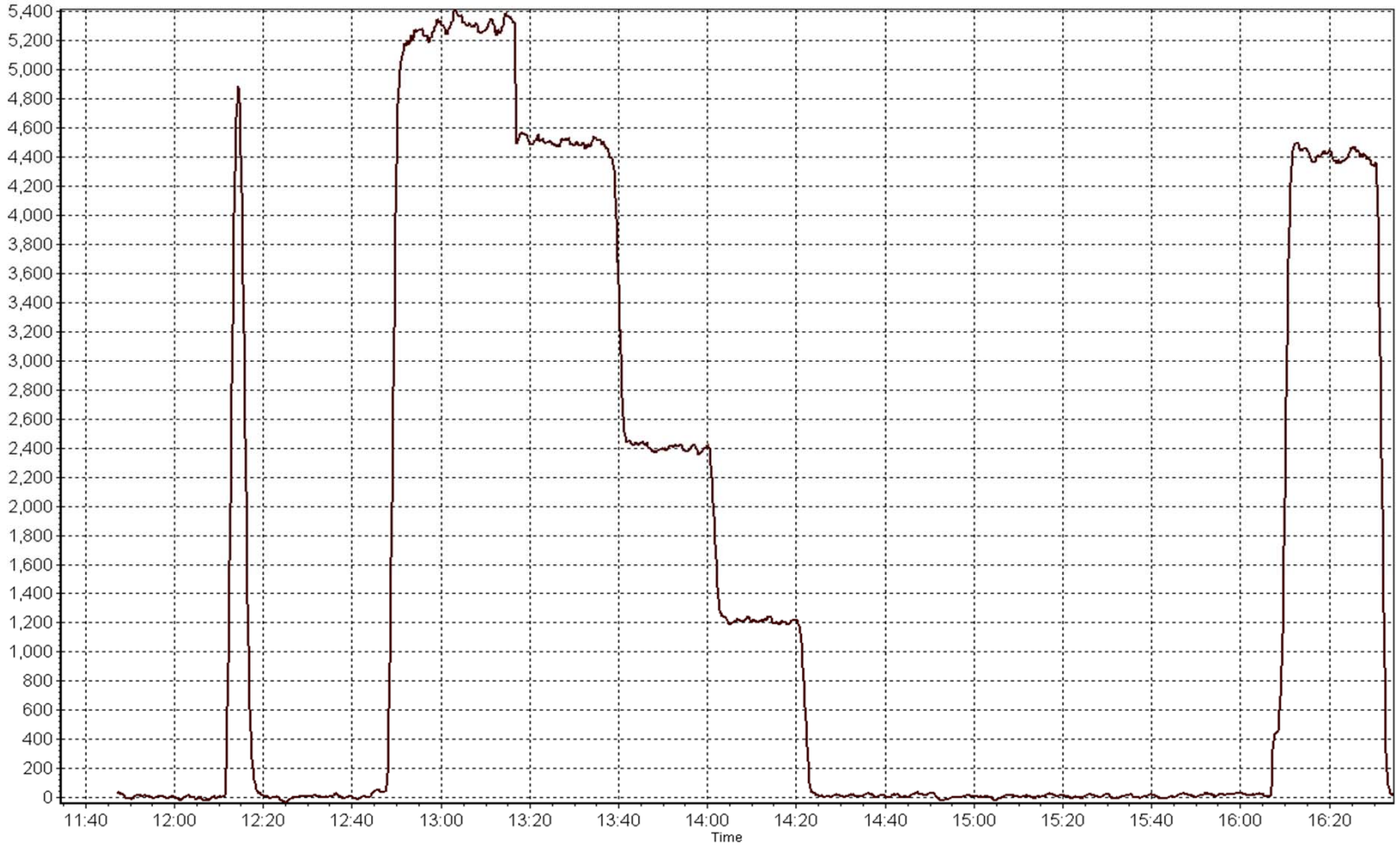
Calibration Date	January 7, 2014	Previous Calibration	December 3, 2013
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	11:45	End Time (MST)	16:35
Analyzer make	TEI 43i-TLE	Analyzer serial #	1136451241

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999998
17.9	18.0	0.9935		
9.5	9.6	0.9891	Slope	0.995787
4.8	4.9	0.9867		
			Intercept	-0.048254



SO_2 Calibration Plot **Date:** January 7, 2014



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 3, 2013
Station Name	Fort Chipewyan	Station Number	AMS 8
Reason:	Routine		
Start Time (MST)	9:45	End Time (MST)	12:07
Barometric Pressure	n/a mmHg	Station temp.	23 Deg C
Calibrator Make/Model	API 700	Serial Number	996
NO2 calibration used	Tuesday, January 07, 2014	Transfer Standard	n/a
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2575
DACS voltage range	0-5V	DACS channel #	5

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	200	200	Bench temp.	30.0	30.0
Analyzer Range (mv)	5000	5000	Bench Lamp temp.	54.0	54.0
Calculated slope	1.003729	1.003535	Pressure	728.0	728.0
Calculated intercept	-0.088364	-0.006670	Flow cell A	700	700
Analyzer Background	-0.3	-0.3	Flow cell B	700	700
Analyzer Coefficient	1.695	1.647	Cell A Intensity	109771	109771
			Cell B Intensity	87026	87026

Analyzer make	TEI 49i	Analyzer serial #	1300156233

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Ref voltage(mv) / O3 Lamp Drive voltage (mv)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
As Found Zero	5000	0.0	0.0	0.36	N/A
As Found Span	5000	212 / 906	114.0	116.7	0.977
calibrator zero	5000	0.0	0.0	0.36	N/A
high point	5000	212 / 906	114.0	114.0	1.000
second point	5000	156 / 859	86.2	85.88	1.004
third point	5000	99 / 800	57.2	56.32	1.016
As left Zero	5000	0.0	0.0	0.2	NA
As Left Span	5000	0.348	128.4	126.3	1.017
				Average Correction Factor	1.007

Corrected As found	116.4	Previous response	114.5	% change	-1.6%

Notes: Span adjusted.

Calibration Performed By: Zach Eastman

Wood Buffalo Environmental Association

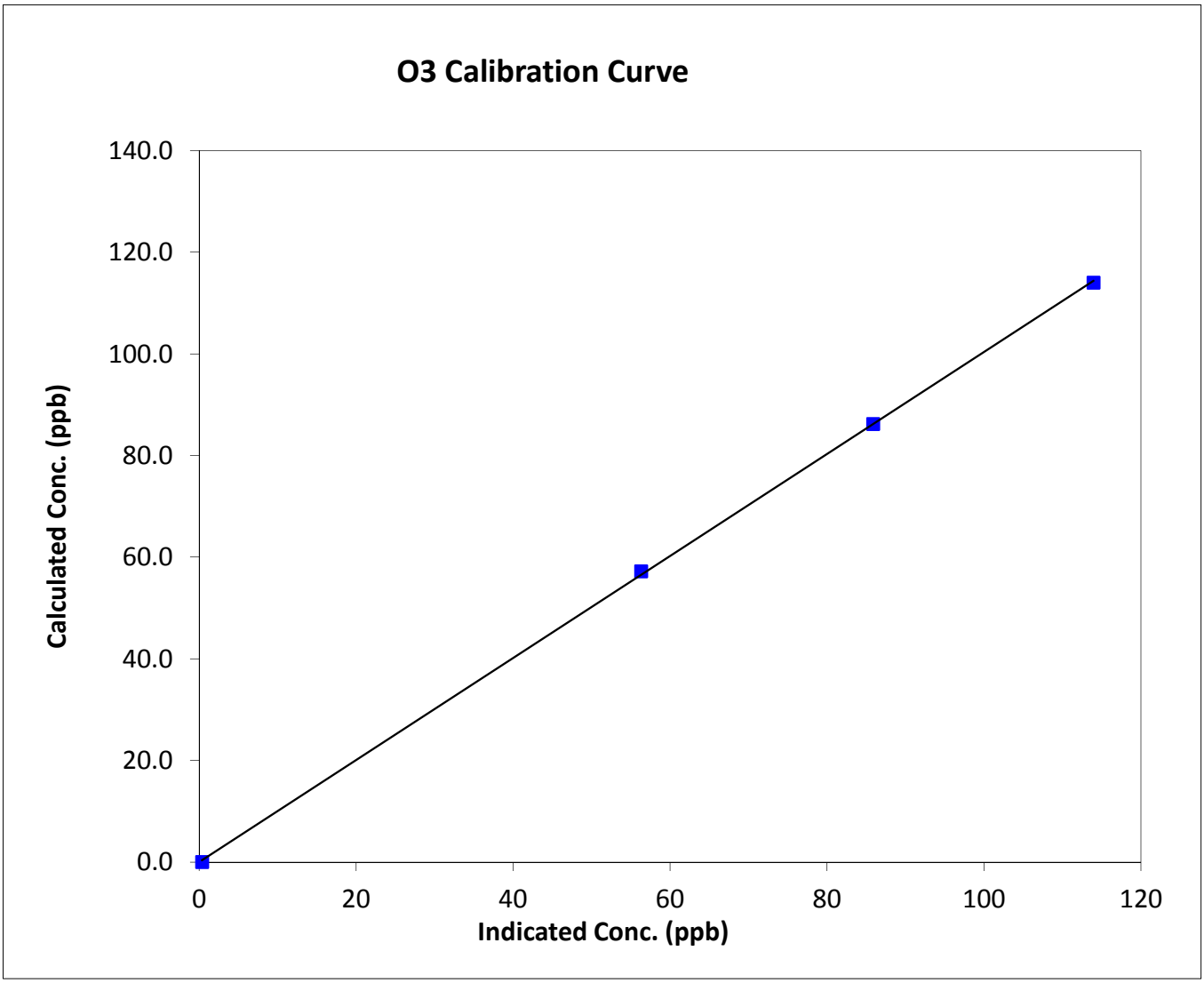
O_3 Calibration Summary

Station Information

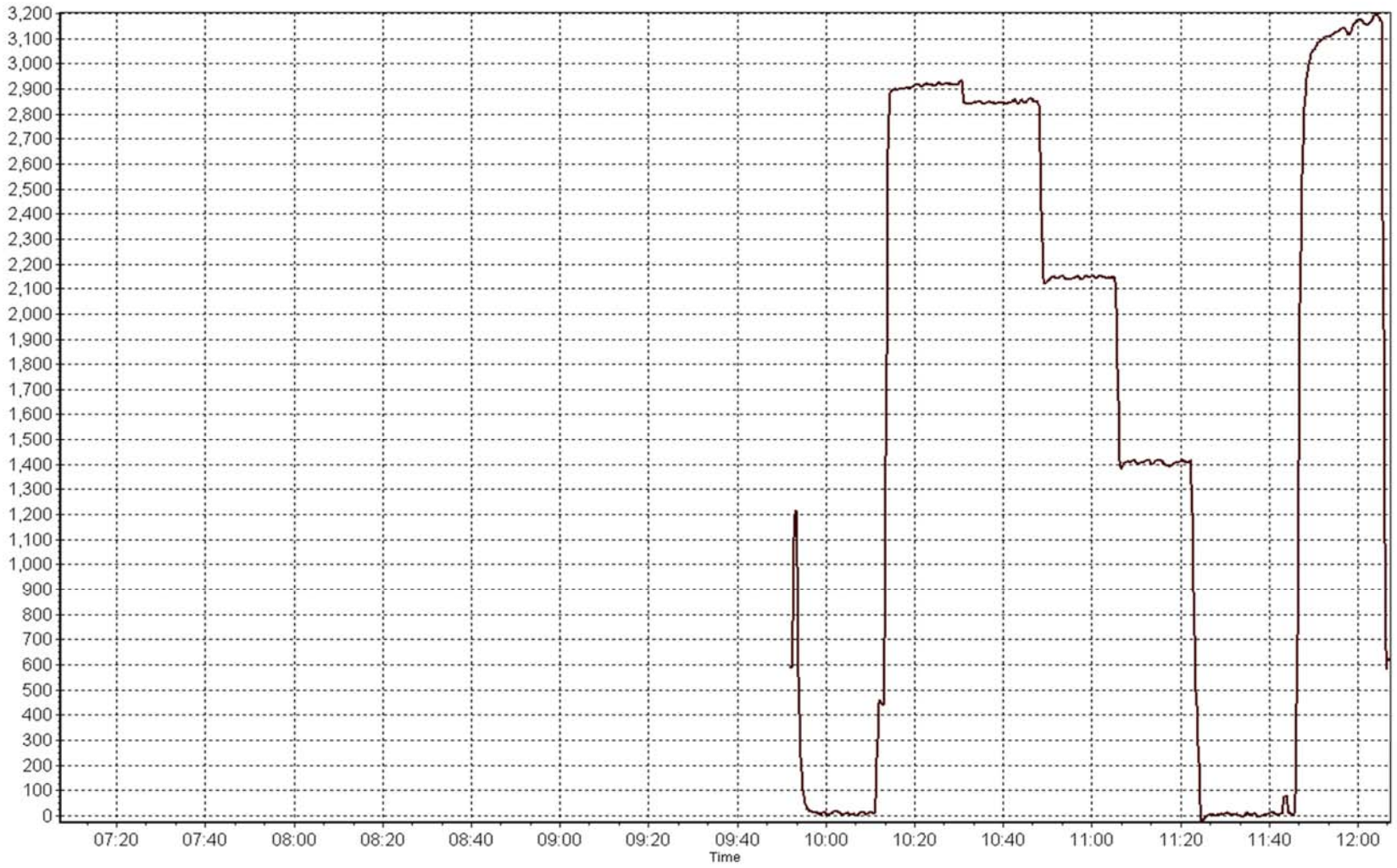
Calibration Date	Wednesday, January 08, 2014	Previous Calibration	December 3, 2013
Station Name	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	9:45	End Time (MST)	12:07
Analyzer make	TEI 49i	Analyzer serial #	1300156233

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.4	N/A	Correlation Coefficient	0.999898
114.0	114.0	1.0004		
86.2	85.9	1.0037	Slope	1.003535
57.2	56.3	1.0156		
			Intercept	-0.006670



O3 Calibration Plot **Date:** January 8, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 3, 2013
Station Name	Fort Chipewyan	Station Number	AMS 8
Reason:		Routine	
Start Time (MST)	11:45	End Time (MST)	16:35
Barometric Pressure	n/a mmHg	Station Temperature	21.0 Deg C
Calibrator	API T700	Serial Number	996
NO Cal Gas Conc	20.3 ppm	Cal Gas Expiry Date	09_16_2016
NOx Cal Gas Conc	20.3 ppm	Cal Gas Serial #	LL104216

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2575

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	200	200	200
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	1.006745	1.000961	0.998932
	Data Offset	-1.127752	-0.855740	-0.414537
After	Data Slope	1.004967	0.996243	1.002344
	Data Offset	-1.161855	-0.834808	-0.261171
Channel #		4	2	3
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	TEI 42i	Analyzer serial #	1218153460

Test Point	before		after	
Concentration range	200	ppb	200	ppb
NO coefficient	0.833	ppb	0.806	ppb
NOX coefficient	1.001	ppb	1.004	ppb
NO2 coefficient	1.005	ppb	1.005	ppb
NO bkgrnd	3.5		3.4	
NOX bkgrnd	4.0		3.8	
Chamber Temp	50.6	Deg C	50.6	Deg C
Moly Temp	324.0	Deg C	324.0	Deg C
PMT Temp	-2.8	Deg C	-2.8	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	201.0	mmHg	201.0	mmHg
Sample Flow	772.0	ccm	772.0	ccm
PMT Voltage	-807.0	V	-807.0	V

Notes: Span adjusted

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 7, 2014 Station Number: AMS 8

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.2	0.5	0.3	N/A	N/A
as found span	5000	36.9	149.8	149.8	0.0	155.5	154.9	0.4	0.963	0.967
calibrator zero	5000	0.0	0.0	0.0	0.0	0.2	0.5	0.3	N/A	N/A
high point	5000	36.9	149.8	149.8	0.0	150.8	149.8	0.8	0.993	1.000
second point	5000	19.7	80.0	80.0	0.0	81.6	81.3	0.6	0.980	0.984
third point	5000	9.9	40.2	40.2	0.0	41.7	41.7	0.3	0.964	0.963
calibrator zero	5000	0.0	0.0	0.0	0.0	1.0	0.6	1.0	N/A	N/A
As left zero	5000	0.0	0.0	0.0	0.0	1.0	0.6	1.0	N/A	N/A
As left span	5000	36.9	149.8	35.8	114.0	149.7	30.6	119.1	1.001	1.169
								Average Correction Factor	0.979	0.982

Corrcted As found	NO_X=	155.3	NO=	154.4	Percent Change	NO_X=	-2.1%	NO= -2.3%
Previous Response	NO_X=	152.0	NO=	150.8				

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 36.90 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.3			N/A	
1st NO2 (100ppb O3)	N/A	36.2	114.0	150.0	36.2	113.9	0.998	1.000	1.001	99.9%
2nd NO2 (75ppb O3)	N/A	64.0	86.2	150.1	64.0	86.5	0.998	1.000	0.997	100.3%
3rd NO2 (50ppb O3)	N/A	93.0	57.2	150.0	93.0	57.2	0.999	1.000	1.000	100.0%
4th NO2 (0ppb O3)	150.2	N/A	0.8	151.1	150.2	0.8	0.992	1.000	N/A	N/A
					Average Correction Factor		0.997	1.000	0.999	100.1%

Calibration Performed By: Zach Eastman

Wood Buffalo Environmental Association

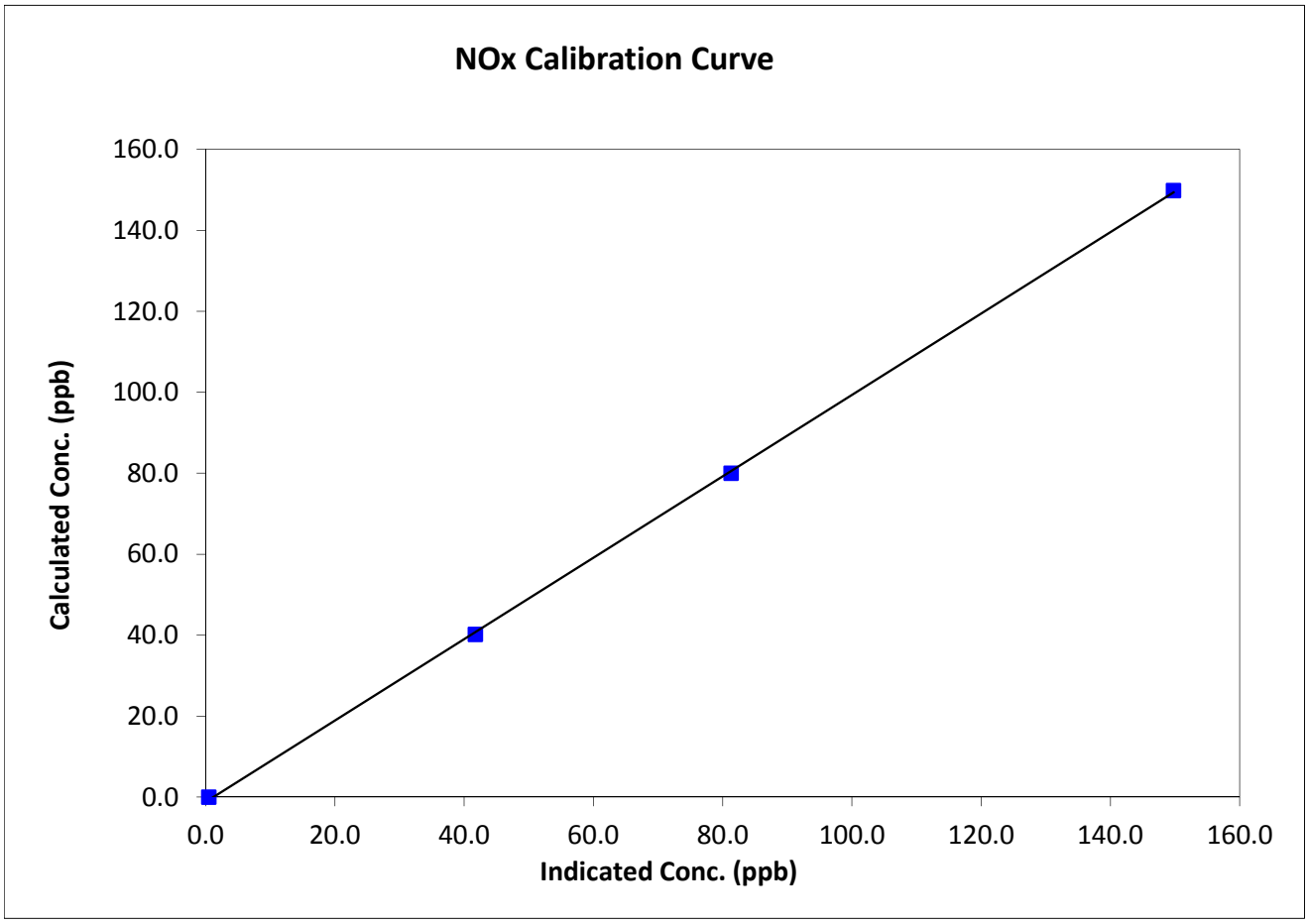
NO_X Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 3, 2013
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	11:45	End Time (MST)	16:35
Analyzer make	TEI 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.5	N/A	Correlation Coefficient	0.999890
149.8	149.8	1.0004		
80.0	81.3	0.9835	Slope	1.004967
40.2	41.7	0.9634		
			Intercept	-1.161855



Wood Buffalo Environmental Association

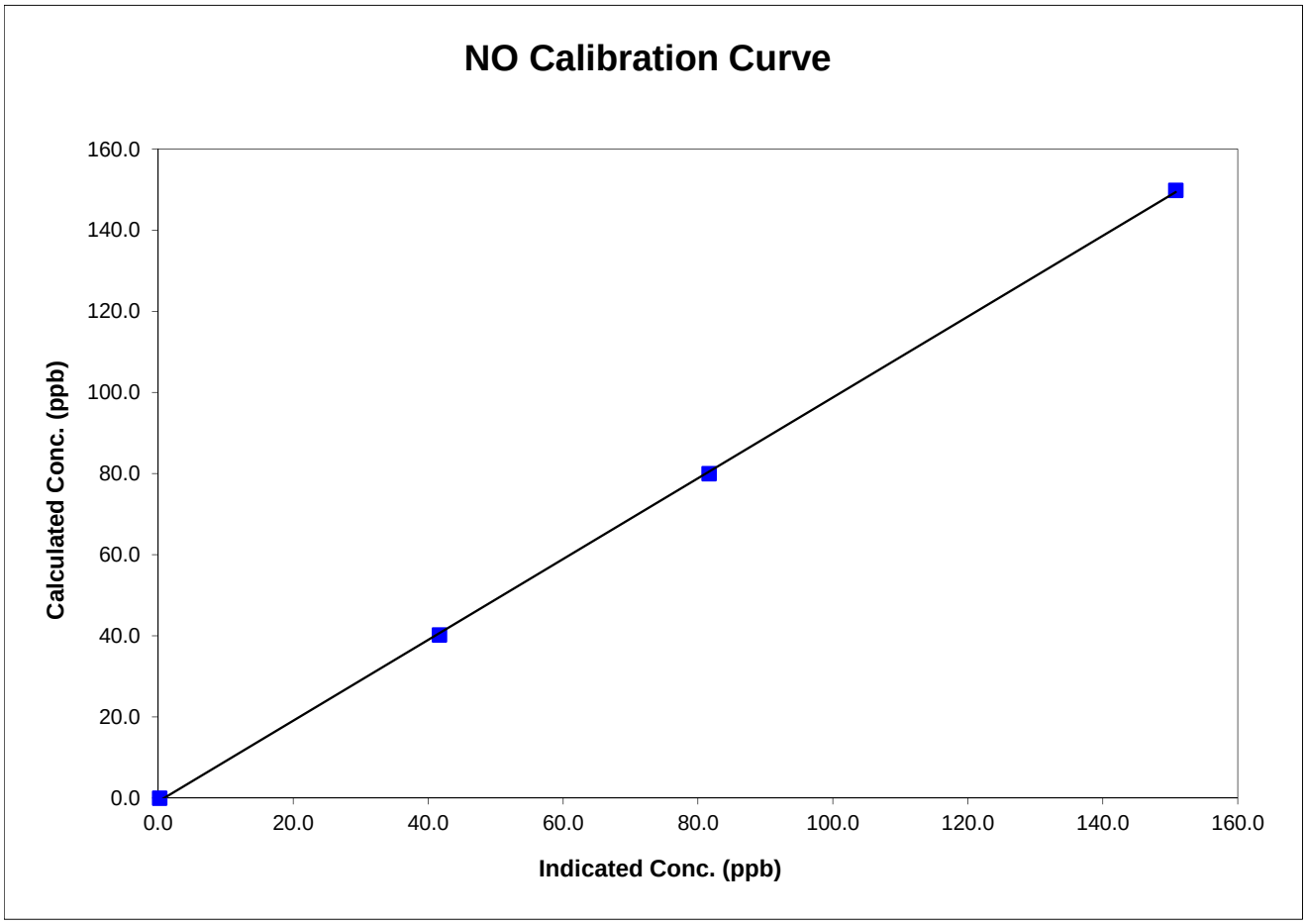
NO Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 3, 2013
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	11:45	End Time (MST)	16:35
Analyzer make	TEI 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999915
149.8	150.8	0.9935		
80.0	81.6	0.9797	Slope	0.996243
40.2	41.7	0.9643		
			Intercept	-0.834808



Wood Buffalo Environmental Association

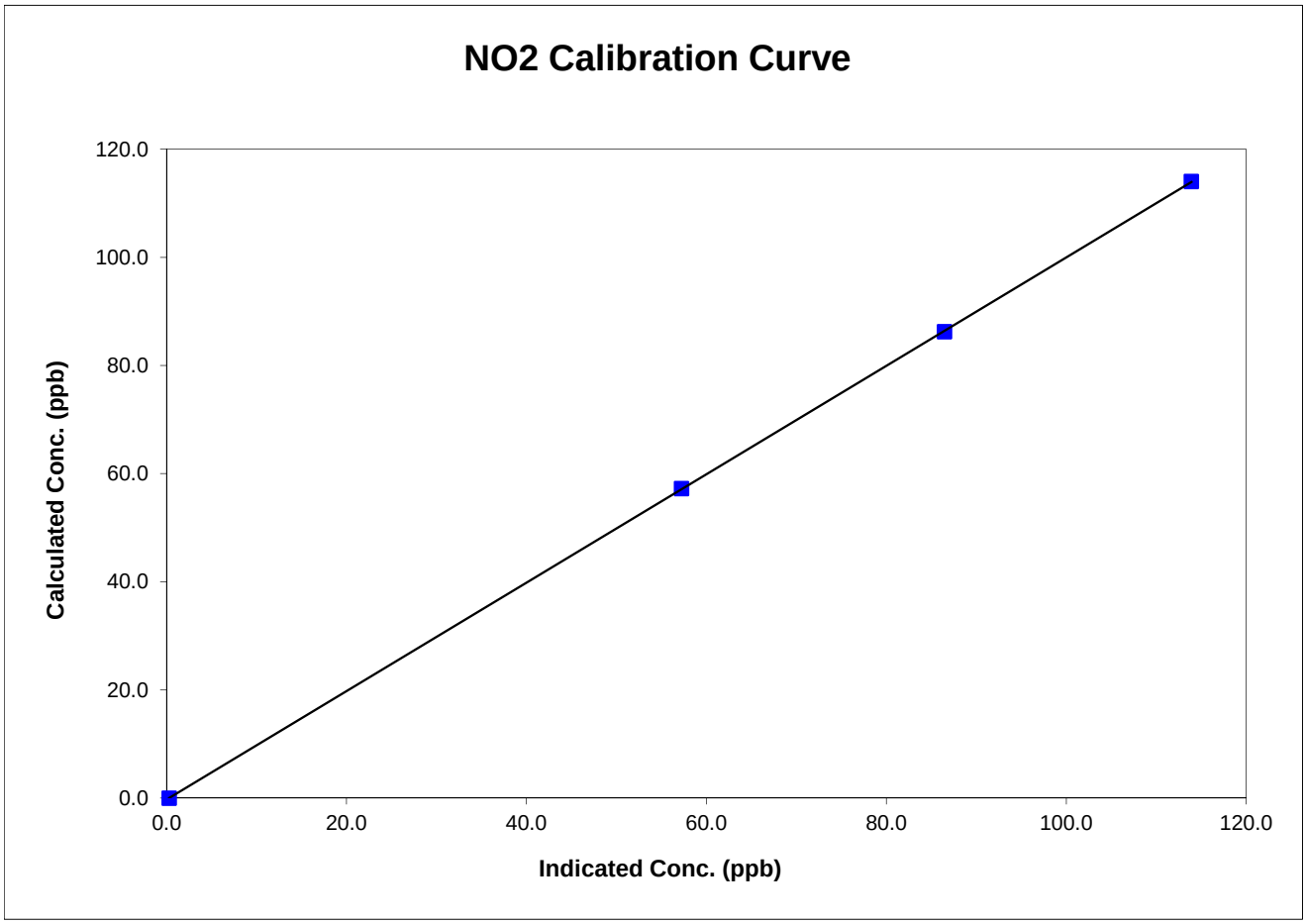
NO_2 Calibration Summary

Station Information

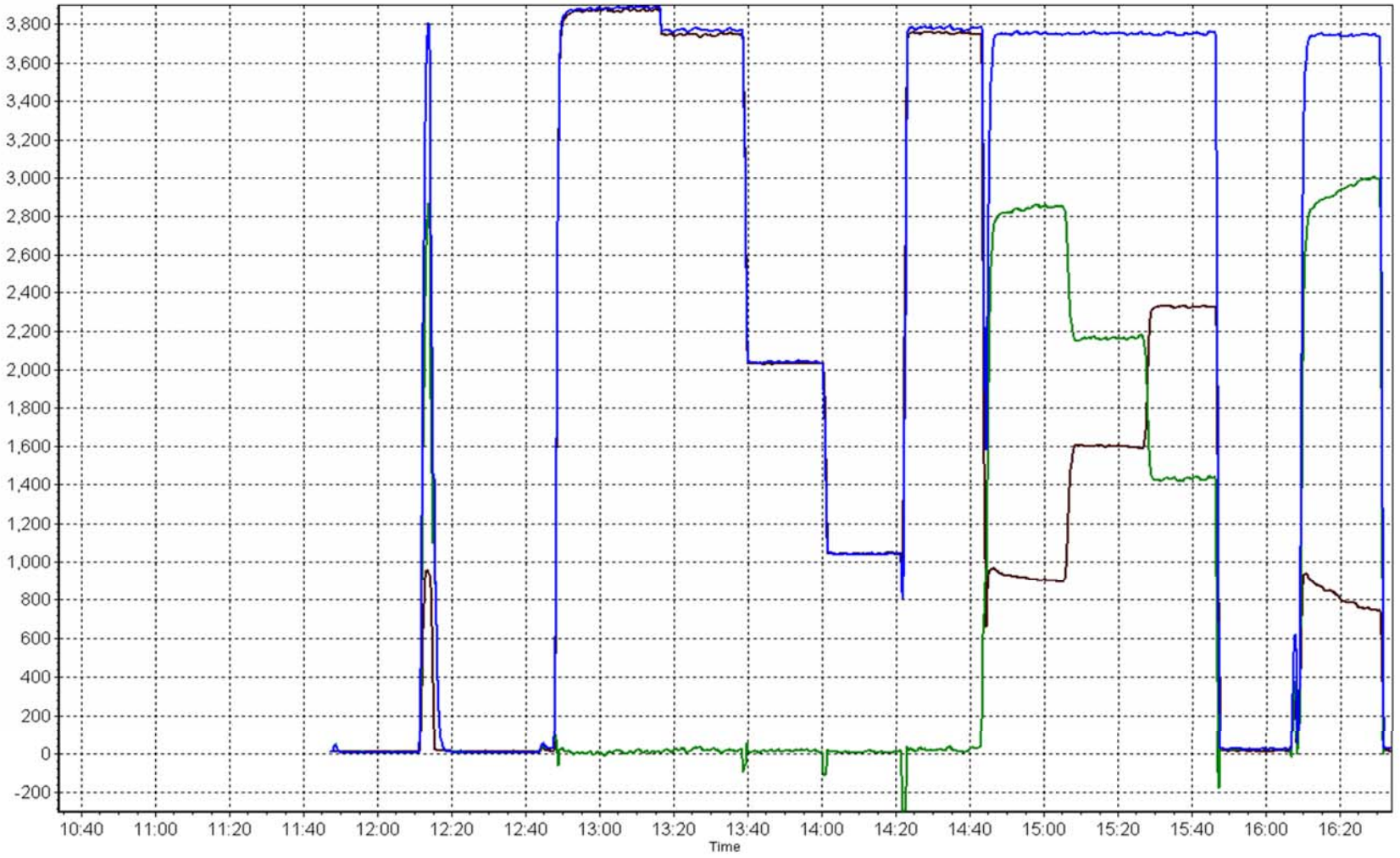
Calibration Date	January 7, 2014	Previous Calibration	December 3, 2013
Station Number	Fort Chipewyan	Station Number	AMS 8
Start Time (MST)	11:45	End Time (MST)	16:35
Analyzer make	TEI 42i	Analyzer serial #	1218153460

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999992
114.0	113.9	1.0007		
86.2	86.5	0.9972	Slope	1.002344
57.2	57.2	1.0000		
			Intercept	-0.261171



NOx, NO & NO_2 Calibration Plot **Date:** **January 7, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 9
BARGE LANDING
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
JANUARY 2014

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	705	38	39	99.87	3	0	1	0
THC(ppm) Average	685	42	59	97.72	4.3	0	3.1	0
Temperature (C) Average	744	0	0	100.00	8.5	-	1.2	-
Wind Speed 10 m (km/h) Average	741	0	3	99.60	32	-	-	-
Wind Direction 10 m (deg) Average	741	0	3	99.60	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
TRS(ppb) Average	705	0.5	0	-	0	0	0	0	1	1	3
THC(ppm) Average	685	2.43	0.3	-	2	2.1	2.2	2.3	2.6	2.9	4.3
Temperature (C) Average	744	-15.81	9.8	-	-37.3	-27.7	-22.9	-15.8	-9.5	-2.4	8.5
Wind Speed 10 m (km/h) Average	741	5.6	4	-	0	2	3	5	7	10	32
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS 9)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	14 Jan 2014 12:00	14 Jan 2014 12:00	1	Maintenance - verified daily QA check
THC	13 Jan 2014 19:00	14 Jan 2014 11:00	17	Analyzer in left in maintenance mode
Wind Speed, Wind Direction	06 Jan 2014 09:00	06 Jan 2014 09:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	08 Jan 2014 20:00	08 Jan 2014 20:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	26 Jan 2014 23:00	26 Jan 2014 23:00	1	Flatline in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 2 18:00 Maximum Daily Average: 1.2 ppb on Jan 7

Minimum Value: 0 ppb on Jan 22 02:00 Minimum Daily Average: 0.1 ppb on Jan 24
Maximum Diurnal Average: 0.6 ppb at hour 18 Minimum Diurnal Average: 0.4 ppb at hour 12
Monthly Average: 0.5 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	38
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	Z	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0.8	1
2-Jan	1	1	Z	2	1	1	1	0	0	0	1	1	1	1	1	1	2	3	3	2	1	1	1	0	1.2	3
3-Jan	0	0	Z	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Jan	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
5-Jan	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0.5	1
6-Jan	1	1	Z	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0.5	1
7-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1.2	2
8-Jan	1	1	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	1	1	1	0.5	1
9-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.7	1
10-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0.3	1
11-Jan	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
12-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0.3	1
13-Jan	1	0	Z	1	1	1	1	1	0	0	C	C	C	C	C	C	C	0	0	0	0	1	0	0	--	1
14-Jan	0	1	Z	1	1	1	1	1	1	1	1	M	1	1	1	1	1	1	2	3	2	0	0	1	1.1	3
15-Jan	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
16-Jan	1	1	Z	1	1	1	0	1	0	0	1	0	1	1	2	2	1	2	1	1	1	1	1	1	0.8	2
17-Jan	1	1	Z	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
18-Jan	0	0	Z	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.6	1
19-Jan	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
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0.3	1
21-Jan	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-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0.3	1
23-Jan	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
24-Jan	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
25-Jan	0	0	Z	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
26-Jan	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-Jan	0	0	Z	0	0	1	1	1	1	1	0	1	0	0	1	2	1	1	1	1	1	1	2	2	0.8	2
28-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0.7	1
29-Jan	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
30-Jan	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
31-Jan	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
	0.4	0.4	--	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.5	Diurnal Average	
	1	1	--	2	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	2	1	2	2	Diurnal Maximum	

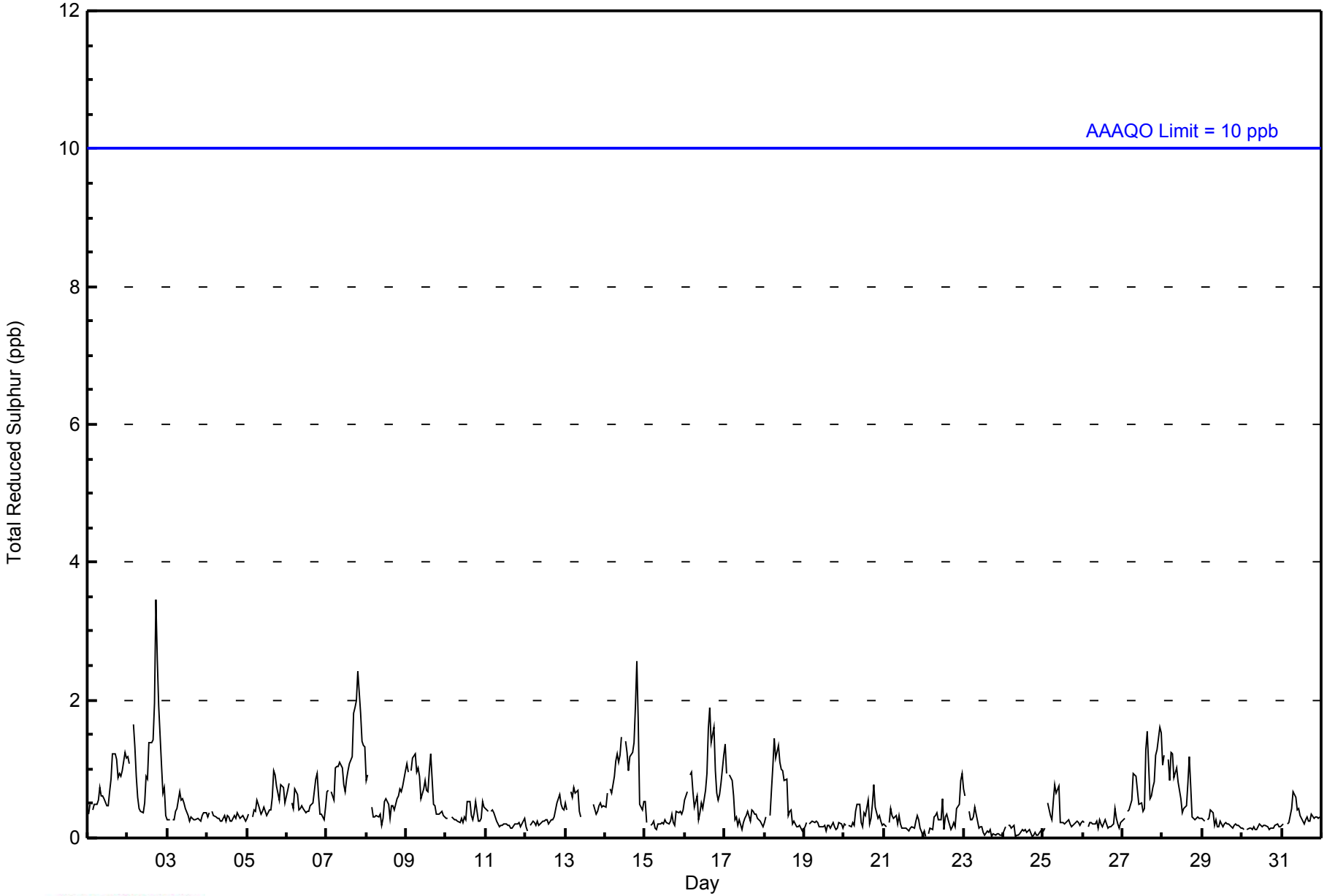
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2014



AURORA ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	702	99.57	99.57
3 - 4	3	0.43	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: 705

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	72	64	24	12	14	13	33	65	133	62	32	24	23	24	40	64	699
3 - 4	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	3
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	72	64	24	12	14	14	33	66	133	62	33	24	23	24	40	64	702

Total Number of Valid Hours: 702

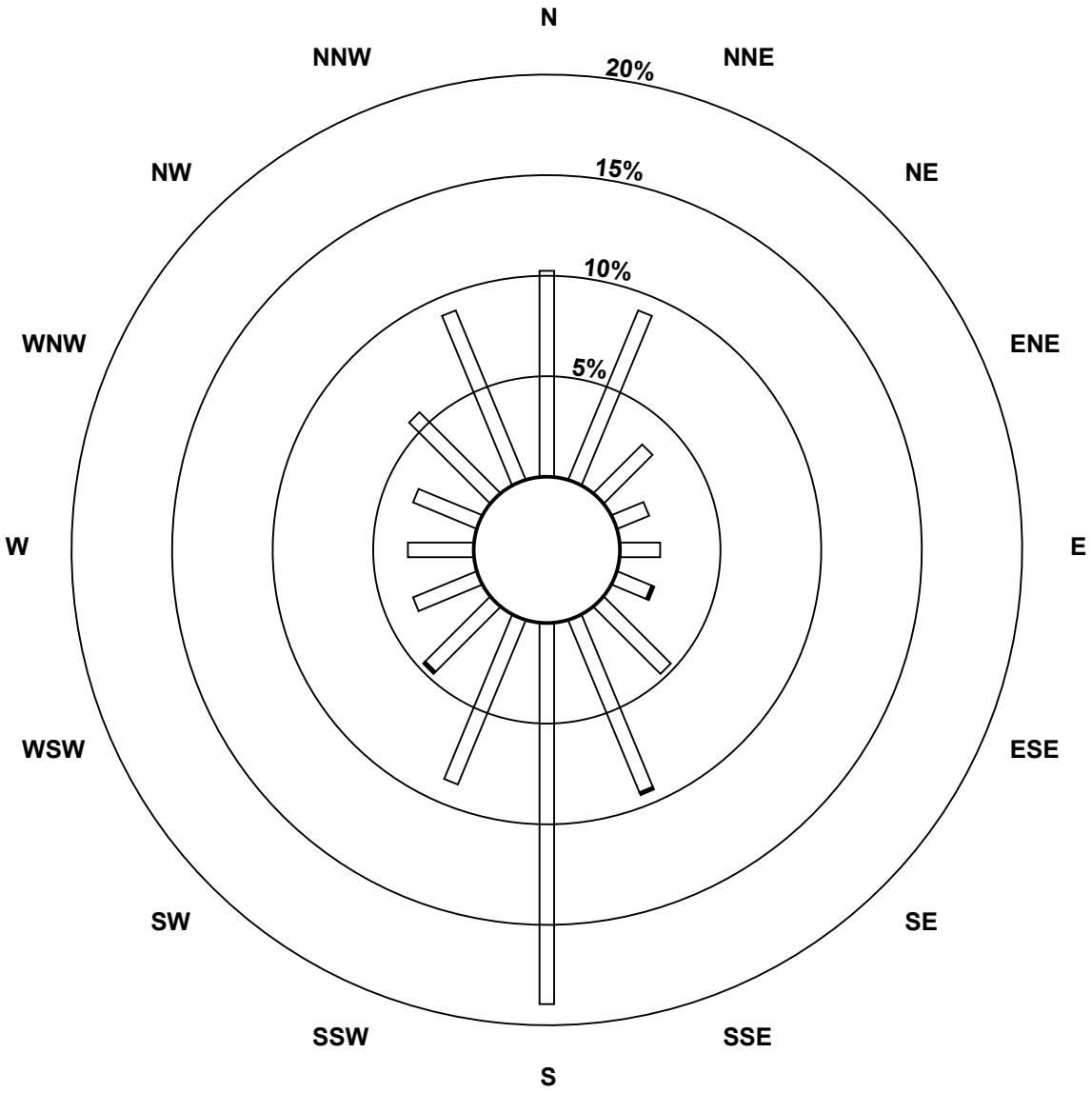
Total Number of Hours: 744

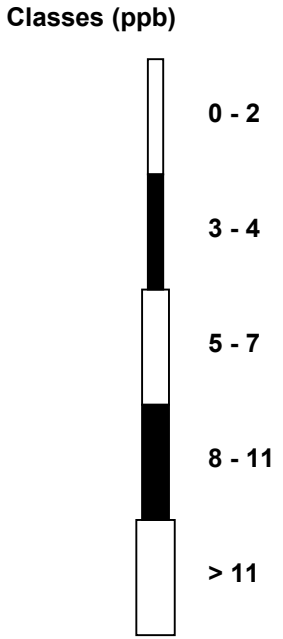
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Barge Landing (AMS 9)





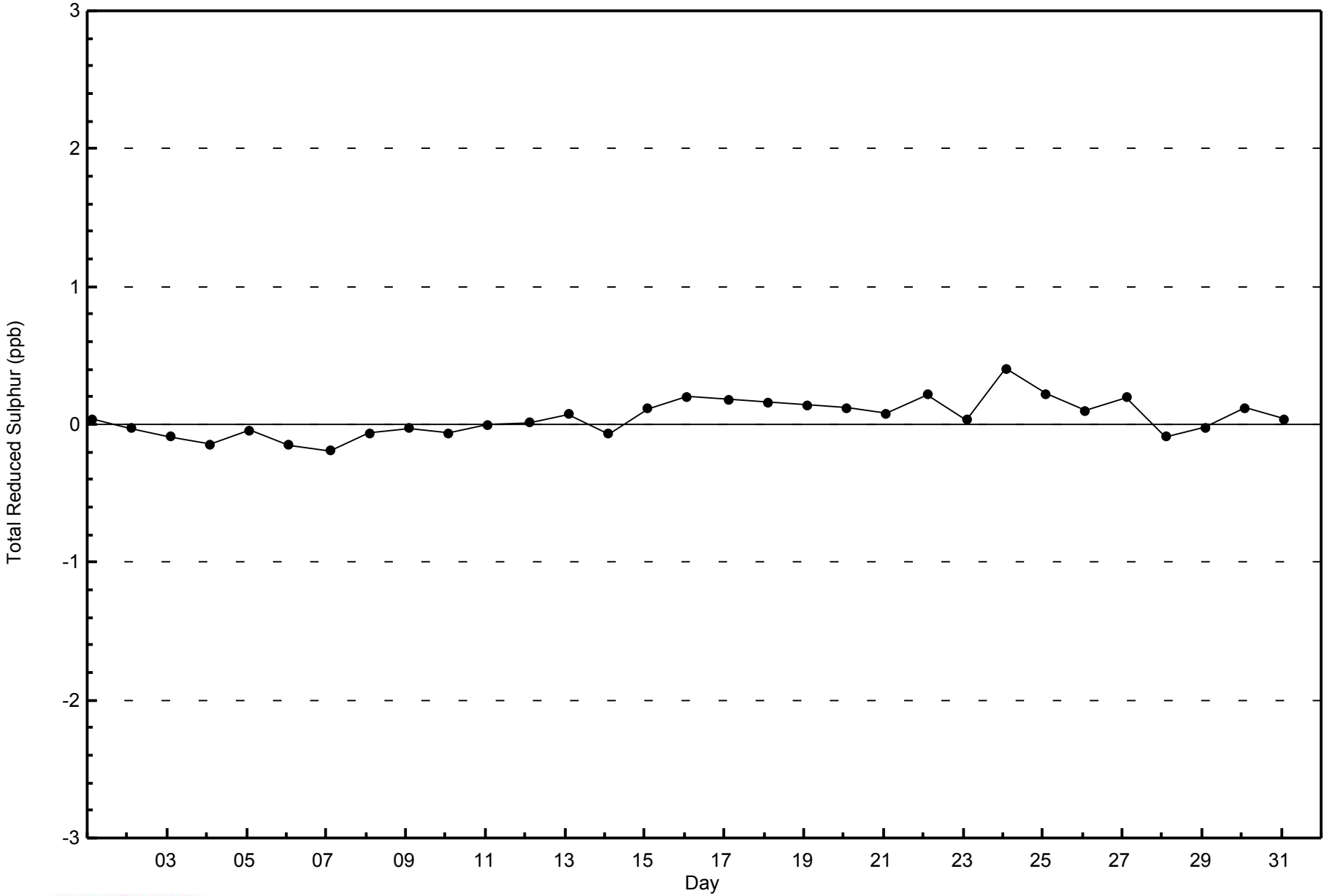
Total Number of Valid Hours: 702

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2014



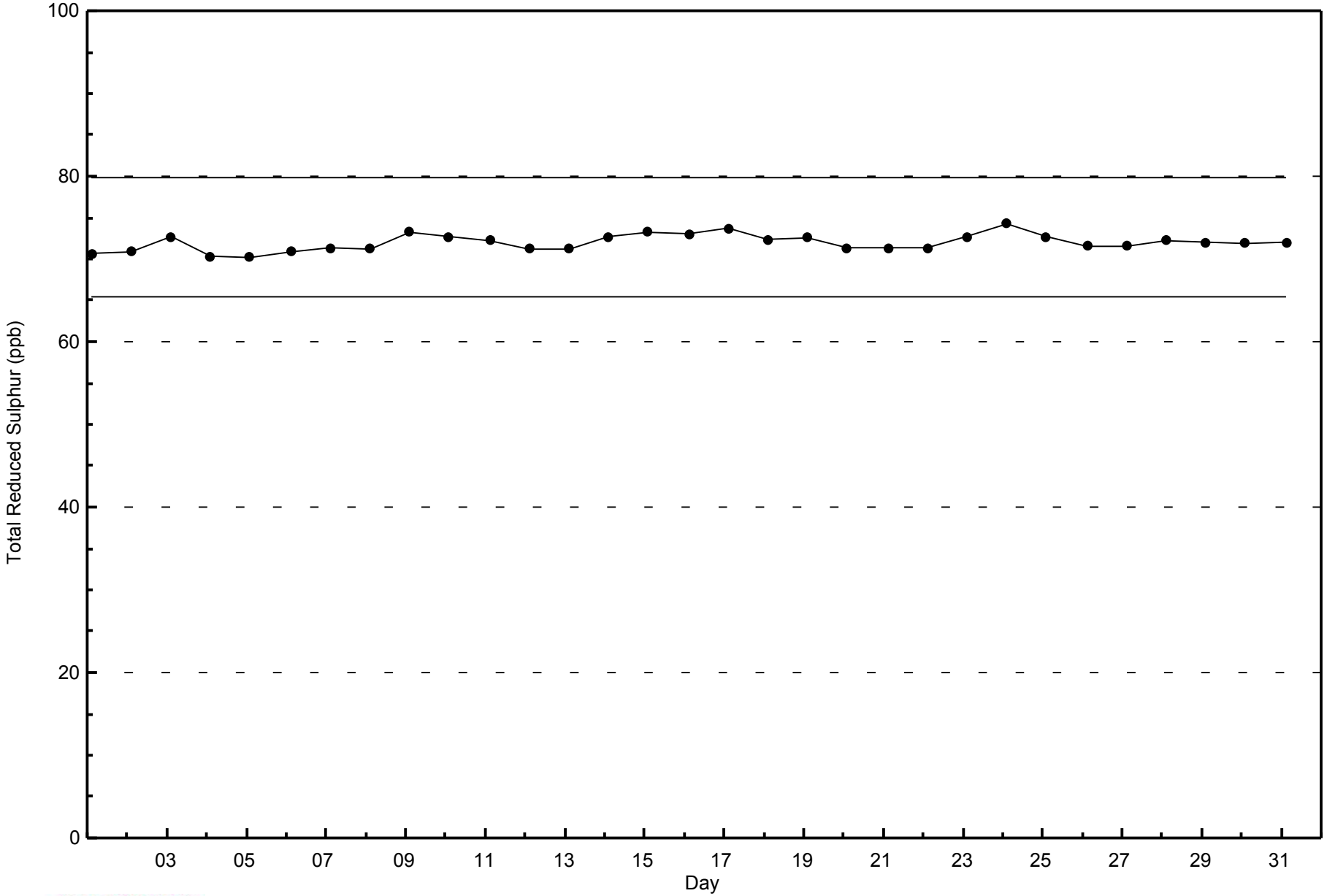
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2014

Maximum Value: 4.3 ppm on Jan 9 16:00

Maximum Daily Average: 3.1 ppm on Jan 2

Minimum Value: 2.0 ppm on Jan 17 11:00

Minimum Daily Average: 2.1 ppm on Jan 30

Maximum Diurnal Average: 2.5 ppm at hour 16

Minimum Diurnal Average: 2.3 ppm at hour 23

Monthly Average: 2.43 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.3 Q_3 = 2.6 P_{90} = 2.9 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	685
Hours of Missing Data:	59
Hours of Calibration:	42
Percent Operational Time:	97.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.8	Z	2.9	2.9	3.0	3.0	2.9	3.0	3.0	3.0	3.0	2.9	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.9	3.0
2-Jan	2.7	Z	2.7	2.7	2.7	2.7	2.9	2.9	3.0	3.0	3.2	4.2	3.4	3.4	3.7	4.0	3.5	3.2	3.3	3.5	3.2	2.7	2.8	2.5	3.1	4.2
3-Jan	2.3	Z	2.3	2.3	2.3	2.5	2.4	2.3	2.3	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.5
4-Jan	2.3	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	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.5
5-Jan	2.5	Z	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.8	2.8	2.8	2.9	2.9	2.8	2.7	2.8	2.8	2.7	2.6	2.7	2.9
6-Jan	2.6	Z	2.8	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.6	2.5	3.1	3.3	2.9	2.4	2.4	2.4	2.4	2.6	3.3
7-Jan	2.7	Z	3.2	2.9	2.8	2.8	2.9	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.0	2.9	3.0	3.0	3.1	3.2	3.2	3.0	3.1	2.9	3.0	3.2
8-Jan	2.8	Z	2.9	2.7	2.7	2.7	2.6	2.5	2.6	2.6	2.5	2.8	3.2	3.2	2.8	2.8	2.8	2.8	2.9	3.0	3.0	3.0	3.0	3.1	2.8	3.2
9-Jan	3.2	Z	3.1	3.1	3.1	3.2	3.0	3.4	3.4	2.9	3.5	3.4	3.2	3.1	3.9	4.3	2.9	2.7	2.5	2.5	2.5	2.4	2.3	2.2	3.0	4.3
10-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.6	2.7	2.4	2.3	2.4	2.4	2.2	2.2	2.3	2.3	2.3	2.3	2.7
11-Jan	2.3	Z	2.3	2.5	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.5
12-Jan	2.1	Z	2.2	2.2	2.3	2.4	2.3	2.2	2.5	2.3	2.3	2.4	2.4	2.2	2.3	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.4	2.3	2.5
13-Jan	2.5	Z	2.4	2.4	2.5	2.6	2.6	2.6	2.4	2.4	C	C	C	C	C	C	C	C	M	M	M	M	M	M	--	2.6
14-Jan	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	2.6	2.6	2.5	2.5	2.6	2.6	2.4	2.4	2.4	--	2.6
15-Jan	2.4	Z	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.6	2.5	2.3	2.2	2.5	2.2	2.6
16-Jan	2.6	Z	2.9	2.8	2.8	2.7	2.6	3.0	2.2	2.4	2.4	2.4	2.8	3.0	3.1	3.1	2.8	2.8	2.5	2.4	2.5	2.7	2.5	2.5	2.7	3.1
17-Jan	2.5	Z	2.5	2.7	2.6	2.7	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.3	2.2	2.1	2.2	2.1	2.3	2.1	2.1	2.2	2.7
18-Jan	2.1	Z	2.1	2.1	2.4	2.6	3.1	2.9	3.4	3.1	2.9	2.8	3.0	3.5	2.3	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.5	3.5
19-Jan	2.1	Z	2.3	2.3	2.4	2.5	2.2	2.4	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.5
20-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.1	2.2	2.2	2.3	2.2	2.2	2.5	2.5	2.5	2.4	2.4	2.3	2.2	2.3	2.5
21-Jan	2.2	Z	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.5	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.3	2.2	2.1	2.1	2.2	2.5
22-Jan	2.1	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.2	2.3	2.3	2.5	2.5	2.4	2.5	2.3	2.5
23-Jan	2.6	Z	2.6	2.4	2.3	2.3	2.3	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.2	2.2	2.6
24-Jan	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.4
25-Jan	2.2	Z	2.4	2.6	2.4	2.3	2.9	2.8	2.6	2.9	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.9
26-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3
27-Jan	2.2	Z	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.7	2.7	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.7
28-Jan	2.4	Z	2.4	2.3	2.4	2.4	2.5	2.4	2.8	2.5	2.5	2.5	2.3	2.4	2.5	2.9	3.0	2.5	2.1	2.2	2.2	2.2	2.2	2.2	2.4	3.0
29-Jan	2.1	Z	2.2	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.2
30-Jan	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
31-Jan	2.1	Z	2.2	2.1	2.1	2.2	2.3	2.3	2.4	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	2.2	2.4
	2.4	--	2.4	2.4	2.4	2.5	2.4	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.3	Diurnal Average	
	3.2	--	3.2	3.1	3.1	3.2	3.1	3.4	3.4	3.1	3.5	4.2	3.4	3.5	3.9	4.3	3.5	3.2	3.3	3.5	3.2	3.0	3.1	3.1	Diurnal Maximum	

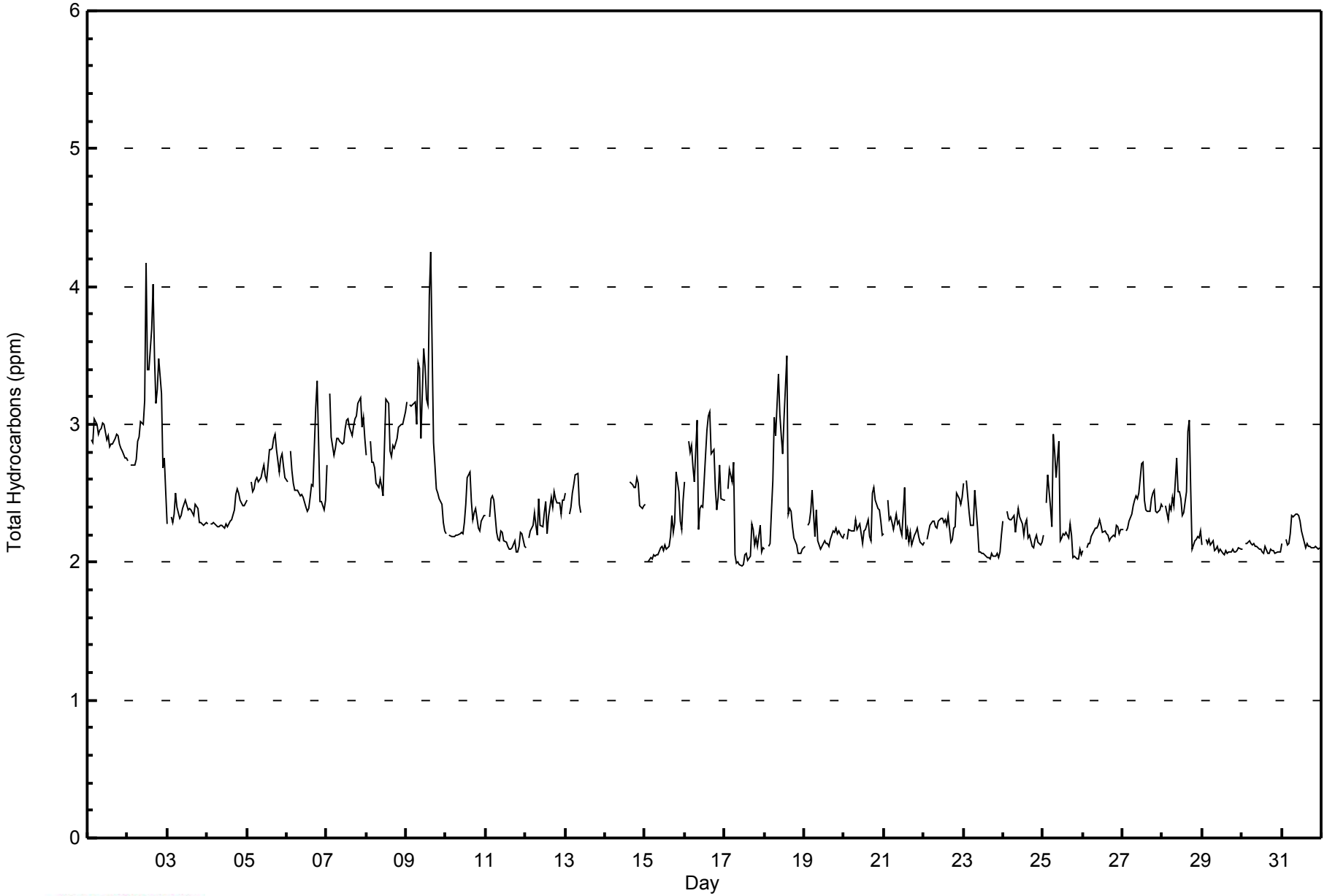
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	22	3.21	3.21
2.1 - 3.0	623	90.95	94.16
3.1 - 10.0	40	5.84	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2014

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	3	0	0	0	0	0	0	0	0	1	0	2	4	8	1	3	22
2.1 - 3.0	63	60	20	13	16	12	32	60	117	49	28	20	18	17	37	58	620
3.1 - 10.0	2	3	2	0	0	1	0	5	13	8	2	1	1	0	0	2	40
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	68	63	22	13	16	13	32	65	130	58	30	23	23	25	38	63	682

Total Number of Valid Hours: 682

Total Number of Hours: 744

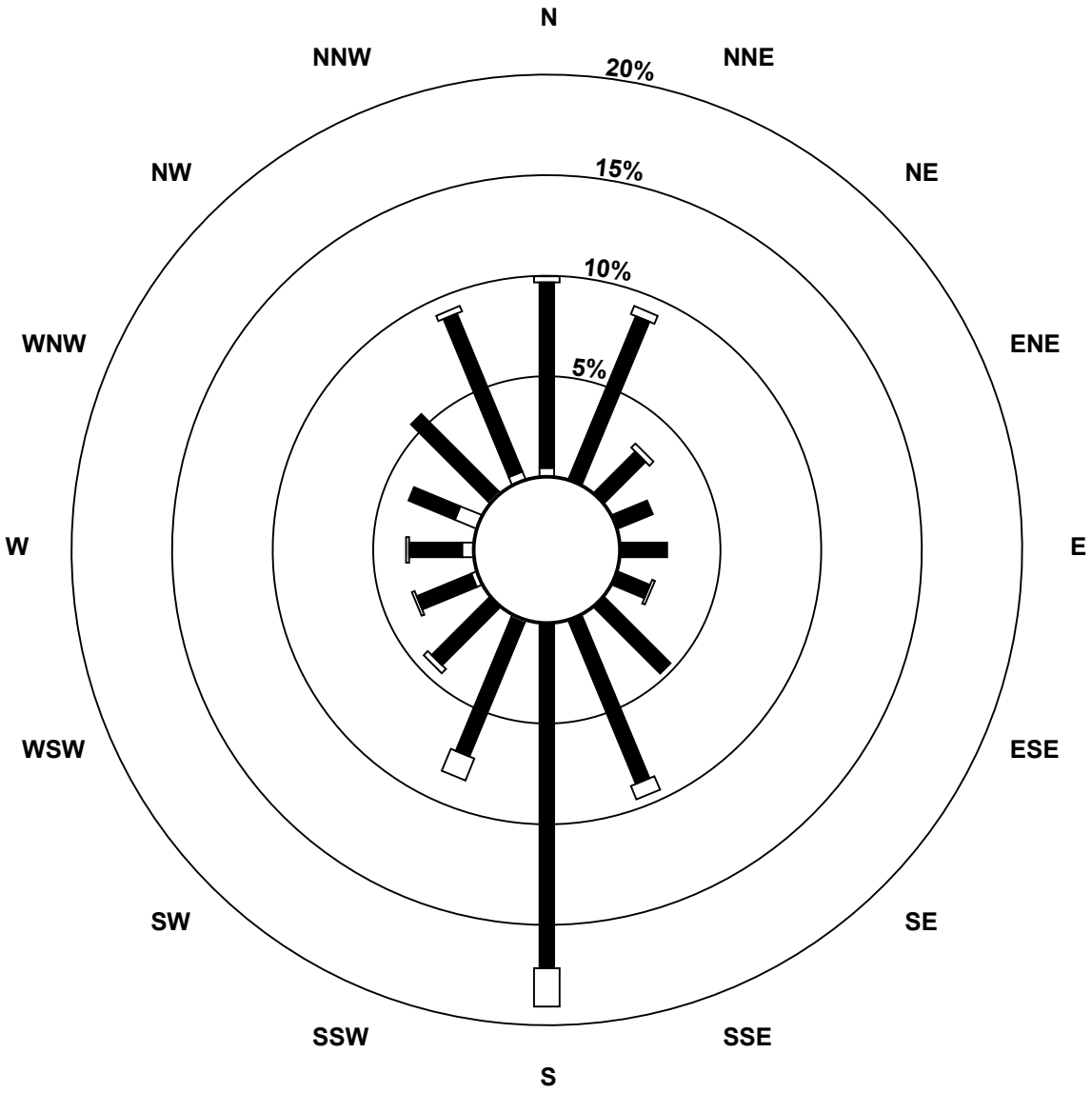
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

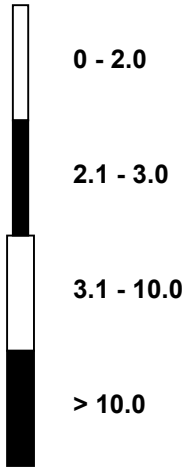
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Barge Landing (AMS 9)



Classes (ppm)



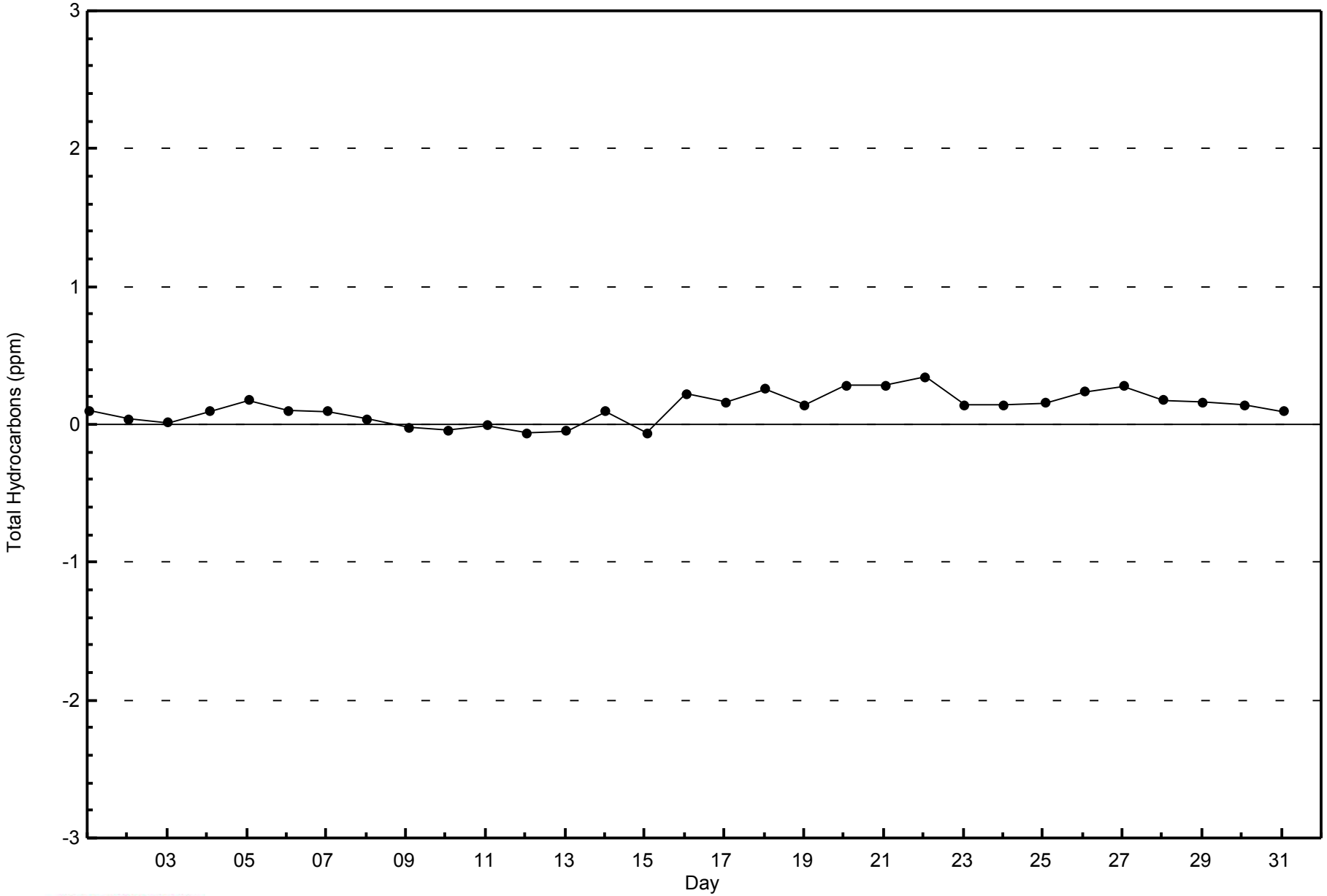
Total Number of Valid Hours: 682

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2014



AURORA
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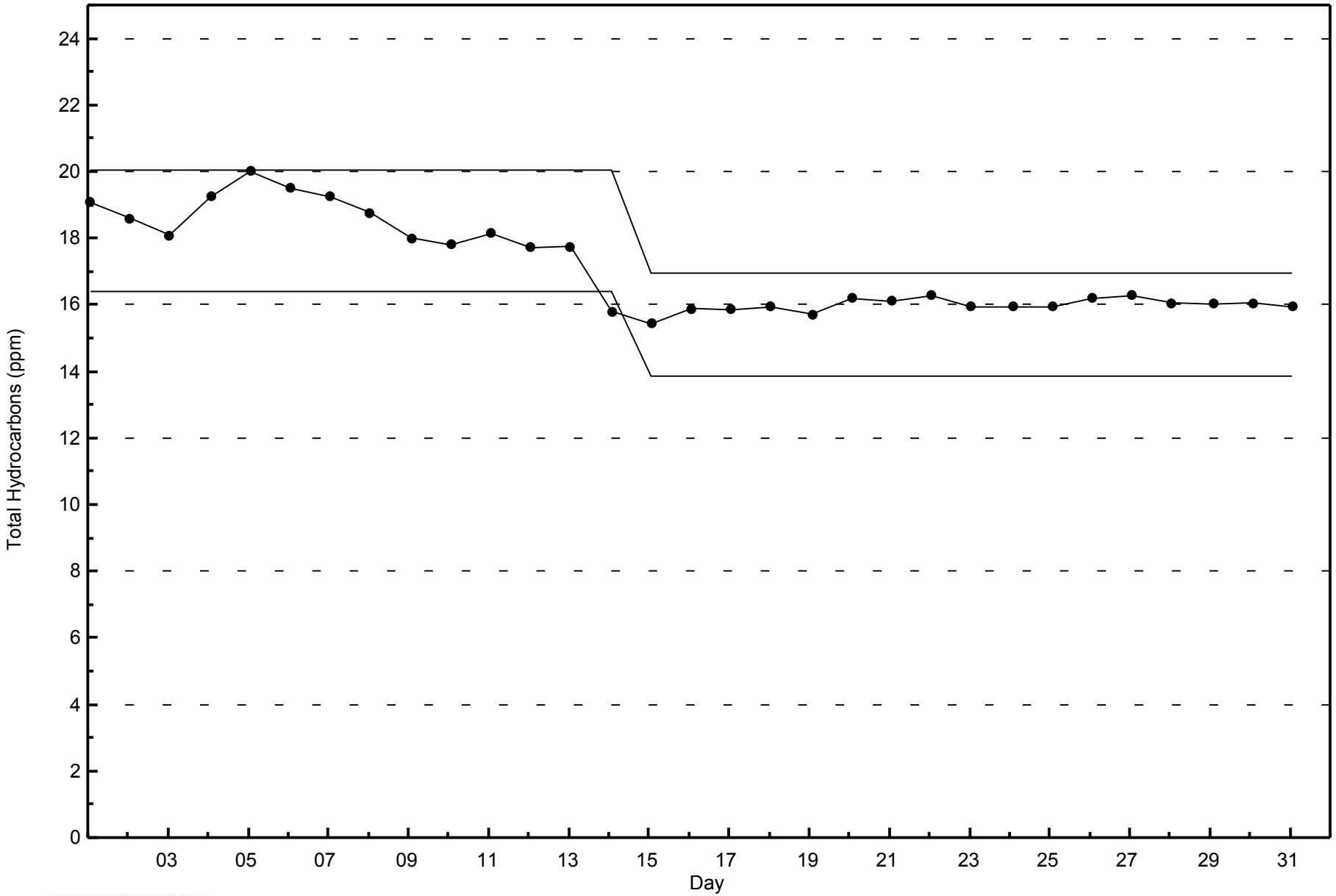
WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Barge Landing - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 8.5 C on Jan 17 12:00

Maximum Daily Average: 1.2 C on Jan 17

Minimum Value: -37.3 C on Jan 1 08:00

Minimum Daily Average: -32.8 C on Jan 1

Maximum Diurnal Average: -12.8 C at hour 15

Minimum Diurnal Average: -17.7 C at hour 4

Monthly Average: -15.81 C

Percentiles: P_1 = -36.2 P_{10} = -27.7 Q_1 = -22.9 Median = -15.8 Q_3 = -9.5 P_{90} = -2.4 P_{99} = 7.3

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

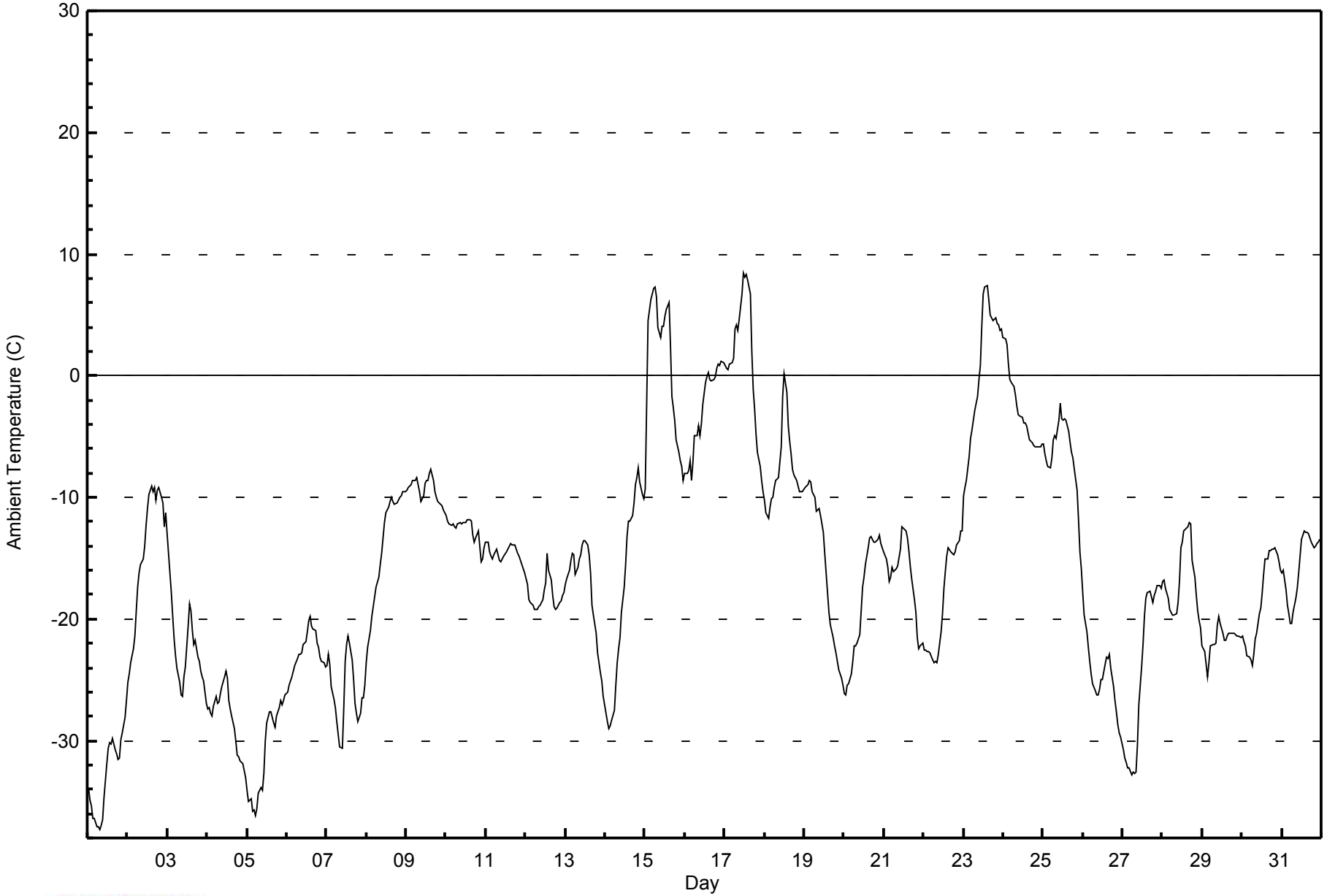
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-34.0	-34.8	-35.3	-36.4	-36.4	-37.1	-37.1	-37.3	-37.0	-36.5	-34.7	-31.9	-30.7	-30.2	-30.2	-29.8	-30.7	-31.1	-31.6	-31.4	-30.0	-29.4	-28.1	-26.7	-32.8	-26.7
2-Jan	-25.2	-24.5	-23.5	-22.5	-21.5	-19.4	-17.3	-16.2	-15.5	-15.1	-14.1	-12.3	-10.9	-9.8	-9.0	-9.5	-9.2	-10.3	-9.4	-9.2	-10.0	-10.5	-12.4	-11.3	-14.5	-9.0
3-Jan	-12.9	-16.3	-17.9	-19.8	-21.6	-23.0	-24.1	-25.2	-26.2	-26.3	-24.7	-24.0	-20.6	-18.7	-19.3	-21.0	-22.1	-21.8	-23.1	-23.5	-24.3	-24.7	-25.1	-26.9	-22.2	-12.9
4-Jan	-27.4	-27.2	-27.7	-27.9	-27.2	-26.4	-26.9	-26.8	-26.1	-25.5	-24.7	-24.3	-24.9	-26.7	-27.4	-28.0	-29.0	-30.0	-31.2	-31.3	-31.6	-31.9	-32.5	-33.0	-28.2	-24.3
5-Jan	-34.1	-34.9	-34.8	-35.8	-35.7	-36.2	-35.6	-34.3	-33.9	-34.0	-32.7	-30.0	-28.6	-27.7	-27.7	-28.1	-28.6	-28.9	-28.0	-27.3	-26.7	-27.0	-26.7	-26.2	-31.0	-26.2
6-Jan	-26.0	-25.5	-25.1	-24.8	-24.2	-23.8	-23.2	-22.9	-22.9	-22.7	-22.1	-21.8	-21.1	-20.1	-19.8	-20.6	-20.8	-20.9	-22.0	-22.3	-23.2	-23.4	-23.5	-23.9	-22.8	-19.8
7-Jan	-23.8	-22.9	-23.7	-25.6	-26.6	-27.3	-28.5	-29.5	-30.5	-30.6	-27.2	-23.4	-22.1	-21.4	-21.9	-23.4	-25.0	-26.9	-27.8	-28.5	-27.7	-26.5	-26.5	-25.4	-25.9	-21.4
8-Jan	-23.6	-22.3	-20.9	-19.8	-18.9	-18.1	-17.3	-16.6	-15.5	-14.7	-13.3	-12.1	-11.3	-10.8	-10.3	-10.0	-10.4	-10.6	-10.4	-10.2	-10.0	-9.9	-9.5	-9.5	-14.0	-9.5
9-Jan	-9.4	-9.2	-9.0	-8.9	-8.7	-8.6	-8.4	-8.9	-9.6	-10.3	-9.8	-8.8	-8.6	-8.6	-8.0	-7.6	-8.6	-9.6	-10.0	-10.3	-10.5	-10.7	-11.0	-11.3	-9.4	-7.6
10-Jan	-11.5	-11.9	-12.2	-12.3	-12.2	-12.4	-12.5	-12.2	-12.1	-12.2	-12.0	-12.0	-12.1	-11.9	-11.8	-12.0	-13.2	-13.7	-13.3	-12.7	-14.0	-15.3	-15.1	-14.2	-12.7	-11.5
11-Jan	-13.7	-13.7	-14.5	-14.9	-15.1	-14.8	-14.3	-14.7	-15.2	-15.2	-15.1	-14.8	-14.5	-14.2	-14.0	-13.9	-13.9	-13.9	-14.3	-14.6	-14.9	-15.2	-15.5	-16.2	-14.6	-13.7
12-Jan	-16.7	-17.2	-18.5	-18.6	-18.8	-19.2	-19.2	-19.2	-19.0	-18.9	-18.4	-17.6	-17.0	-14.6	-15.9	-16.8	-18.1	-19.0	-19.2	-19.1	-18.7	-18.5	-18.0	-17.8	-18.1	-14.6
13-Jan	-17.1	-16.7	-16.0	-15.2	-14.6	-14.7	-16.3	-15.8	-15.1	-14.8	-13.9	-13.5	-13.5	-13.9	-14.7	-16.2	-18.8	-19.7	-21.2	-22.8	-23.6	-24.5	-25.0	-26.4	-17.7	-13.5
14-Jan	-27.8	-28.4	-29.0	-28.8	-28.3	-27.5	-25.4	-23.6	-22.4	-21.5	-19.4	-17.4	-15.5	-13.2	-11.9	-11.9	-11.5	-10.5	-9.0	-8.4	-7.6	-8.7	-9.8	-10.1	-17.8	-7.6
15-Jan	-9.3	-2.3	4.5	6.2	6.8	7.2	7.3	6.4	4.0	3.2	4.1	4.1	4.8	5.5	6.1	2.4	-1.7	-2.7	-3.7	-5.3	-6.3	-7.0	-7.5	-8.6	0.8	7.3
16-Jan	-8.0	-8.1	-7.8	-7.0	-8.6	-7.1	-4.9	-4.9	-4.1	-5.0	-4.0	-2.4	-0.5	0.0	0.2	-0.4	-0.4	-0.3	-0.1	0.6	1.0	0.8	1.1	1.0	-2.9	1.1
17-Jan	0.8	0.6	0.5	0.9	1.1	1.4	3.9	4.2	3.8	4.6	6.7	8.5	8.1	8.3	7.9	6.7	2.0	-1.1	-2.8	-4.8	-6.3	-7.4	-8.7	-9.5	1.2	8.5
18-Jan	-10.2	-11.3	-11.7	-10.8	-10.2	-10.0	-9.2	-8.6	-8.4	-7.2	-5.8	-1.7	0.2	-1.3	-4.1	-5.4	-6.4	-7.7	-8.1	-8.6	-9.1	-9.5	-9.6	-9.5	-7.7	0.2
19-Jan	-9.2	-9.1	-8.9	-8.7	-8.7	-9.5	-10.0	-11.2	-11.0	-10.9	-11.5	-12.9	-14.6	-16.3	-17.9	-19.4	-20.5	-21.5	-22.2	-22.8	-23.4	-24.1	-24.9	-25.4	-15.6	-8.7
20-Jan	-26.1	-26.2	-25.5	-25.3	-24.5	-23.4	-22.3	-22.2	-21.9	-21.3	-19.3	-17.4	-16.6	-15.5	-14.1	-13.3	-13.2	-13.5	-13.6	-13.6	-13.4	-13.1	-13.8	-14.2	-18.5	-13.1
21-Jan	-14.5	-15.0	-15.8	-16.9	-16.5	-15.8	-16.1	-15.9	-15.7	-15.0	-14.3	-12.4	-12.6	-12.8	-13.4	-14.3	-15.7	-16.7	-18.4	-19.4	-21.5	-22.5	-22.2	-22.0	-16.5	-12.4
22-Jan	-22.6	-22.5	-22.7	-22.7	-22.8	-23.4	-23.5	-23.5	-23.6	-22.9	-21.0	-19.5	-17.4	-16.0	-14.8	-14.2	-14.5	-14.6	-14.8	-14.4	-13.9	-13.6	-12.7	-12.8	-18.5	-12.7
23-Jan	-9.9	-9.1	-8.6	-6.7	-5.1	-4.4	-3.6	-2.8	-1.7	-0.3	0.9	4.1	6.7	7.3	7.4	6.3	5.0	4.8	4.6	4.7	4.3	4.2	3.7	3.9	0.6	7.4
24-Jan	3.2	3.0	2.6	0.9	-0.3	-0.6	-0.9	-1.5	-2.5	-3.1	-3.3	-3.5	-3.9	-3.8	-4.1	-4.7	-5.2	-5.5	-5.8	-5.9	-5.8	-5.8	-5.8	-5.6	-2.8	3.2
25-Jan	-5.6	-6.4	-7.0	-7.4	-7.5	-6.8	-5.2	-5.0	-5.1	-3.7	-2.2	-3.6	-3.7	-3.5	-3.7	-4.6	-5.5	-6.3	-6.7	-7.7	-9.4	-11.8	-14.5	-15.8	-6.6	-2.2
26-Jan	-17.9	-19.7	-21.0	-22.4	-23.5	-24.5	-25.3	-25.9	-26.2	-26.2	-25.8	-24.9	-25.0	-23.7	-23.2	-23.2	-22.9	-24.1	-25.6	-26.7	-27.6	-28.7	-29.4	-29.7	-24.7	-17.9
27-Jan	-30.7	-31.4	-31.8	-32.2	-32.2	-32.8	-32.5	-32.7	-32.6	-30.4	-27.0	-23.9	-22.0	-19.8	-18.3	-17.8	-17.7	-18.2	-18.7	-18.1	-17.8	-17.3	-17.3	-17.5	-24.6	-17.3
28-Jan	-16.9	-16.8	-17.5	-18.3	-19.2	-19.5	-19.7	-19.7	-19.6	-18.7	-16.9	-14.1	-13.6	-12.7	-12.5	-12.5	-12.1	-12.2	-15.2	-16.6	-18.1	-19.3	-20.1	-20.7	-16.8	-12.1
29-Jan	-22.2	-22.6	-23.7	-24.8	-23.6	-22.2	-22.1	-22.1	-22.0	-20.5	-19.8	-20.3	-21.2	-21.8	-21.7	-21.4	-21.2	-21.2	-21.2	-21.2	-21.3	-21.4	-21.4	-21.5	-21.8	-19.8
30-Jan	-21.5	-21.9	-22.2	-23.0	-23.2	-23.4	-23.8	-22.9	-21.7	-21.2	-19.6	-19.1	-17.8	-16.4	-15.1	-15.1	-14.4	-14.4	-14.3	-14.3	-14.1	-14.7	-15.3	-16.0	-18.5	-14.1
31-Jan	-16.3	-16.0	-17.6	-18.8	-19.5	-20.3	-20.4	-19.5	-18.3	-17.5	-16.2	-14.8	-13.4	-12.7	-12.9	-12.9	-13.0	-13.3	-13.6	-14.1	-14.0	-13.8	-13.7	-13.4	-15.7	-12.7
	-17.4	-17.4	-17.5	-17.7	-17.7	-17.5	-17.2	-17.1	-17.0	-16.6	-15.4	-14.1	-13.4	-12.8	-12.8	-13.3	-14.1	-14.7	-15.2	-15.5	-15.8	-16.2	-16.5	-16.6	Diurnal Average	
	3.2	3.0	4.5	6.2	6.8	7.2	7.3	6.4	4.0	4.6	6.7	8.5	8.1	8.3	7.9	6.7	5.0	4.8	4.6	4.7	4.3	4.2	3.7	3.9	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Barge Landing - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	266	35.75	35.75
-20 - 0	422	56.72	92.47
0 - 10	56	7.53	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Barge Landing - January 2014

Maximum Speed: 32 km/h on Jan 15 08:00

Maximum Daily Speed Average: 11.7 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 14 02:00

Minimum Daily Speed Average: 0.2 km/h on Jan 6

Maximum Diurnal Speed Average: 2.2 km/h at hour 9

Minimum Diurnal Speed Average: 0.1 km/h at hour 22

Monthly Average Velocity: 0.5 km/h 279.9 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 3 Median = 5 Q_3 = 7 P_{90} = 10 P_{99} = 16

Hours in Service: 744

Hours of Data: 741

Hours of Missing Data: 3

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-Jan	SE1	WSW1	E1	N1	SSE0	SE2	SE3	S2	SSE3	SSE3	S3	SSE3	SW3	SSW2	SSW2	SSW3	S3	SE3	SSW3	SSE2	S2	SW3	S3	SW4	S2.0	SW4
2-Jan	SW4	SW2	NW2	NW2	NW1	SW4	SSW4	SSW4	SSW5	SW6	SSW8	S8	S7	S7	S9	S9	S8	ESE5	SSE5	S6	SSW5	WNW4	N4	NNE6	SSW3.4	S9
3-Jan	NNE11	NNE11	NNE8	NNE6	NNE4	NNE2	ESE2	SE3	S2	S3	SSE1	ESE1	W2	NW4	NNW6	NW3	WNW3	NW4	NW4	WNW5	NW5	WNW6	WNW4	SSW2	NNW2.4	NNE11
4-Jan	WSW5	WSW5	SW4	SW4	WSW6	SW7	SW7	WSW7	SW8	WSW8	WNW9	NW9	NNW13	NNE12	N9	NNW7	NW6	NNW4	WNW3	NW4	NW3	WNW3	WSW3	SSW2	WNW3.8	NNW13
5-Jan	S2	S2	SW4	WSW2	SE3	SE2	SSE4	SE4	SE1	WSW1	S2	SSE3	SSE3	SSW3	SSW3	SSE3	S2	SE3	SSE4	S5	S5	SSE6	SSE6	SSE5	SSE2.8	SSE6
6-Jan	SSE4	S5	S4	S4	SSW4	S5	SSW4	WSW2	AF	NNE1	NW3	NNW4	NNW5	NNW4	NNW4	N4	N4	NE2	NE1	ESE4	E3	E2	SE5	ENE0	SSE0.2	S5
7-Jan	NNW3	NNW2	N1	N2	NW1	NNW2	WNW2	WSW1	S2	SE4	SSE3	S3	SSE3	SW4	SW3	SSW3	SE3	SSE1	SSW1	S2	SSE4	S5	SSW4	S5	S1.5	S5
8-Jan	S6	SSW7	SSW6	S7	SSW6	S5	S5	SSW5	S7	SSW6	SSW5	S5	S5	SSW6	SW4	W1	NW2	W1	ESE3	AF	SSE2	SSW2	SSE2	W1	SSW3.9	SSW7
9-Jan	N0	NNW0	WSW2	SSW2	SW3	SW2	SSE5	S6	S6	S4	SSE3	S3	NNW1	NNE4	NNE3	NNW3	N7	NNE8	N7	NNE7	N6	N6	N6	N6	N1.3	NNE8
10-Jan	N6	N6	N6	NNW5	NNW5	NNW4	NNW4	NNW3	NNW4	NNE5	N4	NNE3	NNE3	NNE3	NE2	ENE2	E2	SE2	S2	SW4	SSW2	SSE3	SE4	SE2	N1.8	N6
11-Jan	N0	NW1	NNW4	NNW3	NNW4	NNW4	NNW5	N6	N6	N5	N6	N6	N6	NNW7	N8	N8	N8	N7	N9	NNE8	N7	NNE8	NNE7	N9	N5.8	N9
12-Jan	N9	N8	NNE9	NE8	NNE6	NNE3	NNW4	NE2	ESE3	SE3	SSE4	S5	S4	SW7	S8	S9	S6	S6	SSE7	S7	S6	SSW5	SSW4	SSW4	SSE1.6	SSW9
13-Jan	S4	W4	W2	S3	S4	SSE5	S1	NNW3	NNW3	WNW2	NNW2	NE5	NE5	NE6	NE6	NE6	NE4	NE4	NE4	N1	N1	N2	NNW1	NNW2	NE1.3	NE6
14-Jan	NW1	NW0	S2	SE4	SSE3	SSE3	S3	SSW3	SW3	SW4	SSW4	W3	SW3	SW3	SSW3	WSW4	SW3	SSW4	SSW6	SW5	WSW4	W5	W4	W5	SW2.8	SSW6
15-Jan	S3	W17	W27	WNW26	WNW27	WNW27	WNW29	WNW32	NW21	NW15	NW20	NW11	NW14	NW18	NW21	N8	ENE7	NE6	NE5	E1	SSW3	SE4	S3	SSE4	WNW11.7	WNW32
16-Jan	SSE5	SE5	SSE6	S6	S5	SSE6	S6	S6	SSW5	S3	S4	SSE5	S7	S7	S7	SSE7	SSE6	SSE6	SSE6	S4	SSE5	S5	S7	SSE8	S5.6	SSE8
17-Jan	S6	SSE5	S6	S7	S6	SSW6	WSW14	W13	WSW13	WNW9	WNW11	WNW12	NW12	NNW13	NNW15	NNW14	NE9	NE8	ENE6	ENE7	ENE6	ENE4	ESE5	SE5	WNW2.5	NNW15
18-Jan	ESE4	ESE4	SE3	S3	SSW4	S3	S6	S7	SSW6	S5	E5	ESE4	NE4	NNE8	NNE10	NNE8	N7	N6	NNW7	N9	NNW7	NNW5	WNW3	WNW3	NNE1.3	NNE10
19-Jan	S2	S4	E0	NNW3	NW2	NE4	NNE3	N3	NNW5	N7	N9	NNE13	NNE15	NNE15	NNE14	N13	N11	N11	N10	N7	N4	E2	SSW3	S3	N5.6	NNE15
20-Jan	S3	SSE5	S6	SSE6	S7	S9	S8	SSE9	S8	S9	S9	S9	S10	S9	S6	SSW3	SE1	NNW4	NNW6	NW6	NNW6	N7	N5	NNW4	S3.5	S10
21-Jan	NW1	NNE2	ENE3	ENE2	ESE2	NE1	NNW4	NW4	NNW5	NW3	NNW5	NNE11	NNE9	NNE8	NNE7	NE7	NE5	ENE6	E4	E3	E3	SE3	SSE5	SE5	NE2.9	NNE11
22-Jan	SSE5	SE6	SSE5	SSE6	SSE7	SSE5	S6	S7	S6	SSW6	S7	SSW8	S10	S9	S10	S8	S8	S8	S8	S8	S7	S9	S7	SSW6	S7.0	S10
23-Jan	S11	S11	S14	S14	S12	S9	S8	SSE6	SW8	W5	WSW7	W5	W5	W7	W9	W10	WNW6	NW7	WNW4	NW3	S4	SSW4	SE4	SSE4	SSW4.9	S14
24-Jan	ESE3	SSW2	NNW2	NNW9	NNW5	N5	NNE7	NNE8	NNE8	NE7	NNE6	NE8	NNE8	NE7	NE7	NE7	NE6	NE5	E4	ENE1	ESE1	SE3	SE4	SSE3	NE3.9	NNW9
25-Jan	SSW3	W3	W3	SW3	SSW5	S6	SSE5	SE5	SE2	NNE8	NNE10	NNE11	NNE8	NNE7	NNE9	NNE10	NNE8	NNE9	N12	N15	NNW17	N19	NNE15	N18	NNE6.0	N19
26-Jan	NNE20	NNE19	N14	N12	N11	N9	NNE7	NNE6	NNE6	NE4	NNW3	ESE1	ENE3	S2	S3	SE5	SSE3	SE2	ENE1	E3	E3	E1	AF	S2	NNE4.5	NNE20
27-Jan	SE2	S2	SSE3	SSE3	SSE3	SSE2	S3	SSE4	SSW3	S3	S6	S7	S10	S10	S9	S7	SSE8	S6	S8	S7	S8	SSE8	S8	S7	S5.6	S10
28-Jan	S7	S7	SSE8	S7	SSE6	S6	S6	S8	SSE7	SSE6	W2	W2	N2	NNW1	NNW3	NNW4	NNW6	N9	NNE13	NNE13	NNE14	NNE9	NNE6	N5	ENE1.1	NNE14
29-Jan	NNW4	N4	NW2	W3	W4	NW1	WNW2	NNW3	NNW5	N7	N11	N12	N14	N11	NNE10	NNE10	N9	N10	N8	NNW5	NNW4	NW3	NNW3	NNW3	N5.5	N14
30-Jan	NNW5	NW4	WNW3	WSW3	WSW3	SW2	SSW3	SW6	WSW8	SW8	SW10	SW12	SW12	SSW12	SSW9	SSW9	SSW12	SSW10	SSW9	SSW9	SSW4	WSW6	W3	NW5	SW5.9	SSW12
31-Jan	N5	N6	NNW5	NW4	NW4	NW1	WSW3	SE2	E1	WSW1	WNW3	NNW5	NW4	NNW6	NNE6	NNE6	N6	N4	W3	WSW2	SW3	W2	SSE3	SSW4	NNW2.1	NNE6
	SE0.3	WSW0.4	WSW1.1	WSW1.2	SW1.8	SW1.5	SW2.1	SW1.8	WSW2.2	WSW1.3	WNW1.5	WNW0.9	NNW1.3	NNW1.5	NNW1.7	N1.3	NNE1.3	NNE1.8	NNE1.0	N0.6	N0.2	N0.1	SSE0.7	SSW0.3	Diurnal Average		
	NNE20	NNE19	W27	WNW26	WNW27	WNW27	WNW29	WNW32	NW21	NW15	NW20	NNE13	NNE15	NW18	NW21	NNW14	SSW12	N11	NNE13	N15	NNW17	N19	NNE15	N18	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 - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 13 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 29 03:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 2 P_{90} = 3 P_{99} = 8

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-Jan	1	2	1	1	1	2	1	1	2	2	2	3	2	2	3	3	3	1	1	2	2	2	1	2	3
3-Jan	3	3	3	3	1	1	1	1	1	1	1	2	2	2	2	1	2	2	1	1	1	2	3	1	3
4-Jan	1	1	1	2	2	2	2	2	2	2	3	3	4	4	3	2	2	2	1	1	1	1	1	1	4
5-Jan	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2
6-Jan	1	2	2	2	1	2	1	1	AF	1	2	1	2	1	1	1	1	1	1	1	1	1	2	1	2
7-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8-Jan	2	3	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	AF	1	1	1	1	3
9-Jan	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
10-Jan	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
11-Jan	1	1	2	1	1	1	1	2	2	1	2	2	2	2	2	2	2	2	3	2	3	2	2	2	3
12-Jan	2	2	3	3	3	1	1	1	1	1	1	2	1	2	3	3	2	1	2	2	2	1	1	1	3
13-Jan	1	1	1	1	2	2	1	1	1	1	1	2	1	2	2	2	1	1	1	1	1	1	1	1	2
14-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	1	1	2	2
15-Jan	1	9	11	11	11	12	12	13	8	6	8	5	5	7	7	6	3	2	2	1	1	1	1	1	13
16-Jan	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	1	1	1	1	1	2	2	2	2
17-Jan	2	1	2	2	2	2	5	5	4	4	5	4	4	5	5	5	3	3	2	2	2	1	1	1	5
18-Jan	1	1	1	1	2	1	2	2	2	2	1	1	2	3	3	2	2	1	2	2	2	1	1	1	3
19-Jan	1	1	2	1	1	1	1	1	1	2	3	4	4	4	4	4	3	3	3	2	1	2	1	1	4
20-Jan	1	1	1	2	2	3	3	4	3	3	3	3	3	3	3	2	2	1	2	2	2	2	2	1	4
21-Jan	1	1	1	2	1	1	1	1	1	1	2	3	3	2	2	2	1	2	1	2	1	1	1	1	3
22-Jan	1	1	1	2	2	1	2	2	2	2	2	2	3	4	4	3	3	3	3	2	2	3	3	3	4
23-Jan	3	4	4	4	3	2	2	2	2	2	2	2	2	2	3	4	2	2	2	2	1	1	1	1	4
24-Jan	1	1	3	3	2	1	2	2	2	2	2	2	3	2	2	2	2	1	1	1	1	1	1	1	3
25-Jan	1	1	1	1	1	2	2	1	1	3	4	3	2	2	3	3	3	2	5	6	6	6	4	6	6
26-Jan	6	6	5	4	4	3	3	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	AF	1	6
27-Jan	1	1	1	1	1	2	1	1	1	1	2	3	3	3	3	3	2	2	3	2	3	3	3	2	3
28-Jan	3	2	2	2	1	2	2	3	2	2	1	1	1	1	1	1	1	5	5	4	4	3	2	2	5
29-Jan	1	1	0	1	1	1	1	1	1	3	3	4	5	4	3	3	3	3	2	2	1	1	1	1	5
30-Jan	2	2	1	1	1	1	1	2	2	2	3	3	3	3	5	4	4	3	3	3	2	2	2	2	5
31-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	2
	6	9	11	11	11	12	12	13	8	6	8	5	5	7	7	6	4	5	5	6	6	6	4	6	
	Diurnal Maximum																								

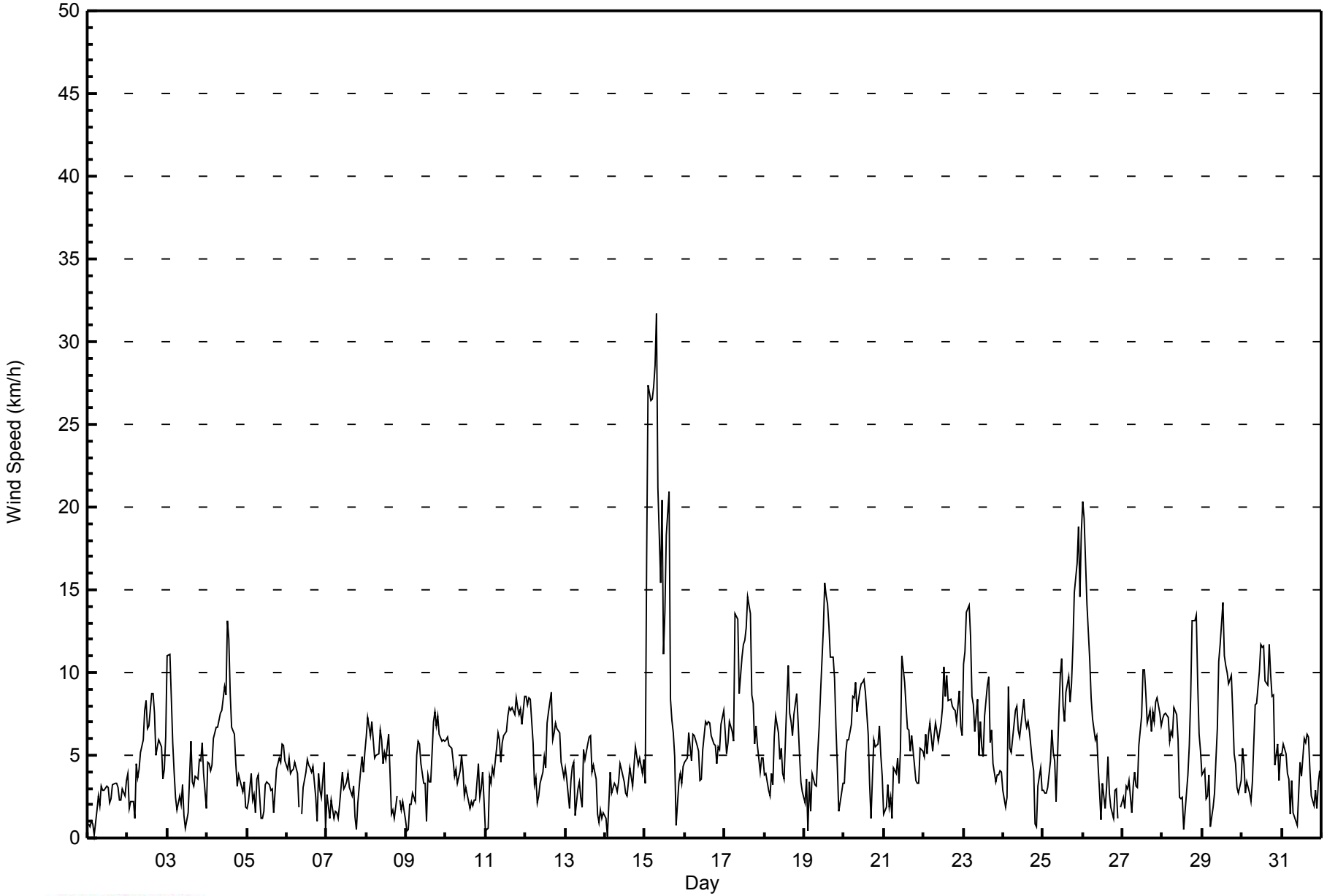
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Barge Landing - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	427	57.62	57.62
6 - 11	264	35.63	93.25
12 - 19	40	5.40	98.65
20 - 28	8	1.08	99.73
29 - 38	2	0.27	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Barge Landing - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	22	12	16	8	16	14	33	48	58	42	24	17	21	14	30	52	427
6 - 11	44	43	14	5	0	0	1	22	77	19	9	6	3	5	5	11	264
12 - 19	9	10	0	0	0	0	0	0	3	2	2	2	2	1	4	5	40
20 - 28	0	1	0	0	0	0	0	0	0	0	0	0	1	3	3	0	8
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	66	30	13	16	14	34	70	138	63	35	25	27	25	42	68	741

Total Number of Valid Hours: 741

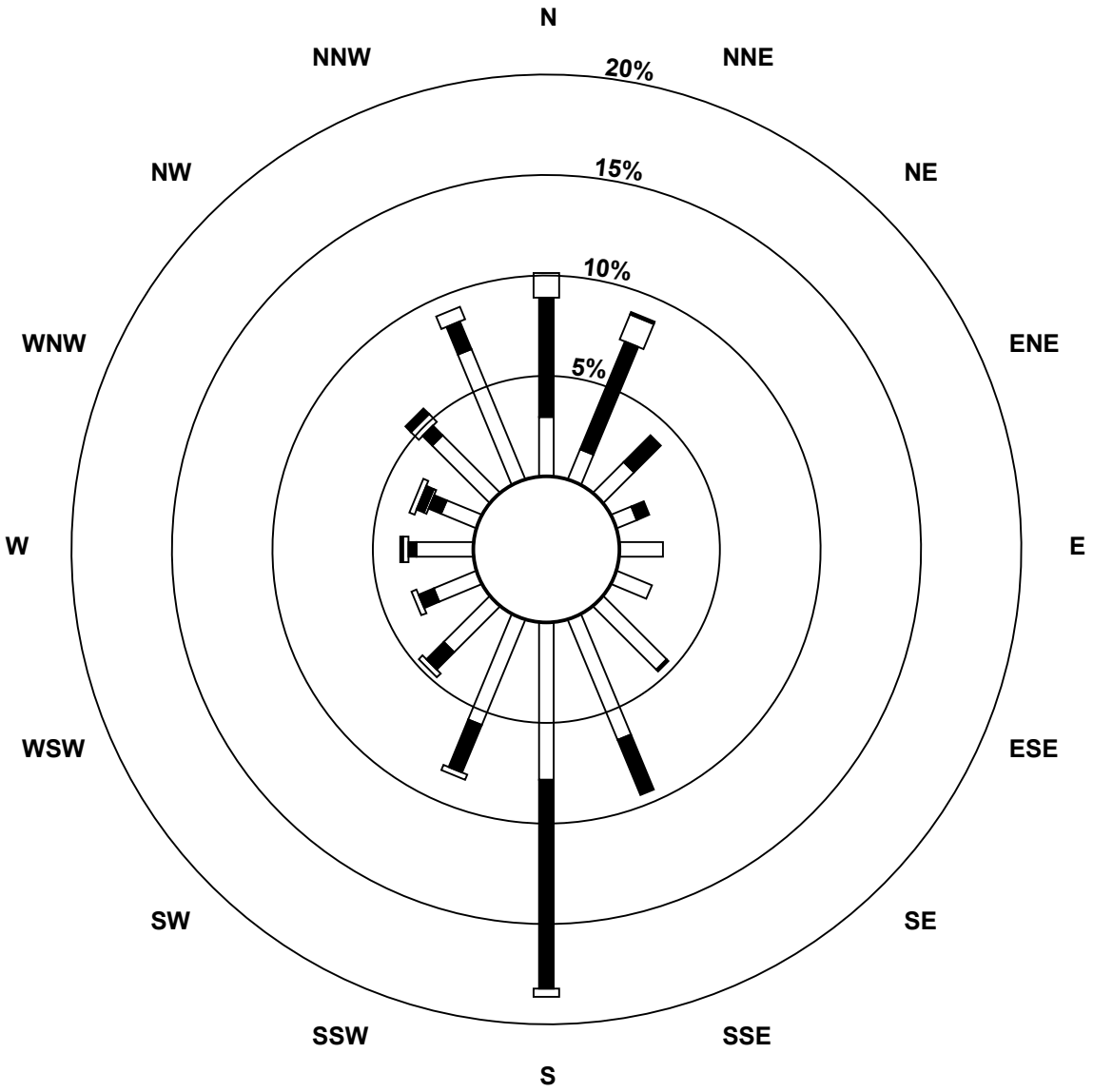
Total Number of Hours: 744

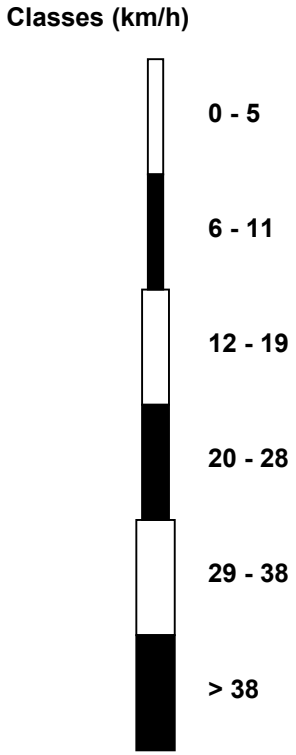
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Barge Landing (AMS 9)





Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Barge Landing - January 2014

Direction of Maximum Speed: 298 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 296.9 deg on Jan 15

Direction of Minimum Speed: 305 deg on Jan 14 02:00
Direction of Minimum Daily Speed Average: 0.2 deg on Jan 6

Monthly Average Direction: 252.2 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	141	257	98	354	148	132	145	191	167	160	173	167	221	213	201	195	184	144	197	164	175	219	183	222	181.8
2-Jan	229	215	323	312	316	222	212	207	211	223	199	181	169	171	179	181	174	117	162	188	198	290	6	18	192.7
3-Jan	21	26	13	12	12	25	102	139	188	185	156	122	281	317	333	322	289	321	305	297	305	294	289	212	342.4
4-Jan	250	245	229	229	251	227	226	237	230	245	303	324	347	12	9	340	324	327	293	308	304	296	258	210	291.1
5-Jan	172	181	224	238	141	145	148	135	144	238	178	157	151	206	203	166	185	129	156	174	169	152	158	166	167.7
6-Jan	168	188	185	183	207	179	197	238	AF	31	323	334	338	335	331	351	351	55	41	106	97	87	134	61	168.0
7-Jan	338	336	4	349	323	342	289	237	189	135	162	169	165	227	225	195	142	163	192	180	160	175	198	175	185.3
8-Jan	184	195	195	180	196	187	190	192	187	199	198	189	187	206	214	263	322	280	113	AF	151	195	158	265	192.7
9-Jan	353	330	249	209	230	217	165	169	191	184	160	176	346	14	12	348	10	12	10	13	10	2	351	354	3.1
10-Jan	349	353	356	345	342	336	340	330	344	13	10	17	22	17	41	76	97	126	185	232	194	159	132	135	2.8
11-Jan	359	308	343	336	334	337	342	352	357	2	350	350	353	345	355	353	359	1	355	13	8	19	13	8	356.7
12-Jan	6	8	18	34	15	22	345	47	116	125	147	170	181	223	181	191	180	176	165	170	180	195	196	197	158.2
13-Jan	179	276	268	180	186	166	175	344	336	283	342	43	48	56	49	50	40	46	35	10	352	350	337	339	36.3
14-Jan	319	305	179	133	157	156	187	208	215	219	199	270	235	234	197	237	224	200	206	219	241	261	271	278	219.2
15-Jan	182	263	273	288	287	292	287	298	305	310	312	306	313	307	310	6	58	55	38	84	206	146	181	159	296.9
16-Jan	160	146	161	171	180	150	176	183	195	187	175	168	175	177	174	165	164	155	151	170	168	178	172	164	169.0
17-Jan	178	168	171	186	190	202	252	259	249	285	286	283	311	331	338	348	37	48	68	75	61	59	120	137	291.1
18-Jan	115	111	135	170	204	190	189	188	205	186	101	117	42	21	18	13	11	351	348	349	335	328	295	302	14.4
19-Jan	176	181	85	327	326	39	29	9	335	360	3	12	14	19	13	10	9	8	10	359	7	93	208	183	9.7
20-Jan	187	166	178	168	174	175	181	160	182	187	184	183	175	175	185	212	137	327	330	324	336	6	7	339	184.1
21-Jan	306	24	75	60	110	55	338	326	327	322	335	18	22	31	31	48	56	58	81	89	95	139	154	142	39.6
22-Jan	153	142	155	165	156	168	171	183	190	196	190	197	189	184	181	185	183	187	181	183	175	169	188	192	178.9
23-Jan	170	171	182	185	187	172	169	165	231	259	247	262	262	259	272	271	286	311	295	308	175	198	143	150	212.4
24-Jan	122	200	343	344	343	357	21	12	24	38	30	34	30	41	37	56	51	52	83	63	110	136	145	165	34.8
25-Jan	195	272	261	217	213	170	166	137	127	27	16	19	19	26	30	28	28	23	5	349	348	7	17	2	12.4
26-Jan	12	12	9	8	5	5	18	27	33	38	344	121	75	183	179	137	154	125	67	90	89	99	AF	173	24.5
27-Jan	131	191	154	152	164	153	176	158	195	173	180	177	171	173	180	169	162	183	177	175	173	168	169	175	171.7
28-Jan	176	171	168	174	168	186	173	170	164	150	264	265	355	345	334	336	348	7	17	19	21	25	27	6	63.7
29-Jan	334	353	318	268	266	310	285	330	344	357	11	10	7	6	18	14	6	5	359	339	327	312	331	337	355.6
30-Jan	333	324	287	241	239	216	210	231	242	228	229	229	220	211	208	206	204	201	201	200	202	238	267	311	224.8
31-Jan	349	350	328	322	317	304	238	136	88	238	294	332	318	348	17	17	9	353	261	237	231	274	168	194	330.1
	134.9	250.2	246.5	244.3	236.2	214.0	224.2	230.4	239.8	246.7	284.3	303.7	339.1	330.0	339.5	3.7	30.4	31.5	25.9	353.9	357.1	357.8	157.3	192.6	
	Diurnal Average																								

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
Maximum Value: 116 deg on Jan 3 12:00

Minimum Value: 11 deg on Jan 18 01:00

Percentiles: P_1 = 14 P_{10} = 18 Q_1 = 20 Median = 23 Q_3 = 32 P_{90} = 50 P_{99} = 90

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	76	58	68	65	83	43	45	60	22	29	38	38	32	47	40	28	23	17	33	42	39	28	37	35	83
2-Jan	29	68	53	31	75	28	27	24	23	22	23	23	23	28	22	21	24	19	18	24	34	61	21	20	75
3-Jan	17	18	19	20	18	27	31	18	32	26	78	116	76	50	16	23	23	24	34	25	22	23	41	65	116
4-Jan	23	21	22	24	22	18	15	16	17	20	25	23	27	21	22	21	18	21	18	20	18	19	29	50	50
5-Jan	43	58	31	26	19	61	26	19	84	64	54	36	34	40	43	31	76	15	21	25	26	20	18	23	84
6-Jan	24	26	30	29	38	28	27	46	AF	34	32	19	20	19	18	20	17	35	41	14	18	39	29	85	85
7-Jan	15	20	21	18	40	23	60	66	42	13	19	28	30	29	32	34	28	79	90	32	17	17	31	18	90
8-Jan	21	26	21	21	24	25	29	28	27	22	22	24	27	24	31	56	34	35	16	AF	42	63	44	84	84
9-Jan	70	44	50	37	30	40	23	26	25	34	30	36	68	16	19	26	19	19	19	19	22	26	21	20	70
10-Jan	19	22	25	21	22	25	21	21	24	18	21	26	19	29	27	34	19	26	47	19	60	40	17	65	65
11-Jan	77	90	48	18	17	18	19	22	19	20	20	21	21	21	20	20	19	23	24	22	28	17	16	18	90
12-Jan	21	19	17	19	32	32	24	43	25	17	23	25	27	22	24	22	20	17	20	21	23	23	25	27	43
13-Jan	30	35	60	27	25	28	69	24	31	32	49	21	21	22	20	22	24	24	30	49	56	25	50	44	69
14-Jan	53	59	47	18	31	21	35	38	40	24	27	37	45	43	41	24	45	27	26	22	50	26	33	36	59
15-Jan	55	24	26	29	28	27	29	27	22	25	22	32	24	21	21	53	26	22	35	85	18	14	23	37	85
16-Jan	27	19	19	17	21	15	14	17	17	35	31	19	22	23	20	17	17	13	15	33	19	24	20	21	35
17-Jan	23	22	22	24	21	32	23	24	17	36	30	27	24	23	23	30	18	22	27	20	20	31	13	14	36
18-Jan	11	19	52	55	33	59	23	24	39	53	22	27	50	18	17	19	20	19	20	20	21	19	29	47	59
19-Jan	55	29	90	35	68	33	34	29	18	22	22	19	20	21	21	22	21	22	22	24	27	75	39	21	90
20-Jan	21	22	18	20	22	24	25	24	27	22	23	24	22	24	29	55	98	20	22	21	22	23	23	29	98
21-Jan	59	41	20	62	35	73	20	23	21	18	23	20	18	19	22	18	18	16	23	67	12	25	12	18	73
22-Jan	18	16	14	17	16	17	18	19	19	23	24	23	22	26	25	25	22	26	21	18	21	22	31	34	34
23-Jan	24	22	18	18	20	21	21	29	24	36	25	33	37	23	28	25	31	18	26	43	27	25	21	32	43
24-Jan	39	62	57	22	23	21	20	20	19	21	18	18	19	19	20	21	20	21	23	68	75	22	19	29	75
25-Jan	30	31	34	17	24	28	38	32	58	17	22	20	21	20	18	20	25	19	25	23	23	23	17	23	58
26-Jan	21	21	20	21	23	23	24	19	24	24	45	91	33	73	53	22	31	20	43	16	20	55	AF	46	91
27-Jan	40	45	25	28	25	66	18	20	28	42	26	26	23	23	25	24	19	17	18	22	21	23	25	25	66
28-Jan	21	22	24	20	20	23	23	21	22	26	42	49	47	95	36	19	19	27	21	18	19	20	23	22	95
29-Jan	14	15	48	37	21	73	37	31	19	25	21	23	23	23	19	20	22	21	22	22	14	18	18	17	73
30-Jan	20	16	28	16	26	43	21	19	19	19	17	19	20	21	25	27	21	22	21	24	53	33	66	24	66
31-Jan	21	21	16	14	24	79	20	51	44	86	32	21	28	25	24	19	22	25	30	41	35	72	31	23	86
	77	90	90	65	83	79	69	66	84	86	78	116	76	95	53	56	98	79	90	85	75	75	66	85	
	Diurnal Maximum																								

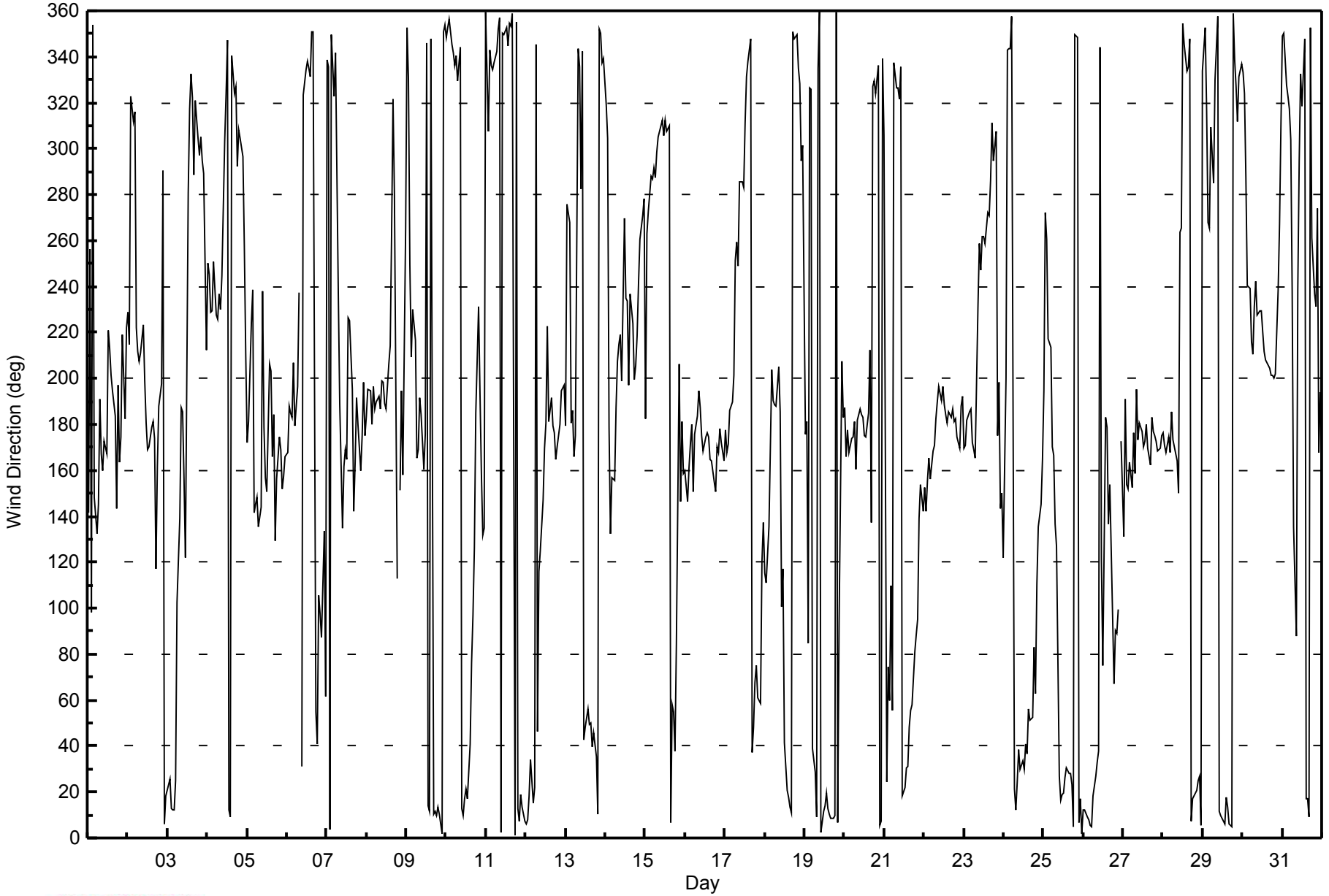
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Barge Landing - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Routine		
Start Time (MST)	11:00		16:20
Barometric Pressure	730 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11071107
Cal Gas Concentration	5.64 ppm	Cal Gas Expiry Date	3/11/2009
Gas Cert Reference	SA6920	SO2 gas conc.	59.0 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2638
DACS voltage range	5000	DACS channel #	3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-536	-536
Analyzer Range (mv)	5000	5000	Lamp voltage	848	848
Calculated slope	1.012800	0.999922	Chamber temp.	45	45
Calculated intercept	0.296312	0.076427	Pressure	604.0	604.0
Analyzer Background	18.7	18.3	Flow	0.348	0.348
Analyzer Coefficient	1.191	1.191	Intensity	39200	39200
			Converter temp.	850	850

Analyzer make/model	Thermo 45C	Analyzer serial #	328702540
Converter make/model	CDN-101	Converter serial #	376

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.0	N/A
as found span	5002	70.9	79.9	78.3	1.021
SO2 scrubber check	6000	12.2	120.0	0.2	N/A
calibrator zero	5000	0.0	0.0	0.0	N/A
high point	5000	70.9	80.0	80.0	1.000
second point	4997	35.5	40.1	39.8	1.006
third point	4997	17.7	20.0	19.9	1.004
calibrator zero	5000	0.0	0.0	-0.1	N/A
as left zero	6000	0.0	0.0	0.5	N/A
as left span	5000	70.9	80.0	78.7	1.017
				Average Correction Factor	1.003

Corrected As found	78.3	Previous response	80.7	% change	3.1%

Notes: Adjusted span
Changed filter and filter holder
Scrubber check passed

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

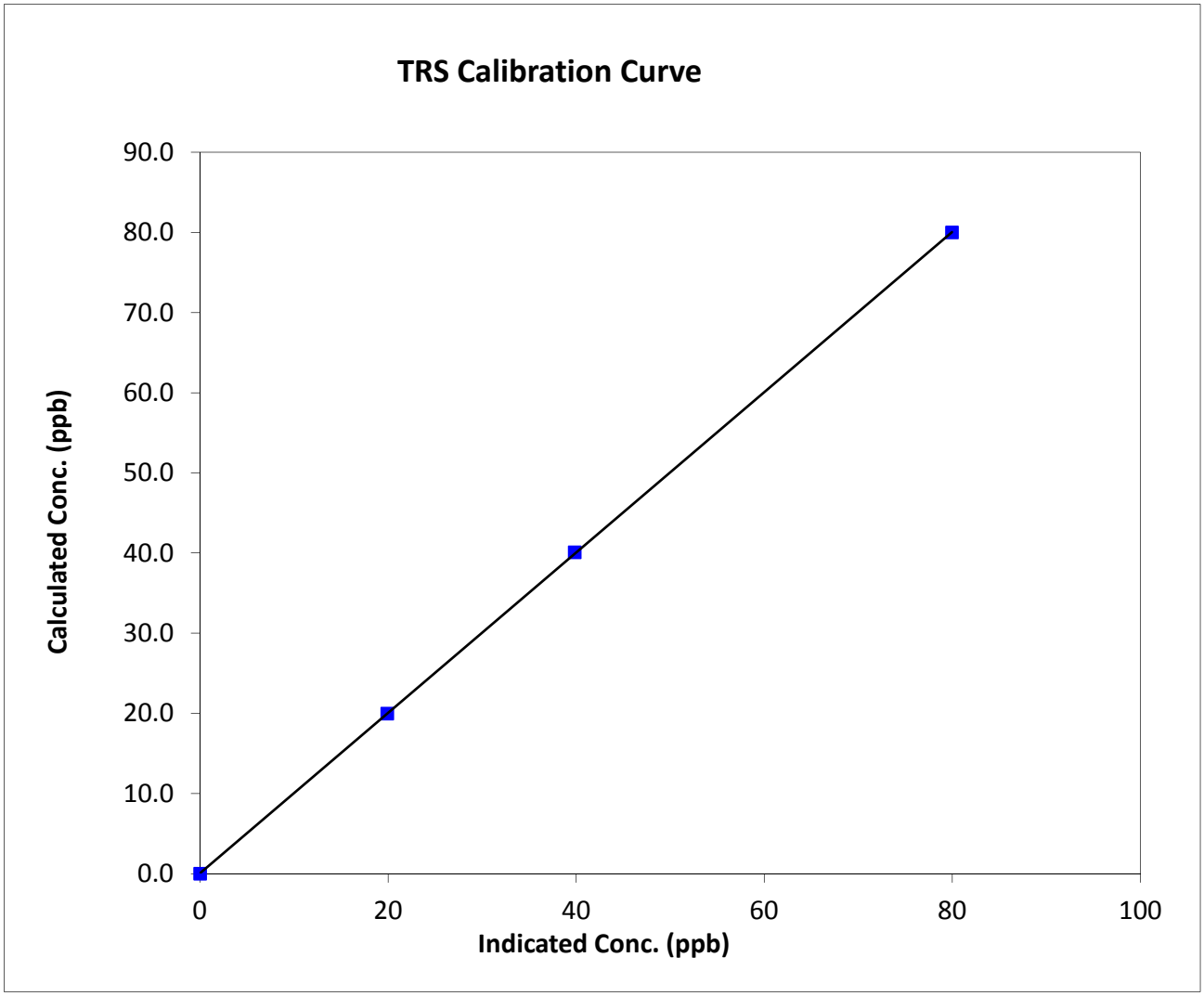
TRS Calibration Summary

Station Information

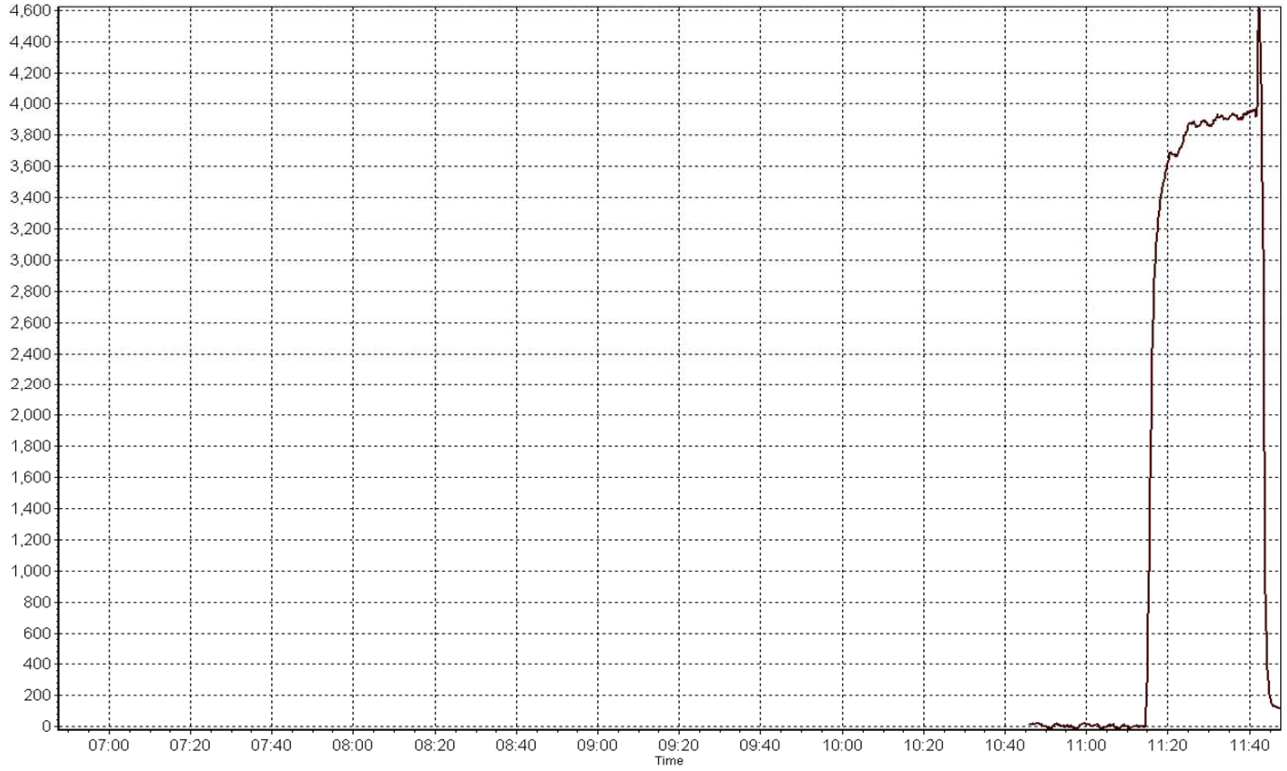
Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	11:00	End Time (MST)	16:20
Analyzer make	Thermo 45C	Analyzer serial #	328702540

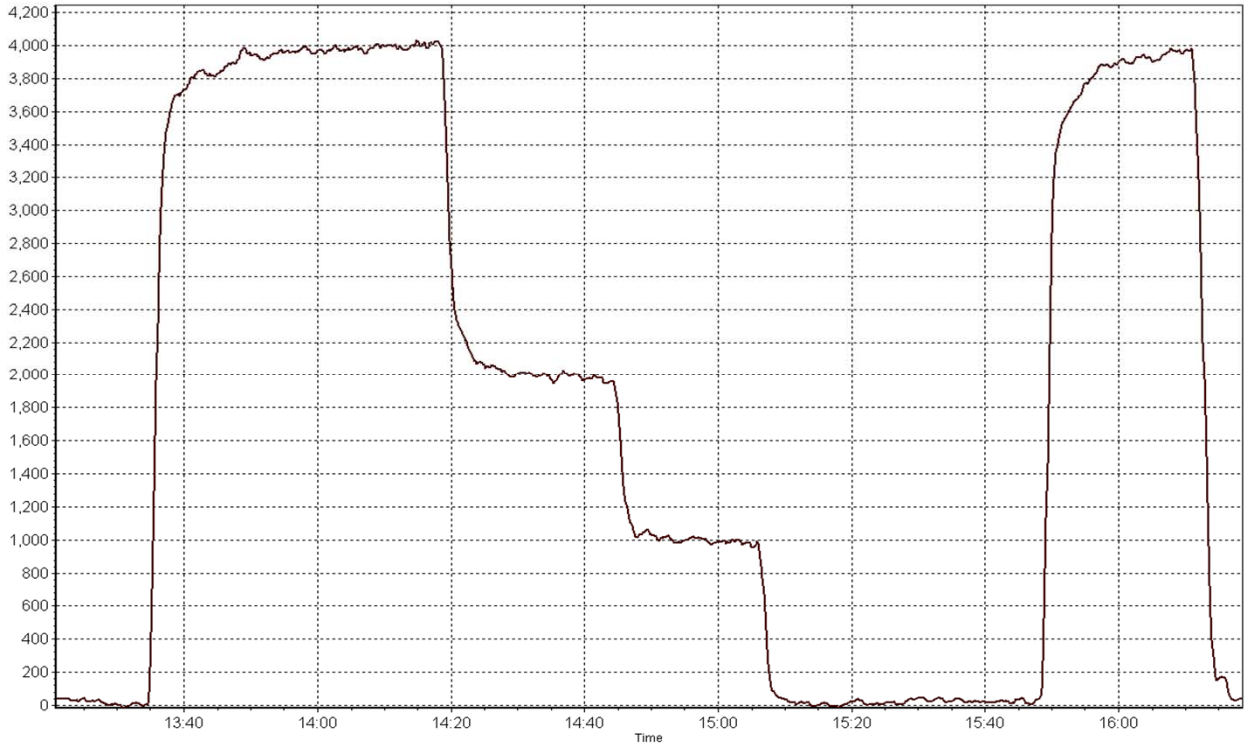
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999990
80.0	80.0	0.9999		
40.1	39.8	1.0057	Slope	0.999922
20.0	19.9	1.0039		
			Intercept	0.076427



TRS Calibration Plot **Date:** January 13, 2014

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1,200
1,000
800
600
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200
0
13:40
14:00
14:20
14:40
15:00
15:20
15:40
16:00
Time

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Monday, January 13, 2014	Previous Calibration	Monday, December 09, 2013
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Removal		
Start Time (MST)	11:50	End Time (MST)	13:15
Barometric Pressure	730 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11071107
Gas Cert Reference	139843	Cal Gas Expiry Date	11/24/2012
CH4 Cal Gas Conc.	494.0 ppm	CH4 Equiv Conc.	1049.5 ppm
C3H8 Cal Gas Conc.	202.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2638
DACS voltage range	5000	DACS channel #	5

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	6.9	6.9
Analyzer Range (mv)	5000	5000	Air or Bypass press	20.3	20.3
Calculated slope	0.993764	0.953917	Fuel Pressure	6.3	6.3
Calculated intercept	0.106055	0.129436	Zero Coefficient	0.1336	0.1336
			Span Coefficient	0.1439	0.1439

Analyzer make	TE-51C	Analyzer serial #	77840-387

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.00	0.01	N/A
as found span	5990	89.7	15.72	16.43	0.956
calibrator zero	6000	0.0	0.00	0.01	N/A
high point	5990	89.7	15.72	16.43	0.956
second point	5998	48.1	8.42	8.54	0.986
third point	5991	18.1	3.17	3.10	1.024
calibrator zero	6000	0.0	0.00	0.01	N/A
as left zero					
as left span					
				Average Correction Factor	0.989

Corrected As found	16.42	Previous response	15.71	% change	-4.4%

Notes:

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

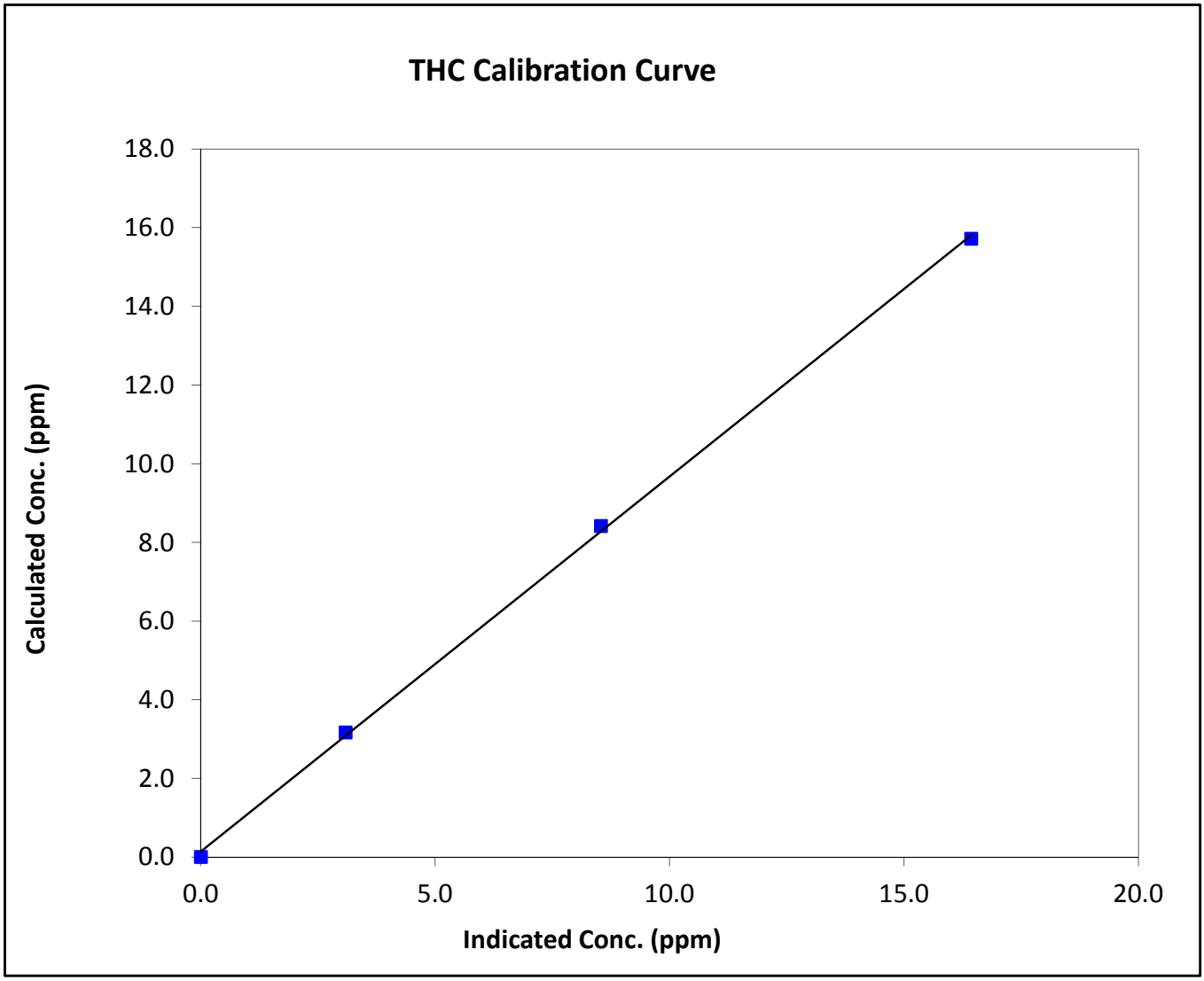
THC Calibration Summary

Station Information

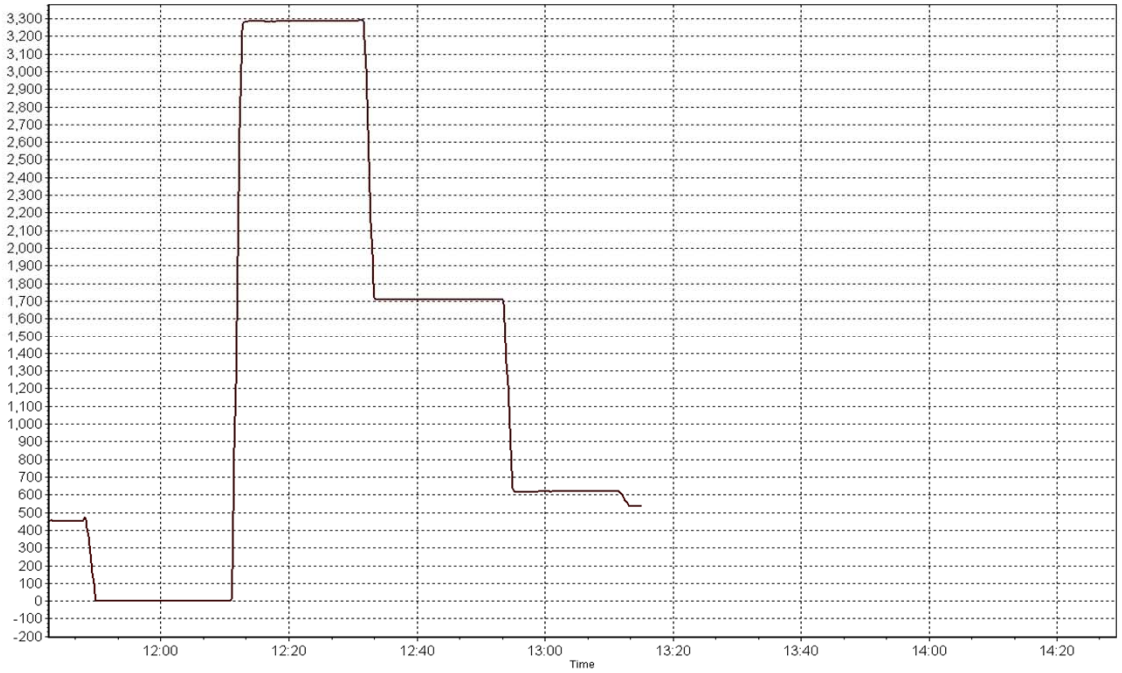
Calibration Date	January 13, 2014	Previous Calibration	December 9, 2013
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	11:50	End Time (MST)	13:15
Analyzer make	TE-51C	Analyzer serial #	77840-387

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.01	N/A	Correlation Coefficient	0.999607
15.72	16.43	0.9563		
8.42	8.54	0.9857	Slope	0.953917
3.17	3.10	1.0242		
			Intercept	0.129436



THC Calibration Plot **Date:** Monday, January 13, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Tuesday, January 14, 2014	Previous Calibration	Monday, January 13, 2014
Station Name	Barge Landing	Station Number	AMS 9
Reason:	Install		
Start Time (MST)	12:00	End Time (MST)	14:50
Barometric Pressure	730 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11071107
Gas Cert Reference	139843	Cal Gas Expiry Date	11/24/2012
CH4 Cal Gas Conc.	494.0 ppm	CH4 Equiv Conc.	1049.5 ppm
C3H8 Cal Gas Conc.	202.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2638
DACS voltage range	5000	DACS channel #	5

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	9.1	9.1
Analyzer Range (mv)	5000	5000	Air or Bypass press	34.7	34.7
Calculated slope	0.994130	1.016936	Fuel Pressure	24.1	24.1
Calculated intercept	-0.034795	-0.080756	Zero Coefficient	6.54	6.33
			Span Coefficient	4.598	4.555

Analyzer make	Thermo 51i-LT	Analyzer serial #	1327059296

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5993	0.4	0.07	0.10	N/A
as found span	5993	89.6	15.69	15.52	1.011
calibrator zero	5993	0.4	0.07	0.15	N/A
high point	5993	89.6	15.69	15.52	1.011
second point	5993	48.1	8.42	8.33	1.011
third point	5993	18.1	3.17	3.22	0.985
calibrator zero	5993	0.4	0.07	0.15	N/A
as left zero	5993	0.4	0.07	0.12	N/A
as left span	5993	89.6	15.69	15.64	1.003
				Average Correction Factor	1.002

Corrected As found	15.43	Previous response	15.63	% change	1.3%

Notes: Adjusted zero
Changed filter

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

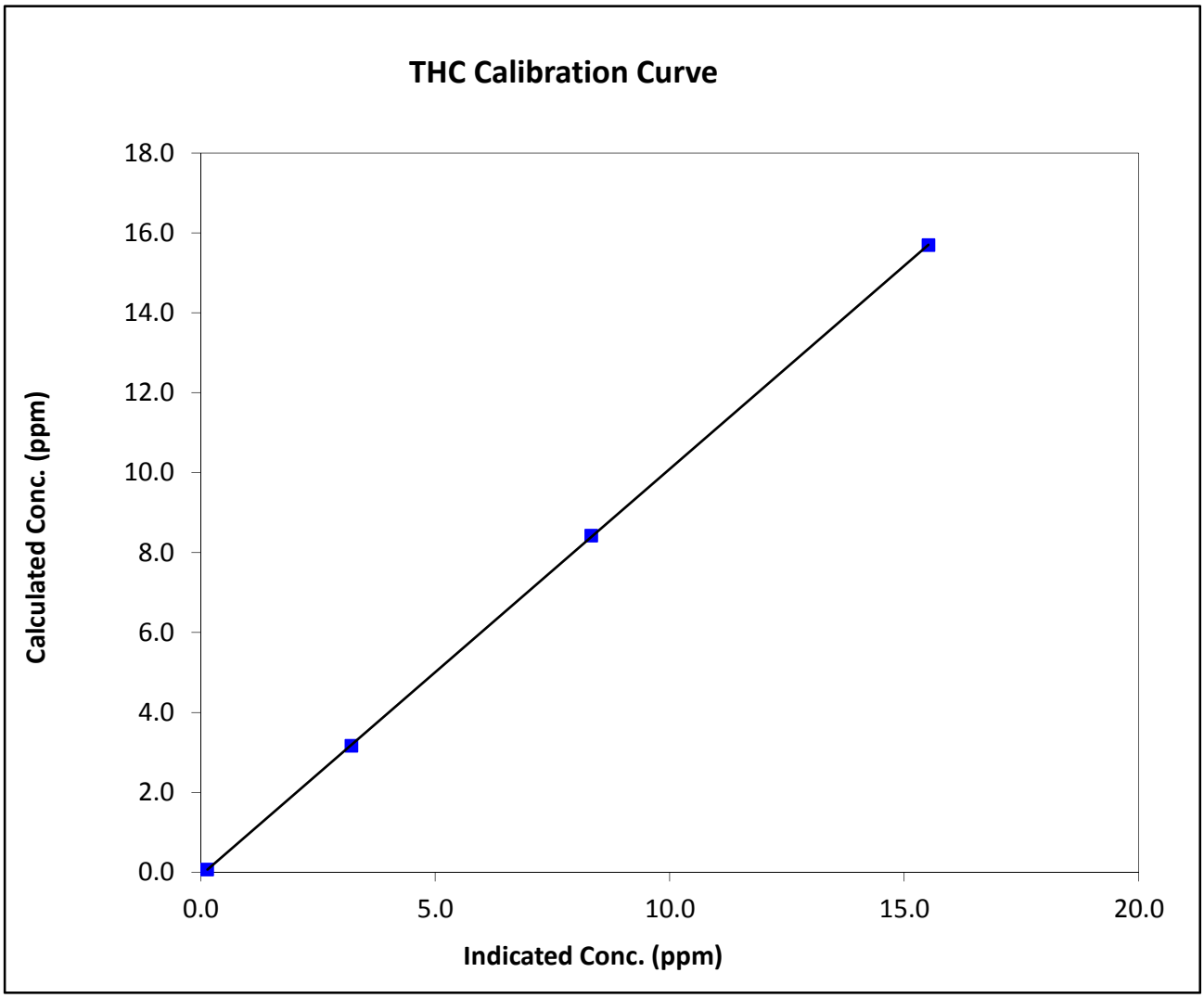
THC Calibration Summary

Station Information

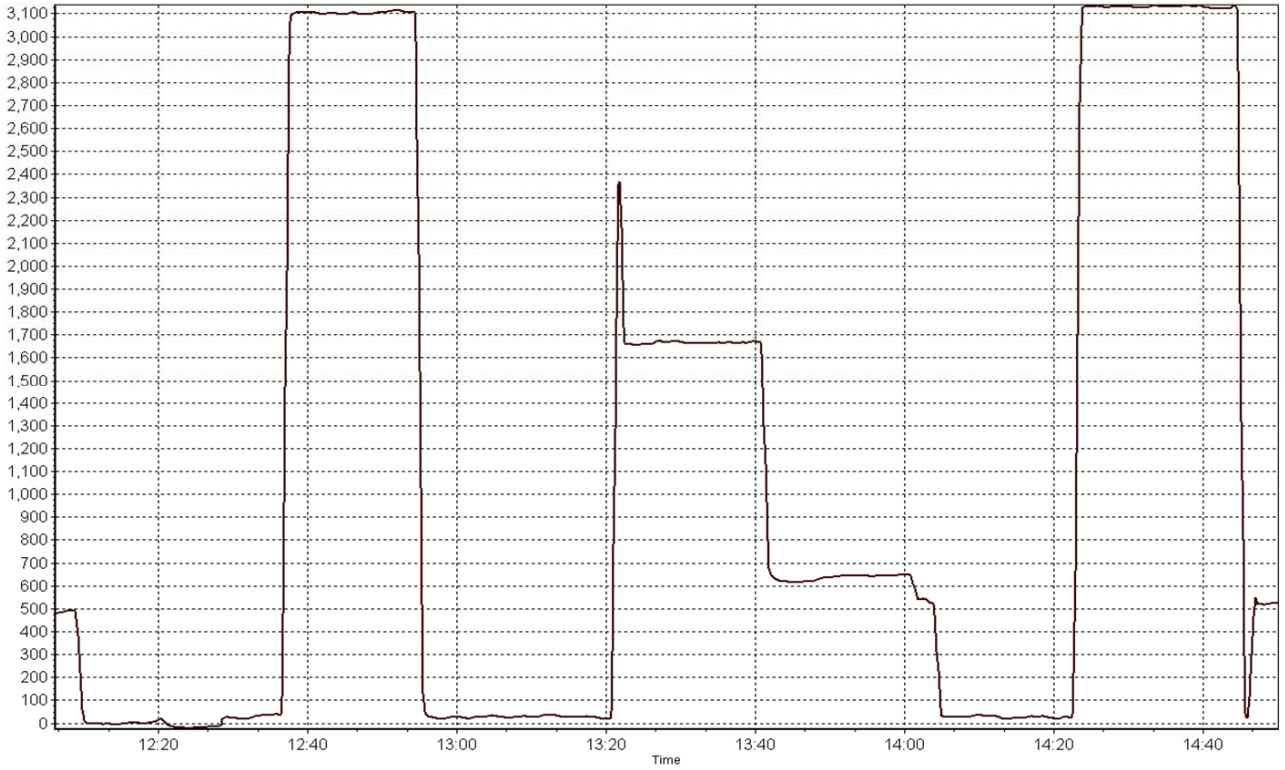
Calibration Date	January 14, 2014	Previous Calibration	January 13, 2014
Station Name	Barge Landing	Station Number	AMS 9
Start Time (MST)	12:00	End Time (MST)	14:50
Analyzer make	Thermo 51i-LT	Analyzer serial #	1327059296

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.07	0.15	N/A	Correlation Coefficient	0.999987
15.69	15.52	1.0109		
8.42	8.33	1.0112	Slope	1.016936
3.17	3.22	0.9846		
			Intercept	-0.080756



THC Calibration Plot **Date:** Tuesday, January 14, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 11
LOWER CAMP
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
JANUARY 2014

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	703	41	41	100.00	32	0	4	0
H2S (ppb) Average	709	35	35	100.00	5	0	2	0
THC (ppm) Average	684	41	60	97.45	4.4	-	2.9	-
Temperature (C) Average	744	0	0	100.00	6.9	-	0.8	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	52	-	-	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	703	1.6	3	-	0	0	1	1	1	3	32
H2S (ppb) Average	709	0.6	1	-	0	0	0	0	1	1	5
THC (ppm) Average	684	2.38	0.3	-	1.9	2.1	2.1	2.3	2.5	2.8	4.4
Temperature 2 m (C) Average	744	-16.85	9.6	-	-38.5	-28.9	-23.9	-16.8	-10.8	-3.3	6.9
Wind Speed 10 m (km/h) Average	740	9.6	7	-	0	2	4	8	13	18	52
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS 11)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC	11 Jan 2014 10:00	11 Jan 2014 10:00	1	Power spike
THC	12 Jan 2014 08:00	13 Jan 2014 01:00	18	Unstable operation - baseline drift
Wind Speed, Wind Direction	07 Jan 2014 10:00	07 Jan 2014 11:00	2	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 16:00	07 Jan 2014 16:00	1	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	09 Jan 2014 13:00	09 Jan 2014 13:00	1	Flatline in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 32 ppb on Jan 13 21:00 Maximum Daily Average: 3.8 ppb on Jan 3

Minimum Value: 0 ppb on Jan 5 07:00 Minimum Daily Average: 0.3 ppb on Jan 5
Maximum Diurnal Average: 2.8 ppb at hour 14 Minimum Diurnal Average: 1.1 ppb at hour 18
Monthly Average: 1.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 11$

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	41
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	1	0	1	0	0	0	0	0	0	0	0	0	0	0	7	0	1	1	0	0	0	0	0.6	7
2-Jan	0	Z	1	1	1	2	3	2	4	2	1	2	1	1	1	2	5	4	4	5	4	4	4	2	2.5	5
3-Jan	1	Z	1	1	1	1	0	0	2	2	1	1	13	19	30	5	3	1	1	1	1	0	0	3	3.8	30
4-Jan	4	Z	9	7	5	6	7	6	4	5	12	1	1	0	0	0	0	0	0	0	0	0	0	0	3.1	12
5-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0.3	1
6-Jan	0	Z	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0.5	1
7-Jan	0	Z	0	1	1	4	3	5	4	1	1	3	11	22	8	2	1	1	1	1	1	1	1	1	3.2	22
8-Jan	1	Z	1	2	2	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	4
9-Jan	1	Z	1	1	1	1	1	2	C	C	C	C	C	C	C	C	C	C	0	0	0	0	1	0	--	2
10-Jan	0	Z	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	1	2	9	10	2	1	1	1.4	10
11-Jan	1	Z	10	4	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1.3	10
12-Jan	0	Z	1	0	0	1	1	0	0	0	0	1	2	7	1	1	0	0	0	0	1	2	8	3	1.4	8
13-Jan	4	Z	1	2	1	1	1	2	1	1	2	1	0	0	0	0	0	0	1	3	32	11	2	6	3.3	32
14-Jan	4	Z	1	1	1	1	1	1	1	1	1	2	6	2	1	1	2	3	3	5	4	3	1	1	2.0	6
15-Jan	1	Z	4	12	5	5	16	17	2	1	1	1	1	1	1	0	1	0	0	1	9	4	2	1	3.7	17
16-Jan	1	Z	1	2	3	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1.3	3
17-Jan	1	Z	1	1	1	1	1	2	3	2	5	1	1	1	1	1	1	1	1	0	1	0	0	0	1.2	5
18-Jan	1	Z	1	0	1	0	1	1	1	1	1	1	1	4	2	1	1	1	0	0	0	0	0	0	0.9	4
19-Jan	0	Z	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Jan	0	Z	1	1	1	1	1	2	3	2	1	2	5	2	1	1	1	1	1	2	2	2	1	1	1.6	5
21-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	0.8	1
22-Jan	1	Z	1	1	1	1	3	1	1	2	3	2	1	2	3	1	1	1	1	1	1	1	1	1	1.4	3
23-Jan	1	Z	1	1	1	1	2	1	2	2	5	4	1	3	8	3	3	2	5	2	2	2	2	1	2.4	8
24-Jan	2	Z	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	2
25-Jan	1	Z	5	1	2	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1.3	5
26-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	3	8	5	10	5	2	1	1	1	1	1	2.0	10
27-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.0	1
28-Jan	1	Z	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.7	1
29-Jan	0	Z	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0.4	1
30-Jan	1	Z	1	1	1	1	1	1	2	3	2	2	3	3	3	4	2	2	2	2	1	1	1	2	1.8	4
31-Jan	1	Z	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0.8	2
	1.1	--	1.6	1.6	1.1	1.4	1.8	1.7	1.4	1.3	1.7	1.2	2.0	2.8	2.6	1.3	1.6	1.1	1.2	1.4	2.5	1.4	1.2	1.1	Diurnal Average	
	4	--	10	12	5	6	16	17	4	5	12	4	13	22	30	5	10	5	5	9	32	11	8	6	Diurnal Maximum	

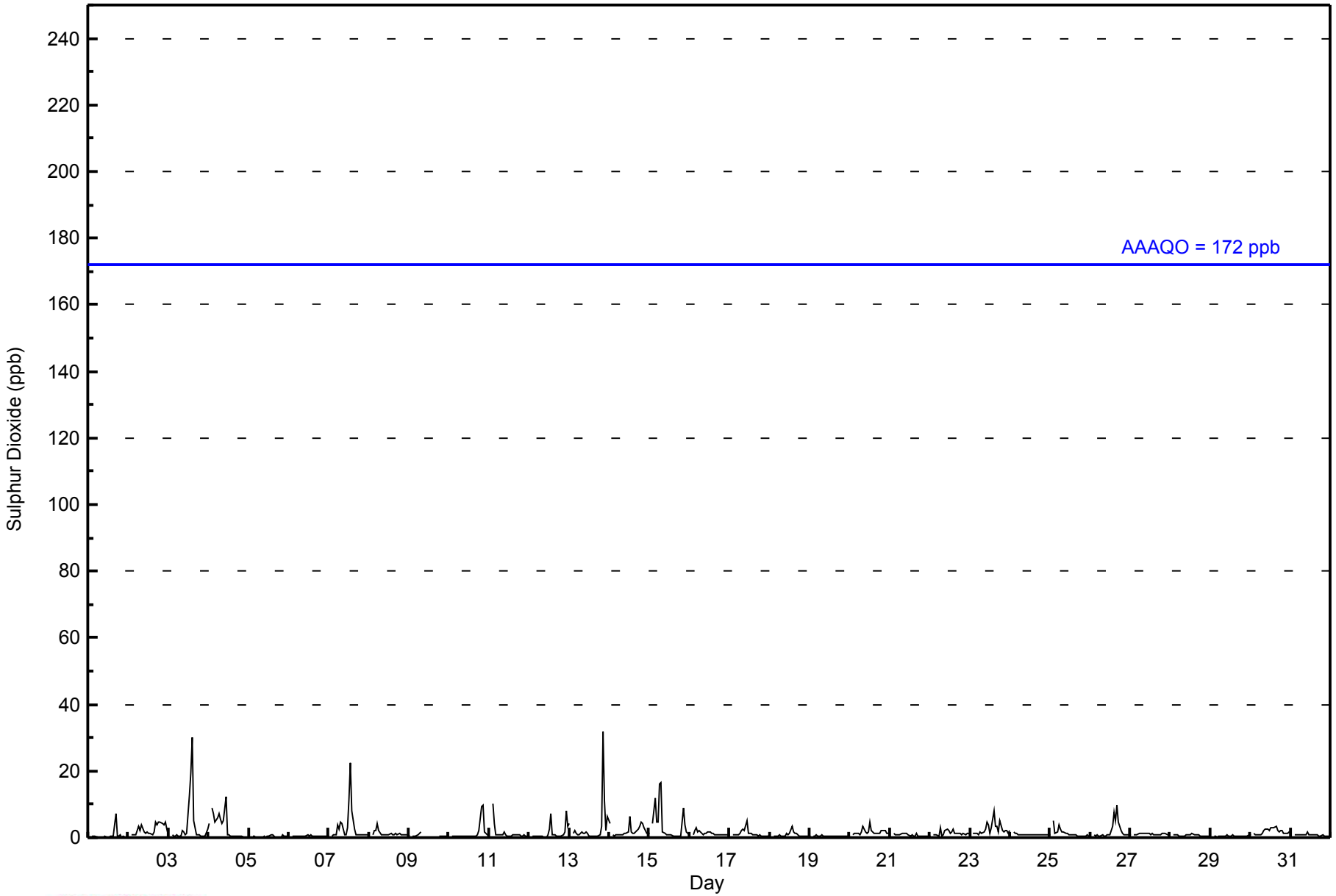
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	692	98.44	98.44
11 - 20	8	1.14	99.57
21 - 60	3	0.43	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: 703

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	88	25	9	4	7	30	245	14	4	3	6	22	20	45	83	84	689
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	1	8
21 - 60	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3
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	88	26	9	4	7	30	245	14	4	3	6	22	22	51	84	85	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

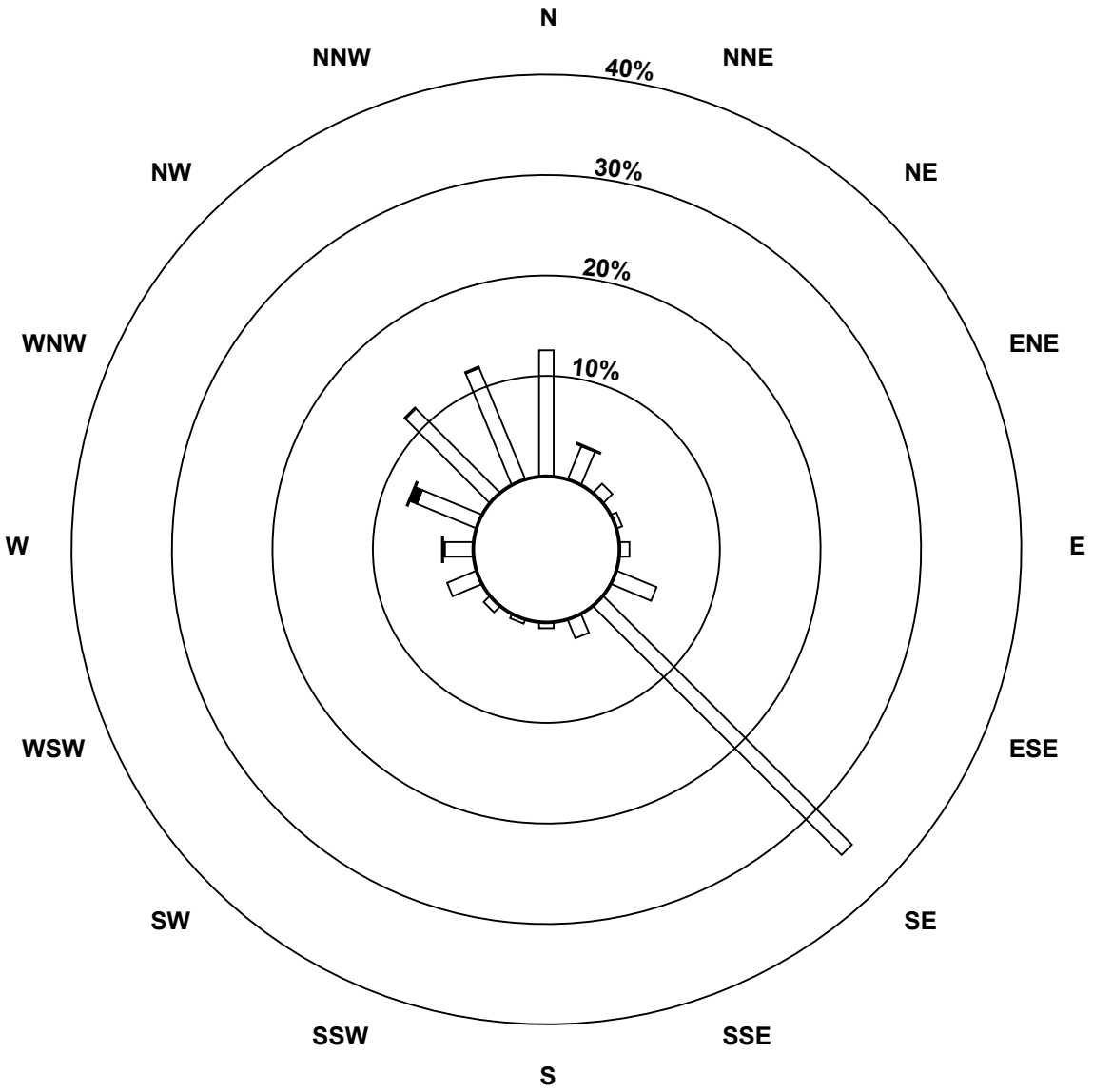
AURORA
ATMOSPHERICS INC.

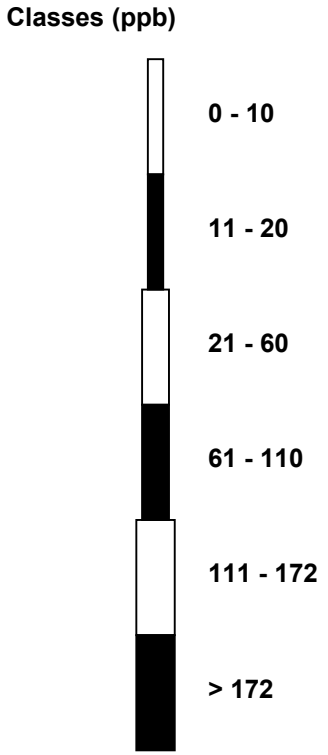
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Lower Camp (AMS 11)





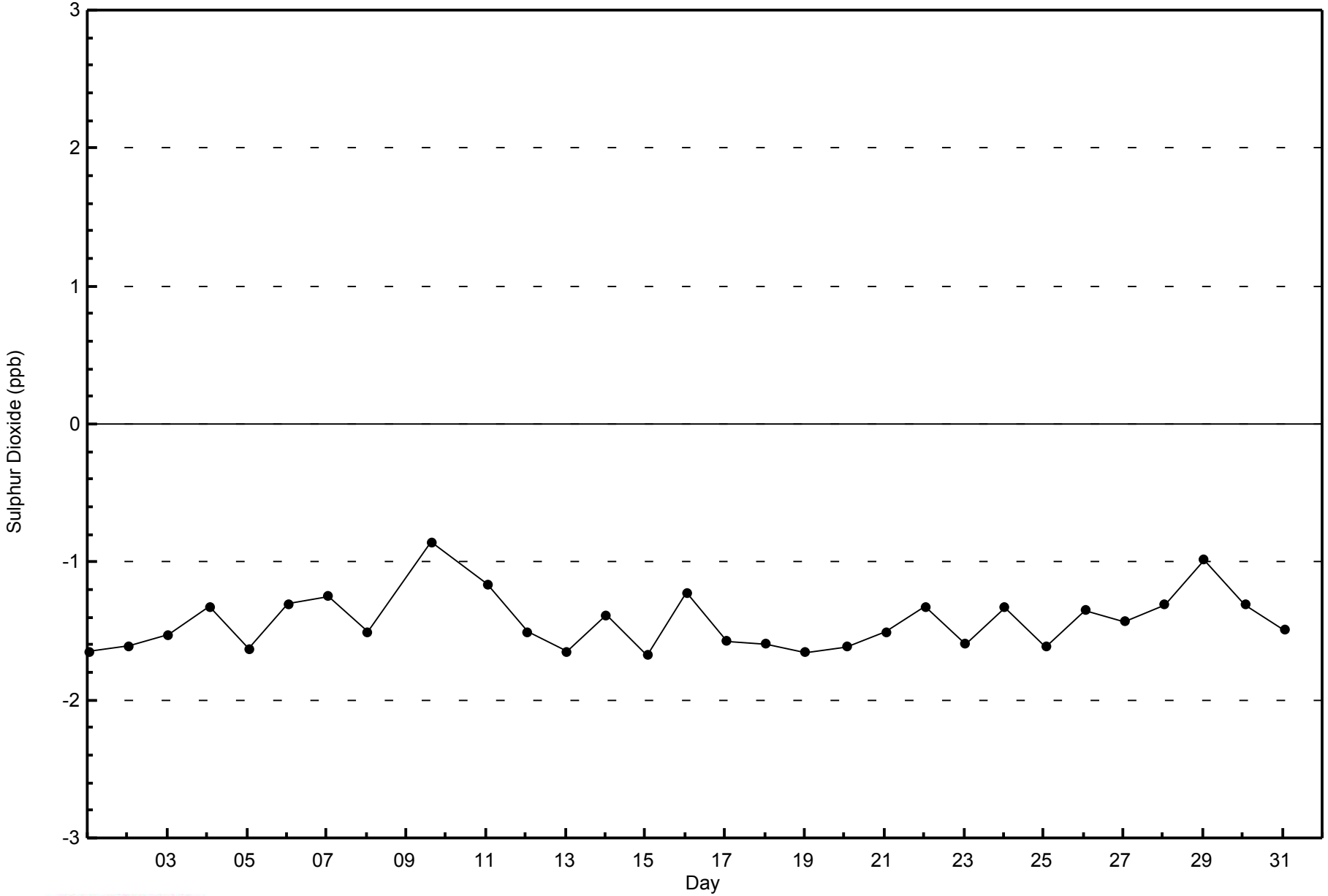
Total Number of Valid Hours: 700

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2014



AURORA
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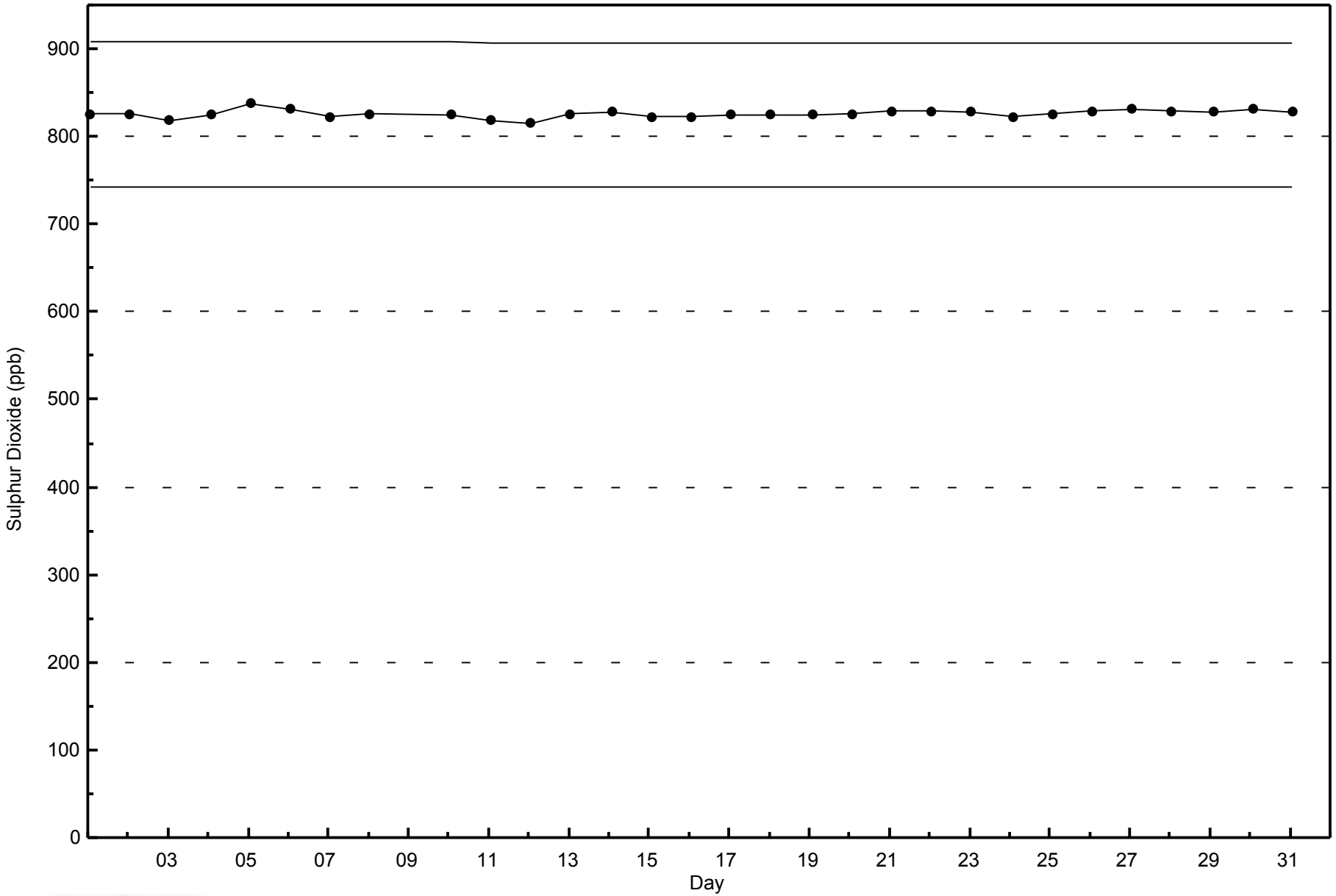
WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 ppb on Jan 7 14:00 Maximum Daily Average: 1.5 ppb on Jan 7

Minimum Value: 0 ppb on Jan 19 18:00 Minimum Daily Average: 0.3 ppb on Jan 29
Maximum Diurnal Average: 0.8 ppb at hour 14 Minimum Diurnal Average: 0.5 ppb at hour 18
Monthly Average: 0.6 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	0	Z	1	1	1	0	1	1	0	1	0	0	0	1	1	1	1	1	1	1	1	0	0	0.6	1
2-Jan	0	0	Z	0	0	1	1	1	2	1	1	1	0	0	0	1	2	2	2	2	2	2	2	1	1.1	2
3-Jan	0	0	Z	0	0	0	0	0	1	1	1	1	2	3	3	1	1	0	0	0	0	0	0	1	0.7	3
4-Jan	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
5-Jan	0	0	Z	0	0	0	1	0	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0	0.5	1
6-Jan	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0.4	1
7-Jan	0	0	Z	1	1	2	2	2	2	1	1	2	5	5	3	2	1	1	1	1	1	1	1	1	1.5	5
8-Jan	1	0	Z	1	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
9-Jan	1	1	Z	1	1	1	1	1	1	1	C	C	C	C	1	1	1	1	0	0	0	0	0	0	0.7	1
10-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0.4	2
11-Jan	1	2	Z	2	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
12-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	2	1	1	1	1	1	1	0	0	1	1	0.6	2
13-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	5	3	1	2	0.9	5
14-Jan	2	3	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	3
15-Jan	1	0	Z	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	0.6	2
16-Jan	1	1	Z	1	2	2	2	2	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1.2	2
17-Jan	1	1	Z	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
18-Jan	1	1	Z	1	1	0	1	1	1	1	1	1	1	2	1	1	1	1	0	0	0	1	0	1	0.7	2
19-Jan	0	0	Z	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
20-Jan	0	0	Z	1	0	1	0	0	0	0	0	1	2	1	0	0	0	1	1	1	1	1	1	0	0.6	2
21-Jan	0	0	Z	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0.4	1
22-Jan	0	0	Z	0	0	0	0	0	1	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0.5	1
23-Jan	0	0	Z	1	1	1	1	1	1	0	1	1	0	1	2	2	3	1	2	1	1	1	1	1	1.0	3
24-Jan	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1
25-Jan	1	1	Z	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
26-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	1	1	1	0.3	1
27-Jan	1	0	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0.5	1
28-Jan	0	0	Z	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0.6	1
29-Jan	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
30-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	0	0	1	1	0.5	1
31-Jan	1	0	Z	1	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
	0.6	0.6	--	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.8	0.8	0.7	0.6	0.7	0.5	0.6	0.6	0.7	0.6	0.6	0.6	Diurnal Average	
	2	3	--	2	2	2	2	2	2	1	2	2	5	5	3	2	3	2	2	2	5	3	2	2	Diurnal Maximum	

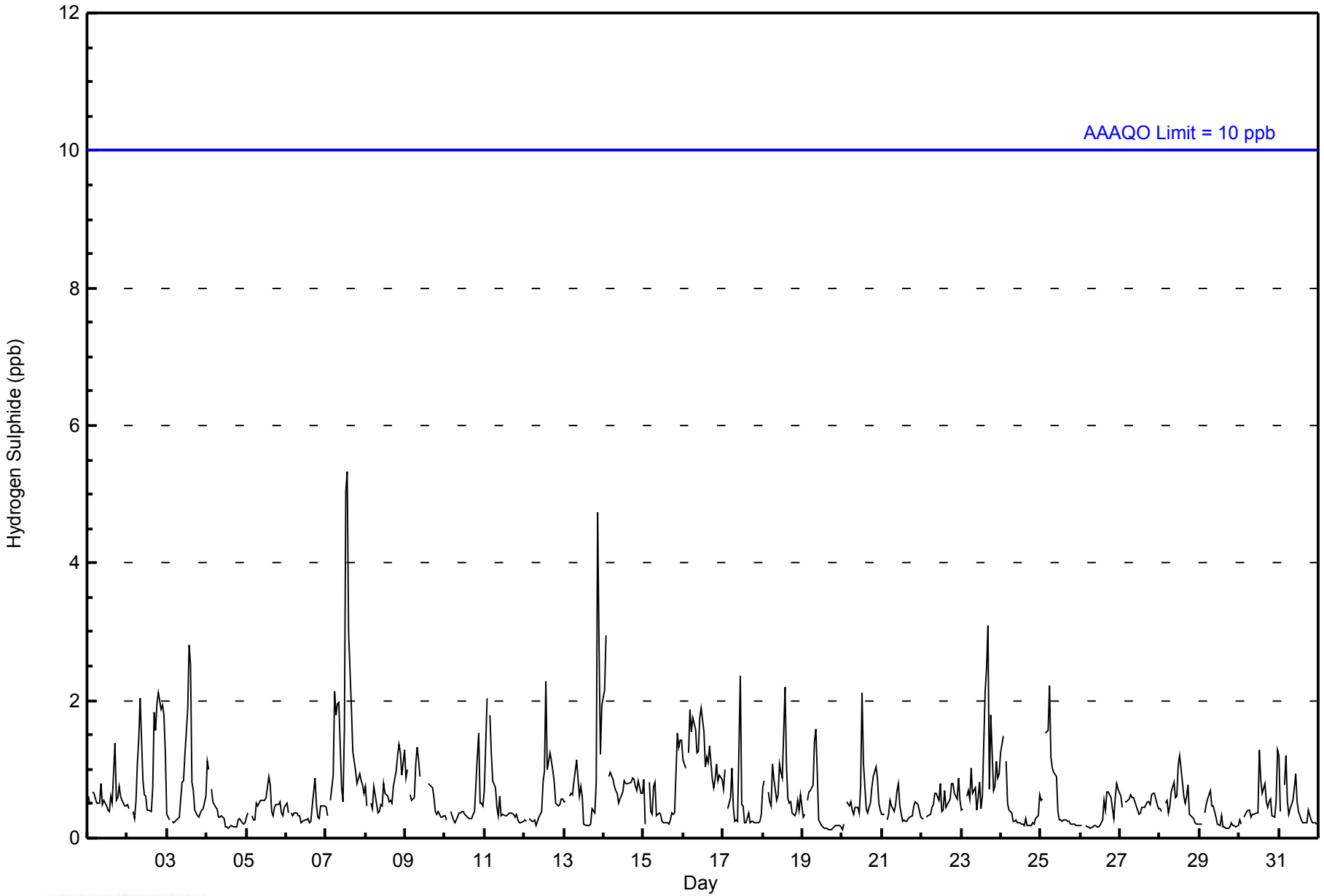
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	700	98.73	98.73
3 - 4	6	0.85	99.58
5 - 7	3	0.42	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	87	24	9	4	8	27	246	15	5	2	6	22	22	48	85	87	697
3 - 4	0	0	0	0	0	1	0	0	0	0	0	0	1	2	2	0	6
5 - 7	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	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	87	25	9	4	8	28	246	15	5	2	6	22	23	51	87	88	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

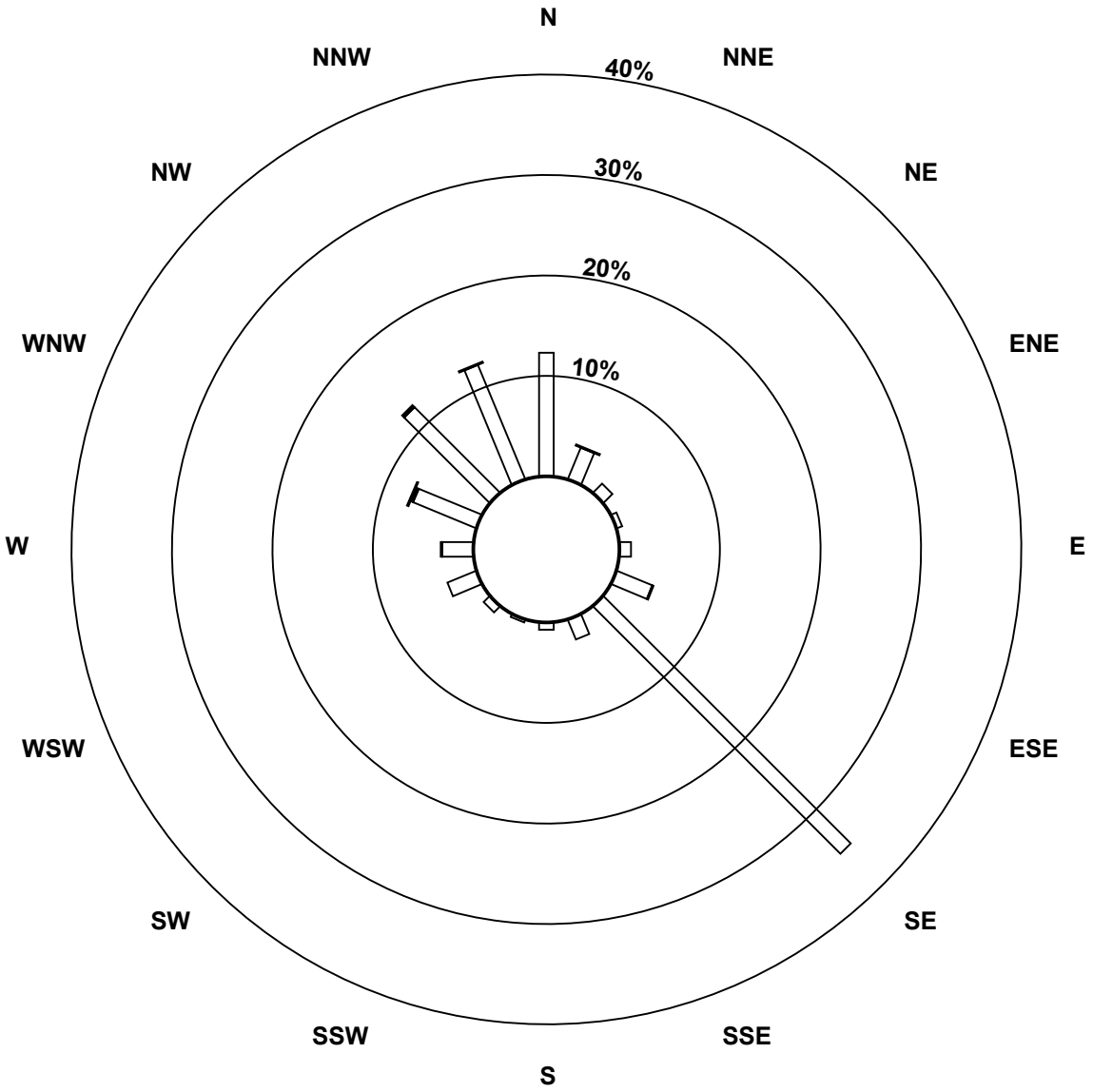
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

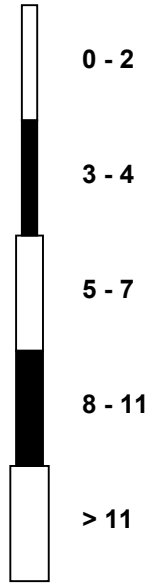
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

Lower Camp (AMS 11)



Classes (ppb)



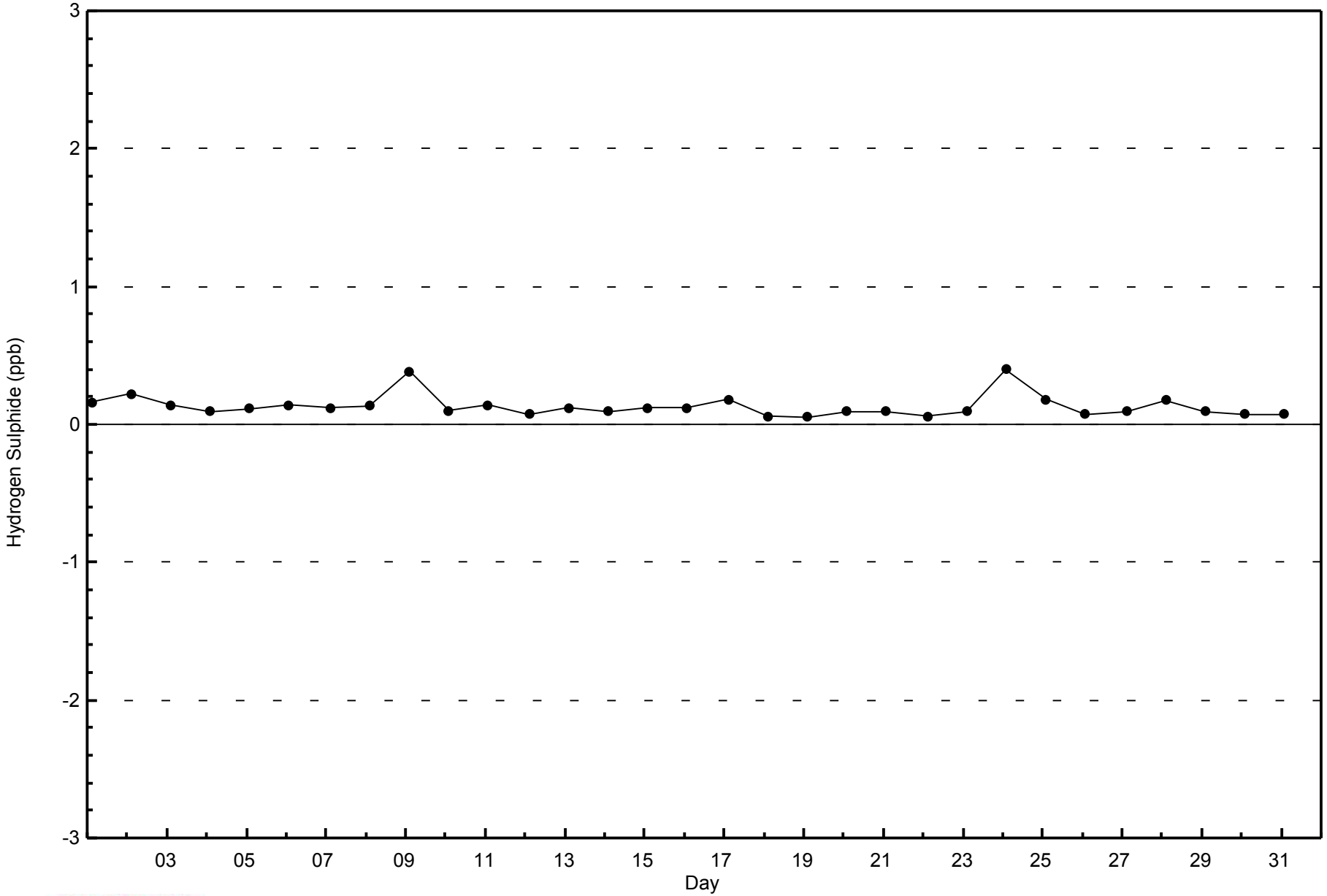
Total Number of Valid Hours: 706

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2014



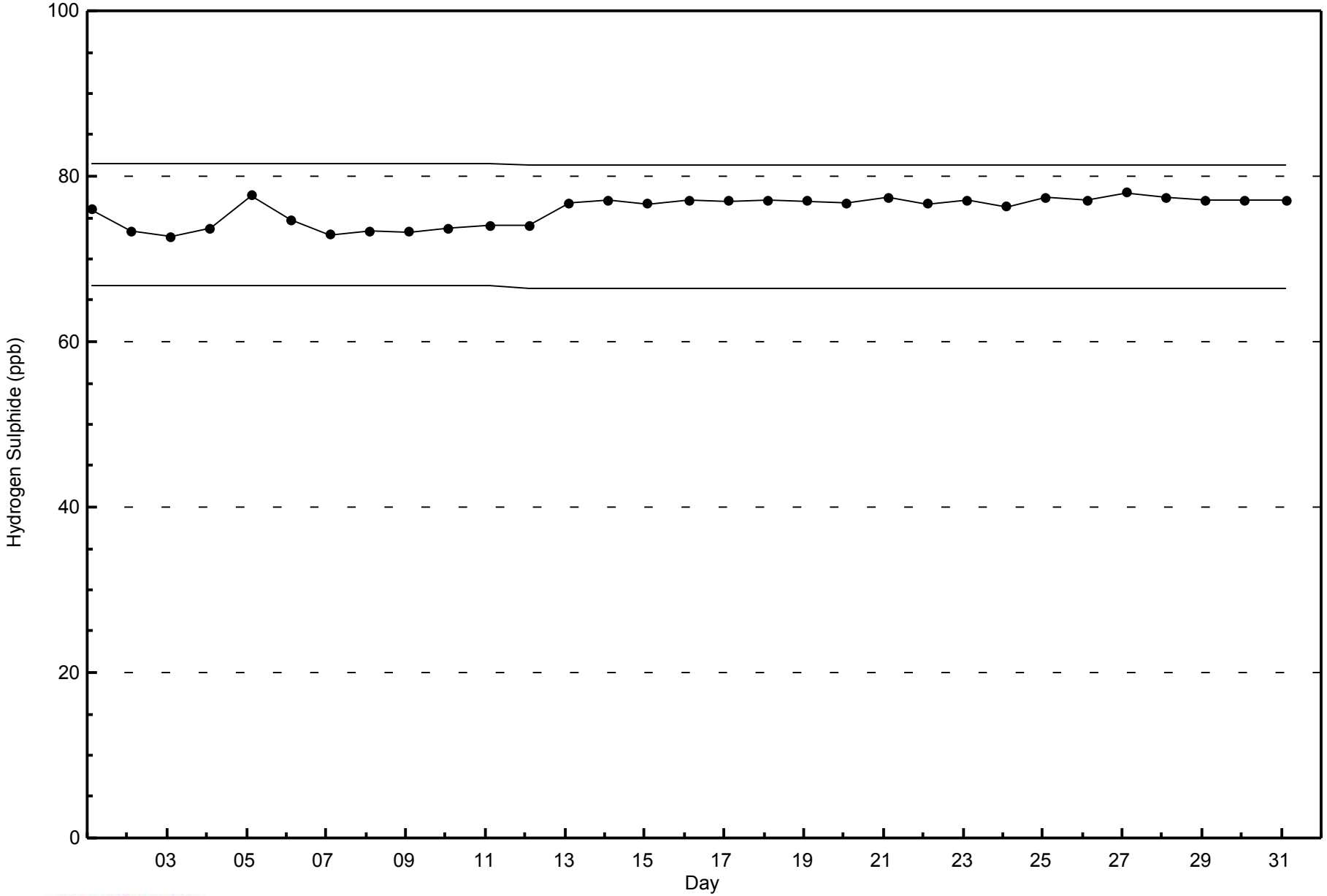
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2014

Maximum Value: 4.4 ppm on Jan 7 13:00

Maximum Daily Average: 2.9 ppm on Jan 2

Minimum Value: 1.9 ppm on Jan 19 14:00

Minimum Daily Average: 2.1 ppm on Jan 19

Maximum Diurnal Average: 2.5 ppm at hour 24

Minimum Diurnal Average: 2.3 ppm at hour 15

Monthly Average: 2.38 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.1 Q_1 = 2.1 Median = 2.3 Q_3 = 2.5 P_{90} = 2.8 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	684
Hours of Missing Data:	60
Hours of Calibration:	41
Percent Operational Time:	97.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.4	Z	2.6	2.7	2.4	2.4	2.3	2.3	2.4	2.3	2.4	2.5	2.4	2.5	2.8	2.4	2.7	2.5	2.5	2.6	2.6	2.6	2.5	2.6	2.5	2.8
2-Jan	2.6	Z	2.8	2.8	2.8	2.9	3.2	3.4	3.4	2.9	2.8	2.7	2.7	2.7	2.7	2.7	2.8	2.7	2.9	3.1	3.0	3.2	3.5	2.9	2.9	3.5
3-Jan	2.3	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	3.6	2.9	3.0	3.2	2.6	2.3	2.8	3.2	2.8	2.6	3.3	2.6	3.6
4-Jan	2.7	Z	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.7	2.5	2.3	2.2	2.2	2.3	2.7
5-Jan	2.2	Z	2.3	2.3	2.2	2.1	2.1	2.2	2.3	2.3	2.2	2.4	2.5	2.8	2.6	2.5	2.4	2.5	2.5	2.5	2.5	2.4	2.3	2.5	2.4	2.8
6-Jan	2.6	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.2	2.2	2.3	2.5	2.4	2.3	2.6
7-Jan	2.3	Z	2.3	2.6	2.7	2.7	2.6	2.6	2.6	2.3	2.3	2.7	4.4	3.9	3.4	3.3	3.2	3.1	3.0	2.8	2.7	2.6	2.4	2.5	2.8	4.4
8-Jan	2.4	Z	2.4	2.5	2.5	2.5	2.3	2.2	2.2	2.3	2.3	2.7	2.6	2.3	2.2	2.3	2.3	2.6	2.9	3.1	3.1	2.8	2.5	3.1	2.5	3.1
9-Jan	2.5	Z	2.5	2.3	2.1	2.4	2.8	2.7	C	C	C	C	C	C	C	C	C	C	2.4	2.3	2.3	2.2	2.1	2.1	--	2.8
10-Jan	2.1	Z	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6	2.3	2.3	2.7	2.5	2.6	2.3	2.7
11-Jan	2.8	Z	3.0	2.9	2.8	2.7	2.7	2.4	2.2	PF	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.4	3.0
12-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.3
13-Jan	UO	Z	2.6	2.6	2.8	2.8	2.8	3.0	2.8	2.5	2.7	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.7	2.7	2.5	2.6	2.5	3.0
14-Jan	2.5	Z	2.3	2.3	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.2	2.3	2.3	2.4	2.6
15-Jan	2.4	Z	2.3	2.6	2.2	2.2	2.6	2.7	2.4	2.8	2.3	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.2	2.7	2.8	3.5	3.9	2.4	3.9
16-Jan	3.2	Z	2.6	2.6	3.3	3.2	3.2	3.3	2.7	2.7	3.0	2.9	2.8	2.5	2.5	2.5	2.6	2.4	2.3	2.5	2.5	2.5	2.7	2.6	2.7	3.3
17-Jan	2.4	Z	2.5	2.2	2.3	2.6	2.2	2.0	2.0	2.0	3.0	2.1	2.5	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.7	3.4	2.3	3.4
18-Jan	2.5	Z	2.9	2.4	2.3	2.2	2.6	2.3	2.2	2.2	2.5	2.5	2.3	2.9	2.4	2.1	2.3	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.3	2.9
19-Jan	2.1	Z	2.0	2.2	2.1	2.5	2.7	2.3	2.4	2.2	2.0	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.7
20-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.6	2.5	2.3	2.1	2.2	2.6
21-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.5	2.7	2.3	2.0	2.0	2.0	2.0	3.2	2.3	2.1	2.1	2.2	2.1	2.1	2.1	2.2	3.2
22-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.3	2.2	2.4	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.5	2.2	2.4	2.3	2.2	2.2	2.5
23-Jan	2.2	Z	2.3	2.4	2.4	2.4	2.6	2.4	2.1	2.1	2.0	2.3	2.5	2.3	2.5	2.6	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.7	2.4	2.7
24-Jan	2.9	Z	3.5	2.8	2.5	2.3	2.2	2.1	2.0	2.4	2.0	2.1	2.1	2.0	2.1	2.5	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	3.5
25-Jan	2.2	Z	4.2	2.9	2.5	2.7	2.6	3.0	2.8	2.5	2.1	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	2.3	4.2
26-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.3	2.2	2.2	2.3	2.2	2.2	2.5
27-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.4	2.4	2.5	2.2	2.3	2.6	2.5	2.4	2.4	2.3	2.3	2.6
28-Jan	2.3	Z	2.4	2.4	2.4	2.2	2.3	2.5	2.7	2.3	2.6	3.2	3.4	2.8	2.3	2.3	2.3	2.6	2.1	2.0	2.0	2.0	2.1	2.0	2.4	3.4
29-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	3.0	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	3.0
30-Jan	2.2	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	2.1	2.2	2.0	2.0	2.1	2.1	2.3	2.3	2.1	2.3
31-Jan	2.5	Z	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.4	3.7	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.3	3.7
	2.4	--	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5	Diurnal Average	
	3.2	--	4.2	2.9	3.3	3.2	3.2	3.4	3.4	2.9	3.7	3.2	4.4	3.9	3.4	3.3	3.2	3.1	3.0	3.1	3.2	3.2	3.5	3.9	Diurnal Maximum	

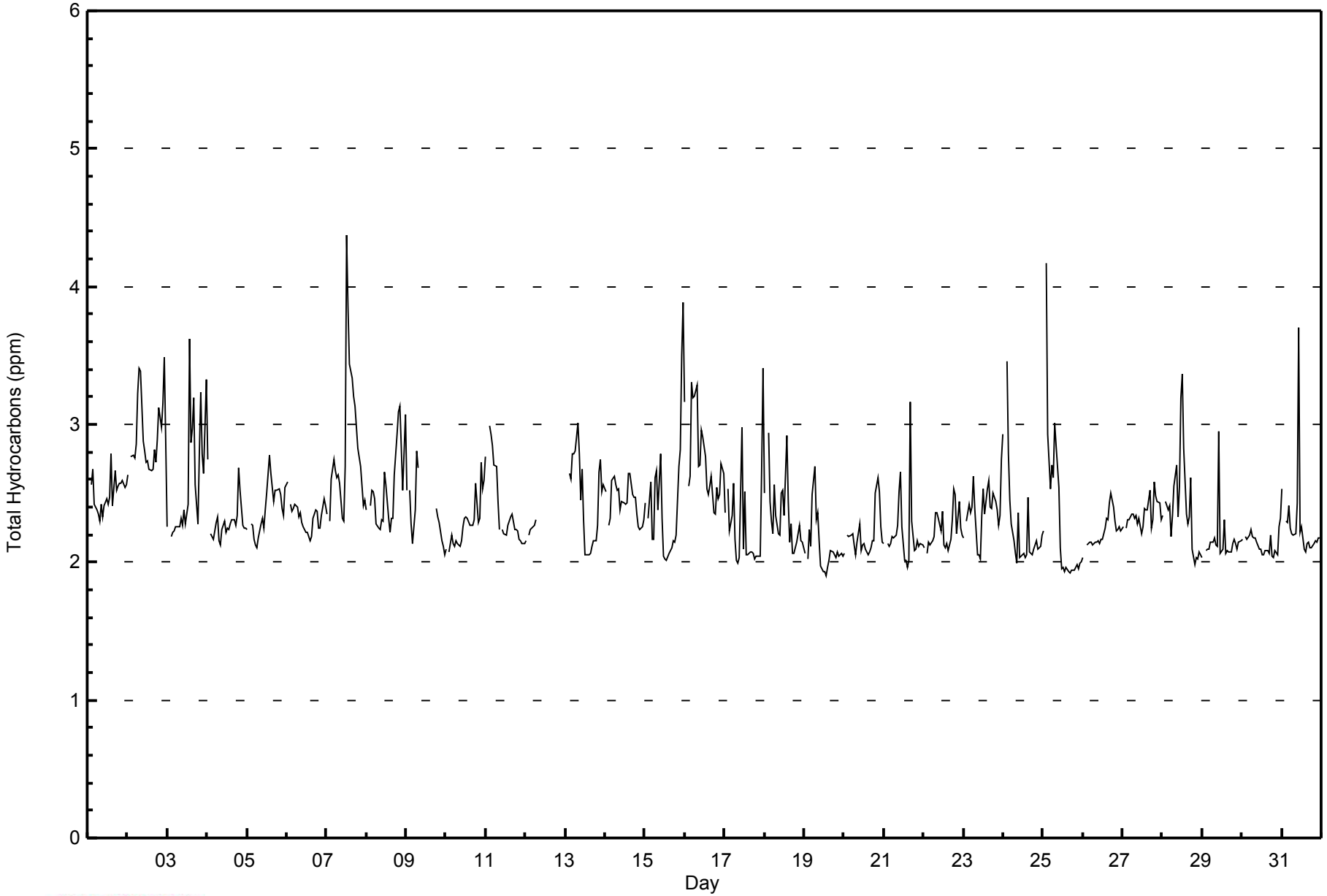
Z - zerospan C - Calibration UO - Unstable Operation PF - Power Failure

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	49	7.16	7.16
2.1 - 3.0	602	88.01	95.18
3.1 - 10.0	33	4.82	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2014

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	24	9	2	1	0	0	0	0	1	1	0	3	1	1	5	1	49
2.1 - 3.0	64	14	5	3	5	25	223	10	3	1	4	19	19	48	78	79	600
3.1 - 10.0	0	3	1	0	0	4	15	0	0	1	0	0	2	2	0	4	32
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	88	26	8	4	5	29	238	10	4	3	4	22	22	51	83	84	681

Total Number of Valid Hours: 681

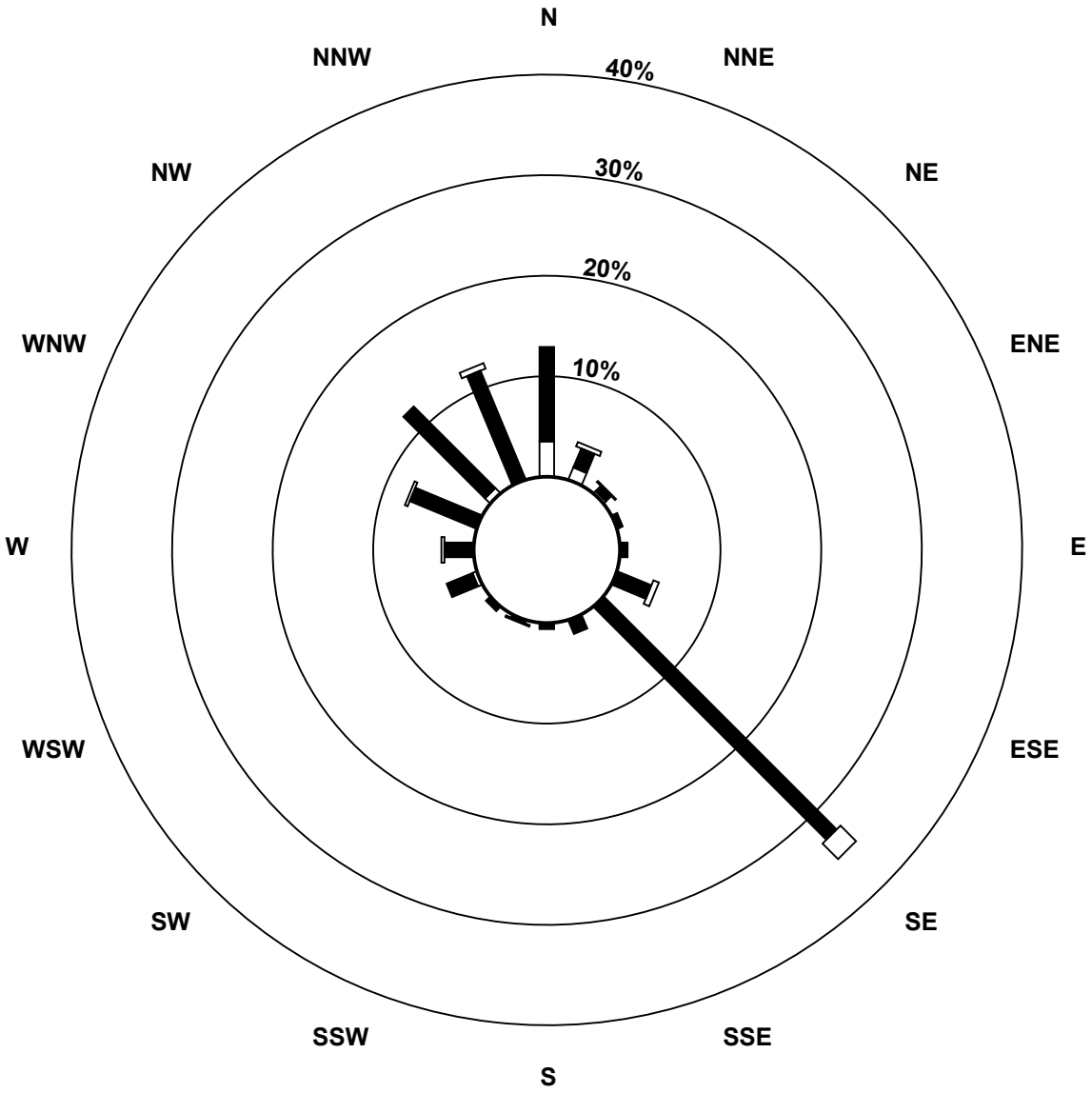
Total Number of Hours: 744

Wood Buffalo Environmental Association

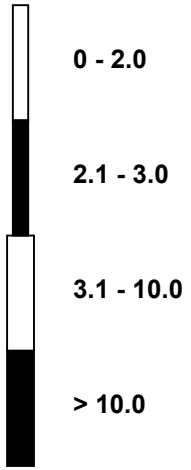
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Lower Camp (AMS 11)



Classes (ppm)



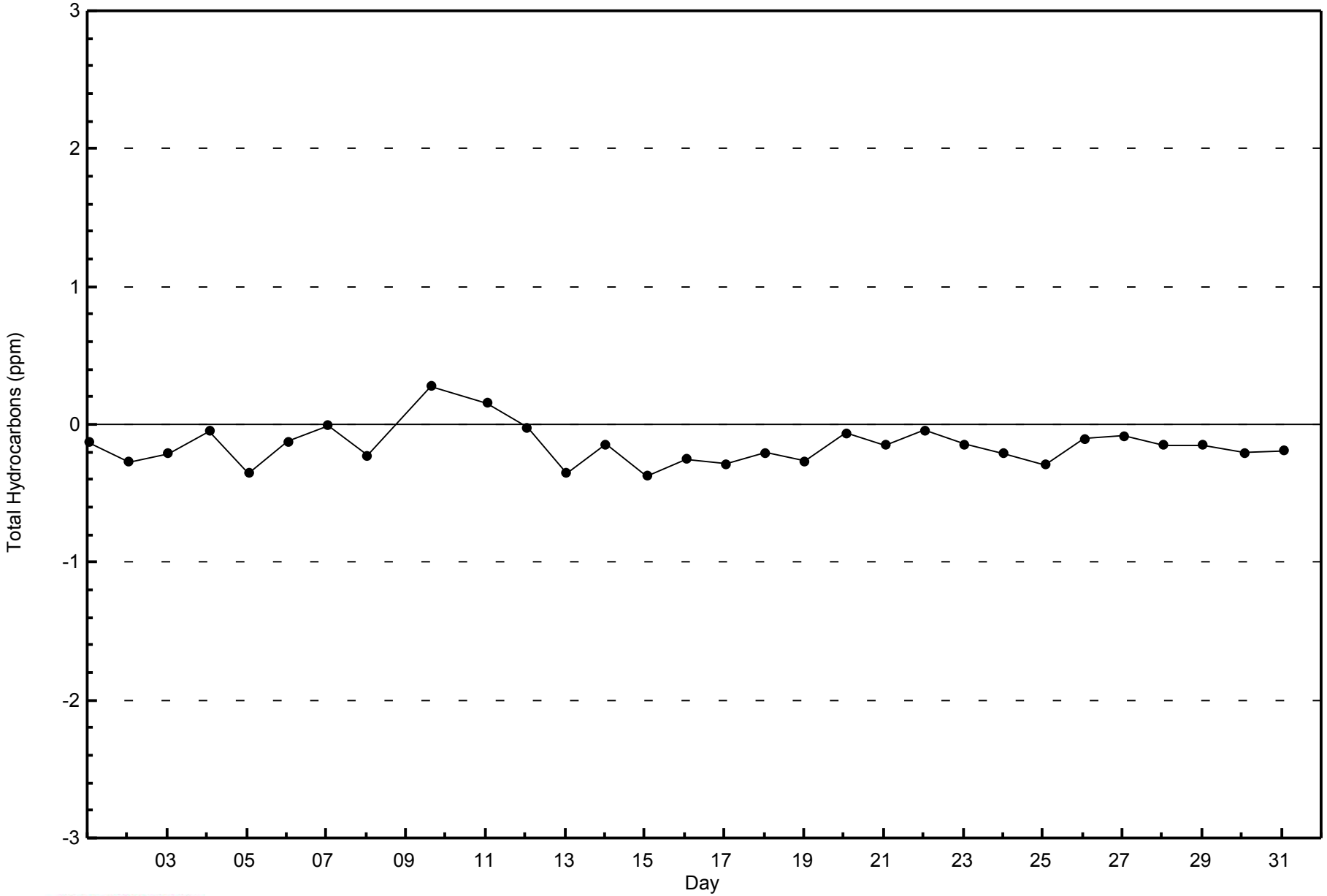
Total Number of Valid Hours: 681

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2014



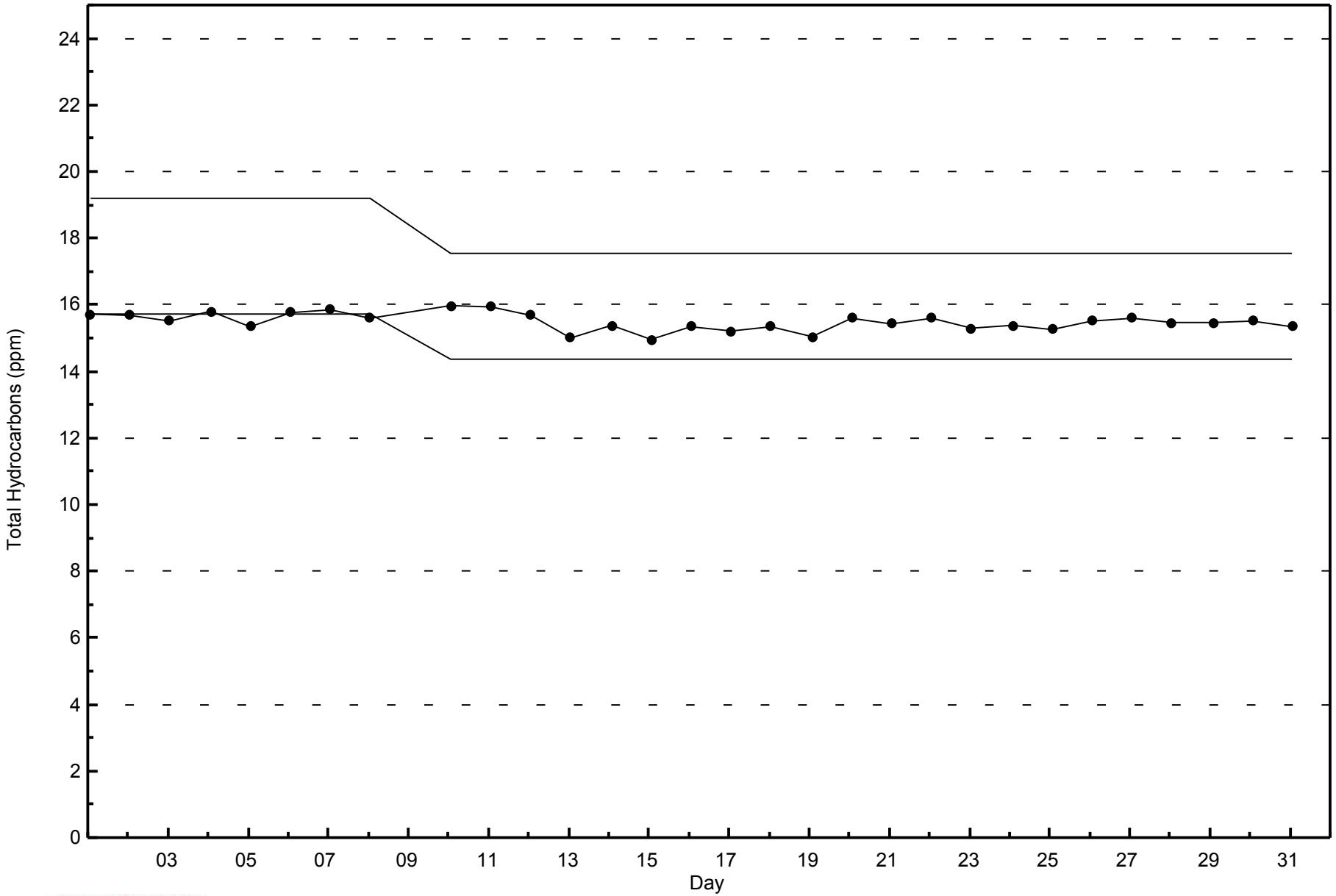
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 6.9 C on Jan 17 14:00

Maximum Daily Average: 0.8 C on Jan 15

Minimum Value: -38.5 C on Jan 5 07:00

Minimum Daily Average: -32.6 C on Jan 5

Maximum Diurnal Average: -13.8 C at hour 15

Minimum Diurnal Average: -18.6 C at hour 1

Monthly Average: -16.85 C

Percentiles: P_1 = -36.8 P_{10} = -28.9 Q_1 = -23.9 Median = -16.8 Q_3 = -10.8 P_{90} = -3.3 P_{99} = 5.6

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

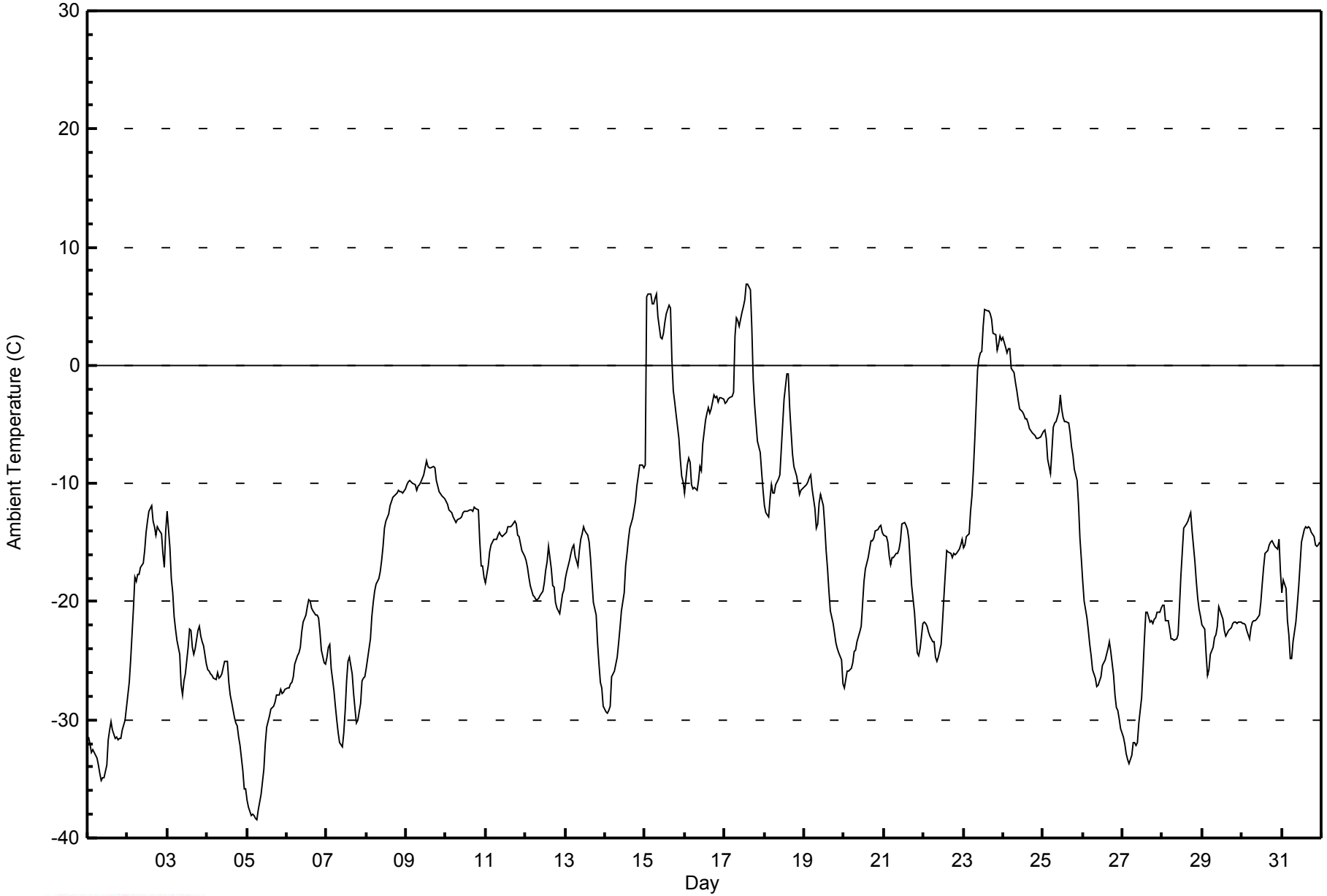
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-31.5	-32.1	-32.7	-32.5	-32.8	-33.2	-33.9	-34.6	-35.2	-34.9	-34.9	-33.9	-31.7	-30.9	-30.1	-30.9	-31.5	-31.5	-31.6	-31.6	-31.6	-30.9	-30.0	-29.0	-32.2	-29.0
2-Jan	-27.9	-26.8	-24.9	-20.6	-17.9	-18.3	-17.7	-17.7	-17.1	-16.7	-15.7	-14.2	-13.2	-12.4	-11.9	-13.2	-13.6	-14.4	-13.7	-13.9	-14.2	-15.9	-17.2	-14.0	-16.8	-11.9
3-Jan	-12.3	-15.5	-18.1	-19.3	-21.3	-22.4	-23.3	-24.4	-27.0	-28.0	-26.8	-26.1	-23.9	-22.3	-22.4	-23.9	-24.5	-24.0	-22.4	-22.0	-22.9	-23.4	-23.8	-25.3	-22.7	-12.3
4-Jan	-25.8	-25.8	-26.1	-26.2	-26.4	-26.6	-26.0	-26.5	-26.3	-26.2	-25.0	-25.0	-25.0	-26.8	-27.9	-28.5	-29.8	-30.3	-30.6	-31.5	-32.1	-34.3	-35.9	-35.9	-28.3	-25.0
5-Jan	-36.8	-37.4	-38.1	-37.9	-38.1	-38.4	-38.5	-37.7	-36.3	-35.3	-34.1	-32.0	-30.7	-29.7	-29.0	-29.0	-28.9	-28.5	-27.9	-27.9	-27.4	-27.8	-27.7	-27.4	-32.6	-27.4
6-Jan	-27.3	-27.3	-27.0	-26.8	-26.3	-25.3	-24.5	-24.3	-23.8	-22.5	-21.7	-21.1	-20.4	-19.8	-20.0	-20.5	-20.8	-21.2	-21.2	-21.4	-22.6	-24.1	-25.2	-25.3	-23.4	-19.8
7-Jan	-24.6	-23.8	-23.6	-25.6	-27.5	-28.9	-30.0	-31.1	-31.9	-32.3	-31.1	-29.2	-26.7	-25.1	-24.7	-26.2	-27.7	-29.1	-30.2	-30.0	-28.7	-26.8	-26.4	-26.3	-27.8	-23.6
8-Jan	-25.6	-24.8	-23.2	-21.3	-20.0	-19.1	-18.6	-18.1	-17.4	-16.6	-15.3	-13.8	-13.2	-12.5	-11.9	-11.6	-11.2	-11.0	-10.8	-10.6	-10.7	-10.7	-10.9	-10.5	-15.4	-10.5
9-Jan	-10.2	-9.9	-9.8	-9.9	-9.9	-10.2	-10.6	-10.3	-10.1	-9.8	-9.3	-8.7	-8.1	-8.6	-8.7	-8.6	-8.5	-8.7	-9.7	-10.2	-10.7	-11.0	-11.1	-11.3	-9.7	-8.1
10-Jan	-11.5	-11.8	-12.2	-12.5	-12.8	-13.0	-13.2	-13.1	-13.0	-12.8	-12.5	-12.3	-12.3	-12.3	-12.3	-12.2	-12.3	-12.0	-12.1	-12.3	-14.9	-16.9	-17.0	-18.0	-13.1	-11.5
11-Jan	-18.5	-16.9	-15.8	-15.3	-15.0	-14.7	-14.7	-14.4	-14.1	-14.3	-14.5	-14.4	-14.1	-13.7	-13.7	-13.7	-13.6	-13.2	-13.5	-14.3	-14.4	-15.1	-15.7	-16.2	-14.7	-13.2
12-Jan	-16.5	-17.1	-18.0	-18.6	-19.4	-19.5	-19.8	-19.9	-19.7	-19.4	-19.1	-18.4	-17.3	-16.6	-15.3	-17.2	-18.7	-18.8	-20.1	-20.6	-21.1	-20.1	-19.3	-19.0	-18.7	-15.3
13-Jan	-18.0	-17.4	-16.6	-15.9	-15.5	-15.2	-16.2	-17.0	-15.7	-14.7	-14.3	-13.7	-14.1	-14.4	-15.0	-16.4	-18.3	-20.1	-21.1	-23.5	-25.3	-26.8	-27.3	-28.9	-18.4	-13.7
14-Jan	-29.4	-29.4	-29.3	-28.8	-26.4	-25.9	-25.2	-24.8	-23.5	-22.2	-20.7	-19.2	-17.0	-15.9	-14.7	-13.8	-12.9	-12.2	-11.5	-10.2	-9.4	-8.5	-8.5	-8.7	-18.7	-8.5
15-Jan	-8.4	5.8	6.0	6.0	5.2	5.2	5.7	6.1	4.1	2.3	2.2	2.7	3.6	4.4	5.1	4.8	0.5	-2.1	-3.1	-4.2	-6.2	-7.9	-9.4	-9.9	0.8	6.1
16-Jan	-10.8	-8.5	-7.8	-8.2	-10.1	-10.4	-10.3	-10.5	-9.8	-8.5	-8.9	-6.7	-4.7	-4.0	-3.5	-4.0	-3.8	-2.5	-2.8	-2.6	-3.2	-2.7	-2.8	-2.9	-6.2	-2.5
17-Jan	-3.3	-3.1	-2.8	-2.8	-2.6	-2.3	2.5	4.0	3.7	3.3	4.5	5.0	5.6	6.9	6.9	6.4	3.1	-1.2	-3.3	-4.9	-6.4	-7.4	-9.0	-10.5	-0.3	6.9
18-Jan	-11.9	-12.4	-12.9	-11.2	-10.0	-10.8	-10.8	-10.1	-9.6	-9.3	-7.2	-4.9	-2.8	-0.8	-0.7	-3.5	-5.6	-7.4	-8.6	-9.4	-10.2	-10.9	-10.5	-10.5	-8.4	-0.7
19-Jan	-10.2	-10.1	-9.9	-9.5	-9.3	-10.4	-12.2	-13.7	-13.4	-11.7	-10.9	-11.8	-13.5	-15.6	-17.3	-19.2	-20.8	-21.9	-22.7	-23.5	-24.0	-24.4	-24.9	-26.9	-16.2	-9.3
20-Jan	-27.3	-26.6	-25.9	-25.9	-25.6	-25.2	-24.2	-24.1	-23.3	-22.6	-22.1	-20.2	-18.2	-17.2	-16.3	-15.6	-14.8	-14.8	-14.6	-14.0	-13.9	-13.7	-13.6	-14.1	-19.7	-13.6
21-Jan	-14.4	-14.5	-15.0	-16.2	-16.9	-16.3	-16.3	-16.0	-16.0	-15.6	-14.8	-13.5	-13.3	-13.5	-13.9	-14.7	-16.7	-18.6	-20.9	-22.6	-24.4	-24.5	-23.9	-21.9	-17.3	-13.3
22-Jan	-21.7	-21.9	-22.1	-22.5	-22.9	-23.4	-23.4	-24.7	-25.1	-24.7	-23.7	-21.8	-19.6	-17.6	-15.6	-15.8	-16.0	-16.2	-16.0	-16.0	-15.9	-15.6	-15.2	-14.7	-19.7	-14.7
23-Jan	-15.4	-15.2	-14.5	-14.3	-12.4	-11.1	-8.9	-6.3	-0.4	0.5	1.0	1.1	3.3	4.7	4.6	4.7	4.4	3.9	2.7	2.6	1.3	1.7	2.4	2.1	-2.4	4.7
24-Jan	2.4	1.5	1.1	1.4	1.4	-0.3	-0.6	-1.4	-2.2	-3.0	-3.8	-3.9	-4.2	-4.5	-4.5	-4.9	-5.4	-5.7	-5.8	-6.0	-6.1	-6.2	-6.0	-5.9	-3.0	2.4
25-Jan	-5.5	-5.5	-6.2	-8.0	-9.2	-7.3	-5.3	-4.9	-4.7	-3.9	-2.6	-3.7	-4.5	-4.8	-4.7	-4.8	-5.8	-6.9	-7.6	-8.8	-9.8	-11.8	-14.6	-16.3	-7.0	-2.6
26-Jan	-18.3	-20.0	-21.4	-22.5	-23.6	-24.6	-25.7	-26.5	-27.2	-27.1	-26.7	-26.4	-25.4	-25.0	-24.5	-23.9	-23.4	-24.2	-26.2	-27.9	-28.9	-29.2	-29.9	-30.7	-25.4	-18.3
27-Jan	-31.4	-32.0	-32.8	-33.3	-33.7	-33.1	-32.0	-32.0	-32.2	-32.0	-30.3	-28.1	-25.8	-23.1	-20.9	-20.9	-21.7	-21.6	-21.8	-21.5	-21.4	-20.9	-20.8	-20.5	-26.8	-20.5
28-Jan	-20.4	-20.3	-21.6	-21.7	-22.3	-23.2	-23.2	-23.3	-23.1	-22.8	-20.4	-17.8	-15.8	-13.8	-13.5	-13.1	-12.9	-12.5	-14.0	-16.6	-18.3	-19.7	-20.6	-21.3	-18.8	-12.5
29-Jan	-21.9	-22.4	-24.5	-26.3	-25.8	-24.5	-23.9	-23.1	-22.8	-22.0	-20.5	-20.8	-21.5	-22.5	-22.9	-22.6	-22.4	-22.2	-21.8	-21.7	-21.8	-21.8	-21.8	-21.8	-22.6	-20.5
30-Jan	-21.9	-21.8	-22.0	-22.5	-23.2	-22.2	-21.7	-21.6	-21.6	-21.5	-21.1	-20.1	-18.6	-17.1	-15.9	-15.7	-15.2	-15.0	-14.9	-15.1	-15.4	-15.5	-14.8	-17.5	-18.8	-14.8
31-Jan	-19.2	-18.2	-18.9	-21.6	-22.8	-24.8	-24.9	-23.3	-21.8	-20.3	-18.8	-16.8	-15.0	-13.9	-13.6	-13.7	-13.7	-13.8	-14.1	-14.5	-15.2	-15.4	-15.2	-15.0	-17.7	-13.6
	-18.6	-18.1	-18.3	-18.4	-18.5	-18.6	-18.3	-18.2	-17.9	-17.6	-16.7	-15.8	-14.8	-14.1	-13.8	-14.3	-14.9	-15.4	-15.9	-16.4	-17.0	-17.4	-17.6	-17.9	Diurnal Average	
	2.4	5.8	6.0	6.0	5.2	5.2	5.7	6.1	4.1	3.3	4.5	5.0	5.6	6.9	6.9	6.4	4.4	3.9	2.7	2.6	1.3	1.7	2.4	2.1	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	309	41.53	41.53
-20 - 0	388	52.15	93.68
0 - 10	47	6.32	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Lower Camp - January 2014

Maximum Speed: 52 km/h on Jan 15 09:00

Maximum Daily Speed Average: 22.4 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 7 17:00

Minimum Daily Speed Average: 0.9 km/h on Jan 9

Maximum Diurnal Speed Average: 2.9 km/h at hour 14

Minimum Diurnal Speed Average: 0.1 km/h at hour 3

Monthly Average Velocity: 0.6 km/h 51.1 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 4 Median = 8 Q_3 = 13 P_{90} = 18 P_{99} = 36

Hours in Service: 744

Hours of Data: 740

Hours of Missing Data: 4

Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SE5	SE6	SE5	SE3	SE5	SE5	SE5	SE4	SE4	SE6	SE6	SE6	SE5	SE6	SE4	SE5	SSE3	SE5	SE5	SE5	SE6	SE5	SE6	SE6	SE5.1	SE6
2-Jan	SE7	SE10	SE8	SE12	SE13	SSE5	SE7	SE10	SE9	SE12	SE11	SE14	SE12	SE15	SE12	SE14	SE15	SE13	SE14	SE15	SE14	SE10	W1	NW7	SE10.2	SE15
3-Jan	N15	N22	N19	N20	N13	N8	N6	NNW5	W2	NNW1	WNW3	NNW1	WNW2	WNW2	W5	W2	NNW4	N5	NNW7	WNW16	WNW13	WNW16	WNW14	W12	NNW7.2	N22
4-Jan	WSW12	WSW15	WSW16	WSW14	WSW11	W7	WSW16	WSW21	WSW23	W18	WNW20	NW20	NNW21	N21	N17	NNW10	NW9	NW7	NW9	NW7	NW6	NNW4	NNW2	NW3	WNW9.9	WSW23
5-Jan	NNW2	NW2	NNE1	NNE1	NNE1	ESE1	E1	ESE2	ESE5	ESE4	SE5	SE8	SE9	SE6	SE8	SE7	SE6	SE5	SE9	SE9	ESE8	SE11	SE9	SE8	SE4.8	SE11
6-Jan	SE10	SE8	SE7	SE9	SE6	SE5	SE6	SSE8	SE8	SE26	SE27	SE26	ESE23	ESE16	ESE17	S2	N3	NNW4	E1	SE4	SSE3	NNW2	SW1	NW1	SE8.3	SE27
7-Jan	WNW1	NNE1	W0	NW3	NW2	NW1	NW1	NNE0	NE0	AF	AF	WNW2	NNW1	NNE1	ESE1	AF	NE0	NNE1	N1	E2	ESE4	SE8	SE9	SE10	SE1.0	SE10
8-Jan	SE10	SE11	SE7	SE7	SE9	SSE6	SE10	SE11	SE10	SE11	SE12	SE12	SE13	SE11	SE13	SE10	SE7	SE3	SE4	SE8	SE8	SE9	SE14	SE8	SE9.3	SE14
9-Jan	SE9	SE7	SE10	SE10	SE10	SSE7	SSE6	ENE1	W2	SSE2	ESE3	SE4	AF	N3	NNW5	NW7	NW6	NNW9	NNW9	NNW8	NNW9	NNW8	NNW7	NNW8	NNE0.9	SE10
10-Jan	NNW8	NNW8	NNW8	NW9	NW9	NW8	WNW6	NW6	NNW8	NW5	NNW6	NW5	N6	NW6	NW3	N1	NNE1	WNW3	W8	WSW8	NW2	ESE1	SE4	E1	NW4.5	NW9
11-Jan	WNW1	W1	NW1	N1	NW3	NW4	NNW6	NNW7	NNW7	NNW8	NNW8	NW8	NNW8	NW9	NW6	NW7	NNW6	NNW8	NW10	NNW10	N13	N14	N13	N13	NNW6.8	N14
12-Jan	N13	N14	N13	NNW10	N11	NNW8	NW7	NW4	NE1	E4	SE6	SE7	SW5	SW7	SSE5	SSE5	SSE8	SSE10	SE15	SE13	SE9	E3	SE5	ESE3	E1.3	SE15
13-Jan	SE11	N3	NNE3	SE4	SE4	SE4	SE5	NW1	WNW5	NW5	NNW3	N4	NNE8	NNE9	NE12	NNE10	N5	NNW6	WNW6	WNW4	WNW3	NW3	NW1	NW3	N2.2	NE12
14-Jan	NW2	NW1	NE1	ESE3	SE11	SE14	SE11	SE11	SE10	SE8	SE10	SE7	SE4	SE10	SE8	SE10	SE9	SE14	ESE15	SE13	SE21	SE24	SE23	SE24	SE10.7	SE24
15-Jan	SE15	W38	W50	WNW39	W28	W29	W36	WNW50	WNW52	WNW32	WNW30	NW28	NW26	NW33	WNW37	NW35	NNW13	NNW9	NNW8	WNW5	WSW3	NNW1	ESE1	ESE3	WNW22.4	WNW52
16-Jan	SE4	SE10	SE13	SE12	SE10	SE11	SE11	SE12	SE13	SE12	SE9	SE12	SE15	SE13	SE15	SE14	SE14	SE13	SE14	SE14	SE15	SE13	SE13	SE16	SE12.4	SE16
17-Jan	SE12	SE16	SE14	SE13	SE16	SE12	WSW19	WSW33	WSW32	W21	WNW18	W23	WNW16	WNW16	NW23	NW15	NNE15	NNE16	NNE10	NNE13	NNE8	N5	W1	NNW1	WNW5.1	WSW33
18-Jan	SE1	E1	SE2	SE9	SE8	SE5	WSW1	SE9	SE9	SE12	SE14	SE13	SE9	SE1	NNW10	NNW11	NNW10	NW8	NW7	WNW6	WNW5	NW3	WNW4	NNW4	ESE1.1	SE14
19-Jan	SE1	NE1	N2	NW5	NNW6	NW3	WNW2	NW2	NW4	NW5	N13	N21	N26	NNE27	N25	N19	N17	N14	N11	N7	N7	NW3	NW4	ENE1	N8.8	NNE27
20-Jan	ENE1	SE4	ESE5	SE11	SE10	SE12	SE23	ESE16	ESE14	ESE10	SE18	SE15	SE14	SE15	SE14	E6	N2	W2	NW4	NW5	NW8	NW8	N10	NNW9	ESE6.0	SE23
21-Jan	NW6	NNW6	N4	NNW2	NNW3	NW3	NNW6	NNW4	NNW6	NNW7	NW8	N15	N16	NNE16	NE12	NE12	NNE5	NNE1	NNW2	NW2	WNW0	N2	SE7	SE17	N4.5	SE17
22-Jan	SE24	SE20	SE16	SE15	SE13	SE8	SE12	SE8	ESE8	ESE6	SE12	SE8	SE13	SE10	SE9	SSE8	SSE7	SE10	SE10	SE17	SE17	SE22	SE22	SE22	SE13.1	SE24
23-Jan	SE24	SE21	SE18	SE19	SE19	SE13	SE12	SE13	WSW21	WSW21	WSW18	NW7	NW12	WNW16	W15	W16	WNW12	NNW5	WSW3	WNW4	ESE2	SE3	SE7	SE8	SSW4.6	SE24
24-Jan	SE6	SE1	ESE2	NNW7	NNW11	NW9	NNW13	N15	NNW12	NNE14	NNE14	NNE15	N17	NNE14	N12	N12	N9	N7	N6	NW6	NNW5	NNW2	WNW1	NW3	N7.8	N17
25-Jan	SE4	S3	SSW2	WNW3	W1	S3	SSE3	SE8	SE7	N8	N11	NNE18	N14	N15	N11	N16	N13	N15	N21	N20	N22	N37	N28	N30	N10.7	N37
26-Jan	N34	N33	N27	N20	N15	NNW11	N9	NNW6	N5	N10	NNW8	NNW4	WNW2	NW4	N3	ENE1	ESE5	ESE5	NE2	N2	NNW2	NW3	NW2	NW2	N8.0	N34
27-Jan	N1	N1	N1	NNW1	ESE1	SE7	SE12	SE12	SE12	SE13	SE10	SE14	SE15	SE16	SE18	SE15	SE16	SE17	SE18	SE18	SE17	SE18	SE18	SE18	SE11.7	SE18
28-Jan	SE19	SE15	SE18	SE18	SE21	SE13	SE10	SE8	SE13	SE14	SE10	SE7	SE3	WNW2	NNW4	NW5	NW7	NW9	N18	NNE18	N20	N12	N11	NW10	ESE4.1	SE21
29-Jan	WNW8	WNW7	WNW4	NNW4	WNW3	NNW2	NNW2	WNW3	WNW4	WNW6	N15	N18	N23	N22	N17	N15	N14	N11	N15	NNW13	NW11	NW11	NW9	NW9	NNW9.2	N23
30-Jan	NW8	NW11	NW9	NNW6	NNW4	NW11	W11	W14	WSW16	WSW18	WSW16	WSW16	WSW12	SW11	SW9	SW10	SSW9	S5	SSW5	S6	SE7	SE2	WNW7	WNW4	WSW6.8	WSW18
31-Jan	WNW5	WNW8	WNW6	NW4	WNW4	NE1	NNW1	NNW1	NNW1	NW3	NNW3	NNW3	NW6	NW11	NNW10	N9	N6	NNW6	NNW5	WNW3	N1	ESE1	ESE2	ESE2	NW3.5	NW11
	ESE2.6	E0.4	SSE0.1	ESE0.8	SE1.7	SSE1.4	SSW1.5	SW1.8	WSW2.7	SW1.4	W0.2	NE1.1	NNE2.5	NNE2.9	NNE2.7	N2.7	NNE2.2	NNE2.0	NNE1.9	NE1.1	ENE1.7	ENE1.5	ESE1.7	ESE1.6	Diurnal Average	
	N34	W38	W50	WNW39	W28	W29	W36	WNW50	WNW52	WNW32	WNW30	NW28	N26	NW33	WNW37	NW35	N17	SE17	N21	N20	N22	N37	N28	N30	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

Lower Camp - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 14 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 10 15:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 8

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

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

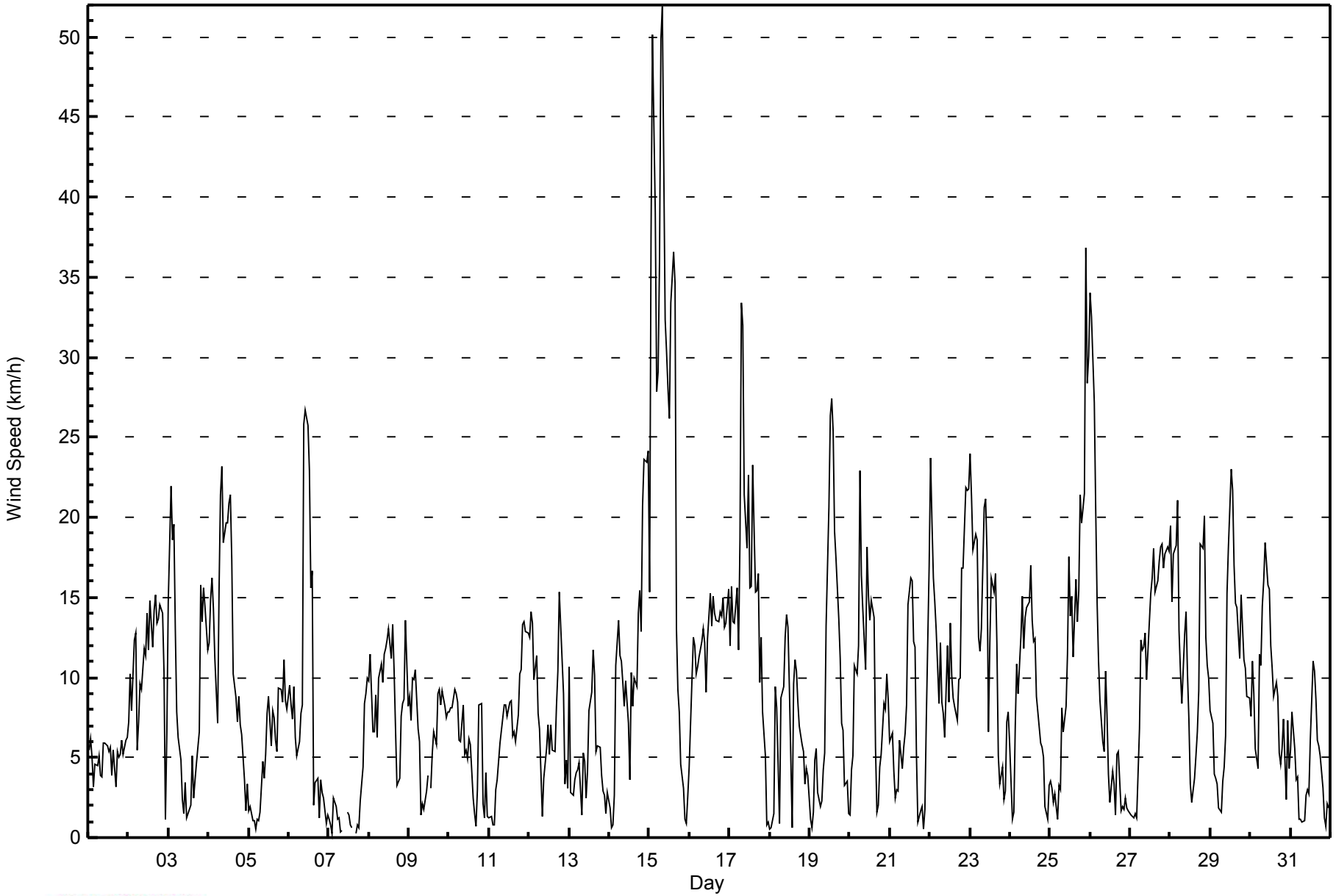
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	246	33.24	33.24
6 - 11	249	33.65	66.89
12 - 19	181	24.46	91.35
20 - 28	46	6.22	97.57
29 - 38	14	1.89	99.46
> 38	4	0.54	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Lower Camp - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	21	11	7	4	7	21	41	7	4	2	2	3	10	28	41	37	246
6 - 11	20	5	0	0	1	4	105	8	1	1	4	2	3	9	40	46	249
12 - 19	34	10	3	0	0	5	96	0	0	0	0	12	5	9	2	5	181
20 - 28	15	1	0	0	0	1	16	0	0	0	0	4	3	1	4	1	46
29 - 38	4	0	0	0	0	0	0	0	0	0	0	2	3	3	2	0	14
> 38	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4
Totals	94	27	10	4	8	31	258	15	5	3	6	23	25	53	89	89	740

Total Number of Valid Hours: 740

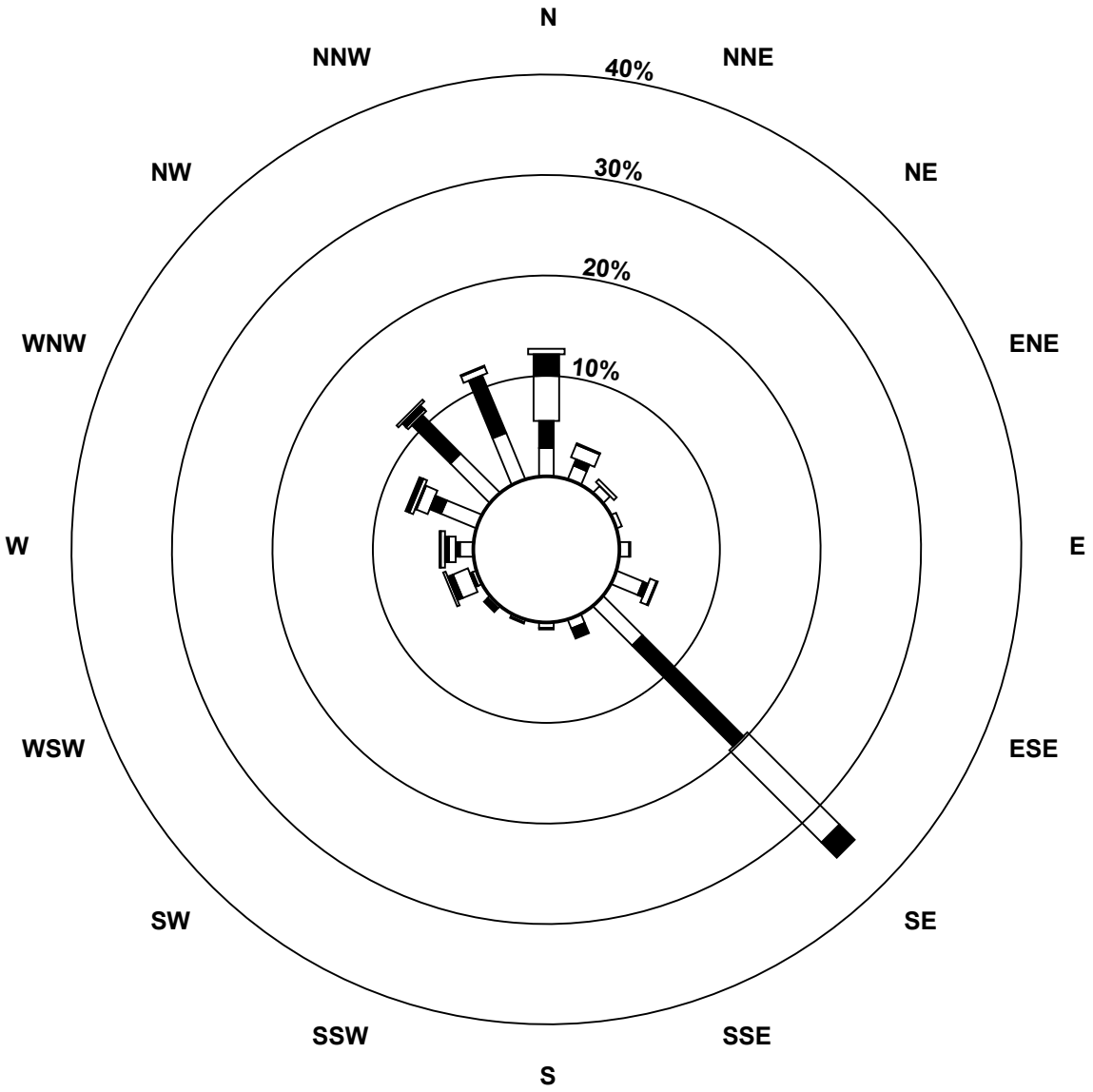
Total Number of Hours: 744

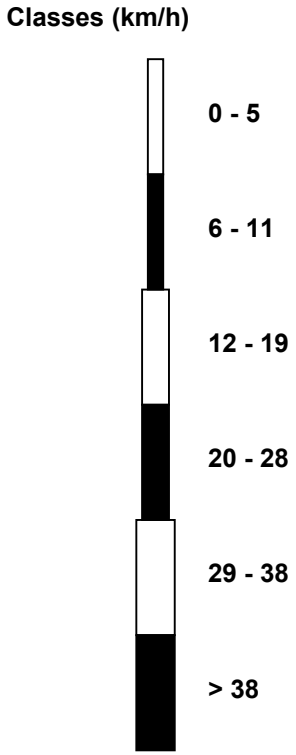
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Lower Camp (AMS 11)





Total Number of Valid Hours: 740

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Lower Camp - January 2014

Direction of Maximum Speed: 302 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 294.1 deg on Jan 15

Direction of Minimum Speed: 43 deg on Jan 7 17:00

Direction of Minimum Daily Speed Average: 0.9 deg on Jan 9

Monthly Average Direction: 323.5 deg

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	142	139	136	140	141	138	141	143	131	138	138	136	136	138	137	140	147	136	140	139	138	137	136	137	138.3
2-Jan	129	127	124	128	134	153	143	137	139	138	134	135	133	134	136	139	139	138	140	141	141	135	263	326	136.2
3-Jan	3	3	6	5	1	351	350	344	270	348	292	327	283	290	263	274	332	350	337	295	297	293	290	270	329.7
4-Jan	256	249	245	247	258	271	258	258	258	262	299	308	336	5	359	337	312	323	304	317	314	342	344	323	290.7
5-Jan	338	305	20	19	17	108	87	114	119	122	140	138	136	138	136	135	137	132	132	131	122	132	136	134	130.4
6-Jan	131	138	144	134	141	133	129	148	138	131	132	131	120	121	121	171	11	328	99	146	147	341	215	314	129.9
7-Jan	286	29	272	306	317	326	316	33	35	AF	AF	291	328	26	106	AF	43	14	356	85	112	134	143	144	125.1
8-Jan	144	141	142	145	143	147	142	143	138	141	139	136	134	128	136	136	142	132	128	133	140	136	135	142	138.3
9-Jan	127	137	137	138	140	154	151	57	261	161	122	133	AF	352	327	316	323	339	341	341	327	327	328	331	15.9
10-Jan	331	347	328	315	315	311	302	311	329	313	336	320	349	308	319	355	32	294	276	245	312	105	128	100	316.2
11-Jan	283	271	308	351	307	316	347	338	334	335	331	320	329	317	312	308	327	331	313	336	354	359	351	349	333.7
12-Jan	350	352	351	339	350	334	324	306	42	89	127	130	233	230	150	163	150	153	142	138	128	93	137	113	86.9
13-Jan	127	354	17	130	136	129	139	307	291	312	343	356	13	20	42	23	357	327	288	287	302	307	312	310	7.1
14-Jan	310	309	49	121	138	139	135	138	133	136	126	127	145	139	140	135	135	131	121	135	129	136	139	134	134.0
15-Jan	132	271	277	289	275	273	281	294	302	299	302	306	308	305	301	306	344	339	348	299	250	330	121	123	294.1
16-Jan	127	143	141	141	135	133	127	132	139	140	133	134	136	130	129	130	133	139	138	140	138	136	136	139	135.6
17-Jan	134	135	137	138	136	141	257	257	256	269	286	272	287	302	311	324	22	23	19	26	22	357	263	342	284.2
18-Jan	137	95	129	137	125	133	250	141	139	142	137	138	137	139	336	339	337	326	316	297	295	306	299	344	120.9
19-Jan	127	34	357	315	348	304	298	325	307	315	351	359	3	18	10	353	1	353	349	352	353	321	304	70	355.8
20-Jan	74	135	122	136	130	126	132	107	120	117	132	135	136	130	128	98	2	276	320	319	321	323	356	327	119.2
21-Jan	319	327	4	342	328	314	335	330	331	339	311	356	7	27	37	37	27	28	332	322	293	2	125	131	7.9
22-Jan	127	124	129	129	128	130	140	127	122	120	141	142	139	139	144	159	148	146	143	139	136	140	139	138	135.7
23-Jan	133	137	136	131	131	134	140	145	246	258	258	306	315	282	272	270	282	328	246	288	103	137	143	136	195.5
24-Jan	136	134	104	330	337	306	347	356	343	13	14	12	1	19	1	2	358	349	356	316	346	340	299	322	356.4
25-Jan	137	174	213	302	280	173	148	138	132	352	2	12	357	360	355	353	352	1	1	4	352	353	7	0	1.2
26-Jan	1	4	357	356	352	341	351	341	360	358	329	345	289	323	358	59	117	121	40	353	344	320	318	307	356.4
27-Jan	354	6	357	341	109	128	134	135	137	136	135	133	130	132	132	134	133	139	137	129	134	137	135	141	133.6
28-Jan	136	132	138	144	141	141	142	144	139	135	138	134	131	297	335	318	318	325	4	14	11	358	353	312	102.5
29-Jan	299	288	287	331	297	327	336	295	298	299	360	8	356	360	3	3	359	360	352	332	310	313	308	312	340.9
30-Jan	320	307	320	343	327	306	274	260	255	252	253	246	239	230	219	220	198	186	194	171	135	141	283	301	255.4
31-Jan	299	288	293	320	294	43	348	334	329	309	329	331	316	314	344	356	354	348	333	293	7	111	122	112	325.8
	105.5	84.1	149.6	116.4	132.7	164.4	192.4	229.5	244.0	223.9	271.8	43.6	16.4	11.8	11.6	352.9	21.9	28.4	24.6	45.2	64.5	63.6	104.3	104.6	
	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

Lower Camp - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 100 deg on Jan 21 21:00

Minimum Value: 4 deg on Jan 16 16:00

Percentiles: P_1 = 5 P_{10} = 9 Q_1 = 12 Median = 17 Q_3 = 31 P_{90} = 58 P_{99} = 91

Hours in Service:	744
Hours of Data:	740
Hours of Missing Data:	4
Hours of Calibration:	0
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	13	17	19	16	17	18	17	21	27	15	14	18	15	16	18	15	22	17	18	16	17	17	18	16	27
2-Jan	18	11	12	14	21	28	19	9	10	10	12	13	15	12	17	13	11	11	10	10	11	11	82	30	82
3-Jan	15	15	15	12	15	15	15	19	64	55	17	27	66	41	11	30	38	31	21	12	11	9	10	9	66
4-Jan	16	7	8	9	17	36	12	10	10	13	12	10	16	17	16	14	13	17	17	16	21	25	60	48	60
5-Jan	53	50	84	35	52	68	57	79	14	29	29	6	4	9	8	13	15	19	11	17	31	9	10	11	84
6-Jan	10	11	12	12	17	44	35	23	27	10	7	8	9	9	8	81	36	48	91	38	47	56	82	72	91
7-Jan	71	55	55	30	47	34	58	63	88	AF	AF	32	47	47	81	AF	26	44	79	24	30	12	15	12	88
8-Jan	14	13	17	20	16	21	15	13	14	10	6	6	6	9	7	8	15	25	37	11	11	9	8	21	37
9-Jan	11	10	10	11	10	30	37	79	60	44	61	20	AF	77	14	12	23	23	18	18	15	18	16	16	79
10-Jan	17	18	16	10	11	10	12	16	12	16	26	14	19	14	29	35	67	81	18	19	69	89	41	65	89
11-Jan	83	66	69	83	35	30	22	19	17	16	15	17	14	16	21	21	27	18	17	17	19	17	16	18	83
12-Jan	17	18	17	18	20	20	20	26	54	15	20	9	58	21	20	19	16	16	9	11	21	73	41	72	73
13-Jan	14	48	36	23	14	18	13	79	27	30	65	54	20	19	12	15	31	20	22	34	33	44	65	48	79
14-Jan	48	92	85	54	10	11	11	13	14	16	22	28	80	9	10	10	19	11	14	21	10	8	7	6	92
15-Jan	54	12	11	12	11	11	10	15	10	10	11	11	10	10	10	14	19	17	18	38	69	81	77	36	81
16-Jan	19	12	9	11	12	8	8	6	8	9	9	7	5	6	5	4	6	6	6	8	7	7	9	7	19
17-Jan	12	9	8	8	7	17	55	11	10	12	12	10	19	12	11	13	18	18	23	18	25	22	93	65	93
18-Jan	94	83	69	17	18	21	89	16	11	11	12	7	11	84	33	18	17	20	20	21	34	37	26	29	94
19-Jan	66	79	51	33	22	42	64	43	31	34	17	15	17	13	16	21	17	16	17	16	17	43	44	40	79
20-Jan	59	19	28	12	40	31	8	24	37	21	7	9	13	13	11	36	78	89	29	25	10	12	29	15	89
21-Jan	18	20	17	32	42	33	15	32	25	17	17	24	19	18	17	13	23	77	47	46	100	51	70	12	100
22-Jan	7	8	13	11	13	19	15	15	45	48	14	14	8	13	14	20	16	17	16	6	6	6	6	6	48
23-Jan	5	6	5	8	8	9	14	28	12	12	14	39	28	12	11	10	44	34	27	65	45	46	13	22	65
24-Jan	28	96	50	61	15	16	22	18	18	19	18	16	14	21	19	15	16	16	18	23	19	37	65	30	96
25-Jan	68	51	77	54	95	54	52	14	22	63	19	16	22	14	22	18	19	19	16	15	19	21	16	18	95
26-Jan	16	17	17	18	19	18	22	20	22	14	23	32	57	33	36	57	24	13	52	30	29	29	17	15	57
27-Jan	44	29	43	32	74	18	7	9	8	8	8	8	6	6	5	6	7	6	6	7	6	7	7	7	74
28-Jan	7	8	5	6	7	13	11	14	11	9	9	10	29	56	20	25	18	17	23	17	14	21	21	19	56
29-Jan	14	11	36	47	41	45	73	27	28	24	20	16	19	17	17	16	14	15	18	16	13	10	11	10	73
30-Jan	13	11	9	16	23	15	22	12	12	12	12	15	12	18	24	24	31	48	36	36	37	70	30	32	70
31-Jan	14	12	21	33	21	69	68	78	51	46	37	42	25	17	20	16	18	19	17	44	69	86	26	68	86
	94	96	85	83	95	69	89	79	88	63	65	54	80	84	81	81	78	89	91	65	100	89	93	72	
	Diurnal Maximum																								

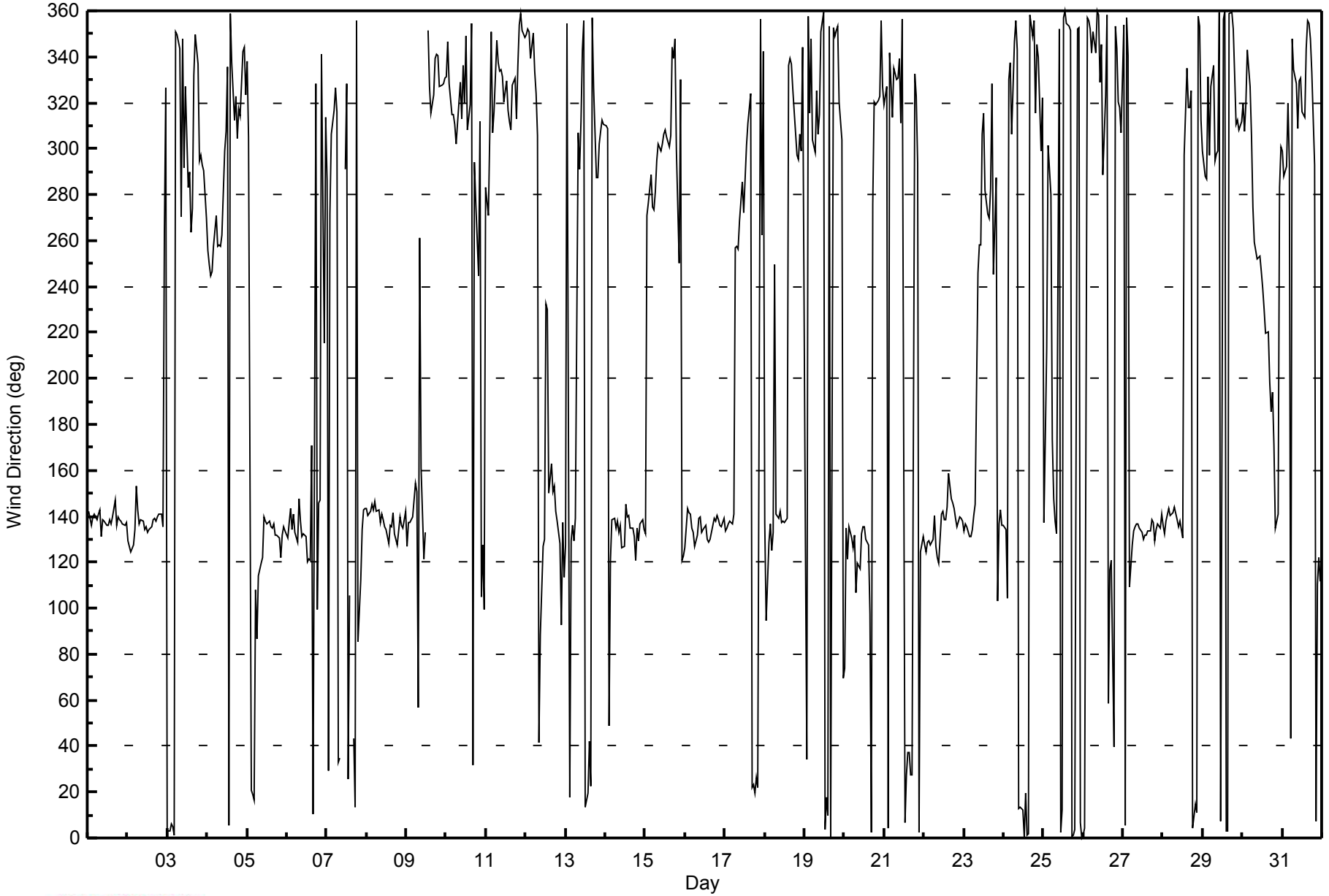
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Lower Camp - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	13:05	End Time (MST)	16:55
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Cal Gas Concentration	51.3 ppm	Cal Gas Expiry Date	5/29/2014
Gas Cert Reference	LL107920		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5V	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-558	-558
Analyzer Range (mv)	5000	5000	Lamp voltage	867	867
Calculated slope	0.997108	0.997288	Chamber temp.	45.1	45.1
Calculated intercept	1.176216	1.869805	Pressure (mmHg)	710.0	694.9
Analyzer Background	21.2	21.5	Flow (lpm)	0.483	0.473
Analyzer Coefficient	1.021	1.014	Intensity	34400	34100

Analyzer make	TEI 43C	Analyzer serial #	518112184

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.8	N/A
as found span	5000	80.9	830.0	836.2	0.993
calibrator zero	5000	0.0	0.0	-0.8	N/A
high point	4999	80.9	830.2	831.3	0.999
second point	5000	40.9	419.6	417.9	1.004
third point	5005	20.5	210.1	208.0	1.010
calibrator zero	5002	0.0	0.0	-0.8	N/A
as left zero	5000	0.0	0.0	-0.7	N/A
as left span	5000	80.9	830.0	831.7	0.998
				Average Correction Factor	1.004

Corrected As found	837.0	Previous response	826.5	% change	-1.3%

Notes: Changed filter after as founds
Adjusted span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

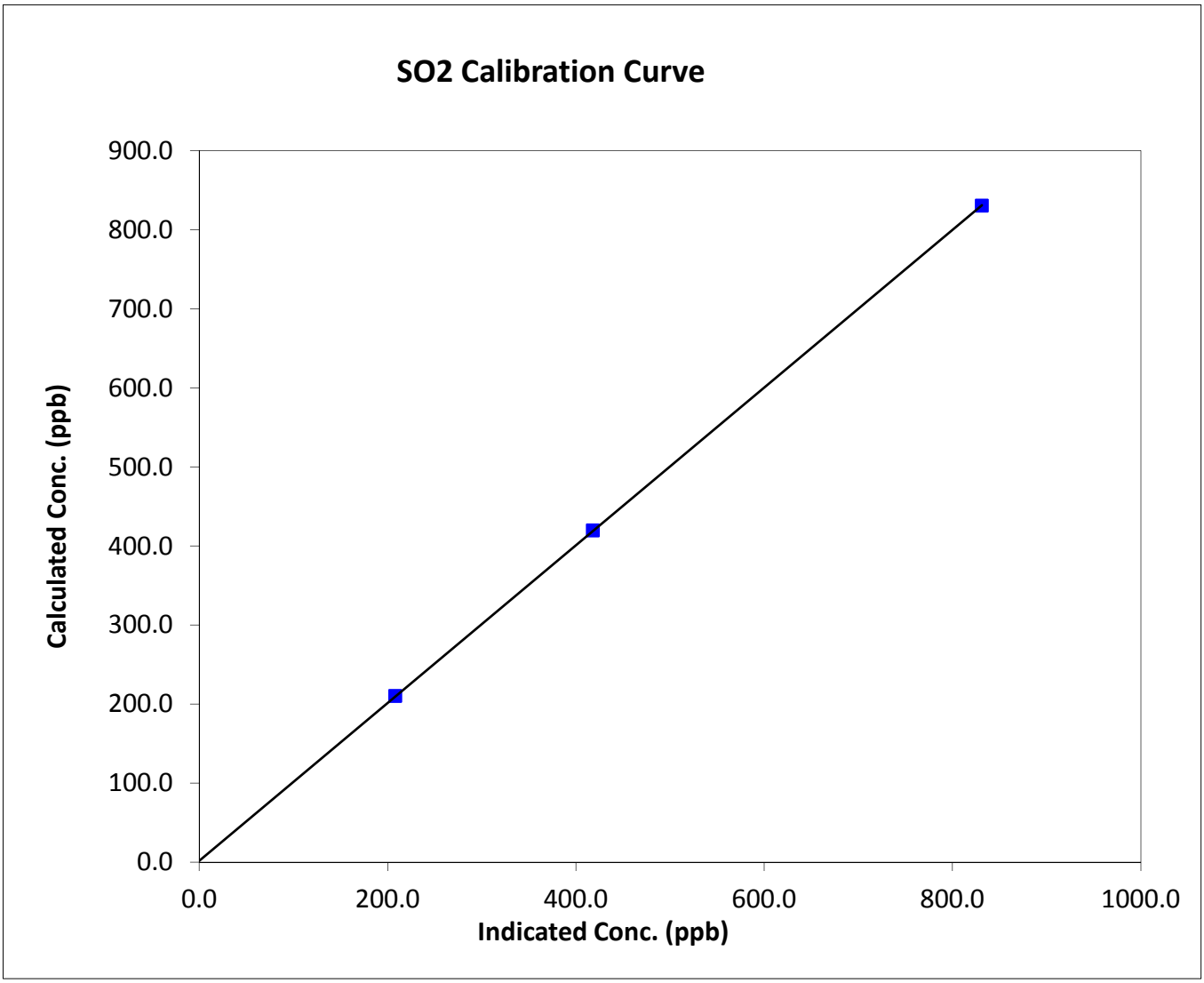
SO_2 Calibration Summary

Station Information

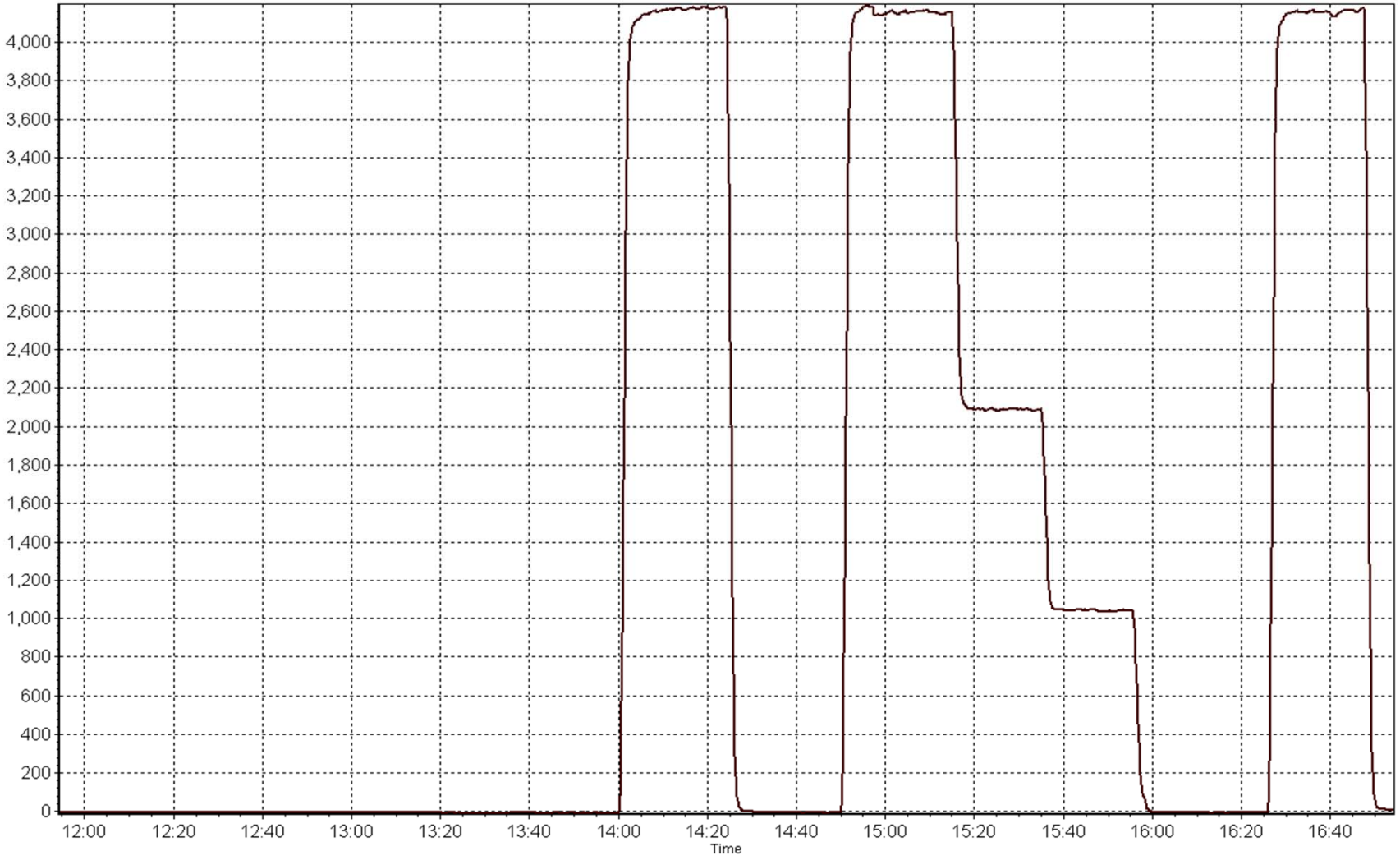
Calibration Date	Thursday, January 09, 2014	Previous Calibration	December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	13:05	End Time (MST)	16:55
Analyzer make	TEI 43C	Analyzer serial #	518112184

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.8	N/A	Correlation Coefficient	0.999992
830.2	831.3	0.9987		
419.6	417.9	1.0040	Slope	0.997288
210.1	208.0	1.0101		
			Intercept	1.869805



SO_2 Calibration Plot **Date:** January 9, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 12, 2013
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	10:05	End Time (MST)	13:20
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11051107
Cal Gas Concentration	10.3 ppm H2S	Cal Gas Expiry Date	5/30/2013
Gas Cert Reference	LL20284	SO2 gas conc.	51.3 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5V	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-679	-679
Analyzer Range (mv)	5000	5000	Lamp voltage	990	990
Calculated slope	1.005098	1.001090	Chamber temp.	45.0	45.0
Calculated intercept	-0.023487	-0.061777	Pressure	668.2	655.3
Analyzer Background	1.49	1.53	Flow	0.446	0.443
Analyzer Coefficient	0.890	0.903	Intensity	90	91
			Converter temp.	375	375

Analyzer make/model	Thermo 43i	Analyzer serial #	1008841400
Converter make/model	TEI 340	Converter serial #	328702539

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.2	N/A
as found span	5000	36.4	75.0	73.5	1.020
SO2 scrubber check	5000	20.4	209.3	1.8	N/A
calibrator zero	5001	0.0	0.0	0.2	N/A
high point	5001	36.4	75.0	75.1	0.998
second point	5003	19.4	39.9	39.6	1.009
third point	5002	9.7	20.0	20.1	0.995
calibrator zero	5000	0.0	0.0	0.2	N/A
as left zero	5000	0.0	0.0	0.2	N/A
as left span	4999	36.4	75.0	75.3	0.996
				Average Correction Factor	1.001

Corrected As found	73.3	Previous response	75.4	% change	2.9%

Notes: Changed filter after as found
Scrubber passes
Adjusted span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

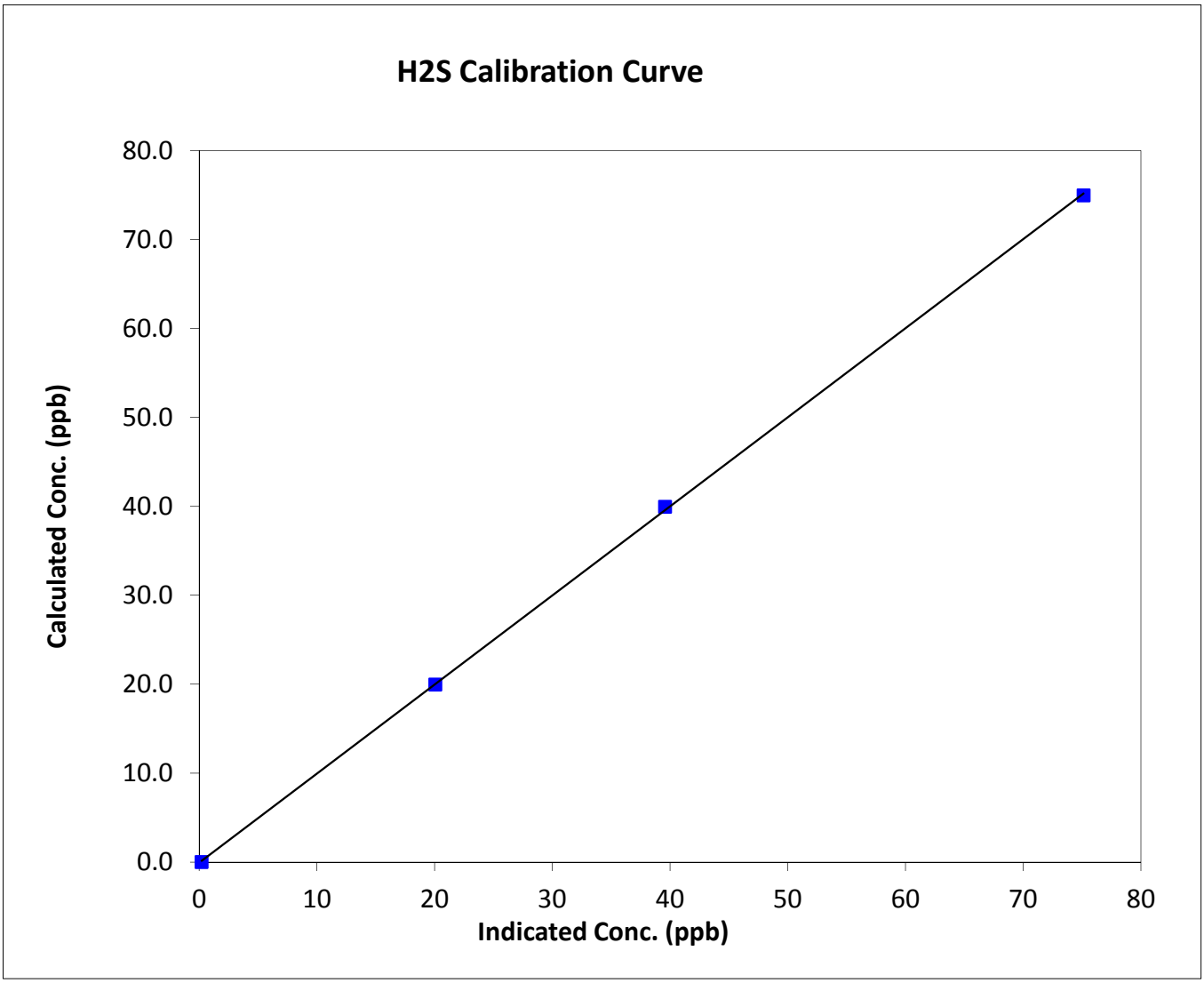
H2S Calibration Summary

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 12, 2013
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	10:05	End Time (MST)	13:20
Analyzer make	Thermo 43i	Analyzer serial #	1008841400

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999935
75.0	75.1	0.9978		
39.9	39.6	1.0091	Slope	1.001090
20.0	20.1	0.9952		
			Intercept	-0.061777



H2S Calibration Plot Date: Thursday, January 09, 2014

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, January 09, 2014	Previous Calibration	Friday, December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
		3449	
Reason:	Routine		
Start Time (MST)	13:05	End Time (MST)	16:55
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Gas Cert Reference	CC 302056	Cal Gas Expiry Date	5/29/2014
CH4 Cal Gas Conc.	510 ppm	CH4 Equiv Conc.	1073.8 ppm
C3H8 Cal Gas Conc.	205 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5V	DACS channel #	3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.2	8.2
Analyzer Range (mv)	5000	5000	Air Pressure	37.8	37.8
Calculated slope	1.001084	1.001796	Fuel Pressure	24.2	24.2
Calculated intercept	0.005289	-0.010233	Background	4.12	3.79
			Coefficient	4.698	4.698

Analyzer make	51i-LT	Analyzer serial #	121853580

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.32	N/A
as found span	5000	80.9	17.37	16.85	1.031
calibrator zero	5000	0.0	0.00	0.01	N/A
high point	4999	80.9	17.38	17.38	1.000
second point	5003	41.0	8.80	8.73	1.008
third point	5005	20.5	4.40	4.44	0.991
calibrator zero	5002	0.0	0.00	0.01	N/A
as left zero	5000	0.0	0.00	0.03	N/A
as left span	5000	80.9	17.37	17.35	1.001
				Average Correction Factor	1.000

Corrected As found	17.16	Previous response	17.39	% change	1.3%

Notes: Changed filter after as founds
Adjusted zero and span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

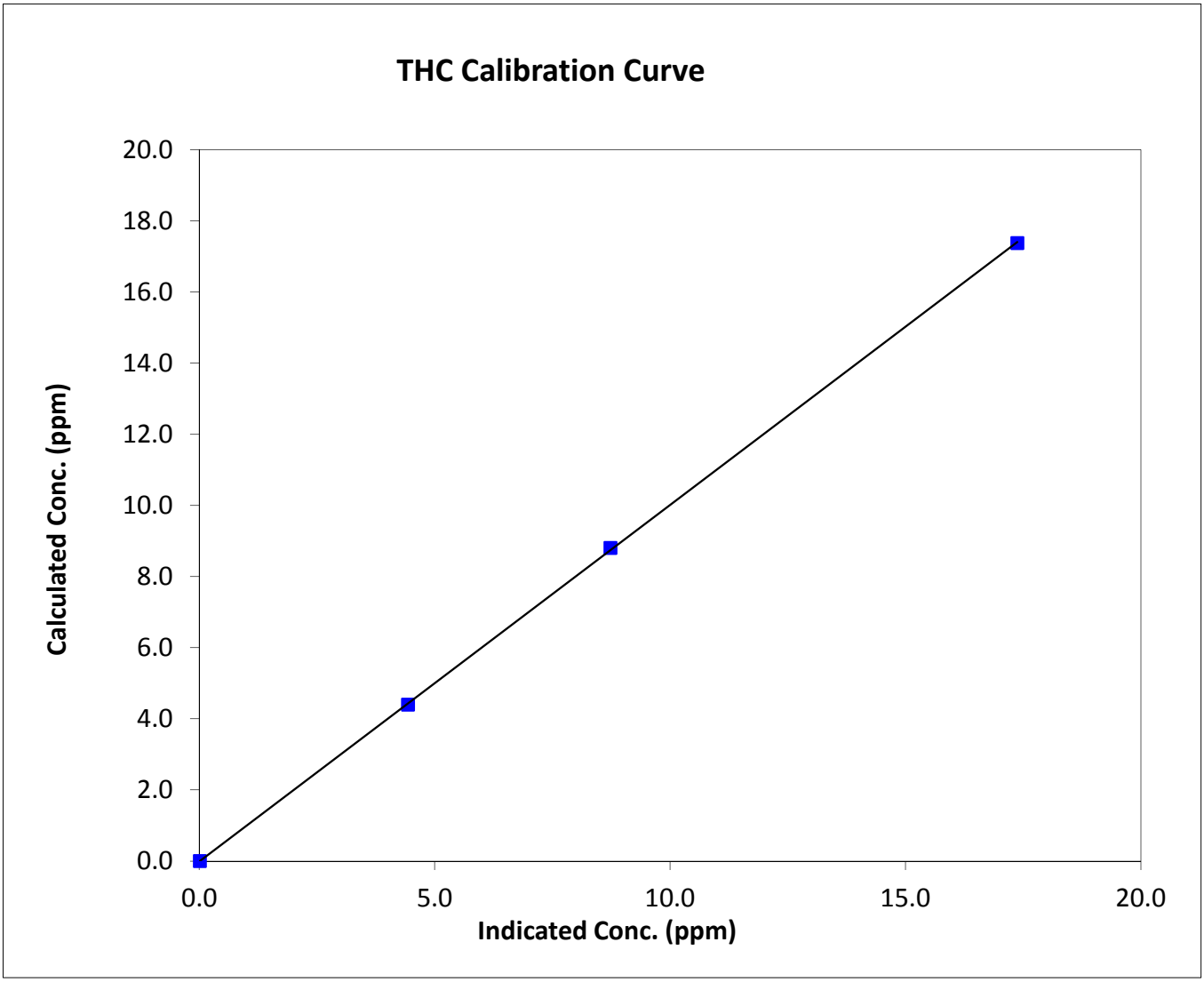
THC Calibration Summary

Station Information

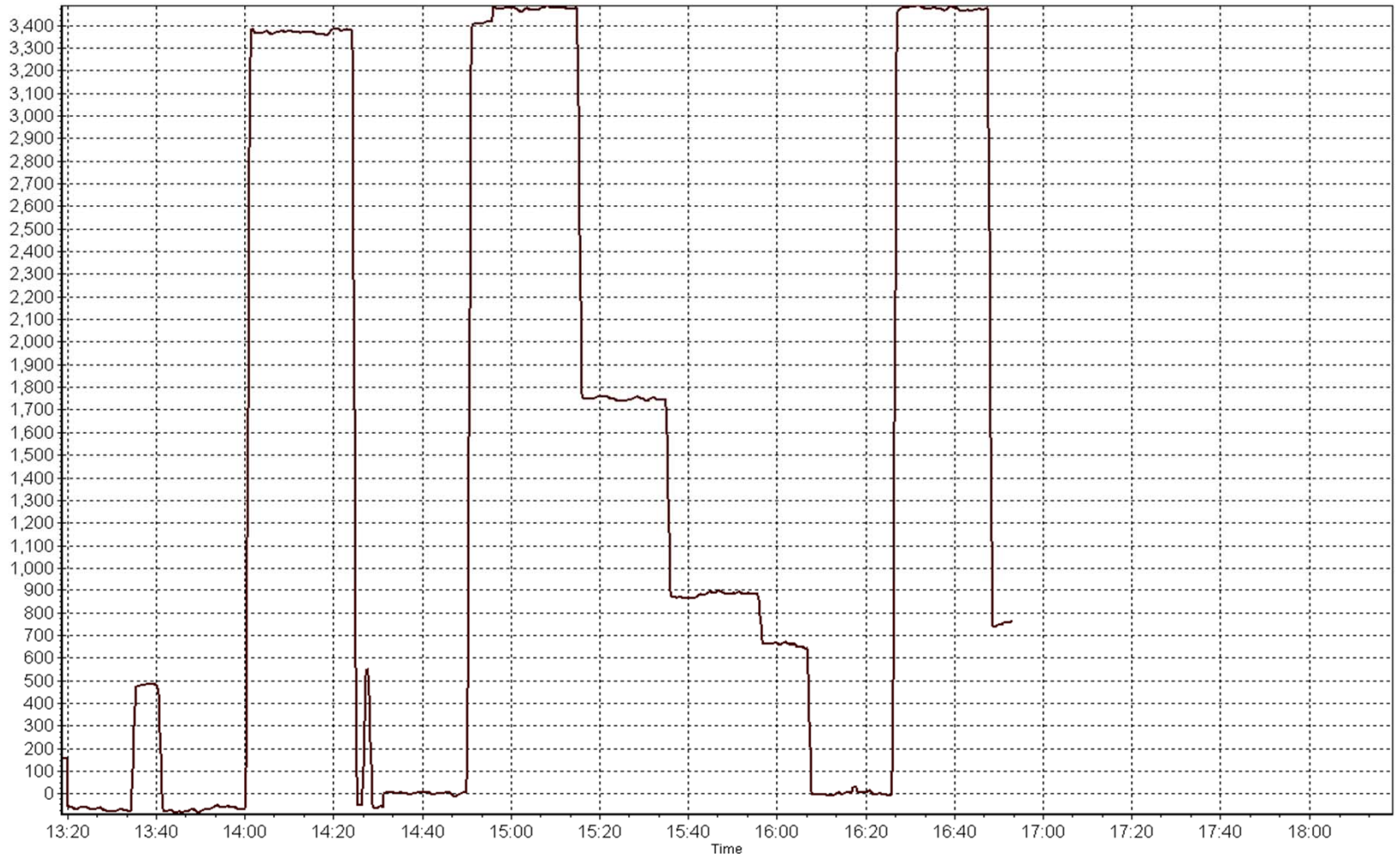
Calibration Date	January 9, 2014	Previous Calibration	December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	13:05	End Time (MST)	16:55
Analyzer make	51i-LT	Analyzer serial #	121853580

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.01	N/A	Correlation Coefficient	0.999967
17.38	17.38	1.0000		
8.80	8.73	1.0076	Slope	1.001796
4.40	4.44	0.9914		
			Intercept	-0.010233



THC Calibration Plot **Date:** January 9, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 12
MILLENNIUM MINE
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILLENNIUM MINE (AMS 12)
JANUARY 2014

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	707	37	37	100.00	68	0	3	0
TRS(ppb) Average	709	35	35	100.00	3	0	1	0
THC(ppm) Average	707	37	37	100.00	5.6	-	3.3	-
NO2(ppb) Average	707	37	37	100.00	56	0	36	-
NO(ppb) Average	707	37	37	100.00	257	-	85	-
NOX(ppb) Average	707	37	37	100.00	308	-	121	-
PM2.5(ug/m3) Average	719	0	25	96.64	81.6	-	15.0	0
Temperature 2 m (C) Average	744	0	0	100.00	6	-	0.8	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	37	-	19	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILLENNIUM MINE (AMS 12)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	707	0.8	4	-	0	0	0	0	1	1	68
TRS(ppb) Average	709	0.3	0	-	0	0	0	0	0	1	3
THC(ppm) Average	707	2.6	0.5	-	2	2.2	2.3	2.4	2.8	3.2	5.6
NO2(ppb) Average	707	19.6	12	-	1	3	8	20	30	35	56
NO(ppb) Average	707	18.2	33	-	0	0	0	4	22	50	257
NOX(ppb) Average	707	37.8	42	-	1	3	9	26	49	85	308
PM2.5(ug/m3) Average	719	6.12	6.4	-	0.3	1.7	2.6	4.1	7.4	13.8	81.6
Temperature 2 m (C) Average	744	-16.41	9.5	-	-37.2	-28	-23.4	-16.5	-10.4	-2.3	6
Wind Speed 10 m (km/h) Average	744	8.6	6	-	0	3	4	7	11	17	37
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MILLENNIUM MINE (AMS 12)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	15 Jan 2014 09:00	16 Jan 2014 08:00	24	Communication to analyzer interrupted
PM2.5	16 Jan 2014 11:00	16 Jan 2014 11:00	1	Flow and zero reference checks, sample head cleaning

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 68 ppb on Jan 15 14:00 Maximum Daily Average: 2.7 ppb on Jan 26

Minimum Value: 0 ppb on Jan 17 19:00 Minimum Daily Average: 0.1 ppb on Jan 29
Maximum Diurnal Average: 2.9 ppb at hour 14 Minimum Diurnal Average: 0.4 ppb at hour 9
Monthly Average: 0.8 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 9$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0.6	1
2-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.1	1
3-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	1	7	8	5	4	1	1.6	8
4-Jan	1	Z	0	0	0	0	0	0	0	1	3	9	1	0	0	0	0	0	0	1	1	2	1	1	1.0	9
5-Jan	2	Z	1	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	0	0	0.6	2
6-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
7-Jan	0	Z	0	0	0	0	1	0	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	1	0.5	1
8-Jan	1	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.9	1
9-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	0.9	4
10-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.4	1
11-Jan	1	Z	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
12-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0.3	1
13-Jan	0	Z	0	0	1	0	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0.5	2
14-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0.8	1
15-Jan	0	Z	0	0	0	0	0	C	C	C	C	C	C	68	52	33	1	1	0	0	0	0	0	1	--	68
16-Jan	2	Z	1	1	2	2	2	2	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0.7	2
17-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0.2	2
18-Jan	0	Z	1	0	0	0	0	0	0	0	0	1	1	1	2	1	0	0	0	0	0	0	0	0	0.5	2
19-Jan	0	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
20-Jan	0	Z	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0.4	1
21-Jan	0	Z	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
22-Jan	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
23-Jan	0	Z	0	0	0	0	0	0	0	0	0	2	10	7	1	1	0	6	5	1	1	0	1	1	1.7	10
24-Jan	1	Z	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	4
25-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
26-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	2	7	27	15	2	1	1	3	2	1	2	2.7	27
27-Jan	2	Z	1	2	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.6	2
28-Jan	0	Z	0	0	0	0	0	0	0	0	1	0	0	2	2	1	1	1	0	0	0	0	0	0	0.5	2
29-Jan	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
30-Jan	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0.3	1
	0.6	--	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.8	0.8	2.9	2.4	2.3	0.9	0.8	0.5	0.6	0.7	0.6	0.6	0.5	Diurnal Average	
	2	--	4	4	2	2	2	2	1	1	3	9	10	68	52	33	15	6	5	7	8	5	4	2	Diurnal Maximum	

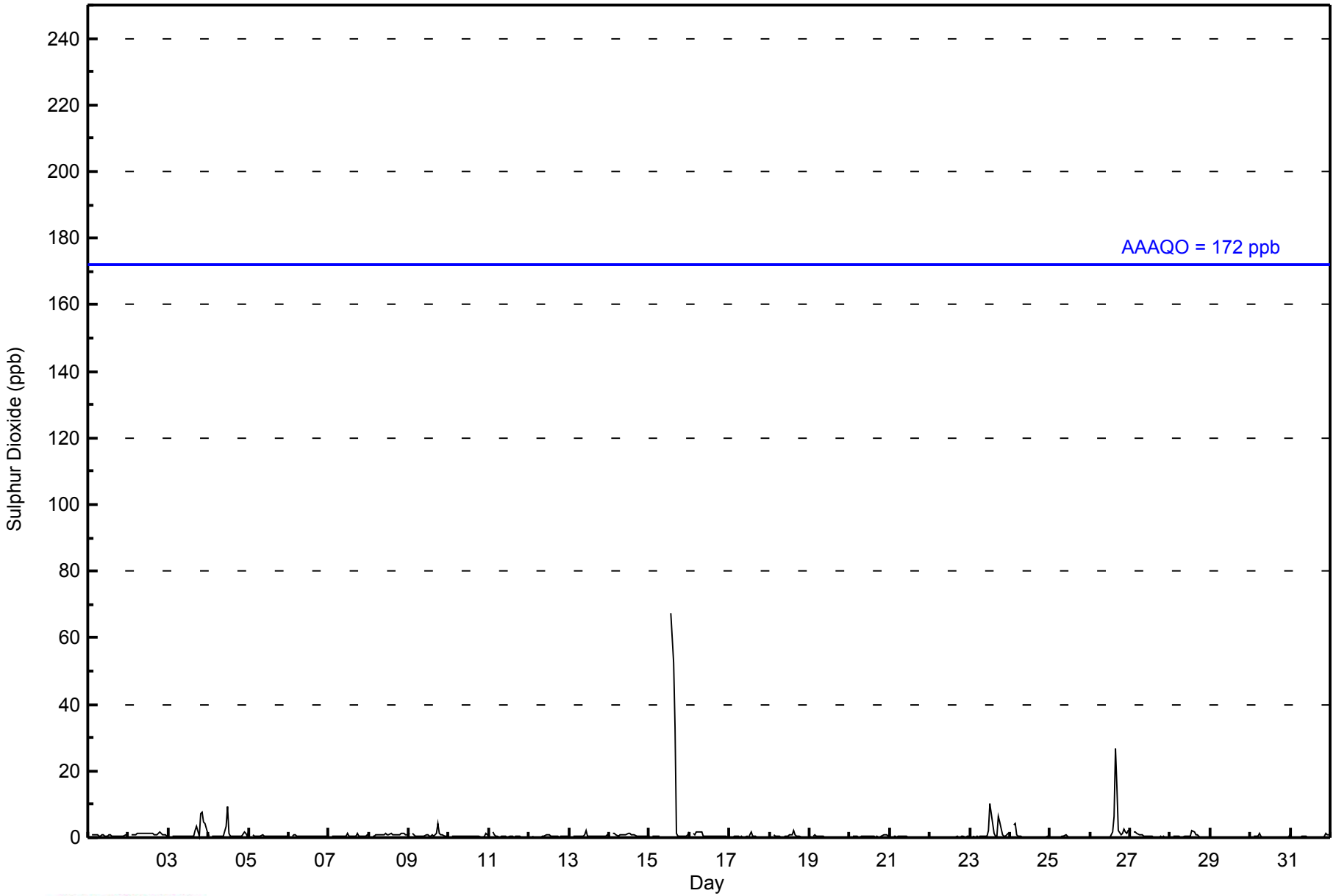
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	702	99.29	99.29
11 - 20	1	0.14	99.43
21 - 60	3	0.42	99.86
61 - 110	1	0.14	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	83	104	11	5	4	6	39	121	60	67	52	19	13	34	46	38	702
11 - 20	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
21 - 60	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	3
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	83	104	12	5	4	6	39	121	60	68	52	19	13	34	49	38	707

Total Number of Valid Hours: 707

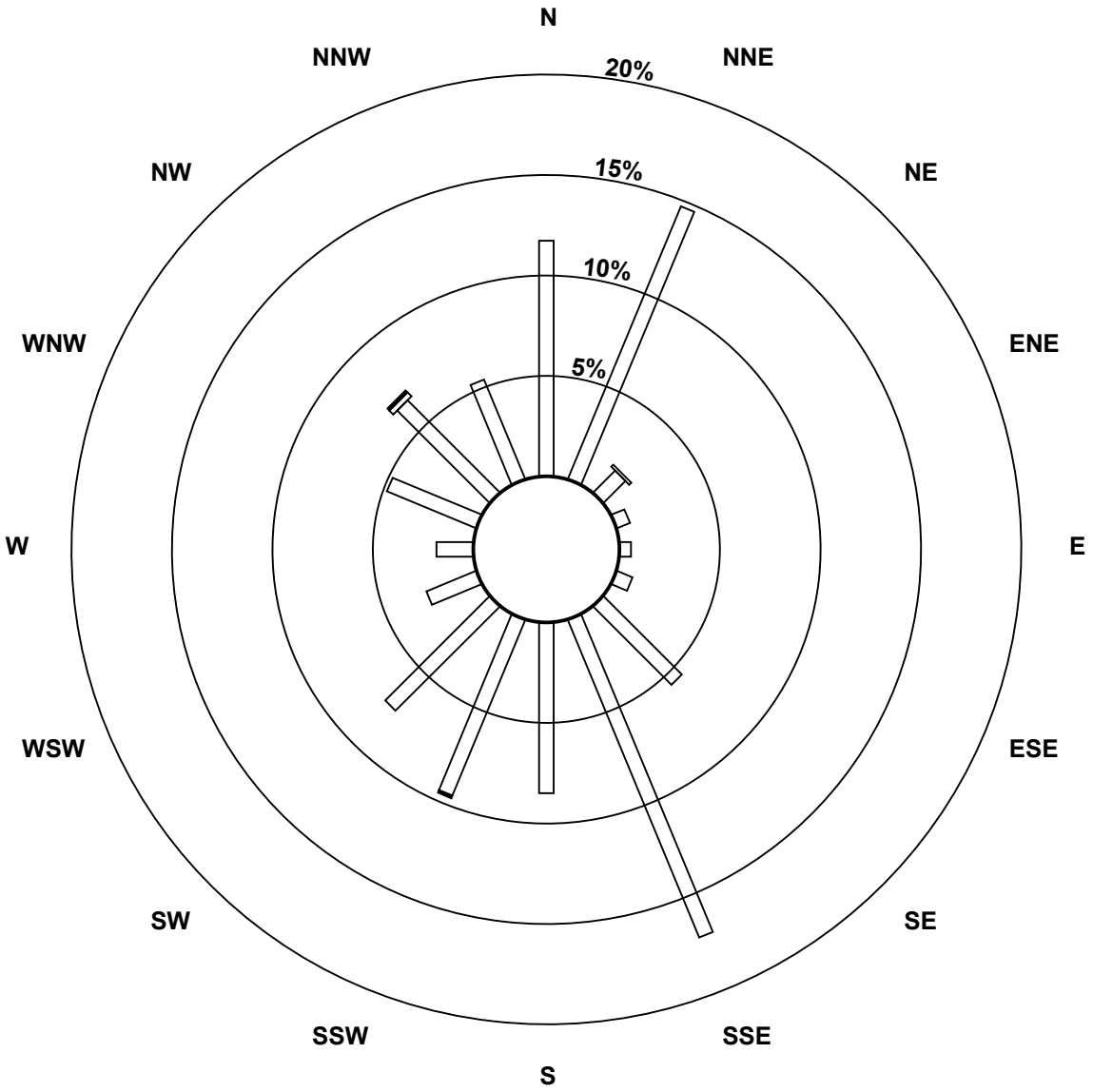
Total Number of Hours: 744

Wood Buffalo Environmental Association

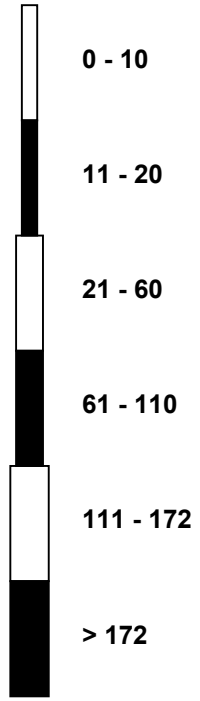
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Millennium (AMS 12)



Classes (ppb)



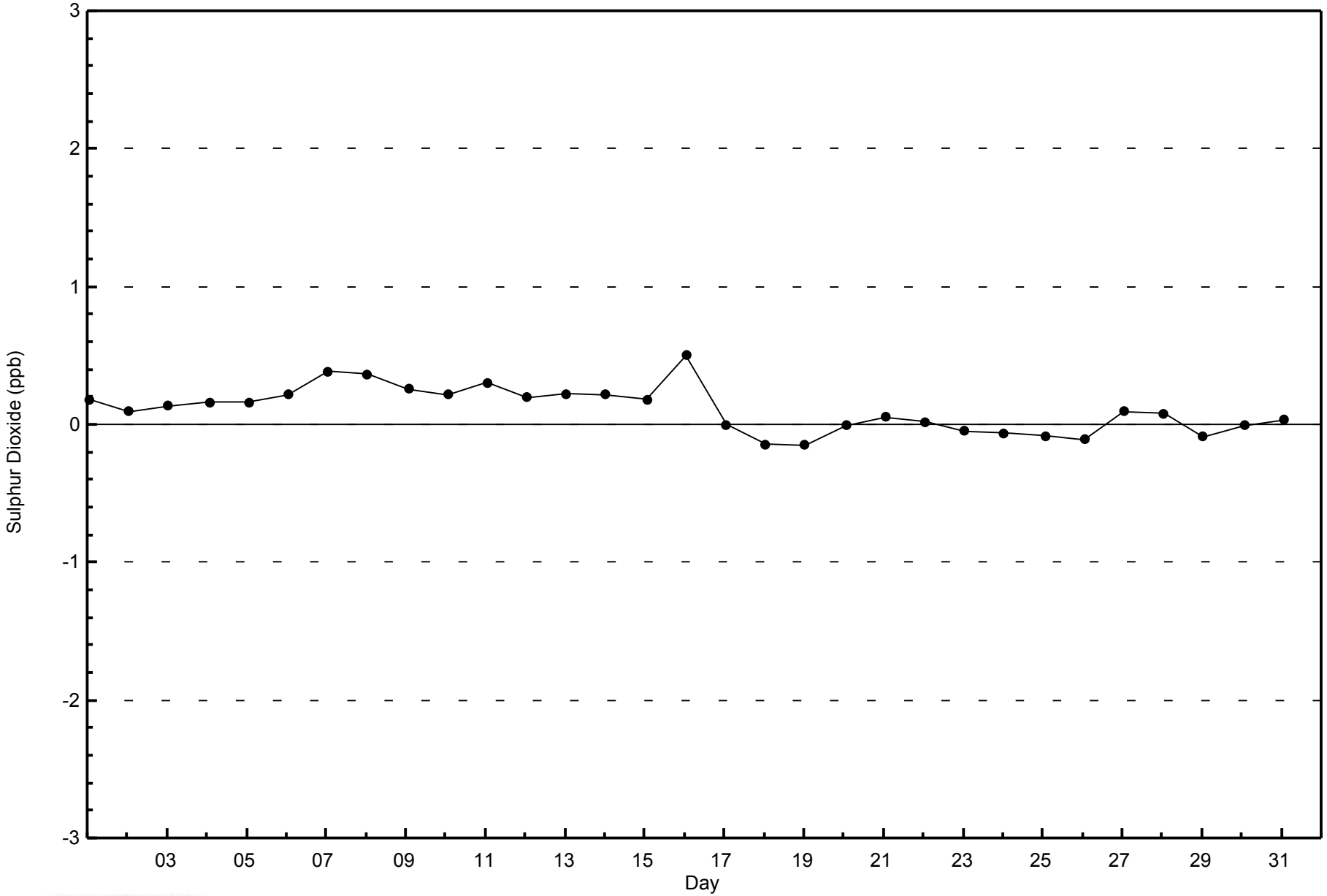
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2014



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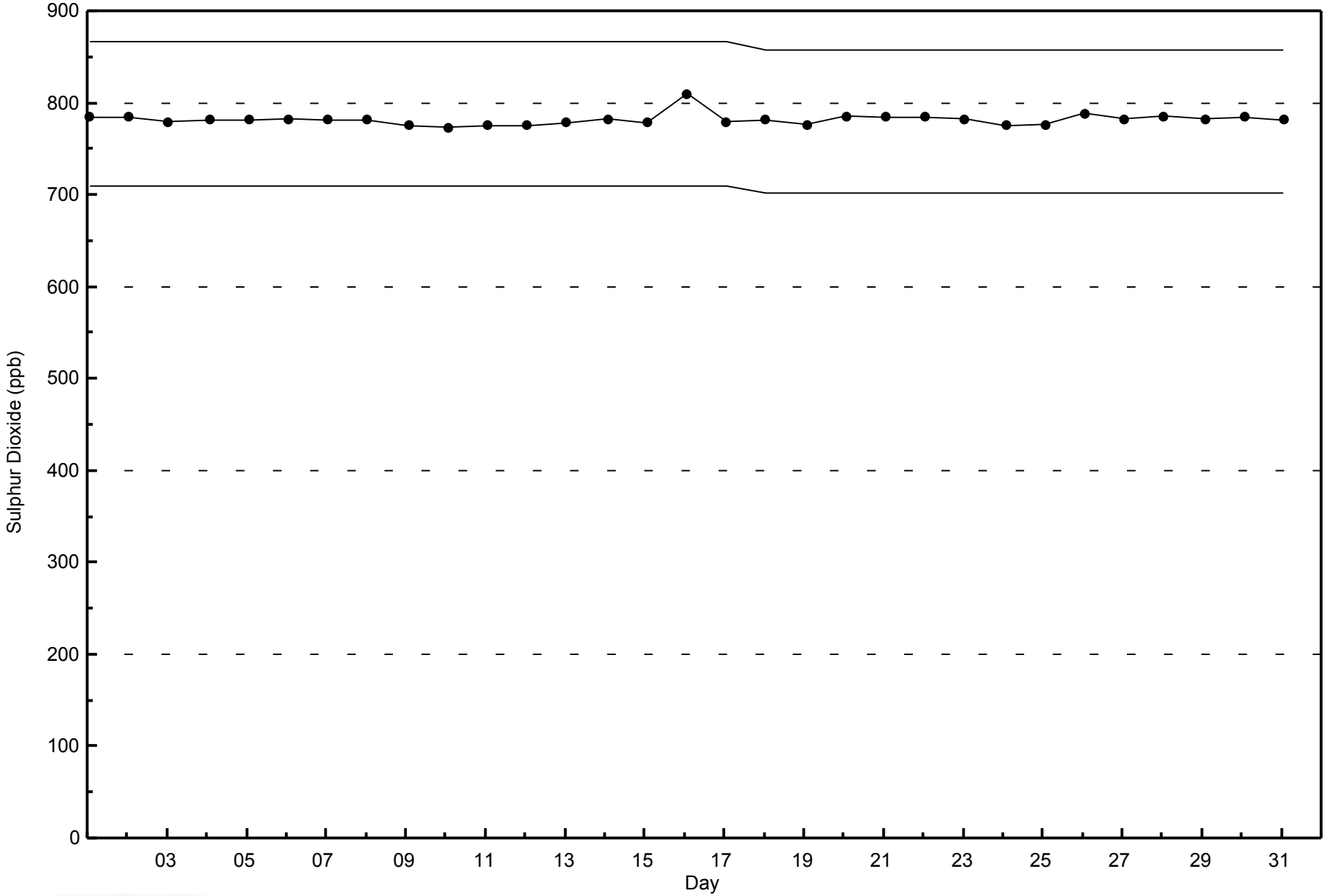
WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 15 15:00 Maximum Daily Average: 0.7 ppb on Jan 15

Minimum Value: 0 ppb on Jan 19 13:00 Minimum Daily Average: 0.1 ppb on Jan 19
Maximum Diurnal Average: 0.5 ppb at hour 4 Minimum Diurnal Average: 0.3 ppb at hour 19
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

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

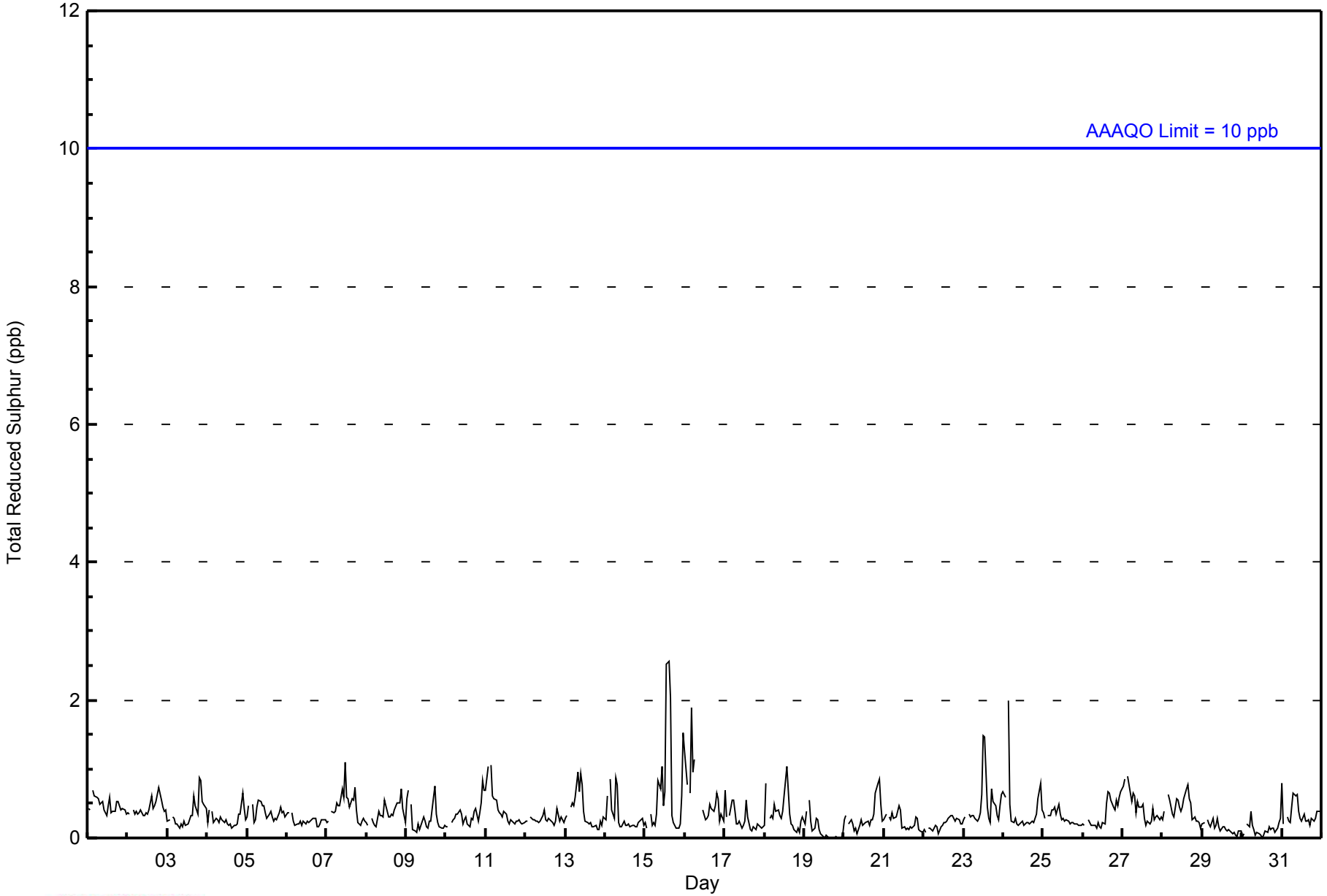
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	99.72	99.72
3 - 4	2	0.28	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: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	81	105	12	6	4	7	38	118	61	66	52	19	15	33	51	39	707
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	81	105	12	6	4	7	38	118	61	66	52	19	15	33	53	39	709

Total Number of Valid Hours: 709

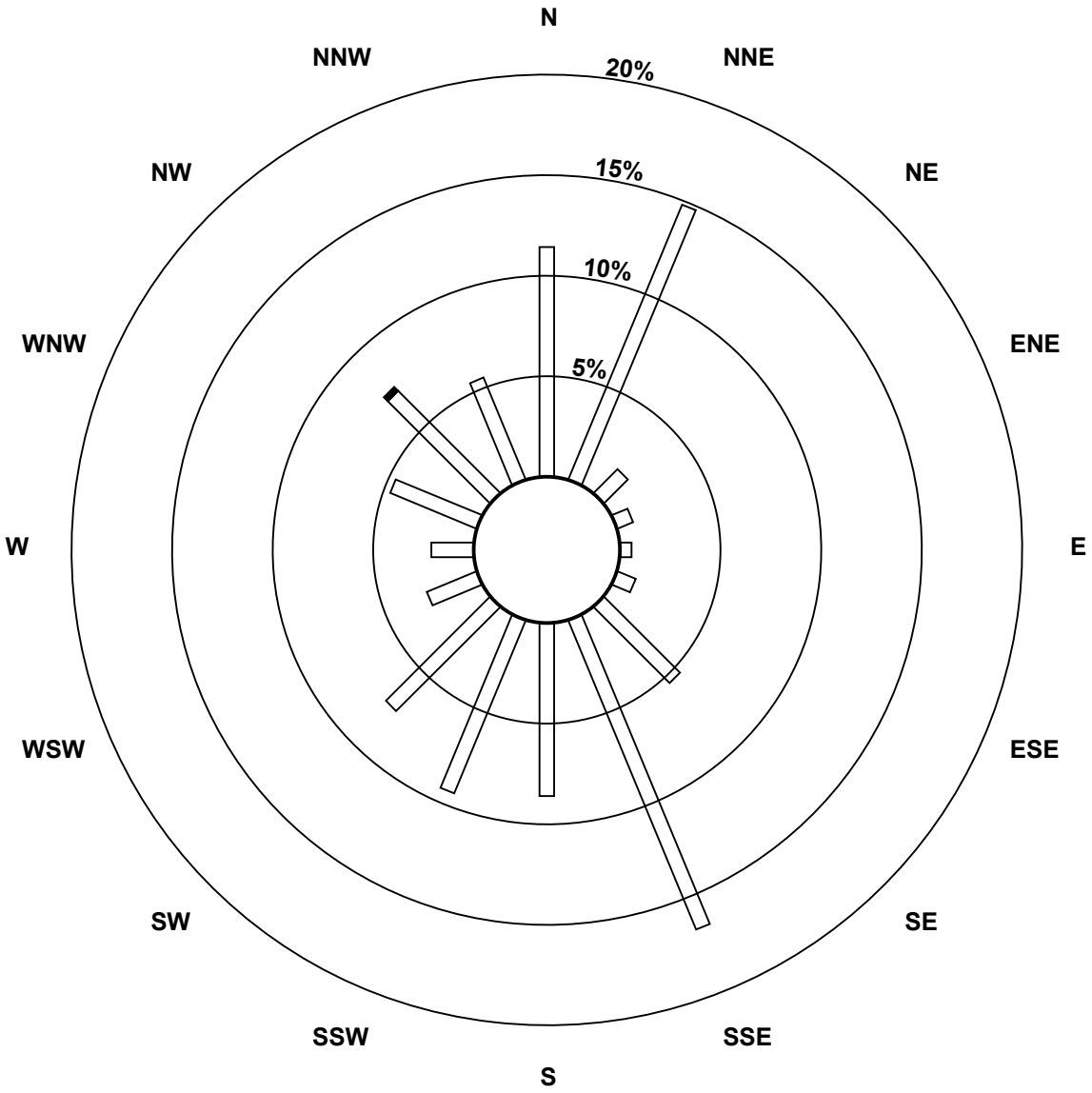
Total Number of Hours: 744

Wood Buffalo Environmental Association

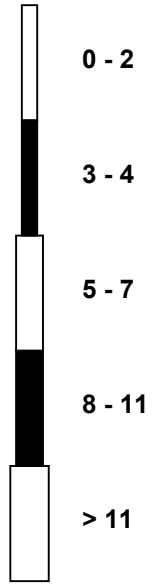
Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Millennium (AMS 12)



Classes (ppb)



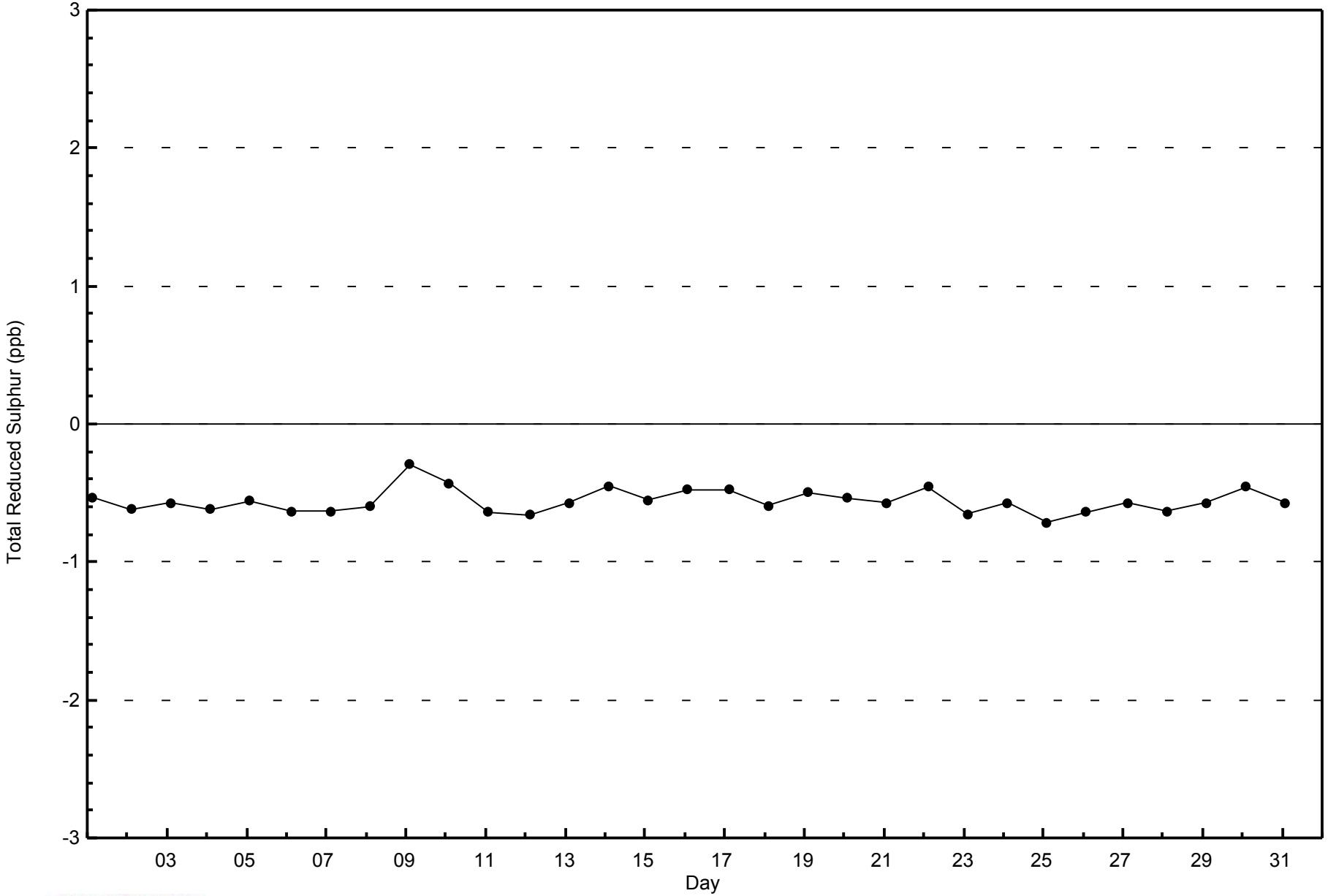
Total Number of Valid Hours: 709

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2014



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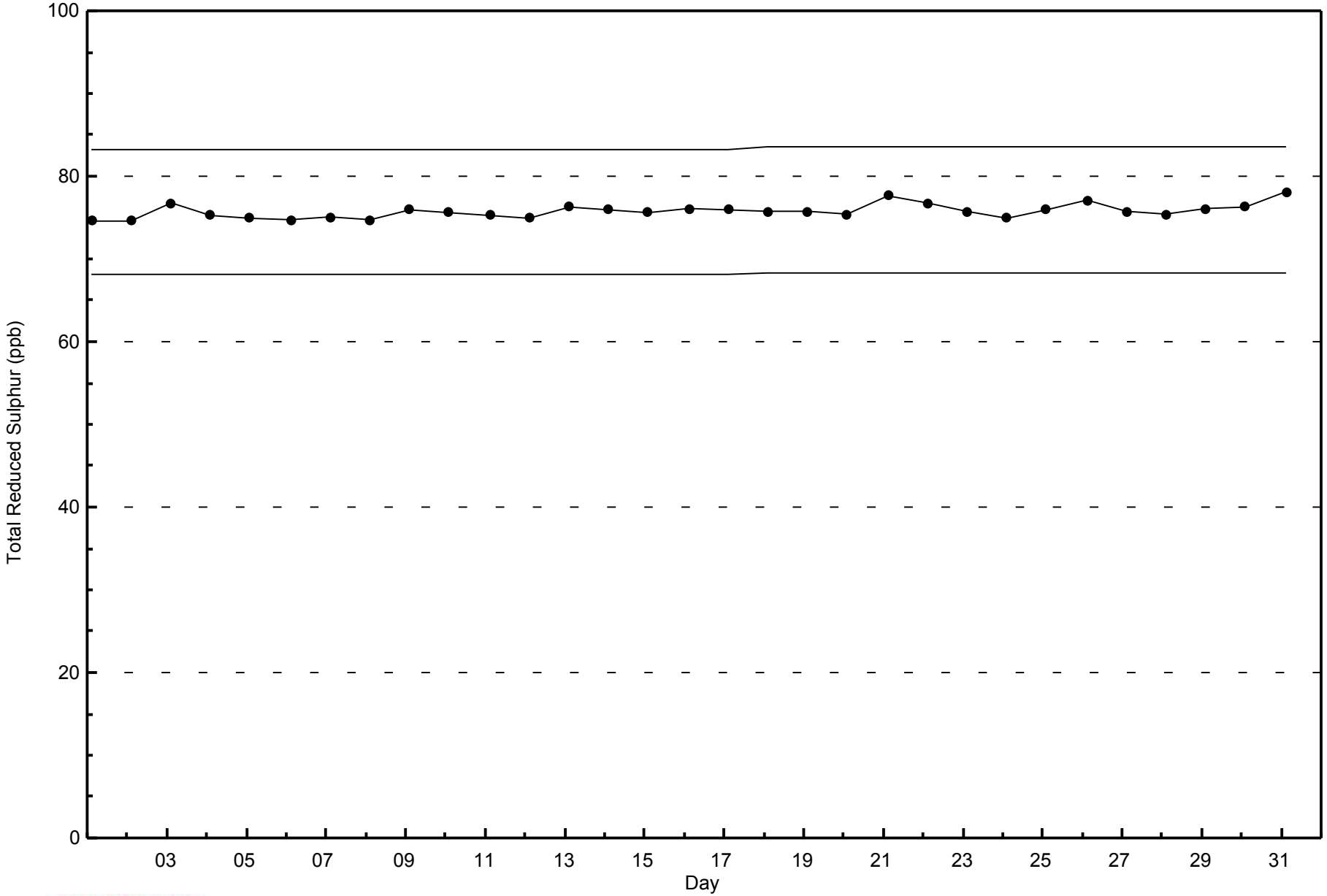
WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Millennium - January 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Millennium - January 2014

Maximum Value: 5.6 ppm on Jan 16 05:00

Maximum Daily Average: 3.3 ppm on Jan 1

Minimum Value: 2.0 ppm on Jan 15 03:00

Minimum Daily Average: 2.2 ppm on Jan 12

Maximum Diurnal Average: 2.8 ppm at hour 3

Minimum Diurnal Average: 2.5 ppm at hour 17

Monthly Average: 2.60 ppm

Percentiles: P_1 = 2.1 P_{10} = 2.2 Q_1 = 2.3 Median = 2.4 Q_3 = 2.8 P_{90} = 3.2 P_{99} = 4.3

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	3.0	Z	3.2	3.7	4.4	4.0	3.7	3.6	4.3	3.2	2.8	2.6	2.9	3.0	3.0	2.9	3.0	4.1	4.4	3.4	3.2	3.0	2.7	2.6	3.3	4.4
2-Jan	2.6	Z	2.5	2.6	2.7	2.8	2.8	2.8	2.9	2.9	2.8	2.8	2.8	2.7	2.8	3.1	2.8	2.7	3.4	3.9	3.5	3.0	2.9	2.5	2.9	3.9
3-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.4	2.4	2.5	2.6	2.6	2.3	2.6	2.8	2.7	2.6	2.4	2.4	2.8
4-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.8	2.9	2.8	2.8	2.4	2.4	2.9
5-Jan	2.6	Z	2.6	2.5	2.3	2.3	3.5	3.6	3.1	3.5	2.9	2.7	2.4	2.4	2.5	3.0	2.4	2.4	2.4	2.7	2.9	2.8	2.4	2.6	2.7	3.6
6-Jan	2.4	Z	2.6	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.4	2.3	2.6
7-Jan	2.4	Z	2.4	2.3	2.3	2.5	3.0	3.7	3.6	3.9	3.3	4.2	3.0	3.1	3.0	3.0	2.6	2.8	2.5	2.3	2.2	2.4	2.3	2.3	2.8	4.2
8-Jan	2.3	Z	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	3.2	2.7	2.7	2.8	2.6	2.7	3.2	3.1	3.3	3.7	4.0	3.3	3.0	2.8	4.0
9-Jan	3.4	Z	4.2	3.6	2.6	2.7	3.0	3.1	2.8	2.9	2.9	3.0	2.7	2.7	2.8	2.7	2.9	2.7	2.6	2.6	2.5	2.4	2.3	2.2	2.8	4.2
10-Jan	2.2	Z	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.4	2.2	2.1	2.2	2.9	3.3	2.8	2.4	3.3
11-Jan	2.8	Z	4.4	4.4	2.4	2.6	2.4	2.4	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	4.4
12-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.5	2.5	2.4	2.1	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.5
13-Jan	2.2	Z	2.8	2.4	2.7	2.7	2.7	3.3	2.8	2.9	2.6	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.8	2.5	3.3
14-Jan	2.7	Z	3.9	3.0	2.5	2.4	3.2	2.9	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	2.3	2.1	2.5	3.9
15-Jan	2.1	Z	2.0	2.1	2.0	2.1	2.0	C	C	C	C	C	C	2.4	2.4	2.3	2.1	2.2	2.2	2.2	2.2	2.3	3.3	4.3	--	4.3
16-Jan	4.5	Z	3.9	3.1	5.6	3.8	3.8	4.3	2.9	2.7	2.7	2.7	2.5	2.4	2.5	2.7	2.5	2.4	2.7	3.2	3.2	2.5	2.8	2.6	3.1	5.6
17-Jan	3.2	Z	2.5	2.8	3.5	3.4	2.9	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	3.5
18-Jan	2.4	Z	2.9	2.5	2.7	2.9	3.8	3.8	3.2	2.7	2.8	2.9	3.2	3.8	2.9	2.5	2.4	2.3	2.3	2.3	2.4	2.3	2.5	3.0	2.8	3.8
19-Jan	3.2	Z	2.8	2.9	2.6	2.4	2.5	3.1	2.8	2.3	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	2.4	3.2
20-Jan	2.5	Z	2.6	2.4	2.6	2.5	2.4	2.5	2.3	2.6	2.7	2.4	2.3	2.4	2.4	2.4	2.9	2.7	2.5	2.9	3.0	3.2	2.7	2.4	2.6	3.2
21-Jan	2.5	Z	2.4	2.4	2.5	2.6	2.6	2.7	2.8	3.2	2.8	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.4	2.4	2.4	2.5	3.2
22-Jan	2.4	Z	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.6	2.5	2.5	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.7
23-Jan	2.5	Z	2.5	2.5	2.7	2.6	2.5	2.4	2.6	2.6	2.4	2.6	3.2	2.8	3.0	2.2	2.4	2.5	2.6	2.8	2.3	2.4	2.7	3.6	2.6	3.6
24-Jan	3.9	Z	3.8	3.2	2.5	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	2.3	2.4	2.6	2.8	2.9	2.6	2.5	3.9
25-Jan	2.6	Z	2.3	2.4	2.5	2.7	2.6	2.8	2.6	2.8	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.4	2.8
26-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.6	2.6	2.8	3.0	2.7	2.6	2.8	2.8	2.7	2.7	2.5	3.0
27-Jan	3.4	Z	4.1	4.0	4.2	3.8	4.0	4.1	3.9	3.4	3.2	3.6	2.9	2.5	2.4	2.4	2.5	2.6	3.0	2.5	3.1	2.7	2.4	2.6	3.2	4.2
28-Jan	2.9	Z	3.8	4.2	3.4	2.8	2.4	2.5	4.1	4.0	3.0	3.1	3.6	3.0	3.5	3.5	3.1	2.8	2.3	2.2	2.3	2.3	2.3	2.3	3.0	4.2
29-Jan	2.3	Z	2.3	2.4	2.3	2.3	2.5	2.4	2.4	2.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.5	2.3	2.6
30-Jan	2.3	Z	2.3	2.4	2.7	2.6	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.3	2.3	2.5	2.2	2.6	2.8	2.8	2.4	2.8
31-Jan	2.9	Z	2.3	2.4	2.6	2.3	3.5	2.8	2.8	2.8	2.4	2.3	2.3	2.6	2.4	2.4	2.3	2.3	2.3	2.3	2.5	2.5	2.5	2.5	2.5	3.5
	2.7	--	2.8	2.7	2.7	2.6	2.7	2.8	2.7	2.7	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	Diurnal Average	
	4.5	--	4.4	4.4	5.6	4.0	4.0	4.3	4.3	4.0	3.3	4.2	3.6	3.8	3.5	3.5	3.1	4.1	4.4	3.9	3.7	4.0	3.3	4.3	Diurnal Maximum	

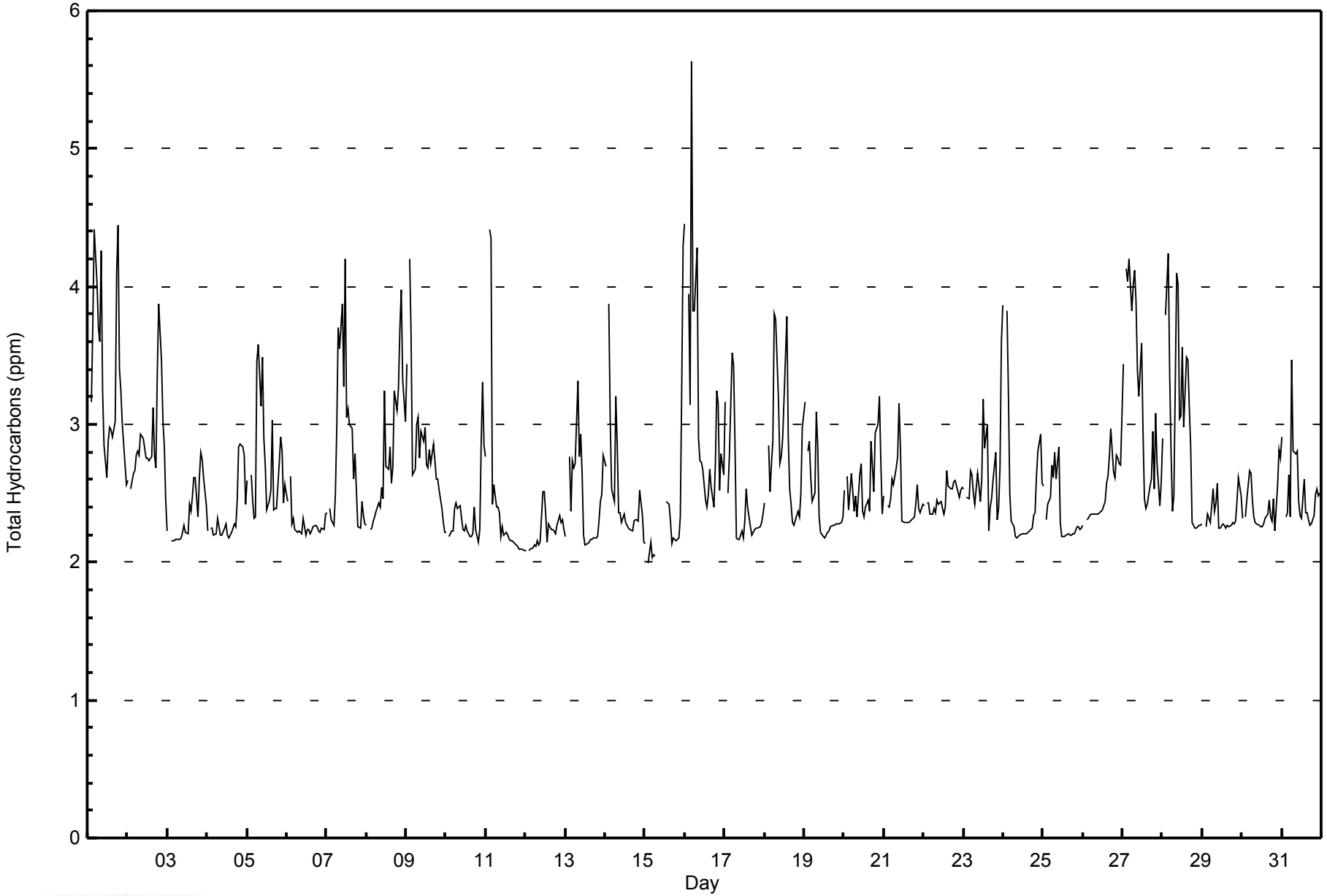
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	3	0.42	0.42
2.1 - 3.0	610	86.28	86.70
3.1 - 10.0	94	13.30	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Millennium - January 2014

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	3	0	0	3
2.1 - 3.0	83	104	12	4	3	5	28	114	52	45	22	17	13	30	42	36	610
3.1 - 10.0	0	0	0	1	1	1	11	7	8	23	30	2	0	1	7	2	94
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	83	104	12	5	4	6	39	121	60	68	52	19	13	34	49	38	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

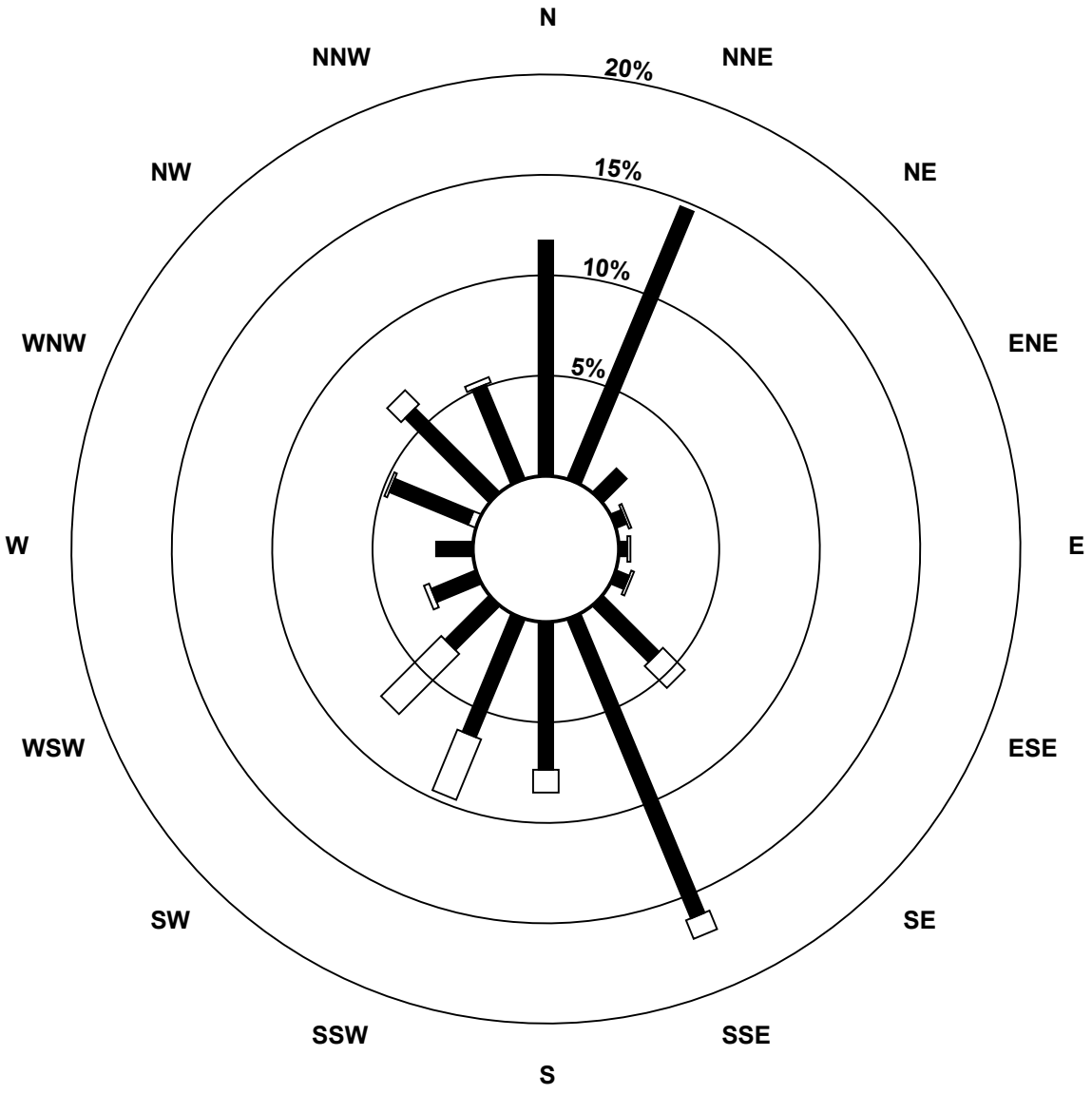
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

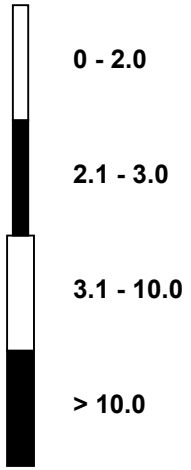
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Millennium (AMS 12)



Classes (ppm)



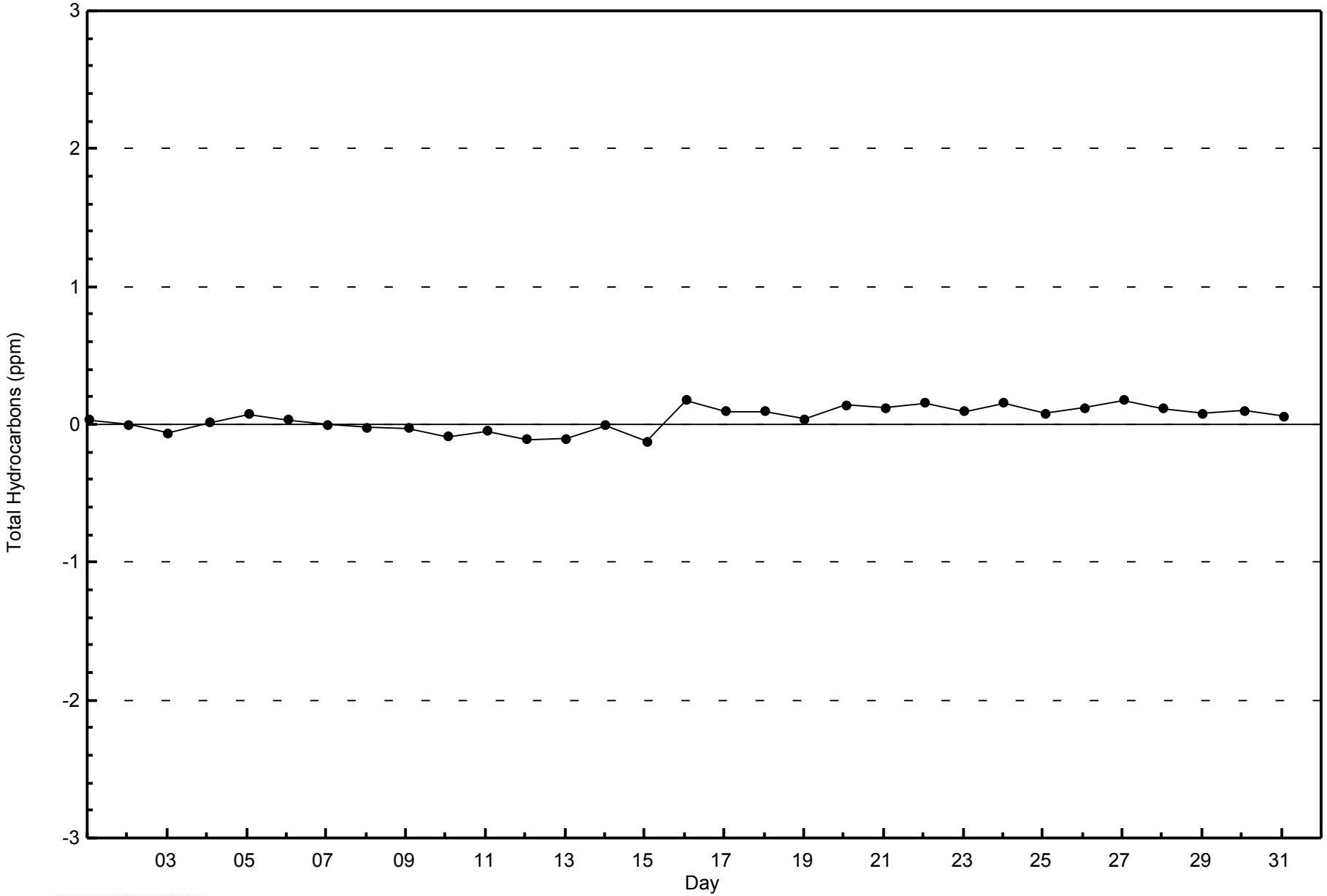
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Millennium - January 2014



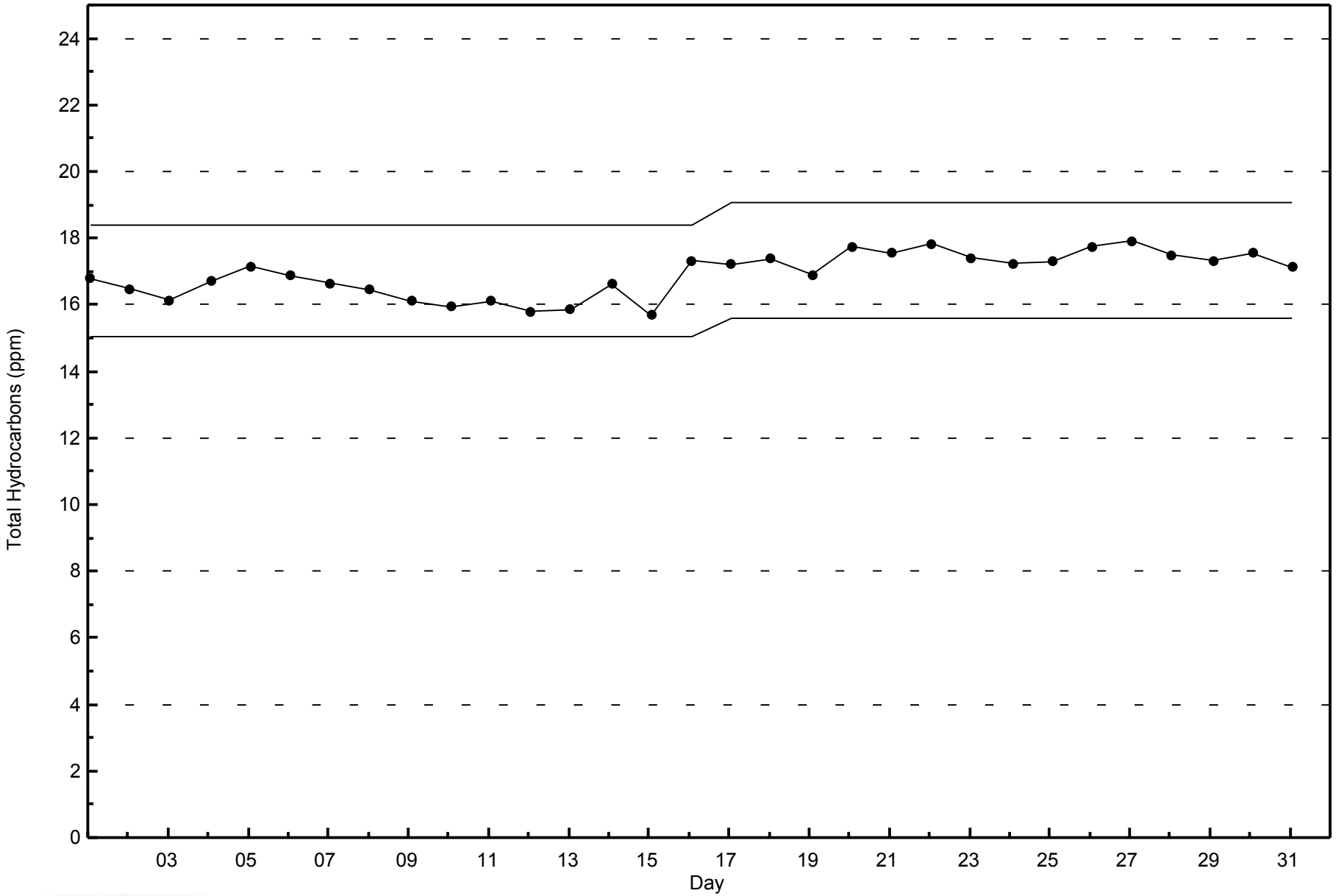
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Millennium - January 2014

Maximum Value: 257 ppb on Jan 11 03:00

Maximum Daily Average: 84.7 ppb on Jan 16

Minimum Value: 0 ppb on Jan 3 01:00

Minimum Daily Average: 0.4 ppb on Jan 29

Maximum Diurnal Average: 34.4 ppb at hour 3

Minimum Diurnal Average: 11.1 ppb at hour 16

Monthly Average: 18.2 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 4 $Q_3 = 22$ $P_{90} = 50$ $P_{99} = 149$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	43	Z	65	60	57	50	42	47	61	58	21	31	41	83	26	28	38	32	35	15	21	27	27	10	39.9	83
2-Jan	7	Z	7	7	4	5	11	7	7	9	16	19	10	22	57	38	35	45	82	158	89	63	14	2	31.0	158
3-Jan	0	Z	0	0	0	0	0	0	0	1	3	3	3	6	6	4	1	1	0	0	0	0	1	0	1.4	6
4-Jan	0	Z	0	0	0	1	1	0	2	2	3	1	0	0	1	0	1	1	1	1	1	1	0	1	0.8	3
5-Jan	1	Z	10	9	0	0	16	37	85	46	38	37	25	38	48	30	15	8	9	26	42	27	27	22	26.0	85
6-Jan	26	Z	14	2	5	1	0	0	0	1	4	1	4	4	3	5	5	1	1	1	1	7	2	9	4.3	26
7-Jan	4	Z	11	16	13	41	60	20	7	33	33	165	67	35	31	58	62	142	33	6	3	6	9	12	37.7	165
8-Jan	5	Z	3	2	3	6	7	8	2	12	17	32	28	13	17	8	43	31	42	71	74	113	63	51	28.3	113
9-Jan	87	Z	117	51	21	18	24	18	17	21	66	40	18	26	48	27	22	4	1	1	0	0	0	0	27.2	117
10-Jan	0	Z	0	0	0	0	1	1	1	1	2	3	4	2	1	1	0	8	1	0	0	29	129	90	11.9	129
11-Jan	96	Z	257	134	42	31	14	19	10	2	4	2	3	2	1	2	0	0	0	0	0	0	0	0	27.0	257
12-Jan	0	Z	0	0	0	0	0	0	0	0	24	42	9	2	7	16	6	2	1	24	11	7	10	5	7.3	42
13-Jan	4	Z	6	16	26	13	20	18	12	9	10	3	1	1	0	0	0	0	0	2	4	6	28	73	11.0	73
14-Jan	51	Z	119	153	76	40	49	49	11	11	10	13	10	9	6	5	4	3	8	4	3	12	3	1	28.3	153
15-Jan	0	Z	0	1	0	0	0	C	C	C	C	C	C	8	12	7	1	0	1	1	0	0	16	38	--	38
16-Jan	198	Z	125	103	232	193	213	244	43	72	71	46	23	9	26	28	42	22	49	70	55	12	54	16	84.7	244
17-Jan	33	Z	17	13	26	30	10	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	5.8	33
18-Jan	1	Z	111	29	53	46	54	18	19	22	49	66	130	141	60	7	1	0	0	2	1	1	3	3	35.5	141
19-Jan	9	Z	25	14	1	1	5	11	19	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3.9	25
20-Jan	3	Z	14	5	13	8	5	6	1	20	26	16	22	28	25	17	16	10	17	37	9	15	3	0	13.8	37
21-Jan	0	Z	1	1	7	51	33	46	10	19	29	1	0	0	0	0	0	0	4	15	5	5	3	2	10.0	51
22-Jan	4	Z	2	3	4	2	4	3	6	3	10	11	12	13	14	14	20	12	9	14	15	7	4	9	8.5	20
23-Jan	7	Z	4	8	22	19	20	17	2	1	1	4	5	7	3	1	0	0	0	0	0	3	62	131	13.9	131
24-Jan	160	Z	47	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	50	42	13.7	160
25-Jan	17	Z	2	3	12	10	4	49	14	41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6.8	49
26-Jan	0	Z	0	0	0	0	0	0	0	0	0	2	1	2	5	5	3	4	2	13	60	50	82	87	13.8	87
27-Jan	102	Z	80	115	69	37	70	61	29	42	46	36	40	16	3	3	17	11	62	19	24	19	3	11	39.8	115
28-Jan	11	Z	28	49	34	48	19	11	45	47	35	25	15	11	25	35	19	5	0	0	0	0	0	0	20.1	49
29-Jan	0	Z	0	0	0	0	0	0	1	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	4
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	2	1	6	0	1	0	0	2	7	1	1.0	7
31-Jan	3	Z	0	1	4	1	2	8	9	17	8	2	1	6	1	1	0	0	0	0	0	0	0	0	2.8	17
	28.1	--	34.4	25.9	23.4	21.1	22.2	23.3	13.8	16.7	17.6	20.1	15.8	15.8	13.9	11.1	11.6	11.1	11.6	15.5	13.5	13.3	19.4	19.9	Diurnal Average	
	198	--	257	153	232	193	213	244	85	72	71	165	130	141	60	58	62	142	82	158	89	113	129	131	Diurnal Maximum	

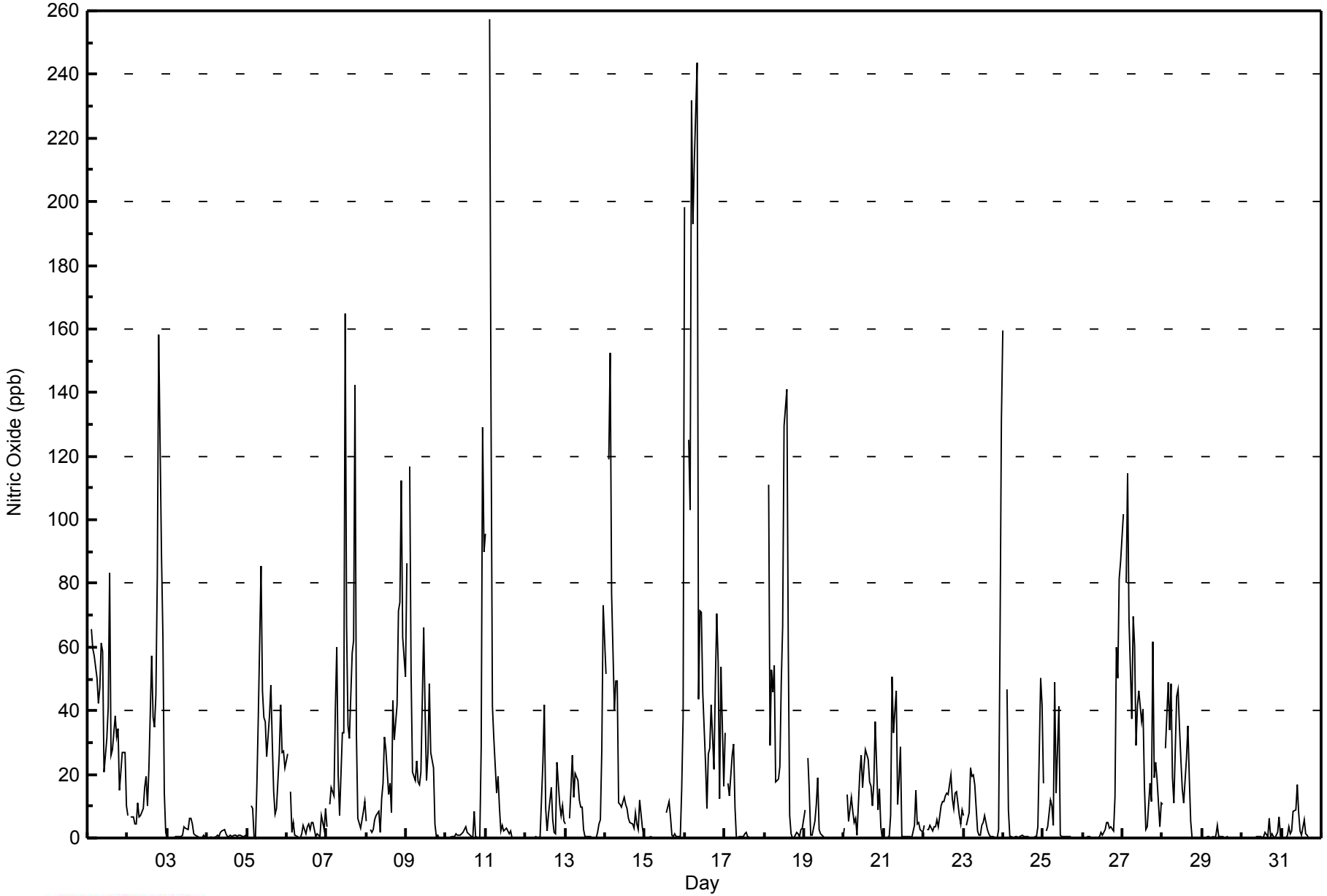
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	525	74.26	74.26
21 - 40	76	10.75	85.01
11 - 80	73	10.33	95.33
81 - 159	25	3.54	98.87
> 159	8	1.13	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitric Oxide (NO) - ppb

Millennium - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	80	101	9	4	3	4	19	86	28	29	19	18	13	33	43	36	525
21 - 40	2	1	1	0	0	0	2	12	15	21	15	1	0	0	4	2	76
11 - 80	1	2	2	1	0	0	8	14	14	11	17	0	0	1	2	0	73
81 - 159	0	0	0	0	1	2	7	6	2	6	1	0	0	0	0	0	25
> 159	0	0	0	0	0	0	3	3	1	1	0	0	0	0	0	0	8
Totals	83	104	12	5	4	6	39	121	60	68	52	19	13	34	49	38	707

Total Number of Valid Hours: 707

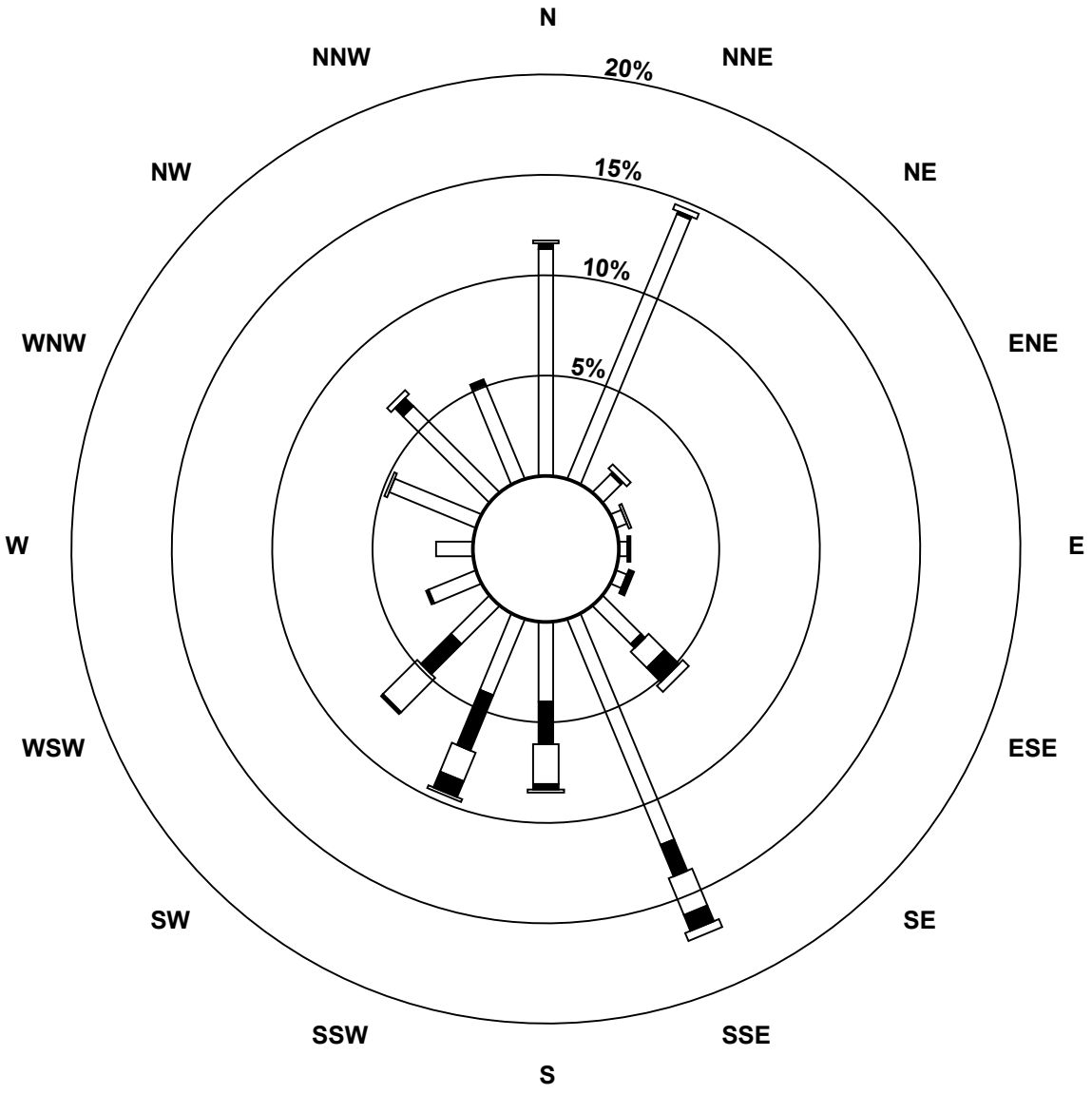
Total Number of Hours: 744

Wood Buffalo Environmental Association

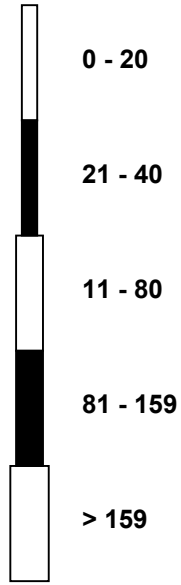
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Millennium (AMS 12)



Classes (ppb)



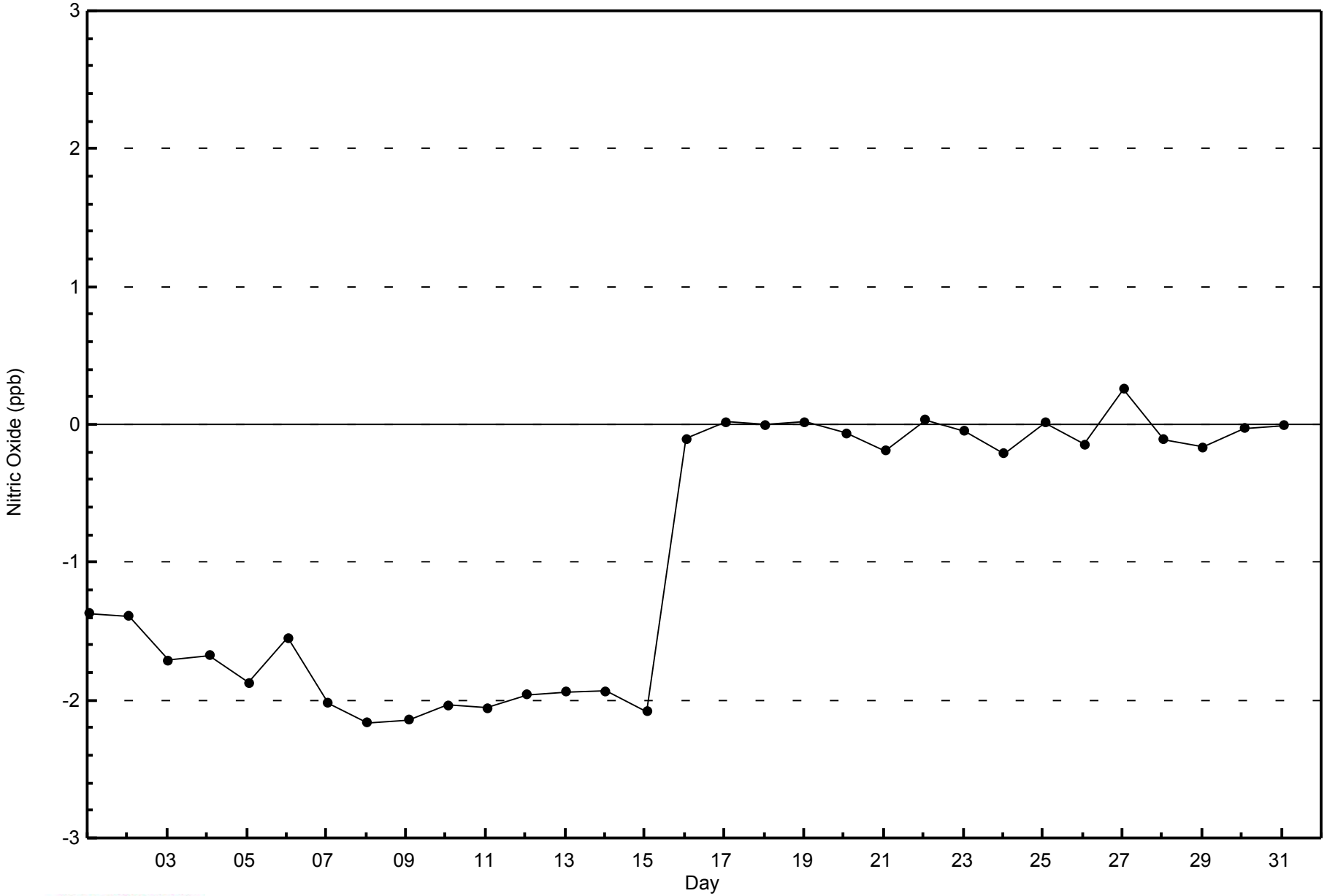
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Millennium - January 2014



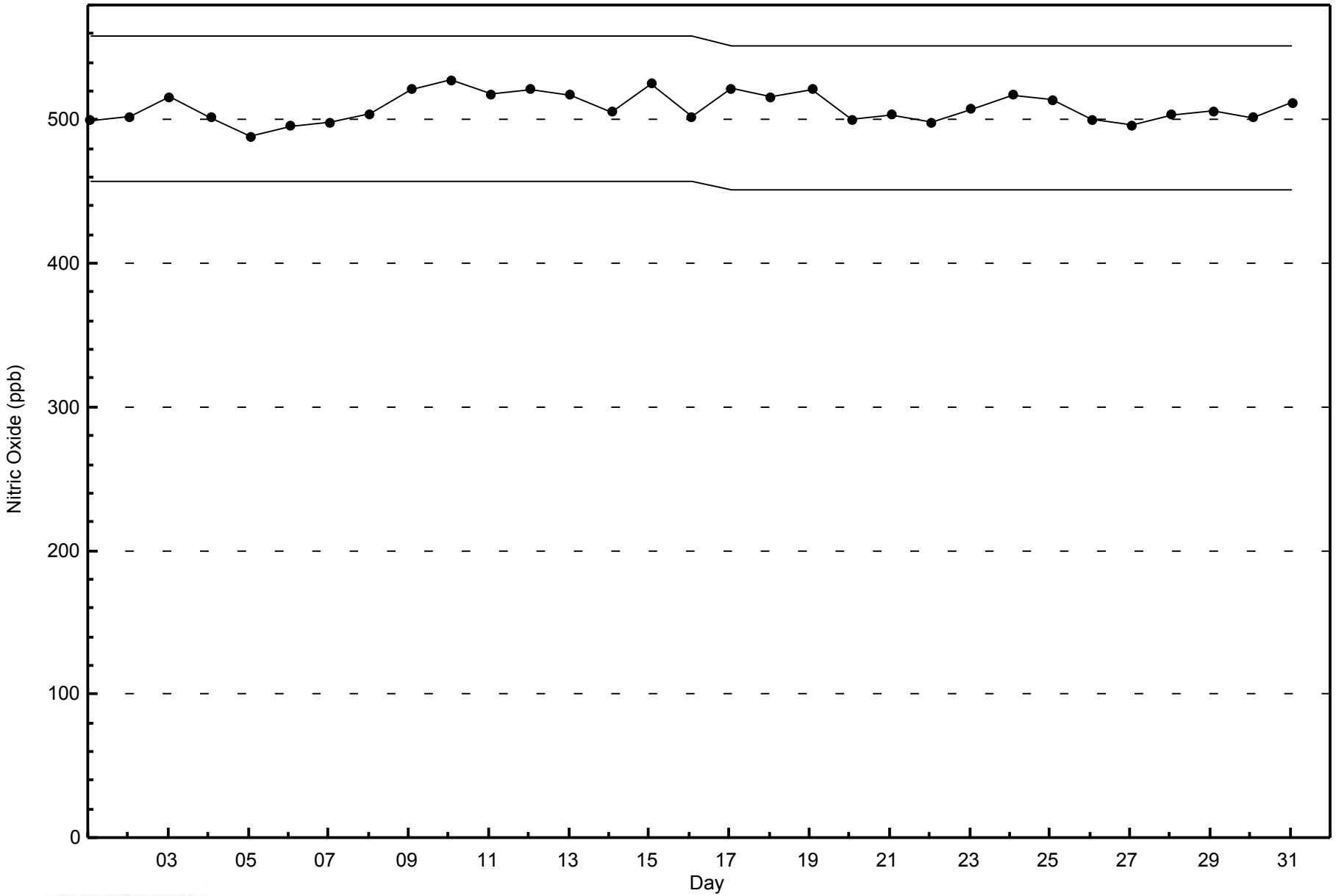
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 56 ppb on Jan 7 12:00 Maximum Daily Average: 36.2 ppb on Jan 16

Minimum Value: 1 ppb on Jan 24 13:00 Minimum Daily Average: 7.5 ppb on Jan 29
Maximum Diurnal Average: 23.5 ppb at hour 3 Minimum Diurnal Average: 13.5 ppb at hour 13
Monthly Average: 19.6 ppb Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 8$ Median = 20 $Q_3 = 30$ $P_{90} = 35$ $P_{99} = 45$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	28	Z	31	30	28	28	26	27	29	25	15	17	19	25	17	21	24	24	24	20	21	21	21	17	23.4	31
2-Jan	17	Z	17	17	15	18	23	21	21	19	19	20	16	21	29	27	27	29	31	37	35	33	25	13	23.0	37
3-Jan	3	Z	1	1	2	2	3	8	7	7	13	9	6	12	17	23	22	18	12	13	11	15	22	16	10.5	23
4-Jan	5	Z	9	6	5	10	16	9	15	14	14	7	3	2	2	5	13	15	12	15	17	18	15	13	10.4	18
5-Jan	14	Z	31	26	8	11	28	36	45	35	30	29	27	31	34	33	32	30	30	35	37	34	35	35	29.8	45
6-Jan	35	Z	26	17	23	11	10	9	7	12	17	9	12	13	11	21	27	17	16	17	15	23	25	30	17.4	35
7-Jan	31	Z	38	36	34	36	40	33	28	35	30	56	38	28	30	40	39	46	38	27	19	25	26	26	33.9	56
8-Jan	22	Z	13	14	17	23	28	28	17	29	27	31	28	24	30	26	34	35	34	39	36	45	35	34	28.2	45
9-Jan	42	Z	40	33	25	24	23	25	22	25	29	25	20	22	31	27	26	23	12	12	9	5	5	6	22.2	42
10-Jan	5	Z	8	14	12	13	15	12	18	13	8	9	8	7	5	7	11	23	9	8	12	27	40	35	13.7	40
11-Jan	34	Z	51	40	24	25	23	22	20	12	14	8	9	10	9	13	8	9	7	5	5	2	3	2	15.3	51
12-Jan	1	Z	2	2	3	7	4	6	5	9	26	34	17	7	16	32	30	26	22	37	32	28	31	26	17.6	37
13-Jan	23	Z	23	30	32	26	29	33	32	24	21	7	3	3	3	4	5	5	11	30	29	31	31	44	20.7	44
14-Jan	44	Z	48	54	44	38	37	36	25	28	20	20	17	18	19	21	22	20	27	22	22	31	23	17	28.4	54
15-Jan	9	Z	3	8	5	4	6	C	C	C	C	C	C	21	24	19	5	4	13	8	11	14	31	36	--	36
16-Jan	44	Z	38	36	44	43	46	50	36	35	36	33	27	20	30	32	37	36	36	38	38	32	36	32	36.2	50
17-Jan	31	Z	30	31	30	30	17	3	4	7	5	4	7	8	4	5	3	2	2	3	2	3	5	15	10.9	31
18-Jan	15	Z	40	35	34	33	34	31	30	29	30	32	38	41	34	20	17	11	12	16	20	18	20	26	26.7	41
19-Jan	29	Z	31	29	20	19	24	27	28	18	8	3	1	2	2	1	2	2	1	3	5	7	6	10	12.1	31
20-Jan	15	Z	29	23	24	24	19	19	8	25	23	17	20	24	24	24	28	27	29	31	26	28	21	8	22.4	31
21-Jan	12	Z	19	21	25	30	27	27	22	23	25	2	2	1	1	3	9	18	31	31	25	25	18	14	17.8	31
22-Jan	21	Z	18	16	20	17	18	17	21	13	17	14	14	17	19	24	30	29	29	30	29	22	21	25	20.9	30
23-Jan	21	Z	20	24	28	29	31	30	18	12	7	10	14	19	12	12	11	17	18	9	10	13	40	42	19.4	42
24-Jan	44	Z	38	28	22	11	7	2	5	3	2	3	1	1	1	2	3	3	12	23	21	32	40	40	15.0	44
25-Jan	32	Z	24	30	34	30	28	35	26	28	9	2	2	2	3	4	2	3	2	2	4	3	1	1	13.3	35
26-Jan	1	Z	1	1	3	3	3	5	3	2	2	5	4	8	17	22	27	32	28	33	36	36	38	39	15.1	39
27-Jan	47	Z	38	40	35	31	36	34	30	29	27	23	25	16	9	15	30	30	36	34	32	30	25	26	29.5	47
28-Jan	30	Z	33	36	33	33	28	30	36	33	29	22	20	19	30	33	32	31	6	2	1	3	3	3	22.9	36
29-Jan	5	Z	5	12	13	7	20	15	19	19	2	2	2	2	1	3	3	4	4	3	8	11	8	7	7.5	20
30-Jan	12	Z	7	10	12	17	12	5	5	5	2	2	2	2	5	6	20	11	14	17	7	26	35	18	10.9	35
31-Jan	31	Z	14	23	27	21	29	36	37	34	16	8	5	16	7	9	5	3	7	12	20	15	16	14	17.5	37
	22.7	--	23.5	23.3	22.0	21.1	22.2	22.3	20.5	20.0	17.4	15.4	13.5	14.2	15.3	17.1	18.8	18.8	18.3	19.6	19.2	21.1	22.5	21.5	Diurnal Average	
	47	--	51	54	44	43	46	50	45	35	36	56	38	41	34	40	39	46	38	39	38	45	40	44	Diurnal Maximum	

Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

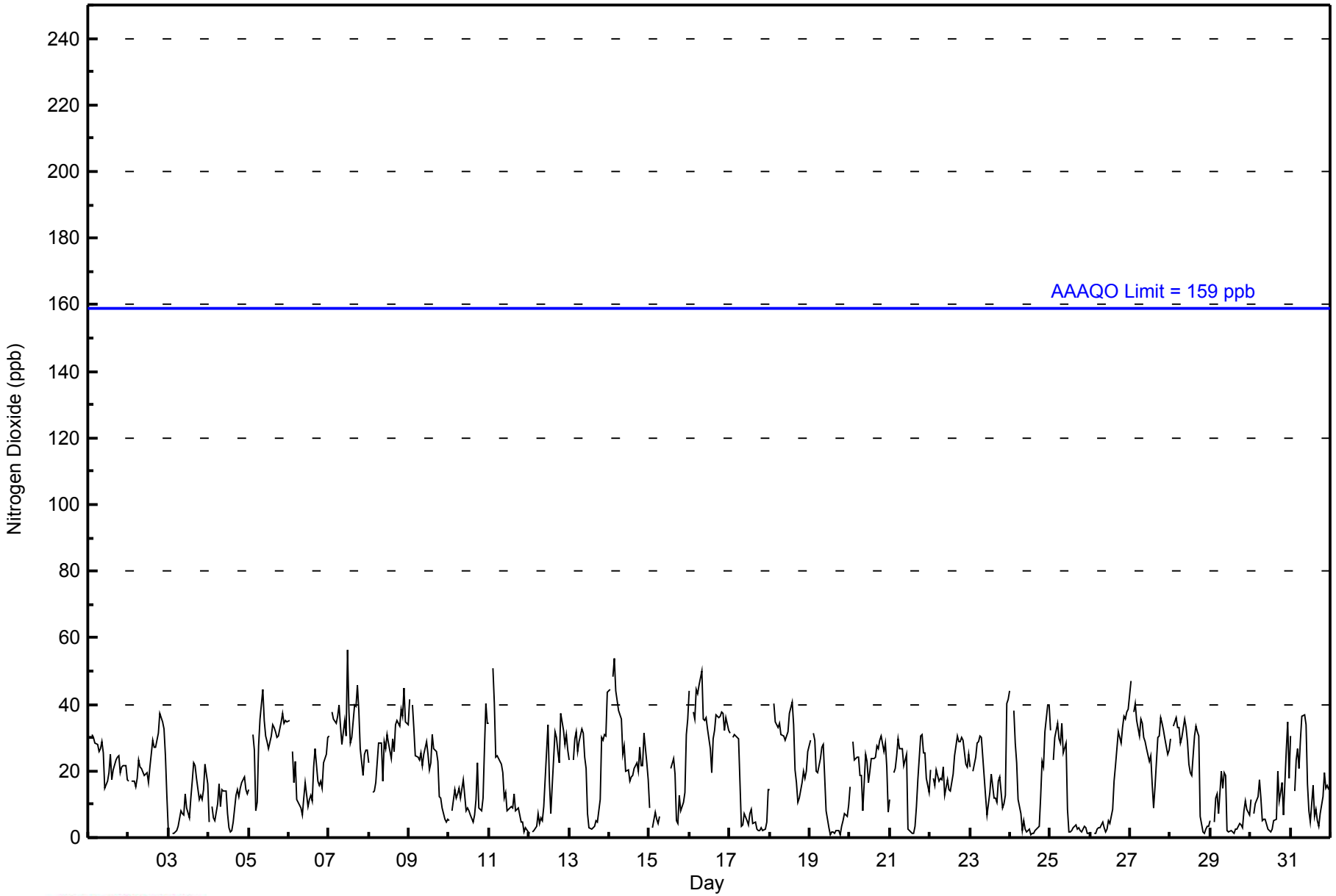
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	366	51.77	51.77
21 - 40	321	45.40	97.17
11 - 80	20	2.83	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	73	96	5	2	0	1	12	35	12	12	13	12	10	27	33	23	366
21 - 40	10	8	7	3	3	5	23	80	46	51	38	7	3	6	16	15	321
11 - 80	0	0	0	0	1	0	4	6	2	5	1	0	0	1	0	0	20
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	83	104	12	5	4	6	39	121	60	68	52	19	13	34	49	38	707

Total Number of Valid Hours: 707

Total Number of Hours: 744

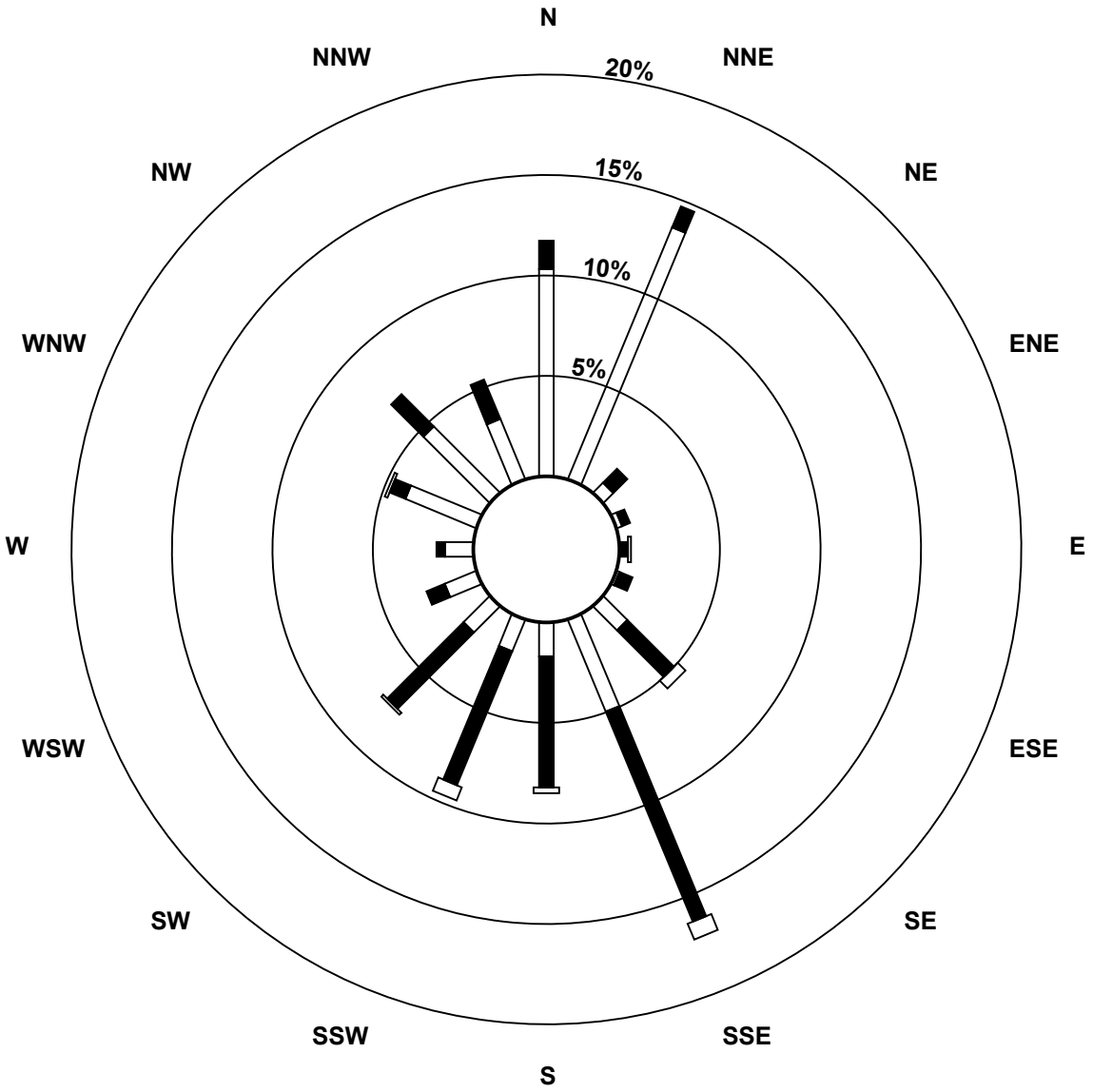
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

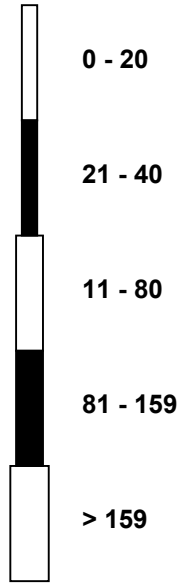
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Millennium (AMS 12)



Classes (ppb)



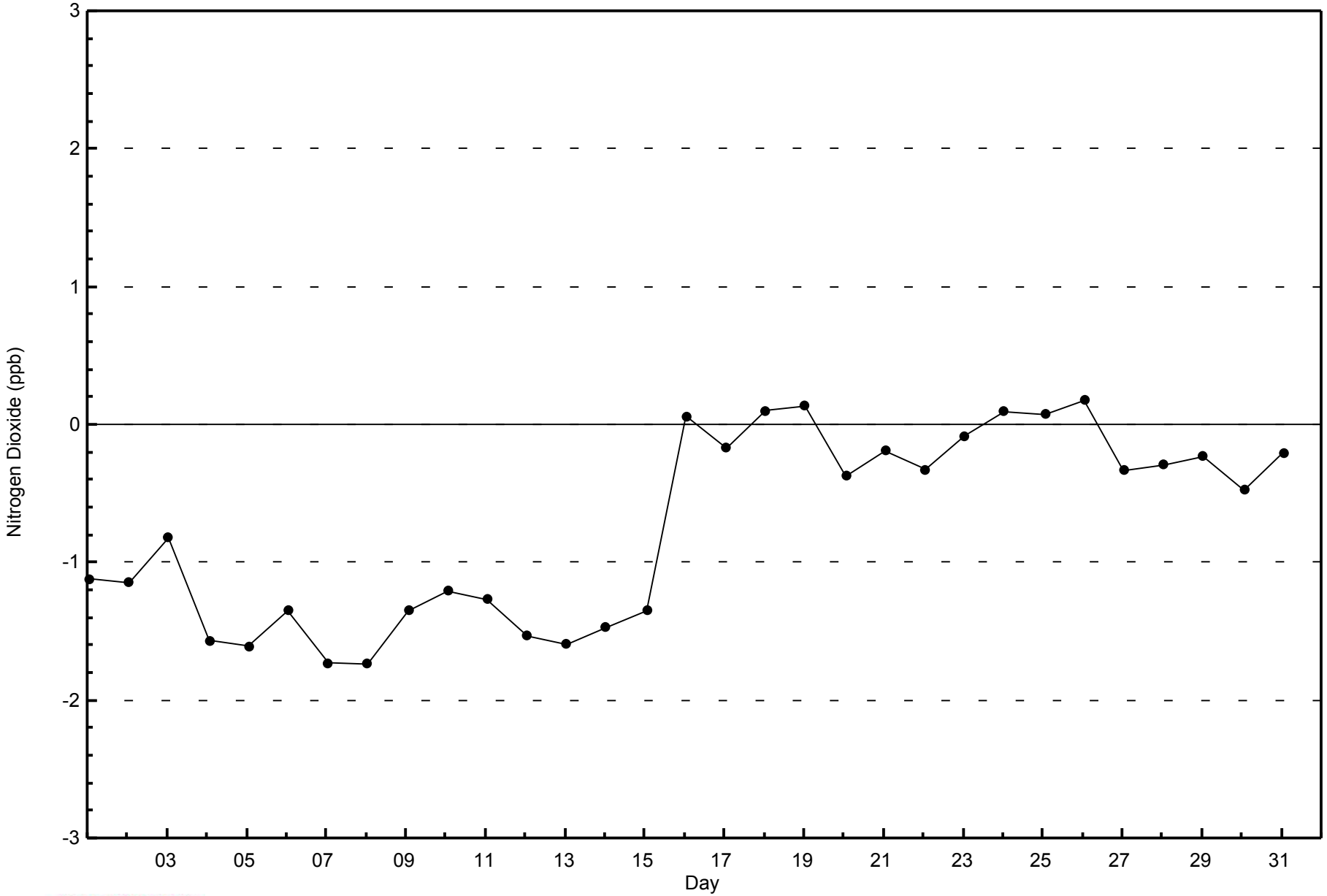
Total Number of Valid Hours: 707

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2014



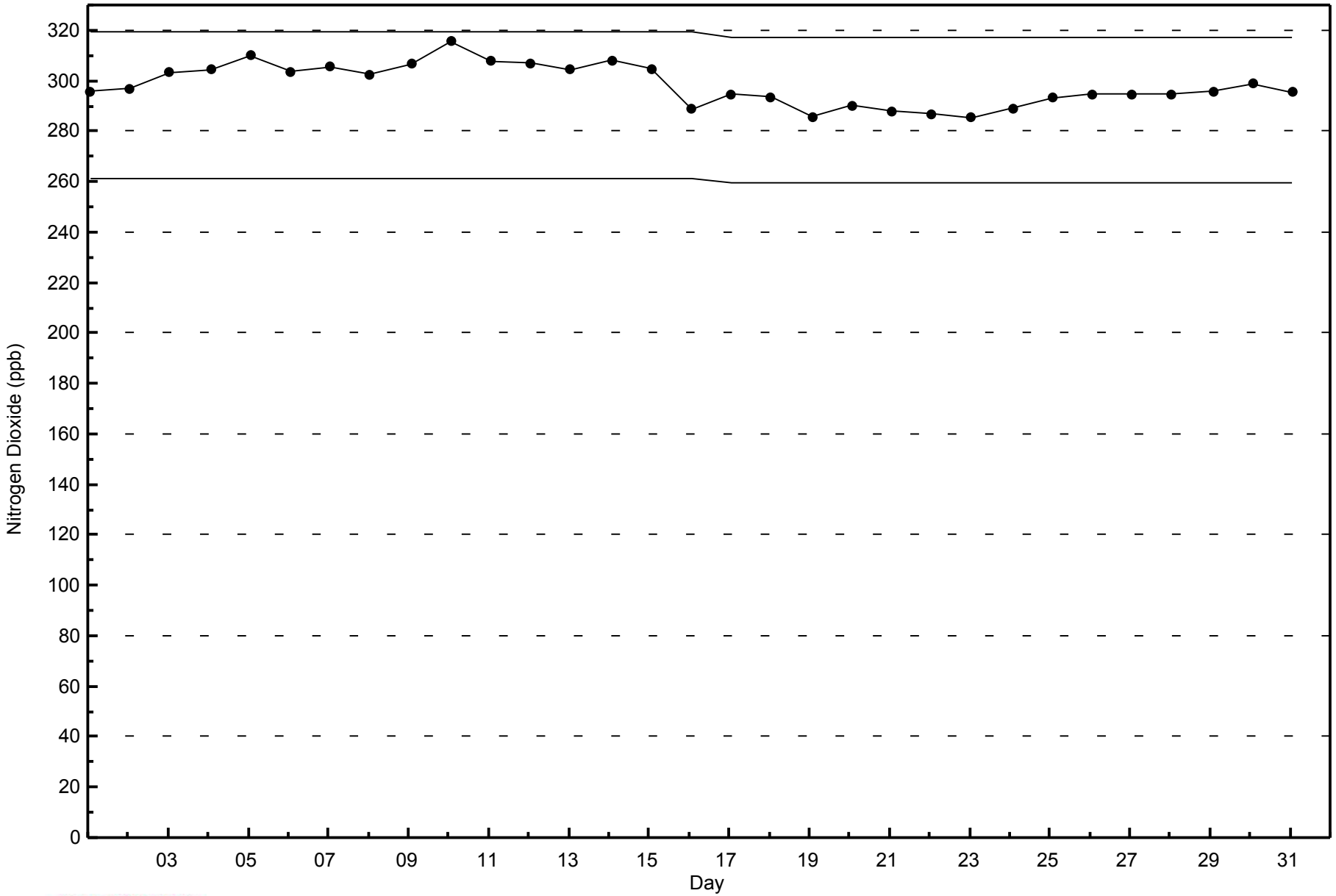
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2014

Maximum Value: 308 ppb on Jan 11 03:00

Maximum Daily Average: 120.9 ppb on Jan 16

Minimum Value: 1 ppb on Jan 19 13:00

Minimum Daily Average: 7.9 ppb on Jan 29

Maximum Diurnal Average: 57.9 ppb at hour 3

Minimum Diurnal Average: 28.2 ppb at hour 16

Monthly Average: 37.8 ppb

Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 9$ Median = 26 $Q_3 = 49$ $P_{90} = 85$ $P_{99} = 212$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	37
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	71	Z	96	90	86	78	68	74	90	84	36	48	60	109	43	48	62	56	59	35	42	48	48	27	63.4	109
2-Jan	24	Z	24	23	19	22	34	28	28	28	35	39	26	43	86	65	62	74	114	195	123	96	39	15	54.0	195
3-Jan	3	Z	1	2	2	2	4	8	7	7	17	12	9	18	23	27	23	19	12	13	11	15	23	16	11.9	27
4-Jan	5	Z	9	6	5	11	17	9	16	16	17	9	3	2	3	5	14	15	13	16	17	19	15	14	11.1	19
5-Jan	15	Z	41	36	8	11	44	73	130	81	68	66	52	69	82	63	46	38	39	61	79	61	63	57	55.8	130
6-Jan	62	Z	40	18	28	12	10	9	7	13	21	11	15	17	14	26	32	18	17	18	16	29	27	39	21.7	62
7-Jan	34	Z	48	52	48	78	100	53	35	68	63	221	104	64	62	98	102	188	71	33	22	31	35	38	71.6	221
8-Jan	28	Z	16	16	19	28	35	37	19	41	44	63	56	37	47	34	77	66	76	110	111	157	98	85	56.5	157
9-Jan	128	Z	157	84	45	42	48	43	38	46	95	65	39	49	79	53	48	27	13	13	9	5	4	5	49.4	157
10-Jan	5	Z	8	15	12	13	16	13	18	14	10	12	12	8	6	7	12	31	10	8	12	55	169	124	25.7	169
11-Jan	130	Z	308	174	66	56	37	41	29	14	18	10	12	12	10	16	8	9	7	5	5	1	3	2	42.3	308
12-Jan	1	Z	2	2	3	7	4	6	5	10	49	76	26	9	23	48	35	28	24	61	43	35	41	31	24.8	76
13-Jan	27	Z	30	45	58	39	49	51	43	34	30	10	3	3	3	4	5	5	12	32	33	37	58	117	31.7	117
14-Jan	96	Z	168	206	120	79	86	85	36	38	30	33	28	27	25	26	27	23	35	26	24	43	26	18	56.7	206
15-Jan	9	Z	3	8	5	4	6	C	C	C	C	C	C	29	35	25	6	5	14	9	11	14	47	74	--	74
16-Jan	242	Z	163	139	276	236	259	294	79	106	107	78	50	29	56	60	79	58	85	108	93	44	90	49	120.9	294
17-Jan	64	Z	48	44	56	59	26	3	4	7	6	4	8	10	5	5	2	2	2	3	2	3	5	15	16.7	64
18-Jan	15	Z	151	64	87	79	88	48	49	52	79	98	167	182	94	27	18	11	12	18	21	18	22	29	62.2	182
19-Jan	38	Z	57	43	21	20	29	38	47	21	9	3	1	2	1	1	2	2	1	3	5	7	6	10	16.0	57
20-Jan	18	Z	43	28	37	33	23	25	9	46	49	32	43	51	49	41	44	37	46	67	35	44	25	8	36.2	67
21-Jan	12	Z	20	21	32	80	60	73	32	42	54	3	2	2	2	4	9	18	34	46	30	30	20	15	27.8	80
22-Jan	25	Z	20	18	24	19	22	21	27	16	28	26	26	30	33	38	50	41	38	44	44	29	25	34	29.5	50
23-Jan	28	Z	24	32	50	48	51	47	21	13	8	14	18	26	14	13	11	17	18	9	10	15	102	173	33.3	173
24-Jan	203	Z	85	37	23	12	7	2	6	3	2	3	1	2	1	2	3	3	12	23	21	35	90	82	28.7	203
25-Jan	49	Z	26	33	46	40	32	83	40	70	10	2	2	3	3	4	3	3	2	2	4	3	1	1	20.1	83
26-Jan	1	Z	2	2	3	3	3	5	3	2	3	7	5	11	22	27	30	35	30	46	96	86	120	125	28.9	125
27-Jan	149	Z	118	155	104	68	105	95	59	70	73	59	65	32	12	19	47	42	98	53	56	48	28	38	69.3	155
28-Jan	40	Z	61	85	67	82	48	41	80	80	64	47	35	29	56	69	50	36	7	2	1	3	3	3	42.9	85
29-Jan	5	Z	5	12	13	7	20	15	20	23	3	2	3	2	1	3	3	4	4	3	8	11	8	7	7.9	23
30-Jan	12	Z	7	10	12	17	12	5	5	6	3	2	2	3	7	6	26	11	15	17	7	28	41	19	11.9	41
31-Jan	33	Z	14	24	30	22	32	45	45	51	24	10	6	21	8	9	5	3	7	12	20	15	16	14	20.3	51
	50.8	--	57.9	49.2	45.4	42.2	44.4	45.6	34.3	36.7	35.1	35.5	29.3	30.0	29.2	28.2	30.3	29.9	29.9	35.2	32.6	34.4	41.9	41.4	Diurnal Average	
	242	--	308	206	276	236	259	294	130	106	107	221	167	182	94	98	102	188	114	195	123	157	169	173	Diurnal Maximum	

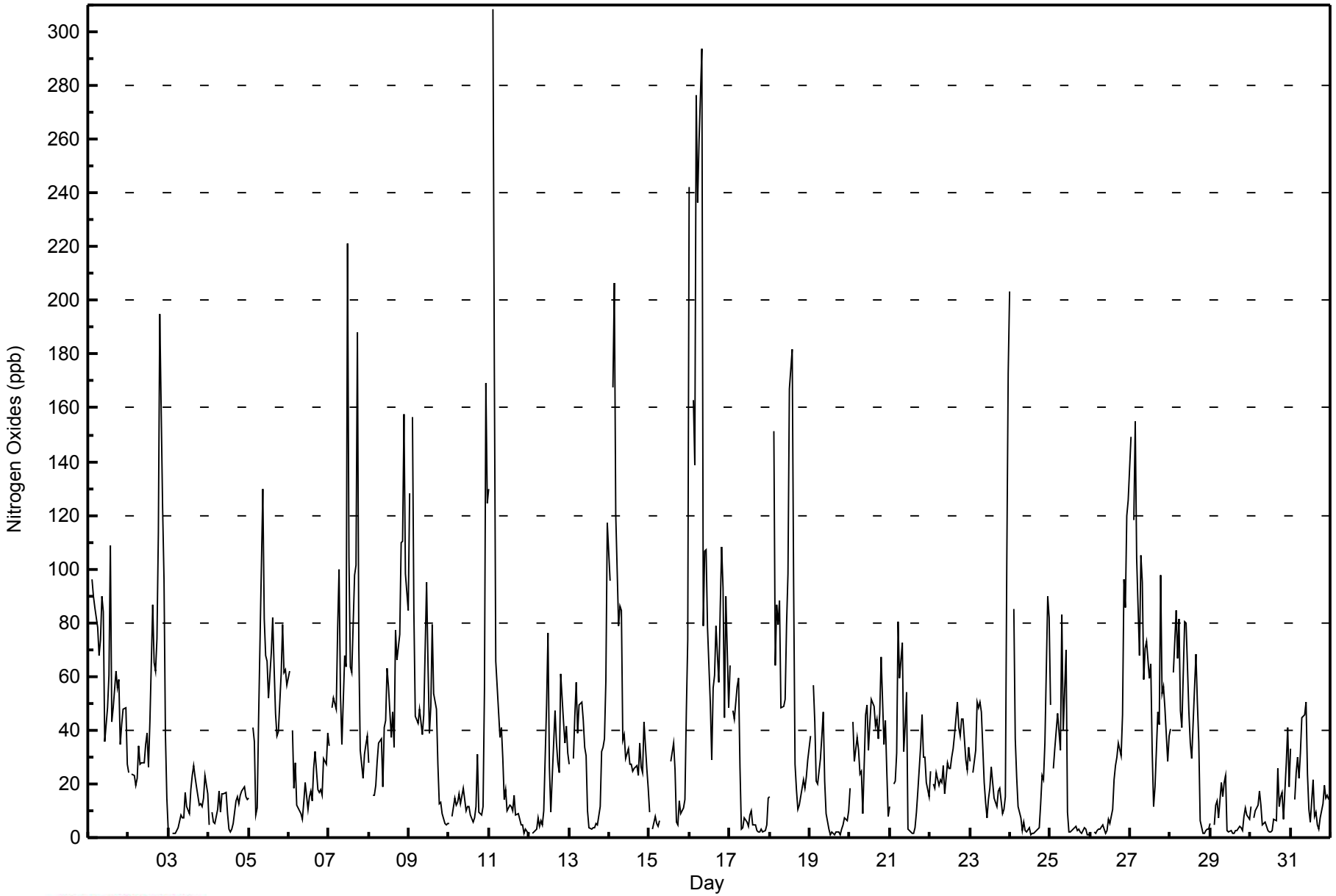
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	308	43.56	43.56
21 - 40	159	22.49	66.05
11 - 80	159	22.49	88.54
81 - 159	62	8.77	97.31
> 159	18	2.55	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	68	94	4	2	0	1	8	19	3	5	7	10	10	27	29	21	308
21 - 40	10	4	5	2	1	2	9	51	18	15	8	5	1	5	11	12	159
11 - 80	5	5	3	1	2	1	7	32	26	32	25	4	2	1	8	5	159
81 - 159	0	1	0	0	0	1	8	13	12	14	11	0	0	1	1	0	62
> 159	0	0	0	0	1	1	7	6	1	2	0	0	0	0	0	0	18
Totals	83	104	12	5	4	6	39	121	60	68	51	19	13	34	49	38	706

Total Number of Valid Hours: 707

Total Number of Hours: 744

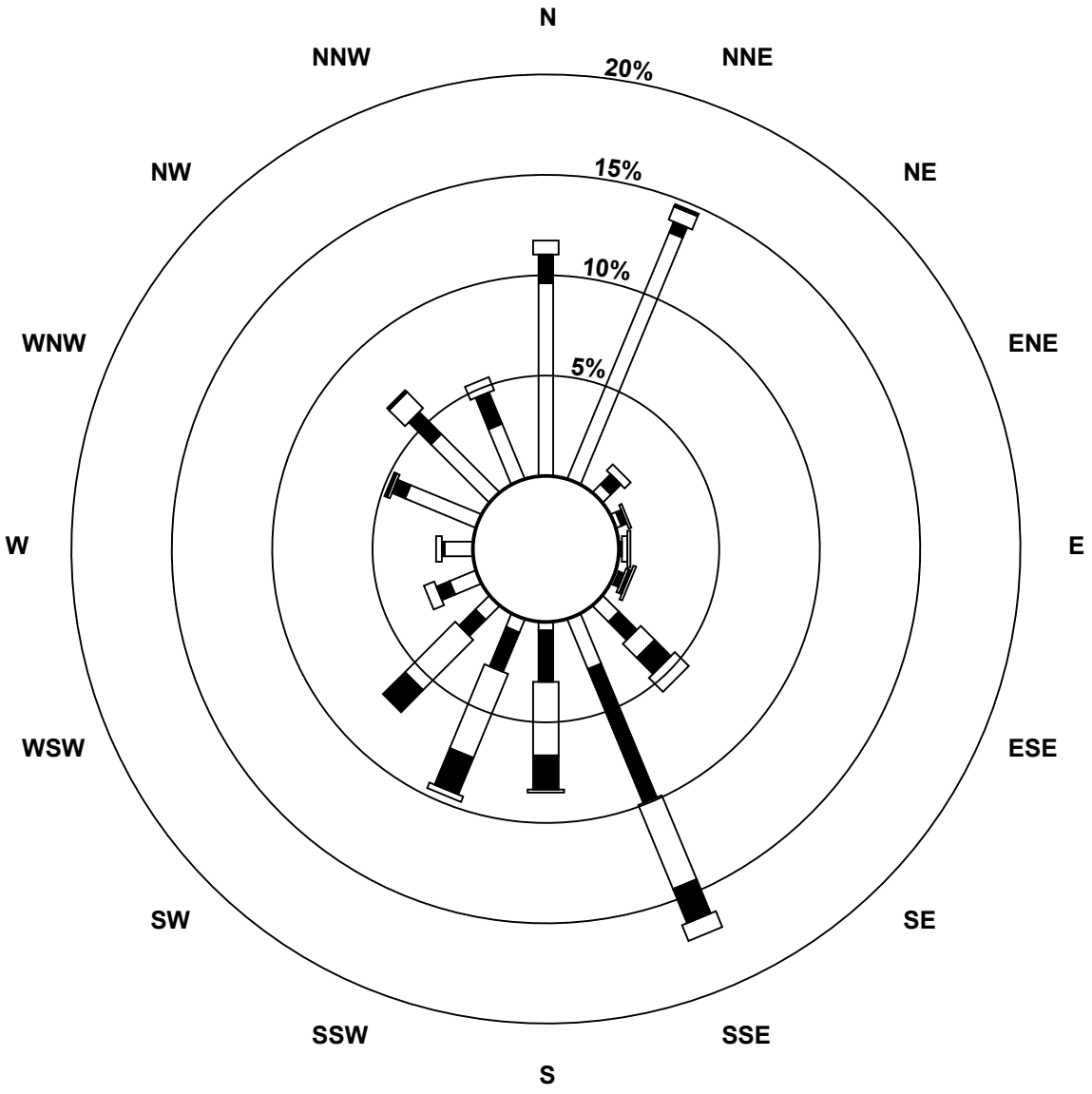
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

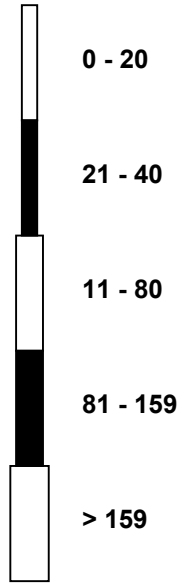
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Millennium (AMS 12)



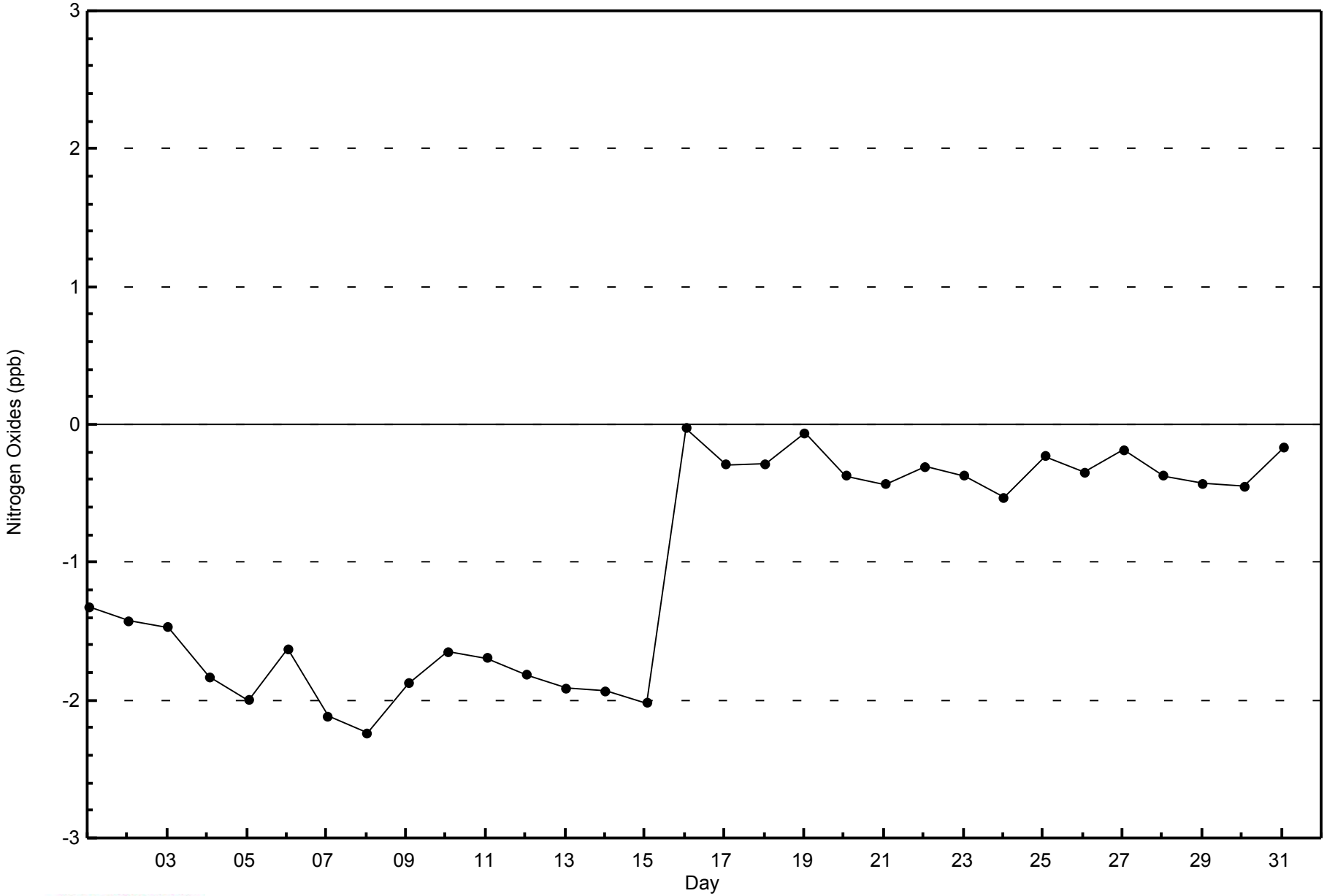
Classes (ppb)



Total Number of Valid Hours: 707

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Millennium - January 2014



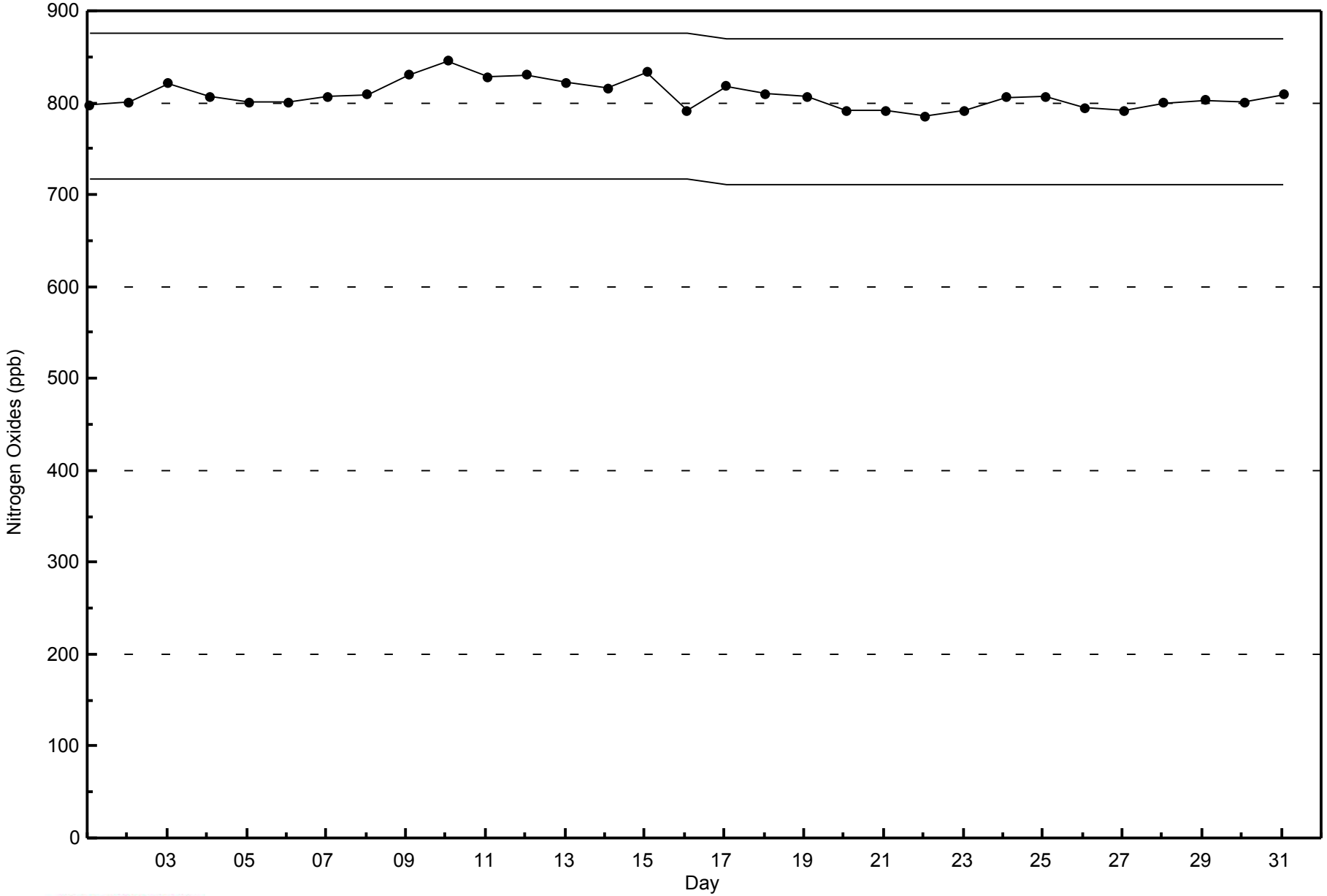
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Millennium - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 81.6 $\mu g/m^3$ on Jan 1 09:00

Maximum Daily Average: 15.0 $\mu g/m^3$ on Jan 1

Minimum Value: 0.3 $\mu g/m^3$ on Jan 15 06:00

Minimum Daily Average: 2.2 $\mu g/m^3$ on Jan 30

Maximum Diurnal Average: 10.3 $\mu g/m^3$ at hour 9

Minimum Diurnal Average: 4.5 $\mu g/m^3$ at hour 16

Monthly Average: 6.12 $\mu g/m^3$

Percentiles: P_1 = 0.6 P_{10} = 1.7 Q_1 = 2.6 Median = 4.1 Q_3 = 7.4 P_{90} = 13.8 P_{99} = 32.2

Hours in Service:	744
Hours of Data:	719
Hours of Missing Data:	25
Hours of Calibration:	0
Percent Operational Time:	96.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	14.4	8.0	20.3	20.1	17.9	14.5	12.5	10.0	81.6	10.7	5.2	6.1	11.3	8.2	5.2	4.5	12.9	13.8	41.1	17.0	8.9	6.5	5.7	3.6	15.0	81.6
2-Jan	4.5	4.1	3.2	3.1	2.8	2.9	3.0	2.8	3.2	3.1	3.3	3.9	14.0	10.7	18.2	9.4	11.3	21.0	18.6	16.2	13.5	9.6	4.6	3.6	7.9	21.0
3-Jan	3.0	3.5	2.9	2.6	2.5	2.4	2.5	2.7	2.6	2.7	3.2	2.8	2.6	3.3	3.1	3.5	4.5	3.7	2.6	4.7	4.6	5.4	4.6	3.2	3.3	5.4
4-Jan	2.4	2.9	3.1	2.6	2.2	2.6	4.3	2.6	2.6	2.6	3.2	3.7	2.9	3.9	4.2	4.0	4.5	3.5	4.5	6.6	6.6	6.4	5.6	4.5	3.8	6.6
5-Jan	5.2	7.9	6.9	7.3	3.7	4.4	42.8	33.1	44.2	25.2	5.5	10.4	2.6	2.4	2.9	3.2	2.3	2.1	2.3	3.3	4.5	3.5	2.7	3.0	9.6	44.2
6-Jan	2.7	3.1	3.2	2.2	2.1	1.7	1.8	2.2	2.2	2.6	2.7	2.3	2.1	1.8	1.7	2.0	1.7	1.5	1.5	1.6	1.7	2.5	2.9	3.0	2.2	3.2
7-Jan	3.0	3.2	3.7	4.4	4.1	5.0	9.1	8.2	8.1	13.9	9.8	25.6	10.8	8.2	7.2	9.5	8.2	11.8	6.0	5.5	3.3	3.2	3.2	4.1	7.5	25.6
8-Jan	3.9	2.8	2.6	2.6	2.8	3.4	3.8	3.8	4.0	6.3	7.1	8.0	9.2	9.1	10.1	11.7	16.2	14.3	16.0	15.0	17.0	15.9	16.1	13.8	9.0	17.0
9-Jan	14.2	14.1	16.4	11.2	14.3	16.3	20.4	17.8	19.8	16.5	17.2	14.6	13.6	14.1	15.8	14.2	17.1	19.9	8.0	9.2	10.5	8.8	7.1	5.9	14.0	20.4
10-Jan	5.3	4.3	3.4	2.7	2.6	3.4	4.2	3.7	4.4	4.3	3.7	3.5	3.5	3.3	3.1	3.0	3.1	4.3	3.0	2.7	2.7	5.3	10.1	7.2	4.0	10.1
11-Jan	8.4	12.2	15.8	11.6	5.2	4.7	4.5	4.2	4.7	5.8	3.9	2.6	2.7	2.6	3.0	3.3	2.3	1.9	1.7	1.8	1.7	1.7	1.6	1.4	4.6	15.8
12-Jan	1.4	1.4	1.4	1.2	1.4	1.7	2.1	1.8	2.1	1.9	3.6	4.4	2.7	1.7	2.1	3.1	2.8	2.4	2.2	2.6	2.9	3.1	3.7	5.2	2.5	5.2
13-Jan	4.8	3.8	6.0	6.8	7.3	5.4	6.1	6.2	5.9	6.7	7.0	2.7	1.9	1.9	1.9	2.0	2.2	2.4	3.0	4.3	4.3	5.2	5.9	8.8	4.7	8.8
14-Jan	8.7	12.9	14.2	16.1	9.3	6.9	7.4	8.1	4.0	3.7	4.9	5.0	4.1	3.9	3.6	3.2	2.6	1.8	2.0	1.6	1.8	2.5	2.1	1.8	5.5	16.1
15-Jan	1.3	0.7	0.6	0.4	0.3	0.3	0.4	1.0	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	1.3
16-Jan	AF	AF	AF	AF	AF	AF	AF	AF	4.1	5.0	M	5.2	4.6	3.5	6.3	7.0	8.4	5.4	7.5	7.9	7.4	4.6	7.4	5.0	--	8.4
17-Jan	5.8	4.4	4.2	4.6	6.1	5.9	3.0	1.3	1.1	1.1	0.9	0.6	1.9	2.2	1.4	1.2	0.3	0.6	0.7	0.9	0.9	1.0	1.3	2.1	2.2	6.1
18-Jan	3.2	15.9	10.6	5.6	5.5	5.5	6.8	5.2	5.2	6.3	8.6	8.6	13.1	15.9	9.2	4.5	4.1	3.5	3.4	3.9	4.4	4.3	8.0	12.4	7.2	15.9
19-Jan	13.9	13.3	18.7	29.0	19.6	15.7	20.2	20.5	20.1	6.4	2.1	2.1	2.2	2.5	2.8	3.8	4.3	4.4	4.3	4.1	4.0	3.9	3.8	4.1	9.4	29.0
20-Jan	4.7	5.1	5.6	5.1	6.1	5.9	5.1	4.6	4.2	5.8	6.4	5.4	6.2	6.2	6.2	5.5	4.9	4.6	5.2	6.9	7.4	12.7	11.1	3.9	6.0	12.7
21-Jan	4.8	5.0	4.7	4.9	5.8	7.5	6.7	7.2	6.2	8.6	8.5	2.7	2.4	1.9	1.5	1.5	1.5	1.9	2.4	2.6	2.9	2.9	2.2	2.1	4.1	8.6
22-Jan	2.4	2.8	2.6	2.8	3.0	3.2	3.0	3.0	3.2	3.0	3.1	2.5	2.3	3.0	3.0	3.3	5.6	5.6	6.1	6.0	6.4	6.7	7.5	9.2	4.1	9.2
23-Jan	8.2	9.0	8.8	9.1	10.2	8.6	8.6	7.4	5.2	4.1	3.2	4.0	5.8	7.2	2.7	2.1	1.7	3.2	3.6	1.9	2.0	3.2	7.9	9.5	5.7	10.2
24-Jan	12.6	8.6	9.7	7.4	5.4	2.5	1.4	1.0	0.8	0.7	0.6	0.8	0.6	0.7	0.7	0.7	0.8	0.9	1.6	2.3	3.0	4.9	9.2	7.6	3.5	12.6
25-Jan	6.0	1.9	2.0	2.8	5.1	11.9	8.8	16.3	8.0	8.1	2.7	0.9	0.9	1.0	1.0	1.0	1.0	1.4	1.8	1.6	2.2	2.7	1.9	2.5	3.9	16.3
26-Jan	3.1	4.0	4.7	5.4	5.6	6.3	6.5	6.0	6.0	5.7	5.9	6.1	5.6	5.7	7.4	10.5	11.8	12.0	11.9	13.6	16.4	15.7	15.9	16.0	8.7	16.4
27-Jan	23.2	23.9	20.7	27.4	40.3	20.4	19.8	19.0	34.3	23.0	13.8	9.3	8.9	4.5	2.2	2.5	4.9	4.7	7.1	5.5	6.3	5.5	9.5	13.5	14.6	40.3
28-Jan	10.9	9.4	8.5	12.3	10.1	9.3	6.4	6.6	10.9	12.4	10.1	7.6	8.1	9.2	10.7	10.2	7.3	6.1	3.1	2.9	3.4	3.9	4.4	4.1	7.8	12.4
29-Jan	3.8	3.6	3.3	3.5	3.2	2.8	4.1	3.4	3.6	3.7	2.3	1.8	2.3	1.8	1.7	1.6	1.6	1.6	2.1	1.6	1.9	2.2	2.1	2.2	2.6	4.1
30-Jan	1.7	2.0	1.7	2.3	3.0	2.4	2.0	1.5	1.4	1.3	1.3	1.3	1.3	1.2	1.3	1.3	2.0	2.0	2.9	3.4	2.5	3.4	4.7	4.2	2.2	4.7
31-Jan	7.2	4.4	3.3	3.7	4.6	2.8	6.9	5.6	5.8	6.1	3.3	2.2	1.8	5.3	2.4	2.5	2.0	1.4	1.6	1.9	2.8	2.8	2.5	2.4	3.6	7.2
	6.5	6.6	7.1	7.4	7.1	6.2	7.8	7.2	10.3	6.9	5.3	5.2	5.1	4.9	4.8	4.5	5.1	5.5	5.9	5.3	5.3	5.3	5.8	5.7	Diurnal Average	
	23.2	23.9	20.7	29.0	40.3	20.4	42.8	33.1	81.6	25.2	17.2	25.6	14.0	15.9	18.2	14.2	17.1	21.0	41.1	17.0	17.0	15.9	16.1	16.0	Diurnal Maximum	

M - Maintenance AF - Analyzer Failure

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

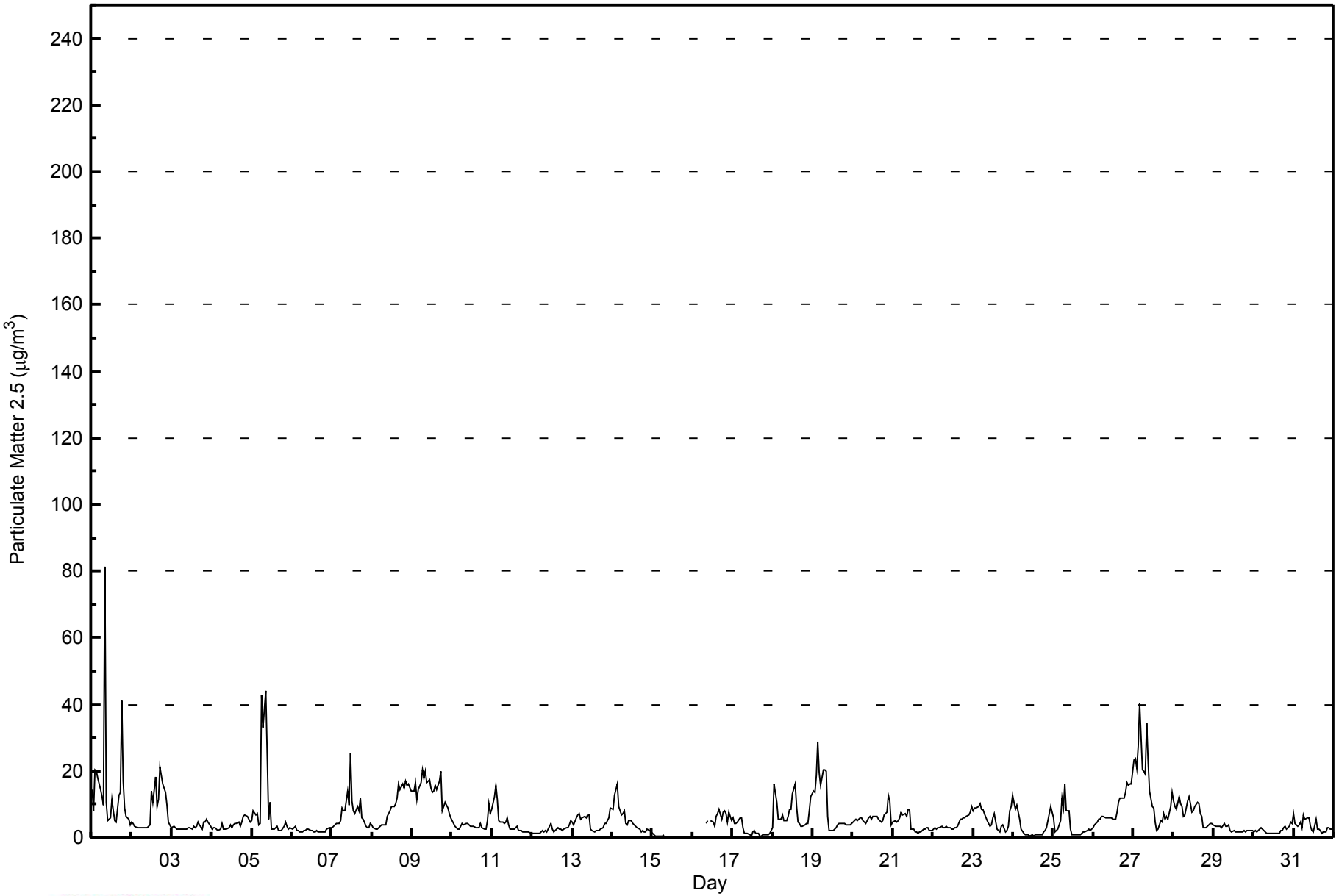
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

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

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	426	59.25	59.25
6 - 15	210	29.21	88.46
16 - 25	46	6.40	94.85
26 - 80	9	1.25	96.11
> 81.0	1	0.14	96.24

Total Number of Valid Hours: 719

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Millennium - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	64	77	7	2	3	4	24	78	24	26	11	14	11	22	29	30	426
6 - 15	15	11	4	4	0	2	10	38	32	32	26	5	3	7	16	5	210
16 - 25	2	1	1	0	1	1	3	6	7	10	9	0	0	0	1	4	46
26 - 80	0	1	0	0	0	0	0	0	0	3	5	0	0	0	0	0	9
> 81.0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	81	90	12	6	4	7	37	122	63	71	52	19	14	29	46	39	692

Total Number of Valid Hours: 719

Total Number of Hours: 744

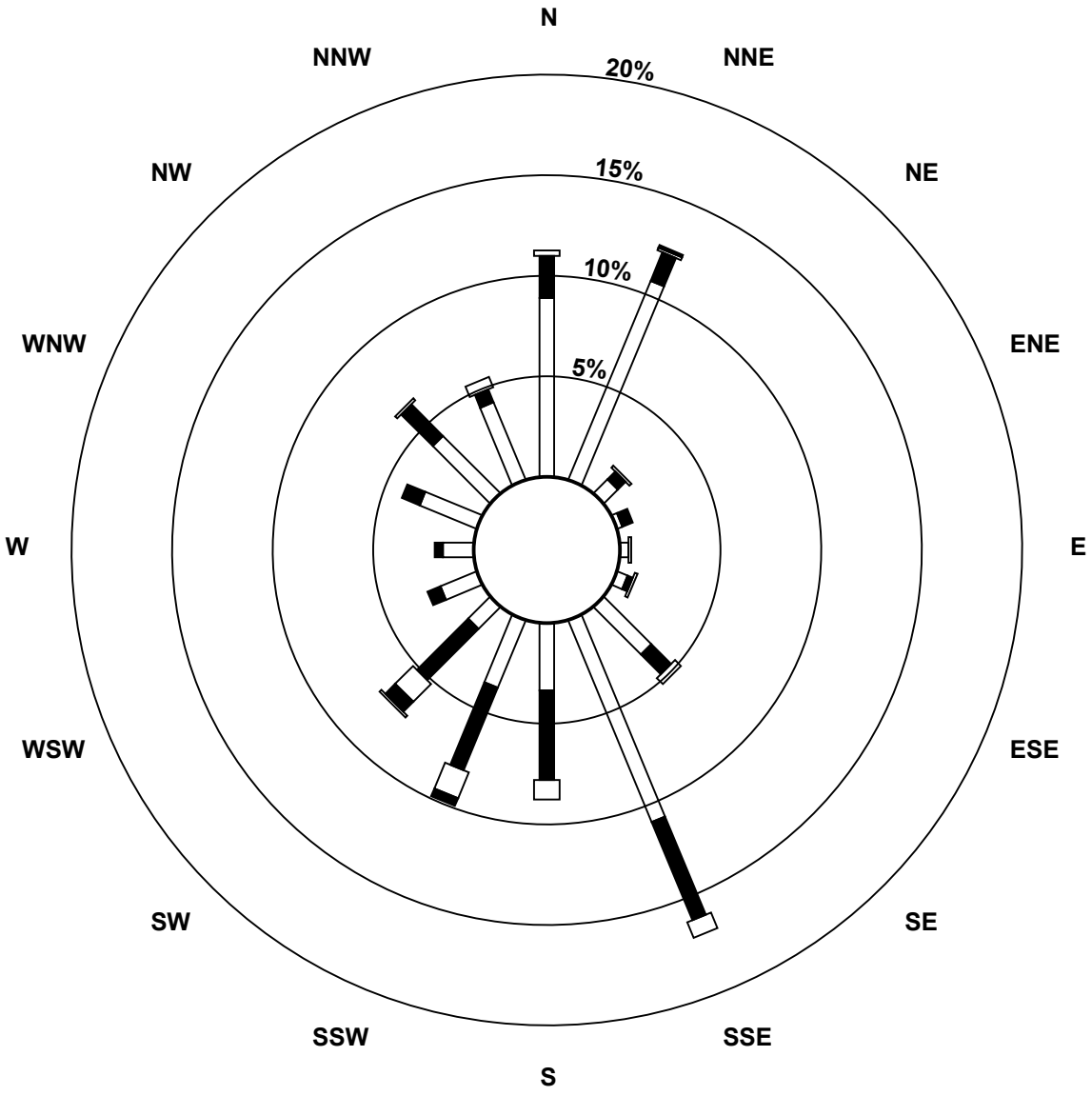
AURORA ATMOSPHERICS INC.

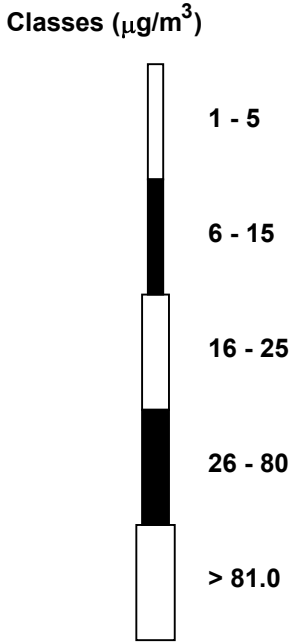
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Millennium (AMS 12)





Total Number of Valid Hours: 719

Maximum Value: 6.0 C on Jan 17 15:00

Maximum Daily Average: 0.8 C on Jan 15

Minimum Value: -37.2 C on Jan 1 10:00

Minimum Daily Average: -33.0 C on Jan 1

Maximum Diurnal Average: -14.0 C at hour 15

Minimum Diurnal Average: -17.9 C at hour 6

Monthly Average: -16.41 C

Percentiles: P_1 = -34.8 P_{10} = -28.0 Q_1 = -23.4 Median = -16.5 Q_3 = -10.4 P_{90} = -2.3 P_{99} = 5.1

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

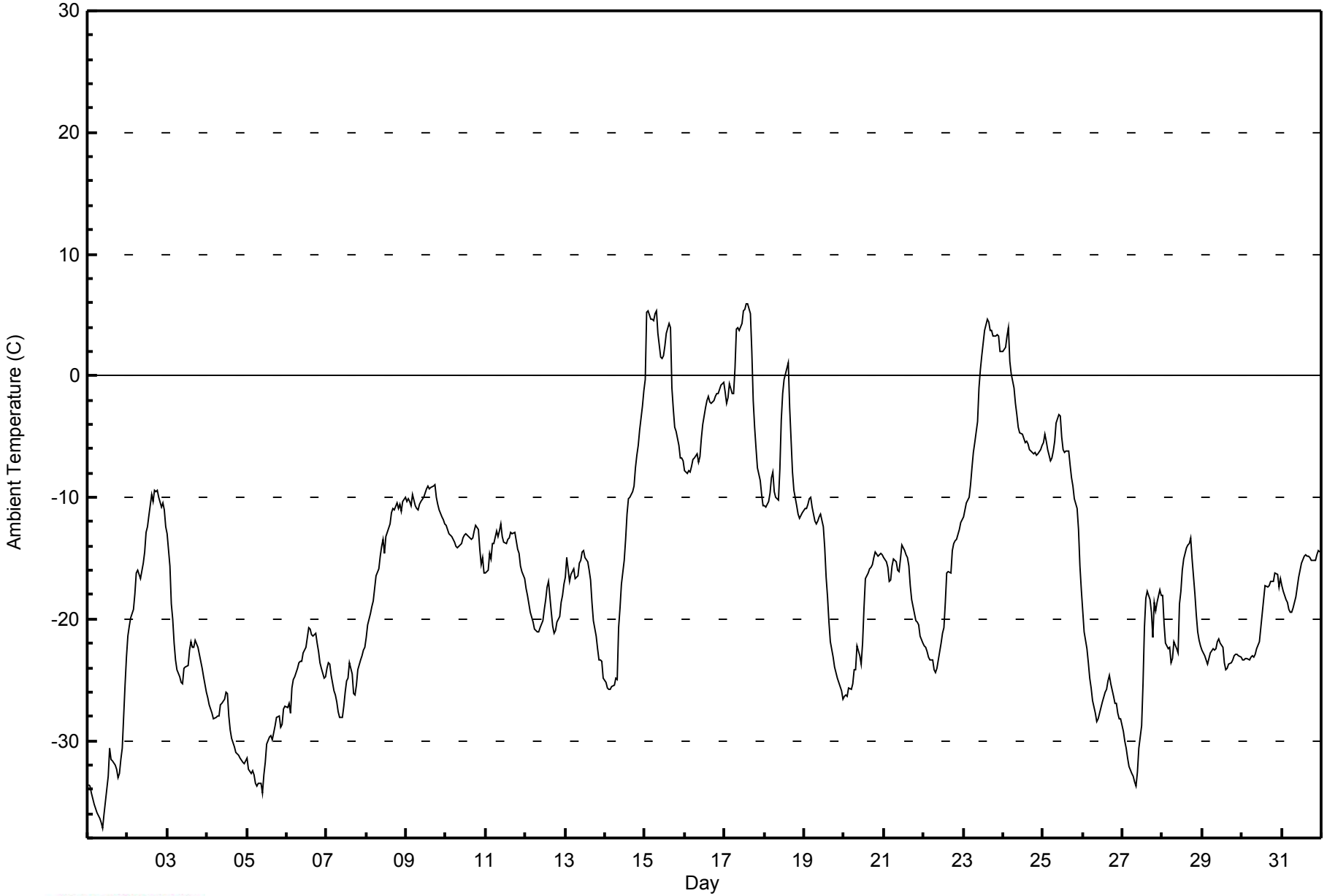
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-33.6	-33.8	-34.3	-34.8	-35.2	-35.9	-36.1	-36.3	-36.8	-37.2	-36.0	-34.0	-32.9	-30.6	-31.6	-31.7	-32.1	-32.4	-33.0	-32.8	-31.5	-30.6	-25.4	-23.1	-33.0	-23.1
2-Jan	-21.4	-20.6	-19.9	-19.3	-18.0	-16.3	-16.0	-16.3	-16.6	-15.4	-14.5	-12.9	-12.4	-11.4	-9.8	-10.4	-9.4	-9.6	-9.4	-10.1	-10.7	-10.5	-11.1	-12.4	-13.9	-9.4
3-Jan	-13.0	-15.6	-18.7	-20.0	-22.0	-23.4	-24.2	-24.7	-25.2	-25.3	-24.0	-23.9	-23.8	-22.5	-21.8	-22.3	-22.4	-21.8	-22.3	-22.9	-23.5	-24.0	-24.7	-26.0	-22.4	-13.0
4-Jan	-26.5	-27.1	-27.4	-27.8	-28.2	-28.1	-28.0	-28.0	-27.0	-26.9	-26.5	-26.0	-26.1	-27.9	-29.1	-29.9	-30.5	-30.9	-31.0	-31.2	-31.4	-31.8	-31.9	-31.6	-28.8	-26.0
5-Jan	-31.5	-32.4	-32.7	-32.5	-32.8	-33.5	-33.7	-33.6	-33.5	-34.3	-32.8	-31.8	-30.3	-29.7	-29.6	-29.9	-29.3	-28.8	-28.1	-27.9	-28.9	-28.6	-27.4	-27.1	-30.9	-27.1
6-Jan	-27.3	-27.0	-27.8	-25.7	-25.0	-24.8	-24.1	-23.6	-23.5	-23.5	-22.8	-22.3	-21.5	-20.8	-20.8	-21.2	-21.4	-21.2	-22.0	-22.6	-23.6	-24.1	-24.8	-24.7	-23.6	-20.8
7-Jan	-24.0	-23.6	-23.7	-24.6	-25.9	-26.3	-26.8	-27.7	-28.1	-28.1	-27.1	-26.0	-25.1	-24.9	-23.6	-24.6	-26.1	-26.2	-25.5	-24.2	-23.3	-23.1	-22.6	-22.3	-25.1	-22.3
8-Jan	-21.6	-20.5	-19.6	-19.0	-18.5	-17.5	-16.5	-15.8	-14.8	-14.0	-13.4	-14.6	-13.3	-12.6	-12.2	-11.3	-10.9	-11.1	-10.4	-10.9	-10.5	-11.1	-10.3	-10.0	-14.2	-10.0
9-Jan	-10.4	-10.1	-10.4	-10.7	-9.8	-10.7	-10.9	-11.0	-10.5	-10.4	-10.0	-9.7	-9.3	-9.1	-9.3	-9.2	-9.1	-9.0	-10.0	-10.5	-11.0	-11.6	-11.9	-12.2	-10.3	-9.0
10-Jan	-12.4	-12.6	-13.0	-13.3	-13.5	-13.7	-14.1	-14.1	-13.9	-13.8	-13.4	-13.2	-13.0	-13.1	-13.4	-13.4	-13.3	-12.8	-12.4	-12.7	-14.3	-15.5	-14.9	-16.2	-13.6	-12.4
11-Jan	-16.3	-16.0	-14.6	-15.1	-13.8	-13.8	-12.8	-13.2	-12.8	-12.2	-13.2	-13.7	-13.7	-13.5	-13.4	-12.9	-13.0	-12.8	-13.5	-14.3	-14.6	-15.6	-16.2	-16.7	-14.1	-12.2
12-Jan	-17.5	-18.0	-18.8	-19.4	-20.2	-20.8	-21.0	-21.1	-21.1	-20.7	-20.1	-19.2	-18.4	-17.4	-16.9	-19.5	-20.6	-21.2	-20.9	-20.3	-19.8	-18.6	-18.1	-17.2	-19.4	-16.9
13-Jan	-16.5	-15.0	-16.9	-16.4	-16.1	-15.9	-16.7	-16.4	-15.4	-15.2	-14.4	-14.3	-14.9	-15.3	-16.0	-16.8	-18.6	-20.1	-21.3	-22.4	-23.4	-23.4	-23.5	-24.8	-17.9	-14.3
14-Jan	-25.2	-25.6	-25.8	-25.8	-25.5	-25.5	-24.8	-24.9	-20.7	-19.1	-17.1	-15.1	-13.4	-11.4	-10.1	-10.0	-9.6	-9.1	-7.6	-6.5	-5.8	-4.5	-2.5	-1.3	-15.3	-1.3
15-Jan	-0.3	5.2	5.4	4.7	4.7	4.5	5.1	5.3	3.5	1.6	1.4	1.7	2.5	3.5	4.3	4.0	-1.0	-2.7	-4.2	-4.6	-5.8	-6.8	-6.7	-7.0	0.8	5.4
16-Jan	-7.8	-8.1	-7.8	-7.9	-7.4	-6.9	-6.8	-6.5	-7.1	-6.6	-5.1	-4.0	-2.7	-2.1	-1.7	-2.1	-2.3	-2.0	-1.7	-1.4	-1.5	-1.1	-0.7	-0.5	-4.2	-0.5
17-Jan	-1.3	-2.2	-1.8	-0.7	-1.5	-1.5	0.6	3.9	3.9	3.8	4.3	5.3	5.4	5.9	6.0	5.1	2.0	-2.0	-4.2	-6.0	-7.6	-8.6	-9.8	-10.7	-0.5	6.0
18-Jan	-10.7	-10.8	-10.4	-9.7	-8.4	-8.0	-9.6	-9.9	-10.2	-7.7	-3.6	-1.5	-0.3	0.6	1.1	-2.6	-5.2	-7.9	-9.4	-10.7	-11.4	-11.7	-11.5	-11.3	-7.5	1.1
19-Jan	-11.0	-11.0	-10.6	-10.1	-10.0	-10.7	-11.9	-12.2	-12.0	-11.6	-11.4	-12.4	-14.2	-16.5	-18.2	-20.2	-21.9	-23.1	-24.0	-24.4	-24.9	-25.2	-25.9	-26.6	-16.7	-10.0
20-Jan	-26.4	-26.2	-26.3	-25.7	-25.8	-25.4	-24.2	-24.2	-22.2	-23.0	-23.7	-22.0	-19.1	-16.7	-16.2	-15.9	-15.7	-15.6	-14.9	-14.5	-14.9	-14.8	-14.6	-14.8	-20.1	-14.5
21-Jan	-15.0	-15.3	-15.8	-16.9	-16.8	-15.6	-15.1	-15.2	-16.0	-16.1	-15.1	-13.9	-14.4	-14.7	-15.0	-15.7	-17.3	-18.4	-19.5	-20.1	-20.2	-20.5	-21.5	-21.9	-16.9	-13.9
22-Jan	-22.2	-22.4	-22.7	-23.2	-23.4	-23.4	-24.2	-24.4	-24.0	-23.4	-22.0	-21.1	-20.7	-18.6	-16.2	-16.1	-16.2	-14.4	-13.8	-13.6	-13.5	-12.6	-12.1	-11.9	-19.0	-11.9
23-Jan	-11.6	-11.0	-10.5	-10.0	-8.9	-7.6	-6.3	-5.5	-3.8	-1.0	0.5	1.6	2.7	3.8	4.7	4.4	3.7	3.7	3.3	3.2	3.4	3.3	2.0	2.0	-1.4	4.7
24-Jan	2.0	2.3	3.3	4.0	1.2	0.1	-1.0	-2.3	-3.2	-4.3	-4.7	-4.8	-5.2	-5.5	-5.4	-5.6	-6.1	-6.3	-6.4	-6.3	-6.5	-6.4	-6.1	-5.7	-3.3	4.0
25-Jan	-5.5	-4.8	-5.4	-6.1	-7.0	-6.8	-6.2	-5.4	-3.9	-3.2	-3.4	-5.0	-6.0	-6.4	-6.2	-6.2	-7.3	-8.4	-9.1	-10.1	-11.0	-12.7	-15.7	-17.6	-7.5	-3.2
26-Jan	-19.3	-21.0	-22.5	-23.6	-24.8	-25.7	-26.7	-27.7	-28.4	-28.2	-27.7	-27.3	-26.8	-26.0	-25.8	-25.0	-24.6	-25.3	-26.3	-26.9	-27.0	-27.7	-28.2	-28.2	-25.9	-19.3
27-Jan	-29.2	-30.0	-30.6	-31.5	-32.1	-32.7	-33.0	-33.4	-33.8	-32.5	-30.6	-28.8	-25.3	-20.8	-18.3	-17.7	-18.4	-19.5	-21.5	-18.7	-19.4	-18.6	-17.6	-18.1	-25.5	-17.6
28-Jan	-18.1	-20.4	-21.9	-22.4	-22.3	-23.6	-23.2	-21.9	-22.4	-22.8	-18.7	-17.7	-16.0	-15.0	-14.1	-13.9	-13.8	-13.3	-15.1	-17.9	-19.7	-21.1	-21.8	-22.2	-19.1	-13.3
29-Jan	-22.6	-23.0	-23.4	-23.7	-23.2	-22.8	-22.4	-22.5	-22.4	-21.9	-21.6	-22.0	-22.3	-23.5	-24.2	-24.0	-23.8	-23.6	-23.3	-23.0	-22.9	-22.9	-23.0	-23.2	-23.0	-21.6
30-Jan	-23.4	-23.3	-23.2	-23.2	-23.3	-23.1	-23.0	-23.1	-22.9	-22.5	-21.8	-20.7	-19.5	-18.4	-17.3	-17.4	-17.3	-17.0	-16.9	-16.9	-16.2	-16.3	-17.4	-16.7	-20.0	-16.2
31-Jan	-17.3	-17.8	-18.4	-18.7	-19.2	-19.5	-19.5	-19.0	-18.2	-17.4	-16.6	-16.0	-15.4	-14.9	-14.8	-14.8	-14.8	-15.0	-15.2	-15.2	-15.2	-14.8	-14.4	-14.5	-16.5	-14.4
	-17.3	-17.3	-17.6	-17.7	-17.8	-17.9	-17.8	-17.8	-17.5	-17.2	-16.3	-15.7	-15.0	-14.4	-14.0	-14.4	-15.0	-15.4	-15.8	-16.0	-16.3	-16.5	-16.5	-16.6	Diurnal Average	
	2.0	5.2	5.4	4.7	4.7	4.5	5.1	5.3	3.9	3.8	4.3	5.3	5.4	5.9	6.0	5.1	3.7	3.7	3.3	3.2	3.4	3.3	2.0	2.0	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Millennium - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	297	39.92	39.92
-20 - 0	399	53.63	93.55
0 - 10	48	6.45	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Millennium - January 2014

Maximum Speed: 37 km/h on Jan 26 01:00

Maximum Daily Speed Average: 16.4 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 10 17:00

Minimum Daily Speed Average: 0.7 km/h on Jan 18

Maximum Diurnal Speed Average: 4.3 km/h at hour 16

Minimum Diurnal Speed Average: 0.1 km/h at hour 6

Monthly Average Velocity: 1.8 km/h 0.1 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 4 Median = 7 Q_3 = 11 P_{90} = 17 P_{99} = 34

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SW6	SSW5	SSW3	SW4	SW4	SW2	SW5	SW5	SW4	SW6	SW6	SSW3	SW4	S3	SW4	SSW5	SSW4	SSW4	SW5	SW7	SSW5	S4	SSE7	SSE8	SSW4.4	SSE8
2-Jan	SSE11	SE16	SE18	SE16	SE16	SSE10	SSE8	SSW6	SW7	SSW6	S5	S6	S5	S5	S4	S5	SSE6	S5	SE6	SSE5	SSW5	SSW4	NNW5	NNE19	SSE5.9	NNE19
3-Jan	NNE23	NNE29	NNE27	NNE23	NNE22	NNE11	N7	NNE8	NNE7	NW3	NW4	N3	N7	NNW6	NNW7	NW6	NW9	NW10	NW10	NW11	NW11	NW12	WNW8	W7	N9.4	NNE29
4-Jan	WSW7	W7	W6	WSW6	WSW7	W5	WSW7	W7	WNW13	WNW13	WNW14	NW13	NNW16	NNE26	NNE23	N13	NNW6	NNW6	NW10	NW8	NW9	WNW8	WNW8	WNW8	NW7.6	NNE26
5-Jan	WNW7	N5	WNW4	W4	W4	WNW2	SW2	SSW4	SSW4	SW5	SSW3	SSE4	S3	S4	SSW4	SSW4	S5	SSE5	S4	SSW4	SSW4	S4	SSE6	SSE5	SSW2.7	WNW7
6-Jan	S4	S5	S6	SSE11	SSE7	SSE12	SSE12	SSE13	SSE15	SE17	SE15	SSE16	SE16	SE12	SSE12	SSE8	SSE7	ESE6	SE10	SE8	SSE6	E5	ESE3	ESE3	SSE9.2	SE17
7-Jan	SSW3	ESE1	N2	E2	NNE2	NE1	SW2	SW3	SW3	SW5	SSW2	SSW4	SSW4	SW6	SW4	SSW3	SSE4	SSE5	S6	SSE8	SSE9	SSE11	SSE12	SSE10	S3.7	SSE12
8-Jan	SSE13	SSE15	SSE15	SSE14	SSE13	SSE9	SSE8	S6	SSE9	SSE8	S5	SSW5	S4	S5	S4	S3	S3	SSW3	SE3	SSE3	S3	S3	SSE5	S3	SSE6.5	SSE15
9-Jan	SSE1	S3	SSW4	SW5	SSW7	SSW9	SSW9	SW6	SW6	SSW4	S4	SW4	S4	SSW3	NW3	NW3	N4	N7	N11	N11	N8	N9	N9	N9	WNW1.3	N11
10-Jan	N9	N8	N9	NNW6	N6	NW5	NW5	NW5	NW4	N4	NNW4	NNW4	N5	N4	NNE5	NNE2	NNE0	WSW5	W7	WSW6	SW4	S2	SE5	SSE4	NNW2.9	N9
11-Jan	SE4	ENE3	S1	ESE3	NE3	N3	E4	NNE7	NE5	ENE8	NNE6	N7	NNE10	N11	NNE12	NNE14	NNE13	NNE13	N12	NNE16	NNE18	NNE20	NNE21	N15	NNE8.7	NNE21
12-Jan	N20	N15	N17	N16	N17	NNE13	N10	N6	NNE6	ENE2	SE2	SSE4	SSW4	SW6	S5	SSE4	SSE7	SSE5	SSE7	SSE8	SSE9	SSE9	SSE7	SSE7	NE2.3	N20
13-Jan	SSE10	SSE7	SW7	SSW6	SW4	SSW4	SW4	WSW2	NNW4	WNW6	NW5	NNE9	NNE9	NNE8	NNE12	NNE12	NNE8	NNE8	NNE11	NE5	NNW3	N5	NE4	SW1	NNE2.5	NNE12
14-Jan	WNW1	SW4	SSW3	SSE4	S5	S5	S5	S5	SSE8	SSE7	SSE8	SSE8	SSE7	SSE9	SE10	SSE11	SE13	SSE11	SE12	SSE10	SSE8	SSE8	SSE9	S8	SSE7.2	SE13
15-Jan	SW8	W28	WNW34	WNW27	WNW21	WNW19	WNW28	WNW35	NW36	NW24	NW20	NNW19	NW19	NW24	NW26	NW24	NNE15	N11	NNE14	NNE13	NNW4	W3	SW4	SW5	NW16.4	NW36
16-Jan	SE5	SE6	SE5	SE4	SE4	SSE4	SE5	SSE5	SE7	SE7	SE7	SE7	SSE6	SSE5	SSE5	SSE4	SSE4	SSE5	SE5	S4	SE4	SE6	SSE5	SSE6	SSE5.2	SE7
17-Jan	SSW6	S4	SSE4	S4	SSW6	SSW5	WSW9	WNW14	WNW14	WNW13	NW12	WNW14	WNW14	NW14	NW13	N13	NNE22	NNE20	NNE18	NNE15	NNE12	N6	W3	N1	NNW5.9	NNE22
18-Jan	SSE2	SE5	SSE6	SSE6	SSE6	SSE6	SSW3	SSW6	SSW5	SSE4	SSE5	SSE3	SE5	E5	NNE5	N12	NNW9	N11	N9	N7	NNW7	N5	NW4	N4	NE0.7	N12
19-Jan	ENE1	W1	NNW2	NNE5	NNE8	NE6	NNW4	NNW4	NNW5	N8	N13	NNE21	NNE30	NNE29	NNE29	NNE33	NNE27	NNE22	NNE18	NNE13	NNE14	NNE10	NW3	WNW2	NNE12.5	NNE33
20-Jan	SW3	SSW5	SSW6	S7	S5	SSE6	S9	S8	S8	SSW6	SW8	SSW8	S7	S7	S6	SSW6	WSW2	WNW2	N4	NW4	NW7	NW8	NNW7	N8	SSW3.3	S9
21-Jan	NW5	NNW4	NNE5	NNE5	NE3	ENE4	NNE5	N4	WNW4	NW7	NNW6	NNE21	NNE19	NNE17	NE13	NE12	NNE5	NNE5	NE5	E5	SE8	SE10	SSE9	SE12	NE4.9	NNE21
22-Jan	SE12	SE14	SSE10	SSE11	SE13	SE13	SSE9	SSE9	SSE11	SSE11	SSE9	S8	SSW8	SSW7	SSW7	SSW7	S6	SSE10	SSE11	SSE10	SSE8	SSE8	SSE9	SSE8	SSE9.0	SE14
23-Jan	SSE9	SSE11	SSE9	SSE7	SE9	SE9	SSE6	SSE4	WSW7	NNW6	NW8	NW10	NW10	NW9	WNW11	WNW12	WNW11	NW11	NW6	WNW7	WSW6	SW5	SE4	SE3	W2.5	WNW12
24-Jan	SE3	NW2	NW5	N9	NNE18	N13	N12	N15	N14	NNE19	NNE15	NNE16	NNE17	NNE15	NNE11	NNE10	N8	NNE8	NNE6	NW3	NNW3	SSW1	SSE3	SSW4	N8.5	NNE19
25-Jan	SSE6	SSE9	SSE6	S4	SSW5	SSW5	S3	SSE3	WSW2	NNE14	NNE24	NNE24	N18	N16	N14	NNE19	NNE21	NNE26	NNE25	N28	N27	N26	N36	N35	NNE13.0	NNE36
26-Jan	N37	NNE36	N29	NNE26	NNE24	NNE20	NNE17	NNE16	NNE14	N12	N8	NNE6	NE4	N3	NNE6	NE3	SSW2	WSW3	SSW4	ESE1	SSE3	SSE2	ESE2	S3	NNE10.1	N37
27-Jan	SSW4	SW4	SSW4	SW5	SW6	SW6	SSW6	SW7	SW7	SSW5	SW5	SW6	S5	SSE7	SSE8	SSE7	SSE5	S5	S5	SSE7	S5	SSE7	SSE7	SSE6	S5.2	SSE8
28-Jan	S6	SSW6	SW7	SW8	SW7	S5	SSW6	S5	S6	S4	SSW4	WSW3	SW1	N3	NW4	NW5	NW6	N9	NNE24	NNE24	NNE27	NNE25	NNE18	NNE17	N3.8	NNE27
29-Jan	N13	N13	N10	NNW7	N10	N8	NNW4	NNW5	NNW6	N7	NNE20	NNE20	N21	N23	N21	NNE17	N17	NNE14	N13	N14	NNW8	NNW7	NNW8	NNW8	N11.9	N23
30-Jan	NNW6	NNW7	NNW7	NW6	NW5	NW6	WNW5	W9	W9	WSW7	WSW7	WSW9	SW11	SW11	SSW7	SSW4	SW9	SSW11	SSW8	S7	SSW7	SSW4	W3	WNW8	WSW4.8	SW11
31-Jan	N7	NNE14	N9	NNW6	NNW7	NNW6	WNW5	WSW4	W3	NNW3	N10	N10	N11	NW8	N13	N11	N12	NNE13	N6	WNW3	WNW4	NW5	NW5	WSW3	N6.3	NNE14
	NE1.0	NE1.1	NNW0.9	NNW0.4	NNE0.8	SSE0.1	WSW1.5	W2.1	W2.0	NW1.4	NNW2.2	N2.9	N3.5	N3.8	N4.2	N4.3	NNE3.6	NNE3.7	NNE4.0	NNE2.8	N2.0	NNE1.7	NNE1.3	NNE1.2	Diurnal Average	
	N37	NNE36	WNW34	WNW27	NNE24	NNE20	WNW28	WNW35	NW36	NW24	NNE24	NNE24	NNE30	NNE29	NNE29	NNE33	NNE27	NNE26	NNE25	N28	N27	N26	NNE36	N35	Diurnal Maximum	

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 14 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 27 00:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 5 P_{99} = 10

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

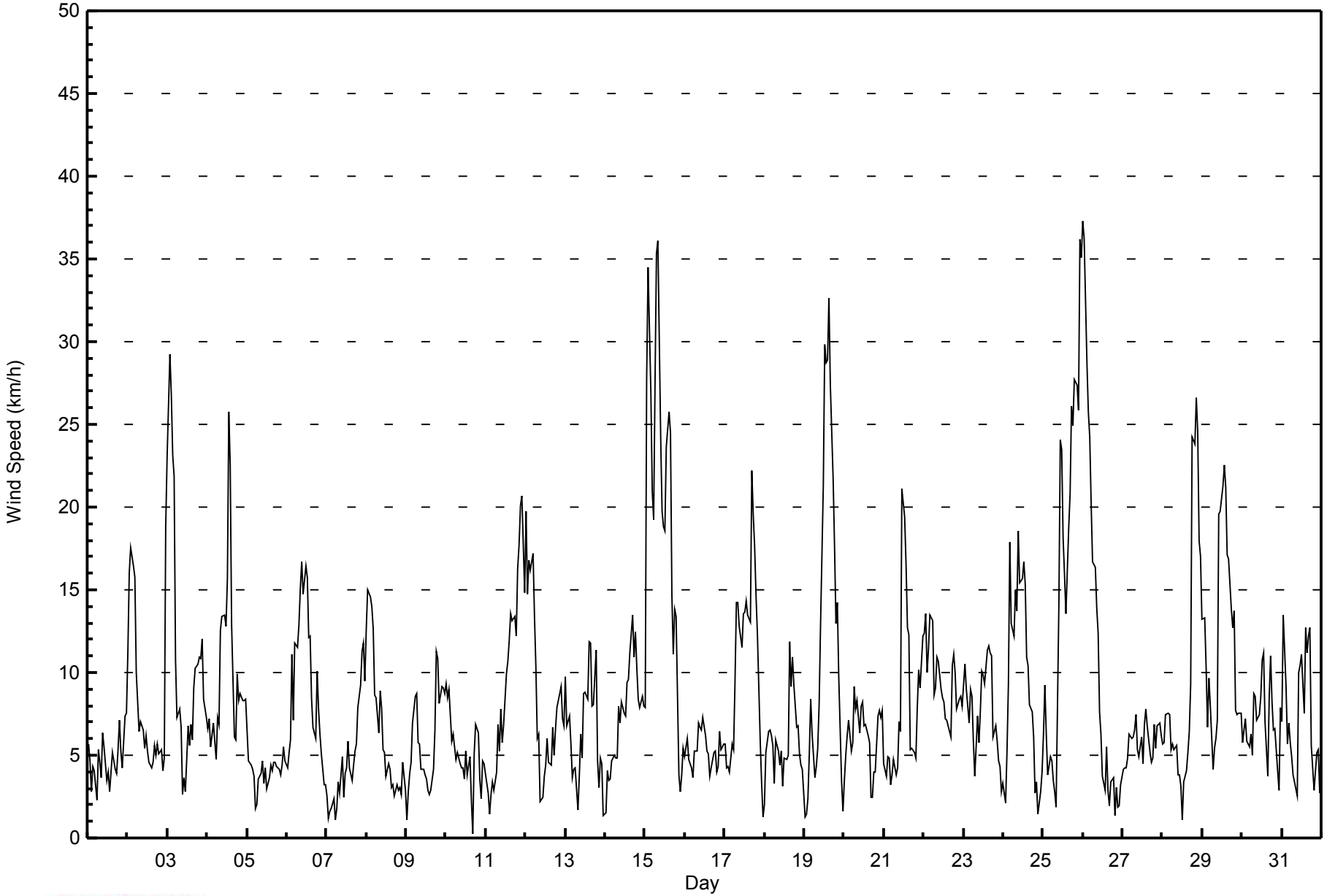
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	2	2	2	2	2	1	3	3	3
2-Jan	3	4	5	5	5	5	3	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	3	5	5
3-Jan	5	6	6	5	5	4	3	2	2	1	1	1	1	2	2	2	2	3	4	3	4	4	3	2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

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Millennium - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	286	38.44	38.44
6 - 11	291	39.11	77.55
12 - 19	110	14.78	92.34
20 - 28	44	5.91	98.25
29 - 38	13	1.75	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Millennium - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	16	11	9	5	4	6	15	34	46	47	31	8	8	10	20	16	286
6 - 11	38	21	1	1	0	1	13	79	17	24	23	11	7	10	22	23	291
12 - 19	23	40	2	0	0	0	15	12	0	0	0	0	0	10	6	2	110
20 - 28	7	28	0	0	0	0	0	0	0	0	0	0	1	3	5	0	44
29 - 38	3	7	0	0	0	0	0	0	0	0	0	0	0	2	1	0	13
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	87	107	12	6	4	7	43	125	63	71	54	19	16	35	54	41	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

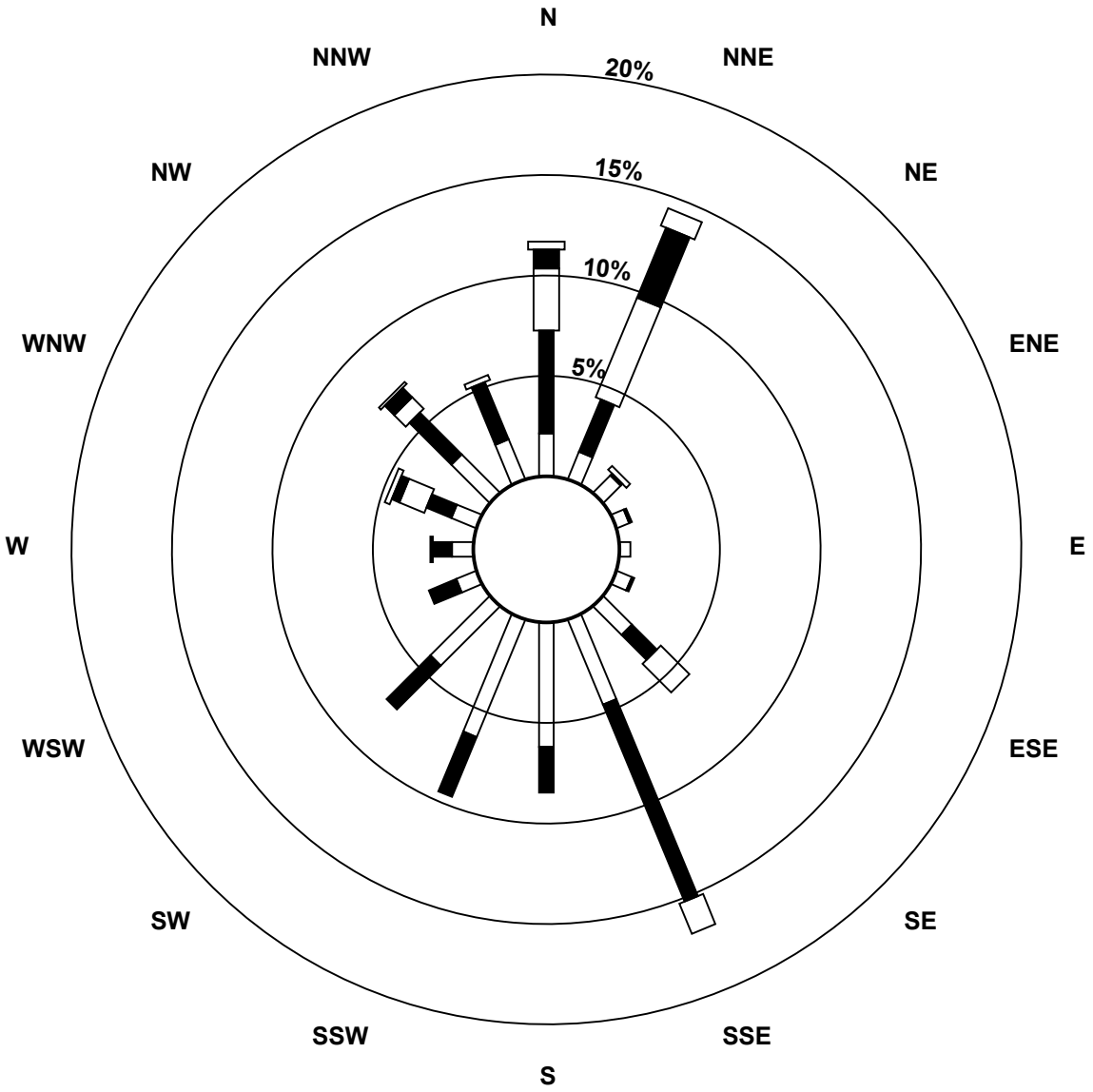
AURORA
ATMOSPHERICS INC.

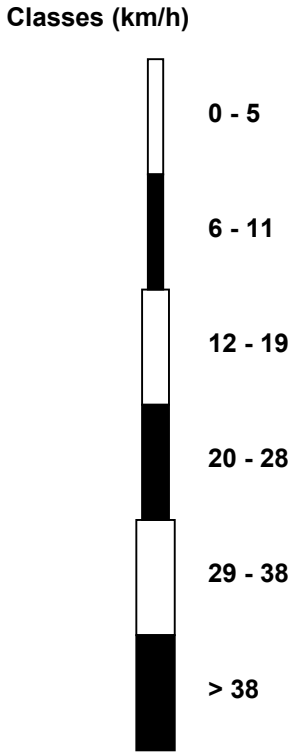
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Millennium (AMS 12)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 11 deg on Jan 26 01:00
Direction of Maximum Daily Speed Average: 308.8 deg on Jan 15

Direction of Minimum Speed: 22 deg on Jan 10 17:00

Direction of Minimum Daily Speed Average: 0.7 deg on Jan 18

Monthly Average Direction: 245.3 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	221	207	202	223	219	230	227	220	219	223	217	213	215	187	215	211	209	202	221	220	208	179	163	162	207.8
2-Jan	153	143	139	138	143	163	164	204	221	196	185	181	185	177	174	170	159	178	139	151	194	201	334	14	158.6
3-Jan	18	21	22	20	23	14	9	18	12	305	326	1	10	335	338	314	309	320	319	319	308	311	299	267	354.7
4-Jan	257	272	260	251	253	280	250	274	294	291	296	321	348	21	19	11	346	331	321	310	309	300	296	298	317.0
5-Jan	303	359	282	261	264	284	223	202	196	217	199	160	186	187	201	195	175	167	169	193	207	170	155	159	202.5
6-Jan	175	181	184	155	167	155	153	155	151	145	136	151	143	144	149	148	149	118	130	146	154	98	116	113	147.5
7-Jan	201	107	7	80	22	37	235	230	222	222	211	198	202	224	215	210	147	156	175	166	162	154	157	160	176.8
8-Jan	153	150	155	152	154	161	155	171	157	159	178	197	176	188	188	177	172	205	143	164	169	191	161	174	162.4
9-Jan	161	178	209	217	196	207	210	225	218	208	185	219	186	203	321	325	349	6	6	8	357	359	2	1	295.5
10-Jan	4	1	1	346	357	317	315	322	319	351	331	335	360	357	32	23	22	256	272	241	217	170	143	150	335.3
11-Jan	138	76	182	107	50	9	79	19	46	58	12	360	12	6	15	21	20	18	5	18	20	18	19	7	21.0
12-Jan	8	6	5	7	5	12	10	353	18	69	145	165	207	231	183	166	160	165	159	157	152	157	161	162	37.9
13-Jan	147	150	214	213	218	212	216	239	338	300	317	14	23	21	24	22	31	25	22	37	333	4	45	222	15.6
14-Jan	286	220	192	165	179	172	184	179	151	159	165	161	166	151	146	148	144	157	144	161	163	159	168	176	161.1
15-Jan	217	274	287	298	289	284	291	301	309	312	320	327	325	318	318	321	14	6	21	23	343	272	231	220	308.8
16-Jan	146	143	140	132	145	148	131	151	141	133	141	141	152	159	151	165	156	150	138	172	143	142	153	159	146.5
17-Jan	197	180	160	190	205	201	253	289	287	290	310	292	302	322	324	350	26	29	22	24	25	3	269	356	329.8
18-Jan	168	141	163	157	158	166	203	211	196	162	165	147	125	84	20	3	346	354	354	351	343	354	317	350	34.1
19-Jan	67	276	343	20	20	34	346	332	345	6	11	15	18	14	13	18	22	23	21	19	23	27	311	287	15.5
20-Jan	219	194	199	183	182	168	181	176	170	197	216	212	191	188	191	206	244	292	359	310	316	324	343	354	210.4
21-Jan	318	328	16	32	42	68	29	353	301	317	337	17	25	32	34	36	25	27	43	97	127	137	155	143	36.4
22-Jan	144	141	155	149	137	138	159	161	147	154	152	190	209	207	210	196	186	157	149	155	162	162	159	159	159.7
23-Jan	155	152	152	154	140	143	151	167	244	330	315	309	314	315	295	294	300	317	308	291	253	233	136	138	262.5
24-Jan	139	319	320	349	12	7	5	8	6	18	16	22	17	18	18	18	10	15	26	315	334	202	166	199	11.1
25-Jan	155	150	164	184	198	202	173	160	245	20	18	15	4	7	6	12	19	23	16	10	5	1	11	8	13.9
26-Jan	11	12	10	14	20	20	20	26	24	11	358	17	35	349	12	36	201	239	211	111	159	153	119	177	15.9
27-Jan	210	220	208	231	228	222	213	214	221	207	214	216	191	162	157	157	164	173	175	159	171	163	161	167	190.1
28-Jan	177	206	218	223	215	191	196	172	186	175	195	237	231	355	326	319	323	355	24	16	18	23	16	17	6.6
29-Jan	11	10	3	336	359	4	329	344	345	351	15	17	6	11	10	14	9	12	4	3	341	330	336	337	3.4
30-Jan	348	336	346	315	322	315	287	271	264	248	248	242	231	224	208	196	214	210	205	187	192	205	271	298	250.3
31-Jan	350	13	4	336	339	339	287	249	266	342	9	11	6	323	2	4	8	13	351	287	291	310	326	257	349.7
	54.1	35.8	335.2	348.3	23.1	161.2	241.2	272.2	273.5	303.9	337.9	352.1	359.8	358.9	1.7	5.2	17.4	16.1	22.2	17.7	5.6	16.7	28.9	18.1	
	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

Millennium - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 84 deg on Jan 19 01:00

Minimum Value: 7 deg on Jan 7 10:00

Percentiles: P_1 = 10 P_{10} = 13 Q_1 = 15 Median = 19 Q_3 = 27 P_{90} = 35 P_{99} = 76

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

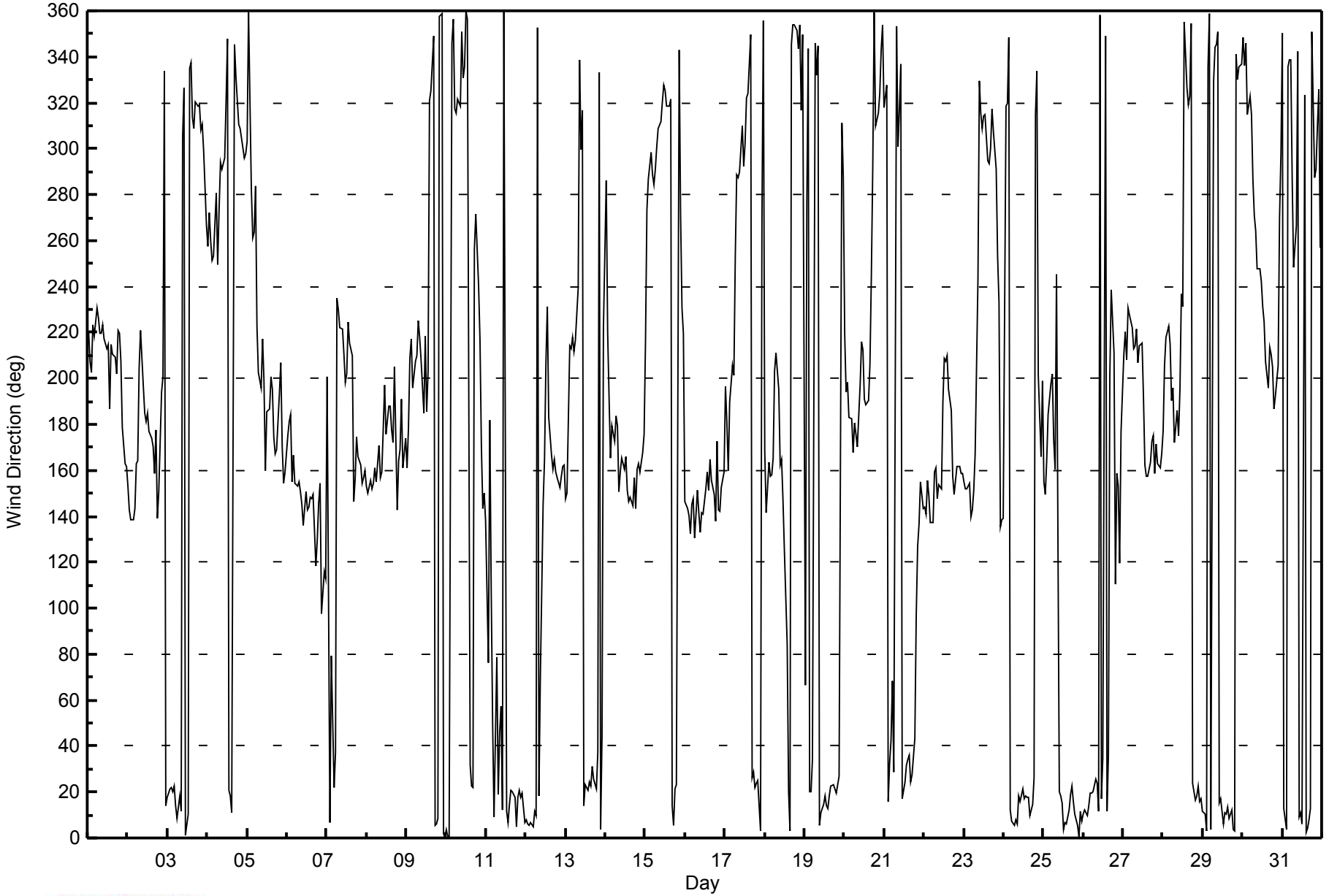
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	13	12	32	12	15	51	11	12	12	14	24	21	16	40	16	12	21	19	16	20	14	21	20	17	51
2-Jan	17	15	16	17	16	23	21	24	21	18	19	15	21	20	13	16	15	16	16	22	15	33	60	14	60
3-Jan	11	11	13	13	13	19	24	16	15	41	27	35	9	30	25	34	19	27	29	25	23	25	29	21	41
4-Jan	21	19	22	19	20	24	24	27	23	23	24	33	32	17	18	21	38	35	26	23	24	18	19	19	38
5-Jan	23	29	25	24	23	49	47	23	22	14	26	24	32	22	14	26	15	14	15	27	18	24	17	14	49
6-Jan	15	26	28	16	18	17	17	17	16	16	16	16	17	19	15	17	19	32	18	21	18	33	54	67	67
7-Jan	44	79	44	22	21	71	62	19	18	7	31	18	19	12	16	19	14	26	19	18	19	15	16	19	79
8-Jan	18	16	17	16	17	18	16	20	17	17	16	19	19	20	21	21	21	22	22	27	22	34	29	54	54
9-Jan	78	28	28	26	15	16	19	18	15	19	18	34	23	35	30	24	28	25	15	15	23	20	18	19	78
10-Jan	18	22	23	30	29	28	28	26	32	34	34	34	24	25	17	23	77	30	23	21	47	36	16	15	77
11-Jan	40	47	78	44	45	31	46	12	37	12	26	20	12	14	13	13	12	13	16	12	13	10	10	18	78
12-Jan	18	19	18	19	19	17	31	29	16	42	52	21	27	24	24	10	16	11	13	14	15	16	17	22	52
13-Jan	21	30	16	17	29	22	22	74	33	24	37	20	15	17	12	12	15	18	10	20	22	26	23	71	74
14-Jan	44	14	15	13	13	17	22	26	17	17	18	19	19	18	17	16	15	16	15	19	20	16	21	16	44
15-Jan	34	26	25	26	27	27	25	28	27	29	30	31	31	26	29	31	13	18	11	10	37	30	11	19	37
16-Jan	32	40	27	23	32	38	11	13	12	14	13	14	15	15	17	12	14	11	16	24	21	12	20	13	40
17-Jan	36	12	17	26	29	26	35	31	31	25	27	26	24	29	30	32	15	14	14	12	15	35	23	34	36
18-Jan	43	17	20	18	22	16	18	17	19	26	44	66	25	17	45	16	21	18	17	21	23	32	27	46	66
19-Jan	84	70	47	29	22	14	30	22	20	16	13	13	12	15	15	13	11	11	12	14	12	17	34	41	84
20-Jan	75	16	13	13	21	16	16	20	17	20	15	18	18	18	15	18	70	47	24	32	22	25	34	26	75
21-Jan	31	31	14	12	24	15	15	40	25	26	34	13	14	14	14	12	13	12	26	16	15	15	17	17	40
22-Jan	15	15	17	16	14	15	16	15	17	18	18	24	18	18	21	17	23	14	14	14	14	13	13	14	24
23-Jan	12	12	11	12	14	14	16	26	31	42	29	26	26	26	25	27	27	27	25	26	20	28	27	35	42
24-Jan	24	54	21	30	15	19	19	15	17	11	12	12	13	11	12	14	16	11	16	29	23	62	22	21	62
25-Jan	29	19	17	31	25	31	39	62	66	37	12	15	21	17	19	15	13	12	13	15	21	28	16	21	66
26-Jan	18	18	18	16	13	14	13	12	15	16	25	20	32	79	24	33	53	22	13	62	26	37	48	18	79
27-Jan	9	14	17	17	14	10	12	13	9	19	16	15	21	21	17	14	13	13	14	15	14	12	13	18	21
28-Jan	15	19	13	10	13	11	11	12	14	36	40	36	82	36	26	24	27	28	14	13	12	11	11	13	82
29-Jan	17	15	21	27	24	24	34	31	31	35	12	14	22	20	18	14	16	16	19	24	31	32	31	33	35
30-Jan	33	31	35	31	33	30	35	24	27	27	30	25	21	18	21	19	17	18	17	16	19	26	52	17	52
31-Jan	35	15	21	28	30	32	23	19	17	38	19	13	21	34	25	18	16	12	35	36	32	25	41	35	41
	84	79	78	44	45	71	62	74	66	42	52	66	82	79	45	34	77	47	35	62	47	62	60	71	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Millennium - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	13:05	End Time (MST)	16:55
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Cal Gas Concentration	51.3 ppm	Cal Gas Expiry Date	5/29/2014
Gas Cert Reference	LL107920		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5V	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-558	-558
Analyzer Range (mv)	5000	5000	Lamp voltage	867	867
Calculated slope	0.997108	0.997288	Chamber temp.	45.1	45.1
Calculated intercept	1.176216	1.869805	Pressure (mmHg)	710.0	694.9
Analyzer Background	21.2	21.5	Flow (lpm)	0.483	0.473
Analyzer Coefficient	1.021	1.014	Intensity	34400	34100

Analyzer make	TEI 43C	Analyzer serial #	518112184

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.8	N/A
as found span	5000	80.9	830.0	836.2	0.993
calibrator zero	5000	0.0	0.0	-0.8	N/A
high point	4999	80.9	830.2	831.3	0.999
second point	5000	40.9	419.6	417.9	1.004
third point	5005	20.5	210.1	208.0	1.010
calibrator zero	5002	0.0	0.0	-0.8	N/A
as left zero	5000	0.0	0.0	-0.7	N/A
as left span	5000	80.9	830.0	831.7	0.998
				Average Correction Factor	1.004

Corrected As found	837.0	Previous response	826.5	% change	-1.3%

Notes: Changed filter after as founds
Adjusted span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

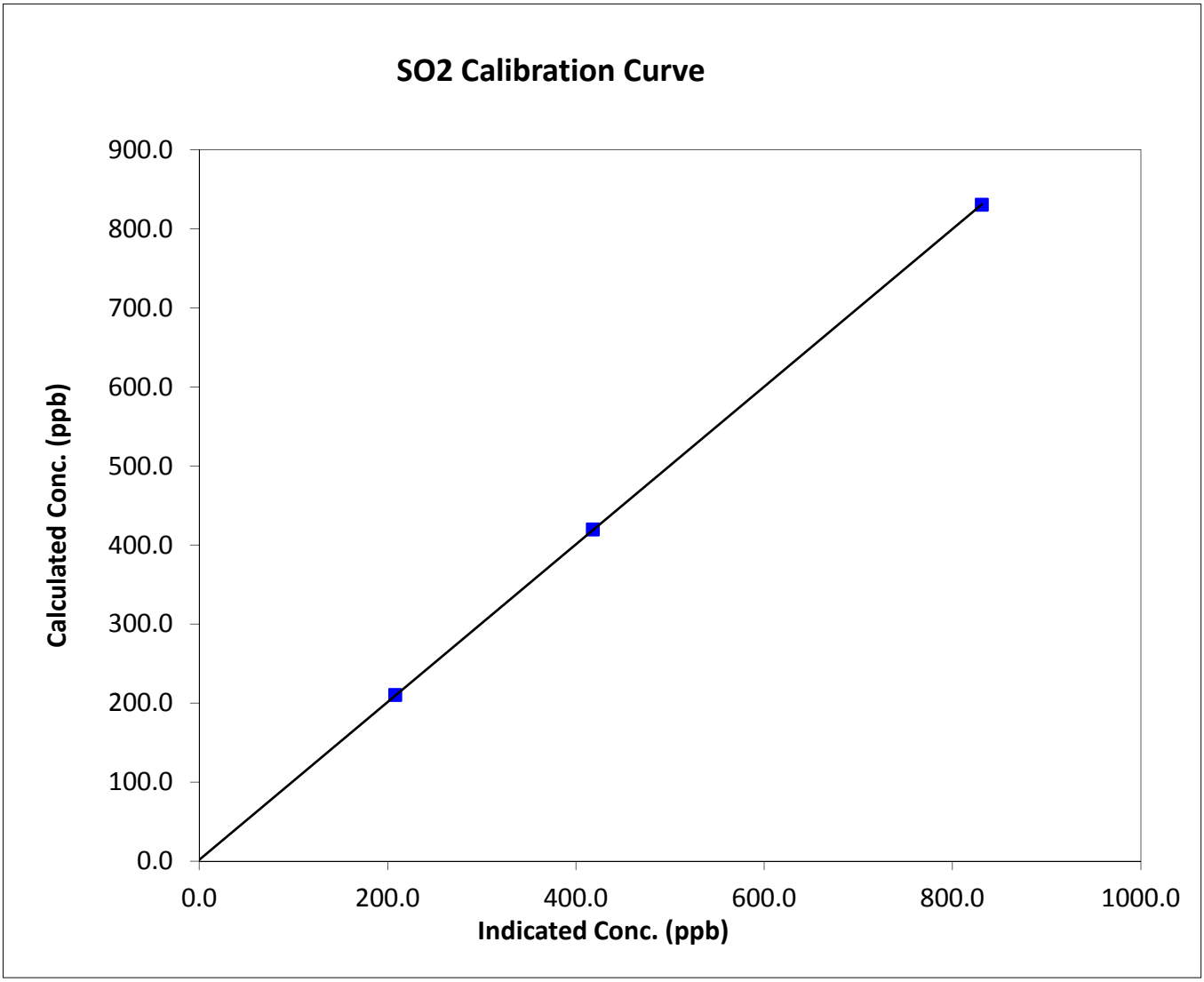
SO_2 Calibration Summary

Station Information

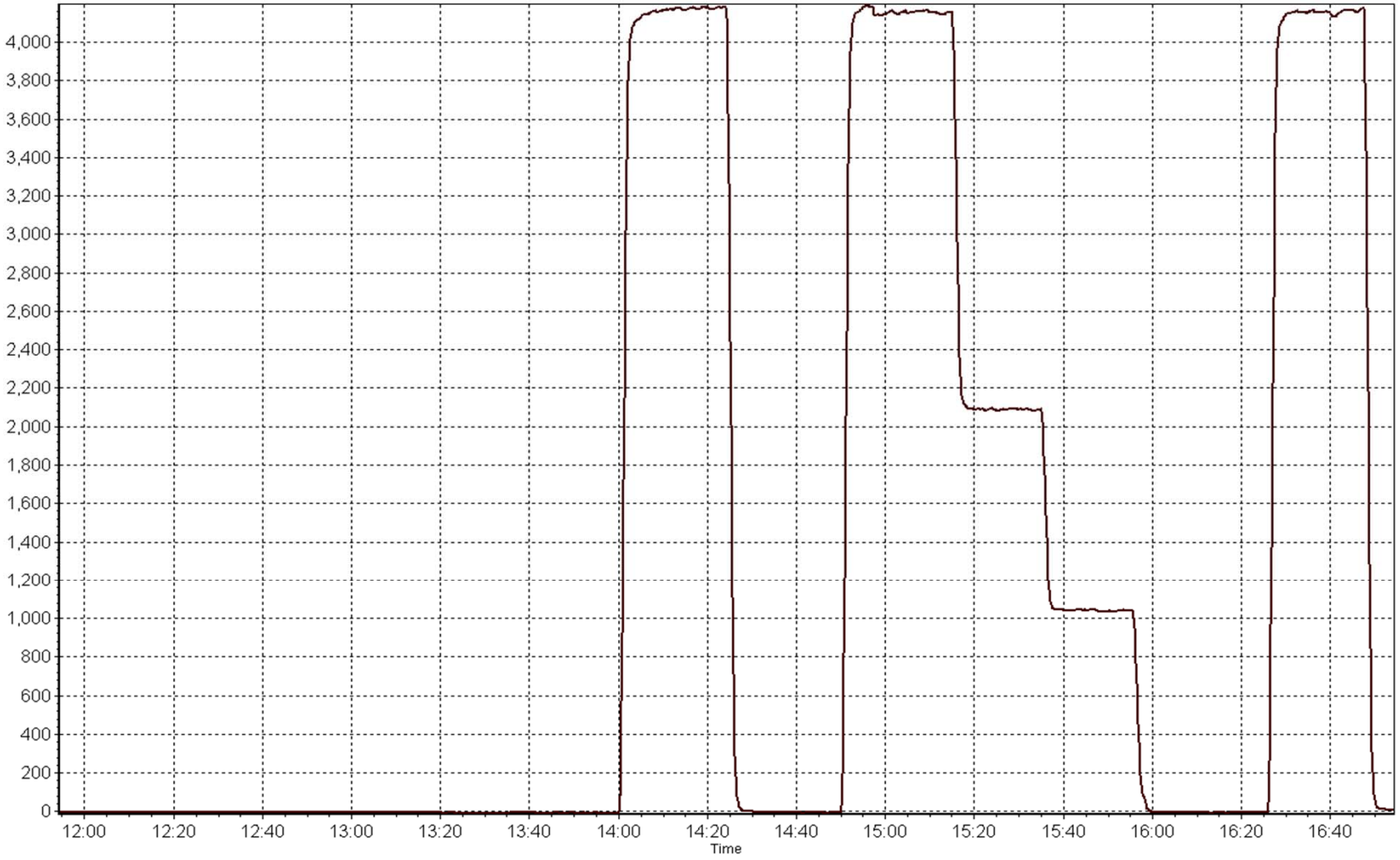
Calibration Date	Thursday, January 09, 2014	Previous Calibration	December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	13:05	End Time (MST)	16:55
Analyzer make	TEI 43C	Analyzer serial #	518112184

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.8	N/A	Correlation Coefficient	0.999992
830.2	831.3	0.9987		
419.6	417.9	1.0040	Slope	0.997288
210.1	208.0	1.0101		
			Intercept	1.869805



SO_2 Calibration Plot **Date:** January 9, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 12, 2013
Station Name	Lower Camp	Station Number	AMS 11
Reason:	Routine		
Start Time (MST)	10:05	End Time (MST)	13:20
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11051107
Cal Gas Concentration	10.3 ppm H2S	Cal Gas Expiry Date	5/30/2013
Gas Cert Reference	LL20284	SO2 gas conc.	51.3 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5V	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-679	-679
Analyzer Range (mv)	5000	5000	Lamp voltage	990	990
Calculated slope	1.005098	1.001090	Chamber temp.	45.0	45.0
Calculated intercept	-0.023487	-0.061777	Pressure	668.2	655.3
Analyzer Background	1.49	1.53	Flow	0.446	0.443
Analyzer Coefficient	0.890	0.903	Intensity	90	91
			Converter temp.	375	375

Analyzer make/model	Thermo 43i	Analyzer serial #	1008841400
Converter make/model	TEI 340	Converter serial #	328702539

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.2	N/A
as found span	5000	36.4	75.0	73.5	1.020
SO2 scrubber check	5000	20.4	209.3	1.8	N/A
calibrator zero	5001	0.0	0.0	0.2	N/A
high point	5001	36.4	75.0	75.1	0.998
second point	5003	19.4	39.9	39.6	1.009
third point	5002	9.7	20.0	20.1	0.995
calibrator zero	5000	0.0	0.0	0.2	N/A
as left zero	5000	0.0	0.0	0.2	N/A
as left span	4999	36.4	75.0	75.3	0.996
				Average Correction Factor	1.001

Corrected As found	73.3	Previous response	75.4	% change	2.9%

Notes: Changed filter after as found
Scrubber passes
Adjusted span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

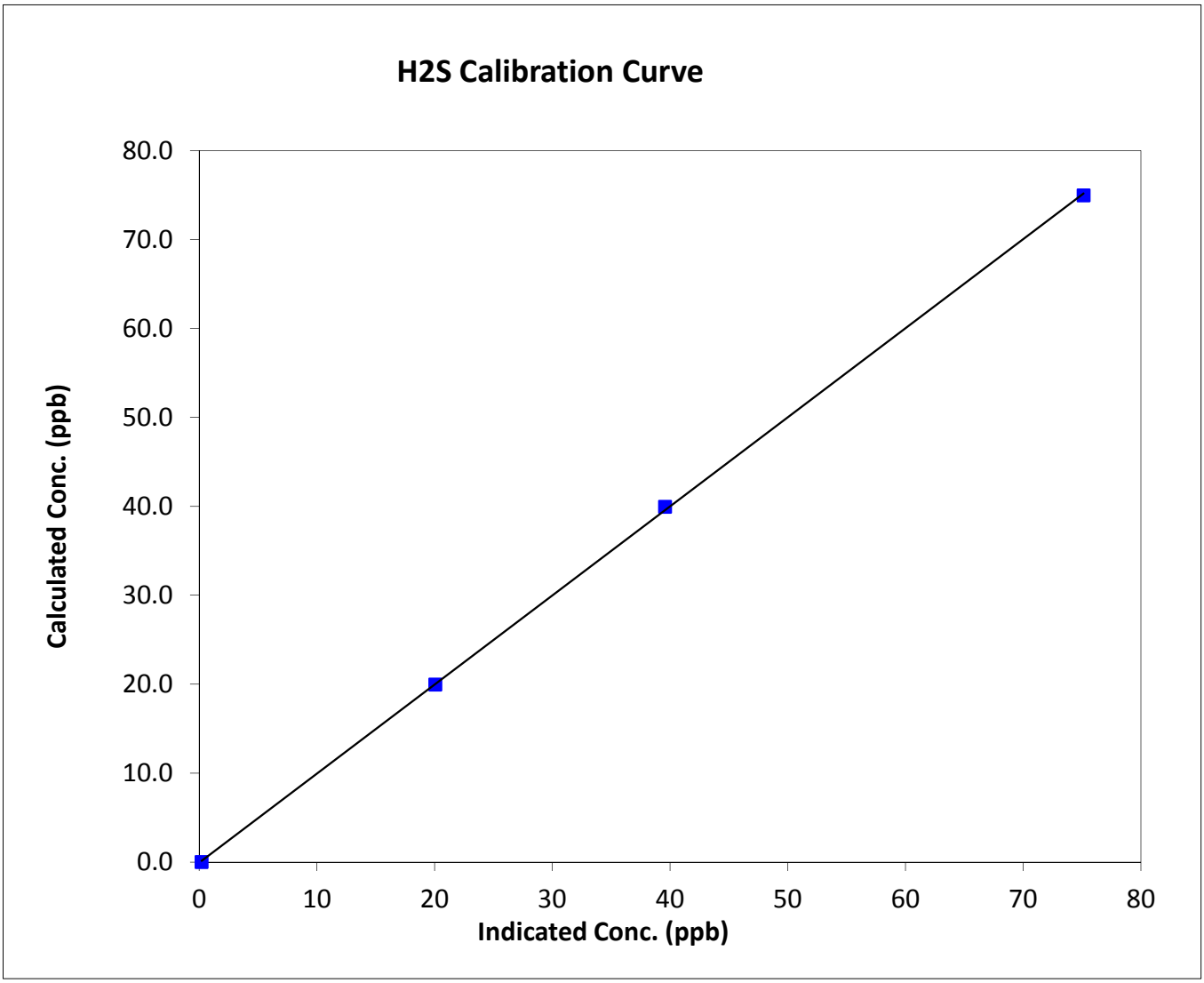
H2S Calibration Summary

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 12, 2013
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	10:05	End Time (MST)	13:20
Analyzer make	Thermo 43i	Analyzer serial #	1008841400

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999935
75.0	75.1	0.9978		
39.9	39.6	1.0091	Slope	1.001090
20.0	20.1	0.9952		
			Intercept	-0.061777



H2S Calibration Plot Date: Thursday, January 09, 2014

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Thursday, January 09, 2014	Previous Calibration	Friday, December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
		3449	
Reason:	Routine		
Start Time (MST)	13:05	End Time (MST)	16:55
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11051107
Gas Cert Reference	CC 302056	Cal Gas Expiry Date	5/29/2014
CH4 Cal Gas Conc.	510 ppm	CH4 Equiv Conc.	1073.8 ppm
C3H8 Cal Gas Conc.	205 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2634
DACS voltage range	0-5V	DACS channel #	3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Sample Pressure	8.2	8.2
Analyzer Range (mv)	5000	5000	Air Pressure	37.8	37.8
Calculated slope	1.001084	1.001796	Fuel Pressure	24.2	24.2
Calculated intercept	0.005289	-0.010233	Background	4.12	3.79
			Coefficient	4.698	4.698

Analyzer make	51i-LT	Analyzer serial #	121853580

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.32	N/A
as found span	5000	80.9	17.37	16.85	1.031
calibrator zero	5000	0.0	0.00	0.01	N/A
high point	4999	80.9	17.38	17.38	1.000
second point	5003	41.0	8.80	8.73	1.008
third point	5005	20.5	4.40	4.44	0.991
calibrator zero	5002	0.0	0.00	0.01	N/A
as left zero	5000	0.0	0.00	0.03	N/A
as left span	5000	80.9	17.37	17.35	1.001
				Average Correction Factor	1.000

Corrected As found	17.16	Previous response	17.39	% change	1.3%

Notes: Changed filter after as founds
Adjusted zero and span

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

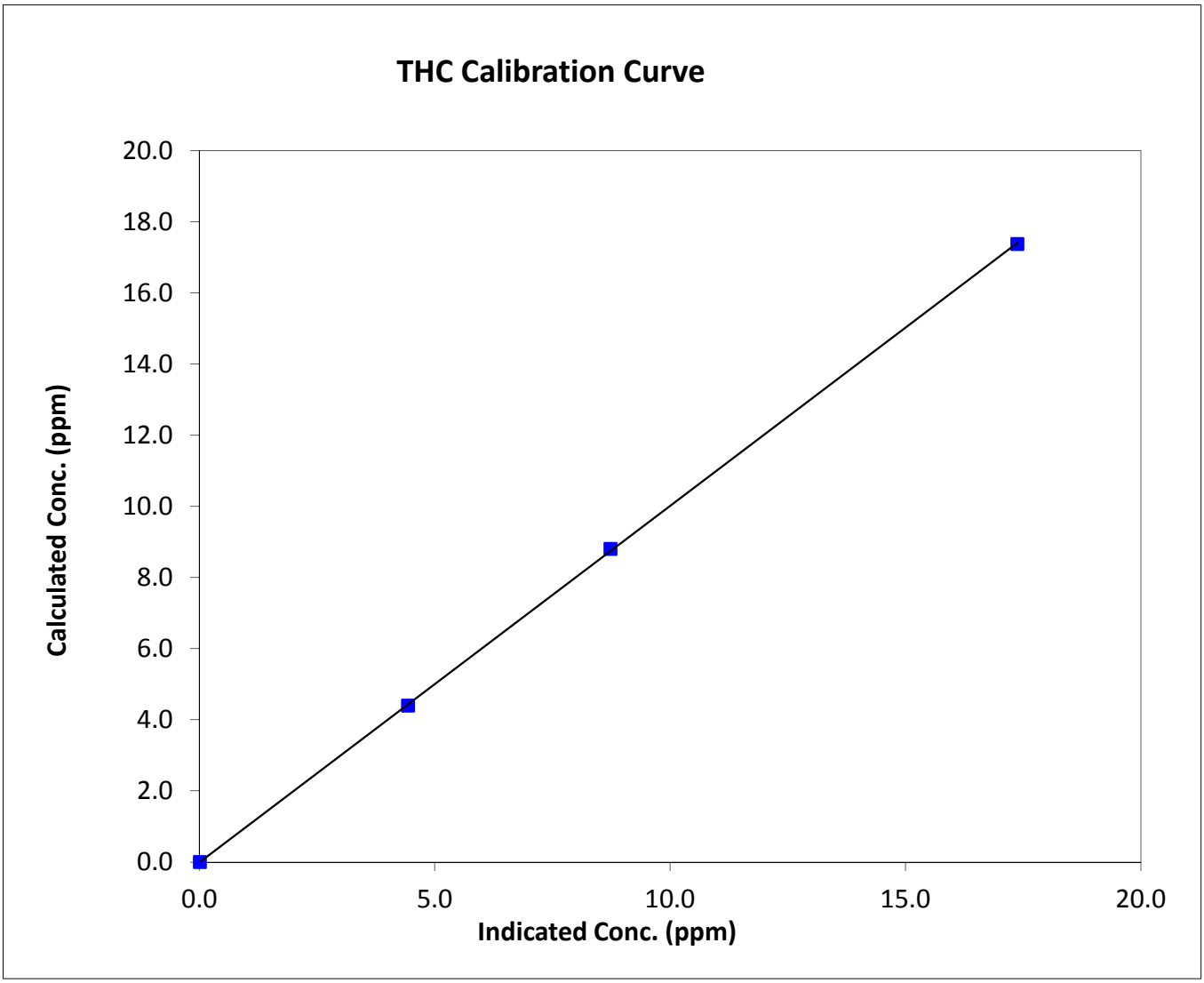
THC Calibration Summary

Station Information

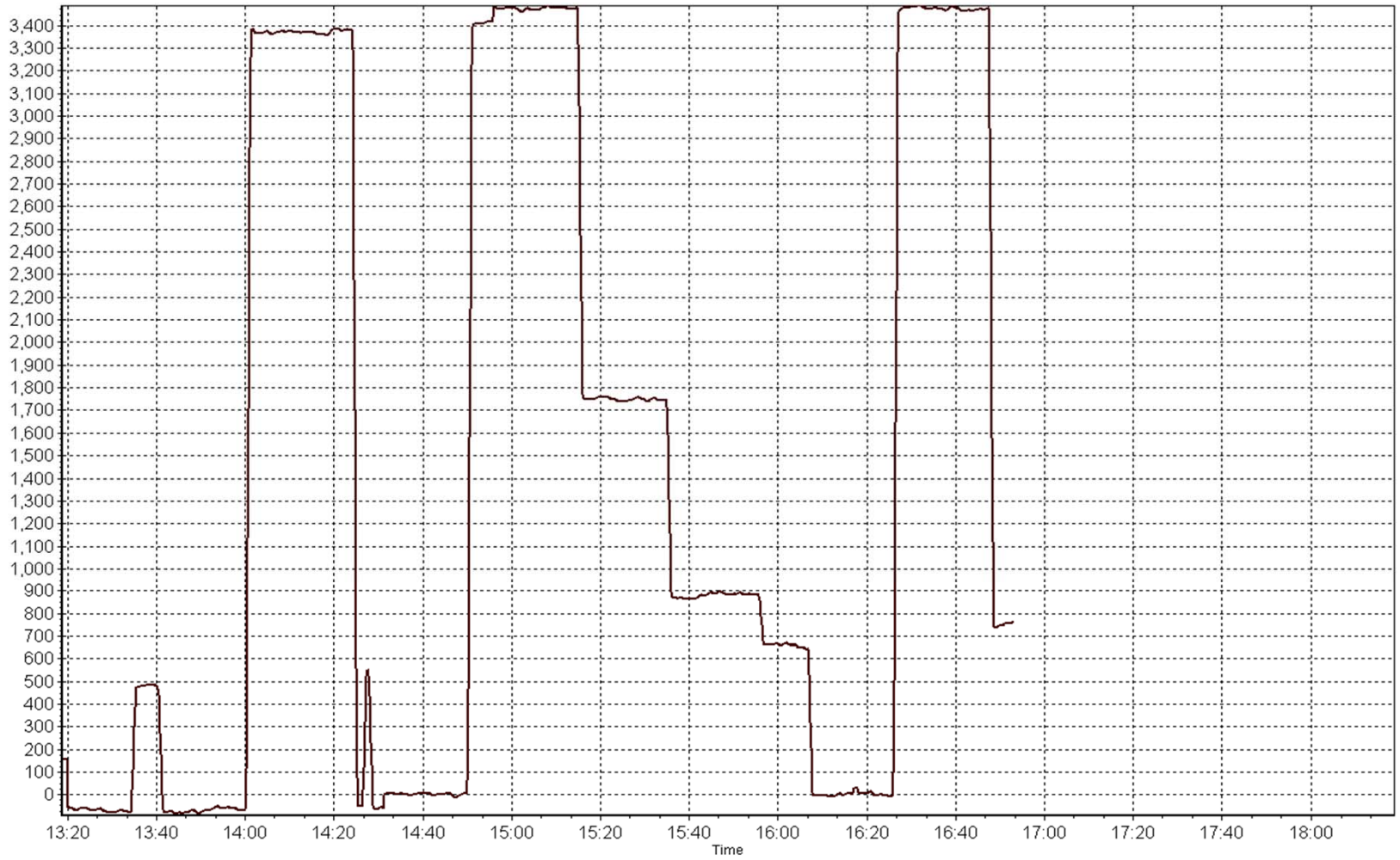
Calibration Date	January 9, 2014	Previous Calibration	December 13, 2013
Station Name	Lower Camp	Station Number	AMS 11
Start Time (MST)	13:05	End Time (MST)	16:55
Analyzer make	51i-LT	Analyzer serial #	121853580

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.01	N/A	Correlation Coefficient	0.999967
17.38	17.38	1.0000		
8.80	8.73	1.0076	Slope	1.001796
4.40	4.44	0.9914		
			Intercept	-0.010233



THC Calibration Plot **Date:** January 9, 2014



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 13
FORT MCKAY SOUTH
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS 13)
JANUARY 2014

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	705	39	39	100.00	10	0	2	0
TRS(ppb) Average	709	35	35	100.00	3	0	1	0
THC(ppm) Average	708	36	36	100.00	4.7	-	2.9	-
O3(ppb) Average	709	35	35	100.00	42	0	33	-
NO2(ppb) Average	706	38	38	100.00	44	0	24	-
NO(ppb) Average	706	38	38	100.00	105	-	36	-
NOX(ppb) Average	706	38	38	100.00	149	-	60	-
PM2.5(ug/m3) Average	743	0	1	99.87	34.3	-	13.4	0
Temperature 2 m (C) Average	744	0	0	100.00	7.2	-	-0.3	-
Relative Humidity (%) Average	744	0	0	100.00	94	-	90.0	-
Wind Speed 10 m (km/h) Average	686	0	58	92.20	29	-	-	-
Wind Direction 10 m (deg) Average	686	0	58	92.20	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS 13)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	705	0.7	1	-	0	0	0	0	1	2	10
TRS(ppb) Average	709	0.4	0	-	0	0	0	0	0	1	3
THC(ppm) Average	708	2.33	0.3	-	1.9	2	2.1	2.2	2.5	2.8	4.7
O3(ppb) Average	709	15.9	13	-	0	0	4	14	27	34	42
NO2(ppb) Average	706	12.7	10	-	0	1	4	11	21	27	44
NO(ppb) Average	706	7	14	-	0	0	0	0	7	24	105
NOX(ppb) Average	706	19.7	22	-	0	1	4	12	29	47	149
PM2.5(ug/m3) Average	743	4.64	3.9	-	0	1.1	2.1	3.7	6.1	9.2	34.3
Temperature 2 m (C) Average	744	-17.99	10.2	-	-40.4	-30.8	-25.3	-17.5	-11.6	-4.4	7.2
Relative Humidity (%) Average	744	77	9	-	49	67	71	77	84	88	94
Wind Speed 10 m (km/h) Average	686	5	4	-	0	1	2	4	7	11	29
Wind Direction 10 m (deg) Average	686	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -FORT McKAY SOUTH (AMS 13)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	15 Jan 2014 15:00	15 Jan 2014 15:00	1	Flow and zero reference checks, sample head cleaning
Wind Speed, Wind Direction	01 Jan 2014 02:00	01 Jan 2014 02:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	01 Jan 2014 05:00	01 Jan 2014 06:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	01 Jan 2014 10:00	01 Jan 2014 10:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	02 Jan 2014 01:00	02 Jan 2014 01:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	02 Jan 2014 04:00	02 Jan 2014 04:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	03 Jan 2014 06:00	03 Jan 2014 06:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	03 Jan 2014 11:00	03 Jan 2014 12:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	05 Jan 2014 17:00	05 Jan 2014 17:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	06 Jan 2014 03:00	06 Jan 2014 03:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	06 Jan 2014 09:00	06 Jan 2014 09:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	06 Jan 2014 21:00	06 Jan 2014 21:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 02:00	07 Jan 2014 03:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 06:00	07 Jan 2014 06:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 10:00	07 Jan 2014 10:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 12:00	07 Jan 2014 12:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 15:00	07 Jan 2014 16:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 19:00	07 Jan 2014 19:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 21:00	08 Jan 2014 00:00	4	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	08 Jan 2014 18:00	08 Jan 2014 21:00	4	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	09 Jan 2014 01:00	09 Jan 2014 05:00	5	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	09 Jan 2014 13:00	09 Jan 2014 13:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	10 Jan 2014 15:00	10 Jan 2014 18:00	4	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	11 Jan 2014 02:00	11 Jan 2014 03:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	13 Jan 2014 08:00	13 Jan 2014 08:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	14 Jan 2014 07:00	14 Jan 2014 09:00	3	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	15 Jan 2014 22:00	15 Jan 2014 23:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	16 Jan 2014 08:00	16 Jan 2014 08:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	16 Jan 2014 10:00	16 Jan 2014 11:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	16 Jan 2014 16:00	16 Jan 2014 16:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	17 Jan 2014 02:00	17 Jan 2014 03:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	18 Jan 2014 00:00	18 Jan 2014 03:00	4	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	20 Jan 2014 14:00	20 Jan 2014 14:00	1	Maintenance - replaced wind sesnors

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 10 ppb on Jan 14 22:00 Maximum Daily Average: 2.0 ppb on Jan 8

Minimum Value: 0 ppb on Jan 12 09:00 Minimum Daily Average: 0.2 ppb on Jan 12
Maximum Diurnal Average: 1.0 ppb at hour 2 Minimum Diurnal Average: 0.6 ppb at hour 23
Monthly Average: 0.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	705
Hours of Missing Data:	39
Hours of Calibration:	39
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1.0	4
2-Jan	4	Z	3	2	2	1	2	5	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1.9	5
3-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.3	1
4-Jan	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
5-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	1	1	0	0	0	0	0.4	1
6-Jan	0	Z	0	1	2	2	4	5	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	0	1.4	5
7-Jan	1	0	0	Z	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	1	1	1	1	1	1.0	2
8-Jan	1	Z	1	1	1	1	2	6	3	2	8	2	2	1	2	2	2	2	2	2	2	2	2	2	2.0	8
9-Jan	2	2	2	1	1	Z	1	0	0	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1.0	2
10-Jan	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Jan	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	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-Jan	1	Z	3	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0.6	3
14-Jan	0	Z	0	0	0	0	0	1	1	2	C	C	C	C	C	C	C	C	2	2	5	10	2	2	--	10
15-Jan	2	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0.8	2
16-Jan	1	Z	1	2	2	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.8	2
17-Jan	0	Z	1	1	1	1	1	1	0	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0.5	1
18-Jan	0	Z	0	0	0	1	1	1	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1.1	3
19-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0.5	1
20-Jan	0	Z	0	0	0	0	1	2	1	1	2	2	2	1	1	1	2	1	2	1	1	1	1	1	1.1	2
21-Jan	1	Z	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Jan	0	Z	1	0	0	0	0	0	0	0	0	1	3	2	0	1	2	4	3	1	1	2	1	1	1.0	4
23-Jan	1	Z	1	1	1	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0.5	1
24-Jan	1	Z	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
25-Jan	0	Z	0	0	1	1	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0.7	2
26-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.3	1
27-Jan	0	Z	0	0	0	0	1	1	1	1	1	1	1	3	4	1	1	0	0	0	0	1	2	2	1.0	4
28-Jan	2	Z	1	0	0	1	1	1	1	1	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0.9	2
29-Jan	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	1
30-Jan	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
31-Jan	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
	0.7	1.0	0.7	0.6	0.6	0.6	0.7	1.0	0.8	0.7	0.9	0.7	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.8	0.6	0.6	Diurnal Average	
	4	2	3	2	2	2	4	6	3	3	8	2	3	3	4	2	2	4	3	2	5	10	2	4	Diurnal Maximum	

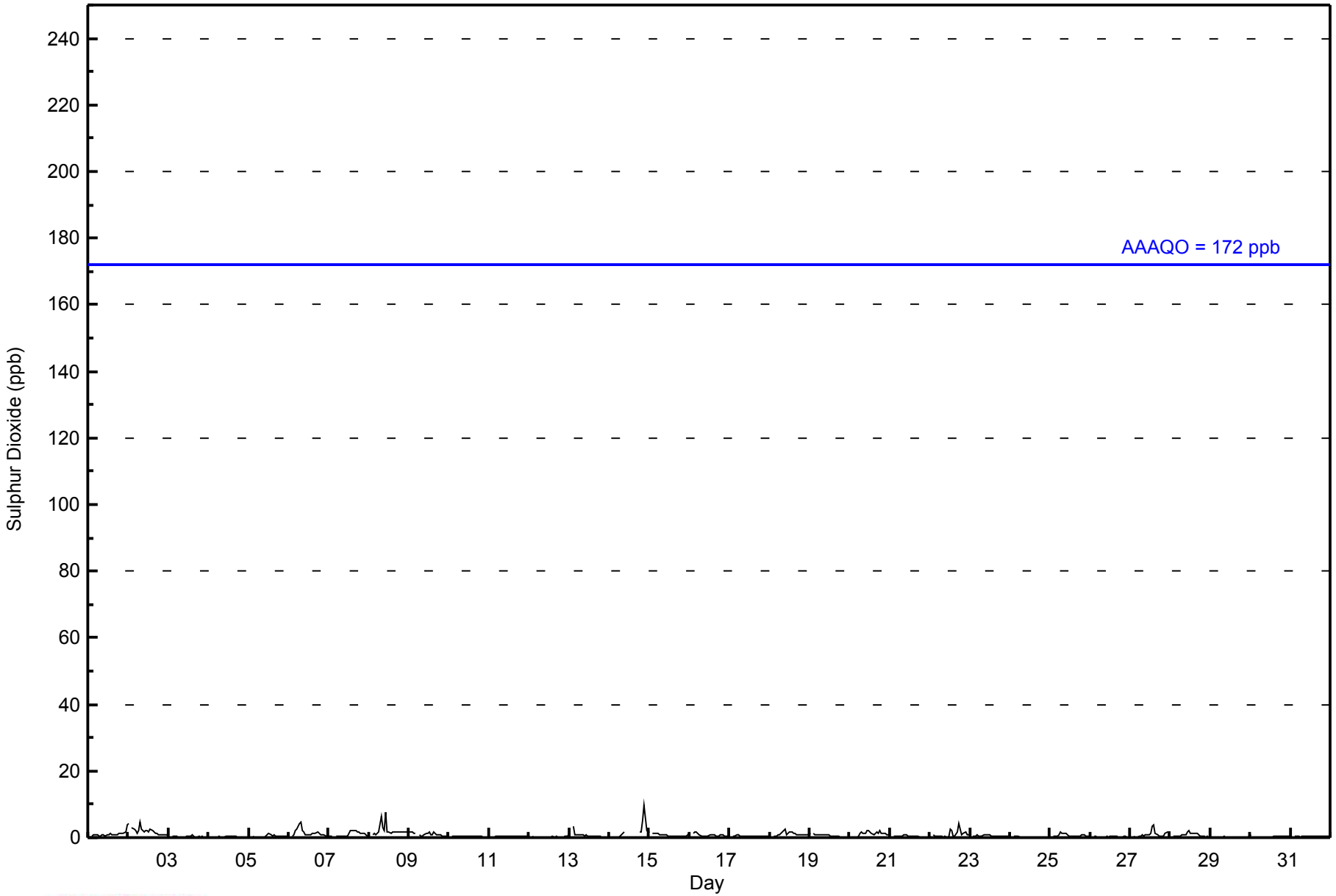
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	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: 705

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	132	40	10	3	4	8	17	47	101	54	61	56	36	14	23	45	651
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	132	40	10	3	4	8	17	47	101	54	61	56	36	14	23	45	651

Total Number of Valid Hours: 651

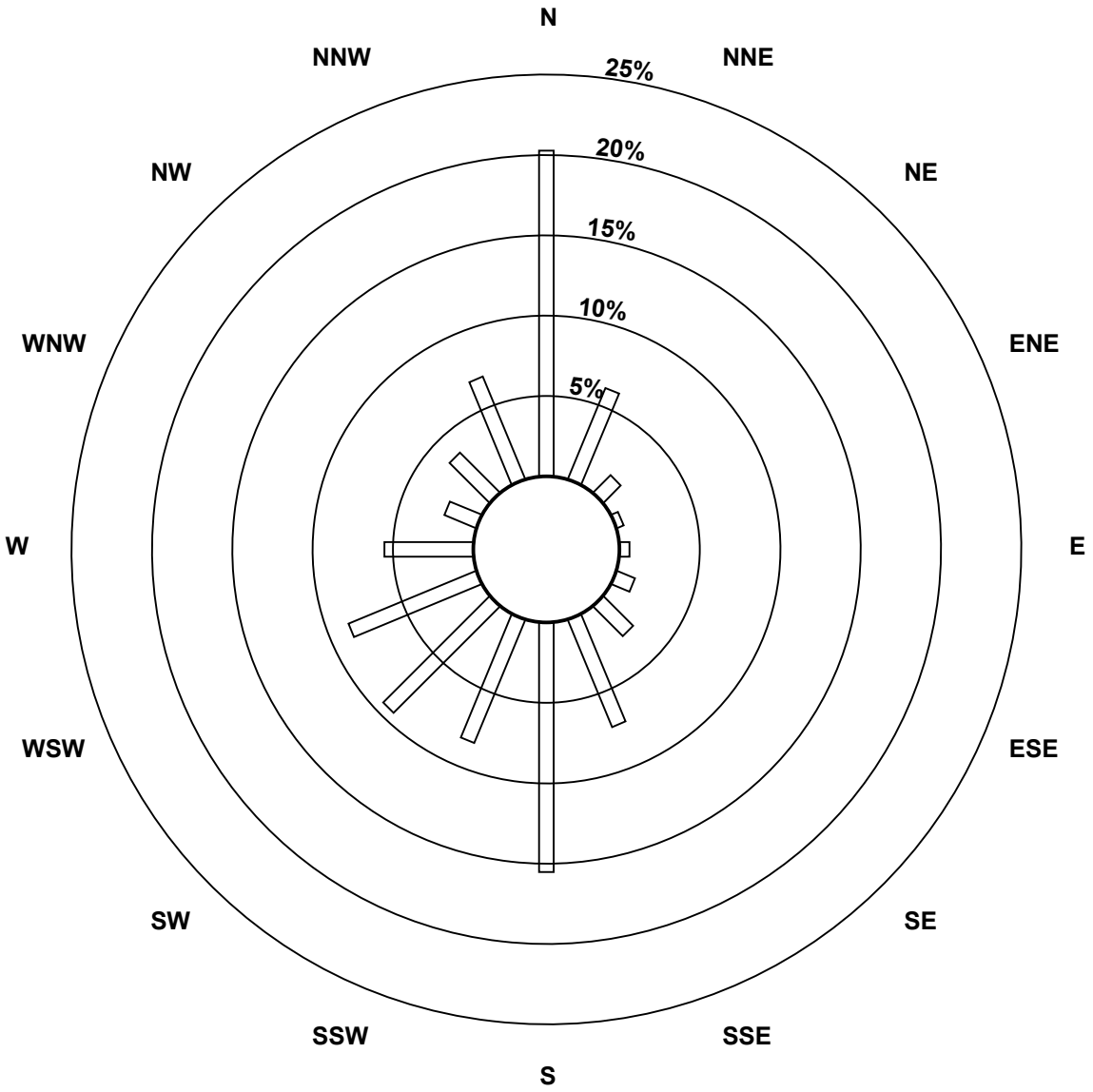
Total Number of Hours: 744

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Fort McKay South (AMS 13)



Classes (ppb)

- 0 - 10
- 11 - 20
- 21 - 60
- 61 - 110
- 111 - 172
- > 172

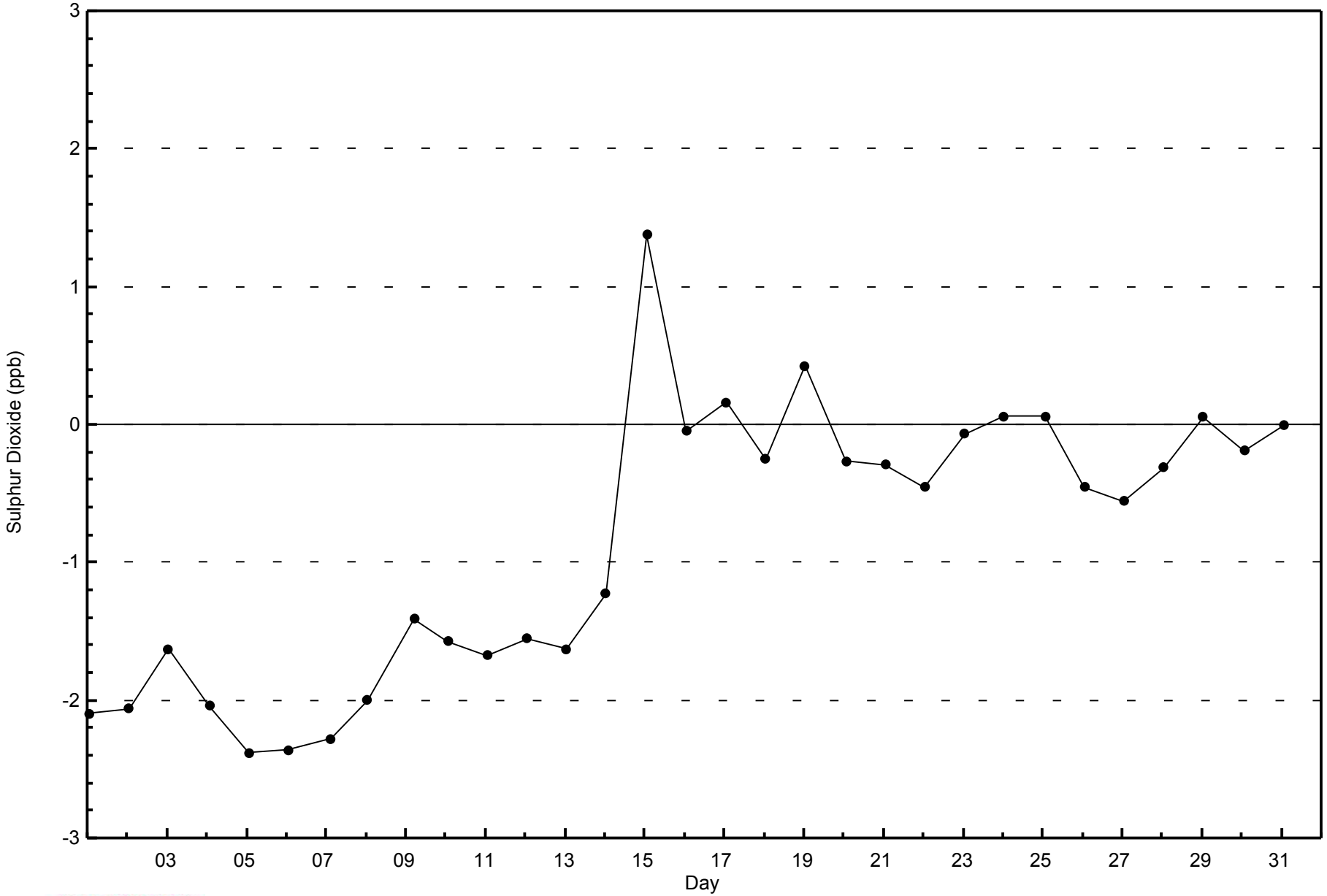
Total Number of Valid Hours: 651

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2014



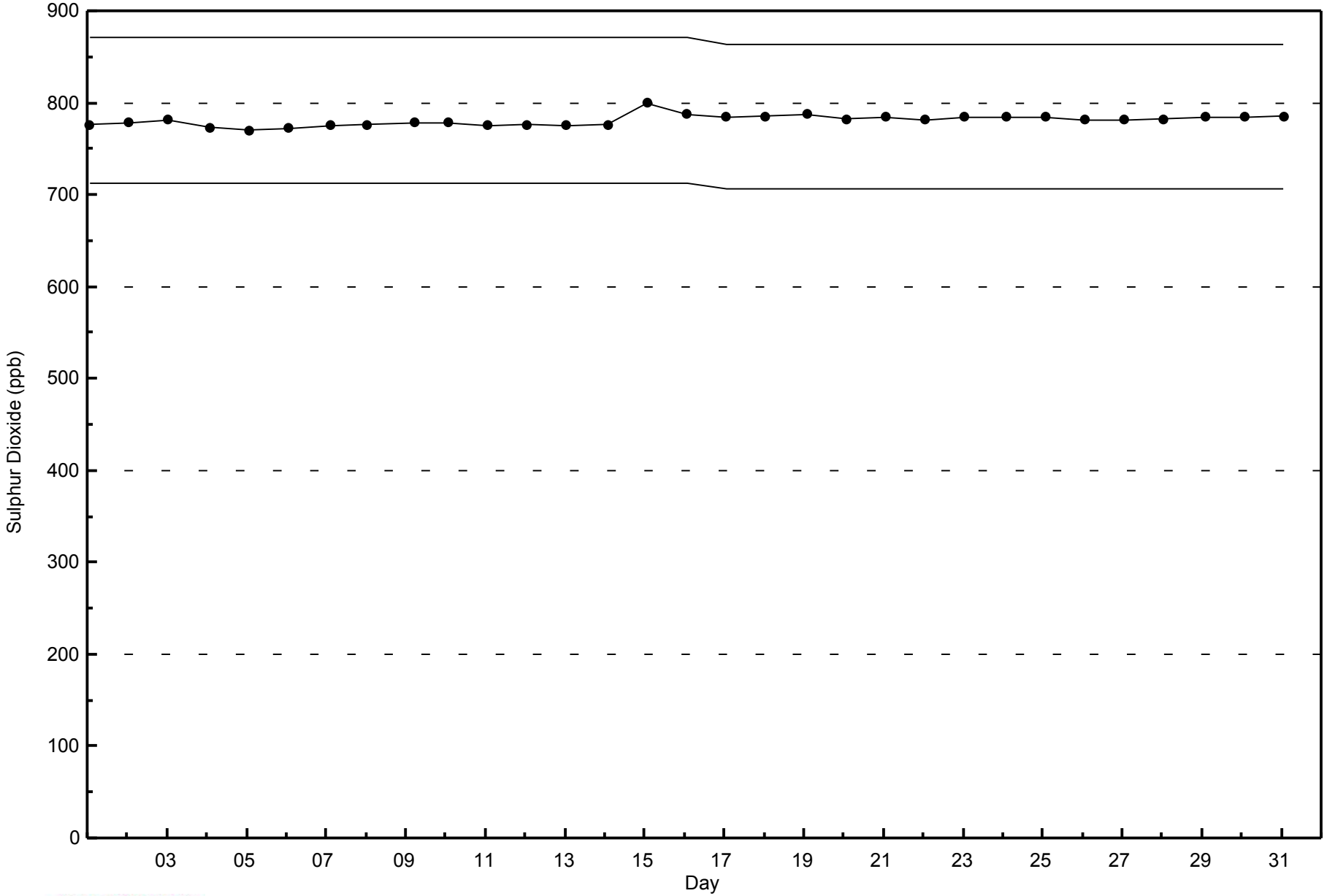
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 16 01:00 Maximum Daily Average: 1.0 ppb on Jan 16

Minimum Value: 0 ppb on Jan 23 14:00 Minimum Daily Average: 0.1 ppb on Jan 31
Maximum Diurnal Average: 0.6 ppb at hour 3 Minimum Diurnal Average: 0.3 ppb at hour 11
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

Hours in Service: 744
Hours of Data: 709
Hours of Missing Data: 35
Hours of Calibration: 35
Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
2-Jan	1	1	Z	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	1	0	0.7	1
3-Jan	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
4-Jan	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
5-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0.3	1
6-Jan	0	0	Z	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1
7-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1
8-Jan	1	0	Z	1	0	0	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	1	1	1	0.5	1
9-Jan	1	1	1	1	1	1	Z	1	0	0	0	C	C	C	C	1	0	0	0	0	0	0	0	0	0.4	1
10-Jan	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
11-Jan	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
12-Jan	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
13-Jan	0	0	Z	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Jan	0	0	Z	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0.7	1
15-Jan	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
16-Jan	3	2	Z	1	1	1	0	0	0	0	0	0	1	1	2	2	1	1	1	1	1	1	1	1	1.0	3
17-Jan	1	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
18-Jan	0	0	Z	0	0	0	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0.5	1
19-Jan	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
20-Jan	0	0	Z	0	1	1	1	0	0	0	1	1	1	0	0	1	1	1	1	1	1	0	0	0	0.6	1
21-Jan	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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1	1	2	1	0.6	2
23-Jan	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
24-Jan	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
25-Jan	0	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
26-Jan	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-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	0.5	1
28-Jan	1	1	Z	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0.7	1
29-Jan	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
30-Jan	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
31-Jan	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
	0.4	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	Diurnal Average	
	3	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	1	Diurnal Maximum	

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

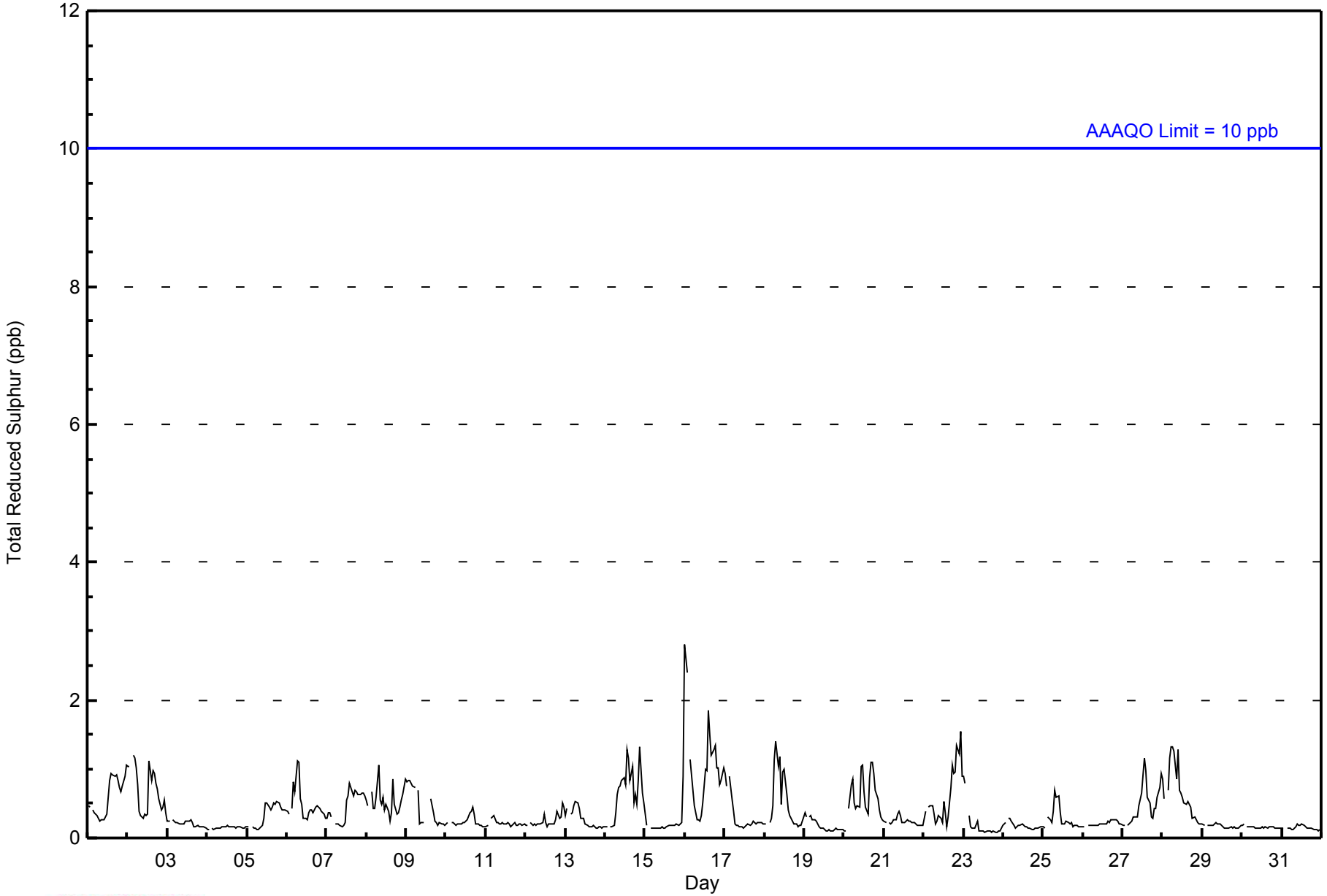
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	99.86	99.86
3 - 4	1	0.14	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: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	130	40	11	4	6	8	19	51	98	53	60	57	36	14	22	46	655
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	130	40	11	4	6	8	19	51	99	53	60	57	36	14	22	46	656

Total Number of Valid Hours: 656

Total Number of Hours: 744

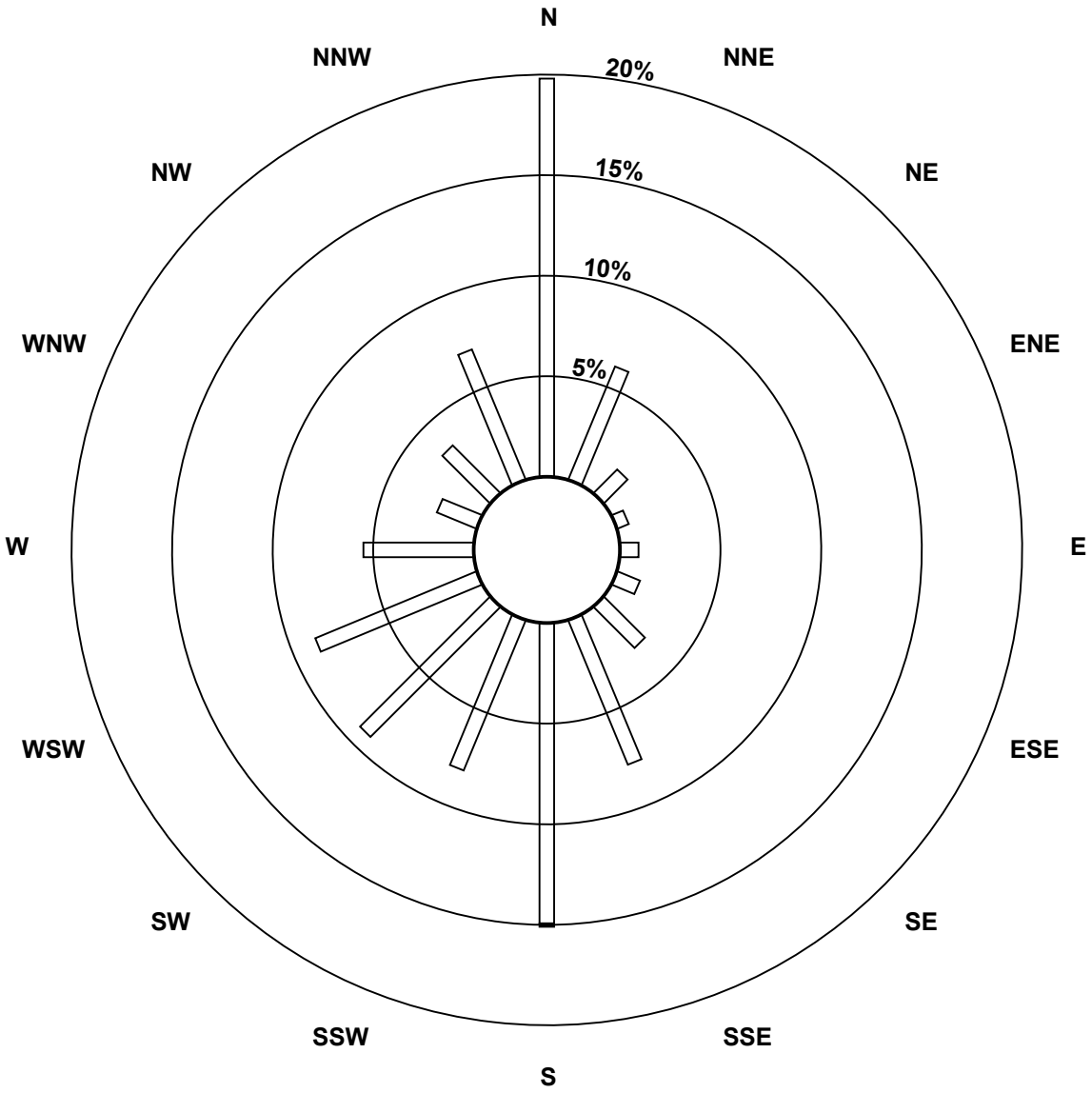
AURORA ATMOSPHERICS INC.

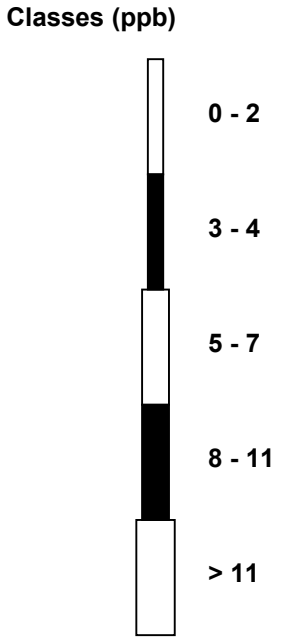
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Fort McKay South (AMS 13)





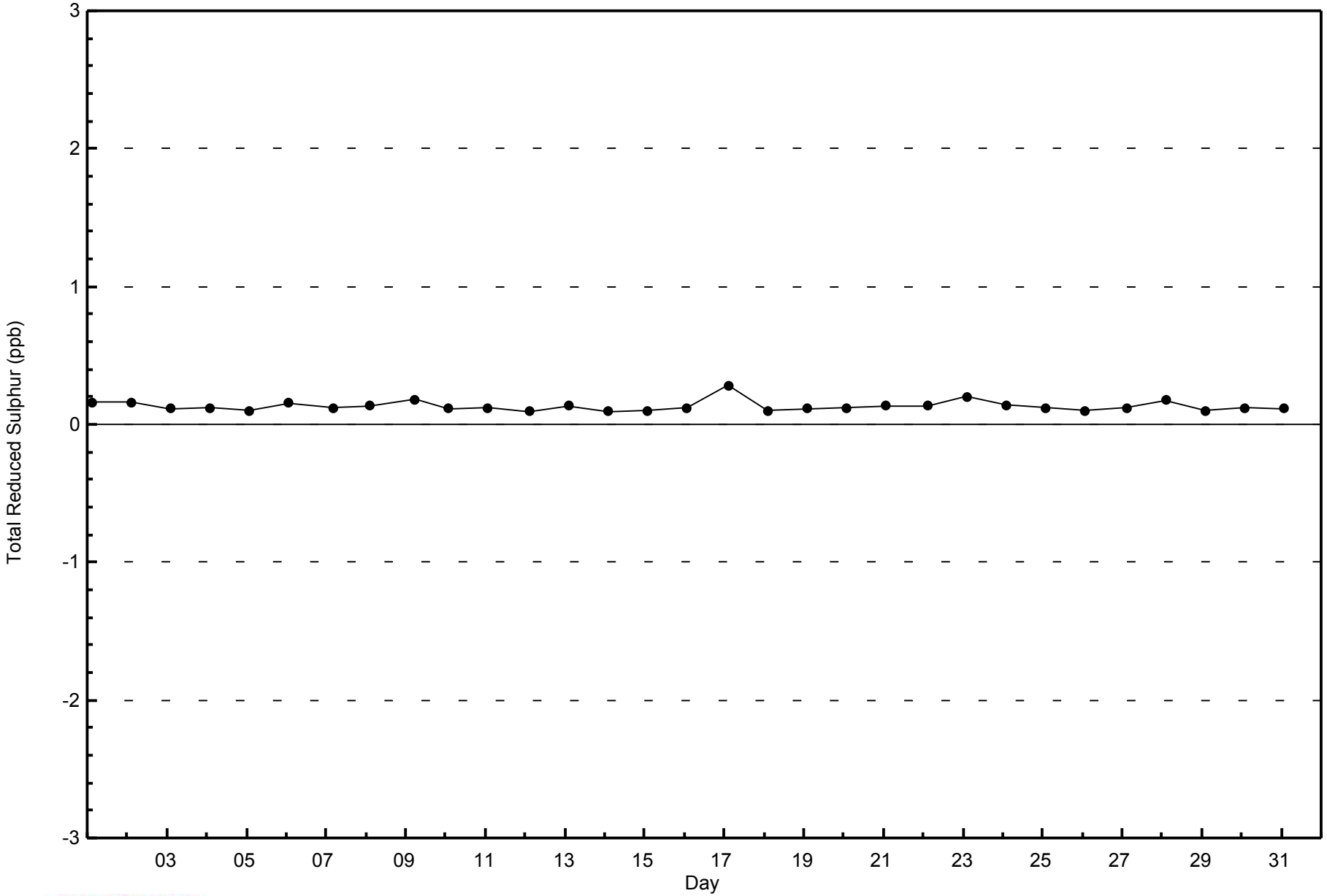
Total Number of Valid Hours: 656

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2014



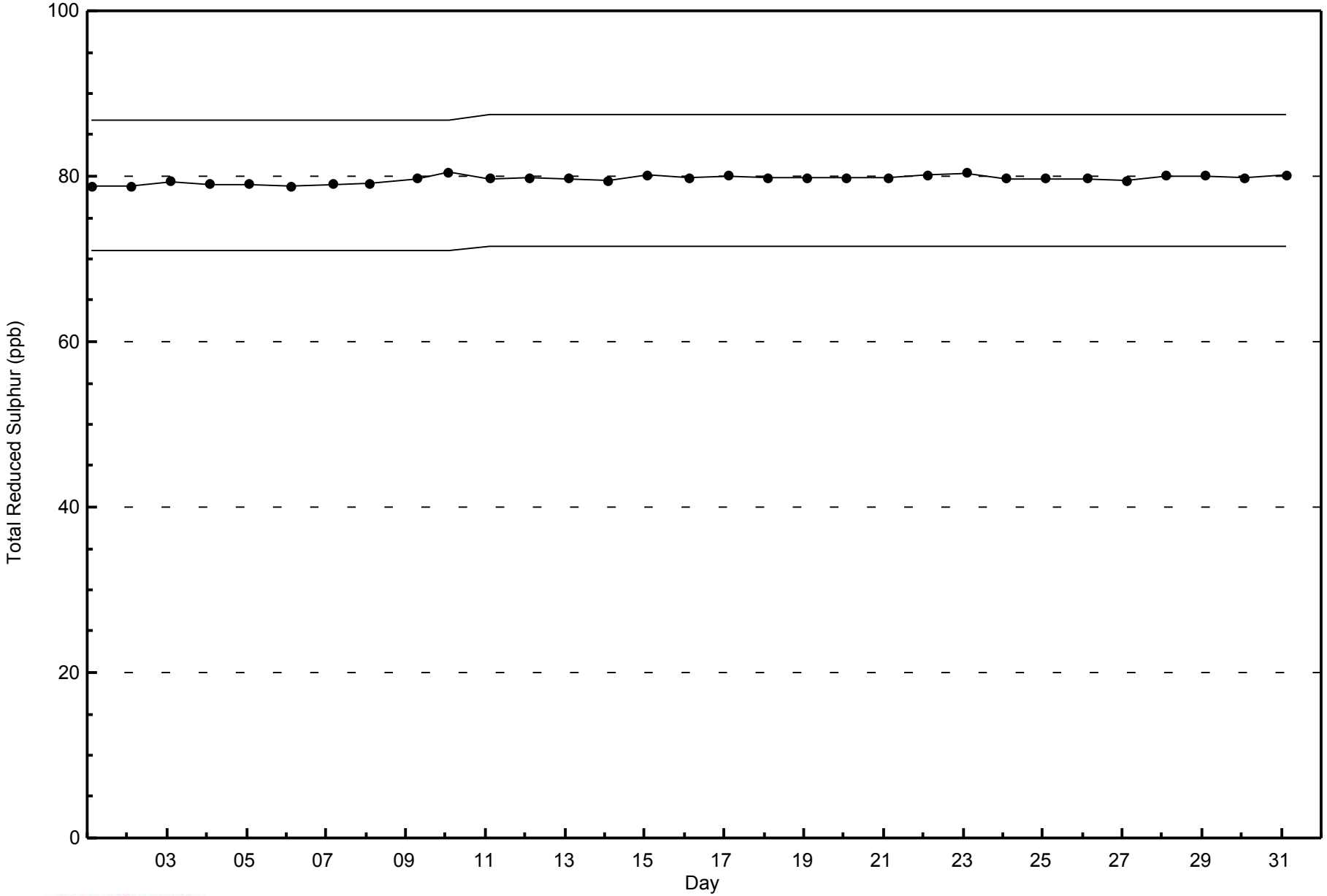
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2014

Maximum Value: 4.7 ppm on Jan 22 21:00

Maximum Daily Average: 2.9 ppm on Jan 2

Minimum Value: 1.9 ppm on Jan 20 15:00

Minimum Daily Average: 2.0 ppm on Jan 4

Maximum Diurnal Average: 2.7 ppm at hour 2

Minimum Diurnal Average: 2.3 ppm at hour 24

Monthly Average: 2.33 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.1 Median = 2.2 Q_3 = 2.5 P_{90} = 2.8 P_{99} = 3.6

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.6	Z	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.8	2.6	2.6	2.6	2.6	2.9	3.1	3.2	3.0	2.9	2.8	2.6	2.6	2.8	3.2
2-Jan	2.6	Z	2.6	2.5	2.6	2.6	2.6	2.6	2.8	2.8	3.1	2.7	2.6	3.0	3.7	4.3	4.0	3.7	2.8	2.6	2.5	2.5	2.5	2.4	2.9	4.3
3-Jan	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2
4-Jan	2.0	Z	2.0	2.0	1.9	1.9	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	2.0	2.0	2.0
5-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.7	2.6	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.7
6-Jan	2.4	Z	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.2	2.4
7-Jan	2.3	2.3	2.3	Z	2.3	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.4	2.5	2.6	2.7	2.9	3.1	3.0	2.9	2.8	2.7	2.7	2.6	2.5	3.1
8-Jan	2.5	Z	2.2	2.1	2.0	2.0	2.1	2.9	2.2	2.4	2.7	2.3	3.0	2.6	2.6	2.8	2.8	2.8	3.0	2.9	2.9	2.8	2.9	3.1	2.6	3.1
9-Jan	3.0	3.0	3.0	3.0	3.0	Z	3.2	2.7	2.7	2.7	2.7	2.7	2.7	2.9	2.9	3.6	2.8	2.5	2.4	2.2	2.3	2.2	2.1	2.1	2.7	3.6
10-Jan	2.1	Z	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.3	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.4
11-Jan	2.1	Z	2.2	2.1	2.3	2.5	2.1	2.0	2.0	2.0	2.1	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	2.1	2.5
12-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.4	2.2	2.4	2.1	2.1	2.1	2.2	2.4
13-Jan	2.1	Z	2.2	2.3	2.2	2.3	2.4	2.5	2.5	2.3	2.3	C	C	C	C	C	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.5
14-Jan	2.6	Z	2.6	2.6	2.6	2.7	2.8	3.0	2.9	2.8	2.7	2.7	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.6	2.5	2.8	2.6	2.6	2.6	3.0
15-Jan	2.4	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.2	2.4
16-Jan	2.9	Z	3.1	3.2	3.1	3.0	2.8	2.4	2.4	2.3	2.3	2.3	2.8	2.8	3.2	3.1	3.1	3.1	3.1	2.8	2.8	2.6	2.7	2.6	2.8	3.2
17-Jan	2.7	Z	3.1	3.0	2.7	2.7	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.3	3.1
18-Jan	2.1	Z	2.1	2.1	2.1	2.4	2.7	3.0	3.1	3.0	2.4	2.7	2.6	2.9	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.4	3.1
19-Jan	2.1	Z	2.3	2.2	2.2	2.1	2.2	2.2	2.1	2.0	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.3
20-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.3	2.2	2.1	2.1	2.4	2.5	2.2	1.9	1.9	2.5	2.9	2.9	2.7	2.4	2.3	2.2	2.1	2.1	2.3	2.9
21-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.3	2.5	2.6	2.4	2.1	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.1	2.2	2.2	2.6
22-Jan	2.1	Z	2.2	2.2	2.2	2.3	2.2	2.1	2.2	2.2	2.1	2.1	2.3	2.2	2.1	2.1	2.2	2.8	3.2	3.4	4.7	3.8	3.2	2.7	2.5	4.7
23-Jan	2.8	Z	2.7	2.3	2.2	2.3	2.2	2.2	2.3	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.8
24-Jan	2.2	Z	2.3	2.3	2.2	2.1	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.3
25-Jan	2.1	Z	2.4	2.5	2.4	2.4	3.1	3.1	3.0	2.8	2.4	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.1	2.3	3.1
26-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
27-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.6	2.7	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.7
28-Jan	2.3	Z	2.3	2.3	2.4	2.5	2.6	2.7	2.6	2.6	2.4	2.4	2.4	2.3	2.4	2.3	2.4	2.3	2.0	2.1	2.0	2.1	2.1	2.0	2.3	2.7
29-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
30-Jan	2.1	Z	2.2	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
31-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.3
	2.3	2.7	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	2.4	2.3	2.4	2.3	2.3	2.3	Diurnal Average	
	3.0	3.0	3.1	3.2	3.1	3.0	3.2	3.1	3.1	3.0	3.1	2.8	3.0	3.0	3.7	4.3	4.0	3.7	3.2	3.4	4.7	3.8	3.2	3.1	Diurnal Maximum	

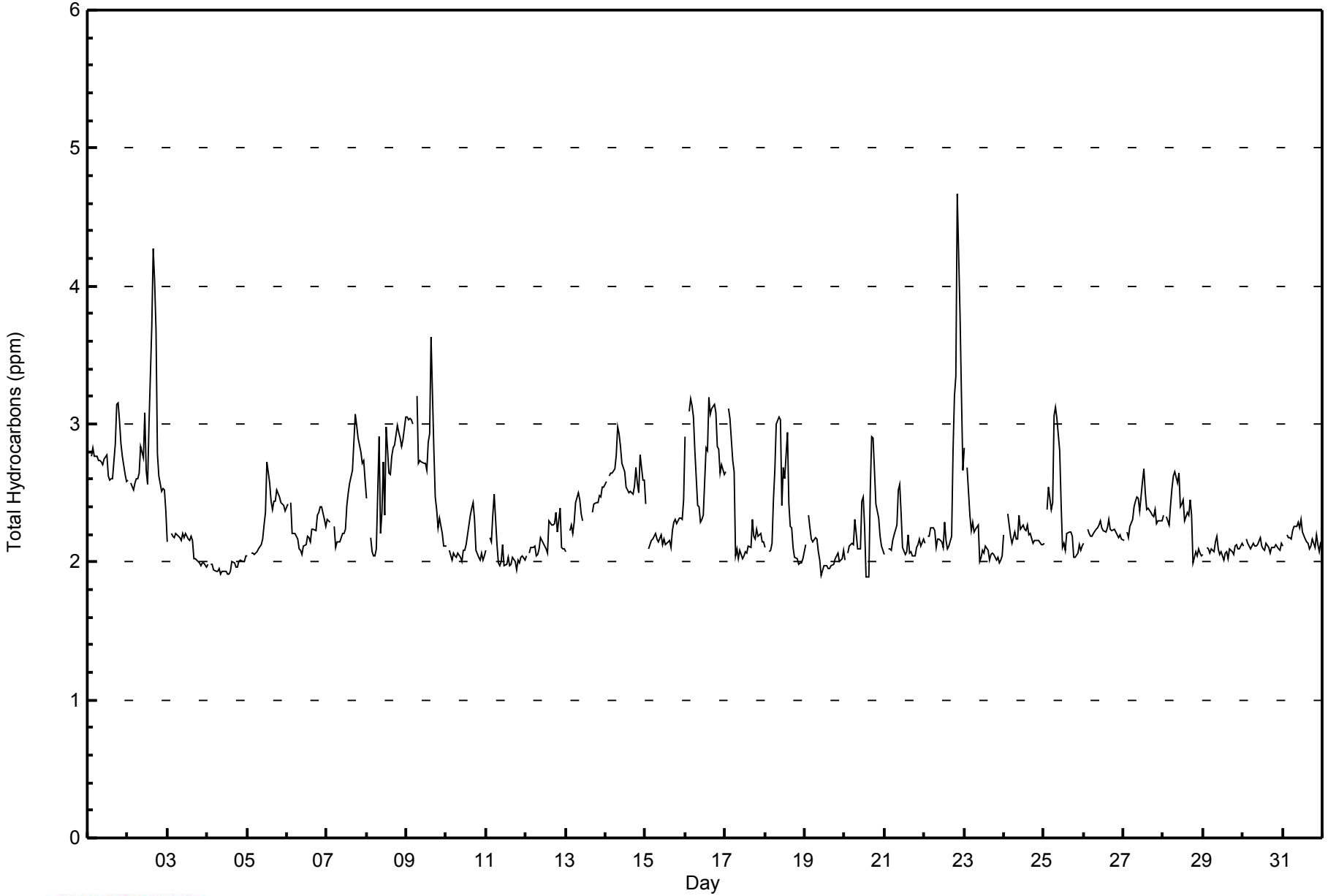
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	105	14.83	14.83
2.1 - 3.0	575	81.21	96.05
3.1 - 10.0	28	3.95	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2014

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	39	1	0	0	0	0	0	2	4	4	7	16	12	6	3	10	104
2.1 - 3.0	92	35	9	4	6	8	17	45	85	46	53	38	24	8	19	35	524
3.1 - 10.0	1	0	1	0	0	0	1	3	12	4	1	2	0	0	1	0	26
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	36	10	4	6	8	18	50	101	54	61	56	36	14	23	45	654

Total Number of Valid Hours: 654

Total Number of Hours: 744

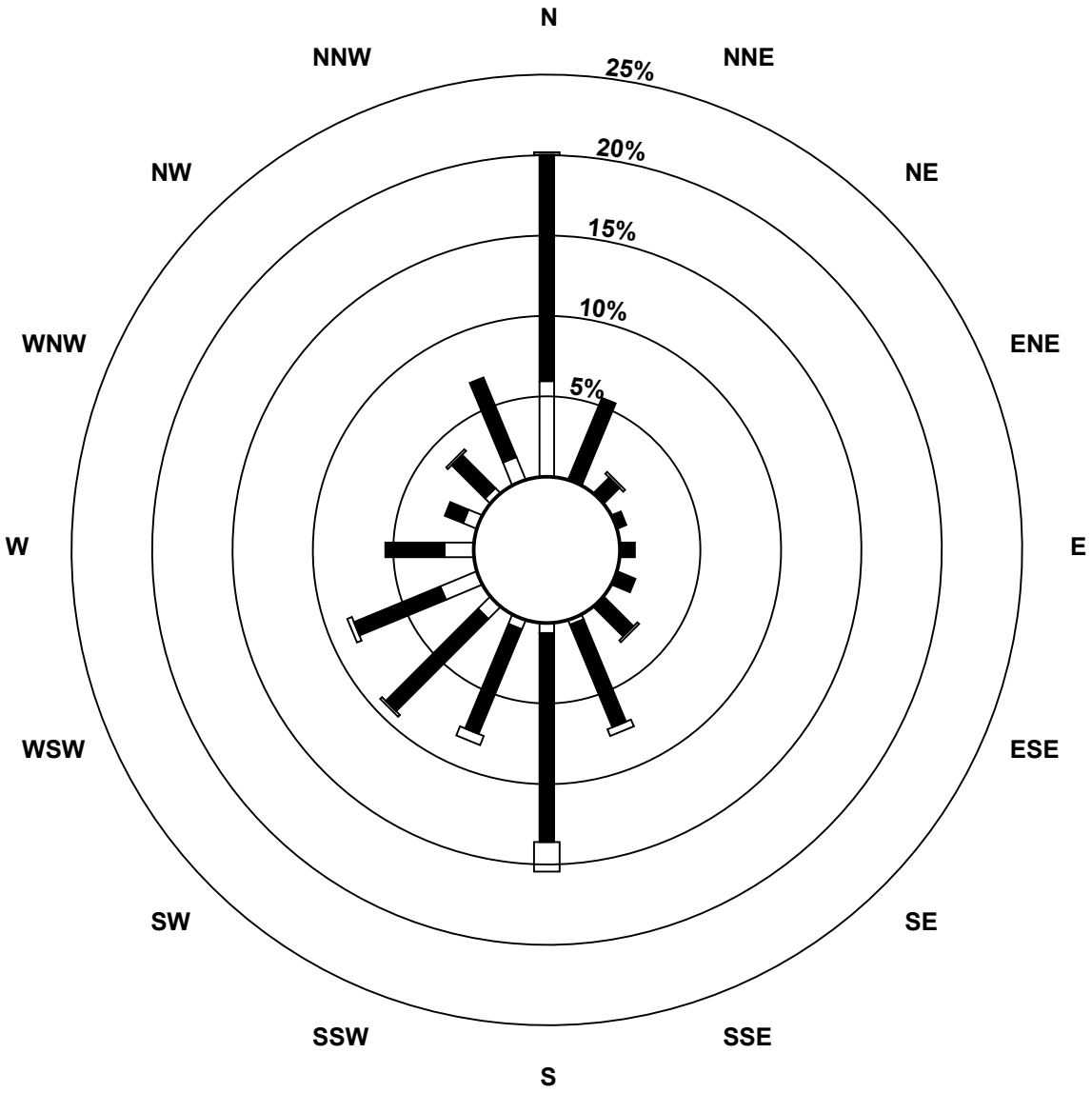
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Fort McKay South (AMS 13)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

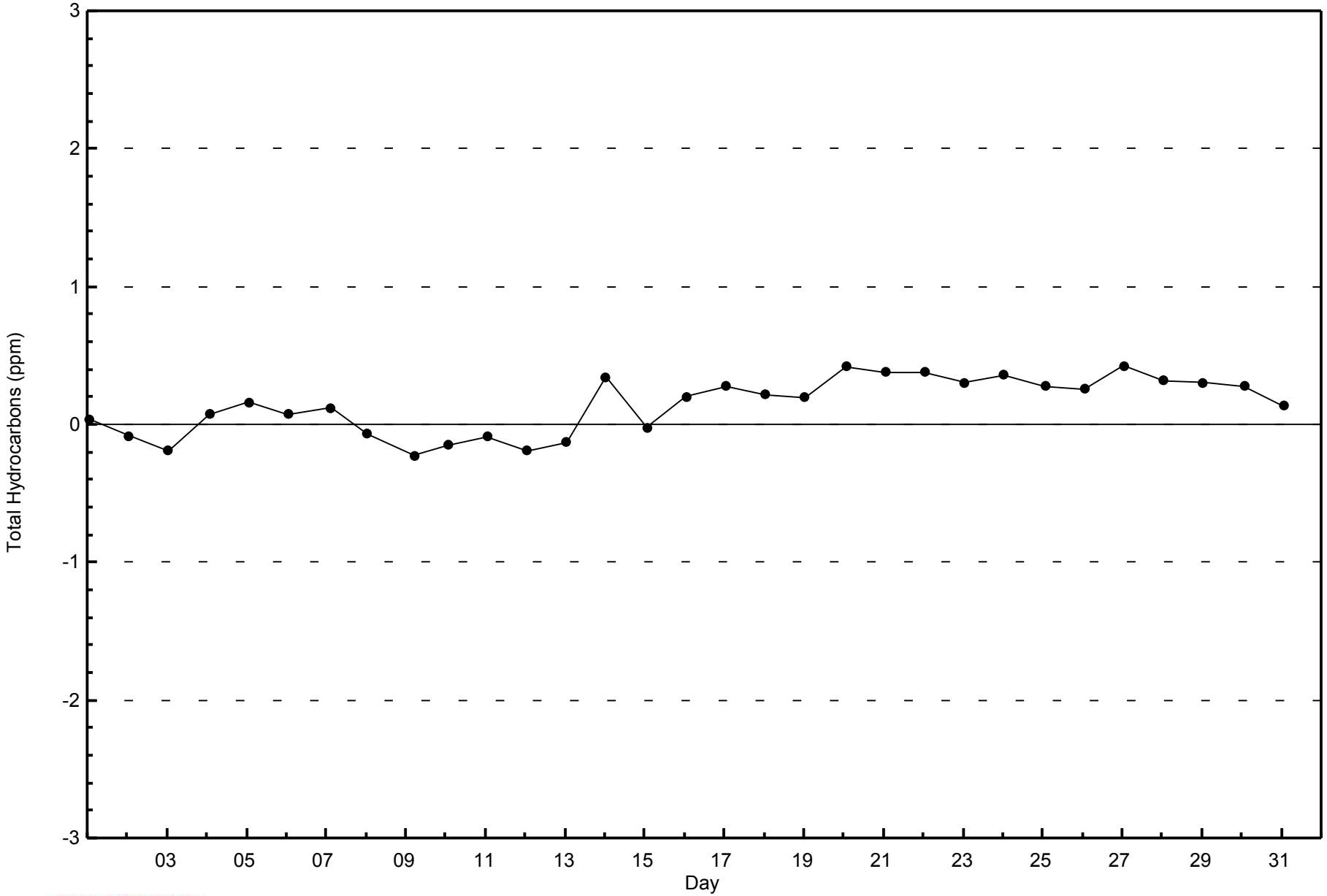
Total Number of Valid Hours: 654

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2014



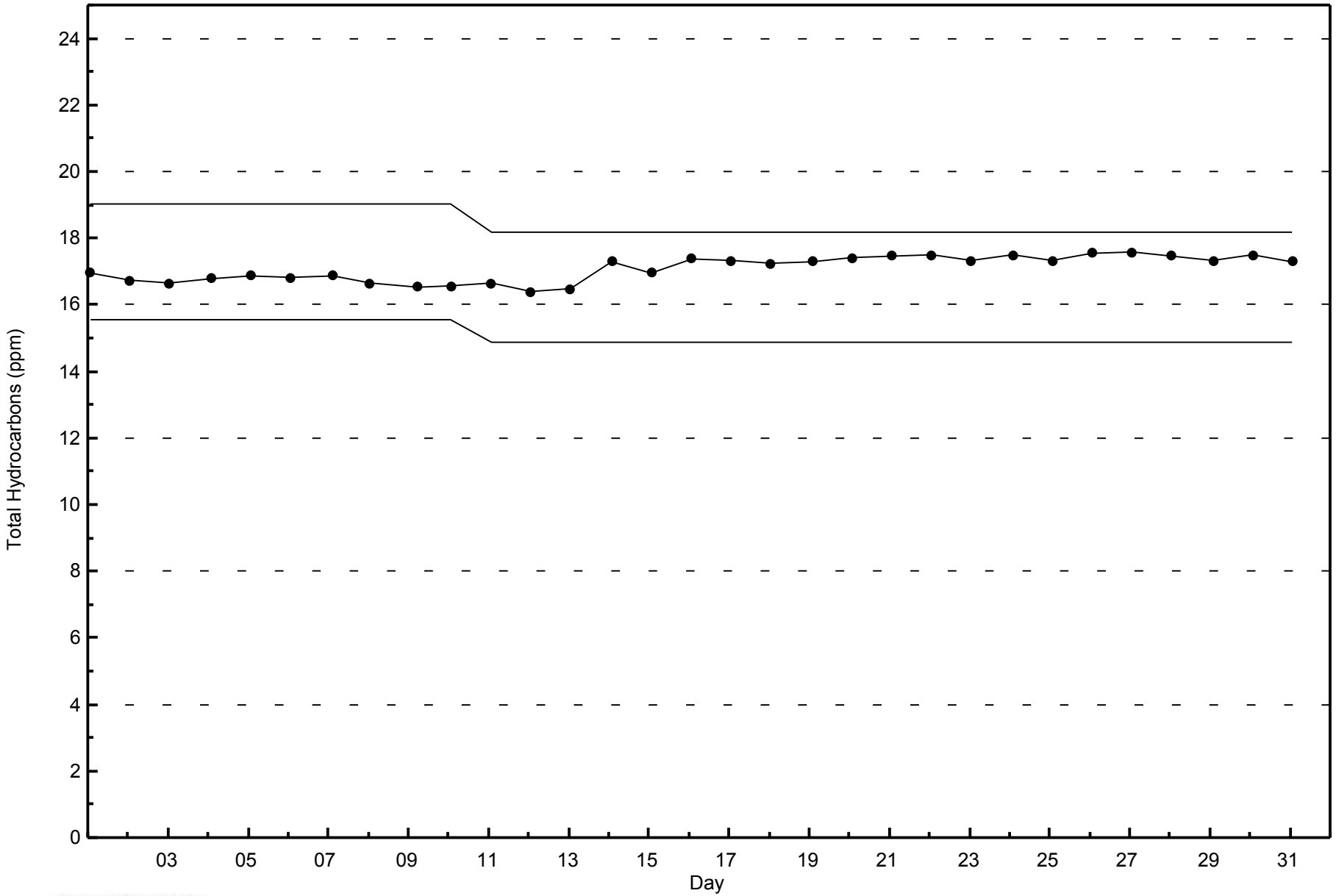
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Fort McKay South - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 42 ppb on Jan 15 08:00 Maximum Daily Average: 33.4 ppb on Jan 30

Minimum Value: 0 ppb on Jan 16 18:00 Minimum Daily Average: 1.1 ppb on Jan 1
Maximum Diurnal Average: 20.6 ppb at hour 14 Minimum Diurnal Average: 0.4 ppb at hour 3
Monthly Average: 15.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 4$ Median = 14 $Q_3 = 27$ $P_{90} = 34$ $P_{99} = 41$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	Z	0	0	0	0	0	0	1	2	4	5	5	4	2	0	0	0	0	0	0	0	1	1.1	5
2-Jan	0	0	Z	0	0	0	1	7	1	3	2	7	9	5	6	3	1	0	0	0	0	1	7	16	3.1	16
3-Jan	24	24	Z	25	22	18	15	13	12	10	10	7	11	13	20	20	32	32	31	34	33	32	33	28	21.9	34
4-Jan	26	24	Z	23	26	30	34	36	37	36	37	37	36	35	34	31	31	32	30	27	25	23	26	28	30.5	37
5-Jan	26	20	Z	18	14	14	15	13	9	7	8	8	7	11	16	5	1	0	1	0	1	0	1	1	8.5	26
6-Jan	1	2	Z	13	12	13	11	8	7	12	14	12	16	18	16	13	10	4	1	0	0	0	1	1	8.1	18
7-Jan	2	1	1	1	Z	8	7	6	6	7	8	7	4	3	2	1	0	0	0	0	0	0	0	0	2.9	8
8-Jan	0	3	Z	26	30	28	25	14	21	18	18	18	18	17	7	3	3	0	0	0	0	0	0	0	10.9	30
9-Jan	0	0	0	0	0	0	Z	5	2	1	2	2	2	3	4	1	7	12	15	17	17	20	21	22	6.7	22
10-Jan	23	24	Z	23	24	24	22	22	21	22	22	22	19	17	14	10	3	6	22	20	24	17	10	7	18.2	24
11-Jan	7	6	Z	10	5	1	14	25	27	24	19	24	24	25	26	26	26	25	28	28	29	29	30	31	21.2	31
12-Jan	32	32	Z	28	29	23	29	30	25	24	26	23	28	33	15	11	2	1	4	9	13	17	17	16	20.4	33
13-Jan	17	14	Z	2	3	0	0	0	1	8	12	17	28	28	31	33	29	25	24	22	21	19	16	15	15.9	33
14-Jan	12	10	Z	7	5	3	0	0	0	1	3	6	10	7	6	4	1	7	8	10	9	2	1	2	5.0	12
15-Jan	4	30	Z	42	42	42	42	42	41	38	37	38	C	C	C	C	29	26	26	21	13	2	0	0	27.1	42
16-Jan	0	0	Z	0	0	0	0	0	0	4	5	4	4	4	5	2	0	0	0	0	0	0	0	0	1.3	5
17-Jan	1	0	Z	2	0	5	34	36	37	38	39	40	41	41	40	39	30	32	32	35	33	31	29	23	27.8	41
18-Jan	20	16	Z	11	5	2	0	0	0	1	14	9	13	10	15	18	20	23	26	28	30	31	31	27	15.2	31
19-Jan	21	16	Z	17	17	11	7	7	14	28	32	35	34	33	31	29	27	25	25	23	26	23	19	17	22.5	35
20-Jan	15	11	Z	1	1	3	7	11	8	5	9	11	11	13	12	8	3	0	2	2	3	10	15	16	7.7	16
21-Jan	18	17	Z	11	9	5	2	1	1	2	8	23	30	28	26	29	26	20	17	15	13	10	9	8	14.2	30
22-Jan	7	9	Z	17	18	13	14	18	17	21	23	21	17	21	22	21	8	3	6	4	7	7	9	9	13.6	23
23-Jan	8	7	Z	7	3	10	6	3	11	31	32	33	36	37	39	39	39	37	25	33	19	17	11	7	21.3	39
24-Jan	5	3	Z	18	19	25	25	31	34	27	27	23	28	28	27	33	34	37	34	30	28	27	22	21	25.4	37
25-Jan	21	13	Z	0	5	3	0	0	0	2	11	28	29	30	24	27	23	24	37	40	39	40	38	41	20.7	41
26-Jan	41	40	Z	37	36	34	33	26	22	27	22	25	23	23	13	7	12	10	9	8	8	8	6	4	20.5	41
27-Jan	4	3	Z	2	1	0	0	0	1	3	7	9	12	15	15	15	7	5	7	4	4	2	2	4	5.4	15
28-Jan	5	6	Z	6	6	3	1	0	1	4	9	11	13	14	13	8	4	14	33	31	30	27	28	28	12.7	33
29-Jan	24	20	Z	19	18	17	12	5	6	17	32	33	36	37	36	36	36	36	35	36	36	35	33	35	27.4	37
30-Jan	36	32	Z	31	34	36	34	34	36	37	37	37	35	35	35	35	31	29	26	33	32	25	33	35	33.4	37
31-Jan	30	27	Z	26	26	22	20	18	7	6	16	24	23	31	33	33	33	33	26	23	28	31	22	23	24.4	33
	13.8	13.3	0.4	13.6	13.7	12.7	13.7	13.3	13.1	15.0	17.6	19.3	20.2	20.6	19.5	18.0	16.3	16.1	17.1	17.3	16.8	15.7	15.2	15.1	Diurnal Average	
	41	40	1	42	42	42	42	42	41	38	39	40	41	41	40	39	39	37	37	40	39	40	38	41	Diurnal Maximum	

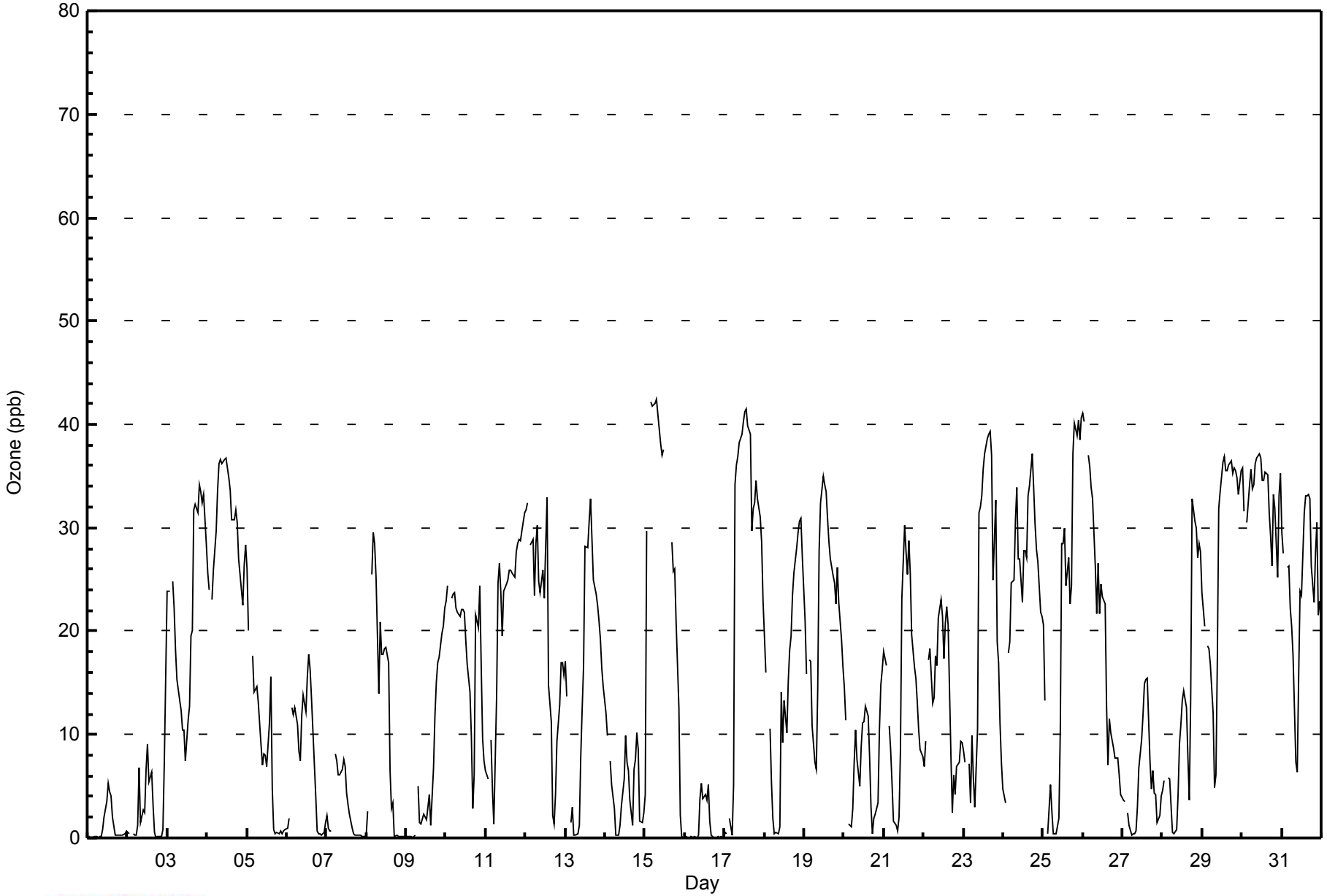
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	431	60.79	60.79
21 - 50	278	39.21	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Ozone (O_3) - ppb

Fort McKay South - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	40	13	4	3	6	5	13	44	90	42	50	25	11	4	8	20	378
21 - 50	92	27	7	1	0	3	6	7	10	11	10	32	25	10	11	25	277
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	40	11	4	6	8	19	51	100	53	60	57	36	14	19	45	655

Total Number of Valid Hours: 655

Total Number of Hours: 744

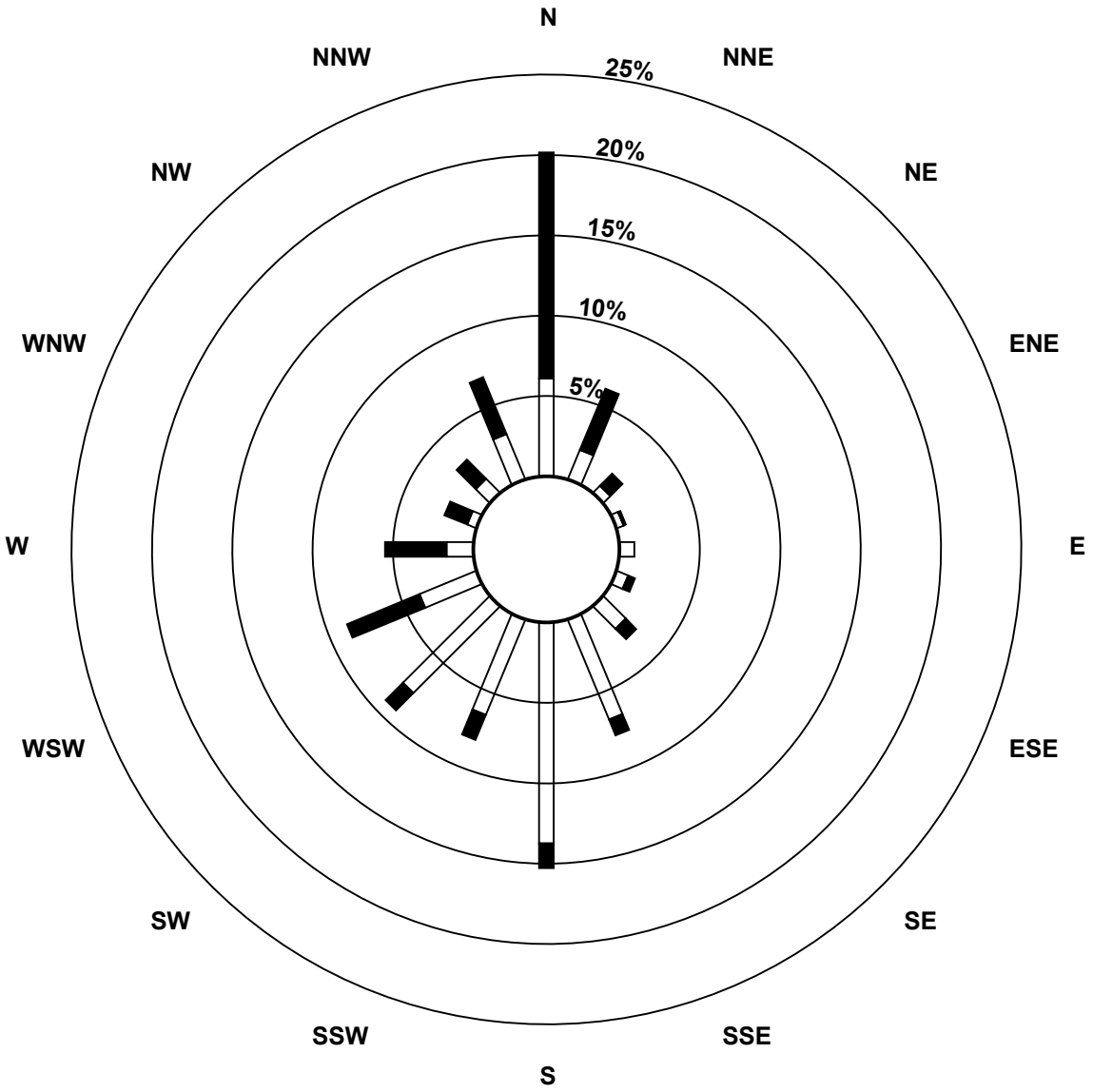
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ozone (O_3) - ppb

Fort McKay South (AMS 13)



Classes (ppb)

0 - 20

21 - 50

51 - 82

> 83

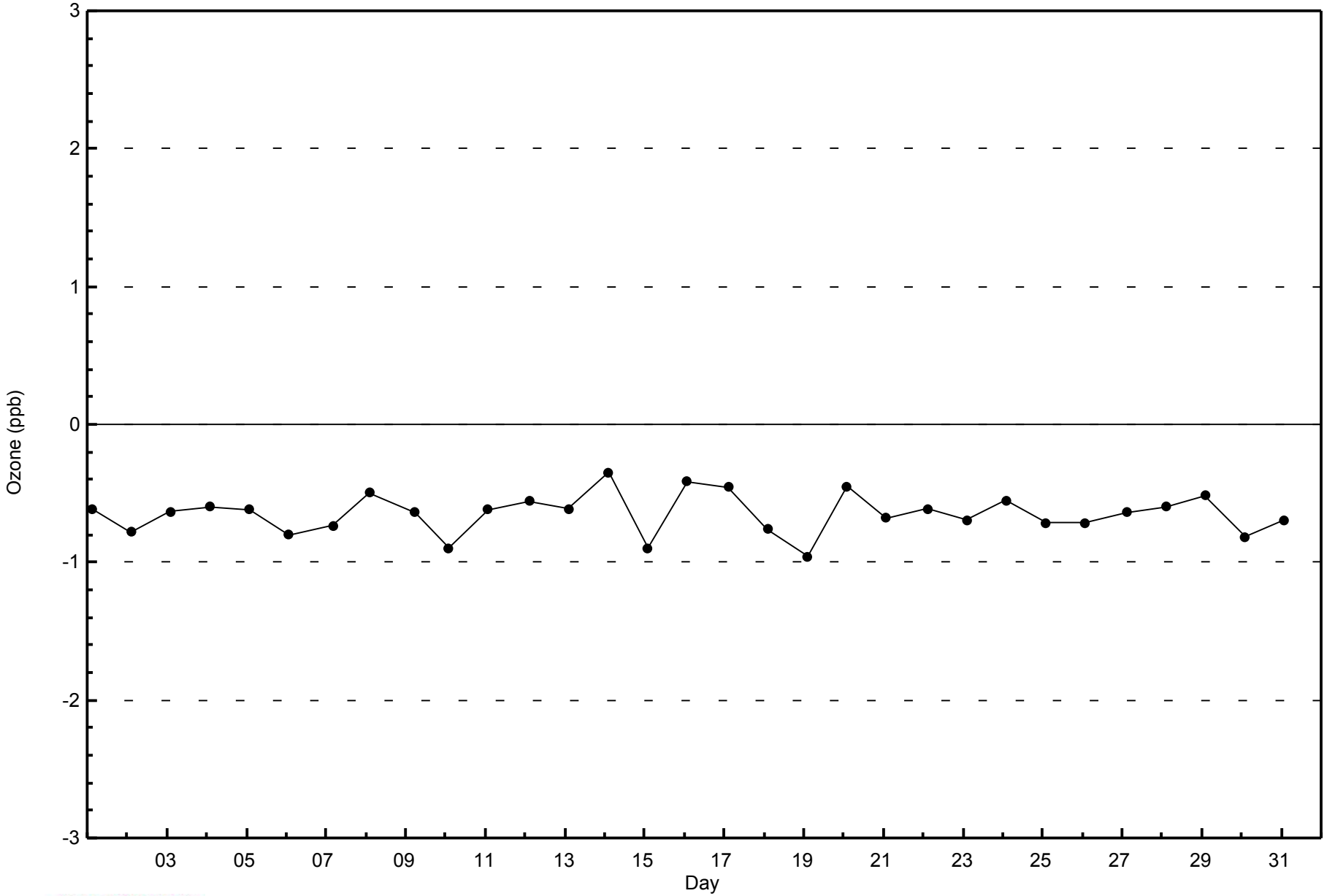
Total Number of Valid Hours: 655

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Fort McKay South - January 2014



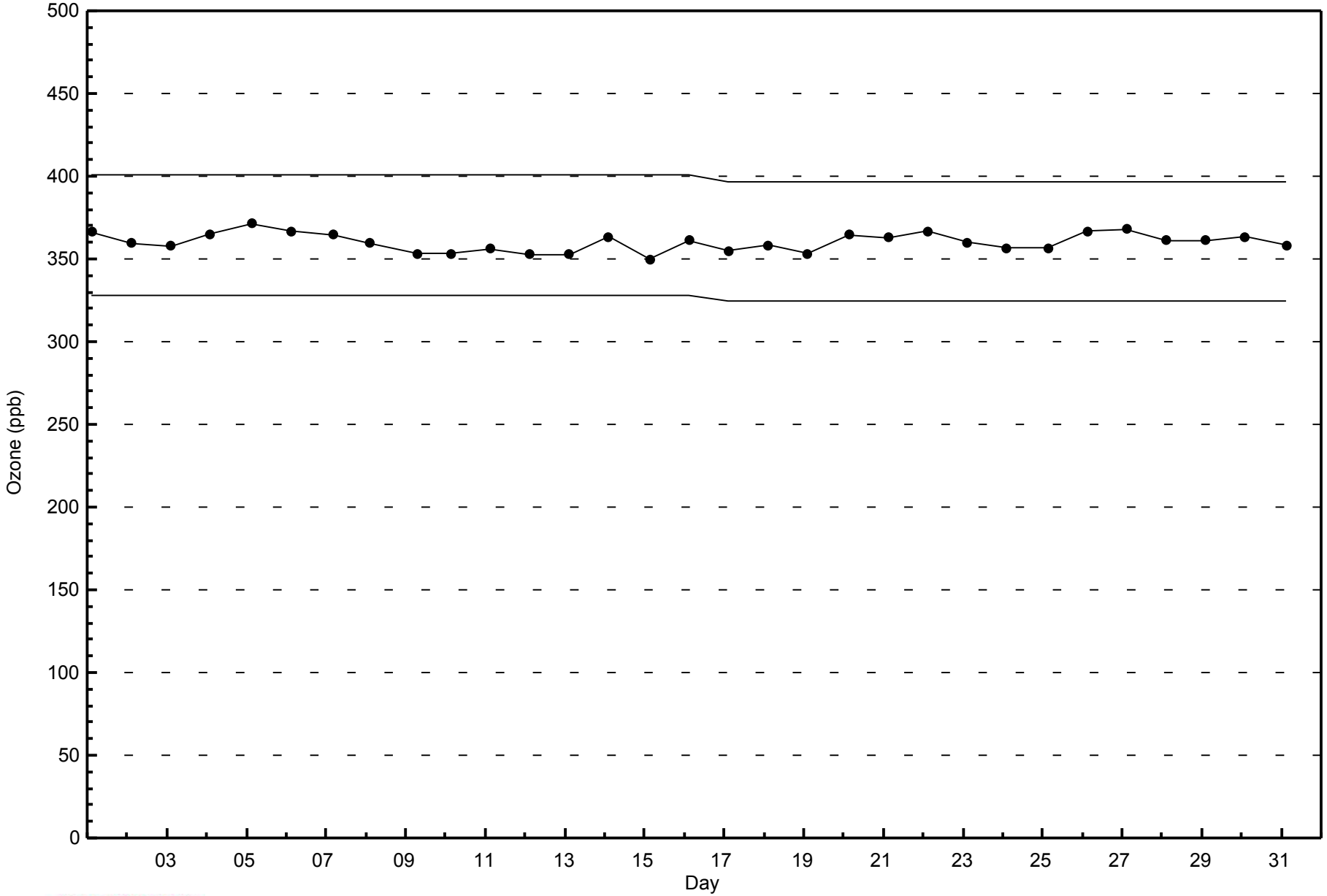
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort McKay South - January 2014

Maximum Value: 105 ppb on Jan 7 16:00

Maximum Daily Average: 35.8 ppb on Jan 7

Minimum Value: 0 ppb on Jan 3 03:00

Minimum Daily Average: 0.0 ppb on Jan 4

Maximum Diurnal Average: 15.9 ppb at hour 2

Minimum Diurnal Average: 3.9 ppb at hour 1

Monthly Average: 7.0 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 7$ $P_{90} = 24$ $P_{99} = 79$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	38
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	6	Z	13	27	31	28	23	22	24	25	25	30	23	21	15	16	20	33	47	57	56	42	30	22	27.6	57
2-Jan	21	Z	13	13	14	12	9	1	6	8	20	9	4	11	8	8	9	10	13	12	6	10	4	0	9.6	21
3-Jan	0	Z	0	0	0	0	0	0	0	1	2	16	15	11	4	1	0	0	0	0	0	0	0	0	2.2	16
4-Jan	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
5-Jan	0	Z	0	0	0	0	0	0	0	2	11	27	44	19	6	14	16	12	13	11	4	5	4	3	8.3	44
6-Jan	2	Z	2	1	0	0	1	0	1	1	2	4	5	5	5	3	1	1	7	13	19	17	10	4	4.6	19
7-Jan	4	3	3	Z	1	0	0	0	0	2	4	11	60	88	105	105	90	78	69	57	45	41	36	23	35.8	105
8-Jan	12	Z	0	0	0	0	0	1	0	1	3	4	4	3	12	19	3	26	36	32	33	27	29	27	11.8	36
9-Jan	29	29	32	34	35	Z	23	2	9	20	39	49	53	27	15	41	12	0	0	0	0	0	0	0	19.5	53
10-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	2	3	3	3	3	1	0	0	0	0	0	0	0.8	3
11-Jan	0	Z	1	0	6	16	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1.3	16
12-Jan	0	Z	0	0	0	0	0	0	0	1	1	3	2	1	10	8	12	5	4	1	0	0	0	0	2.1	12
13-Jan	0	Z	7	13	5	20	26	29	22	4	2	3	1	1	1	0	0	0	0	0	0	0	0	0	5.9	29
14-Jan	0	Z	0	0	0	2	15	34	34	27	C	C	C	C	C	C	C	1	0	0	0	4	4	2	--	34
15-Jan	2	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	22	38	2.9	38
16-Jan	40	Z	48	82	67	48	37	21	16	7	5	15	38	41	21	22	12	15	22	31	30	21	9	7	28.5	82
17-Jan	3	Z	2	2	19	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	22
18-Jan	0	Z	0	0	0	2	10	21	80	97	12	16	11	21	7	2	0	0	0	0	0	0	0	0	12.2	97
19-Jan	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-Jan	0	Z	0	1	4	3	0	2	1	7	10	11	8	5	4	4	4	5	5	1	1	0	0	0	3.4	11
21-Jan	0	Z	0	0	0	1	4	3	22	24	11	2	1	2	2	1	0	0	0	0	0	0	0	0	3.1	24
22-Jan	0	Z	0	0	0	0	0	0	0	1	2	3	8	4	3	2	3	4	1	0	0	0	0	0	1.3	8
23-Jan	0	Z	0	2	8	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	8
24-Jan	0	Z	0	0	0	0	0	0	0	0	1	2	1	2	1	0	0	0	0	0	0	0	0	0	0.3	2
25-Jan	0	Z	0	7	8	16	57	25	27	18	8	0	1	0	1	0	0	0	0	0	0	0	0	0	7.3	57
26-Jan	0	Z	0	0	0	0	0	0	0	1	3	3	3	4	8	13	2	0	0	0	0	0	0	0	1.6	13
27-Jan	0	Z	0	0	2	14	27	26	24	24	28	27	24	15	11	5	5	1	0	0	0	1	1	0	10.2	28
28-Jan	1	Z	0	0	0	0	4	10	15	18	18	19	15	8	7	8	5	0	0	0	0	0	0	0	5.5	19
29-Jan	0	Z	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.1	1
31-Jan	0	Z	0	0	0	0	0	0	2	6	5	2	3	1	0	0	0	0	0	0	0	0	0	0	0.8	6
	3.9	15.9	3.9	6.1	6.4	6.2	7.6	6.5	9.4	9.6	7.2	8.6	10.9	9.8	8.3	9.2	6.6	6.3	7.0	7.0	6.3	5.6	4.8	4.0	Diurnal Average	
	40	29	48	82	67	48	57	34	80	97	39	49	60	88	105	105	90	78	69	57	56	42	36	38	Diurnal Maximum	

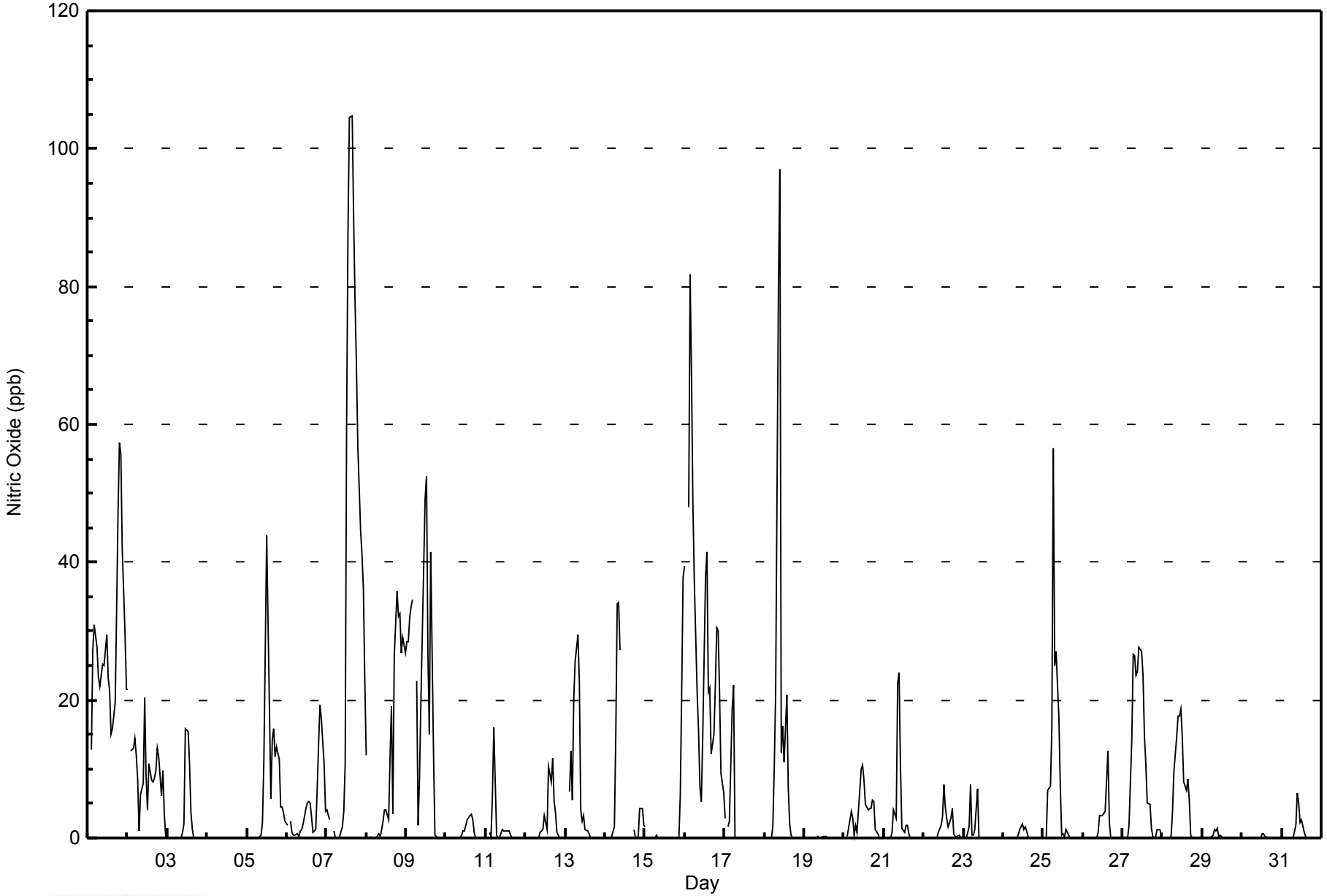
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	615	87.11	87.11
21 - 40	65	9.21	96.32
11 - 80	20	2.83	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitric Oxide (NO) - ppb

Fort McKay South - January 2014

Concentration Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	129	40	9	3	2	8	12	41	86	44	48	52	35	14	22	43	588
21 - 40	2	0	1	0	1	0	4	4	10	7	9	2	1	0	1	2	44
11 - 80	1	0	0	0	1	0	1	2	5	2	2	2	0	0	0	0	16
81 - 159	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	40	10	3	4	8	17	48	101	54	61	56	36	14	23	45	652

Total Number of Valid Hours: 652

Total Number of Hours: 744

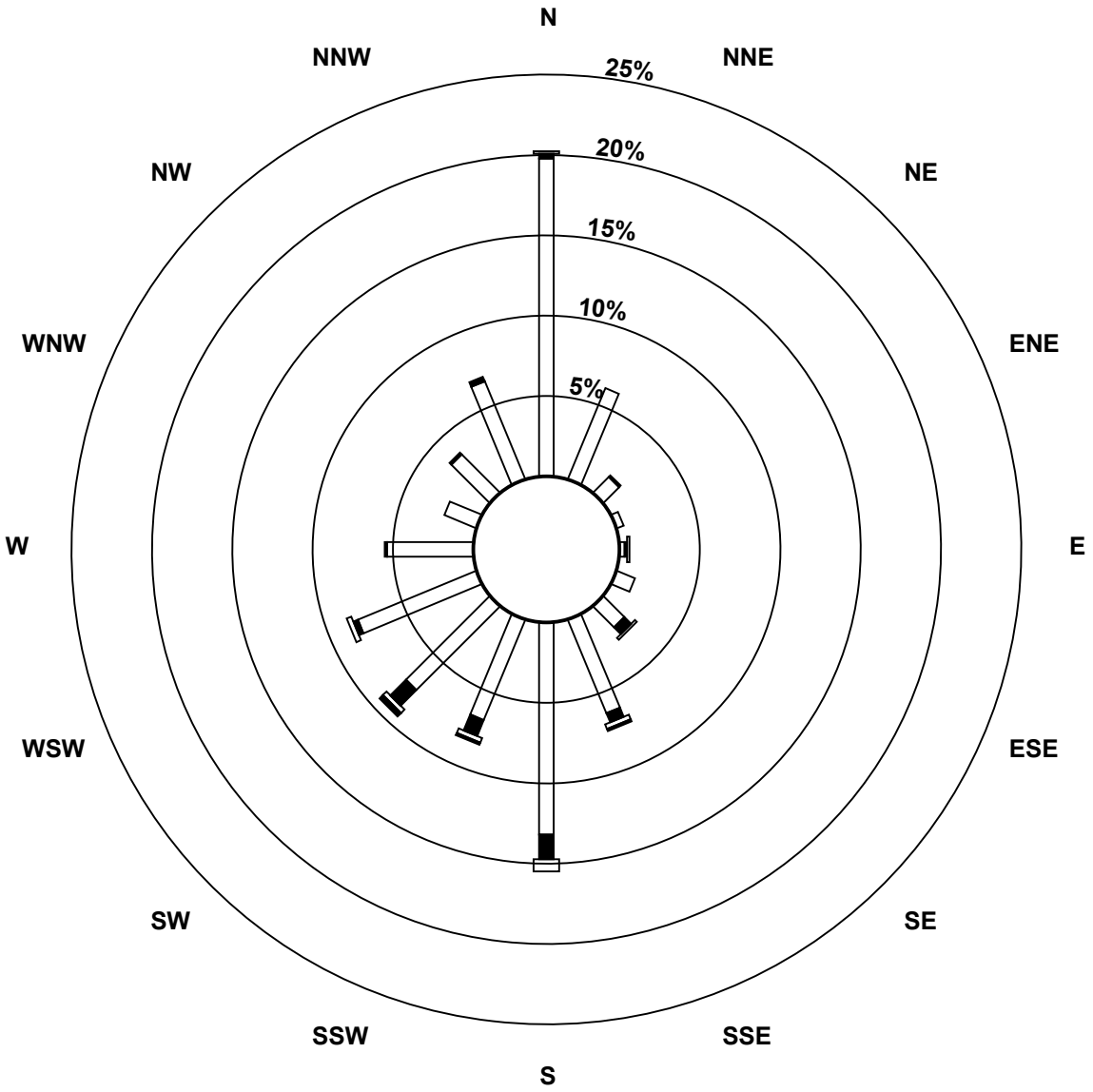
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

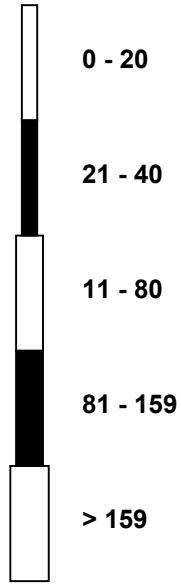
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



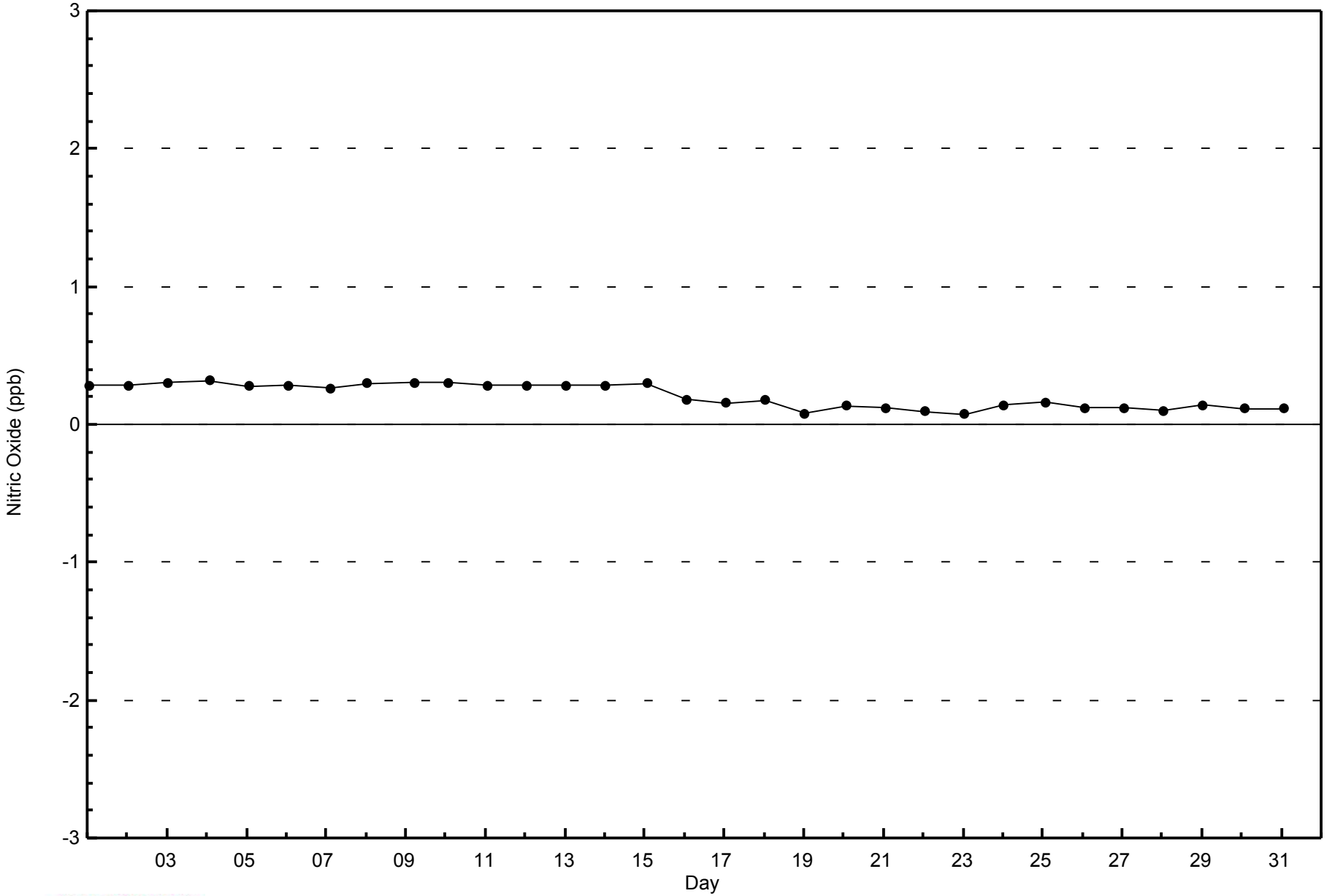
Total Number of Valid Hours: 652

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Fort McKay South - January 2014



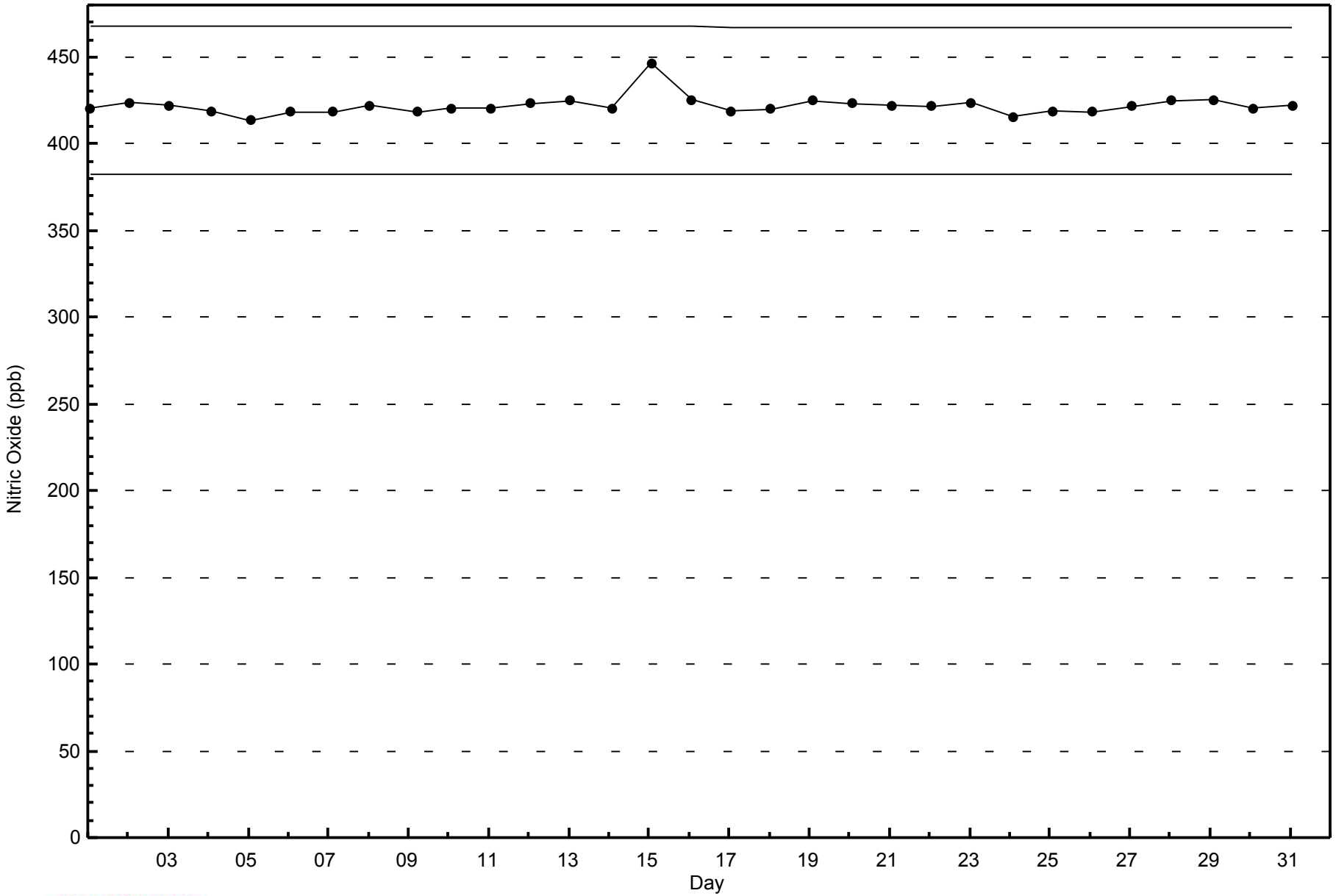
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Fort McKay South - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 44 ppb on Jan 7 15:00 Maximum Daily Average: 24.3 ppb on Jan 7

Minimum Value: 0 ppb on Jan 4 23:00 Minimum Daily Average: 1.0 ppb on Jan 4
Maximum Diurnal Average: 27.3 ppb at hour 2 Minimum Diurnal Average: 11.2 ppb at hour 12
Monthly Average: 12.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 4$ Median = 11 $Q_3 = 21$ $P_{90} = 27$ $P_{99} = 33$

Hours in Service: 744
Hours of Data: 706
Hours of Missing Data: 38
Hours of Calibration: 38
Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	17	Z	15	17	16	15	13	12	12	12	11	13	16	18	18	18	18	19	20	20	21	21	23	23	16.8	23
2-Jan	23	Z	21	20	20	19	17	15	22	18	21	15	12	19	17	19	21	17	19	18	15	16	16	10	17.8	23
3-Jan	3	Z	3	5	8	8	7	6	5	4	5	15	18	17	14	10	1	1	1	1	1	1	1	1	5.8	18
4-Jan	1	Z	2	2	1	1	1	1	1	1	1	1	2	1	1	2	2	1	1	1	0	0	0	0	1.0	2
5-Jan	0	Z	2	3	6	4	2	3	9	11	16	23	33	26	19	33	34	32	32	30	31	29	27	26	18.7	34
6-Jan	25	Z	26	20	21	21	23	26	26	22	19	20	17	14	16	19	21	30	32	31	30	28	27	24	23.3	32
7-Jan	24	27	26	Z	16	11	12	11	10	8	6	10	32	41	44	39	37	36	34	29	28	27	27	24	24.3	44
8-Jan	24	Z	10	10	6	7	10	21	14	15	16	15	14	14	25	29	28	31	31	29	30	29	30	29	20.4	31
9-Jan	29	28	28	26	23	Z	21	18	22	21	23	26	26	22	21	29	17	10	7	6	6	5	4	4	18.4	29
10-Jan	4	Z	3	4	3	2	4	4	4	4	4	5	9	13	16	20	26	20	4	2	1	3	7	8	7.3	26
11-Jan	9	Z	12	12	20	26	13	5	4	8	12	8	7	6	5	5	5	6	3	3	2	3	3	2	7.7	26
12-Jan	2	Z	2	6	6	12	6	4	9	9	8	11	7	4	23	27	35	33	28	22	21	15	12	10	13.6	35
13-Jan	13	Z	27	30	27	29	26	25	23	16	12	12	6	7	4	3	5	8	6	5	5	4	4	5	13.2	30
14-Jan	6	Z	7	7	8	13	21	27	29	30	C	C	C	C	C	C	C	22	22	19	19	26	20	18	--	30
15-Jan	18	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	1	5	7	6	4	5	19	21	21	4.7	21
16-Jan	24	Z	20	22	21	18	17	18	19	14	9	12	28	28	30	22	21	22	22	18	18	18	19	20	20.0	30
17-Jan	19	Z	13	14	25	18	1	1	1	0	0	0	0	1	2	2	9	5	3	2	3	4	3	4	5.5	25
18-Jan	4	Z	5	8	17	17	24	26	29	30	17	21	18	25	19	15	13	8	7	4	3	2	1	3	13.8	30
19-Jan	7	Z	10	8	7	6	7	8	10	6	4	3	3	2	2	1	1	3	4	5	3	3	3	3	4.6	10
20-Jan	3	Z	10	19	21	23	21	17	19	24	19	18	18	16	17	21	26	26	26	26	24	17	12	11	18.8	26
21-Jan	9	Z	6	6	7	16	24	22	27	27	21	8	3	6	9	5	5	4	5	5	7	9	10	11	10.8	27
22-Jan	16	Z	17	11	11	15	17	13	12	9	8	10	15	11	10	11	22	30	24	23	21	21	19	20	15.8	30
23-Jan	20	Z	18	21	28	19	16	18	17	2	1	1	1	1	1	1	1	1	1	1	1	1	2	6	7.7	28
24-Jan	7	Z	8	10	12	10	10	6	4	10	9	13	8	10	10	7	6	3	5	7	8	8	13	11	8.4	13
25-Jan	7	Z	10	18	17	24	30	27	22	22	18	4	4	4	10	7	13	11	2	1	1	0	1	0	11.0	30
26-Jan	1	Z	1	1	1	2	3	8	10	9	14	11	13	14	25	31	25	23	21	20	19	18	18	20	13.4	31
27-Jan	20	Z	17	18	19	24	25	24	23	20	25	25	24	21	22	20	29	28	20	23	26	30	28	26	23.2	30
28-Jan	24	Z	23	19	19	21	25	28	30	28	25	23	21	19	20	25	28	21	2	4	4	7	5	5	18.5	30
29-Jan	4	Z	3	3	2	2	7	16	14	13	3	2	1	1	2	2	2	2	2	1	1	1	2	2	3.9	16
30-Jan	2	Z	2	1	0	0	0	1	0	0	0	1	3	3	3	2	6	8	10	4	5	5	1	1	2.6	10
31-Jan	1	Z	4	3	2	2	2	3	17	24	17	11	11	4	3	4	4	4	3	2	2	1	1	2	5.5	24
	11.8	27.3	11.3	11.6	12.5	12.8	13.1	13.2	14.3	13.5	11.4	11.2	12.2	12.3	13.5	14.3	15.5	15.2	13.1	11.8	11.5	11.9	11.7	11.2	Diurnal Average	
	29	28	28	30	28	29	30	28	30	30	25	26	33	41	44	39	37	36	34	31	31	30	30	29	Diurnal Maximum	

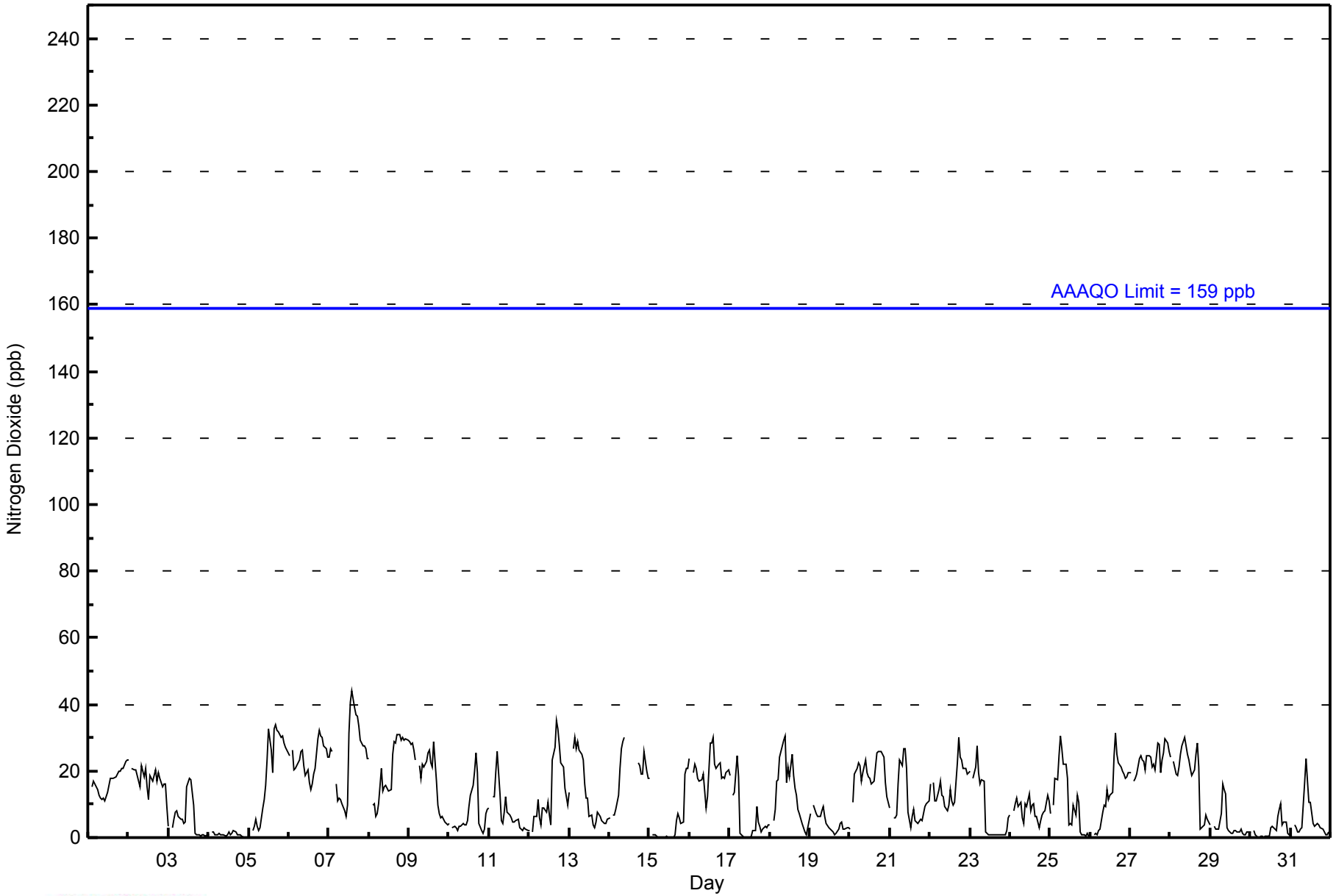
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	523	74.08	74.08
21 - 40	181	25.64	99.72
11 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	118	39	8	1	0	4	9	31	48	37	51	51	33	14	20	36	500
21 - 40	14	1	2	2	4	4	8	16	53	17	10	5	3	0	3	9	151
11 - 80	0	0	0	0	0	0	0	1	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	132	40	10	3	4	8	17	48	101	54	61	56	36	14	23	45	652

Total Number of Valid Hours: 652

Total Number of Hours: 744

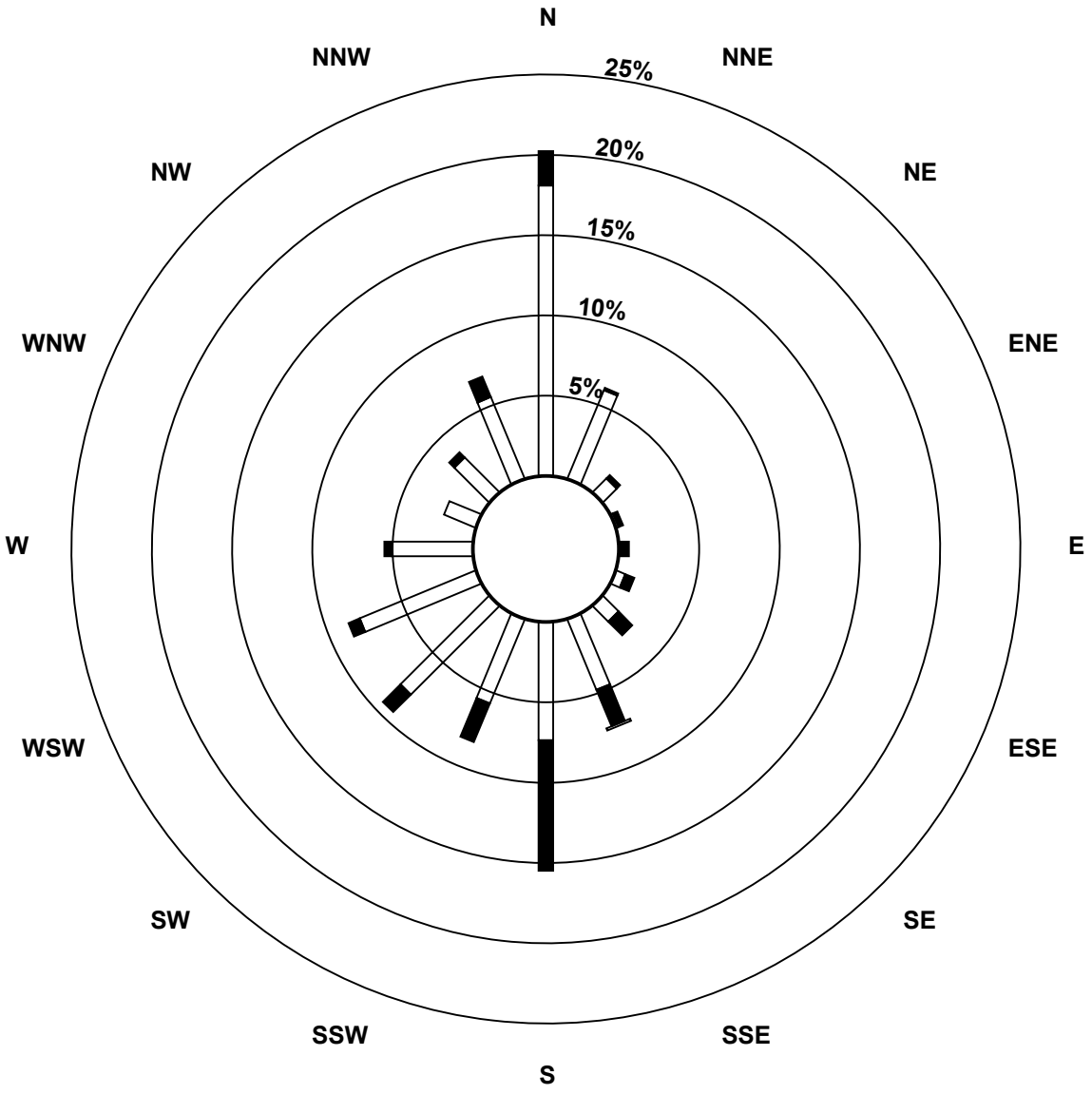
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

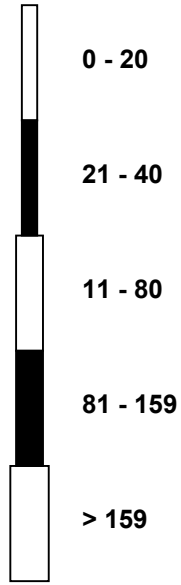
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South (AMS 13)



Classes (ppb)



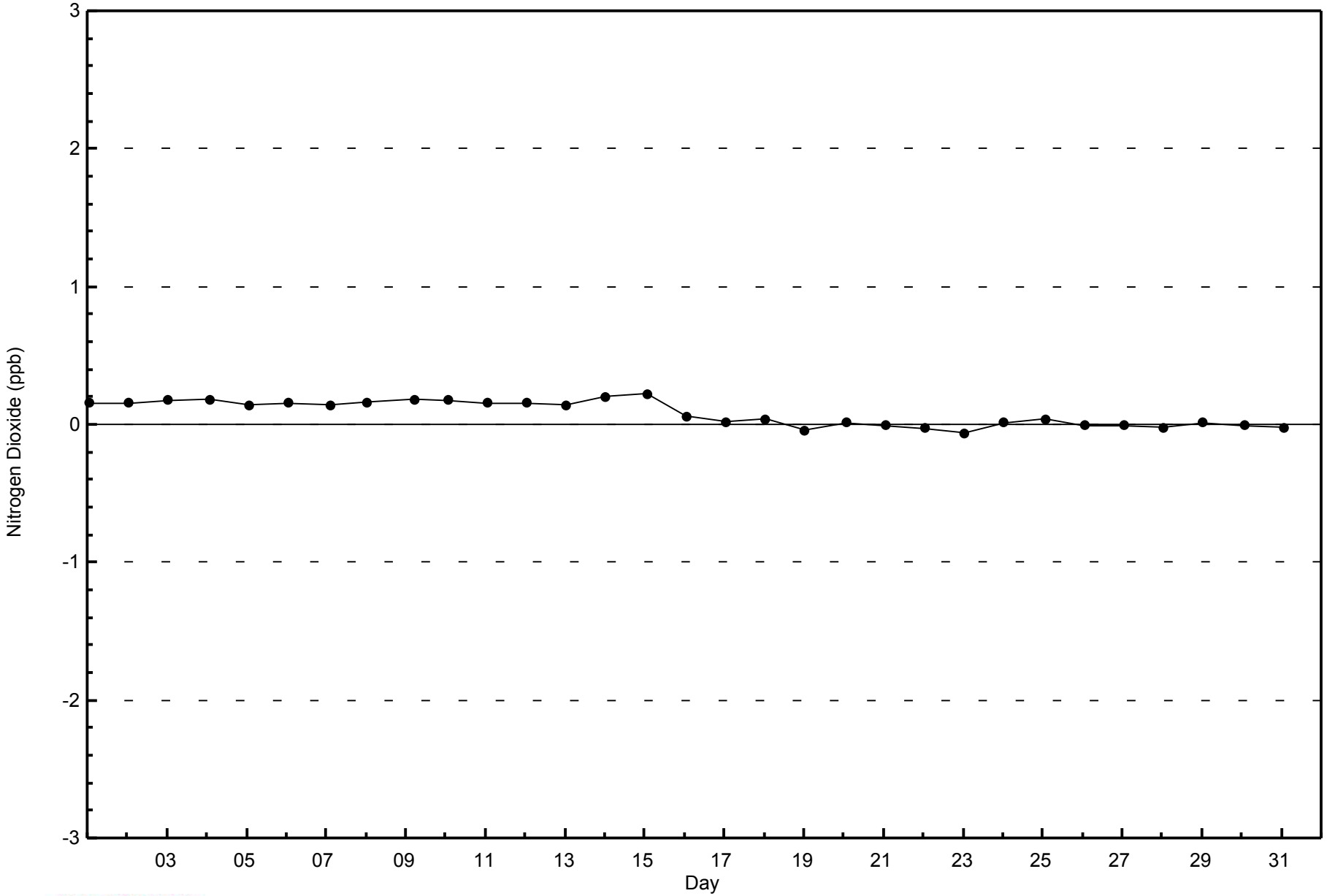
Total Number of Valid Hours: 652

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2014



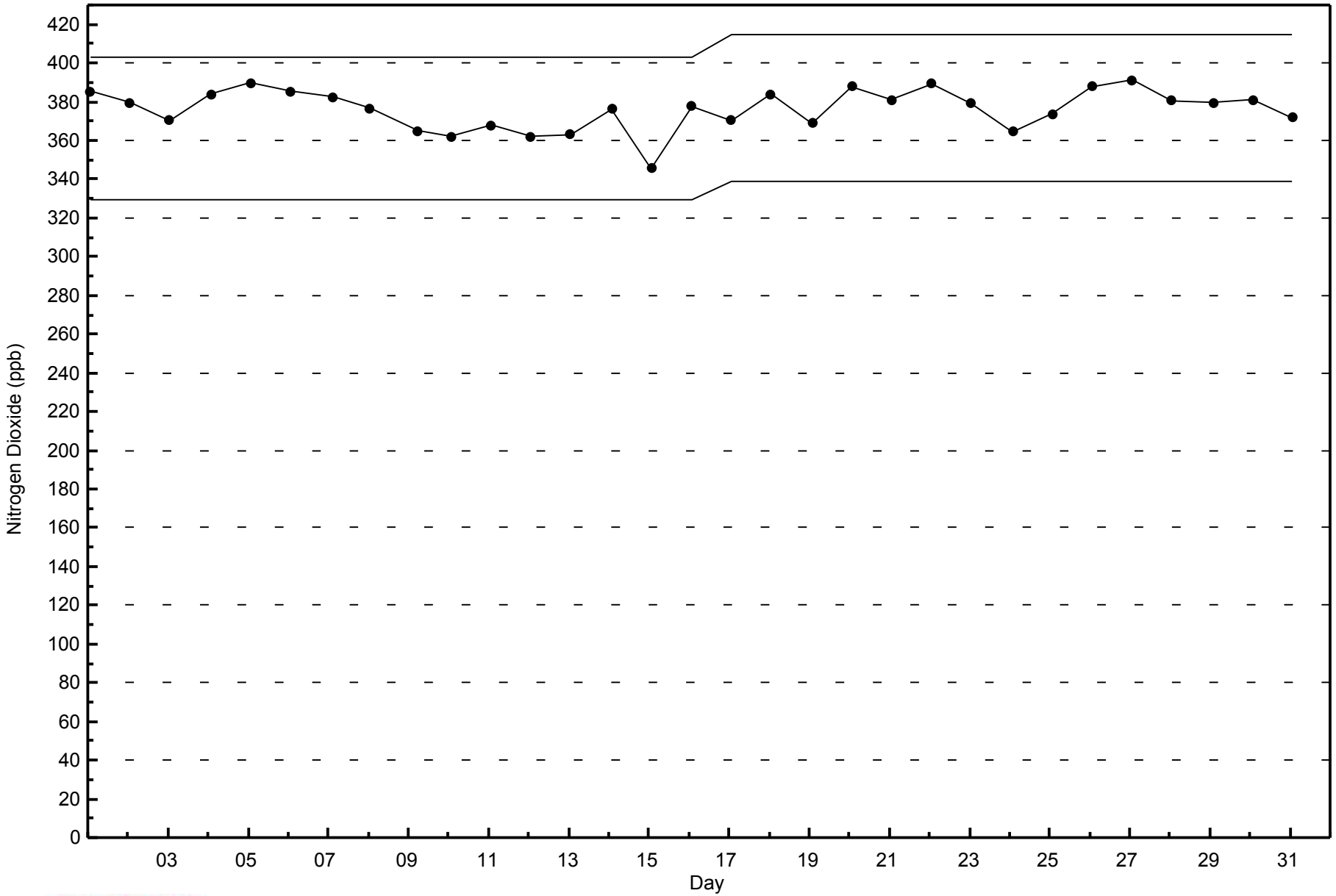
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2014

Maximum Value: 149 ppb on Jan 7 15:00

Maximum Daily Average: 60.0 ppb on Jan 7

Minimum Value: 0 ppb on Jan 15 06:00

Minimum Daily Average: 1.0 ppb on Jan 4

Maximum Diurnal Average: 43.3 ppb at hour 2

Minimum Diurnal Average: 15.2 ppb at hour 3

Monthly Average: 19.7 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 4$ Median = 12 $Q_3 = 29$ $P_{90} = 47$ $P_{99} = 106$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	38
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	23	Z	28	44	47	42	36	34	35	37	36	43	39	39	33	34	38	52	67	77	76	63	52	45	44.4	77
2-Jan	45	Z	33	33	35	31	26	16	28	26	41	24	16	29	25	27	29	27	33	30	21	26	20	10	27.4	45
3-Jan	3	Z	3	5	8	8	6	6	5	5	7	31	33	28	17	11	1	1	1	1	1	1	0	1	8.0	33
4-Jan	1	Z	2	2	1	1	1	1	1	1	1	1	2	1	1	2	2	1	1	1	0	0	0	0	1.0	2
5-Jan	0	Z	2	3	6	4	2	3	9	14	27	51	76	45	25	47	50	44	45	42	35	33	31	29	27.0	76
6-Jan	27	Z	28	21	21	22	24	26	27	23	21	25	22	19	21	22	22	31	39	44	49	45	37	28	28.0	49
7-Jan	28	30	28	Z	17	11	12	11	10	10	10	20	91	129	149	144	127	115	102	86	72	69	63	46	60.0	149
8-Jan	36	Z	10	10	6	7	10	21	14	16	18	19	18	17	37	48	32	57	67	61	63	56	59	56	32.2	67
9-Jan	57	57	60	60	58	Z	44	20	31	41	62	75	79	49	36	70	29	10	8	6	6	5	4	4	37.9	79
10-Jan	4	Z	3	4	3	2	3	4	4	4	5	6	11	15	19	24	28	20	4	2	1	3	7	8	8.1	28
11-Jan	9	Z	13	13	26	42	14	5	4	8	13	9	8	7	5	5	5	6	3	2	2	3	3	2	9.0	42
12-Jan	2	Z	2	6	6	12	6	4	9	10	9	14	9	5	34	35	47	38	32	23	21	15	12	10	15.7	47
13-Jan	14	Z	34	43	32	49	52	54	46	20	14	15	8	8	4	3	5	8	6	5	5	4	4	5	19.1	54
14-Jan	6	Z	7	7	9	14	36	61	63	57	C	C	C	C	C	C	C	24	22	19	19	30	24	20	--	63
15-Jan	20	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	1	5	7	6	4	5	25	42	59	7.7	59
16-Jan	63	Z	68	104	88	66	54	39	35	21	14	27	66	70	51	44	33	37	44	48	48	39	29	27	48.4	104
17-Jan	21	Z	14	16	43	40	1	1	1	0	0	0	0	1	2	2	9	5	3	2	3	3	3	4	7.6	43
18-Jan	4	Z	5	8	17	19	34	47	109	127	29	38	29	46	26	17	13	8	7	4	3	2	1	3	25.9	127
19-Jan	7	Z	10	8	7	6	6	8	10	6	4	3	3	2	2	1	1	3	4	4	3	3	3	3	4.7	10
20-Jan	3	Z	11	20	25	25	22	19	20	30	30	29	26	21	21	25	30	31	31	27	25	17	12	11	22.2	31
21-Jan	9	Z	6	6	7	17	28	25	49	51	31	9	4	8	10	6	4	4	5	5	7	9	10	11	13.9	51
22-Jan	16	Z	17	11	11	15	17	13	12	10	10	13	22	15	12	12	25	34	25	23	21	21	19	20	17.2	34
23-Jan	20	Z	18	23	35	20	17	19	24	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6	8.5	35
24-Jan	7	Z	8	10	12	10	10	6	4	10	10	15	9	11	11	7	6	3	5	7	8	8	13	11	8.8	15
25-Jan	7	Z	10	25	25	41	87	52	49	39	25	4	5	4	11	7	12	11	2	1	1	0	1	0	18.3	87
26-Jan	1	Z	1	1	1	2	3	8	10	10	17	15	16	18	33	44	27	23	21	20	19	18	18	20	15.0	44
27-Jan	20	Z	17	18	21	38	51	50	47	44	52	52	48	36	33	25	33	29	20	23	26	31	29	26	33.4	52
28-Jan	25	Z	23	19	19	21	29	37	45	45	43	42	35	27	27	34	34	22	2	4	4	7	5	5	24.0	45
29-Jan	4	Z	3	3	2	2	8	17	15	15	3	3	1	1	2	2	2	2	2	1	1	1	2	2	4.1	17
30-Jan	2	Z	2	1	0	0	0	1	0	0	0	1	4	4	3	2	6	8	10	4	5	5	1	1	2.6	10
31-Jan	1	Z	4	3	2	2	2	3	19	30	22	13	13	5	4	4	4	4	3	2	2	1	1	2	6.3	30
	15.6	43.3	15.2	17.6	19.0	18.9	20.7	19.7	23.7	23.1	18.5	19.8	23.1	22.1	21.9	23.5	22.1	21.4	20.1	18.7	17.8	17.5	16.5	15.2	Diurnal Average	
	63	57	68	104	88	66	87	61	109	127	62	75	91	129	149	144	127	115	102	86	76	69	63	59	Diurnal Maximum	

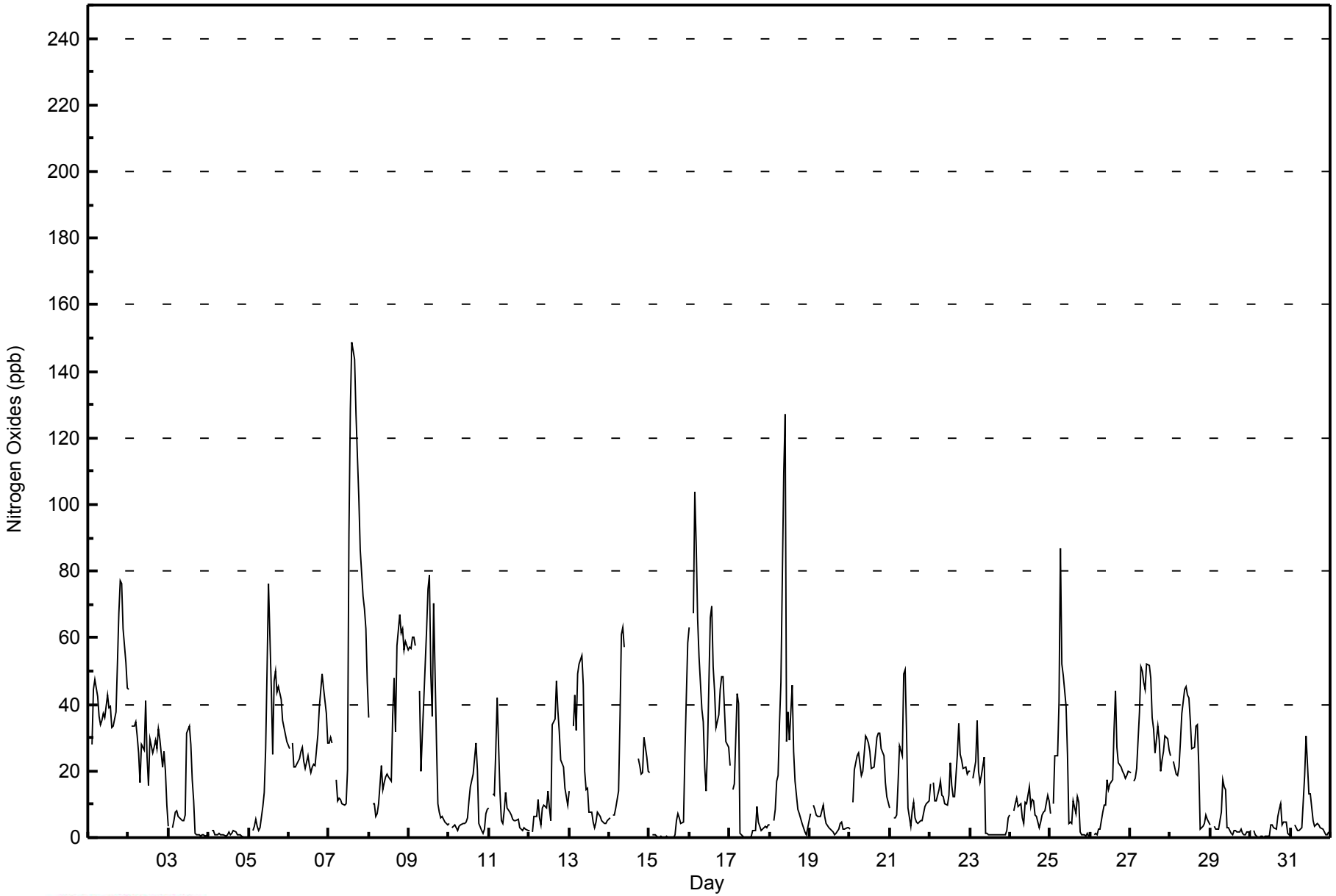
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	441	62.46	62.46
21 - 40	161	22.80	85.27
11 - 80	91	12.89	98.16
81 - 159	13	1.84	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	111	34	7	1	0	4	8	19	37	26	39	46	30	13	18	35	428
21 - 40	16	6	2	1	2	3	2	20	45	17	11	6	5	1	3	7	147
11 - 80	5	0	1	1	1	1	7	8	17	9	8	3	1	0	2	3	67
81 - 159	0	0	0	0	1	0	0	1	2	2	3	1	0	0	0	0	10
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	132	40	10	3	4	8	17	48	101	54	61	56	36	14	23	45	652

Total Number of Valid Hours: 652

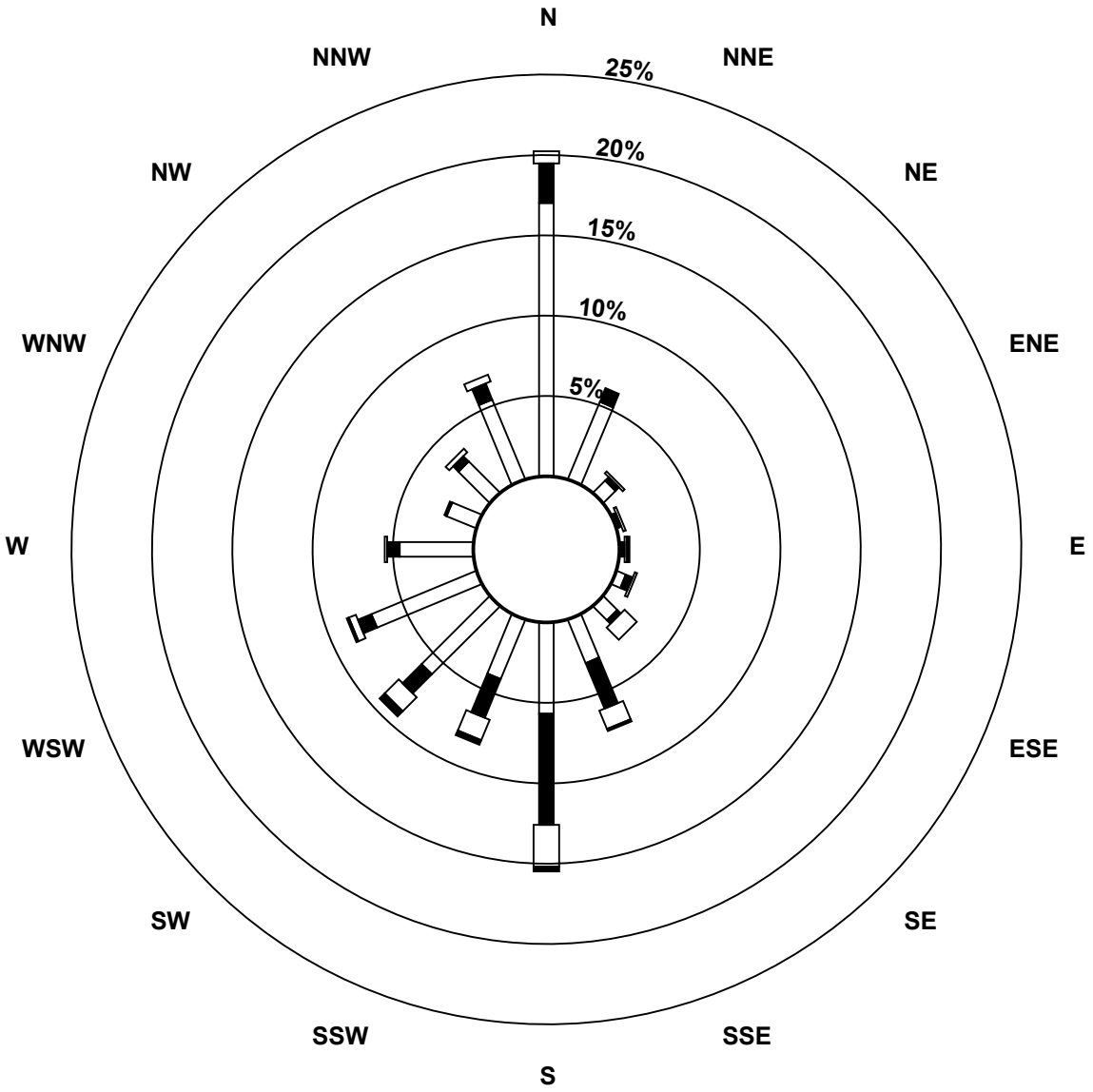
Total Number of Hours: 744

Wood Buffalo Environmental Association

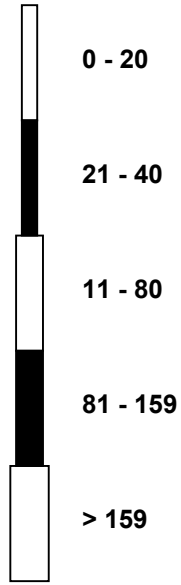
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Fort McKay South (AMS 13)



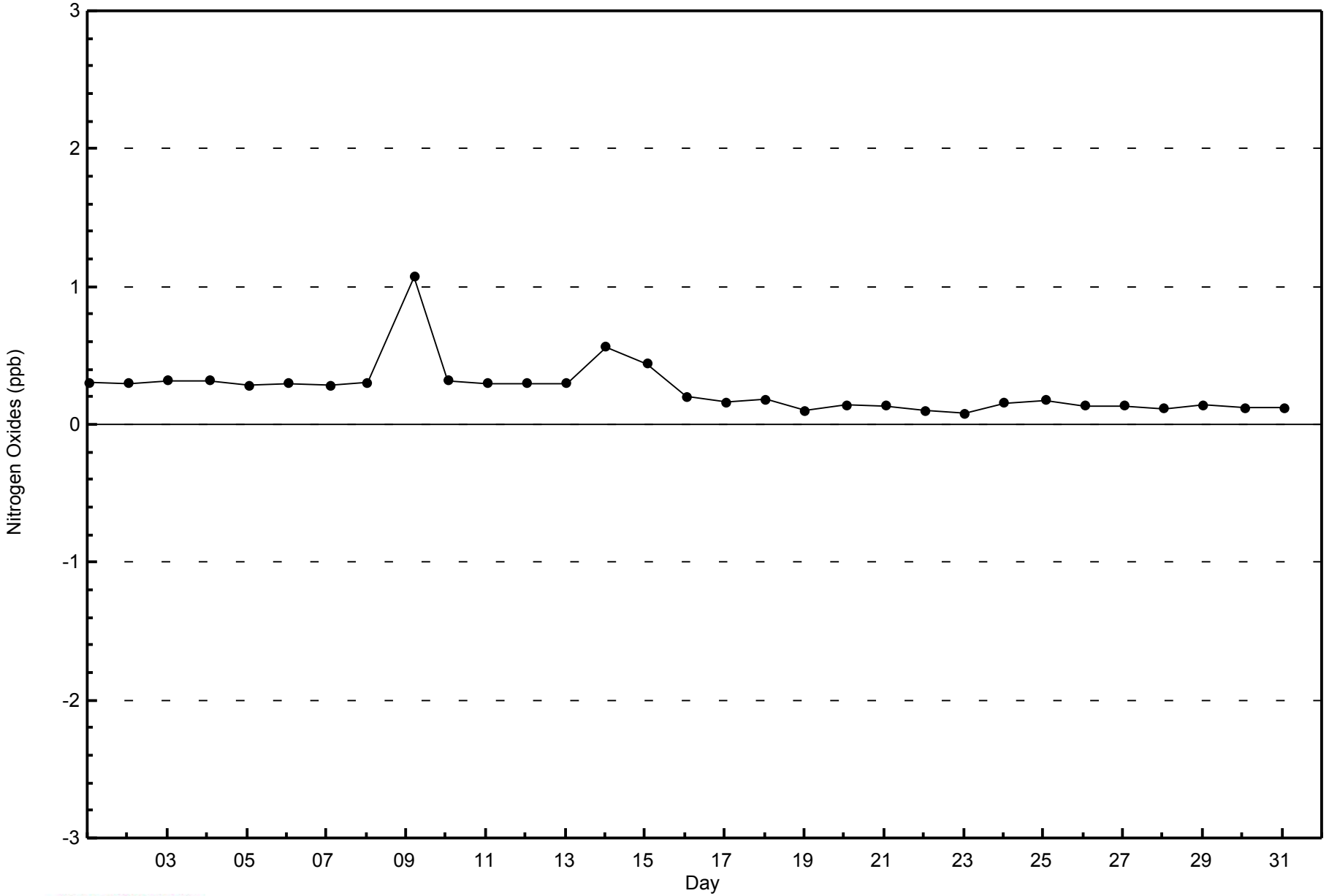
Classes (ppb)



Total Number of Valid Hours: 652

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Fort McKay South - January 2014



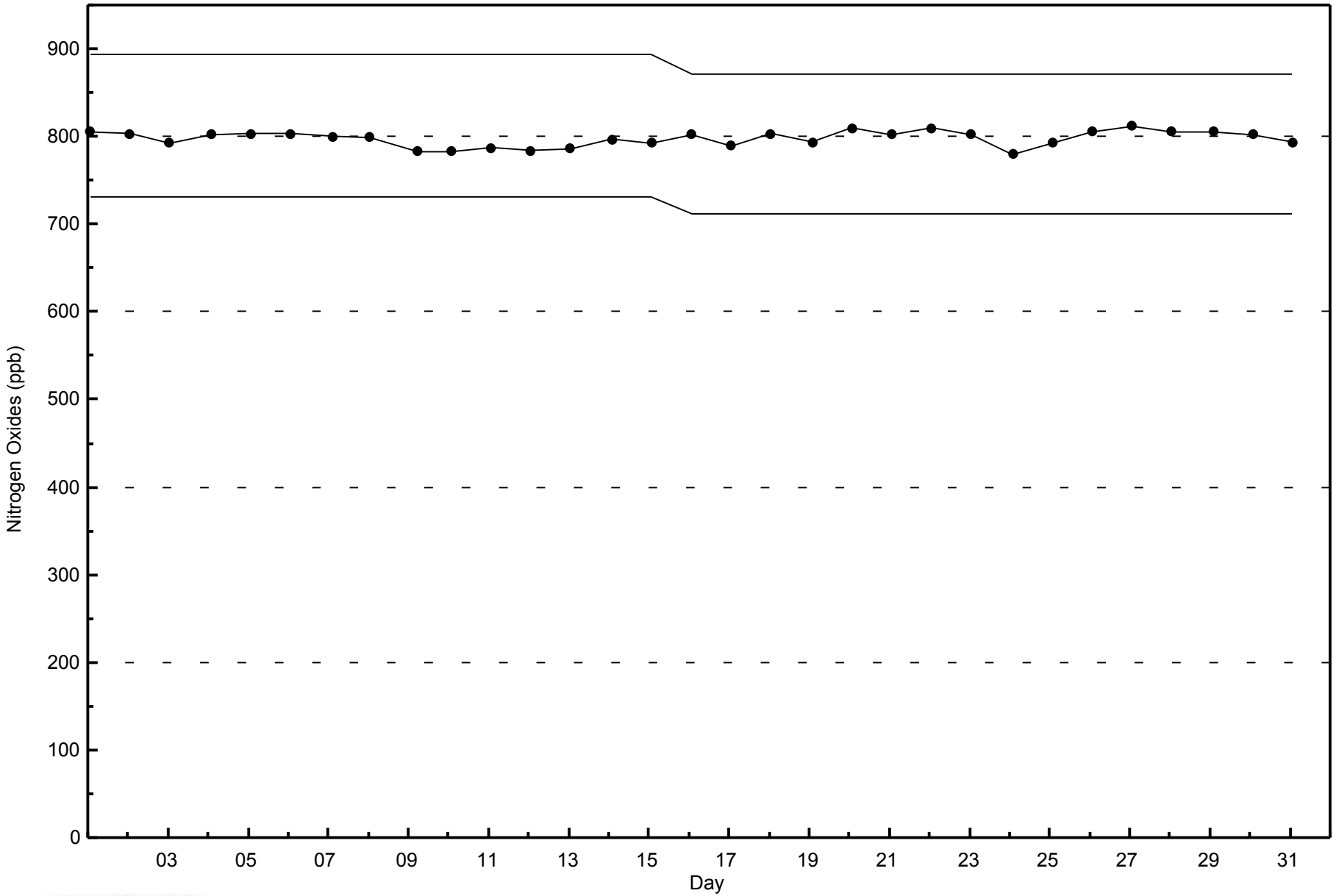
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay South - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 34.3 $\mu g/m^3$ on Jan 19 01:00

Maximum Daily Average: 13.4 $\mu g/m^3$ on Jan 9

Minimum Value: 0.0 $\mu g/m^3$ on Jan 17 13:00

Minimum Daily Average: 1.0 $\mu g/m^3$ on Jan 30

Maximum Diurnal Average: 5.3 $\mu g/m^3$ at hour 15

Minimum Diurnal Average: 3.9 $\mu g/m^3$ at hour 23

Monthly Average: 4.64 $\mu g/m^3$

Percentiles: P_1 = 0.3 P_{10} = 1.1 Q_1 = 2.1 Median = 3.7 Q_3 = 6.1 P_{90} = 9.2 P_{99} = 19.1

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	4.7	4.0	4.2	4.8	4.3	3.4	2.7	2.4	2.6	3.0	3.1	5.6	6.9	7.7	7.5	5.9	6.4	6.6	6.4	6.0	5.6	5.0	5.7	6.8	5.1	7.7
2-Jan	6.5	5.8	5.6	5.3	5.2	4.2	3.7	3.9	4.3	4.5	5.8	5.7	5.5	6.8	9.3	8.2	5.9	4.6	3.6	2.7	2.0	2.3	3.6	3.0	4.9	9.3
3-Jan	2.2	3.6	3.7	3.1	2.6	2.3	1.9	1.6	1.8	1.5	1.3	1.7	2.6	3.2	4.1	2.7	1.7	1.4	1.2	1.1	1.2	1.3	1.4	0.9	2.1	4.1
4-Jan	1.1	1.1	1.2	1.4	1.5	1.7	1.8	1.7	1.3	1.4	1.5	1.8	2.2	2.5	2.2	2.4	4.4	2.7	3.0	2.8	2.8	2.3	2.5	4.0	2.1	4.4
5-Jan	4.2	3.7	3.9	3.6	3.3	2.8	2.3	2.0	2.4	2.5	5.2	8.8	8.3	8.4	6.8	7.7	7.5	6.8	6.3	5.2	5.5	4.8	4.0	3.3	5.0	8.8
6-Jan	2.8	2.6	3.5	3.7	3.8	3.1	3.6	5.0	3.9	3.4	3.5	4.0	3.6	3.0	3.3	3.8	3.7	3.8	4.0	4.1	4.6	4.4	3.9	3.2	3.7	5.0
7-Jan	3.2	3.6	3.5	3.1	2.6	2.5	2.6	2.2	2.4	1.8	1.8	2.6	7.7	11.1	12.4	12.4	12.3	11.9	9.4	6.5	5.4	5.5	4.8	3.2	5.6	12.4
8-Jan	2.8	2.2	2.3	2.2	1.9	2.1	2.2	7.6	4.6	5.1	6.4	6.1	7.5	9.0	10.1	11.1	11.1	10.5	9.7	9.0	9.5	9.7	10.7	10.2	6.8	11.1
9-Jan	10.1	12.2	15.1	15.1	13.1	11.9	14.0	19.4	18.4	19.9	17.3	17.4	15.0	16.2	14.1	18.9	11.9	10.0	10.6	11.0	9.9	7.8	6.8	6.0	13.4	19.9
10-Jan	4.2	3.4	3.7	3.4	3.1	3.2	3.6	3.6	3.2	3.8	4.0	3.3	3.2	3.5	4.0	4.3	4.4	4.1	2.9	2.0	2.3	2.2	2.2	3.0	3.3	4.4
11-Jan	3.5	3.0	4.2	8.9	10.7	9.2	5.8	3.8	2.4	5.9	13.7	8.0	6.8	9.2	5.3	4.0	5.4	5.5	3.8	2.3	2.1	2.3	2.1	1.8	5.4	13.7
12-Jan	2.1	1.8	1.9	2.1	2.2	2.4	1.9	1.7	2.1	2.3	2.1	2.2	1.5	1.1	1.8	1.9	2.4	2.6	2.2	2.2	2.2	2.5	2.8	2.9	2.1	2.9
13-Jan	4.7	4.8	9.0	10.0	7.8	8.8	6.9	6.3	5.7	5.0	4.7	4.7	2.4	2.3	2.2	2.0	2.2	2.6	2.2	1.8	1.7	1.5	1.3	1.2	4.2	10.0
14-Jan	1.1	1.0	0.9	0.9	1.0	1.2	2.5	3.7	4.2	5.1	5.3	6.3	6.2	5.9	6.3	6.5	6.9	5.6	4.8	3.5	3.6	4.8	3.8	4.4	4.0	6.9
15-Jan	4.1	2.3	0.9	0.5	0.3	0.3	0.4	0.7	0.6	0.4	0.4	0.4	0.4	0.4	M	0.1	0.3	0.3	0.3	0.4	0.4	1.0	2.1	6.3	1.0	6.3
16-Jan	13.3	9.9	6.2	6.1	4.7	3.9	3.0	2.2	2.0	1.6	1.2	1.8	3.3	3.6	5.5	5.6	5.2	5.8	6.8	6.3	6.0	4.6	4.6	5.4	4.9	13.3
17-Jan	5.5	5.6	5.6	5.4	4.4	3.8	1.5	1.4	1.3	1.1	0.7	0.1	0.0	0.2	12.1	1.4	1.2	1.0	0.7	1.0	1.3	1.1	1.0	1.6	2.5	12.1
18-Jan	1.6	2.1	2.3	2.1	2.6	3.8	5.1	6.3	8.6	9.2	4.3	4.9	4.9	6.1	4.5	6.0	11.0	5.9	6.3	3.9	3.8	4.3	7.4	15.0	5.5	15.0
19-Jan	34.3	20.7	13.8	18.2	23.6	22.4	22.6	19.2	9.9	3.4	3.0	3.4	2.9	2.9	3.6	3.9	4.0	4.5	4.4	3.7	3.6	3.2	2.9	2.7	9.9	34.3
20-Jan	3.0	3.0	3.1	4.0	4.5	4.4	4.3	4.2	3.8	4.8	8.2	9.0	7.0	4.6	4.3	5.4	6.5	7.0	10.8	16.7	15.0	9.6	6.8	6.2	6.5	16.7
21-Jan	5.7	5.2	4.8	4.7	4.9	6.0	8.1	6.8	10.8	17.0	20.9	4.5	2.2	2.4	2.4	2.0	2.0	1.8	2.5	2.4	2.6	2.8	3.0	3.5	5.4	20.9
22-Jan	3.8	4.4	5.2	3.3	3.0	3.0	2.7	2.3	2.8	6.1	2.2	2.9	8.8	4.7	1.5	1.6	4.8	9.5	8.4	7.6	13.3	9.4	6.6	6.2	5.2	13.3
23-Jan	7.4	7.2	8.0	7.1	6.0	4.7	4.3	4.7	5.1	3.5	3.1	2.4	2.1	1.5	1.0	1.0	1.3	1.3	1.1	1.0	1.0	1.0	1.1	1.2	3.3	8.0
24-Jan	1.4	1.7	2.0	4.0	4.7	5.3	4.5	3.2	2.8	1.7	1.5	1.8	1.3	1.5	1.6	1.2	1.2	1.3	1.4	1.4	2.8	4.8	2.3	1.9	2.4	5.3
25-Jan	1.7	1.7	2.3	3.5	4.2	5.2	5.8	6.9	7.2	9.8	7.3	3.0	5.7	3.5	8.5	5.3	2.5	2.8	3.0	2.3	1.8	1.7	2.5	2.7	4.2	9.8
26-Jan	2.3	2.7	3.4	4.9	6.5	7.2	7.2	8.1	7.2	6.5	7.2	6.6	6.2	6.1	6.6	7.8	7.0	6.3	5.9	6.0	6.2	6.9	7.1	5.7	6.2	8.1
27-Jan	5.7	5.8	5.5	5.8	5.7	7.1	8.0	7.7	7.5	7.3	10.0	9.3	9.0	8.3	7.3	4.2	4.5	4.6	5.4	5.1	4.7	4.9	5.0	5.7	6.4	10.0
28-Jan	7.6	10.3	11.0	11.1	11.4	9.6	9.1	7.9	6.9	7.3	7.5	7.1	6.4	6.1	7.5	9.0	9.6	6.9	8.5	11.4	4.1	5.0	8.0	3.7	8.0	11.4
29-Jan	3.0	2.5	2.2	1.8	1.5	1.1	1.2	1.7	2.1	2.7	1.8	1.2	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	1.2	3.0
30-Jan	0.4	0.8	0.7	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.8	0.8	0.7	0.7	0.9	1.4	2.1	2.4	2.3	2.1	2.0	1.9	1.0	2.4
31-Jan	1.8	2.1	2.1	1.7	1.8	2.6	3.6	3.5	3.7	4.8	3.8	3.3	3.4	1.8	1.2	1.7	1.7	1.6	1.5	1.3	1.2	1.2	1.2	1.2	2.2	4.8
	5.0	4.5	4.6	4.9	4.9	4.8	4.8	4.9	4.6	4.9	5.1	4.5	4.7	4.7	5.3	4.8	4.8	4.6	4.5	4.3	4.2	3.9	3.9	4.0	Diurnal Average	
	34.3	20.7	15.1	18.2	23.6	22.4	22.6	19.4	18.4	19.9	20.9	17.4	15.0	16.2	14.1	18.9	12.3	11.9	10.8	16.7	15.0	9.7	10.7	15.0	Diurnal Maximum	

M - Maintenance

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

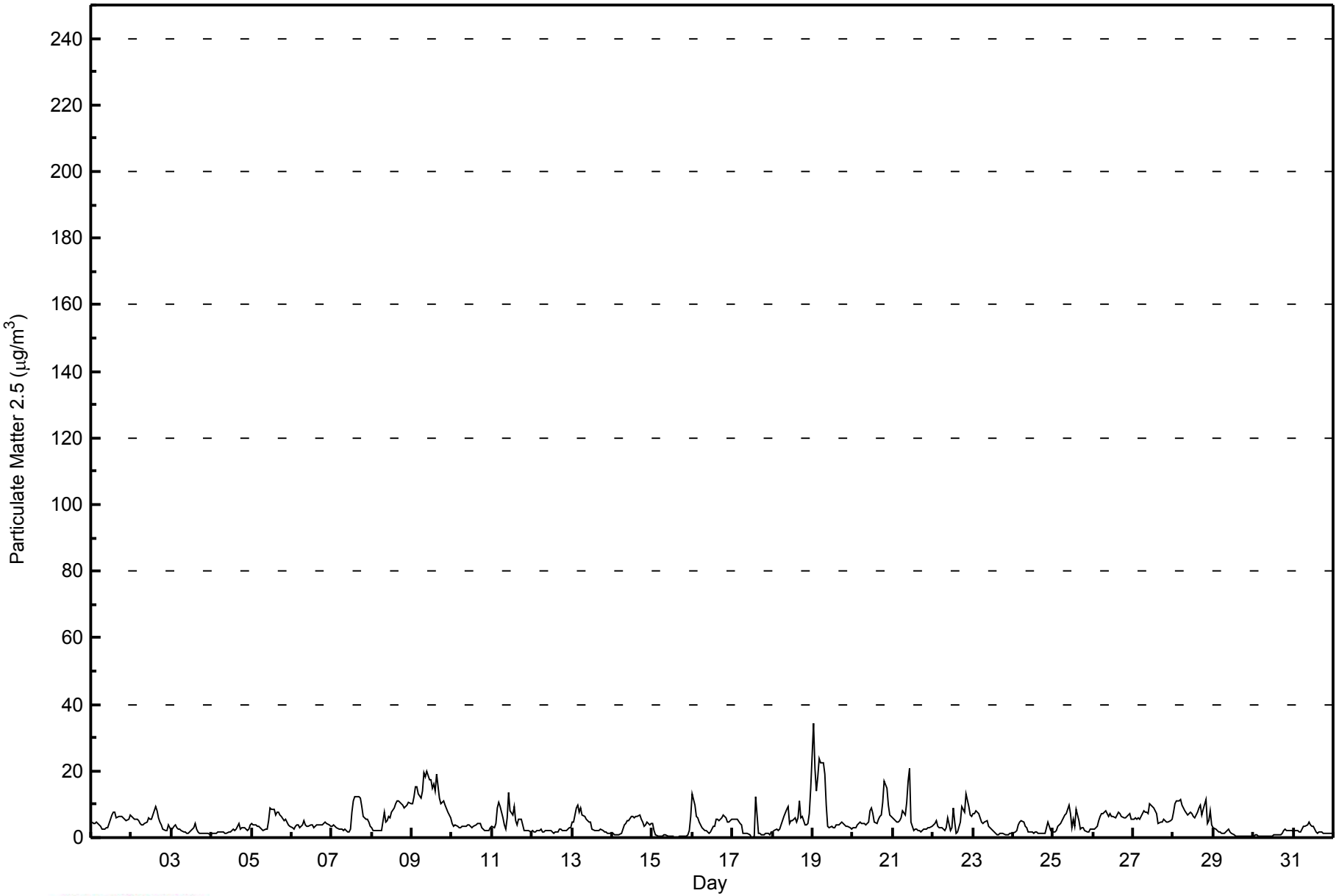
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

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

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	453	60.97	60.97
6 - 15	212	28.53	89.50
16 - 25	16	2.15	91.66
26 - 80	1	0.13	91.79
> 81.0	0	0.00	91.79

Total Number of Valid Hours: 743

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Fort McKay South - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	84	33	5	1	2	4	8	27	55	35	43	43	28	9	10	28	415
6 - 15	42	6	4	3	4	4	10	24	43	14	16	8	2	2	2	8	192
16 - 25	3	1	0	0	0	0	0	0	6	0	0	0	0	0	1	5	16
26 - 80	0	0	0	0	0	0	0	0	0	0	1	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	129	40	9	4	6	8	18	51	104	49	60	51	30	11	13	41	624

Total Number of Valid Hours: 685

Total Number of Hours: 744

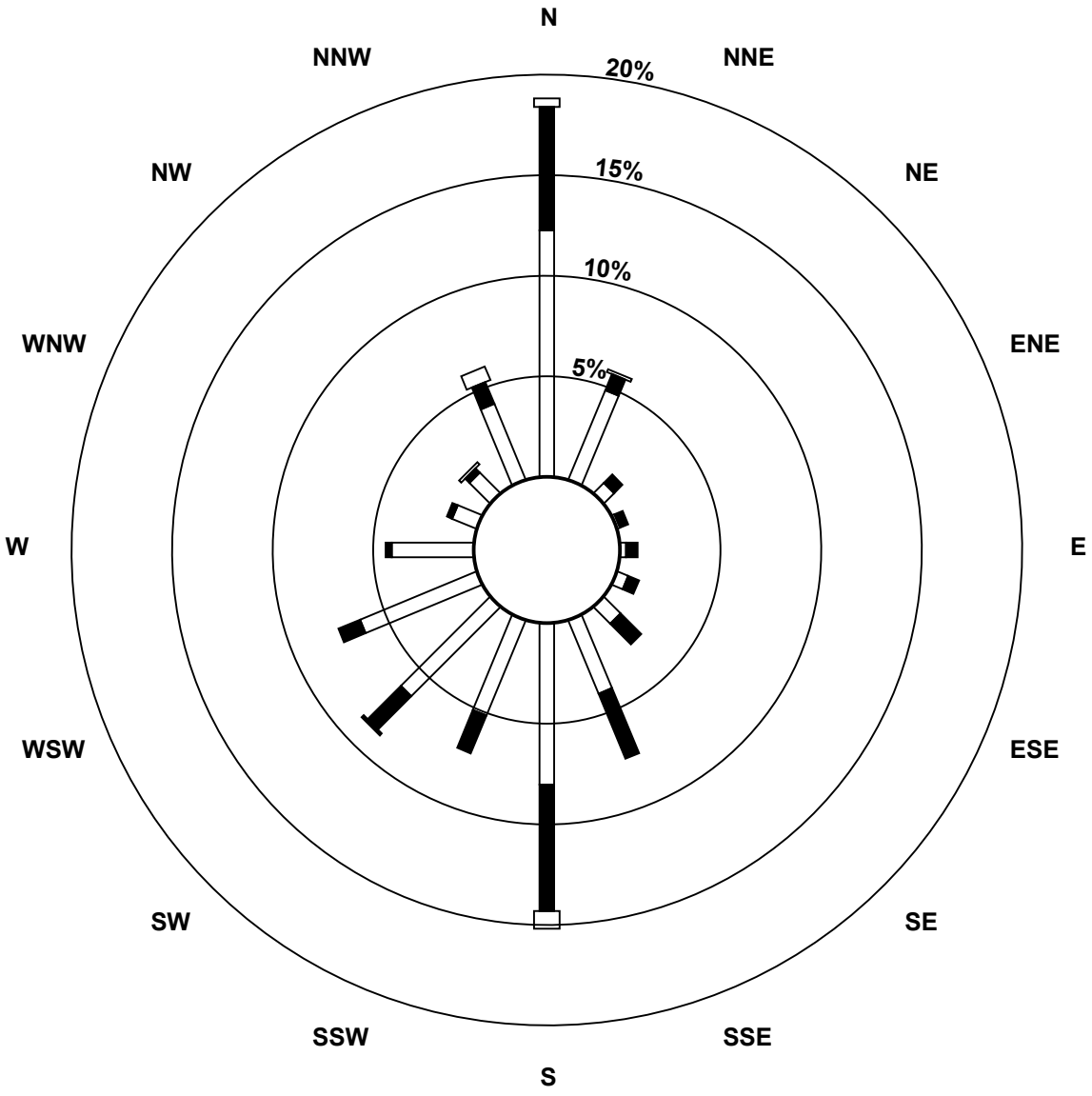
AURORA ATMOSPHERICS INC.

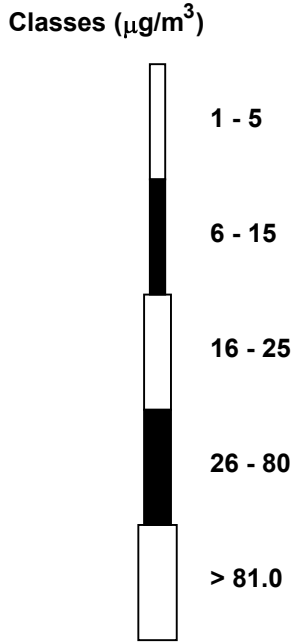
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Fort McKay South (AMS 13)





Total Number of Valid Hours: 685

Maximum Value: 7.2 C on Jan 17 13:00

Maximum Daily Average: -0.3 C on Jan 17

Minimum Value: -40.4 C on Jan 1 09:00

Minimum Daily Average: -35.4 C on Jan 1

Maximum Diurnal Average: -14.1 C at hour 15

Minimum Diurnal Average: -20.3 C at hour 4

Monthly Average: -17.99 C

Percentiles: P_1 = -39.3 P_{10} = -30.8 Q_1 = -25.3 Median = -17.5 Q_3 = -11.6 P_{90} = -4.4 P_{99} = 5.5

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

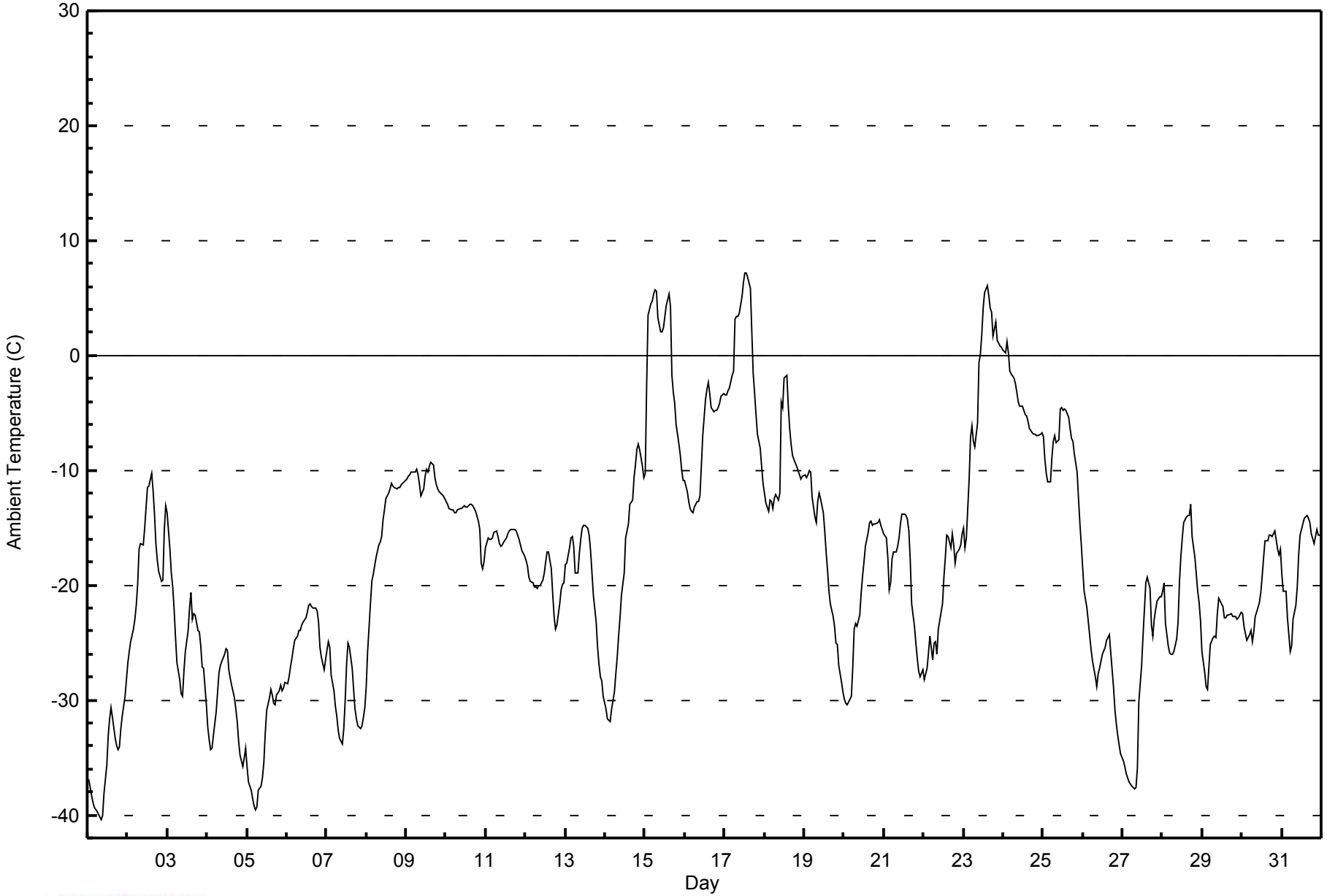
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-36.8	-37.5	-38.2	-38.8	-39.3	-39.6	-39.9	-40.2	-40.4	-40.1	-38.1	-35.6	-33.1	-31.6	-30.6	-31.6	-33.3	-33.9	-34.3	-34.0	-32.5	-31.4	-29.7	-28.3	-35.4	-28.3
2-Jan	-26.7	-25.8	-24.9	-23.9	-23.0	-21.7	-20.0	-16.9	-16.4	-16.5	-15.1	-13.2	-11.5	-11.4	-10.3	-11.8	-13.9	-16.4	-17.8	-18.8	-19.7	-19.5	-15.2	-13.1	-17.6	-10.3
3-Jan	-13.7	-16.9	-19.0	-20.2	-22.1	-24.6	-26.8	-28.2	-29.4	-29.7	-27.5	-25.8	-23.9	-22.0	-20.6	-22.9	-22.5	-22.6	-24.0	-24.1	-25.3	-27.1	-27.2	-30.5	-24.0	-13.7
4-Jan	-32.3	-33.4	-34.3	-34.2	-33.1	-31.0	-29.3	-27.5	-27.0	-26.7	-26.1	-25.6	-25.7	-27.4	-28.1	-28.7	-29.8	-30.7	-31.9	-33.6	-34.8	-35.8	-35.0	-34.2	-30.7	-25.6
5-Jan	-35.7	-37.1	-37.9	-38.5	-39.2	-39.6	-39.3	-37.8	-37.4	-36.7	-35.5	-32.8	-30.9	-29.8	-29.0	-29.5	-30.2	-30.4	-29.6	-29.1	-28.7	-29.2	-28.9	-28.5	-33.4	-28.5
6-Jan	-28.5	-28.0	-27.2	-26.3	-25.6	-24.8	-24.4	-24.0	-24.0	-23.4	-23.2	-22.9	-22.3	-21.7	-21.6	-21.9	-22.0	-22.0	-22.2	-23.3	-25.4	-26.3	-27.4	-26.5	-24.4	-21.6
7-Jan	-25.7	-24.9	-25.4	-27.8	-29.2	-30.5	-31.4	-32.5	-33.3	-33.8	-32.5	-30.0	-26.9	-25.0	-25.4	-27.2	-29.1	-30.8	-31.6	-32.2	-32.5	-32.2	-31.5	-30.6	-29.7	-24.9
8-Jan	-28.8	-25.8	-21.6	-19.7	-19.1	-18.4	-17.6	-16.5	-16.2	-15.8	-14.2	-13.5	-12.5	-12.0	-11.6	-11.1	-11.4	-11.5	-11.7	-11.5	-11.5	-11.3	-11.1	-10.8	-15.2	-10.8
9-Jan	-10.7	-10.5	-10.4	-10.2	-10.1	-10.2	-9.9	-10.4	-11.2	-12.2	-11.6	-10.5	-9.9	-10.2	-9.6	-9.3	-9.5	-10.6	-11.2	-11.6	-11.9	-12.1	-12.2	-12.5	-10.8	-9.3
10-Jan	-12.7	-13.0	-13.4	-13.4	-13.5	-13.6	-13.7	-13.5	-13.4	-13.3	-13.2	-13.1	-13.2	-13.2	-13.0	-12.9	-13.1	-13.4	-13.5	-14.4	-15.1	-18.1	-18.6	-17.9	-14.0	-12.7
11-Jan	-16.7	-15.9	-16.0	-16.1	-15.8	-15.4	-15.3	-15.8	-16.4	-16.6	-16.4	-16.2	-15.9	-15.5	-15.2	-15.1	-15.1	-15.1	-15.2	-15.6	-16.0	-16.5	-16.9	-17.5	-15.9	-15.1
12-Jan	-17.9	-18.3	-19.3	-19.7	-19.7	-20.2	-20.2	-20.2	-20.1	-20.0	-19.5	-18.9	-18.0	-17.1	-17.1	-18.5	-20.7	-22.8	-23.8	-23.4	-21.6	-20.4	-19.9	-19.8	-19.9	-17.1
13-Jan	-18.2	-18.1	-16.8	-15.9	-15.8	-16.6	-18.9	-18.9	-17.2	-16.0	-15.1	-14.8	-14.8	-15.1	-15.7	-17.0	-19.0	-20.9	-23.2	-25.4	-26.9	-28.0	-28.4	-29.6	-19.4	-14.8
14-Jan	-30.8	-31.6	-31.8	-31.8	-30.7	-29.3	-27.7	-26.2	-24.4	-22.8	-20.9	-19.0	-15.8	-15.2	-14.7	-13.0	-12.6	-10.7	-9.6	-8.3	-7.7	-8.1	-9.6	-10.6	-19.3	-7.7
15-Jan	-10.3	-2.6	3.5	4.5	4.7	5.4	5.7	5.6	3.2	2.1	2.0	2.5	3.4	4.4	5.3	4.2	-1.8	-3.2	-4.2	-6.0	-7.7	-8.7	-10.1	-10.9	-0.4	5.7
16-Jan	-10.8	-11.8	-12.7	-13.3	-13.5	-13.7	-13.3	-12.7	-12.7	-12.2	-9.7	-7.0	-3.8	-2.9	-2.3	-3.3	-4.6	-4.9	-4.8	-4.8	-4.6	-4.1	-3.6	-3.3	-7.9	-2.3
17-Jan	-3.5	-3.4	-3.1	-2.8	-1.7	-1.3	3.2	3.4	3.3	3.7	5.1	6.4	7.2	7.2	6.8	5.9	2.0	-1.7	-3.3	-5.2	-6.9	-8.1	-9.7	-11.1	-0.3	7.2
18-Jan	-12.0	-12.9	-13.6	-12.6	-12.7	-13.3	-12.5	-12.1	-12.6	-12.0	-4.0	-4.6	-2.0	-1.7	-4.4	-6.3	-7.7	-8.7	-9.0	-9.6	-10.0	-10.4	-10.7	-10.5	-9.4	-1.7
19-Jan	-10.4	-10.6	-10.4	-10.1	-10.1	-12.3	-14.0	-14.5	-12.7	-12.0	-12.5	-13.7	-15.3	-17.1	-18.7	-20.5	-21.6	-22.7	-23.6	-25.0	-25.2	-27.0	-28.4	-29.3	-17.4	-10.1
20-Jan	-29.9	-30.3	-30.4	-30.2	-29.7	-27.1	-23.8	-23.3	-23.6	-22.6	-20.7	-19.1	-17.9	-16.7	-15.4	-14.6	-14.5	-14.8	-14.7	-14.7	-14.5	-14.3	-14.8	-15.2	-20.5	-14.3
21-Jan	-15.5	-15.9	-17.6	-20.4	-19.8	-17.7	-17.1	-17.1	-16.6	-15.9	-14.7	-13.8	-13.8	-14.0	-14.4	-15.3	-17.9	-21.6	-23.6	-25.0	-26.3	-27.5	-27.9	-27.4	-19.0	-13.8
22-Jan	-28.2	-27.7	-27.2	-25.8	-24.5	-26.5	-25.1	-25.0	-26.0	-23.9	-22.4	-21.6	-19.3	-17.6	-15.6	-15.7	-16.7	-15.6	-16.5	-18.0	-17.2	-16.8	-16.5	-15.5	-21.0	-15.5
23-Jan	-15.0	-16.7	-15.8	-10.8	-7.1	-6.2	-7.4	-7.9	-5.9	-0.6	0.2	1.8	4.1	5.4	6.1	5.2	4.2	3.8	1.7	2.9	1.3	1.1	0.9	0.7	-2.3	6.1
24-Jan	0.5	0.2	1.2	0.3	-1.4	-1.6	-2.0	-2.5	-3.2	-4.1	-4.4	-4.4	-4.8	-5.1	-5.2	-5.7	-6.4	-6.7	-6.8	-6.9	-7.0	-7.0	-6.9	-6.7	-4.0	1.2
25-Jan	-7.1	-9.1	-10.2	-11.0	-11.0	-8.9	-7.5	-6.9	-7.6	-7.3	-4.7	-4.6	-4.7	-4.7	-4.8	-5.4	-6.4	-7.3	-7.5	-8.6	-10.2	-12.4	-14.7	-16.5	-8.3	-4.6
26-Jan	-18.6	-20.5	-22.0	-23.2	-24.5	-25.6	-26.6	-28.0	-28.8	-27.7	-27.3	-26.6	-26.0	-25.4	-24.8	-24.5	-24.3	-25.9	-29.0	-30.9	-32.1	-33.1	-33.9	-34.6	-26.8	-18.6
27-Jan	-35.3	-35.8	-36.3	-36.7	-37.1	-37.4	-37.6	-37.7	-37.7	-35.9	-30.1	-27.0	-24.4	-22.1	-19.8	-19.4	-20.3	-23.4	-24.5	-22.9	-22.2	-21.3	-21.1	-21.0	-28.6	-19.4
28-Jan	-20.5	-19.8	-23.4	-25.2	-25.8	-26.1	-26.0	-25.8	-24.7	-23.3	-19.6	-17.5	-15.9	-14.5	-14.0	-14.0	-14.0	-12.9	-15.8	-17.6	-19.0	-20.5	-21.5	-23.1	-20.0	-12.9
29-Jan	-25.7	-27.7	-28.9	-29.1	-27.2	-25.1	-24.5	-24.5	-24.6	-22.5	-21.1	-21.4	-21.9	-22.9	-22.9	-22.7	-22.5	-22.5	-22.7	-22.7	-22.7	-22.9	-22.9	-22.3	-23.9	-21.1
30-Jan	-22.5	-23.5	-24.2	-24.7	-24.4	-23.9	-25.0	-24.1	-22.7	-22.4	-21.5	-20.7	-19.2	-17.6	-16.1	-16.1	-15.6	-15.7	-15.8	-15.5	-15.3	-16.9	-17.4	-16.9	-19.9	-15.3
31-Jan	-19.0	-20.5	-20.5	-22.8	-24.4	-25.8	-25.3	-22.9	-21.7	-20.1	-17.3	-15.7	-15.1	-14.2	-14.0	-14.0	-14.2	-14.6	-15.5	-16.4	-15.7	-15.1	-15.7	-15.7	-18.2	-14.0
	-20.0	-20.2	-20.2	-20.3	-20.2	-20.1	-19.8	-19.5	-19.4	-18.7	-17.1	-16.1	-15.0	-14.4	-14.1	-14.6	-15.6	-16.5	-17.3	-17.8	-18.2	-18.8	-18.9	-19.0	Diurnal Average	
	0.5	0.2	3.5	4.5	4.7	5.4	5.7	5.6	3.3	3.7	5.1	6.4	7.2	7.2	6.8	5.9	4.2	3.8	1.7	2.9	1.3	1.1	0.9	0.7	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	321	43.15	43.15
-20 - 0	380	51.08	94.22
0 - 10	43	5.78	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 94 % on Jan 15 02:00

Maximum Daily Average: 89.7 % on Jan 9

Minimum Value: 49 % on Jan 15 08:00

Minimum Daily Average: 65.0 % on Jan 26

Maximum Diurnal Average: 79.5 % at hour 3

Minimum Diurnal Average: 71.3 % at hour 15

Monthly Average: 77.0 %

Percentiles: P_1 = 54 P_{10} = 67 Q_1 = 71 Median = 77 Q_3 = 84 P_{90} = 88 P_{99} = 92

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

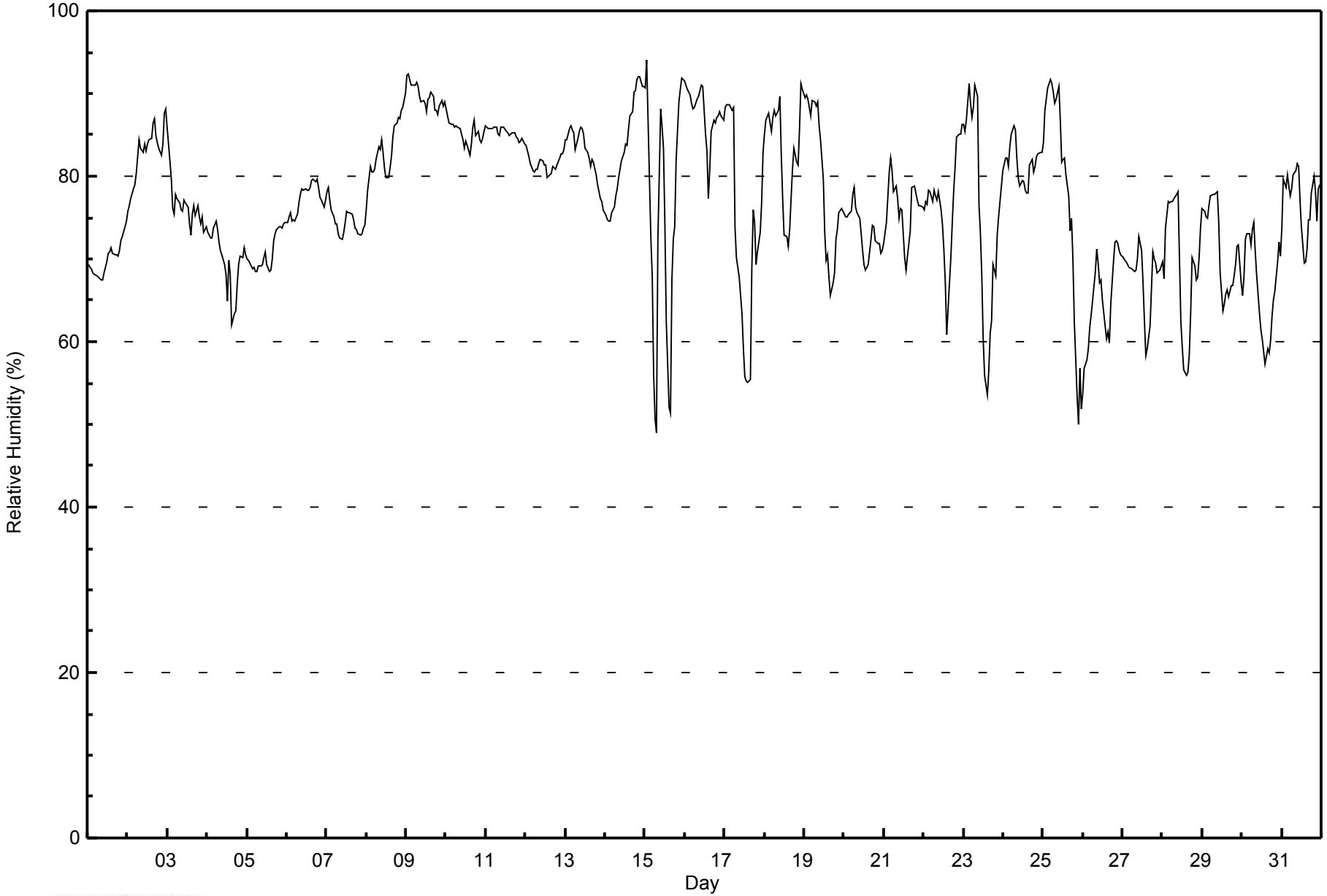
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	69	69	69	68	68	68	68	68	68	68	68	70	71	71	71	71	70	71	70	71	72	73	74	75	70.0	75
2-Jan	76	77	77	78	79	80	82	84	83	83	84	83	84	84	85	86	87	85	84	83	82	84	88	88	82.8	88
3-Jan	86	82	80	76	75	78	77	77	76	76	77	77	76	74	73	75	77	75	76	75	74	75	73	74	76.5	86
4-Jan	73	73	72	73	74	75	73	72	71	71	69	68	65	70	68	62	63	64	67	69	70	70	71	70	69.8	75
5-Jan	70	70	69	69	69	68	68	69	69	69	70	71	69	68	69	70	72	73	74	74	74	74	74	74	70.7	74
6-Jan	74	75	76	75	75	75	75	77	78	78	78	78	78	78	79	79	80	79	80	79	77	77	76	77	77.3	80
7-Jan	78	79	77	76	75	74	74	73	73	72	73	74	76	76	76	75	75	74	73	73	73	73	74	74	74.6	79
8-Jan	76	78	81	81	80	81	82	84	83	84	83	81	80	80	81	82	85	86	86	87	87	88	88	90	83.1	90
9-Jan	92	92	92	91	91	91	91	91	90	89	89	89	88	89	89	90	90	88	88	87	88	89	89	89	89.7	92
10-Jan	88	87	86	86	86	86	86	86	86	85	84	83	84	84	83	84	86	87	85	85	84	84	85	85	85.3	88
11-Jan	86	86	86	86	86	86	86	85	85	86	86	86	85	85	85	85	85	85	85	85	84	84	85	84	85.3	86
12-Jan	84	83	82	82	81	81	81	81	81	82	82	81	81	80	80	80	81	81	81	81	82	83	83	83	81.5	84
13-Jan	84	84	86	86	86	85	83	85	85	86	86	85	83	83	82	81	82	82	80	79	78	77	77	76	82.6	86
14-Jan	75	75	75	75	76	76	78	79	80	81	82	83	84	84	86	87	88	90	90	92	92	92	91	91	83.3	92
15-Jan	91	94	87	73	68	56	51	49	72	88	86	83	74	62	52	51	67	72	74	82	89	91	92	92	74.8	94
16-Jan	92	90	90	90	89	88	88	89	90	90	91	91	85	83	77	81	85	87	86	87	87	88	87	87	87.5	92
17-Jan	88	89	89	89	88	88	74	70	69	68	63	59	56	55	55	55	69	76	74	69	71	73	77	83	72.8	89
18-Jan	85	87	88	87	85	87	88	87	88	90	83	77	73	73	72	74	77	81	83	82	81	86	91	90	83.1	91
19-Jan	89	90	89	88	87	89	89	88	89	86	84	80	73	70	70	68	66	67	68	72	74	76	76	76	79.4	90
20-Jan	75	75	75	75	76	78	79	76	76	75	73	71	69	69	69	71	72	74	74	72	72	72	71	71	73.3	79
21-Jan	72	74	78	80	82	81	78	79	77	75	76	76	70	69	70	72	73	79	79	78	77	76	76	76	76.0	82
22-Jan	76	77	77	78	78	77	78	78	77	78	76	74	71	67	61	64	70	75	78	81	85	85	85	86	76.4	86
23-Jan	86	85	87	91	89	87	88	91	90	77	73	68	60	56	54	56	61	63	69	68	73	75	77	79	75.2	91
24-Jan	81	82	82	81	84	85	86	86	82	80	79	79	79	78	78	78	81	82	80	81	82	83	83	83	81.5	86
25-Jan	84	88	89	91	92	91	90	89	89	91	87	82	82	82	80	78	73	75	70	62	53	50	57	52	78.2	92
26-Jan	54	57	58	59	62	63	65	68	71	69	67	67	65	62	60	61	60	65	70	72	72	72	71	71	65.0	72
27-Jan	70	70	70	69	69	69	69	69	69	70	73	71	67	62	58	59	62	66	71	70	69	68	69	69	67.8	73
28-Jan	70	68	74	77	77	77	77	77	78	78	70	62	59	57	56	56	58	64	70	69	67	68	70	74	68.9	78
29-Jan	76	76	75	75	76	78	78	78	78	78	74	68	64	65	66	66	65	67	67	68	69	72	72	67	71.5	78
30-Jan	66	68	72	73	73	72	74	74	71	68	64	62	60	59	57	59	59	60	63	65	66	70	72	70	66.5	74
31-Jan	74	80	79	80	79	78	79	80	81	82	81	77	74	69	70	71	75	75	78	80	78	75	78	79	77.1	82
	78.7	79.3	79.5	79.3	79.1	79.0	78.6	78.7	79.1	79.1	77.8	76.1	73.8	72.4	71.3	72.0	74.1	75.7	76.6	76.8	77.0	77.4	78.4	78.6	Diurnal Average	
	92	94	92	91	92	91	91	91	90	91	91	91	88	89	89	90	90	90	90	92	92	92	92	92	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay South - January 2014

Maximum Speed: 29 km/h on Jan 15 08:00

Maximum Daily Speed Average: 11.2 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 1 22:00

Minimum Daily Speed Average: 0.3 km/h on Jan 12

Maximum Diurnal Speed Average: 2.8 km/h at hour 14

Minimum Diurnal Speed Average: 1.1 km/h at hour 1

Monthly Average Velocity: 1.4 km/h 314.8 deg

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 4 $Q_3 = 7$ $P_{90} = 11$ $P_{99} = 19$

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	WSW1	AF	WSW1	SW2	AF	AF	WSW1	SW1	SSW1	AF	SSW1	SSW1	S3	SSE2	SSE2	SSW1	S2	SW2	WSW2	SW1	SSE1	S0	SSW0	SE1	SSW1.1	S3
2-Jan	AF	SE1	N1	AF	NNW1	WSW2	SSW4	SSW5	SSW5	SW5	SSW6	S9	S6	SSE4	SSE4	S4	S4	NW1	SW2	SSW2	SW2	W4	N6	N8	SSW2.0	S9
3-Jan	N12	NNE13	N11	N9	N6	AF	WSW3	WSW3	SW3	SSW2	AF	AF	WNW1	NNE2	N5	WNW3	W6	WNW5	W6	W6	WNW5	W6	WSW4	WSW4	NW3.3	NNE13
4-Jan	WSW4	SW4	SW5	SSW5	WSW5	SW6	WSW9	WSW10	WSW8	WSW8	WNW7	NW9	NNW13	N14	N11	NNW9	NW7	WNW5	W5	W4	W4	W4	WSW6	WSW5	WNW4.7	N14
5-Jan	NNW1	WSW1	SW2	SE1	SW1	SW2	SSW1	S2	SW1	WSW1	SSE2	E3	SE3	SSE4	SSE3	SE2	AF	WSW1	SSW0	SSW2	S2	S1	S2	SSW1	S1.2	SSE4
6-Jan	SSW1	SSE1	AF	SE2	S3	SSE4	SSE4	S2	AF	ESE3	NNE2	NNE2	NNE4	NNE4	N4	N4	N3	N4	N1	NW0	AF	NNW0	SW2	SW1	NE0.7	NNE4
7-Jan	NNE1	AF	AF	WNW1	WSW3	AF	SW3	SW1	SW2	AF	S2	AF	E1	SSE1	AF	AF	SW2	WSW2	AF	SW1	AF	AF	AF	AF	----	WSW3
8-Jan	WSW1	SSE3	SSE6	S8	S7	S7	S8	S5	S7	S4	SSW6	S6	S5	S6	SSW4	N0	ENE1	AF	AF	AF	AF	SSE1	SSW2	NE0	S4.1	S8
9-Jan	AF	AF	AF	AF	AF	SW1	S4	S5	S5	S3	S3	S3	AF	N5	N4	N4	N8	N9	N8	N8	N7	N7	N7	N7	N2.8	N9
10-Jan	N6	N7	N6	NNW4	NNW4	NNW4	NNW3	NNW2	N4	NNE4	N4	NNE2	NNE3	NNE3	AF	AF	AF	AF	WSW3	SSW3	SW4	SW1	SW1	SW2	NNW2.4	N7
11-Jan	NNW1	AF	AF	NNE3	N4	N5	N6	N8	N8	N8	N8	N8	N8	N8	N9	N9	N9	N11	N10	N9	N13	N11	N10	N11	N7.9	N13
12-Jan	N11	N12	N9	NNE11	N8	N5	N3	ENE1	SE1	ESE2	SE4	SE3	SSW4	SW6	S7	S7	S4	S4	S4	S5	S6	S5	SSW3	SSW2	ESE0.3	N12
13-Jan	SSE4	N1	SSW3	S2	SSW4	S3	WSW1	AF	NNW2	W3	NW1	NNE4	NNE5	NE6	NNE6	NNE7	N4	N4	NNW3	W2	WSW2	W1	WSW2	WSW1	N0.9	NNE7
14-Jan	SW1	SW1	S1	SSW1	SW1	WSW2	AF	AF	AF	SW0	SE1	E1	SSE3	ENE2	NE1	SSE1	E1	SSE6	S6	S6	SSE0	SSW1	W1	W2	S1.3	SSE6
15-Jan	W0	WSW14	W22	W20	W19	W21	W19	WNW29	WNW20	WNW14	NW12	NW10	NW11	NW16	NW16	NW13	NNE6	N6	N5	NNW1	SW3	AF	AF	S2	WNW11.2	WNW29
16-Jan	S3	S2	S3	SSW3	SSW3	SSW3	SW2	AF	SW2	AF	AF	S3	S3	SSE3	SE2	AF	S3	SSW2	S3	S2	S3	SSW1	S2	S2	S2.3	SSW3
17-Jan	S3	AF	AF	S4	SSW4	SW3	WSW13	WSW11	WSW13	W12	W12	W11	NW11	NNW13	NNW12	NNW10	NNE10	NE8	NE5	NE6	NNE4	NE3	SE2	AF	WNW4.1	NNW13
18-Jan	AF	AF	AF	ESE1	SW1	SSW2	S5	S4	S3	SW6	W5	E2	NE3	N11	N13	N9	N7	N7	N8	N8	NNW6	NNW5	WNW2	WNW2	NNW2.7	N13
19-Jan	SW1	S1	NNE1	NNW4	NNW1	NNE1	NW2	N2	N5	N8	N11	N15	N16	N16	N17	N16	N13	N9	N6	N3	N5	W1	SW3	SW3	N6.1	N17
20-Jan	SSW2	SSW2	SSW2	S3	S3	S4	S6	SSE7	SSE5	S5	SSE7	SSE7	SSE8	M	SSE6	E1	ESE1	NNW2	NNW4	NNW4	NNW3	NNW7	N7	NNW4	S1.6	SSE8
21-Jan	NNE2	N1	WNW1	WSW2	WNW1	N2	N3	NW1	NW3	NNW3	NNW7	N11	N11	N10	NNE8	NNE6	N2	NW2	WSW2	WSW3	WSW2	SW2	SW2	SW1	NNW2.6	N11
22-Jan	S2	S3	S3	S5	SSE5	S4	SSE6	S6	S5	S8	SSE9	SSE7	SSE7	SSE9	SSE8	SSE8	S5	S7	S4	S3	S4	SSE5	S5	S6	S5.6	SSE9
23-Jan	SSE4	S3	S3	SSE7	S8	SSE6	S3	S3	SW7	WSW8	WSW11	WSW8	WSW8	WSW7	WSW9	WSW8	W9	NW4	SW1	W3	SSE2	S2	S2	SSW2	SW4.0	WSW11
24-Jan	SSW1	WSW1	W3	N10	NNW6	NNW8	N9	N8	N10	NNE8	NNE8	NNE8	N10	NNE9	N7	NNE7	NNE6	NNE5	NE4	NNW2	NE3	ESE2	SE3	S2	N4.9	N10
25-Jan	SSE1	W1	SW1	SSW2	SW4	SSE4	S3	SSE2	W2	NNW4	N6	NNE12	N7	N7	NNE8	NNE9	NNE8	N9	N13	NNW15	NNW17	NNW18	N13	N17	N5.9	NNW18
26-Jan	N18	N17	N13	N12	N11	N8	N6	N4	NE2	NNE4	N3	SE2	SE3	ESE3	SSE2	ESE4	ESE2	WSW0	W2	SW2	WSW2	WSW2	SW2	SW2	N3.4	N18
27-Jan	WSW2	SW2	SW2	SW1	SSW2	SW1	SW1	SW2	SW2	SSW2	SSE4	SE5	SE6	SE7	SSE6	SSE5	SSE5	SSW2	S3	S3	S4	S4	S4	S3	S2.8	SE7
28-Jan	S4	S4	S3	S3	S3	S3	S3	S4	S6	SSE2	SE2	ENE2	NE4	NNE3	N2	N2	N4	N8	N15	N12	N13	N9	N7	NNW4	NNE2.0	N15
29-Jan	W2	WSW2	SW4	SW4	SW2	SSW1	NNW1	NNW1	N1	NNW6	N10	N13	N14	N14	N11	N11	N10	N10	NNW7	NNW4	NW4	WNW3	NW3	NW7	NNW4.9	N14
30-Jan	NW6	W3	WSW3	WSW4	WSW4	WSW5	SW5	WSW7	WSW9	WSW10	SW11	SSW10	SSW9	SSW10	SSW8	SSW6	S9	S7	S6	SSW8	SSW4	W1	WSW8	W7	SW5.7	SW11
31-Jan	NNW3	NNW5	NW3	NW4	W3	SW2	SW2	SE1	NNW1	W1	NW2	N4	NNE5	N6	NNE6	N5	N6	N3	WSW1	SW2	W3	WSW3	SSW3	SSW3	NW1.8	N6
	NNW1.1	NW1.4	WNW1.7	WNW1.2	WSW1.6	WSW1.5	WSW2.1	WSW2.1	WSW2.2	W2.0	WNW1.6	NNW1.4	N1.9	N2.8	N2.7	N2.7	N2.2	N2.5	NNW1.9	NW1.5	NW1.8	NW1.6	WNW1.2	WNW1.4	Diurnal Average	
	N18	N17	W22	W20	W19	W21	W19	WNW29	WNW20	WNW14	NW12	N15	N16	N16	N17	N16	N13	N11	N15	NNW15	NNW17	NNW18	N13	N17	Diurnal Maximum	

M - Maintenance 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

Fort McKay South - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 13 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 26 20:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 2 P_{90} = 4 P_{99} = 8

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Hours of Calibration:	0
Percent Operational Time:	92.2

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-Jan	1	AF	1	1	AF	AF	1	1	1	AF	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
2-Jan	AF	1	1	AF	1	1	2	2	2	2	2	3	2	2	2	2	2	1	2	1	2	3	1	2	3
3-Jan	4	4	4	3	2	AF	1	1	1	1	AF	AF	1	2	2	2	2	2	2	2	2	2	2	1	4
4-Jan	1	1	1	2	1	2	3	3	2	2	3	4	5	4	4	4	3	2	2	1	2	1	2	3	5
5-Jan	1	2	2	1	1	1	1	1	1	1	2	1	1	2	1	1	AF	1	1	1	1	1	1	1	2
6-Jan	1	1	AF	1	2	2	2	1	AF	2	1	1	1	1	1	1	1	2	1	1	AF	2	1	1	2
7-Jan	1	AF	AF	1	1	AF	1	1	1	AF	1	AF	1	1	AF	AF	1	1	AF	1	AF	AF	AF	AF	1
8-Jan	1	2	2	3	2	3	3	2	3	1	2	2	2	2	2	2	1	AF	AF	AF	AF	1	1	1	3
9-Jan	AF	AF	AF	AF	AF	1	2	2	2	2	2	1	AF	1	1	1	3	3	3	3	2	2	2	2	3
10-Jan	2	2	2	2	1	1	1	1	1	1	1	1	1	1	AF	AF	AF	AF	2	1	2	2	1	1	2
11-Jan	1	AF	AF	1	1	1	2	2	3	2	2	2	2	2	3	3	3	3	3	3	4	4	3	3	4
12-Jan	3	4	3	3	3	2	1	1	1	1	1	1	2	3	2	2	1	1	1	2	2	2	2	2	4
13-Jan	2	2	2	2	1	2	1	AF	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
14-Jan	1	1	1	1	1	1	AF	AF	AF	1	1	1	1	1	1	1	1	2	2	2	1	2	1	2	2
15-Jan	1	8	10	9	8	10	10	13	10	7	8	6	6	7	7	6	3	2	2	2	2	AF	AF	2	13
16-Jan	2	1	1	1	1	1	2	AF	2	AF	AF	1	2	2	2	AF	1	1	1	1	1	1	2	1	2
17-Jan	2	AF	AF	1	2	4	4	4	4	4	4	4	6	5	5	4	4	4	2	2	2	2	1	AF	6
18-Jan	AF	AF	AF	1	1	2	1	2	1	3	4	1	2	4	4	3	2	2	2	3	2	2	2	2	4
19-Jan	1	1	2	1	2	1	1	2	2	3	4	5	6	5	6	5	5	3	3	2	2	1	1	1	6
20-Jan	1	1	1	1	2	2	3	2	2	2	2	2	3	M	2	1	1	1	1	1	1	2	2	2	3
21-Jan	1	1	1	1	1	1	1	1	1	1	3	4	4	3	2	2	1	1	1	1	1	1	1	1	4
22-Jan	1	2	1	2	2	1	2	2	2	3	3	3	3	3	3	3	2	2	2	2	1	1	1	2	3
23-Jan	1	1	1	3	3	2	1	1	4	3	4	3	3	2	3	3	3	2	1	2	1	1	1	1	4
24-Jan	1	1	2	3	2	2	3	3	3	3	2	3	3	3	2	3	2	2	1	1	1	1	1	1	3
25-Jan	1	1	1	1	2	1	2	2	1	3	5	4	3	2	3	3	2	3	6	6	8	7	4	6	8
26-Jan	6	6	5	4	4	3	2	1	1	1	2	1	1	2	1	1	1	1	1	0	1	1	1	1	6
27-Jan	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	0	1	1	1	1	1	1	2
28-Jan	2	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	4	5	4	4	4	2	1	5
29-Jan	1	1	1	0	1	1	1	1	1	2	4	4	5	5	3	3	3	3	3	1	1	1	2	3	5
30-Jan	3	1	1	1	1	1	1	2	3	3	3	3	3	4	4	2	3	2	2	3	2	1	2	2	4
31-Jan	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	2
	6	8	10	9	8	10	10	13	10	7	8	6	6	7	7	6	5	4	6	6	8	7	4	6	
	Diurnal Maximum																								

M - Maintenance AF - Analyzer Failure

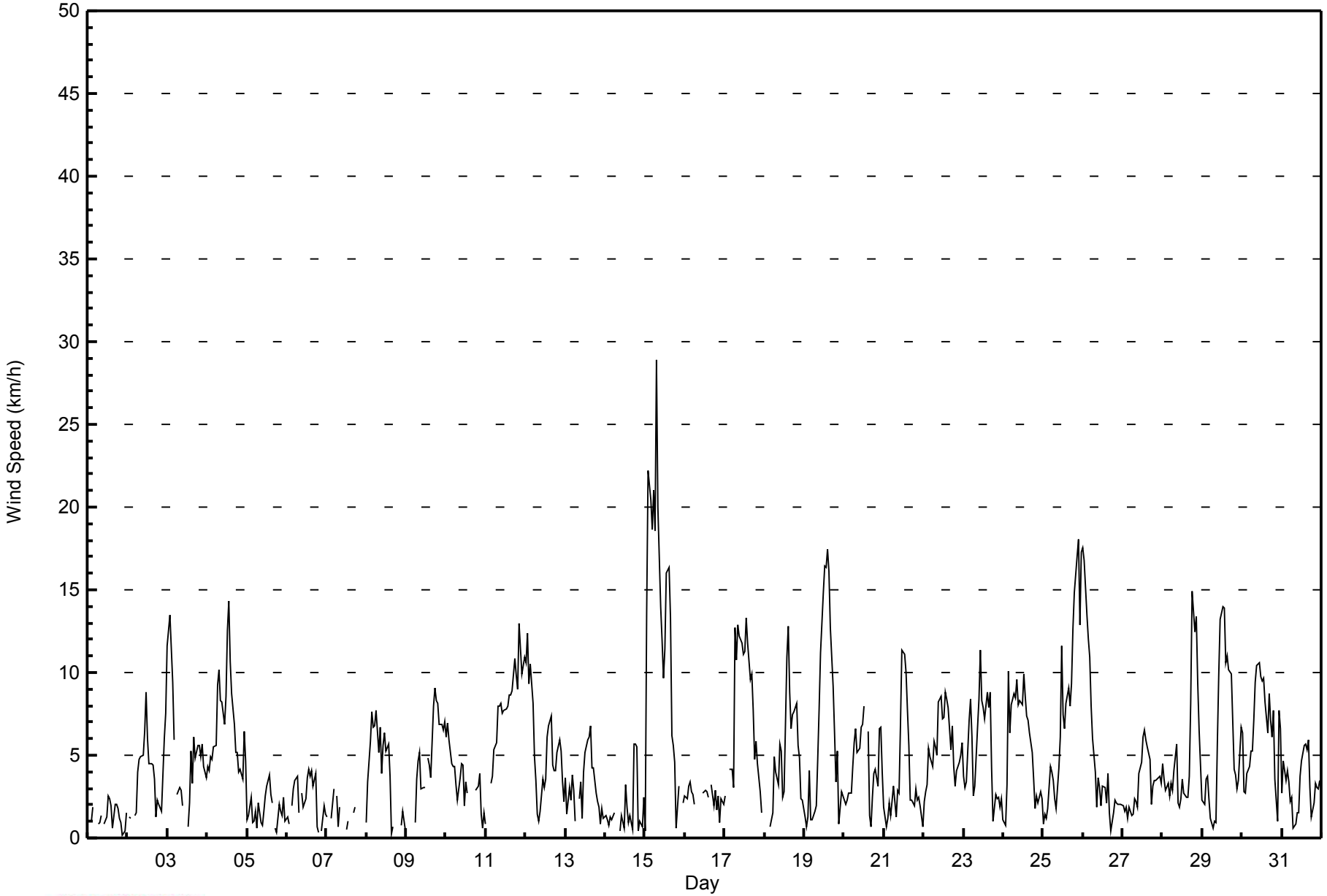
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	445	64.87	64.87
6 - 11	192	27.99	92.86
12 - 19	44	6.41	99.27
20 - 28	4	0.58	99.85
29 - 38	1	0.15	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Fort McKay South - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	38	22	8	4	6	8	17	34	83	47	60	40	24	11	13	30	445
6 - 11	75	17	3	0	0	0	2	18	23	8	5	17	7	1	7	9	192
12 - 19	24	2	0	0	0	0	0	0	0	0	0	3	4	1	3	7	44
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	137	41	11	4	6	8	19	52	106	55	65	60	38	15	23	46	686

Total Number of Valid Hours: 686

Total Number of Hours: 744

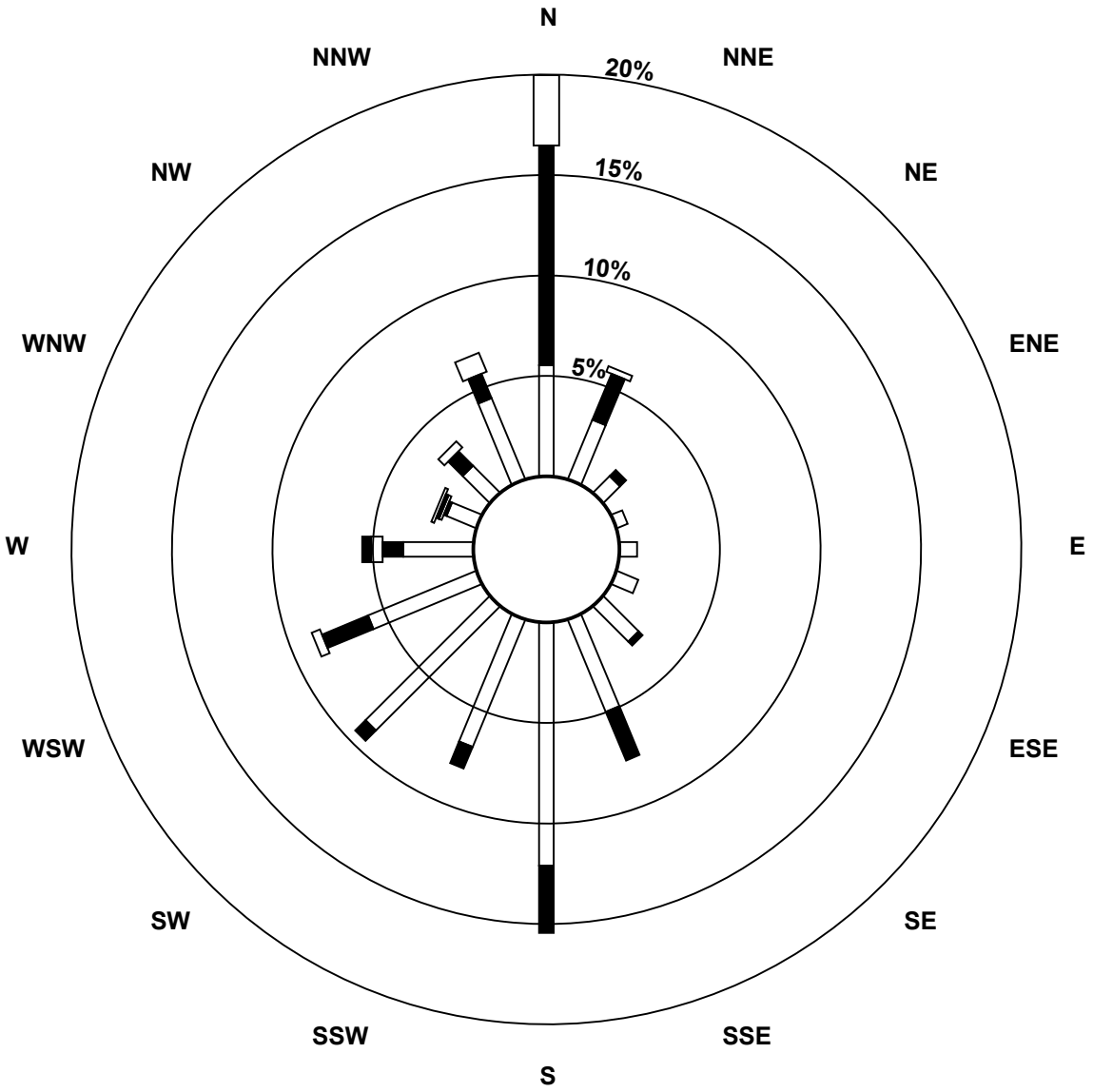
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

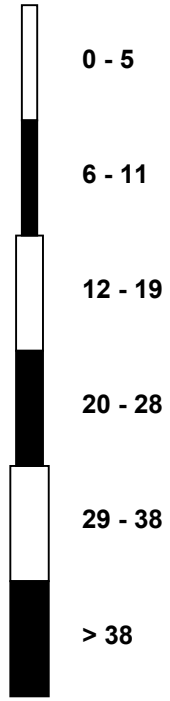
Wind Rose Jan 2014

Wind Speed (WS) - km/h

Fort McKay South (AMS 13)



Classes (km/h)



Total Number of Valid Hours: 686

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Fort McKay South - January 2014

Direction of Maximum Speed: 291 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 292.6 deg on Jan 15

Direction of Minimum Speed: 188 deg on Jan 1 22:00
Direction of Minimum Daily Speed Average: 0.3 deg on Jan 12

Monthly Average Direction: 254.0 deg

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	256	AF	255	235	AF	AF	238	226	198	AF	212	210	178	159	168	198	190	214	238	235	164	188	193	133	201.0
2-Jan	AF	128	9	AF	329	241	202	202	207	218	199	182	172	154	163	173	171	323	225	213	236	276	356	7	199.7
3-Jan	8	15	5	9	5	AF	239	241	216	212	AF	AF	295	26	351	294	276	282	275	278	289	274	256	250	322.2
4-Jan	245	233	229	196	241	226	238	254	254	246	288	320	345	10	354	331	305	296	280	266	275	272	258	254	283.2
5-Jan	340	256	234	141	217	220	198	191	214	246	160	93	133	162	158	136	AF	240	200	198	183	183	182	203	178.7
6-Jan	195	159	AF	129	173	159	157	176	AF	117	23	15	27	18	11	9	0	7	353	304	AF	327	232	220	47.5
7-Jan	12	AF	AF	294	237	AF	231	222	233	AF	178	AF	92	156	AF	AF	220	247	AF	219	AF	AF	AF	AF	--
8-Jan	251	162	164	172	176	176	173	172	171	179	193	182	183	191	197	7	63	AF	AF	AF	AF	147	197	46	177.5
9-Jan	AF	AF	AF	AF	AF	215	177	174	190	183	175	187	AF	10	3	355	3	4	4	0	357	354	349	357	358.3
10-Jan	355	1	355	341	340	342	339	333	355	13	10	32	14	22	AF	AF	AF	AF	239	209	220	215	218	218	345.6
11-Jan	332	AF	AF	14	3	1	1	359	359	3	360	359	0	354	359	357	0	3	357	2	5	4	3	359	0.8
12-Jan	5	2	6	12	8	360	350	66	127	115	146	141	209	214	179	182	188	182	185	172	174	179	192	193	121.1
13-Jan	154	357	199	189	194	170	257	AF	334	260	319	20	26	35	32	32	6	8	343	262	245	266	242	243	1.2
14-Jan	228	218	180	212	222	238	AF	AF	AF	215	140	91	150	68	45	161	88	168	175	175	160	199	281	261	178.7
15-Jan	274	258	265	280	272	278	273	291	295	295	317	307	311	306	315	326	17	7	11	338	225	AF	AF	187	292.6
16-Jan	178	183	183	213	199	198	227	AF	233	AF	AF	171	175	162	141	AF	181	198	176	178	180	204	185	181	185.5
17-Jan	174	AF	AF	186	201	227	246	255	250	265	267	271	307	333	337	333	22	34	53	44	17	34	129	AF	297.3
18-Jan	AF	AF	AF	110	216	206	186	175	187	218	261	91	42	7	7	5	355	355	359	357	340	346	292	284	348.4
19-Jan	216	172	29	347	332	18	320	3	353	359	2	9	8	10	7	6	6	9	6	350	5	267	219	223	3.2
20-Jan	208	206	192	182	172	178	176	166	160	172	167	161	167	M	158	99	103	329	335	332	337	343	356	345	175.2
21-Jan	24	1	300	249	297	357	358	318	308	328	341	359	6	10	13	27	1	309	256	243	237	229	224	223	346.1
22-Jan	189	175	181	174	164	172	168	169	177	171	165	164	154	164	164	168	178	180	179	177	172	166	173	174	169.8
23-Jan	159	171	171	168	175	165	169	172	222	251	248	256	252	251	255	255	265	321	220	269	163	191	178	201	226.3
24-Jan	209	257	278	353	340	347	358	356	4	16	15	14	8	15	11	32	24	28	41	343	39	119	143	170	8.6
25-Jan	166	268	234	192	217	166	170	154	276	348	1	14	6	6	22	21	24	6	352	342	338	346	356	350	355.4
26-Jan	1	358	360	2	355	3	6	6	43	28	355	124	127	108	154	110	123	239	264	236	239	241	228	223	4.1
27-Jan	237	214	217	228	211	232	222	221	223	199	155	142	135	145	154	161	167	211	180	181	184	176	178	173	174.7
28-Jan	175	175	184	189	170	184	185	175	173	168	130	66	56	22	358	9	357	356	5	4	6	5	359	338	13.0
29-Jan	277	247	227	233	234	196	347	344	5	342	3	7	359	0	9	6	358	357	348	331	313	287	304	326	347.3
30-Jan	322	267	252	253	251	249	234	238	246	239	227	213	208	196	198	201	188	181	179	194	194	261	249	265	223.2
31-Jan	344	337	316	306	271	217	228	125	340	262	322	2	13	8	16	5	5	360	250	228	274	252	210	212	325.0
	336.5	321.2	283.4	284.6	257.0	245.2	238.4	250.1	254.0	269.0	290.6	346.9	358.1	2.1	0.1	359.4	354.8	352.3	341.0	314.3	323.3	320.9	290.1	301.4	
	Diurnal Average																								

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

AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 98 deg on Jan 14 21:00

Minimum Value: 5 deg on Jan 29 04:00

Percentiles: P_1 = 13 P_{10} = 18 Q_1 = 22 Median = 27 Q_3 = 41 P_{90} = 67 P_{99} = 92

Hours in Service:	744
Hours of Data:	686
Hours of Missing Data:	58
Hours of Calibration:	0
Percent Operational Time:	92.2

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	67	AF	53	64	AF	AF	59	54	21	AF	65	34	33	32	36	75	52	26	36	59	76	92	84	37	92
2-Jan	AF	65	63	AF	44	45	18	22	28	26	27	21	27	26	28	18	21	71	47	49	62	53	17	20	71
3-Jan	21	22	23	21	17	AF	12	9	19	25	AF	AF	70	37	22	39	21	21	21	23	27	21	27	29	70
4-Jan	19	24	16	20	16	16	14	18	19	23	38	39	26	23	27	28	28	30	21	20	18	21	15	27	39
5-Jan	73	72	72	66	73	35	67	30	82	41	54	47	38	34	36	30	AF	83	68	26	55	70	24	53	83
6-Jan	15	61	AF	42	34	31	34	77	AF	34	49	30	28	26	18	19	15	23	62	61	AF	82	33	34	82
7-Jan	73	AF	AF	39	34	AF	14	71	13	AF	16	AF	60	37	AF	AF	23	16	AF	48	AF	AF	AF	AF	73
8-Jan	76	28	25	25	27	28	24	25	28	25	23	21	23	28	53	93	68	AF	AF	AF	AF	67	47	68	93
9-Jan	AF	AF	AF	AF	AF	80	40	28	21	24	54	31	AF	20	24	18	20	23	22	21	22	24	24	22	80
10-Jan	23	21	26	25	23	24	24	29	19	20	19	33	26	22	AF	AF	AF	AF	38	22	48	65	83	56	83
11-Jan	64	AF	AF	19	19	18	19	20	21	19	22	21	21	21	21	20	20	22	22	21	22	21	21	22	64
12-Jan	20	21	21	21	23	23	32	39	35	49	33	32	54	35	24	19	18	14	16	20	21	28	29	52	54
13-Jan	40	30	52	31	27	45	50	AF	44	24	58	25	24	28	27	26	17	15	32	35	44	51	55	54	58
14-Jan	50	20	73	68	57	36	AF	AF	AF	89	37	76	41	34	88	51	62	29	23	28	98	76	69	60	98
15-Jan	92	43	30	34	35	32	36	35	33	35	40	43	39	33	35	41	28	24	24	88	15	AF	AF	76	92
16-Jan	67	16	18	18	24	17	54	AF	88	AF	AF	21	66	28	26	AF	12	55	19	68	53	75	57	17	88
17-Jan	42	AF	AF	23	34	84	20	25	20	23	24	29	35	32	28	30	25	31	31	35	24	38	36	AF	84
18-Jan	AF	AF	AF	79	79	81	11	17	25	51	83	47	54	19	22	22	22	18	22	21	29	33	46	43	83
19-Jan	56	87	77	26	63	18	39	34	18	21	23	21	24	23	23	22	23	24	25	20	19	68	26	16	87
20-Jan	23	47	27	26	53	19	24	30	27	28	23	26	26	M	27	68	81	39	30	29	34	26	24	36	81
21-Jan	44	97	55	29	40	23	24	67	40	54	31	26	25	24	26	29	42	35	35	29	33	17	17	83	97
22-Jan	42	57	24	25	16	16	20	17	18	24	28	28	27	26	29	27	25	21	23	34	15	16	14	19	57
23-Jan	20	18	17	20	20	24	43	44	39	30	24	26	26	30	30	29	36	34	79	60	29	26	37	35	79
24-Jan	76	93	58	23	23	24	25	26	22	26	24	24	24	31	27	32	27	28	36	51	47	28	26	30	93
25-Jan	82	50	63	41	27	22	36	73	68	44	33	27	27	27	29	24	27	25	32	28	30	31	25	28	82
26-Jan	25	26	24	24	24	25	25	22	70	37	58	65	45	61	68	27	31	69	43	14	22	17	17	22	70
27-Jan	43	28	27	21	29	53	32	19	28	29	25	28	29	28	30	25	21	32	16	18	16	18	36	20	53
28-Jan	19	23	21	16	30	21	32	12	16	73	53	41	39	42	47	22	24	23	24	24	25	28	24	18	73
29-Jan	35	33	21	5	32	47	92	62	81	26	24	26	27	26	26	26	25	24	24	25	25	26	28	32	92
30-Jan	31	24	17	16	19	18	14	19	23	21	22	26	26	25	26	23	23	22	20	30	55	77	20	22	77
31-Jan	43	18	22	17	20	43	37	53	80	50	65	41	32	28	27	26	25	38	41	17	29	29	15	15	80
	92	97	77	79	79	84	92	77	88	89	83	76	70	61	88	93	81	83	79	88	98	92	84	83	
	Diurnal Maximum																								

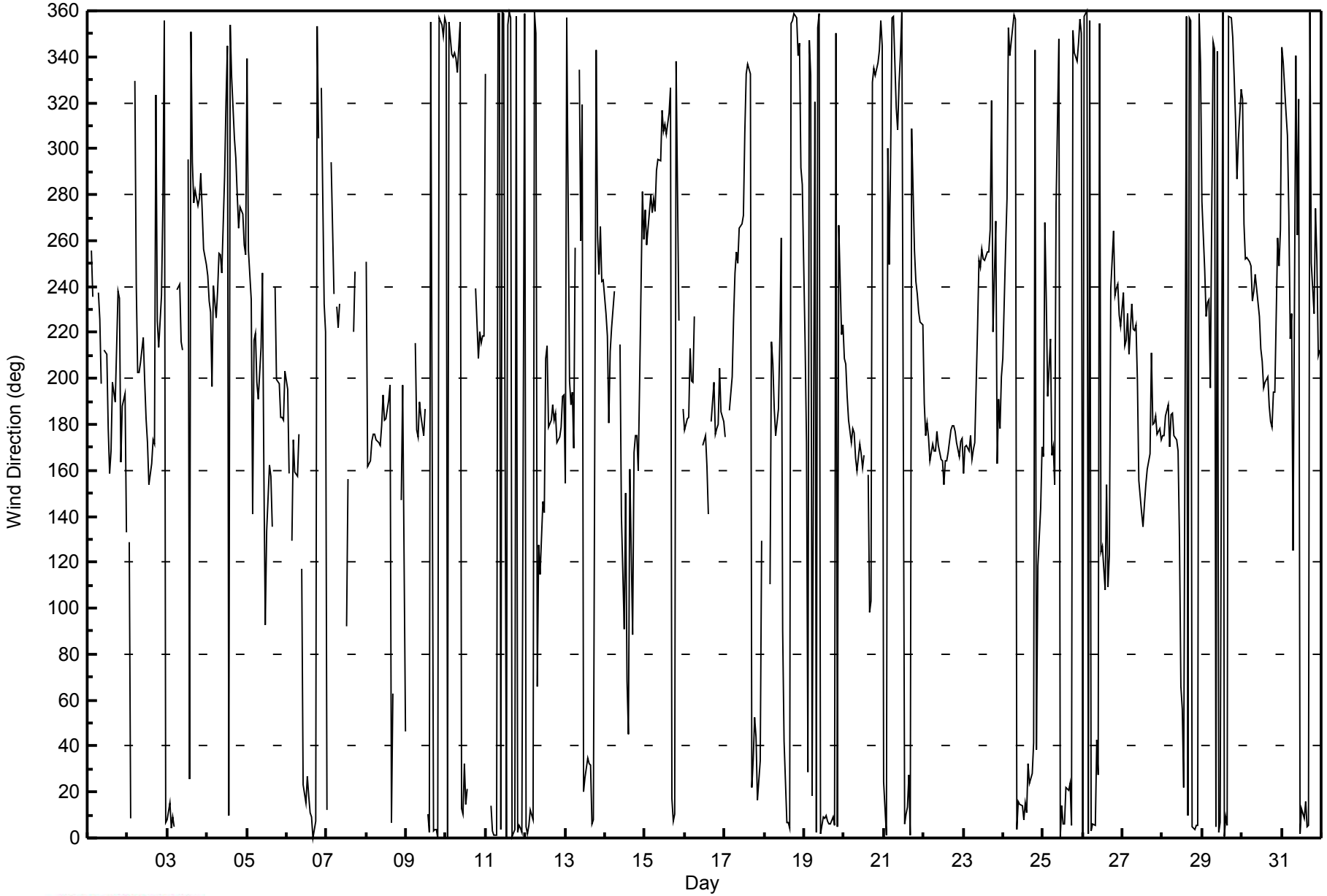
M - Maintenance AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Fort McKay South - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 14, 2014	Previous Calibration	December 10, 2013
Station Name	Fort McKay South	Station Number	AMS 13

Reason: ROUTINE

Start Time (MST)	10:30	End Time (MST)	16:35
Barometric Pressure	734 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	1377
Cal Gas Concentration	51.1	Cal Gas Expiry Date	29-May-14
Gas Cert Reference	LL107918	Pressure:	1500 psi
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2581
DACS voltage range	0-5000mV	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	Norm PMT voltage		
Analyzer Range (mv)	5000	5000	Lamp voltage	2700	2699
Calculated slope	0.998017	0.997494	HVPS	512	512
Calculated intercept	0.335930	1.028477	Pressure (inHg)	26.4	26.0
Analyzer Background	25.3	25.3	Flow (cc/min)	682	670
Analyzer Coefficient	1.556	1.571	Dark Lamp	3.6	3.5

Analyzer make	API T100	Analyzer serial #	599

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-2.0	N/A
as found span	5000	78.9	806.4	795.6	1.013
calibrator zero	5000	0.0	0.0	-0.1	N/A
high point	5000	78.9	806.4	808.2	0.998
second point	5000	39.4	402.7	400.9	1.004
third point	5000	19.6	200.3	199.6	1.003
calibrator zero					
as left zero	5000	0.0	0.0	-0.6	N/A
as left span	5000	78.9	806.4	803.3	1.004
				Average Correction Factor	1.002

Corrected As found	797.6	Previous response	804.4	% change	0.9%

Notes: Filter changed after as founds
DAC adjustment after as founds
Small adjustment to span

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

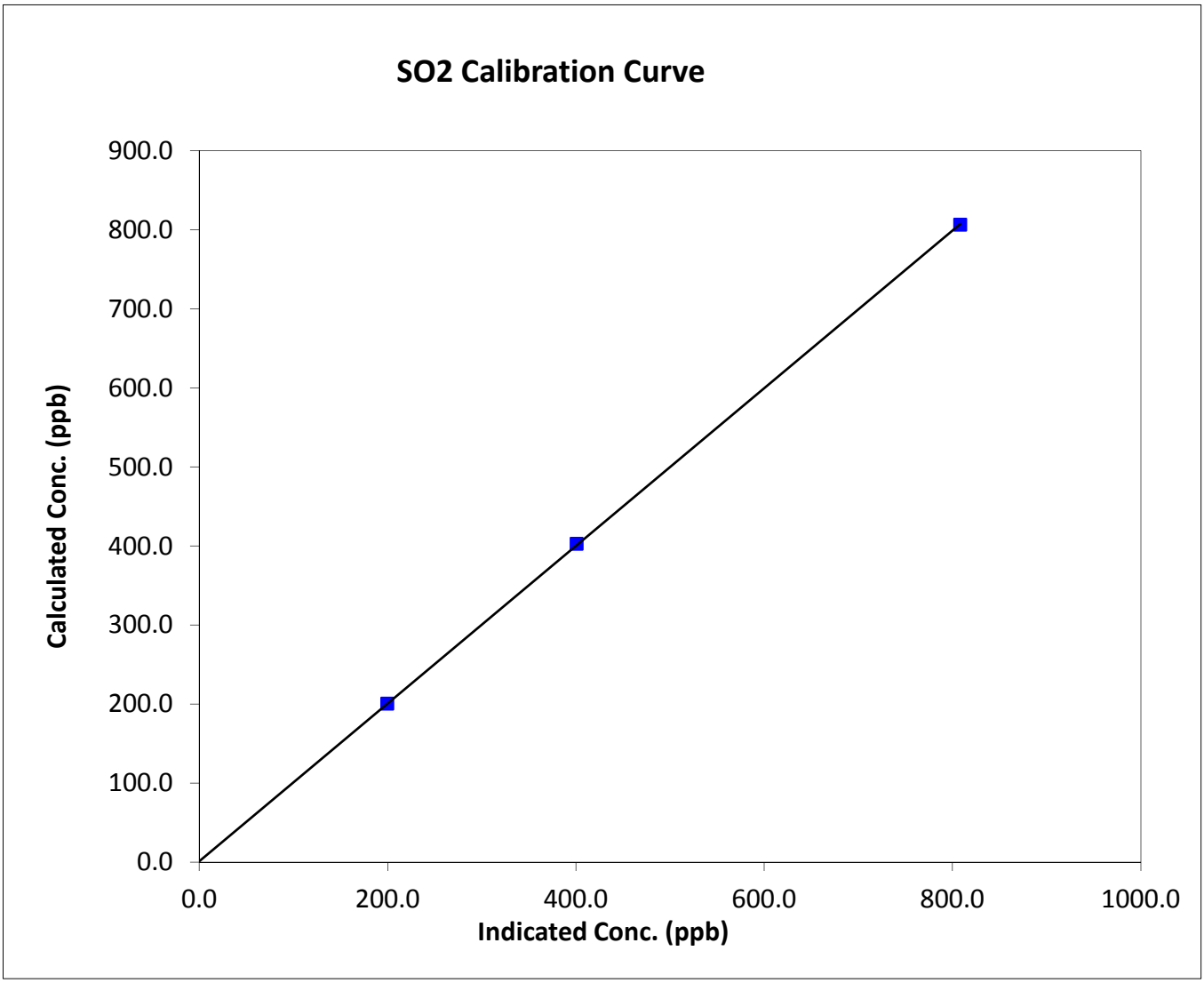
SO_2 Calibration Summary

Station Information

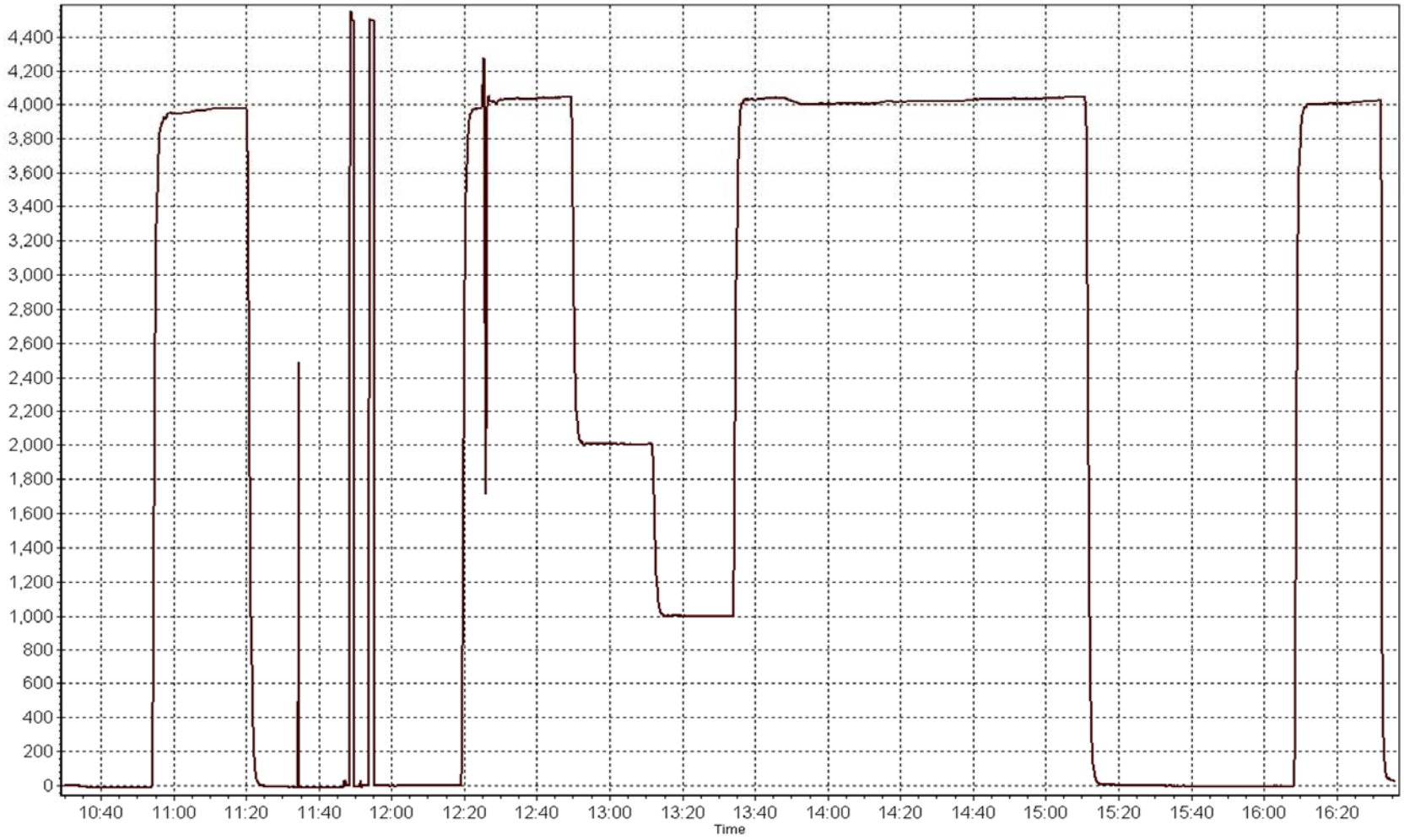
Calibration Date	January 14, 2014	Previous Calibration	December 10, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:30	End Time (MST)	16:35
Analyzer make	API T100	Analyzer serial #	599

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999987
806.4	808.2	0.9977		
402.7	400.9	1.0044	Slope	0.997494
200.3	199.6	1.0033		
			Intercept	1.028477



SO_2 Calibration Plot **Date:** January 14, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 13, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	11:30	End Time (MST)	14:18
Barometric Pressure	741 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	11041107
Cal Gas Concentration	10.4 ppm	Cal Gas Expiry Date	5/30/2013
Gas Cert Reference	LL82750	SO2 gas conc.	51.1 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2581
DACS voltage range	5000	DACS channel #	n/a

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-726.7	-726.3
Analyzer Range (mv)	5000	5000	Lamp voltage	1017	1014
Calculated slope	0.998441	0.998969	Chamber temp.	44.9	44.9
Calculated intercept	0.040175	-0.197387	Pressure	675.4	673.9
Analyzer Background	1.87	1.87	Flow	0.425	0.426
Analyzer Coefficient	1.046	1.046	Intensity	89	89
			Converter temp.	800	800

Analyzer make/model	TEI 43i-TLE	Analyzer serial #	1218153359
Converter make/model	CDN-101	Converter serial #	456

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	4991	0	0.0	0.1	N/A
as found span	5000	38.5	80.1	80.3	0.998
SO2 scrubber check	5000	9.9	101.2	0.3	N/A
calibrator zero	5000	0.0	0.0	0.1	N/A
high point	5000	38.5	80.1	80.3	0.998
second point	5000	19.2	39.9	40.4	0.990
third point	5000	9.6	20.0	20.2	0.987
calibrator zero					N/A
as left zero	5000	0	0.0	0.1	N/A
as left span	4000	30.8	80.1	81.1	0.988
				Average Correction Factor	0.992

Corrected As found	80.2	Previous response	79.9	% change	-0.3%

Notes: No adjustments, As Found Zero used as Calibrator Zero, As Found Span used for High Point
Scrubber check occurred before As lefts
Inlet filter changed

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

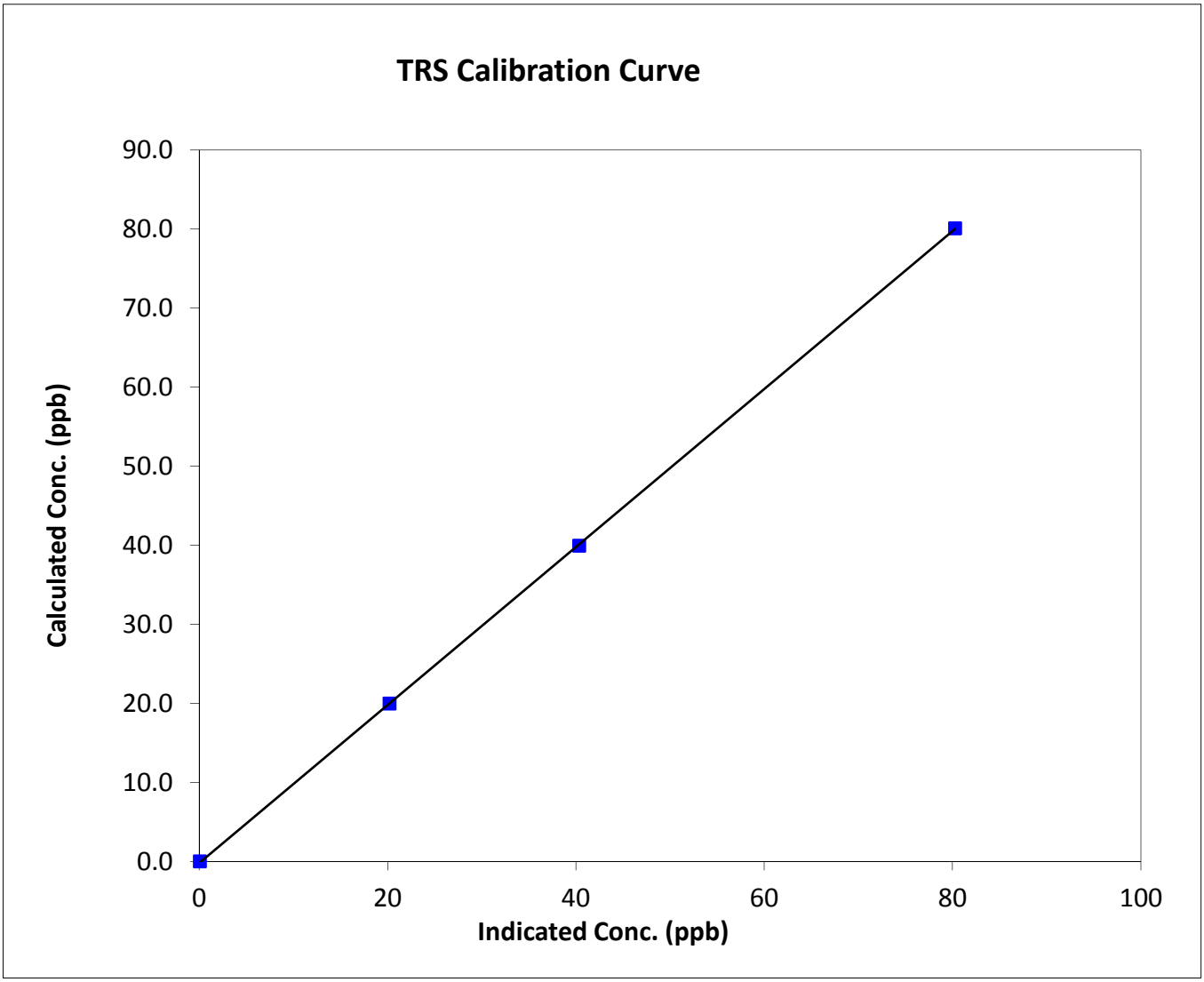
TRS Calibration Summary

Station Information

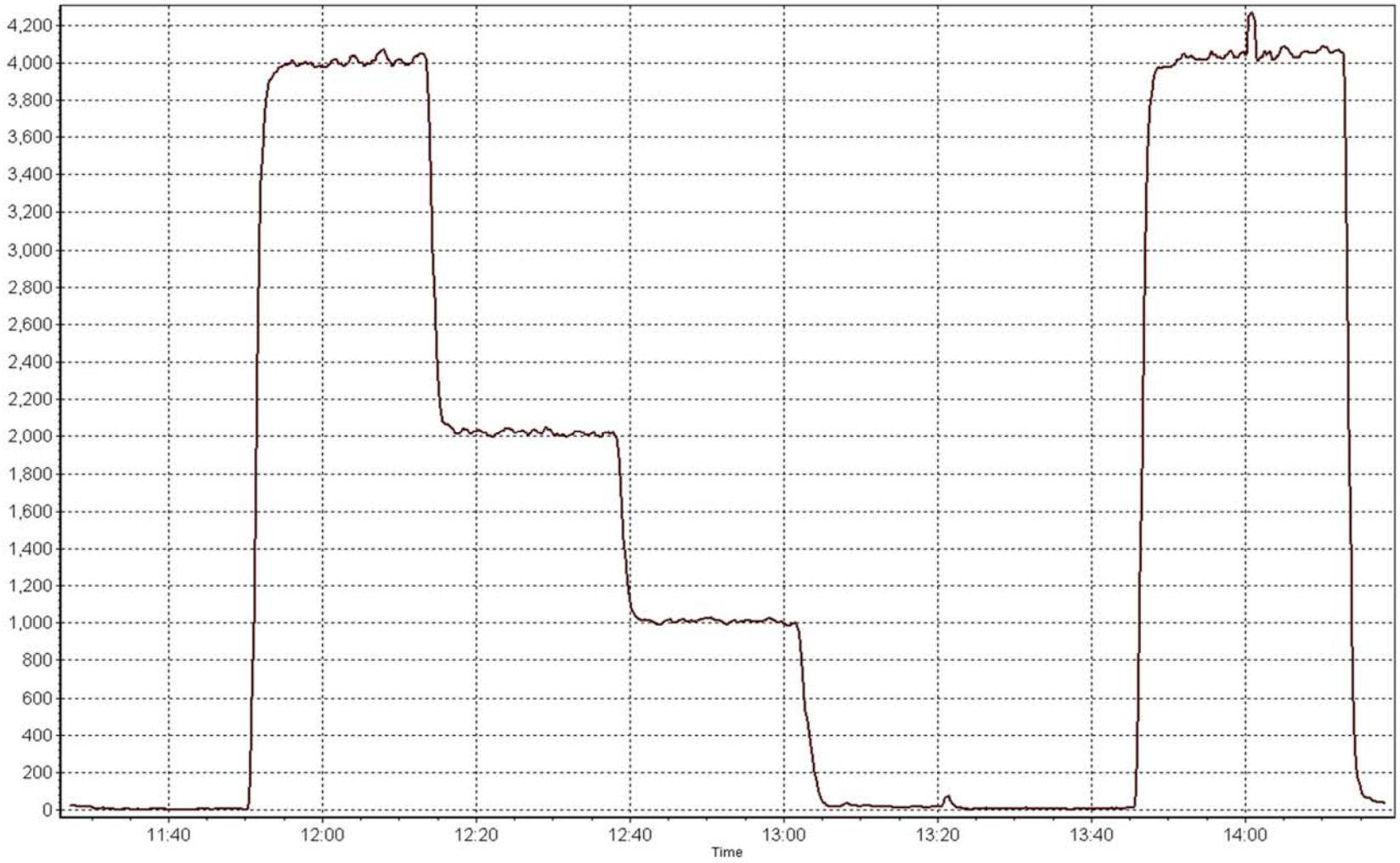
Calibration Date	January 9, 2014	Previous Calibration	December 13, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	11:30	End Time (MST)	14:18
Analyzer make	TEI 43i-TLE	Analyzer serial #	1218153359

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999983
80.1	80.3	0.9978		
39.9	40.4	0.9896	Slope	0.998969
20.0	20.2	0.9874		
			Intercept	-0.197387



TRS Calibration Plot **Date:** January 9, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Monday, January 13, 2014	Previous Calibration	Tuesday, December 10, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	routine		
Start Time (MST)	11:20	End Time (MST)	15:20
Barometric Pressure	747 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11041107
Gas Cert Reference	LL107918	Cal Gas Expiry Date	29-May-14
CH4 Cal Gas Conc.	515.0 ppm	CH4 Equiv Conc.	1076.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2581
DACS voltage range	5000mv	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Flame Temp	158.6	159.7
Analyzer Range (mv)	5000	5000	Sample Pressure	8.0	8.0
Calculated slope	1.003191	1.005264	Fuel Pressure	22.6	22.6
Calculated intercept	0.071574	-0.097538	Air Pressure	42.4	42.4
backgound	3.50	2.27			
coefficient	5.351	4.862			

Analyzer make	Thermo Model 51iLT	Analyzer serial #	1236656114

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.15	N/A
as found span	5000	78.9	16.98	16.30	1.042
calibrator zero	5000	0.0	0.00	0.07	N/A
high point	5000	78.9	16.98	16.98	1.000
second point	5000	39.4	8.48	8.53	0.994
third point	5000	19.6	4.22	4.33	0.974
calibrator zero					
as left zero	5000	0.0	0.00	0.03	N/A
as left span	5000	78.7	16.94	16.86	1.005
				Average Correction Factor	0.989

Corrected As found	16.45	Previous response	16.96	% change	3.1%

Notes:
H2 change after As Founds
Internal Pump changed after As Founds
Zero and Span both adjusted after changes
Filter changed after third point

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

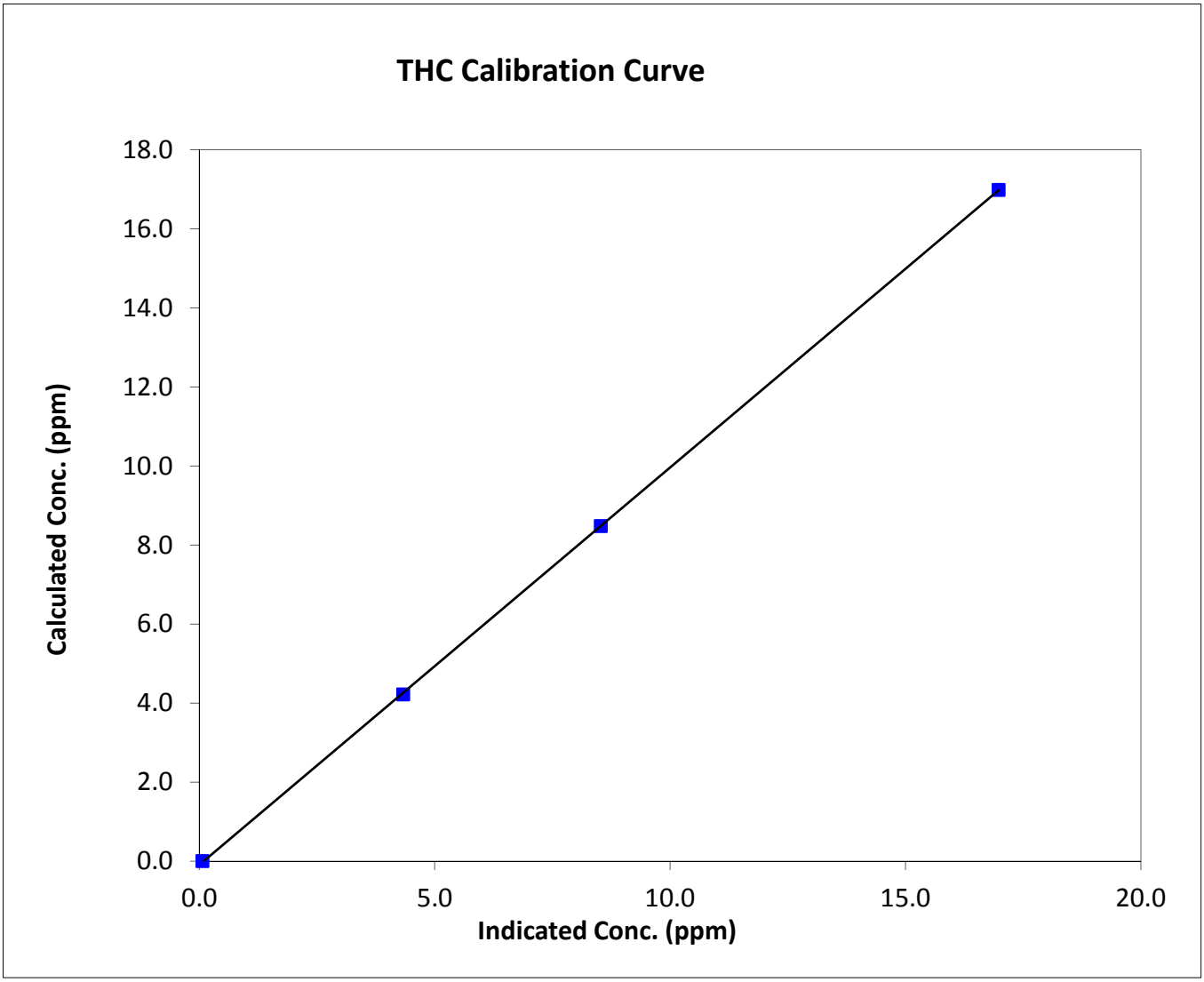
THC Calibration Summary

Station Information

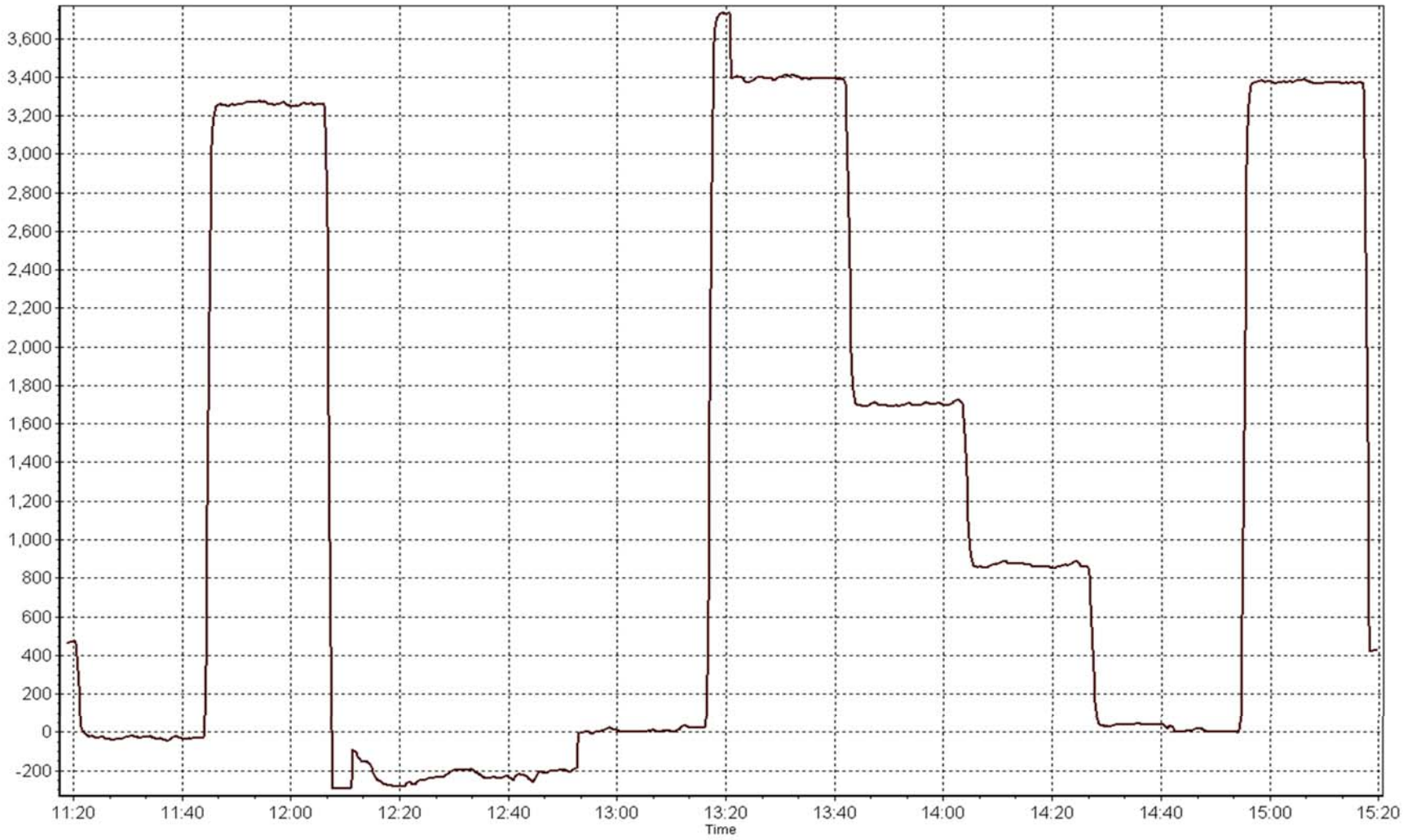
Calibration Date	January 13, 2014	Previous Calibration	December 10, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	11:20	End Time (MST)	15:20
Analyzer make	Thermo Model 51iLT	Analyzer serial #	1236656114

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.07	N/A	Correlation Coefficient	0.999986
16.98	16.98	1.0000		
8.48	8.53	0.9940	Slope	1.005264
4.22	4.33	0.9741		
			Intercept	-0.097538



THC Calibration Plot **Date:** January 13, 2014



Wood Buffalo Environmental Association
O_3 Calibration Report

Station Information

Calibration Date	January 15, 2014	Previous Calibration	December 11, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	12:35	End Time (MST)	15:04
Barometric Pressure	727.5 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11041107
NO2 calibration used	14-Jan-14		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2681
DACS voltage range	5000	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Box temp.	32.4	30.9
Analyzer Range (mv)	5000	5000	Lamp temp.	58.0	58.0
Calculated slope	0.995780	1.000380	Pressure "Hg	26.1	26.2
Calculated intercept	1.423312	1.392649	Sample Flow	678	687
Analyzer Background	-1.1	-1.1	Flow cell B		
Analyzer Coefficient	1.026	1.026	Cell A Intensity		
			Cell B Intensity		

Analyzer make	API T400	Analyzer serial #	825

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	-0.6	N/A
as found span	5000	0.903	359.4	358.4	1.003
calibrator zero	5000	0.00	0.0	-0.6	N/A
high point	5000	0.903	359.4	358.4	1.003
second point	5000	0.585	214.8	212.9	1.009
third point	5000	0.358	114.2	111.9	1.021
calibrator zero					
as left zero	5000	0.00	0.0	-0.3	0.000
as left span	5000	0.903	359.4	354.8	1.013
				Average Correction Factor	1.011

Corrected As found	359.0	Previous response	356.5	% change	-0.7%

Notes: As Found Zero used as Calibrator Zero
As Found Span used as High Point
Filter changed before As Lefts

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

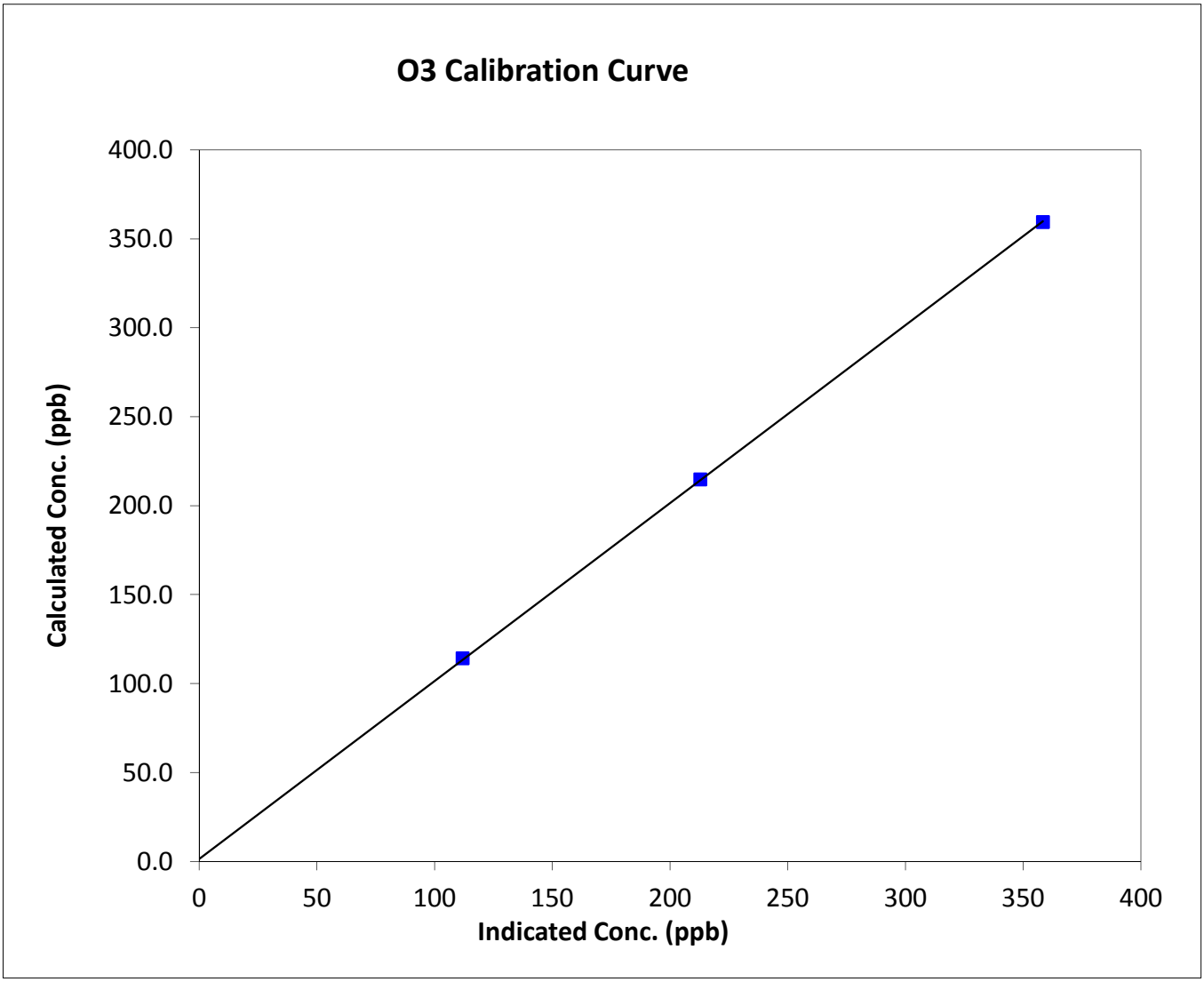
O_3 Calibration Summary

Station Information

Calibration Date	Wednesday, January 15, 2014	Previous Calibration	December 11, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Start Time (MST)	12:35	End Time (MST)	15:04
Analyzer make	API T400	Analyzer serial #	825

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.6	N/A	Correlation Coefficient	0.999973
359.4	358.4	1.0028		
214.8	212.9	1.0088	Slope	1.000380
114.2	111.9	1.0210		
			Intercept	1.392649



O3 Calibration Plot **Date:** January 15, 2014

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 14, 2014	Previous Calibration	December 10, 2013
Station Name	Fort McKay South	Station Number	AMS 13
Reason:	Routine		
Start Time (MST)	10:30	End Time (MST)	16:35
Barometric Pressure	734 mmHg	Station Temperature	22.0 Deg C
Calibrator	Sabio 4010	Serial Number	11041107
NO Cal Gas Conc	50.7 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	50.8 ppm	Cal Gas Serial #	LL107918

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2581

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	0.995479	0.997237	0.986598
	Data Offset	3.034360	2.644866	3.329374
After	Data Slope	0.998872	0.999158	0.995408
	Data Offset	1.270480	1.460229	0.427906
Channel #		3	2	1
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	Thermo 42C	Analyzer serial #	2185

Test Point	before		after	
Concentration range	0 - 1000	ppb	0 - 1000	ppb
NO coefficient	0.787	ppb	0.804	ppb
NOX coefficient	1.001	ppb	1.002	ppb
NO2 coefficient	0.997	ppb	0.997	ppb
NO bkgrnd	3.5		3.8	
NOX bkgrnd	3.6		4.0	
Chamber Temp	49.8	Deg C	49.5	Deg C
Moly Temp	325.0	Deg C	325.0	Deg C
PMT Temp	-3.7	Deg C	-3.7	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	195.5	mmHg	193.9	mmHg
Sample Flow	0.823	ccm	0.821	ccm

Notes:

Span adjusted

Filter changed after as founds

Long calibrator zero as a DAC adjustment was required for SO2 cal carried out at the same time

Delayed as lefts as the analyzer was still in service mode

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 14, 2014 Station Number: AMS 13

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.1	N/A	N/A
as found span	5000	78.9	801.6	800.0	1.6	784.1	782.9	1.8	1.0223	1.0219
calibrator zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.2	N/A	N/A
high point	5000	78.8	800.6	799.0	1.6	801.2	800.0	2.0	0.9992	0.9988
second point	5000	39.4	400.3	399.5	0.8	396.7	396.3	0.9	1.0091	1.0081
third point	5000	19.6	199.1	198.7	0.4	197.1	197.2	0.6	1.0102	1.0080
calibrator zero		0.0								
as left zero	5000	0.0	0.0	0.0	0.0	0.3	0.3	0.1	N/A	N/A
as left span	5000	78.8	800.6	799.0	1.6	792.7	441.3	351.8	1.0099	
								Average Correction Factor	1.0062	1.0050

Corrcted As found NO_X= 783.8 NO= 782.6 Percent Change NO_X= 1.4% NO= 1.6%

Previous Response NO_X= 795.0 NO= 795.2

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.90 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.2			N/A	
1st NO2 (350)	N/A	436.5	359.4	797.1	436.5	361.2	0.9901	1.0000	0.9952	100.5%
2nd NO2 (200)	N/A	581.2	214.8	795.4	581.2	214.8	0.9922	1.0000	0.9998	100.0%
3rd NO2 (100)	N/A	681.7	114.2	794.7	681.7	113.7	0.9930	1.0000	1.0046	99.5%
4th NO2 (0)	795.9	N/A	1.5	797.4	795.9	2.3	0.9897	1.0000	N/A	N/A
					Average Correction Factor		0.9912	1.0000	0.9998	100.0%

Calibration Performed By: Ryan Power

Wood Buffalo Environmental Association

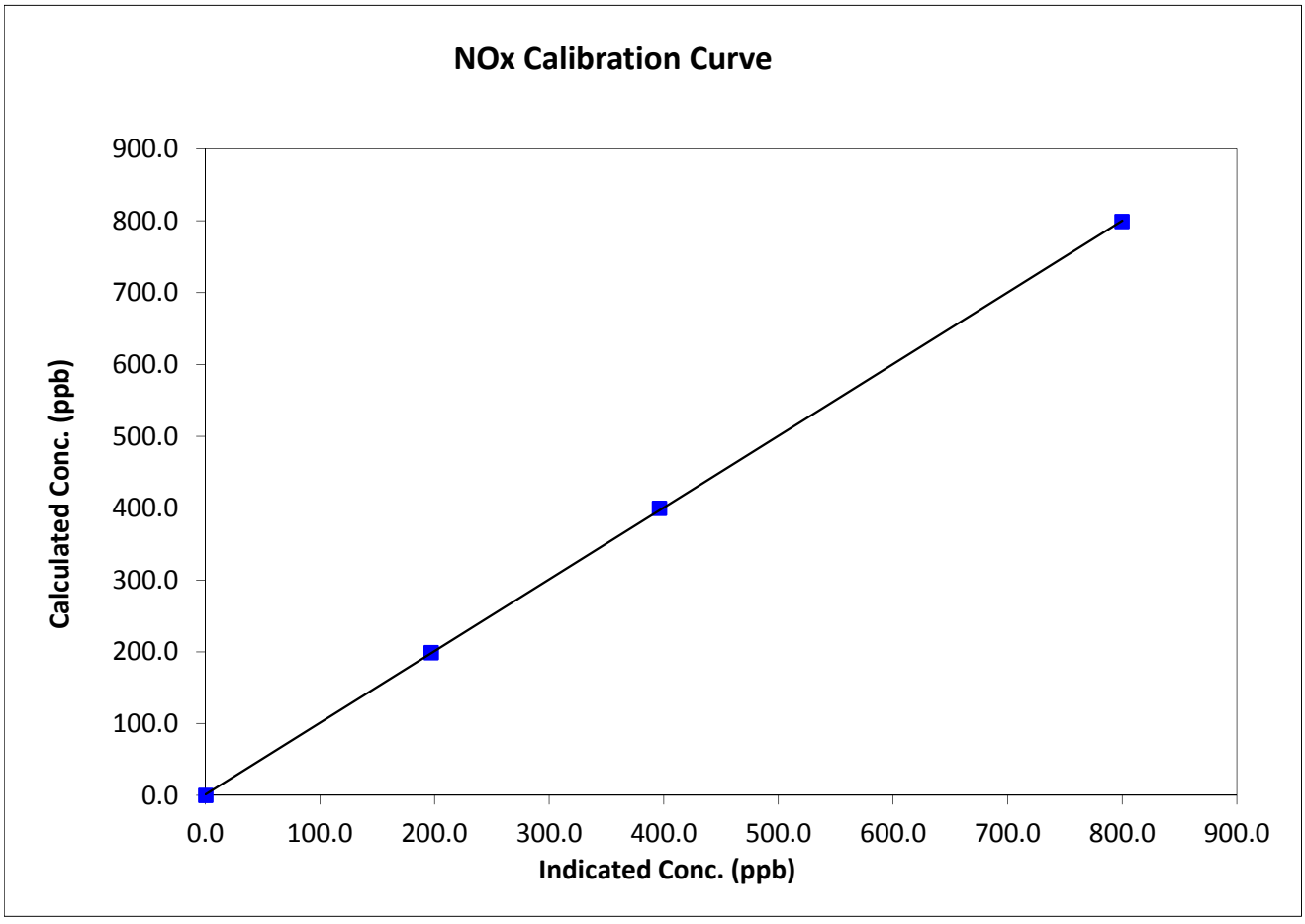
NO_X Calibration Summary

Station Information

Calibration Date	January 14, 2014	Previous Calibration	December 10, 2013
Station Number	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:30	End Time (MST)	16:35
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999971
799.0	800.0	0.9988		
399.5	396.3	1.0081	Slope	0.998872
198.7	197.2	1.0080		
			Intercept	1.270480



Wood Buffalo Environmental Association

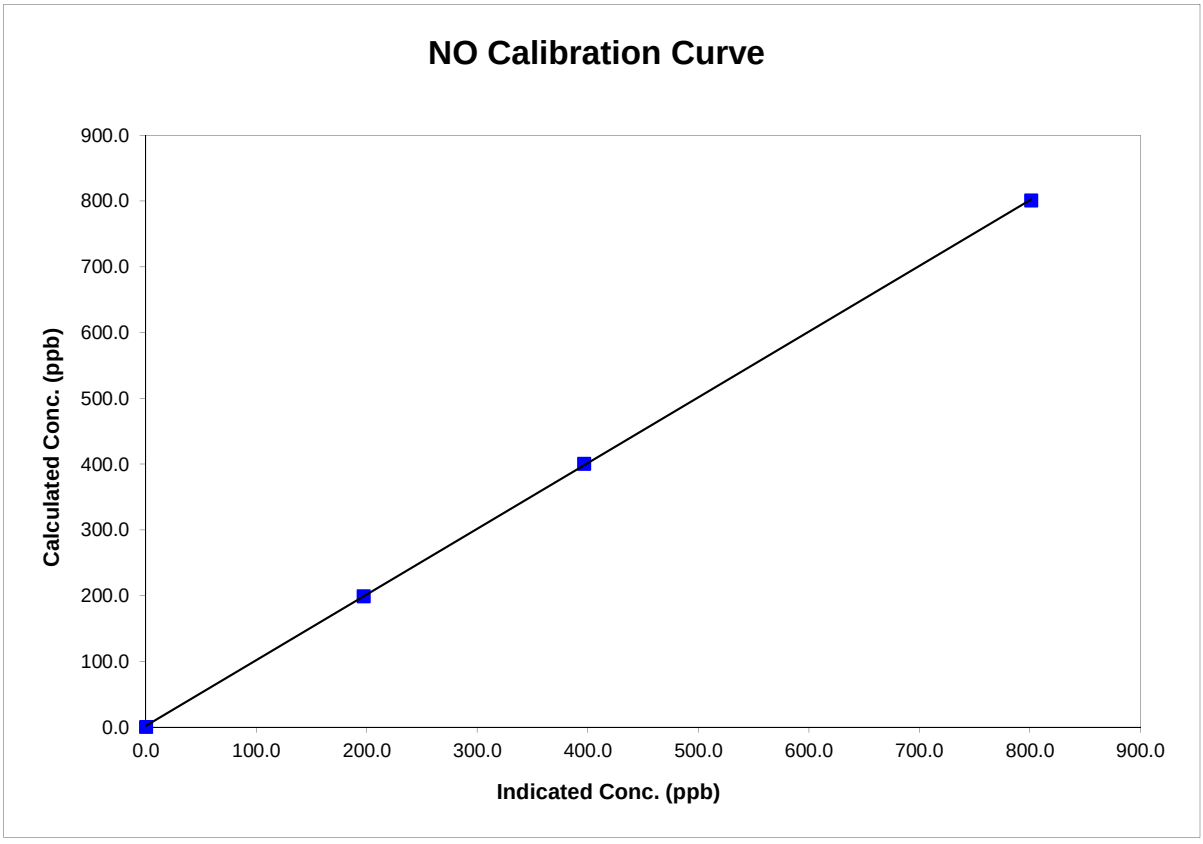
NO Calibration Summary

Station Information

Calibration Date	January 14, 2014	Previous Calibration	December 10, 2013
Station Number	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:30	End Time (MST)	16:35
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999966
800.6	801.2	0.9992		
400.3	396.7	1.0091	Slope	0.999158
199.1	197.1	1.0102		
			Intercept	1.460229



Wood Buffalo Environmental Association

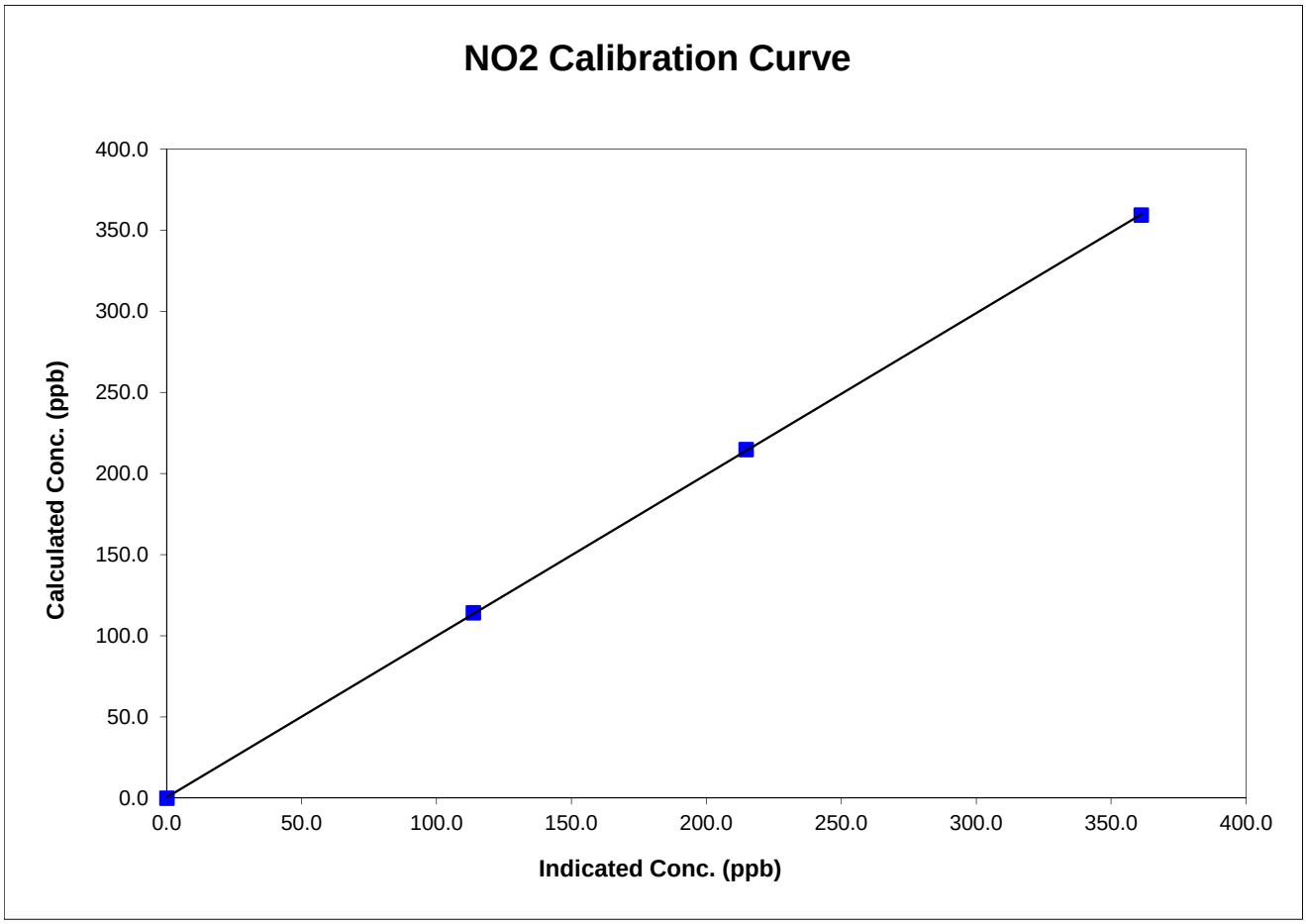
NO_2 Calibration Summary

Station Information

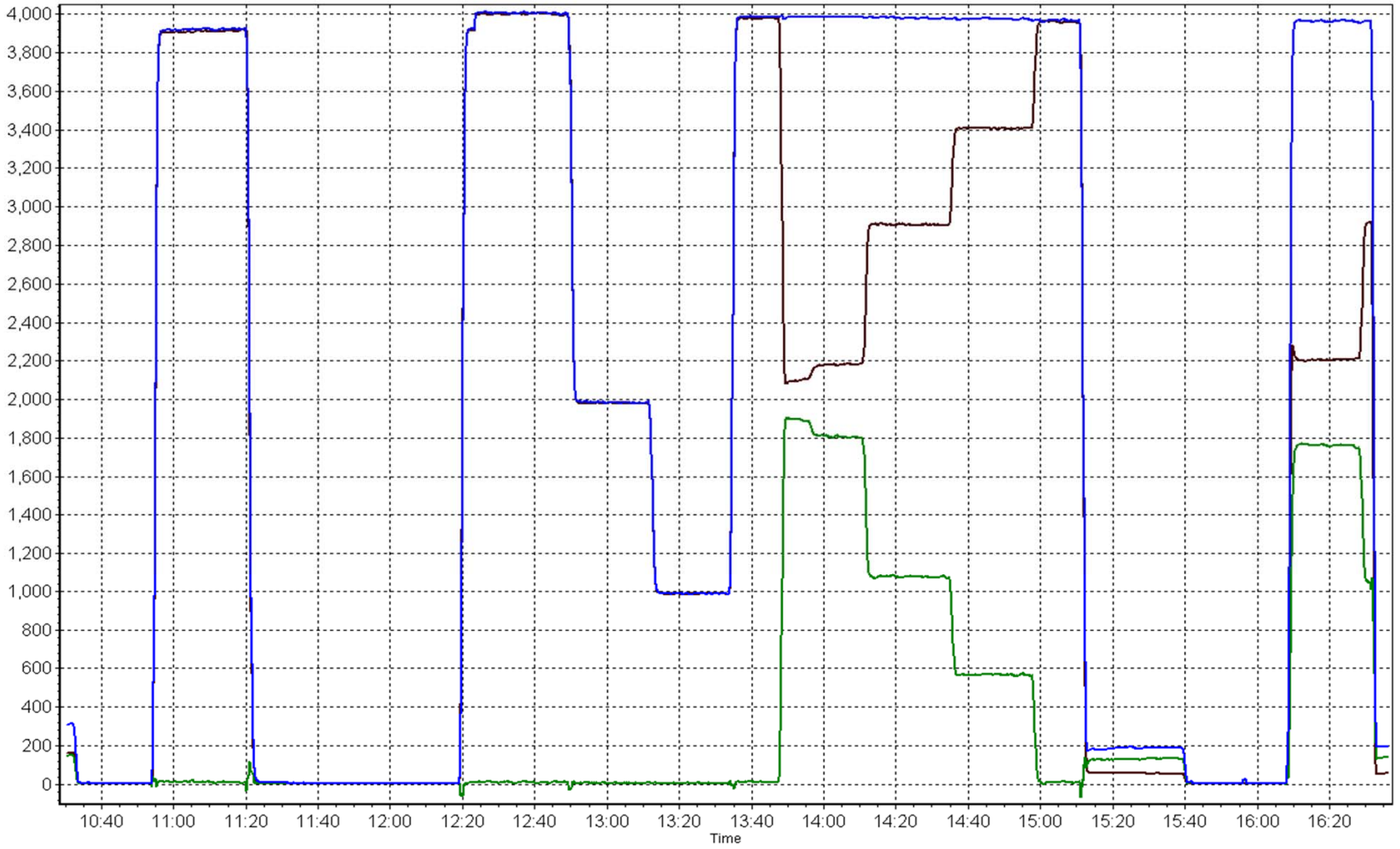
Calibration Date	January 14, 2014	Previous Calibration	December 10, 2013
Station Number	Fort McKay South	Station Number	AMS 13
Start Time (MST)	10:30	End Time (MST)	16:35
Analyzer make	Thermo 42C	Analyzer serial #	2185

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999982
359.4	361.2	0.9952		
214.8	214.8	0.9998	Slope	0.995408
114.2	113.7	1.0046		
			Intercept	0.427906



NOx, NO & NO_2 Calibration Plot **Date:** **January 14, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 14
ANZAC
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
JANUARY 2014

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	706	36	38	99.73	10	0	2	0
TRS(ppb) Average	707	35	37	99.73	9	0	1	0
THC(ppm) Average	681	45	63	97.58	2.5	-	2.2	-
NMHC(ppm) Average	681	45	63	97.58	0.209	-	0.051	-
CH4(ppm) Average	681	45	63	97.58	2.4	-	2.2	-
NO2(ppb) Average	706	36	38	99.73	27	0	12	0
NO(ppb) Average	706	36	38	99.73	21	-	4	-
NOX(ppb) Average	706	36	38	99.73	39	-	14	-
O3(ppb) Average	708	34	36	99.73	43	0	38	-
PM2.5(ug/m3) Average	738	0	6	99.19	22.1	-	10.6	0
Temperature 2 m (C) Average	743	0	1	99.87	6.5	-	2.2	-
Relative Humidity (%) Average	743	0	1	99.87	95	-	90	-
Surface Wetness (% of range) Average	742	0	2	99.73	24	-	-	-
Wind Speed 10 m (km/h) Average	741	0	3	99.60	35	-	-	-
Wind Direction 10 m (deg) Average	741	0	3	99.60	-	-	-	-
Precipitation (mm) Total	744	0	0	100.00	3	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	706	0.7	1	-	0	0	0	0	1	2	10
TRS(ppb) Average	707	0.4	1	-	0	0	0	0	0	1	9
THC(ppm) Average	681	1.9	0.1	-	1.8	1.8	1.8	1.9	1.9	2	2.5
NMHC (ppm) Average	681	0.007	0.02	-	0	0	0	0	0	0	0.209
CH4(ppm) Average	681	1.89	0.1	-	1.7	1.8	1.8	1.9	1.9	2	2.4
NO2(ppb) Average	706	5.1	5	-	0	1	2	4	7	11	27
NO(ppb) Average	706	0.5	2	-	0	0	0	0	0	2	21
NOX(ppb) Average	706	5.7	6	-	0	1	1	4	8	13	39
O3(ppb) Average	708	26.3	9	-	0	13	21	28	33	37	43
PM2.5(ug/m3) Average	738	4.35	2.9	-	0.6	1.7	2.4	3.4	5.6	8	22.1
Temperature 2 m (C) Average	743	-14.89	10.5	-	-35	-28	-23.7	-15.3	-7.4	1.4	6.5
Relative Humidity (%) Average	743	75.8	10	-	43	62	70	77	83	88	95
Surface Wetness (% of range) Average	742	0.1	1	-	0	0	0	0	0	0	24
Wind Speed 20 m (km/h) Average	741	9.3	5	-	0	4	6	9	12	15	35
Wind Direction 20 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	6.1	0	0	0	0	0	0	3

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS 14)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	15 Jan 2014 03:00	15 Jan 2014 04:00	2	Power failure
CH4, NMHC, THC	12 Jan 2014 13:00	12 Jan 2014 14:00	2	Maintenance - analyzer response verified
CH4, NMHC, THC	13 Jan 2014 03:00	13 Jan 2014 03:00	1	Unstable operation - baseline drift
CH4, NMHC, THC	13 Jan 2014 09:00	13 Jan 2014 09:00	1	Unstable operation - baseline drift
CH4, NMHC, THC	13 Jan 2014 11:00	13 Jan 2014 21:00	11	Maintenance - analyzer column purge
CH4, NMHC, THC	27 Jan 2014 03:00	27 Jan 2014 03:00	1	Unstable operation - baseline drift
PM2.5	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Power spike
PM2.5	10 Jan 2014 10:00	10 Jan 2014 11:00	2	Flow and zero reference checks, sample head cleaning
PM2.5	23 Jan 2014 11:00	23 Jan 2014 11:00	1	Flow and zero reference checks, sample head cleaning
Temperature 2 m	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Power spike
Relative Humidity	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Power spike
Wind Speed, Wind Direction	01 Jan 2014 03:00	01 Jan 2014 03:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	01 Jan 2014 08:00	01 Jan 2014 09:00	2	Flatline in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 10 ppb on Jan 12 10:00 Maximum Daily Average: 2.1 ppb on Jan 13

Minimum Value: 0 ppb on Jan 1 07:00
Maximum Diurnal Average: 1.2 ppb at hour 16
Monthly Average: 0.7 ppb

Minimum Daily Average: 0.0 ppb on Jan 30
Minimum Diurnal Average: 0.3 ppb at hour 20
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 8$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0.2	1
2-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0.7	1
3-Jan	1	Z	0	0	0	0	0	0	0	1	1	3	3	1	1	0	0	0	0	0	0	0	0	0	0.5	3
4-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0.1	1
5-Jan	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
6-Jan	0	Z	0	0	1	1	2	0	0	0	0	0	0	1	6	7	1	0	0	0	0	0	0	0	0.9	7
7-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.1	1
8-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.7	1
9-Jan	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
10-Jan	1	Z	3	3	2	1	4	5	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1.2	5
11-Jan	0	Z	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
12-Jan	0	Z	1	2	3	3	3	4	9	10	1	0	0	0	0	0	0	0	0	0	0	0	1	4	1.8	10
13-Jan	7	Z	2	1	1	1	0	0	0	0	0	3	4	3	3	4	3	4	6	2	1	1	0	0	2.1	7
14-Jan	0	Z	0	0	1	1	1	1	1	1	1	1	1	1	2	2	1	0	0	0	0	0	0	0	0.7	2
15-Jan	0	0	PF	PF	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	1	1	0.4	4
16-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
17-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0.3	4
18-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0.2	1
19-Jan	0	Z	0	1	0	1	10	9	6	5	3	6	5	0	0	0	0	0	0	0	0	0	0	0	2.0	10
20-Jan	0	0	0	0	0	Z	1	1	1	0	0	0	1	1	1	1	0	0	0	0	1	1	4	3	0.7	4
21-Jan	5	4	Z	5	3	2	1	0	0	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	1.1	5
22-Jan	0	0	0	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0.2	1
23-Jan	0	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
24-Jan	Z	0	0	0	0	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	3
25-Jan	0	0	0	0	Z	0	0	0	0	0	1	1	1	3	6	8	2	0	0	0	0	0	0	0	1.1	8
26-Jan	0	Z	0	0	0	0	0	0	0	0	0	4	7	4	3	4	5	4	3	3	2	1	1	1	1.9	7
27-Jan	1	Z	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
28-Jan	0	0	Z	0	1	2	2	2	1	0	1	1	1	1	2	4	8	6	3	2	1	0	0	0	1.7	8
29-Jan	0	0	0	Z	0	0	2	5	2	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0.6	5
30-Jan	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
31-Jan	0	0	0	0	0	Z	2	1	1	0	0	1	7	7	8	5	6	1	0	0	1	1	0	0	1.8	8
	0.6	0.4	0.4	0.5	0.6	0.6	1.1	1.0	0.9	0.9	0.5	0.9	1.1	0.9	1.2	1.2	1.0	0.7	0.5	0.3	0.4	0.4	0.4	0.4	Diurnal Average	
	7	4	3	5	3	3	10	9	9	10	3	6	7	7	8	8	8	6	6	3	3	4	4	4	Diurnal Maximum	

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

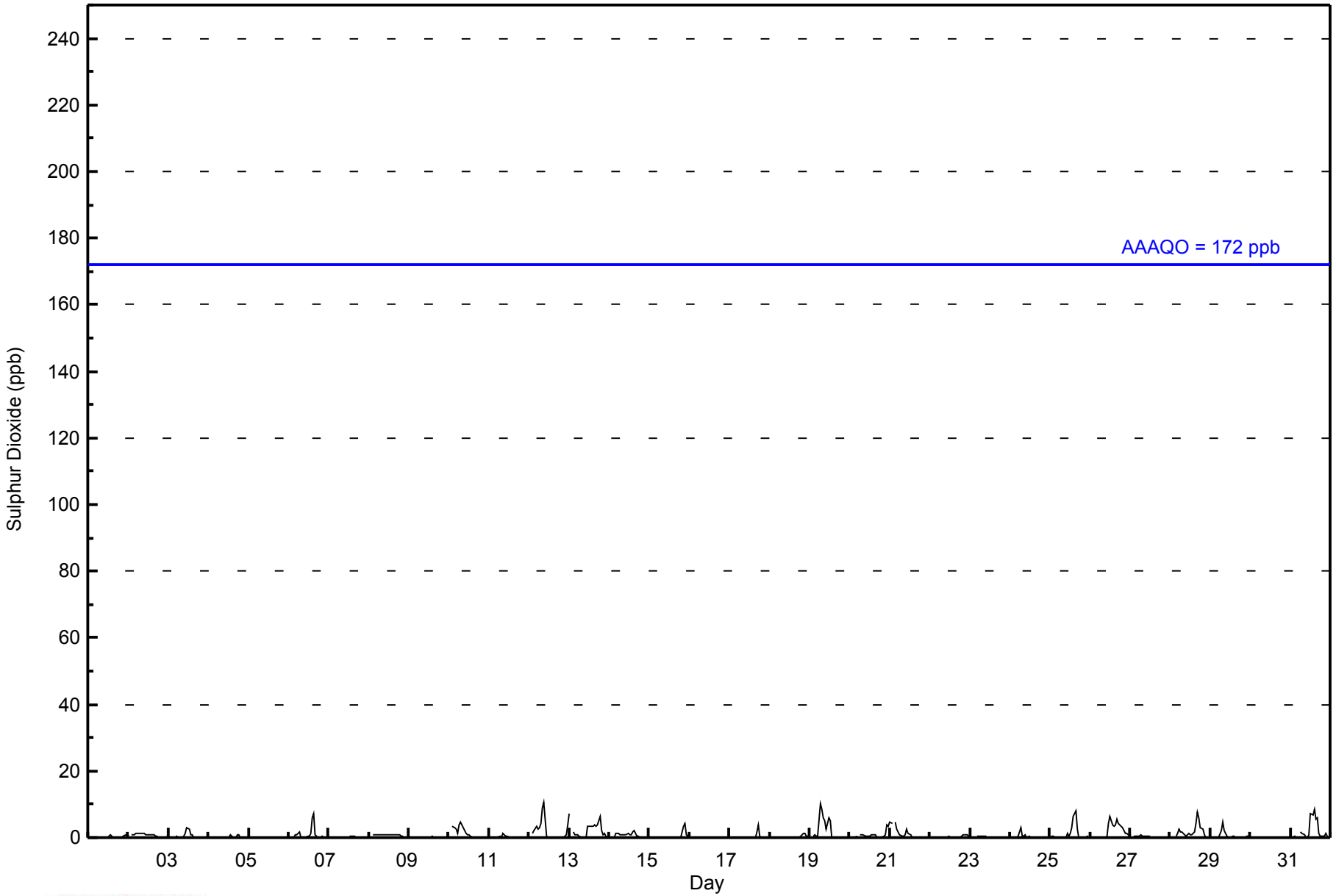
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	706	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: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2014

Concentration	**Wind Direction**																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	16	6	2	9	19	36	109	46	20	22	16	15	35	130	118	104	703
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	16	6	2	9	19	36	109	46	20	22	16	15	35	130	118	104	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

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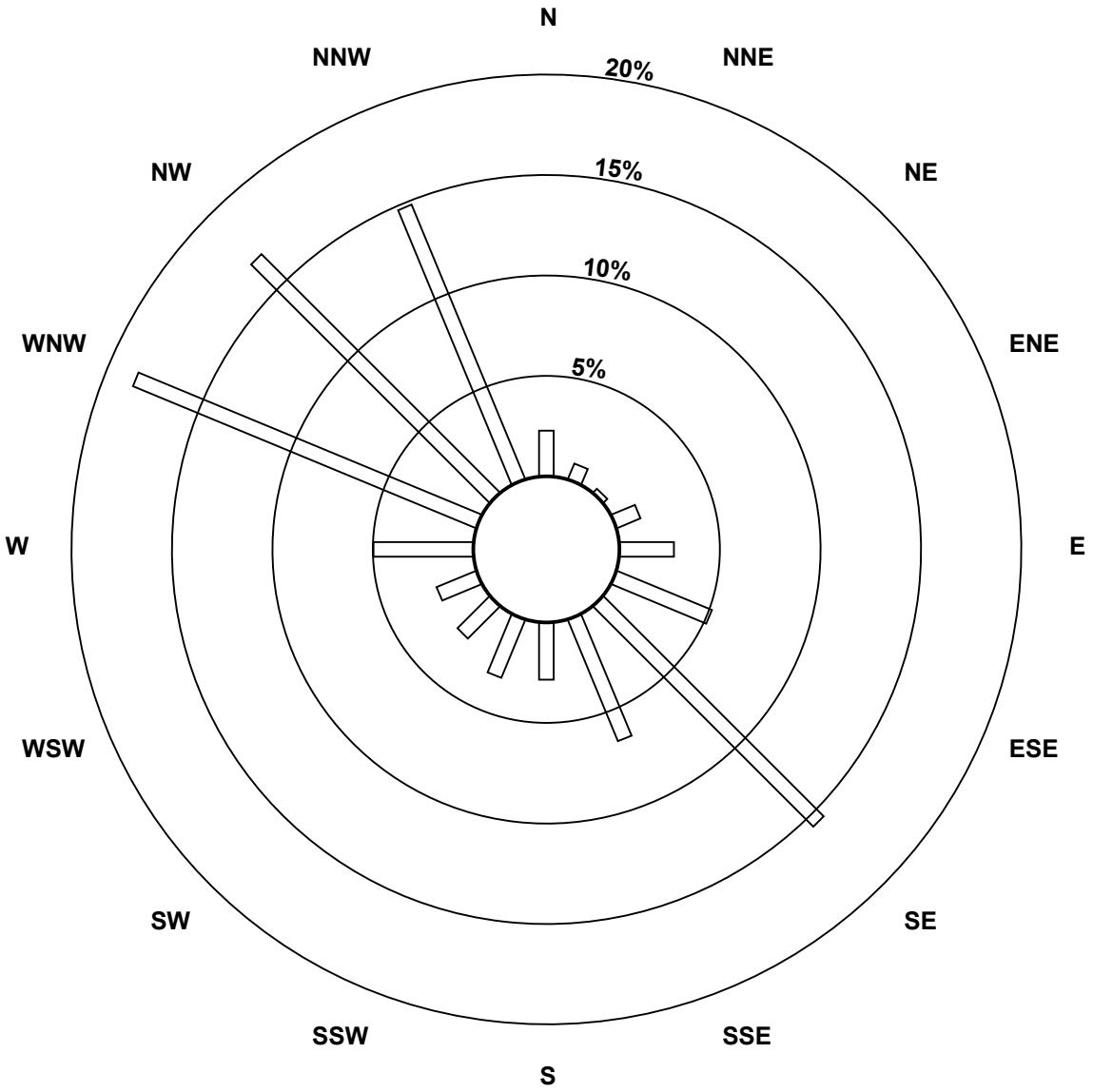
Wood Buffalo Environmental Association

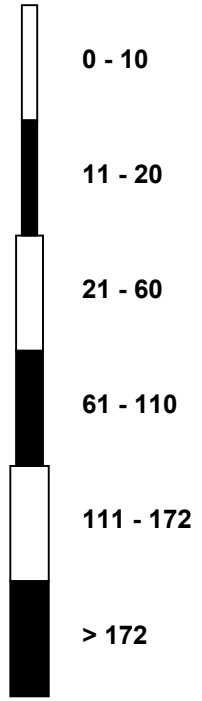
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Anzac (AMS 14)



Classes (ppb)



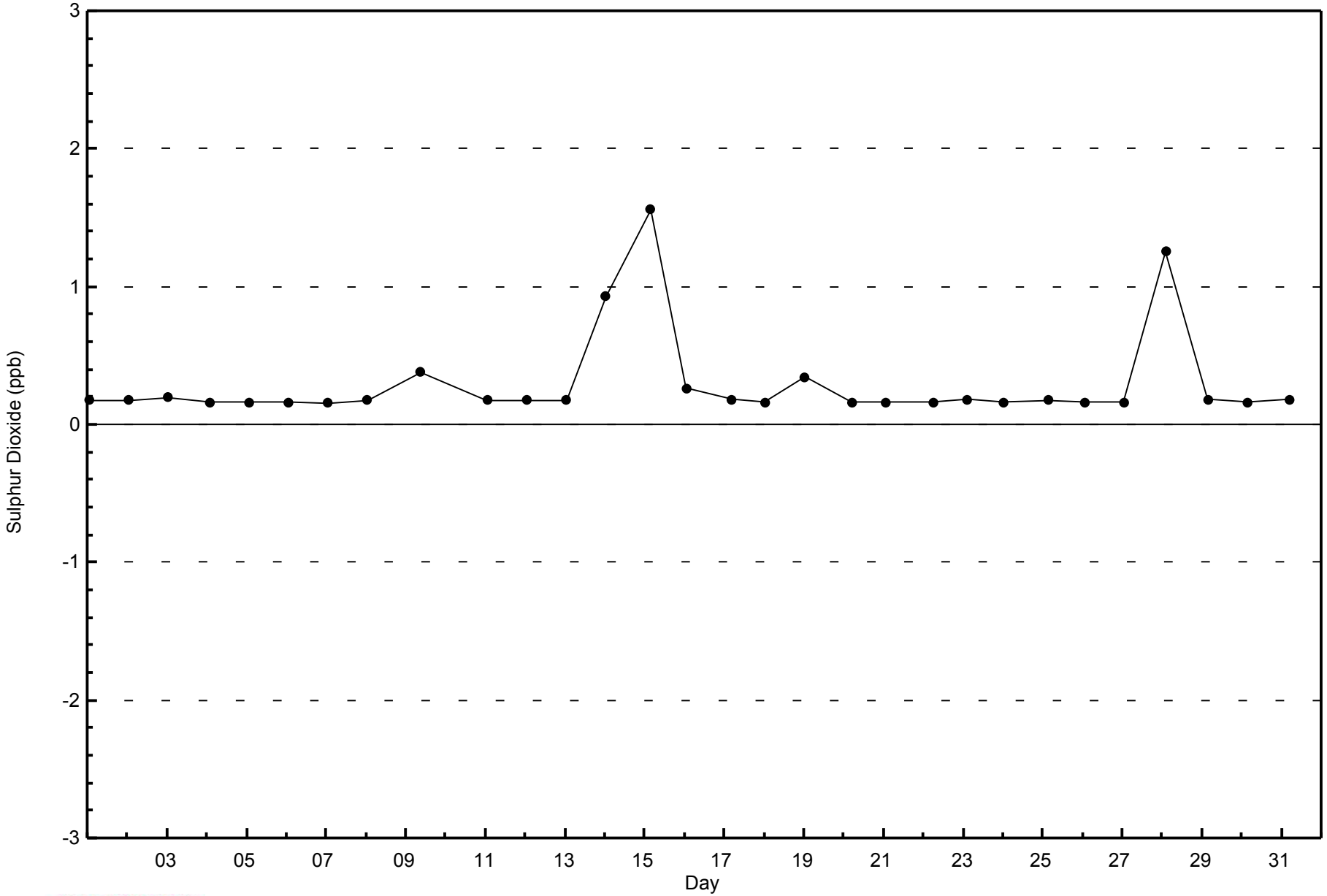
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2014



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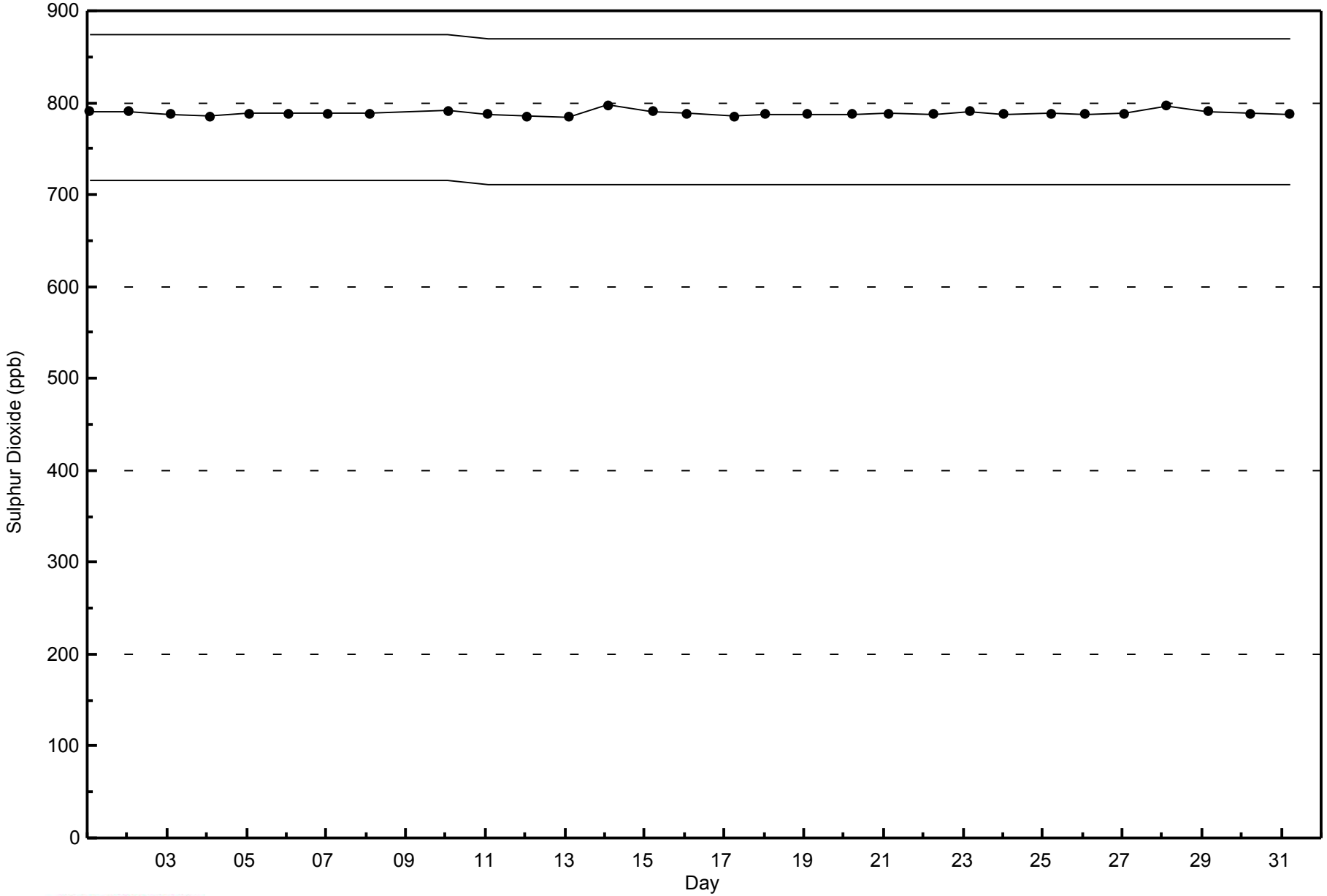
WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 9 ppb on Jan 12 22:00 Maximum Daily Average: 1.1 ppb on Jan 12

Minimum Value: 0 ppb on Jan 17 14:00 Minimum Daily Average: 0.2 ppb on Jan 23
Maximum Diurnal Average: 0.6 ppb at hour 22 Minimum Diurnal Average: 0.3 ppb at hour 20
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	35
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	Z	0	1	1	1	1	1	0	0	0	1	1	1	2	2	2	1	1	0	1	1	1	0.8	2
2-Jan	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
3-Jan	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
4-Jan	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
5-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
6-Jan	1	1	Z	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
7-Jan	0	0	Z	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0.4	1
8-Jan	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.4	1
9-Jan	0	1	Z	1	1	2	1	1	2	2	3	3	1	2	1	1	1	1	0	0	0	0	0	0	1.1	3
10-Jan	1	1	Z	1	0	0	1	1	1	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0.4	1
11-Jan	1	3	Z	1	3	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	4
12-Jan	0	0	Z	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	9	7	1	1.1	9
13-Jan	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
14-Jan	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0.4	1
15-Jan	0	0	PF	PF	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
16-Jan	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
17-Jan	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-Jan	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
19-Jan	0	0	Z	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
20-Jan	0	0	0	0	0	0	Z	0	0	2	1	1	1	1	0	1	1	0	0	0	0	0	0	1	0.5	2
21-Jan	1	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	1
22-Jan	0	0	0	0	0	0	0	Z	0	0	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0.4	2
23-Jan	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
24-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	1
25-Jan	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
26-Jan	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-Jan	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
28-Jan	0	0	0	Z	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0.4	1
29-Jan	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-Jan	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
31-Jan	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
	0.4	0.5	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.6	0.5	0.3	Diurnal Average	
	1	3	1	1	3	4	1	1	2	2	3	3	1	2	1	2	2	2	1	1	3	9	7	1	Diurnal Maximum	

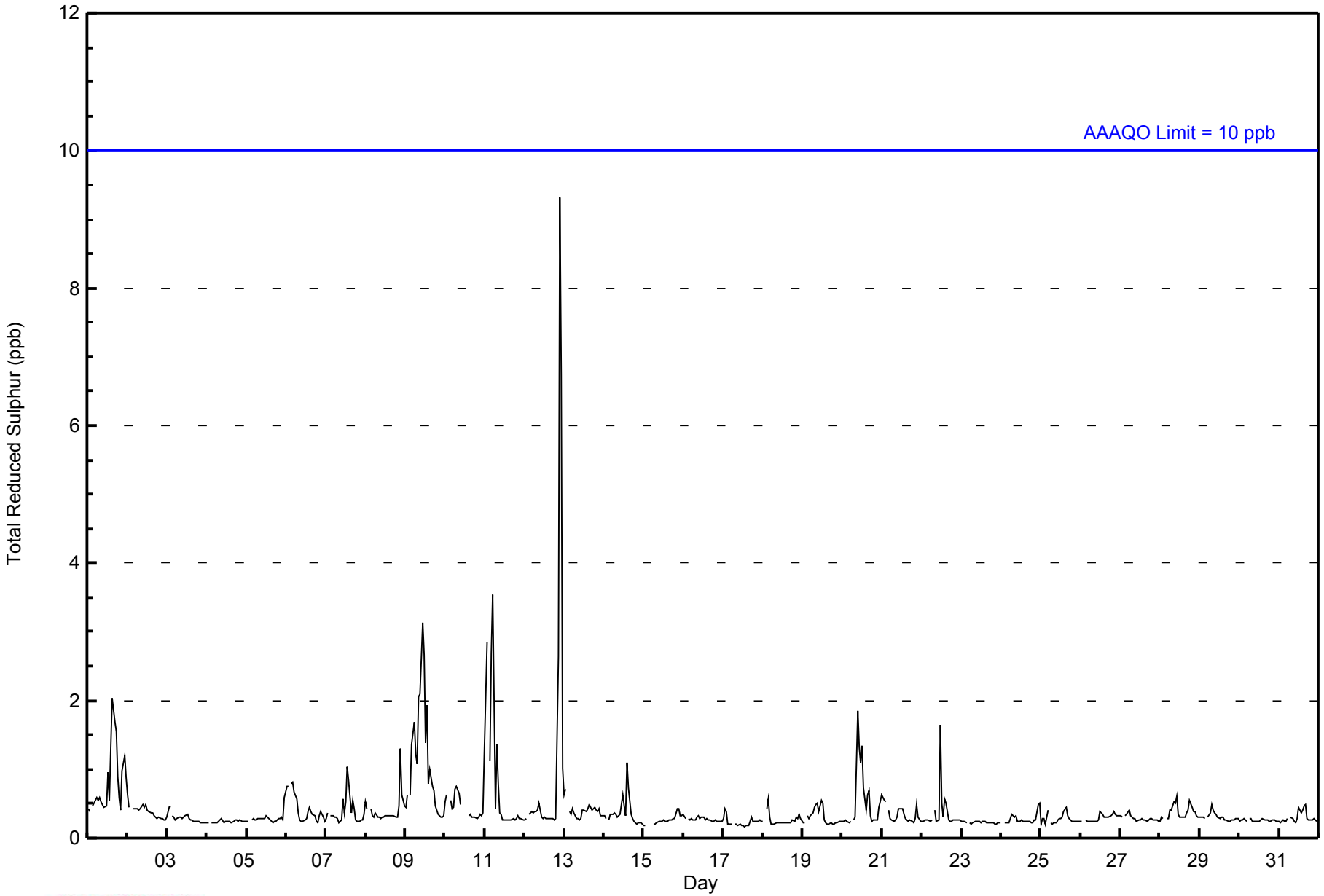
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	699	98.87	98.87
3 - 4	6	0.85	99.72
5 - 7	1	0.14	99.86
8 - 11	1	0.14	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	17	7	2	9	20	35	105	46	23	22	15	15	36	124	117	104	697
3 - 4	0	0	0	1	0	1	2	1	0	0	0	0	0	0	1	0	6
5 - 7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	7	2	10	20	36	109	47	23	22	15	15	36	124	118	104	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

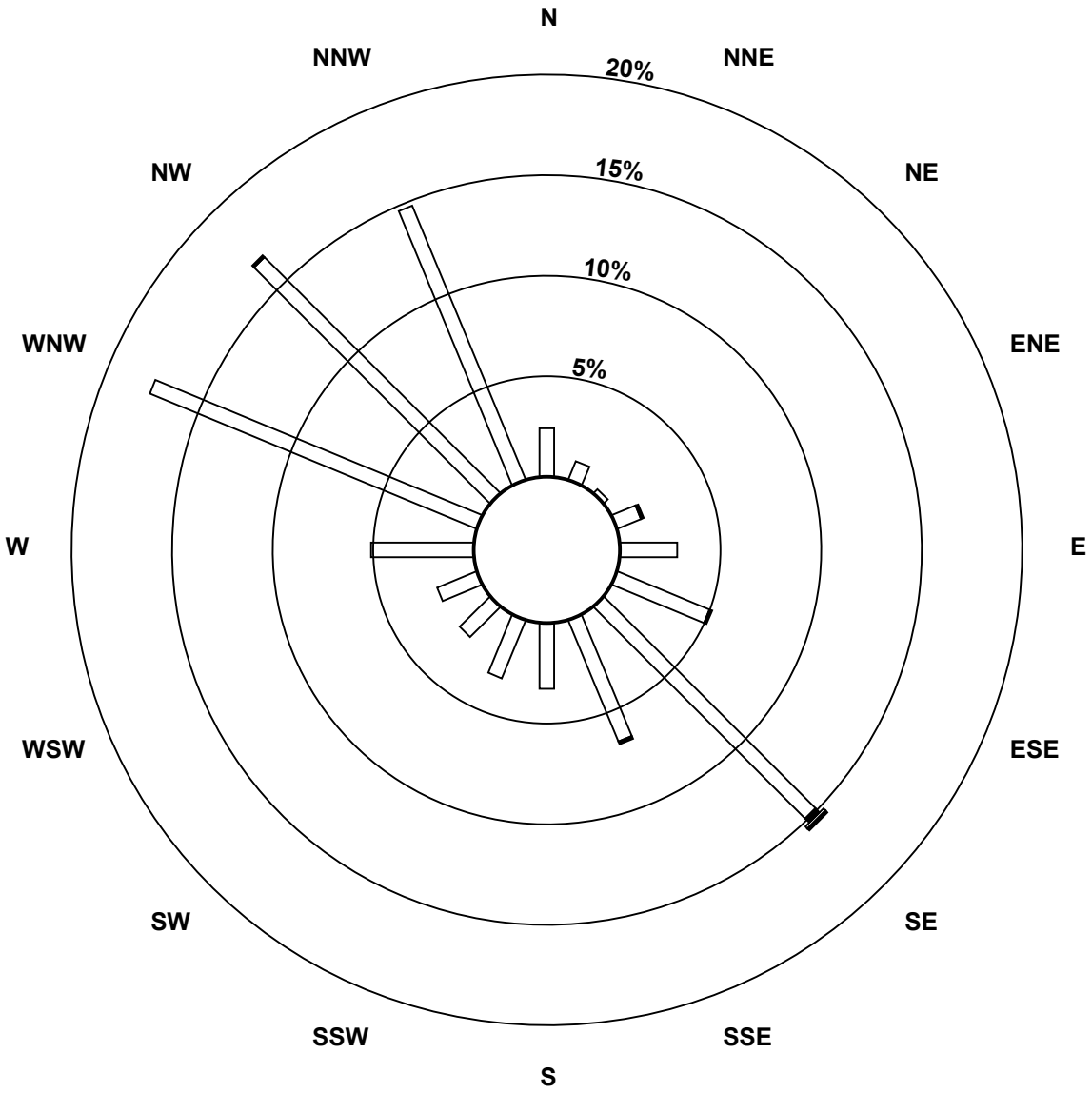
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

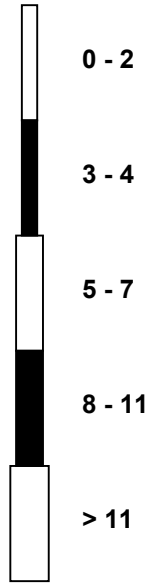
Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

Anzac (AMS 14)



Classes (ppb)



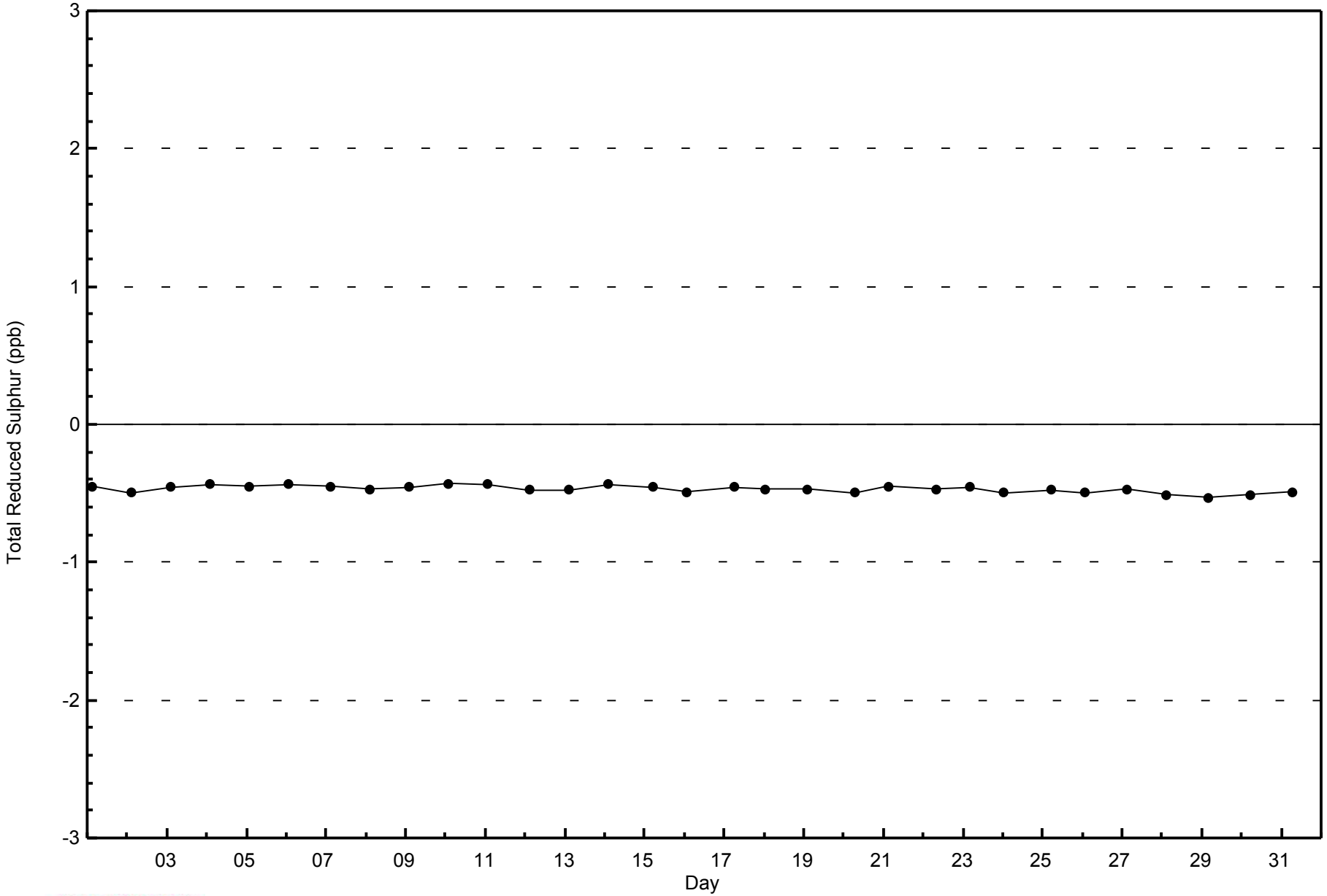
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2014



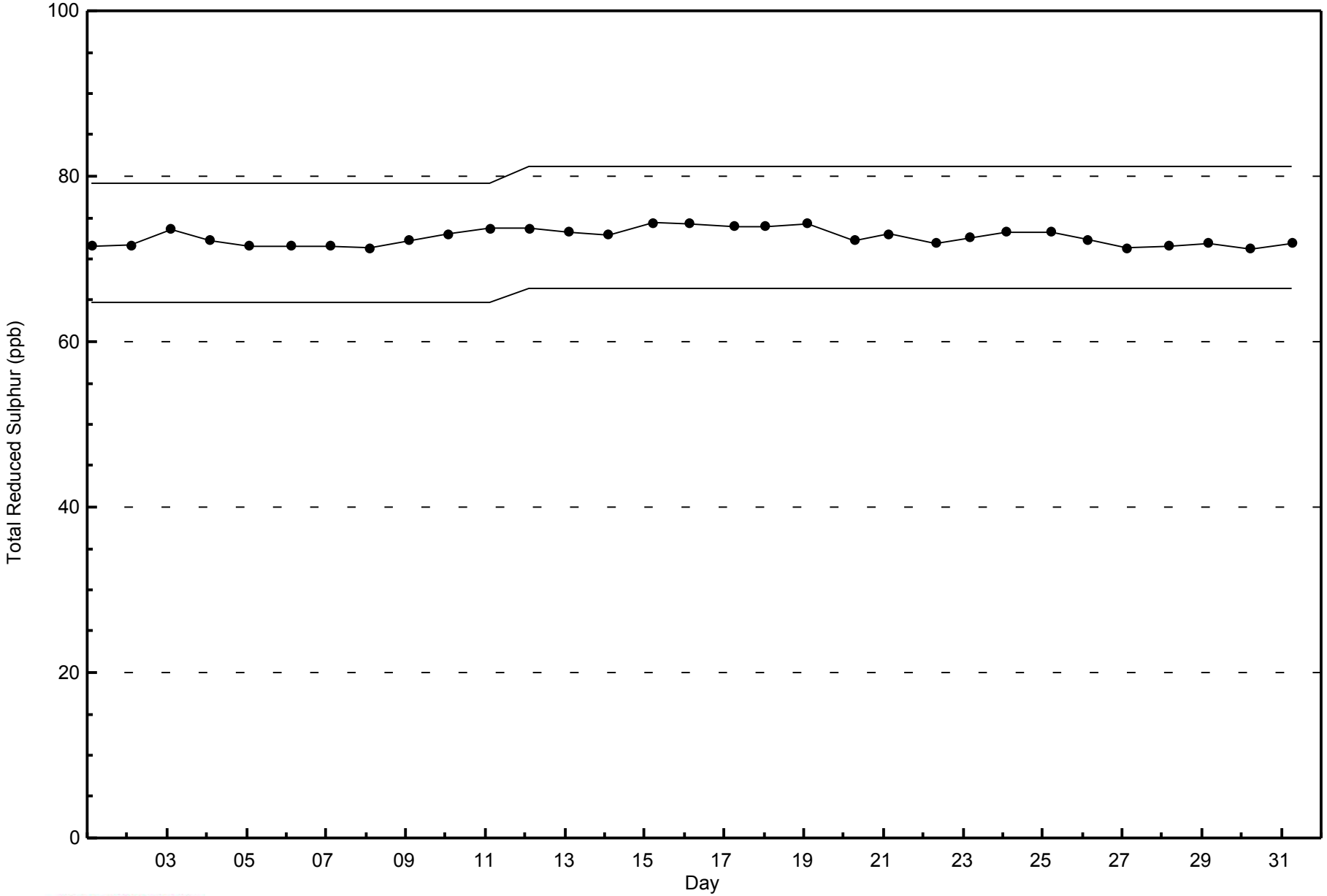
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Anzac - January 2014

Maximum Value: 2.5 ppm on Jan 8 22:00

Maximum Daily Average: 2.2 ppm on Jan 1

Minimum Value: 1.8 ppm on Jan 15 01:00

Minimum Daily Average: 1.8 ppm on Jan 15

Maximum Diurnal Average: 1.9 ppm at hour 3

Minimum Diurnal Average: 1.9 ppm at hour 2

Monthly Average: 1.90 ppm

Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 1.9 P_{90} = 2.0 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	45
Percent Operational Time:	97.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.3	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	2.3
2-Jan	2.2	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.9	2.1	2.4
3-Jan	1.8	Z	2.0	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9	2.0
4-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
5-Jan	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	2.0
6-Jan	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	2.0
7-Jan	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
8-Jan	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.5	2.2	2.2	2.1	2.5
9-Jan	2.2	Z	2.3	2.1	2.3	2.3	2.2	2.3	C	C	C	C	C	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3
10-Jan	2.4	Z	2.3	2.2	2.1	2.0	2.1	2.1	2.2	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	2.0	1.9	2.0	2.4
11-Jan	2.0	Z	2.0	2.0	2.1	2.2	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.2
12-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.8	1.8	M	M	1.9	1.8	1.8	2.0	1.9	1.9	1.9	2.1	2.1	2.0	1.9	2.1
13-Jan	1.9	Z	UO	1.9	1.9	1.9	1.9	1.9	UO	1.9	M	M	M	M	M	M	M	M	M	M	M	1.9	1.9	1.9	--	1.9
14-Jan	2.0	Z	1.9	2.0	1.9	1.9	1.9	1.9	C	C	C	C	1.9	1.9	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0
15-Jan	1.8	1.8	PF	PF	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
16-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
17-Jan	1.8	1.9	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
18-Jan	Z	1.8	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
19-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
20-Jan	1.8	1.8	1.9	1.9	1.8	Z	1.8	1.8	1.8	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0
21-Jan	1.9	1.9	Z	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
22-Jan	1.8	1.8	1.8	1.8	1.8	1.8	Z	1.9	1.8	1.8	1.8	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
23-Jan	1.9	1.9	2.0	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
24-Jan	Z	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
25-Jan	1.8	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
26-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9
27-Jan	1.9	Z	UO	1.9	1.9	1.9	2.0	2.0	2.0	2.1	C	C	C	C	C	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.0	1.9	--	2.1
28-Jan	1.9	1.9	Z	1.9	1.9	1.9	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	1.9	1.9	1.9	1.9	1.9	2.0
29-Jan	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-Jan	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
31-Jan	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.4	1.9	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.2	2.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure

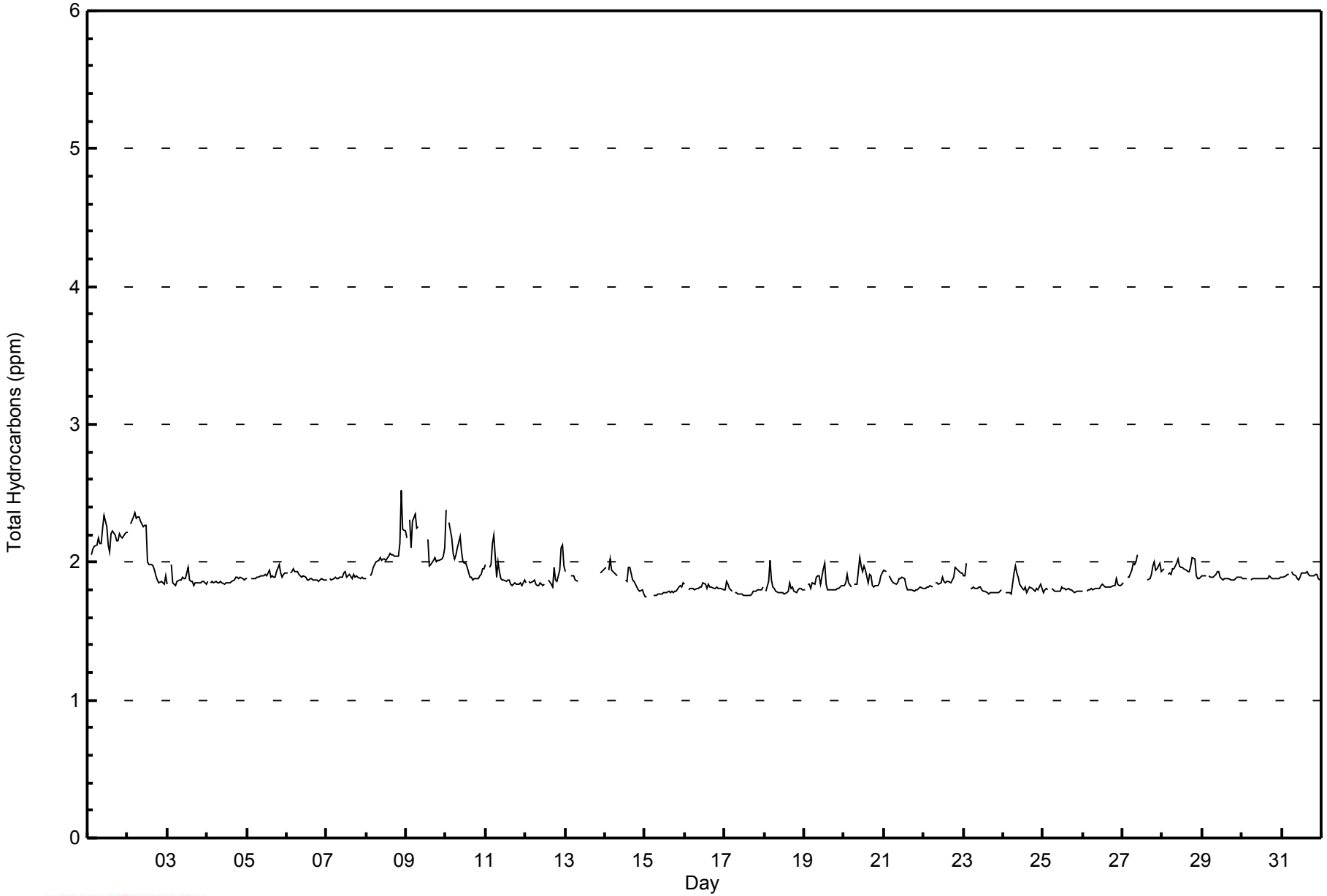
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	620	91.04	91.04
2.1 - 3.0	61	8.96	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: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Anzac - January 2014

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	16	6	2	9	16	34	83	34	16	16	14	14	32	124	108	96	620
2.1 - 3.0	0	0	0	0	3	2	22	11	3	4	1	0	1	3	7	1	58
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	6	2	9	19	36	105	45	19	20	15	14	33	127	115	97	678

Total Number of Valid Hours: 678

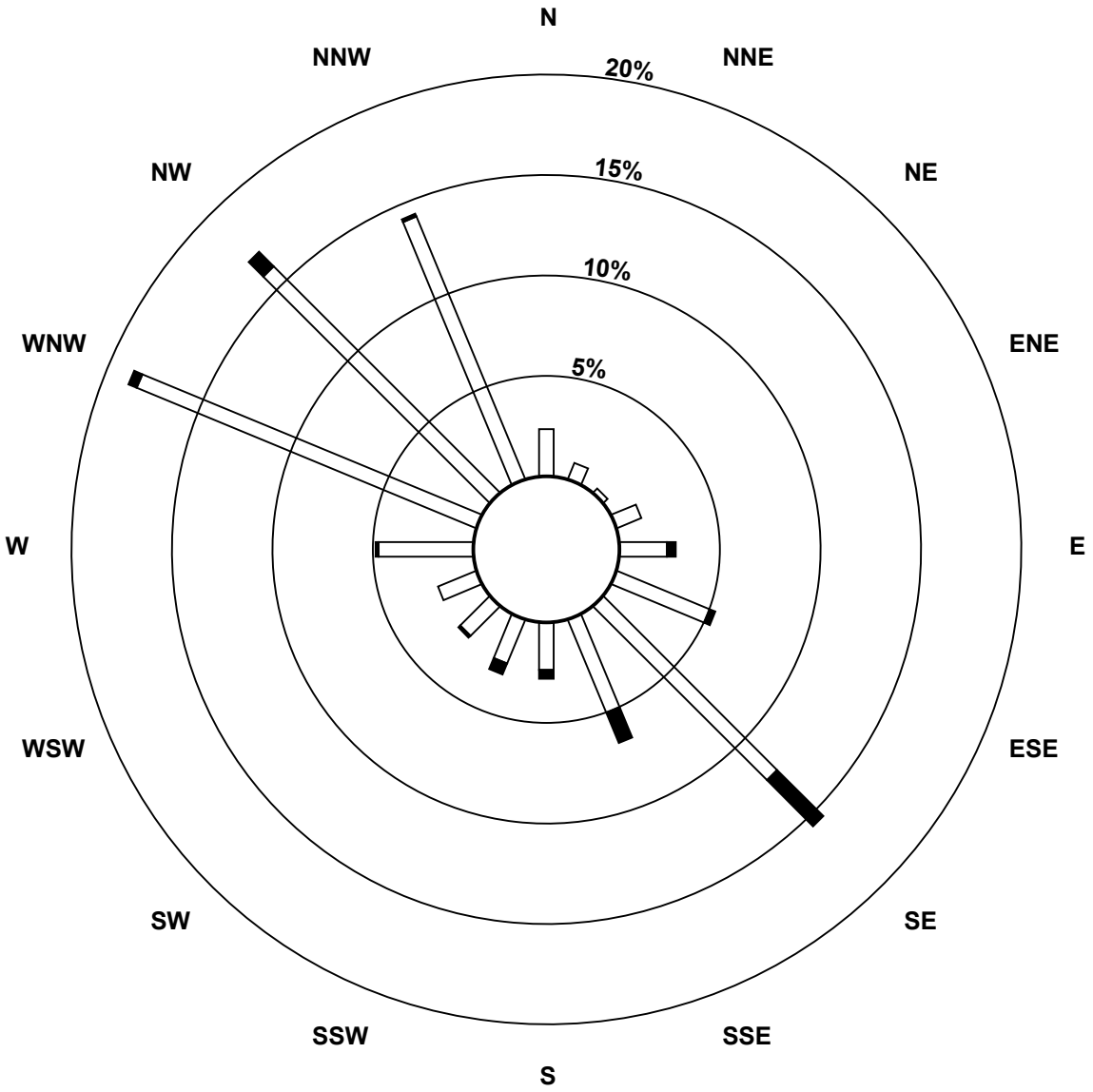
Total Number of Hours: 744

Wood Buffalo Environmental Association

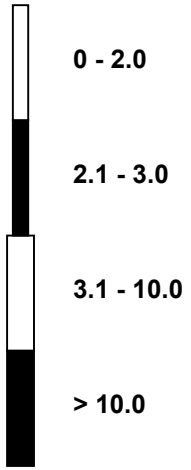
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Anzac (AMS 14)



Classes (ppm)



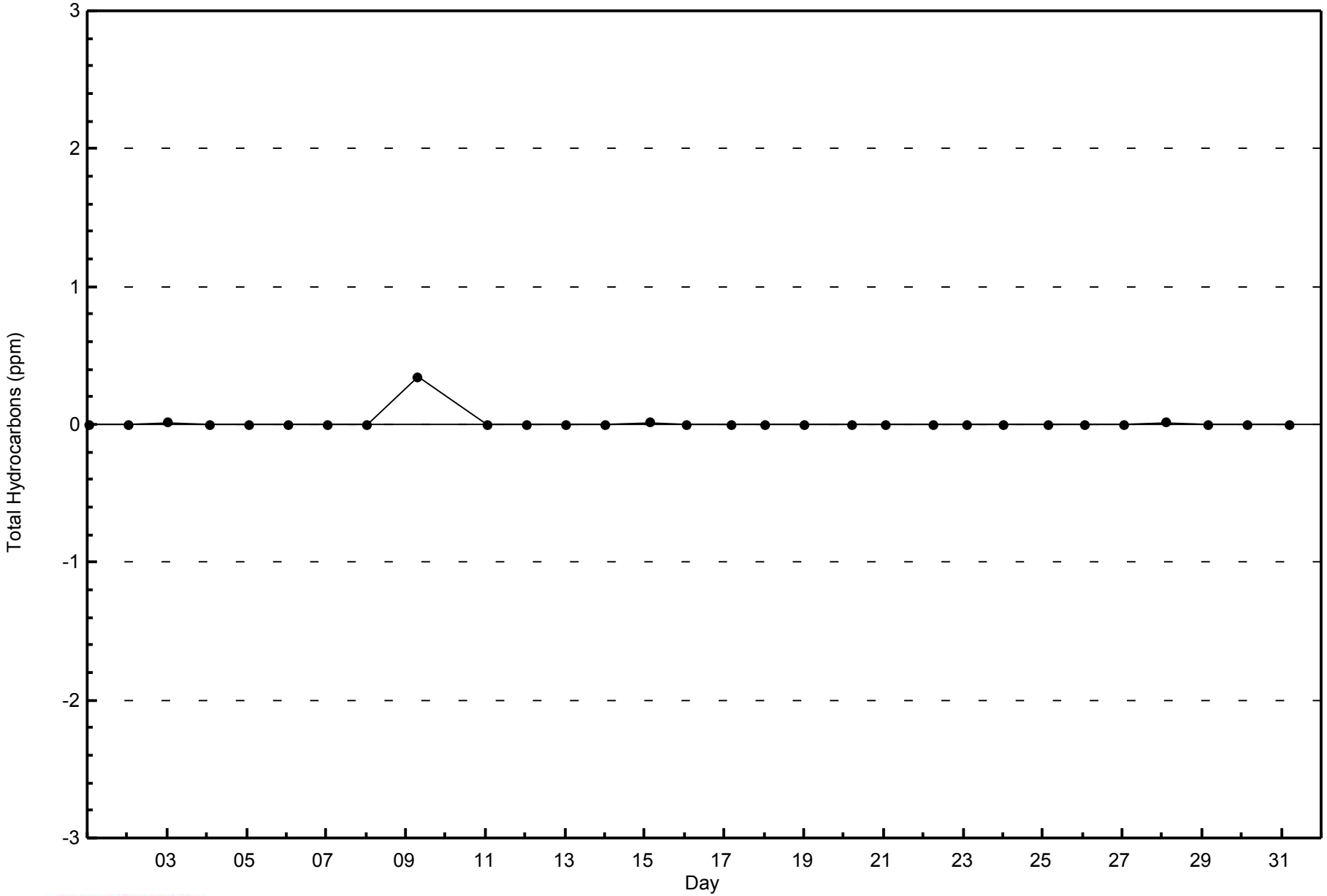
Total Number of Valid Hours: 678

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Anzac - January 2014



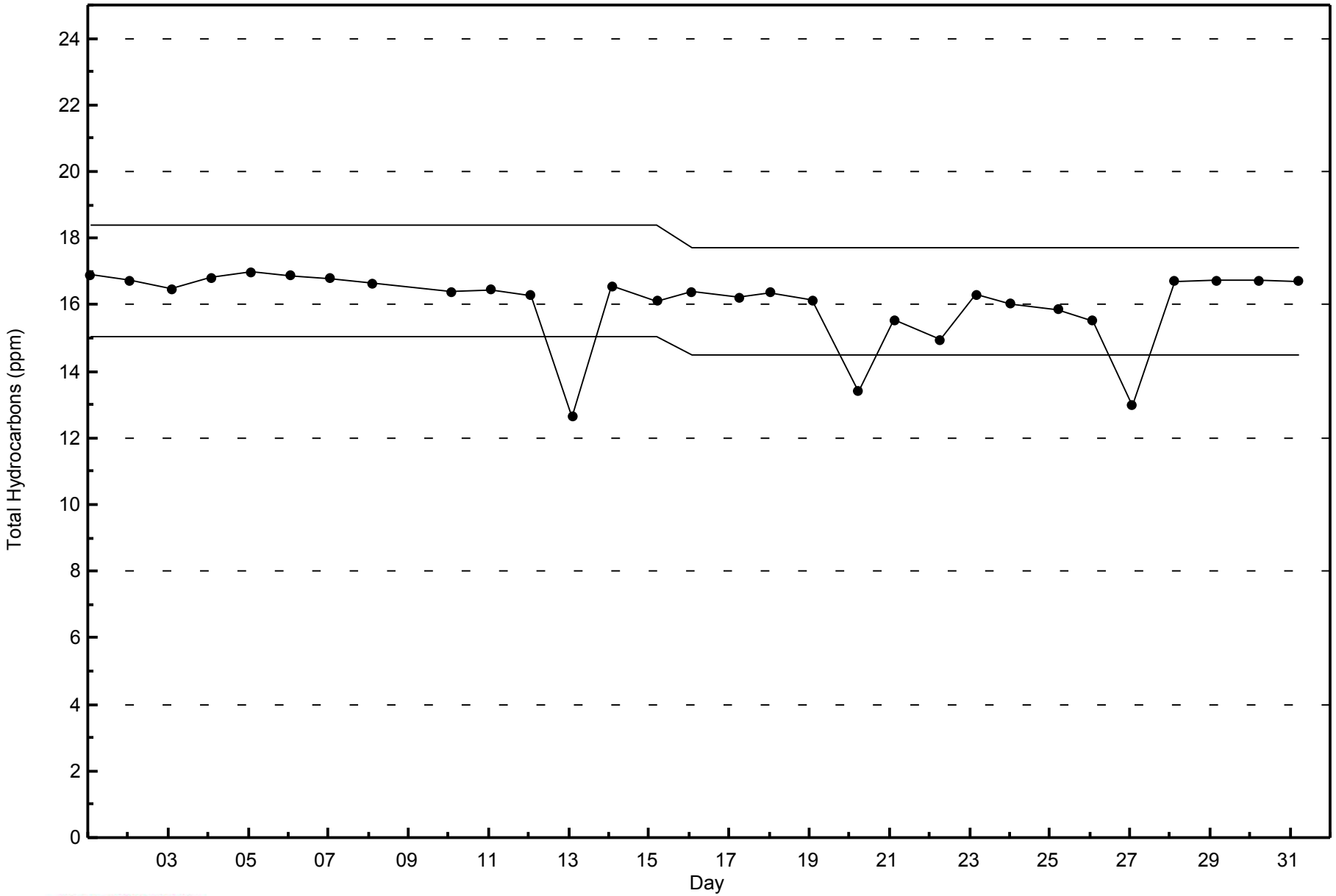
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2014

Maximum Value: 0.209 ppm on Jan 9 06:00

Maximum Daily Average: 0.051 ppm on Jan 9

Minimum Value: 0.000 ppm on Jan 1 13:00

Minimum Daily Average: 0.000 ppm on Jan 31

Maximum Diurnal Average: 0.014 ppm at hour 6

Minimum Diurnal Average: 0.001 ppm at hour 20

Monthly Average: 0.007 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} = 0.1

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	45
Percent Operational Time:	97.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.000	Z	0.001	0.003	0.001	0.001	0.003	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.023	0.035	0.031	0.009	0.004	0.002	0.001	0.004	0.001	0.000	0.005	0.035
2-Jan	0.001	Z	0.004	0.001	0.003	0.003	0.002	0.005	0.002	0.007	0.003	0.009	0.011	0.029	0.009	0.035	0.002	0.004	0.002	0.001	0.001	0.005	0.001	0.074	0.009	0.074
3-Jan	0.004	Z	0.004	0.002	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.083	0.001	0.000	0.005	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.083
4-Jan	0.000	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	0.000	0.000	0.013	0.000	0.000	0.000	0.001	0.013
5-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.048	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.048
6-Jan	0.000	Z	0.001	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	0.001	0.000	0.000	0.000	0.000	0.000	0.003
7-Jan	0.000	Z	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
8-Jan	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.007	0.016	0.019	0.021	0.018	0.020	0.006	0.020	0.007	0.031	0.186	0.059	0.047	0.020	0.186
9-Jan	0.027	Z	0.049	0.023	0.151	0.209	0.141	0.132	C	C	C	C	C	0.097	0.010	0.021	0.014	0.011	0.007	0.003	0.002	0.004	0.004	0.008	0.051	0.209
10-Jan	0.049	Z	0.011	0.001	0.000	0.002	0.002	0.028	0.088	0.017	0.001	0.002	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.005	0.000	0.006	0.009	0.088
11-Jan	0.030	Z	0.007	0.006	0.085	0.133	0.000	0.021	0.002	0.000	0.001	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.013	0.133
12-Jan	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	0.046	0.000	0.017	0.097	0.044	0.000	0.026	0.129	0.129	0.013	0.024	0.129
13-Jan	0.001	Z	UO	0.001	0.001	0.001	0.000	0.000	UO	0.000	M	M	M	M	M	M	M	M	M	M	M	0.010	0.011	0.019	--	0.019
14-Jan	0.016	Z	0.008	0.004	0.003	0.005	0.001	0.000	C	C	C	C	0.000	0.001	0.049	0.064	0.005	0.006	0.000	0.000	0.005	0.000	0.006	0.005	0.009	0.064
15-Jan	0.000	0.003	PF	PF	Z	0.002	0.000	0.001	0.001	0.001	0.001	0.002	0.001	0.000	0.011	0.003	0.004	0.001	0.001	0.002	0.001	0.001	0.001	0.003	0.002	0.011
16-Jan	0.006	Z	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.002	0.005	0.006	0.003	0.008	0.002	0.002	0.002	0.002	0.008	0.003	0.002	0.004	0.001	0.003	0.008
17-Jan	0.003	0.007	0.009	0.005	0.001	Z	0.003	0.002	0.000	0.001	0.000	0.000	0.008	0.002	0.001	0.000	0.001	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.009
18-Jan	Z	0.001	0.002	0.017	0.001	0.002	0.002	0.000	0.001	0.000	0.002	0.002	0.002	0.002	0.015	0.067	0.034	0.039	0.006	0.001	0.006	0.006	0.004	0.000	0.009	0.067
19-Jan	0.001	Z	0.060	0.019	0.001	0.002	0.000	0.002	0.002	0.003	0.001	0.003	0.018	0.002	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.005	0.060
20-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.001	0.000	0.000	0.074	0.034	0.023	0.044	0.057	0.001	0.038	0.031	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.013	0.074
21-Jan	0.000	0.001	Z	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
22-Jan	0.000	0.000	0.000	0.000	0.000	0.000	Z	0.002	0.001	0.000	0.000	0.023	0.000	0.000	0.001	0.000	0.000	0.009	0.000	0.001	0.001	0.001	0.000	0.001	0.002	0.023
23-Jan	0.003	0.003	0.000	Z	0.004	0.001	0.002	0.002	0.006	0.004	0.006	0.004	0.003	0.004	0.002	0.001	0.003	0.002	0.003	0.002	0.002	0.003	0.008	0.008	0.003	0.008
24-Jan	Z	0.010	0.010	0.008	0.007	0.004	0.026	0.036	0.042	0.047	0.040	0.014	0.002	0.023	0.002	0.013	0.029	0.002	0.001	0.001	0.001	0.002	0.009	0.000	0.014	0.047
25-Jan	0.000	0.001	0.001	0.000	Z	0.004	0.002	0.001	0.001	0.003	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.004
26-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.002	0.003	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.003
27-Jan	0.000	Z	UO	0.000	0.002	0.001	0.018	0.000	0.003	0.000	C	C	C	C	C	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	--	0.018
28-Jan	0.000	0.000	Z	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	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.004
29-Jan	0.000	0.000	0.000	Z	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	0.001	0.000	0.000	0.000	0.001
30-Jan	0.000	0.000	0.000	0.000	Z	0.001	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	0.001
31-Jan	0.000	0.000	0.000	0.000	0.001	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	0.001
	0.005	0.002	0.007	0.003	0.009	0.014	0.007	0.008	0.006	0.005	0.004	0.004	0.008	0.010	0.007	0.010	0.007	0.007	0.003	0.001	0.003	0.012	0.008	0.006	Diurnal Average	
	0.049	0.010	0.060	0.023	0.151	0.209	0.141	0.132	0.088	0.074	0.040	0.023	0.083	0.097	0.049	0.067	0.034	0.097	0.044	0.008	0.031	0.186	0.129	0.074	Diurnal Maximum	

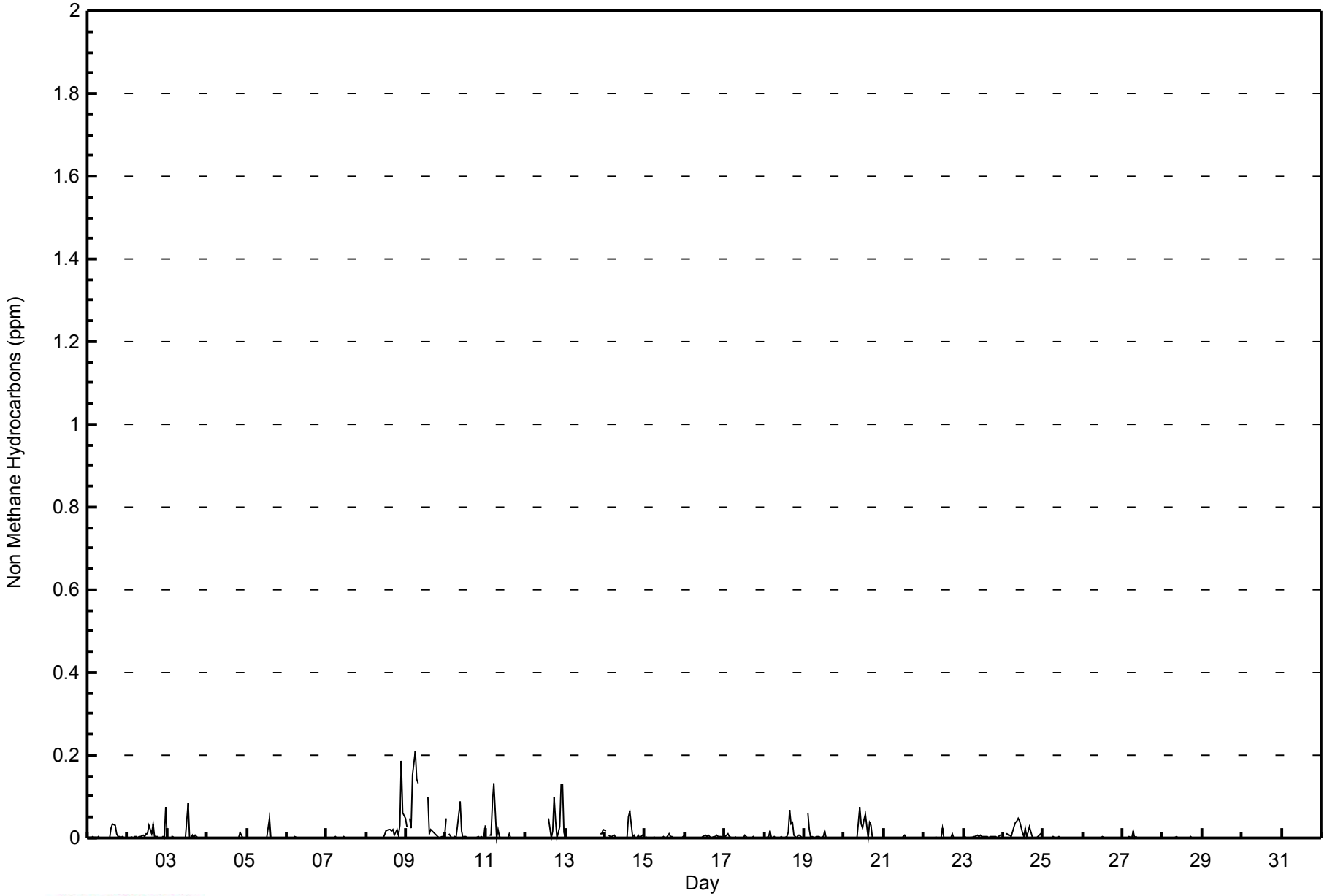
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure

WBEA NETWORK

Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	564	82.82	82.82
0.006 - 0.05	97	14.24	97.06
0.06 - 0.1	17	2.50	99.56
> 0.1	3	0.44	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2014

Concentration Ranges (ppm)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 0.005	14	5	2	7	16	28	78	36	16	16	14	13	24	109	98	85	561
0.006 - 0.05	2	1	0	2	3	6	16	7	3	4	1	1	9	15	15	12	97
0.06 - 0.1	0	0	0	0	0	2	9	1	0	0	0	0	0	3	2	0	17
> 0.1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
Totals	16	6	2	9	19	36	105	45	19	20	15	14	33	127	115	97	678

Total Number of Valid Hours: 678

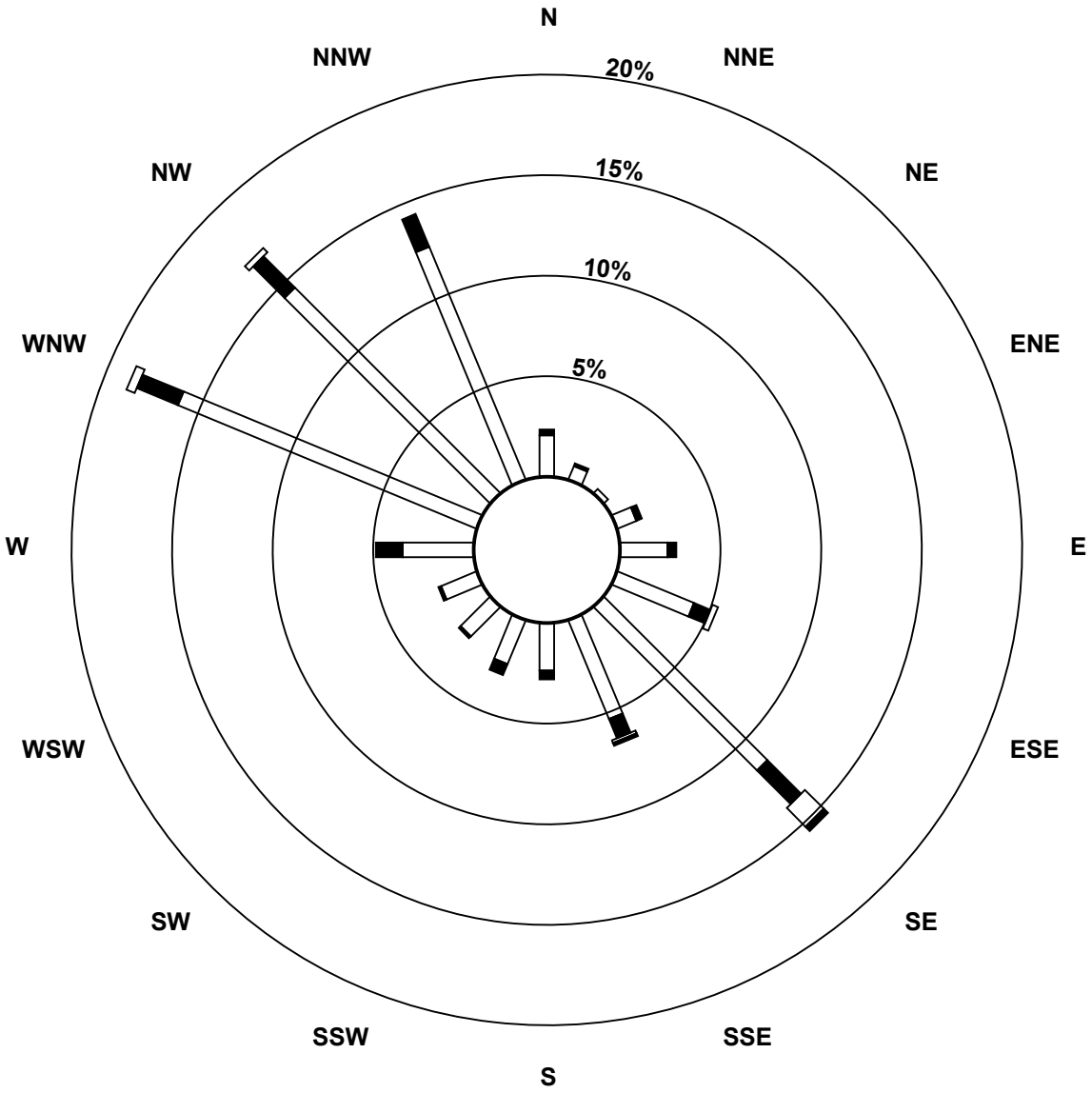
Total Number of Hours: 744

Wood Buffalo Environmental Association

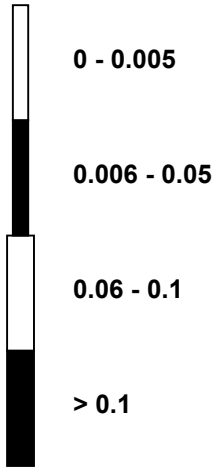
Wind Rose Jan 2014

Non Methane Hydrocarbons (NMHC) - ppm

Anzac (AMS 14)



Classes (ppm)



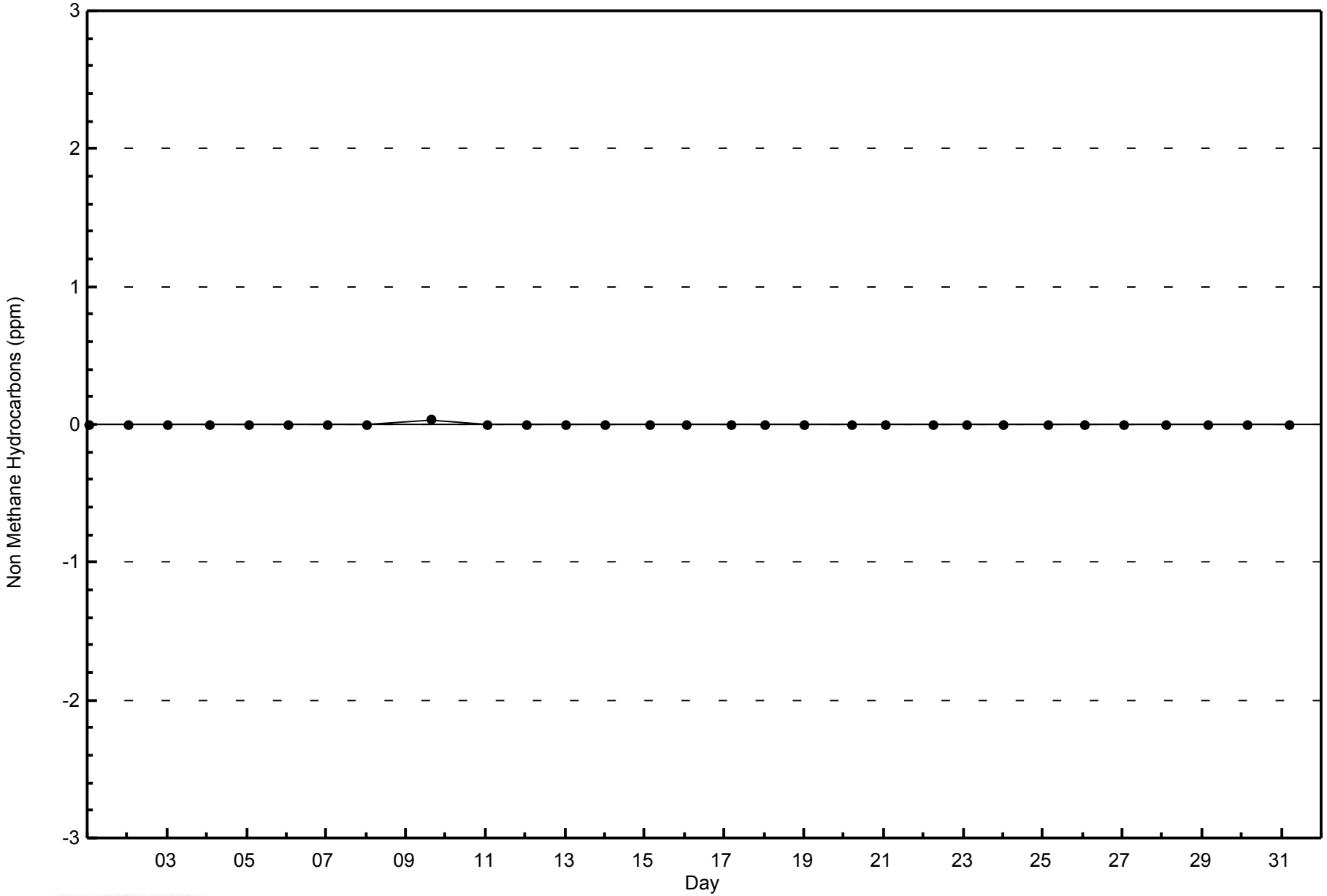
Total Number of Valid Hours: 678

WBEA NETWORK

Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2014



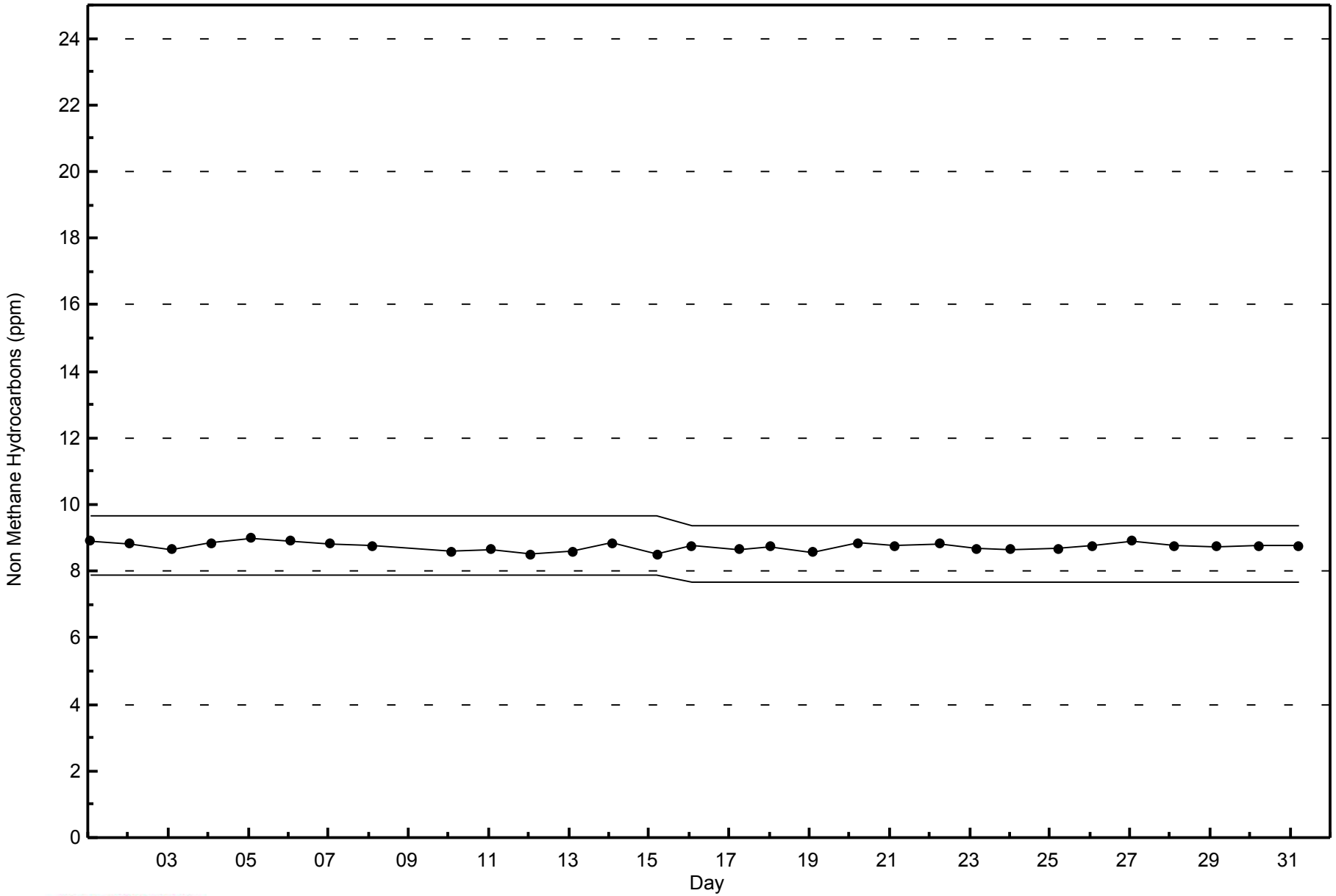
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Non Methane Hydrocarbons (NMHC) - ppm

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH_4) - ppm

Anzac - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0

Maximum Value: 2.4 ppm on Jan 8 22:00 Maximum Daily Average: 2.2 ppm on Jan 1

Minimum Value: 1.7 ppm on Jan 15 02:00 Minimum Daily Average: 1.8 ppm on Jan 15

Maximum Diurnal Average: 1.9 ppm at hour 3 Minimum Diurnal Average: 1.9 ppm at hour 2

Monthly Average: 1.89 ppm Percentiles: P_1 = 1.8 P_{10} = 1.8 Q_1 = 1.8 Median = 1.9 Q_3 = 1.9 P_{90} = 2.0 P_{99} = 2.3

Hours in Service:	744
Hours of Data:	681
Hours of Missing Data:	63
Hours of Calibration:	45
Percent Operational Time:	97.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.0	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.3	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	2.3
2-Jan	2.2	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	2.1	2.4
3-Jan	1.9	Z	2.0	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9	2.0
4-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
5-Jan	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	2.0
6-Jan	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	2.0
7-Jan	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
8-Jan	1.9	Z	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	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.2	2.2	2.0	2.4
9-Jan	2.1	Z	2.3	2.1	2.1	2.1	2.1	2.1	C	C	C	C	C	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3
10-Jan	2.3	Z	2.3	2.2	2.1	2.0	2.1	2.1	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	2.0	1.9	2.0	2.3
11-Jan	2.0	Z	2.0	2.0	2.1	2.1	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	2.1
12-Jan	1.9	Z	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.8	1.8	M	M	1.8	1.8	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	1.9	2.0
13-Jan	1.9	Z	UO	1.9	1.9	1.9	1.9	1.9	UO	1.9	M	M	M	M	M	M	M	M	M	M	M	1.9	1.9	1.9	--	1.9
14-Jan	1.9	Z	1.9	2.0	1.9	1.9	1.9	1.9	C	C	C	C	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0
15-Jan	1.8	1.7	PF	PF	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
16-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
17-Jan	1.8	1.9	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
18-Jan	Z	1.8	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
19-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
20-Jan	1.8	1.8	1.9	1.8	1.8	Z	1.8	1.8	1.8	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0
21-Jan	1.9	1.9	Z	1.9	1.9	1.9	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
22-Jan	1.8	1.8	1.8	1.8	1.8	1.8	Z	1.9	1.8	1.8	1.8	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
23-Jan	1.9	1.9	2.0	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.0
24-Jan	Z	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9
25-Jan	1.8	1.8	1.8	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
26-Jan	1.8	Z	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.9
27-Jan	1.9	Z	UO	1.9	1.9	1.9	2.0	2.0	2.0	2.1	C	C	C	C	C	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.0	1.9	--	2.1
28-Jan	1.9	1.9	Z	1.9	1.9	1.9	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	1.9	1.9	1.9	1.9	1.9	2.0
29-Jan	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-Jan	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
31-Jan	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	Diurnal Average	
	2.3	1.9	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.2	2.2	Diurnal Maximum	

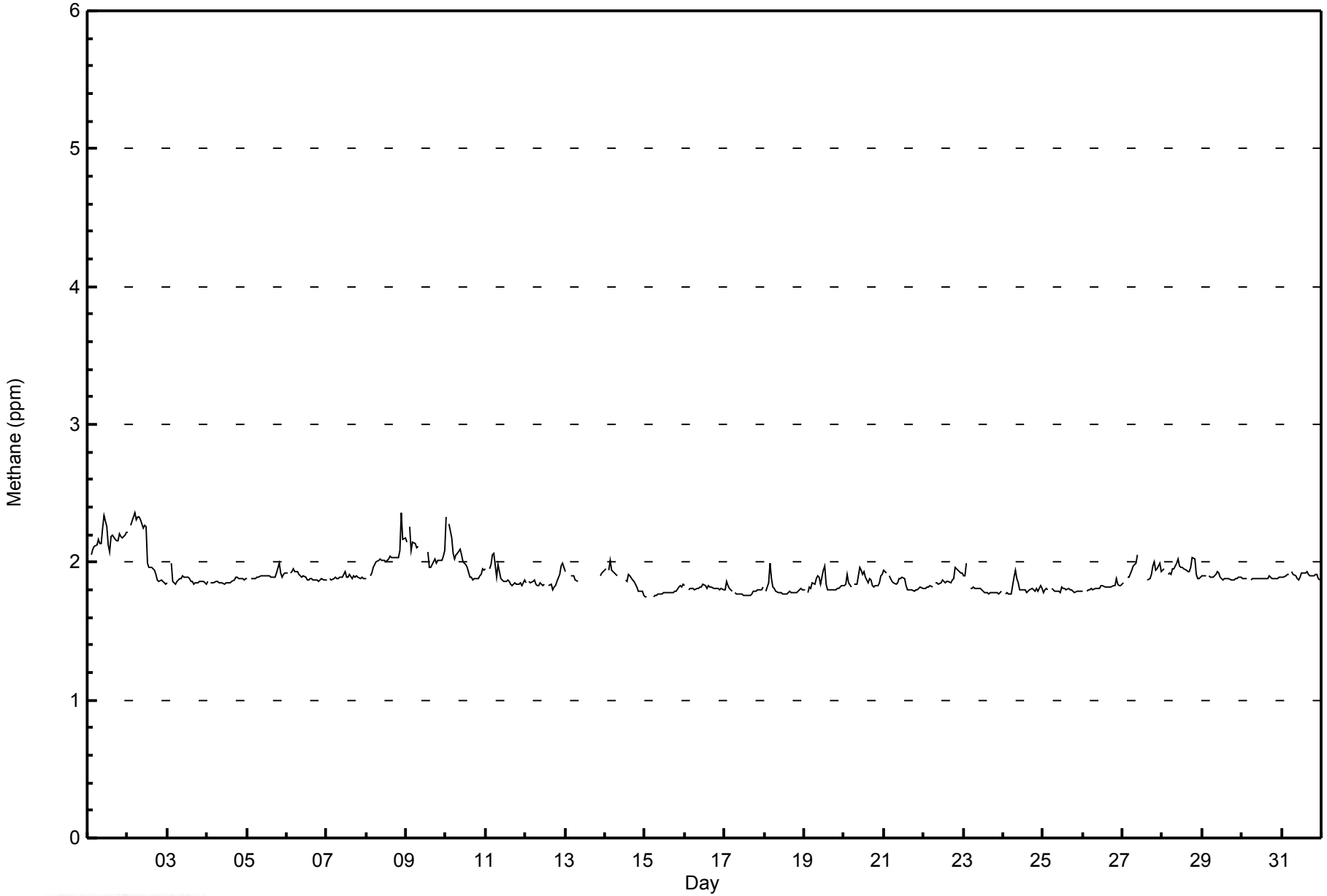
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure

WBEA NETWORK

Hourly Averages

Methane (CH_4) - ppm

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	624	91.63	91.63
2.1 - 3.0	57	8.37	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: 744

WBEA NETWORK

Frequency Distribution

Methane (CH_4) - ppm

Anzac - January 2014

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	16	6	2	9	16	34	85	34	16	16	14	14	33	125	108	96	624
2.1 - 3.0	0	0	0	0	3	2	20	11	3	4	1	0	0	2	7	1	54
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	6	2	9	19	36	105	45	19	20	15	14	33	127	115	97	678

Total Number of Valid Hours: 678

Total Number of Hours: 744

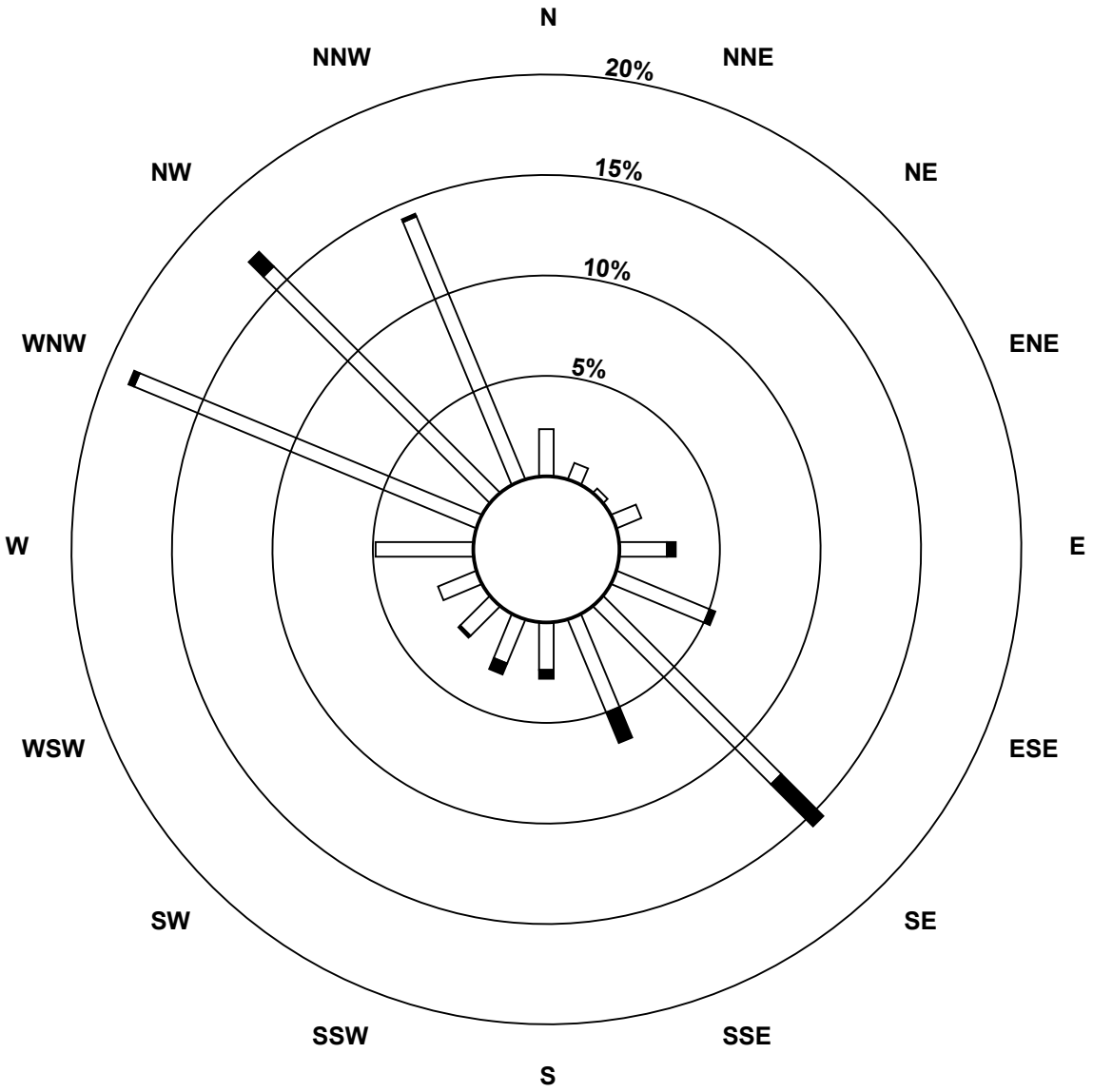
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

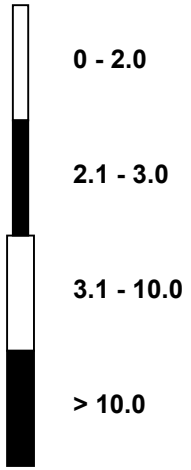
Wind Rose Jan 2014

Methane (CH_4) - ppm

Anzac (AMS 14)



Classes (ppm)



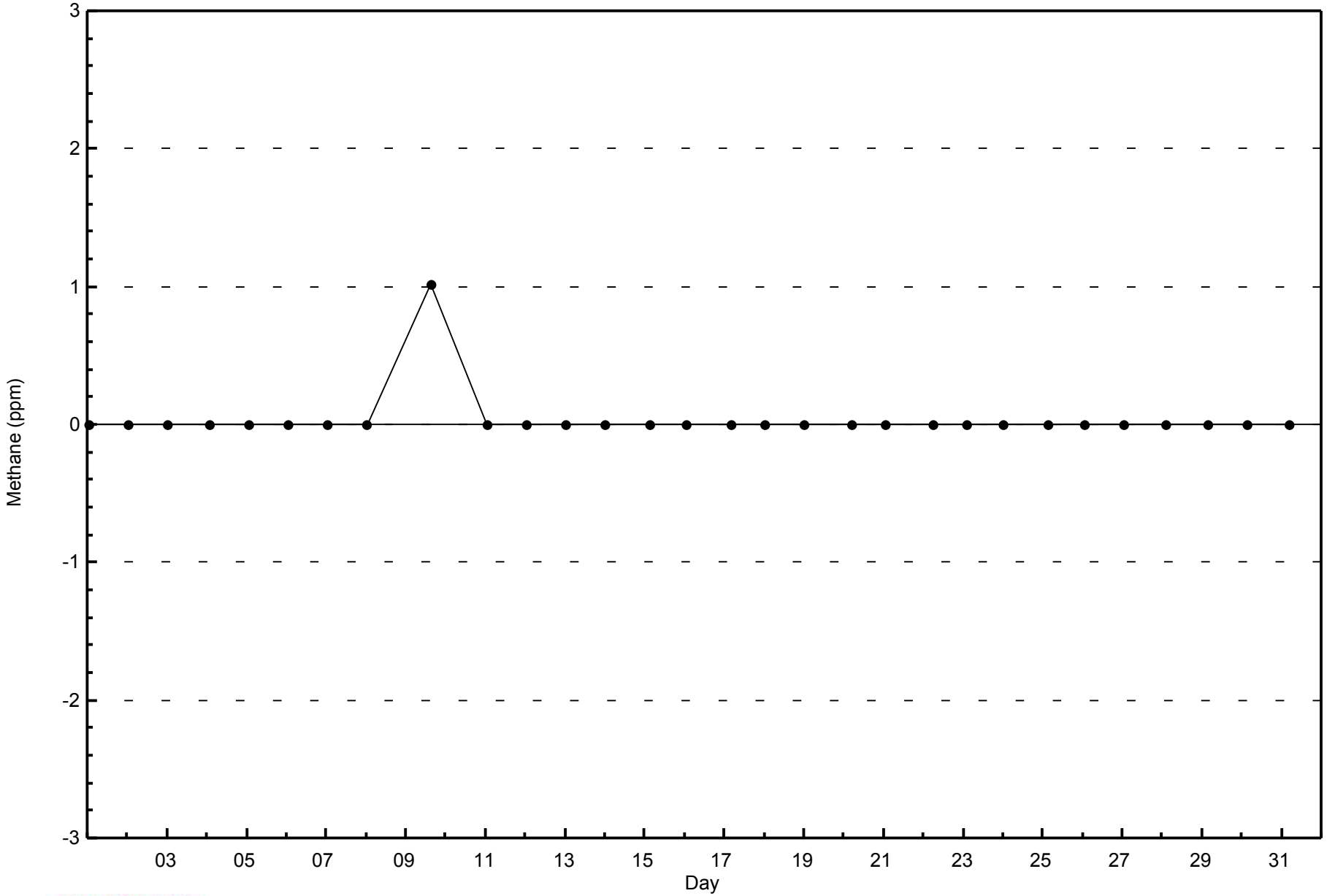
Total Number of Valid Hours: 678

WBEA NETWORK

Zero Responses

Methane (CH_4) - ppm

Anzac - January 2014



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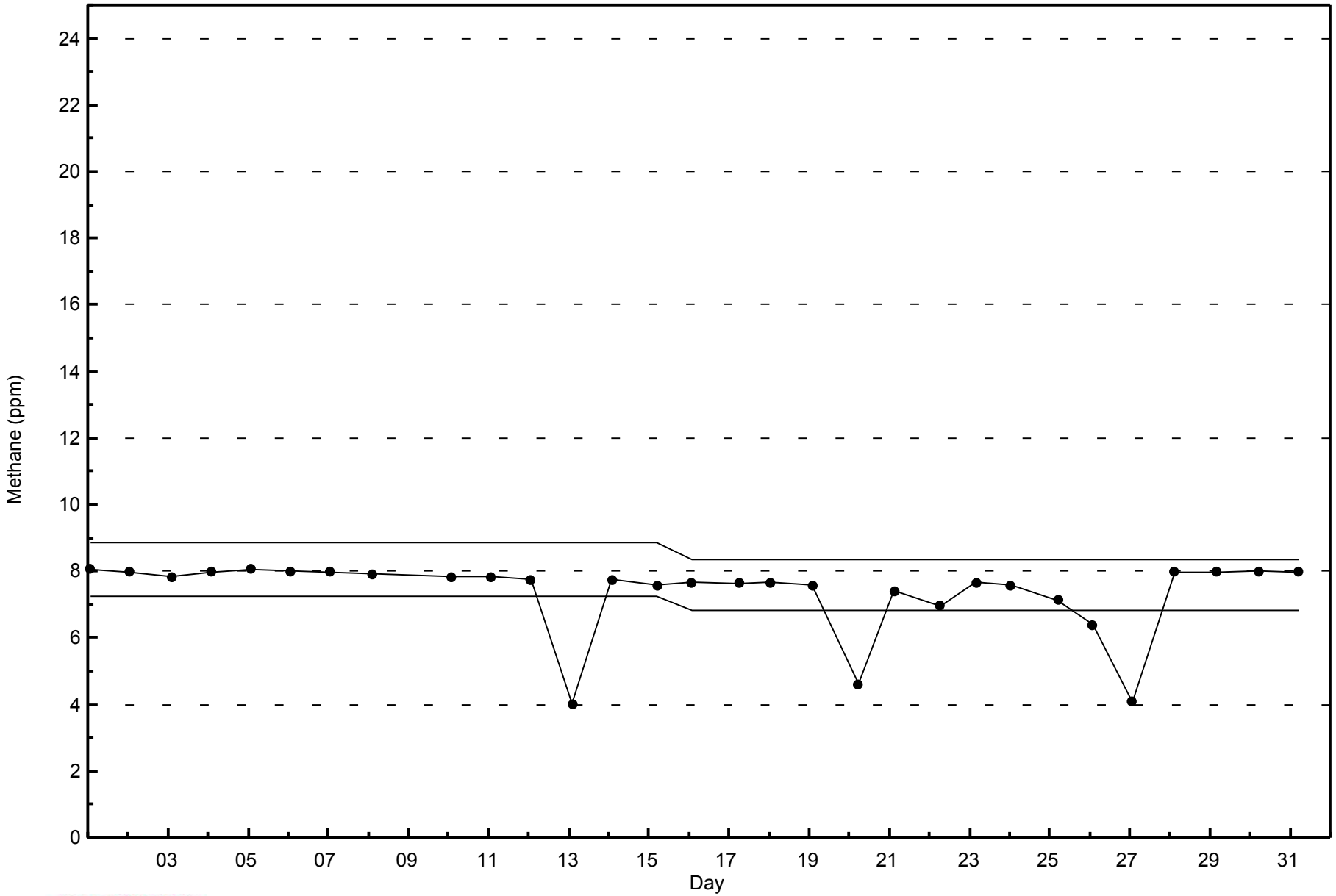
WBEA NETWORK

Span Responses

Methane (CH_4) - ppm

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Anzac - January 2014

Maximum Value: 21 ppb on Jan 5 13:00

Maximum Daily Average: 3.8 ppb on Jan 1

Minimum Value: 0 ppb on Jan 1 22:00

Minimum Daily Average: 0.0 ppb on Jan 17

Maximum Diurnal Average: 2.1 ppb at hour 13

Minimum Diurnal Average: 0.1 ppb at hour 7

Monthly Average: 0.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 2$ $P_{99} = 9$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	0	0	0	0	0	19	12	11	9	6	3	2	5	3	7	5	1	1	0	0	3	0	3.8	19
2-Jan	0	Z	0	0	0	0	0	0	2	6	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0.5	6
3-Jan	0	Z	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	1	0	0	0	0	0	0.3	2
4-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0.3	5
5-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	21	1	0	0	0	0	0	0	1	0	0	0	1.1	21
6-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0.2	2
7-Jan	0	Z	0	0	0	0	0	0	0	0	3	2	2	3	2	0	0	0	0	0	0	5	0	0	0.8	5
8-Jan	1	Z	0	0	0	0	0	0	0	0	0	1	2	1	0	0	4	0	1	0	1	0	0	0	0.4	4
9-Jan	0	Z	0	0	0	0	0	0	C	C	C	C	C	2	0	0	0	0	0	0	0	1	1	0	0.3	2
10-Jan	10	Z	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	0	1	1	0	0.8	10
11-Jan	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
12-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	0	0.3	3
13-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	3	3	3	2	1	0	1	0	0	13	3	2	1.4	13
14-Jan	1	Z	10	2	1	0	1	0	0	1	1	4	2	2	1	1	0	0	0	0	0	0	0	0	1.2	10
15-Jan	0	0	PF	PF	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16-Jan	0	Z	0	0	0	0	0	0	0	0	1	4	2	0	0	0	0	0	0	0	0	0	0	0	0.3	4
17-Jan	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
18-Jan	Z	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	5
19-Jan	0	Z	0	0	0	0	0	1	0	2	1	4	8	1	0	0	0	0	0	0	0	0	0	0	0.8	8
20-Jan	0	0	1	0	0	Z	0	0	0	3	3	3	3	3	2	1	0	0	0	0	0	0	0	0	0.8	3
21-Jan	0	0	Z	0	0	0	0	0	0	0	2	3	3	1	0	0	0	0	0	0	0	6	1	0	0.7	6
22-Jan	0	0	0	2	0	0	Z	0	0	0	2	2	1	3	1	0	0	0	0	0	0	0	0	0	0.5	3
23-Jan	0	0	0	Z	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0.2	2
24-Jan	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
25-Jan	1	0	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
26-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0.2	2
27-Jan	0	Z	0	0	1	2	0	0	1	3	2	1	1	1	1	0	0	0	0	0	0	0	0	1	0.7	3
28-Jan	0	1	Z	1	0	0	0	0	0	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	2
29-Jan	0	0	0	Z	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
30-Jan	0	0	0	0	Z	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0.1	1
31-Jan	0	0	0	0	0	Z	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0.3	2
	0.5	0.1	0.6	0.2	0.1	0.1	0.1	0.6	0.5	1.0	1.0	1.3	2.1	1.0	0.6	0.3	0.4	0.2	0.2	0.2	0.3	0.8	0.3	0.2	Diurnal Average	
	10	1	10	2	1	2	1	19	12	11	9	6	21	3	5	3	7	5	2	3	5	13	3	2	Diurnal Maximum	

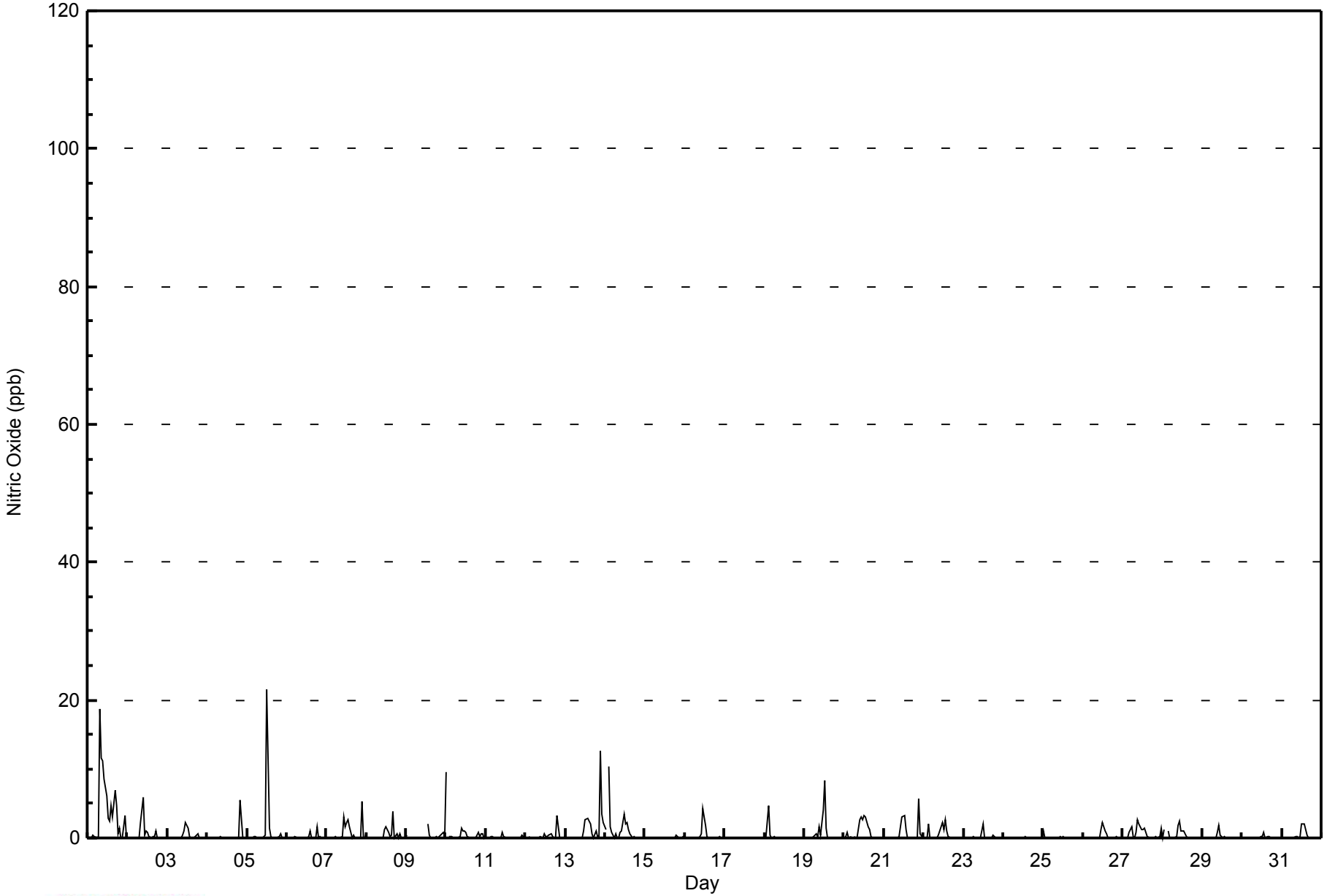
Z - zerospan C - Calibration PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	99.86	99.86
21 - 40	1	0.14	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: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitric Oxide (NO) - ppb

Anzac - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	16	6	2	9	19	36	109	46	20	22	16	15	35	129	118	104	702
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	6	2	9	19	36	109	46	20	22	16	15	35	130	118	104	703

Total Number of Valid Hours: 703

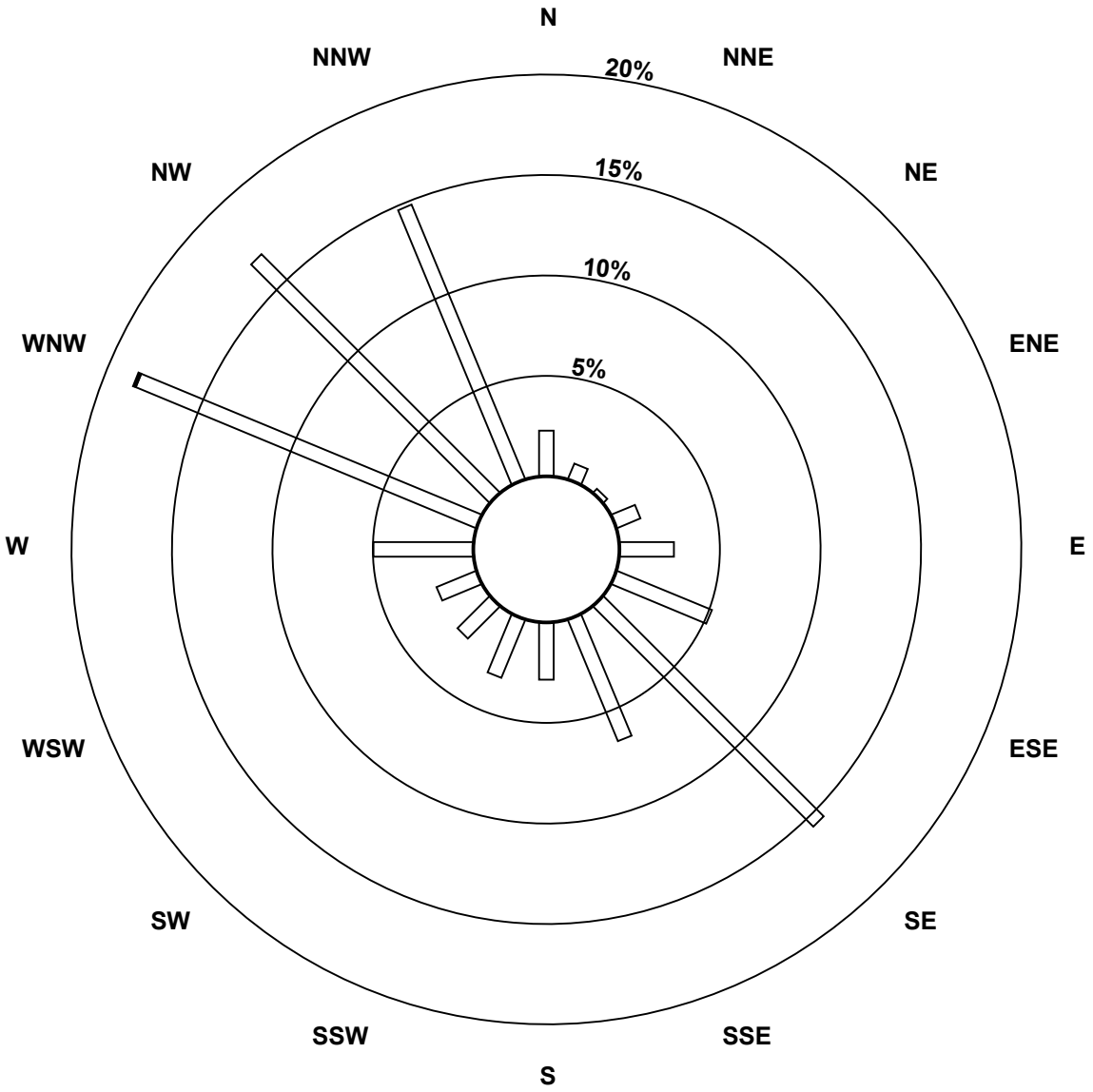
Total Number of Hours: 744

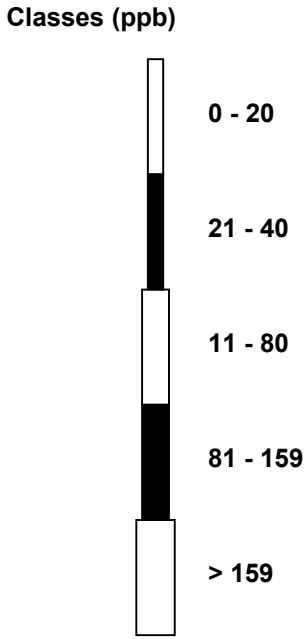
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Anzac (AMS 14)





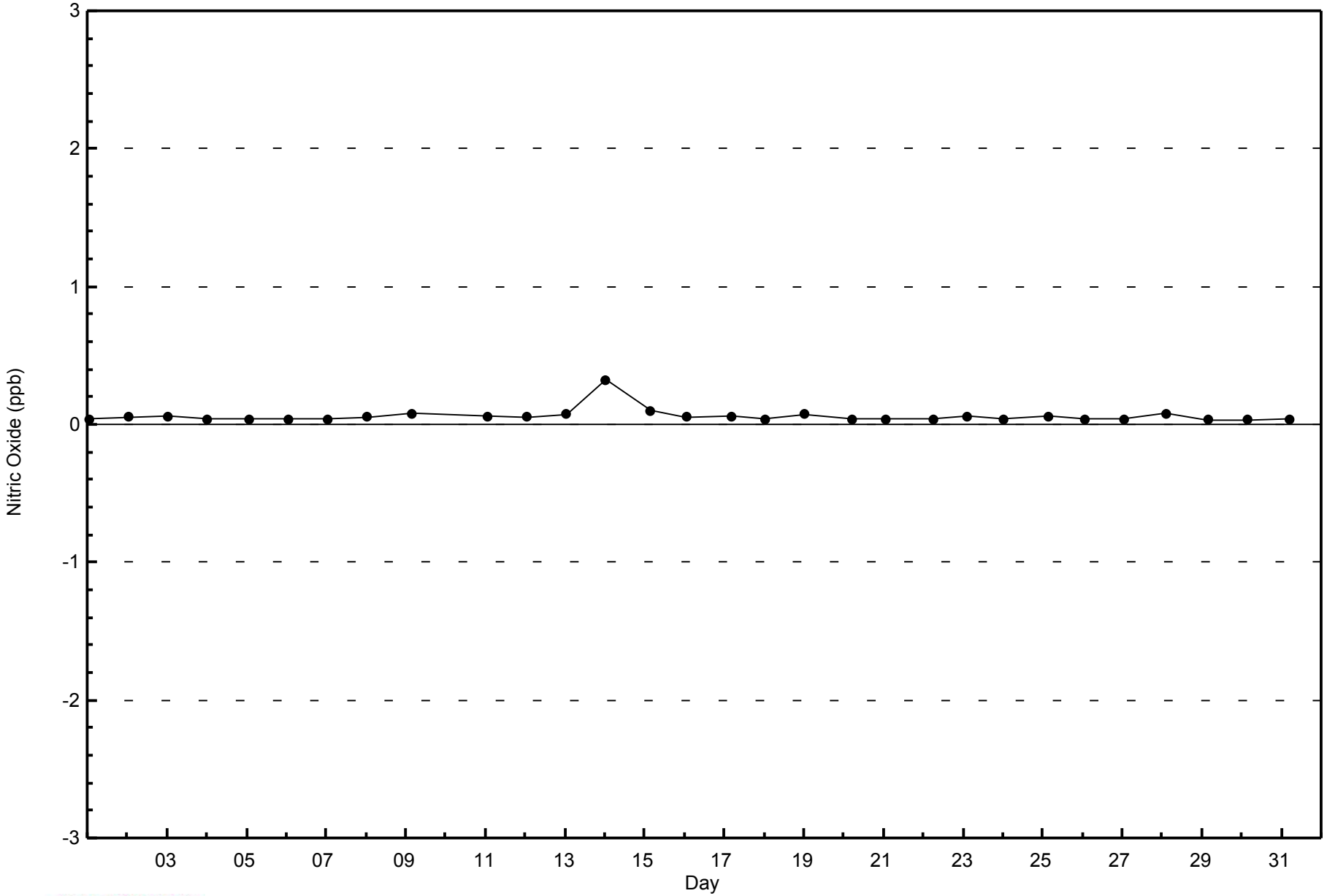
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Anzac - January 2014



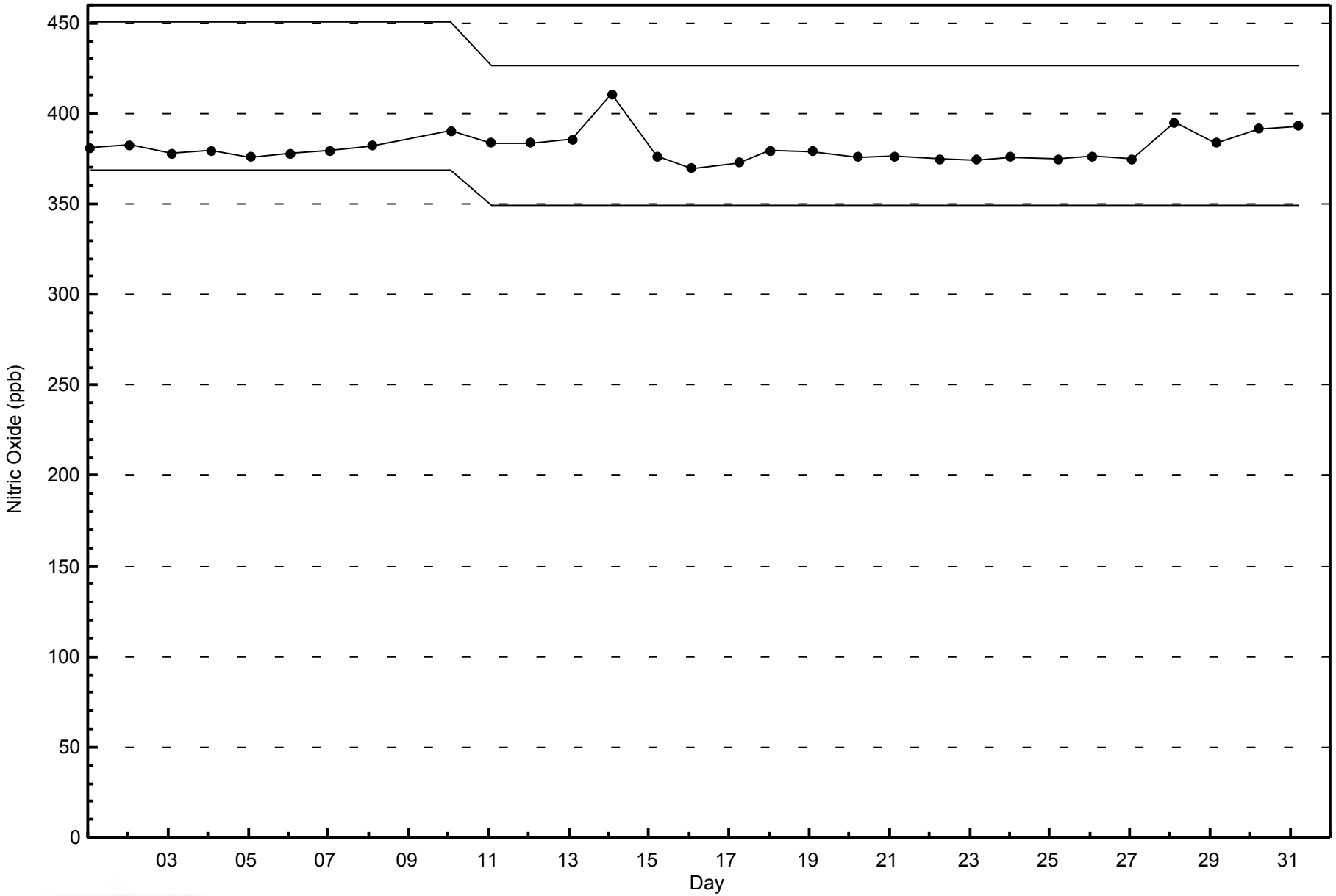
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 27 ppb on Jan 13 23:00 Maximum Daily Average: 11.8 ppb on Jan 13

Minimum Value: 0 ppb on Jan 15 14:00 Minimum Daily Average: 1.1 ppb on Jan 17
Maximum Diurnal Average: 6.2 ppb at hour 8 Minimum Diurnal Average: 4.1 ppb at hour 2
Monthly Average: 5.1 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 4 $Q_3 = 7$ $P_{90} = 11$ $P_{99} = 22$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	8	Z	7	7	8	8	8	12	13	13	8	6	4	5	10	13	20	18	13	12	9	7	10	7	9.9	20
2-Jan	6	Z	6	7	7	6	6	6	7	10	6	6	6	5	4	5	4	5	2	2	2	1	1	1	4.9	10
3-Jan	3	Z	10	2	0	0	3	6	6	6	6	6	5	2	2	2	1	1	2	1	1	1	1	1	3.0	10
4-Jan	1	Z	1	1	1	1	1	1	2	2	2	1	1	1	1	0	1	5	3	1	6	1	2	1	1.6	6
5-Jan	0	Z	1	1	1	2	2	2	2	2	2	2	6	3	2	3	2	1	2	5	7	6	5	14	3.2	14
6-Jan	12	Z	6	7	13	7	9	5	4	4	4	5	3	4	6	6	3	1	2	1	4	5	1	1	4.9	13
7-Jan	4	Z	4	1	1	3	2	2	3	3	8	5	7	8	8	7	10	5	5	3	2	5	5	5	4.6	10
8-Jan	6	Z	5	4	4	4	4	4	4	4	4	5	6	4	5	6	7	5	5	5	13	10	7	7	5.6	13
9-Jan	7	Z	6	6	8	9	9	11	C	C	C	C	C	8	7	6	6	6	7	4	3	4	8	14	7.1	14
10-Jan	22	Z	18	14	11	11	13	18	20	13	6	3	3	3	1	1	1	1	1	2	2	6	3	3	7.6	22
11-Jan	5	Z	5	8	10	11	5	6	5	6	5	3	1	1	2	1	0	1	0	0	0	0	2	2	3.5	11
12-Jan	1	Z	6	6	8	6	5	5	7	8	1	2	2	2	3	4	3	2	3	7	5	6	10	12	4.9	12
13-Jan	10	Z	5	4	5	4	2	2	1	2	2	7	10	9	11	14	21	19	20	23	22	26	27	26	11.8	27
14-Jan	26	Z	26	20	14	13	15	14	13	10	8	9	8	8	10	11	8	7	4	2	2	2	2	1	10.2	26
15-Jan	1	0	PF	PF	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	7	4	7	1.2	7
16-Jan	4	Z	0	0	0	1	1	1	2	5	5	8	7	4	4	2	3	2	4	2	2	2	2	1	2.7	8
17-Jan	1	1	2	1	1	Z	1	1	0	0	1	0	1	0	0	0	3	4	2	0	1	2	1	1	1.1	4
18-Jan	Z	1	7	11	4	2	3	1	1	1	1	1	1	1	2	2	2	2	1	1	4	4	1	2	2.5	11
19-Jan	1	Z	2	4	3	4	10	14	15	14	7	16	19	8	1	1	1	0	0	0	1	4	5	7	5.9	19
20-Jan	7	7	12	7	5	Z	9	10	9	16	10	7	8	11	9	13	13	5	4	2	2	5	13	16	8.6	16
21-Jan	20	20	Z	18	11	4	2	1	3	5	12	14	13	6	1	1	2	2	1	0	1	4	2	2	6.3	20
22-Jan	1	1	2	4	4	3	Z	5	6	6	6	5	4	5	4	5	5	4	5	5	5	4	4	4	4.2	6
23-Jan	3	3	3	Z	2	3	5	2	2	2	2	2	3	1	1	1	1	1	2	1	1	1	1	1	1.8	5
24-Jan	Z	1	1	1	1	1	16	21	14	10	5	5	5	6	1	2	5	8	5	2	5	3	2	1	5.3	21
25-Jan	3	2	1	2	Z	3	2	2	1	1	3	5	6	5	6	9	6	4	1	0	1	2	2	0	2.9	9
26-Jan	0	Z	1	1	1	0	0	1	1	1	1	6	8	6	5	5	5	5	8	8	8	6	6	5	3.8	8
27-Jan	6	Z	10	12	14	20	20	15	14	11	6	4	4	5	3	5	5	7	8	11	14	11	9	9	9.5	20
28-Jan	5	6	Z	7	5	8	8	9	12	11	9	6	5	4	4	6	10	13	17	20	6	1	1	2	7.6	20
29-Jan	5	7	6	Z	7	5	6	8	9	11	9	3	0	2	4	4	1	0	0	1	2	4	4	3	4.3	11
30-Jan	1	2	1	1	Z	1	2	2	2	2	1	2	2	3	2	2	4	3	2	2	2	2	2	2	1.8	4
31-Jan	2	2	4	5	8	Z	8	7	6	3	2	3	11	12	11	10	10	7	8	9	10	8	1	1	6.3	12
	5.9	4.1	5.6	5.8	5.5	5.0	6.0	6.2	6.1	6.0	4.7	4.9	5.3	4.6	4.2	4.7	5.2	4.7	4.4	4.3	4.8	4.8	4.6	5.1	Diurnal Average	
	26	20	26	20	14	20	20	21	20	16	12	16	19	12	11	14	21	19	20	23	22	26	27	26	Diurnal Maximum	

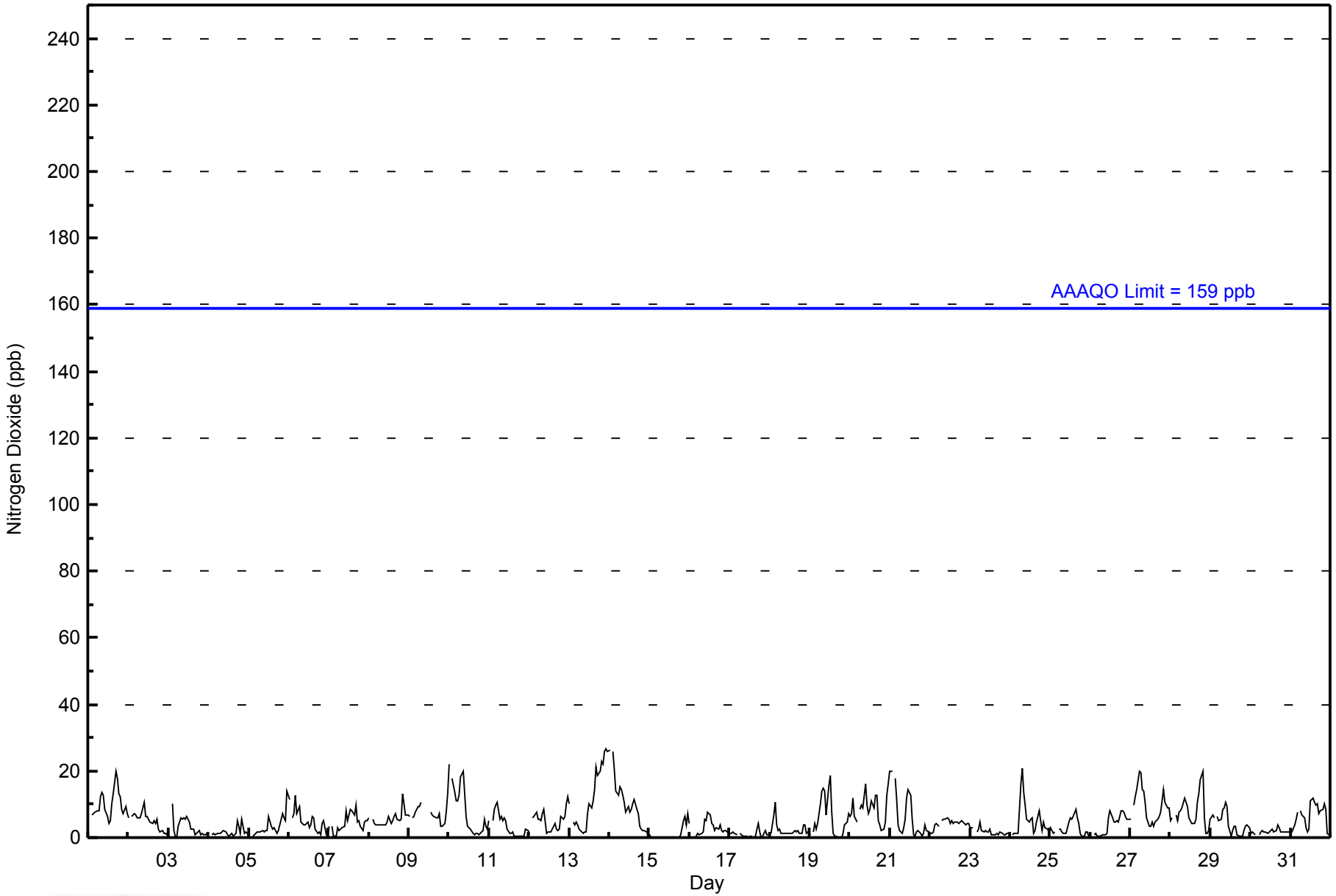
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	98.58	98.58
21 - 40	10	1.42	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: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	15	6	2	9	19	36	109	45	20	21	16	15	34	128	117	101	693
21 - 40	1	0	0	0	0	0	0	1	0	1	0	0	1	2	1	3	10
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	6	2	9	19	36	109	46	20	22	16	15	35	130	118	104	703

Total Number of Valid Hours: 703

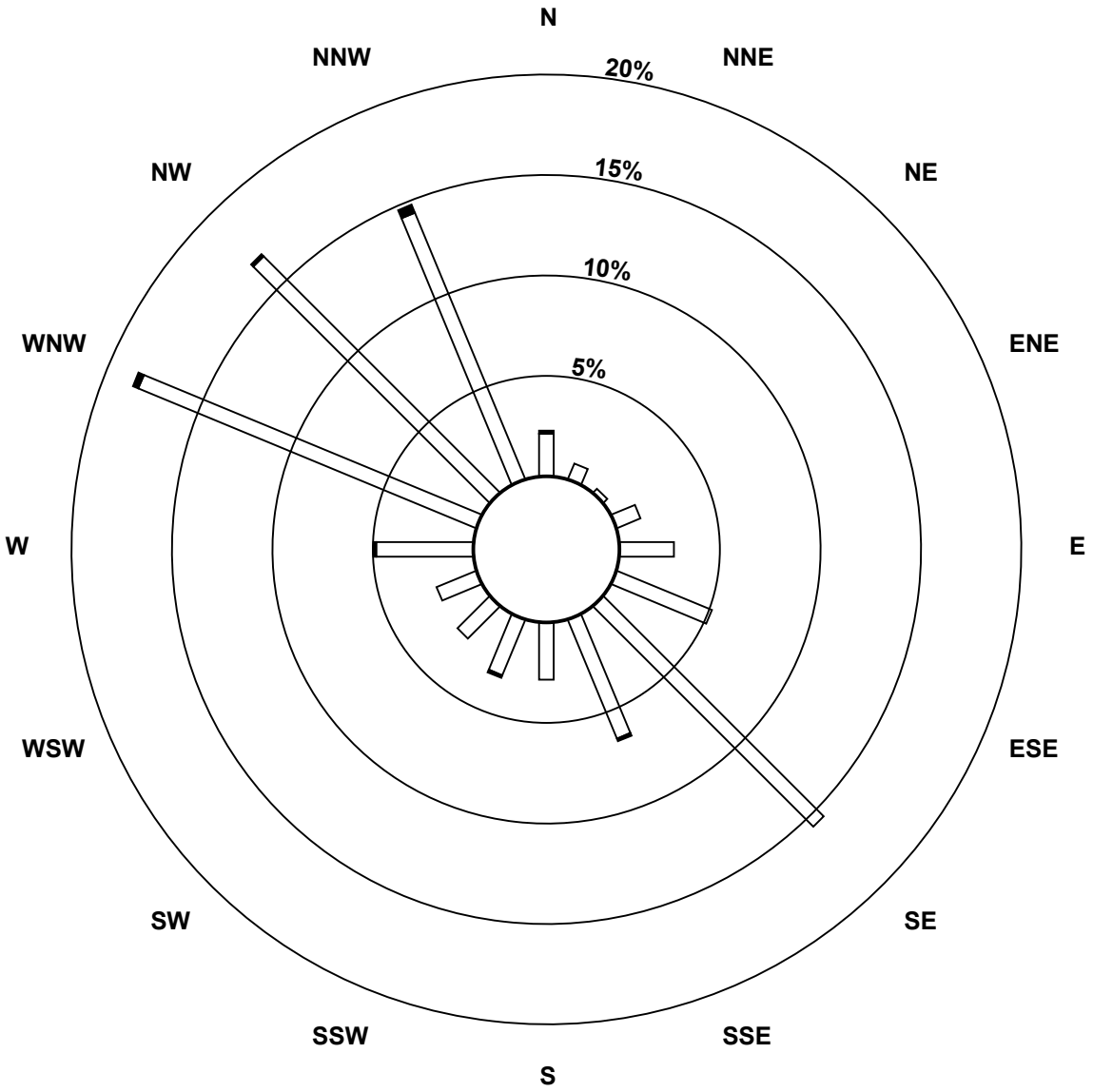
Total Number of Hours: 744

Wood Buffalo Environmental Association

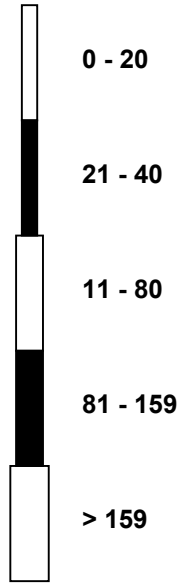
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Anzac (AMS 14)



Classes (ppb)



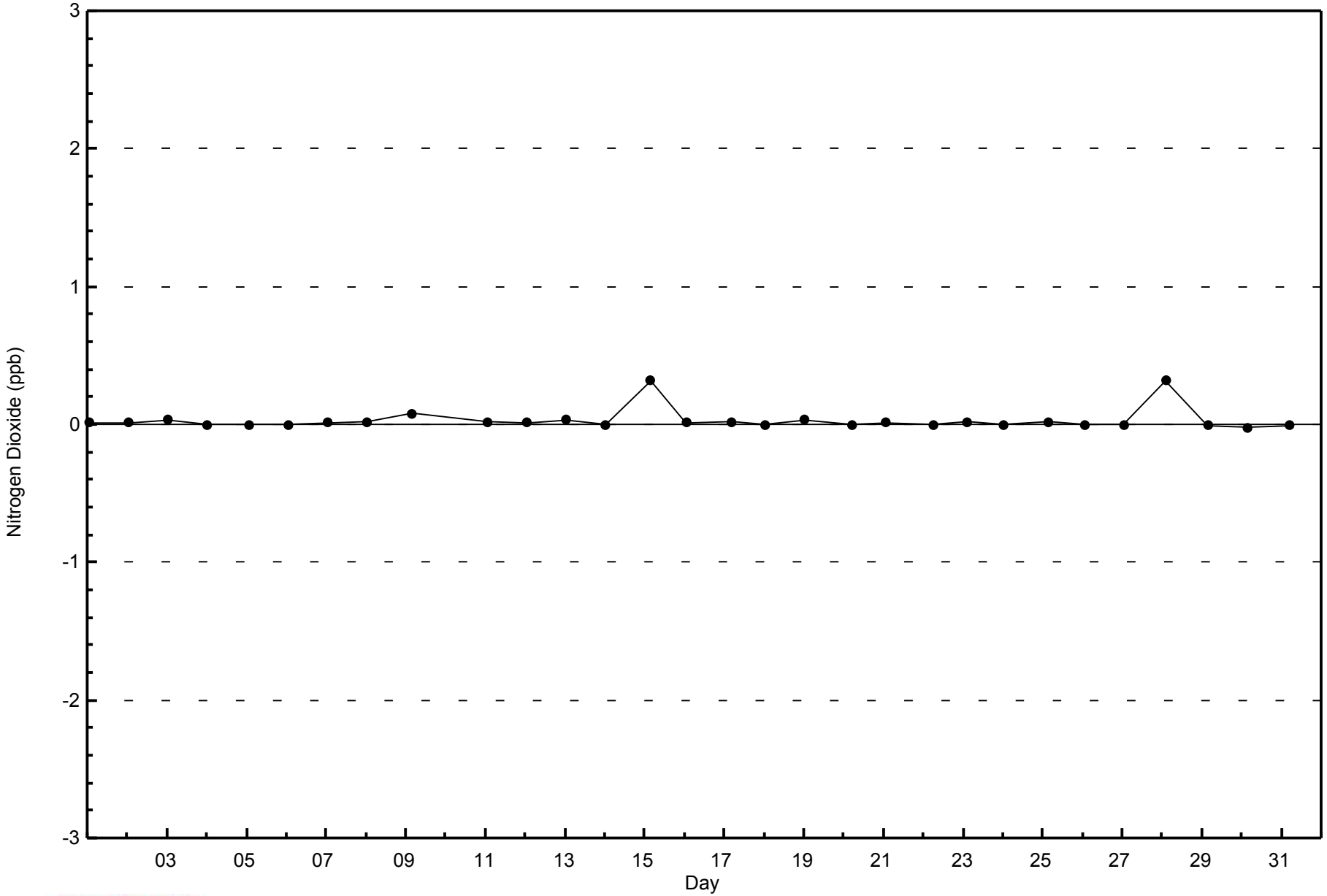
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2014



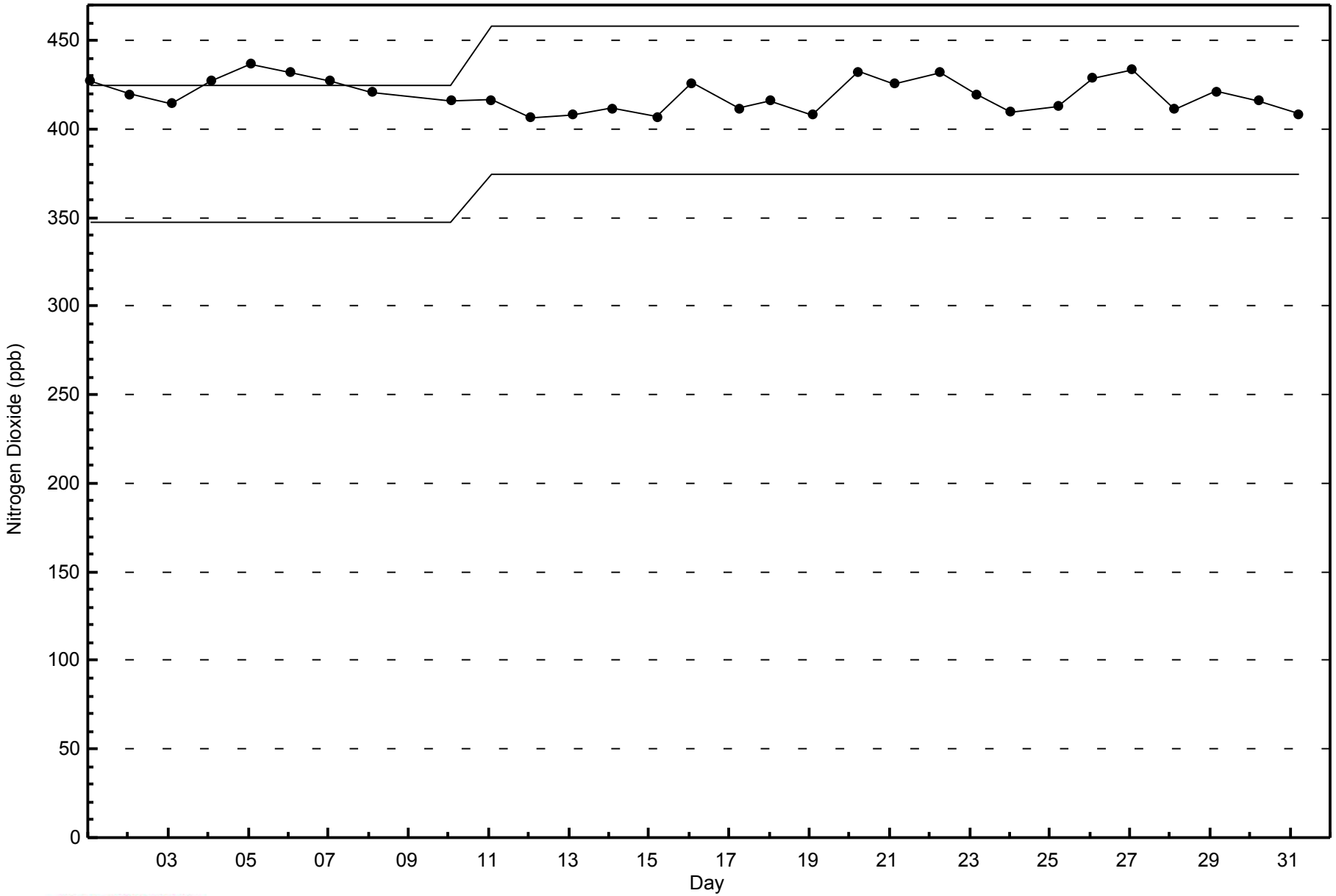
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2014

Maximum Value: 39 ppb on Jan 13 22:00

Maximum Daily Average: 13.7 ppb on Jan 1

Minimum Value: 0 ppb on Jan 15 18:00

Minimum Daily Average: 1.1 ppb on Jan 17

Maximum Diurnal Average: 7.3 ppb at hour 13

Minimum Diurnal Average: 4.2 ppb at hour 2

Monthly Average: 5.7 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 4 $Q_3 = 8$ $P_{90} = 13$ $P_{99} = 28$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	8	Z	7	8	8	8	8	31	25	24	17	12	7	8	15	16	27	23	14	14	9	7	13	7	13.7	31
2-Jan	6	Z	6	7	7	6	6	6	9	16	7	7	6	5	4	5	4	6	2	2	2	1	1	1	5.4	16
3-Jan	3	Z	10	2	0	0	3	6	6	6	6	8	6	3	2	2	1	1	3	1	1	1	1	1	3.2	10
4-Jan	1	Z	1	1	1	1	1	1	2	2	1	1	1	1	1	0	1	5	3	1	11	1	2	1	1.9	11
5-Jan	0	Z	1	1	2	2	2	2	2	2	2	3	28	5	3	3	2	1	2	5	8	6	5	14	4.3	28
6-Jan	12	Z	6	7	13	8	9	5	4	4	4	5	3	4	7	6	2	1	3	1	4	5	1	1	5.0	13
7-Jan	4	Z	4	1	1	3	2	3	3	4	11	7	9	11	10	7	10	5	5	3	2	10	5	5	5.3	11
8-Jan	7	Z	5	4	4	4	4	4	4	4	4	6	8	5	5	7	11	5	6	5	14	10	7	7	6.0	14
9-Jan	7	Z	6	6	8	9	9	11	C	C	C	C	C	10	7	6	6	6	7	4	3	5	9	14	7.4	14
10-Jan	32	Z	18	14	11	11	13	18	20	15	7	4	4	3	1	1	1	1	1	3	2	6	4	2	8.4	32
11-Jan	6	Z	5	9	10	11	5	6	5	6	6	3	1	1	2	0	0	0	0	0	0	0	3	2	3.6	11
12-Jan	1	Z	6	6	8	6	5	5	7	9	1	2	2	2	3	5	3	2	3	10	5	6	10	12	5.2	12
13-Jan	11	Z	5	4	5	4	2	2	1	2	2	8	13	12	14	16	22	19	21	23	22	39	30	28	13.2	39
14-Jan	27	Z	37	22	15	13	16	14	13	11	9	13	10	11	11	12	8	7	4	2	2	2	2	1	11.4	37
15-Jan	1	0	PF	PF	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	7	4	7	1.2	7
16-Jan	4	Z	0	0	0	1	1	1	2	5	6	12	9	4	4	2	3	2	4	2	2	2	2	1	3.1	12
17-Jan	1	1	2	1	1	Z	1	1	0	0	1	0	0	0	0	1	3	4	1	0	1	2	1	1	1.1	4
18-Jan	Z	1	11	11	4	2	3	1	1	1	1	1	1	1	2	2	2	2	1	1	4	4	1	2	2.7	11
19-Jan	1	Z	2	4	3	4	11	15	15	16	7	20	27	9	1	1	1	0	0	0	1	4	5	7	6.7	27
20-Jan	6	8	13	6	5	Z	9	10	9	18	13	10	12	14	11	14	13	5	4	2	2	5	13	16	9.4	18
21-Jan	20	20	Z	18	11	4	2	1	3	5	13	17	16	7	1	1	2	2	1	0	1	10	3	2	7.0	20
22-Jan	1	1	1	6	4	3	Z	5	5	6	7	7	5	8	5	5	5	4	5	5	5	4	4	4	4.7	8
23-Jan	3	3	3	Z	2	3	5	2	2	2	2	3	5	1	1	1	1	1	2	1	1	1	1	1	2.0	5
24-Jan	Z	1	1	1	1	1	16	21	14	10	5	5	5	6	1	2	5	8	5	2	5	3	2	1	5.3	21
25-Jan	4	2	1	2	Z	3	2	1	1	1	3	5	6	5	6	9	6	4	1	0	1	2	2	0	3.0	9
26-Jan	0	Z	1	1	1	0	0	1	1	1	1	7	10	7	5	5	5	5	8	8	8	6	6	5	4.1	10
27-Jan	6	Z	10	12	15	22	20	14	15	13	8	5	5	6	4	5	5	7	8	11	15	10	9	10	10.2	22
28-Jan	5	7	Z	8	5	8	8	9	12	13	12	7	6	5	5	6	10	13	17	20	6	1	1	2	8.0	20
29-Jan	5	7	6	Z	7	5	6	8	9	11	11	4	0	3	3	4	1	0	0	0	2	3	4	3	4.5	11
30-Jan	1	1	1	1	Z	1	2	2	2	1	1	2	2	3	2	2	4	3	2	2	2	2	2	2	1.9	4
31-Jan	2	2	4	5	8	Z	8	7	6	3	2	3	13	14	12	10	10	7	8	8	10	8	1	1	6.6	14
	6.4	4.2	6.2	6.1	5.6	5.1	6.0	6.9	6.6	7.0	5.7	6.2	7.3	5.6	4.8	5.0	5.6	4.9	4.6	4.5	5.0	5.6	4.9	5.3	Diurnal Average	
	32	20	37	22	15	22	20	31	25	24	17	20	28	14	15	16	27	23	21	23	22	39	30	28	Diurnal Maximum	

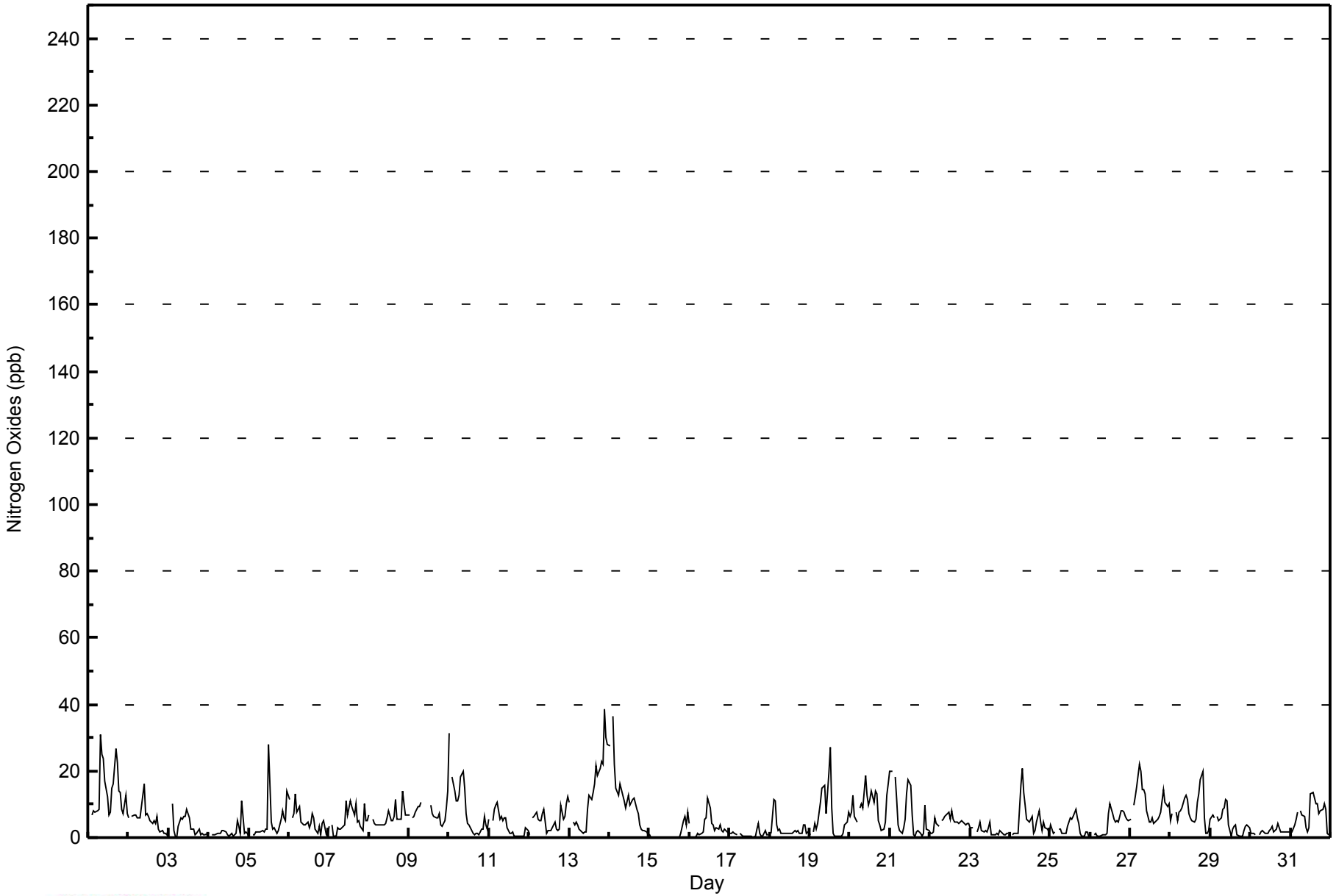
Z - zerospan C - Calibration PF - Power Failure

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	686	97.17	97.17
21 - 40	20	2.83	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: 706

Total Number of Hours: 744

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	15	6	2	9	19	36	108	42	20	21	15	15	34	126	117	100	685
21 - 40	1	0	0	0	0	0	1	4	0	1	1	0	1	4	1	4	18
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	6	2	9	19	36	109	46	20	22	16	15	35	130	118	104	703

Total Number of Valid Hours: 703

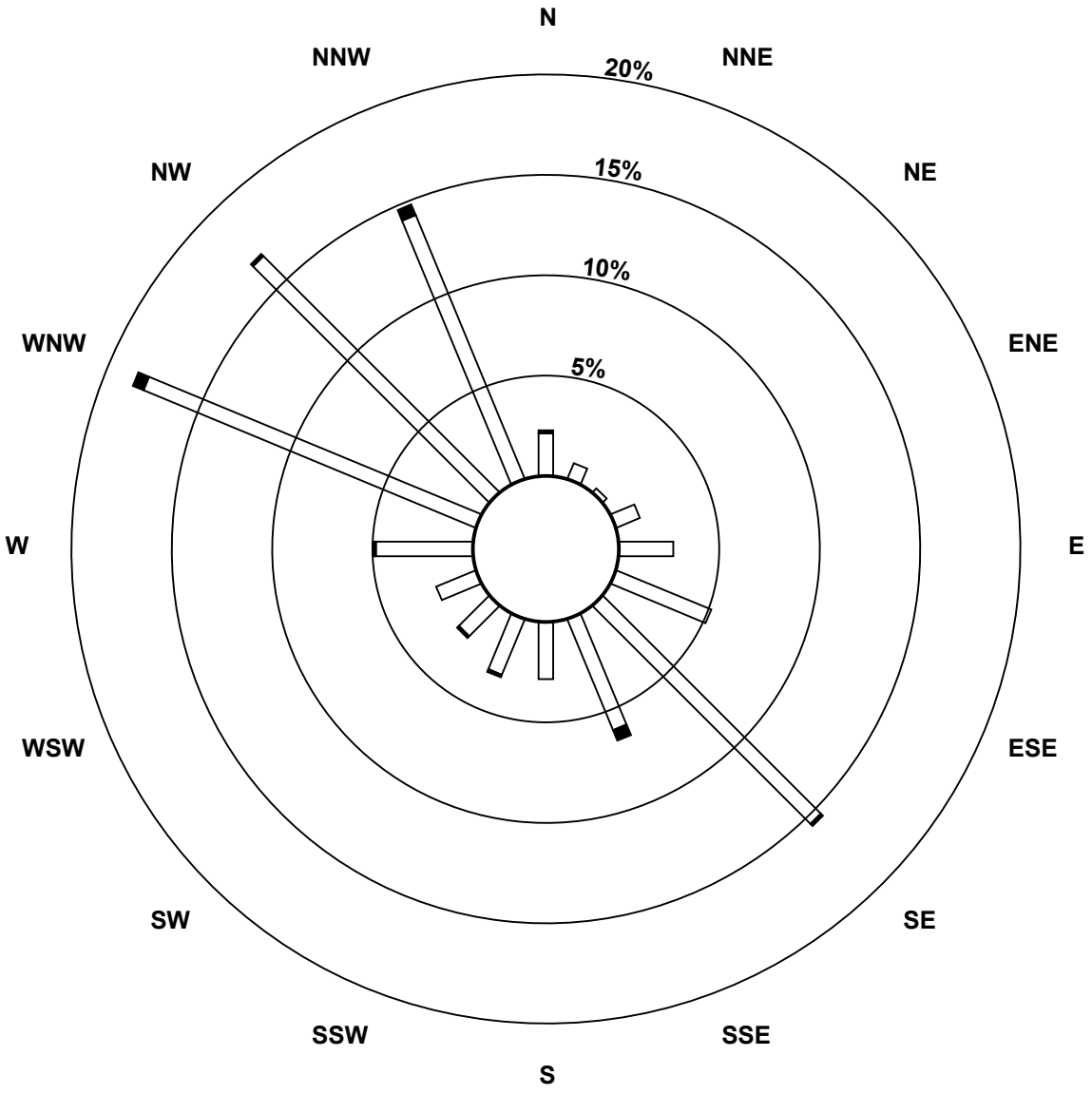
Total Number of Hours: 744

Wood Buffalo Environmental Association

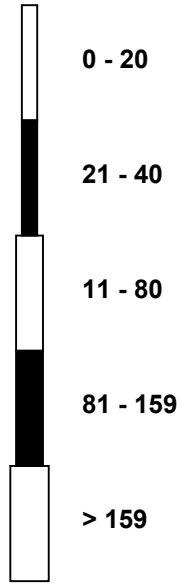
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Anzac (AMS 14)



Classes (ppb)



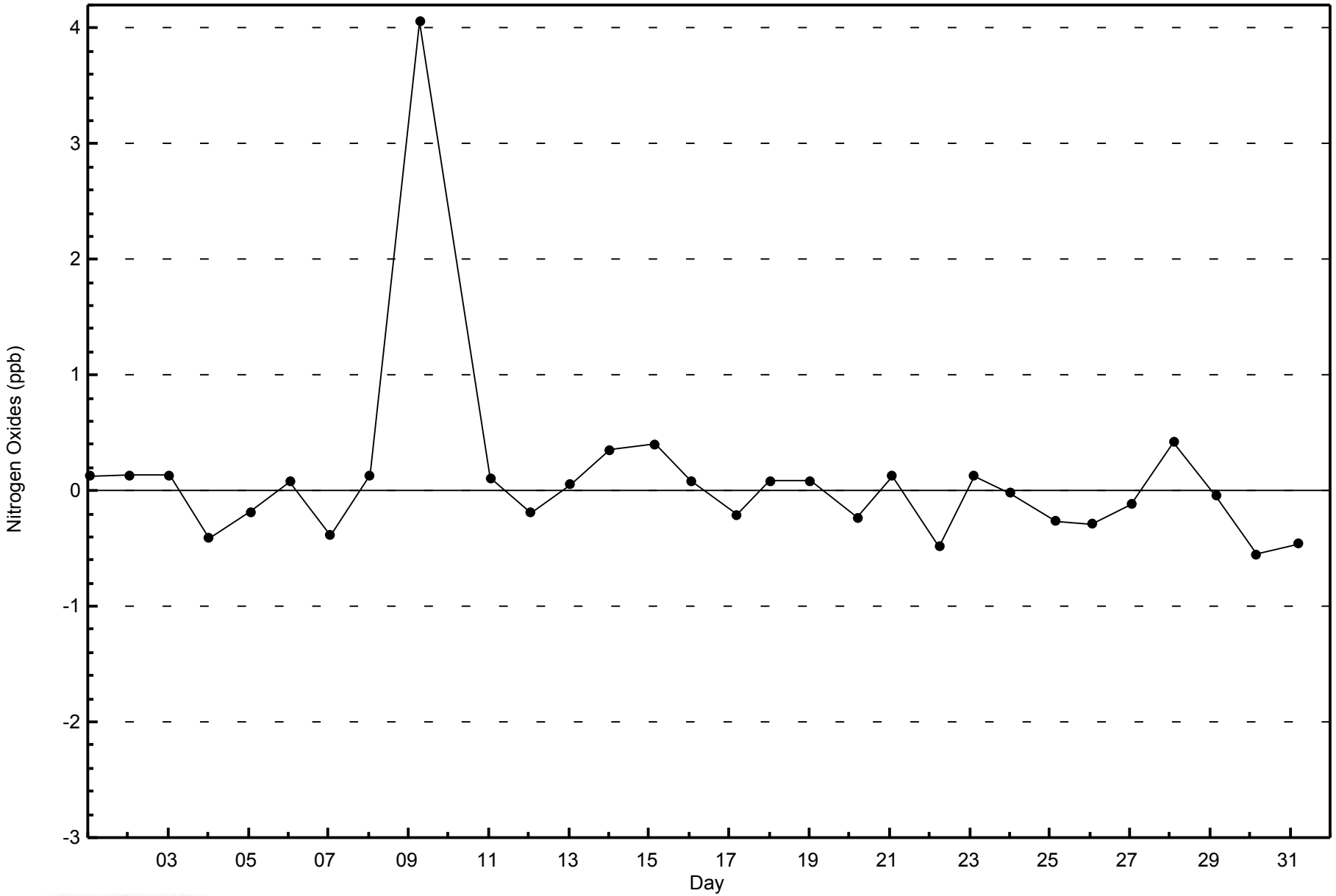
Total Number of Valid Hours: 703

Wood Buffalo Environmental Association

Zero Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2014



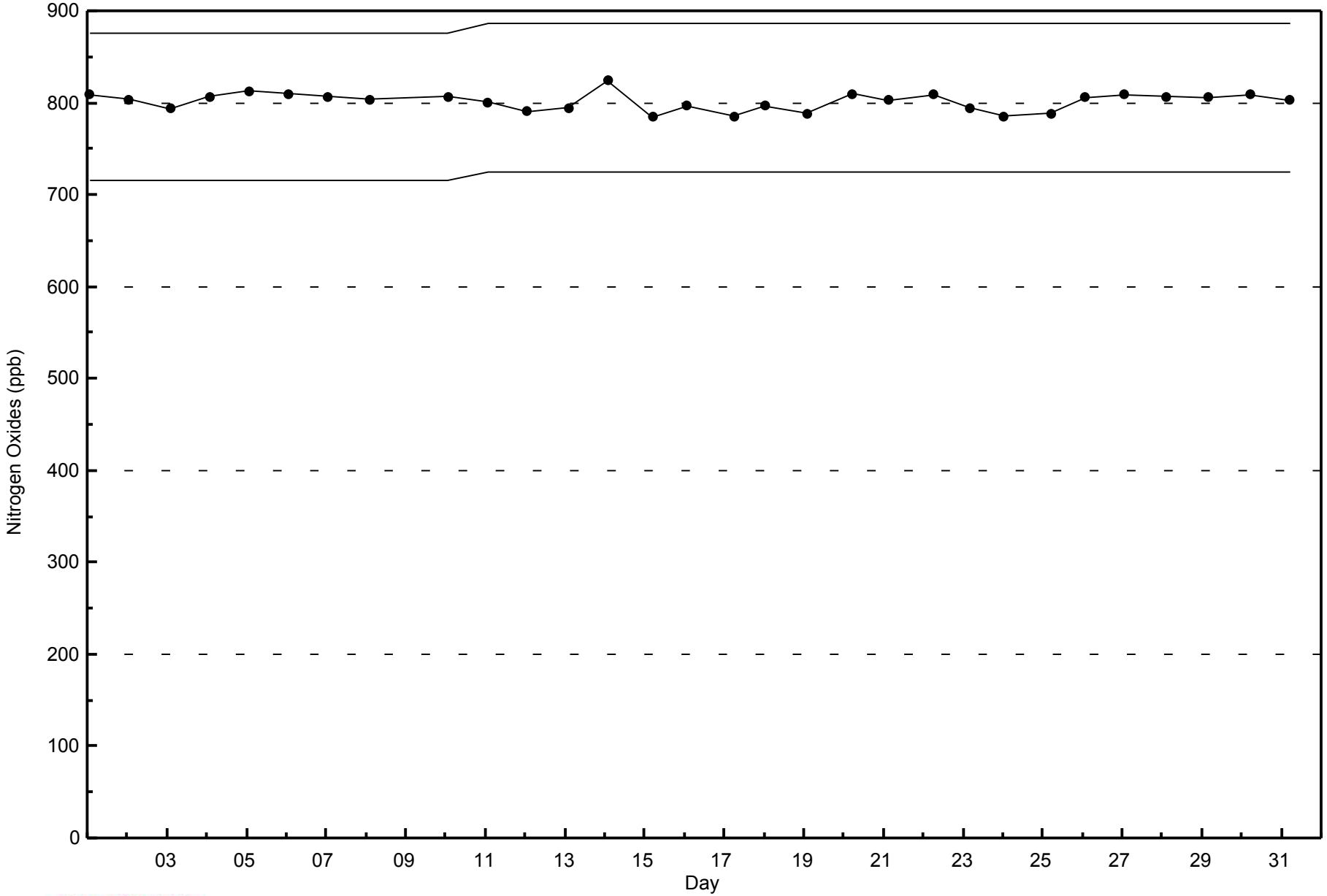
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Anzac - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 43 ppb on Jan 15 06:00 Maximum Daily Average: 38.0 ppb on Jan 15

Minimum Value: 0 ppb on Jan 10 01:00
Maximum Diurnal Average: 30.0 ppb at hour 15
Monthly Average: 26.3 ppb

Minimum Daily Average: 7.8 ppb on Jan 1
Minimum Diurnal Average: 23.6 ppb at hour 3
Percentiles: $P_1 = 3$ $P_{10} = 13$ $Q_1 = 21$ Median = 28 $Q_3 = 33$ $P_{90} = 37$ $P_{99} = 41$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	34
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	7	Z	8	7	6	6	6	2	1	3	8	12	14	17	13	8	1	1	4	6	10	13	12	13	7.8	17
2-Jan	14	Z	15	16	17	18	18	18	17	12	13	13	21	24	24	25	25	25	31	32	31	31	31	32	21.9	32
3-Jan	28	Z	15	25	30	32	27	24	24	24	25	25	26	30	33	34	36	35	34	34	33	34	35	35	29.6	36
4-Jan	35	Z	35	35	35	35	34	35	35	35	36	36	36	35	34	33	31	27	28	30	29	30	29	29	32.9	36
5-Jan	30	Z	30	31	31	32	32	32	32	32	32	32	30	32	32	31	28	26	26	27	26	25	24	17	29.2	32
6-Jan	20	Z	25	24	19	24	22	26	27	28	28	28	30	30	29	29	31	32	32	33	31	28	32	32	27.8	33
7-Jan	30	Z	29	31	29	24	23	21	21	21	21	28	29	27	27	27	23	27	27	28	29	28	28	29	26.4	31
8-Jan	29	Z	30	31	31	31	31	30	30	29	29	28	26	26	26	25	25	25	24	23	12	15	17	15	25.6	31
9-Jan	16	Z	13	17	12	11	9	7	5	6	8	10	C	C	C	19	15	13	12	15	15	15	11	5	11.7	19
10-Jan	0	Z	2	6	10	11	9	5	3	9	14	17	17	18	22	24	25	24	24	24	22	18	16	14	14.5	25
11-Jan	12	Z	14	13	11	11	17	16	17	17	18	21	24	25	25	27	27	26	25	25	25	26	24	24	20.4	27
12-Jan	25	Z	24	25	24	26	27	28	26	24	32	33	33	34	34	31	31	31	30	27	26	24	21	18	27.5	34
13-Jan	19	Z	23	23	21	22	28	30	30	29	28	21	20	21	20	17	11	14	13	8	6	4	3	3	18.0	30
14-Jan	3	Z	2	5	15	15	13	15	18	19	21	20	21	21	19	17	20	20	26	33	34	32	34	41	20.1	41
15-Jan	41	42	PF	PF	Z	43	43	43	42	40	40	40	39	39	39	39	39	39	39	38	31	27	29	24	38.0	43
16-Jan	29	Z	37	38	37	37	37	37	36	32	32	28	29	34	33	37	36	37	36	37	38	38	36	29	34.7	38
17-Jan	25	23	21	36	36	Z	36	38	39	39	39	40	41	41	41	41	38	35	36	36	33	32	32	30	35.0	41
18-Jan	Z	23	19	18	26	33	36	38	38	37	37	37	37	37	37	29	24	22	28	30	28	27	27	27	30.2	38
19-Jan	24	Z	38	32	35	29	20	14	11	13	27	15	12	26	35	34	33	33	31	30	27	23	21	20	25.4	38
20-Jan	18	16	14	21	24	Z	18	17	18	13	18	21	21	19	21	17	14	23	22	25	26	22	14	11	18.8	26
21-Jan	7	7	Z	9	15	26	28	29	26	22	19	17	19	28	33	34	32	28	26	26	30	29	30	29	23.8	34
22-Jan	30	29	29	27	26	27	Z	25	25	25	25	26	28	27	29	29	28	28	27	27	29	31	29	25	27.4	31
23-Jan	24	23	23	Z	35	36	34	36	35	34	32	33	35	36	37	37	37	37	36	37	37	38	36	34	34.0	38
24-Jan	Z	33	33	33	33	33	16	11	18	24	32	35	33	32	39	37	33	29	33	37	32	35	36	37	31.1	39
25-Jan	36	36	35	33	Z	25	29	31	31	30	29	28	27	28	28	25	27	30	34	37	38	37	37	39	31.7	39
26-Jan	39	Z	39	37	37	36	35	34	33	33	33	29	27	30	30	30	29	28	23	20	20	20	19	19	29.5	39
27-Jan	18	Z	12	9	9	4	5	9	10	16	24	32	34	34	35	32	27	24	24	21	19	21	21	24	20.2	35
28-Jan	28	28	Z	29	30	26	23	21	16	16	21	29	30	30	31	31	25	21	17	15	29	32	31	30	25.6	32
29-Jan	27	26	27	Z	27	29	28	26	25	24	25	32	35	33	33	33	34	35	35	36	34	33	32	32	30.4	36
30-Jan	35	34	34	35	Z	35	35	34	35	35	36	35	35	35	36	35	33	35	36	36	38	37	37	37	35.4	38
31-Jan	36	35	32	30	28	Z	26	28	29	33	35	33	26	25	27	28	27	29	28	27	25	27	36	37	29.9	37
	23.6	27.4	23.6	24.1	24.6	25.6	24.8	24.4	24.2	24.3	26.3	26.9	27.8	29.2	30.0	28.9	27.3	27.0	27.3	27.7	27.3	26.8	26.5	25.6	Diurnal Average	
	41	42	39	38	37	43	43	43	42	40	40	40	41	41	41	41	39	39	39	38	38	38	37	41	Diurnal Maximum	

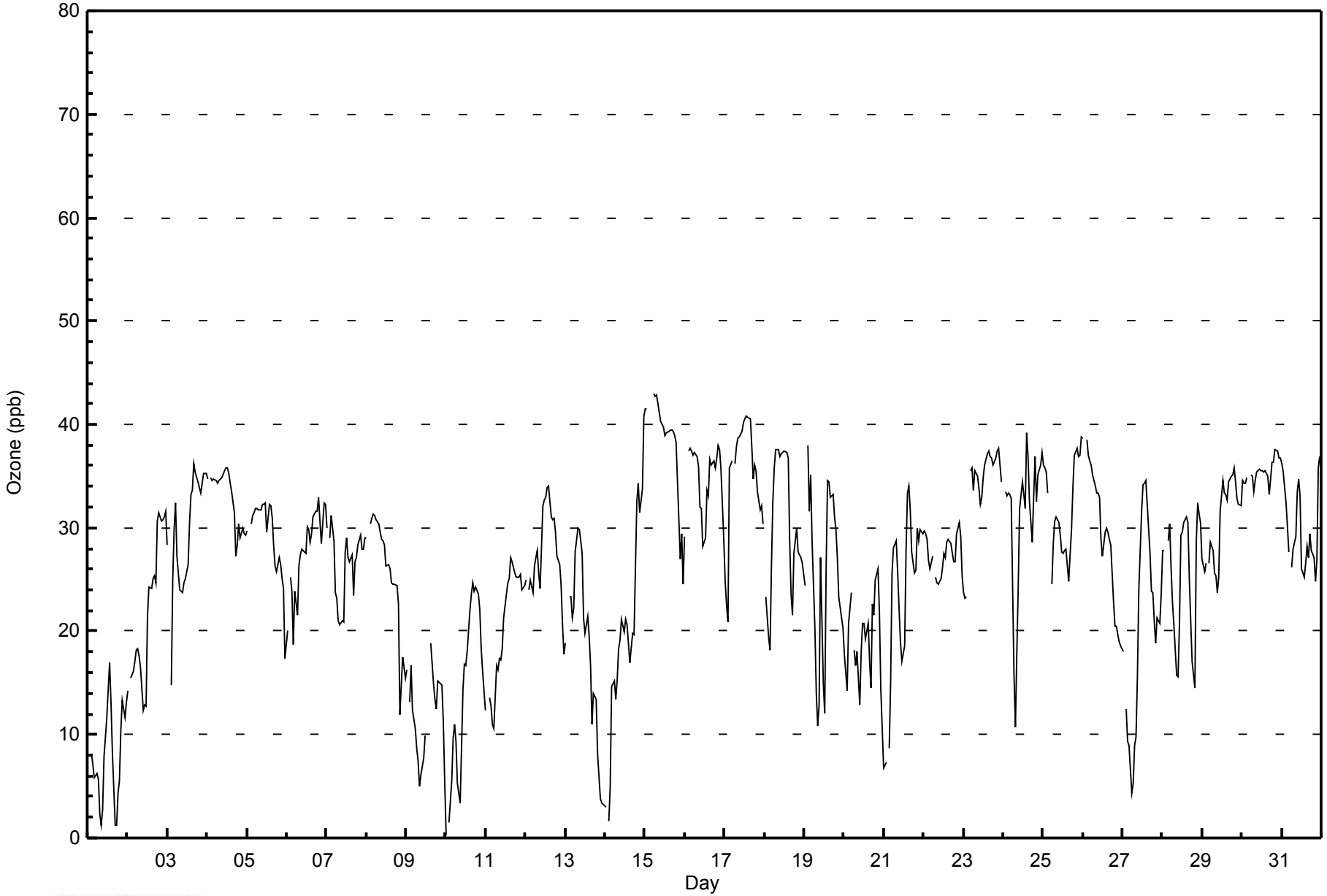
Z - zerospan C - Calibration PF - Power Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	166	23.45	23.45
21 - 50	542	76.55	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Ozone (O_3) - ppb

Anzac - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	6	3	0	4	4	11	36	24	10	7	8	2	5	11	16	16	163
21 - 50	11	3	2	6	14	24	73	22	11	15	8	13	30	119	103	88	542
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	6	2	10	18	35	109	46	21	22	16	15	35	130	119	104	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

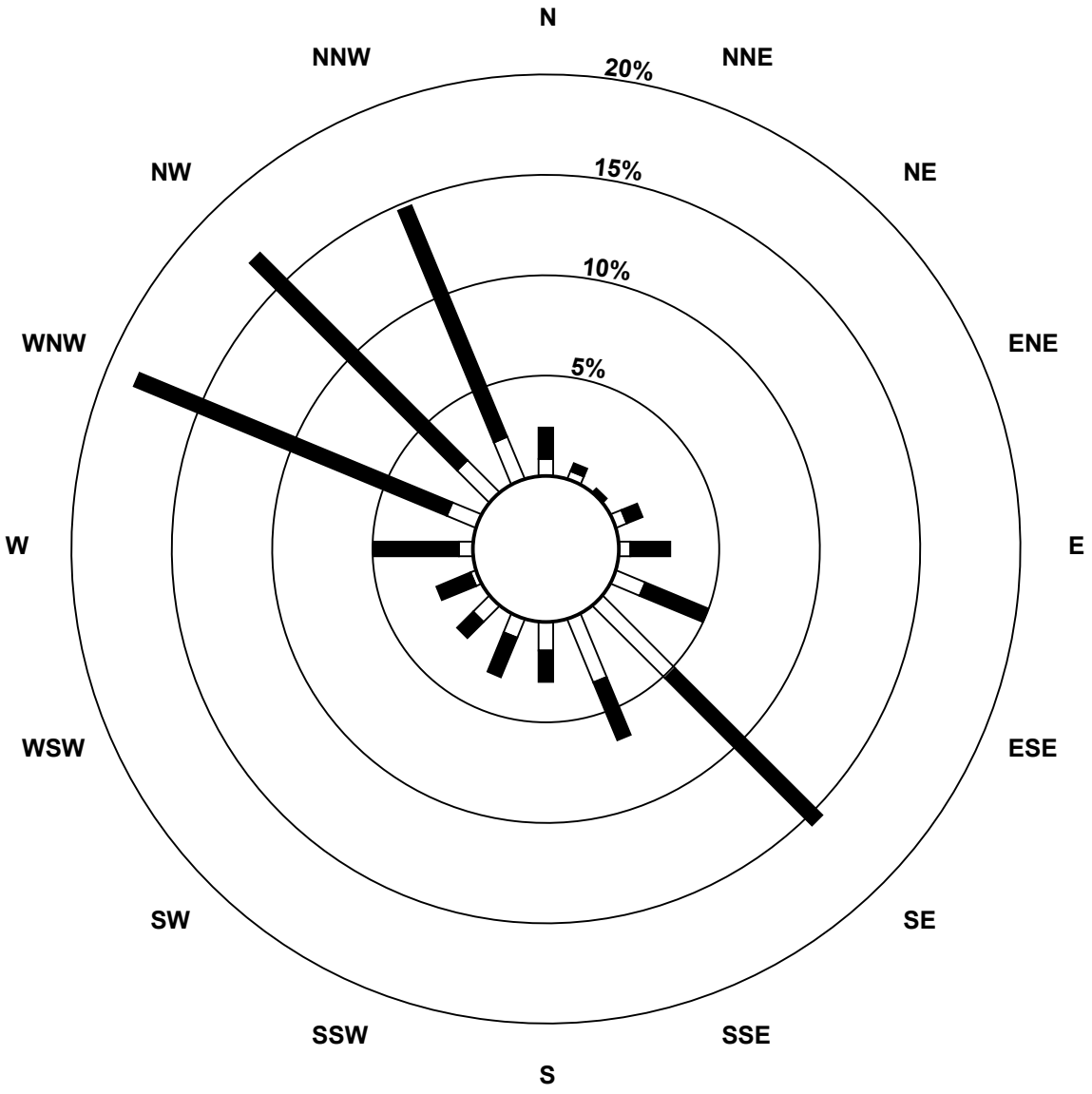
AURORA ATMOSPHERICS INC.

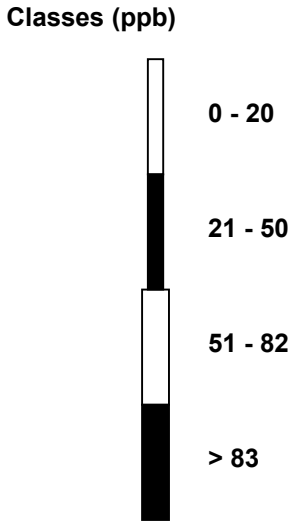
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ozone (O_3) - ppb

Anzac (AMS 14)





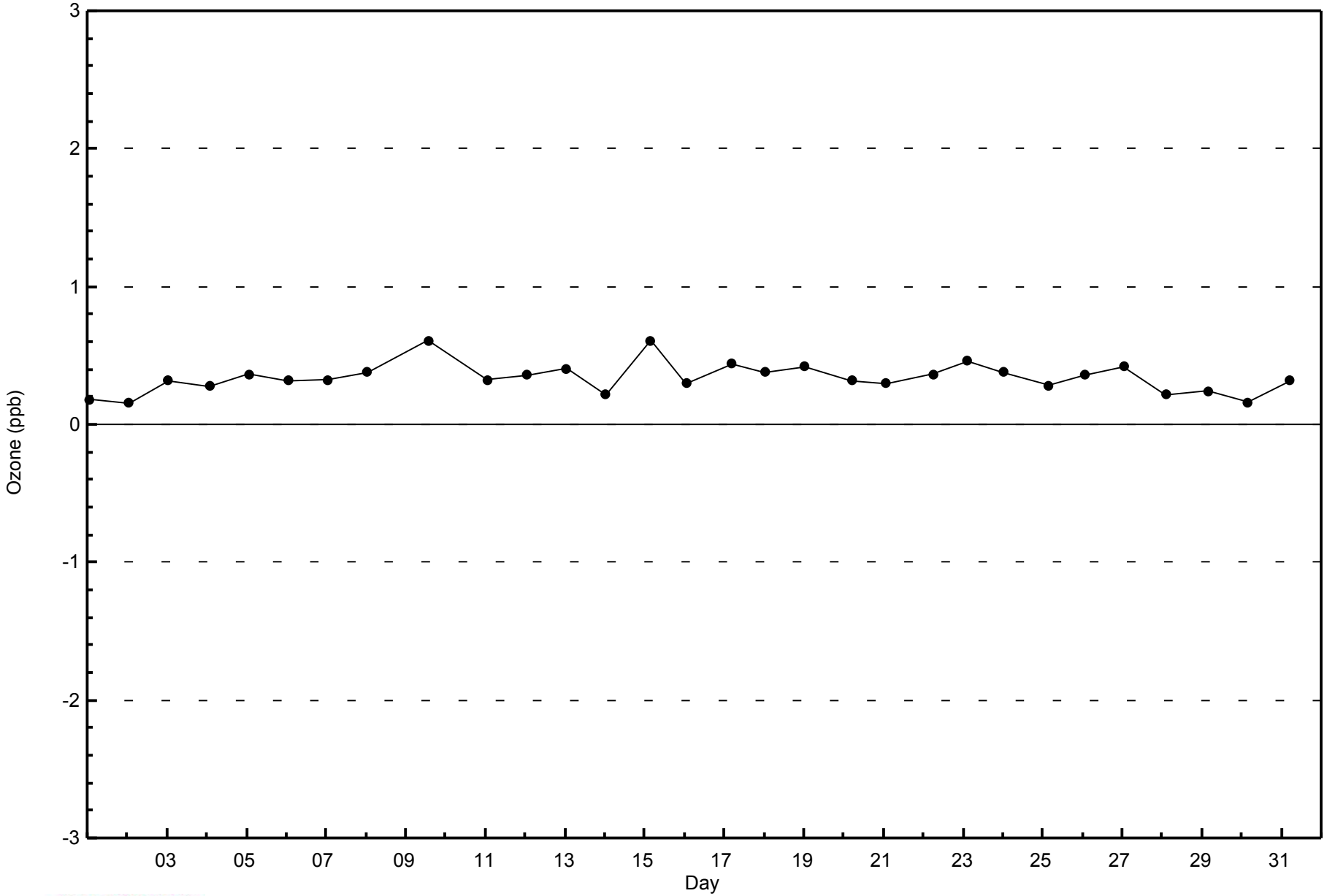
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Anzac - January 2014



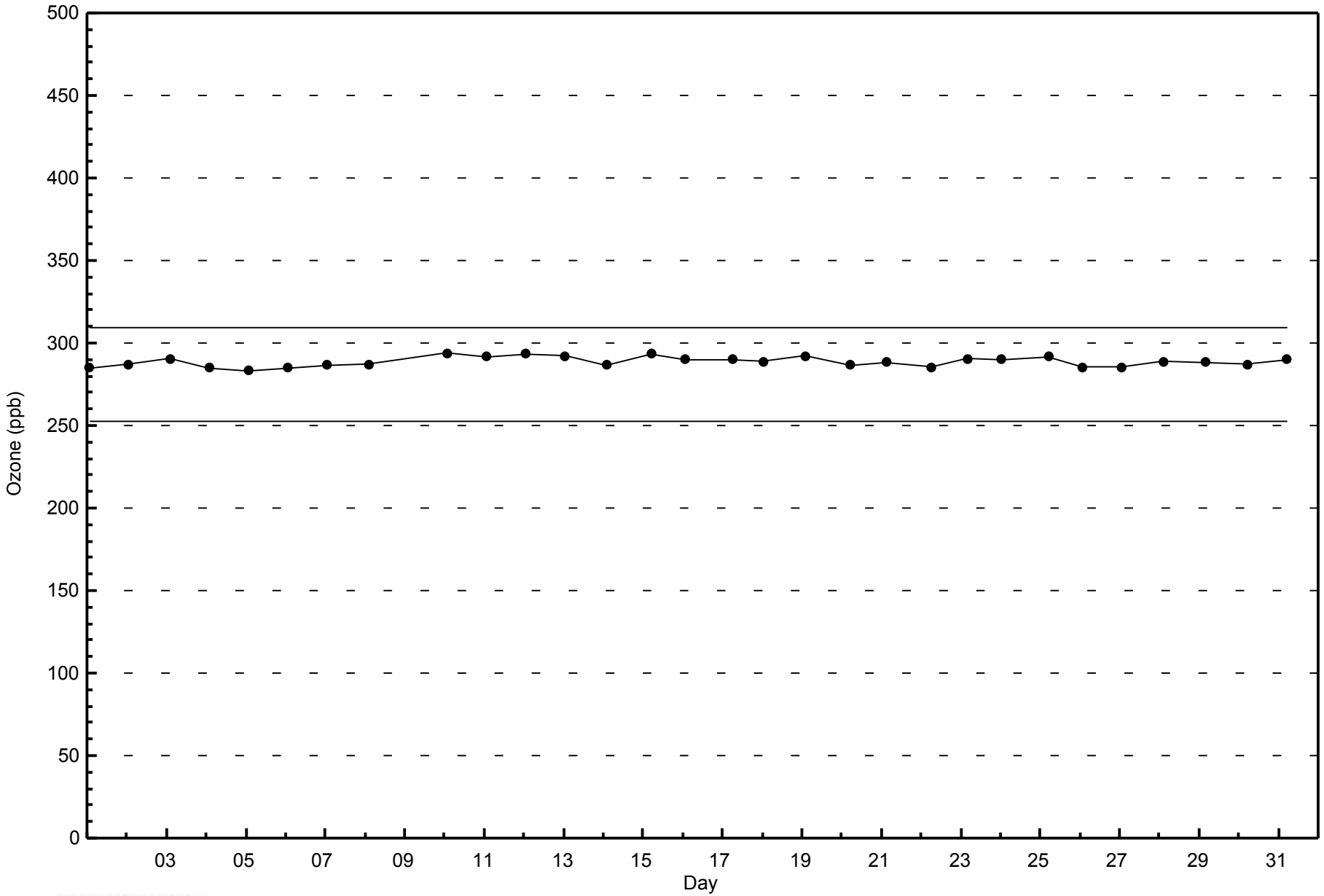
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Anzac - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 22.1 $\mu g/m^3$ on Jan 19 09:00

Maximum Daily Average: 10.6 $\mu g/m^3$ on Jan 9

Minimum Value: 0.6 $\mu g/m^3$ on Jan 24 15:00

Minimum Daily Average: 2.1 $\mu g/m^3$ on Jan 25

Maximum Diurnal Average: 4.9 $\mu g/m^3$ at hour 1

Minimum Diurnal Average: 3.5 $\mu g/m^3$ at hour 15

Monthly Average: 4.35 $\mu g/m^3$

Percentiles: P_1 = 0.9 P_{10} = 1.7 Q_1 = 2.4 Median = 3.4 Q_3 = 5.6 P_{90} = 8.0 P_{99} = 15.3

Hours in Service:	744
Hours of Data:	738
Hours of Missing Data:	6
Hours of Calibration:	0
Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	5.3	6.1	5.6	5.5	5.2	5.5	5.1	5.6	5.5	4.9	5.3	4.3	2.8	2.6	4.8	7.1	7.6	8.0	8.1	8.6	7.1	5.4	5.1	4.9	5.7	8.6
2-Jan	4.6	4.4	4.4	4.4	4.1	4.2	4.1	3.7	4.1	7.4	3.9	3.9	4.4	3.7	3.9	3.5	2.4	1.9	1.9	1.6	1.4	1.2	1.2	1.2	3.4	7.4
3-Jan	2.5	6.0	5.9	6.8	4.5	3.9	4.7	5.3	5.5	5.5	4.7	3.9	3.4	1.9	2.2	3.0	3.1	3.1	2.7	2.8	2.8	2.7	3.3	2.9	3.9	6.8
4-Jan	2.9	3.0	2.9	2.8	2.9	2.8	2.8	2.5	2.6	2.7	2.6	2.6	2.7	3.1	3.2	3.0	3.3	4.6	4.4	3.6	4.7	3.7	3.9	3.3	3.2	4.7
5-Jan	2.9	2.7	2.4	2.3	2.2	2.1	2.1	2.2	2.3	2.5	2.4	2.4	3.1	2.6	2.4	4.2	2.3	2.2	2.5	2.3	2.3	2.1	2.1	3.6	2.5	4.2
6-Jan	5.3	6.4	4.7	4.5	4.1	3.7	3.4	2.9	3.0	2.9	3.4	3.6	2.5	2.0	2.0	2.0	2.4	2.2	2.0	2.1	2.6	2.6	2.8	2.5	3.1	6.4
7-Jan	2.5	2.7	2.6	2.6	2.7	2.9	3.0	2.4	2.6	3.0	3.9	2.8	3.3	4.5	4.4	4.1	7.3	9.7	16.8	6.0	5.3	9.1	10.7	7.8	5.1	16.8
8-Jan	9.0	8.7	6.8	6.0	4.8	4.8	4.5	4.2	4.4	4.5	5.5	6.5	5.8	6.2	7.8	8.4	7.9	8.6	7.6	7.9	8.0	10.3	8.5	7.6	6.8	10.3
9-Jan	6.0	PF	5.4	7.3	11.0	15.2	14.2	13.8	13.7	12.9	12.7	12.9	10.2	10.4	7.8	8.4	9.6	9.6	8.7	7.7	7.4	8.6	14.0	15.4	10.6	15.4
10-Jan	15.9	12.5	11.7	11.0	8.8	8.4	8.3	8.2	9.2	M	M	8.1	7.8	6.0	3.5	2.6	3.2	2.8	2.7	2.8	3.3	3.9	2.9	2.5	6.6	15.9
11-Jan	4.5	5.7	4.1	5.3	7.2	9.6	5.6	5.8	6.1	4.8	4.2	3.2	3.1	3.1	3.2	2.2	1.8	2.2	2.0	2.1	2.8	2.8	2.6	2.4	4.0	9.6
12-Jan	1.9	2.0	1.7	1.7	1.9	2.1	2.2	2.0	2.9	4.5	2.4	1.9	1.3	1.4	1.9	1.8	1.5	1.7	2.0	3.9	8.5	9.2	15.2	18.5	3.9	18.5
13-Jan	15.6	11.7	7.0	4.3	3.6	4.5	4.0	2.6	2.3	2.1	2.1	4.4	4.2	3.9	4.2	5.8	6.8	5.9	8.0	7.8	10.1	8.3	5.7	5.7	5.9	15.6
14-Jan	5.5	4.3	4.2	3.5	5.8	5.3	5.1	4.6	3.9	4.6	4.7	5.3	4.1	3.6	4.6	4.7	3.3	2.1	1.5	1.3	1.3	1.2	1.2	1.3	3.6	5.8
15-Jan	1.3	1.3	PF	PF	1.1	1.0	1.0	1.2	1.5	2.0	1.8	1.9	1.9	1.6	1.6	1.6	1.6	1.7	1.8	1.8	5.3	10.3	5.2	6.0	2.5	10.3
16-Jan	7.3	2.9	2.6	2.1	1.9	1.8	1.7	1.7	1.9	4.4	3.0	3.3	10.3	3.1	3.2	3.0	3.1	3.2	4.6	5.2	3.7	3.3	2.9	2.6	3.4	10.3
17-Jan	2.4	2.5	2.7	2.5	2.1	2.1	2.2	2.2	2.2	2.1	1.9	1.8	2.0	1.6	1.5	1.5	2.2	6.0	2.8	1.9	2.0	2.2	2.3	2.5	2.3	6.0
18-Jan	2.0	2.0	2.6	2.5	2.2	2.4	2.9	3.8	4.1	3.9	3.9	3.7	3.8	4.4	5.2	5.5	4.6	5.1	3.8	3.4	3.4	3.4	3.4	3.4	3.6	5.5
19-Jan	4.1	4.6	4.3	7.2	4.9	7.1	12.3	19.7	22.1	16.9	6.2	10.5	12.9	4.1	4.3	4.7	4.7	4.7	5.8	6.2	7.5	7.8	8.2	7.6	8.3	22.1
20-Jan	7.7	8.2	7.8	6.3	5.7	5.7	5.5	5.5	5.2	6.6	7.0	5.9	5.8	4.9	4.5	4.4	4.1	3.3	3.2	3.2	3.2	4.1	6.7	6.6	5.5	8.2
21-Jan	7.6	7.8	7.3	7.7	6.3	4.2	2.9	2.5	2.8	3.7	6.7	7.1	6.1	3.7	2.3	1.7	1.8	2.3	2.4	2.7	3.3	3.1	2.7	2.8	4.2	7.8
22-Jan	2.5	2.4	2.7	3.6	3.6	3.4	3.4	3.8	3.0	2.9	2.7	3.0	3.6	3.8	2.7	2.8	2.7	2.9	2.7	3.5	3.6	4.0	4.3	4.7	3.3	4.7
23-Jan	4.9	5.2	5.1	3.9	2.8	2.5	2.5	2.8	2.8	3.2	M	2.9	2.8	2.4	2.2	2.1	2.8	3.2	3.7	3.0	3.2	3.3	2.6	2.1	3.1	5.2
24-Jan	1.9	2.0	2.3	2.3	2.5	3.0	6.3	6.4	5.8	4.3	3.1	2.2	1.9	1.3	0.6	0.7	1.2	2.4	2.0	1.3	2.7	1.5	1.4	1.4	2.5	6.4
25-Jan	1.0	1.1	1.1	1.2	1.4	1.6	2.5	2.3	2.3	2.2	2.7	2.6	2.3	2.8	3.4	5.5	2.4	1.6	1.2	1.4	1.2	1.8	2.5	1.5	2.1	5.5
26-Jan	2.1	2.2	3.1	3.9	5.6	7.0	7.6	8.3	8.0	9.0	7.6	7.3	8.8	7.3	6.4	6.4	7.3	7.4	8.5	9.0	9.3	8.9	8.0	7.0	6.9	9.3
27-Jan	6.2	6.0	6.2	6.2	6.8	7.0	7.0	5.8	5.9	5.2	3.2	1.7	0.9	1.3	0.6	0.8	1.3	4.1	6.9	6.4	5.3	6.5	9.6	12.1	5.1	12.1
28-Jan	8.2	6.1	3.2	3.1	3.5	4.2	5.1	5.6	6.7	7.1	8.8	9.7	7.9	7.7	6.8	5.6	6.1	6.7	7.2	6.5	3.4	2.9	3.8	6.2	5.9	9.7
29-Jan	5.0	5.9	5.5	5.1	4.3	4.0	4.0	4.5	4.7	4.5	3.8	2.2	1.6	1.5	1.3	1.0	0.9	0.9	0.9	1.0	0.9	1.6	1.7	2.3	2.9	5.9
30-Jan	1.9	1.8	1.9	1.9	1.6	1.9	2.6	2.7	2.0	1.6	1.5	1.4	1.4	1.5	1.6	2.3	2.6	3.2	3.5	3.2	3.6	3.0	3.7	2.8	2.3	3.7
31-Jan	3.2	3.6	3.0	2.5	2.5	3.5	4.1	2.4	2.5	2.0	1.9	1.9	2.8	2.5	3.5	4.0	3.9	2.5	2.6	2.9	2.8	2.7	1.5	1.1	2.7	4.1
	4.9	4.7	4.4	4.3	4.1	4.4	4.6	4.7	4.9	4.8	4.3	4.4	4.4	3.6	3.5	3.7	3.7	4.1	4.3	4.0	4.3	4.6	4.8	4.9	Diurnal Average	
	15.9	12.5	11.7	11.0	11.0	15.2	14.2	19.7	22.1	16.9	12.7	12.9	12.9	10.4	7.8	8.4	9.6	9.7	16.8	9.0	10.1	10.3	15.2	18.5	Diurnal Maximum	

M - Maintenance PF - Power Failure

Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

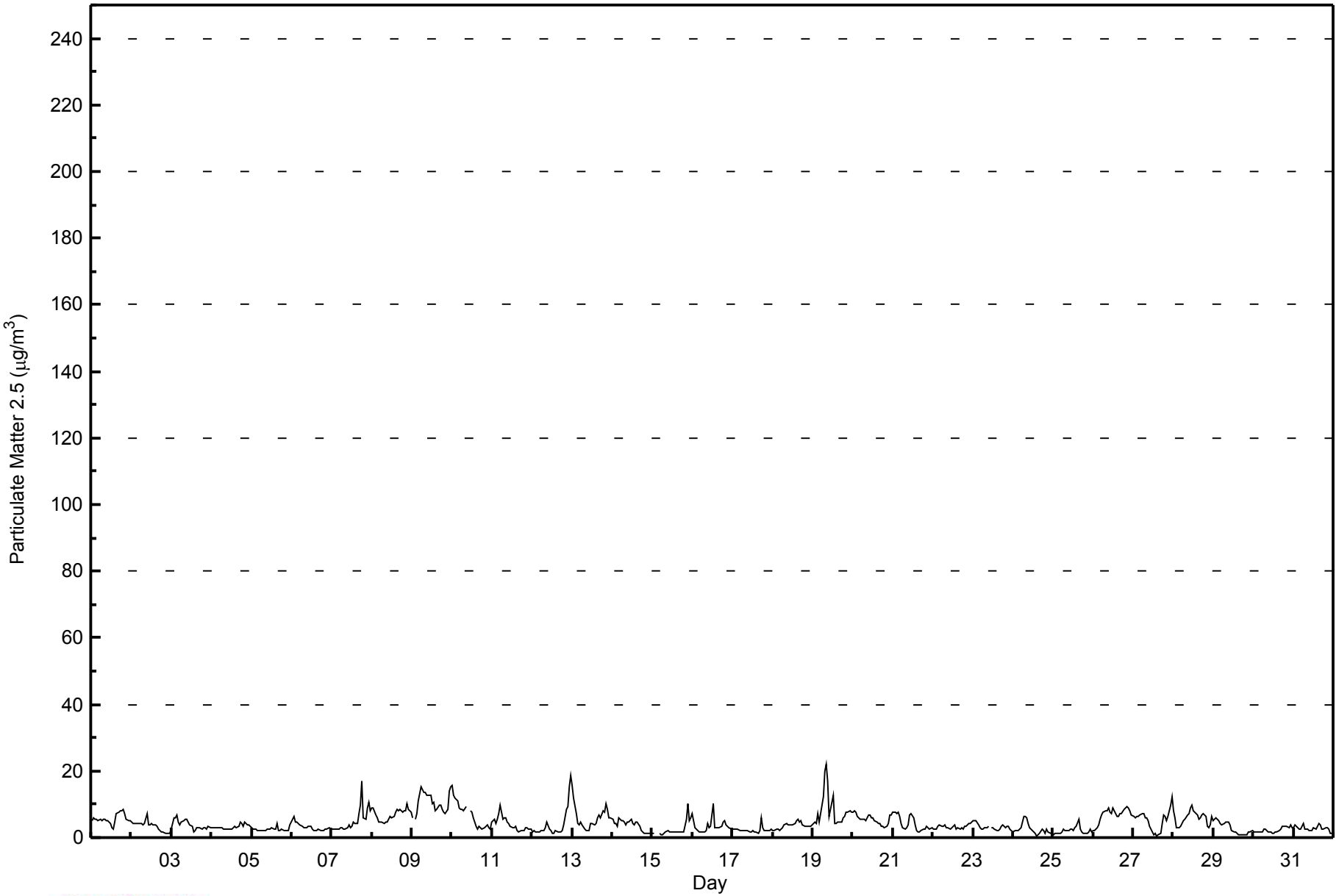
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

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

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	533	72.22	72.22
6 - 15	187	25.34	97.56
16 - 25	7	0.95	98.51
26 - 80	0	0.00	98.51
> 81.0	0	0.00	98.51

Total Number of Valid Hours: 738

Total Number of Hours: 744

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

Anzac - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	11	3	2	8	17	28	83	29	12	17	9	12	31	114	93	64	533
6 - 15	5	3	0	3	3	6	31	19	11	5	7	3	5	17	30	36	184
16 - 25	1	1	0	0	0	2	1	0	0	0	0	0	0	2	0	0	7
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	7	2	11	20	36	115	48	23	22	16	15	36	133	123	100	724

Total Number of Valid Hours: 735

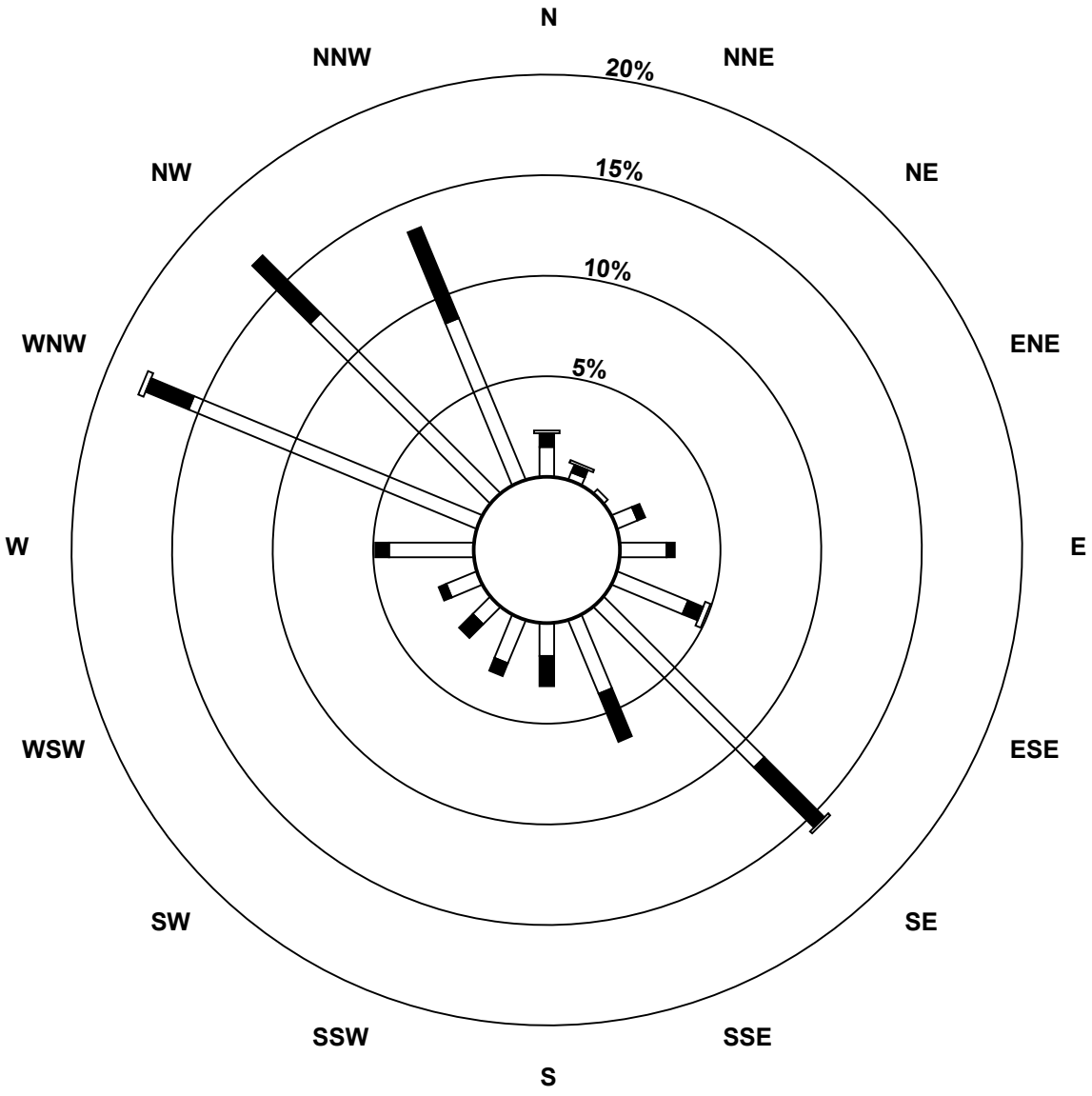
Total Number of Hours: 744

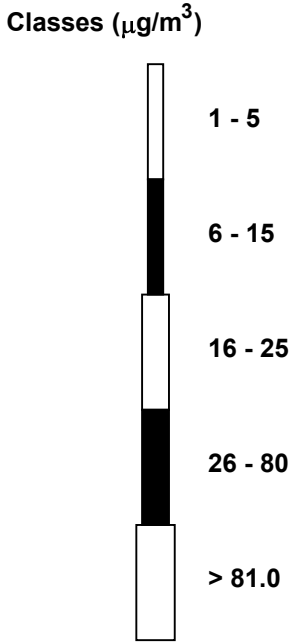
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Anzac (AMS 14)





Total Number of Valid Hours: 735

Summary of Hour Averages

Anzac - January 2014

Maximum Value: 6.5 C on Jan 15 02:00

Maximum Daily Average: 2.2 C on Jan 15

Minimum Value: -35.0 C on Jan 1 08:00

Minimum Daily Average: -30.0 C on Jan 5

Maximum Diurnal Average: -11.9 C at hour 15

Minimum Diurnal Average: -17.0 C at hour 2

Monthly Average: -14.89 C

Percentiles: P_1 = -33.8 P_{10} = -28.0 Q_1 = -23.7 Median = -15.3 Q_3 = -7.4 P_{90} = 1.4 P_{99} = 5.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-33.0	-33.6	-33.8	-33.7	-34.3	-34.3	-34.5	-35.0	-35.0	-34.9	-32.0	-27.5	-23.6	-22.0	-23.9	-26.4	-28.5	-29.0	-28.4	-27.7	-25.3	-23.2	-22.8	-22.3	-29.4	-22.0
2-Jan	-21.3	-20.6	-19.5	-18.5	-17.7	-16.4	-14.9	-13.6	-12.3	-10.7	-10.3	-9.0	-5.5	-4.5	-4.6	-4.4	-5.1	-6.0	-5.0	-4.0	-4.3	-4.7	-5.2	-5.8	-10.2	-4.0
3-Jan	-7.1	-10.8	-13.3	-15.3	-18.3	-20.6	-22.2	-23.7	-24.7	-25.2	-24.2	-22.7	-21.0	-20.8	-20.8	-21.4	-22.0	-22.5	-22.9	-23.6	-24.4	-25.1	-25.6	-26.4	-21.0	-7.1
4-Jan	-27.2	-27.8	-27.9	-28.1	-28.3	-28.5	-29.0	-28.4	-28.0	-28.1	-27.7	-27.3	-27.0	-27.0	-28.0	-29.9	-31.2	-31.8	-31.9	-32.3	-32.6	-32.9	-33.0	-33.1	-29.4	-27.0
5-Jan	-32.5	-32.4	-32.7	-32.7	-32.7	-32.2	-31.8	-31.6	-31.7	-31.5	-30.3	-29.0	-27.8	-27.2	-27.3	-27.5	-28.8	-29.9	-29.5	-28.5	-28.1	-28.3	-29.0	-28.2	-30.0	-27.2
6-Jan	-28.2	-28.2	-27.6	-27.0	-26.5	-26.3	-25.9	-25.7	-25.2	-24.7	-24.1	-23.7	-22.7	-21.6	-20.6	-21.0	-21.8	-22.6	-23.8	-24.7	-25.2	-25.8	-26.5	-27.0	-24.8	-20.6
7-Jan	-26.5	-26.2	-26.0	-26.3	-28.0	-29.6	-30.4	-30.8	-31.5	-31.4	-27.9	-23.3	-21.1	-20.4	-20.7	-22.2	-23.7	-24.1	-23.9	-23.4	-23.2	-23.4	-23.1	-22.7	-25.4	-20.4
8-Jan	-22.5	-21.9	-20.4	-19.3	-17.8	-17.4	-16.4	-16.0	-15.3	-14.7	-13.8	-11.9	-10.3	-9.6	-9.1	-9.0	-8.8	-8.5	-8.1	-8.0	-8.9	-9.1	-8.8	-8.6	-13.1	-8.0
9-Jan	-8.2	PF	-10.5	-10.3	-11.8	-12.7	-14.7	-14.5	-14.4	-13.8	-12.4	-10.1	-8.3	-7.7	-7.4	-7.4	-7.7	-7.9	-7.7	-7.8	-8.3	-8.4	-9.0	-9.0	-10.0	-7.4
10-Jan	-9.5	-10.0	-10.8	-11.2	-11.9	-12.9	-13.9	-13.7	-13.2	-12.8	-12.0	-11.6	-11.0	-10.8	-11.1	-11.5	-12.3	-12.7	-12.8	-13.3	-13.7	-14.5	-16.8	-17.5	-12.6	-9.5
11-Jan	-18.5	-18.7	-16.2	-14.4	-13.8	-13.6	-13.8	-13.7	-13.6	-13.8	-13.3	-12.5	-11.7	-11.1	-10.5	-10.2	-10.3	-10.8	-10.9	-11.2	-11.6	-11.9	-11.9	-12.1	-12.9	-10.2
12-Jan	-12.2	-13.6	-16.6	-18.3	-19.4	-19.9	-20.0	-20.4	-20.7	-20.4	-20.1	-19.6	-19.0	-18.7	-17.5	-18.1	-20.8	-21.6	-22.1	-21.0	-20.9	-20.3	-19.0	-18.4	-19.1	-12.2
13-Jan	-17.4	-16.2	-15.0	-13.8	-13.3	-11.6	-9.8	-9.3	-9.5	-9.8	-10.6	-12.7	-13.0	-12.3	-12.6	-13.6	-15.5	-17.1	-18.5	-20.7	-22.7	-23.1	-23.7	-25.0	-15.3	-9.3
14-Jan	-25.9	-26.8	-26.6	-26.2	-23.8	-22.9	-21.8	-19.8	-16.7	-15.1	-13.4	-12.2	-10.2	-8.2	-7.7	-7.8	-6.9	-6.3	-4.5	-1.3	0.5	0.4	1.5	4.8	-12.4	4.8
15-Jan	5.9	6.5	6.4	4.0	3.6	4.2	4.4	4.2	3.7	2.4	2.7	2.2	2.0	3.0	3.6	3.3	2.4	1.9	1.2	0.5	-1.4	-3.4	-4.6	-6.0	2.2	6.5
16-Jan	-5.4	-3.4	-2.7	-2.7	-2.5	-2.4	-1.9	-1.7	-2.2	-2.5	-1.9	-1.5	0.2	0.7	0.9	1.2	1.2	1.5	1.4	1.5	1.6	1.7	1.4	0.3	-0.7	1.7
17-Jan	-1.5	-2.2	-1.8	1.7	2.4	2.2	2.7	3.1	2.9	2.8	4.0	4.8	5.3	5.6	5.8	5.2	4.0	2.5	0.1	-2.5	-4.0	-5.5	-7.0	-8.2	0.9	5.8
18-Jan	-9.0	-9.1	-8.7	-8.2	-6.0	-2.4	-0.1	1.7	2.3	2.2	2.9	4.2	4.7	5.1	5.7	2.0	-1.2	-2.6	-2.3	-1.5	-2.0	-2.2	-3.5	-3.8	-1.3	5.7
19-Jan	-5.0	-6.4	1.4	-1.3	-1.0	-2.8	-6.5	-8.4	-9.5	-8.2	-3.4	-6.8	-8.5	-11.1	-14.6	-17.7	-20.0	-21.4	-22.7	-23.5	-24.4	-25.3	-25.9	-26.1	-12.5	1.4
20-Jan	-26.8	-27.3	-27.2	-26.5	-26.0	-26.3	-25.9	-25.1	-22.5	-21.7	-20.1	-17.7	-14.6	-13.3	-12.3	-11.2	-11.0	-11.1	-11.1	-10.9	-11.2	-12.5	-12.9	-13.2	-18.3	-10.9
21-Jan	-13.6	-13.6	-13.9	-14.4	-14.8	-11.7	-10.1	-9.5	-10.3	-11.4	-12.6	-13.4	-13.5	-13.6	-14.0	-14.7	-16.9	-19.6	-21.8	-22.6	-21.3	-21.1	-22.1	-22.7	-15.6	-9.5
22-Jan	-22.9	-23.4	-23.7	-24.0	-24.5	-24.4	-24.8	-24.8	-24.8	-24.3	-21.9	-19.0	-17.1	-15.1	-13.6	-13.3	-14.2	-14.9	-15.5	-13.7	-10.9	-8.8	-7.7	-9.3	-18.2	-7.7
23-Jan	-10.0	-9.9	-9.5	-2.7	-0.3	0.2	-0.4	0.7	0.5	0.0	-0.2	0.9	2.7	3.6	4.0	3.5	2.1	1.9	1.9	2.0	2.4	3.1	3.6	3.7	0.1	4.0
24-Jan	4.3	4.9	4.9	5.0	4.8	4.5	2.5	1.0	0.0	-0.9	-1.6	-2.1	-2.8	-3.2	-3.4	-3.5	-4.2	-4.6	-4.8	-4.7	-4.5	-4.3	-4.1	-4.1	-0.9	5.0
25-Jan	-3.8	-3.6	-4.1	-4.5	-5.5	-5.0	0.7	2.5	2.5	2.3	2.0	-1.6	-2.9	-3.9	-4.5	-5.3	-6.3	-6.9	-7.8	-9.5	-11.3	-12.4	-14.2	-17.2	-5.0	2.5
26-Jan	-18.9	-20.6	-22.2	-23.6	-24.9	-25.9	-26.7	-27.7	-28.3	-28.0	-27.2	-26.5	-25.6	-25.0	-24.5	-24.6	-24.8	-25.0	-26.5	-28.1	-28.7	-29.4	-30.2	-30.4	-26.0	-18.9
27-Jan	-31.1	-31.7	-32.0	-32.5	-32.6	-32.9	-32.8	-33.0	-32.9	-30.9	-25.5	-20.5	-18.2	-16.4	-15.2	-15.6	-18.8	-20.6	-20.4	-20.3	-19.5	-19.6	-19.1	-18.9	-24.6	-15.2
28-Jan	-17.9	-17.3	-14.5	-14.8	-14.1	-14.1	-16.1	-16.0	-19.2	-18.9	-14.1	-9.1	-9.3	-8.9	-8.8	-9.7	-11.1	-12.3	-13.2	-13.7	-15.4	-18.6	-20.8	-22.0	-14.6	-8.8
29-Jan	-23.3	-23.9	-24.3	-24.4	-24.4	-23.9	-23.8	-23.2	-23.0	-22.8	-22.4	-22.1	-21.8	-22.3	-23.0	-24.5	-25.4	-25.6	-25.4	-25.0	-24.6	-24.5	-24.6	-24.7	-23.9	-21.8
30-Jan	-24.7	-24.8	-25.1	-24.5	-24.5	-24.1	-24.0	-23.9	-23.6	-23.3	-22.5	-20.8	-19.4	-18.5	-17.9	-17.8	-18.6	-17.9	-16.5	-16.1	-14.9	-15.0	-15.5	-16.0	-20.4	-14.9
31-Jan	-16.9	-17.9	-18.0	-18.0	-18.4	-18.8	-19.2	-19.0	-18.7	-17.6	-16.6	-16.3	-16.0	-15.9	-15.7	-15.7	-15.9	-16.2	-16.3	-16.4	-16.5	-16.3	-16.0	-15.9	-17.0	-15.7
	-16.5	-17.0	-16.5	-16.3	-16.3	-16.2	-16.2	-16.0	-16.0	-15.7	-14.5	-13.5	-12.5	-12.0	-11.9	-12.5	-13.6	-14.3	-14.5	-14.6	-14.7	-15.0	-15.4	-15.7	Diurnal Average	
	5.9	6.5	6.4	5.0	4.8	4.5	4.4	4.2	3.7	2.8	4.0	4.8	5.3	5.6	5.8	5.2	4.0	2.5	1.9	2.0	2.4	3.1	3.6	4.8	Diurnal Maximum	

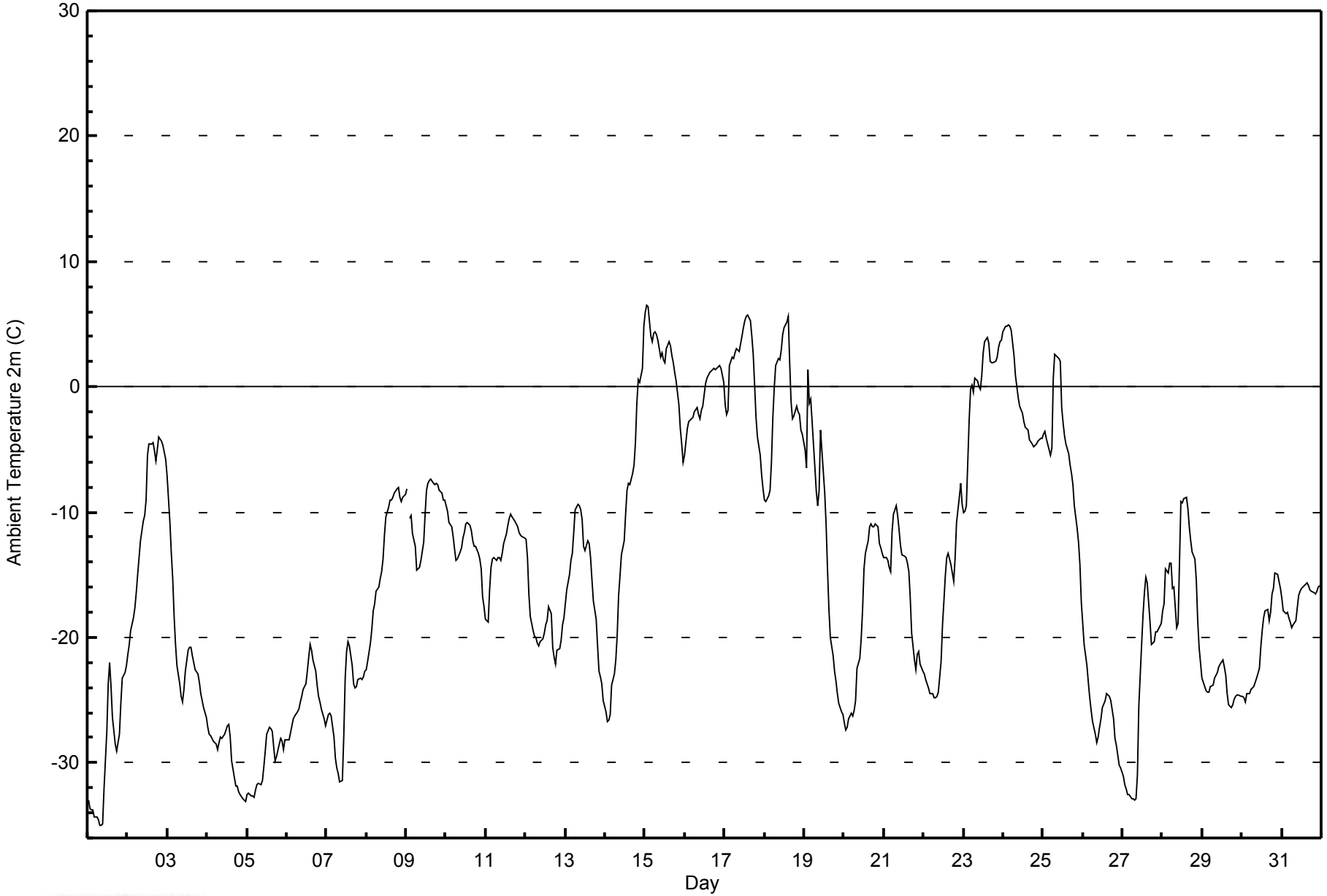
PF - Power Failure

WBEA NETWORK

Hourly Averages

Ambient Temperature 2m (AT 2m) - C

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	278	37.42	37.42
-20 - 0	372	50.07	87.48
0 - 10	93	12.52	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Maximum Value: 24 % on Jan 14 22:00 — Maximum Daily Average: 2.7 % on Jan 14

Minimum Value: 0 % on Jan 1 01:00 — Minimum Daily Average: 0.0 % on Jan 1

Maximum Diurnal Average: 0.8 % at hour 22 — Minimum Diurnal Average: 0.0 % at hour 2

Monthly Average: 0.1 % — Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 4$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	24	19	11	2.7	24
15-Jan	4	0	PF	PF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	4
16-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	6
20-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	0	0	0	0	0	0	0	0	0	5	4	4	3	0	0	0	0	0	0	4	4	1.0	5
24-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	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-Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
31-Jan	0	0	0	0	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	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.8	0.7	0.5	Diurnal Average	
	4	0	6	0	0	0	0	0	0	0	0	0	5	4	4	3	0	0	0	0	11	24	19	11	Diurnal Maximum	

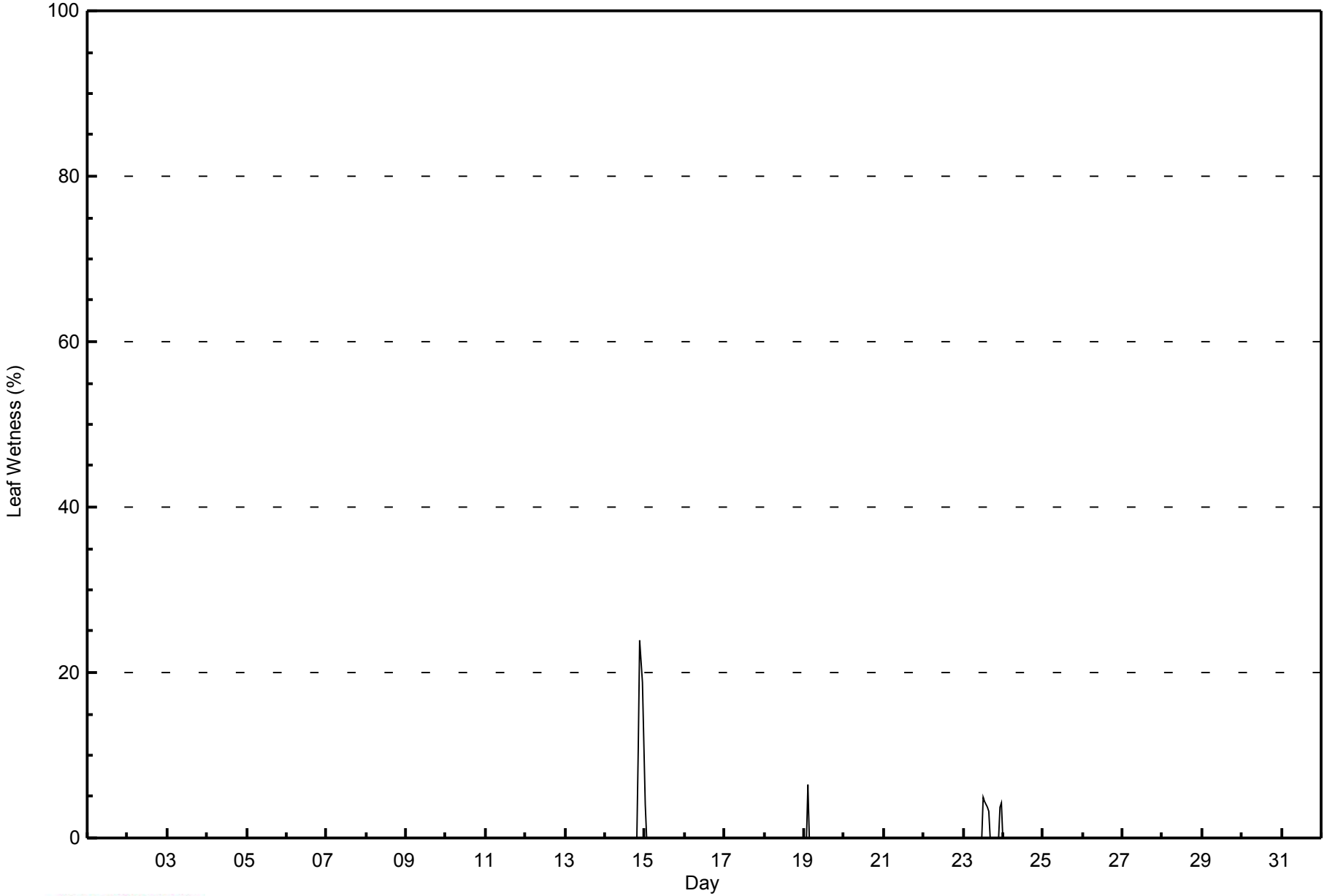
PF - Power Failure

WBEA NETWORK

Hourly Averages

Leaf Wetness (SW) - %

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	730	98.38	98.38
0.4 - 0.5	0	0.00	98.38
0.6 - 0.7	0	0.00	98.38
0.8 - 1.4	0	0.00	98.38
1.5 - 10	8	1.08	99.46
> 10	4	0.54	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Anzac - January 2014

Maximum Value: 95 % on Jan 14 19:00

Maximum Daily Average: 89.6 % on Jan 9

Minimum Value: 43 % on Jan 27 15:00

Minimum Daily Average: 58.0 % on Jan 28

Maximum Diurnal Average: 78.3 % at hour 24

Minimum Diurnal Average: 70.5 % at hour 15

Monthly Average: 75.8 %

Percentiles: P_1 = 47 P_{10} = 62 Q_1 = 70 Median = 77 Q_3 = 83 P_{90} = 88 P_{99} = 92

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	71	70	70	71	71	69	70	69	69	69	68	64	63	65	70	70	72	73	75	76	77	77	77	78	71.0	78
2-Jan	78	79	80	81	81	83	85	86	86	87	88	88	91	90	85	83	84	84	82	79	80	81	82	83	83.6	91
3-Jan	86	88	88	85	81	77	78	78	78	78	75	72	71	72	72	76	76	75	76	76	77	77	75	76	77.7	88
4-Jan	75	75	75	74	74	74	74	74	73	73	73	72	71	69	70	69	68	71	70	69	70	70	70	70	71.9	75
5-Jan	69	69	69	70	70	70	70	71	72	72	70	67	65	65	68	70	71	72	73	74	73	73	73	73	70.3	74
6-Jan	73	73	73	73	74	73	73	73	75	75	75	76	76	76	76	77	78	78	78	77	77	76	76	76	75.2	78
7-Jan	76	75	75	75	74	74	73	72	72	73	74	72	70	69	70	74	78	78	77	77	78	78	78	77	74.6	78
8-Jan	77	77	78	80	81	81	82	83	83	84	83	77	74	78	82	83	87	89	89	89	90	93	92	92	83.5	93
9-Jan	92	PF	91	92	90	88	86	87	87	86	87	87	87	88	88	90	90	91	91	92	92	92	94	92	89.6	94
10-Jan	90	90	89	88	88	87	87	87	87	87	86	85	85	85	86	86	86	86	85	85	86	87	85	85	86.5	90
11-Jan	84	84	86	86	87	87	87	87	87	87	87	87	88	89	89	89	89	88	88	88	88	88	88	88	87.3	89
12-Jan	88	86	84	83	82	82	82	81	81	81	79	77	77	77	73	73	80	80	81	81	81	82	82	82	80.7	88
13-Jan	84	85	86	86	86	90	91	90	89	88	87	85	85	83	84	84	85	84	83	81	79	79	80	79	84.8	91
14-Jan	78	77	77	78	82	80	81	86	86	86	87	87	89	88	89	90	92	93	95	92	92	95	87	73	85.8	95
15-Jan	68	65	65	73	69	62	56	52	54	67	63	71	75	60	53	50	51	52	54	57	63	71	75	80	62.8	80
16-Jan	77	67	64	63	62	61	60	59	62	63	63	63	58	57	58	58	59	59	60	61	64	66	68	73	62.7	77
17-Jan	80	82	83	80	77	77	74	71	69	69	65	62	61	59	58	58	61	65	75	81	81	80	82	85	72.3	85
18-Jan	87	88	88	89	90	85	77	71	70	70	67	61	58	56	54	67	80	84	83	82	84	84	88	88	77.1	90
19-Jan	90	91	70	72	81	78	77	83	87	85	72	80	84	83	80	78	73	68	69	70	73	74	76	77	78.0	91
20-Jan	75	75	77	76	73	74	74	74	74	75	74	71	71	73	75	77	80	81	83	82	81	80	79	82	76.6	83
21-Jan	83	84	83	84	87	86	85	83	85	85	84	82	79	74	67	64	71	78	79	79	81	80	79	79	80.0	87
22-Jan	78	78	78	78	78	78	77	77	77	76	75	73	70	67	67	69	75	79	83	84	82	81	83	89	77.2	89
23-Jan	90	91	92	79	71	70	72	68	68	70	72	70	64	61	60	62	68	71	73	74	73	72	73	73	72.4	92
24-Jan	72	71	72	72	73	74	80	83	85	87	86	84	81	79	76	75	80	82	83	82	83	82	82	81	79.4	87
25-Jan	81	82	84	87	89	91	81	72	71	72	71	80	83	82	81	84	85	81	77	75	73	61	64	57	77.7	91
26-Jan	59	64	66	67	64	66	68	71	72	68	63	63	63	62	58	59	57	60	66	70	72	73	72	72	65.6	73
27-Jan	72	72	73	72	71	72	71	71	72	72	68	56	51	46	43	43	54	62	59	60	57	61	63	63	62.7	73
28-Jan	59	59	48	47	45	46	53	55	64	65	56	49	49	46	45	48	59	62	68	72	75	72	73	74	58.0	75
29-Jan	76	78	78	78	78	78	78	79	79	78	78	75	72	67	68	67	69	71	73	75	74	75	75	76	74.9	79
30-Jan	76	76	76	76	76	77	78	78	78	77	76	70	67	64	64	65	66	68	65	64	59	60	68	78	71.0	78
31-Jan	80	82	81	81	82	83	83	82	82	81	80	78	76	76	76	76	78	80	82	83	83	82	78	78	80.2	83
	78.2	77.9	77.4	77.3	77.0	76.6	76.2	75.9	76.7	77.1	75.2	73.8	72.7	71.2	70.5	71.4	74.3	75.6	76.7	77.0	77.4	77.4	78.0	78.3	Diurnal Average	
	92	91	92	92	90	91	91	90	89	88	88	88	91	90	89	90	92	93	95	92	92	95	94	92	Diurnal Maximum	

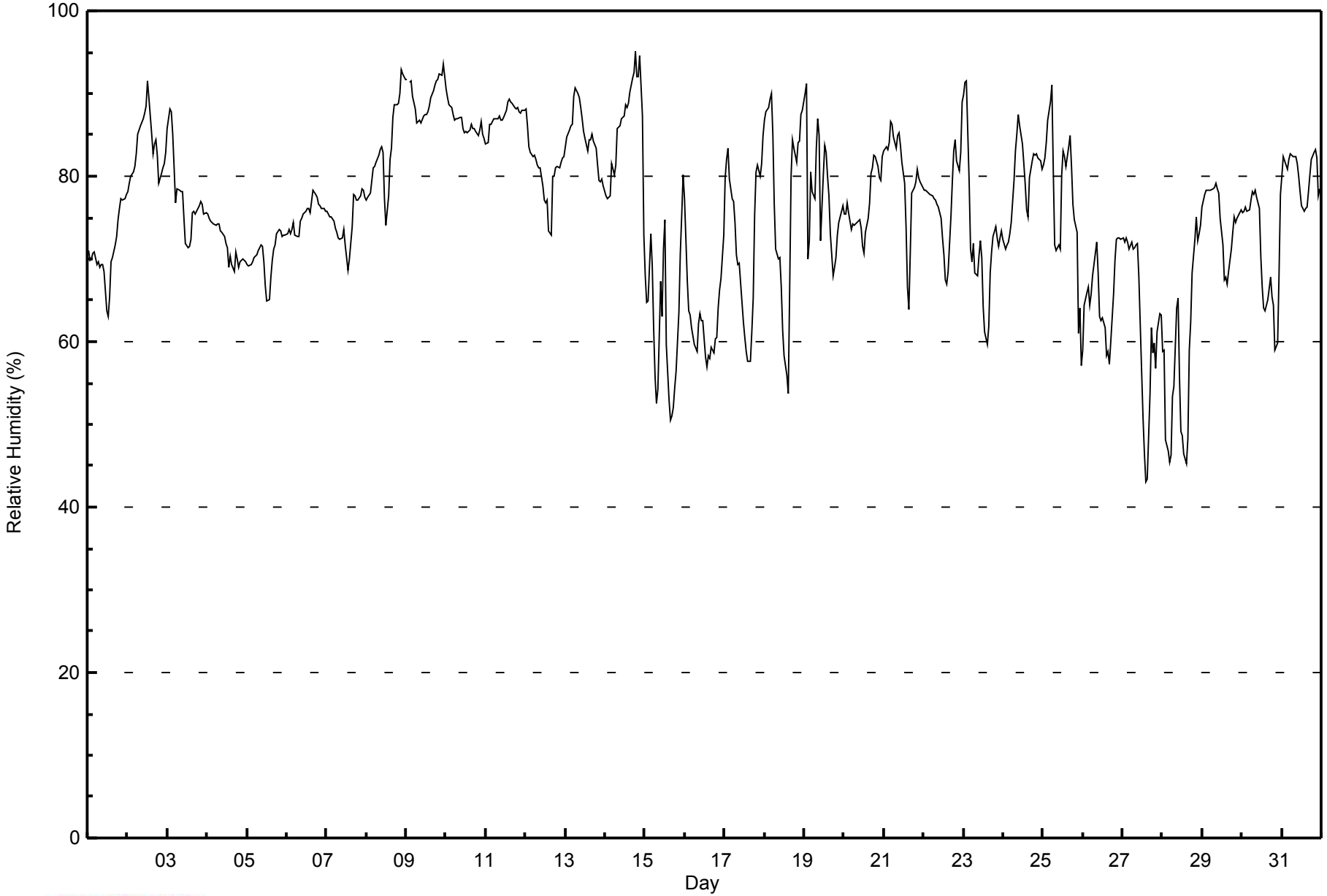
PF - Power Failure

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	57	7.67	7.67
60 - 80	416	55.99	63.66
80 - 100	270	36.34	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Anzac - January 2014

Maximum Speed: 35 km/h on Jan 15 09:00

Maximum Daily Speed Average: 22.5 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 9 10:00

Minimum Daily Speed Average: 1.3 km/h on Jan 20

Maximum Diurnal Speed Average: 6.4 km/h at hour 14

Minimum Diurnal Speed Average: 1.7 km/h at hour 24

Monthly Average Velocity: 3.8 km/h 304.3 deg

Percentiles: P_1 = 1 P_{10} = 4 Q_1 = 6 Median = 9 Q_3 = 12 P_{90} = 15 P_{99} = 30

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SW3	S1	AF	S2	SSW2	SSE2	SSW2	AF	AF	SSE1	SW2	E1	E2	E4	SSE3	SE4	SE5	SSE6	SSE6	SSE7	SE7	SE11	SE12	SE12	SE4.1	SE12
2-Jan	SE12	SE13	SE15	SE17	SE17	SSE15	SE8	SSE8	S8	SSW5	SE1	NW3	W10	W10	WNW9	W9	WSW7	WSW7	WNW10	WNW12	WNW13	WNW14	WNW12	WNW11	SW3.3	SE17
3-Jan	NNW10	NNW12	NNW13	NNW16	NNW15	NNW10	NW9	NW9	NW7	WNW8	WNW8	WNW8	NW11	NW16	NW15	NW12	NW11	NW11	NW12	NW12	WNW9	NW10	NW12	WNW12	NW10.9	NNW16
4-Jan	WNW14	WNW12	WNW11	WNW11	WNW12	WNW11	WNW10	WNW13	WNW13	WNW13	WNW14	WNW14	NW13	NNW16	N17	N15	NNW11	NW10	NW13	NW11	NW10	NW11	WNW11	WNW12	NW11.7	N17
5-Jan	WNW11	NW10	WNW10	WNW11	WNW10	WNW10	WNW11	WNW11	WNW9	WNW10	WNW10	WNW8	WNW6	WNW7	NW4	NW2	ENE1	ESE2	SSE3	SSE5	S6	SE4	SE3	SE6	WNW4.9	WNW11
6-Jan	SE6	SE8	SE5	SE7	ESE10	SE12	SE12	SE12	SE13	SE12	SE14	SE15	SE14	SE12	SE9	ESE8	E7	E8	E10	ESE9	SE6	ESE6	ENE7	ESE8	SE9.2	SE15
7-Jan	ESE6	SE4	ENE3	E5	SE4	SSE4	SE4	SSE5	SE5	ESE6	SE6	SE6	ESE8	ESE8	ESE7	ESE8	SE10	SE12	SE12	SE12	SE12	SE11	SE10	SE11	SE7.2	SE12
8-Jan	SE11	SE13	SE12	SE10	SE10	SE12	SE11	SSE9	SE8	SE6	SSE7	SSW8	WSW2	NW5	WNW10	W9	WNW8	NW6	WNW6	NW4	S4	SSE4	SE3	SSE4	SSE3.6	SE13
9-Jan	SE5	ESE4	SSE6	SE6	SE6	SE5	SE4	SE4	S3	N0	NW1	ENE1	E2	ESE4	E5	E3	ENE4	NNE3	N3	NNE4	NNW4	W2	W4	NW2	ESE1.8	SE6
10-Jan	WNW3	NW3	NNW4	WNW4	NW5	NW6	NW6	NW7	NW8	NW9	WNW10	WNW10	WNW10	NW9	WNW9	NW10	WNW12	WNW10	WNW10	WNW8	NW7	W4	SE3	SE5	WNW6.4	WNW12
11-Jan	SE4	SSE3	ESE5	SE3	SE6	ESE7	ESE10	SE8	ESE9	ESE9	ESE9	ESE7	ESE7	ESE7	ESE7	E7	E7	E7	ESE6	E8	E8	ENE6	NE5	NE4	ESE6.1	ESE10
12-Jan	N3	NNW6	WNW8	NW9	WNW8	NW9	NW9	NW9	NNW9	NW6	WNW9	WNW8	W7	W8	W5	SW3	SSE6	SSE5	SE7	SE8	SE7	SE7	SE8	ESE5	WNW2.4	NW9
13-Jan	ESE7	SE9	SE9	SE5	E1	NW7	WNW11	WNW10	NW11	NW11	NW10	NNW9	NNW8	NNW9	NNW8	NNW8	NNW7	NNW7	WNW5	WNW4	NW4	NNW3	N3	W3	NNW4.3	WNW11
14-Jan	SSW1	S1	SSE3	SSE5	S6	SSE6	SSE5	SSE5	SSE6	SE6	SE7	SE6	SE5	SE5	SE5	SE5	SE4	SSE5	S5	SSW8	SSW11	S9	SSW13	WSW26	S5.0	WSW26
15-Jan	W31	W32	WNW31	WNW25	WNW24	WNW30	WNW29	WNW31	NW35	NW27	NW31	NW31	NW27	NW27	NW25	NW26	NW21	NW20	NW16	NW14	NNW13	NNW9	NNW7	WNW4	NW22.5	NW35
16-Jan	WNW8	WNW9	WNW10	WNW12	WNW11	WNW10	WNW10	WNW9	WNW8	WNW6	W6	SW5	SW5	WSW6	W7	WSW9	WSW11	WSW11	WSW11	W10	W11	WSW9	WSW6	ENE5	W7.8	WNW12
17-Jan	ESE3	S4	WNW4	WNW10	WNW11	WNW12	WNW14	WNW19	WNW18	WNW16	WNW18	WNW18	WNW17	NW17	NW16	NW18	NNW15	NNW11	N11	N8	NNW5	N5	NNW4	S3	NW9.9	WNW19
18-Jan	SSE3	SE5	SSE6	S7	SW10	SW10	WSW11	W11	W12	WNW12	W15	WNW12	WNW11	WNW9	WNW7	WNW4	NNW1	E5	ESE8	ESE9	SE10	ESE7	ESE4	E5	WSW3.0	W15
19-Jan	E4	NNE2	WNW22	NW17	NW15	NNW10	N7	WNW4	NNE4	N4	NNW7	N12	NNW13	NNW17	NNW20	NNW21	NNW19	NNW19	NNW15	NNW10	NNW8	NNW4	NW4	W4	NNW10.1	WNW22
20-Jan	WSW3	WSW3	SSW5	SSE6	SSE7	SSE5	S6	SSE6	SE5	SE7	SE7	SE7	ESE7	SE7	ESE5	ESE5	ENE2	NNE3	N4	NNW8	NW11	WNW9	WNW9	NW7	SSE1.3	NW11
21-Jan	WNW6	WNW7	NW7	NW4	NW8	WNW10	WNW8	NW7	NW10	NW9	NNW11	NW10	NNW10	NNW12	N11	N11	NNE5	N1	E2	E6	ESE7	SE9	SSE10	SE10	NNW4.1	NNW12
22-Jan	SSE12	SSE11	SE9	SE10	SE10	SE11	SE11	SE9	SE9	SE8	SE8	SE9	SE12	SE10	SE11	SE10	SE8	SSE7	S9	SSW11	SSW13	SSW10	SSW9	SSE8.7	SSW13	
23-Jan	SSW5	SW5	SW7	W13	WNW13	W11	W11	W15	WNW18	WNW18	WNW16	WNW16	NW14	WNW12	WNW12	WNW12	WNW11	WNW11	WNW10	WNW9	WNW9	W9	W10	WNW10	WNW10.8	WNW18
24-Jan	WNW13	WNW16	NW14	WNW13	NW11	NW12	NNW10	NNW10	NW8	NNW9	NW8	NNW10	NNW11	NNW9	NNW9	NNW6	NNW6	NNW5	N3	SE2	SSE5	SE6	SE9	SE11	NW6.0	WNW16
25-Jan	SSE10	SE10	SSE9	SE7	ENE3	NW6	WNW15	WNW18	WNW17	WNW16	NNW20	NNW19	NNW18	NNW17	NNW16	NNW15	NNW14	NNW14	NNW17	NNW19	NNW17	NNW21	NNW24	N22	NNW11.3	NNW24
26-Jan	NNW22	NNW21	NNW17	NNW17	NNW16	NNW11	NNW10	NNW9	NNW8	NNW10	NW10	NW7	WNW7	NW8	NW8	NNW7	NW6	NNW5	NNE4	ENE2	S4	SSE5	SSE5	SSE5	NNW7.5	NNW22
27-Jan	S4	S4	SW3	SW3	SW2	SW3	SSW2	SW3	SW5	SSW4	S3	SSW3	WNW4	WSW4	SSW4	S5	SE4	SSE7	S7	S8	S6	SSE7	SSE4	SSE6	S3.6	S8
28-Jan	SSE6	S9	SSW10	SSW11	SW13	SSW8	SSW8	S2	ESE3	SSE2	NW6	WNW11	WNW12	WNW12	NW10	NNW12	NNW10	NNW12	NNW12	NNW15	NNW16	NNW17	NNW13	NW12	NW5.5	NNW17
29-Jan	NW12	NW8	NW8	NW9	NW11	NW10	NW8	NW9	NW9	NW11	NNW12	NNW14	NNW15	NNW17	NNW17	NNW15	NNW13	NNW12	NNW11	NNW13	NNW11	NNW10	NW9	NW9	NNW11.1	NNW17
30-Jan	NW10	NW9	NW9	NW9	NW10	NW10	NW10	WNW10	WNW13	WNW13	WNW15	WNW13	W13	W14	WNW11	W5	W10	W12	W14	W12	W16	W14	WNW13	WNW12	WNW11.0	W16
31-Jan	NW10	NW8	NNW10	NNW11	NW10	NW10	NW10	NW9	WNW10	NW11	NW13	NW15	NNW14	NW13	NW12	NNW13	NNW10	NNW8	NNW8	NW7	NW7	NW8	NW9	NW9	NW9.9	NW15
	W1.9	W2.0	WNW3.2	WNW3.3	WNW3.6	WNW3.8	WNW4.2	WNW5.2	WNW5.3	WNW5.0	WNW5.8	NW5.8	NW5.9	NW6.4	NW6.1	NNW5.4	NW4.2	NNW3.6	NW3.3	NW2.8	WNW2.6	WNW1.8	WNW1.8	W1.7	Diurnal Average	
	W31	W32	WNW31	WNW25	WNW24	WNW30	WNW29	WNW31	NW35	NW27	NW31	NW31	NW27	NW27	NW25	NW26	NW21	NW20	NNW17	NNW19	NNW17	NNW21	NNW24	WSW26	Diurnal Maximum	

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
Maximum Value: 13 km/h on Jan 15 09:00

Minimum Value: 0 km/h on Jan 27 05:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 11

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	AF	1	1	0	1	AF	AF	1	1	2	1	2	1	1	1	2	1	2	2	3	3	3	3
2-Jan	3	3	4	5	5	4	3	2	3	2	1	3	3	3	4	3	2	3	4	4	5	5	4	4	5
3-Jan	4	4	4	5	4	4	3	3	2	2	2	3	5	5	5	4	4	4	4	4	4	4	4	4	5
4-Jan	5	4	4	4	4	4	3	5	5	5	5	6	5	6	5	5	3	3	4	4	3	4	3	4	6
5-Jan	4	4	4	4	3	3	4	4	3	3	4	3	2	2	2	1	1	1	1	1	1	2	2	2	4
6-Jan	2	2	2	2	2	3	3	3	3	4	4	4	4	4	3	3	2	2	3	3	2	2	2	2	4
7-Jan	2	2	1	1	2	1	1	2	1	1	1	2	2	2	2	2	2	2	3	3	3	3	2	3	3
8-Jan	3	4	3	3	3	3	3	3	2	2	2	3	1	4	4	3	3	2	2	2	2	1	1	1	4
9-Jan	1	1	2	2	2	1	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2
10-Jan	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	4	5	4	4	3	2	1	1	1	5
11-Jan	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	3	2	1	1	3
12-Jan	1	2	3	3	3	3	3	3	3	2	3	3	3	3	3	1	2	1	2	2	2	2	2	2	3
13-Jan	2	2	3	2	1	5	4	4	4	4	4	3	3	3	2	2	2	2	2	1	1	1	1	1	5
14-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	4	3	5	11	11
15-Jan	12	12	13	11	9	11	11	12	13	12	11	13	9	11	9	9	8	7	6	5	4	3	2	1	13
16-Jan	2	3	3	4	4	3	3	3	3	2	2	1	1	1	3	3	3	3	3	3	3	2	2	2	4
17-Jan	1	2	2	3	4	5	5	7	7	6	6	6	6	6	6	6	5	4	3	3	1	1	2	1	7
18-Jan	1	1	2	2	2	2	3	4	4	4	5	4	4	3	3	1	1	2	2	3	3	4	2	2	5
19-Jan	1	2	11	6	5	4	2	2	2	4	3	3	4	5	6	7	6	5	4	3	2	2	1	1	11
20-Jan	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	3	3	3	2	3
21-Jan	2	2	2	1	3	3	2	2	3	3	4	3	4	4	3	4	2	1	1	1	2	2	3	2	4
22-Jan	3	3	2	2	2	3	3	2	3	2	2	3	3	2	3	2	2	2	2	3	4	4	4	3	4
23-Jan	2	1	2	3	5	3	4	5	7	7	6	6	5	4	4	4	4	4	4	4	3	3	3	3	7
24-Jan	5	5	4	4	3	4	3	3	2	3	3	3	3	3	3	2	2	1	1	2	1	2	2	3	5
25-Jan	3	3	2	2	2	5	5	6	6	6	7	6	6	6	5	4	4	5	5	6	6	7	8	7	8
26-Jan	6	7	6	6	5	3	3	3	3	3	3	3	2	3	2	2	2	1	1	1	1	1	1	1	7
27-Jan	1	1	1	1	0	1	1	0	1	1	1	1	1	2	1	1	1	2	2	1	1	1	3	2	3
28-Jan	3	3	2	2	3	2	3	3	2	1	4	4	4	4	4	4	3	3	3	4	6	5	5	4	6
29-Jan	4	3	2	3	3	3	3	3	3	4	4	4	5	5	6	5	4	4	4	4	4	4	3	3	6
30-Jan	3	3	2	3	3	4	3	4	4	5	5	5	5	5	4	3	4	6	6	4	6	6	5	4	6
31-Jan	3	3	3	3	3	3	3	3	3	4	4	5	5	4	4	4	3	2	2	2	2	3	3	3	5
	12	12	13	11	9	11	11	12	13	12	11	13	9	11	9	9	8	7	6	6	6	7	8	11	
	Diurnal Maximum																								

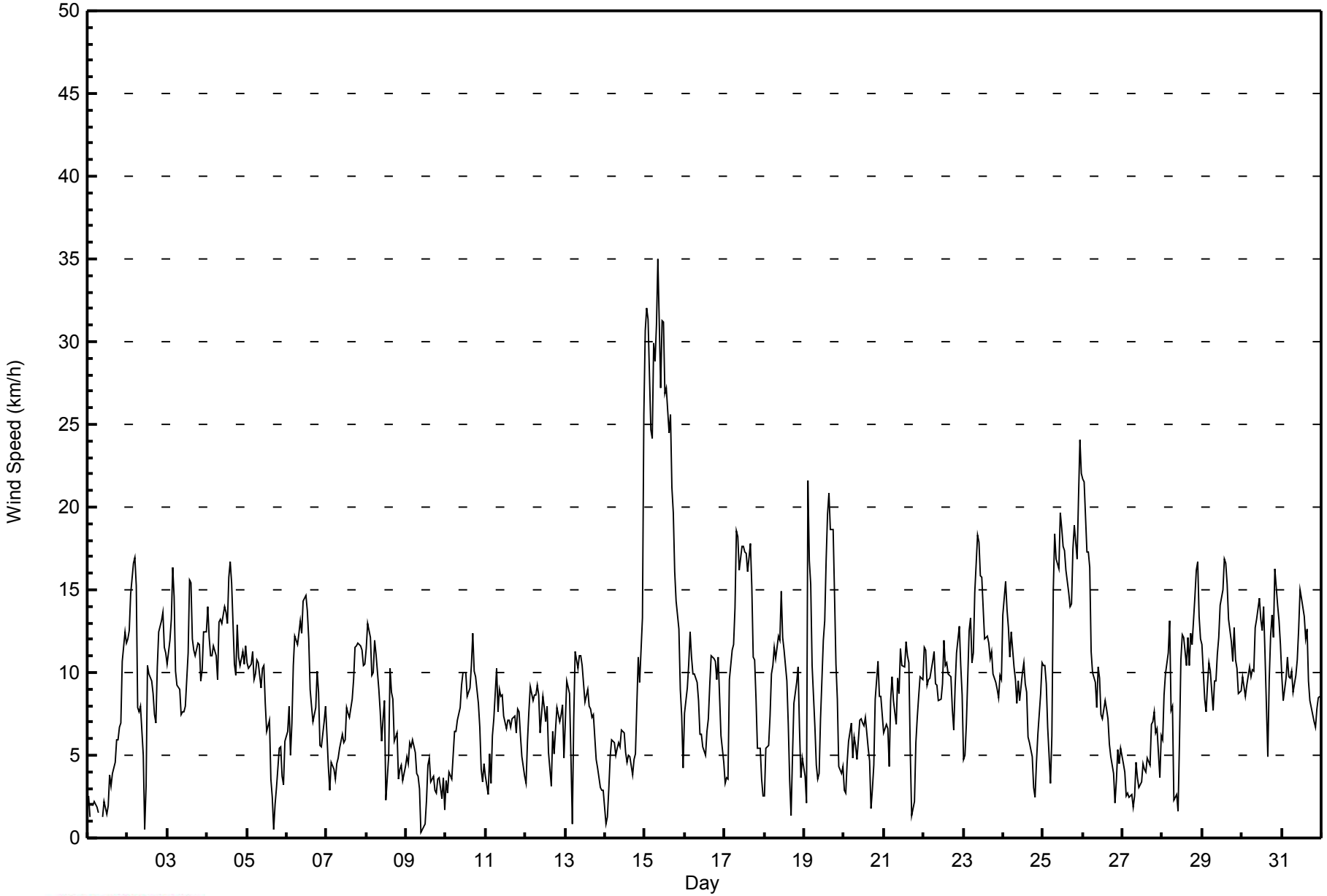
AF - Analyzer Failure

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	178	24.02	24.02
6 - 11	376	50.74	74.76
12 - 19	159	21.46	96.22
20 - 28	19	2.56	98.79
29 - 38	9	1.21	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Anzac - January 2014

Wind Speed	**Wind Direction**																
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	9	7	2	9	11	10	29	24	14	10	12	4	7	9	12	9	178
6 - 11	5	0	0	2	9	27	63	23	10	11	3	10	16	73	78	46	376
12 - 19	2	0	0	0	0	0	23	2	0	2	1	0	11	49	24	45	159
20 - 28	1	0	0	0	0	0	0	0	0	0	0	1	0	3	7	7	19
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	4	3	0	9
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	7	2	11	20	37	115	49	24	23	16	15	36	138	124	107	741

Total Number of Valid Hours: 741

Total Number of Hours: 744

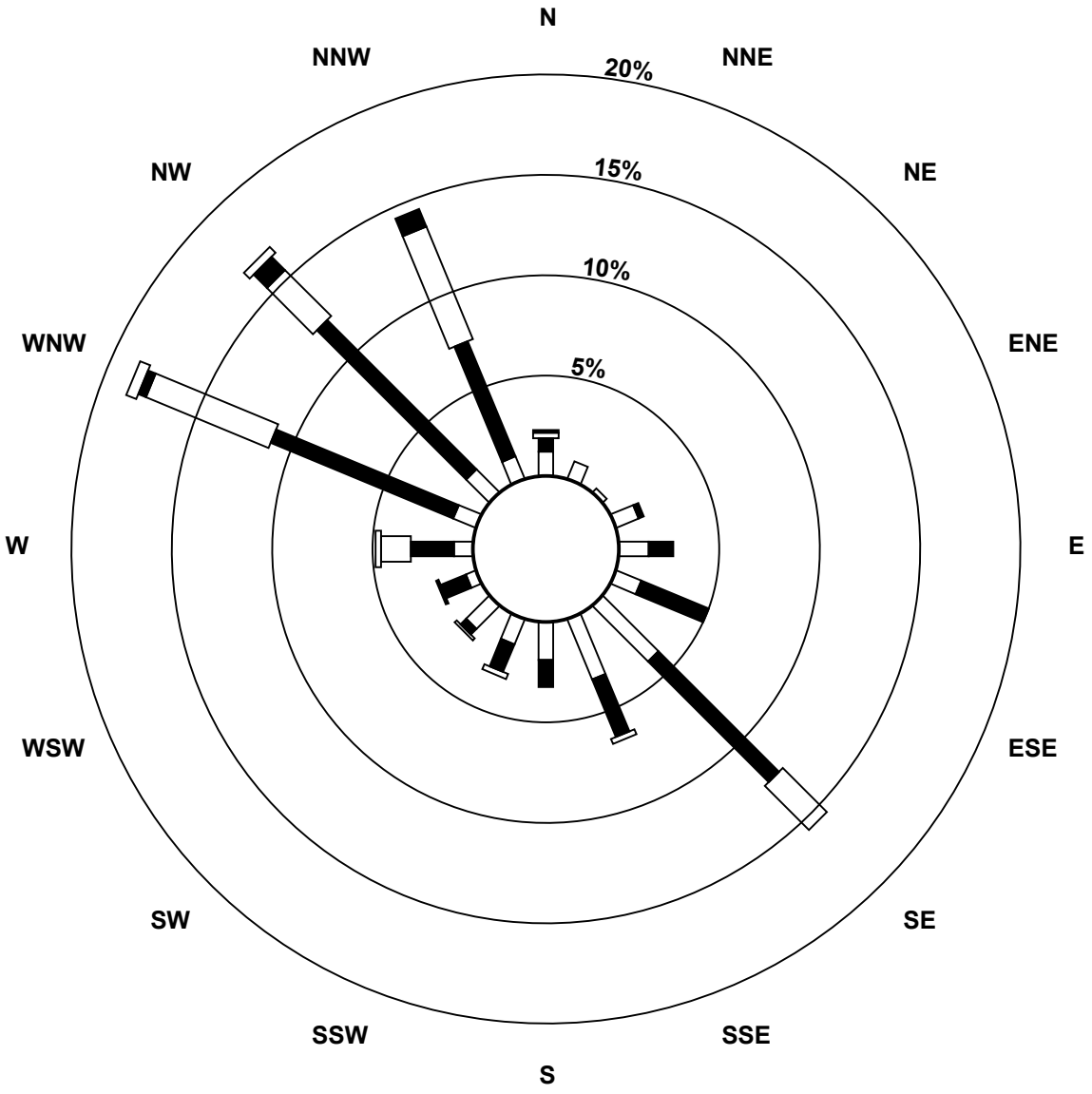
AURORA
ATMOSPHERICS INC.

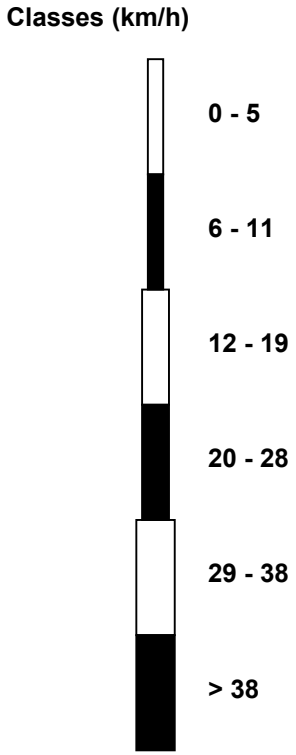
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Anzac (AMS 14)





Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Anzac - January 2014

Direction of Maximum Speed: 305 deg on Jan 15 09:00
Direction of Maximum Daily Speed Average: 304.6 deg on Jan 15

Direction of Minimum Speed: 358 deg on Jan 9 10:00

Direction of Minimum Daily Speed Average: 1.3 deg on Jan 20

Monthly Average Direction: 303.8 deg

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	214	169	AF	181	198	155	210	AF	AF	157	219	89	98	101	160	127	139	155	148	150	136	136	131	135	143.6
2-Jan	133	135	140	142	142	150	135	160	176	198	125	319	276	279	285	273	244	245	286	296	301	301	298	302	222.5
3-Jan	327	335	338	345	348	346	322	320	312	300	298	303	317	323	323	322	316	315	311	309	302	308	307	302	320.5
4-Jan	301	297	296	299	299	292	294	294	293	293	297	301	309	328	352	349	341	321	321	317	305	306	303	299	309.3
5-Jan	301	304	301	299	285	297	296	296	298	303	297	292	282	293	324	307	66	120	147	165	176	133	135	130	291.1
6-Jan	132	136	130	124	123	135	132	138	133	136	138	140	133	128	129	122	99	86	98	116	137	108	74	115	125.3
7-Jan	118	127	62	81	126	153	139	147	134	111	139	132	121	121	118	121	133	136	137	142	144	134	133	126	129.7
8-Jan	125	133	134	126	134	136	141	149	146	138	164	210	238	316	296	278	288	305	301	305	182	158	142	150	159.8
9-Jan	143	122	149	135	126	127	126	133	188	358	318	77	79	116	94	84	74	29	6	12	335	279	270	314	111.1
10-Jan	287	323	333	297	306	310	315	307	313	304	298	303	302	307	300	304	286	293	295	293	305	262	141	137	300.2
11-Jan	143	150	103	139	130	116	119	129	121	121	121	118	113	114	102	89	85	97	109	92	91	72	50	42	107.6
12-Jan	5	331	300	305	301	311	309	317	327	326	292	285	280	275	276	220	161	160	142	136	135	137	128	106	288.9
13-Jan	112	125	140	136	79	321	303	301	308	306	322	342	334	334	342	342	346	348	300	297	313	343	353	264	327.0
14-Jan	211	171	161	160	169	158	165	162	154	135	137	133	139	134	125	130	135	156	184	199	213	178	208	250	177.9
15-Jan	264	265	284	302	299	296	303	300	305	312	315	312	313	318	319	318	317	317	315	318	329	332	333	294	304.6
16-Jan	283	289	287	289	289	292	296	295	287	282	263	236	231	237	265	258	255	258	258	270	270	257	239	71	272.2
17-Jan	117	182	286	286	287	285	291	287	292	293	297	298	301	306	316	325	334	341	2	350	343	352	344	175	307.1
18-Jan	147	137	152	187	221	231	241	272	274	282	279	286	290	290	287	288	348	79	104	115	124	102	110	99	244.1
19-Jan	101	27	300	310	314	341	351	299	13	359	342	359	331	333	334	334	342	347	347	339	336	340	304	272	333.2
20-Jan	255	237	193	164	168	164	173	168	125	133	135	137	117	126	117	123	65	27	4	345	323	303	302	305	152.4
21-Jan	303	299	310	311	309	295	299	314	321	313	329	326	332	346	354	3	13	9	91	85	121	125	153	145	331.8
22-Jan	148	147	140	144	138	145	146	137	138	137	129	129	127	128	126	130	141	143	153	188	204	205	212	210	151.0
23-Jan	194	217	227	275	284	269	270	278	292	295	295	299	315	301	299	299	294	287	292	295	286	279	280	290	286.5
24-Jan	301	301	304	303	308	321	344	332	319	330	318	330	331	330	341	340	343	342	10	138	153	128	132	142	322.6
25-Jan	150	139	151	129	60	304	296	299	296	299	329	334	335	332	338	339	340	335	347	348	342	344	345	353	333.2
26-Jan	344	348	338	341	347	342	336	333	328	330	324	309	301	314	325	330	323	342	20	64	173	167	165	151	335.4
27-Jan	173	174	222	226	223	219	205	215	214	194	186	209	293	258	196	172	142	155	172	182	172	160	163	162	186.4
28-Jan	168	191	203	208	216	204	197	180	103	164	321	290	299	303	314	334	339	343	333	331	342	345	338	326	304.6
29-Jan	320	311	311	310	309	319	308	321	321	324	328	346	347	343	340	333	341	345	344	345	339	327	318	309	329.9
30-Jan	316	317	317	316	312	307	306	302	298	290	285	285	274	281	284	277	267	260	275	276	276	278	286	302	289.5
31-Jan	305	309	333	331	316	312	310	311	303	305	317	324	330	324	323	330	337	343	334	323	322	318	318	319	321.0
	273.6	269.7	283.6	291.7	288.4	287.5	288.7	290.3	294.8	299.4	303.4	307.6	312.5	316.9	324.2	326.7	325.7	326.4	324.7	316.7	295.0	298.3	292.7	276.9	
	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 - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Jan 14 01:00

Minimum Value: 10 deg on Jan 27 03:00

Percentiles: P_1 = 13 P_{10} = 16 Q_1 = 18 Median = 21 Q_3 = 26 P_{90} = 33 P_{99} = 75

Hours in Service:	744
Hours of Data:	741
Hours of Missing Data:	3
Hours of Calibration:	0
Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	27	73	AF	38	18	21	55	AF	AF	68	29	67	61	29	33	12	18	16	19	20	23	16	16	18	73
2-Jan	18	19	19	19	21	18	20	19	21	22	84	67	26	27	27	25	23	22	26	25	26	24	25	25	84
3-Jan	26	16	16	16	17	15	19	16	20	21	20	24	23	18	16	17	18	19	19	22	23	22	21	21	26
4-Jan	21	23	23	22	24	25	26	25	27	27	27	24	25	20	18	17	17	16	15	20	19	20	20	23	27
5-Jan	22	22	21	21	23	24	23	24	22	19	24	27	31	24	33	45	86	40	23	17	19	35	29	18	86
6-Jan	20	18	29	20	15	17	18	19	19	21	20	19	20	21	25	18	21	23	22	19	24	26	20	16	29
7-Jan	22	25	39	24	24	22	20	20	26	16	18	17	12	15	18	15	13	16	16	18	18	17	18	19	39
8-Jan	19	22	20	19	20	19	18	27	21	27	20	23	58	39	25	24	23	21	23	31	21	21	28	23	58
9-Jan	20	14	22	23	16	21	26	22	23	79	79	61	24	27	26	36	24	46	36	22	28	31	31	33	79
10-Jan	29	39	18	30	21	18	19	20	18	20	22	22	23	22	27	24	27	29	26	28	24	29	46	26	46
11-Jan	40	63	24	30	15	20	17	17	18	14	14	18	21	21	23	25	25	25	24	25	25	24	20	23	63
12-Jan	25	20	24	22	24	21	22	20	17	21	29	30	32	28	41	35	18	23	14	15	16	15	20	28	41
13-Jan	21	16	19	28	71	29	23	24	23	24	22	16	17	17	17	16	16	15	37	13	27	21	17	31	71
14-Jan	95	55	26	14	14	14	15	17	19	19	18	19	20	20	21	20	24	20	27	30	23	24	26	29	95
15-Jan	29	30	31	24	25	25	25	26	24	23	22	20	21	20	20	20	20	19	20	18	16	17	22	20	31
16-Jan	21	28	27	24	24	26	25	26	25	23	31	22	15	16	30	25	21	21	21	23	24	26	27	36	36
17-Jan	51	45	49	26	30	25	28	28	27	26	25	24	23	22	21	16	16	15	16	15	16	16	15	41	51
18-Jan	17	15	21	16	14	13	18	26	28	26	26	27	25	26	25	33	55	32	15	17	19	49	63	33	63
19-Jan	33	56	27	21	19	22	37	35	42	65	34	16	17	16	16	17	17	16	15	16	16	26	25	22	65
20-Jan	29	19	18	19	20	19	16	17	26	20	20	20	17	20	37	27	69	48	17	14	18	22	22	22	69
21-Jan	22	24	23	28	19	19	19	25	19	19	19	17	17	18	16	19	15	75	32	18	18	19	17	20	75
22-Jan	16	16	18	17	17	16	16	18	21	21	20	19	18	19	17	19	17	17	22	18	23	19	17	15	23
23-Jan	29	35	34	24	26	21	26	26	25	25	25	23	21	22	22	21	25	25	29	25	28	28	26	27	35
24-Jan	24	22	21	21	20	22	14	16	18	18	21	18	16	18	18	24	18	18	37	53	27	19	20	20	53
25-Jan	18	19	24	20	48	50	24	23	26	24	21	17	17	16	16	17	17	17	16	18	16	18	18	19	50
26-Jan	17	17	18	17	17	17	15	16	18	16	21	29	25	27	25	22	20	24	15	48	19	13	13	15	48
27-Jan	17	16	10	12	12	25	49	23	12	22	21	23	37	47	36	20	28	19	14	12	14	14	62	35	62
28-Jan	35	23	17	15	15	20	21	75	48	61	46	27	24	22	24	17	16	15	18	16	17	16	16	17	75
29-Jan	16	21	17	17	18	18	20	17	19	16	18	17	18	18	17	17	18	16	17	16	17	17	19	19	21
30-Jan	18	17	16	19	19	21	22	23	23	29	29	30	31	27	26	45	31	26	31	30	29	31	27	24	45
31-Jan	20	22	17	16	17	18	17	19	22	20	19	17	16	17	19	17	18	15	15	15	15	19	20	20	22
	95	73	49	38	71	50	55	75	48	79	84	67	61	47	41	45	86	75	37	53	29	49	63	41	
	Diurnal Maximum																								

AF - Analyzer Failure

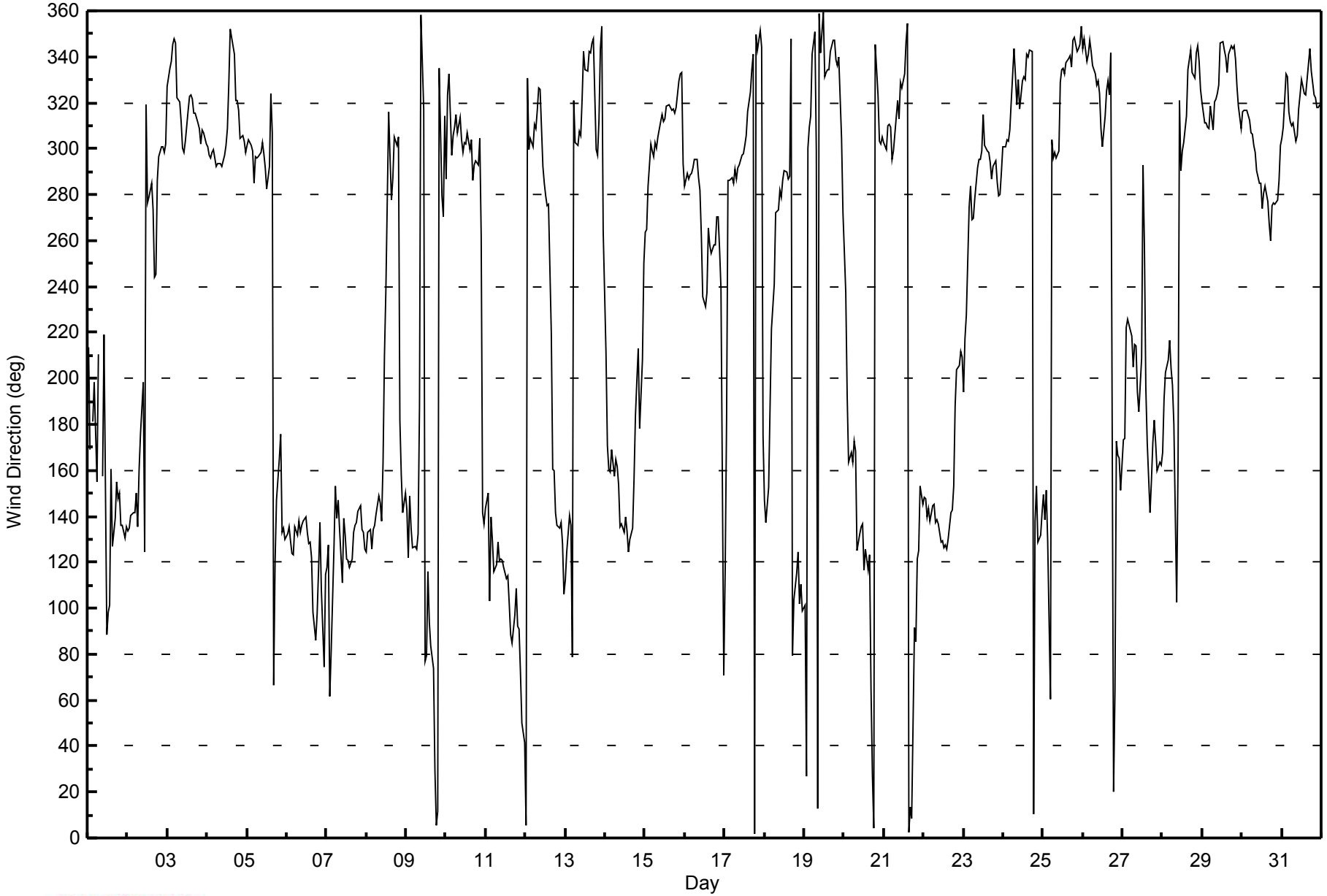
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Anzac - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Anzac - January 2014

Maximum Value: 3.0 mm on Jan 15 00:00

Maximum Daily Total: 3.6 mm on Jan 14

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 3.0 mm at hour 24

Minimum Diurnal Total: 0.0 mm at hour 2

Monthly Total: 6.10 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} = -0.2

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

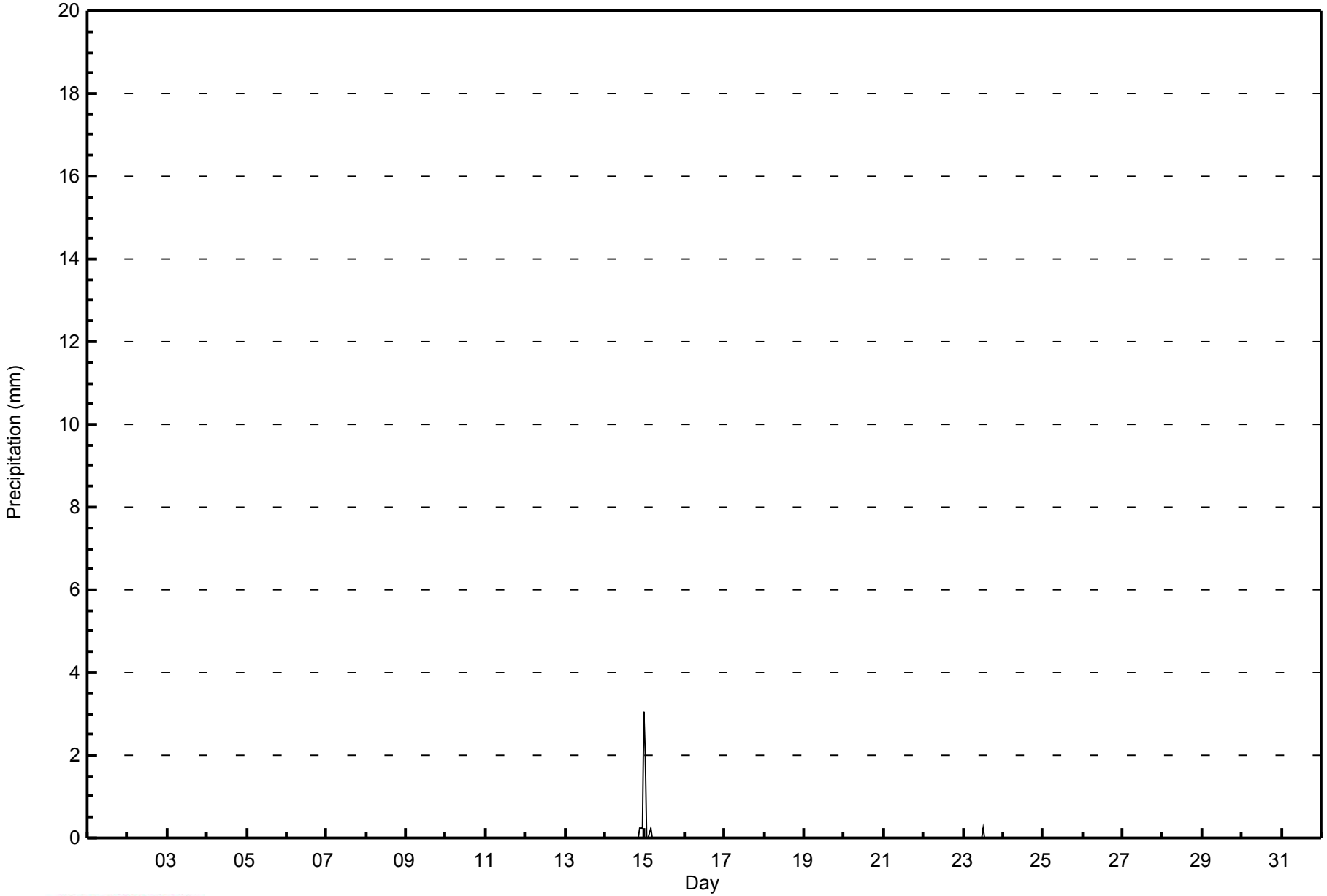
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	3.0	3.6	3.0
15-Jan	2.0	0.0	0.0	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	2.3	2.0
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	3.0	Diurnal Average	
	2.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	3.0	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

Anzac - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 6, 2013
Station Name	Anzac	Station Number	AMS 14

Reason: Routine

Start Time (MST)	8:38	End Time (MST)	12:25
Barometric Pressure	782 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	5/29/2014
Gas Cert Reference	Praxair 000039037 LL107928		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	NA	DACS channel #	NA

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-596	-596
Analyzer Range (mv)	5000	5000	Lamp voltage	809	809
Calculated slope	0.993160	0.998680	Chamber temp.	44.4	44.4
Calculated intercept	0.658417	0.543982	Pressure (mmHg)	672.4	672.4
Analyzer Background	12.4	12.4	Flow (lpm)	0.385	0.385
Analyzer Coefficient	0.945	0.945	Intensity	30000	30000

Analyzer make	TEI 43C	Analyzer serial #	613516095

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.2	N/A
as found span	5000	78.3	798.7	800.0	0.998
calibrator zero	5000	0.0	0.0	0.2	N/A
high point	5000	78.3	798.7	800.0	0.998
second point	5000	39.1	398.8	397.0	1.005
third point	5000	19.6	199.9	199.9	1.000
calibrator zero	6003	0.0	0.0	0.5	N/A
as left zero	6003	0.0	0.0	0.5	N/A
as left span	5002	78.2	797.3	800.6	0.996
				Average Correction Factor	1.001

Corrected As found	799.8	Previous response	792.5	% change	-0.9%

Notes:

No Adjustments made

Filter changed out

No Maintenance Done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

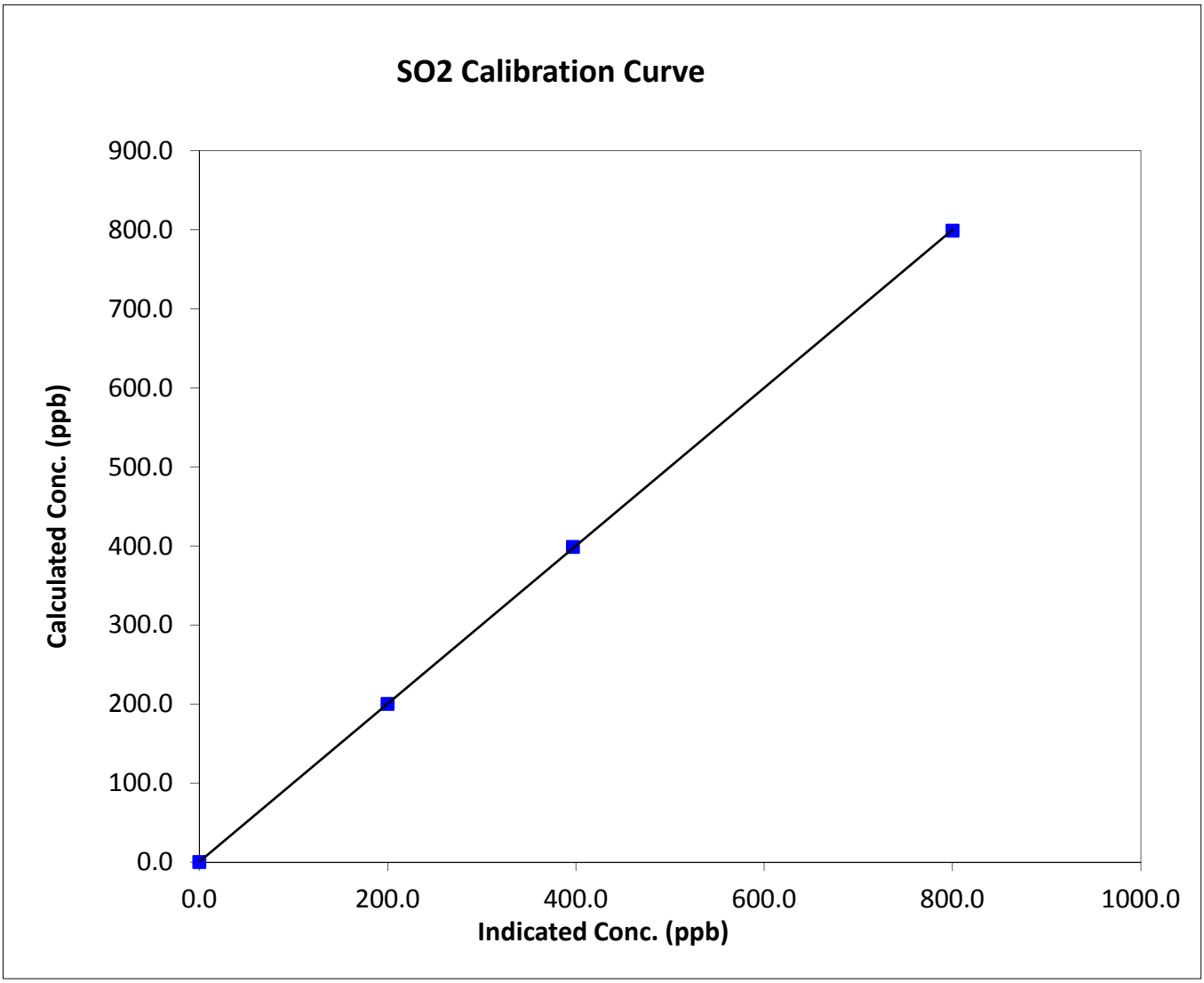
SO_2 Calibration Summary

Station Information

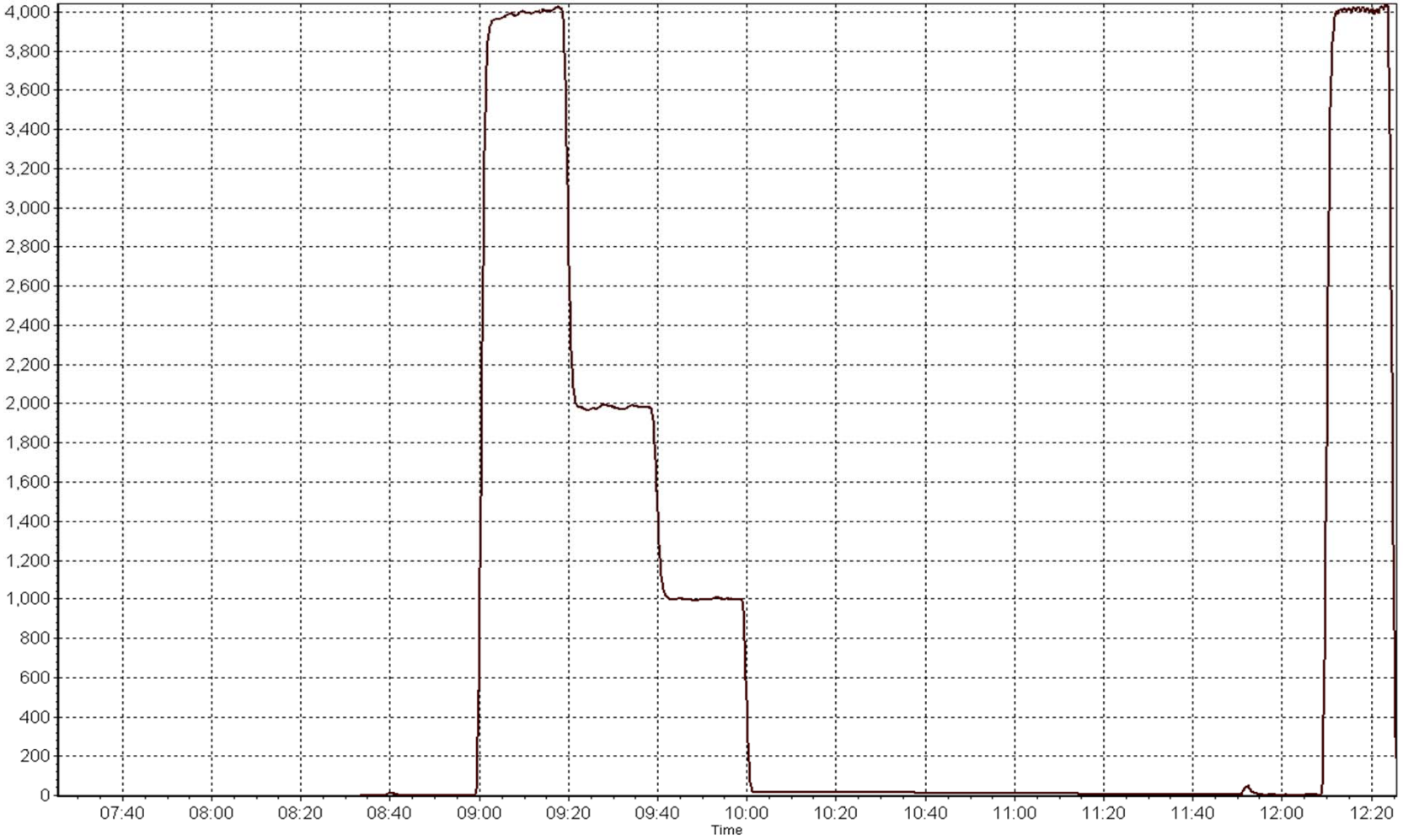
Calibration Date	January 9, 2014	Previous Calibration	December 6, 2013
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	8:38	End Time (MST)	12:25
Analyzer make	TEI 43C	Analyzer serial #	613516095

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999987
798.7	800.0	0.9983		
398.8	397.0	1.0046	Slope	0.998680
199.9	199.9	1.0001		
			Intercept	0.543982



SO_2 Calibration Plot **Date:** January 9, 2014



Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 11, 2014	Previous Calibration	December 15, 2013
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	10:40	End Time (MST)	13:05
Barometric Pressure	732 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	8400311
Cal Gas Concentration	9.6 ppm	Cal Gas Expiry Date	2/22/2016
Gas Cert Reference	LL82745	SO2 gas conc.	51.0 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	0-5 volts	DACS channel #	2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-730	-730
Analyzer Range (mv)	5000	5000	Lamp voltage	982	982
Calculated slope	1.001548	0.994824	Chamber temp.	45	45
Calculated intercept	-0.208442	0.116600	Pressure	644.4	644.4
Analyzer Background	1.97	2	Flow	0.387	0.387
Analyzer Coefficient	1.078	1.092	Intensity	90	90
			Converter temp.	800	800

Analyzer make/model	43i-TL	Analyzer serial #	1300156232
Converter make/model	CDN-101	Converter serial #	510

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.5	N/A
as found span	5000	39.1	75.1	73.7	1.018
SO2 scrubber check	5000	19.5	198.9	0.0	N/A
calibrator zero	5000	0.0	0.0	-0.5	N/A
high point	5000	39.1	75.1	75.1	1.000
second point	5000	20.8	39.9	40.5	0.987
third point	5000	10.4	20.0	20.1	0.991
calibrator zero	5000	0.0	0.0	-0.5	N/A
as left zero	5000	0.0	0.0	-0.5	N/A
as left span	5000	39.1	75.1	74.6	1.006
				Average Correction Factor	0.993

Corrected As found	74.2	Previous response	75.4	% change	1.6%

Notes: Span adjusted
No maintenance Done
Filter Changed

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

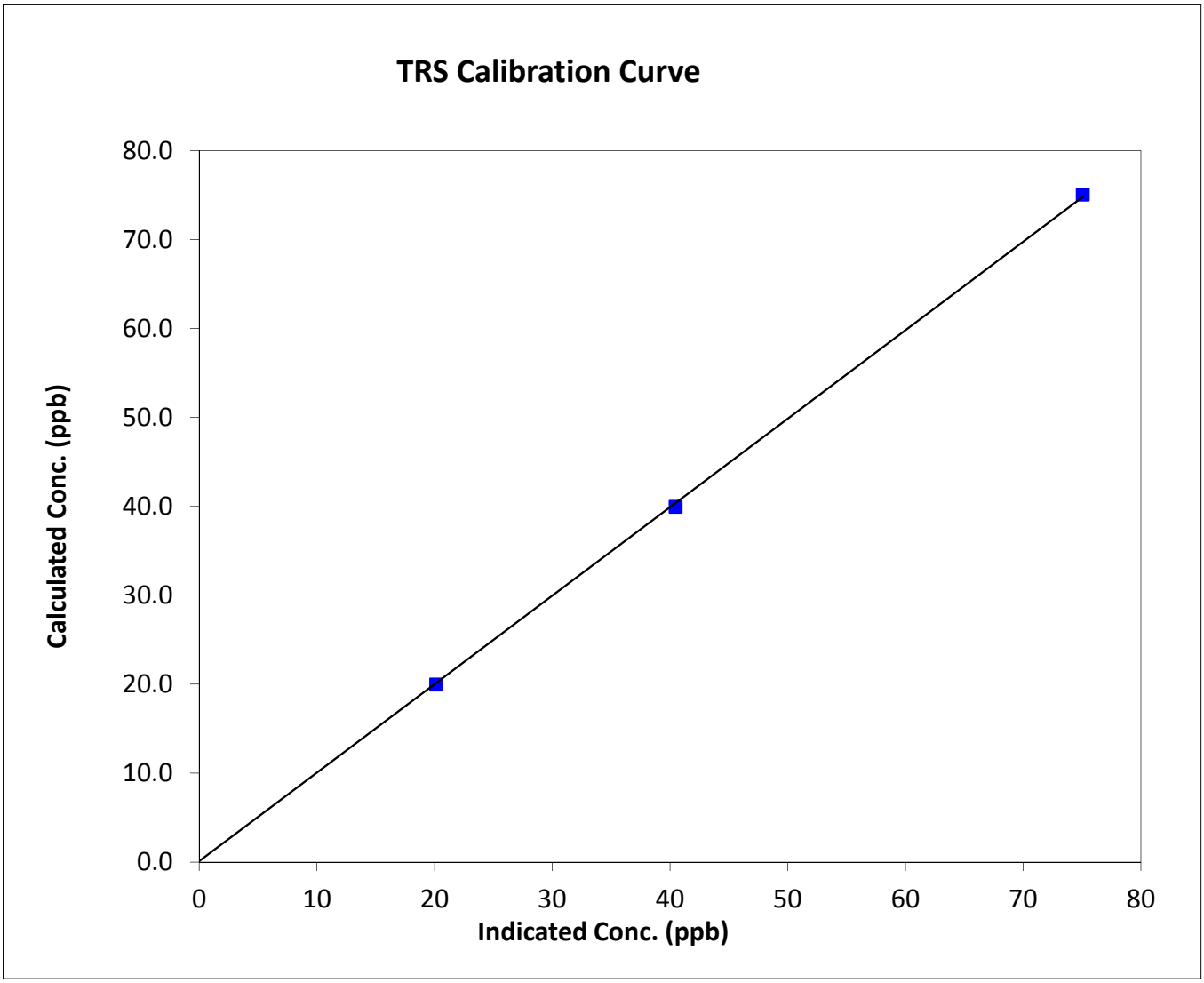
TRS Calibration Summary

Station Information

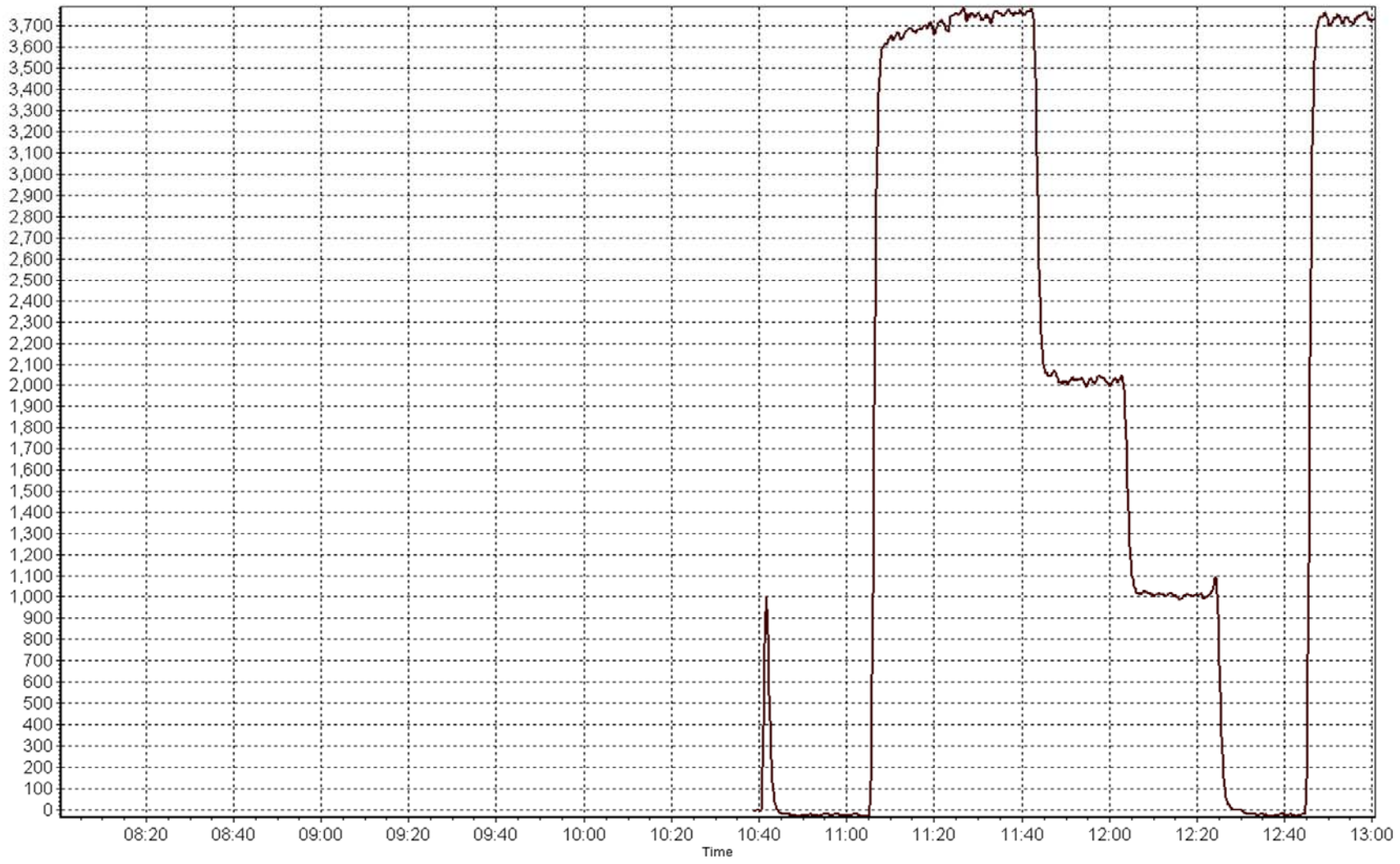
Calibration Date	January 11, 2014	Previous Calibration	December 15, 2013
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	10:40	End Time (MST)	13:05
Analyzer make	43i-TL	Analyzer serial #	1300156232

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.5	N/A	Correlation Coefficient	0.999866
75.1	75.1	1.0002		
39.9	40.5	0.9870	Slope	0.994824
20.0	20.1	0.9915		
			Intercept	0.116600



TRS Calibration Plot **Date:** January 11, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 9, 2014		Previous Calibration	December 6, 2013	
Station Name	Anzac		Station Number	AMS 14	
Reason:	Routine				
Start Time (MST)	8:38		End Time (MST)	12:25	
Barometric Pressure	782	mmHg	Station Temperature	22.0	Deg C
Calibrator	Sabio 4010		Serial Number	8400311	
NO Cal Gas Conc	51.1	ppm	Cal Gas Expiry Date	May 29, 2014	
NOx Cal Gas Conc	51.2	ppm	Cal Gas Serial #	LL107928	

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2372

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	1.000364	0.997210	0.992783
	Data Offset	1.150724	1.016856	-0.825422
After	Data Slope	1.004678	0.997055	0.990931
	Data Offset	1.468576	1.535808	-0.949033
Channel #		6	5	4
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model	TECO 42C	Analyzer serial #	509110890

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO coefficient	0.991	ppb	0.991	ppb
NOX coefficient	1.005	ppb	1.005	ppb
NO2 coefficient	1.002	ppb	1.002	ppb
NO bkgrnd	1.5		1.5	
NOX bkgrnd	1.7		1.7	
Nt coefficient	NA		NA	
Chamber Temp	49.4	Deg C	49.4	Deg C
Moly Temp	317.0	Deg C	317.0	Deg C
PMT Temp	-2.5	Deg C	-2.5	Deg C
O3 flow	oK	ccm	oK	ccm
R Cell Press	202.5	mmHg	202.5	mmHg
Sample Flow	0.536	ccm	0.536	ccm

Notes:

No Adjustments made

Filter changed out

No Maintenance Done

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 9, 2014 Station Number: AMS 14

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	N/A	N/A
as found span	5000	78.3	801.8	800.2	1.6	802.6	795.0	6.5	0.9990	1.0066
calibrator zero	5001	0.0	0.0	0.0	0.0	0.1	0.0	0.0	N/A	N/A
high point	5002	78.2	800.4	798.9	1.6	802.6	795.0	6.5	0.9973	1.0049
second point	5003	39.1	400.1	399.4	0.8	397.4	393.6	3.1	1.0069	1.0146
third point	5004	19.6	200.5	200.2	0.4	199.0	197.4	1.2	1.0078	1.0139
calibrator zero	4907	0.0	0.0	0.0	0.0	0.1	0.0	0.0	N/A	N/A
as left zero	4908	0.0	0.0	0.0	0.0	0.1	0.0	0.0	N/A	N/A
as left span	5002	78.2	800.4	798.9	1.6	809.2	420.6	387.8	0.9892	N/A
								Average Correction Factor	1.0040	1.0112

Corrcted As found NO_X= 802.5 NO= 795.0 Percent Change NO_X= -0.2% NO= 0.3%

Previous Response NO_X= 800.9 NO= 797.0

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 78.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.0			N/A	
1st NO2 (300)	N/A	409.6	383.6	797.6	409.6	387.4	0.9898	1.0000	0.9902	101.0%
2nd NO2 (200)	N/A	530.6	262.6	797.4	530.6	266.2	0.9900	1.0000	0.9865	101.4%
3rd NO2 (100)	N/A	655.6	137.6	797.6	655.6	141.2	0.9898	1.0000	0.9745	102.6%
4th NO2 (0)	793.2	N/A	6.0	799.2	793.2	4.9	0.9878	1.0000	N/A	N/A
					Average Correction Factor		0.9893	1.0000	0.9837	101.7%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

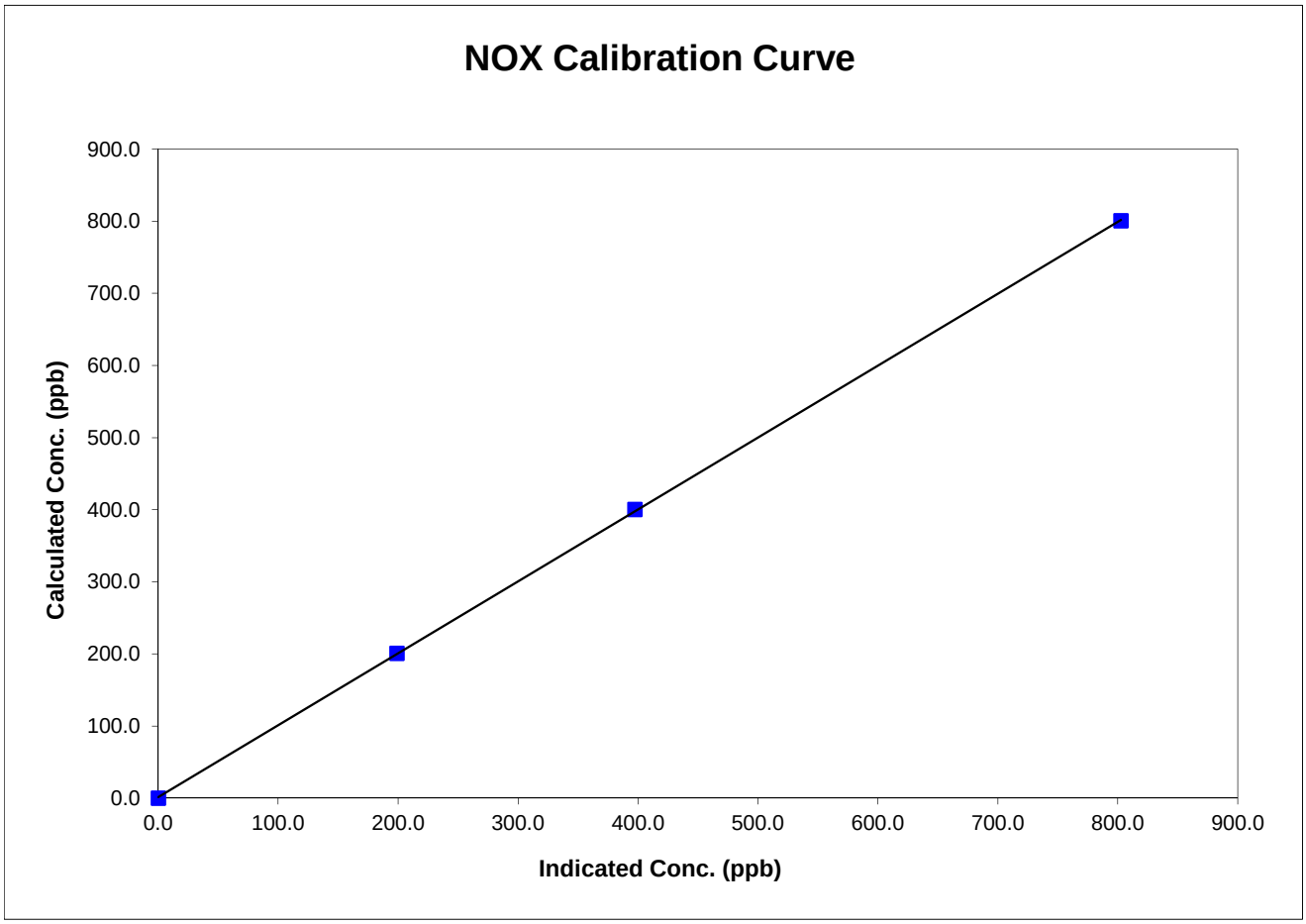
NOx Calibration Summary

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 6, 2013
Station Number	Anzac	Station Number	AMS 14
Start Time (MST)	8:38	End Time (MST)	12:25
Analyzer make	TECO 42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999970
800.4	802.6	0.9973		
400.1	397.4	1.0069	Slope	0.997055
200.5	199.0	1.0078		
			Intercept	1.535808



Wood Buffalo Environmental Association

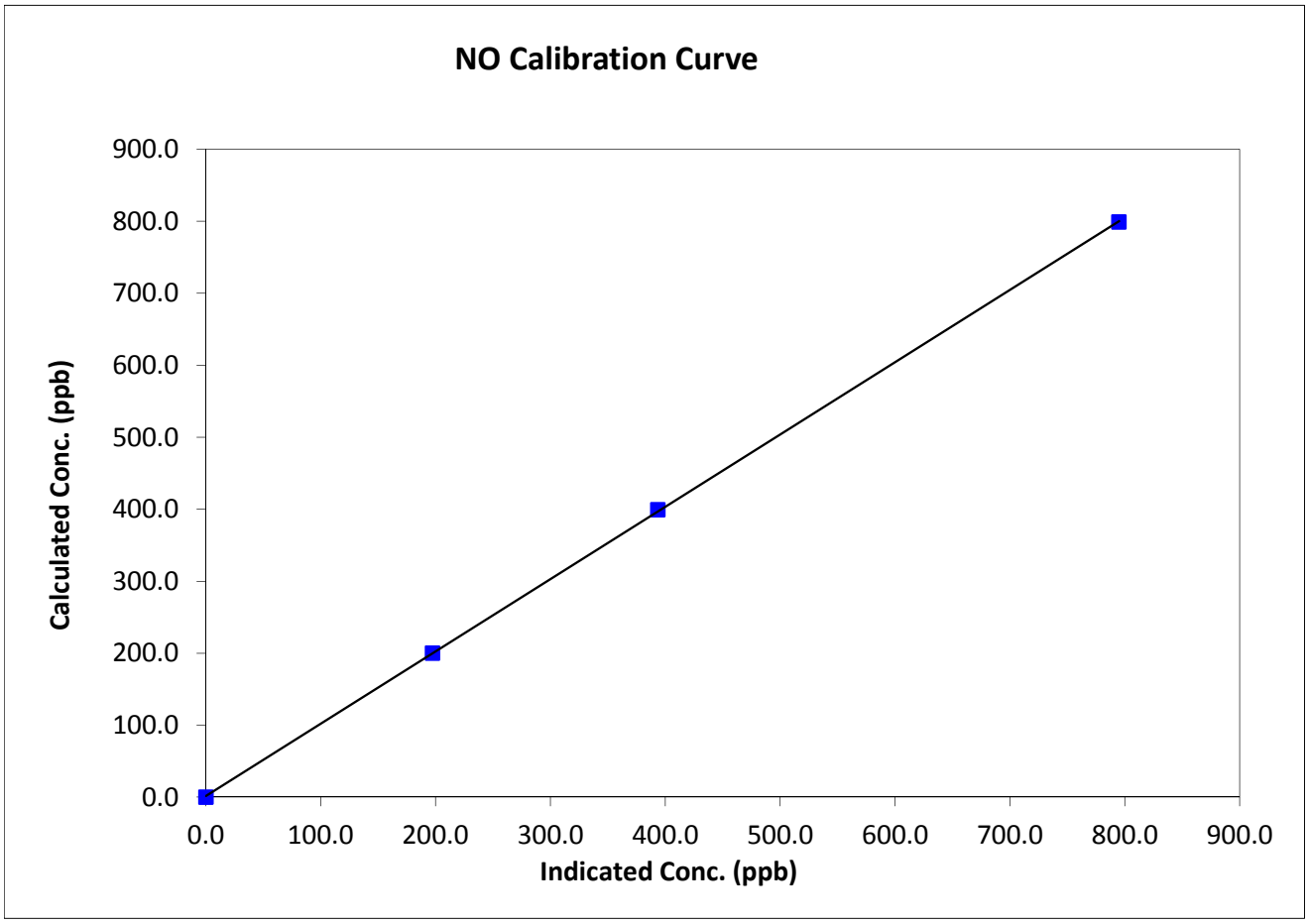
NO Calibration Summary

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 6, 2013
Station Number	Anzac	Station Number	AMS 14
Start Time (MST)	8:38	End Time (MST)	12:25
Analyzer make	TECO 42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999971
798.9	795.0	1.0049		
399.4	393.6	1.0146	Slope	1.004678
200.2	197.4	1.0139		
			Intercept	1.468576



Wood Buffalo Environmental Association

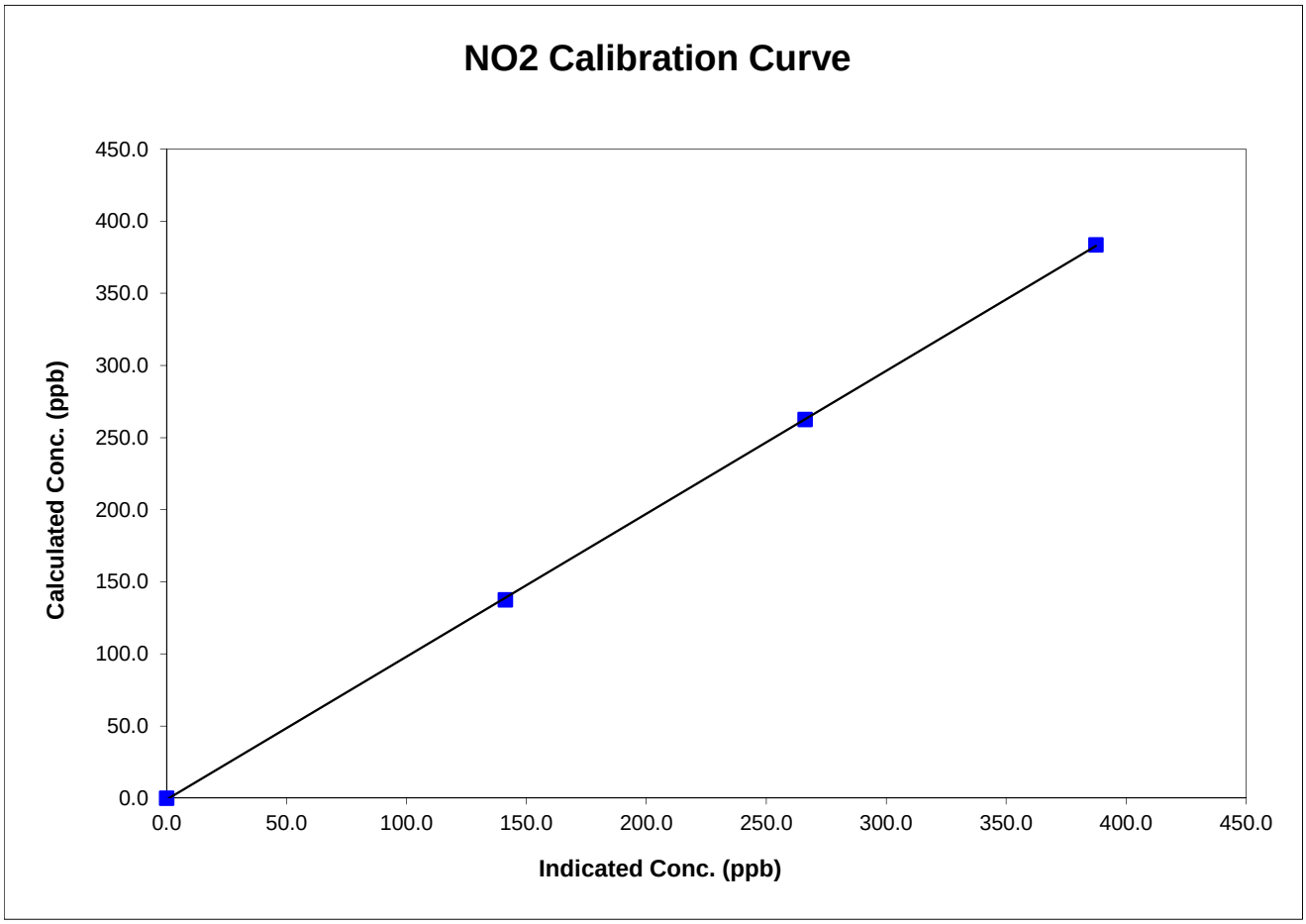
NO_2 Calibration Summary

Station Information

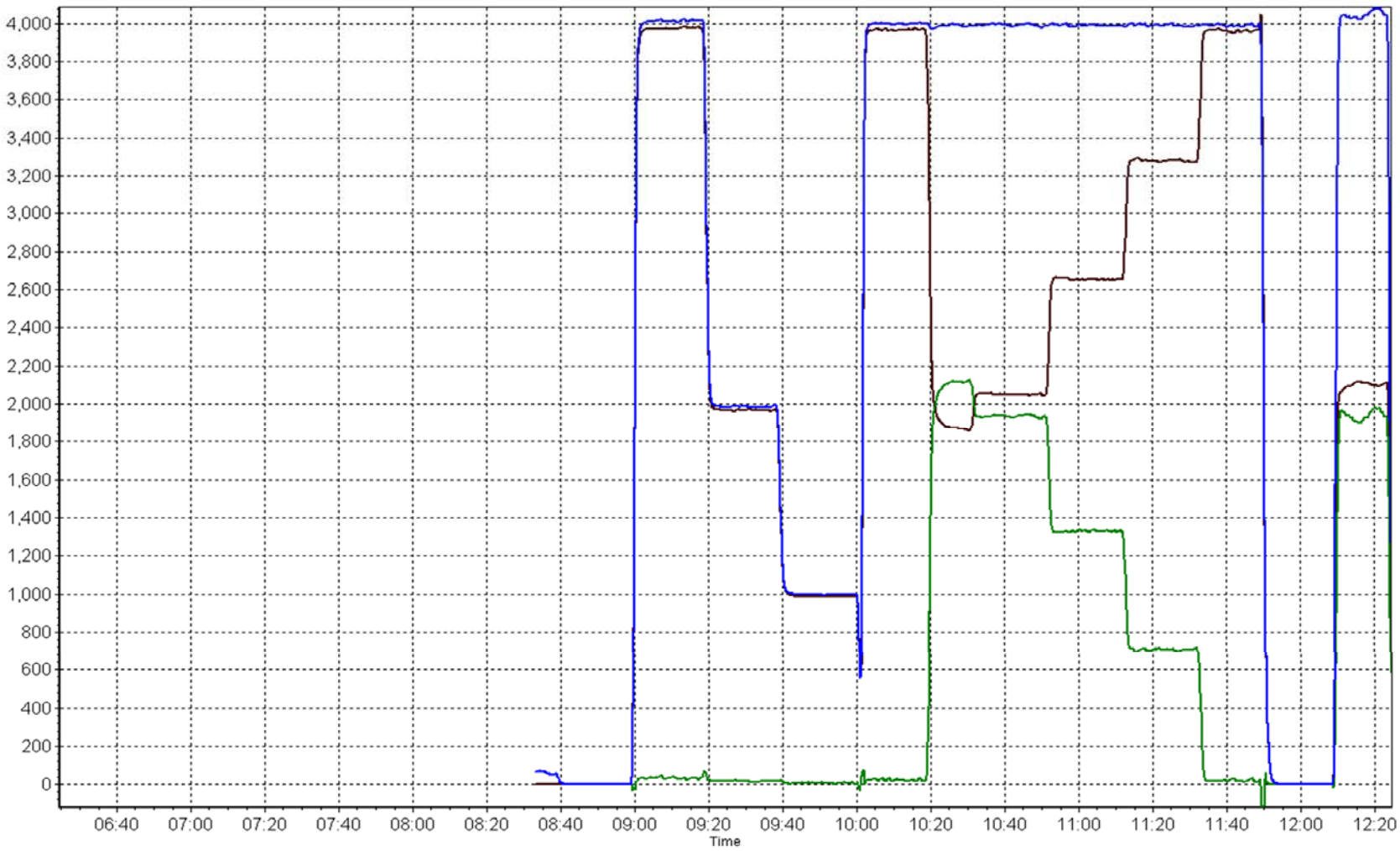
Calibration Date	January 9, 2014	Previous Calibration	December 6, 2013
Station Number	Anzac	Station Number	AMS 14
Start Time (MST)	8:38	End Time (MST)	12:25
Analyzer make	TECO 42C	Analyzer serial #	509110890

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999960
383.6	387.4	0.9902		
262.6	266.2	0.9865	Slope	0.990931
137.6	141.2	0.9745		
			Intercept	-0.949033



NOx, NO & NO_2 Calibration Plot **Date:** **January 9, 2014**



Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 11, 2013
Station Name	Anzac	Station Number	AMS 14
Reason:	Routine		
Start Time (MST)	12:25	End Time (MST)	14:12
Barometric Pressure	732 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
NO2 calibration used	Friday, December 06, 2013		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372
DACS voltage range	5000	DACS channel #	7 & 8

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Bench temp.	29.9	29.9
Analyzer Range (mv)	5000	5000	Lamp temp.	55.8	55.8
Calculated slope	0.986638	1.008060	Pressure	665.9	665.9
Calculated intercept	0.364456	0.557704	Flow cell A	0.848	0.848
Analyzer Background	0.1	0.1	Flow cell B	0.739	0.739
Analyzer Coefficient	1.008	1.008	Cell A Intensity	68012	68012
			Cell B Intensity	62403	62403

Analyzer make	TEI 49C	Analyzer serial #	509110892

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	-0.4	N/A
as found span	5000	NA	383.6	380.1	1.009
calibrator zero	5000	0.00	0.0	-0.4	N/A
high point	5000	NA	383.6	380.1	1.009
second point	5003	NA	262.6	259.9	1.010
third point	5012	NA	137.6	135.7	1.014
calibrator zero	6000	0.00	.	0.1	
as left zero	6000	0.00	0.0	0.1	N/A
as left span	NA	32.80	NA	291.5	
				Average Correction Factor	1.011

Corrected As found	380.5	Previous response	378.1	% change	-0.6%

Notes: No Adjustments made, No Maintance Done, Filter Changed

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

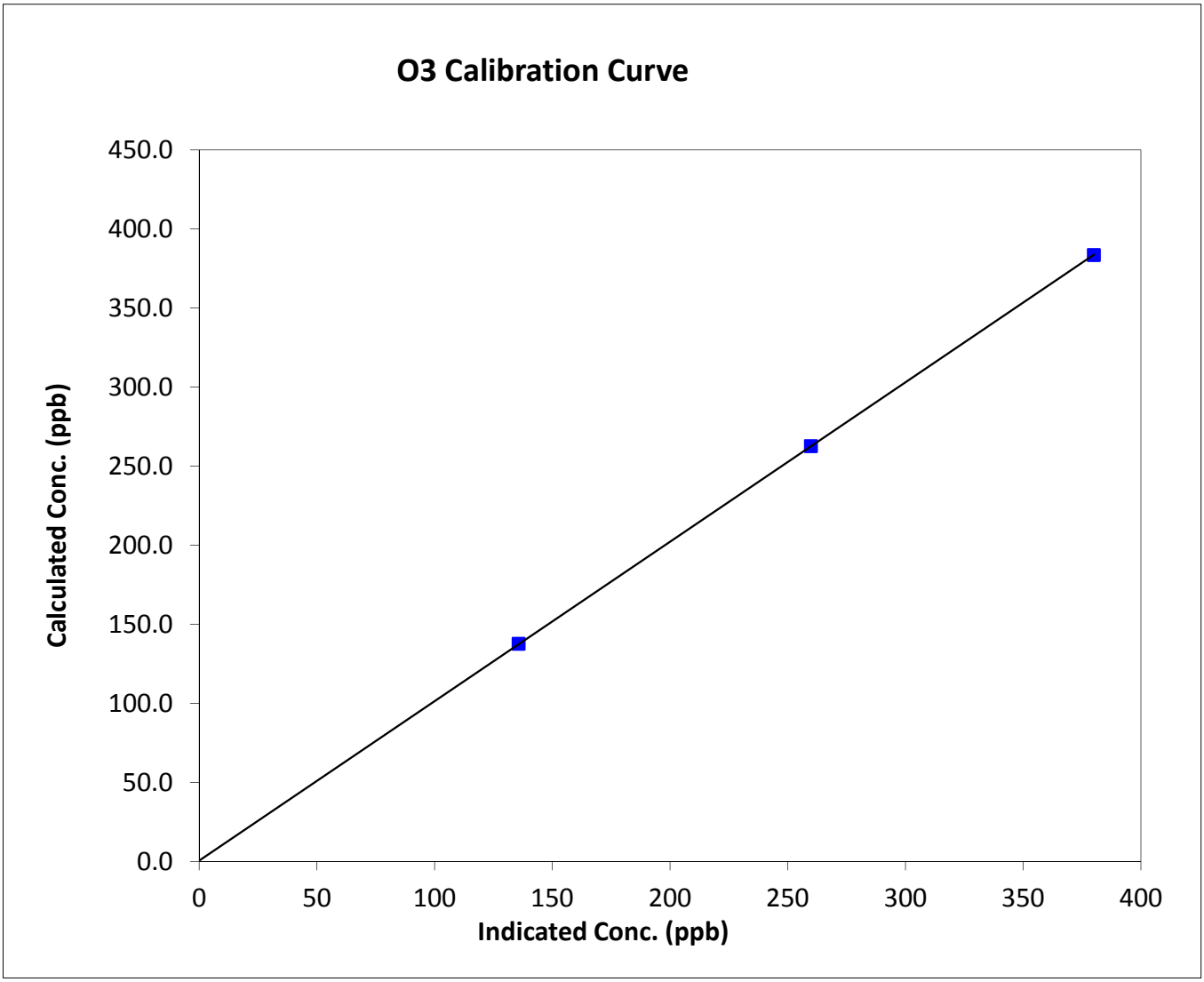
O_3 Calibration Summary

Station Information

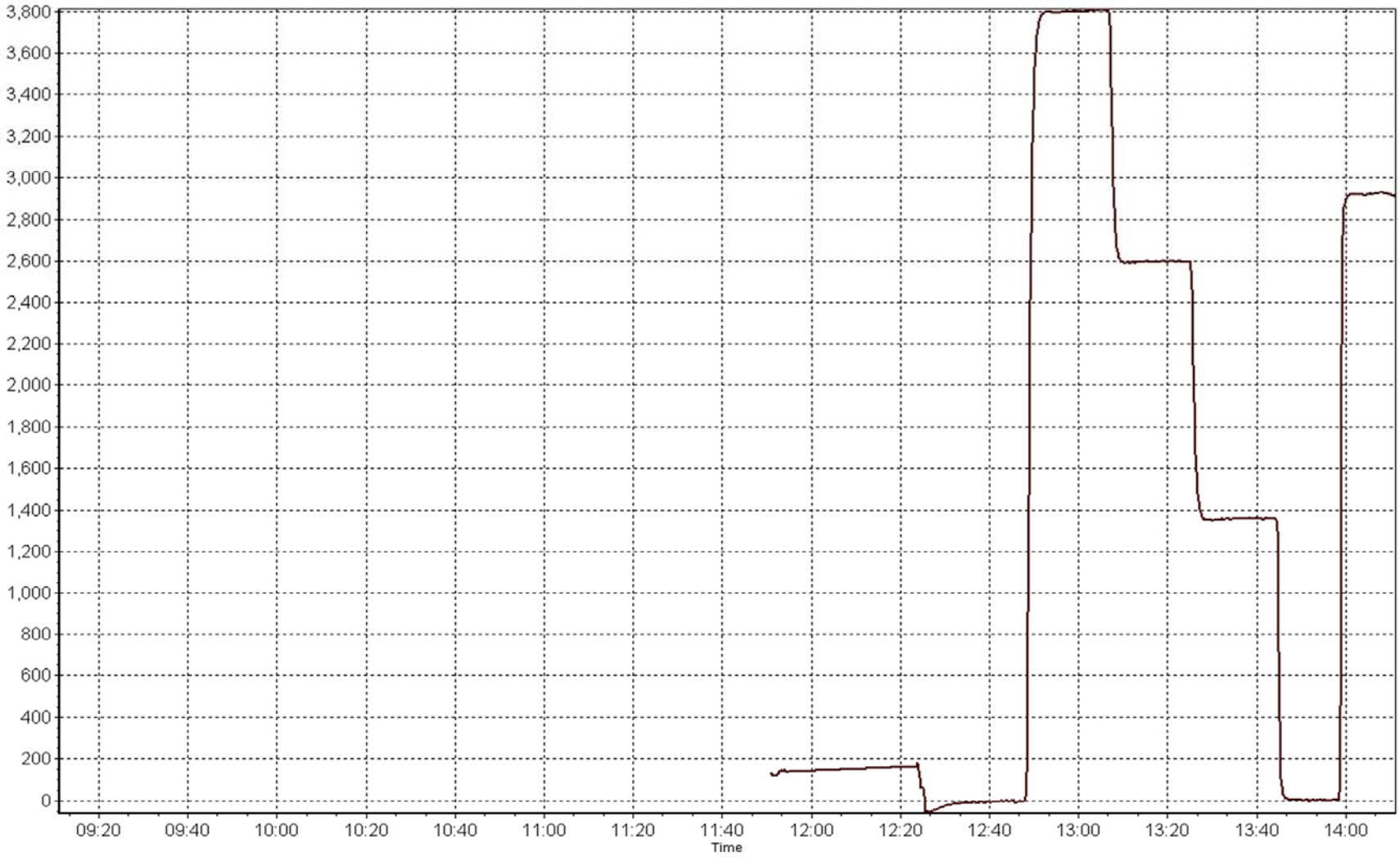
Calibration Date	Thursday, January 09, 2014	Previous Calibration	December 11, 2013
Station Name	Anzac	Station Number	AMS 14
Start Time (MST)	12:25	End Time (MST)	14:12
Analyzer make	TEI 49C	Analyzer serial #	509110892

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.4	N/A	Correlation Coefficient	0.999999
383.6	380.1	1.0092		
262.6	259.9	1.0104	Slope	1.008060
137.6	135.7	1.0140		
			Intercept	0.557704



O3 Calibration Plot **Date:** January 9, 2014



Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	Thursday, January 09, 2014	Previous Calibration	Monday, December 23, 2013
Station Name	Anzac	Station Number	14

Reason:	Routine	Install	Removal	Other:

Start Time (MST)	8:38	End Time (MST)	12:25
Barometric Pressure	782 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	000039037 LL107928	Cal Gas Expiry Date	May 29, 2014
CH4 Cal Gas Conc.	505.0 ppm	CH4 Equiv Conc.	1066.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	33.2	33.2
THC Range (mv)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Fuel Pressure	41.4	41.4
NMHC Range (mv)	50	50	Air Pressure	32.5	32.5
THC Calc slope	1.008562	1.011150	Carrier Pressure	31.8	31.8
THC Calc intercept	0.000114	0.014237			
NMHC Calc slope	1.013552	1.016616	Analyzer Background	NA	NA
NMHC Calc intercept	0.004293	0.002592	Analyzer Coefficient	NA	NA

Analyzer make	TEC 55i	Analyzer serial #	1118148495

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.0	N/A
as found span	5000	78.3	16.69	16.5	1.011
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	16.51	1.011
second point	5000	39.1	8.34	8.20	1.017
third point	5000	19.6	4.18	4.12	1.014
calibrator zero				0.00	
as left zero	6003	0.0	0.00	0.00	N/A
as left span	4996	78.2	16.69	16.46	1.014
				Average Correction Factor	1.014

Corrected As found	16.51	Previous response	16.84	% change	2.0%

Notes:

No Adjustments made

Filter changed out

No Maintenance Done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	8.79	8.65	1.016
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	8.65	1.016
second point	5000	39.2	4.40	4.29	1.025
third point	5000	19.6	2.20	2.18	1.009
calibrator zero				0.00	
as left zero	5900	0.0	0.00	0.00	N/A
as left span	4996	78.2	8.78	8.61	1.020
				Average Correction Factor	1.017

Corrected As found	8.65	Previous response	8.90	% change	2.9%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	7.91	7.86	1.006
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	7.86	1.006
second point	5009	39.2	3.95	3.91	1.011
third point	5000	19.6	1.98	1.94	1.020
calibrator zero				0.00	
as left zero	6003	0.0	0.00	0.00	N/A
as left span	4996	78.2	7.90	7.85	1.007
				Average Correction Factor	1.012

Corrected As found	7.86	Previous response	7.94	% change	1.0%

Wood Buffalo Environmental Association

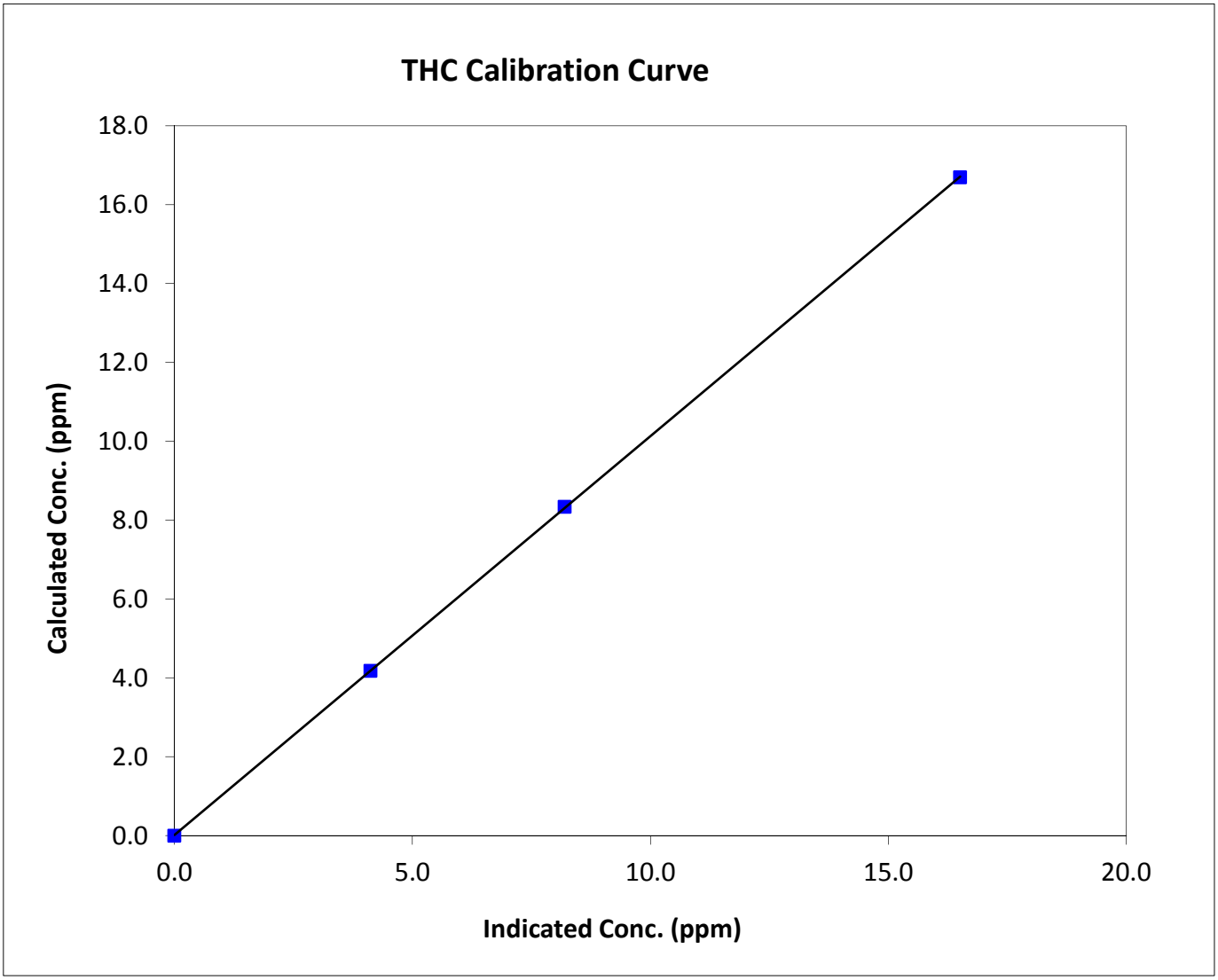
THC Calibration Summary

Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 23, 2013
Station Name	Anzac	Station Number	14
Start Time (MST)	8:38	End Time (MST)	12:25
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999991
16.69	16.51	1.0111		
8.34	8.20	1.0166	Slope	1.011150
4.18	4.12	1.0143		
			Intercept	0.014237



Wood Buffalo Environmental Association

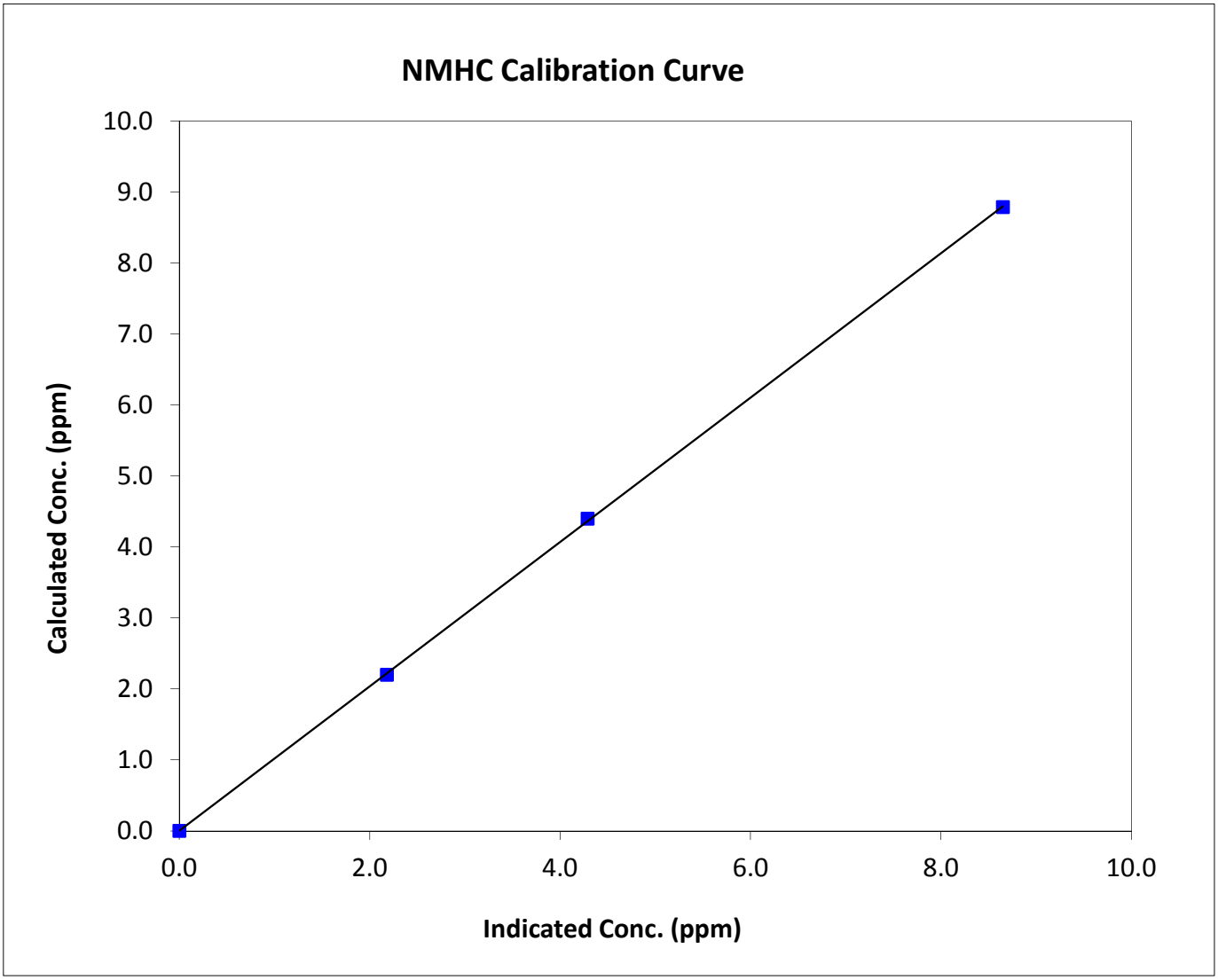
NMHC Calibration Summary

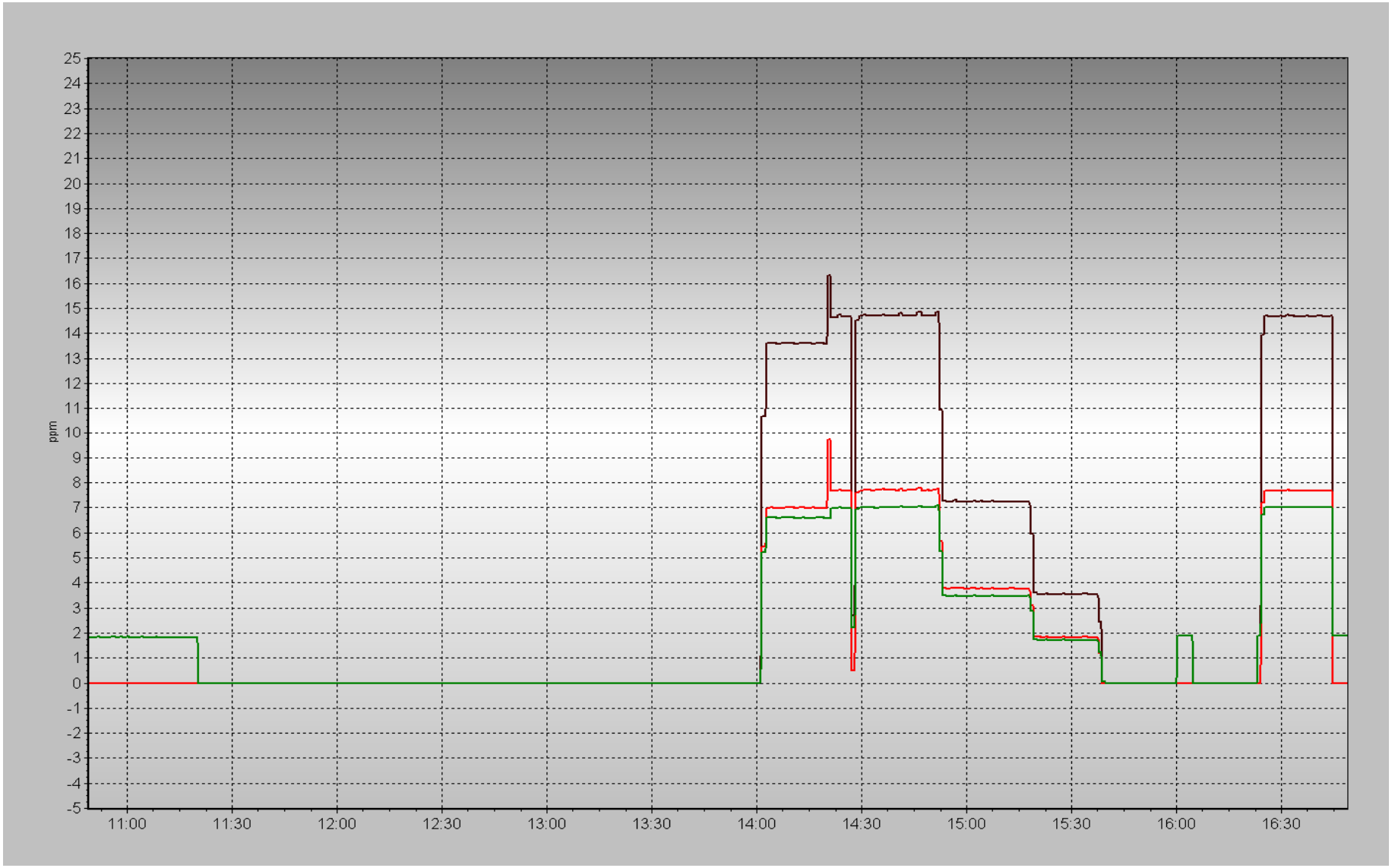
Station Information

Calibration Date	January 9, 2014	Previous Calibration	December 23, 2013
Station Name	Anzac	Station Number	14
Start Time (MST)	8:38	End Time (MST)	12:25
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999959
8.79	8.65	1.0155		
4.40	4.29	1.0252	Slope	1.016616
2.20	2.18	1.0088		
			Intercept	0.002592

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15:30
16:00
16:30

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January 13, 2014	Previous Calibration	January 9, 2014
Station Name	Anzac	Station Number	14

Reason:	Routine	Install	Removal	Other:	Repair

Start Time (MST)	10:38	End Time (MST)	12:10
Barometric Pressure	782 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	000039037 LL107928	Cal Gas Expiry Date	May 29, 2014
CH4 Cal Gas Conc.	505.0 ppm	CH4 Equiv Conc.	1066.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	33.6	33.6
THC Range (mv)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Fuel Pressure	41.4	41.4
NMHC Range (mv)	50	50	Air Pressure	32.5	32.5
THC Calc slope	1.011150	1.005502	Carrier Pressure	31.8	31.8
THC Calc intercept	0.014237	0.032320			
NMHC Calc slope	1.016616	1.008872	Analyzer Background	NA	NA
NMHC Calc intercept	0.002592	-0.005712	Analyzer Coefficient	NA	NA

Analyzer make	TEC 55i	Analyzer serial #	1118148495

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	16.59	1.006
second point	5000	39.1	8.34	8.23	1.013
third point	5000	19.6	4.18	4.10	1.019
calibrator zero					
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	16.69	16.81	0.993
				Average Correction Factor	1.013

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Condition the column; final zero/span indicated was performed after column bakeout.

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	8.72	1.007
second point	5000	39.2	4.40	4.34	1.013
third point	5000	19.6	2.20	2.21	0.995
calibrator zero					
as left zero	5900	0.0	0.00	0.00	N/A
as left span	4996	78.2	8.78	8.88	0.989
				Average Correction Factor	1.005

Corrected As found	NA	Previous response	NA	% change	NA

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	7.87	1.005
second point	5009	39.2	3.95	3.89	1.016
third point	5000	19.6	1.98	1.89	1.047
calibrator zero					
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	7.91	7.93	0.997
				Average Correction Factor	1.023

Corrected As found	NA	Previous response	NA	% change	NA

Wood Buffalo Environmental Association

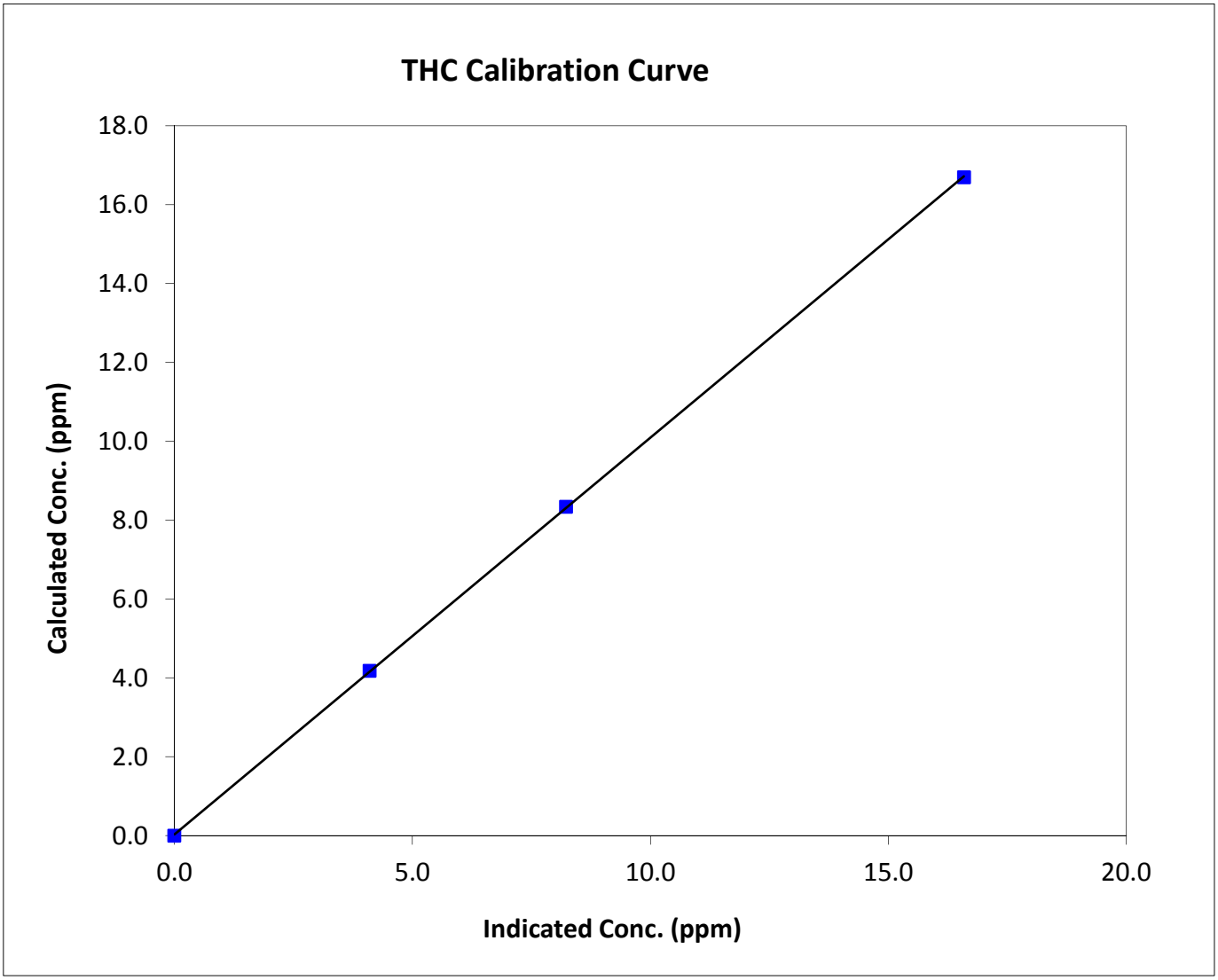
THC Calibration Summary

Station Information

Calibration Date	January 13, 2014	Previous Calibration	January 9, 2014
Station Name	Anzac	Station Number	14
Start Time (MST)	10:38	End Time (MST)	12:10
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999981
16.69	16.59	1.0062		
8.34	8.23	1.0129	Slope	1.005502
4.18	4.10	1.0192		
			Intercept	0.032320



Wood Buffalo Environmental Association

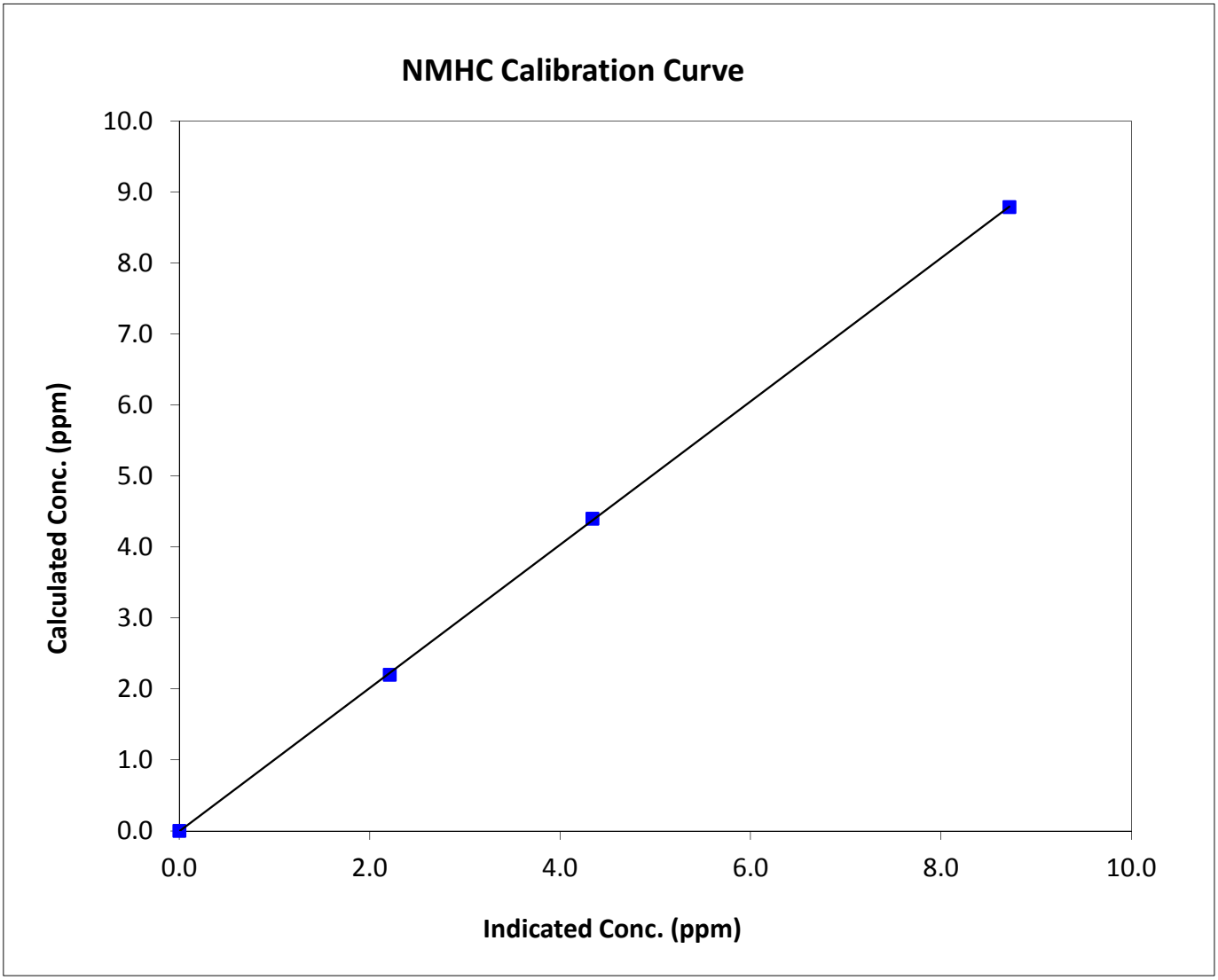
NMHC Calibration Summary

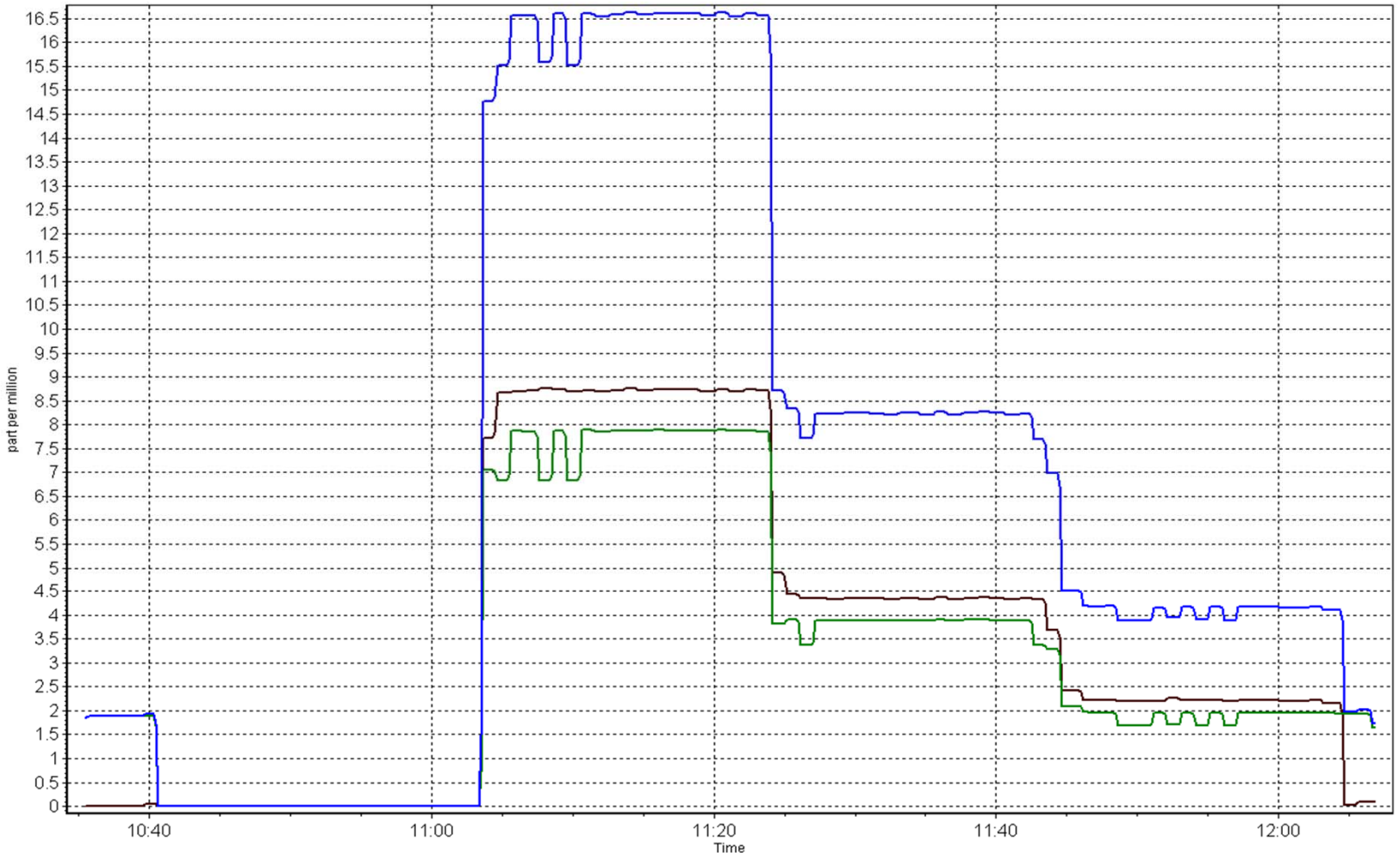
Station Information

Calibration Date	January 13, 2014	Previous Calibration	January 9, 2014
Station Name	Anzac	Station Number	14
Start Time (MST)	10:38	End Time (MST)	12:10
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999968
8.79	8.72	1.0075		
4.40	4.34	1.0134	Slope	1.008872
2.20	2.21	0.9951		
			Intercept	-0.005712

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11:00
11:20
11:40
12:00
Time

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January 14, 2014	Previous Calibration	January 13, 2014
Station Name	Anzac	Station Number	14

Reason:	Routine	Install	Removal	Other:	Repair

Start Time (MST)	9:40	End Time (MST)	11:40
Barometric Pressure	782 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	000039037 LL107928	Cal Gas Expiry Date	May 29, 2014
CH4 Cal Gas Conc.	505.0 ppm	CH4 Equiv Conc.	1066.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	33.2	33.6
THC Range (mv)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Fuel Pressure	41.4	41.4
NMHC Range (mv)	50	50	Air Pressure	32.5	32.5
THC Calc slope	1.005502	1.010147	Carrier Pressure	31.8	31.8
THC Calc intercept	0.032320	0.006316			
NMHC Calc slope	1.008872	0.998631	Analyzer Background	NA	NA
NMHC Calc intercept	-0.005712	-0.001571	Analyzer Coefficient	NA	NA

Analyzer make	TEC 55i	Analyzer serial #	1118148495

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.0	N/A
as found span	5000	78.3	16.69	16.54	1.009
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	16.54	1.009
second point	5000	39.1	8.34	8.19	1.018
third point	5000	19.6	4.18	4.16	1.005
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	16.69	16.47	1.014
				Average Correction Factor	1.011

Corrected As found	16.54	Previous response	16.75	% change	1.3%

Notes:

Calibration after Column Conditioning

Timing was changed

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	8.79	8.81	0.997
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	8.81	0.997
second point	5000	39.2	4.40	4.37	1.006
third point	5000	19.6	2.20	2.23	0.986
calibrator zero				0.00	
as left zero	5900	0.0	0.00	0.00	N/A
as left span	4996	78.2	8.78	8.77	1.001
				Average Correction Factor	0.997

Corrected As found	8.81	Previous response	8.87	% change	0.7%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	7.91	7.73	1.023
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	7.73	1.023
second point	5009	39.2	3.95	3.82	1.035
third point	5000	19.6	1.98	1.93	1.026
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	7.91	7.70	1.027
				Average Correction Factor	1.028

Corrected As found	7.73	Previous response	7.88	% change	2.0%

Wood Buffalo Environmental Association

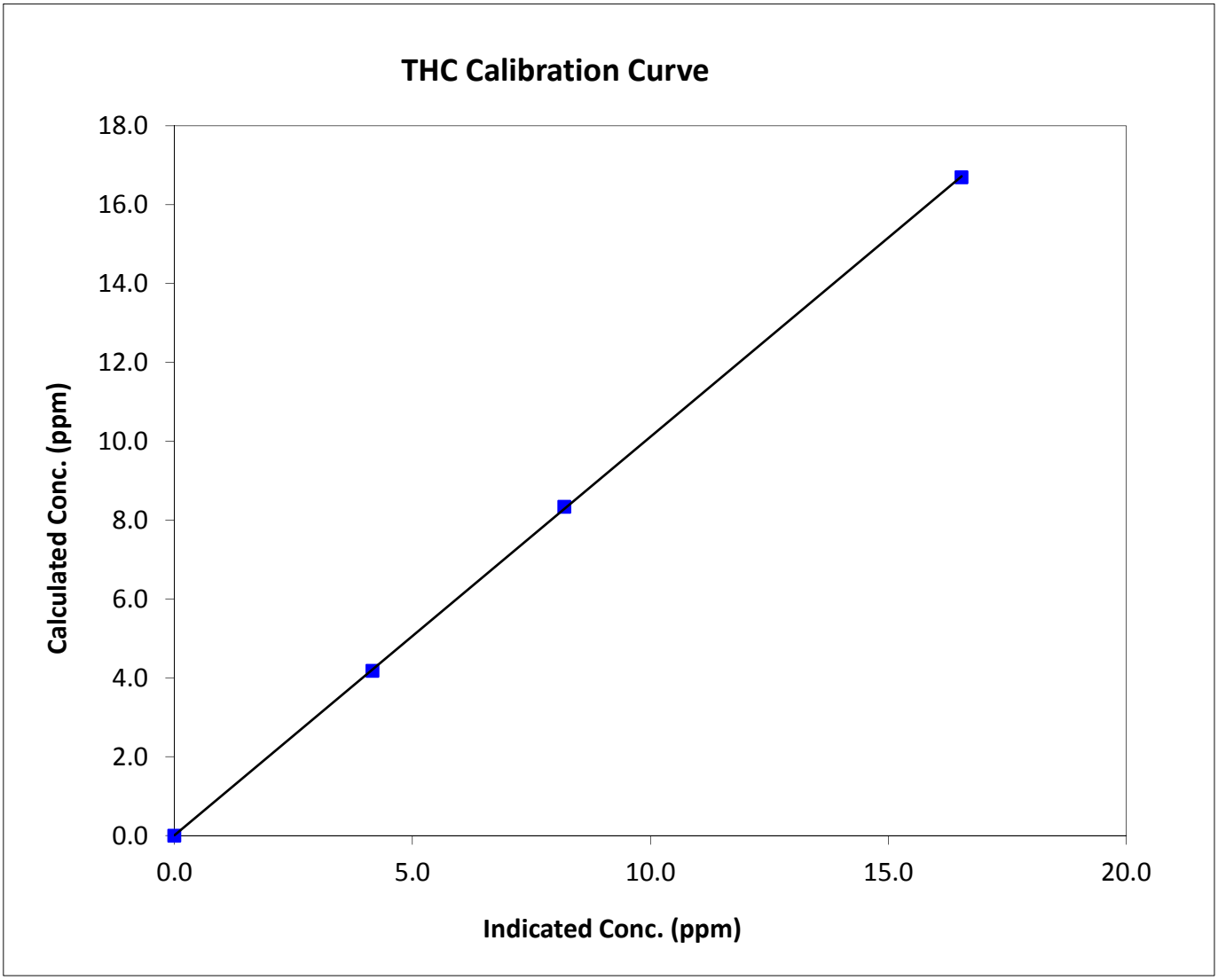
THC Calibration Summary

Station Information

Calibration Date	January 14, 2014	Previous Calibration	January 13, 2014
Station Name	Anzac	Station Number	14
Start Time (MST)	9:40	End Time (MST)	11:40
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999970
16.69	16.54	1.0093		
8.34	8.19	1.0178	Slope	1.010147
4.18	4.16	1.0045		
			Intercept	0.006316



Wood Buffalo Environmental Association

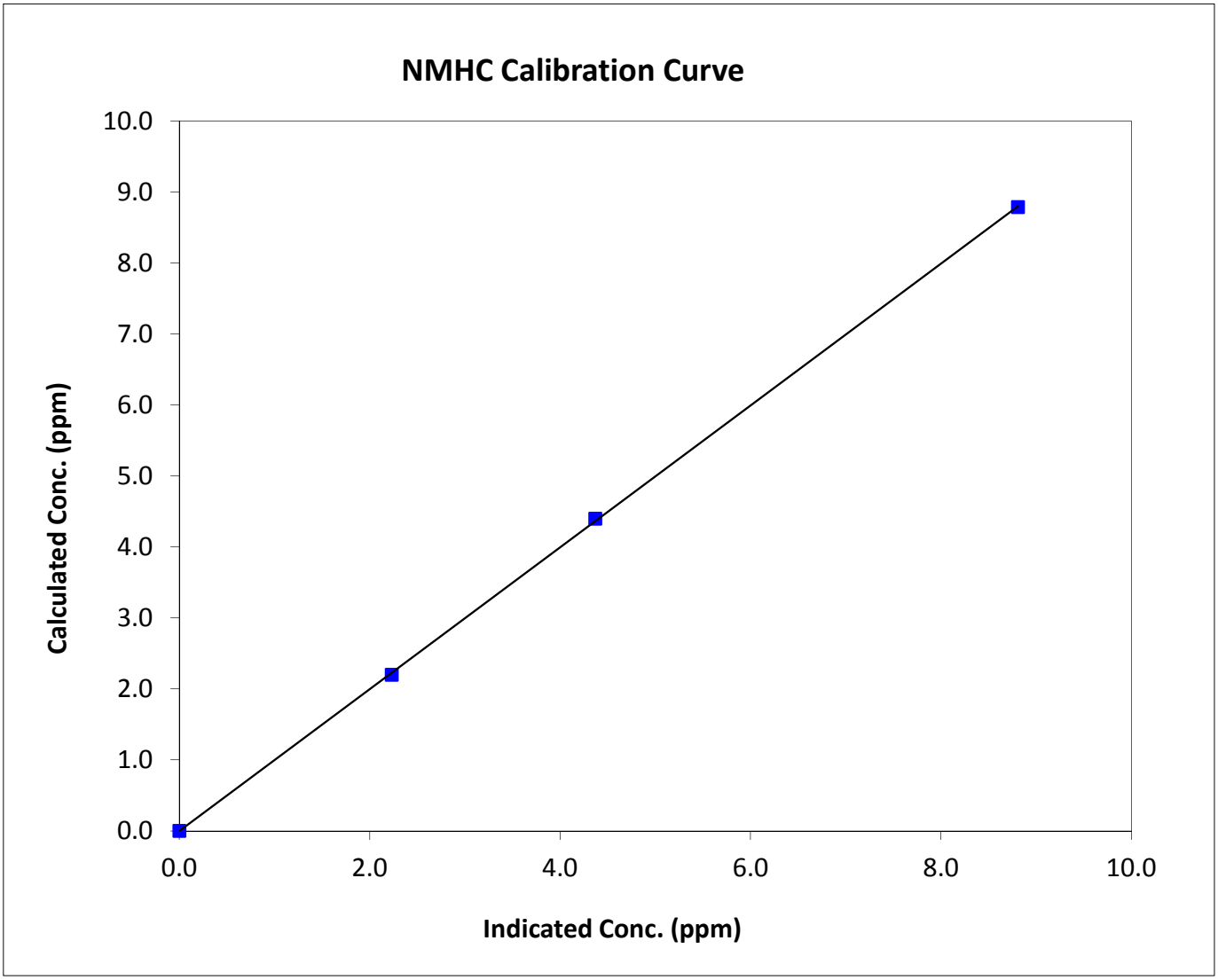
NMHC Calibration Summary

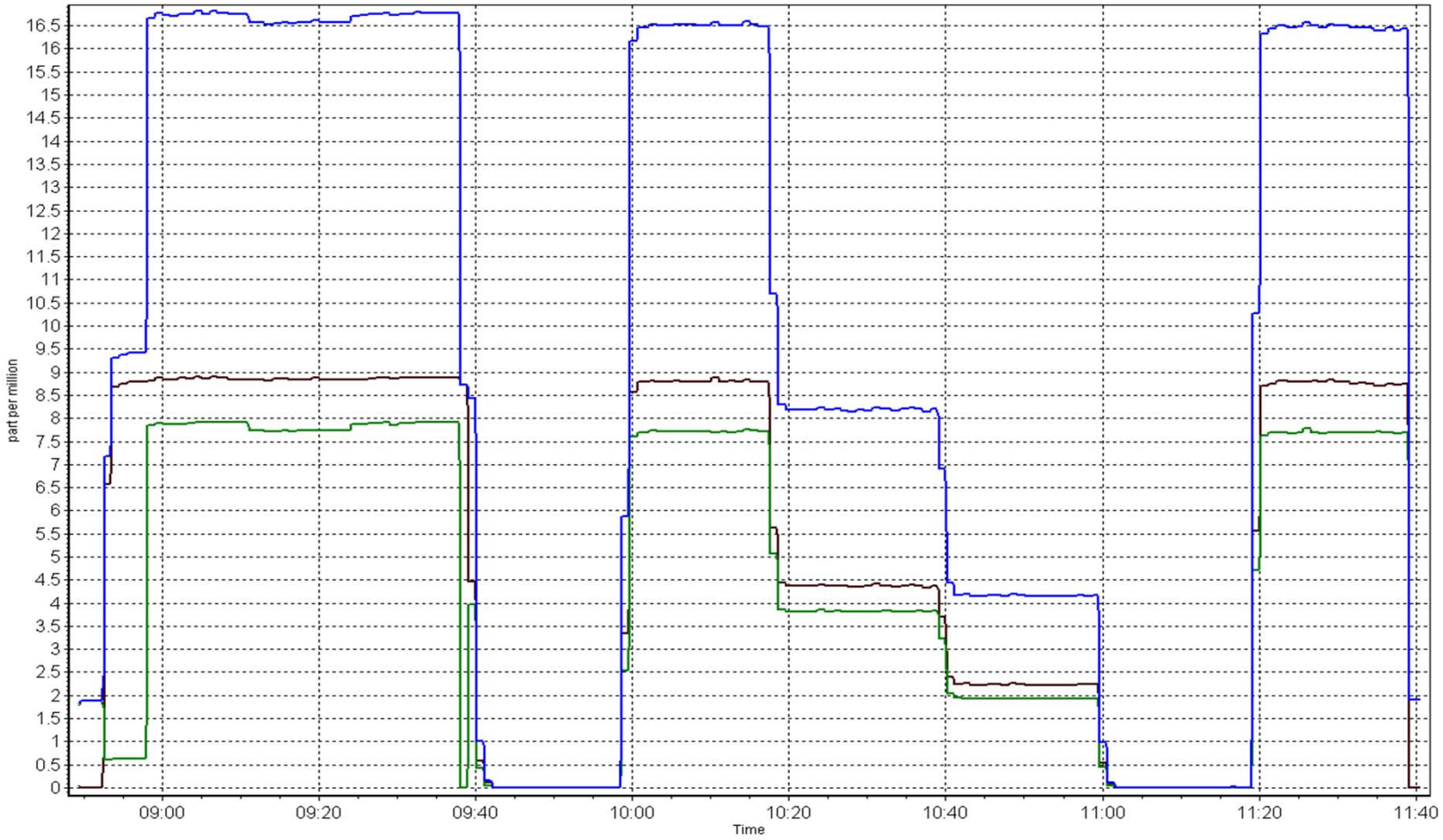
Station Information

Calibration Date	January 14, 2014	Previous Calibration	January 13, 2014
Station Name	Anzac	Station Number	14
Start Time (MST)	9:40	End Time (MST)	11:40
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999950
8.79	8.81	0.9972		
4.40	4.37	1.0065	Slope	0.998631
2.20	2.23	0.9862		
			Intercept	-0.001571

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10:00
10:20
10:40
11:00
11:20
11:40
Time

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January 27, 2014	Previous Calibration	January 14, 2014
Station Name	Anzac	Station Number	14

Reason:	Routine	Install	Removal	Other:

Start Time (MST)	10:05	End Time (MST)	11:20
Barometric Pressure	782 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	000039037 LL107928	Cal Gas Expiry Date	May 29, 2014
CH4 Cal Gas Conc.	505.0 ppm	CH4 Equiv Conc.	1066.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	32.8	33.6
THC Range (mv)	50	50	Flame Temp	405.0	405.0
NMHC Range (ppm)	50	50	Fuel Pressure	41.4	41.4
NMHC Range (mv)	50	50	Air Pressure	32.5	32.5
THC Calc slope	1.010147	1.299738	Carrier Pressure	31.8	31.8
THC Calc intercept	0.006316	-0.408597			
NMHC Calc slope	0.998631	0.987998	Analyzer Background	NA	NA
NMHC Calc intercept	-0.001571	0.002344	Analyzer Coefficient	NA	NA

Analyzer make	TEC 55i	Analyzer serial #	1118148495

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.0	N/A
as found span	5000	78.3	16.69	12.99	1.285
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	12.99	1.285
second point	5000	39.1	8.34	6.83	1.221
third point	5000	19.6	4.18	3.91	1.069
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.191

Corrected As found	12.99	Previous response	16.86	% change	29.8%

Notes:

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	8.79	8.90	0.987
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	8.90	0.987
second point	5000	39.2	4.40	4.42	0.995
third point	5000	19.6	2.20	2.24	0.982
calibrator zero					
as left zero	5900	0.0	0.00		N/A
as left span	4996	78.2	8.78		
				Average Correction Factor	0.988

Corrected As found	8.90	Previous response	8.77	% change	-1.4%

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0	0.00	0.00	N/A
as found span	5000	78.3	7.91	4.09	1.934
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	4.09	1.934
second point	5009	39.2	3.95	2.41	1.640
third point	5000	19.6	1.98	1.67	1.185
calibrator zero					
as left zero					
as left span					
				Average Correction Factor	1.586

Corrected As found	4.09	Previous response	8.08	% change	97.6%

Wood Buffalo Environmental Association

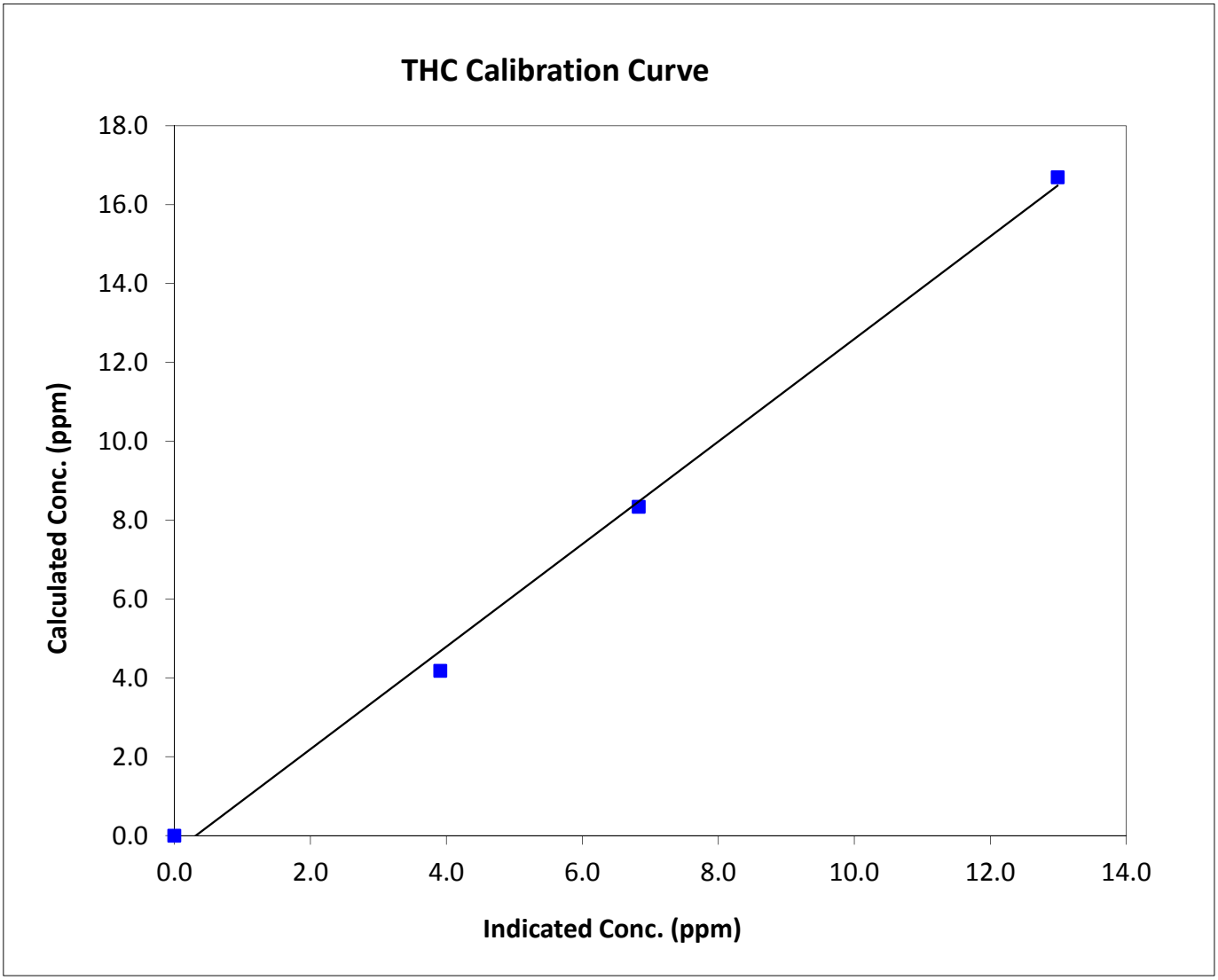
THC Calibration Summary

Station Information

Calibration Date	January 27, 2014	Previous Calibration	January 14, 2014
Station Name	Anzac	Station Number	14
Start Time (MST)	10:05	End Time (MST)	11:20
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.996869
16.69	12.99	1.2851		
8.34	6.83	1.2205	Slope	1.299738
4.18	3.91	1.0687		
			Intercept	-0.408597



Wood Buffalo Environmental Association

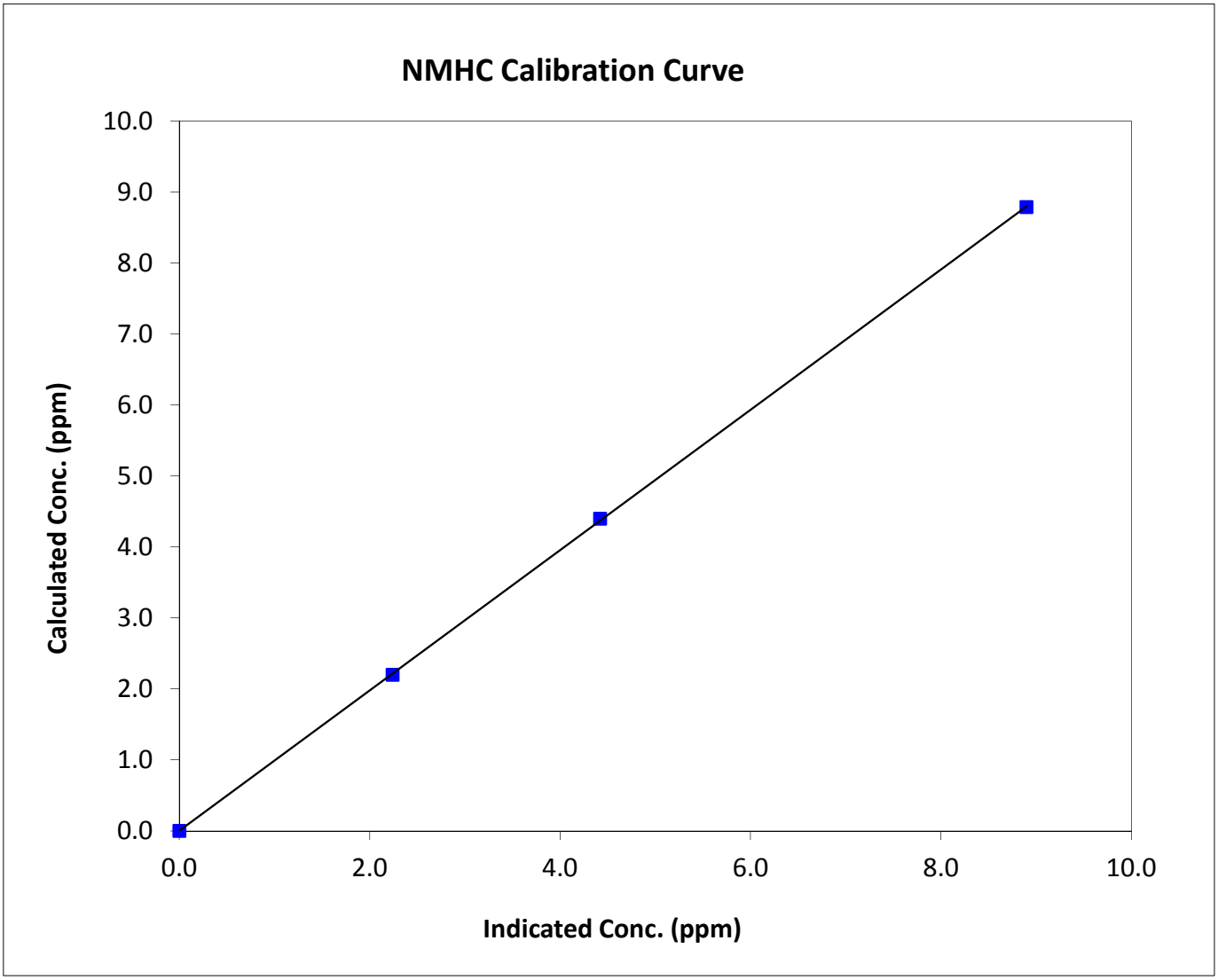
NMHC Calibration Summary

Station Information

Calibration Date	January 27, 2014	Previous Calibration	January 14, 2014
Station Name	Anzac	Station Number	14
Start Time (MST)	10:05	End Time (MST)	11:20
Analyzer make	TEC 55i	Analyzer serial #	1118148495

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999971
8.79	8.90	0.9871		
4.40	4.42	0.9951	Slope	0.987998
2.20	2.24	0.9818		
			Intercept	0.002344




part per million
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11:00
11:20
Time

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

Station Information

Calibration Date	January 27, 2014	Previous Calibration	NA
Station Name	Anzac	Station Number	14

Reason:	Routine	Install	Removal	Other:
		X		

Start Time (MST)	12:10	End Time (MST)	14:20
Barometric Pressure	782 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	8400311
Gas Cert Reference	000039037 LL107928	Cal Gas Expiry Date	May 29, 2014
CH4 Cal Gas Conc.	505.0 ppm	CH4 Equiv Conc.	1066.0 ppm
C3H8 Cal Gas Conc.	204.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2372

Analyzer Information

	Before	*After*		*Before*	*After*
THC Range (ppm)	50	50	Internal Temp	29.5	32.9
THC Range (mv)	50	50	Flame Temp	393.5	380.0
NMHC Range (ppm)	50	50	Fuel Pressure	42.3	42.3
NMHC Range (mv)	50	50	Air Pressure	32.4	32.4
THC Calc slope	NA	0.996462	Carrier Pressure	34.5	34.5
THC Calc intercept	NA	0.019210			
NMHC Calc slope	NA	0.999205	Analyzer Background	NA	NA
NMHC Calc intercept	NA	0.007209	Analyzer Coefficient	NA	NA

Analyzer make	TEC 55i	Analyzer serial #	1331259521

THC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	16.69	16.76	0.996
second point	5000	39.1	8.34	8.29	1.006
third point	5000	19.6	4.18	4.19	0.997
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	16.69	16.74	0.997
				Average Correction Factor	1.000

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

Bias Voltage Rate on border of Max at -285

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC / NMHC Calibration Report

NMHC Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	8.79	8.80	0.998
second point	5000	39.2	4.40	4.36	1.010
third point	5000	19.6	2.20	2.21	0.995
calibrator zero				0.00	
as left zero	5900	0.0	0.00	0.00	N/A
as left span	4996	78.2	8.78	8.77	1.001
				Average Correction Factor	1.001

Corrected As found	NA	Previous response	NA	% change	NA

CH4 Calibration Data

Set Point	Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	78.3	7.91	7.96	0.994
second point	5009	39.2	3.95	3.93	1.006
third point	5000	19.6	1.98	1.98	1.000
calibrator zero	5000	0.0	0.00	0.00	N/A
as left zero	5000	0.0	0.00	0.00	N/A
as left span	5000	78.3	7.91	7.97	0.992
				Average Correction Factor	1.000

Corrected As found	NA	Previous response	NA	% change	NA

Wood Buffalo Environmental Association

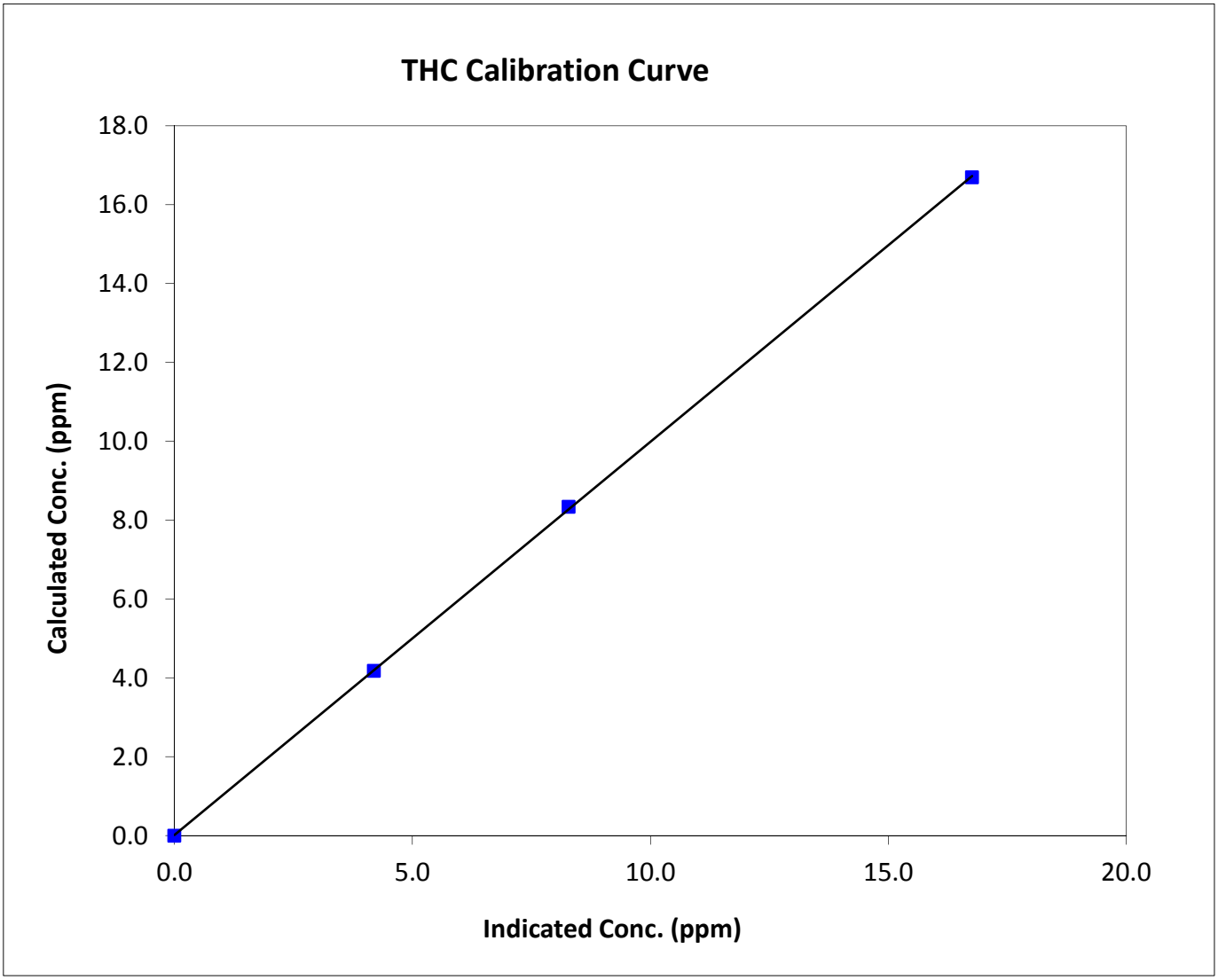
THC Calibration Summary

Station Information

Calibration Date	January 27, 2014	Previous Calibration	NA
Station Name	Anzac	Station Number	14
Start Time (MST)	12:10	End Time (MST)	14:20
Analyzer make	TEC 55i	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999967
16.69	16.76	0.9960		
8.34	8.29	1.0062	Slope	0.996462
4.18	4.19	0.9973		
			Intercept	0.019210



Wood Buffalo Environmental Association

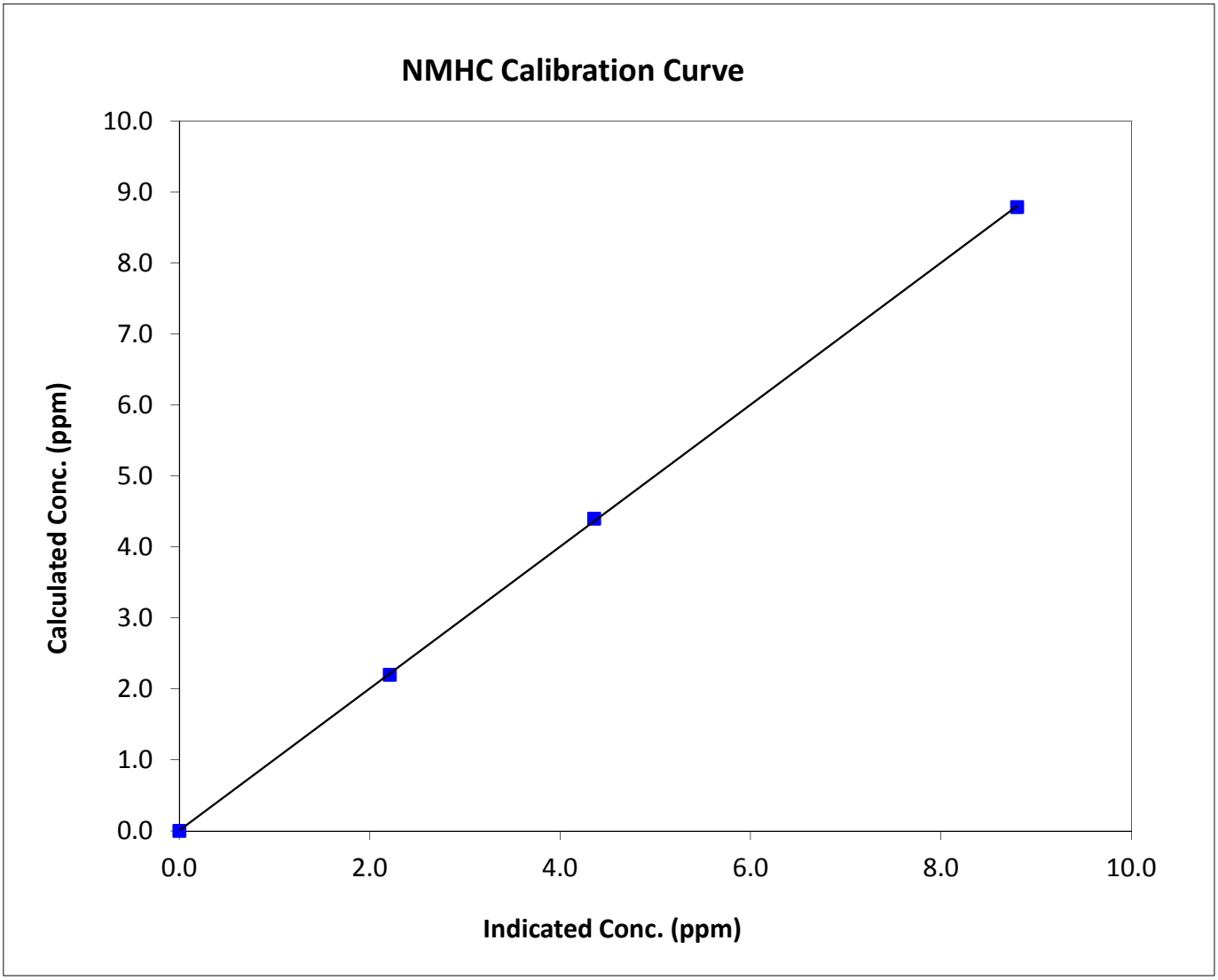
NMHC Calibration Summary

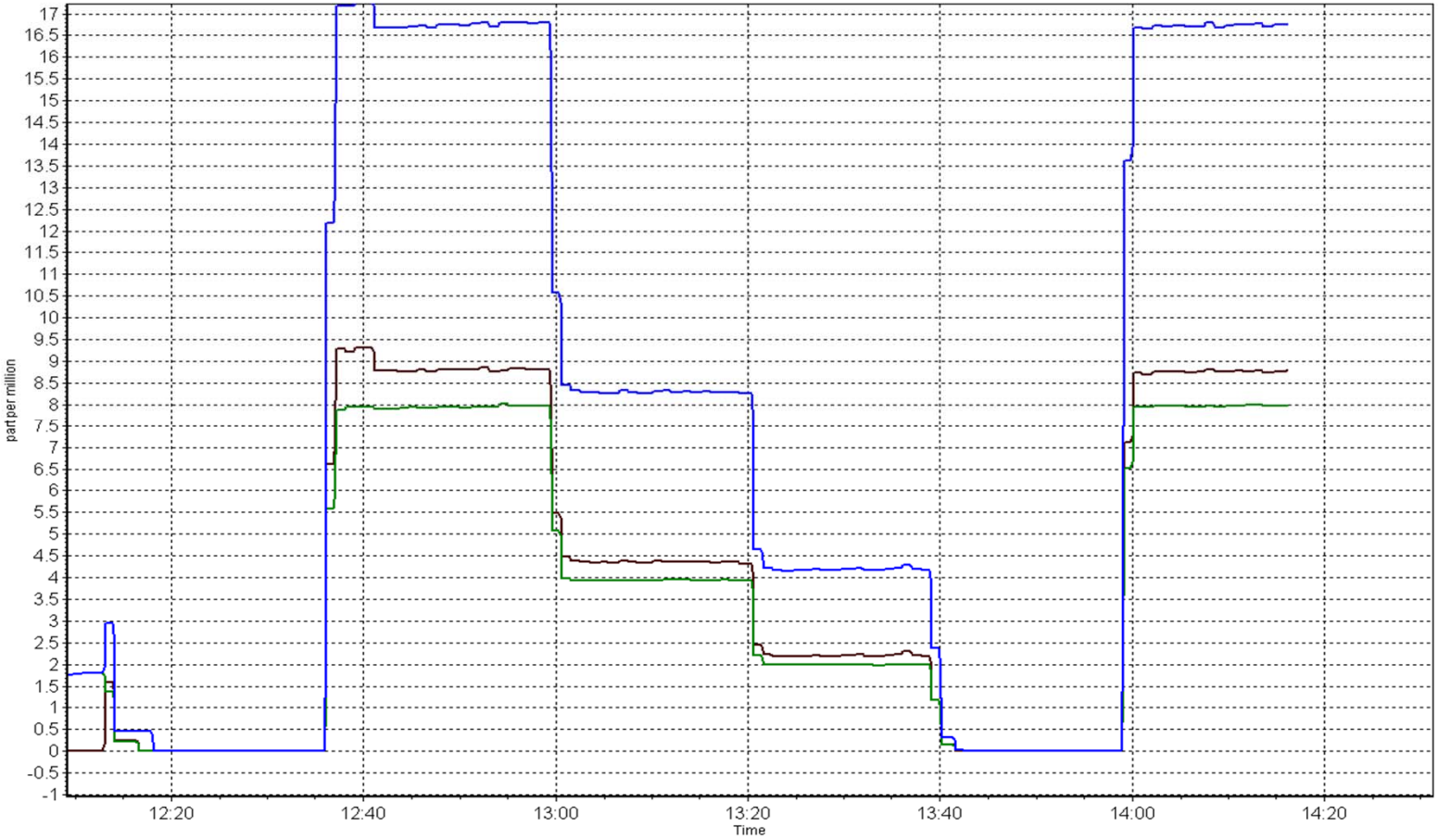
Station Information

Calibration Date	January 27, 2014	Previous Calibration	NA
Station Name	Anzac	Station Number	14
Start Time (MST)	12:10	End Time (MST)	14:20
Analyzer make	TEC 55i	Analyzer serial #	1331259521

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999952
8.79	8.80	0.9983		
4.40	4.36	1.0097	Slope	0.999205
2.20	2.21	0.9951		
			Intercept	0.007209

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14:00
14:20
Time

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 15
CNRL HORIZON
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
JANUARY 2014

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	708	36	36	100.00	71	0	6	0
TRS (ppb) Average	708	35	36	99.87	1	0	1	0
THC (ppm) Average	706	36	38	99.73	4.8	-	3.2	-
NO2 (ppb) Average	708	36	36	100.00	38	0	26	-
NO (ppb) Average	708	36	36	100.00	67	-	33	-
NOX (ppb) Average	708	36	36	100.00	103	-	53	-
PM2.5 (ug/m3) Average	742	0	2	99.73	108.9	-	21.5	0
Temperature 2 m (C) Average	744	0	0	100.00	6.7	-	0.0	-
Wind Speed 10 m (km/h) Average	744	0	0	100.00	49	-	-	-
Wind Direction 10 m (deg) Average	744	0	0	100.00	-	-	-	-
Precipitation (mm) Total	744	0	0	100.00	0.1	-	-	-
Relative Humidity (%) Average	744	0	0	100.00	94	-	90	-
Global Solar Radiation (W/m2) Average	744	0	0	100.00	193	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	1.2	3	-	0	0	0	1	1	2	71
TRS (ppb) Average	708	0.3	0	-	0	0	0	0	0	1	1
THC (ppm) Average	706	2.42	0.3	-	2	2.2	2.2	2.3	2.5	2.8	4.8
NO2 (ppb) Average	708	10.9	10	-	0	1	3	7	17	26	38
NO (ppb) Average	708	4.1	10	-	0	0	0	0	2	13	67
NOX (ppb) Average	708	15	18	-	0	1	3	8	21	38	103
PM2.5 (ug/m3) Average	742	9.94	9.7	-	0.6	2.3	3.6	7.4	13.1	20	108.9
Temperature 2 m (C) Average	744	-17.3	10.1	-	-40.2	-29.2	-24.7	-17.6	-10.8	-3.6	6.7
Wind Speed 10 m (km/h) Average	744	8.6	6	-	0	3	5	7	11	15	49
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	0.1	0	0	0	0	0	0	0.1
Relative Humidity (%) Average	744	75.4	9	-	44	63	69	76	82	87	94
Global Solar Radiation (W/m2) Average	744	13.2	32	-	0	0	0	0	6	56	193

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CNRL HORIZON (AMS 15)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	03 Jan 2014 10:00	03 Jan 2014 10:00	1	Maintenance - manifold cleaning
THC	24 Jan 2014 10:00	24 Jan 2014 11:00	2	Maintenance - replace fuel cylinder
PM2.5	24 Jan 2014 11:00	24 Jan 2014 12:00	2	Flow and zero reference checks, sample head cleaning

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 71 ppb on Jan 7 16:00 Maximum Daily Average: 6.1 ppb on Jan 7

Minimum Value: 0 ppb on Jan 24 13:00 Minimum Daily Average: 0.2 ppb on Jan 24
Maximum Diurnal Average: 3.1 ppb at hour 16 Minimum Diurnal Average: 0.8 ppb at hour 21
Monthly Average: 1.2 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 1 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 15$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2	Z	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	3	4	0.9	4
2-Jan	7	Z	2	3	7	4	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	1.6	7
3-Jan	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	1	0	0	0	0	0.3	1
4-Jan	0	Z	1	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	1	0.4	2
5-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0.3	1
6-Jan	0	Z	0	1	3	2	5	5	7	8	6	6	5	3	2	2	2	3	3	3	3	2	2	2	3.3	8
7-Jan	2	Z	1	1	1	1	1	1	1	1	1	1	1	1	29	71	15	5	2	1	1	1	1	1	6.1	71
8-Jan	1	Z	1	1	1	15	26	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3.1	26
9-Jan	2	Z	2	2	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0.8	2
10-Jan	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0.4	1
11-Jan	1	Z	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.5	2
12-Jan	1	Z	1	0	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.5	1
13-Jan	1	Z	1	1	0	0	0	0	0	1	1	0	0	0	0	0	1	2	1	2	2	1	1	1	0.8	2
14-Jan	1	Z	1	1	1	1	1	1	2	3	12	14	18	17	3	2	2	1	1	1	1	1	1	1	3.7	18
15-Jan	1	Z	1	1	1	0	0	0	0	1	1	1	2	2	2	1	1	1	1	1	1	0	0	1	0.9	2
16-Jan	1	Z	1	1	1	0	0	0	0	0	1	1	1	1	0	1	2	2	0	0	2	1	1	0	0.8	2
17-Jan	1	Z	2	0	0	0	0	0	0	0	0	1	3	1	0	4	0	0	0	0	0	1	1	0	0.7	4
18-Jan	0	Z	0	0	1	6	6	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	6
19-Jan	1	Z	2	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
20-Jan	0	Z	1	1	0	1	2	2	3	2	1	1	1	1	1	1	3	2	2	2	2	1	1	1	1.3	3
21-Jan	1	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0.6	1
22-Jan	1	Z	3	4	4	10	14	10	4	4	1	2	2	2	1	1	0	1	1	1	1	2	2	1	3.1	14
23-Jan	1	Z	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	1
24-Jan	0	Z	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
25-Jan	0	Z	1	1	1	2	2	1	1	1	1	0	0	0	0	0	0	3	5	4	3	4	5	4	1.7	5
26-Jan	2	Z	0	0	0	0	0	0	0	0	0	2	2	1	1	0	1	0	0	0	0	0	0	0	0.6	2
27-Jan	0	Z	0	0	0	0	0	0	1	0	1	1	0	0	0	1	4	3	1	1	2	2	2	2	1.0	4
28-Jan	1	Z	1	1	1	1	1	0	0	1	1	1	1	2	6	5	2	1	0	0	0	0	0	0	1.2	6
29-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	2	1	0.6	2
30-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
31-Jan	0	Z	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.3	1
	1.0	--	0.9	0.8	0.9	1.7	2.1	1.1	1.0	1.1	1.2	1.3	1.5	1.4	1.7	3.1	1.3	1.0	0.9	0.8	0.8	0.8	0.9	0.9	Diurnal Average	
	7	--	3	4	7	15	26	10	7	8	12	14	18	17	29	71	15	5	5	4	3	4	5	4	Diurnal Maximum	

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

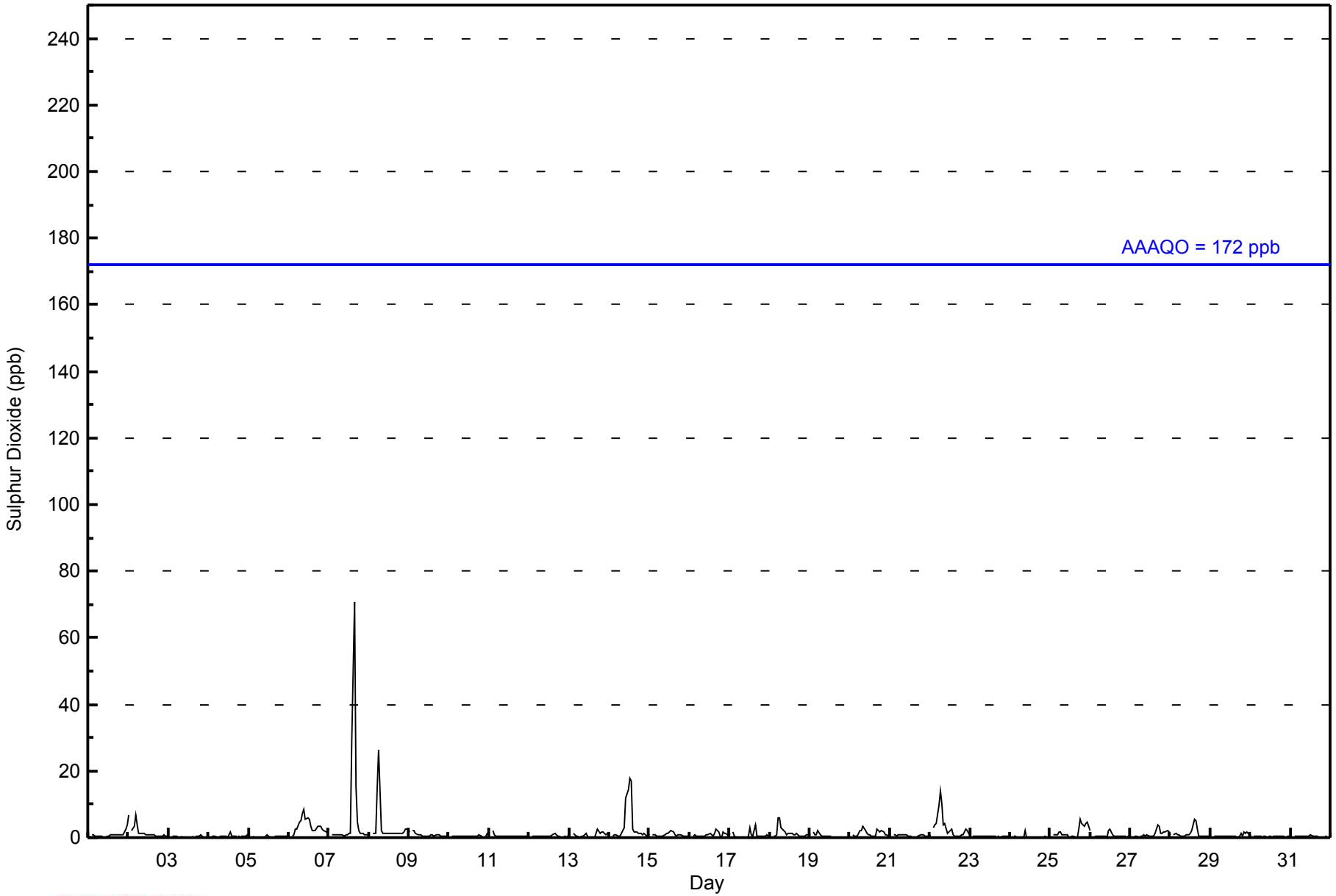
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	698	98.59	98.59
11 - 20	7	0.99	99.58
21 - 60	2	0.28	99.86
61 - 110	1	0.14	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	42	104	46	13	13	10	14	33	136	104	70	16	15	25	24	33	698
11 - 20	0	0	0	0	0	0	0	0	1	3	3	0	0	0	0	0	7
21 - 60	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
61 - 110	0	0	0	0	0	0	0	0	1	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	42	104	46	13	13	10	15	33	139	107	73	16	15	25	24	33	708

Total Number of Valid Hours: 708

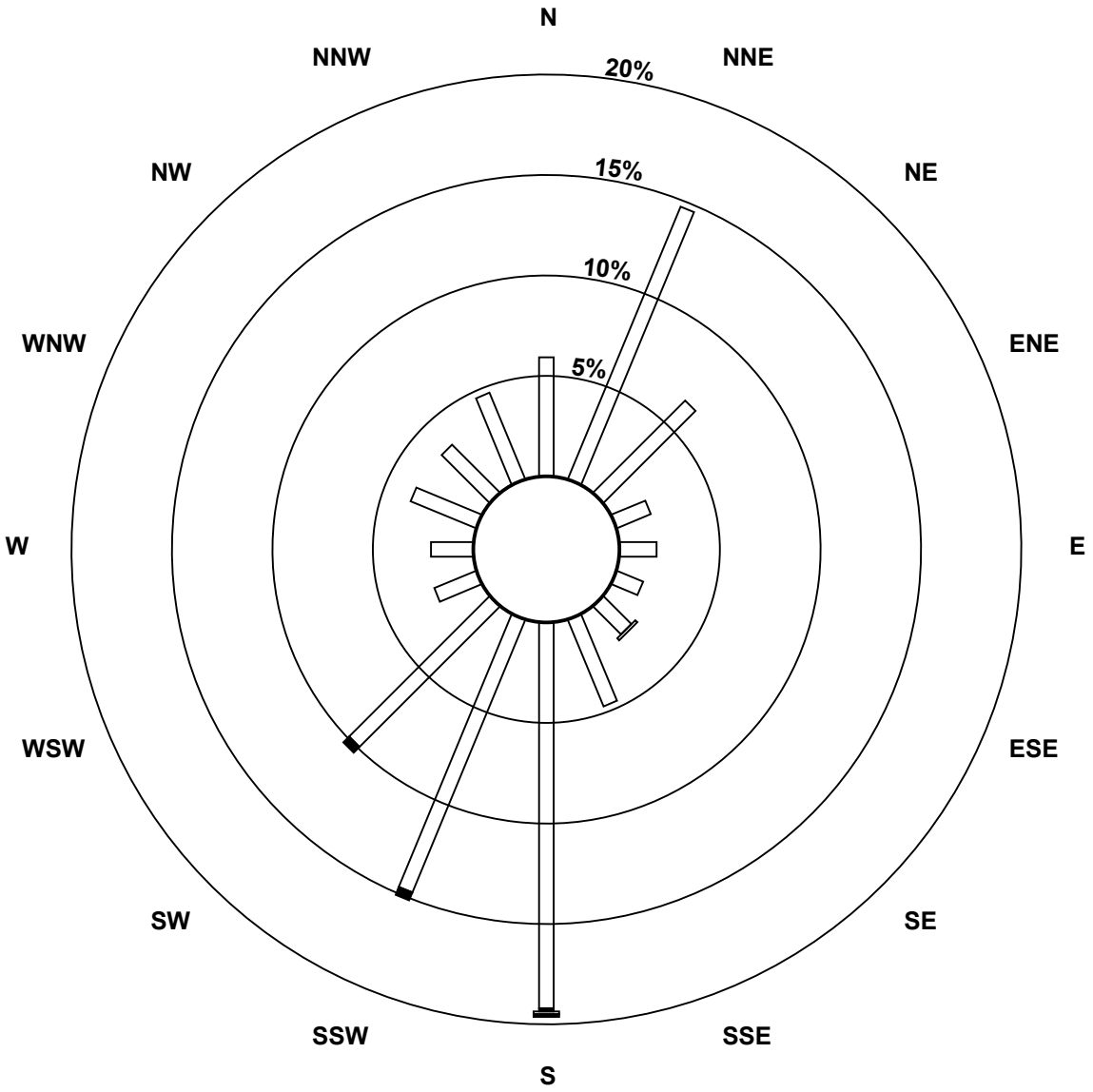
Total Number of Hours: 744

Wood Buffalo Environmental Association

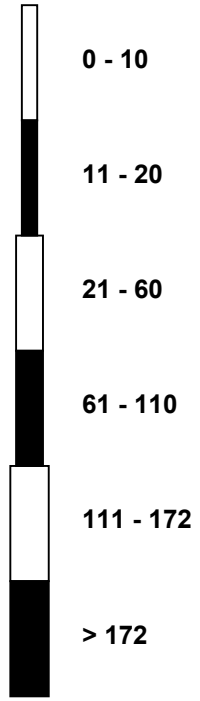
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



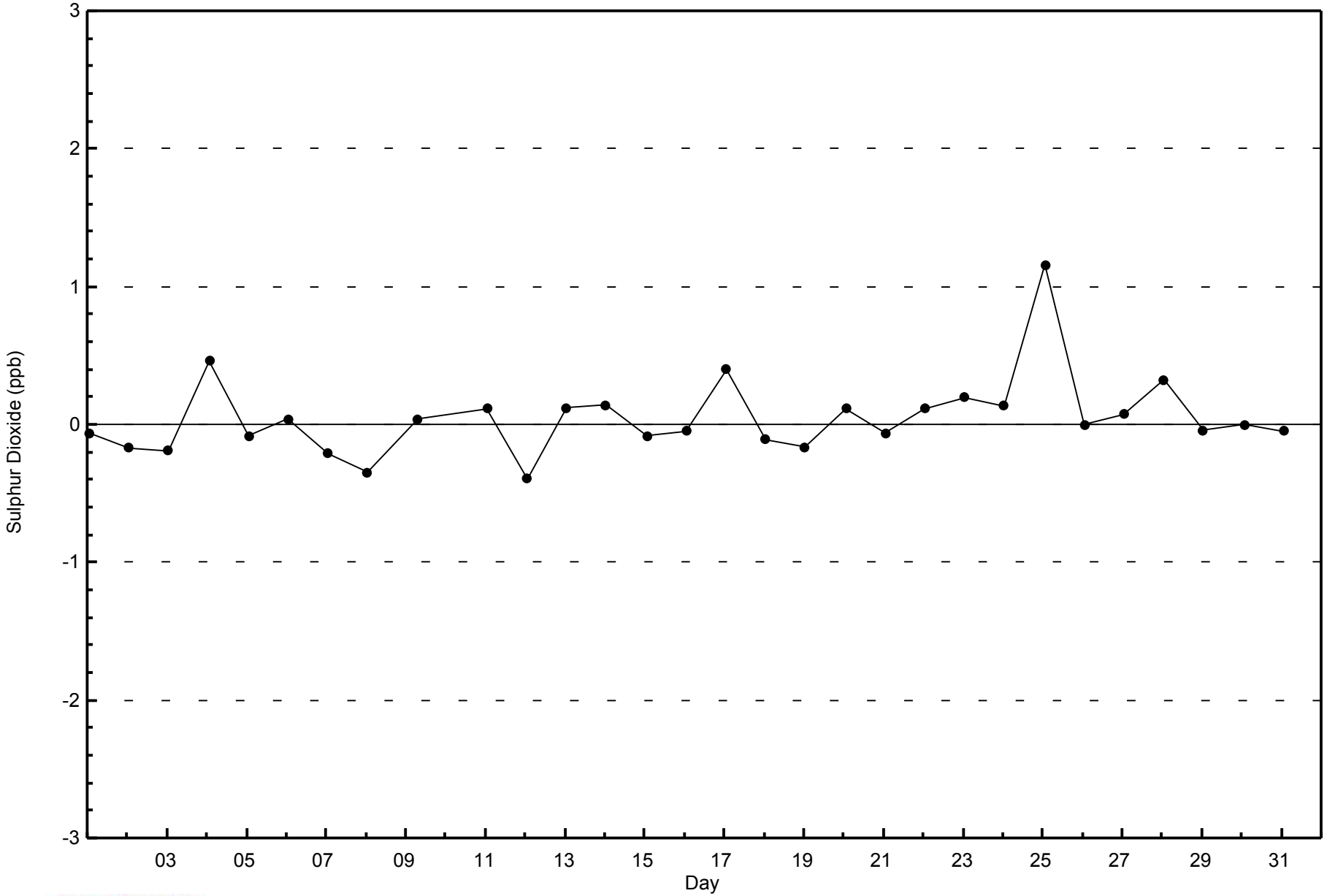
Total Number of Valid Hours: 708

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2014



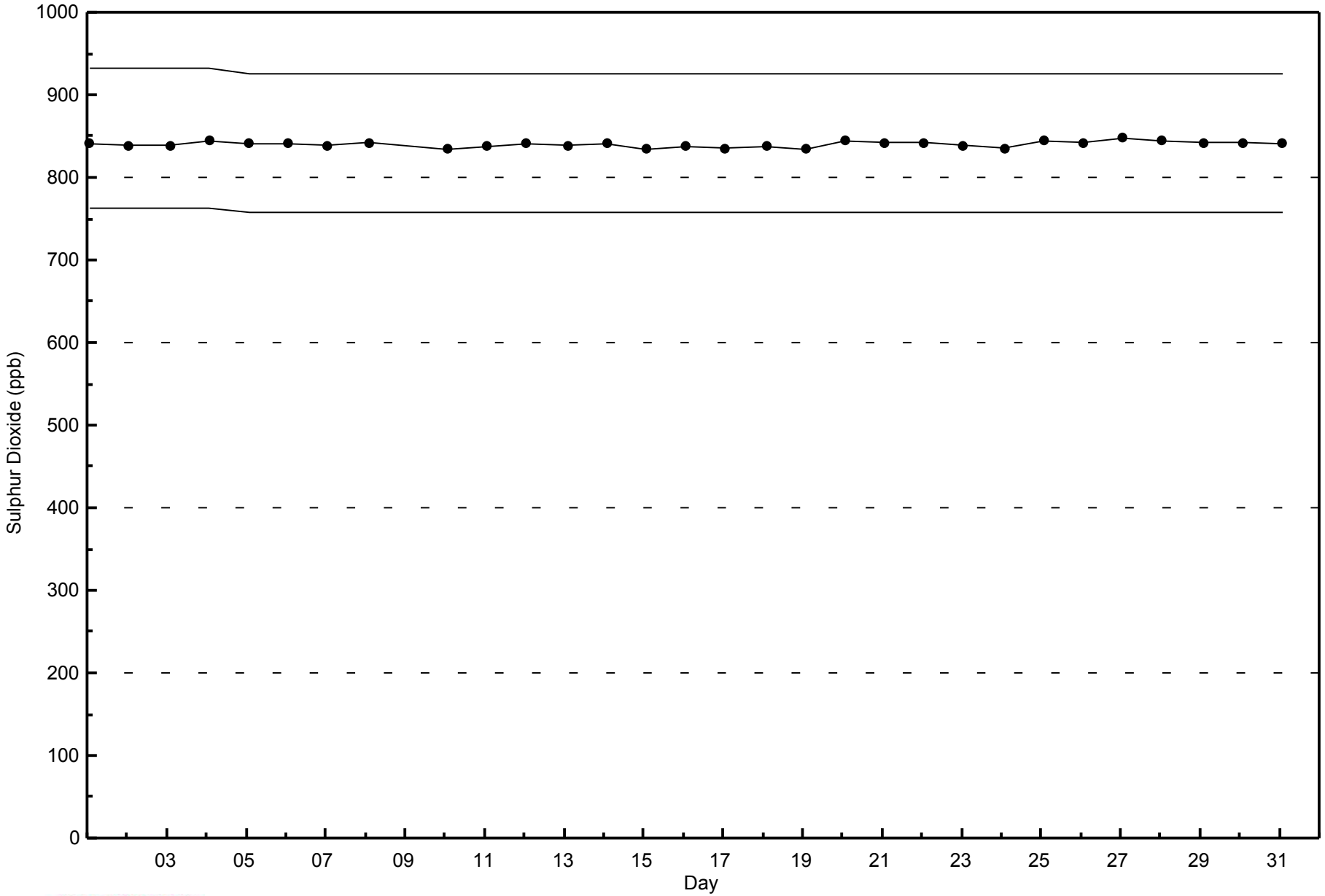
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 1 ppb on Jan 28 15:00 Maximum Daily Average: 0.6 ppb on Jan 6

Minimum Value: 0 ppb on Jan 20 04:00 Minimum Daily Average: 0.1 ppb on Jan 24
Maximum Diurnal Average: 0.3 ppb at hour 1 Minimum Diurnal Average: 0.2 ppb at hour 23
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 1$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	0.4	1
2-Jan	1	0	Z	1	0	0	0	0	0	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0.3	1
3-Jan	0	0	Z	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0
4-Jan	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
5-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0.3	1
6-Jan	1	1	Z	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0	0	1	0.6	1
7-Jan	1	1	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0.5	1
8-Jan	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
9-Jan	1	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
10-Jan	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
11-Jan	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
12-Jan	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
13-Jan	1	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
14-Jan	0	0	Z	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
15-Jan	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-Jan	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
17-Jan	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
18-Jan	0	0	Z	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.4	1
19-Jan	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
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0.3	1
21-Jan	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
22-Jan	0	0	Z	1	1	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0.5	1
23-Jan	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
24-Jan	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
25-Jan	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-Jan	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-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0.4	1
28-Jan	0	0	Z	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.4	1
29-Jan	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
30-Jan	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
31-Jan	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
	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	0.2	0.2	Diurnal Average	
	1	1	--	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	Diurnal Maximum	

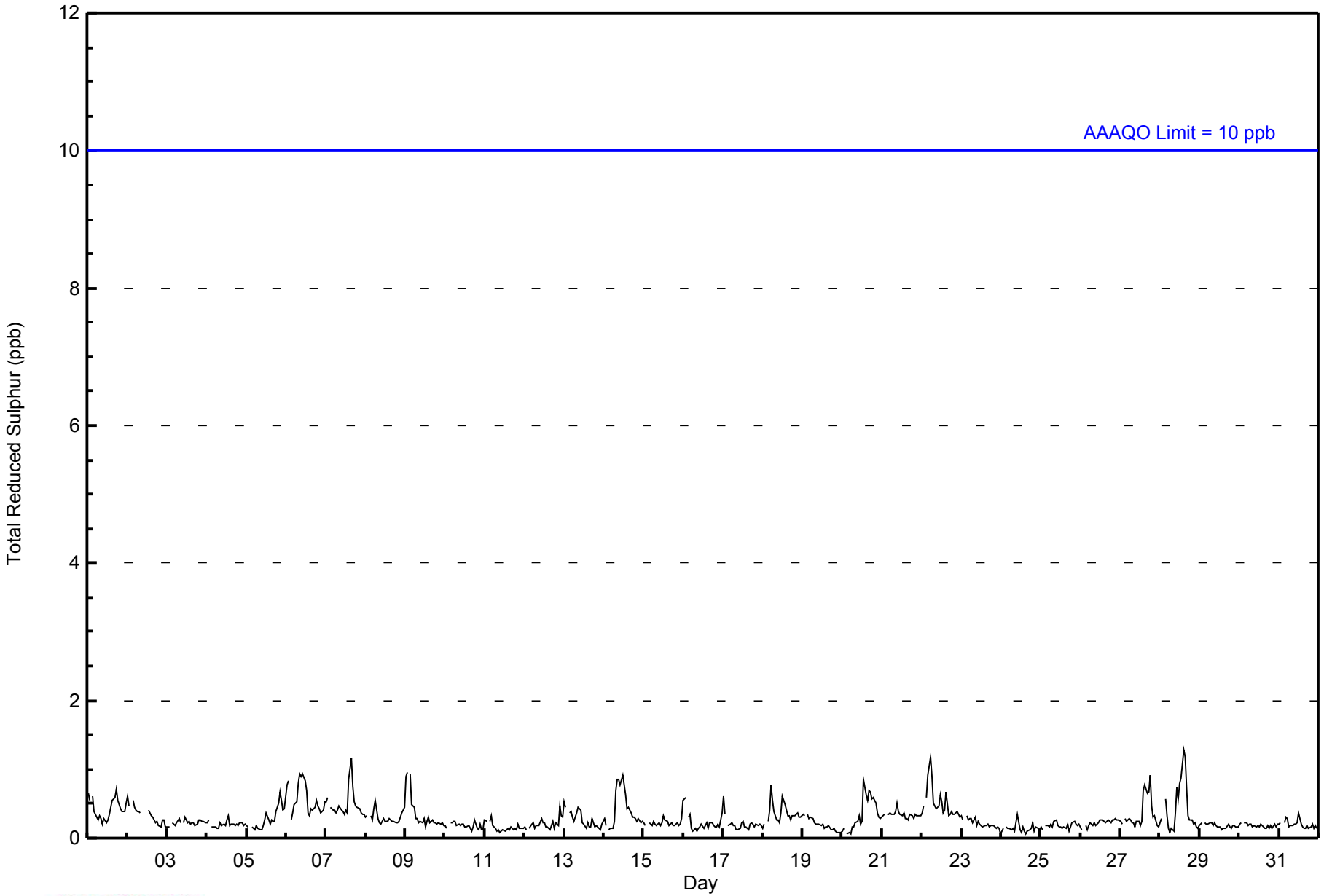
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	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: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	42	102	45	13	14	11	16	33	139	107	73	15	17	25	25	31	708
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	42	102	45	13	14	11	16	33	139	107	73	15	17	25	25	31	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

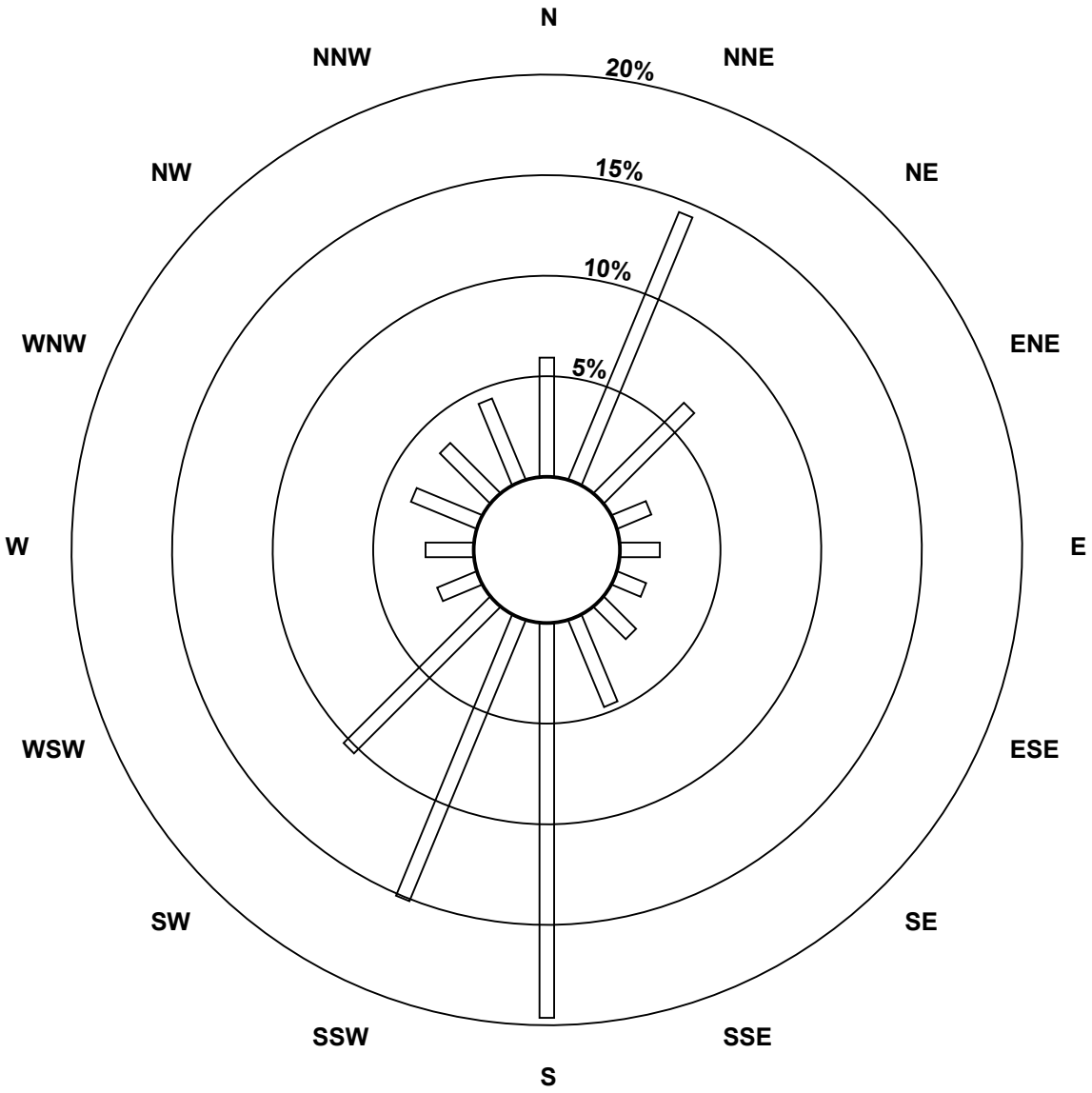
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

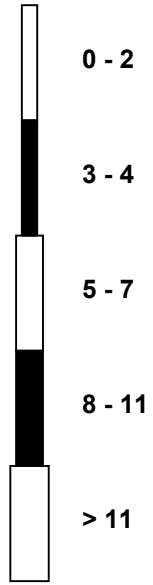
Wind Rose Jan 2014

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



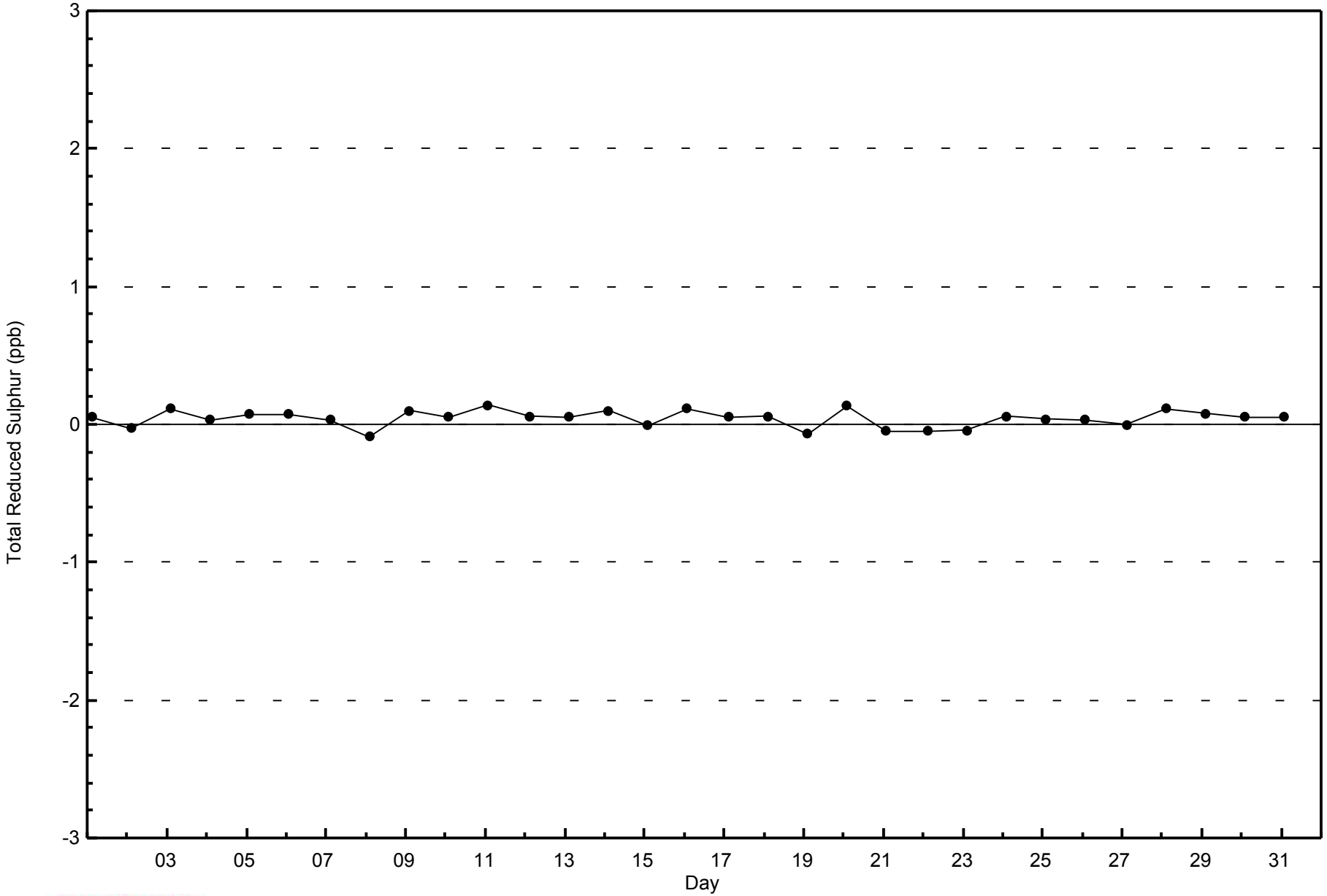
Total Number of Valid Hours: 708

WBEA NETWORK

Zero Responses

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2014



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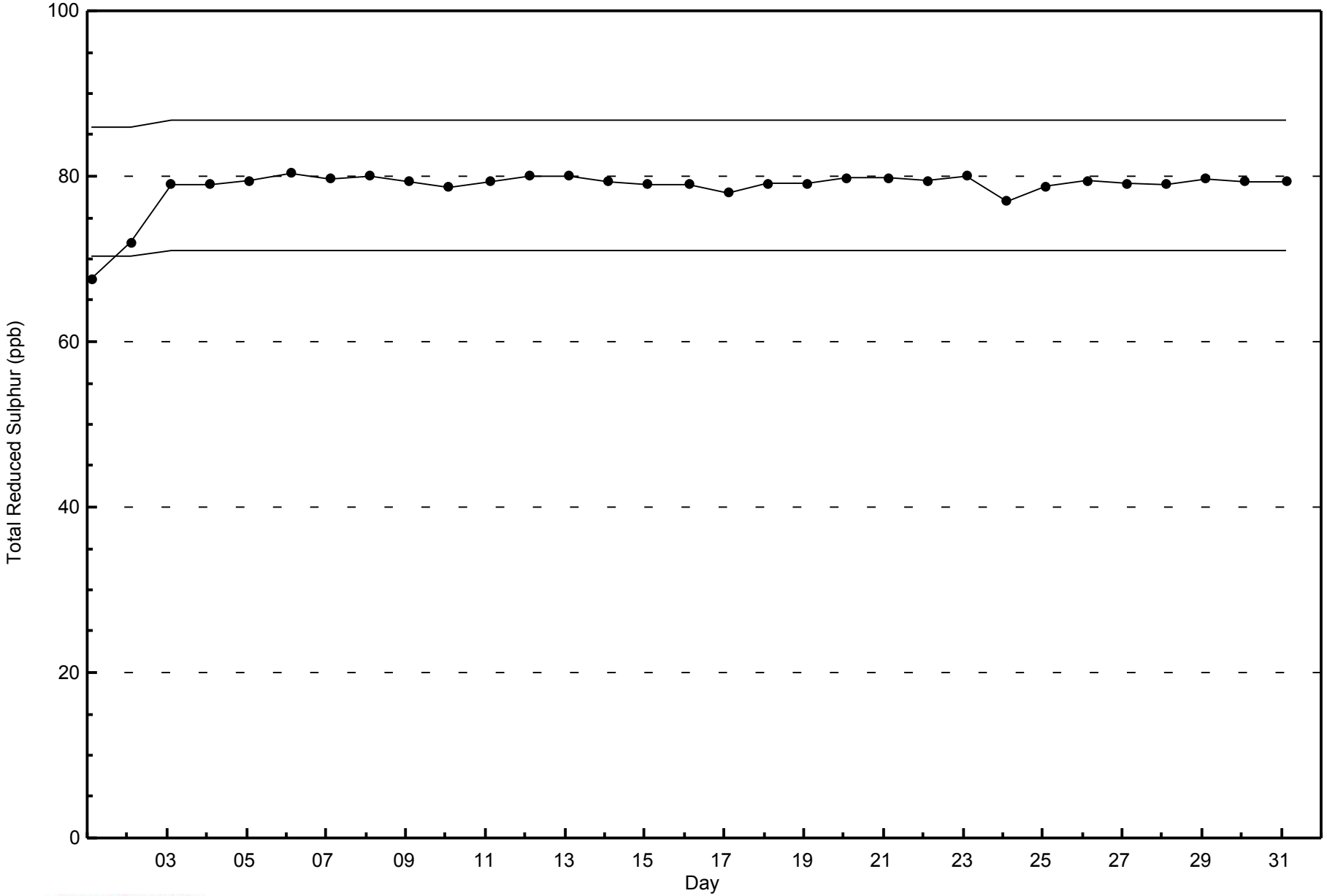
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Reduced Sulphur (TRS) - ppb

CNRL Horizon - January 2014



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Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2014

Maximum Value: 4.8 ppm on Jan 28 14:00

Maximum Daily Average: 3.2 ppm on Jan 1

Minimum Value: 2.0 ppm on Jan 10 01:00

Minimum Daily Average: 2.1 ppm on Jan 10

Maximum Diurnal Average: 2.5 ppm at hour 1

Minimum Diurnal Average: 2.4 ppm at hour 7

Monthly Average: 2.42 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.2 Q_1 = 2.2 Median = 2.3 Q_3 = 2.5 P_{90} = 2.8 P_{99} = 3.8

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	3.2	Z	3.6	3.9	3.5	3.0	2.8	2.9	2.8	2.8	2.7	2.7	3.2	3.5	3.3	3.4	3.5	3.5	3.4	3.2	3.2	3.0	2.9	3.1	3.2	3.9
2-Jan	3.2	Z	2.9	2.9	2.9	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.6	2.4	2.3	2.5	3.2
3-Jan	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.4	C	C	C	C	C	2.3	2.3	2.3	2.3	2.4	2.6	2.4	3.0	2.5	2.5	2.4	3.0
4-Jan	2.6	Z	2.4	2.3	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.3	2.5	2.7	2.9	2.7	2.4	2.4	2.9
5-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6	3.6	3.2	2.5	2.4	2.4	2.4	2.5	2.7	2.8	3.0	3.0	2.9	2.9	2.6	3.6
6-Jan	3.5	Z	2.7	2.6	2.6	2.8	2.9	2.4	3.0	3.4	3.0	2.9	3.1	2.9	2.7	2.8	2.8	2.6	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.5
7-Jan	2.5	Z	2.5	2.4	2.5	2.5	2.8	3.3	3.1	2.7	2.6	2.7	2.5	2.5	2.8	2.9	2.8	2.7	2.7	2.7	2.7	2.7	2.5	2.4	2.7	3.3
8-Jan	2.4	Z	2.3	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.5	2.6	2.8	2.4	2.8
9-Jan	3.1	Z	3.0	3.1	4.0	2.8	2.4	2.4	2.3	2.3	2.5	2.4	2.4	2.5	2.5	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.4	4.0
10-Jan	2.0	Z	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	2.2	2.3	2.4	2.2	2.2	2.2	2.2	2.4	2.1	2.4
11-Jan	2.8	Z	3.7	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.7
12-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.6	2.7	2.6	2.3	2.7
13-Jan	2.5	Z	2.4	2.3	2.3	2.3	2.3	3.2	3.4	4.3	3.4	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.7	2.5	4.3
14-Jan	2.8	Z	2.5	2.5	2.4	2.4	2.6	2.8	2.9	2.8	2.8	2.8	2.8	2.5	2.5	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.6	2.9
15-Jan	2.3	Z	2.1	2.3	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.2	2.4
16-Jan	2.5	Z	2.6	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.5	2.3	2.6
17-Jan	2.8	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	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	2.8
18-Jan	2.2	Z	2.2	2.3	2.4	2.4	2.5	2.5	2.4	2.3	2.3	2.4	3.5	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	3.5
19-Jan	2.5	Z	2.5	2.3	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	2.3	2.3	2.3	2.3	2.3	2.2	2.5
20-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.6	2.7	2.5	2.6	2.4	2.3	2.3	2.3	2.4	2.7
21-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.8	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.3	2.8
22-Jan	2.4	Z	2.3	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5
23-Jan	2.4	Z	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	2.5	2.4	2.2	2.3	2.2	2.3	2.2	2.2	2.5
24-Jan	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	M	M	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.4
25-Jan	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.6	2.5	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	2.6
26-Jan	2.2	Z	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	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.3	2.5
27-Jan	2.5	Z	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.9	2.7	2.8	2.8	2.8	2.6	2.6	2.5	2.5	2.5	2.9
28-Jan	2.5	Z	2.6	2.6	2.4	2.3	2.3	2.2	2.2	2.6	2.7	3.5	3.8	4.8	4.4	3.9	3.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.8	4.8
29-Jan	2.2	Z	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.5	2.4	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	2.3	2.5
30-Jan	2.3	Z	2.4	2.4	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	2.6	2.3	2.6
31-Jan	2.5	Z	2.4	2.4	2.4	2.7	2.7	2.4	2.4	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.6	2.5	2.2	2.2	2.4	2.7
	2.5	--	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Diurnal Average	
	3.5	--	3.7	3.9	4.0	3.0	2.9	3.3	3.4	4.3	3.4	3.6	3.8	4.8	4.4	3.9	3.5	3.5	3.4	3.2	3.2	3.0	2.9	3.1	Diurnal Maximum	

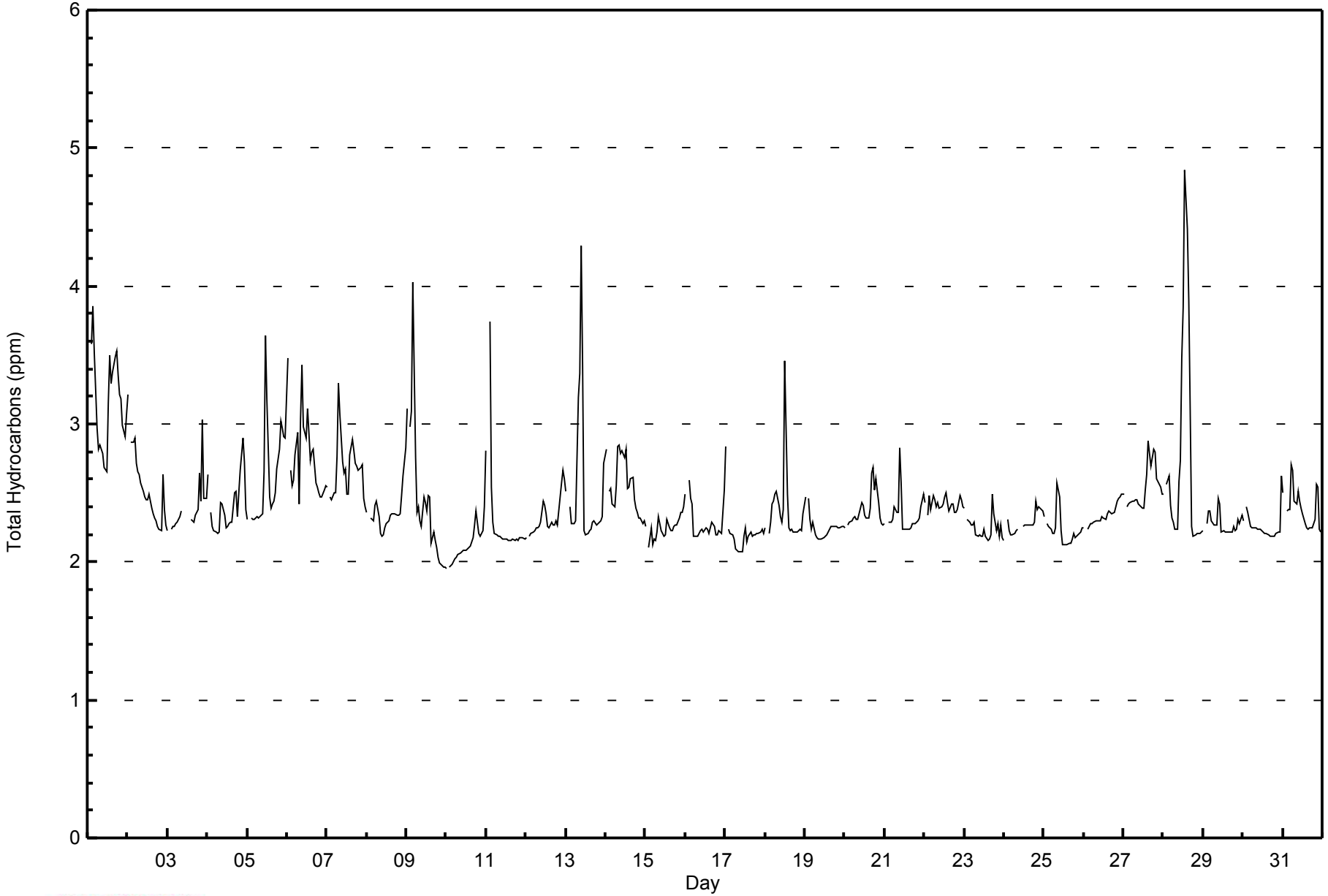
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2014



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Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	11	1.56	1.56
2.1 - 3.0	658	93.20	94.76
3.1 - 10.0	37	5.24	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2014

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	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
2.1 - 3.0	38	92	43	12	13	10	13	29	133	104	66	16	14	24	22	29	658
3.1 - 10.0	1	2	3	1	0	0	2	4	6	3	7	0	1	1	2	4	37
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	102	46	13	13	10	15	33	139	107	73	16	15	25	24	33	706

Total Number of Valid Hours: 706

Total Number of Hours: 744

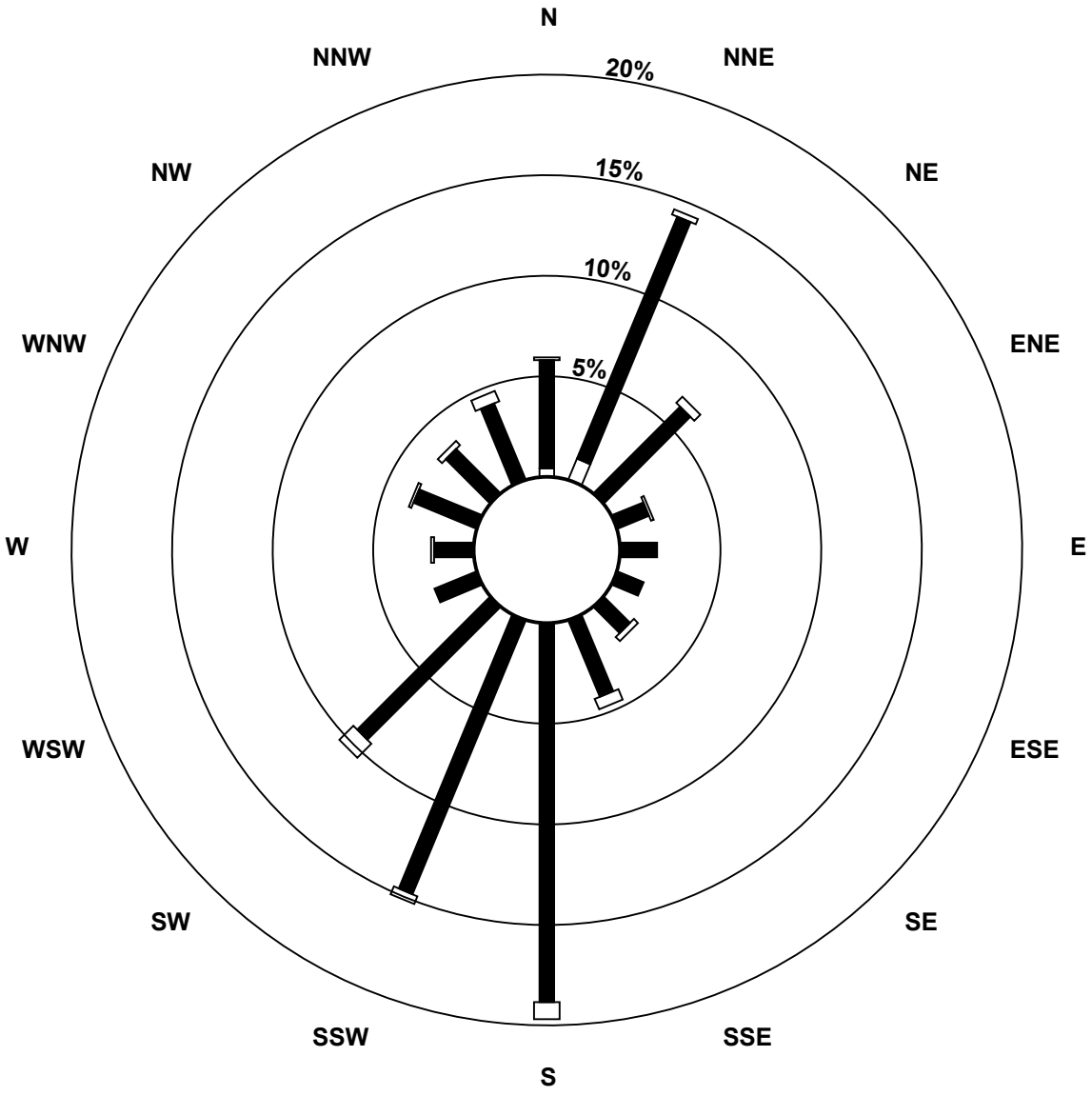
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

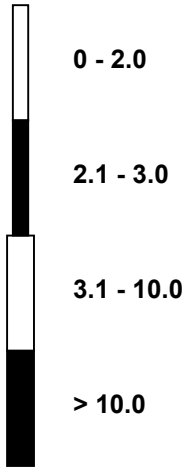
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

CNRL Horizon (AMS 15)



Classes (ppm)



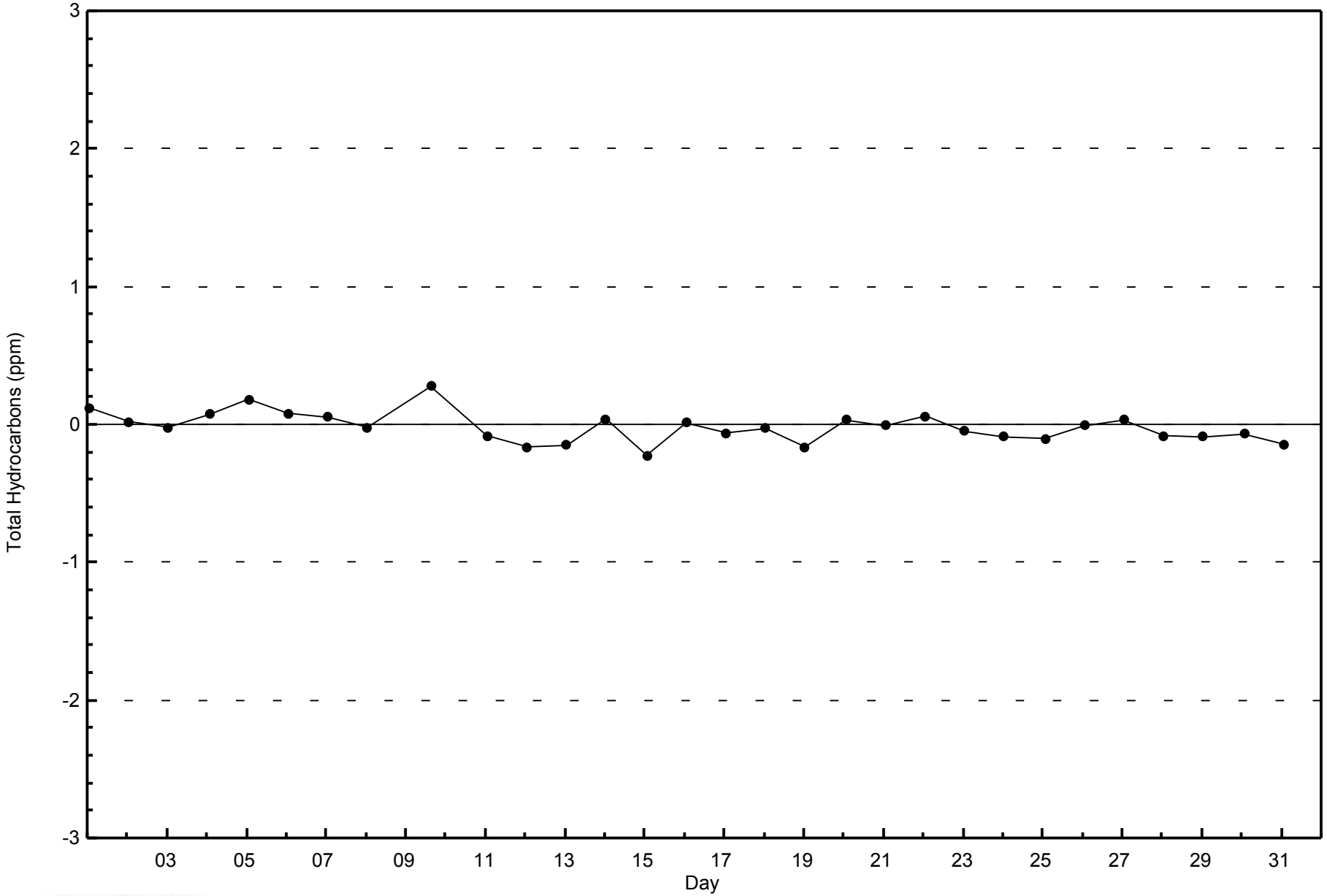
Total Number of Valid Hours: 706

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2014



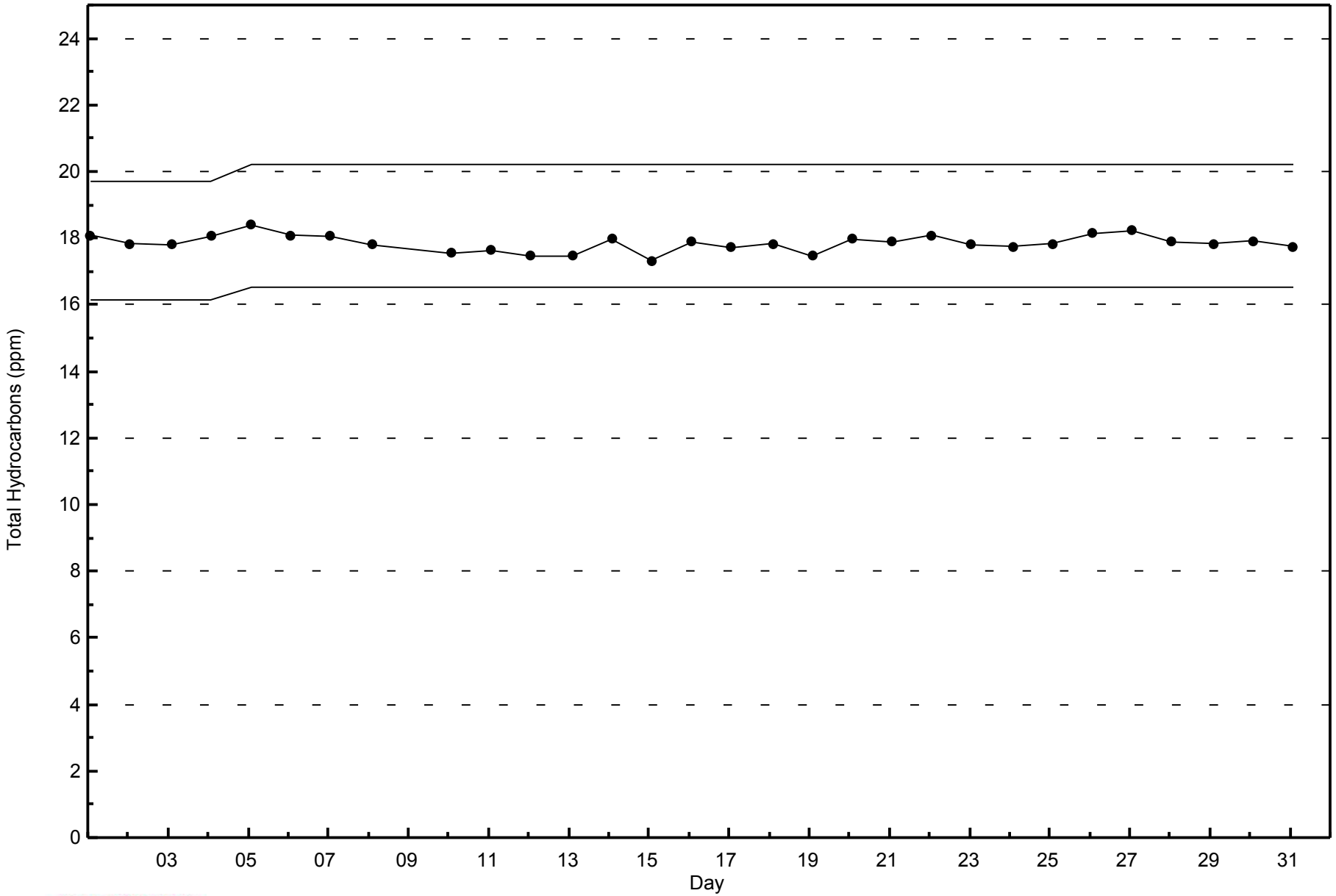
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2014

Maximum Value: 67 ppb on Jan 1 14:00

Maximum Daily Average: 33.2 ppb on Jan 1

Minimum Value: 0 ppb on Jan 4 00:00

Minimum Daily Average: 0.0 ppb on Jan 24

Maximum Diurnal Average: 7.5 ppb at hour 14

Minimum Diurnal Average: 1.3 ppb at hour 7

Monthly Average: 4.1 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 2$ $P_{90} = 13$ $P_{99} = 53$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	13	Z	46	51	38	24	10	17	17	11	8	7	34	67	56	38	40	41	66	64	54	34	14	12	33.2	67
2-Jan	13	Z	6	2	2	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	1	0	0	1.4	13
3-Jan	0	Z	0	0	0	0	0	1	1	C	C	C	C	C	2	1	0	0	0	0	0	1	0	0	0.4	2
4-Jan	0	Z	0	0	0	0	0	0	0	0	1	0	1	1	2	1	0	0	0	0	0	2	3	1	0.5	3
5-Jan	0	Z	0	0	0	0	0	0	0	0	11	45	21	4	2	2	1	0	2	4	8	21	23	15	7.0	45
6-Jan	1	Z	13	2	1	0	0	0	5	9	10	20	24	20	10	16	16	1	0	0	0	1	1	1	6.6	24
7-Jan	0	Z	0	0	0	0	5	31	53	15	12	10	5	4	7	13	8	5	18	22	23	12	1	0	10.6	53
8-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	6	30	1.8	30
9-Jan	62	Z	29	34	40	19	1	1	0	1	15	9	6	14	18	1	1	0	0	0	1	0	2	0	11.2	62
10-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	2	0	0	0	0	4	0.4	4
11-Jan	22	Z	35	6	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9	35
12-Jan	0	Z	0	0	0	0	0	0	0	1	5	4	5	0	0	0	0	0	0	0	0	1	4	3	1.0	5
13-Jan	1	Z	0	0	0	0	1	10	15	43	32	1	0	1	0	0	1	0	0	0	0	0	0	14	5.1	43
14-Jan	23	Z	1	0	0	1	3	17	23	24	25	18	14	9	9	8	7	0	0	0	0	0	0	0	7.9	25
15-Jan	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-Jan	1	Z	12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	12
17-Jan	6	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.4	6
18-Jan	0	Z	0	0	1	7	8	4	0	0	1	4	36	6	1	0	0	0	0	0	0	0	0	0	3.0	36
19-Jan	0	Z	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
20-Jan	0	Z	0	0	0	0	0	0	0	4	10	12	7	7	7	5	5	2	1	1	0	0	0	0	2.6	12
21-Jan	0	Z	0	0	0	0	4	3	1	13	8	0	0	0	0	0	0	0	0	0	0	0	5	6	1.8	13
22-Jan	2	Z	0	0	0	1	3	3	1	4	8	11	11	11	10	5	3	1	0	0	0	0	0	0	3.2	11
23-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.1	1
24-Jan	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	1
25-Jan	0	Z	0	0	0	0	0	0	11	13	1	0	0	0	0	0	0	0	0	1	1	1	2	1	1.4	13
26-Jan	0	Z	0	0	0	0	0	0	1	0	0	1	1	1	1	1	0	0	0	0	0	1	1	7	0.7	7
27-Jan	3	Z	0	0	1	1	1	1	1	2	5	4	5	10	14	9	3	0	19	34	17	8	1	0	6.1	34
28-Jan	2	Z	14	20	2	0	0	0	0	24	23	30	47	66	45	34	17	0	0	0	0	0	0	0	14.0	66
29-Jan	0	Z	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
30-Jan	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0.4	9
31-Jan	2	Z	0	0	0	0	2	0	1	1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0.6	2
	4.9	--	5.0	3.9	2.9	1.8	1.3	3.0	4.3	5.7	6.0	6.1	7.5	7.5	6.1	4.4	3.3	1.7	3.5	4.1	3.4	2.7	2.1	3.3	Diurnal Average	
	62	--	46	51	40	24	10	31	53	43	32	45	47	67	56	38	40	41	66	64	54	34	23	30	Diurnal Maximum	

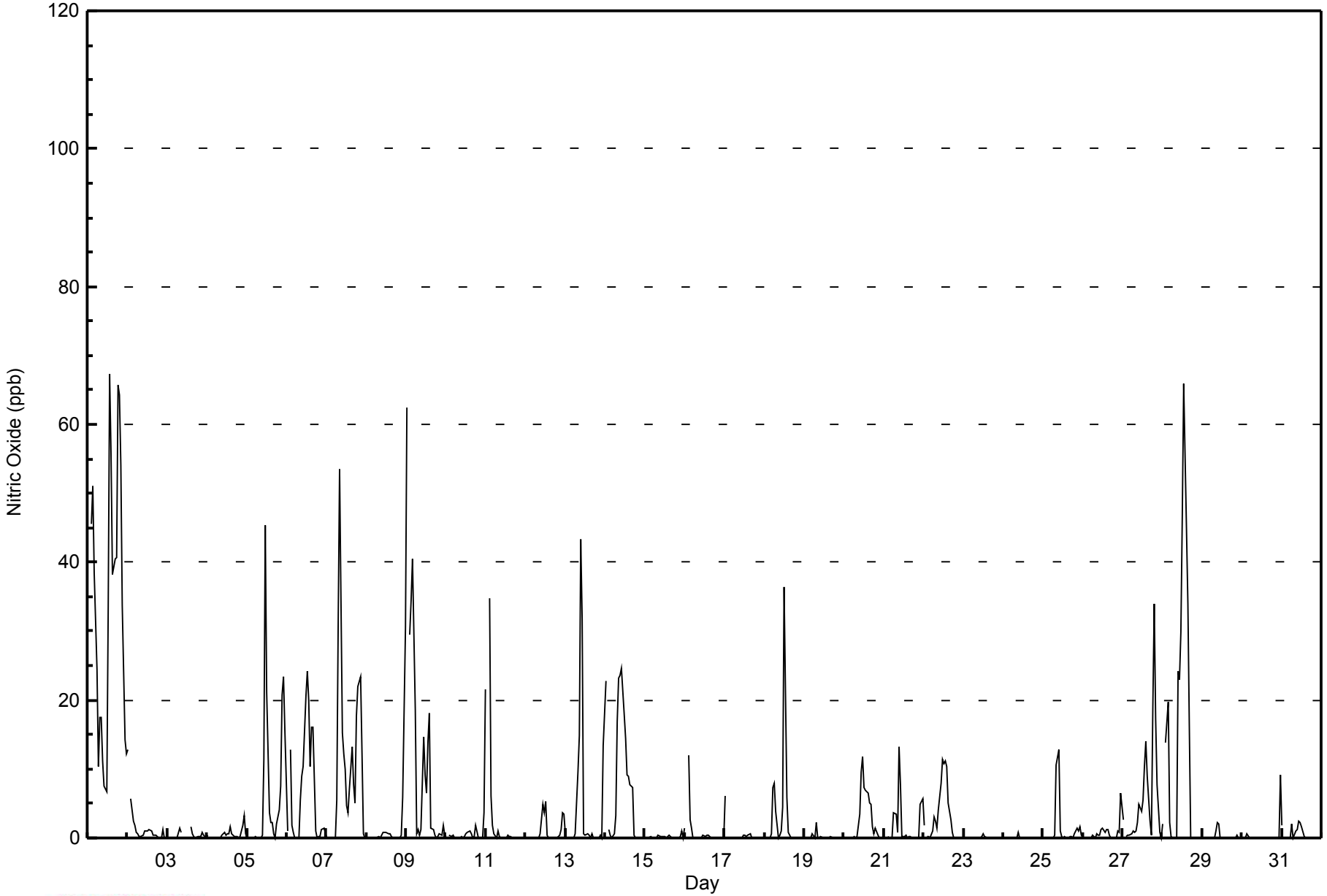
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	93.64	93.64
21 - 40	30	4.24	97.88
11 - 80	15	2.12	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	42	102	43	12	13	10	12	27	130	100	66	15	15	24	23	29	663
21 - 40	0	1	1	1	0	0	1	3	7	6	4	1	0	1	1	3	30
11 - 80	0	1	2	0	0	0	2	3	2	1	3	0	0	0	0	1	15
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	42	104	46	13	13	10	15	33	139	107	73	16	15	25	24	33	708

Total Number of Valid Hours: 708

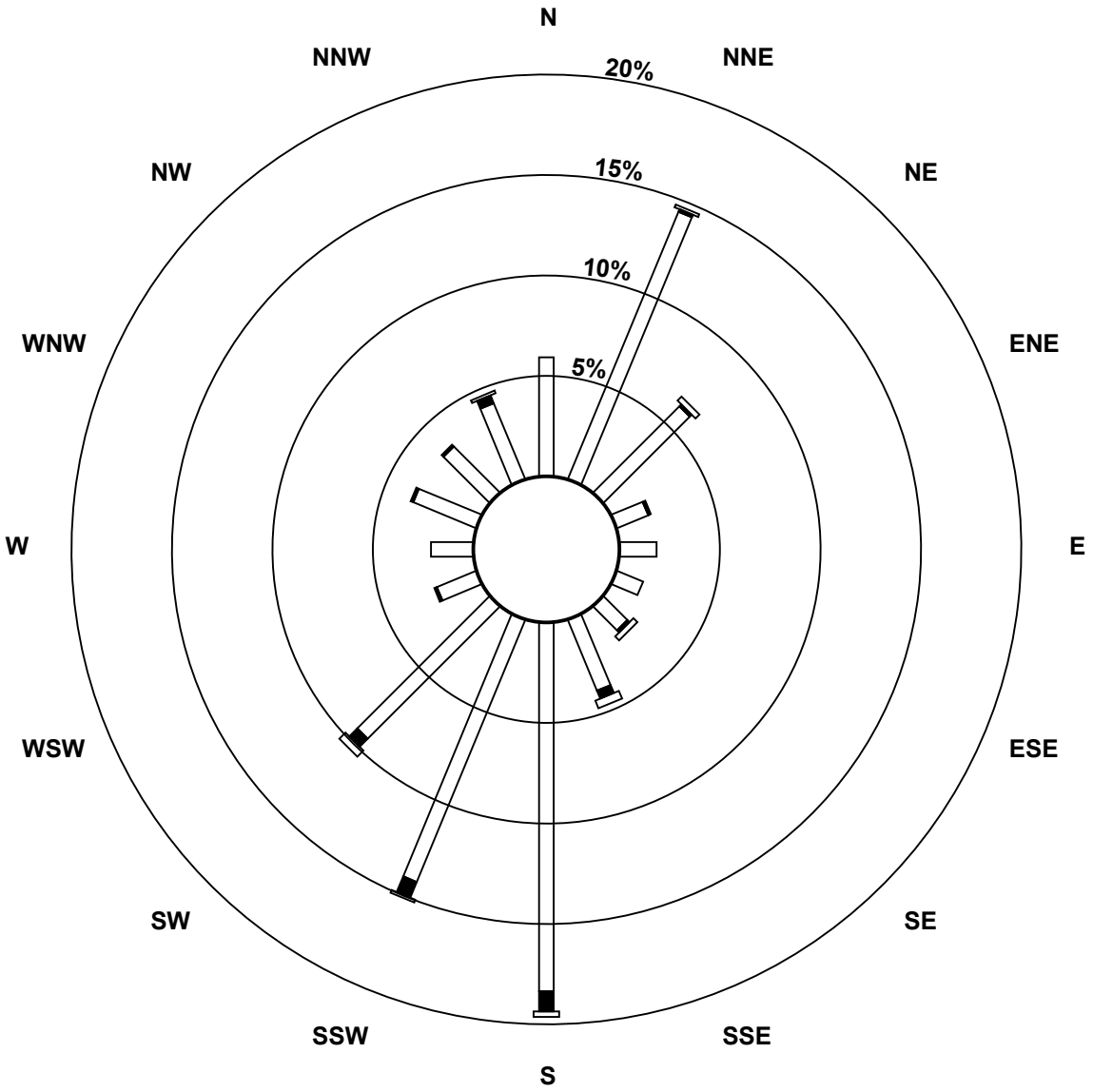
Total Number of Hours: 744

Wood Buffalo Environmental Association

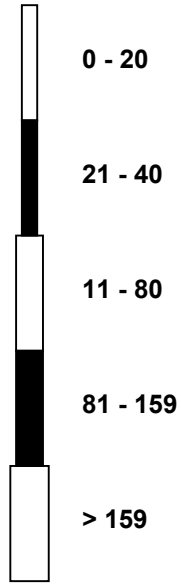
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



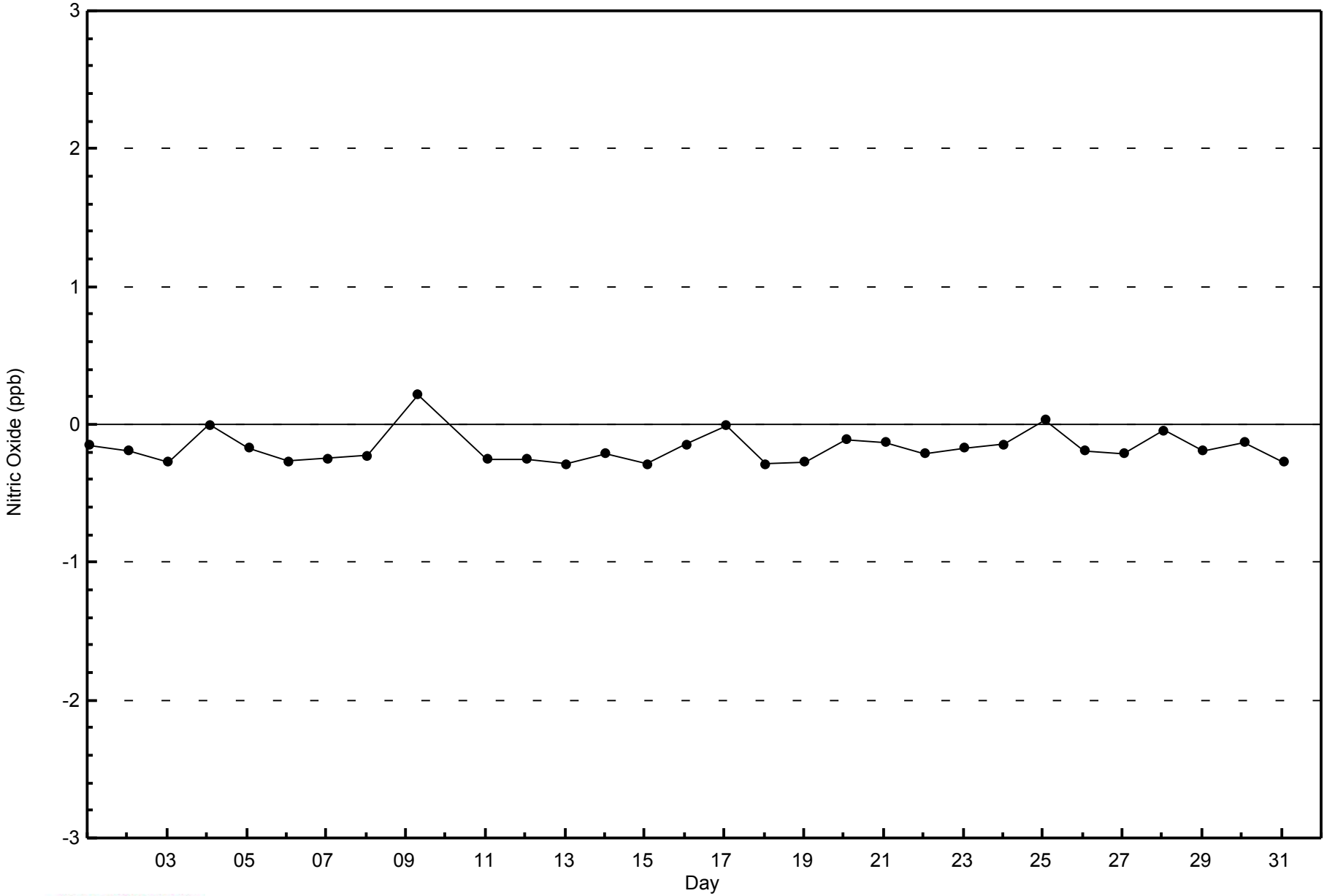
Total Number of Valid Hours: 708

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2014



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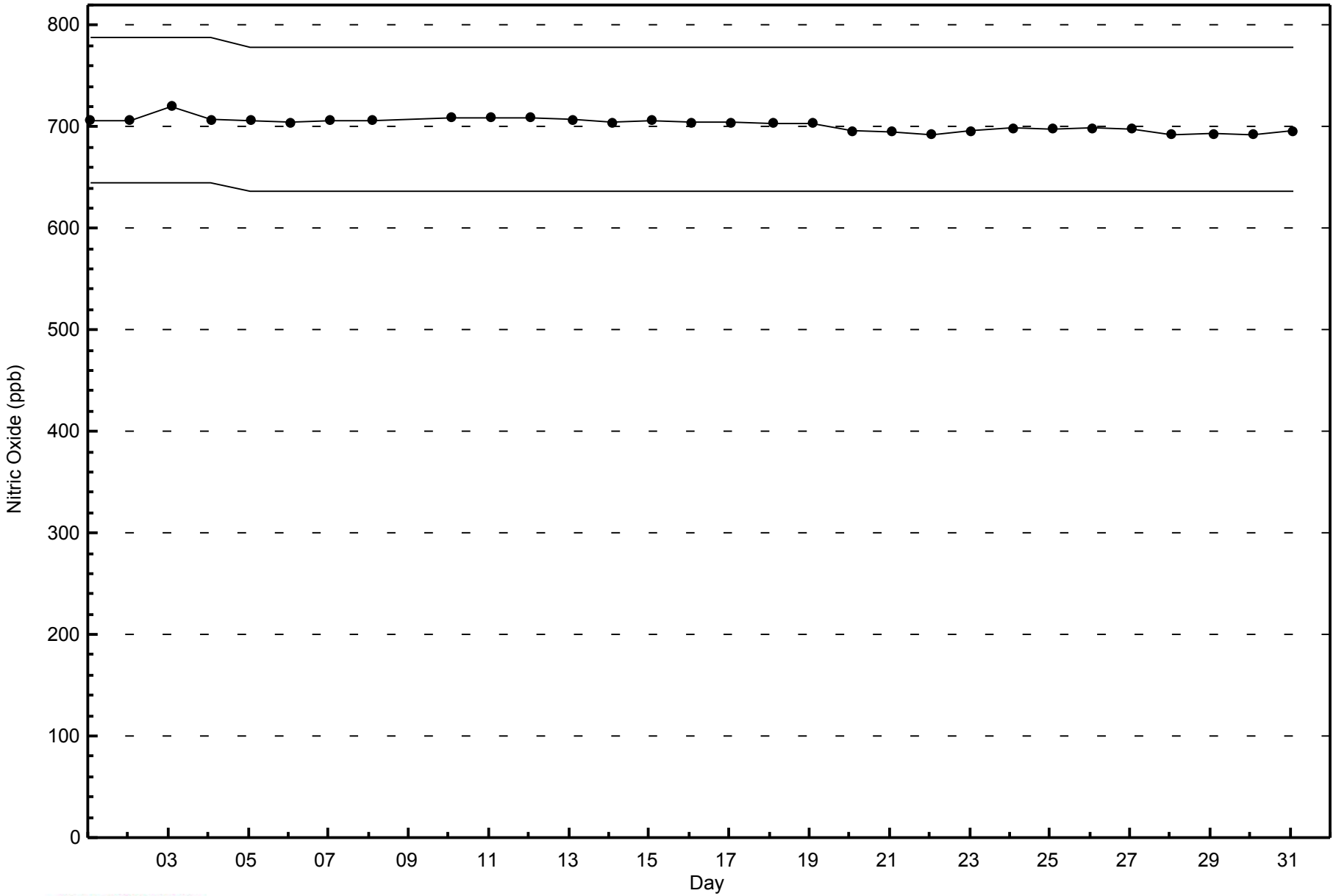
WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 38 ppb on Jan 28 14:00 Maximum Daily Average: 25.9 ppb on Jan 6

Minimum Value: 0 ppb on Jan 24 13:00 Minimum Daily Average: 2.8 ppb on Jan 23
Maximum Diurnal Average: 14.4 ppb at hour 1 Minimum Diurnal Average: 8.2 ppb at hour 14
Monthly Average: 10.9 ppb Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 7 $Q_3 = 17$ $P_{90} = 26$ $P_{99} = 34$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	24	Z	24	25	21	19	17	19	19	14	8	5	15	23	22	21	23	24	25	26	24	22	20	19	19.9	26
2-Jan	20	Z	20	20	20	16	11	7	7	5	4	4	4	4	3	3	4	4	5	2	3	12	4	2	8.0	20
3-Jan	0	Z	1	1	1	1	7	21	18	C	C	C	C	C	9	8	17	10	10	16	9	24	17	10	10.0	24
4-Jan	22	Z	11	5	2	1	2	1	11	10	7	3	3	3	4	6	10	12	16	12	18	26	24	14	9.7	26
5-Jan	5	Z	5	7	7	10	11	6	5	5	12	29	21	9	9	15	20	24	30	33	33	34	33	33	17.1	34
6-Jan	29	Z	33	31	28	17	16	17	24	29	26	29	28	26	22	31	34	23	21	28	27	28	29	21	25.9	34
7-Jan	16	Z	14	10	14	12	25	32	32	28	20	16	10	8	16	29	33	33	37	37	34	34	18	15	22.7	37
8-Jan	11	Z	11	13	13	22	24	21	9	8	7	4	4	4	5	6	7	7	6	7	6	17	26	30	11.6	30
9-Jan	34	Z	30	30	28	24	11	15	12	8	17	16	13	17	17	7	8	8	5	4	4	4	8	4	14.0	34
10-Jan	3	Z	4	5	6	3	3	3	2	3	1	3	4	5	7	7	7	16	21	5	0	1	3	15	5.5	21
11-Jan	28	Z	29	21	9	4	1	6	3	2	3	2	2	3	4	4	3	1	1	1	1	0	0	1	5.6	29
12-Jan	1	Z	0	0	1	1	2	3	3	9	18	12	10	2	2	3	2	3	6	5	25	31	32	32	8.8	32
13-Jan	28	Z	17	8	7	5	9	27	28	30	25	4	2	4	3	3	7	7	7	6	6	13	17	29	12.6	30
14-Jan	33	Z	24	16	12	12	18	31	31	30	29	24	21	19	21	24	28	19	13	11	9	9	4	5	19.2	33
15-Jan	3	Z	2	3	3	4	3	2	8	4	3	3	4	3	4	4	3	4	4	4	12	16	16	15	5.5	16
16-Jan	17	Z	22	20	17	1	1	1	1	2	2	4	3	4	4	6	6	6	3	4	2	2	1	11	6.0	22
17-Jan	33	Z	3	2	1	1	1	1	1	1	1	3	4	3	3	7	1	1	2	1	1	2	2	3	3.3	33
18-Jan	6	Z	8	11	19	31	30	29	16	7	5	11	26	13	4	3	3	2	2	2	2	2	2	7	10.3	31
19-Jan	15	Z	11	6	4	8	2	8	2	1	1	1	1	1	1	1	1	1	0	0	1	1	3	5	3.2	15
20-Jan	9	Z	6	7	7	8	7	7	11	15	15	15	14	15	17	19	24	25	20	20	13	7	5	4	12.5	25
21-Jan	6	Z	14	10	10	15	23	17	15	23	11	1	1	1	1	1	5	10	13	14	15	18	21	26	11.7	26
22-Jan	22	Z	17	15	15	22	26	25	24	18	16	19	18	18	18	18	21	22	17	14	14	13	6	4	17.4	26
23-Jan	4	Z	4	3	2	2	4	2	1	1	2	2	4	2	1	1	1	6	8	2	4	3	6	4	2.8	8
24-Jan	2	Z	7	5	4	1	1	1	1	2	0	0	0	0	1	1	2	3	6	18	14	13	12	8	4.3	18
25-Jan	6	Z	5	4	4	4	5	7	24	23	7	1	1	2	1	1	2	4	6	7	8	8	10	5	6.3	24
26-Jan	4	Z	2	1	1	2	4	1	4	4	3	5	6	4	7	9	11	11	14	17	24	30	28	27	9.5	30
27-Jan	22	Z	13	18	19	17	14	16	13	8	9	6	8	13	20	22	23	28	34	36	34	33	25	17	19.4	36
28-Jan	25	Z	31	32	22	12	10	5	3	28	25	26	32	38	36	36	30	7	1	1	1	1	1	2	17.4	38
29-Jan	2	Z	9	10	10	6	4	8	12	13	9	1	1	1	1	1	1	1	4	1	3	6	4	4	4.8	13
30-Jan	5	Z	8	15	3	1	1	0	0	0	0	0	1	1	1	2	2	1	1	1	1	2	1	22	3.0	22
31-Jan	13	Z	15	15	14	18	21	11	14	14	12	10	7	2	1	1	1	1	1	3	10	11	3	2	8.6	21
	14.4	--	12.8	11.8	10.5	9.6	10.1	11.2	11.3	11.4	9.9	8.6	8.7	8.2	8.5	9.6	10.9	10.4	10.9	10.8	11.5	13.6	12.3	12.6	Diurnal Average	
	34	--	33	32	28	31	30	32	32	30	29	29	32	38	36	36	34	33	37	37	34	34	33	33	Diurnal Maximum	

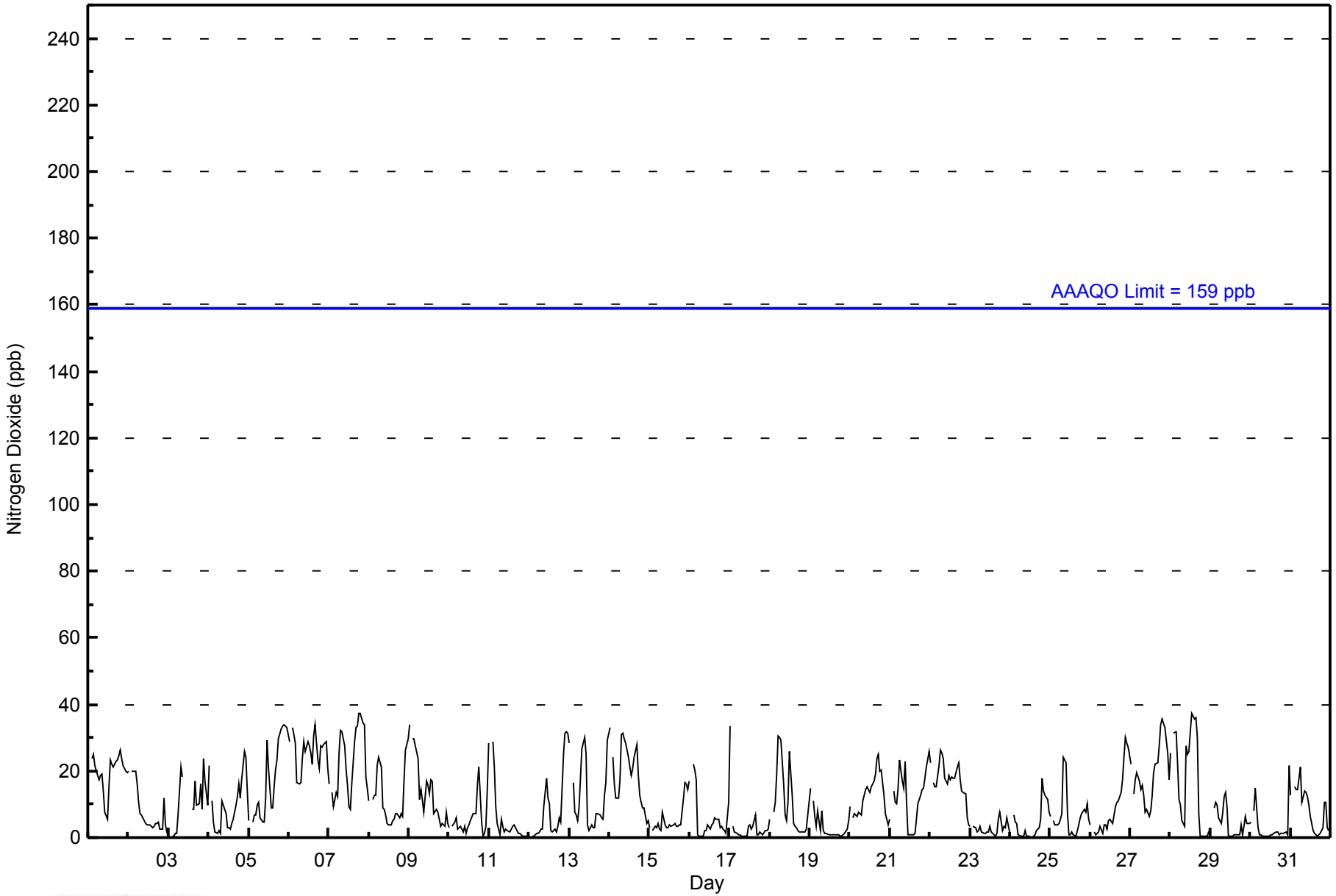
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	567	80.08	80.08
21 - 40	141	19.92	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: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	38	98	38	12	12	8	11	25	98	80	57	14	13	19	20	24	567
21 - 40	4	6	8	1	1	2	4	8	41	27	16	2	2	6	4	9	141
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	42	104	46	13	13	10	15	33	139	107	73	16	15	25	24	33	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

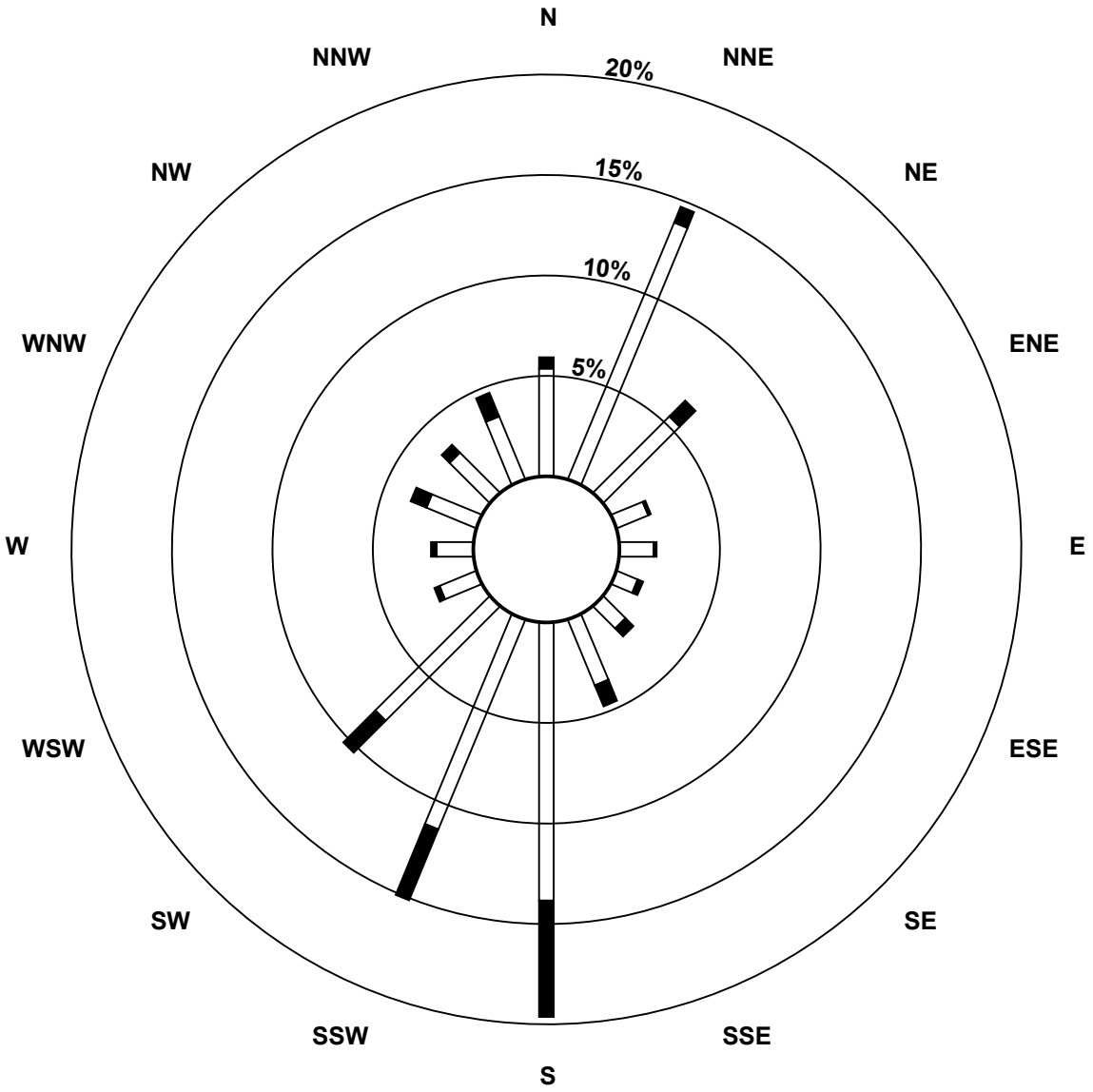
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

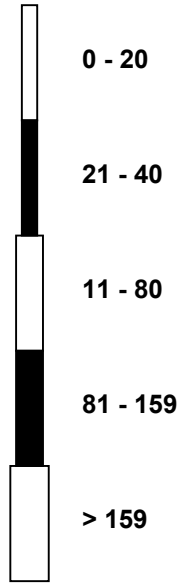
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



0 - 20

21 - 40

11 - 80

81 - 159

> 159

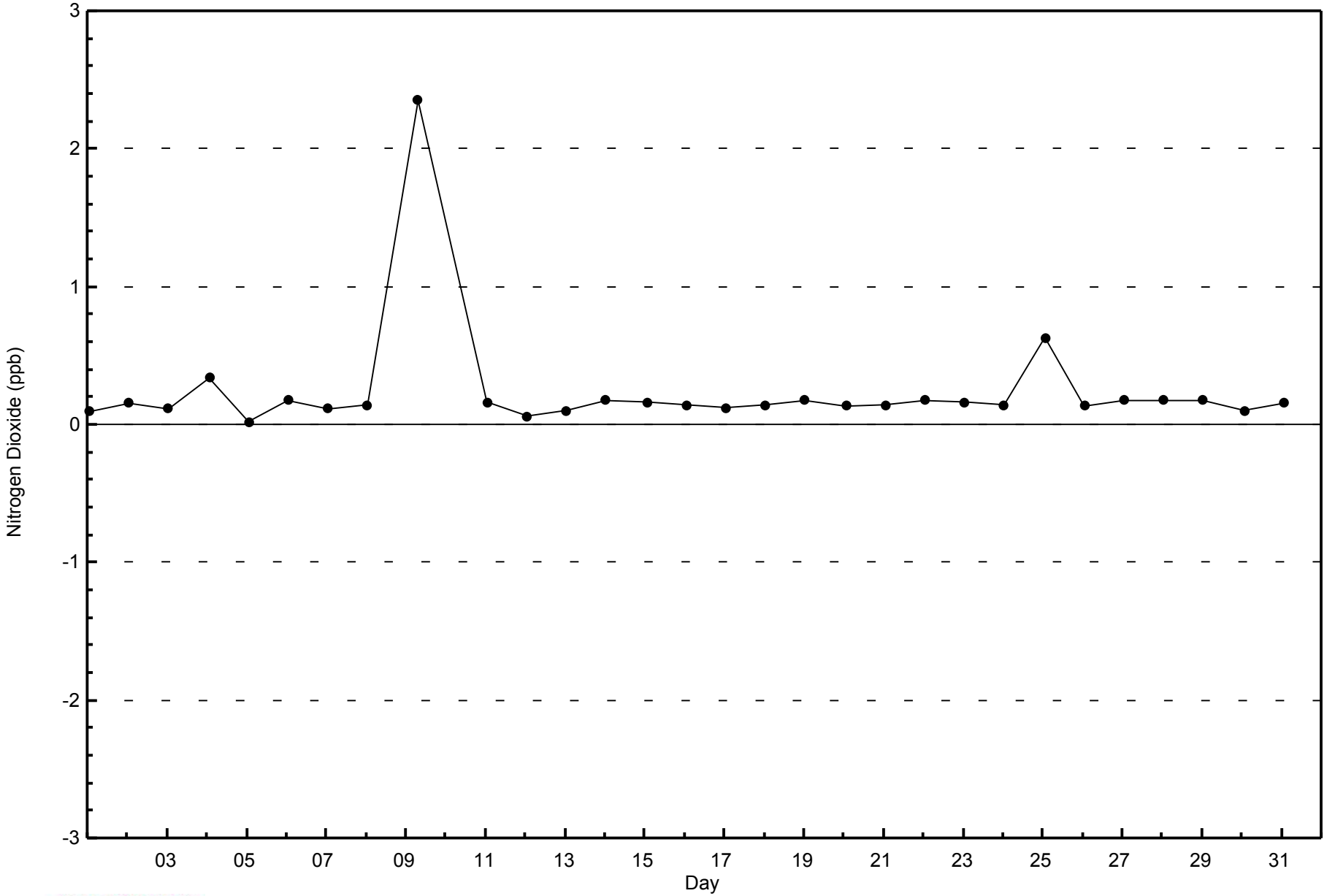
Total Number of Valid Hours: 708

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2014



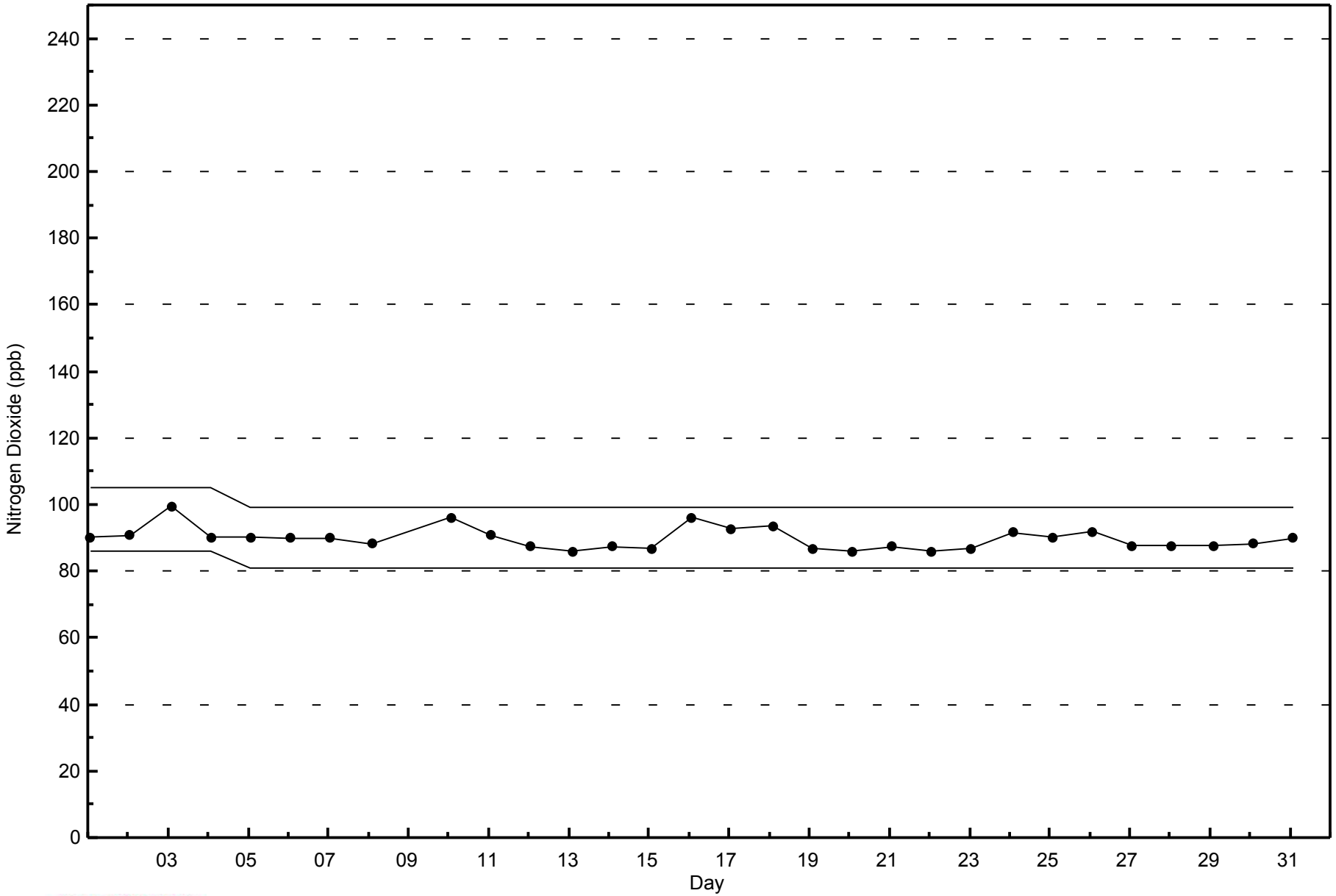
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 103 ppb on Jan 28 14:00

Maximum Daily Average: 53.1 ppb on Jan 1

Minimum Value: 0 ppb on Jan 24 13:00

Minimum Daily Average: 2.9 ppb on Jan 23

Maximum Diurnal Average: 19.3 ppb at hour 1

Minimum Diurnal Average: 11.4 ppb at hour 7

Monthly Average: 15.0 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 3$ Median = 8 $Q_3 = 21$ $P_{90} = 38$ $P_{99} = 77$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	36
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	36	Z	69	76	60	43	28	36	36	25	15	12	49	91	78	59	63	64	90	90	78	55	34	32	53.1	91
2-Jan	33	Z	25	22	22	17	11	7	7	6	5	5	5	5	4	4	5	5	5	2	3	13	4	2	9.4	33
3-Jan	1	Z	0	1	1	1	7	23	19	C	C	C	C	C	10	9	17	10	10	17	9	25	18	10	10.4	25
4-Jan	22	Z	11	4	2	1	2	1	11	10	8	3	4	3	6	6	10	12	17	12	18	28	27	14	10.2	28
5-Jan	5	Z	5	7	7	10	11	6	4	5	23	75	42	13	11	18	21	24	32	37	41	55	57	48	24.1	75
6-Jan	30	Z	46	33	29	17	16	17	29	38	36	49	52	45	33	47	50	24	21	28	27	29	30	21	32.5	52
7-Jan	16	Z	14	10	14	12	31	63	85	43	33	26	14	12	23	42	41	39	55	59	58	46	19	15	33.4	85
8-Jan	11	Z	11	13	13	22	24	21	9	9	7	5	5	4	5	6	7	7	6	7	6	17	32	60	13.4	60
9-Jan	96	Z	59	64	68	42	12	16	12	9	32	25	20	31	35	9	10	8	5	4	5	4	10	5	25.2	96
10-Jan	3	Z	4	5	6	3	3	4	1	3	1	3	4	6	8	8	7	16	23	5	0	1	3	18	6.0	23
11-Jan	50	Z	64	27	11	5	1	7	4	2	3	2	2	3	4	4	3	1	1	1	1	0	0	0	8.5	64
12-Jan	1	Z	0	0	1	1	2	3	3	10	23	15	15	3	2	3	2	3	6	5	25	33	36	35	9.8	36
13-Jan	29	Z	16	8	7	5	9	36	43	73	57	4	3	5	3	3	8	7	7	6	6	13	17	43	17.7	73
14-Jan	56	Z	25	16	12	12	21	48	54	53	53	42	35	28	30	32	35	19	13	11	9	9	4	5	27.1	56
15-Jan	3	Z	2	4	3	4	3	2	8	4	3	3	4	4	4	5	3	4	4	4	12	17	17	15	5.7	17
16-Jan	18	Z	34	23	19	1	1	0	1	2	2	4	3	4	5	6	5	6	3	3	2	2	1	11	6.8	34
17-Jan	39	Z	3	2	1	1	1	1	0	0	0	4	4	3	4	8	1	1	2	1	1	2	2	3	3.6	39
18-Jan	5	Z	8	11	20	38	38	33	16	7	6	15	62	18	5	4	3	2	2	2	2	2	2	7	13.4	62
19-Jan	15	Z	11	6	4	9	2	10	2	1	2	1	1	1	1	1	1	1	0	0	1	1	3	5	3.4	15
20-Jan	9	Z	6	7	7	8	8	7	11	18	25	26	21	22	24	24	29	27	21	22	13	7	5	4	15.2	29
21-Jan	5	Z	14	10	10	15	27	20	16	36	18	1	1	1	1	1	6	10	13	14	15	18	26	31	13.5	36
22-Jan	24	Z	17	15	15	23	29	28	25	22	24	30	28	29	28	23	24	23	17	14	14	13	6	4	20.7	30
23-Jan	4	Z	4	3	2	2	4	2	1	1	1	2	4	2	1	1	1	6	8	2	4	3	6	4	2.9	8
24-Jan	2	Z	7	5	4	1	1	1	1	3	0	0	0	0	1	1	2	3	6	18	14	13	12	7	4.3	18
25-Jan	6	Z	5	4	4	4	5	8	35	35	8	1	1	2	1	1	2	4	6	8	10	9	12	6	7.7	35
26-Jan	4	Z	2	1	1	2	4	1	4	4	3	6	7	5	8	11	11	11	13	17	24	31	29	34	10.2	34
27-Jan	25	Z	13	18	20	18	15	16	14	10	13	10	13	23	34	31	25	28	53	70	52	41	26	17	25.4	70
28-Jan	28	Z	45	51	24	12	10	5	3	52	48	56	78	103	80	70	46	7	1	1	1	1	1	2	31.5	103
29-Jan	2	Z	9	10	10	6	4	8	13	16	11	1	1	1	1	1	1	1	4	1	3	7	5	4	5.1	16
30-Jan	5	Z	8	16	3	1	1	0	0	0	0	0	1	1	2	2	1	1	1	1	1	2	1	31	3.4	31
31-Jan	14	Z	15	15	14	18	23	11	15	15	14	12	8	2	1	1	1	1	1	3	10	10	3	2	9.1	23
	19.3	--	17.9	15.7	13.3	11.4	11.4	14.2	15.6	17.1	15.9	14.7	16.2	15.7	14.5	14.1	14.2	12.1	14.3	14.9	14.9	16.3	14.4	15.9	Diurnal Average	
	96	--	69	76	68	43	38	63	85	73	57	75	78	103	80	70	63	64	90	90	78	55	57	60	Diurnal Maximum	

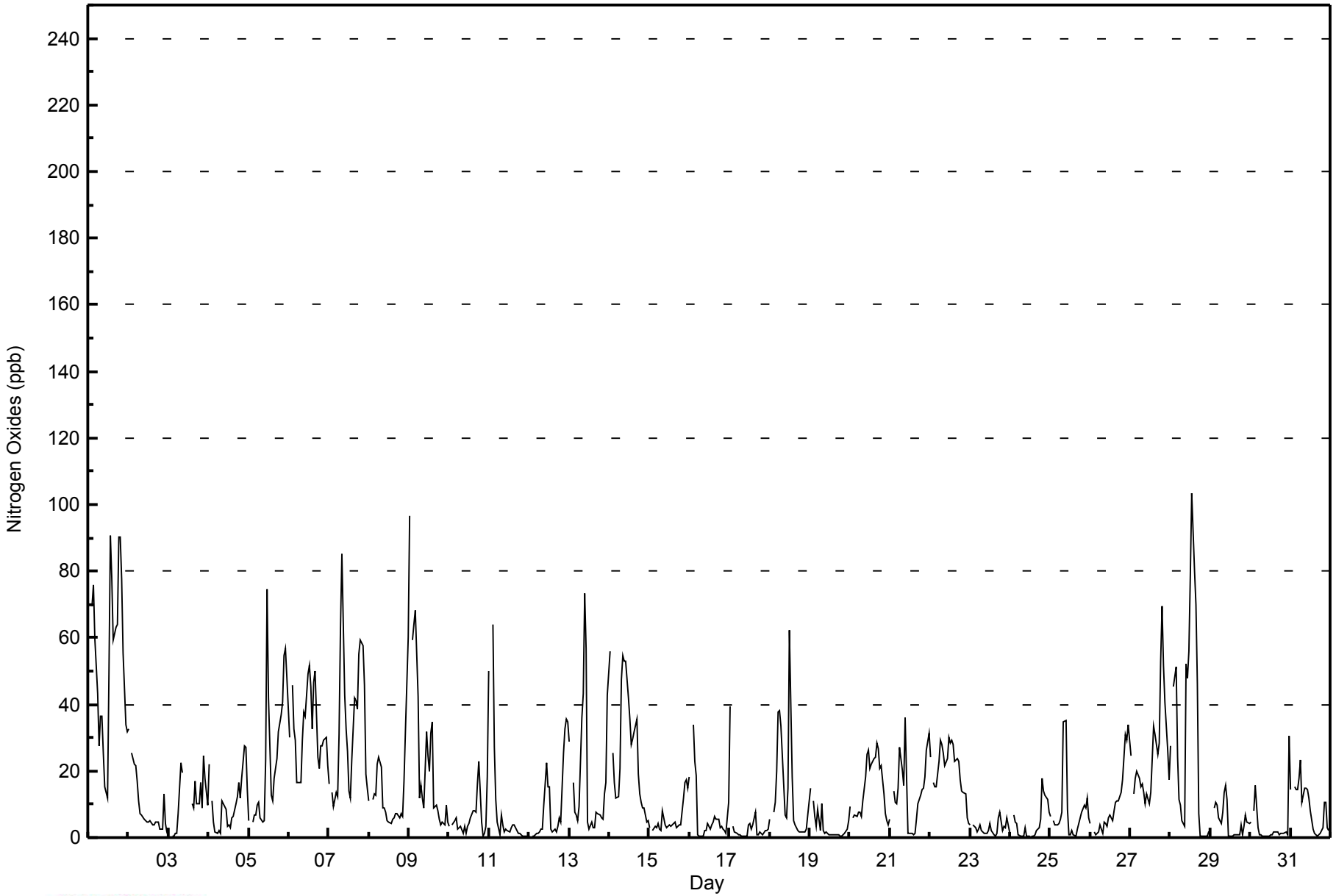
Z - zerospan C - Calibration

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	525	74.15	74.15
21 - 40	115	16.24	90.40
11 - 80	62	8.76	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	37	97	37	12	12	7	8	18	86	72	50	14	13	19	20	23	525
21 - 40	4	4	6	0	1	3	4	8	35	24	13	1	1	5	2	4	115
11 - 80	1	3	2	1	0	0	2	6	17	10	9	1	1	1	2	6	62
81 - 159	0	0	1	0	0	0	1	1	1	1	1	0	0	0	0	0	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	104	46	13	13	10	15	33	139	107	73	16	15	25	24	33	708

Total Number of Valid Hours: 708

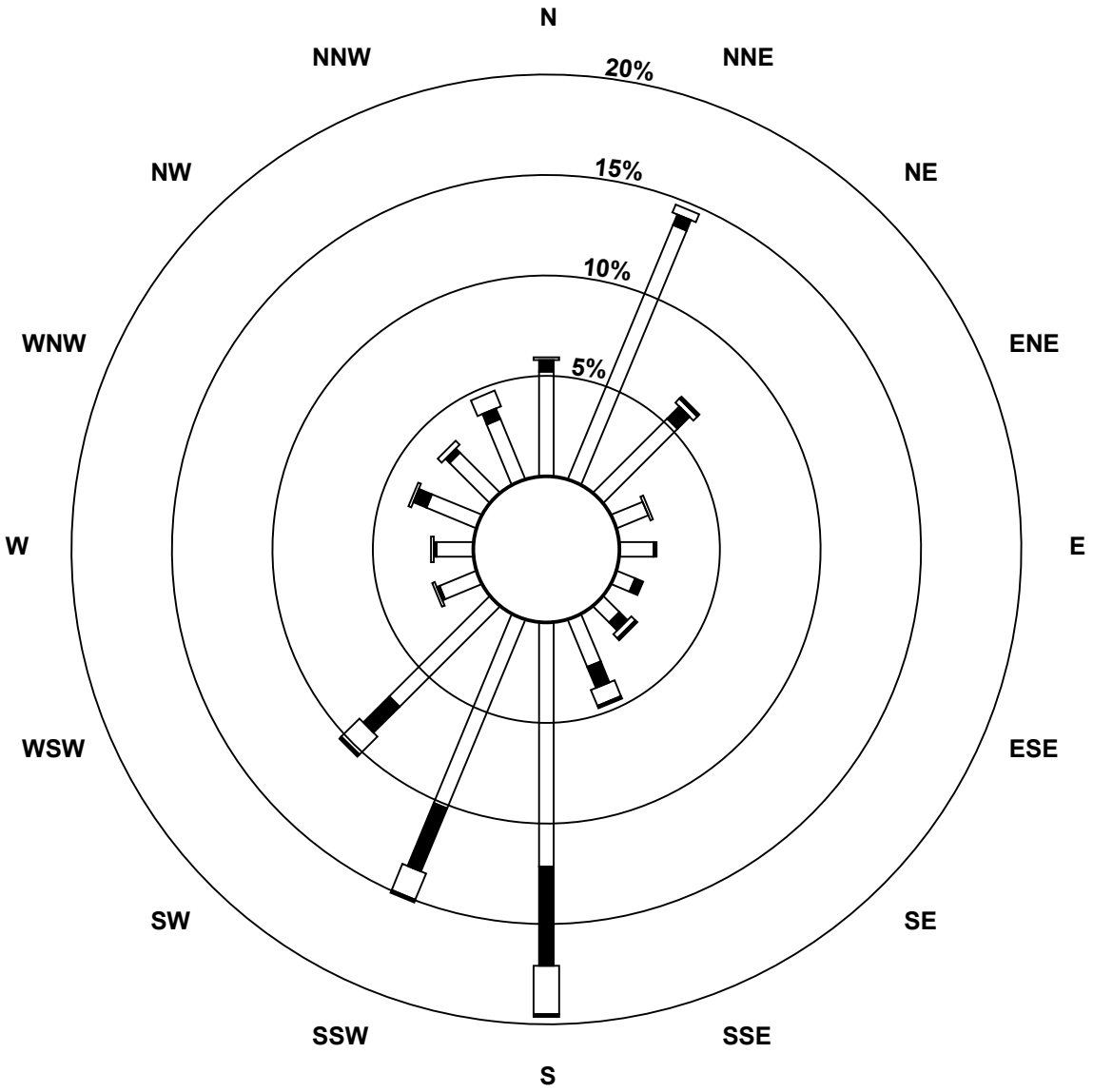
Total Number of Hours: 744

Wood Buffalo Environmental Association

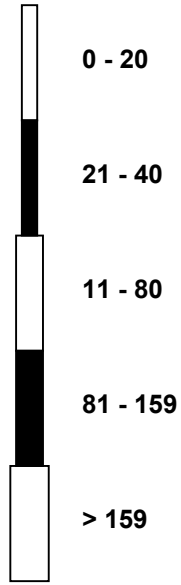
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon (AMS 15)



Classes (ppb)



0 - 20

21 - 40

11 - 80

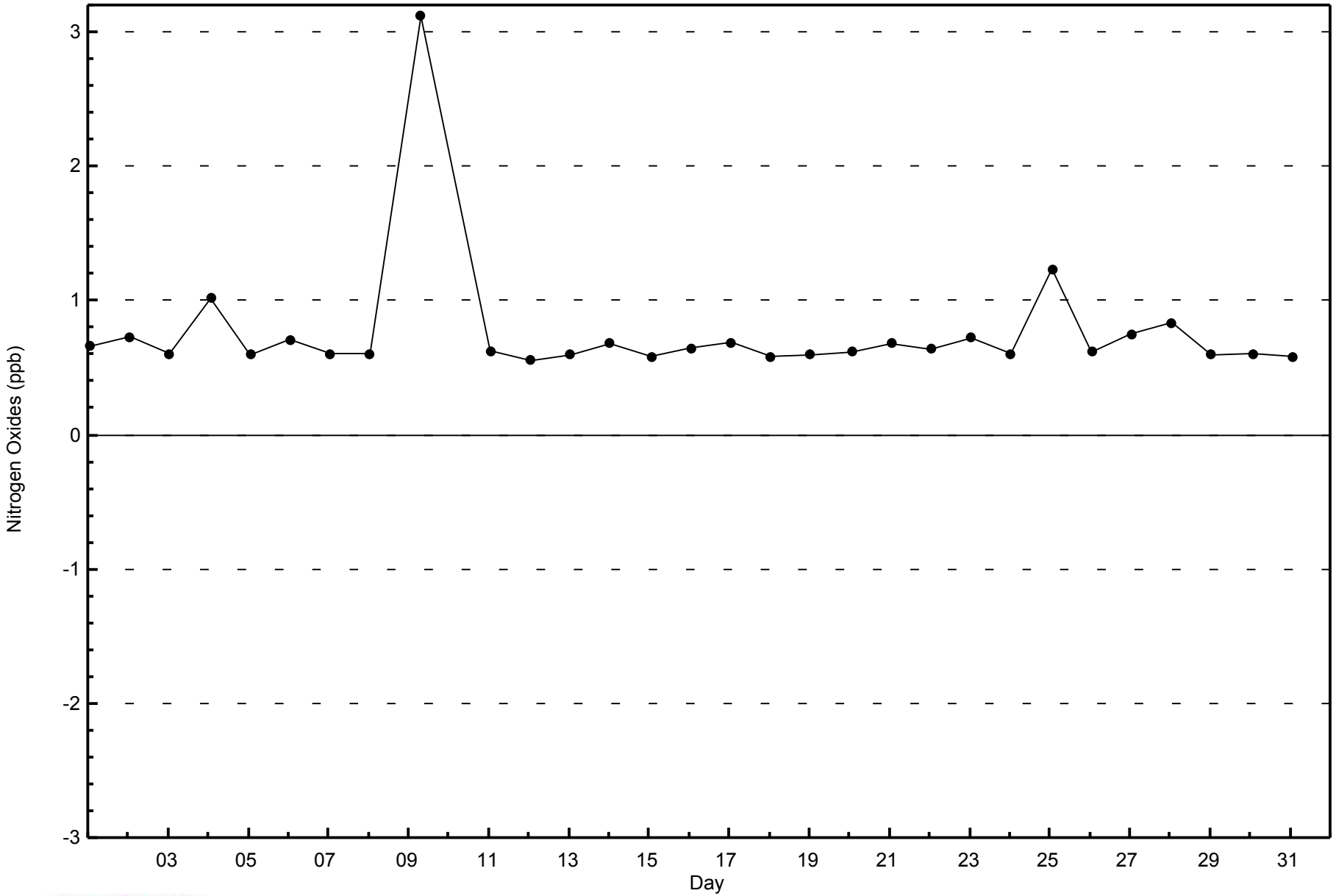
81 - 159

> 159

Total Number of Valid Hours: 708

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
CNRL Horizon - January 2014



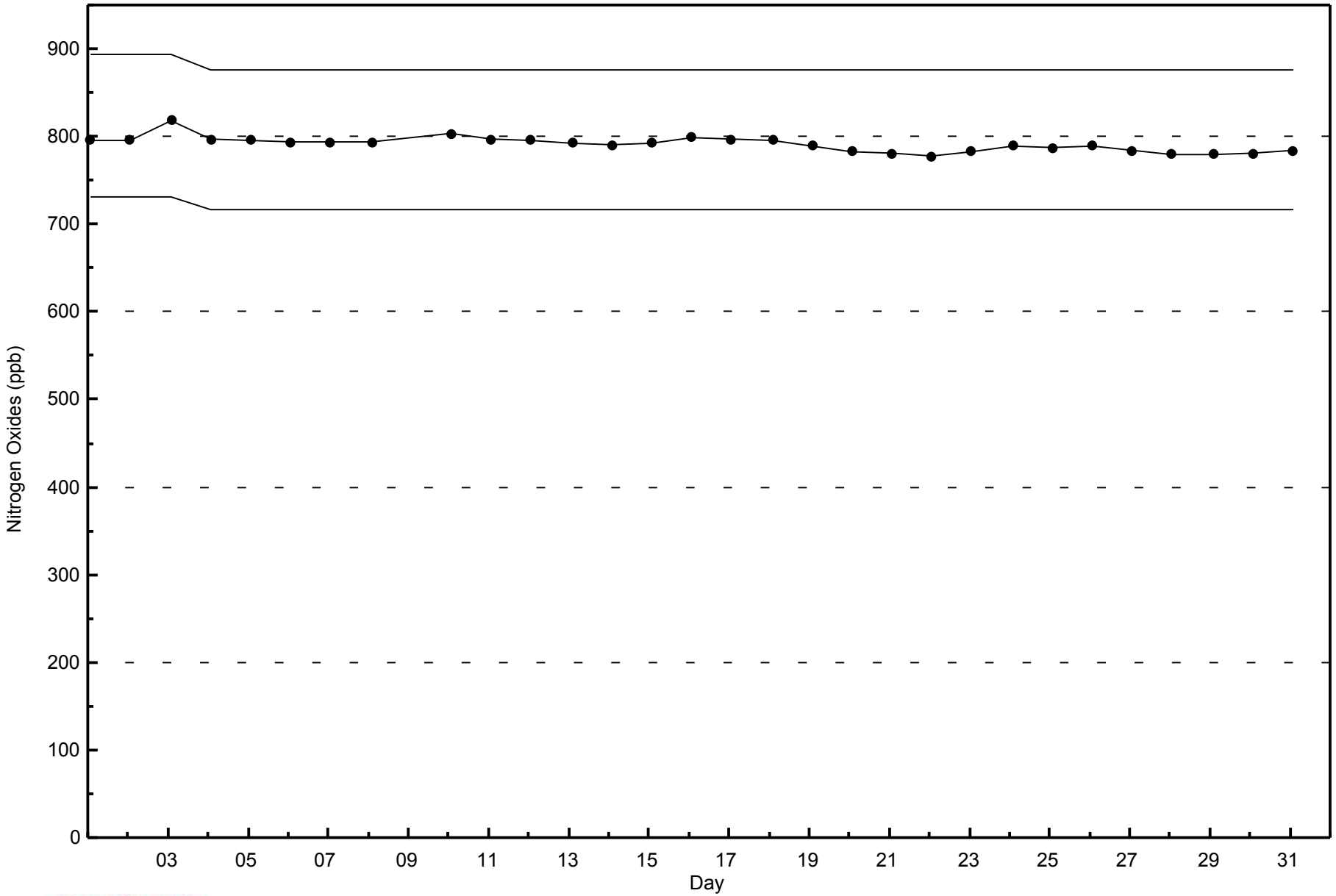
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

CNRL Horizon - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 108.9 $\mu g/m^3$ on Jan 7 16:00

Maximum Daily Average: 21.5 $\mu g/m^3$ on Jan 9

Minimum Value: 0.6 $\mu g/m^3$ on Jan 12 08:00

Minimum Daily Average: 2.7 $\mu g/m^3$ on Jan 30

Maximum Diurnal Average: 12.6 $\mu g/m^3$ at hour 3

Minimum Diurnal Average: 7.6 $\mu g/m^3$ at hour 15

Monthly Average: 9.94 $\mu g/m^3$

Percentiles: P_1 = 0.9 P_{10} = 2.3 Q_1 = 3.6 Median = 7.4 Q_3 = 13.1 P_{90} = 20.0 P_{99} = 40.3

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	19.2	15.5	15.1	18.3	13.5	9.4	8.3	8.9	9.4	6.4	4.5	3.6	14.4	23.7	20.0	20.8	26.6	28.5	23.9	18.4	13.7	10.0	9.0	10.4	14.6	28.5
2-Jan	11.3	7.1	7.0	7.1	7.3	6.3	6.8	5.3	5.4	5.3	5.0	5.2	5.2	6.1	5.0	3.2	2.5	2.2	1.6	1.0	1.0	10.5	3.3	1.9	5.1	11.3
3-Jan	1.3	1.3	1.3	1.3	1.6	2.7	2.6	3.6	2.9	2.9	2.1	1.5	2.3	1.9	1.2	0.6	2.9	1.3	14.3	20.9	2.3	3.4	2.2	1.8	3.3	20.9
4-Jan	8.6	8.2	12.3	4.9	5.1	20.1	8.8	4.1	5.2	3.6	10.1	3.2	10.6	7.6	3.4	4.0	4.6	5.1	5.0	4.5	5.2	6.1	11.6	13.9	7.3	20.1
5-Jan	25.1	32.8	16.9	10.5	8.9	9.8	15.0	10.9	5.0	4.6	8.0	23.5	19.4	13.6	12.0	18.7	17.1	10.6	10.4	10.6	9.9	9.3	8.8	7.9	13.3	32.8
6-Jan	8.2	7.7	6.9	5.3	7.3	10.0	14.2	13.0	12.0	16.4	11.9	11.1	9.5	6.9	4.9	6.4	7.9	7.6	9.7	11.5	7.6	5.5	7.0	9.2	9.1	16.4
7-Jan	15.3	12.6	3.8	2.7	3.7	3.4	6.5	16.3	13.3	7.4	7.0	3.0	1.6	0.6	25.5	108.9	18.3	15.2	12.7	9.5	8.4	8.1	6.2	7.5	13.2	108.9
8-Jan	8.1	6.3	5.6	5.3	5.4	13.1	17.2	5.5	3.6	3.6	3.8	5.4	8.3	9.8	10.1	10.0	9.6	10.2	12.7	14.2	19.3	20.2	40.3	40.1	12.0	40.3
9-Jan	32.1	21.8	40.2	55.8	46.5	42.9	29.1	26.6	20.8	14.1	23.0	22.0	21.0	23.6	19.0	7.1	8.0	10.8	13.0	12.0	9.6	7.3	5.8	4.2	21.5	55.8
10-Jan	2.6	2.6	3.1	3.6	4.5	4.8	4.2	4.7	4.6	4.2	3.3	3.0	2.4	2.1	2.9	3.1	4.7	10.9	14.7	10.5	2.1	2.9	4.2	29.3	5.6	29.3
11-Jan	21.8	37.0	31.7	8.6	5.1	2.3	1.5	1.7	2.0	2.5	3.9	4.9	5.1	5.2	5.5	5.5	4.6	3.4	2.8	2.5	2.0	2.2	1.8	1.4	6.9	37.0
12-Jan	1.4	1.3	1.3	1.1	2.6	0.8	0.7	0.6	0.7	1.4	2.2	2.3	3.0	5.2	4.9	13.3	6.9	1.7	2.3	3.8	5.9	7.6	6.7	6.1	3.5	13.3
13-Jan	14.6	13.3	10.5	14.3	8.4	5.2	4.4	7.9	8.5	14.0	15.3	1.3	0.9	1.3	1.8	1.0	60.3	57.5	21.7	40.0	33.6	20.9	17.1	26.9	16.7	60.3
14-Jan	19.3	9.0	11.1	15.4	15.4	9.9	10.1	15.5	17.7	15.5	19.7	14.5	14.4	9.8	6.7	6.6	7.1	6.1	5.3	5.0	4.8	9.5	4.5	8.7	10.9	19.7
15-Jan	6.5	1.9	1.0	0.9	1.0	1.0	1.3	1.9	2.4	8.8	9.8	4.0	5.9	16.7	14.6	2.7	4.1	18.9	12.3	7.3	7.2	5.2	5.9	16.8	6.6	18.9
16-Jan	11.3	12.2	14.1	27.0	7.4	3.2	2.7	2.2	2.3	3.9	24.7	16.5	16.4	16.1	3.8	13.0	68.7	35.3	3.0	2.9	35.7	22.9	14.7	6.3	15.3	68.7
17-Jan	23.3	11.9	27.9	5.9	3.7	3.5	3.4	3.0	2.7	2.2	2.1	9.1	65.2	13.3	1.6	1.2	3.3	2.1	2.7	2.5	2.9	12.3	17.5	3.4	9.4	65.2
18-Jan	4.4	4.7	10.3	7.2	12.9	13.4	12.9	33.5	44.5	25.2	15.5	18.4	14.5	10.2	5.3	8.0	17.4	7.4	4.9	4.6	5.7	7.1	17.0	20.4	13.6	44.5
19-Jan	12.1	28.0	47.7	20.5	22.6	42.4	7.5	4.2	4.1	3.9	4.0	4.7	4.9	5.2	6.5	7.4	8.3	8.0	7.1	6.4	5.7	5.3	5.7	5.6	11.6	47.7
20-Jan	8.7	10.6	25.4	14.9	11.1	14.5	17.5	12.2	11.9	13.2	12.7	11.7	10.2	11.8	9.0	8.8	18.8	17.7	14.2	13.8	10.9	9.9	8.1	7.2	12.7	25.4
21-Jan	8.7	9.3	9.9	9.2	8.8	10.5	11.1	12.4	11.9	12.8	9.4	4.6	3.4	2.8	2.5	2.1	3.2	17.6	21.1	20.1	13.1	9.4	10.1	8.3	9.7	21.1
22-Jan	27.3	14.2	15.2	23.0	26.0	22.3	19.8	12.0	13.5	14.0	24.0	26.0	32.4	46.0	17.1	8.7	8.1	7.6	8.0	11.9	12.9	40.7	33.0	17.0	20.0	46.0
23-Jan	14.9	14.5	11.6	10.3	9.7	11.8	11.3	9.4	9.2	8.2	7.2	5.9	3.9	2.4	1.2	0.8	1.6	2.6	2.7	2.3	2.5	3.8	13.6	10.1	7.1	14.9
24-Jan	4.6	3.8	6.3	4.1	3.4	3.3	3.4	2.9	2.6	2.2	M	M	3.4	3.4	3.1	3.2	3.6	4.5	4.9	8.4	14.7	12.3	6.5	5.5	5.0	14.7
25-Jan	13.0	4.6	6.0	7.4	7.6	8.9	10.4	11.3	25.9	13.9	6.4	2.3	2.5	2.8	2.7	2.4	2.7	3.3	2.9	4.2	6.3	4.9	4.9	6.3	6.8	25.9
26-Jan	5.6	5.0	6.6	8.3	9.2	10.1	9.6	9.3	10.0	9.0	8.8	8.3	9.3	9.9	10.2	12.7	13.2	12.9	11.9	13.2	13.4	13.3	13.3	13.1	10.3	13.4
27-Jan	11.9	13.0	14.6	15.3	15.9	14.6	14.4	12.1	16.5	8.1	18.6	13.0	7.9	8.7	13.1	14.1	12.1	13.8	14.5	14.3	15.2	17.0	19.4	20.5	14.1	20.5
28-Jan	12.9	22.3	15.8	23.8	14.1	11.5	7.2	6.2	6.7	10.9	12.3	11.9	15.8	17.1	15.1	14.4	11.8	5.5	3.9	4.5	5.1	5.1	4.9	4.7	11.0	23.8
29-Jan	4.3	4.3	4.5	4.5	5.7	6.0	6.8	8.0	7.1	5.9	4.8	3.2	2.4	2.3	2.3	2.4	2.5	2.6	2.5	2.4	2.2	2.5	2.3	2.5	3.9	8.0
30-Jan	2.4	2.2	2.5	2.5	2.0	1.9	2.1	2.3	2.3	2.3	2.1	2.1	2.3	2.2	2.1	2.0	1.9	2.5	2.8	3.0	3.6	4.3	5.1	6.8	2.7	6.8
31-Jan	6.1	5.2	5.7	5.0	5.0	5.6	8.8	5.9	9.3	17.0	6.5	4.6	3.7	2.8	2.5	2.5	2.5	2.6	2.6	2.7	3.0	2.9	2.3	2.5	4.9	17.0
	11.8	11.1	12.6	11.1	9.7	10.5	9.0	8.8	9.5	8.5	9.6	8.4	10.4	9.4	7.6	10.2	11.8	10.8	8.8	9.3	9.2	9.7	10.1	10.5	Diurnal Average	
	32.1	37.0	47.7	55.8	46.5	42.9	29.1	33.5	44.5	25.2	24.7	26.0	65.2	46.0	25.5	108.9	68.7	57.5	23.9	40.0	35.7	40.7	40.3	40.1	Diurnal Maximum	

M - Maintenance

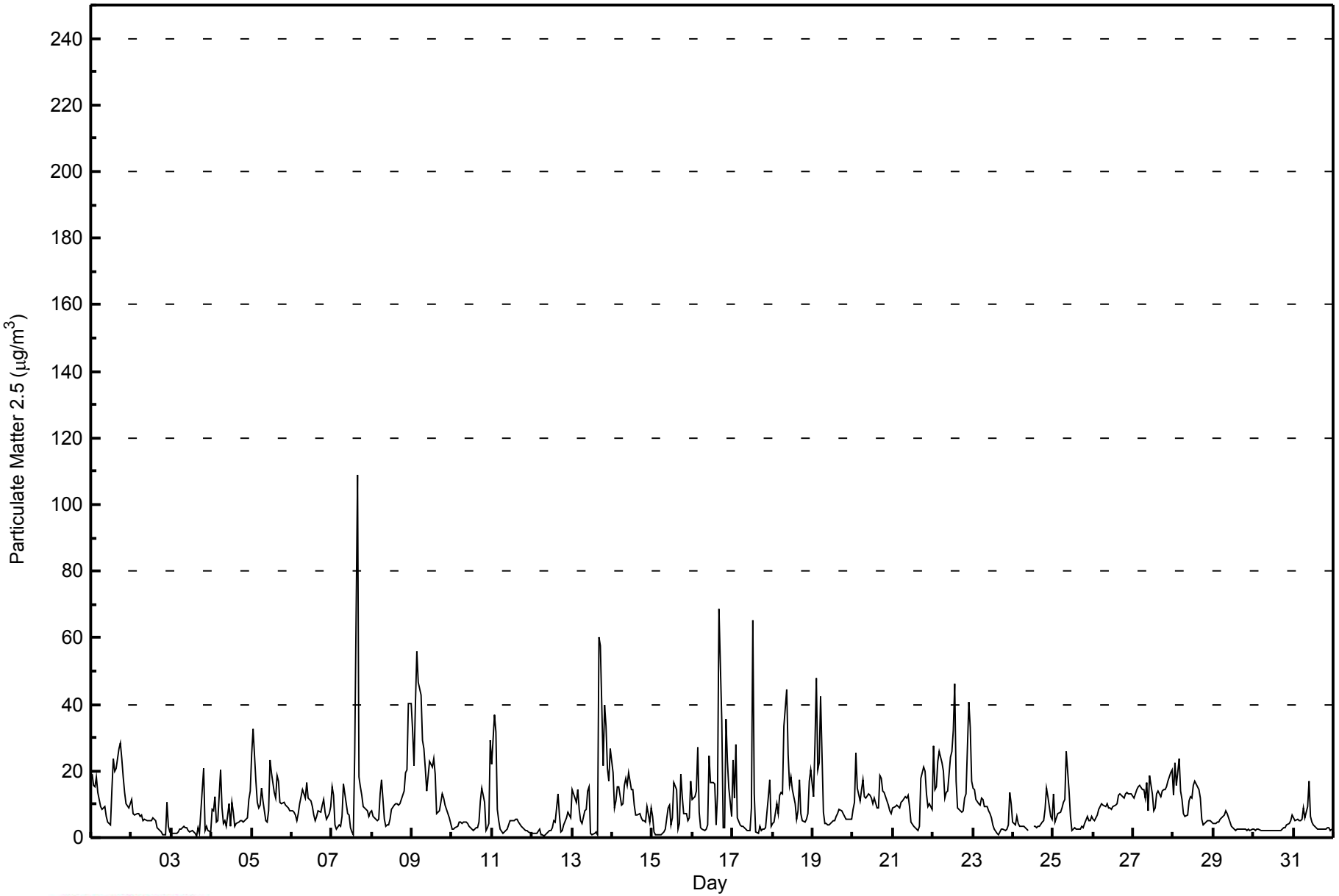
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	288	38.81	38.81
6 - 15	326	43.94	82.75
16 - 25	78	10.51	93.26
26 - 80	40	5.39	98.65
> 81.0	1	0.13	98.79

Total Number of Valid Hours: 742

Total Number of Hours: 744

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

CNRL Horizon - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	23	68	21	6	8	1	2	6	25	38	31	8	12	14	11	14	288
6 - 15	18	32	14	4	5	5	7	18	78	63	40	6	3	6	10	17	326
16 - 25	2	4	7	2	1	2	5	5	24	13	5	1	1	2	2	2	78
26 - 80	0	1	2	1	0	1	2	3	19	1	3	2	1	1	2	1	40
> 81.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Totals	43	105	44	13	14	9	16	32	147	115	79	17	17	23	25	34	733

Total Number of Valid Hours: 742

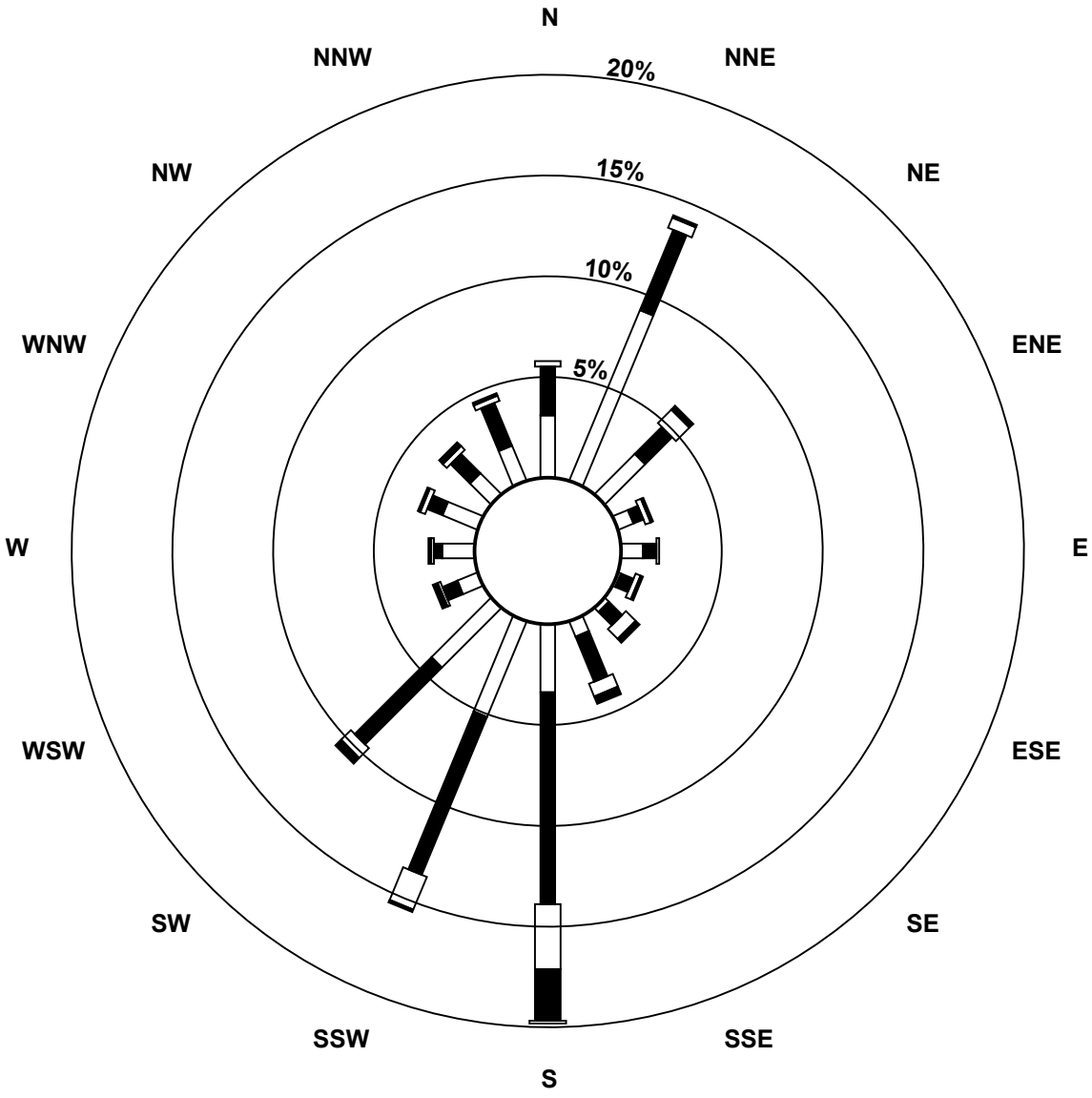
Total Number of Hours: 744

Wood Buffalo Environmental Association

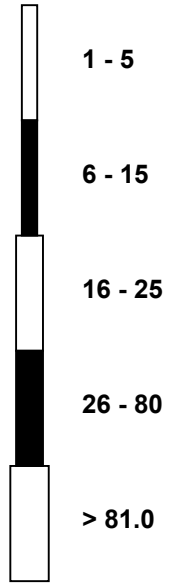
Wind Rose Jan 2014

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

CNRL Horizon (AMS 15)



Classes ($\mu g/m^3$)



Total Number of Valid Hours: 742

Maximum Value: 6.7 C on Jan 17 13:00

Maximum Daily Average: 0.0 C on Jan 17

Minimum Value: -40.2 C on Jan 1 06:00

Minimum Daily Average: -34.5 C on Jan 1

Maximum Diurnal Average: -14.4 C at hour 15

Minimum Diurnal Average: -19.0 C at hour 4

Monthly Average: -17.30 C

Percentiles: P_1 = -38.5 P_{10} = -29.2 Q_1 = -24.7 Median = -17.6 Q_3 = -10.8 P_{90} = -3.6 P_{99} = 6.3

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

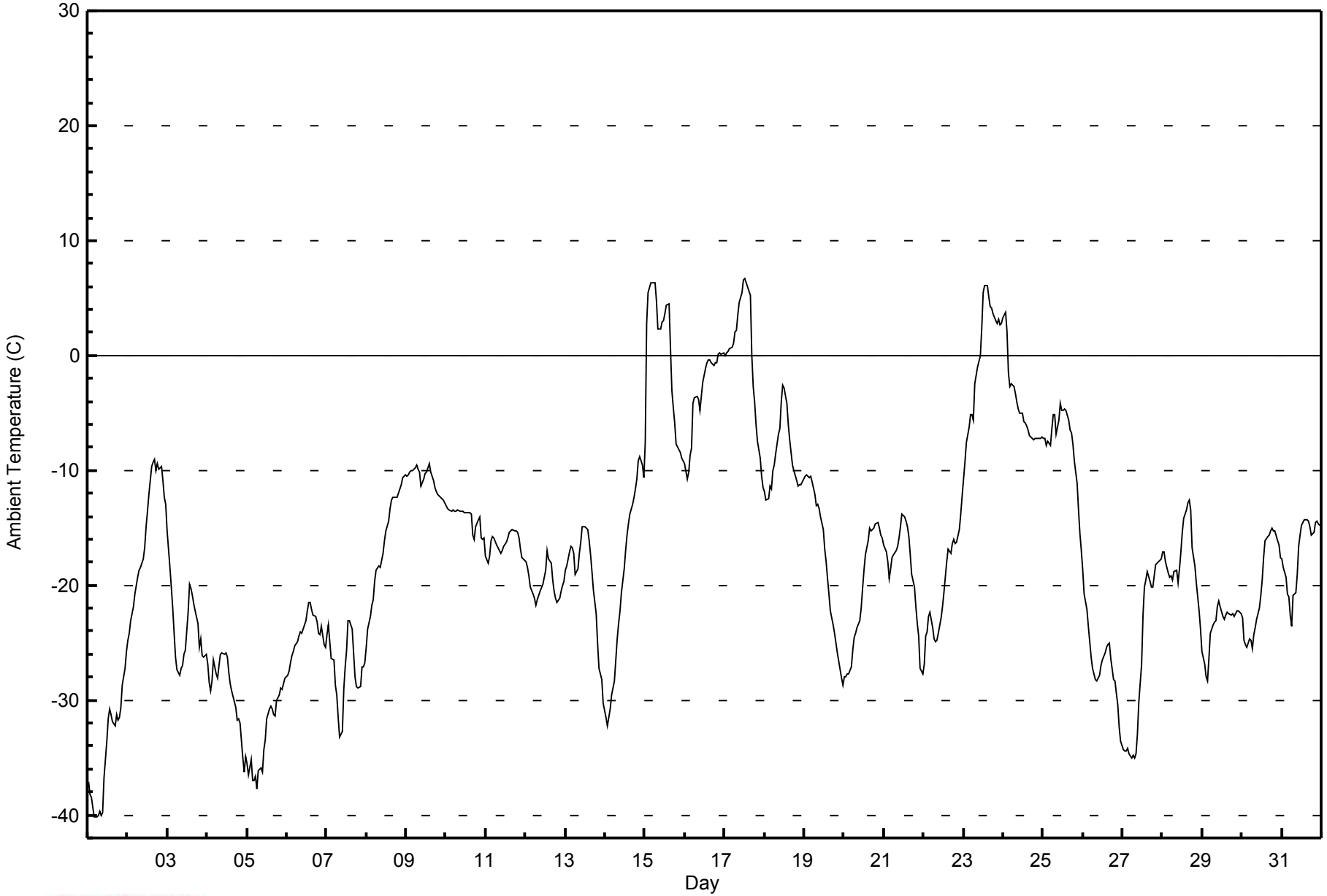
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-37.1	-38.3	-38.5	-39.3	-40.1	-40.2	-40.1	-39.7	-40.0	-39.8	-36.8	-33.5	-31.7	-30.8	-31.2	-31.8	-32.3	-31.2	-31.8	-31.5	-30.7	-28.7	-27.2	-25.8	-34.5	-25.8
2-Jan	-24.8	-24.2	-23.1	-21.8	-20.8	-20.0	-19.3	-18.7	-18.4	-17.7	-16.8	-15.0	-13.5	-12.1	-9.6	-9.2	-9.0	-10.1	-9.4	-9.9	-9.6	-10.9	-12.4	-12.9	-15.4	-9.0
3-Jan	-15.3	-18.4	-20.2	-22.0	-24.2	-26.3	-27.4	-27.9	-27.2	-27.0	-26.0	-25.6	-22.3	-19.9	-20.3	-20.9	-21.6	-22.2	-23.3	-25.4	-24.6	-26.1	-26.2	-26.0	-23.6	-15.3
4-Jan	-26.8	-28.5	-29.1	-28.3	-26.5	-27.7	-28.1	-26.9	-26.0	-25.9	-26.0	-25.9	-26.3	-27.5	-28.5	-29.2	-30.2	-30.7	-31.7	-31.6	-32.0	-35.0	-36.3	-34.9	-29.2	-25.9
5-Jan	-35.5	-36.5	-35.2	-37.0	-36.9	-36.6	-37.7	-36.1	-35.9	-36.2	-34.3	-33.5	-31.7	-30.8	-30.6	-30.8	-31.2	-31.4	-30.1	-29.6	-29.0	-29.0	-28.5	-28.1	-33.0	-28.1
6-Jan	-27.8	-27.5	-26.7	-26.2	-25.7	-25.3	-24.9	-24.4	-24.1	-24.2	-23.8	-23.0	-22.3	-21.5	-21.6	-22.1	-22.6	-22.7	-23.3	-24.2	-24.3	-23.5	-25.2	-25.4	-24.3	-21.5
7-Jan	-24.3	-23.4	-24.9	-26.3	-26.5	-28.7	-29.5	-31.6	-33.2	-32.7	-29.1	-27.2	-25.7	-23.1	-23.1	-23.8	-25.8	-28.0	-28.9	-29.0	-28.8	-27.1	-27.1	-26.7	-27.3	-23.1
8-Jan	-25.4	-23.8	-22.7	-21.8	-21.2	-19.7	-18.7	-18.4	-18.5	-17.9	-17.2	-16.2	-15.3	-14.5	-13.3	-12.6	-12.4	-12.3	-12.4	-12.0	-11.6	-11.2	-10.7	-10.4	-16.3	-10.4
9-Jan	-10.5	-10.4	-10.1	-10.0	-10.0	-9.8	-9.5	-9.9	-10.1	-11.4	-10.7	-10.3	-10.1	-9.8	-9.5	-10.2	-10.9	-11.5	-11.9	-12.1	-12.2	-12.5	-12.6	-12.8	-10.8	-9.5
10-Jan	-13.1	-13.3	-13.5	-13.5	-13.5	-13.6	-13.6	-13.4	-13.6	-13.6	-13.6	-13.7	-13.7	-13.7	-13.6	-13.8	-15.7	-16.1	-14.9	-14.3	-14.1	-15.8	-16.0	-15.9	-14.2	-13.1
11-Jan	-17.4	-18.0	-17.5	-16.1	-15.7	-15.9	-16.4	-16.8	-17.0	-17.2	-17.0	-16.7	-16.2	-15.9	-15.4	-15.2	-15.2	-15.3	-15.3	-15.4	-15.9	-16.9	-17.6	-17.8	-16.4	-15.2
12-Jan	-17.9	-18.5	-19.2	-20.2	-20.8	-21.2	-21.7	-21.2	-20.9	-20.5	-20.0	-19.3	-18.7	-16.9	-17.7	-18.1	-19.5	-20.5	-21.1	-21.5	-21.2	-20.6	-20.0	-19.6	-19.9	-16.9
13-Jan	-18.7	-18.3	-17.1	-16.6	-16.7	-17.2	-19.1	-18.6	-17.2	-16.3	-14.9	-14.9	-14.9	-15.2	-16.1	-17.3	-18.8	-20.4	-22.5	-25.1	-27.3	-27.7	-28.2	-30.3	-19.6	-14.9
14-Jan	-31.5	-32.2	-31.5	-30.8	-29.5	-28.4	-26.5	-24.7	-23.4	-22.2	-20.6	-18.5	-17.0	-15.6	-14.6	-13.8	-13.0	-12.3	-11.6	-10.7	-9.2	-8.8	-9.5	-10.6	-19.4	-8.8
15-Jan	-7.6	2.8	5.4	6.3	6.4	6.4	6.3	4.7	2.2	2.3	2.9	3.0	3.7	4.3	4.5	0.6	-3.1	-4.5	-5.9	-7.7	-8.2	-8.4	-8.9	-9.1	-0.1	6.4
16-Jan	-9.4	-10.8	-10.2	-8.7	-8.0	-4.1	-3.7	-3.5	-3.9	-4.7	-3.6	-2.3	-1.1	-0.7	-0.3	-0.4	-0.7	-0.8	-0.6	-0.6	0.1	0.2	0.2	0.2	-3.2	0.2
17-Jan	0.0	0.2	0.4	0.6	0.8	1.1	2.0	2.1	3.5	4.7	5.4	6.6	6.7	6.3	5.9	5.2	0.0	-2.7	-4.0	-5.9	-7.5	-9.0	-10.6	-11.5	0.0	6.7
18-Jan	-11.8	-12.6	-12.5	-11.4	-11.6	-10.1	-9.6	-8.5	-6.8	-6.4	-4.0	-2.6	-2.8	-4.2	-6.0	-7.4	-8.5	-9.6	-10.1	-10.9	-11.3	-11.2	-11.3	-11.0	-8.8	-2.6
19-Jan	-10.6	-10.4	-10.5	-10.7	-10.5	-11.0	-12.1	-13.1	-12.9	-13.4	-14.1	-15.2	-16.8	-18.0	-19.5	-20.8	-22.2	-23.5	-24.2	-25.1	-25.9	-26.7	-28.1	-28.7	-17.7	-10.4
20-Jan	-28.0	-28.0	-27.7	-27.7	-27.1	-25.6	-24.5	-24.1	-23.7	-23.0	-22.0	-20.3	-18.7	-17.4	-16.1	-15.1	-15.3	-15.1	-15.0	-14.6	-14.5	-15.0	-15.6	-15.8	-20.4	-14.5
21-Jan	-16.5	-17.2	-17.9	-19.5	-18.6	-17.6	-17.3	-17.0	-16.6	-15.9	-14.9	-13.8	-14.1	-14.4	-15.0	-15.7	-17.4	-19.1	-20.2	-21.9	-23.3	-24.4	-27.2	-27.7	-18.5	-13.8
22-Jan	-26.9	-24.5	-24.0	-22.8	-22.4	-23.7	-24.6	-24.9	-24.9	-24.2	-22.8	-21.9	-20.7	-19.3	-17.9	-16.8	-17.2	-16.4	-16.0	-16.4	-16.2	-15.2	-13.8	-12.2	-20.2	-12.2
23-Jan	-10.7	-9.3	-7.6	-6.2	-5.2	-5.2	-5.7	-2.5	-1.0	-0.6	0.0	2.4	5.4	6.1	6.1	5.2	4.3	4.1	3.6	3.1	2.7	3.1	2.7	2.7	-0.1	6.1
24-Jan	3.3	3.8	2.1	-1.5	-2.6	-2.4	-2.7	-3.4	-4.1	-4.6	-5.0	-5.1	-5.7	-5.9	-6.1	-6.4	-7.0	-7.2	-7.3	-7.3	-7.3	-7.2	-7.2	-7.1	-4.3	3.8
25-Jan	-7.2	-7.3	-7.8	-7.5	-7.8	-6.4	-5.1	-5.2	-6.8	-5.7	-4.1	-4.7	-4.8	-4.7	-4.8	-5.6	-6.5	-6.8	-7.7	-9.2	-11.1	-13.4	-15.6	-17.0	-7.6	-4.1
26-Jan	-18.7	-20.7	-22.1	-23.6	-24.9	-26.2	-27.2	-28.2	-28.3	-28.1	-27.8	-27.0	-26.5	-25.8	-25.4	-25.2	-25.0	-26.4	-28.2	-28.3	-29.4	-30.4	-32.3	-33.6	-26.6	-18.7
27-Jan	-34.3	-34.4	-34.4	-34.2	-34.7	-35.0	-34.7	-35.1	-34.7	-33.0	-30.1	-26.9	-22.6	-20.2	-19.5	-18.8	-19.7	-20.2	-20.1	-19.2	-18.2	-18.0	-17.9	-17.8	-26.4	-17.8
28-Jan	-17.1	-17.1	-18.0	-18.9	-19.3	-19.1	-19.6	-18.8	-18.7	-19.7	-18.6	-17.1	-15.4	-14.1	-13.4	-12.9	-12.6	-13.5	-16.7	-18.4	-19.7	-21.0	-22.3	-23.8	-17.7	-12.6
29-Jan	-25.7	-26.9	-28.0	-28.3	-26.4	-24.1	-23.4	-23.2	-23.1	-21.9	-21.4	-21.8	-22.7	-22.9	-22.5	-22.4	-22.4	-22.6	-22.5	-22.7	-22.5	-22.2	-22.2	-22.4	-23.5	-21.4
30-Jan	-22.8	-24.8	-25.2	-25.4	-24.6	-24.8	-25.5	-24.3	-23.7	-23.0	-22.0	-20.9	-19.5	-17.5	-16.1	-15.7	-15.6	-15.3	-15.1	-15.2	-15.3	-16.2	-16.5	-17.6	-20.1	-15.1
31-Jan	-17.7	-18.5	-19.3	-20.7	-21.0	-22.6	-23.6	-20.9	-20.7	-19.0	-16.6	-15.7	-14.8	-14.3	-14.3	-14.2	-14.4	-14.9	-15.7	-15.4	-14.6	-14.4	-14.7	-14.8	-17.2	-14.2
	-19.0	-18.9	-18.9	-19.0	-18.9	-18.7	-18.8	-18.5	-18.4	-18.0	-17.0	-16.0	-15.2	-14.5	-14.4	-14.7	-15.5	-16.1	-16.6	-17.0	-17.2	-17.5	-18.0	-18.2	Diurnal Average	
	3.3	3.8	5.4	6.3	6.4	6.4	6.3	4.7	3.5	4.7	5.4	6.6	6.7	6.3	6.1	5.2	4.3	4.1	3.6	3.1	2.7	3.1	2.7	2.7	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	307	41.26	41.26
-20 - 0	386	51.88	93.15
0 - 10	51	6.85	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 0.1 mm on Jan 17 14:00

Maximum Daily Total: 0.1 mm on Jan 17

Minimum Value: 0.0 mm on Jan 1 01:00

Minimum Daily Total: 0.0 mm on Jan 1

Maximum Diurnal Total: 0.1 mm at hour 14

Minimum Diurnal Total: 0.0 mm at hour 1

Monthly Total: 0.10 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} = 0.0

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

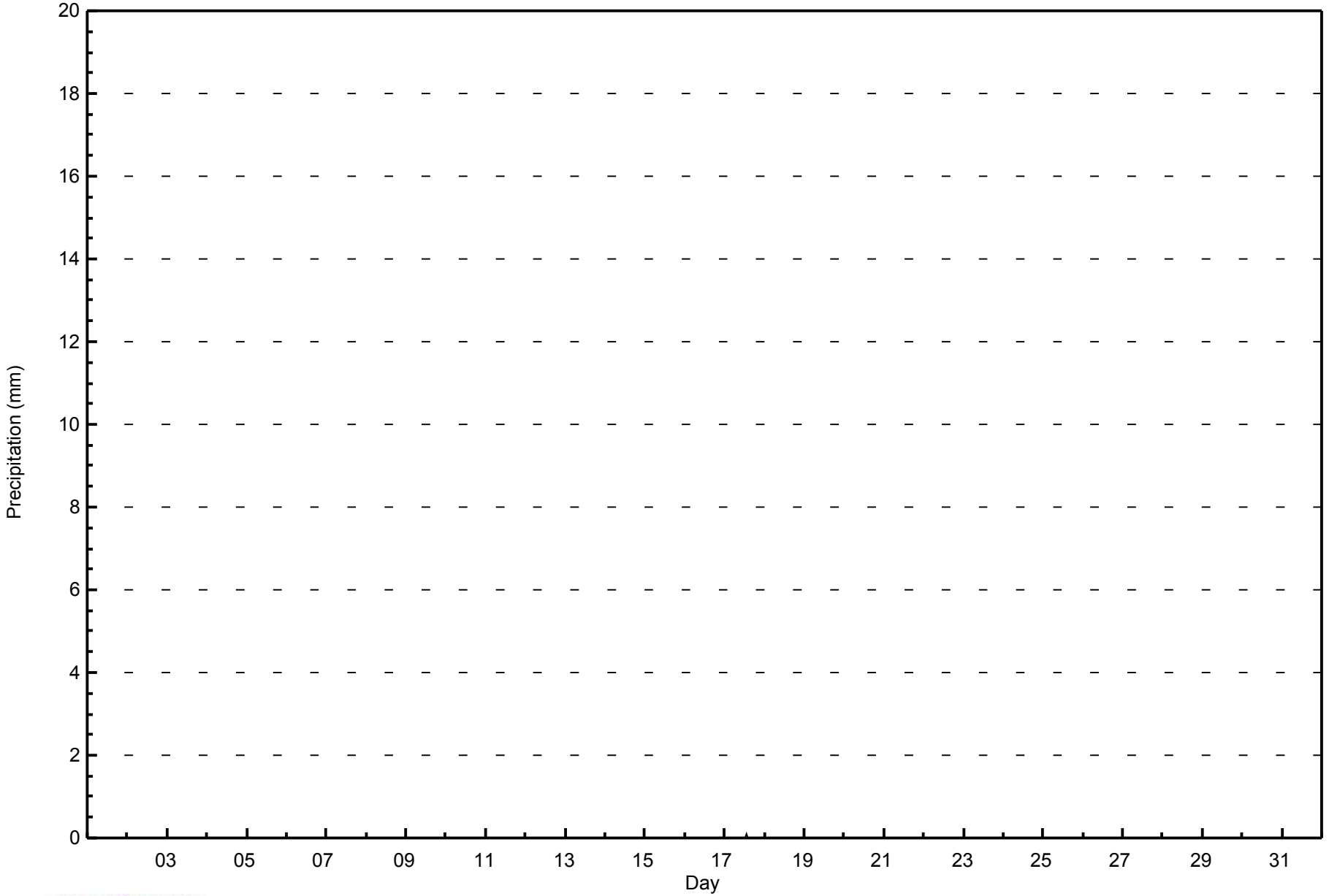
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	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	0.0	0.0	0.0	0.1	0.1
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	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	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Maximum	

Wood Buffalo Environmental Association

Hourly Averages

Precipitation (PC) - mm

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Maximum Value: 94 % on Jan 15 01:00

Maximum Daily Average: 90.2 % on Jan 9

Minimum Value: 44 % on Jan 15 07:00

Minimum Daily Average: 63.8 % on Jan 4

Maximum Diurnal Average: 77.9 % at hour 3

Minimum Diurnal Average: 70.0 % at hour 15

Monthly Average: 75.4 %

Percentiles: P_1 = 54 P_{10} = 63 Q_1 = 69 Median = 76 Q_3 = 82 P_{90} = 87 P_{99} = 92

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

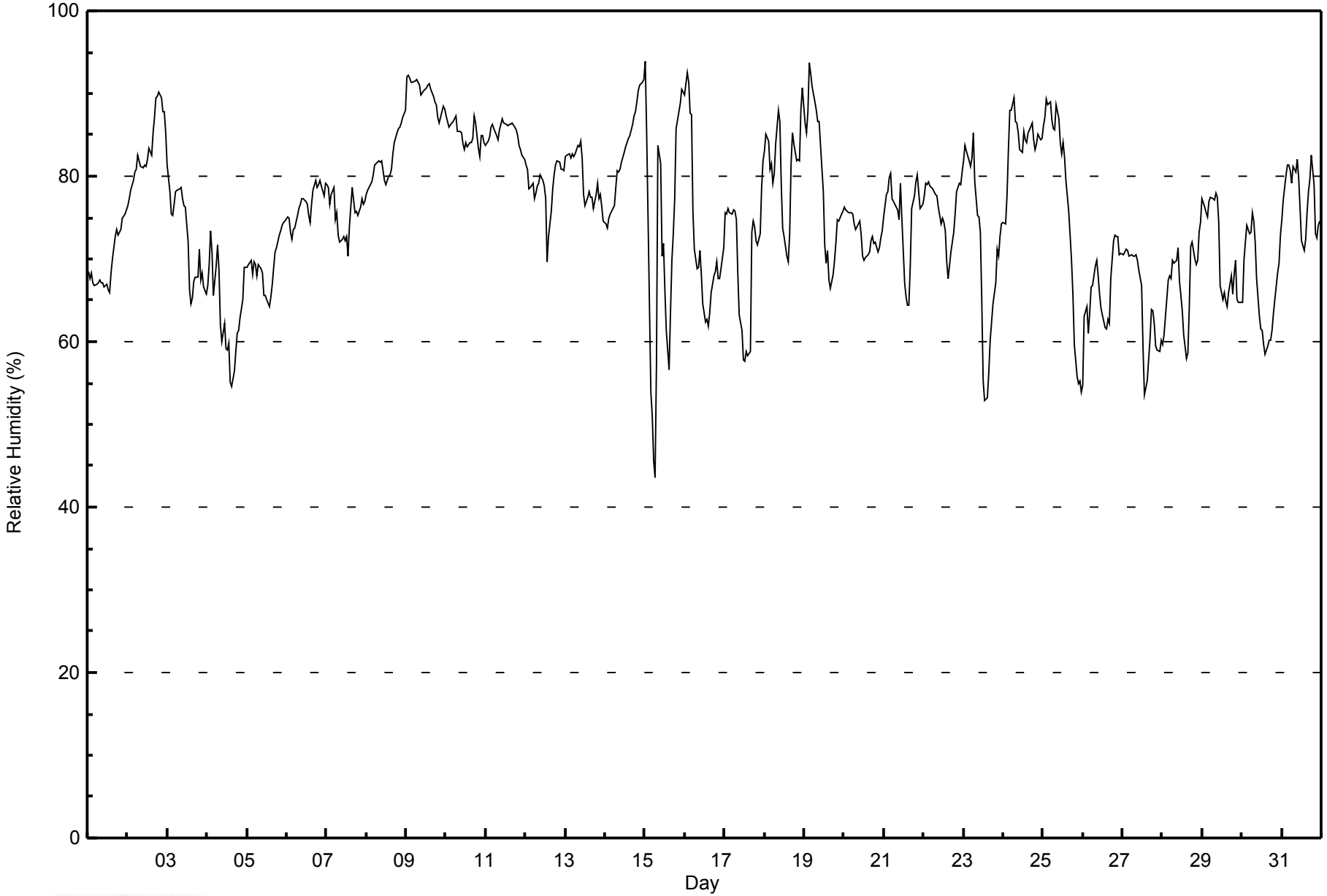
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	68	68	68	67	67	67	67	67	67	67	67	67	66	66	68	70	73	73	73	73	73	75	75	76	69.6	76
2-Jan	76	77	78	79	81	81	82	82	81	81	81	81	82	83	82	85	87	90	90	90	89	88	88	85	83.4	90
3-Jan	81	78	75	75	77	78	78	78	79	77	76	76	72	66	65	65	67	68	68	71	67	68	67	66	72.5	81
4-Jan	67	69	73	71	66	69	72	69	62	60	62	59	59	60	55	55	56	59	61	61	63	65	69	69	63.8	73
5-Jan	69	69	70	68	70	69	68	69	69	68	66	66	65	64	65	67	69	71	71	73	73	74	74	75	69.3	75
6-Jan	75	75	73	72	73	74	75	76	77	77	77	77	77	75	74	77	78	80	79	79	79	79	78	79	76.5	80
7-Jan	79	79	77	78	79	75	76	73	72	72	73	72	73	70	74	79	77	76	76	75	76	77	77	77	75.4	79
8-Jan	78	78	79	79	80	81	82	82	82	82	81	79	79	80	80	81	83	84	85	86	86	87	87	88	82.0	88
9-Jan	92	92	92	91	91	92	92	91	91	90	90	91	91	91	91	91	90	89	89	87	86	88	88	88	90.2	92
10-Jan	87	87	86	86	87	87	87	85	85	85	84	83	84	83	84	84	85	87	87	83	82	85	85	84	85.2	87
11-Jan	84	84	85	86	86	86	85	84	86	86	87	86	86	86	86	86	86	86	86	85	84	83	83	82	85.2	87
12-Jan	81	81	79	79	79	77	78	79	79	80	80	79	77	70	73	76	79	80	81	82	82	81	81	81	78.8	82
13-Jan	82	83	83	82	83	82	83	84	84	84	82	78	76	77	78	77	78	76	78	79	77	78	76	75	79.8	84
14-Jan	74	74	75	75	76	76	79	81	81	81	82	83	84	84	85	85	86	87	88	89	90	91	91	92	82.8	92
15-Jan	94	85	75	54	51	46	44	57	84	82	70	72	66	61	57	64	70	73	77	86	88	89	91	90	71.8	94
16-Jan	90	93	91	88	87	76	71	69	69	71	68	65	62	63	62	64	66	68	68	70	68	68	69	71	72.3	93
17-Jan	76	75	76	76	75	76	76	75	68	63	61	58	58	59	58	59	73	75	74	72	72	73	79	82	70.3	82
18-Jan	83	85	84	81	82	79	80	84	88	87	79	74	73	70	70	73	81	85	84	82	82	82	88	91	81.1	91
19-Jan	86	85	88	94	92	91	89	88	87	87	84	78	72	69	71	67	66	68	70	72	75	74	75	76	79.4	94
20-Jan	76	76	76	76	76	75	74	74	74	75	73	70	70	70	71	71	72	73	72	72	71	71	73	73	73.0	76
21-Jan	75	78	78	80	80	77	77	76	76	75	79	75	67	65	64	64	69	76	78	79	80	78	76	77	75.0	80
22-Jan	78	79	79	79	79	78	78	78	78	76	74	75	74	73	70	68	71	72	73	75	78	79	79	81	76.0	81
23-Jan	82	84	83	82	81	82	85	79	75	75	73	65	55	53	53	56	60	62	64	67	71	70	73	74	71.1	85
24-Jan	74	74	78	83	88	88	89	87	86	85	83	83	85	84	84	85	86	86	84	83	84	85	84	85	84.0	89
25-Jan	86	87	89	89	89	87	86	86	89	87	84	83	84	82	80	76	73	70	66	60	56	55	55	54	77.1	89
26-Jan	55	63	64	61	64	67	67	69	70	68	66	64	63	62	61	63	62	68	72	73	73	73	70	71	66.1	73
27-Jan	71	71	71	71	70	70	70	70	71	70	69	67	59	53	54	55	60	64	64	62	59	59	59	60	64.6	71
28-Jan	60	61	63	67	68	68	70	70	70	71	67	66	64	61	58	59	64	72	72	70	69	70	73	74	66.9	74
29-Jan	77	76	76	75	77	78	77	77	78	77	74	67	65	66	65	64	66	68	66	68	70	65	65	65	70.9	78
30-Jan	65	70	72	74	73	73	76	75	72	68	63	62	61	60	58	59	60	60	61	63	65	68	70	73	66.7	76
31-Jan	75	77	80	81	81	81	79	81	81	82	80	76	72	71	72	76	78	80	82	79	73	73	74	75	77.5	82
	77.3	77.8	77.9	77.4	77.7	77.0	77.2	77.2	77.7	77.1	75.4	73.4	71.7	70.3	70.0	71.0	73.3	75.0	75.4	75.8	75.6	75.9	76.5	77.0	Diurnal Average	
	94	93	92	94	92	92	92	91	91	90	90	91	91	91	91	91	90	90	90	90	90	91	91	92	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	42	5.65	5.65
60 - 80	457	61.42	67.07
80 - 100	245	32.93	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

CNRL Horizon - January 2014

Maximum Value: 193 W/m2 on Jan 27 13:00

Maximum Daily Average: 37.5 W/m2 on Jan 27

Minimum Value: 0 W/m2 on Jan 14 06:00

Minimum Daily Average: 1.0 W/m2 on Jan 11

Maximum Diurnal Average: 65.0 W/m2 at hour 13

Minimum Diurnal Average: 0.0 W/m2 at hour 3

Monthly Average: 13.2 W/m2

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 6$ $P_{90} = 56$ $P_{99} = 152$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

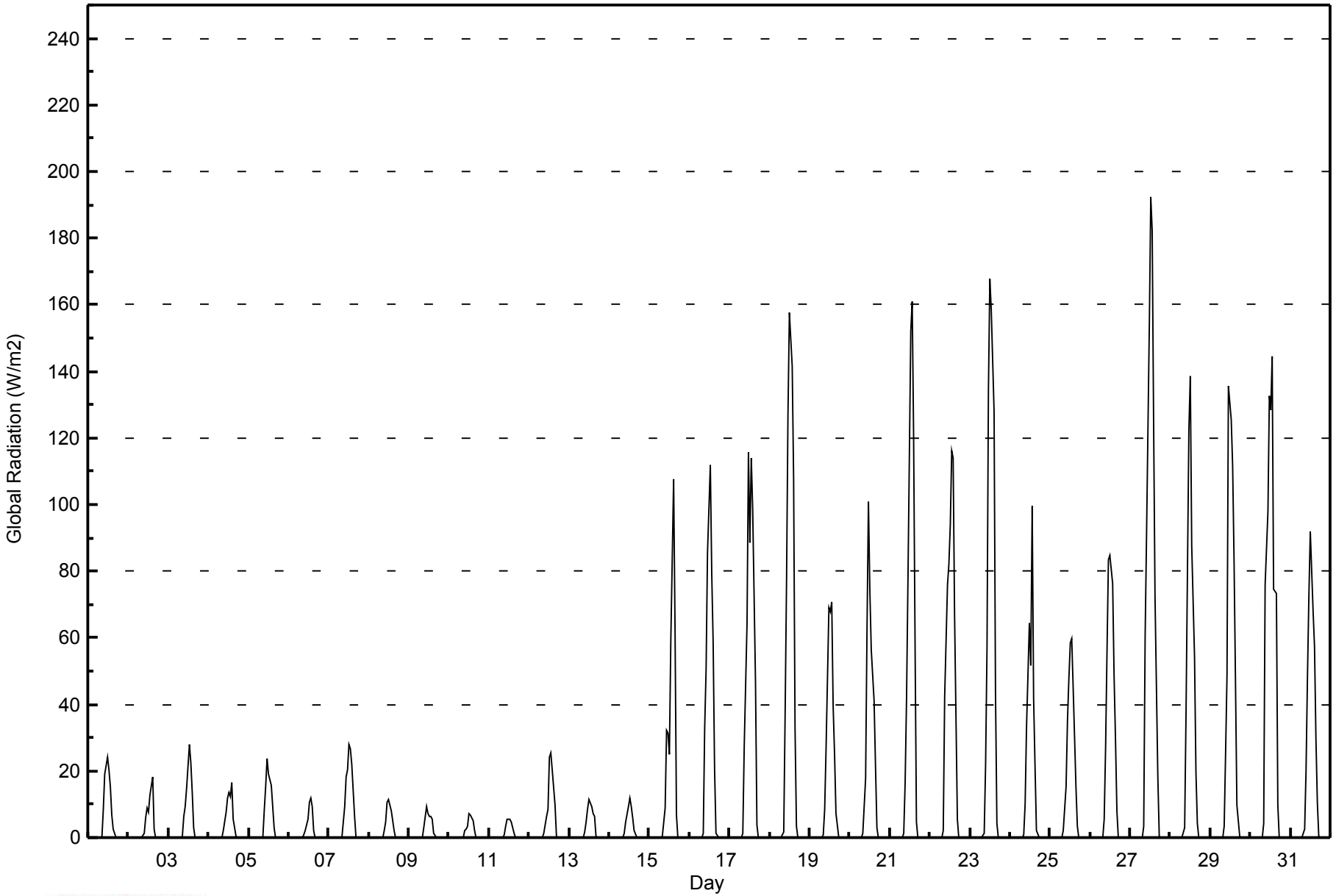
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	0	0	0	0	0	0	0	9	19	24	20	15	7	3	0	0	0	0	0	0	0	0	4.1	24
2-Jan	0	0	0	0	0	0	0	0	0	1	6	9	7	13	18	3	0	0	0	0	0	0	0	0	2.4	18
3-Jan	0	0	0	0	0	0	0	0	0	6	10	15	28	23	14	3	0	0	0	0	0	0	0	0	4.1	28
4-Jan	0	0	0	0	0	0	0	0	0	2	7	12	13	12	17	6	0	0	0	0	0	0	0	0	2.9	17
5-Jan	0	0	0	0	0	0	0	0	0	8	15	24	19	16	9	3	0	0	0	0	0	0	0	0	4.0	24
6-Jan	0	0	0	0	0	0	0	0	0	1	2	6	11	12	9	2	0	0	0	0	0	0	0	0	1.8	12
7-Jan	0	0	0	0	0	0	0	0	0	9	18	20	28	27	22	6	0	0	0	0	0	0	0	0	5.5	28
8-Jan	0	0	0	0	0	0	0	0	0	2	5	11	11	8	5	2	0	0	0	0	0	0	0	0	1.9	11
9-Jan	0	0	0	0	0	0	0	0	0	3	9	7	7	6	5	1	0	0	0	0	0	0	0	0	1.7	9
10-Jan	0	0	0	0	0	0	0	0	0	2	2	3	7	7	5	2	0	0	0	0	0	0	0	0	1.2	7
11-Jan	0	0	0	0	0	0	0	0	0	1	3	5	6	5	3	1	0	0	0	0	0	0	0	0	1.0	6
12-Jan	0	0	0	0	0	0	0	0	0	1	6	9	24	26	20	10	0	0	0	0	0	0	0	0	4.0	26
13-Jan	0	0	0	0	0	0	0	0	0	2	4	8	11	9	7	6	0	0	0	0	0	0	0	0	2.0	11
14-Jan	0	0	0	0	0	0	0	0	0	1	5	9	12	10	6	2	0	0	0	0	0	0	0	0	1.9	12
15-Jan	0	0	0	0	0	0	0	0	0	9	32	31	25	59	108	63	7	0	0	0	0	0	0	0	13.9	108
16-Jan	0	0	0	0	0	0	0	0	1	33	50	86	112	79	58	21	1	0	0	0	0	0	0	0	18.4	112
17-Jan	0	0	0	0	0	0	0	0	1	27	64	116	88	114	99	47	4	0	0	0	0	0	0	0	23.3	116
18-Jan	0	0	0	0	0	0	0	0	2	38	78	127	158	141	108	33	3	0	0	0	0	0	0	0	28.6	158
19-Jan	0	0	0	0	0	0	0	0	1	8	27	69	68	71	40	25	7	0	0	0	0	0	0	0	13.2	71
20-Jan	0	0	0	0	0	0	0	0	1	18	63	101	74	56	41	21	3	0	0	0	0	0	0	0	15.8	101
21-Jan	0	0	0	0	0	0	0	0	1	17	42	77	152	161	120	60	5	0	0	0	0	0	0	0	26.5	161
22-Jan	0	0	0	0	0	0	0	0	2	42	76	82	94	116	114	67	6	0	0	0	0	0	0	0	25.0	116
23-Jan	0	0	0	0	0	0	0	0	1	22	57	134	168	158	128	43	4	0	0	0	0	0	0	0	29.9	168
24-Jan	0	0	0	0	0	0	0	0	1	10	33	65	52	99	42	22	2	0	0	0	0	0	0	0	13.6	99
25-Jan	0	0	0	0	0	0	0	0	2	15	35	48	59	60	45	15	3	0	0	0	0	0	0	0	11.8	60
26-Jan	0	0	0	0	0	0	0	0	5	27	56	83	85	76	49	29	8	0	0	0	0	0	0	0	17.5	85
27-Jan	0	0	0	0	0	0	0	0	3	60	91	155	193	182	126	72	18	0	0	0	0	0	0	0	37.5	193
28-Jan	0	0	0	0	0	0	0	0	3	38	81	123	139	88	54	19	4	0	0	0	0	0	0	0	22.9	139
29-Jan	0	0	0	0	0	0	0	0	3	26	49	136	125	112	83	47	10	0	0	0	0	0	0	0	24.6	136
30-Jan	0	0	0	0	0	0	0	0	4	76	98	133	128	144	75	73	10	0	0	0	0	0	0	0	30.9	144
31-Jan	0	0	0	0	0	0	0	0	2	20	48	72	92	68	57	30	11	0	0	0	0	0	0	0	16.7	92
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	17.3	35.3	58.0	65.0	63.6	48.2	23.8	3.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Average	
	0	0	0	0	0	0	0	0	5	76	98	155	193	182	128	73	18	0	0	0	0	0	0	0	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Global Radiation (GR) - W/m2

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

CNRL Horizon - January 2014

Maximum Speed: 49 km/h on Jan 15 08:00

Maximum Daily Speed Average: 15.9 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 30 02:00

Minimum Daily Speed Average: 0.4 km/h on Jan 6

Maximum Diurnal Speed Average: 4.7 km/h at hour 8

Minimum Diurnal Speed Average: 0.5 km/h at hour 22

Monthly Average Velocity: 1.3 km/h 243.9 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 5 Median = 7 Q_3 = 11 P_{90} = 15 P_{99} = 24

Hours in Service: 744

Hours of Data: 744

Hours of Missing Data: 0

Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SW1	SSW2	NE1	SW2	SSW3	SW5	S5	SSW5	SSW5	SSW5	S5	S4	S5	SSE4	SE3	S6	S8	SSE7	S7	SSW6	S6	SSW6	SSW4	SW4	S4.1	S8
2-Jan	SW5	SW6	SW5	SW6	SW6	SW6	SSW7	SW9	S10	S16	S18	S15	S13	S11	S15	SSW17	SSW14	S11	SSW12	SSW11	SW13	N8	NNE12	NNE15	SSW7.4	S18
3-Jan	NNE19	NNE20	NNE16	N8	NNW2	S2	S5	SSW6	SSW6	SSW6	SSW4	SW2	SSW5	NNW7	NNW4	NW10	NW10	NW10	WNW7	WNW7	WNW9	WNW6	NW9	WNW9	NW4.2	NNE20
4-Jan	WNW8	W5	SW4	SW7	WSW8	S8	SW8	W8	WNW12	WNW15	NW15	NNW19	NNW24	N20	NNW21	NW14	NW12	NW11	NW8	WNW8	WNW7	W4	SW6	WSW5	WNW8.4	NNW24
5-Jan	W4	SW4	SW9	SSW5	S4	SSW5	SW5	SSE5	SSE4	S3	SSW4	SSE4	SSE3	ESE2	ENE1	ENE2	SE2	SE1	S4	S6	S7	SSE7	S7	SSE8	S3.7	SW9
6-Jan	S7	S8	SSW6	S6	S5	SSW5	S6	S4	WSW2	N2	NNW3	NNW4	NNW3	NNW3	NW4	NW4	N5	NE4	NE2	E3	NE3	ESE4	NE3	NNE5	SSE0.4	S8
7-Jan	NNW5	NW5	NE3	N4	N5	WNW1	WNW4	WNW4	SW4	SW4	SSW5	SSW5	SSE4	SSE4	SE4	S6	SSW5	S4	SSW4	SW5	SSW7	SW8	SSW7	SW7	SW2.6	SSW8
8-Jan	SW8	SSW8	SSW7	SSW7	SSW6	S9	S10	SSW8	SW7	SSW7	SSW7	S9	S10	S11	S8	S5	SSE2	SSE3	SE4	S4	S5	S5	S5	SSE4	SSW6.2	S11
9-Jan	SE4	ESE1	WSW1	SW4	SSW4	S5	S5	SSE7	SSW3	SSE3	SE3	ESE3	NE3	NE5	NNE8	NNE10	NNE11	N12	NNE11	NNE12	NNE11	NNE12	NNE11	NNE10	NNE3.5	N12
10-Jan	NNE9	NNE9	NNE9	N5	N4	N1	NNE2	NNE5	NE5	NE5	ENE4	E3	NE4	ENE3	ENE3	E3	SSW3	SSW5	S5	SW8	SW10	SSW4	WSW2	NW3	NNE1.5	SW10
11-Jan	SSW2	W4	NNW4	N7	NNE10	NNE11	N10	N10	NNE12	NNE11	N12	NNE12	NNE13	NNE13	NNE11	NNE13	NNE14	NNE16	N14	NNE15	NNE18	NNE17	NNE18	NNE17	NNE11.5	NNE18
12-Jan	N13	NNE11	NNE13	NNE8	NE6	NE5	NNE3	ESE3	ESE3	SE3	SSE6	SSE6	SSE6	SSW9	S9	S10	S10	S10	SSW10	SSW9	SSW10	SSW10	SSW8	SSW7	SSE2.9	NNE13
13-Jan	SSW5	SW5	SSW8	S10	S9	S6	SSW2	NW4	W3	SW4	ENE3	NE7	NE6	NE8	NE9	NE8	NE7	ENE7	NE4	WNW1	WSW3	SSE1	WSW2	SW1	ESE0.7	S10
14-Jan	SW5	SW6	SW8	SSW5	S7	S6	S8	S7	S5	S4	SSW5	SW4	SW5	SW4	SSW5	SW5	SSW5	SW5	SW6	SW6	SSW9	SSW9	SSW9	S9	SSW5.8	SSW9
15-Jan	SSW14	WSW25	W40	WNW45	W40	W36	W41	WNW49	WNW24	NW26	NW27	NW14	NW15	NW23	NW27	NE11	ENE8	ENE6	ENE5	SSE4	SSW7	S5	SSW7	SSW9	WNW15.9	WNW49
16-Jan	S6	SE4	S8	S5	S6	SW13	SW13	SW13	SW10	SSW7	SSW8	S5	S10	SSW10	SSW10	SSW12	S9	S7	SSW6	S5	S8	S8	S12	S10	SSW8.2	SW13
17-Jan	S10	S11	S13	SSW11	SW13	SW17	SW20	SW16	WSW15	SW15	WSW13	WNW14	NW26	NW26	NNW26	NNW23	NE15	ENE11	E6	E7	E6	NE5	SE3	S6	W5.1	NNW26
18-Jan	S5	S6	SW6	SW5	S9	S14	S11	S15	S15	S11	SSE5	SE3	NE8	NNE15	NNE13	N10	NNE8	NNE8	NNE10	NNE10	N9	N6	NNE1	SW2	SE0.9	S15
19-Jan	SSW4	S5	NNE8	N4	E3	NE5	N7	N7	NNE8	NNE12	NNE14	NNE18	NNE20	NNE17	NNE19	NNE16	NNE15	NNE14	NNE8	NNE3	NE4	NNW2	SW5	SSW6	NNE7.5	NNE20
20-Jan	SSW8	SSW8	SSW9	S8	S10	SSW11	SSW12	S13	S14	S14	S14	S15	SSE16	S15	SSE11	SSE5	N5	NNW4	N8	NNW6	NNE8	NNE9	NE7	ENE3	S5.5	SSE16
21-Jan	ESE4	E4	NNE5	NNW3	NNW1	NNE3	N5	N4	NNW2	WNW3	NNE10	NNE16	NE16	NE16	NNE12	NNE10	NE6	NE6	NE5	NE2	NNW4	NNE1	SSW4	SSW6	NNE4.7	NNE16
22-Jan	S7	S7	S7	SSW8	S9	S9	SSW10	S10	S11	S12	S12	S12	S13	S12	S12	SSW10	SSW10	SSW13	SSW13	S13	S13	S16	S17	S19	S11.4	S19
23-Jan	S18	S19	SSW20	SSW20	S18	S16	S11	SW16	WSW18	WSW14	SW12	WSW9	W8	W9	W12	W11	W10	WNW13	W5	SW1	SE4	SSE5	SSE3	SE4	SW8.8	SSW20
24-Jan	SW6	SW10	NNW7	N12	N8	NNE8	NNE13	NNE13	NNE12	NNE10	NNE11	NNE13	NNE12	NNE10	NNE9	NNE9	NE7	ENE5	E5	SE2	S2	S4	SSE6	S7	NNE5.2	NNE13
25-Jan	SSW6	SW4	SW6	SW8	SSW12	SSW13	S5	SSW6	ESE1	NE8	NNE8	NE14	NE13	NE11	NNE12	NE14	NE12	N16	N20	NNW25	NNW29	NNW25	NNW25	NNW30	N7.4	NNW30
26-Jan	N24	N19	N14	N14	N12	NNE8	NE9	NNE6	NE8	NE5	E2	S4	SSE4	SE5	ESE6	ESE6	ESE5	E1	NE3	NNE4	NNE3	NNW2	SW2	SW2	NNE4.8	N24
27-Jan	SSW4	SSW6	SSW6	SSW6	SSW5	SSW6	SSW6	S7	S7	S6	S9	S8	SSE8	SSE11	SSE8	SSE7	S9	S10	S10	S10	S12	S12	S14	S13	S8.1	S14
28-Jan	S13	S15	S11	S12	S11	S13	S15	S19	S10	SE5	NNE2	NW4	NNW3	NE2	NNE2	NNW2	NNE6	NNE13	NNE15	NNE17	NNE14	NNE11	NNE7	NNE2	SE1.8	S19
29-Jan	S2	S2	SSW3	SW5	SW6	SW4	SW4	SSW2	NNE2	NNE5	NNE11	NNE18	N23	N19	N18	N15	N15	N10	N9	NNE4	NNW7	NNW12	NNW15	NW12	N6.8	N23
30-Jan	NW9	W0	WSW2	WSW7	SW7	SW8	SW9	SW10	SW11	SW11	SW15	SW15	SSW16	SSW16	SSW14	SSW16	S13	SSW12	SSW9	SSW12	SSW10	SW10	WSW10	WNW8	SW9.4	SSW16
31-Jan	N7	N4	NNW6	NW4	WNW4	WSW3	SSW6	SW5	E3	NW0	N3	N4	NNE3	NE3	E4	NE5	NE4	E2	SSW4	W4	WNW6	SW5	SSW7	SSW6	WNW1.1	N7
	SW1.9	SW2.7	WSW2.8	WSW3.4	SW3.7	SSW4.5	SW4.5	SW4.7	SW3.1	SW2.4	SW1.4	NNW0.7	N1.7	NNE1.9	N2.4	N1.8	NNE1.7	NNE1.4	N0.8	W0.9	W1.4	WSW0.5	SW1.4	WSW1.6	Diurnal Average	
	N24	WSW25	W40	WNW45	W40	W36	W41	WNW49	WNW24	NW26	NW27	NNW19	NW26	NW26	NW27	NNW23	NE15	N16	N20	NNW25	NNW29	NNW25	NNW25	NNW30	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

CNRL Horizon - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 17 km/h on Jan 15 08:00

Minimum Value: 1 km/h on Jan 7 19:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 4 P_{99} = 11

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

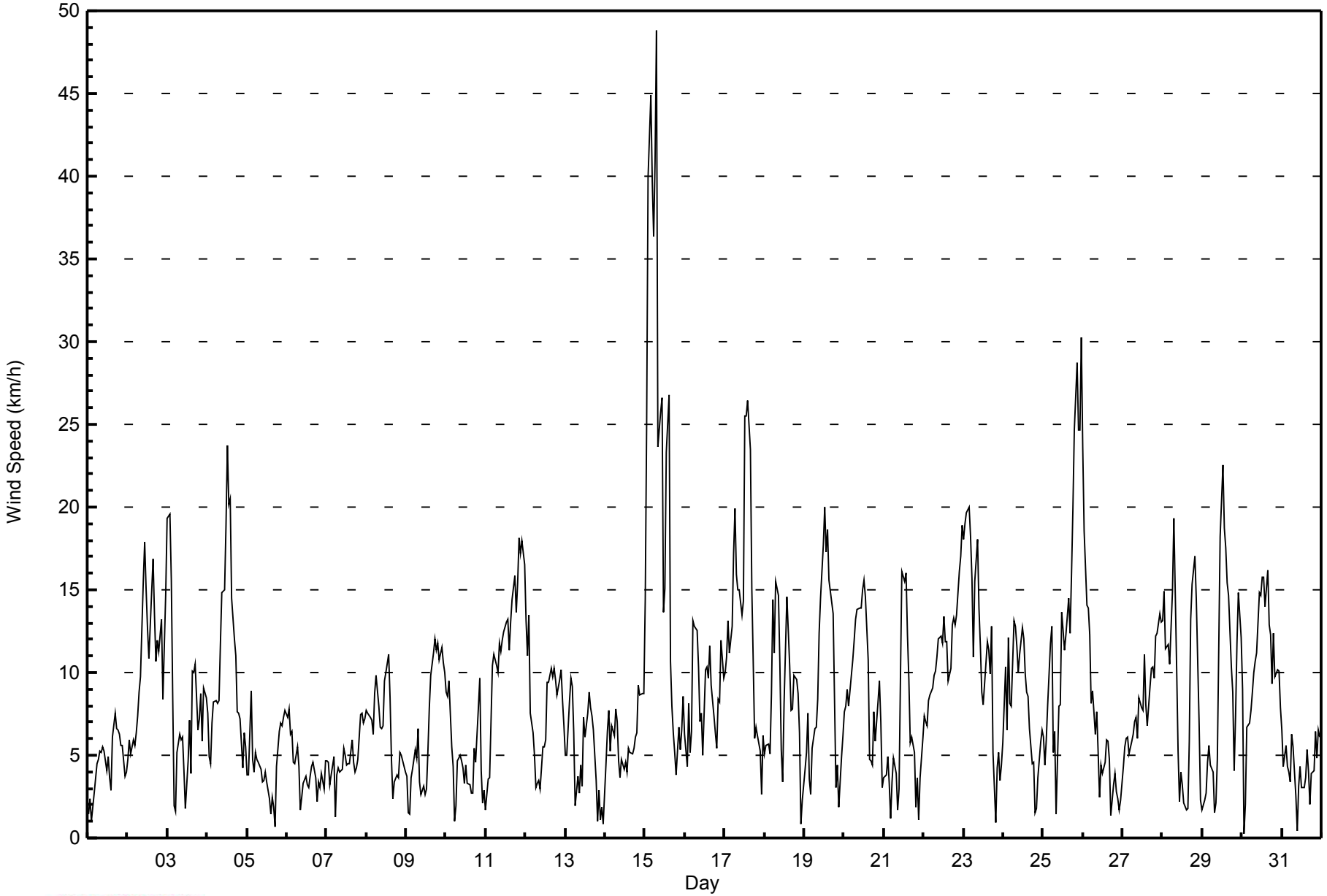
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2
2-Jan	1	1	1	1	1	2	2	2	3	4	3	3	3	3	3	3	3	2	2	2	2	3	3	4	4
3-Jan	5	5	4	3	2	1	1	1	1	1	1	2	2	3	3	3	2	3	3	3	2	2	1	2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

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

CNRL Horizon - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	270	36.29	36.29
6 - 11	290	38.98	75.27
12 - 19	152	20.43	95.70
20 - 28	24	3.23	98.92
29 - 38	3	0.40	99.33
> 38	5	0.67	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

CNRL Horizon - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	13	20	23	9	11	9	16	18	34	36	34	8	8	7	7	17	270
6 - 11	14	41	17	4	3	2	0	13	72	61	32	4	5	11	6	5	290
12 - 19	12	45	6	0	0	0	0	2	41	16	12	4	1	4	6	3	152
20 - 28	4	2	0	0	0	0	0	0	0	2	1	1	0	1	6	7	24
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5
Totals	43	108	46	13	14	11	16	33	147	115	79	17	18	25	25	34	744

Total Number of Valid Hours: 744

Total Number of Hours: 744

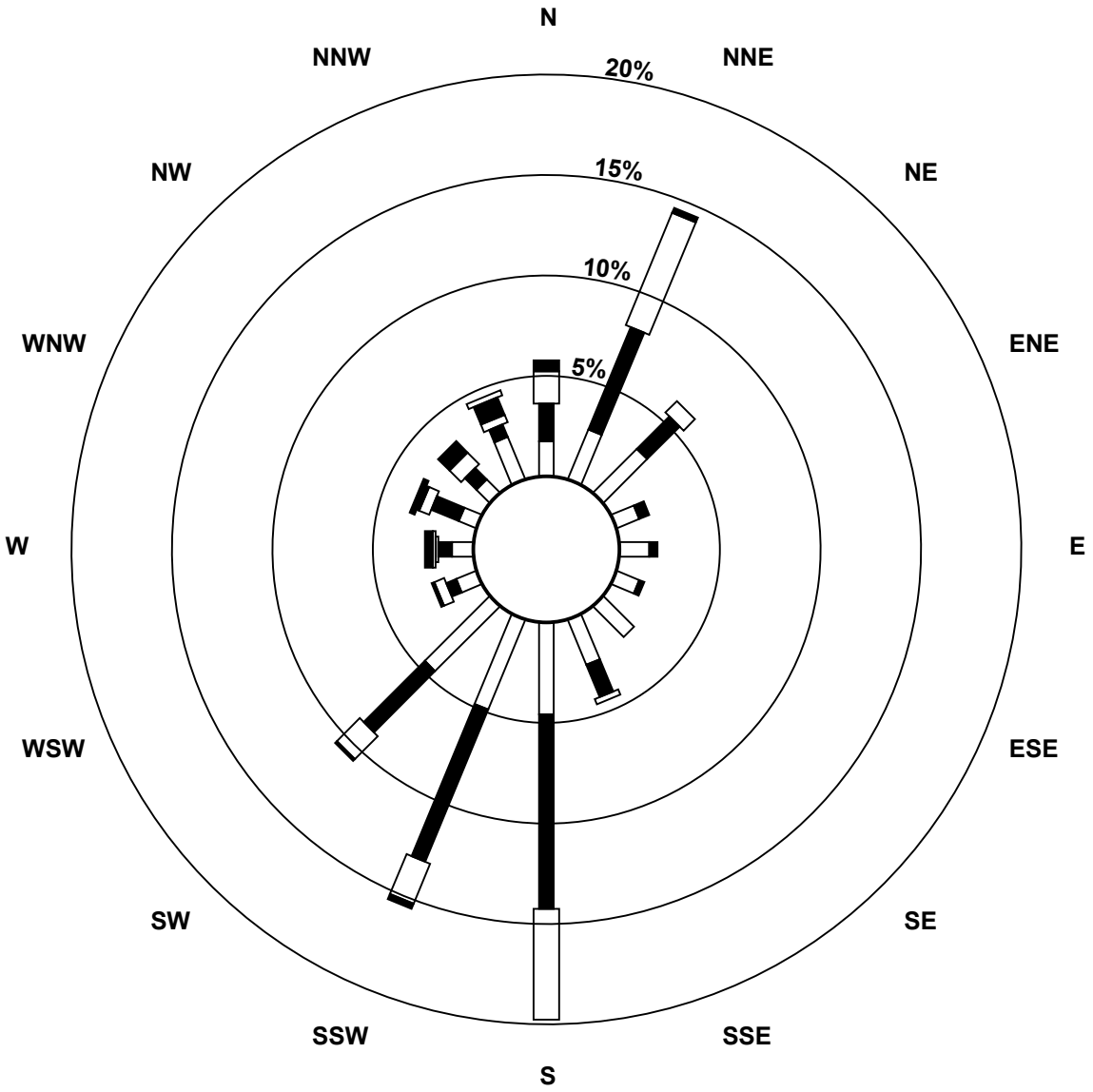
AURORA ATMOSPHERICS INC.

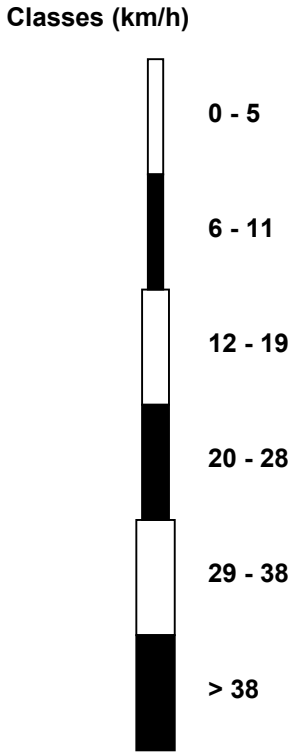
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

CNRL Horizon (AMS 15)





Total Number of Valid Hours: 744

Direction of Maximum Speed: 287 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 287.7 deg on Jan 15

Direction of Minimum Speed: 265 deg on Jan 30 02:00

Direction of Minimum Daily Speed Average: 0.4 deg on Jan 6

Monthly Average Direction: 223.4 deg

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	233	213	43	233	195	215	188	206	197	195	188	172	171	154	142	183	169	168	191	202	180	192	212	223	188.9
2-Jan	230	226	236	230	228	216	199	216	191	181	182	184	172	171	188	193	196	176	195	193	225	3	25	20	194.8
3-Jan	17	18	13	11	344	191	181	195	201	207	194	214	204	337	347	304	312	307	287	296	294	289	318	295	321.7
4-Jan	289	279	231	225	256	188	232	265	299	294	306	329	340	352	332	324	304	307	309	290	287	278	222	242	301.4
5-Jan	269	216	222	206	188	210	217	167	157	187	206	167	156	109	74	62	136	144	175	191	188	163	171	164	184.1
6-Jan	171	185	193	184	191	194	183	184	257	7	345	333	347	344	323	324	3	38	38	87	41	113	46	18	164.2
7-Jan	341	313	34	10	352	285	285	288	232	215	205	196	164	154	137	173	197	185	200	214	210	214	213	218	214.8
8-Jan	229	209	208	208	212	189	187	206	216	207	194	182	187	184	191	191	167	159	129	179	172	184	170	147	192.0
9-Jan	128	119	252	229	204	181	173	166	198	154	126	110	48	41	17	12	15	9	13	16	17	17	14	17	27.2
10-Jan	19	16	17	7	10	356	14	27	39	43	69	79	42	68	66	96	192	192	178	220	231	213	252	314	29.1
11-Jan	192	273	345	7	12	16	11	11	12	12	11	14	15	12	13	14	16	16	11	19	17	18	16	12	13.0
12-Jan	11	17	32	24	41	38	14	110	123	142	157	168	166	199	185	191	183	188	192	193	194	195	199	206	168.2
13-Jan	213	236	213	187	178	169	202	318	272	230	58	40	43	47	48	45	50	60	49	288	256	166	251	233	104.9
14-Jan	225	226	224	198	185	182	181	172	183	174	203	221	228	226	199	217	206	220	220	228	211	198	212	187	204.6
15-Jan	193	249	275	286	278	281	280	287	299	314	317	312	320	309	317	55	61	65	64	159	198	182	198	194	287.7
16-Jan	173	145	190	172	182	227	224	226	225	192	194	188	186	199	196	198	191	188	207	189	189	185	185	177	196.6
17-Jan	181	181	187	199	216	227	231	235	249	234	237	286	311	319	327	339	37	58	79	80	80	43	143	173	265.8
18-Jan	184	183	215	223	187	174	188	183	183	188	163	128	39	32	15	10	14	18	19	13	350	358	31	222	125.3
19-Jan	198	169	33	356	90	53	7	10	17	15	18	17	16	25	20	20	20	22	22	31	49	341	227	209	20.7
20-Jan	206	197	199	191	185	195	195	176	183	176	177	171	168	169	161	154	11	340	359	340	22	25	38	63	175.6
21-Jan	116	80	25	337	338	18	7	354	348	290	15	23	34	37	29	33	36	51	48	38	335	23	193	204	27.7
22-Jan	181	175	187	192	183	185	192	189	183	190	189	187	183	182	187	201	202	196	192	191	182	179	180	183	186.8
23-Jan	184	191	202	198	183	178	171	223	238	241	229	247	275	261	264	266	281	289	280	224	125	161	158	131	217.9
24-Jan	217	235	342	6	3	19	21	30	31	30	32	26	23	32	26	20	46	60	87	136	178	172	168	183	27.2
25-Jan	194	217	225	225	193	207	187	197	120	44	32	40	36	51	33	43	38	358	349	337	339	342	340	344	355.5
26-Jan	354	11	8	8	7	17	38	29	40	49	94	175	147	129	110	110	106	100	39	20	16	336	231	233	26.5
27-Jan	202	213	204	193	192	192	207	186	191	179	174	184	158	159	160	149	172	185	188	184	177	173	178	180	180.4
28-Jan	174	181	174	182	180	186	186	184	179	133	31	321	345	38	16	332	16	21	21	21	19	30	29	12	132.5
29-Jan	178	188	213	214	228	221	214	213	25	17	15	16	10	11	11	8	7	10	352	12	348	328	330	325	356.3
30-Jan	318	265	238	249	236	231	223	227	230	220	220	216	202	196	202	205	191	211	204	206	208	214	244	291	218.3
31-Jan	2	9	334	304	286	257	212	227	93	307	351	2	27	39	81	48	50	80	210	270	292	220	204	213	300.8
	215.6	218.6	243.2	242.2	222.5	213.1	219.9	225.6	225.3	226.0	234.3	330.6	3.6	12.3	354.8	4.0	28.2	12.4	356.5	280.5	272.0	251.0	234.0	236.5	
	Diurnal Average																								

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 95 deg on Jan 30 02:00

Minimum Value: 4 deg on Jan 14 02:00

Percentiles: P_1 = 8 P_{10} = 12 Q_1 = 15 Median = 17 Q_3 = 24 P_{90} = 42 P_{99} = 81

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

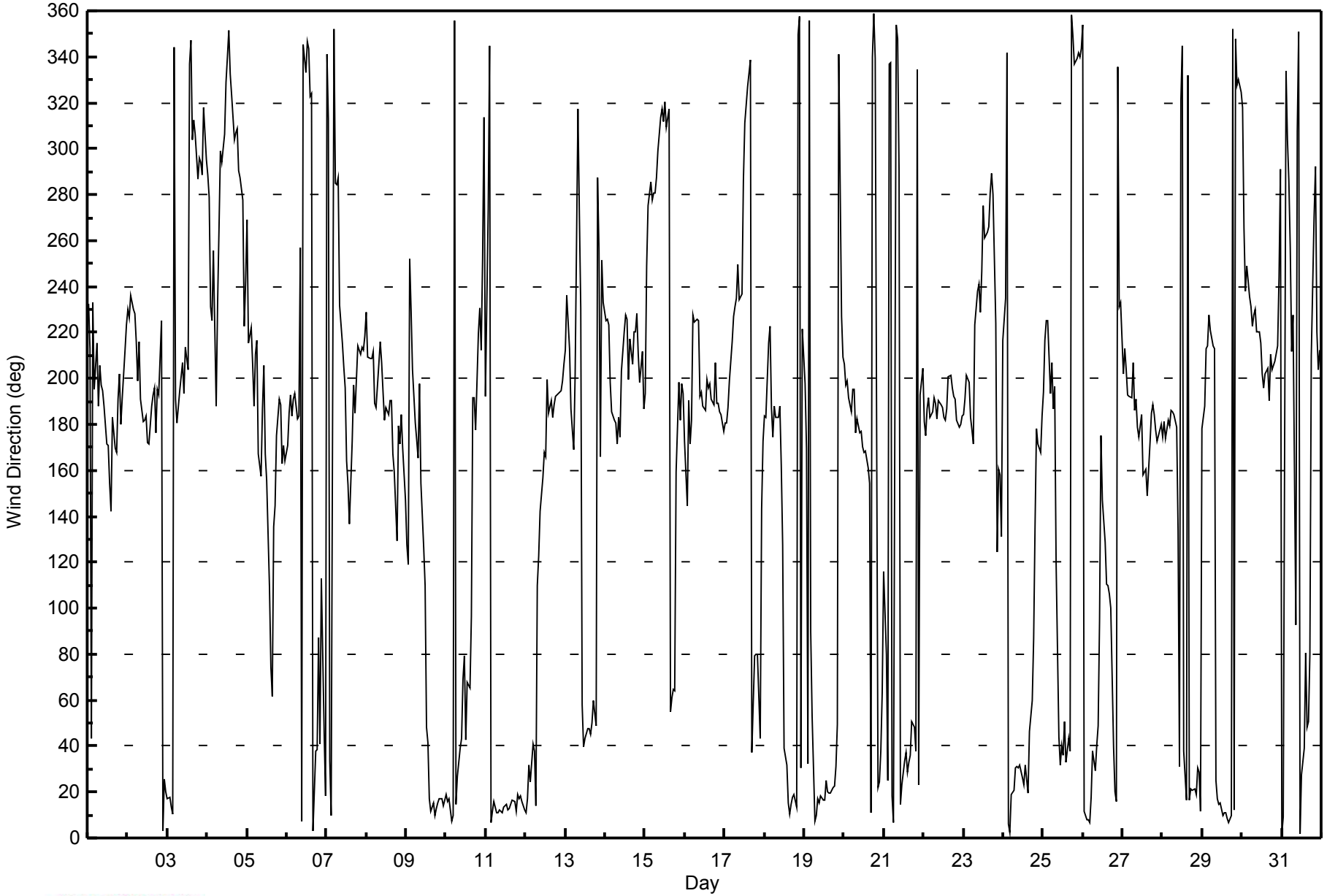
Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	53	55	43	39	20	10	19	15	10	13	16	16	14	24	19	8	13	14	11	11	12	17	25	23	55
2-Jan	19	23	21	23	23	24	17	19	19	12	12	13	14	16	13	13	14	14	12	12	14	52	16	17	52
3-Jan	17	17	17	27	62	48	13	8	16	10	14	83	24	42	52	15	12	13	28	21	17	16	15	14	83
4-Jan	18	29	25	33	22	16	22	15	16	17	16	17	18	19	15	15	12	11	16	15	13	22	7	33	33
5-Jan	34	75	13	16	21	18	12	36	32	17	37	24	30	54	58	23	27	66	18	13	14	14	12	10	75
6-Jan	12	16	16	17	22	18	16	20	54	64	25	25	21	21	18	19	24	19	45	34	29	43	49	28	64
7-Jan	16	23	24	20	9	47	17	8	21	8	10	19	17	20	20	19	25	16	9	20	12	9	9	10	47
8-Jan	13	15	16	16	18	16	17	20	20	18	22	12	15	14	16	19	46	21	18	20	14	26	24	21	46
9-Jan	24	59	67	18	19	17	23	19	21	43	30	34	56	17	18	17	16	17	18	18	16	17	17	15	67
10-Jan	16	17	17	16	18	36	22	28	18	16	19	26	24	38	26	31	44	18	36	18	24	39	68	68	68
11-Jan	82	32	24	15	16	16	16	15	15	16	15	18	16	17	17	17	16	16	17	15	17	16	18	15	82
12-Jan	18	17	16	26	20	27	37	33	21	25	17	15	15	19	12	14	13	10	11	10	13	13	13	15	37
13-Jan	22	20	23	13	17	36	70	24	38	18	78	17	18	19	22	16	13	13	16	68	28	59	62	89	89
14-Jan	21	4	4	15	8	17	11	13	17	21	22	30	25	28	22	25	17	18	15	17	33	30	26	16	33
15-Jan	21	23	20	19	20	19	19	18	20	18	17	31	43	17	16	30	20	18	17	27	12	25	23	13	43
16-Jan	30	18	25	42	37	13	14	16	17	17	16	24	13	16	17	15	13	14	16	16	16	18	15	16	42
17-Jan	14	13	12	15	15	17	17	17	18	19	18	33	14	14	14	21	17	18	24	16	14	20	65	15	65
18-Jan	14	9	16	44	17	10	13	11	15	15	34	60	18	18	18	17	14	15	16	18	19	24	74	72	74
19-Jan	28	42	15	56	49	21	24	16	17	16	17	18	17	17	16	16	17	16	17	63	20	63	15	15	63
20-Jan	9	11	11	13	12	17	18	14	13	13	13	13	13	15	15	73	18	27	16	21	21	17	16	40	73
21-Jan	32	37	17	20	86	18	33	21	56	39	22	16	16	17	18	17	19	13	17	52	27	90	17	9	90
22-Jan	10	16	20	17	12	12	12	11	12	15	14	14	13	15	15	17	16	17	14	14	13	13	12	12	20
23-Jan	13	13	15	14	13	16	12	22	17	17	15	23	18	23	19	18	31	17	39	79	56	21	44	44	79
24-Jan	24	13	59	17	17	19	17	16	16	20	18	18	19	18	17	22	20	20	27	52	79	22	14	14	79
25-Jan	17	22	20	17	16	15	43	58	84	17	22	14	16	15	16	15	18	24	18	19	19	19	18	19	84
26-Jan	22	17	18	15	17	16	14	14	13	22	49	22	42	30	23	22	18	41	25	16	19	22	33	42	49
27-Jan	18	14	9	10	16	19	14	10	15	22	13	15	20	15	14	24	13	11	12	12	13	13	12	13	24
28-Jan	15	12	10	10	9	13	11	11	13	26	54	29	33	45	61	67	30	17	19	16	16	15	12	62	67
29-Jan	32	29	46	13	7	16	19	53	58	15	18	20	18	18	19	19	17	17	21	23	17	15	17	15	58
30-Jan	14	95	36	12	13	11	11	16	18	18	17	18	18	17	19	16	16	20	20	22	22	17	19	24	95
31-Jan	26	25	14	27	30	17	20	30	44	90	26	24	34	46	35	17	21	36	29	37	20	30	15	18	90
	82	95	67	56	86	48	70	58	84	90	78	83	56	54	61	73	46	66	45	79	79	90	74	89	
	Diurnal Maximum																								

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

CNRL Horizon - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	CNRL Horizon	Station Number	15
Reason:	Routine		
Start Time (MST)	9:15	End Time (MST)	13:50
Barometric Pressure	736 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	10880507
SO2 Gas Concentration	50.3 ppm	Cal Gas Expiry Date	11/6/2014
Gas Cert Reference	LL107945		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	1850
DACS voltage range	0-5000mV	DACS channel #	Diff 1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage (v)	-647.5	-647.5
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	783	783
Calculated slope	0.984479	0.987518	Chamber temp. (Deg C)	45.0	45.0
Calculated Intercept	0.899995	0.427562	Pressure (mmHg)	712.4	712.4
Analyzer Background	11.9	11.9	Flow (lpm)	0.359	0.359
Analyzer Coefficient	0.96	0.96	Intensity (%)	87	87

Analyzer make	43i	Analyzer serial #	710321322

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.2	N/A
as found span	5000	82.3	827.9	838.0	0.988
calibrator zero	4998	0.0	0.0	-0.2	N/A
high point	5000	82.3	827.9	838.0	0.988
second point	5000	41.1	413.5	418.4	0.988
third point	5000	20.5	206.2	208.0	0.991
calibrator zero	4999	0.0	0.0	-0.1	N/A
as left zero	4999	0.0	0.0	-0.1	N/A
as left span	5000	83.4	839.0	851.0	0.986
				Average Correction Factor	0.989

Corrected As found	838.2	Previous response	814.2	% change	-2.9%

Notes:

No adjustments made

Filter Changed out

No Maintenance Done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

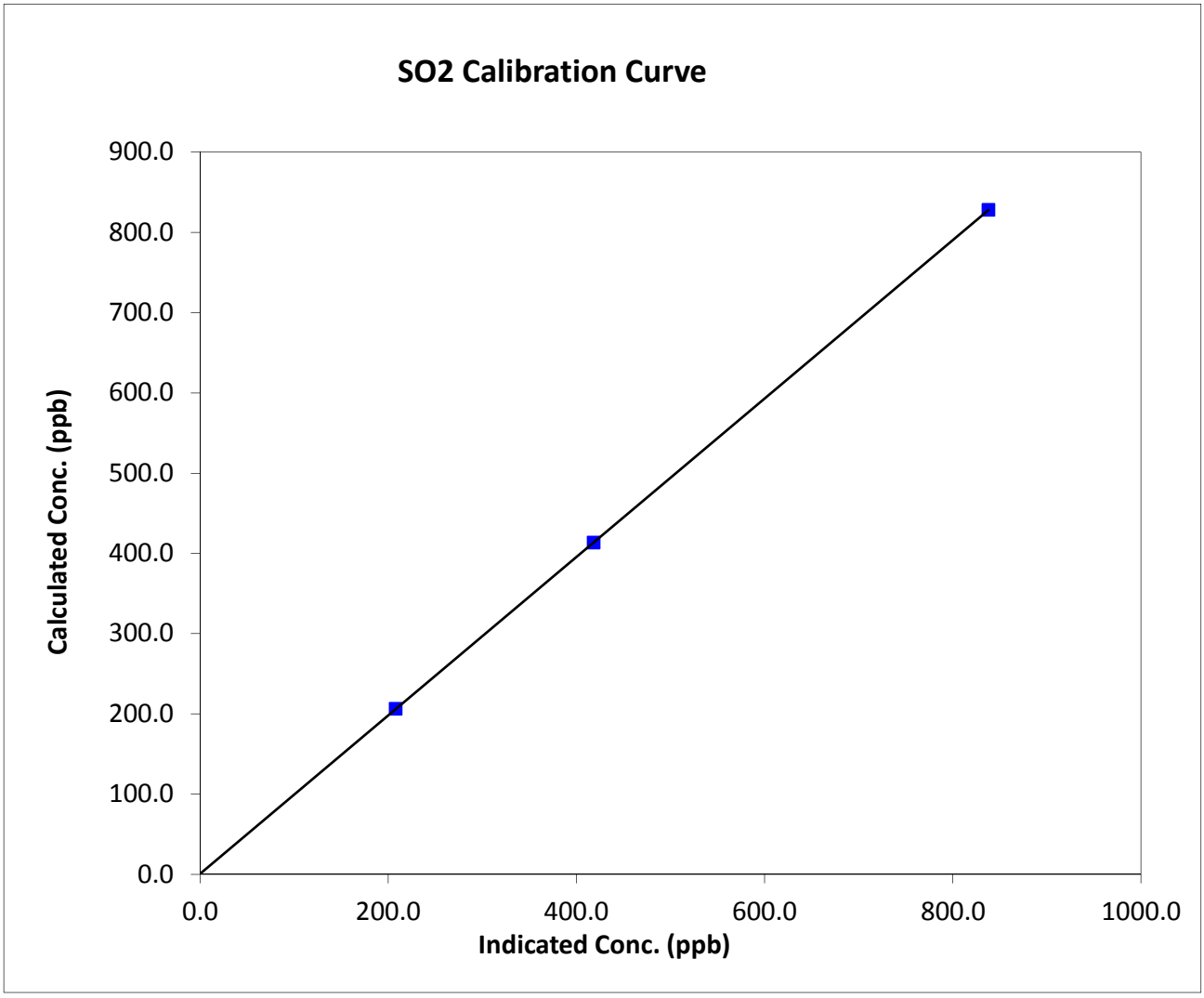
SO_2 Calibration Summary

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	CNRL Horizon	Station Number	15
Start Time (MST)	9:15	End Time (MST)	13:50
Analyzer make	43i	Analyzer serial #	710321322

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999999
827.9	838.0	0.9880		
413.5	418.4	0.9882	Slope	0.987518
206.2	208.0	0.9915		
			Intercept	0.427562



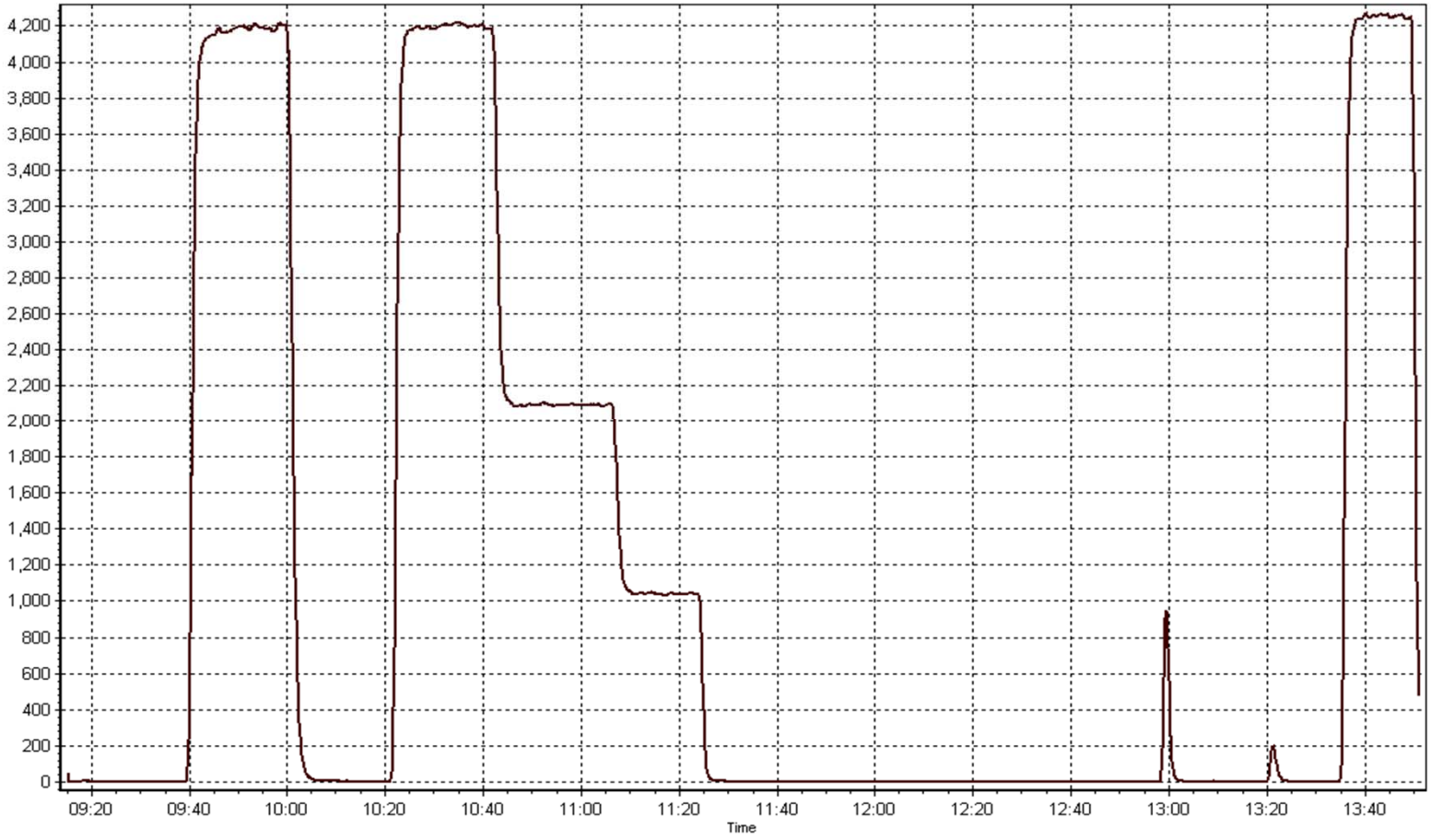
Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Plot

Calibration Date: January 3, 2014 Start Time (MST) 9:15 End Time: 13:50

Station Name: CNRL Horizon Station Number: 15



Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

TRS Calibration Report

Station Information

Calibration Date	January 2, 2014	Previous Calibration	December 17, 2013
Station Name	CNRL Horizon	Station Number	15
Reason:	Routine		
Start Time (MST)	9:10	End Time (MST)	12:22
Barometric Pressure	736 mmHg	Station temp.	20 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	10880507
Cal Gas Concentration	10.4 ppm	Cal Gas Expiry Date	3/11/2009
Gas Cert Reference	cc257967	SO2 Cal gas Concentration	60.0 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	1850
DACS voltage range	0-5000mV	DACS channel #	DIFF 2

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage (v)	-672.3	-672.3
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	775	775
Calculated slope	0.998761	1.013993	Chamber temp. (Deg C)	45.1	45.1
Calculated intercept	-0.440990	-0.475027	Pressure (mmHg)	679.8	679.8
Analyzer Background	9	8.4	Flow (lpm)	0.412	0.412
Analyzer Coefficient	0.922	0.878	Intensity (%)	91	91
			Converter temp (Deg C)	809	809

Analyzer make	TEI 43I	Analyzer serial #	0710321323
Converter make	NOVA model CDN101	Converter serial #	363

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	4000	0.0	0.0	-0.01	N/A
as found span	4000	30.8	80.1	80.2	0.999
SO2 Scrubber	4000	41.9	628.5	0.3	N/A
calibrator zero	4000	0.0	0.0	0.1	N/A
high point	4000	30.8	80.1	79.2	1.011
second point	4000	15.4	40.0	40.2	0.997
third point	4000	7.7	20.0	20.6	0.974
calibrator zero	5000	0.0	0.0	0.22	N/A
as left zero	5000	0.0	0.0	0.22	N/A
as left span	3000	23.0	79.7	79.0	1.009
				Average Correction Factor	0.994

Corrected As found	80.2	Previous response	80.4	% change	0.3%

Notes:
- Scrubber material and scrubber material holder changed out
- Scrubber done before calibrator zero
- Span adjusted
- Filter changed out

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

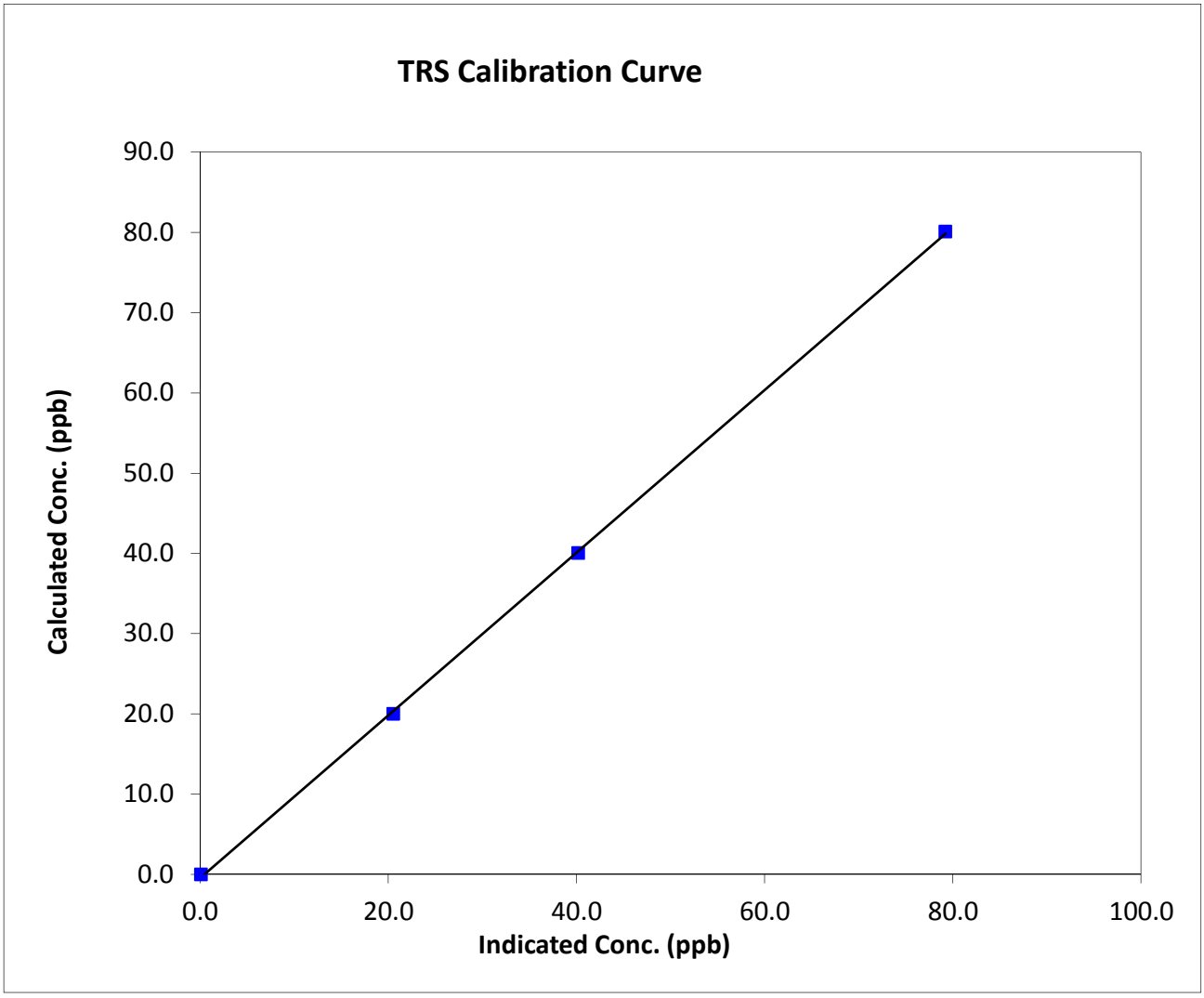
TRS Calibration Summary

Station Information

Calibration Date	January 2, 2014	Previous Calibration	December 17, 2013
Station Name	CNRL Horizon	Station Number	15
Start Time (MST)	9:10	End Time (MST)	12:22
Analyzer make	TEI 43I	Analyzer serial #	0710321323
		Converter Serial #	363

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999898
80.1	79.2	1.0106		
40.0	40.2	0.9965	Slope	1.013993
20.0	20.6	0.9737		
			Intercept	-0.475027



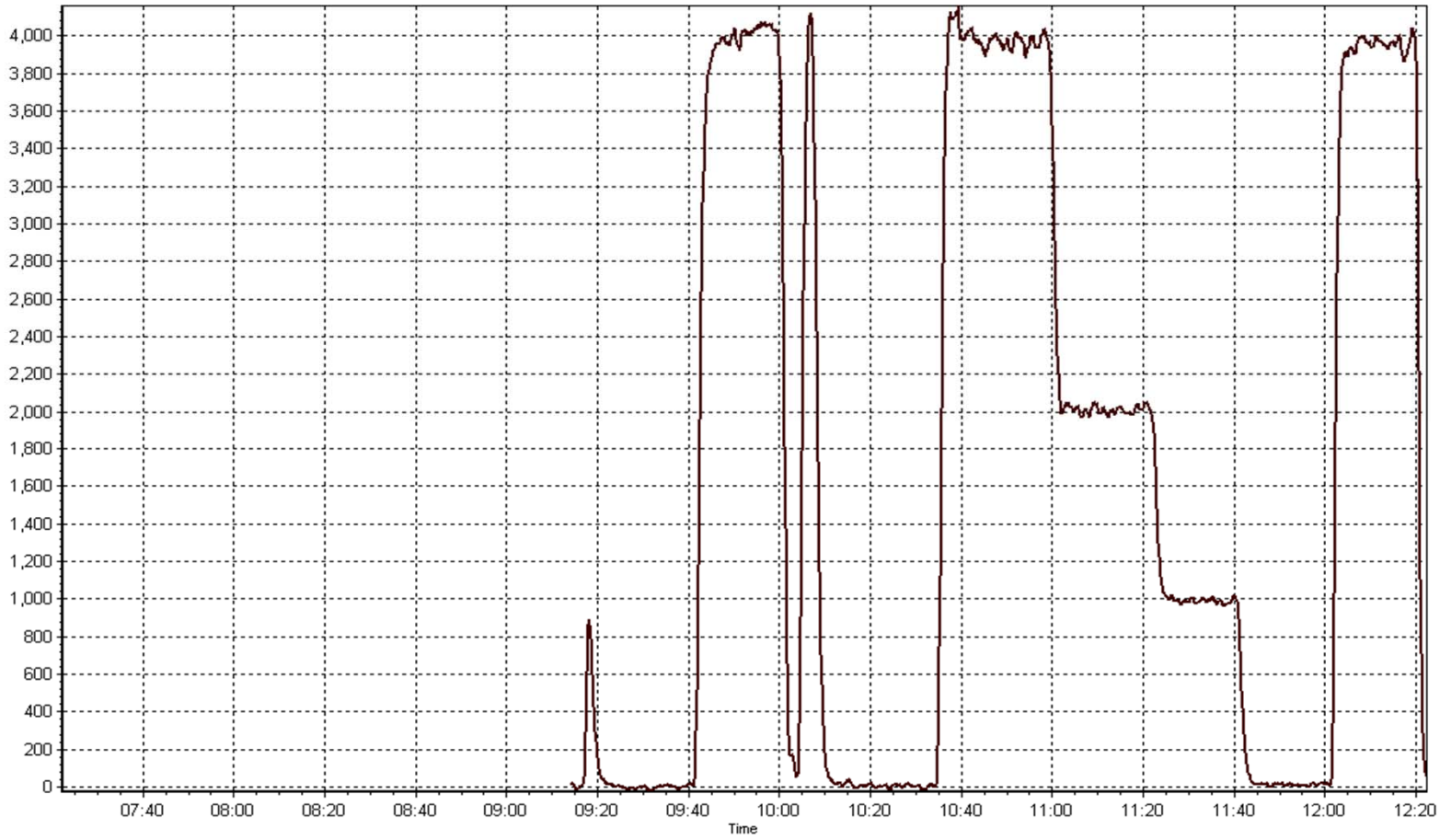
Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

TRS Calibration Plot

Calibration Date: January 2, 2014 Start Time (MST) 9:10 End Time: 12:22

Station Name: CNRL Horizon Station Number: 15



Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	CNRL Horizon	Station Number	AMS 15
Reason:	Routine		
Start Time (MST)	9:15	End Time (MST)	13:50
Barometric Pressure	737 mmHg	Station temp.	- Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	10880507
CH4 Gas Concentration	490.0 ppm	Cal Gas Expiry Date	11/6/2014
C3H8 Gas Concentration	208.0 ppm		
Gas Cert Reference	LL107945	CH4 Equivalent	1062 ppm
DACS make/model	Campbell Scientific CR3000	DACS serial No.	2582
DACS voltage range	0-5000mV	DACS channel #	SE 3

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	25	25	Sample Pressure	6	6
Analyzer Range (mv)	5000	5000	Flame Temp.	164	164
Calculated slope	0.997742	0.991473			
Calculated intercept	-0.004108	0.020382			
Bkg	N/A	N/A			
Coef	N/A	N/A			

Analyzer make	TEI 51C-LT	Analyzer serial #	76232382

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.05	N/A
as found span	5000	82.3	17.48	17.63	0.992
calibrator zero	4998	0.0	0.00	0.00	N/A
high point	5000	82.3	17.48	17.63	0.992
second point	5000	41.1	8.73	8.75	0.998
third point	5000	20.5	4.35	4.37	0.996
calibrator zero	4999	0.0	0.00	0.06	N/A
as left zero	4999	0.0	0.00	0.06	N/A
as left span	5000	83.5	17.74	17.95	0.988
				Average Correction Factor	0.995

Corrected As found	17.6	Previous response	17.4	% change	-0.8%

Notes:

Zero was adjusted

Filter changed

No Maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

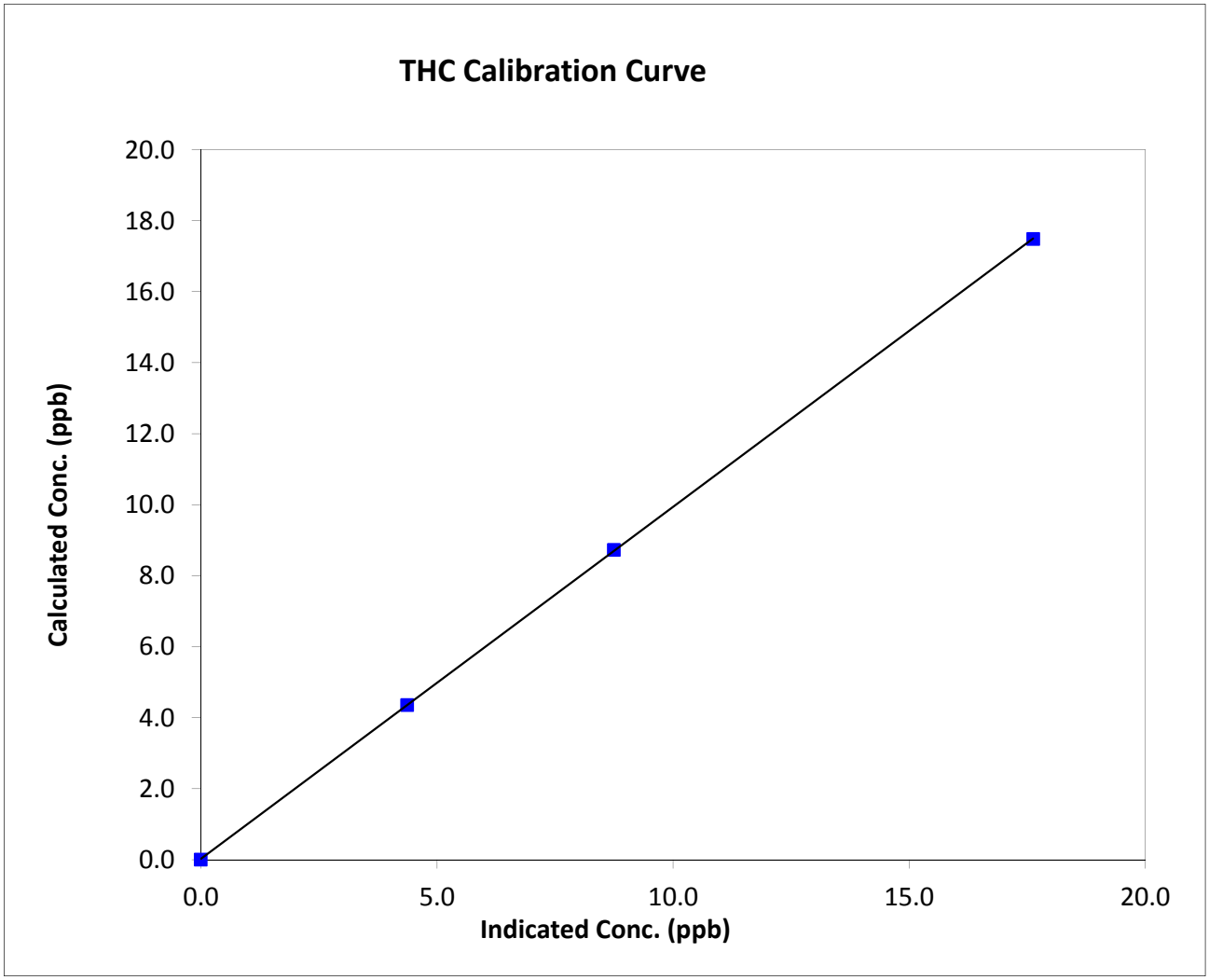
THC Calibration Summary

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:15	End Time (MST)	13:50
Analyzer make	TEI 51C-LT	Analyzer serial #	76232382

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999986
17.48	17.63	0.9915		
8.73	8.75	0.9982	Slope	0.991473
4.35	4.37	0.9964		
			Intercept	0.020382



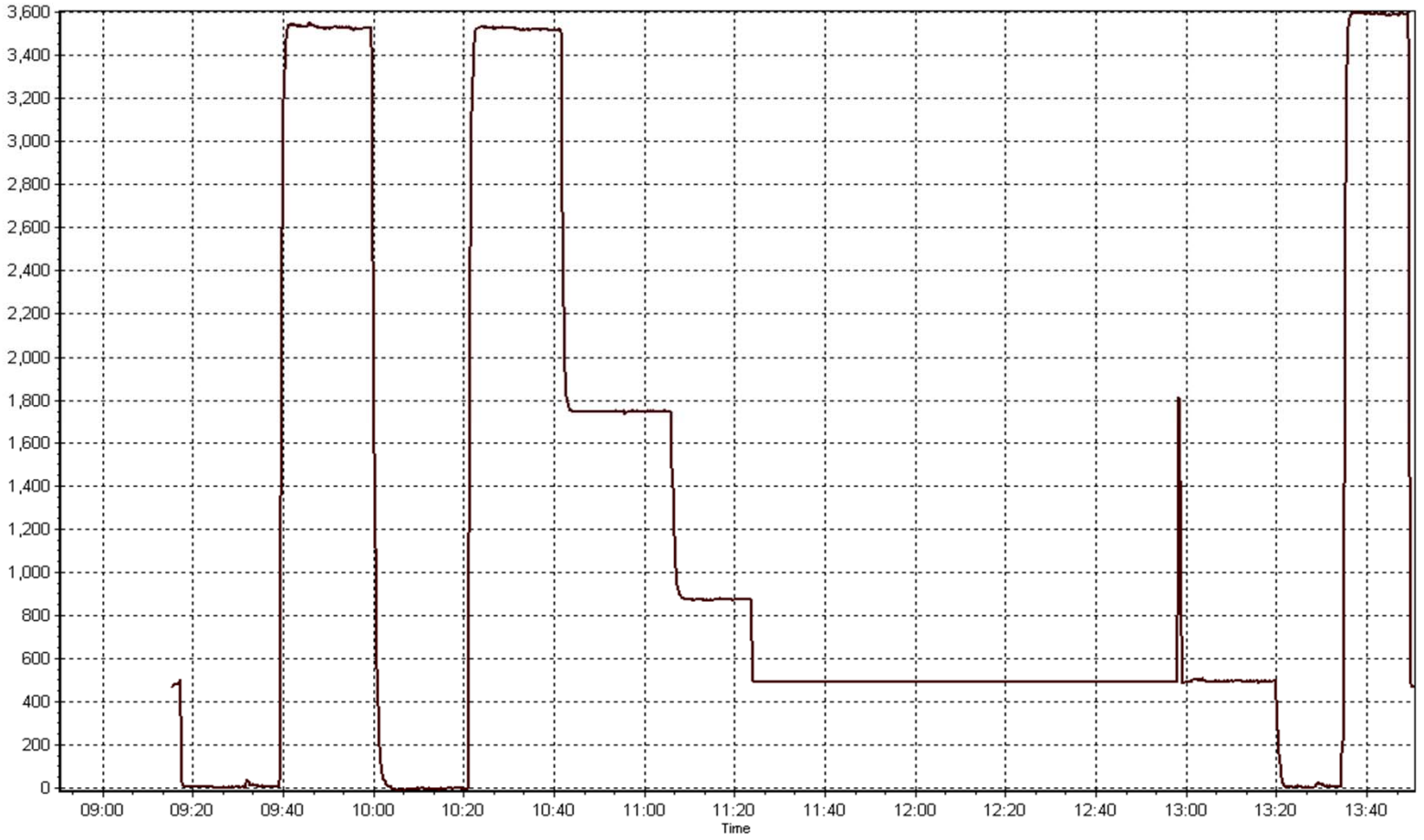
Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

THC Calibration Plot

Calibration Date: January 3, 2014 Start Time (MST) 9:15 End Time: 13:50

Station Name: CNRL Horizon Station Number: AMS 15



Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Name	CNRL Horizon	Station Number	AMS 15
Reason:	Routine		
Start Time (MST)	9:15	End Time (MST)	13:50
Barometric Pressure	mmHg	Station Temperature	22.0 Deg C
Calibrator	Sabio 4010	Serial Number	10880507
NO Cal Gas Conc	48.6 ppm	Cal Gas Expiry Date	November 6, 2014
NOx Cal Gas Conc	48.6 ppm	Cal Gas Serial #	LL107945

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	2632

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	1.000038	1.000029	1.003526
	Data Offset	0.013751	0.391900	-0.479503
After	Data Slope	1.003524	1.005167	0.999684
	Data Offset	1.303610	0.783619	0.497379
Channel #		Diff 3	Diff 4	Diff 5
Voltage Range		0-5000mv	0-5000mv	0-5000mv

Analyzer Information

Analyzer make/model	42i	Analyzer serial #	710321429

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.783	ppb	0.783	ppb
NOX coefficient	0.999	ppb	0.999	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	9.5		9.5	
NOX bkgrnd	9.7		9.7	
PMT Voltage	-784.000		-784.000	
Chamber Temp	50.1	Deg C	50.1	Deg C
Moly Temp	326.6	Deg C	326.6	Deg C
PMT Temp	-2.8	Deg C	-2.8	Deg C
O3 flow	ok	ccm	ok	ccm
R Cell Press	174.0	mmHg	174.0	mmHg
Sample Flow	0.698	ccm	0.698	ccm

Notes:

NO adjustements made

No Maintenance Done

Filter changed out

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 3, 2014 Station Number: AMS 15

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.4	-0.2	0.0	N/A	N/A
as found span	5000	82.3	800.0	800.0	0.0	796.0	796.8	0.4	1.0050	1.0040
calibrator zero	5000	0.0	0.0	0.0	0.0	0.4	-0.2	0.0	N/A	N/A
high point	5000	82.3	800.0	800.0	0.0	796.0	796.8	0.4	1.0050	1.0040
second point	5000	41.1	399.5	399.5	0.0	395.0	395.0	0.4	1.0114	1.0114
third point	5000	20.5	199.3	199.3	0.0	197.0	197.0	0.2	1.0115	1.0115
calibrator zero	5000	0.0	0.0	0.0	0.0	0.8	0.8	0.0	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	0.8	0.8	0.0	N/A	N/A
as left span	5000	83.5	811.6	811.6	0.0	798.6	708.0	91.6	1.0163	N/A
								Average Correction Factor	1.0093	1.0089

Corrcted As found NO_X= 795.6 NO= 797.0 Percent Change NO_X= 0.5% NO= 0.3%

Previous Response NO_X= 800.0 NO= 799.6

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 82.30 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.0			N/A	
1st NO2 (330)	N/A	476.8	314.4	789.6	476.8	314.2	0.9967	1.0000	1.0006	99.9%
2nd NO2 (200)	N/A	600.2	191.0	789.6	600.2	190.6	0.9967	1.0000	1.0021	99.8%
3rd NO2 (100)	N/A	695.4	95.8	789.2	695.4	94.6	0.9972	1.0000	1.0127	98.7%
4th NO2 (0)	791.2	N/A	0.0	791.2	791.2	0.0	0.9947	1.0000	N/A	N/A
					Average Correction Factor		0.9963	1.0000	1.0051	99.5%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

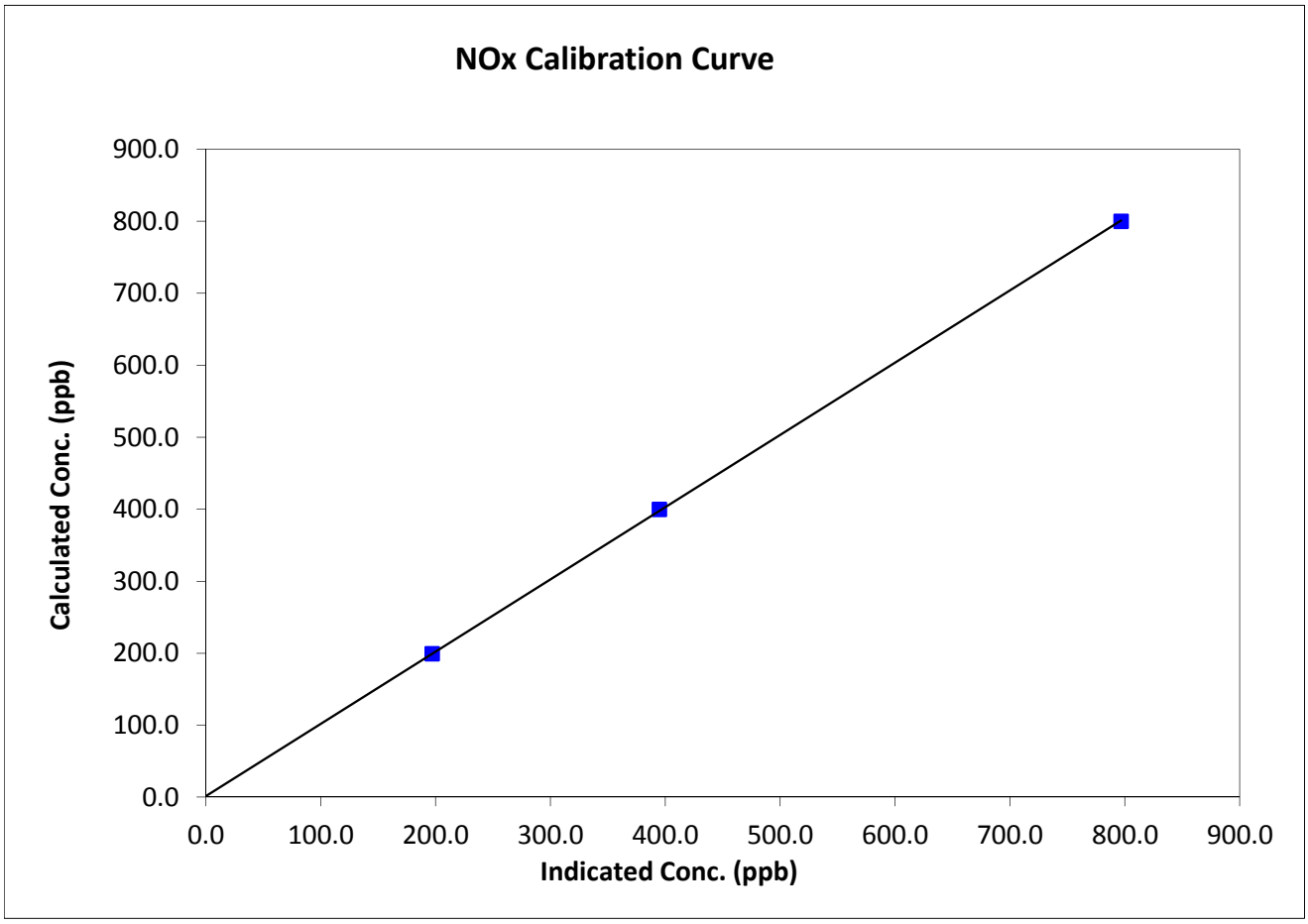
NO_X Calibration Summary

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Number	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:15	End Time (MST)	13:50
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999985
800.0	796.8	1.0040		
399.5	395.0	1.0114	Slope	1.003524
199.3	197.0	1.0115		
			Intercept	1.303610



Wood Buffalo Environmental Association

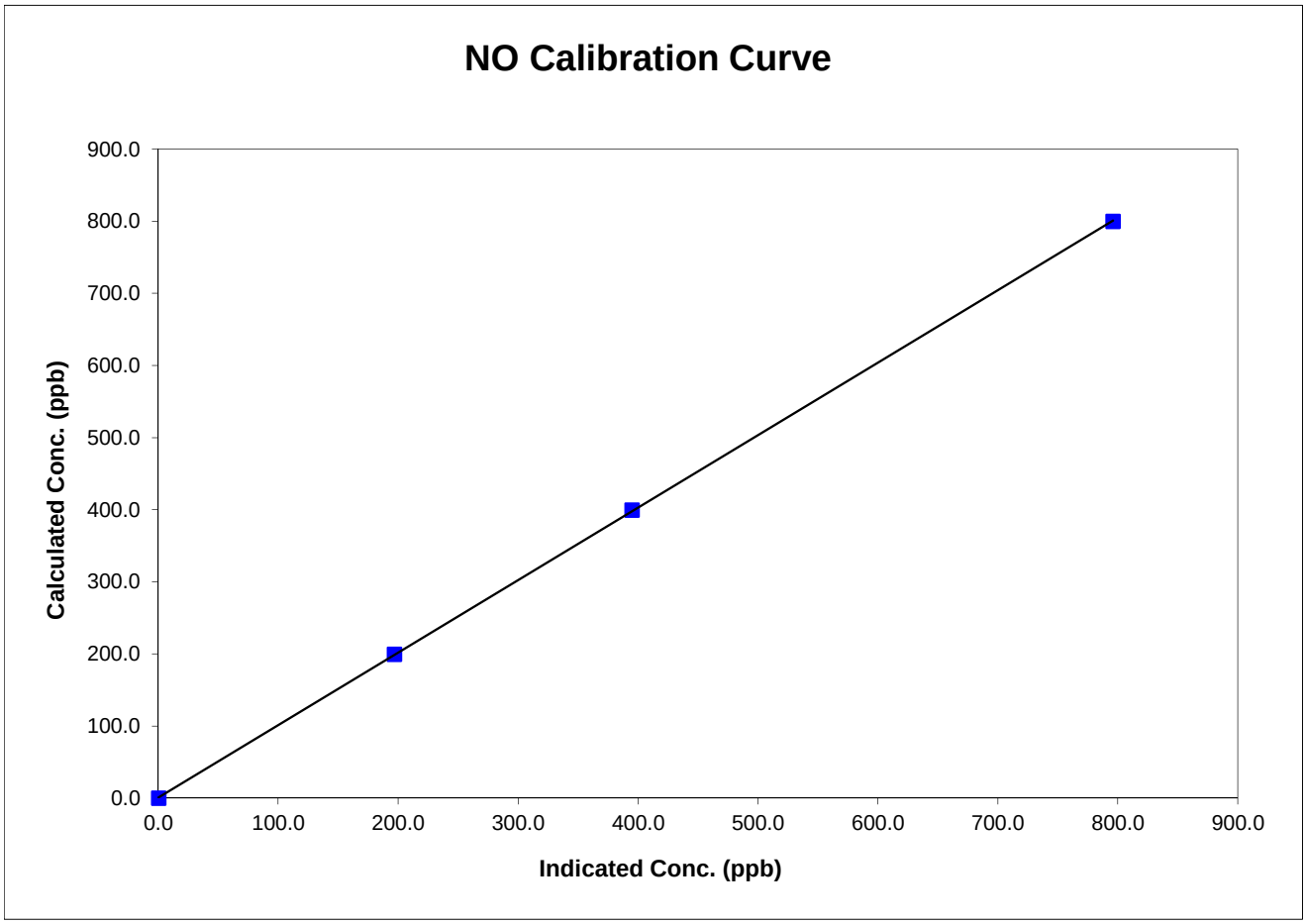
NO Calibration Summary

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Number	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:15	End Time (MST)	13:50
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.4	N/A	Correlation Coefficient	0.999985
800.0	796.0	1.0050		
399.5	395.0	1.0114	Slope	1.005167
199.3	197.0	1.0115		
			Intercept	0.783619



Wood Buffalo Environmental Association

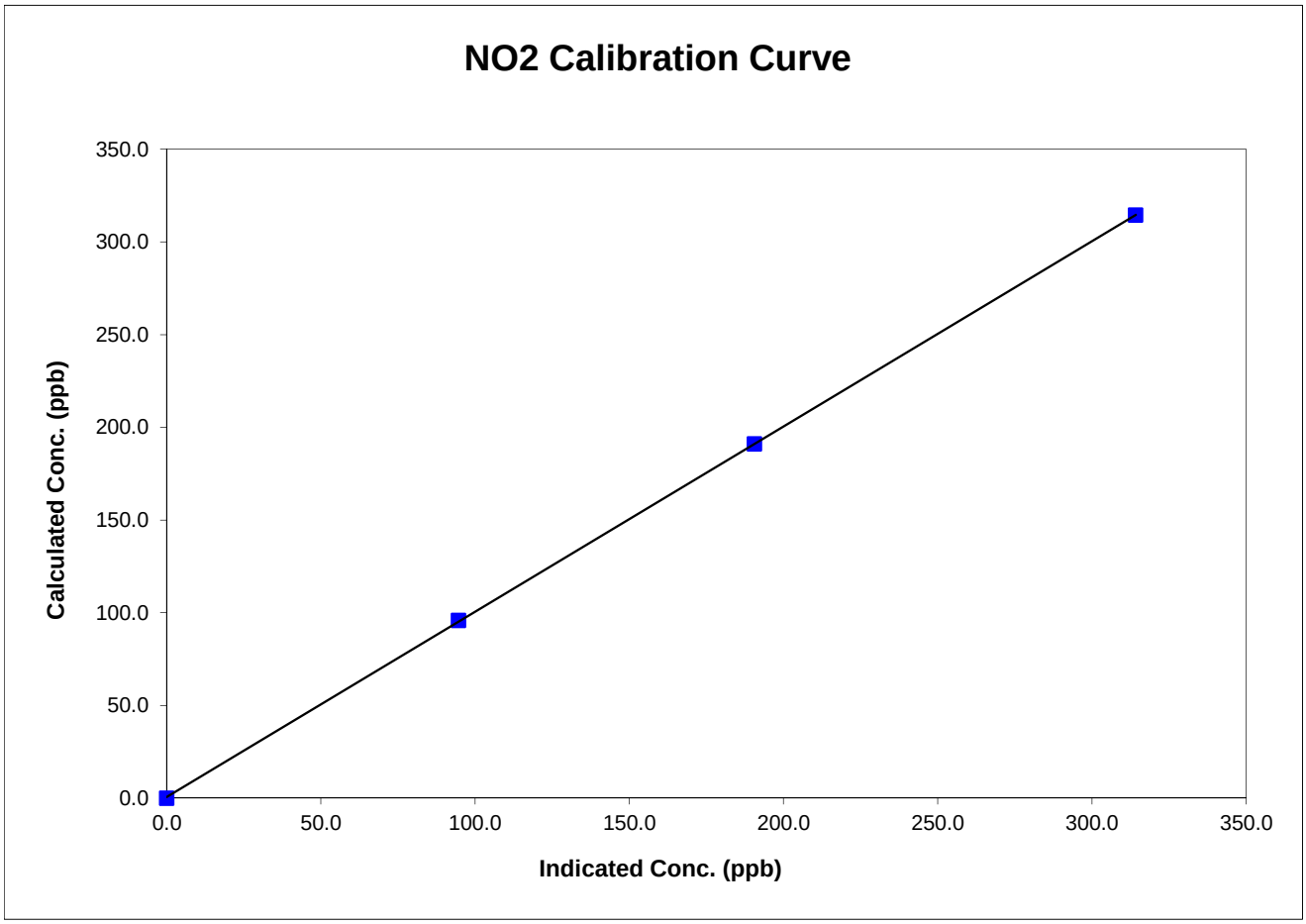
NO_2 Calibration Summary

Station Information

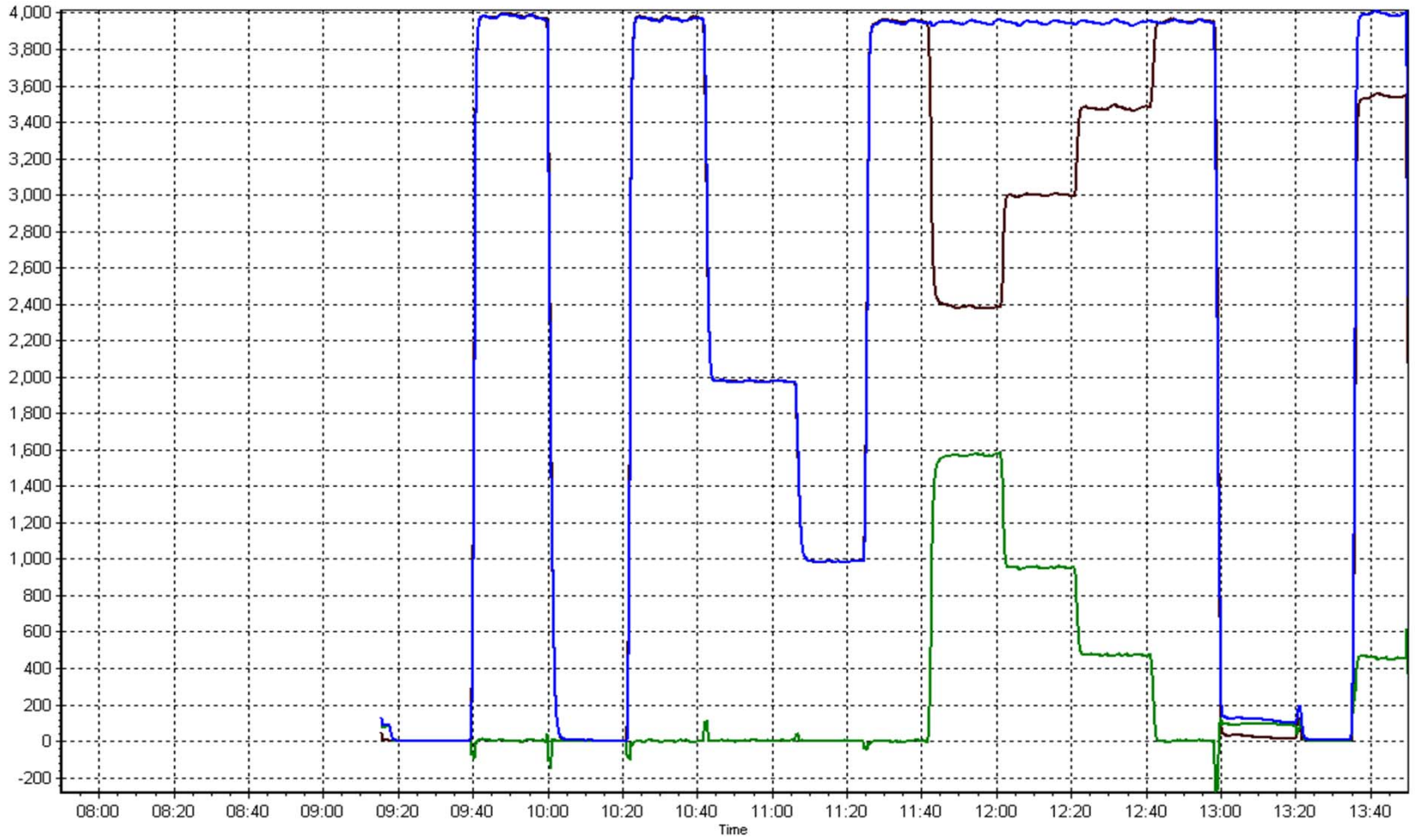
Calibration Date	January 3, 2014	Previous Calibration	December 16, 2013
Station Number	CNRL Horizon	Station Number	AMS 15
Start Time (MST)	9:15	End Time (MST)	13:50
Analyzer make	42i	Analyzer serial #	710321429

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999985
314.4	314.2	1.0006		
191.0	190.6	1.0021	Slope	0.999684
95.8	94.6	1.0127		
			Intercept	0.497379



NOx, NO & NO_2 Calibration Plot **Date:** **January 3, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 16
SHELL MUSKEG RIVER
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
JANUARY 2014

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	703	37	41	99.46	90	0	13	0
THC (ppm) Average	706	37	38	99.87	4.6	-	2.9	-
NO2 (ppb) Average	706	37	38	99.87	49	0	34	-
NO (ppb) Average	706	37	38	99.87	107	-	38	-
NOX (ppb) Average	706	37	38	99.87	156	-	72	-
PM2.5 (ug/m3) Average	742	0	2	99.73	34.9	0	15.5	0
Temperature 2 m (C) Average	743	0	1	99.87	6.4	-	-0.5	-
Relative Humidity (%) Average	743	0	1	99.87	93	-	89	-
Barometric Pressure (inHg) Average	743	0	1	99.87	29.8	-	29.7	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	60	-	25	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	703	1.7	6	-	0	0	0	0	1	3	90
THC (ppm) Average	706	2.45	0.3	-	1.9	2.1	2.2	2.4	2.6	2.9	4.6
NO2 (ppb) Average	706	18.7	10	-	0	5	12	17	26	32	49
NO (ppb) Average	706	9.6	15	-	0	0	0	4	12	26	107
NOX (ppb) Average	706	28.2	23	-	0	5	14	23	36	55	156
PM2.5 (ug/m3) Average	742	5.52	4.4	-	0.2	1.6	2.5	4.4	7.1	10.6	34.9
Temperature 2 m (C) Average	743	-17.24	9.7	-	-40.9	-29.6	-24.1	-17	-11	-4.2	6.4
Relative Humidity (%) Average	743	76.5	8	-	44	66	71	76	83	87	93
Barometric Pressure (inHg) Average	743	28.93	0.4	-	28	28.4	28.6	28.9	29.2	29.5	29.8
Wind Speed 10 m (km/h) Average	742	10.6	7	-	1	4	5	9	14	19	60
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SHELL MUSKEG RIVER (AMS 16)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	01 Jan 2014 09:00	01 Jan 2014 09:00	1	DAS collection error - data not recorded
SO2	22 Jan 2014 10:00	22 Jan 2014 12:00	3	Maintenance - replaced flow sensor
PM2.5	21 Jan 2014 14:00	21 Jan 2014 14:00	1	Flow and zero reference checks, sample head cleaning
Wind Speed, Wind Direction	09 Jan 2014 02:00	09 Jan 2014 02:00	1	Flatline in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 90 ppb on Jan 20 14:00 Maximum Daily Average: 12.7 ppb on Jan 20

Minimum Value: 0 ppb on Jan 3 09:00 Minimum Daily Average: 0.0 ppb on Jan 29
Maximum Diurnal Average: 6.2 ppb at hour 15 Minimum Diurnal Average: 0.7 ppb at hour 19
Monthly Average: 1.7 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 19$

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	37
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	Z	0	0	0	0	0	0	0	MS	0	0	1	5	10	40	22	2	2	2	1	1	1	1	1	4.2	40
2-Jan	Z	2	4	3	3	2	3	3	2	2	3	3	4	7	5	4	2	2	1	1	1	1	1	1	2.6	7
3-Jan	Z	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.2	1
4-Jan	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
5-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.3	1
6-Jan	Z	0	0	1	1	1	1	1	1	1	1	0	1	2	3	2	2	2	1	1	1	0	0	0	0.9	3
7-Jan	Z	1	1	1	0	0	0	0	0	0	0	0	1	4	9	4	3	1	1	1	2	3	3	1	1.6	9
8-Jan	Z	1	1	1	1	1	1	2	12	11	3	3	3	3	2	1	2	1	1	1	1	1	1	1	2.4	12
9-Jan	Z	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	0	0	0	0.8	2
10-Jan	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
11-Jan	Z	0	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
12-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0	2	2	2	5	3	0.9	5
13-Jan	Z	4	8	10	3	3	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6	10
14-Jan	Z	0	0	0	0	0	0	1	2	1	1	1	3	8	10	9	5	3	3	2	8	18	9	6	4.0	18
15-Jan	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
16-Jan	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	2	1	0	1	1	1	1	2	0.7	3
17-Jan	Z	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	3
18-Jan	Z	0	0	0	0	2	1	0	0	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0.6	2
19-Jan	Z	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.2	1
20-Jan	Z	0	0	1	1	2	4	5	8	8	6	2	28	90	86	35	4	3	3	3	2	1	1	1	12.7	90
21-Jan	Z	1	1	1	1	1	1	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	--	1
22-Jan	Z	0	0	0	0	0	0	0	0	M	M	M	7	10	5	1	3	2	1	3	5	5	10	8	3.0	10
23-Jan	Z	6	4	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	1	0	0	1.0	6
24-Jan	Z	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
25-Jan	Z	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0.4	1
26-Jan	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
27-Jan	Z	0	0	0	0	0	1	1	2	3	8	7	3	13	20	18	7	1	3	7	11	15	15	17	6.6	20
28-Jan	Z	17	18	16	13	6	5	9	6	13	14	4	1	1	1	1	1	0	0	0	0	0	0	0	5.5	18
29-Jan	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
30-Jan	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
31-Jan	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
	--	1.3	1.4	1.3	1.0	0.8	0.7	0.9	1.4	1.6	1.4	0.9	2.1	5.1	6.2	3.5	1.2	0.7	0.7	0.9	1.2	1.6	1.6	1.5	Diurnal Average	
	--	17	18	16	13	6	5	9	12	13	14	7	28	90	86	35	7	3	3	7	11	18	15	17	Diurnal Maximum	

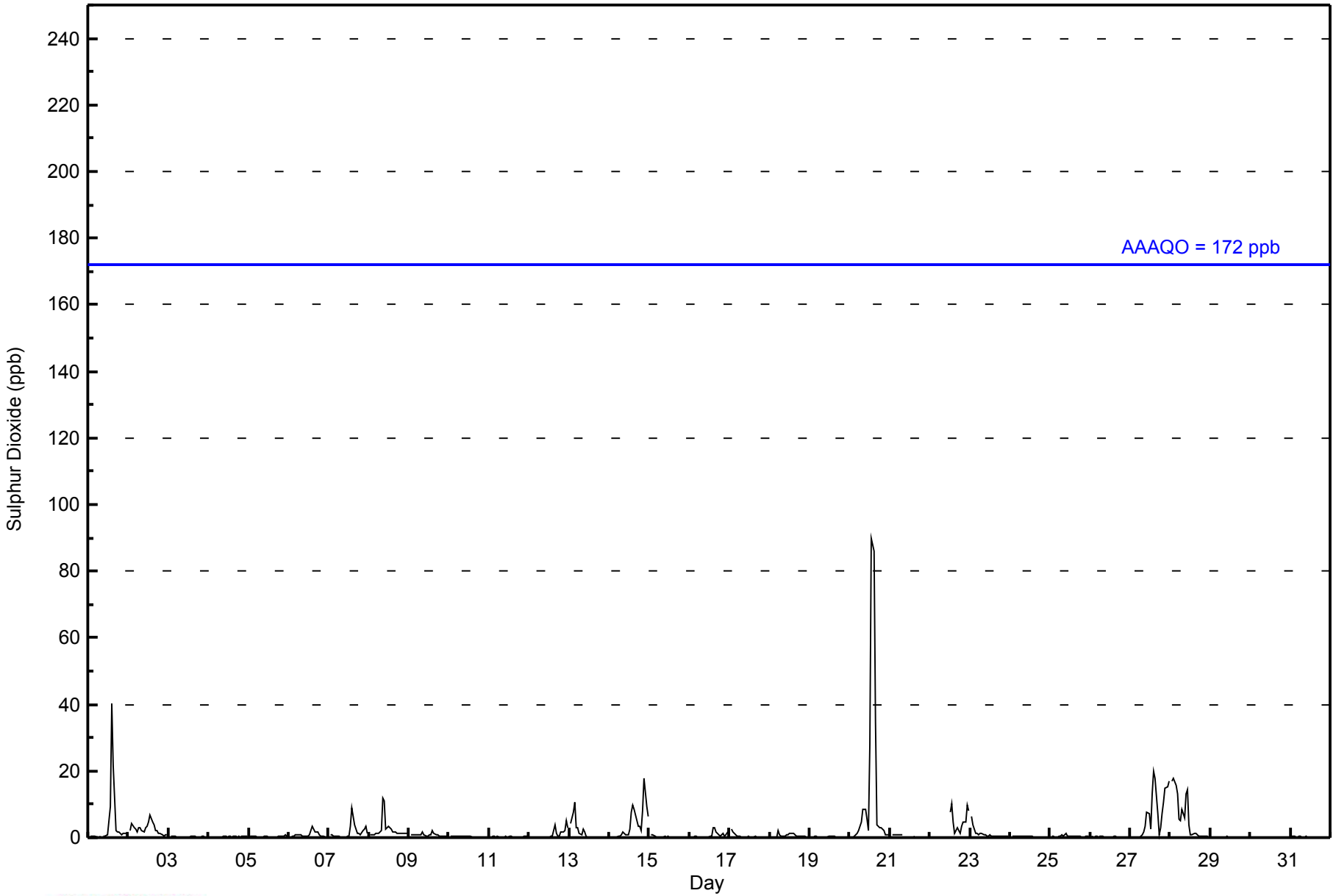
Z - zerospan C - Calibration M - Maintenance MS - Missing
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	681	96.87	96.87
11 - 20	16	2.28	99.15
21 - 60	4	0.57	99.72
61 - 110	2	0.28	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	43	77	43	35	15	6	9	21	101	159	53	31	19	24	27	17	680
11 - 20	0	0	0	0	0	0	0	0	6	7	3	0	0	0	0	0	16
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	2	0	0	0	0	0	0	2
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	43	77	43	35	15	6	9	21	107	170	58	31	19	24	27	17	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

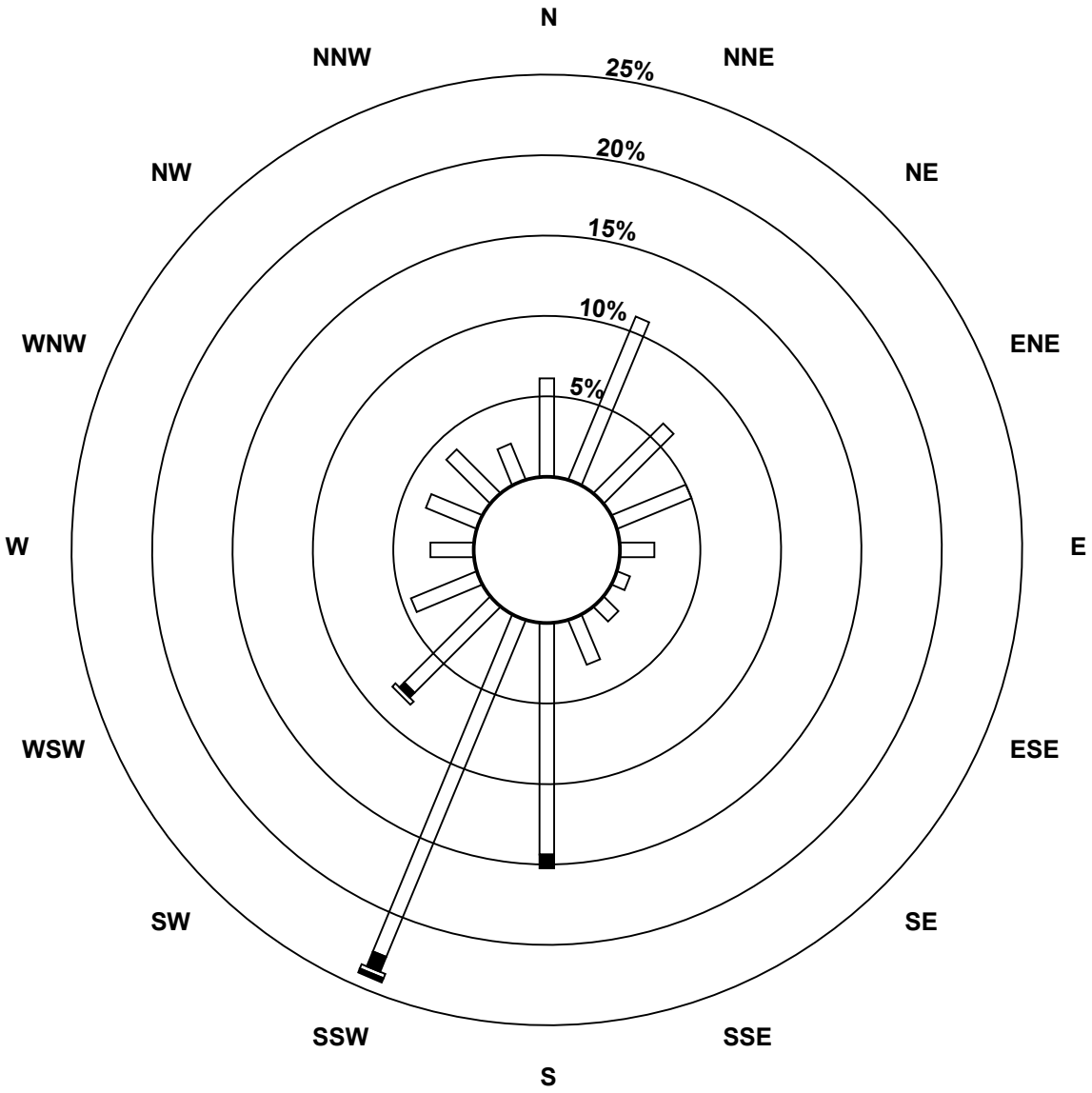
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

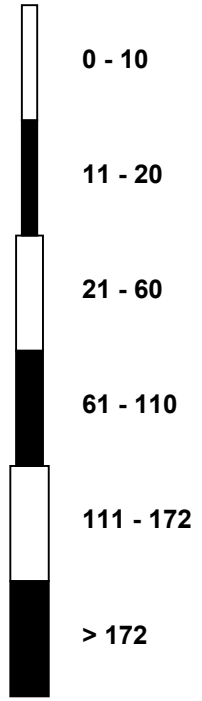
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



0 - 10

11 - 20

21 - 60

61 - 110

111 - 172

> 172

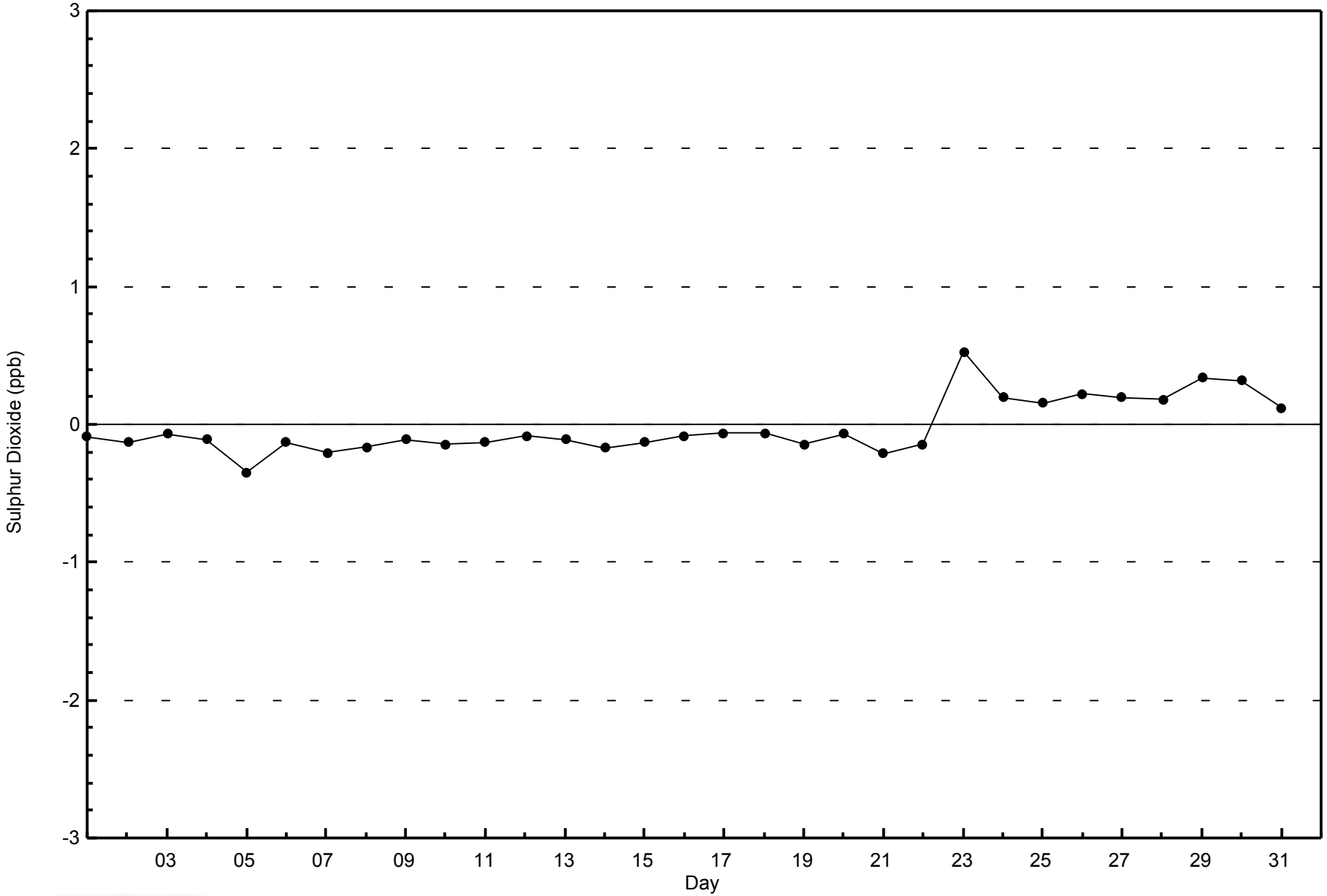
Total Number of Valid Hours: 702

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2014



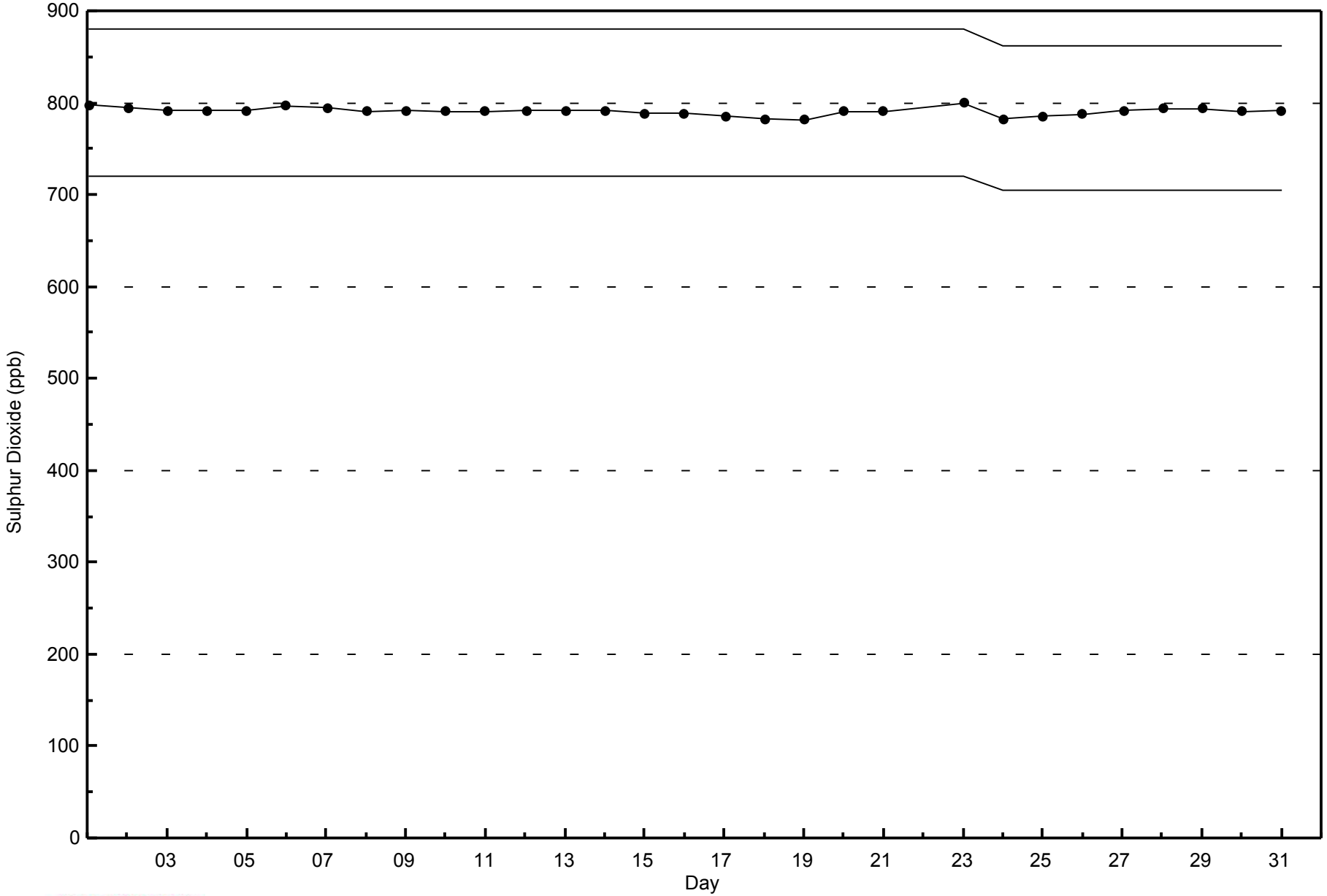
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2014

Maximum Value: 4.6 ppm on Jan 18 13:00

Maximum Daily Average: 2.9 ppm on Jan 9

Minimum Value: 1.9 ppm on Jan 23 11:00

Minimum Daily Average: 2.1 ppm on Jan 30

Maximum Diurnal Average: 2.6 ppm at hour 14

Minimum Diurnal Average: 2.4 ppm at hour 24

Monthly Average: 2.45 ppm

Percentiles: P_1 = 2.0 P_{10} = 2.1 Q_1 = 2.2 Median = 2.4 Q_3 = 2.6 P_{90} = 2.9 P_{99} = 3.5

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	Z	3.0	3.0	3.1	3.0	2.9	2.8	2.9	MS	2.8	2.8	2.7	2.6	2.6	2.6	2.5	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.7	3.1
2-Jan	Z	2.6	2.6	2.6	2.6	2.7	2.7	2.9	2.8	2.8	3.2	3.2	3.2	3.0	3.3	3.3	3.3	3.1	3.0	2.9	3.0	2.8	2.5	2.4	2.9	3.3
3-Jan	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.8	3.2	3.6	2.7	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.4	3.6
4-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.2	2.1	2.2	2.3	2.6	2.7	2.5	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.3	2.7
5-Jan	Z	2.4	2.4	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.7	2.5	2.5	2.6	2.6	2.5	2.4	2.3	2.3	2.4	2.7
6-Jan	Z	2.2	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.4	2.5	2.2	2.3	2.4	2.5	3.0	3.4	2.9	2.6	2.7	2.8	2.5	2.5	2.6	2.5	3.4
7-Jan	Z	3.8	2.7	2.5	2.9	3.1	3.0	3.0	2.8	2.8	2.5	2.5	2.5	2.9	3.0	3.0	3.1	3.3	3.3	3.3	2.9	2.6	2.5	2.5	2.9	3.8
8-Jan	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.8	2.9	2.8	2.9	3.1	3.1	2.8	3.0	3.2	3.0	2.9	2.8	2.9	2.7	3.2
9-Jan	Z	2.6	2.6	2.7	3.1	3.1	2.8	2.6	2.9	3.5	3.5	3.1	3.3	4.2	3.5	2.9	2.8	2.8	2.6	2.5	2.4	2.7	2.6	2.4	2.9	4.2
10-Jan	Z	2.7	2.4	2.9	2.9	2.9	3.1	2.7	2.6	2.6	2.7	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.2	2.3	2.3	2.5	3.1
11-Jan	Z	2.6	3.3	4.2	2.7	2.3	2.7	2.6	2.3	2.5	2.6	2.4	2.5	3.2	3.2	3.0	2.6	2.4	2.9	2.6	2.4	2.3	2.4	2.3	2.7	4.2
12-Jan	Z	2.3	2.4	2.3	2.4	2.5	2.7	2.7	2.3	2.3	2.3	2.2	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.4	2.4	2.4	2.4	2.7
13-Jan	Z	2.5	2.5	2.6	2.4	2.4	2.4	2.6	3.1	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.3	2.5	2.6	2.8	2.4	3.1
14-Jan	Z	2.6	2.5	2.5	2.5	2.8	2.9	2.7	2.6	2.5	2.5	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.7	2.6	2.9
15-Jan	Z	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.2	2.1	2.1	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.2	2.5
16-Jan	Z	2.5	2.6	2.7	2.9	2.8	2.6	2.7	2.8	2.4	2.4	2.6	2.5	2.9	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.6	2.4	2.6	2.9
17-Jan	Z	2.6	2.7	2.8	2.7	2.9	2.3	2.1	2.2	2.2	2.2	2.3	2.8	3.4	3.2	2.9	2.4	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.5	3.4
18-Jan	Z	2.4	2.3	2.3	2.5	2.6	2.5	2.5	2.7	2.7	2.8	2.8	4.6	3.2	2.3	2.3	2.3	2.6	2.4	2.6	2.7	3.2	2.6	2.2	2.7	4.6
19-Jan	Z	2.1	2.2	3.0	3.1	2.3	2.3	2.2	2.4	2.5	2.5	2.3	2.2	2.0	2.0	2.1	2.3	2.4	2.5	2.3	2.3	2.1	2.1	2.2	2.3	3.1
20-Jan	Z	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.4	2.4	2.7	2.9	2.6	2.5	2.3	2.5	2.3	2.9
21-Jan	Z	2.5	2.4	2.3	2.3	2.4	2.7	2.5	C	C	C	C	C	C	2.1	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.2	2.1	--	2.7
22-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.3
23-Jan	Z	2.3	2.4	2.3	2.3	2.2	2.2	2.3	2.2	1.9	1.9	2.0	2.1	2.2	2.2	2.1	2.1	2.3	2.5	2.4	2.1	2.0	2.1	2.0	2.2	2.5
24-Jan	Z	2.2	3.7	2.6	3.0	2.3	2.2	2.2	2.2	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.2	3.7
25-Jan	Z	2.2	2.3	2.4	2.6	2.3	2.6	2.5	2.5	2.7	2.3	2.1	2.1	2.2	2.1	2.3	2.1	2.3	2.6	2.5	2.3	2.3	2.5	2.6	2.4	2.7
26-Jan	Z	2.4	2.5	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.2	2.5
27-Jan	Z	2.3	2.3	2.2	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.3	2.5
28-Jan	Z	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.4	2.4	2.4	2.5	2.4	2.8	2.9	3.1	3.1	2.5	2.1	2.1	2.1	2.2	2.3	2.4	2.4	3.1
29-Jan	Z	2.4	2.3	2.3	2.4	2.3	2.6	2.7	2.5	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.2	2.2	2.2	2.1	2.2	2.3	2.7
30-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1
31-Jan	Z	2.4	2.5	2.4	2.4	2.6	2.4	2.3	2.3	2.5	2.3	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.5	2.1	2.1	2.3	2.2	2.1	2.4	2.6
	--	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	Diurnal Average	
	--	3.8	3.7	4.2	3.1	3.1	3.1	3.0	3.1	3.5	3.5	3.2	4.6	4.2	3.5	3.6	3.4	3.3	3.3	3.3	3.0	3.2	2.8	2.9	Diurnal Maximum	

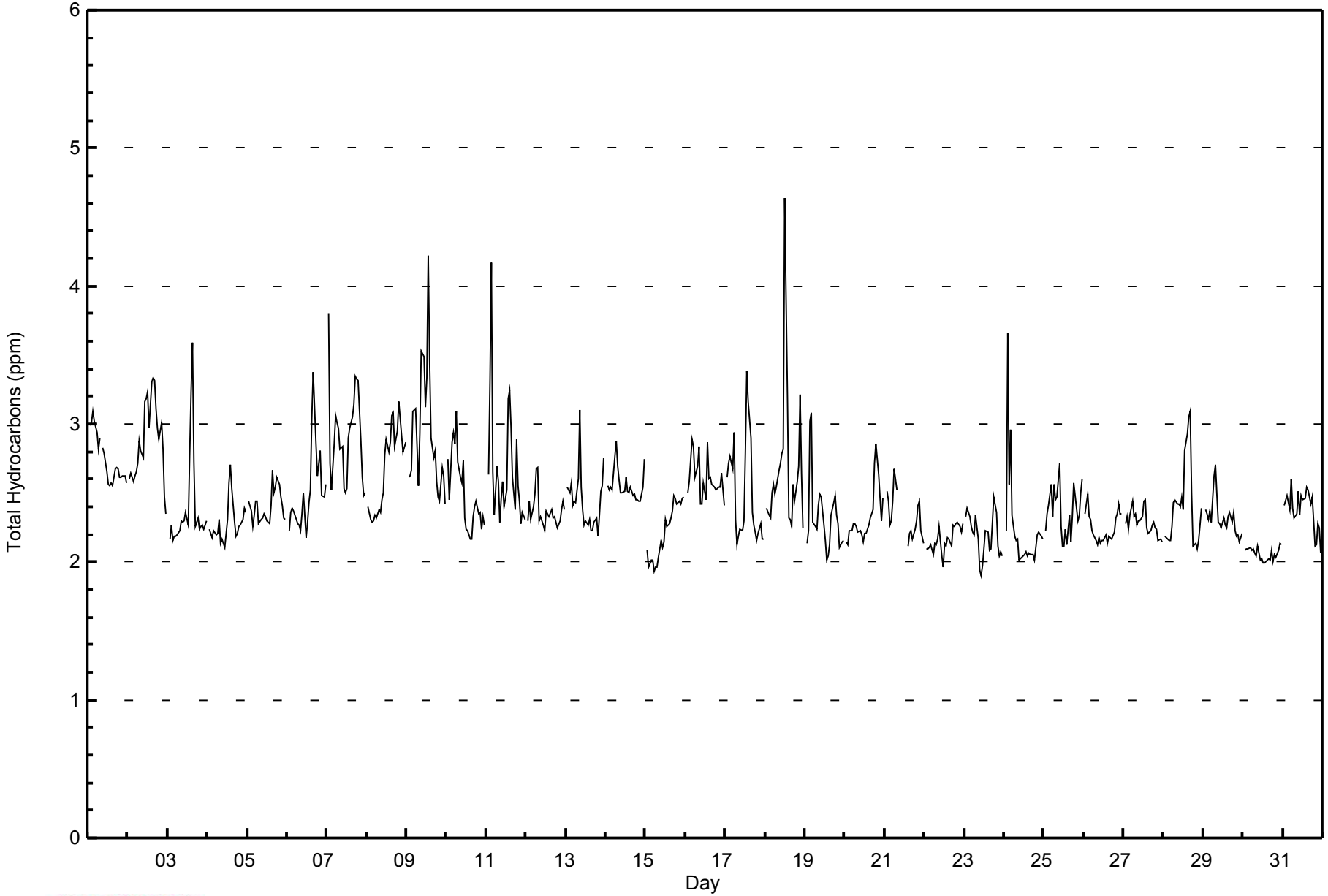
Z - zerospan C - Calibration MS - Missing

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	31	4.39	4.39
2.1 - 3.0	632	89.52	93.91
3.1 - 10.0	43	6.09	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2014

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	2	3	1	1	0	0	0	2	8	3	3	2	5	1	0	31
2.1 - 3.0	40	70	38	31	14	6	9	20	100	154	52	24	17	18	25	13	631
3.1 - 10.0	3	5	2	3	0	0	0	1	5	11	3	4	0	1	1	4	43
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	77	43	35	15	6	9	21	107	173	58	31	19	24	27	17	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

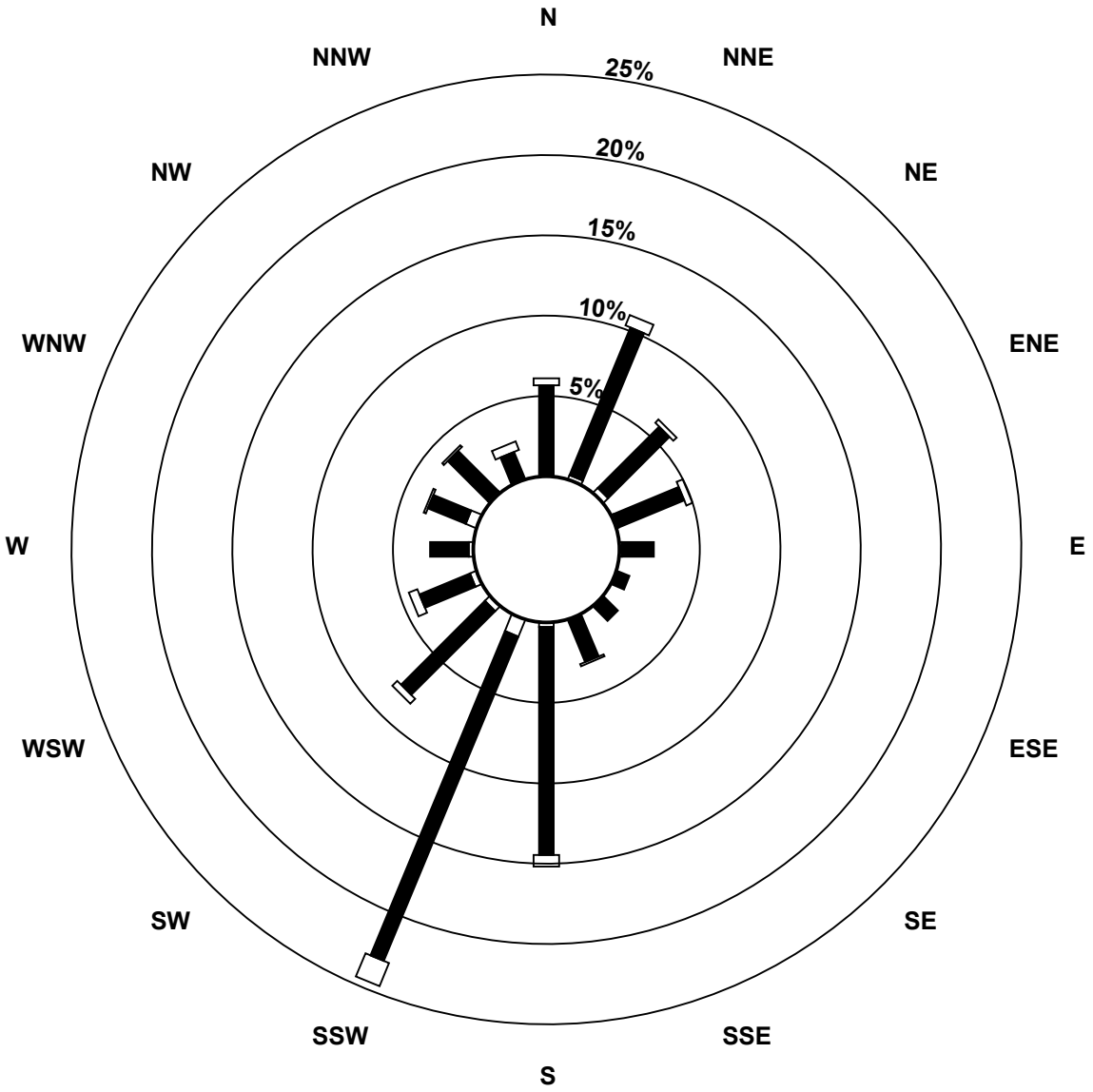
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Shell Muskeg River (AMS 16)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

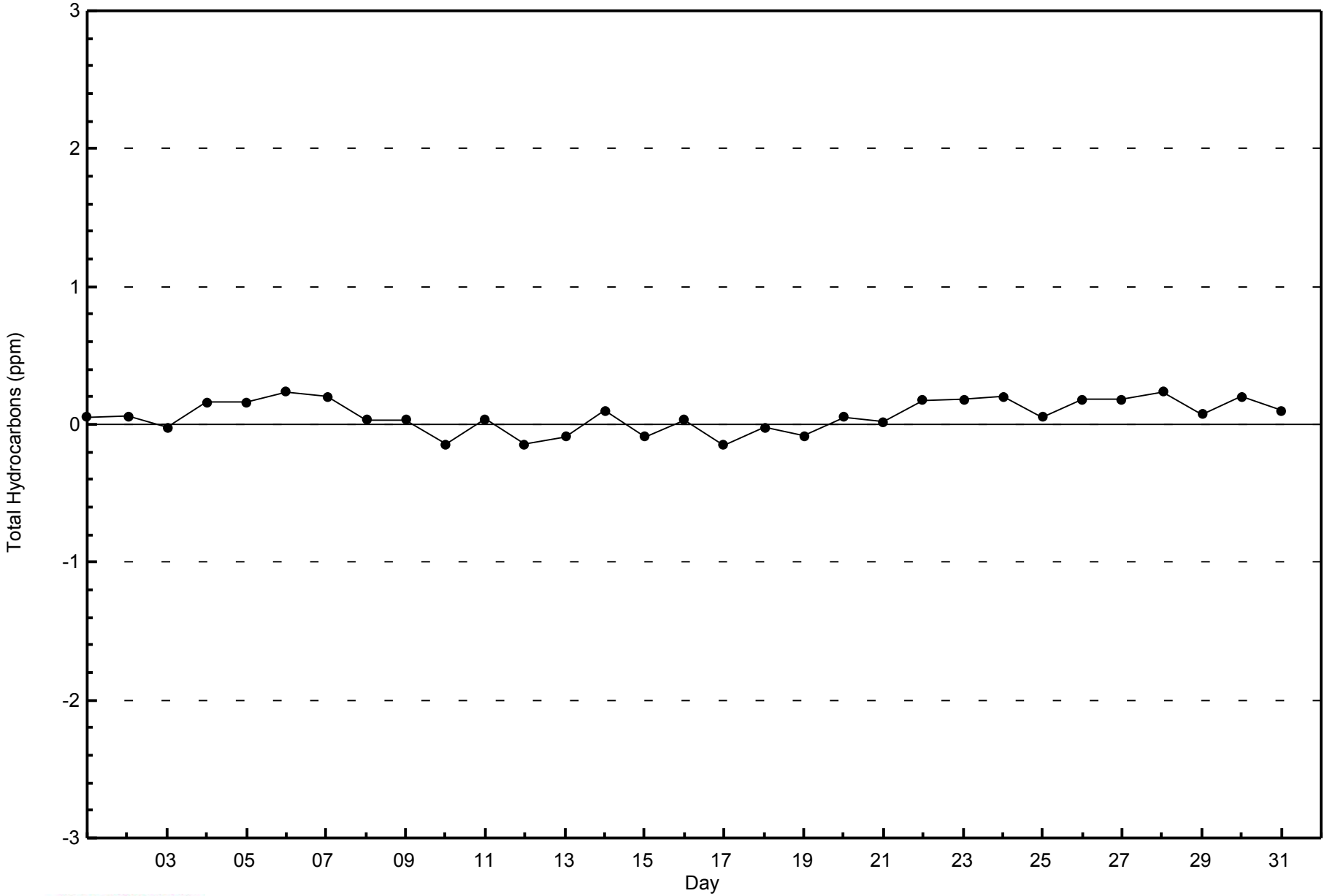
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2014



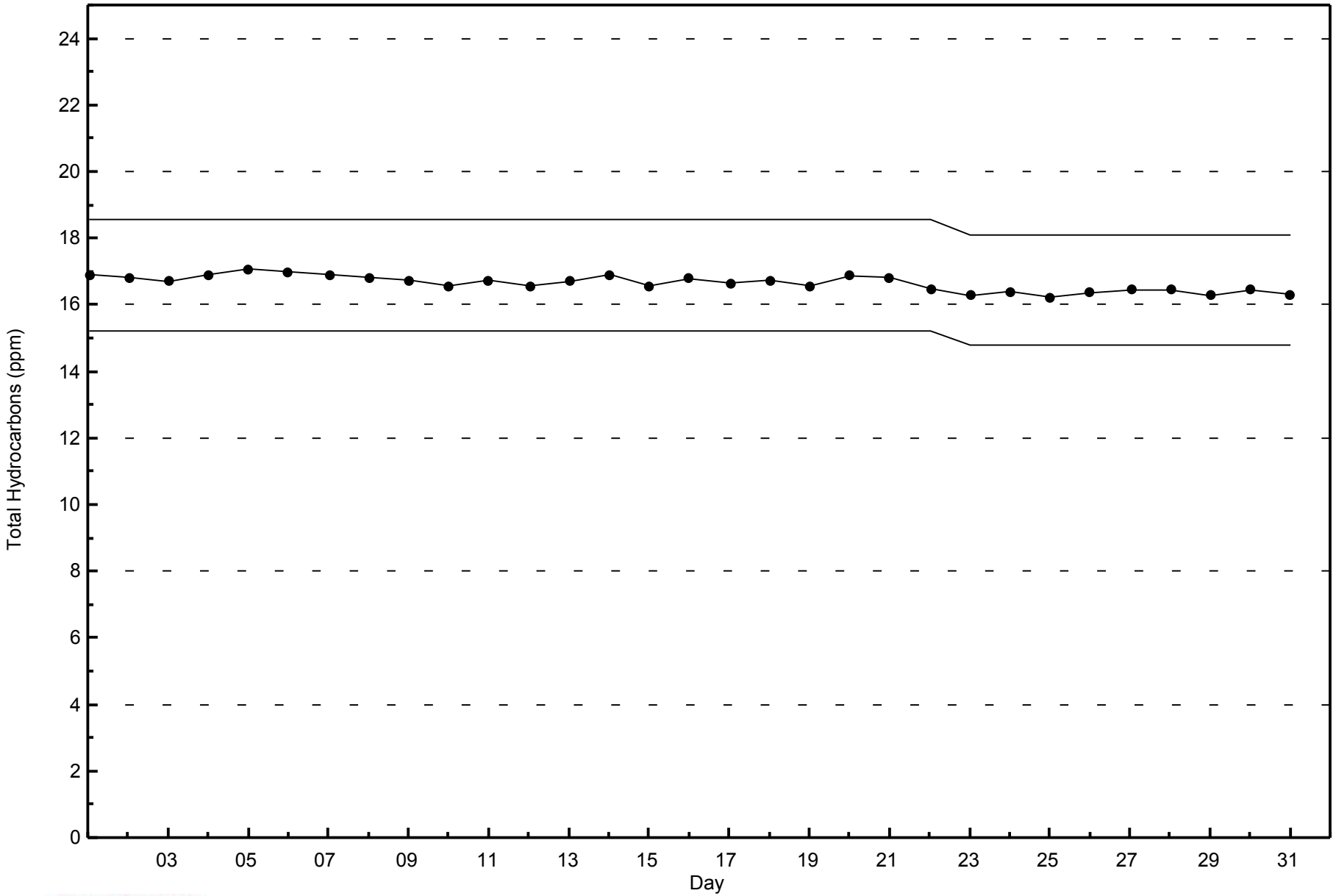
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2014

Maximum Value: 107 ppb on Jan 3 16:00

Maximum Daily Average: 38.1 ppb on Jan 7

Minimum Value: 0 ppb on Jan 3 07:00

Minimum Daily Average: 0.7 ppb on Jan 15

Maximum Diurnal Average: 15.5 ppb at hour 16

Minimum Diurnal Average: 4.8 ppb at hour 23

Monthly Average: 9.6 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 4 $Q_3 = 12$ $P_{90} = 26$ $P_{99} = 71$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	Z	27	29	37	26	21	20	39	MS	34	33	26	24	26	36	28	15	16	14	12	12	10	12	15	23.2	39
2-Jan	Z	13	13	8	6	2	2	1	0	1	18	5	4	5	5	3	1	0	0	0	4	16	11	14	5.8	18
3-Jan	Z	19	17	11	6	0	0	0	0	1	3	11	7	23	58	107	45	8	15	4	2	0	0	0	14.7	107
4-Jan	Z	1	0	0	0	0	0	0	0	1	4	6	11	9	10	19	12	5	15	4	4	5	1	0	4.7	19
5-Jan	Z	0	0	0	0	0	8	1	0	1	5	8	4	5	12	14	4	3	10	25	16	12	5	1	5.9	25
6-Jan	Z	1	9	15	8	1	2	1	1	5	16	3	26	31	49	79	91	25	10	15	22	4	3	19	18.9	91
7-Jan	Z	99	32	22	28	42	39	34	22	24	21	29	28	36	44	48	46	51	64	56	56	34	13	7	38.1	99
8-Jan	Z	2	1	0	0	0	0	0	1	2	3	3	4	3	1	1	3	26	19	7	3	5	10	18	4.8	26
9-Jan	Z	2	2	3	25	12	3	0	0	1	4	3	8	73	16	13	8	6	7	7	8	5	5	9	9.7	73
10-Jan	Z	4	6	7	10	27	28	8	3	8	6	3	1	1	0	1	1	1	1	0	0	0	0	0	5.1	28
11-Jan	Z	2	74	101	7	4	8	7	8	5	13	5	10	10	7	6	8	7	6	6	9	9	8	10	14.3	101
12-Jan	Z	8	8	6	5	4	4	6	0	5	3	1	2	4	1	0	0	0	0	0	0	1	1	1	2.5	8
13-Jan	Z	3	1	1	0	0	11	30	32	7	7	2	0	0	1	0	0	0	0	0	0	6	5	10	5.1	32
14-Jan	Z	5	8	11	24	44	73	67	48	26	27	23	26	20	19	19	12	8	4	1	1	1	9	12	21.2	73
15-Jan	Z	1	0	1	1	0	1	2	2	2	1	1	2	1	1	0	1	0	0	0	1	0	0	0	0.7	2
16-Jan	Z	1	0	12	41	28	2	1	1	0	4	9	5	5	4	3	0	0	0	0	0	0	0	0	5.2	41
17-Jan	Z	12	0	0	0	0	0	0	0	1	3	3	9	8	7	14	5	2	0	0	0	0	0	0	2.8	14
18-Jan	Z	0	1	1	26	24	3	2	1	4	7	17	94	41	9	4	7	10	6	16	21	39	20	1	15.5	94
19-Jan	Z	0	0	39	36	1	1	6	4	4	11	19	25	31	28	19	12	10	9	5	7	0	0	0	11.5	39
20-Jan	Z	0	0	0	0	0	0	0	0	2	4	3	6	7	6	7	1	1	48	69	28	9	6	9	9.0	69
21-Jan	Z	35	9	0	0	18	19	3	C	C	C	C	C	C	0	0	0	0	0	1	0	3	1	0	--	35
22-Jan	Z	0	0	0	0	0	0	0	1	7	9	11	9	7	6	3	0	0	0	0	2	0	0	0	2.5	11
23-Jan	Z	0	0	0	0	0	0	0	1	1	1	4	5	4	1	0	1	8	2	0	0	0	0	0	1.2	8
24-Jan	Z	0	26	9	11	8	10	4	8	8	8	8	6	6	1	0	0	0	0	0	0	0	0	0	4.9	26
25-Jan	Z	0	0	2	16	10	13	3	1	24	25	23	13	7	14	12	20	14	10	4	3	13	15	13	11.1	25
26-Jan	Z	18	7	13	12	9	8	7	1	1	0	0	1	2	1	0	0	0	4	5	4	12	3	2	4.8	18
27-Jan	Z	0	0	1	0	1	11	26	23	29	20	13	7	8	8	8	4	0	1	0	0	0	0	1	7.1	29
28-Jan	Z	0	0	0	0	6	35	20	28	24	26	12	8	10	40	53	60	12	15	19	20	14	17	10	18.7	60
29-Jan	Z	5	6	1	5	12	31	33	13	12	16	13	13	11	9	8	8	6	5	4	5	5	3	6	10.0	33
30-Jan	Z	8	8	4	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1.0	8
31-Jan	Z	10	15	4	12	69	34	8	2	19	11	14	12	10	10	12	8	12	10	1	0	0	0	0	11.9	69
	--	8.9	8.8	10.0	9.9	11.1	11.8	9.9	7.0	8.6	10.3	9.3	12.4	13.5	13.2	15.5	11.9	7.5	8.9	8.5	7.3	6.6	4.8	5.1	Diurnal Average	
	--	99	74	101	41	69	73	67	48	34	33	29	94	73	58	107	91	51	64	69	56	39	20	19	Diurnal Maximum	

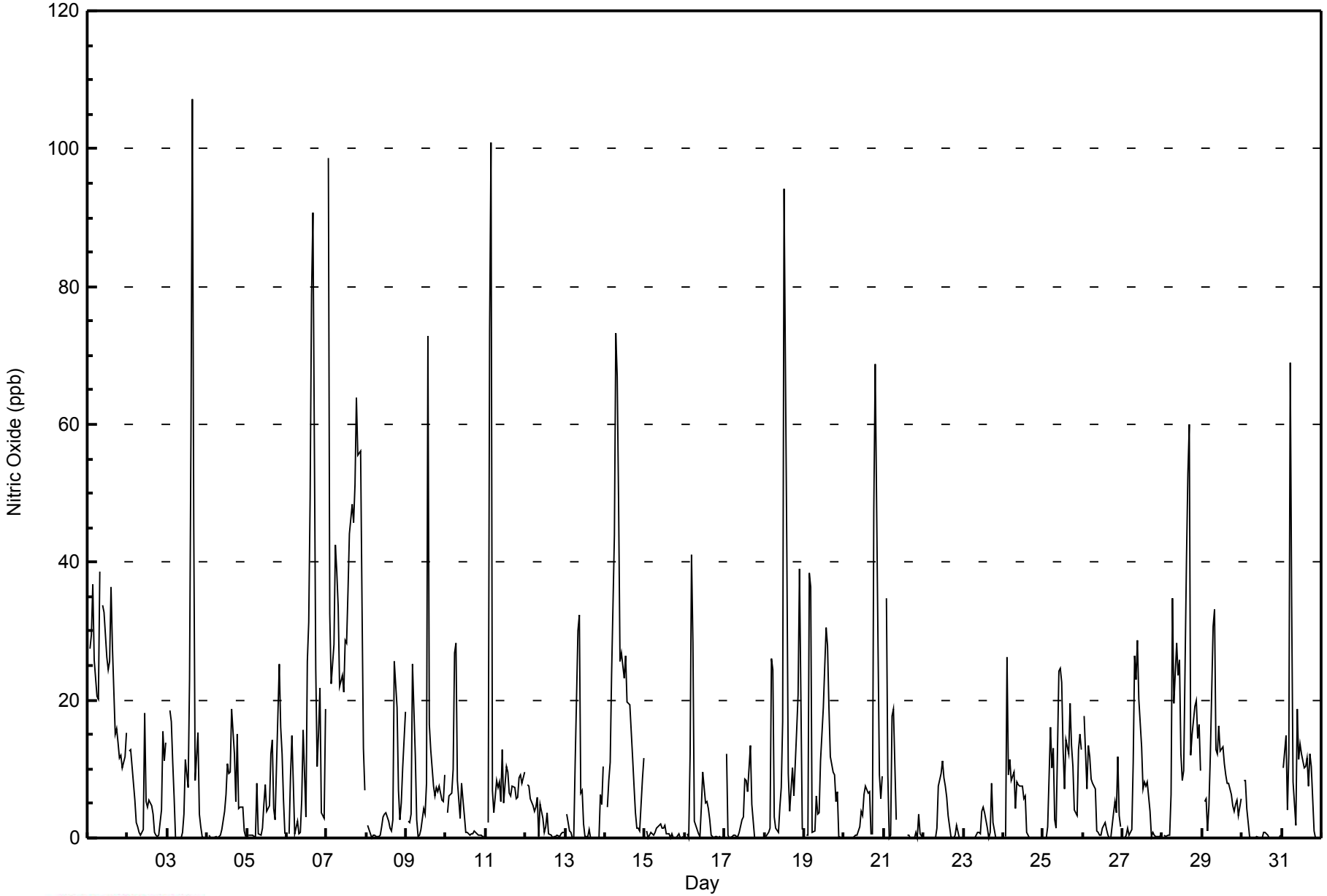
Z - zerospan C - Calibration MS - Missing

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	607	85.98	85.98
21 - 40	69	9.77	95.75
11 - 80	25	3.54	99.29
81 - 159	5	0.71	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	40	68	40	32	15	6	8	19	95	150	46	23	18	18	16	12	606
21 - 40	2	7	1	2	0	0	1	1	10	17	9	5	1	4	5	4	69
11 - 80	1	0	2	0	0	0	0	1	2	6	3	2	0	1	6	1	25
81 - 159	0	2	0	1	0	0	0	0	0	0	0	1	0	1	0	0	5
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	77	43	35	15	6	9	21	107	173	58	31	19	24	27	17	705

Total Number of Valid Hours: 705

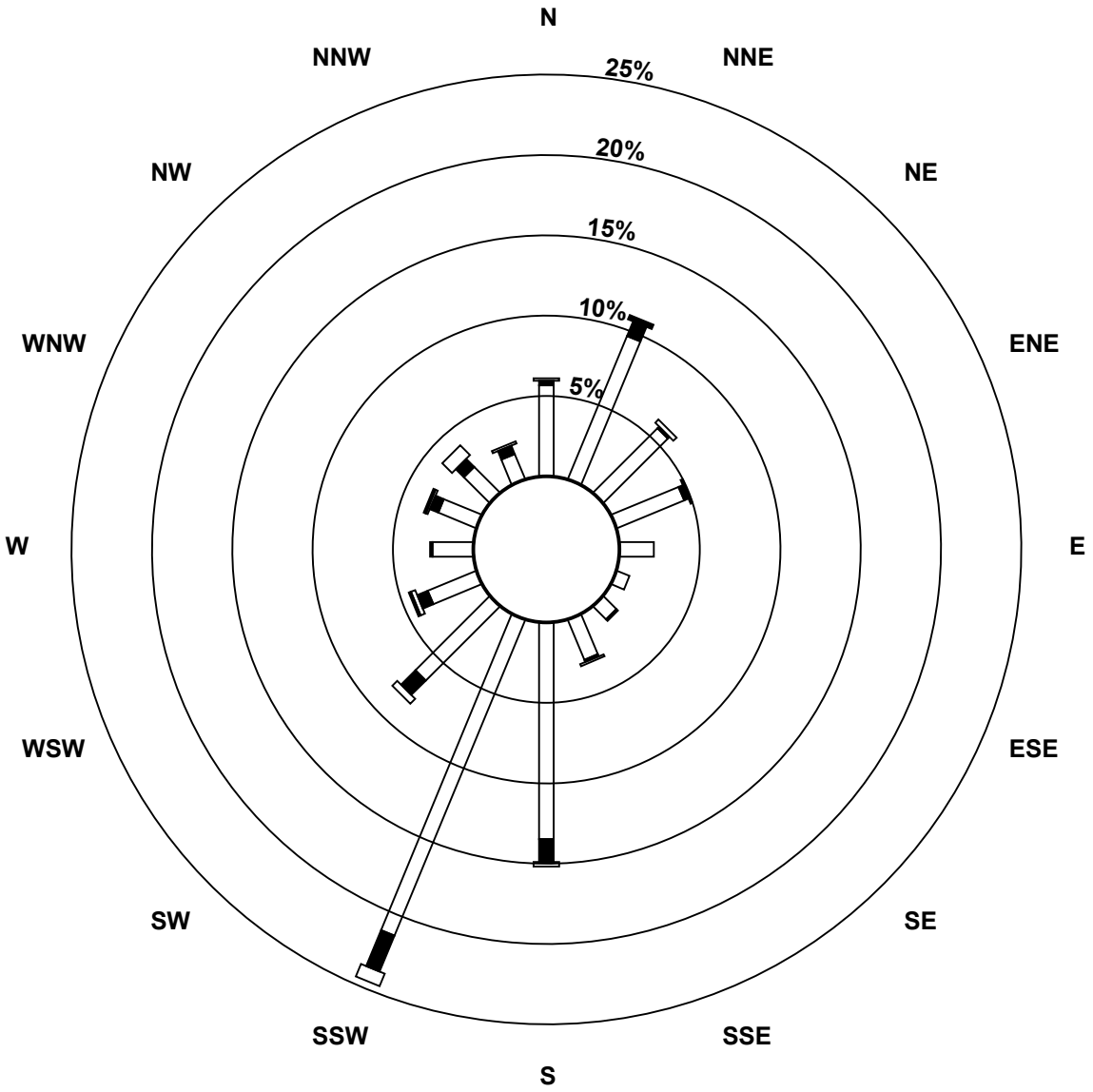
Total Number of Hours: 744

Wood Buffalo Environmental Association

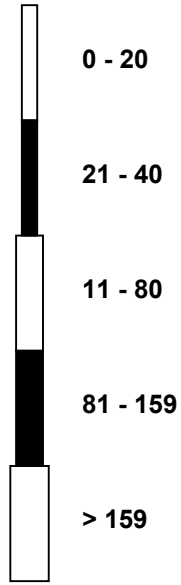
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



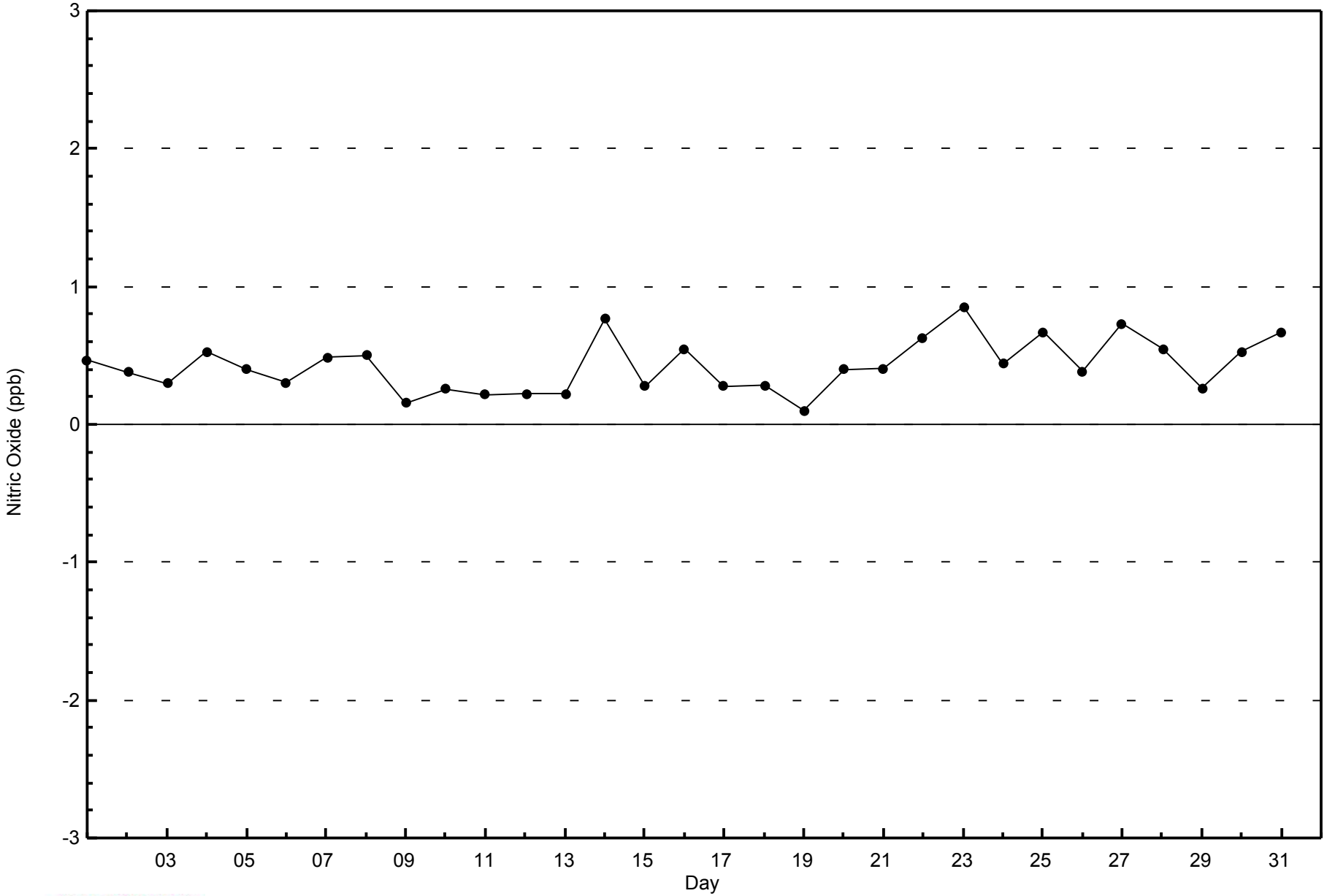
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2014



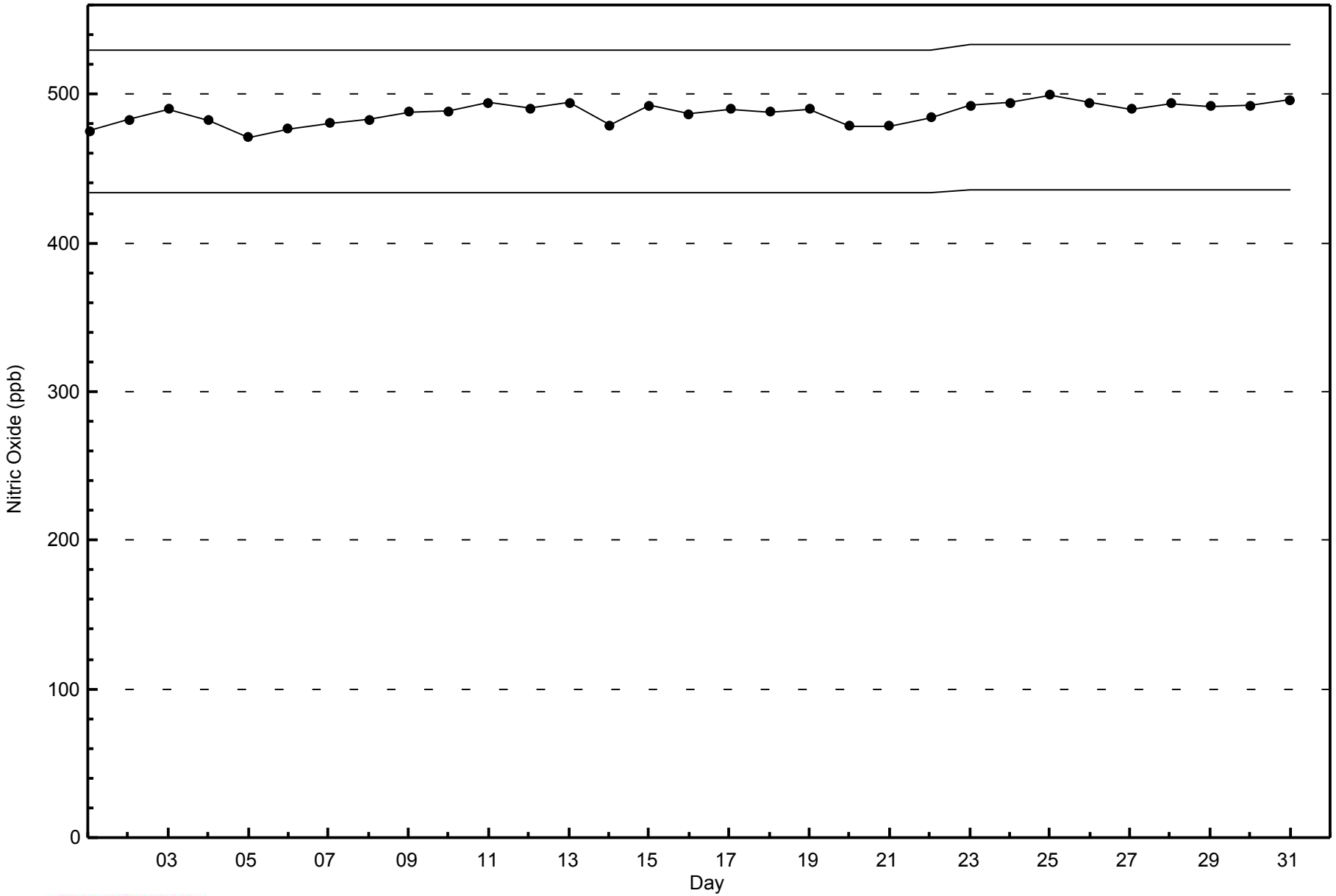
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 49 ppb on Jan 3 16:00 Maximum Daily Average: 34.4 ppb on Jan 7

Minimum Value: 0 ppb on Jan 22 03:00 Minimum Daily Average: 7.0 ppb on Jan 15
Maximum Diurnal Average: 20.9 ppb at hour 7 Minimum Diurnal Average: 14.1 ppb at hour 12
Monthly Average: 18.7 ppb Percentiles: P_1 = 1 P_{10} = 5 Q_1 = 12 Median = 17 Q_3 = 26 P_{90} = 32 P_{99} = 43

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	Z	21	23	23	20	18	18	18	MS	18	16	17	16	17	21	22	21	21	21	20	21	20	21	22	19.7	23
2-Jan	Z	21	24	23	22	21	21	19	16	13	22	14	14	14	14	17	18	18	17	16	22	28	17	15	18.5	28
3-Jan	Z	16	17	11	10	2	1	6	9	8	10	15	13	26	42	49	39	30	40	17	13	10	13	13	17.8	49
4-Jan	Z	15	12	6	12	7	7	7	11	15	12	16	15	14	20	33	30	21	32	24	22	25	18	15	16.9	33
5-Jan	Z	13	14	19	16	12	19	13	13	13	14	17	10	13	24	31	29	30	30	35	34	33	30	22	21.1	35
6-Jan	Z	13	33	36	35	26	28	25	22	23	32	12	28	32	41	49	49	37	34	33	35	26	26	31	30.5	49
7-Jan	Z	47	37	35	32	32	32	30	27	24	20	24	26	32	39	43	43	40	43	36	41	39	36	34	34.4	47
8-Jan	Z	30	25	19	21	22	24	21	20	19	16	13	13	13	12	14	21	35	31	30	28	28	28	28	22.1	35
9-Jan	Z	19	14	18	28	26	18	6	10	10	11	10	17	35	22	19	17	14	14	12	12	14	13	16	16.2	35
10-Jan	Z	15	14	19	25	31	29	21	14	21	15	11	3	4	3	8	18	24	21	16	17	21	14	15	16.5	31
11-Jan	Z	21	37	43	22	10	22	20	16	15	17	11	15	16	16	15	13	11	16	14	12	12	13	12	17.3	43
12-Jan	Z	12	14	11	9	9	19	25	7	29	15	4	5	9	3	5	4	12	18	17	21	30	30	30	14.7	30
13-Jan	Z	30	23	26	12	10	21	35	33	18	11	5	2	2	3	2	2	3	2	5	14	17	30	31	14.6	35
14-Jan	Z	26	27	27	34	37	41	40	37	33	31	27	27	25	27	30	31	32	31	28	29	28	30	29	30.7	41
15-Jan	Z	7	1	4	3	3	2	3	6	11	6	7	14	6	7	3	3	3	3	4	18	16	17	14	7.0	18
16-Jan	Z	13	14	25	34	35	28	27	23	9	19	21	16	19	20	22	19	16	16	15	15	16	12	17	19.5	35
17-Jan	Z	34	18	10	17	20	6	5	5	9	10	9	23	24	22	27	8	4	1	2	3	1	3	5	11.6	34
18-Jan	Z	12	15	17	31	33	28	27	23	21	17	20	44	27	14	11	15	25	17	27	31	39	35	16	23.6	44
19-Jan	Z	5	10	34	33	5	3	14	16	15	16	19	21	23	20	16	14	13	14	12	13	3	4	7	14.2	34
20-Jan	Z	7	6	11	13	16	20	21	18	14	13	10	16	20	20	22	15	19	36	41	25	20	14	20	18.2	41
21-Jan	Z	34	20	8	15	29	26	21	C	C	C	C	C	C	1	2	2	4	7	14	12	25	16	2	--	34
22-Jan	Z	2	0	1	6	3	8	13	25	24	18	17	15	14	14	14	13	16	21	28	30	24	18	14	14.5	30
23-Jan	Z	13	14	13	11	10	8	9	16	11	5	10	11	13	7	2	7	28	25	19	7	3	4	6	11.0	28
24-Jan	Z	10	33	26	27	18	15	10	13	11	10	11	9	10	2	2	2	1	1	5	11	11	11	10	11.1	33
25-Jan	Z	11	16	23	30	29	31	20	18	28	25	21	13	14	18	20	23	22	23	20	15	20	22	22	20.9	31
26-Jan	Z	21	17	19	18	14	13	10	4	5	3	4	7	9	10	8	6	4	21	33	30	31	27	25	14.7	33
27-Jan	Z	15	19	21	17	19	25	29	29	27	22	17	13	15	18	24	27	30	31	30	31	28	28	30	23.6	31
28-Jan	Z	25	24	26	27	33	37	35	36	32	29	19	15	20	35	42	37	21	14	17	19	16	21	20	26.0	42
29-Jan	Z	13	12	11	24	31	39	40	24	16	17	14	17	15	15	16	21	24	20	21	23	24	22	23	20.9	40
30-Jan	Z	27	29	21	9	11	15	15	4	4	2	1	2	4	7	6	8	14	9	9	6	5	3	13	9.8	29
31-Jan	Z	27	28	19	29	49	44	34	30	30	24	28	25	22	26	29	26	35	36	13	6	13	10	7	25.6	49
	--	18.5	19.0	19.3	20.7	19.9	20.9	20.0	18.1	17.5	15.8	14.1	15.4	16.8	17.5	19.4	18.7	19.4	20.8	19.7	19.8	20.2	18.9	18.1	Diurnal Average	
	--	47	37	43	35	49	44	40	37	33	32	28	44	35	42	49	49	40	43	41	41	39	36	34	Diurnal Maximum	

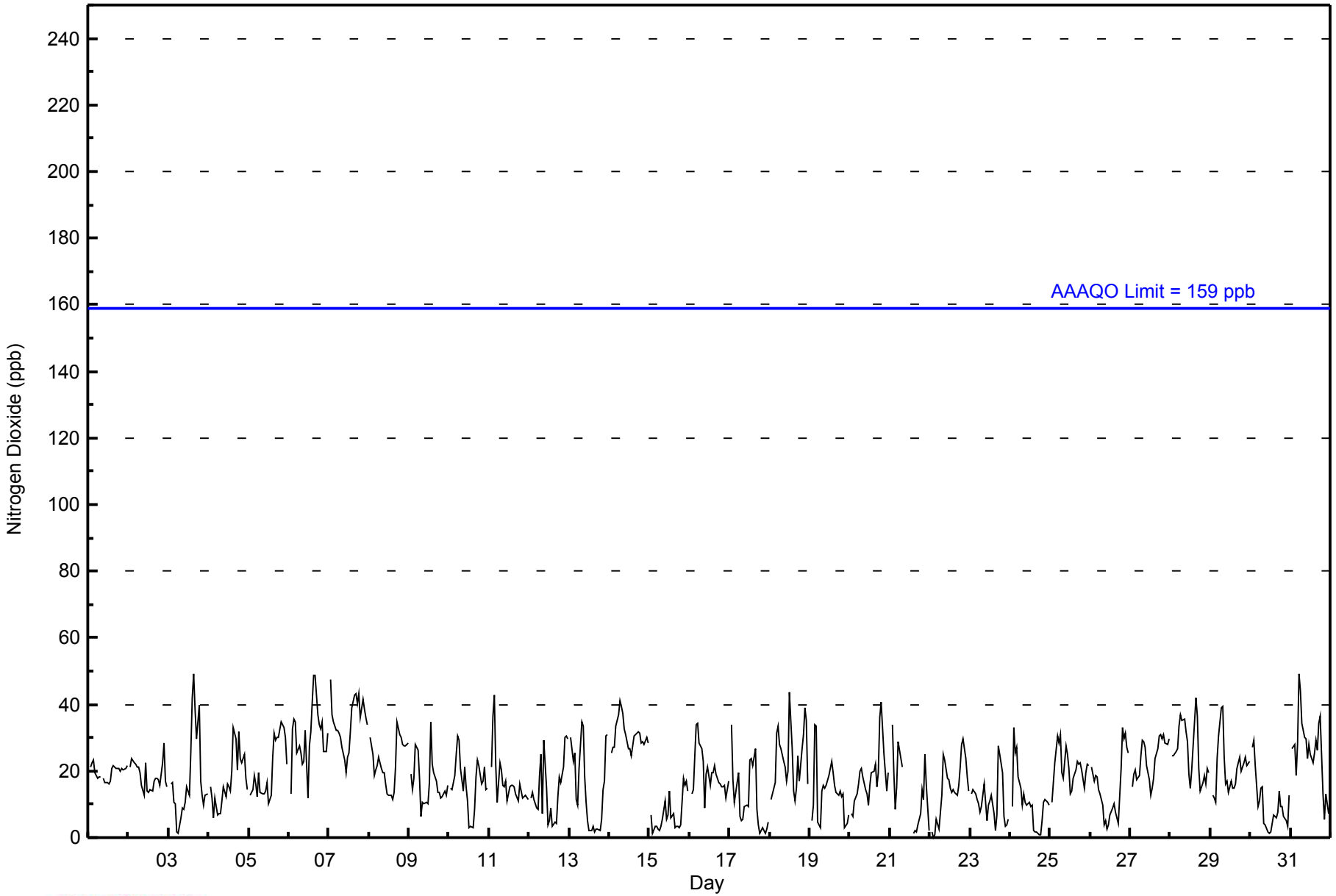
Z - zerospan C - Calibration MS - Missing
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	420	59.49	59.49
21 - 40	269	38.10	97.59
11 - 80	17	2.41	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	19	59	37	29	9	3	7	12	69	103	20	15	16	14	5	2	419
21 - 40	24	16	6	5	6	3	2	9	38	66	37	14	3	7	18	15	269
11 - 80	0	2	0	1	0	0	0	0	0	4	1	2	0	3	4	0	17
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	43	77	43	35	15	6	9	21	107	173	58	31	19	24	27	17	705

Total Number of Valid Hours: 705

Total Number of Hours: 744

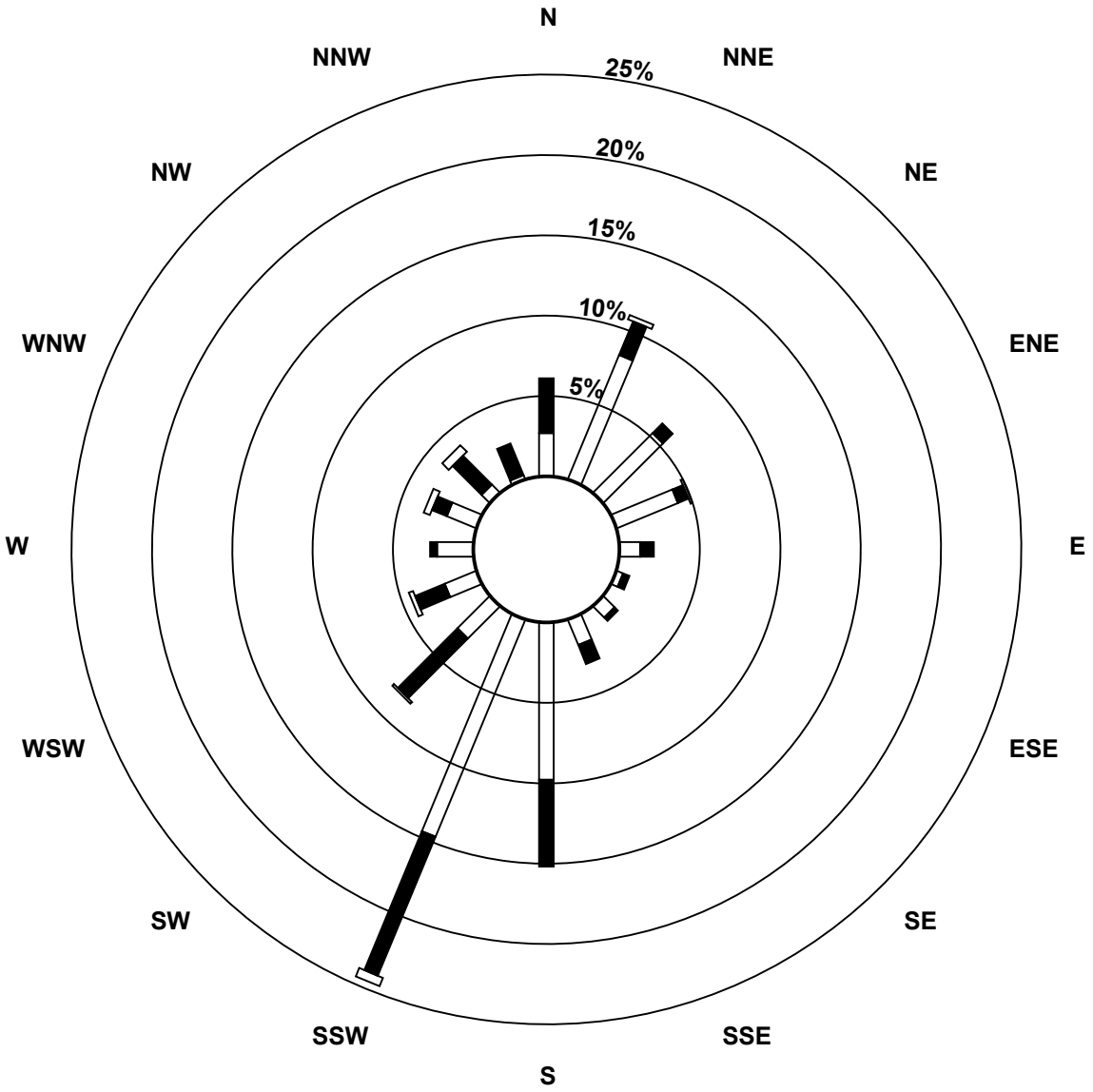
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

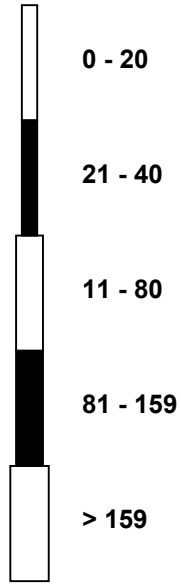
Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



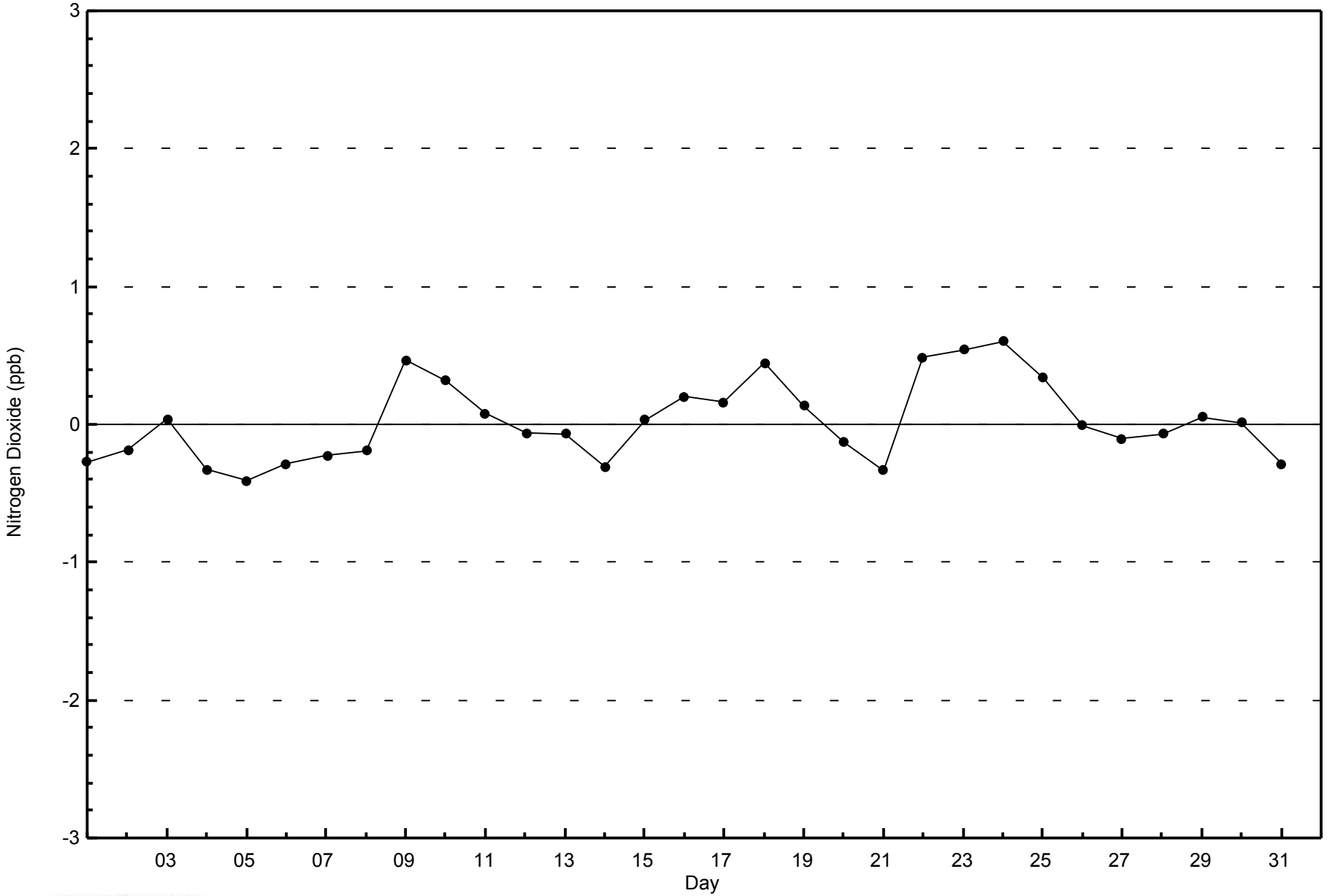
Total Number of Valid Hours: 705

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2014



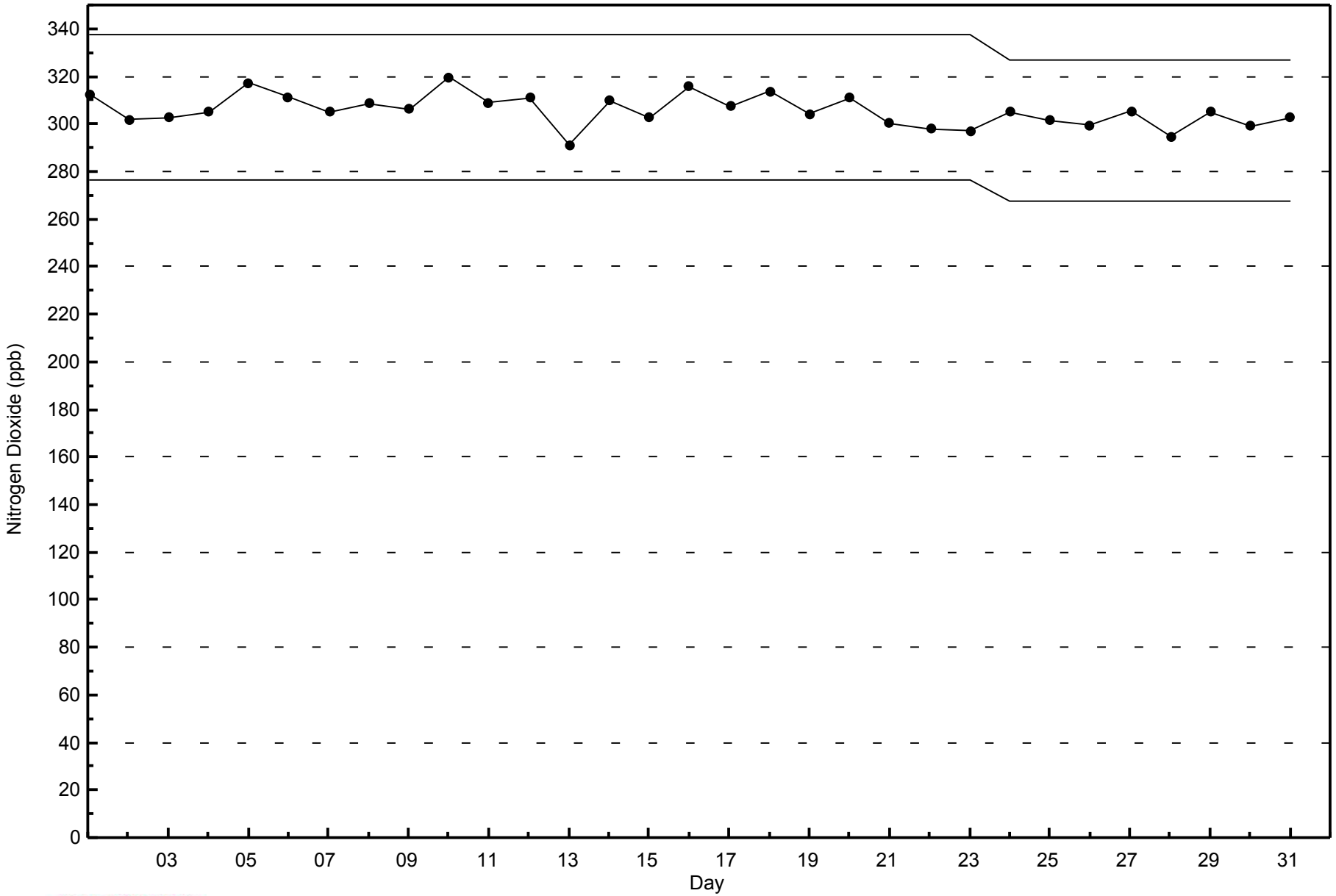
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2014

Maximum Value: 156 ppb on Jan 3 16:00

Maximum Daily Average: 72.5 ppb on Jan 7

Minimum Value: 0 ppb on Jan 22 03:00

Minimum Daily Average: 7.7 ppb on Jan 15

Maximum Diurnal Average: 34.9 ppb at hour 16

Minimum Diurnal Average: 23.1 ppb at hour 24

Monthly Average: 28.2 ppb

Percentiles: $P_1 = 1$ $P_{10} = 5$ $Q_1 = 14$ Median = 23 $Q_3 = 36$ $P_{90} = 55$ $P_{99} = 113$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	Z	49	52	60	46	39	39	57	MS	52	49	43	40	42	57	49	36	36	34	32	33	31	32	37	42.9	60
2-Jan	Z	34	37	31	28	23	23	20	16	14	40	19	18	20	19	20	18	18	18	16	26	44	28	29	24.3	44
3-Jan	Z	35	34	22	16	2	1	6	9	9	14	27	20	49	100	156	84	38	55	21	14	10	13	13	32.5	156
4-Jan	Z	16	12	6	12	7	7	7	12	16	16	22	26	24	29	52	42	26	47	28	27	29	19	15	21.5	52
5-Jan	Z	13	15	19	16	13	27	14	14	15	19	24	14	17	36	46	34	32	41	60	50	45	36	22	27.0	60
6-Jan	Z	14	41	50	43	26	30	26	23	28	48	15	53	63	90	127	140	61	44	48	56	29	29	50	49.4	140
7-Jan	Z	146	69	57	60	75	70	64	49	47	41	53	54	68	83	91	89	91	107	92	98	73	49	41	72.5	146
8-Jan	Z	32	25	19	21	22	24	21	20	21	19	17	16	15	13	14	24	60	50	37	30	33	38	47	26.9	60
9-Jan	Z	21	16	21	53	38	21	6	11	11	15	14	24	108	38	32	24	20	21	18	20	19	18	25	25.9	108
10-Jan	Z	19	20	25	35	57	58	29	17	29	21	15	4	4	4	9	19	25	22	16	18	21	15	15	21.6	58
11-Jan	Z	24	110	143	28	14	31	27	24	20	30	16	25	25	22	21	21	18	22	20	21	21	20	21	31.6	143
12-Jan	Z	20	21	17	14	12	23	31	7	34	18	5	7	12	4	5	4	13	19	17	21	31	31	30	17.2	34
13-Jan	Z	33	24	26	12	10	32	65	66	25	18	7	2	2	4	2	2	2	2	5	14	23	35	41	19.8	66
14-Jan	Z	30	35	38	57	81	115	107	86	59	58	50	53	44	47	50	43	39	35	30	30	29	39	40	51.9	115
15-Jan	Z	8	1	4	4	3	3	5	7	13	7	8	16	7	8	3	4	3	3	4	19	16	17	14	7.7	19
16-Jan	Z	14	14	37	75	63	31	28	23	9	24	31	21	25	24	24	19	16	16	16	15	16	12	17	24.7	75
17-Jan	Z	46	18	10	17	20	7	5	5	10	13	13	32	32	28	40	13	6	1	2	3	1	2	5	14.4	46
18-Jan	Z	12	16	18	57	58	31	28	23	25	24	37	138	68	23	15	22	35	23	42	52	78	56	17	39.0	138
19-Jan	Z	5	10	73	70	5	4	20	19	19	27	38	46	53	48	35	26	22	23	18	20	3	4	7	25.8	73
20-Jan	Z	7	6	11	13	16	20	21	19	16	17	13	22	27	26	29	16	20	84	109	53	29	20	29	27.1	109
21-Jan	Z	69	29	8	16	47	45	24	C	C	C	C	C	C	1	3	2	4	7	15	12	28	16	2	--	69
22-Jan	Z	2	0	1	5	3	8	13	26	31	27	29	24	21	20	17	13	15	21	28	31	24	18	14	17.0	31
23-Jan	Z	13	14	13	11	10	8	9	17	12	6	14	16	16	9	2	8	36	27	19	6	3	4	6	12.1	36
24-Jan	Z	10	59	35	39	26	25	14	21	18	17	18	15	16	3	2	2	1	1	5	11	11	11	10	16.1	59
25-Jan	Z	11	16	24	46	39	44	22	19	52	50	43	26	21	32	32	42	36	33	24	18	32	37	35	32.0	52
26-Jan	Z	39	24	32	30	23	21	17	5	6	3	4	8	11	11	8	6	4	24	38	33	43	30	27	19.5	43
27-Jan	Z	15	19	22	18	20	36	56	52	56	42	31	20	23	25	32	31	30	31	30	31	29	28	30	30.7	56
28-Jan	Z	25	25	26	27	40	71	55	64	55	55	31	23	30	75	95	97	33	29	36	39	31	37	29	44.7	97
29-Jan	Z	18	18	12	29	43	70	73	37	29	33	26	30	26	24	24	29	30	25	25	27	30	25	29	30.8	73
30-Jan	Z	36	38	26	10	11	15	15	5	4	1	1	2	5	8	6	7	14	9	9	6	5	3	13	10.8	38
31-Jan	Z	37	43	23	41	118	78	42	32	48	35	42	37	32	36	41	34	47	47	14	6	13	10	7	37.5	118
	--	27.4	27.8	29.3	30.6	31.0	32.8	29.9	25.1	26.1	26.1	23.5	27.7	30.2	30.6	34.9	30.6	26.9	29.7	28.2	27.1	26.8	23.6	23.1	Diurnal Average	
	--	146	110	143	75	118	115	107	86	59	58	53	138	108	100	156	140	91	107	109	98	78	56	50	Diurnal Maximum	

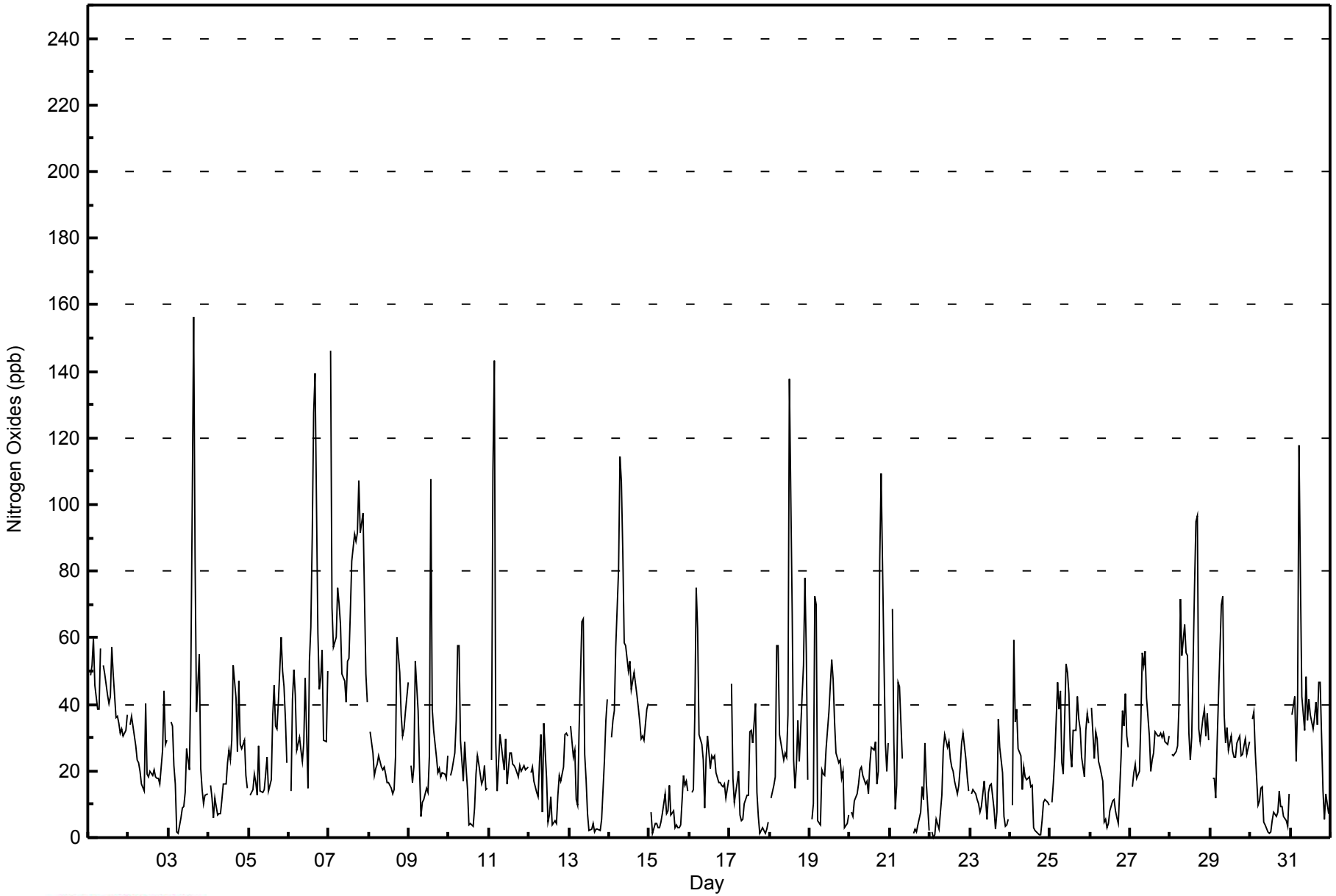
Z - zerospan C - Calibration MS - Missing

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	307	43.48	43.48
21 - 40	257	36.40	79.89
11 - 80	115	16.29	96.18
81 - 159	26	3.68	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	2	17	27	28	8	3	7	12	60	79	15	14	16	13	5	1	307
21 - 40	34	49	12	3	4	1	1	5	27	64	28	7	2	5	7	7	256
11 - 80	6	9	3	3	3	2	1	3	20	24	12	7	1	4	9	8	115
81 - 159	1	2	1	1	0	0	0	1	0	5	3	3	0	2	6	1	26
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	43	77	43	35	15	6	9	21	107	172	58	31	19	24	27	17	704

Total Number of Valid Hours: 705

Total Number of Hours: 744

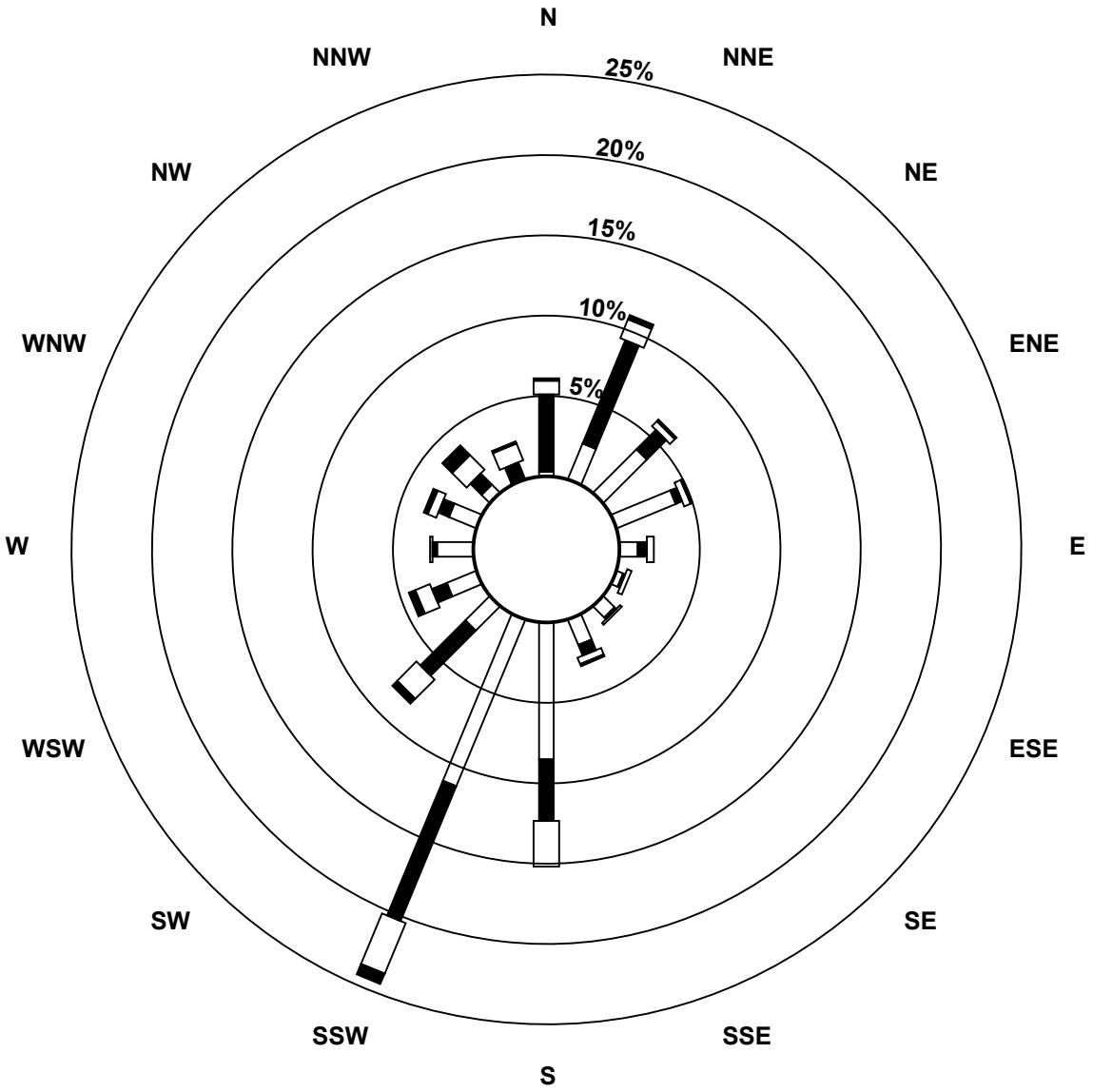
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

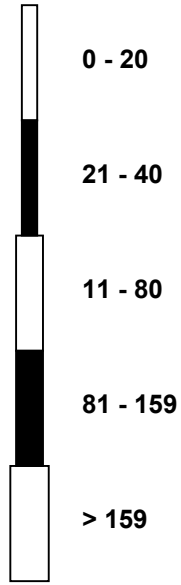
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River (AMS 16)



Classes (ppb)



0 - 20

21 - 40

11 - 80

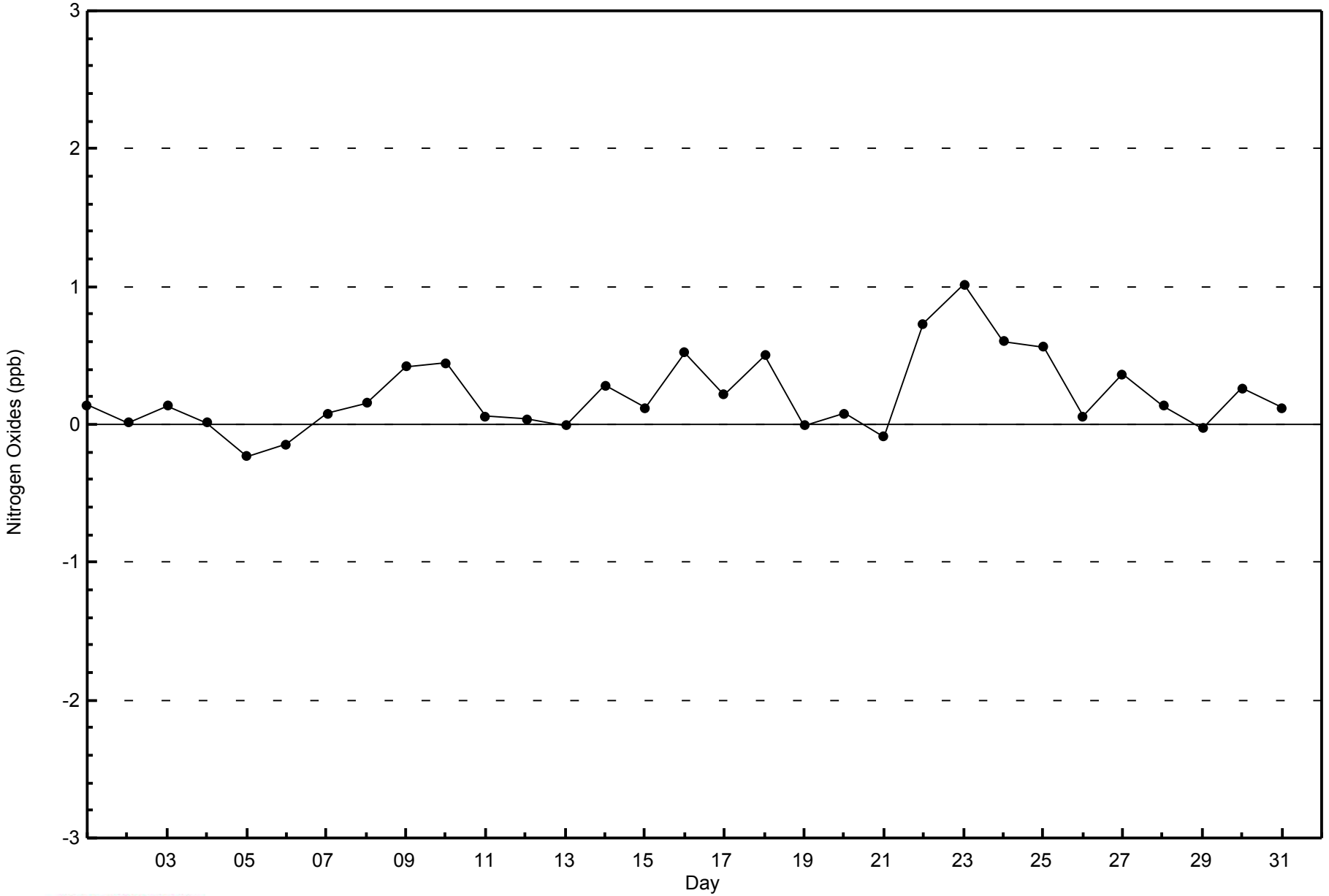
81 - 159

> 159

Total Number of Valid Hours: 705

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Shell Muskeg River - January 2014



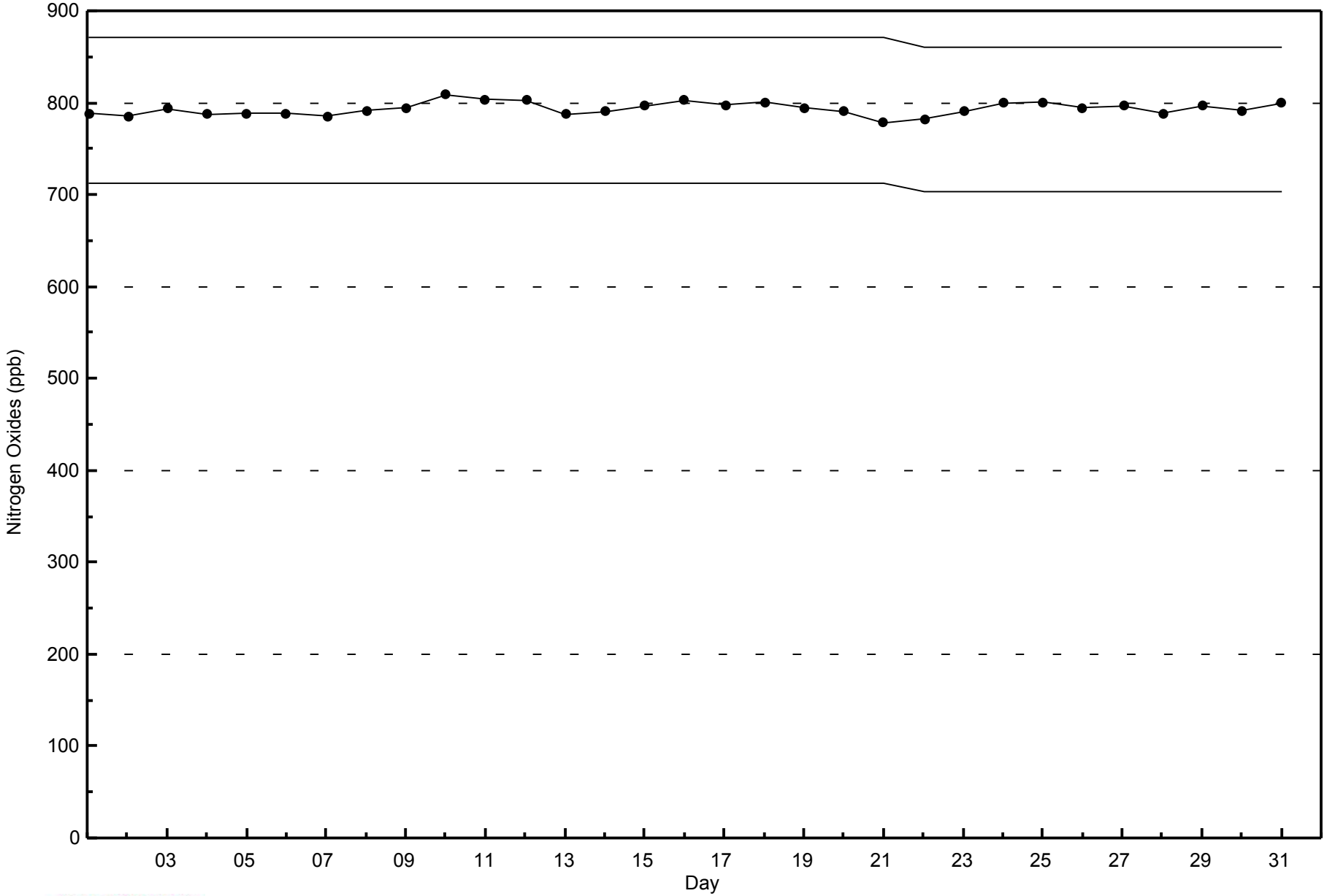
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Shell Muskeg River - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 34.9 $\mu g/m^3$ on Jan 19 04:00

Maximum Daily Average: 15.5 $\mu g/m^3$ on Jan 9

Minimum Value: 0.2 $\mu g/m^3$ on Jan 30 11:00

Minimum Daily Average: 2.1 $\mu g/m^3$ on Jan 15

Maximum Diurnal Average: 6.7 $\mu g/m^3$ at hour 4

Minimum Diurnal Average: 4.1 $\mu g/m^3$ at hour 12

Monthly Average: 5.52 $\mu g/m^3$

Percentiles: $P_1 = 0.6$ $P_{10} = 1.6$ $Q_1 = 2.5$ Median = 4.4 $Q_3 = 7.1$ $P_{90} = 10.6$ $P_{99} = 23.4$

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	8.1	8.5	7.6	6.7	6.6	4.9	10.4	9.0	MS	5.9	12.6	6.1	4.7	4.2	5.9	8.1	7.3	7.5	7.2	6.6	6.6	6.2	5.9	6.2	7.1	12.6
2-Jan	5.7	4.9	4.6	4.2	3.9	3.6	3.8	3.4	3.2	2.9	4.0	4.7	6.8	7.8	7.9	9.2	6.1	5.7	4.4	3.9	3.4	3.2	2.9	3.0	4.7	9.2
3-Jan	3.5	3.4	3.4	2.2	2.0	1.5	1.5	1.7	1.6	1.6	2.1	3.1	2.9	4.2	7.3	13.2	6.5	3.9	3.4	4.7	5.3	5.3	10.5	5.4	4.2	13.2
4-Jan	5.6	7.4	6.0	1.9	2.2	2.5	2.0	3.0	3.6	3.3	4.0	4.6	10.3	8.7	7.9	7.8	8.1	8.0	11.8	7.7	13.7	6.2	6.7	9.3	6.3	13.7
5-Jan	7.3	6.2	6.1	4.7	3.7	2.6	6.1	3.8	2.3	2.9	3.7	4.3	2.4	2.7	5.3	9.4	9.8	8.5	8.6	7.1	5.1	4.6	3.7	3.3	5.2	9.8
6-Jan	3.1	1.8	3.6	4.7	4.7	3.4	3.9	3.9	2.9	3.4	4.6	2.1	4.1	5.4	7.0	8.0	10.3	5.9	4.5	4.9	5.0	3.3	2.7	5.1	4.5	10.3
7-Jan	8.8	13.1	7.1	8.4	7.1	7.3	7.2	5.7	5.2	4.2	4.9	6.3	6.5	9.8	12.4	14.4	15.8	16.8	18.5	13.8	12.6	8.7	9.8	24.0	10.3	24.0
8-Jan	19.0	10.3	5.1	3.7	4.2	3.6	3.4	4.3	4.0	5.1	5.0	7.4	8.1	12.4	16.4	11.9	14.5	10.8	12.0	14.0	12.4	11.3	11.2	11.9	9.2	19.0
9-Jan	11.1	12.7	15.4	18.4	23.5	26.7	19.6	16.7	19.5	21.7	20.2	20.0	23.7	27.0	21.4	11.6	6.7	10.0	11.0	9.1	8.1	7.6	6.6	4.5	15.5	27.0
10-Jan	3.3	2.9	2.8	3.8	5.0	6.0	6.5	5.2	4.2	4.2	3.6	2.9	2.4	2.3	2.2	2.7	3.5	3.8	3.2	3.5	4.4	5.6	4.2	3.3	3.8	6.5
11-Jan	3.5	3.9	10.4	11.1	6.5	4.5	4.9	3.2	2.5	3.3	3.1	3.1	3.3	3.3	3.8	3.5	3.2	2.5	4.3	3.5	2.6	1.9	2.2	1.5	4.0	11.1
12-Jan	2.1	1.4	1.9	1.3	1.6	2.0	2.3	2.6	1.3	2.3	1.6	1.3	1.8	1.7	1.4	4.4	2.7	2.5	2.1	2.4	2.9	3.6	8.2	6.3	2.6	8.2
13-Jan	6.0	5.6	6.5	10.2	7.9	7.2	7.3	9.9	9.4	4.9	2.3	1.7	1.7	1.5	1.5	1.4	1.4	2.2	2.2	2.0	2.7	4.4	3.4	5.5	4.5	10.2
14-Jan	2.8	3.7	5.6	11.8	15.3	9.7	10.9	9.6	6.2	4.1	4.0	4.1	4.7	5.5	6.0	7.7	7.6	7.6	5.6	4.8	2.9	1.6	2.1	4.8	6.2	15.3
15-Jan	6.9	3.1	0.7	0.7	0.7	0.7	0.7	1.0	0.8	0.7	0.6	0.6	0.7	0.6	1.6	1.8	2.2	2.4	2.4	2.4	4.0	4.1	5.5	4.9	2.1	6.9
16-Jan	4.2	3.4	5.1	8.8	8.7	7.1	4.1	3.4	3.1	1.2	1.5	2.0	3.9	7.7	16.1	16.0	9.0	6.7	6.7	7.6	6.5	4.7	4.7	3.3	6.1	16.1
17-Jan	4.5	4.0	4.1	3.7	1.7	3.6	1.8	1.0	1.0	2.5	1.9	1.2	1.4	2.2	1.8	2.6	2.1	2.5	2.2	2.2	2.1	2.0	1.8	1.8	2.3	4.5
18-Jan	2.1	2.0	2.0	2.8	5.5	5.9	6.1	5.9	6.4	7.2	4.9	2.8	6.3	3.4	3.2	3.8	3.8	5.2	4.2	8.0	12.2	9.8	9.4	9.3	5.5	12.2
19-Jan	9.6	28.5	32.9	34.9	19.3	5.8	3.1	2.0	2.0	2.3	2.3	3.2	3.2	3.1	4.5	4.0	5.8	5.0	4.1	4.3	3.0	2.1	2.3	2.5	7.9	34.9
20-Jan	2.8	2.8	2.6	3.7	3.9	4.4	4.5	5.7	5.0	4.5	4.6	4.4	4.5	6.3	6.8	9.4	7.4	7.2	12.6	15.4	11.1	6.1	5.4	5.7	6.1	15.4
21-Jan	5.0	10.6	5.5	4.7	5.2	6.6	6.4	5.5	6.7	10.0	4.9	2.4	1.8	M	1.0	1.0	0.9	0.9	1.1	1.5	1.6	2.6	2.0	1.3	3.9	10.6
22-Jan	1.2	1.6	1.2	1.3	1.6	1.4	1.9	2.1	3.4	4.7	3.5	3.5	3.6	3.1	1.8	1.7	2.7	5.5	5.1	6.6	5.6	5.3	7.2	9.1	3.5	9.1
23-Jan	11.9	11.3	10.3	7.4	3.9	3.7	3.4	2.6	2.1	1.4	1.4	1.8	4.4	6.3	5.5	4.6	6.2	2.7	2.5	5.0	5.1	3.0	2.4	1.3	4.6	11.9
24-Jan	2.3	3.6	4.4	2.9	4.1	4.0	3.8	2.9	3.4	3.6	3.4	2.7	2.2	2.7	2.0	2.0	2.1	1.7	1.8	1.9	2.7	2.4	2.0	2.1	2.8	4.4
25-Jan	2.0	2.8	7.7	6.9	8.8	8.3	4.9	3.4	5.8	6.9	1.0	0.7	1.6	3.3	3.5	3.6	4.7	5.3	6.0	6.6	8.0	6.6	6.4	8.1	5.1	8.8
26-Jan	8.0	8.1	9.6	9.8	11.0	9.8	10.7	11.3	5.9	5.8	5.2	5.3	5.0	5.3	5.5	5.0	5.1	5.0	8.3	8.0	8.4	9.6	6.8	6.2	7.4	11.3
27-Jan	6.3	8.1	9.0	7.3	6.3	8.9	12.1	11.8	11.2	10.3	8.7	9.5	9.4	7.7	5.2	3.7	3.0	3.6	5.6	6.4	5.0	4.7	5.2	8.4	7.4	12.1
28-Jan	16.0	19.7	15.7	11.3	9.1	9.0	10.1	9.9	8.4	9.1	10.2	9.3	5.9	7.0	12.5	13.8	12.6	5.8	3.5	4.4	4.6	4.6	4.9	5.2	9.3	19.7
29-Jan	9.0	3.9	3.2	2.3	6.1	4.2	6.0	5.3	4.3	3.6	2.8	3.3	2.5	2.1	1.8	2.3	3.1	1.6	1.7	1.6	1.3	1.4	1.2	1.6	3.2	9.0
30-Jan	1.5	1.6	1.3	1.2	1.6	5.7	2.2	1.2	0.5	0.3	0.2	0.4	0.6	0.7	0.8	0.9	0.9	1.5	2.1	3.0	3.7	3.6	4.1	10.8	2.1	10.8
31-Jan	11.7	5.4	7.0	6.6	5.4	5.6	4.2	4.1	5.9	4.6	3.7	3.9	2.0	2.2	1.9	2.2	2.3	2.5	1.9	1.1	1.0	1.2	1.2	1.5	3.7	11.7
	6.3	6.7	6.7	6.7	6.4	5.8	5.7	5.2	4.7	4.8	4.4	4.1	4.6	5.3	5.9	6.2	5.7	5.2	5.5	5.6	5.6	4.7	4.9	5.7	Diurnal Average	
	19.0	28.5	32.9	34.9	23.5	26.7	19.6	16.7	19.5	21.7	20.2	20.0	23.7	27.0	21.4	16.0	15.8	16.8	18.5	15.4	13.7	11.3	11.2	24.0	Diurnal Maximum	

M - Maintenance MS - Missing

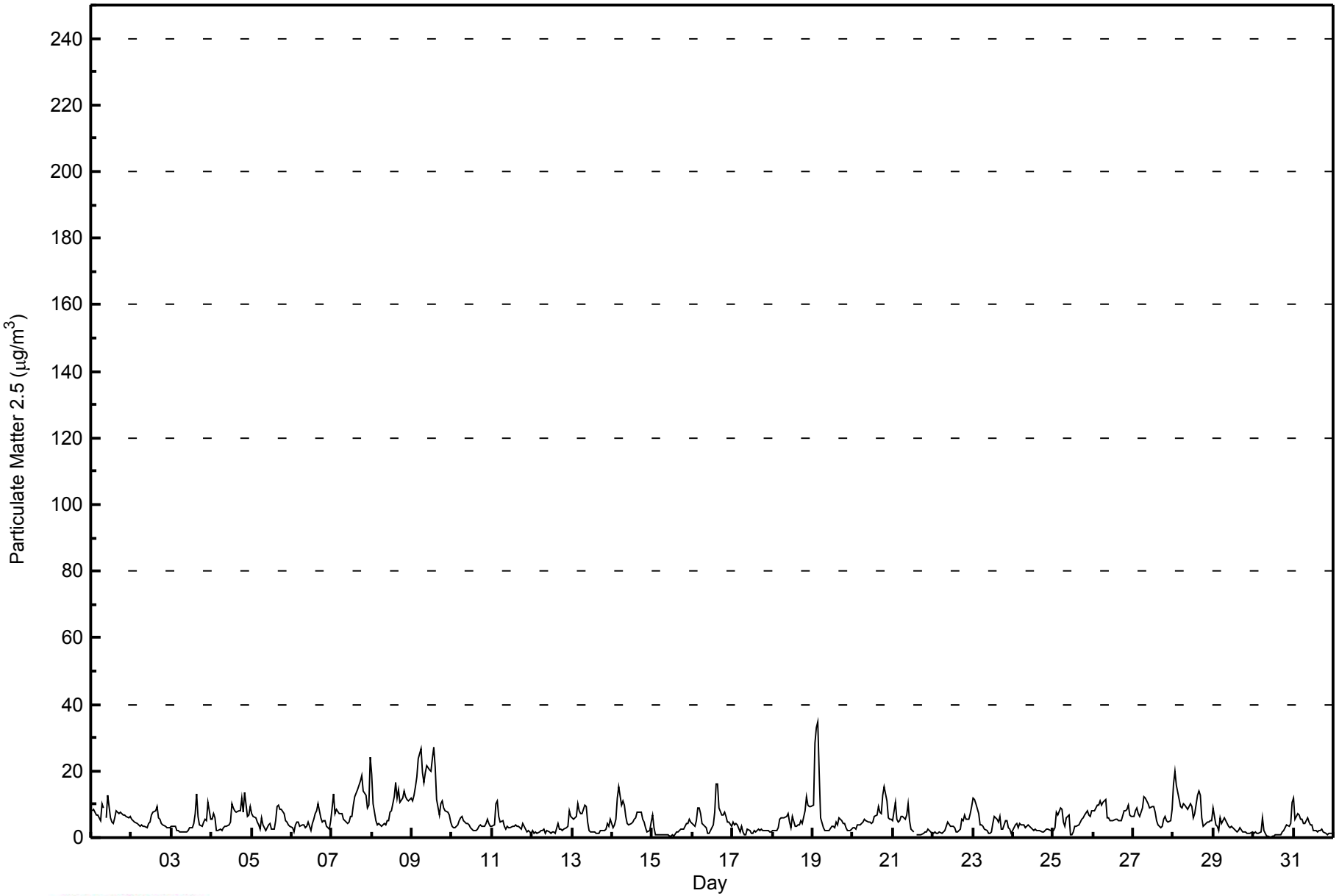
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	435	58.63	58.63
6 - 15	253	34.10	92.72
16 - 25	22	2.96	95.69
26 - 80	5	0.67	96.36
> 81.0	0	0.00	96.36

Total Number of Valid Hours: 742

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Shell Muskeg River - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	27	63	38	22	12	5	8	16	61	95	29	17	11	10	10	11	435
6 - 15	17	19	5	8	4	2	1	6	46	74	23	12	7	9	13	6	252
16 - 25	0	1	0	1	0	0	0	1	4	12	2	1	0	0	0	0	22
26 - 80	0	0	1	0	0	0	0	0	1	0	2	0	0	0	1	0	5
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	83	44	31	16	7	9	23	112	181	56	30	18	19	24	17	714

Total Number of Valid Hours: 741

Total Number of Hours: 744

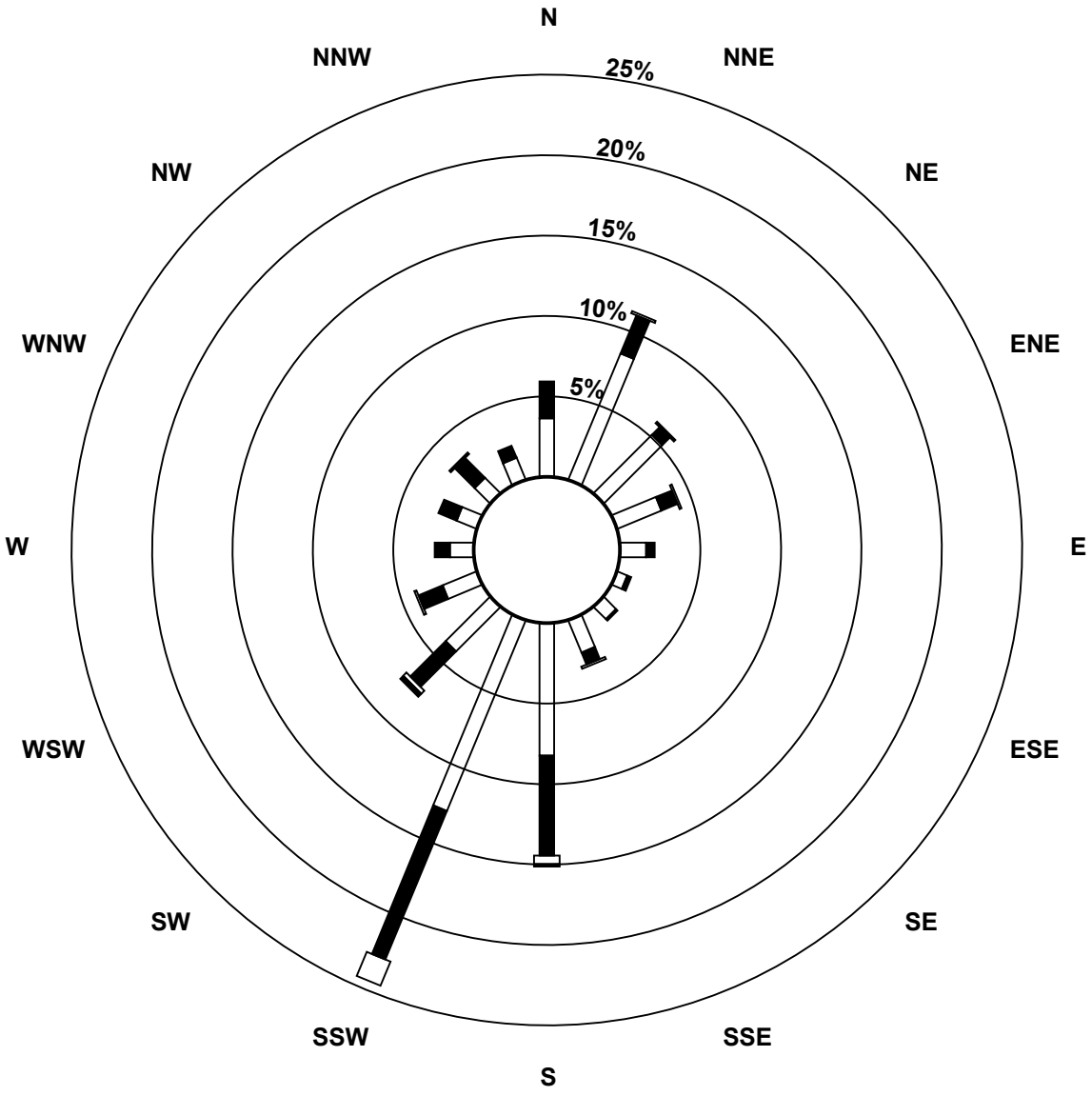
AURORA
ATMOSPHERICS INC.

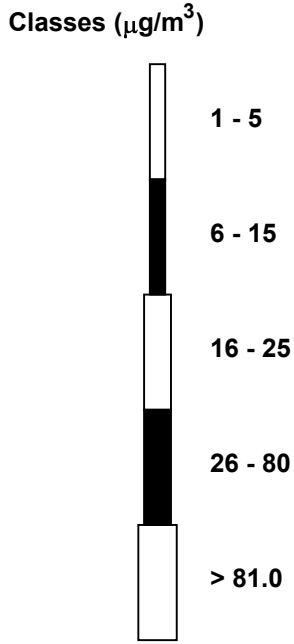
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Shell Muskeg River (AMS 16)





Total Number of Valid Hours: 741

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Shell Muskeg River - January 2014

Maximum Value: 93 % on Jan 15 00:00

Maximum Daily Average: 89.3 % on Jan 9

Minimum Value: 44 % on Jan 15 07:00

Minimum Daily Average: 65.0 % on Jan 27

Maximum Diurnal Average: 79.1 % at hour 9

Minimum Diurnal Average: 71.9 % at hour 15

Monthly Average: 76.5 %

Percentiles: P_1 = 55 P_{10} = 66 Q_1 = 71 Median = 76 Q_3 = 83 P_{90} = 87 P_{99} = 92

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	69	69	69	68	68	67	67	67	MS	67	68	70	70	69	72	74	72	72	72	73	73	74	75	76	70.6	76
2-Jan	77	78	79	80	81	82	83	84	84	85	85	85	84	85	84	86	89	90	90	89	89	89	86	86	84.6	90
3-Jan	84	82	79	75	75	72	75	76	76	76	76	75	72	68	68	73	75	71	71	71	71	73	71	72	74.0	84
4-Jan	71	70	70	72	73	71	72	72	70	67	65	64	68	74	67	67	65	65	67	66	66	66	68	69	68.6	74
5-Jan	70	69	69	69	69	69	69	70	71	70	71	70	67	64	67	69	72	73	73	74	74	74	75	75	70.5	75
6-Jan	75	74	73	74	74	74	75	76	78	78	79	78	76	76	76	78	79	79	79	78	78	78	78	78	76.7	79
7-Jan	79	79	78	77	76	75	74	73	73	72	74	77	76	72	74	75	76	75	74	73	75	76	76	76	75.2	79
8-Jan	77	79	80	81	81	82	82	83	84	83	83	81	80	80	80	81	82	82	86	86	87	87	88	89	82.6	89
9-Jan	93	92	92	92	92	92	92	91	90	90	90	90	90	89	89	88	87	86	87	85	84	86	88	87	89.3	93
10-Jan	88	86	85	85	85	85	84	83	83	83	81	80	80	81	81	81	84	86	86	86	85	86	86	86	84.1	88
11-Jan	86	86	87	86	86	85	85	85	85	87	87	86	87	87	87	86	86	85	85	85	83	84	84	83	85.5	87
12-Jan	82	81	80	77	77	77	75	76	78	79	77	75	75	70	70	74	78	81	82	81	81	81	81	82	78.0	82
13-Jan	82	84	83	85	85	85	85	85	83	82	76	75	75	75	76	75	73	74	76	78	77	77	77	77	79.2	85
14-Jan	75	74	74	74	76	77	77	78	79	80	80	80	79	79	82	85	87	88	88	89	91	92	92	93	82.1	93
15-Jan	92	86	75	55	51	46	44	53	81	85	64	62	66	66	67	68	70	71	71	77	85	87	90	89	70.9	92
16-Jan	90	89	89	92	90	91	92	91	89	85	79	81	71	69	68	71	73	72	74	78	79	79	78	77	81.2	92
17-Jan	76	78	78	79	80	82	76	73	73	72	60	58	59	60	60	65	74	74	71	70	71	71	75	82	71.5	82
18-Jan	83	85	87	84	84	85	85	88	89	90	87	81	80	76	73	78	82	86	83	83	84	86	88	90	84.1	90
19-Jan	90	92	91	91	91	90	87	82	83	87	85	82	77	78	79	75	74	74	74	73	75	71	72	76	81.2	92
20-Jan	76	76	76	77	77	77	75	74	72	72	70	67	68	68	70	72	72	74	75	76	74	72	73	73	73.1	77
21-Jan	72	75	75	77	76	75	75	76	76	77	82	77	74	73	71	70	70	71	75	79	78	79	79	79	75.4	82
22-Jan	78	78	78	78	78	78	77	77	77	77	76	74	70	65	63	65	68	71	75	79	80	83	83	83	75.4	83
23-Jan	83	85	84	84	83	85	86	86	81	80	76	70	63	60	57	60	63	65	69	73	71	75	76	79	74.8	86
24-Jan	82	79	83	82	85	87	87	85	83	82	83	85	84	84	82	82	82	83	85	84	84	84	85	85	83.6	87
25-Jan	85	87	89	92	93	92	90	90	91	85	84	85	88	86	81	76	76	78	70	62	55	59	64	62	80.0	93
26-Jan	63	65	64	70	72	71	73	73	71	70	67	67	66	61	61	60	59	62	68	71	72	73	73	72	67.6	73
27-Jan	71	72	71	71	70	70	71	70	71	72	73	70	60	55	53	56	58	60	63	62	59	59	60	61	65.0	73
28-Jan	62	61	65	66	70	69	70	71	70	70	67	64	60	61	62	63	68	75	75	74	74	75	77	77	68.5	77
29-Jan	76	77	78	77	78	75	74	72	77	79	76	73	72	74	73	72	74	71	70	71	71	70	71	70	73.6	79
30-Jan	69	68	68	70	73	73	75	77	73	71	67	64	63	61	60	62	60	61	62	65	68	70	70	72	67.5	77
31-Jan	75	77	77	77	79	81	81	81	82	81	79	74	73	73	77	76	74	74	76	79	80	76	78	78	77.4	82
	78.5	78.4	78.2	77.9	78.3	77.9	77.9	78.1	79.1	78.5	76.3	74.9	73.3	72.2	71.9	72.9	74.3	75.1	75.9	76.5	76.6	77.1	78.0	78.5	Diurnal Average	
	93	92	92	92	93	92	92	91	91	90	90	90	90	89	89	88	89	90	90	89	91	92	92	93	Diurnal Maximum	

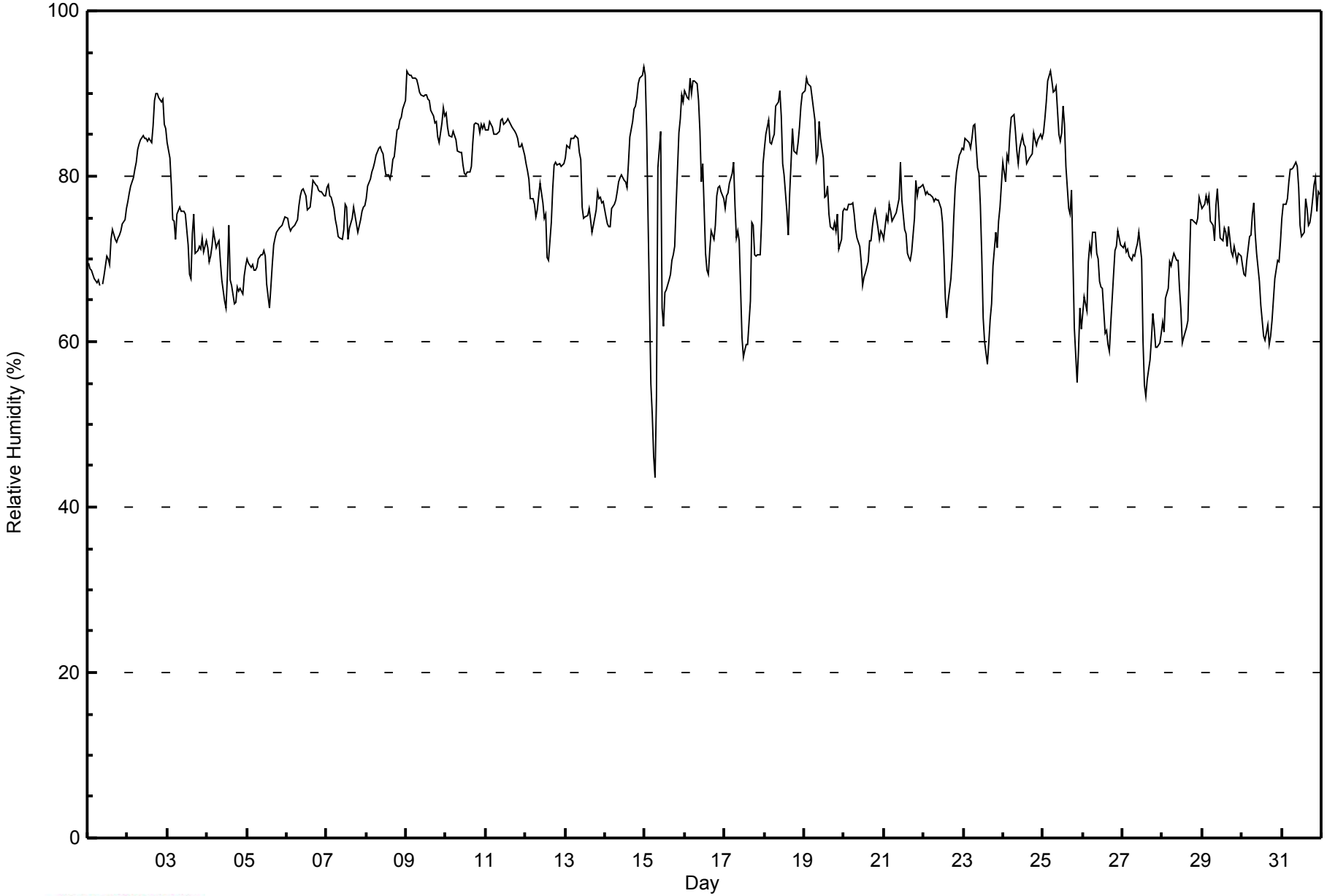
MS - Missing

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	26	3.50	3.50
60 - 80	460	61.91	65.41
80 - 100	257	34.59	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Maximum Value: 6.4 C on Jan 17 12:00

Maximum Daily Average: -0.5 C on Jan 17

Minimum Value: -40.9 C on Jan 1 08:00

Minimum Daily Average: -34.6 C on Jan 1

Maximum Diurnal Average: -14.4 C at hour 15

Minimum Diurnal Average: -18.9 C at hour 1

Monthly Average: -17.24 C

Percentiles: P_1 = -38.6 P_{10} = -29.6 Q_1 = -24.1 Median = -17.0 Q_3 = -11.0 P_{90} = -4.2 P_{99} = 6.0

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-37.2	-38.1	-38.6	-38.9	-39.7	-40.3	-40.3	-40.9	MS	-40.7	-38.6	-34.1	-31.3	-30.0	-29.9	-30.7	-32.0	-32.9	-32.5	-32.0	-31.0	-29.7	-28.7	-27.1	-34.6	-27.1
2-Jan	-25.6	-24.3	-23.2	-22.1	-21.0	-20.0	-18.4	-17.4	-16.7	-16.0	-15.2	-13.3	-11.8	-10.4	-9.3	-9.7	-11.2	-10.7	-11.3	-9.6	-10.0	-10.4	-11.3	-12.3	-15.1	-9.3
3-Jan	-14.5	-17.9	-19.1	-20.9	-21.9	-23.1	-24.4	-26.1	-27.7	-28.5	-27.1	-26.1	-23.0	-21.3	-20.8	-22.7	-23.8	-22.3	-23.6	-24.8	-25.2	-26.4	-26.6	-28.0	-23.6	-14.5
4-Jan	-27.8	-27.7	-28.0	-28.9	-29.1	-27.5	-27.9	-27.3	-27.3	-26.7	-25.6	-25.6	-26.5	-28.0	-28.6	-29.3	-30.2	-31.0	-31.3	-32.0	-32.2	-32.0	-33.4	-35.0	-29.1	-25.6
5-Jan	-35.7	-36.6	-37.4	-37.2	-38.2	-38.2	-37.5	-36.0	-34.8	-34.7	-33.4	-31.9	-30.0	-29.2	-29.2	-29.4	-30.3	-31.0	-30.7	-29.7	-29.1	-29.6	-29.5	-28.4	-32.8	-28.4
6-Jan	-27.9	-27.2	-26.7	-26.3	-25.5	-25.0	-24.6	-24.2	-23.8	-23.3	-22.4	-21.3	-21.8	-21.2	-21.3	-21.4	-21.8	-22.1	-23.5	-24.7	-25.8	-25.1	-25.7	-25.8	-24.1	-21.2
7-Jan	-24.2	-23.6	-24.0	-25.2	-27.0	-28.8	-30.5	-32.3	-33.2	-33.5	-31.8	-27.7	-24.9	-23.8	-24.0	-24.7	-27.0	-29.7	-30.9	-32.3	-30.9	-29.5	-28.2	-27.6	-28.1	-23.6
8-Jan	-26.6	-24.1	-22.6	-21.0	-20.2	-19.5	-18.8	-18.0	-16.2	-15.3	-14.9	-13.7	-12.8	-12.3	-11.8	-11.6	-11.6	-11.7	-11.8	-11.6	-11.5	-11.2	-11.0	-10.5	-15.4	-10.5
9-Jan	-10.1	-9.7	-9.4	-9.3	-9.4	-9.3	-9.4	-10.0	-11.1	-11.7	-11.4	-10.5	-10.2	-9.9	-9.0	-8.9	-10.2	-11.0	-11.4	-11.6	-11.7	-11.9	-12.2	-12.4	-10.5	-8.9
10-Jan	-12.8	-13.1	-13.3	-13.4	-13.5	-13.6	-13.6	-13.6	-13.5	-13.5	-13.5	-13.6	-13.7	-13.6	-13.3	-13.6	-14.4	-15.3	-15.4	-15.3	-16.5	-17.7	-16.9	-15.7	-14.3	-12.8
11-Jan	-15.4	-16.6	-15.7	-14.7	-14.4	-14.4	-14.7	-15.6	-16.2	-16.3	-15.8	-15.6	-14.9	-14.5	-14.5	-14.4	-14.7	-15.1	-15.2	-15.7	-16.0	-16.5	-16.9	-17.3	-15.5	-14.4
12-Jan	-17.7	-18.3	-19.0	-19.9	-20.3	-20.3	-20.3	-20.5	-20.6	-20.6	-20.2	-19.4	-19.2	-17.4	-17.5	-18.3	-20.1	-21.6	-22.1	-22.2	-21.2	-20.4	-20.0	-19.7	-19.9	-17.4
13-Jan	-18.8	-18.0	-17.4	-16.8	-16.0	-15.8	-17.5	-16.0	-14.8	-13.8	-14.4	-15.4	-15.7	-16.2	-17.0	-18.0	-19.3	-20.3	-21.3	-22.6	-23.6	-25.5	-26.9	-28.3	-18.7	-13.8
14-Jan	-29.9	-31.3	-32.2	-32.3	-30.4	-29.1	-27.8	-25.7	-23.8	-22.0	-20.8	-19.2	-17.7	-16.0	-14.6	-13.7	-12.3	-11.5	-10.5	-9.7	-7.9	-6.8	-8.1	-9.0	-19.3	-6.8
15-Jan	-8.8	-0.5	4.9	6.0	6.1	6.1	6.1	4.9	2.1	1.7	3.1	3.3	3.0	0.2	-0.8	-2.7	-3.5	-4.0	-4.6	-5.8	-8.1	-9.5	-11.2	-12.8	-1.0	6.1
16-Jan	-12.5	-12.9	-13.5	-11.7	-12.2	-11.8	-10.2	-10.3	-9.0	-7.0	-5.4	-5.8	-2.5	-1.7	-1.5	-2.0	-2.4	-1.8	-2.0	-2.6	-2.3	-1.9	-1.3	-1.0	-6.1	-1.0
17-Jan	-0.5	-0.6	-0.4	0.0	0.1	0.1	2.2	2.7	2.1	2.3	5.6	6.4	6.2	6.0	5.6	4.0	-0.3	-3.0	-4.7	-6.8	-7.9	-8.9	-10.5	-12.1	-0.5	6.4
18-Jan	-12.8	-14.0	-14.3	-13.0	-12.2	-10.8	-10.3	-10.2	-9.7	-9.8	-7.5	-4.6	-2.8	-3.7	-5.3	-6.4	-7.3	-8.2	-8.8	-9.4	-10.0	-10.4	-10.6	-10.9	-9.3	-2.8
19-Jan	-10.9	-10.8	-10.4	-9.9	-9.6	-10.0	-10.7	-11.3	-11.6	-12.2	-13.1	-14.0	-15.9	-17.7	-19.2	-20.8	-21.6	-22.5	-23.0	-23.5	-23.8	-24.8	-25.6	-27.1	-16.7	-9.6
20-Jan	-28.3	-28.7	-28.5	-27.5	-26.8	-25.5	-23.6	-23.1	-22.7	-22.0	-20.1	-18.4	-17.0	-16.0	-14.8	-14.5	-14.3	-14.3	-14.3	-14.2	-13.7	-14.5	-15.4	-15.4	-19.7	-13.7
21-Jan	-15.9	-16.3	-17.0	-18.3	-17.7	-17.0	-16.3	-16.2	-16.0	-15.0	-13.5	-13.6	-14.0	-14.5	-15.3	-16.0	-17.0	-18.3	-20.1	-22.7	-24.8	-25.6	-25.3	-24.4	-17.9	-13.5
22-Jan	-24.4	-25.4	-24.9	-24.7	-25.1	-25.0	-25.3	-26.0	-25.9	-25.3	-23.4	-21.5	-19.2	-17.3	-15.8	-15.2	-15.7	-16.1	-16.8	-16.1	-14.6	-14.2	-13.3	-12.3	-20.2	-12.3
23-Jan	-11.0	-10.4	-9.1	-7.9	-6.7	-6.5	-5.8	-5.1	-3.0	-2.5	-1.0	0.9	3.2	4.4	5.3	4.4	3.6	3.4	2.6	1.7	2.3	1.7	1.8	1.6	-1.3	5.3
24-Jan	1.2	2.0	1.1	-0.4	-0.9	-2.0	-2.4	-3.2	-4.3	-4.9	-5.2	-5.4	-5.8	-6.0	-6.2	-6.7	-7.1	-7.5	-7.6	-7.6	-7.5	-7.5	-7.3	-7.2	-4.5	2.0
25-Jan	-7.1	-7.2	-7.6	-9.0	-9.9	-8.5	-7.3	-6.8	-6.9	-4.0	-3.5	-5.1	-5.6	-5.4	-5.4	-6.1	-7.0	-7.7	-8.4	-9.9	-11.2	-13.5	-15.9	-17.4	-8.2	-3.5
26-Jan	-19.3	-20.8	-22.3	-23.1	-24.1	-25.1	-26.0	-27.0	-28.0	-28.0	-27.9	-27.4	-26.8	-26.2	-25.6	-25.0	-24.7	-25.9	-27.5	-28.6	-30.0	-30.9	-31.8	-33.1	-26.5	-19.3
27-Jan	-33.9	-33.5	-34.6	-34.5	-35.5	-36.1	-35.7	-35.5	-34.6	-32.8	-29.5	-26.0	-22.7	-19.9	-18.4	-18.5	-19.1	-19.7	-20.5	-19.3	-18.2	-17.7	-17.8	-18.1	-26.3	-17.7
28-Jan	-17.9	-17.3	-18.8	-19.6	-20.7	-20.6	-20.7	-20.9	-20.6	-19.7	-17.9	-16.5	-15.5	-14.8	-13.8	-13.2	-12.4	-13.5	-16.6	-18.0	-19.4	-20.4	-20.7	-20.9	-17.9	-12.4
29-Jan	-21.1	-21.5	-21.8	-22.5	-22.3	-21.8	-21.6	-20.9	-20.9	-20.8	-21.1	-21.8	-22.7	-23.2	-22.9	-22.6	-22.2	-22.3	-22.2	-22.2	-22.1	-22.1	-22.2	-22.2	-22.0	-20.8
30-Jan	-22.3	-22.8	-23.0	-23.9	-24.0	-24.5	-26.2	-25.7	-23.1	-22.7	-22.2	-21.1	-19.8	-18.2	-17.2	-17.0	-15.9	-16.0	-15.9	-15.9	-15.8	-16.3	-16.6	-17.6	-20.2	-15.8
31-Jan	-16.4	-16.2	-16.0	-16.4	-17.0	-18.9	-19.7	-20.5	-19.4	-16.8	-15.5	-15.0	-14.5	-14.3	-14.3	-14.1	-14.1	-14.4	-14.7	-15.1	-15.0	-14.7	-15.1	-15.1	-16.0	-14.1
	-18.9	-18.8	-18.8	-18.8	-18.9	-18.8	-18.7	-18.7	-17.7	-17.9	-16.9	-15.9	-15.0	-14.6	-14.4	-14.8	-15.5	-16.1	-16.7	-17.1	-17.3	-17.5	-17.9	-18.2	Diurnal Average	
	1.2	2.0	4.9	6.0	6.1	6.1	6.1	4.9	2.1	2.3	5.6	6.4	6.2	6.0	5.6	4.4	3.6	3.4	2.6	1.7	2.3	1.7	1.8	1.6	Diurnal Maximum	

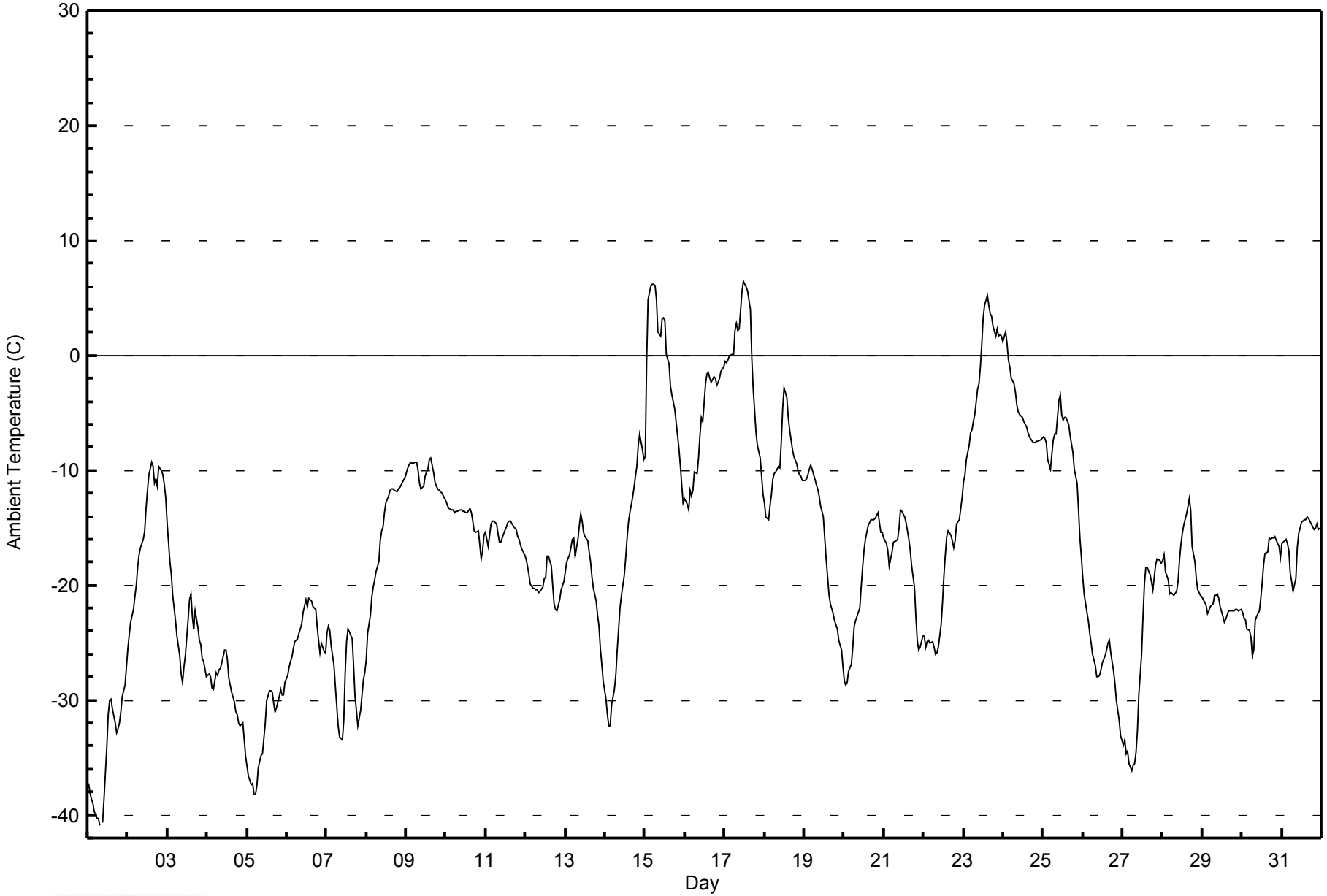
MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	301	40.51	40.51
-20 - 0	402	54.10	94.62
0 - 10	40	5.38	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744

Maximum Value: 29.8 inHg on Jan 5 10:00

Maximum Daily Average: 29.7 inHg on Jan 5

Minimum Value: 28.0 inHg on Jan 15 03:00

Minimum Daily Average: 28.3 inHg on Jan 11

Maximum Diurnal Average: 29.0 inHg at hour 18

Minimum Diurnal Average: 28.9 inHg at hour 9

Monthly Average: 28.93 inHg

Percentiles: P_1 = 28.1 P_{10} = 28.4 Q_1 = 28.6 Median = 28.9 Q_3 = 29.2 P_{90} = 29.5 P_{99} = 29.8

Hours in Service:	744
Hours of Data:	743
Hours of Missing Data:	1
Hours of Calibration:	0
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	MS	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.1	29.1	29.1	29.3	29.4
2-Jan	29.0	29.0	28.9	28.9	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.4	28.4	28.5	28.5	28.5	28.6	29.0
3-Jan	28.6	28.6	28.6	28.7	28.7	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.0	29.3
4-Jan	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.5	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.4	29.7
5-Jan	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.5	29.5	29.7	29.8
6-Jan	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.5
7-Jan	29.2	29.2	29.2	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	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.2	29.3
8-Jan	29.0	28.9	28.9	28.8	28.8	28.7	28.7	28.7	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	29.0
9-Jan	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.3	28.3	28.3	28.3	28.4	28.5
10-Jan	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.4	28.5
11-Jan	28.5	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.3	28.3	28.3	28.2	28.2	28.2	28.2	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.3	28.5
12-Jan	28.2	28.2	28.2	28.3	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.3	28.3	28.4	28.5
13-Jan	28.3	28.2	28.2	28.2	28.2	28.3	28.3	28.4	28.4	28.5	28.5	28.6	28.6	28.7	28.8	28.8	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	28.6	29.1
14-Jan	29.1	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.6	28.6	28.5	28.4	28.3	28.2	28.1	28.8	29.2
15-Jan	28.1	28.0	28.0	28.0	28.1	28.1	28.1	28.1	28.2	28.3	28.4	28.4	28.5	28.5	28.6	28.7	28.7	28.8	28.8	28.9	28.9	29.0	29.0	29.0	28.5	29.0
16-Jan	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	28.8	28.8	28.8	28.7	28.7	28.9	29.0
17-Jan	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	28.8	29.0
18-Jan	29.0	28.9	28.9	28.9	28.9	28.9	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.4	28.4	28.6	29.0
19-Jan	28.4	28.4	28.4	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.7	28.8	28.9	29.0	29.1	29.1	29.1	29.2	29.3	29.3	29.3	29.3	28.8	29.3
20-Jan	29.3	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	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.2	29.4
21-Jan	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.3	29.5
22-Jan	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.1	29.1	29.0	29.0	29.3	29.5
23-Jan	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.9	28.9	29.0
24-Jan	28.7	28.7	28.7	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	28.9	28.9	29.1
25-Jan	28.9	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.2	29.2	28.8	29.2
26-Jan	29.3	29.3	29.4	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.7
27-Jan	29.6	29.6	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	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.4	29.6
28-Jan	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	29.1
29-Jan	28.9	28.9	28.9	28.9	29.0	28.9	28.9	28.9	28.9	28.9	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	29.0	29.1
30-Jan	29.2	29.1	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.9	29.2
31-Jan	28.6	28.7	28.7	28.7	28.7	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	29.1	29.1	29.1	29.1	29.0	29.0	28.9	29.1
	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	28.9	28.9	28.9	28.9	28.9	28.9	Diurnal Average	
	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.7	29.7	29.7	29.7	Diurnal Maximum	

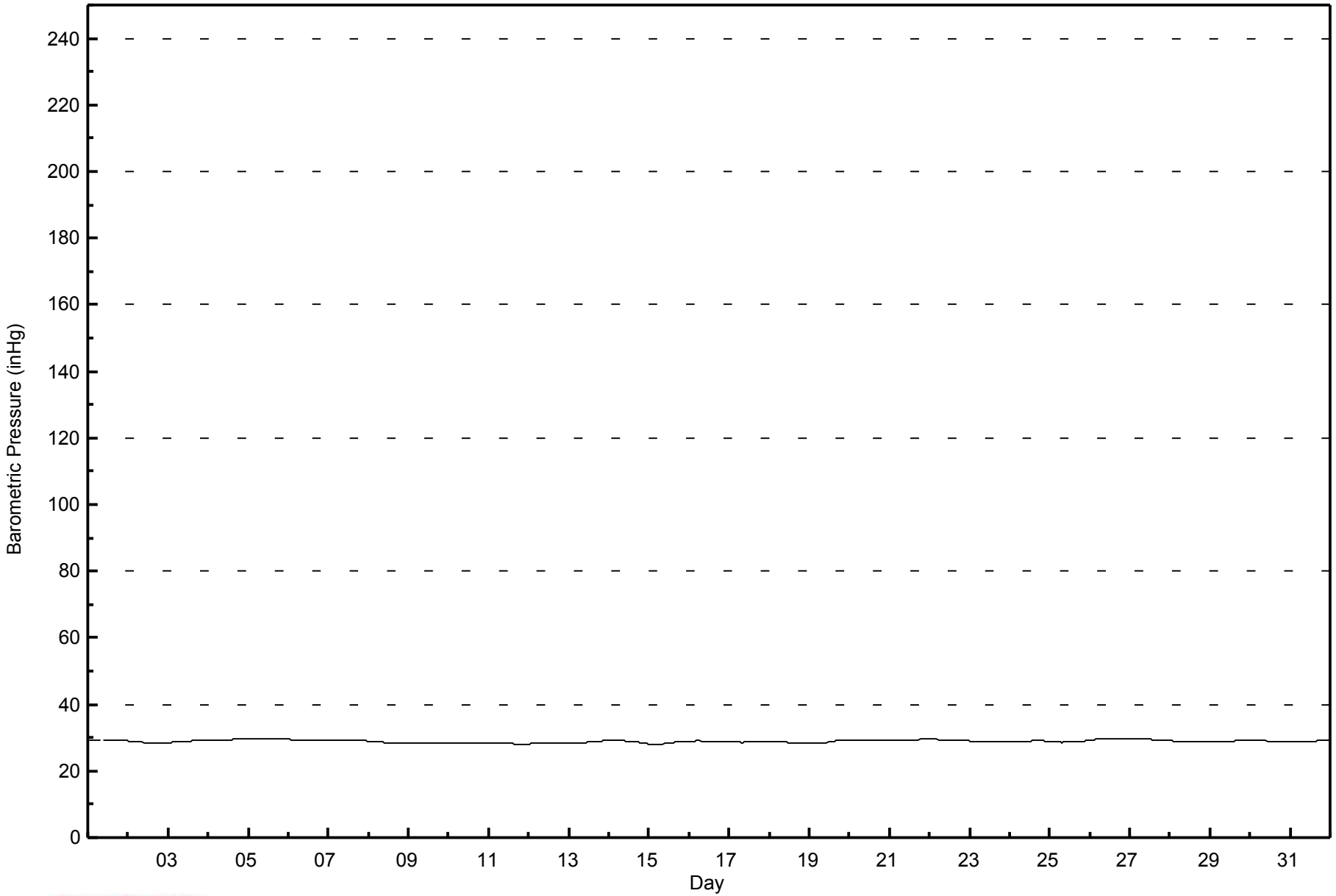
MS - Missing

WBEA NETWORK

Hourly Averages

Barometric Pressure (BP) - inHg

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Shell Muskeg River - January 2014

Maximum Speed: 60 km/h on Jan 15 08:00

Maximum Daily Speed Average: 17.3 km/h on Jan 15

Minimum Speed Value: 1 km/h on Jan 9 00:00

Minimum Daily Speed Average: 1.3 km/h on Jan 6

Maximum Diurnal Speed Average: 3.9 km/h at hour 18

Minimum Diurnal Speed Average: 0.3 km/h at hour 1

Monthly Average Velocity: 1.2 km/h 340.3 deg

Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 5$ Median = 9 $Q_3 = 14$ $P_{90} = 19$ $P_{99} = 33$

Hours in Service: 744

Hours of Data: 742

Hours of Missing Data: 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-Jan	SSE3	SSW3	SSE2	S2	S3	S5	S5	SSW6	MS	SSW6	SSW6	S5	SSW4	S3	SW5	SSW7	SSW7	SSW7	SSW7	SSW8	SSW8	SSW6	SSW4	SSW4	SSW4.9	SSW8
2-Jan	SSW3	SW4	WSW3	WSW3	SW3	SW6	SSW8	SSW8	SSW9	SSW10	SSW10	SSW10	S11	S11	SSW12	SSW11	S9	SSW10	SSW9	SSW12	SW10	N7	NNE21	NNE21	SSW5.0	NNE21
3-Jan	NNE27	NNE31	NNE23	NE23	NE19	ENE15	ESE3	SW3	S3	SSW5	SW5	SSW4	S3	NW1	NW4	WNW4	NW10	NW11	NW10	WNW13	WNW9	W12	W9	WNW8	N4.9	NNE31
4-Jan	W9	WNW10	W9	SW8	WSW10	WSW11	WSW11	WSW12	W11	WNW11	NW18	NNW17	N24	N24	N19	NNW11	NW11	NW11	NW10	WNW9	WNW9	NW8	W6	S5	NW8.2	N24
5-Jan	S5	SSW6	S4	SSE4	S4	SSE4	SSW6	S6	SSE5	SSW5	SSW5	SSW5	S5	S3	SW2	S2	SSW4	SSW5	S5	SSW7	SSW6	S5	S7	S6	S4.8	SSW7
6-Jan	S7	S6	SSW5	SSW4	SW5	SSW4	SW4	WSW3	WSW1	E2	S1	S5	WNW6	NW5	NW6	NW5	NNE4	ENE8	E4	ESE4	SE5	SE3	SSW1	E4	SSW1.3	ENE8
7-Jan	WSW2	W5	WNW4	NW2	SW2	S2	WSW3	SSW3	SSW4	S5	SSW6	SSW5	SW6	SW8	WSW5	SW4	SSW4	SSE4	SSW4	SW6	SSW9	SSW8	SSW8	SSW8	SW4.3	SSW9
8-Jan	SSW8	SW7	SSW7	SSW9	SW11	SW8	SW7	SSW8	SSW10	SW10	SW11	SSW9	SSW9	SSW11	SSW7	SSW5	WSW3	WSW3	SSE3	SSW3	S3	SW5	SSW3	ESE1	SSW6.5	SW11
9-Jan	E4	AF	S2	SW5	SW8	SW6	S6	S9	SSW7	SSW4	S4	SSW4	WSW3	NE6	ENE12	NE15	NNE18	NNE19	NNE21	NNE21	NNE17	NNE14	NNE15	NNE17	NE5.2	NNE21
10-Jan	NNE12	NNE12	NNE15	N9	NNW7	NW4	N6	N7	N7	NNE7	N5	E3	ENE9	ENE5	SE3	SE3	SSE3	S4	SSE4	SSW6	SW6	S6	S5	SSW4	NNE2.4	NNE15
11-Jan	SSW5	SW3	NNW5	ENE8	NE15	NE16	NNE10	NNE13	NNE17	NE14	NNE13	NNE16	NNE13	NNE13	NNE14	NNE15	NNE19	NNE25	NNE17	NNE21	NNE28	NNE26	NNE24	NNE23	NNE14.7	NNE28
12-Jan	NNE18	NNE24	NNE20	NNE23	NE19	NE15	NNE8	NE2	SSE4	SSE5	SSE6	S6	S5	SSW9	SSW10	SSW12	S10	S11	S11	S10	S10	SSW7	SW5	SW5	ESE2.0	NNE24
13-Jan	SW4	W7	WSW8	SSW6	S9	SSW7	SW4	WNW4	ENE6	NE11	NE19	NE15	ENE16	ENE16	NE18	ENE15	ENE14	ENE15	ENE12	E4	E5	E2	ENE8	SSE2	ENE5.5	NNE19
14-Jan	SW3	SSW4	SSW5	S7	SSW7	SSW6	SSW6	SSW6	SW5	SW4	SW3	WSW3	WSW5	SW4	SSW4	WSW4	SW6	SW6	SSW4	SW4	SW6	SW4	SSW4	SW8	SW4.7	SW8
15-Jan	SSW6	WSW33	W47	WNW52	WNW45	WNW52	WNW51	WNW60	NW39	NW25	NW35	NW28	NNW18	ENE10	ENE10	NE18	NE15	ENE12	ENE11	E6	SSW4	SSW4	SSW6	SSW7	WNW17.3	WNW60
16-Jan	SSE7	SSW7	S7	SSE7	S7	SSW6	SSW7	S5	SW9	SSW8	SSW10	SSW8	SSW11	SSW11	SSW10	SSW8	SSW8	SSW9	S7	S7	S8	SSW9	SSW9	S8	SSW7.8	SSW11
17-Jan	SSW9	SSW7	SSW10	SSW11	SSW12	SSW12	WSW24	W27	WSW18	W13	WNW19	WNW17	NW14	NNW18	NNW19	N18	NE20	NE16	ENE14	ENE13	ENE14	ENE14	SE4	SSW5	WNW3.8	W27
18-Jan	S5	SSE5	S4	SSW5	SSW7	SW11	SSW9	SSW8	S9	SSE6	S5	SSW2	NNE6	NE21	NE20	NE19	NE16	NNE16	NNE16	NNE12	NNW8	NNW3	WSW4	W6	NE2.5	NE21
19-Jan	SSW4	S5	SW3	NW3	NNE4	ENE14	ENE14	NE14	NNE11	NNE14	NNE19	NNE23	NNE29	NNE32	NNE30	NNE25	NNE19	N20	N16	NNE16	NE16	ENE12	SSE3	SSW6	NNE12.4	NNE32
20-Jan	SSW6	S7	S9	S10	S10	S13	S13	S14	S11	SSW10	SSW13	SSW13	SSW13	SSW13	SSW10	SW9	SSW5	SW3	NW7	WNW5	NNE12	NNE17	NE16	NNE7	S5.2	NNE17
21-Jan	ESE3	W4	ENE9	E6	ESE4	E4	ENE6	S2	SSW3	NW3	NNE21	NNE25	NE22	NE19	NE18	ENE16	ENE12	ENE11	E8	ESE3	SE4	SSE5	SSW7	SSW10	ENE6.5	NNE25
22-Jan	S8	S9	S12	S11	S10	S10	SSW10	SSW9	SSW8	SSW9	SSW9	SSW11	SSW12	SSW12	SSW14	SSW13	SSW12	SSW11	SSW9	SSW12	SSW12	SSW13	SSW13	S14	SSW10.9	S14
23-Jan	S16	SSW16	SSW17	SSW16	SSW15	S14	S10	S9	WSW13	WSW7	WSW14	W8	W9	WSW9	W12	W17	W15	WNW14	W6	SW5	S7	S6	SSW8	S5	SW9.1	SSW17
24-Jan	SSW7	WSW6	N8	NNE22	NNE17	NNE22	NE20	NE17	NE20	NE19	NE19	NE19	NE20	NE18	ENE17	NE17	ENE13	E9	E5	SSE1	S3	S4	S5	S5	NE10.4	NNE22
25-Jan	SSW5	SW5	SSW5	S5	S7	S10	S7	SSW7	SE3	NE16	NNE22	NNE25	NE19	NE14	NNE20	NNE18	NNE23	NNE18	N22	N25	N30	N26	N26	N29	NNE11.2	N30
26-Jan	N30	N30	N28	NNE25	N21	NNE20	NE18	NE18	ENE16	ENE15	ENE8	SE5	SSE4	SSW4	S4	SE6	SSE4	SSE4	E6	E6	ESE5	S4	S4	SSW6	NE7.8	N30
27-Jan	SSW7	S6	S6	S5	S5	S6	S9	SSW7	SSW9	S8	S8	SSW8	S12	S12	S11	S10	S10	SSW8	SSW9	SSW10	S11	SSW9	SSW10	SSW9	S8.4	S12
28-Jan	SSW9	S11	SSW10	SSW10	SSW9	SSW10	S10	S10	S11	S8	SW6	SW8	SW4	SW5	WSW4	WSW3	N13	NNE24	NNE28	NNE31	NNE30	NNE24	NNE19	NNE14	NNE2.5	NNE31
29-Jan	NNE13	NE15	NE16	NE4	NW3	NW9	NNW9	NNW13	N14	NNE18	NNE19	NNE25	N21	N21	N18	N17	N17	N20	N18	N16	N17	NNW14	NNW13	N16	N14.4	NNE25
30-Jan	NNW11	NW11	NW10	WNW8	W8	SW5	SSW5	SSW6	WSW15	SW12	SW15	SW19	SW17	SSW16	SSW12	SSW14	SSW16	SSW12	SSW10	SSW12	SSW8	SSW8	SW8	WNW6	SW8.7	SW19
31-Jan	NNE11	N10	N18	N17	N11	NW6	WNW7	SSW4	S1	NE11	N10	NNW14	N14	N15	NNW13	N15	N13	NNW12	NW7	W8	WSW7	W6	SSW6	SSW7	NNW7.5	N18
	SW0.3	W1.7	WNW2.2	WNW1.3	WSW1.6	SW1.9	WSW3.0	WSW3.4	WSW2.3	NW0.7	NNW2.4	NNW2.3	N2.5	NNE2.8	NNE3.0	NNE3.0	NNE3.6	NNE3.9	NNE3.3	N1.6	N1.5	NNE1.3	NNE0.5	WNW0.3	Diurnal Average	
	N30	WSW33	W47	WNW52	WNW45	WNW52	WNW51	WNW60	NW39	NW25	NW35	NW28	NNE29	NNE32	NNE30	NNE25	NNE23	NNE25	NNE28	NNE31	NNE30	NNE26	N26	N29	Diurnal Maximum	

AF - Analyzer Failure MS - Missing

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

Shell Muskeg River - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 15 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 1 04:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 1 Median = 2 Q_3 = 3 P_{90} = 5 P_{99} = 11

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	0	1	1	1	1	MS	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2
2-Jan	1	1	2	1	1	1	2	2	2	3	3	3	3	3	3	3	2	2	2	3	3	6	4	5	6
3-Jan	7	8	5	4	3	2	3	1	1	1	2	2	2	2	2	1	3	3	2	2	2	2	3	1	8
4-Jan	3	2	2	2	2	2	3	2	2	4	5	6	7	6	6	4	3	2	2	2	2	2	2	1	7
5-Jan	1	2	2	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
6-Jan	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	3	2	1	2	2	2	1	3
7-Jan	1	1	2	2	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	2	1	2	2
8-Jan	2	2	2	2	2	2	1	2	3	3	2	3	2	3	2	2	1	1	1	1	1	1	1	2	3
9-Jan	1	AF	2	1	2	1	2	2	2	2	1	1	1	3	2	2	4	7	4	3	3	4	4	3	7
10-Jan	3	3	4	3	3	2	3	3	3	3	3	2	2	2	1	1	1	1	1	1	2	1	1	2	4
11-Jan	2	2	2	3	2	3	3	3	2	2	2	2	3	3	4	4	5	5	5	5	7	5	4	5	7
12-Jan	6	5	4	4	3	3	3	2	1	1	1	2	1	3	3	3	2	2	2	2	2	2	1	1	6
13-Jan	1	2	2	2	2	2	2	2	4	7	5	3	3	2	3	4	3	3	2	2	2	2	2	1	7
14-Jan	1	1	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	3	3	2	2	3	3
15-Jan	2	10	12	12	12	13	14	15	13	9	12	9	7	4	3	3	3	2	2	4	2	1	1	1	15
16-Jan	2	2	1	1	1	2	2	1	4	2	2	3	2	3	3	2	1	1	2	1	1	2	2	1	4
17-Jan	2	2	2	3	3	4	5	6	5	8	4	4	5	6	7	6	4	5	3	4	3	3	2	1	8
18-Jan	1	1	1	2	2	2	2	2	2	2	2	2	4	4	4	3	3	4	4	4	3	3	2	3	4
19-Jan	2	2	3	2	4	2	3	3	3	4	6	6	7	7	8	7	6	6	5	4	3	3	3	1	8
20-Jan	1	1	1	2	2	3	4	4	3	3	3	4	4	3	3	1	3	2	2	2	7	4	3	6	7
21-Jan	2	2	2	1	1	1	2	1	1	3	8	6	4	3	3	3	2	2	2	2	2	2	2	2	8
22-Jan	2	1	2	2	2	2	2	2	2	2	2	3	4	3	4	4	3	3	2	2	3	2	3	3	4
23-Jan	4	3	5	5	4	4	3	4	7	4	3	4	2	2	3	3	3	3	2	2	1	2	1	2	7
24-Jan	2	2	6	6	4	3	4	3	4	3	3	3	3	3	2	2	2	2	2	1	1	1	1	1	6
25-Jan	1	2	2	2	2	3	2	2	3	4	8	5	5	4	5	5	5	5	7	9	9	9	7	8	9
26-Jan	10	9	9	7	6	5	4	3	3	3	4	2	2	2	1	2	1	1	1	1	1	1	1	1	10
27-Jan	1	1	1	1	1	2	1	1	1	1	3	2	3	3	3	3	2	1	2	2	3	2	2	2	3
28-Jan	3	3	2	2	2	2	2	3	3	2	1	2	1	1	1	2	7	10	6	6	7	7	4	4	10
29-Jan	3	3	3	3	4	3	3	4	4	5	6	7	7	6	5	5	5	5	5	5	5	4	4	5	7
30-Jan	4	3	2	1	1	2	1	1	3	3	3	4	4	5	4	4	5	4	3	3	2	2	3	3	5
31-Jan	5	4	6	5	4	3	2	1	1	6	3	4	5	4	3	5	4	4	2	1	1	1	1	2	6
	10	10	12	12	12	13	14	15	13	9	12	9	7	7	8	7	7	10	7	9	9	9	7	8	
	Diurnal Maximum																								

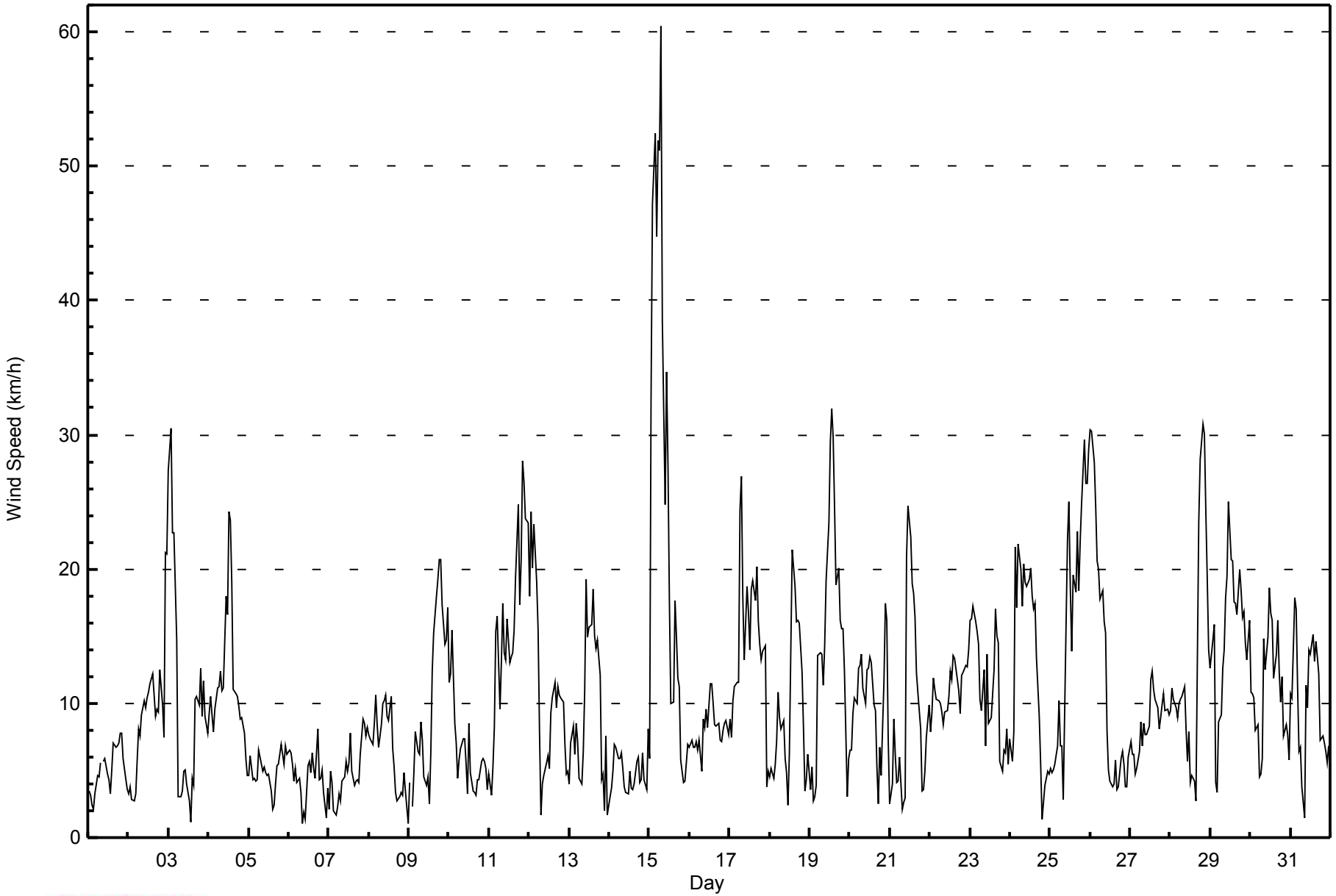
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	205	27.63	27.63
6 - 11	286	38.54	66.17
12 - 19	177	23.85	90.03
20 - 28	55	7.41	97.44
29 - 38	12	1.62	99.06
> 38	7	0.94	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Shell Muskeg River - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	1	2	2	1	10	7	8	19	45	46	31	17	1	4	9	2	205
6 - 11	9	7	3	12	6	0	1	4	58	111	25	8	13	10	13	6	286
12 - 19	18	38	32	22	0	0	0	0	9	28	4	5	4	5	2	10	177
20 - 28	12	31	8	0	0	0	0	0	0	0	0	1	1	0	2	0	55
29 - 38	4	6	0	0	0	0	0	0	0	0	0	1	0	0	1	0	12
> 38	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	0	7
Totals	44	84	45	35	16	7	9	23	112	185	60	32	20	24	28	18	742

Total Number of Valid Hours: 742

Total Number of Hours: 744

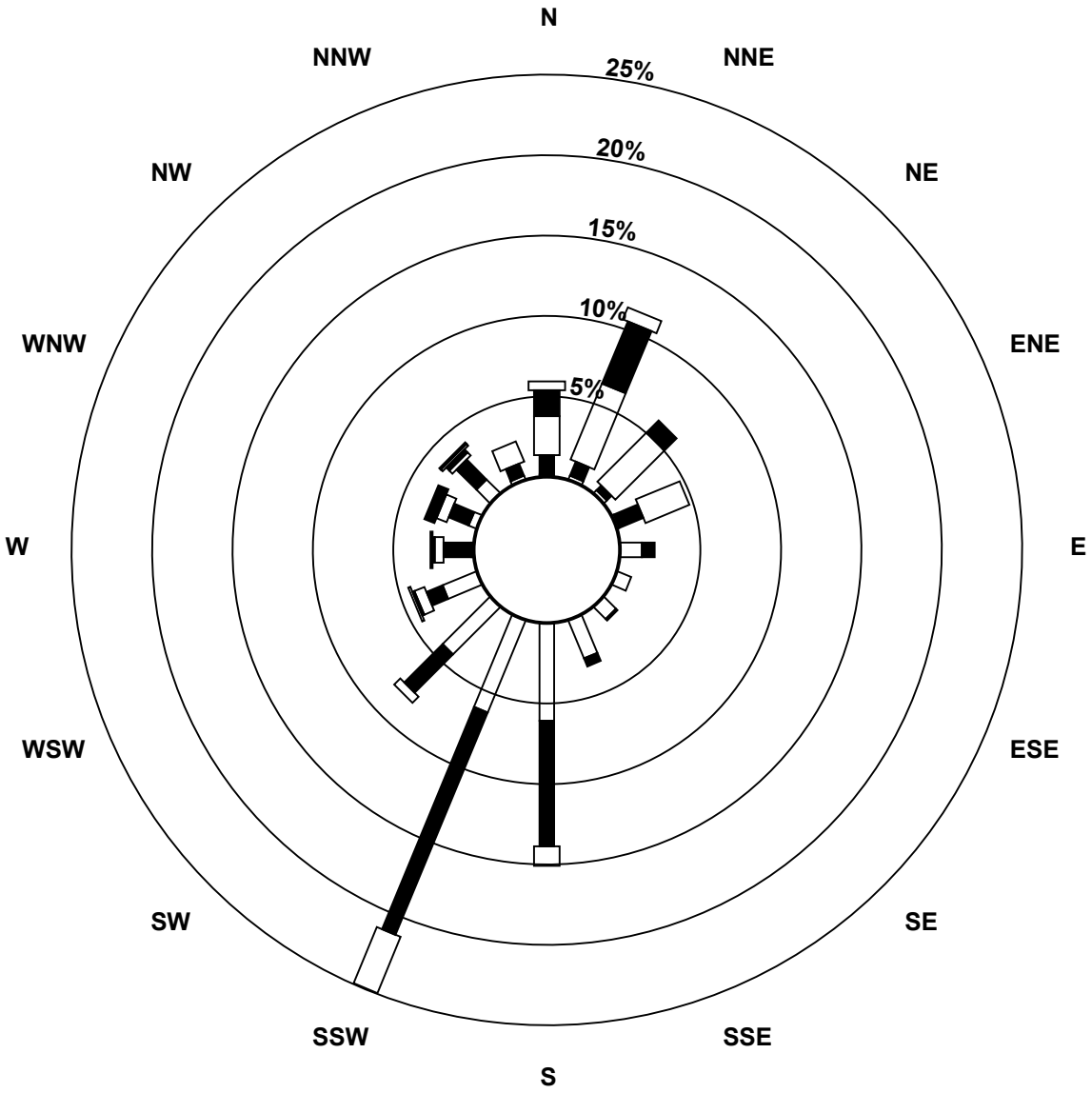
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

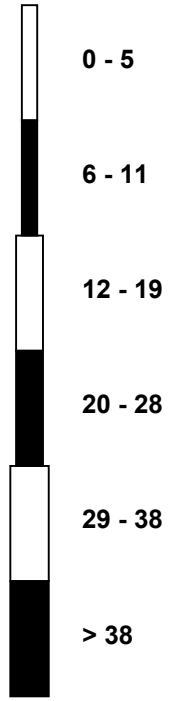
Wind Rose Jan 2014

Wind Speed (WS) - km/h

Shell Muskeg River (AMS 16)



Classes (km/h)



Total Number of Valid Hours: 742

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Shell Muskeg River - January 2014

Direction of Maximum Speed: 294 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 299.0 deg on Jan 15

Direction of Minimum Speed: 104 deg on Jan 9 00:00

Direction of Minimum Daily Speed Average: 1.3 deg on Jan 6

Monthly Average Direction: 223.2 deg

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	157	201	162	190	177	187	189	210	MS	212	204	186	193	190	229	208	195	192	205	205	195	212	206	204	198.7
2-Jan	212	214	256	241	231	223	212	207	208	209	200	194	189	188	200	201	177	202	196	213	214	350	33	30	203.1
3-Jan	29	28	31	44	47	62	115	221	183	200	215	197	185	318	320	285	308	321	307	289	282	270	275	282	358.6
4-Jan	271	282	260	220	253	239	237	248	267	283	314	338	8	8	357	341	326	322	320	298	298	307	278	188	306.2
5-Jan	181	204	187	167	174	168	199	175	147	210	193	199	189	191	236	182	204	197	187	205	201	172	187	182	188.6
6-Jan	188	189	207	204	233	210	228	249	243	90	188	189	291	306	315	317	18	67	89	117	143	135	198	96	199.1
7-Jan	237	259	286	307	220	189	240	194	197	181	197	203	218	231	238	235	201	151	213	216	207	203	205	210	214.3
8-Jan	204	214	212	211	224	219	219	212	201	216	223	210	209	210	198	198	239	254	155	210	182	214	197	104	211.0
9-Jan	84	AF	186	217	219	217	190	190	206	213	182	211	254	49	57	41	29	25	29	30	29	24	25	29	35.7
10-Jan	20	14	26	349	346	325	352	8	359	12	11	85	66	71	139	130	168	173	167	211	227	179	189	197	24.4
11-Jan	209	236	344	63	54	52	30	24	29	40	32	28	29	19	15	15	20	28	13	23	25	31	32	29	28.2
12-Jan	27	29	29	27	45	46	25	56	153	152	154	173	190	203	200	197	191	187	189	190	190	201	226	215	102.2
13-Jan	229	266	250	206	189	193	220	296	68	49	34	52	61	61	55	62	64	61	65	87	81	100	72	154	63.5
14-Jan	218	192	194	190	202	198	207	212	221	229	215	243	239	232	202	240	226	218	207	220	227	216	200	220	214.5
15-Jan	205	254	276	294	292	289	286	294	304	313	315	317	330	77	70	54	53	60	61	85	205	198	210	195	299.0
16-Jan	163	195	183	148	171	201	200	175	228	201	194	207	208	201	195	201	197	203	189	185	189	205	197	186	194.4
17-Jan	200	195	196	205	212	203	254	266	258	273	283	290	325	332	335	6	52	55	64	68	63	62	124	195	299.0
18-Jan	182	150	188	196	207	218	193	194	188	158	176	195	26	39	39	44	35	32	29	21	347	327	252	266	47.1
19-Jan	208	186	229	306	19	60	58	37	24	24	18	26	25	27	24	21	15	11	11	18	41	72	151	197	27.7
20-Jan	198	185	187	181	190	182	188	184	188	200	202	199	194	193	196	232	206	218	321	289	28	29	48	22	190.5
21-Jan	108	281	70	89	113	96	65	181	203	312	28	31	38	42	56	58	61	66	81	116	133	148	196	193	59.6
22-Jan	188	177	184	181	173	186	192	195	204	206	207	211	202	208	198	197	200	200	197	208	206	196	192	186	195.7
23-Jan	190	202	206	202	207	190	186	190	237	241	247	268	263	257	269	274	281	293	274	224	189	190	202	190	227.8
24-Jan	212	246	358	24	28	31	37	36	38	48	48	44	44	42	58	55	60	80	90	165	181	172	177	187	45.1
25-Jan	192	216	211	189	178	183	174	196	138	35	17	33	43	45	28	18	33	25	6	353	351	358	8	7	17.5
26-Jan	4	10	2	12	10	12	35	42	61	60	75	134	159	201	177	143	149	149	100	96	115	172	188	196	34.3
27-Jan	194	186	186	175	171	181	191	193	199	189	189	192	184	182	191	182	181	200	204	193	190	193	198	203	189.9
28-Jan	194	186	194	203	201	199	187	190	187	191	217	231	224	234	257	251	1	19	27	26	25	27	30	23	28.4
29-Jan	26	45	39	55	321	316	331	342	10	19	24	14	9	10	9	8	3	351	354	351	349	345	342	351	4.4
30-Jan	332	319	316	283	261	234	212	205	241	221	217	221	216	211	195	201	210	201	203	204	196	208	234	286	226.5
31-Jan	15	10	1	5	360	315	294	212	180	38	0	345	350	351	346	349	356	345	319	261	249	265	207	210	344.1
	217.5	274.6	296.5	300.4	254.3	232.4	239.7	251.1	248.4	312.2	326.3	341.6	9.7	24.2	22.1	22.5	27.0	25.7	25.5	357.0	7.0	15.2	28.6	300.9	
	Diurnal Average																								

AF - Analyzer Failure MS - Missing

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

Shell Muskeg River - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 90 deg on Jan 12 08:00

Minimum Value: 6 deg on Jan 3 22:00

Percentiles: P_1 = 8 P_{10} = 11 Q_1 = 13 Median = 17 Q_3 = 22 P_{90} = 37 P_{99} = 82

Hours in Service:	744
Hours of Data:	742
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	21	14	24	23	21	11	13	10	MS	11	13	17	25	32	15	17	14	11	13	15	14	14	20	27	32
2-Jan	30	32	50	28	38	21	18	18	16	18	19	19	16	16	16	19	16	14	16	15	14	62	12	14	62
3-Jan	12	13	16	11	12	9	60	26	22	19	10	28	53	61	42	34	19	18	12	13	16	6	15	15	61
4-Jan	16	13	14	17	13	14	13	9	14	15	16	24	25	19	18	20	19	14	13	14	10	13	28	19	28
5-Jan	16	16	36	14	11	12	17	11	27	21	17	24	25	30	14	37	16	13	12	12	14	20	14	16	37
6-Jan	15	18	18	15	19	22	14	15	44	69	67	27	25	38	28	39	56	17	35	23	21	54	60	41	69
7-Jan	58	17	27	71	47	26	36	71	11	20	13	17	20	8	9	12	32	36	19	14	13	13	13	14	71
8-Jan	15	15	18	16	8	15	13	19	17	17	12	18	19	18	18	17	28	27	20	15	23	17	26	77	77
9-Jan	42	AF	50	21	14	14	20	18	20	18	15	17	36	51	9	14	10	16	10	10	11	20	18	11	51
10-Jan	19	20	15	28	33	58	50	44	40	34	55	79	23	33	29	31	35	17	33	13	29	23	18	17	79
11-Jan	13	57	37	25	9	8	23	16	8	14	13	7	10	19	20	18	15	11	18	14	14	9	10	11	57
12-Jan	17	10	14	9	15	15	35	90	20	18	18	17	16	19	19	16	15	12	12	12	11	16	15	13	90
13-Jan	21	9	13	19	18	19	18	49	80	53	15	18	9	9	8	11	10	10	9	49	49	82	14	41	82
14-Jan	29	13	13	11	13	20	17	14	16	17	18	17	16	19	28	17	16	13	21	29	28	34	41	26	41
15-Jan	33	10	14	12	14	12	13	13	22	19	17	21	25	35	28	9	10	10	10	58	40	22	10	12	58
16-Jan	23	17	13	32	15	14	17	24	18	16	15	18	16	15	15	14	12	11	14	14	12	22	18	15	32
17-Jan	15	14	14	18	18	21	9	11	10	27	12	16	21	22	24	28	14	17	12	16	11	11	49	14	49
18-Jan	11	17	37	21	19	13	15	15	21	20	18	72	39	11	13	13	13	16	16	27	33	75	32	19	75
19-Jan	20	22	64	84	83	10	13	12	18	19	22	16	15	14	17	18	19	21	22	20	22	16	57	15	84
20-Jan	11	12	11	12	16	14	15	17	16	18	16	16	16	15	19	11	17	54	26	62	82	11	14	63	82
21-Jan	71	62	16	19	30	37	44	18	29	80	19	13	13	15	8	8	10	8	17	44	44	25	13	14	80
22-Jan	13	9	12	10	10	15	13	14	14	16	16	15	18	17	17	16	15	15	14	11	14	15	14	14	18
23-Jan	13	14	15	19	16	17	16	24	30	27	8	31	14	11	10	12	12	10	31	20	14	16	11	16	31
24-Jan	13	41	40	11	14	8	13	14	12	10	10	13	13	13	9	8	10	13	36	36	18	13	13	10	41
25-Jan	13	13	21	19	25	22	20	17	59	15	21	12	15	18	15	19	12	24	19	20	20	22	19	18	59
26-Jan	20	20	20	19	19	19	20	14	12	11	31	27	22	33	19	23	21	16	18	17	13	26	13	10	33
27-Jan	8	16	11	18	14	13	9	13	12	15	17	18	14	14	15	13	11	13	13	14	14	15	14	14	18
28-Jan	14	13	17	14	13	14	12	16	16	15	17	15	14	13	38	72	31	20	12	11	12	16	16	19	72
29-Jan	21	16	15	87	82	27	23	16	25	22	22	21	21	20	21	21	21	17	19	19	18	19	21	18	87
30-Jan	30	20	15	12	9	44	13	16	9	14	12	11	16	18	18	21	17	17	16	17	18	15	24	58	58
31-Jan	29	29	20	17	25	37	31	20	25	54	28	17	21	18	18	21	20	19	24	14	7	12	16	12	54
	71	62	64	87	83	58	60	90	80	80	67	79	53	61	42	72	56	54	36	62	82	82	60	77	
	Diurnal Maximum																								

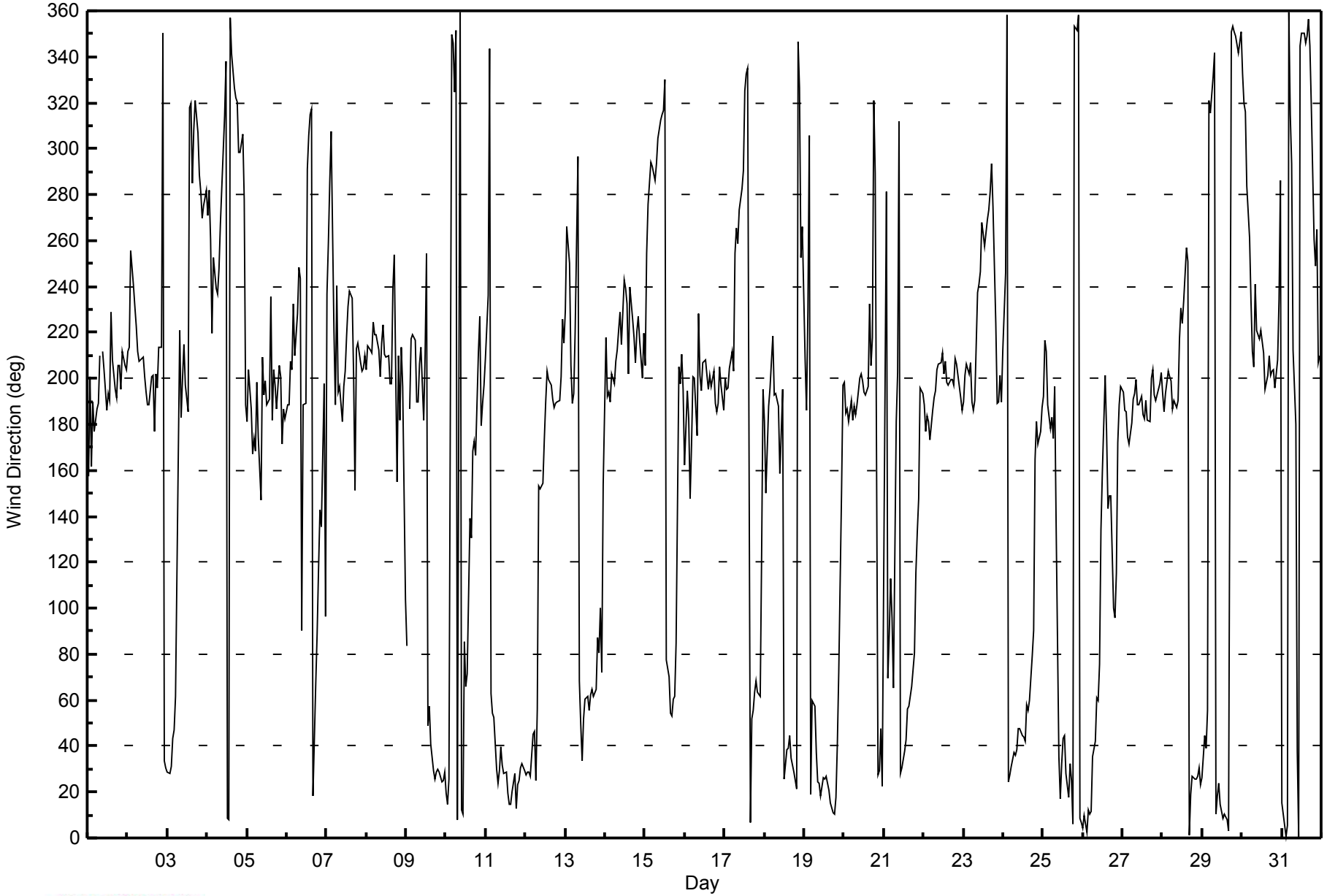
AF - Analyzer Failure MS - Missing

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Shell Muskeg River - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Name	Shell Muskeg River	Station Number	AMS 16

Reason: Routine

Start Time (MST)	8:50	End Time (MST)	13:20
Barometric Pressure	mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11081107
Cal Gas Concentration	50.8 ppm	Cal Gas Expiry Date	5/29/2014
Gas Cert Reference	LL107937		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	3492
DACS voltage range	5	DACS channel #	1

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-710	-710
Analyzer Range (mv)	5000	5000	Lamp voltage	823	823
Calculated slope	0.981375	0.981645	Chamber temp.	45.0	45.0
Calculated intercept	3.458721	2.514567	Pressure (mmHg)	711.1	711.1
Analyzer Background	6.0	6.0	Flow (lpm)	1.382	1.382
Analyzer Coefficient	1.23	1.23	Lamp intensity	90	90

Analyzer make	Thermo 43i	Analyzer serial #	1118148498

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.1	N/A
as found span	5000	78.7	799.6	815.2	0.981
calibrator zero	5000	0.00	0.0	0.2	N/A
high point	5000	78.7	799.6	814.0	0.982
second point	5000	39.4	400.3	401.8	0.996
third point	5000	19.7	200.2	200.0	1.001
calibrator zero	5000	0.00	0.0	0.5	N/A
as left zero	5000	0.00	0.0	0.5	N/A
as left span	5000	78.1	793.5	802.8	0.988
				Average Correction Factor	0.993

Corrected As found	815.3	Previous response	811.3	% change	-0.5%

Notes:

no adjustments required.

Pressure sensor faulty, all other perameters ok,

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

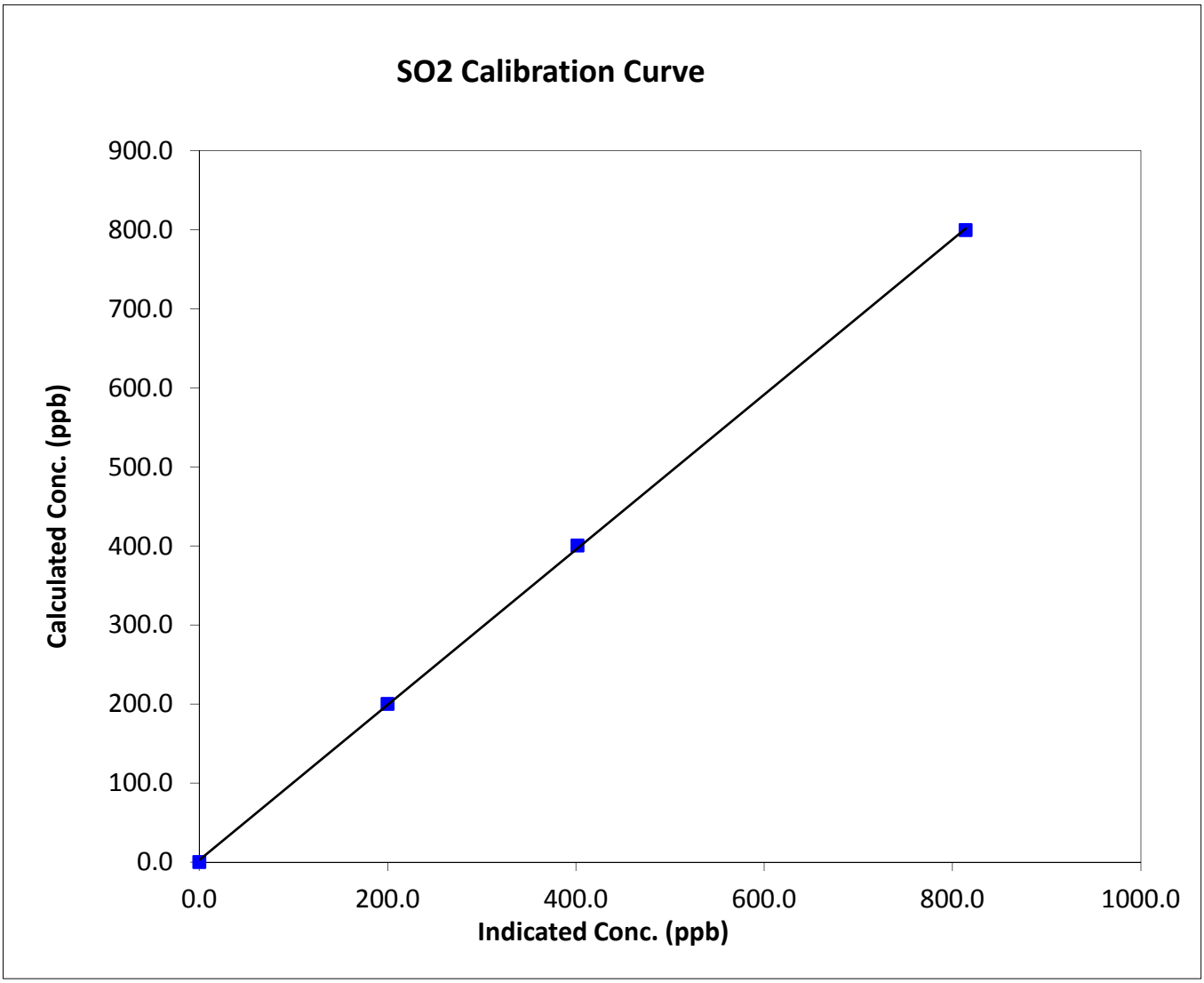
SO_2 Calibration Summary

Station Information

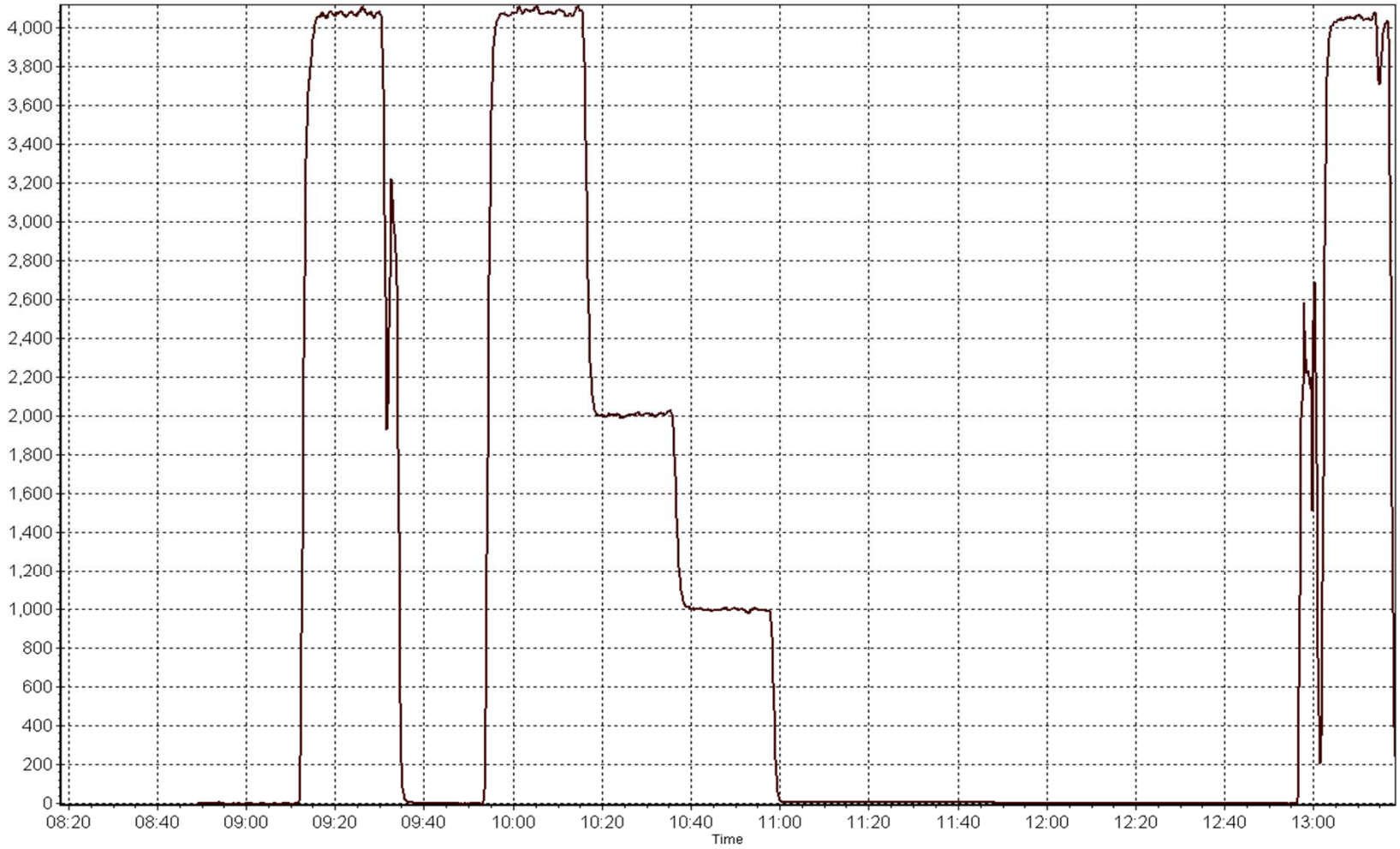
Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	8:50	End Time (MST)	13:20
Analyzer make	Thermo 43i	Analyzer serial #	1118148498

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999931
799.6	814.0	0.9823		
400.3	401.8	0.9963	Slope	0.981645
200.2	200.0	1.0008		
			Intercept	2.514567



SO_2 Calibration Plot **Date:** January 21, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Tuesday, January 21, 2014	Previous Calibration	Friday, December 06, 2013
Station Name	Shell Muskeg River	Station Number	AMS 16
Reason:	Routine		
Start Time (MST)	8:50	End Time (MST)	13:20
Barometric Pressure	mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	11081107
Gas Cert Reference	LL107937	Cal Gas Expiry Date	5/29/2014
CH4 Cal Gas Conc.	515.0 ppm	CH4 Equiv Conc.	1078.8 ppm
C3H8 Cal Gas Conc.	205.0 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	3492
DACS voltage range	0 - 5 VDC	DACS channel #	Diff input 4

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Detector Temp	124.9	124.9
Analyzer Range (mv)	5000	5000	Flame Temp	157.2	157.2
Calculated slope	1.008030	0.998117	Sample Press	8.2	8.2
Calculated intercept	-0.077088	-0.117883	Fuel Press	24.2	24.2
THC Bkgrnd	1.96	1.76	Air Press	34.8	34.8
THC Coef	4.692	4.550			

Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153485

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	-0.31	N/A
as found span	5000	78.7	16.98	16.62	1.022
calibrator zero	5000	0.0	0.00	-0.02	N/A
high point	5000	78.7	16.98	17.03	0.997
second point	5000	39.4	8.50	8.78	0.968
third point	5000	19.7	4.25	4.47	0.951
calibrator zero	5000	0.0	0.00	0.12	N/A
as left zero	5000	0.0	0.00	16.13	N/A
as left span	5000	78.7	16.98	16.25	1.045
				Average Correction Factor	0.972

Corrected As found	16.93	Previous response	16.92	% change	-0.1%

Notes:

Span and Zero adjusted

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

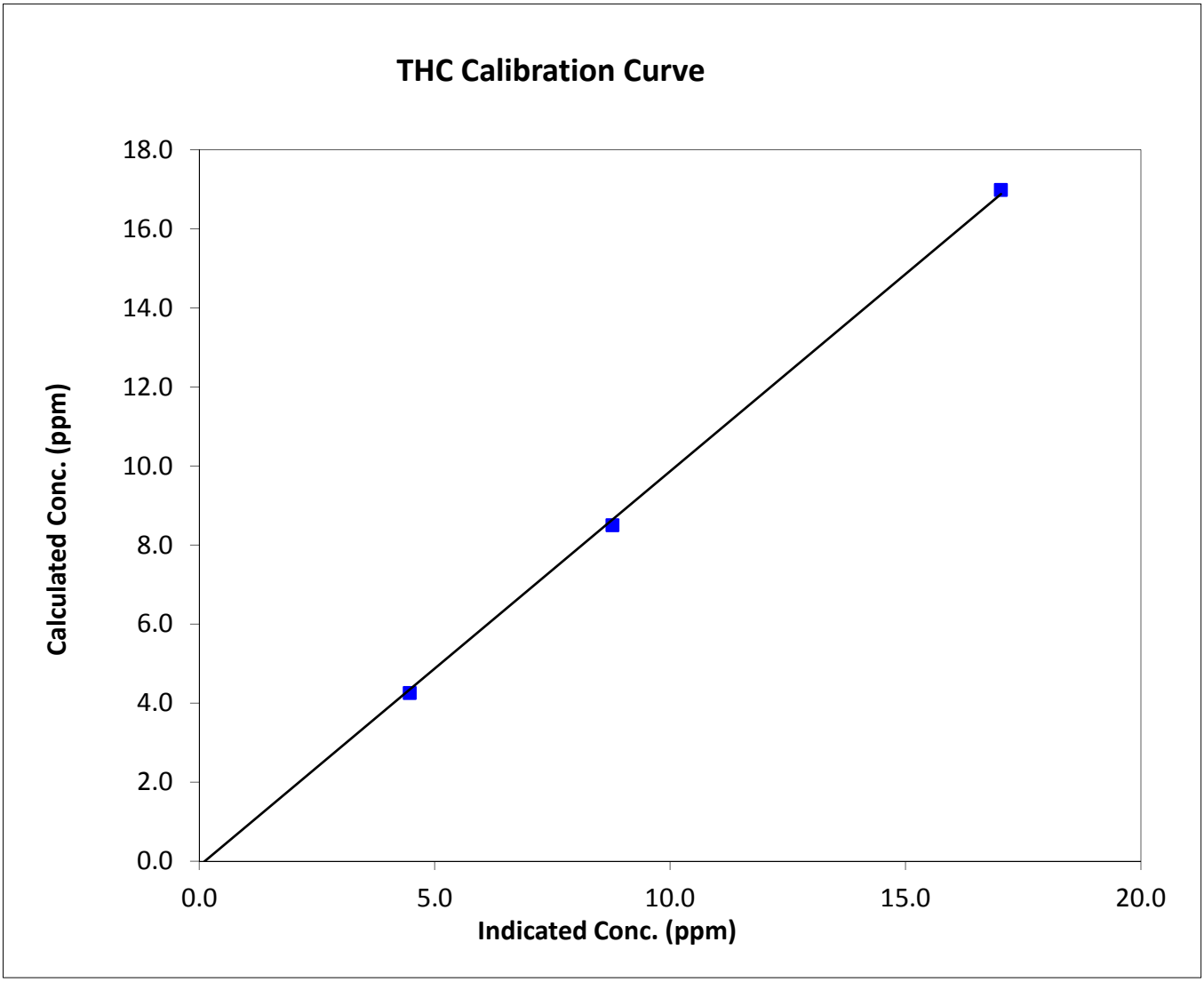
THC Calibration Summary

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Name	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	8:50	End Time (MST)	13:20
Analyzer make	Thermo 51i-LT	Analyzer serial #	1218153485

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	-0.02	N/A	Correlation Coefficient	0.999626
16.98	17.03	0.9970		
8.50	8.78	0.9682	Slope	0.998117
4.25	4.47	0.9508		
			Intercept	-0.117883



THC Calibration Plot **Date:** January 21, 2014

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Name	Shell Muskeg River	Station Number	AMS 16
Reason:	ROUTINE		
Start Time (MST)	8:50	End Time (MST)	13:20
Barometric Pressure	mmHg	Station Temperature	21.0 Deg C
Calibrator	Sabio 2010	Serial Number	11081107
NO Cal Gas Conc	51.2 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	51.3 ppm	Cal Gas Serial #	LL107937

DACS Information

DACS make & model: Campbell Scientific CR3000 DACS serial No.:

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	5000	5000	5000
Before	Data Slope	1.010845	1.005188	0.994790
	Data Offset	2.566851	2.736940	-2.083340
After	Data Slope	1.001057	1.002919	1.008713
	Data Offset	2.598398	2.126825	0.403677
Channel #		3	2	1
Voltage Range		0 - 5V	0 - 5V	0 - 5V

Analyzer Information

Analyzer make/model: API T200 Analyzer serial #: 724

Test Point	before		after	
Concentration range	0-1000	ppb	0-1000	ppb
NO slope	1.164	ppb	1.159	ppb
NOX slope	1.152	ppb	1.157	ppb
Autozero	0.9	mV	0.9	mV
NO offset	-0.2		-0.2	
NOX offset	0.8		0.8	
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	315.1	Deg C	315.8	Deg C
PMT Temp	7.0	Deg C	7.0	Deg C
O3 flow	86.0	ccm	88.0	ccm
R Cell Press	8.5	inHg	7.5	inHg
Sample Flow	495	ccm	481	ccm

Notes:

span adjusted

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 21, 2014 Station Number: AMS 16

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	0.0	0.2	-0.2	N/A	N/A
as found span	5000	78.7	807.5	805.9	1.6	805.8	786.8	19.4	1.0021	1.0243
calibrator zero	5000	0.0	0.0	0.0	0.0	0.0	0.4	-0.3	N/A	N/A
high point	5000	78.7	807.5	805.9	1.6	804.6	804.8	0.5	1.0036	1.0014
second point	5000	39.4	404.2	403.5	0.8	398.2	396.2	1.3	1.0152	1.0183
third point	5000	19.7	202.1	201.7	0.4	198.4	197.8	0.3	1.0188	1.0199
calibrator zero	5000	0.0	0.0	0.0	0.0	0.8	1.2	0.0	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	0.8	1.2	0.0	N/A	N/A
as left span	5000	78.1	801.3	799.7	1.6	783.4	487.8	295.4	1.0229	N/A
								Average Correction Factor	1.0125	1.0132

Corrcted As found NO_X= 805.8 NO= 786.6 Percent Change NO_X= -1.2% NO= 2.6%

Previous Response NO_X= 796.2 NO= 807.3

GPT Calibration Data

Dilution Flow 2853 ccm Source Gas Flow 46.90 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-0.3			N/A	
1st NO2 (300)	N/A	488.6	314.8	801.0	488.6	312.0	1.0358	1.0000	1.0090	99.1%
2nd NO2 (200)	N/A	589.2	214.2	800.8	589.2	211.4	1.0361	1.0000	1.0132	98.7%
3rd NO2 (100)	N/A	693.2	110.2	801.8	693.2	109.0	1.0348	1.0000	1.0110	98.9%
4th NO2 (0)	803.4	N/A	-1.0	802.4	803.4	-0.4	1.0340	1.0000	N/A	N/A
					Average Correction Factor		1.0352	1.0000	1.0111	98.9%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

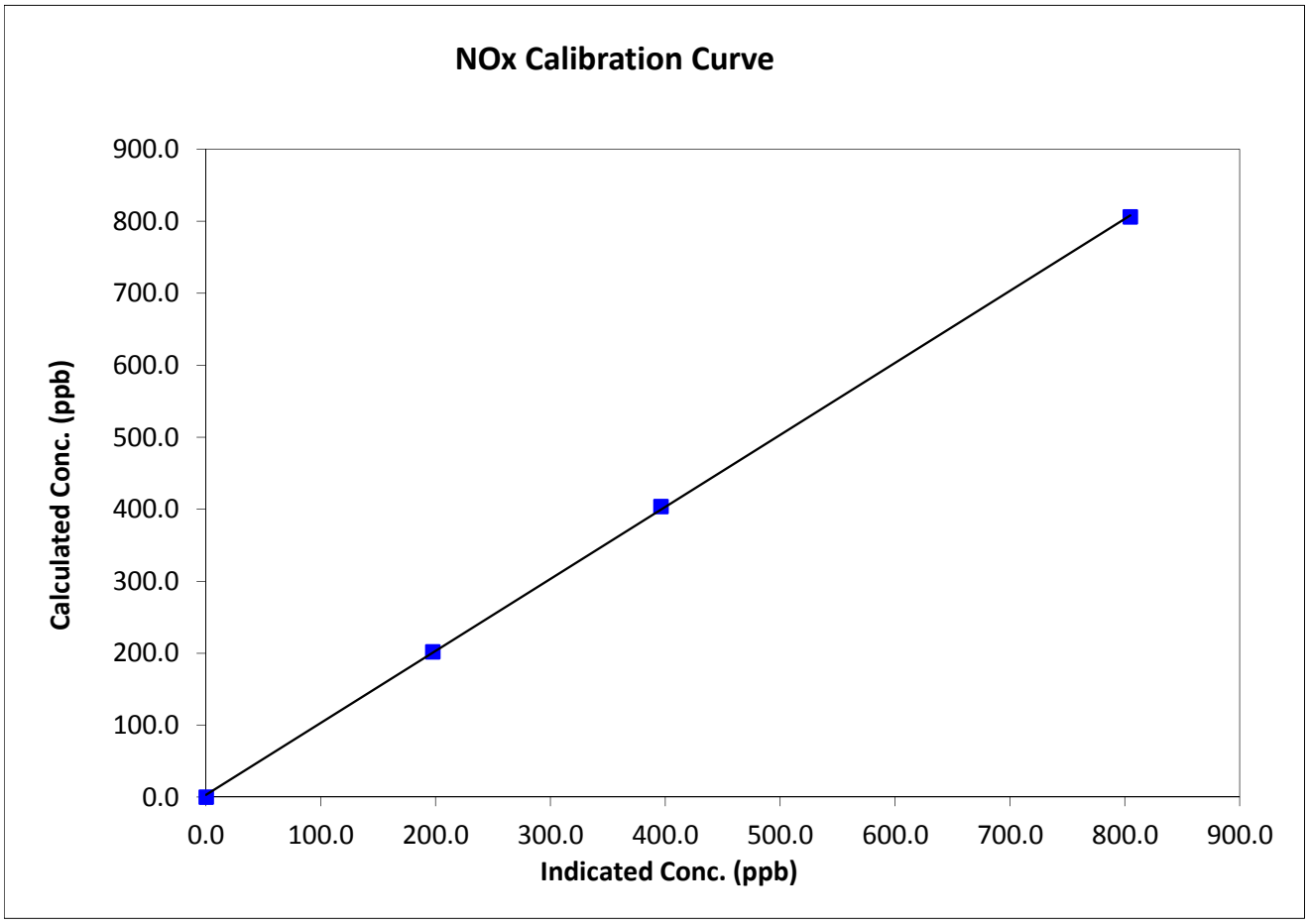
NO_X Calibration Summary

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Number	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	8:50	End Time (MST)	13:20
Analyzer make	API T200	Analyzer serial #	724

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.4	N/A	Correlation Coefficient	0.999905
805.9	804.8	1.0014		
403.5	396.2	1.0183	Slope	1.001057
201.7	197.8	1.0199		
			Intercept	2.598398



Wood Buffalo Environmental Association

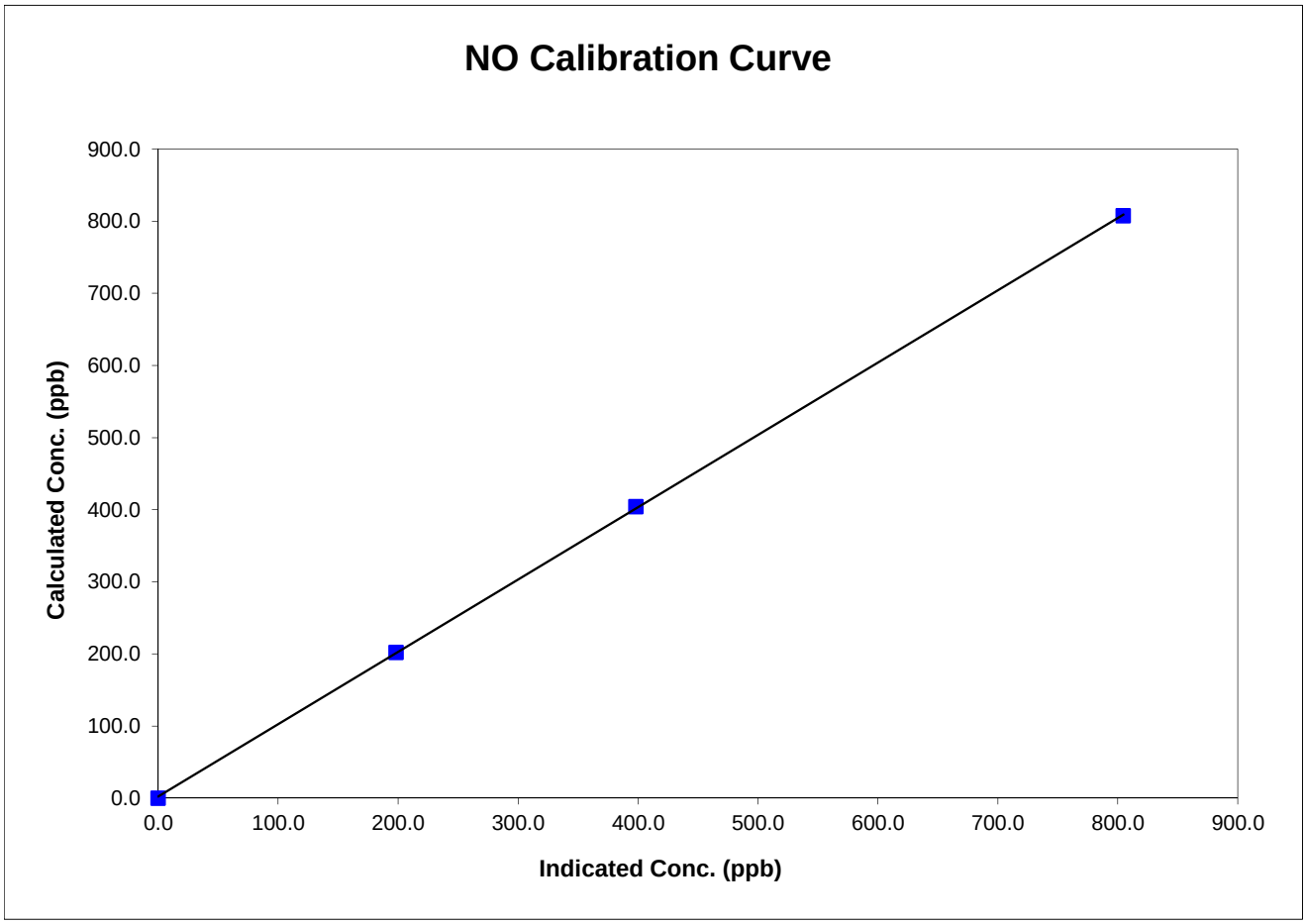
NO Calibration Summary

Station Information

Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Number	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	8:50	End Time (MST)	13:20
Analyzer make	API T200	Analyzer serial #	724

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999955
807.5	804.6	1.0036		
404.2	398.2	1.0152	Slope	1.002919
202.1	198.4	1.0188		
			Intercept	2.126825



Wood Buffalo Environmental Association

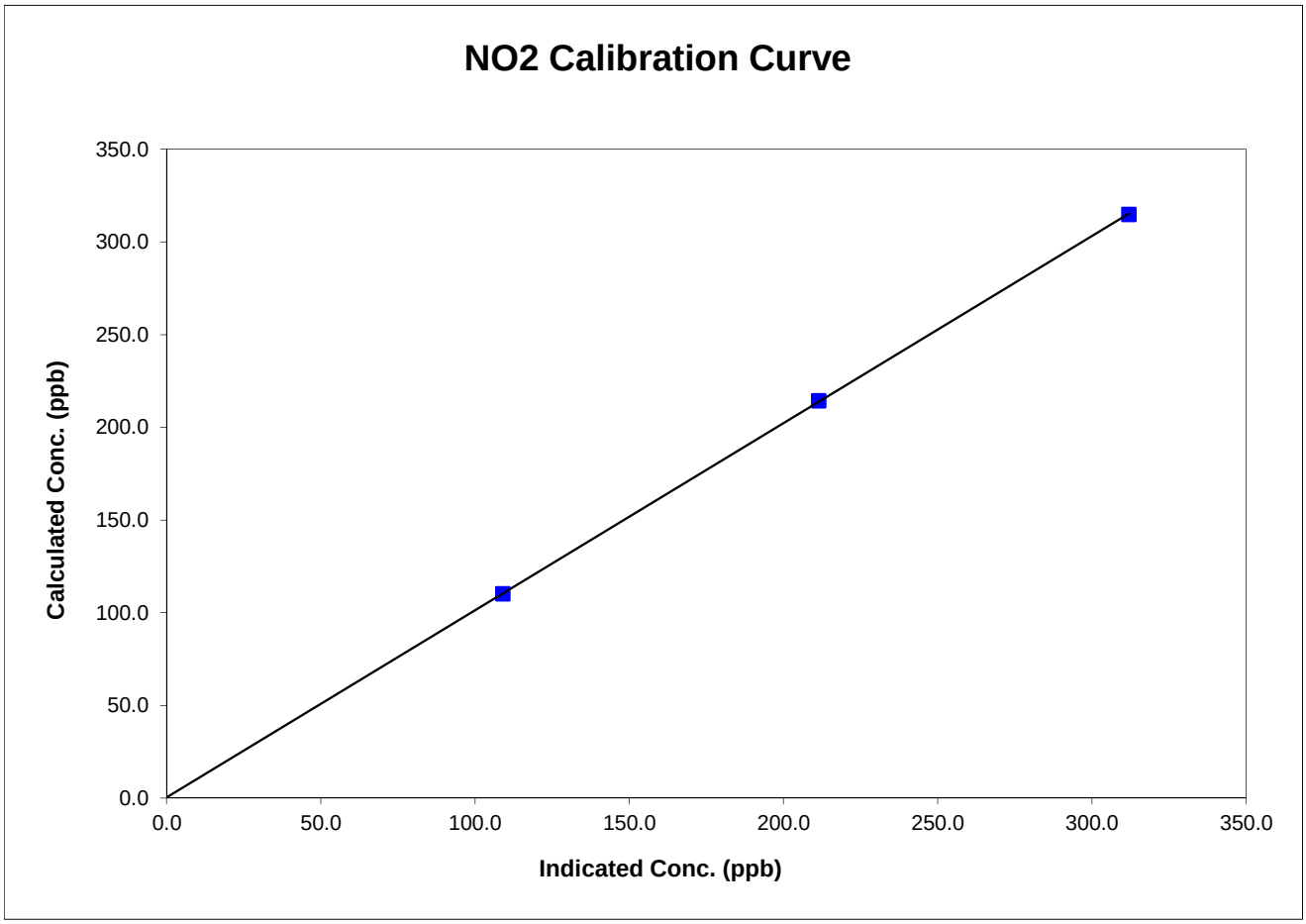
NO_2 Calibration Summary

Station Information

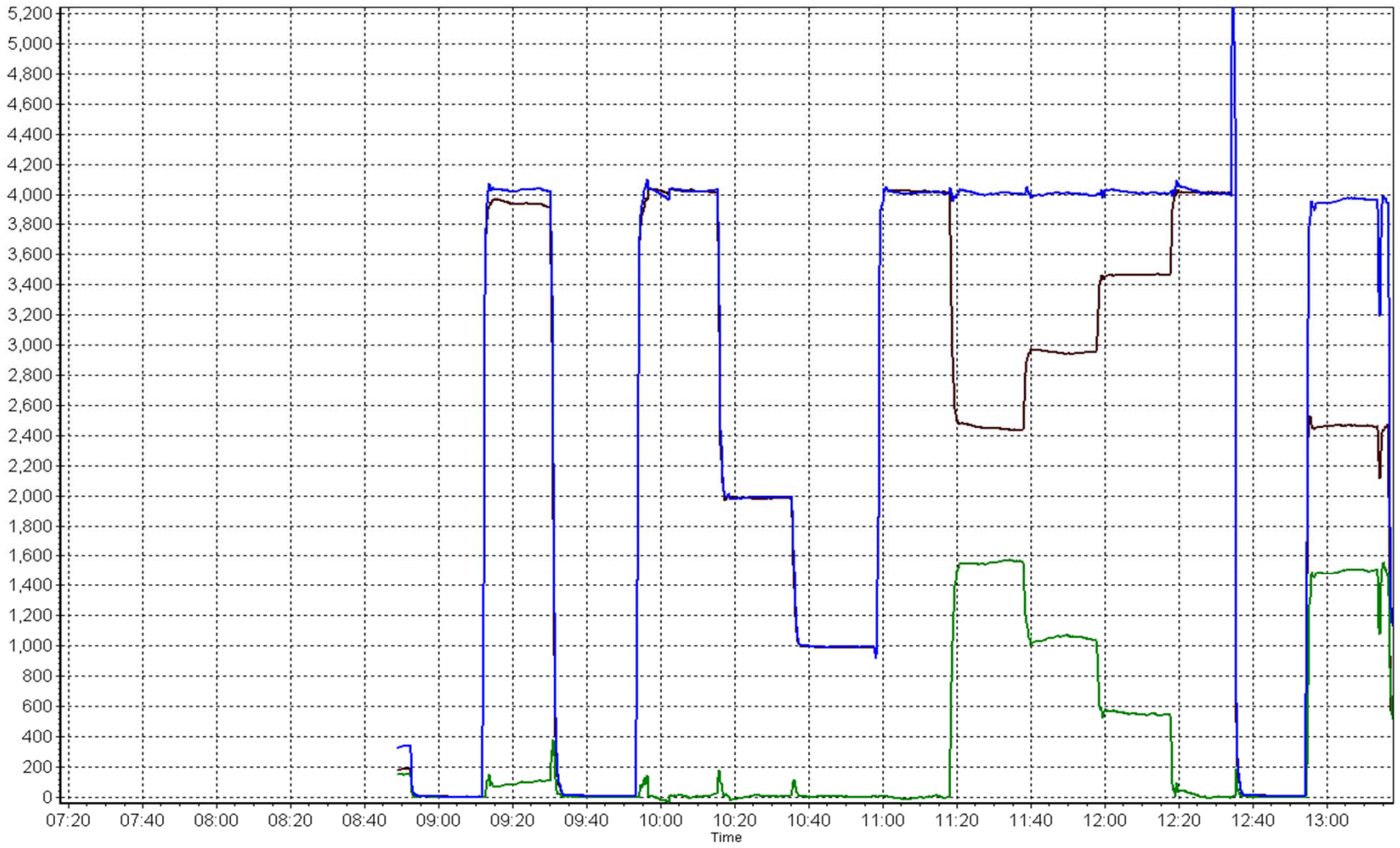
Calibration Date	January 21, 2014	Previous Calibration	December 6, 2013
Station Number	Shell Muskeg River	Station Number	AMS 16
Start Time (MST)	8:50	End Time (MST)	13:20
Analyzer make	API T200	Analyzer serial #	724

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999992
314.8	312.0	1.0090		
214.2	211.4	1.0132	Slope	1.008713
110.2	109.0	1.0110		
			Intercept	0.403677



NOx, NO & NO_2 Calibration Plot **Date:** **January 21, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 17
WAPASU
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
JANUARY 2014

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	707	36	37	99.87	113	0	20	0
H2S (ppb) Average	708	35	36	99.87	5	0	2	0
THC (ppm) Average	707	36	37	99.87	2.7	-	2.5	-
O3 (ppb) Average	709	35	35	100.00	41	0	35	-
NO2 (ppb) Average	706	37	38	99.87	32	0	15	-
NO (ppb) Average	706	37	38	99.87	22	-	5	-
NOX (ppb) Average	706	37	38	99.87	48	-	17	-
PM2.5 (ug/m3) Average	713	0	31	95.83	28.6	-	9.6	0
Temperature 2 m (C) Average	744	0	0	100.00	5	-	-2	-
Relative Humidity (%) Average	744	0	0	100.00	94	-	91	-
Wind Speed 10 m (km/h) Average	737	0	7	99.06	31	-	-	-
Wind Direction 10 m (deg) Average	737	0	7	99.06	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	2.2	7	-	0	0	0	0	1	5	113
H2S (ppb) Average	708	0.3	0	-	0	0	0	0	0	0	5
THC (ppm) Average	707	2.16	0.1	-	2	2.1	2.1	2.1	2.2	2.3	2.7
O3 (ppb) Average	709	26.7	8	-	0	15	21	29	33	36	41
NO2 (ppb) Average	706	5.7	6	-	0	1	1	3	8	15	32
NO (ppb) Average	706	1.5	2	-	0	0	1	1	1	2	22
NOX (ppb) Average	706	7.2	7	-	0	1	2	4	10	18	48
PM2.5 (ug/m3) Average	713	3.26	3.5	-	0	0.5	1	2	4.4	7.3	28.6
Temperature 2 m (C) Average	744	-17.01	9.5	-	-39.4	-29.5	-24.1	-17.1	-10.4	-3.7	5
Relative Humidity (%) Average	744	78.6	9	-	46	69	74	78	86	89	94
Wind Speed 10 m (km/h) Average	737	8.6	5	-	1	3	5	8	11	15	31
Wind Direction 10 m (deg) Average	737	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS 17)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	26 Jan 2014 10:00	26 Jan 2014 10:00	1	Maintenance - remotely initiated daily QA check
H2S	31 Jan 2014 14:00	31 Jan 2014 14:00	1	Maintenance - new in-situ calibrator installed
THC	26 Jan 2014 10:00	26 Jan 2014 10:00	1	Maintenance - remotely initiated daily QA check
NO2, NO, NOX	26 Jan 2014 10:00	26 Jan 2014 10:00	1	Maintenance - remotely initiated daily QA check
PM2.5	07 Jan 2014 11:00	07 Jan 2014 11:00	1	Intermittent unstable operation - excessive baseline drift
PM2.5	07 Jan 2014 19:00	07 Jan 2014 20:00	2	Intermittent unstable operation - excessive baseline drift
PM2.5	08 Jan 2014 13:00	08 Jan 2014 13:00	1	Flow and zero reference checks, sample head cleaning
PM2.5	15 Jan 2014 03:00	15 Jan 2014 07:00	5	Intermittent unstable operation - excessive baseline drift
PM2.5	15 Jan 2014 09:00	15 Jan 2014 13:00	5	Intermittent unstable operation - excessive baseline drift
PM2.5	17 Jan 2014 13:00	17 Jan 2014 14:00	2	Intermittent unstable operation - excessive baseline drift
PM2.5	29 Jan 2014 14:00	30 Jan 2014 00:00	11	Intermittent unstable operation - excessive baseline drift
PM2.5	30 Jan 2014 06:00	30 Jan 2014 07:00	2	Intermittent unstable operation - excessive baseline drift
PM2.5	30 Jan 2014 09:00	30 Jan 2014 10:00	2	Intermittent unstable operation - excessive baseline drift
Wind Speed, Wind Direction	05 Jan 2014 05:00	05 Jan 2014 05:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	05 Jan 2014 07:00	05 Jan 2014 08:00	2	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	05 Jan 2014 10:00	05 Jan 2014 10:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	07 Jan 2014 04:00	07 Jan 2014 04:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	11 Jan 2014 03:00	11 Jan 2014 03:00	1	Flatline in sensor output signal -sensor frozen
Wind Speed, Wind Direction	18 Jan 2014 22:00	18 Jan 2014 22:00	1	Flatline in sensor output signal -sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 113 ppb on Jan 1 13:00 Maximum Daily Average: 20.2 ppb on Jan 1

Minimum Value: 0 ppb on Jan 15 05:00 Minimum Daily Average: 0.1 ppb on Jan 15
Maximum Diurnal Average: 6.0 ppb at hour 13 Minimum Diurnal Average: 0.9 ppb at hour 22
Monthly Average: 2.2 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 5$ $P_{99} = 29$

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2	Z	4	11	10	14	14	21	23	13	29	82	113	56	39	14	5	2	2	3	3	2	2	2	20.2	113
2-Jan	2	Z	1	2	2	2	2	2	2	2	2	3	2	3	4	6	10	6	6	3	2	2	1	1	2.9	10
3-Jan	0	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
4-Jan	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
5-Jan	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2	2	1	1	0.6	2
6-Jan	1	Z	2	2	2	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0.9	2
7-Jan	1	Z	1	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	1	0.4	1
8-Jan	0	Z	0	1	1	1	1	1	1	1	1	2	6	10	11	9	9	9	6	4	4	5	15	42	6.0	42
9-Jan	13	Z	2	1	0	0	0	1	0	0	1	3	5	1	2	4	9	3	1	1	1	0	0	0	2.2	13
10-Jan	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
11-Jan	1	Z	1	1	1	2	3	1	1	1	1	1	1	1	1	0	8	4	1	0	0	0	0	0	1.3	8
12-Jan	0	Z	0	0	0	0	0	0	0	0	0	0	1	3	13	3	0	0	0	0	0	0	1	1	1.1	13
13-Jan	2	Z	1	1	1	2	8	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	8
14-Jan	0	Z	0	1	3	29	20	18	16	5	2	2	3	3	2	1	1	1	1	0	0	0	0	0	4.7	29
15-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
16-Jan	0	Z	6	5	4	1	1	1	2	5	6	6	5	6	11	6	3	3	4	5	5	5	5	4	4.3	11
17-Jan	1	Z	0	3	6	7	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	7
18-Jan	0	Z	1	1	0	2	2	5	6	5	7	5	2	2	1	1	1	0	1	1	0	0	0	0	1.9	7
19-Jan	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
20-Jan	0	Z	0	0	1	1	3	2	1	1	1	1	1	0	0	1	0	1	1	3	7	2	1	1	1.2	7
21-Jan	1	Z	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
22-Jan	0	Z	0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	1	1	1	1	1	1	1	0.5	1
23-Jan	2	Z	8	11	13	14	13	7	6	2	1	1	1	0	1	1	1	1	1	1	1	1	0	0	3.8	14
24-Jan	1	Z	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
25-Jan	0	Z	1	0	0	2	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	5
26-Jan	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
27-Jan	0	Z	0	1	1	2	4	5	6	11	32	14	15	30	8	5	3	0	0	0	0	0	0	0	6.1	32
28-Jan	0	Z	0	0	0	1	1	2	4	7	8	10	8	3	1	0	0	0	0	0	0	0	0	0	2.2	10
29-Jan	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
30-Jan	0	Z	0	0	0	0	0	0	0	0	0	10	15	7	6	5	4	4	4	4	4	3	2	1	3.0	15
31-Jan	1	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
	1.1	--	1.1	1.4	1.6	2.7	2.8	2.7	2.6	2.0	3.2	4.8	6.0	4.1	3.3	2.0	1.9	1.2	1.0	1.0	1.1	0.9	1.1	1.9	Diurnal Average	
	13	--	8	11	13	29	20	21	23	13	32	82	113	56	39	14	10	9	6	5	7	5	15	42	Diurnal Maximum	

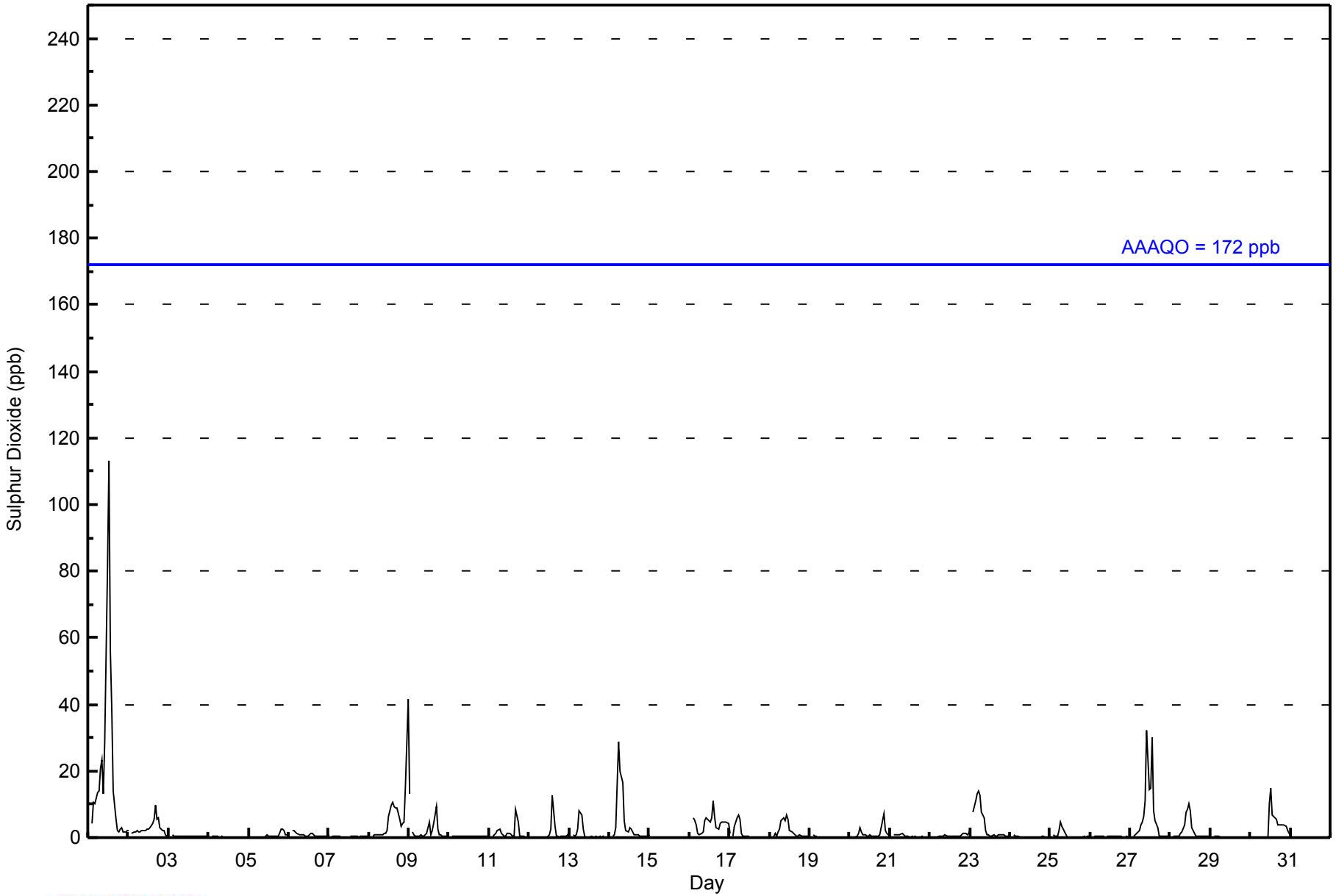
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	675	95.47	95.47
11 - 20	21	2.97	98.44
21 - 60	9	1.27	99.72
61 - 110	1	0.14	99.86
111 - 172	1	0.14	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2014

Concentration	Wind Direction																
Ranges (ppb)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	88	24	10	15	10	19	49	103	100	33	24	13	12	24	31	113	668
11 - 20	0	0	0	0	0	2	3	5	2	8	1	0	0	0	0	0	21
21 - 60	0	0	0	0	0	0	4	2	2	1	0	0	0	0	0	0	9
61 - 110	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
111 - 172	0	0	0	0	0	0	0	1	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	88	24	10	15	10	21	56	111	105	42	25	13	12	24	31	113	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

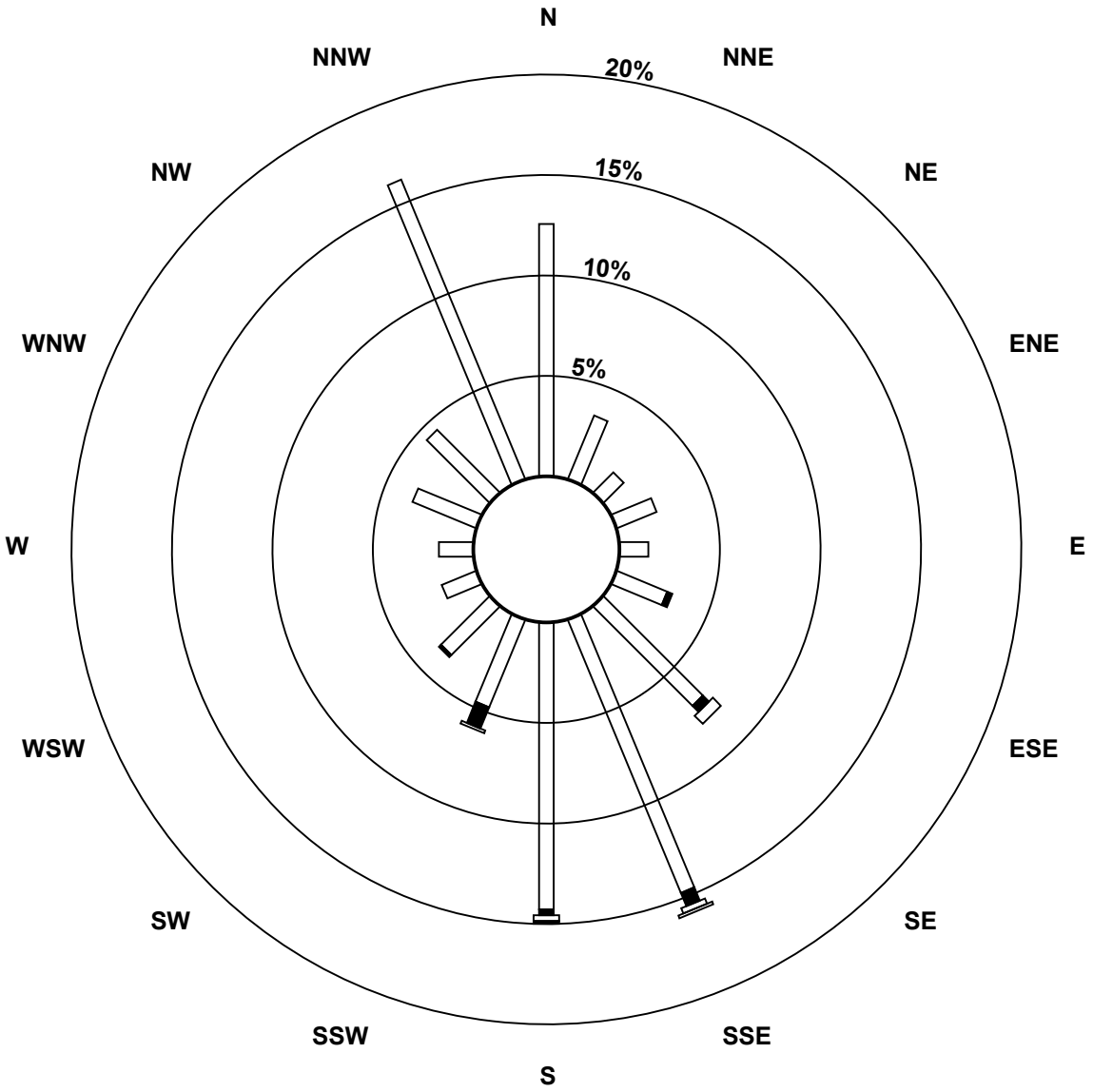
AURORA ATMOSPHERICS INC.

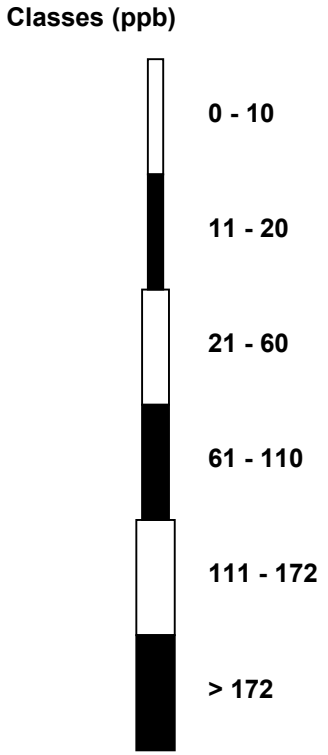
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Wapasu (AMS 17)





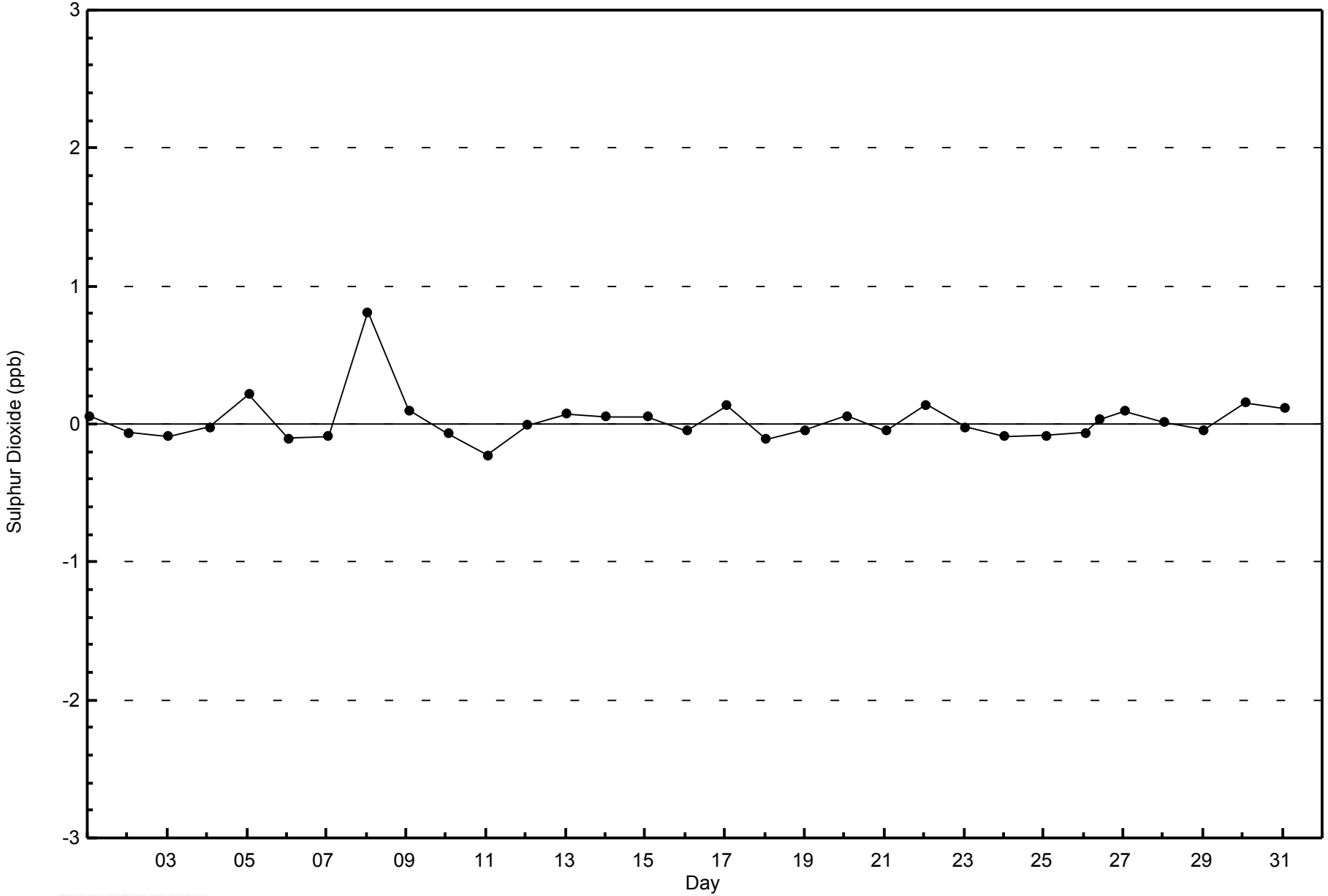
Total Number of Valid Hours: 700

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2014



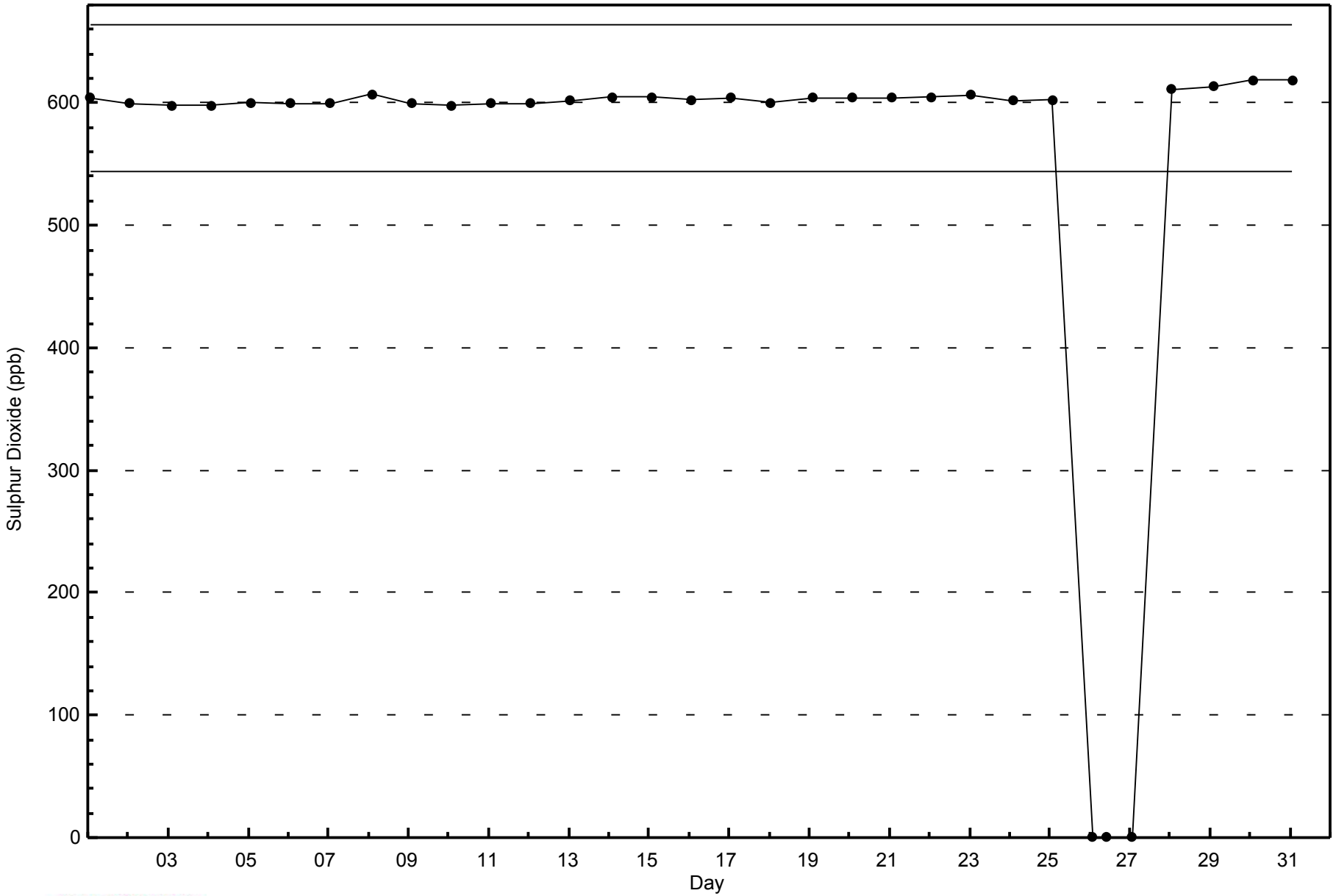
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 ppb on Jan 1 14:00 Maximum Daily Average: 1.7 ppb on Jan 1

Minimum Value: 0 ppb on Jan 14 14:00 Minimum Daily Average: 0.1 ppb on Jan 29
Maximum Diurnal Average: 0.5 ppb at hour 14 Minimum Diurnal Average: 0.2 ppb at hour 1
Monthly Average: 0.3 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	708
Hours of Missing Data:	36
Hours of Calibration:	35
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	0	Z	1	1	1	1	1	1	1	1	2	4	5	5	4	3	2	2	1	1	1	1	1	1.7	5
2-Jan	0	1	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0.6	1
3-Jan	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
4-Jan	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
5-Jan	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
6-Jan	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
7-Jan	0	0	Z	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2
8-Jan	0	0	Z	0	0	0	0	0	C	C	C	C	1	1	1	1	1	1	1	1	0	0	1	1	0.6	1
9-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0.3	1
10-Jan	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
11-Jan	0	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
12-Jan	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
13-Jan	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-Jan	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
15-Jan	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-Jan	0	0	Z	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
17-Jan	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
18-Jan	0	0	Z	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0.4	1
19-Jan	0	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
20-Jan	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
21-Jan	0	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
22-Jan	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
23-Jan	0	0	Z	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0.3	1
24-Jan	0	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
25-Jan	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-Jan	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-Jan	0	0	Z	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
28-Jan	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
29-Jan	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
30-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.2	1
31-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0	0	0	0.2	0
	0.2	0.2	--	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Average	
	0	1	--	1	1	1	2	2	1	1	1	2	4	5	5	4	3	2	2	1	1	1	1	1	Diurnal Maximum	

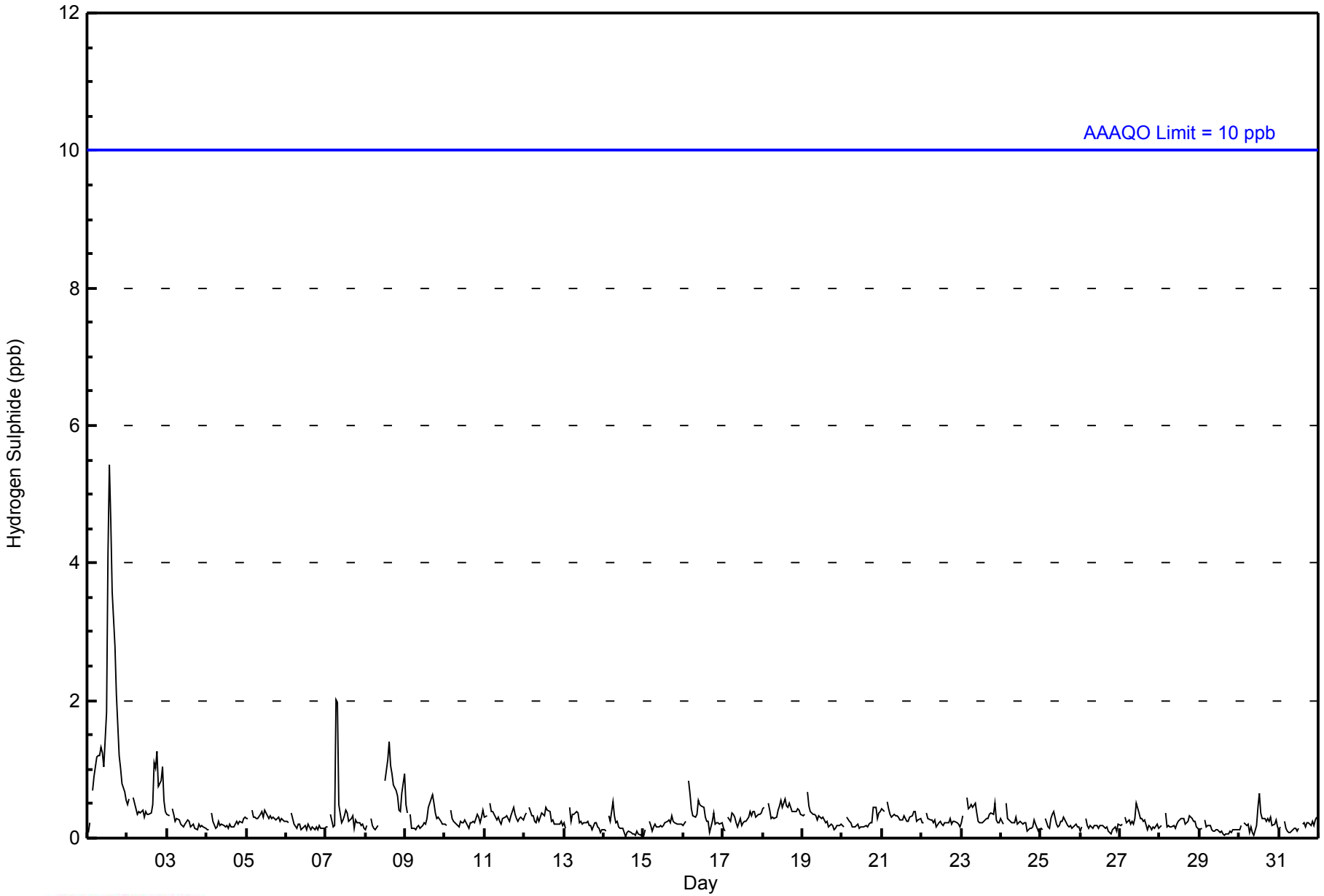
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.29	99.29
3 - 4	3	0.42	99.72
5 - 7	2	0.28	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	88	24	9	15	10	22	60	107	101	42	25	16	10	21	33	114	697
3 - 4	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3
5 - 7	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
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	88	24	9	15	10	22	60	110	103	42	25	16	10	21	33	114	702

Total Number of Valid Hours: 702

Total Number of Hours: 744

AURORA
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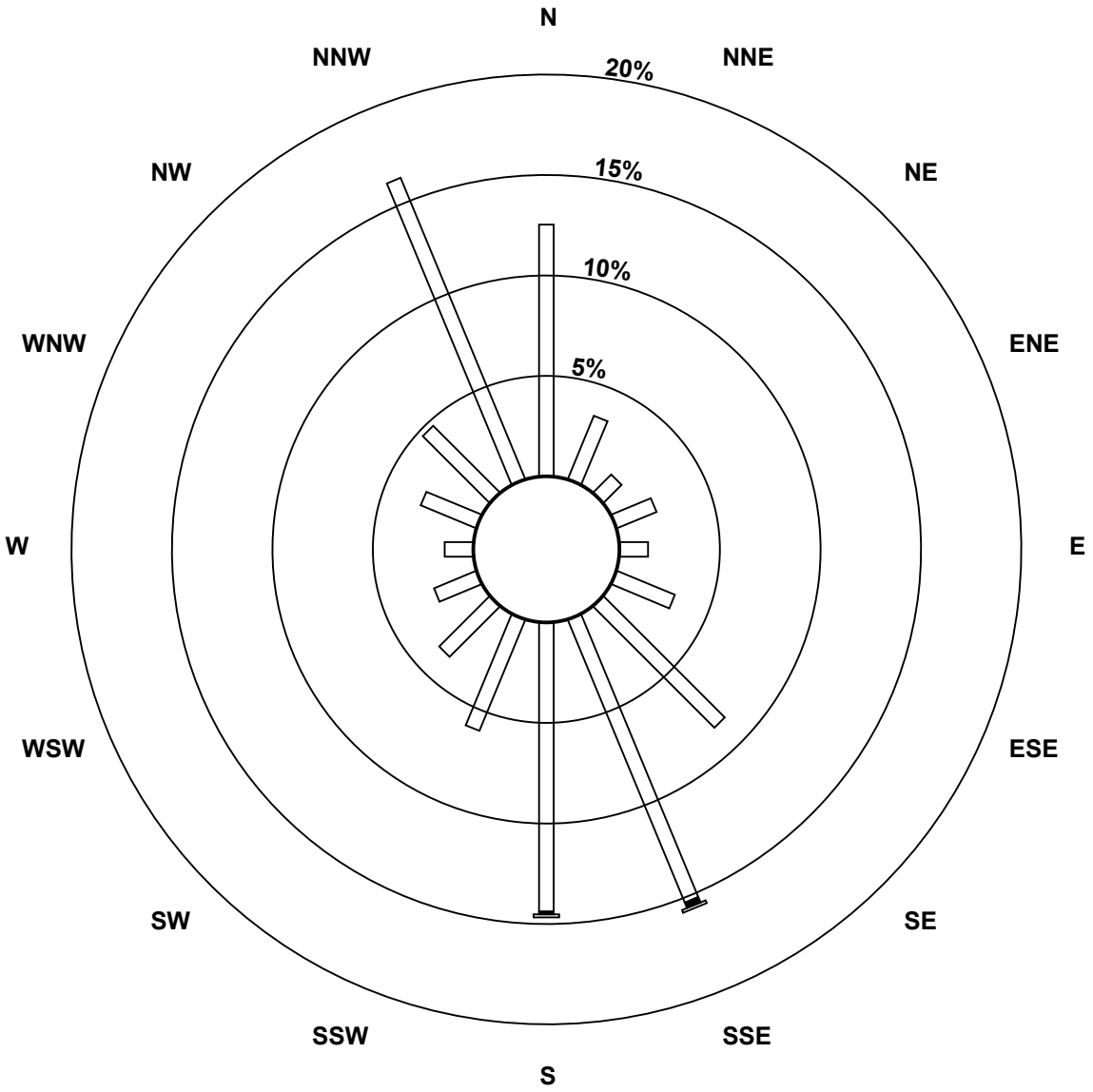
Wood Buffalo Environmental Association

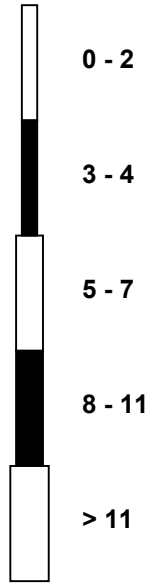
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

Wapasu (AMS 17)



Classes (ppb)



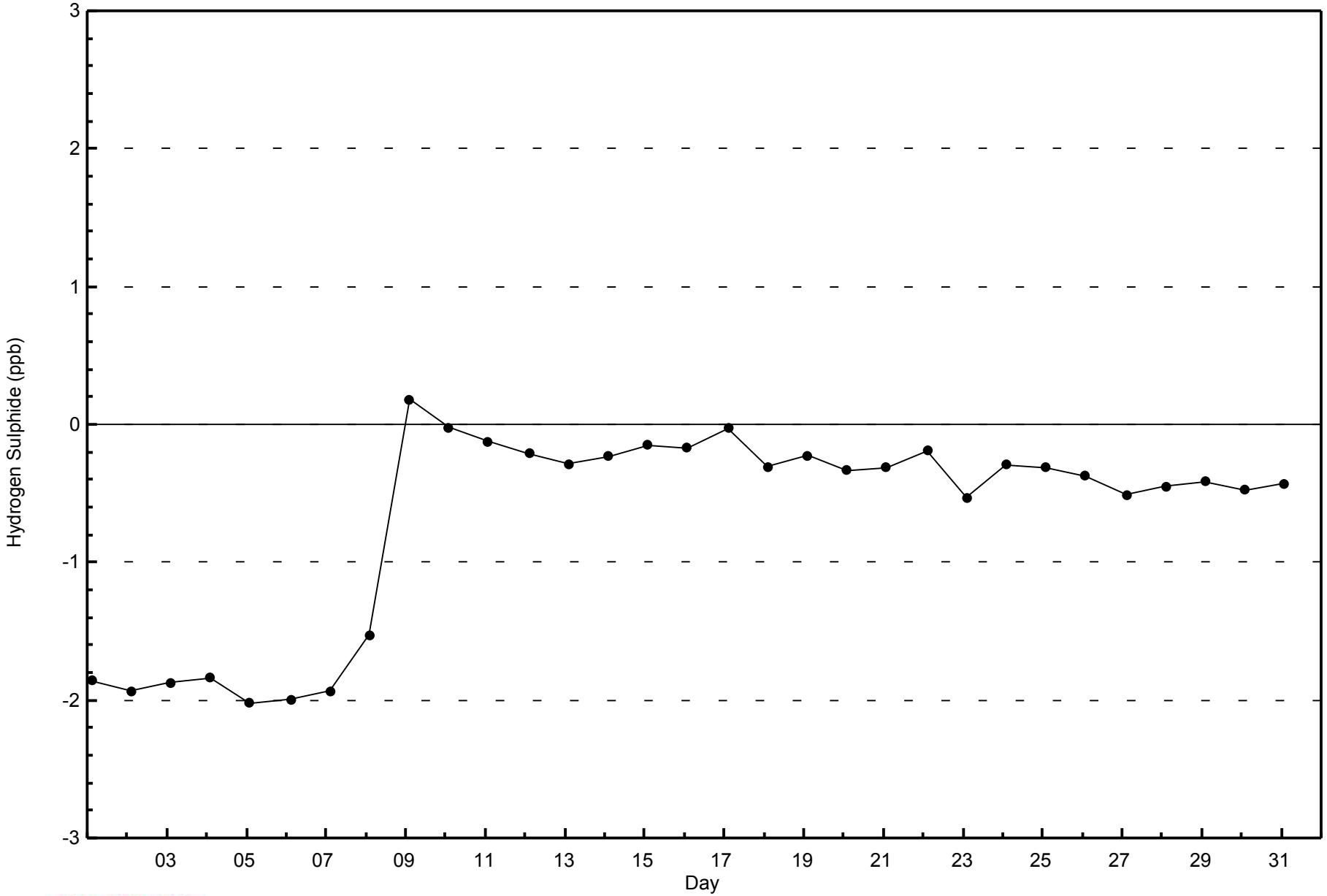
Total Number of Valid Hours: 702

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2014



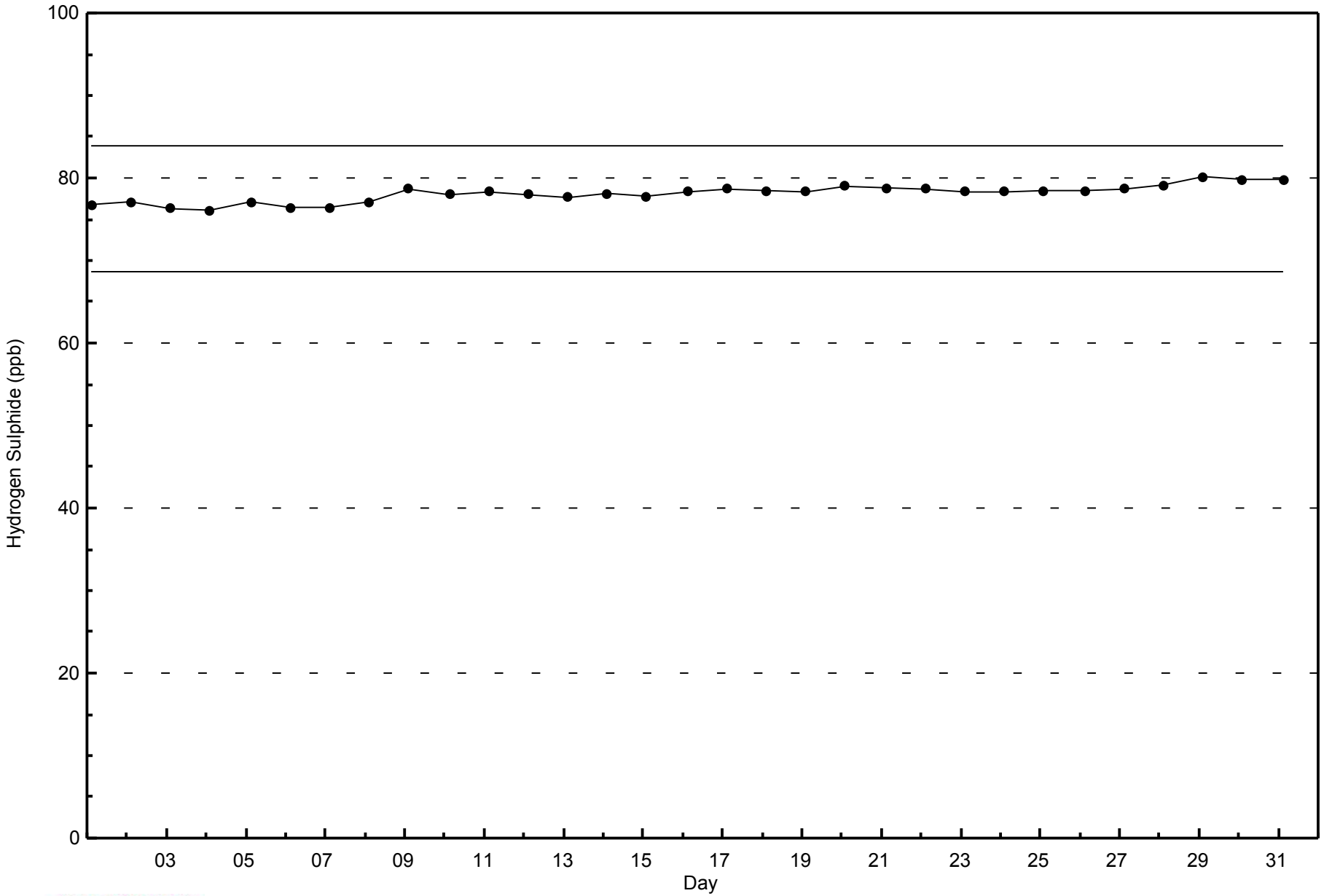
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Wapasu - January 2014

Maximum Value: 2.7 ppm on Jan 9 18:00

Maximum Daily Average: 2.5 ppm on Jan 2

Minimum Value: 2.0 ppm on Jan 15 00:00

Minimum Daily Average: 2.1 ppm on Jan 25

Maximum Diurnal Average: 2.2 ppm at hour 4

Minimum Diurnal Average: 2.1 ppm at hour 17

Monthly Average: 2.16 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} = 2.6

Hours in Service:	744
Hours of Data:	707
Hours of Missing Data:	37
Hours of Calibration:	36
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5
2-Jan	2.4	Z	2.4	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.4	2.3	2.4	2.5	2.5	2.3	2.5	2.6
3-Jan	2.2	Z	2.2	2.2	2.3	2.3	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	2.2	2.2	2.2	2.3
4-Jan	2.2	Z	2.3	2.3	2.3	2.2	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	2.2	2.2	2.2	2.3
5-Jan	2.1	Z	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.4
6-Jan	2.2	Z	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	2.1	2.2	2.2	2.2	2.1	2.2
7-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.4	2.4	C	C	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	2.2	2.4
8-Jan	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	2.4	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.5	2.6	2.5	2.3	2.6
9-Jan	2.4	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.6	2.6	2.6	2.7	2.6	2.5	2.4	2.4	2.3	2.3	2.4	2.7
10-Jan	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.3
11-Jan	2.3	Z	2.3	2.3	2.3	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	2.1	2.1	2.1	2.1	2.1	2.2	2.3
12-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.3
13-Jan	2.1	Z	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	2.1	2.1	2.2
14-Jan	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	2.0	2.0	2.0	2.1	2.1
15-Jan	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1
16-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3
17-Jan	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.1	2.1	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	2.2
18-Jan	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	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	2.3
19-Jan	2.1	Z	2.2	2.4	2.2	2.1	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	2.1	2.1	2.1	2.1	2.1	2.1	2.4
20-Jan	2.1	Z	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	2.1	2.3	2.2	2.1	2.2	2.2	2.1	2.3
21-Jan	2.3	Z	2.3	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
22-Jan	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	2.2	2.2	2.1	2.2
23-Jan	2.2	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	2.2	2.2	2.2	2.3	2.4	2.5	2.4	2.1	2.0	2.0	2.2	2.5
24-Jan	2.1	Z	2.2	2.4	2.0	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	2.4
25-Jan	2.1	Z	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
26-Jan	2.1	Z	2.1	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	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
27-Jan	2.1	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	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
28-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2
29-Jan	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	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1
30-Jan	2.0	Z	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2
31-Jan	2.2	Z	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	2.1	2.1	2.1	2.0	2.0	2.1	2.1	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	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average	
	2.4	--	2.4	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.6	2.6	2.6	2.5	2.6	2.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance

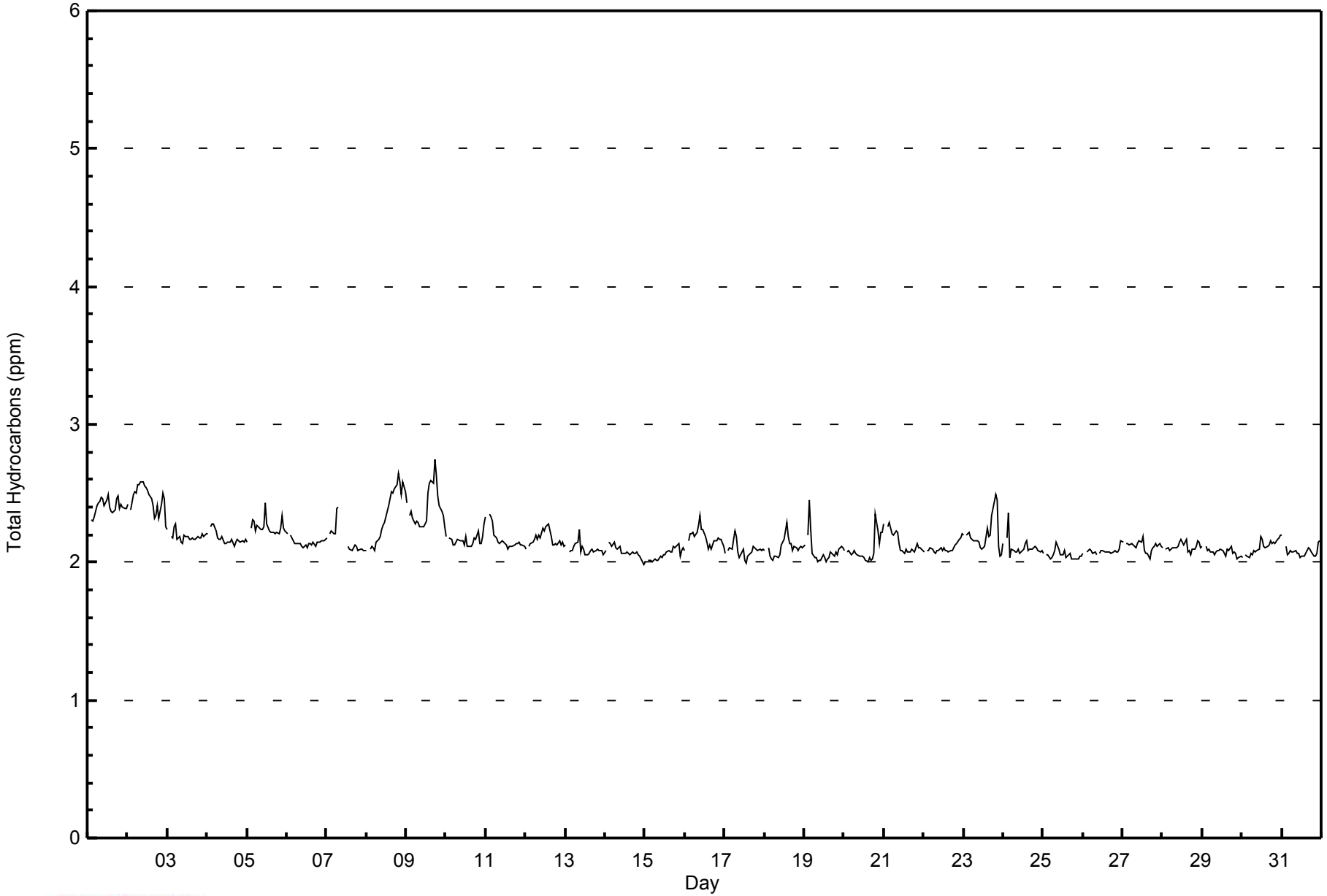
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	69	9.76	9.76
2.1 - 3.0	638	90.24	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

Wapasu - January 2014

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	2	5	0	1	0	0	0	5	13	4	0	1	3	4	7	24	69
2.1 - 3.0	86	19	10	14	10	21	56	106	92	38	25	12	9	20	24	89	631
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	88	24	10	15	10	21	56	111	105	42	25	13	12	24	31	113	700

Total Number of Valid Hours: 700

Total Number of Hours: 744

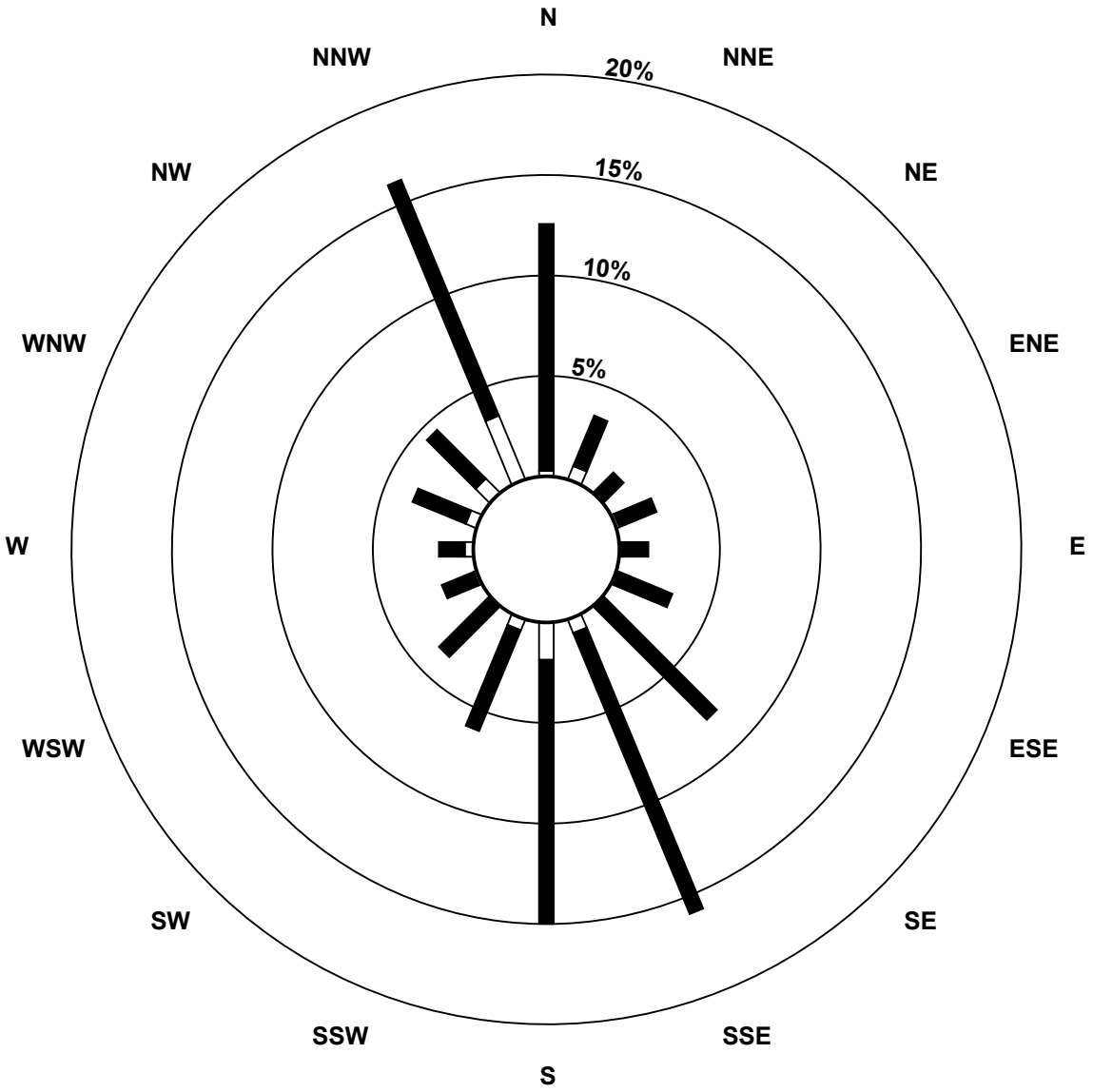
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

Wapasu (AMS 17)



Classes (ppm)

0 - 2.0

2.1 - 3.0

3.1 - 10.0

> 10.0

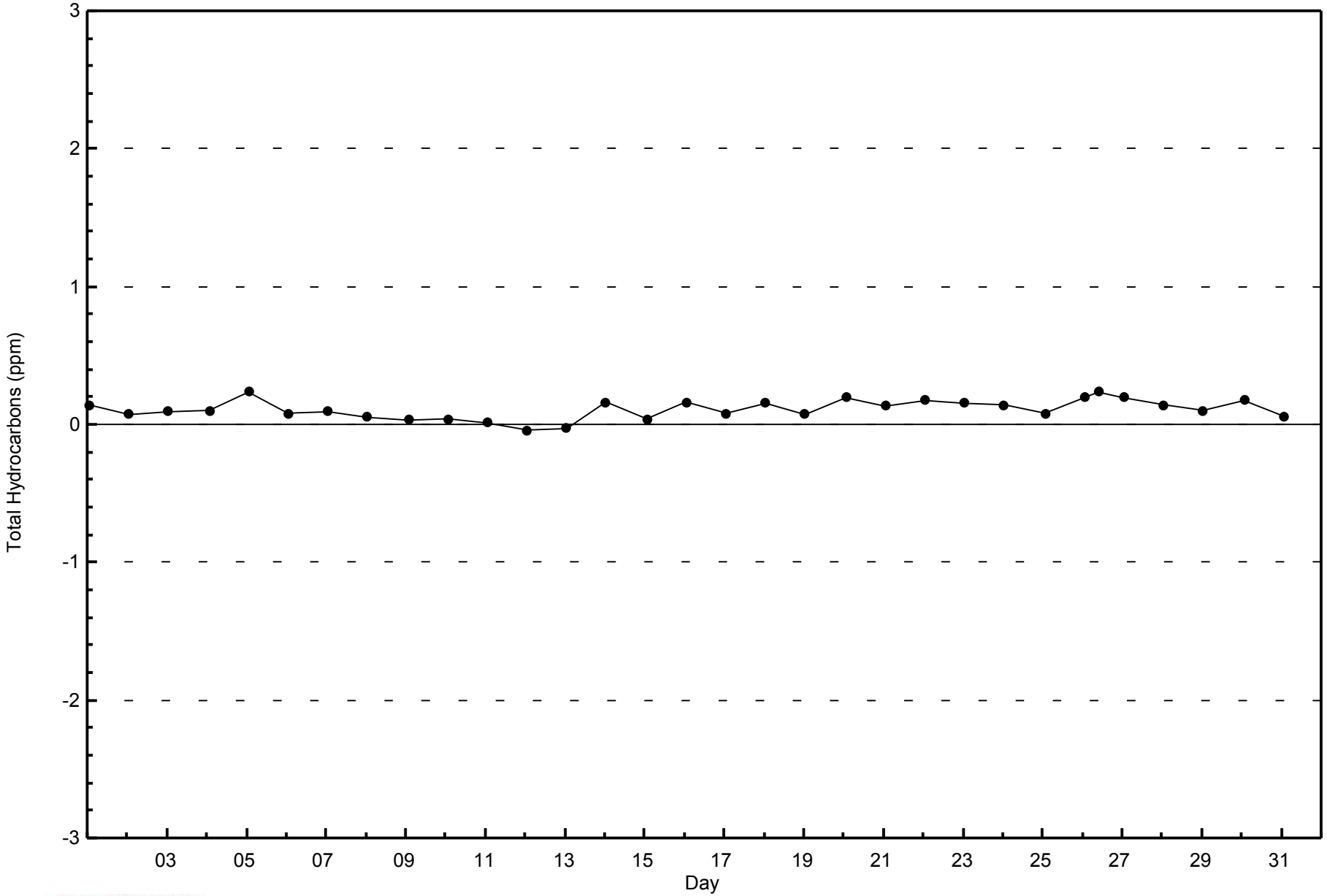
Total Number of Valid Hours: 700

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

Wapasu - January 2014



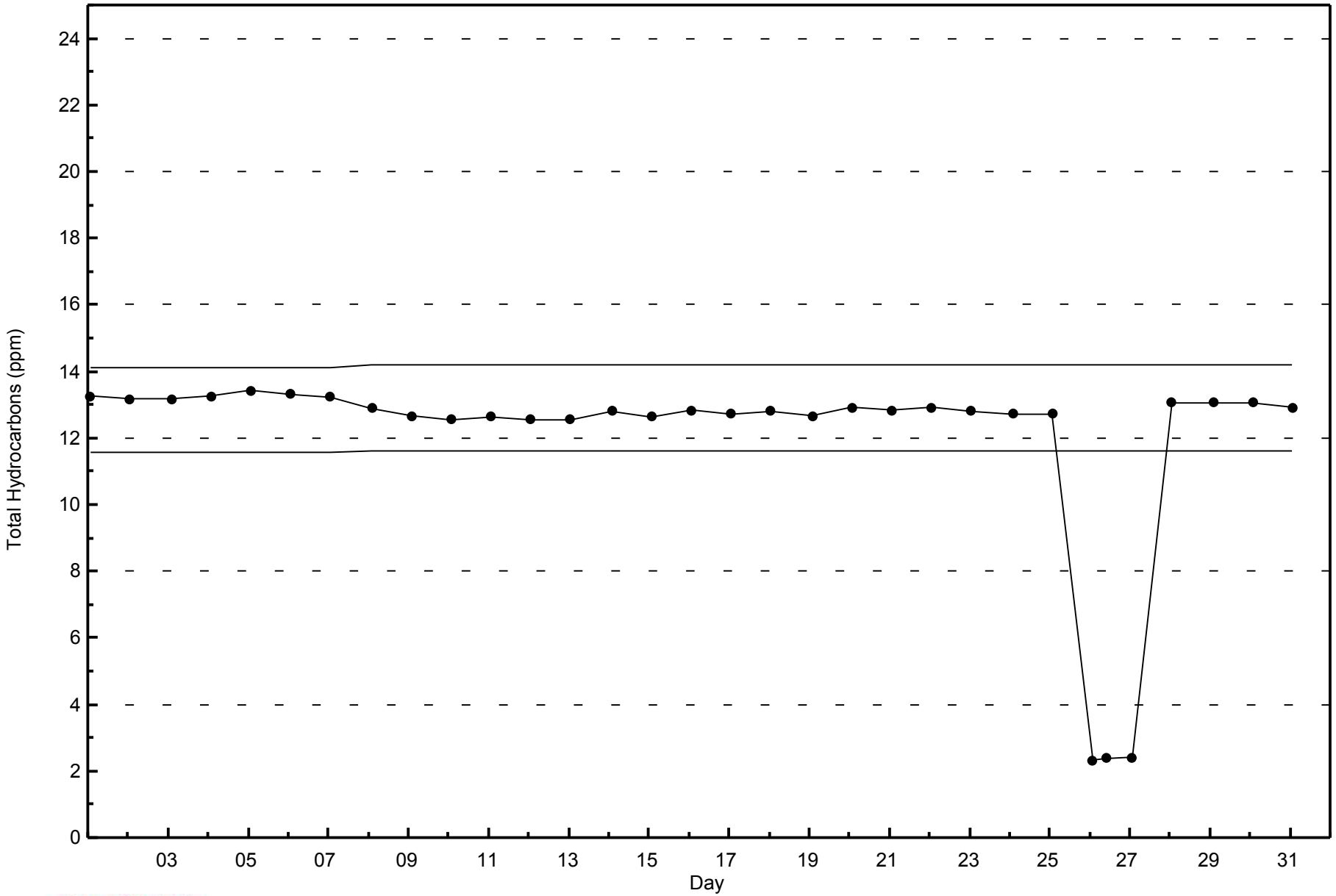
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O_3) - ppb

Wapasu - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 41 ppb on Jan 15 05:00 Maximum Daily Average: 35.2 ppb on Jan 15

Minimum Value: 0 ppb on Jan 1 07:00 Minimum Daily Average: 11.7 ppb on Jan 1
Maximum Diurnal Average: 29.5 ppb at hour 13 Minimum Diurnal Average: 25.0 ppb at hour 9
Monthly Average: 26.7 ppb Percentiles: $P_1 = 3$ $P_{10} = 15$ $Q_1 = 21$ Median = 29 $Q_3 = 33$ $P_{90} = 36$ $P_{99} = 39$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	35
Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	16	14	12	Z	2	1	0	1	1	4	10	11	11	13	13	9	15	15	17	20	20	20	21	21	11.7	21
2-Jan	21	24	22	Z	19	20	20	21	21	20	19	18	17	17	16	15	13	14	13	20	17	13	15	23	18.1	24
3-Jan	25	29	29	Z	28	28	30	31	31	31	30	29	32	32	33	34	33	35	34	31	33	36	36	33	31.5	36
4-Jan	32	34	29	Z	27	29	29	30	31	29	35	35	34	33	32	31	31	30	29	28	29	27	28	28	30.5	35
5-Jan	29	29	28	Z	24	25	25	23	13	13	21	22	29	32	32	30	24	26	30	31	29	28	32	32	26.4	32
6-Jan	33	35	36	Z	37	38	37	37	37	37	38	38	36	35	35	36	35	33	33	34	33	30	30	29	34.9	38
7-Jan	32	29	21	Z	17	18	19	16	16	25	30	35	34	39	39	39	39	39	40	40	37	37	37	36	31.0	40
8-Jan	37	37	38	Z	36	35	35	34	32	30	C	C	C	C	15	10	7	10	8	12	14	15	8	5	21.9	38
9-Jan	14	19	21	Z	23	24	21	23	19	20	19	16	10	7	5	4	6	2	7	13	16	17	18	20	15.0	24
10-Jan	23	23	24	Z	20	15	16	16	18	22	22	24	24	26	27	26	23	14	15	4	21	21	16	9	19.5	27
11-Jan	17	15	12	Z	10	19	19	22	22	23	23	23	24	24	25	24	22	20	22	22	23	24	26	26	21.1	26
12-Jan	30	29	30	Z	33	34	33	31	31	29	30	23	27	24	21	22	31	32	33	33	31	31	30	30	29.4	34
13-Jan	30	30	29	Z	23	19	20	17	17	31	33	32	33	34	34	35	35	34	34	32	29	29	31	33	29.3	35
14-Jan	30	26	23	Z	27	18	21	25	24	31	33	32	32	32	31	31	31	30	30	30	31	31	33	35	29.0	35
15-Jan	31	34	37	Z	41	40	39	40	39	39	39	38	36	35	34	34	34	33	32	34	33	34	30	24	35.2	41
16-Jan	17	25	17	Z	15	17	17	16	11	14	19	20	22	25	23	20	28	24	19	20	21	22	24	26	20.0	28
17-Jan	31	31	32	Z	21	15	18	26	31	34	32	34	40	39	38	38	36	35	35	35	32	32	32	22	31.3	40
18-Jan	26	21	25	Z	31	31	31	27	26	21	16	18	28	19	24	28	27	29	25	26	27	10	17	17	23.9	31
19-Jan	18	11	11	Z	15	30	29	27	29	32	29	34	35	34	31	28	27	26	26	25	25	24	22	21	25.6	35
20-Jan	22	24	27	Z	25	25	26	26	27	28	30	29	29	29	30	26	22	25	16	1	11	21	16	12	22.9	30
21-Jan	11	10	13	Z	12	13	13	16	18	26	28	33	34	34	34	33	31	28	27	27	25	27	31	31	24.1	34
22-Jan	32	32	31	Z	31	31	31	32	31	30	31	31	32	32	31	30	30	30	31	31	31	30	29	28	30.8	32
23-Jan	25	20	20	Z	16	16	14	18	18	24	27	28	33	35	28	30	24	15	9	3	8	28	16	20	20.6	35
24-Jan	15	21	22	Z	36	28	29	38	35	36	36	35	36	35	35	38	36	35	33	30	23	29	31	35	31.7	38
25-Jan	36	36	36	Z	33	30	18	15	14	26	31	32	32	31	33	34	33	34	36	37	38	37	39	39	31.7	39
26-Jan	39	38	37	Z	34	34	33	33	32	32	32	32	32	33	31	32	31	28	25	22	21	20	19	19	30.0	39
27-Jan	19	20	20	Z	22	21	23	27	23	23	14	24	29	25	31	30	34	33	34	34	33	34	33	33	26.9	34
28-Jan	32	32	33	Z	33	32	30	29	26	24	23	21	26	28	25	33	33	33	32	32	32	32	32	32	29.8	33
29-Jan	32	32	32	Z	32	33	33	33	34	34	34	34	35	35	35	35	35	35	36	36	36	36	36	36	34.3	36
30-Jan	36	35	36	Z	34	31	31	27	33	31	29	27	27	28	26	25	23	19	21	20	22	14	10	14	26.0	36
31-Jan	23	34	36	Z	35	35	34	33	33	33	34	33	34	34	35	35	35	35	34	37	34	33	21	12	32.3	37
	26.2	26.7	26.3	--	25.5	25.2	25.1	25.5	25.0	26.9	27.5	28.1	29.5	29.3	28.4	28.2	27.9	26.8	26.3	25.8	26.3	26.6	25.8	25.2	Diurnal Average	
	39	38	38	--	41	40	39	40	39	39	39	38	40	39	39	39	39	39	40	40	38	37	39	39	Diurnal Maximum	

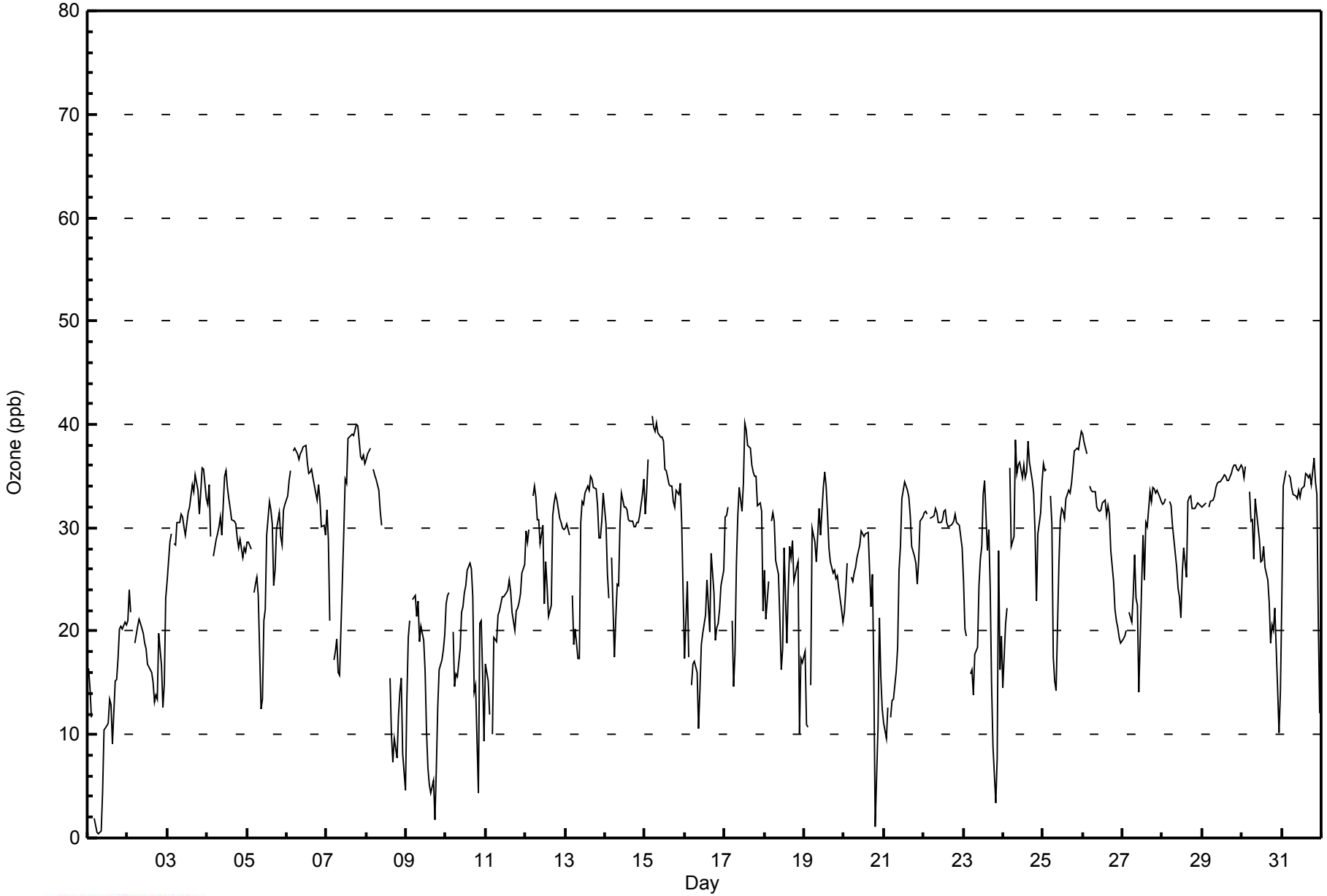
Z - zerospan C - Calibration
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 82 ppb

WBEA NETWORK

Hourly Averages

Ozone (O_3) - ppb

Wapasu - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	163	22.99	22.99
21 - 50	546	77.01	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Ozone (O_3) - ppb

Wapasu - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	8	8	3	2	2	6	24	22	27	23	12	3	2	5	3	10	160
21 - 50	80	16	7	13	7	15	34	92	76	19	11	13	10	17	29	104	543
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	88	24	10	15	9	21	58	114	103	42	23	16	12	22	32	114	703

Total Number of Valid Hours: 703

Total Number of Hours: 744

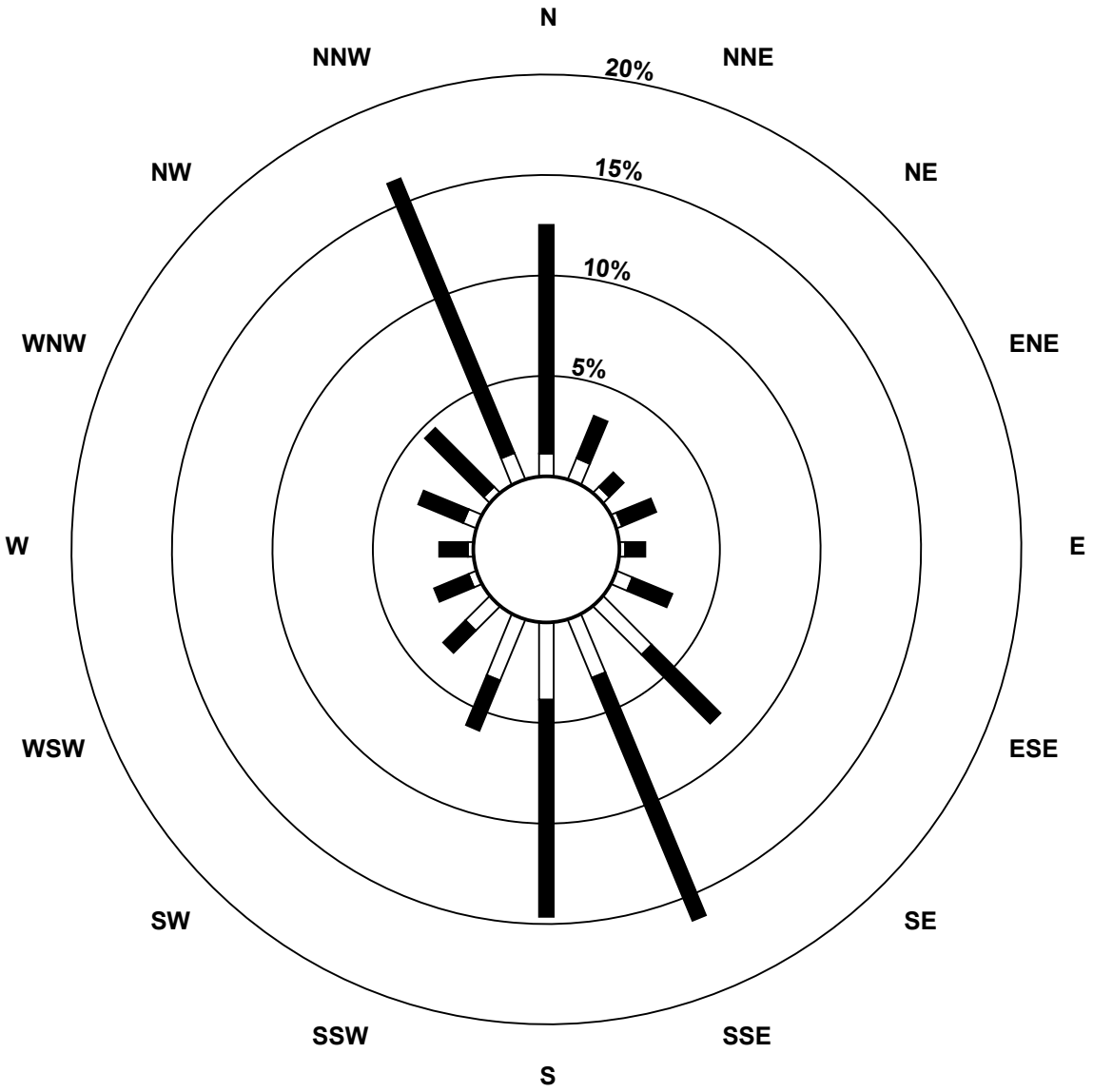
AURORA
ATMOSPHERICS INC.

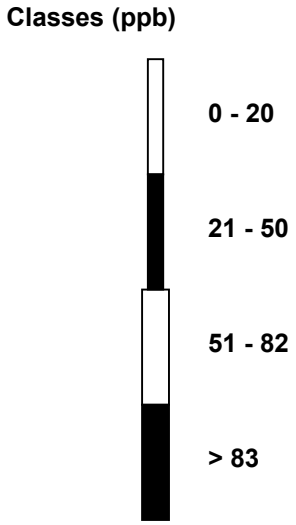
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Ozone (O_3) - ppb

Wapasu (AMS 17)





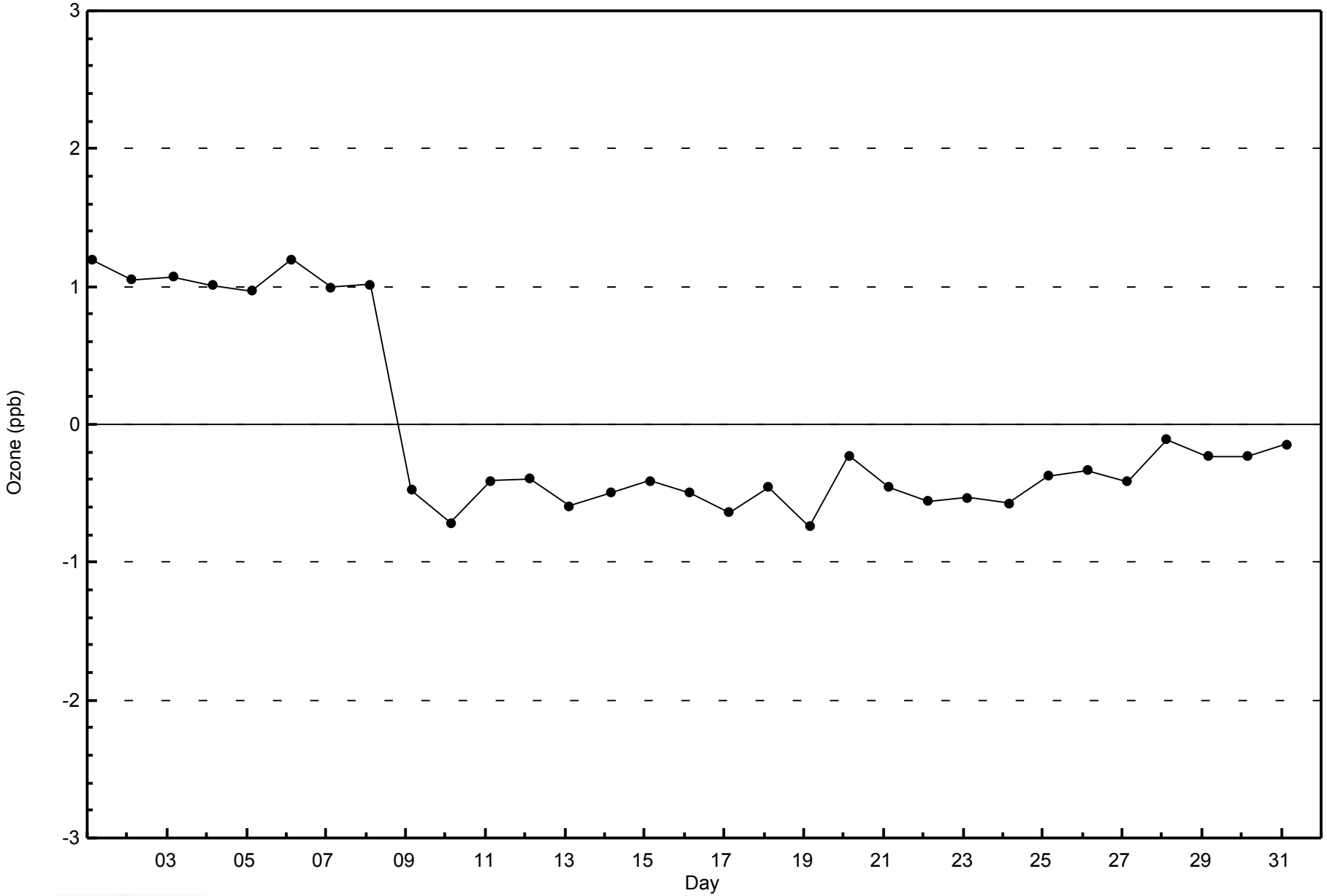
Total Number of Valid Hours: 703

WBEA NETWORK

Zero Responses

Ozone (O_3) - ppb

Wapasu - January 2014



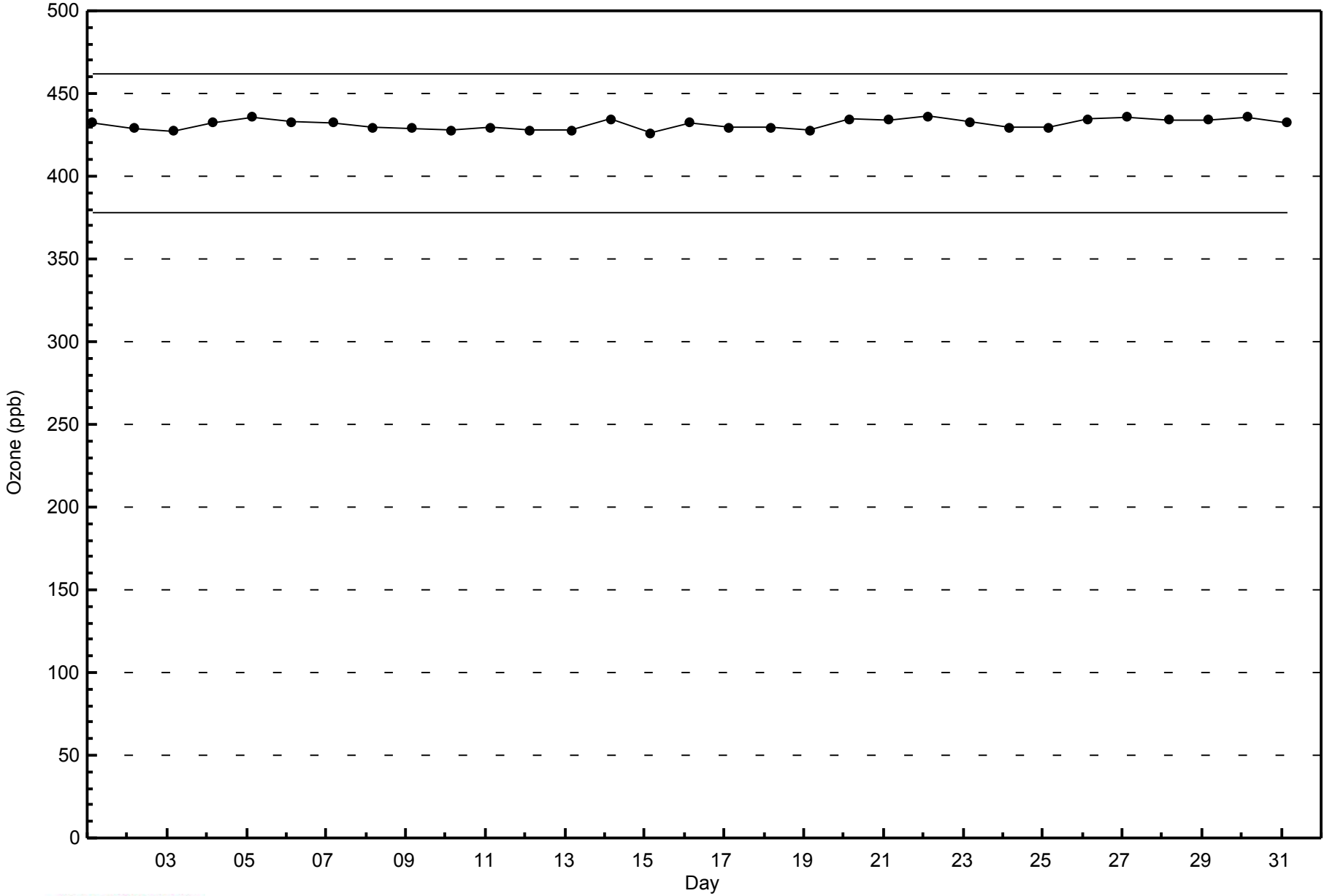
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Ozone (O_3) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Wapasu - January 2014

Maximum Value: 22 ppb on Jan 27 11:00

Maximum Daily Average: 5.5 ppb on Jan 1

Minimum Value: 0 ppb on Jan 26 08:00

Minimum Daily Average: 0.6 ppb on Jan 26

Maximum Diurnal Average: 3.3 ppb at hour 12

Minimum Diurnal Average: 0.9 ppb at hour 22

Monthly Average: 1.5 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 1$ $P_{90} = 2$ $P_{99} = 10$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	1	1	3	7	8	8	8	9	9	17	20	9	6	9	1	1	1	1	2	1	1	1	5.5	20
2-Jan	2	Z	1	1	1	2	1	1	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2	1	1.6	2
3-Jan	1	Z	1	1	1	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1	1	1.2	2
4-Jan	1	Z	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1.4	2
5-Jan	1	Z	1	1	1	1	1	1	1	3	4	6	4	2	1	1	1	2	1	1	1	1	1	1	1.7	6
6-Jan	1	Z	1	1	1	1	1	0	0	0	0	1	1	1	1	0	1	0	0	0	1	0	1	1	0.6	1
7-Jan	0	Z	1	1	1	1	1	3	C	C	C	C	C	C	1	1	1	1	1	1	1	1	0	1	--	3
8-Jan	0	Z	1	1	1	0	1	1	1	1	2	2	3	3	3	4	2	1	2	2	1	1	1	1	1.5	4
9-Jan	1	Z	1	2	1	1	1	1	1	1	2	4	8	10	12	8	1	2	1	1	1	1	2	1	2.8	12
10-Jan	1	Z	1	1	1	1	2	1	1	1	2	2	2	2	2	1	1	2	1	4	2	1	1	2	1.5	4
11-Jan	1	Z	1	1	1	1	2	1	2	1	1	2	2	2	2	2	1	2	1	2	2	2	2	2	1.5	2
12-Jan	2	Z	2	2	2	2	1	2	1	1	1	5	4	7	7	4	2	2	1	1	1	2	2	1	2.3	7
13-Jan	1	Z	1	1	1	1	1	1	1	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1.2	2
14-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1.1	2
15-Jan	1	Z	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	0	1	0	0	0	0	0	1.0	2
16-Jan	0	Z	1	1	0	0	0	1	2	3	4	5	6	4	4	2	0	1	1	1	1	0	0	0	1.7	6
17-Jan	0	Z	1	0	1	1	1	0	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0.7	1
18-Jan	1	Z	1	1	1	1	1	1	1	3	8	10	3	8	3	2	1	1	1	1	1	1	1	1	2.3	10
19-Jan	1	Z	1	10	2	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1.3	10
20-Jan	1	Z	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	11	3	0	0	0	1.2	11
21-Jan	1	Z	1	0	1	0	1	1	1	1	1	1	1	1	0	0	0	1	0	0	1	0	1	0	0.6	1
22-Jan	0	Z	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	0	1	0	0	1	1	0.9	2
23-Jan	1	Z	1	1	1	1	1	1	1	2	2	3	2	2	4	2	1	1	1	10	10	1	1	0	2.3	10
24-Jan	1	Z	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0	0	1	1	1	0.7	1
25-Jan	1	Z	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	1.0	2
26-Jan	1	Z	1	1	0	0	0	0	1	M	1	1	1	1	1	1	0	0	1	0	0	0	0	1	0.6	1
27-Jan	0	Z	0	0	0	1	1	1	1	3	22	10	6	10	4	3	2	2	1	1	1	1	1	2	3.2	22
28-Jan	2	Z	2	1	1	1	1	1	1	2	4	8	4	2	2	1	1	1	1	1	0	0	1	0	1.6	8
29-Jan	0	Z	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
30-Jan	1	Z	1	1	1	1	1	1	1	1	3	5	5	5	5	4	2	2	1	1	1	1	1	1	2.0	5
31-Jan	1	Z	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7	1
	0.9	--	0.9	1.2	1.0	1.2	1.2	1.3	1.2	1.6	2.7	3.3	3.0	2.9	2.4	1.9	1.1	0.9	0.9	1.6	1.3	0.9	0.9	0.9	Diurnal Average	
	2	--	2	10	3	7	8	8	8	9	22	17	20	10	12	9	2	2	2	11	10	2	2	2	Diurnal Maximum	

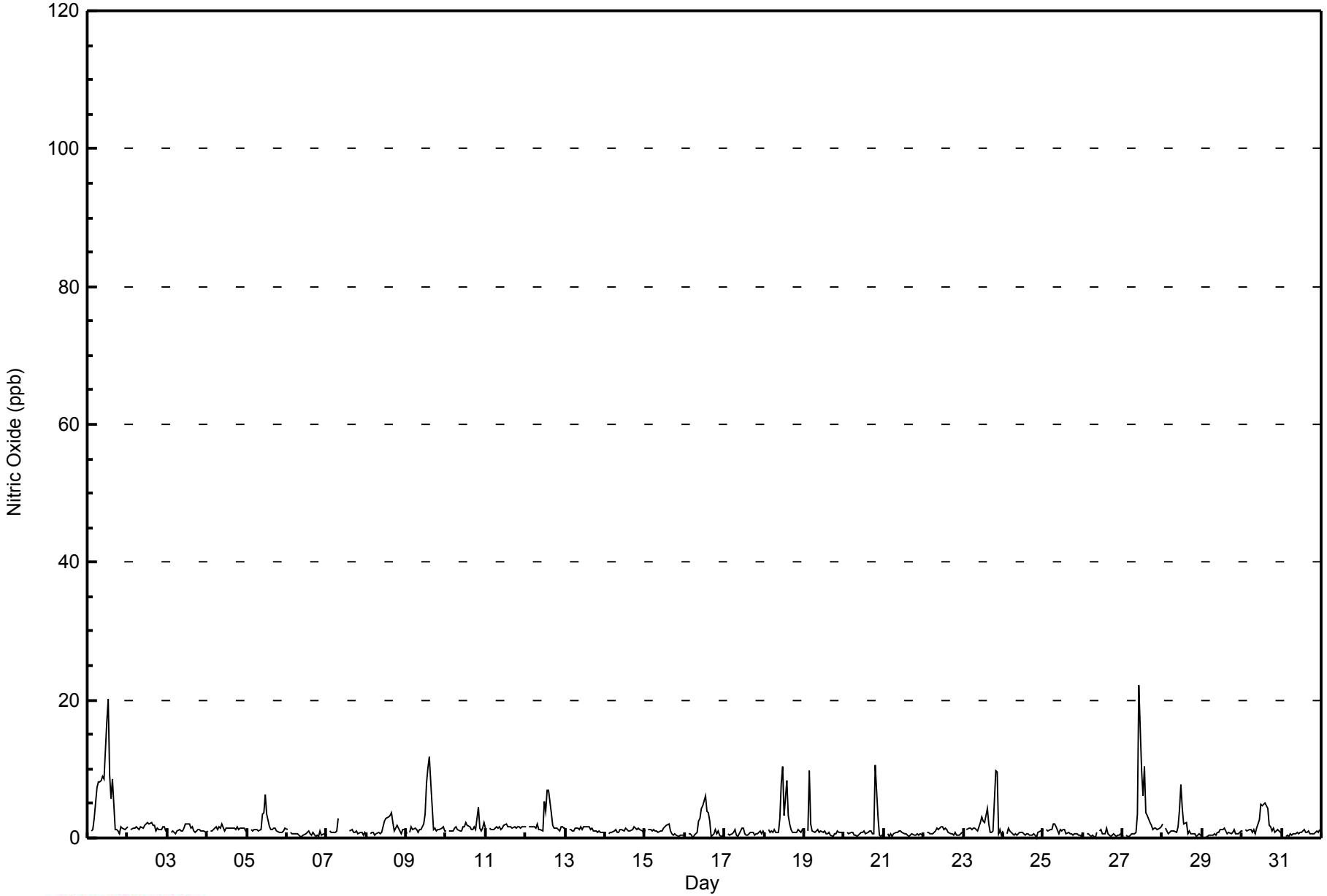
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Nitric Oxide (NO) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	99.86	99.86
21 - 40	1	0.14	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: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitric Oxide (NO) - ppb

Wapasu - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	88	24	10	15	10	21	56	111	103	42	25	13	12	24	31	113	698
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	88	24	10	15	10	21	56	111	104	42	25	13	12	24	31	113	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

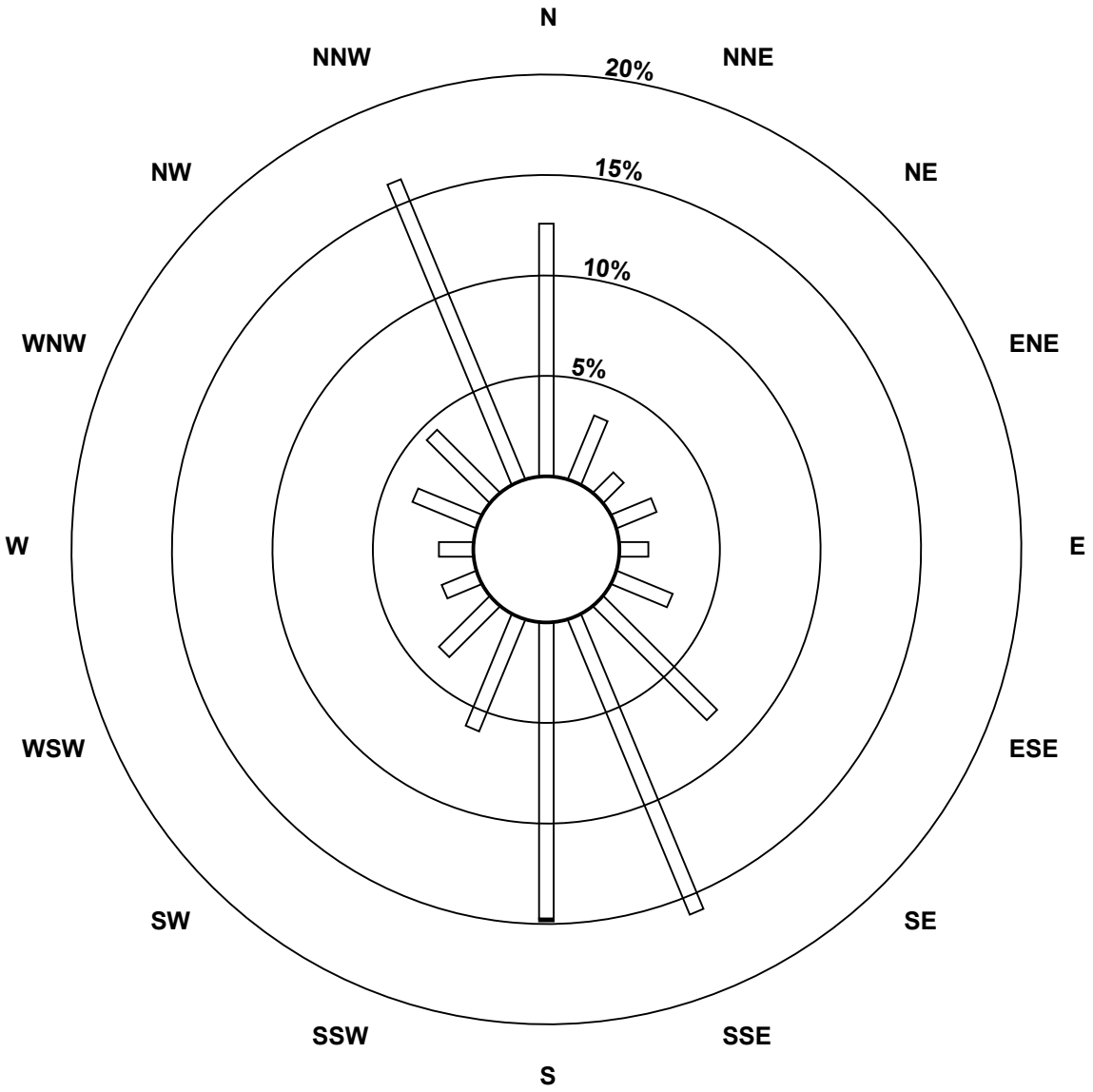
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

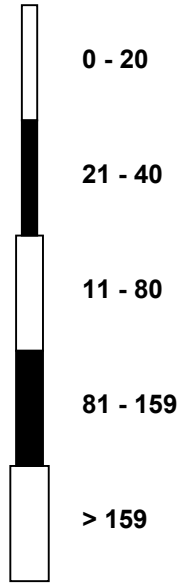
Wind Rose Jan 2014

Nitric Oxide (NO) - ppb

Wapasu (AMS 17)



Classes (ppb)



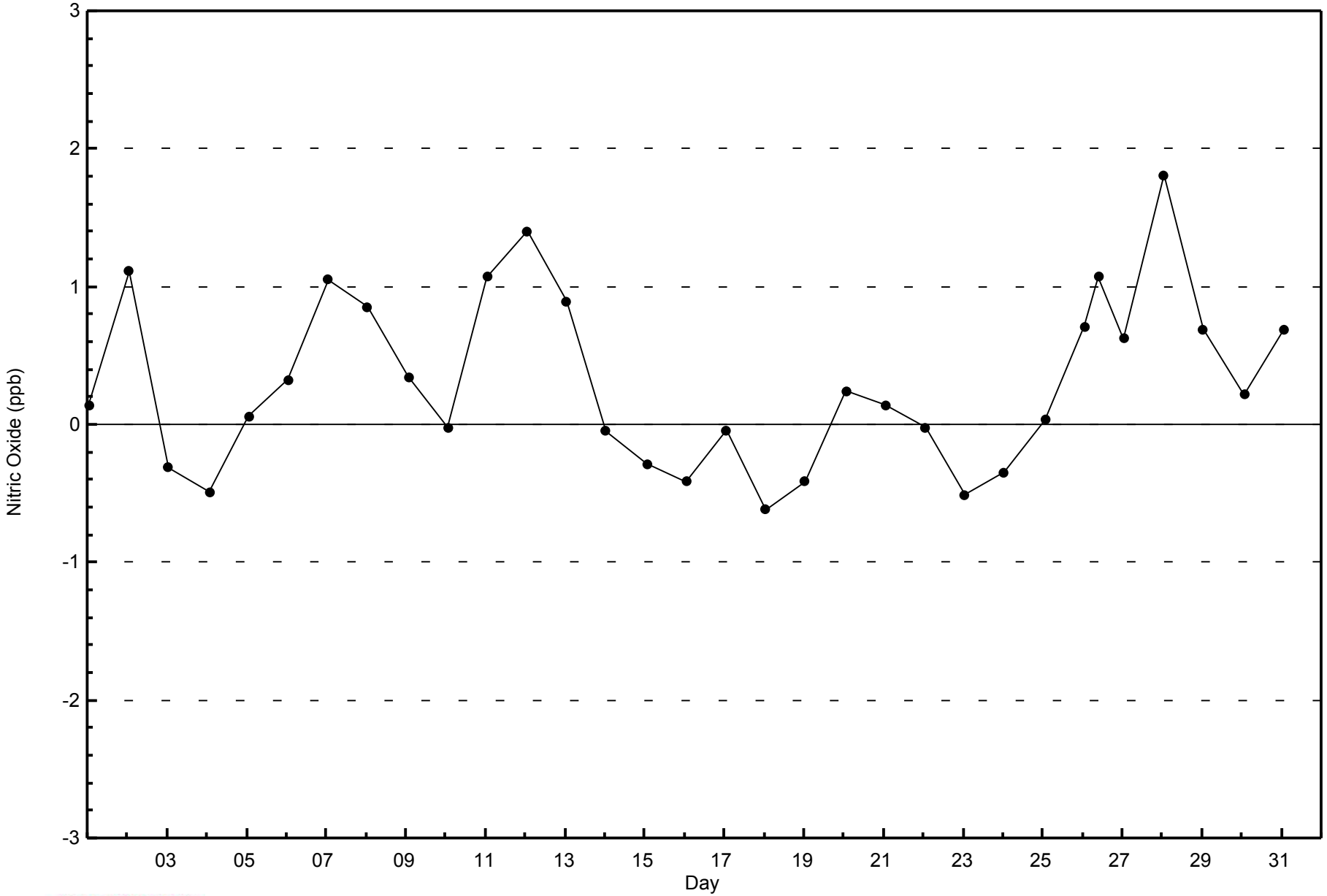
Total Number of Valid Hours: 699

WBEA NETWORK

Zero Responses

Nitric Oxide (NO) - ppb

Wapasu - January 2014



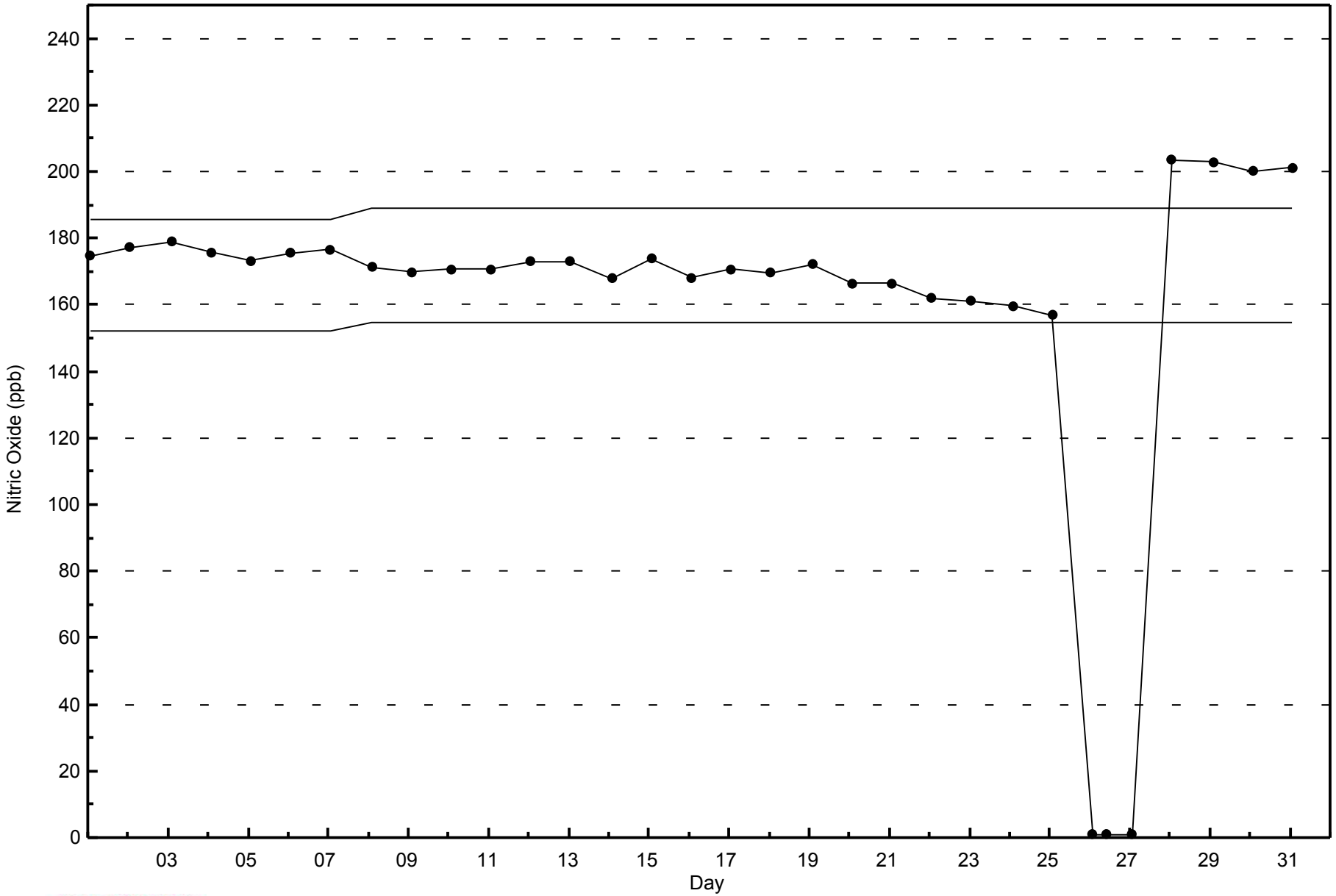
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitric Oxide (NO) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 32 ppb on Jan 20 20:00 Maximum Daily Average: 14.9 ppb on Jan 23

Minimum Value: 0 ppb on Jan 13 20:00
Maximum Diurnal Average: 6.9 ppb at hour 9
Monthly Average: 5.7 ppb

Minimum Daily Average: 1.0 ppb on Jan 15
Minimum Diurnal Average: 4.3 ppb at hour 1
Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 1$ Median = 3 $Q_3 = 8$ $P_{90} = 15$ $P_{99} = 25$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	4	Z	7	14	18	21	20	21	21	16	11	14	16	11	11	16	5	4	4	3	3	3	2	3	10.6	21
2-Jan	2	Z	2	3	4	4	3	3	4	4	5	5	6	6	7	9	15	15	16	10	13	16	12	3	7.2	16
3-Jan	2	Z	2	1	3	3	1	1	1	2	3	4	2	2	2	3	4	2	4	5	2	1	2	3	2.2	5
4-Jan	2	Z	9	9	9	7	5	5	5	7	2	1	1	1	1	2	2	2	3	4	3	5	4	4	4.1	9
5-Jan	3	Z	4	5	4	5	5	7	22	18	12	13	5	2	3	3	10	8	4	3	5	5	2	2	6.6	22
6-Jan	2	Z	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	4	3	4	6	5	6	2.1	6
7-Jan	5	Z	13	12	9	6	8	13	C	C	C	C	C	C	1	0	1	0	0	0	1	1	1	1	--	13
8-Jan	1	Z	1	1	1	1	1	2	3	3	6	7	9	10	15	21	23	19	21	14	11	9	17	21	9.5	23
9-Jan	11	Z	3	2	2	3	5	3	7	5	6	9	15	16	19	20	17	20	13	6	3	2	2	2	8.4	20
10-Jan	1	Z	0	0	5	12	10	10	8	6	6	5	5	4	3	4	6	15	13	25	6	6	12	18	7.8	25
11-Jan	7	Z	7	9	12	6	7	4	3	2	2	2	2	2	2	3	4	6	4	2	2	5	4	4	4.3	12
12-Jan	1	Z	3	1	1	0	1	3	3	5	3	12	6	11	14	13	3	2	1	1	1	1	1	1	3.9	14
13-Jan	1	Z	3	11	8	12	8	10	12	2	2	3	1	1	1	1	2	2	1	0	2	2	2	0	3.8	12
14-Jan	0	Z	2	6	5	17	12	9	8	3	1	1	1	1	2	2	2	2	2	2	2	2	2	1	3.7	17
15-Jan	3	Z	2	0	0	1	1	0	0	0	0	0	1	1	2	1	1	2	3	2	3	2	0	0	1.0	3
16-Jan	6	Z	14	18	15	16	15	20	24	19	15	13	16	12	14	16	5	9	13	12	11	10	7	5	13.2	24
17-Jan	1	Z	1	3	14	20	16	7	3	1	5	5	0	1	1	1	1	1	1	1	3	2	1	10	4.2	20
18-Jan	5	Z	8	3	4	3	3	5	7	12	18	17	6	15	8	5	4	2	6	5	4	17	10	12	7.8	18
19-Jan	9	Z	17	28	15	1	3	4	2	1	5	3	1	1	1	1	1	2	2	3	3	4	2	2	4.8	28
20-Jan	4	Z	3	4	6	5	3	3	3	3	2	2	2	2	2	6	9	3	13	32	20	8	12	15	7.0	32
21-Jan	15	Z	11	13	12	9	9	10	11	4	2	0	0	0	0	0	0	0	0	3	6	4	0	0	4.7	15
22-Jan	0	Z	0	0	0	0	1	1	1	2	1	1	1	1	2	2	3	3	3	3	3	3	3	4	1.6	4
23-Jan	7	Z	13	17	18	17	20	15	14	8	6	7	5	4	13	10	15	23	23	30	31	8	23	17	14.9	31
24-Jan	21	Z	10	24	1	8	7	0	1	0	1	2	1	3	3	0	0	0	0	4	12	2	2	1	4.5	24
25-Jan	1	Z	0	1	1	3	16	16	15	5	1	1	1	2	0	1	2	1	0	0	0	0	0	0	2.9	16
26-Jan	0	Z	0	0	1	1	1	1	2	M	3	3	2	2	3	2	2	1	1	1	1	2	2	2	1.6	3
27-Jan	3	Z	7	6	5	6	7	6	11	12	26	16	10	16	8	8	3	3	2	2	2	2	3	3	7.2	26
28-Jan	2	Z	2	2	3	3	5	6	8	10	10	13	8	8	11	3	3	2	2	1	1	1	2	2	4.6	13
29-Jan	2	Z	2	1	3	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1.4	3
30-Jan	1	Z	0	1	3	6	5	9	2	4	9	12	11	10	12	14	16	20	18	18	15	24	27	19	11.1	27
31-Jan	12	Z	1	1	1	1	2	3	2	2	2	2	1	1	0	0	2	2	3	1	2	3	16	25	3.6	25
	4.3	--	4.7	6.3	5.9	6.4	6.5	6.4	6.9	5.4	5.6	5.8	4.6	4.9	5.3	5.5	5.2	5.6	5.9	6.3	5.7	5.0	5.7	6.0	Diurnal Average	
	21	--	17	28	18	21	20	21	24	19	26	17	16	16	19	21	23	23	23	32	31	24	27	25	Diurnal Maximum	

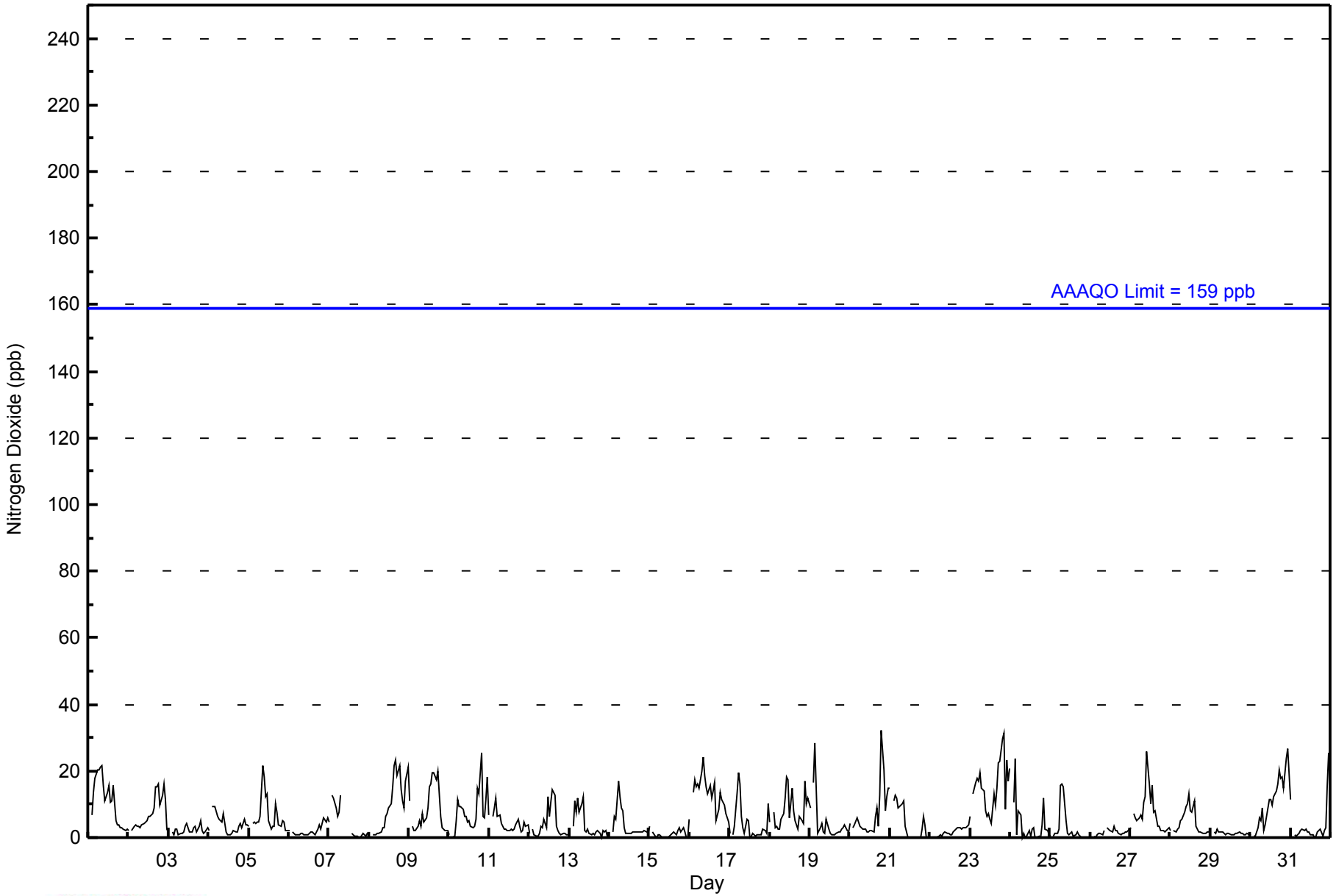
Z - zerospan C - Calibration M - Maintenance
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	96.74	96.74
21 - 40	23	3.26	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: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	87	24	10	15	10	20	52	110	98	36	24	13	12	23	30	112	676
21 - 40	1	0	0	0	0	1	4	1	6	6	1	0	0	1	1	1	23
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	88	24	10	15	10	21	56	111	104	42	25	13	12	24	31	113	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

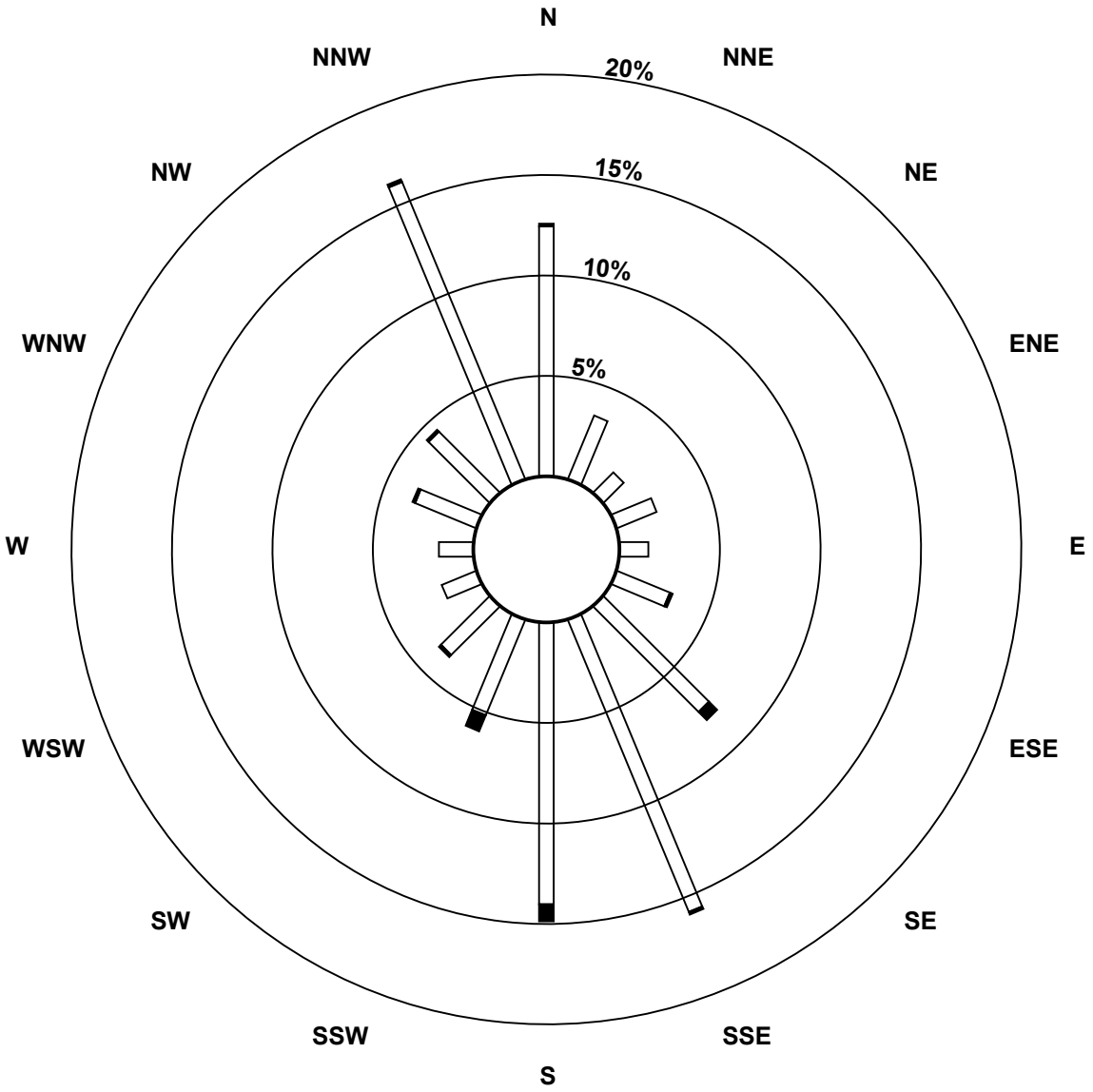
AURORA ATMOSPHERICS INC.

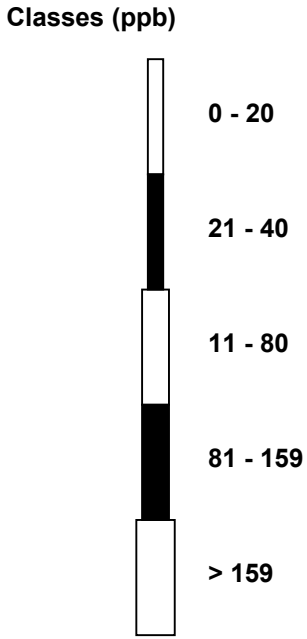
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Wapasu (AMS 17)





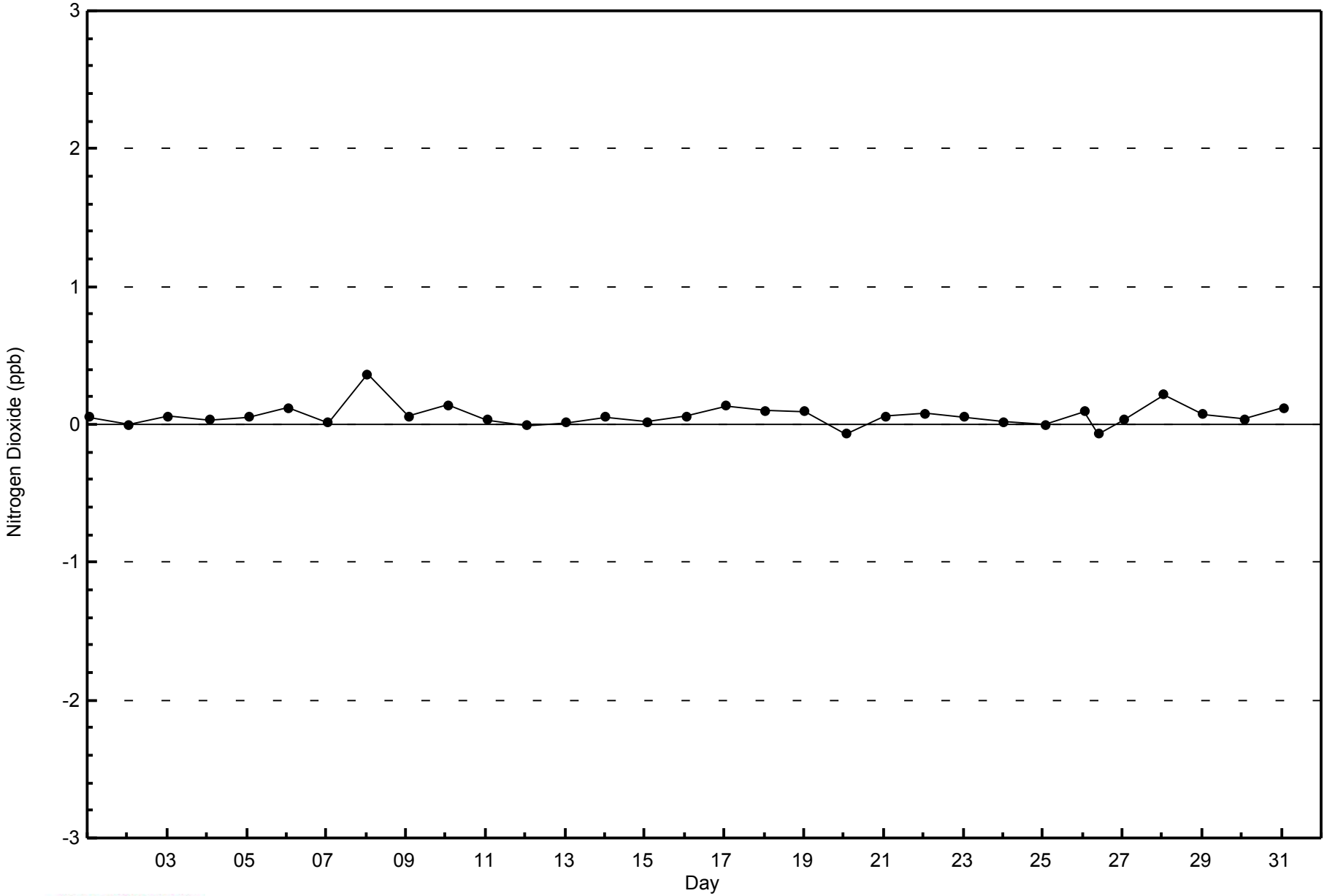
Total Number of Valid Hours: 699

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2014



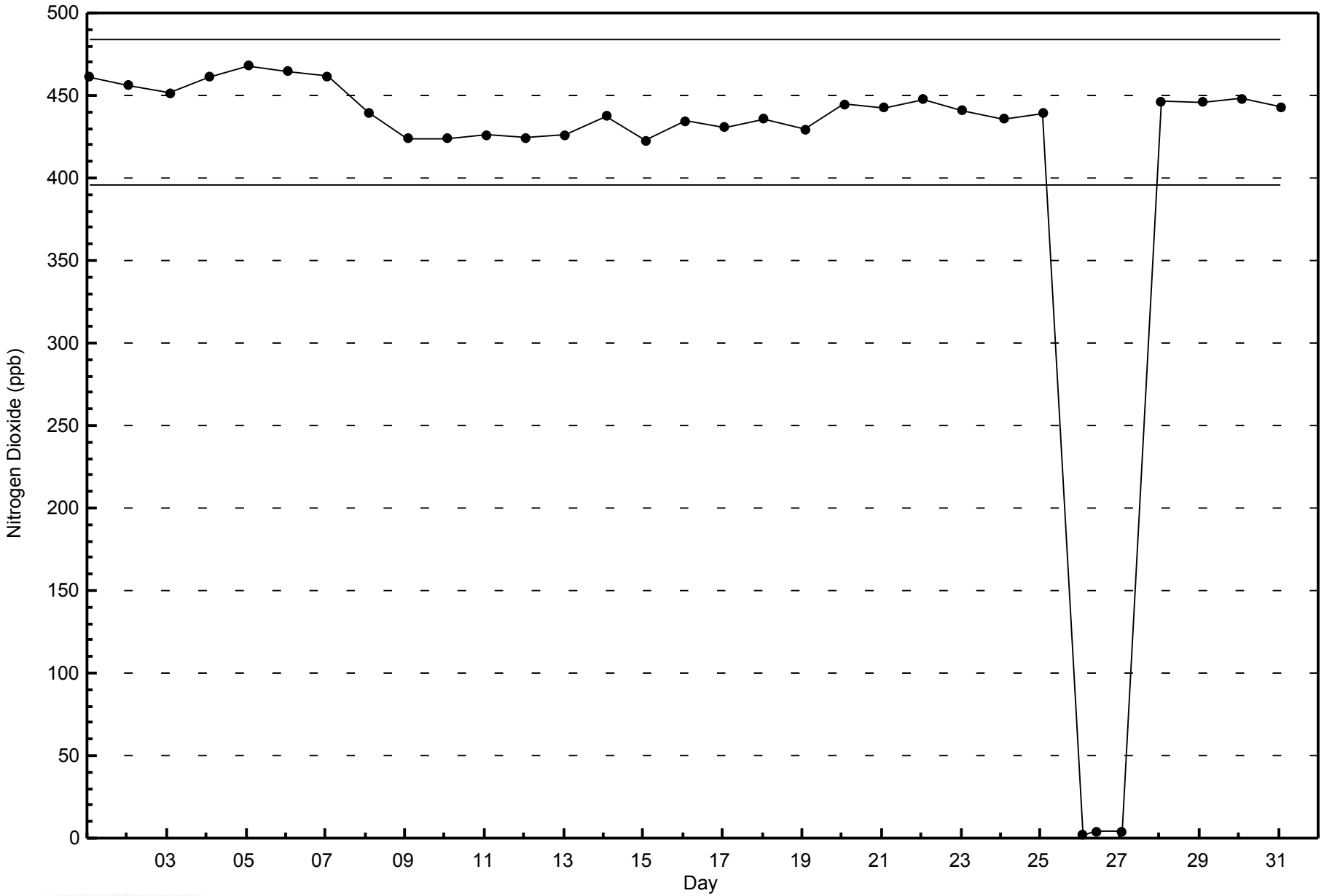
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2014

Maximum Value: 48 ppb on Jan 27 11:00

Maximum Daily Average: 17.2 ppb on Jan 23

Minimum Value: 0 ppb on Jan 21 16:00

Minimum Daily Average: 2.0 ppb on Jan 15

Maximum Diurnal Average: 9.1 ppb at hour 12

Minimum Diurnal Average: 5.2 ppb at hour 1

Monthly Average: 7.2 ppb

Percentiles: $P_1 = 0$ $P_{10} = 1$ $Q_1 = 2$ Median = 4 $Q_3 = 10$ $P_{90} = 18$ $P_{99} = 29$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	37
Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	6	Z	8	15	21	28	28	29	30	25	20	31	36	20	17	24	6	5	5	4	5	4	4	4	16.1	36
2-Jan	4	Z	3	5	5	5	5	4	5	6	7	7	8	8	10	11	17	16	17	11	14	18	13	4	8.8	18
3-Jan	3	Z	3	2	3	3	2	3	2	3	5	6	4	4	3	4	4	3	5	6	3	2	3	4	3.4	6
4-Jan	3	Z	10	10	11	8	7	7	6	9	3	2	3	2	3	4	3	3	5	5	4	7	5	5	5.5	11
5-Jan	4	Z	5	6	6	6	6	7	23	22	16	19	9	4	4	5	12	9	5	4	6	6	3	3	8.3	23
6-Jan	3	Z	2	2	2	1	1	2	1	1	1	1	2	3	2	2	2	3	4	3	5	6	6	7	2.7	7
7-Jan	5	Z	14	13	10	7	9	16	C	C	C	C	C	C	3	2	1	1	1	1	2	2	1	2	--	16
8-Jan	2	Z	1	1	2	2	2	3	3	4	8	10	12	13	18	25	26	20	23	16	12	10	18	22	11.0	26
9-Jan	12	Z	4	4	3	5	6	4	8	6	8	13	23	26	31	28	18	22	14	8	4	4	4	3	11.2	31
10-Jan	2	Z	1	1	6	13	11	11	9	7	8	6	7	5	5	5	7	17	14	30	8	7	13	21	9.3	30
11-Jan	8	Z	8	10	13	8	9	6	5	4	4	4	4	4	4	4	6	7	5	3	4	6	5	5	5.9	13
12-Jan	3	Z	4	2	2	2	3	5	4	6	4	18	10	18	21	16	5	3	3	2	2	3	3	2	6.3	21
13-Jan	2	Z	4	12	9	13	9	11	13	4	3	4	3	2	3	2	3	3	2	1	3	3	3	1	5.0	13
14-Jan	1	Z	2	7	6	18	13	10	9	4	3	2	3	3	3	3	3	4	3	3	3	3	3	2	4.8	18
15-Jan	4	Z	3	2	1	2	2	1	1	1	1	1	2	3	4	2	1	3	3	2	3	2	0	0	2.0	4
16-Jan	6	Z	14	18	16	16	15	21	27	21	19	18	22	16	17	19	5	9	15	12	12	10	7	5	14.8	27
17-Jan	2	Z	2	4	14	20	17	7	3	2	7	6	1	1	1	1	2	2	1	1	3	3	2	11	4.9	20
18-Jan	5	Z	9	4	4	4	4	6	8	15	26	28	9	23	11	7	5	3	7	6	6	18	11	13	10.1	28
19-Jan	10	Z	18	38	17	2	4	5	3	2	6	3	2	1	2	2	2	2	2	3	4	5	3	3	6.0	38
20-Jan	5	Z	3	4	7	5	4	3	3	3	3	3	3	3	3	7	10	4	14	43	23	9	13	15	8.2	43
21-Jan	15	Z	12	13	12	9	10	11	12	5	3	1	1	1	0	0	0	1	0	3	7	4	1	0	5.3	15
22-Jan	0	Z	1	1	1	1	2	2	3	3	3	3	2	2	3	3	3	4	4	4	3	3	4	4	2.5	4
23-Jan	7	Z	14	18	19	18	21	16	15	10	9	10	8	7	17	12	16	23	24	39	41	9	24	18	17.2	41
24-Jan	22	Z	11	25	2	9	7	1	2	1	1	3	1	3	3	1	1	1	1	4	12	3	3	2	5.1	25
25-Jan	2	Z	2	2	3	4	18	18	17	6	2	2	3	3	1	2	2	1	1	1	1	1	0	0	3.9	18
26-Jan	1	Z	1	1	1	1	2	1	3	M	4	4	3	2	5	3	3	2	2	1	2	2	2	3	2.2	5
27-Jan	3	Z	8	6	5	6	7	6	11	16	48	26	16	26	11	11	5	5	4	4	4	3	4	4	10.5	48
28-Jan	4	Z	3	3	4	4	6	6	8	11	14	21	12	10	13	4	4	2	2	2	1	2	2	2	6.2	21
29-Jan	3	Z	2	1	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2.0	3
30-Jan	2	Z	1	2	4	7	6	10	3	5	11	16	16	15	17	18	18	22	19	19	16	25	28	20	13.1	28
31-Jan	12	Z	1	1	1	2	2	3	3	3	2	3	2	2	1	1	3	3	3	1	3	4	16	27	4.3	27
	5.2	--	5.6	7.5	6.9	7.5	7.7	7.7	8.1	7.1	8.3	9.1	7.6	7.7	7.7	7.4	6.3	6.6	6.8	7.9	7.0	5.9	6.6	6.9	Diurnal Average	
	22	--	18	38	21	28	28	29	30	25	48	31	36	26	31	28	26	23	24	43	41	25	28	27	Diurnal Maximum	

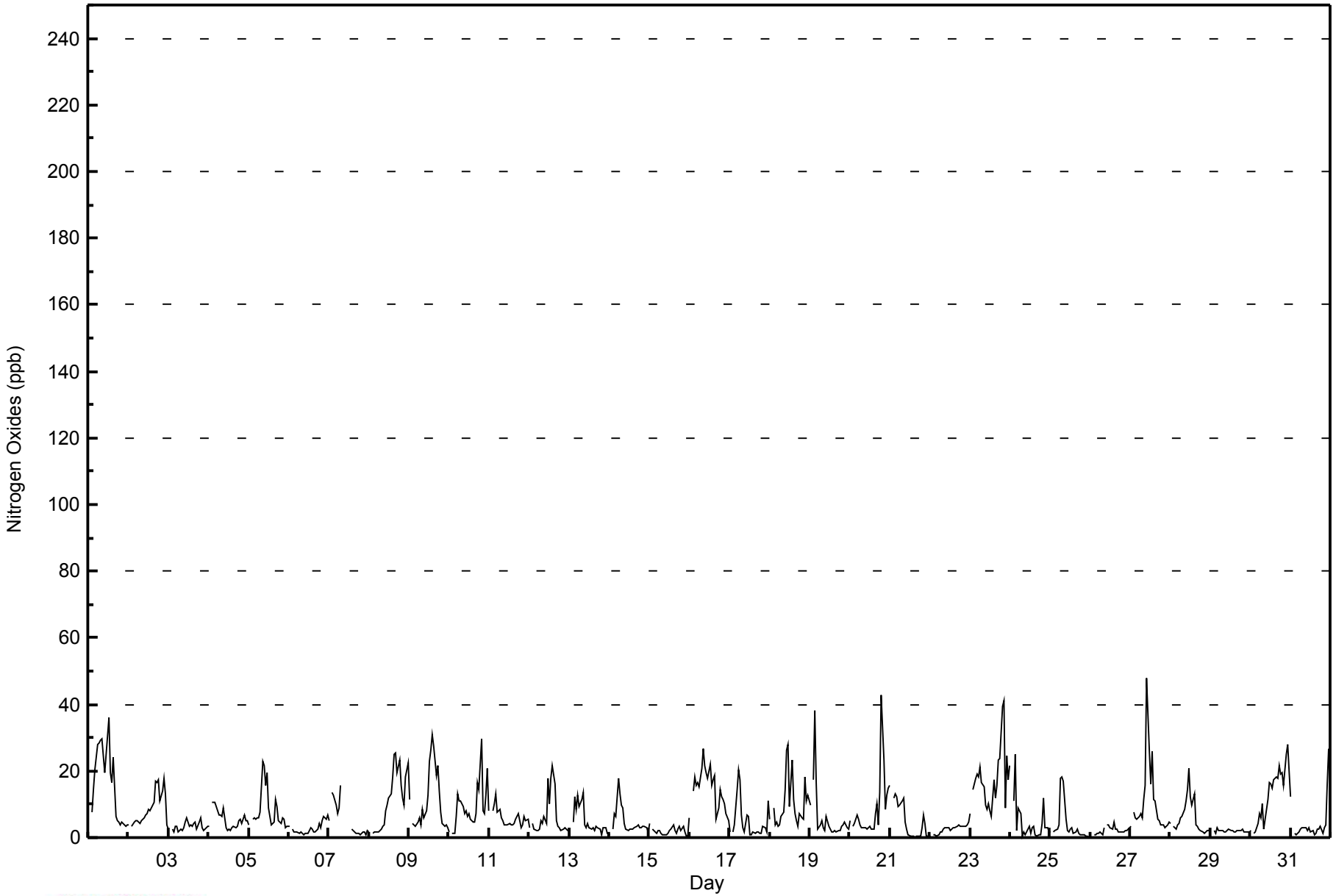
Z - zerospan C - Calibration M - Maintenance

WBEA NETWORK

Hourly Averages

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	657	93.06	93.06
21 - 40	46	6.52	99.58
11 - 80	3	0.42	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	84	22	9	15	10	20	49	109	91	31	24	11	12	22	30	112	651
21 - 40	4	2	1	0	0	1	7	2	12	11	0	2	0	2	1	0	45
11 - 80	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	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	88	24	10	15	10	21	56	111	104	42	25	13	12	24	31	113	699

Total Number of Valid Hours: 699

Total Number of Hours: 744

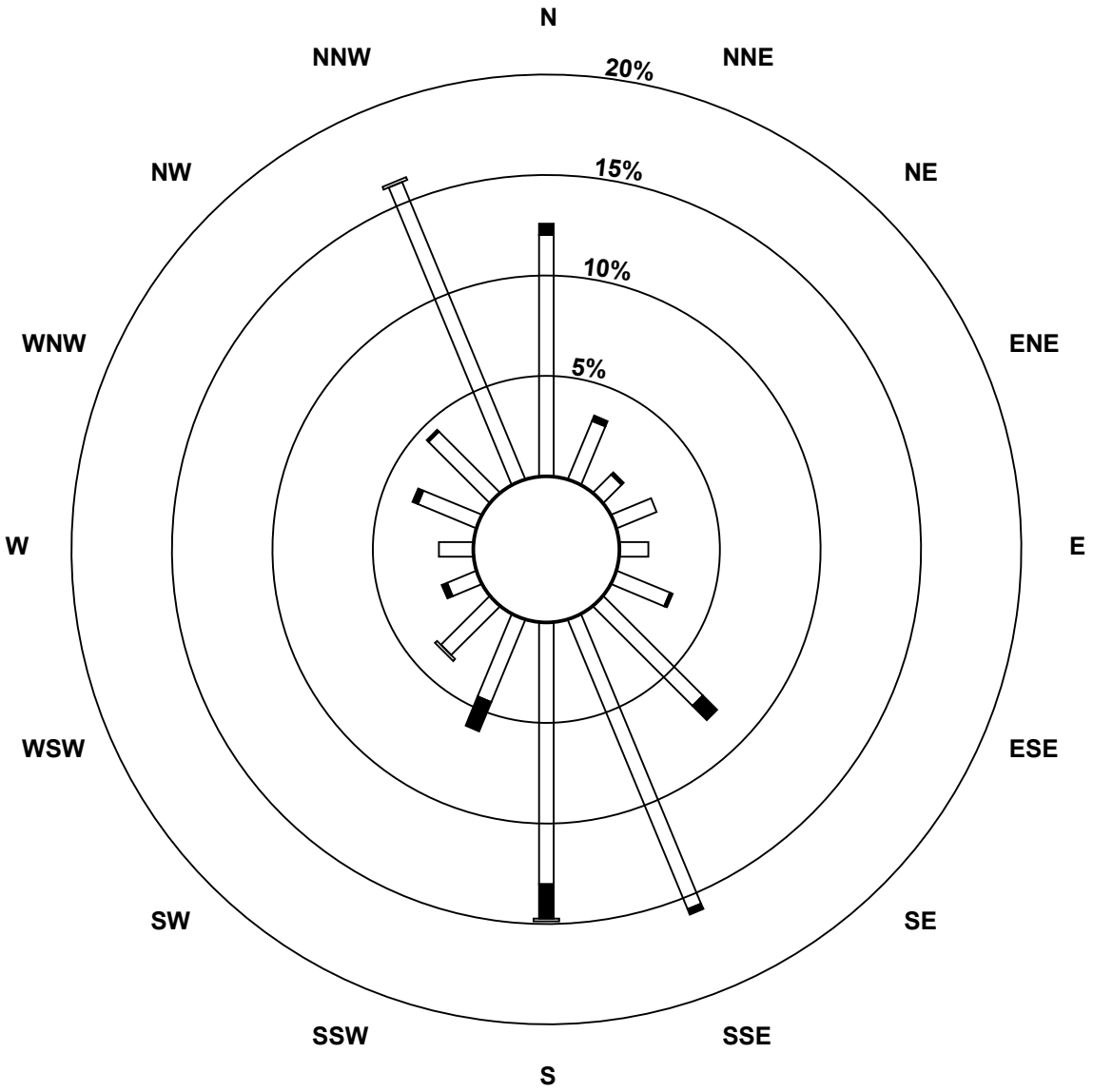
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

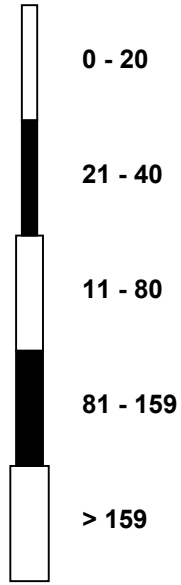
Wind Rose Jan 2014

Nitrogen Oxides (NO_X) - ppb

Wapasu (AMS 17)



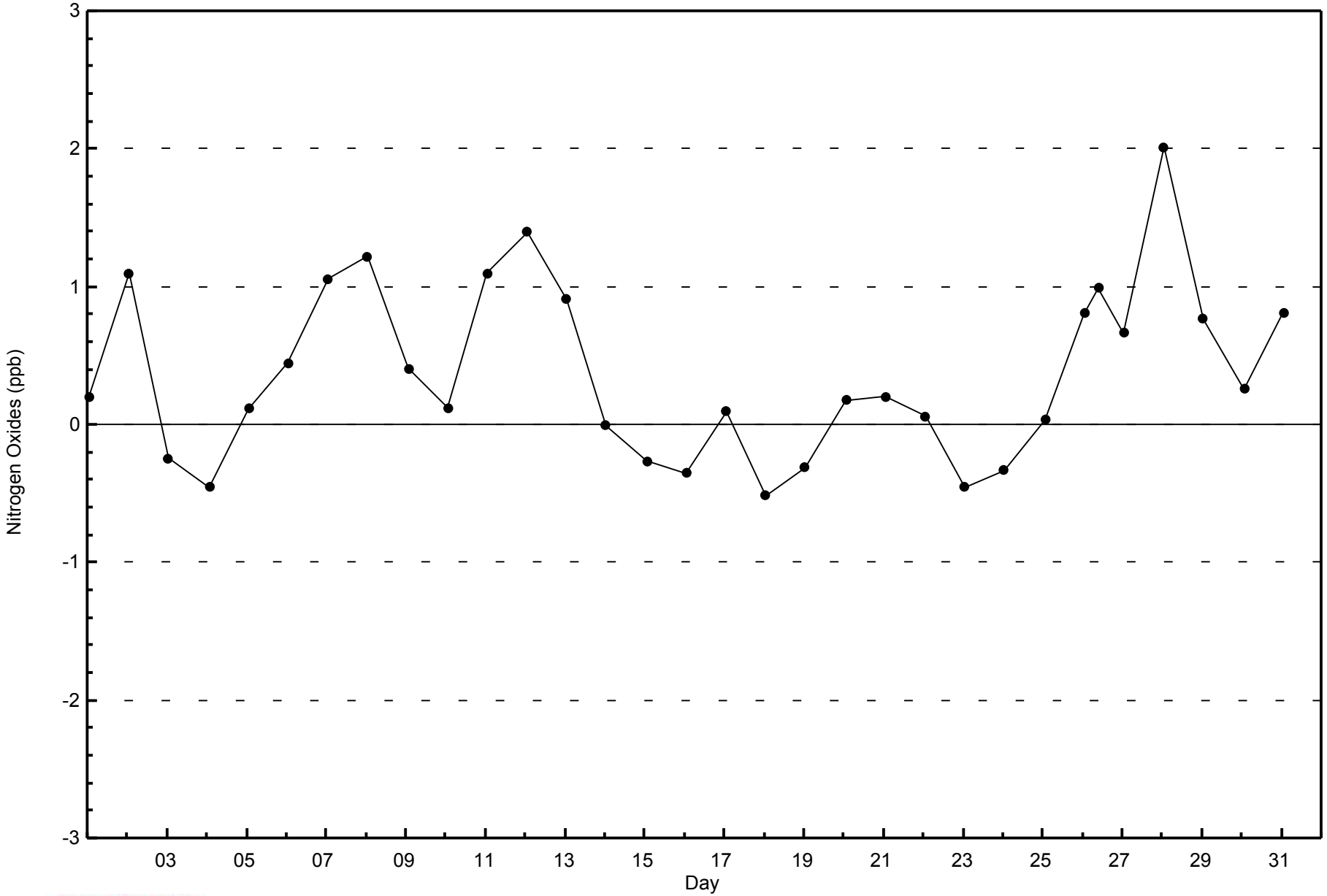
Classes (ppb)



Total Number of Valid Hours: 699

Wood Buffalo Environmental Association
Zero Responses

Nitrogen Oxides (NO_X) - ppb
Wapasu - January 2014



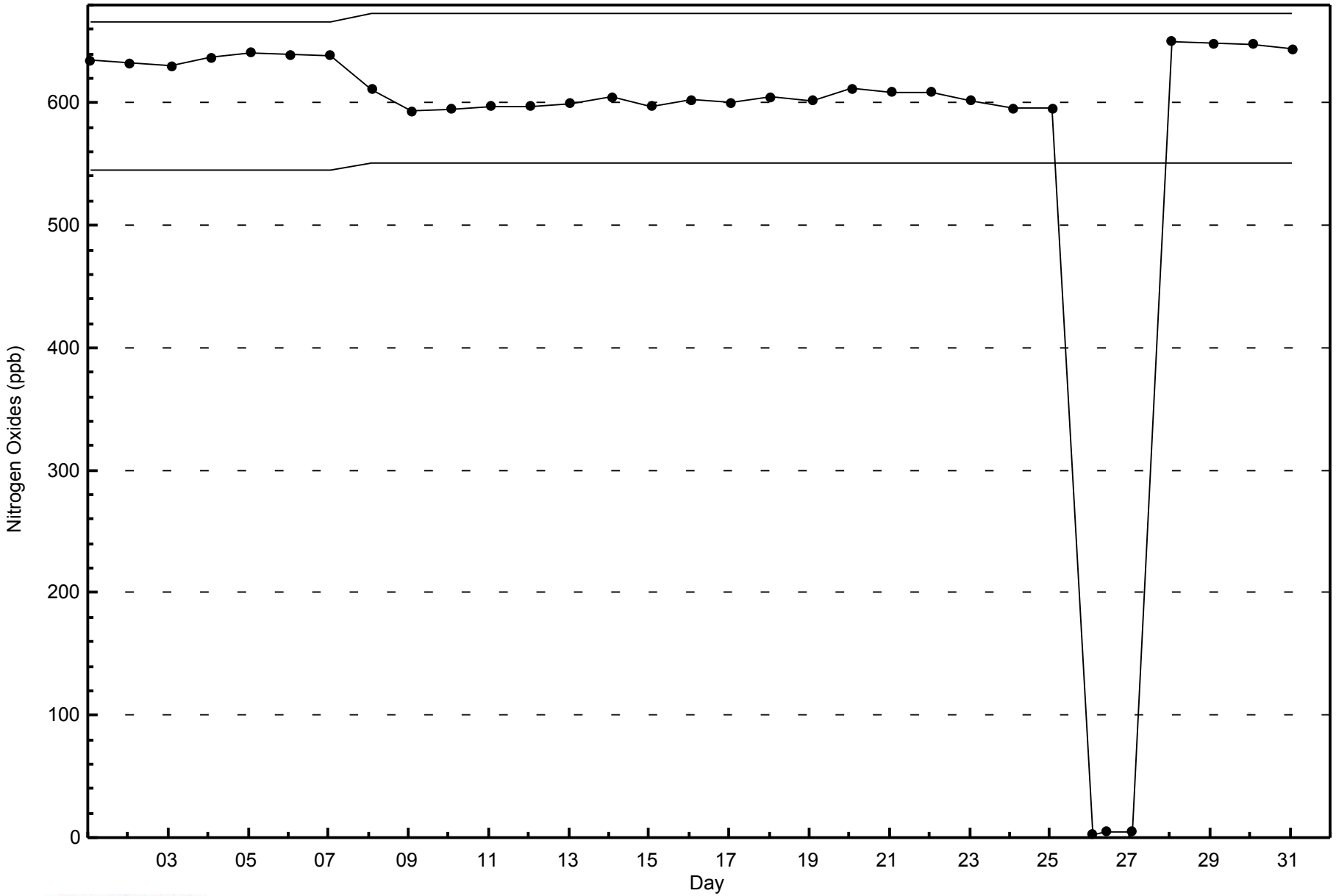
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxides (NO_X) - ppb

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

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

Wapasu - January 2014

Number of Exceedences (AAAQO): 24-hr: 0

Maximum Value: 28.6 $\mu g/m^3$ on Jan 1 13:00

Maximum Daily Average: 9.6 $\mu g/m^3$ on Jan 1

Minimum Value: 0.0 $\mu g/m^3$ on Jan 15 15:00

Minimum Daily Average: 0.6 $\mu g/m^3$ on Jan 7

Maximum Diurnal Average: 4.5 $\mu g/m^3$ at hour 7

Minimum Diurnal Average: 2.5 $\mu g/m^3$ at hour 18

Monthly Average: 3.26 $\mu g/m^3$

Percentiles: P_1 = 0.1 P_{10} = 0.5 Q_1 = 1.0 Median = 2.0 Q_3 = 4.4 P_{90} = 7.3 P_{99} = 15.3

Hours in Service:	744
Hours of Data:	713
Hours of Missing Data:	31
Hours of Calibration:	0
Percent Operational Time:	95.8

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	3.9	3.8	4.6	9.8	11.9	14.0	12.7	15.5	14.8	8.5	13.3	26.7	28.6	13.1	10.1	8.7	4.8	3.7	3.5	3.2	3.3	3.4	3.7	4.1	9.6	28.6
2-Jan	4.1	3.9	4.1	4.4	4.1	3.8	3.6	3.2	3.4	3.9	5.1	5.7	5.8	5.6	5.8	5.4	4.9	5.3	5.1	3.3	4.2	4.2	3.2	2.4	4.3	5.8
3-Jan	5.6	2.6	1.8	1.9	2.1	7.3	6.6	1.0	1.0	1.1	1.1	1.6	1.5	1.2	1.1	1.1	0.7	0.5	0.7	0.7	0.7	0.5	0.6	0.8	1.8	7.3
4-Jan	0.6	0.7	0.9	0.9	1.3	1.3	1.0	0.8	0.9	1.2	1.0	1.3	1.5	1.9	2.0	2.1	2.2	2.5	3.0	3.4	2.5	2.5	2.7	2.7	1.7	3.4
5-Jan	2.1	2.4	2.2	1.8	1.5	1.8	2.0	2.0	3.1	2.6	2.4	3.7	1.9	1.1	1.1	1.3	1.5	1.3	1.2	1.3	3.2	2.7	1.7	1.1	2.0	3.7
6-Jan	0.9	1.0	0.7	0.6	0.4	0.2	0.1	0.2	0.5	0.5	0.9	0.9	1.1	1.4	1.3	1.3	1.0	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.6	1.4
7-Jan	0.3	0.3	0.5	0.4	0.3	0.2	1.1	1.5	1.0	0.4	UO	0.5	0.4	0.3	0.3	0.4	0.5	0.5	UO	UO	0.2	0.8	0.8	1.1	0.6	1.5
8-Jan	1.0	1.0	1.5	1.6	2.3	2.2	2.3	2.3	2.9	3.9	5.4	7.4	M	13.9	15.2	14.2	14.6	12.8	10.9	9.9	11.5	13.1	20.2	16.9	8.1	20.2
9-Jan	9.8	5.9	5.4	5.5	5.1	7.8	9.7	9.6	9.7	9.8	10.9	11.7	12.5	13.5	15.6	16.1	13.3	10.9	7.1	8.2	8.3	7.2	5.9	5.1	9.4	16.1
10-Jan	4.8	4.4	3.7	3.3	2.3	1.7	1.9	2.5	2.4	1.8	1.7	1.9	1.8	1.6	1.4	1.3	1.4	1.7	2.0	2.8	2.0	2.0	2.2	2.9	2.3	4.8
11-Jan	3.0	3.5	3.3	3.6	4.2	6.6	6.0	5.1	4.6	4.2	4.0	4.4	4.5	3.0	1.8	1.6	1.7	1.3	1.4	1.8	1.7	1.7	1.2	0.9	3.1	6.6
12-Jan	0.7	1.1	0.9	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.5	1.1	1.5	1.4	8.2	1.7	0.5	0.4	0.4	0.6	1.5	1.3	1.3	1.4	1.2	8.2
13-Jan	1.8	1.0	0.7	1.1	1.6	5.0	7.3	5.6	3.6	1.0	1.8	1.8	1.7	4.7	2.3	2.6	3.3	2.4	2.8	4.0	3.2	2.2	1.1	1.7	2.7	7.3
14-Jan	0.5	0.2	0.3	1.5	2.3	8.9	7.3	8.2	6.0	2.3	1.0	2.7	2.6	1.7	1.9	1.7	1.2	1.1	1.2	1.1	0.7	0.6	0.5	0.4	2.3	8.9
15-Jan	0.8	1.3	UO	UO	UO	UO	UO	0.4	UO	UO	UO	UO	UO	1.3	0.0	0.0	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.2	--	1.3
16-Jan	0.6	3.2	7.4	8.8	9.8	4.4	2.9	4.9	8.2	13.1	9.4	8.5	6.8	6.9	5.2	3.1	1.4	1.8	3.2	4.4	5.7	5.0	4.5	3.5	5.5	13.1
17-Jan	1.3	1.3	0.9	1.5	4.6	9.3	6.8	2.3	0.9	0.5	0.6	0.6	UO	UO	0.0	0.1	0.2	0.4	0.5	0.5	0.5	0.6	0.5	1.0	1.6	9.3
18-Jan	0.9	0.6	0.9	0.9	0.4	0.7	0.9	2.5	2.3	3.7	8.0	7.4	3.3	4.4	2.6	2.3	2.2	2.2	3.5	2.1	2.0	3.6	2.9	2.9	2.6	8.0
19-Jan	3.4	3.9	6.7	21.0	13.4	5.6	4.0	3.0	1.8	0.9	1.4	2.0	1.7	1.6	2.3	2.9	3.5	3.4	2.8	2.8	2.8	2.8	2.4	2.2	4.1	21.0
20-Jan	2.1	1.9	1.9	2.0	2.1	3.1	4.1	3.0	2.6	2.6	2.0	1.8	1.6	1.5	1.4	1.6	2.0	1.8	2.6	5.0	6.1	4.6	5.5	5.8	2.9	6.1
21-Jan	6.9	7.8	7.6	7.4	6.2	5.1	4.8	5.6	5.1	3.4	2.8	1.5	0.9	1.0	1.2	1.3	1.4	1.5	0.8	1.1	1.0	0.8	0.7	0.5	3.2	7.8
22-Jan	0.3	0.4	1.4	1.6	1.7	1.3	0.9	1.3	1.3	1.5	1.6	1.5	1.4	1.3	1.5	1.8	2.0	2.3	2.3	2.4	3.0	4.1	5.4	6.0	2.0	6.0
23-Jan	6.3	6.5	7.3	10.1	11.8	11.0	14.8	9.3	7.7	5.2	3.5	3.0	2.0	1.7	4.2	5.7	4.6	4.1	4.1	4.6	5.1	6.3	3.8	2.4	6.0	14.8
24-Jan	3.8	5.3	5.3	4.8	0.9	1.4	1.1	0.3	0.4	0.2	0.3	0.4	0.2	0.6	0.9	0.5	0.7	1.0	1.0	2.1	2.4	0.8	0.6	0.8	1.5	5.3
25-Jan	0.8	0.5	0.5	0.5	0.7	1.9	5.1	5.4	6.1	2.7	0.6	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.3	1.3	1.5	1.4	1.7	2.1	1.7	6.1
26-Jan	2.7	4.3	5.5	7.3	7.3	6.4	5.8	5.8	6.0	5.4	5.6	5.9	5.7	5.2	5.5	5.2	4.9	4.1	3.9	3.5	3.5	3.0	3.0	3.0	4.9	7.3
27-Jan	2.5	2.5	2.6	3.2	5.4	13.4	11.4	7.3	5.3	4.9	6.5	2.9	1.9	2.5	1.2	0.7	0.5	0.9	2.0	2.4	1.5	1.5	10.7	15.1	4.5	15.1
28-Jan	9.7	6.3	4.9	4.1	3.5	3.3	3.5	3.9	5.2	6.0	6.8	7.2	6.0	4.7	4.2	3.3	2.1	1.9	2.1	2.6	2.6	2.5	1.8	1.6	4.1	9.7
29-Jan	1.2	1.1	1.1	1.0	1.0	1.0	1.0	0.8	0.5	0.3	0.1	0.1	0.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	1.2
30-Jan	0.1	0.2	0.3	0.3	0.3	UO	UO	0.7	UO	UO	0.8	2.0	1.8	1.5	1.3	1.2	1.0	1.3	1.6	2.3	2.8	3.2	3.7	3.7	1.5	3.7
31-Jan	4.5	1.5	1.1	0.9	0.9	0.9	1.0	1.0	1.1	1.0	0.8	0.8	0.8	0.7	0.7	0.9	1.0	0.9	0.9	0.6	0.7	0.8	1.7	2.0	1.1	4.5
	2.8	2.6	2.9	3.7	3.7	4.5	4.5	3.7	3.7	3.2	3.4	3.9	3.6	3.5	3.4	3.0	2.7	2.5	2.5	2.7	2.8	2.8	3.1	3.1	Diurnal Average	
	9.8	7.8	7.6	21.0	13.4	14.0	14.8	15.5	14.8	13.1	13.3	26.7	28.6	13.9	15.6	16.1	14.6	12.8	10.9	9.9	11.5	13.1	20.2	16.9	Diurnal Maximum	

M - Maintenance UO - Unstable Operation

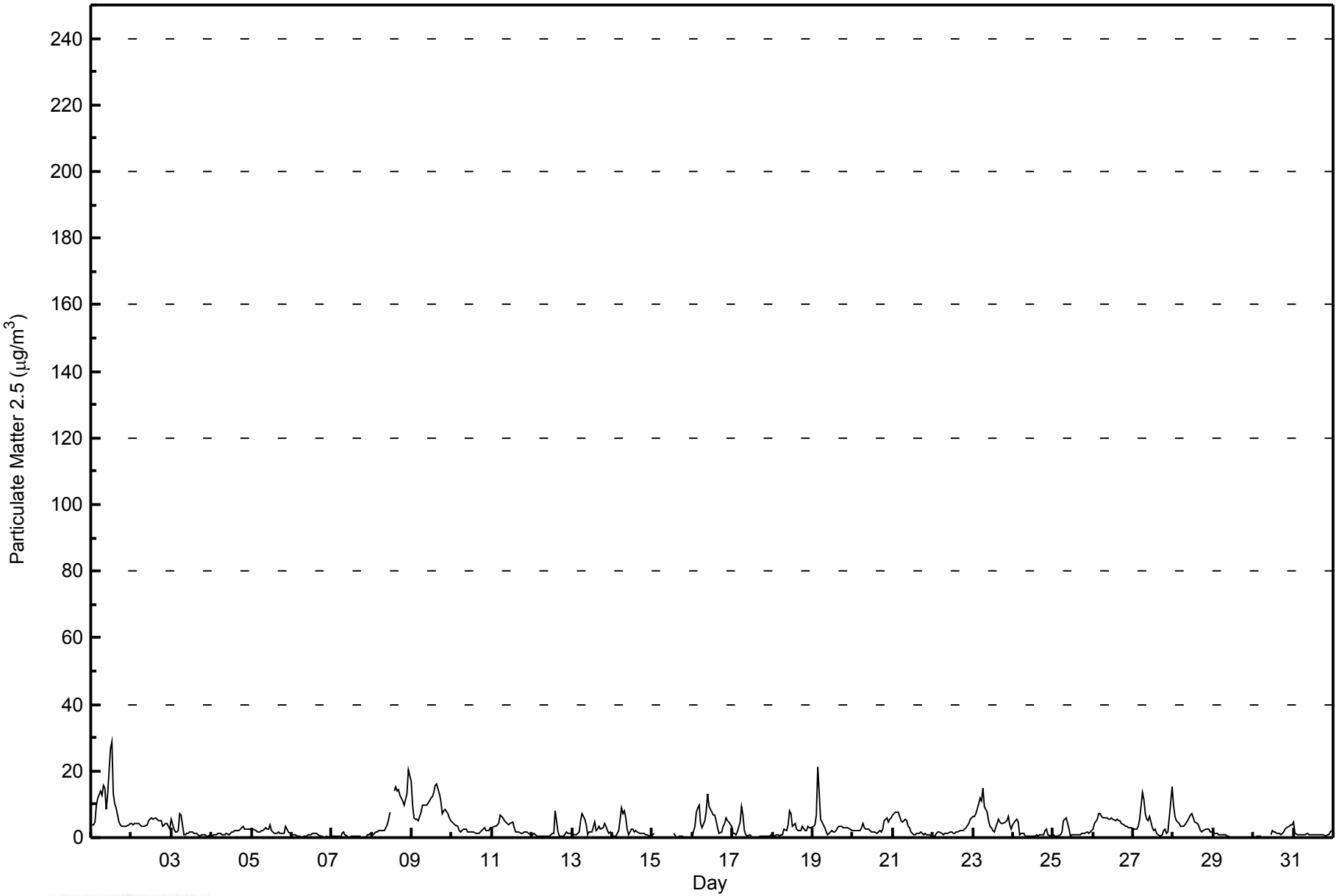
Alberta Ambient Air Quality Objectives (AAAQO): 24-hr 30 $\mu g/m^3$

WBEA NETWORK

Hourly Averages

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

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

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

Wapasu - January 2014

Concentration Ranges ($\mu g/m^3$)	Number of Hours	%	Cumulative %
1 - 5	410	57.50	57.50
6 - 15	114	15.99	73.49
16 - 25	6	0.84	74.33
26 - 80	2	0.28	74.61
> 81.0	0	0.00	74.61

Total Number of Valid Hours: 713

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

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

Wapasu - January 2014

Concentration Ranges ($\mu g/m^3$)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
1 - 5	47	12	5	12	7	12	33	69	64	28	12	9	6	8	12	68	404
6 - 15	13	5	3	0	0	4	10	13	27	13	9	2	2	4	3	6	114
16 - 25	0	2	0	0	0	0	2	1	0	0	0	0	0	0	1	0	6
26 - 80	0	0	0	0	0	0	0	1	1	0	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	60	19	8	12	7	16	45	84	92	41	21	11	8	12	16	74	526

Total Number of Valid Hours: 706

Total Number of Hours: 744

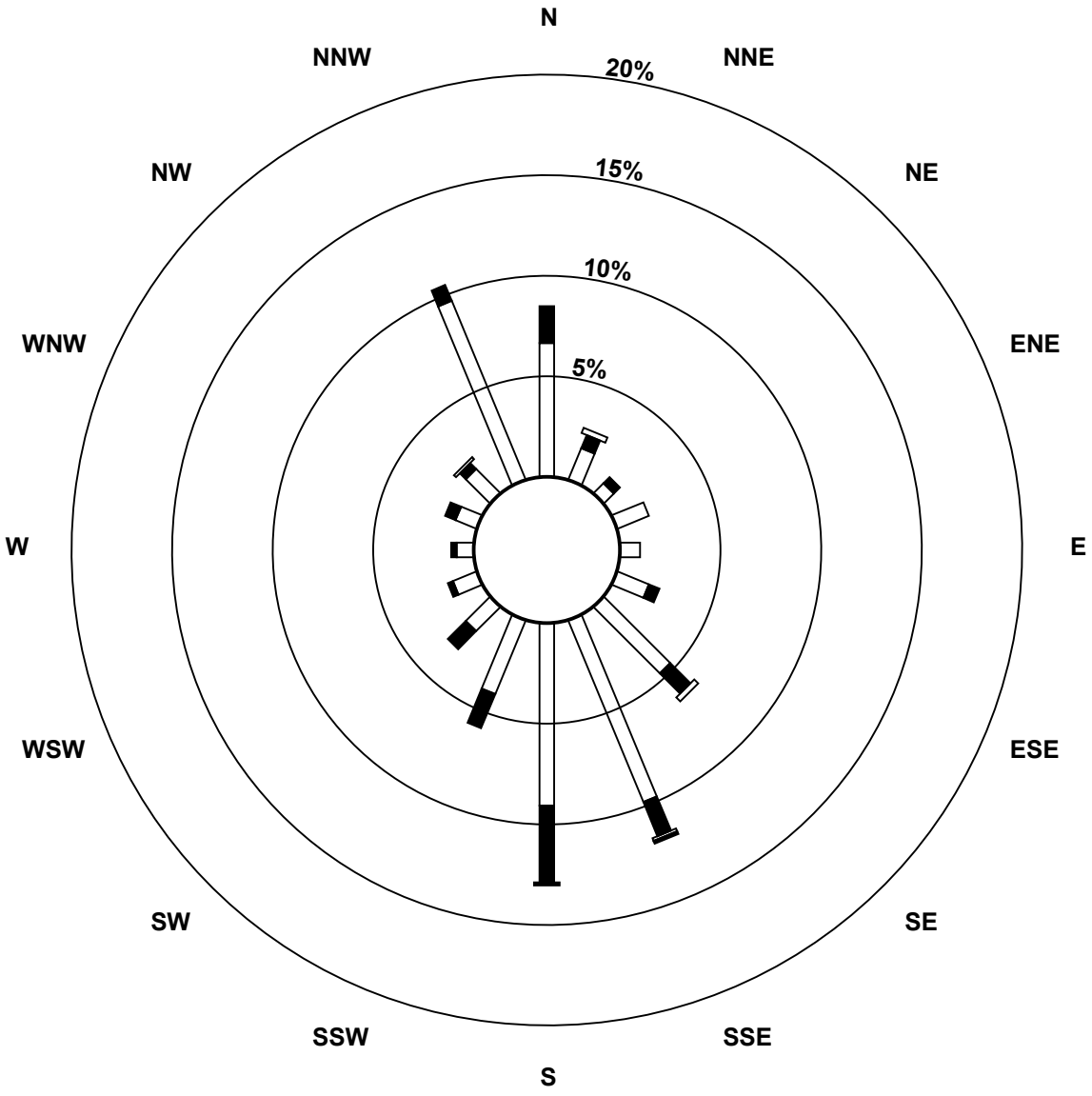
AURORA ATMOSPHERICS INC.

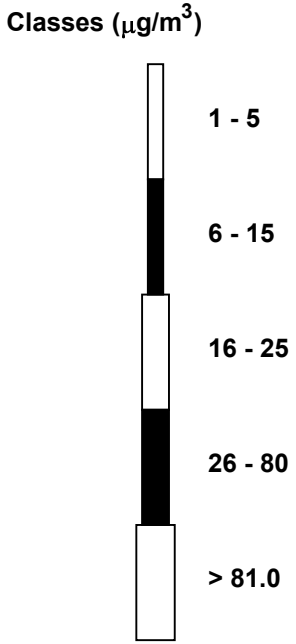
Wood Buffalo Environmental Association

Wind Rose Jan 2014

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

Wapasu (AMS 17)





Total Number of Valid Hours: 706

Maximum Value: 5.0 C on Jan 17 13:00

Maximum Daily Average: -2.0 C on Jan 15

Minimum Value: -39.4 C on Jan 1 07:00

Minimum Daily Average: -31.0 C on Jan 5

Maximum Diurnal Average: -14.7 C at hour 14

Minimum Diurnal Average: -18.5 C at hour 1

Monthly Average: -17.01 C

Percentiles: P_1 = -37.4 P_{10} = -29.5 Q_1 = -24.1 Median = -17.1 Q_3 = -10.4 P_{90} = -3.7 P_{99} = 2.8

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

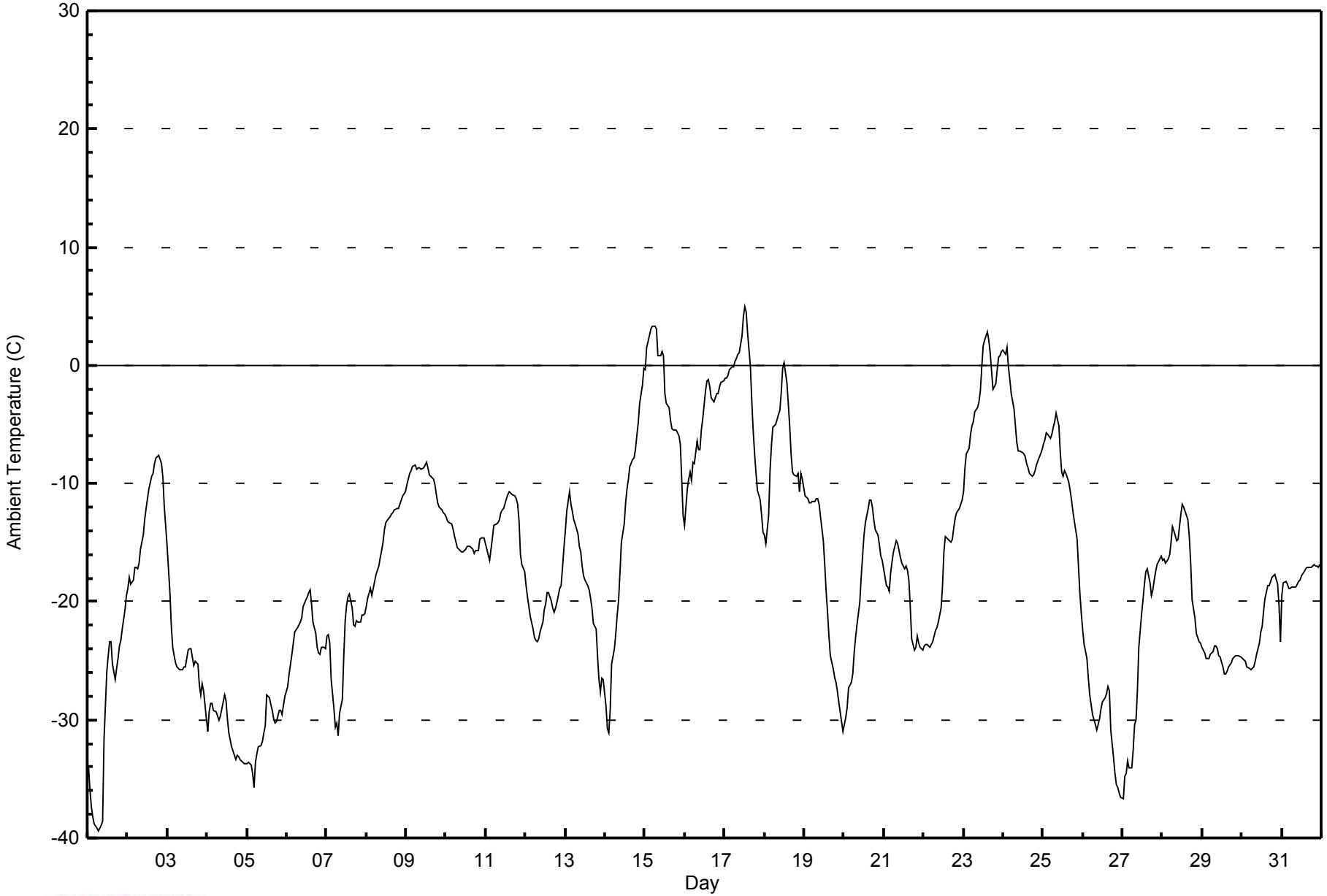
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-34.1	-35.9	-37.4	-38.2	-38.8	-39.2	-39.4	-39.2	-39.0	-38.6	-31.7	-25.9	-24.6	-23.4	-23.4	-25.3	-26.6	-25.7	-24.8	-23.7	-23.3	-22.4	-20.7	-19.5	-30.0	-19.5
2-Jan	-18.8	-17.9	-18.5	-18.2	-17.1	-17.1	-17.2	-16.8	-15.6	-14.4	-13.0	-12.2	-11.3	-10.4	-9.4	-9.1	-8.3	-7.9	-7.8	-7.6	-8.3	-9.5	-12.0	-13.7	-13.0	-7.6
3-Jan	-15.3	-19.2	-22.1	-23.8	-24.6	-25.2	-25.5	-25.8	-25.8	-25.7	-25.5	-25.6	-24.1	-23.9	-24.0	-24.7	-25.4	-25.1	-25.3	-27.1	-27.9	-27.0	-27.6	-29.9	-24.8	-15.3
4-Jan	-31.0	-29.4	-28.6	-28.6	-29.2	-29.3	-29.7	-30.0	-29.6	-29.1	-28.0	-28.3	-30.0	-31.1	-31.7	-32.3	-33.0	-33.3	-33.1	-33.1	-33.3	-33.6	-33.7	-33.8	-30.9	-28.0
5-Jan	-33.7	-33.6	-33.8	-34.5	-35.7	-33.7	-32.8	-32.3	-32.2	-31.8	-31.1	-30.6	-27.9	-28.1	-28.7	-29.2	-29.9	-30.2	-30.2	-29.2	-29.3	-29.6	-28.8	-28.1	-31.0	-27.9
6-Jan	-27.2	-26.1	-25.3	-24.5	-23.5	-22.5	-22.2	-21.9	-21.8	-21.4	-20.5	-19.9	-19.6	-19.2	-19.0	-20.2	-21.7	-22.7	-23.9	-24.3	-24.4	-23.9	-23.8	-23.9	-22.6	-19.0
7-Jan	-22.9	-22.8	-23.5	-26.6	-29.1	-30.7	-30.3	-31.3	-29.5	-28.3	-24.6	-21.6	-20.3	-19.6	-19.4	-20.6	-22.0	-22.1	-21.6	-21.8	-21.7	-21.2	-21.1	-21.0	-23.9	-19.4
8-Jan	-20.4	-19.7	-18.9	-19.4	-18.9	-18.3	-17.7	-17.0	-16.3	-15.7	-15.0	-13.9	-13.2	-12.9	-12.8	-12.6	-12.5	-12.3	-12.1	-12.1	-11.8	-11.4	-11.1	-10.7	-14.9	-10.7
9-Jan	-10.2	-9.6	-9.1	-8.9	-8.6	-8.5	-8.8	-8.7	-8.7	-8.7	-8.7	-8.4	-8.2	-8.7	-9.3	-9.4	-9.6	-10.1	-11.0	-11.6	-12.0	-12.3	-12.4	-12.5	-9.7	-8.2
10-Jan	-12.8	-13.1	-13.3	-13.5	-13.9	-14.5	-14.9	-15.5	-15.7	-15.8	-15.8	-15.7	-15.5	-15.3	-15.3	-15.4	-15.5	-15.9	-15.7	-15.6	-14.7	-14.6	-14.6	-14.6	-14.9	-12.8
11-Jan	-15.1	-16.0	-16.5	-15.6	-14.6	-13.6	-13.4	-13.3	-13.0	-12.5	-12.2	-12.1	-11.3	-10.9	-10.7	-10.8	-11.0	-11.1	-11.3	-11.8	-13.1	-16.1	-16.8	-17.4	-13.3	-10.7
12-Jan	-18.6	-19.6	-20.5	-21.3	-22.3	-23.1	-23.3	-23.4	-23.2	-22.6	-21.8	-20.6	-20.2	-19.2	-19.2	-20.0	-20.5	-20.9	-20.6	-20.1	-18.8	-18.6	-17.1	-15.4	-20.5	-15.4
13-Jan	-14.0	-12.3	-10.7	-11.7	-12.3	-13.0	-13.4	-14.2	-15.3	-15.8	-17.0	-17.8	-18.2	-18.6	-19.0	-19.7	-20.5	-21.8	-22.4	-24.6	-26.6	-27.7	-26.4	-26.6	-18.3	-10.7
14-Jan	-28.8	-30.7	-31.1	-29.2	-25.3	-24.0	-22.6	-21.1	-19.9	-17.5	-14.9	-13.4	-11.6	-10.5	-9.6	-8.6	-7.9	-7.9	-7.1	-6.0	-4.9	-3.2	-1.6	-0.3	-14.9	-0.3
15-Jan	-0.3	1.5	2.0	3.0	3.3	3.4	3.3	3.0	0.9	0.8	1.2	0.8	-2.4	-3.2	-3.6	-4.7	-5.4	-5.5	-5.5	-5.5	-5.9	-6.6	-9.7	-12.7	-2.0	3.4
16-Jan	-13.5	-10.4	-9.7	-9.0	-9.7	-8.2	-8.3	-6.4	-7.1	-7.1	-5.4	-4.5	-2.1	-1.4	-1.2	-1.8	-2.8	-3.1	-2.7	-2.4	-2.4	-1.8	-1.5	-1.3	-5.2	-1.2
17-Jan	-1.1	-1.0	-0.9	-0.3	-0.1	-0.1	0.3	0.6	1.0	1.0	2.4	4.1	5.0	4.5	2.8	-0.1	-3.1	-5.6	-7.4	-9.1	-10.5	-11.4	-12.8	-14.1	-2.3	5.0
18-Jan	-14.4	-15.1	-12.8	-8.9	-6.7	-5.2	-5.1	-5.1	-4.2	-3.8	-2.3	-0.2	0.2	-1.5	-3.3	-5.1	-7.5	-9.0	-9.3	-9.4	-9.1	-10.7	-9.2	-9.6	-7.0	0.2
19-Jan	-11.0	-11.1	-11.3	-11.7	-11.7	-11.6	-11.5	-11.3	-11.2	-11.7	-12.9	-14.8	-16.9	-19.1	-21.0	-23.0	-24.6	-25.6	-26.3	-26.8	-27.5	-28.5	-30.1	-31.0	-18.4	-11.0
20-Jan	-30.3	-29.8	-29.0	-27.3	-26.9	-26.1	-24.3	-23.0	-22.0	-20.1	-17.9	-16.1	-14.4	-13.3	-12.1	-11.4	-11.4	-12.0	-13.1	-14.0	-14.3	-15.2	-16.2	-16.5	-19.0	-11.4
21-Jan	-17.2	-18.7	-18.8	-19.1	-17.6	-16.7	-15.8	-14.9	-15.1	-15.7	-16.3	-16.7	-17.2	-17.0	-17.4	-18.2	-20.4	-23.2	-24.2	-23.8	-23.0	-23.6	-23.8	-24.2	-19.1	-14.9
22-Jan	-23.8	-23.7	-23.7	-23.8	-23.8	-23.4	-22.9	-22.5	-22.2	-21.8	-20.5	-18.6	-15.7	-14.5	-14.6	-14.8	-15.0	-14.8	-13.7	-13.0	-12.5	-12.2	-11.8	-11.4	-18.1	-11.4
23-Jan	-10.7	-8.6	-7.5	-7.0	-5.8	-5.1	-4.7	-4.0	-3.6	-3.0	-2.1	-0.1	1.6	2.1	2.8	2.1	1.0	-0.6	-2.0	-1.6	-0.3	0.7	0.8	1.1	-2.3	2.8
24-Jan	1.3	1.0	1.5	-0.1	-1.2	-2.4	-3.6	-5.1	-6.5	-7.2	-7.2	-7.3	-7.4	-7.8	-8.3	-8.6	-9.1	-9.4	-9.3	-9.0	-8.4	-8.1	-7.5	-7.1	-5.7	1.5
25-Jan	-6.7	-6.3	-5.7	-5.8	-6.2	-5.8	-5.2	-4.8	-4.1	-5.1	-7.4	-9.1	-9.4	-8.9	-9.1	-9.9	-10.6	-11.4	-12.4	-13.2	-14.8	-17.2	-19.4	-21.0	-9.6	-4.1
26-Jan	-22.4	-23.7	-24.8	-26.4	-27.8	-28.7	-29.5	-30.4	-30.9	-30.4	-30.0	-29.1	-28.5	-28.1	-27.7	-27.2	-27.5	-30.9	-33.3	-34.6	-35.5	-35.7	-36.2	-36.6	-29.8	-22.4
27-Jan	-36.6	-34.8	-34.6	-33.5	-34.1	-34.1	-32.6	-30.4	-30.0	-27.6	-23.8	-21.0	-19.9	-18.5	-17.4	-17.2	-18.4	-19.5	-19.0	-18.2	-17.5	-16.8	-16.4	-16.2	-24.5	-16.2
28-Jan	-16.5	-16.4	-16.7	-16.4	-16.0	-15.0	-13.7	-14.0	-14.8	-14.7	-13.6	-12.6	-11.8	-12.0	-12.8	-13.1	-14.5	-16.7	-19.8	-21.4	-22.7	-23.0	-23.4	-23.5	-16.5	-11.8
29-Jan	-23.9	-24.4	-24.8	-24.9	-24.8	-24.4	-24.2	-23.8	-23.7	-24.0	-24.5	-24.7	-25.6	-26.1	-26.2	-25.8	-25.6	-25.2	-24.8	-24.7	-24.6	-24.6	-24.6	-24.7	-24.8	-23.7
30-Jan	-24.8	-24.9	-25.1	-25.5	-25.7	-25.7	-25.7	-25.5	-25.1	-24.5	-23.5	-22.6	-22.1	-20.8	-19.8	-18.6	-18.6	-18.3	-18.0	-17.8	-17.7	-18.5	-20.4	-23.4	-22.2	-17.7
31-Jan	-19.5	-18.5	-18.3	-18.6	-18.8	-18.9	-18.8	-18.7	-18.8	-18.6	-18.3	-18.1	-17.8	-17.5	-17.2	-17.1	-17.1	-17.1	-17.1	-16.9	-17.0	-16.9	-17.1	-16.9	-17.9	-16.9
	-18.5	-18.4	-18.4	-18.4	-18.3	-18.1	-17.9	-17.6	-17.5	-17.1	-16.2	-15.4	-14.9	-14.7	-14.8	-15.2	-16.0	-16.6	-16.9	-17.1	-17.2	-17.5	-17.6	-18.0	Diurnal Average	
	1.3	1.5	2.0	3.0	3.3	3.4	3.3	3.0	1.0	1.0	2.4	4.1	5.0	4.5	2.8	2.1	1.0	-0.6	-2.0	-1.6	-0.3	0.7	0.8	1.1	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Wapasu - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	288	38.71	38.71
-20 - 0	424	56.99	95.70
0 - 10	32	4.30	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Maximum Value: 94 % on Jan 18 21:00

Maximum Daily Average: 90.9 % on Jan 9

Minimum Value: 46 % on Jan 27 16:00

Minimum Daily Average: 60.4 % on Jan 27

Maximum Diurnal Average: 79.8 % at hour 9

Minimum Diurnal Average: 75.3 % at hour 14

Monthly Average: 78.6 %

Percentiles: $P_1 = 50$ $P_{10} = 69$ $Q_1 = 74$ Median = 78 $Q_3 = 86$ $P_{90} = 89$ $P_{99} = 93$

Hours in Service:	744
Hours of Data:	744
Hours of Missing Data:	0
Hours of Calibration:	0
Percent Operational Time:	100.0

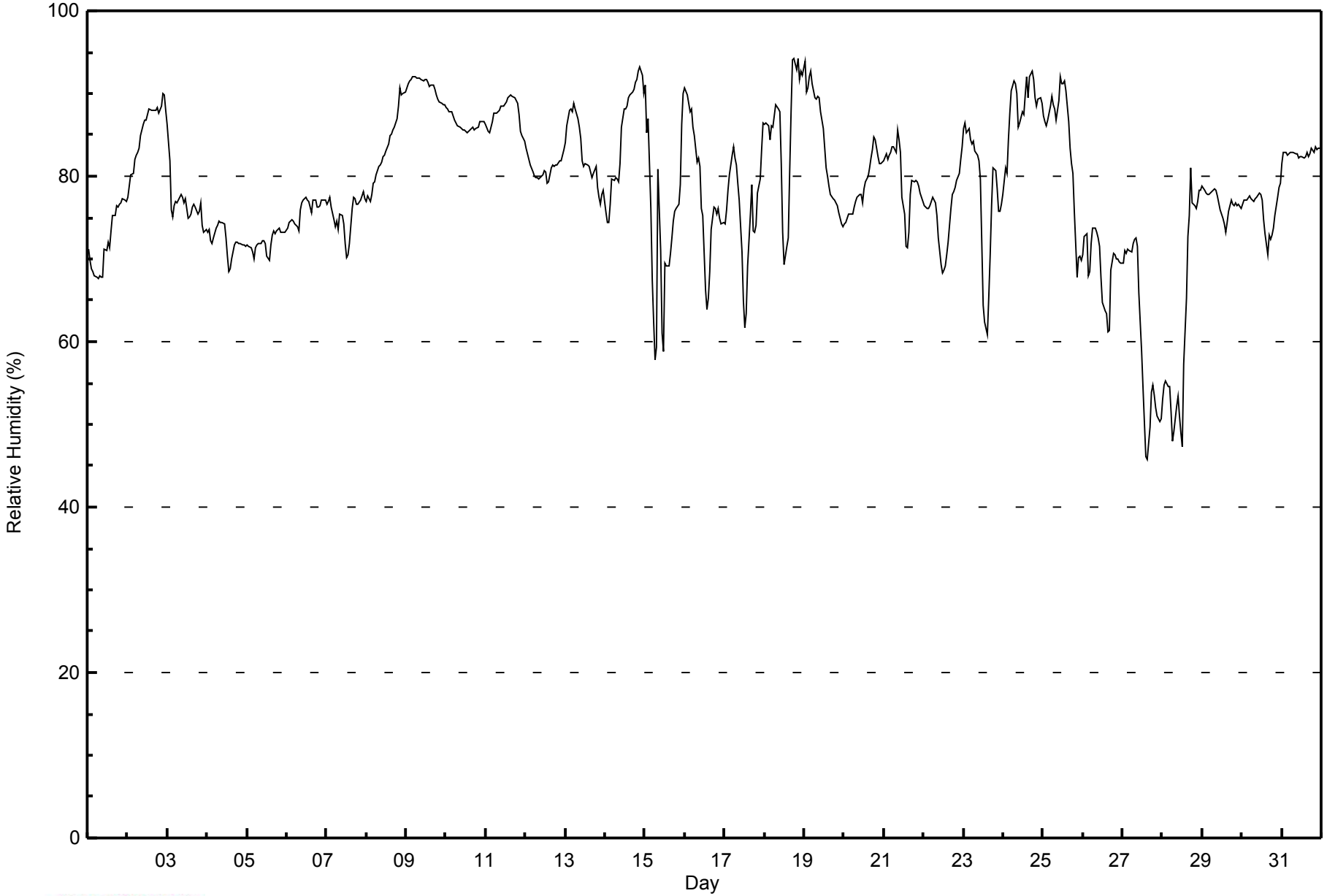
Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	71	70	69	68	68	68	68	68	68	68	71	71	72	71	73	75	75	76	76	77	77	77	77	77	72.2	77
2-Jan	78	79	80	80	82	82	83	83	85	86	87	87	88	88	88	88	88	88	88	88	89	90	90	88	85.5	90
3-Jan	86	82	76	75	76	77	77	77	78	77	77	77	75	75	75	76	77	76	75	76	77	74	73	74	76.6	86
4-Jan	73	74	72	72	73	74	74	75	74	74	74	73	70	68	69	70	72	72	72	72	72	72	72	72	72.2	75
5-Jan	72	72	71	71	70	71	72	72	72	72	72	72	70	70	72	73	73	73	73	74	73	73	73	73	72.1	74
6-Jan	74	74	75	75	75	74	74	73	76	77	77	77	77	77	76	76	77	77	76	76	77	77	77	77	75.9	77
7-Jan	77	77	78	76	75	74	75	74	75	75	74	72	70	70	72	76	77	77	77	77	77	78	78	77	75.3	78
8-Jan	77	78	77	78	79	79	80	81	81	82	82	83	83	84	85	85	86	86	87	89	91	90	90	90	83.4	91
9-Jan	91	91	92	92	92	92	92	92	92	92	92	92	92	91	91	91	91	91	90	89	89	89	89	89	90.9	92
10-Jan	88	88	88	88	87	87	86	86	86	86	86	86	85	85	86	86	86	86	86	86	87	87	87	87	86.4	88
11-Jan	86	85	85	86	87	88	88	88	88	88	88	88	89	89	90	90	90	89	89	89	88	85	85	84	87.6	90
12-Jan	83	83	82	81	81	80	80	80	80	80	80	81	80	79	79	81	81	81	81	81	82	82	83	83	81.1	83
13-Jan	84	86	88	88	88	89	88	87	86	85	82	81	81	81	81	80	80	80	81	79	78	77	78	78	82.8	89
14-Jan	76	74	74	77	80	80	80	80	79	82	86	88	88	88	90	90	90	91	91	92	93	93	92	90	85.1	93
15-Jan	91	85	87	76	67	62	58	59	81	71	61	59	69	69	69	71	72	75	76	76	77	79	86	90	73.6	91
16-Jan	91	90	89	88	88	86	85	82	82	81	76	75	66	64	65	68	74	76	76	75	76	75	74	74	78.2	91
17-Jan	74	76	78	80	82	84	82	81	79	77	71	65	62	63	69	75	79	73	73	74	78	80	83	86	76.1	86
18-Jan	86	86	86	84	86	86	87	89	88	88	81	73	69	71	72	80	88	94	94	93	94	92	93	92	85.6	94
19-Jan	94	90	91	92	93	91	89	89	90	89	88	86	83	81	80	79	78	77	77	77	76	76	74	74	83.9	94
20-Jan	74	74	75	75	75	76	76	77	77	78	78	77	78	79	80	81	82	83	85	84	82	81	82	82	78.9	85
21-Jan	82	83	82	83	83	84	84	83	86	84	83	77	75	72	71	73	78	80	79	80	79	79	78	77	79.7	86
22-Jan	77	76	76	76	76	77	77	77	75	73	69	68	69	69	71	72	76	78	78	79	80	80	82	84	75.6	84
23-Jan	86	86	85	86	84	84	84	83	83	82	80	72	64	62	61	65	70	76	81	81	79	76	76	77	77.6	86
24-Jan	78	81	80	84	88	90	92	91	90	86	86	88	87	90	92	90	92	93	92	89	88	89	90	89	88.1	93
25-Jan	87	87	86	87	89	90	89	88	87	89	92	91	91	91	90	87	83	81	80	76	68	70	70	70	84.2	92
26-Jan	70	73	73	68	68	72	74	74	73	73	72	68	65	64	63	61	61	69	71	70	70	70	70	69	69.2	74
27-Jan	70	71	71	71	71	71	72	72	72	72	66	59	54	50	46	46	50	54	55	54	52	51	50	51	60.4	72
28-Jan	53	55	55	55	55	51	48	49	52	53	51	49	47	57	65	73	75	81	77	76	76	77	78	78	62.0	81
29-Jan	79	78	78	78	78	78	78	78	78	78	77	76	75	74	73	74	76	77	77	76	77	76	77	76	76.8	79
30-Jan	77	77	77	77	78	77	77	77	77	77	78	78	77	75	73	70	73	72	73	74	75	77	79	79	76.0	79
31-Jan	82	83	83	83	83	83	83	83	83	83	82	82	82	82	82	83	82	83	83	83	84	83	83	83	82.8	84
	79.5	79.5	79.3	79.0	79.2	79.2	79.0	79.0	79.8	79.3	78.0	76.5	75.4	75.3	75.8	77.0	78.5	79.6	79.7	79.4	79.3	79.2	79.6	79.7	Diurnal Average	
	94	91	92	92	93	92	92	92	92	92	92	92	92	91	92	91	92	94	94	93	94	93	93	92	Diurnal Maximum	

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Wapasu - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	30	4.03	4.03
60 - 80	388	52.15	56.18
80 - 100	326	43.82	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Wapasu - January 2014

Maximum Speed: 31 km/h on Jan 15 08:00

Maximum Daily Speed Average: 13.2 km/h on Jan 22

Minimum Speed Value: 1 km/h on Jan 21 04:00

Minimum Daily Speed Average: 1.2 km/h on Jan 5

Maximum Diurnal Speed Average: 2.6 km/h at hour 7

Minimum Diurnal Speed Average: 0.2 km/h at hour 19

Monthly Average Velocity: 0.7 km/h 218.0 deg

Percentiles: P_1 = 1 P_{10} = 3 Q_1 = 5 Median = 8 Q_3 = 11 P_{90} = 15 P_{99} = 24

Hours in Service: 744

Hours of Data: 737

Hours of Missing Data: 7

Percent Operational Time: 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-Jan	SE5	SE3	SE3	ESE3	SE3	ESE3	SE3	SE5	SE3	SE5	SE5	S3	SSE5	SSE5	S4	S5	SSE7	SSE8	SE9	SSE10	SSE10	SSE12	SSE14	SSE17	SSE6.1	SSE17
2-Jan	SSE17	SSE16	SSE18	SE22	SSE20	SSE20	SSE15	SSE12	S11	S12	S10	S10	S10	SSE9	S10	S10	SSW8	SW7	SW9	WSW7	SW6	WNW6	N9	N10	S8.8	SE22
3-Jan	N14	N16	N15	N12	N12	N10	N10	N9	N10	N9	NNW8	NNW9	NW11	NNW11	NW10	NNW9	N6	NNW7	NW9	NW5	NW6	NW9	NW5	WNW3	NNW9.0	N16
4-Jan	WNW3	NW8	WNW7	WNW7	W6	WSW7	SW6	WSW5	WSW7	W8	WNW12	NNW16	N14	NNW16	NNW12	NNW11	NNW9	NNW9	NNW11	NNW9	NW8	NW7	NNW8	NNW7	NW7.4	NNW16
5-Jan	NNW7	NNW7	N5	N3	AF	ENE1	AF	AF	SSE2	AF	WSW5	S2	NW3	NW5	NW1	SE2	SE4	SE4	SSE5	SSE5	SSE6	SSE8	SSE7	SSE7	SSE1.2	SSE8
6-Jan	SSE8	SSE10	SSE8	SSE11	SSE12	SSE12	SSE15	SE16	SSE16	SE19	SE20	SE18	SE18	SE16	SE8	SE4	SE1	ESE5	SE7	SE8	ESE2	NNE2	NE1	E4	SE9.6	SE20
7-Jan	SE3	NW2	W2	AF	E3	ESE4	E3	S2	SE6	SSE5	S3	S5	S5	S6	SSE5	SE8	SE7	SSE10	SSE13	SSE14	SSE14	SSE17	SSE17	SSE18	SSE6.8	SSE18
8-Jan	SSE17	SSE18	SSE18	SSE18	SSE16	SSE16	SSE17	SSE15	S13	S13	S11	S10	SW10	SW10	SW8	SSW6	SSW5	SW5	S5	S5	SSE4	SSE4	SSE4	SE5	S9.6	SSE18
9-Jan	SE4	SE4	SSE6	SSE8	SSE8	S8	S7	S7	SSW6	S6	SW5	SW2	WNW2	N4	NNE4	NNE5	NNE5	NE6	NNE6	NE7	NNE6	NNE5	NNE5	NNE5	ESE1.2	S8
10-Jan	NNE5	NNE4	NNE4	NNE5	NNW5	N4	NNW4	NNW6	NNW5	NNW5	NNW5	NNW6	NNW6	N5	NNW4	NNW3	WNW1	SSW2	SSW2	S3	WSW6	SW4	SSW3	S2	NNW2.5	NNW6
11-Jan	SE1	SE2	AF	E2	ESE4	ESE7	SE6	SE5	ESE4	ESE6	ESE7	ESE6	ESE6	E6	E5	E6	ENE5	ENE7	NE7	NNE5	N6	N7	N6	N7	ENE3.9	ENE7
12-Jan	N8	N7	N8	N8	N8	N8	NNW6	N5	N4	NE2	SE2	SW4	SW6	SSW6	S7	S7	S7	S9	S10	S10	S11	S11	SSE11	SSE11	S1.8	SSE11
13-Jan	SSE11	SSE12	S7	S6	SSW6	SW6	W4	NW7	N11	NNW12	N11	N10	N9	N8	N8	N7	N6	NNE4	NNE5	ENE3	ENE3	ENE3	ENE5	E5	NNE2.4	NNW12
14-Jan	SE3	ESE3	SSE4	SE5	SSE6	SSE7	SSE8	SSE9	SSE12	SE13	SSE14	SSE14	SE16	SSE15	SSE13	SSE12	SSE12	SSE15	SSE15	SSE15	S13	S12	S14	S14	SSE10.8	SE16
15-Jan	SSW10	WSW20	W17	WNW23	WNW24	WNW24	W24	WNW31	NW28	NW26	NW24	NW18	N12	N10	N9	N10	N8	NNW8	NNW8	N9	N8	NNE6	E2	SSE3	NW11.8	WNW31
16-Jan	SSE6	SSE7	SSE6	S6	SSE5	SSW5	SSW5	S5	S5	S6	S7	SSE6	SSW7	SSW7	SSW8	SSW8	S6	S7	S7	S6	S6	S6	SSE6	SSE7	S5.9	SSW8
17-Jan	SSE7	SSE7	SSE8	S8	S7	SSW7	SW10	WSW10	WSW10	WSW10	W10	WNW11	NW18	NNW16	NNW16	N15	N13	N14	N10	NNW10	N6	NNE7	ENE3	SSE4	NW3.9	NW18
18-Jan	SE5	SE5	SSE8	SSE10	SSE9	SSE7	SSE7	S8	S9	S7	S6	WSW3	NW7	N7	NE10	NE8	NNE4	ENE7	ENE6	ESE3	SSE2	AF	SSE4	W5	SE2.8	NE10
19-Jan	SSE2	WSW3	WNW6	NW4	NW5	NW5	NNE3	ENE5	NNE4	NNE5	N8	N9	NNW12	NNW15	NNW15	NNW14	NNW14	NNW11	NNW7	NNW7	NNW3	NE3	SE2	SE3	NNW5.7	NNW15
20-Jan	SE5	SSE6	SSE5	SSE6	SSE8	S9	S10	S11	S11	S11	S12	S11	S11	S12	S10	SSW6	W3	NNW3	NNW4	NNW5	N8	N8	NNW6	NNW4	S4.4	S12
21-Jan	NNW2	NNW2	NE3	SE1	ESE3	ESE3	ENE3	N5	N10	N12	N13	N13	N11	N9	N8	NNE5	NE3	ENE4	ESE5	E7	SE9	SE8	SE10	SE10	NE3.5	N13
22-Jan	SSE12	SSE12	SSE13	SSE11	SSE12	SSE13	SSE14	SSE14	SSE13	SSE12	S12	S13	S13	S13	S12	SSE15	SSE15	S16	S16	S15	S16	S16	S15	S13	SSE13.2	S16
23-Jan	SSW12	SSW12	SSW11	SSW10	SSW11	SSW10	SSW8	SW9	SW7	WSW9	W9	WNW8	NNW12	NW8	W8	W7	WNW7	WNW3	SE1	S3	SW5	SW4	SSW5	SSW5	SW5.6	SSW12
24-Jan	SSW4	WSW6	WNW6	N7	NNE6	N7	N9	N10	N9	N8	N8	NNW8	NNW8	NNW8	N8	NNE6	ENE5	ENE3	ESE2	ESE5	SSW4	SSE5	S8	SSE9	N2.9	N10
25-Jan	SSE13	SSE12	SSE13	SSE11	S8	S9	S7	S4	WNW4	NNW17	NNW18	NNW18	NNW15	NNW15	NNW18	NNW17	NNW15	NNW17	NNW16	NNW18	NNW21	NNW21	NNW25	NNW27	NNW8.6	NNW27
26-Jan	NNW21	NNW19	N15	NNW18	NNW12	N9	N8	N7	N5	N7	N8	N7	NNW6	NW4	WNW4	WNW3	NW2	SE2	ESE3	ESE3	E3	SE4	SE4	SE5	N5.6	NNW21
27-Jan	SE6	SE6	SE6	SE6	SE6	SE6	SSE6	SSE6	SSE6	SSE6	S6	SSW7	SSW9	SSW9	S9	S6	SSE8	S9	S10	S11	S11	S10	S10	S9	S7.3	S11
28-Jan	S10	S11	S10	S9	S10	S10	S11	S10	S9	S7	S6	WSW4	WNW7	NNW11	N11	NNW13	NNW15	NNW16	N16	NNW16	N14	N12	NNW11	NNW12	NW2.7	NNW16
29-Jan	N11	N9	N10	N8	NNW8	NNW9	NNW9	NNW10	NNW12	N11	N13	N12	NNW13	NNW13	N12	N11	N10	NNW11	NNW13	NNW13	NNW13	NNW14	NNW15	NNW14	NNW11.3	NNW15
30-Jan	NNW10	NW10	NW10	NW8	NW6	WNW4	WSW4	SW6	SW8	SW7	SSW9	SW10	SSW12	SSW12	SSW10	SSW11	SSW12	SSW10	SSW9	SSW11	SW9	SSW5	S2	NW2	SW5.9	SSW12
31-Jan	NNW8	N12	NNW12	NNW11	NNW12	NNW11	NNW10	NNW10	NNW7	NNW9	NNW11	NNW11	NNW12	NNW12	NNW12	NNW10	NNW9	NNW8	NW7	NNW9	NW5	WNW3	SW3	SSW3	NNW8.5	NNW12
	SSE2.3	S1.7	S1.4	S1.6	S2.2	S2.4	S2.6	SSW2.3	SW1.5	WSW1.0	W1.5	WNW1.9	NW2.5	NW2.4	NNW2.0	NNW1.5	NNW1.1	N0.7	ENE0.2	S0.5	SW0.8	S0.6	SSE1.4	SSE1.7		Diurnal Average
	NNW21	WSW20	SSE18	WNW23	WNW24	WNW24	W24	WNW31	NW28	NW26	NW24	NNW18	NW18	NNW16	NNW18	NNW17	NNW15	NNW17	NNW16	NNW18	NNW21	NNW21	NNW25	NNW27		Diurnal Maximum

AF - Analyzer Failure

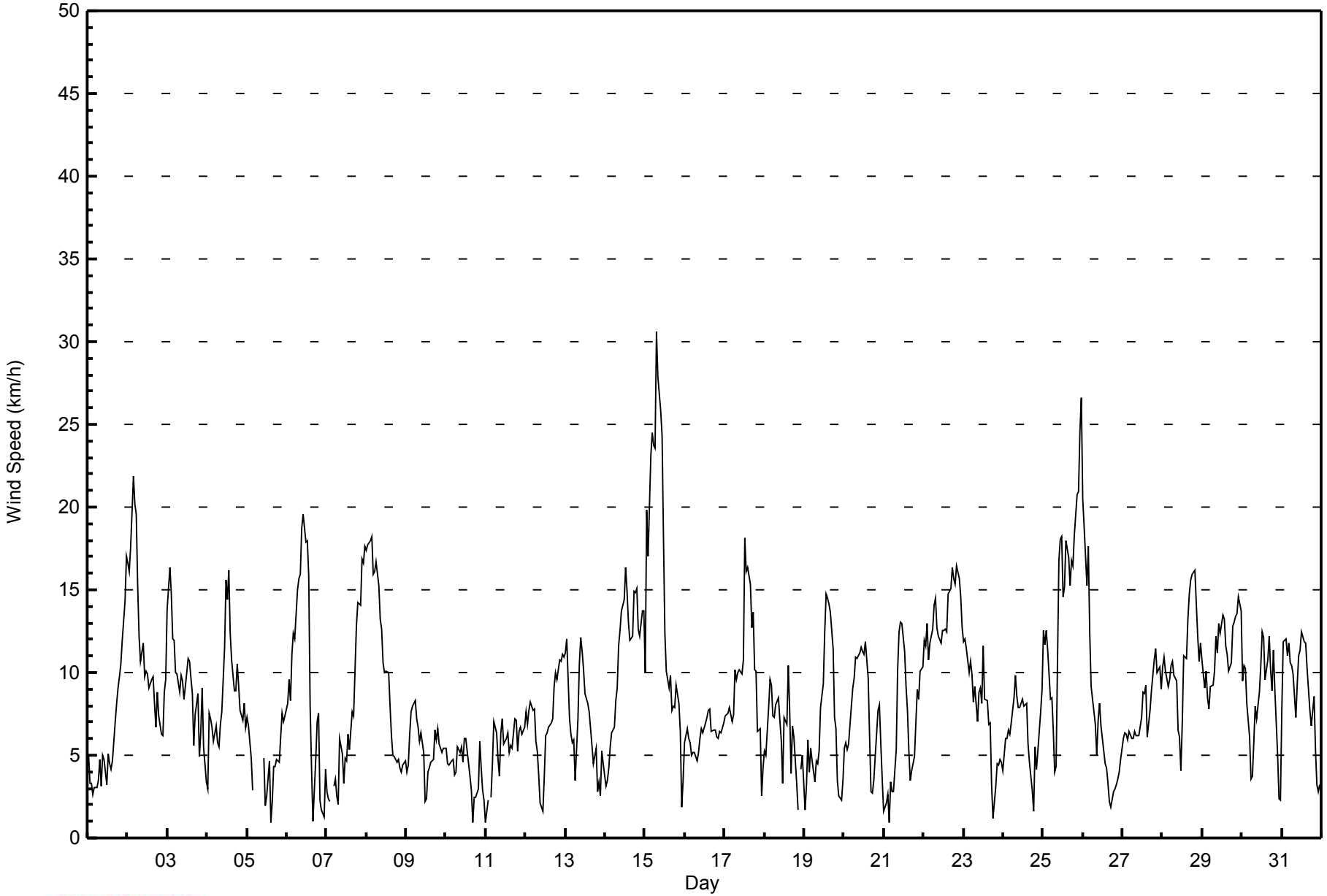
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Wapasu - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	207	28.09	28.09
6 - 11	358	48.58	76.66
12 - 19	154	20.90	97.56
20 - 28	17	2.31	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 737

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Wapasu - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	9	19	5	12	7	17	35	19	17	12	8	6	4	10	13	14	207
6 - 11	64	6	5	3	3	5	18	49	71	26	17	9	6	9	16	51	358
12 - 19	20	0	0	0	0	0	7	51	21	5	0	0	1	1	2	46	154
20 - 28	0	0	0	0	0	0	2	2	0	0	0	1	1	3	3	5	17
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	93	25	10	15	10	22	62	121	109	43	25	16	12	24	34	116	737

Total Number of Valid Hours: 737

Total Number of Hours: 744

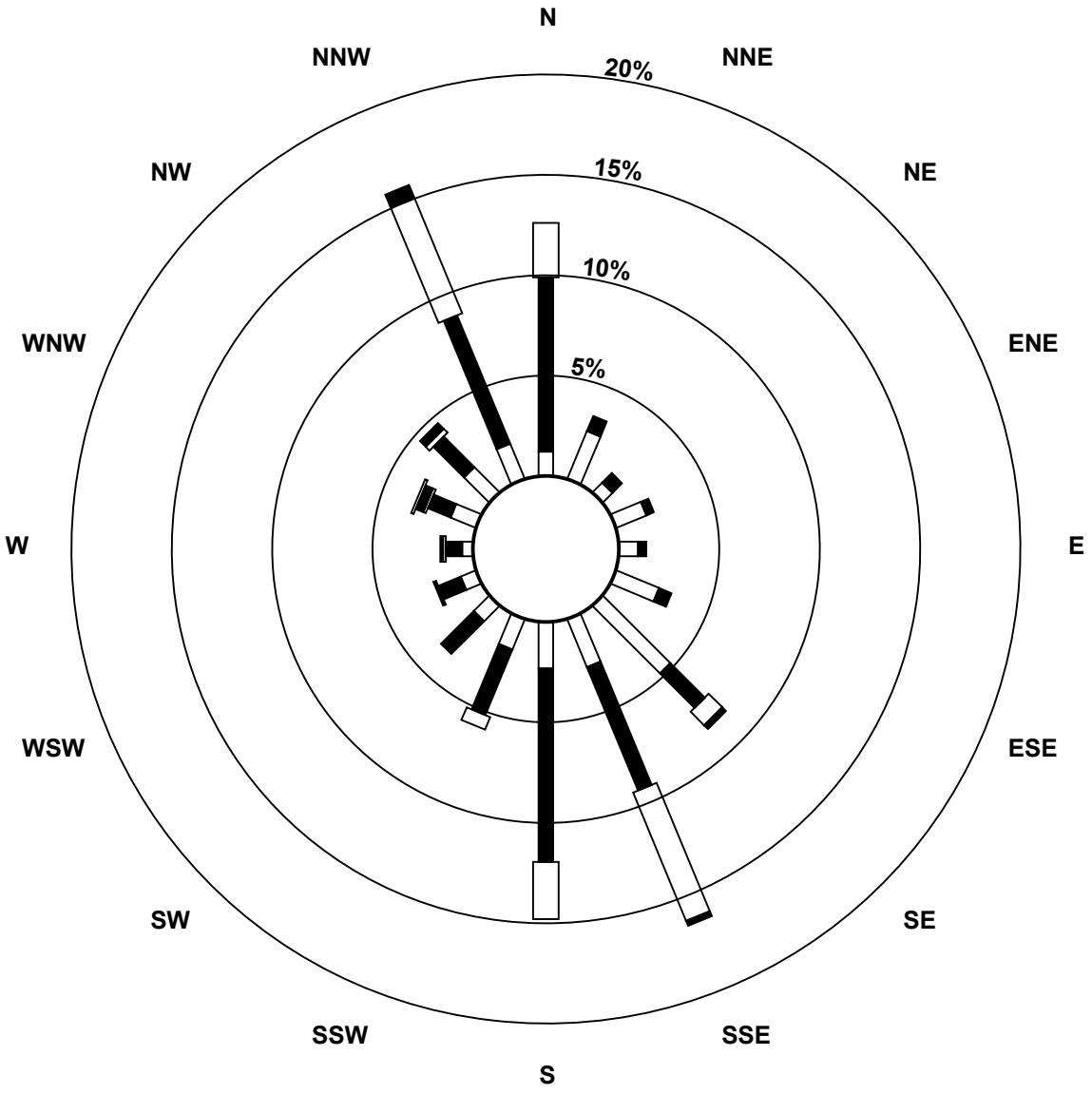
AURORA ATMOSPHERICS INC.

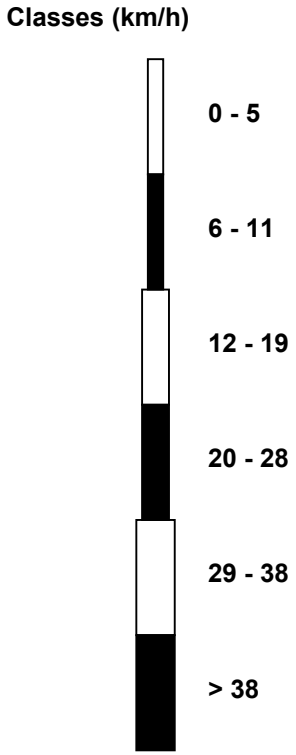
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Wapasu (AMS 17)





Total Number of Valid Hours: 737

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Wapasu - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 km/h on Jan 15 08:00

Minimum Value: 0 km/h on Jan 26 20:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 2$ Median = 2 $Q_3 = 4$ $P_{90} = 5$ $P_{99} = 9$

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Hours of Calibration:	0
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4	5	5
2-Jan	5	5	5	6	6	6	5	4	4	4	3	3	3	2	3	3	3	2	3	2	2	3	3	4	6
3-Jan	5	6	5	4	4	4	4	3	4	3	2	2	3	3	3	2	2	2	3	2	2	2	2	1	6
4-Jan	1	3	2	2	2	2	2	1	2	2	4	5	5	6	4	3	2	2	3	3	2	2	2	2	6
5-Jan	2	2	2	1	AF	1	AF	AF	1	AF	2	2	2	1	1	2	1	1	1	1	2	2	2	2	2
6-Jan	2	3	3	3	3	3	4	4	4	5	5	5	5	4	5	3	2	1	2	2	3	2	2	1	5
7-Jan	2	1	1	AF	1	1	2	1	1	1	1	1	2	2	2	2	2	3	3	3	4	5	5	5	5
8-Jan	5	5	5	5	5	5	5	5	5	4	4	3	3	3	3	2	2	2	1	1	1	1	1	2	5
9-Jan	1	1	2	3	2	3	3	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	3
10-Jan	2	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	2	1	2	1	2
11-Jan	1	1	AF	1	1	2	2	2	2	3	3	2	2	2	1	2	2	3	2	2	3	2	2	2	3
12-Jan	3	2	3	3	3	3	2	2	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3
13-Jan	3	3	3	2	2	2	1	2	4	4	4	4	4	3	3	2	2	2	2	1	1	1	1	1	4
14-Jan	1	1	1	1	1	1	2	2	3	3	4	4	4	4	4	4	5	5	5	5	5	4	5	4	5
15-Jan	3	7	6	9	9	9	9	11	9	8	9	7	4	3	3	3	3	2	3	3	3	3	1	1	11
16-Jan	1	1	1	1	1	1	2	2	2	1	2	2	2	2	2	3	2	2	2	2	1	2	2	2	3
17-Jan	2	2	2	2	2	2	4	2	2	3	3	3	7	6	6	6	5	5	4	3	2	2	2	1	7
18-Jan	1	1	2	3	3	2	2	2	2	3	2	2	2	2	3	3	1	2	2	3	2	AF	3	1	3
19-Jan	2	1	2	2	2	2	1	1	1	2	3	4	4	4	5	5	4	4	2	2	2	1	1	1	5
20-Jan	1	1	1	2	2	3	3	4	3	4	4	4	3	4	3	3	1	1	1	2	3	3	2	1	4
21-Jan	2	1	1	1	1	2	1	2	4	5	5	5	4	4	3	2	1	1	1	1	2	2	2	3	5
22-Jan	3	3	4	3	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	4	5
23-Jan	4	4	4	3	4	3	3	3	2	2	3	3	4	2	3	2	2	1	1	1	1	2	1	1	4
24-Jan	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3	3	3
25-Jan	4	4	4	3	3	3	2	2	4	6	7	6	5	5	6	7	6	6	6	7	8	8	9	9	9
26-Jan	7	7	5	7	5	3	3	2	2	3	3	3	2	2	2	1	1	2	1	0	1	1	0	1	7
27-Jan	1	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	2	3	3	4	4	3	3	3	4
28-Jan	3	4	3	3	3	4	3	3	3	2	2	1	2	3	4	4	5	6	6	6	5	4	4	4	6
29-Jan	4	3	4	3	3	2	2	4	5	5	5	4	5	5	4	4	4	4	5	4	4	4	5	5	5
30-Jan	3	3	3	2	2	1	2	2	2	3	3	4	4	5	4	4	4	4	3	4	3	2	2	1	5
31-Jan	3	4	5	4	4	4	4	3	2	3	4	4	4	4	3	3	3	2	2	3	2	1	1	1	5
	7	7	6	9	9	9	9	11	9	8	9	7	7	6	6	7	6	6	6	7	8	8	9	9	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Wapasu - January 2014

Direction of Maximum Speed: 291 deg on Jan 15 08:00
Direction of Maximum Daily Speed Average: 168.3 deg on Jan 22

Direction of Minimum Speed: 129 deg on Jan 21 04:00

Direction of Minimum Daily Speed Average: 1.2 deg on Jan 5

Monthly Average Direction: 298.0 deg

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	145	144	126	110	127	115	133	145	128	141	141	171	163	167	178	182	158	153	146	148	157	148	152	150	149.6
2-Jan	150	153	147	143	149	153	160	164	172	174	186	186	182	166	173	184	209	215	224	237	230	295	351	355	170.1
3-Jan	359	354	352	352	349	354	356	6	2	353	338	331	326	328	326	329	350	341	322	308	317	316	310	294	341.3
4-Jan	293	304	301	285	259	246	233	239	245	274	303	336	352	339	335	332	333	333	340	330	325	319	332	332	316.1
5-Jan	334	338	357	352	AF	57	AF	AF	152	AF	243	174	316	312	313	137	137	139	152	155	164	154	162	160	162.9
6-Jan	154	158	160	151	150	148	147	146	149	146	142	143	142	136	135	131	131	104	137	130	112	16	55	95	142.4
7-Jan	132	314	278	AF	89	119	92	169	145	150	172	174	187	171	165	142	144	148	148	149	155	152	155	151	151.8
8-Jan	150	149	154	155	157	159	161	166	173	180	187	191	218	228	222	210	198	217	186	180	155	160	159	141	171.6
9-Jan	136	140	149	155	167	187	190	189	194	187	220	219	284	2	19	25	26	35	24	36	31	28	16	23	117.3
10-Jan	18	18	23	20	341	8	343	333	335	328	345	327	335	358	348	333	292	212	206	183	246	234	209	177	334.3
11-Jan	132	138	AF	81	104	106	127	129	102	112	110	107	113	89	100	88	72	65	48	25	2	349	4	3	78.3
12-Jan	358	4	0	356	353	353	344	356	8	38	129	223	227	209	185	174	172	186	181	178	179	169	165	153	181.3
13-Jan	153	152	170	191	205	215	260	314	353	341	359	11	7	357	4	355	9	14	16	73	75	73	60	83	14.4
14-Jan	141	117	147	141	150	151	150	149	154	145	150	149	144	151	151	159	158	159	164	160	172	172	175	177	156.2
15-Jan	192	245	263	284	283	284	281	291	305	306	313	321	357	357	351	9	352	333	344	353	9	17	93	164	304.0
16-Jan	149	161	154	174	157	200	206	190	179	177	175	168	202	193	202	196	180	184	187	184	169	175	147	152	178.0
17-Jan	162	162	163	186	189	194	231	243	241	246	266	283	317	331	344	357	357	353	358	339	356	23	67	163	304.1
18-Jan	134	144	153	166	166	162	161	178	187	189	189	239	315	5	45	47	22	62	76	120	160	AF	152	269	145.4
19-Jan	154	241	302	306	317	323	33	61	20	14	355	351	340	340	346	339	335	341	343	334	344	36	137	142	343.7
20-Jan	142	147	152	168	165	172	173	181	178	171	178	184	176	177	176	194	259	340	343	342	353	351	332	347	177.6
21-Jan	327	346	41	129	119	102	58	358	356	359	355	0	9	1	6	24	37	61	102	101	128	136	138	145	39.7
22-Jan	151	151	149	152	155	158	153	158	161	160	169	171	183	180	172	167	166	169	174	182	187	180	183	190	168.3
23-Jan	194	202	203	201	204	210	211	219	234	253	259	294	334	314	270	272	289	302	144	177	219	219	197	200	233.7
24-Jan	198	250	303	1	19	357	351	357	353	9	359	340	346	339	349	27	66	60	120	115	207	167	171	160	358.3
25-Jan	163	160	155	161	176	185	190	187	302	348	346	343	347	343	342	343	346	347	347	339	341	342	344	334	340.4
26-Jan	338	337	352	343	348	353	358	0	358	356	353	353	333	309	288	289	308	125	105	113	101	132	135	139	349.3
27-Jan	142	142	144	145	144	144	148	152	148	154	186	204	207	203	190	191	168	171	178	174	182	182	181	179	172.1
28-Jan	178	184	177	177	173	182	189	185	173	184	189	252	302	332	349	341	342	344	350	342	351	350	346	346	309.4
29-Jan	350	353	3	357	343	330	328	334	348	358	352	349	345	348	354	349	349	348	339	334	333	335	332	336	344.1
30-Jan	328	324	322	315	313	300	237	234	233	224	213	215	213	213	208	210	212	207	208	205	222	201	183	308	233.8
31-Jan	346	350	348	342	342	345	344	337	332	342	342	338	337	334	328	331	331	330	320	327	306	287	218	210	335.0
	150.6	180.3	169.2	178.1	180.1	185.4	191.1	208.1	217.3	240.6	272.8	293.7	309.8	318.8	327.2	333.7	335.5	8.6	72.4	175.1	218.4	181.9	157.6	159.1	
	Diurnal Average																								

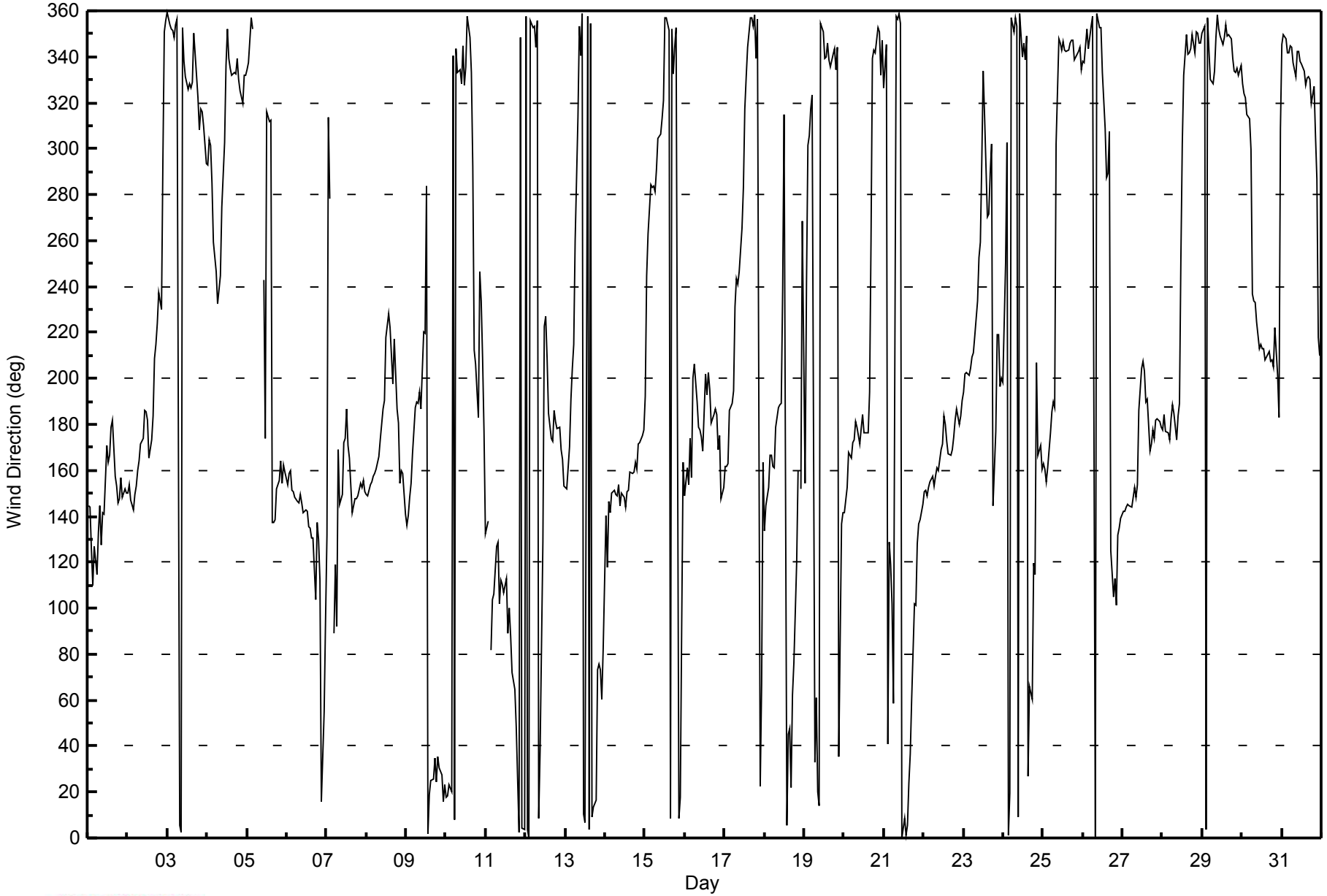
AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Wapasu - January 2014



AURORA ATMOSPHERICS INC.

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 90 deg on Jan 6 17:00

Minimum Value: 4 deg on Jan 27 06:00

Percentiles: P_1 = 7 P_{10} = 19 Q_1 = 23 Median = 29 Q_3 = 33 P_{90} = 37 P_{99} = 77

Hours in Service:	744
Hours of Data:	737
Hours of Missing Data:	7
Hours of Calibration:	0
Percent Operational Time:	99.1

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	9	15	25	29	17	19	16	10	17	14	19	20	22	23	27	27	20	21	19	22	24	21	21	20	29
2-Jan	20	23	20	17	21	24	29	30	30	28	35	33	32	26	31	32	39	27	29	25	26	37	36	40	40
3-Jan	35	36	31	30	35	34	35	34	34	31	28	20	22	22	24	19	31	26	20	20	20	17	24	27	36
4-Jan	38	26	25	27	24	22	24	23	21	26	24	28	34	29	26	21	22	21	27	22	18	18	21	18	38
5-Jan	25	26	31	37	AF	33	AF	AF	28	AF	25	53	82	28	88	62	14	12	16	22	25	21	23	24	88
6-Jan	22	22	28	23	20	20	19	19	20	18	18	19	18	19	35	37	90	36	17	14	73	71	62	34	90
7-Jan	33	46	20	AF	17	19	62	66	8	10	20	25	36	28	25	17	18	19	18	18	21	20	23	21	66
8-Jan	19	21	22	23	24	25	25	27	29	32	35	33	33	29	36	35	35	30	32	27	27	29	32	28	36
9-Jan	17	20	19	26	29	36	37	39	37	35	30	42	54	39	35	31	31	25	35	30	32	36	37	33	54
10-Jan	30	34	31	32	31	32	24	20	26	23	30	23	32	36	32	36	54	50	27	27	24	26	59	44	59
11-Jan	40	24	AF	33	23	21	23	25	29	26	26	31	25	24	27	25	27	30	28	31	36	33	37	35	40
12-Jan	35	35	37	33	33	34	29	35	35	47	61	35	31	36	35	30	30	34	33	31	33	29	27	23	61
13-Jan	23	22	50	32	36	35	50	24	33	26	35	34	38	34	38	32	37	39	36	24	26	32	13	23	50
14-Jan	20	24	19	9	11	16	21	22	23	19	20	21	19	21	23	30	34	29	28	27	34	29	33	30	34
15-Jan	34	24	28	27	27	27	27	26	26	22	22	27	34	32	33	37	38	25	32	33	32	32	51	34	51
16-Jan	12	17	12	18	21	28	34	33	25	22	26	24	35	35	34	36	27	27	29	31	24	26	29	27	36
17-Jan	27	23	24	34	35	32	33	21	20	21	24	27	22	28	32	35	38	32	32	29	34	31	69	26	69
18-Jan	14	13	20	25	25	28	23	28	28	31	34	54	27	37	26	25	31	22	25	78	81	AF	36	28	81
19-Jan	80	54	34	36	29	36	47	27	35	37	31	34	28	28	33	29	25	28	27	23	43	36	21	21	80
20-Jan	11	11	13	22	26	29	28	31	31	29	31	32	31	31	30	34	38	51	38	31	30	32	26	37	51
21-Jan	63	50	32	83	27	24	30	31	33	34	35	35	34	34	35	38	24	19	13	14	18	17	16	19	83
22-Jan	22	22	21	24	24	23	22	22	26	24	28	29	34	31	30	27	28	28	30	30	31	33	35	36	36
23-Jan	35	31	31	33	33	32	31	33	29	22	22	32	26	23	23	23	28	29	78	33	28	32	27	29	78
24-Jan	30	24	34	35	35	32	32	32	35	34	37	31	32	31	32	38	34	56	68	19	35	30	30	24	68
25-Jan	26	25	24	23	33	31	30	62	48	33	30	29	32	29	29	31	32	32	34	29	31	30	30	26	62
26-Jan	27	26	34	32	31	32	35	33	34	31	31	39	38	45	33	36	34	50	11	9	19	9	6	7	50
27-Jan	4	5	6	5	4	4	7	11	12	17	28	32	32	37	31	34	24	28	31	30	31	30	29	29	37
28-Jan	30	31	29	27	28	29	32	29	27	31	35	45	26	26	31	28	30	31	33	29	33	32	30	29	45
29-Jan	31	33	38	34	28	22	22	25	33	35	36	35	33	33	32	33	36	33	28	26	25	25	23	26	38
30-Jan	23	20	19	19	20	25	22	21	23	30	33	32	31	33	35	35	34	35	33	36	33	33	53	71	71
31-Jan	30	31	33	29	30	28	30	25	24	27	31	30	26	25	21	24	23	27	20	22	25	36	35	27	36
	80	54	50	83	36	36	62	66	48	47	61	54	82	45	88	62	90	56	78	78	81	71	69	71	
	Diurnal Maximum																								

AF - Analyzer Failure

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Name	Wapasu	Station Number	AMS 17

Reason: Routine .

Start Time (MST)	8:25	End Time (MST)	12:10
Barometric Pressure	716 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	API T700	Serial Number	493
Cal Gas Concentration	51 ppm	Cal Gas Expiry Date	29-May-14
Gas Cert Reference	LL107933		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6894
DACS voltage range	NA	DACS channel #	TCP/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	-702	-702
Analyzer Range (mv)	1000	1000	Lamp voltage	909	909
Calculated slope	1.004345	0.997097	Chamber temp.	45.2	45.2
Calculated intercept	-0.965772	-0.992240	Pressure (mmHg)	694.6	694.6
Analyzer Background	8.8	8.8	Flow (lpm)	0.454	0.454
Analyzer Coefficient	0.841	0.841	Intensity	82	82

Analyzer make	Thermo 43i	Analyzer serial #	1218153459

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-0.1	N/A
as found span	5000	59.2	603.8	606.2	0.996
calibrator zero	5000	0.0	0.0	-0.1	N/A
high point	5000	59.2	603.8	606.2	0.996
second point	5000	29.7	302.9	305.0	0.993
third point	5000	14.8	151.0	153.7	0.982
calibrator zero	5000	0.0	0.0	0.3	N/A
as left zero	5000	0.0	0.0	0.3	N/A
as left span	5000	59.2	603.8	607.5	0.994
				Average Correction Factor	0.991

Corrected As found	606.2	Previous response	607.4	% change	0.2%

Notes:

No Adjustments Made, Filter changed, No Maintanence Done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

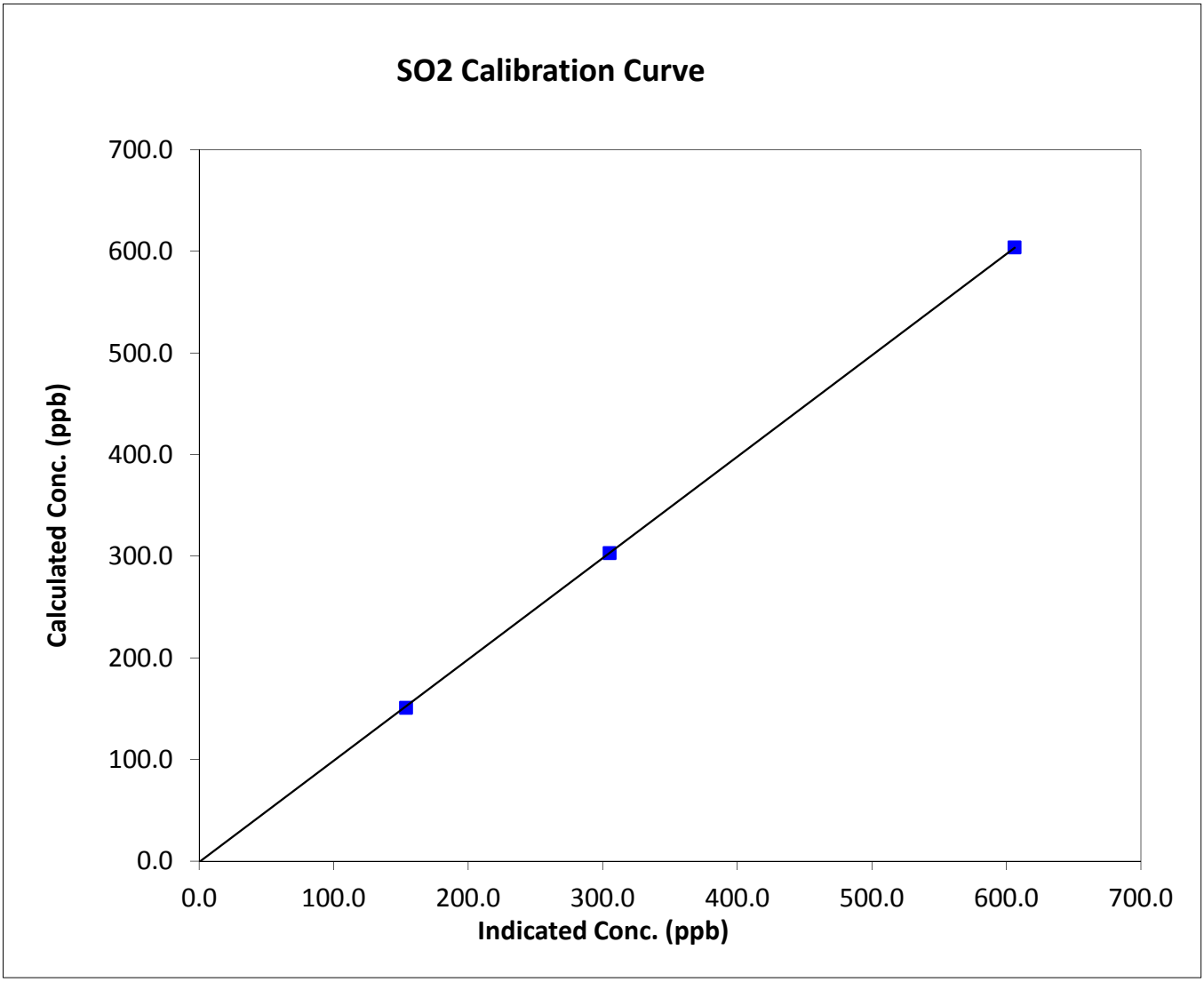
SO_2 Calibration Summary

Station Information

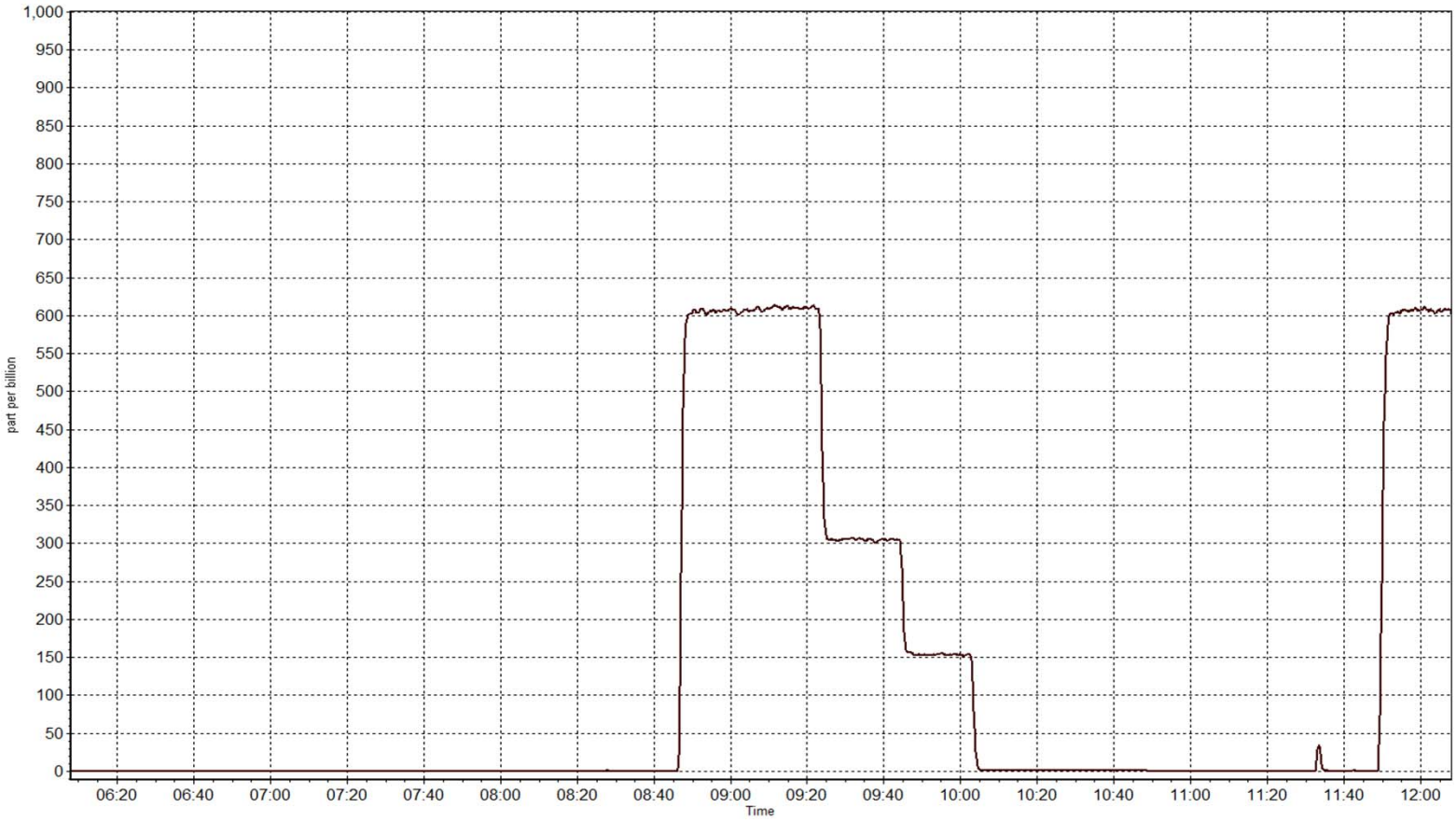
Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:25	End Time (MST)	12:10
Analyzer make	Thermo 43i	Analyzer serial #	1218153459

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	0.999985
603.8	606.2	0.9962		
302.9	305.0	0.9932	Slope	0.997097
151.0	153.7	0.9822		
			Intercept	-0.992240



SO_2 Calibration Plot **Date:** January 7, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Wapasu	Station Number	AMS 17
Reason:	Install		
Start Time (MST)	8:05	End Time (MST)	10:55
Barometric Pressure	mmHg	Station temp.	27 Deg C
Calibrator Make/Model	API T700	Serial number	493
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	30-May-13
Gas Cert Reference	SA5558	SO2 gas conc.	51.0 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6894
DACS voltage range	NA	DACS channel #	TCP/IP

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	-651	-651
Analyzer Range (mv)	100	100	Lamp voltage	826	826
Calculated slope	0.995481	1.010586	Chamber temp.	45	45
Calculated intercept	-0.164869	-0.867757	Pressure	578.0	578.0
Analyzer Background	14.4	13.2	Flow	0.772	0.772
Analyzer Coefficient	0.854	0.854	Intensity	90	90
			Converter temp.	342	342

Analyzer make/model	Thermo 450i	Analyzer serial #	1218153583
Converter make/model		Converter serial #	

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-1.6	N/A
as found span	5000	39.2	80.0	77.7	1.029
SO2 scrubber check	5000	19.6	199.9	0.6	N/A
calibrator zero	5000	0.0	0.0	0.6	N/A
high point	5000	39.2	80.0	79.8	1.002
second point	5000	19.6	40.0	40.7	0.982
third point	6000	11.8	20.1	20.9	0.960
calibrator zero	5000	0.0	0.0	1.0	N/A
as left zero	5000	0.0	0.0	1.0	N/A
as left span	5000	39.2	80.0	81.0	0.987
				Average Correction Factor	0.981

Corrected As found	79.3	Previous response	79.8	% change	0.6%

Notes:

Analyzer was zero adjusted.

Scrubber material changed out, checked pump is good, Filter changed out

Calibration Performed By: Melissa Lemay

:

Wood Buffalo Environmental Association

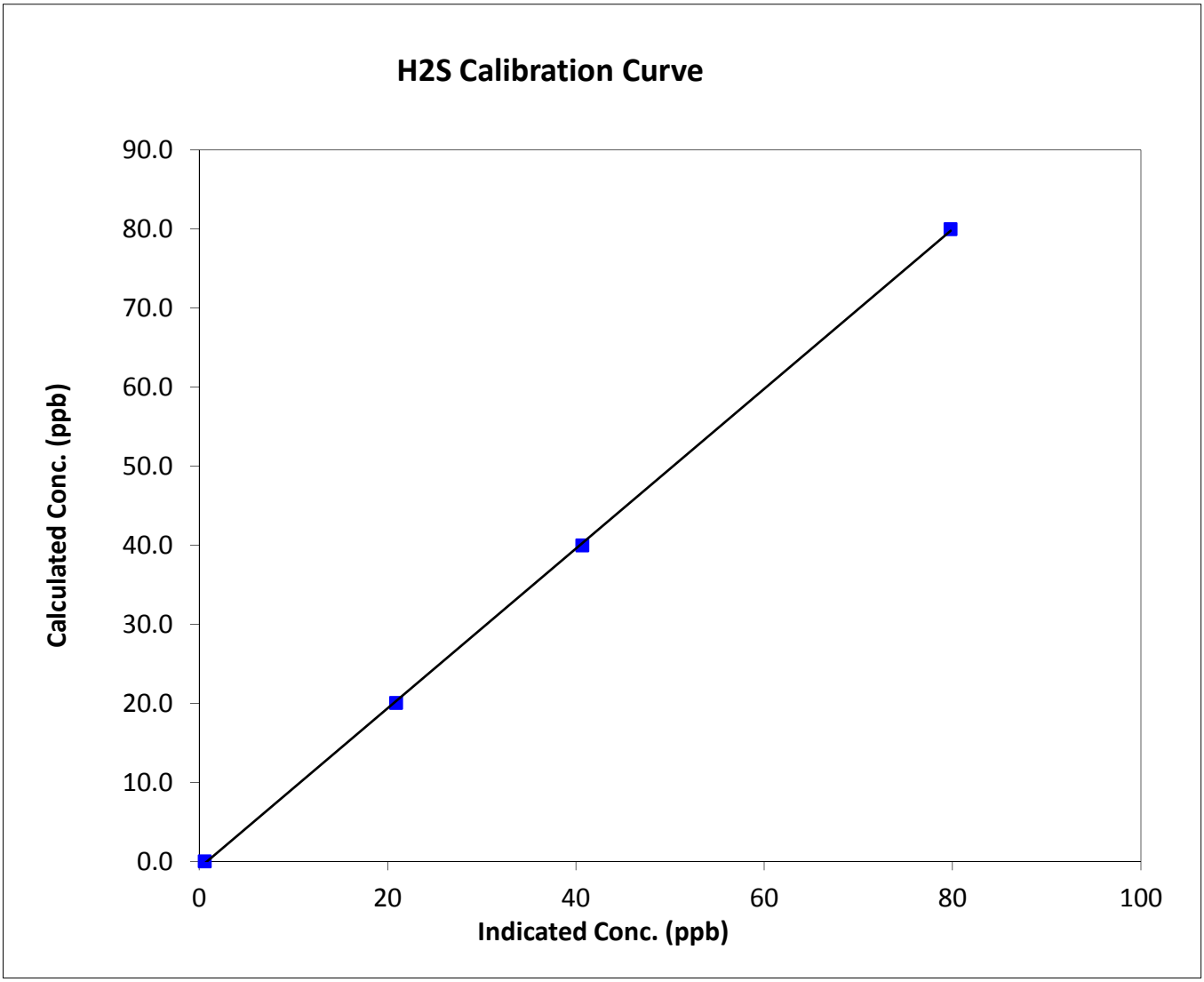
H2S Calibration Summary

Station Information

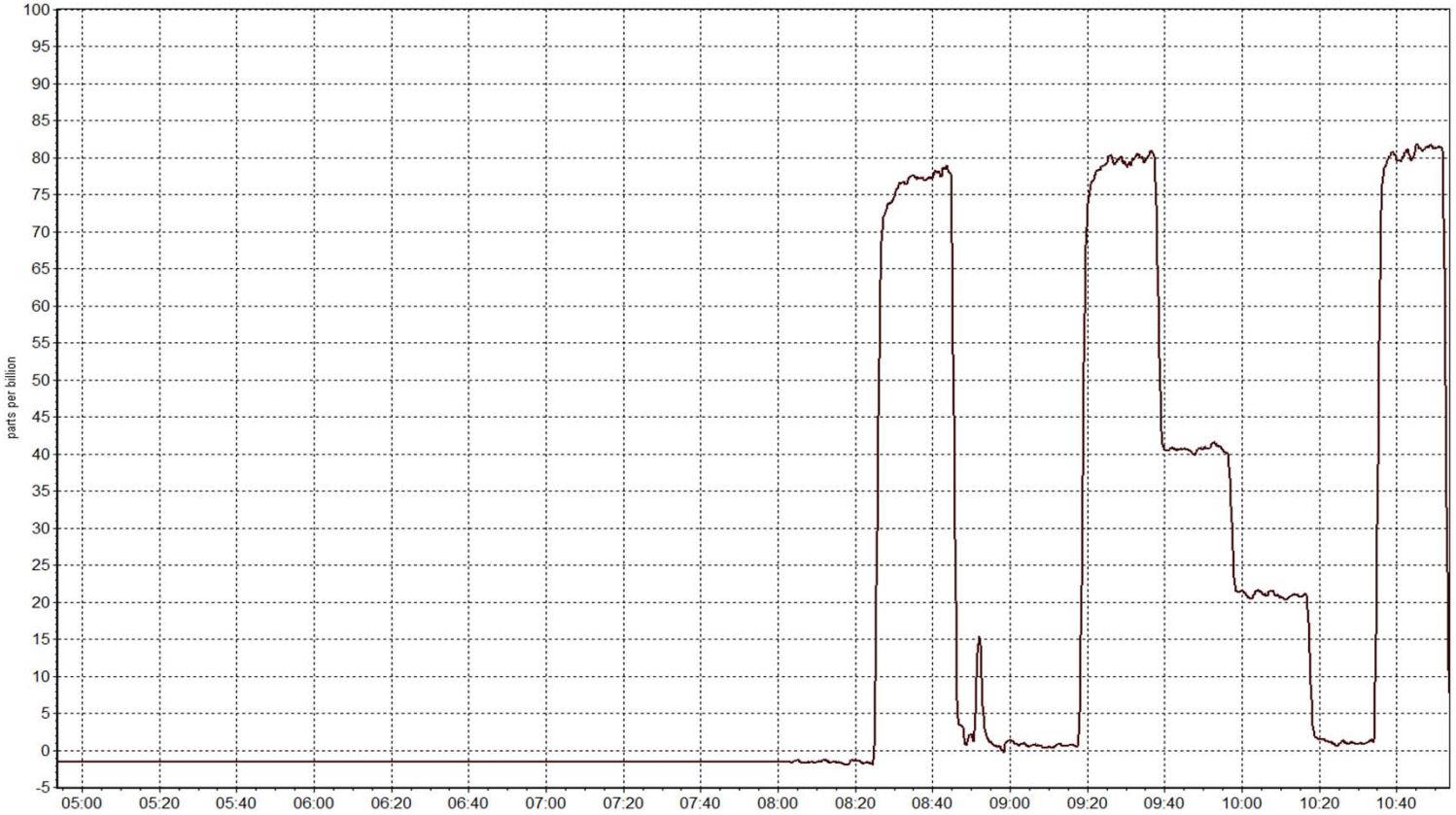
Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:05	End Time (MST)	10:55
Analyzer make	Thermo 450i	Analyzer serial #	1218153583

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.6	N/A	Correlation Coefficient	0.999934
80.0	79.8	1.0021		
40.0	40.7	0.9824	Slope	1.010586
20.1	20.9	0.9598		
			Intercept	-0.867757



H2S Calibration Plot Date: January 8, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	Tuesday, January 07, 2014	Previous Calibration	Monday, December 09, 2013
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine .		
Start Time (MST)	8:25	End Time (MST)	12:08
Barometric Pressure	716 mmHg	Station temp.	23 Deg C
Calibrator Make/Model	API T700	Serial Number	493
Gas Cert Reference	LL107933	Cal Gas Expiry Date	29-May-14
CH4 Cal Gas Conc.	510 ppm	CH4 Equiv Conc.	1079.3 ppm
C3H8 Cal Gas Conc.	207 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6894
DACS voltage range	NA	DACS channel #	NA

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	100	100	Sample Pressure	8.5	8.5
Analyzer Range (mv)	100	100	Air or Bypass press	37.9	37.9
Calculated slope	1.001180	1.004481	Fuel Pressure	24.8	24.8
Calculated intercept	0.014335	-0.059314	BKG	1.9	1.8
			COEF	4.517	4.350

Analyzer make	Thermo 51i	Analyzer serial #	1218153352

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.00	0.00	N/A
as found span	5000	59.2	12.78	13.26	0.964
calibrator zero	5000	0.0	0.00	0.00	N/A
high point	5000	59.2	12.78	12.76	1.001
second point	5000	29.7	6.41	6.44	0.995
third point	5000	14.8	3.19	3.32	0.962
calibrator zero	5000	0.0	0.00	0.08	N/A
as left zero	5000	0.0	0.00	0.08	N/A
as left span	5000	59.2	12.78	12.89	0.991
				Average Correction Factor	0.986

Corrected As found	13.26	Previous response	12.78	% change	-3.6%

Notes:

span adjusted, filter changed out, no maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

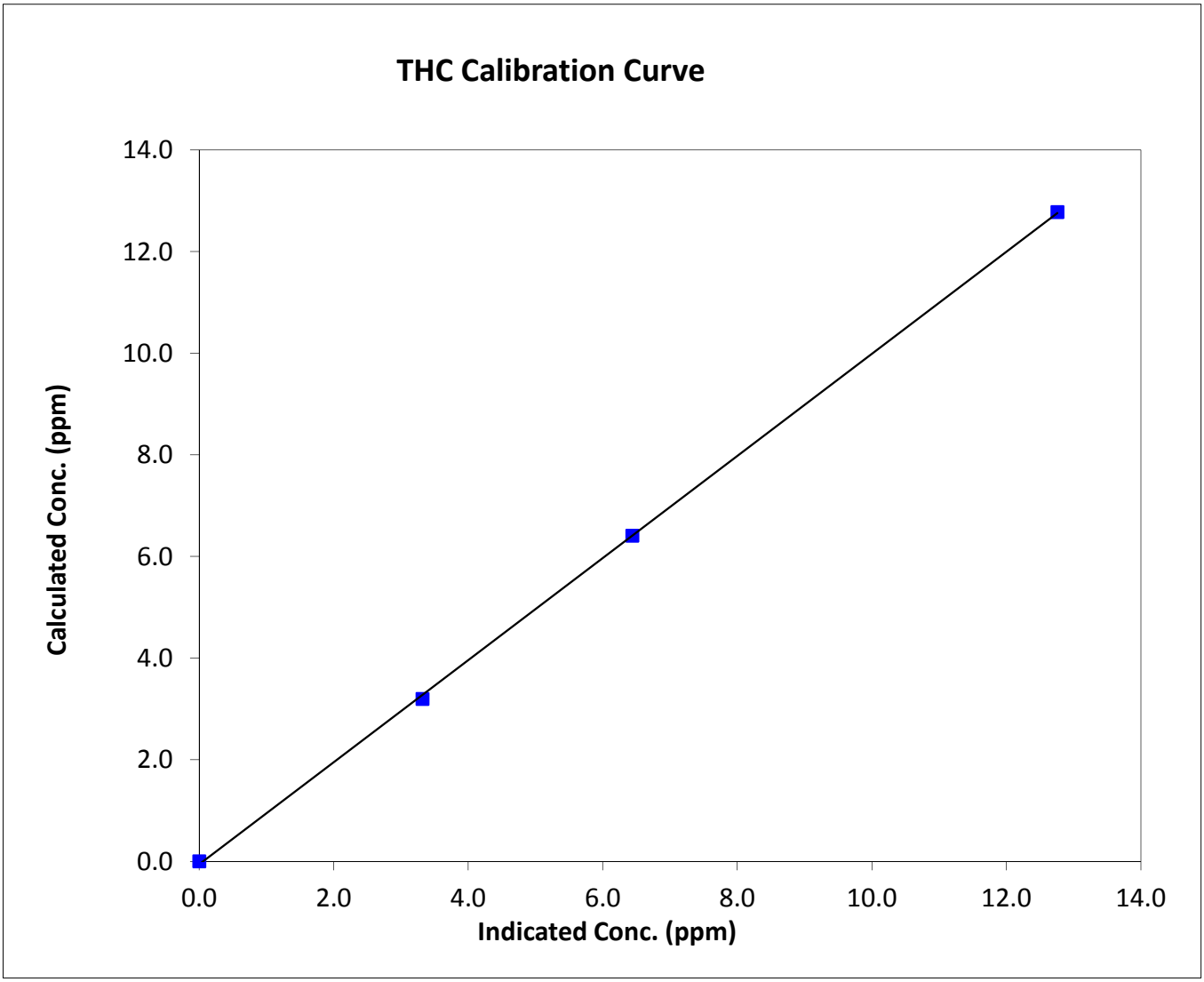
THC Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	8:25	End Time (MST)	12:08
Analyzer make	Thermo 51i	Analyzer serial #	1218153352

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.00	N/A	Correlation Coefficient	0.999883
12.78	12.76	1.0014		
6.41	6.44	0.9955	Slope	1.004481
3.19	3.32	0.9622		
			Intercept	-0.059314



THC Calibration Plot **Date:** January 7, 2014

Wood Buffalo Environmental Association

O_3 Calibration Report

Station Information

Calibration Date	January 8, 2014	Previous Calibration	December 10, 2013
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	10:55	End Time (MST)	13:20
Barometric Pressure	732 mmHg	Station temp.	22 Deg C
Calibrator Make/Model	T700	Serial Number	493
NO2 calibration used	Tuesday, January 07, 2014		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	
DACS voltage range	5000	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	500	500	Box Temp	28.7	29.0
Analyzer Range (mv)	500	500	Photo Lamp Temp	58.0	58.0
Calculated slope	1.002810	1.003255	Pressure	25.7	26.4
Calculated intercept	0.225742	0.966402	Flow	655	685
Analyzer Background	0	1.5			
Analyzer Coefficient	1.018	1.028			

Analyzer make	T400	Analyzer serial #	824

Calibration Data

Set Point	Dilution air flow rate (cc/min)	Calibrator Lamp Intensity (mA)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.00	0.0	1.1	N/A
as found span	5000	NA	432.7	428.0	1.011
calibrator zero	5000	0.00	0.0	-0.2	N/A
high point	5000	NA	432.7	430.7	1.005
second point	5000	NA	218.9	217.0	1.009
third point	5000	NA	111.9	109.7	1.020
calibrator zero	5000	0.00	0.0	-0.3	N/A
as left zero	5000	0.00	0.0	-0.3	N/A
as left span	5000	NA	426.7	431.0	0.990
				Average Correction Factor	1.011

Corrected As found	426.9	Previous response	433.7	% change	1.6%

Notes:

zero and span adjusted

Filter changed

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

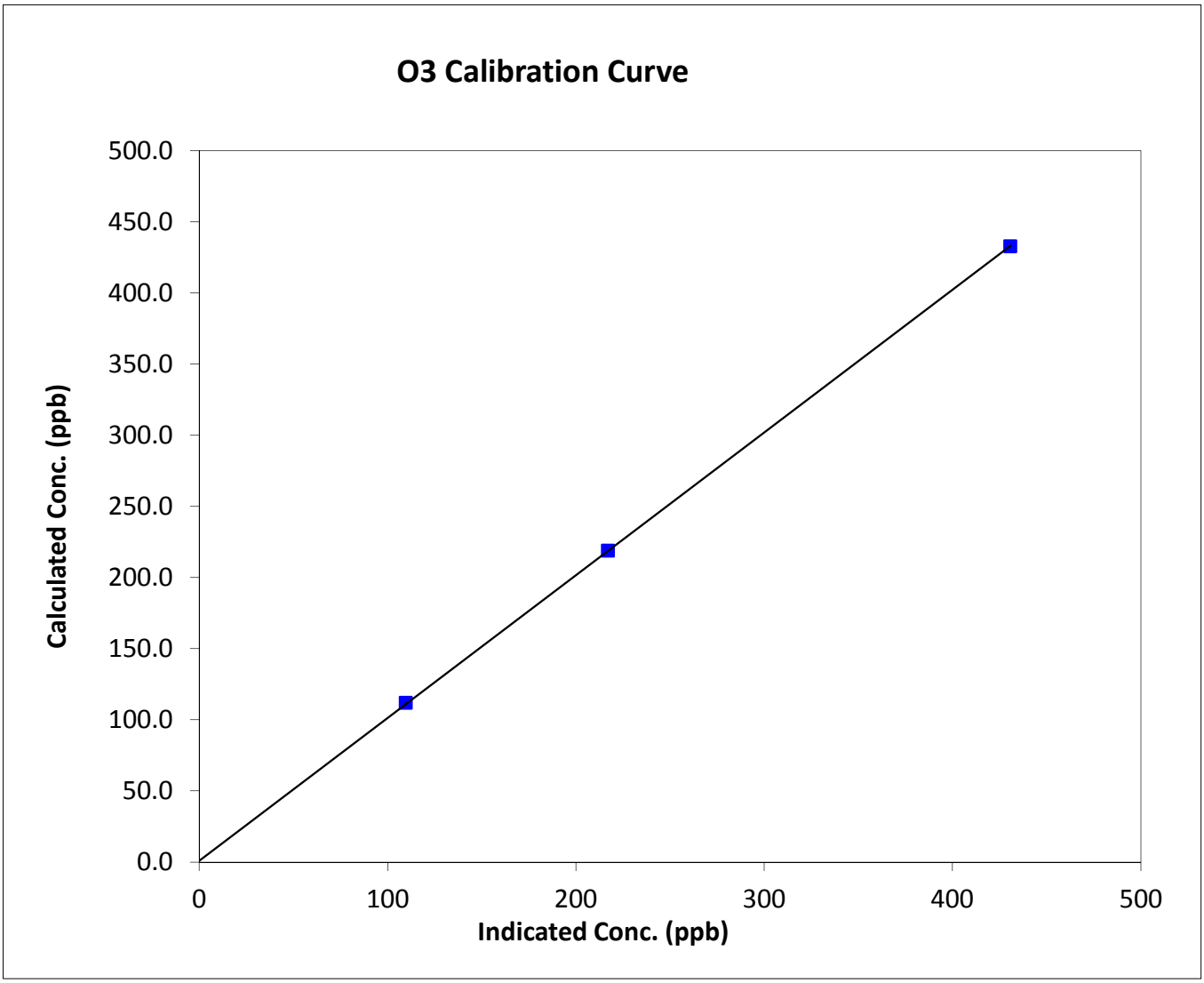
O_3 Calibration Summary

Station Information

Calibration Date	Wednesday, January 08, 2014	Previous Calibration	December 10, 2013
Station Name	Wapasu	Station Number	AMS 17
Start Time (MST)	10:55	End Time (MST)	13:20
Analyzer make	T400	Analyzer serial #	824

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.2	N/A	Correlation Coefficient	0.999985
432.7	430.7	1.0047		
218.9	217.0	1.0088	Slope	1.003255
111.9	109.7	1.0201		
			Intercept	0.966402



O3 Calibration Plot **Date:** January 8, 2014

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Name	Wapasu	Station Number	AMS 17
Reason:	Routine		
Start Time (MST)	8:25	End Time (MST)	12:08
Barometric Pressure	716 mmHg	Station Temperature	22.7 Deg C
Calibrator	API T700	Serial Number	493
NO Cal Gas Conc	50.7 ppm	Cal Gas Expiry Date	May 29, 2014
NOx Cal Gas Conc	50.7 ppm	Cal Gas Serial #	LL107933

DACS Information

DACS make & model: Campbell Scientific CR3000 DACS serial No.:

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	1.002025	1.003859	1.001072
	Data Offset	-0.981211	-1.233350	-0.171796
After	Data Slope	1.000557	1.001195	1.001625
	Data Offset	-0.677271	-0.692477	0.175689
Channel #		TCP/IP	TCP/IP	TCP/IP
Voltage Range				

Analyzer Information

Analyzer make/model: Thermo 42i Analyzer serial #: 1218153356

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	0.862	ppb	0.808	ppb
NOX coefficient	0.999	ppb	0.999	ppb
NO2 coefficient	1.000	ppb	1.000	ppb
NO bkgrnd	6.9		6.4	
NOX bkgrnd	6.8		6.4	
Nt coefficient				
Chamber Temp	50.2	Deg C	50.2	Deg C
Moly Temp	326.3	Deg C	326.3	Deg C
PMT Temp	-2.9	Deg C	-2.9	Deg C
O3 flow	OK	ccm	OK	ccm
R Cell Press	183.9	mmHg	183.9	mmHg
Sample Flow	0.724	ccm	0.724	ccm

Notes: Checked Diagonistics, similar to last month, Pump is good.

Span adjusted, Filter changed, No Maintanence Done

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 7, 2014 Station Number: AMS 17

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.3	0.0	N/A	N/A
as found span	5000	59.2	600.3	600.3	0.0	641.8	641.9	0.0	0.9353	0.9352
calibrator zero	5000	0.0	0.0	0.0	0.0	-0.3	-0.3	0.0	N/A	N/A
high point	5000	59.2	600.3	600.3	0.0	600.0	600.5	-0.5	1.0005	0.9996
second point	5000	29.7	301.2	301.2	0.0	301.3	301.1	0.3	0.9995	1.0002
third point	5000	14.8	150.1	150.1	0.0	152.0	152.3	-0.3	0.9873	0.9854
calibrator zero	5000	0.0	0.0	0.0	0.0	0.5	0.5	0.0	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	0.5	0.5	0.0	N/A	N/A
as left span	5000	59.2	600.3	600.3	0.0	610.4	168.4	442.1	0.9834	N/A
								Average Correction Factor	0.9958	0.9951

Corrcted As found NO_X= 642.1 NO= 642.2 Percent Change NO_X= -6.2% NO= -6.0%

Previous Response NO_X= 602.5 NO= 603.8

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 59.20 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.0			N/A	
1st NO2 (300)	N/A	166.1	432.7	597.9	166.1	431.9	0.9922	1.0000	1.0019	99.8%
2nd NO2 (200)	N/A	379.9	218.9	598.3	379.9	218.4	0.9916	1.0000	1.0023	99.8%
3rd NO2 (100)	N/A	486.9	111.9	598.2	486.9	111.3	0.9917	1.0000	1.0054	99.5%
4th NO2 (0)	598.8	N/A	-1.1	597.7	598.8	-1.1	0.9926	1.0000	N/A	N/A
					Average Correction Factor		0.9920	1.0000	1.0032	99.7%

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

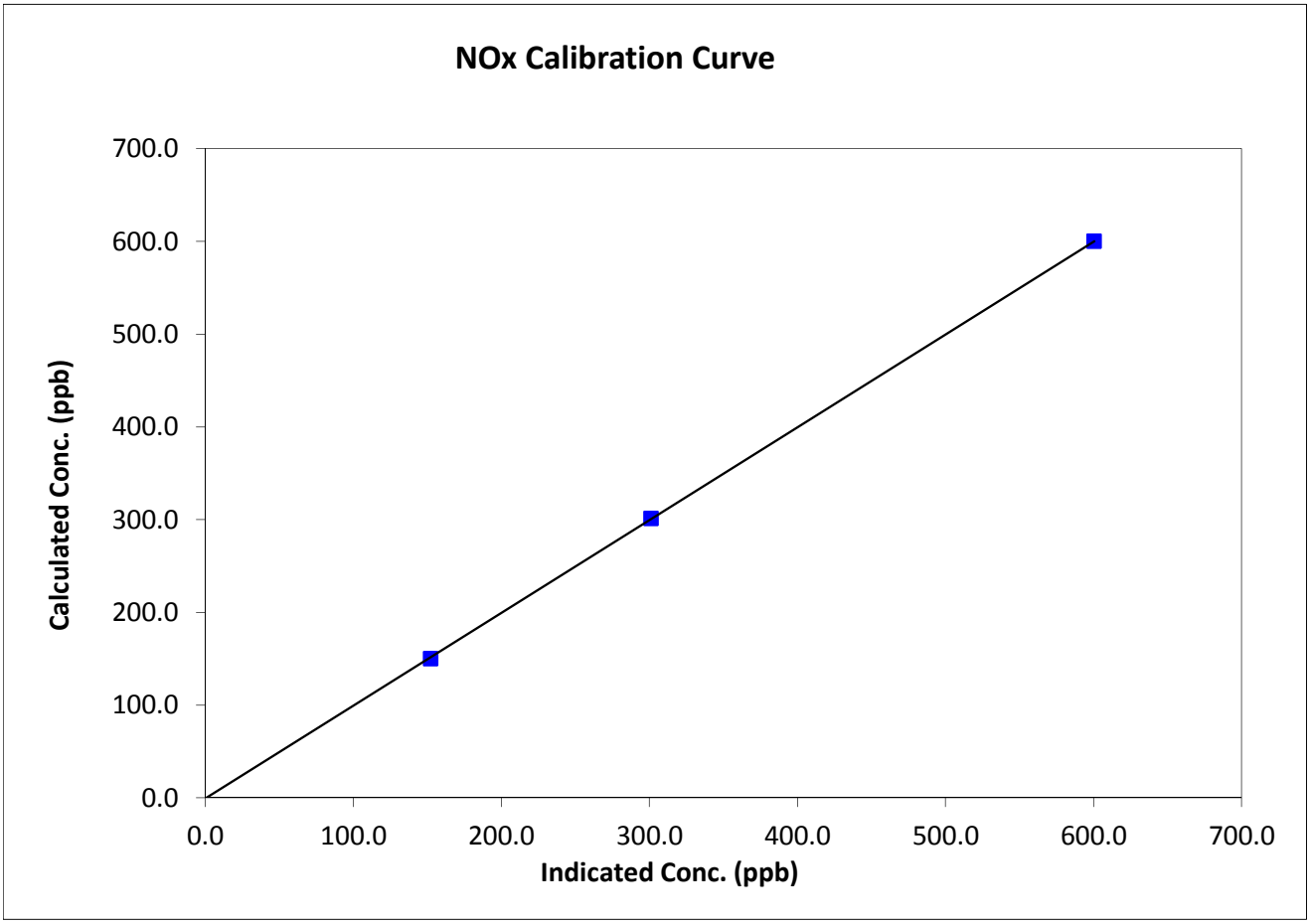
NO_X Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Number	Wapasu	Station Number	AMS 17
Start Time (MST)	8:25	End Time (MST)	12:08
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999980
600.3	600.5	0.9996		
301.2	301.1	1.0002	Slope	1.000557
150.1	152.3	0.9854		
			Intercept	-0.677271



Wood Buffalo Environmental Association

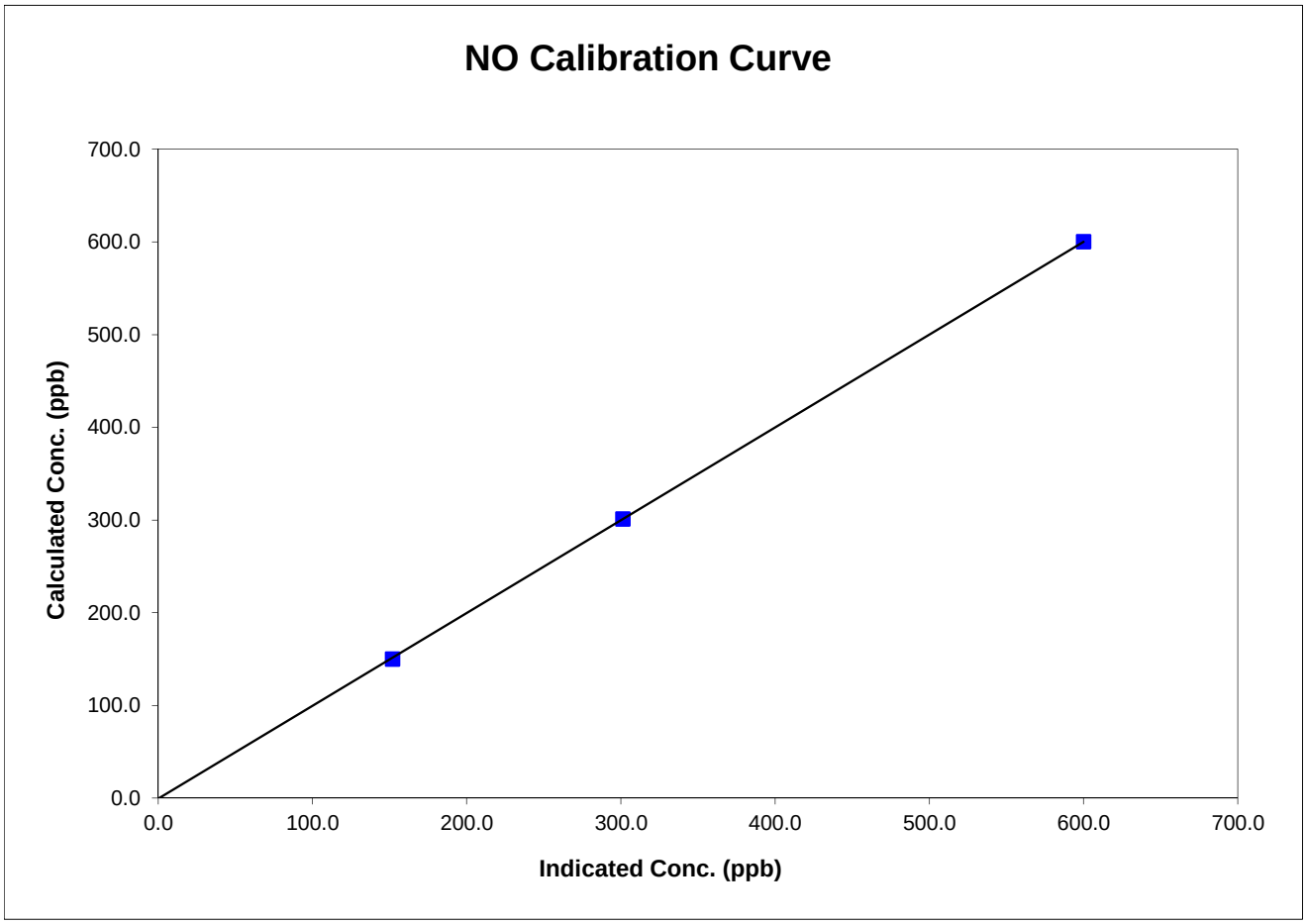
NO Calibration Summary

Station Information

Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Number	Wapasu	Station Number	AMS 17
Start Time (MST)	8:25	End Time (MST)	12:08
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999985
600.3	600.0	1.0005		
301.2	301.3	0.9995	Slope	1.001195
150.1	152.0	0.9873		
			Intercept	-0.692477



Wood Buffalo Environmental Association

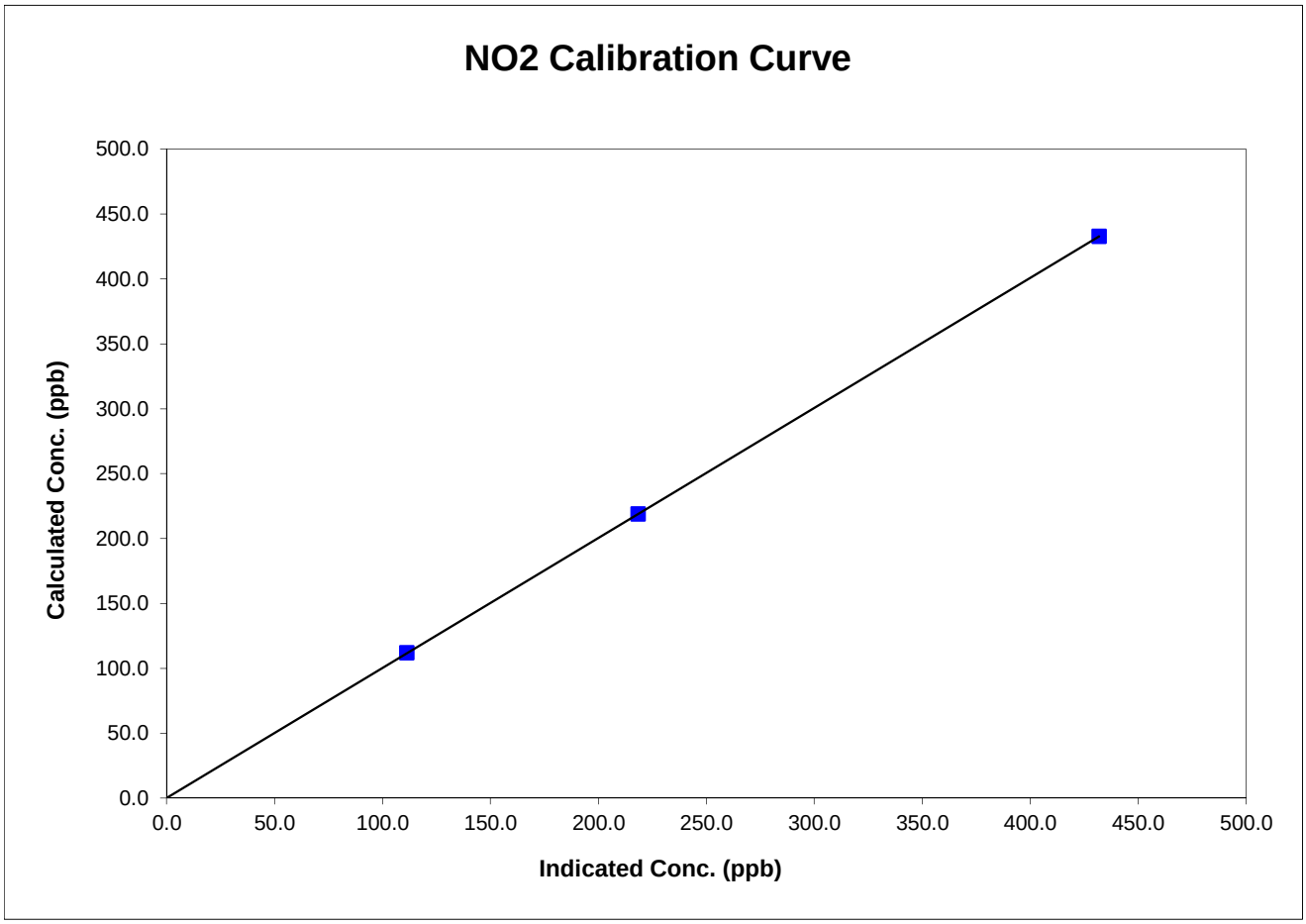
NO_2 Calibration Summary

Station Information

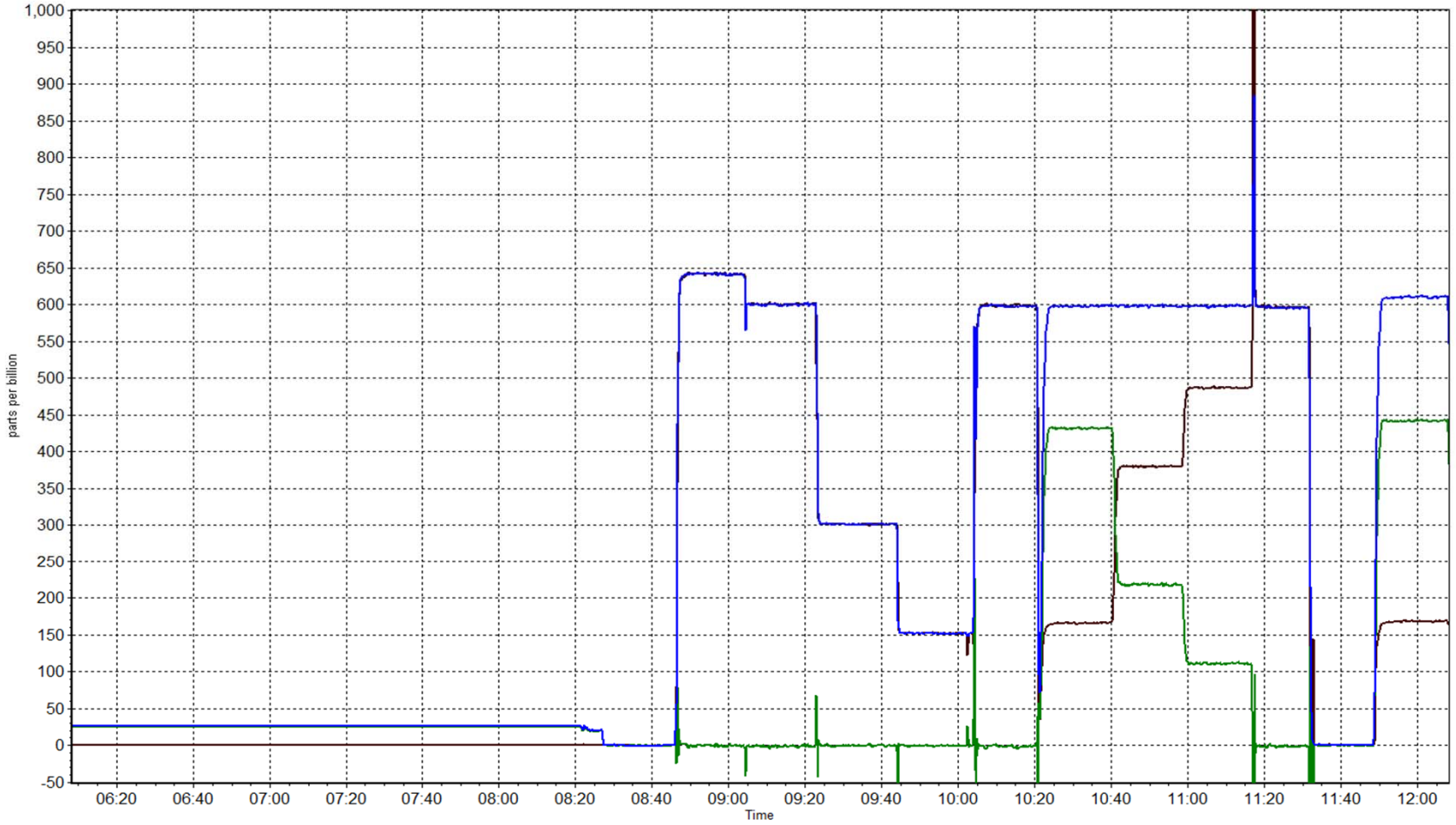
Calibration Date	January 7, 2014	Previous Calibration	December 9, 2013
Station Number	Wapasu	Station Number	AMS 17
Start Time (MST)	8:25	End Time (MST)	12:08
Analyzer make	Thermo 42i	Analyzer serial #	1218153356

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999999
432.7	431.9	1.0019		
218.9	218.4	1.0023	Slope	1.001625
111.9	111.3	1.0054		
			Intercept	0.175689



NOx, NO & NO_2 Calibration Plot **Date:** **January 7, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS 500
CENOVUS
CHRISTINA LAKE
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 25, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CENOVUS CHRISTINA LAKE (AMS 500)
JANUARY 2014

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	709	31	35	99.46	11	0	5	0
H2S (ppb) Average	669	35	75	94.62	3	0	1	0
NO2 (ppb) Average	706	36	38	99.73	36	0	16	0
NO (ppb) Average	706	36	38	99.73	56	-	14	-
NOX (ppb) Average	706	36	38	99.73	92	-	30	-
Temperature 2 m (C) Average	703	0	41	94.49	6.8	-	3.1	-
Relative Humidity (%) Average	703	0	41	94.49	93	-	87.0	-
Wind Speed 10 m (km/h) Average	714	0	30	95.97	55	-	-	-
Wind Direction 10 m (deg) Average	714	0	30	95.97	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CENOVUS CHRISTINA LAKE (AMS 500)
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	1.1	2	-	0	0	0	0	1	3	11
H2S (ppb) Average	669	0.4	0	-	0	0	0	0	1	1	3
NO2 (ppb) Average	706	6.4	5	-	0	2	3	5	9	14	36
NO (ppb) Average	706	2.7	5	-	0	0	1	1	3	6	56
NOX (ppb) Average	706	9.2	9	-	0	2	4	7	11	20	92
Temperature 2 m (C) Average	703	-12.4	10.5	-	-33.8	-26.4	-20.9	-12.3	-4.4	2.5	6.8
Relative Humidity (%) Average	703	72.3	11	-	37	57	65	73	81	86	93
Wind Speed 10 m (km/h) Average	714	11.6	7	-	0	4	7	11	15	21	55
Wind Direction 10 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CENOVUS CHRISTINA LAKE (AMS 500)
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	01 Jan 2014 03:00	01 Jan 2014 03:00	1	Stabilization after daily span
SO2	02 Jan 2014 03:00	02 Jan 2014 03:00	1	Stabilization after daily span
SO2	03 Jan 2014 11:00	03 Jan 2014 11:00	1	Maintenance - analyzer response test
SO2	20 Jan 2014 03:00	20 Jan 2014 03:00	1	Unstable operation - excessive baseline drift
H2S	01 Jan 2014 01:00	02 Jan 2014 15:00	39	Analyzer not in service
H2S	11 Jan 2014 01:00	11 Jan 2014 01:00	1	Unstable operation - excessive baseline drift
NO2, NO, NOX	01 Jan 2014 03:00	01 Jan 2014 03:00	1	Stabilization after daily span
NO2, NO, NOX	02 Jan 2014 03:00	02 Jan 2014 03:00	1	Stabilization after daily span
Temperature, Relative Humidity	01 Jan 2014 14:00	01 Jan 2014 14:00	1	Intermittent spikes in sensor output signal
Temperature, Relative Humidity	03 Jan 2014 13:00	03 Jan 2014 14:00	2	Intermittent spikes in sensor output signal
Temperature, Relative Humidity	07 Jan 2014 16:00	07 Jan 2014 17:00	2	Intermittent spikes in sensor output signal
Temperature, Relative Humidity	15 Jan 2014 04:00	15 Jan 2014 09:00	6	Intermittent spikes in sensor output signal
Temperature, Relative Humidity	18 Jan 2014 14:00	18 Jan 2014 16:00	3	Flatline in sensor output signal
Temperature, Relative Humidity	21 Jan 2014 15:00	22 Jan 2014 17:00	27	Flatline in sensor output signal
Wind Speed, Wind Direction	18 Jan 2014 14:00	18 Jan 2014 16:00	3	Flatline in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	21 Jan 2014 15:00	22 Jan 2014 17:00	27	Flatline in sensor output signal - Sensor frozen

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

Cenovus - Christina Lake - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 11 ppb on Jan 15 18:00 Maximum Daily Average: 5.0 ppb on Jan 15

Minimum Value: 0 ppb on Jan 1 01:00 Minimum Daily Average: 0.2 ppb on Jan 5
Maximum Diurnal Average: 1.8 ppb at hour 11 Minimum Diurnal Average: 0.6 ppb at hour 24
Monthly Average: 1.1 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 3$ $P_{99} = 9$

Hours in Service:	744
Hours of Data:	709
Hours of Missing Data:	35
Hours of Calibration:	31
Percent Operational Time:	99.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	RE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0.4	1
2-Jan	2	Z	RE	1	1	2	2	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1.2	2
3-Jan	1	Z	1	3	1	1	0	0	1	1	M	1	1	0	0	0	0	0	1	1	0	1	2	2	0.8	3
4-Jan	1	Z	1	1	1	1	0	0	0	1	1	3	3	1	0	0	0	0	1	1	0	0	0	1	0.8	3
5-Jan	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
6-Jan	0	Z	0	0	0	1	0	0	0	1	1	1	1	1	2	3	4	4	2	2	2	2	1	1	1.4	4
7-Jan	0	Z	1	0	0	0	0	0	1	1	1	1	0	0	1	0	1	1	1	0	0	1	1	0	0.5	1
8-Jan	1	Z	3	3	3	1	2	0	0	1	0	1	1	2	1	1	1	1	1	1	1	1	1	0	1.2	3
9-Jan	0	Z	0	0	0	1	0	0	0	0	0	1	2	2	2	1	1	1	1	1	1	1	2	2	0.9	2
10-Jan	1	Z	1	0	0	0	0	0	0	0	0	1	5	3	1	1	2	1	1	0	0	0	0	0	0.9	5
11-Jan	0	Z	0	0	0	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	0	Z	0	0	1	3	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0.9	5
13-Jan	2	Z	1	1	1	1	6	2	2	9	6	4	4	3	6	4	5	2	4	2	1	0	1	0	3.0	9
14-Jan	0	Z	1	2	2	1	1	0	0	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0.7	2
15-Jan	0	Z	0	1	2	1	2	1	4	6	7	9	8	7	6	7	10	11	7	9	9	3	1	2	5.0	11
16-Jan	2	Z	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	2
17-Jan	1	Z	0	0	0	0	0	0	0	3	9	8	7	4	8	5	3	2	0	0	2	2	0	0	2.4	9
18-Jan	0	Z	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
19-Jan	0	Z	0	2	3	0	0	1	0	0	0	0	4	3	1	1	0	0	0	0	0	0	0	0	0.8	4
20-Jan	0	Z	UO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	5	4	1	0.7	5
21-Jan	0	Z	1	1	0	0	1	0	0	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0.5	2
22-Jan	0	Z	0	0	0	0	1	1	2	3	2	0	1	0	1	1	0	0	0	0	0	1	1	1	0.7	3
23-Jan	1	Z	1	1	1	0	1	1	0	0	0	0	3	2	0	1	1	0	0	0	0	0	0	0	0.7	3
24-Jan	0	Z	1	1	2	5	4	5	3	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1.5	5
25-Jan	1	Z	0	0	1	0	0	0	3	4	5	1	0	0	1	1	0	0	0	1	1	1	1	0	1.0	5
26-Jan	1	Z	1	1	0	0	1	1	2	2	2	2	2	2	2	1	1	1	1	1	0	1	1	0	1.3	2
27-Jan	0	Z	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
28-Jan	0	Z	3	2	2	1	1	1	1	3	3	2	1	1	1	2	2	1	0	0	2	2	2	2	1.6	3
29-Jan	2	Z	2	2	3	3	5	4	5	4	4	4	3	3	4	2	2	2	2	0	0	0	0	2	2.5	5
30-Jan	2	Z	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2
31-Jan	0	Z	1	0	0	0	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.5	2
	0.7	--	0.9	0.8	0.9	0.9	1.2	0.9	1.1	1.5	1.8	1.6	1.7	1.4	1.4	1.2	1.3	1.0	0.9	0.8	0.8	0.8	0.7	0.6	Diurnal Average	
	2	--	3	3	3	5	6	5	5	9	9	9	8	7	8	7	10	11	7	9	9	5	4	2	Diurnal Maximum	

Z - zerospan M - Maintenance UO - Unstable Operation RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

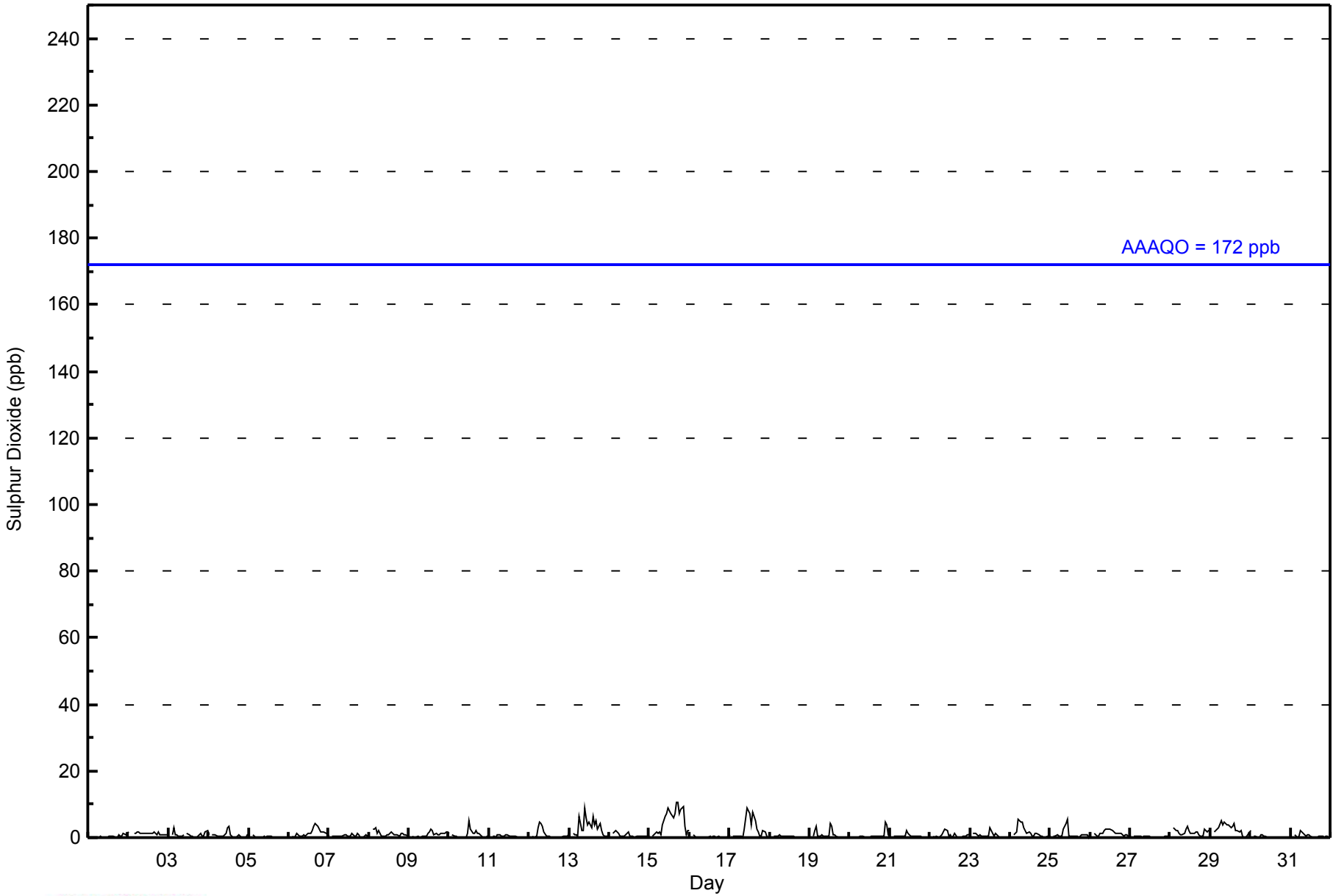
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	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: 709

Total Number of Hours: 744

Sulphur Dioxide (SO_2) - ppb

Cenovus - Christina Lake - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	13	10	7	18	11	17	40	52	55	65	86	63	54	72	89	27	679
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
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	13	10	7	18	11	17	40	52	55	65	86	63	55	72	89	27	680

Total Number of Valid Hours: 680

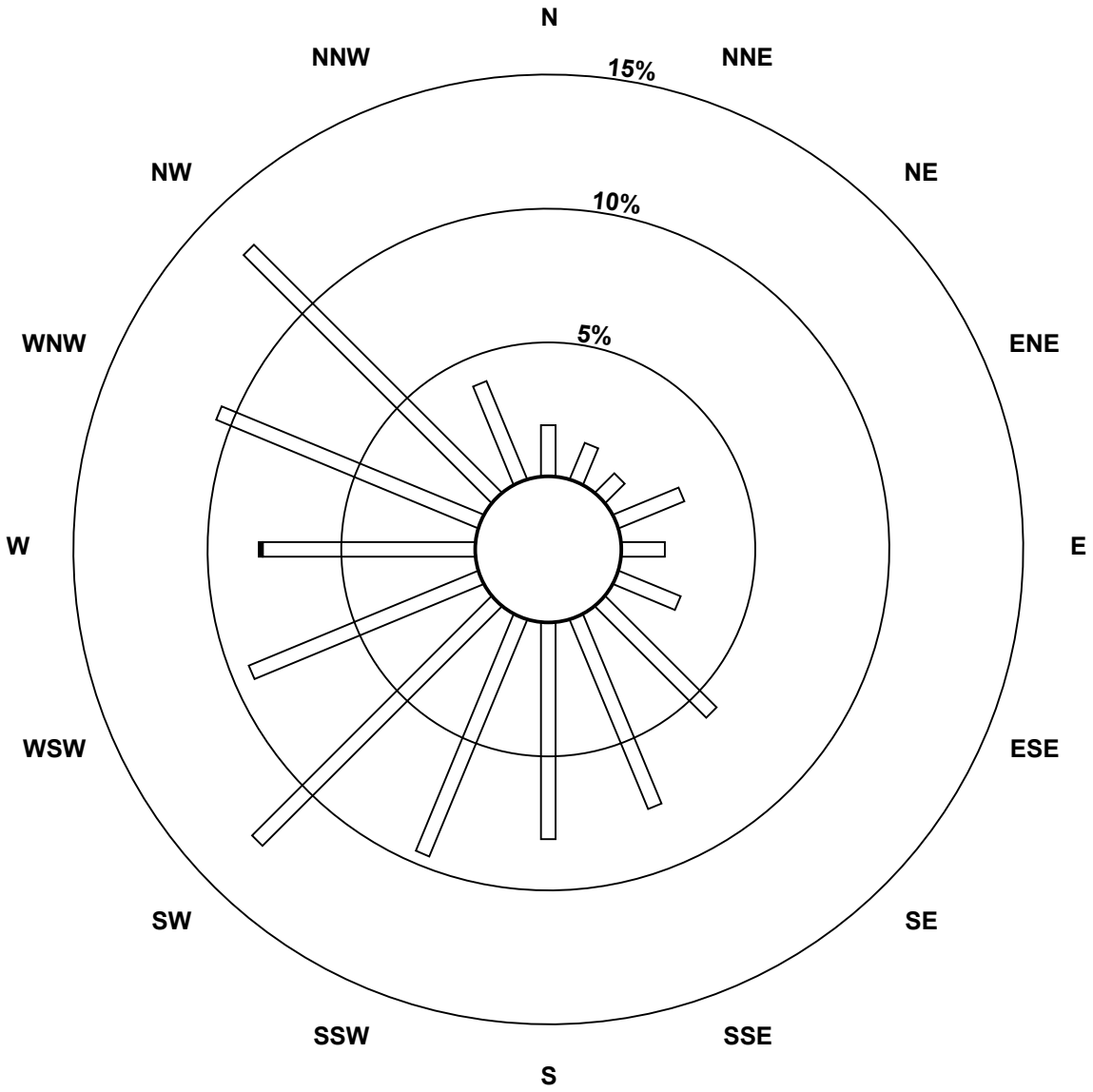
Total Number of Hours: 744

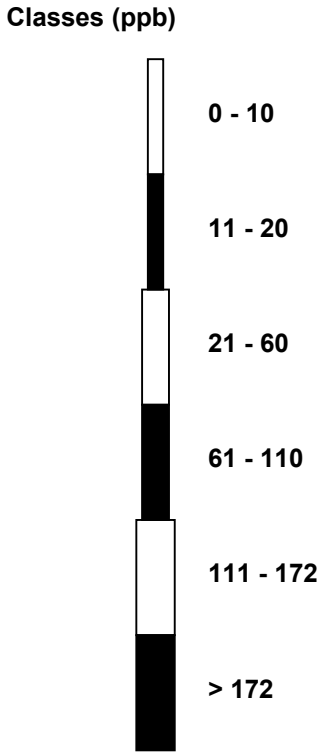
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

Cenovus - Christina Lake (AMS500)





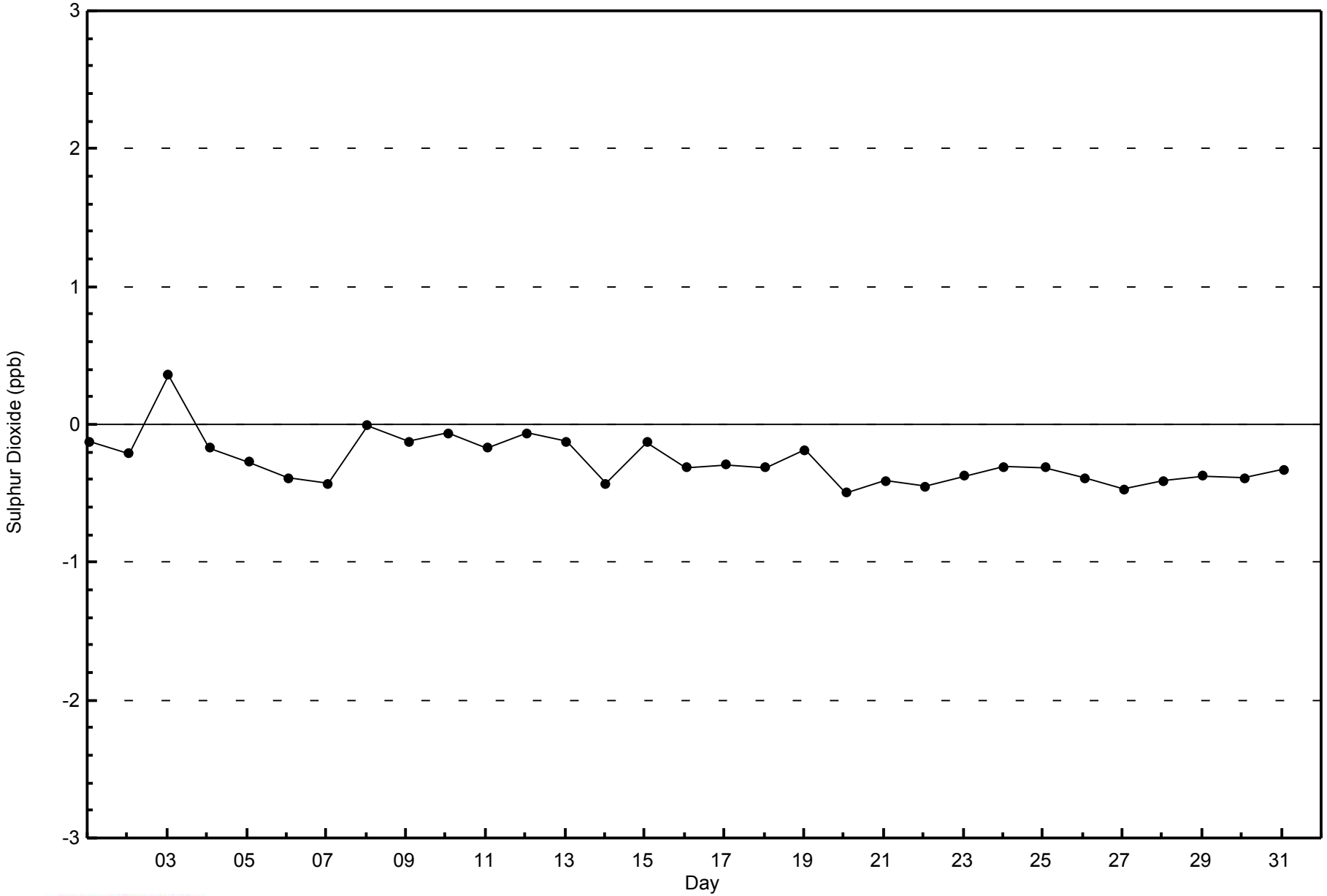
Total Number of Valid Hours: 680

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

Cenovus - Christina Lake - January 2014



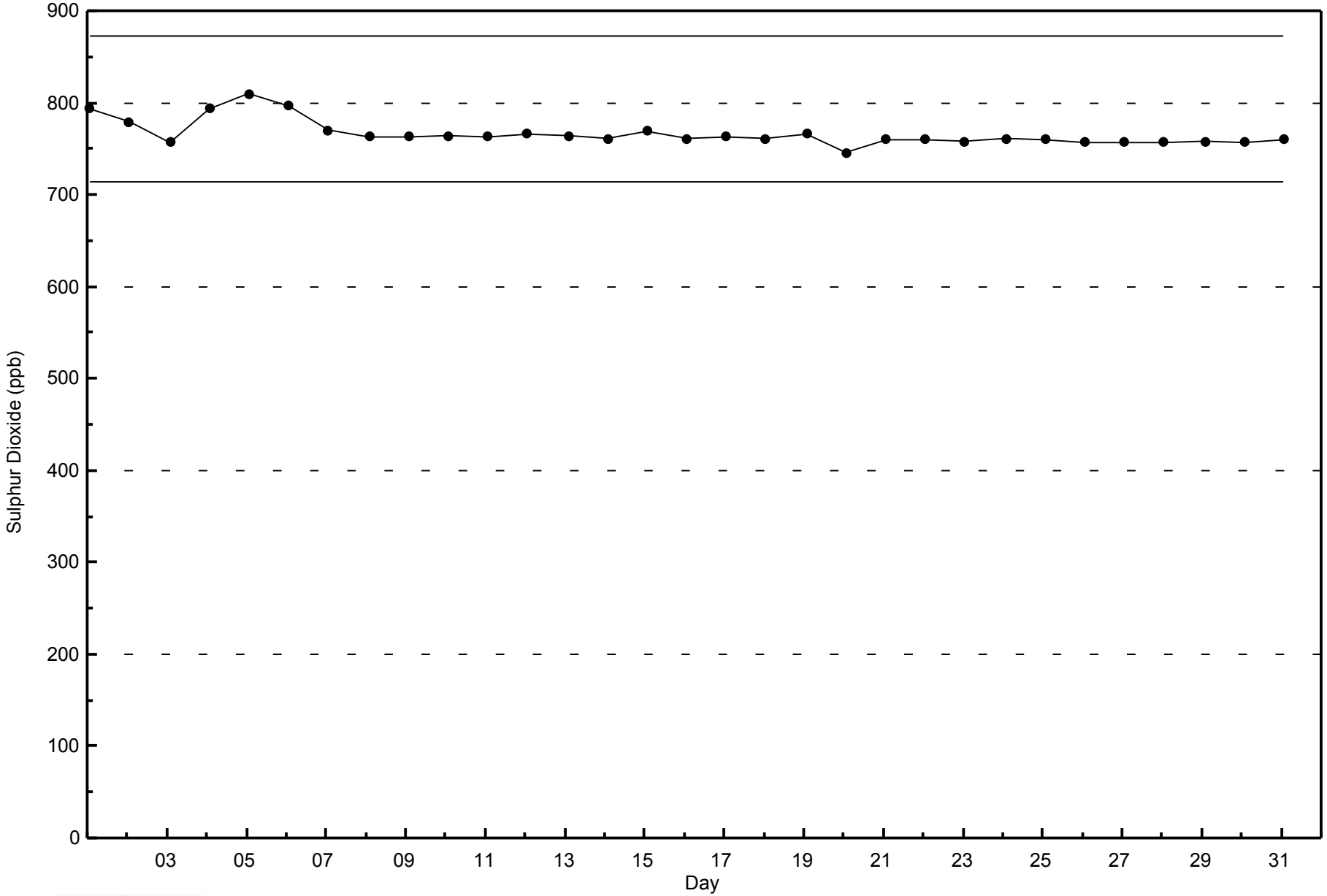
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

Cenovus - Christina Lake - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 2 19:00 Maximum Daily Average: 0.8 ppb on Jan 7

Minimum Value: 0 ppb on Jan 30 13:00 Minimum Daily Average: 0.2 ppb on Jan 30
Maximum Diurnal Average: 0.5 ppb at hour 18 Minimum Diurnal Average: 0.4 ppb at hour 24
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	744
Hours of Data:	669
Hours of Missing Data:	75
Hours of Calibration:	35
Percent Operational Time:	94.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
2-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	C	C	2	3	2	2	2	1	1	--	3
3-Jan	1	1	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0.4	1
4-Jan	0	1	Z	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0.5	1
5-Jan	0	1	Z	1	0	0	1	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0.4	1
6-Jan	0	0	Z	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0.5	1
7-Jan	0	0	Z	0	0	0	0	0	1	1	1	C	C	C	C	1	2	3	2	1	1	0	0	0	0.8	3
8-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0.4	1
9-Jan	0	1	Z	0	0	1	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0.6	1
10-Jan	1	1	Z	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	0	0	0	0.6	1
11-Jan	UO	0	Z	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
12-Jan	0	0	Z	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
13-Jan	0	0	Z	0	0	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	0	0	0	1	0.5	1
14-Jan	0	1	Z	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-Jan	0	0	Z	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0.6	1
16-Jan	1	0	Z	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
17-Jan	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	2	0	0	0.5	2
18-Jan	0	0	Z	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0.4	1
19-Jan	0	0	Z	0	1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0.4	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.3	1
21-Jan	0	0	Z	0	0	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	0	0	0	0	0.5	1
22-Jan	0	0	Z	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
23-Jan	0	0	Z	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0.4	2
24-Jan	0	0	Z	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
25-Jan	0	0	Z	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
26-Jan	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-Jan	0	0	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0.5	1
28-Jan	0	0	Z	0	0	0	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	0	1	0.5	1
29-Jan	0	0	Z	1	0	0	0	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0.4	1
30-Jan	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
31-Jan	0	0	Z	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1
	0.4	0.4	--	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	Diurnal Average	
	1	1	--	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	2	2	2	1	1	Diurnal Maximum	

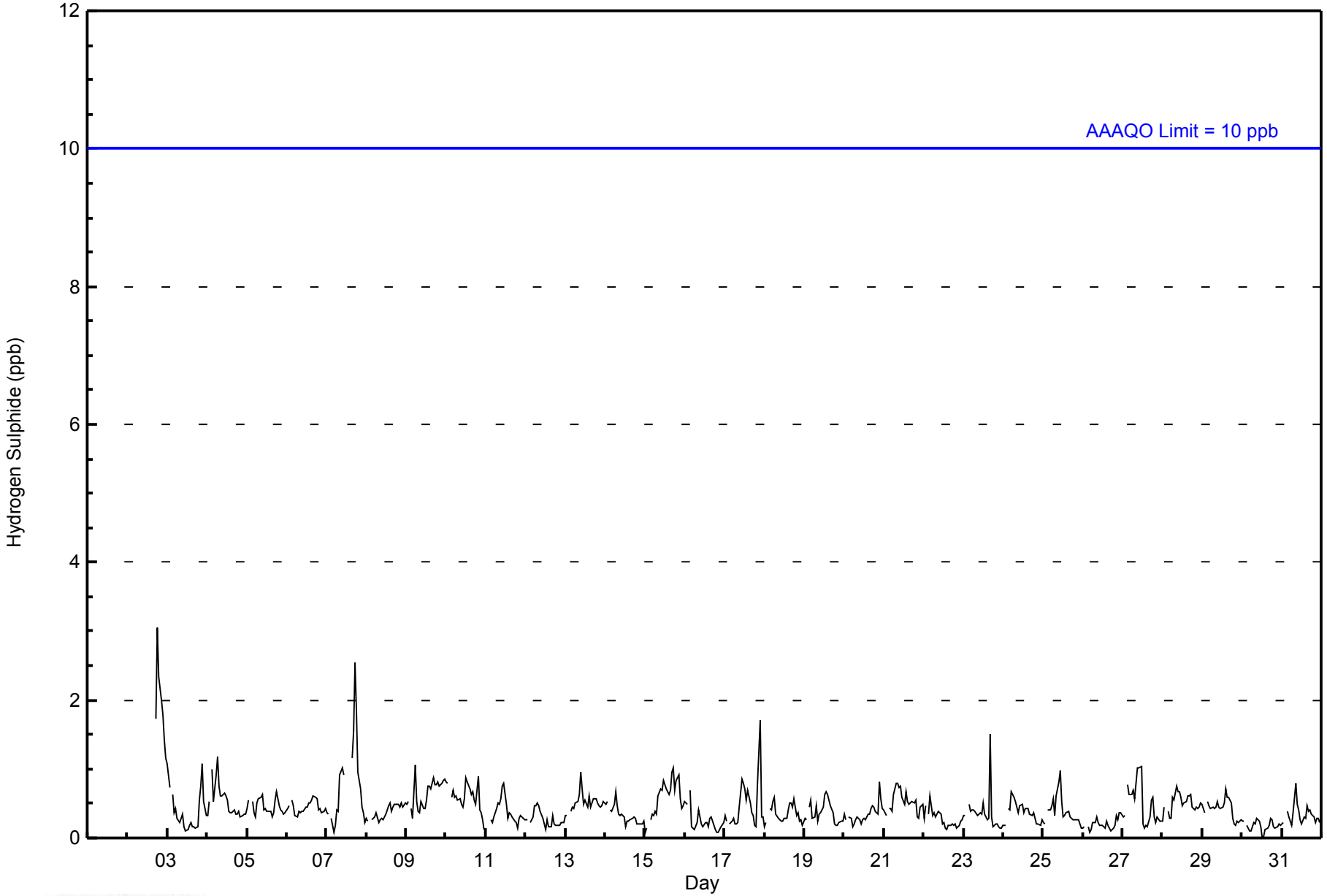
Z - zerospan C - Calibration AF - Analyzer Failure UO - Unstable Operation
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	667	99.70	99.70
3 - 4	2	0.30	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: 669

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

Cenovus - Christina Lake - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	13	10	6	19	9	15	29	40	50	62	82	61	55	72	88	27	638
3 - 4	0	0	0	0	0	0	0	1	0	0	1	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	13	10	6	19	9	15	29	41	50	62	83	61	55	72	88	27	640

Total Number of Valid Hours: 640

Total Number of Hours: 744

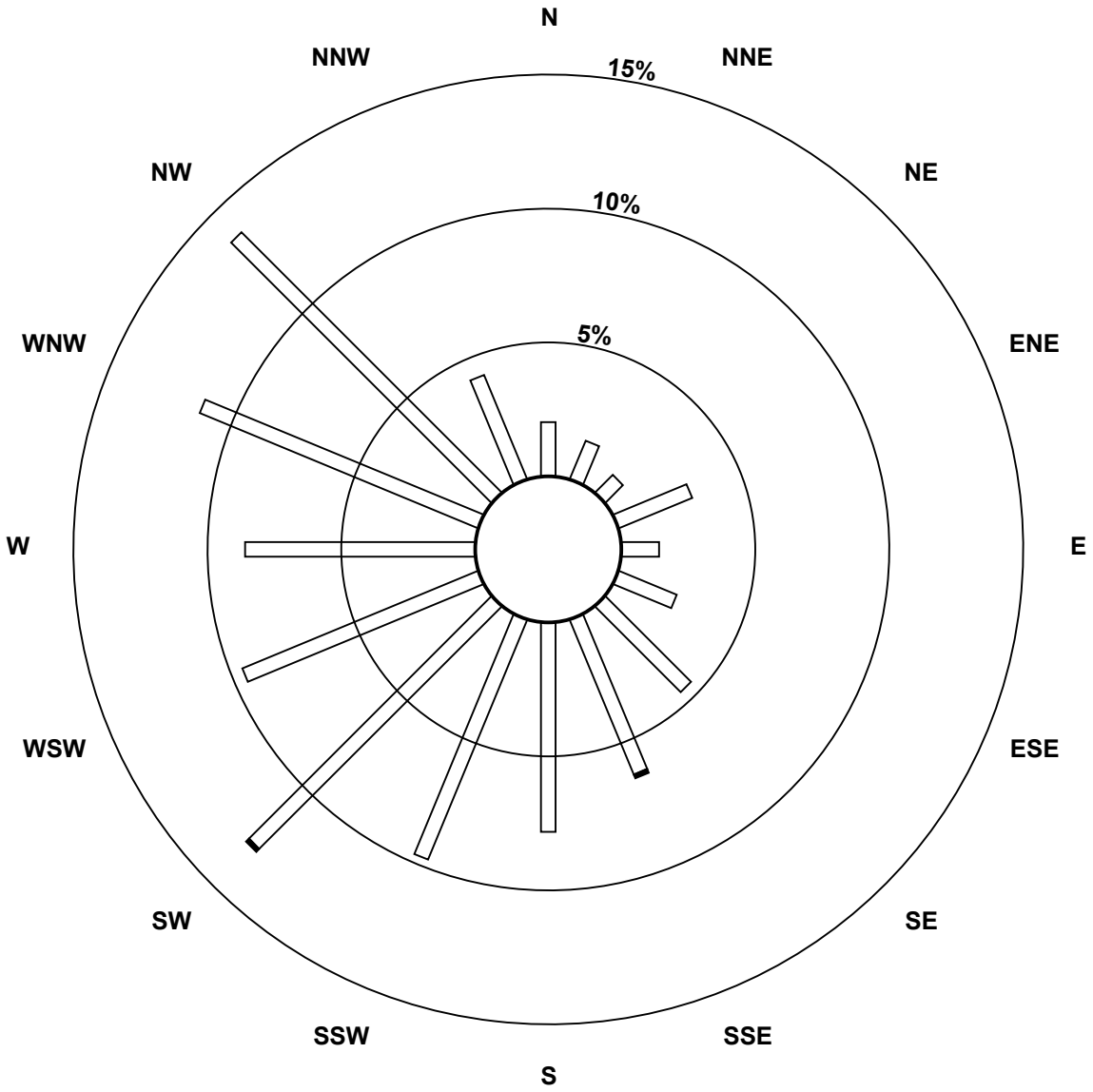
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

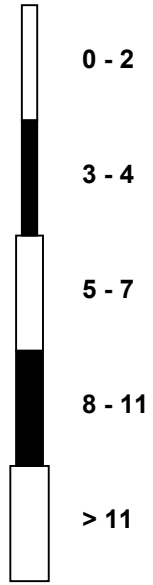
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

Cenovus - Christina Lake (AMS500)



Classes (ppb)



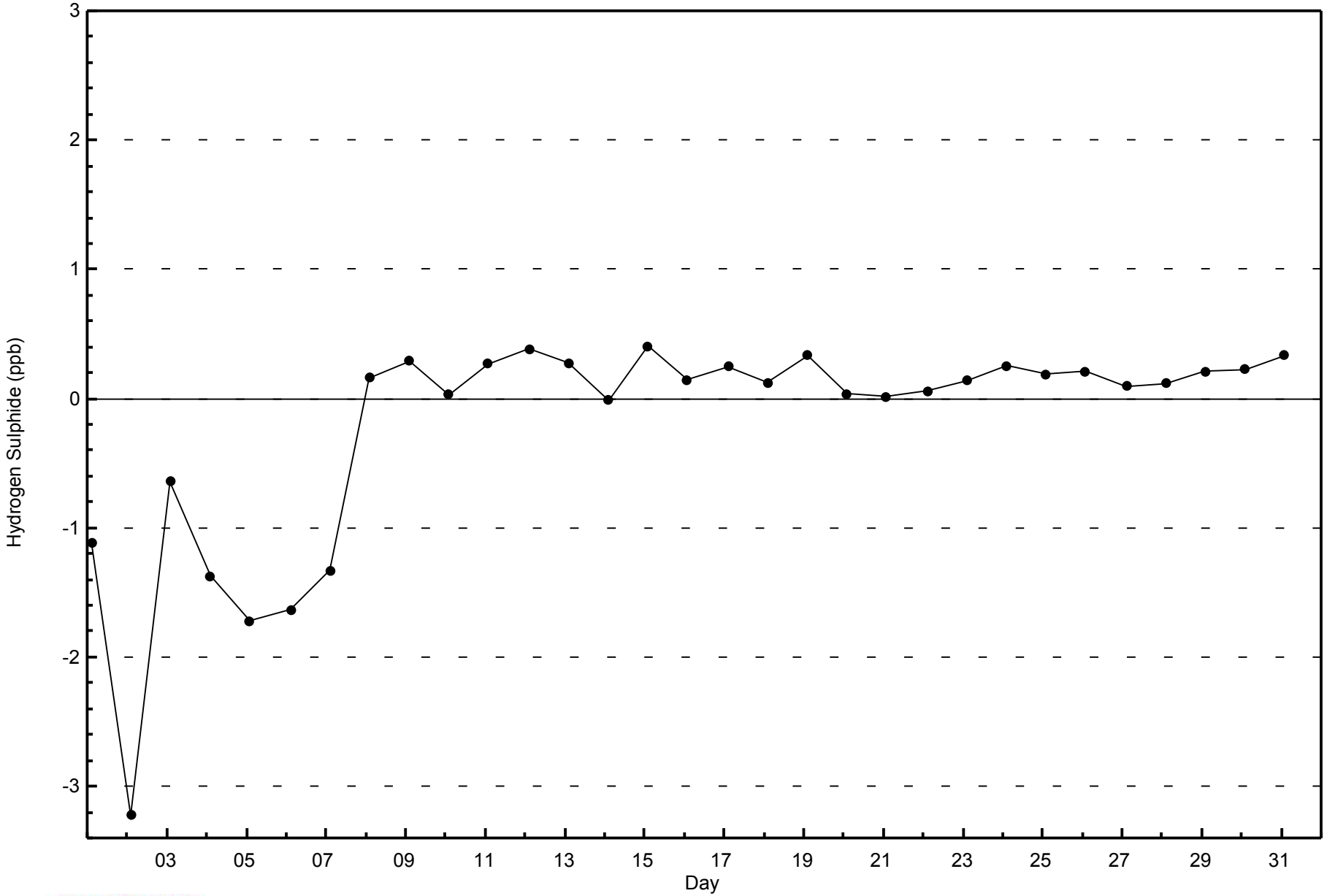
Total Number of Valid Hours: 640

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

Cenovus - Christina Lake - January 2014



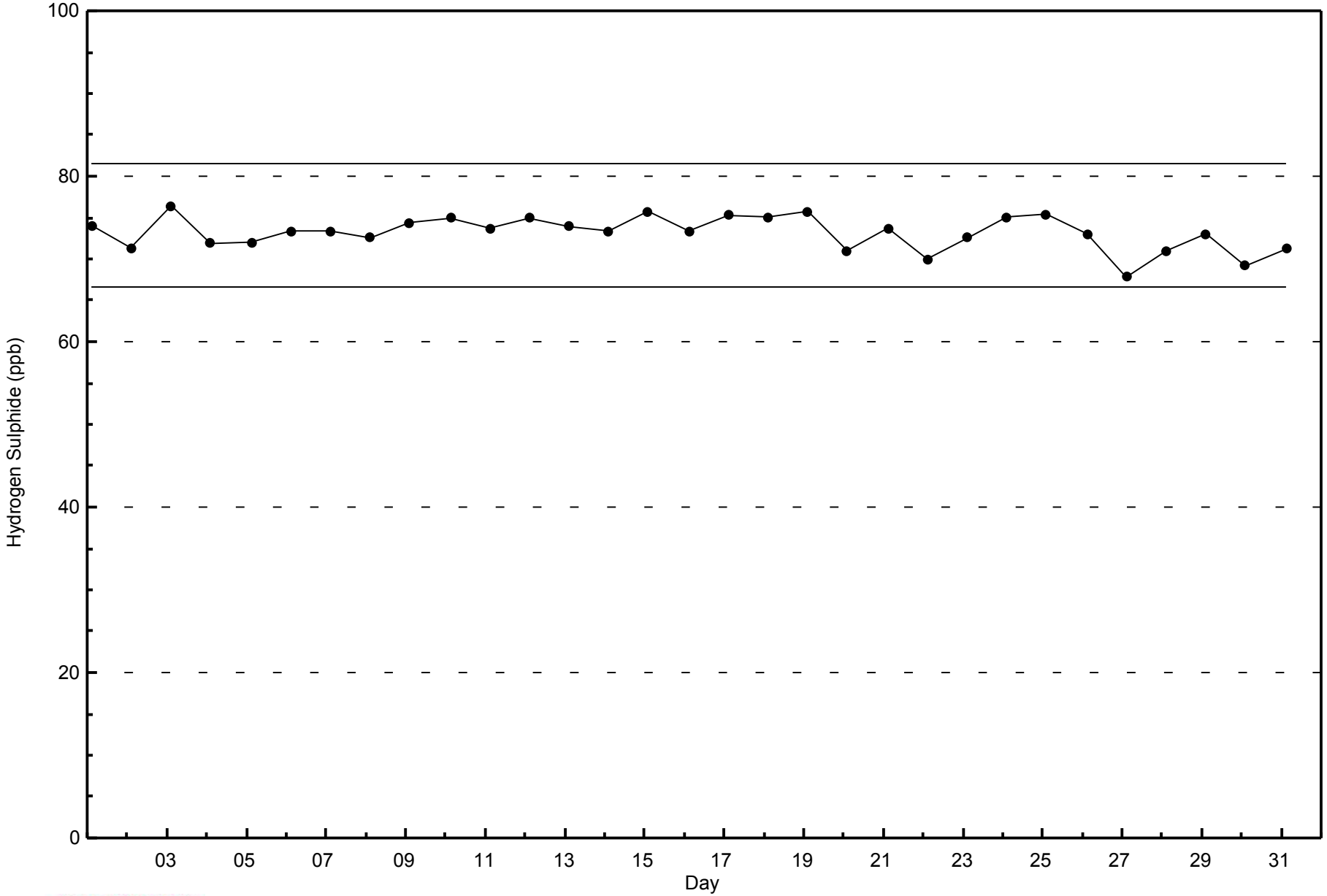
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxide (NO) - ppb

Cenovus - Christina Lake - January 2014

Maximum Value: 56 ppb on Jan 7 18:00

Maximum Daily Average: 14.2 ppb on Jan 7

Minimum Value: 0 ppb on Jan 18 06:00

Minimum Daily Average: 0.5 ppb on Jan 18

Maximum Diurnal Average: 5.1 ppb at hour 11

Minimum Diurnal Average: 0.9 ppb at hour 1

Monthly Average: 2.7 ppb

Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 1$ Median = 1 $Q_3 = 3$ $P_{90} = 6$ $P_{99} = 24$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	0	Z	RE	1	0	1	3	8	1	1	2	2	3	3	3	2	3	3	30	9	1	0	0	0	3.5	30
2-Jan	0	Z	RE	0	0	0	0	0	0	1	1	1	2	4	8	6	8	1	31	11	5	8	4	1	4.3	31
3-Jan	5	Z	6	3	1	0	1	1	3	5	C	C	C	C	C	1	1	1	1	3	5	18	4	2	3.3	18
4-Jan	1	Z	7	7	2	3	12	4	6	3	5	6	5	2	2	2	2	1	1	1	0	1	1	1	3.2	12
5-Jan	1	Z	0	1	0	0	1	1	1	3	3	2	2	2	2	1	1	2	5	1	1	0	1	1	1.4	5
6-Jan	0	Z	1	1	1	0	1	1	1	1	1	1	1	2	1	1	1	1	1	0	1	0	1	1	0.9	2
7-Jan	2	Z	1	1	1	1	4	6	22	35	26	20	11	19	48	8	19	56	34	6	4	0	0	1	14.2	56
8-Jan	0	Z	0	0	0	0	1	1	0	1	1	1	1	2	2	1	1	1	1	1	0	1	1	3	1.0	3
9-Jan	1	Z	1	3	1	18	4	1	1	3	1	2	3	5	4	2	2	1	1	1	0	0	0	1	2.3	18
10-Jan	1	Z	0	0	0	0	0	0	1	1	1	3	10	6	5	3	4	2	2	0	0	0	0	0	1.7	10
11-Jan	0	Z	1	0	0	0	2	3	3	3	8	12	2	1	1	1	1	1	1	0	0	1	0	0	1.8	12
12-Jan	1	Z	1	1	1	1	2	6	5	5	2	1	1	4	1	1	1	1	1	0	1	0	0	0	1.6	6
13-Jan	0	Z	0	0	0	0	2	2	3	11	7	4	5	4	6	3	2	2	2	1	1	1	1	1	2.5	11
14-Jan	1	Z	0	0	1	1	3	2	1	1	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0.9	3
15-Jan	0	Z	0	3	3	2	4	2	8	12	12	15	13	14	11	12	16	18	10	12	13	5	1	4	8.3	18
16-Jan	3	Z	2	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0.8	3
17-Jan	0	Z	0	0	0	0	0	0	0	5	16	12	11	7	10	5	2	1	0	0	1	1	0	0	3.2	16
18-Jan	0	Z	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0.5	1
19-Jan	0	Z	1	4	6	1	1	2	0	1	0	0	9	6	2	4	5	3	1	1	1	1	1	2	2.2	9
20-Jan	3	Z	1	1	0	0	2	2	2	2	1	2	1	1	1	1	1	0	0	0	0	7	3	1	1.4	7
21-Jan	1	Z	1	1	0	0	3	4	6	6	7	6	4	7	3	4	3	3	3	4	1	1	4	6	3.3	7
22-Jan	1	Z	7	2	9	2	3	2	2	4	4	2	2	1	1	1	1	1	0	0	0	0	0	0	2.0	9
23-Jan	0	Z	0	0	0	0	1	0	1	1	1	1	7	4	1	2	1	0	0	0	0	0	0	0	1.0	7
24-Jan	0	Z	1	2	3	9	7	5	2	2	5	4	3	3	3	3	2	1	1	1	0	1	1	1	2.5	9
25-Jan	1	Z	0	1	0	0	0	0	6	9	12	2	1	1	2	2	1	1	1	1	1	1	1	1	1.9	12
26-Jan	1	Z	1	1	1	1	2	2	3	2	4	3	2	2	4	2	1	1	1	1	2	1	1	2	1.8	4
27-Jan	1	Z	5	5	2	4	7	4	13	18	19	20	2	2	1	2	1	2	5	1	0	0	0	0	5.1	20
28-Jan	0	Z	1	0	0	0	5	5	6	4	3	4	3	3	3	3	4	3	1	1	1	1	1	1	2.3	6
29-Jan	1	Z	1	2	1	1	1	1	3	4	3	3	3	5	7	5	6	4	2	2	2	2	1	1	2.6	7
30-Jan	1	Z	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	1	1	0	1	0	0	0	1.1	2
31-Jan	0	Z	1	1	1	1	2	2	7	4	3	3	2	3	3	4	4	3	2	1	1	1	1	1	2.1	7
	0.9	--	1.4	1.4	1.2	1.7	2.5	2.3	3.5	4.8	5.1	4.6	3.8	3.8	4.6	2.7	3.1	3.8	4.5	2.0	1.4	1.7	1.0	1.1	Diurnal Average	
	5	--	7	7	9	18	12	8	22	35	26	20	13	19	48	12	19	56	34	12	13	18	4	6	Diurnal Maximum	

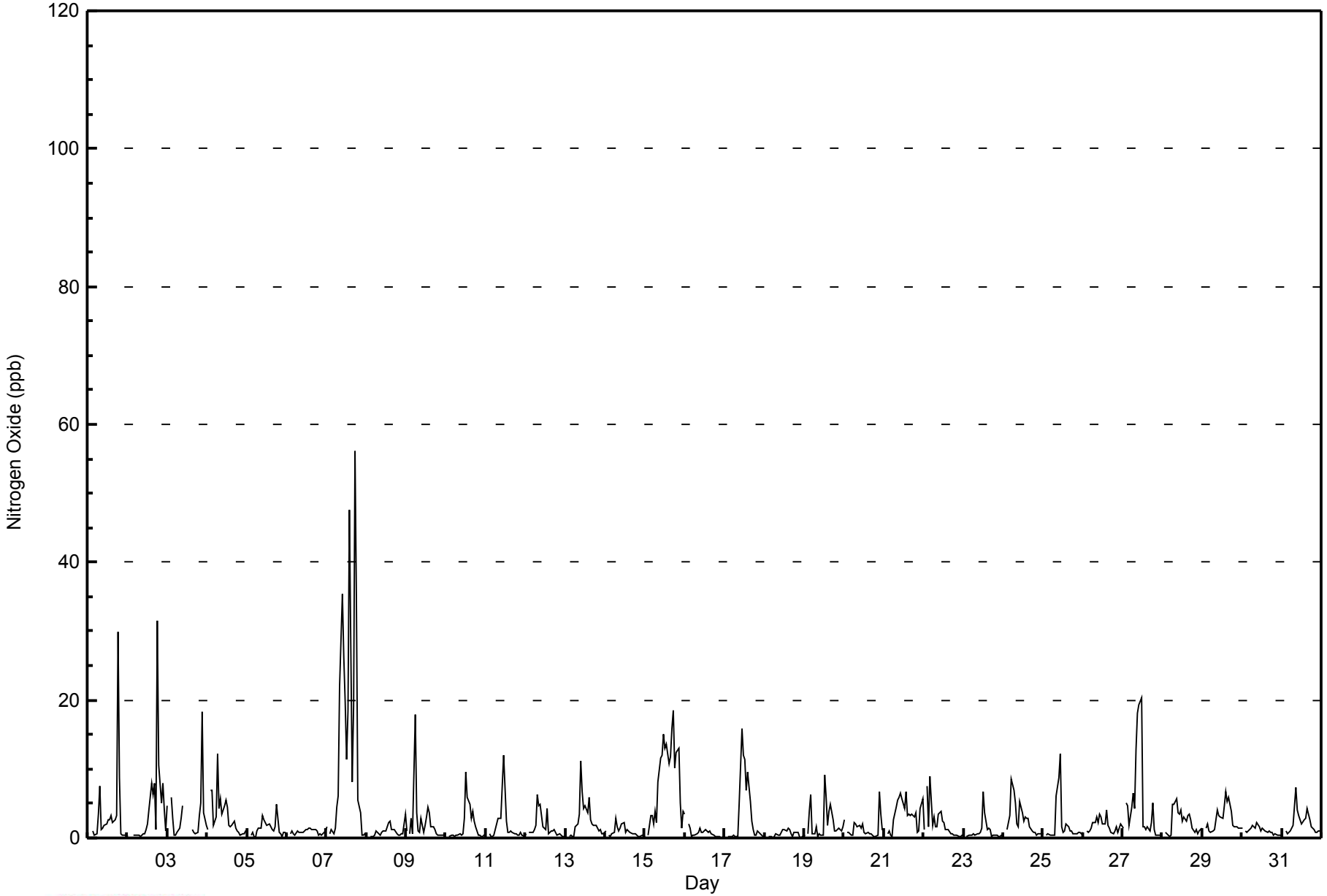
Z - zerospan C - Calibration RE - Recovery

WBEA NETWORK

Hourly Averages

Nitrogen Oxide (NO) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

500-21

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	98.87	98.87
21 - 40	6	0.85	99.72
11 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Oxide (NO) - ppb

Cenovus - Christina Lake - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	12	9	7	18	11	17	39	50	54	65	85	63	55	70	87	27	669
21 - 40	0	1	0	0	0	0	2	1	1	0	1	0	0	0	0	0	6
11 - 80	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	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	13	10	7	18	11	17	41	52	55	65	86	63	55	70	87	27	677

Total Number of Valid Hours: 677

Total Number of Hours: 744

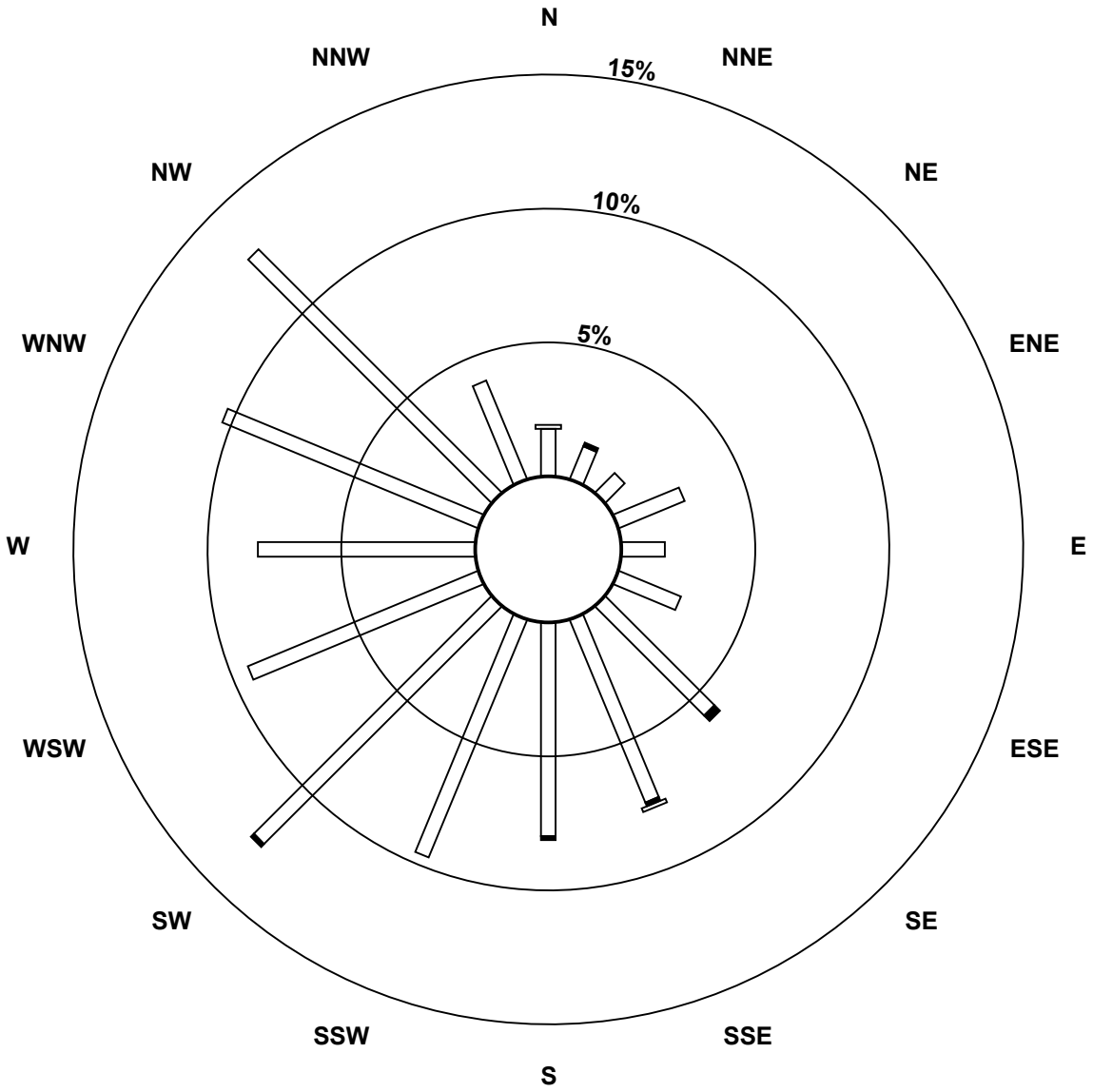
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

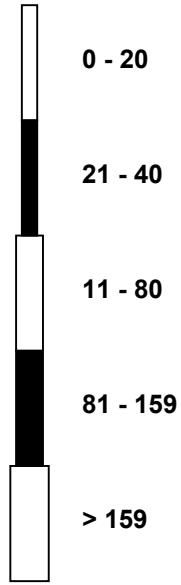
Wind Rose Jan 2014

Nitrogen Oxide (NO) - ppb

Cenovus - Christina Lake (AMS500)



Classes (ppb)



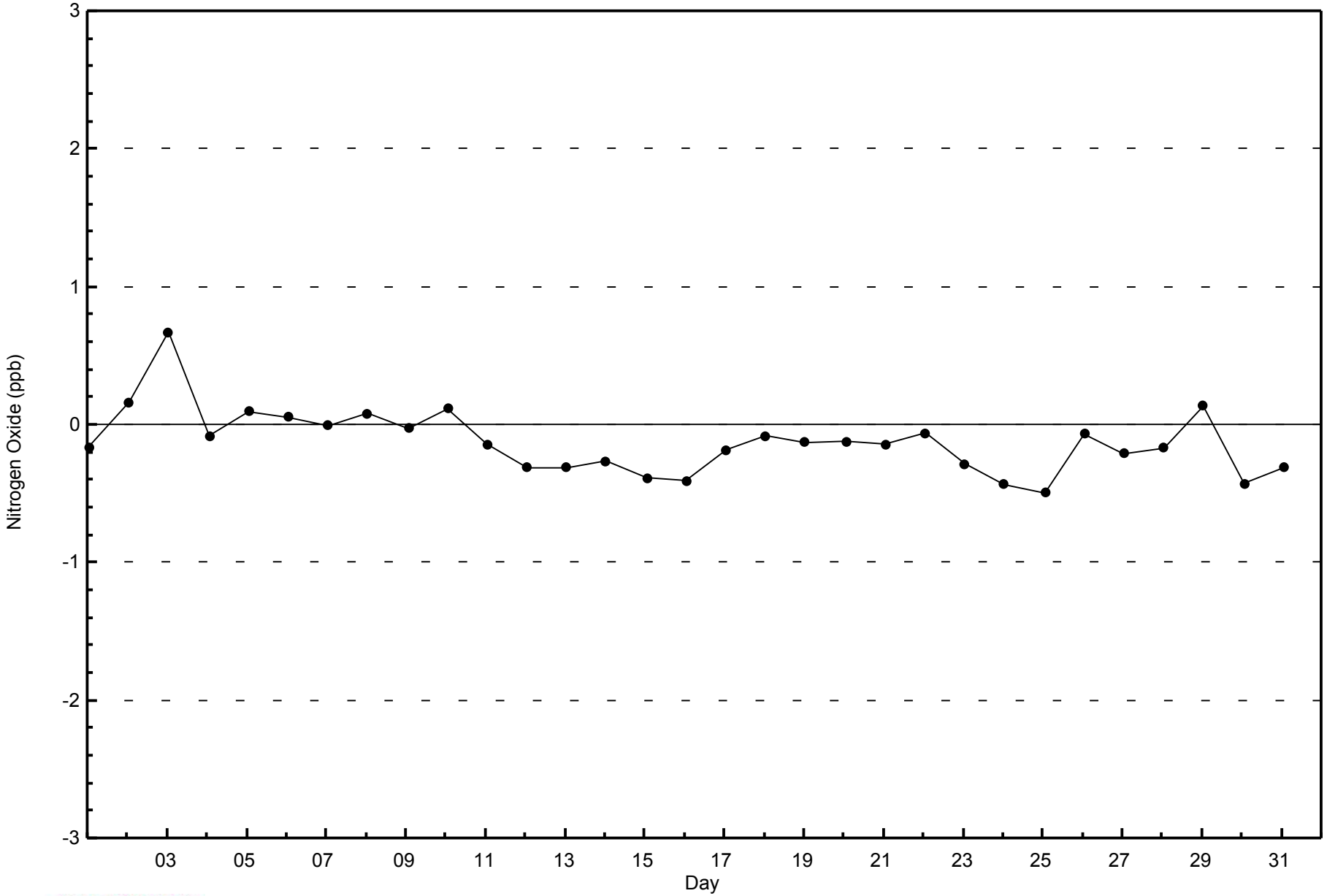
Total Number of Valid Hours: 677

WBEA NETWORK

Zero Responses

Nitrogen Oxide (NO) - ppb

Cenovus - Christina Lake - January 2014



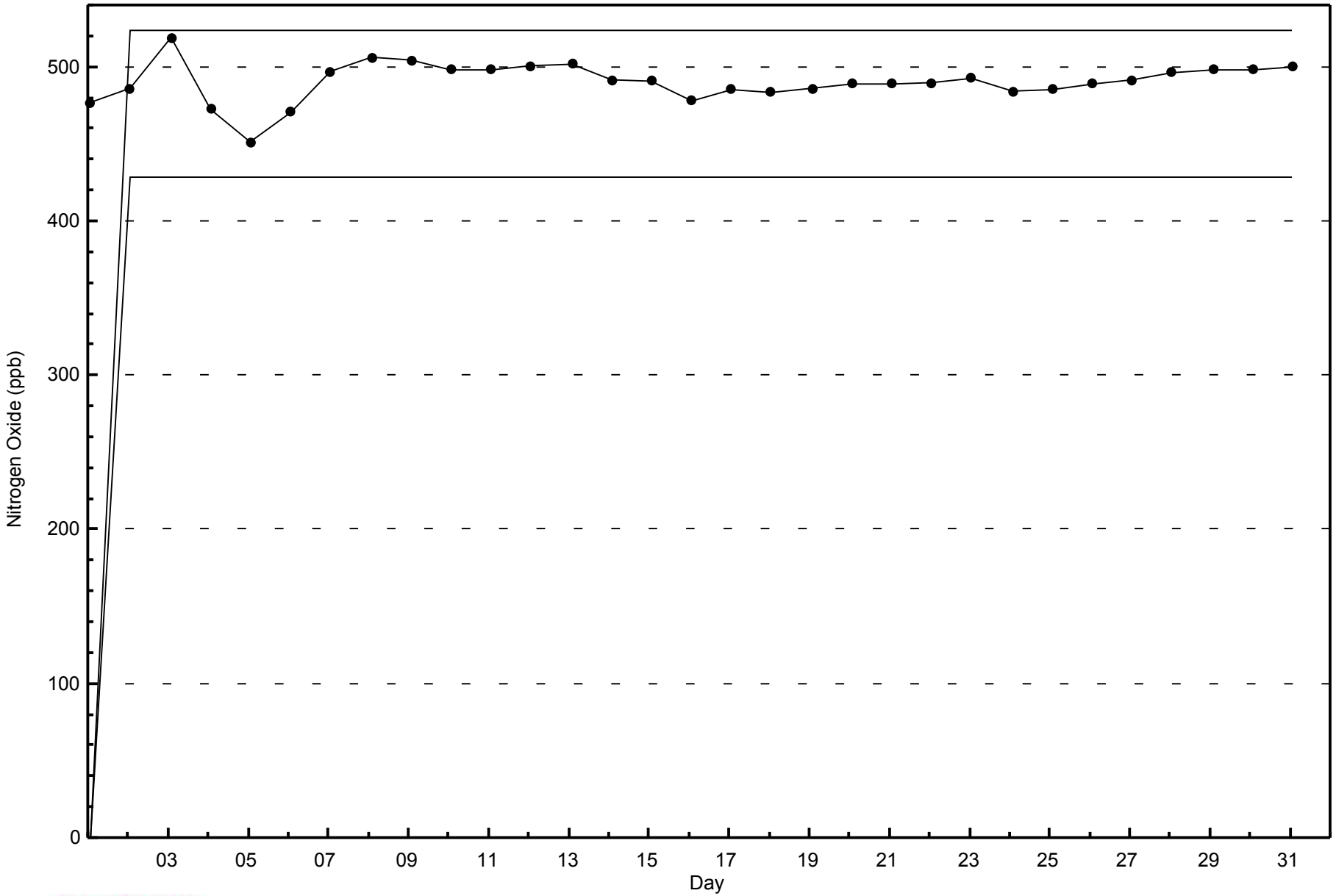
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Oxide (NO) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 36 ppb on Jan 7 18:00 Maximum Daily Average: 16.0 ppb on Jan 7

Minimum Value: 0 ppb on Jan 15 01:00 Minimum Daily Average: 3.0 ppb on Jan 12
Maximum Diurnal Average: 8.8 ppb at hour 9 Minimum Diurnal Average: 4.5 ppb at hour 23
Monthly Average: 6.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 2$ $Q_1 = 3$ Median = 5 $Q_3 = 9$ $P_{90} = 14$ $P_{99} = 25$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	RE	7	4	5	10	15	10	8	7	7	7	7	9	10	13	11	20	10	7	7	5	8	8.6	20
2-Jan	8	Z	RE	5	5	8	5	5	5	5	6	8	11	13	13	12	16	15	28	17	16	18	14	14	11.1	28
3-Jan	15	Z	14	8	3	5	4	5	10	11	C	C	C	C	C	4	4	2	2	6	8	14	5	3	6.7	15
4-Jan	2	Z	6	8	3	5	12	6	6	5	6	7	5	3	3	4	5	4	4	5	2	3	4	3	4.8	12
5-Jan	3	Z	2	3	2	2	12	16	13	14	7	4	3	4	5	7	8	11	14	9	6	4	4	6	6.8	16
6-Jan	7	Z	10	10	7	4	2	3	3	5	4	4	3	3	4	5	6	6	6	2	2	0	2	3	4.4	10
7-Jan	4	Z	5	5	1	9	18	19	30	26	21	17	11	16	35	17	30	36	31	20	11	3	3	1	16.0	36
8-Jan	1	Z	3	2	4	2	5	0	1	2	1	2	2	5	6	5	7	9	9	9	7	9	6	9	4.6	9
9-Jan	9	Z	6	7	3	19	8	2	2	4	1	2	4	8	7	8	16	10	11	7	6	6	7	7	6.9	19
10-Jan	8	Z	7	4	4	2	2	1	3	1	2	3	7	5	5	4	6	5	3	2	4	4	1	2	3.7	8
11-Jan	1	Z	3	2	1	4	9	11	11	10	12	12	6	2	3	2	1	0	0	2	0	3	2	0	4.2	12
12-Jan	2	Z	2	1	2	6	8	6	6	5	1	1	1	2	0	3	9	4	2	1	2	2	1	1	3.0	9
13-Jan	4	Z	2	3	4	4	4	5	7	12	8	4	5	4	7	6	7	7	7	5	4	6	7	8	5.6	12
14-Jan	9	Z	10	9	9	10	18	10	7	5	7	7	2	3	5	5	5	7	6	5	3	2	1	2	6.2	18
15-Jan	0	Z	0	4	5	3	6	3	10	13	13	15	14	15	11	14	18	21	14	18	19	9	4	8	10.4	21
16-Jan	6	Z	5	4	0	0	5	4	12	9	2	1	3	2	3	7	8	5	2	1	0	1	4	4	3.8	12
17-Jan	4	Z	3	1	1	1	1	1	2	8	18	16	15	10	15	9	5	3	2	2	6	5	2	2	5.7	18
18-Jan	1	Z	5	2	2	2	3	6	4	2	2	2	2	2	6	8	14	9	14	7	9	2	3	0	4.6	14
19-Jan	0	Z	1	6	10	2	1	5	1	2	0	0	11	9	4	7	7	4	2	2	3	4	4	6	3.9	11
20-Jan	11	Z	4	6	5	2	4	4	4	4	1	1	0	0	1	1	4	5	4	2	1	10	5	2	3.4	11
21-Jan	3	Z	1	4	2	2	13	20	19	15	9	7	6	11	8	9	11	14	11	16	6	7	14	16	9.7	20
22-Jan	11	Z	15	6	14	8	11	8	9	9	6	3	3	1	2	3	2	2	2	2	2	2	2	3	5.3	15
23-Jan	3	Z	4	7	6	8	7	7	4	3	2	3	8	6	3	4	6	2	0	0	0	0	0	0	3.7	8
24-Jan	0	Z	3	5	6	13	10	11	7	6	14	12	10	10	9	11	7	7	7	4	2	3	4	5	7.1	14
25-Jan	3	Z	2	4	5	1	1	2	9	13	14	2	1	3	6	4	3	3	3	3	3	3	3	2	4.2	14
26-Jan	3	Z	4	3	3	5	8	9	11	8	7	6	5	5	10	6	7	7	6	9	13	9	15	13	7.5	15
27-Jan	14	Z	26	22	20	20	23	18	21	21	19	21	4	3	3	4	10	18	20	11	4	7	3	2	13.5	26
28-Jan	4	Z	9	6	5	4	15	12	16	12	9	8	4	5	6	7	9	12	6	2	5	3	4	7	7.4	16
29-Jan	4	Z	6	7	4	6	5	5	7	10	6	6	6	8	12	11	13	10	7	5	6	7	7	8	7.1	13
30-Jan	7	Z	4	3	4	5	5	5	5	4	3	2	2	2	2	3	6	8	5	2	2	3	1	1	3.5	8
31-Jan	1	Z	5	4	7	5	5	9	20	10	6	3	4	5	6	11	10	10	8	7	3	3	4	4	6.4	20
	4.8	--	5.7	5.4	4.8	5.5	7.7	7.4	8.8	8.4	7.2	6.2	5.4	5.7	6.9	6.7	8.8	8.6	8.2	6.2	5.3	5.0	4.5	4.8	Diurnal Average	
	15	--	26	22	20	20	23	20	30	26	21	21	15	16	35	17	30	36	31	20	19	18	15	16	Diurnal Maximum	

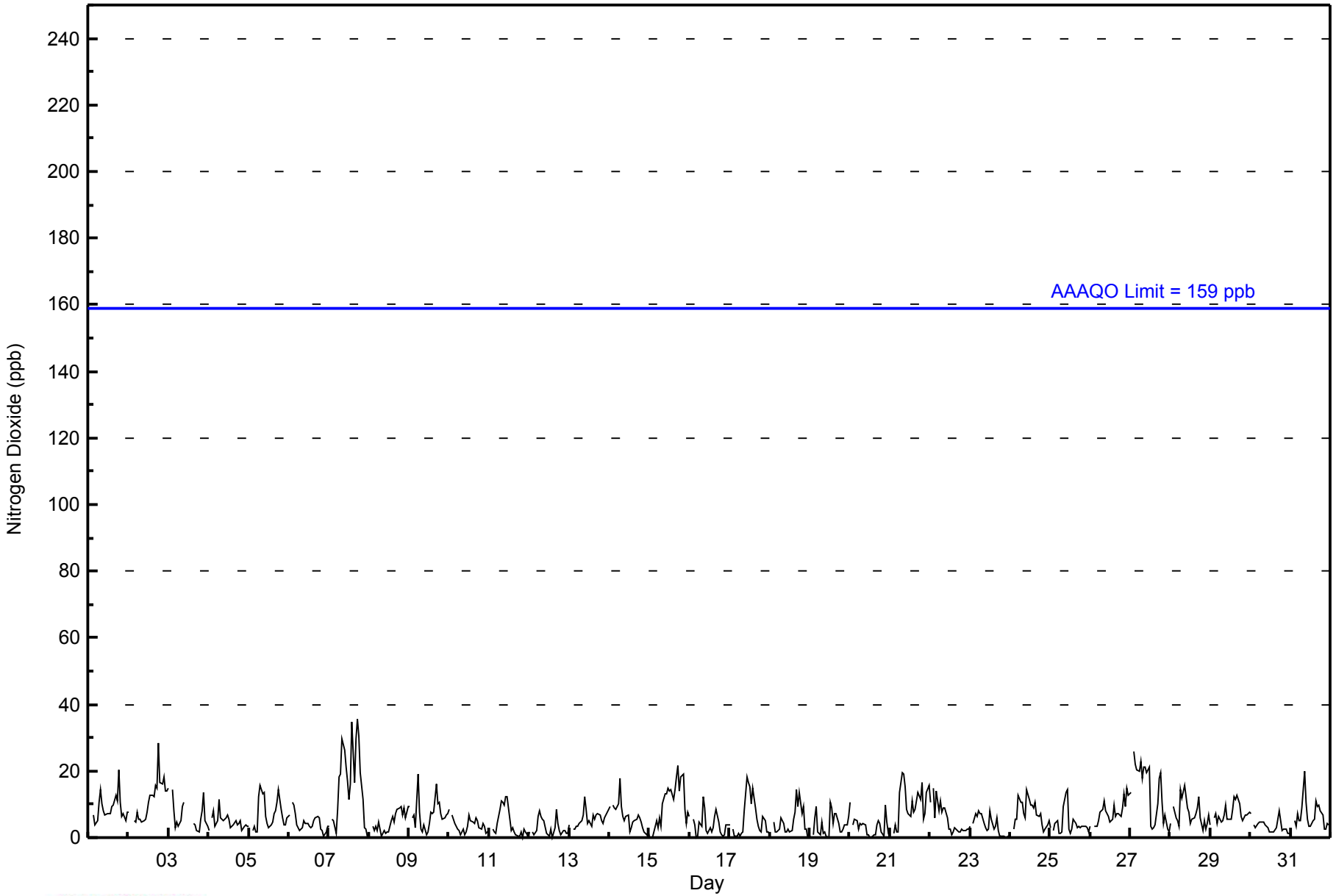
Z - zerospan C - Calibration RE - Recovery
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb

WBEA NETWORK

Hourly Averages

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	691	97.88	97.88
21 - 40	15	2.12	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: 706

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	12	9	7	18	11	17	38	49	50	65	85	63	54	70	87	27	662
21 - 40	1	1	0	0	0	0	3	3	5	0	1	0	1	0	0	0	15
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	13	10	7	18	11	17	41	52	55	65	86	63	55	70	87	27	677

Total Number of Valid Hours: 677

Total Number of Hours: 744

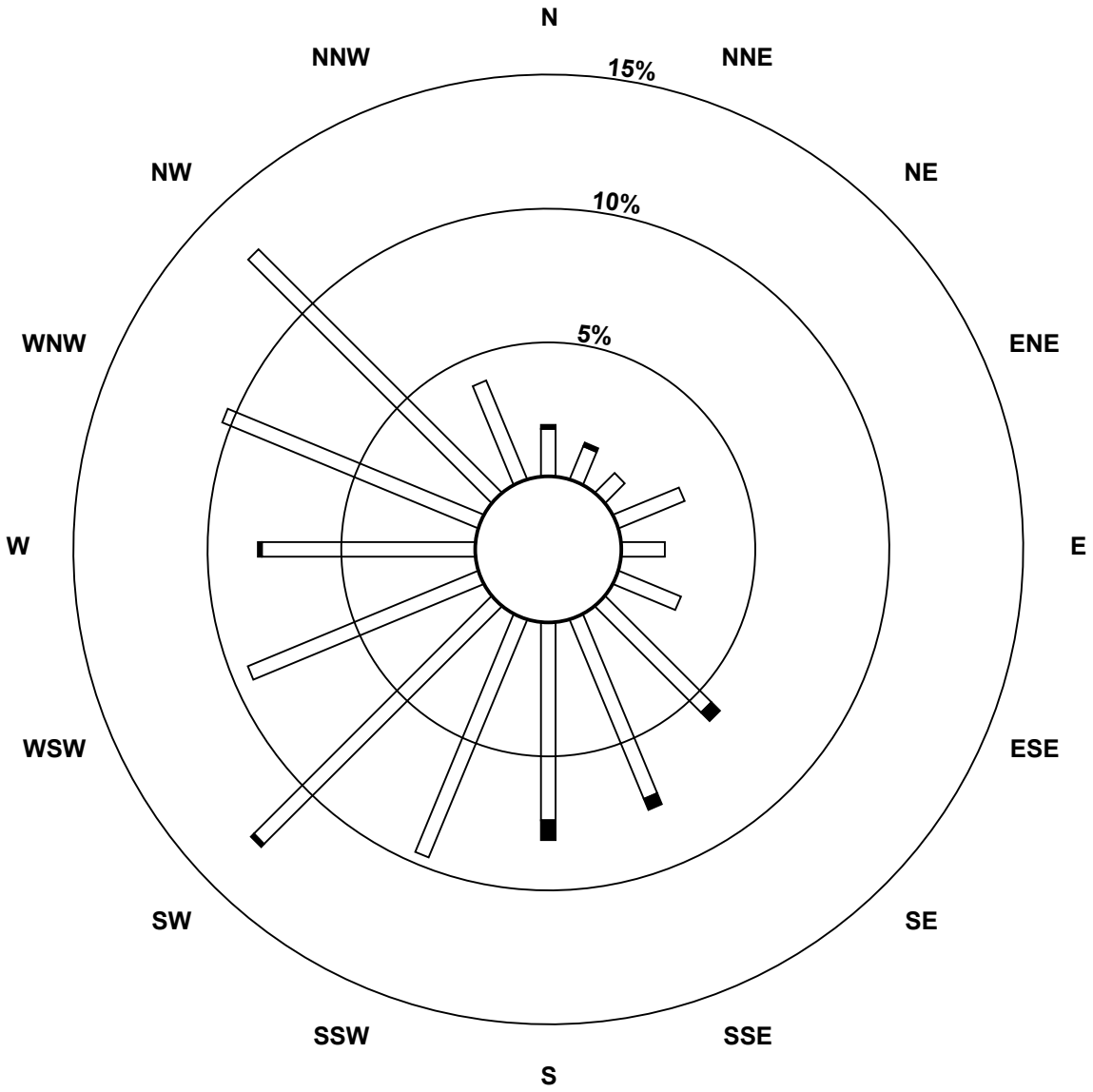
AURORA ATMOSPHERICS INC.

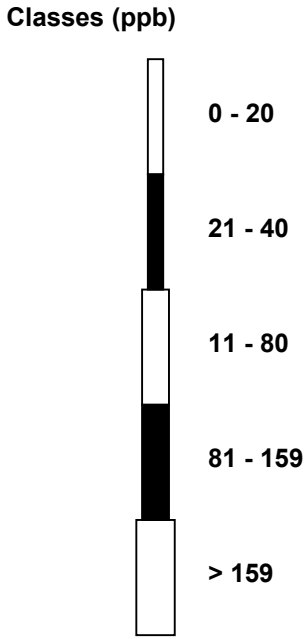
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake (AMS500)





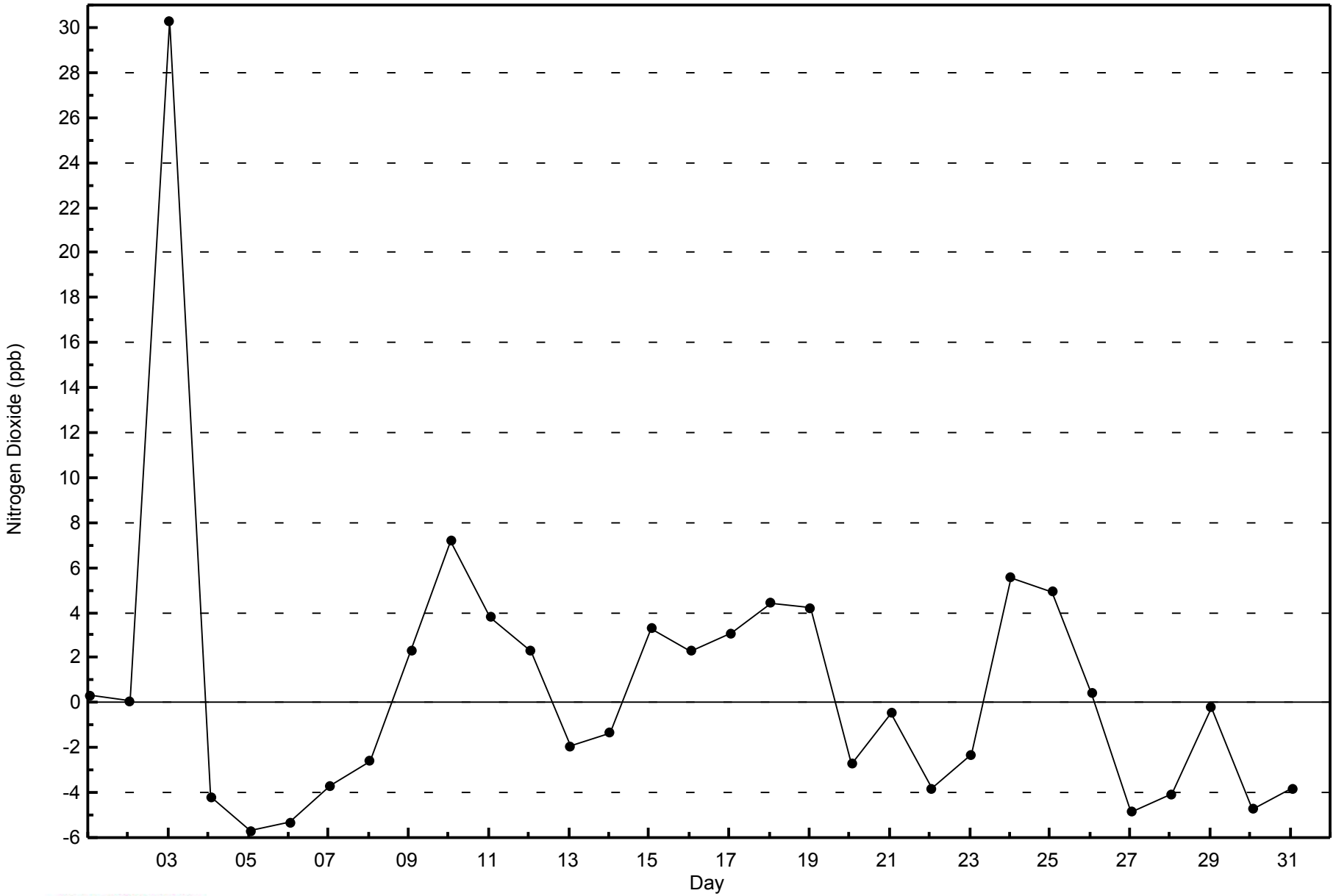
Total Number of Valid Hours: 677

WBEA NETWORK

Zero Responses

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake - January 2014



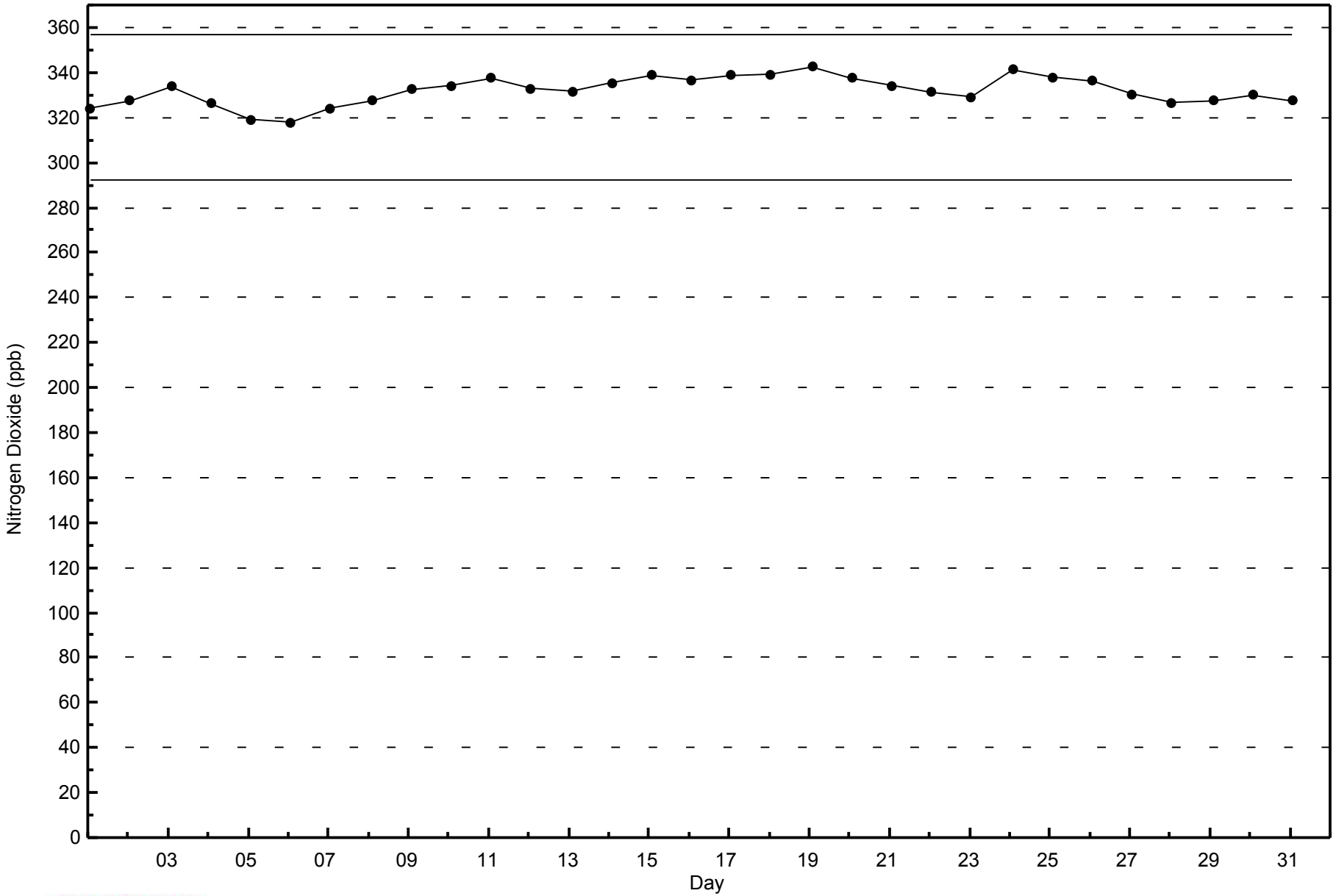
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Nitrogen Dioxide (NO_2) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

NOx (NO_X) - ppb

Cenovus - Christina Lake - January 2014

Maximum Value: 92 ppb on Jan 7 18:00

Maximum Daily Average: 30.1 ppb on Jan 7

Minimum Value: 0 ppb on Jan 16 05:00

Minimum Daily Average: 4.6 ppb on Jan 16

Maximum Diurnal Average: 13.3 ppb at hour 10

Minimum Diurnal Average: 5.5 ppb at hour 23

Monthly Average: 9.2 ppb

Percentiles: $P_1 = 1$ $P_{10} = 2$ $Q_1 = 4$ Median = 7 $Q_3 = 11$ $P_{90} = 20$ $P_{99} = 49$

Hours in Service:	744
Hours of Data:	706
Hours of Missing Data:	38
Hours of Calibration:	36
Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	1	Z	RE	8	4	6	14	22	11	10	9	9	10	10	12	12	15	14	50	19	7	8	5	8	12.0	50
2-Jan	8	Z	RE	6	5	8	6	6	5	6	6	9	13	17	21	18	24	16	60	27	21	26	18	15	15.4	60
3-Jan	19	Z	20	11	3	5	4	7	12	15	C	C	C	C	C	5	5	3	2	9	13	32	9	5	10.1	32
4-Jan	4	Z	13	15	5	8	24	10	11	9	10	12	10	5	5	6	7	5	5	6	3	4	5	4	8.1	24
5-Jan	4	Z	3	4	2	2	13	17	15	17	9	7	5	6	6	8	9	12	19	9	6	4	5	7	8.2	19
6-Jan	7	Z	11	10	8	4	3	3	4	6	5	6	5	4	5	6	7	8	7	3	3	1	2	5	5.3	11
7-Jan	5	Z	6	6	2	10	23	25	52	62	48	37	23	34	82	25	49	92	65	25	15	3	3	1	30.1	92
8-Jan	1	Z	4	2	4	3	6	1	2	3	2	2	3	7	9	6	9	10	9	10	7	9	7	13	5.6	13
9-Jan	11	Z	7	10	3	37	11	3	2	7	2	3	7	12	11	9	17	11	11	7	6	6	7	8	9.2	37
10-Jan	9	Z	7	5	4	3	3	1	3	2	3	6	17	11	10	7	10	7	5	3	5	4	1	2	5.4	17
11-Jan	1	Z	3	2	1	4	11	14	13	12	20	24	8	3	4	3	2	1	1	2	1	3	2	1	6.0	24
12-Jan	2	Z	2	2	3	7	10	13	10	10	3	2	2	7	1	4	10	5	3	1	3	3	2	2	4.6	13
13-Jan	4	Z	3	3	4	4	6	7	10	23	15	8	10	7	13	8	9	9	8	6	5	7	8	9	8.1	23
14-Jan	10	Z	10	9	9	11	21	11	7	7	8	9	2	4	6	6	6	7	7	5	3	2	1	2	7.2	21
15-Jan	0	Z	0	7	8	5	10	6	18	25	25	30	27	28	22	26	34	40	24	31	32	14	6	11	18.7	40
16-Jan	10	Z	7	5	0	1	5	4	13	10	3	2	4	3	4	8	9	5	2	1	1	1	4	4	4.6	13
17-Jan	4	Z	3	1	1	2	1	1	2	13	34	28	27	17	25	14	8	5	3	2	7	6	2	2	9.0	34
18-Jan	1	Z	5	2	2	2	3	6	5	2	3	3	3	3	7	9	15	9	14	8	10	3	2	0	5.1	15
19-Jan	1	Z	2	10	16	2	2	6	1	2	1	1	20	15	6	11	12	7	3	2	4	5	5	8	6.1	20
20-Jan	13	Z	5	6	5	3	6	6	6	6	2	3	1	1	2	1	4	5	4	2	1	16	8	3	4.8	16
21-Jan	4	Z	2	5	2	2	16	24	25	21	15	13	11	18	11	12	14	17	14	20	6	8	18	21	13.0	25
22-Jan	12	Z	22	8	23	10	14	9	10	12	10	5	5	2	3	4	3	2	2	3	2	2	3	3	7.3	23
23-Jan	4	Z	5	7	7	8	8	7	5	4	3	4	15	9	4	5	7	2	1	1	1	0	0	1	4.7	15
24-Jan	0	Z	4	8	9	21	17	16	9	7	20	15	12	13	12	13	9	8	8	5	2	3	4	6	9.6	21
25-Jan	4	Z	3	5	5	2	2	2	16	22	27	4	2	4	8	6	4	5	4	4	4	4	4	3	6.1	27
26-Jan	4	Z	5	4	4	6	10	11	14	10	11	9	7	7	14	8	9	8	7	10	14	10	16	15	9.3	16
27-Jan	15	Z	31	27	22	24	30	22	34	39	39	41	5	4	4	5	11	20	25	12	5	7	3	2	18.6	41
28-Jan	5	Z	10	6	5	4	19	17	21	16	12	12	7	8	8	10	12	15	7	3	6	3	5	8	9.6	21
29-Jan	5	Z	7	9	5	7	6	6	9	14	9	9	8	13	19	17	18	14	8	7	8	8	8	9	9.7	19
30-Jan	9	Z	5	4	5	6	6	6	6	6	5	2	3	3	3	4	7	9	6	3	3	3	2	2	4.6	9
31-Jan	1	Z	6	4	8	6	7	11	27	14	9	6	6	8	8	15	13	12	10	8	4	3	5	5	8.5	27
	5.8	--	7.2	6.8	6.0	7.2	10.2	9.7	12.3	13.3	12.2	10.8	9.2	9.5	11.5	9.5	11.8	12.4	12.7	8.2	6.7	6.8	5.5	5.9	Diurnal Average	
	19	--	31	27	23	37	30	25	52	62	48	41	27	34	82	26	49	92	65	31	32	32	18	21	Diurnal Maximum	

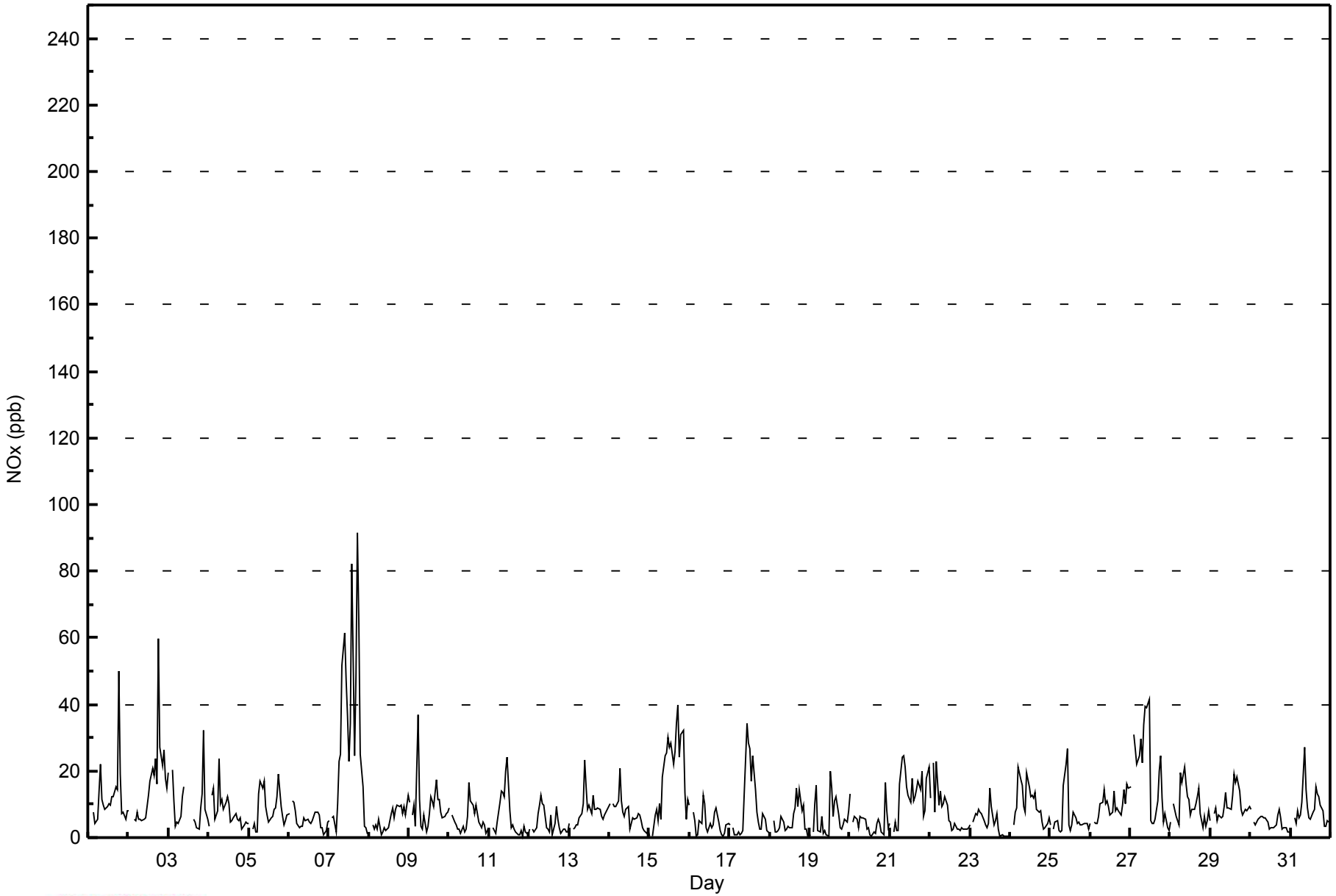
Z - zerospan C - Calibration RE - Recovery

WBEA NETWORK

Hourly Averages

NOx (NO_X) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	640	90.65	90.65
21 - 40	56	7.93	98.58
11 - 80	8	1.13	99.72
81 - 159	2	0.28	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744

NOx (NO_X) - ppb

Cenovus - Christina Lake - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 20	12	8	5	16	10	15	36	47	46	62	81	61	51	54	86	24	614
21 - 40	0	1	2	2	1	2	1	3	8	3	4	2	4	16	1	3	53
11 - 80	0	1	0	0	0	0	4	1	1	0	1	0	0	0	0	0	8
81 - 159	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	10	7	18	11	17	41	52	55	65	86	63	55	70	87	27	677

Total Number of Valid Hours: 677

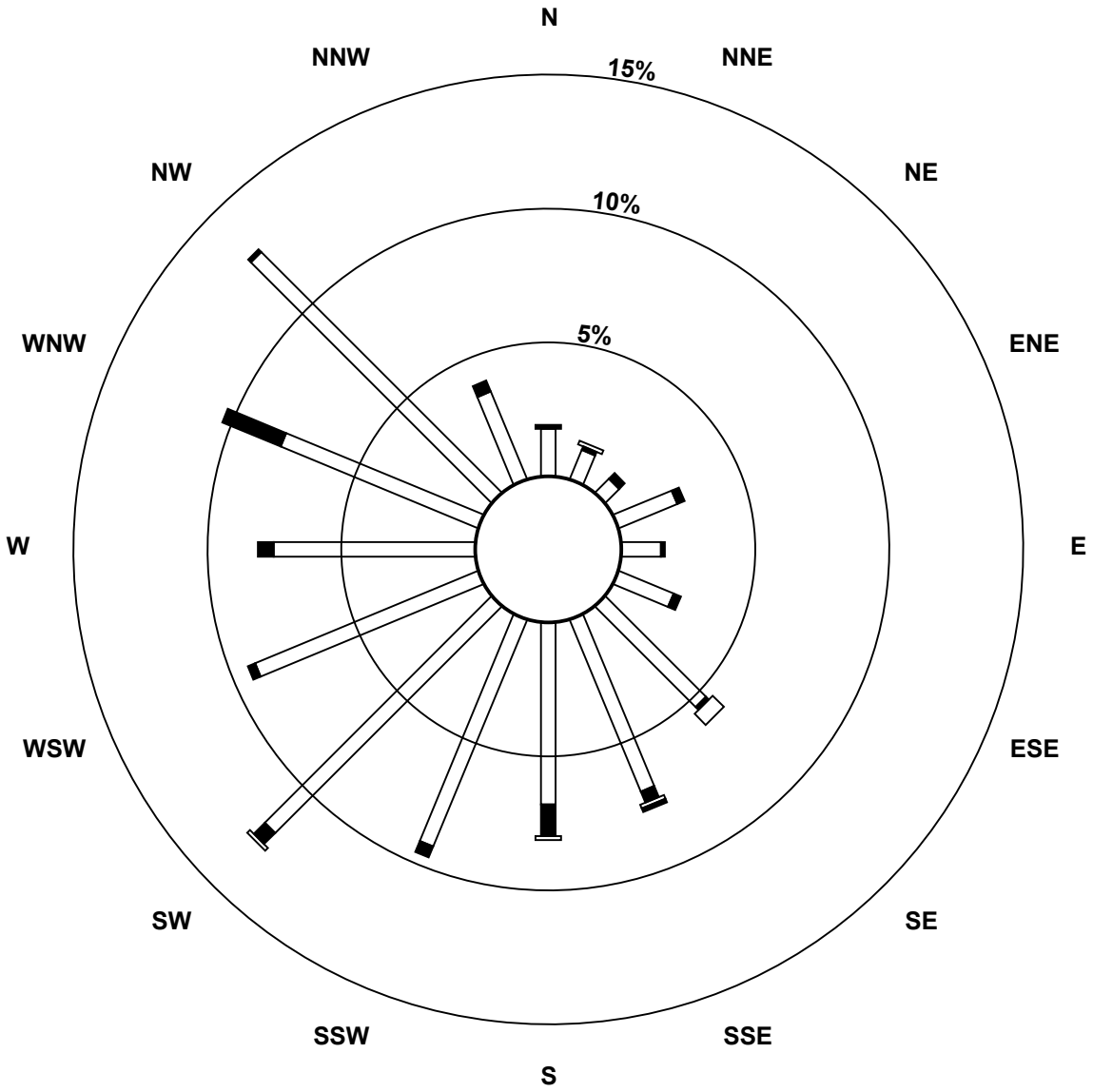
Total Number of Hours: 744

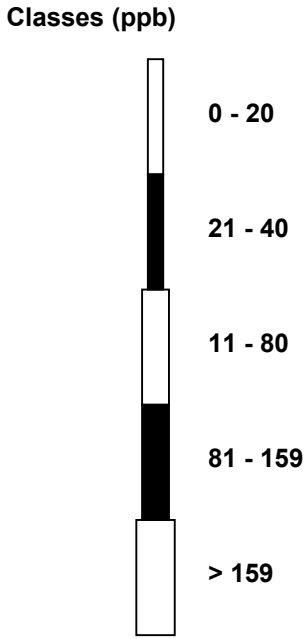
Wood Buffalo Environmental Association

Wind Rose Jan 2014

NOx (NO_X) - ppb

Cenovus - Christina Lake (AMS500)





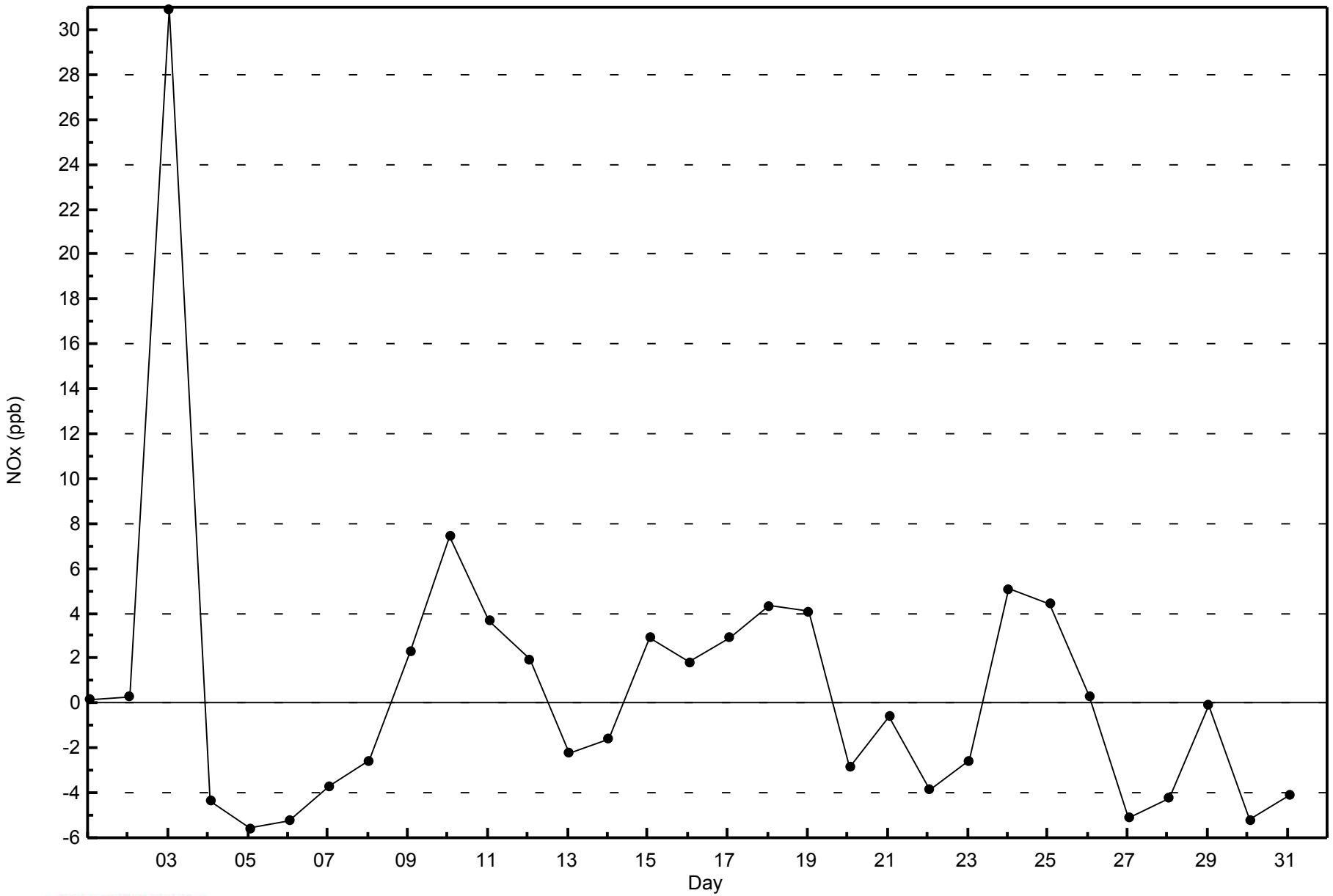
Total Number of Valid Hours: 677

Wood Buffalo Environmental Association

Zero Responses

NOx (NO_X) - ppb

Cenovus - Christina Lake - January 2014



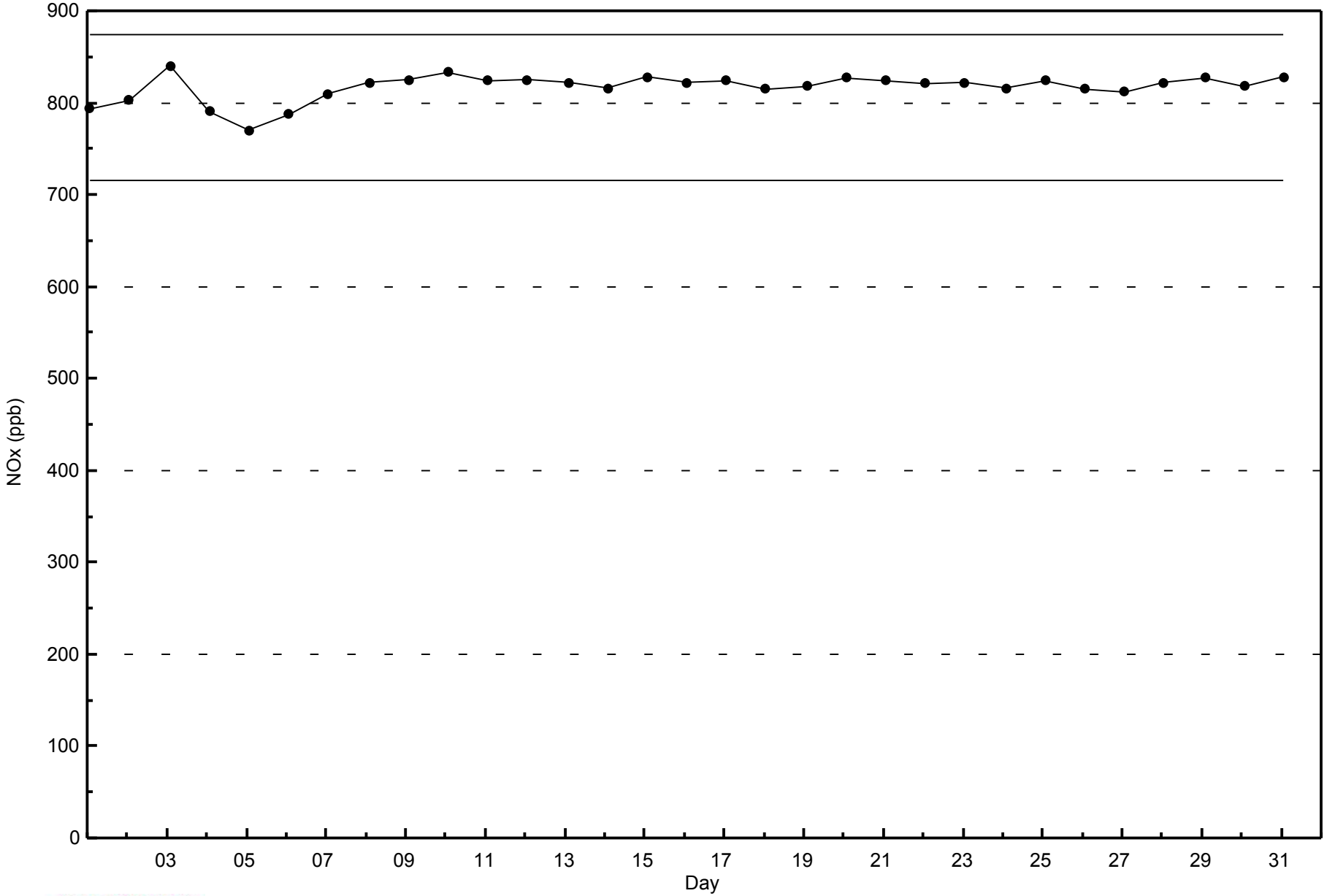
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

NOx (NO_X) - ppb

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

Cenovus - Christina Lake - January 2014

Maximum Value: 6.8 C on Jan 24 05:00

Maximum Daily Average: 3.1 C on Jan 17

Minimum Value: -33.8 C on Jan 5 09:00

Minimum Daily Average: -30.2 C on Jan 5

Maximum Diurnal Average: -9.5 C at hour 14

Minimum Diurnal Average: -14.3 C at hour 4

Monthly Average: -12.40 C

Percentiles: P_1 = -32.5 P_{10} = -26.4 Q_1 = -20.9 Median = -12.3 Q_3 = -4.4 P_{90} = 2.5 P_{99} = 6.3

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	0
Percent Operational Time:	94.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	-23.4	-26.0	-25.7	-26.2	-28.3	-29.1	-27.7	-26.7	-25.7	-24.3	-23.3	-22.1	-21.1	MS	-20.2	-20.9	-23.6	-26.1	-26.5	-23.8	-21.6	-20.4	-20.2	-19.6	-24.0	-19.6
2-Jan	-18.7	-18.1	-17.2	-16.3	-15.1	-14.2	-13.7	-13.4	-13.1	-12.5	-11.0	-9.5	-7.6	-7.4	-6.8	-6.5	-6.1	-6.4	-6.3	-6.1	-6.3	-6.2	-6.1	-6.4	-10.5	-6.1
3-Jan	-6.6	-7.1	-8.4	-7.4	-8.9	-11.2	-14.6	-17.7	-19.1	-19.9	-20.2	-19.7	UO	UO	-18.7	-19.6	-20.4	-21.2	-21.8	-22.4	-23.0	-23.2	-23.8	-24.4	-17.2	-6.6
4-Jan	-25.1	-25.6	-26.2	-26.4	-26.3	-26.6	-27.1	-27.2	-27.4	-27.2	-27.0	-26.5	-26.4	-26.6	-26.4	-26.8	-27.5	-28.8	-30.5	-31.3	-31.5	-32.0	-32.5	-32.2	-28.0	-25.1
5-Jan	-32.2	-31.9	-31.7	-31.7	-32.5	-33.0	-33.2	-33.3	-33.8	-32.4	-30.8	-29.1	-27.9	-26.7	-26.6	-27.3	-27.8	-28.1	-28.6	-28.9	-28.4	-29.0	-29.7	-29.2	-30.2	-26.6
6-Jan	-28.6	-28.9	-28.9	-28.0	-25.6	-23.8	-23.0	-22.2	-22.1	-21.7	-21.4	-20.8	-20.0	-18.9	-18.3	-18.2	-18.3	-18.4	-18.6	-18.9	-19.1	-19.3	-19.4	-20.7	-21.8	-18.2
7-Jan	-22.4	-23.1	-23.4	-23.8	-23.7	-24.8	-26.3	-27.2	-29.5	-30.0	-26.2	-24.1	-21.7	-20.4	-19.5	UO	UO	-26.9	-28.9	-29.9	-26.7	-23.0	-21.2	-20.6	-24.7	-19.5
8-Jan	-19.4	-18.8	-18.2	-17.6	-17.1	-16.4	-16.1	-15.9	-15.5	-14.8	-13.9	-12.6	-11.2	-10.3	-9.7	-9.5	-9.1	-8.7	-8.3	-8.0	-8.0	-7.8	-9.0	-11.5	-12.8	-7.8
9-Jan	-12.6	-15.1	-16.9	-17.5	-15.6	-12.8	-8.5	-6.9	-5.7	-5.1	-4.5	-4.2	-4.7	-4.8	-4.4	-4.0	-3.7	-3.7	-4.1	-4.4	-4.8	-5.4	-5.5	-5.5	-7.5	-3.7
10-Jan	-4.4	-4.6	-6.0	-6.2	-6.1	-5.3	-4.9	-5.1	-5.1	-4.6	-4.5	-4.6	-5.9	-7.2	-7.5	-8.0	-8.6	-9.6	-10.6	-11.9	-12.4	-10.8	-9.2	-8.6	-7.1	-4.4
11-Jan	-9.0	-10.0	-10.2	-9.6	-9.8	-9.8	-10.3	-11.1	-10.8	-9.7	-9.3	-7.8	-7.0	-6.9	-6.6	-6.8	-7.5	-8.1	-8.6	-9.3	-9.9	-10.8	-10.6	-10.6	-9.2	-6.6
12-Jan	-10.8	-11.0	-11.4	-11.8	-12.1	-13.9	-15.0	-15.7	-16.6	-17.4	-18.1	-18.7	-18.1	-17.6	-17.4	-17.5	-18.8	-19.0	-19.6	-19.3	-18.6	-16.8	-15.1	-13.3	-16.0	-10.8
13-Jan	-11.1	-10.0	-10.1	-9.8	-8.2	-7.3	-7.2	-7.4	-8.0	-8.3	-8.6	-8.2	-7.7	-8.2	-8.2	-9.0	-9.7	-10.4	-11.2	-11.9	-13.0	-14.9	-13.7	-13.1	-9.8	-7.2
14-Jan	-13.7	-15.2	-15.3	-15.8	-16.0	-15.6	-14.4	-12.8	-11.2	-10.1	-8.5	-6.7	-5.2	-4.5	-4.4	-4.0	-3.2	-2.9	-2.6	-1.5	0.6	0.8	1.5	3.5	-7.4	3.5
15-Jan	4.7	5.8	6.6	UO	UO	UO	UO	UO	UO	4.7	4.0	3.5	3.3	3.4	3.6	3.7	3.4	2.9	2.1	1.5	1.2	0.7	-0.1	-0.1	3.0	6.6
16-Jan	-0.3	-1.1	-1.2	-1.5	-2.7	-3.2	-3.2	-2.9	-2.7	-2.9	-2.0	-1.1	0.3	0.9	1.2	0.9	0.5	0.3	0.3	0.3	0.4	0.6	0.8	0.5	-0.7	1.2
17-Jan	0.3	0.9	1.3	1.0	2.0	3.3	2.0	1.1	1.0	3.3	5.5	5.8	6.2	6.5	6.7	6.6	5.8	5.0	3.9	3.0	2.2	1.3	0.2	-0.9	3.1	6.7
18-Jan	-1.6	-1.9	-1.8	-2.2	-1.7	-0.9	-0.2	0.7	1.3	1.2	2.0	3.5	4.0	AF	AF	AF	3.3	2.2	0.2	-3.7	-3.6	1.9	2.5	4.4	0.4	4.4
19-Jan	6.1	5.4	5.0	5.1	3.8	2.8	2.5	2.9	1.4	2.0	3.5	3.6	3.2	1.3	-2.1	-8.3	-13.1	-15.4	-17.1	-18.5	-20.0	-20.9	-21.7	-22.3	-4.6	6.1
20-Jan	-23.1	-24.1	-24.9	-25.7	-24.9	-24.1	-23.8	-22.5	-20.5	-18.9	-15.9	-13.5	-10.8	-8.7	-7.7	-7.5	-7.2	-7.1	-6.8	-6.6	-6.3	-4.9	-5.3	-5.8	-14.4	-4.9
21-Jan	-6.5	-7.0	-7.3	-7.7	-8.2	-9.1	-10.5	-11.2	-12.1	-11.4	-9.9	-9.2	-8.7	-8.5	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	-6.5
22-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	-14.4	-14.9	-14.1	-13.4	-12.5	-12.3	-12.4	--	-12.3
23-Jan	-12.1	-11.9	-12.0	-11.8	-10.9	-9.8	-8.8	-8.0	-7.0	-5.2	-3.5	-0.6	2.4	3.2	3.6	3.6	3.0	1.9	1.7	2.5	3.1	3.0	3.0	3.3	-2.8	3.6
24-Jan	3.3	3.3	4.8	6.5	6.8	6.3	6.1	5.1	4.7	4.5	4.0	3.3	3.3	2.1	0.7	-0.3	-1.1	-1.6	-2.0	-2.2	-2.3	-2.3	-1.9	-1.8	2.1	6.8
25-Jan	-1.3	-1.0	-0.6	-0.1	1.0	1.7	2.4	3.0	5.1	5.4	5.9	5.7	4.5	3.3	2.0	1.7	1.6	0.2	-1.9	-3.4	-5.8	-8.2	-10.1	-12.5	-0.1	5.9
26-Jan	-14.7	-16.8	-18.8	-20.4	-21.8	-23.0	-23.9	-24.8	-25.5	-25.6	-25.1	-24.6	-24.0	-23.2	-22.6	-22.4	-22.2	-22.0	-22.2	-23.8	-25.5	-26.8	-28.1	-29.0	-23.2	-14.7
27-Jan	-29.9	-30.7	-31.2	-31.5	-31.4	-31.5	-32.2	-32.8	-33.2	-30.4	-25.2	-20.4	-17.9	-16.5	-15.7	-15.3	-16.2	-17.9	-21.5	-21.7	-19.0	-18.8	-16.7	-16.2	-23.9	-15.3
28-Jan	-15.7	-15.7	-16.3	-14.6	-13.0	-12.8	-15.0	-17.5	-16.3	-12.7	-12.1	-10.4	-9.2	-7.6	-6.7	-6.3	-7.1	-7.9	-8.0	-8.3	-10.1	-10.9	-11.7	-13.4	-11.6	-6.3
29-Jan	-16.1	-18.5	-20.0	-21.1	-22.0	-22.9	-22.6	-22.4	-22.2	-21.7	-21.3	-21.0	-20.2	-19.4	-19.7	-20.7	-21.7	-22.7	-24.0	-25.2	-25.4	-25.1	-24.8	-24.7	-21.9	-16.1
30-Jan	-24.6	-24.5	-24.2	-24.2	-24.3	-24.4	-24.2	-23.6	-23.4	-23.4	-23.1	-21.8	-20.2	-18.6	-17.5	-17.0	-17.4	-17.7	-17.7	-17.5	-17.6	-17.0	-16.6	-16.6	-20.7	-16.6
31-Jan	-16.6	-17.3	-17.0	-17.8	-18.3	-18.2	-17.6	-17.8	-17.8	-17.4	-16.5	-15.4	-14.8	-14.2	-13.8	-13.8	-14.1	-14.7	-14.9	-15.0	-15.0	-15.1	-15.3	-15.7	-16.0	-13.8
	-12.9	-13.4	-13.6	-14.3	-14.2	-14.1	-14.2	-14.3	-14.2	-12.9	-11.9	-10.9	-9.8	-9.5	-10.1	-10.1	-10.3	-11.6	-12.3	-12.7	-12.7	-12.5	-12.4	-12.5	Diurnal Average	
	6.1	5.8	6.6	6.5	6.8	6.3	6.1	5.1	5.1	5.4	5.9	5.8	6.2	6.5	6.7	6.6	5.8	5.0	3.9	3.0	3.1	3.0	3.0	4.4	Diurnal Maximum	

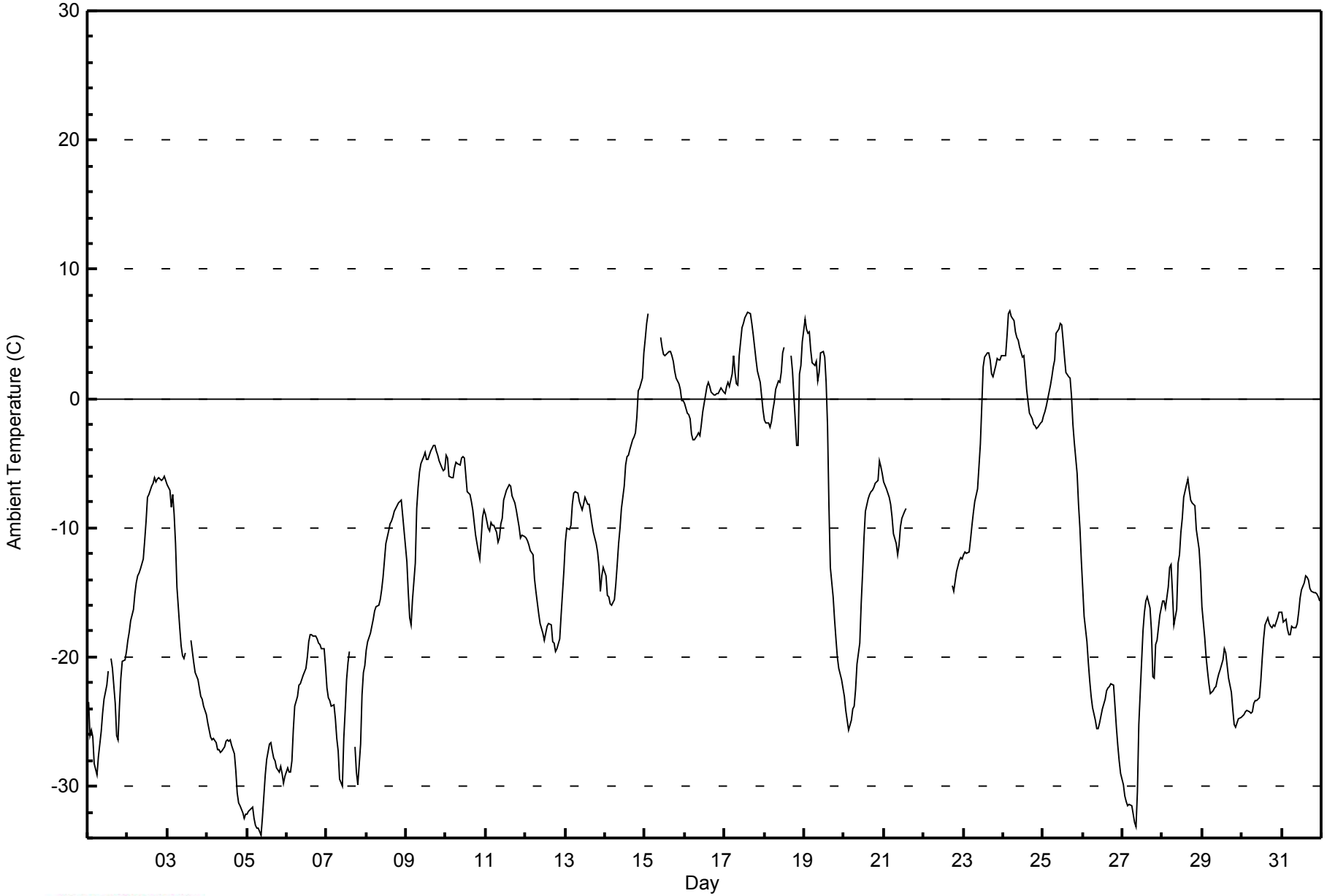
AF - Analyzer Failure UO - Unstable Operation MS - Missing

WBEA NETWORK

Hourly Averages

Ambient Temperature (AT) - C

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	194	27.60	27.60
-20 - 0	387	55.05	82.65
0 - 10	122	17.35	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Cenovus - Christina Lake - January 2014

Maximum Value: 93 % on Jan 11 00:00

Maximum Daily Average: 87.5 % on Jan 11

Minimum Value: 37 % on Jan 28 05:00

Minimum Daily Average: 53.5 % on Jan 15

Maximum Diurnal Average: 75.3 % at hour 9

Minimum Diurnal Average: 68.3 % at hour 13

Monthly Average: 72.3 %

Percentiles: P_1 = 45 P_{10} = 57 Q_1 = 65 Median = 73 Q_3 = 81 P_{90} = 86 P_{99} = 91

Hours in Service:	744
Hours of Data:	703
Hours of Missing Data:	41
Hours of Calibration:	0
Percent Operational Time:	94.5

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	75	75	75	73	72	72	74	74	74	73	73	73	72	UO	72	74	77	75	75	77	76	74	73	74	74.1	77
2-Jan	74	77	78	77	80	80	81	80	80	81	81	82	82	84	85	85	85	86	86	86	85	83	79	80	81.4	86
3-Jan	82	83	86	84	87	85	81	79	77	74	72	70	UO	UO	67	70	72	73	73	72	72	73	74	75	76.3	87
4-Jan	72	71	71	72	71	72	72	70	70	70	69	70	69	66	66	63	60	58	59	61	62	62	63	65	66.8	72
5-Jan	66	66	65	65	66	67	68	69	69	68	65	63	61	59	61	64	66	68	70	70	70	70	71	71	66.6	71
6-Jan	70	71	71	72	69	66	64	65	73	75	76	76	76	75	75	75	75	76	78	78	77	76	76	77	73.4	78
7-Jan	77	76	76	75	75	75	76	75	73	71	66	64	59	62	62	UO	UO	75	73	73	77	77	74	75	72.1	77
8-Jan	75	75	76	79	78	77	78	80	80	79	78	78	79	78	79	82	84	87	88	88	87	86	88	90	81.1	90
9-Jan	89	86	85	84	86	87	91	91	91	90	93	88	84	83	84	87	89	89	87	85	84	86	86	84	87.0	93
10-Jan	82	83	85	83	81	82	81	82	85	86	86	85	86	85	83	82	82	83	82	85	87	87	92	93	84.4	93
11-Jan	91	90	89	88	87	86	88	88	88	85	87	85	84	87	91	90	89	87	86	87	87	87	86	86	87.5	91
12-Jan	90	90	86	85	84	81	80	81	83	82	78	70	71	69	69	69	76	77	78	77	78	77	78	82	78.8	90
13-Jan	84	82	84	85	88	87	87	87	85	86	83	76	74	76	72	71	75	77	77	75	76	81	79	80	80.3	88
14-Jan	81	83	83	83	83	83	84	85	87	87	89	88	87	88	89	89	90	89	89	88	86	87	85	76	85.8	90
15-Jan	71	65	60	UO	UO	UO	UO	UO	UO	45	52	58	58	55	50	46	47	47	48	50	52	52	53	53	53.5	71
16-Jan	53	55	53	53	58	61	62	63	64	65	64	63	59	58	58	60	62	63	63	64	66	68	70	72	61.5	72
17-Jan	73	73	72	73	72	69	73	75	74	66	59	58	56	55	54	51	53	55	57	61	64	68	71	77	64.9	77
18-Jan	81	83	83	84	83	80	75	71	68	68	63	57	55	AF	AF	AF	56	59	64	76	75	54	54	52	68.7	84
19-Jan	50	54	55	57	73	79	75	64	73	65	59	59	60	80	87	81	71	69	67	66	64	66	68	70	67.2	87
20-Jan	71	74	76	76	75	73	72	73	71	70	66	62	64	68	70	70	70	69	68	68	70	74	75	76	70.8	76
21-Jan	78	79	79	79	81	84	87	87	86	86	83	78	76	75	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	87
22-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	70	74	74	75	76	77	78	--	78
23-Jan	78	80	82	82	84	84	84	84	84	82	78	73	65	62	61	61	64	69	71	69	67	71	73	74	74.3	84
24-Jan	75	75	71	65	64	66	67	70	72	73	75	77	76	79	82	83	82	84	83	82	81	83	84	86	76.4	86
25-Jan	86	87	87	86	82	77	73	71	63	62	61	61	63	66	70	70	65	68	72	74	74	62	56	43	70.0	87
26-Jan	54	59	53	56	58	60	62	63	64	62	59	58	57	56	56	54	53	54	55	62	68	69	72	72	59.9	72
27-Jan	72	72	71	71	71	71	70	70	69	70	66	55	48	44	42	42	45	51	63	63	55	58	55	55	60.4	72
28-Jan	57	59	60	49	37	38	45	54	55	47	49	49	49	47	48	48	51	55	66	73	65	72	74	73	55.1	74
29-Jan	73	71	72	74	74	74	73	71	73	73	77	76	72	69	65	63	61	63	66	63	68	70	70	68	70.0	77
30-Jan	67	70	72	71	71	71	74	75	75	74	75	71	66	62	59	59	62	63	63	61	63	63	60	61	66.9	75
31-Jan	63	73	74	76	78	78	78	78	78	76	73	71	69	69	67	70	69	68	69	71	70	71	73	74	72.4	78
	73.8	74.4	74.3	74.4	74.8	74.6	75.0	75.0	75.3	73.0	71.7	69.6	68.3	68.7	68.7	68.8	68.9	70.2	71.7	72.6	72.7	72.8	73.0	73.0	Diurnal Average	
	91	90	89	88	88	87	91	91	91	90	93	88	87	88	91	90	90	89	89	88	87	87	92	93	Diurnal Maximum	

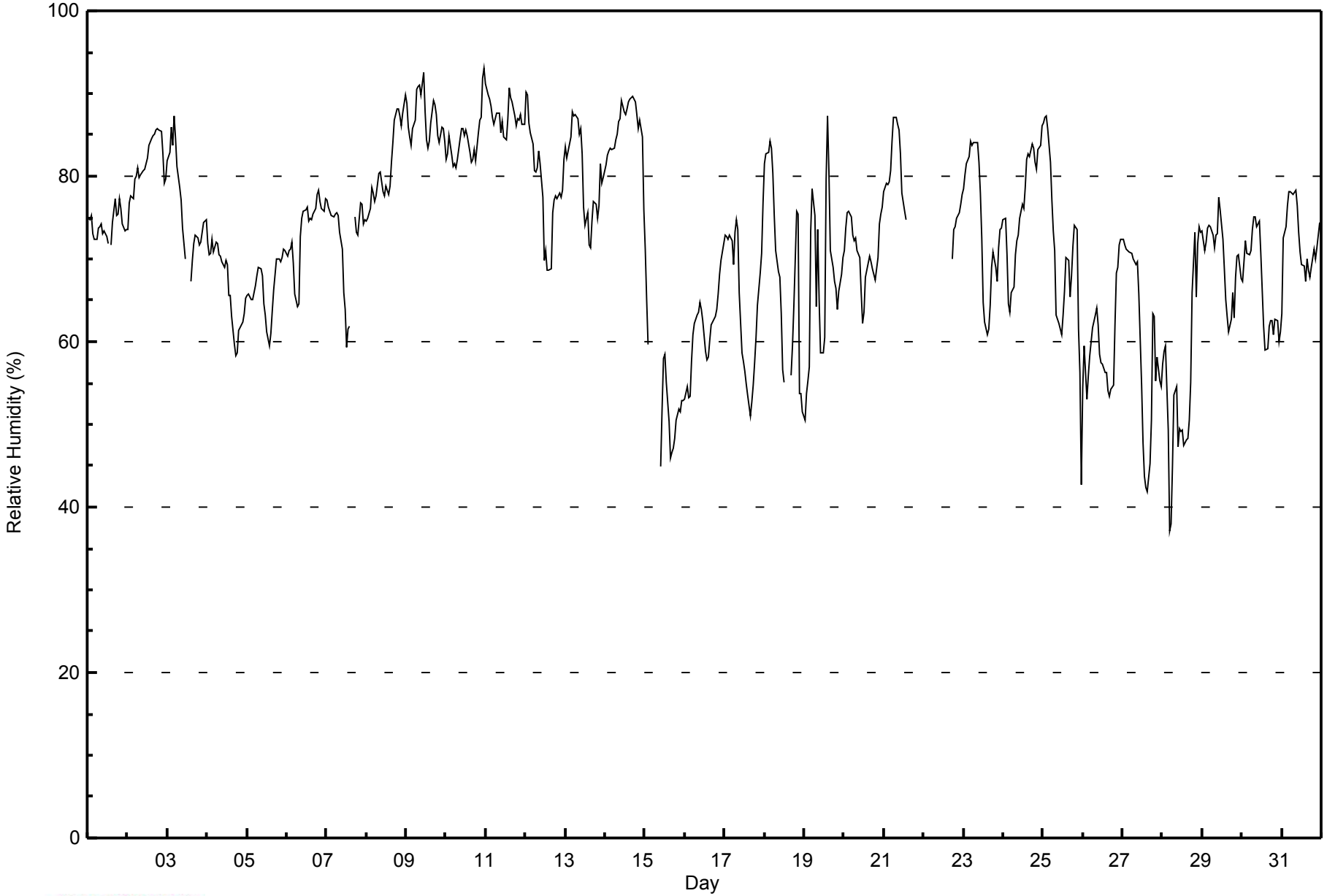
AF - Analyzer Failure UO - Unstable Operation

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

Cenovus - Christina Lake - January 2014



AURORA
ATMOSPHERICS INC.

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	2	0.28	0.28
40 - 60	97	13.80	14.08
60 - 80	414	58.89	72.97
80 - 100	190	27.03	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Cenovus - Christina Lake - January 2014

Maximum Speed: 55 km/h on Jan 15 10:00

Maximum Daily Speed Average: 33.1 km/h on Jan 15

Minimum Speed Value: 0 km/h on Jan 13 22:00

Minimum Daily Speed Average: 1.9 km/h on Jan 7

Maximum Diurnal Speed Average: 9.7 km/h at hour 13

Minimum Diurnal Speed Average: 4.4 km/h at hour 21

Monthly Average Velocity: 6.4 km/h 263.1 deg

Percentiles: P_1 = 2 P_{10} = 4 Q_1 = 7 Median = 11 Q_3 = 15 P_{90} = 21 P_{99} = 37

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	SSW4	SSE2	ESE1	SSW2	SSE2	SSE2	SE2	SSE2	SSE3	SE2	SE3	S5	ESE3	SSE5	ESE5	ESE5	SE4	SE4	SE3	SSE6	SE6	SSE10	SSE10	SE11	SSE4.0	SE11
2-Jan	SSE12	SSE11	SSE14	SE16	SE15	SSE15	S13	S13	S13	S16	SSW10	SSW10	SW11	SW11	SW7	SW8	SW6	SSW6	SW6	SW7	SSW7	SW9	SW8	SW8	S9.1	S16
3-Jan	SW10	SW10	WSW4	WNW13	NNW12	N15	N15	N10	NW10	NW11	WNW13	WNW15	NW16	NW16	WNW17	WNW14	WNW14	WNW15	WNW16	W12	WSW11	WSW12	WNW14	WNW14	WNW11.1	WNW17
4-Jan	W17	W15	WSW14	W14	W17	W13	WSW11	W16	WSW14	W16	W17	WNW19	WNW20	WNW21	WNW22	NW21	NW22	NW21	NW16	WNW12	WNW14	NW12	NW11	WNW14	WNW15.0	NW22
5-Jan	W12	WSW13	WSW12	WSW12	SW11	SW10	SW8	SSW9	S2	SW9	SW9	WSW6	W5	W3	SW5	SSW6	S5	S5	SE3	SSE5	S7	S6	SSE4	ESE4	SW5.7	WSW13
6-Jan	ESE4	ENE4	ENE3	ENE3	SE4	SE8	SE9	ESE9	SE12	SE11	SE11	ESE10	ESE10	SE9	SE10	ESE8	ESE6	SE7	E6	ENE6	E7	E7	ENE4	N9	ESE6.3	SE12
7-Jan	N8	N5	NNW6	NNE4	NNE5	N6	NNW5	NNW5	NNE1	S2	SSE1	E2	NE3	NNE3	N3	ENE3	SE3	SSE2	SE2	ESE3	ESE7	SE9	SE13	SE11	ENE1.9	SE13
8-Jan	SE15	SSE15	SSE16	SSE15	SSE17	SSE17	SSE16	SSE15	SSE11	S12	S12	S12	SSW11	SSW13	SW10	SW11	SW9	SW8	SSW6	SSW6	S5	SSW4	S4	S3	S10.0	SSE17
9-Jan	SSW4	ESE2	SE3	S3	SSE2	NE2	SSE5	SE4	S8	S7	S9	SSW9	SSW9	SSW7	SSW7	S7	SSW5	SSW8	SSW7	SSW7	SSW9	SSW9	SSW11	SSW8	SSW5.9	SSW11
10-Jan	SSW10	SSW9	SSW8	SW10	SW10	SW8	SW10	WSW12	SW11	SW10	SW9	W12	WNW18	W13	W15	W13	WNW13	WNW10	WNW9	WSW5	SW7	SW7	SSW8	SSE6	WSW8.5	WNW18
11-Jan	S6	SSE7	SSE7	SSE9	S9	SSE6	ESE6	E4	E6	E6	ENE7	ENE7	ENE7	E13	ENE13	ENE16	ENE12	ENE11	ENE8	NNE6	NE6	NE4	NE4	ENE4	E5.6	ENE16
12-Jan	N5	NNW7	NW11	NW11	NW14	WNW20	WNW20	WNW20	WNW18	W16	WSW14	WSW14	WSW10	SW12	SW12	SW8	SSW7	SSE6	SSE6	SSE7	SE6	SSE8	SSE7	SSE7	W6.6	WNW20
13-Jan	SE11	SSE13	SSE9	SSE7	SSW7	SW10	W13	WSW15	W16	WNW19	WNW16	WNW16	WNW18	WNW20	WNW18	WNW13	W11	W11	W11	W11	W7	WSW0	NNW1	NW1	W8.4	WNW20
14-Jan	NNE4	NNE3	E3	ENE4	ENE3	E3	E3	SE6	SE9	SE10	SE8	SSE12	S13	S13	SSE11	S9	S10	S12	S15	S11	S13	S14	S14	SSW21	SSE7.7	SSW21
15-Jan	SW25	SW30	WSW32	W35	W27	W39	W36	W38	W43	W55	WNW54	WNW48	WNW46	WNW44	WNW39	WNW38	WNW34	W31	WNW29	WNW22	W21	W21	W18	W19	W33.1	W55
16-Jan	W20	WSW15	WSW17	WSW14	SW10	SW8	WSW9	SW11	SW9	SW8	SW10	SW9	WSW8	SW8	SW9	SW8	SSW9	SW10	SW11	SW10	SW11	SW11	SW11	S7	SW10.1	W20
17-Jan	SSW8	SSW7	SW9	SW12	WSW13	WSW17	WSW14	SW13	SW12	W17	W25	WNW21	WNW21	W23	WNW25	WNW28	WNW25	WNW21	NW14	NW15	WNW10	W9	WSW10	SW9	W13.9	WNW28
18-Jan	SW7	SSW7	S7	SSW8	SSW10	SSW14	SSW14	SSW14	SW13	SW13	WSW13	SW12	SW12	AF	AF	AF	SW8	SSW7	SSW4	ESE3	SSE3	SW8	SW9	WSW17	SW9.1	WSW17
19-Jan	WSW24	WSW25	WSW27	W31	W26	WSW21	WSW19	WSW18	WSW12	WSW15	WSW17	WSW21	W30	W23	WNW22	NW26	NW25	NW23	NW21	NW20	NW13	NW11	NW8	NW6	W17.4	W31
20-Jan	N4	ENE3	SE4	SE5	SSE5	S7	SSE5	SE5	SSE6	SSE7	S8	S8	SSW12	SSW12	SSW11	SSE8	SSW6	SSW7	SW10	SW13	WSW11	WNW15	WNW20	NW15	SSW5.0	WNW20
21-Jan	NW11	NW10	NW11	NW10	WNW6	SW5	SSW6	SSW8	SSW8	NNW3	WNW10	WNW11	NW11	NW14	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	----	NW14
22-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	S12	S12	S12	SSW15	SSW14	SSW12	SSW13	----	SSW15
23-Jan	SSW12	SSW11	SSW11	SSW9	SW8	SW8	SSW9	SW10	WSW12	WSW14	WSW14	WSW15	W19	NW17	NW17	NW17	W12	WSW11	WSW12	WSW14	WSW13	WSW12	WSW14	WSW13	WSW11.0	W19
24-Jan	WSW15	WSW15	W16	W22	W23	W18	W19	WNW15	WNW11	NW10	N8	N7	NNW8	NNE9	N10	NNE9	N11	NNE8	NNE6	ENE4	E4	ESE4	SE3	ESE5	WNW6.4	W23
25-Jan	SSE7	S9	SSW8	SSW6	SW8	WSW15	WSW15	WSW16	W21	WNW19	WNW24	NW30	NW31	NW28	NW23	NW24	NW26	NNW23	NNW20	NNW22	NNW23	NNW28	NW28	NW31	NW16.4	NW31
26-Jan	NW25	NNW22	NW30	NW25	NNW23	NNW15	NW17	NW14	NW11	NW13	NW13	NW11	NW8	WNW5	NW7	WNW8	WNW6	W4	WNW4	NE3	NE3	E3	SSE2	SE3	NW10.3	NNW30
27-Jan	SE2	S3	S4	S3	SSE2	S2	S3	S3	SSE4	S3	S2	SE4	SW6	SW9	SW7	SW7	SW6	SSW5	S5	S4	S6	S6	SSW9	SSW9	SSW4.5	SSW9
28-Jan	S10	S7	SSE6	SSE6	S7	SSW7	S4	SSE5	SE5	SSW7	SSW9	SW9	WSW10	SW9	SW10	W14	WNW17	NW10	NW12	NW14	NNW15	NW19	NNW15	NNW17	W5.0	NW19
29-Jan	NNW17	NW15	NW9	NW9	NW11	NW8	WNW11	WNW10	WNW9	NW8	WNW10	NW11	NW9	NW13	NNW14	NW17	NNW18	NW18	NNW17	NNW16	NNW10	NW9	NW10	NW13	NW11.8	NW18
30-Jan	NW14	NW14	NW15	NW16	NW15	NW13	WNW13	W13	W13	W15	WSW14	WSW13	WSW13	WSW14	WSW13	SW13	SW12	SW10	SW17	SW16	SW13	SW15	WSW15	WSW12	W11.6	SW17
31-Jan	WSW11	SW7	WNW11	WNW12	NW10	NW11	NW17	NW14	NW12	NW12	W13	NW19	NW18	NW16	NW17	NW14	NNW17	NNW13	NNW10	NW11	NW14	WNW11	NW12	NW12	NW12.3	NW19
	WSW5.4	WSW5.4	WSW5.9	WSW6.5	WSW6.1	WSW6.7	WSW6.6	WSW7.0	WSW6.9	WSW7.8	W8.7	W8.7	W9.7	W8.8	W8.3	WNW7.8	WNW7.4	W5.6	W5.0	W4.7	W4.4	WSW5.0	WSW5.3	W4.9	Diurnal Average	
	NW25	SW30	WSW32	W35	W27	W39	W36	W38	W43	W55	WNW54	WNW48	WNW46	WNW44	WNW39	WNW38	WNW34	W31	WNW29	NNW22	NNW23	NNW28	NW28	NW31	Diurnal Maximum	

AF - Analyzer Failure

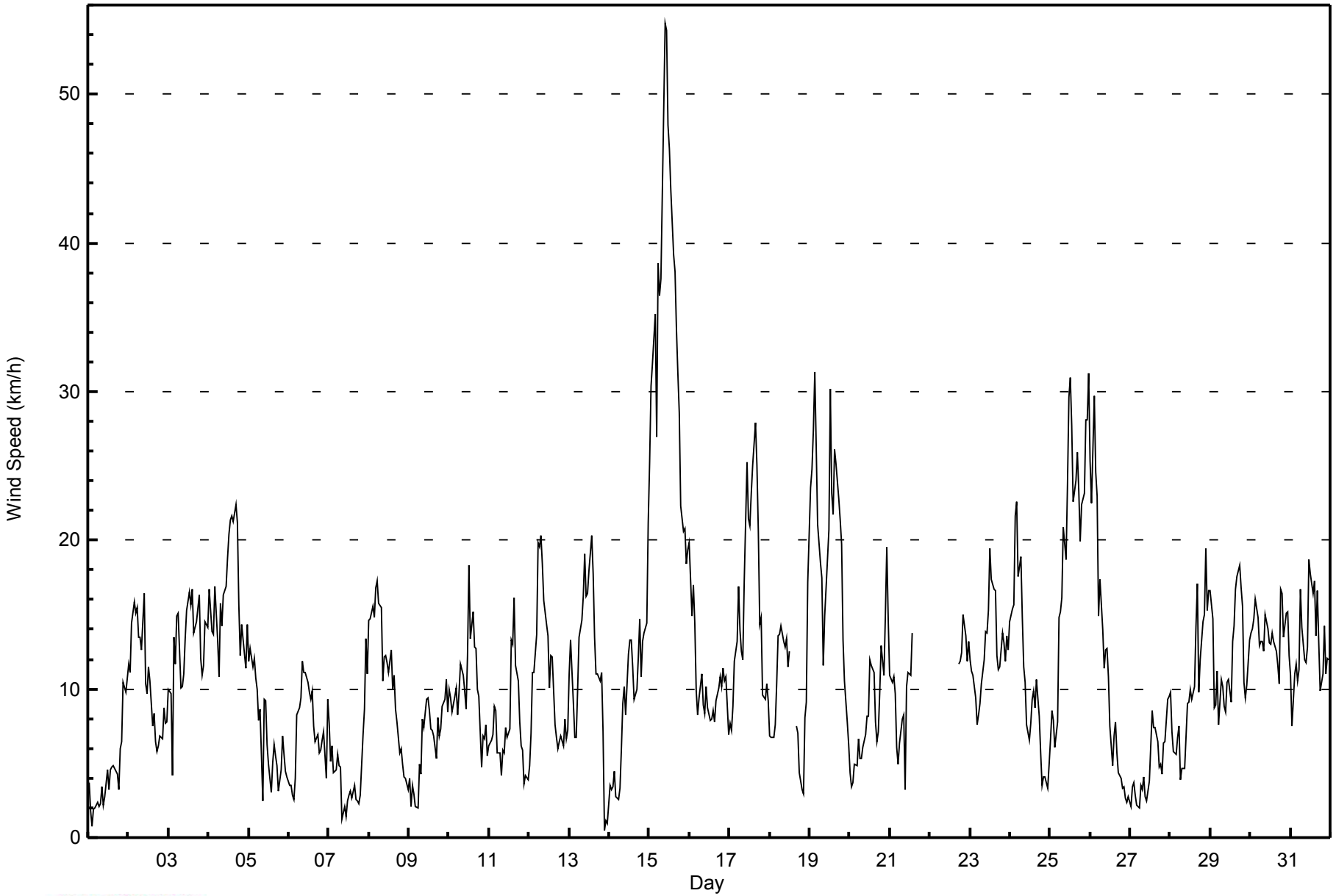
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

Cenovus - Christina Lake - January 2014



AURORA
ATMOSPHERICS INC.

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	125	17.51	17.51
6 - 11	283	39.64	57.14
12 - 19	226	31.65	88.80
20 - 28	57	7.98	96.78
29 - 38	15	2.10	98.88
> 38	8	1.12	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

Cenovus - Christina Lake - January 2014

Wind Speed Ranges (km/h)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	4	6	6	10	6	12	20	19	20	7	2	4	2	2	1	4	125
6 - 11	8	5	1	7	4	7	17	25	22	50	69	11	6	16	30	5	283
12 - 19	2	0	0	3	1	0	4	14	16	11	16	46	28	30	43	12	226
20 - 28	0	0	0	0	0	0	0	0	0	1	1	5	11	17	15	7	57
29 - 38	0	0	0	0	0	0	0	0	0	0	1	1	6	3	3	1	15
> 38	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0	0	8
Totals	14	11	7	20	11	19	41	58	58	69	89	67	56	73	92	29	714

Total Number of Valid Hours: 714

Total Number of Hours: 744

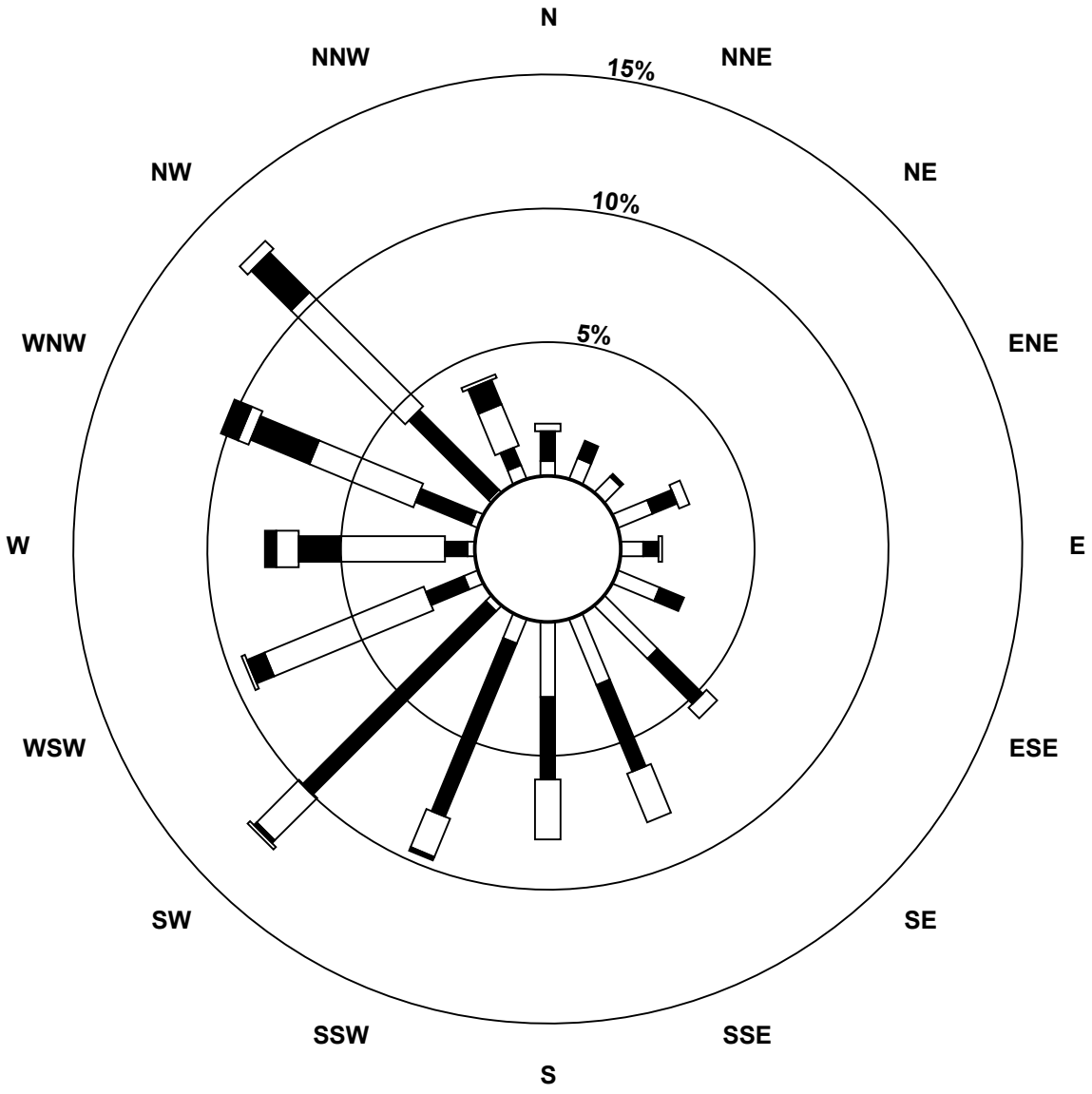
AURORA ATMOSPHERICS INC.

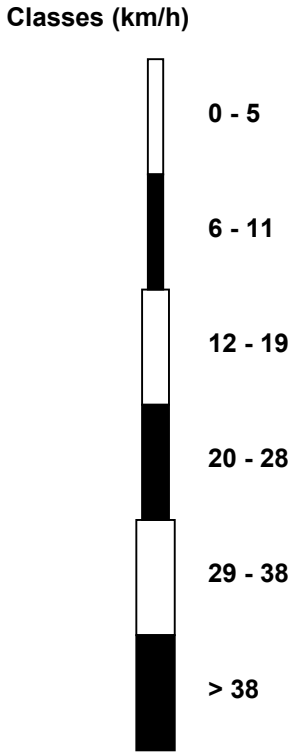
Wood Buffalo Environmental Association

Wind Rose Jan 2014

Wind Speed (WS) - km/h

Cenovus - Christina Lake (AMS500)





Total Number of Valid Hours: 714

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Cenovus - Christina Lake - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 22 km/h on Jan 15 04:00

Minimum Value: 0 km/h on Jan 9 04:00

Percentiles: P_1 = 1 P_{10} = 1 Q_1 = 2 Median = 3 Q_3 = 4 P_{90} = 5 P_{99} = 12

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Hours of Calibration:	0
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	3	3
2-Jan	3	3	3	4	4	4	3	4	4	4	4	3	4	3	3	3	2	2	2	1	1	2	2	1	4
3-Jan	2	2	3	3	3	4	4	4	3	3	3	3	4	4	4	3	4	3	4	4	4	3	3	3	4
4-Jan	4	4	4	4	4	4	3	5	4	4	5	5	5	5	5	6	6	6	5	4	3	3	3	3	6
5-Jan	3	4	3	3	2	2	2	1	3	2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	4
6-Jan	1	1	1	1	3	2	2	2	2	3	3	3	2	2	2	2	1	1	1	1	1	2	2	2	3
7-Jan	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	3
8-Jan	3	3	4	4	4	4	4	4	4	3	4	4	3	3	3	3	2	2	1	1	2	2	2	1	4
9-Jan	1	2	1	0	1	1	2	2	2	2	3	3	3	2	2	2	2	2	2	2	3	2	2	3	3
10-Jan	3	3	2	3	3	2	3	3	3	3	2	4	4	4	4	4	3	3	3	2	1	2	2	1	4
11-Jan	1	1	2	2	2	1	1	1	1	1	1	2	3	3	3	4	3	3	3	1	1	1	1	1	4
12-Jan	1	2	3	2	5	5	5	5	4	5	4	4	3	3	4	3	2	1	1	1	1	2	2	2	5
13-Jan	3	4	2	3	3	3	5	4	4	4	4	4	5	5	4	3	2	3	3	3	4	2	2	2	5
14-Jan	2	1	1	1	2	1	1	1	2	2	3	3	4	3	3	2	3	3	4	3	3	3	4	7	7
15-Jan	7	9	9	22	18	14	10	14	18	14	13	10	11	11	10	9	8	7	7	5	5	5	5	5	22
16-Jan	6	4	4	4	2	2	2	3	2	3	3	3	3	2	2	2	2	2	3	3	3	3	3	2	6
17-Jan	2	3	3	3	4	5	3	3	3	7	6	5	5	6	7	6	5	5	3	3	3	2	2	2	7
18-Jan	1	1	1	2	2	3	3	4	4	4	4	3	3	AF	AF	AF	1	2	1	2	1	2	3	5	5
19-Jan	7	6	7	9	8	5	5	6	3	5	5	6	8	7	8	8	7	6	6	5	4	3	2	2	9
20-Jan	1	1	1	1	2	2	1	1	1	2	2	3	3	3	3	2	2	2	3	3	4	3	5	4	5
21-Jan	3	3	3	2	3	3	2	1	2	3	3	2	3	4	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	4
22-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	3	3	4	5	4	4	4	5
23-Jan	4	3	3	3	2	2	2	4	4	4	4	4	6	4	4	4	3	3	3	4	3	3	3	4	6
24-Jan	4	4	5	5	5	5	5	4	3	3	2	2	2	2	3	2	3	2	1	1	1	1	1	1	5
25-Jan	2	2	2	2	4	4	3	4	5	4	6	7	8	8	6	7	7	7	5	6	8	9	10	9	10
26-Jan	8	7	9	7	8	4	4	4	3	3	3	3	3	2	2	3	3	2	2	1	2	1	1	1	9
27-Jan	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	2	1	1	3	3	3
28-Jan	3	2	2	2	2	3	1	2	2	3	3	3	3	2	3	4	4	3	4	4	5	5	4	5	5
29-Jan	5	4	2	2	3	2	3	3	2	2	2	3	2	4	4	4	5	5	5	5	3	2	3	3	5
30-Jan	3	3	3	4	3	3	3	3	4	4	4	3	3	4	4	3	4	3	5	5	4	4	4	3	5
31-Jan	2	3	4	2	3	3	4	3	3	3	4	4	4	4	4	4	4	4	3	4	4	2	4	3	4
	8	9	9	22	18	14	10	14	18	14	13	10	11	11	10	9	8	7	7	6	8	9	10	9	
	Diurnal Maximum																								

AF - Analyzer Failure

Direction of Maximum Speed: 278 deg on Jan 15 10:00
Direction of Maximum Daily Speed Average: 272.7 deg on Jan 15

Direction of Minimum Speed: 248 deg on Jan 13 22:00

Direction of Minimum Daily Speed Average: 1.9 deg on Jan 7

Monthly Average Direction: 259.3 deg

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average
1-Jan	209	166	113	193	167	156	126	153	150	136	138	177	116	160	122	120	146	126	125	161	142	158	157	145	149.0
2-Jan	148	154	153	143	145	157	170	176	186	188	204	205	219	226	222	218	224	210	233	222	212	221	218	215	187.1
3-Jan	225	224	243	298	342	354	351	350	325	313	301	303	305	309	301	303	302	300	298	277	257	257	286	289	300.6
4-Jan	275	266	258	261	266	260	247	262	252	261	267	287	294	299	299	312	320	319	322	303	303	306	306	292	287.2
5-Jan	274	258	250	255	230	227	220	212	188	221	219	238	259	272	235	204	181	176	128	166	179	172	149	107	223.1
6-Jan	115	69	76	66	132	131	126	122	129	128	124	120	105	130	129	120	117	124	87	77	81	79	68	359	110.3
7-Jan	10	350	330	21	31	351	346	348	24	174	147	95	45	16	354	67	140	159	135	111	123	135	142	131	73.4
8-Jan	146	154	161	158	160	163	159	162	168	171	178	189	200	207	215	218	216	218	193	194	190	202	180	179	177.2
9-Jan	192	119	136	172	155	48	162	145	182	174	190	209	212	209	198	188	202	204	206	202	200	197	204	209	193.0
10-Jan	207	203	202	216	216	232	230	240	233	231	225	267	285	271	261	278	288	298	287	244	217	215	212	157	244.8
11-Jan	172	148	166	168	175	158	118	95	86	100	65	74	60	84	68	64	63	73	76	31	47	37	42	63	88.0
12-Jan	11	333	304	307	305	300	296	289	288	279	252	250	243	232	234	216	193	157	151	149	130	157	161	155	264.0
13-Jan	138	158	166	162	212	234	278	254	261	284	291	298	291	299	296	293	281	274	276	271	260	248	327	315	269.9
14-Jan	20	26	95	68	75	101	101	129	140	130	145	166	177	169	165	170	176	176	180	177	188	178	188	213	167.7
15-Jan	222	232	246	265	268	263	264	262	271	278	282	283	284	286	288	287	283	281	289	286	278	268	261	267	272.7
16-Jan	267	255	256	250	235	229	237	230	217	221	227	228	238	231	217	214	213	226	227	228	232	221	215	190	233.0
17-Jan	197	196	226	235	242	248	242	236	235	259	277	289	285	268	288	292	294	298	312	306	287	268	237	229	269.6
18-Jan	223	209	191	196	192	202	200	211	224	233	237	224	230	AF	AF	AF	215	210	199	113	162	223	220	239	215.3
19-Jan	253	250	253	266	266	252	250	255	237	247	245	250	268	265	301	316	319	321	319	321	319	315	310	323	277.1
20-Jan	2	78	140	144	150	179	150	137	155	168	180	179	198	192	193	165	200	202	216	231	239	282	297	305	209.4
21-Jan	308	306	311	311	282	236	200	208	209	344	282	301	312	321	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
22-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	179	179	189	206	206	204	204	--
23-Jan	213	207	202	213	215	216	205	232	242	247	250	257	275	304	306	304	261	244	245	250	249	247	243	244	249.6
24-Jan	248	249	259	272	275	281	281	302	292	304	354	356	344	14	8	19	5	13	18	74	95	117	130	114	302.0
25-Jan	154	176	193	201	234	254	254	252	275	284	296	311	314	318	325	315	311	328	333	334	334	327	322	326	306.6
26-Jan	325	335	326	320	329	327	325	321	315	315	321	315	313	286	313	302	296	264	297	45	42	100	160	140	322.2
27-Jan	143	179	180	173	166	180	173	177	164	174	184	126	216	233	219	225	217	198	172	184	190	174	200	192	192.9
28-Jan	190	180	156	159	186	193	179	157	145	199	211	229	237	227	236	271	303	317	322	322	332	312	329	335	270.6
29-Jan	329	326	324	319	305	304	285	297	295	310	301	309	312	318	331	325	328	325	337	336	331	320	311	310	318.5
30-Jan	312	310	308	310	313	312	301	278	260	263	257	255	242	244	243	235	229	223	224	228	232	227	243	249	262.0
31-Jan	242	232	302	303	307	306	306	309	315	314	279	304	308	308	309	319	329	339	334	321	310	303	310	316	307.8
	246.5	239.8	247.9	258.3	255.9	252.0	253.4	249.8	247.5	255.8	260.1	268.7	274.1	275.8	280.9	287.2	286.2	280.1	280.0	272.8	258.9	251.0	251.0	258.9	
	Diurnal Average																								

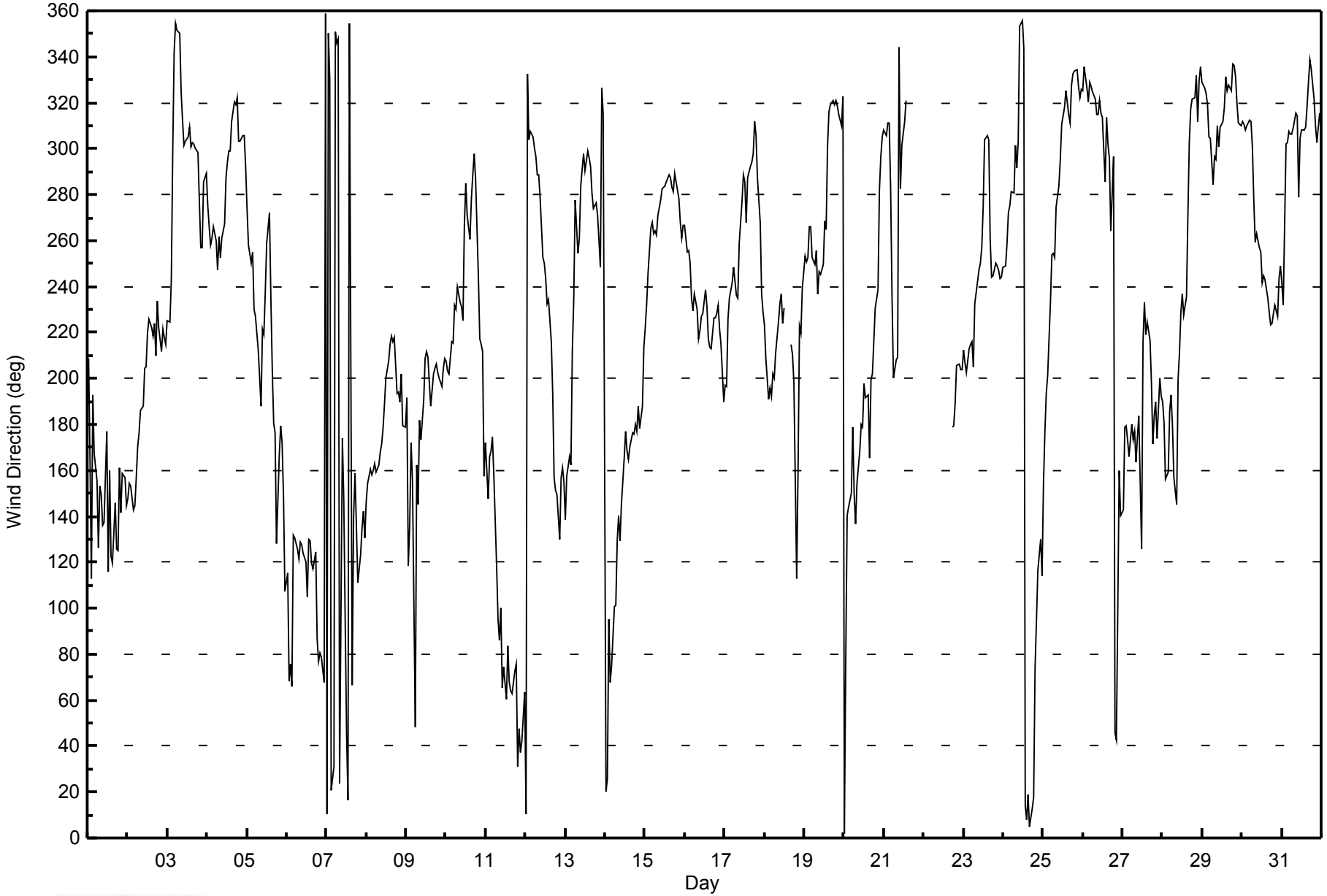
AF - Analyzer Failure
All monthly, daily, and diurnal averages have been calculated using vector methods

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

Cenovus - Christina Lake - January 2014



AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

Cenovus - Christina Lake - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 108 deg on Jan 13 22:00

Minimum Value: 9 deg on Jan 7 16:00

Percentiles: P_1 = 10 P_{10} = 14 Q_1 = 15 Median = 17 Q_3 = 21 P_{90} = 31 P_{99} = 77

Hours in Service:	744
Hours of Data:	714
Hours of Missing Data:	30
Hours of Calibration:	0
Percent Operational Time:	96.0

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	29	57	68	49	47	42	37	50	34	39	25	25	27	19	20	14	11	23	29	19	21	15	17	16	68
2-Jan	12	14	13	14	15	17	15	16	19	18	21	20	19	19	22	21	19	17	20	15	17	16	14	10	22
3-Jan	14	11	84	19	24	18	19	19	18	15	13	14	15	17	14	14	12	12	13	24	20	18	20	16	84
4-Jan	17	16	16	17	15	17	18	15	16	17	17	19	14	14	14	17	18	16	16	14	13	15	13	20	20
5-Jan	19	17	17	17	13	12	12	12	87	14	16	29	27	59	35	17	12	15	34	20	11	17	31	24	87
6-Jan	26	13	16	18	56	16	14	10	11	14	13	17	13	16	12	14	12	12	14	15	12	12	28	17	56
7-Jan	19	34	16	24	29	17	16	15	80	37	57	23	37	41	37	9	42	24	41	30	22	14	12	12	80
8-Jan	12	13	14	14	13	14	13	13	18	15	19	20	21	18	20	16	17	19	22	20	43	30	21	31	43
9-Jan	15	55	16	26	42	45	31	31	17	16	18	22	19	21	19	18	19	21	22	20	21	16	16	22	55
10-Jan	21	16	17	17	17	20	19	15	15	15	17	29	17	19	19	27	21	24	22	40	13	22	20	20	40
11-Jan	22	13	12	13	12	18	15	20	16	26	10	17	18	13	13	13	15	16	19	14	14	44	32	19	44
12-Jan	30	19	14	15	15	13	14	17	15	20	18	16	19	17	17	20	20	24	12	10	10	16	16	17	30
13-Jan	14	17	17	20	29	19	29	17	18	15	16	16	16	14	15	22	17	20	22	22	72	108	102	96	108
14-Jan	40	42	38	12	20	41	36	21	12	10	17	17	15	13	13	17	17	16	14	16	17	17	17	19	42
15-Jan	17	16	17	33	13	16	17	17	15	15	15	14	15	15	15	15	15	16	15	15	16	15	16	16	33
16-Jan	15	16	15	16	15	14	16	19	16	18	19	19	24	22	19	16	14	17	18	17	17	18	17	17	24
17-Jan	18	32	22	17	16	15	15	15	15	23	15	16	17	15	16	15	14	15	15	16	24	22	16	15	32
18-Jan	14	12	16	20	15	16	15	16	19	18	17	19	16	AF	AF	AF	11	21	31	50	49	16	17	19	50
19-Jan	15	16	16	17	18	15	16	19	14	18	18	16	18	20	35	17	16	17	17	17	15	16	14	25	35
20-Jan	23	44	30	18	21	14	18	13	14	15	18	21	19	17	19	19	26	23	18	18	18	17	14	15	44
21-Jan	14	15	15	15	44	63	47	11	25	87	23	15	23	22	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	87
22-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	17	16	18	18	18	20	20	20
23-Jan	19	19	17	20	22	22	21	24	20	15	17	15	18	15	13	15	16	13	14	14	15	14	17	16	24
24-Jan	17	15	18	13	13	15	15	17	19	17	31	22	20	21	19	18	21	21	22	29	17	22	38	23	38
25-Jan	16	15	17	21	20	16	14	14	13	15	14	16	16	18	17	16	16	18	18	19	19	17	18	17	21
26-Jan	18	20	17	16	18	20	14	17	17	16	18	19	33	48	27	28	54	45	36	55	45	33	33	18	55
27-Jan	27	23	16	26	50	56	22	29	21	38	54	40	42	22	22	23	14	17	9	28	17	16	20	21	56
28-Jan	20	14	24	31	16	22	26	36	39	20	21	24	21	19	22	17	17	15	17	22	24	16	18	19	39
29-Jan	16	16	19	15	15	13	17	15	17	23	17	18	21	18	20	17	17	18	20	20	19	16	15	15	23
30-Jan	15	15	14	14	15	15	19	18	19	19	18	17	19	18	18	19	18	17	17	18	18	17	18	15	19
31-Jan	14	46	19	12	13	13	13	14	16	17	18	15	14	14	15	16	18	18	20	17	16	20	18	16	46
	40	57	84	49	56	63	47	50	87	87	57	40	42	59	37	28	54	45	41	55	72	108	102	96	
	Diurnal Maximum																								

AF - Analyzer Failure

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	December 31, 2013	Previous Calibration	NA
Station Name	Cenovus	Station Number	AMS 103

Reason: Install

Start Time (MST)	14:30	End Time (MST)	18:00
Barometric Pressure	mmHg	Station temp.	18 Deg C
Calibrator Make/Model	API T700	Serial Number	451
Cal Gas Concentration	49.4 ppm	Cal Gas Expiry Date	10/6/2016
Gas Cert Reference	EY0000359		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8203
DACS voltage range	0-5V	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage	13	13
Analyzer Range (mv)	1000	1000	Lamp voltage	3598	3598
Calculated slope	NA	1.002413	Chamber temp.	50.0	50.0
Calculated intercept	NA	-1.961462	Pressure (mmHg)	25.3	25.3
Analyzer Background	13.8	14.3	Flow (lpm)	645.000	645.000
Analyzer Coefficient	1.060	1.053	Intensity	89	89

Analyzer make	API T100	Analyzer serial #	720

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero					
as found span					
calibrator zero	4996	0.0	0.0	0.0	N/A
high point	5000	81.1	801.3	800.0	1.002
second point	5000	40.6	401.1	404.0	0.993
third point	5000	20.3	200.6	203.4	0.986
calibrator zero	4996	0.0	0.0	0.0	N/A
as left zero					
as left span					
				Average Correction Factor	0.994

Corrected As found	NA	Previous response	NA	% change	NA

Notes:

As lefts not complete due to site time restriction

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

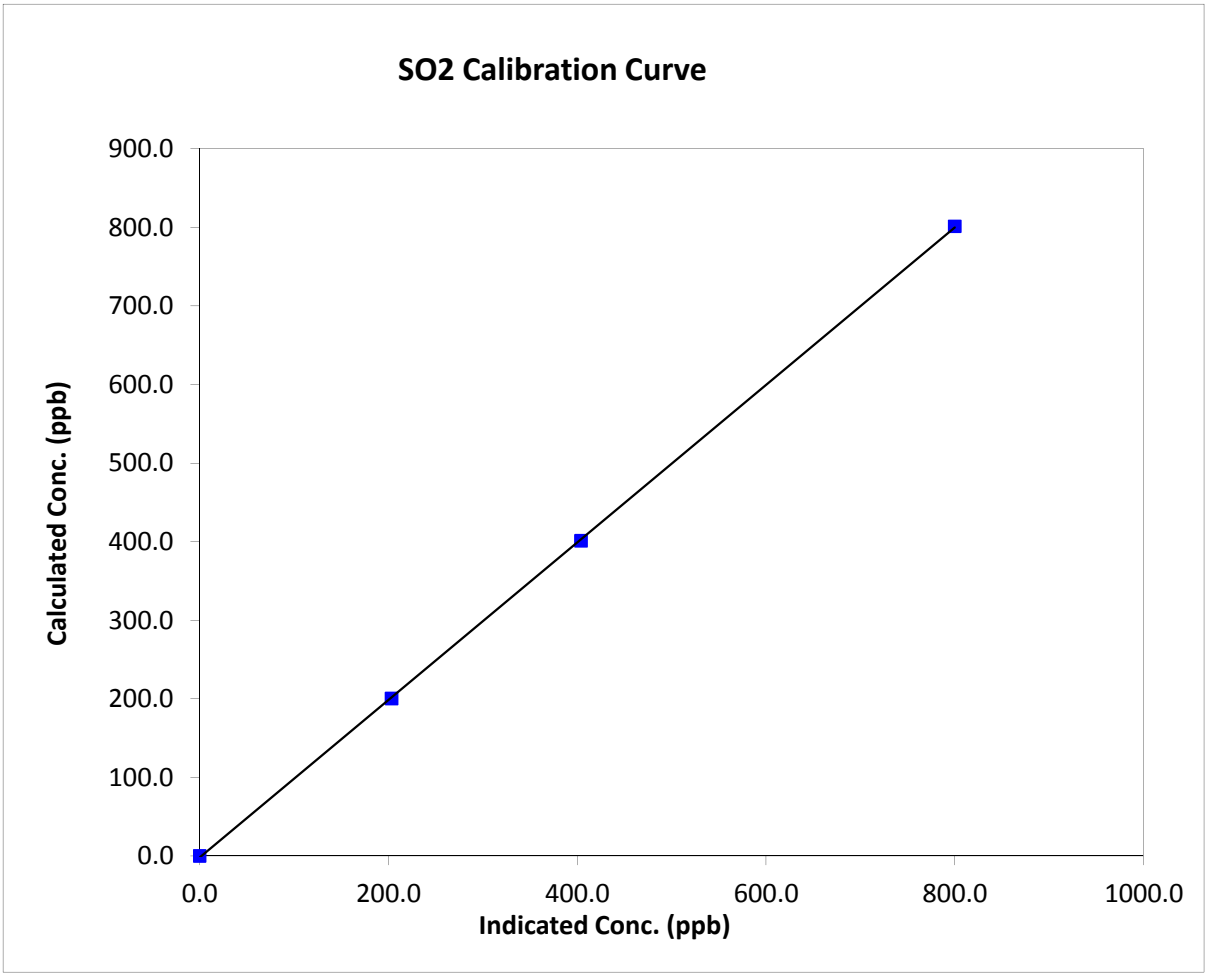
SO_2 Calibration Summary

Station Information

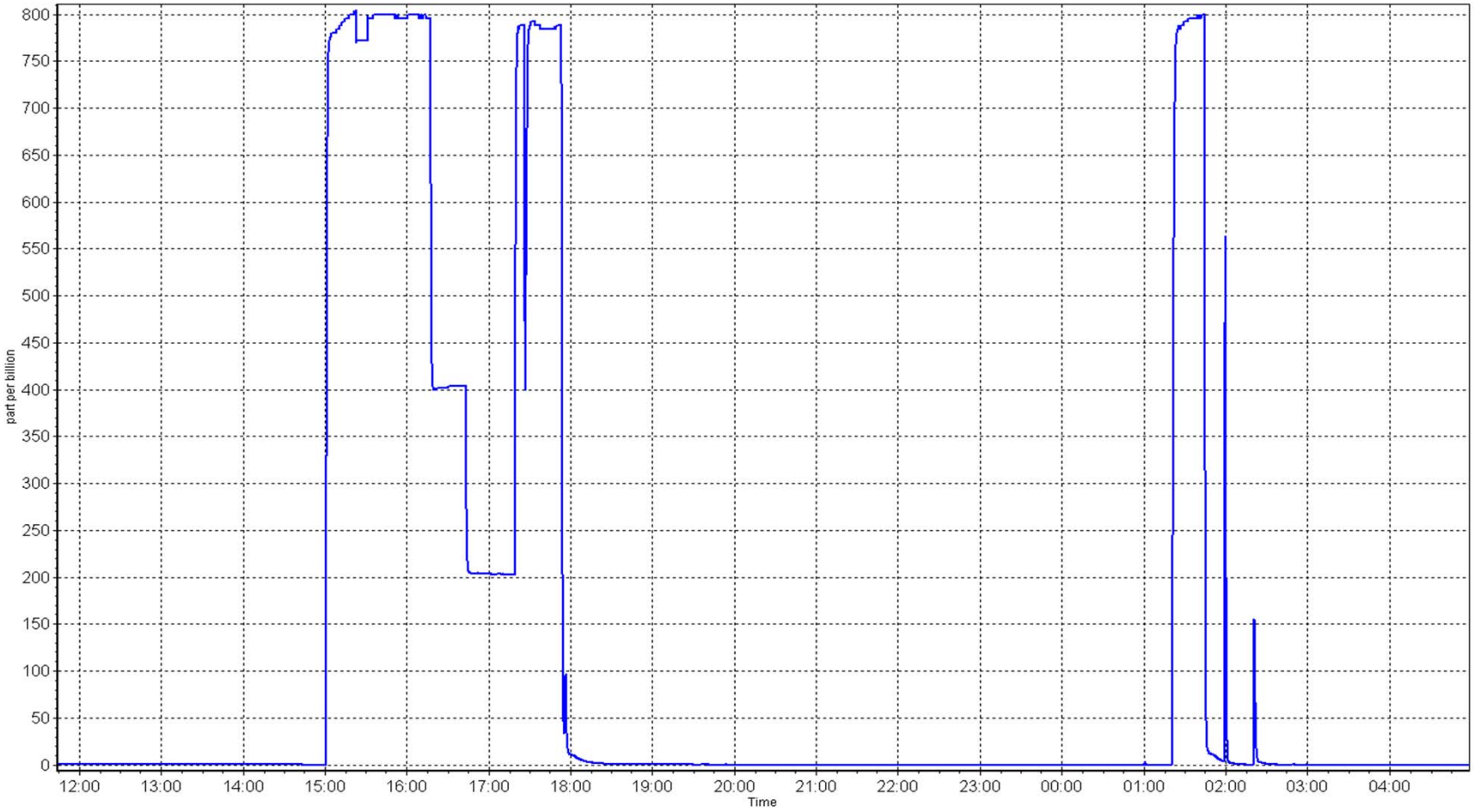
Calibration Date	41639	Previous Calibration	
Station Name	Cenovus	Station Number	AMS 103
Start Time (MST)	14:30	End Time (MST)	18:00
Analyzer make	API T100	Analyzer serial #	720

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999969
801.3	800.0	1.0016		
401.1	404.0	0.9929	Slope	1.002413
200.6	203.4	0.9861		
			Intercept	-1.961462



SO_2 Calibration Plot **Date:** December 31, 2013



Wood Buffalo Environmental Association

H2S/TRS Calibration Report

Station Information

Calibration Date	December 31, 2013	Previous Calibration	NA
Station Name	Cenovus	Station Number	AMS 103
Reason:	Install		
Start Time (MST)	8:20	End Time (MST)	14:25
Barometric Pressure	mmHg	Station temp.	13 Deg C
Calibrator Make/Model	API T700	Serial number	451
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	5/30/2016
Gas Cert Reference	LL23598	SO2 gas conc.	49.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8203
DACS voltage range	0-5V	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	10	13
Analyzer Range (mv)	5000	5000	Lamp voltage	2697	2687
Calculated slope		1.000127	Chamber temp.	50	50
Calculated intercept		0.693289	Pressure	23.1	23.2
Analyzer Background	17.1	27.3	Flow	0.562	569.000
Analyzer Coefficient	1.010	0.957	Intensity	67	66
			Converter temp.	316	315

Analyzer make/model	API T101	Analyzer serial #	157
Converter make/model	API T101	Converter serial #	

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	0.3	N/A
as found span	5000	36.7	74.9	76.4	0.980
SO2 scrubber check	4999	10.2	100.8	3.3	N/A
calibrator zero	4997	0.0	0.0	-0.3	N/A
high point	5000	36.7	74.9	74.5	1.005
second point	5000	19.6	40.0	38.8	1.032
third point	5002	9.9	20.2	19.4	1.043
calibrator zero	5000	0.0	0.0	0.0	N/A
as left zero	5000	0.0	0.0	-1.6	N/A
as left span	5000	39.3	80.2	74.8	1.071
				Average Correction Factor	1.027

Corrected As found	76.1	Previous response	NA	% change	NA

Notes:

Scrubber issues, replaced, and installed old one again.

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

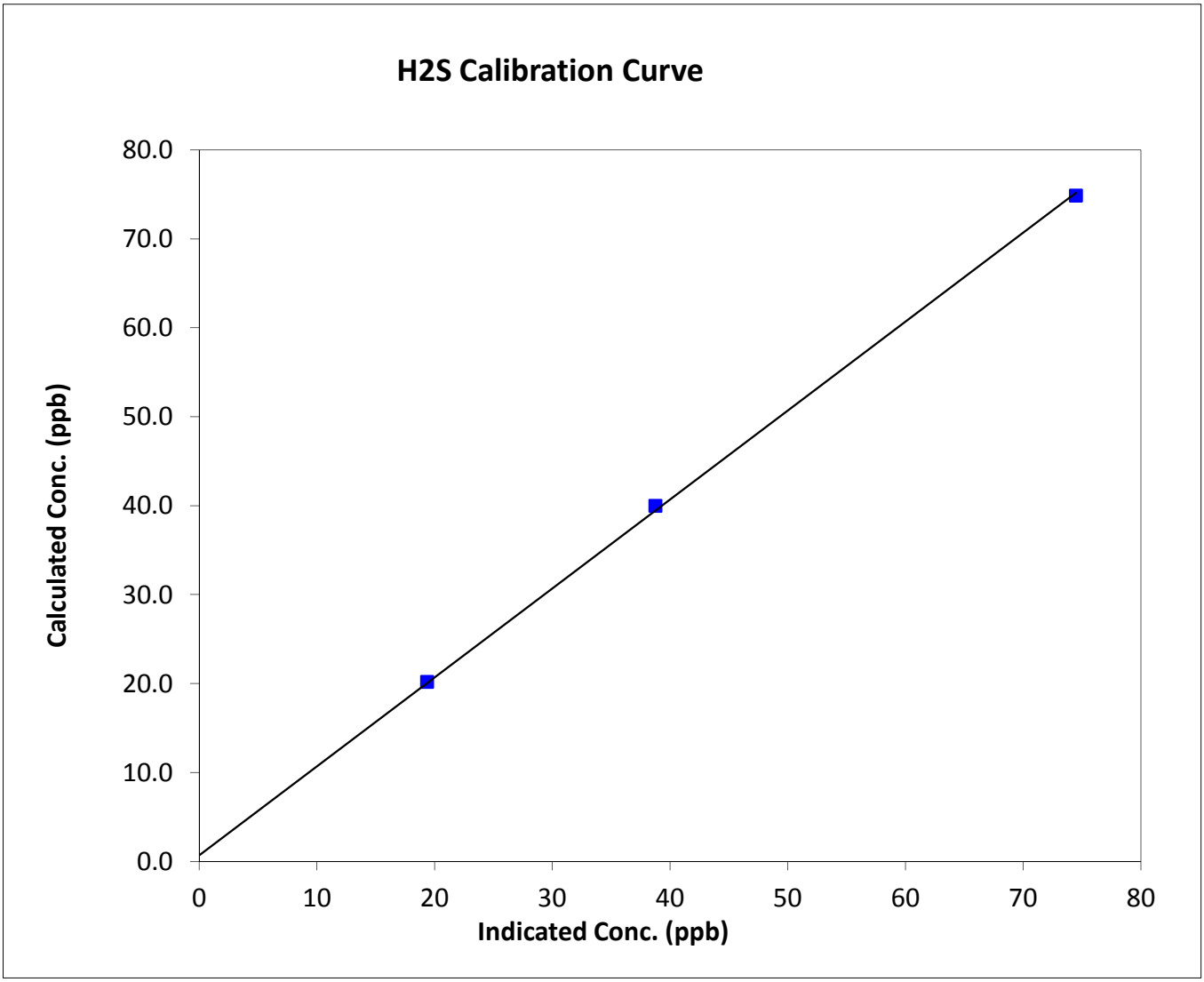
H2S Calibration Summary

Station Information

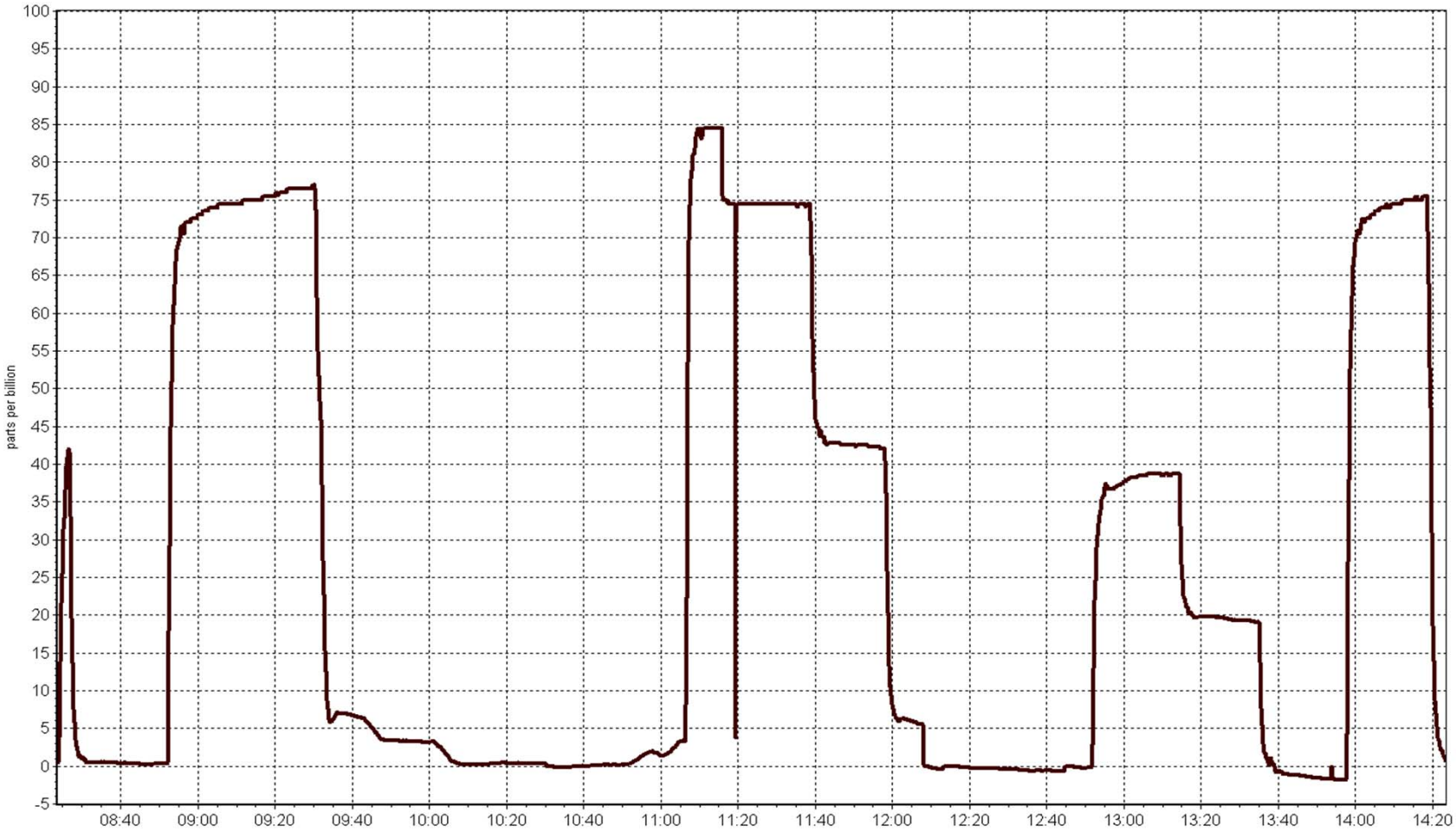
Calibration Date	December 31, 2013	Previous Calibration	
Station Name	Cenovus	Station Number	AMS 103
Start Time (MST)	8:20	End Time (MST)	14:25
Analyzer make	API T101	Analyzer serial #	157

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999827
74.9	74.5	1.0052		
40.0	38.8	1.0318	Slope	1.000127
20.2	19.4	1.0428		
			Intercept	0.693289



H2S Calibration Plot Date: December 31, 2013



Wood Buffalo Environmental Association

H2S/TRS Calibration Report

W B E A

Station Information

Calibration Date	January 2, 2014	Previous Calibration	December 31, 2013
Station Name	CENOVUS	Station Number	103

Reason: Other: Baseline adjustment

Start Time (MST)	14:30	End Time (MST)	16:25
Barometric Pressure	mmHg	Station temp.	30 Deg C
Calibrator Make/Model	API T700	Serial number	451
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	5/30/2016
Gas Cert Reference	LL23598	SO2 gas conc.	49.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8203
DACS voltage range	0-5V	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	11	13
Analyzer Range (mv)	100	100	Lamp voltage	2697	2663
Calculated slope	1.000127	0.996248	Chamber temp.	50	50
Calculated intercept	0.693289	0.049812	Pressure	22.5	22.4
Analyzer Background	27.3	20.6	Flow	529	523
Analyzer Coefficient	0.957	0.983	Intensity	67	66
			Converter temp.	315	315

Analyzer make/model	API T101	Analyzer serial #	157
Converter make/model	API T101	Converter serial #	

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-3.1	N/A
as found span	5000	36.8	75.1	67.0	1.120
SO2 scrubber check					
calibrator zero	4997	0.0	0.0	-0.1	N/A
high point	5000	36.8	74.9	75.1	0.997
second point					
third point					
calibrator zero	5000	0.0	0.0	-0.1	N/A
as left zero	5000	0.0	0.0	0.0	N/A
as left span	5000	39.2	80.0	79.2	1.010
				Average Correction Factor	0.997

Corrected As found	70.1	Previous response	74.4	% change	6.1%

Notes:

Adjusted zero and span and ran remote as lefts to verify

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

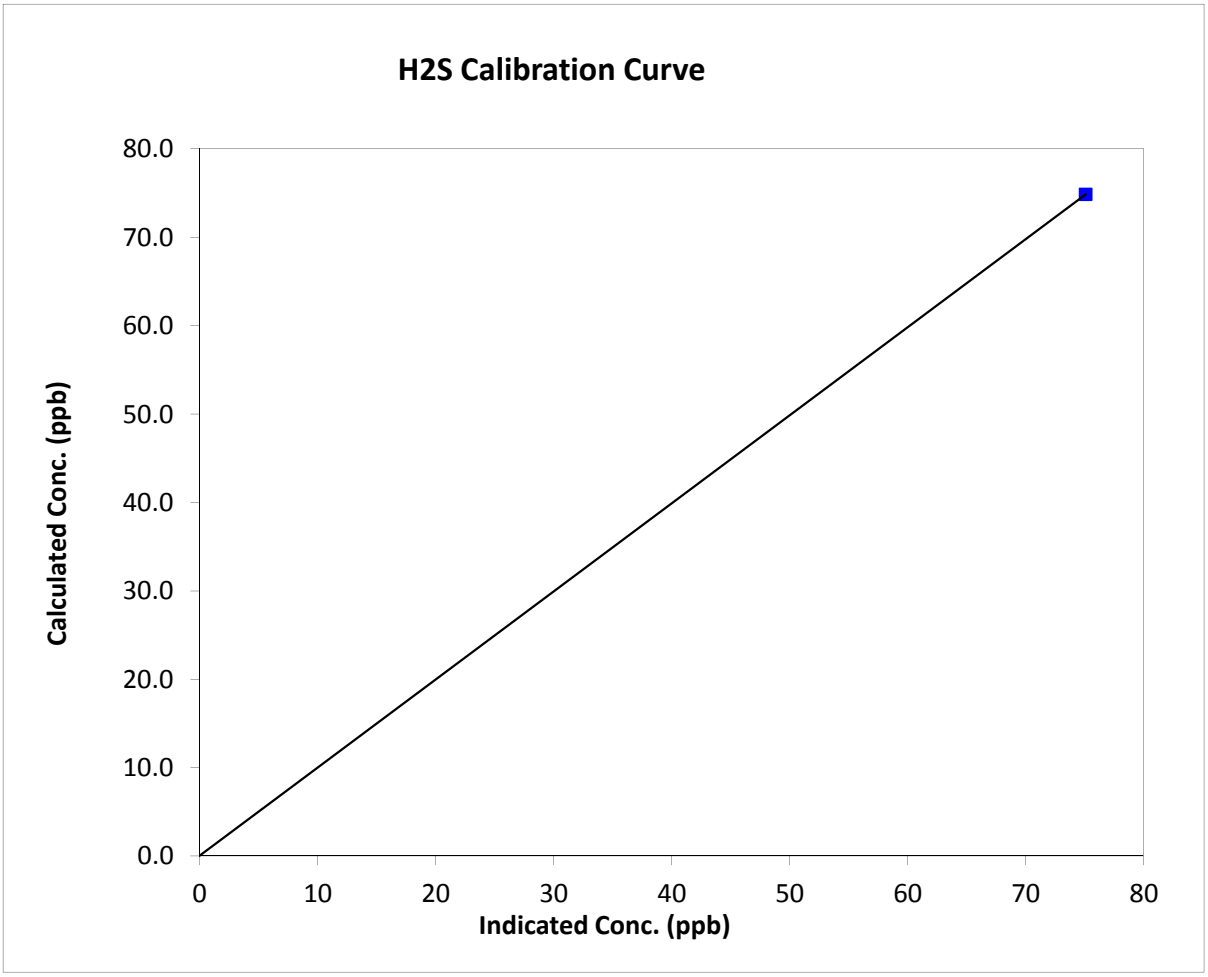
H2S Calibration Summary

Station Information

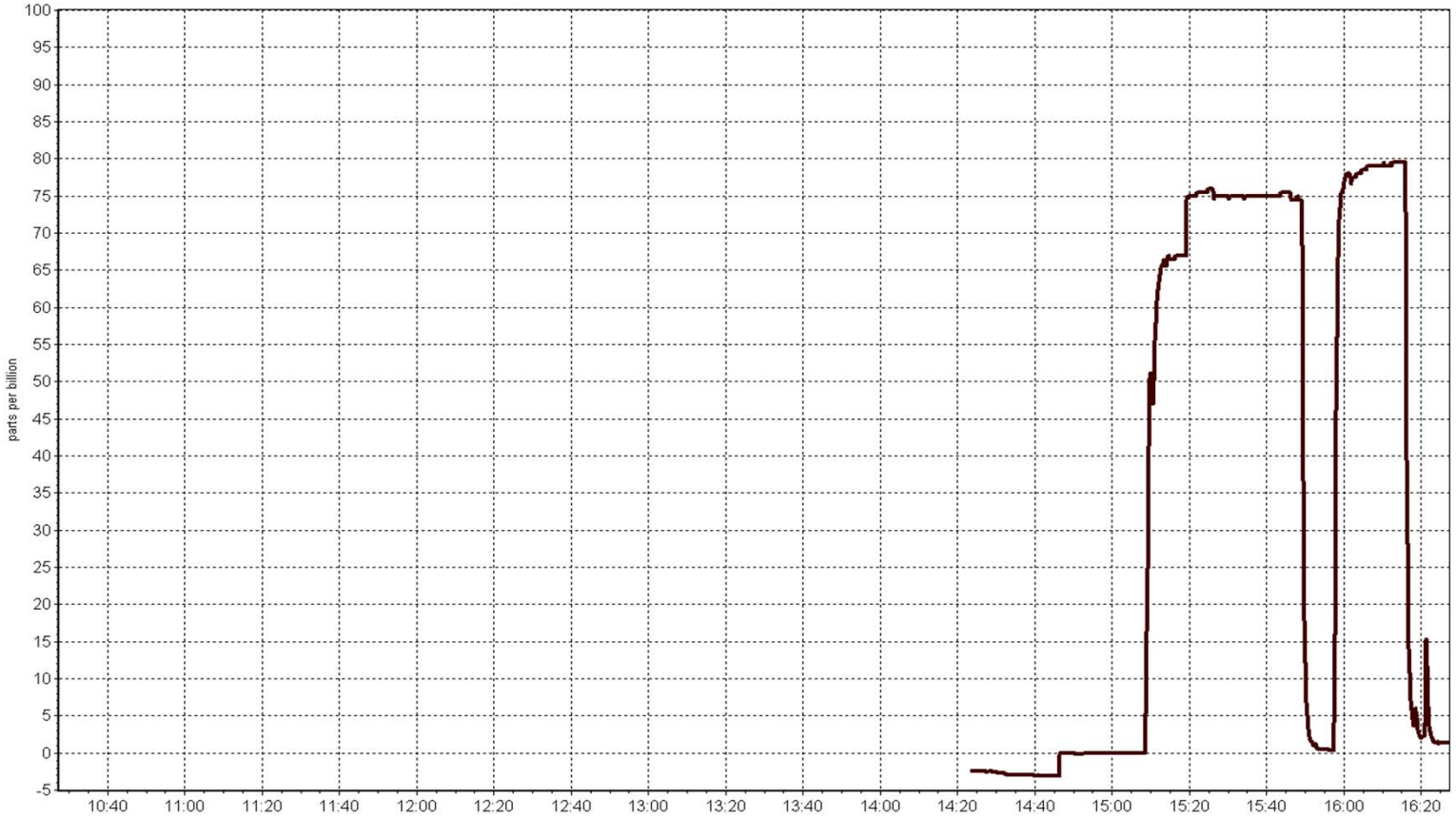
Calibration Date	January 2, 2014	Previous Calibration	December 31, 2013
Station Name	CENOVUS	Station Number	103
Start Time (MST)	14:30	End Time (MST)	16:25
Analyzer make	API T101	Analyzer serial #	157

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.1	N/A	Correlation Coefficient	1.000000
74.9	75.1	0.9969		
			Slope	0.996248
			Intercept	0.049812



H2S Calibration Plot Date: January 2, 2014



Wood Buffalo Environmental Association

H2S Calibration Report

W B E A

Station Information

Calibration Date	January 7, 2014	Previous Calibration	January 2, 2014
Station Name	CENOVUS	Station Number	103
Reason:	Routine		
Start Time (MST)	10:50	End Time (MST)	14:15
Barometric Pressure	NA mmHg	Station temp.	30 Deg C
Calibrator Make/Model	API T700	Serial number	451
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	5/30/2016
Gas Cert Reference	LL23598	SO2 gas conc.	49.4 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	8203

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage	13	12
Analyzer Range (mv)	100	100	Lamp voltage	2663	2663
Calculated slope	0.998360	1.000067	Chamber temp.	50	50
Calculated intercept	0.000998	-0.392299	Pressure	22.4	23.0
Analyzer Background	20.6	18.1	Flow	523	548
Analyzer Coefficient	0.983	0.979	Intensity	66	66
			Converter temp.	315	315

Analyzer make/model	API T101	Analyzer serial #	157
Converter make/model	Internal		

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	5000	0.0	0.0	-1.3	N/A
as found span	5000	36.8	75.1	73.4	1.023
SO2 scrubber check					
calibrator zero	4997	0.0	0.0	0.2	N/A
high point	5000	36.8	74.9	75.1	0.997
second point	5000	19.6	40.0	40.6	0.985
third point	5002	9.9	20.2	20.7	0.975
calibrator zero	5000	0.0	0.0	0.2	N/A
as left zero	5000	0.0	0.0	-2.0	N/A
as left span	5000	39.2	80.0	80.2	0.997
				Average Correction Factor	0.986

Corrected As found	74.7	Previous response	74.9	% change	0.3%

Notes:

Adjusted zero and span

Bypassed internal filter

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

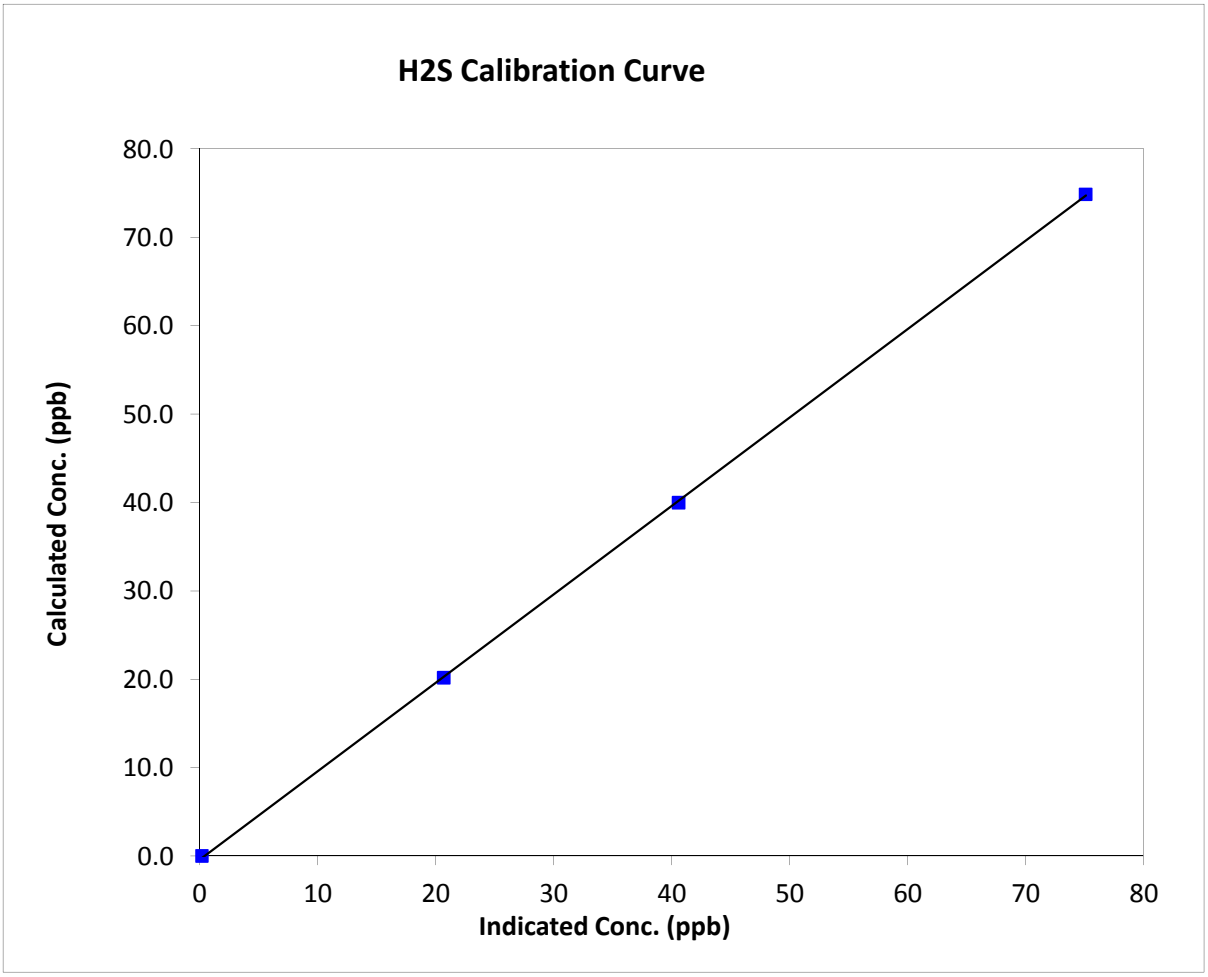
H2S Calibration Summary

Station Information

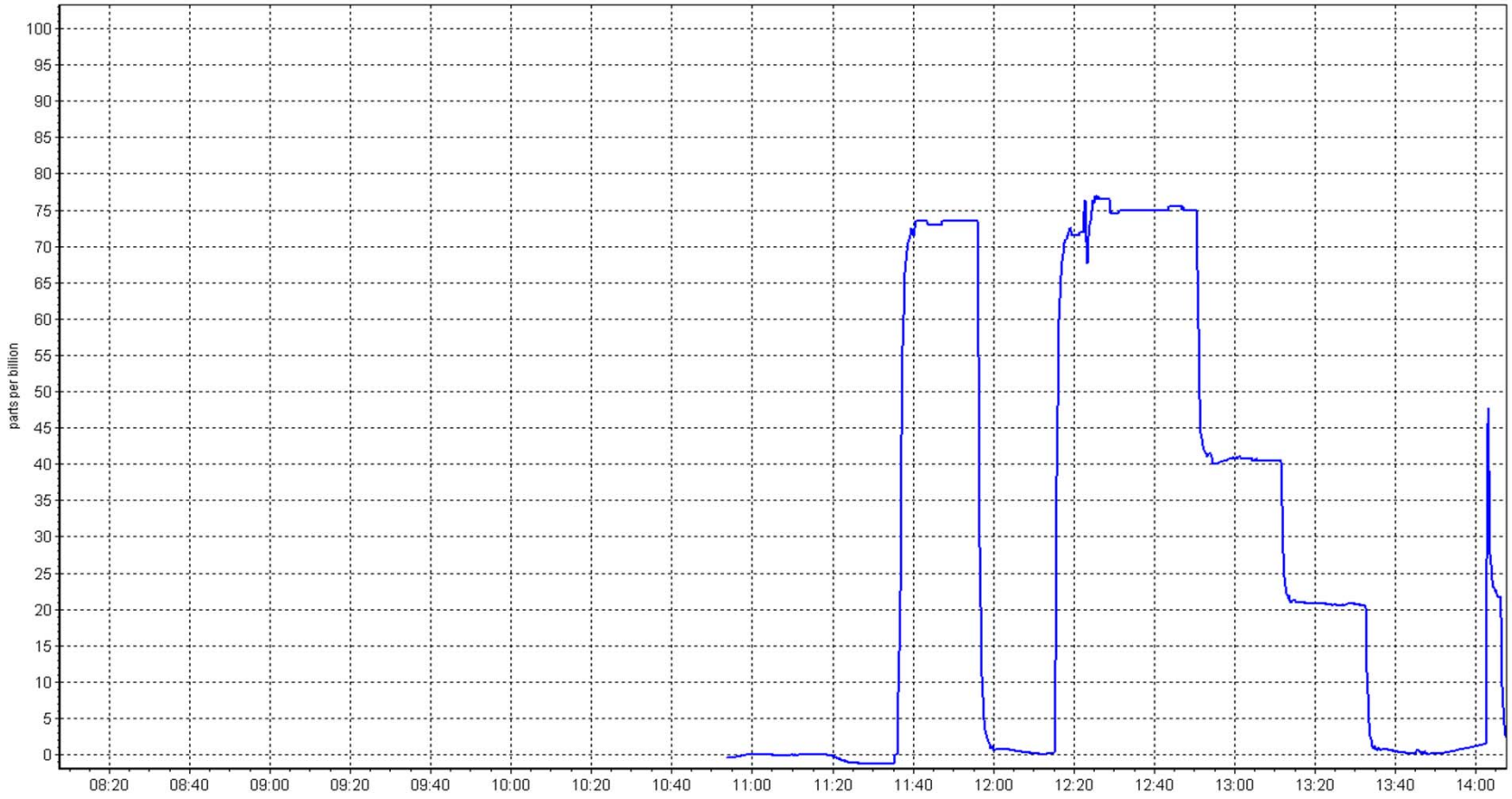
Calibration Date	January 7, 2014	Previous Calibration	January 2, 2014
Station Name	CENOVUS	Station Number	103
Start Time (MST)	10:50	End Time (MST)	14:15
Analyzer make	API T101	Analyzer serial #	157

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999958
74.9	75.1	0.9969		
40.0	40.6	0.9848	Slope	1.000067
20.2	20.7	0.9753		
			Intercept	-0.392299



H2S Calibration Plot Date: January 7, 2014



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	December 31, 2013	Previous Calibration	na
Station Name	CENOVUS	Station Number	AMS 103

Reason: Install

Start Time (MST)	14:30	End Time (MST)	18:00
Barometric Pressure	mmHg	Station Temperature	19.0 Deg C
Calibrator	Sabio 2010	Serial Number	
NO Cal Gas Conc	50.3 ppm	Cal Gas Expiry Date	October 6, 2016
NOx Cal Gas Conc	50.3 ppm	Cal Gas Serial #	EY0000359

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	8203

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	NA	NA	NA
	Data Offset	NA	NA	NA
After	Data Slope	1.000365	0.996435	0.991654
	Data Offset	0.842393	4.078272	1.487481
Channel #				
Voltage Range				

Analyzer Information

Analyzer make/model	Teledyne T200	Analyzer serial #	722

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient		ppb	1.024	ppb
NOX coefficient		ppb	1.029	ppb
NO2 coefficient		ppb		ppb
NO bkgrnd	-0.6		-0.8	
NOX bkgrnd	6.4		10.6	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	314.3	Deg C	314.3	Deg C
PMT Temp	6.8	Deg C	6.8	Deg C
O3 flow	84.0	ccm	84.0	ccm
R Cell Press	5.3	mmHg	5.3	mmHg
Sample Flow	454	ccm	454	ccm

Notes:

GPT incomplete due to site time restrictions; completed single GPT point check.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: December 31, 2013 Station Number: AMS 103

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero										
as found span										
calibrator zero	5000	0.0	0.0	0.0	0.0	-1.5	0.0	-1.5	N/A	N/A
high point	5000	81.1	815.9	815.9	0.0	816.0	816.0	1.0	0.9998	0.9998
second point	5000	40.6	408.4	408.4	0.0	404.4	404.4	-1.1	1.0100	1.0100
third point	5000	20.3	204.2	204.2	0.0	198.4	204.2	1.0	1.0295	0.9999
calibrator zero	5000	0.0	0.0	0.0	0.0	-1.5	0.0	-1.5	N/A	N/A
as left zero	5000									
as left span										
								Average Correction Factor	1.0131	1.0032

Corrcted As found NO_X= NA NO= NA Percent Change NO_X= N/A NO= N/A

Previous Response NO_X= NA NO= NA

GPT Calibration Data

Dilution Flow 4813 ccm Source Gas Flow 79.60 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			-1.5			N/A	
1st NO2 (300)	N/A	474.0	322.0	797.0	474.0	323.2	1.0268	1.0000	0.9963	100.4%
2nd NO2 (200)										
3rd NO2 (100)										
4th NO2 (0)	796.0	N/A	4.0	800.0	796.0	2.6	1.0229	1.0000	N/A	N/A
					Average Correction Factor		1.0249	1.0000	0.9963	100.4%

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

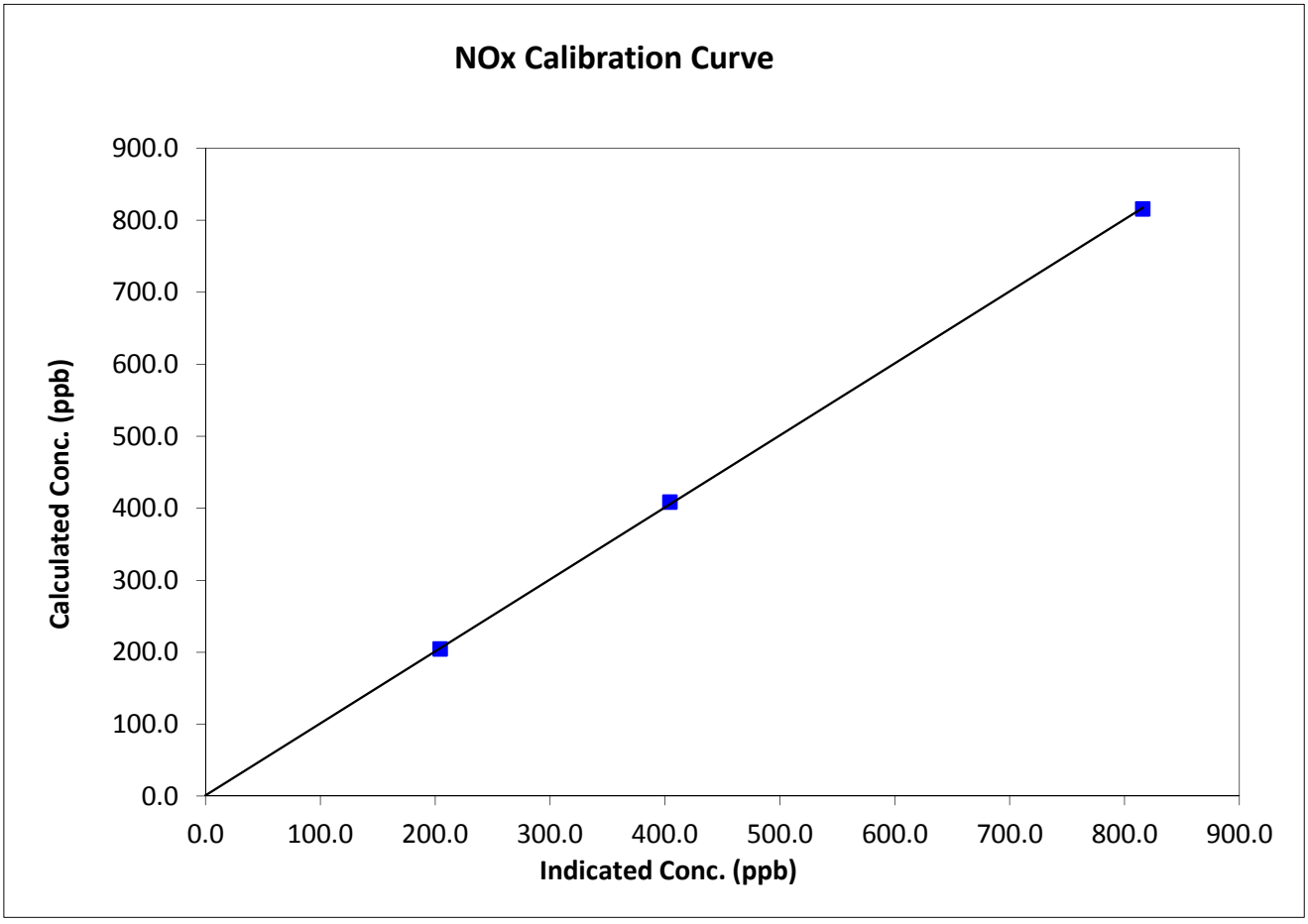
NO_X Calibration Summary

Station Information

Calibration Date	December 31, 2013	Previous Calibration	
Station Number	CENOVUS	Station Number	AMS 103
Start Time (MST)	14:30	End Time (MST)	18:00
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.0	N/A	Correlation Coefficient	0.999966
815.9	816.0	0.9998		
408.4	404.4	1.0100	Slope	1.000365
204.2	204.2	0.9999		
			Intercept	0.842393



Wood Buffalo Environmental Association

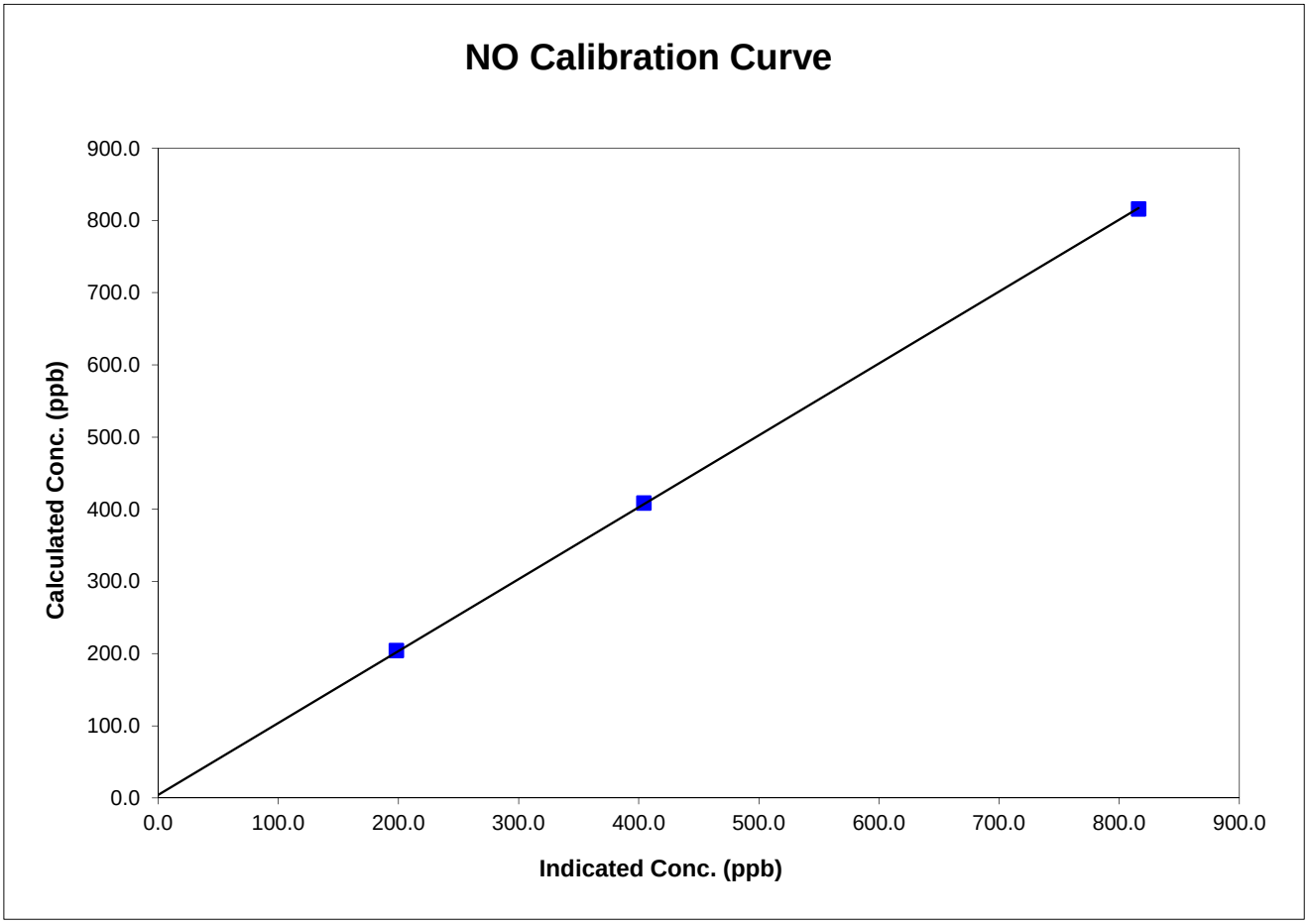
NO Calibration Summary

Station Information

Calibration Date	December 31, 2013	Previous Calibration	
Station Number	CENOVUS	Station Number	AMS 103
Start Time (MST)	14:30	End Time (MST)	18:00
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.5	N/A	Correlation Coefficient	0.999955
815.9	816.0	0.9998		
408.4	404.4	1.0100	Slope	0.996435
204.2	198.4	1.0295		
			Intercept	4.078272



Wood Buffalo Environmental Association

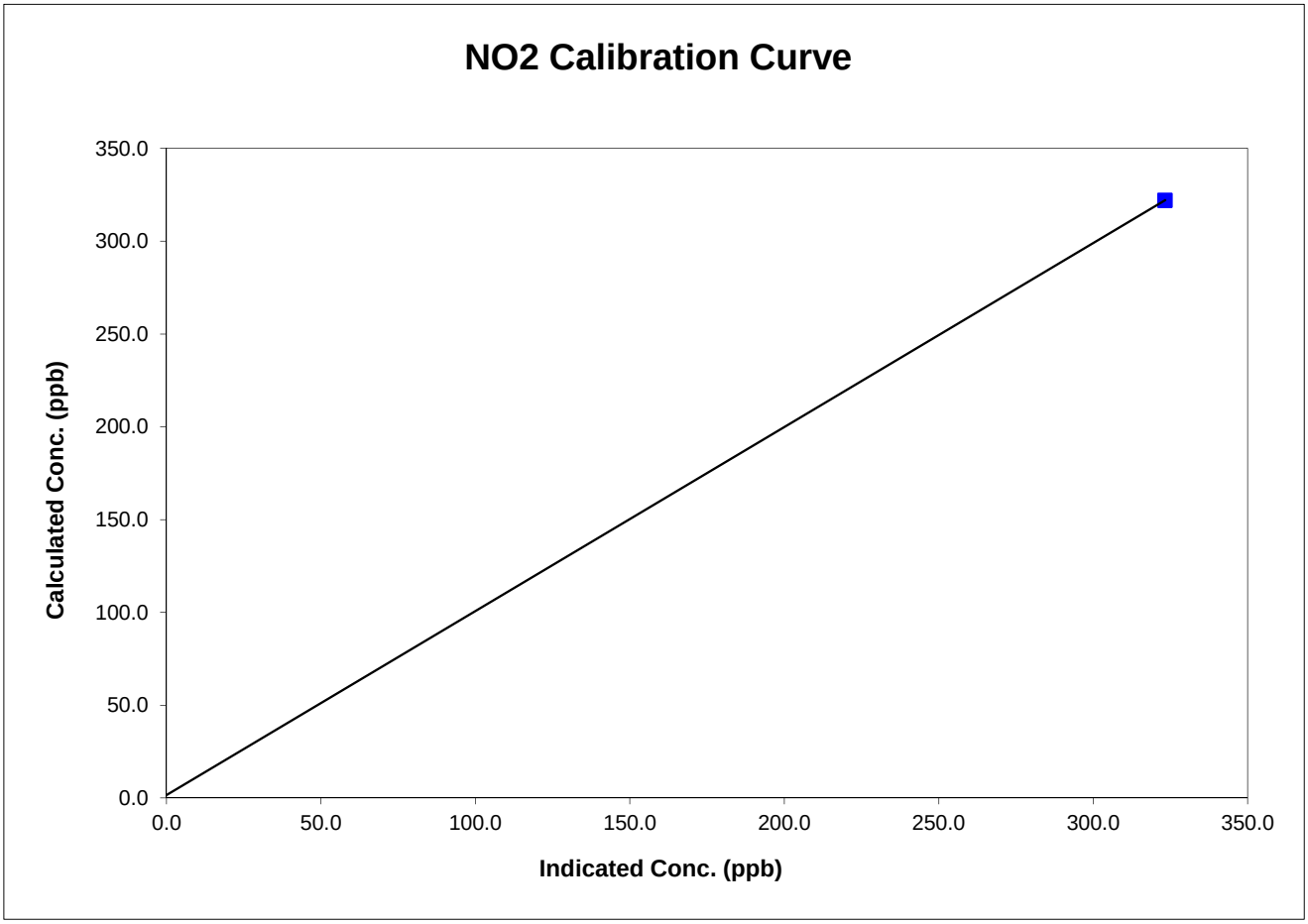
NO2 Calibration Summary

Station Information

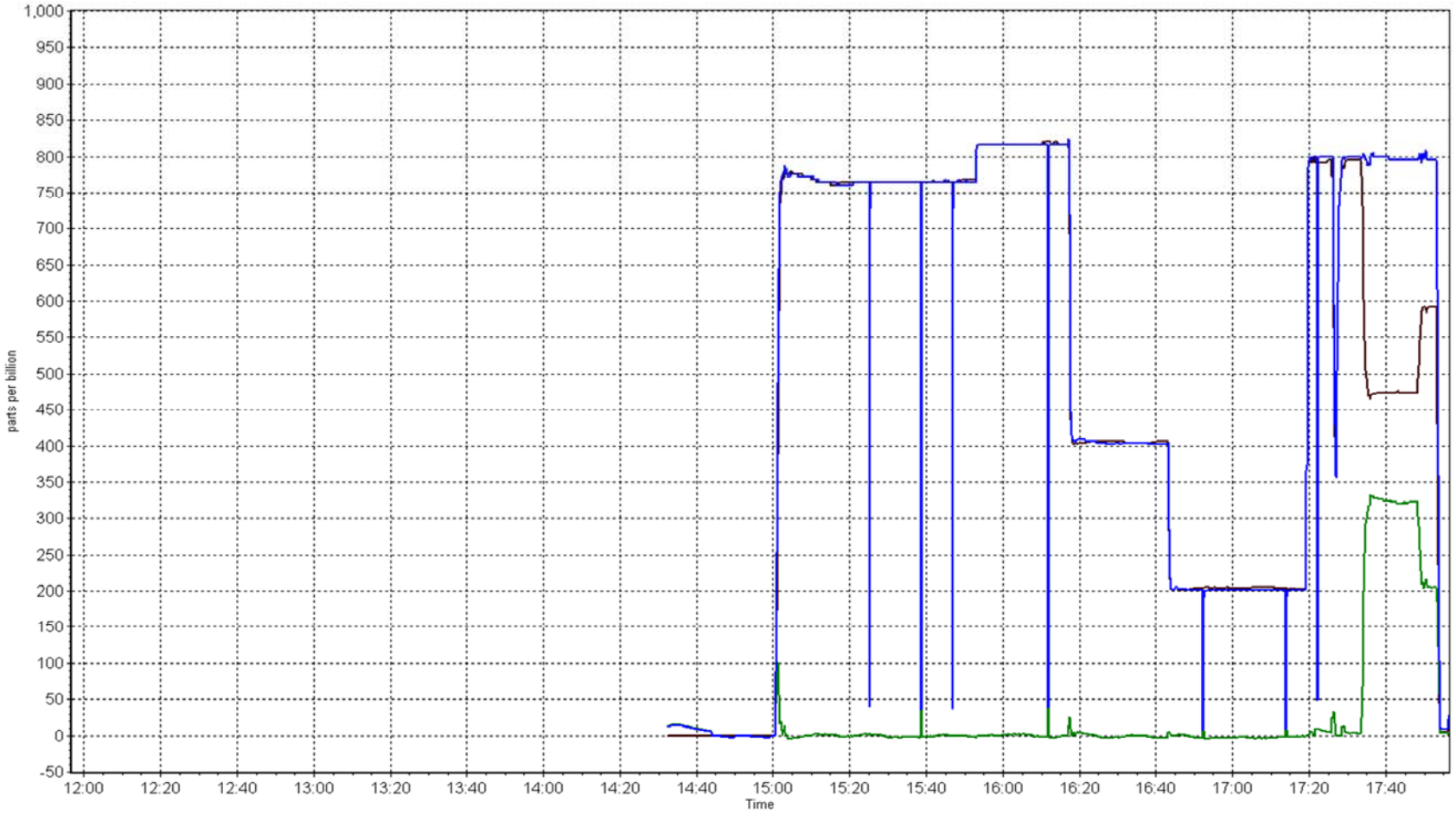
Calibration Date	December 31, 2013	Previous Calibration	
Station Number	CENOVUS	Station Number	AMS 103
Start Time (MST)	14:30	End Time (MST)	18:00
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.5	N/A	Correlation Coefficient	1.000000
322.0	323.2	0.9963		
			Slope	0.991654
			Intercept	1.487481



NOx, NO & NO_2 Calibration Plot **Date:** **December 31, 2013**



Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 31, 2013
Station Name	Cenovus	Station Number	AMS 103
Reason:	Routine		
Start Time (MST)	11:28	End Time (MST)	13:45
Barometric Pressure	NA mmHg	Station Temperature	23.0 Deg C
Calibrator	API T700	Serial Number	451
NO Cal Gas Conc	50.3 ppm	Cal Gas Expiry Date	October 6, 2016
NOx Cal Gas Conc	50.3 ppm	Cal Gas Serial #	EY0000359

DACS Information

DACS make & model	Campbell Scientific CR3000	DACS serial No.	8203

Parameter		NOx	NO	NO2
MV conversion	Analyzer Range (ppb)	1000	1000	1000
	Analyzer Range (mv)	1000	1000	1000
Before	Data Slope	1.000365	0.996435	0.991654
	Data Offset	0.842393	4.078272	1.487481
After	Data Slope	1.011362	1.012115	0.996145
	Data Offset	-2.022725	-2.631499	-1.858854
Channel #				
Voltage Range		0-5V	0-5V	0-5V

Analyzer Information

Analyzer make/model	Teledyne T200	Analyzer serial #	722

Test Point	before		after	
Concentration range	1000	ppb	1000	ppb
NO coefficient	1.024	ppb	1.024	ppb
NOX coefficient	1.029	ppb	1.029	ppb
NO2 coefficient		ppb		ppb
NO bkgrnd	-0.8		-0.8	
NOX bkgrnd	10.6		10.6	
Nt coefficient				
Chamber Temp	50.0	Deg C	50.0	Deg C
Moly Temp	314.3	Deg C	314.3	Deg C
PMT Temp	6.8	Deg C	6.8	Deg C
O3 flow	84.0	ccm	84.0	ccm
R Cell Press	5.3	mmHg	5.3	mmHg
Sample Flow	454	ccm	454	ccm

Notes:

GPT performed with single NO point to complete calibration test for January.

Wood Buffalo Environmental Association

NO_X-NO-NO_2 Calibration Report

Station Information

Calibration Date: January 3, 2014 Station Number: AMS 103

Calibration Data

Set Point	Total flow rate (ccm)	Source gas flow rate (ccm)	Calculated NOx conc (ppb)	Calculated NO conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor
as found zero	5000	0.0	0.0	0.0	0.0	2.6	2.0	0.3	N/A	N/A
as found span	5000	81.1	815.9	815.9	0.0	808.7	808.7	1.7	1.0089	1.0089
calibrator zero	5000	0.0	0.0	0.0	0.0	2.6	2.0	0.3	N/A	N/A
high point	5000	81.1	815.9	815.9	0.0	808.7	808.7	1.7	1.0089	1.0089
second point										
third point										
calibrator zero	5000	0.0	0.0	0.0	0.0	2.6	2.0	0.3	N/A	N/A
as left zero	5000	0.0	0.0	0.0	0.0	-3.1	0.4	-3.5	N/A	N/A
as left span	5000	81.1	815.9	480.5	335.4	803.6	488.4	325.7	1.0153	0.9839
								Average Correction Factor	1.0089	1.0089

Corrcted As found NO_X= 806.1 NO= 806.7 Percent Change NO_X= 1.1% NO= 0.3%

Previous Response NO_X= 815.3 NO= 808.9

GPT Calibration Data

Total Flow 5000 ccm Source Gas Flow 81.10 ccm

O3 Setpoint (ppb)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO2 conc (ppb)	Indicated NOx conc (ppb)	Indicated NO conc (ppb)	Indicated NO2 conc (ppb)	NOx Correction factor	NO Correction factor	NO2 Correction factor	Converter Efficiency
Cal zero			0.0			0.3			N/A	
1st NO2 (300)	N/A	480.5	326.5	809.2	480.5	328.5	0.9921	1.0000	0.9939	100.6%
2nd NO2 (200)	N/A	611.8	195.2	810.0	611.8	198.8	0.9912	1.0000	0.9821	101.8%
3rd NO2 (100)	N/A	707.0	100.0	802.8	707.0	104.0	1.0001	1.0000	0.9615	104.0%
4th NO2 (0)	807.0	N/A	1.0	808.0	807.0	1.1	0.9936	1.0000	N/A	N/A
					Average Correction Factor		0.9942	1.0000	0.9792	102.1%

Calibration Performed By: Ben Wentzell

Wood Buffalo Environmental Association

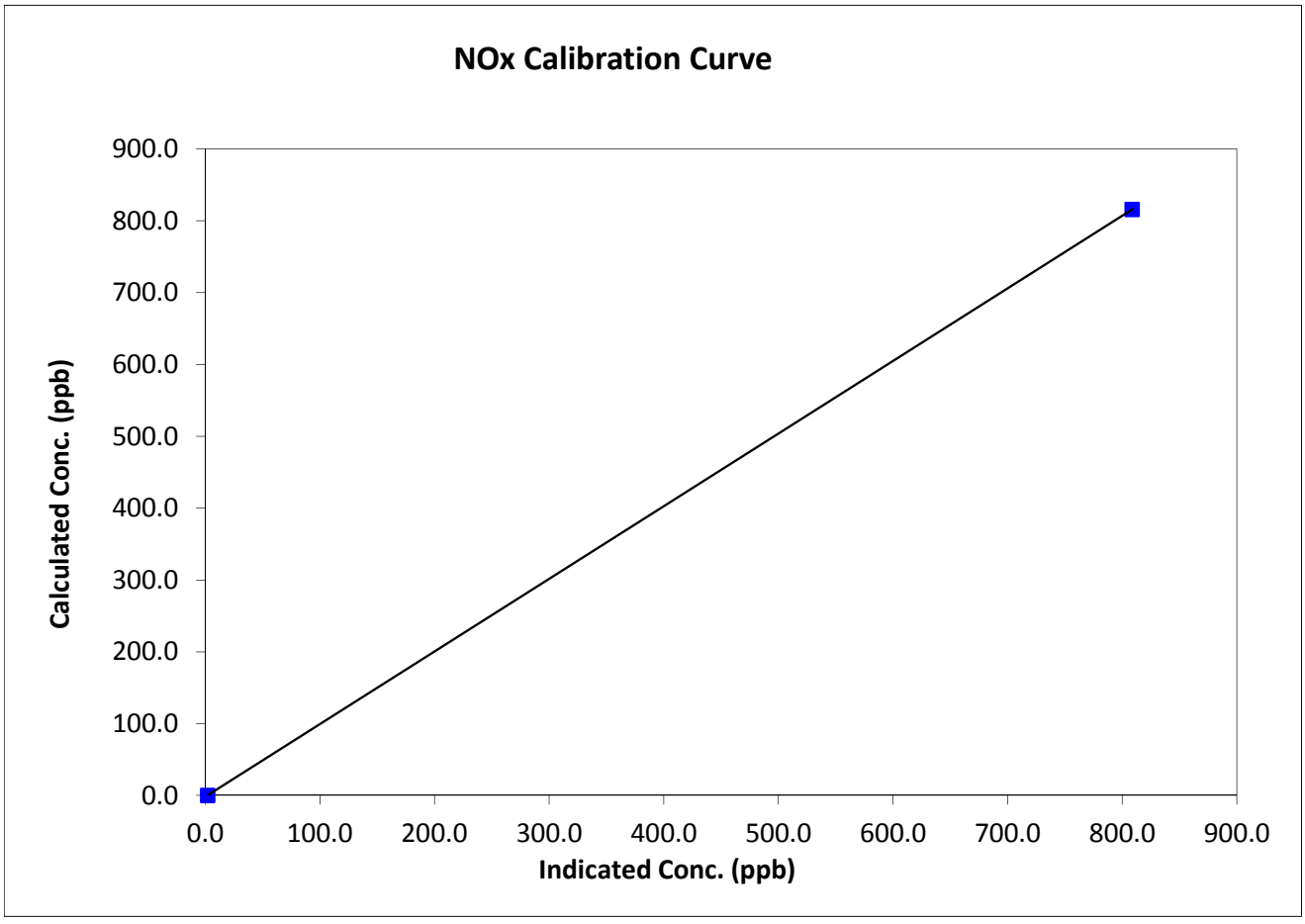
NO_X Calibration Summary

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 31, 2013
Station Number	Cenovus	Station Number	AMS 103
Start Time (MST)	11:28	End Time (MST)	13:45
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	2.0	N/A	Correlation Coefficient	1.000000
815.9	808.7	1.0089		
			Slope	1.011362
			Intercept	-2.022725



Wood Buffalo Environmental Association

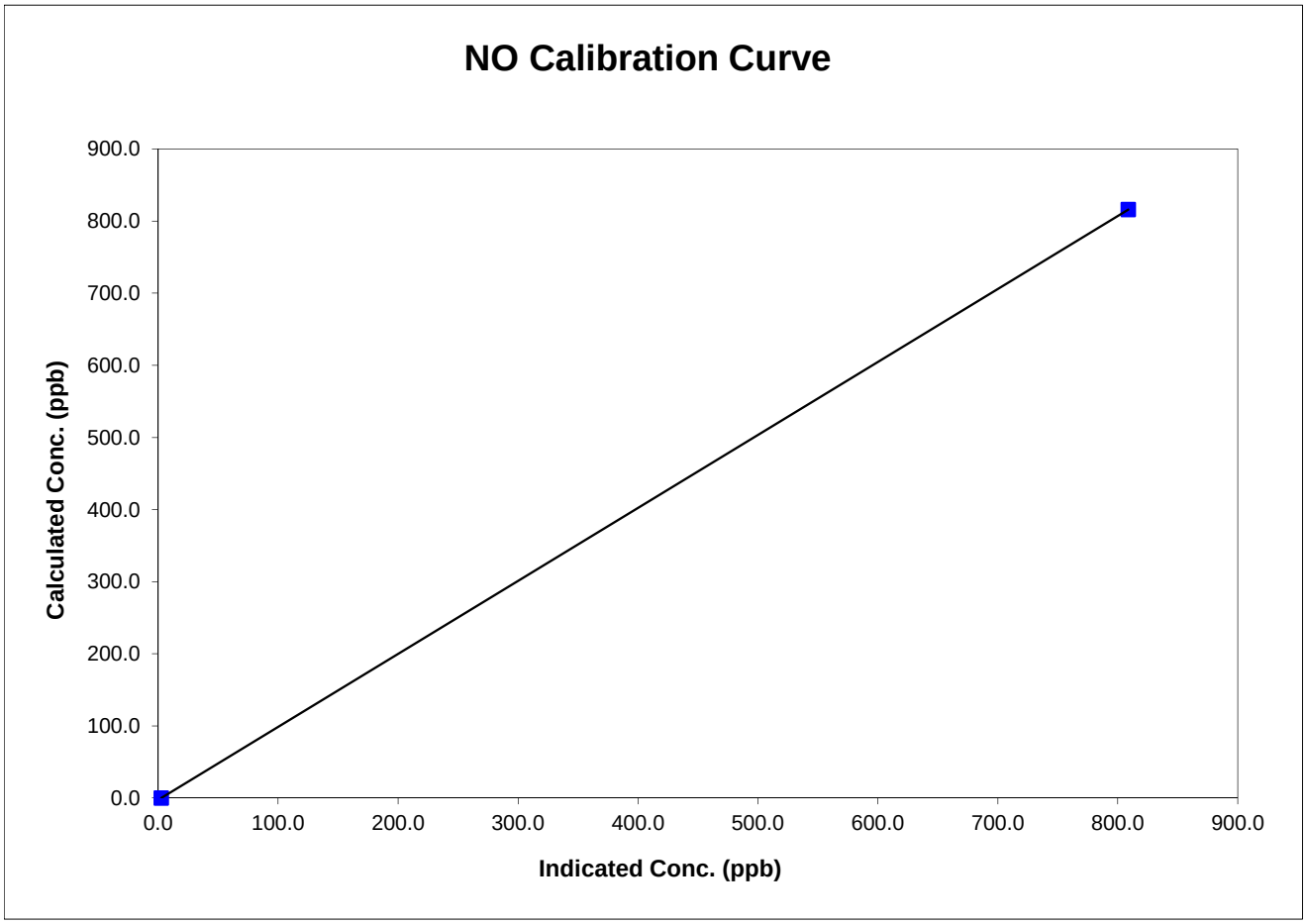
NO Calibration Summary

Station Information

Calibration Date	January 3, 2014	Previous Calibration	December 31, 2013
Station Number	Cenovus	Station Number	AMS 103
Start Time (MST)	11:28	End Time (MST)	13:45
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	2.6	N/A	Correlation Coefficient	1.000000
815.9	808.7	1.0089		
			Slope	1.012115
			Intercept	-2.631499



Wood Buffalo Environmental Association

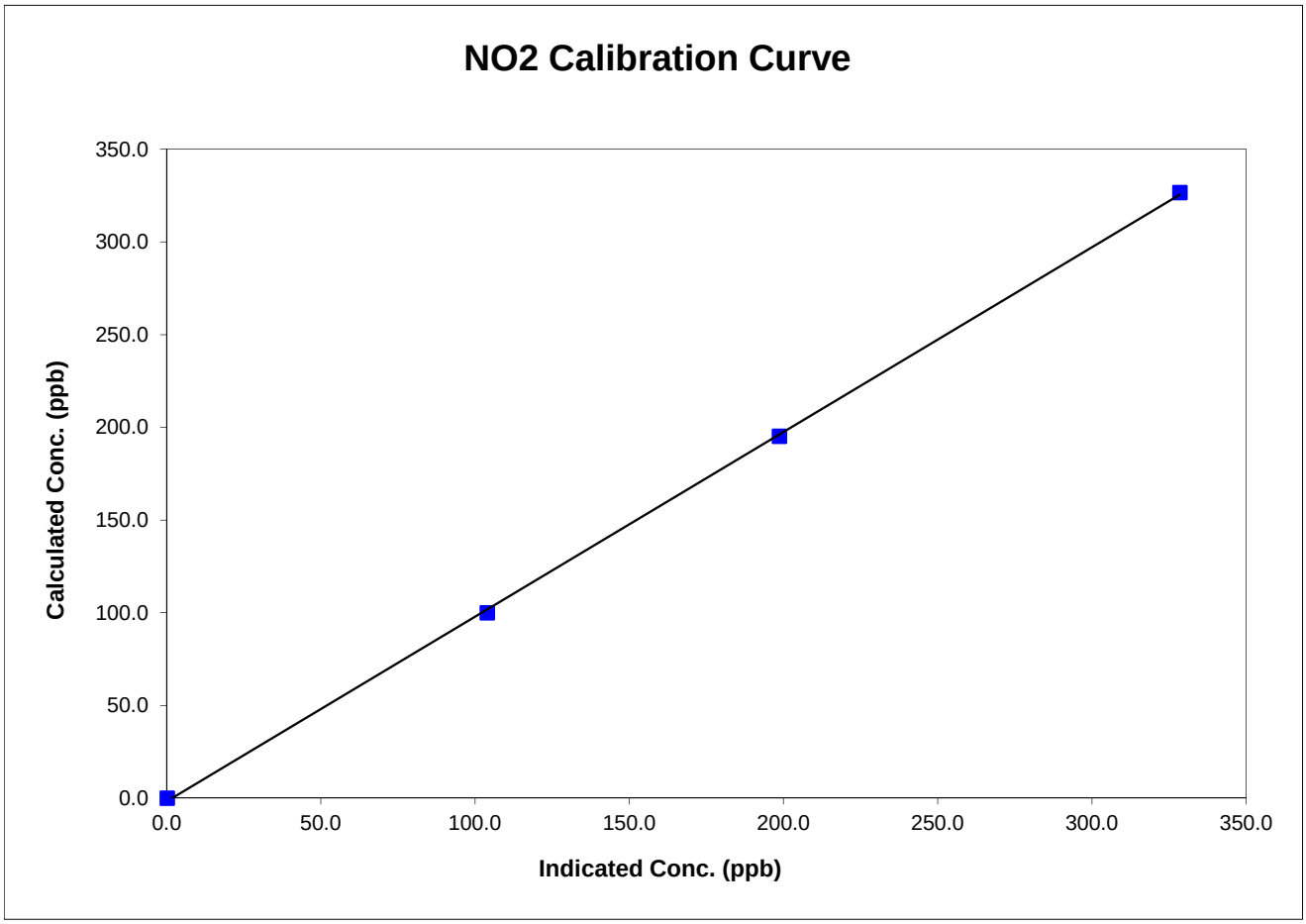
NO_2 Calibration Summary

Station Information

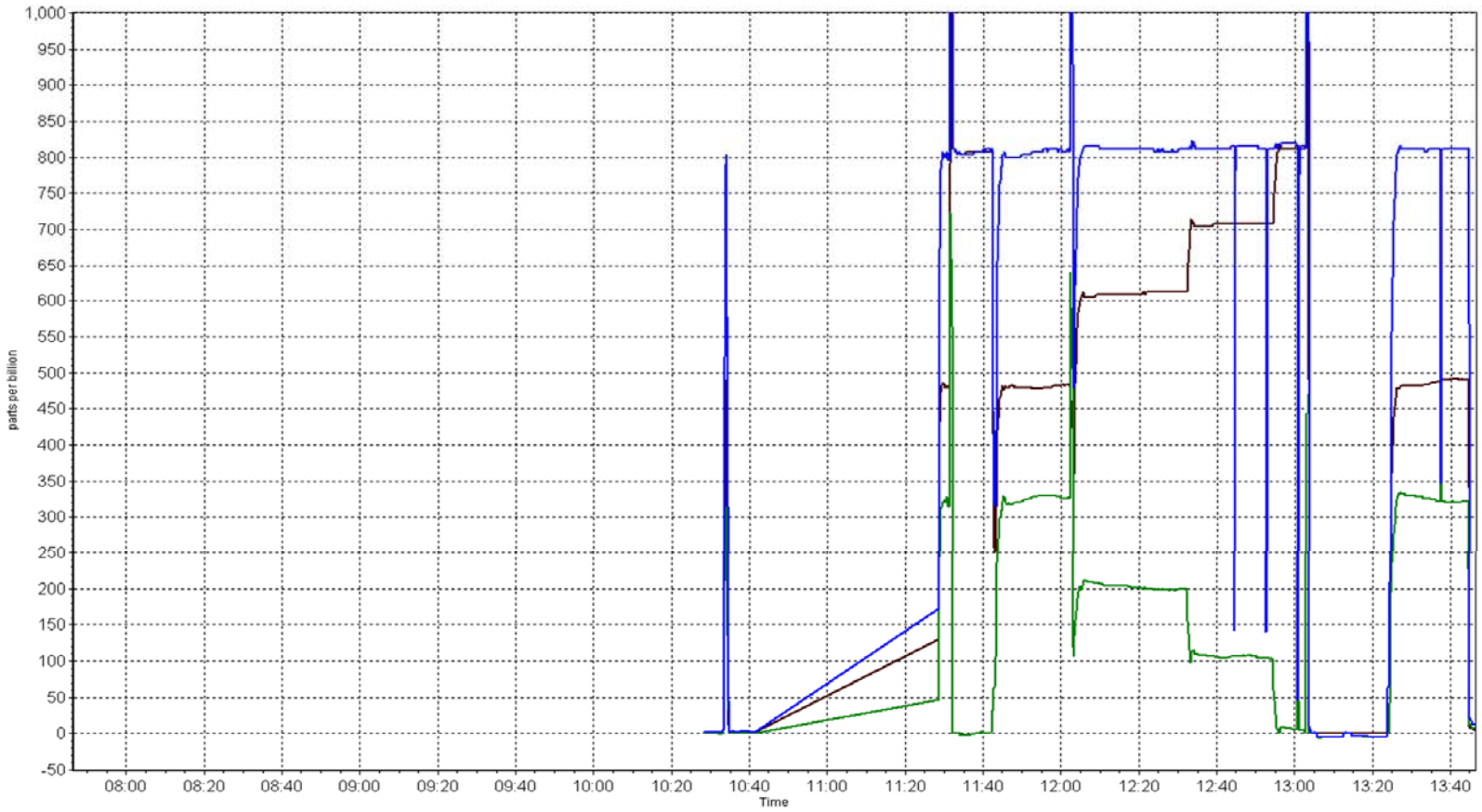
Calibration Date	January 3, 2014	Previous Calibration	December 31, 2013
Station Number	Cenovus	Station Number	AMS 103
Start Time (MST)	11:28	End Time (MST)	13:45
Analyzer make	Teledyne T200	Analyzer serial #	722

Calibration Information

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.3	N/A	Correlation Coefficient	0.999869
326.5	328.5	0.9939		
195.2	198.8	0.9821	Slope	0.996145
100.0	104.0	0.9615		
			Intercept	-1.858854



NOx, NO & NO_2 Calibration Plot **Date:** **January 3, 2014**



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

MAMS
AMS 4
BUFFALO VIEWPOINT
JANUARY 2014

Operations and Data Collection by:
Wood Buffalo Environmental Association
Fort McMurray, Alberta

QA/QC, Data Validation and Reporting by:
Aurora Atmospherics Inc.
Calgary, Alberta

February 28, 2014

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WBEA MOBILE AT AMS 4
JANUARY 2014

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	319	26	30	98.85	3	0	1	0
H2S (ppb) Average	308	21	26	98.50	5	0	1	0
THC (ppm) Average	318	26	31	98.57	6.2	-	2.6	-
Temperature (C) Average	342	0	2	99.42	5.9	-	-0.3	-
Relative Humidity (%) Average	342	0	2	99.42	88	-	79	-
Wind Speed 10 m (km/h) Average	342	0	2	99.42	20	-	-	-
Wind Direction 10 m (deg) Average	342	0	2	99.42	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WBEA MOBILE AT AMS 4
JANUARY 2014

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

					Percentile						
Parameter	Number	Mean	StnDev	Total	Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	319	0.5	0	-	0	0	0	0	1	1	3
H2S (ppb) Average	308	0.4	0	-	0	0	0	0	0	1	5
THC (ppm) Average	318	2.24	0.3	-	1.9	2	2.1	2.2	2.3	2.4	6.2
Temperature 2 m (C) Average	342	-15.08	8.8	-	-33.6	-25.3	-22	-15.7	-9.4	-2.5	5.9
Relative Humidity (%) Average	342	70.7	8	-	51	60	66	71	75	82	88
Wind Speed 10 m (km/h) Average	342	5.8	3	-	0	2	3	5	8	10	20
Wind Direction 10 m (deg) Average	342	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WBEA MOBILE AT AMS 4
JANUARY 2014

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	01 Jan 2014 01:00	17 Jan 2014 11:00	395	Not in service
SO2	29 Jan 2014 12:00	29 Jan 2014 15:00	4	Power interruption
H2S	01 Jan 2014 01:00	18 Jan 2014 02:00	410	Not in service
H2S	29 Jan 2014 12:00	29 Jan 2014 15:00	4	Power interruption
H2S	31 Jan 2014 10:00	31 Jan 2014 10:00	1	Maintenance
THC	01 Jan 2014 01:00	17 Jan 2014 11:00	395	Not in service
THC	29 Jan 2014 12:00	29 Jan 2014 16:00	5	Power interruption
ET	01 Jan 2014 01:00	17 Jan 2014 16:00	400	Not in service
ET	17 Jan 2014 17:00	17 Jan 2014 18:00	2	Maintenance -alignment of sensor prior to data collection
RH	01 Jan 2014 01:00	17 Jan 2014 16:00	400	Not in service
RH	17 Jan 2014 17:00	17 Jan 2014 18:00	2	Maintenance -alignment of sensor prior to data collection
WS	01 Jan 2014 01:00	17 Jan 2014 16:00	400	Not in service
WS	17 Jan 2014 17:00	17 Jan 2014 18:00	2	Maintenance -alignment of sensor prior to data collection
WD	01 Jan 2014 01:00	17 Jan 2014 16:00	400	Not in service
WD	17 Jan 2014 17:00	17 Jan 2014 18:00	2	Maintenance -alignment of sensor prior to data collection

Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 3 ppb on Jan 25 21:00 Maximum Daily Average: 0.7 ppb on Jan 25

Minimum Value: 0 ppb on Jan 18 07:00
Maximum Diurnal Average: 0.8 ppb at hour 14
Monthly Average: 0.5 ppb

Minimum Daily Average: 0.3 ppb on Jan 22
Minimum Diurnal Average: 0.3 ppb at hour 7
Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 1$ $P_{90} = 1$ $P_{99} = 2$

Hours in Service:	349
Hours of Data:	319
Hours of Missing Data:	30
Hours of Calibration:	26
Percent Operational Time:	98.9

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

Z - zerospan C - Calibration PF - Power Failure NS - Not in Service
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb

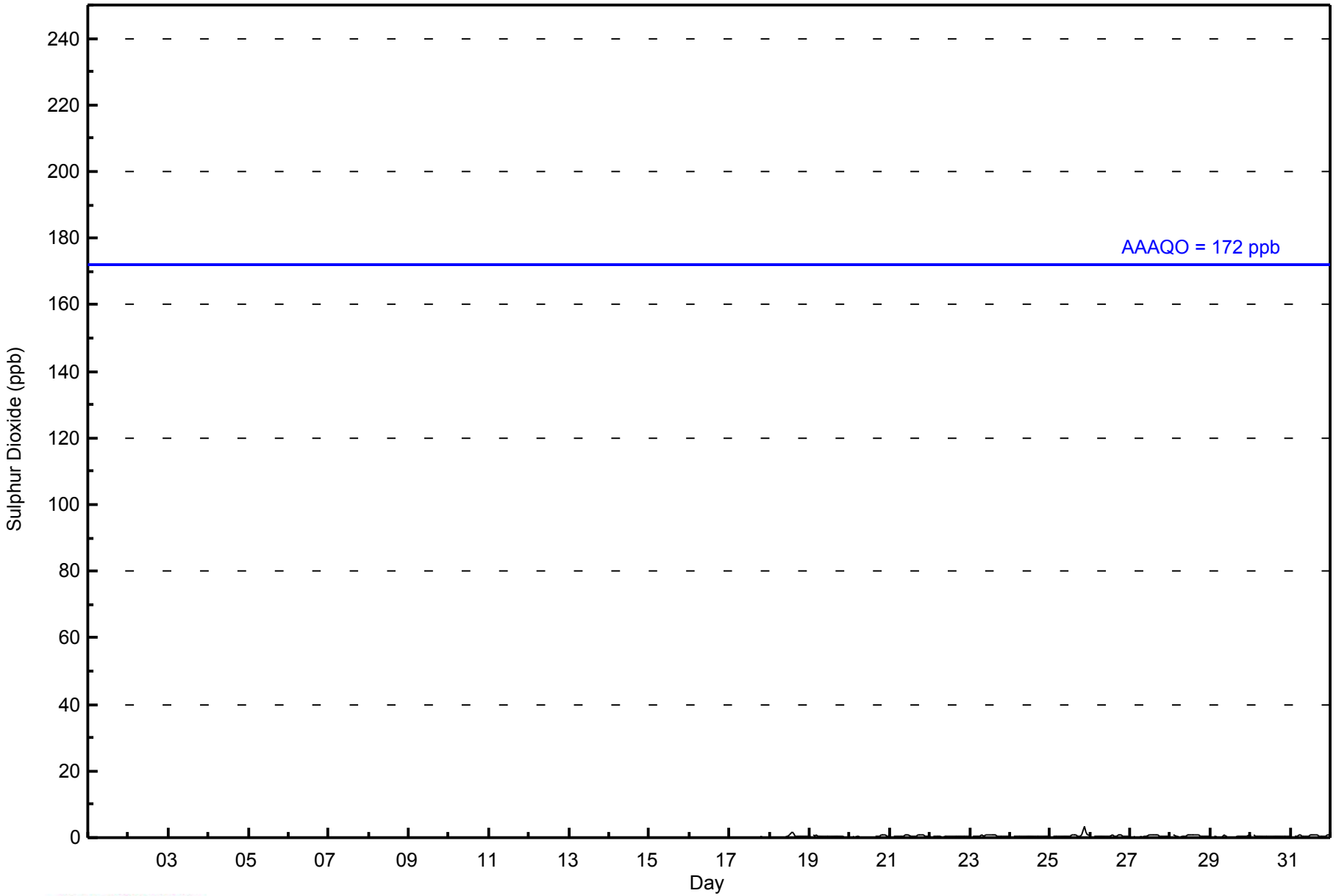
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	319	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: 319

Total Number of Hours: 744

WBEA NETWORK

Frequency Distribution

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 10	53	54	14	9	2	1	1	16	73	17	7	11	18	9	15	19	319
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	54	14	9	2	1	1	16	73	17	7	11	18	9	15	19	319

Total Number of Valid Hours: 319

Total Number of Hours: 744

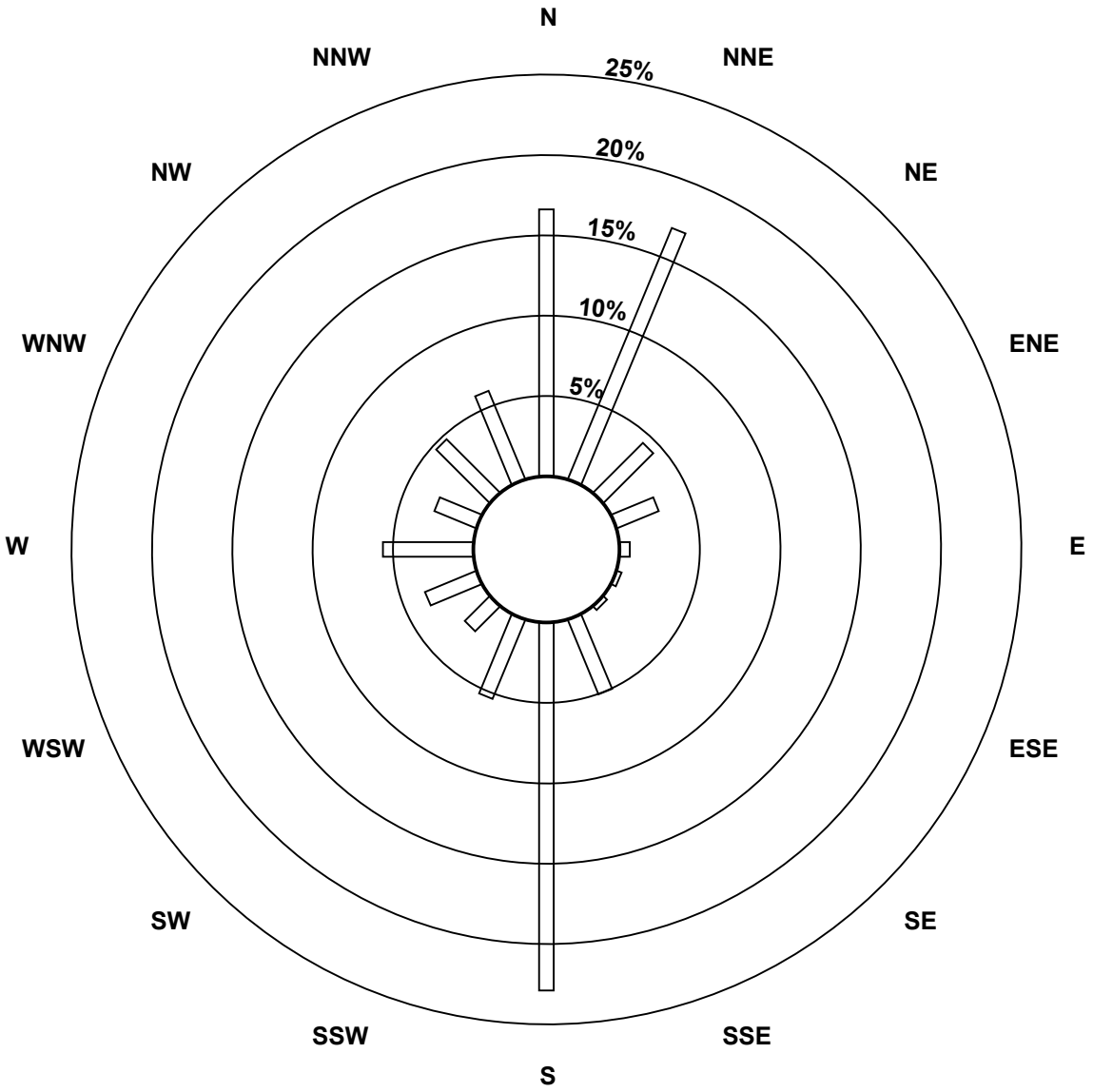
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

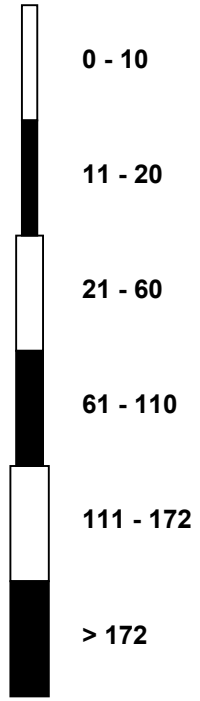
Wind Rose Jan 2014

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile (MAMSL1)



Classes (ppb)



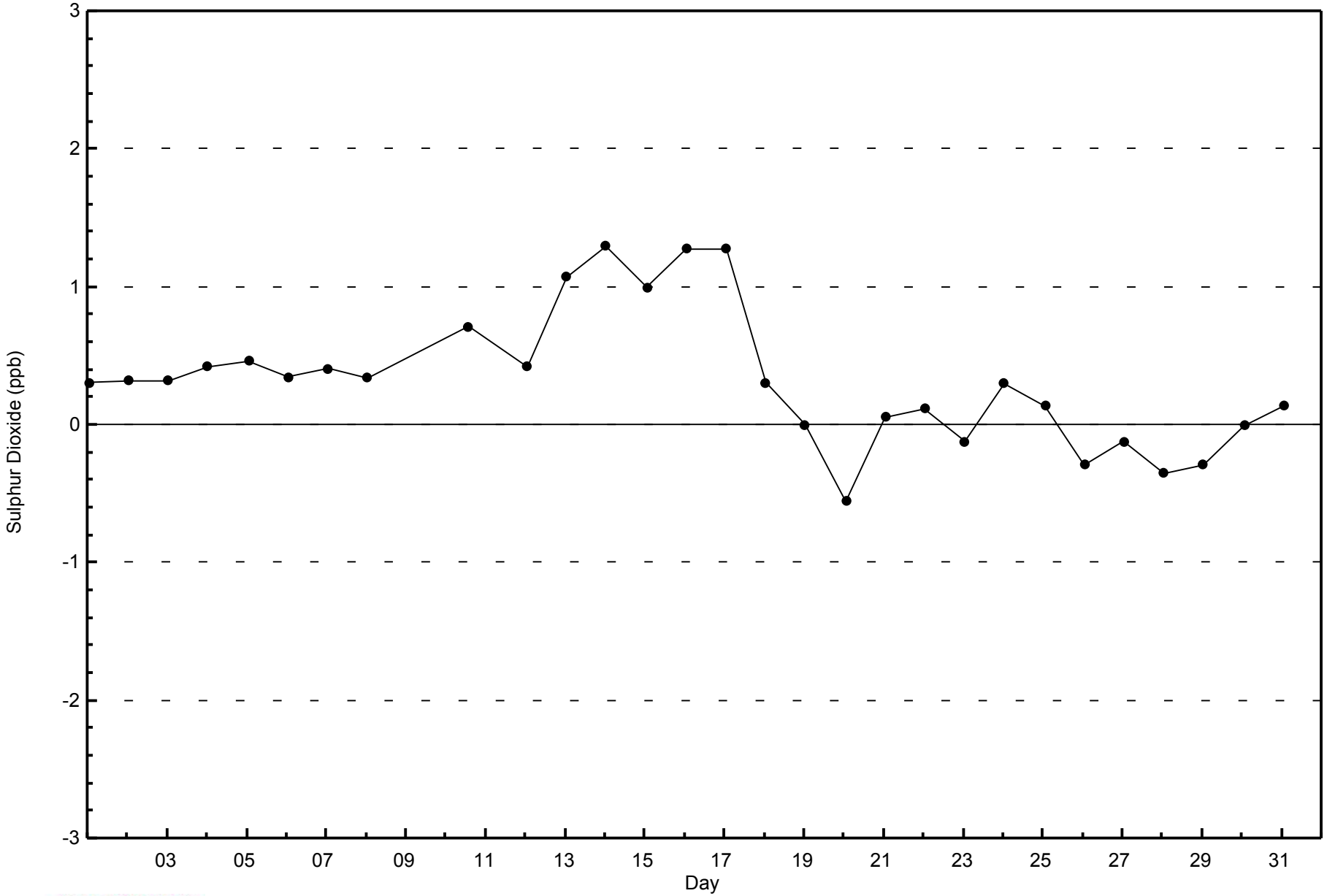
Total Number of Valid Hours: 319

WBEA NETWORK

Zero Responses

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile - January 2014



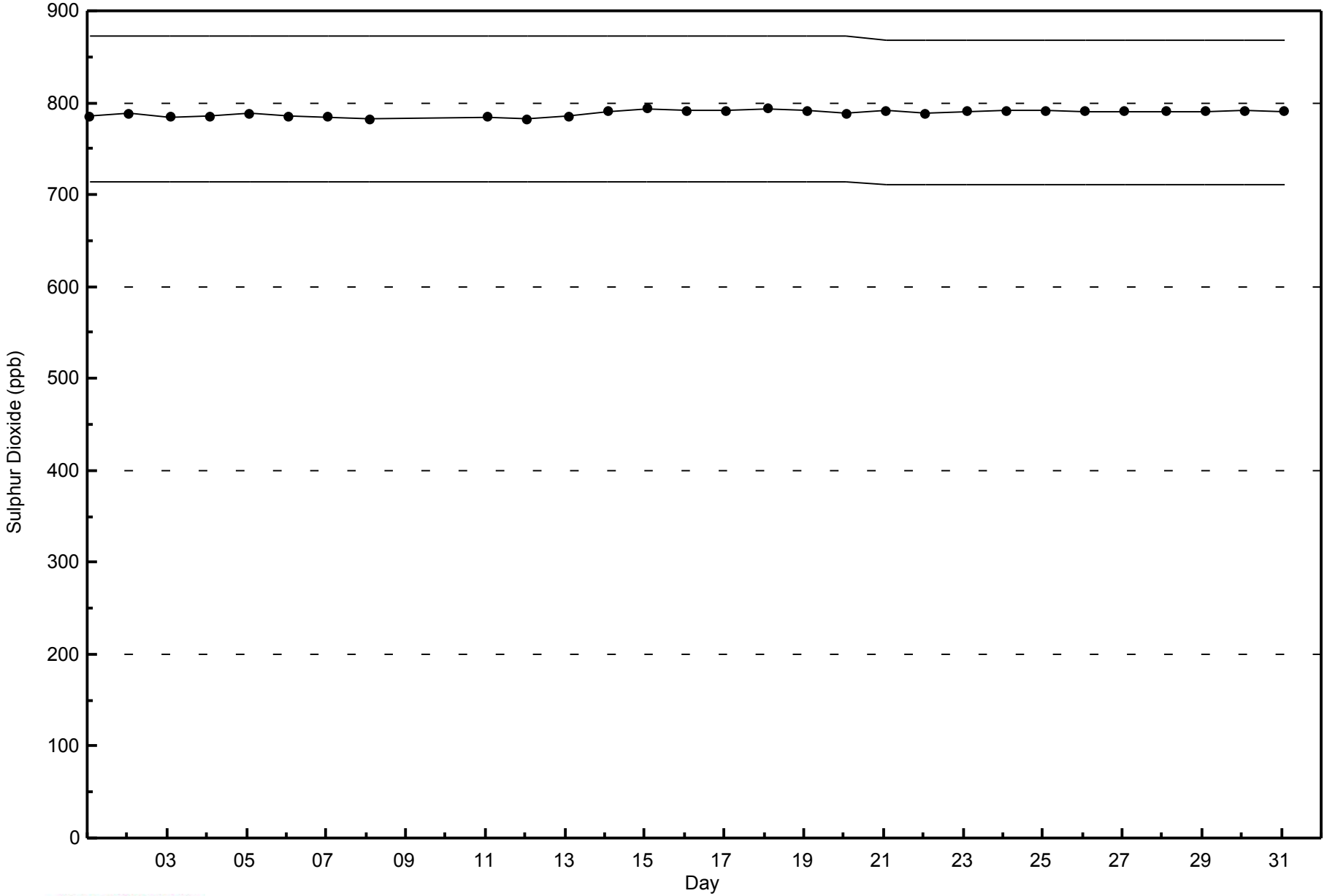
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Sulphur Dioxide (SO_2) - ppb

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 5 ppb on Jan 18 14:00 Maximum Daily Average: 0.8 ppb on Jan 18

Minimum Value: 0 ppb on Jan 30 10:00 Minimum Daily Average: 0.2 ppb on Jan 23
Maximum Diurnal Average: 0.8 ppb at hour 14 Minimum Diurnal Average: 0.3 ppb at hour 12
Monthly Average: 0.4 ppb Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 1$ $P_{99} = 3$

Hours in Service:	334
Hours of Data:	308
Hours of Missing Data:	26
Hours of Calibration:	21
Percent Operational Time:	98.5

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
18-Jan	NS	NS	Z	0	0	0	0	0	0	0	0	0	1	5	3	1	1	0	1	0	0	1	1	0	0.8	5
19-Jan	0	0	Z	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
20-Jan	0	0	Z	0	0	0	0	0	0	0	C	C	C	C	C	C	C	0	0	2	2	2	1	0	--	2
21-Jan	0	0	Z	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	0	0.6	1
22-Jan	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
23-Jan	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
24-Jan	0	0	Z	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1
25-Jan	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-Jan	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-Jan	0	0	Z	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1
28-Jan	0	0	Z	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0.5	1
29-Jan	0	0	Z	0	0	1	1	1	1	0	0	PF	PF	PF	PF	0	0	0	0	0	0	1	1	1	0.4	1
30-Jan	2	3	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	3
31-Jan	0	0	Z	0	3	1	0	0	0	M	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0.5	3
	0.4	0.5	--	0.3	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.8	0.5	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.3	0.3	Diurnal Average	
	2	3	--	1	3	1	1	1	1	1	1	1	1	5	3	1	1	1	1	2	2	2	1	1	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure NS - Not in Service
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb

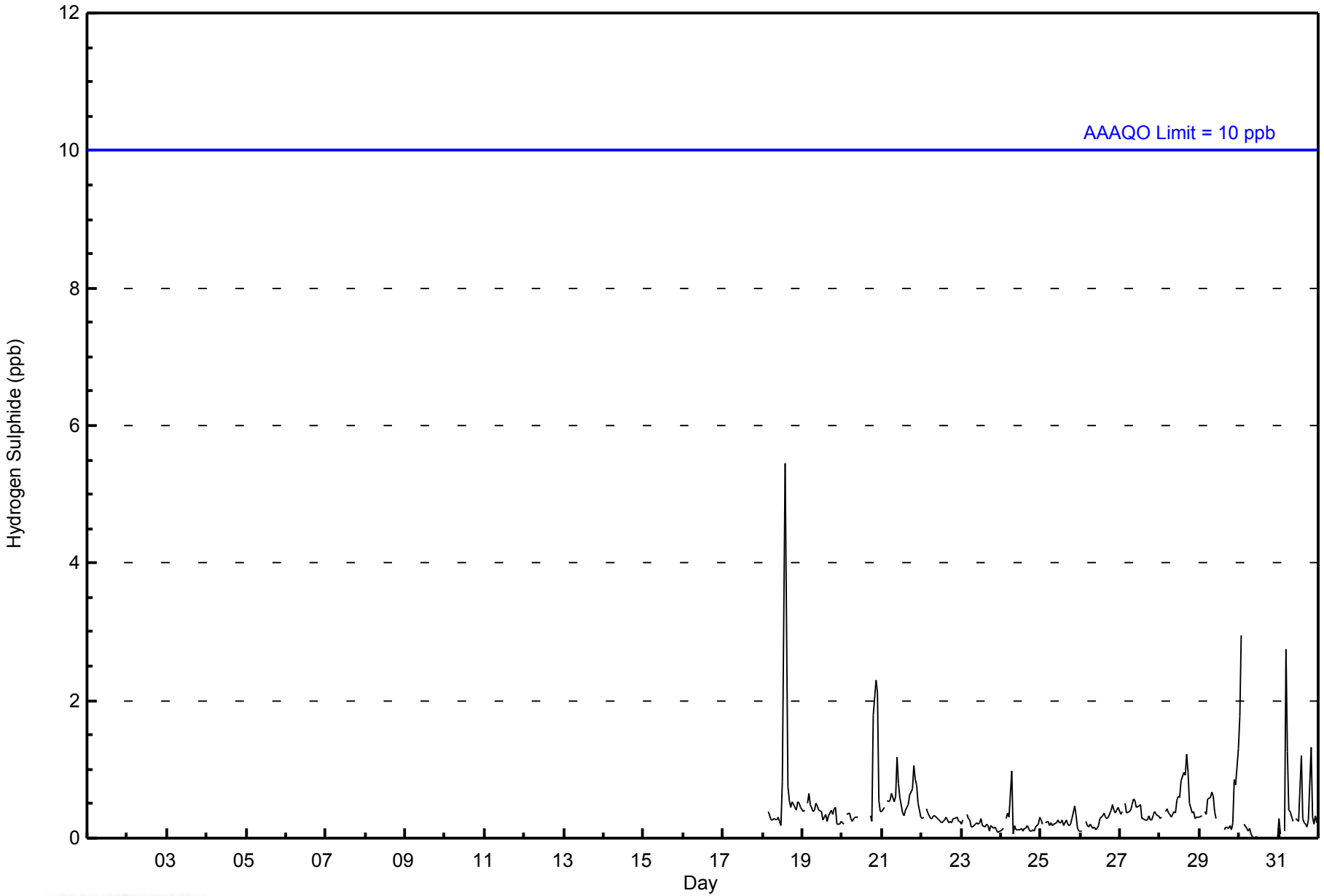
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile - January 2014

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	304	98.70	98.70
3 - 4	3	0.97	99.68
5 - 7	1	0.32	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 308

Total Number of Hours: 744

AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Frequency Distribution

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile - January 2014

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 2	53	54	12	5	1	0	1	15	68	19	7	10	18	9	15	17	304
3 - 4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
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	53	55	12	6	1	0	1	15	68	19	7	10	18	9	15	19	308

Total Number of Valid Hours: 308

Total Number of Hours: 744

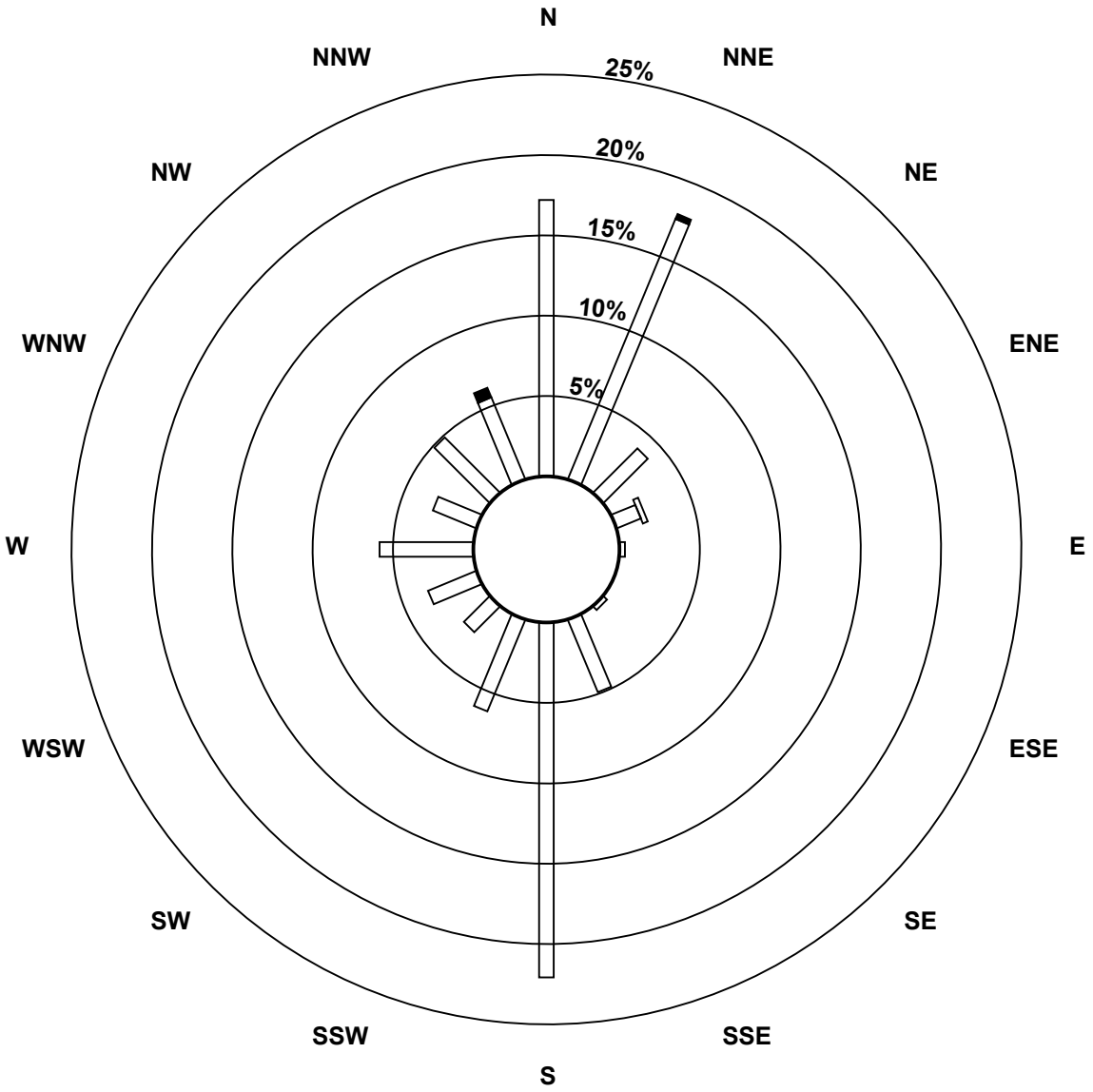
AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

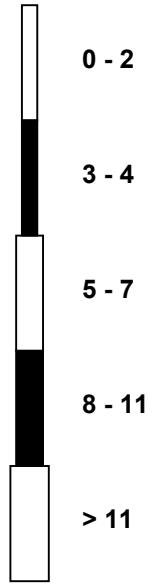
Wind Rose Jan 2014

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile (MAMSL1)



Classes (ppb)



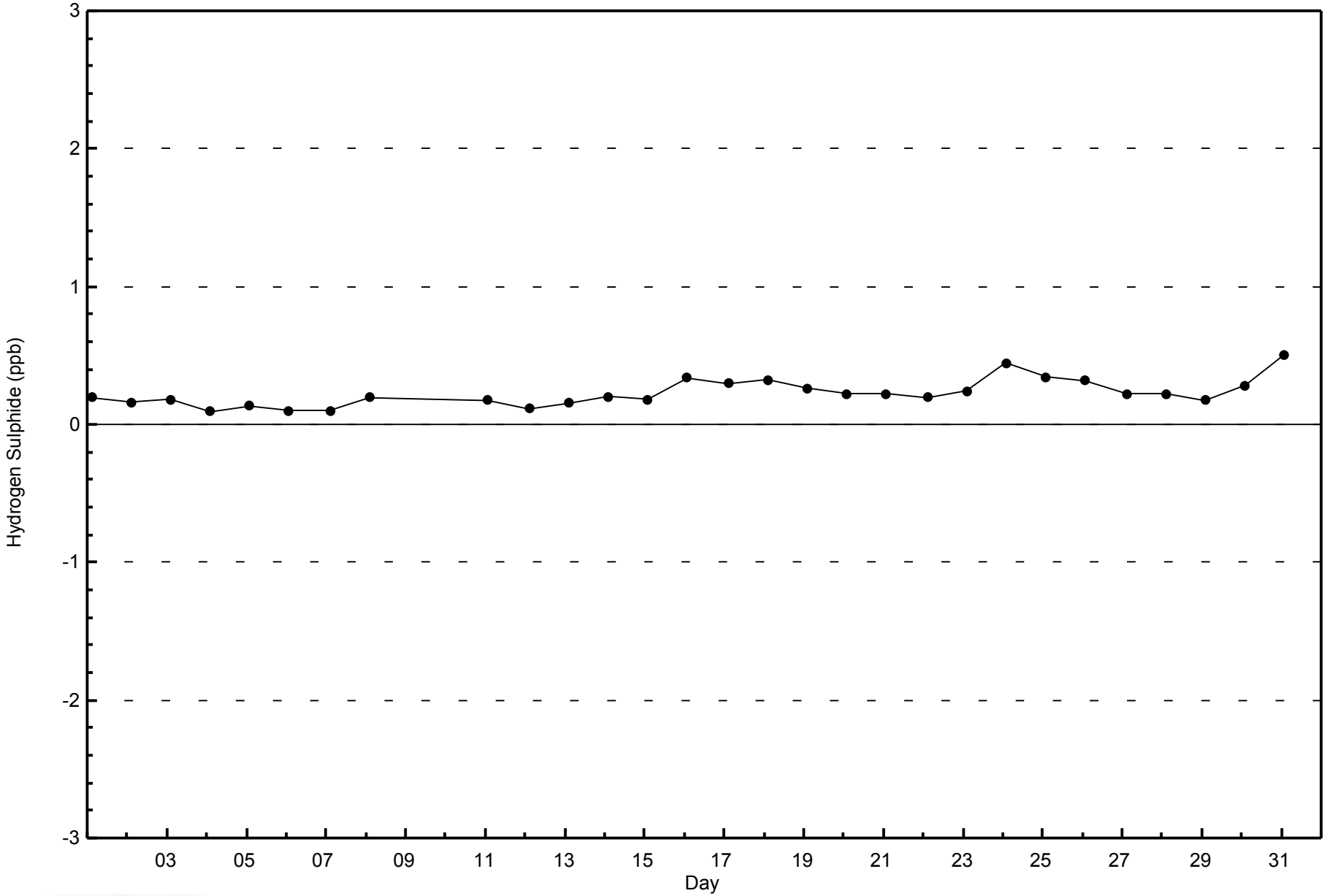
Total Number of Valid Hours: 308

WBEA NETWORK

Zero Responses

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile - January 2014



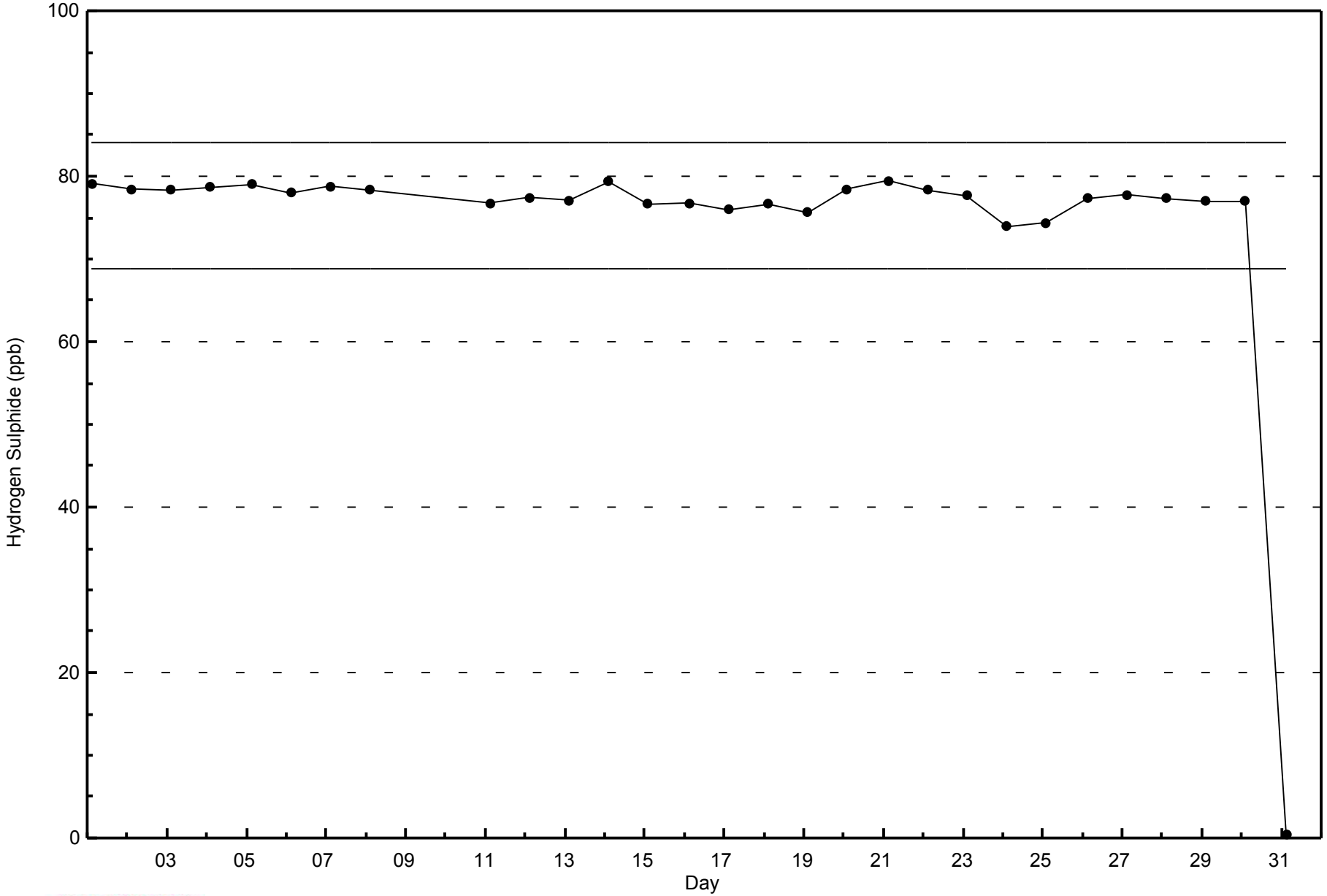
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Span Responses

Hydrogen Sulphide (H_2S) - ppb

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

WBEA Mobile - January 2014

Maximum Value: 6.2 ppm on Jan 18 14:00

Maximum Daily Average: 2.6 ppm on Jan 18

Minimum Value: 1.9 ppm on Jan 27 09:00

Minimum Daily Average: 2.1 ppm on Jan 22

Maximum Diurnal Average: 2.6 ppm at hour 14

Minimum Diurnal Average: 2.2 ppm at hour 8

Monthly Average: 2.24 ppm

Percentiles: P_1 = 1.9 P_{10} = 2.0 Q_1 = 2.1 Median = 2.2 Q_3 = 2.3 P_{90} = 2.4 P_{99} = 3.1

Hours in Service:	349
Hours of Data:	318
Hours of Missing Data:	31
Hours of Calibration:	26
Percent Operational Time:	98.6

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	C	C	C	2.4	2.4	2.4	2.3	2.2	2.2	--	2.4
18-Jan	2.2	Z	2.4	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.3	3.6	6.2	3.3	2.8	2.7	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.6	6.2
19-Jan	2.2	Z	2.3	2.4	2.4	2.4	2.4	2.5	2.7	2.2	2.3	2.3	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.7
20-Jan	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	C	C	C	C	C	2.2	2.2	2.2	2.2	2.6	2.7	2.9	2.3	2.2	2.2	2.9
21-Jan	2.2	Z	2.3	2.3	2.2	2.3	2.3	2.3	2.3	3.0	2.8	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	2.3	2.1	2.0	2.3	3.0
22-Jan	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2
23-Jan	2.2	Z	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.6	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.6
24-Jan	2.1	Z	2.2	2.3	2.6	2.4	2.5	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	2.2	2.3	2.2	2.6
25-Jan	2.2	Z	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.5	2.3	2.1	2.1	2.2	2.5
26-Jan	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4
27-Jan	2.3	Z	2.2	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.1	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.4
28-Jan	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	3.2	3.0	2.9	2.8	2.7	2.3	2.1	2.0	2.0	2.1	2.1	2.3	3.2
29-Jan	2.1	Z	2.1	2.0	2.1	2.2	2.2	2.3	2.4	2.1	2.1	PF	PF	PF	PF	PF	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.4
30-Jan	2.1	Z	2.3	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.3
31-Jan	2.7	Z	2.3	2.2	2.4	2.7	2.6	2.4	2.3	2.4	2.3	2.4	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.5	2.2	2.2	2.1	2.3	2.7
	2.2	--	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.6	2.4	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.2	Diurnal Average	
	2.7	--	2.4	2.4	2.6	2.7	2.6	2.5	2.7	3.0	2.8	2.4	3.6	6.2	3.3	2.9	2.8	2.7	2.5	2.6	2.7	2.9	2.4	2.3	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure NS - Not in Service

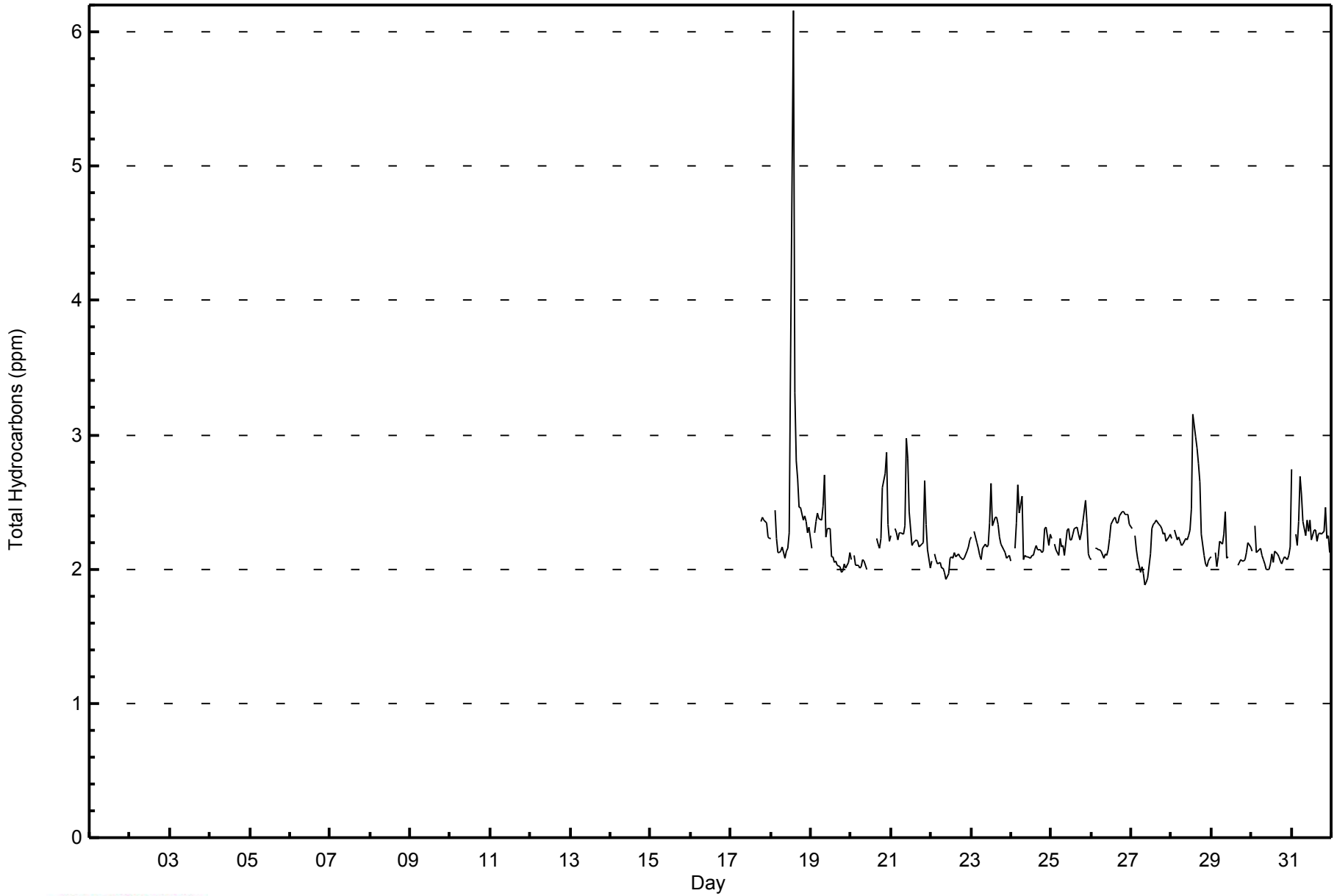
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Total Hydrocarbons (THC) - ppm

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm

WBEA Mobile - January 2014

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	36	11.32	11.32
2.1 - 3.0	278	87.42	98.74
3.1 - 10.0	4	1.26	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 318

Total Number of Hours: 744

AURORA ATMOSPHERICS INC.

WBEA NETWORK

Frequency Distribution

Total Hydrocarbons (THC) - ppm

WBEA Mobile - January 2014

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	2	4	5	0	0	0	0	0	15	4	1	2	3	0	0	0	36
2.1 - 3.0	50	48	9	8	2	1	1	16	58	13	6	9	15	8	15	19	278
3.1 - 10.0	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	54	14	9	2	1	1	16	73	17	7	11	18	9	15	19	318

Total Number of Valid Hours: 318

Total Number of Hours: 744

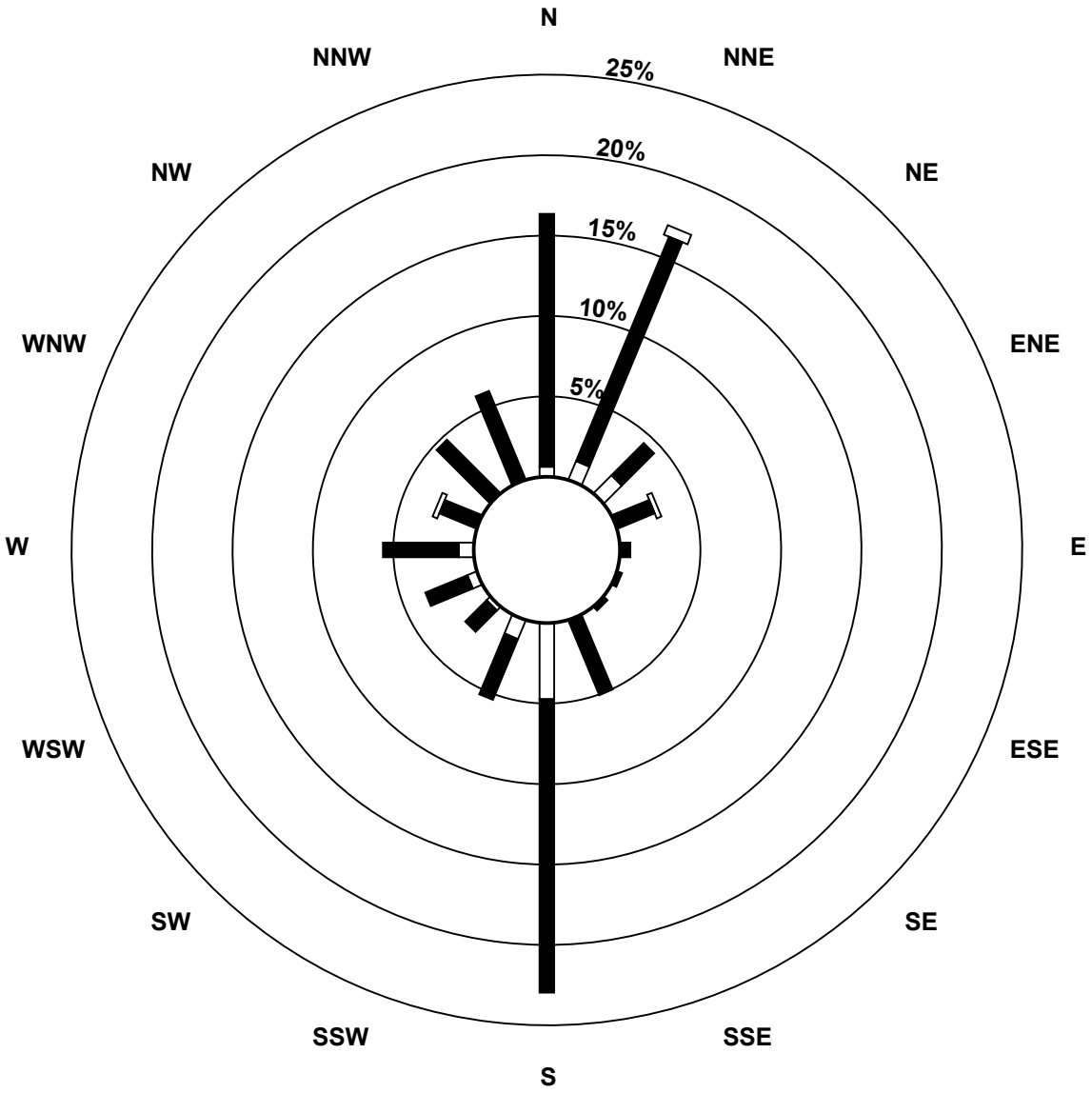
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

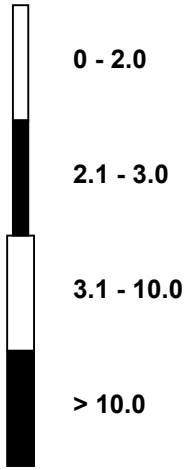
Wind Rose Jan 2014

Total Hydrocarbons (THC) - ppm

WBEA Mobile (MAMSL1)



Classes (ppm)



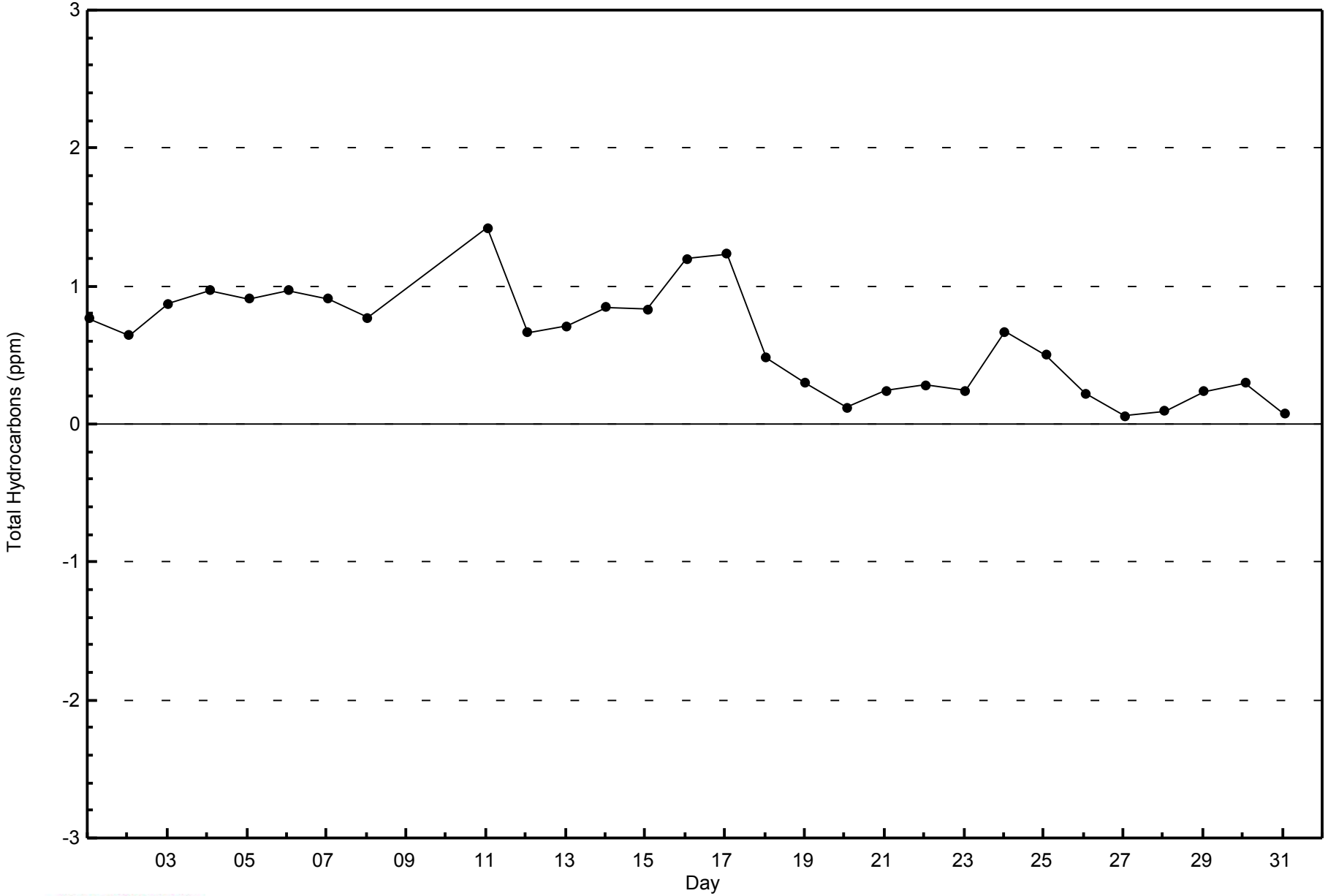
Total Number of Valid Hours: 318

WBEA NETWORK

Zero Responses

Total Hydrocarbons (THC) - ppm

WBEA Mobile - January 2014



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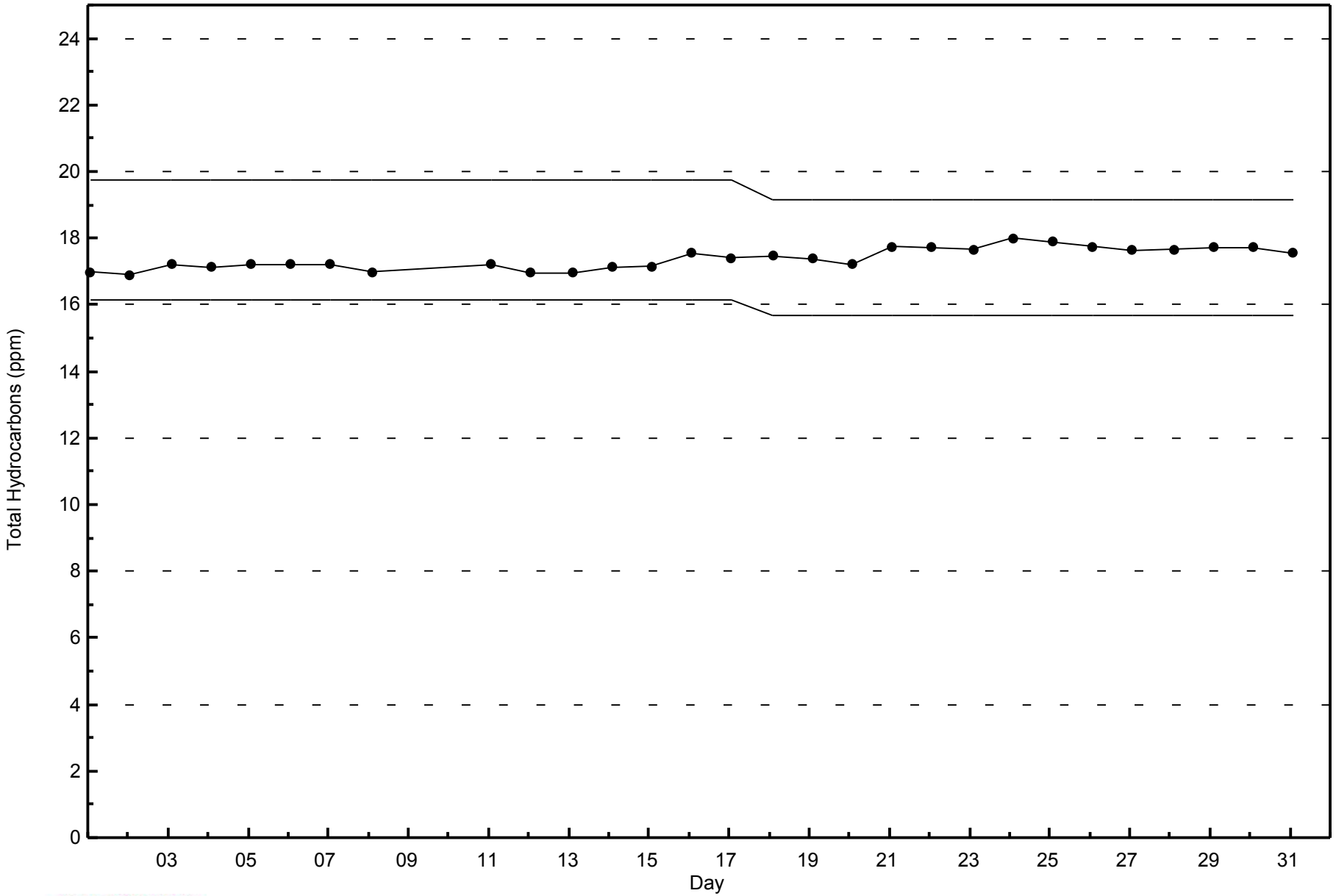
WBEA NETWORK

Span Responses

Total Hydrocarbons (THC) - ppm

WBEA Mobile - January 2014



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ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

WBEA Mobile - January 2014

Maximum Value: 5.9 C on Jan 24 03:00

Maximum Daily Average: -0.3 C on Jan 23

Minimum Value: -33.6 C on Jan 27 07:00

Minimum Daily Average: -25.7 C on Jan 27

Maximum Diurnal Average: -12.7 C at hour 15

Minimum Diurnal Average: -17.3 C at hour 5

Monthly Average: -15.08 C

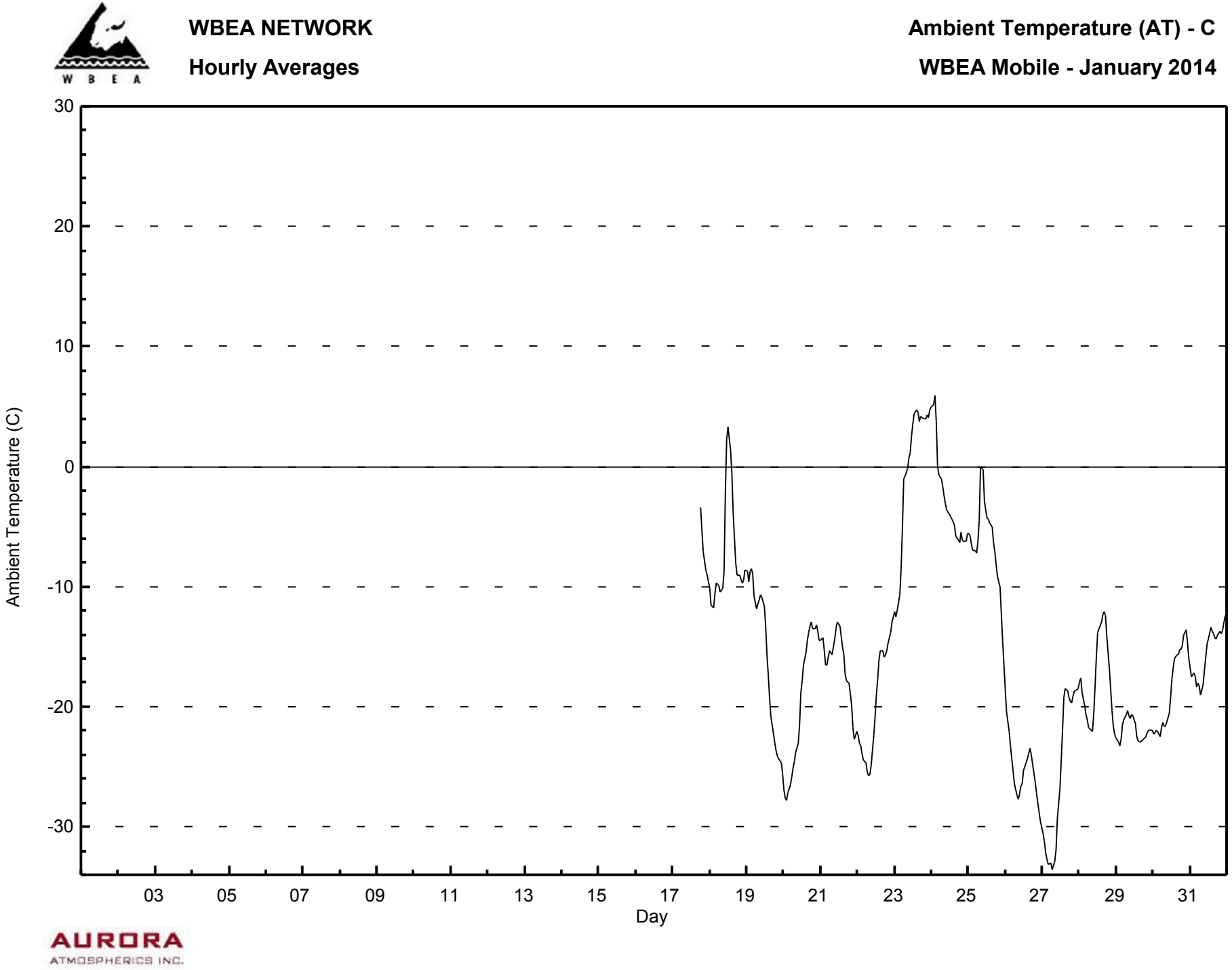
Percentiles: P_1 = -33.1 P_{10} = -25.3 Q_1 = -22.0 Median = -15.7 Q_3 = -9.4 P_{90} = -2.5 P_{99} = 4.7

Hours in Service:	344
Hours of Data:	342
Hours of Missing Data:	2
Hours of Calibration:	0
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-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	M	M	-3.4	-5.4	-7.1	-8.6	-9.0	-9.6	--	-3.4
18-Jan	-10.1	-11.5	-11.8	-10.6	-9.8	-9.9	-10.0	-10.5	-10.2	-8.7	-2.3	2.2	3.4	1.4	-0.6	-3.9	-6.0	-8.0	-9.1	-9.1	-9.4	-9.7	-9.4	-8.7	-7.2	3.4
19-Jan	-8.7	-9.6	-8.7	-8.5	-9.0	-10.8	-11.9	-11.5	-11.1	-10.7	-10.8	-11.6	-13.4	-15.8	-17.4	-19.3	-20.8	-22.3	-23.1	-23.7	-24.1	-24.3	-24.7	-25.7	-15.7	-8.5
20-Jan	-27.0	-27.6	-27.8	-27.2	-26.5	-25.9	-25.1	-24.6	-23.8	-23.1	-21.5	-18.8	-17.9	-16.6	-15.5	-14.5	-13.9	-13.3	-13.0	-13.5	-13.5	-13.2	-13.7	-14.5	-19.7	-13.0
21-Jan	-14.5	-14.3	-15.3	-16.6	-16.5	-15.9	-15.3	-15.7	-15.0	-14.4	-13.6	-12.9	-13.3	-14.1	-15.0	-15.6	-17.3	-17.8	-18.1	-19.0	-19.9	-21.7	-22.7	-22.1	-16.5	-12.9
22-Jan	-22.3	-23.1	-23.3	-23.9	-24.5	-24.7	-25.4	-25.7	-25.7	-24.9	-22.4	-20.8	-19.0	-17.8	-16.1	-15.3	-15.4	-15.9	-15.7	-15.4	-14.7	-13.8	-13.0	-12.5	-19.6	-12.5
23-Jan	-12.1	-12.5	-12.0	-10.7	-8.5	-5.1	-1.0	-0.8	-0.1	0.8	1.2	2.6	3.6	4.4	4.8	4.5	3.8	4.1	4.1	4.0	3.9	4.2	4.1	4.7	-0.3	4.8
24-Jan	4.9	5.2	5.9	3.8	0.1	-0.7	-1.0	-1.7	-2.4	-3.1	-3.7	-3.9	-4.1	-4.4	-4.6	-4.9	-5.8	-6.1	-6.3	-5.5	-6.1	-6.2	-6.3	-5.6	-2.6	5.9
25-Jan	-5.6	-5.7	-6.5	-7.0	-6.9	-7.2	-6.2	-4.5	-0.1	-0.3	-2.8	-3.6	-4.3	-4.4	-4.7	-5.1	-6.3	-7.1	-8.2	-9.2	-10.0	-12.3	-14.6	-16.5	-6.6	-0.1
26-Jan	-18.6	-20.4	-22.1	-23.3	-24.4	-25.3	-26.4	-27.4	-27.7	-27.3	-26.6	-26.4	-25.3	-24.6	-24.4	-23.9	-23.5	-24.1	-25.5	-26.3	-27.1	-28.0	-28.8	-29.5	-25.3	-18.6
27-Jan	-30.5	-31.2	-32.2	-32.7	-33.2	-33.1	-33.6	-33.3	-32.9	-31.9	-29.4	-26.9	-24.5	-21.9	-19.3	-18.5	-18.7	-19.3	-19.6	-19.6	-19.1	-18.7	-18.6	-18.4	-25.7	-18.4
28-Jan	-18.0	-17.6	-18.8	-19.9	-20.6	-21.1	-21.7	-21.9	-22.1	-20.5	-18.2	-15.8	-13.8	-13.5	-12.9	-12.3	-12.1	-12.4	-14.1	-16.9	-18.6	-20.3	-21.6	-22.3	-17.8	-12.1
29-Jan	-22.6	-23.0	-23.3	-22.8	-21.5	-21.1	-20.7	-20.4	-20.8	-21.0	-20.6	-20.8	-21.5	-22.5	-22.8	-22.9	-22.9	-22.7	-22.6	-22.5	-22.1	-22.0	-22.0	-22.0	-22.0	-20.4
30-Jan	-22.2	-22.2	-22.0	-22.1	-22.5	-21.8	-21.3	-21.7	-21.6	-21.4	-20.6	-19.3	-17.7	-16.8	-16.0	-15.7	-15.7	-15.3	-15.2	-14.9	-14.0	-13.6	-14.7	-16.0	-18.5	-13.6
31-Jan	-16.8	-17.5	-17.2	-17.5	-18.3	-18.0	-18.3	-19.0	-18.2	-17.0	-15.9	-14.8	-14.4	-13.4	-13.7	-14.0	-14.2	-14.4	-14.0	-13.7	-13.9	-13.6	-13.0	-12.4	-15.6	-12.4
	-16.0	-16.5	-16.8	-17.1	-17.3	-17.2	-17.0	-17.0	-16.5	-16.0	-14.8	-13.6	-13.0	-12.9	-12.7	-13.0	-13.5	-13.9	-13.6	-14.0	-14.4	-14.8	-15.2	-15.4	Diurnal Average	
	4.9	5.2	5.9	3.8	0.1	-0.7	-1.0	-0.8	-0.1	0.8	1.2	2.6	3.6	4.4	4.8	4.5	3.8	4.1	4.1	4.0	3.9	4.2	4.1	4.7	Diurnal Maximum	

M - Maintenance NS - Not in Service

AURORA ATMOSPHERICS INC.


WBEA NETWORK
Hourly Averages
Ambient Temperature (AT) - C
WBEA Mobile - January 2014
30
20
10
0
-10
-20
-30
Ambient Temperature (C)
03
05
07
09
11
13
15
17
19
21
23
25
27
29
31
Day
AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Ambient Temperature (AT) - C

WBEA Mobile - January 2014

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	115	33.63	33.63
-20 - 0	204	59.65	93.27
0 - 10	23	6.73	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 342

Total Number of Hours: 744

AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

WBEA Mobile - January 2014

Maximum Value: 88 % on Jan 18 10:00

Maximum Daily Average: 79.2 % on Jan 18

Minimum Value: 51 % on Jan 27 16:00

Minimum Daily Average: 60.7 % on Jan 27

Maximum Diurnal Average: 74.6 % at hour 6

Minimum Diurnal Average: 66.2 % at hour 15

Monthly Average: 70.7 %

Percentiles: P_1 = 53 P_{10} = 60 Q_1 = 66 Median = 71 Q_3 = 75 P_{90} = 82 P_{99} = 86

Hours in Service:	344
Hours of Data:	342
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily	Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Average	Maximum
1-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	M	M	75	72	72	74	71	70	--	75
18-Jan	73	81	82	80	80	82	84	85	86	88	77	68	65	70	72	73	75	80	83	84	83	84	85	82	79.2	88
19-Jan	82	86	83	83	83	84	84	84	82	82	82	80	75	75	73	71	69	68	69	68	68	69	70	72	76.9	86
20-Jan	73	72	72	72	71	72	71	72	72	70	68	65	66	68	68	69	69	68	69	73	71	71	73	72	70.3	73
21-Jan	71	70	72	74	74	74	73	75	73	72	73	73	69	68	69	69	73	73	72	74	76	73	74	75	72.4	76
22-Jan	74	73	73	73	73	72	72	73	73	71	69	69	67	64	61	62	64	67	71	74	77	78	79	80	71.3	80
23-Jan	81	83	84	85	85	83	74	73	72	70	69	65	63	60	59	60	64	64	65	67	69	68	69	69	70.9	85
24-Jan	70	70	69	75	84	85	85	85	82	80	77	76	76	76	75	76	81	82	81	77	80	81	83	81	78.7	85
25-Jan	82	82	85	86	85	86	85	84	77	75	80	81	79	80	82	80	76	75	77	71	57	56	60	60	76.7	86
26-Jan	59	59	60	62	63	65	65	66	66	64	65	67	64	62	62	62	58	61	66	68	69	68	67	66	63.9	69
27-Jan	68	66	67	66	65	67	67	68	67	67	65	64	61	57	52	51	52	53	55	57	55	55	56	56	60.7	68
28-Jan	57	56	60	62	63	64	66	67	68	66	61	56	53	58	59	58	62	66	71	70	68	68	70	72	63.4	72
29-Jan	72	72	72	71	70	71	71	71	72	74	74	72	69	68	69	70	70	70	69	69	69	68	67	67	70.3	74
30-Jan	69	67	65	66	67	65	65	66	66	65	60	57	56	55	56	55	56	58	60	62	59	60	63	66	61.7	69
31-Jan	70	71	72	76	76	75	74	76	76	75	76	74	71	67	69	71	75	75	74	72	70	67	66	64	72.3	76
	71.6	72.2	72.6	73.6	74.4	74.6	74.2	74.5	73.7	72.8	71.1	69.0	66.8	66.4	66.2	66.2	67.4	68.6	70.5	70.5	69.5	69.3	70.1	70.1	Diurnal Average	
	82	86	85	86	85	86	85	85	86	88	82	81	79	80	82	80	81	82	83	84	83	84	85	82	Diurnal Maximum	

M - Maintenance NS - Not in Service

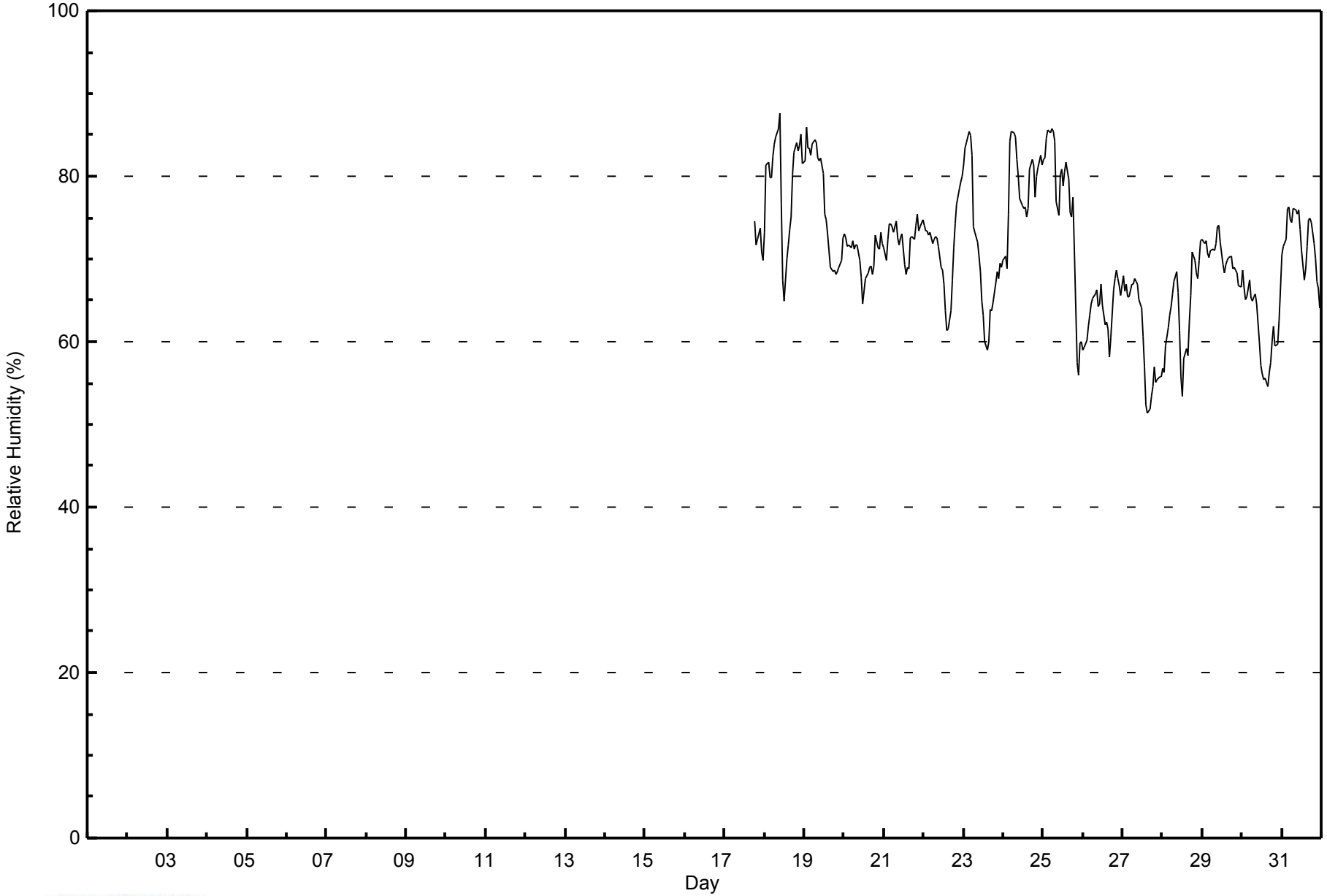
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Relative Humidity (RH) - %

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Relative Humidity (RH) - %

WBEA Mobile - January 2014

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	38	11.11	11.11
60 - 80	248	72.51	83.63
80 - 100	56	16.37	100.00

Total Number of Valid Hours: 342

Total Number of Hours: 744

AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

WBEA Mobile - January 2014

Maximum Speed: 20 km/h on Jan 25 21:00

Maximum Daily Speed Average: 7 km/h on Jan 30

Minimum Speed Value: 0 km/h on Jan 19 23:00

Minimum Daily Speed Average: 1 km/h on Jan 18

Maximum Diurnal Speed Average: 3 km/h at hour 13

Minimum Diurnal Speed Average: 0 km/h at hour 5

Monthly Average Velocity: 1.0 km/h 333.1 deg

Percentiles: P_1 = 1 P_{10} = 2 Q_1 = 3 Median = 5 Q_3 = 8 P_{90} = 10 P_{99} = 16

Hours in Service:	344
Hours of Data:	342
Hours of Missing Data:	2
Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average	Daily Maximum
1-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	----	----
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	M	M	NE4	ENE4	ENE3	E2	SSE2	ESE2	----	NE4
18-Jan	S2	SSE3	SSW3	S7	SSW4	SSW3	SSW5	S6	S6	S5	W5	W10	W1	ENE3	NNE6	NNE7	N7	NNE6	NNE5	N5	N4	NNE3	NNE1	NW3	WNW1	W10
19-Jan	NW1	SSW0	W2	NNE2	NE4	NE1	WNW1	NW1	NNE3	NNE5	NNE8	NNE10	NNE14	NNE14	NE14	NE12	NE10	NE9	NE7	NE4	NE3	NNE1	WSW0	SSE2	NNE5	NNE14
20-Jan	SSW3	SSW3	S3	SSW4	S4	S6	SSW8	S8	S10	SSW8	SSW7	SSW7	S7	S8	S8	S7	S4	S0	N2	N3	NNW3	NNW5	N6	N4	SSW3	S10
21-Jan	N1	NNE1	ENE2	ENE2	ENE2	NE1	NNE2	NNE3	NNW1	NNW4	N6	N6	NNE9	NNE6	NE4	NE4	ENE3	ENE2	ENE4	E3	SE2	S3	S4	S6	NE2	NNE9
22-Jan	S6	S4	S6	S5	S4	SSW4	S5	S6	S7	S8	S8	S8	S10	S11	S10	S8	S7	SSW6	S7	SSW5	S6	S8	S6	S6	S7	S11
23-Jan	S5	SSE6	SSE8	SSE8	SSE7	SW6	W15	W9	W9	W13	WNW5	NW8	NNW10	NW7	NW7	WNW7	WNW8	NW8	WNW4	W4	WSW5	W4	WSW4	W5	W5	W15
24-Jan	W7	NW3	NW5	NNW6	N6	N4	N6	N8	N7	N7	N6	NNE6	NNE8	NNE6	NNE5	NNE5	NNE4	NNE3	NNE2	NW1	N1	SSE1	SSE2	S3	N4	N8
25-Jan	SSE3	SSW2	S1	SW1	SW3	SSW4	SSW4	SSW4	WNW9	NNW8	NNE6	NNE8	N8	N5	NNE6	N9	NNE11	N11	N12	N12	N20	N17	N16	N17	N6	N20
26-Jan	N19	N16	N15	N12	N11	NNE8	NNE6	NNE5	NNE3	NNE4	N4	NE3	NNE2	NNE2	NNE2	SSE2	S3	S3	SSE3	SSE4	S2	S2	S3	SSW3	NNE4	N19
27-Jan	S3	S4	S4	S5	SSW6	S6	S7	S8	S9	S9	S7	SSE5	SSE7	SSE7	SSE7	S6	S6	S6	S8	S8	S7	S6	S7	S5	S6	S9
28-Jan	S5	S8	S4	S4	S6	S5	S6	S7	S7	S6	SSE6	S3	N2	NNE3	NNE2	N2	N6	N8	NNE11	NNE11	NNE11	NNE12	NNE9	NNE6	ENE1	NNE12
29-Jan	N4	N4	N4	N3	NNW1	NNW1	WNW1	WSW1	N2	N5	N6	NNE10	N13	N13	N10	N9	N9	N10	N9	N8	N7	NNW5	NNW6	NNW9	N6	N13
30-Jan	NNW8	NNW6	NNW5	NW5	NNW6	NW5	W7	W9	W11	W14	W14	WSW11	WSW10	WSW10	WSW10	WSW7	SW9	SW8	SW7	SW8	WSW7	W7	NW4	NW3	W7	W14
31-Jan	NNW6	N6	N5	N6	NNW4	NW3	W1	S2	SSW1	NE2	NNE3	N5	N6	N5	N5	NNE5	NNE5	NNE4	N1	WNW2	NNW3	NNW4	NW3	W3	N3	N6
	NW1	NNW0	NNW0	NNW0	W0	SW1	SW3	SW2	WSW3	W2	WNW1	NNW2	N3	NNE2	NNE2	NNE2	N2	N2	NNE2	N1	NNW2	NNW2	NNW1	NNW1	Diurnal Average	
	N19	N16	N15	N12	N11	NNE8	W15	W9	W11	W14	W14	WSW11	NNE14	NNE14	NNE14	NE12	NNE11	N11	N12	N12	N20	N17	N16	N17	Diurnal Maximum	

M - Maintenance NS - Not in Service

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

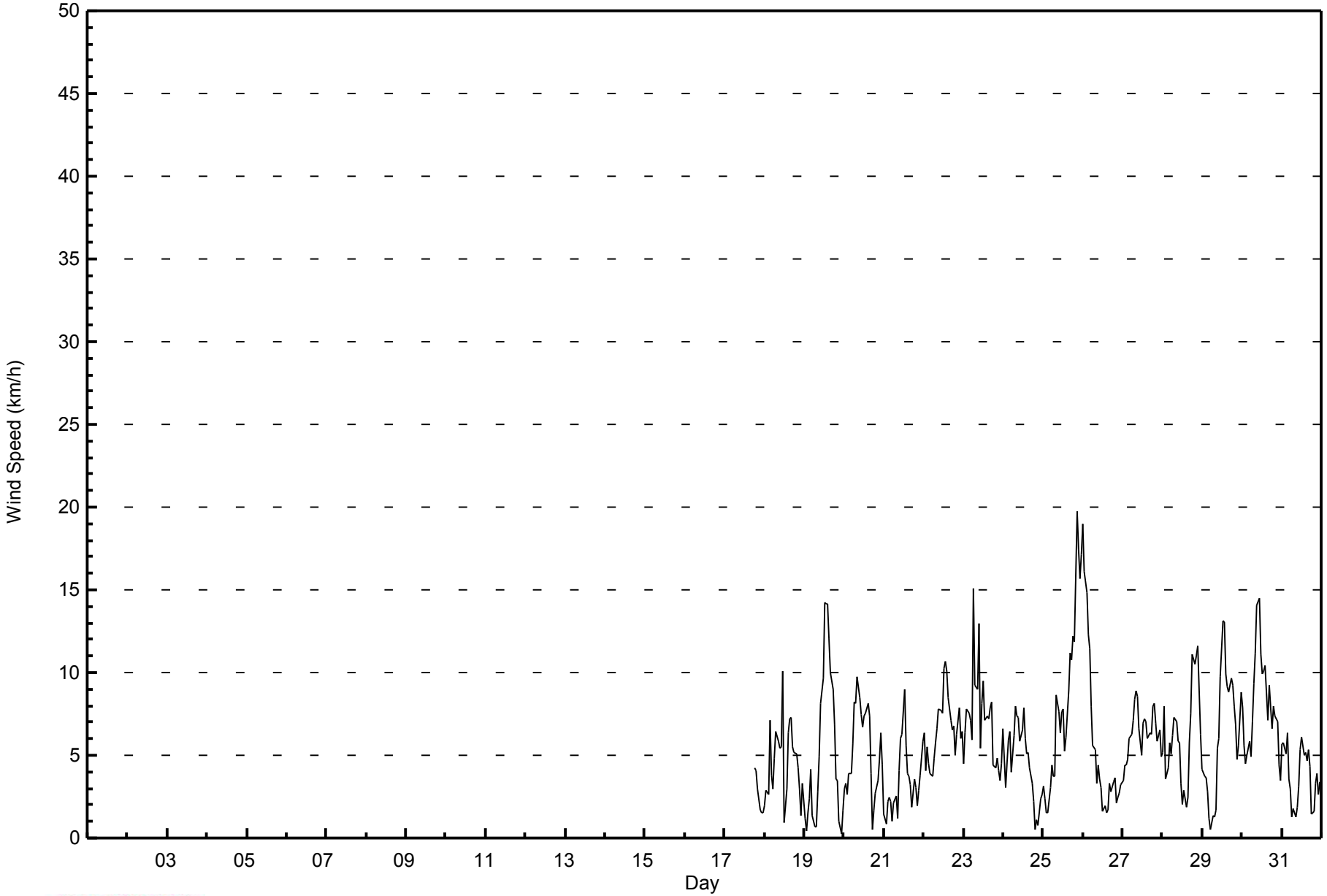
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Wind Speed (WS) - km/h

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Cumulative Frequency Distribution

Wind Speed (WS) - km/h

WBEA Mobile - January 2014

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	172	50.29	50.29
6 - 11	149	43.57	93.86
12 - 19	20	5.85	99.71
20 - 28	1	0.29	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 342

Total Number of Hours: 744

AURORA
ATMOSPHERICS INC.

WBEA NETWORK

Frequency Distribution

Wind Speed (WS) - km/h

WBEA Mobile - January 2014

Wind Speed	**Wind Direction**																
Ranges (km/h)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	**Totals**
0 - 5	21	29	10	9	2	1	1	10	31	16	2	5	6	6	12	11	172
6 - 11	26	23	3	0	0	0	0	8	48	6	5	6	8	3	4	9	149
12 - 19	11	4	1	0	0	0	0	0	0	0	0	0	4	0	0	0	20
20 - 28	1	0	0	0	0	0	0	0	0	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	59	56	14	9	2	1	1	18	79	22	7	11	18	9	16	20	342

Total Number of Valid Hours: 342

Total Number of Hours: 744

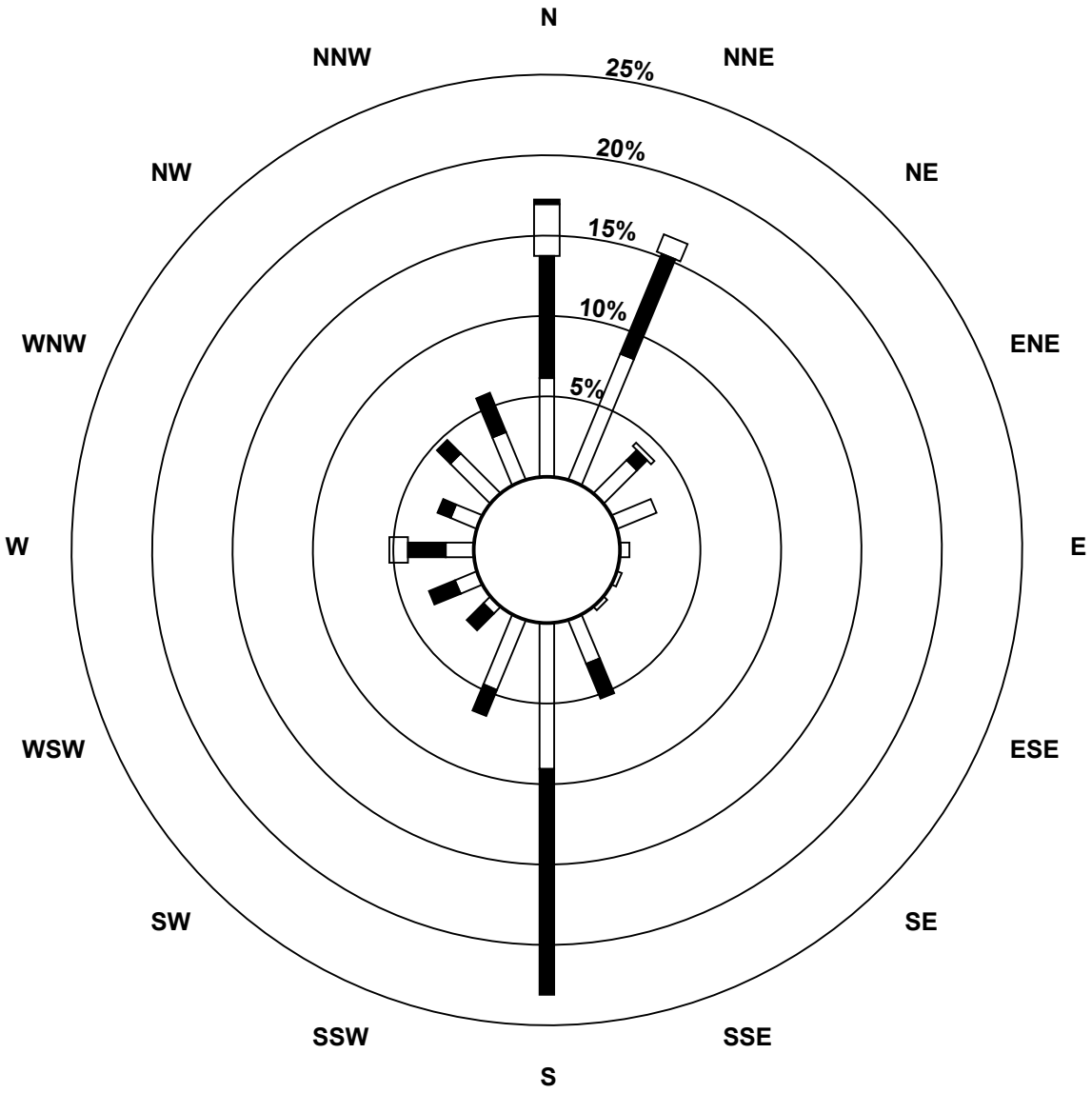
AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

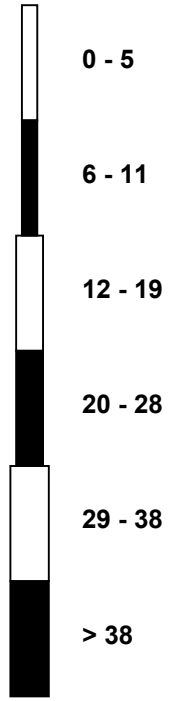
Wind Rose Jan 2014

Wind Speed (WS) - km/h

WBEA Mobile (MAMSL1)



Classes (km/h)



Total Number of Valid Hours: 342

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

WBEA Mobile - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 7 km/h on Jan 25 21:00

Minimum Value: 1 km/h on Jan 26 22:00

Percentiles: $P_1 = 1$ $P_{10} = 1$ $Q_1 = 1$ Median = 2 $Q_3 = 3$ $P_{90} = 4$ $P_{99} = 6$

Hours in Service:	344
Hours of Data:	342
Hours of Missing Data:	2
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-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	M	M	3	2	2	1	1	1	3
18-Jan	1	1	2	2	2	2	2	1	2	1	2	4	3	2	3	3	3	2	2	2	1	1	2	2	4
19-Jan	1	1	1	1	2	1	1	1	2	2	3	4	5	6	6	5	4	4	3	2	2	1	1	1	6
20-Jan	1	1	1	1	1	2	3	2	3	3	3	3	3	2	3	2	3	1	2	2	2	2	3	2	3
21-Jan	1	1	1	1	1	1	2	2	1	2	3	3	4	2	2	2	1	1	1	1	1	1	2	2	4
22-Jan	2	2	2	2	2	2	2	2	2	3	3	3	4	4	4	3	2	2	3	2	3	3	2	2	4
23-Jan	2	2	2	2	2	4	4	6	6	7	4	4	3	3	3	3	3	4	2	2	2	2	2	2	7
24-Jan	3	2	2	3	2	2	2	3	3	3	2	3	3	3	2	2	2	2	2	1	1	1	1	1	3
25-Jan	1	1	1	1	1	1	2	2	3	4	3	3	3	3	2	3	4	4	4	5	7	6	5	6	7
26-Jan	6	6	5	4	4	3	2	2	2	2	2	2	1	2	1	2	1	1	1	1	1	1	1	1	6
27-Jan	1	1	1	1	1	1	1	1	1	2	3	2	2	2	2	2	2	2	3	2	2	2	2	2	3
28-Jan	2	3	2	2	1	1	1	2	2	2	2	2	2	2	1	2	3	3	5	4	4	4	3	3	5
29-Jan	2	1	1	1	1	1	1	1	2	2	3	4	5	5	4	3	3	3	3	3	3	2	2	3	5
30-Jan	3	2	2	2	2	2	3	3	4	4	3	4	3	3	4	2	3	3	2	3	3	4	2	2	4
31-Jan	3	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	2	1	2	3
	6	6	5	4	4	4	4	6	6	7	4	4	5	6	6	5	4	4	5	5	7	6	5	6	
	Diurnal Maximum																								

M - Maintenance NS - Not in Service

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

WBEA Mobile - January 2014

Direction of Maximum Speed: 354 deg on Jan 25 21:00
Direction of Maximum Daily Speed Average: 265.4 deg on Jan 30

Direction of Minimum Speed: 252 deg on Jan 19 23:00

Direction of Minimum Daily Speed Average: 0.5 deg on Jan 18

Monthly Average Direction: 249.3 deg

Hours in Service:	344
Hours of Data:	342
Hours of Missing Data:	2
Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Average
1-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	M	M	45	60	57	101	149	122	--
18-Jan	183	162	196	191	197	205	211	188	189	185	267	281	281	76	27	25	11	14	13	9	11	17	16	325	298.7
19-Jan	306	194	259	33	35	51	299	326	16	33	25	28	29	31	34	35	37	42	39	42	55	17	252	163	32.4
20-Jan	195	192	181	192	191	182	196	187	188	192	205	210	180	177	184	181	186	190	353	351	338	346	3	8	193.3
21-Jan	10	17	65	62	60	35	14	15	335	328	357	1	17	25	46	49	59	59	77	80	137	188	178	174	38.3
22-Jan	180	181	184	191	178	193	178	179	184	189	189	184	178	177	182	189	189	197	182	192	189	180	182	184	184.2
23-Jan	179	164	163	153	161	224	260	274	280	278	284	321	330	316	305	298	303	306	291	271	258	279	242	279	271.8
24-Jan	279	315	305	343	1	353	358	10	5	10	10	17	18	22	24	28	18	17	25	321	11	164	149	180	3.2
25-Jan	168	201	187	236	231	198	192	202	285	346	17	18	7	7	16	7	16	11	10	4	354	1	5	5	360.0
26-Jan	8	9	7	9	9	12	21	24	21	19	9	44	21	18	25	154	180	171	159	167	174	182	177	197	17.4
27-Jan	177	185	181	187	192	180	179	183	186	174	172	164	163	160	161	169	173	181	177	171	182	185	184	186	176.8
28-Jan	182	184	175	188	177	180	181	174	182	178	161	174	11	17	14	3	360	1	15	16	15	18	22	16	59.9
29-Jan	8	10	11	6	344	331	290	254	350	8	11	12	9	8	9	11	8	6	9	7	358	347	340	340	3.4
30-Jan	340	331	327	325	328	304	271	270	273	268	261	256	245	239	240	243	225	219	225	229	255	281	304	315	265.4
31-Jan	338	4	0	357	329	308	277	185	192	45	20	7	5	351	11	19	17	12	350	285	332	327	304	273	351.3
Diurnal Average	321.5	331.2	326.7	332.5	262.5	221.3	231.9	217.0	238.0	266.6	299.2	334.2	6.2	16.3	17.1	16.2	6.6	1.4	20.8	7.5	347.2	341.0	346.7	326.8	

M - Maintenance NS - Not in Service

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

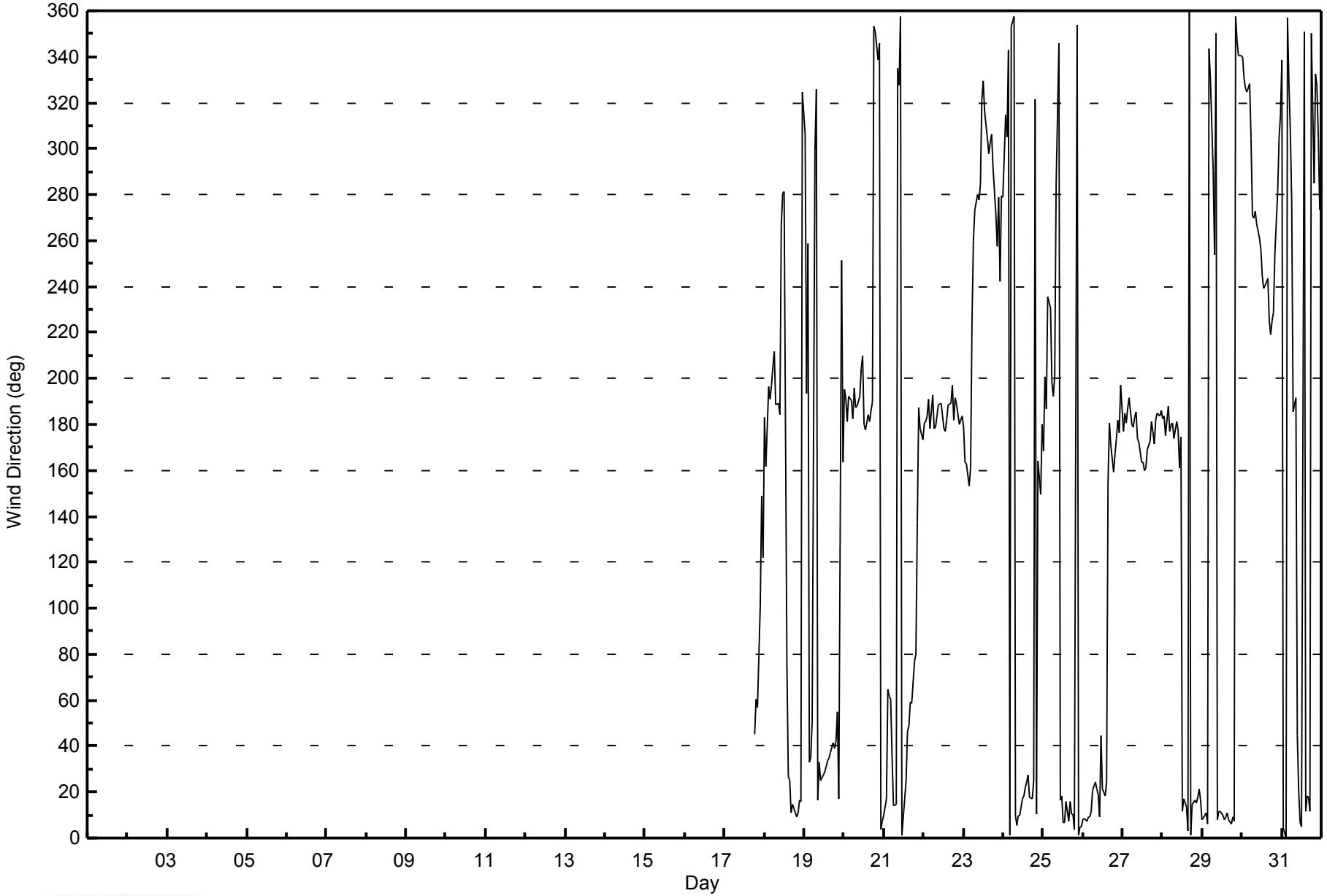
AURORA ATMOSPHERICS INC.

WBEA NETWORK

Hourly Averages

Wind Direction (WD) - deg

WBEA Mobile - January 2014



AURORA
ATMOSPHERICS INC.

Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction (WD) - deg

WBEA Mobile - January 2014

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0
Maximum Value: 97 deg on Jan 18 13:00

Minimum Value: 7 deg on Jan 27 07:00

Percentiles: P_1 = 8 P_{10} = 15 Q_1 = 19 Median = 22 Q_3 = 26 P_{90} = 36 P_{99} = 69

Hours in Service:	344
Hours of Data:	342
Hours of Missing Data:	2
Hours of Calibration:	0
Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Maximum
1-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
2-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
3-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
4-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
5-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
8-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
9-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
10-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
11-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
12-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
13-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
14-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
15-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
16-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
17-Jan	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	M	M	29	32	31	31	43	39	43
18-Jan	31	19	20	17	22	26	18	16	23	16	23	20	97	28	22	27	23	19	19	23	21	42	56	26	97
19-Jan	72	95	36	37	28	46	74	42	22	27	25	26	26	28	28	28	27	26	28	28	30	31	58	73	95
20-Jan	15	18	15	17	18	18	19	20	19	22	26	29	21	21	20	18	50	81	44	20	17	19	23	21	81
21-Jan	21	45	20	17	20	22	15	33	29	22	22	21	23	26	25	24	23	22	16	29	41	13	19	20	45
22-Jan	22	19	17	24	17	14	19	17	18	18	20	21	22	21	22	20	18	19	23	23	20	20	23	16	24
23-Jan	33	19	19	21	24	50	15	33	27	28	29	27	21	24	25	24	26	26	24	37	38	24	41	23	50
24-Jan	20	26	23	32	19	25	26	24	22	23	24	23	25	25	23	27	22	23	23	26	56	30	21	22	56
25-Jan	25	24	70	23	15	23	26	50	26	43	26	26	22	24	22	22	22	22	21	22	20	21	21	21	70
26-Jan	22	22	21	21	20	20	22	20	22	21	21	28	60	59	31	67	22	15	11	8	14	9	10	8	67
27-Jan	15	9	11	8	7	7	7	9	8	15	19	23	22	24	22	19	20	19	18	17	19	18	17	17	24
28-Jan	15	18	23	13	13	13	11	11	11	23	24	36	50	22	20	13	16	20	23	24	24	23	21	21	50
29-Jan	20	17	15	16	31	65	44	30	24	21	21	23	21	21	21	22	21	20	21	21	20	19	21	19	65
30-Jan	19	20	20	20	21	23	17	13	18	16	14	17	17	16	23	23	17	23	19	20	28	23	23	27	28
31-Jan	19	16	14	17	24	21	42	19	32	56	26	23	22	22	22	22	23	22	32	17	25	24	29	20	56
	72	95	70	37	31	65	74	50	32	56	29	36	97	59	31	67	50	81	44	37	56	42	58	73	
	Diurnal Maximum																								

M - Maintenance NS - Not in Service

AURORA ATMOSPHERICS INC.

Wood Buffalo Environmental Association

SO_2 Calibration Report

Station Information

Calibration Date	January 20, 2014	Previous Calibration	January 17, 2014
Station Name	MAMS	Station Number	MAMS

Reason: ROUTINE

Start Time (MST)	11:40	End Time (MST)	14:10
Barometric Pressure	747 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	12800811
SO2 Gas Concentration	50.7 ppm	Cal Gas Expiry Date	May 29 2014
Gas Cert Reference	LL107944		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6465
DACS voltage range	0-5000mV	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	1000	1000	PMT voltage (v)	-639	-639
Analyzer Range (mv)	5000	5000	Lamp voltage (v)	851	851
Calculated slope	1.007603	1.006698	Chamber temp. (Deg C)	46	46
Calculated intercept	1.115548	1.589069	Pressure (mmHg)	719	719
Analyzer Background	27.7	27.7	Flow (lpm)	0.634	0.634
Analyzer Coefficient	0.796	0.796	Intensity (%)	41xxx	41xxx

Analyzer make	TEI 45C	Analyzer serial #	45c-77878-387

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.0	-0.3	N/A
as found span	5000	79.7	808.2	801.6	1.008
calibrator zero	5000	0.0	0.0	-0.3	N/A
high point	5000	79.7	808.2	801.6	1.008
second point	5000	39.9	404.6	399.8	1.012
third point	5000	10.0	101.4	98.0	1.035
calibrator zero	6000	0.0	0.0	0.0	N/A
as left zero	6000	0.0	0.0	0.0	N/A
as left span	5000	79.7	808.2	795.8	1.016
				Average Correction Factor	1.018

Corrected As found	801.9	Previous response	813.2	% change	1.4%

Notes: No Adjustments or maintenance done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

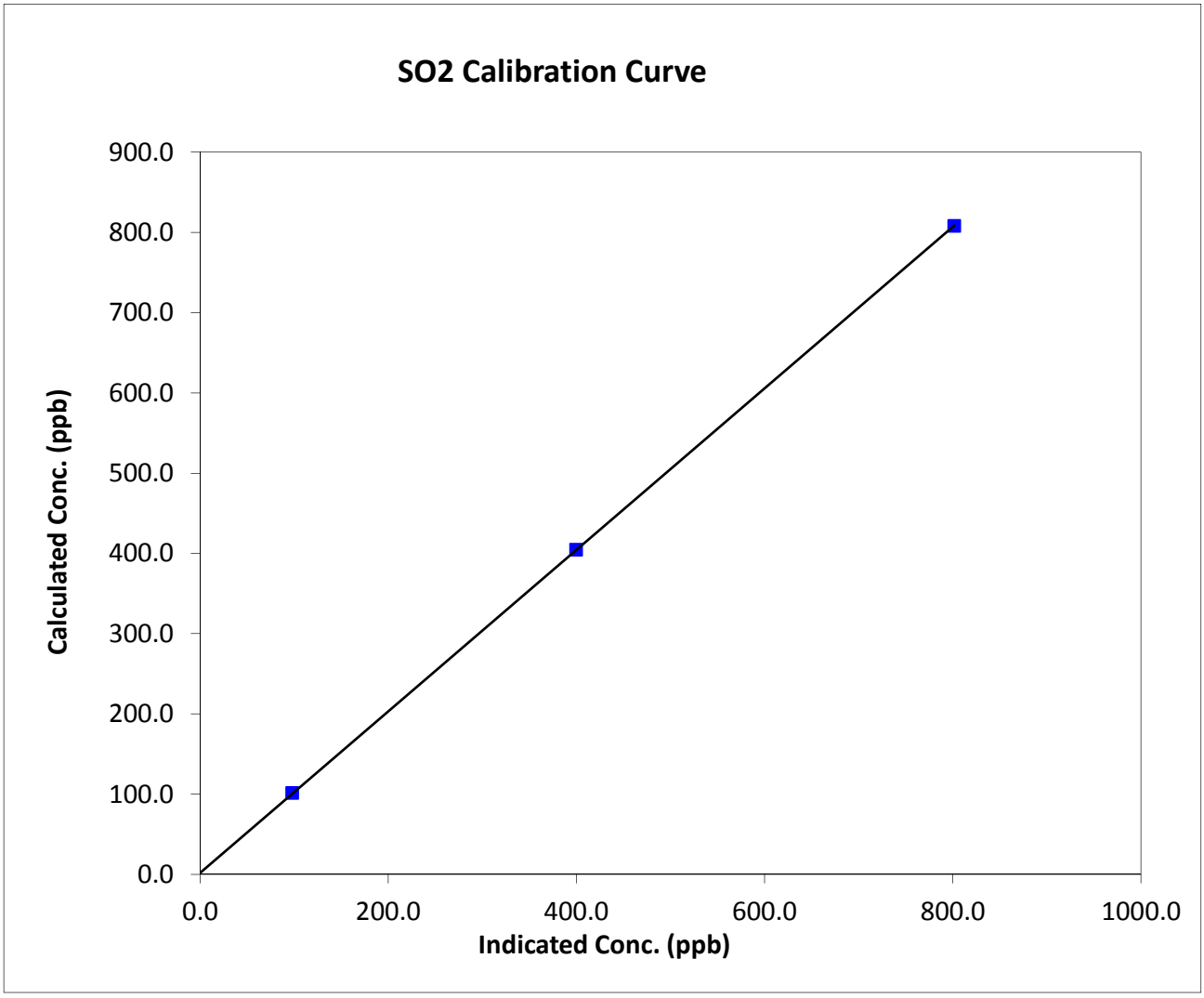
SO_2 Calibration Summary

Station Information

Calibration Date	January 20, 2014	Previous Calibration	January 17, 2014
Station Name	MAMS	Station Number	MAMS
Start Time (MST)	11:40	End Time (MST)	14:10
Analyzer make	TEI 45C	Analyzer serial #	45c-77878-387

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.3	N/A	Correlation Coefficient	0.999991
808.2	801.6	1.0082		
404.6	399.8	1.0120	Slope	1.006698
101.4	98.0	1.0347		
			Intercept	1.589069



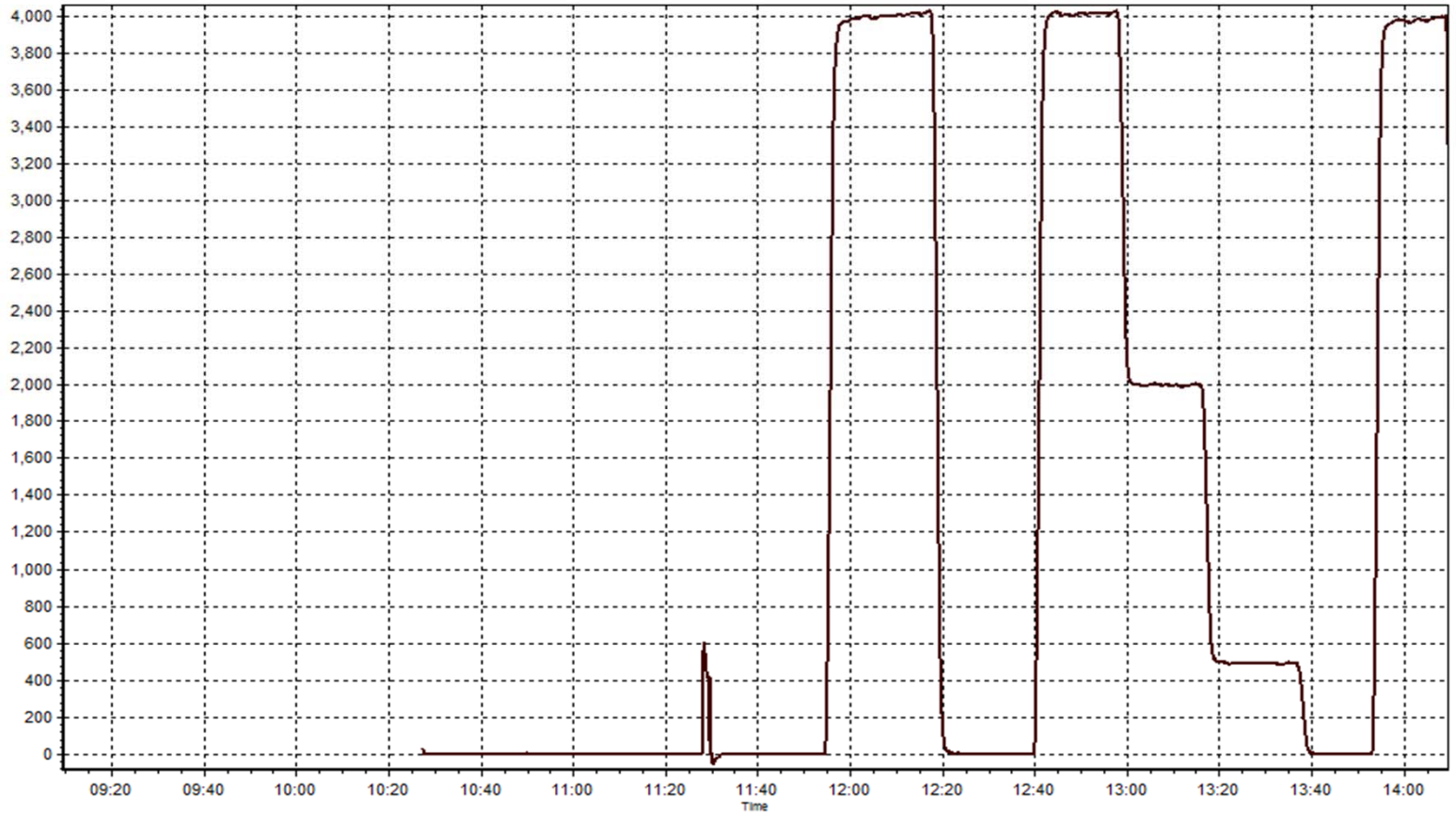
Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

SO_2 Calibration Plot

Calibration Date: January 20, 2014 Start Time (MST) 11:40 End Time: 14:10 \

Station Name: MAMS Station Number: MAMS



Wood Buffalo Environmental Association

H2S Calibration Report

Station Information

Calibration Date	January 20, 2014	Previous Calibration	September 6, 2013
Station Name	MAMS	Station Number	MAMS
Reason:	Routine		
Start Time (MST)	14:10	End Time (MST)	16:00
Barometric Pressure	N/A mmHg	Station temp.	22 Deg C
Calibrator Make/Model	Sabio 4010	Serial number	12800811
Cal Gas Concentration	10.2 ppm H2S	Cal Gas Expiry Date	
Gas Cert Reference		SO2 gas conc.	50.7 ppm SO2
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6465
DACS voltage range	0-5V	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppb)	100	100	PMT voltage (V)	-653.8	-689.7
Analyzer Range (mv)	5000	5000	Lamp voltage (V)	895.0	872.0
Calculated slope	0.999298	1.002351	Chamber temp.(Deg C)	44.9	44.9
Calculated intercept	0.314216	-0.326011	Pressure (mmHg)	644.5	595.6
Analyzer Background	11.2	16.1	Flow (LPM)	0.720	1.004
Analyzer Coefficient	0.925	0.868	Intensity	97%	91%
			Converter temp.(Deg C)	324.9	324.0

Analyzer make/model	TEI 450i	Analyzer serial #	922436967
Converter make/model	N/A	Converter serial #	N/A

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.0	0.22	N/A
as found span	6000	44.2	75.1	75.0	1.002
SO2 scrubber check	6000	14.7	124.2	0.75	N/A
calibrator zero	6000	0.0	0.0	0.22	N/A
high point	6000	44.1	75.0	75.0	1.000
second point	6000	24.7	42.0	42.5	0.988
third point	6000	14.7	25.0	25.2	0.991
calibrator zero	6000	0.0	0.0	0.4	N/A
as left zero	6000	0.0	0.0	0.4	N/A
as left span	6000	47.1	80.1	80.7	0.993
				Average Correction Factor	0.993

Corrected As found	74.7	Previous response	74.8	% change	0.0%

Notes:

No Adjustments made

Scrubber checked after third point

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

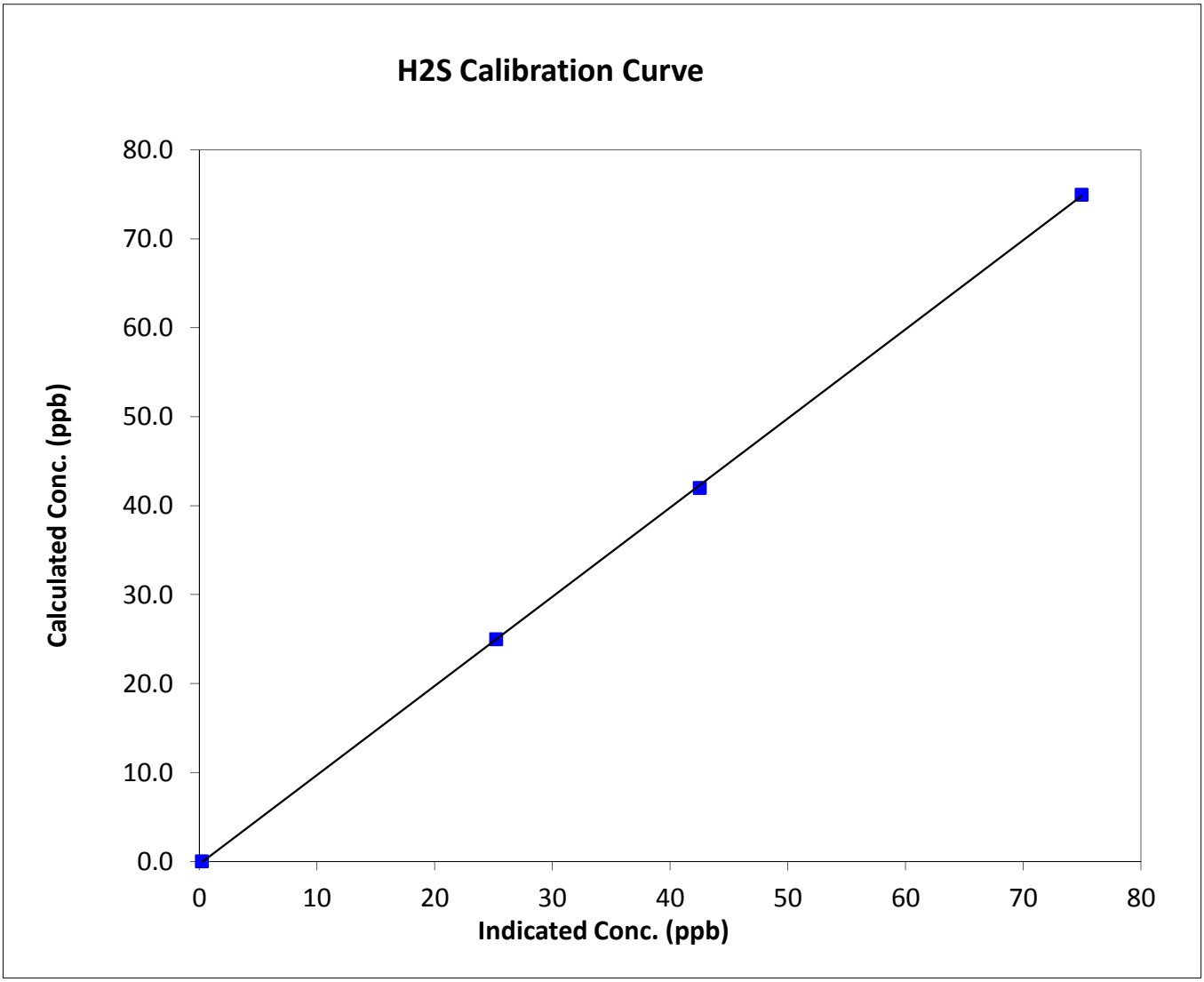
H2S Calibration Summary

Station Information

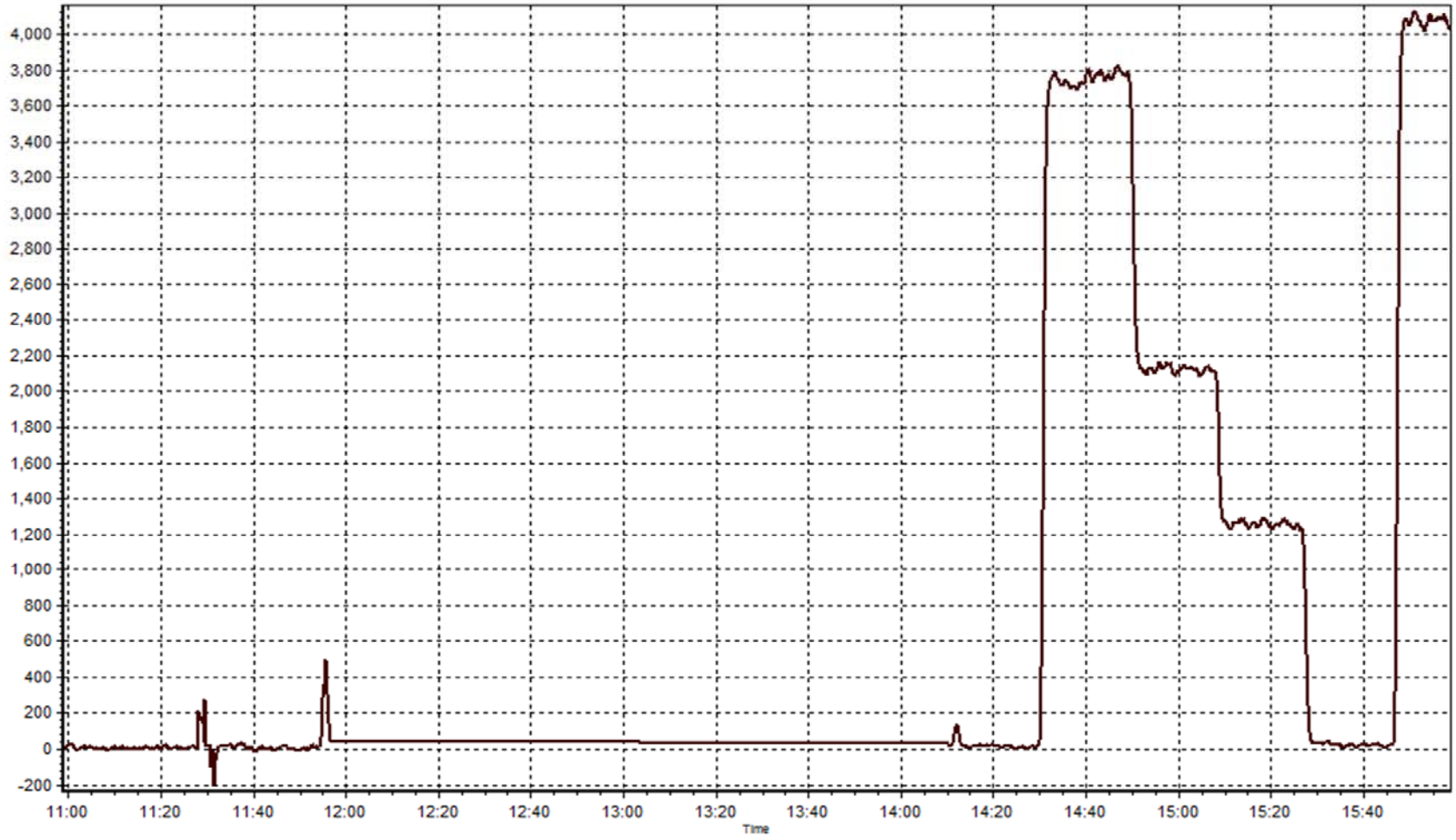
Calibration Date	January 20, 2014	Previous Calibration	September 6, 2013
Station Name	MAMS	Station Number	MAMS
Start Time (MST)	14:10	End Time (MST)	16:00
Analyzer make	TEI 450i	Analyzer serial #	922436967

Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.2	N/A	Correlation Coefficient	0.999956
75.0	75.0	1.0001		
42.0	42.5	0.9875	Slope	1.002351
25.0	25.2	0.9909		
			Intercept	-0.326011



H2S Calibration Plot Date: Monday, January 20, 2014



Wood Buffalo Environmental Association

THC Calibration Report

Station Information

Calibration Date	January 20, 2014	Previous Calibration	January 17, 2014
Station Name	MAMS	Station Number	1001
Reason:	Routine		
Start Time (MST)	11:40	End Time (MST)	14:10
Barometric Pressure	747 mmHg	Station temp.	21 Deg C
Calibrator Make/Model	Sabio 4010	Serial Number	12800811
Gas Cert Reference	LL107944	Cal Gas Expiry Date	May 29 2014
CH4 Cal Gas Conc.	515 ppm	CH4 Equiv Conc.	1078.8 ppm
C3H8 Cal Gas Conc.	205 ppm		
DACS make/model	Campbell Scientific CR3000	DACS serial No.	6465
DACS voltage range	0-5V	DACS channel #	

Analyzer Information

	Before	*After*		*Before*	*After*
Analyzer Range (ppm)	25	25	Flame Temp	149.1	149.1
Analyzer Range (mv)	5000	5000	Base Temp	125.0	125.0
Calculated slope	1.010001	0.992648	Sample Pressure	8.5	8.5
Calculated intercept	-0.050500	-0.054409	Fuel Pressure	18.8	18.8
Bkg Coef	2.39	3.77	Air Pressure	29.8	29.8
Span Coef	4.693	4.693			

Analyzer make	TEI 51i-LT	Analyzer serial #	913935796

Calibration Data

Set Point	Total flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration NMHC (ppm) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
as found zero	6000	0.0	0.00	0.26	NA
as found span	5000	79.7	17.20	17.37	0.990
calibrator zero	5000	0.0	0.00	0.03	NA
high point	5000	79.7	17.20	17.37	0.990
second point	5000	39.9	8.61	8.74	0.986
third point	5000	10.0	2.16	2.26	0.957
calibrator zero	6000	0.0	0.00	0.11	0.000
as left zero	6000	0.0	0.00	0.11	NA
as left span	5000	79.7	17.20	17.44	0.986
				Average Correction Factor	0.977

Corrected As found	17.11	Previous response	17.42	% change	1.8%

Notes: Adjusted zero
No Maintenance Done

Calibration Performed By: Melissa Lemay

Wood Buffalo Environmental Association

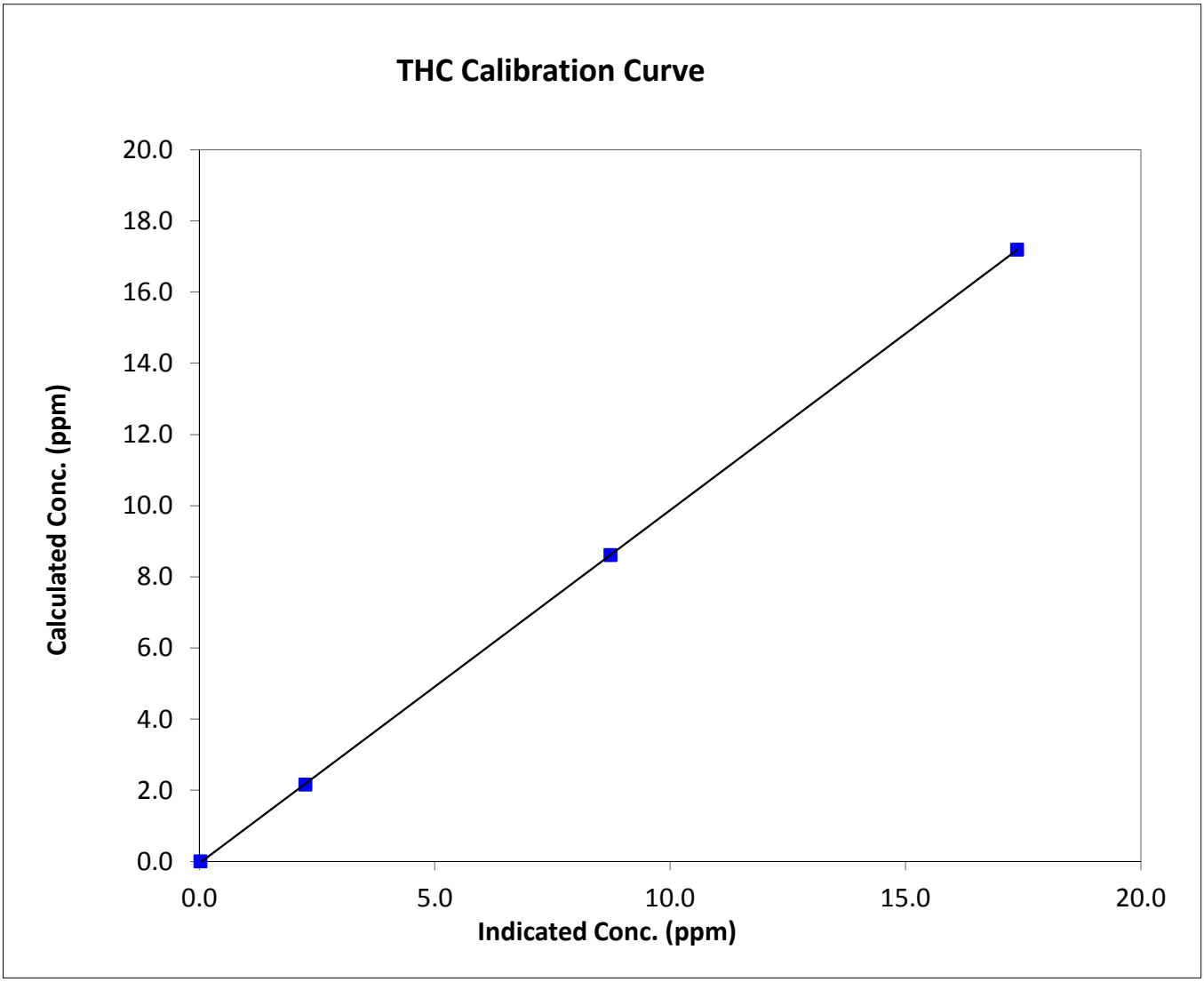
THC Calibration Summary

Station Information

Calibration Date	January 20, 2014	Previous Calibration	January 17, 2014
Station Name	MAMS	Station Number	1001
Start Time (MST)	11:40	End Time (MST)	14:10
Analyzer make	TEI 51i-LT	Analyzer serial #	913935796

Calibration Data

Calculated concentration (ppm) (Cc)	Indicated concentration (ppm) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.00	0.03	N/A	Correlation Coefficient	0.999991
17.20	17.37	0.9899		
8.61	8.74	0.9855	Slope	0.992648
2.16	2.26	0.9568		
			Intercept	-0.054409



THC Calibration Plot **Date:** January 20, 2014