

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

September 14, 2018

**Subject: Monthly Report Submission for the LICA Cold Lake South station**

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of July 2018.

The air monitoring program consists of continuous air monitoring, passive sampling, intermittent sampling, including both VOC and PAH sampling program, and Partisol sampling program. All the air monitoring activities were conducted by contractors.

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Passive	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Intermittent	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable
VOC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

All data collected in July 2018, with the exception of PM2.5, was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

**Non-Conformance:** Two 1-hour exceedances were recorded on July 11: concentrations of 86 µg/m<sup>3</sup> at hour 14:00 and 97 µg/m<sup>3</sup> at hour 15:00. One 24-hour exceedance was also recorded on July 11 at a concentration of 41 µg/m<sup>3</sup>. AEP under reference number: 340789.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to AEP and Alberta’s Ambient Air Quality Data Warehouse have been submitted by the time of this report submission, with the exception of electronic submission for the results of intermittent samples and VOC canister samples. We are currently working with the airdata warehouse to set up codes for some VOC/PAH species that are missing in the parameter list. The results for these data will be submitted once all needed codes are available.



Lakeland Industry & Community Association  
5107 50 St  
Bonnyville, AB T9N 2J7

Should you have any questions, please don't hesitate to contact us.

Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga". The signature is written in a cursive style with a large, looped initial "M".

Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[mbisaga@otonabee.ca](mailto:mbisaga@otonabee.ca)

A handwritten signature in blue ink that reads "Lily Lin". The signature is written in a cursive style with a large, looped initial "L".

Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[rebbacaa@gmail.com](mailto:rebbacaa@gmail.com)



MAXXAM ANALYTICS  
#1 2080 39 Ave. NE, Calgary, AB  
T2E 6P7

maxxam.ca  
Toll Free 800-386-7247  
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT**  
**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
**COLD LAKE SOUTH CONTINUOUS MONITORING STATION**

**JOB #: 2833-2018-07-1-C**

**July 2018**

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**

5107 50 ST.  
BONNYVILLE, ALBERTA  
T9N 2J7

**Attention: MIKE BISAGA**

DATE: **August 30, 2018**

Prepared by: *Maram Ghaleb*

---

Maram Ghaleb, B.Sc.  
Project Manager, Customer Service, Air Services

Reviewed by: *Wunmi Adekanmbi*

---

Wunmi Adekanmbi, M.Sc., EPT, PMP  
Project Team Lead, Customer Service, Air Services

## **SUMMARY**

In July 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake Continuous Monitoring Station, near Cold Lake, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

The operational time for each monitoring analyzer, meteorological unit and data acquisition system was above the 90% requirement.

With the exception of  $PM_{2.5}$ , data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017). Two 1-hour exceedances were recorded on July 11: concentrations of  $86 \mu\text{g}/\text{m}^3$  at hour 14:00 and  $97 \mu\text{g}/\text{m}^3$  at hour 15:00. One 24-hour exceedance was also recorded on July 11 at a concentration of  $41 \mu\text{g}/\text{m}^3$ . These events were reported to AEP under reference number: 340789. Details are recorded in the Exceedance Summary Report.

**TRS:** One hour of downtime was recorded on July 30 at hour 13:00, due to an additional zero-span check performed to assess a biased low drift in span response.

**$PM_{2.5}$ :** On July 15, the Thermo 5030 Sharp unit recorded anomalous readings from hour 07:00 to 10:00. These four hours were rejected as the data collected was outside the instrument's specifications.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

### Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	0	2	27	17	8.5	N	0	1	100.0
TRS (ppb)	-	-	-	-	0	2	19	7	4.1	W	0	1	99.9
THC (ppm)	-	-	-	-	2.28	3.76	28	5	0	N	2.74	28	100.0
NO <sub>2</sub> (ppb)	159	-	0	-	2	7	12	5	5.3	WSW	3	12	100.0
NO (ppb)	-	-	-	-	0	6	31	6	0.1	W	1	3	100.0
NO <sub>x</sub> (ppb)	-	-	-	-	2	10	31	6	0.1	W	3	9	100.0
O <sub>3</sub> (ppb)	82	-	0	-	23.2	48.5	28	15	5.4	WSW	38.2	21	100.0
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	1	1	9	97	11	15	10.9	NW	41	11	99.5
RELATIVE HUMIDITY (%)	-	-	-	-	70	100	3	5	0.9	NNE	85	3	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	17.6	30.6	6	14	10	SW	23.6	17	100.0
VECTOR WS (kph)	-	-	-	-	2.4	20.5	22	15	-	NW	10.5	14	100.0
VECTOR WD (sec)	-	-	-	-	277 (W)	-	-	-	-	-	-	-	100.0

## Exceedance Summary Report

---

### SO<sub>2</sub> 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

### SO<sub>2</sub> 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

### NO<sub>2</sub> 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

### PM<sub>2.5</sub> 1-Hour Exceedances

DATE	TIME (MST)	READING (ppb)	WS (kph)	WD (deg)	ESRD Reference #
July 11	14:00	86	13.1	342	340789
July 11	15:00	97	10.9	322	340789

### PM<sub>2.5</sub> 24-Hour Exceedances

DATE	READING (µg/m <sup>3</sup> )	WS (kph)	WD (deg)	ESRD Reference #
July 11	41	7.3	288	340789

### O<sub>3</sub> 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

*In accordance with EPEA and the Substance Release Regulation.*

*In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.*

**TABLE OF CONTENTS**

<u>Title</u>	<u>Page</u>
<b>SUMMARY</b>	<b>2</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY REPORT</b>	<b>3</b>
<b>EXCEEDANCE SUMMARY REPORT</b>	<b>4</b>
<b>TABLE OF CONTENTS</b>	<b>5</b>
<b>1.0 Discussion</b>	<b>7</b>
<b>2.0 Project Personnel</b>	<b>10</b>
<b>3.0 Plant Monthly Required AMD Summary</b>	<b>10</b>
<b>4.0 Calculations and Results</b>	<b>10</b>
<b>5.0 Methods and Procedures</b>	<b>11</b>
<b>Appendix I</b>	
<b>Continuous Monitoring Data Results</b>	<b>14</b>
<b>Sulphur Dioxide</b>	<b>15</b>
<b>Total Reduced Sulphur</b>	<b>21</b>
<b>Total Hydrocarbon</b>	<b>27</b>
<b>Oxides of Nitrogen</b>	<b>33</b>
<b>Nitric Oxides</b>	<b>39</b>
<b>Nitrogen Dioxide</b>	<b>44</b>
<b>Ozone</b>	<b>50</b>
<b>Particulate Matter 2.5</b>	<b>56</b>
<b>Wind Speed</b>	<b>61</b>
<b>Wind Direction</b>	<b>66</b>
<b>Standard Deviation Wind Direction</b>	<b>69</b>
<b>Relative Humidity</b>	<b>72</b>
<b>Ambient Temperature</b>	<b>75</b>

<b>Appendix III</b>	<b>Equipment Calibration Results</b>	<b>78</b>
	Sulphur Dioxide	79
	Total Reduced Sulphur	82
	Total Hydrocarbon	85
	Nitrogen Dioxide	88
	Ozone	92
	Particulate Matter	95
	Wind System	97
	Calibrators	99
	Calibration Gases	102
<b>Appendix III</b>	<b>Maximum Instantaneous Data</b>	<b>107</b>
<b>Appendix IV</b>	<b>Report Certification Form</b>	<b>124</b>
<b>Appendix V</b>	<b>Data Validation Certification Form</b>	<b>126</b>



## **1.0 Discussion**

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

**SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on July 9.

**TOTAL REDUCED SULPHUR (TRS)**

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on July 9.
- The analyzer spanned close to the lower acceptance limit on July 29. An additional zero-span check was performed on July 30 at hour 13:00 to assess span response, yielding similar results. Subsequent scheduled zero-span checks were much closer to the mean. No further issues were identified. The probable cause of the span drift could not be determined. One hour of downtime was, however, incurred due to the additional quality check.

**TOTAL HYDROCARBONS (THC)**

- Operational time for the monitoring period was 100%
- The routine monthly calibration was performed on July 6.

**OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)**

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on July 9.

**OZONE (O<sub>3</sub>)**

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on July 10.

**PARTICULATE MATTER < 2.5 MICRONS (PM<sub>2.5</sub>)**

- Operational time for the monitoring period was 99.5%, equivalent to 4 hours of downtime.
- The routine monthly audit was performed on June 10.
- On July 15, the Thermo 5030 Sharp unit recorded anomalous, negative readings from hour 07:00 to 10:00. These four hours were rejected as the data collected was outside the instrument's specifications.

**WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)**

- Operational time for the monitoring period was 100%.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing and is measured in degrees from true north.

**RELATIVE HUMIDITY (RH)**

- Operational time for the monitoring period was 100%.

**AMBIENT TEMPERATURE (AmbTPX)**

- Operational time for the monitoring period was 100%.

**2.0 Project Personnel**

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

**3.0 Plant Monthly Required AMD Summary**

The operational time for each monitoring analyzer, meteorological unit and data acquisition system was above the 90% requirement.

With the exception of PM<sub>2.5</sub>, data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017). Two 1-hour exceedances were recorded on July 11: concentrations of 86 µg/m<sup>3</sup> at hour 14:00 and 97 µg/m<sup>3</sup> at hour 15:00. One 24-hour exceedance was also recorded on July 11 at a concentration of 41 µg/m<sup>3</sup>. These events were reported to AEP under reference number: 340789. Details are recorded in the Exceedance Summary Report.

**4.0 Calculations and Results**

All calculations and reporting of results, except for WS/WD/STDWD, follow the methods described in the AMD, 2016.

**WS/WD/STDWD:**

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings for WS and WD, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. The calm threshold was set at 1.8 kph for the STDWD channel, therefore the population of rejected instant data will be larger. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected for the month of July was re-calculated from the available 1-minute vector averages. To incorporate the highest number of instant data, minute data that contained less than 45 seconds were averaged based on the remaining sample set and not excluded when calculating hourly averages. This data treatment had a minor impact on data; applicable hours are outlined in the table below. Overall, in comparison with the original hourly averages, the change was insignificant. On July 31, the DAS vendor modified the datalogger configuration, in order to optimize the collection of wind data. The criteria of the calm threshold was eased and hourly data is calculated based on 1-minute vector averages.

Summary of Hourly Wind Data Revised After Data Treatment					
Date	Time	Date	Time	Date	Time
01/07/2018	03:00	03/07/2018	04:00	04/07/2018	22:00
01/07/2018	04:00	03/07/2018	05:00	04/07/2018	23:00
02/07/2018	13:00	03/07/2018	20:00	05/07/2018	00:00
02/07/2018	16:00	03/07/2018	21:00	05/07/2018	01:00
02/07/2018	18:00	03/07/2018	22:00	05/07/2018	02:00
02/07/2018	19:00	03/07/2018	23:00	05/07/2018	03:00
02/07/2018	20:00	04/07/2018	00:00	05/07/2018	04:00
02/07/2018	21:00	04/07/2018	01:00	05/07/2018	05:00
02/07/2018	22:00	04/07/2018	02:00	05/07/2018	07:00
02/07/2018	23:00	04/07/2018	03:00	05/07/2018	08:00
03/07/2018	00:00	04/07/2018	04:00	05/07/2018	17:00
03/07/2018	01:00	04/07/2018	05:00	09/07/2018	17:00
03/07/2018	02:00	04/07/2018	17:00	26/07/2018	19:00
03/07/2018	03:00	04/07/2018	21:00	31/07/2018	23:00

## 5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP  
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring  
Maxxam AIR SOP-00212: Ambient O<sub>3</sub> Monitoring  
Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring  
Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring  
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer  
Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer  
Total Hydrocarbons - Thermo 51i FID Analyzer  
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer  
Ozone - Thermo 49i Photometric Analyzer  
Particulate Matter (PM<sub>2.5</sub>) - Thermo SHARP 5030 Unit  
Wind System - Met One Unit  
Relative Humidity - Met One Unit  
Ambient Temperature - Met One Unit  
Datalogger - Envidas Ultimate

The following steps were used to complete the data verification and validation process:

**Level 0 Preliminary Verification**

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

**Level 1 Primary Validation**

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

**Level 2 Final Validation**

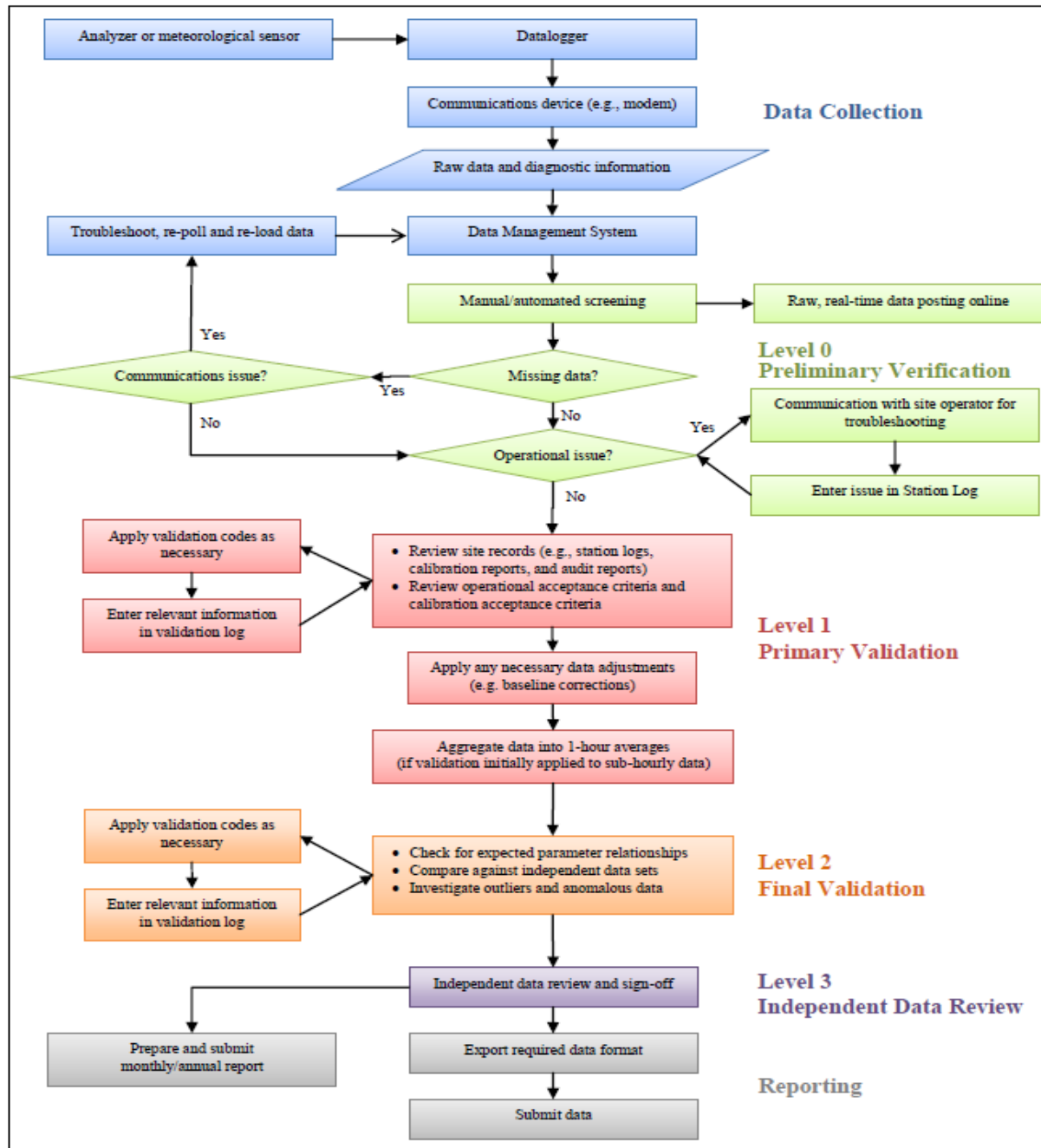
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

**Level 3 Independent Data Review**

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

**Post-Final Validation**

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***



***SULPHUR DIOXIDE***

**SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	0	0	0	S	0	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
2	0	0	0	0	S	0	0	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
3	0	0	0	S	0	0	0	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
4	0	0	S	0	0	0	0	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
5	0	S	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	1	24
6	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
9	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	0	0	0	0	0	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
20	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	24
23	0	0	0	0	0	0	S	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
24	0	0	0	0	0	S	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
25	0	0	0	0	S	0	0	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
26	0	0	0	S	0	0	0	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
27	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	0	24
28	0	S	0	0	0	0	0	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
29	S	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	0	0	0	0	1	0	1	1	1	0	1	0	1	1	1	1	2	2	0	1	1	1	0	0	0	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

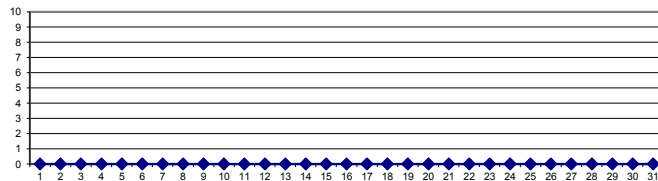
**OBJECTIVE LIMIT:**

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
----------------------	------	-----	-----	-------	----	-----

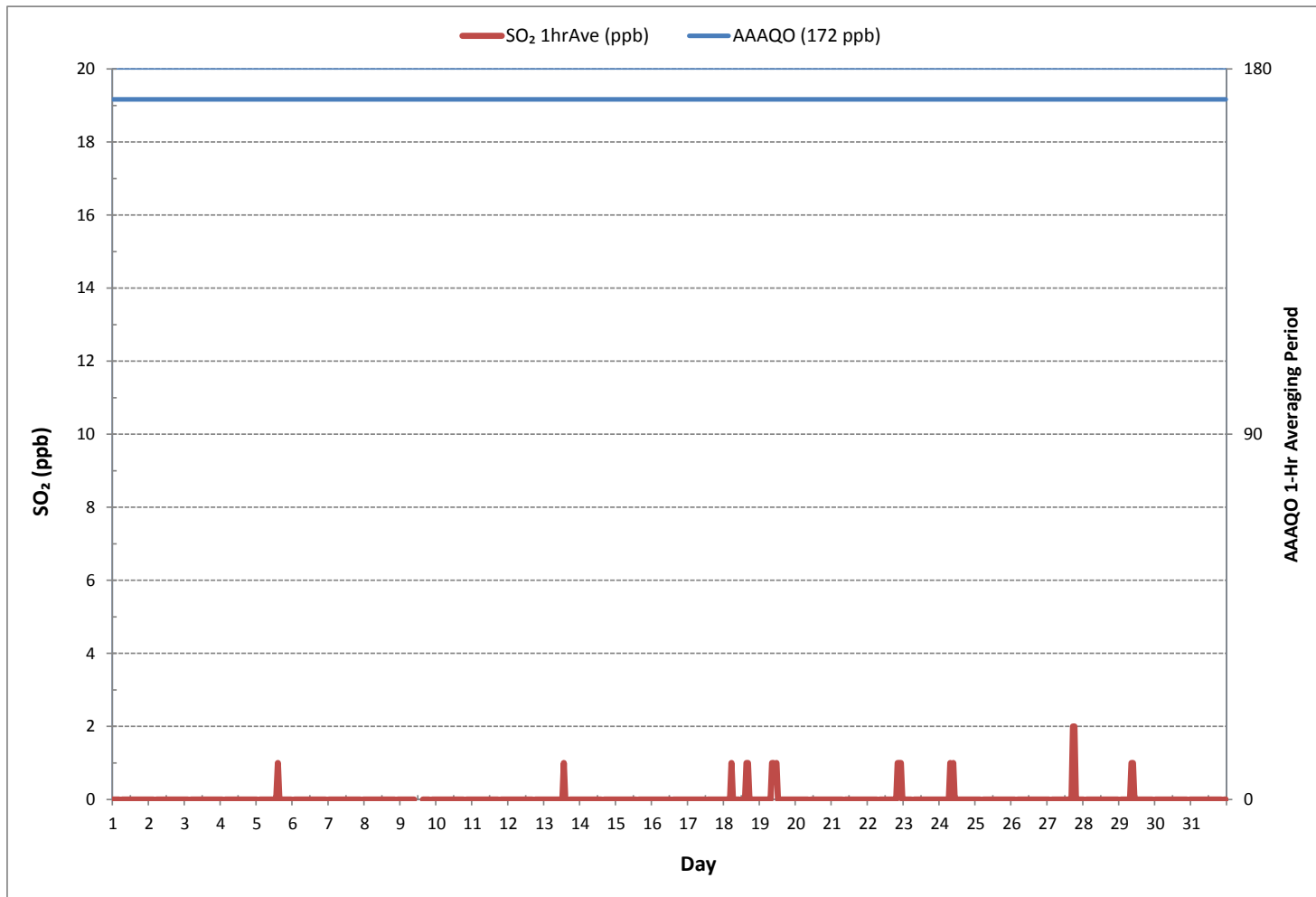
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	17
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 17 ON DAY 27
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

**24 HR AVERAGES July 2018**



SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)



Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-SO<sub>2</sub> [ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

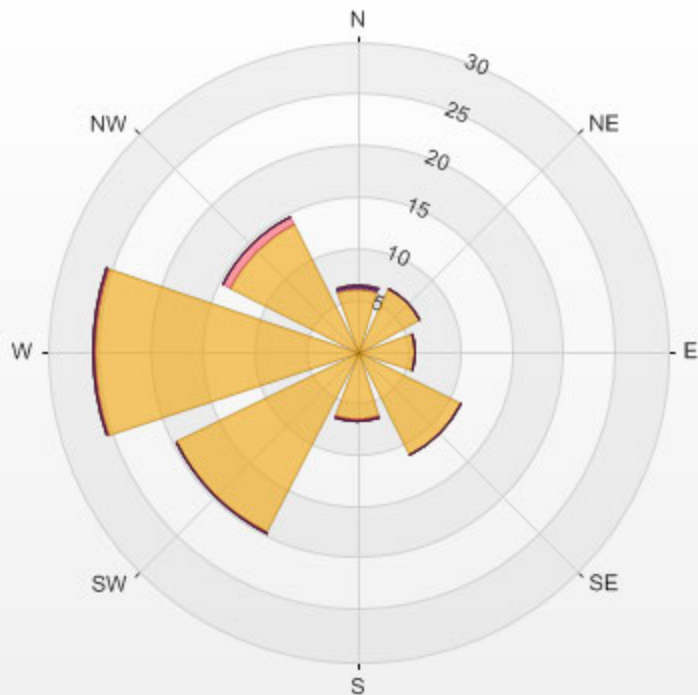
Calm: 3.26%

Calm Avg: 0.05 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
<b>N</b>	6.1	0.1	0.0	0.3	0.0	0.0	6.5
<b>NE</b>	6.8	0.0	0.0	0.0	0.0	0.0	6.8
<b>E</b>	5.5	0.0	0.0	0.0	0.0	0.0	5.5
<b>SE</b>	11.2	0.0	0.0	0.0	0.0	0.0	11.2
<b>S</b>	6.7	0.1	0.0	0.0	0.0	0.0	6.8
<b>SW</b>	19.6	0.1	0.0	0.0	0.0	0.0	19.7
<b>W</b>	25.5	0.1	0.0	0.0	0.0	0.0	25.6
<b>NW</b>	13.9	0.7	0.0	0.0	0.0	0.0	14.6
<b>Summary</b>	95.2	1.3	0.0	0.3	0.0	0.0	96.7

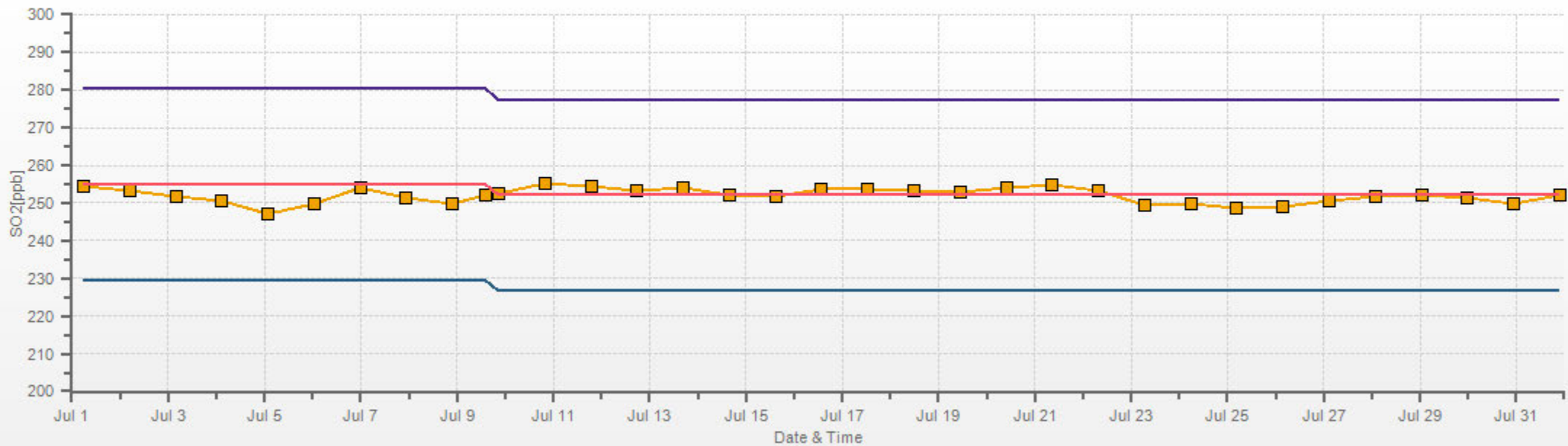
% Icon	Classes (ppb)	95	0.0-0.6	1	0.6-1.2	0	1.2-1.8	0	1.8-2.4	0	2.4-3.0	0	>3.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.26% Calm Poll Avg: 0.05[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***TOTAL REDUCED SULPHUR***

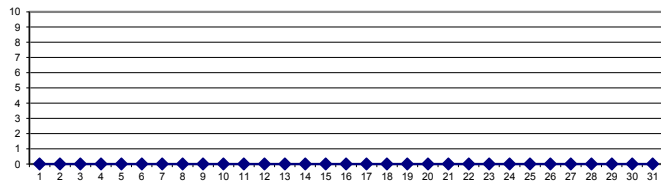
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
2	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	24
4	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
5	0	S	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
6	S	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24	
7	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24	
8	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
9	0	1	1	0	0	1	1	1	0	0	C	C	C	C	C	0	0	0	0	0	S	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	1	0	24	
11	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24	
13	0	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	S	0	1	0	1	0	0	0	0	1	0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	0	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	1	0	1	0	24	
18	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
19	0	0	1	1	1	1	1	2	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
20	0	1	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
21	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
22	0	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
23	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
24	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
25	1	1	0	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
26	0	0	0	S	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
27	0	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
28	0	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
29	S	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24	
30	0	0	0	0	0	0	0	1	0	1	0	0	S1	0	0	0	0	0	0	0	0	0	S	1	0	1	0	23	
31	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	1	0	24	
HOURLY MAX	1	1	1	1	1	1	1	2	1	1	0	0	0	0	0	0	0	0	1	0	1	0	1	1					
HOURLY AVG	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

24 HR AVERAGES July 2018

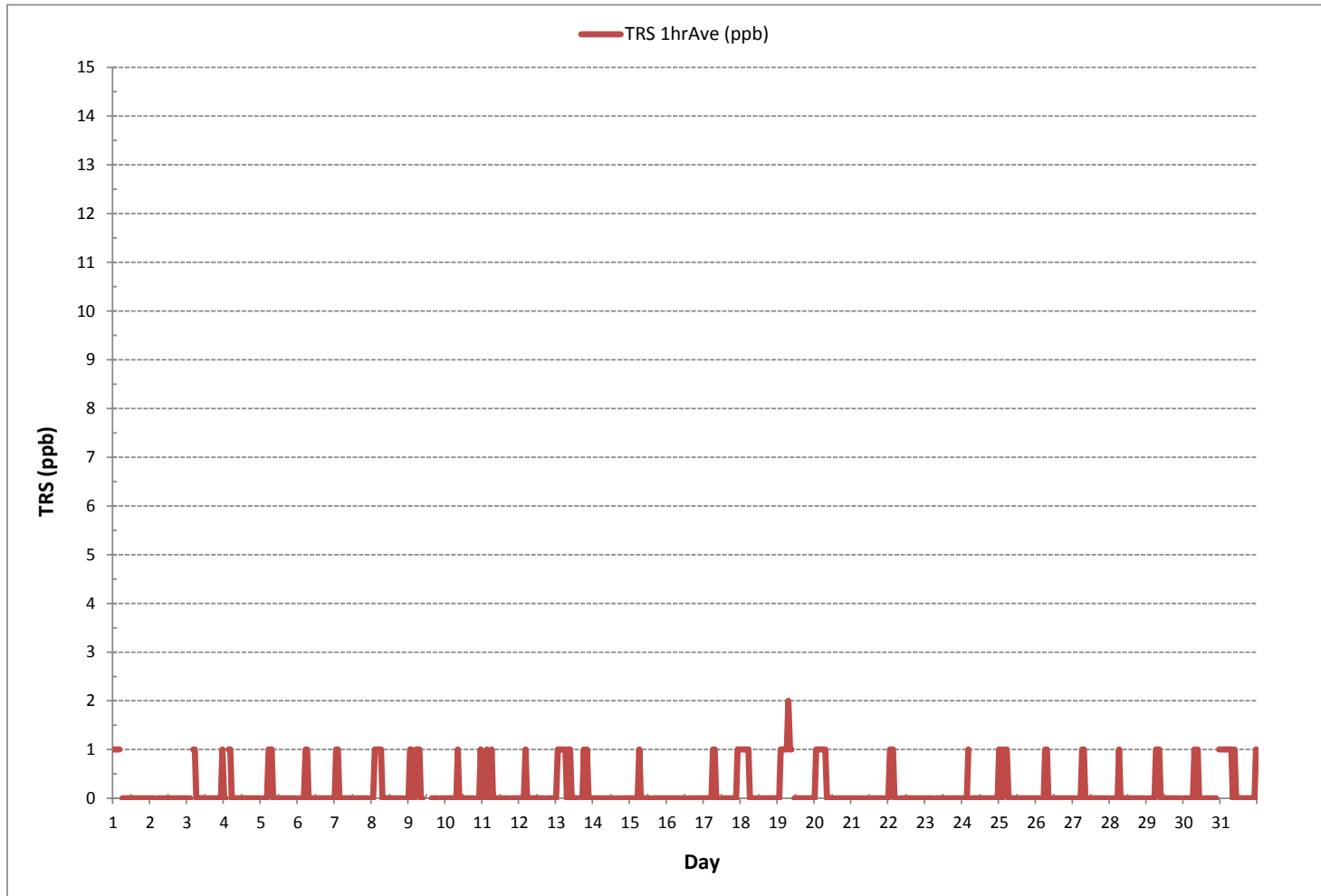


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	97			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	6	ON DAY 1
MAXIMUM 1-HR AVERAGE:	2	ppb @ HOUR	7	ON DAY 19
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	743
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	99.9
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0
				ppb



TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



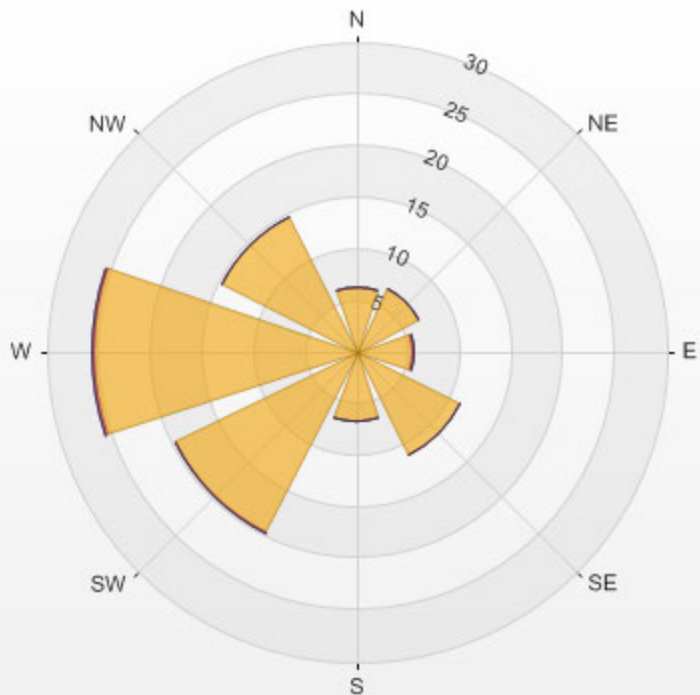
Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-TRS [ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 3.26% Calm Avg: 0.38 [ppb]

Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
<b>N</b>	6.4	0.0	0.0	0.0	6.4
<b>NE</b>	6.8	0.0	0.0	0.0	6.8
<b>E</b>	5.4	0.1	0.0	0.0	5.5
<b>SE</b>	11.2	0.0	0.0	0.0	11.2
<b>S</b>	6.8	0.0	0.0	0.0	6.8
<b>SW</b>	19.6	0.1	0.0	0.0	19.7
<b>W</b>	25.4	0.3	0.0	0.0	25.7
<b>NW</b>	14.6	0.0	0.0	0.0	14.6
<b>Summary</b>	96.2	0.6	0.0	0.0	96.7

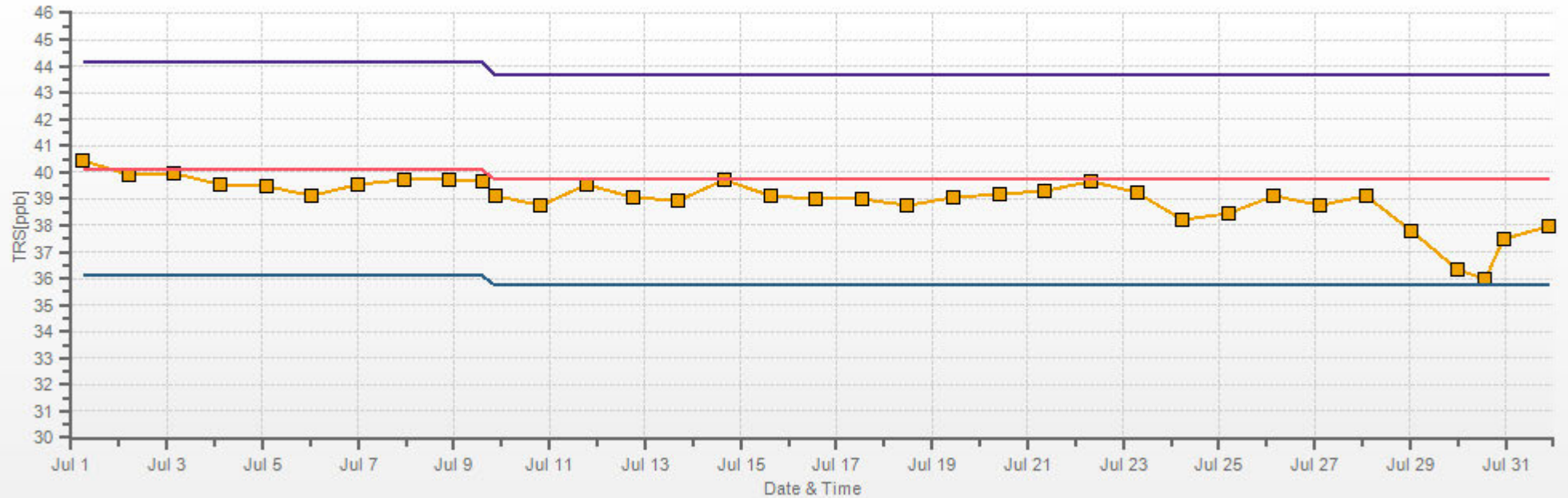
% Icon	Classes (ppb)	96	0.0-1.0	1	1.0-2.0	0	2.0-3.0	0	>3.0
--------	---------------	----	---------	---	---------	---	---------	---	------

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.26% Calm Poll Avg: 0.38[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***TOTAL HYDROCARBON***



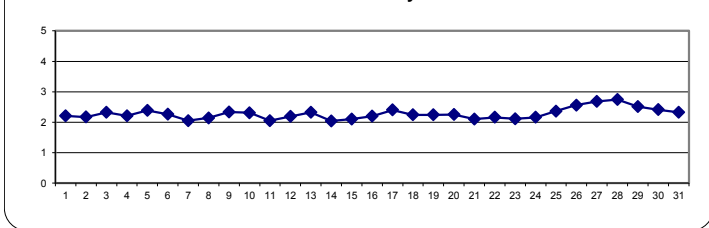
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.34	2.28	2.32	2.39	2.49	S	2.49	2.31	2.20	2.19	2.17	2.13	2.12	2.11	2.12	2.13	2.12	2.11	2.11	2.08	2.13	2.15	2.18	2.25	2.08	2.49	2.21	24	
2	2.16	2.21	2.14	2.16	S	2.28	2.17	2.13	2.16	2.16	2.10	2.09	2.08	2.14	2.10	2.09	2.10	2.18	2.13	2.14	2.22	2.26	2.36	2.44	2.08	2.44	2.17	24	
3	2.80	2.84	2.71	S	2.83	2.79	2.35	2.18	2.20	2.16	2.15	2.13	2.13	2.11	2.11	2.12	2.10	2.09	2.07	2.10	2.20	2.41	2.55	2.21	2.07	2.84	2.32	24	
4	2.24	2.30	S	2.45	2.46	2.32	2.13	2.10	2.15	2.12	2.17	2.15	2.15	2.16	2.15	2.13	2.11	2.12	2.11	2.15	2.20	2.26	2.27	2.33	2.10	2.46	2.21	24	
5	2.49	S	2.63	2.85	2.94	2.91	2.63	2.54	2.49	2.31	2.24	2.22	2.20	2.20	2.17	2.19	2.21	2.18	2.19	2.20	2.26	2.31	2.28	2.28	2.17	2.94	2.39	24	
6	S	2.31	2.50	2.61	2.64	2.46	2.43	2.46	C	C	C	C	C	C	2.20	2.09	2.05	2.05	2.06	2.07	2.22	2.17	2.08	2.10	S	2.05	2.64	2.26	24
7	2.07	2.07	2.10	2.12	2.19	2.21	2.09	2.10	2.07	2.06	2.04	2.01	1.99	1.98	1.99	1.98	1.99	2.01	1.98	2.00	2.02	2.02	1.99	S	2.02	1.98	2.21	2.05	24
8	2.01	2.12	2.19	2.34	2.31	2.37	2.35	2.13	2.07	2.03	2.04	2.05	2.04	2.03	2.05	2.06	2.04	2.04	2.05	2.04	2.10	S	2.36	2.42	2.01	2.42	2.14	24	
9	2.44	2.65	2.74	2.79	2.86	2.89	2.54	2.42	2.34	2.36	2.26	2.15	2.11	2.13	2.12	2.08	2.06	2.04	2.02	1.99	S	2.04	2.18	2.39	1.99	2.89	2.33	24	
10	2.38	2.58	2.52	2.61	2.77	2.68	2.53	2.50	2.43	2.30	2.27	2.19	2.12	2.10	2.12	2.09	2.09	2.18	2.32	S	2.22	2.06	2.04	1.99	1.99	2.77	2.31	24	
11	2.01	1.99	2.05	2.07	2.10	2.04	2.04	2.00	2.03	2.03	2.04	2.02	2.02	2.05	2.02	2.01	2.01	2.01	S	2.11	2.11	2.12	2.13	2.22	1.99	2.22	2.05	24	
12	2.30	2.30	2.39	2.33	2.30	2.36	2.29	2.21	2.13	2.06	2.06	2.03	2.03	2.00	2.02	2.03	2.01	S	2.01	2.04	2.19	2.40	2.37	2.45	2.00	2.45	2.19	24	
13	2.46	2.62	2.68	2.83	2.80	2.78	2.78	2.36	2.47	2.34	2.23	2.20	2.21	2.06	2.04	2.01	S	2.03	2.01	2.02	2.07	2.12	2.08	2.12	2.01	2.83	2.32	24	
14	2.13	2.10	2.08	2.07	2.05	2.03	2.00	2.00	2.00	2.00	2.02	2.03	2.03	2.03	2.04	2.01	S	2.05	2.05	2.06	2.03	2.01	2.04	2.05	2.07	2.01	2.13	2.04	24
15	2.08	2.10	2.10	2.16	2.17	2.17	2.12	2.07	2.07	2.06	2.05	2.05	2.08	2.06	S	2.04	2.05	2.07	2.06	2.18	2.26	2.13	2.08	2.08	2.04	2.26	2.10	24	
16	2.09	2.07	2.11	2.15	2.21	2.32	2.39	2.46	2.48	2.32	2.30	2.15	2.11	S	2.10	2.07	2.07	2.08	2.10	2.16	2.16	2.21	2.25	2.28	2.07	2.48	2.20	24	
17	2.35	2.50	2.51	2.88	2.85	2.89	2.75	2.68	2.54	2.29	2.10	2.07	S	2.06	2.06	2.07	2.06	2.06	2.08	2.15	2.33	2.56	2.58	2.72	2.06	2.89	2.40	24	
18	3.08	3.24	2.95	2.90	2.73	2.26	2.04	2.08	2.10	2.04	2.07	S	1.99	1.98	1.98	1.95	1.97	1.97	1.99	2.06	1.95	2.01	2.08	2.20	1.95	3.24	2.24	24	
19	2.19	2.11	2.25	2.50	2.44	2.58	2.41	2.40	2.18	2.09	S	2.07	2.02	2.02	2.03	2.02	2.02	2.05	2.00	2.11	2.35	2.59	2.52	2.63	2.00	2.63	2.24	24	
20	2.58	2.40	2.45	2.44	2.59	2.67	2.60	2.44	2.31	S	2.11	2.07	2.10	2.10	2.15	2.10	2.07	2.10	2.09	2.08	2.09	2.11	2.07	2.07	2.07	2.07	2.25	24	
21	2.10	2.12	2.15	2.07	2.06	2.15	2.10	2.11	S	2.06	2.07	2.08	2.09	2.08	2.07	2.10	2.12	2.13	2.13	2.08	2.10	2.12	2.10	2.18	2.06	2.18	2.10	24	
22	2.26	2.30	2.33	2.30	2.25	2.26	2.26	S	2.20	2.15	2.13	2.14	2.11	2.06	2.10	2.10	2.08	2.10	2.09	2.09	2.09	2.11	2.09	2.10	2.06	2.33	2.16	24	
23	2.08	2.09	2.09	2.09	2.11	2.09	S	2.12	2.13	2.11	2.10	2.10	2.11	2.11	2.13	2.11	2.12	2.12	2.11	2.09	2.09	2.13	2.11	2.09	2.08	2.13	2.11	24	
24	2.09	2.16	2.26	2.28	2.31	S	2.01	2.07	2.05	2.07	2.09	2.13	2.11	2.11	2.07	2.12	2.13	2.21	2.19	2.19	2.22	2.20	2.28	2.31	2.01	2.31	2.16	24	
25	2.34	2.39	2.37	2.70	S	2.66	2.29	2.11	2.31	2.34	2.31	2.30	2.28	2.26	2.29	2.28	2.26	2.24	2.25	2.30	2.50	2.46	2.45	2.58	2.11	2.70	2.36	24	
26	2.80	2.86	3.00	S	3.32	3.41	3.36	3.06	2.78	2.30	2.30	2.37	2.29	2.29	2.24	2.23	2.22	2.20	2.18	2.21	2.32	2.33	2.34	2.58	2.18	3.41	2.56	24	
27	2.73	2.92	S	3.20	3.22	3.36	3.21	3.04	2.80	2.63	2.48	2.46	2.38	2.32	2.35	2.34	2.31	2.34	2.32	2.47	2.82	2.63	2.70	2.71	2.31	3.36	2.68	24	
28	3.15	S	3.42	3.42	3.41	3.76	3.38	3.02	2.74	2.57	2.44	2.39	2.36	2.29	2.28	2.29	2.25	2.26	2.31	2.30	2.57	2.74	2.84	2.83	2.25	3.76	2.74	24	
29	S	3.02	2.94	3.12	2.79	3.40	3.33	2.65	2.33	2.28	2.31	2.31	2.30	2.24	2.19	2.17	2.18	2.17	2.31	2.55	2.15	2.21	2.31	S	2.15	3.40	2.51	24	
30	2.51	2.66	2.75	2.69	2.98	3.20	3.01	2.75	2.88	2.53	2.42	2.19	2.09	2.09	2.07	2.01	2.01	2.03	2.02	2.03	2.08	2.11	S	2.24	2.01	3.20	2.41	24	
31	2.28	2.43	2.51	2.54	2.59	2.74	2.78	2.44	2.19	2.20	2.16	2.16	2.12	2.13	2.12	2.08	2.13	2.13	2.18	2.20	2.38	S	2.47	2.43	2.08	2.78	2.32	24	
HOURLY MAX	3.15	3.24	3.42	3.42	3.41	3.76	3.38	3.06	2.88	2.63	2.48	2.46	2.38	2.32	2.35	2.34	2.31	2.34	2.32	2.55	2.82	2.74	2.84	2.83					
HOURLY AVG	2.36	2.40	2.46	2.52	2.58	2.62	2.50	2.36	2.30	2.21	2.18	2.15	2.13	2.12	2.11	2.10	2.10	2.11	2.12	2.15	2.21	2.24	2.28	2.32					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

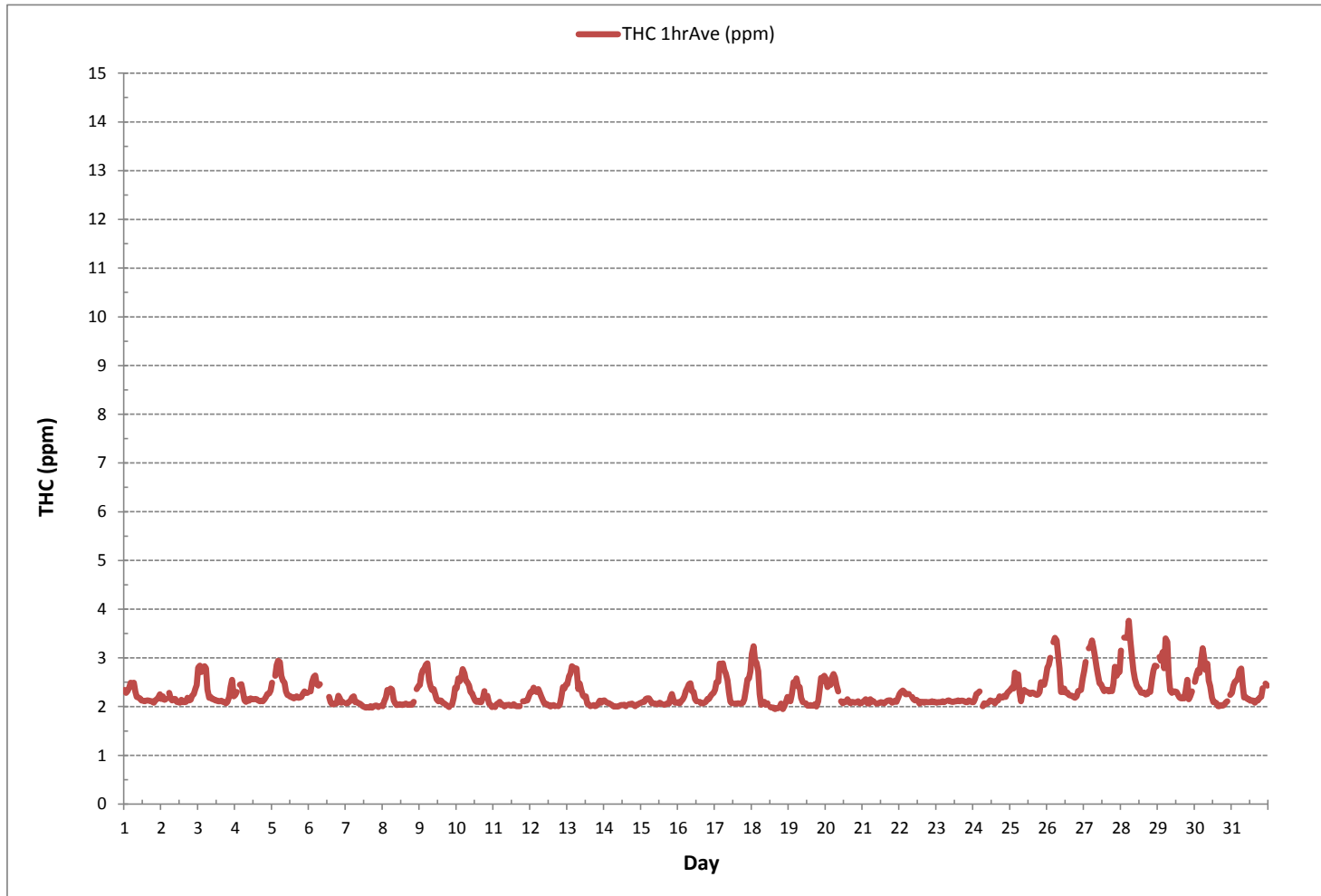
24 HR AVERAGES July 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706			
MINIMUM 1-HR AVERAGE:	1.95 ppm	@ HOUR	15	ON DAY 18
MAXIMUM 1-HR AVERAGE:	3.76 ppm	@ HOUR	5	ON DAY 28
MAXIMUM 24-HR AVERAGE:	2.74 ppm			ON DAY 28
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	0.29	MONTHLY AVERAGE:	2.28 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 3.26%

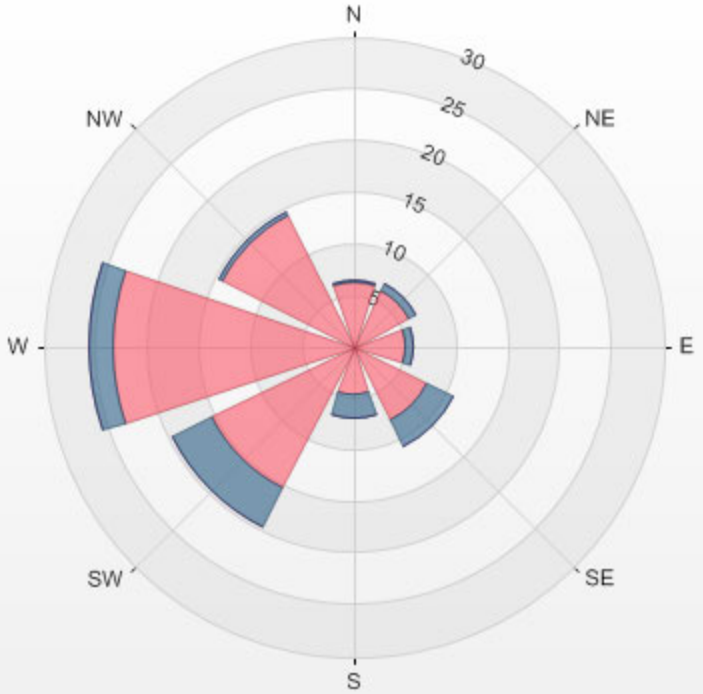
Calm Avg: 2.78 [ppm]

Direction	0.0-1.3	1.3-2.5	2.5-3.8	>3.8	Total
N	0.0	6.4	0.1	0.0	6.5
NE	0.0	6.1	0.7	0.0	6.8
E	0.0	5.1	0.7	0.0	5.8
SE	0.0	7.9	3.0	0.0	10.9
S	0.0	4.7	2.3	0.0	6.9
SW	0.0	15.3	4.3	0.0	19.6
W	0.0	23.4	2.3	0.0	25.6
NW	0.0	14.2	0.4	0.0	14.6
Summary	0.0	83.0	13.7	0.0	96.7



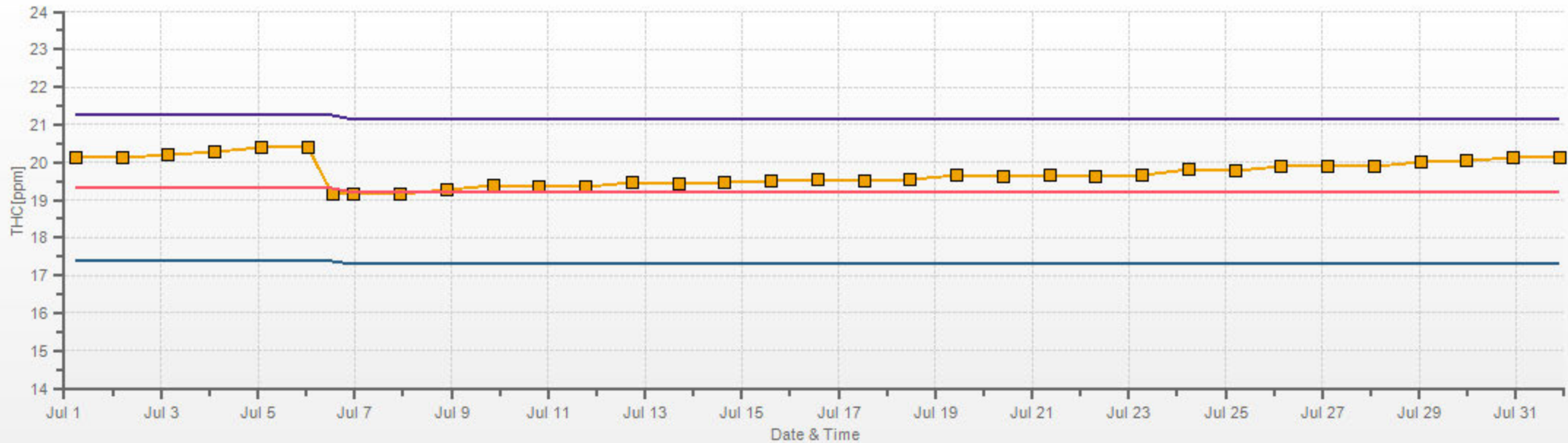
% Icon	Classes (ppm)	0	0.0-1.3	83	1.3-2.5	14	2.5-3.8	0	>3.8
--------	---------------	---	---------	----	---------	----	---------	---	------

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.26% Calm Poll Avg: 2.78[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



## ***OXIDES OF NITROGEN***



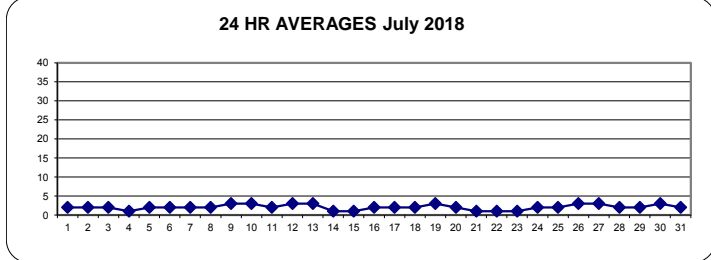
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	3	3	3	4	4	S	6	3	2	1	1	1	1	1	1	1	1	0	0	1	2	1	2	3	0	6	2	24
2	3	2	2	2	S	4	2	2	2	2	1	1	1	1	2	1	1	1	1	2	2	2	2	2	1	4	2	24
3	3	2	2	S	6	5	5	2	2	1	1	1	2	1	2	2	1	1	2	2	1	1	1	2	1	6	2	24
4	3	2	S	2	2	1	2	1	1	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	0	3	1	24
5	2	S	3	2	4	4	4	4	3	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	4	2	24
6	S	2	2	3	3	4	2	3	2	2	1	1	2	2	2	2	1	1	1	2	2	1	2	S	1	4	2	24
7	2	2	2	3	3	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	3	1	4	2	24
8	1	1	2	4	4	6	5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	S	3	2	1	6	2	24
9	1	1	1	2	3	7	3	3	2	3	C	C	C	C	C	C	C	C	3	1	S	2	3	3	1	7	3	24
10	2	2	2	2	2	3	9	5	4	2	2	1	2	2	2	2	3	4	4	S	3	2	2	1	1	9	3	24
11	1	2	3	3	2	2	2	2	2	2	2	1	1	1	2	1	2	1	1	S	2	3	2	1	3	1	3	24
12	4	4	4	5	7	9	5	5	3	2	2	1	1	1	1	1	1	S	2	1	2	3	3	3	1	9	3	24
13	3	3	3	2	3	6	7	5	5	4	4	4	2	4	2	2	S	4	4	1	2	3	2	2	1	7	3	24
14	3	2	2	3	2	1	1	1	0	0	1	1	0	1	1	S	2	1	1	1	1	1	2	2	0	3	1	24
15	2	2	3	3	3	3	2	1	0	0	0	0	0	0	S	2	1	1	1	2	2	2	1	1	0	3	1	24
16	1	1	1	1	1	2	2	2	2	2	2	1	1	S	2	2	2	1	2	1	2	2	1	2	1	2	2	24
17	2	2	2	2	2	4	4	4	6	5	1	1	S	2	1	1	1	1	1	2	3	2	2	2	1	6	2	24
18	2	2	2	4	3	4	1	3	5	2	2	S	2	1	1	1	1	1	1	2	1	1	1	1	1	5	2	24
19	2	2	3	2	2	2	2	4	3	4	S	3	2	1	1	1	1	1	1	2	3	5	7	8	1	8	3	24
20	5	2	1	1	1	3	4	3	2	S	2	2	1	1	1	2	1	1	1	1	2	2	2	2	1	5	2	24
21	1	1	1	1	2	1	2	2	S	3	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1	3	1	24
22	2	2	2	2	2	2	S	3	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	3	1	24
23	1	1	1	1	1	2	S	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	2	0	2	1	24
24	2	2	3	4	3	S	4	3	2	2	1	1	2	1	1	1	1	1	1	1	1	1	2	2	1	4	2	24
25	2	3	2	2	S	6	3	2	3	4	3	2	2	2	1	1	1	1	1	2	2	2	2	2	1	6	2	24
26	1	1	1	S	3	3	7	8	6	6	2	2	2	2	1	1	1	2	1	2	2	2	2	2	1	8	3	24
27	2	2	S	3	2	2	4	3	3	3	2	1	1	1	1	1	1	6	6	3	3	3	3	3	1	6	3	24
28	3	S	3	2	4	4	5	3	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	5	2	24
29	S	3	2	2	2	2	3	2	3	3	2	2	2	1	1	1	1	1	2	3	2	2	2	S	1	3	2	24
30	3	3	3	3	3	4	6	7	5	3	4	2	2	1	1	1	1	1	1	1	1	1	S	3	1	7	3	24
31	2	2	2	2	3	4	10	8	1	1	1	1	1	1	1	1	1	1	1	1	3	S	3	2	1	10	2	24
HOURLY MAX	5	4	4	5	7	9	10	8	6	6	4	4	2	4	2	2	3	6	6	3	3	5	7	8				
HOURLY AVG	2	2	2	2	3	4	4	3	3	2	2	1	1	1	1	1	1	1	2	1	2	2	2	2				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

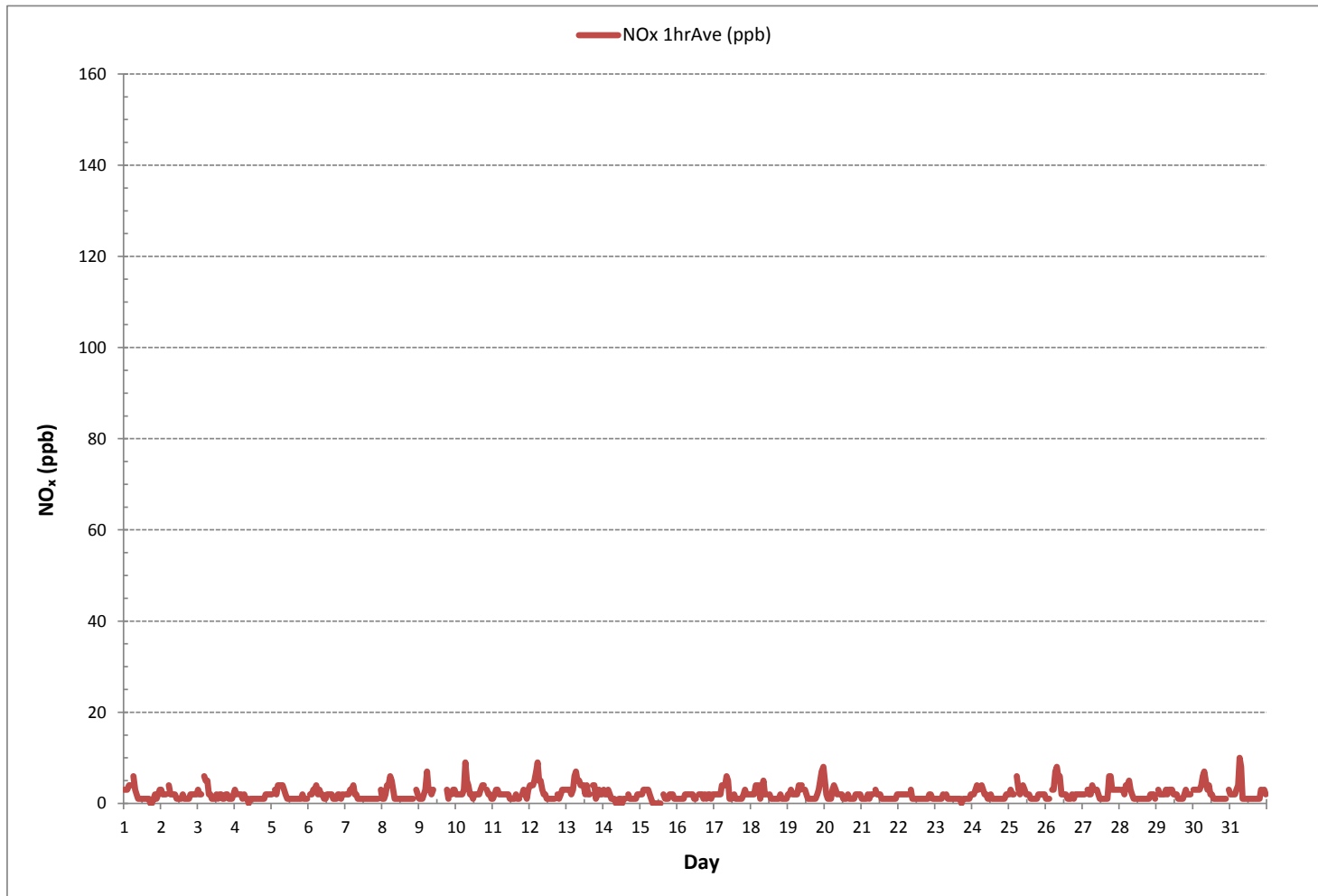
24 HR AVERAGES July 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	690				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	17	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	10	ppb @ HOUR	6	ON DAY 31	
MAXIMUM 24-HR AVERAGE:	3	ppb		ON DAY 9	
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	2	ppb

OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)



Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-NO<sub>x</sub> [ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

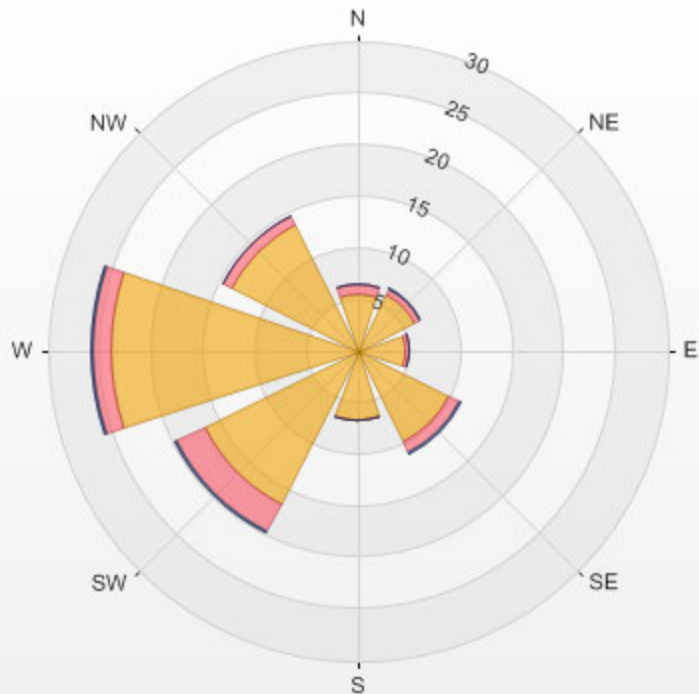
Calm: 3.27%

Calm Avg: 3.18 [ppb]

<b>Direction</b>	<b>0.0-3.7</b>	<b>3.7-7.3</b>	<b>7.3-11.0</b>	<b>&gt;11.0</b>	<b>Total</b>
<b>N</b>	5.6	1.0	0.0	0.0	6.6
<b>NE</b>	6.1	0.6	0.1	0.0	6.8
<b>E</b>	4.6	0.6	0.0	0.0	5.1
<b>SE</b>	9.8	1.3	0.1	0.0	11.2
<b>S</b>	6.8	0.0	0.0	0.0	6.8
<b>SW</b>	16.6	3.0	0.1	0.0	19.8
<b>W</b>	23.9	1.7	0.1	0.0	25.8
<b>NW</b>	13.7	1.0	0.0	0.0	14.7
<b>Summary</b>	87.1	9.1	0.6	0.0	96.8

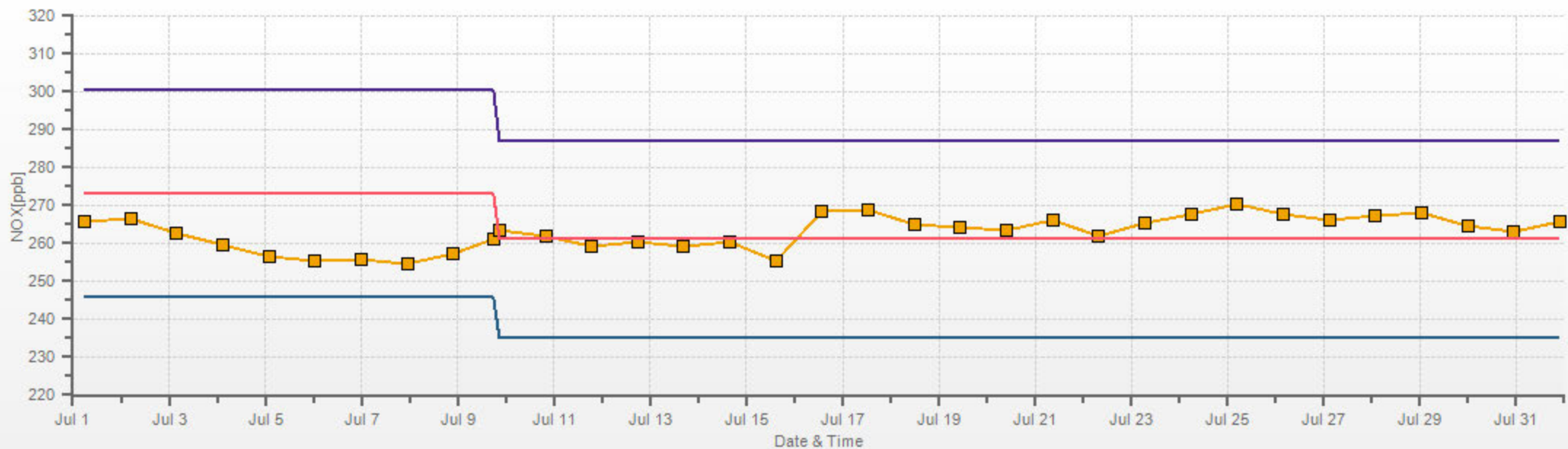
% Icon	Classes (ppb)	87	0.0-3.7	9	3.7-7.3	1	7.3-11.0	0	>11.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.27% Calm Poll Avg: 3.18[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High





## ***NITRIC OXIDES***

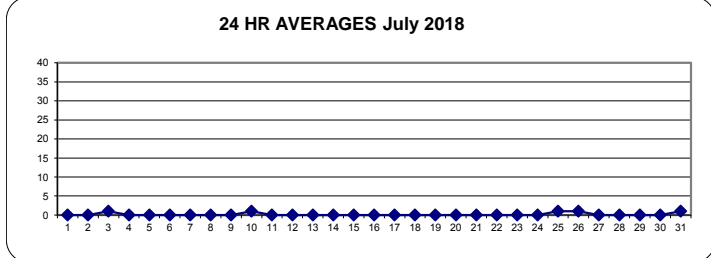
**NITRIC OXIDE Hourly Averages (NO ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
2	0	0	0	0	S	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
3	1	1	1	S	2	2	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1	24																					
4	0	0	S	0	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																					
5	0	S	1	1	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24																					
6	S	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24																					
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24																					
8	0	0	0	0	1	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	3	0	24																					
9	0	0	0	0	1	5	1	0	0	0	C	C	C	C	C	C	C	C	0	0	S	0	0	0	0	0	5	0	24																					
10	0	0	1	0	1	2	5	2	1	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	5	1	24																					
11	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24																					
12	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	2	0	24																					
13	0	0	0	0	0	0	1	1	2	1	1	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	2	0	24																					
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24																					
15	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24																					
16	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
17	0	0	0	0	0	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
18	0	0	0	0	0	0	0	0	1	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
19	0	0	0	0	0	1	0	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	24																					
20	0	0	0	0	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
21	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
22	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
23	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
24	0	0	0	0	0	S	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
25	0	0	0	1	S	2	1	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	24																					
26	0	0	0	S	0	2	4	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24																					
27	0	0	S	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	24																					
28	0	S	0	0	2	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24																					
29	S	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24																					
30	0	0	0	0	1	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	2	0	24																					
31	0	0	0	0	1	2	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	6	1	24																					
HOURLY MAX	1	1	1	1	3	5	6	5	2	2	1	1	1	1	0	1	0	1	1	0	0	0	0	1	0																									
HOURLY AVG	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																									

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

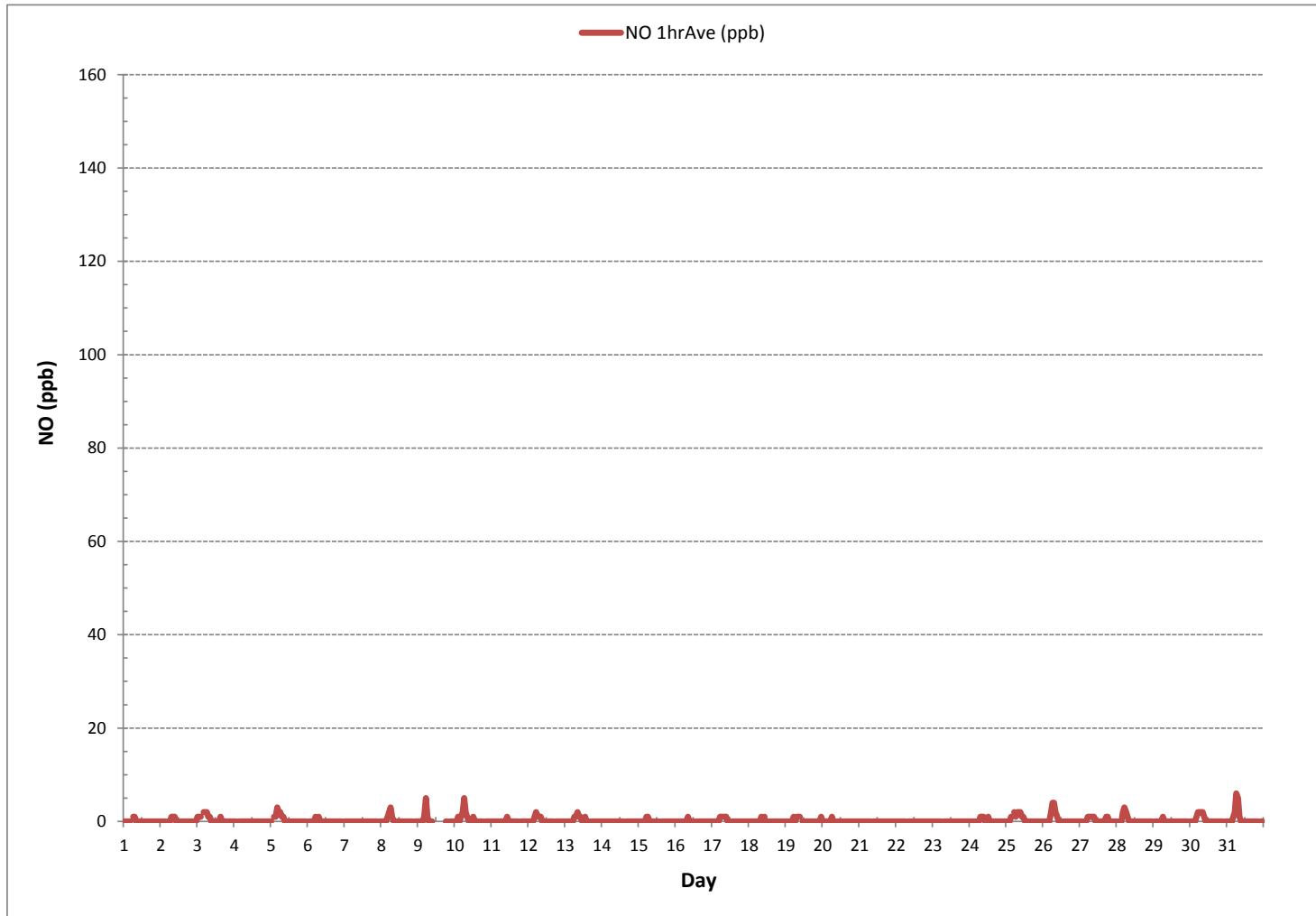
**24 HR AVERAGES July 2018**



**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	105				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	6 ppb @ HOUR	6	ON DAY	31	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	3	
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	744 hrs		
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb		

NITRIC OXIDE Hourly Averages (NO ppb)



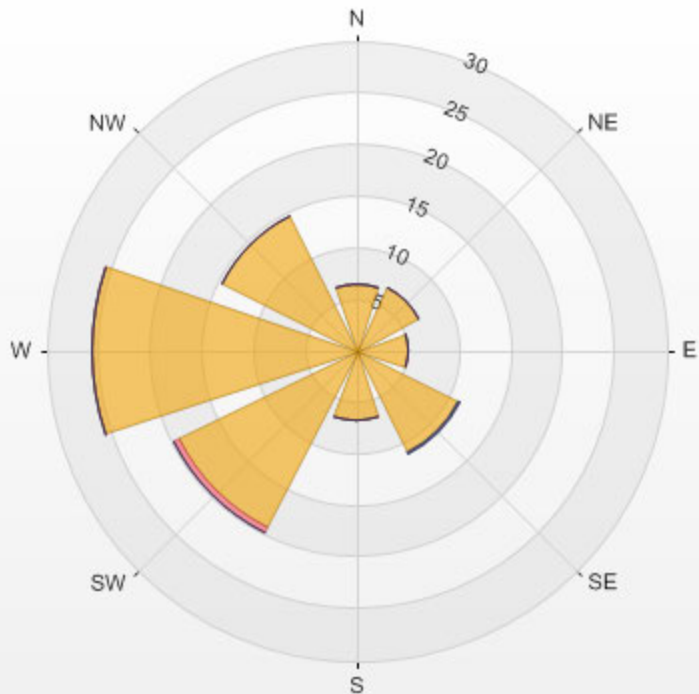
Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-NO [ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 3.27% Calm Avg: 1.03 [ppb]

Direction	0.0-2.3	2.3-4.7	4.7-7.0	>7.0	Total
N	6.5	0.0	0.0	0.0	6.5
NE	6.8	0.0	0.0	0.0	6.8
E	5.0	0.1	0.0	0.0	5.1
SE	11.0	0.1	0.1	0.0	11.2
S	6.8	0.0	0.0	0.0	6.8
SW	19.2	0.6	0.0	0.0	19.8
W	25.6	0.1	0.0	0.0	25.7
NW	14.7	0.0	0.0	0.0	14.7
<b>Summary</b>	95.6	1.0	0.1	0.0	96.7

% Icon Classes (ppb) 96 0.0-2.3 1 2.3-4.7 0 4.7-7.0 0 >7.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.27% Calm Poll Avg: 1.03[ppb]



***NITROGEN DIOXIDE***



NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	3	3	3	4	3	S	5	3	2	1	1	1	1	1	1	1	1	0	0	1	2	1	2	3	0	5	2	24
2	3	2	2	2	S	4	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	1	4	2	24
3	2	2	1	S	3	3	3	2	1	1	1	1	2	1	2	1	1	1	2	1	1	1	1	1	1	3	2	24
4	2	2	S	2	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	2	2	2	0	2	1	24
5	2	S	2	1	1	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	24
6	S	2	2	2	3	3	2	2	2	1	1	1	1	2	1	1	1	1	1	2	2	1	2	S	1	3	2	24
7	2	2	2	3	3	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	3	1	4	2	24
8	1	1	2	4	3	4	3	2	1	1	0	0	0	0	0	1	1	1	1	1	1	S	3	2	0	4	1	24
9	1	1	1	2	1	3	2	2	2	2	C	C	C	C	C	C	C	C	2	1	S	2	3	2	1	3	2	24
10	2	2	1	1	2	1	4	3	3	2	1	1	1	2	2	1	2	4	4	S	3	2	2	1	1	4	2	24
11	1	2	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	S	2	3	2	1	3	1	3	2	24
12	4	4	4	5	6	7	4	3	2	1	1	1	1	1	1	1	1	S	2	1	2	3	3	2	1	7	3	24
13	2	3	3	2	3	6	6	3	4	3	3	4	2	3	2	2	S	4	4	1	2	3	2	2	1	6	3	24
14	3	2	2	3	2	1	1	1	0	0	0	0	0	0	1	S	2	1	1	1	1	1	2	2	0	3	1	24
15	2	2	3	3	2	2	1	1	0	0	0	0	0	0	S	1	1	1	1	1	2	2	1	1	0	3	1	24
16	1	1	1	1	1	2	1	1	1	1	1	1	S	2	2	1	1	1	1	1	2	2	1	1	1	2	1	24
17	2	2	2	2	2	3	3	3	5	4	1	1	S	2	1	1	1	1	1	2	3	2	2	2	1	5	2	24
18	2	2	2	3	3	3	1	3	4	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	4	2	24
19	2	2	3	2	2	2	1	3	3	3	S	3	2	1	1	1	1	1	1	2	3	5	7	7	1	7	3	24
20	5	2	1	1	1	3	4	3	2	S	2	1	1	1	1	1	1	1	1	1	2	2	2	2	1	5	2	24
21	1	1	1	1	1	1	2	2	S	3	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	3	1	24
22	2	2	2	2	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	1	24
23	1	1	1	1	1	2	S	2	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	2	0	2	1	24
24	2	2	2	3	3	S	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	4	2	24
25	2	2	2	2	S	4	2	1	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	1	1	4	2	24
26	1	1	1	S	2	1	3	5	4	4	2	2	2	2	1	1	1	1	1	2	2	2	2	1	1	5	2	24
27	1	2	S	3	2	2	3	2	2	2	1	1	1	1	1	1	1	5	6	2	3	3	2	2	1	6	2	24
28	2	S	3	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	3	2	24
29	S	2	2	2	1	2	2	2	3	3	2	2	2	1	1	1	1	1	2	3	2	2	2	S	1	3	2	24
30	3	3	2	3	2	2	4	5	3	2	3	2	1	1	1	1	1	1	1	1	0	1	S	3	0	5	2	24
31	2	2	2	2	2	2	4	3	1	1	0	0	1	1	1	1	1	1	1	1	2	S	3	2	0	4	2	24
HOURLY MAX	5	4	4	5	6	7	6	5	5	4	3	4	2	3	2	2	2	5	6	3	3	5	7	7				
HOURLY AVG	2	2	2	2	2	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

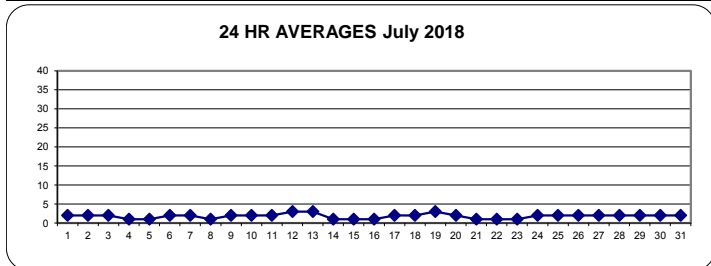
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

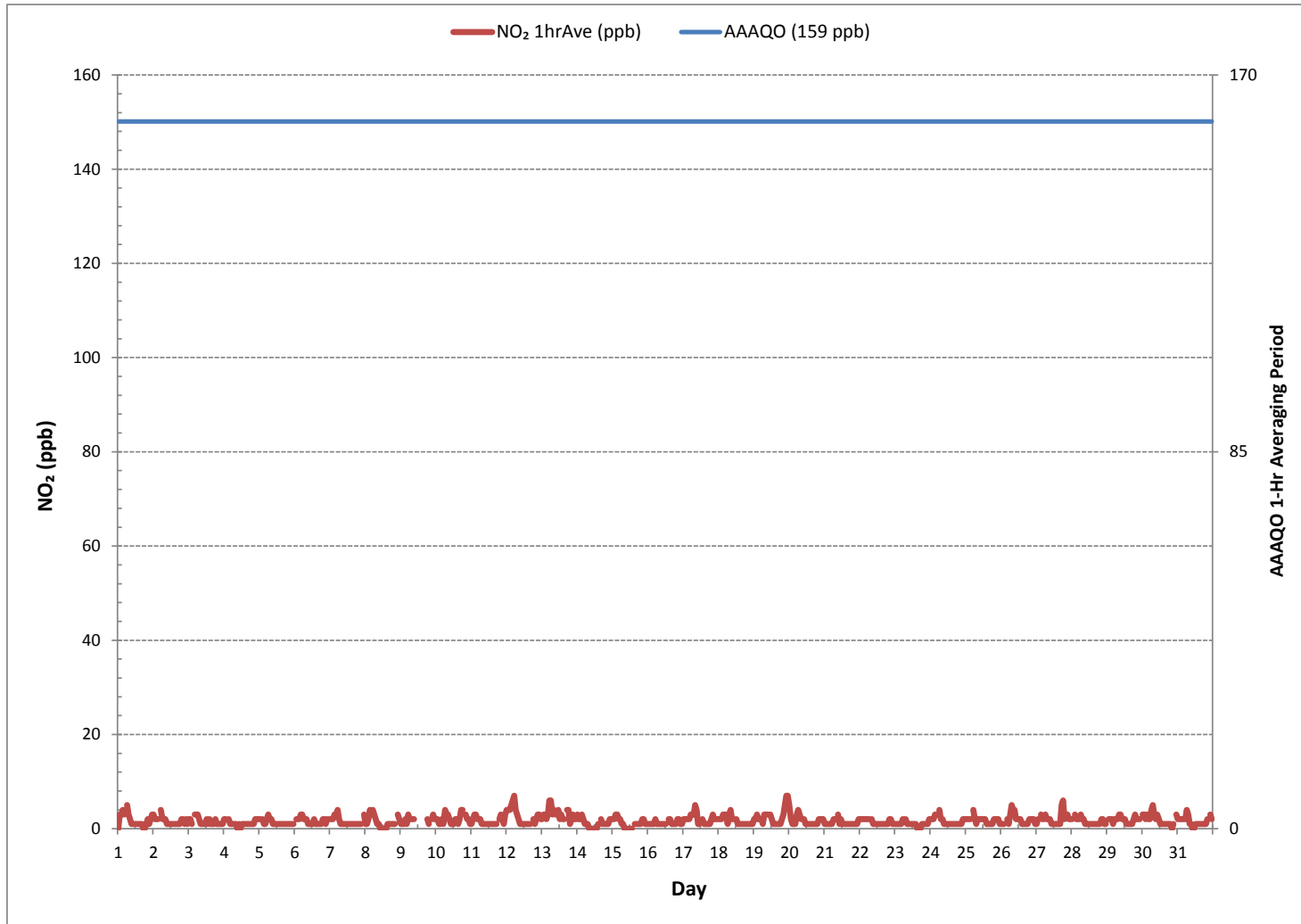
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	676				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	17	ON DAY	1
MAXIMUM 1-HR AVERAGE:	7	ppb @ HOUR	5	ON DAY	12
MAXIMUM 24-HR AVERAGE:	3	ppb		ON DAY	12
IZS CALIBRATION TIME:	33	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	2	ppb

24 HR AVERAGES July 2018



**NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)**





Wind: LICA COLD LAKE SOUTH  
Poll.: LICA COLD LAKE SOUTH-NO<sub>2</sub> [ppb]  
Monthly: 18/07  
Type: PollutionRose  
Direction: Blowing From (Wind Frequency)  
Based On 1 Hr.

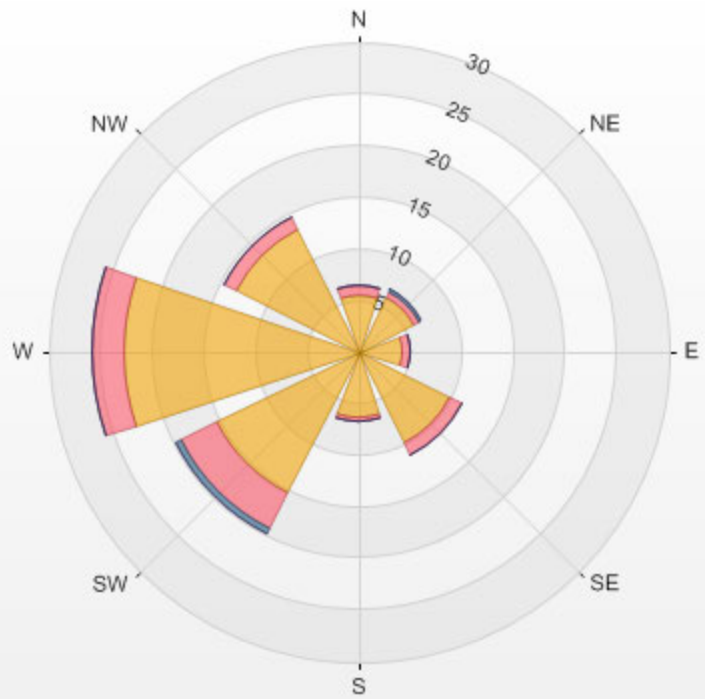
Calm: 3.27%

Calm Avg: 2.16 [ppb]

Direction	0.0-2.7	2.7-5.3	5.3-8.0	>8.0	Total
<b>N</b>	5.6	0.9	0.1	0.0	6.5
<b>NE</b>	6.0	0.6	0.3	0.0	6.8
<b>E</b>	4.3	0.9	0.0	0.0	5.1
<b>SE</b>	9.8	1.4	0.0	0.0	11.2
<b>S</b>	6.4	0.4	0.0	0.0	6.8
<b>SW</b>	15.4	3.8	0.6	0.0	19.8
<b>W</b>	22.8	3.0	0.0	0.0	25.8
<b>NW</b>	13.2	1.4	0.0	0.0	14.7
<b>Summary</b>	83.4	12.4	1.0	0.0	96.7

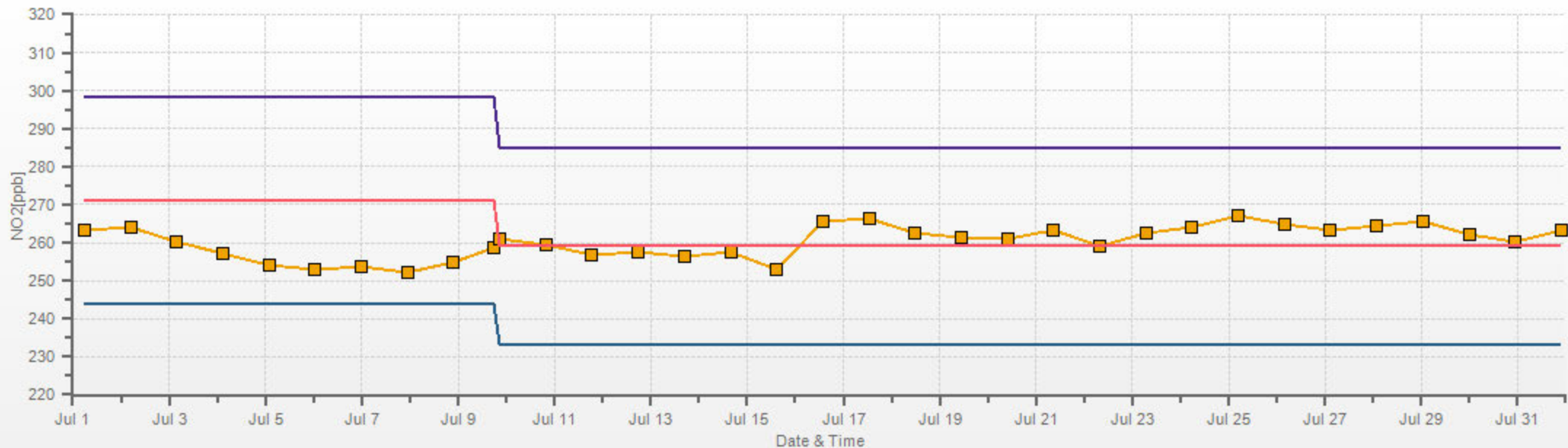
% Icon Classes (ppb)	83	0.0-2.7	12	2.7-5.3	1	5.3-8.0	0	>8.0
----------------------	----	---------	----	---------	---	---------	---	------

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.27% Calm Poll Avg: 2.16[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



## ***OZONE***

**OZONE Hourly Averages (O<sub>3</sub> ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	20.2	23.3	21.4	17.2	11.5	S	14.7	22.4	27.1	29.5	31.8	33.3	33.0	34.9	35.5	37.5	36.4	35.2	35.3	33.6	30.8	29.1	25.4	23.4	11.5	37.5	27.9	24	
2	23.0	21.8	20.0	17.7	S	10.6	12.0	12.4	13.8	16.6	19.3	22.8	23.1	22.6	19.9	25.8	27.1	23.9	23.2	21.7	13.9	6.9	4.5	2.9	2.9	27.1	17.6	24	
3	2.0	1.1	0.9	S	1.3	2.9	9.4	14.5	15.6	22.8	27.7	27.4	28.1	29.2	30.8	33.7	33.3	37.2	35.3	34.6	29.8	20.7	15.2	20.7	0.9	37.2	20.6	24	
4	15.6	16.8	S	7.4	4.5	12.7	19.9	25.5	25.3	25.9	24.1	27.0	26.2	26.7	24.2	25.9	27.5	27.0	29.5	25.9	19.2	12.9	7.7	5.0	4.5	29.5	20.1	24	
5	3.0	S	1.0	0.6	0.5	2.6	10.8	15.6	20.9	29.7	36.6	39.2	40.8	41.0	43.6	41.8	41.5	42.8	42.7	39.0	36.3	34.3	33.2	33.0	0.5	43.6	27.4	24	
6	S	30.0	21.5	12.8	14.6	20.8	25.3	24.1	27.6	29.6	32.2	36.2	40.1	45.5	45.6	45.3	47.4	47.5	46.5	36.7	34.0	40.6	40.5	S	12.8	47.5	33.8	24	
7	41.0	39.9	32.5	26.4	23.3	21.3	24.8	27.2	29.6	32.2	31.3	27.3	30.2	32.2	30.4	31.0	28.7	24.4	21.8	19.1	17.4	17.9	S	13.5	13.5	41.0	27.1	24	
8	12.7	10.1	7.0	5.5	5.2	8.3	14.8	19.7	23.5	25.1	26.2	27.8	29.3	32.5	33.4	35.1	35.4	34.2	32.2	25.5	S	10.3	8.4	5.2	35.4	20.3	24		
9	5.6	3.9	3.2	2.1	1.7	3.8	16.2	19.9	21.9	21.3	23.4	26.8	34.3	31.0	31.0	37.9	41.7	41.9	38.6	35.7	S	29.6	16.6	9.6	1.7	41.9	21.6	24	
10	5.7	3.1	1.8	1.5	1.1	2.8	7.9	16.8	C	C	C	C	44.4	43.7	41.7	42.4	37.9	34.2	22.9	S	29.9	31.8	33.0	34.8	1.1	44.4	23.0	24	
11	34.1	34.0	28.5	24.1	19.2	19.7	20.1	21.5	19.7	18.0	19.3	22.3	22.6	24.3	33.0	32.9	33.5	38.3	S	28.2	24.4	22.2	24.4	19.4	18.0	38.3	25.4	24	
12	19.6	15.7	10.6	11.4	10.8	11.8	17.4	21.5	26.2	28.4	31.7	33.5	33.1	31.9	32.2	32.1	34.4	S	33.3	31.6	26.9	20.2	18.4	11.7	10.6	34.4	23.7	24	
13	8.5	7.9	4.4	2.0	3.5	8.2	11.1	21.0	25.0	33.1	37.1	34.8	37.8	39.0	41.6	42.6	S	19.8	35.4	29.4	28.4	22.3	18.6	21.7	19.7	2.0	42.6	23.2	24
14	16.7	13.9	17.1	15.1	14.0	13.4	13.1	14.7	17.0	18.9	19.3	20.1	18.7	17.7	18.6	S	19.8	19.6	18.9	19.9	20.4	17.7	17.6	17.2	13.1	20.4	17.4	24	
15	15.7	14.3	13.5	12.4	11.3	11.7	13.4	15.6	18.1	20.3	21.7	23.3	25.1	26.4	S	25.3	24.5	24.0	23.4	18.7	11.7	16.8	20.3	20.4	11.3	26.4	18.6	24	
16	21.0	21.3	19.6	17.2	15.0	13.1	12.9	11.6	14.2	24.9	29.5	31.5	31.9	S	36.8	38.4	40.5	41.9	41.5	36.2	30.0	27.8	28.2	27.8	11.6	41.9	26.6	24	
17	20.9	12.8	11.7	7.5	5.5	6.1	17.1	24.5	33.9	37.9	35.5	36.7	S	38.1	36.0	34.4	34.4	34.3	33.1	27.4	16.5	11.8	8.8	7.0	5.5	38.1	23.1	24	
18	3.9	2.1	2.9	6.7	8.0	15.1	20.9	15.7	13.4	19.0	18.3	S	27.4	29.1	32.8	36.0	35.1	35.6	35.1	23.1	41.2	38.5	32.2	24.8	2.1	41.2	22.5	24	
19	22.5	23.5	19.4	11.5	5.8	10.2	19.6	21.8	28.6	33.2	S	37.2	34.6	37.3	34.7	34.8	36.5	36.7	34.4	28.2	17.0	9.8	10.9	8.9	5.8	37.3	24.2	24	
20	9.6	13.6	11.0	14.2	12.0	11.1	12.3	19.6	24.6	S	38.0	40.8	39.7	37.0	33.8	33.6	33.5	32.4	31.4	29.9	37.0	44.2	45.0	45.6	9.6	45.6	28.3	24	
21	45.4	44.1	38.8	43.2	40.9	27.7	27.7	26.3	S	31.7	34.6	39.5	41.6	40.7	41.9	41.0	39.7	35.3	37.6	40.2	39.5	44.2	42.9	34.1	26.3	45.4	<b>38.2</b>	24	
22	28.2	26.4	19.9	13.8	12.9	14.2	15.7	S	17.8	19.1	22.6	24.9	29.2	34.1	36.4	36.1	34.6	33.3	30.8	29.7	28.1	25.9	25.2	22.9	12.9	36.4	25.3	24	
23	20.7	20.2	19.9	18.9	17.2	15.5	S	17.3	20.5	23.1	21.4	22.8	23.3	24.4	24.3	23.8	24.0	23.5	22.7	20.8	20.4	18.6	17.0	15.4	15.4	24.4	20.7	24	
24	16.0	10.5	6.0	4.9	6.9	S	12.2	13.5	16.9	21.1	24.6	23.9	21.7	26.3	25.7	24.2	23.8	24.8	27.4	24.5	17.9	14.8	13.1	9.8	4.9	27.4	17.8	24	
25	6.3	3.2	0.8	0.4	S	1.9	6.8	9.2	8.1	9.6	14.9	20.6	24.6	29.8	30.8	30.9	31.2	31.5	30.1	24.8	13.3	7.0	5.6	3.9	0.4	31.5	15.0	24	
26	2.2	1.5	1.0	S	0.5	0.9	2.8	10.4	18.8	29.4	31.7	32.7	33.7	36.1	38.4	39.8	37.8	38.1	40.1	36.5	23.8	16.3	11.2	7.3	0.5	40.4	21.3	24	
27	5.1	4.9	S	6.2	4.0	3.1	7.4	13.6	21.0	26.2	31.6	32.9	35.7	38.0	37.8	38.7	39.2	36.8	35.4	29.4	16.5	11.9	8.4	5.5	3.1	39.2	21.3	24	
28	3.5	S	1.7	1.1	0.9	1.1	8.3	20.2	30.1	35.4	41.6	43.8	43.6	43.7	45.0	<b>48.5</b>	48.4	48.2	47.5	35.8	22.7	18.8	16.0	13.6	0.9	<b>48.5</b>	26.9	24	
29	S	10.1	7.0	5.6	6.3	5.3	11.9	26.5	34.2	39.4	43.6	45.1	46.6	42.8	40.9	39.6	37.6	34.4	29.1	17.1	29.8	27.0	17.6	S	5.3	46.6	27.2	24	
30	10.0	5.7	2.8	1.9	1.1	1.4	3.6	5.0	8.0	20.8	26.1	22.2	25.3	25.5	23.4	26.4	30.1	30.1	28.7	26.6	22.0	20.1	S	8.2	1.1	30.1	16.3	24	
31	3.3	2.7	1.0	0.5	0.4	1.0	1.4	5.3	15.1	17.9	20.8	22.4	25.3	28.6	30.5	30.3	32.3	30.8	30.3	28.0	16.3	S	15.1	13.0	0.4	32.3	16.2	24	
HOURLY MAX	45.4	44.1	38.8	43.2	40.9	27.7	27.7	27.2	34.2	39.4	43.6	45.1	46.6	45.5	45.6	48.5	48.4	48.2	47.5	40.2	41.2	44.2	45.0	45.6					
HOURLY AVG	15.2	15.1	12.0	10.7	9.0	9.5	13.5	17.6	21.1	25.5	28.1	30.2	31.7	32.9	33.7	34.8	34.3	33.8	32.4	28.8	24.5	22.6	20.2	16.8					

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

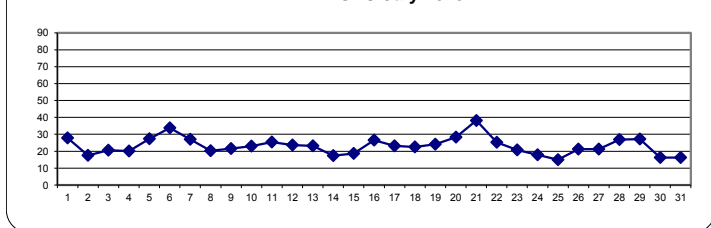
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

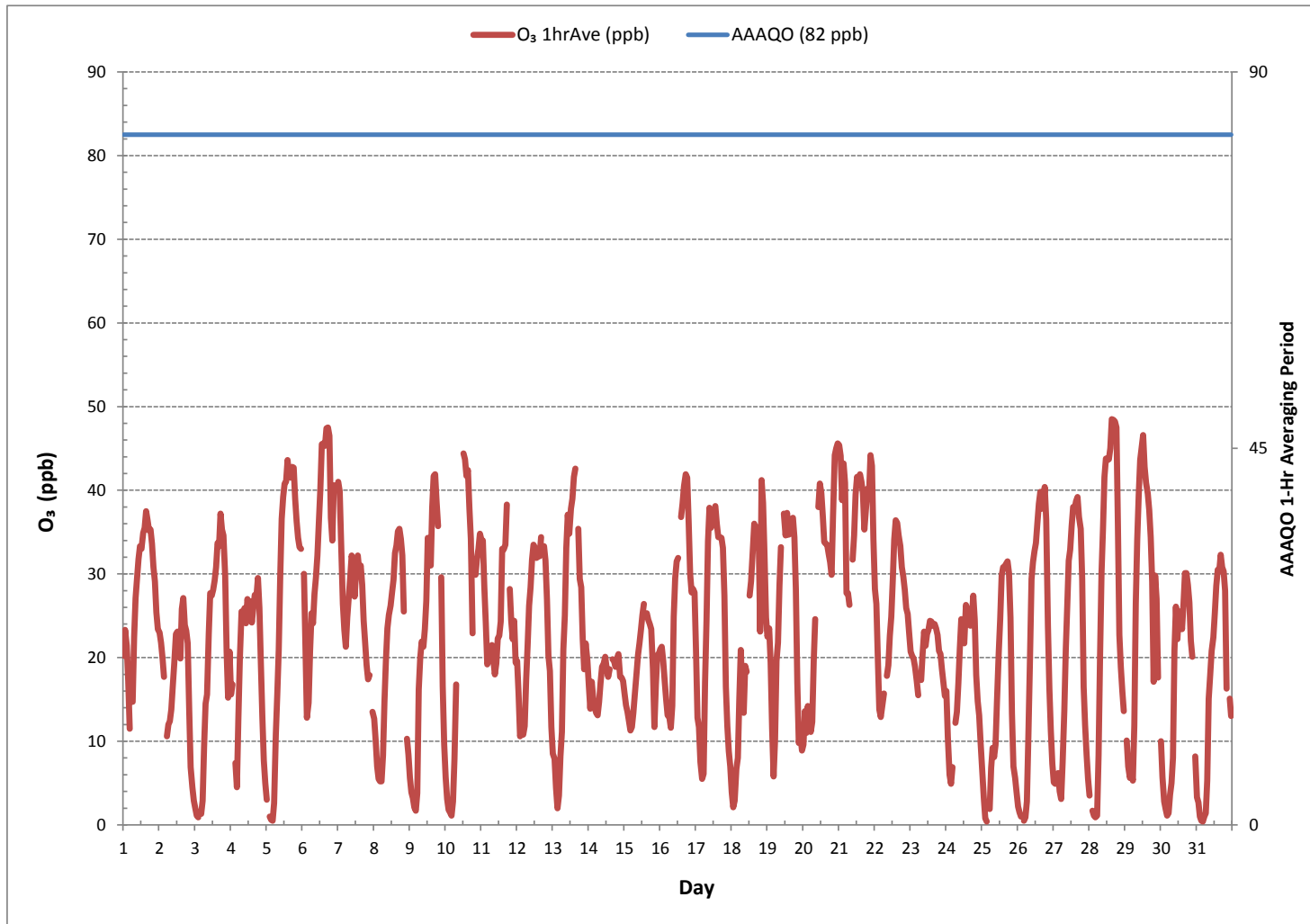
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	707				
MINIMUM 1-HR AVERAGE:	0.4 ppb	@ HOUR	3	ON DAY	25
MAXIMUM 1-HR AVERAGE:	48.5 ppb	@ HOUR	15	ON DAY	28
MAXIMUM 24-HR AVERAGE:	38.2 ppb			ON DAY	21
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	744 hrs		
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	12.0	MONTHLY AVERAGE:	23.2 ppb		

**24 HR AVERAGES July 2018**



OZONE Hourly Averages (O<sub>3</sub> ppb)



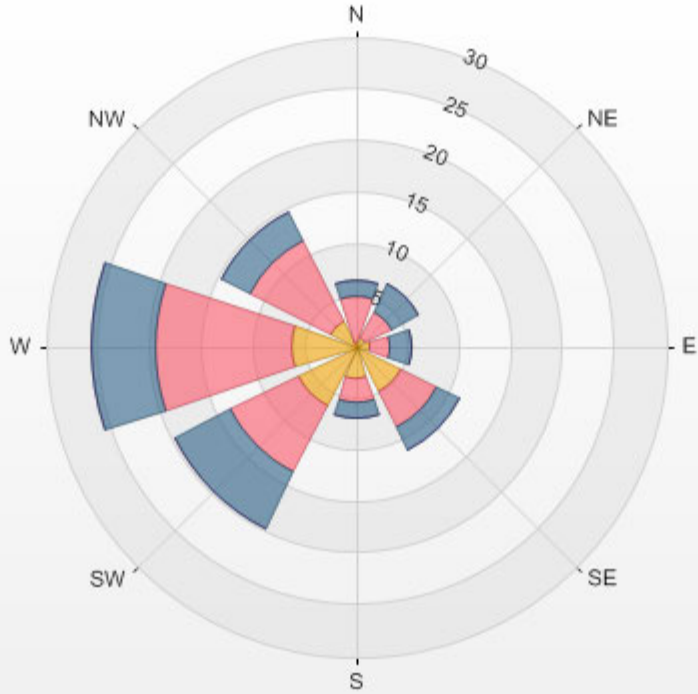
Wind: LICA COLD LAKE SOUTH  
Poll.: LICA COLD LAKE SOUTH-O<sub>3</sub> [ppb]  
Monthly: 18/07  
Type: PollutionRose  
Direction: Blowing From (Wind Frequency)  
Based On 1 Hr.

Calm: 3.25% Calm Avg: 6.09 [ppb]

Direction	0.0-16.2	16.2-32.4	32.4-48.6	>48.6	Total
N	0.4	4.5	1.6	0.0	6.5
NE	1.0	2.8	3.0	0.0	6.8
E	1.4	1.8	2.1	0.0	5.4
SE	4.8	3.8	2.7	0.0	11.3
S	3.1	2.3	1.6	0.0	6.9
SW	6.4	7.2	6.1	0.0	19.7
W	6.2	13.3	6.1	0.0	25.6
NW	2.8	8.6	3.1	0.0	14.6
<b>Summary</b>	26.2	44.4	26.2	0.0	96.7

% Icon	Classes (ppb)	26	44	26	0
	0.0-16.2				
	16.2-32.4				
	32.4-48.6				
	>48.6				

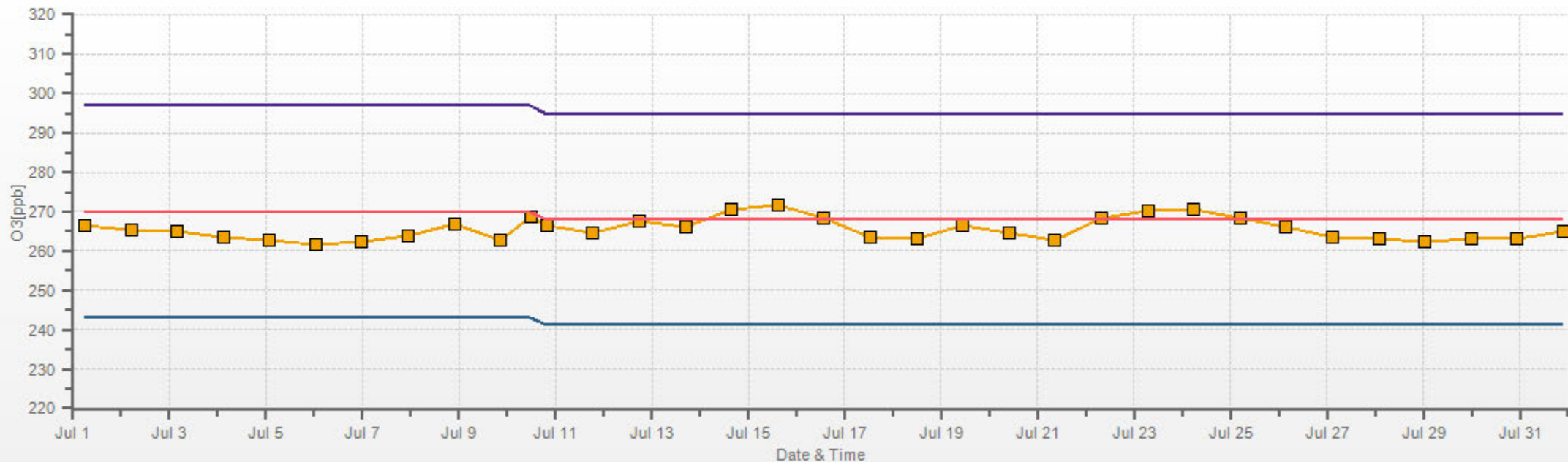
LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.25% Calm Poll Avg: 6.09[ppb]





O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***PARTICULATE MATTER 2.5***



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	5	6	7	9	8	9	7	5	5	4	3	1	1	1	1	3	4	3	4	11	12	13	12	1	13	6	24		
2	4	3	6	7	7	6	7	8	8	8	8	8	8	9	23	13	11	11	11	7	8	9	9	9	3	23	9	24	
3	13	10	9	17	17	16	19	27	23	18	15	13	15	13	17	10	10	11	10	9	7	8	8	7	7	27	13	24	
4	7	6	5	5	4	10	12	11	11	12	18	16	24	26	24	13	14	17	17	19	23	24	23	22	4	26	15	24	
5	25	23	20	19	17	22	20	15	11	9	10	9	10	8	6	5	3	3	3	3	4	3	3	3	3	3	25	11	24
6	3	3	3	3	3	4	3	3	3	3	3	6	8	11	10	10	10	9	9	11	10	10	13	12	3	13	7	24	
7	10	11	13	15	12	10	7	5	4	3	3	2	1	1	2	1	2	2	2	2	1	0	1	0	1	15	5	24	
8	1	1	0	0	0	1	1	2	3	2	2	2	2	2	2	2	2	1	1	1	1	3	3	3	0	3	2	24	
9	3	2	2	2	3	5	6	5	3	2	2	2	1	4	2	2	2	2	2	2	2	2	4	4	1	6	3	24	
10	4	4	4	3	3	8	6	4	3	C	2	19	20	27	44	29	24	30	26	29	31	26	25	24	2	44	17	24	
11	25	23	25	29	30	30	29	26	29	36	40	40	52	50	86	97	74	46	37	37	37	34	27	35	23	97	41	24	
12	35	28	27	20	15	15	12	8	5	6	7	3	2	1	2	2	2	2	2	2	2	2	5	18	1	35	9	24	
13	29	31	31	27	25	22	12	6	10	10	12	15	10	10	8	4	2	4	8	8	8	8	6	7	2	31	13	24	
14	10	9	9	8	10	10	8	6	4	2	2	1	0	0	2	3	2	2	1	1	0	1	1	0	0	10	4	24	
15	0	0	4	4	4	4	3	X	X	X	X	3	3	2	0	1	1	2	2	3	8	17	13	13	0	17	4	20	
16	13	12	13	14	13	12	12	14	13	10	11	14	13	15	16	17	18	19	18	17	17	16	12	13	10	19	14	24	
17	15	13	13	11	11	18	22	26	26	21	13	12	10	10	9	8	7	7	8	6	7	9	8	10	6	26	13	24	
18	13	13	15	16	13	8	6	7	7	6	7	11	10	9	12	8	6	7	5	6	2	1	1	1	1	16	8	24	
19	1	2	2	2	2	3	3	4	4	4	4	3	3	2	2	2	2	2	2	2	2	4	4	8	1	8	3	24	
20	10	9	8	7	7	8	8	8	7	7	6	6	6	8	7	4	3	3	2	2	1	1	3	1	10	6	24		
21	4	5	3	2	3	3	3	3	3	4	2	3	3	5	5	4	3	2	2	1	1	1	1	2	1	5	3	24	
22	2	2	2	1	1	2	2	1	1	0	0	0	2	4	3	3	3	2	2	3	6	6	5	4	0	6	2	24	
23	3	2	2	2	2	2	2	2	2	1	1	1	1	2	2	1	2	1	7	3	4	4	3	3	1	7	2	24	
24	3	3	3	4	3	4	3	2	1	1	1	2	1	1	1	1	2	2	4	3	2	2	2	2	1	4	2	24	
25	2	3	2	2	2	3	2	7	15	5	5	4	4	4	5	4	3	4	5	5	10	16	21	30	2	30	7	24	
26	29	25	25	21	14	14	18	9	2	2	3	3	3	4	7	10	10	6	5	5	8	17	20	25	2	29	12	24	
27	28	28	27	25	22	20	10	8	16	21	20	18	12	11	9	7	5	8	6	4	4	5	14	21	4	28	15	24	
28	25	22	19	18	15	17	15	9	5	2	2	2	2	2	2	2	3	5	4	3	6	5	3	7	2	25	8	24	
29	15	26	30	22	17	23	20	22	23	19	15	22	23	22	11	4	7	6	17	18	14	13	15	16	4	30	18	24	
30	16	16	15	17	23	23	19	16	15	17	19	14	6	2	1	1	0	0	0	1	3	5	6	10	0	23	10	24	
31	11	10	10	11	12	8	7	6	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	7	1	12	4	24	
HOURLY MAX	35	31	31	29	30	30	29	27	29	36	40	40	52	50	86	97	74	46	37	37	37	34	27	35					
HOURLY AVG	12	11	11	11	10	11	10	9	9	8	8	8	8	9	10	9	8	7	7	7	8	9	9	11					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

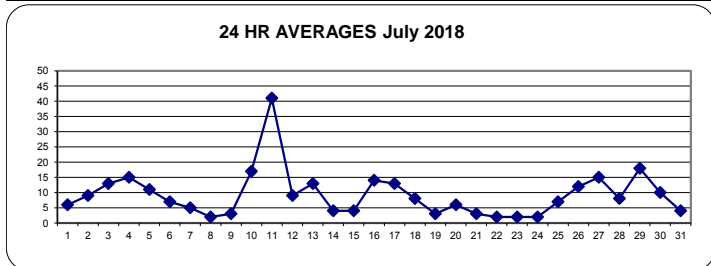
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m <sup>3</sup>	24-HR	30 µg/m <sup>3</sup>
----------------------	------	----------------------	-------	----------------------

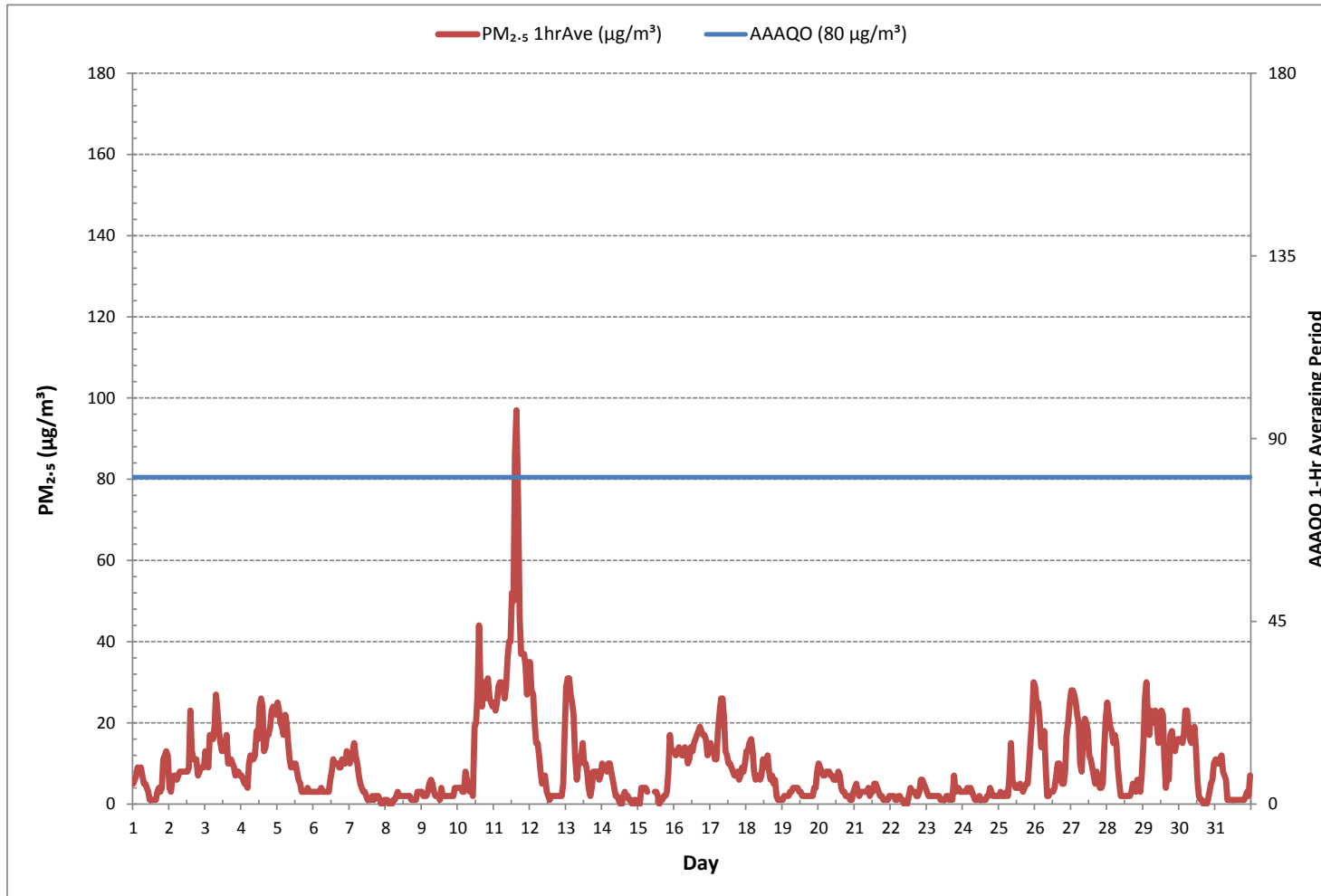
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	1				
NUMBER OF 24-HR EXCEEDANCES:	1				
NUMBER OF NON-ZERO READINGS:	721				
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	21	ON DAY	7	
MAXIMUM 1-HR AVERAGE:	97 µg/m <sup>3</sup> @ HOUR	15	ON DAY	11	
MAXIMUM 24-HR AVERAGE:	41 µg/m <sup>3</sup>		ON DAY	11	
MONTHLY CALIBRATION TIME:	1	hrs	OPERATIONAL TIME:	740	hrs
STANDARD DEVIATION:	10		AMD OPERATION UPTIME:	99.5	%
			MONTHLY AVERAGE:	9	µg/m <sup>3</sup>

24 HR AVERAGES July 2018



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)



Wind: LICA COLD LAKE SOUTH  
 Poll.: LICA COLD LAKE SOUTH-PM<sub>2.5</sub> [ug/m<sup>3</sup>]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

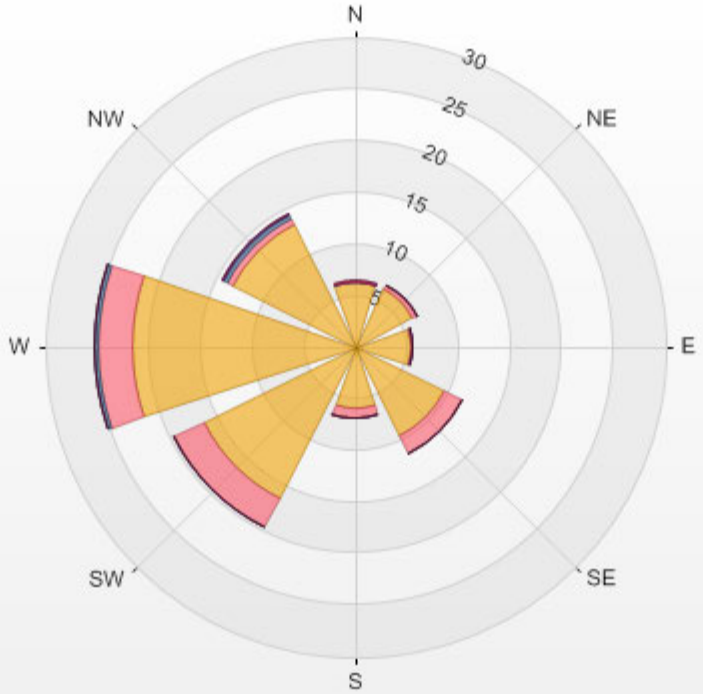
Calm: 3.11%

Calm Avg: 13.05 [ug/m<sup>3</sup>]

Direction	0.0-19.6	19.6-39.2	39.2-58.8	58.8-78.4	78.4-98.0	>98.0	Total
<b>N</b>	6.2	0.1	0.0	0.0	0.1	0.0	6.5
<b>NE</b>	6.2	0.5	0.0	0.0	0.0	0.0	6.8
<b>E</b>	5.4	0.1	0.1	0.0	0.0	0.0	5.7
<b>SE</b>	9.7	1.9	0.0	0.0	0.0	0.0	11.6
<b>S</b>	6.0	1.1	0.0	0.0	0.0	0.0	7.0
<b>SW</b>	16.4	3.3	0.0	0.0	0.0	0.0	19.6
<b>W</b>	21.5	3.4	0.3	0.0	0.0	0.0	25.2
<b>NW</b>	13.3	0.5	0.4	0.1	0.1	0.0	14.5
<b>Summary</b>	84.7	11.0	0.8	0.1	0.3	0.0	96.9

% Icon	Classes (ug/m3(L))	85	11	1	0	0	0
		0.0-19.6	19.6-39.2	39.2-58.8	58.8-78.4	78.4-98.0	>98.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5\_2[ug/m3(L)] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.11% Calm Poll Avg: 13.05[ug/m3(L)]



## ***WIND SPEED***



WIND SPEED Hourly Averages (WS kph)

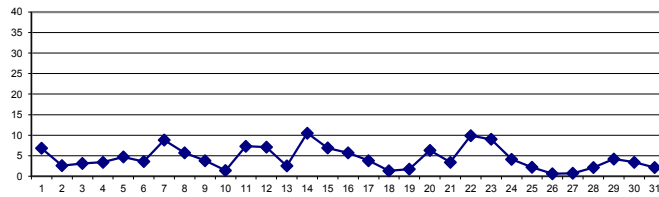
HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	3.9	4.4	4.3	3.7	1.7	3.7	4.1	5.3	7.3	7.3	9.7	10.9	10.5	11.6	9.4	13.6	14.2	11.4	8.6	5.3	5.5	3.9	4.4	5.6	1.7	14.2	6.8	24
2	7.0	6.3	5.6	4.3	4.1	4.0	5.8	7.0	6.3	6.8	5.7	5.4	1.8	0.6	5.1	4.8	2.3	4.2	2.5	2.0	1.6	0.7	1.0	1.0	0.6	7.0	2.6	24
3	0.6	1.3	0.5	1.2	0.3	0.9	2.5	3.1	5.3	7.4	9.4	7.2	3.6	6.3	7.3	6.4	8.0	6.2	2.9	5.5	3.0	1.2	2.0	1.9	0.3	9.4	3.1	24
4	2.0	1.8	0.9	2.3	0.9	3.4	6.1	7.1	7.3	11.3	10.5	11.0	8.7	10.1	6.3	2.3	2.9	2.8	5.2	3.6	2.9	1.8	1.8	0.5	0.5	11.3	3.4	24
5	0.8	0.5	0.5	0.3	0.4	0.8	2.8	2.8	3.1	4.9	6.8	7.5	7.1	6.7	7.3	7.5	8.1	9.6	8.2	7.3	8.0	6.7	7.7	9.2	0.3	9.6	4.7	24
6	9.5	4.7	0.3	1.1	0.3	5.7	10.2	5.9	7.2	10.4	11.3	11.3	9.4	9.7	9.5	9.4	7.9	8.5	6.4	2.9	6.6	12.2	7.2	2.8	0.3	12.2	3.6	24
7	8.7	7.3	5.8	5.8	4.5	4.8	8.2	9.3	8.3	10.5	12.5	12.7	11.6	16.7	16.3	15.8	15.3	10.7	10.5	10.1	9.7	11.4	5.6	4.3	4.3	16.7	8.8	24
8	4.6	2.6	3.7	4.0	4.1	4.1	5.3	6.2	6.2	7.9	8.7	8.6	9.3	9.0	9.8	7.9	9.3	7.9	7.2	5.8	2.8	1.1	1.9	1.5	1.1	9.8	5.7	24
9	0.6	0.3	0.5	0.5	0.5	0.8	2.8	7.1	2.8	4.8	5.2	5.9	11.3	7.6	11.2	10.9	8.9	10.5	8.6	6.4	5.8	1.7	0.3	0.1	0.1	11.3	3.8	24
10	0.2	0.5	0.4	0.4	0.5	1.1	0.3	2.9	4.2	5.3	6.0	5.8	5.4	6.2	4.9	3.7	3.4	2.5	1.6	2.8	4.5	9.8	9.7	9.1	0.2	9.8	1.4	24
11	8.7	11.1	8.3	5.6	3.7	7.6	8.1	6.2	8.8	9.4	8.9	9.8	11.3	9.1	13.1	10.9	13.9	9.9	7.4	5.6	6.6	4.9	4.0	4.1	3.7	13.9	7.3	24
12	4.0	2.7	2.7	3.8	4.3	5.3	8.2	7.6	8.9	8.6	11.4	13.0	13.1	12.5	11.8	10.3	11.7	11.4	10.5	6.3	3.4	2.4	1.6	1.0	1.0	13.1	7.1	24
13	0.7	0.9	0.2	0.6	3.2	4.0	3.3	3.5	3.1	1.5	2.1	2.1	5.6	5.5	5.5	6.7	7.9	11.5	5.5	3.7	4.6	5.9	3.7	3.0	0.2	11.5	2.5	24
14	3.3	4.1	7.2	7.9	6.5	9.9	11.7	10.6	12.1	12.7	12.5	16.7	15.3	15.0	14.7	14.8	14.6	13.5	10.5	10.1	9.7	8.4	9.3	9.1	3.3	16.7	10.5	24
15	9.8	10.1	9.9	8.1	7.9	9.0	9.7	10.3	12.5	15.1	16.3	13.9	11.9	11.6	11.6	9.4	8.1	6.5	4.7	1.9	1.3	4.5	10.3	10.6	1.3	16.3	6.9	24
16	10.7	10.3	10.8	7.8	7.3	4.6	5.1	4.8	4.6	6.3	7.6	8.7	9.7	9.9	9.9	10.2	9.4	6.3	3.6	2.2	3.5	3.3	3.4	2.2	2.2	10.8	5.7	24
17	1.7	0.9	0.3	1.1	0.6	0.4	3.9	5.2	4.2	3.4	4.5	5.8	7.0	8.3	8.5	9.4	8.5	8.1	6.2	3.0	0.6	0.9	0.8	0.3	0.3	9.4	3.8	24
18	1.0	0.5	2.3	1.8	1.3	7.7	4.8	2.1	2.7	4.2	4.2	4.1	6.4	2.4	3.4	3.3	3.4	2.3	2.3	5.1	10.6	5.1	1.4	2.8	0.5	10.6	1.3	24
19	2.6	3.8	3.2	0.7	0.9	1.3	3.3	4.1	5.1	2.8	3.3	5.7	5.9	4.6	7.5	3.7	3.5	3.4	4.3	1.5	0.6	0.7	1.3	0.8	0.6	7.5	1.7	24
20	1.2	1.2	0.3	3.0	2.4	0.9	3.8	4.9	5.2	7.6	8.5	9.3	9.7	12.1	11.3	13.1	16.4	14.9	13.5	12.2	8.6	3.2	9.1	7.1	0.3	16.4	6.3	24
21	9.0	1.9	3.2	5.7	5.9	1.3	4.6	5.5	5.9	7.1	7.1	7.5	7.0	6.0	6.4	5.0	6.3	3.6	7.4	11.4	5.1	7.8	4.0	3.4	1.3	11.4	3.4	24
22	2.3	4.4	5.4	4.7	4.4	5.5	7.3	6.6	7.3	11.3	13.3	14.0	16.1	18.2	16.4	20.5	19.7	17.8	16.0	17.1	12.5	10.5	7.3	9.7	2.3	20.5	9.9	24
23	7.9	9.4	9.4	7.6	9.9	8.1	7.5	10.8	14.1	16.9	15.8	15.7	13.3	13.9	13.7	13.0	11.2	10.2	8.4	7.2	4.0	3.1	3.6	3.5	3.1	16.9	9.0	24
24	4.6	1.7	3.0	4.1	4.6	3.8	7.7	7.9	8.8	9.2	10.1	7.7	12.1	12.4	10.0	9.4	8.7	6.0	9.2	5.3	4.0	3.5	2.9	3.2	1.7	12.4	4.1	24
25	2.5	0.2	0.8	1.6	2.6	2.9	5.0	3.1	2.4	3.5	3.7	3.2	2.9	1.5	4.3	4.0	6.4	4.9	4.7	2.6	1.1	0.9	0.8	0.3	0.2	6.4	2.2	24
26	0.7	0.7	0.5	0.6	0.7	0.2	1.0	1.9	2.1	2.5	1.9	1.4	1.6	0.6	5.8	2.9	4.9	4.7	5.1	3.7	1.1	0.9	0.8	0.8	0.2	5.8	0.6	24
27	0.2	0.9	0.8	1.2	1.1	0.6	2.8	2.9	1.2	1.4	3.2	3.4	4.4	2.1	4.5	4.2	4.2	8.5	4.1	1.2	1.0	0.9	0.6	0.8	0.2	8.5	0.7	24
28	0.4	0.8	0.8	0.2	0.0	0.1	2.3	3.2	1.7	3.3	3.9	4.3	3.7	4.8	4.4	5.4	5.0	4.6	4.2	1.7	1.4	1.6	1.6	1.3	0.0	5.4	2.1	24
29	0.7	0.4	0.8	0.2	1.1	0.6	2.1	5.1	8.1	8.2	8.2	8.3	9.4	9.2	10.9	9.8	10.3	7.4	3.0	1.4	10.6	1.0	2.3	1.2	0.2	10.9	4.2	24
30	1.0	0.5	1.1	0.5	0.3	1.0	0.4	2.0	3.0	3.0	6.7	8.9	6.2	7.4	9.6	12.5	10.3	6.0	4.8	7.6	6.1	4.1	4.0	1.6	0.3	12.5	3.4	24
31	1.6	1.9	1.2	0.5	0.9	0.6	0.1	2.4	4.9	4.4	2.4	3.3	2.8	6.0	6.4	6.1	4.8	5.0	3.8	2.4	2.1	2.3	2.6	2.4	0.1	6.4	2.1	24
HOURLY MAX	10.7	11.1	10.8	8.1	9.9	9.9	11.7	10.8	14.1	16.9	16.3	16.7	16.1	18.2	16.4	20.5	19.7	17.8	16.0	17.1	12.5	12.2	10.3	10.6				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	November 9, 2017
DECLINATION:	MAGNETIC DECLINATION 19 DEGREE EAST

24 HR AVERAGES July 2018

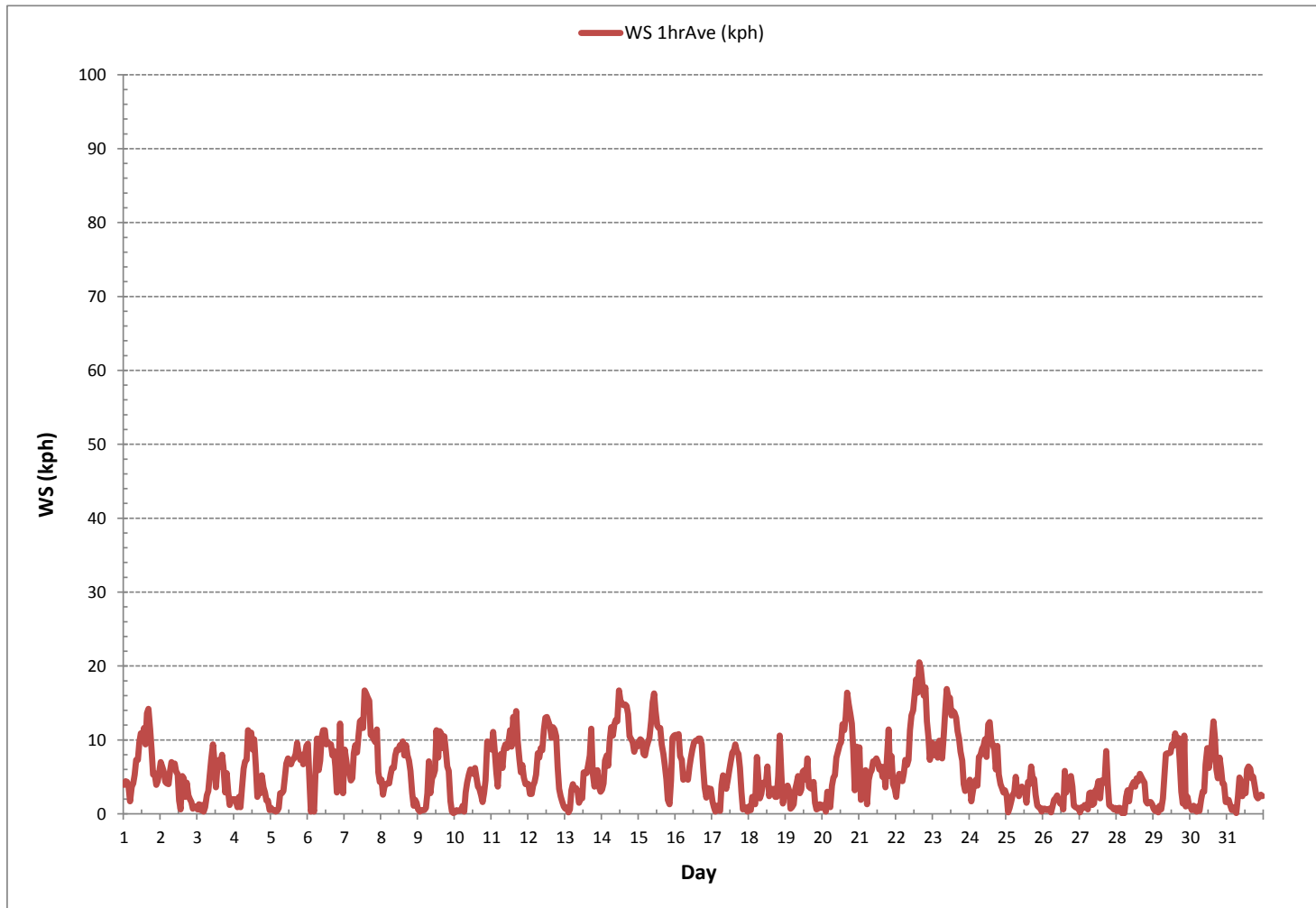


MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	743
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR 4 ON DAY 28
MAXIMUM 1-HR AVERAGE:	20.5 kph @ HOUR 15 ON DAY 22
MAXIMUM 24-HR AVERAGE:	10.5 kph ON DAY 14
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMT OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.1
MONTHLY AVERAGE:	2.4 kph



WIND SPEED Hourly Averages (WS kph)



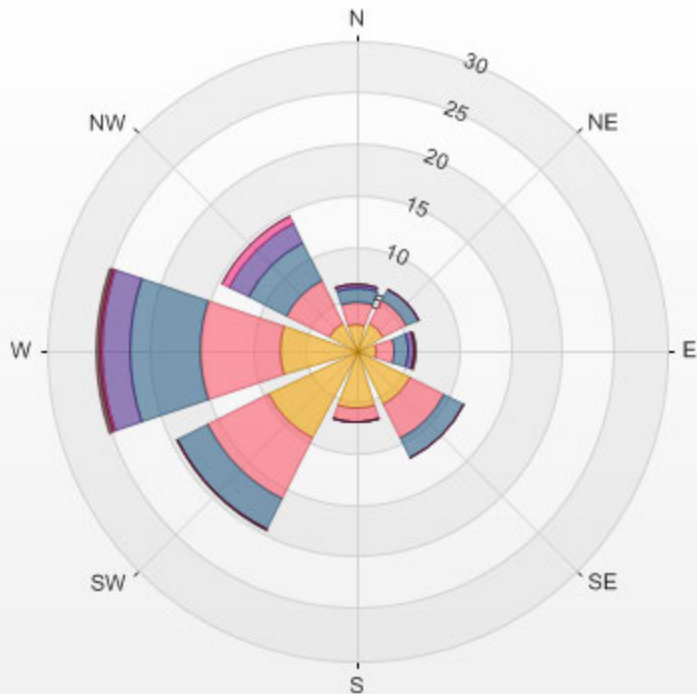
Wind: LICA COLD LAKE SOUTH  
 Monitor: WSP [kph]  
 Monthly: 18/07  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 3.09%

Direction	0.4-4.1	4.1-8.2	8.2-12.4	12.4-16.5	16.5-20.6	>20.6	Total
<b>N</b>	2.6	2.3	1.3	0.3	0.0	0.0	6.4
<b>NE</b>	3.0	2.6	1.2	0.0	0.0	0.0	6.7
<b>E</b>	1.9	1.8	1.5	0.5	0.0	0.1	5.8
<b>SE</b>	5.8	3.6	2.2	0.0	0.0	0.0	11.6
<b>S</b>	5.7	1.3	0.0	0.0	0.0	0.0	7.0
<b>SW</b>	9.5	6.6	3.2	0.0	0.0	0.1	19.5
<b>W</b>	7.4	7.8	6.7	2.7	0.3	0.4	25.3
<b>NW</b>	3.0	4.7	4.0	2.2	0.8	0.0	14.7
<b>Summary</b>	38.7	30.6	20.2	5.7	1.1	0.7	96.9

% Icon Classes (kph) 39 0.4-4.1 31 4.1-8.2 20 8.2-12.4 6 12.4-16.5 1 16.5-20.6 1 >20.6

LICA COLD LAKE SOUTH 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.09% Calm Wind Avg Speed: 0.24(kph)



***WIND DIRECTION***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.
DAY 1	WSW	SW	SW	WSW	SW	SW	SW	W	W	W	W	W	WSW	W	W	W	W	WNW	WNW	W	W	W	WSW	WSW	W	24
2	W	W	WSW	WSW	SW	SW	WSW	WSW	W	WNW	WNW	WNW	W	SE	NNE	NNE	NNE	SSW	W	SSW	SSE	SSE	SE	SE	W	24
3	WNW	WSW	ESE	ENE	NE	NNE	E	E	NNE	ENE	ESE	ENE	NNE	E	E	ENE	NE	E	NE	NNE	NNE	ENE	NNW	NE	ENE	24
4	ENE	NNE	NW	NW	W	NNW	NNW	NNE	N	NNW	NNW	NNW	NW	WNW	WNW	NNE	ENE	W	WSW	SW	WSW	WSW	SW	SE	NW	24
5	S	S	SE	S	SSE	SE	SE	SE	SSW	SSW	S	SSW	SSW	S	SSW	S	SSE	SE	SSE	SE	SE	SE	SE	SE	SSE	24
6	SE	SE	SE	NE	NNW	SE	SE	SE	SE	SE	SE	SE	SE	SE	SW	SW	WSW	WSW	SW	WSW	NW	WNW	W	S	SSW	24
7	SW	SW	WSW	WSW	SW	SW	WSW	WSW	W	WSW	WSW	W	WSW	WSW	WSW	W	W	WNW	W	NW	NW	NW	NW	W	W	24
8	WNW	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	W	WSW	WSW	S	SW	SW	WSW	24
9	ESE	S	SW	ESE	ENE	ENE	SSE	SE	SSW	SW	S	ESE	SE	E	ENE	E	ENE	ESE	ESE	SE	SE	ENE	SW	ESE	ENE	24
10	S	SSW	E	WSW	SSW	W	NNW	SE	E	E	ESE	ESE	SE	ESE	ENE	ENE	SE	NE	SW	NW	WSW	SW	WSW	SW	SSE	24
11	WSW	W	W	W	W	W	W	WNW	W	W	W	W	WNW	NW	NNW	NW	NW	NNW	WNW	W	W	W	WSW	WSW	W	24
12	SW	SW	SW	SW	WSW	WSW	WSW	WSW	W	WSW	W	W	W	W	W	W	WNW	W	W	WSW	WSW	SW	S	W	W	24
13	NE	SSW	SSW	SSW	WSW	WSW	SW	WNW	N	W	N	NNW	NW	NNE	NE	NE	NE	NNW	NNE	NNW	WNW	NW	NW	WNW	NNW	24
14	WNW	WNW	NW	NW	WNW	WNW	NW	NW	WNW	WNW	W	W	W	W	W	W	WNW	WNW	W	W	WSW	WSW	W	WNW	W	24
15	WSW	WSW	W	W	WSW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	WNW	WNW	WNW	W	E	ESE	SE	SE	W	W	24
16	SE	SE	SE	SE	SE	SE	SE	SE	SSE	S	S	SSW	SSW	SSW	SSW	SW	SW	SW	SW	S	SSE	SE	SSE	SW	S	24
17	W	S	S	SW	W	SW	WSW	SW	SW	WSW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	SSW	SSE	S	SSE	NE	SW	24
18	WSW	SSE	WNW	WNW	WSW	NNW	NW	SSW	WNW	NW	NW	NNE	NE	NNE	ENE	NE	SSE	S	ENE	ENE	SE	SW	WSW	NNE	W	24
19	W	W	ENE	SSW	SSW	SW	SW	W	NNW	NW	W	WNW	NNW	NNW	WNW	N	ENE	NW	NE	E	E	ENE	ENE	NE	NW	24
20	NNE	SSW	SSE	SE	S	W	ENE	ENE	E	E	E	ESE	ESE	E	E	E	E	E	E	E	NW	ENE	NE	NE	E	24
21	ENE	ENE	NNW	NE	NE	W	W	WNW	NNW	N	NW	NW	NW	W	WNW	W	W	W	WNW	W	SW	SW	W	SW	WNW	24
22	SW	SW	SW	SW	SW	SW	WSW	W	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	WNW	WNW	WNW	24
23	WNW	NW	NW	WNW	NW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NNW	N	N	NNE	NNE	NNE	N	NNW	NW	NW	24
24	NNW	WNW	WSW	WSW	W	W	WNW	WNW	WNW	WNW	NW	N	NE	NE	NE	NE	NE	NE	NNE	NNE	N	WNW	WNW	W	N	24
25	W	W	SE	W	WSW	WNW	NNW	NNE	WNW	W	W	WNW	N	SSW	W	W	W	W	W	WSW	SSW	S	S	W	W	24
26	SSW	S	SE	SSW	S	S	SW	WSW	SW	NW	NW	ESE	NNW	WSW	NE	NE	NNW	NNE	NE	ENE	S	S	S	WSW	NNE	24
27	SE	SSW	SE	SSE	SE	W	SE	SSE	WSW	SSW	SE	SE	SE	S	SSW	SW	W	N	N	NW	SSE	SSE	SSE	SE	S	24
28	WSW	ESE	ESE	SSW	ENE	N	SE	SSE	SSW	WSW	SW	SSW	SSW	SSW	SW	WSW	WSW	SW	SW	S	S	SSW	SW	SW	SW	24
29	SW	SW	S	ESE	SE	W	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	N	N	SE	WSW	N	WSW	24
30	WSW	SSW	SSE	SE	NE	WSW	W	SW	SE	S	NW	NE	NNE	NNE	NNE	NNE	NNE	N	NNE	N	N	NNW	WNW	NNW	NNW	24
31	SW	WSW	SW	S	SSW	W	W	SE	SE	SE	SSE	SW	W	WSW	SW	SW	SW	SW	SW	SSE	SE	SE	SE	SE	SSW	24

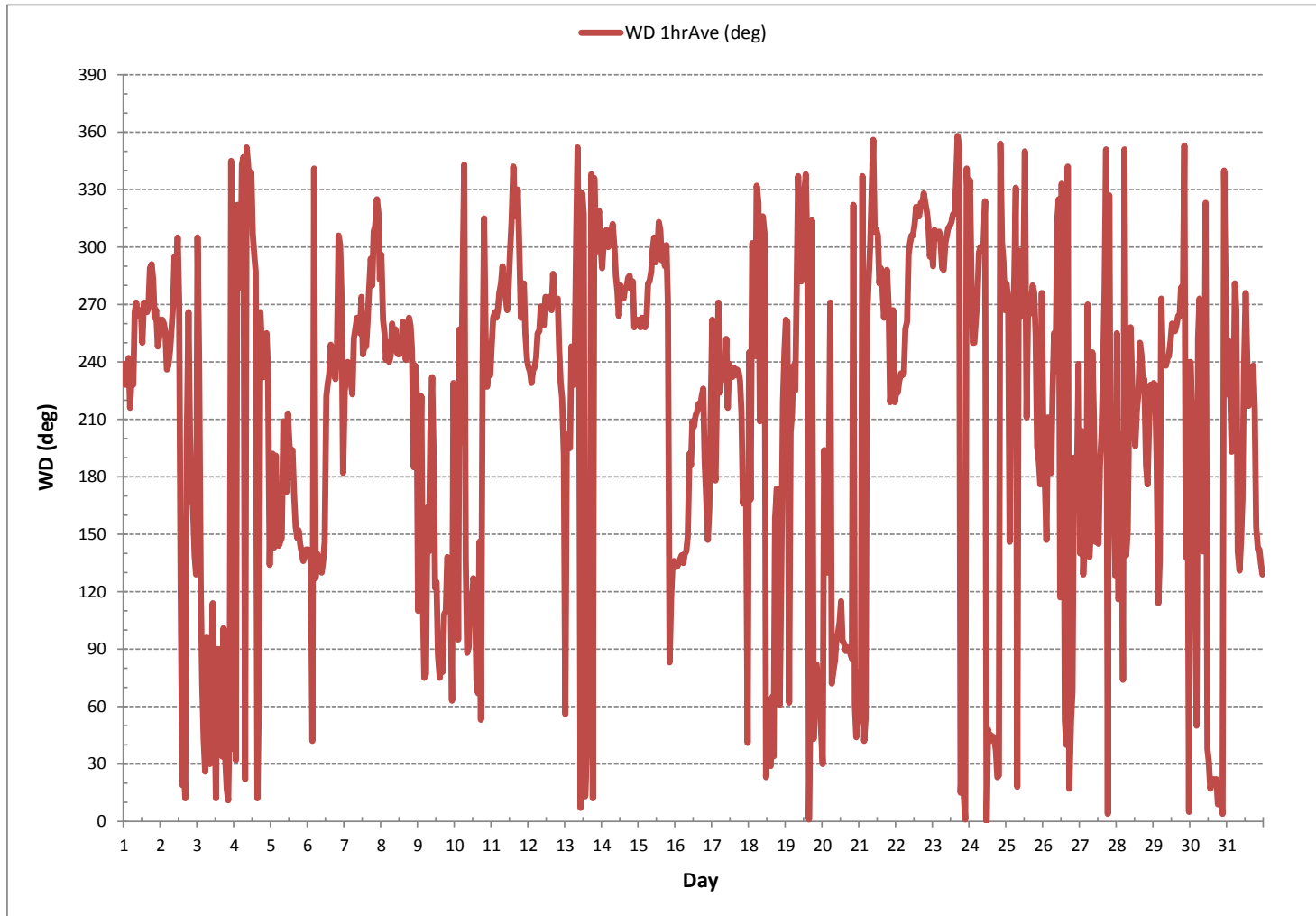
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	91		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	277 (W)	

WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	
DAY																									
1	15	14	16	11	16	18	19	30	25	30	24	23	27	25	26	22	21	23	21	23	17	20	16	17	24
2	16	19	24	22	18	19	19	19	22	24	27	25	62	19	23	30	19	35	13	11	12	22	9	7	24
3	9	7	12	9	14	16	34	44	27	26	26	37	47	38	23	24	29	41	42	22	12	16	11	14	24
4	12	12	11	13	17	13	19	25	26	24	24	25	29	23	27	63	48	14	24	19	16	10	5	13	24
5	8	8	13	13	11	20	24	17	22	40	39	30	34	37	41	37	33	21	25	18	12	11	13	14	24
6	13	16	65	54	78	19	18	19	19	19	15	26	32	24	24	22	22	20	19	26	15	19	33	55	24
7	17	18	19	19	17	19	21	23	24	25	23	23	23	20	22	23	21	27	22	20	14	23	22	20	24
8	19	16	16	15	15	18	21	25	28	30	25	28	25	26	27	28	25	23	22	18	25	25	16	20	24
9	52	70	62	65	57	53	46	19	46	23	40	36	22	29	28	25	33	20	25	17	17	50	70	74	24
10	70	57	72	70	61	49	74	42	39	42	32	34	36	29	31	37	24	37	40	28	44	19	19	19	24
11	19	18	21	16	23	19	21	21	20	21	20	23	21	30	22	20	19	17	24	16	19	20	15	15	24
12	16	23	21	16	16	17	18	21	22	25	23	26	23	25	25	24	23	23	20	20	20	18	34	47	24
13	62	59	72	52	19	19	27	35	40	64	60	55	31	37	26	24	22	17	32	46	26	16	32	40	24
14	28	28	18	19	21	17	17	17	23	24	24	20	22	22	21	21	23	22	23	21	21	16	17	16	24
15	16	15	16	17	16	19	22	21	23	22	20	24	25	25	26	27	27	29	19	36	47	22	14	11	24
16	12	11	11	12	11	16	32	23	30	36	35	29	31	29	28	24	24	22	19	33	40	20	35	30	24
17	47	65	69	45	67	69	19	18	24	36	36	26	27	24	28	20	22	19	19	24	54	50	45	73	24
18	56	66	36	59	70	16	41	47	37	19	32	45	31	51	45	47	34	51	46	45	20	29	46	20	24
19	33	24	24	62	50	49	30	39	31	45	49	35	42	49	29	53	50	52	25	55	57	58	39	49	24
20	47	63	74	33	57	67	27	23	25	25	28	28	27	24	26	24	20	20	21	22	57	65	30	49	24
21	32	64	41	19	21	56	24	19	22	31	24	25	23	32	34	37	34	28	24	21	24	21	24	29	24
22	40	24	16	17	18	18	18	21	24	18	19	17	19	17	17	16	16	17	17	17	15	15	19	18	24
23	19	15	15	17	15	19	21	22	19	17	19	22	22	24	19	27	22	20	24	21	23	21	21	17	24
24	17	51	16	13	19	22	25	24	22	23	24	45	21	20	24	23	22	25	21	21	23	18	15	13	24
25	14	69	56	39	21	31	18	35	41	43	40	48	45	62	35	38	29	23	23	23	29	43	52	65	24
26	58	58	61	59	46	73	42	38	46	43	53	65	55	74	26	45	35	28	18	16	52	54	58	54	24
27	74	52	51	48	25	55	16	41	60	63	39	42	39	61	39	33	45	22	19	49	37	30	64	47	24
28	67	42	42	75	80	78	21	33	53	43	35	38	52	42	45	32	31	26	18	32	27	26	26	38	24
29	51	61	56	70	23	47	24	18	18	21	22	26	24	26	22	20	22	17	38	58	22	68	26	58	24
30	58	65	47	66	71	57	69	59	40	49	33	22	27	26	23	20	24	27	21	21	20	21	13	45	24
31	37	35	50	68	56	65	78	33	22	36	57	50	49	31	33	34	38	30	28	22	15	18	19	16	24

STATUS FLAG CODES

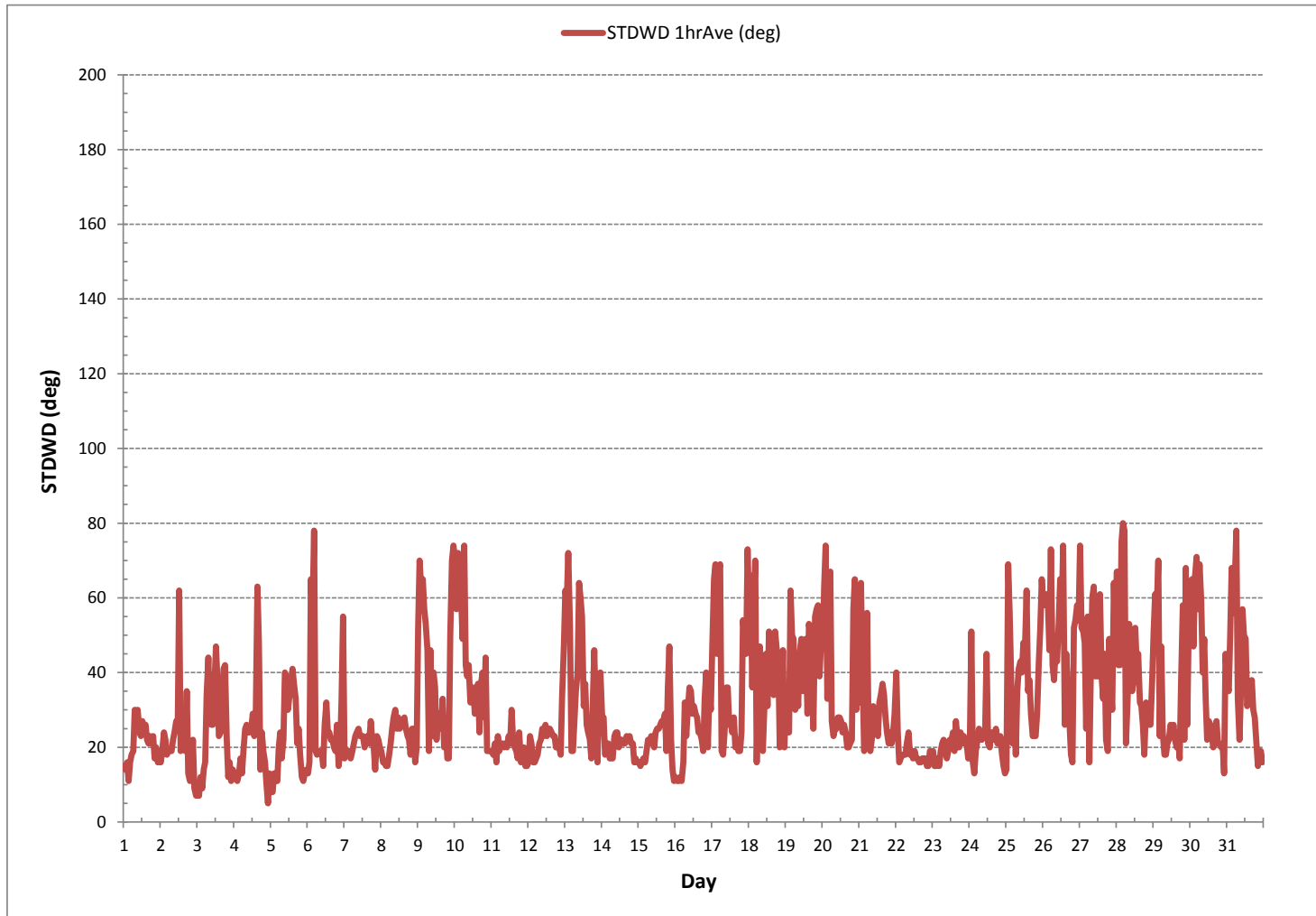
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs



STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



***RELATIVE HUMIDITY***



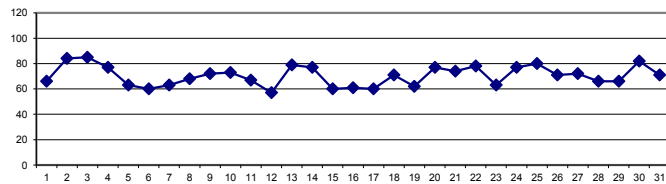
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	88	85	87	90	92	90	85	72	66	62	55	49	47	45	44	39	44	46	50	56	62	69	75	76	39	92	66	24
2	79	84	95	98	99	99	98	94	88	82	76	69	68	70	84	72	64	72	73	72	85	93	95	97	64	99	84	24
3	97	98	99	99	99	100	99	93	86	74	65	73	85	70	88	76	71	66	67	73	84	92	94	97	65	100	85	24
4	97	98	99	100	100	94	82	75	70	60	62	54	58	65	78	62	56	60	53	62	74	89	95	97	53	100	77	24
5	97	98	98	98	98	90	83	73	64	56	49	46	46	44	41	39	38	37	39	44	50	57	62	63	37	98	63	24
6	66	71	83	88	86	81	74	70	64	61	57	51	48	50	47	43	44	43	47	58	60	43	41	60	41	88	60	24
7	54	54	64	71	72	71	62	54	49	45	47	56	54	47	44	42	41	74	82	84	83	87	91	92	41	92	63	24
8	94	94	97	98	99	99	91	77	67	57	51	50	48	46	44	43	43	40	42	44	56	77	87	91	40	99	68	24
9	91	93	95	94	93	78	73	73	70	73	87	79	61	59	59	45	44	43	50	56	63	73	85	90	43	95	72	24
10	93	95	96	96	96	91	77	76	69	64	54	48	44	43	47	45	52	56	71	75	75	92	96	97	43	97	73	24
11	98	97	97	98	99	97	92	88	85	80	73	64	58	50	35	36	31	27	32	43	53	59	59	67	27	99	67	24
12	66	71	81	82	82	76	69	62	56	50	44	39	37	36	36	37	37	36	38	43	54	69	78	83	36	83	57	24
13	89	88	93	91	91	87	83	73	64	57	59	65	62	57	57	57	58	81	96	97	100	100	97	98	57	100	79	24
14	98	99	96	93	91	90	88	81	69	64	65	65	68	68	68	68	67	68	68	67	68	76	80	79	64	99	77	24
15	82	83	84	86	88	83	77	68	58	51	48	44	41	39	37	37	37	37	39	48	65	63	66	70	37	88	60	24
16	72	72	76	81	83	83	79	79	69	53	48	46	47	45	45	43	42	42	44	51	62	69	71	71	42	83	61	24
17	80	89	88	92	95	84	74	67	57	45	36	33	32	33	32	32	33	34	38	47	64	78	83	88	32	95	60	24
18	91	93	96	87	86	76	74	82	82	77	82	66	58	56	53	48	48	48	52	68	62	64	74	82	48	96	71	24
19	82	81	85	90	93	87	79	73	65	58	54	49	44	38	34	33	34	33	34	45	64	74	75	80	33	93	62	24
20	83	85	88	81	88	95	96	92	83	71	65	58	54	57	60	60	61	64	68	71	87	98	96	96	54	98	77	24
21	95	93	92	89	88	94	95	96	97	88	81	73	62	55	48	43	43	51	49	60	68	68	73	80	43	97	74	24
22	85	90	93	94	94	90	91	95	87	85	81	85	75	65	57	54	59	62	62	66	71	72	73	75	54	95	78	24
23	79	79	81	82	80	79	75	69	62	55	53	47	45	41	41	41	43	44	51	62	67	71	75	78	41	82	63	24
24	80	87	92	94	94	94	91	85	74	65	57	58	66	61	60	61	64	65	72	80	83	86	87	90	57	94	77	24
25	94	95	96	96	97	99	99	100	98	89	76	66	62	56	53	55	54	52	54	63	81	89	92	94	52	100	80	24
26	94	96	96	96	96	97	95	79	66	54	56	56	55	50	45	45	48	49	46	52	71	84	87	91	45	97	71	24
27	90	91	92	92	93	93	91	85	74	66	61	57	52	45	44	40	40	51	52	61	79	85	92	92	40	93	72	24
28	92	94	93	95	96	93	84	77	65	58	49	45	44	41	40	37	36	36	40	53	70	80	86	90	36	96	66	24
29	91	94	93	92	92	93	85	71	62	56	52	50	43	39	35	34	32	38	48	66	68	77	88	88	32	94	66	24
30	93	95	95	95	95	95	93	91	90	71	72	79	73	73	74	75	68	67	71	74	78	81	88	93	67	95	82	24
31	96	97	97	97	97	97	96	89	75	66	58	53	49	45	42	42	42	41	45	55	72	79	80	83	41	97	71	24
HOURLY MAX	98	99	99	100	100	100	99	100	98	89	87	85	85	73	88	76	71	81	96	97	100	100	97	98				
HOURLY AVG	87	88	91	91	92	90	85	79	72	64	60	57	54	51	51	48	48	50	54	61	70	77	81	85				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

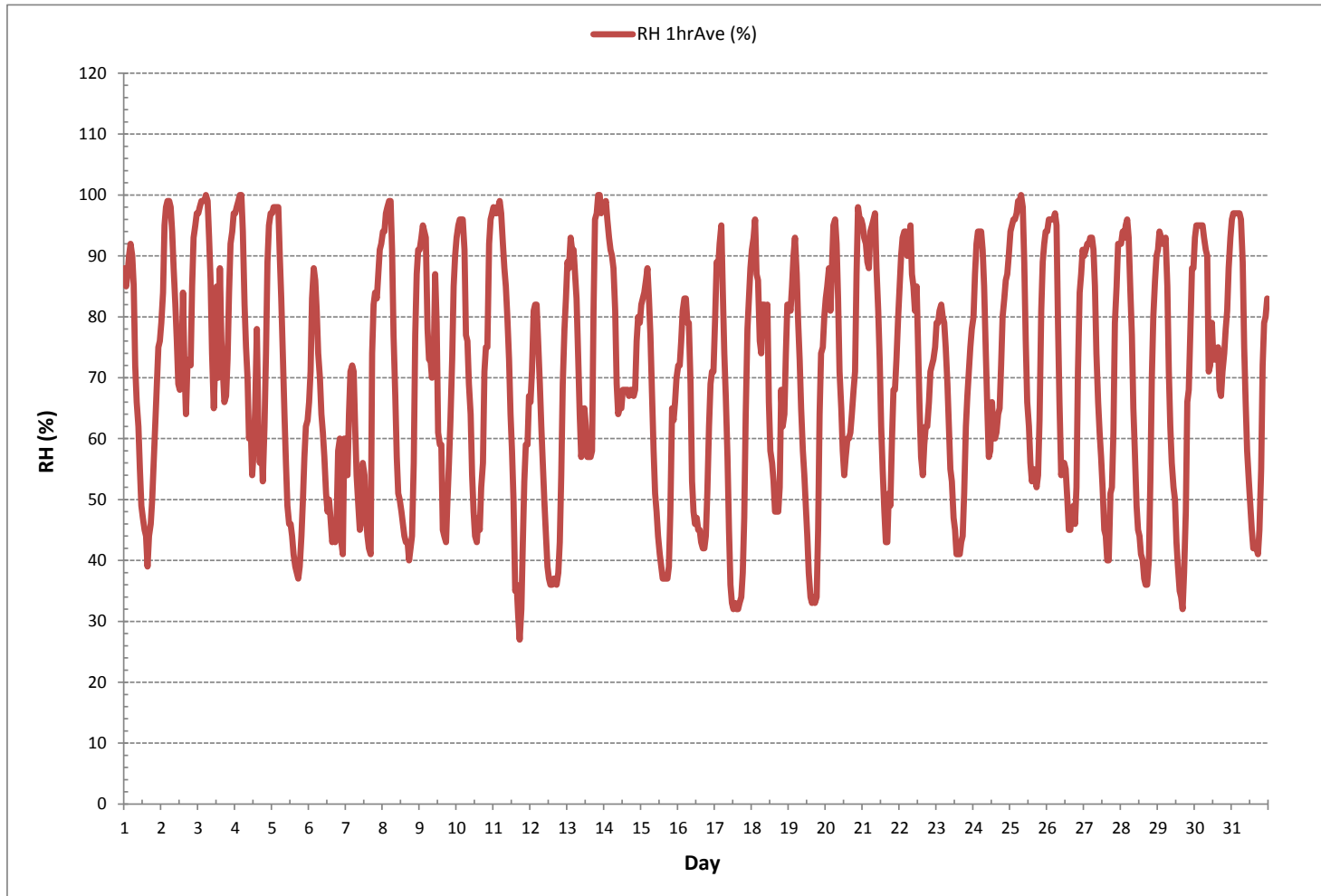
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	27	%	@ HOUR	17	ON DAY	11		
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	5	ON DAY	3		
MAXIMUM 24-HR AVERAGE:	85	%			ON DAY	3		
OPERATIONAL TIME:						744	hrs	
AMD OPERATION UPTIME:						100.0	%	
STANDARD DEVIATION:	20					MONTHLY AVERAGE:	70	%

**RELATIVE HUMIDITY Hourly Averages (RH %)**



***AMBIENT TEMPERATURE***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

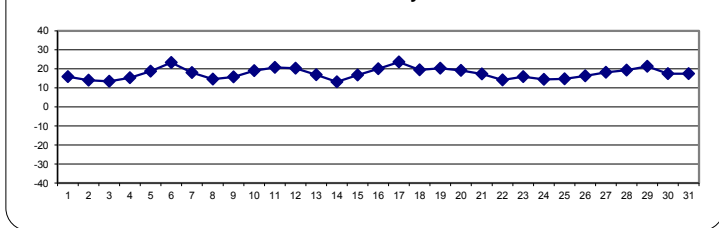
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	11.2	11.8	11.6	10.9	10.4	11.3	12.4	15.1	16.4	17.3	18.4	19.5	19.8	19.8	20.7	21.0	20.3	19.6	18.2	17.3	16.5	14.9	13.5	13.5	10.4	21.0	15.9	24	
2	13.1	12.8	11.9	11.8	11.6	11.7	12.0	12.7	13.4	14.3	15.2	16.5	16.8	16.8	14.9	16.4	17.5	16.4	16.5	16.3	14.1	12.3	11.1	10.1	10.1	10.1	17.5	14.0	24
3	9.1	8.3	8.0	7.9	7.9	9.8	12.8	14.1	14.8	16.6	18.2	16.8	14.8	18.1	14.1	16.3	17.6	16.8	16.2	16.4	14.0	12.7	11.5	11.0	7.9	18.2	13.5	24	
4	11.1	11.3	9.8	8.9	8.8	11.6	13.8	14.8	16.2	18.0	18.4	19.6	19.5	18.7	17.5	18.4	19.5	19.5	20.1	19.2	17.3	14.1	12.4	11.3	8.8	20.1	15.4	24	
5	10.2	9.4	8.6	8.0	8.2	11.6	14.8	17.5	20.4	21.8	22.7	22.9	23.1	23.5	24.6	24.9	25.1	25.2	24.6	23.5	21.6	19.7	18.4	17.9	8.0	25.2	18.7	24	
6	17.2	16.4	14.2	13.2	14.1	15.7	17.7	19.6	21.9	23.8	26.1	28.0	29.2	29.6	30.6	30.5	30.1	29.8	28.4	26.2	24.9	25.0	24.6	21.7	13.2	30.6	23.3	24	
7	21.0	20.1	17.8	16.4	16.1	16.2	17.8	19.7	21.0	22.1	21.4	19.0	20.1	21.3	22.2	22.5	21.7	16.2	15.6	15.3	13.9	12.9	11.2	10.4	10.4	22.5	18.0	24	
8	9.6	8.7	8.0	7.8	7.7	8.3	10.6	12.9	14.5	15.5	16.5	17.0	18.1	18.2	19.6	20.4	20.9	21.2	20.7	20.3	17.7	13.5	11.6	10.4	7.7	21.2	14.6	24	
9	9.4	8.5	7.7	7.2	7.3	11.2	14.7	16.1	17.6	18.0	15.5	17.3	19.8	20.0	20.5	21.9	22.0	21.9	21.3	20.2	18.6	16.3	13.8	12.2	7.2	22.0	15.8	24	
10	11.2	10.4	9.8	9.0	9.2	11.5	16.4	18.8	21.0	22.9	24.7	25.9	26.7	26.6	26.2	26.1	25.2	24.7	22.9	21.9	20.5	16.5	15.8	15.3	9.0	26.7	19.1	24	
11	15.1	14.9	15.0	15.2	15.4	15.7	16.1	16.8	17.3	18.9	21.0	23.1	24.6	26.2	27.6	27.3	28.4	26.8	24.1	22.7	21.3	20.3	18.3	14.9	28.4	20.8	24		
12	17.9	16.9	15.1	14.2	13.8	15.3	17.3	19.5	21.0	22.5	23.7	24.2	24.7	25.2	25.6	25.2	25.4	25.2	24.4	23.1	21.0	17.7	15.7	14.0	13.8	25.6	20.4	24	
13	12.7	12.5	12.1	12.6	13.2	14.5	15.6	17.5	20.2	22.1	22.0	21.0	21.3	21.4	21.2	20.7	20.2	16.9	15.0	15.0	14.8	14.9	14.8	14.2	12.1	22.1	16.9	24	
14	13.9	13.8	13.3	12.4	11.8	11.3	11.4	11.7	13.0	13.1	13.1	13.3	13.1	13.1	12.9	13.3	14.3	14.7	15.1	15.1	14.6	13.3	12.4	11.8	11.3	15.1	13.2	24	
15	11.0	10.7	10.4	10.0	9.6	10.7	12.4	14.2	15.9	17.4	18.4	19.6	20.6	21.5	22.2	22.7	22.7	22.9	22.8	21.7	18.1	16.4	15.6	14.6	9.6	22.9	16.8	24	
16	14.1	13.7	12.8	12.1	11.8	12.1	13.3	14.0	17.5	21.1	22.8	23.7	24.0	25.5	26.1	26.6	27.1	27.4	27.3	25.7	23.0	20.6	19.8	19.3	11.8	27.4	20.1	24	
17	17.4	15.3	16.0	15.5	14.5	16.8	19.7	21.9	24.7	27.1	28.3	29.2	29.6	30.0	30.5	30.5	30.3	30.2	29.6	27.5	23.7	20.7	19.0	17.8	14.5	30.5	23.6	24	
18	16.8	16.1	15.2	16.7	16.9	18.0	18.4	17.8	18.3	18.7	19.0	21.4	22.2	22.9	23.4	24.2	24.0	24.7	24.4	21.4	18.5	17.7	15.9	14.6	14.6	24.7	19.5	24	
19	14.5	14.5	13.5	12.4	11.6	13.6	16.4	18.5	20.7	22.8	23.9	24.9	25.7	26.2	27.1	27.0	26.5	27.0	25.8	23.9	20.5	18.2	17.3	16.4	11.6	27.1	20.4	24	
20	16.4	16.5	16.0	16.7	16.3	15.5	15.8	16.4	18.0	20.1	20.7	22.5	23.6	23.7	24.1	24.3	24.1	23.3	22.2	21.5	17.2	14.5	15.1	15.2	14.5	24.3	19.2	24	
21	15.5	15.1	14.4	15.5	15.2	14.9	15.1	14.9	15.1	16.6	17.9	19.0	20.6	21.6	22.4	22.8	22.5	21.0	21.2	16.5	15.5	14.8	13.7	13.0	13.0	22.8	17.3	24	
22	12.2	11.6	11.2	11.0	10.9	11.8	12.5	13.2	15.4	15.4	15.0	14.3	15.2	16.7	17.8	17.7	16.8	16.4	16.4	15.4	14.3	14.0	13.4	13.0	10.9	17.8	14.2	24	
23	12.3	12.3	11.9	11.7	11.5	11.5	12.3	14.0	15.6	17.0	17.8	19.0	19.7	20.5	20.8	21.0	20.6	20.5	19.2	16.9	15.4	14.2	13.5	13.4	11.5	21.0	15.9	24	
24	13.0	11.3	9.9	9.0	9.5	10.5	11.3	12.2	14.3	16.2	17.7	18.0	17.2	17.7	18.3	18.5	17.8	17.6	16.1	15.1	14.8	14.3	14.1	13.4	9.0	18.5	14.5	24	
25	11.8	10.8	9.7	8.9	8.6	10.0	11.0	11.3	12.4	13.9	16.4	18.3	18.8	20.0	20.6	20.3	20.4	20.4	19.8	18.5	15.2	13.1	11.9	11.4	8.6	20.6	14.7	24	
26	11.1	10.4	9.6	8.8	8.4	8.6	11.6	16.0	18.9	20.5	19.9	20.2	20.7	21.9	21.6	21.7	21.4	21.5	21.6	20.5	16.9	14.3	13.2	13.0	8.4	21.9	16.3	24	
27	13.2	13.2	13.3	13.3	13.3	13.6	14.7	16.4	18.2	19.9	20.5	21.6	22.1	23.7	24.0	24.5	24.5	22.4	22.3	21.7	17.8	15.2	13.9	12.9	12.9	24.5	18.2	24	
28	12.3	11.7	11.1	10.3	9.9	10.9	14.6	17.6	20.5	22.6	23.8	24.5	24.9	25.7	26.4	26.6	26.4	26.5	25.8	23.1	19.7	17.2	15.9	15.0	9.9	26.6	19.3	24	
29	14.3	13.6	13.4	13.8	13.1	13.3	15.6	18.1	20.9	23.1	25.1	26.9	28.5	29.7	30.4	29.4	30.5	28.7	27.1	23.7	21.0	18.9	16.8	16.0	13.1	30.5	21.3	24	
30	14.9	14.1	13.8	13.5	13.3	13.6	15.8	16.9	18.2	22.0	22.1	20.7	21.0	20.4	20.8	19.4	20.1	20.6	20.1	19.2	17.3	15.8	14.1	12.9	12.9	22.1	17.5	24	
31	11.6	10.7	9.8	9.3	8.9	10.0	11.9	14.6	17.0	18.8	20.5	22.1	22.5	23.2	23.9	24.3	24.3	24.8	24.0	21.9	18.5	16.4	15.8	14.9	8.9	24.8	17.5	24	
HOURLY MAX	21.0	20.1	17.8	16.7	16.9	18.0	19.7	21.9	24.7	27.1	28.3	29.2	29.6	30.0	30.6	30.5	30.5	30.2	29.6	27.5	24.9	25.0	24.6	21.7					
HOURLY AVG	13.4	12.8	12.1	11.7	11.6	12.6	14.4	16.0	17.8	19.4	20.2	21.0	21.6	22.2	22.5	22.8	22.8	22.3	21.7	20.3	18.1	16.2	15.0	14.2					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

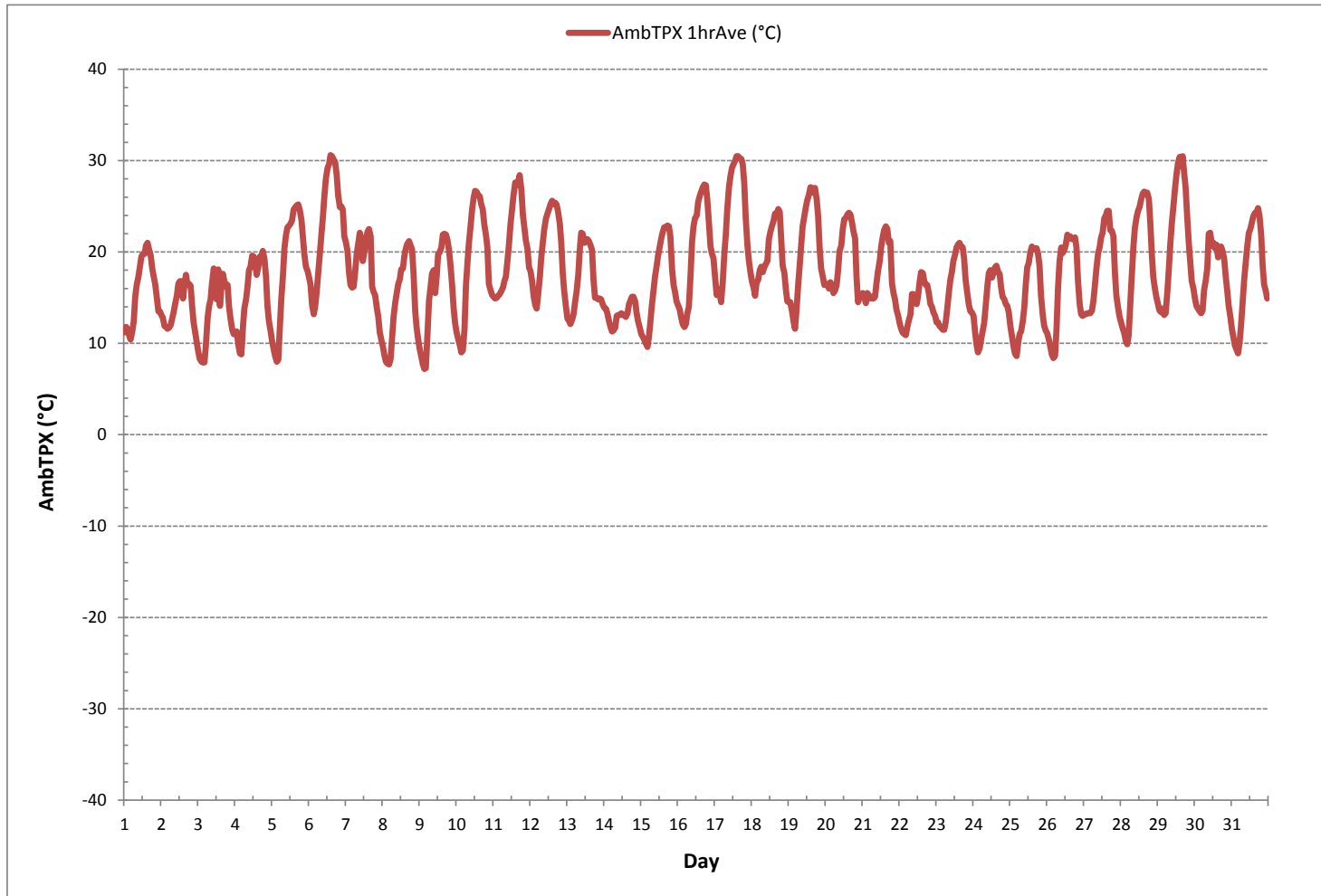
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	7.2 °C	@ HOUR	3	ON DAY	9
MAXIMUM 1-HR AVERAGE:	30.6 °C	@ HOUR	14	ON DAY	6
MAXIMUM 24-HR AVERAGE:	23.6 °C			ON DAY	17
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	5.2	MONTHLY AVERAGE:		17.6	°C

**AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)**



***APPENDIX II***  
***EQUIPMENT CALIBRATION RESULTS***



***SULPHUR DIOXIDE***



### Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	July 9, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	952	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	9:51	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:29	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	806528242   LICA	Range ppb:	500		
Last Calibration Date:	June 5, 2018	As Found C.F.:	1.007		
Previous C.F.:	1.000	New C.F.:	0.999		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	<b>Standard Calibration Points for Ranges</b> <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

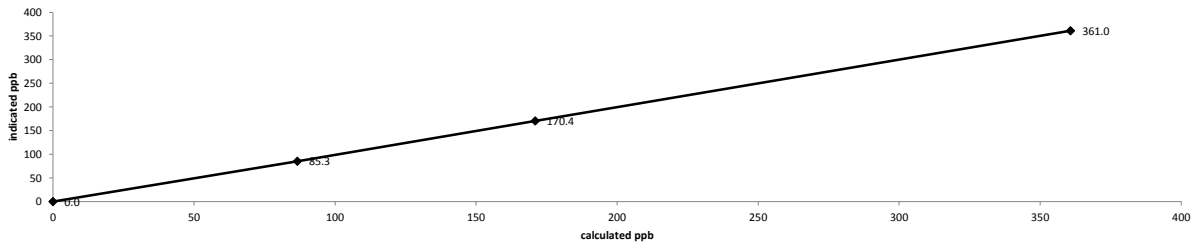
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5069	0.00	5069	0.0	0.0	n/a
as found high	5037	37.21	5074	360.8	358.3	1.007
adjusted zero	5069	0.00	5069	0.0	0.0	n/a
adjusted high	5037	37.21	5074	360.8	361.0	0.999
mid	5052	17.62	5070	171.0	170.4	1.003
low	5056	8.92	5065	86.6	85.3	1.016
calibrator zero	5069	0.00	5069	0.0	0.0	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		0.95-1.05
b (Intercept as % of full scale) =	0.14%		± 3% F.S.
% change in C.F. from last cal =	-0.70%		± 10%

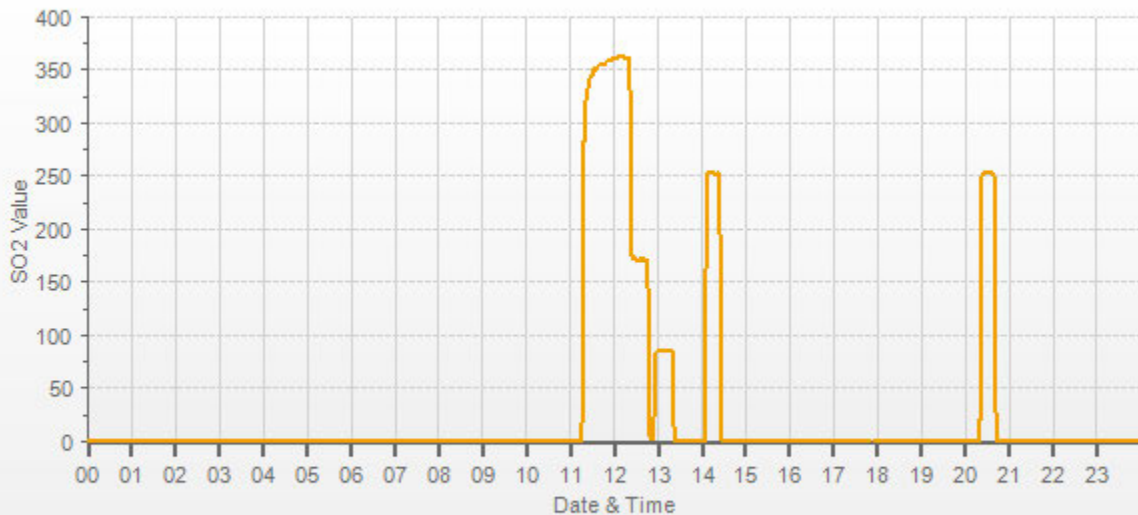
Thermo 43i Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	8.5	Bkg:	8.8
Coef:	0.971	Coef:	0.979
Pmt:	-624.6	Pmt:	-624.2
Flash:	761	Flash:	760
Internal:	28.6	Internal:	28.4
Chamber:	44.9	Chamber:	45.0
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Heater:	44.25	Perm Oven Heater:	44.24
Pressure:	684.3	Pressure:	683.1
Sample Flow:	0.486	Sample Flow:	0.485
Lamp Intensity:	96	Lamp Intensity:	97
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	255.0	Expected Value:	252.0

Comments: The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

SO2 [ppb] Station: LICA COLD LAKE SOUTH Daily: 18/07/09 Type: AVG 1 Min. [1 Min.]



— SO2 [ppb]

***TOTAL REDUCED SULPHUR***



### Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	July 9, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	952	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	9:51	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:30	Cal Gas Expiry Date:	June 14, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	CDNOVA / Model CDN - 101 / #501		
Analyzer:					
Serial Number/Owner:	812728560   LICA	Range ppb:	100		
Last Calibration Date:	June 5, 2018	As Found C.F.:	1.023		
Previous C.F.:	1.000	New C.F.:	0.996		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	<b>Standard Calibration Points for Ranges</b> <table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>SO2 Scrubber Check (10 minutes):</b> Start/End Time 24 hr.: 11:04 / 11:14 SO2 Analyzer Range: 500 Target Concentration (ppb): 380 As Found Zero: 0.0 Analyzer Response (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

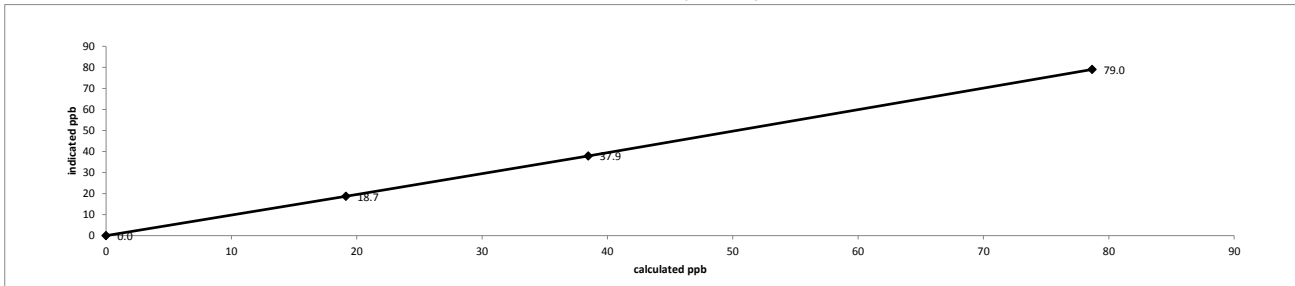
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7475	0.00	7475	0.0	0.0	n/a
as found high	7426	57.72	7484	78.7	76.9	1.023
adjusted zero	7475	0.00	7475	0.0	0.0	n/a
adjusted high	7426	57.72	7484	78.7	79.0	0.996
mid	7440	28.17	7468	38.5	37.9	1.015
low	7475	14.05	7489	19.1	18.7	1.023
calibrator zero	7475	0.00	7475	0.0	0.0	n/a
Average C.F. =						1.011

Linear Regression/Calibration Results:

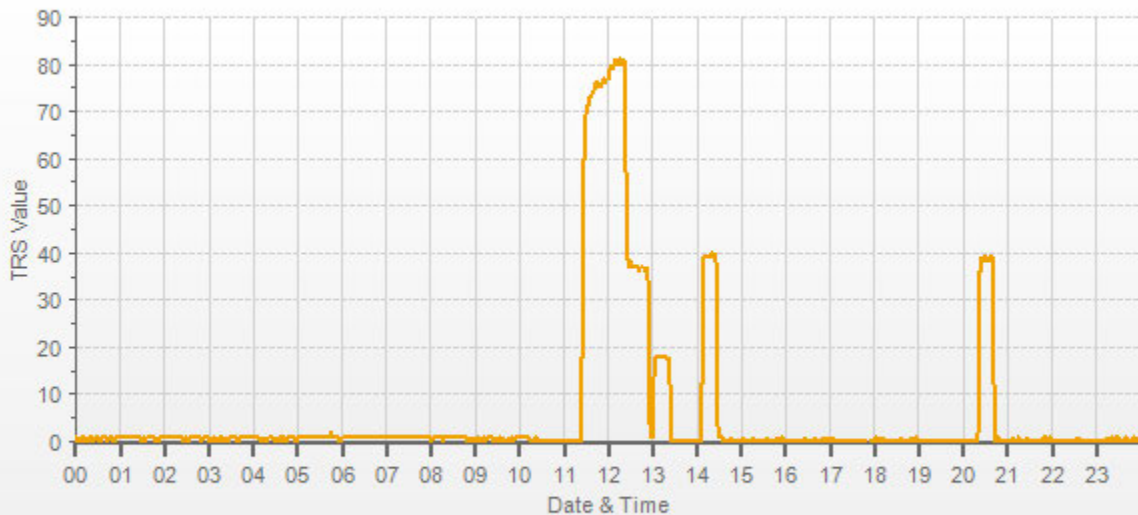
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.994		0.95-1.05
b (Intercept as % of full scale) =	0.36%		± 3% F.S.
% change in C.F. from last cal =	-2.30%		± 10%

Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:		As left:	
Bkg:	15.3	Bkg:	15.4
Coef:	0.938	Coef:	0.933
Pmt:	-651.2	Pmt:	-651.2
Flash:	743	Flash:	742
Internal:	31.9	Internal:	32.0
Chamber:	45.0	Chamber:	45.0
Converter Temp:	825	Converter Temp:	825
Converter Set:	825	Converter Set:	825
Perm Oven Gas:	44.99	Perm Oven Gas:	45.00
Perm Oven Htr:	44.37	Perm Oven Htr:	44.37
Pressure:	636.4	Pressure:	634.9
Sample Flow:	0.495	Sample Flow:	0.495
Lamp Intensity:	91	Lamp Intensity:	91
Averaging Time:	120	Averaging Time:	120
Expected Value:	40.1	Expected Value:	39.7

Comments: The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.



— TRS [ppb]

***TOTAL HYDROCARBON***



## Thermo 51i Total Hydrocarbon Analyzer Calibration

<b>Date:</b> July 6, 2018 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Cold Lake South <b>Parameter:</b> Total Hydrocarbon <b>Start/End Time 24 hr. (mst):</b> 8:36 / 12:59 <b>Calibration Method:</b> Gas Dilution <b>Analyzer:</b> <b>Serial Number/Owner:</b> 1118249035   Maxxam <b>Last Calibration Date:</b> June 6, 2018 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019   497   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   21   °C <b>Weather Conditions:</b> Mainly sunny <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> November 24, 2022 <b>Range ppm:</b> 50 <b>As Found C.F.:</b> 0.949 <b>New C.F.:</b> 1.000
---	---

**Calibration Standards:**

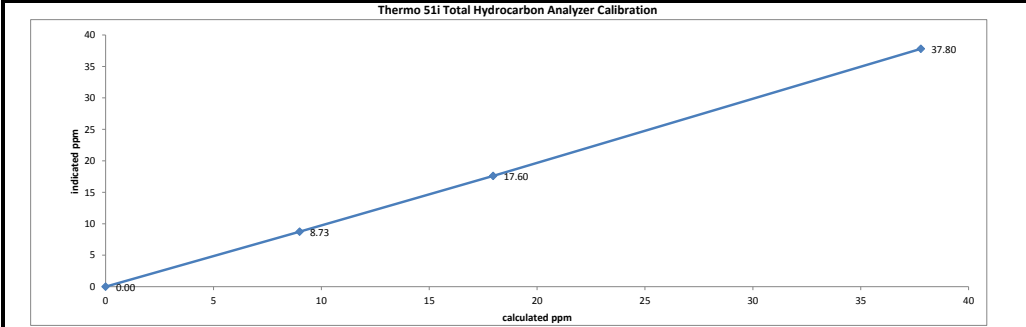
<b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018 <b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018 <b>Calibrator ID/Expiry Date:</b> EnviroNics id# 4760 expires March 2, 2019 <b>Cal Gas Cylinder I.D. #:</b> LL 165367 <b>CH<sub>4</sub>/C<sub>2</sub>H<sub>6</sub> Cylinder Conc. (ppm):</b> CH <sub>4</sub> as propane/total CH <sub>4</sub> equivalents (ppm): <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">590.0</td> <td style="width: 50%;">207.0</td> </tr> <tr> <td>569.3</td> <td>1159.3</td> </tr> </table>	590.0	207.0	569.3	1159.3	<b>Standard Calibration Points for a Range of: 50 ppm</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>	Point	Target ppm	High	38	Mid	18	Low	9
590.0	207.0												
569.3	1159.3												
Point	Target ppm												
High	38												
Mid	18												
Low	9												

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2523	0.00	2523	0.0	0.20	n/a
as found high	2445	82.37	2527	37.79	40.00	0.949
adjusted zero	2523	0.00	2523	0.00	0.00	n/a
adjusted high	2445	82.37	2527	37.79	37.80	1.000
mid	2480	39.03	2519	17.96	17.60	1.021
low	2500	19.54	2520	8.99	8.73	1.030
calibrator zero	2523	0.00	2523	0.0	0.00	n/a
<b>Average C.F.=</b>						1.017

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000 <b>Slope =</b> 0.998 <b>b (Intercept as % of full scale) =</b> 0.37% <b>% change in C.F. from last cal =</b> 5.06%	<b>LIMITS</b> > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
--	--



<b>As found:</b> Bkg: 1.08 Coef: 4.257 Bias Supply: -291 Detector Base: 125.0 Filter: 125 Pump: n/a Flame: 157.9 Internal: 28.4 Sample: 8.3 Fuel: 20.9 Air: 39.5 Signal: 248 Status: UT	<b>As left:</b> Bkg: 1.15 Coef: 4.041 Bias Supply: -291 Detector Base: 125.0 Filter: 125 Pump: n/a Flame: 157.9 Internal: 29.2 Sample: 8.3 Fuel: 20.9 Air: 39.5 Signal: 233 Status: LIT
--	--

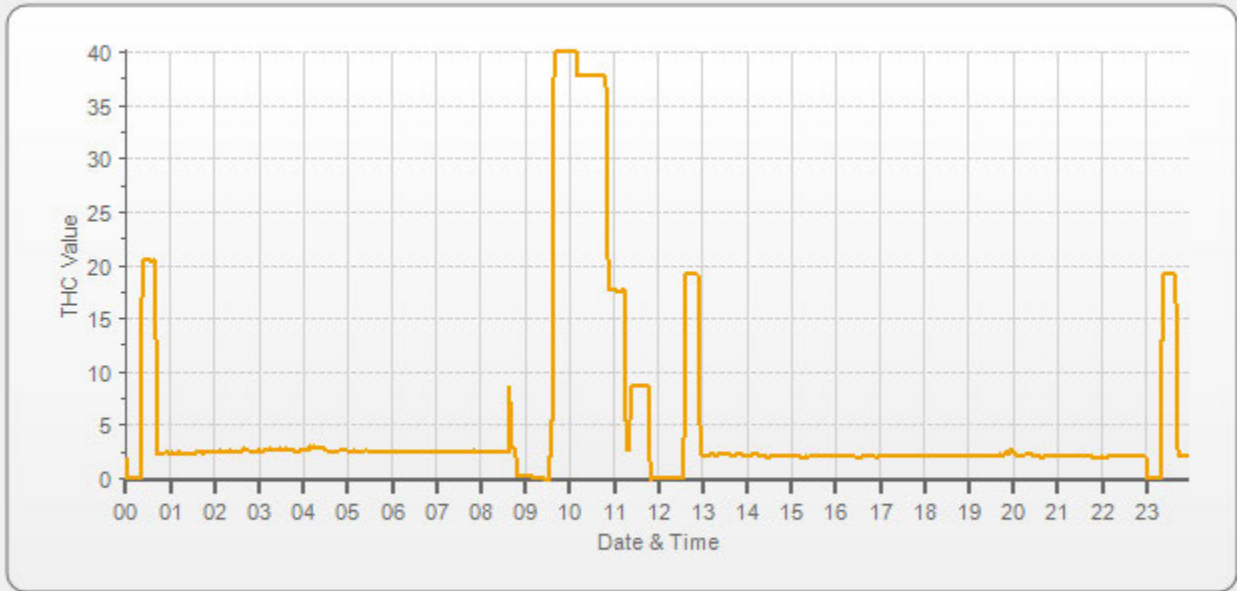
<b>Cylinder/Regulator Pressures:</b> H2 Cylinder (psi): 600 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 50 Span Cylinder (psi): 900 Span Cylinder reg set (psi): 22 Measured Flow: 1210 Expected Value: 19.30	H2 Cylinder (psi): 600 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 50 Span Cylinder (psi): 900 Span Cylinder reg set (psi): 22 Measured Flow: n/a Expected Value: 19.20
---	--

**Comments:**  
 The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned.      The manifold blower was found to be working normally.



THC [ppm] Station: LICA COLD LAKE SOUTH Daily: 18/07/06 Type: AVG 1 Min. [1 Min.]



— THC [ ppm ]

***NITROGEN DIOXIDE***



## Thermo 42i NO-NO2-NOx Analyzer Calibration

<b>Date:</b> July 9, 2018 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Cold Lake South <b>Start/End Time 24 hr. (mst):</b> 9:51 / 17:49 <b>G.P.T. to be used for Ozone?</b> Yes with 500 ppb NOx full scale <b>Calibration Method:</b> Gas Dilution & Gas Phase Titration	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019    952    millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019    22    °C <b>Weather Conditions:</b> A few clouds <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov    Rob Fisher <b>Cal Gas Expiry Date:</b> October 24, 2020
--	--

<b>Analyzer:</b>  <b>Serial Number/Owner:</b> 1505664393    LICA <b>Last Calibration Date:</b> June 5, 2018 <b>Range ppb:</b> 500	<b>Correction Factors:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.018</td> <td>0.999</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.018</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.018	0.999	NO <sub>2</sub> =	1.000	1.000	1.000	NOx =	1.000	1.018	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.018	0.999														
NO <sub>2</sub> =	1.000	1.000	1.000														
NOx =	1.000	1.018	0.999														

<b>Calibration Standards:</b>  <b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018 <b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018 <b>Calibrator ID/Expiry Date:</b> EnviroNics id# 5212 expires March 1, 2019 <b>Cal Gas Cylinder I.D. #:</b> LL 104225 <b>Cal Gas Conc. (ppm):</b> 51.5    51.6	<b>Standard Calibration Points for a Range of: 500 ppb</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO<sub>2</sub> (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>380</td> <td>330</td> <td>&lt;-high ozone</td> </tr> <tr> <td>Mid</td> <td>180</td> <td>245</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>90</td> <td>175</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>133</td> <td>&lt;-mid ozone</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>53</td> <td>&lt;-low ozone</td> </tr> </tbody> </table>	Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?	High	380	330	<-high ozone	Mid	180	245	n/a	Low	90	175	n/a	Extra Point #1	n/a	133	<-mid ozone	Extra Point #2	n/a	53	<-low ozone
Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?																						
High	380	330	<-high ozone																						
Mid	180	245	n/a																						
Low	90	175	n/a																						
Extra Point #1	n/a	133	<-mid ozone																						
Extra Point #2	n/a	53	<-low ozone																						

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5069	0.0	5069	0	0	0.0	0.0	n/a	n/a
as found high	5037	37.2	5074	377.7	378.4	371.1	371.8	1.018	1.018
adjusted zero	5069	0.00	5069	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5037	37.21	5074	377.7	378.4	378.0	378.6	0.999	0.999
mid	5052	17.62	5070	179.0	179.3	178.9	179.5	1.000	0.999
low	5056	8.92	5065	90.7	90.9	90.1	90.1	1.007	1.009
calibrator zero	5069	0.00	5069	0	0	0.0	0.0	n/a	n/a
<b>Average C.F. =</b>								1.002	1.002

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	5037	37.21	5074	0.0	378.0	379.0	1.0	0.0	1.0	
as found high NO2	5037	37.21	5074	285.0	134.0	379.0	245.0	244.0	244.0	1.000
adjusted high NO2	5037	37.21	5074	285.0	134.0	379.0	245.0	244.0	244.0	1.000
gpt mid	5037	37.21	5074	160.0	247.0	379.0	132.0	131.0	131.0	1.000
gpt low	5037	37.21	5074	65.0	328.0	379.0	51.0	50.0	50.0	1.000
<b>Average NO<sub>2</sub> C.F. =</b>										1.000

Linear Regression/Calibration Results:				LIMITS	
	NO	NOx	NO <sub>2</sub>	> or =	
Correlation Coefficient =	1.000	1.000	1.000		0.95-1.05
Slope =	0.999	0.999	1.003		± 3% F.S.
b (Intercept as % of full scale) =	-0.06%	-0.06%	0.12%		± 10%
% change in C.F. from last cal =	-1.77%	-1.78%	0.00%		0.96 to 1.04
NO <sub>2</sub> converter efficiency			1.00		

As found:		As left:	
NO Bkg:	4.0	NO Bkg:	4.0
NOx Bkg:	4.2	NOx Bkg:	4.1
NO Coef:	1.022	NO Coef:	1.037
NO <sub>2</sub> Coef:	1.000	NO <sub>2</sub> Coef:	1.000
NOx Coef:	1.001	NOx Coef:	1.001
PMT:	-855.1	PMT:	-854.7
Internal:	25.7	Internal:	26.2
Chamber:	50.6	Chamber:	50.4
Cooler:	-3.1	Cooler:	-2.8
NO <sub>2</sub> Converter:	327.4	NO <sub>2</sub> Converter:	325.3
NO <sub>2</sub> Converter Set:	325.0	NO <sub>2</sub> Converter Set:	325.0
Perm Oven Gas:	34.99	Perm Oven Gas:	35.00
Perm Oven Heater:	34.23	Perm Oven Heater:	34.24
Pressure:	183.2	Pressure:	182.3
Flow:	0.759	Flow:	0.760
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	2
Expected Value NO <sub>2</sub> :	271	Expected Value NO <sub>2</sub> :	259
Expected Value NOx:	273	Expected Value NOx:	261

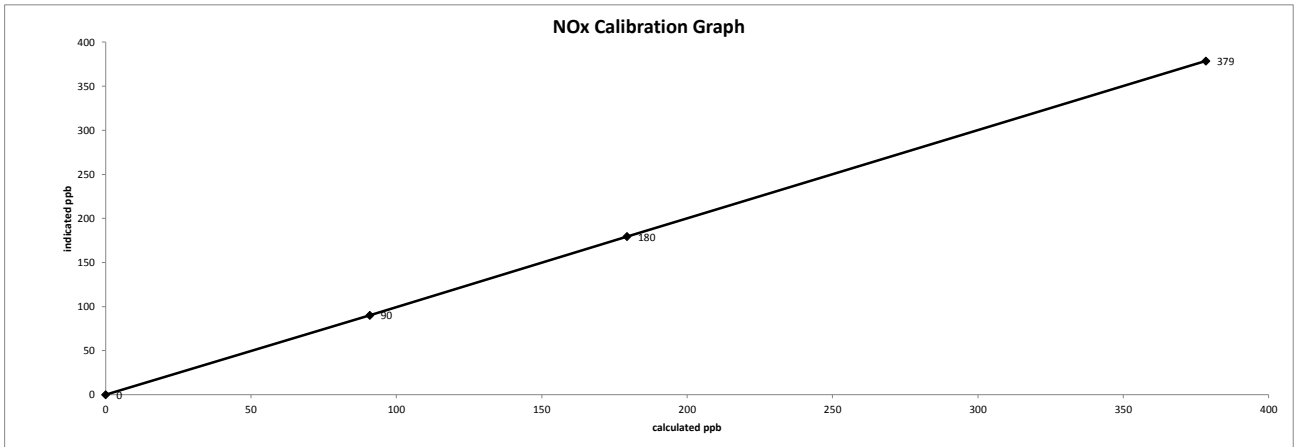
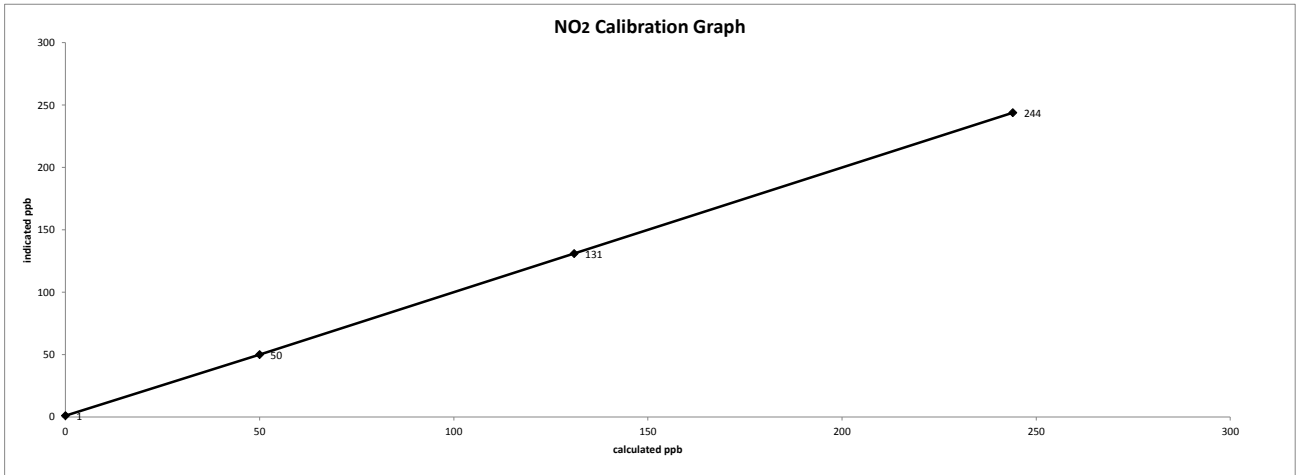
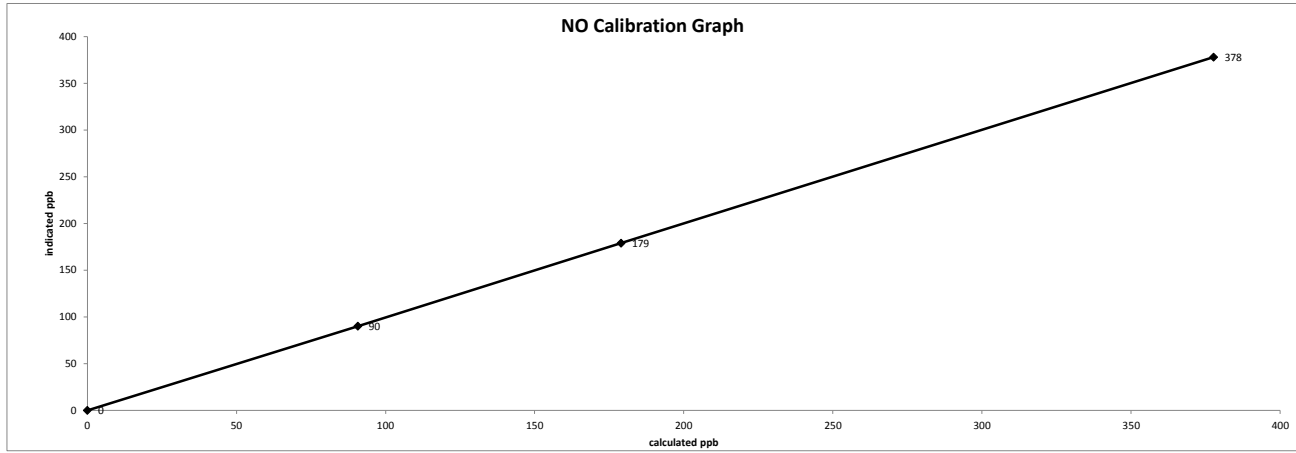
**Comments:**  
 The analyzer sample inlet filter was changed.      No high point NO<sub>2</sub> adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.  
 The manifold blower was found to be working normally.  
 The analyzer cooling fan filter(s) were cleaned.

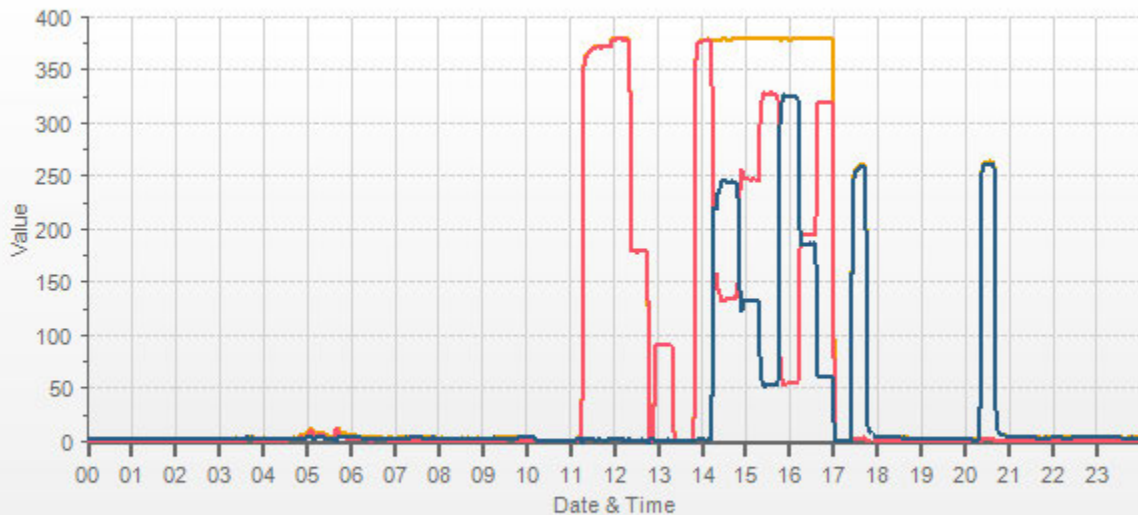
The GPT for O<sub>3</sub> (ppb): High O<sub>3</sub> set = 380, NO drop = 324; Mid O<sub>3</sub> set = 220, NO drop = 184; Low O<sub>3</sub> set = 75, NO drop = 59.

Date: July 9, 2018  
Company/Airshed: LICA  
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:51 / 17:49  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NOX [ppb] — NO [ppb] — NO2 [ppb]

## ***OZONE***



## Thermo 49i Ozone Analyzer Calibration

<b>Date:</b> July 10, 2018 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Cold Lake South <b>Start/End Time 24 hr. (mst):</b> 7:58 / 11:45 <b>Ozone Calibration Method:</b> Direct G.P.T. <b>G.P.T. Date:</b> July 9, 2018 <b>Analyzer:</b> <b>Serial Number/Owner:</b> 700419951   LICA <b>Last Calibration Date:</b> June 6, 2018 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019   949   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   22   °C <b>Weather Conditions:</b> Mainly sunny <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> October 24, 2020 <b>Ozone Range ppb:</b> 500 <b>As Found C.F.:</b> 1.006 <b>New C.F.:</b> 1.000
---	---

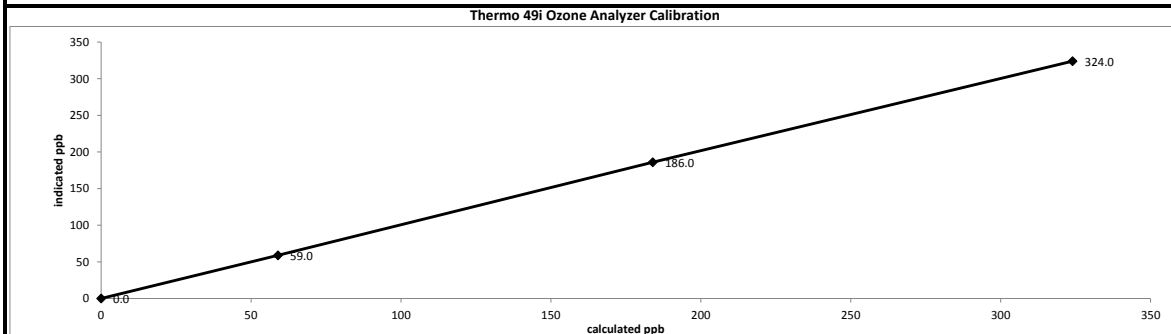
<b>Calibration Standards:</b> <b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018 <b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018 <b>Calibrator ID/Expiry Date:</b> Envirionics id# 5212 expires March 1, 2019 <b>Cal Gas Cylinder I.D. # :</b> LL 104225	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-100 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-100 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-100 ppb								

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	324.0	324.0	322.0	1.006
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	324.0	324.0	324.0	1.000
mid	5000	5000	184.0	184.0	186.0	0.989
low	5000	5000	59.0	59.0	59.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
<b>Average C.F.=</b>						0.996

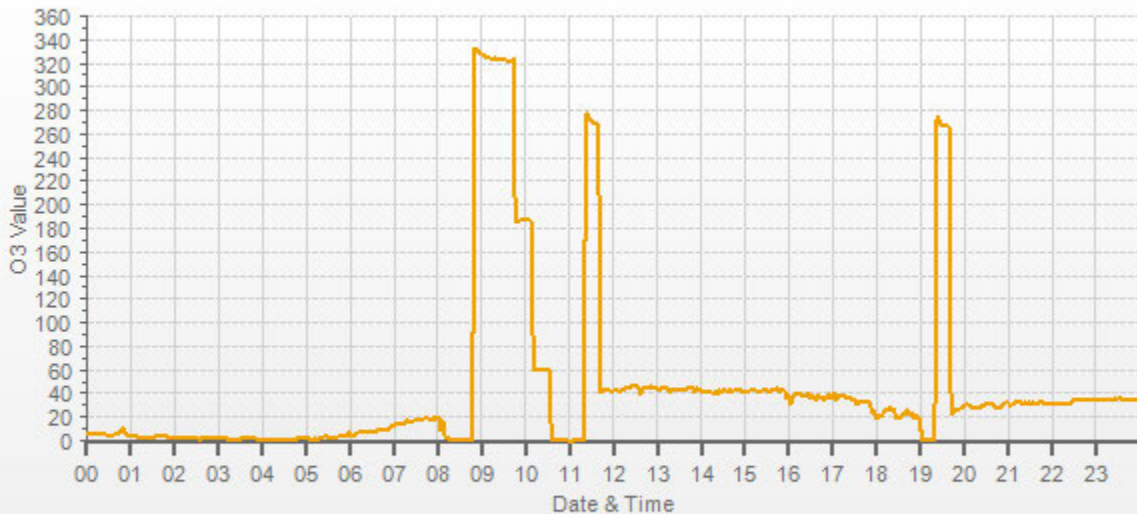
**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 0.999	> or = 0.995
<b>b (Intercept as % of full scale)=</b> -0.06%	0.95-1.05
<b>% change in C.F. from last cal=</b> -0.62%	± 3% F.S.
	± 10%



<b>As found:</b> O3 Bkg: 0.0 O3 Coef: 1.004 Photo Lamp: 9.6 O3 Lamp: 8.1 Bench: 28.6 Bench Lamp: 53.5 O3 Lamp: 67.5 Pressure: 708.9 Cell A lpm: 0.718 Cell B lpm: 0.759 O3 ppb: -0.1 Cell A ppb: 1.3 Cell B ppb: -1.1 Cell A int (Hz): 80152 Cell B int (Hz): 81407 Expected Value: 270.0	<b>As left:</b> O3 Bkg: 0.0 O3 Coef: 1.020 Photo Lamp: 9.6 O3 Lamp: 8.1 Bench: 28.1 Bench Lamp: 53.2 O3 Lamp: 67.5 Pressure: 709.2 Cell A lpm: 0.718 Cell B lpm: 0.759 O3 ppb: 0.0 Cell A ppb: -1.7 Cell B ppb: 1.8 Cell A int (Hz): 80161 Cell B int (Hz): 81378 Expected Value: 268.0
---	---

**Comments:**  
 The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.  
 No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.



— O3 [ppb]



***PARTICULATE MATTER***



# Thermo 5030 SHARP Monitor Audit

Date:	July 10, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	9:07	
Station Name/Location:	Cold Lake South	End Time (mst):	10:05	
Previous Audit Date:	June 22, 2018	Calibration Purpose:	routine monthly	
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny	

<b>SHARP Information and Status:</b>				
Serial Number/Owner:	CM - 2209	LICA	Status Code	800
Approx. % Tape Reaming	60%		Error Code	0

<b>Reference Standards/I.D./Cert. Date:</b>	
High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires April 24, 2019
Digital Manometer:	Dwyer 475 Mark III id# 3 expires January 9, 2019
Temperature:	F.S. 170286131 expires April 19, 2019
Pressure:	F.S. 05544 expires January 15, 2019

<b>As Found Temperatures, Pressure, Humidity:</b>						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	23	n/a	n/a	n/a	949	n/a
Reference:	23.1	n/a	n/a	n/a	949.0	n/a
Difference:	0.1	n/a	n/a	n/a	0.0	n/a
	Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%					

<b>As Left Temperature and Pressure (same as above if as found adequate):</b>						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	23	n/a	n/a	n/a	949	n/a
Reference:	23.1	n/a	n/a	n/a	949.0	n/a
Difference:	0.1	n/a	n/a	n/a	0.0	n/a
	Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%					

<b>Mass Foil Calibration:</b>			
Mass Foil ID:	Mass Foil:	ZERO:	Span Sensitivity
Spanfoil Value (µg):	n/a	QLF:	n/a
	n/a	CONFID:	n/a
		OLD:	n/a
		NEW:	n/a

<b>Nephelometer Zero:</b>				
	<b>As Found</b>		<b>As Left</b>	
Analog	n/a		n/a	
NEPH	n/a		n/a	
C14	n/a		n/a	
Conc	n/a		n/a	

<b>Flow rate:</b>				
	<b>As Found</b>		<b>As Left</b>	
SHARP AirFlow l/hr	1000		SHARP AirFlow l/hr	
Reference AirFlow (l/min)	16.81		Reference AirFlow (l/min)	
Reference AirFlow (l/hr)	1009		Reference AirFlow (l/hr)	
% Difference:	-0.9%		Difference:	
			0.0%	
	$%D = 100 \times \frac{Q_m - Q_i}{Q_i}$			
	Tolerance +/- 5%			

<b>Inlet Assembly:</b>		
	Yes/No?	If no, explain:
PM10 Inlet Cleaned	yes	
PM2.5 Cyclone Cleaned	yes	

<b>Pump Assembly:</b>		
	Yes/No?	If no, explain:
Pump Inspected / Cleaned	yes	
Pump Vanes Replaced	no	Not required

**Comments:**

The instrument displayed Status Code - 0800: Sample RH is more than 10% of the set limit. The instrument cannot maintain the relative humidity set point due to the high humidity in area.

## ***WIND SYSTEM***



## ***CALIBRATORS***

**Company:** Maxxam **Operator:** Chris W

<b>Calibrator:</b>			<b>Flow Measurement Device:</b>		
Make/Model	<u>Envionics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>24.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>702 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

<b>Dilution Flow (sccm)</b>					
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>	Pt. #3	<u>5000</u>
<b>Gas Flow (sccm)</b>					
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>	Pt. #3	<u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<b>NO</b>	<b>LIMITS</b>	<b>NOx</b>
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9934	<b>0.90-1.10</b>	m (Slope)= 0.9921
b (Intercept % of FS)= -0.0332	± 3% F.S.	b (Intercept % of FS)= -0.0277

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO <sub>2</sub>	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<b>NO<sub>2</sub></b>	<b>LIMITS</b>
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9880	<b>0.90-1.10</b>
b (Intercept % of FS)= 0.1153	± 3% F.S.

<b>AENV Standards</b>	<b>NO<sub>x</sub> Analyzer</b>
<b>Audit Calibrator</b>	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>March 1, 2018</u>
SRM Gas Cylinder No. <u>APEX1170572</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>49.99</u>	Cylinder Gas Expiry Date <u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO<sub>2</sub>.

Auditor: Al Clark Date: March 1, 2018

Operator Signature: *Chris W* Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envronics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>4760</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>23.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>704 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

Dilution Flow (sccm)					
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>	Pt. #3	<u>5000</u>
Gas Flow (sccm)					
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>	Pt. #3	<u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9901	0.90-1.10		m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092	± 3% F.S.		b (Intercept % of FS)=	-0.0320

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO <sub>2</sub>	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 10%	
Absolute Average Percent Difference							1%	± 10%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO <sub>2</sub>		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9836	0.90-1.10	
b (Intercept % of FS)=	0.1675	± 3% F.S.	

AENV Standards Audit Calibrator		NO <sub>x</sub> Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO<sub>2</sub>.

Auditor: Al Clark  
Operator Signature: *Chris W*

Date: March 2, 2018  
Location: McIntyre Center Edmonton

## ***CALIBRATION GASES***





# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

**Company:** Maxxam **Operator's Name:** Mike  
**Cylinder #:** LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

**Reference Calibrator and Gas:**

**Make/Model:** R&R MFC 201  
**Serial Number:** AMU 1690  
**Last Verification Date:** December 13, 2017  
**Gas Type:** SO2 **Conc.** 98.07  
**Cylinder Number:** CAL016625  
**Expiry Date:** January 2019

**Flow Measurement Device:**

**Make/Model:** Mesa Definer 220  
**Serial Number:** H-133034 / L-132702  
**Temp. °C:** 23.4 C  
**B.P.** 707 mmHg

**Reference Analyzer:**

**Make/Model:** Teco 43C **Serial/AMU Number:** 1623  
**Instrument Settings:** **Zero:** 10.0 **Span:** 1.006 **Range:** 1.0  
**Last Calibration:** **Date:** Dec12/17 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.000</del>	<del>0.000</del>	<del>0.000</del>
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2

Percent variance from Stated: 3

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** \_\_\_\_\_  
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

**Auditor:** Al Clark  
**Operator Signature:** *Al Clark*

**Date:** December 13, 2017  
**Location:** McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2016-334CGA

**Company:** Maxxam **Operator's Name:** Russell Kirchner  
**Cylinder #:** EY0000654 **Concentration PPM:** 10.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** June 2019

**Reference Calibrator and Gas:**

**Make/Model:** R&R MFC 201  
**Serial Number:** AMU 1690  
**Last Verification Date:** October 19, 2016  
**Gas Type:** H2S **Conc.** 20.43  
**Cylinder Number:** CAL015584  
**Expiry Date:** January 2019

**Flow Measurement Device:**

**Make/Model:** Bios DC2  
**Serial Number:** AMU 1659  
**Temp. °C:** 24.0 C  
**B.P.** 706 mmhg

**Reference Analyzer:**

**Make/Model:** Teco 450i **Serial/AMU Number:** 1980  
**Instrument Settings:** **Zero:** 16.6 **Span:** 1.231 **Range:** 0.1  
**Last Calibration:** **Date:** Oct 19/16 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	<del>0.00752</del>	<del>132.895</del>	<del>10.2</del>
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					<b>10.1</b>

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** \_\_\_\_\_  
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

**Auditor:** Al Clark  
**Operator Signature:** *Al Clark*

**Date:** October 19, 2016  
**Location:** McIntyre Center Edmonton



# Calibration Gas Audit

## CH4 / C3H8 Cylinder Gas

File No. 2015-029CGA

**Company:** Maxxam                      **Operators name:** Limin Li  
**Cylinder #:** LL165367   **Conc CH4 (PPM)** 590/207   **Tolerance (%)** 2   **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&amp;R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1650</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

**Reference Analyzer:**  
 Make/Model Teco 55C                      Serial/AMU Number: 1643  
 Instrument Settings                      Zero: N/A                      Span: N/A                      Range: 20  
 Last Calibration:                      Date: May 21/15                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
		CH4	C3H8			CH4	C3H8
Dilution	Gas						
<del>2600</del>	<del>0.0</del>	<del>0.00</del>	<del>0.00</del>	<del>0.02005</del>	<del>49.883</del>	<del>602</del>	<del>206</del>
2569	51.5	12.06	11.37	0.02005	49.883	602	206
3549	22.3	3.77	3.57	0.00628	159.148	600	207
3523	10.4	1.77	1.70	0.00295	338.750	600	209
Average Cylinder Concentration:						<b>600</b>	<b>207</b>

	<b><u>CH4</u></b>		<b><u>C3H8</u></b>
Previous Stated Concentration PPM:	<u>590</u>		<u>207</u>
Percent variance from Stated:	<u>1.8</u>		<u>0.2</u>

**Cylinder gas tolerances based on CH4 only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** \_\_\_\_\_  
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

Auditor: Al Clark                      Date: May 21, 2015  
 Operator Signature: \_\_\_\_\_                      Location: McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam **Operators name:** Mike  
**Cylinder #:** LL104225 **Conc (PPM)** 51.5/51.6 **Tolerance (%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.4 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.03</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX 1223938</u>				
Expiry Date	<u>June 2020</u>				

**Reference Analyzer:**

Make/Model Teco 42i Serial/AMU Number: 1868  
Instrument Settings Zero: 4.7 Span: 1.004 Range: 1.0  
Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u><b>NO</b></u>	<u><b>NOx</b></u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:**  
<=5% Outside Manufacturer Tolerance. Use manufacturers concentration   
> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark Date: December 13, 2017  
Operator Signature: *Al Clark* Location: McIntyre Center Edmonton

***APPENDIX III  
MAXIMUM INSTANTANEOUS DATA***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	0	0	0	0	1	S	0	1	1	1	1	0	0	0	0	0	0	1	0	0	1	1	1	0	0	1	0	24		
2	0	0	0	1	S	0	1	0	0	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	24	
3	1	1	0	S	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	1	0	24		
4	0	0	S	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	24	
5	0	S	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	24	
6	S	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	S	0	1	1	24	
7	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	1	1	0	0	0	1	1	S	1	0	1	0	1	0	24
8	1	1	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1	S	1	0	0	1	1	24	
9	0	0	0	0	1	1	0	1	1	C	C	C	C	C	C	1	0	0	0	0	S	0	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	S	0	0	0	0	0	0	1	0	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	S	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
13	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	S	1	1	0	1	1	1	1	1	0	1	0	24
14	1	0	1	1	1	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24
15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24
16	0	0	0	0	0	0	0	0	1	1	0	0	1	S	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24
18	0	0	0	0	1	2	0	0	1	1	1	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	2	1	24	
19	0	0	0	0	0	0	0	0	1	2	S	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	2	0	24	
20	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
21	0	0	0	0	0	0	0	0	S	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
22	0	0	0	0	0	0	0	S	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	24	
23	0	1	0	1	1	1	S	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	1	1	0	1	1	1	24	
24	1	0	0	1	0	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	24	
25	0	0	0	0	S	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
26	0	0	0	S	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	24	
27	0	0	S	0	0	0	0	0	1	1	1	0	1	0	1	0	2	4	4	1	1	1	0	0	0	0	4	1	24	
28	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
29	S	1	0	0	0	0	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	1	0	0	S	0	1	0	24	
30	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24	
HOURLY MAX	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	2	4	4	1	1	1	1	1	1	1	1	1	24	
HOURLY AVG	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	24	

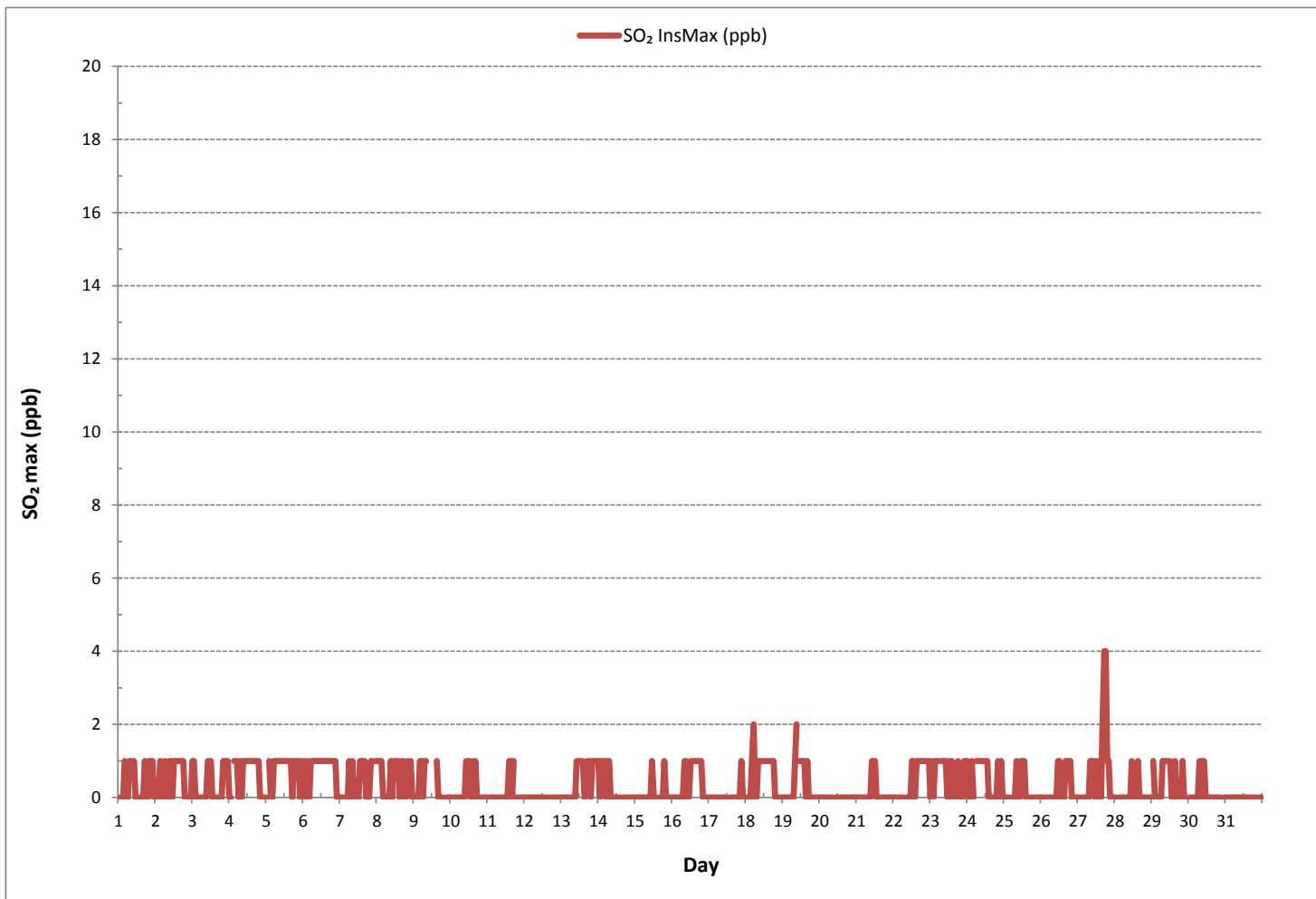
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	237
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 17 ON DAY 27
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
2	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
3	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
4	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
5	1	S	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
6	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	24
7	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24
8	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
9	1	1	1	1	1	2	1	1	1	C	C	C	C	C	C	1	1	1	1	1	1	S	1	1	1	1	1	24
10	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	24
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24
13	1	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	24
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	24
16	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24
17	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
18	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
19	1	1	1	2	1	1	2	3	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	24
20	1	1	1	1	1	2	2	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
21	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
22	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
23	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
24	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
25	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
26	1	1	1	S	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
27	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
28	1	S	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	24
29	S	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	24
30	1	1	1	1	1	1	1	1	1	2	1	1	1	S1	1	1	1	1	1	1	1	1	1	S	2	1	1	23
31	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
HOURLY MAX	1	2	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2		
HOURLY AVG	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	1		

STATUS FLAG CODES

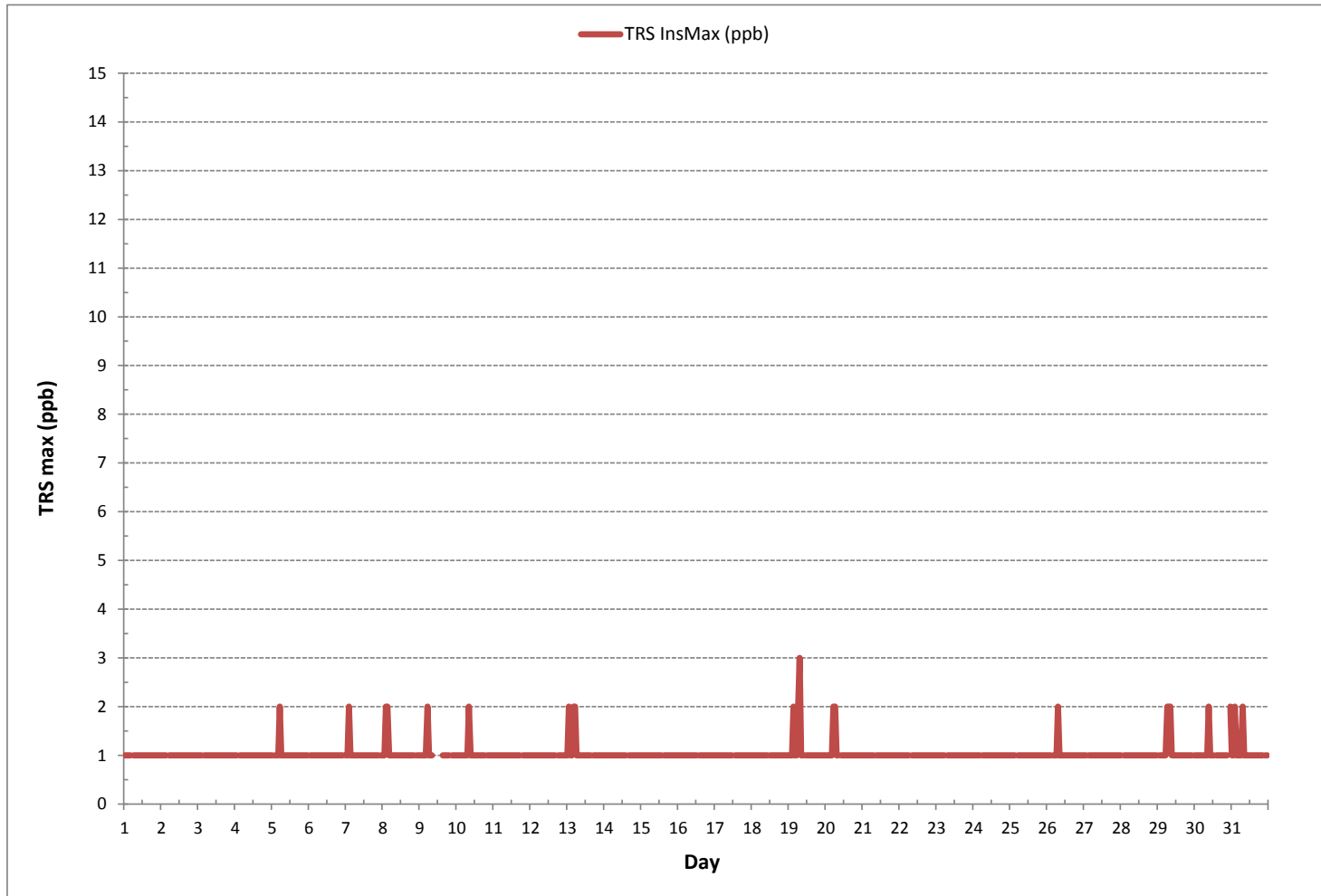
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	704
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 7 ON DAY 19
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	0



TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2.68	2.38	2.43	2.45	2.62	S	2.61	2.45	2.25	2.22	2.23	2.21	2.20	2.20	2.17	2.20	2.17	2.20	2.18	2.14	2.24	2.27	2.28	2.39	2.14	2.68	2.31	24
2	2.24	2.35	2.26	2.28	S	2.38	2.27	2.26	2.29	2.26	2.22	2.20	2.17	2.22	2.20	2.20	2.22	2.28	2.25	2.26	2.61	2.45	2.65	2.66	2.17	2.66	2.31	24
3	3.05	3.20	2.93	S	3.00	2.99	2.69	2.29	2.31	2.32	2.26	2.24	2.27	2.22	2.21	2.28	2.22	2.20	2.21	2.21	2.82	2.94	3.47	2.42	2.20	3.47	2.55	24
4	2.45	2.82	S	2.72	2.73	2.69	2.30	2.25	2.30	2.26	2.29	2.30	2.28	2.34	2.31	2.26	2.27	2.24	2.27	2.34	2.43	2.51	2.58	2.52	2.24	2.82	2.41	24
5	2.78	S	2.87	3.38	3.25	3.11	2.86	2.67	2.67	2.51	2.40	2.38	2.35	2.39	2.32	2.34	2.36	2.32	2.38	2.32	2.41	2.50	2.47	2.44	2.32	3.38	2.59	24
6	S	2.52	2.90	2.92	2.98	2.58	2.53	2.55	C	C	C	C	C	2.27	2.23	2.11	2.11	2.11	2.11	2.91	2.47	2.13	2.13	S	2.11	2.98	2.44	24
7	2.11	2.09	2.14	2.22	2.20	2.27	2.10	2.12	2.10	2.05	2.02	1.99	1.98	1.95	1.97	1.98	2.03	1.96	1.98	2.02	2.02	1.99	S	2.05	1.95	2.27	2.06	24
8	2.00	2.15	2.19	2.39	2.32	2.38	2.45	2.16	2.07	2.02	2.03	2.06	2.09	2.08	2.13	2.07	2.06	2.06	2.08	2.04	2.39	S	2.50	2.58	2.00	2.58	2.19	24
9	2.52	2.74	2.84	2.95	2.97	3.12	2.87	2.48	2.40	2.43	2.43	2.20	2.20	2.15	2.17	2.14	2.14	2.07	2.05	S	2.20	2.40	2.47	2.05	3.12	2.44	24	
10	2.63	2.79	2.78	2.76	3.06	2.87	2.66	2.62	2.74	2.37	2.33	2.26	2.17	2.14	2.17	2.13	2.19	2.52	2.63	S	2.35	2.13	2.07	2.02	2.02	3.06	2.45	24
11	2.06	2.03	2.11	2.11	2.15	2.12	2.10	2.08	2.06	2.11	2.06	2.05	2.10	2.10	2.10	2.05	2.09	2.08	S	2.16	2.17	2.25	2.16	2.34	2.03	2.34	2.11	24
12	2.38	2.47	2.56	2.42	2.38	2.43	2.43	2.37	2.19	2.10	2.11	2.06	2.11	2.02	2.05	2.08	2.08	S	2.03	2.05	2.28	2.91	2.52	2.60	2.02	2.91	2.29	24
13	2.64	3.01	2.75	3.04	2.93	2.82	2.90	2.55	2.52	2.43	2.24	4.16	2.37	2.08	2.01	S	2.05	2.03	2.03	2.09	2.13	2.12	2.20	2.01	4.16	2.50	24	
14	2.22	2.11	2.06	2.06	2.04	2.02	1.98	1.98	1.97	2.04	2.00	2.01	2.00	2.04	2.01	S	2.01	2.06	2.04	2.01	1.99	2.02	2.04	2.05	1.97	2.22	2.03	24
15	2.05	2.06	2.07	2.14	2.14	2.18	2.12	2.08	2.07	2.07	2.11	2.05	2.08	2.05	S	2.04	2.05	2.11	2.05	2.60	2.38	2.31	2.09	2.08	2.04	2.60	2.13	24
16	2.11	2.09	2.14	2.18	2.21	2.40	2.43	2.49	2.52	2.36	2.33	2.19	2.14	S	2.11	2.11	2.11	2.08	2.11	2.21	2.24	2.27	2.35	2.31	2.08	2.52	2.34	24
17	2.42	2.97	2.79	3.26	3.26	3.07	2.80	2.73	2.62	2.39	2.15	2.09	S	2.06	2.06	2.07	2.07	2.08	2.10	2.27	2.96	3.00	2.86	2.91	2.06	3.26	2.56	24
18	3.46	3.75	3.19	3.18	3.16	2.43	2.19	2.14	2.19	2.13	2.18	S	2.04	2.08	2.07	1.98	2.03	2.01	2.09	2.12	2.02	2.08	2.29	2.55	1.98	3.75	2.41	24
19	2.38	2.21	2.37	2.81	2.58	2.85	2.50	2.47	2.23	2.16	S	2.13	2.12	2.08	2.06	2.05	2.07	2.09	2.08	2.20	2.89	3.24	2.90	3.11	2.05	3.24	2.42	24
20	2.98	3.59	2.60	2.68	2.78	2.71	2.63	2.50	2.35	S	2.09	2.10	2.11	2.10	2.21	2.10	2.07	2.14	2.06	2.09	2.07	2.17	2.06	2.08	2.06	3.59	2.36	24
21	2.11	2.12	2.25	2.11	2.17	2.21	2.18	2.10	S	2.02	2.04	2.09	2.06	2.07	2.06	2.10	2.09	2.07	2.12	2.02	2.09	2.09	2.11	2.02	2.25	2.10	2.10	24
22	2.32	2.26	2.27	2.21	2.23	2.18	2.22	S	2.13	2.06	2.06	2.11	2.05	2.01	2.02	2.10	2.00	2.05	2.03	1.99	2.03	2.06	2.03	2.09	1.99	2.32	2.11	24
23	2.05	2.05	2.05	2.04	2.07	2.07	S	2.10	2.11	2.11	2.06	2.06	2.10	2.08	2.07	2.08	2.08	2.11	2.07	2.09	2.07	2.11	2.10	2.09	2.04	2.11	2.08	24
24	2.05	2.25	2.32	2.28	2.30	S	2.09	2.10	2.03	2.10	2.10	2.15	2.09	2.09	2.09	2.11	2.18	2.21	2.22	2.24	2.27	2.24	2.30	2.36	2.03	2.36	2.18	24
25	2.42	2.47	2.50	2.76	S	2.67	2.60	2.22	2.40	2.38	2.38	2.35	2.30	2.32	2.33	2.37	2.31	2.33	2.34	2.57	2.89	2.93	2.75	2.78	2.22	2.93	2.49	24
26	3.10	3.18	3.16	S	3.57	3.64	3.58	3.32	3.10	2.56	2.60	2.64	2.46	2.43	2.37	2.38	2.36	2.38	2.31	2.40	2.80	2.65	2.60	2.84	2.31	3.64	2.80	24
27	2.94	3.32	S	3.83	4.18	3.74	3.59	3.22	3.17	2.77	2.61	2.61	2.50	2.48	2.43	2.45	2.48	2.43	2.40	2.95	3.51	3.18	3.20	2.94	2.40	4.18	3.00	24
28	3.67	S	4.14	3.77	3.88	3.95	3.85	3.16	2.90	2.71	2.58	2.52	2.50	2.43	2.43	2.43	2.42	2.43	2.53	2.57	3.11	3.00	3.26	3.32	2.42	4.14	3.02	24
29	S	3.62	3.36	3.58	3.40	4.24	4.07	3.09	2.56	2.51	2.54	2.50	2.54	2.43	2.40	2.35	2.41	2.43	2.96	3.93	2.67	2.88	2.63	S	2.35	4.24	2.96	24
30	3.08	3.18	3.28	3.23	3.53	3.74	3.41	3.06	3.30	2.88	2.66	2.48	2.29	2.27	2.27	2.21	2.22	2.26	2.21	2.22	2.26	2.29	S	2.64	2.21	3.74	2.74	24
31	2.61	2.72	2.82	3.00	3.07	3.07	3.08	2.95	2.48	2.43	2.36	2.37	2.34	2.35	2.35	2.28	2.34	2.33	2.42	2.46	3.23	S	2.73	2.85	2.28	3.23	2.64	24
HOURLY MAX	3.67	3.75	4.14	3.83	4.18	4.24	4.07	3.32	3.30	2.88	2.66	2.64	4.16	2.48	2.43	2.45	2.48	2.52	2.96	3.93	3.51	3.24	3.47	3.32				
HOURLY AVG	2.53	2.64	2.63	2.72	2.80	2.79	2.67	2.49	2.41	2.30	2.26	2.23	2.27	2.20	2.18	2.17	2.17	2.19	2.21	2.32	2.46	2.45	2.47	2.48				

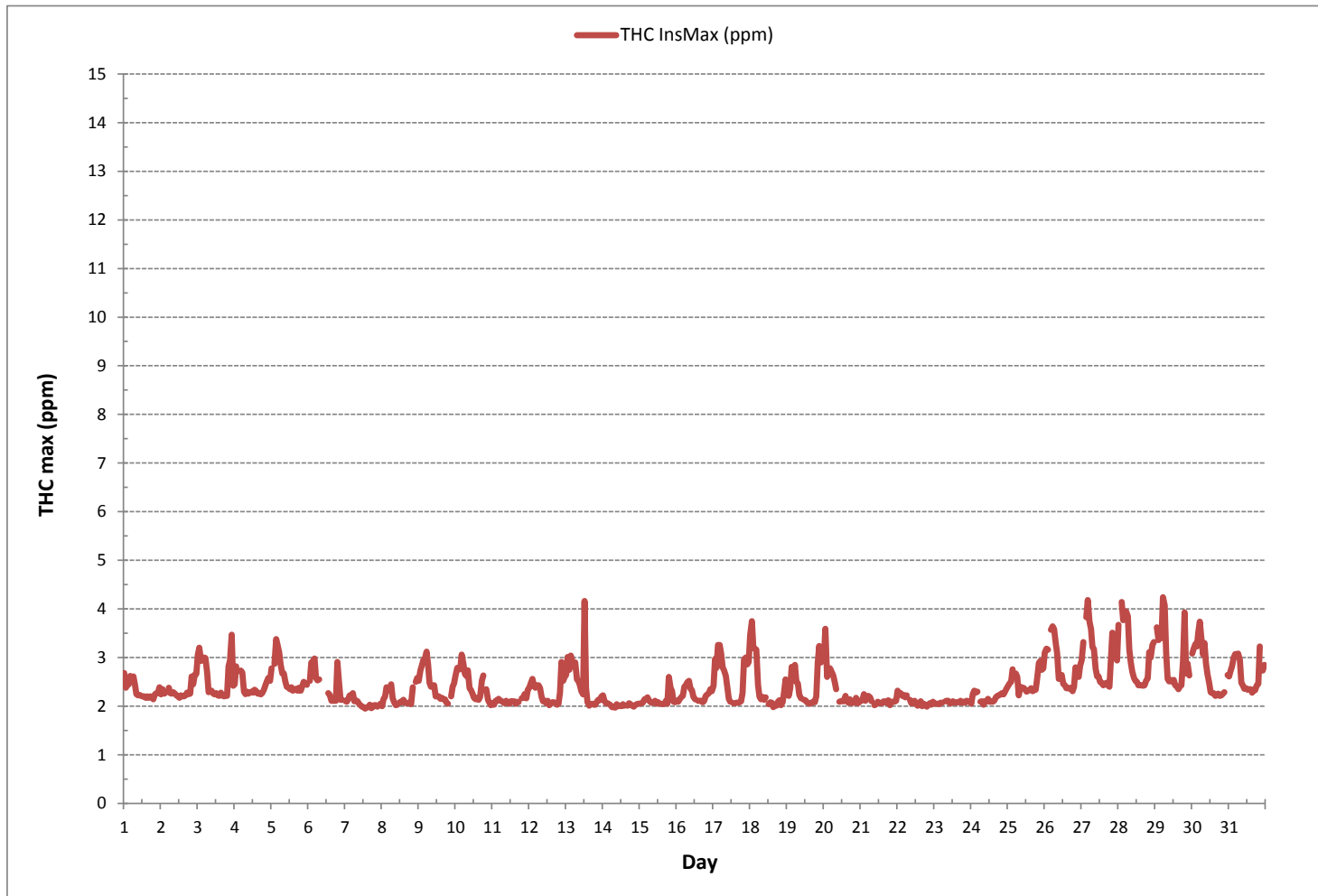
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	4.24 ppm @ HOUR 5 ON DAY 29
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.42

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	4	4	4	4	5	S	7	5	2	2	2	1	1	1	1	1	1	1	1	1	3	2	7	4	1	7	3	24
2	4	2	2	6	S	5	4	3	3	3	2	2	1	2	5	2	2	2	2	5	3	3	3	5	1	6	3	24
3	4	3	4	S	9	7	11	3	5	7	6	3	4	4	6	15	3	2	6	9	2	3	2	6	2	15	5	24
4	6	3	S	3	3	3	3	1	2	1	2	1	2	2	2	2	6	2	1	2	2	2	2	3	1	6	2	24
5	3	S	4	3	8	7	6	5	3	2	2	1	1	2	2	2	5	1	5	1	10	3	4	2	1	10	4	24
6	S	3	3	4	17	7	3	9	2	2	2	3	2	10	3	3	3	2	2	3	3	2	2	S	2	17	4	24
7	3	2	3	3	4	5	3	2	2	2	2	1	3	2	2	5	1	1	1	1	1	3	S	5	1	5	2	24
8	2	2	5	5	6	7	7	4	3	1	1	1	1	3	1	3	4	2	1	2	2	S	4	3	1	7	3	24
9	2	2	2	5	8	15	6	4	3	C	C	C	C	C	C	C	C	C	5	2	S	4	5	4	2	15	5	24
10	4	3	4	3	4	9	31	19	6	3	6	3	21	8	6	7	17	20	9	S	4	2	2	2	2	31	8	24
11	2	3	3	3	3	3	3	3	2	2	6	2	4	3	3	5	2	3	S	4	3	2	2	4	2	6	3	24
12	4	6	5	7	9	27	6	7	6	4	3	3	6	5	3	2	1	S	3	2	3	4	3	4	1	27	5	24
13	4	5	3	3	6	8	9	12	8	8	11	8	3	16	3	3	S	8	5	3	4	4	4	3	3	16	6	24
14	4	4	3	3	3	2	2	1	1	1	1	1	1	1	1	S	3	2	1	1	1	2	2	3	1	4	2	24
15	2	3	3	3	3	3	3	2	1	1	1	1	1	1	S	3	1	1	1	3	4	4	1	1	1	4	2	24
16	1	1	1	1	2	11	2	3	6	3	3	2	2	S	4	5	4	2	2	2	6	2	2	2	1	11	3	24
17	2	3	3	3	3	7	5	6	10	7	3	2	S	4	2	4	12	2	2	4	13	4	8	3	2	13	5	24
18	3	3	3	6	5	6	2	4	9	3	6	S	3	3	3	3	4	2	2	3	3	2	2	2	2	9	4	24
19	3	3	8	4	3	4	3	6	9	4	S	5	3	3	3	2	2	2	2	12	5	9	9	21	2	21	5	24
20	14	3	3	2	3	5	7	5	4	S	7	3	4	2	2	5	3	2	2	2	3	3	4	2	2	14	4	24
21	3	2	2	2	2	2	3	3	S	5	3	3	3	2	3	3	6	2	1	2	2	2	2	2	1	6	3	24
22	3	2	3	3	3	3	3	S	5	2	1	1	2	2	1	1	1	1	2	2	2	2	2	2	1	5	2	24
23	1	1	1	1	2	3	S	4	2	1	1	1	1	1	5	1	3	1	4	5	2	2	2	3	1	5	2	24
24	3	3	4	4	4	S	7	4	3	3	2	2	3	3	3	4	3	7	3	3	2	2	3	3	2	7	3	24
25	3	4	3	3	S	8	5	10	40	5	4	3	3	6	2	2	2	2	2	3	4	4	3	2	2	40	5	24
26	2	2	2	S	4	7	9	11	9	12	5	6	3	3	3	2	2	10	3	4	4	3	3	3	2	12	5	24
27	2	3	S	6	3	6	8	5	6	5	2	2	4	4	1	2	8	13	19	4	5	5	11	4	1	19	6	24
28	4	S	7	3	26	7	6	7	4	2	4	4	2	3	2	2	4	2	1	2	4	4	2	2	1	26	5	24
29	S	4	3	2	2	8	13	3	3	3	5	3	3	5	1	2	1	2	2	6	3	4	2	S	1	13	4	24
30	4	4	3	5	6	6	14	17	6	8	9	4	4	2	4	2	1	3	1	3	1	1	S	5	1	17	5	24
31	3	3	3	3	4	7	18	13	3	4	1	3	2	4	2	5	5	2	1	3	11	S	5	3	1	18	5	24
HOURLY MAX	14	6	8	7	26	27	31	19	40	12	11	8	21	16	6	15	17	20	19	12	13	9	11	21				
HOURLY AVG	3	3	3	4	6	7	7	6	6	4	4	3	3	4	3	3	4	4	3	3	4	3	4	4				

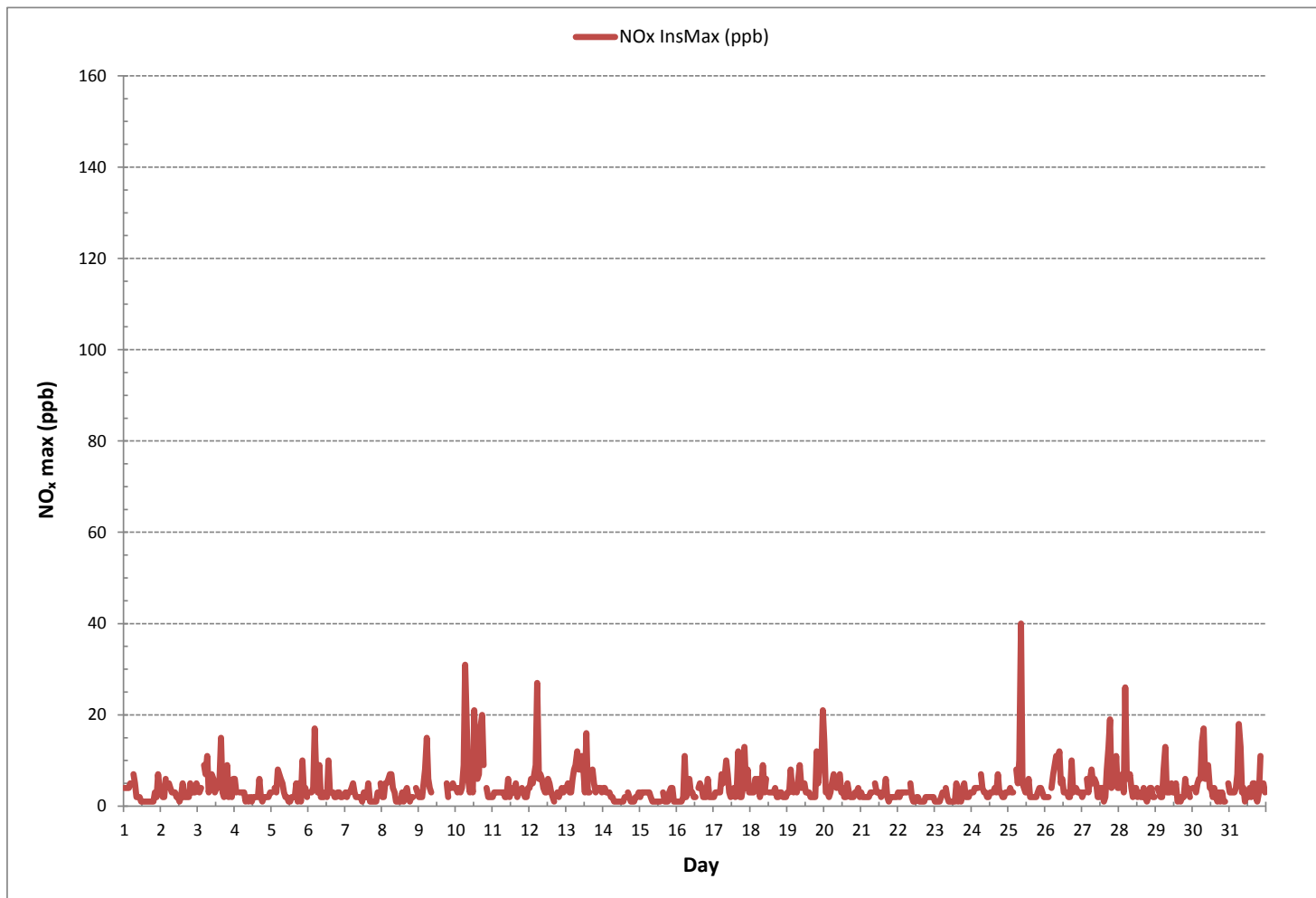
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	40 ppb @ HOUR 8 ON DAY 25
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	4

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	0	0	0	0	1	S	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	24	
2	0	0	0	1	S	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	2	0	0	2	1	24	
3	1	1	2	S	4	4	6	1	4	2	2	1	1	3	2	23	1	1	3	4	0	0	0	1	0	0	23	3	24	
4	1	1	S	1	1	1	1	0	1	0	1	0	0	1	1	0	4	0	0	0	0	0	1	1	0	0	4	1	24	
5	1	S	1	1	6	4	3	3	1	1	0	0	0	0	1	0	1	0	1	0	1	0	7	0	1	0	7	1	24	
6	S	0	0	1	5	1	1	4	1	1	1	1	0	4	0	1	1	0	0	0	0	0	0	S	0	0	5	1	24	
7	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	1	0	0	0	0	0	1	S	0	0	0	2	0	24	
8	0	0	0	0	1	3	4	2	1	0	0	0	0	2	0	1	2	0	1	0	0	S	0	0	0	0	4	1	24	
9	0	1	1	2	6	13	3	1	1	C	C	C	C	C	C	C	C	C	1	0	S	0	1	0	0	0	13	2	24	
10	1	1	3	1	1	5	22	12	2	1	5	1	20	3	2	2	9	4	1	S	0	0	0	0	0	0	22	4	24	
11	0	0	0	0	0	0	0	1	1	1	3	0	2	1	1	2	0	1	S	0	0	0	0	0	0	0	0	3	1	24
12	0	1	1	0	1	11	2	3	2	4	1	1	2	2	3	0	0	S	0	0	0	0	0	0	0	0	0	11	1	24
13	0	1	1	1	1	1	2	6	5	5	3	1	0	6	1	1	S	1	0	0	0	0	0	0	0	0	6	2	24	
14	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	S	1	0	0	0	0	0	0	0	0	0	1	0	24
15	0	0	0	0	1	1	1	1	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
16	0	0	0	0	0	5	1	1	5	2	1	2	1	S	0	1	4	0	0	0	0	2	0	0	0	0	5	1	24	
17	0	0	0	0	0	2	1	3	2	1	1	0	S	0	0	2	4	0	0	0	0	6	0	4	1	0	6	1	24	
18	1	1	1	1	2	2	0	1	3	1	2	S	0	1	1	1	1	0	0	1	1	0	0	0	0	0	3	1	24	
19	0	0	3	0	1	1	1	2	3	1	S	0	0	1	1	0	0	0	0	2	0	0	1	9	0	0	9	1	24	
20	3	0	0	0	0	1	1	1	1	S	1	1	2	0	0	1	1	1	0	1	0	0	0	0	0	0	3	1	24	
21	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	24	
22	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
23	0	0	0	0	0	0	S	1	0	0	0	0	0	0	3	0	1	0	1	2	0	0	0	0	0	0	3	0	24	
24	0	0	1	1	0	S	1	1	1	1	0	1	1	1	1	3	1	3	1	0	0	0	0	0	0	0	3	1	24	
25	0	0	1	1	S	2	1	15	25	3	2	1	1	3	1	0	1	0	0	0	0	0	1	1	0	0	25	3	24	
26	1	1	1	S	1	4	6	5	4	3	1	1	1	0	2	0	0	5	1	0	0	0	0	1	0	0	6	2	24	
27	1	1	S	1	1	2	3	3	1	4	0	2	2	2	0	0	4	3	5	0	0	0	7	0	0	0	7	2	24	
28	0	S	2	1	14	5	4	4	1	0	3	1	0	1	0	0	2	1	0	0	0	0	0	0	0	0	14	2	24	
29	S	0	0	0	0	2	4	1	1	1	1	0	0	2	0	0	0	0	0	0	0	0	0	S	0	0	4	1	24	
30	0	1	1	1	2	3	7	8	2	2	2	2	2	0	2	1	0	1	0	1	0	0	S	1	0	0	8	2	24	
31	1	1	1	1	2	4	13	9	2	1	0	2	0	1	4	4	0	0	0	0	4	S	0	0	0	0	13	2	24	
HOURLY MAX	3	1	3	2	14	13	22	15	25	5	5	2	20	6	3	23	9	5	5	4	7	1	7	9						
HOURLY AVG	0	0	1	1	2	3	3	3	2	1	1	1	1	1	1	2	2	1	1	0	1	0	1	1						

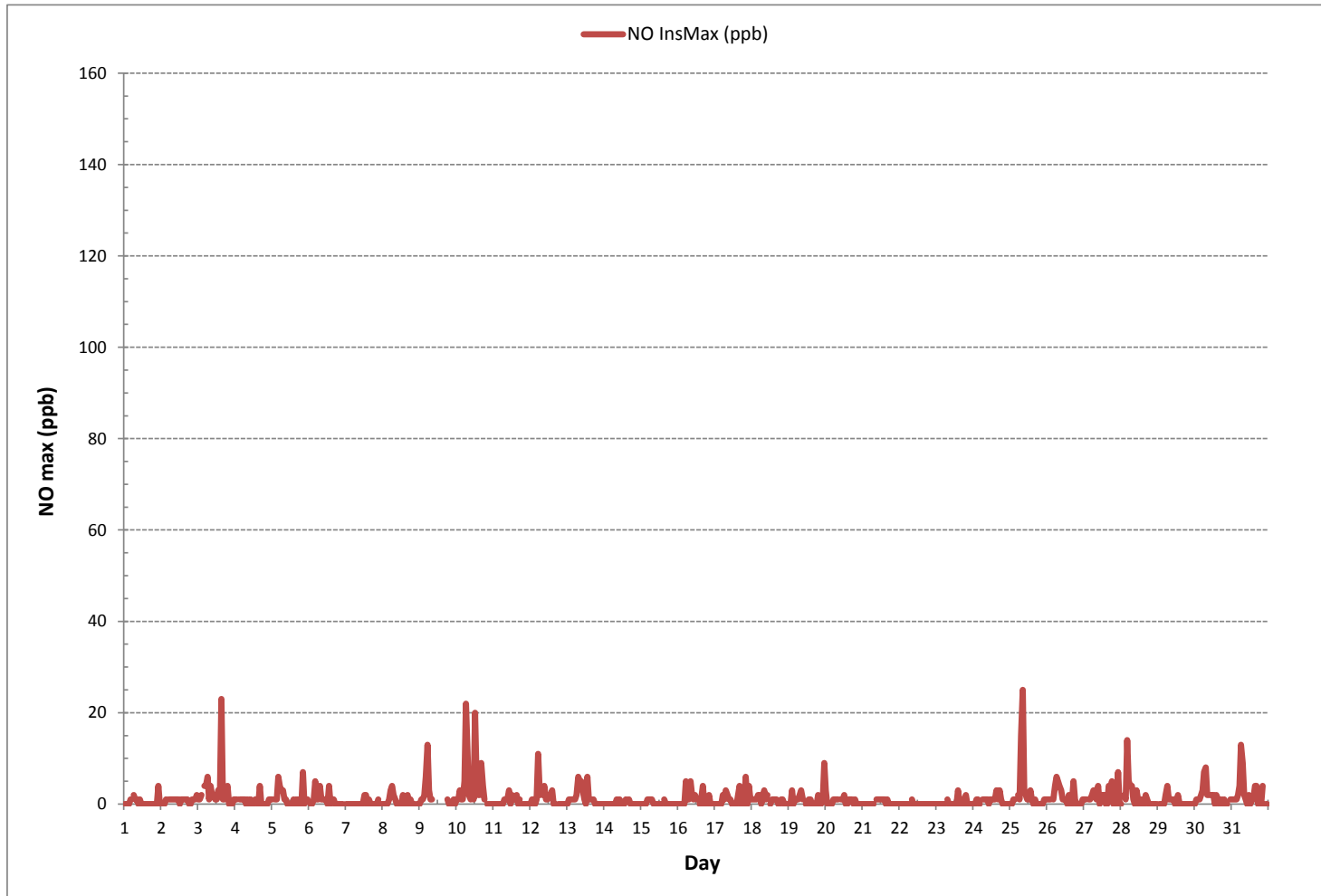
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	359
MAXIMUM INSTANTANEOUS VALUE:	25 ppb @ HOUR 8 ON DAY 25
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	3	4	3	4	4	S	6	4	2	2	2	1	1	1	1	1	1	1	1	1	3	1	3	4	1	6	2	24	
2	4	2	2	5	S	5	3	2	2	2	1	1	1	2	3	2	1	1	2	4	2	2	2	2	1	5	2	24	
3	2	2	2	S	5	3	5	3	3	6	4	2	4	2	4	4	2	1	4	5	2	2	2	5	1	6	3	24	
4	5	3	S	3	2	2	2	1	1	1	1	1	2	1	2	1	2	1	1	1	2	2	2	3	1	5	2	24	
5	2	S	3	2	3	4	4	3	2	2	2	1	1	2	1	2	5	1	4	1	3	3	2	2	1	5	2	24	
6	S	3	3	4	12	6	3	5	2	2	2	3	2	6	2	2	2	2	1	1	3	3	2	2	S	1	12	3	24
7	3	2	3	3	4	4	3	2	1	2	2	1	1	1	1	4	1	1	1	1	1	2	S	5	1	5	2	24	
8	2	2	4	5	4	5	3	2	2	1	1	1	1	2	1	3	2	2	1	2	2	S	4	2	1	5	2	24	
9	2	2	2	3	3	4	3	3	2	C	C	C	C	C	C	C	C	C	C	4	2	S	4	4	4	2	4	3	24
10	3	3	3	2	3	5	11	12	5	2	4	2	7	6	4	6	9	16	8	S	4	2	2	2	2	16	5	24	
11	2	2	3	3	3	2	2	2	2	2	4	1	2	2	2	4	2	2	S	3	3	2	2	4	1	4	2	24	
12	4	5	5	7	8	16	5	5	4	3	2	2	4	4	2	2	1	S	3	2	3	4	3	3	1	16	4	24	
13	4	4	3	3	5	7	8	7	5	4	9	6	3	12	3	3	S	7	5	3	3	4	3	3	3	12	5	24	
14	4	4	3	3	3	2	2	1	1	1	1	1	1	1	1	S	3	1	1	1	1	2	2	2	1	4	2	24	
15	2	3	3	3	3	3	2	1	1	0	1	1	1	1	S	3	1	1	1	3	3	4	1	1	0	4	2	24	
16	1	1	1	1	1	7	2	2	2	2	3	2	1	S	4	4	2	2	2	2	2	4	2	2	2	1	7	2	24
17	2	3	3	3	2	4	4	3	8	6	2	2	S	4	2	3	8	1	1	4	8	3	4	3	1	8	4	24	
18	3	3	3	6	4	5	2	3	6	3	4	S	3	3	3	2	3	2	2	2	2	2	2	2	2	2	6	3	24
19	3	3	6	3	2	3	3	4	6	4	S	5	2	3	2	2	2	1	2	10	5	9	9	14	1	14	4	24	
20	11	3	2	2	3	4	6	4	3	S	6	2	2	2	2	4	2	2	2	1	3	3	3	2	1	11	3	24	
21	2	2	2	2	2	2	2	3	S	5	3	3	2	2	2	2	5	2	1	2	2	1	2	2	1	5	2	24	
22	3	2	3	2	2	2	2	S	4	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	4	2	24	
23	1	1	1	1	2	2	S	4	2	1	1	1	1	1	1	2	1	3	3	2	2	2	3	1	4	2	24		
24	3	2	3	4	3	S	6	3	2	2	1	2	2	2	2	3	2	4	2	2	2	2	3	3	1	6	3	24	
25	3	3	3	3	S	7	4	5	16	3	2	2	2	4	2	2	2	2	2	3	4	4	2	2	2	16	4	24	
26	2	1	1	S	4	3	4	6	5	9	4	4	3	3	2	2	2	6	2	3	4	3	3	2	1	9	3	24	
27	2	2	S	5	3	4	5	3	4	3	2	1	3	2	1	2	4	10	14	3	5	5	5	3	1	14	4	24	
28	4	S	4	3	13	2	4	4	3	2	2	3	2	2	1	1	2	1	1	2	4	4	2	2	1	13	3	24	
29	S	4	3	2	2	6	9	3	3	3	4	2	2	4	1	2	1	2	2	5	3	4	2	S	1	9	3	24	
30	4	4	3	4	3	3	7	9	5	6	7	4	2	2	2	1	1	2	1	2	1	1	S	5	1	9	3	24	
31	2	3	2	2	2	3	6	5	1	3	1	1	2	3	2	2	1	2	1	3	8	S	5	3	1	8	3	24	
HOURLY MAX	11	5	6	7	13	16	11	12	16	9	9	6	7	12	4	6	9	16	14	10	8	9	9	14					
HOURLY AVG	3	3	3	3	4	4	4	4	4	3	3	2	2	3	2	2	2	3	3	3	3	3	3	3					

STATUS FLAG CODES

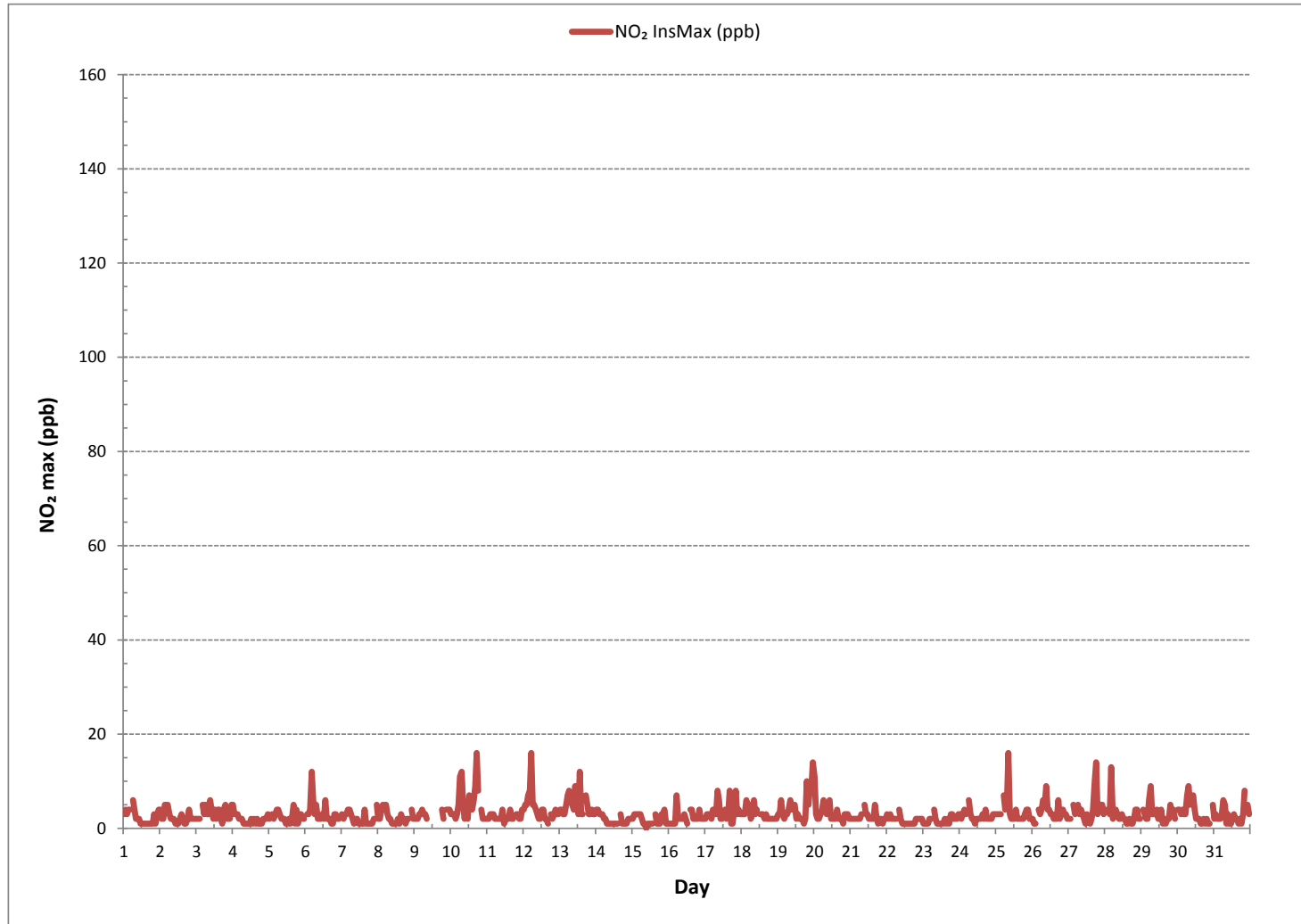
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	701
MAXIMUM INSTANTANEOUS VALUE:	16 ppb @ HOUR 17 ON DAY 10
	VAR-VARIOUS
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	2



NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

OZONE Instantaneous Maximum (O<sub>3</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	25.2	24.9	22.4	21.5	15.4	S	17.0	26.8	29.8	30.3	33.7	33.8	33.9	37.1	36.8	40.3	37.5	36.2	36.4	35.1	31.6	30.5	28.1	24.6	15.4	40.3	30.0	24
2	24.5	23.0	23.1	23.4	S	11.5	12.4	13.5	15.4	17.8	21.5	24.7	25.5	23.9	22.0	28.0	29.2	26.4	24.3	26.0	19.0	9.5	6.5	4.9	4.9	29.2	19.8	24
3	6.0	1.5	1.0	S	2.0	3.6	14.6	16.0	16.2	26.4	29.8	31.7	31.4	33.7	35.9	36.9	34.9	41.2	40.5	36.9	35.8	31.1	23.6	25.6	1.0	41.2	24.2	24
4	19.5	19.7	S	13.2	10.2	17.3	23.7	28.0	27.3	26.8	26.6	28.3	28.8	28.4	27.0	27.9	29.9	35.9	31.4	28.0	23.0	17.3	12.8	10.2	10.2	35.9	23.5	24
5	4.7	S	2.2	1.0	0.8	8.0	14.9	17.7	25.6	33.2	39.1	41.4	42.4	43.5	45.5	43.4	43.2	44.1	43.7	40.6	37.9	34.6	33.6	33.4	0.8	45.5	29.3	24
6	S	31.5	26.5	16.9	19.3	25.9	26.0	25.8	29.3	31.9	33.0	38.9	43.0	47.4	46.5	47.5	48.4	48.1	48.5	45.1	37.8	43.2	42.6	S	16.9	48.5	36.5	24
7	43.5	42.0	36.2	29.3	23.7	22.2	26.3	28.6	31.4	33.4	33.9	28.9	35.6	35.1	31.5	33.4	29.3	28.0	22.5	21.2	18.3	19.6	S	14.2	14.2	43.5	29.0	24
8	13.2	13.2	8.7	6.0	5.6	6.1	13.1	17.5	21.8	24.7	26.2	28.1	29.5	31.0	33.7	34.1	35.9	36.2	35.2	33.6	29.7	S	13.4	11.2	5.6	36.2	22.1	24
9	6.8	5.9	4.8	3.5	2.0	11.1	19.8	21.8	23.6	24.3	25.0	33.4	36.4	34.1	34.6	41.5	42.6	43.1	41.8	37.0	S	35.4	27.7	13.5	2.0	43.1	24.8	24
10	10.0	4.4	2.7	2.1	1.2	6.2	12.4	C	C	C	C	C	46.9	45.3	43.0	44.1	40.5	40.2	28.6	S	32.3	32.6	34.8	35.6	1.2	46.9	25.7	24
11	35.4	35.3	31.1	25.5	21.7	20.3	21.2	22.5	20.7	19.2	20.8	23.9	23.6	31.0	34.4	35.0	35.5	42.5	S	29.8	27.6	24.4	26.5	23.2	19.2	42.5	27.4	24
12	21.2	19.1	12.2	13.1	12.1	13.2	19.1	23.1	27.6	31.3	32.9	35.1	35.4	32.8	33.0	33.6	35.9	S	34.2	33.0	29.8	28.1	22.4	16.5	12.1	35.9	25.9	24
13	11.8	13.2	5.6	2.9	8.7	9.7	16.9	23.8	28.6	38.2	39.7	39.0	39.0	41.6	43.2	43.2	S	41.2	30.7	31.6	26.2	19.4	23.3	20.9	2.9	43.2	26.0	24
14	17.7	15.2	18.3	15.6	15.7	13.8	13.8	16.2	18.4	19.6	20.3	21.0	20.3	18.2	19.5	S	20.6	19.9	20.3	20.4	20.6	19.6	18.1	17.7	13.8	21.0	18.3	24
15	16.6	14.9	13.9	12.6	11.6	12.7	13.7	18.5	19.8	21.4	22.3	24.9	26.4	28.7	S	26.3	25.1	25.0	25.1	24.2	13.5	20.5	20.7	20.7	11.6	28.7	20.0	24
16	21.6	21.6	20.8	18.0	15.6	14.3	13.4	12.8	20.1	27.6	32.5	32.8	33.3	S	38.0	39.8	41.6	43.0	42.8	39.7	34.4	29.1	28.9	28.3	12.8	43.0	28.3	24
17	27.1	19.4	17.4	13.9	6.9	11.6	20.1	28.9	38.9	39.7	36.8	38.0	S	40.0	37.4	35.3	35.3	34.7	34.3	32.0	21.6	17.1	11.6	8.5	6.9	40.0	26.4	24
18	5.0	4.0	5.1	9.7	9.7	19.1	21.6	19.0	16.9	20.1	22.7	S	29.1	32.4	34.9	37.3	36.1	37.0	39.2	38.5	42.9	40.5	36.6	31.1	4.0	42.9	25.6	24
19	27.0	27.0	20.9	18.1	8.1	16.7	22.0	26.2	31.2	37.0	S	41.3	37.2	39.0	37.2	36.1	37.5	38.3	35.4	33.0	20.8	13.8	13.9	13.2	8.1	41.3	27.4	24
20	15.7	16.0	16.0	16.1	14.2	12.1	16.6	23.0	28.3	S	40.5	43.7	41.6	40.4	34.4	34.1	34.0	32.7	32.2	31.1	45.4	48.3	46.4	48.6	12.1	48.6	30.9	24
21	47.1	48.3	48.9	45.2	44.3	36.4	31.9	27.7	S	34.7	37.3	42.4	44.3	42.0	44.1	43.0	41.3	39.2	40.1	42.9	41.4	47.9	47.9	38.5	27.7	48.9	41.6	24
22	33.6	31.0	23.7	16.5	13.7	14.9	16.4	S	20.2	20.4	25.4	27.0	34.2	37.9	37.8	37.6	35.3	34.5	31.7	30.1	29.6	26.4	25.5	24.7	13.7	37.9	27.3	24
23	21.3	20.4	20.3	19.5	18.0	15.6	S	18.3	23.3	24.7	23.0	23.2	24.5	25.3	25.3	24.9	24.4	24.1	23.6	21.2	20.8	19.7	18.6	16.9	15.6	25.3	21.6	24
24	16.8	14.3	9.2	6.2	7.5	S	17.7	14.6	20.4	23.3	26.3	28.1	24.1	27.8	28.2	25.5	26.1	25.9	29.4	29.1	18.7	16.2	14.0	11.8	6.2	29.4	20.1	24
25	8.1	4.9	1.2	0.5	S	3.2	10.5	10.6	8.7	12.4	17.3	24.0	26.7	32.7	32.3	33.4	32.9	33.1	31.8	28.8	21.3	9.7	8.3	5.7	0.5	33.4	17.3	24
26	4.9	2.1	1.4	S	0.4	1.2	5.2	13.5	24.8	32.9	34.3	35.8	36.1	38.1	39.3	41.9	42.5	41.4	41.6	39.0	32.1	20.8	18.9	9.4	0.4	42.5	24.2	24
27	6.2	6.8	S	10.7	6.1	6.9	9.9	16.1	26.0	31.1	33.2	34.2	38.1	39.3	39.4	40.1	40.6	38.3	37.0	37.0	24.3	19.0	12.3	6.5	6.1	40.6	24.3	24
28	7.7	S	2.4	1.6	0.8	1.3	15.9	25.9	34.1	38.6	46.0	45.4	44.5	45.7	47.9	50.5	51.0	49.7	49.9	45.2	28.7	23.5	20.1	18.2	0.8	51.0	30.2	24
29	S	17.1	9.0	7.1	8.6	8.0	23.7	32.2	36.4	41.9	45.2	47.3	48.1	46.2	42.2	41.7	38.0	36.9	32.0	20.3	33.3	31.8	21.8	S	7.1	48.1	30.4	24
30	12.9	9.2	3.9	2.7	1.0	2.5	4.2	6.6	12.0	26.1	28.1	23.8	26.2	26.4	24.4	31.0	31.1	30.3	30.0	27.3	24.1	20.8	S	11.9	1.0	31.1	18.1	24
31	4.3	4.0	1.9	0.6	0.2	0.9	2.6	13.9	17.2	19.9	23.1	22.9	27.0	31.0	31.5	31.0	33.7	31.9	31.4	31.0	22.8	S	18.6	19.1	0.2	33.7	18.3	24
HOURLY MAX	47.1	48.3	48.9	45.2	44.3	36.4	31.9	32.2	38.9	41.9	46.0	47.3	48.1	47.4	47.9	50.5	51.0	49.7	49.9	45.2	45.4	48.3	47.9	48.6				
HOURLY AVG	17.8	17.6	14.2	12.9	10.5	11.9	16.6	20.3	23.9	27.9	30.2	32.5	33.8	35.2	35.4	36.6	35.7	36.0	34.2	32.3	28.2	25.9	23.4	19.5				

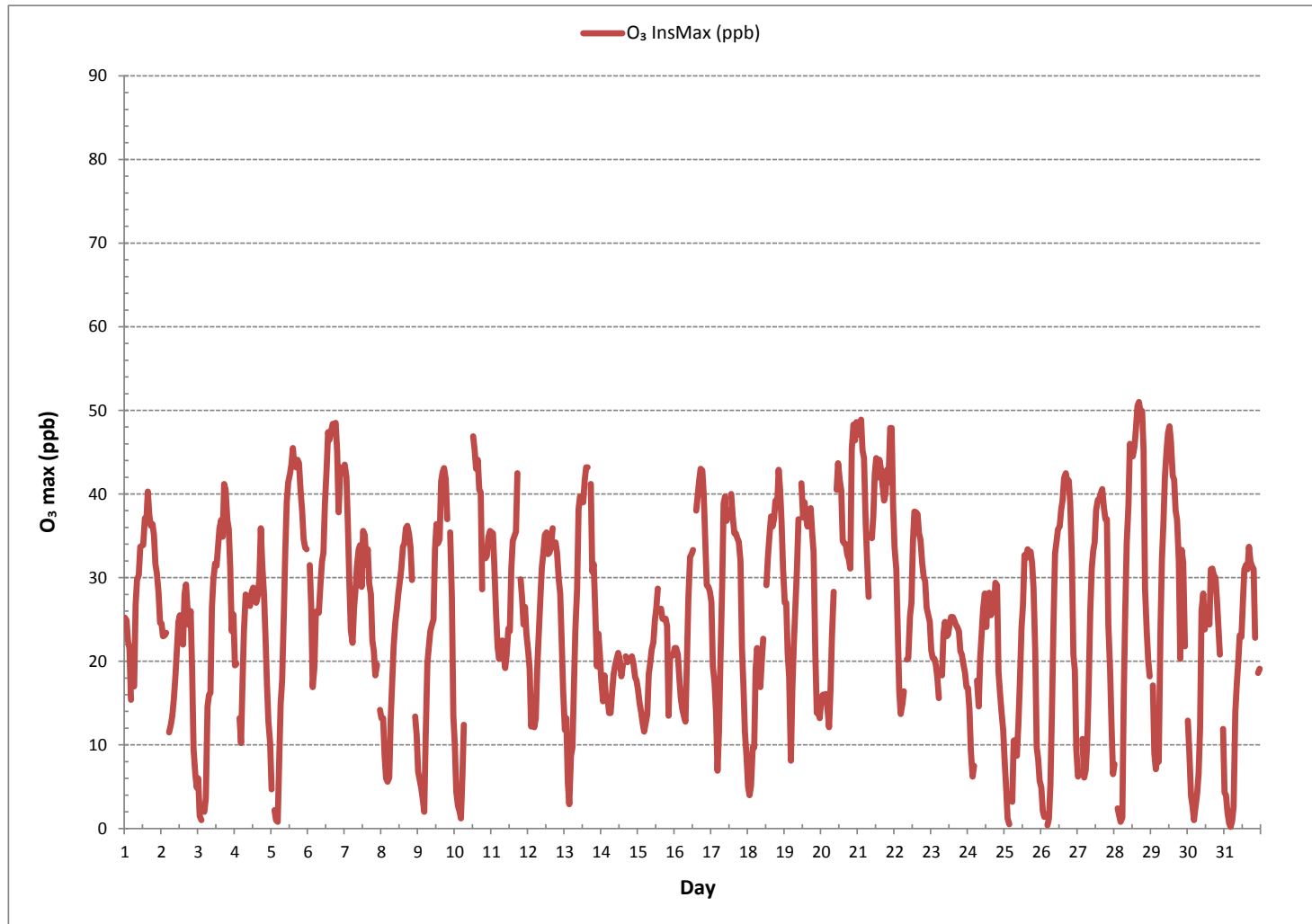
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	706
MAXIMUM INSTANTANEOUS VALUE:	51.0 ppb @ HOUR 16 ON DAY 28
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	12.1

**OZONE Instantaneous Maximum (O<sub>3</sub> ppb)**





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Cold Lake South Continuous Monitoring Station - July 2018

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	9.5	9.1	11.7	11.9	8.0	9.9	10.6	14.8	18.5	23.3	33.2	33.6	31.6	33.2	33.2	38.6	42.4	37.8	19.8	17.0	16.5	11.5	10.8	14.2	8.0	42.4	20.9	24	
2	19.2	15.8	14.8	16.1	11.7	9.9	16.7	16.7	15.9	17.0	16.4	13.4	11.7	16.5	15.4	12.6	8.2	15.0	7.1	8.4	4.4	3.8	3.7	3.8	3.7	19.2	12.3	24	
3	3.5	3.2	2.9	3.7	6.4	6.0	8.7	11.0	13.0	21.1	33.0	20.0	15.9	28.4	26.2	18.3	19.6	21.9	11.5	15.9	9.5	8.6	6.9	8.8	2.9	33.0	13.5	24	
4	6.0	5.5	6.0	7.1	4.9	9.3	15.0	18.9	17.8	28.4	24.6	34.5	19.3	28.6	16.5	19.1	13.9	11.9	13.4	9.3	6.9	3.8	3.7	2.4	2.4	34.5	13.6	24	
5	3.8	2.8	2.3	2.5	2.3	4.0	6.7	8.2	14.3	20.2	22.0	20.2	24.2	24.6	29.4	28.8	23.9	23.7	22.6	18.0	19.2	11.9	14.3	18.7	2.3	29.4	15.4	24	
6	18.7	15.6	2.5	6.9	11.5	17.4	21.3	16.9	16.5	23.2	24.9	31.0	37.7	32.5	32.5	28.8	29.0	21.3	16.3	10.2	15.4	33.8	24.6	14.9	2.5	37.7	21.0	24	
7	20.9	18.5	14.8	15.0	11.9	12.3	24.4	24.2	26.1	36.0	43.3	47.2	32.5	46.6	47.6	60.4	53.4	54.7	32.5	26.2	25.8	33.8	16.7	9.7	9.7	60.4	30.6	24	
8	13.9	6.2	8.0	9.7	9.7	11.7	16.3	16.1	15.9	28.2	26.4	24.3	35.6	32.1	33.4	25.0	23.1	29.2	18.7	17.8	10.4	4.4	4.0	3.2	3.2	35.6	17.6	24	
9	2.7	3.4	3.6	5.3	2.7	4.9	13.2	16.3	16.0	14.8	23.1	17.0	27.7	22.0	34.0	44.1	22.4	35.2	21.8	17.4	14.1	9.3	2.7	2.1	2.1	44.1	15.7	24	
10	2.6	2.1	5.4	5.5	2.8	3.7	4.3	9.6	14.3	19.6	19.0	15.6	17.4	17.6	15.2	10.0	7.7	6.7	7.0	10.2	22.2	28.4	23.9	22.7	2.1	28.4	12.2	24	
11	23.1	31.2	27.3	13.7	11.3	19.7	25.3	16.5	21.8	27.5	32.1	31.8	30.7	27.7	46.3	27.9	34.7	22.6	22.0	14.8	16.6	11.6	8.2	8.7	8.2	46.3	23.0	24	
12	10.4	11.3	9.3	9.9	11.3	14.1	17.5	23.9	21.5	22.2	36.2	37.7	39.1	37.7	35.3	35.0	33.4	31.8	34.5	25.9	11.9	6.4	6.2	3.9	3.9	39.1	21.9	24	
13	13.7	6.4	2.3	2.8	13.9	10.9	10.2	9.6	12.3	12.3	11.9	10.6	18.0	18.8	13.7	16.7	17.4	25.5	17.6	12.1	12.2	14.1	12.6	15.4	2.3	25.5	13.0	24	
14	10.4	12.0	17.3	20.0	16.3	20.7	36.9	33.0	28.8	48.5	44.4	50.7	58.4	43.7	49.6	36.9	39.2	33.6	29.7	28.6	27.0	21.8	19.8	21.1	10.4	58.4	31.2	24	
15	20.5	19.8	21.8	19.4	18.5	20.7	23.5	24.5	37.2	40.6	37.8	40.6	31.4	32.3	30.3	31.0	25.3	21.5	11.2	6.4	5.3	17.0	22.9	19.4	5.3	40.6	24.1	24	
16	25.5	19.1	19.6	17.0	14.1	12.6	16.3	11.0	15.0	23.3	26.1	30.7	35.1	30.3	32.5	30.5	26.8	26.3	20.2	12.5	8.6	9.5	12.3	17.5	8.6	35.1	20.5	24	
17	8.4	8.6	4.2	3.4	5.3	4.7	12.3	11.5	12.3	11.2	16.9	20.2	22.0	23.9	30.3	26.1	26.6	18.9	16.9	12.5	4.3	3.4	2.7	6.2	2.7	30.3	13.0	24	
18	4.8	7.6	17.6	13.0	13.3	19.2	16.7	9.7	10.6	11.5	11.7	23.9	16.7	13.0	11.4	10.8	10.4	12.4	12.1	38.5	31.4	14.4	7.6	6.9	4.8	38.5	14.4	24	
19	9.5	11.5	7.5	5.5	4.2	6.3	13.0	13.7	15.2	15.4	21.3	19.8	22.6	41.0	23.3	14.9	15.0	15.8	12.3	8.6	2.9	6.4	6.2	4.9	2.9	41.0	13.2	24	
20	4.7	12.0	6.9	12.6	12.6	6.9	10.2	14.0	15.9	21.8	28.8	29.6	22.6	38.0	34.7	40.4	46.1	44.4	42.0	32.1	51.8	31.7	28.2	35.8	4.7	51.8	26.0	24	
21	34.3	17.8	14.3	17.8	19.1	6.6	11.7	14.3	15.0	17.4	15.4	19.6	17.3	21.3	22.0	15.0	17.6	10.6	40.4	45.9	18.3	20.5	11.8	10.4	6.6	45.9	18.9	24	
22	11.3	10.6	12.1	11.0	12.6	16.3	18.5	17.4	21.8	32.7	33.0	33.0	35.6	42.0	38.0	43.9	41.5	56.6	43.1	51.6	37.9	28.6	17.2	27.7	10.6	56.6	28.9	24	
23	21.3	27.5	23.3	18.0	27.8	22.8	23.3	32.2	34.1	36.9	34.8	46.1	35.1	48.0	31.8	35.3	36.2	23.3	20.9	22.7	12.3	7.8	9.5	8.4	7.8	48.0	26.6	24	
24	11.9	7.8	7.5	9.7	11.0	11.6	18.4	20.2	22.6	23.6	23.2	26.6	32.5	27.1	24.6	19.4	23.8	16.5	30.1	18.8	9.1	9.1	5.1	6.1	5.1	32.5	17.3	24	
25	4.7	2.7	3.6	4.7	5.5	7.7	11.0	9.9	10.2	12.0	16.5	12.5	9.1	11.2	18.7	15.0	15.2	13.2	11.8	8.2	4.7	3.8	2.9	3.6	2.7	18.7	9.1	24	
26	3.2	3.5	2.8	3.4	3.4	2.5	4.2	6.1	8.2	17.1	9.6	9.2	9.9	12.5	16.0	10.0	17.6	14.1	14.9	10.8	4.0	3.6	3.6	3.8	2.5	17.6	8.1	24	
27	3.0	3.2	3.2	5.5	2.9	3.4	7.4	9.1	8.4	12.3	10.2	12.7	13.0	12.7	13.0	15.8	19.5	22.5	11.2	4.9	3.0	5.0	3.6	3.4	2.9	22.5	8.7	24	
28	2.7	3.7	3.6	4.4	2.8	2.1	6.2	8.8	7.5	17.4	12.1	13.0	15.9	25.7	18.9	23.5	20.2	12.1	13.2	9.6	4.7	6.0	6.0	3.9	2.1	25.7	10.2	24	
29	4.8	4.9	3.4	2.3	2.9	3.2	8.0	14.5	18.9	22.6	19.1	29.6	29.2	30.5	31.8	31.4	36.6	26.6	10.8	22.0	45.5	11.5	5.8	11.0	2.3	45.5	17.8	24	
30	6.2	3.4	2.9	3.8	3.0	3.9	3.6	15.2	10.8	16.0	20.0	26.6	15.4	18.0	23.7	43.5	24.0	15.5	16.7	20.7	19.3	11.0	7.4	5.3	2.9	43.5	14.0	24	
31	4.4	4.2	5.3	4.2	3.8	3.6	4.5	7.1	13.2	16.1	17.1	16.6	18.8	28.8	25.1	30.7	25.9	17.8	14.9	8.2	6.2	10.9	10.8	14.2	3.6	30.7	13.0	24	
HOURLY MAX	34.3	31.2	27.3	20.0	27.8	22.8	36.9	33.0	37.2	48.5	44.4	50.7	58.4	48.0	49.6	60.4	53.4	56.6	43.1	51.6	51.8	33.8	28.2	35.8					

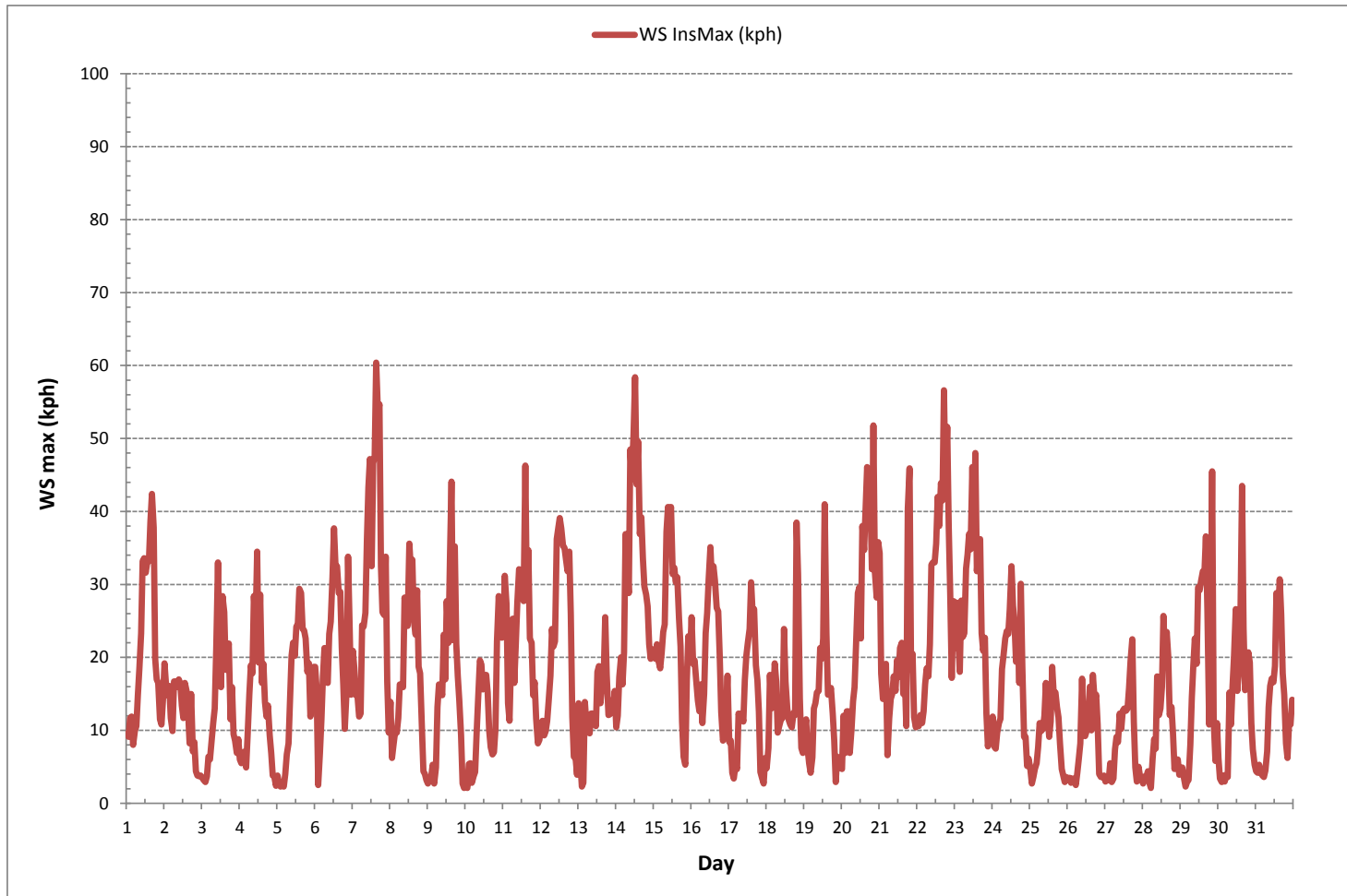
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	60.4	kph	@ HOUR	15	ON DAY	7	
OPERATIONAL TIME:						744	hrs

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV  
REPORT CERTIFICATION FORM***

### Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	COLD LAKE SOUTH CONTINUOUS MONITORING STATION
Name of the Representative of the Person Responsible	Position / Title of the Representative of the Person Responsible
Mike Bisaga	Environment Monitoring Program Manager
Is an External Party Certifying the Report?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adekanmbi	Project Team Lead, Customer Service - Air Services
Company Name for External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
Maxxam Analytics, A Bureau Veritas Group Company	M.Sc., EPT., PMP

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



Signature of the External Person Certifying the Report

30-08-2018

Report Issued Date (dd-mm-yyyy)

***APPENDIX V***  
***DATA VALIDATION CERTIFICATION FORM***





### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2018-07-1-C</u>
<b>Site:</b> <u>Cold Lake South Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>August 02, 2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>August 02, 2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>August 29, 2018</u>
Level 3 Independent Data Review	<u>CSA/mbq</u>	Date <u>August 30, 2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

<b>Notes</b>
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

September 14, 2018

**Subject: Monthly Report Submission for the LICA Maskwa station**

---

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of July 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in July 2018 was compliant with the requirements outlined in the Air Monitoring Directive 2016 (AMD 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems, except PM<sub>2.5</sub>.

**Non-Conformance:** The equipment uptime for PM<sub>2.5</sub> was 15.7% (627 hours of downtime). AEP reference number: 343453.

**PM<sub>2.5</sub>:**

- The Teom unit was found no flow on July 11. Troubleshooting was taken, and an audit was performed on July 11. The audit result met the AMD requirements. Data was discarded back to the last valid audit check, which was on June 21. 250 hours of downtime were incurred in the July monitoring period due to this event.
- The Teom unit failed the second audit on July 23 due to the main flow setting being out of range. LICA's TEOM 1405F (s/n: 1405A208301003) was removed, and an alternate unit from Maxxam's inventory, TEOM 1400A (s/n: 140AB228740001), was installed and audited on July 26. Data was invalidated back to the last valid audit check, which was on July 11. 359 hours of data were discarded due to this event.

**H<sub>2</sub>S:** The LICA-owned API 101E analyzer (s/n: 510) was removed on July 31 and replaced on August 1 with another LICA-owned Thermo 450i analyzer (s/n: CM17360005) due to zero instability.



Lakeland Industry & Community Association  
5107 50 St  
Bonnyville, AB T9N 2J7

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

Should you have any questions, please don't hesitate to contact us.

Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga".

Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[mbisaga@otonabee.ca](mailto:mbisaga@otonabee.ca)

A handwritten signature in blue ink that reads "Lily Lin".

Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[rebbaca@gmail.com](mailto:rebbaca@gmail.com)



MAXXAM ANALYTICS  
#1 2080 39 Ave. NE, Calgary, AB  
T2E 6P7

maxxam.ca  
Toll Free 800-386-7247  
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT**  
**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
**MASKWA CONTINUOUS MONITORING STATION**

**JOB #: 2833-2018-07-30-C**

**July 2018**

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
5107 50 ST.  
BONNYVILLE, ALBERTA  
T9N 2J7

**Attention: MIKE BISAGA**

DATE: **August 31, 2018**

Prepared by: *Maram Ghaleb*

---

Maram Ghaleb, B.Sc.  
Project Manager, Customer Service, Air Services

Reviewed by: *Wunmi Adekanmbi*

---

Wunmi Adekanmbi, M.Sc., EPt, PMP  
Project Team Lead, Customer Service, Air Services

## SUMMARY

In July 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

With the exception of PM<sub>2.5</sub>, the operational time for each monitoring analyzer, meteorological system and data acquisition system was above the 90% requirement, in accordance with the Alberta Air Monitoring Directive (AMD, 2016).

**Non Conformance:** Equipment uptime did not meet the AMD's 90% requirement for PM<sub>2.5</sub> this month. This was reported under AEP reference number: 343453.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017).

**H<sub>2</sub>S:** A total of 15 hours of downtime were recorded this month.

- Two hours of downtime were incurred due to an additional zero-span check performed on July 30 to assess a drift in zero response.
- The LICA-owned resident analyzer, API 101E (s/n: 510), was removed on July 31 and replaced on August 1 with another LICA analyzer, Thermo 450i (s/n: CM17360005), due to zero instability. Thirteen hours of downtime were incurred in the July monitoring period as a result.

**PM<sub>2.5</sub>:** A total of 627 hours of downtime were recorded this month.

- Upon arrival onsite on July 11 for a routine audit, the technician observed that the TEOM unit had no flow. The audit was subsequently performed following troubleshooting activities, and it met AMD requirements. Data was discarded back to the last valid audit check, which was on June 21. 250 hours of downtime were incurred in the July monitoring period due to this event.
- The second audit on July 23 failed due to the main flow setting being out of range. LICA's TEOM 1405F (s/n: 1405A208301003) was removed, and an alternate unit from Maxxam's inventory, TEOM 1400A (s/n: 140AB228740001), was mobilized to site, installed and audited on July 26. Data was invalidated back to the last valid audit check, which was on July 11. 359 hours of data were discarded due to this event.
- One hour of downtime was incurred on July 31 at hour 14:00 while the instrument's configuration was being checked and reset.
- Seventeen hours of data were invalidated as the data was recorded at concentrations below  $-3 \mu\text{g}/\text{m}^3$  this month.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

### Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO <sub>2</sub> (ppb)	172	48	0	0	1	32	23	4	6.9	NW	8	11	100.0
H <sub>2</sub> S (ppb)	10	3	0	0	0	2	9	22	0.8	ENE	1	26	98.0
THC (ppm)	-	-	-	-	2.04	2.88	30	6	2.7	NE	2.31	28	100.0
NO <sub>2</sub> (ppb)	159	-	0	-	2	24	27	16	1.0	WNW	7	11	100.0
NO (ppb)	-	-	-	-	1	13	14	6	7.1	WNW	3	23	100.0
NO <sub>x</sub> (ppb)	-	-	-	-	3	33	27	16	1.0	WNW	9	11	100.0
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	0	0	11	51	29	17	3.1	NNW	20	29	15.7
RELATIVE HUMIDITY (%)	-	-	-	-	73	100	2	23	0.4	SSE	92	3	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	941	951	5	7	3.8	SSW	949	25	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.8	30.6	17	15	6.0	WSW	23.3	17	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	25.5	20	20	5.8	NNE	34.0	20	100.0
VECTOR WS (kph)	-	-	-	-	1.3	14.2	16	11	-	SSW	6.7	14	100.0
VECTOR WD (sec)	-	-	-	-	273 (W)	-	-	-	-	-	-	-	100.0

---

## Exceedance Summary Report

---

### SO<sub>2</sub> 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

### SO<sub>2</sub> 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

### H<sub>2</sub>S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

### H<sub>2</sub>S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

### NO<sub>2</sub> 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

### PM<sub>2.5</sub> 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m<sup>3</sup>.

### PM<sub>2.5</sub> 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m<sup>3</sup>.

*In accordance with EPEA and the Substance Release Regulation.*

*In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.*

**TABLE OF CONTENTS**

<u>Title</u>	<u>Page</u>
<b>SUMMARY</b>	<b>2</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY REPORT</b>	<b>3</b>
<b>EXCEEDANCE SUMMARY REPORT</b>	<b>4</b>
<b>TABLE OF CONTENTS</b>	<b>5</b>
<b>1.0 Discussion</b>	<b>7</b>
<b>2.0 Project Personnel</b>	<b>10</b>
<b>3.0 Plant Monthly Required AMD Summary</b>	<b>10</b>
<b>4.0 Calculations and Results</b>	<b>10</b>
<b>5.0 Methods and Procedures</b>	<b>11</b>
<b>Appendix I</b>	<b>Continuous Monitoring Data Results 14</b>
	<b>Sulphur Dioxide 15</b>
	<b>Hydrogen Sulphide 21</b>
	<b>Total Hydrocarbon 27</b>
	<b>Oxides of Nitrogen 33</b>
	<b>Nitric Oxides 39</b>
	<b>Nitrogen Dioxide 44</b>
	<b>Particulate Matter 2.5 50</b>
	<b>Wind Speed 55</b>
	<b>Wind Direction 60</b>
	<b>Standard Deviation Wind Direction 63</b>
	<b>Relative Humidity 66</b>
	<b>Barometric Pressure 69</b>
	<b>Ambient Temperature 72</b>
	<b>Precipitation 75</b>



---

<b>Appendix II</b>	<b>Equipment Calibration Results</b>	<b>78</b>
	Sulphur Dioxide	79
	Hydrogen Sulphide	82
	Total Hydrocarbon	87
	Nitrogen Dioxide	90
	Particulate Matter	94
	Wind System	97
	Calibrators	99
	Calibration Gases	102
<b>Appendix III</b>	<b>Maximum Instantaneous Data</b>	<b>108</b>
<b>Appendix IV</b>	<b>Report Certification Form</b>	<b>123</b>
<b>Appendix V</b>	<b>Data Validation Certification Form</b>	<b>125</b>

---

## 1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

#### **SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on July 12.

#### **HYDROGEN SULPHIDE (H<sub>2</sub>S)**

- Operational time for the monitoring period was 98.0%, equivalent to 15 hours of downtime.
- The routine monthly calibration was performed on July 12.
- The analyzer began to exhibit a biased high zero drift on July 28. A repeat zero-span check performed on July 30 at hours 13:00-14:00 drifted in the opposite side of the mean, demonstrating instability. This prompted a site visit on July 31 where the LICA-owned resident analyzer, API 101E analyzer (s/n: 510), was removed following a successful shut-down calibration. LICA's Thermo 450i (s/n: CM17360005), was subsequently installed on August 1. Fifteen hours of downtime were incurred in the July monitoring period due to this event.

#### **TOTAL HYDROCARBONS (THC)**

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on July 12.

#### **OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)**

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on July 12.

#### **PARTICULATE MATTER < 2.5 MICRONS (PM<sub>2.5</sub>)**

- Operational time for the monitoring period was 15.7%, equivalent to 627 hours of downtime.
- Equipment uptime did not meet the AMD's 90% requirement. This was reported under AEP reference number: 343453.
- Upon arrival onsite on July 11 for the first of the bi-monthly routine audits, the technician observed that the TEOM unit had no flow. Flow was restored after the technician's troubleshooting attempts. The audit was subsequently performed and it met AMD requirements. Data was discarded back to the last valid audit check, which was on June 21. 250 hours of downtime were incurred in the July monitoring period due to this event.
- The second audit on July 23 failed due to the main flow setting being out of range. LICA's TEOM 1405F (s/n: 1405A208301003) was removed, and an alternate unit from Maxxam's inventory, TEOM 1400A (s/n: 140AB228740001), was mobilized to site, installed and audited on July 26. Data was invalidated back to the last valid audit check, which was on July 11. 359 hours of data were discarded due to this event.
- The channel was placed in maintenance mode on July 31 at hour 14:00 while the instrument's configuration was checked and reset. One hour of downtime was incurred as a result.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and -3 µg/m<sup>3</sup> was corrected to 0 µg/m<sup>3</sup>. Data recorded below -3 µg/m<sup>3</sup> was invalidated. Seventeen hours of data were invalidated as the data was below -3 µg/m<sup>3</sup> this month.

**WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)**

- Operational time for the monitoring period was 100%.
- From July 6 to 11, the wind system started producing “over-range” maximum instantaneous data sporadically. Ten instances of maximum instantaneous data were discarded as a result. This was likely due to worn-out cables being affected by moisture and cold temperatures. The resident MetOne wind system is scheduled to be replaced in late September/early October.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

**RELATIVE HUMIDITY (RH)**

- Operational time for the monitoring period was 100%.

**BAROMETRIC PRESSURE (BP)**

- Operational time for the monitoring period was 100%.

**PRECIPITATION (PRECIP)**

- Operational time for the monitoring period was 100%.

**AMBIENT TEMPERATURE (AmbTPX)**

- Operational time for the monitoring period was 100%.

**2.0 Project Personnel**

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

**3.0 Plant Monthly Required AMD Summary**

With the exception of PM2.5, the operational time for each monitoring analyzer, meteorological system and data acquisition system was above the 90% requirement, in accordance with the Alberta Air Monitoring Directive (AMD, 2016).

Equipment uptime did not meet the AMD's 90% requirement for PM2.5 this month. This was reported under AEP reference number: 343453.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017).

**4.0 Calculations and Results**

All calculations and reporting of results, except for WS/WD/STDWD, follow the methods described in the AMD, 2016.

**WS/WD/STDWD:**

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected for the month of July was re-calculated from the available 1-minute vector averages. To incorporate the highest number of instant data, minute data that contained less than 45 seconds were averaged based on the remaining sample set and not excluded when calculating hourly averages. This data treatment had a minor impact on data; applicable hours are outlined in the table below. Overall, in comparison with the original hourly averages, the change was insignificant. On July 31, the DAS vendor modified the datalogger configuration, in order to optimize the collection of wind data. The criteria of the calm threshold was eased and hourly data is calculated based on 1-minute vector averages.

Summary of Hourly Wind Data Revised After Data Treatment	
Date	Time
03/07/2018	01:00
03/07/2018	02:00
03/07/2018	03:00
03/07/2018	21:00
03/07/2018	22:00
05/07/2018	04:00
06/07/2018	04:00
31/07/2018	08:00
31/07/2018	10:00
31/07/2018	14:00

## 5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- MET One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00215: TEOM Operation
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E & Thermo 450i UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
- Particulate Matter (PM<sub>2.5</sub>) - R&P 1405F TEOM & R&P 1400A Unit
- Wind System - Met One Unit
- Relative Humidity - Rotronic Hygroclip Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Rotronic Hygroclip Unit
- Precipitation - Met One Unit
- Datalogger - Envidas Ultimate

The following steps were used to complete the data verification and validation process:

**Level 0 Preliminary Verification**

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

**Level 1 Primary Validation**

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

**Level 2 Final Validation**

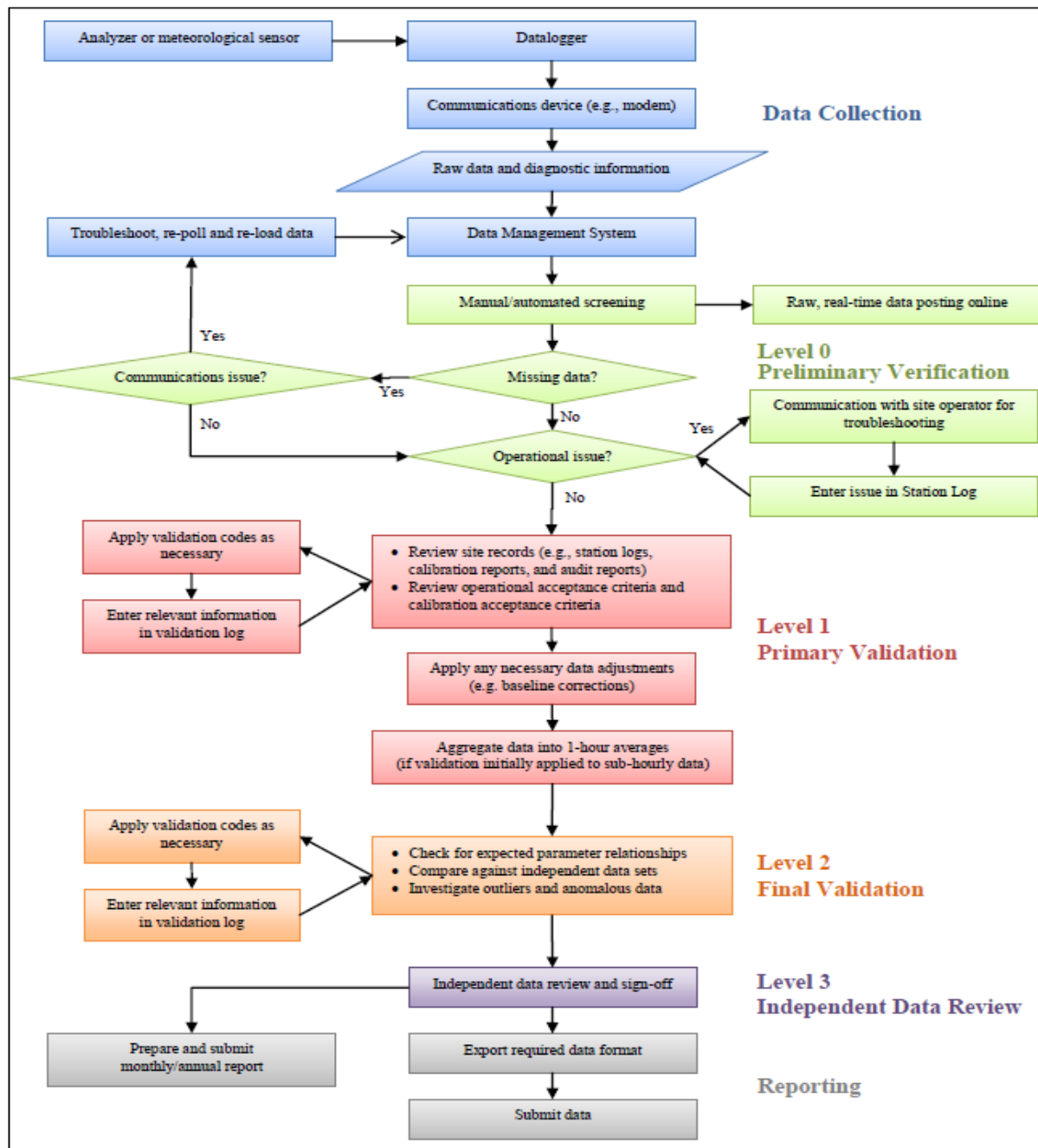
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

**Level 3 Independent Data Review**

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

**Post-Final Validation**

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart



***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***

***SULPHUR DIOXIDE***

**SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0	0	S	0	7	3	5	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7	1	24	
2	5	S	0	0	0	1	2	1	0	0	2	1	0	0	0	0	0	1	1	0	0	0	0	0	0	5	1	24	
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	1	0	24	
4	0	0	0	0	0	0	0	0	1	0	0	2	2	2	1	1	0	0	1	0	0	0	S	0	0	2	0	24	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	1	0	24	
6	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
7	0	1	0	1	0	0	1	1	0	0	0	2	2	0	0	0	2	2	2	S	1	0	0	2	0	2	1	24	
8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	2	0	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	S	0	0	0	1	2	0	0	0	2	0	24	
11	0	0	2	18	9	10	30	28	7	6	6	3	5	0	0	S	1	7	9	2	9	4	13	4	0	30	8	24	
12	6	5	5	3	3	2	3	3	4	3	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	6	2	24	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	2	1	0	1	0	2	0	24	
14	4	5	4	7	3	10	16	14	4	3	4	1	S	0	0	0	0	1	0	0	0	0	0	0	0	16	3	24	
15	0	0	0	0	0	0	3	13	4	4	6	S	3	5	4	2	2	0	1	0	0	0	0	0	0	13	2	24	
16	0	0	0	0	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
17	0	0	0	0	0	0	1	2	1	S	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	24	
18	0	0	0	0	5	0	7	2	S	0	1	1	1	0	2	1	1	0	0	0	0	0	0	0	0	7	1	24	
19	0	0	1	0	0	0	1	S	1	5	3	5	4	1	2	3	3	1	0	0	0	0	0	0	0	5	1	24	
20	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	0	24	
21	0	0	0	0	0	S	1	1	0	0	1	4	2	1	0	0	0	0	0	0	0	0	0	0	0	4	0	24	
22	0	0	1	1	S	0	0	3	4	14	9	12	3	2	10	1	0	0	0	0	0	1	6	17	0	17	4	24	
23	31	14	26	S	32	3	14	2	2	8	6	8	6	4	3	0	0	0	0	0	0	0	0	0	0	32	7	24	
24	1	1	S	2	1	4	2	10	9	9	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	24	
25	0	S	0	0	0	0	0	0	4	2	1	4	3	1	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
26	S	0	0	0	0	0	0	0	3	2	3	0	1	1	1	0	0	7	1	1	0	0	0	S	0	7	1	24	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	6	1	0	0	0	S	0	0	12	1	24	
28	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
29	0	0	2	1	0	0	1	2	1	2	1	0	0	0	0	1	1	1	1	0	S	0	0	0	0	2	1	24	
30	0	0	0	0	0	0	0	0	1	4	3	0	1	0	0	0	0	0	0	0	S	0	0	2	0	4	0	24	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
HOURLY MAX	31	14	26	18	32	10	30	28	9	14	9	12	6	5	10	3	12	7	9	2	9	4	13	17	0	0	0	24	
HOURLY AVG	2	1	1	1	2	1	3	3	2	2	2	2	1	1	1	0	1	1	1	0	1	0	1	1	0	0	0	24	

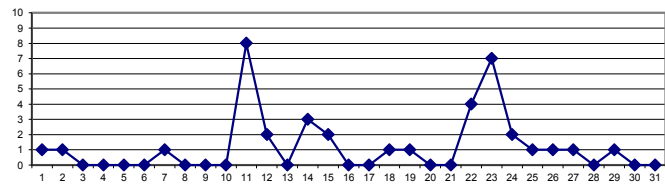
**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

**OBJECTIVE LIMIT:**

<b>ALBERTA ENVIRONMENT:</b>	1-HR	172	ppb	24-HR	48	ppb
-----------------------------	------	-----	-----	-------	----	-----

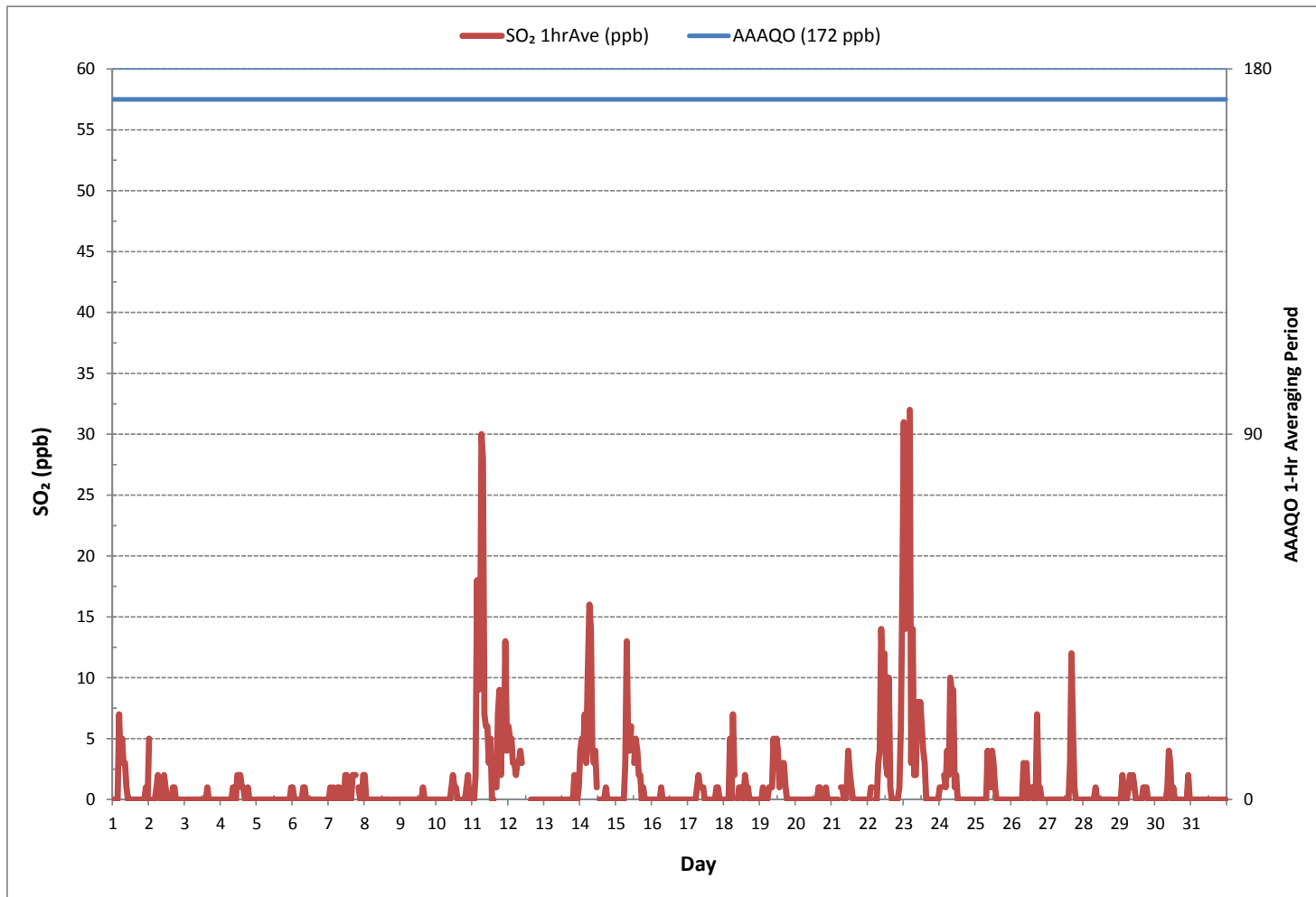
**24 HR AVERAGES July 2018**



**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	213
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	32 ppb @ HOUR ON DAY 23
MAXIMUM 24-HR AVERAGE:	8 ppb ON DAY 11
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3
MONTHLY AVERAGE:	1 ppb

SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-SO<sub>2</sub> [ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.71%

Calm Avg: 0.01 [ppb]

Direction	0.0-6.6	6.6-13.2	13.2-19.8	19.8-26.4	26.4-33.0	>33.0	Total
<b>N</b>	10.8	0.1	0.0	0.0	0.0	0.0	10.9
<b>NE</b>	9.5	0.0	0.0	0.0	0.0	0.0	9.5
<b>E</b>	8.2	0.1	0.0	0.0	0.0	0.0	8.3
<b>SE</b>	6.8	0.0	0.0	0.0	0.0	0.0	6.8
<b>S</b>	15.1	0.0	0.0	0.0	0.0	0.0	15.1
<b>SW</b>	16.4	0.0	0.0	0.0	0.0	0.0	16.4
<b>W</b>	17.1	0.0	0.0	0.0	0.0	0.0	17.1
<b>NW</b>	10.8	2.7	1.0	0.1	0.6	0.0	15.1
<b>Summary</b>	94.6	3.0	1.0	0.1	0.6	0.0	99.3

% Icon Classes (ppb)

95  0.0-6.6

3  6.6-13.2

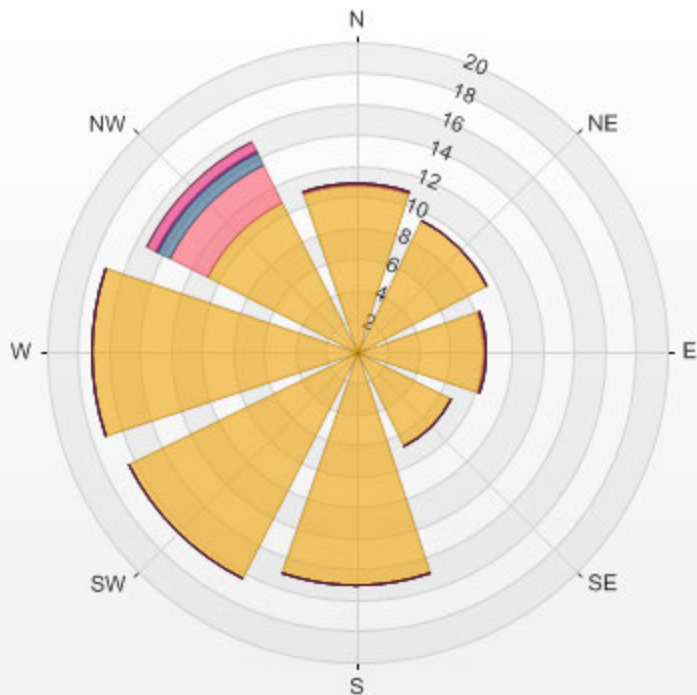
1  13.2-19.8

0  19.8-26.4

1  26.4-33.0

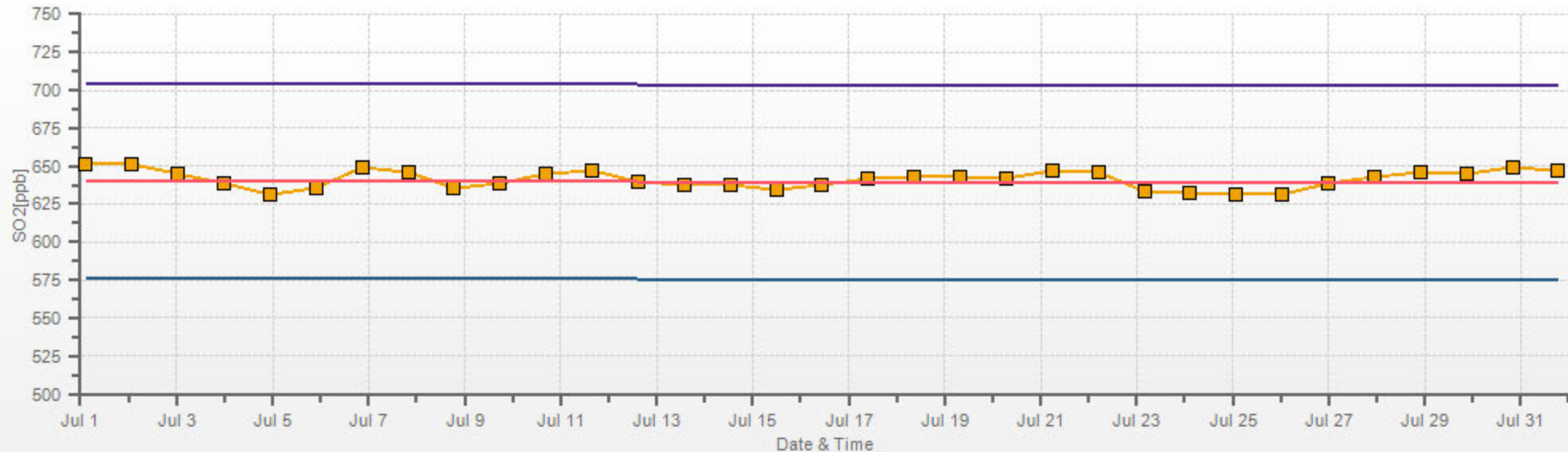
0  >33.0

LICA MASKWA Poll.: LICA MASKWA-SO<sub>2</sub>[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.71% Calm Poll Avg: 0.01[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***HYDROGEN SULPHIDE***





HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	S	0	0	0	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	
2	0	S	0	0	0	0	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	
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
6	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
9	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	1	2	1	0	0	2	2	0	24	
10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
11	0	0	0	1	0	0	2	1	1	1	0	0	0	0	0	0	S	0	0	0	0	1	0	1	1	0	0	0	2	0	24	
12	1	1	1	0	0	1	1	1	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
14	0	0	0	0	0	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
15	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
18	0	1	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
19	0	0	0	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
20	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
21	0	0	0	0	0	S	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	
22	0	0	0	0	S	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	24	
23	1	1	1	S	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	24	
24	0	0	S	0	0	0	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	
25	0	S	0	0	0	0	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	
26	S	0	1	1	0	0	0	0	1	2	1	0	0	1	1	1	0	0	1	1	1	1	1	0	S	0	0	0	2	1	24	
27	0	1	1	2	0	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	2	0	24	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
29	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24	
30	0	0	0	1	0	0	2	1	1	1	2	2	S1	S1	2	1	0	0	0	0	S	0	0	0	0	0	0	0	2	1	22	
31	0	0	0	0	0	0	0	0	0	0	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	0	0	0	11	
HOURLY MAX	1	1	1	2	1	1	2	1	1	2	2	2	2	1	0	2	1	1	0	1	1	1	1	2	1	0	0					
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

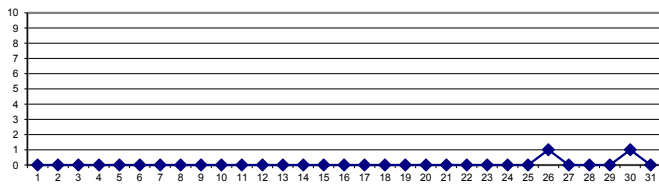
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
----------------------	------	----	-----	-------	---	-----

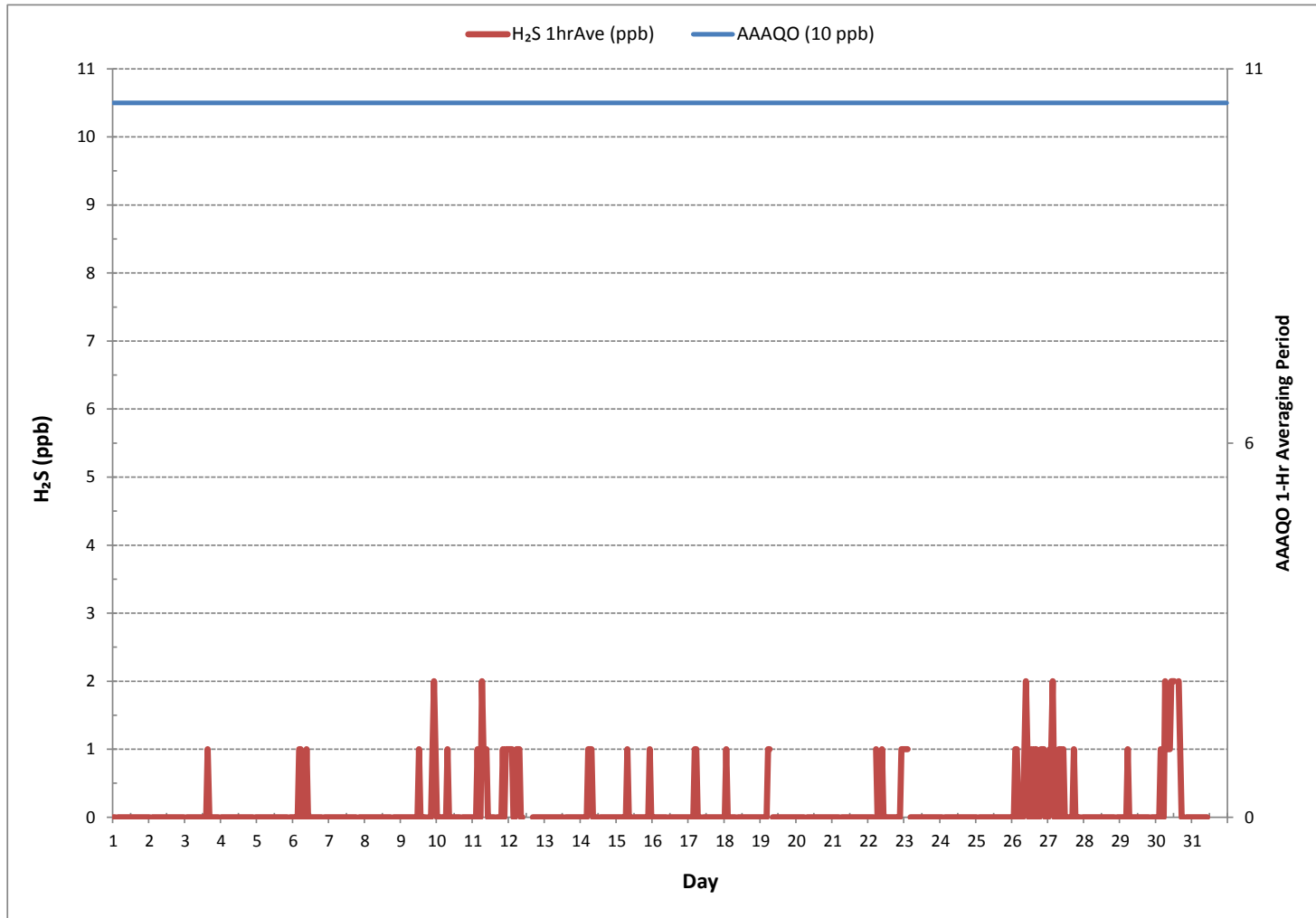
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	69				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR	22	ON DAY	9	
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY	26	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	729	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	98.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES July 2018



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)



Wind: LICA MASKWA  
 Poll.: LICA MASKWA-H<sub>2</sub>S [ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.72% Calm Avg: 0.11 [ppb]

Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
<b>N</b>	10.4	0.4	0.0	0.0	10.8
<b>NE</b>	8.8	0.3	0.6	0.0	9.7
<b>E</b>	8.2	0.3	0.0	0.0	8.5
<b>SE</b>	6.8	0.1	0.0	0.0	6.9
<b>S</b>	13.7	0.6	0.0	0.0	14.3
<b>SW</b>	16.0	0.1	0.0	0.0	16.2
<b>W</b>	17.3	0.0	0.0	0.0	17.3
<b>NW</b>	15.3	0.1	0.0	0.0	15.5
<b>Summary</b>	96.7	2.0	0.6	0.0	99.3

% Icon Classes (ppb)

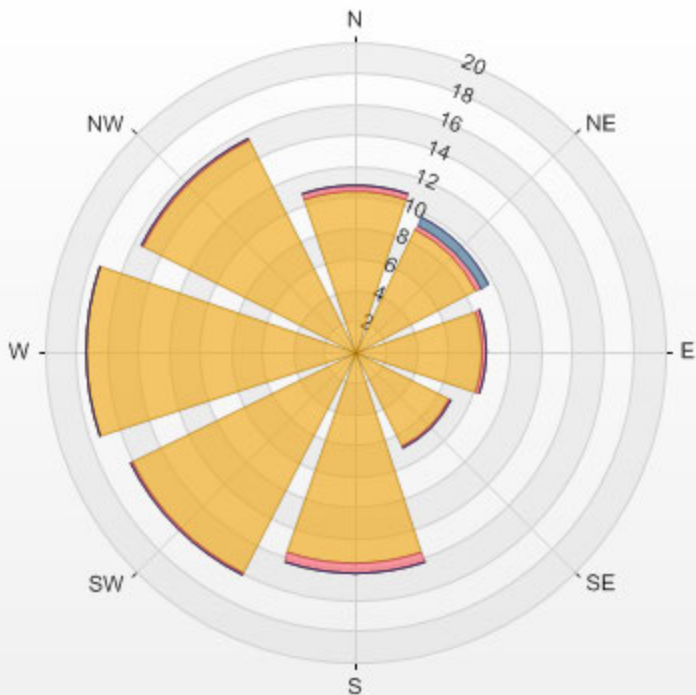
97 0.0-1.0

2 1.0-2.0

1 2.0-3.0

0 >3.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.72% Calm Poll Avg: 0.11[ppb]





Span Meas Span Ref Span Low Span High

***TOTAL HYDROCARBON***

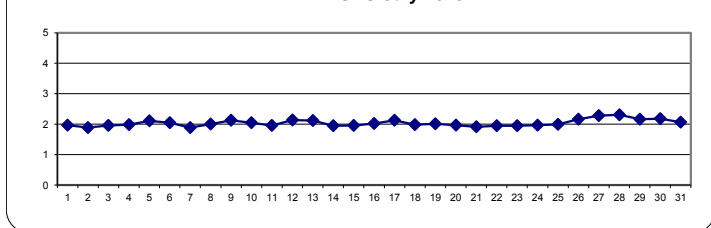
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.04	2.14	S	2.17	2.17	2.02	1.97	1.97	1.93	1.91	1.92	1.92	1.92	1.91	1.94	1.93	1.93	1.93	1.91	1.89	1.92	1.92	1.95	1.93	1.89	2.17	1.97	24	
2	1.98	S	1.91	1.90	1.90	1.88	1.90	1.89	1.86	1.86	1.87	1.86	1.86	1.85	1.87	1.87	1.86	1.85	1.86	1.86	1.88	1.91	1.99	2.07	1.85	2.07	1.89	24	
3	S	2.25	2.16	2.29	2.21	2.14	2.07	1.88	1.87	1.89	1.90	1.83	1.86	1.84	1.87	1.85	1.86	1.85	1.86	1.86	1.92	1.92	1.93	S	1.83	2.29	1.96	24	
4	2.07	2.06	2.02	2.07	2.10	2.08	2.02	1.98	1.98	1.94	2.00	1.92	1.87	1.88	1.89	1.93	1.91	1.90	1.93	1.91	1.93	2.00	S	2.07	1.87	2.10	1.98	24	
5	2.17	2.18	2.29	2.28	2.31	2.40	2.31	2.13	2.09	2.13	2.07	2.04	2.08	2.05	2.02	2.01	2.01	2.01	2.00	1.99	1.98	S	2.02	2.07	1.98	2.40	2.11	24	
6	2.09	2.09	2.09	2.15	2.20	2.23	2.24	2.23	2.15	2.07	2.04	1.99	2.02	2.11	1.96	1.93	1.91	1.91	1.94	1.96	S	1.96	1.93	1.86	1.86	2.24	2.05	24	
7	1.88	1.93	1.95	1.89	1.86	1.86	1.90	1.90	1.87	1.88	1.87	1.84	1.82	1.87	1.85	1.87	1.91	1.87	1.88	S	1.91	1.92	1.95	2.03	1.82	2.03	1.89	24	
8	2.10	2.06	2.02	2.04	2.10	2.12	2.06	2.00	1.95	1.96	1.95	1.96	1.95	1.94	1.93	1.94	1.95	1.94	S	1.89	1.93	2.00	2.04	2.13	1.89	2.13	2.00	24	
9	2.20	2.35	2.40	2.39	2.55	2.74	2.39	2.28	2.32	2.31	2.20	1.94	1.93	1.92	1.89	1.91	1.88	S	1.87	1.85	1.86	1.89	1.90	2.00	1.85	2.74	2.13	24	
10	2.04	2.27	2.39	2.29	2.12	2.14	2.19	2.20	2.05	1.95	1.96	1.96	1.95	1.95	1.95	S	1.96	2.02	2.02	1.96	1.96	1.96	1.94	1.94	1.94	2.39	2.05	24	
11	1.91	1.87	1.92	1.90	1.83	1.86	1.93	1.94	2.08	1.98	1.92	1.86	1.89	1.87	1.89	S	1.93	1.96	2.06	2.06	2.09	2.05	2.09	2.08	1.83	2.09	1.96	24	
12	2.10	2.13	2.15	2.10	2.11	2.14	2.16	2.17	2.21	2.20	2.20	2.27	2.24	2.25	2.23	C	C	C	C	1.97	1.95	2.04	2.05	2.08	1.95	2.27	2.14	24	
13	2.43	2.33	2.40	2.51	2.61	2.46	2.43	2.06	2.10	1.97	1.95	1.96	1.92	S	1.93	1.91	1.94	1.99	1.98	2.08	2.02	1.88	1.90	1.90	1.88	2.61	2.12	24	
14	1.94	1.93	1.88	1.93	1.99	2.07	2.12	2.06	1.99	1.95	1.98	1.93	S	1.93	1.94	1.90	1.91	1.93	1.91	1.91	1.88	1.89	1.92	1.99	1.88	2.12	1.95	24	
15	2.00	1.95	1.95	1.93	1.93	1.94	2.03	1.98	1.91	1.92	1.98	S	1.98	1.99	1.97	1.96	1.95	1.94	1.95	1.93	1.97	1.94	1.94	1.93	1.91	2.03	1.96	24	
16	1.92	1.94	1.95	2.00	2.08	2.13	2.16	2.29	2.27	2.22	S	2.05	2.01	1.93	1.92	1.92	1.90	1.91	1.92	1.93	1.94	1.97	2.02	2.09	1.90	2.29	2.02	24	
17	2.17	2.19	2.26	2.21	2.28	2.38	2.33	2.35	2.31	S	2.05	2.00	1.95	1.92	1.94	1.94	1.95	1.97	1.99	2.04	2.04	2.16	2.18	2.43	1.92	2.43	2.13	24	
18	2.33	2.25	2.44	2.13	2.15	1.90	1.90	1.89	S	1.93	1.94	1.90	1.90	1.88	1.90	1.88	1.90	1.89	1.90	1.88	1.85	1.86	1.90	1.98	1.85	2.44	1.98	24	
19	1.95	1.99	2.02	2.04	2.15	2.12	2.00	S	1.98	1.97	1.96	1.97	1.97	1.96	1.94	1.96	1.95	1.96	1.96	1.98	2.00	2.15	2.17	2.09	1.94	2.17	2.01	24	
20	2.18	2.17	2.00	2.06	2.04	2.05	S	2.10	2.08	2.03	1.99	1.96	1.91	1.90	1.91	1.94	1.93	1.89	1.87	1.88	1.92	1.90	1.84	1.81	1.81	2.18	1.97	24	
21	1.83	1.89	1.91	1.96	2.01	S	1.95	1.97	1.87	1.86	1.86	1.90	1.90	1.90	1.90	1.93	1.93	1.89	1.92	1.92	1.91	1.92	1.92	1.94	1.83	2.01	1.91	24	
22	2.02	2.14	2.27	2.18	S	2.17	2.08	1.90	1.85	1.84	1.85	1.86	1.86	1.87	1.91	1.88	1.87	1.88	1.87	1.87	1.86	1.87	1.94	1.93	1.84	2.27	1.95	24	
23	1.93	1.98	1.99	S	1.92	1.90	1.96	1.95	1.92	1.89	1.91	1.92	1.92	1.89	1.95	1.97	1.99	1.97	1.94	1.93	1.95	1.98	2.05	2.05	1.89	2.05	1.95	24	
24	2.02	2.00	S	2.04	1.98	2.00	1.99	2.00	1.98	1.93	1.92	1.94	1.94	1.95	1.93	1.96	1.94	1.92	1.93	1.94	1.94	1.97	1.99	2.07	1.92	2.07	1.97	24	
25	2.14	S	2.05	2.10	2.06	2.03	2.00	1.96	1.95	1.93	1.93	1.95	1.95	1.95	1.97	1.97	1.95	1.93	1.93	1.92	1.97	2.05	2.03	2.14	1.92	2.14	1.99	24	
26	S	2.33	2.40	2.41	2.34	2.57	2.71	2.38	2.05	2.00	2.08	2.04	2.06	2.04	2.03	2.01	1.98	2.01	1.98	2.01	2.01	2.04	2.11	S	1.98	2.71	2.16	24	
27	2.39	2.42	2.41	2.45	2.52	2.58	2.55	2.39	2.26	2.22	2.21	2.22	2.13	2.10	2.09	2.12	2.10	2.09	2.11	2.11	2.18	2.36	S	2.51	2.09	2.58	2.28	24	
28	2.58	2.56	2.66	2.86	2.75	2.53	2.64	2.55	2.30	2.29	2.16	2.12	2.08	2.07	2.07	2.06	2.08	2.08	2.06	2.08	2.12	S	2.18	2.18	2.06	2.86	2.31	24	
29	2.25	2.24	2.23	2.24	2.31	2.31	2.32	2.34	2.31	2.41	2.26	2.07	2.04	2.01	2.00	2.00	2.03	2.05	2.01	2.03	S	1.93	2.08	2.20	1.93	2.41	2.16	24	
30	2.34	2.48	2.40	2.57	2.58	2.51	2.88	2.59	2.36	2.10	1.99	1.94	1.93	1.92	1.90	1.87	1.89	1.90	1.90	S	1.90	2.00	2.06	2.09	1.87	2.88	2.18	24	
31	2.07	2.11	2.23	2.27	2.22	2.25	2.23	2.16	1.99	1.96	2.03	2.00	2.01	1.98	1.95	1.94	1.97	1.95	S	1.96	1.95	2.01	2.05	2.14	1.94	2.27	2.06	24	
HOURLY MAX	2.58	2.56	2.66	2.86	2.75	2.74	2.88	2.59	2.36	2.41	2.26	2.27	2.24	2.25	2.23	2.12	2.10	2.09	2.11	2.11	2.18	2.36	2.18	2.51					
HOURLY AVG	2.11	2.15	2.16	2.18	2.18	2.18	2.18	2.12	2.06	2.02	2.00	1.97	1.96	1.95	1.95	1.94	1.94	1.94	1.95	1.95	1.96	1.98	2.00	2.06					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

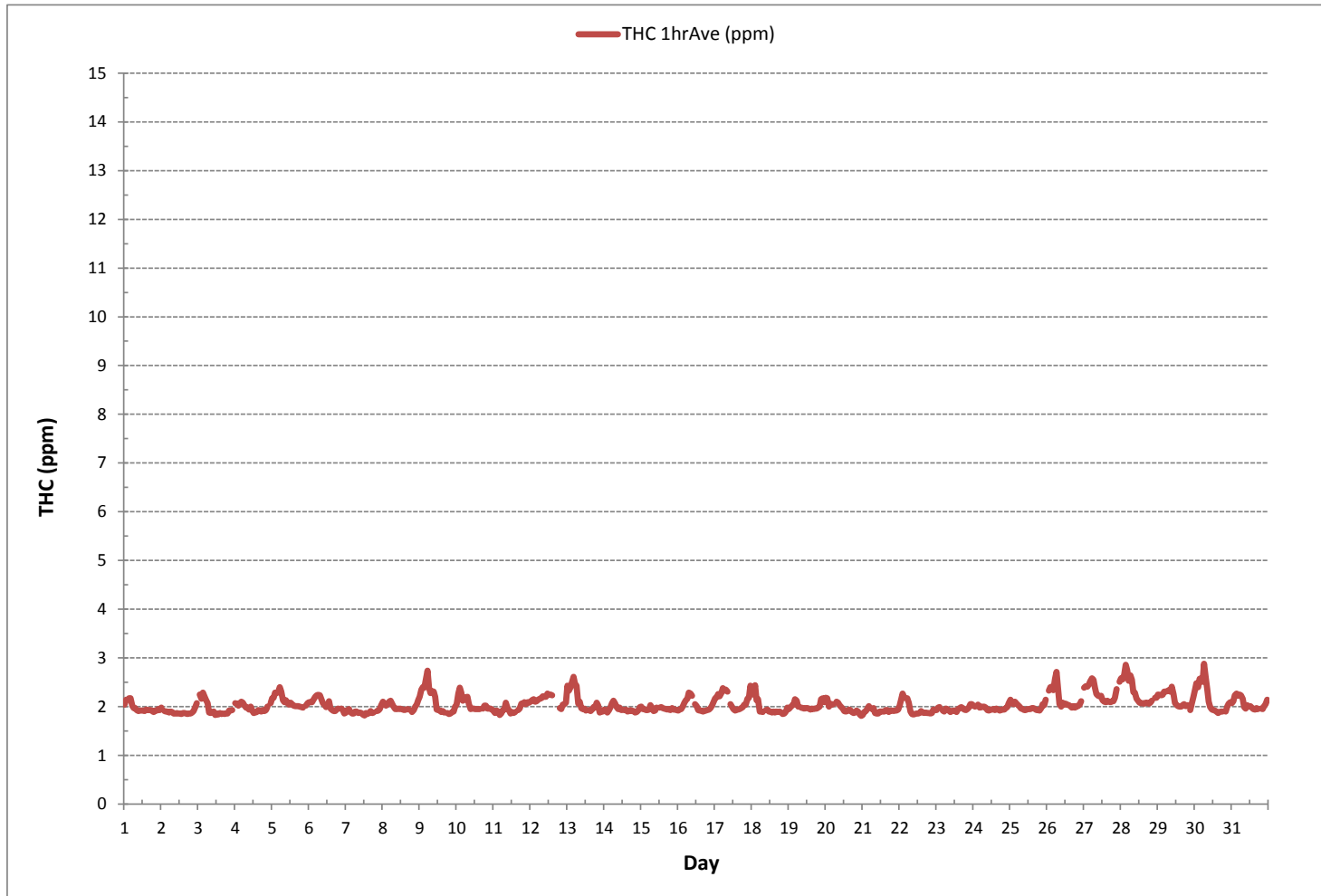
24 HR AVERAGES July 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	708			
MINIMUM 1-HR AVERAGE:	1.81 ppm	@ HOUR	23	ON DAY 20
MAXIMUM 1-HR AVERAGE:	2.88 ppm	@ HOUR	6	ON DAY 30
MAXIMUM 24-HR AVERAGE:	2.31 ppm			ON DAY 28
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0.17	MONTHLY AVERAGE:	2.04	ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)





Wind: LICA MASKWA  
 Poll.: LICA MASKWA-THC [ppm]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.71%

Calm Avg: 2.43 [ppm]

Direction	0.0-1.0	1.0-1.9	1.9-2.9	>2.9	Total
<b>N</b>	0.0	3.8	7.1	0.0	10.9
<b>NE</b>	0.0	3.4	6.1	0.0	9.5
<b>E</b>	0.0	2.7	5.7	0.0	8.3
<b>SE</b>	0.0	0.7	6.1	0.0	6.8
<b>S</b>	0.0	0.6	14.6	0.0	15.1
<b>SW</b>	0.0	4.4	12.0	0.0	16.4
<b>W</b>	0.0	6.4	10.9	0.0	17.2
<b>NW</b>	0.0	5.5	9.6	0.0	15.1
<b>Summary</b>	0.0	27.4	71.9	0.0	99.3

% Icon Classes (ppm)

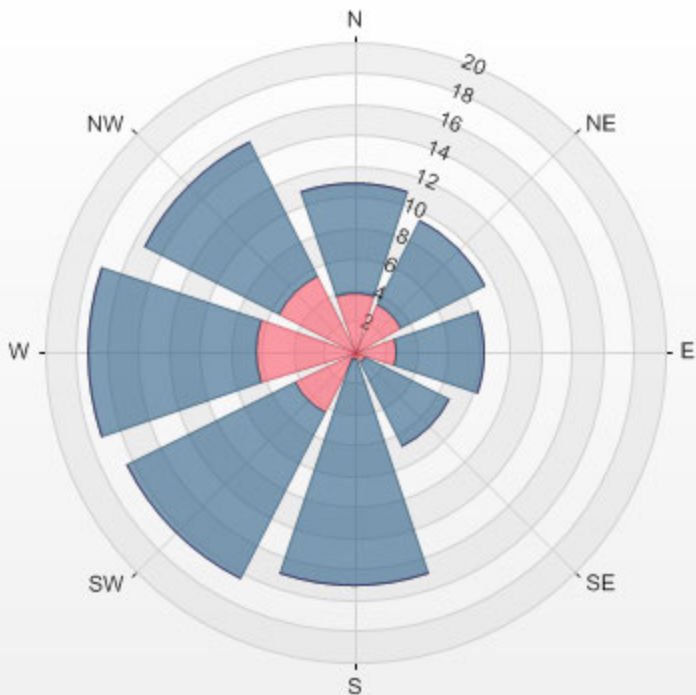
0 0.0-1.0

27 1.0-1.9

72 1.9-2.9

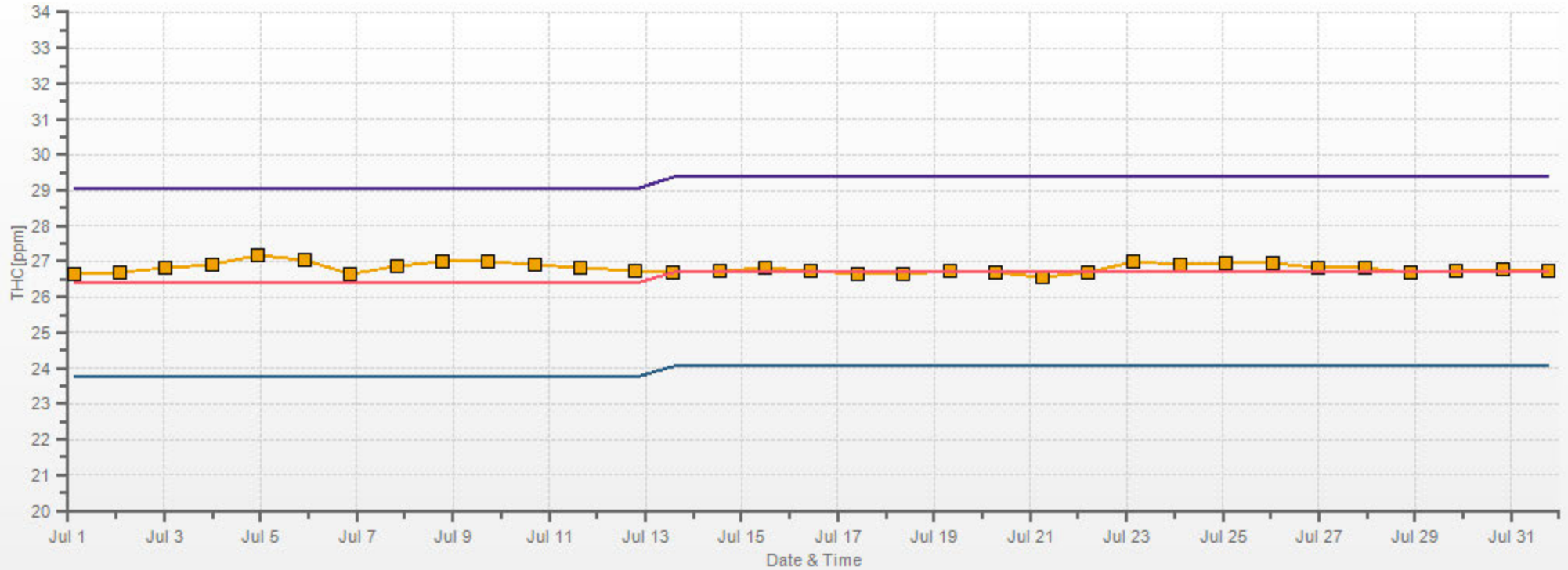
0 >2.9

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.71% Calm Poll Avg: 2.43[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



## ***OXIDES OF NITROGEN***



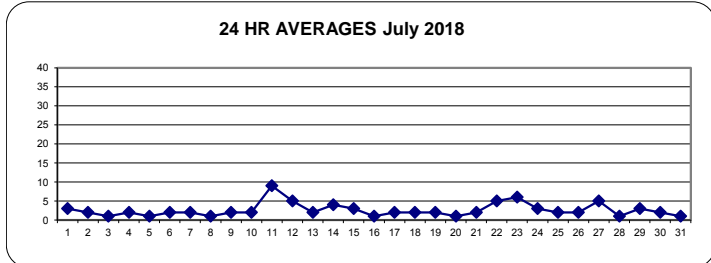
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	3	S	1	12	11	14	10	9	3	0	0	0	0	0	0	0	0	0	0	1	0	9	4	0	14	3	24	
2	13	S	2	1	6	3	5	4	1	1	4	1	1	0	1	2	3	2	0	1	1	1	1	0	0	13	2	24	
3	S	1	0	1	1	0	0	0	0	1	0	0	2	0	3	3	0	0	1	0	0	0	0	S	0	3	1	24	
4	2	0	0	0	2	2	0	1	3	2	1	2	3	3	2	2	1	2	3	1	1	1	S	1	0	3	2	24	
5	1	0	0	1	1	1	3	4	2	1	1	1	1	1	1	1	1	1	1	0	1	S	1	2	0	4	1	24	
6	3	3	3	2	1	2	2	2	2	2	1	1	2	2	1	1	1	1	2	1	S	1	1	1	1	3	2	24	
7	1	2	1	6	2	1	2	3	1	1	1	2	3	1	0	0	2	6	8	S	4	0	0	8	0	8	2	24	
8	8	2	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	1	2	3	0	8	1	24	
9	3	3	3	2	2	2	3	4	4	3	3	1	3	1	1	3	1	S	2	1	0	1	1	1	0	4	2	24	
10	0	1	1	1	1	1	1	3	2	1	4	4	2	2	1	1	S	1	1	1	1	3	5	2	3	0	5	2	24
11	2	2	8	22	10	9	31	27	10	7	6	3	5	0	0	S	1	6	9	3	11	13	16	13	0	31	9	24	
12	18	26	18	3	5	1	1	1	4	1	C	C	C	C	C	C	C	0	0	0	0	0	0	1	0	26	5	24	
13	1	3	4	2	4	2	4	1	2	1	1	1	2	S	2	1	0	3	4	3	6	1	1	2	0	6	2	24	
14	7	6	4	7	4	13	21	16	6	4	7	2	S	0	0	0	0	2	1	0	0	0	0	0	0	21	4	24	
15	0	0	0	0	1	1	9	14	5	4	7	S	4	6	3	2	2	0	1	0	0	1	2	1	0	14	3	24	
16	0	0	0	0	0	1	2	2	2	2	S	1	1	1	1	1	1	1	1	1	1	2	1	2	0	2	1	24	
17	3	3	3	3	5	6	6	7	4	S	2	1	0	0	0	0	0	0	0	2	2	3	1	1	0	7	2	24	
18	1	1	0	1	5	1	6	3	S	2	3	2	1	0	3	1	1	1	1	1	0	2	1	2	0	6	2	24	
19	1	1	3	1	2	3	5	S	2	4	3	5	4	1	2	3	2	2	0	0	0	0	0	0	0	5	2	24	
20	0	0	1	1	0	1	S	0	0	0	0	0	1	1	0	2	2	0	0	0	5	2	2	1	0	5	1	24	
21	1	1	1	0	0	S	5	4	2	1	3	6	2	2	0	0	1	0	1	1	1	1	2	1	0	6	2	24	
22	2	3	6	4	S	3	3	7	7	16	9	12	2	2	9	2	0	0	0	0	0	2	9	13	0	16	5	24	
23	25	15	24	S	22	2	10	5	7	9	5	6	5	3	2	0	0	0	0	0	1	1	1	1	0	25	6	24	
24	2	3	S	4	3	5	4	10	9	10	1	2	0	0	0	0	0	0	1	0	0	0	0	6	0	10	3	24	
25	3	S	1	2	1	1	0	0	7	8	7	7	1	1	1	1	1	1	1	1	1	1	1	1	0	8	2	24	
26	S	3	1	1	1	2	2	2	7	5	5	1	2	2	1	1	1	8	1	2	1	1	1	S	1	8	2	24	
27	1	1	1	1	1	1	3	4	2	1	1	1	1	1	1	6	33	32	8	3	3	5	S	3	1	33	5	24	
28	2	2	2	2	1	1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	S	2	2	1	3	1	24	
29	4	3	5	4	2	3	4	5	5	4	1	1	1	1	1	2	2	3	3	S	1	1	2	1	5	3	24		
30	2	2	1	1	1	3	3	1	7	8	5	1	1	1	0	0	1	1	1	S	1	0	7	3	0	8	2	24	
31	3	3	2	2	1	1	1	1	2	1	0	0	1	1	1	1	0	S	0	1	1	1	1	1	0	3	1	24	
HOURLY MAX	25	26	24	22	22	13	31	27	10	16	9	12	7	6	9	6	33	32	9	3	11	13	16	13					
HOURLY AVG	4	3	3	3	3	3	5	5	4	4	3	2	2	1	1	1	2	2	2	1	2	2	2	3					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

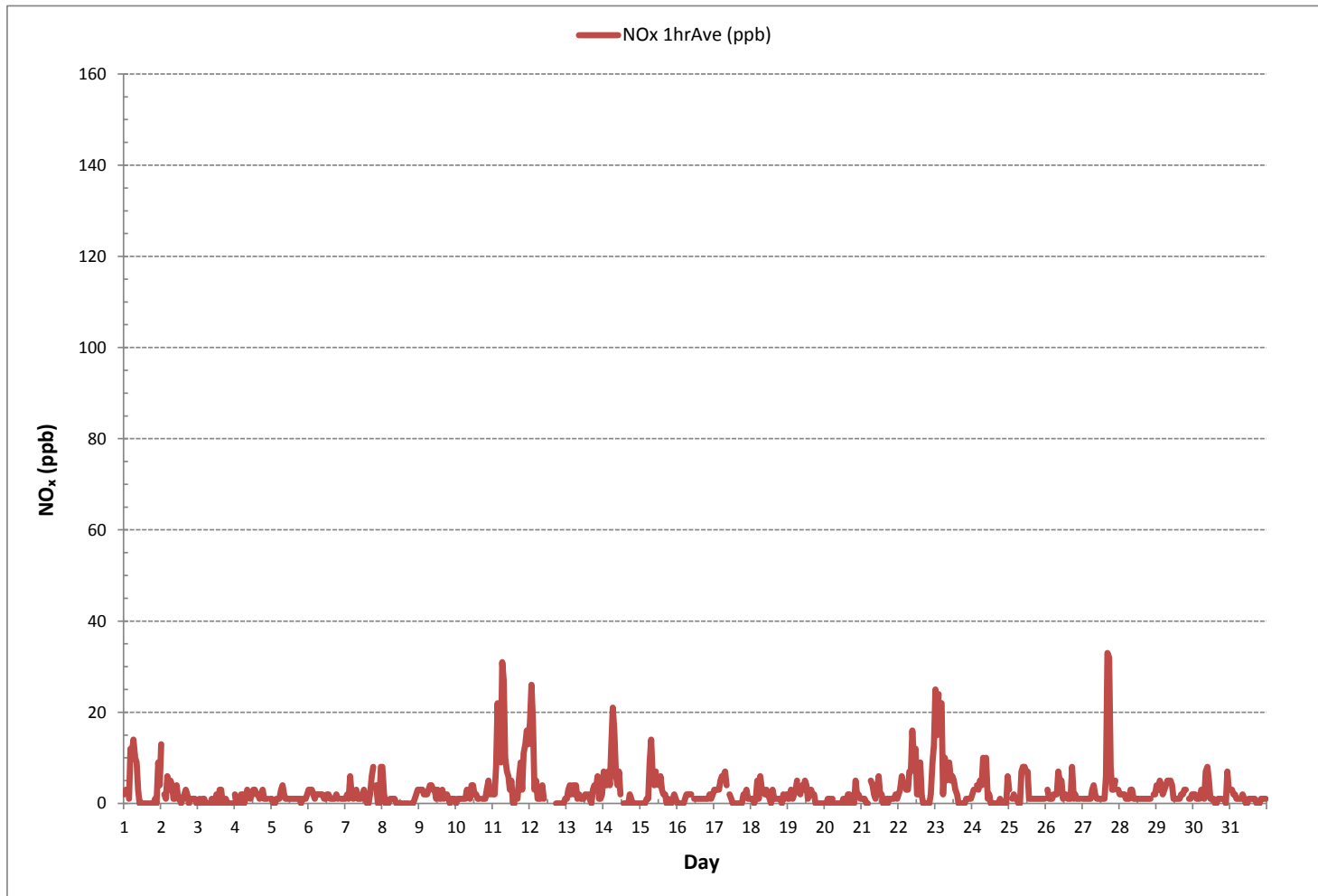
24 HR AVERAGES July 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	558			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	10	ON DAY 1
MAXIMUM 1-HR AVERAGE:	33 ppb	@ HOUR	16	ON DAY 27
MAXIMUM 24-HR AVERAGE:	9 ppb			ON DAY 11
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	4	MONTHLY AVERAGE:	3 ppb	

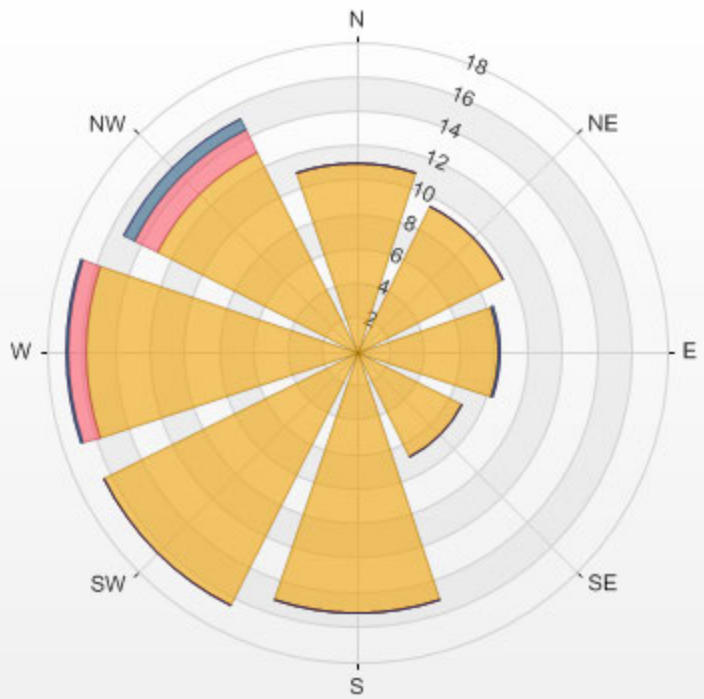
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)





% Icon Classes (ppb) 96 0.0-11.3 3 11.3-22.7 1 22.7-34.0 0 >34.0

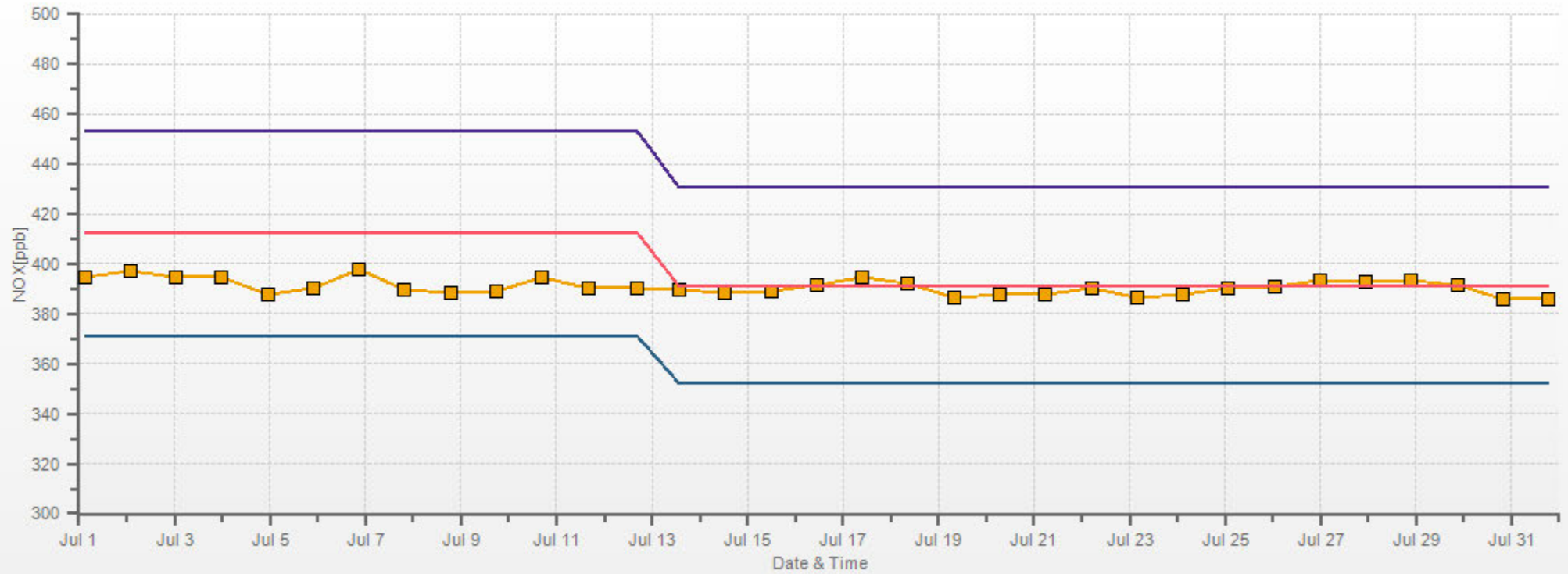
LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.71% Calm Poll Avg: 1.81[ppb]





NOX[ppb] Calibration: LICA MASKWA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***NITRIC OXIDES***

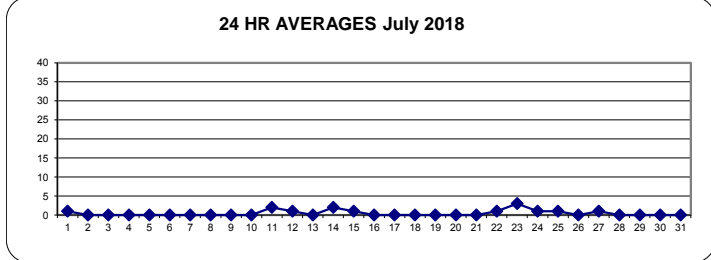
**NITRIC OXIDE Hourly Averages (NO ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	S	0	3	2	4	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
2	2	S	0	0	1	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	1	0	24		
4	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	1	0	0	0	0	S	0	0	0	1	0	24		
5	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24		
6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24		
7	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	2	S	1	0	0	2	0	0	0	2	0	24		
8	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	2	0	24		
9	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	1	0	24		
10	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
11	0	0	1	7	2	2	12	12	3	3	2	1	2	0	0	S	0	2	1	0	1	0	3	2	0	0	0	12	2	24		
12	3	6	3	0	1	0	0	0	1	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	6	1	24		
13	0	0	0	0	1	0	1	0	1	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24		
14	1	2	1	3	2	7	13	9	3	2	3	1	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	13	2	24		
15	0	0	0	0	0	0	4	8	3	2	4	S	2	3	2	1	1	0	0	0	0	0	0	0	0	0	0	8	1	24		
16	0	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
17	0	0	0	0	0	1	1	2	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24		
18	0	0	0	0	1	0	2	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24		
19	0	0	0	0	0	0	1	S	0	2	1	2	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	2	0	24		
20	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
21	0	0	0	0	0	S	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24		
22	0	0	0	0	S	0	1	2	2	7	4	5	1	1	3	1	0	0	0	0	0	0	2	4	0	0	0	7	1	24		
23	11	6	12	S	12	1	5	2	3	5	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	12	3	24		
24	0	0	S	1	0	1	1	5	5	6	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	6	1	24		
25	0	S	0	0	0	0	0	0	3	4	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24		
26	S	0	0	0	0	1	1	1	2	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	S	0	0	2	0	24		
27	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	9	9	1	0	0	0	S	0	0	0	0	9	1	24		
28	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24		
29	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24		
30	0	0	0	0	0	2	2	0	3	2	1	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	3	0	24		
31	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24		
HOURLY MAX	11	6	12	7	12	7	13	12	5	7	4	5	3	3	3	1	9	9	2	0	1	0	3	4	0	0						
HOURLY AVG	1	0	1	0	1	1	2	2	1	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0						

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

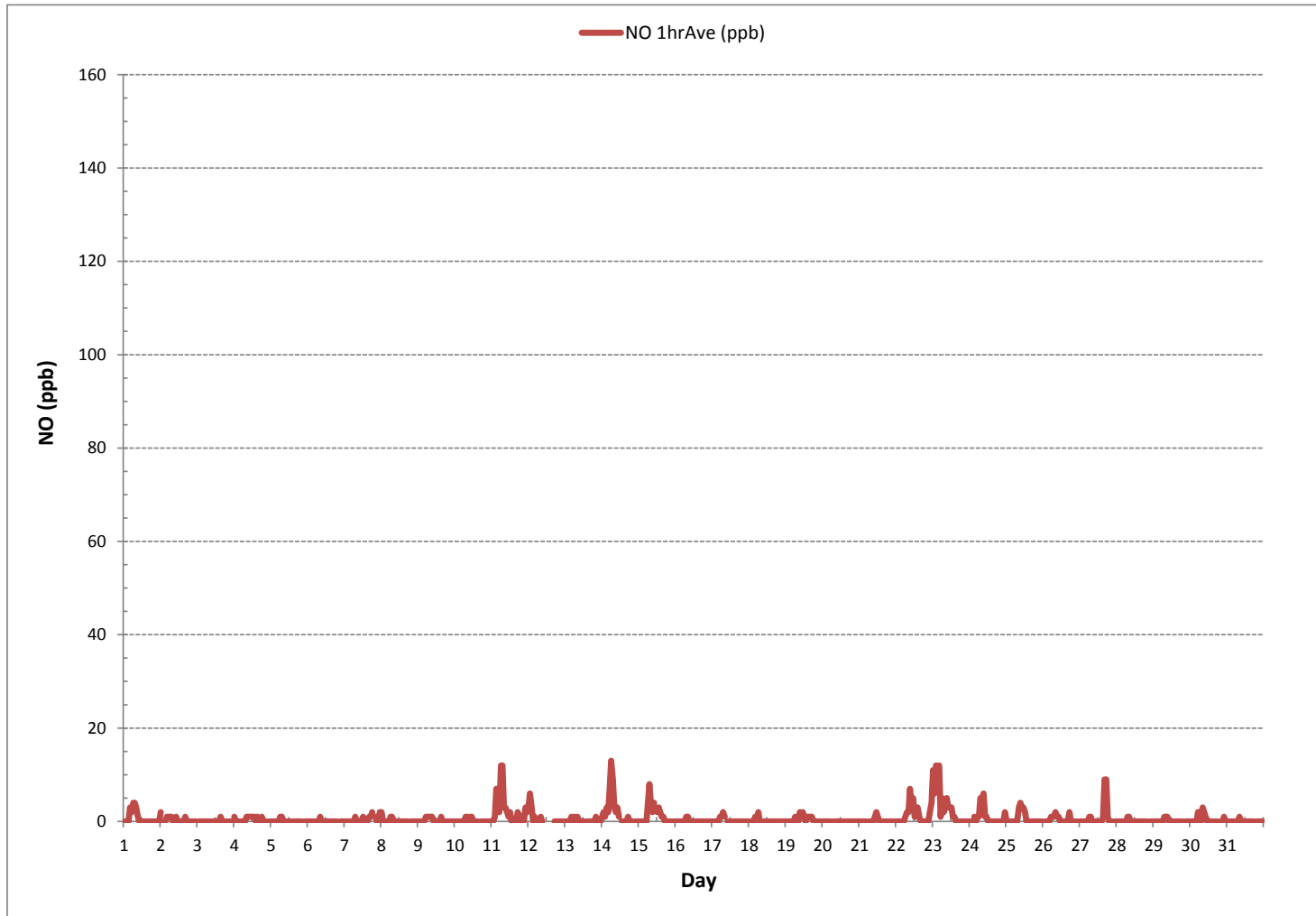
**24 HR AVERAGES July 2018**



**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	179			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	13 ppb	@ HOUR	6	ON DAY 14
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 23
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	1	ppb

**NITRIC OXIDE Hourly Averages (NO ppb)**





% Icon Classes (ppb)

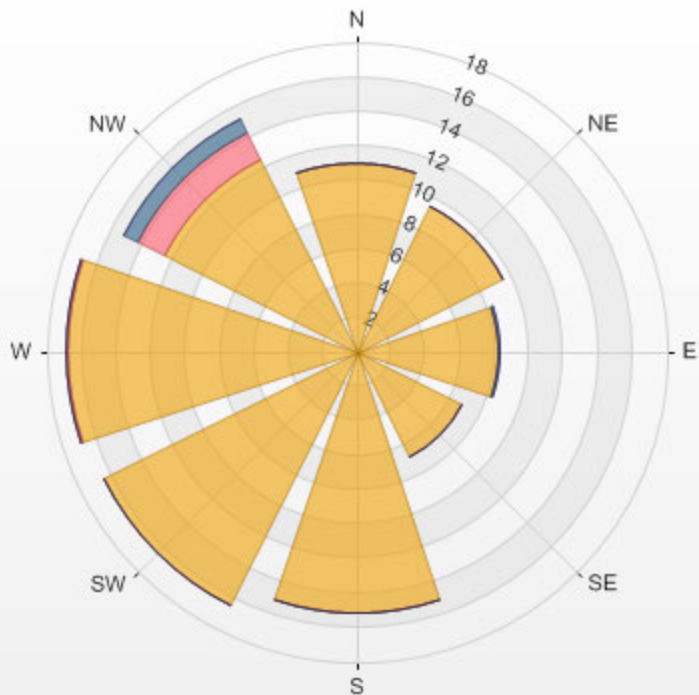
96 0.0-4.7

2 4.7-9.3

1 9.3-14.0

0 >14.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.71% Calm Poll Avg: 0.06[ppb]



***NITROGEN DIOXIDE***

**NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	2	S	1	9	9	10	7	6	2	0	0	0	0	0	0	0	0	0	0	1	0	9	4	0	10	3	24	
2	11	S	2	1	5	3	4	3	1	1	3	1	1	0	1	1	3	2	0	1	1	1	1	0	0	11	2	24	
3	S	1	0	0	1	0	0	0	0	0	0	0	2	0	2	3	0	0	1	0	0	0	0	S	0	3	0	24	
4	1	0	0	0	1	2	0	1	1	1	1	1	2	2	1	2	1	2	3	1	1	1	S	1	0	3	1	24	
5	1	0	0	1	1	1	2	2	1	1	1	1	1	1	1	1	1	0	0	0	1	S	1	2	0	2	1	24	
6	3	3	3	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	S	1	1	1	1	3	2	24
7	1	2	1	6	2	1	2	2	0	1	1	2	2	1	0	0	2	5	6	S	3	0	0	6	0	6	2	24	
8	6	2	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	1	2	3	0	6	1	24	
9	3	3	3	2	1	2	3	3	3	3	2	1	2	1	1	2	1	S	1	1	0	1	1	1	0	3	2	24	
10	0	1	1	1	1	0	1	2	2	1	3	3	2	2	1	1	S	1	1	1	3	5	2	3	0	5	2	24	
11	2	2	7	15	7	7	19	16	7	4	3	2	3	0	0	S	1	4	8	3	9	13	13	11	0	19	7	24	
12	15	19	15	3	4	1	1	1	3	1	C	C	C	C	C	C	C	0	0	0	0	0	0	1	0	19	4	24	
13	1	3	4	2	3	2	3	1	2	1	1	1	2	S	1	1	0	3	3	3	6	1	1	2	0	6	2	24	
14	5	5	3	4	2	6	8	7	2	2	4	1	S	0	0	0	1	1	0	0	0	0	0	0	0	8	2	24	
15	0	0	0	0	0	1	5	6	2	2	3	S	2	3	2	1	1	0	1	0	0	1	2	1	0	6	1	24	
16	0	0	0	0	0	1	2	2	1	1	S	1	1	1	1	1	1	1	1	1	1	2	1	2	0	2	1	24	
17	3	3	3	3	5	5	5	5	4	S	1	1	0	0	0	0	0	0	0	2	2	3	1	1	0	5	2	24	
18	1	1	0	1	4	1	4	3	S	2	2	2	1	0	2	1	1	1	1	1	0	2	1	2	0	4	1	24	
19	1	1	3	1	2	2	4	S	1	3	2	3	2	1	1	2	2	2	0	0	0	0	0	0	0	4	1	24	
20	0	0	1	1	0	1	S	0	0	0	0	0	1	0	0	1	1	0	0	0	5	2	2	1	0	5	1	24	
21	1	1	1	0	0	S	4	4	1	1	2	4	2	1	0	0	1	0	1	1	1	1	2	1	0	4	1	24	
22	2	3	6	4	S	3	3	4	4	9	5	7	2	1	5	1	0	0	0	0	0	2	8	9	0	9	3	24	
23	14	9	12	S	10	1	5	3	4	4	3	3	2	1	0	0	0	0	0	0	1	0	1	1	0	14	3	24	
24	2	3	S	3	3	3	3	5	4	4	1	1	0	0	0	0	0	0	1	0	0	0	0	3	0	5	2	24	
25	3	S	1	2	1	1	0	0	3	4	5	4	1	1	0	0	1	0	0	0	0	1	1	1	0	5	1	24	
26	S	2	1	0	1	1	1	1	4	3	4	1	2	2	1	1	1	6	1	2	1	1	1	S	0	6	2	24	
27	1	1	1	1	1	1	2	3	2	1	1	1	1	1	1	5	24	22	7	3	3	5	S	2	1	24	4	24	
28	2	2	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	S	2	2	1	2	1	24
29	4	3	5	4	2	3	4	5	4	4	3	1	1	1	1	1	2	2	3	3	S	1	1	2	1	5	3	24	
30	2	2	1	1	1	1	1	1	4	6	4	1	1	1	0	0	1	1	1	S	1	0	6	3	0	6	2	24	
31	3	3	2	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	S	0	1	1	1	1	0	3	1	24	
HOURLY MAX	15	19	15	15	10	9	19	16	7	9	5	7	4	3	5	5	24	22	8	3	9	13	13	11					
HOURLY AVG	3	3	3	2	2	2	3	3	2	2	2	2	1	1	1	1	2	2	2	1	1	2	2	2					

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

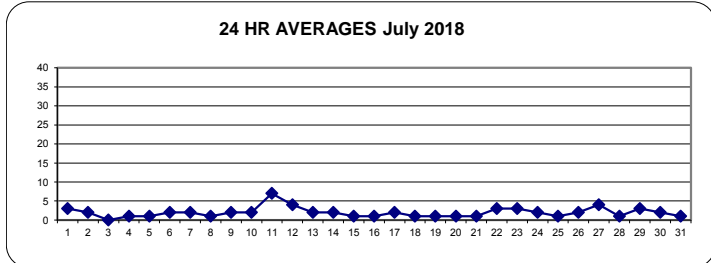
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

**MONTHLY SUMMARY**

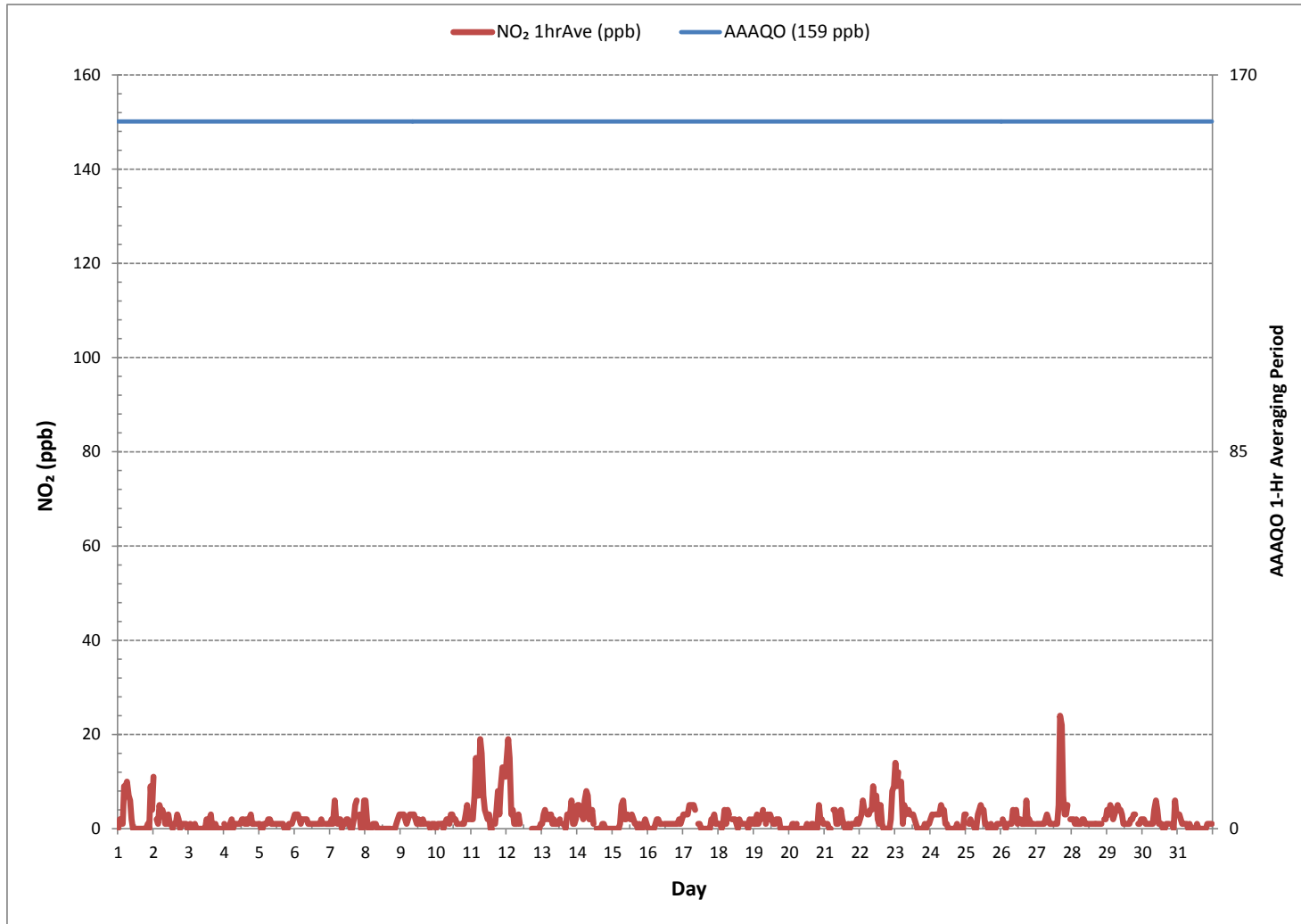
NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	536			
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	10 ON DAY 1
MAXIMUM 1-HR AVERAGE:	24	ppb	@ HOUR	16 ON DAY 27
MAXIMUM 24-HR AVERAGE:	7	ppb		ON DAY 11
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	2 ppb

**24 HR AVERAGES July 2018**





NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)



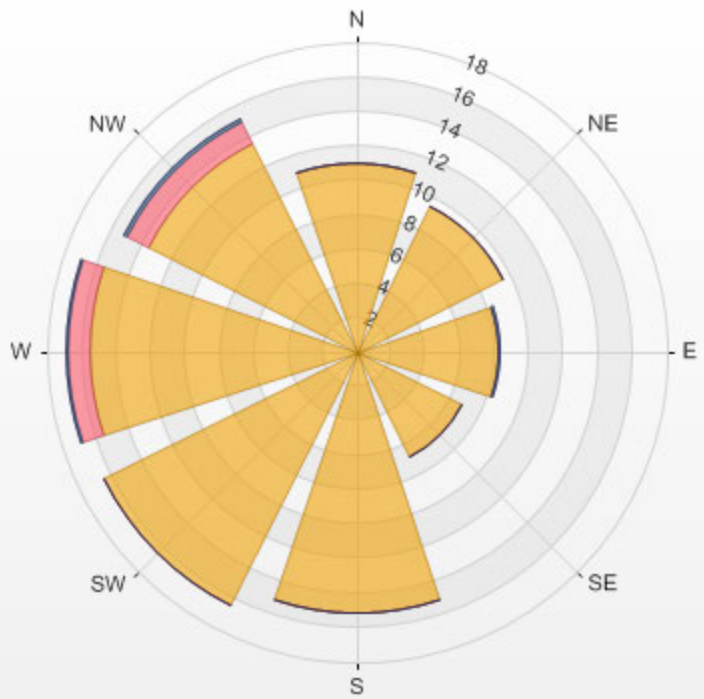
Wind: LICA MASKWA  
 Poll.: LICA MASKWA-NO<sub>2</sub>[ppb]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.71% Calm Avg: 1.76 [ppb]

Direction	0.0-8.3	8.3-16.7	16.7-25.0	>25.0	Total
N	10.9	0.0	0.0	0.0	10.9
NE	9.5	0.0	0.0	0.0	9.5
E	8.2	0.0	0.1	0.0	8.4
SE	6.8	0.0	0.0	0.0	6.8
S	15.2	0.0	0.0	0.0	15.2
SW	16.5	0.0	0.0	0.0	16.5
W	15.5	1.3	0.1	0.0	16.9
NW	13.5	1.4	0.3	0.0	15.2
Summary	96.0	2.7	0.6	0.0	99.3

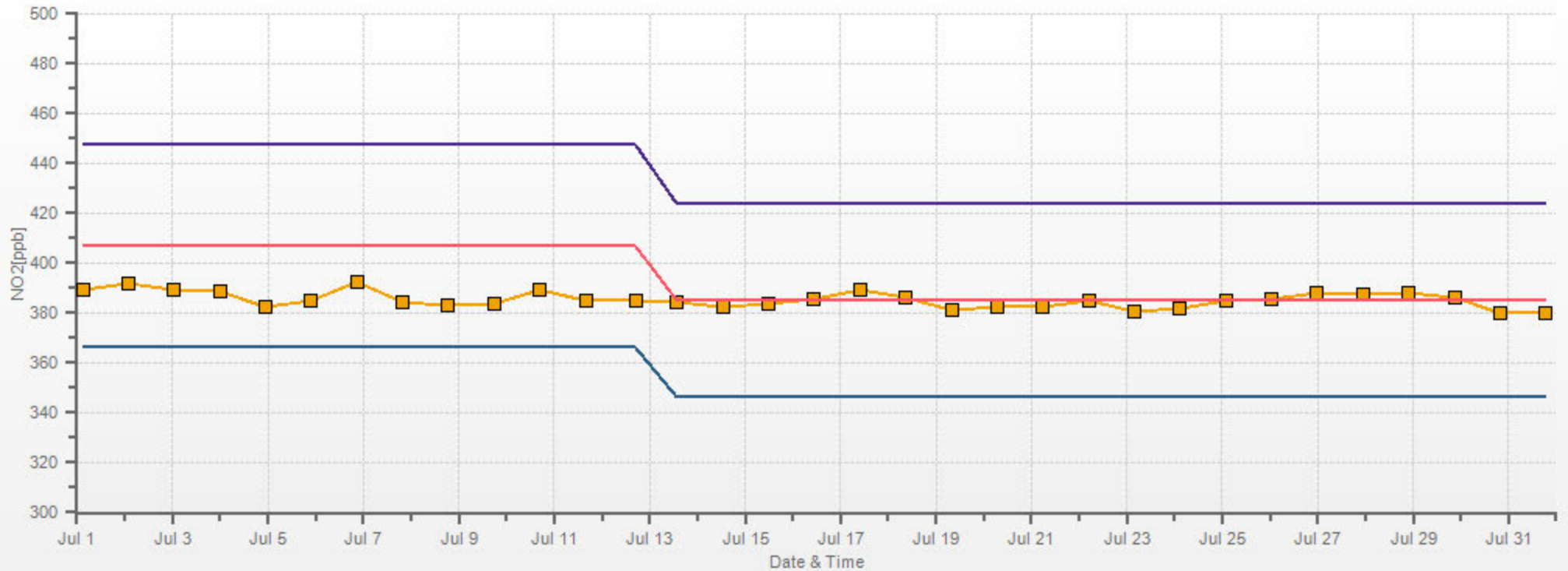
% Icon Classes (ppb)   96   0.0-8.3   3   8.3-16.7   1   16.7-25.0   0   >25.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.71% Calm Poll Avg: 1.76[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***PARTICULATE MATTER 2.5***

**PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
11	X	X	X	X	X	X	X	X	X	X	C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	3																					
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																					
26	X	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	C	X	5	4	2	2	0	0	0	5	3	11																					
27	4	7	9	8	8	14	28	8	2	6	5	8	3	0	10	11	11	16	13	15	6	1	2	3	0	28	8	24																						
28	2	2	6	2	6	24	40	26	0	6	0	6	1	10	18	10	23	20	12	23	12	11	11	14	0	40	12	24																						
29	11	10	8	6	12	19	20	22	24	31	35	23	9	12	27	24	43	51	37	29	11	3	4	2	2	51	20	24																						
30	0	3	7	4	4	23	27	24	50	X	11	12	X	3	0	X	X	2	2	X	X	X	0	1	0	50	10	17																						
31	X	X	X	0	1	12	18	27	X	X	X	X	Y	6	7	3	0	10	8	1	3	1	1	0	0	27	7	14																						
HOURLY MAX	11	10	9	8	12	24	40	27	50	31	35	23	9	12	27	24	43	51	37	29	12	11	11	14																										
HOURLY AVG	4	6	8	4	6	18	27	21	19	14	13	12	4	6	14	13	21	18	13	16	8	4	4	4																										

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

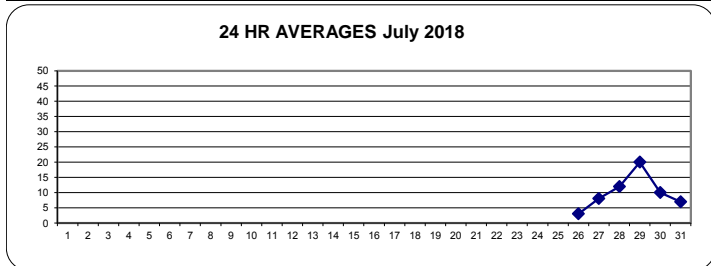
**OBJECTIVE LIMIT:**

<b>ALBERTA ENVIRONMENT:</b>	1-HR	80	µg/m <sup>3</sup>	24-HR	30	µg/m <sup>3</sup>
-----------------------------	------	----	-------------------	-------	----	-------------------

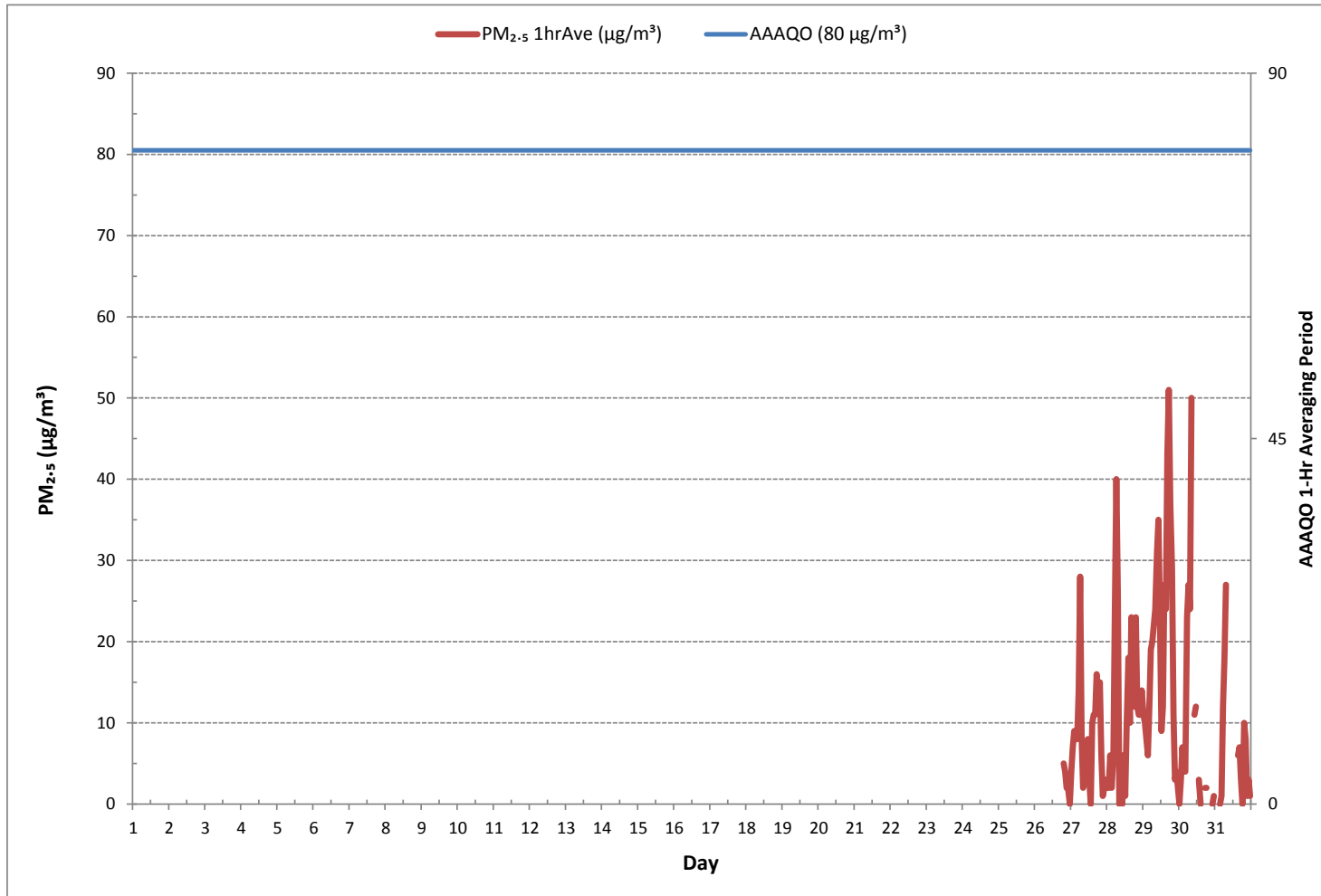
**MONTHLY SUMMARY**

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF 24-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	99					
MINIMUM 1-HR AVERAGE:	0	µg/m <sup>3</sup>	@ HOUR	23	ON DAY	26
MAXIMUM 1-HR AVERAGE:	51	µg/m <sup>3</sup>	@ HOUR	17	ON DAY	29
MAXIMUM 24-HR AVERAGE:	20	µg/m <sup>3</sup>			ON DAY	29
MONTHLY CALIBRATION TIME:	9	hrs	OPERATIONAL TIME:	117 hrs		
STANDARD DEVIATION:	11		AMD OPERATION UPTIME:	15.7 %		
			MONTHLY AVERAGE:	11 µg/m <sup>3</sup>		

**24 HR AVERAGES July 2018**



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)









Wind: LICA MASKWA  
 Poll.: LICA MASKWA-PM<sub>25</sub>[ug/m<sup>3</sup>]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 3.70%

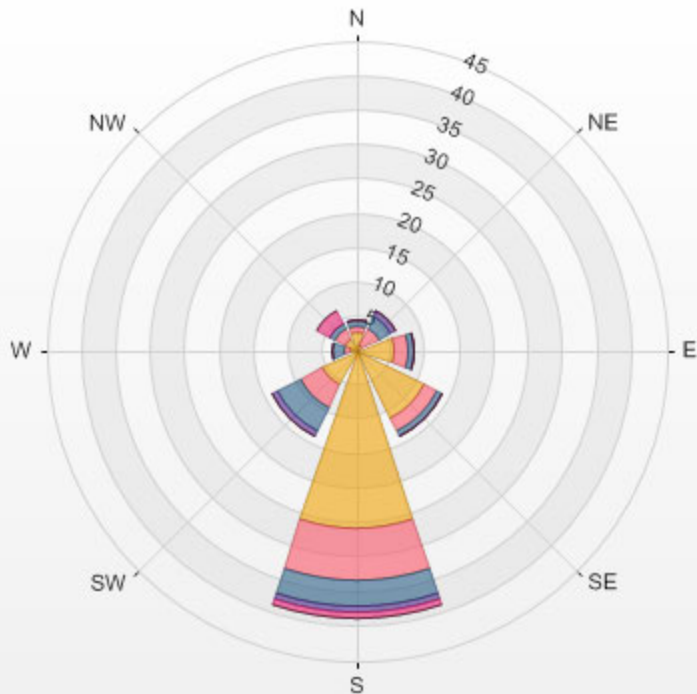
Calm Avg: 4.10 [ug/m<sup>3</sup>]

Direction	0.0-10.4	10.4-20.8	20.8-31.2	31.2-41.6	41.6-52.0	>52.0	Total
<b>N</b>	2.8	0.9	0.9	0.0	0.0	0.0	4.6
<b>NE</b>	0.9	2.8	1.9	0.9	0.0	0.0	6.5
<b>E</b>	5.6	1.9	0.9	0.0	0.0	0.0	8.3
<b>SE</b>	11.1	1.9	0.9	0.0	0.0	0.0	13.9
<b>S</b>	25.9	7.4	3.7	0.9	0.9	0.0	38.9
<b>SW</b>	5.6	3.7	3.7	0.9	0.0	0.0	13.9
<b>W</b>	0.9	0.9	1.9	0.0	0.0	0.0	3.7
<b>NW</b>	1.9	1.9	0.9	0.0	1.9	0.0	6.5
<b>Summary</b>	54.7	21.3	14.8	2.8	2.8	0.0	96.3



% Icon	Classes (ug/m3(L))	55		0.0-10.4	21		10.4-20.8	15		20.8-31.2	3		31.2-41.6	3		41.6-52.0	0		>52.0
--------	--------------------	----	---	----------	----	---	-----------	----	---	-----------	---	---	-----------	---	---	-----------	---	---	-------

LICA MASKWA Poll.: LICA MASKWA-PM25 [ug/m3] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 3.70% Calm Poll Avg: 4.10[ug/m3]



## ***WIND SPEED***



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	4.3	3.7	2.0	1.5	2.1	2.6	5.4	6.3	4.8	4.1	5.0	4.6	4.3	5.7	5.9	7.1	8.7	7.7	4.4	4.9	3.1	3.5	3.1	3.8	1.5	8.7	4.2	24	
2	3.5	3.7	3.2	2.6	2.9	3.9	3.7	3.9	3.3	4.5	3.0	1.8	2.6	1.7	1.5	1.3	1.5	1.5	4.1	2.7	1.0	1.2	1.5	0.4	0.4	4.5	1.9	24	
3	0.6	0.7	0.5	1.4	2.3	3.1	4.4	4.9	5.5	5.3	8.7	5.9	3.3	4.5	7.0	3.6	6.3	4.4	4.7	2.5	0.9	0.9	1.1	0.9	0.5	8.7	3.3	24	
4	1.9	0.8	0.6	0.7	1.7	1.5	2.4	4.4	4.8	5.9	6.4	4.3	2.5	5.0	4.9	2.1	1.2	1.8	1.6	2.6	3.4	2.3	1.3	2.1	0.6	6.4	1.4	24	
5	1.9	2.0	1.5	0.6	0.6	1.7	2.0	3.8	6.6	8.3	9.2	9.5	8.8	9.6	9.0	8.3	9.7	7.5	7.5	6.9	5.4	6.6	6.9	5.4	0.6	9.7	5.4	24	
6	3.9	1.0	0.6	1.5	1.4	2.6	1.7	2.7	5.2	6.0	6.8	7.8	13.3	7.6	6.8	5.7	5.8	5.2	4.6	2.2	3.1	3.4	4.8	2.4	0.6	13.3	2.3	24	
7	4.3	3.8	3.2	5.4	3.4	2.8	4.8	4.8	5.7	5.7	7.3	8.1	7.2	7.7	8.6	8.9	8.4	4.8	7.0	6.6	5.8	4.6	3.1	2.7	2.7	8.9	4.9	24	
8	2.5	2.8	2.8	2.7	2.3	2.0	3.6	3.3	3.7	5.5	6.2	7.2	6.4	6.7	4.9	6.5	4.5	5.0	3.9	2.8	2.6	5.0	5.4	4.7	2.0	7.2	3.9	24	
9	3.1	1.1	1.6	1.3	0.9	1.0	2.7	4.4	4.0	4.8	7.6	7.2	3.0	4.7	4.6	4.5	5.3	5.3	4.1	2.9	2.2	1.9	0.8	0.8	0.8	7.6	1.9	24	
10	1.3	1.2	0.8	1.3	1.6	1.5	2.7	1.0	4.8	6.1	5.0	3.8	4.6	4.3	3.6	3.1	2.4	0.6	0.8	1.4	1.6	5.3	6.7	4.3	0.6	6.7	1.3	24	
11	3.4	3.3	5.2	6.2	4.6	4.4	7.0	5.4	6.2	7.5	6.7	8.2	7.7	9.5	7.4	7.4	6.4	6.6	2.9	3.8	4.9	4.3	4.7	4.7	2.9	9.5	5.1	24	
12	5.5	3.2	3.1	3.6	3.5	4.9	5.7	5.9	6.1	6.8	6.9	7.4	6.3	6.6	7.1	6.6	6.8	6.3	6.8	3.6	2.7	3.0	3.0	2.0	2.0	7.4	4.8	24	
13	0.8	2.4	1.6	1.8	2.0	1.2	2.0	1.7	1.5	2.2	4.6	3.7	1.4	2.0	1.3	1.7	1.7	1.3	1.8	1.4	3.4	3.9	2.7	3.6	0.8	4.6	0.7	24	
14	2.4	3.8	5.3	5.3	4.9	5.8	7.1	6.9	9.3	8.4	6.9	7.6	9.3	8.1	9.0	9.0	9.4	9.4	9.0	7.6	6.4	5.8	5.2	3.4	2.4	9.4	6.7	24	
15	4.9	5.5	5.6	5.5	6.3	7.2	8.4	7.8	6.7	8.8	10.3	8.4	7.9	7.8	6.6	7.2	4.9	4.0	3.5	1.7	2.0	3.2	3.1	3.0	1.7	10.3	4.7	24	
16	3.6	3.2	3.5	2.1	2.9	2.7	3.0	2.9	5.8	8.4	11.2	14.2	13.4	12.9	13.4	12.3	11.0	8.5	7.3	4.9	3.5	5.0	6.9	7.1	2.1	2.1	14.2	6.3	24
17	4.0	2.9	5.7	5.2	4.7	6.5	5.4	4.8	4.8	4.5	5.6	6.0	5.6	5.5	6.0	5.6	4.6	4.0	0.9	2.0	2.1	1.3	0.7	0.7	0.7	0.7	6.5	3.7	24
18	1.8	1.2	2.1	1.2	4.8	6.9	5.1	2.1	3.3	1.8	1.7	3.6	4.6	3.1	0.5	4.3	6.1	6.0	2.9	5.0	7.2	2.6	1.4	2.5	0.5	7.2	0.7	24	
19	2.6	1.7	0.8	2.1	3.1	1.9	4.6	2.3	2.8	4.4	4.1	5.9	5.6	4.1	4.5	4.4	4.2	3.6	4.5	2.3	1.7	0.9	2.4	2.5	0.8	5.9	1.8	24	
20	3.5	2.7	1.4	2.5	1.6	0.9	3.3	4.5	5.3	8.2	8.1	9.4	9.4	10.3	10.7	9.2	12.0	10.8	10.4	6.6	5.8	10.4	7.2	7.6	0.9	12.0	6.3	24	
21	4.7	3.9	2.1	2.8	2.2	0.8	1.9	2.2	4.9	6.2	3.6	4.4	3.9	3.4	3.8	4.3	3.1	2.2	4.6	7.5	2.4	4.7	2.3	1.8	0.8	7.5	1.3	24	
22	3.0	5.8	4.5	4.1	4.4	5.1	4.6	4.8	6.8	7.5	8.4	8.4	9.9	9.4	10.7	9.5	9.6	8.3	8.8	8.0	6.3	4.6	5.1	5.5	3.0	10.7	4.8	24	
23	6.8	6.3	6.8	6.3	6.9	7.1	7.1	5.1	6.4	8.0	8.1	9.4	9.0	8.0	8.0	8.7	8.5	7.8	9.9	8.4	5.6	4.1	3.3	3.2	3.2	9.9	6.0	24	
24	3.5	3.0	1.2	1.6	3.2	3.2	4.2	4.5	5.7	5.4	6.0	6.1	7.0	10.0	8.8	11.7	10.1	9.0	4.8	4.4	4.0	3.4	1.2	1.0	1.0	11.7	4.4	24	
25	1.1	1.1	2.0	0.9	3.6	2.8	3.0	2.4	0.7	3.2	2.6	1.3	3.0	5.0	5.5	4.0	4.2	4.3	2.6	1.7	1.6	1.0	1.7	1.1	0.7	5.5	1.3	24	
26	2.6	1.7	1.2	1.0	0.7	1.3	1.1	1.3	1.9	0.4	2.9	3.8	1.9	1.0	1.7	3.2	1.9	2.1	1.2	2.0	3.3	1.1	1.1	1.3	0.4	3.8	0.6	24	
27	0.5	0.3	0.9	0.8	1.4	0.6	1.0	2.4	4.5	3.0	4.4	6.4	5.9	5.3	5.2	4.1	1.0	0.9	1.3	1.9	1.0	2.1	1.1	0.1	0.1	6.4	1.7	24	
28	1.2	0.4	0.2	1.2	0.4	0.7	1.0	1.7	3.7	4.5	6.9	6.3	6.5	6.6	7.1	6.9	7.3	7.9	6.9	4.4	4.5	5.1	5.2	5.6	0.2	7.9	4.0	24	
29	5.1	4.7	4.9	5.4	6.1	5.7	5.9	5.5	4.2	5.1	4.5	5.0	5.6	4.5	6.5	3.0	2.6	3.1	0.6	5.4	2.9	1.0	0.8	1.5	0.6	6.5	2.8	24	
30	0.3	2.5	1.1	0.7	1.7	1.2	2.7	2.0	1.7	1.6	6.1	7.0	5.0	4.0	10.0	12.0	8.5	6.3	11.0	8.9	4.0	1.6	1.8	2.1	0.3	12.0	3.3	24	
31	1.3	0.5	0.3	1.2	0.6	1.8	2.3	3.3	2.0	3.7	3.0	2.8	4.4	7.6	7.4	5.5	6.6	7.3	6.6	3.8	3.4	4.7	4.6	5.7	0.3	7.6	2.8	24	
HOURLY MAX	6.8	6.3	6.8	6.3	6.9	7.2	8.4	7.8	9.3	8.8	11.2	14.2	13.4	12.9	13.4	12.3	12.0	10.8	11.0	8.9	7.2	10.4	7.2	7.6					

STATUS FLAG CODES

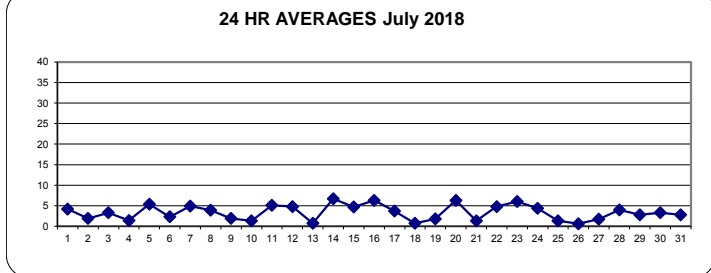
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	January 9, 2018
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

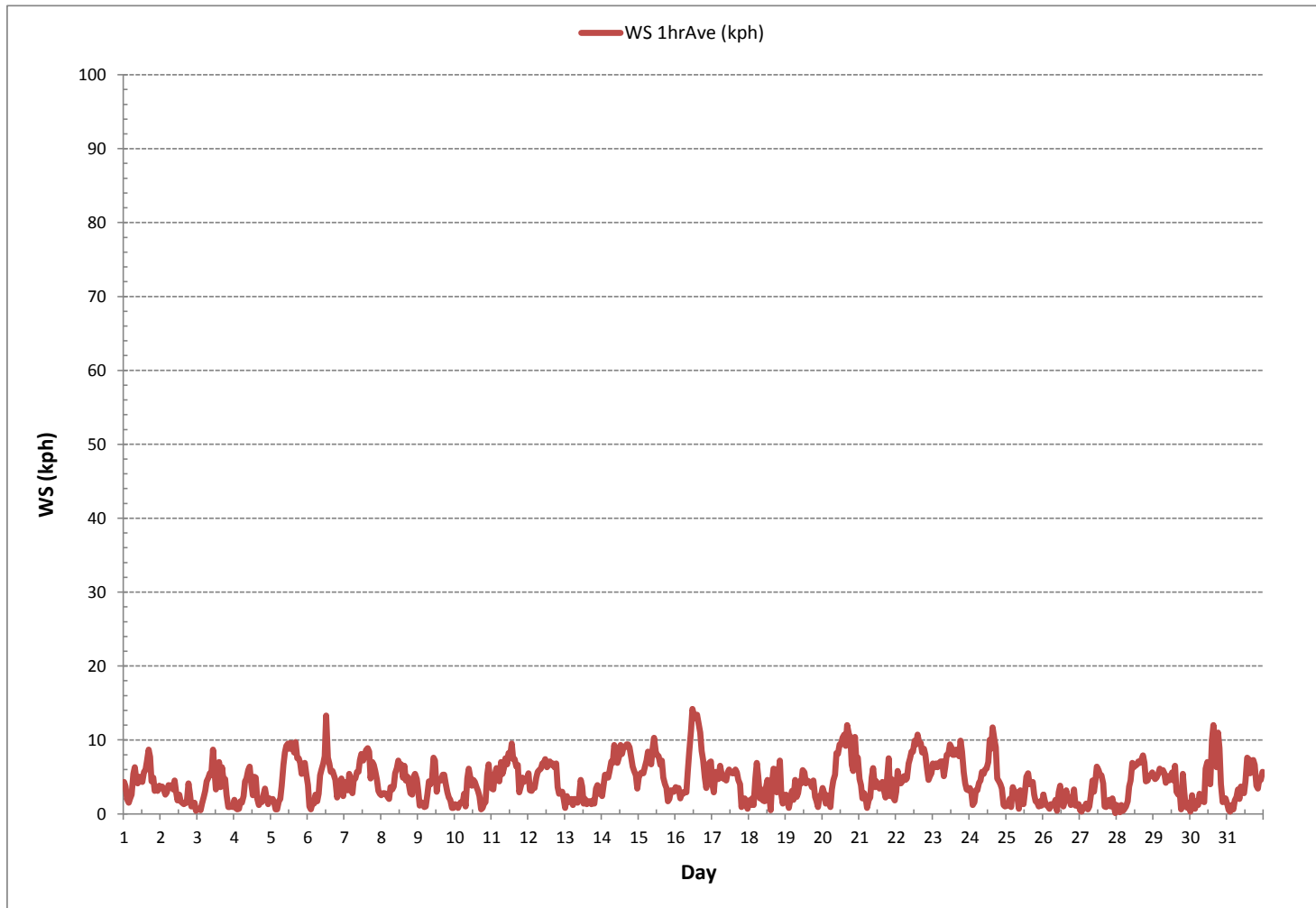
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 23 ON DAY 27
MAXIMUM 1-HR AVERAGE:	14.2 kph @ HOUR 11 ON DAY 16
MAXIMUM 24-HR AVERAGE:	6.7 kph ON DAY 14
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMT OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.7
MONTHLY AVERAGE:	1.3 kph

24 HR AVERAGES July 2018



WIND SPEED Hourly Averages (WS kph)



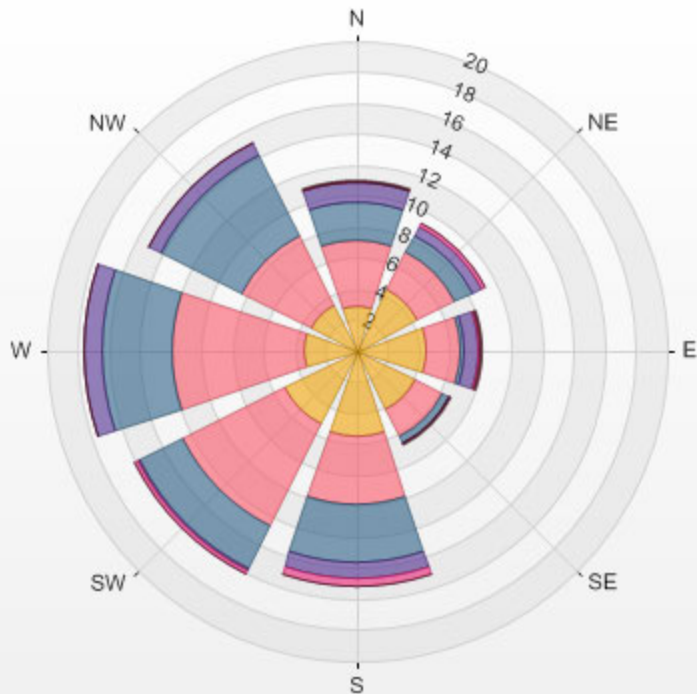
Wind: LICA MASKWA  
 Monitor: WSP [kph]  
 Monthly: 18/07  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.67%

Direction	0.4-2.9	2.9-5.7	5.7-8.6	8.6-11.4	11.4-14.3	>14.3	Total
<b>N</b>	3.0	4.2	2.4	1.3	0.0	0.1	11.0
<b>NE</b>	4.4	2.7	1.2	0.7	0.3	0.0	9.3
<b>E</b>	4.6	2.2	0.3	0.9	0.1	0.1	8.2
<b>SE</b>	4.3	1.9	0.5	0.0	0.0	0.1	6.9
<b>S</b>	5.5	4.4	3.8	0.9	0.5	0.0	15.2
<b>SW</b>	5.2	7.4	3.1	0.1	0.3	0.0	16.1
<b>W</b>	3.4	8.6	4.4	1.2	0.0	0.0	17.6
<b>NW</b>	3.2	5.1	5.8	0.9	0.0	0.0	15.1
<b>Summary</b>	33.6	36.4	21.5	6.2	1.2	0.4	99.3

% Icon	Classes (kph)	34		0.4-2.9	36		2.9-5.7	22		5.7-8.6	6		8.6-11.4	1		11.4-14.3	0		>14.3
--------	---------------	----	---	---------	----	---	---------	----	---	---------	---	---	----------	---	---	-----------	---	---	-------

LICA MASKWA 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.67% Calm Wind Avg Speed: 0.26(kph)



***WIND DIRECTION***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - July 2018

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.		
DAY 1	SSW	SSW	SSW	SW	WNW	WSW	WNW	WNW	WNW	W	W	W	WSW	WSW	W	W	WNW	WNW	W	W	W	W	W	W	W	W	24	
2	WNW	W	SW	SW	W	W	WNW	WNW	W	WNW	NNW	W	NNW	NNW	NNW	WNW	W	SSW	SSW	WNW	SE	SE	SSE	W	W	24		
3	ENE	ENE	NE	ESE	ENE	ENE	NE	NE	ENE	ENE	ENE	NE	NE	ENE	E	E	ENE	NE	ENE	NE	ENE	E	ENE	NNE	ENE	ENE	24	
4	ENE	NNE	E	NW	WNW	N	N	NNW	NNW	N	N	NNW	NW	NW	NW	WSW	SSE	SE	S	WSW	SSW	SSW	SSW	SSW	NNW	W	24	
5	S	S	SSE	SE	S	NE	S	SSW	SSW	SSW	S	SSW	SSW	SSW	S	S	SSE	SSE	SSE	SSE	SSE	SE	SE	SSE	S	W	24	
6	SSE	SSE	ENE	ENE	ENE	ESE	N	ENE	ESE	ESE	SE	SSE	SSW	SW	SW	SW	SW	SW	WNW	WNW	WSW	W	W	WSW	SSW	W	24	
7	SW	SW	WSW	W	WSW	WSW	SW	SW	W	W	WSW	WSW	SW	WSW	WSW	W	WNW	W	WNW	WNW	NNW	NNW	W	W	W	W	24	
8	WSW	WSW	SW	SW	SW	W	W	W	WSW	SW	WSW	WSW	WSW	W	WSW	W	W	W	WSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	W	24
9	SSW	S	SSW	SSW	ENE	NE	S	S	SSW	SSW	S	SSE	NE	NE	E	E	ENE	ENE	ENE	SE	ESE	ESE	ENE	ENE	SE	W	24	
10	ESE	ESE	E	E	E	ENE	NE	E	NNE	ENE	ESE	ESE	ESE	E	ESE	SE	SE	S	SW	WNW	W	SSW	SSW	WSW	ESE	W	24	
11	WSW	WSW	WNW	NW	NW	NW	WNW	NW	WNW	WNW	WNW	NW	NW	N	NNW	NW	N	NNW	WNW	W	WNW	W	WNW	W	NW	W	24	
12	WNW	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	W	W	WSW	W	WSW	W	W	W	SSW	SSW	SSW	SSW	SSW	SSW	W	W	24
13	SE	S	S	E	SW	W	SW	W	NW	W	SW	W	NW	NE	NE	E	NNE	SSW	NE	WNW	WNW	N	N	NNW	WNW	W	24	
14	WNW	NW	NNW	NW	NW	WNW	WNW	NW	WNW	WNW	WNW	WNW	W	W	W	W	WNW	WNW	WNW	WNW	W	W	W	WSW	WNW	W	24	
15	W	W	W	W	W	WNW	WNW	NW	WNW	WNW	WNW	NW	NW	WNW	NW	WNW	WNW	WNW	NNW	NNE	ESE	ENE	E	E	WNW	W	24	
16	ESE	ESE	ESE	SE	ESE	ESE	SE	SSE	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	SSW	S	W	24	
17	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	W	S	S	SE	SSE	SSW	W	24
18	E	N	NNE	NW	NW	N	N	N	NNE	SW	NE	E	E	SSW	SSW	SSW	SSW	SSW	SSW	ENE	NE	ESE	WSW	SSW	NE	W	24	
19	SW	W	ENE	ENE	SE	SSE	SSW	WNW	NNW	NNW	NNW	NW	NW	NW	NW	NW	NW	N	NNE	ENE	ENE	ENE	ENE	ENE	NNW	W	24	
20	NE	ENE	E	NE	E	NNE	NNE	NE	NE	NE	ENE	ENE	ENE	ENE	E	E	E	ENE	ENE	NNE	NE	ENE	NE	ENE	ENE	W	24	
21	NE	NNE	NNE	ENE	NE	WSW	WNW	NW	NNE	NNE	NW	NW	NW	NNW	W	SSW	WSW	SW	SW	SSW	W	W	SSW	W	WNW	W	24	
22	SSW	SSW	SSW	SW	SSW	S	SSW	WNW	WNW	NW	NW	NW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NW	WNW	WNW	NW	W	24	
23	NW	WNW	WNW	WNW	NW	NW	NW	W	WNW	WNW	WNW	NW	NW	NW	NW	N	N	NNE	NNE	NNE	NNE	NNE	N	NNE	N	NNW	W	24
24	NNW	N	SW	NNW	NNW	WNW	WNW	NW	NW	NW	NNW	NNW	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	N	W	N	N	W	24	
25	NW	NNW	N	NNE	NNE	N	N	NNE	NW	SW	WNW	SW	SW	SW	SW	WSW	WSW	SW	W	SSW	S	S	SSW	SSW	WSW	W	24	
26	SSW	SSW	ESE	S	S	S	NE	NE	NNW	NNW	S	S	WSW	W	NNW	N	NNE	E	ESE	SE	SSE	S	SSE	SE	SSE	W	24	
27	SE	E	S	SE	SE	SSE	WSW	S	SSW	S	SSW	S	SSE	SE	SSE	NNW	WNW	ENE	SE	SE	SE	SE	SE	W	SSE	W	24	
28	ESE	SSE	SE	ESE	E	ENE	ENE	SSW	SSW	SSW	S	SSW	SSW	SSW	S	S	SSW	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	W	24
29	SSW	SSW	SW	SSW	SSW	SSW	SSW	SW	SW	SSW	SW	WSW	W	WSW	W	NW	NNW	NNW	S	NNE	NNE	S	SE	S	SSW	W	24	
30	SSE	S	SSE	SE	E	SSE	NE	ESE	S	WSW	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNW	WNW	NNW	NNW	NNW	NNE	W	24
31	N	E	NE	ESE	ENE	ENE	ENE	NE	E	S	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSE	SSE	S	S	S	S	W	24	

STATUS FLAG CODES

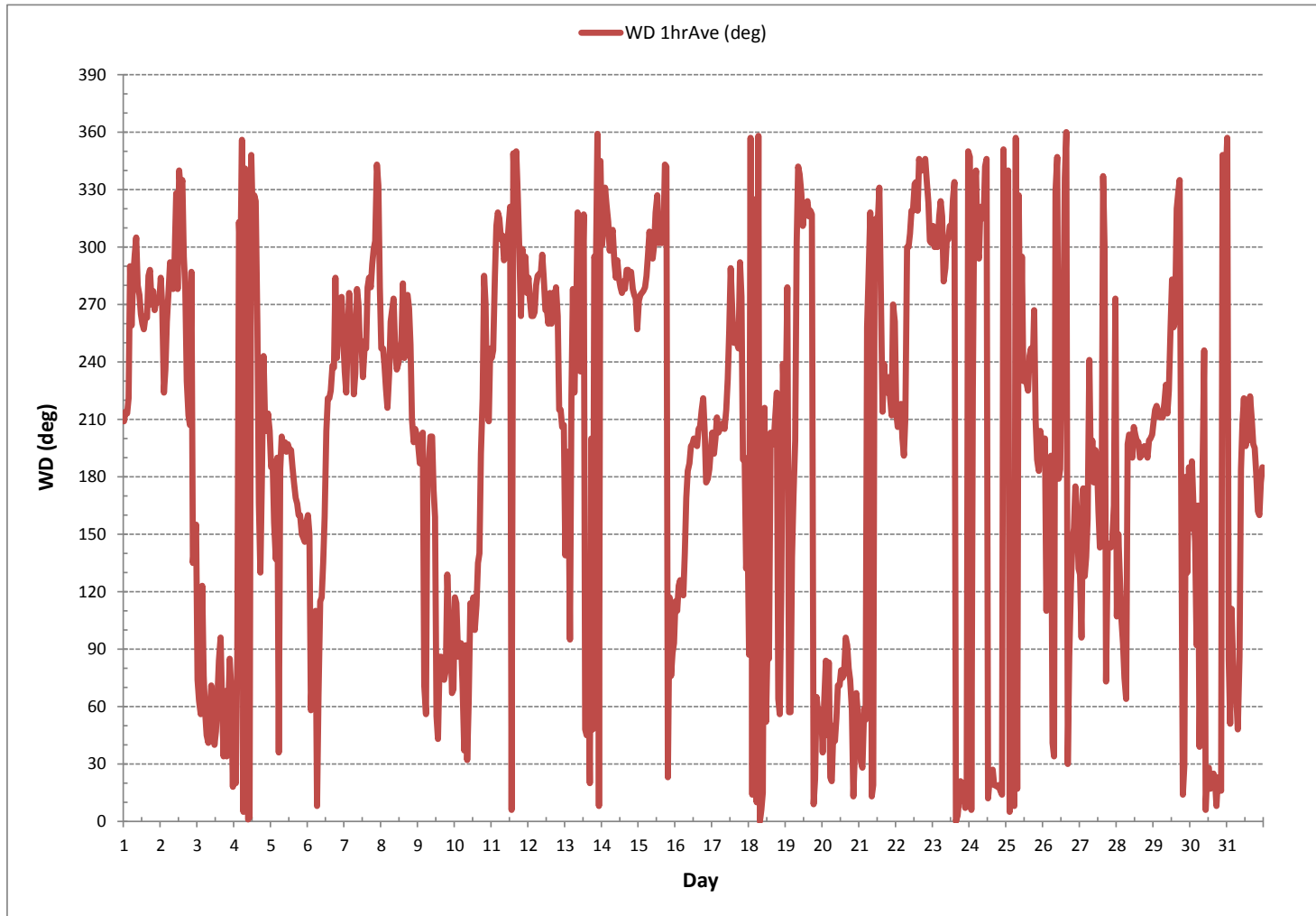
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	January 9, 2018
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	100		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	273	(W)



WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - July 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59		
DAY																										
1	17	21	33	37	44	39	32	33	36	42	40	44	41	42	39	39	33	32	36	31	34	32	36	31	24	
2	35	33	24	31	33	35	34	33	36	30	45	54	45	47	45	49	49	58	26	19	57	45	33	66	24	
3	58	57	18	44	25	23	19	20	30	38	38	27	39	30	34	40	27	22	32	20	53	53	47	50	24	
4	35	55	57	55	37	42	38	34	34	34	36	43	54	35	41	60	71	63	45	36	12	18	28	27	24	
5	28	15	37	58	14	20	44	29	21	23	25	27	26	24	28	31	28	27	25	24	19	18	21	22	24	
6	21	50	61	33	55	53	54	42	30	32	33	32	24	35	34	41	38	38	34	36	37	36	40	43	24	
7	34	31	33	29	35	36	26	32	38	41	34	42	32	37	35	33	38	33	31	31	40	34	44	40	24	
8	32	32	30	28	27	37	33	42	44	39	38	36	39	38	39	39	40	39	39	39	28	10	11	11	24	
9	13	44	38	49	52	50	32	28	29	29	25	25	45	38	33	35	30	33	29	33	29	34	54	55	24	
10	31	51	43	43	28	48	19	67	35	32	36	52	43	40	39	23	19	50	59	42	52	37	26	34	24	
11	33	45	30	31	33	34	29	32	32	30	30	36	36	32	37	38	37	33	36	33	29	31	31	31	24	
12	28	35	37	31	32	30	30	32	32	32	37	38	41	43	38	37	37	38	32	34	21	22	20	27	24	
13	65	28	32	31	44	53	36	50	56	57	38	36	57	43	58	49	55	62	55	57	40	35	39	38	24	
14	43	39	36	33	37	33	32	33	31	32	34	31	33	33	31	32	31	30	31	31	30	30	30	35	24	
15	30	30	30	30	27	29	29	32	35	32	32	35	38	38	39	37	39	39	37	38	52	26	34	28	24	
16	31	30	27	36	22	31	34	41	27	26	21	21	20	23	20	23	23	28	26	18	12	14	17	16	24	
17	27	28	15	17	14	14	18	20	21	30	37	41	40	45	42	41	40	40	35	55	26	19	55	62	24	
18	31	46	45	51	35	26	39	44	29	51	52	44	39	41	75	36	33	27	39	43	24	41	41	26	24	
19	29	39	69	44	30	48	20	54	47	38	45	38	37	46	37	45	41	47	28	35	30	48	22	23	24	
20	13	26	61	20	55	62	26	22	18	26	31	32	32	31	31	34	29	27	26	48	50	19	27	28	24	
21	41	22	31	28	23	62	44	50	29	25	42	37	40	50	49	36	38	38	32	34	36	24	41	45	24	
22	24	18	18	20	16	17	22	36	33	32	35	35	35	38	35	36	37	36	37	37	35	41	36	33	24	
23	33	30	29	29	31	31	32	34	30	34	36	33	36	35	38	32	32	28	21	19	19	30	24	35	24	
24	33	40	45	55	40	36	38	39	37	36	40	38	33	22	26	17	24	20	20	19	22	21	40	47	24	
25	44	51	34	54	27	35	33	40	71	40	47	65	45	34	37	44	39	37	40	39	41	31	21	36	24	
26	17	23	47	41	52	44	41	46	48	76	50	33	56	66	62	38	33	36	42	23	13	50	51	38	24	
27	56	65	44	36	23	63	53	25	20	40	37	32	36	36	40	42	59	54	35	24	51	27	49	75	24	
28	36	55	71	43	64	41	29	54	37	34	27	29	29	31	31	27	26	21	19	15	13	12	13	14	24	
29	14	18	19	16	16	17	17	23	30	25	36	42	38	46	36	58	50	50	70	38	61	62	69	53	24	
30	71	30	50	58	34	46	25	54	53	62	42	17	19	31	21	18	22	32	17	19	18	37	37	34	24	
31	39	67	72	45	64	27	23	24	22	43	27	50	37	27	21	35	26	21	21	16	12	15	19	19	24	

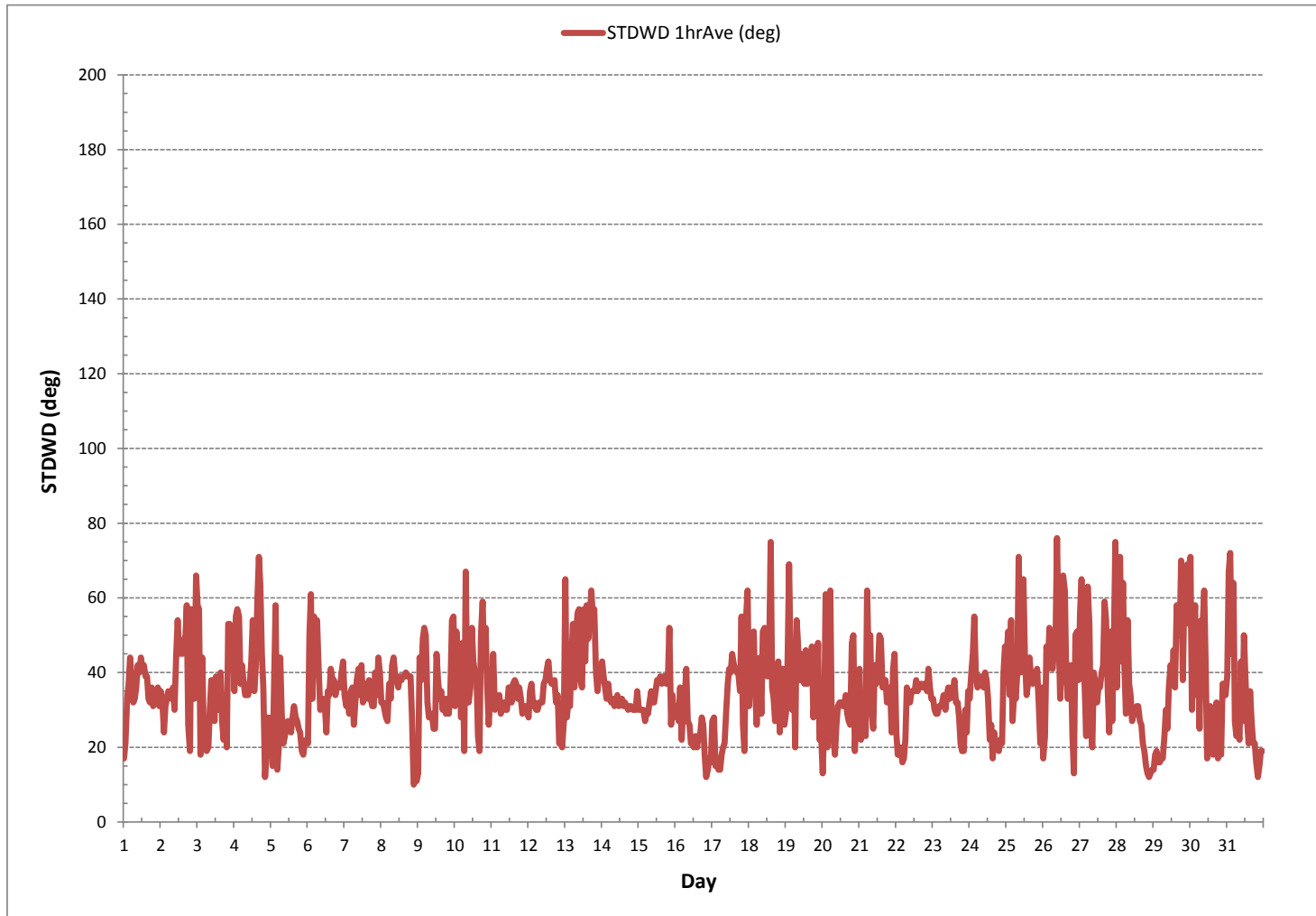
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: January 9, 2018

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



***RELATIVE HUMIDITY***



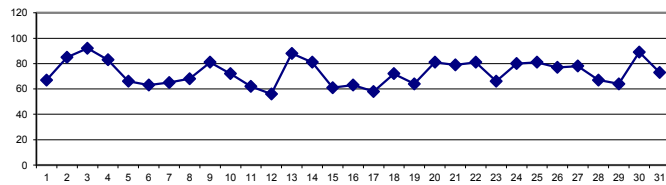
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	90	93	96	95	90	86	77	70	65	59	53	50	52	46	45	43	47	50	55	57	65	70	76	81	43	96	67	24	
2	83	92	97	98	97	94	91	87	85	81	75	73	83	91	88	80	72	68	62	74	85	95	99	100	62	100	85	24	
3	100	100	100	100	100	99	99	94	81	72	72	91	91	88	79	92	82	77	88	96	98	100	100	100	72	100	92	24	
4	100	100	100	100	100	97	88	82	79	76	68	66	78	73	61	58	69	71	78	70	83	94	97	98	58	100	83	24	
5	100	100	100	100	100	93	83	74	65	60	53	47	49	48	46	43	41	41	43	47	56	61	64	66	41	100	66	24	
6	71	83	91	95	92	86	83	79	64	60	59	56	53	54	48	42	38	39	40	54	57	55	49	56	38	95	63	24	
7	53	61	70	60	59	62	59	59	47	44	48	59	53	50	47	45	52	88	89	82	87	96	94	97	44	97	65	24	
8	97	99	100	100	99	97	89	77	68	60	52	47	47	46	47	42	44	42	43	48	65	76	75	83	42	100	68	24	
9	89	96	98	98	98	90	72	67	64	73	83	86	94	94	80	64	56	56	57	61	78	88	94	98	56	98	81	24	
10	99	100	100	100	99	97	87	76	70	59	50	46	40	36	37	44	53	60	74	66	69	77	94	96	36	100	72	24	
11	96	96	94	89	88	84	83	81	79	73	66	59	49	39	36	32	28	28	38	47	46	51	52	60	28	96	62	24	
12	64	71	74	75	77	72	62	57	49	44	41	38	36	35	34	36	37	37	40	47	63	74	82	87	34	87	56	24	
13	91	97	99	99	95	92	86	75	66	55	54	65	85	93	87	90	91	97	98	98	97	97	96	97	54	99	88	24	
14	97	97	95	94	94	94	91	81	70	68	72	79	68	80	77	75	71	70	71	73	76	79	79	86	68	97	81	24	
15	86	84	85	86	87	82	75	68	60	53	47	43	41	39	38	37	37	37	37	50	70	69	74	81	37	87	61	24	
16	77	80	80	85	90	87	81	77	69	58	50	47	48	46	46	42	40	37	38	46	68	71	73	78	37	90	63	24	
17	86	93	90	87	90	82	72	61	53	44	36	31	31	29	29	28	28	29	31	46	64	75	83	85	28	93	58	24	
18	89	87	83	81	72	75	78	79	80	75	77	65	58	57	55	54	53	52	52	69	73	81	89	93	52	93	72	24	
19	90	93	93	96	99	93	81	75	67	60	54	42	38	36	36	34	32	33	37	48	63	73	79	76	32	99	64	24	
20	79	87	89	91	91	97	98	98	96	87	74	66	60	55	54	57	58	64	70	74	99	99	99	99	54	99	81	24	
21	99	99	100	100	99	100	99	99	98	95	88	79	68	60	44	44	47	49	45	63	72	78	85	88	44	100	79	24	
22	90	94	97	97	99	97	97	90	90	90	84	84	76	64	57	59	64	66	68	75	75	75	78	80	57	99	81	24	
23	81	85	88	89	87	83	78	76	73	62	53	48	43	43	42	44	43	47	54	62	69	68	76	80	42	89	66	24	
24	84	90	97	97	93	93	92	84	77	70	61	60	62	60	61	61	61	61	77	88	86	86	92	95	98	60	98	80	24
25	99	100	100	100	100	100	100	100	98	86	75	65	59	59	52	49	51	50	51	71	87	91	93	98	49	100	81	24	
26	100	100	100	100	100	100	92	80	64	57	58	61	53	56	55	65	59	57	51	74	83	93	96	99	51	100	77	24	
27	99	97	98	97	99	98	93	84	73	65	59	56	50	45	44	58	63	70	68	80	91	97	99	100	44	100	78	24	
28	100	100	100	100	100	97	90	78	66	59	51	44	40	41	38	38	39	41	44	56	66	69	70	73	38	100	67	24	
29	71	72	71	73	79	80	79	71	62	59	53	44	37	34	33	32	37	44	60	71	89	97	99	99	32	99	64	24	
30	100	100	100	100	100	100	99	97	90	70	86	88	83	85	83	75	69	68	77	82	88	95	97	97	68	100	89	24	
31	98	100	100	100	100	100	99	96	85	71	62	56	54	49	47	44	44	46	47	61	79	75	74	73	44	100	73	24	
HOURLY MAX	100	100	100	100	100	100	100	100	98	95	88	91	94	94	88	92	91	97	98	98	99	100	100	100					
HOURLY AVG	89	92	93	93	93	91	86	80	73	66	62	59	57	56	52	52	52	55	58	66	76	81	84	87					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

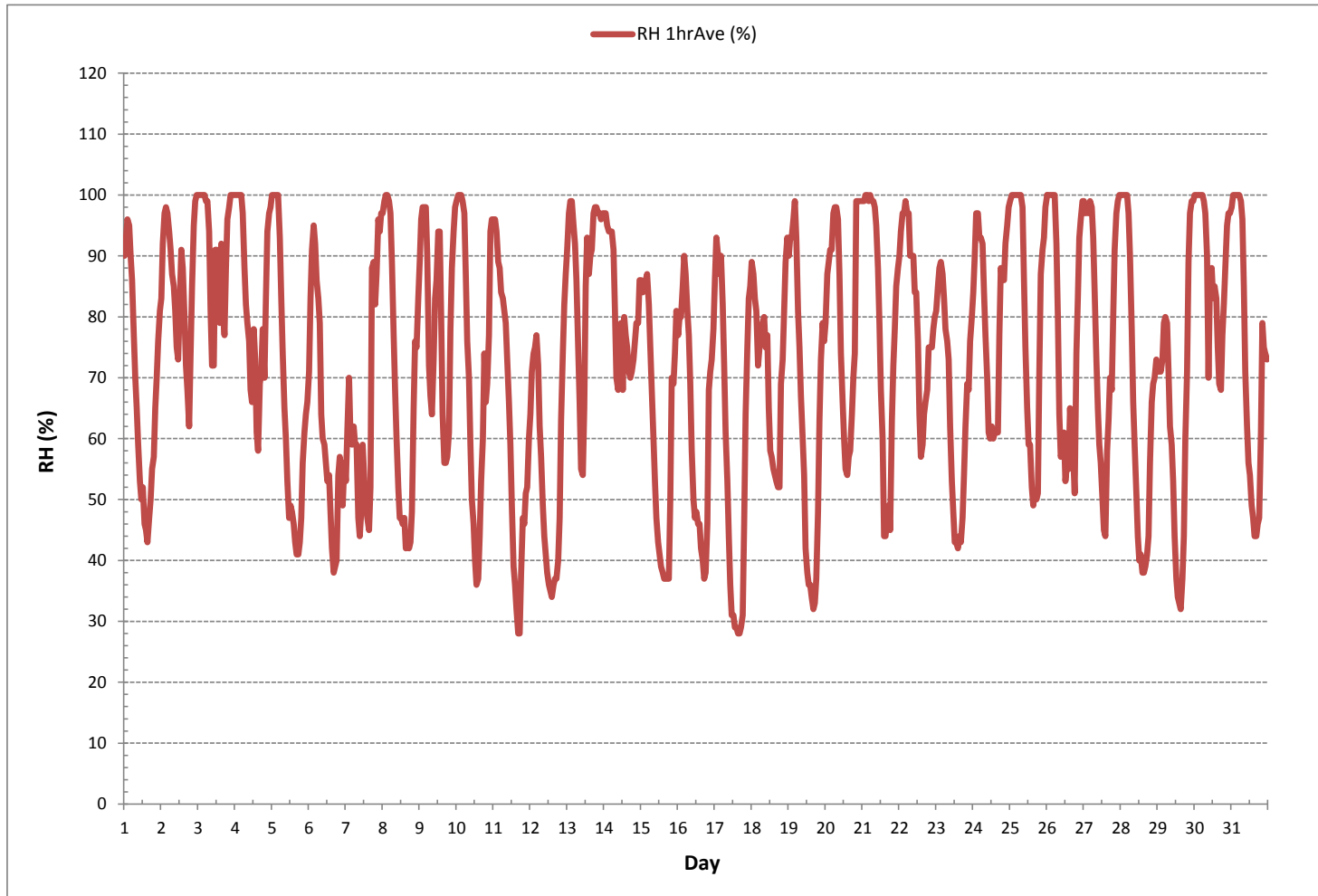
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	28	%	@ HOUR	16	ON DAY	11
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	23	ON DAY	2
MAXIMUM 24-HR AVERAGE:	92	%			ON DAY	3
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	21					MONTHLY AVERAGE: 73 %

**RELATIVE HUMIDITY Hourly Averages (RH %)**

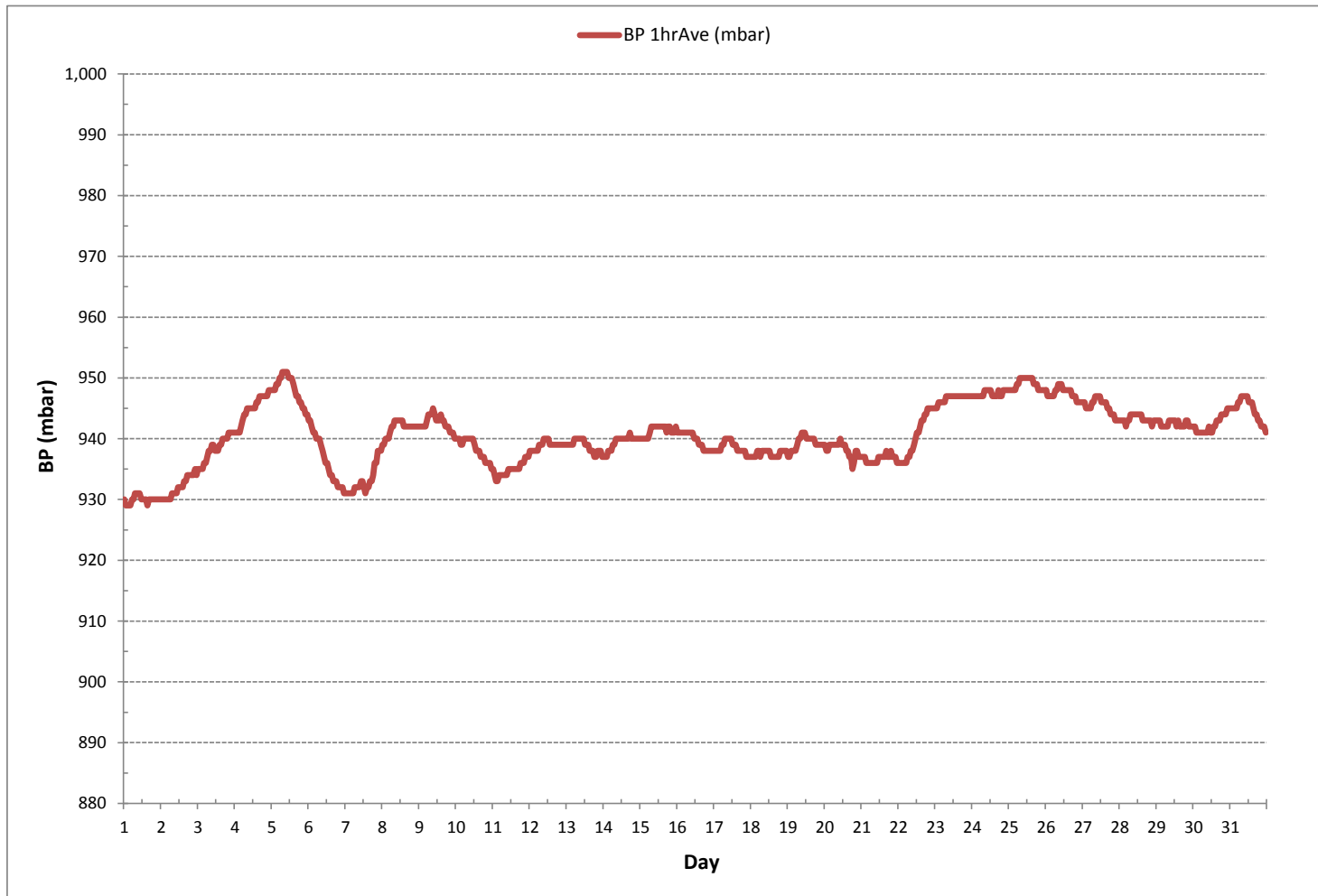


## ***BAROMETRIC PRESSURE***





BAROMETRIC PRESSURE Hourly Averages (BP mbar)



***AMBIENT TEMPERATURE***



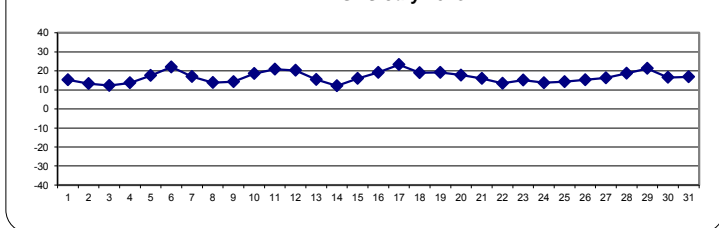
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	11.4	11.1	9.9	9.3	10.5	11.6	13.4	15.0	16.2	17.0	18.1	18.8	18.2	19.7	19.7	20.4	20.1	19.1	17.2	16.6	15.4	14.2	13.2	12.5	9.3	20.4	15.4	24	
2	12.7	12.0	11.3	10.8	10.9	11.5	12.3	13.0	13.5	13.9	14.8	15.2	14.5	13.6	14.5	15.4	16.2	16.8	17.2	15.9	13.8	11.4	9.8	8.8	8.8	17.2	13.3	24	
3	7.8	7.3	7.0	6.5	6.8	8.9	11.0	13.0	15.2	17.1	17.3	15.0	14.3	15.6	16.0	14.0	15.8	16.2	14.5	13.1	11.6	10.9	10.4	9.3	6.5	17.3	12.3	24	
4	8.5	8.3	7.0	6.6	7.3	9.9	12.7	14.1	15.3	15.9	17.3	17.5	17.2	17.6	18.1	19.5	17.5	17.4	16.9	17.8	15.1	12.1	10.5	9.8	6.6	19.5	13.7	24	
5	8.7	8.0	7.4	6.9	6.9	9.9	14.1	16.8	18.6	20.0	21.3	22.1	22.3	22.6	23.0	24.1	24.3	24.2	23.7	22.5	20.1	18.7	17.9	17.4	6.9	24.3	17.6	24	
6	16.4	13.9	12.3	11.1	12.1	14.5	16.0	17.6	22.1	23.7	24.8	27.0	27.5	28.1	29.2	29.9	30.1	29.7	27.9	24.7	23.6	22.8	22.6	20.6	11.1	30.1	22.0	24	
7	20.3	18.9	17.2	17.7	17.0	16.6	17.8	18.3	20.7	21.6	20.0	17.2	18.6	20.8	21.6	21.1	19.5	14.0	14.2	14.3	12.8	11.1	10.2	9.2	9.2	21.6	17.1	24	
8	8.3	7.6	7.1	7.1	7.5	8.0	10.2	12.4	13.9	14.6	15.8	16.6	17.4	17.9	18.1	20.0	19.8	20.2	20.1	19.0	14.9	12.4	12.7	11.5	7.1	20.2	13.9	24	
9	10.1	8.2	7.3	7.8	6.9	9.7	14.6	16.1	17.7	17.2	15.7	14.5	13.6	14.4	17.3	19.9	20.5	20.5	20.2	19.3	15.6	13.4	11.9	10.6	6.9	20.5	14.3	24	
10	9.9	9.1	8.3	8.0	8.0	10.5	14.2	18.9	20.8	22.5	24.2	24.9	26.1	26.6	26.3	25.1	24.7	24.3	22.3	21.1	19.7	18.5	15.9	15.6	8.0	26.6	18.6	24	
11	15.5	15.5	15.8	16.4	16.1	16.4	16.7	17.3	18.0	19.5	21.5	23.2	25.1	26.2	26.4	27.3	27.5	27.1	24.8	23.3	22.8	21.0	20.4	18.8	15.5	27.5	20.9	24	
12	18.1	16.7	15.6	15.0	14.8	16.1	18.3	19.7	21.3	22.5	23.5	23.8	24.3	25.0	25.5	24.9	25.1	24.8	24.0	22.5	19.1	16.9	15.1	14.0	14.0	25.5	20.3	24	
13	13.0	11.8	11.2	11.1	12.7	13.5	14.9	16.9	19.1	21.6	21.8	19.9	17.5	16.6	16.7	16.6	16.0	14.9	14.7	14.7	14.7	14.2	13.6	13.2	11.1	21.8	15.5	24	
14	13.2	12.7	12.1	11.5	10.9	10.5	10.7	11.1	12.1	11.7	11.3	11.1	13.0	11.3	11.8	12.4	13.7	14.0	14.2	14.1	13.1	12.4	12.0	11.0	10.5	14.2	12.2	24	
15	10.7	10.6	10.4	10.0	9.6	10.7	11.9	13.4	15.4	17.0	18.1	19.2	19.9	21.0	21.7	22.3	22.5	22.1	22.1	19.9	15.7	14.3	13.7	12.8	9.6	22.5	16.0	24	
16	12.8	12.2	12.0	11.1	10.6	11.9	13.5	14.5	16.5	20.0	21.7	22.6	23.4	25.0	25.2	26.2	26.6	27.0	26.5	24.9	20.1	18.9	19.8	18.9	10.6	27.0	19.2	24	
17	17.3	15.9	16.6	17.0	15.7	17.3	19.1	21.8	24.1	26.1	27.5	28.7	29.6	30.2	30.3	30.6	30.6	30.6	29.9	26.1	21.3	18.7	17.5	17.3	15.7	30.6	23.3	24	
18	16.0	15.5	16.2	16.3	18.1	17.8	17.4	17.4	17.8	19.1	19.3	21.2	22.2	22.2	23.2	24.0	24.4	23.8	23.7	19.1	16.4	15.3	14.2	14.2	14.2	24.4	19.0	24	
19	14.5	13.3	12.6	11.6	10.6	12.9	15.7	17.8	19.7	21.7	23.1	24.5	24.9	25.5	25.2	25.8	26.1	25.7	24.1	21.6	18.3	16.0	14.6	14.8	10.6	26.1	19.2	24	
20	14.7	14.6	14.9	14.7	15.2	15.0	15.1	15.3	16.1	17.9	19.6	21.0	22.2	22.8	23.3	23.6	23.5	22.2	21.2	20.1	13.6	13.3	13.5	14.3	13.3	23.6	17.8	24	
21	14.4	13.8	12.8	12.3	11.6	12.4	13.7	14.0	14.0	14.9	16.6	18.0	19.3	20.3	21.7	21.8	21.0	20.8	21.0	16.5	14.6	13.6	12.6	11.9	11.6	21.8	16.0	24	
22	11.5	11.2	10.8	10.4	10.1	11.0	11.7	14.4	14.4	13.9	14.1	14.0	14.5	16.2	17.3	16.6	15.6	15.4	15.0	14.0	13.7	13.1	12.7	12.7	10.1	17.3	13.5	24	
23	12.6	11.8	11.4	10.8	10.6	10.8	11.8	12.8	13.3	15.7	17.5	18.3	19.3	19.6	20.1	19.8	19.1	18.2	16.4	14.5	13.7	12.9	12.8	10.6	20.1	15.2	24		
24	12.1	10.9	9.4	9.9	11.0	11.1	11.1	12.4	13.6	15.2	16.6	16.8	16.8	17.0	17.7	17.8	18.1	15.3	14.2	14.3	13.9	13.3	12.4	11.1	9.4	18.1	13.8	24	
25	10.4	10.2	10.6	10.4	10.2	10.0	10.9	11.6	12.7	14.5	16.0	17.6	18.5	18.7	19.8	20.1	20.0	19.8	19.2	15.9	13.0	12.6	12.1	10.8	10.0	20.1	14.4	24	
26	10.2	9.9	8.9	8.4	8.4	9.4	12.5	15.5	18.5	19.5	19.6	19.4	20.6	20.2	20.5	18.9	19.4	20.2	21.1	17.1	14.9	13.0	12.1	11.3	8.4	21.1	15.4	24	
27	11.0	11.5	11.7	11.9	11.8	12.3	14.3	16.2	17.9	19.6	21.0	21.9	22.8	23.3	23.7	20.1	18.8	17.9	18.7	17.4	14.5	12.9	11.7	11.1	11.0	23.7	16.4	24	
28	10.5	10.1	9.5	9.0	8.7	10.0	13.5	17.4	19.7	21.7	22.7	23.9	24.5	25.1	25.4	25.6	25.6	25.2	24.3	22.1	19.6	18.6	18.2	17.7	8.7	25.6	18.7	24	
29	17.6	17.5	17.4	16.5	15.6	15.3	16.0	17.8	20.7	22.4	25.7	27.7	29.0	30.0	29.2	28.9	28.9	26.9	23.5	21.1	17.5	15.6	15.0	14.5	14.5	30.0	21.3	24	
30	13.7	13.2	13.3	12.8	12.4	13.4	15.2	16.0	18.2	22.3	19.5	19.4	19.4	19.2	19.2	18.9	20.3	20.6	18.9	17.2	15.5	13.4	13.1	13.0	12.4	22.3	16.6	24	
31	11.7	10.5	9.8	9.4	9.1	10.1	11.5	13.1	15.9	18.1	19.6	20.4	21.3	22.2	22.8	23.5	23.6	23.2	22.7	20.4	16.6	16.7	16.9	16.8	9.1	23.6	16.9	24	
HOURLY MAX	20.3	18.9	17.4	17.7	18.1	17.8	19.1	21.8	24.1	26.1	27.5	28.7	29.6	30.2	30.3	30.6	30.6	30.6	29.9	26.1	23.6	22.8	22.6	20.6					
HOURLY AVG	12.8	12.1	11.5	11.2	11.2	12.2	13.9	15.5	17.2	18.7	19.5	20.0	20.6	21.1	21.6	21.8	21.8	21.3	20.5	18.8	16.3	14.9	14.2	13.5					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

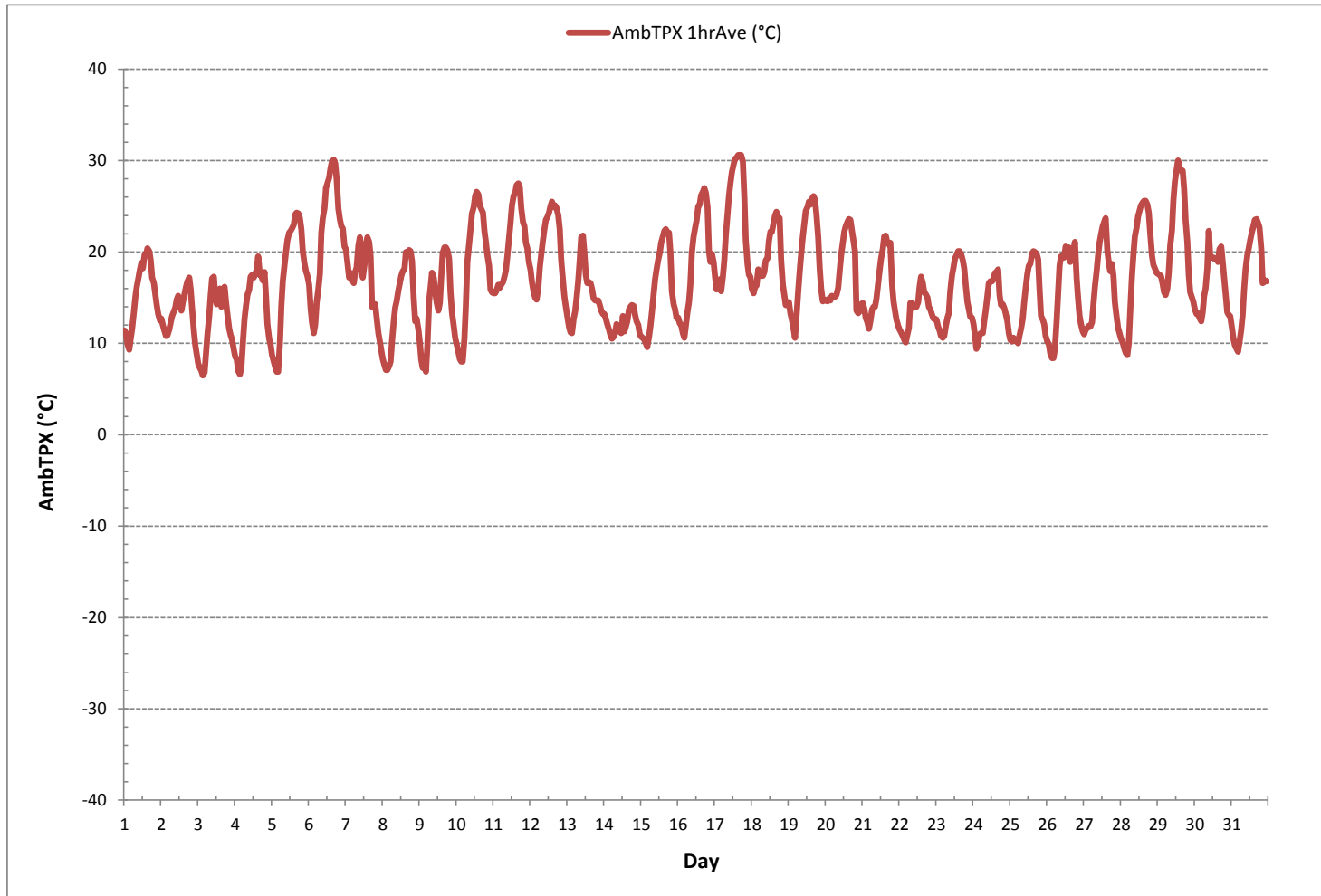
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	6.5	°C	@ HOUR	3	ON DAY	3
MAXIMUM 1-HR AVERAGE:	30.6	°C	@ HOUR	15	ON DAY	17
MAXIMUM 24-HR AVERAGE:	23.3	°C			ON DAY	17
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	5.2					MONTHLY AVERAGE: 16.8 °C

**AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)**



## ***PRECIPITATION***

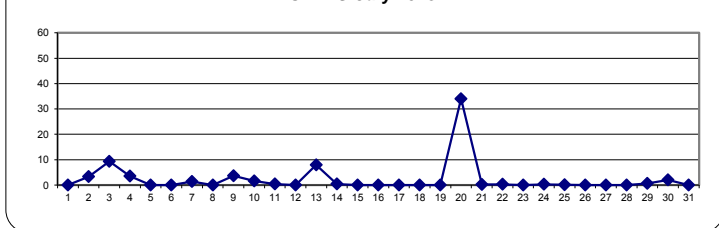
**PRECIPITATION Hourly Totals (mm)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.								
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	TOTALS									
DAY																																				
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	3.3	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	1.5	0.4	3.8	0.3	0.0	0.0	0.9	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	9.3	24		
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	3.5	24			
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.3	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4	24			
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.4	1.9	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	1.9	3.6	24			
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.9	0.0	0.0	0.0	0.0	0.0	0.9	1.6	24				
11	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	24				
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.1	0.2	0.0	1.7	3.1	0.7	0.3	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	3.1	7.9	24				
14	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	0.1	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	0.3	0.4	24				
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
20	0.0	0.0	0.0	0.0	0.2	1.9	0.6	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	1.2	25.5	2.5	1.3	0.6	0.0	0.0	0.0	25.5	34.0	24					
21	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	24					
22	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	24					
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
24	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	24						
25	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	24						
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.1	0.0	0.0	0.3	0.6	24						
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.5	2.0	24							
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
HOURLY MAX	0.1	1.6	0.1	0.3	0.2	1.9	0.6	0.2	0.1	0.1	1.5	2.6	1.9	1.3	3.8	0.3	1.7	3.1	0.9	1.2	25.5	2.5	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	
HOURLY AVG	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

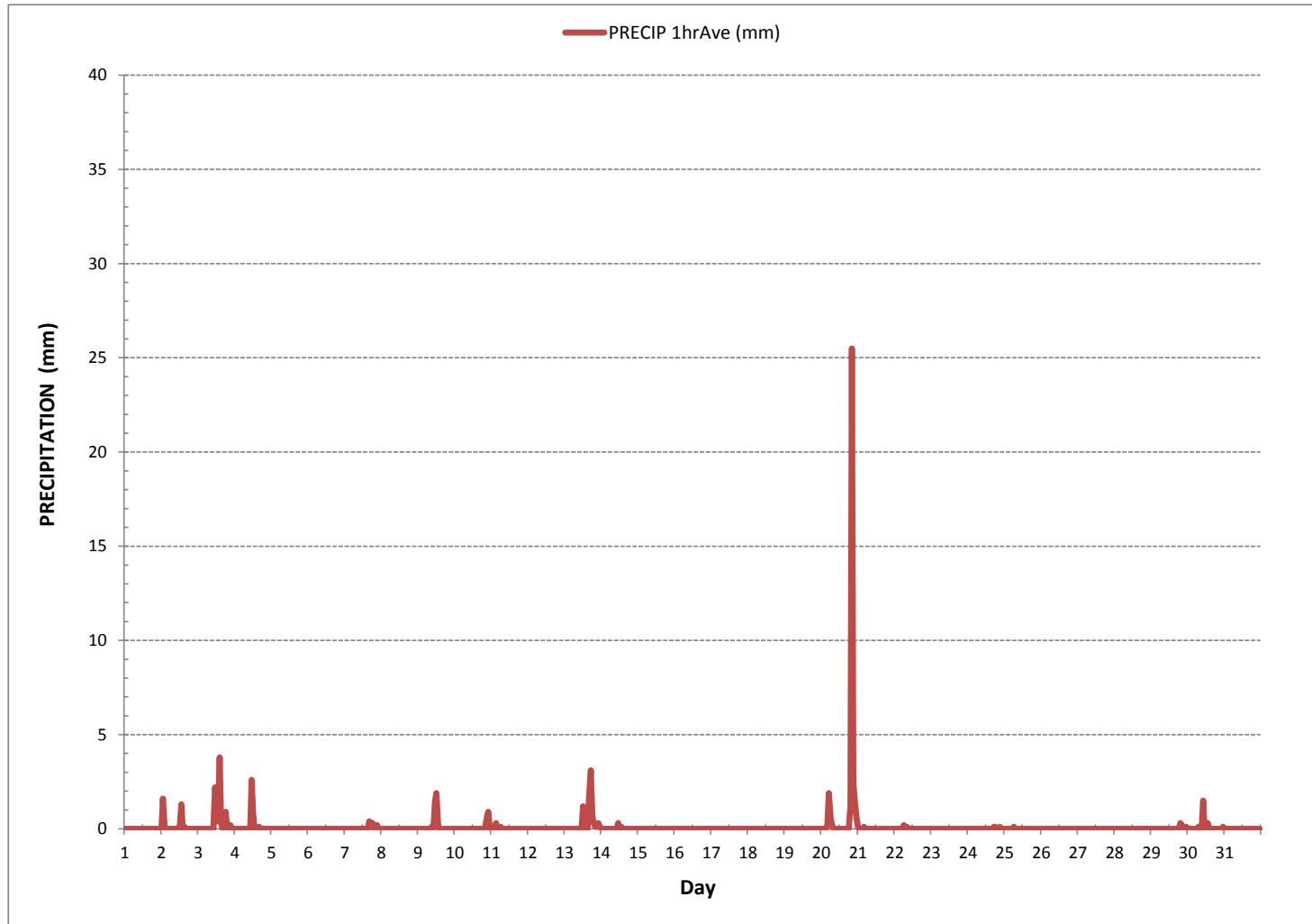
**24 HR TOTALS July 2018**



**MONTHLY SUMMARY**

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	25.5	mm	@ HOUR	20	ON DAY	20
MAXIMUM 24-HR AVERAGE:	34.0	mm			ON DAY	20
MONTHLY TOTAL	68.9	mm				
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	1.0					
MONTHLY AVERAGE:						0.1 mm

**PRECIPITATION Hourly Totals (mm)**





***APPENDIX II***  
***EQUIPMENT CALIBRATION RESULTS***

***SULPHUR DIOXIDE***



### API 100E Sulphur Dioxide Analyzer Calibration

Date:	July 12, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	939	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:38	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	14:45	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	508   LICA	Range ppb:	1000		
Last Calibration Date:	June 7, 2018	As Found C.F.:	1.004		
Previous C.F.:	1.001	New C.F.:	1.000		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	<b>Standard Calibration Points for Ranges</b> <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

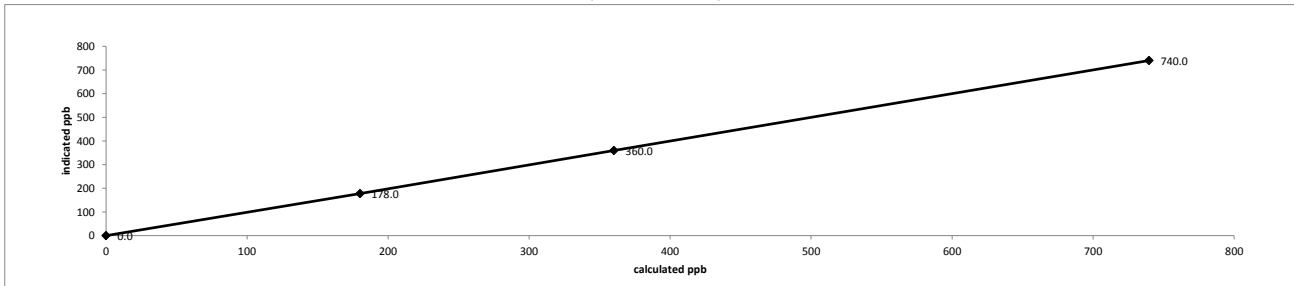
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5077	0.00	5077	0.0	4.0	n/a
as found high	4998	76.28	5074	739.6	741.0	1.004
adjusted zero	5077	0.00	5077	0.0	0.0	n/a
adjusted high	4998	76.28	5074	739.6	740.0	1.000
mid	5036	37.14	5073	360.2	360.0	1.001
low	5054	18.57	5073	180.1	178.0	1.012
calibrator zero	5077	0.00	5077	0.0	0.0	n/a
Average C.F. =						1.004

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale) =	0.10%		± 3% F.S.
% change in C.F. from last cal =	-0.26%		± 10%

API 100E Sulphur Dioxide Analyzer Calibration

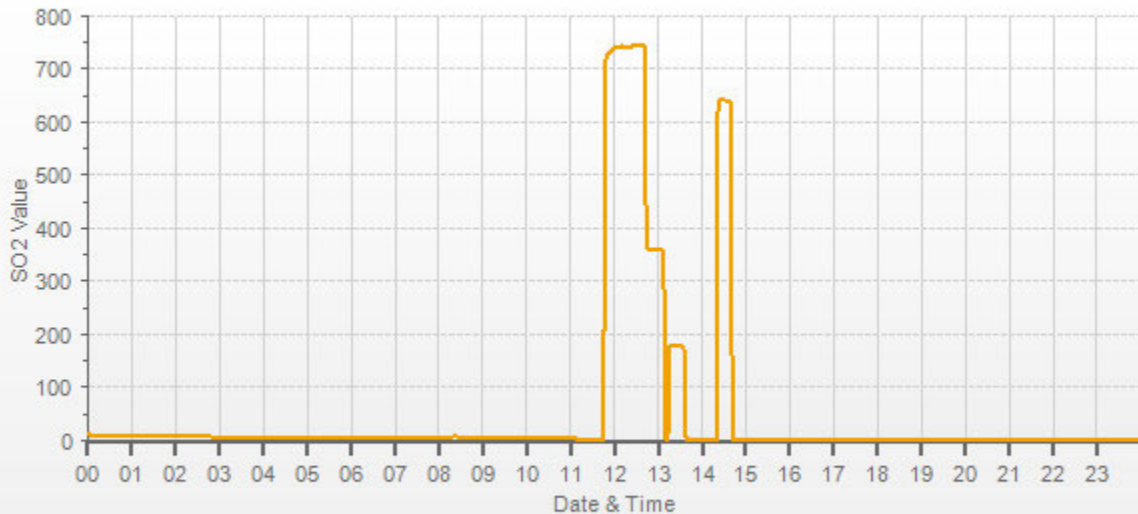


As found:	As left:
Slope: 0.933	Slope: 0.935
Offset: 182.5	Offset: 191.3
Hvps: 483	Hvps: 483
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 29.3	Box Temp: 29.2
Pmt Temp: 7.7	Pmt Temp: 7.7
Izs Temp: 50.0	Izs Temp: 50.0
Pres: 24.7	Pres: 24.7
Samp Fl: 582	Samp Fl: 583
Norm Pmt: 190.6	Norm Pmt: 190.4
Uv Lamp: 2159.8	Uv Lamp: 2161.6
Lamp Ratio: 78.9	Lamp Ratio: 78.9
Str Lgt: 85.1	Str Lgt: 89.4
Drk Pmt: 10.1	Drk Pmt: 10.6
Expected Value: 640.0	Expected Value: 639.0

Comments: The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

SO2 [ppb] Station: LICA MASKWA Daily: 18/07/12 Type: AVG 1 Min. [1 Min.]



— SO2 [ppb]

***HYDROGEN SULPHIDE***



### API 101E Hydrogen Sulphide Analyzer Calibration

Date:	July 12, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	939	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	10:38	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:36	Cal Gas Expiry Date:	June 14, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	510   LICA	Range ppb:	100		
Last Calibration Date:	June 7, 2018	As Found C.F.:	0.999		
Previous C.F.:	1.000	New C.F.:	0.999		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	<b>Standard Calibration Points for Ranges</b> <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>SO2 Scrubber Check (10 minutes):</b> Start/End Time 24 hr.: 11:41 / 11:51 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.0 Analyzer Response: (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

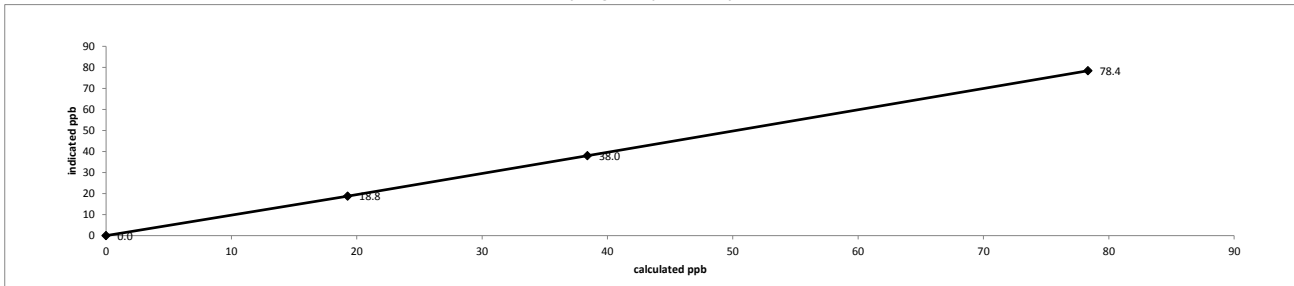
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7467	0.00	7467	0.0	0.8	n/a
as found high	7411	57.36	7468	78.3	79.2	0.999
adjusted zero	7467	0.00	7467	0.0	0.0	n/a
adjusted high	7411	57.36	7468	78.3	78.4	0.999
mid	7433	28.09	7461	38.4	38.0	1.011
low	7446	14.10	7460	19.3	18.8	1.025
calibrator zero	7467	0.00	7467	0.0	0.0	n/a
Average C.F. =						1.012

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		0.95-1.05
b (Intercept as % of full scale) =	0.29%		± 3% F.S.
% change in C.F. from last cal =	0.07%		± 10%

#### API 101E Hydrogen Sulphide Analyzer Calibration



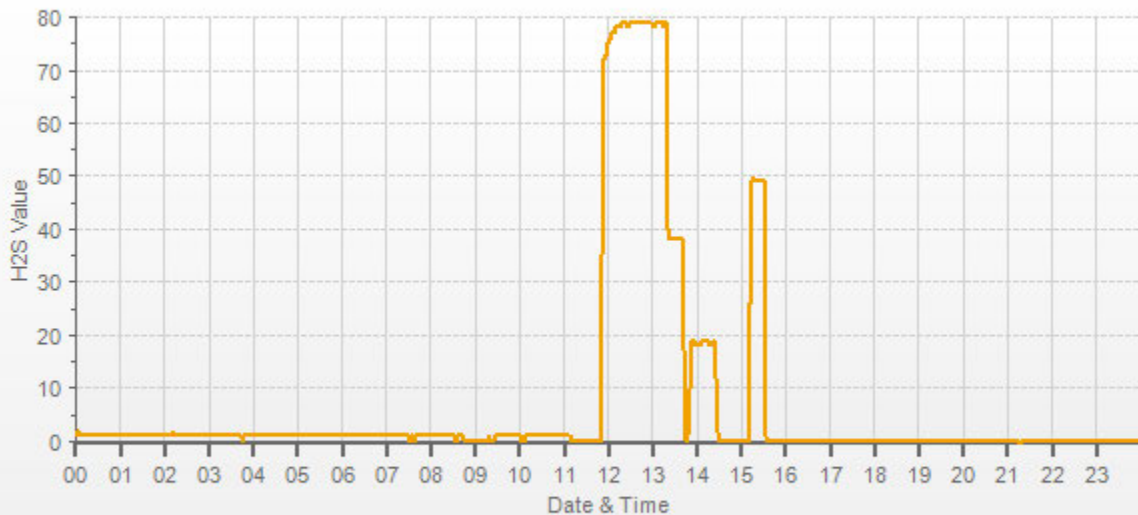
As found:		As left:	
Slope:	0.997	Slope:	0.975
Offset:	34.8	Offset:	36.4
Hvps:	530	Hvps:	530
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	33.5	Box Temp:	33.5
Pmt Temp:	8.4	Pmt Temp:	8.4
Izs Temp:	45.0	Izs Temp:	45.0
Converter Temp:	314.5	Converter Temp:	315.2
Pres:	19.8	Pres:	19.9
Samp Fl:	524	Samp Fl:	525
Uv Lamp:	2727.6	Uv Lamp:	2729.2
Lamp Ratio:	81.3	Lamp Ratio:	81.3
Str Lgt:	17.0	Str Lgt:	17.7
Drk Pmt:	33.3	Drk Pmt:	33.6
Expected Value:	49.1	Expected Value:	49.1

Comments:  
The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The SPAN value did not change after the calibration.

H2S [ppb] Station: LICA MASKWA Daily: 18/07/12 Type: AVG 1 Min. [1 Min.]



— H2S [ppb]



## API 101E Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> July 31, 2018	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019	947	millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019	22	°C
<b>Location/Station Name:</b> Maskwa	<b>Weather Conditions:</b> A few clouds		
<b>Parameter:</b> Hydrogen Sulphide	<b>Calibration Purpose:</b> shut down		
<b>Start Time 24 hr. (mst):</b> 10:35	<b>Performed By/Reviewer:</b> Alex Yakupov	Rob Fisher	
<b>End Time 24 hr. (mst):</b> 13:45	<b>Cal Gas Expiry Date:</b> October 20, 2020		
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> n/a		
<b>Analyzer:</b>			
<b>Serial Number/Owner:</b> 510   LICA	<b>Range ppb:</b> 100		
<b>Last Calibration Date:</b> July 12, 2018	<b>As Found C.F.:</b> 1.009		
<b>Previous C.F.:</b> 0.999	<b>New C.F.:</b> n/a		

<b>Calibration Standards:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 minutes):</b>
<b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018	<b>Point</b>	<b>Start/End Time 24 hr.:</b> 11:12 / 11:22
<b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018	<b>High</b> 78	<b>SO2 Analyzer Range:</b> 1000
<b>Calibrator ID/Expiry Date:</b> Envionics id# 4760 expires March 2, 2019	<b>Mid</b> 38	<b>Target Concentration (ppb):</b> 780
<b>Cal Gas Cylinder I.D. #:</b> EY 0001003	<b>Low</b> 19	<b>As Found Zero:</b> 0.0
<b>Cal Gas Conc. (ppm):</b> 9.55		<b>Analyzer Response: (ppb):</b> -0.5
		<b>Zero Corrected Result (ppb):</b> -0.5

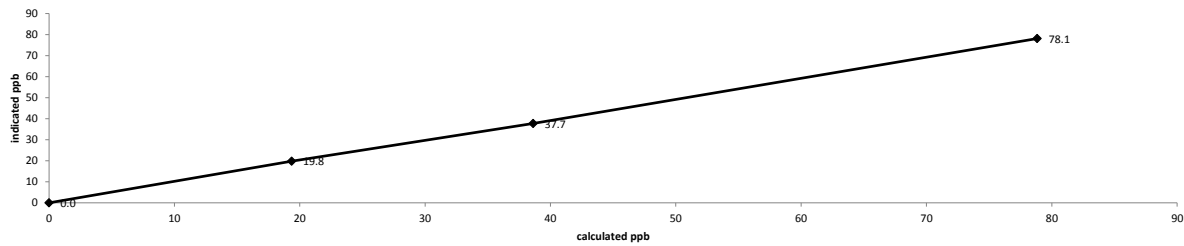
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7482	0.00	7482	0.0	0.0	n/a
as found high	7414	61.71	7476	78.8	78.1	1.009
mid	7454	30.27	7484	38.6	37.7	1.025
low	7456	15.14	7471	19.4	19.8	0.977
<b>Average C.F. =</b>						<b>1.004</b>

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b>	<u>1.000</u>	<b>LIMITS</b>	> or = 0.995
<b>Slope =</b>	<u>1.013</u>		0.90-1.10
<b>b (Intercept as % of full scale) =</b>	<u>-0.13%</u>		± 3% F.S.
<b>% change in C.F. from last cal =</b>	<u>-1.04%</u>		± 10%

**API 101E Hydrogen Sulphide Analyzer Calibration**



<b>As found:</b>	<b>As left:</b>
Slope: <u>0.975</u>	Slope: <u>n/a</u>
Offset: <u>36.4</u>	Offset: <u>n/a</u>
Hvps: <u>530</u>	Hvps: <u>n/a</u>
Rcell Temp: <u>50.0</u>	Rcell Temp: <u>n/a</u>
Box Temp: <u>36.2</u>	Box Temp: <u>n/a</u>
Pmt Temp: <u>8.4</u>	Pmt Temp: <u>n/a</u>
Izs Temp: <u>45.0</u>	Izs Temp: <u>n/a</u>
Converter Temp: <u>314.8</u>	Converter Temp: <u>n/a</u>
Pres: <u>20.1</u>	Pres: <u>n/a</u>
Samp Fl: <u>528</u>	Samp Fl: <u>n/a</u>
Uv Lamp: <u>2703.5</u>	Uv Lamp: <u>n/a</u>
Lamp Ratio: <u>80.6</u>	Lamp Ratio: <u>n/a</u>
Str Lgt: <u>17.7</u>	Str Lgt: <u>n/a</u>
Drk Pmt: <u>39.8</u>	Drk Pmt: <u>n/a</u>
Expected Value: <u>49.1</u>	Expected Value: <u>n/a</u>

**Comments:**

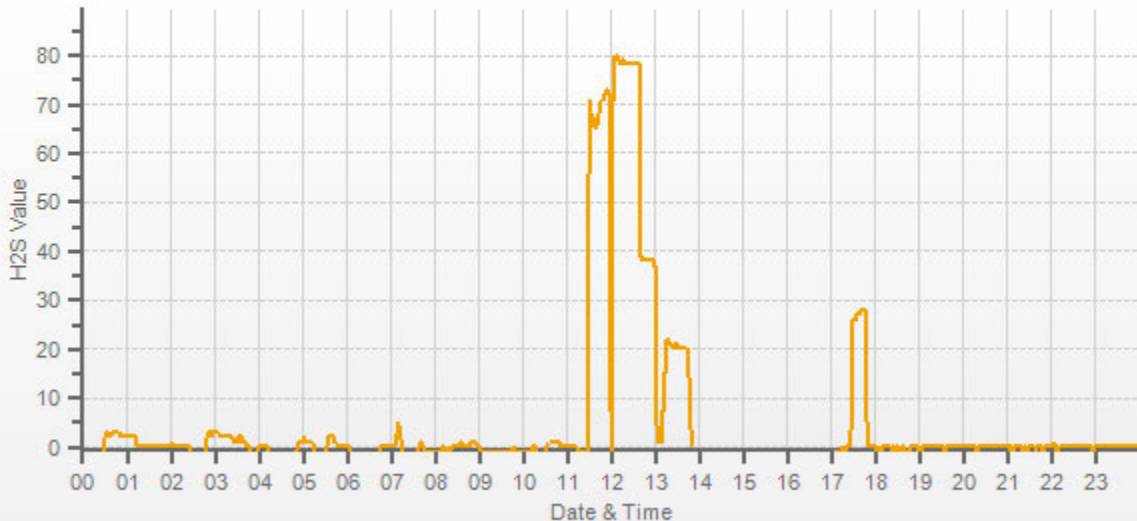
The manifold blower was found to be working normally.

The Shutdown calibration was completed because of unstable ZERO readings.  
Initial slow As-Found response due to new calibration gas. The As-Found high point restarts at 12:18



H2S[ppb] Station: LICA MASKWA Daily: 18/07/31 Type: AVG 1 Min. [1 Min.]

H2S[ppb]



***TOTAL HYDROCARBON***



## Thermo 51C Total Hydrocarbon Analyzer Calibration

<b>Date:</b> July 12, 2018 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> Maskwa <b>Parameter:</b> Total Hydrocarbon <b>Start/End Time 24 hr. (mst):</b> 14:58 / 18:42 <b>Calibration Method:</b> Gas Dilution <b>Analyzer:</b> <b>Serial Number/Owner:</b> 436609738   LICA <b>Last Calibration Date:</b> June 11, 2018 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019   939   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   22   °C <b>Weather Conditions:</b> Mainly sunny <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> November 24, 2022 <b>Range ppm:</b> 50 <b>As Found C.F.:</b> 1.004 <b>New C.F.:</b> 1.000
--	---

**Calibration Standards:**

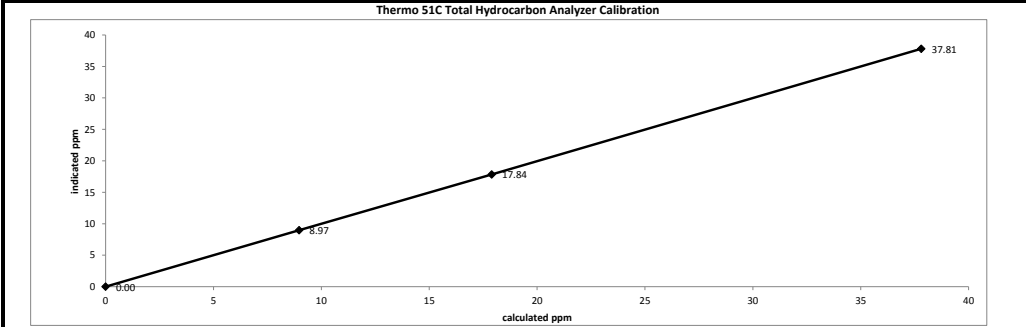
<b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018 <b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018 <b>Calibrator ID/Expiry Date:</b> Enviroconics id# 4760 expires March 2, 2019 <b>Cal Gas Cylinder I.D. #:</b> LL 165367 <b>CH<sub>4</sub>/C<sub>2</sub>H<sub>6</sub> Cylinder Conc. (ppm):</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">590.0</td> <td style="width: 50%;">207.0</td> </tr> <tr> <td><b>CH<sub>4</sub> as propane/total CH<sub>4</sub> equivalents (ppm):</b></td> <td>569.3   1159.3</td> </tr> </table>	590.0	207.0	<b>CH<sub>4</sub> as propane/total CH<sub>4</sub> equivalents (ppm):</b>	569.3   1159.3	<b>Standard Calibration Points for a Range of: 50 ppm</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>	Point	Target ppm	High	38	Mid	18	Low	9
590.0	207.0												
<b>CH<sub>4</sub> as propane/total CH<sub>4</sub> equivalents (ppm):</b>	569.3   1159.3												
Point	Target ppm												
High	38												
Mid	18												
Low	9												

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2516	0.00	2516	0.0	0.43	n/a
as found high	2439	82.22	2521	37.81	38.07	1.004
adjusted zero	2515	0.00	2515	0.00	0.00	n/a
adjusted high	2439	82.22	2521	37.81	37.81	1.000
mid	2475	38.81	2514	17.90	17.84	1.003
low	2498	19.47	2517	8.97	8.97	1.000
calibrator zero	2516	0.00	2516	0.0	0.00	n/a
<b>Average C.F.=</b>						1.001

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000 <b>Slope =</b> 1.000 <b>b (Intercept as % of full scale) =</b> 0.02% <b>% change in C.F. from last cal =</b> -0.45%	<b>LIMITS</b> > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
---	--



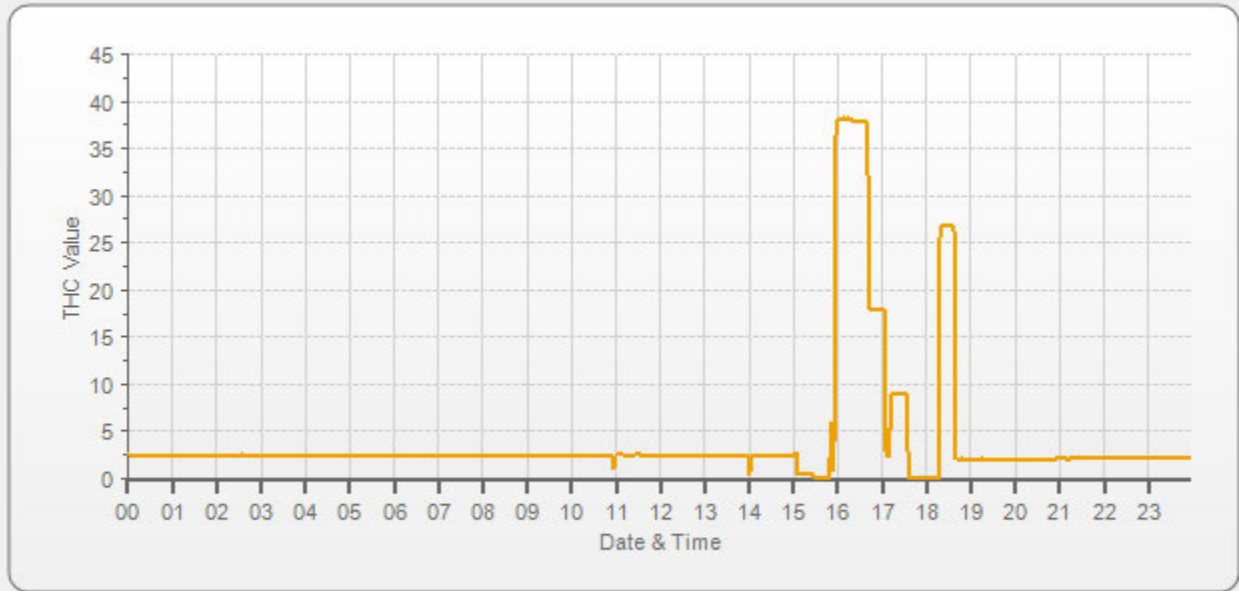
<b>As found:</b> measurement alarms: None service alarms: None cnt: 2731 rng: 1 try: 0 flm: 215.0 det: 125.6 Flame: 215 Filter: 125 Base: 125 Sample psi: 07.52 Internal Air Pressure: 20 Internal Fuel Pressure: 13	<b>As left:</b> measurement alarms: None service alarms: None cnt: 2785 rng: 1 try: 0 flm: 215.6 det: 125.1 Flame: 215 Filter: 125 Base: 125 Sample psi: 07.52 Internal Air Pressure: 20 Internal Fuel Pressure: 13
---	--

<b>Cylinder/Regulator Pressures:</b> H2 Cylinder (psi): 700 H2 cylinder reg set (psi): 22 Zero Air Gen Pressure: 42 Span Cylinder (psi): 1300 Span Cylinder reg set (psi): 22 Measured Flow: 0.881 Expected Value: 26.40	H2 Cylinder (psi): 700 H2 cylinder reg set (psi): 22 Zero Air Gen Pressure: 42 Span Cylinder (psi): 1300 Span Cylinder reg set (psi): 22 Measured Flow: n/a Expected Value: 26.70
---	---

**Comments:**  
 The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

THC [ppm] Station: LICA MASKWA Daily: 18/07/12 Type: AVG 1 Min. [1 Min.]



— THC [ppm]

***NITROGEN DIOXIDE***



## API 200A NO-NO2-NOx Analyzer Calibration

Date: July 12, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	939	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 10:38 / 16:51	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone?: No	Performed By/Reviewer: Alex Yakupov	Rob Fisher	
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

<b>Analyzer:</b> Serial Number/Owner: 1899   Maxxam Last Calibration Date: June 7, 2018 Range ppb: 1000	<b>Correction Factors:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Previous C.F.:</th> <th>As Found C.F.:</th> <th>New C.F.:</th> </tr> </thead> <tbody> <tr> <td>NO =</td> <td>1.000</td> <td>1.009</td> <td>1.000</td> </tr> <tr> <td>NO<sub>2</sub> =</td> <td>1.000</td> <td>0.996</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.001</td> <td>1.013</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.009	1.000	NO <sub>2</sub> =	1.000	0.996	1.000	NOx =	1.001	1.013	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.009	1.000														
NO <sub>2</sub> =	1.000	0.996	1.000														
NOx =	1.001	1.013	1.000														

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envirionics idR 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5   51.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO<sub>2</sub> (ppb)</th> <th>Cc Ozone ?</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>780</td> <td>500</td> <td>n/a</td> </tr> <tr> <td>Mid</td> <td>380</td> <td>275</td> <td>n/a</td> </tr> <tr> <td>Low</td> <td>190</td> <td>100</td> <td>n/a</td> </tr> <tr> <td>Extra Point #1</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> <tr> <td>Extra Point #2</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>	Standard Calibration Points for a Range of: 1000 ppb				Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?	High	780	500	n/a	Mid	380	275	n/a	Low	190	100	n/a	Extra Point #1	n/a	n/a	n/a	Extra Point #2	n/a	n/a	n/a
Standard Calibration Points for a Range of: 1000 ppb																													
Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)	Cc Ozone ?																										
High	780	500	n/a																										
Mid	380	275	n/a																										
Low	190	100	n/a																										
Extra Point #1	n/a	n/a	n/a																										
Extra Point #2	n/a	n/a	n/a																										

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5077	0.0	5077	0	0	0.0	0.0	n/a	n/a
as found high	4998	76.3	5074	774.2	775.7	767.0	766.0	1.009	1.013
adjusted zero	5077	0.00	5077	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4998	76.28	5074	774.2	775.7	774.0	776.0	1.000	1.000
mid	5036	37.14	5073	377.0	377.8	371.0	372.0	1.016	1.016
low	5054	18.57	5073	188.5	188.9	182.0	183.0	1.036	1.032
calibrator zero	5077	0.00	5077	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	1.017

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.	
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	
NOx reference	4998	76.28	5074	0.0	775.0	777.0	2.0	0.0	2.0		
as found high NO2	4998	76.28	5074	550.0	275.0	779.0	504.0	500.0	502.0	0.996	
adjusted high NO2	4998	76.28	5074	550.0	279.0	777.0	498.0	496.0	496.0	1.000	
gpt mid	4998	76.28	5074	310.0	502.0	779.0	277.0	273.0	275.0	0.993	
gpt low	4998	76.28	5074	120.0	673.0	779.0	105.0	102.0	103.0	0.990	
										Average NO <sub>2</sub> C.F.=	0.994

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.998	1.003	0.95-1.05
b (Intercept as % of full scale)=	-0.38%	-0.36%	0.19%	± 3% F.S.
% change in C.F. from last cal=	-0.94%	-1.17%	0.40%	± 10%
NO2 converter efficiency			0.98	0.96 to 1.04

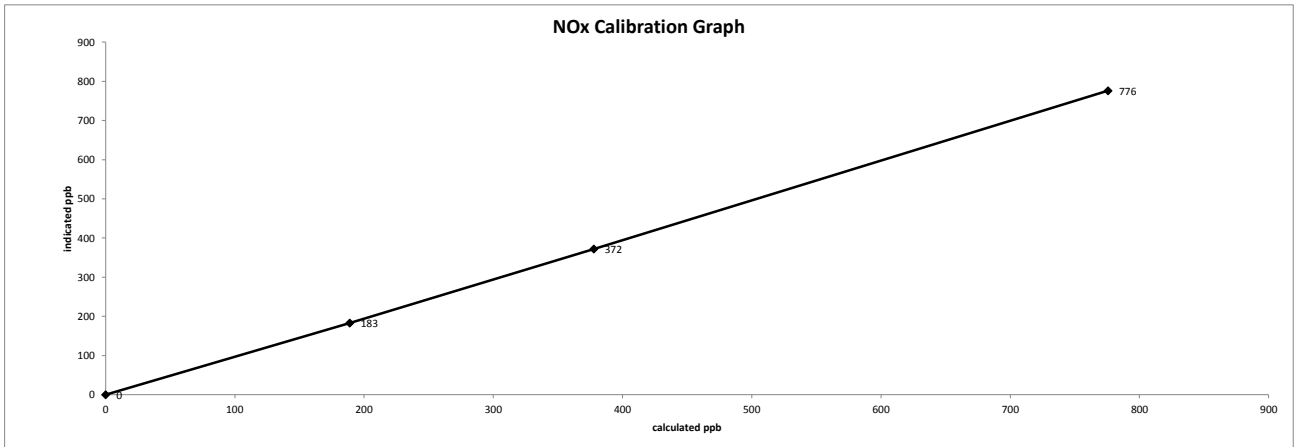
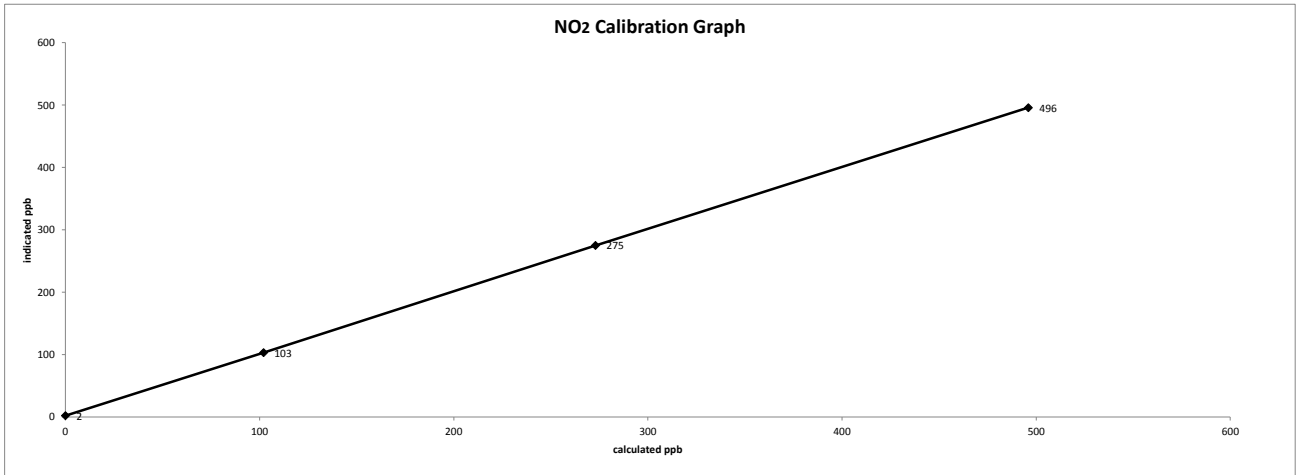
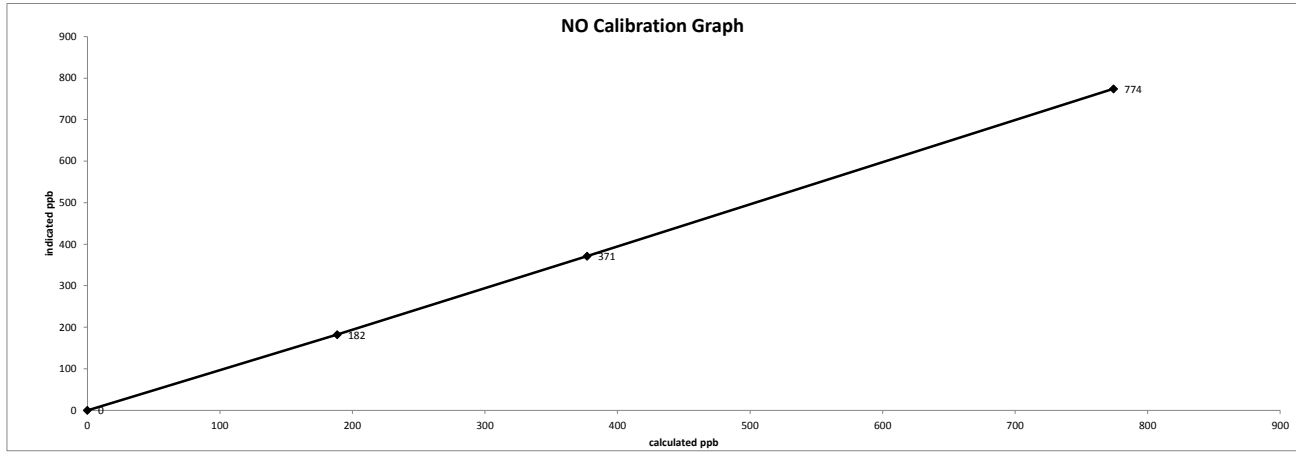
<b>As found:</b> NOx SLOPE: 1.036 NOx OFFS: -0.1 NO SLOPE: 1.041 NO OFFS: -0.8 SAMP FLW: 553 OZONE FL: 79 NORM PMT: -1.6 AZERO: 21.1 HVPS: 669 DCPS: 2556 RCELL: 50.4 BOX TEMP: 29.3 IZS TEMP: 50.1 MOLY TEMP: 314.9 RCEL: 6.7 SAMP: 26.5 Expected Value NO: 5 Expected Value NO2: 407 Expected Value NOx: 412	<b>As left:</b> NOx SLOPE: 1.049 NOx OFFS: -0.1 NO SLOPE: 1.050 NO OFFS: -0.8 SAMP FLW: 553 OZONE FL: 79 NORM PMT: -0.3 AZERO: 21.0 HVPS: 670 DCPS: 2556 RCELL: 49.9 BOX TEMP: 29.4 IZS TEMP: 6.8 MOLY TEMP: 50.0 RCEL: 6.7 SAMP: 26.6 Expected Value NO: 6 Expected Value NO2: 385 Expected Value NOx: 391
---	--

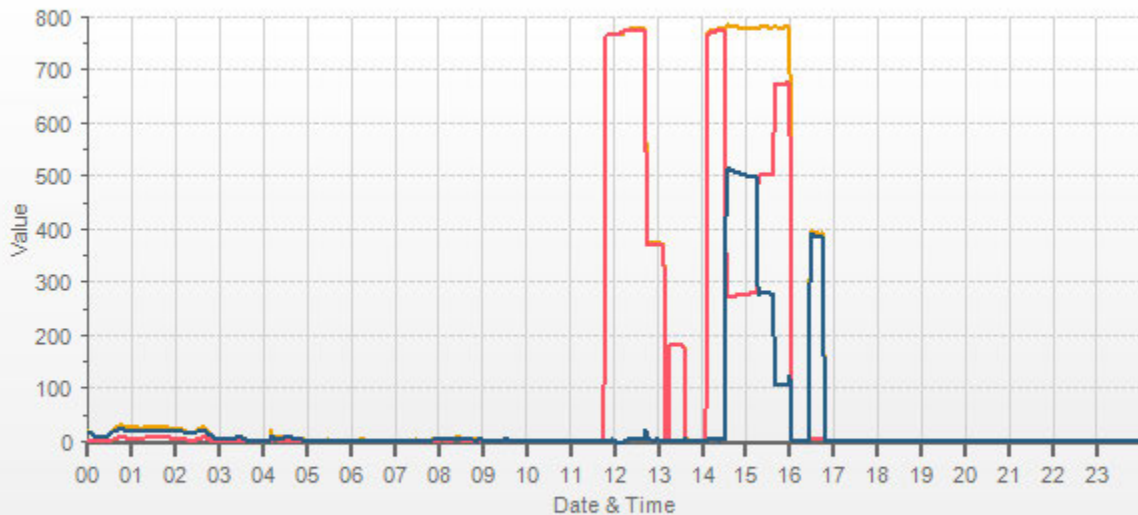
**Comments:**  
 The analyzer sample inlet filter was changed.  
 The manifold blower was found to be working normally.

Date: July 12, 2018  
Company/Airshed: LICA  
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:38 / 16:51  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration





— NOX [ppb] — NO [ppb] — NO2 [ppb]



***PARTICULATE MATTER***



# R & P 1405F TEOM PM 2.5 Analyzer Audit/Calibration

Date:	July 11, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	10:23	
Station Name/Location:	Maskwa	End Time (mst):	12:35	
Previous Audit Date:	June 21, 2018	Calibration Purpose:	Bi-monthly #1	
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny	

**1400A Information and Status:**

Serial Number/Owner:	1405A208301003	LICA	As Found Filter Loading %:	1%
Ko Factor:	13125		As Left Filter Loading %:	15%
Ambient Temperature °C:	21.69		As Found Noise:	0.012
Ambient Pressure atm:	0.920		As Left Noise:	0.015
Main Flow Reading lpm:	3.00		Pump Vacuum:	0.30
Aux Flow Reading lpm:	13.67		Warnings:	None

**Reference Standards/I.D./Expiry Date:**

Low Flow:	Airmetrics/Chinook Low Maxxam ID #3 expires April 24, 2019
High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires April 24, 2019
Digital Manometer:	Dwyer 475 Mark III id# 3 expires January 9, 2019
Temperature:	F.S. 170286131 expires April 19, 2019
Pressure:	F.S. 05544 expires January 15, 2019

**As found leak check:**

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	2.76	0.00	2.76
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.89	0.01	-0.90
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

**As left leak check (same as above if as found passes):**

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.00	2.76	0.00	2.76
	limit	0.15	<del>0.15</del>	0.15	<del>0.15</del>
Bypass Flow	actual	0.00	-0.89	0.01	-0.90
	limit	0.60	<del>0.60</del>	0.60	<del>0.60</del>

**As found temperature and pressure:**

1405F temperature °C:	21.7	tolerance +/- 2.0°C	1405F pressure atm:	0.920	tolerance +/- 0.01 atm
reference temperature °C:	21.7		reference pressure:	0.921	
difference °C:	0.0		difference :	-0.001	

**As left temperature and pressure (same as above if as found adequate):**

1405F temperature °C:	21.7	tolerance +/- 2.0°C	1405F pressure atm:	0.920	tolerance +/- 0.01 atm
reference temperature °C:	21.7		reference pressure:	0.921	
difference °C:	0.0		difference :	0.001	

**As found flows:**

main flow tolerance 3.00 lpm +/- 0.20 lpm	1405F main flow lpm:	3.00	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%	1400A total/aux flow lpm:	13.67
reference main flow lpm:	2.98		reference total/aux flow lpm:	13.69	
difference lpm:	-0.02		difference lpm:	0.02	

**As left flows (same as above if as found adequate):**

main flow tolerance 3.00 lpm +/- 0.20 lpm	1405F main flow lpm:	3.00	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%	1400A total/aux flow lpm:	13.67
reference main flow lpm:	2.99		reference total/aux flow lpm:	13.62	
difference lpm:	-0.01		difference lpm:	-0.05	

**K<sub>o</sub> Audit:**

Last K <sub>o</sub> audit date:	May 16, 2018
1405F K <sub>o</sub> factor:	13125
Measured K <sub>o</sub> factor:	13095.4000
% difference:	0.23%

**Comments:**  
 The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.  
 The 47 mm FDMS filter was changed.  
 The flows were calibrated

# Maxxam R & P 1400A TEOM PM 2.5 Analyzer Audit/Calibration

**Date:** July 26, 2018  
**Company:** LICA  
**Station Name/Location:** Makswa  
**Previous Audit Date:** n/a  
**Parameter:** PM 2.5  
**Performed By/Reviewer:** Alex Yakupov | not yet reviewed  
**Start Time (mst):** 12:27  
**End Time (mst):** 17:45  
**Calibration Purpose:** installation  
**Weather Conditions:** Cloudy/Overcast

**1400A Information and Status:**

**Serial Number/Owner:** 140A8228740001 | Maxxam  
**K<sub>o</sub> Factor:** 12166  
**Ambient Temperature °C:** 19.7  
**Ambient Pressure atm:** 0.947  
**Main Flow Reading lpm:** 3.00  
**Aux Flow Reading lpm:** 13.66  
**As Found Filter Loading %:** n/a  
**As Left Filter Loading %:** 20%  
**As Found/As Left Noise:** 0%  
**FDMS or SES Dryer in use?** no  
**Pump Vacuum:** n/a  
**Warnings:** None

**Reference Standards/I.D./Expiry Date:**

**Low Flow:** Airmetrics/Chinook Low Maxxam ID #3 expires April 24, 2019  
**High Flow:** Airmetrics/Chinook High Maxxam ID #2 expires April 24, 2019  
**Digital Manometer:** Dwyer 475 Mark III id# 3 expires January 9, 2019  
**Temperature:** F.S. 170286131 expires April 19, 2019  
**Pressure:** F.S. 05544 expires January 15, 2019

**As Found Pump Off Test and Leak Check :**

	main flow	auxiliary flow	
pump unplugged zero (lpm)	n/a	n/a	
seconds to reach full flow (max. 60s)	n/a	n/a	(maintenance required if either > 60 seconds)
leak rate (lpm)	n/a	n/a	
0 corrected leak rate (lpm)	n/a	n/a	
limit (lpm)	0.15	0.15	

**As Left Pump Off Test and Leak Check (same as above if as found adequate):**

	main flow	auxiliary flow	
pump unplugged zero (lpm)	0.23	0.14	
seconds to reach full flow (max. 60s)	45	47	(maintenance required if either > 60 seconds)
leak rate (lpm)	0.23	0.25	
0 corrected leak rate (lpm)	0.00	0.11	
limit (lpm)	0.15	0.15	

**As found temperature and pressure:**

**tolerance +/- 2.0°C**  
**1400A temperature °C:** n/a  
**reference temperature °C:** n/a  
**difference °C:** n/a  
**tolerance +/- 0.01 atm**  
**1400A pressure atm:** n/a  
**reference pressure:** n/a  
**difference :** n/a

**As left temperature and pressure (same as above if as found adequate):**

**tolerance +/- 2.0°C**  
**1400A temperature °C:** 19.7  
**reference temperature °C:** 19.7  
**difference °C:** 0.0  
**tolerance +/- 0.01 atm**  
**1400A pressure atm:** 0.947  
**reference pressure:** 0.947  
**difference :** 0.000

**As found flows:**

**main flow tolerance 3.00 lpm +/- 0.20 lpm**  
**1400A main flow lpm:** n/a  
**reference main flow lpm:** n/a  
**difference lpm:** n/a  
**total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%**  
**1400A total/aux flow lpm:** n/a  
**reference total/aux flow lpm:** n/a  
**difference lpm:** n/a

**As left flows (same as above if as found adequate):**

**main flow tolerance 3.00 lpm +/- 0.20 lpm**  
**1400A main flow lpm:** 3.00  
**reference main flow lpm:** 2.90  
**difference lpm:** -0.10  
**total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%**  
**1400A total/aux flow lpm:** 13.67  
**reference total/aux flow lpm:** 13.39  
**difference lpm:** -0.28

K <sub>o</sub> Audit:	Instrument Operating Parameters:
Last K <sub>o</sub> audit date: July 25, 2018	Pump Vacuum: n/a
1400A Ko factor: 12166	Main Fadj: 1.000
Measured K <sub>o</sub> factor: 12350	Aux Fadj: 1.000
% difference: 1.51%	

**Comments:**  
 The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.  
 The bypass (auxiliary) flow filter was changed.  
 The sensor flow filter was changed.

Before the installation flows were audited, ambient temperature and ambient pressure gauges were calibrated.

## ***WIND SYSTEM***



## ***CALIBRATORS***

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envionics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>24.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>702 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

Dilution Flow (sccm)		
Pt. #1	<u>5000</u>	Pt. #3 <u>5000</u>
Pt. #2	<u>5000</u>	
Gas Flow (sccm)		
Pt. #1	<u>80</u>	Pt. #3 <u>20</u>
Pt. #2	<u>40</u>	

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

**LINEAR REGRESSION ANALYSIS**

$y=mx+b$  (where x=calculated concentration, y=indicated concentration)

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9934	0.90-1.10		m (Slope)=	0.9921
b (Intercept % of FS)=	-0.0332	± 3% F.S.		b (Intercept % of FS)=	-0.0277

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
						NO <sub>2</sub>	% Diff. Limit
5004	0.000	0.0000	0.7766	0.0007	0.7773		
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

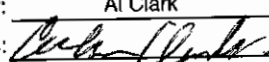
**LINEAR REGRESSION ANALYSIS**

$y=mx+b$  (where x=calculated concentration, y=indicated concentration)

NO <sub>2</sub>		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9880	0.90-1.10	
b (Intercept % of FS)=	0.1153	± 3% F.S.	

AENV Standards Audit Calibrator		NO <sub>x</sub> Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 1, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO<sub>2</sub>.

Auditor: Al Clark  
Operator Signature: 

Date: March 1, 2018  
Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:				Flow Measurement Device:			
Make/Model	<u>Envronics 6100</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>4760</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>February 2017</u>			Temperature (°C)	<u>23.0 C</u>		
NO Cylinder S/N	<u>EY0000715</u>			Barometric Pressure	<u>704 mmHg</u>		
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>				
Expiry Date	<u>May 2021</u>						

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9901	0.90-1.10		m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092	± 3% F.S.		b (Intercept % of FS)=	-0.0320

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO <sub>2</sub>	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 10%	
Absolute Average Percent Difference							1%	± 10%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO <sub>2</sub>		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9836	0.90-1.10	
b (Intercept % of FS)=	0.1675	± 3% F.S.	

AENV Standards Audit Calibrator		NO <sub>x</sub> Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO<sub>2</sub>.

Auditor: Al Clark  
Operator Signature: *Chris W*

Date: March 2, 2018  
Location: McIntyre Center Edmonton



## ***CALIBRATION GASES***



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: LL104225 Concentration PPM: 49.2 Tolerance(%) 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**

Make/Model: R&R MFC 201  
 Serial Number: AMU 1690  
 Last Verification Date: December 13, 2017  
 Gas Type: SO2 Conc. 98.07  
 Cylinder Number: CAL016625  
 Expiry Date: January 2019

**Flow Measurement Device:**

Make/Model: Mesa Definer 220  
 Serial Number: H-133034 / L-132702  
 Temp. °C: 23.4 C  
 B.P.: 707 mmHg

**Reference Analyzer:**

Make/Model: Teco 43C Serial/AMU Number: 1623  
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0  
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000	<del>0.000</del>	<del>0.000</del>	<del>0.000</del>
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2

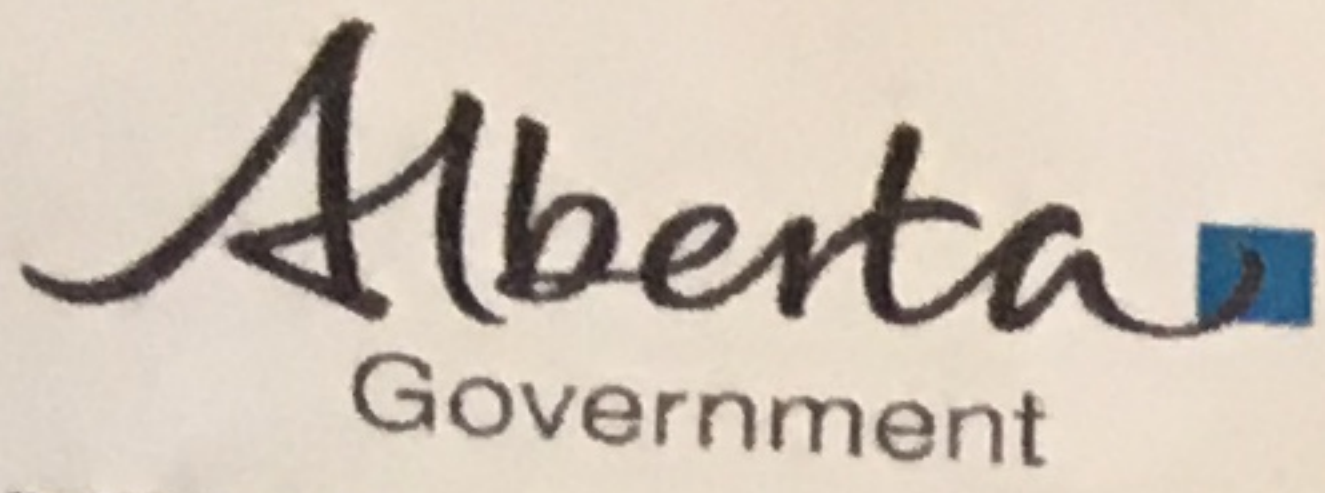
Percent variance from Stated: 3

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: \_\_\_\_\_  
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

Auditor: Al Clark  
 Operator Signature: *Al Clark*

Date: December 13, 2017  
 Location: McIntyre Center Edmonton





# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**  
 Make/Model: Sabio 2010  
 Serial Number: AMU 2092  
 Last Verification Date: January 17, 2018  
 Gas Type: H2S Conc. 20.43  
 Cylinder Number: CAL015272  
 Expiry Date: January 2019

**Flow Measurement Device:**  
 Make/Model: Mesa Defender 530  
 Serial Number: H-153961 / L-153874  
 Temp. °C: 23.0 C  
 B.P. 697 mmHg

**Reference Analyzer:**  
 Make/Model: Teco 450i Serial/AMU Number: 1980  
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1  
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	<del>0.0000</del>	<del>0.0000</del>	<del>0.0000</del>
5051	39.6	0.0753	0.00784	127.551	9.60
5028	20.2	0.0387	0.00402	248.911	9.63
5033	10.5	0.0198	0.00209	479.333	9.49
Average Cylinder Concentration:					<b>9.58</b>

Previous Stated Concentration PPM: 9.55

Percent variance from Stated: 0

Meets Manufacturer Tolerance. Use manufacturers stated concentration  COMMENTS: Used AEP regulator  
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration   
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark

Date: January 18, 2018

Operator Signature: *Al Clark*

Location: McIntyre Center Edmonton



# Calibration Gas Audit

## CH<sub>4</sub> / C<sub>3</sub>H<sub>8</sub> Cylinder Gas

File No. 2015-029CGA

**Company:** Maxxam                      **Operators name:** Limin Li  
**Cylinder #:** LL165367   **Conc CH<sub>4</sub> (PPM)** 590/207   **Tolerance (%)** 2   **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&amp;R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1650</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH<sub>4</sub></u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C<sub>3</sub>H<sub>8</sub></u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

**Reference Analyzer:**  
 Make/Model Teco 55C                      Serial/AMU Number: 1643  
 Instrument Settings                      Zero: N/A                      Span: N/A                      Range: 20  
 Last Calibration:                      Date: May 21/15                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH <sub>4</sub>	C <sub>3</sub> H <sub>8</sub>			CH <sub>4</sub>	C <sub>3</sub> H <sub>8</sub>
2600	0.0	0.00	0.00	<del>0.02005</del>	<del>49.883</del>	<del>602</del>	<del>206</del>
2569	51.5	12.06	11.37	0.02005	49.883	602	206
3549	22.3	3.77	3.57	0.00628	159.148	600	207
3523	10.4	1.77	1.70	0.00295	338.750	600	209
Average Cylinder Concentration:						<b>600</b>	<b>207</b>

	<b><u>CH<sub>4</sub></u></b>		<b><u>C<sub>3</sub>H<sub>8</sub></u></b>
Previous Stated Concentration PPM:	<u>590</u>		<u>207</u>
Percent variance from Stated:	<u>1.8</u>		<u>0.2</u>

**Cylinder gas tolerances based on CH<sub>4</sub> only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** \_\_\_\_\_  
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

Auditor: Al Clark                      Date: May 21, 2015  
 Operator Signature: \_\_\_\_\_                      Location: McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL104225    Conc (PPM) 51.5/51.6    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>Teco 146i</u>			Make/Model	<u>Mesa Definer 220</u>
Serial Number	<u>AMU 1809</u>			Serial Number	<u>H-133034 / L-132702</u>
Last Verification Date	<u>December 13, 2017</u>			Temp. °C	<u>23.4 C</u>
Gas Type	<u>NO</u>	Conc.	<u>50.03</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>APEX 1223938</u>				
Expiry Date	<u>June 2020</u>				

**Reference Analyzer:**

Make/Model Teco 42i                      Serial/AMU Number: 1868

Instrument Settings    Zero: 4.7                      Span: 1.004                      Range: 1.0

Last Calibration:                      Date: Dec12/17                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:**

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark                      Date: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton

***APPENDIX III***  
***MAXIMUM INSTANTANEOUS DATA***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - July 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	4	4	S	4	27	8	10	9	10	7	4	4	4	4	4	4	4	4	4	4	4	4	6	5	4	27	6	24	
2	22	S	4	4	5	5	8	6	4	4	9	5	5	4	5	5	5	6	4	4	4	4	4	4	4	4	22	6	24
3	S	3	4	3	3	3	3	3	3	4	4	3	4	3	5	5	3	3	5	3	3	3	3	S	3	5	3	24	
4	3	3	3	3	4	4	3	3	6	5	3	14	8	10	9	9	3	3	4	4	2	2	S	2	2	14	5	24	
5	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	4	S	3	4	2	4	2	24		
6	5	4	4	3	3	4	5	5	5	5	4	4	4	4	4	5	5	6	5	6	S	4	5	5	3	6	4	24	
7	5	6	5	7	5	5	6	6	5	5	4	17	16	5	5	4	15	14	17	S	8	4	5	17	4	17	8	24	
8	16	4	4	4	3	3	3	3	4	3	3	3	3	4	3	3	3	4	S	3	4	4	4	4	3	16	4	24	
9	4	3	3	3	3	3	4	4	4	4	4	4	4	3	4	7	5	S	5	4	4	4	4	4	4	3	7	4	24
10	4	4	4	4	4	4	4	4	5	5	6	8	6	6	6	5	S	5	5	5	8	14	5	5	4	14	5	24	
11	5	5	12	33	28	44	51	43	28	23	22	15	26	5	5	S	12	42	33	7	32	9	46	11	5	51	23	24	
12	10	9	10	5	5	4	5	5	6	4	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	10	3	24
13	0	0	0	0	0	0	0	0	1	0	1	0	0	S	2	1	0	1	1	1	8	3	1	4	0	8	1	24	
14	10	13	14	19	14	28	26	26	17	10	16	6	S	0	0	0	0	2	1	0	0	0	0	0	0	28	9	24	
15	0	0	0	0	0	1	6	25	11	19	16	S	12	14	12	6	8	3	7	1	1	1	2	1	0	25	6	24	
16	0	0	0	0	0	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
17	1	1	1	1	1	1	3	3	3	S	3	1	1	2	1	1	1	1	2	3	2	2	1	1	1	3	2	24	
18	1	1	1	2	11	3	37	16	S	2	2	3	3	2	3	2	2	1	3	1	1	4	1	1	1	37	4	24	
19	1	1	3	1	1	2	3	S	5	20	17	12	17	6	26	12	27	10	1	1	1	1	1	1	1	27	7	24	
20	1	1	1	1	1	1	S	1	1	1	1	3	2	1	5	4	2	2	3	7	1	2	1	1	1	7	2	24	
21	1	1	1	1	2	S	6	6	2	2	9	12	6	6	2	2	2	2	3	4	2	2	2	2	2	12	3	24	
22	2	2	3	3	S	2	2	12	15	25	22	23	11	11	24	16	4	1	1	3	1	12	28	42	1	42	12	24	
23	48	38	49	S	55	12	26	15	3	18	14	21	14	11	11	2	1	1	1	1	1	1	1	1	1	55	15	24	
24	2	2	S	5	4	14	11	16	33	34	6	10	3	1	1	1	1	1	1	1	1	1	0	2	0	34	7	24	
25	2	S	0	1	0	0	0	0	10	8	3	9	7	1	1	1	1	1	1	1	1	1	1	1	0	10	2	24	
26	S	1	1	1	1	1	1	1	8	10	10	2	2	2	2	1	1	22	4	2	1	1	1	S	1	22	3	24	
27	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	10	17	10	4	2	2	2	S	1	1	17	3	24	
28	1	1	1	2	2	1	1	3	5	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	1	5	2	24
29	2	3	6	4	2	2	3	4	4	4	3	3	2	2	2	2	8	5	7	2	S	2	2	2	2	8	3	24	
30	2	2	2	2	2	2	2	2	3	7	17	2	2	2	2	2	2	2	2	S	2	2	6	2	2	17	3	24	
31	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	S	2	2	2	3	2	2	3	2	24	
HOURLY MAX	48	38	49	33	55	44	51	43	33	34	22	23	26	14	26	16	27	42	33	7	32	14	46	42					
HOURLY AVG	5	4	5	4	6	5	8	8	7	8	7	7	6	4	5	4	5	5	4	3	4	3	5	4					

STATUS FLAG CODES

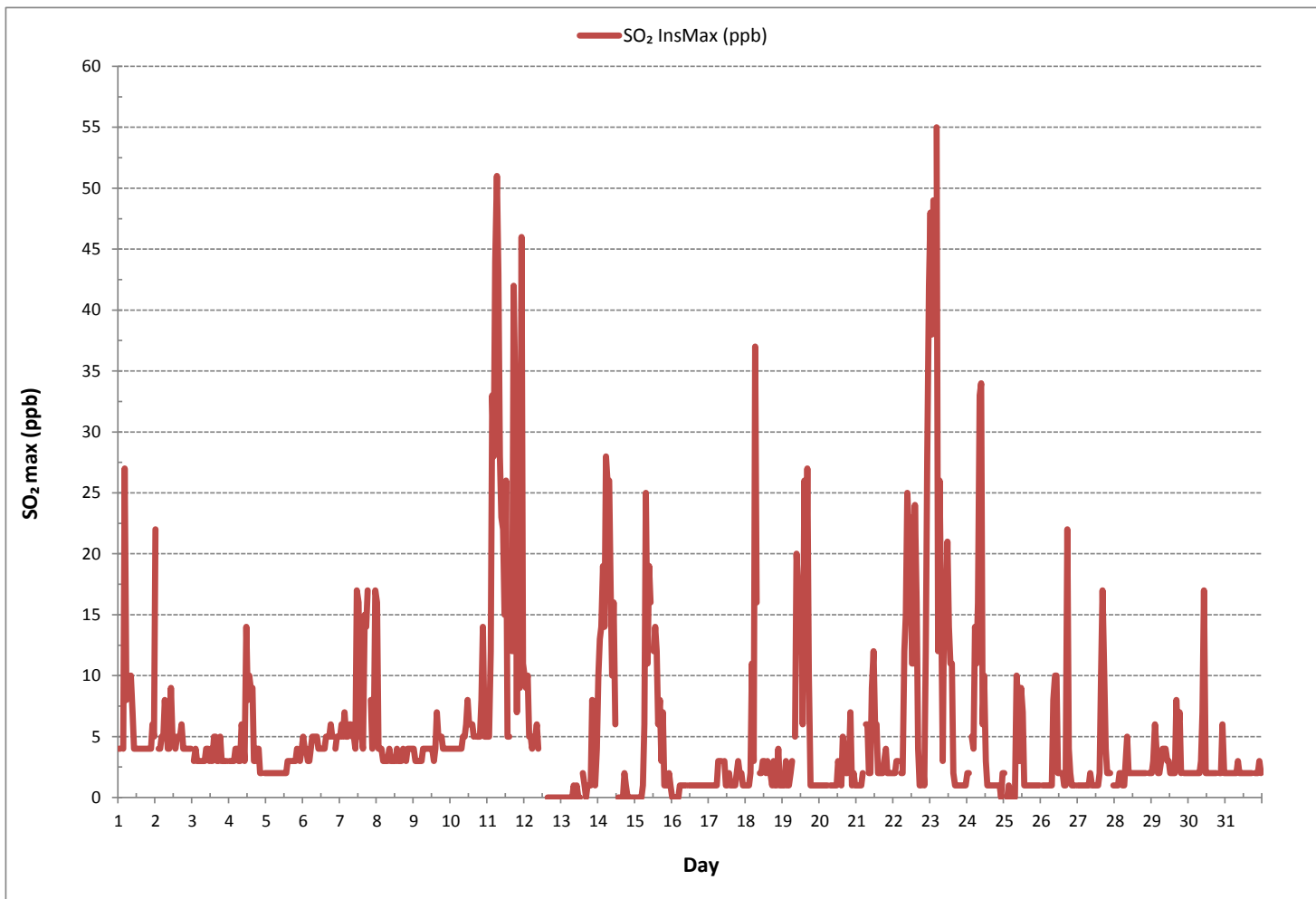
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	661
MAXIMUM INSTANTANEOUS VALUE:	55 ppb @ HOUR 4 ON DAY 23
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	744 hrs



SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	1	1	S	1	2	1	2	1	2	1	2	2	1	1	1	2	2	2	2	2	1	2	2	2	1	2	2	24		
2	2	S	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	2	24		
3	S	1	1	1	1	2	2	1	1	1	1	1	0	1	1	3	1	1	1	1	1	1	1	1	S	0	3	1	24	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	S	1	0	1	1	1	24	
5	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	S	1	1	0	1	1	24	
6	1	1	1	1	2	4	2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	4	1	24
7	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	1	2	2	2	S	1	1	1	1	1	1	2	1	1	24
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	24
9	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	S	1	1	2	2	3	2	1	3	1	24		
10	1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1	S	1	1	1	1	1	2	1	1	1	3	1	24	
11	1	1	2	2	2	3	3	2	2	2	1	1	2	1	1	S	1	1	1	1	2	1	2	2	1	3	2	24		
12	2	1	2	1	1	1	1	1	1	1	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	2	1	24		
13	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	0	1	1	0	1	1	0	0	0	0	1	0	24		
14	1	1	1	0	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
15	0	0	0	0	0	0	1	1	0	1	S	1	0	0	0	0	0	0	0	0	0	0	2	1	0	2	0	24		
16	0	0	0	0	0	0	0	0	1	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24		
17	0	0	0	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	24		
18	1	1	1	0	0	1	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	24	
19	2	0	1	1	0	3	2	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24		
20	0	0	0	1	0	0	S	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	24		
21	0	3	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24		
22	0	0	0	0	S	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
23	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	24		
24	0	0	S	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	24		
25	2	S	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	24		
26	S	2	4	2	1	2	4	6	6	7	5	3	0	5	2	5	2	0	1	1	1	0	S	0	7	3	24			
27	0	1	5	4	0	1	1	4	2	1	2	0	2	2	1	2	2	2	2	2	0	6	S	1	0	6	2	24		
28	2	1	2	4	3	2	1	1	1	1	1	2	1	1	1	1	0	0	0	2	2	S	2	2	0	4	1	24		
29	2	1	0	2	2	4	2	4	4	2	5	0	0	0	0	0	2	2	0	S	1	0	1	0	5	2	24			
30	2	3	0	2	1	4	4	0	1	1	2	1	1	S1	S1	0	0	1	0	S	3	6	6	6	0	6	2	22		
31	3	2	3	3	2	2	0	5	1	0	1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	0	5	2	11		
HOURLY MAX	3	3	5	4	3	4	4	6	6	7	5	5	3	5	2	5	2	2	2	2	2	3	6	6	6					
HOURLY AVG	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					

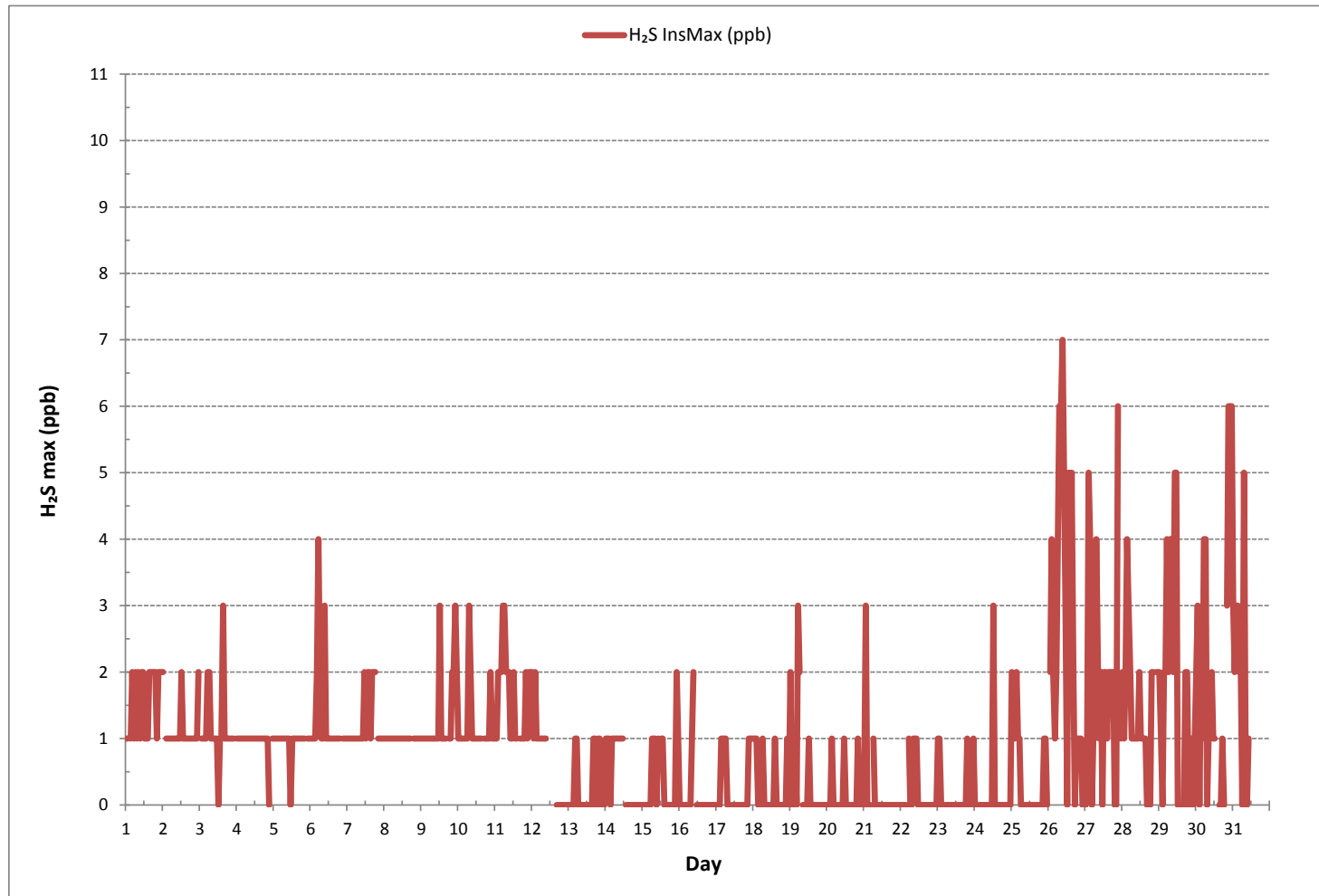
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	423
MAXIMUM INSTANTANEOUS VALUE:	7 ppb @ HOUR 9 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	729 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

DAY	HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
	HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
1	2.43	2.51	S	2.53	2.59	2.44	2.41	2.60	2.30	2.26	2.26	2.26	2.24	2.26	2.25	2.27	2.25	2.24	2.22	2.26	2.25	2.28	2.25	2.22	2.22	2.60	2.33	24	
2	2.37	S	2.25	2.24	2.24	2.27	2.28	2.33	2.23	2.24	2.25	2.26	2.26	2.26	2.28	2.30	2.32	2.30	2.30	2.31	2.35	2.39	2.59	2.70	2.23	2.70	2.32	24	
3	S	2.82	2.68	2.98	2.82	2.73	2.71	2.38	2.37	2.40	2.42	2.34	2.43	2.37	2.48	2.40	2.38	2.38	2.43	2.40	2.45	2.46	2.48	S	2.34	2.98	2.51	24	
4	2.62	2.65	2.58	2.68	2.67	2.70	2.64	2.61	2.57	2.59	4.46	2.52	2.53	2.49	2.52	2.54	2.54	2.52	2.54	2.52	2.58	2.67	S	2.74	2.49	4.46	2.67	24	
5	2.92	2.84	3.04	3.03	3.04	3.15	3.13	2.76	2.72	2.74	2.74	2.63	2.68	2.66	2.61	2.59	2.58	2.58	2.56	2.55	2.55	S	2.58	2.61	2.55	3.15	2.75	24	
6	2.62	2.61	2.62	2.73	2.86	2.85	2.78	2.76	2.67	2.54	2.52	2.46	2.54	2.57	2.45	2.36	2.33	2.33	2.35	2.38	S	2.38	2.37	2.26	2.26	2.86	2.54	24	
7	2.29	2.34	2.37	2.31	2.27	2.27	2.30	2.32	2.28	2.29	2.28	2.31	2.26	2.28	2.26	2.28	2.49	2.37	2.34	S	2.35	2.36	2.41	2.67	2.26	2.67	2.33	24	
8	2.64	2.57	2.50	2.52	2.60	2.60	2.57	2.50	2.46	2.47	2.47	2.46	2.46	2.46	2.45	2.48	2.49	2.49	S	2.44	2.50	2.63	2.64	2.76	2.44	2.76	2.53	24	
9	2.82	3.02	3.15	3.19	3.36	3.49	3.45	2.93	2.90	2.88	2.82	2.61	2.49	2.56	2.53	2.59	2.49	S	2.49	2.42	2.43	2.44	2.51	2.59	2.42	3.49	2.79	24	
10	2.62	3.32	3.02	2.93	2.76	2.69	2.77	3.00	2.71	2.51	2.50	2.47	2.46	2.47	2.46	2.45	S	2.46	2.58	2.57	2.48	2.53	2.49	2.42	2.42	3.32	2.64	24	
11	2.42	2.38	2.54	2.52	2.39	2.64	2.45	2.65	2.94	2.64	2.83	2.48	2.46	2.36	2.36	S	2.38	2.44	2.57	2.46	2.53	2.47	2.50	2.46	2.36	2.94	2.52	24	
12	2.47	2.68	2.51	2.39	2.38	2.39	2.39	2.41	2.42	2.40	2.45	2.62	2.39	2.40	C	C	C	C	C	C	2.03	2.07	2.14	2.19	2.26	2.03	2.68	2.37	24
13	2.80	2.62	2.59	2.64	2.82	2.64	2.53	2.20	2.23	2.08	1.99	2.03	2.41	S	1.99	1.93	2.14	2.13	2.07	2.22	2.11	1.93	1.99	1.97	1.93	2.82	2.26	24	
14	2.00	1.99	1.93	1.96	2.09	2.15	2.38	2.18	2.05	2.04	2.06	1.99	S	1.97	1.97	1.94	1.95	2.00	2.00	1.96	1.93	1.93	1.97	2.05	1.93	2.38	2.02	24	
15	2.04	2.02	2.01	2.01	2.00	2.05	2.15	2.14	2.03	2.05	2.61	S	2.36	2.36	2.45	2.12	2.11	2.24	2.11	2.02	2.10	2.10	2.04	2.02	2.00	2.61	2.14	24	
16	2.12	2.04	2.05	2.12	2.20	2.30	2.27	2.43	2.37	2.33	S	2.14	2.12	2.01	2.00	2.08	2.00	2.07	2.10	2.12	2.04	2.14	2.14	2.17	2.00	2.43	2.15	24	
17	2.26	2.29	2.54	2.44	2.40	2.46	2.43	2.41	2.41	S	2.22	2.11	2.04	1.98	2.00	1.99	2.00	2.01	2.04	2.10	2.15	2.52	2.39	2.70	1.98	2.70	2.26	24	
18	2.51	2.64	2.98	2.28	3.41	1.98	1.96	1.92	S	1.96	1.96	1.95	1.94	1.91	1.92	1.90	1.92	1.91	1.91	1.94	1.87	1.90	1.95	2.03	1.87	3.41	2.12	24	
19	1.98	2.02	2.12	2.12	2.30	2.20	2.09	S	2.01	2.01	2.00	2.03	2.01	2.00	1.98	2.13	2.02	2.13	2.01	2.03	2.13	2.25	2.28	2.26	1.98	2.30	2.09	24	
20	2.30	2.27	2.07	2.17	2.20	2.16	S	2.16	2.12	2.08	2.02	2.02	1.95	1.94	1.93	1.99	1.97	1.91	1.88	1.99	1.96	1.93	1.86	1.95	1.86	2.30	2.04	24	
21	1.87	1.94	1.93	2.03	2.13	S	2.02	2.01	1.92	1.87	1.95	1.92	1.91	1.91	1.91	1.93	1.94	1.94	1.93	1.94	1.91	1.93	1.94	1.96	1.87	2.13	1.95	24	
22	2.02	2.21	2.29	2.28	S	2.20	2.13	2.04	1.90	1.90	1.92	1.94	1.94	1.96	2.09	2.01	1.98	1.98	1.99	2.00	1.99	2.05	2.30	2.10	1.90	2.30	2.05	24	
23	2.15	2.18	2.18	S	2.14	2.08	2.21	2.21	2.13	2.12	2.11	2.12	2.10	2.20	2.14	2.12	2.14	2.14	2.09	2.08	2.11	2.13	2.21	2.22	2.08	2.22	2.14	24	
24	2.17	2.13	S	2.20	2.12	2.14	2.15	2.17	2.16	2.13	2.07	2.10	2.12	2.11	2.09	2.12	2.10	2.09	2.10	2.12	2.12	2.15	2.16	2.37	2.07	2.37	2.14	24	
25	2.34	S	2.25	2.37	2.29	2.22	2.20	2.15	2.14	2.13	2.13	2.15	2.16	2.17	2.18	2.17	2.16	2.15	2.15	2.13	2.27	2.29	2.31	2.43	2.13	2.43	2.21	24	
26	S	2.64	2.82	2.92	2.77	2.91	3.18	2.80	2.31	2.19	2.99	2.56	2.35	2.27	2.24	2.17	2.15	2.20	2.19	2.17	2.15	2.23	2.35	S	2.15	3.18	2.48	24	
27	2.54	2.58	2.76	2.62	2.83	2.85	2.85	2.54	2.38	2.33	2.32	2.35	2.26	2.21	2.20	2.39	2.23	2.18	2.24	2.20	2.42	2.59	S	2.81	2.18	2.85	2.46	24	
28	2.88	2.76	2.82	3.53	2.96	2.65	2.85	3.02	2.39	2.40	2.33	2.21	2.17	2.16	2.14	2.14	2.17	2.16	2.15	2.17	2.20	S	2.28	2.27	2.14	3.53	2.47	24	
29	2.34	2.34	2.31	2.32	2.43	2.40	2.41	2.43	2.42	2.51	2.46	2.28	2.22	2.10	2.09	2.09	2.14	2.21	2.12	2.33	S	2.08	2.22	2.41	2.08	2.51	2.29	24	
30	2.51	2.63	2.67	2.86	2.77	2.72	3.52	3.01	2.52	2.27	2.34	1.98	1.97	1.97	1.95	1.90	1.92	1.95	1.95	S	1.96	2.04	2.11	2.13	1.90	3.52	2.33	24	
31	2.12	2.20	2.43	2.54	2.39	2.37	2.39	2.29	2.14	2.03	2.08	2.07	2.05	2.02	1.99	1.99	2.01	2.00	S	1.99	1.99	2.04	2.10	2.15	1.99	2.54	2.15	24	
HOURLY MAX	2.92	3.32	3.15	3.53	3.41	3.49	3.52	3.02	2.94	2.88	4.46	2.63	2.68	2.66	2.61	2.59	2.58	2.58	2.58	2.57	2.58	2.67	2.64	2.81					
HOURLY AVG	2.39	2.46	2.48	2.52	2.54	2.49	2.52	2.45	2.34	2.28	2.39	2.25	2.24	2.21	2.20	2.18	2.18	2.19	2.19	2.20	2.21	2.24	2.26	2.34					

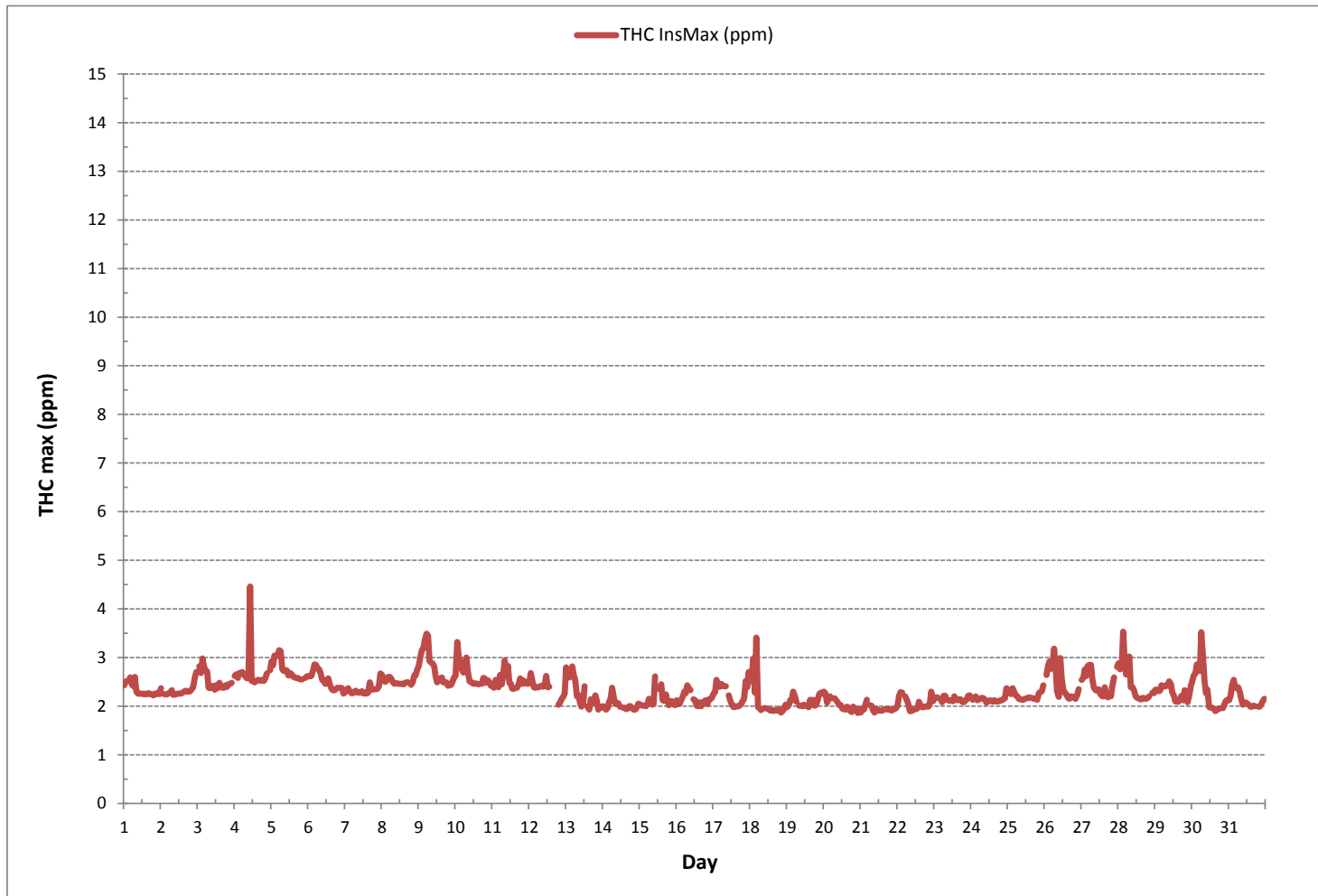
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	707
MAXIMUM INSTANTANEOUS VALUE:	4.46 ppm @ HOUR 10 ON DAY 4
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.31

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - July 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	3	3	S	2	30	19	18	18	11	7	1	0	0	0	0	1	0	1	0	1	1	1	14	6	0	30	6	24
2	25	S	6	3	11	10	8	5	3	2	10	3	2	0	2	2	7	5	0	1	3	2	1	0	0	25	5	24
3	S	2	0	1	1	0	0	0	0	1	1	0	7	1	10	11	1	0	7	0	0	0	0	S	0	11	2	24
4	9	0	0	1	5	5	1	2	7	7	13	8	6	8	5	6	2	3	4	4	1	1	S	1	0	13	4	24
5	1	1	0	1	1	1	5	4	3	1	1	1	1	1	1	1	1	1	0	0	3	S	2	2	0	5	1	24
6	3	3	3	2	1	3	3	3	3	2	1	1	3	2	1	1	1	2	6	2	S	2	1	1	1	6	2	24
7	2	3	2	14	4	1	3	6	1	2	21	13	13	2	1	0	10	13	18	S	13	0	3	22	0	22	7	24
8	22	6	0	0	1	1	2	2	2	1	0	0	1	0	1	0	0	0	S	0	1	2	3	4	0	22	2	24
9	4	4	3	2	2	3	5	4	4	4	3	3	4	3	2	7	4	S	4	2	0	1	1	1	0	7	3	24
10	1	1	1	2	1	1	2	4	5	3	7	7	6	3	3	2	S	1	5	4	5	16	2	4	1	16	4	24
11	2	2	17	32	27	28	40	36	26	16	11	11	12	1	0	S	4	18	20	7	24	20	35	32	0	40	18	24
12	30	28	25	7	24	2	2	5	6	5	C	C	C	C	C	C	C	0	1	1	1	1	1	1	0	30	8	24
13	1	6	6	2	7	4	6	3	5	2	1	1	7	S	4	4	1	5	5	5	14	5	2	7	1	14	4	24
14	12	15	14	18	16	30	30	25	17	13	15	10	S	1	0	0	1	5	2	2	0	0	0	0	0	30	10	24
15	0	0	0	0	2	7	11	23	13	15	12	S	13	12	9	4	5	1	4	0	0	2	5	1	0	23	6	24
16	0	0	0	0	0	2	2	3	2	2	S	1	1	1	1	1	1	0	1	1	1	2	1	2	0	3	1	24
17	3	3	4	4	7	6	8	8	6	S	3	1	1	1	1	1	1	0	1	2	3	6	1	2	0	8	3	24
18	1	1	1	2	10	3	27	16	S	2	3	4	2	1	4	2	1	1	2	1	0	6	2	2	0	27	4	24
19	1	2	6	2	3	4	7	S	4	14	9	10	11	8	7	8	10	11	0	0	0	0	0	0	0	14	5	24
20	0	0	1	2	1	2	S	0	0	0	0	3	2	0	6	4	0	0	4	9	2	4	1	0	9	2	24	
21	1	1	1	0	0	S	15	15	2	2	9	8	4	5	1	0	1	1	2	3	2	2	4	2	0	15	4	24
22	2	5	6	6	S	3	5	10	14	23	21	22	8	7	22	19	1	0	0	1	1	8	24	25	0	25	10	24
23	32	31	37	S	40	7	17	17	12	15	10	12	9	7	5	3	0	0	1	1	1	1	1	1	0	40	11	24
24	3	3	S	7	5	10	10	14	33	31	3	8	1	0	1	1	1	1	1	1	0	0	0	37	0	37	7	24
25	7	S	1	4	0	1	1	1	14	13	11	11	9	4	1	1	1	2	0	0	0	0	1	1	0	14	4	24
26	S	6	1	1	1	2	3	3	14	11	11	1	2	2	3	3	21	3	2	1	1	1	S	1	1	21	4	24
27	1	1	1	1	1	1	5	6	2	2	1	3	3	1	1	18	44	41	20	4	4	6	S	4	1	44	7	24
28	2	2	2	4	3	1	1	5	4	1	1	1	1	1	1	1	1	1	1	2	2	S	2	3	1	5	2	24
29	4	4	6	5	3	4	5	6	6	6	4	2	0	1	3	1	5	4	6	7	S	1	1	3	0	7	4	24
30	3	2	2	1	1	10	10	3	9	10	19	2	2	1	0	0	1	1	0	S	1	1	10	5	0	19	4	24
31	4	3	3	2	1	1	1	1	3	2	1	1	1	1	1	1	0	S	0	2	1	1	1	1	0	4	1	24
HOURLY MAX	32	31	37	32	40	30	40	36	33	31	21	22	13	12	22	19	44	41	20	7	24	20	35	37				
HOURLY AVG	6	5	5	4	7	6	8	8	8	7	7	5	5	3	3	4	4	5	4	2	3	3	4	6				

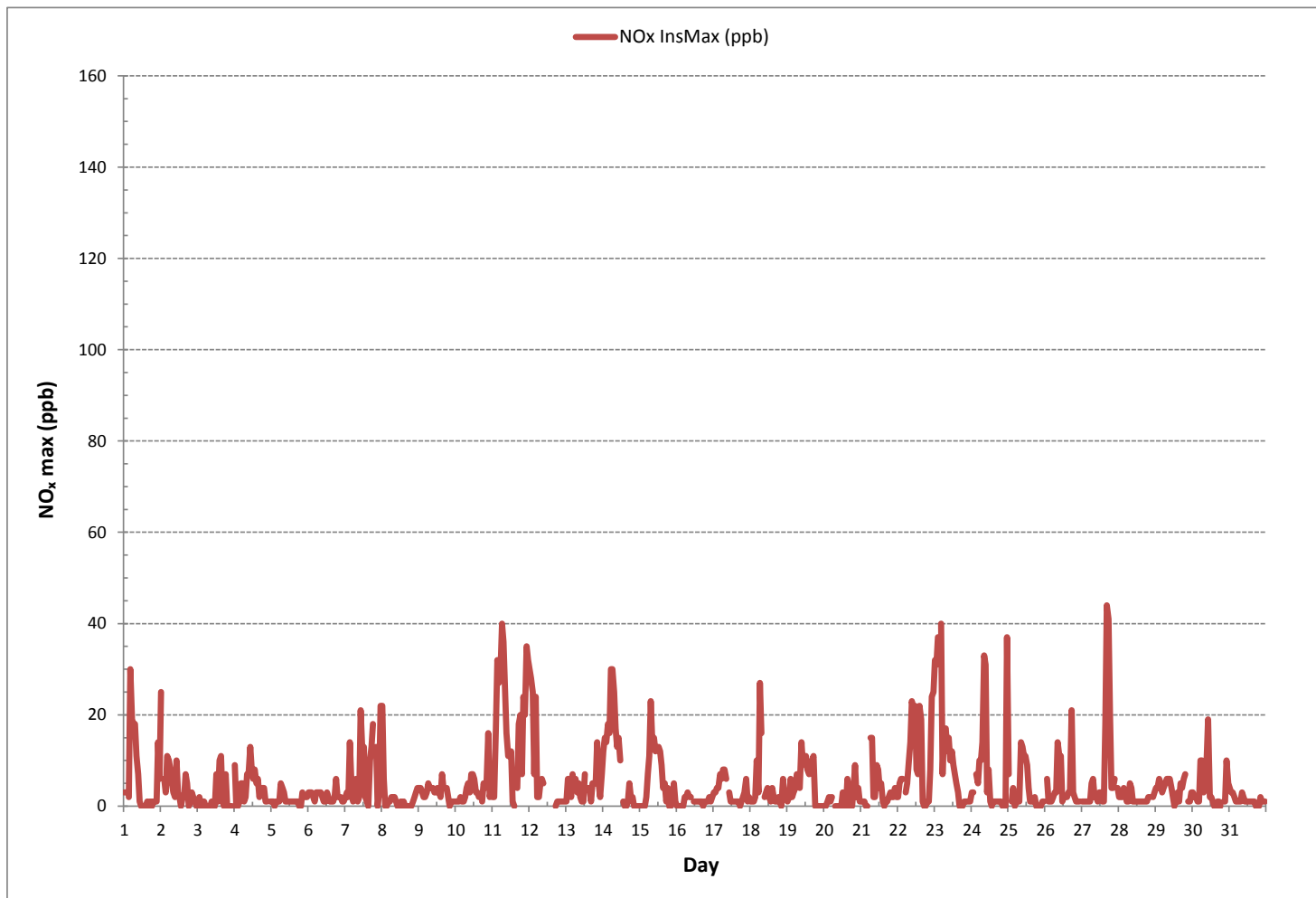
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	607
MAXIMUM INSTANTANEOUS VALUE:	44 ppb @ HOUR 16 ON DAY 27
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	7

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)





NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0	0	S	0	10	5	7	7	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	24
2	7	S	0	1	2	2	3	2	1	1	4	1	0	0	1	0	2	1	0	0	0	0	0	0	0	0	7	1	24
3	S	0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	0	0	1	0	0	0	0	0	S	0	2	0	24
4	6	0	0	0	1	2	0	1	4	3	10	4	2	2	2	1	0	1	1	0	0	0	S	0	0	10	2	24	
5	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	24	
6	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	1	0	S	0	0	0	0	1	0	24	
7	0	0	0	0	0	0	1	2	0	0	9	3	3	1	0	0	3	4	8	S	4	0	1	10	0	10	2	24	
8	10	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	24
9	0	0	0	0	0	1	1	1	1	1	1	0	0	0	1	2	1	S	1	0	0	0	0	0	0	2	0	24	
10	0	0	0	0	0	0	1	2	2	1	2	1	1	1	0	0	S	0	1	1	1	1	3	0	0	3	1	24	
11	0	0	3	12	9	11	19	17	11	8	5	5	7	0	0	S	1	7	4	1	5	0	11	8	0	19	6	24	
12	8	8	7	0	10	0	0	1	2	3	C	C	C	C	C	C	C	0	1	1	0	0	0	0	0	10	2	24	
13	0	0	0	0	4	0	1	1	2	0	0	0	1	S	0	0	0	0	0	0	3	0	0	1	0	4	1	24	
14	3	5	6	8	8	19	20	16	11	7	8	4	S	1	0	0	0	2	0	1	0	0	0	0	0	20	5	24	
15	0	0	0	0	0	3	6	15	7	9	7	S	7	6	4	2	2	0	1	0	0	0	0	0	0	15	3	24	
16	0	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
17	0	0	0	0	0	1	2	2	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
18	0	0	0	0	2	0	11	5	S	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	11	1	24	
19	0	0	0	0	0	1	2	S	1	6	4	4	5	3	2	2	4	4	0	0	0	0	0	0	0	6	2	24	
20	0	0	0	0	0	0	S	0	0	0	0	0	1	0	0	2	1	0	0	0	1	0	0	0	0	2	0	24	
21	0	0	0	0	0	S	1	1	0	0	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
22	0	0	0	0	S	0	2	4	7	11	10	9	3	2	9	7	0	0	0	0	0	1	8	9	0	11	4	24	
23	16	15	21	S	25	3	10	10	5	8	6	7	5	3	3	1	0	0	0	0	0	0	0	0	0	25	6	24	
24	0	0	S	2	1	4	4	8	21	20	1	4	1	0	0	0	0	0	0	0	0	0	0	19	0	21	4	24	
25	1	S	0	1	0	0	0	0	8	7	4	5	4	1	0	0	0	1	0	0	0	0	0	0	0	8	1	24	
26	S	2	0	0	0	1	1	1	6	4	3	0	0	0	1	1	5	1	0	0	0	0	0	S	0	6	1	24	
27	0	0	0	0	0	0	1	1	0	0	1	1	0	0	3	16	12	5	0	0	0	S	0	0	16	2	24		
28	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	24		
29	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	0	1	1	0	0	S	0	0	0	1	0	24		
30	0	0	0	0	0	8	8	1	5	3	6	0	0	0	0	0	0	0	0	0	S	0	1	0	8	1	24		
31	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24	
HOURLY MAX	16	15	21	12	25	19	20	17	21	20	10	9	7	6	9	7	16	12	8	1	5	3	11	19					
HOURLY AVG	2	1	1	1	2	2	4	4	4	3	3	2	2	1	1	1	1	1	1	0	0	0	1	2					

STATUS FLAG CODES

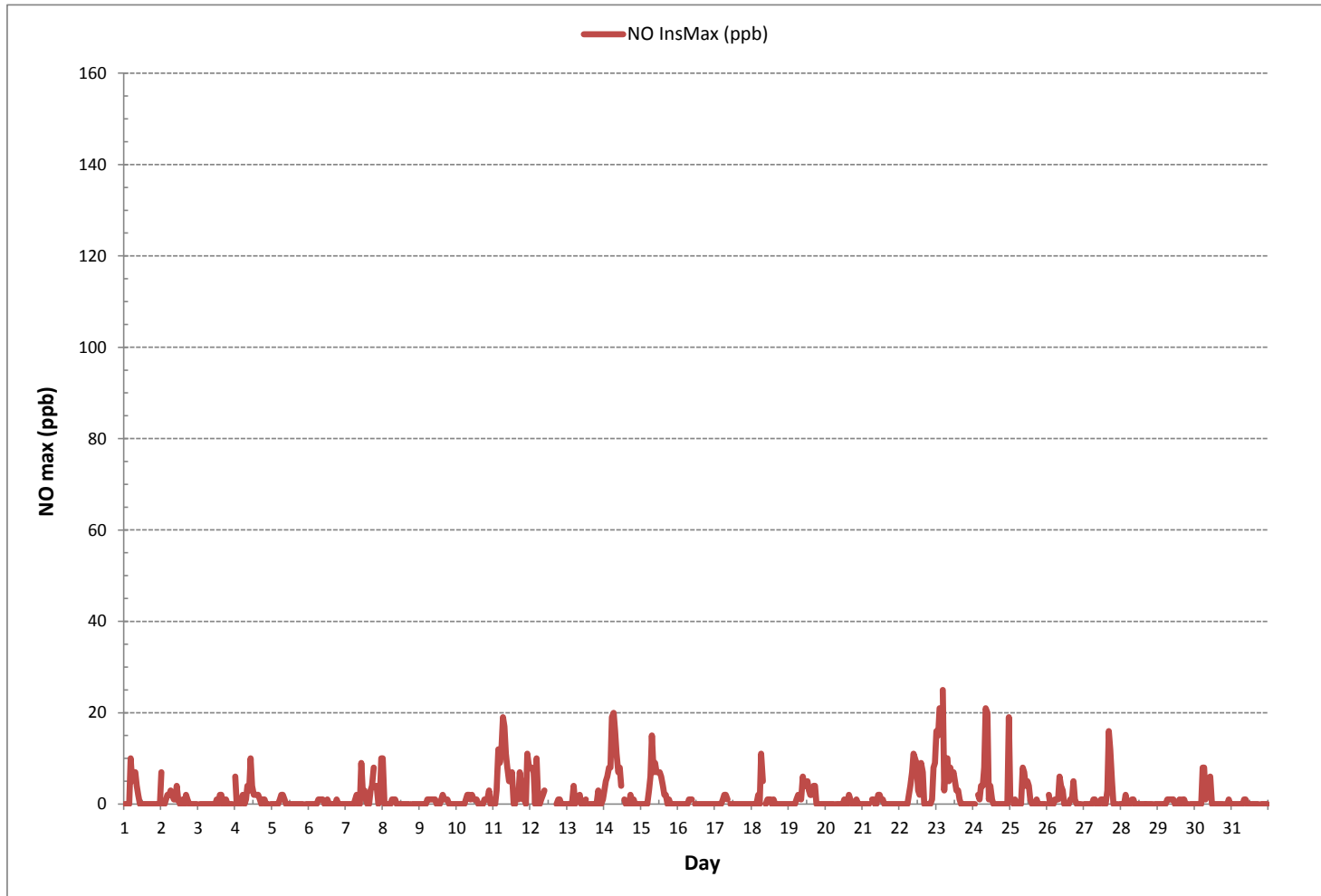
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	270
MAXIMUM INSTANTANEOUS VALUE:	25 ppb @ HOUR 4 ON DAY 23
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	744 hrs



NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - July 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	3	3	S	2	19	14	12	11	7	5	1	0	0	1	0	0	0	1	0	1	1	1	14	6	0	19	4	24
2	18	S	6	2	9	9	5	3	2	2	6	2	2	0	1	2	5	4	1	1	3	2	2	0	0	18	4	24
3	S	1	1	1	1	0	0	0	0	1	1	0	6	1	9	10	1	0	6	0	0	0	0	S	0	10	2	24
4	3	0	0	1	3	3	0	1	4	4	3	5	5	5	3	4	2	2	3	3	1	1	S	1	0	5	2	24
5	1	1	0	1	1	1	3	3	2	1	1	1	1	1	1	1	1	1	1	1	3	S	2	2	0	3	1	24
6	3	3	3	2	2	2	3	3	2	2	1	1	2	2	1	1	2	5	2	S	2	1	1	1	1	5	2	24
7	2	3	2	14	4	1	3	4	1	1	13	10	10	1	1	0	7	10	10	S	9	0	2	12	0	14	5	24
8	12	6	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	S	0	1	2	3	4	0	12	1	24
9	4	4	3	2	2	2	4	4	3	3	3	2	3	3	2	4	3	S	3	2	0	1	1	1	0	4	3	24
10	1	2	1	2	1	1	1	3	3	2	5	5	4	3	2	2	S	1	4	3	5	13	3	4	1	13	3	24
11	2	2	15	20	17	18	21	19	14	8	6	6	6	1	0	S	3	11	16	7	19	20	24	25	0	25	12	24
12	22	20	19	7	15	1	1	4	4	2	C	C	C	C	C	C	C	0	0	1	1	1	1	1	0	22	6	24
13	1	6	6	3	4	3	5	3	4	2	1	1	6	S	4	4	1	5	5	5	11	4	2	6	1	11	4	24
14	9	10	8	9	9	11	10	10	7	6	8	6	S	0	0	0	1	3	1	1	0	0	0	0	0	11	5	24
15	0	0	0	0	2	4	6	8	5	6	5	S	6	6	5	2	3	1	3	0	1	2	5	1	0	8	3	24
16	0	0	0	0	0	2	2	2	2	1	S	1	1	1	1	1	1	1	1	1	1	2	1	2	0	2	1	24
17	3	3	4	4	6	6	6	6	5	S	3	1	1	1	1	0	1	0	1	2	3	6	1	2	0	6	3	24
18	1	1	1	2	8	3	16	11	S	2	3	2	1	3	2	1	1	2	1	0	6	2	2	0	16	3	24	
19	1	2	6	2	3	3	5	S	3	8	6	6	7	6	5	6	6	6	1	0	0	0	0	0	0	8	4	24
20	0	0	1	2	1	2	S	0	0	0	0	0	2	1	0	4	3	0	0	4	9	2	4	1	0	9	2	24
21	1	1	1	1	0	S	14	14	2	1	7	6	3	4	1	0	1	1	1	3	2	2	4	2	0	14	3	24
22	2	5	6	6	S	3	4	7	7	12	12	12	5	5	13	12	1	0	0	1	0	7	16	16	0	16	7	24
23	17	16	17	S	15	5	8	7	7	6	5	6	4	3	3	1	0	0	1	1	1	1	1	1	0	17	5	24
24	3	4	S	6	4	6	5	7	14	12	2	4	1	0	0	0	1	0	0	1	1	0	0	17	0	17	4	24
25	5	S	1	4	0	1	0	0	6	6	6	6	6	3	1	1	1	1	0	0	1	0	1	1	0	6	2	24
26	S	4	1	1	1	1	2	2	9	8	8	1	2	2	2	2	16	3	2	2	1	1	S	1	16	3	24	
27	1	1	1	1	1	1	4	4	2	1	1	2	2	1	1	15	29	29	15	4	4	6	S	4	1	29	6	24
28	2	2	2	4	2	1	1	4	3	1	1	1	1	1	1	1	1	1	1	2	2	S	2	3	1	4	2	24
29	4	4	7	5	3	4	4	5	5	5	4	2	1	1	2	1	5	3	6	7	S	1	2	3	1	7	4	24
30	3	2	2	1	1	2	3	2	5	6	13	1	1	1	1	0	1	1	1	S	1	1	9	4	0	13	3	24
31	4	3	3	2	1	1	1	1	2	1	0	1	1	1	1	1	0	S	0	2	1	1	1	1	0	4	1	24
HOURLY MAX	22	20	19	20	19	18	21	19	14	12	13	12	10	6	13	15	29	29	16	7	19	20	24	25				
HOURLY AVG	4	4	4	4	5	4	5	5	4	4	4	3	3	2	2	3	3	3	3	2	3	3	4	4				

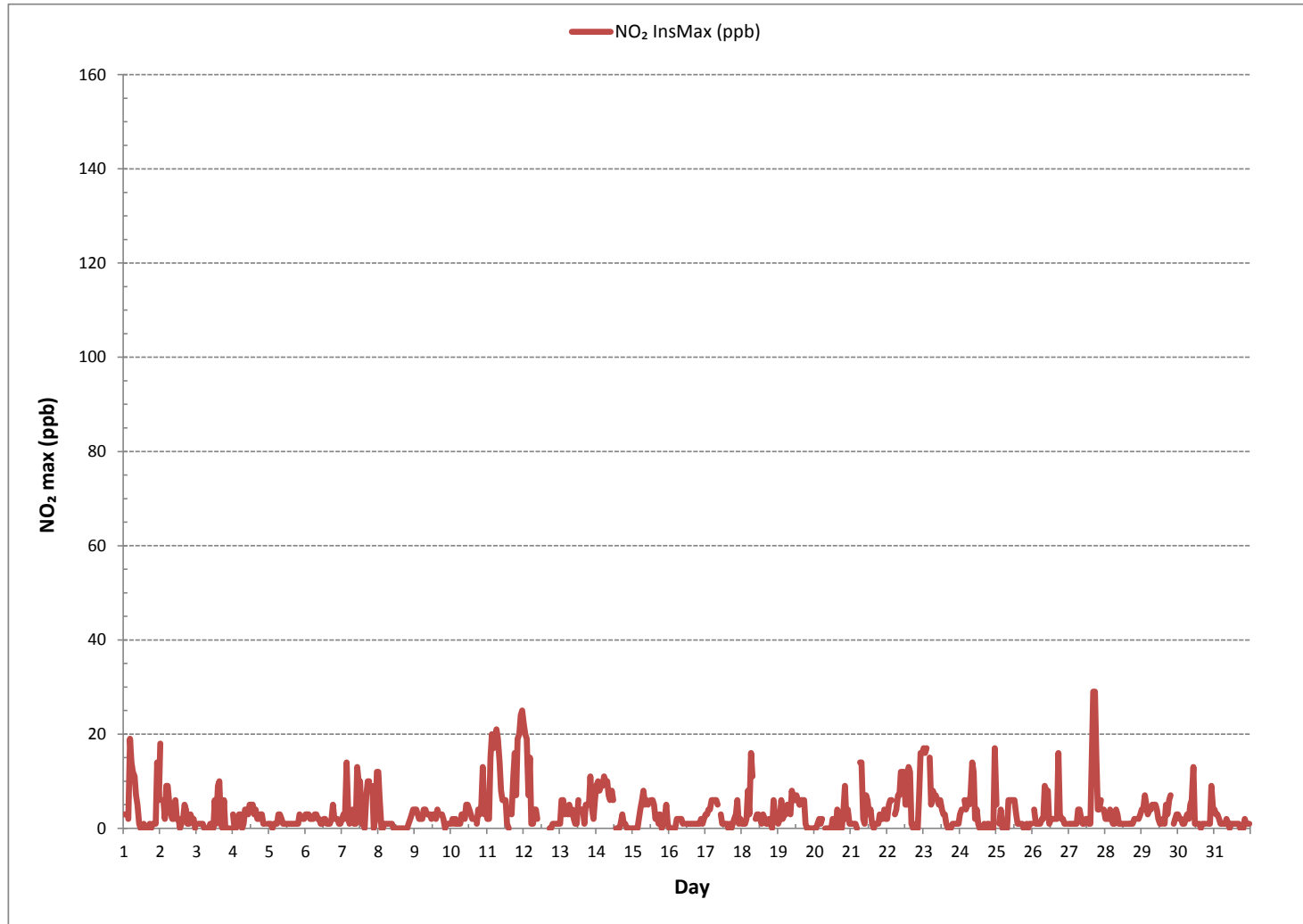
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	606
MAXIMUM INSTANTANEOUS VALUE:	29 ppb @ HOUR 16 ON DAY 27
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	4

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
Maskwa Continuous Monitoring Station - July 2018

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	10.5	8.0	6.1	5.7	14.6	13.1	25.4	28.2	22.3	19.0	22.5	24.9	23.4	26.6	29.4	35.4	31.4	38.9	28.0	20.5	16.6	15.3	14.3	16.8	5.7	38.9	20.7	24
2	15.9	13.5	12.4	8.3	12.2	19.0	16.4	14.1	12.9	13.3	12.9	10.4	11.1	10.7	6.0	8.7	12.0	11.3	14.3	9.1	8.9	3.9	4.2	3.2	3.2	19.0	11.0	24
3	2.4	3.0	3.0	4.6	6.7	7.8	11.1	11.6	20.1	24.7	34.1	19.0	16.5	16.8	29.5	17.0	22.2	12.4	27.2	6.1	5.4	3.7	4.4	4.8	2.4	34.1	13.1	24
4	6.7	6.1	3.0	3.2	7.4	6.3	9.0	15.8	21.2	18.3	22.1	19.9	24.7	20.1	24.5	15.7	15.7	17.9	7.8	20.1	7.1	4.6	3.7	5.4	3.0	24.7	12.8	24
5	5.2	5.2	4.8	3.0	3.9	3.7	10.7	11.6	16.4	23.6	26.0	23.6	23.0	25.8	23.3	26.8	26.4	24.4	27.5	24.0	15.6	16.8	18.8	17.7	3.0	27.5	17.0	24
6	10.8	7.5	3.2	4.0	10.5	15.3	9.9	10.2	23.6	28.2	25.5	28.2	35.6	X	36.1	23.6	22.9	24.9	24.0	8.7	15.6	13.7	31.0	12.9	3.2	36.1	18.5	23
7	21.0	13.7	13.3	18.3	17.5	X	13.5	22.3	24.4	23.8	29.9	33.1	25.3	35.0	30.6	38.4	38.4	19.9	25.9	28.6	X	19.2	16.2	X	13.3	38.4	24.2	21
8	10.7	10.2	9.4	8.0	7.0	9.2	15.9	13.3	18.6	33.4	23.6	37.6	23.9	30.2	19.7	24.9	25.5	24.7	20.1	13.3	8.1	8.5	10.9	8.3	7.0	37.6	17.3	24
9	9.1	6.1	9.8	9.1	3.7	3.5	12.0	14.0	12.2	15.0	24.2	22.5	12.9	17.7	X	18.8	22.7	X	17.5	12.6	6.6	X	3.0	3.7	3.0	24.2	12.2	21
10	3.4	3.3	2.2	4.0	X	5.0	5.9	15.0	X	20.7	22.3	19.4	22.5	25.3	18.8	12.4	8.7	2.8	6.4	5.6	13.7	20.4	20.4	16.6	2.2	25.3	12.5	22
11	13.5	19.0	23.4	23.4	19.2	22.9	23.8	19.0	24.1	27.1	25.8	30.8	31.2	X	27.7	32.5	25.3	23.8	14.8	19.4	18.8	18.1	16.1	15.5	13.5	32.5	22.4	23
12	25.1	12.0	13.7	14.0	14.0	22.9	20.1	19.2	27.5	25.3	30.7	32.1	27.9	29.9	34.3	28.6	25.6	27.1	24.7	7.4	8.0	6.7	7.6	6.7	6.7	34.3	21.4	24
13	17.0	5.2	4.8	4.0	11.1	6.1	7.6	11.0	11.1	12.4	19.0	17.5	8.8	6.4	16.2	7.2	9.1	11.6	7.9	9.5	20.1	17.0	15.0	17.0	4.0	20.1	11.4	24
14	17.0	19.0	21.1	20.5	19.0	25.6	22.9	26.9	32.9	32.8	27.3	34.8	43.3	36.8	46.6	30.9	50.1	44.6	35.2	37.0	31.9	24.3	22.7	13.5	13.5	50.1	29.9	24
15	25.1	19.4	24.2	28.6	23.6	23.6	28.8	27.3	31.4	43.3	47.7	30.8	30.2	30.2	27.9	29.3	27.7	14.1	14.6	8.1	12.9	8.9	12.4	11.8	8.1	47.7	24.2	24
16	13.7	12.7	11.8	9.7	8.7	8.3	12.2	10.0	17.9	21.2	28.0	33.9	33.7	33.2	35.2	36.7	26.0	29.1	23.3	15.7	6.7	10.7	14.4	14.8	6.7	36.7	19.5	24
17	11.3	8.3	12.4	12.9	14.1	15.3	12.2	10.3	10.9	17.4	30.3	28.1	25.1	23.1	31.0	32.5	27.9	21.1	18.2	6.5	4.8	4.4	4.8	4.6	4.4	32.5	16.1	24
18	5.2	3.9	13.3	7.4	28.8	25.1	15.9	8.0	10.0	12.8	8.0	15.3	21.8	17.7	17.2	20.0	17.7	16.4	32.6	23.4	11.9	5.2	8.9	3.9	3.9	32.6	15.2	24
19	8.8	9.4	11.1	10.9	8.5	8.3	13.7	19.4	12.0	14.6	21.2	32.1	25.1	22.2	16.8	20.1	22.7	20.7	13.1	9.6	6.5	5.0	5.5	8.0	5.0	32.1	14.4	24
20	8.4	9.8	11.8	6.9	8.0	6.6	11.9	11.8	10.9	27.1	29.5	35.4	32.8	32.1	33.7	34.7	42.8	38.2	35.7	35.2	30.2	28.6	38.5	35.8	6.6	42.8	24.9	24
21	21.6	11.4	6.8	7.8	6.3	6.3	10.2	11.3	16.6	17.0	15.3	16.8	16.6	20.3	21.0	18.1	13.3	11.8	33.9	38.3	9.6	13.1	10.7	8.5	6.3	38.3	15.1	24
22	9.4	13.7	10.7	9.8	8.7	10.7	12.2	21.2	27.5	29.1	35.4	30.0	34.8	45.7	42.6	39.6	43.9	29.9	35.5	35.0	23.8	27.7	23.6	19.9	8.7	45.7	25.9	24
23	23.8	21.4	25.8	24.2	22.9	27.3	26.7	21.4	27.1	41.5	35.0	33.6	41.5	38.0	33.4	25.3	27.3	22.7	25.6	20.6	14.0	18.8	12.9	12.4	12.4	41.5	26.0	24
24	12.0	15.5	15.0	8.7	12.2	15.5	19.7	22.3	21.2	28.0	22.3	23.4	24.7	24.5	26.7	26.0	24.9	24.5	11.1	12.2	9.4	9.6	5.0	5.0	5.0	28.0	17.5	24
25	5.4	8.5	7.4	5.7	13.1	9.6	9.4	9.1	8.9	13.1	10.4	12.7	13.5	19.7	22.7	14.6	18.1	16.8	11.3	6.9	4.3	3.4	3.9	3.7	3.4	22.7	10.5	24
26	4.8	3.9	4.1	3.2	3.2	4.4	3.5	6.1	12.0	9.4	13.1	15.7	14.1	11.6	15.3	17.2	12.0	13.1	14.0	4.3	7.4	3.2	4.6	3.4	3.2	17.2	8.5	24
27	3.3	3.8	4.0	2.7	3.7	3.9	5.2	6.1	11.1	10.9	14.1	21.3	17.9	20.6	19.2	18.6	9.7	3.7	3.5	4.3	4.6	5.2	4.8	4.1	2.7	21.3	8.6	24
28	3.7	2.2	2.2	4.1	4.0	2.0	2.6	9.1	10.0	12.9	17.2	17.0	18.8	24.2	22.5	21.6	20.3	20.2	16.6	10.0	9.1	11.3	11.2	12.2	2.0	24.2	11.9	24
29	10.7	13.3	14.3	10.9	14.1	13.3	14.0	14.6	13.5	12.0	16.1	20.6	27.3	26.0	25.5	18.5	16.1	23.1	7.6	27.1	24.2	5.4	10.5	8.7	5.4	27.3	16.1	24
30	3.9	5.9	4.8	3.9	5.7	4.6	6.4	10.3	10.0	16.8	27.1	16.1	12.7	12.4	30.2	24.0	21.6	20.3	26.5	23.1	8.9	8.0	6.9	8.5	3.9	30.2	13.3	24
31	5.9	4.1	4.6	5.4	5.0	7.8	7.4	8.5	7.8	10.4	8.5	8.9	9.1	12.6	20.2	14.2	11.5	12.4	10.8	7.6	4.6	5.7	7.3	8.7	4.1	20.2	8.7	24
HOURLY MAX	25.1	21.4	25.8	28.6	28.8	27.3	28.8	28.2	32.9	43.3	47.7	37.6	43.3	45.7	46.6	39.6	50.1	44.6	35.7	38.3	31.9	28.6	38.5	35.8				

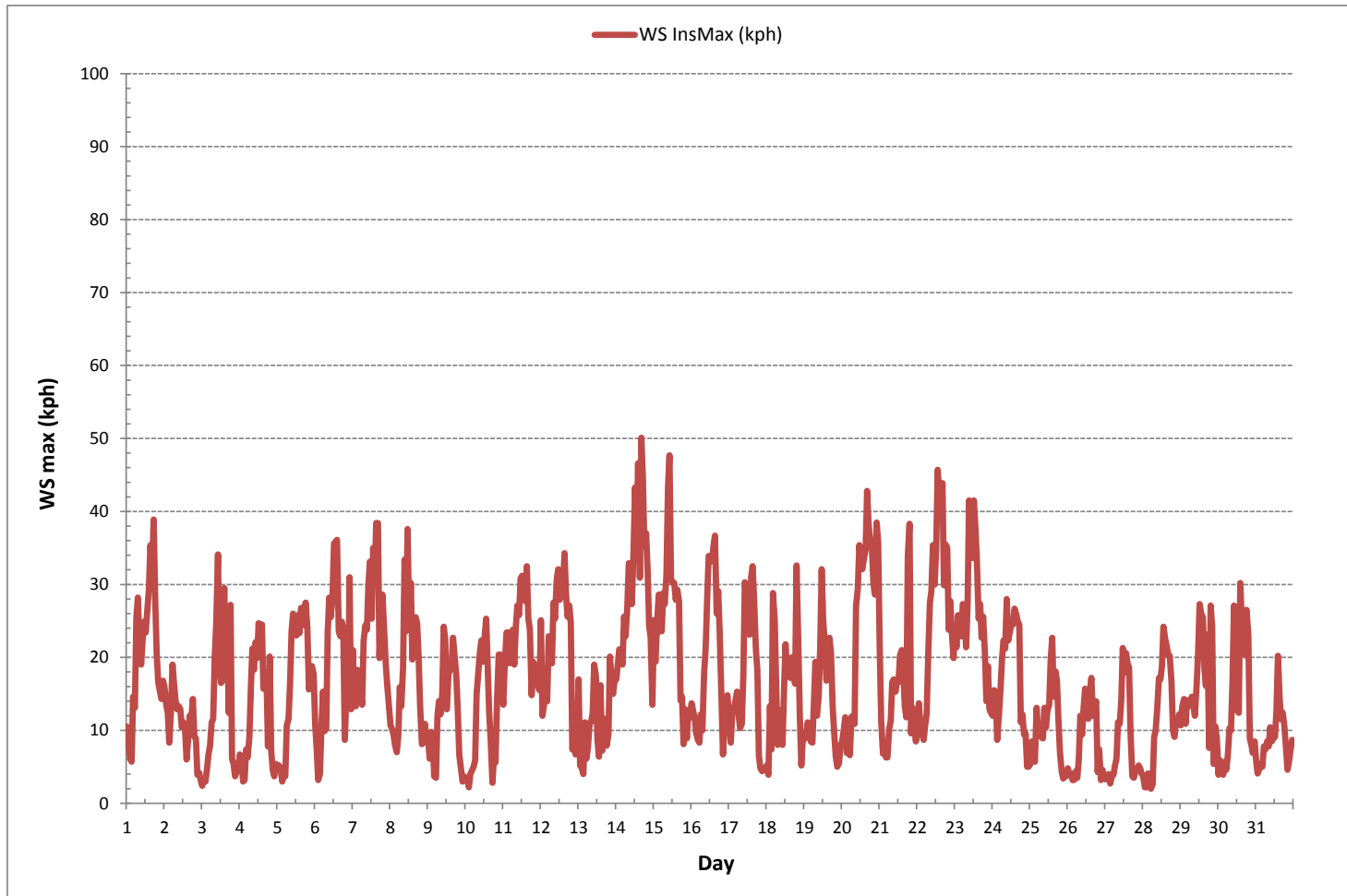
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	50.1	kph	@ HOUR	16	ON DAY	14
OPERATIONAL TIME:					734	hrs

WIND SPEED Instantaneous Maximum (WS kph)



***APPENDIX IV  
REPORT CERTIFICATION FORM***

### Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	Maskwa Continuous Monitoring Station
Name of the Representative of the Person Responsible	Position / Title of the Representative of the Person Responsible
Mike Bisaga	Environment Monitoring Program Manager
Is an External Party Certifying the Report?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adeganmbi	Project Team Lead, Customer Service, Air Services
Company Name for External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
Maxxam Analytics, A Bureau Veritas Group Company	M.Sc., EPT., PMP

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



\_\_\_\_\_  
Signature of the External Person Certifying the Report

31-08-2018

\_\_\_\_\_  
Report Issued Date (dd-mm-yyyy)

***APPENDIX V***  
***DATA VALIDATION CERTIFICATION FORM***





## Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2018-07-30-C</u>
<b>Site:</b> <u>Maskwa Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

<b>Level 0 Preliminary Verification</b>	<u><i>Maram Ghaleb</i></u>	<b>Date</b> <u>August 29, 2018</u>
<b>Level 1 Primary Validation</b>	<u><i>Maram Ghaleb</i></u>	<b>Date</b> <u>August 29, 2018</u>
<b>Level 2 Final Validation</b>	<u><i>Maram Ghaleb</i></u>	<b>Date</b> <u>August 31, 2018</u>
<b>Level 3 Independent Data Review</b>	<u><i>MSB</i></u>	<b>Date</b> <u>August 31, 2018</u>
<b>Post-Final Validation</b>	<u>NA</u>	<b>Date</b> <u>NA</u>

<b>Notes</b>
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.

Alberta Environment and Parks (AEP)  
[Air.Reporting@gov.ab.ca](mailto:Air.Reporting@gov.ab.ca)

September 14, 2018

**Subject: Monthly Report Submission for the LICA St. Lina station**

---

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA St. Lina AQM Station in the month of July 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in July 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

Should you have any questions, please don't hesitate to contact us.

Respectfully,



Lakeland Industry & Community Association  
5107 50 St  
Bonnyville, AB T9N 2J7

A handwritten signature in blue ink that reads "Michael Bisaga".

Michael Bisaga  
Technical Program Manager  
Lakeland Industry & Community Association  
780-266-7068  
[mbisaga@otonabee.ca](mailto:mbisaga@otonabee.ca)

A handwritten signature in blue ink that reads "Lily Lin".

Lily Lin  
Data & Reporting Specialist  
587-225-2248  
[rebbaca@gmail.com](mailto:rebbaca@gmail.com)



MAXXAM ANALYTICS  
#1 2080 39 Ave. NE, Calgary, AB  
T2E 6P7

maxxam.ca  
Toll Free 800-386-7247  
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT**  
**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
**ST. LINA CONTINUOUS MONITORING STATION**

**JOB #: 2833-2018-07-31-C**

**July 2018**

Prepared for:

**LAKELAND INDUSTRY & COMMUNITY ASSOCIATION**  
5107 50 ST.  
BONNYVILLE, ALBERTA  
T9N 2J7

**Attention: MIKE BISAGA**

DATE: **August 31, 2018**

Prepared by:

---

Maram Ghaleb, B.Sc.  
Project Manager, Customer Service, Air Services

Reviewed by:

---

Wunmi Adekanmbi, M.Sc., EPT, PMP  
Project Team Lead, Customer Service, Air Services

## **SUMMARY**

In July 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry and Community Association.

The operational time for each monitoring analyzer, meteorological unit and data acquisition system was above the 90% requirement.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017).

**Power failure:** A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime across all parameters. An additional hour of downtime was recorded at hour 03:00 for gas parameters as the analyzers were recovering from the power failure.

### **H<sub>2</sub>S:**

- Twenty-nine hours of downtime were incurred between July 18 and July 19 due to analyzer slow response and the corrective actions performed to address it.
- One hour of downtime was recorded due to an additional zero-span check performed on July 31 at hour 21:00 to assess a biased high drift in span response.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

### Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO <sub>2</sub> (ppb)	172	48	0	0	0	4	16	8	16.6	SSW	1	6	98.7
H <sub>2</sub> S (ppb)	10	3	0	0	0	2	8	5	6.8	WSW	0	1	94.6
THC (ppm)	-	-	-	-	2.17	2.66	27	6	3.1	SW	2.32	27	98.7
NO <sub>2</sub> (ppb)	159	-	0	-	0	11	16	20	6.5	SW	2	16	98.7
NO (ppb)	-	-	-	-	0	8	26	15	1.4	NNE	0	1	98.7
NO <sub>x</sub> (ppb)	-	-	-	-	0	11	16	20	6.5	SW	2	16	98.7
O <sub>3</sub> (ppb)	82	-	0	-	27.3	50.7	28	15	8.1	SSW	39.6	28	98.7
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	80	30	0	0	5	22	3	20	7.7	NNE	15	29	98.8
RELATIVE HUMIDITY (%)	-	-	-	-	69	99	3	4	7.6	N	87	13	98.8
BAROMETRIC PRESSURE (millibar)	-	-	-	-	935	944	5	7	8.5	SSW	943	25	98.8
AMBIENT TEMPERATURE (°C)	-	-	-	-	17.2	31.1	17	15	11.8	WSW	25.3	17	98.8
PRECIPITATION (mm)	-	-	-	-	0.1	15.6	18	19	6.3	NW	0.7	18	98.8
VECTOR WS (kph)	-	-	-	-	4.4	27.7	7	14	-	W	15.0	14	98.8
VECTOR WD (sec)	-	-	-	-	280 (W)	-	-	-	-	-	-	-	98.8

---

## Exceedance Summary Report

---

### SO<sub>2</sub> 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

### SO<sub>2</sub> 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

### H<sub>2</sub>S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

### H<sub>2</sub>S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

### NO<sub>2</sub> 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

### PM<sub>2.5</sub> 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m<sup>3</sup>.

### PM<sub>2.5</sub> 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m<sup>3</sup>.

### O<sub>3</sub> 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

*In accordance with EPEA and the Substance Release Regulation.*

*In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.*

**TABLE OF CONTENTS**

<b><u>Title</u></b>	<b><u>Page</u></b>
<b>SUMMARY</b>	<b>2</b>
<b>MONTHLY CONTINUOUS DATA SUMMARY REPORT</b>	<b>3</b>
<b>EXCEEDANCE SUMMARY REPORT</b>	<b>4</b>
<b>TABLE OF CONTENTS</b>	<b>5</b>
<b>1.0 Discussion</b>	<b>7</b>
<b>2.0 Project Personnel</b>	<b>10</b>
<b>3.0 Plant Monthly Required AMD Summary</b>	<b>10</b>
<b>4.0 Calculations and Results</b>	<b>10</b>
<b>5.0 Methods and Procedures</b>	<b>11</b>
<b>Appendix I</b>	<b>Continuous Monitoring Data Results 14</b>
	<b>Sulphur Dioxide 15</b>
	<b>Hydrogen Sulphide 21</b>
	<b>Total Hydrocarbon 27</b>
	<b>Oxides of Nitrogen 33</b>
	<b>Nitric Oxides 39</b>
	<b>Nitrogen Dioxide 44</b>
	<b>Ozone 50</b>
	<b>Particulate Matter 2.5 56</b>
	<b>Wind Speed 61</b>
	<b>Wind Direction 66</b>
	<b>Standard Deviation Wind Direction 69</b>
	<b>Relative Humidity 72</b>
	<b>Barometric Pressure 75</b>
	<b>Ambient Temperature 78</b>
	<b>Precipitation 81</b>



---

<b>Appendix II</b>	<b>Equipment Calibration Results</b>	<b>84</b>
	Sulphur Dioxide	85
	Hydrogen Sulphide	88
	Total Hydrocarbon	95
	Nitrogen Dioxide	98
	Ozone	102
	Particulate Matter	105
	Wind System	107
	Calibrators	109
	Calibration Gases	112
<b>Appendix III</b>	<b>Maximum Instantaneous Data</b>	<b>117</b>
<b>Appendix IV</b>	<b>Report Certification Form</b>	<b>134</b>
<b>Appendix V</b>	<b>Data Validation Certification Form</b>	<b>136</b>

## 1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulphide (H<sub>2</sub>S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxides (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter 2.5 (PM<sub>2.5</sub>), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: [Ambient Data Quality \(December, 2016\)](#). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

### **SULPHUR DIOXIDE (SO<sub>2</sub>)**

- Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
- The routine monthly calibration was performed on July 17.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime. An additional hour of downtime was recorded at hour 03:00 due to analyzer recovery.

### **HYDROGEN SULPHIDE (H<sub>2</sub>S)**

- Operational time for the monitoring period was 94.6%, equivalent to 40 hours of downtime.
- The routine monthly calibration was performed on July 17. Slow response was observed at the high point . The calibration met all AMD requirements. However, the analyzer exhibited slow response at the As-Found High Point due to moisture build-up in the SO<sub>2</sub> scrubber. As a proactive measure, a repeat calibration was attempted on July 18 with an extended As-Found Zero phase to allow additional drying time for the scrubber material, but the slow response persisted. A shut-down calibration was therefore completed prior to maintenance. The scrubber material was renewed and was conditioned overnight. A post-repair calibration was successfully completed on July 19. Twenty-nine hours of downtime were incurred as a result of these corrective actions.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime. An additional hour of downtime was recorded at hour 03:00 due to analyzer recovery.
- The analyzer began to exhibit a gradual biased high span drift towards the end of the month. An additional zero-span check was triggered on July 31 at hour 21:00, yielding results outside the upper acceptance limit. This prompted a site visit on August 1 where the analyzer was replaced, following a successful shut-down calibration. As the shut-down calibration met AMD requirements, no data was discarded due to this event. One hour of downtime was, however, incurred due to the additional zero-span check.

### **TOTAL HYDROCARBONS (THC)**

- Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
- The routine monthly calibration was performed on July 1.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime. An additional hour of downtime was recorded at hour 03:00 due to analyzer recovery.

### **OXIDES OF NITROGEN (NO<sub>x</sub>), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO<sub>2</sub>)**

- Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
- The routine monthly calibration was performed on July 17.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime. An additional hour of downtime was recorded at hour 03:00 due to analyzer recovery.

### **OZONE (O<sub>3</sub>)**

- Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
- The routine monthly calibration was performed on July 18.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime. An additional hour of downtime was recorded at hour 03:00 due to analyzer recovery.

### **PARTICULATE MATTER < 2.5 MICRONS (PM<sub>2.5</sub>)**

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- The monthly audit was performed on July 18.
- A power failure occurred from July 20, hour 18:00 to July 21, hour 02:00, resulting in 9 hours of downtime.

**WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)**

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime.
- One instance of maximum instantaneous data was invalidated on July 28 at hour 18:00, due to an anomalous spike, as it was not supported by minute data.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing and is measured in degrees from true north.

**RELATIVE HUMIDITY (RH)**

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime.

**BAROMETRIC PRESSURE (BP)**

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime.

**PRECIPITATION (PRECIP)**

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- A power failure occurred from July 20, hour 18:00 to July 21, hour 02:00, resulting in 9 hours of downtime.

**AMBIENT TEMPERATURE (AmbTPX)**

- Operational time for the monitoring period was 98.8%, equivalent to 9 hours of downtime.
- A power failure occurred from hour 18:00 on July 20 to hour 02:00 on July 21, resulting in 9 hours of downtime.

**2.0 Project Personnel**

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

**3.0 Plant Monthly Required AMD Summary**

The operational time for each monitoring analyzer, meteorological unit and data acquisition system was above the 90% requirement.

All data collected this month were within the Alberta Ambient Air Quality Objectives and Guidelines (June, 2017).

**4.0 Calculations and Results**

All calculations and reporting of results, except for WS/WD/STDWD, follow the methods described in the AMD, 2016.

**WS/WD/STDWD:**

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected for the month of July was re-calculated from the available 1-minute vector averages. To incorporate the highest number of instant data, minute data that contained less than 45 seconds were averaged based on the remaining sample set and not excluded when calculating hourly averages. This data treatment had a minor impact on data; applicable hours are outlined in the table below. Overall, in comparison with the original hourly averages, the change was insignificant. On July 31, the DAS vendor modified the datalogger configuration, in order to optimize the collection of wind data. The criteria of the calm threshold was eased and hourly data is calculated based on 1-minute vector averages.

Summary of Hourly Wind Data Revised After Data Treatment	
Date	Time
01/07/2018	14:00
10/07/2018	07:00
13/07/2018	05:00
13/07/2018	07:00
13/07/2018	08:00
15/07/2018	18:00
17/07/2018	17:00
18/07/2018	14:00
31/07/2018	08:00
31/07/2018	15:00

## 5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration
- MET One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient O<sub>3</sub> Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO<sub>2</sub>/NO<sub>x</sub> Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM<sub>2.5</sub>) - Thermo SHARP 5030i Unit
- Wind System - Met One Unit
- Relative Humidity - RM Young Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - RM Young Unit
- Precipitation - Met One Unit
- Datalogger - Envidas Ultimate

The following steps were used to complete the data verification and validation process:

**Level 0 Preliminary Verification**

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

**Level 1 Primary Validation**

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

**Level 2 Final Validation**

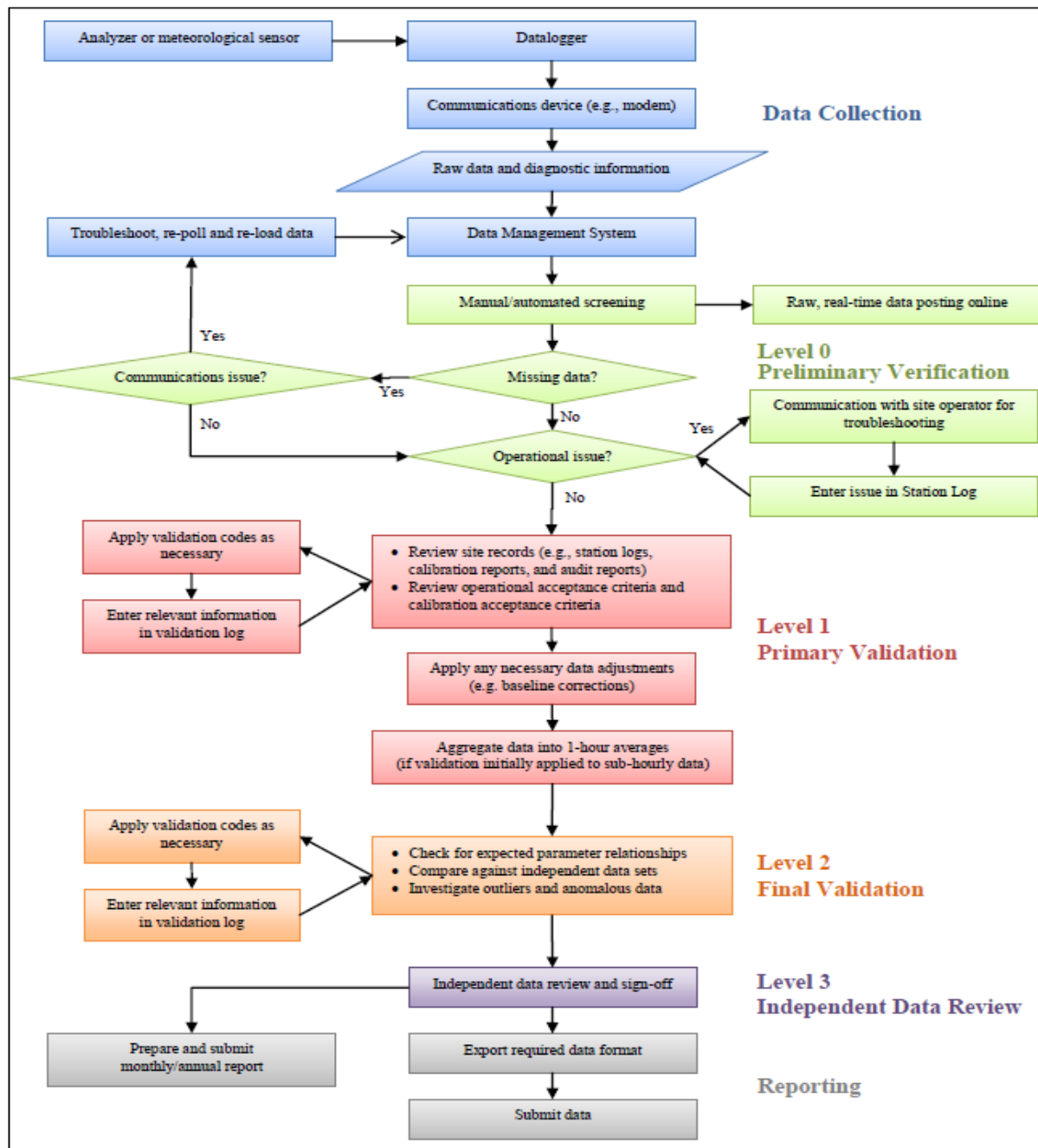
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

**Level 3 Independent Data Review**

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

**Post-Final Validation**

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

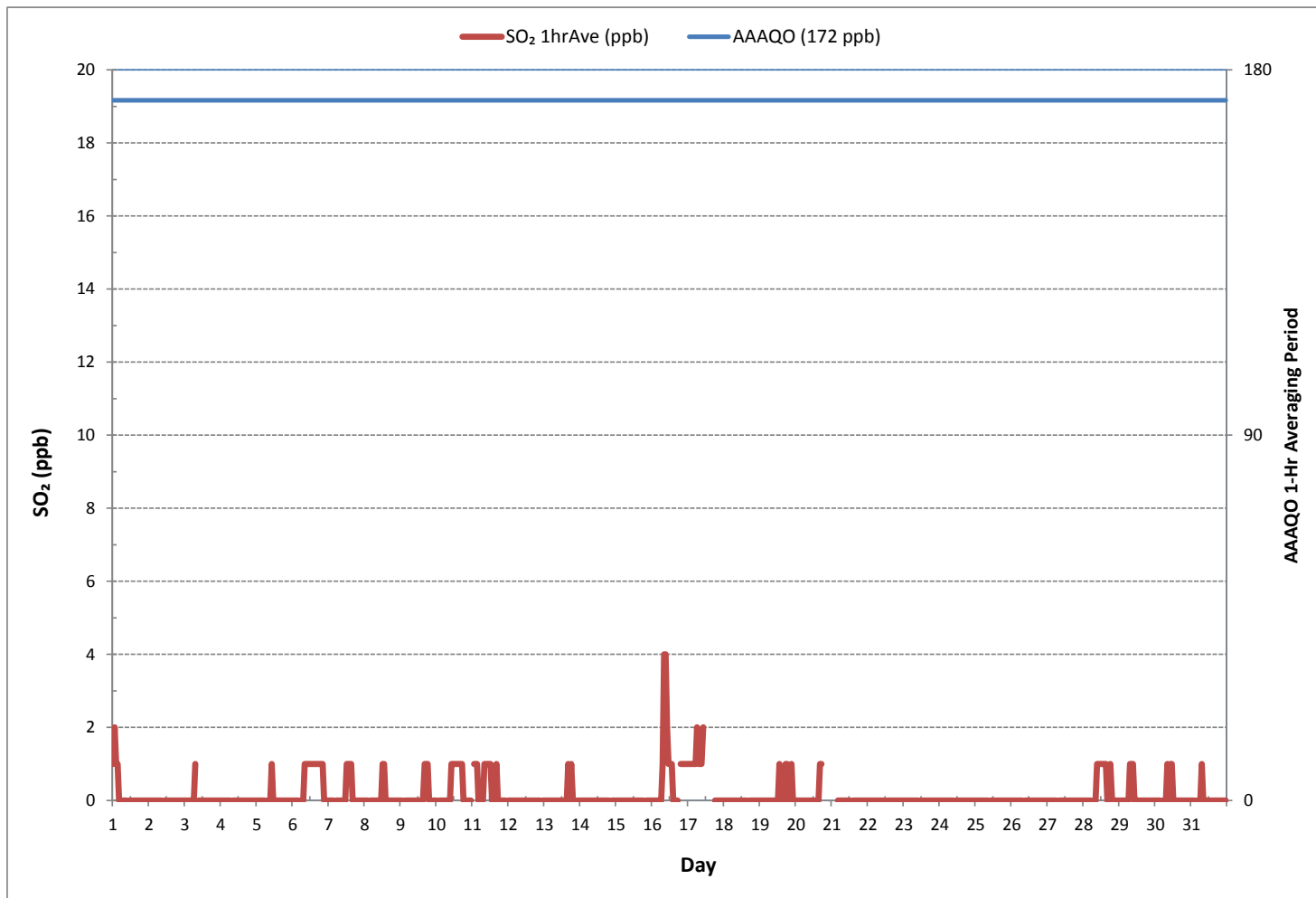


***APPENDIX I***  
***CONTINUOUS MONITORING DATA RESULTS***

***SULPHUR DIOXIDE***



SULPHUR DIOXIDE Hourly Averages (SO<sub>2</sub> ppb)



Wind: LICA ST. LINA Poll.: LICA ST. LINA-SO<sub>2</sub> [ppb]

Monthly: 18/07

Type: PollutionRose

Direction: Blowing From (Wind Frequency)

Based On 1 Hr.

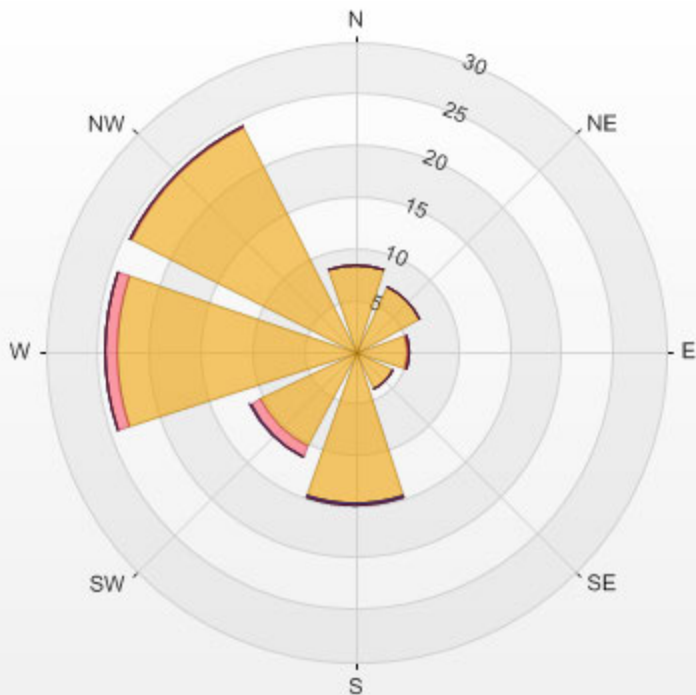
Calm: 0.00%

Calm Avg: 0.00 [ppb]

Direction	0.0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	>5.0	Total
<b>N</b>	8.5	0.0	0.0	0.0	0.0	0.0	8.5
<b>NE</b>	7.0	0.0	0.0	0.0	0.0	0.0	7.0
<b>E</b>	5.0	0.1	0.0	0.0	0.0	0.0	5.2
<b>SE</b>	4.2	0.0	0.0	0.0	0.0	0.0	4.2
<b>S</b>	14.8	0.0	0.0	0.1	0.0	0.0	14.9
<b>SW</b>	10.3	1.0	0.0	0.1	0.0	0.0	11.5
<b>W</b>	23.1	1.2	0.0	0.0	0.0	0.0	24.3
<b>NW</b>	24.3	0.3	0.0	0.0	0.0	0.0	24.5
<b>Summary</b>	97.1	2.6	0.0	0.3	0.0	0.0	100.0

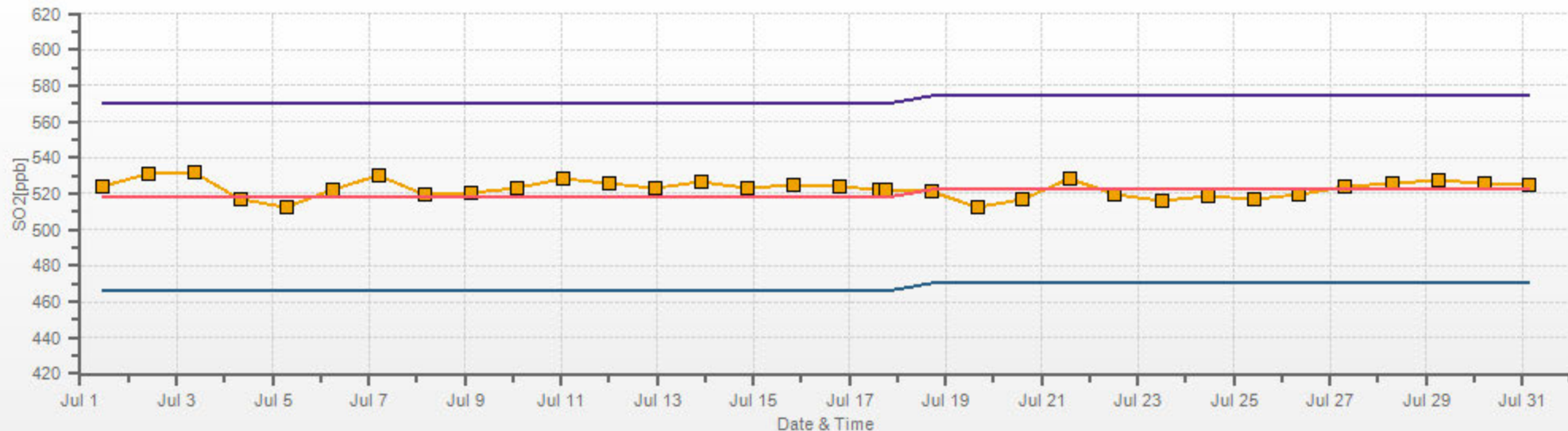
% Icon Classes (ppb) 97 0.0-1.0 3 1.0-2.0 0 2.0-3.0 0 3.0-4.0 0 4.0-5.0 0 >5.0

LICA ST. LINA Poll.: LICA ST. LINA-SO<sub>2</sub>[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***HYDROGEN SULPHIDE***





HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	1	1	0	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
3	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
4	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
5	0	0	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
7	0	0	1	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
8	0	1	1	S	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24																					
9	1	1	S	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24																					
10	0	S	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
11	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24																					
12	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	1	0	24																					
13	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24																					
14	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24																					
15	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24																					
16	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24																					
17	0	0	0	1	1	1	1	1	0	0	0	0	C	C	C	C	C	C	S	0	0	0	0	0	0	0	1	0	24																					
18	0	0	0	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	0	0	0	10																					
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	S	0	0	0	0	0	0	0	0	0	0	0	9																					
20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	P	P	P	P	P	P	0	1	0	18																					
21	P	P	P	R	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	20																					
22	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
23	0	0	0	0	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
24	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
25	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
26	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
27	0	0	1	1	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
28	0	1	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
29	0	1	1	1	1	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
30	1	0	0	0	S	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24																					
31	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S1	0	0	0	1	0	23																					
HOURLY MAX	1	1	1	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1																									
HOURLY AVG	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																									

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

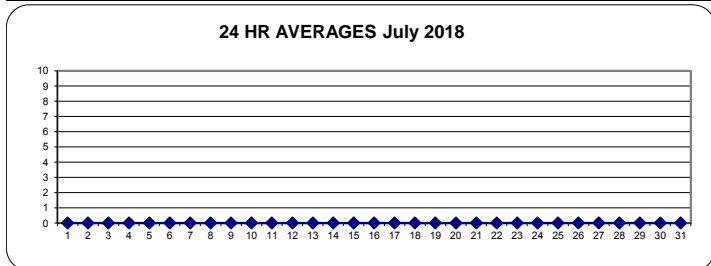
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
----------------------	------	----	-----	-------	---	-----

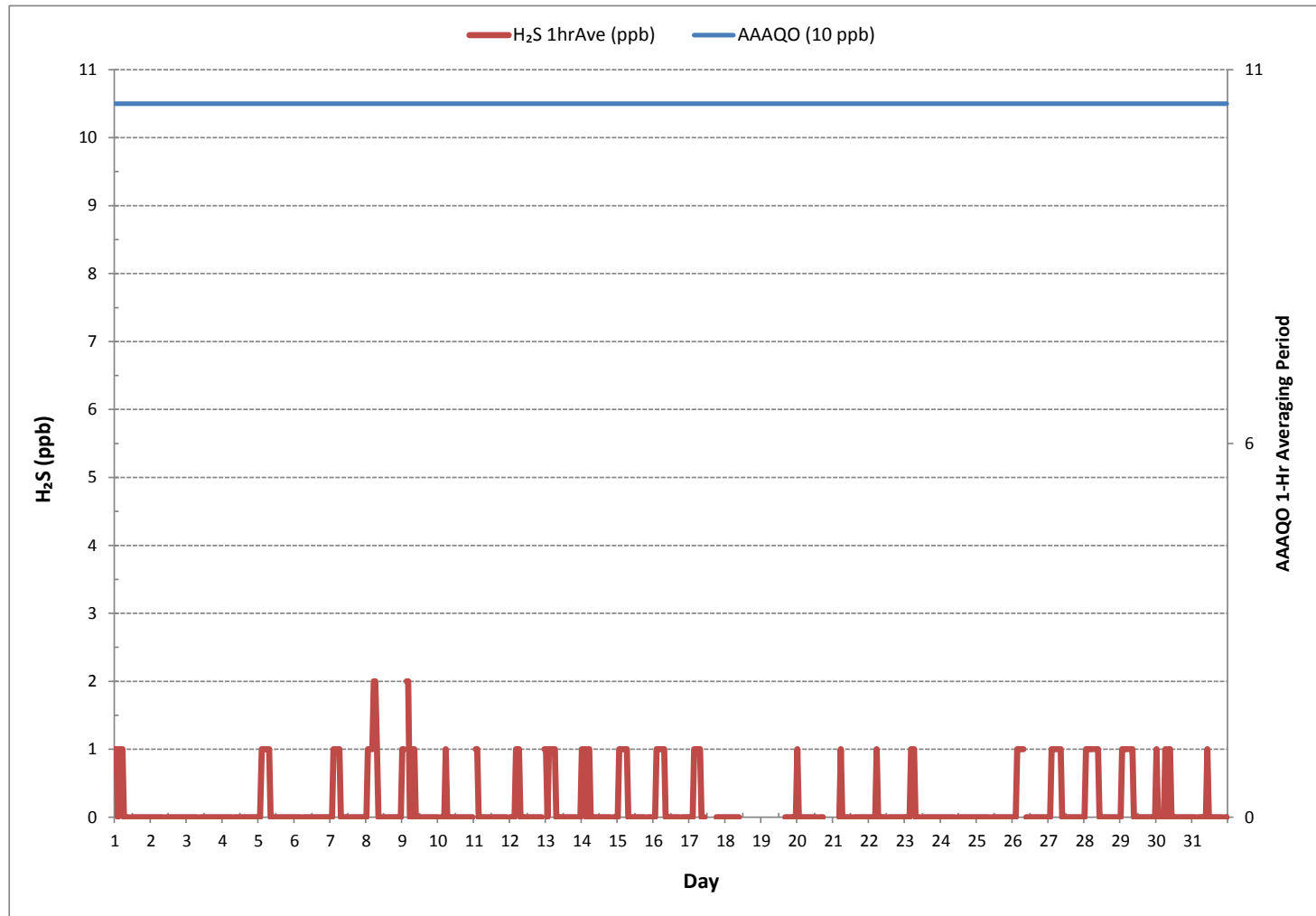
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	98
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 2 ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR 5 ON DAY 8
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	704 hrs
AMD OPERATION UPTIME:	94.6 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES July 2018



HYDROGEN SULPHIDE Hourly Averages (H<sub>2</sub>S ppb)





% Icon Classes (ppb)

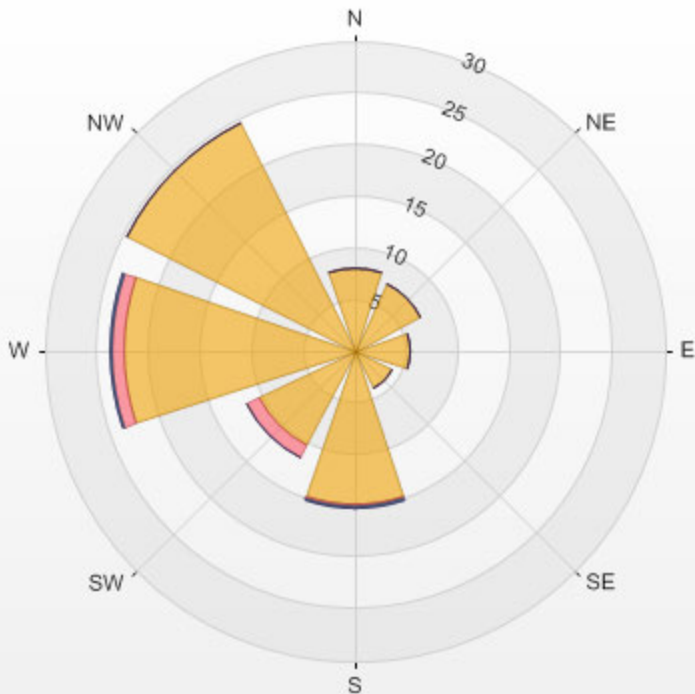
97 0.0-1.0

3 1.0-2.0

0 2.0-3.0

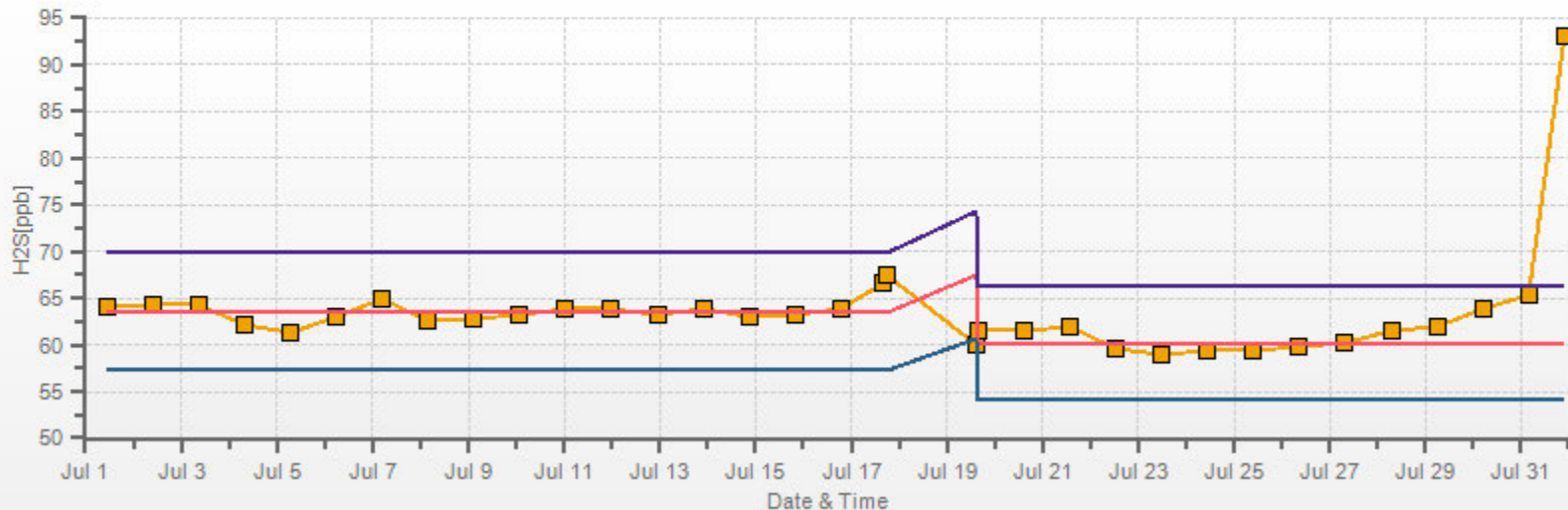
0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***TOTAL HYDROCARBON***



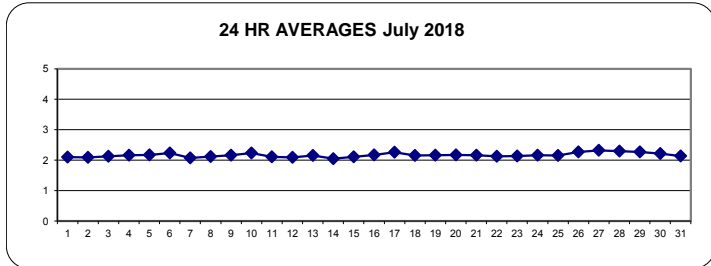
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	2.11	2.08	2.05	2.06	2.03	2.02	2.21	2.30	2.33	2.34	S	C	C	C	C	2.06	2.05	2.06	2.06	2.08	2.04	2.04	2.02	2.02	2.02	2.02	2.34	2.10	24	
2	2.07	2.08	2.09	2.10	2.10	2.10	2.10	2.07	2.06	S	2.09	2.11	2.11	2.11	2.08	2.11	2.10	2.12	2.08	2.08	2.08	2.11	2.10	2.11	2.06	2.12	2.09	24	24	
3	2.11	2.09	2.09	2.11	2.19	2.12	2.14	2.16	S	2.24	2.20	2.17	2.11	2.12	2.09	2.11	2.10	2.08	2.12	2.17	2.12	2.09	2.13	2.19	2.08	2.24	2.13	24	24	
4	2.34	2.22	2.21	2.22	2.19	2.18	2.16	S	2.13	2.14	2.12	2.13	2.12	2.12	2.10	2.13	2.12	2.13	2.12	2.13	2.14	2.14	2.15	2.19	2.10	2.34	2.16	24	24	
5	2.23	2.26	2.37	2.38	2.31	2.30	S	2.23	2.12	2.08	2.04	1.99	2.08	2.09	2.12	2.12	2.11	2.11	2.12	2.13	2.17	2.20	2.17	2.17	1.99	2.38	2.17	24	24	
6	2.22	2.26	2.29	2.30	2.30	S	2.45	2.42	2.38	2.39	2.29	2.15	2.18	2.20	2.17	2.17	2.21	2.18	2.17	2.18	2.19	2.11	2.05	2.05	2.05	2.45	2.23	24	24	
7	2.08	2.09	2.12	2.13	S	2.14	2.14	2.10	2.07	2.05	2.05	2.03	2.05	2.05	2.07	2.07	2.06	2.04	2.04	2.08	2.06	2.06	2.05	2.07	2.03	2.14	2.07	24	24	
8	2.12	2.14	2.19	S	2.21	2.26	2.19	2.13	2.07	2.06	2.06	2.08	2.07	2.10	2.07	2.09	2.12	2.10	2.09	2.07	2.12	2.14	2.17	2.19	2.06	2.26	2.12	24	24	
9	2.27	2.28	S	2.26	2.27	2.08	2.09	2.09	2.11	2.09	2.06	2.08	2.06	2.18	2.22	2.20	2.22	2.19	2.17	2.16	2.14	2.17	2.10	2.11	2.06	2.28	2.16	24	24	
10	2.10	S	2.15	2.36	2.35	2.38	2.34	2.35	2.33	2.31	2.26	2.18	2.16	2.26	2.28	2.26	2.25	2.31	2.24	2.11	2.10	2.04	2.02	2.07	2.02	2.38	2.23	24	24	
11	S	2.06	2.09	2.11	2.10	2.12	2.11	2.13	2.16	2.15	2.12	2.11	2.11	2.11	2.13	2.11	2.10	2.13	2.12	2.12	2.12	2.12	2.08	S	2.06	2.16	2.11	24	24	
12	2.08	2.07	2.08	2.10	2.11	2.14	2.12	2.10	2.12	2.10	2.08	2.08	2.06	2.08	2.07	2.08	2.06	2.05	2.08	2.08	2.11	2.12	S	2.20	2.05	2.20	2.09	24	24	
13	2.18	2.23	2.55	2.30	2.22	2.13	2.12	2.10	2.10	2.17	2.16	2.14	2.10	2.10	2.12	2.12	2.06	2.09	2.10	2.07	S	2.04	2.04	2.04	2.04	2.55	2.15	24	24	
14	2.05	2.05	2.08	2.05	2.07	2.05	2.04	2.04	2.04	2.03	2.05	2.04	2.03	2.04	2.06	2.05	2.05	2.05	2.06	2.05	S	2.08	2.08	2.10	2.03	2.10	2.05	24	24	
15	2.10	2.11	2.13	2.15	2.18	2.19	2.16	2.09	2.07	2.03	2.06	2.08	2.09	2.09	2.08	2.10	2.09	2.12	2.11	S	2.07	2.09	2.14	2.24	2.03	2.24	2.11	24	24	
16	2.27	2.30	2.27	2.27	2.25	2.16	2.13	2.14	2.10	2.12	2.12	2.12	2.11	2.10	2.11	2.11	2.11	2.11	S	2.14	2.18	2.20	2.20	2.19	2.10	2.30	2.17	24	24	
17	2.25	2.21	2.15	2.52	2.44	2.44	2.48	2.56	2.35	2.18	2.08	2.17	2.11	2.10	2.11	2.14	2.11	S	2.18	2.24	2.25	2.26	2.29	2.25	2.08	2.56	2.26	24	24	
18	2.35	2.38	2.19	2.18	2.18	2.15	2.18	2.30	2.24	2.18	2.03	2.05	2.05	2.06	2.04	2.03	S	2.05	2.15	2.12	2.09	2.14	2.25	2.15	2.03	2.38	2.15	24	24	
19	2.16	2.15	2.24	2.32	2.32	2.29	2.30	2.32	2.23	2.18	2.05	2.02	2.00	2.02	2.05	S	2.11	2.11	2.11	2.15	2.19	2.12	2.09	2.13	2.00	2.32	2.16	24	24	
20	2.05	2.04	2.06	2.05	2.08	2.07	2.12	2.25	2.32	2.34	2.32	2.28	2.20	2.13	S	2.17	2.18	2.17	P	P	P	P	P	P	2.04	2.34	2.17	18	24	
21	P	P	P	R	2.21	2.16	2.15	2.16	2.16	2.15	2.18	2.20	2.15	S	2.16	2.14	2.14	2.12	2.14	2.14	2.17	2.16	2.17	2.16	2.12	2.21	2.16	20	24	
22	2.17	2.18	2.16	2.16	2.17	2.15	2.12	2.09	2.09	2.10	2.09	S	2.12	2.16	2.11	2.10	2.12	2.10	2.11	2.10	2.12	2.12	2.10	2.12	2.15	2.09	2.18	2.13	24	24
23	2.15	2.15	2.16	2.18	2.18	2.22	2.20	2.14	2.12	2.11	2.11	S	2.09	2.10	2.13	2.14	2.11	2.12	2.12	2.13	2.13	2.18	2.18	2.15	2.09	2.22	2.14	24	24	
24	2.17	2.19	2.19	2.25	2.25	2.21	2.27	2.21	2.19	2.17	S	2.11	2.09	2.10	2.09	2.10	2.10	2.11	2.09	2.10	2.12	2.13	2.15	2.18	2.09	2.27	2.16	24	24	
25	2.17	2.17	2.16	2.16	2.23	2.26	2.25	2.25	2.14	S	2.13	2.12	2.10	2.14	2.13	2.10	2.09	2.11	2.09	2.11	2.12	2.15	2.17	2.20	2.09	2.26	2.15	24	24	
26	2.35	2.26	2.36	2.52	2.62	2.64	2.49	2.37	S	2.21	2.18	2.14	2.14	2.14	2.15	2.16	2.12	2.14	2.15	2.16	2.19	2.18	2.24	2.29	2.12	2.64	2.27	24	24	
27	2.36	2.43	2.48	2.46	2.50	2.59	2.66	S	2.58	2.37	2.19	2.18	2.18	2.17	2.19	2.18	2.18	2.18	2.19	2.25	2.28	2.21	2.25	2.38	2.17	2.66	2.32	24	24	
28	2.43	2.44	2.49	2.45	2.45	2.45	S	2.46	2.36	2.30	2.23	2.20	2.15	2.16	2.15	2.15	2.16	2.18	2.19	2.21	2.23	2.27	2.35	2.34	2.15	2.49	2.30	24	24	
29	2.28	2.28	2.30	2.32	2.36	S	2.43	2.46	2.41	2.31	2.26	2.20	2.19	2.19	2.18	2.19	2.20	2.16	2.15	2.20	2.19	2.30	2.19	2.37	2.15	2.46	2.27	24	24	
30	2.32	2.34	2.34	2.30	S	2.23	2.36	2.33	2.63	2.43	2.19	2.20	2.18	2.14	2.13	2.11	2.10	2.07	2.09	2.11	2.12	2.15	2.10	2.11	2.07	2.63	2.22	24	24	
31	2.09	2.10	2.07	S	2.08	2.10	2.25	2.20	2.19	2.21	2.15	2.12	2.11	2.09	2.10	2.07	2.08	2.09	2.09	2.17	2.20	2.20	2.23	2.16	2.07	2.25	2.14	24	24	
HOURLY MAX	2.43	2.44	2.55	2.52	2.62	2.64	2.66	2.56	2.63	2.43	2.32	2.28	2.20	2.26	2.28	2.26	2.25	2.31	2.24	2.25	2.28	2.30	2.35	2.38						
HOURLY AVG	2.19	2.19	2.21	2.24	2.24	2.22	2.23	2.23	2.21	2.19	2.14	2.12	2.11	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.13	2.14	2.15	2.15	2.17					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

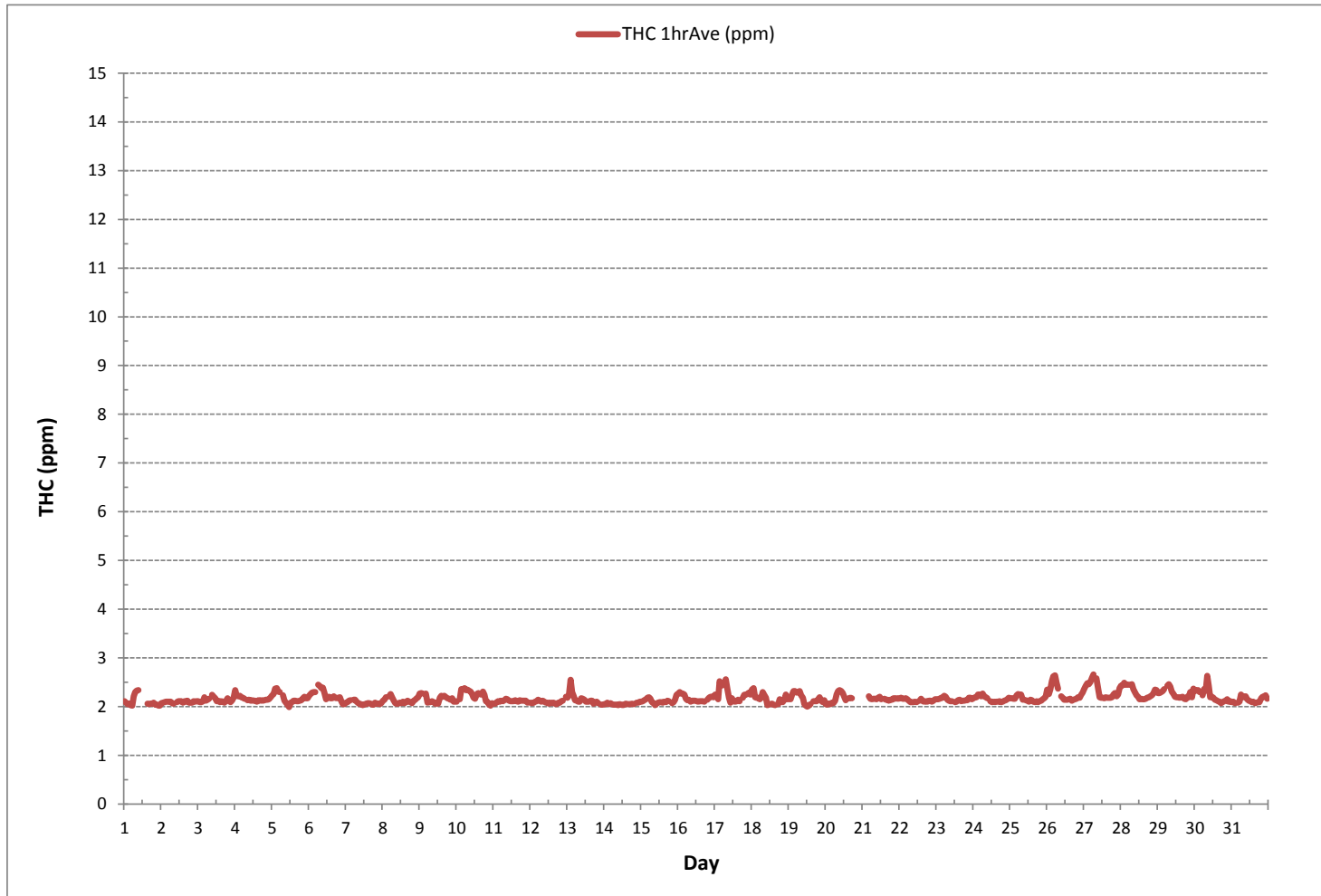
24 HR AVERAGES July 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	698			
MINIMUM 1-HR AVERAGE:	1.99 ppm	@ HOUR	11	ON DAY 5
MAXIMUM 1-HR AVERAGE:	2.66 ppm	@ HOUR	6	ON DAY 27
MAXIMUM 24-HR AVERAGE:	2.32 ppm			ON DAY 27
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	734 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	98.7 %	
STANDARD DEVIATION:	0.11	MONTHLY AVERAGE:	2.17 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)







% Icon Classes (ppm)

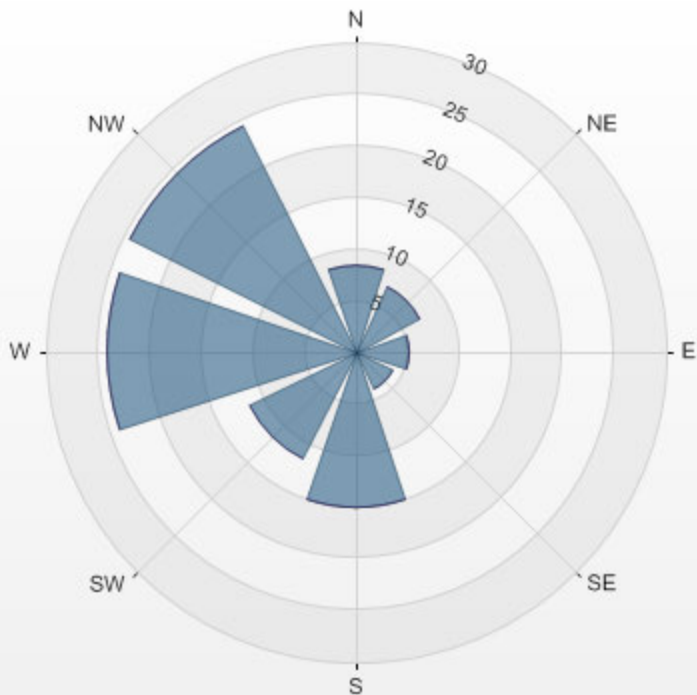
0  0.0-0.9

0  0.9-1.8

100  1.8-2.7

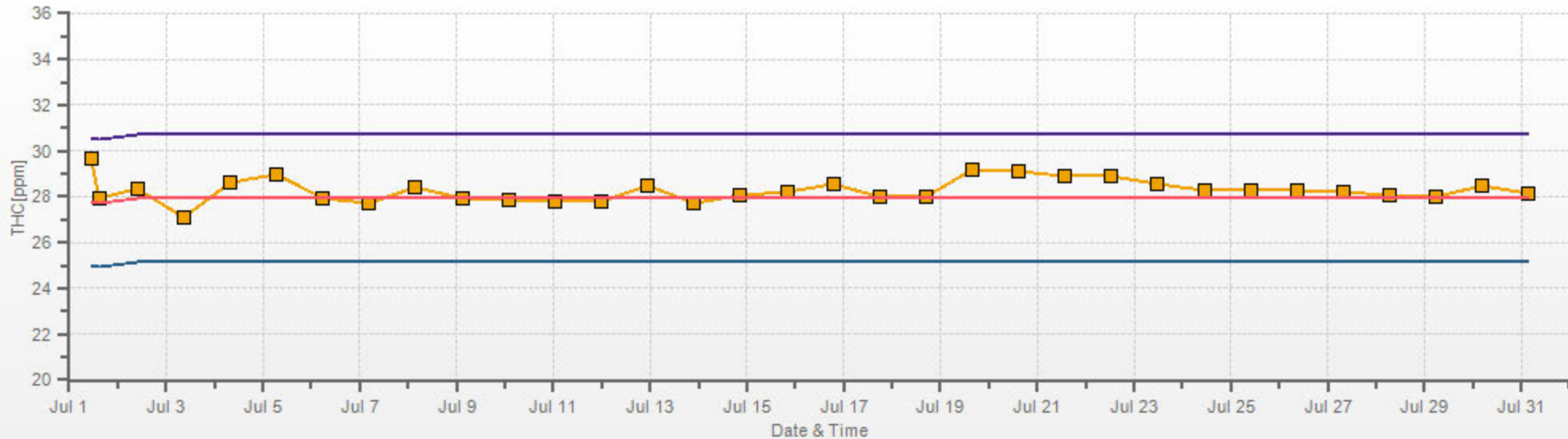
0  >2.7

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



THC[ppm] Calibration: LICA ST. LINA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



## ***OXIDES OF NITROGEN***



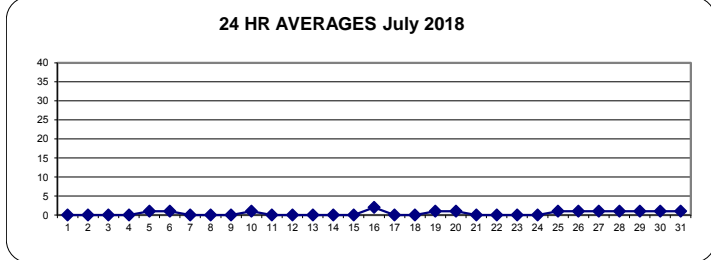
OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	3	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
2	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
3	0	0	0	0	0	0	0	2	S	2	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	2	0	24
4	3	1	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
5	1	0	1	1	2	2	S	2	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	2	1	24
6	2	1	2	2	2	S	3	2	2	2	1	1	1	1	0	1	0	1	1	2	0	0	0	0	0	0	3	1	24
7	0	0	0	0	S	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
8	0	0	0	S	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	24
9	1	1	S	1	1	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	2	0	24
10	1	S	1	1	1	1	2	2	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	2	1	24
11	S	2	1	1	1	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	S	0	0	2	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	1	0	24
13	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	S	0	0	0	0	1	0	24
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
16	1	1	1	1	1	1	1	2	3	3	1	1	1	1	0	1	1	1	S	4	11	1	1	0	0	0	11	2	24
17	1	1	0	1	1	1	1	1	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	1	0	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	1	0	0	0	1	0	24
19	1	0	1	1	0	1	1	1	0	0	1	0	1	0	0	S	1	1	0	2	1	0	0	1	0	0	2	1	24
20	1	1	1	0	1	0	1	2	3	1	1	0	0	0	S	0	0	0	0	P	P	P	P	P	P	0	3	1	18
21	P	P	P	R	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	1	0	0	0	0	0	1	0	20
22	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	4	0	0	0	0	0	0	4	0	24
24	0	0	0	0	0	0	0	0	1	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
25	0	0	0	0	0	1	1	1	1	S	1	0	0	0	0	6	0	0	1	0	0	0	0	0	0	0	6	1	24
26	1	1	1	1	1	2	3	3	S	1	0	0	0	2	0	11	0	0	0	0	1	1	1	1	0	0	11	1	24
27	1	1	2	1	2	3	7	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	7	1	24
28	1	1	1	1	2	1	S	1	1	1	1	1	0	1	1	0	0	0	0	1	1	1	1	1	0	0	2	1	24
29	1	1	1	1	1	S	2	3	3	2	2	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	3	1	24
30	1	1	1	1	S	1	1	1	2	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	2	1	24
31	0	1	1	S	1	1	1	2	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	2	1	24
HOURLY MAX	3	3	2	2	2	3	7	3	3	3	2	1	1	2	1	11	1	1	4	4	11	1	1	1	1				
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

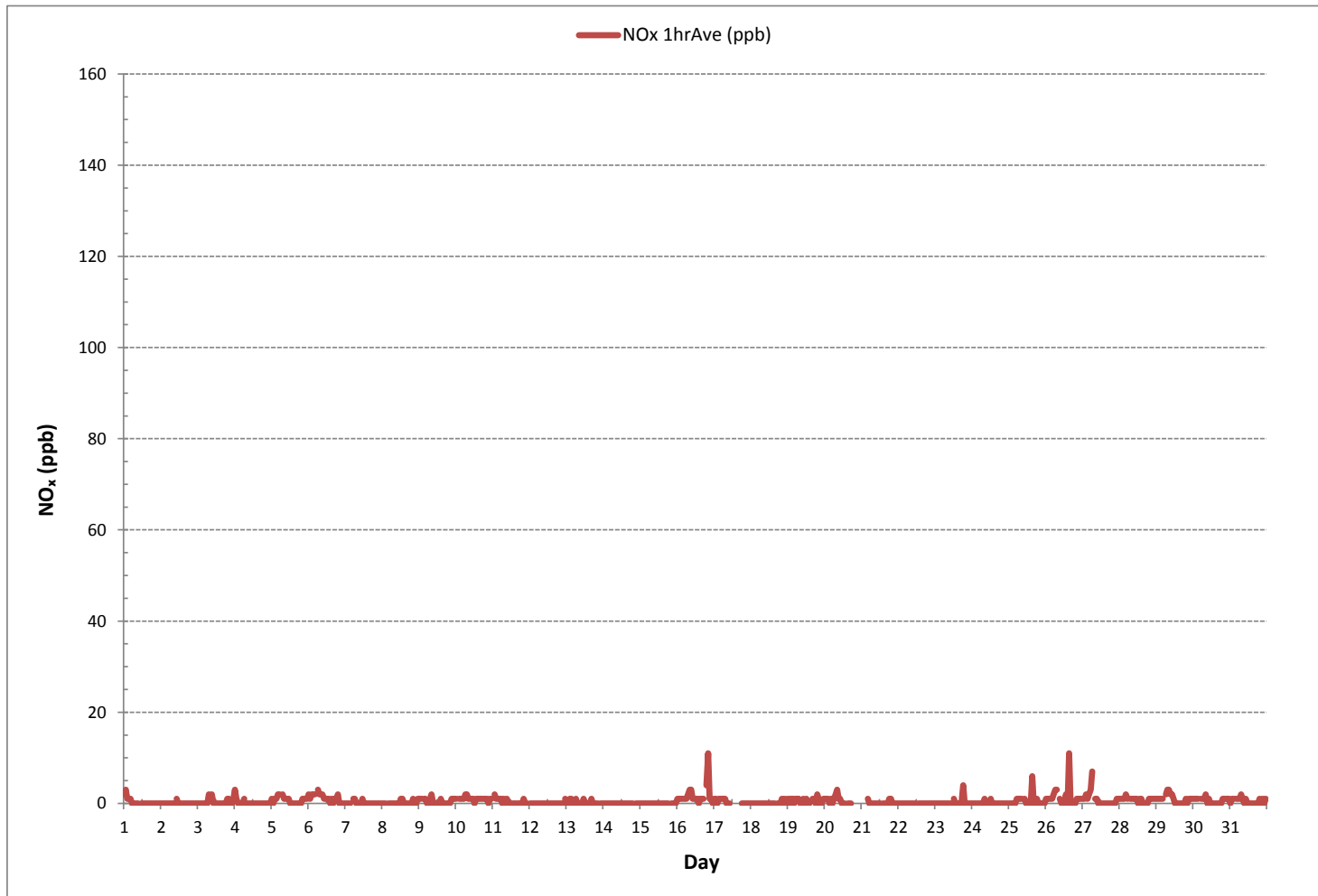
24 HR AVERAGES July 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	247			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	5	ON DAY 1
MAXIMUM 1-HR AVERAGE:	11 ppb	@ HOUR	20	ON DAY 16
MAXIMUM 24-HR AVERAGE:	2 ppb			ON DAY 16
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	734 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.7 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb	

OXIDES OF NITROGEN Hourly Averages (NO<sub>x</sub> ppb)





% Icon Classes (ppb)

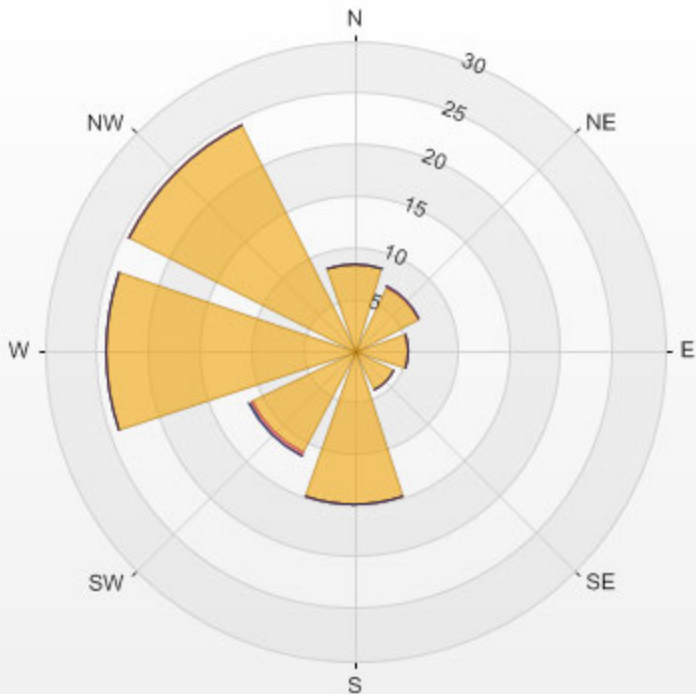
99 0.0-4.0

1 4.0-8.0

0 8.0-12.0

0 >12.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%





NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***NITRIC OXIDES***

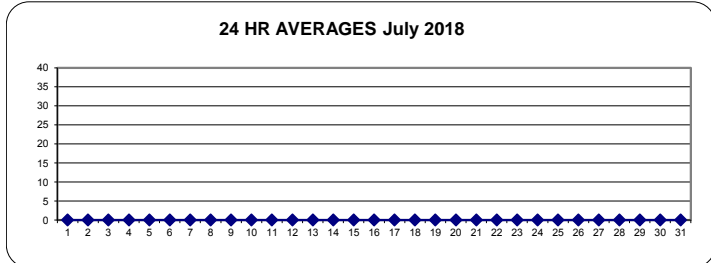
**NITRIC OXIDE Hourly Averages (NO ppb)**

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
3	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
4	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
5	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
7	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
8	0	0	0	S	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																					
9	0	0	S	0	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																					
10	0	S	0	0	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																					
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	24																					
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24																					
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24																					
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24																					
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24																					
16	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24																					
17	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	24																					
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24																					
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24																					
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	P	P	P	P	P	P	0	0	0	18																					
21	P	P	P	R	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	20																					
22	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
23	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24																					
24	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
25	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	24																					
26	0	0	0	0	0	0	1	1	S	0	0	0	0	0	1	0	8	0	0	0	0	0	0	0	0	0	8	0	24																					
27	0	0	0	0	0	1	3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24																					
28	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
29	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
30	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24																					
31	0	0	0	S	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																					
HOURLY MAX	0	0	0	0	0	1	3	1	1	1	1	0	0	1	0	8	0	0	1	0	0	0	0	0	0																									
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																									

**STATUS FLAG CODES**

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

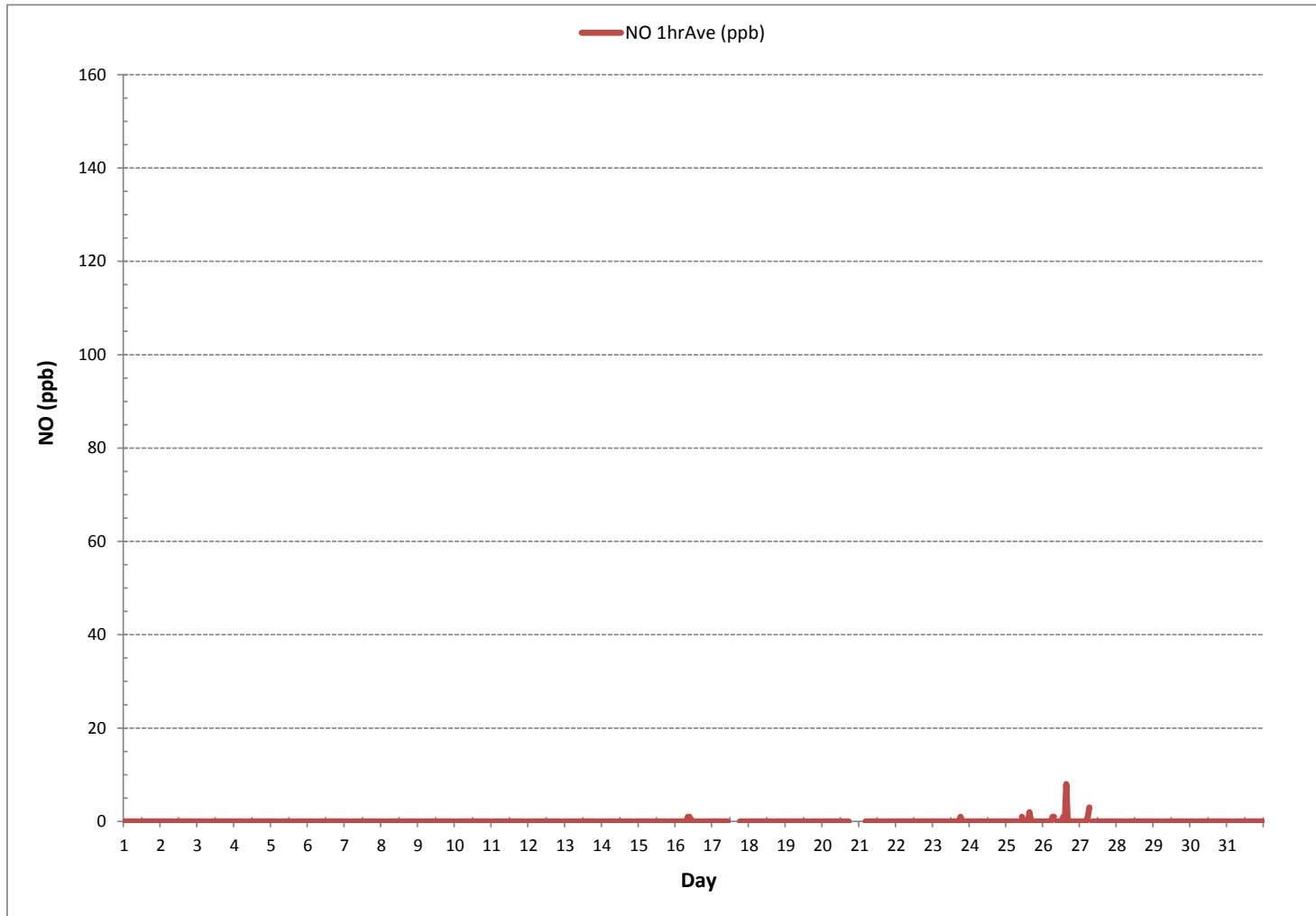
**24 HR AVERAGES July 2018**



**MONTHLY SUMMARY**

NUMBER OF NON-ZERO READINGS:	11				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	8	ppb @ HOUR	15	ON DAY	26
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY	1
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	734	hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	98.7	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

**NITRIC OXIDE Hourly Averages (NO ppb)**





% Icon Classes (ppb)

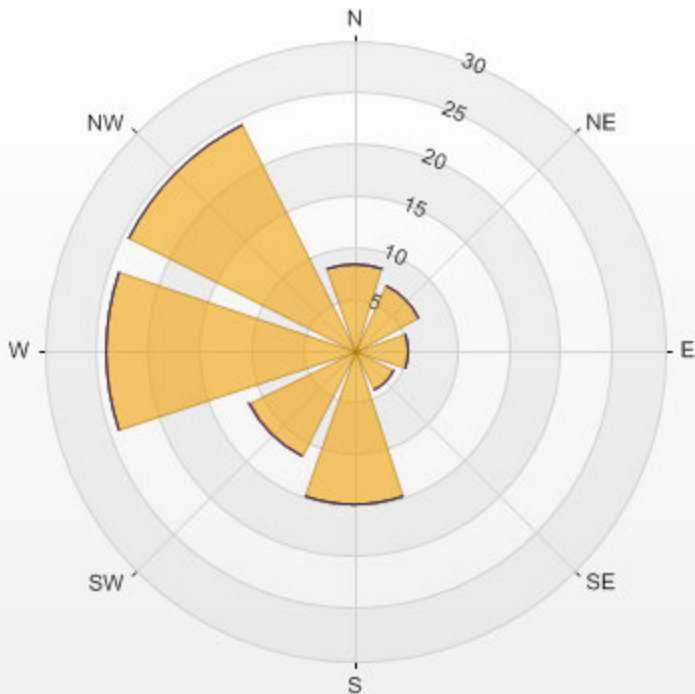
100 0.0-3.0

0 3.0-6.0

0 6.0-9.0

0 >9.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



***NITROGEN DIOXIDE***



NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	3	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
2	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
3	0	0	0	0	0	0	0	2	S	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	2	0	24	
4	3	1	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24	
5	1	0	1	1	2	2	S	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	0	2	1	24	
6	2	1	2	2	2	S	3	2	2	2	1	1	1	1	0	1	0	1	1	2	0	0	0	0	0	3	1	24	
7	0	0	0	0	S	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
8	0	0	0	S	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	1	0	24	
9	1	1	S	1	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	1	0	24	
10	1	S	1	1	1	1	2	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	2	1	24	
11	S	1	1	1	1	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	0	24	
13	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	S	0	0	0	1	0	24	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24	
16	1	1	1	1	1	1	1	1	2	2	1	1	1	1	0	1	1	1	S	4	11	1	1	0	0	11	2	24	
17	1	1	0	1	1	1	1	1	0	0	0	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	0	24	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	1	0	0	1	0	24	
19	1	0	1	1	0	1	1	1	0	0	0	0	0	0	0	S	0	1	0	1	1	0	0	1	0	1	0	24	
20	1	1	1	0	1	0	1	2	2	1	1	0	0	0	S	0	0	0	P	P	P	P	P	P	0	2	1	18	
21	P	P	P	R	1	0	0	0	0	0	0	0	0	0	S	0	0	0	1	1	0	0	0	0	0	1	0	20	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	3	0	0	0	0	0	0	3	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
25	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	0	24	
26	1	1	1	1	1	2	2	2	S	0	0	0	0	0	1	0	3	0	0	0	0	1	1	1	0	3	1	24	
27	1	1	2	1	2	2	4	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	4	1	24	
28	1	1	1	1	2	1	S	1	1	1	1	1	0	1	1	0	0	0	0	1	1	1	1	1	0	2	1	24	
29	1	1	1	1	1	S	2	3	3	2	2	1	0	0	0	0	0	0	0	1	0	1	1	1	0	3	1	24	
30	1	1	1	1	S	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	24	
31	0	1	1	S	1	1	1	2	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	2	1	24	
HOURLY MAX	3	3	2	2	2	2	4	3	3	2	2	1	1	1	1	4	1	1	3	4	11	1	1	1					
HOURLY AVG	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

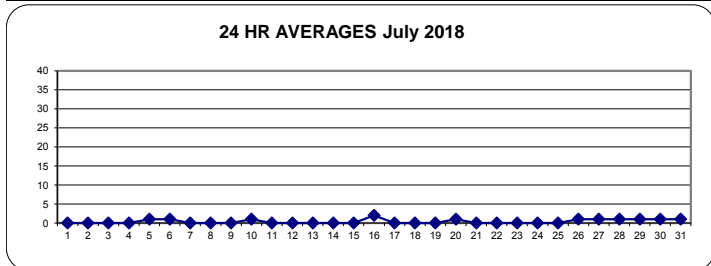
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

MONTHLY SUMMARY

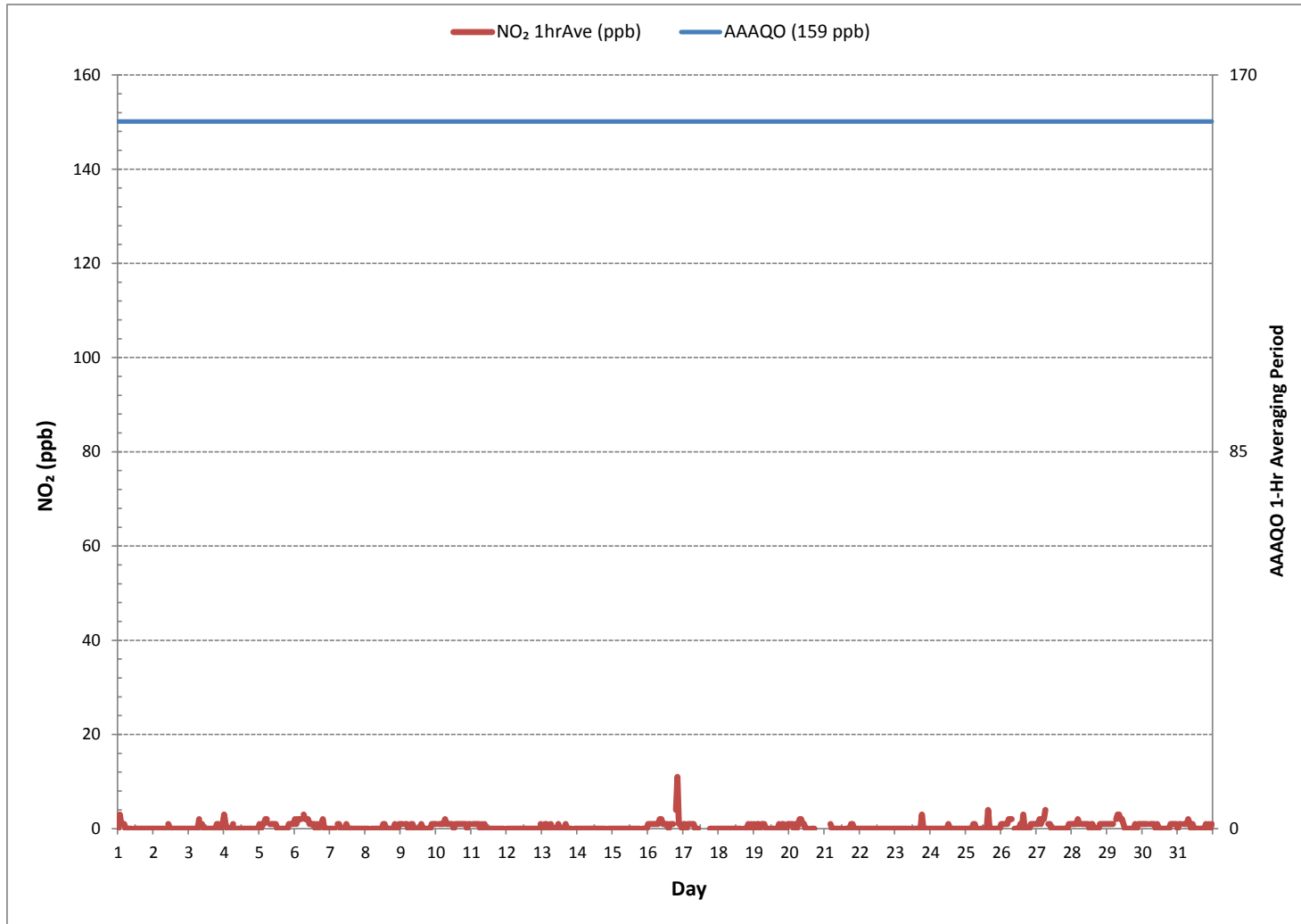
NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	236			
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	5 ON DAY 1
MAXIMUM 1-HR AVERAGE:	11	ppb	@ HOUR	20 ON DAY 16
MAXIMUM 24-HR AVERAGE:	2	ppb		ON DAY 16
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	734 hrs
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	98.7 %
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES July 2018





NITROGEN DIOXIDE Hourly Averages (NO<sub>2</sub> ppb)





% Icon Classes (ppb)

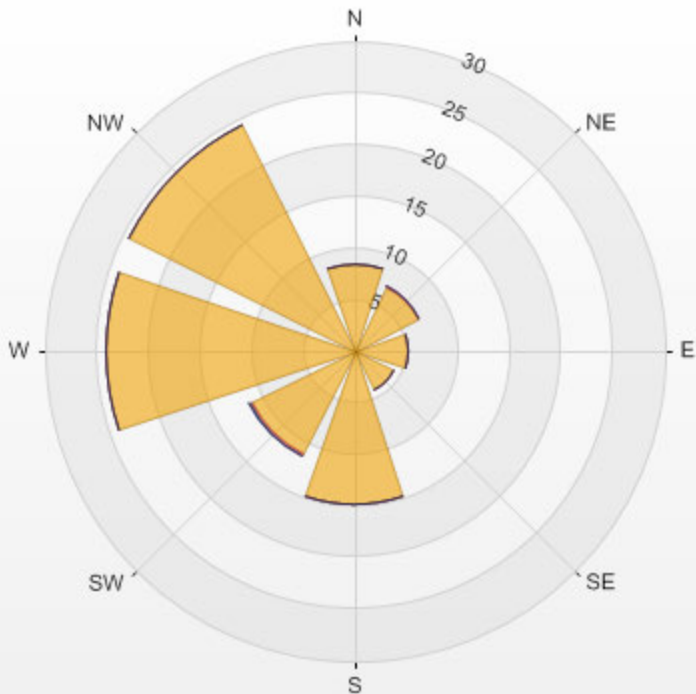
100 0.0-4.0

0 4.0-8.0

0 8.0-12.0

0 >12.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



## ***OZONE***

OZONE Hourly Averages (O<sub>3</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	20.9	20.6	24.7	21.8	21.4	24.4	26.2	25.2	25.8	27.3	S	33.0	32.0	33.1	30.3	30.3	31.2	34.8	32.4	29.6	27.4	24.7	23.8	24.2	20.6	34.8	27.2	24
2	22.7	20.1	16.5	15.8	15.5	14.4	14.7	16.8	18.2	S	22.6	22.9	20.0	24.3	25.1	20.9	22.3	23.0	23.5	21.4	17.1	16.1	19.3	16.0	14.4	25.1	19.5	24
3	17.5	19.9	18.5	17.5	18.2	16.3	14.8	12.6	S	21.0	26.3	29.9	31.9	30.4	31.1	32.9	29.8	26.9	26.8	26.8	25.3	21.3	24.4	27.0	12.6	32.9	23.8	24
4	19.1	13.9	13.0	12.7	13.8	16.0	18.8	S	22.3	22.2	27.9	28.0	27.1	26.1	26.1	26.2	27.8	27.3	27.8	26.8	24.1	23.7	24.0	23.3	12.7	28.0	22.5	24
5	20.8	20.1	17.0	15.0	16.7	15.5	S	25.3	32.1	37.7	38.6	39.1	43.3	44.6	46.9	47.6	47.0	46.7	45.4	43.8	42.0	39.9	36.4	34.1	15.0	47.6	34.6	24
6	32.8	30.7	29.5	27.9	27.4	S	24.1	24.6	28.1	31.0	35.4	37.5	40.0	44.8	48.6	46.9	47.7	47.1	42.9	38.1	36.4	37.4	38.3	36.9	24.1	48.6	36.3	24
7	34.8	33.2	30.9	26.5	S	23.0	23.4	27.1	28.1	27.7	24.7	24.6	29.5	33.2	32.7	28.6	27.1	25.2	23.7	20.5	22.5	20.6	17.5	16.2	16.2	34.8	26.1	24
8	16.3	15.2	14.4	S	15.4	11.1	14.9	19.1	22.5	24.2	25.6	28.6	32.7	34.1	34.8	35.6	36.0	32.7	31.3	30.2	27.2	27.9	28.4	25.0	11.1	36.0	25.4	24
9	24.7	25.1	S	26.2	24.8	29.6	27.2	24.3	21.8	23.2	30.5	31.6	33.7	35.7	36.0	36.8	35.9	34.7	33.9	30.2	28.4	29.3	29.1	28.6	21.8	36.8	29.6	24
10	29.0	S	26.3	20.1	20.4	17.4	17.7	20.6	28.1	32.4	39.8	42.8	42.3	37.4	38.4	28.5	29.0	29.9	32.9	37.3	38.4	38.3	32.9	29.4	17.4	42.8	30.8	24
11	S	31.4	27.7	25.8	27.6	26.9	24.6	19.5	18.3	19.1	20.4	22.8	23.3	23.6	24.7	26.6	25.8	25.9	26.1	26.1	25.9	25.4	25.8	S	18.3	31.4	24.7	24
12	24.7	24.5	24.5	23.3	22.2	20.1	20.4	23.0	25.1	26.7	28.7	29.1	30.8	34.7	31.5	32.1	33.3	34.0	32.9	32.3	32.4	30.6	S	26.2	20.1	34.7	28.0	24
13	27.5	26.5	16.7	20.4	19.1	18.8	20.8	28.4	29.8	22.2	19.5	26.8	25.9	25.5	29.5	32.0	32.5	32.2	30.2	25.4	24.4	S	21.3	21.0	16.7	32.5	25.1	24
14	20.8	20.3	17.5	16.5	15.0	15.4	15.7	16.9	18.6	18.0	17.9	18.5	19.2	20.1	19.4	21.1	22.4	22.7	22.4	23.2	S	20.8	18.4	16.9	15.0	23.2	19.0	24
15	16.9	17.2	16.6	16.5	14.9	14.5	15.0	17.1	19.6	22.5	23.8	22.9	22.7	22.4	22.7	23.3	23.5	23.9	23.1	S	20.5	20.6	21.7	23.3	14.5	23.9	20.2	24
16	23.0	22.3	21.0	20.2	19.4	20.0	20.4	21.2	22.1	24.3	31.3	34.7	36.9	37.7	38.1	39.0	40.9	42.6	S	35.2	30.0	40.0	38.3	38.6	19.4	42.6	30.3	24
17	35.5	42.1	42.9	18.6	31.0	33.4	27.4	26.2	29.0	32.4	32.9	28.1	28.6	32.0	33.4	33.0	34.3	S	40.3	35.0	35.0	32.7	32.1	33.2	18.6	42.9	32.6	24
18	25.5	20.4	26.4	27.0	27.1	26.3	23.0	20.4	18.2	22.6	C	C	C	C	C	31.1	S	30.6	30.1	37.7	34.8	36.8	22.5	27.2	18.2	37.7	27.1	24
19	28.1	25.3	18.6	19.3	18.1	17.3	17.5	19.9	19.9	22.5	24.6	27.3	27.3	27.5	27.3	S	30.9	29.0	27.5	25.0	23.0	25.6	25.4	35.7	17.3	35.7	24.5	24
20	38.2	32.2	32.8	45.3	38.0	32.8	28.1	24.5	25.3	28.9	34.5	36.0	40.3	42.8	S	35.9	36.5	37.3	P	P	P	P	P	P	24.5	45.3	34.7	18
21	P	P	P	R	30.4	31.4	28.5	28.0	27.8	34.8	35.6	34.5	34.7	S	36.5	35.0	35.0	42.9	37.8	35.0	32.5	28.1	26.1	23.0	23.0	42.9	32.5	20
22	21.0	20.6	21.4	22.1	19.8	17.5	18.9	26.1	25.6	24.7	25.9	28.7	S	25.0	25.5	29.7	30.5	33.1	32.0	28.4	26.0	24.9	24.3	23.2	17.5	33.1	25.0	24
23	22.0	18.4	15.2	12.9	11.4	11.5	12.3	13.5	14.7	17.1	19.7	S	22.4	22.6	22.5	21.9	23.0	22.9	21.9	21.6	20.8	20.3	18.9	18.1	11.4	23.0	18.5	24
24	19.0	19.6	17.0	13.6	13.5	13.7	12.7	16.6	20.4	23.1	S	23.1	25.7	26.1	25.5	25.0	24.1	22.7	20.4	19.3	18.7	17.6	20.3	19.7	12.7	26.1	19.9	24
25	16.8	17.2	16.9	13.4	11.6	8.0	8.5	9.8	17.8	S	22.3	24.9	25.4	26.8	27.1	27.8	29.4	29.3	26.7	22.9	27.9	29.2	29.3	27.4	8.0	29.4	21.6	24
26	22.6	25.4	22.7	19.0	16.9	16.4	16.8	19.5	S	27.1	28.9	31.5	33.3	33.5	36.5	37.5	37.3	34.9	32.7	30.6	28.5	32.1	33.3	29.9	16.4	37.5	28.1	24
27	27.3	27.3	24.2	25.0	23.3	19.9	15.0	S	24.5	32.8	38.6	37.9	37.9	37.5	38.0	39.0	37.6	36.2	38.5	35.1	30.2	39.6	39.8	35.9	15.0	39.8	32.2	24
28	33.3	31.2	28.6	28.8	28.1	26.0	S	26.3	31.0	35.7	41.6	46.6	48.7	49.7	50.2	50.7	49.7	48.9	47.1	44.1	41.9	40.2	40.8	40.7	26.0	50.7	39.6	24
29	39.4	35.8	36.3	34.2	32.5	S	27.9	28.1	35.9	47.0	45.5	44.1	43.8	42.5	41.5	41.9	42.1	42.6	42.2	41.5	36.4	42.4	36.5	25.8	25.8	47.0	38.1	24
30	29.3	30.1	30.2	30.4	S	30.4	22.7	21.4	15.8	21.9	23.0	23.7	27.9	27.3	28.5	28.0	31.1	34.9	33.6	29.2	24.2	21.0	19.2	19.6	15.8	34.9	26.2	24
31	21.8	23.3	24.7	S	22.1	21.0	18.8	19.3	19.7	22.4	24.1	25.9	27.2	28.3	30.1	30.2	30.6	30.5	28.7	26.7	25.5	25.3	25.9	25.8	18.8	30.6	25.1	24
HOURLY MAX	39.4	42.1	42.9	45.3	38.0	33.4	28.5	28.4	35.9	47.0	45.5	46.6	48.7	49.7	50.2	50.7	49.7	48.9	47.1	44.1	42.0	40.2	40.8	40.7				
HOURLY AVG	25.2	24.5	23.2	22.0	21.2	20.3	19.9	21.4	23.7	26.6	28.9	30.5	31.5	32.0	32.4	32.5	32.8	32.8	31.5	30.3	28.5	28.4	27.4	26.6				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

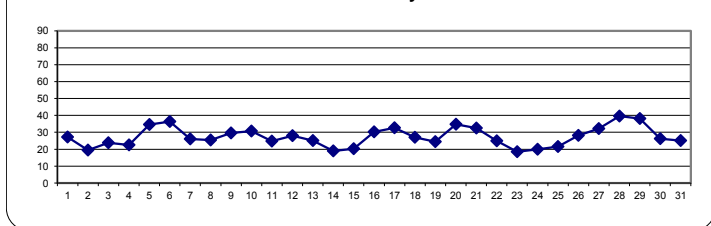
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

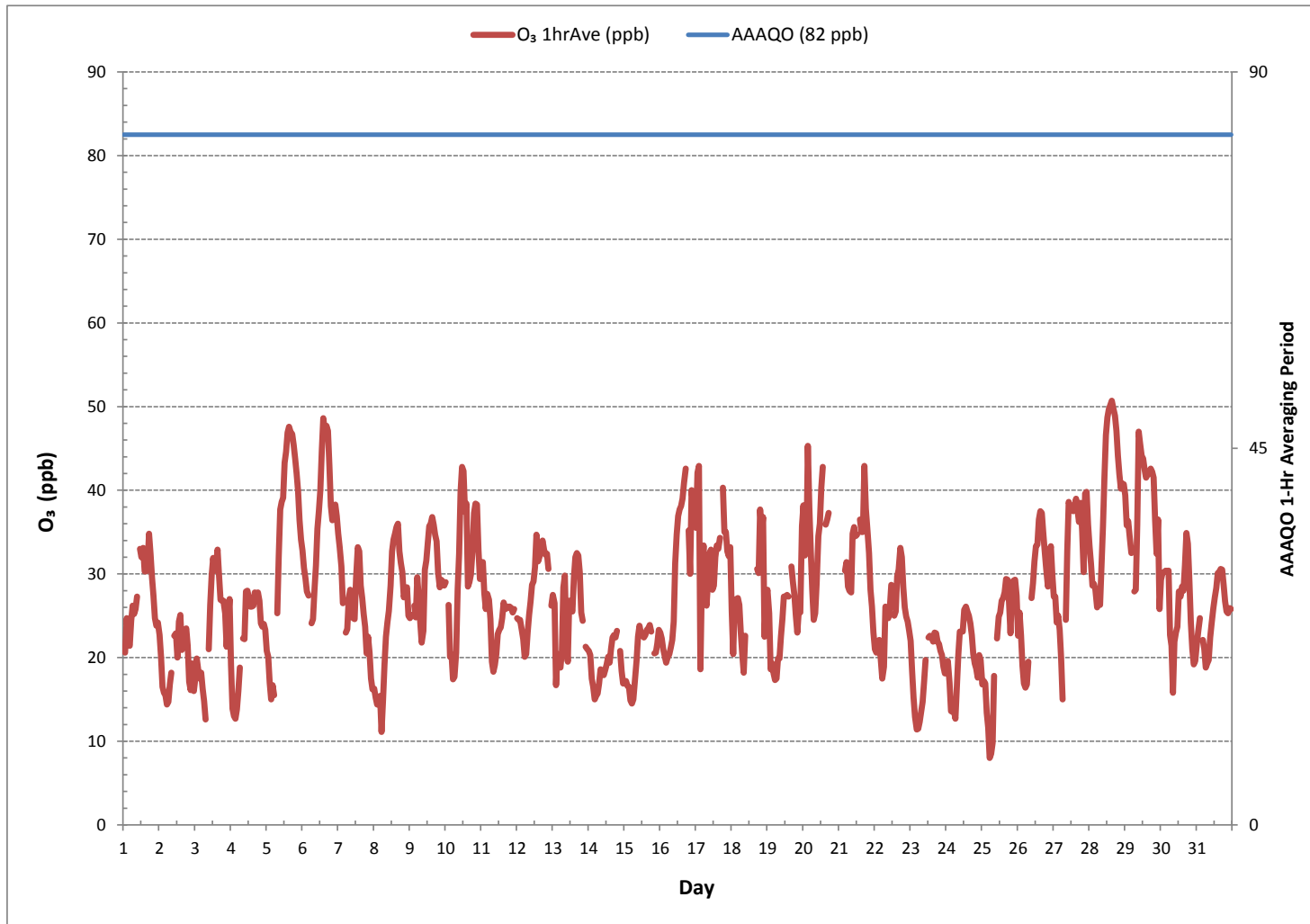
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	697			
MINIMUM 1-HR AVERAGE:	8.0 ppb	@ HOUR	5	ON DAY 25
MAXIMUM 1-HR AVERAGE:	50.7 ppb	@ HOUR	15	ON DAY 28
MAXIMUM 24-HR AVERAGE:	39.6 ppb			ON DAY 28
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	734 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	98.7 %	
STANDARD DEVIATION:	8.1	MONTHLY AVERAGE:	27.3 ppb	

24 HR AVERAGES July 2018



OZONE Hourly Averages (O<sub>3</sub> ppb)

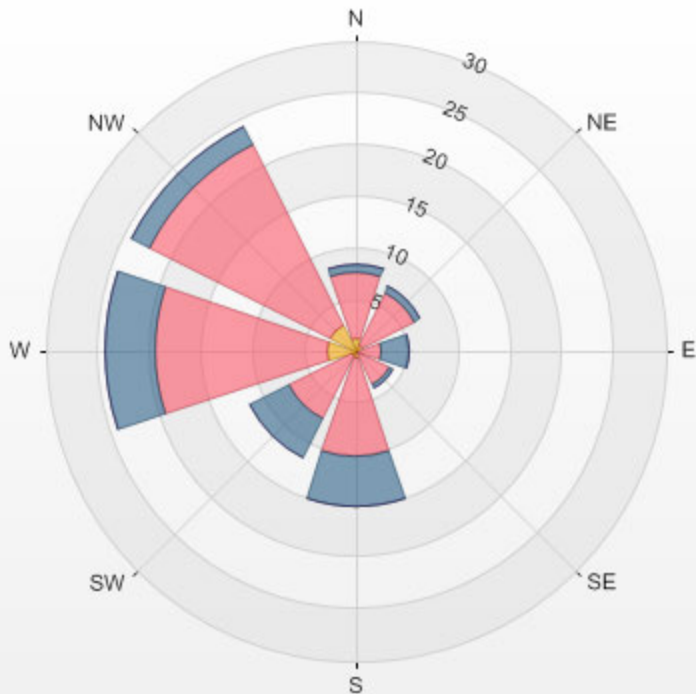






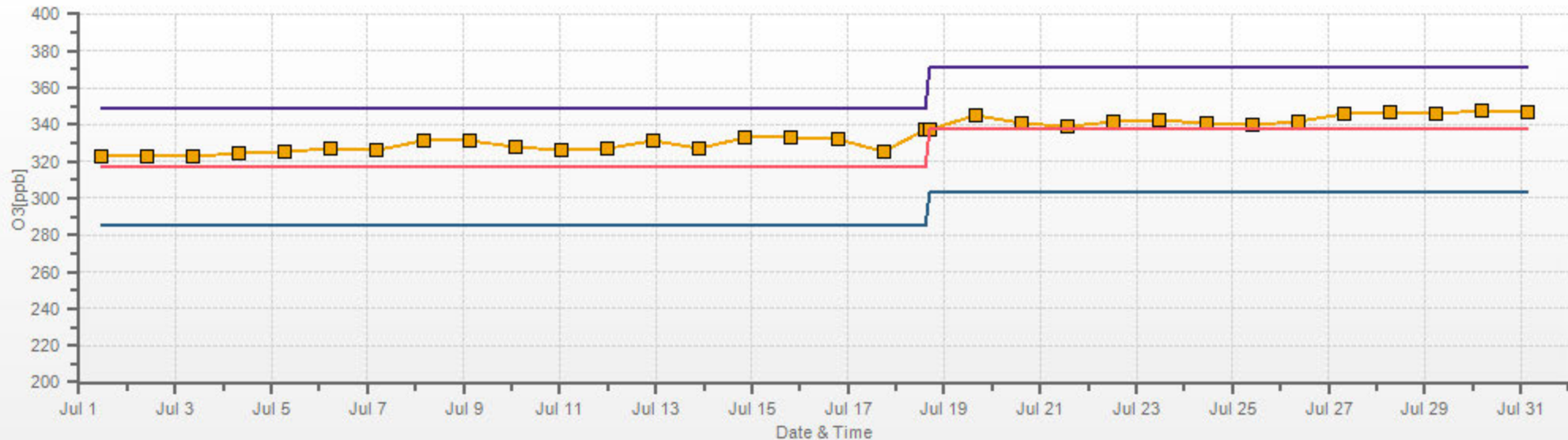
% Icon Classes (ppb) 9 0.0-16.9 70 16.9-33.9 21 33.9-50.8 0 >50.8

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



O3[ppb] Calibration: LICA ST. LINA Monthly: 18/07 Type: Span

Span Meas Span Ref Span Low Span High



***PARTICULATE MATTER 2.5***

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	3	4	2	2	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	24
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	1	24
3	2	2	2	1	1	1	1	7	6	3	3	3	2	2	2	2	3	3	2	3	22	2	1	1	1	1	22	3	24	
4	1	1	1	1	1	1	4	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	4	1	4	3	24	
5	5	5	5	6	7	6	6	6	7	5	6	6	6	6	3	3	2	2	2	2	3	3	3	3	3	3	2	7	4	24
6	3	4	3	3	3	3	3	3	3	4	4	5	5	5	6	6	7	6	6	7	7	8	10	10	3	10	5	24	24	
7	9	7	5	6	6	7	6	4	3	2	2	2	2	1	2	2	2	1	1	1	1	1	1	0	0	9	3	24	24	
8	1	1	1	2	2	2	3	4	3	3	4	4	5	3	2	2	2	2	2	2	2	2	2	2	3	1	5	2	24	24
9	3	3	3	3	3	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	3	2	24	24
10	2	2	2	2	2	2	2	2	2	2	2	3	4	4	4	4	4	4	4	5	5	5	4	4	4	2	5	3	24	24
11	4	4	4	4	4	4	4	5	6	8	9	10	11	11	10	9	8	7	7	8	8	6	4	4	4	4	11	7	24	24
12	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	4	4	4	4	4	4	4	5	6	6	4	6	4	24	24
13	6	6	6	7	6	6	6	5	4	4	3	3	2	2	3	3	4	4	3	3	3	4	4	4	2	7	4	24	24	
14	4	3	3	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	4	2	24	24	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	1	3	1	24	24
16	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3	4	4	4	5	6	6	8	8	2	8	4	24	24	
17	9	8	9	8	9	9	9	8	6	5	5	6	5	5	4	4	4	4	3	3	4	4	4	5	5	3	9	6	24	24
18	6	5	4	3	2	2	2	2	2	2	2	C	4	4	3	3	3	4	3	6	5	4	5	5	2	6	4	24	24	
19	5	5	5	5	5	7	7	7	7	6	6	5	5	4	5	4	4	4	3	3	3	3	4	5	3	7	5	24	24	
20	6	6	5	5	6	3	4	4	5	5	4	4	5	5	4	4	5	5	P	P	P	P	P	P	3	6	5	18	24	
21	P	P	P	4	4	4	3	3	3	3	3	3	2	2	3	3	3	5	4	3	3	3	3	3	2	5	3	21	24	
22	3	3	3	3	3	2	1	1	2	2	3	2	3	3	3	3	2	2	2	2	2	2	2	2	1	3	2	24	24	
23	3	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	24	24	
24	3	2	2	2	2	1	2	2	2	2	4	7	12	13	11	11	8	6	4	2	2	1	1	1	1	13	4	24	24	
25	1	1	1	1	1	2	4	7	8	6	5	5	6	6	6	7	6	4	4	4	5	5	5	5	1	8	4	24	24	
26	6	6	7	7	7	7	7	7	7	7	7	8	9	9	8	9	9	8	9	9	8	9	10	10	6	10	8	24	24	
27	11	11	11	11	11	12	12	11	9	10	11	10	9	9	9	8	8	8	7	6	6	7	8	9	6	12	9	24	24	
28	9	9	10	10	10	10	10	10	10	10	10	11	11	11	11	12	11	11	11	11	11	11	11	12	12	9	12	11	24	24
29	12	12	13	13	14	14	15	16	18	17	17	17	19	19	19	17	15	14	16	17	15	13	13	15	12	19	15	24	24	
30	15	16	17	18	17	18	16	15	13	10	8	9	9	7	7	6	2	2	3	3	5	5	6	6	2	18	10	24	24	
31	6	6	6	6	7	7	7	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	7	4	24	24	
HOURLY MAX	15	16	17	18	17	18	16	16	18	17	17	17	19	19	19	17	15	14	16	17	22	13	13	15						
HOURLY AVG	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	4	4	4	4	4	5	4	5	5					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

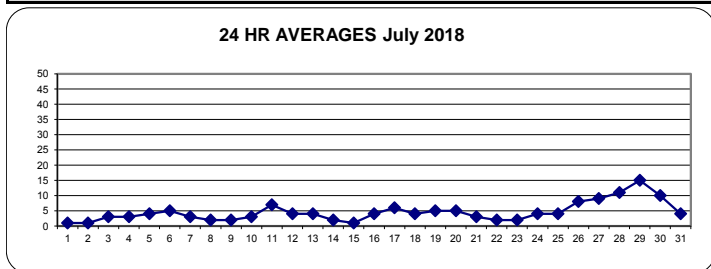
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m <sup>3</sup>	24-HR	30 µg/m <sup>3</sup>
----------------------	------	----------------------	-------	----------------------

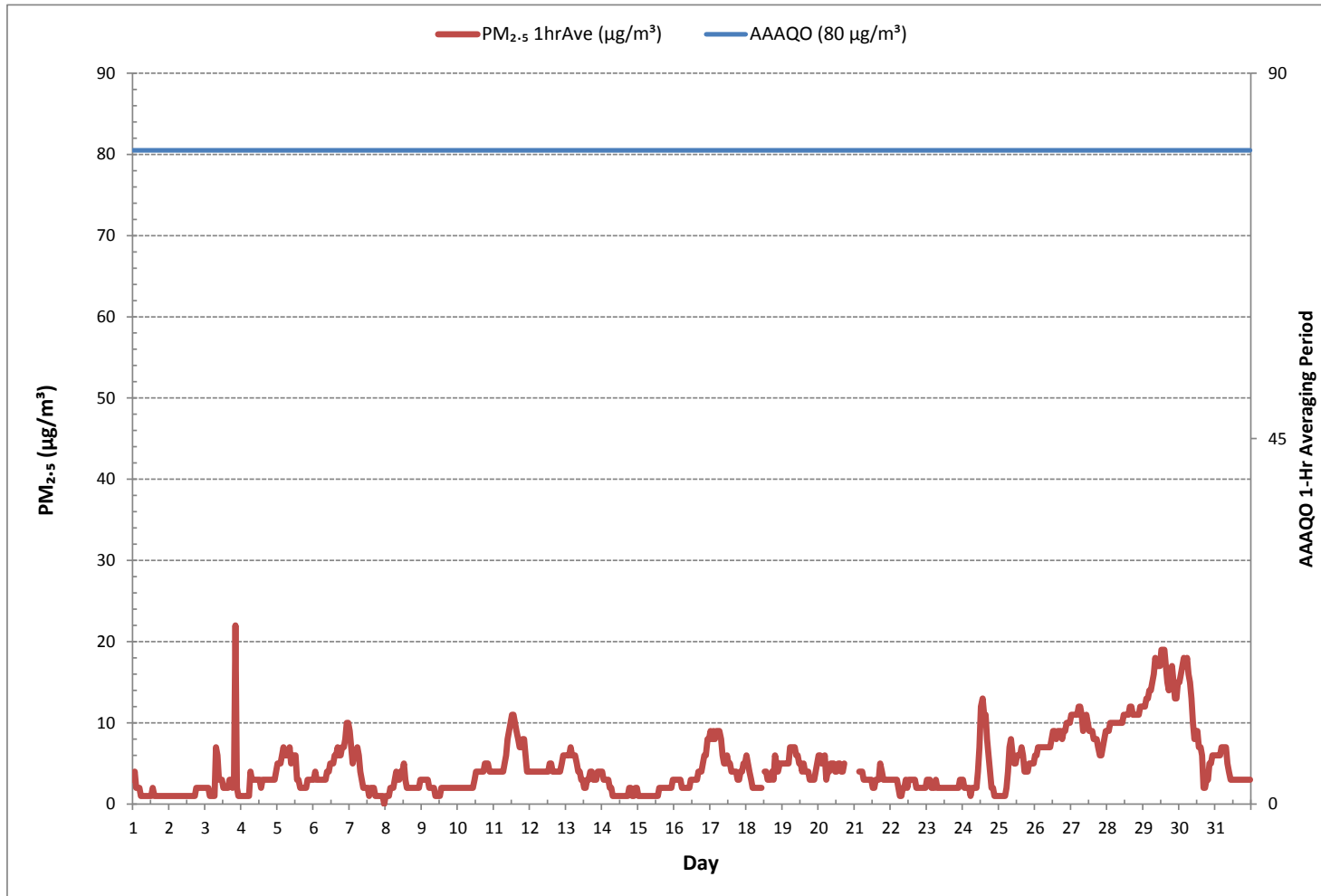
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	733		
MINIMUM 1-HR AVERAGE:	0 µg/m <sup>3</sup> @ HOUR	23 ON DAY	7
MAXIMUM 1-HR AVERAGE:	22 µg/m <sup>3</sup> @ HOUR	20 ON DAY	3
MAXIMUM 24-HR AVERAGE:	15 µg/m <sup>3</sup>	ON DAY	29
MONTHLY CALIBRATION TIME:	1 hrs	OPERATIONAL TIME:	735 hrs
STANDARD DEVIATION:	4	AMD OPERATION UPTIME:	98.8 %
		MONTHLY AVERAGE:	5 µg/m <sup>3</sup>

24 HR AVERAGES July 2018



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM<sub>2.5</sub> µg/m<sup>3</sup>)



Wind: LICA ST. LINA  
 Poll.: LICA ST. LINA-PM<sub>2.5</sub>[ug/m<sup>3</sup>]  
 Monthly: 18/07  
 Type: PollutionRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

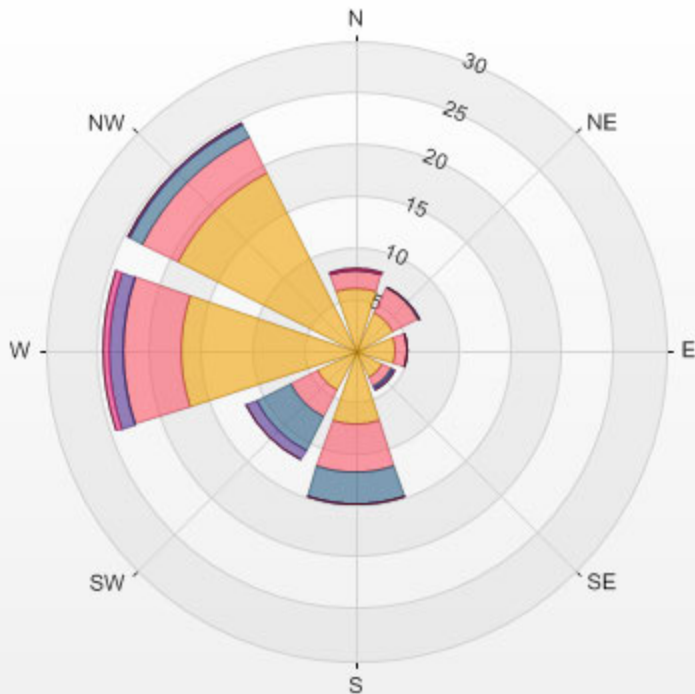
Calm: 0.00%

Calm Avg: 0.00 [ug/m<sup>3</sup>]

Direction	0.0-4.6	4.6-9.2	9.2-13.8	13.8-18.4	18.4-23.0	>23.0	Total
<b>N</b>	6.1	1.6	0.0	0.1	0.1	0.0	8.0
<b>NE</b>	4.1	2.7	0.1	0.0	0.0	0.0	7.0
<b>E</b>	4.0	1.1	0.0	0.0	0.0	0.0	5.0
<b>SE</b>	2.9	1.1	0.1	0.1	0.0	0.0	4.2
<b>S</b>	7.1	4.8	3.0	0.0	0.0	0.0	14.9
<b>SW</b>	4.2	2.9	3.7	1.1	0.0	0.0	11.9
<b>W</b>	17.0	5.5	0.1	1.4	0.4	0.0	24.4
<b>NW</b>	19.2	4.0	1.2	0.3	0.0	0.0	24.7
<b>Summary</b>	64.6	23.6	8.3	3.0	0.6	0.0	100.0

% Icon Classes (ug/m3(L)) 65 0.0-4.6 24 4.6-9.2 8 9.2-13.8 3 13.8-18.4 1 18.4-23.0 0 >23.0

LICA ST. LINA Poll.: LICA ST. LINA-PM2.5 [ug/m<sup>3</sup>] 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



## ***WIND SPEED***





WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	10.4	9.3	7.7	9.3	11.6	10.2	12.9	13.5	12.9	12.4	13.4	16.7	18.9	21.9	19.3	17.0	16.5	15.2	12.8	12.3	10.4	9.9	9.8	11.4	7.7	21.9	12.8	24	
2	10.2	8.6	10.6	10.1	10.1	8.2	9.1	7.8	6.8	5.8	7.2	6.2	15.7	12.2	8.6	8.0	8.3	7.7	6.5	5.6	6.6	6.6	6.2	5.7	5.6	15.7	7.6	24	
3	7.8	6.4	7.9	6.8	7.6	5.9	5.4	4.1	6.3	8.2	9.0	9.0	10.1	12.9	9.8	9.6	8.0	3.1	4.9	6.9	7.7	8.1	8.0	7.9	3.1	12.9	6.4	24	
4	8.2	6.4	5.6	7.3	6.3	6.3	6.1	8.1	9.3	8.7	8.3	10.5	11.4	12.0	13.0	9.7	7.0	5.5	3.6	4.1	4.9	4.1	2.9	4.9	2.9	13.0	5.9	24	
5	6.0	6.3	7.9	7.7	7.9	6.7	6.1	8.5	9.4	13.0	12.4	12.1	13.1	14.3	13.2	16.6	16.1	15.4	13.7	11.8	9.9	9.8	12.0	12.2	6.0	16.6	10.7	24	
6	11.6	12.1	11.8	12.0	11.1	10.4	9.2	10.0	12.5	12.3	15.6	15.8	13.3	11.9	8.5	7.7	8.2	9.4	6.2	7.1	14.4	17.2	8.8	13.9	6.2	17.2	6.9	24	
7	11.7	12.8	9.8	10.1	12.6	11.3	13.7	12.2	9.8	13.1	17.9	13.4	20.0	24.8	27.7	21.4	25.0	20.0	14.4	10.8	15.1	15.7	12.6	9.2	9.2	27.7	13.7	24	
8	7.9	8.2	6.1	7.2	8.1	6.8	6.6	7.8	9.7	12.8	13.4	14.8	16.9	15.7	13.9	18.4	16.9	13.9	12.1	8.4	7.2	7.5	7.0	7.7	6.1	18.4	10.0	24	
9	8.1	9.4	10.3	9.5	10.8	11.1	6.2	7.5	6.7	5.8	8.8	10.6	11.0	8.0	9.7	10.0	9.9	11.8	13.4	11.5	8.9	8.4	8.1	7.6	5.8	13.4	6.0	24	
10	8.4	7.3	6.6	6.8	6.5	8.2	3.9	2.1	5.2	6.3	8.3	10.6	6.3	2.1	4.9	3.7	5.1	5.2	5.6	13.3	20.0	12.1	10.1	8.0	2.1	20.0	2.0	24	
11	12.5	13.4	13.4	12.9	14.3	14.6	12.8	13.8	15.0	13.8	13.1	18.0	15.4	14.8	14.1	13.8	16.0	13.4	13.5	11.9	9.3	9.6	10.4	11.1	9.3	18.0	13.1	24	
12	12.7	11.7	11.3	9.8	11.4	10.2	10.7	11.1	11.0	14.0	18.2	15.9	17.0	18.5	21.7	15.9	12.1	10.8	9.4	5.6	4.1	4.1	6.6	5.7	4.1	21.7	10.9	24	
13	4.0	3.0	6.1	13.4	7.8	2.4	3.3	0.6	4.0	2.8	4.4	9.7	6.0	6.2	9.4	7.9	11.4	9.2	5.3	8.2	11.0	7.2	8.2	10.0	0.6	13.4	3.9	24	
14	8.7	8.9	9.7	11.5	12.6	12.5	14.6	16.0	15.8	15.8	18.6	21.1	22.4	20.7	18.2	20.5	20.6	20.0	17.8	17.5	13.8	10.4	9.2	10.2	8.7	22.4	15.0	24	
15	9.5	9.9	9.9	10.0	10.3	11.3	10.2	10.4	11.3	11.0	12.8	12.3	12.3	11.4	10.7	8.4	6.9	6.0	3.4	5.0	10.0	9.5	9.6	9.7	3.4	12.8	6.3	24	
16	10.7	11.2	10.4	10.9	12.0	13.4	13.4	15.5	16.6	15.3	17.2	16.3	15.1	14.0	13.4	13.7	11.9	13.3	9.3	6.2	6.5	7.4	7.1	7.2	6.2	17.2	11.5	24	
17	3.9	7.3	8.2	7.2	7.8	6.9	4.8	3.8	3.9	3.0	5.1	5.6	8.8	10.2	13.1	11.8	12.1	10.2	7.3	4.6	5.6	0.9	2.3	4.8	0.9	13.1	5.6	24	
18	9.6	12.2	11.4	12.8	8.6	7.2	3.7	4.8	4.5	4.9	10.4	6.6	5.8	6.5	4.8	3.5	3.8	3.0	2.3	6.3	10.7	2.2	7.0	3.6	2.2	12.8	3.8	24	
19	7.7	7.6	9.8	11.2	10.8	11.1	9.9	9.1	7.5	9.6	9.0	8.9	7.0	5.7	5.5	6.9	7.8	5.2	4.9	3.8	5.6	5.2	2.6	13.7	2.6	13.7	5.1	24	
20	8.8	5.2	2.7	9.6	8.0	4.1	7.1	11.0	10.5	10.2	12.6	12.9	14.4	18.2	18.0	19.0	17.5	14.0	P	P	P	P	P	P	2.7	19.0	9.1	18	
21	P	P	P	9.5	14.5	8.7	5.0	7.1	9.3	8.9	11.3	9.8	7.7	6.0	4.2	3.6	3.6	13.1	4.2	5.1	7.3	9.0	11.1	11.7	3.6	14.5	5.8	21	
22	10.8	10.1	11.9	12.7	13.1	11.1	13.2	18.3	17.9	18.4	21.6	23.8	25.0	23.4	22.2	19.7	18.3	16.1	15.8	13.7	10.4	10.4	9.6	11.4	9.6	25.0	14.5	24	
23	12.6	10.2	10.3	9.0	9.7	10.0	10.7	10.2	9.4	11.5	13.5	13.2	15.1	14.3	12.7	11.3	13.1	11.6	10.1	7.2	8.6	9.0	6.3	6.2	6.2	15.1	10.2	24	
24	7.5	8.1	8.4	9.1	9.6	6.6	5.6	7.2	7.7	9.8	11.3	8.8	8.6	8.8	11.1	8.0	9.4	9.9	9.6	7.4	6.3	5.0	6.1	5.7	5.0	11.3	7.9	24	
25	6.3	7.3	6.1	5.0	5.2	3.1	2.9	4.4	4.6	6.2	5.0	3.8	3.4	4.6	5.5	2.3	1.2	1.4	1.7	2.5	2.1	4.8	4.8	5.8	1.2	7.3	2.2	24	
26	6.0	7.2	7.1	5.5	5.7	6.0	5.1	3.4	4.6	3.1	3.5	3.9	2.2	2.4	0.9	1.4	2.4	7.7	6.8	6.1	6.0	6.7	7.4	7.8	0.9	7.8	3.7	24	
27	8.0	7.1	5.8	6.0	5.9	5.9	3.1	3.6	3.6	2.3	3.3	4.5	3.5	3.4	4.1	6.6	3.0	7.6	4.9	3.8	6.5	9.0	9.6	9.6	2.3	9.6	3.6	24	
28	10.5	10.1	8.6	8.5	7.6	6.0	4.8	5.4	5.8	5.3	6.5	7.6	8.6	7.8	8.2	8.1	6.9	7.0	5.5	6.4	8.4	8.6	9.4	8.7	4.8	10.5	7.4	24	
29	9.2	8.5	8.7	8.3	10.2	10.9	8.4	9.2	11.2	11.8	11.5	13.5	13.7	13.4	12.3	11.5	13.2	16.5	12.1	9.1	7.0	4.3	2.4	6.3	2.4	16.5	8.9	24	
30	6.5	6.6	5.6	6.3	6.1	7.4	8.2	2.2	4.5	10.3	5.0	7.4	11.4	13.9	15.2	15.5	15.6	12.0	9.9	8.5	11.9	5.8	8.1	6.0	2.2	15.6	5.8	24	
31	6.2	6.1	5.5	6.6	6.7	6.1	4.0	4.4	4.0	5.1	6.6	6.6	6.8	7.4	6.1	7.9	6.1	6.5	6.6	7.3	9.4	10.4	11.3	14.2	4.0	14.2	4.3	24	
HOURLY MAX	12.7	13.4	13.4	13.4	14.5	14.6	14.6	18.3	17.9	18.4	21.6	23.8	25.0	24.8	27.7	21.4	25.0	20.0	17.8	17.5	20.0	17.2	12.6	14.2					

STATUS FLAG CODES

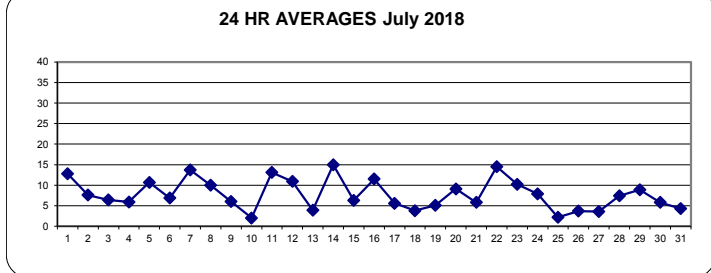
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

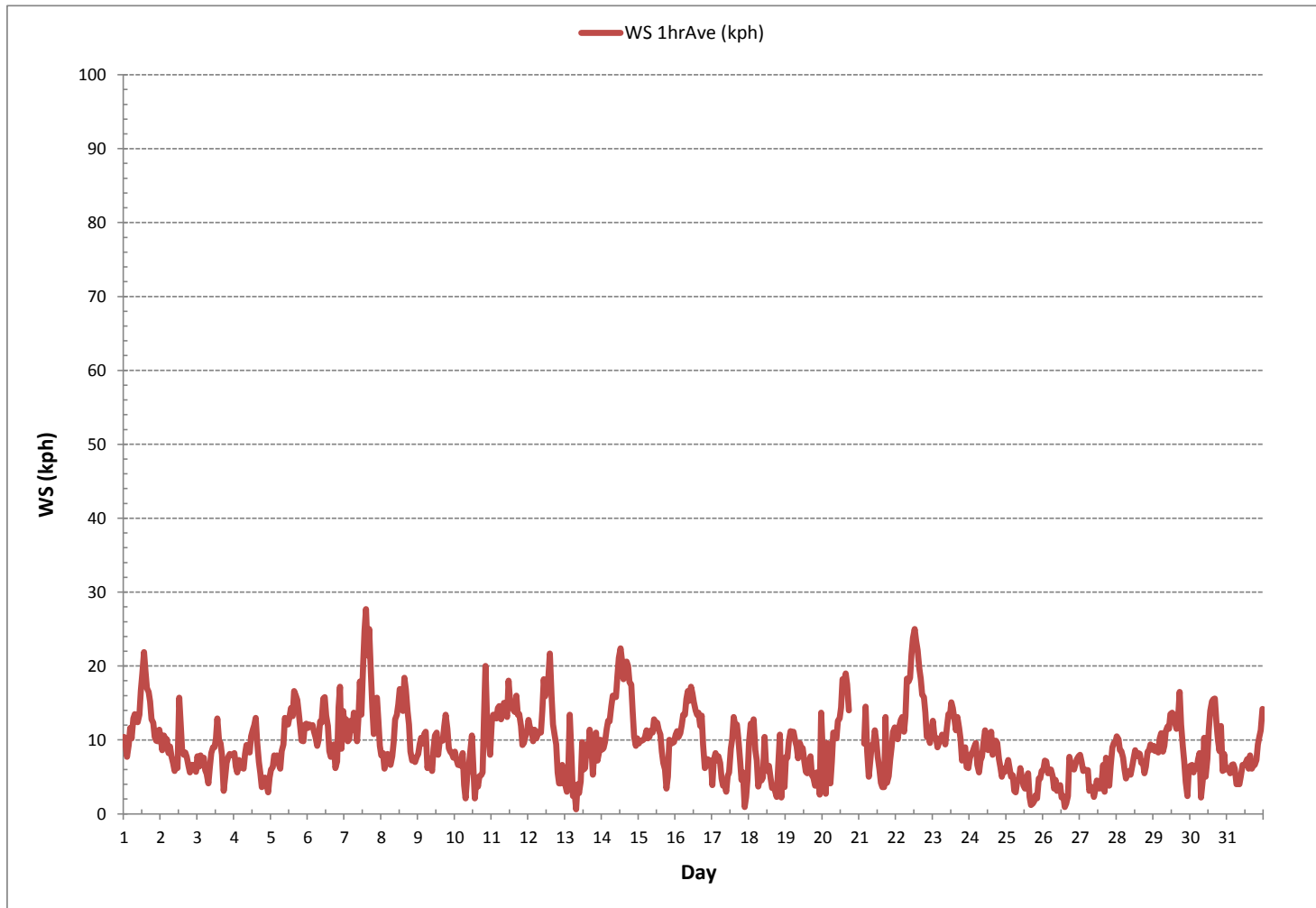
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	735
MINIMUM 1-HR AVERAGE	0.6 kph @ HOUR 7 ON DAY 13
MAXIMUM 1-HR AVERAGE:	27.7 kph @ HOUR 14 ON DAY 7
MAXIMUM 24-HR AVERAGE:	15.0 kph ON DAY 14
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	735 hrs
AMT OPERATION UPTIME:	98.8 %
STANDARD DEVIATION:	4.4
MONTHLY AVERAGE:	4.4 kph

24 HR AVERAGES July 2018





WIND SPEED Hourly Averages (WS kph)



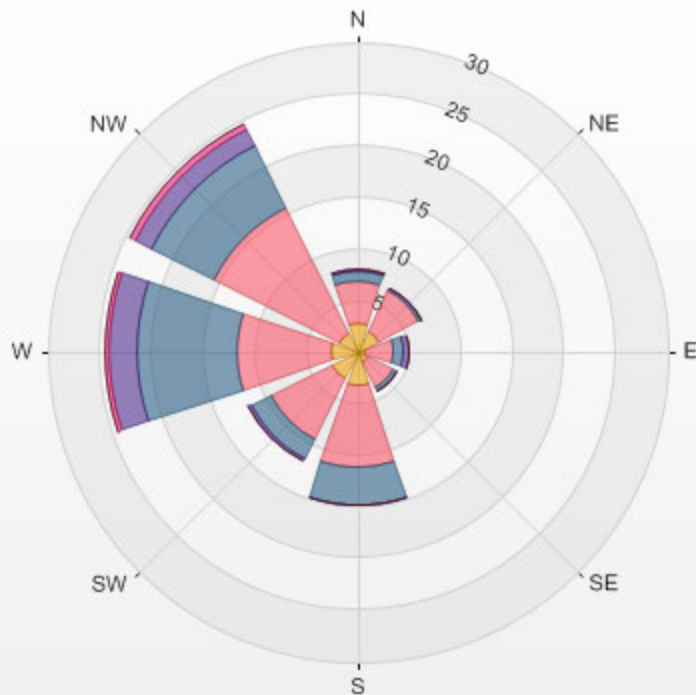
Wind: LICA ST. LINA  
 Monitor: WSP [kph]  
 Monthly: 18/07  
 Type: WindRose  
 Direction: Blowing From (Wind Frequency)  
 Based On 1 Hr.

Calm: 0.00%

Direction	0.4-5.6	5.6-11.1	11.1-16.7	16.7-22.2	22.2-27.8	>27.8	Total
<b>N</b>	2.9	4.0	1.1	0.1	0.0	0.0	8.0
<b>NE</b>	2.3	4.4	0.3	0.0	0.0	0.0	6.9
<b>E</b>	0.7	2.9	1.0	0.5	0.0	0.0	5.0
<b>SE</b>	1.2	2.7	0.3	0.0	0.0	0.0	4.2
<b>S</b>	3.3	8.0	3.5	0.0	0.0	0.0	14.8
<b>SW</b>	2.9	6.5	2.2	0.3	0.0	0.0	11.8
<b>W</b>	2.6	9.1	9.7	2.7	0.4	0.0	24.5
<b>NW</b>	2.0	13.5	6.9	1.6	0.5	0.0	24.6
<b>Summary</b>	17.8	51.0	24.9	5.3	1.0	0.0	100.0

% Icon	Classes (kph)	18		0.4-5.6	51		5.6-11.1	25		11.1-16.7	5		16.7-22.2	1		22.2-27.8	0		>27.8
--------	---------------	----	---	---------	----	---	----------	----	---	-----------	---	--	-----------	---	---	-----------	---	---	-------

LICA ST. LINA 2018/07/01 00:00 - 2018/07/31 23:00 Calm: 0.00%



***WIND DIRECTION***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - July 2018

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	WSW	WNW	NW	W	W	W	W	W	W	W	WNW	W	W	W	W	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	W	24	
2	W	W	W	W	W	W	W	WNW	NNW	WNW	W	W	WSW	W	WNW	NNW	NW	NW	NW	NNW	NW	NW	NW	WNW	WNW	24	
3	NW	NW	NNW	NNW	N	NNE	NE	ENE	NE	ENE	ENE	E	NE	NE	NE	NE	E	NNE	NNE	NNE	NNE	NE	NE	NE	NE	24	
4	NNE	NNE	NNE	NNE	N	N	N	NNW	NW	NNW	NNW	NNW	NW	WNW	WNW	NW	N	N	NW	WNW	W	W	W	SW	NNW	24	
5	SSW	SSW	SSW	SSW	S	S	SSW	SSW	S	S	S	S	S	S	S	S	S	S	SSE	SSE	SSE	SSE	S	S	S	24	
6	S	S	SSE	S	SE	SSE	SSE	SE	SSE	S	SW	SW	SW	W	WNW	W	WNW	W	NW	NNW	W	WSW	WSW	W	SW	24	
7	W	W	W	WSW	W	WSW	WSW	W	WNW	W	WSW	WSW	WSW	W	W	W	WNW	NW	NW	WNW	NW	NNW	NNW	NW	W	24	
8	NW	WNW	WNW	WNW	W	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	WSW	W	WSW	W	W	W	W	WSW	SW	SW	SSW	W	24	
9	SSW	SSW	S	S	SSW	SSE	SSW	SW	SSW	SE	ESE	ESE	ESE	ESE	E	ENE	E	E	E	E	E	E	E	E	E	SE	24
10	SE	SE	SSE	E	ESE	ENE	ESE	SSW	ESE	E	ESE	E	ESE	E	W	NNE	NNE	NNE	NW	SSW	WSW	W	SW	WSW	SSE	24	
11	W	W	W	WNW	WNW	WNW	WNW	W	W	WNW	WNW	WNW	NW	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	24
12	NW	WNW	WNW	W	W	W	W	WNW	W	W	W	W	W	W	W	W	W	W	WNW	NW	NW	SSW	SSW	SW	W	24	
13	W	WNW	WSW	W	WNW	SSW	N	SSE	WSW	N	N	N	NE	NE	E	ENE	N	NE	NNE	NW	NNW	NW	WNW	WNW	NNW	24	
14	WNW	WNW	NW	NW	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	WNW	24	
15	WNW	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	NW	WNW	WNW	NW	WNW	W	ESE	SE	SSE	S	SSE	W	W	24	
16	S	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SW	SW	SW	SW	SSW	SW	SSW	24	
17	W	NNW	WNW	SW	WSW	WSW	SW	SSW	SSW	WSW	WSW	WSW	SSW	WSW	WSW	WSW	W	W	W	NW	SE	SSE	WNW	WSW	24		
18	NW	NNW	NNW	NNW	NNW	WNW	SSE	SSE	NNW	S	W	W	NW	NW	W	WSW	WSW	SSW	NW	WSW	NNW	NE	SE	WNW	24		
19	S	SSW	WSW	WNW	WNW	WNW	WNW	NW	NNW	NNW	NNW	N	NNW	N	NNW	NNW	NW	NNW	NNW	N	NNE	NE	NW	WSW	NW	24	
20	WSW	WSW	SSE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	ESE	E	P	P	P	P	P	P	E	18	
21	P	P	P	W	W	WNW	N	NW	NW	WNW	NW	NW	NNW	NW	NNW	NW	NNW	N	NE	W	E	SSW	S	WSW	W	WNW	21
22	W	W	W	W	W	W	NW	NW	NW	NW	NW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NW	NW	WNW	WNW	WNW	NW	24
23	NW	NW	NW	NW	WNW	WNW	WNW	WNW	NW	NW	NW	NW	NW	NW	NW	NW	NNW	NNW	NNW	NNW	NW	NW	NW	N	NNE	NW	24
24	NNE	N	NNW	NW	NNW	NNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	N	N	NNW	24
25	NNW	NW	NNW	NNW	NNW	N	N	W	WNW	NNW	NNW	N	NNE	NNE	NE	NNE	WNW	NW	W	SW	S	S	S	SSW	NNW	24	
26	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	ESE	ESE	SSW	SSE	SSW	NNE	NNW	E	ESE	SE	ESE	SSE	S	S	SSE	24
27	S	SSW	SSW	SW	SW	SW	SW	SW	SW	SSW	S	SSW	SSW	SSE	SSE	SE	SSW	ENE	E	ENE	ESE	SE	SSE	S	S	24	
28	S	S	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
29	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	W	W	W	W	W	W	WSW	W	WNW	NW	NE	SSW	SW	WSW	24	
30	SW	SW	WSW	SW	W	WNW	NNW	SSE	SSW	WNW	NW	NNW	N	N	N	N	N	NNE	N	NNE	NE	NNE	NNE	NNE	NNW	24	
31	NNE	NE	NE	NE	NE	ENE	E	E	S	S	SSW	S	S	S	S	S	S	SSE	SSE	SE	SE	SSE	S	S	SSE	24	

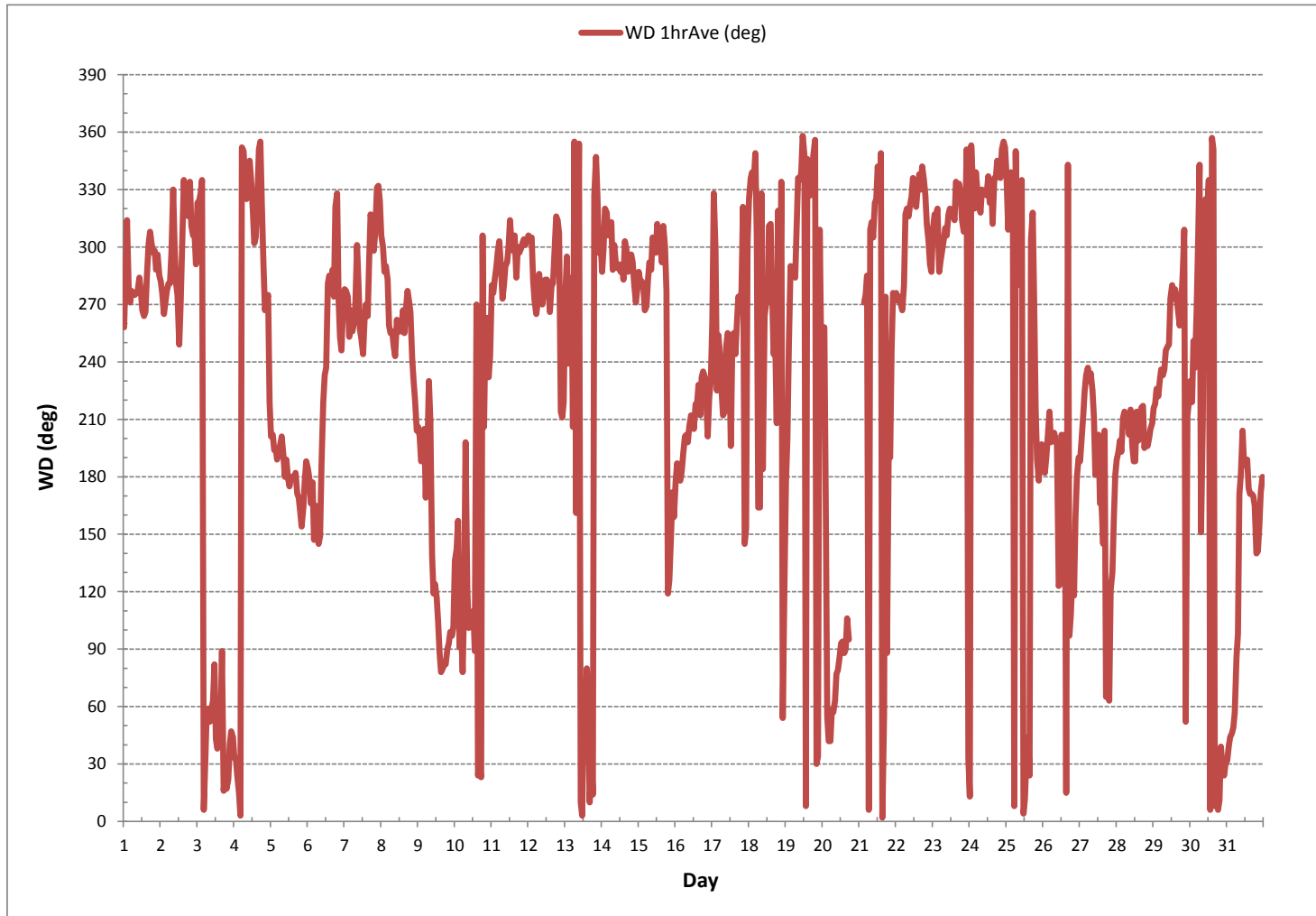
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	735	hrs
STANDARD DEVIATION:	93		AMD OPERATION UPTIME:	98.8	%
			MONTHLY AVERAGE:	280	(W)

WIND DIRECTION Hourly Averages (WD)



***STANDARD DEVIATION WIND DIRECTION***





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - July 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59			
DAY																											
1	8	16	17	14	10	12	12	16	18	23	21	20	17	14	11	24	18	17	17	16	16	14	16	15	24		
2	16	14	7	9	13	14	16	22	25	35	28	28	14	30	18	18	19	18	19	19	13	11	16	16	24		
3	10	11	10	13	15	15	17	21	21	20	21	27	31	19	19	28	43	33	22	16	15	14	13	13	24		
4	14	16	14	17	21	28	20	18	21	23	29	23	24	30	23	25	24	40	44	17	17	30	35	20	24		
5	11	10	9	8	7	13	16	17	20	17	22	20	23	20	23	18	17	17	17	16	14	13	13	10	24		
6	9	10	15	13	18	22	20	19	21	24	22	15	22	25	27	27	25	19	16	14	13	15	29	11	24		
7	11	10	12	12	14	10	12	16	23	20	15	15	15	14	15	16	18	20	18	19	17	18	15	15	24		
8	17	15	14	19	9	12	11	16	22	17	16	19	15	18	25	16	18	19	14	11	7	14	12	10	24		
9	10	10	9	12	17	17	25	22	39	26	20	19	21	29	23	22	22	21	18	18	16	14	13	13	24		
10	14	15	11	20	26	14	43	23	23	26	22	21	26	49	36	25	17	31	49	32	14	20	17	16	24		
11	16	13	14	14	16	16	15	12	14	17	20	18	19	18	18	20	18	18	18	16	14	14	13	13	24		
12	13	14	13	10	9	8	11	17	20	18	19	21	20	19	14	17	22	21	16	14	14	26	8	12	24		
13	16	60	21	18	24	10	32	23	16	49	37	18	18	18	19	40	25	19	38	21	25	23	22	20	24		
14	18	18	17	17	16	16	18	17	18	19	17	18	18	18	18	18	18	18	17	17	15	15	13	12	24		
15	13	10	11	9	9	9	17	18	19	23	20	25	20	24	27	27	29	28	11	28	9	13	8	14	24		
16	11	8	13	9	12	13	14	16	16	16	17	16	20	19	20	19	19	15	13	10	16	7	18	15	24		
17	51	16	16	12	11	10	11	19	22	41	38	45	26	30	18	22	22	13	15	14	18	68	60	33	24		
18	16	19	19	26	28	22	39	17	44	34	22	33	26	26	21	45	34	50	43	58	17	60	27	54	24		
19	12	12	13	14	12	12	17	15	22	21	22	22	27	30	30	34	19	24	19	25	12	10	66	13	24		
20	22	31	67	26	19	48	18	17	20	21	20	21	22	19	19	18	18	18	P	P	P	P	P	P	18		
21	P	P	P	11	16	27	25	40	18	23	23	23	30	43	43	37	32	29	21	40	18	11	11	11	21		
22	13	8	10	11	11	24	16	17	17	17	17	19	17	19	21	18	20	19	16	15	15	14	13	24			
23	17	15	15	22	14	15	15	17	18	19	22	23	20	21	22	19	20	17	16	14	12	11	30	12	24		
24	13	18	12	11	14	18	25	20	22	21	20	24	24	24	21	24	24	17	19	14	11	18	13	17	24		
25	19	13	20	19	24	27	27	26	27	27	38	37	39	36	23	42	56	56	46	18	23	11	7	7	24		
26	13	6	5	11	9	10	13	17	19	36	43	40	60	53	73	65	54	20	17	11	17	7	11	6	24		
27	7	14	9	9	16	17	18	16	28	43	42	41	52	52	47	30	60	30	19	25	10	12	10	6	24		
28	6	9	9	9	12	12	14	16	20	27	28	25	24	27	28	24	27	22	27	13	9	9	10	12	24		
29	13	12	10	10	9	8	8	9	11	13	15	19	17	18	24	22	16	12	13	21	30	32	41	17	24		
30	9	11	15	15	18	17	27	62	25	30	24	21	24	21	21	20	21	21	20	20	17	15	15	14	24		
31	11	10	7	4	6	8	20	22	19	27	29	29	31	30	32	15	33	19	14	13	11	14	15	13	24		

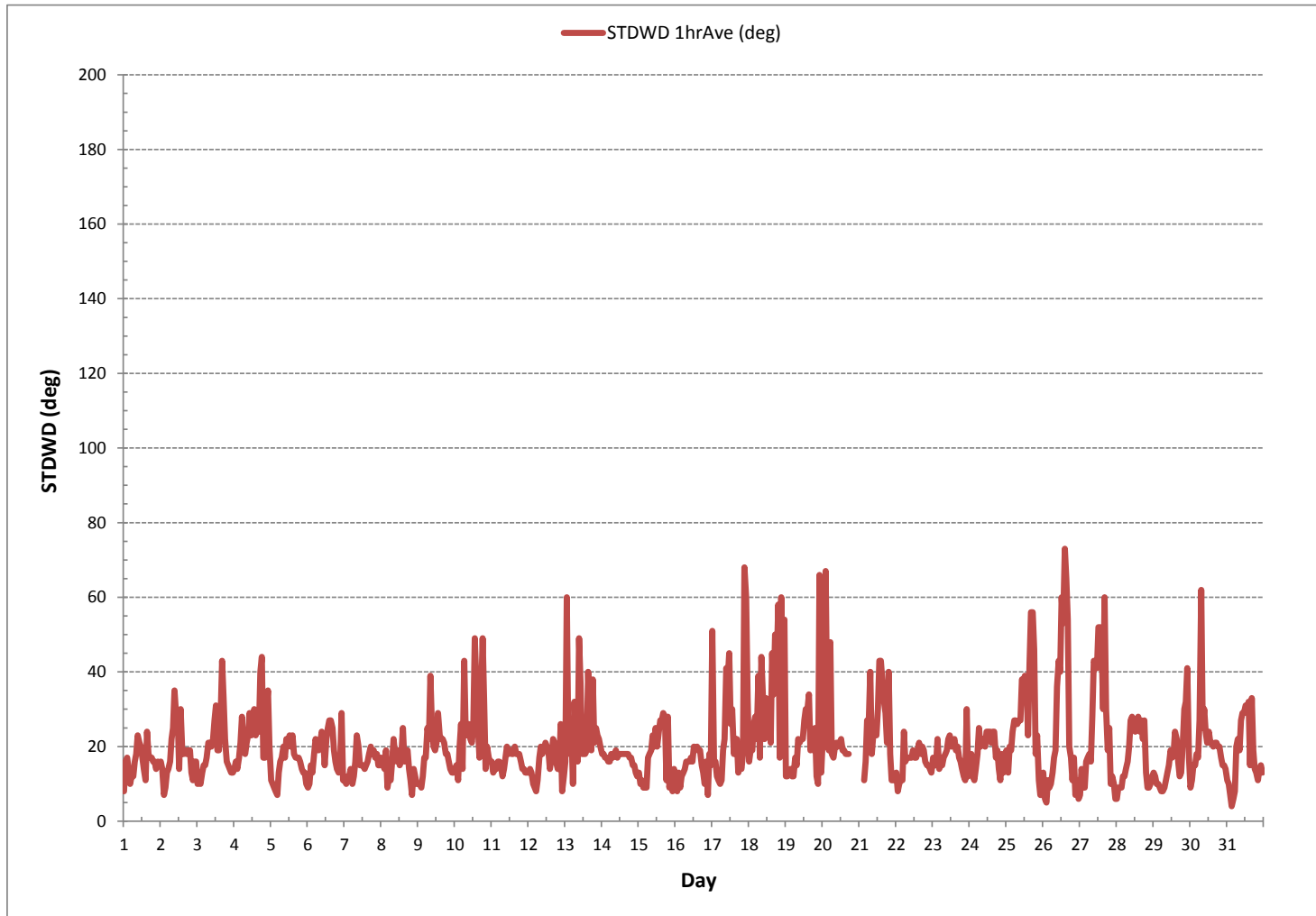
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 735 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



***RELATIVE HUMIDITY***



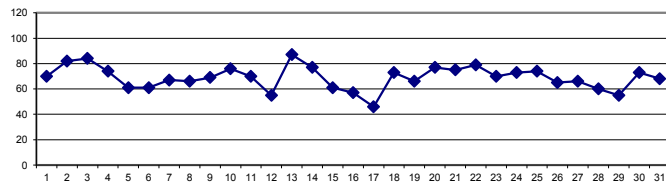
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	89	90	84	88	90	84	77	74	67	63	58	53	53	63	61	53	55	53	58	60	67	76	77	78	78	53	90	70	24
2	82	88	93	92	91	91	87	83	79	70	65	66	74	66	82	79	78	77	76	77	92	96	94	97	65	97	82	24	
3	98	98	98	98	99	98	98	96	91	79	72	64	62	67	66	60	84	81	72	77	84	89	92	93	60	99	84	24	
4	95	97	98	98	98	99	99	96	85	75	64	61	56	56	54	62	52	50	48	52	62	67	69	74	48	99	74	24	
5	78	81	89	94	90	86	80	71	64	58	54	53	49	42	40	37	37	38	40	45	52	59	63	67	37	94	61	24	
6	71	76	77	77	77	77	73	68	64	62	60	57	54	51	43	40	37	36	48	53	60	71	71	64	36	77	61	24	
7	65	65	66	72	73	77	69	58	51	55	80	72	60	48	48	52	50	60	72	79	69	79	88	91	48	91	67	24	
8	93	95	97	95	96	94	84	72	60	57	55	55	55	51	47	44	40	39	40	44	54	63	67	76	39	97	66	24	
9	76	75	72	76	78	75	74	73	85	75	57	52	50	54	57	55	57	59	64	70	76	80	84	87	50	87	69	24	
10	87	90	92	96	97	96	87	73	67	60	54	47	44	54	56	66	68	68	67	78	92	91	94	96	44	97	76	24	
11	97	97	97	96	95	95	96	94	87	77	70	63	58	56	53	46	48	47	45	47	52	55	55	60	45	97	70	24	
12	62	64	67	74	75	72	66	60	54	48	43	41	39	37	43	42	41	44	46	49	52	61	65	73	37	75	55	24	
13	70	69	85	80	92	96	89	76	73	88	91	89	84	81	77	76	93	93	93	96	97	98	98	98	69	98	87	24	
14	98	97	97	95	96	93	89	80	73	74	77	68	71	72	71	65	61	62	60	58	64	71	79	82	58	98	77	24	
15	83	83	84	86	89	85	78	71	62	55	50	48	45	43	41	38	38	37	41	51	59	60	65	72	37	89	61	24	
16	74	76	78	76	75	71	69	64	59	57	51	51	50	44	43	40	39	36	37	44	55	58	64	64	36	78	57	24	
17	68	58	49	83	71	65	63	58	45	33	32	32	34	30	29	28	28	30	33	37	40	45	50	53	28	83	46	24	
18	59	65	59	64	73	77	81	85	94	87	80	80	73	69	62	53	48	51	57	76	85	80	93	90	48	94	73	24	
19	87	90	96	95	94	92	87	81	76	69	61	51	49	46	45	41	40	42	45	52	60	59	60	77	40	96	66	24	
20	82	88	89	91	93	94	93	86	81	77	74	70	65	60	60	61	60	65	P	P	P	P	P	P	60	94	77	18	
21	P	P	P	99	98	94	87	85	81	70	63	59	54	48	44	48	51	79	81	76	85	89	90	91	44	99	75	21	
22	87	87	90	92	95	98	98	95	93	87	76	73	61	62	58	58	53	57	60	67	78	84	88	92	53	98	79	24	
23	91	93	95	96	98	97	92	85	77	68	61	56	53	52	50	50	48	47	48	52	58	62	70	78	47	98	70	24	
24	80	81	88	95	96	94	90	83	72	63	59	57	52	53	54	56	59	60	64	72	76	79	82	84	52	96	73	24	
25	91	94	96	96	98	98	97	95	84	74	66	62	60	57	58	55	53	51	57	65	65	66	68	72	51	98	74	24	
26	81	79	84	88	89	88	85	78	66	56	53	49	47	45	40	37	38	47	56	62	73	70	71	77	37	89	65	24	
27	81	84	89	91	92	95	87	78	67	55	47	48	45	46	44	46	49	62	53	58	72	63	65	70	44	95	66	24	
28	74	77	82	83	85	85	79	71	65	55	48	44	43	39	40	38	38	41	47	54	62	65	66	67	38	85	60	24	
29	68	73	74	78	79	77	77	71	60	51	44	36	33	32	31	35	34	33	39	43	54	67	56	79	31	79	55	24	
30	76	73	73	74	77	72	81	83	82	70	69	68	59	61	63	64	60	59	63	72	79	86	90	89	59	90	73	24	
31	90	91	93	95	97	96	88	84	78	67	61	54	50	46	44	44	41	45	50	58	63	66	66	66	41	97	68	24	
HOURLY MAX	98	98	98	99	99	99	99	96	94	88	91	89	84	81	82	79	93	93	93	96	97	98	98	98					
HOURLY AVG	81	82	84	88	89	87	84	78	72	66	61	57	54	53	52	51	51	53	55	61	68	72	75	79					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

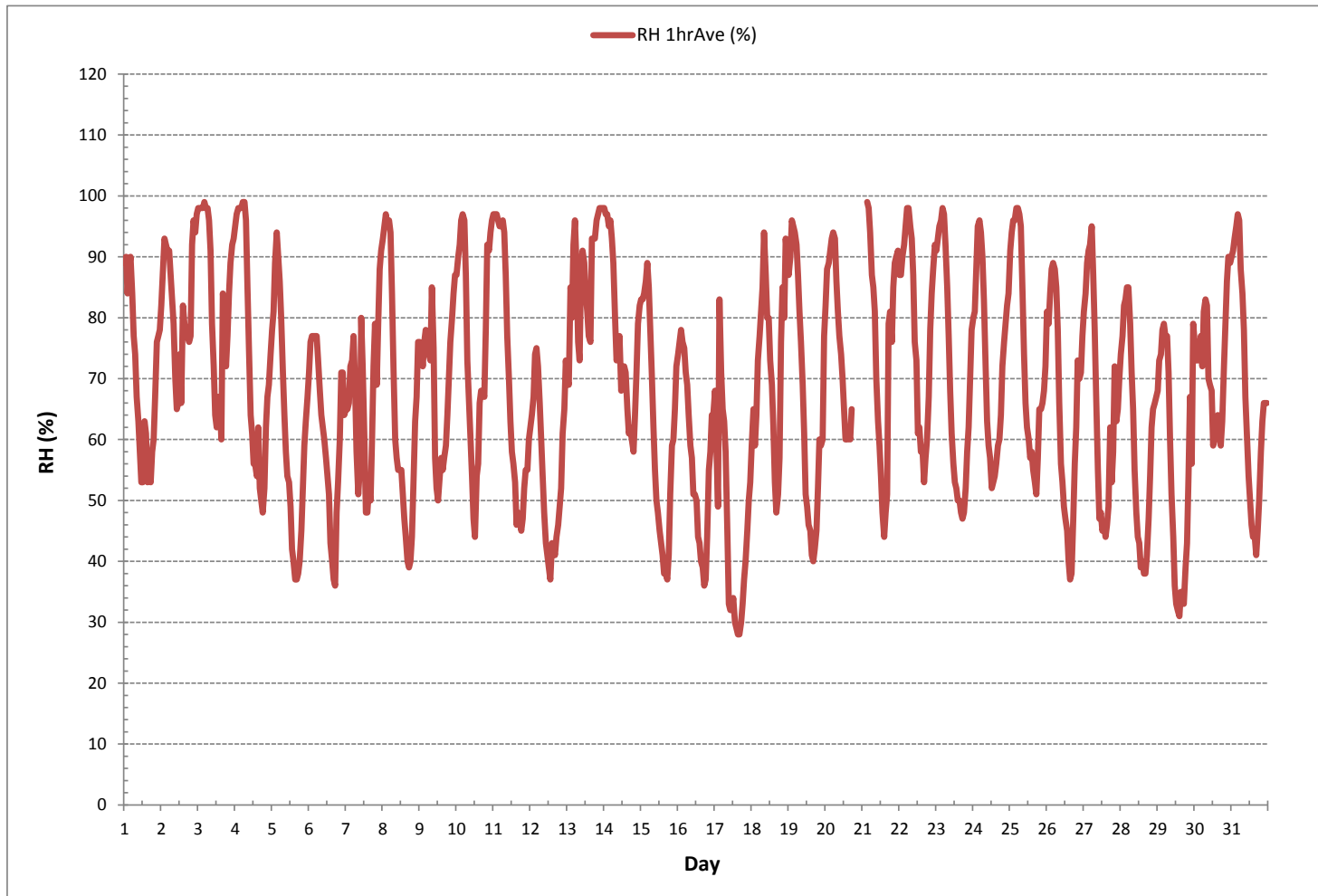
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	28	%	@ HOUR	15	ON DAY	17
MAXIMUM 1-HR AVERAGE:	99	%	@ HOUR	4	ON DAY	3
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY	13
OPERATIONAL TIME:						735 hrs
AMD OPERATION UPTIME:						98.8 %
STANDARD DEVIATION:	18					MONTHLY AVERAGE: 69 %

**RELATIVE HUMIDITY Hourly Averages (RH %)**



## ***BAROMETRIC PRESSURE***



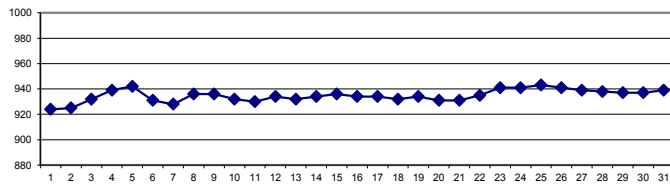
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	923	923	923	923	923	923	923	924	925	925	925	925	925	925	924	924	925	925	925	925	925	924	924	924	923	925	924	24
2	924	923	923	923	923	923	923	924	924	925	925	926	926	927	926	926	927	927	928	928	927	927	928	928	923	928	925	24
3	928	928	928	928	928	929	929	930	931	932	932	932	933	933	932	933	933	933	934	935	934	934	934	933	928	935	932	24
4	933	933	934	934	935	936	937	937	938	939	939	940	940	941	941	941	942	942	943	943	943	942	942	942	933	943	939	24
5	942	942	942	942	942	942	943	944	944	944	944	944	944	943	943	942	941	941	940	939	939	938	937	937	937	944	942	24
6	936	936	935	935	933	933	933	933	932	932	932	932	932	931	931	931	930	929	928	928	928	927	925	925	925	936	931	24
7	925	925	925	925	925	925	926	926	927	927	927	927	927	927	927	927	928	929	929	930	931	931	932	932	925	932	928	24
8	932	932	933	933	933	934	935	936	936	937	937	937	937	937	937	937	937	937	937	938	937	936	936	935	932	938	936	24
9	935	935	936	935	936	936	936	937	937	937	937	937	937	938	938	938	937	937	936	936	935	934	934	933	933	938	936	24
10	933	933	933	932	932	932	932	933	934	934	934	934	934	933	933	932	932	931	931	931	931	930	929	930	929	934	932	24
11	929	928	928	928	928	929	929	929	929	930	930	931	931	931	932	932	932	932	932	933	932	932	932	932	928	933	930	24
12	932	932	932	932	932	932	933	933	934	934	935	935	935	935	935	935	935	935	935	935	935	934	934	933	932	935	934	24
13	933	933	933	934	934	933	933	934	934	933	933	932	932	932	931	931	930	931	932	931	931	931	931	931	930	934	932	24
14	931	931	931	931	932	933	933	933	933	933	933	934	934	934	934	935	935	935	935	936	936	935	934	934	931	936	934	24
15	934	934	934	934	934	934	935	936	936	937	937	937	937	937	937	937	937	937	937	937	937	935	935	934	934	937	936	24
16	934	934	934	934	934	934	934	934	934	934	934	935	934	935	935	935	935	935	934	934	934	934	933	933	932	935	934	24
17	933	933	933	933	933	933	933	934	935	935	935	935	935	935	935	935	935	935	934	934	934	933	932	932	932	935	934	24
18	932	932	932	932	931	931	931	931	931	932	932	932	932	932	932	933	933	933	933	933	931	930	931	931	930	933	932	24
19	931	931	931	932	932	932	933	933	934	935	935	936	936	936	936	936	936	936	936	935	934	933	933	933	931	936	934	24
20	932	931	931	931	931	931	932	932	932	932	932	932	932	931	931	931	930	929	P	P	P	P	P	P	929	932	931	18
21	P	P	P	930	930	930	929	929	929	930	930	931	931	932	932	932	932	932	932	932	932	931	930	930	929	932	931	21
22	930	930	929	929	930	930	931	931	932	933	934	935	936	937	937	938	939	939	939	940	940	939	939	939	929	940	935	24
23	939	939	939	939	939	940	940	941	941	941	942	942	942	942	942	942	942	942	942	942	941	940	940	940	939	942	941	24
24	940	940	940	939	939	940	940	941	941	942	942	942	942	942	941	942	941	941	941	941	941	941	941	941	939	942	941	24
25	941	941	941	941	941	941	942	943	943	944	944	944	944	944	944	944	944	944	944	943	942	942	941	941	940	944	943	24
26	941	941	941	940	940	940	941	941	941	942	943	943	943	943	943	943	943	943	942	942	941	941	940	940	940	943	941	24
27	939	939	938	938	938	938	939	939	940	941	941	941	941	941	941	940	940	940	940	938	937	937	937	937	937	941	939	24
28	937	936	936	936	936	936	936	937	938	938	939	939	939	939	939	939	939	939	939	938	938	937	937	937	936	939	938	24
29	937	936	936	936	936	936	936	936	937	938	939	939	939	939	939	939	939	939	939	938	938	937	936	936	936	939	937	24
30	936	936	936	935	935	935	935	934	935	936	935	936	936	937	938	937	938	939	939	938	938	938	938	938	934	939	937	24
31	938	938	938	938	939	939	939	940	940	941	941	941	941	941	940	940	939	939	938	937	936	935	934	934	934	941	939	24
HOURLY MAX	942	942	942	942	942	942	943	944	944	944	944	944	944	944	944	944	944	944	944	944	943	943	942	942	942			
HOURLY AVG	934	934	934	933	933	934	934	934	935	935	935	936	936	936	936	936	936	936	936	936	935	934	934	934				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

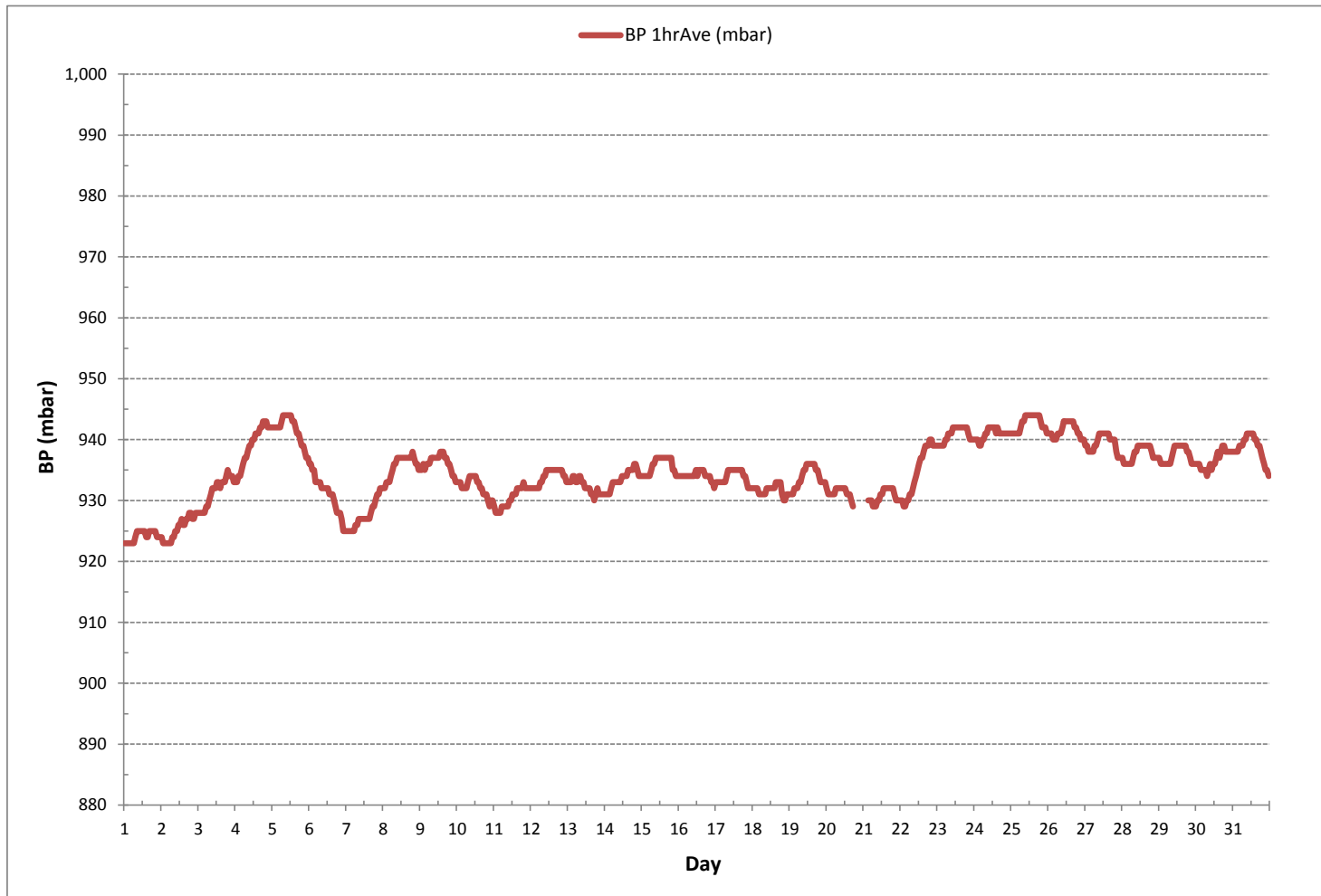
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	923 mbar	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	944 mbar	@ HOUR	7	ON DAY	5
MAXIMUM 24-HR AVERAGE:	943 mbar			ON DAY	25
OPERATIONAL TIME:					735 hrs
AMD OPERATION UPTIME:					98.8 %
STANDARD DEVIATION:	5			MONTHLY AVERAGE:	935 mbar

**BAROMETRIC PRESSURE Hourly Averages (BP mbar)**





***AMBIENT TEMPERATURE***



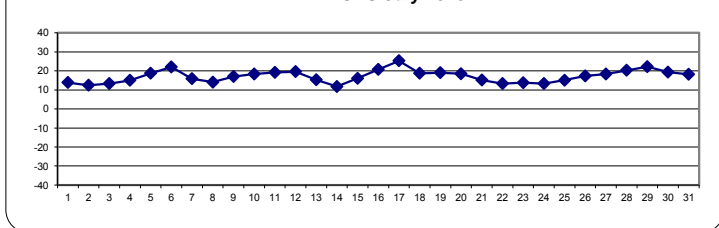
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	10.9	11.0	11.2	10.5	9.9	10.2	11.5	12.6	14.4	15.3	16.5	17.0	17.2	15.8	16.5	17.5	17.2	16.8	16.3	15.7	13.8	12.4	12.3	11.9	9.9	17.5	13.9	24	
2	11.2	10.1	9.0	9.3	9.6	9.7	10.7	11.7	12.5	14.2	15.2	15.2	14.8	15.9	13.0	14.3	14.2	14.5	14.3	14.1	12.2	11.7	11.4	10.5	9.0	15.9	12.5	24	
3	10.5	10.2	9.7	9.3	9.4	9.9	10.5	11.5	12.9	15.0	16.4	18.0	17.6	17.4	17.1	18.8	13.3	14.8	16.4	15.3	13.2	12.5	11.4	10.4	9.3	18.8	13.4	24	
4	9.7	9.4	9.3	9.5	9.5	9.8	10.5	11.6	13.4	15.1	16.8	17.1	18.5	19.2	19.4	18.3	19.8	20.5	20.4	19.6	17.9	15.8	15.2	14.6	9.3	20.5	15.0	24	
5	14.4	13.6	11.7	11.4	11.7	12.4	14.3	16.7	18.6	19.7	20.5	20.5	21.7	22.6	23.3	23.8	24.3	24.2	23.9	22.9	20.9	19.3	18.3	17.4	11.4	24.3	18.7	24	
6	16.7	15.8	15.9	16.1	16.2	16.5	18.0	20.1	22.3	23.6	25.0	26.0	26.7	26.9	28.0	29.0	29.1	28.6	26.1	24.8	22.5	18.6	16.8	17.5	15.8	29.1	22.0	24	
7	16.9	16.4	15.7	14.6	14.7	14.4	16.1	17.9	19.1	18.0	14.1	16.0	18.2	19.9	19.7	19.5	19.3	17.5	15.2	14.5	13.8	11.5	10.0	9.3	9.3	19.9	15.9	24	
8	8.6	8.0	7.6	7.1	6.9	7.3	9.9	12.0	13.8	14.1	14.6	15.9	16.5	18.3	19.1	20.0	20.0	19.8	19.5	17.4	14.9	14.1	13.1	6.9	6.9	20.0	14.1	24	
9	12.4	12.0	11.8	11.2	11.8	14.1	15.4	16.2	14.4	16.7	19.7	21.2	21.1	21.9	22.2	22.6	22.8	21.9	20.3	19.3	17.4	15.8	14.8	14.2	11.2	22.8	17.1	24	
10	14.5	14.0	14.1	12.8	12.5	12.8	15.3	19.5	21.4	23.2	24.2	24.7	24.9	23.7	23.7	22.7	21.9	20.8	20.6	17.0	14.6	14.2	13.9	13.6	12.5	24.9	18.4	24	
11	13.6	13.6	14.1	14.2	14.1	14.2	14.1	14.9	16.3	18.1	20.1	21.4	22.8	23.3	23.5	25.0	24.7	24.5	24.9	23.7	21.7	20.0	19.0	18.0	13.6	25.0	19.2	24	
12	17.3	16.5	15.9	14.8	13.9	14.3	15.9	17.6	19.4	21.0	21.6	22.3	22.9	23.6	22.8	22.6	23.7	22.8	22.8	22.1	21.1	19.4	18.7	17.6	13.9	23.7	19.6	24	
13	17.6	17.1	15.3	15.3	13.6	13.6	15.5	18.0	18.3	16.5	16.3	15.9	17.2	17.7	17.9	17.5	14.9	14.9	14.4	14.1	13.1	12.4	11.8	11.4	11.4	18.3	15.4	24	
14	10.9	10.5	10.6	10.7	10.4	10.0	10.2	10.3	10.7	10.6	10.0	10.8	10.9	11.2	12.1	14.1	15.2	15.0	15.4	15.2	14.1	12.8	11.2	10.6	10.0	15.4	11.8	24	
15	10.3	10.0	9.4	9.1	8.3	9.1	10.9	12.8	14.7	16.1	17.2	18.6	19.7	20.8	21.6	22.3	22.7	23.1	22.6	20.1	18.1	17.3	16.5	15.3	8.3	23.1	16.1	24	
16	14.8	14.0	13.0	13.0	13.2	13.8	14.5	16.3	18.1	19.8	22.0	23.0	24.2	25.8	26.7	27.4	27.4	28.2	28.3	27.3	23.9	22.4	20.8	20.3	13.0	28.3	20.8	24	
17	19.7	20.1	21.1	17.1	17.9	19.0	21.3	23.5	26.2	27.8	28.1	28.5	29.0	30.0	30.2	31.1	30.5	29.9	29.5	28.4	26.2	24.7	23.8	23.2	17.1	31.1	25.3	24	
18	21.4	19.4	19.4	18.4	17.2	16.3	16.0	15.7	15.4	17.4	18.4	18.7	19.9	20.5	22.3	23.9	25.3	24.9	23.7	16.8	14.7	15.3	14.3	14.1	14.1	25.3	18.7	24	
19	14.4	14.3	13.2	13.6	13.7	14.3	15.3	16.7	18.3	19.9	21.3	22.6	23.5	23.9	24.4	24.4	23.7	24.0	23.1	21.4	19.4	18.6	18.5	16.2	13.2	24.4	19.1	24	
20	15.2	14.6	14.6	14.0	13.6	13.7	14.0	16.3	18.1	19.5	20.1	21.4	22.4	22.9	23.2	23.9	23.6	22.3	P	P	P	P	P	P	13.6	23.9	18.5	18	
21	P	P	P	12.9	11.8	11.4	13.2	13.9	14.2	15.7	17.2	18.2	19.3	20.0	20.8	19.7	20.0	13.2	14.4	15.3	12.7	11.9	11.9	12.0	11.4	20.8	15.2	21	
22	11.8	11.1	10.7	10.8	11.3	11.7	12.5	12.4	12.3	13.0	14.0	14.4	16.3	16.2	16.9	16.3	17.4	16.5	15.5	14.3	12.5	11.5	10.5	9.8	9.8	17.4	13.3	24	
23	9.8	9.7	9.4	9.2	8.5	9.0	10.0	11.4	12.8	14.3	15.5	16.4	17.1	17.7	18.3	18.2	18.3	18.5	17.9	16.5	15.1	14.0	12.6	11.1	8.5	18.5	13.8	24	
24	10.9	10.4	9.2	8.4	8.1	9.1	10.2	11.9	13.7	14.8	15.7	16.6	17.4	17.2	17.0	17.0	16.4	16.3	15.9	14.2	13.7	13.4	12.6	12.3	8.1	17.4	13.4	24	
25	11.4	11.0	10.6	10.6	10.0	10.4	11.7	12.2	13.5	15.1	16.7	17.4	18.2	18.6	18.3	18.6	18.9	19.6	18.9	17.8	16.2	15.7	15.3	14.6	10.0	19.6	15.1	24	
26	13.5	13.3	12.5	12.2	12.1	12.2	13.0	14.7	17.0	19.5	20.1	20.6	21.2	22.0	22.4	22.7	23.0	21.6	19.9	18.6	16.7	16.6	16.3	15.6	12.1	23.0	17.4	24	
27	14.9	14.0	13.3	13.2	12.7	12.5	14.2	16.5	19.0	21.0	21.7	22.2	22.8	22.7	23.6	23.0	22.8	20.5	21.5	20.4	17.9	17.4	17.2	16.5	12.5	23.6	18.4	24	
28	15.8	15.0	14.1	13.7	13.3	13.7	15.7	17.7	19.6	22.5	23.4	24.0	24.5	25.5	25.5	25.8	26.5	26.0	24.7	23.1	20.9	19.7	18.7	18.0	13.3	26.5	20.3	24	
29	17.4	16.5	15.9	15.0	14.6	14.8	15.3	17.6	21.2	24.3	26.7	27.4	28.1	28.9	29.3	28.9	29.1	28.6	25.8	24.6	22.4	20.0	21.0	18.3	14.6	29.3	22.2	24	
30	18.3	18.5	18.5	18.0	17.7	18.2	17.2	18.4	20.1	22.0	21.7	22.2	24.2	24.0	22.7	21.7	22.0	21.5	20.5	19.0	16.9	15.3	14.4	13.3	13.3	24.2	19.4	24	
31	12.8	12.7	12.4	12.3	12.2	12.8	14.7	15.8	16.9	18.7	20.3	21.3	22.2	22.8	23.0	23.0	23.9	23.2	22.4	20.4	19.1	18.4	17.8	17.1	12.2	23.9	18.2	24	
HOURLY MAX	21.4	20.1	21.1	18.4	17.9	19.0	21.3	23.5	26.2	27.8	28.1	28.5	29.0	30.0	30.2	31.1	30.5	29.9	29.5	28.4	26.2	24.7	23.8	23.2					
HOURLY AVG	13.9	13.4	13.0	12.5	12.3	12.6	13.8	15.3	16.7	18.1	19.1	19.9	20.7	21.2	21.4	21.7	21.7	21.1	20.5	19.2	17.3	16.1	15.4	14.6					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

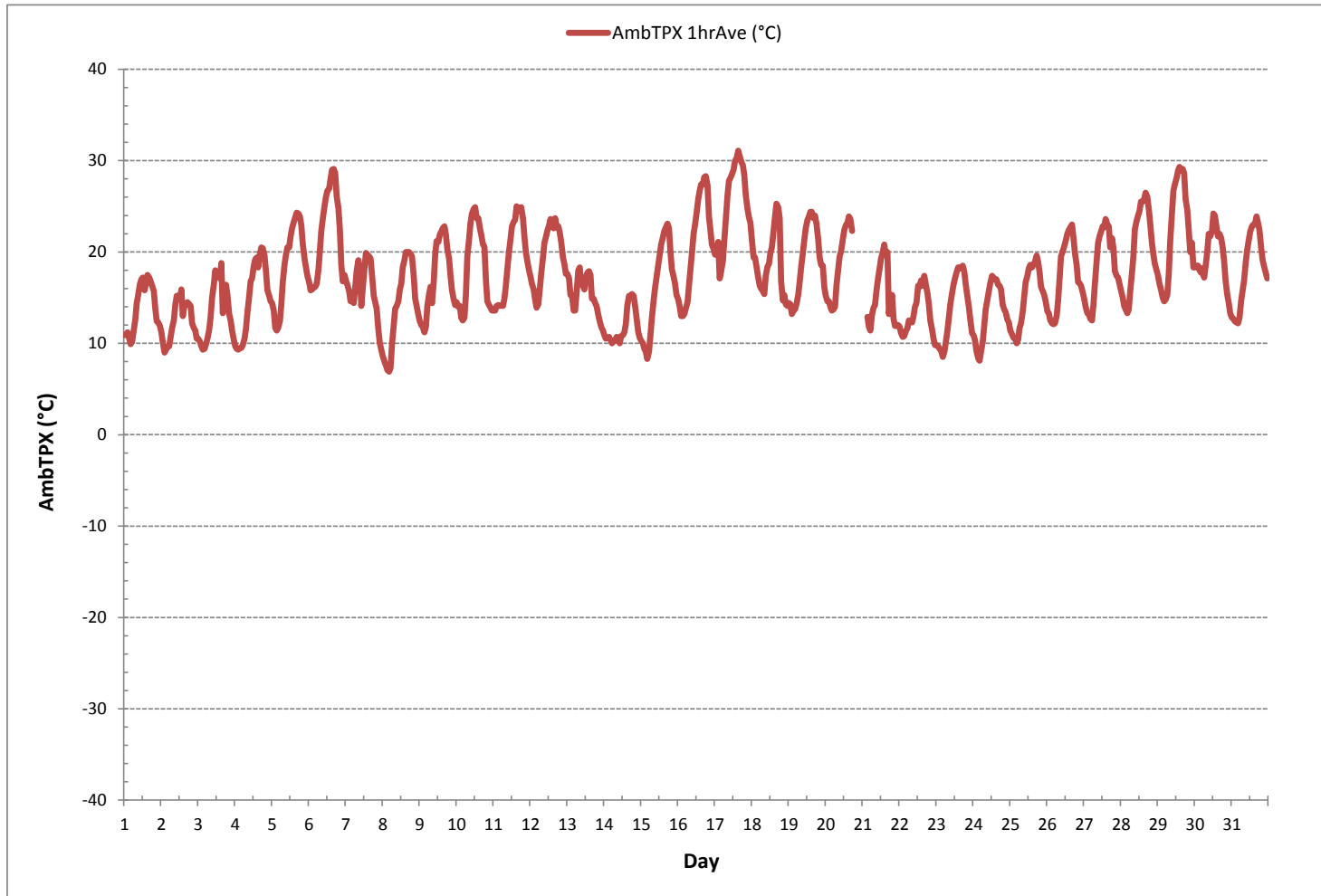
24 HR AVERAGES July 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	6.9 °C	@ HOUR	4	ON DAY	8
MAXIMUM 1-HR AVERAGE:	31.1 °C	@ HOUR	15	ON DAY	17
MAXIMUM 24-HR AVERAGE:	25.3 °C			ON DAY	17
OPERATIONAL TIME:				735	hrs
AMD OPERATION UPTIME:				98.8	%
STANDARD DEVIATION:	4.9			MONTHLY AVERAGE:	17.2 °C

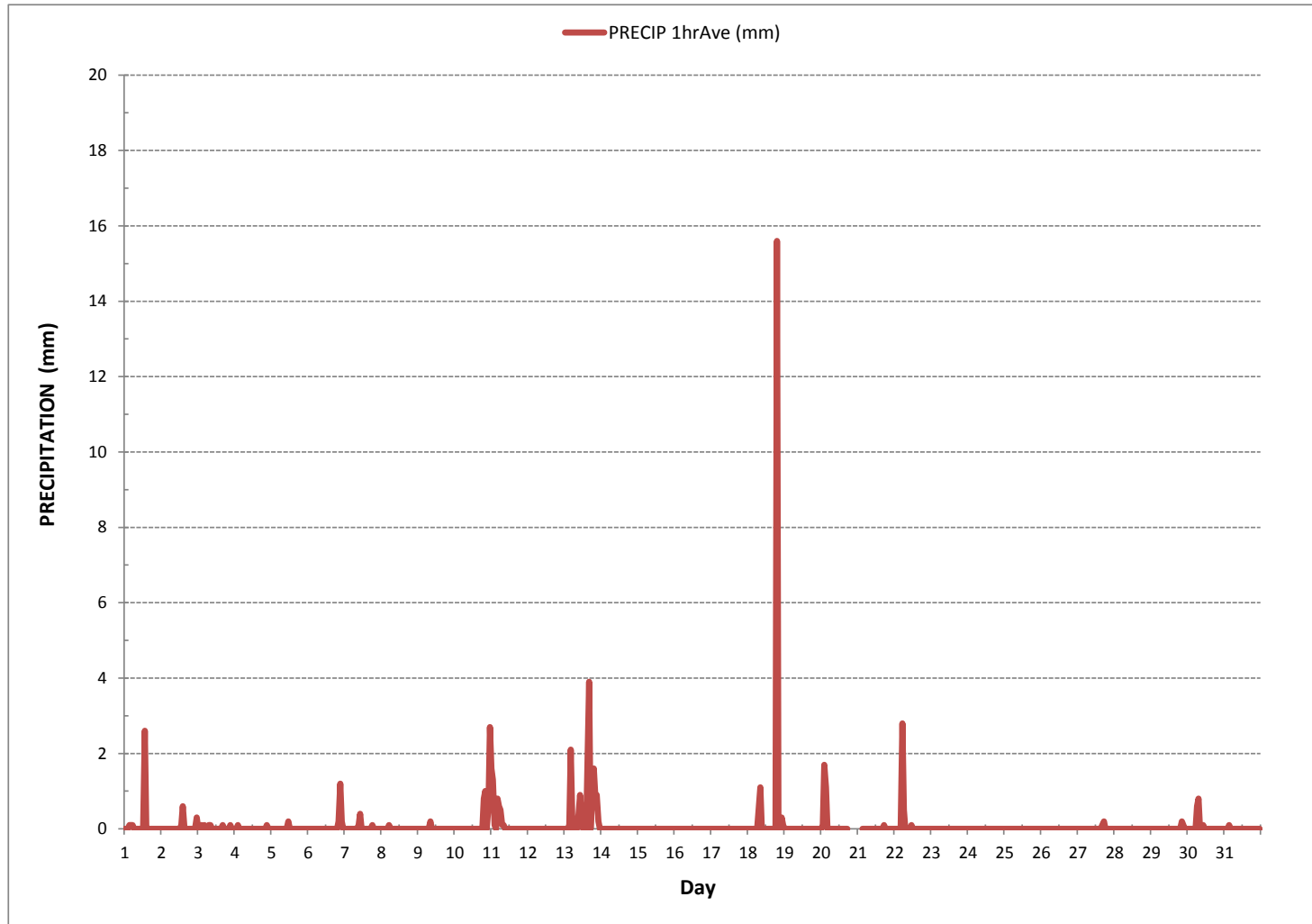
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



## ***PRECIPITATION***



PRECIPITATION Hourly Totals (mm)



***APPENDIX II***  
***EQUIPMENT CALIBRATION RESULTS***

***SULPHUR DIOXIDE***





### API 100E Sulphur Dioxide Analyzer Calibration

Date:	July 17, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	935	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:04	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:20	Cal Gas Expiry Date:	October 24, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	468   LICA	Range ppb:	1000		
Last Calibration Date:	June 12, 2018	As Found C.F.:	0.992		
Previous C.F.:	1.000	New C.F.:	1.000		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	<b>Standard Calibration Points for Ranges</b> <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

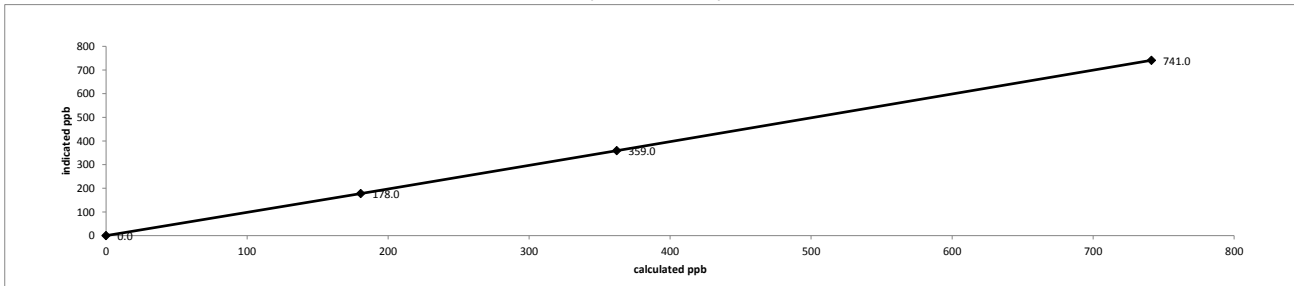
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	5078	0.00	5078	0.0	1.6	n/a
as found high	4997	76.44	5073	741.3	749.0	0.992
adjusted zero	5078	0.00	5078	0.0	0.0	n/a
adjusted high	4997	76.44	5073	741.3	741.0	1.000
mid	5029	37.29	5066	362.2	359.0	1.009
low	5048	18.60	5067	180.6	178.0	1.015
calibrator zero	5078	0.00	5078	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.16%		± 3% F.S.
% change in C.F. from last cal =	0.81%		± 10%

API 100E Sulphur Dioxide Analyzer Calibration

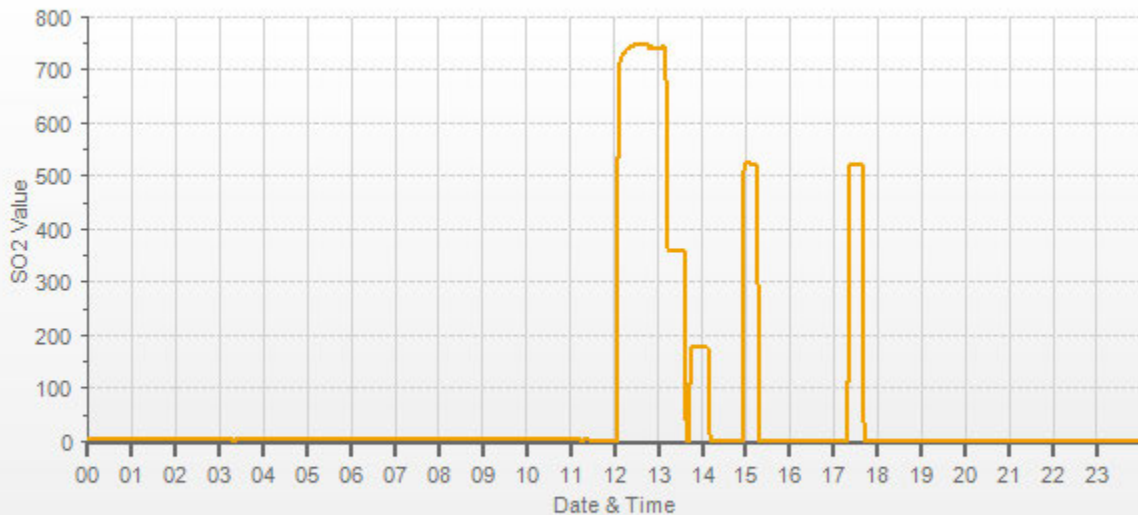


As found:		As left:	
Slope:	0.959	Slope:	0.947
Offset:	159.4	Offset:	162.8
Hvps:	651	Hvps:	651
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	31.7	Box Temp:	30.9
Pmt Temp:	7.9	Pmt Temp:	7.9
Izs Temp:	45.0	Izs Temp:	45.0
Pres:	23.6	Pres:	23.6
Samp Fl:	597	Samp Fl:	598
Norm Pmt:	162.5	Norm Pmt:	162.7
Uv Lamp:	2707.4	Uv Lamp:	2707.2
Lamp Ratio:	86.1	Lamp Ratio:	86.1
Str Lgt:	76.4	Str Lgt:	77.1
Drk Pmt:	5.9	Drk Pmt:	5.9
Expected Value:	518.0	Expected Value:	522.0

Comments:  
The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

SO2 [ppb] Station: LICA ST. LINA Daily: 18/07/17 Type: AVG 1 Min. [1 Min.]



— SO2 [ppb]

***HYDROGEN SULPHIDE***



### API 101E Hydrogen Sulphide Analyzer Calibration

Date:	July 17, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	935	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:04	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	16:24	Cal Gas Expiry Date:	October 20, 2020		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		
Analyzer:					
Serial Number/Owner:	509   LICA	Range ppb:	100		
Last Calibration Date:	June 12, 2018	As Found C.F.:	1.077		
Previous C.F.:	1.000	New C.F.:	0.997		

<b>Calibration Standards:</b> Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: EY 0001003 Cal Gas Conc. (ppm): 9.55	<b>Standard Calibration Points for Ranges</b> <table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>SO2 Scrubber Check (10 minutes):</b> Start/End Time 24 hr.: 11:56 / 12:07 SO2 Analyzer Range: 1000 Target Concentration (ppb): 780 As Found Zero: 0.0 Analyzer Response (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

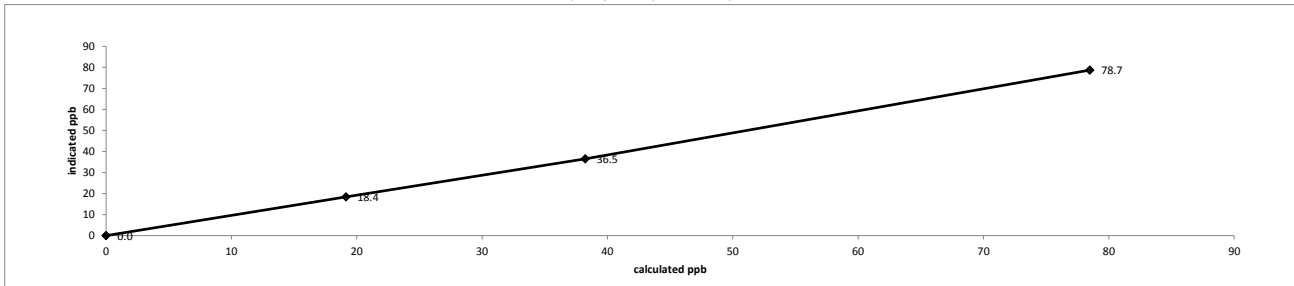
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7474	0.00	7474	0.0	0.4	n/a
as found high	7415	61.44	7476	78.5	73.3	1.077
adjusted zero	7474	0.00	7474	0.0	0.0	n/a
adjusted high	7415	61.44	7476	78.5	78.7	0.997
mid	7434	29.88	7464	38.2	36.5	1.047
low	7438	14.94	7453	19.1	18.4	1.040
calibrator zero	7474	0.00	7474	0.0	0.0	n/a
Average C.F. =						1.028

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.995		0.95-1.05
b (Intercept as % of full scale) =	0.72%		± 3% F.S.
% change in C.F. from last cal =	-7.66%		± 10%

#### API 101E Hydrogen Sulphide Analyzer Calibration



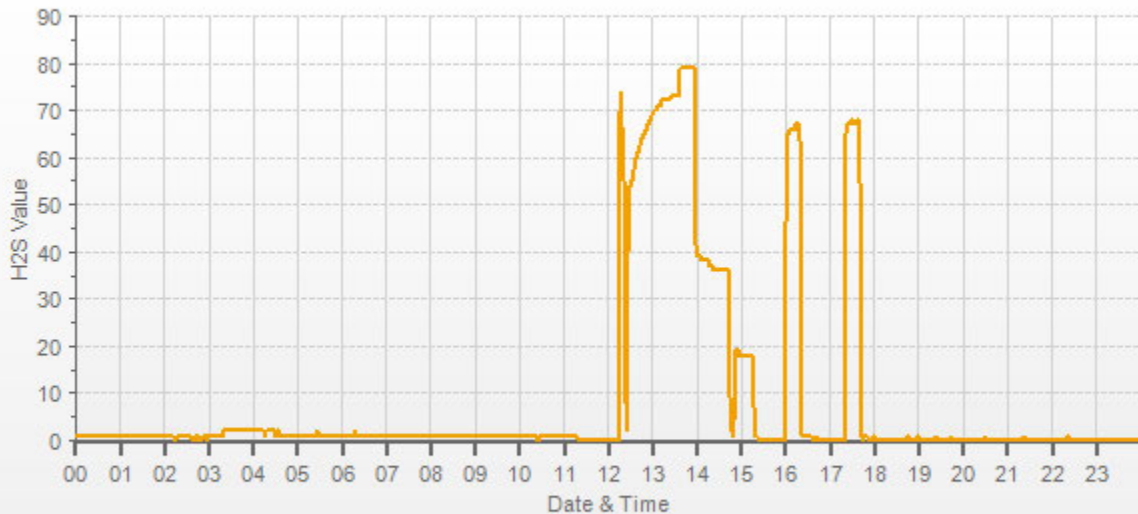
As found:		As left:	
Slope:	0.925	Slope:	0.982
Offset:	76.3	Offset:	77.4
Hvps:	671	Hvps:	671
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	32.4	Box Temp:	31.4
Pmt Temp:	7.9	Pmt Temp:	7.9
Izs Temp:	48.0	Izs Temp:	48.0
Converter Temp:	314.7	Converter Temp:	315.2
Pres:	20.2	Pres:	20.1
Samp Fl:	521	Samp Fl:	520
Uv Lamp:	3069.0	Uv Lamp:	3073.3
Lamp Ratio:	91.5	Lamp Ratio:	91.6
Str Lgt:	35.5	Str Lgt:	38.0
Drk Pmt:	0.6	Drk Pmt:	0.7
Expected Value:	63.5	Expected Value:	67.5

Comments:  
The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

The As-Found High and Adjusted High point both meet the 15 min stability criteria; however the change in concentration shows a slow response. The SO2 scrubber produced an inconsistent response due to moisture. The scrubber was allowed time to dry out before measuring the As Found High Point.

H2S [ppb] Station: LICA ST. LINA Daily: 18/07/17 Type: AVG 1 Min. [1 Min.]



— H2S [ppb]



## API 101E Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> July 18, 2018	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019	932	millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019	22	°C
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> Mix of sun and clouds with rain showers		
<b>Parameter:</b> Hydrogen Sulphide	<b>Calibration Purpose:</b> shut down		
<b>Start Time 24 hr. (mst):</b> 10:02	<b>Performed By/Reviewer:</b> Alex Yakupov		Rob Fisher
<b>End Time 24 hr. (mst):</b> 15:53	<b>Cal Gas Expiry Date:</b> October 20, 2020		
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> n/a		
<b>Analyzer:</b>			
<b>Serial Number/Owner:</b> 509   LICA	<b>Range ppb:</b> 100		
<b>Last Calibration Date:</b> June 12, 2018	<b>As Found C.F.:</b> 0.959		
<b>Previous C.F.:</b> 1.000	<b>New C.F.:</b> n/a		

<b>Calibration Standards:</b>	<b>Standard Calibration Points for Ranges</b>								
<b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19
Point	ppb								
High	78								
Mid	38								
Low	19								
<b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018									
<b>Calibrator ID/Expiry Date:</b> Envionics id# 4760 expires March 2, 2019									
<b>Cal Gas Cylinder I.D. #:</b> EY 0001003									
<b>Cal Gas Conc. (ppm):</b> 9.55									

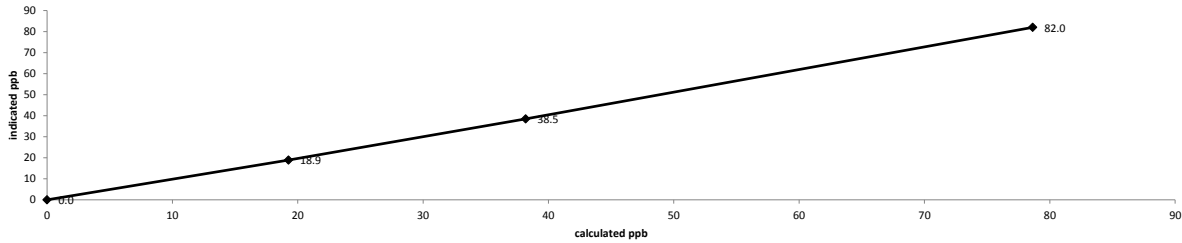
**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7473	0.00	7473	0.0	0.0	n/a
as found high	7407	61.49	7468	78.6	82.0	0.959
mid	7433	29.84	7463	38.2	38.5	0.992
low	7443	15.04	7458	19.3	18.9	1.019
<b>Average C.F. =</b>						0.990

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 0.955	> or = 0.995
<b>b (Intercept as % of full scale) =</b> 0.73%	0.90-1.10
<b>% change in C.F. from last cal =</b> 4.11%	± 3% F.S.
	± 10%

**API 101E Hydrogen Sulphide Analyzer Calibration**

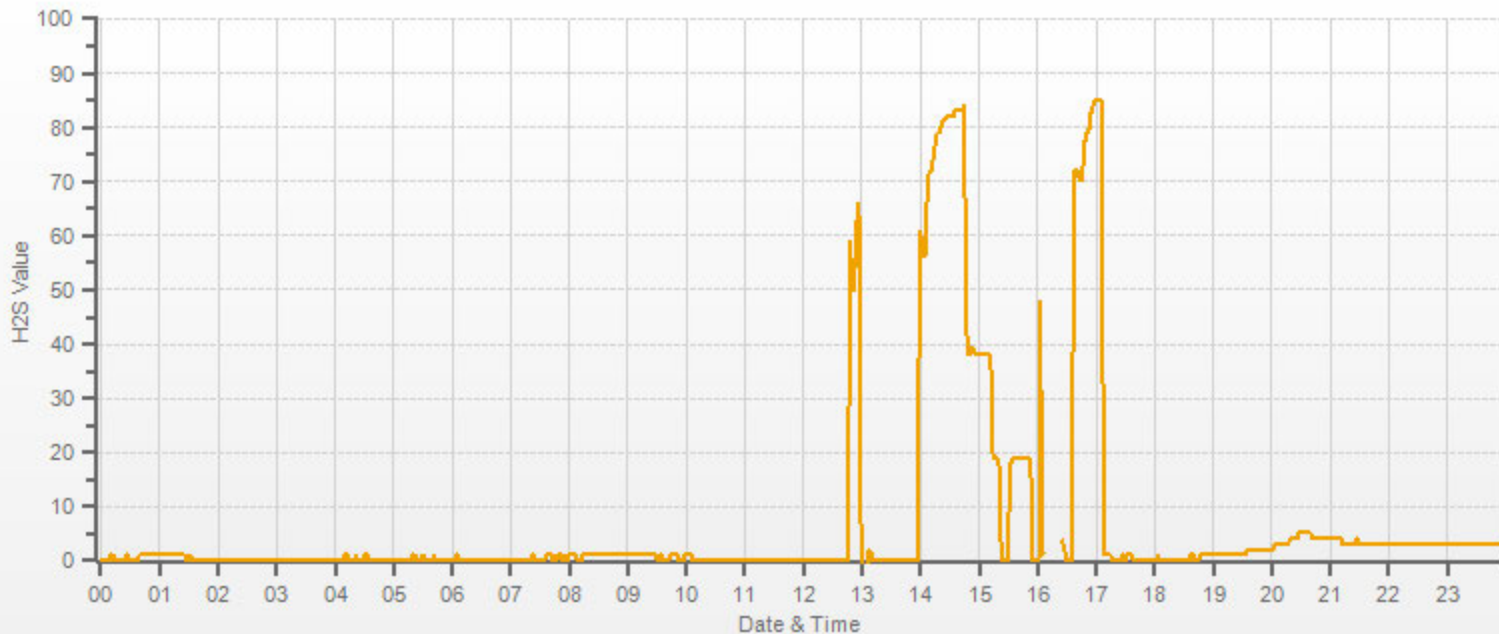


<b>As found:</b>	<b>As left:</b>
Slope: 0.982	Slope: n/a
Offset: 77.4	Offset: n/a
Hvps: 671	Hvps: n/a
Rcell Temp: 50.0	Rcell Temp: n/a
Box Temp: 31.7	Box Temp: n/a
Pmt Temp: 7.9	Pmt Temp: n/a
Izs Temp: 48.0	Izs Temp: n/a
Converter Temp: 315.4	Converter Temp: n/a
Pres: 20.1	Pres: n/a
Samp Fl: 520	Samp Fl: n/a
Uv Lamp: 3067.8	Uv Lamp: n/a
Lamp Ratio: 91.5	Lamp Ratio: n/a
Str Lgt: 38.0	Str Lgt: n/a
Drk Pmt: 0.5	Drk Pmt: n/a
Expected Value: 67.5	Expected Value: n/a

**Comments:** The SO2 scrubber check was not performed, see comments below.  
The manifold blower was found to be working normally.

A shut-down calibration was completed because of a slow As Found High Point response during a monthly calibration on July 17. The SO<sub>2</sub> scrubber test was performed on July 17, during the monthly calibration.

H2S[ppb]





### API 101E Hydrogen Sulphide Analyzer Calibration

<b>Date:</b> July 19, 2018	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019	935	millibars
<b>Company/Airshed:</b> LICA	<b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019	22	°C
<b>Location/Station Name:</b> St. Lina	<b>Weather Conditions:</b> Mainly sunny		
<b>Parameter:</b> Hydrogen Sulphide	<b>Calibration Purpose:</b> post repair		
<b>Start Time 24 hr. (mst):</b> 10:20	<b>Performed By/Reviewer:</b> Alex Yakupov	Rob Fisher	
<b>End Time 24 hr. (mst):</b> 14:43	<b>Cal Gas Expiry Date:</b> October 20, 2020		
<b>Calibration Method:</b> Gas Dilution	<b>Converter Model &amp; s/n (if applicable):</b> n/a		
<b>Analyzer:</b>	<b>Serial Number/Owner:</b> 509   LICA	<b>Range ppb:</b> 100	
<b>Last Calibration Date:</b> June 12, 2018	<b>As Found C.F.:</b> n/a		
<b>Previous C.F.:</b> 1.000	<b>New C.F.:</b> 0.999		

<b>Calibration Standards:</b>	<b>Standard Calibration Points for Ranges</b>	<b>SO2 Scrubber Check (10 minutes):</b>								
<b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018	<table border="1"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	<b>Start/End Time 24 hr.:</b> 10:38 / 10:54
Point	ppb									
High	78									
Mid	38									
Low	19									
<b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018		<b>SO2 Analyzer Range:</b> 1000								
<b>Calibrator ID/Expiry Date:</b> Envionics id# 4760 expires March 2, 2019		<b>Target Concentration (ppb):</b> 780								
<b>Cal Gas Cylinder I.D. #:</b> EY 0001003		<b>As Found Zero:</b> 0.0								
<b>Cal Gas Conc. (ppm):</b> 9.55		<b>Analyzer Response: (ppb):</b> 0.0								
		<b>Zero Corrected Result (ppb):</b> 0.0								

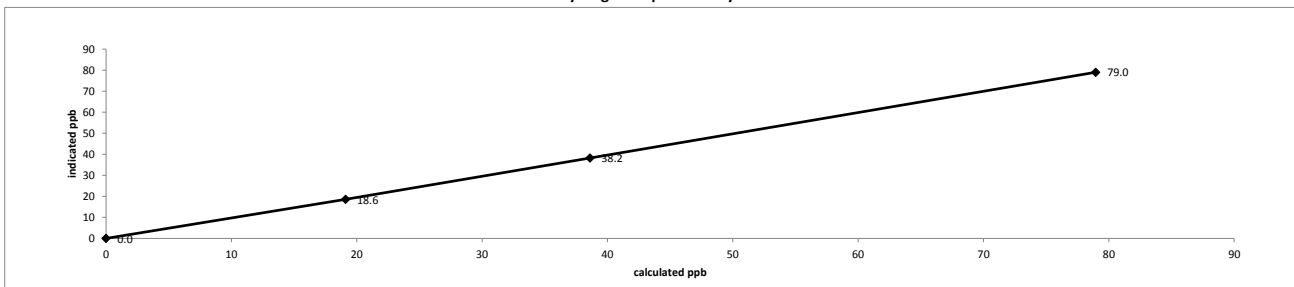
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
adjusted zero	7458	0.00	7458	0.0	0.0	n/a
adjusted high	7396	61.66	7458	79.0	79.0	0.999
mid	7425	30.14	7455	38.6	38.2	1.011
low	7438	14.92	7453	19.1	18.6	1.028
calibrator zero	7458	0.00	7458	0.0	0.0	n/a
<b>Average C.F. =</b>						<b>1.013</b>

**Linear Regression/Calibration Results:**

<b>Correlation Coefficient =</b> 1.000	<b>LIMITS</b>
<b>Slope =</b> 0.998	> or = 0.995
<b>b (Intercept as % of full scale) =</b> 0.30%	0.95-1.05
<b>% change in C.F. from last cal =</b> n/a	± 3% F.S.
	n/a

**API 101E Hydrogen Sulphide Analyzer Calibration**



As found:	As left:
Slope: n/a	Slope: 0.883
Offset: n/a	Offset: 78.6
Hvps: n/a	Hvps: 671
Rcell Temp: n/a	Rcell Temp: 50.0
Box Temp: n/a	Box Temp: 31.9
Pmt Temp: n/a	Pmt Temp: 7.9
Izs Temp: n/a	Izs Temp: 48.0
Converter Temp: n/a	Converter Temp: 314.4
Pres: n/a	Pres: 20.3
Samp Fl: n/a	Samp Fl: 521
Uv Lamp: n/a	Uv Lamp: 2915.1
Lamp Ratio: n/a	Lamp Ratio: 86.9
Str Lgt: n/a	Str Lgt: 34.7
Drk Pmt: n/a	Drk Pmt: 0.7
Expected Value: n/a	Expected Value: 60.1

**Comments:**

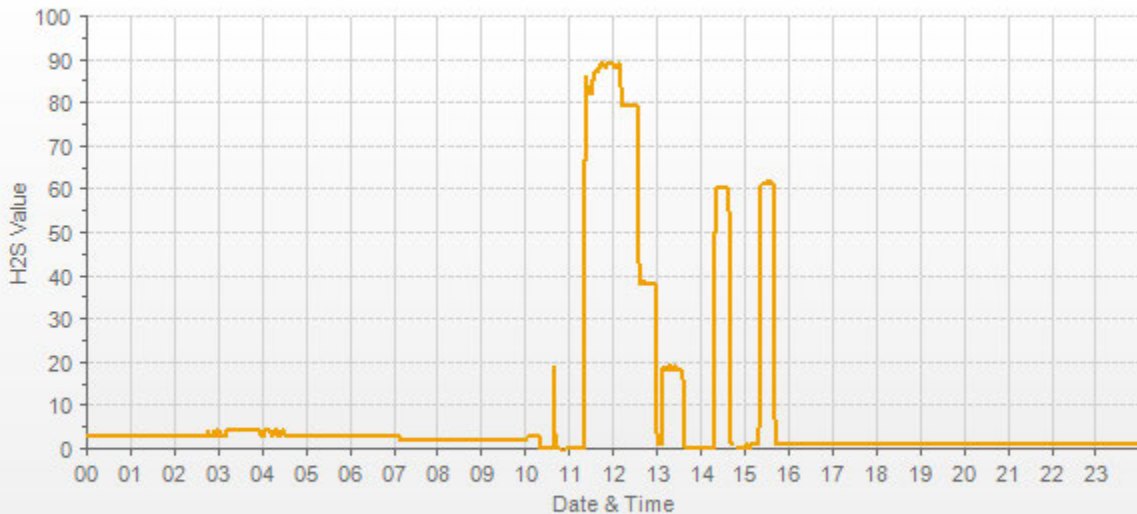
The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

A Post-repair calibration was completed after the SO2 scrubber was renewed and conditioned overnight.




H2S [ppb] Station: LICA ST. LINA Daily: 18/07/19 Type: AVG 1 Min. [1 Min.]



— H2S [ppb]

***TOTAL HYDROCARBON***



## Thermo 51i Total Hydrocarbon Analyzer Calibration

---

**Date:** July 1, 2018

**Company/Airshed:** LICA

**Location/Station Name:** St. Lina

**Parameter:** Total Hydrocarbon

**Start/End Time 24 hr. (mst):** 11:16/ 14:48

**Calibration Method:** Gas Dilution

**Analyzer:**

Serial Number/Owner: 925436893 | Maxxam

Last Calibration Date: June 25, 2018

Previous Cal High Point C.F.: 1.000

**Barometer/B.P./units:** F.S. 05544 expires January 15, 2019 | 925 | millibars

**Thermometer/Station Temp:** F.S. 170286131 expires April 19, 2019 | 20 | °C

**Weather Conditions:** Mainly sunny

**Calibration Purpose:** routine monthly

**Performed By/Reviewer:** Alex Yakupov | Rob Fisher

**Cal Gas Expiry Date:** November 24, 2022

Range ppm: 50

As Found C.F.: 0.971

New C.F.: 1.000

---

**Calibration Standards:**

**Low Flow Meter ID/Expiry Date:** Defender Low 152019 expires December 13, 2018

**High Flow Meter ID/Expiry Date:** Defender High 148944 expires December 13, 2018

**Calibrator ID/Expiry Date:** Enviroconics id# 4760 expires March 2, 2019

**Cal Gas Cylinder I.D. #:** LL 165367

**CH<sub>4</sub>/C<sub>2</sub>H<sub>6</sub> Cylinder Conc. (ppm):** 590.0 | 207.0

**CH<sub>4</sub> as propane/total CH<sub>4</sub> equivalents (ppm):** 569.3 | 1159.3

**Standard Calibration Points for a Range of: 50 ppm**

Point	Target ppm
High	38
Mid	18
Low	9

---

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2518	0.00	2518	0.0	0.00	n/a
as found high	2437	82.24	2519	37.85	38.97	0.971
adjusted zero	2518	0.00	2518	0.00	0.00	n/a
adjusted high	2437	82.24	2519	37.85	37.84	1.000
mid	2480	39.03	2519	17.96	17.90	1.003
low	2500	19.49	2519	8.97	8.97	1.000
calibrator zero	2518	0.00	2518	0.0	0.00	n/a
Average C.F.=						1.001

---

Linear Regression/Calibration Results:

Correlation Coefficient = **1.000**

Slope = **1.000**

b (Intercept as % of full scale) = **0.02%**

% change in C.F. from last cal = **2.88%**

**LIMITS**

> or = 0.995

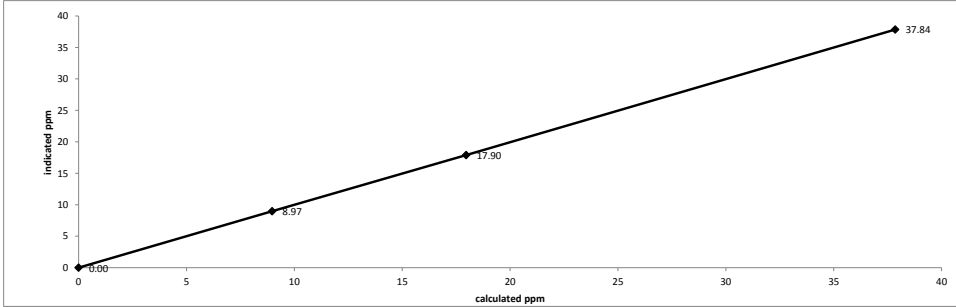
0.95-1.05

± 3% F.S.

± 10%

---

**Thermo 51i Total Hydrocarbon Analyzer Calibration**



**As found:**

Bkg: 4.88

Coef: 4.609

Bias Supply: -298

Detector Base: 125.0

Filter: 125

Pump: n/a

Flame: 141.5

Internal: 29.7

Sample: 8.3

Fuel: 19.9

Air: 39.8

Signal: 880

Status: UT

**As left:**

Bkg: 4.76

Coef: 4.496

Bias Supply: -298

Detector Base: 125.0

Filter: 125

Pump: n/a

Flame: 141.5

Internal: 30.1

Sample: 8.3

Fuel: 19.9

Air: 39.8

Signal: 895

Status: LIT

---

<b>Cylinder/Regulator Pressures:</b>	H2 Cylinder (psi): 950	H2 Cylinder (psi): 950
	H2 cylinder reg set (psi): 50	H2 cylinder reg set (psi): 50
	Zero Air Gen Pressure: 45	Zero Air Gen Pressure: 45
	Span Cylinder (psi): 1000	Span Cylinder (psi): 1000
	Span Cylinder reg set (psi): 22	Span Cylinder reg set (psi): 22
	Measured Flow: 0.690	Measured Flow: n/a
	Expected Value: 27.74	Expected Value: 27.93

---

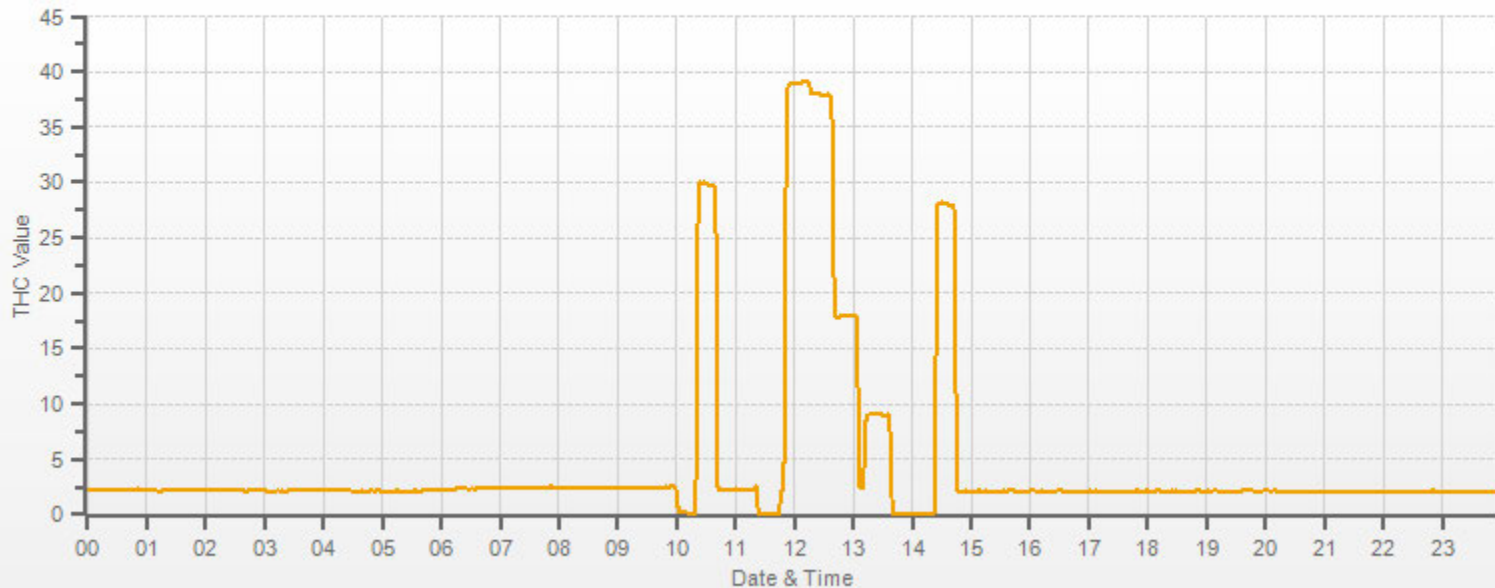
**Comments:**

The analyzer sample inlet filter was changed. No zero adjustment was required/made. As found zero value copied to adjusted zero value for linearity calculation purposes.

The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

The most recent daily ZS passed before the calibration. The problem with the unstable span check result is attributed to the AC issue and unstable station temperature.

THC[ppm]



***NITROGEN DIOXIDE***



## API 200E NO-NO2-NOx Analyzer Calibration

Date: July 17, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	935	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name: St. Lina	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 11:04 / 17:48	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? Yes with 1000 ppb NOx full scale	Performed By/Reviewer: Alex Yakupov		Rob Fisher
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

Analyzer:		Correction Factors:		
Serial Number/Owner: 594   LICA	NO =	Previous C.F.: 1.001	As Found C.F.: 1.028	New C.F.: 1.000
Last Calibration Date: June 12, 2018	NO <sub>2</sub> =	1.000	1.000	1.000
Range ppb: 1000	NOx =	1.000	1.026	1.000

Calibration Standards:			
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of: 1000 ppb		
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	Point	Target NO (ppb)	Target NO <sub>2</sub> (ppb)
Calibrator ID/Expiry Date: Environics id# 5212 expires March 1, 2019	High	610	375
Cal Gas Cylinder I.D. #: LL 104225	Mid	380	190
Cal Gas Conc. (ppm): 51.5   51.6	Low	190	70
	Extra Point #1	n/a	n/a
	Extra Point #2	n/a	n/a
			Cc Ozone ?
			<-high ozone
			<-mid ozone
			<-low ozone
			n/a
			n/a

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5078	0.0	5078	0	0	0.0	1.0	n/a	n/a
as found high	4997	76.44	5073	776.0	777.5	755.0	759.0	1.028	1.026
adjusted zero	5078	0.00	5078	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4997	76.44	5073	776.0	777.5	776.0	777.5	1.000	1.000
mid	5029	37.29	5066	379.1	379.8	378.0	378.0	1.003	1.005
low	5048	18.60	5067	189.0	189.4	188.0	187.0	1.006	1.013
calibrator zero	5078	0.00	5078	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.006

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO <sub>2</sub>	NO drop	NO <sub>2</sub> gain	NO <sub>2</sub> C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4997	76.44	5073	0.0	776.0	775.0	-1.0	0.0	-1.0	
as found high NO2	4997	76.44	5073	550.0	265.0	775.0	510.0	511.0	511.0	1.000
adjusted high NO2	4997	76.44	5073	550.0	265.0	775.0	510.0	511.0	511.0	1.000
gpt mid	4997	76.44	5073	305.0	494.0	775.0	281.0	282.0	282.0	1.000
gpt low	4997	76.44	5073	110.0	677.0	776.0	98.0	99.0	99.0	1.000
Average NO <sub>2</sub> C.F.=										1.000

**Linear Regression/Calibration Results:**

	NO	NOx	NO <sub>2</sub>	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	0.999	0.95-1.05
b (Intercept as % of full scale)=	-0.06%	-0.13%	-0.06%	± 3% F.S.
% change in C.F. from last cal=	-2.68%	-2.57%	0.00%	± 10%
NO2 converter efficiency			0.99	0.96 to 1.04

<p><b>As found:</b></p> <p>NOx SLOPE: 1.160</p> <p>NOx OFFS: 0.8</p> <p>NO SLOPE: 1.152</p> <p>NO OFFS: -1.3</p> <p>SAMP FLW: 483</p> <p>OZONE FL: 78</p> <p>PMT: 18.0</p> <p>NORM PMT: 2.4</p> <p>AZERO: 18.2</p> <p>HVPS: 759</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 32.8</p> <p>PMT TEMP: 6.7</p> <p>IZS TEMP: 45.4</p> <p>MOLY TEMP: 313.7</p> <p>RCEL: 4.9</p> <p>SAMP: 26.6</p> <p>Expected Value NO: 11</p> <p>Expected Value NO2: 612</p> <p>Expected Value NOx: 622</p>	<p><b>As left:</b></p> <p>NOx SLOPE: 1.188</p> <p>NOx OFFS: 0.9</p> <p>NO SLOPE: 1.184</p> <p>NO OFFS: -0.7</p> <p>SAMP FLW: 482</p> <p>OZONE FL: 78</p> <p>PMT: 22.7</p> <p>NORM PMT: 1.2</p> <p>AZERO: 18.5</p> <p>HVPS: 759</p> <p>RCELL TEMP: 50.0</p> <p>BOX TEMP: 32.4</p> <p>PMT TEMP: 6.7</p> <p>IZS TEMP: 45.0</p> <p>MOLY TEMP: 315.5</p> <p>RCEL: 4.8</p> <p>SAMP: 26.6</p> <p>Expected Value NO: 10</p> <p>Expected Value NO2: 607</p> <p>Expected Value NOx: 616</p>
--	---

**Comments:**

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

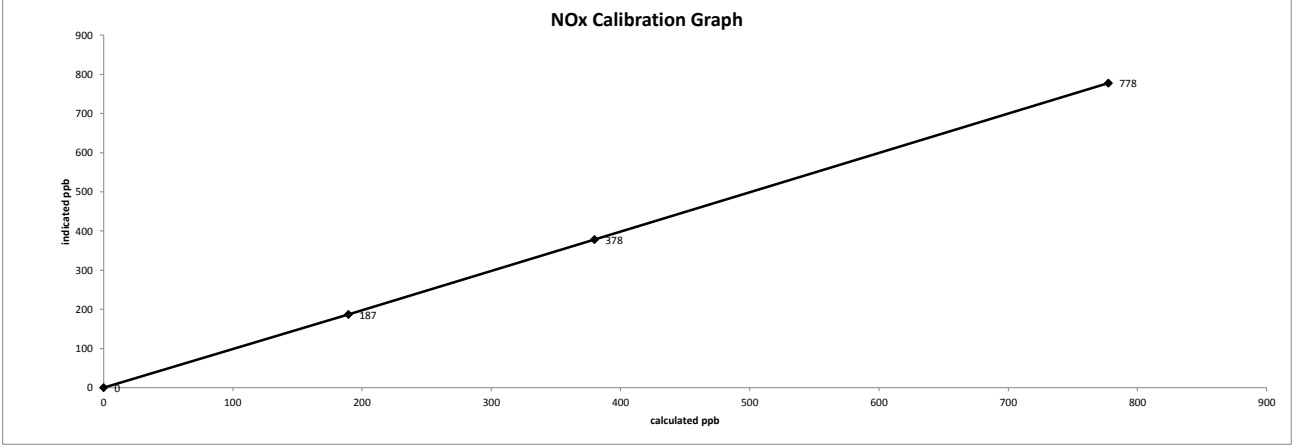
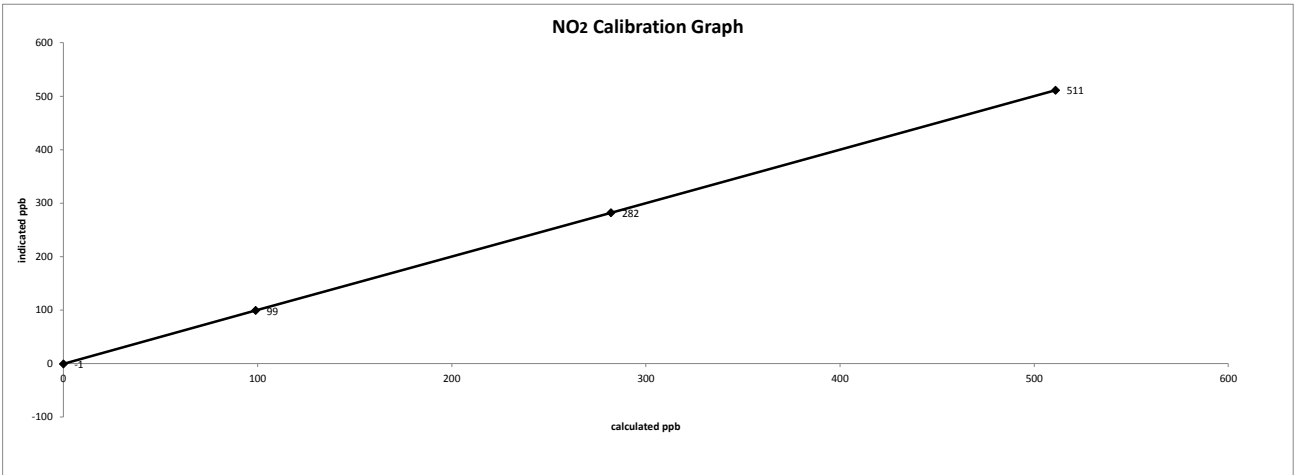
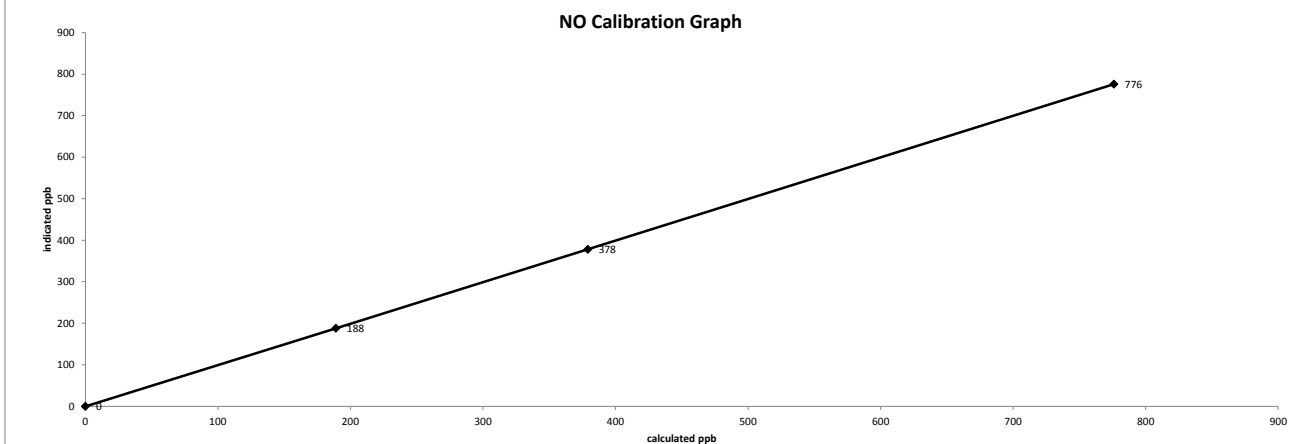
No high point NO2 adjustment was required/made. As found values were copied to adjusted high values for linearity calculation purposes.

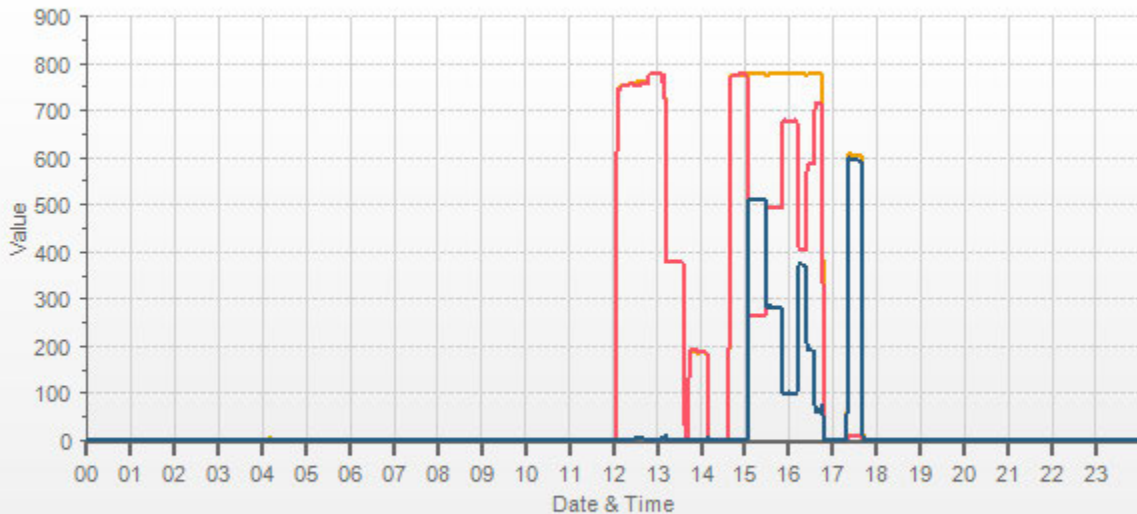
The GPT for O3 (ppb): High O3 set = 400, NO drop = 371; Mid O3 set = 210, NO drop = 192; Low O3 set = 70, NO drop = 61.

Date: July 17, 2018  
Company/Airshed: LICA  
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:04 / 17:48  
Calibration Purpose: routine monthly  
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration





— NOX [ppb] — NO [ppb] — NO2 [ppb]



## ***OZONE***



## Thermo 49i Ozone Analyzer Calibration

<b>Date:</b> July 18, 2018 <b>Company/Airshed:</b> LICA <b>Location/Station Name:</b> St. Lina <b>Start/End Time 24 hr. (mst):</b> 10:22 / 14:36 <b>Ozone Calibration Method:</b> Direct G.P.T. <b>G.P.T. Date:</b> July 17, 2018 <b>Analyzer:</b> <b>Serial Number/Owner:</b> 1002240371   LICA <b>Last Calibration Date:</b> June 2, 2018 <b>Previous Cal High Point C.F.:</b> 1.000	<b>Barometer/B.P./units:</b> F.S. 05544 expires January 15, 2019   932   millibars <b>Thermometer/Station Temp:</b> F.S. 170286131 expires April 19, 2019   22   °C <b>Weather Conditions:</b> Mix of sun and clouds with rain showers <b>Calibration Purpose:</b> routine monthly <b>Performed By/Reviewer:</b> Alex Yakupov   Rob Fisher <b>Cal Gas Expiry Date:</b> October 24, 2020 <b>Ozone Range ppb:</b> 500 <b>As Found C.F.:</b> 1.041 <b>New C.F.:</b> 1.000
---	--

**Calibration Standards:**

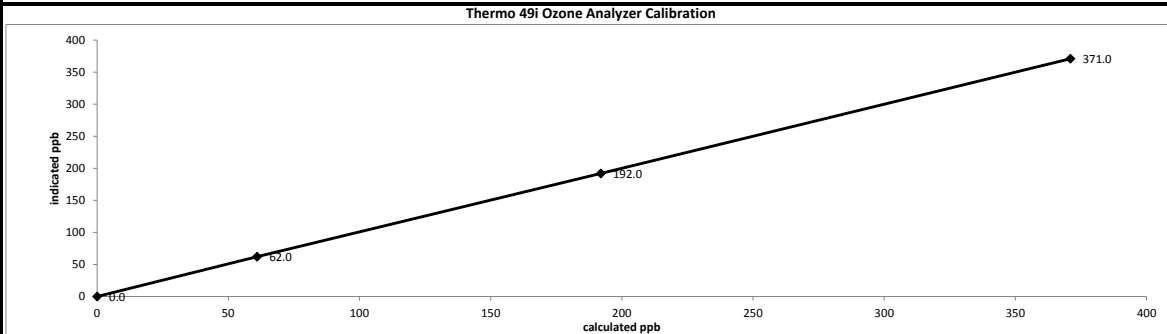
<b>Low Flow Meter ID/Expiry Date:</b> Defender Low 152019 expires December 13, 2018 <b>High Flow Meter ID/Expiry Date:</b> Defender High 148944 expires December 13, 2018 <b>Calibrator ID/Expiry Date:</b> Envirionics id# 5212 expires March 1, 2019 <b>Cal Gas Cylinder I.D. #:</b> LL 104225	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-100 ppb</td> </tr> </tbody> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-100 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-100 ppb								

**ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015**

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	-0.3	n/a
as found high	5000	5000	371.0	371.0	356.0	1.041
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	371.0	371.0	371.0	1.000
mid	5000	5000	192.0	192.0	192.0	1.000
low	5000	5000	61.0	61.0	62.0	0.984
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
<b>Average C.F.=</b>						0.995

**Linear Regression/Calibration Results:**

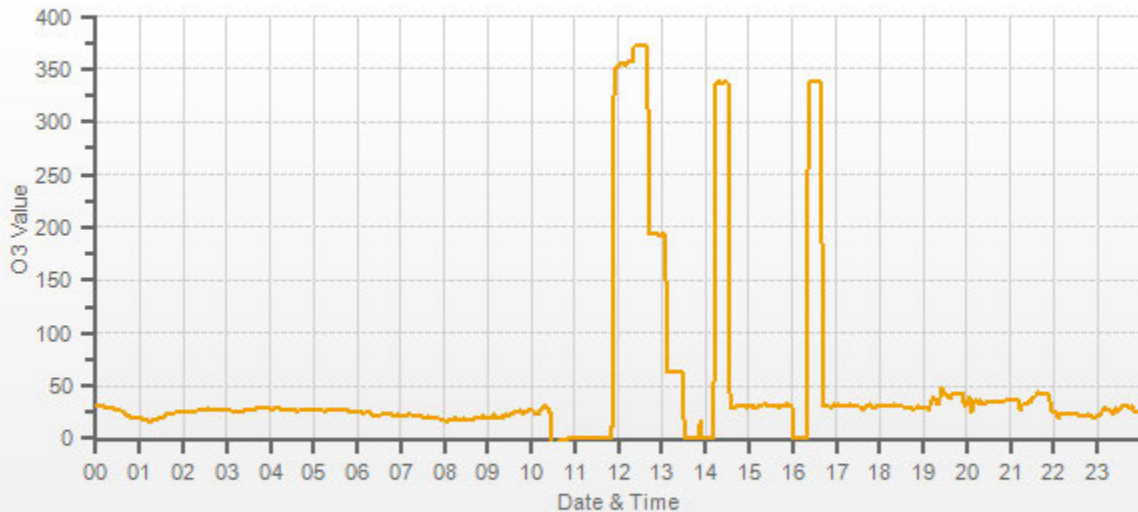
<b>Correlation Coefficient =</b> 1.000 <b>Slope =</b> 1.001 <b>b (Intercept as % of full scale)=</b> -0.09% <b>% change in C.F. from last cal=</b> -4.13%	<b>LIMITS</b> > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
--	--



<b>As found:</b> O3 Bkg: 0.0 O3 Coef: 0.952 Photo Lamp: 10.7 O3 Lamp: 8.2 Bench: 28.7 Bench Lamp: 53.6 O3 Lamp: 67.8 Pressure: 680.9 Cell A lpm: 0.732 Cell B lpm: 0.777 O3 ppb: 0.0 Cell A ppb: 0.0 Cell B ppb: -2.6 Cell A int (Hz): 75229 Cell B int (Hz): 94977 Expected Value: 317.1	<b>As left:</b> O3 Bkg: -0.3 O3 Coef: 0.990 Photo Lamp: 10.7 O3 Lamp: 8.2 Bench: 28.4 Bench Lamp: 53.6 O3 Lamp: 67.8 Pressure: 680.0 Cell A lpm: 0.730 Cell B lpm: 0.777 O3 ppb: 0.0 Cell A ppb: -0.3 Cell B ppb: 0.3 Cell A int (Hz): 75274 Cell B int (Hz): 95029 Expected Value: 337.0
---	---

**Comments:**  
 The analyzer sample inlet filter was changed.  
 The analyzer cooling fan filter(s) were cleaned.  
 The manifold blower was found to be working normally.

O3 [ppb] Station: LICA ST. LINA Daily: 18/07/18 Type: AVG 1 Min. [1 Min.]



— O3 [ppb]

***PARTICULATE MATTER***



## Thermo 5030i SHARP Monitor Monthly Audit

**Date:** July 18, 2018  
**Company:** LICA  
**Station Name/Location:** St Lina  
**Previous Audit Date:** June 26, 2018  
**Parameter:** PM 2.5

**Performed By/Reviewer:** Alex Yakupov | Rob Fisher  
**Start Time (mst):** 11:10  
**End Time (mst):** 11:48  
**Calibration Purpose:** Monthly  
**Weather Conditions:** Mix of sun and clouds with rain showers

**SHARP 5030i Information and Status:**  
**Serial Number:** CM17091001      **Filter Tape Counter:** 200

Reference Standards: Air Flow				
	Manometer	Orifice	Pressure:	Temp / RH:
<b>Make:</b>	Dwyer	Chinook	Fisher Scientific	Fisher Scientific
<b>Model:</b>	475 Mk.III	CHN0901	FB 1291	11-661-7A, 11745843
<b>Serial Number:</b>	#3	#2	130168457 / 05544	170286131
<b>Calibration Date:</b>	January 9, 2019	April 24, 2019	January 15, 2019	April 19, 2019

Ambient Temperature (°C)				Range	Action
				$\pm 2^{\circ}\text{C}$	OK
<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>		$2-3^{\circ}\text{C}$	Recalibrate
#1	19.10	18.9	0.2	$> 3^{\circ}\text{C}$	Fail

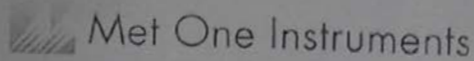
Ambient Relative Humidity (%RH)				Range	Action
<b>As Found:</b>				$\pm 2\% \text{RH}$	OK
<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>		$2-5\% \text{RH}$	Recalibrate
#1	81.60	81.6	0.0	$> 5\% \text{RH}$	Fail

Barometric Pressure (mmHg)				Range	Action
<b>As Found:</b>				$\pm 10 \text{ mmHg}$	OK
<b>Reference</b>	<b>SHARP</b>	<b>Difference</b>		$10-12 \text{ mmHg}$	Recalibrate
#1	699.0	698.7	0.3	$> 12\% \text{RH}$	Fail

Flow Audit (L/min)						Range	Action
<b>As Found:</b>						$\pm 4\%$	OK
<b>Reference</b>	<b>SHARP</b>					$4-5\%$	Recalibrate
#1	16.67	16.66		% Difference	-0.04	$> 5\%$	Fail
#2	16.66	16.65					
#3	16.67	16.67					
<b>Average</b>	16.67	16.66					

Leak Check (L/min)							
Without Leak Check Adapter			With leak Check Adapter				
	Reference	SHARP	Difference	Reference	SHARP	Difference	
#1	16.67	16.67	0.00	16.62	16.64	-0.02	<i>Leak Limit: 0.08 L/min</i>
					<b>LEAK RATE:</b>	<b>-0.02</b>	

## ***WIND SYSTEM***



# Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H  
 Sensor Output Swing: 0V - 1.0V  
 Customer: MAXXAM Analytics  
 Tested per PO: 35-67600  
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635  
 Sensor Output Range: 0 - 50.0 MPS  
 Sales Order No.: 122618  
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found  As Left   
 Corrective Action: No Adjustment  Adjust  Repair   
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.  
 All Work Performed per Customer Purchase Order Requirements.  
 Calibration Document No. 50.5-6100

### Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none  
 Humidity 20 to 70% Radiation none

**Firmware Version: 3194-01 R2.62**

*The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements*

## ***CALIBRATORS***



Company: Maxxam Operator: Chris W

<b>Calibrator:</b>				<b>Flow Measurement Device:</b>			
Make/Model	<u>EnviroNics 6100</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>5212</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>February 2017</u>			Temperature (°C)	<u>24.0 C</u>		
NO Cylinder S/N	<u>EY0000715</u>			Barometric Pressure	<u>702 mmHg</u>		
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>				
Expiry Date	<u>May 2021</u>						

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<b>NO</b>		<b>LIMITS</b>		<b>NOx</b>	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9934	<b>0.90-1.10</b>		m (Slope)=	0.9921
b (Intercept % of FS)=	-0.0332	± 3% F.S.		b (Intercept % of FS)=	-0.0277

Flow	O <sub>3</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO <sub>2</sub>	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

<b>NO<sub>2</sub></b>		<b>LIMITS</b>
Correlation=	1.0000	≥ 0.995
m (Slope)=	0.9880	<b>0.90-1.10</b>
b (Intercept % of FS)=	0.1153	± 3% F.S.

<b>AENV Standards</b>	<b>NO<sub>x</sub> Analyzer</b>
<b>Audit Calibrator</b>	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>March 1, 2018</u>
SRM Gas Cylinder No. <u>APEX1170572</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>49.99</u>	Cylinder Gas Expiry Date <u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO<sub>2</sub>.

Auditor: Al Clark Date: March 1, 2018

Operator Signature: *Chris W* Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:				Flow Measurement Device:			
Make/Model	<u>Envronics 6100</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>4760</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>February 2017</u>			Temperature (°C)	<u>23.0 C</u>		
NO Cylinder S/N	<u>EY0000715</u>			Barometric Pressure	<u>704 mmHg</u>		
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>				
Expiry Date	<u>May 2021</u>						

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO <sub>2</sub>	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥	<b>0.990</b>	Correlation=	1.0000
m (Slope)=	0.9901		<b>0.90-1.10</b>	m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092		<b>± 3% F.S.</b>	b (Intercept % of FS)=	-0.0320

Flow	O <sub>2</sub> Conc	NO Decrease	NO	NO <sub>2</sub>	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO <sub>2</sub>	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 10%	
Absolute Average Percent Difference							1%	± 10%

**LINEAR REGRESSION ANALYSIS** *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO <sub>2</sub>		LIMITS	
Correlation=	1.0000	≥	<b>0.995</b>
m (Slope)=	0.9836		<b>0.90-1.10</b>
b (Intercept % of FS)=	0.1675		<b>± 3% F.S.</b>

AENV Standards Audit Calibrator		NO <sub>x</sub> Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO<sub>2</sub>.

Auditor: Al Clark  
Operator Signature: *Chris W*

Date: March 2, 2018  
Location: McIntyre Center Edmonton

## ***CALIBRATION GASES***



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-482CGA

**Company:** Maxxam **Operator's Name:** Mike  
**Cylinder #:** LL104225 **Concentration PPM:** 49.2 **Tolerance(%)** 2 **Certified By:** Praxair  
**Expiry Date:** October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&amp;R MFC 201</u>	Make/Model: <u>Mesa Definer 220</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>H-133034 / L-132702</u>
Last Verification Date: <u>December 13, 2017</u>	Temp. °C: <u>23.4 C</u>
Gas Type: <u>SO2</u> Conc. <u>98.07</u>	B.P.: <u>707 mmHg</u>
Cylinder Number: <u>CAL016625</u>	
Expiry Date: <u>January 2019</u>	

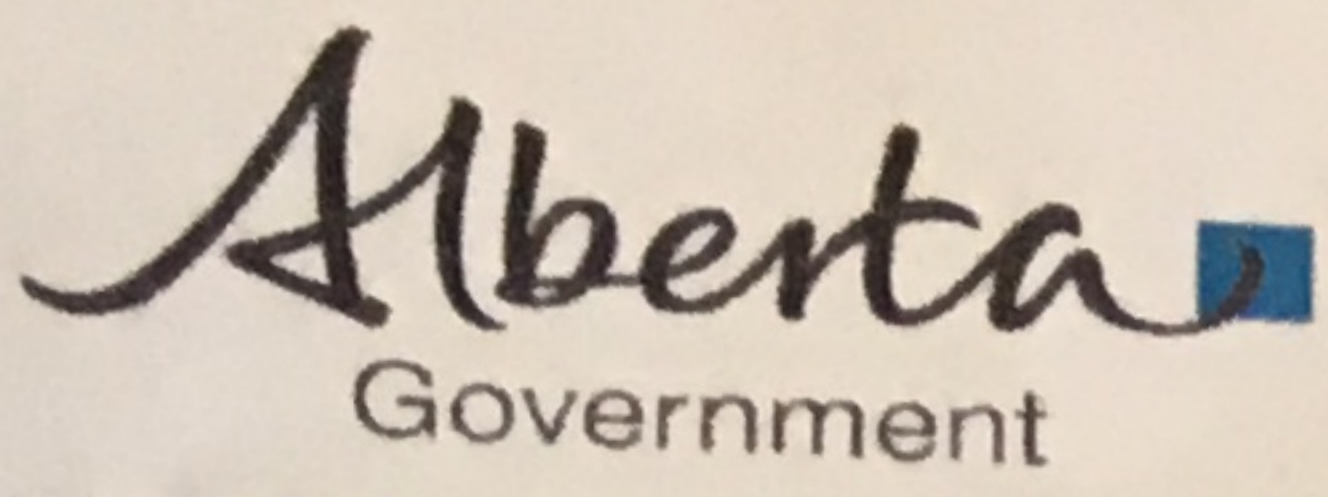
**Reference Analyzer:**  
 Make/Model: Teco 43C Serial/AMU Number: 1623  
 Instrument Settings: Zero: 10.0 Span: 1.006 Range: 1.0  
 Last Calibration: Date: Dec12/17 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.000			
4989	79.5	0.764	0.01594	62.755	47.9
4995	39.6	0.380	0.00793	126.136	47.9
4992	19.6	0.188	0.00393	254.694	47.9
Average Cylinder Concentration:					<b>47.9</b>

Previous Stated Concentration PPM: 49.2  
 Percent variance from Stated: 3

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** \_\_\_\_\_  
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

Auditor: Al Clark Date: December 13, 2017  
 Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



# Calibration Gas Audit

## Single Component Cylinder Gas

File No. 2017-493CGA

Company: Maxxam Operator's Name: Mike  
 Cylinder #: EY0001003 Concentration PPM: 9.55 Tolerance(%) 2 Certified By: Praxair  
 Expiry Date: October 2020

**Reference Calibrator and Gas:**  
 Make/Model: Sabio 2010  
 Serial Number: AMU 2092  
 Last Verification Date: January 17, 2018  
 Gas Type: H2S Conc. 20.43  
 Cylinder Number: CAL015272  
 Expiry Date: January 2019

**Flow Measurement Device:**  
 Make/Model: Mesa Defender 530  
 Serial Number: H-153961 / L-153874  
 Temp. °C: 23.0 C  
 B.P.: 697 mmHg

**Reference Analyzer:**  
 Make/Model: Teco 450i Serial/AMU Number: 1980  
 Instrument Settings: Zero: 12.9 Span: 0.955 Range: 0.1  
 Last Calibration: Date: Jan 17/18 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000			
5051	39.6	0.0753	0.00784	127.551	9.60
5028	20.2	0.0387	0.00402	248.911	9.63
5033	10.5	0.0198	0.00209	479.333	9.49
Average Cylinder Concentration:					<b>9.58</b>

Previous Stated Concentration PPM: 9.55  
 Percent variance from Stated: 0

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** Used AEP regulator  
 <=5% Outside Manufacturer Tolerance. Use manufacturers concentration   
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark  
 Operator Signature: *[Signature]*

Date: January 18, 2018  
 Location: McIntyre Center Edmonton



# Calibration Gas Audit

## CH<sub>4</sub> / C<sub>3</sub>H<sub>8</sub> Cylinder Gas

File No. 2015-029CGA

**Company:** Maxxam                      **Operators name:** Limin Li  
**Cylinder #:** LL165367   **Conc CH<sub>4</sub> (PPM)** 590/207   **Tolerance (%)** 2   **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&amp;R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1650</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH<sub>4</sub></u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C<sub>3</sub>H<sub>8</sub></u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

**Reference Analyzer:**

Make/Model Teco 55C                      Serial/AMU Number: 1643  
Instrument Settings                      Zero: N/A                      Span: N/A                      Range: 20  
Last Calibration:                      Date: May 21/15                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
		CH <sub>4</sub>	C <sub>3</sub> H <sub>8</sub>			CH <sub>4</sub>	C <sub>3</sub> H <sub>8</sub>
Dilution	Gas						
<u>2600</u>	<u>0.0</u>	<u>0.00</u>	<u>0.00</u>	<del>0.02005</del>	<del>49.883</del>	<del>602</del>	<del>206</del>
<u>2569</u>	<u>51.5</u>	<u>12.06</u>	<u>11.37</u>	<u>0.02005</u>	<u>49.883</u>	<u>602</u>	<u>206</u>
<u>3549</u>	<u>22.3</u>	<u>3.77</u>	<u>3.57</u>	<u>0.00628</u>	<u>159.148</u>	<u>600</u>	<u>207</u>
<u>3523</u>	<u>10.4</u>	<u>1.77</u>	<u>1.70</u>	<u>0.00295</u>	<u>338.750</u>	<u>600</u>	<u>209</u>
Average Cylinder Concentration:						<b>600</b>	<b>207</b>

	<b><u>CH<sub>4</sub></u></b>		<b><u>C<sub>3</sub>H<sub>8</sub></u></b>
Previous Stated Concentration PPM:	<u>590</u>		<u>207</u>
Percent variance from Stated:	<u>1.8</u>		<u>0.2</u>

**Cylinder gas tolerances based on CH<sub>4</sub> only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:** \_\_\_\_\_  
< =5% Outside Manufacturer Tolerance. Use manufacturers concentration  \_\_\_\_\_  
> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder  \_\_\_\_\_

Auditor: Al Clark                      Date: May 21, 2015  
Operator Signature: \_\_\_\_\_                      Location: McIntyre Center Edmonton



# Calibration Gas Audit

## NO Cylinder Gas

File No. 2017-483CGA

**Company:** Maxxam                      **Operators name:** Mike

Cylinder #: LL104225    Conc (PPM) 51.5/51.6    Tolerance (%) 2    Certified By: Praxair

Expiry Date: October 2020

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model <u>Teco 146i</u>	Make/Model <u>Mesa Definer 220</u>
Serial Number <u>AMU 1809</u>	Serial Number <u>H-133034 / L-132702</u>
Last Verification Date <u>December 13, 2017</u>	Temp. °C <u>23.4 C</u>
Gas Type <u>NO</u> Conc. <u>50.03</u>	B.P. <u>707 mmHg</u>
Cylinder Number <u>APEX 1223938</u>	
Expiry Date <u>June 2020</u>	

**Reference Analyzer:**

Make/Model Teco 42i                      Serial/AMU Number: 1868

Instrument Settings                      Zero: 4.7                      Span: 1.004                      Range: 1.0

Last Calibration:                      Date: Dec12/17                      C.F. 1.000                      Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	NO	NOX			NO	NOX
5000	0.0	0.000	0.000				
4989	79.5	0.813	0.812	0.016	62.755	51.0	51.0
4995	39.6	0.407	0.406	0.008	126.136	51.3	51.2
4992	19.6	0.202	0.201	0.004	254.694	51.4	51.2
Average Cylinder Concentration:						<b>51.3</b>	<b>51.1</b>

<u>NO</u>	<u>NOx</u>
Previous Stated Concentration PPM: <u>51.5</u>	<u>51.6</u>
Percent variance from Stated: <u>0</u>	<u>1</u>

**Cylinder gas tolerances based on NO only**

Meets Manufacturer Tolerance. Use manufacturers stated concentration  **COMMENTS:**

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder

Auditor: Al Clark                      Date: December 13, 2017

Operator Signature: *Al Clark*                      Location: McIntyre Center Edmonton

***APPENDIX III***  
***MAXIMUM INSTANTANEOUS DATA***





SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	2	3	3	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	24	
3	2	1	2	2	1	2	1	2	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
4	1	1	1	1	1	1	1	S	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	1	1	1	24
5	0	0	0	0	0	0	S	0	0	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1	24	
6	1	1	1	1	1	S	1	2	2	2	2	2	2	2	3	3	2	2	3	2	2	2	2	2	2	1	3	2	24	
7	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	24	
8	1	1	1	S	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
9	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	2	2	2	2	1	1	3	1	24	
10	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	24	
11	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	24	
12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	24	
13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	24	
14	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	24	
15	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	2	24	
16	2	2	2	2	2	2	2	4	7	7	4	4	3	3	2	2	2	2	S	2	3	3	3	3	3	2	7	3	24	
17	2	3	3	2	3	3	3	2	2	2	2	C	C	C	C	C	1	S	1	1	1	1	1	1	1	1	3	2	24	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	24	
19	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	1	1	24	
20	1	1	1	1	1	1	1	1	1	1	1	1	1	2	S	2	2	2	P	P	P	P	P	P	1	2	1	18		
21	P	P	P	R	1	1	2	2	1	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	20	
22	1	2	2	2	2	2	1	2	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	1	0	2	1	24		
23	1	0	1	1	0	1	1	0	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	24		
24	1	1	1	1	1	1	1	1	1	1	1	S	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24		
25	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24		
26	1	1	1	1	1	1	2	1	S	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	24	
27	1	2	2	2	2	2	1	S	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	24	
28	2	2	2	2	2	2	S	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
29	2	2	2	2	2	S	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
30	2	2	2	2	S	2	2	2	3	3	3	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	3	2	24	
31	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	3	3	2	3	2	24		
HOURLY MAX	2	3	3	2	3	3	3	4	7	7	4	4	3	3	3	3	2	3	3	2	3	3	3	3	3	3	3	3	24	
HOURLY AVG	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	24	

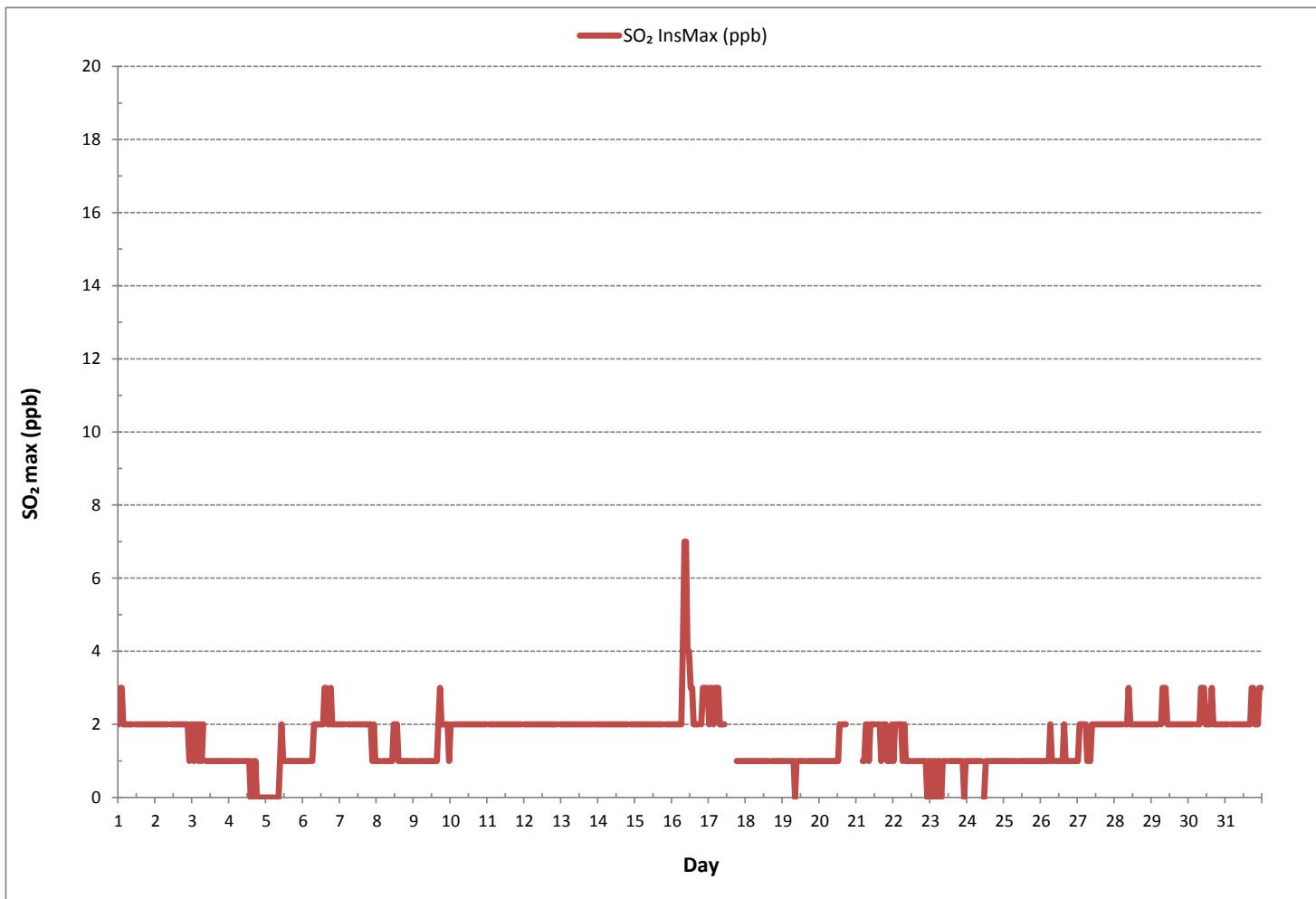
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	674
MAXIMUM INSTANTANEOUS VALUE:	7 ppb @ HOUR 8 ON DAY 16
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO<sub>2</sub> ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	1	1	1	1	2	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
2	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
3	1	1	1	1	1	1	1	1	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
4	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
5	0	0	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
6	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
7	1	1	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
8	1	1	1	S	2	4	3	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	4	1	24	
9	1	1	S	3	3	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	3	1	24	
10	1	S	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	1	24	
11	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	S	1	2	1	24	
12	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	2	1	24	
13	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	2	1	24	
14	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	3	1	24	
15	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	2	1	24	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24	
17	1	1	2	3	2	2	2	1	1	1	1	C	C	C	C	C	C	S	1	1	1	1	1	1	1	1	3	1	24	
18	1	1	1	1	1	1	1	1	1	1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	1	1	10	
19	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	S	1	1	1	1	1	1	1	1	1	1	1	1	9	
20	1	1	1	1	1	1	1	1	1	1	2	2	1	1	S	1	1	2	P	P	P	P	P	P	P	1	2	1	18	
21	P	P	P	R	2	2	1	2	2	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	20
22	1	1	1	1	1	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
23	1	1	0	0	1	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
24	0	0	0	0	1	0	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
25	0	0	0	0	1	0	1	1	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	24	
26	0	0	1	1	1	1	1	1	S	0	0	0	0	1	0	11	0	0	1	0	0	0	0	0	1	0	11	1	24	
27	1	1	1	1	1	1	2	S	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	2	1	24	
28	1	1	1	2	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
29	1	1	1	1	1	S	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	24	
30	1	0	0	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
31	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S1	0	0	0	0	0	23	
HOURLY MAX	1	2	3	3	3	4	3	2	2	1	2	2	1	1	1	11	1	2	1	1	1	1	1	1	1	1	1	1	1	
HOURLY AVG	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	1	1	1	1	

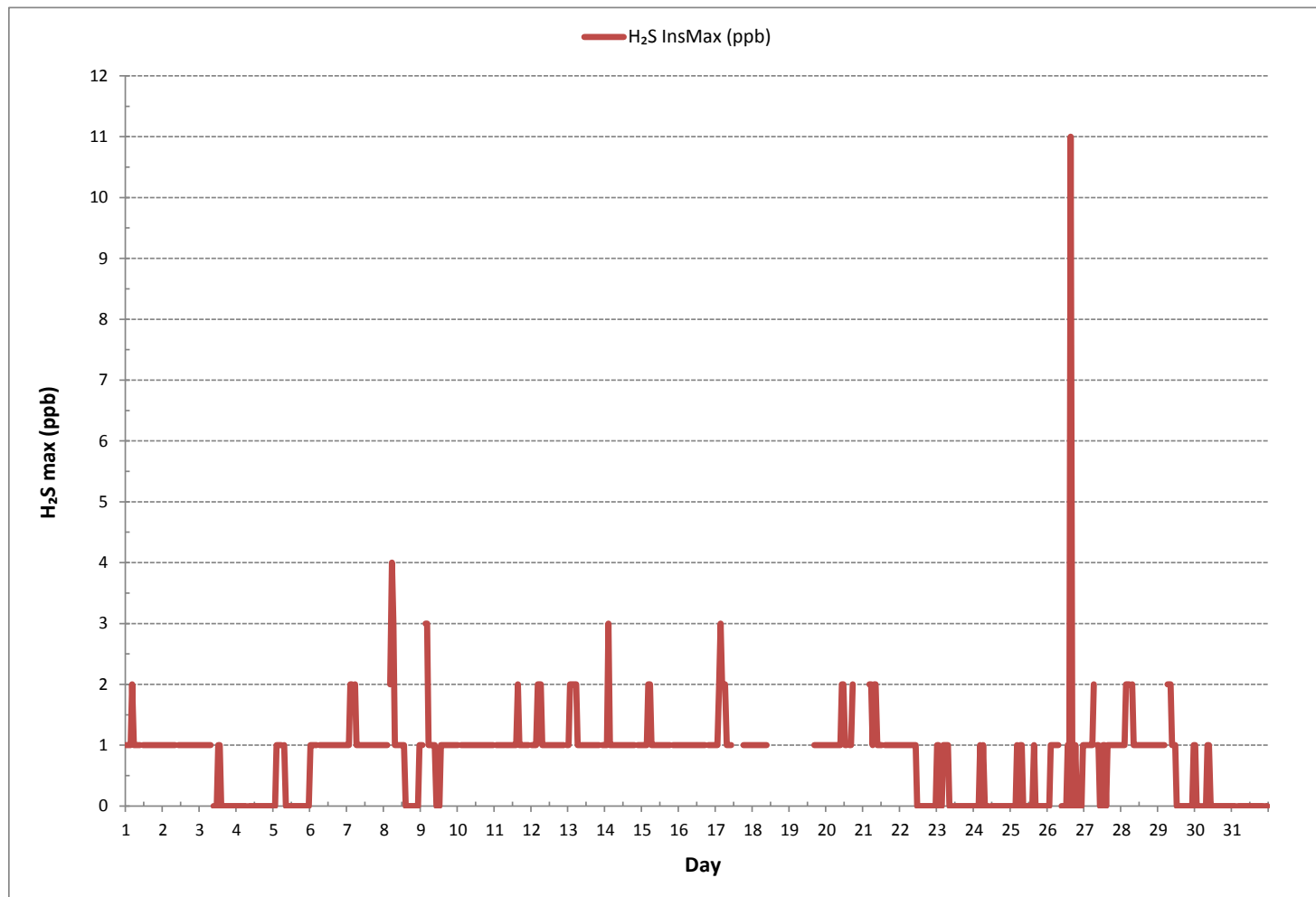
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	463
MAXIMUM INSTANTANEOUS VALUE:	11 ppb @ HOUR 15 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	704 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H<sub>2</sub>S ppb)





TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2.27	2.23	2.20	2.24	2.21	2.23	2.41	2.45	2.46	2.48	S	C	C	C	C	2.14	2.12	2.12	2.12	2.18	2.12	2.08	2.10	2.07	2.07	2.48	2.22	24
2	2.16	2.14	2.14	2.15	2.19	2.16	2.15	2.12	2.12	S	2.16	2.14	2.15	2.18	2.16	2.18	2.14	2.23	2.15	2.16	2.15	2.19	2.19	2.21	2.12	2.23	2.16	24
3	2.19	2.17	2.16	2.20	2.30	2.18	2.22	2.23	S	2.32	2.29	2.28	2.20	2.21	2.18	2.24	2.20	2.18	2.20	2.25	2.22	2.23	2.30	2.30	2.16	2.32	2.23	24
4	2.51	2.32	2.32	2.33	2.31	2.28	2.28	S	2.22	2.26	2.23	2.23	2.22	2.25	2.20	2.27	2.25	2.28	2.26	2.27	2.27	2.28	2.28	2.40	2.20	2.51	2.28	24
5	2.43	2.42	2.59	2.57	2.46	2.51	S	2.43	2.32	2.21	2.24	2.27	2.35	2.23	2.23	2.25	2.25	2.27	2.25	2.26	2.30	2.29	2.27	2.28	2.21	2.59	2.33	24
6	2.33	2.39	2.38	2.40	2.44	S	2.55	2.51	2.44	2.48	2.42	2.27	2.27	2.30	2.23	2.25	2.28	2.26	2.23	2.23	2.26	2.19	2.16	2.12	2.12	2.55	2.32	24
7	2.15	2.18	2.18	2.20	S	2.19	2.24	2.16	2.15	2.15	2.14	2.08	2.14	2.14	2.16	2.16	2.14	2.12	2.13	2.18	2.16	2.15	2.16	2.17	2.08	2.24	2.16	24
8	2.21	2.25	2.28	S	2.33	2.37	2.33	2.24	2.16	2.18	2.15	2.20	2.16	2.23	2.15	2.20	2.21	2.20	2.19	2.16	2.25	2.26	2.27	2.34	2.15	2.37	2.23	24
9	2.38	2.40	S	2.36	2.40	2.21	2.20	2.20	2.22	2.20	2.18	2.19	2.20	2.34	2.34	2.37	2.32	2.31	2.28	2.27	2.26	2.30	2.23	2.24	2.18	2.40	2.28	24
10	2.23	S	2.28	3.22	2.85	2.74	2.49	2.48	2.46	2.43	2.42	2.33	2.29	2.44	2.41	2.43	2.37	2.69	2.34	2.22	2.20	2.15	2.15	2.16	2.15	3.22	2.43	24
11	S	2.16	2.18	2.22	2.20	2.25	2.22	2.23	2.25	2.28	2.21	2.19	2.22	2.21	2.21	2.22	2.19	2.21	2.20	2.22	2.22	2.24	2.18	S	2.16	2.28	2.21	24
12	2.18	2.16	2.17	2.19	2.24	2.26	2.20	2.20	2.23	2.20	2.17	2.20	2.18	2.20	2.20	2.22	2.19	2.18	2.20	2.19	2.26	2.28	S	2.34	2.16	2.34	2.21	24
13	2.30	2.76	2.87	2.49	2.36	2.32	2.29	2.23	2.25	2.32	2.22	2.27	2.23	2.21	2.24	2.22	2.32	2.19	2.20	2.23	2.28	S	2.15	2.14	2.14	2.87	2.31	24
14	2.17	2.17	2.17	2.20	2.16	2.18	2.15	2.14	2.15	2.14	2.16	2.13	2.13	2.14	2.18	2.13	2.17	2.16	2.16	2.18	S	2.19	2.18	2.19	2.13	2.20	2.16	24
15	2.19	2.21	2.21	2.26	2.31	2.33	2.28	2.27	2.20	2.13	2.15	2.19	2.19	2.20	2.19	2.23	2.21	2.25	2.22	S	2.18	2.25	2.34	2.36	2.13	2.36	2.23	24
16	2.44	2.44	2.39	2.39	2.42	2.27	2.25	2.28	2.21	2.28	2.23	2.25	2.24	2.22	2.23	2.27	2.33	2.22	S	2.28	2.32	2.36	2.33	2.33	2.21	2.44	2.30	24
17	2.43	2.35	2.29	2.77	2.69	2.57	2.61	2.80	2.62	2.40	2.20	2.54	2.19	2.20	2.20	2.23	2.18	S	2.26	2.32	2.35	2.32	2.44	2.31	2.18	2.80	2.40	24
18	2.60	2.64	2.26	2.26	2.27	2.26	2.28	2.43	2.33	2.25	2.10	2.14	2.16	2.13	2.15	2.10	S	2.15	2.26	2.23	2.19	2.39	2.49	2.28	2.10	2.64	2.28	24
19	2.27	2.26	2.36	2.44	2.47	2.44	2.43	2.44	2.33	2.32	2.19	2.13	2.12	2.14	2.20	S	2.26	2.29	2.29	2.35	2.37	2.29	2.36	2.39	2.12	2.47	2.31	24
20	2.19	2.18	2.29	2.21	2.25	2.25	2.29	2.43	2.48	2.49	2.47	2.44	2.42	2.29	S	2.34	2.36	2.32	P	P	P	P	P	P	2.18	2.49	2.34	18
21	P	P	P	R	2.34	2.26	2.23	2.30	2.27	2.23	2.27	2.32	2.22	S	2.25	2.25	2.26	2.19	2.22	2.28	2.28	2.28	2.30	2.26	2.19	2.34	2.26	20
22	2.28	2.33	2.26	2.25	2.28	2.27	2.23	2.17	2.18	2.18	2.22	2.19	S	2.26	2.25	2.22	2.25	2.23	2.21	2.24	2.23	2.25	2.25	2.28	2.17	2.33	2.24	24
23	2.33	2.26	2.30	2.29	2.31	2.33	2.33	2.25	2.25	2.26	2.23	S	2.22	2.23	2.28	2.28	2.25	2.27	2.25	2.27	2.27	2.36	2.32	2.28	2.22	2.36	2.28	24
24	2.32	2.35	2.32	2.36	2.34	2.41	2.42	2.31	2.29	2.26	S	2.22	2.24	2.21	2.18	2.21	2.22	2.20	2.20	2.20	2.25	2.25	2.28	2.28	2.18	2.42	2.27	24
25	2.28	2.28	2.29	2.28	2.34	2.40	2.38	2.41	2.29	S	2.32	2.25	2.21	2.29	2.29	2.27	2.27	2.22	2.26	2.25	2.25	2.30	2.34	2.34	2.21	2.41	2.30	24
26	2.63	2.48	2.54	2.69	2.77	2.82	2.66	2.51	S	2.36	2.34	2.28	2.27	2.28	2.24	2.49	2.26	2.23	2.33	2.28	2.32	2.34	2.40	2.48	2.23	2.82	2.43	24
27	2.50	2.57	2.61	2.60	2.67	2.78	2.82	S	2.74	2.57	2.35	2.29	2.34	2.29	2.36	2.30	2.32	2.32	2.33	2.39	2.48	2.39	2.35	2.51	2.29	2.82	2.47	24
28	2.54	2.55	2.59	2.59	2.57	2.66	S	2.60	2.49	2.42	2.35	2.29	2.27	2.27	2.25	2.25	2.30	2.33	2.32	2.33	2.41	2.42	2.46	2.44	2.25	2.66	2.42	24
29	2.37	2.36	2.44	2.45	2.46	S	2.53	2.58	2.56	2.45	2.38	2.30	2.27	2.29	2.30	2.28	2.30	2.26	2.26	2.29	2.29	2.58	2.39	2.48	2.26	2.58	2.39	24
30	2.41	2.47	2.50	2.47	S	2.35	2.52	2.58	2.77	2.73	2.32	2.30	2.35	2.25	2.23	2.20	2.22	2.22	2.25	2.27	2.28	2.23	2.23	2.20	2.77	2.37	24	
31	2.23	2.24	2.21	S	2.21	2.23	2.52	2.38	2.33	2.37	2.30	2.29	2.26	2.26	2.25	2.26	2.21	2.28	2.31	2.35	2.39	2.34	2.41	2.32	2.21	2.52	2.30	24
HOURLY MAX	2.63	2.76	2.87	3.22	2.85	2.82	2.82	2.80	2.77	2.73	2.47	2.54	2.42	2.44	2.41	2.49	2.37	2.69	2.34	2.39	2.48	2.58	2.49	2.51				
HOURLY AVG	2.33	2.34	2.34	2.40	2.38	2.36	2.36	2.36	2.34	2.32	2.42	2.25	2.23	2.24	2.23	2.25	2.24	2.25	2.24	2.25	2.27	2.28	2.29	2.29				

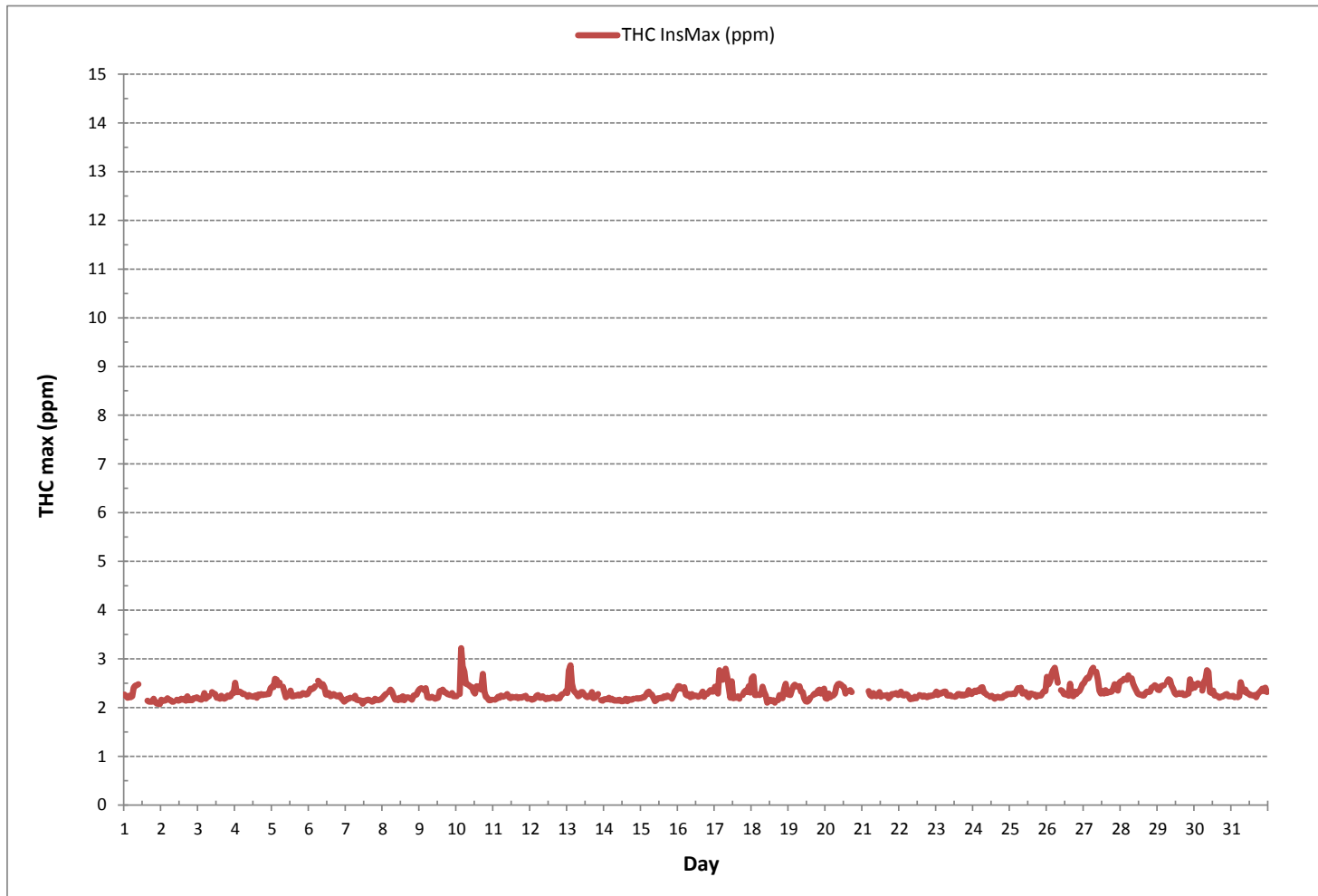
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	698
MAXIMUM INSTANTANEOUS VALUE:	3.22 ppm @ HOUR 3 ON DAY 10
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	0.14

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - July 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	3	3	2	1	1	1	0	0	0	1	S	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	3	1	24
2	0	1	1	0	1	1	1	0	1	S	2	3	2	1	2	3	1	1	1	2	3	1	0	0	0	0	3	1	24
3	0	0	0	0	1	1	2	3	S	3	1	1	1	0	0	0	0	1	1	3	1	1	1	2	0	0	3	1	24
4	6	2	1	1	1	1	2	S	1	1	0	1	0	1	1	1	0	2	1	0	0	0	1	1	0	6	1	24	
5	1	1	1	1	2	3	S	3	2	2	2	2	1	1	1	1	0	1	1	0	1	1	1	2	2	0	3	1	24
6	2	2	2	2	3	S	3	2	2	2	2	2	1	2	1	1	31	1	2	2	4	1	1	0	0	31	3	24	
7	1	0	1	1	S	1	1	1	1	0	1	5	1	1	2	0	0	0	0	0	0	0	0	0	0	0	5	1	24
8	0	0	0	S	1	0	0	0	1	1	0	1	1	1	0	0	0	1	2	2	2	2	1	1	0	2	1	24	
9	1	1	S	1	1	1	1	2	6	1	0	0	0	1	1	0	0	0	0	0	0	1	1	1	1	0	6	1	24
10	1	S	1	1	1	1	2	2	1	1	1	1	1	1	3	3	3	5	2	1	1	0	1	1	0	5	2	24	
11	S	2	2	1	1	1	1	1	1	38	0	1	2	0	1	0	1	0	1	2	25	1	0	S	0	38	4	24	
12	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0	1	S	1	0	1	0	24
13	1	1	2	1	0	1	3	0	1	1	1	1	0	0	1	1	2	0	1	1	0	S	1	1	0	3	1	24	
14	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
15	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	1	1	S	1	0	1	1	0	1	0	24	
16	1	1	1	1	1	2	2	2	4	4	4	3	1	1	1	4	3	3	S	11	22	1	1	1	1	1	22	3	24
17	1	1	1	1	4	2	2	1	0	0	2	C	C	C	C	C	C	C	1	0	0	0	0	0	0	4	1	24	
18	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	S	0	0	1	36	0	1	0	0	36	2	24	
19	0	0	1	0	0	1	3	3	0	0	0	0	0	1	0	S	0	1	1	6	1	0	0	1	0	6	1	24	
20	1	1	0	0	2	0	2	2	3	2	1	0	0	0	S	0	0	0	P	P	P	P	P	P	0	3	1	18	
21	P	P	P	R	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	4	1	1	1	1	1	4	1	20
22	1	1	1	1	1	1	0	0	0	0	1	0	S	1	1	0	1	1	1	2	0	1	0	0	0	2	1	24	
23	0	0	0	0	0	1	0	1	4	0	1	S	23	0	1	1	1	14	140	0	0	2	1	1	1	0	140	8	24
24	0	0	1	1	1	3	1	1	3	2	S	1	34	1	1	2	1	1	2	1	1	1	1	1	0	34	3	24	
25	1	1	1	1	1	5	3	1	2	S	4	2	1	1	5	71	1	1	5	1	2	1	1	1	1	1	71	5	24
26	1	1	1	1	1	4	34	6	S	3	1	0	1	28	1	505	0	1	1	1	1	1	1	1	0	505	26	24	
27	1	2	2	2	5	58	45	S	1	5	1	1	5	1	0	1	1	1	1	1	1	1	1	1	0	58	6	24	
28	1	1	1	1	4	3	S	2	1	3	1	1	1	1	1	3	1	1	1	1	1	1	4	1	1	4	2	24	
29	1	1	1	2	1	S	3	7	4	3	2	2	0	1	1	1	1	0	1	0	1	1	1	1	0	7	2	24	
30	1	1	1	1	S	1	2	1	27	1	5	1	1	1	0	0	1	1	4	1	1	1	1	1	0	27	2	24	
31	1	1	1	S	1	1	1	2	1	1	11	1	1	2	3	0	0	0	0	1	1	1	1	1	0	11	1	24	
HOURLY MAX	6	3	2	2	5	58	45	7	27	38	11	5	34	28	5	505	3	14	140	11	36	4	2	2					
HOURLY AVG	1	1	1	1	1	3	4	2	2	3	2	1	3	2	1	22	1	1	6	2	4	1	1	1					

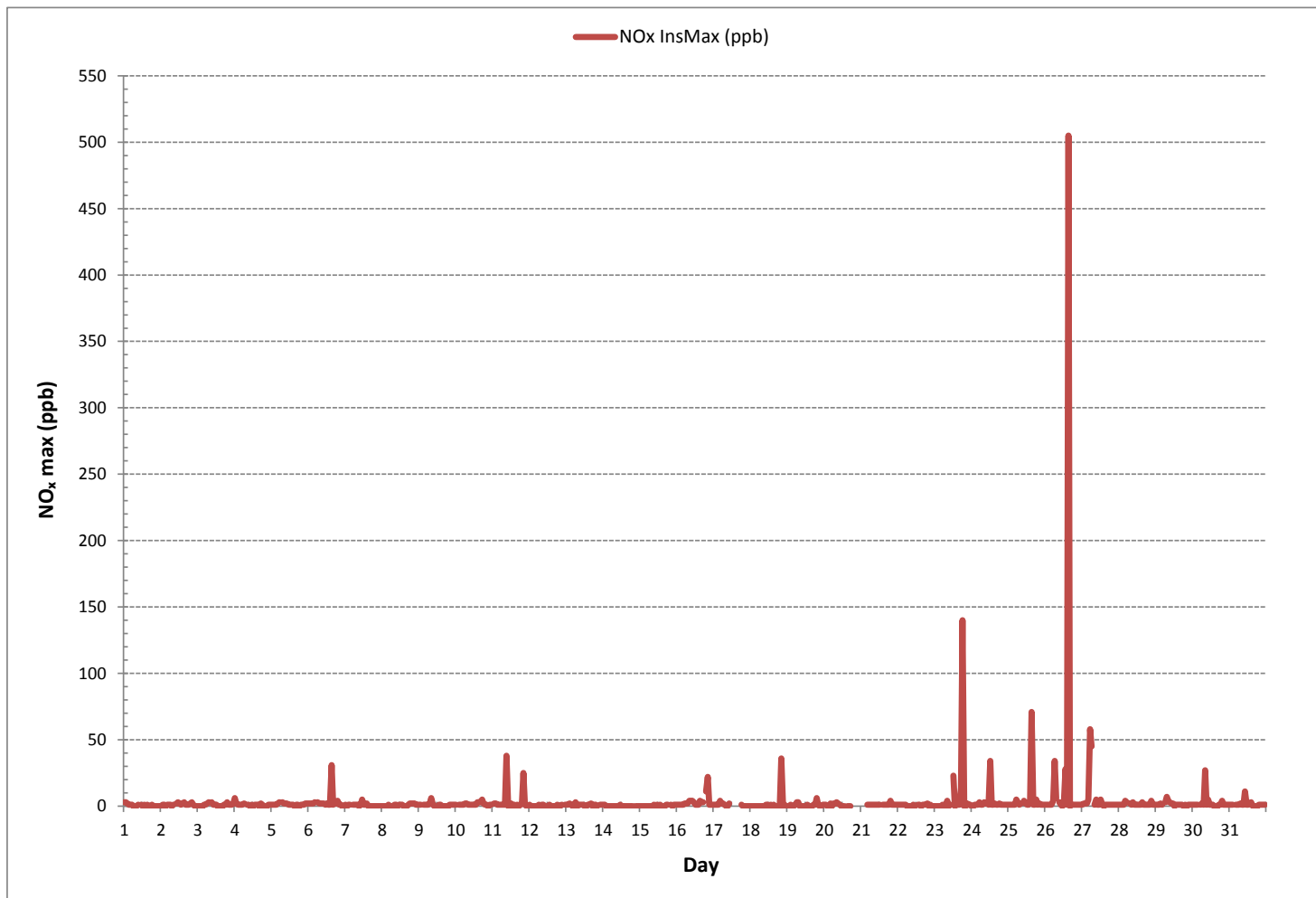
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	491
MAXIMUM INSTANTANEOUS VALUE:	505 ppb @ HOUR 15 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	20

OXIDES OF NITROGEN Instantaneous Maximum (NO<sub>x</sub> ppb)







NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	1	0	0	0	0	1	0	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	24		
2	1	1	1	1	1	1	1	1	1	S	1	2	2	1	2	2	1	1	1	1	1	1	0	1	1	0	2	1	24			
3	1	0	1	1	1	1	1	1	S	2	1	1	1	0	0	0	1	1	1	1	1	1	0	1	0	2	1	24				
4	1	1	1	1	1	1	1	S	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	24			
5	1	1	1	1	1	1	S	2	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	2	1	24				
6	0	0	1	1	1	S	1	1	1	1	1	0	0	0	0	0	15	0	1	0	1	0	0	0	0	0	15	1	24			
7	0	0	1	1	S	1	1	1	1	1	0	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	4	1	24			
8	0	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	0	2	1	24			
9	1	1	S	1	1	0	1	1	5	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	5	1	24			
10	0	S	1	0	1	1	1	1	1	0	0	0	0	1	1	0	0	1	1	1	1	0	1	1	1	0	1	1	24			
11	S	1	0	0	1	0	1	1	1	1	31	1	1	1	1	0	1	0	1	0	1	2	21	1	1	S	0	31	3	24		
12	1	0	0	0	0	1	1	0	1	1	1	0	1	1	0	1	1	1	1	0	1	1	S	1	1	0	1	1	24			
13	0	0	0	0	0	0	2	0	1	1	0	1	0	0	1	1	0	1	0	0	1	S	1	1	1	0	2	0	24			
14	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	0	1	1	24			
15	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	S	1	0	0	0	0	2	1	24			
16	1	0	0	1	1	1	1	1	2	2	2	1	1	1	0	2	1	1	1	S	1	2	0	0	0	0	2	1	24			
17	0	0	0	0	1	1	0	1	0	1	1	C	C	C	C	C	C	C	1	0	0	0	0	0	0	0	1	0	24			
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	19	0	0	0	0	0	19	1	24			
19	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	S	0	1	0	1	0	0	0	0	0	0	2	0	24			
20	0	0	0	0	0	0	0	1	1	1	0	0	0	0	S	1	0	0	P	P	P	P	P	P	P	0	1	0	18			
21	P	P	P	R	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20			
22	1	1	1	1	1	1	1	1	1	1	1	1	S	2	1	1	2	1	1	2	1	1	1	1	1	1	2	1	24			
23	1	1	1	1	1	1	1	1	3	1	2	S	12	1	1	1	1	3	73	1	1	1	1	1	1	1	73	5	24			
24	1	1	1	1	1	2	2	1	2	1	S	1	22	1	1	2	1	1	1	1	1	1	1	1	1	1	22	2	24			
25	1	1	1	1	0	3	3	1	1	S	2	1	1	1	2	41	1	1	2	1	0	1	1	1	1	0	41	3	24			
26	1	1	0	1	1	1	21	3	S	2	1	1	1	18	1	356	1	1	1	1	0	1	1	0	0	356	18	24				
27	0	1	1	0	1	35	34	S	1	3	1	0	7	0	1	1	1	1	1	1	1	0	1	1	0	35	4	24				
28	0	1	0	1	2	1	S	1	0	1	0	1	1	1	5	1	1	1	0	1	1	1	1	1	0	5	1	24				
29	1	0	0	0	0	S	1	3	1	1	1	0	0	1	1	1	1	0	1	0	1	0	0	1	0	3	1	24				
30	0	0	0	0	S	1	0	0	21	0	2	0	0	0	0	0	0	1	1	2	1	1	0	0	0	21	1	24				
31	0	1	0	S	1	0	0	1	1	1	7	1	1	2	2	1	1	1	0	1	1	1	1	1	0	7	1	24				
HOURLY MAX	1	1	1	1	2	35	34	3	21	31	7	4	22	18	2	356	2	3	73	2	21	1	1	1	1	1	1	1	24			
HOURLY AVG	1	0	1	1	1	2	3	1	2	2	1	1	2	1	1	15	1	1	3	1	2	1	1	1	1	1	1	1	24			

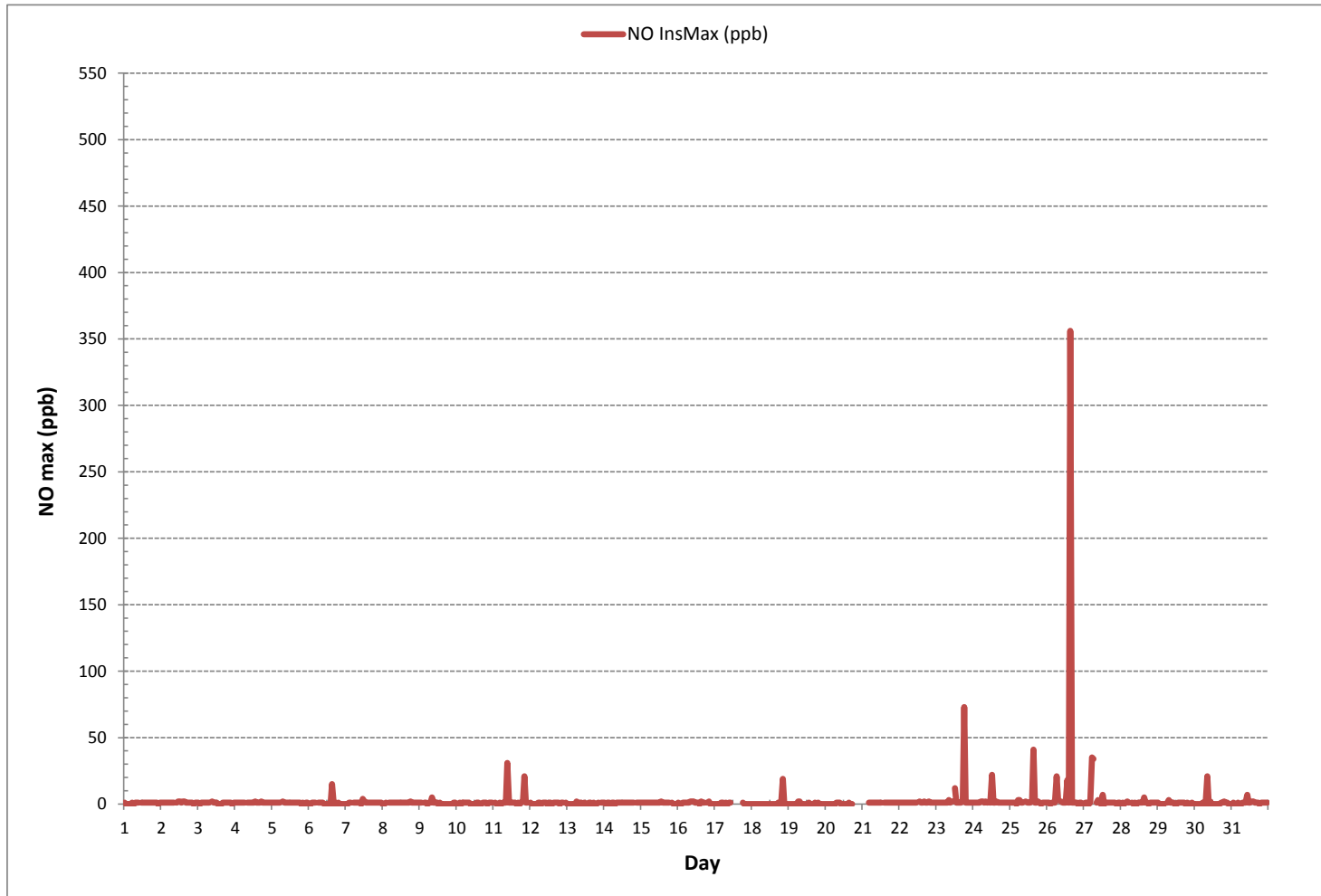
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	499
MAXIMUM INSTANTANEOUS VALUE:	356 ppb @ HOUR 15 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	14
OPERATIONAL TIME:	734 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	3	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
2	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	1	0	0	0	1	2	1	0	0	0	0	2	0	24
3	0	0	0	0	0	1	1	2	S	1	1	0	0	0	0	0	0	1	0	2	1	1	1	2	0	2	1	24	
4	6	1	0	1	0	1	2	S	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	6	1	24
5	1	0	1	1	2	2	S	2	1	1	1	1	0	0	0	0	0	0	0	0	1	1	2	1	0	2	1	24	
6	2	2	2	2	2	S	2	2	2	2	2	1	1	1	1	17	1	2	2	4	1	1	0	0	0	17	2	24	
7	0	0	0	1	S	1	1	1	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	24	
8	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	2	0	24	
9	1	1	S	1	1	1	1	2	2	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	1	24	
10	0	S	1	1	1	1	1	1	1	1	1	0	0	1	2	3	3	4	2	1	1	0	1	1	0	4	1	24	
11	S	1	1	1	1	1	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7	0	0	S	0	7	1	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	1	0	1	0	24
13	1	1	1	1	0	1	1	0	1	1	1	1	0	0	1	1	2	0	1	0	0	S	0	0	0	0	2	1	24
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	0	1	0	1	0	24
16	1	1	1	1	1	1	1	1	2	2	2	2	1	1	0	2	2	2	S	11	21	1	1	1	1	0	21	3	24
17	1	1	1	1	2	2	1	1	0	1	C	C	C	C	C	C	C	C	1	1	0	1	1	1	1	0	2	1	24
18	1	1	1	1	0	0	0	1	0	0	1	0	1	0	1	S	0	0	2	18	1	1	1	1	0	18	1	24	
19	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	S	0	1	1	5	1	0	1	2	0	5	1	24	
20	2	1	1	0	2	1	2	2	2	2	1	1	0	1	S	0	0	0	P	P	P	P	P	P	0	2	1	18	
21	P	P	P	R	1	1	1	1	1	1	0	1	0	S	0	0	1	1	1	2	1	1	1	1	1	0	2	1	20
22	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	0	0	0	0	0	1	0	24	
23	0	0	0	0	0	0	0	0	1	0	0	S	12	0	0	0	0	12	135	0	0	1	1	1	1	0	135	7	24
24	0	0	0	0	0	1	0	0	1	1	S	1	14	0	0	1	0	0	1	0	1	0	1	0	1	0	14	1	24
25	1	1	1	1	1	3	1	1	1	S	2	1	0	1	4	48	1	1	3	1	2	1	0	1	0	48	3	24	
26	1	1	1	1	1	3	15	4	S	1	0	0	1	14	1	150	0	1	1	1	1	1	1	1	1	0	150	9	24
27	2	2	2	2	4	27	16	S	1	3	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	27	3	24
28	1	1	1	1	3	2	S	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	4	1	1	1	4	1	24
29	1	1	2	1	1	S	2	4	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	24
30	1	1	1	1	S	1	2	1	9	1	3	1	1	1	1	1	1	0	1	3	1	1	1	1	0	9	2	24	
31	1	1	1	S	1	1	2	2	1	1	7	1	0	1	1	0	0	0	1	1	1	1	1	1	0	7	1	24	
HOURLY MAX	6	3	2	2	4	27	16	4	9	7	7	2	14	14	4	150	3	12	135	11	21	4	2	2					
HOURLY AVG	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	8	1	1	5	1	2	1	1	1					

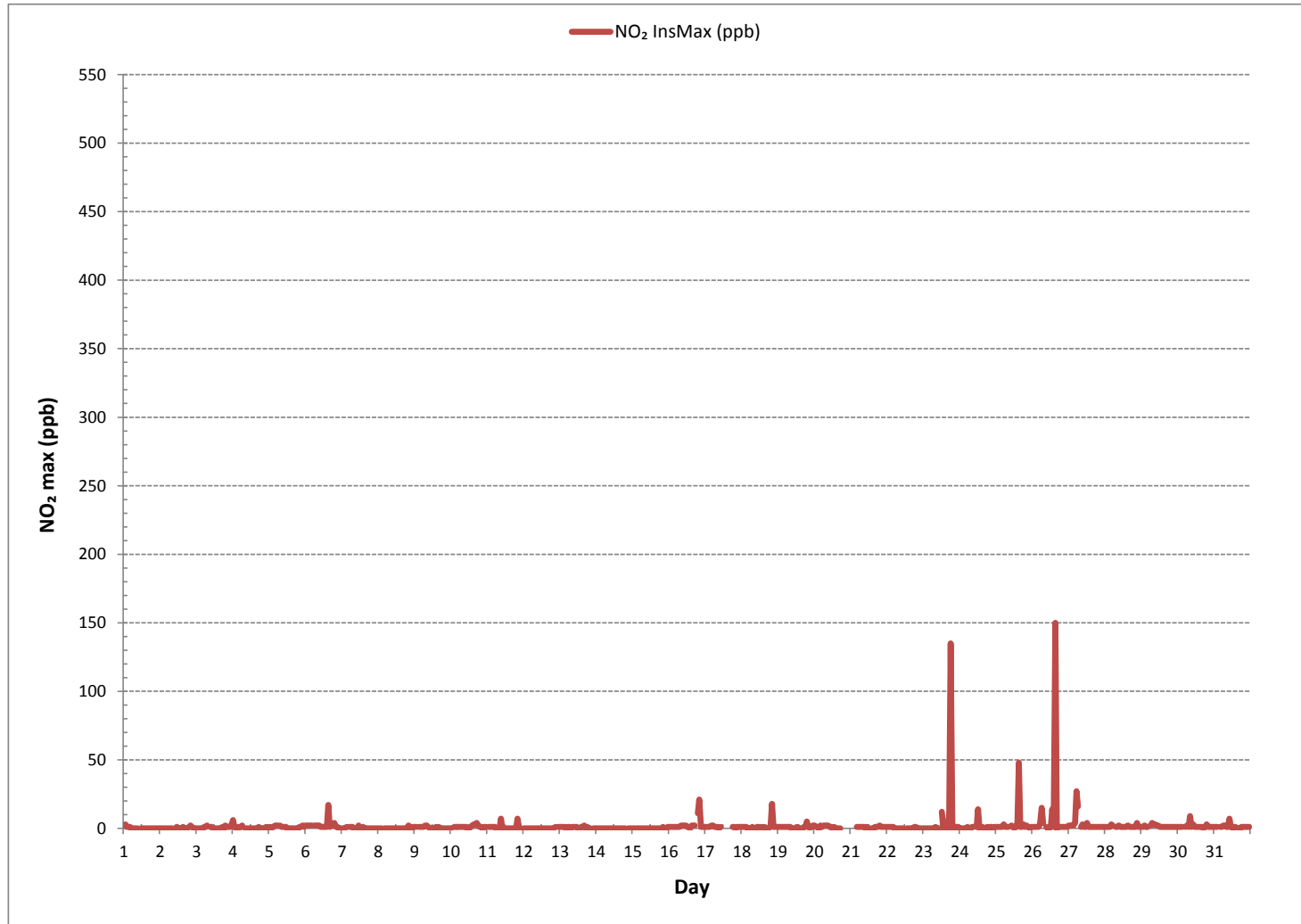
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	396
MAXIMUM INSTANTANEOUS VALUE:	150 ppb @ HOUR 15 ON DAY 26
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	734 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO<sub>2</sub> ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION  
St. Lina Continuous Monitoring Station - July 2018

OZONE Instantaneous Maximum (O<sub>3</sub> ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	22.5	22.2	27.6	26.7	24.5	26.1	27.3	25.9	27.2	29.6	S	34.1	34.5	34.9	32.3	32.0	35.9	36.2	33.6	32.3	28.3	26.3	24.2	24.7	22.2	36.2	29.1	24
2	23.5	21.6	18.1	16.9	15.8	14.9	15.1	18.1	19.9	S	24.1	23.7	21.9	26.7	28.0	22.6	24.7	26.4	24.9	24.0	18.3	17.8	20.5	17.7	14.9	28.0	21.1	24
3	18.3	22.5	20.9	18.4	19.8	17.4	16.1	14.0	S	24.4	28.9	31.7	33.8	31.8	32.1	36.3	33.9	28.9	28.6	28.7	27.8	23.1	26.6	28.2	14.0	36.3	25.7	24
4	27.0	17.9	13.7	13.8	14.8	17.5	20.8	S	23.6	24.9	30.1	29.6	28.1	27.6	26.7	28.6	29.4	29.1	29.0	28.0	25.9	24.9	25.1	25.1	13.7	30.1	24.4	24
5	22.2	21.3	18.5	15.7	17.7	17.7	S	30.2	34.9	39.9	40.3	40.9	45.4	47.1	48.4	48.4	47.9	47.4	46.8	45.0	43.2	41.1	37.7	34.8	15.7	48.4	36.2	24
6	33.6	31.6	30.3	29.6	27.8	S	24.7	26.7	29.7	33.1	36.4	39.6	42.5	49.6	50.3	48.8	48.8	50.1	45.5	40.3	38.6	38.4	41.9	41.6	24.7	50.3	38.2	24
7	35.6	34.3	31.1	30.9	S	25.7	25.0	29.1	28.7	29.1	25.7	27.6	32.3	34.7	34.1	30.7	30.4	27.8	24.8	22.2	24.2	24.1	18.5	16.5	16.5	35.6	28.0	24
8	16.7	15.7	15.8	S	15.9	14.6	16.3	23.2	24.1	25.8	26.8	30.3	34.3	35.6	35.5	37.3	37.3	35.0	32.4	31.7	28.8	29.1	30.0	27.3	14.6	37.3	26.9	24
9	26.4	26.6	S	27.4	27.4	30.9	30.1	27.9	23.9	27.2	32.9	32.8	34.9	37.7	37.1	38.1	36.7	36.6	35.3	31.9	29.2	29.9	29.5	28.9	23.9	38.1	31.3	24
10	29.4	S	26.4	25.2	25.7	19.2	18.8	23.2	30.9	36.1	42.5	44.2	45.0	41.4	42.3	36.3	33.2	35.3	37.4	40.1	40.3	40.8	34.1	31.0	18.8	45.0	33.9	24
11	S	32.4	28.6	26.6	28.3	27.4	25.6	21.4	18.8	20.9	22.3	23.3	24.0	23.9	26.2	27.4	27.2	26.9	26.8	26.5	26.5	25.6	26.2	S	18.8	32.4	25.6	24
12	24.8	24.8	24.4	23.6	23.0	21.8	21.5	24.7	26.4	28.8	29.2	29.6	34.0	35.5	32.9	32.7	34.5	35.2	33.8	33.4	32.8	32.7	S	28.3	21.5	35.5	29.1	24
13	29.8	32.0	23.5	23.4	21.3	21.7	24.5	30.3	32.7	25.9	25.6	29.7	28.4	29.3	34.6	35.4	35.8	36.0	32.6	29.4	25.8	S	22.4	21.2	21.2	36.0	28.3	24
14	20.9	21.1	18.5	17.1	15.4	15.6	17.2	17.4	19.4	18.4	18.6	19.2	19.5	20.8	19.8	22.0	23.0	23.1	23.0	23.6	S	21.8	19.0	17.7	15.4	23.6	19.7	24
15	17.3	17.3	16.8	16.7	16.4	15.2	16.4	18.4	21.4	24.0	24.6	23.8	23.3	22.9	23.5	24.1	24.0	25.0	24.7	S	21.3	21.4	23.1	24.6	15.2	25.0	21.1	24
16	24.5	22.8	22.2	20.8	19.9	20.5	21.0	22.6	23.5	28.2	34.4	36.7	39.1	39.0	39.6	41.6	42.7	43.8	S	39.6	40.4	40.8	39.9	42.5	19.9	43.8	32.4	24
17	37.4	49.3	48.6	34.8	35.8	36.6	35.3	29.3	32.6	34.1	34.4	34.1	31.8	33.5	34.2	33.6	36.3	S	42.2	37.4	36.4	33.4	33.6	35.6	29.3	49.3	36.1	24
18	30.4	25.1	27.5	29.0	28.0	27.4	26.1	23.1	21.2	27.5	C	C	C	C	C	33.0	S	32.1	31.9	47.3	39.3	42.9	25.2	31.2	21.2	47.3	30.5	24
19	29.7	28.2	20.4	22.0	19.3	17.7	19.1	21.3	20.9	23.9	26.6	29.6	29.0	29.2	29.4	S	32.1	30.8	28.8	28.9	24.5	26.1	27.5	40.5	17.7	40.5	26.3	24
20	40.1	38.0	41.5	47.8	47.7	36.5	31.5	27.3	28.8	34.0	35.9	37.8	44.6	44.3	S	38.8	38.7	39.1	P	P	P	P	P	P	27.3	47.8	38.4	18
21	P	P	P	R	33.9	34.0	32.5	32.6	30.9	37.1	38.2	36.2	36.2	S	38.1	37.8	37.1	46.4	41.6	39.6	35.1	31.8	28.2	25.2	25.2	46.4	35.4	20
22	22.5	21.3	23.3	23.1	20.5	18.5	22.4	29.2	27.6	27.3	28.0	32.2	S	30.6	28.1	31.6	32.2	35.5	35.1	29.8	27.5	25.9	25.3	24.0	18.5	35.5	27.0	24
23	23.6	20.0	16.4	14.2	12.2	11.9	13.2	14.6	15.7	18.5	21.4	S	23.5	23.5	23.9	22.9	23.9	23.0	23.0	21.3	20.9	19.7	18.7	11.9	23.9	19.6	24	
24	20.6	21.0	18.5	15.3	14.4	15.1	14.9	19.9	22.2	25.6	S	25.7	28.0	28.3	27.4	26.2	26.1	24.2	21.4	20.7	19.7	18.5	21.3	21.0	14.4	28.3	21.6	24
25	17.6	18.2	18.1	15.4	13.2	10.2	11.2	13.9	21.8	S	24.2	27.1	27.7	28.4	29.0	31.1	31.5	31.3	30.2	27.8	29.8	30.6	30.9	29.0	10.2	31.5	23.8	24
26	26.5	26.7	25.7	21.3	18.5	18.9	19.2	22.9	S	29.7	30.6	33.7	35.2	35.6	39.0	39.4	38.8	37.3	34.9	33.3	30.1	34.0	35.6	31.7	18.5	39.4	30.4	24
27	28.8	28.9	25.9	26.0	26.2	24.2	20.8	S	29.0	39.5	42.1	40.1	39.4	39.2	39.9	40.4	40.3	40.8	42.8	39.7	37.7	42.5	41.6	38.5	20.8	42.8	35.4	24
28	34.0	32.8	30.3	29.6	29.9	28.8	S	29.2	34.0	40.3	44.9	49.7	50.4	52.3	51.8	52.4	51.4	51.0	49.8	45.5	43.3	41.9	42.4	42.0	28.8	52.4	41.6	24
29	41.7	37.6	37.4	35.6	34.0	S	29.1	29.6	45.1	48.7	47.1	45.4	45.0	43.8	42.6	43.3	43.9	43.4	43.2	43.0	38.9	37.2	38.0	33.8	29.1	48.7	40.3	24
30	30.5	31.4	32.3	33.3	S	32.9	26.3	31.5	19.7	26.2	25.8	25.3	31.0	29.2	30.9	30.4	34.9	37.0	35.1	32.0	25.9	22.9	21.1	21.6	19.7	37.0	29.0	24
31	23.8	24.3	25.4	S	23.0	22.5	20.5	20.6	21.7	24.2	25.7	27.4	28.1	30.2	31.3	31.5	31.8	32.4	30.4	27.4	26.5	25.9	26.7	26.4	20.5	32.4	26.4	24
HOURLY MAX	41.7	49.3	48.6	47.8	47.7	36.6	35.3	32.6	45.1	48.7	47.1	49.7	50.4	52.3	51.8	52.4	51.4	51.0	49.8	47.3	43.3	42.9	42.4	42.5				
HOURLY AVG	26.9	26.4	25.1	24.3	23.1	22.1	22.2	24.1	26.1	29.4	31.0	32.5	33.5	34.0	34.1	34.5	34.8	34.9	33.4	32.8	30.6	30.1	28.8	28.6				

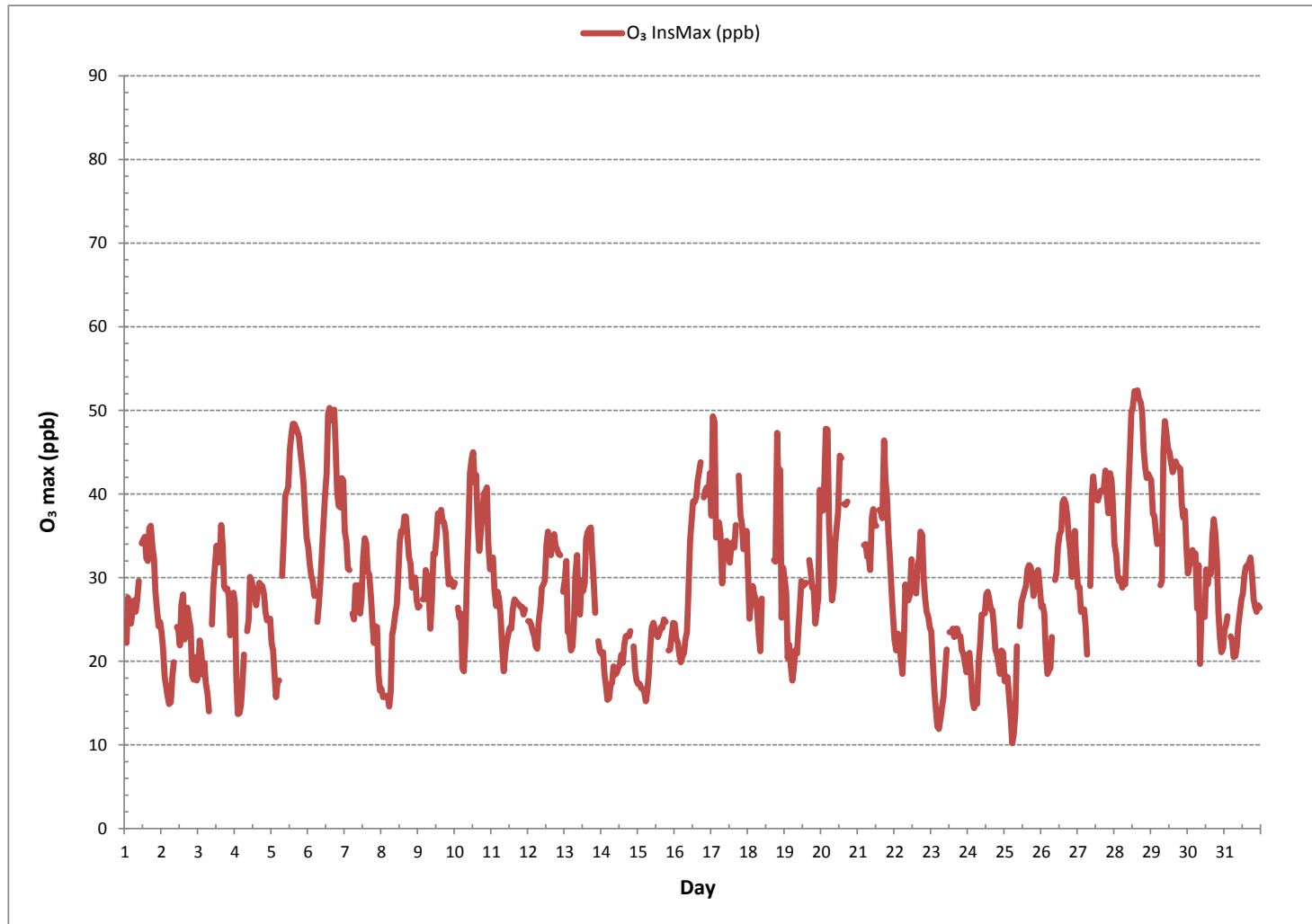
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697
MAXIMUM INSTANTANEOUS VALUE:	52.4 ppb @ HOUR 15 ON DAY 28
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	8.4

**OZONE Instantaneous Maximum (O<sub>3</sub> ppb)**





WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	16.2	21.5	17.8	18.4	18.4	19.7	24.1	24.3	30.0	28.5	35.5	46.6	49.9	51.2	46.2	45.1	42.3	39.6	27.4	31.4	24.1	20.6	21.5	22.8	16.2	51.2	30.1	24	
2	20.2	16.9	17.7	17.5	18.6	16.0	21.3	19.3	16.4	19.3	19.1	19.1	33.7	29.6	20.6	16.9	20.4	17.1	14.9	15.1	12.3	11.2	12.1	9.9	9.9	33.7	18.1	24	
3	12.5	12.3	13.6	12.3	19.3	16.2	17.1	11.6	15.2	19.5	22.8	27.4	41.0	36.6	27.1	52.1	53.0	10.7	13.4	16.2	16.4	17.3	17.4	17.4	10.7	53.0	21.6	24	
4	16.5	16.9	11.0	18.6	18.4	22.6	21.7	24.5	23.2	22.3	25.4	31.8	31.3	34.9	32.6	35.2	26.7	26.7	12.5	9.2	7.9	7.7	4.8	7.5	4.8	35.2	20.4	24	
5	9.6	12.1	13.6	12.1	13.2	12.5	13.4	22.1	25.2	34.6	35.0	33.1	38.5	41.2	36.1	41.8	41.8	37.2	37.4	31.4	21.3	19.6	27.8	25.2	9.6	41.8	26.5	24	
6	19.7	22.3	24.3	26.1	23.0	22.6	24.0	26.5	31.1	34.2	36.3	34.0	36.8	32.0	29.6	20.2	21.2	21.9	13.6	15.8	58.3	55.4	18.4	32.0	13.6	58.3	28.3	24	
7	23.5	23.2	16.2	18.8	21.0	18.0	24.5	29.4	25.2	44.9	47.7	31.1	40.1	56.9	65.0	53.6	57.8	55.8	37.2	25.2	46.9	38.6	26.5	27.4	16.2	65.0	35.6	24	
8	16.7	16.0	11.5	13.6	15.8	10.3	11.0	17.1	22.8	28.7	30.0	32.2	35.3	36.4	39.0	44.2	48.2	35.0	31.1	19.7	10.7	11.6	11.4	14.3	10.3	48.2	23.4	24	
9	14.5	16.0	17.4	15.3	27.6	27.4	13.6	21.7	18.6	19.3	21.2	26.1	25.0	23.4	25.4	29.1	28.7	36.6	44.2	32.0	20.2	17.3	15.1	12.1	12.1	44.2	22.8	24	
10	13.2	12.1	10.8	9.7	12.3	18.0	16.9	7.5	13.4	19.3	20.8	30.7	22.6	11.0	16.0	13.4	12.5	12.1	30.7	45.3	42.3	25.6	19.5	16.0	7.5	45.3	18.8	24	
11	23.4	23.7	25.8	26.7	29.6	30.7	26.9	25.2	37.5	28.5	32.4	44.9	40.1	31.8	31.8	34.4	44.2	37.2	30.7	26.8	21.5	20.0	22.2	23.4	20.0	44.9	30.0	24	
12	25.0	23.9	23.0	16.4	17.1	17.1	18.2	25.0	23.7	37.5	44.7	41.8	41.6	57.3	48.2	44.7	33.7	32.6	25.6	14.0	7.0	7.9	8.4	8.1	7.0	57.3	26.8	24	
13	6.4	13.4	10.7	29.8	23.9	8.8	9.0	7.0	13.2	10.5	19.3	26.1	15.3	15.8	23.7	29.6	38.6	25.4	23.7	27.0	29.6	25.8	22.1	20.6	6.4	38.6	19.8	24	
14	17.5	19.5	25.4	27.2	30.7	31.6	32.7	40.5	39.2	49.7	49.3	55.4	58.5	56.7	51.0	50.4	49.3	59.1	50.4	51.0	34.2	21.7	16.7	18.4	16.7	59.1	39.0	24	
15	19.2	17.1	17.3	17.6	14.9	17.1	23.0	25.0	25.8	27.4	29.4	35.3	30.2	27.8	26.5	24.3	20.4	18.0	15.0	12.9	18.2	17.1	14.5	16.0	12.9	35.3	21.3	24	
16	17.5	18.2	16.1	18.2	29.6	28.0	32.9	34.6	42.7	38.3	43.6	36.8	38.5	35.2	36.3	29.4	29.6	34.4	21.0	12.1	10.1	12.3	11.6	14.2	10.1	43.6	26.7	24	
17	17.7	16.0	16.4	10.9	10.7	8.6	8.4	12.9	12.7	15.8	20.4	23.9	26.5	35.5	32.0	30.7	33.7	24.5	18.0	7.3	8.6	6.8	7.9	10.7	6.8	35.5	17.4	24	
18	23.2	29.6	27.1	36.6	25.0	22.3	11.4	9.9	28.0	15.6	24.1	19.7	16.9	17.1	20.6	16.7	13.0	12.3	9.4	63.7	20.2	13.2	23.2	14.3	9.4	63.7	21.4	24	
19	11.2	11.0	21.7	27.2	21.5	20.4	18.0	20.2	20.8	24.1	25.8	29.4	24.8	21.5	25.2	25.6	25.8	15.1	12.3	8.1	10.6	9.9	32.6	34.8	8.1	34.8	20.7	24	
20	18.2	12.9	23.5	44.0	19.3	16.4	19.1	27.4	25.9	26.7	32.0	44.4	44.7	46.6	53.8	49.9	53.7	37.4	P	P	P	P	P	P	P	12.9	53.8	33.1	18
21	P	P	P	20.8	27.2	23.4	10.8	25.0	21.0	21.0	30.3	27.2	28.5	28.0	21.9	12.1	10.4	52.8	9.9	32.7	18.0	17.1	20.4	18.0	9.9	52.8	22.7	21	
22	19.7	15.6	19.8	20.8	24.3	24.6	33.1	50.8	44.5	49.0	58.0	63.3	68.3	57.1	70.3	52.1	45.1	45.8	43.6	34.2	21.2	21.3	19.9	21.3	15.6	70.3	38.5	24	
23	28.7	23.2	21.9	23.0	19.3	19.1	22.8	21.9	27.0	26.1	37.1	32.0	33.9	38.8	34.6	33.8	33.1	30.0	26.9	15.8	16.9	17.7	14.0	13.2	13.2	38.8	25.5	24	
24	15.6	14.5	15.1	14.9	16.9	13.2	15.3	16.5	23.0	27.6	28.7	26.5	33.1	26.9	29.6	28.0	28.0	30.2	31.1	14.7	12.1	11.2	11.0	9.9	9.9	33.1	20.6	24	
25	11.6	11.6	11.2	10.5	10.1	8.8	7.9	10.7	12.3	16.7	16.2	13.2	10.3	14.7	14.9	8.8	7.2	7.9	6.2	5.3	5.3	7.3	6.2	7.1	5.3	16.7	10.1	24	
26	8.1	9.0	9.5	7.9	9.7	9.5	10.3	7.5	11.4	10.1	14.9	15.3	12.4	13.8	13.4	14.7	13.6	18.8	16.3	9.9	8.3	8.3	9.6	10.3	7.5	18.8	11.4	24	
27	11.4	11.9	9.9	8.1	8.6	8.1	6.4	8.1	9.6	13.6	12.7	19.3	15.6	14.4	16.7	17.3	17.1	30.0	12.5	7.7	12.1	13.4	16.7	14.5	6.4	30.0	13.2	24	
28	15.6	16.2	14.3	13.6	11.2	11.4	10.7	12.1	12.5	12.8	23.2	22.3	27.6	27.1	28.3	29.8	17.1	18.2	X	11.8	13.2	14.0	17.1	16.9	10.7	29.8	17.3	23	
29	19.1	16.0	16.5	14.5	16.2	16.1	14.9	15.8	19.9	20.8	22.8	32.4	31.8	35.7	30.7	29.8	28.1	36.6	24.1	20.2	20.6	11.6	10.3	11.0	10.3	36.6	21.5	24	
30	9.6	9.0	7.9	7.7	11.2	17.1	22.6	11.9	13.8	34.5	14.2	19.5	39.0	40.5	40.3	41.6	39.9	40.7	30.2	33.5	30.2	15.8	20.2	16.0	7.7	41.6	23.6	24	
31	11.8	11.2	9.0	9.4	9.4	8.6	7.2	11.0	12.9	14.0	18.8	19.9	23.0	26.9	28.1	28.5	24.8	16.7	13.4	12.7	18.0	21.7	27.4	39.7	7.2	39.7	17.7	24	
HOURLY MAX	28.7	29.6	27.1	44.0	30.7	31.6	33.1	50.8	44.5	49.7	58.0	63.3	68.3	57.3	70.3	53.6	57.8	59.1	50.4	63.7	58.3	55.4	32.6	39.7					
HOURLY AVG	16.4	16.4	16.5	18.3	18.5	17.6	17.7	20.1	22.5	25.5	28.8	31.0	32.7	33.0	32.8	31.7	30.9	29.6	23.5	22.1	19.9	17.3	16.9	17.4					

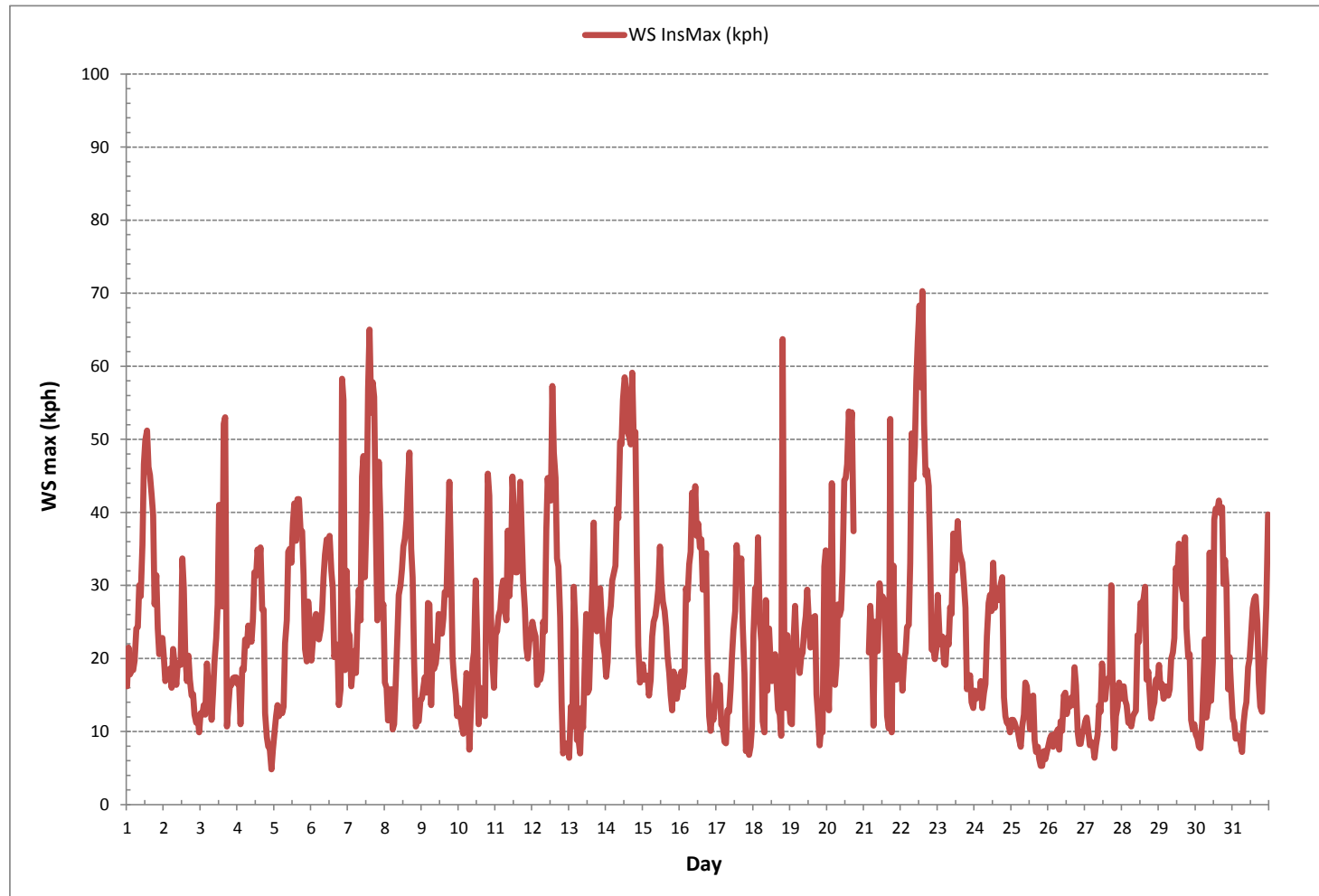
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	70.3	kph	@ HOUR	14	ON DAY	22	
OPERATIONAL TIME:						734	hrs

**WIND SPEED Instantaneous Maximum (WS kph)**





***APPENDIX IV  
REPORT CERTIFICATION FORM***

### Report Certification Form

<b>Alberta Airshed</b> (if applicable)	<b>EPA Approval or Code of Practice Registration #</b> (if applicable)
YES	NA
<b>Company Name</b> (if applicable)	<b>Industrial Operation Name</b> (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	ST. LINA CONTINUOUS MONITORING STATION
<b>Name of the Representative of the Person Responsible</b>	<b>Position / Title of the Representative of the Person Responsible</b>
Mike Bisaga	Environment Monitoring Program Manager
<b>Is an External Party Certifying the Report?</b>	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Name of External Person Certifying the Report</b>	<b>Position / Title of External Person Certifying the Report</b>
Wunmi Adekanmbi	Project Team Lead, Customer Service - Air Services
<b>Company Name for External Person Certifying the Report</b>	<b>Identification of Qualifications / Professional Designations of the External Person Certifying the Report</b>
Maxxam Analytics, A Bureau Veritas Group Company	M.Sc., EPT., PMP

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



\_\_\_\_\_  
Signature of the External Person Certifying the Report

31-08-2018

\_\_\_\_\_  
Report Issued Date (dd-mm-yyyy)

***APPENDIX V***  
***DATA VALIDATION CERTIFICATION FORM***



### Validation Certificate Form

<b>Client:</b> <u>Lakeland Industry &amp; Community Association</u>	<b>Project #:</b> <u>2833-2018-07-31-C</u>
<b>Site:</b> <u>St. Lina Continuous Monitoring Station</u>	<b>Contact:</b> <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>29 - 08 -2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>29 - 08 -2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>30 - 08 -2018</u>
Level 3 Independent Data Review	<u>msdmba</u>	Date <u>31 - 08 -2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

<b>Notes</b>
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.