

Alberta Environment and Parks (AEP)
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May 31, 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 April 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 April 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

THC: The LICA-owned Thermo 51C analyzer, s/n: 51CLT-77021-384, was removed for required maintenance on April 8. Another LICA-owned Thermo 51C analyzer, s/n: 436609739, was installed on the same day. The LICA-owned Thermo 51C, s/n: 436609739, was replaced with a Maxxam-supplied Thermo 51i analyzer, s/n: 1118249035, on April 25 due to zero instability.

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.



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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, sweeping initial "M".

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

JOB #: 2833-2018-04-1-C

April 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **May 30, 2018**

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SUMMARY

In April 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.

All data collected this month 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.

THC: Sixty-six hours of downtime were recorded this month.

- Based on AEP recommendations resulting from the station audit on March 14, the fuel regulator pressure was increased on April 5, in order to address an ongoing instability in zero response. Two hours of downtime were recorded due to this maintenance event.
- Repeat zero-span checks were performed on April 7 at hours 06:00 and 15:00 resulting in two hours of downtime.
- On April 8, the LICA-owned Thermo 51C (s/n: 51CLT-77021-384) was removed for required maintenance and replaced with another LICA-owned Thermo 51C (s/n: 436609739). Eight hours of downtime were recorded as a result.
- The analyzer spanned incorrectly on April 9. A repeat zero-span response check was initiated on April 10 at hour 08:00 resulting in an hour of downtime.
- On April 25, the LICA-owned Thermo 51C (s/n: 436609739) was replaced with a Maxxam-supplied Thermo 51i (s/n: 1118249035) analyzer, due to zero instability. Nine hours of downtime were recorded due to this event.
- Data emerging at concentrations less than 1.80 ppm (based on maxxam's internal standard), subsequent to data treatment, were deemed invalid and therefore discarded. Forty-four hours of downtime were incurred as a result.

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, Cold Lake South Continuous Monitoring Station.

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 ₂ (ppb)	172	48	0	0	0	3	9	17	11.6	SW	1	3	100.0
TRS (ppb)	-	-	-	-	0	1	20	5	1.8	SE	0	1	100.0
THC (ppm)	-	-	-	-	2.19	3.48	25	6	3.1	WSW	2.59	13	90.8
NO ₂ (ppb)	159	-	0	-	3	25	19	6	0.6	E	7	7	100.0
NO (ppb)	-	-	-	-	0	19	19	6	0.6	E	1	1	100.0
NO _x (ppb)	-	-	-	-	4	44	19	6	0.6	E	8	7	100.0
O ₃ (ppb)	82	-	0	-	40.0	58.1	9	16	12.3	SW	47.5	26	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	3	37	15	6	3.2	ENE	10	9	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	57	100	15	21	6.6	NE	88	17	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	0.7	27.3	28	16	12.3	SW	17.3	28	100.0
VECTOR WS (kph)	-	-	-	-	0.6	18.9	22	17	-	NW	12.1	22	100.0
VECTOR WD (sec)	-	-	-	-	238 (SW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 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.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), 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 (SO₂)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on April 4.
- One instance of maximum instantaneous data was discarded on April 8 at hour 11:00 due to a brief power outage.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on April 4.
- One instance of maximum instantaneous data was discarded on April 8 at hour 11:00 due to a brief power outage.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 90.8%, equivalent to 66 hours of downtime.
- Based on AEP recommendations resulting from the station audit on March 14, the fuel regulator pressure was increased on April 5, following a successful shut-down calibration, in order to address an ongoing instability in zero response. A post-repair calibration was successfully completed afterwards. Two hours of downtime were recorded due to this maintenance event.
- The pressure adjustment appeared to have had a negative effect as confirmed by the unusual drifts in the results of scheduled and repeat zero-span checks, and recorded THC concentrations between April 6 and April 7. As such, analyzer replacement was deemed necessary. On April 8, following a successful shut-down calibration, the LICA-owned Thermo 51C (s/n: 51CLT-77021-384) was removed for required maintenance and replaced with another LICA-owned Thermo 51C (s/n: 436609739). An installation calibration was successfully completed afterwards. Ten hours of downtime were recorded due to the additional quality activities.
- The analyzer spanned incorrectly on April 9. A repeat zero-span response check was initiated on April 10 at hour 08:00; the results were within AMD requirements and exhibited no drifts. The issue was investigated remotely and no apparent cause could be found. One hour of downtime was, however, incurred due to the additional quality check.
- The Thermo 51C (s/n: 436609739) analyzer also exhibited zero instability beginning mid-month. It was decided that an i-series analyzer be installed. On April 25, following a successful shut-down calibration, the LICA-owned Thermo 51C (s/n: 436609739) was replaced with a Maxxam-supplied Thermo 51i (s/n: 1118249035) analyzer. An installation calibration was successfully completed afterwards. Nine hours of downtime were recorded due to this event.
- Due to the instability in daily zero response, data collected between April 5 hour 16:00 and April 8 hour 08:00 were baseline-corrected using the April 5 post-repair calibrator zero. Similarly, data collected between April 8 hour 17:00 and April 25 hour 10:00 were baseline-corrected using the calibrator zero of the April 8 installation calibration.
- Data emerging at concentrations less than 1.80 ppm (based on maxxam's internal standard), subsequent to this data treatment, were deemed invalid and therefore discarded. Forty-four hours of downtime were incurred as a result.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on April 4.
- One instance of maximum instantaneous data was discarded on April 8 at hour 11:00 due to a brief power outage.

OZONE (O₃)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on April 5.
- One instance of maximum instantaneous data was discarded on April 8 at hour 11:00 due to a brief power outage.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- The routine monthly audit was performed on April 23.

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

- Operational time for the monitoring period was 100%.
- One instance of maximum instantaneous data was discarded on April 8 at hour 11:00 due to a brief power outage.
- 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%.

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 were Alexander Yakupov and Limin Li.

3.0 Plant Monthly Required AMD Summary

All data collected this month 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.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

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 O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x 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 51C & Thermo 51i FID Analyzers
- Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo SHARP 5030 Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Ambient Temperature - Met One Unit
- Datalogger - ESC 8832

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

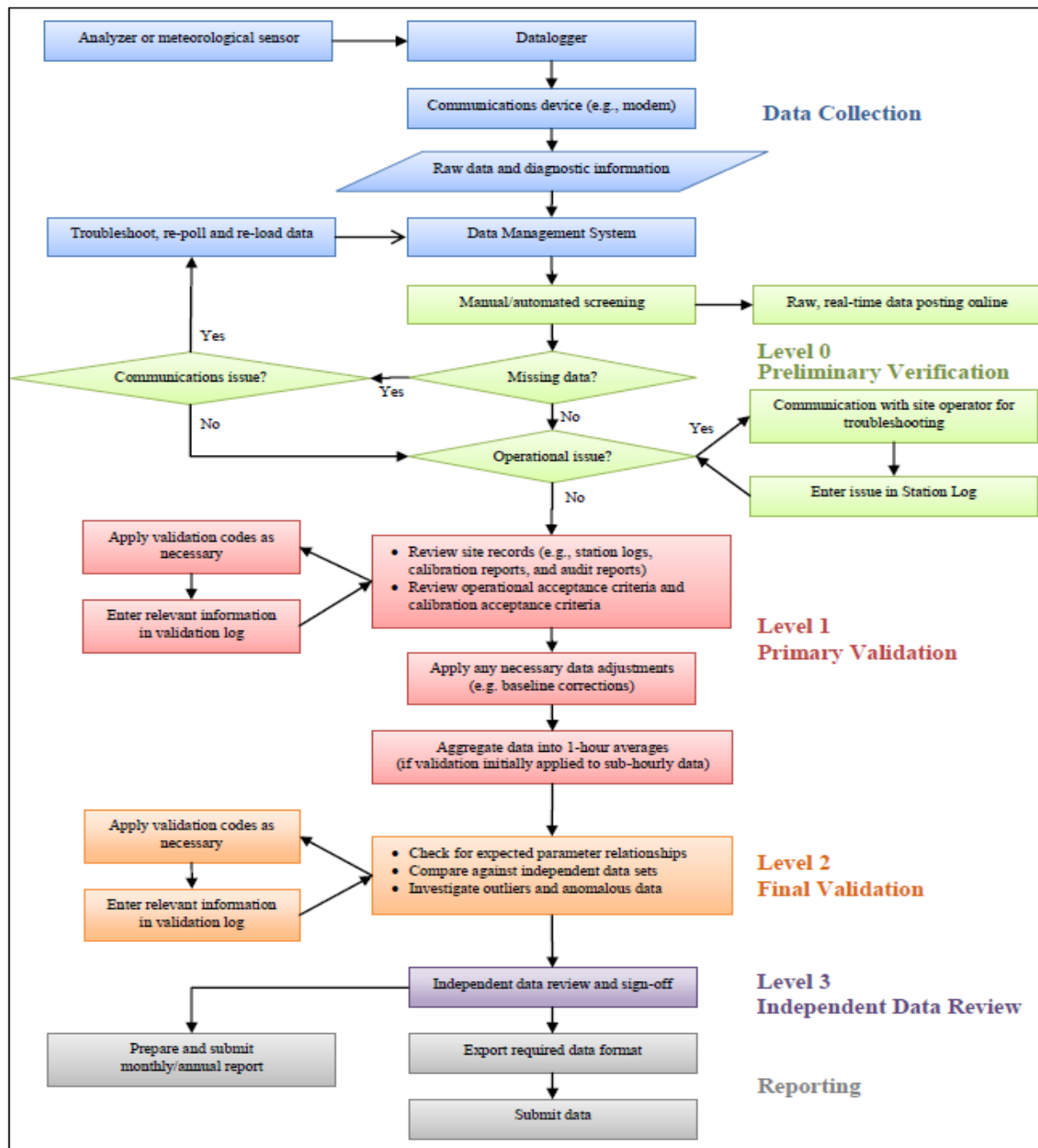
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (SO₂ 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	S	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	0	24	0	1	0	24	
2	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	2	0	0	2	0	24	0	2	0	24	
3	2	2	S	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	1	0	2	1	0	24	2	2	1	24	
4	2	S	2	1	0	1	1	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	24	2	2	0	24	
5	S	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	24	0	1	0	24	
6	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	0	24	0	2	0	24	
7	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	0	24	0	1	0	24	
8	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	0	0	0	24
9	0	0	0	0	0	0	0	0	1	1	2	1	1	1	1	2	3	1	S	0	0	0	0	0	0	0	3	1	0	24	3	1	0	24	
10	0	0	1	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	0	24	0	1	0	24	
11	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	0	0	24	0	0	0	24
12	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	24	0	0	0	24
13	0	0	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	1	0	0	24	0	1	0	24
14	0	0	0	0	0	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	24	0	1	0	24
15	0	0	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	24	0	1	0	24
16	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	0	24	0	0	0	24
17	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	24	0	0	0	24
18	0	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	24	0	1	0	24
19	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	24	0	1	0	24
20	0	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	24	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	0	0	24	0	0	0	24
22	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	0	0	0	24
23	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	0	0	0	24
24	0	0	0	0	S	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	24	0	1	0	24
25	0	0	0	S	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	24	0	2	0	24
26	0	0	S	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	24	0	1	0	24
27	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	1	0	1	0	0	24	0	1	0	24	
28	S	1	1	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	24	0	1	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	S	0	0	0	0	0	0	0	24	0	0	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	S	0	0	0	0	0	0	0	24	0	0	0	24
HOURLY MAX	2	2	2	1	1	1	1	2	2	1	2	1	1	1	1	1	2	3	1	1	1	1	2	2	2	2	2	2	2	2	24				
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	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

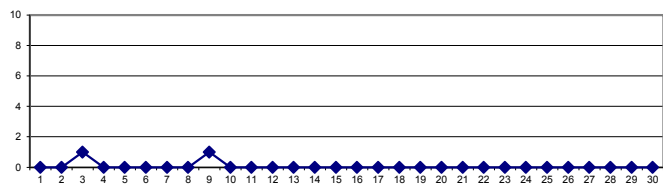
OBJECTIVE LIMIT:

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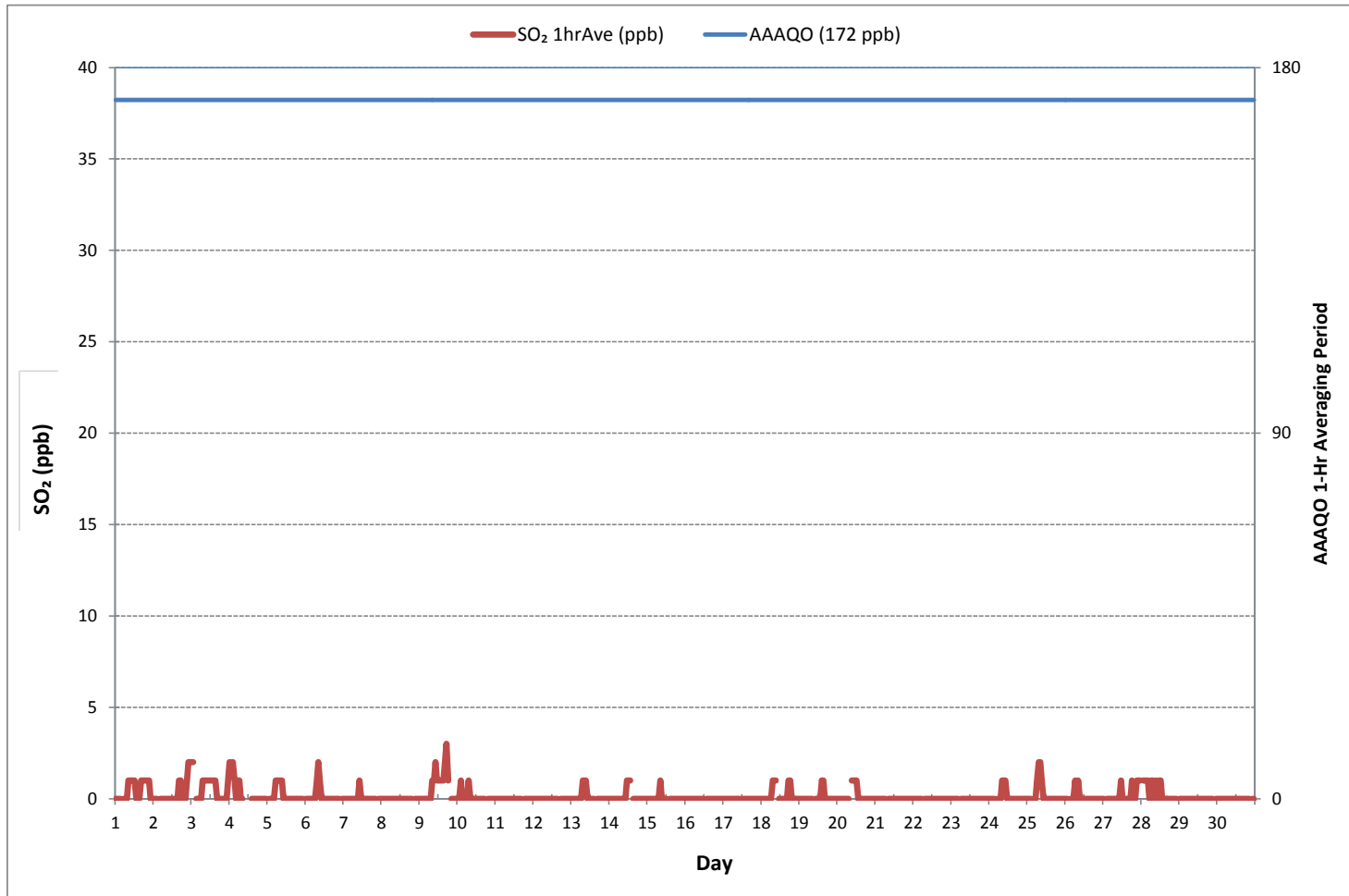
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	96		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	3 ppb @ HOUR	17 ON DAY	9
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	3
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES April 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO2[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

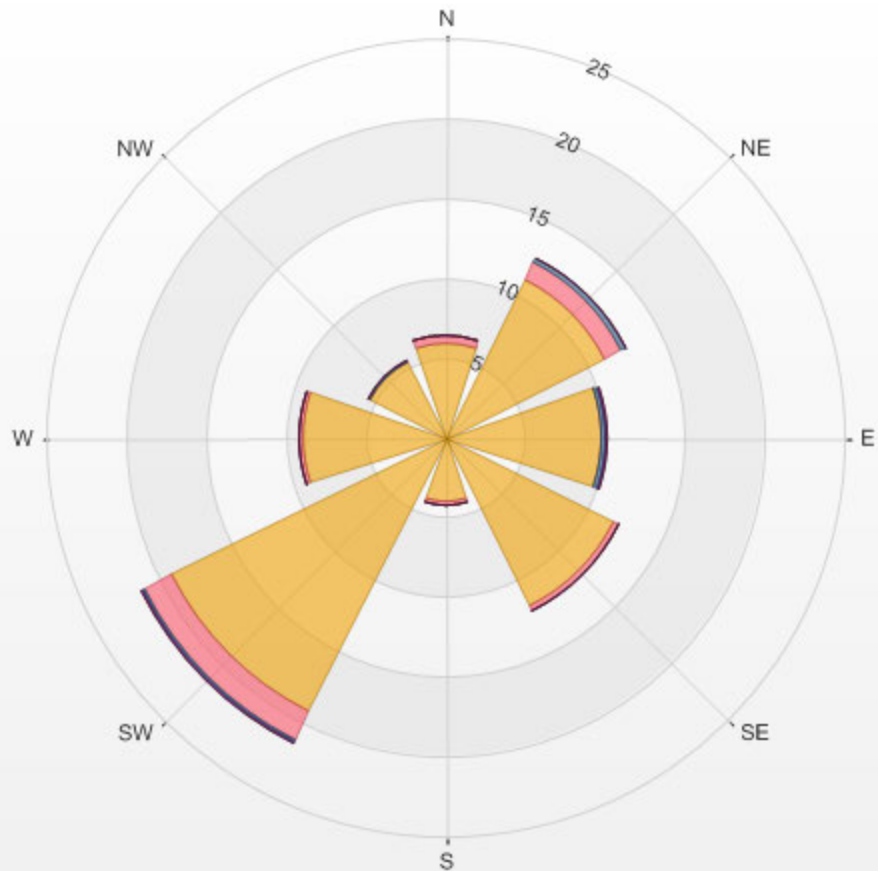
Calm: 18.33%

Calm Avg: 0.14 [ppb]

Direction	0.0-0.8	0.8-1.6	1.6-2.4	2.4-3.2	3.2-4.0	>4.0	Total
N	6.0	0.4	0.0	0.0	0.0	0.0	6.5
NE	11.1	1.2	0.3	0.0	0.0	0.0	12.6
E	9.8	0.0	0.2	0.2	0.0	0.0	10.1
SE	11.7	0.4	0.0	0.0	0.0	0.0	12.2
S	4.0	0.3	0.0	0.0	0.0	0.0	4.3
SW	19.2	1.9	0.2	0.2	0.0	0.0	21.4
W	8.9	0.3	0.0	0.0	0.0	0.0	9.2
NW	5.3	0.0	0.2	0.0	0.0	0.0	5.4
Summary	76.1	4.5	0.7	0.3	0.0	0.0	81.7

%	Icon	Classes (ppb)	76	5	1	0	0	0
		0.0-0.8						
		0.8-1.6						
		1.6-2.4						
		2.4-3.2						
		3.2-4.0						
		>4.0						

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.33% Calm Poll Avg: 0.14[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL REDUCED SULPHUR

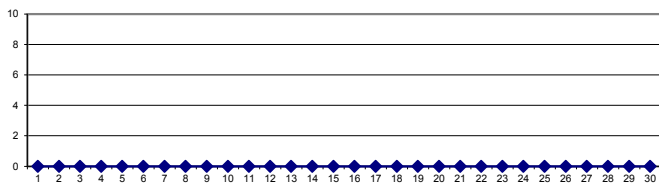
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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 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	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	
2	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	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	
4	0	S	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
5	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	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	S	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	S	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	S	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	0	0	S	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	0	S	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	0	0	S	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	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	24	
14	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	
15	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	
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	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	24	
18	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	
19	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	1	1	1	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	0	S	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	S	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24
25	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
26	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
27	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
28	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	S	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	S	0	0	0	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	S	0	0	0	0	0	24
HOURLY MAX	0	0	0	0	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	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	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

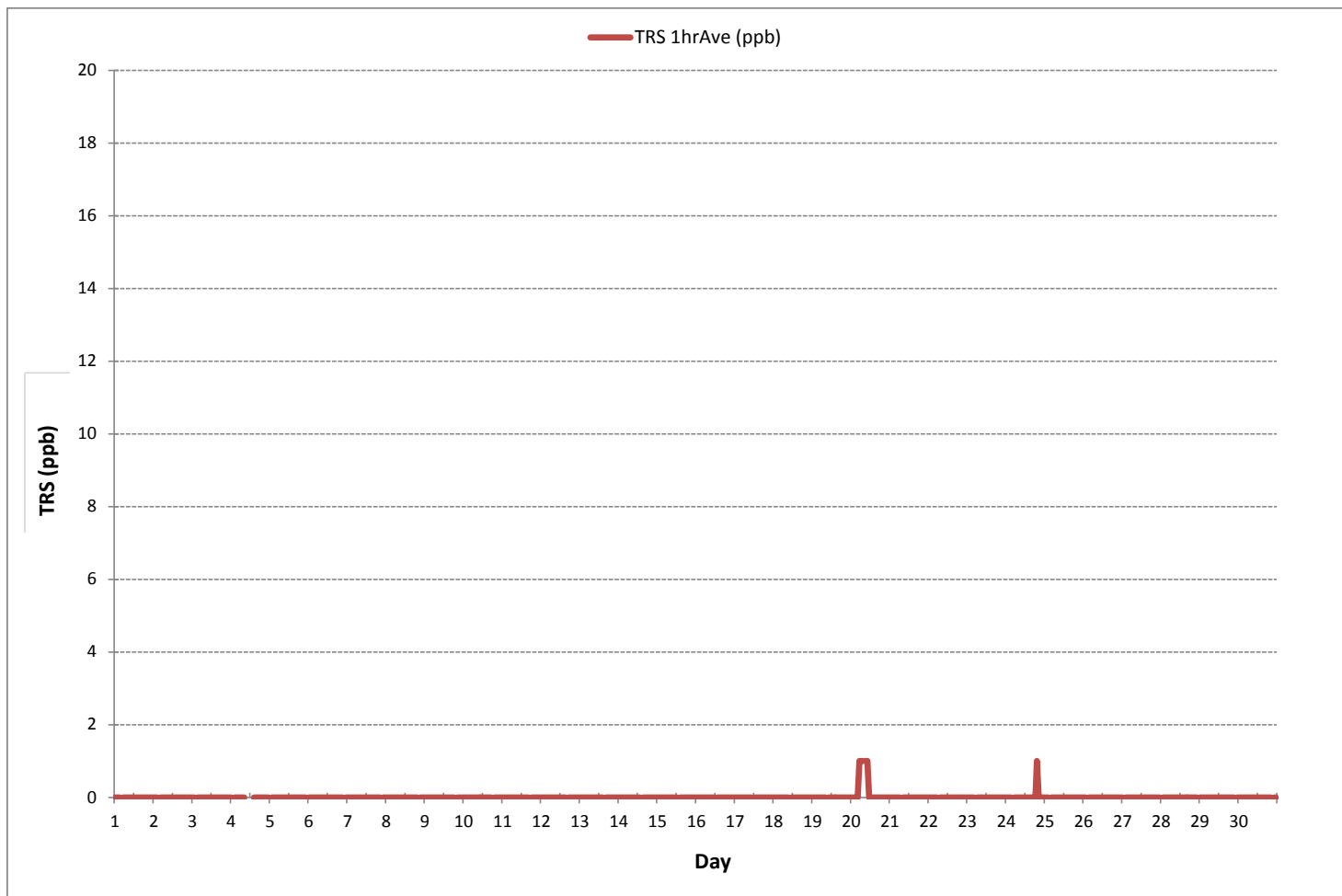
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	6				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	1	ppb @ HOUR	5	ON DAY 20	
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	720	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb




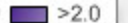
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



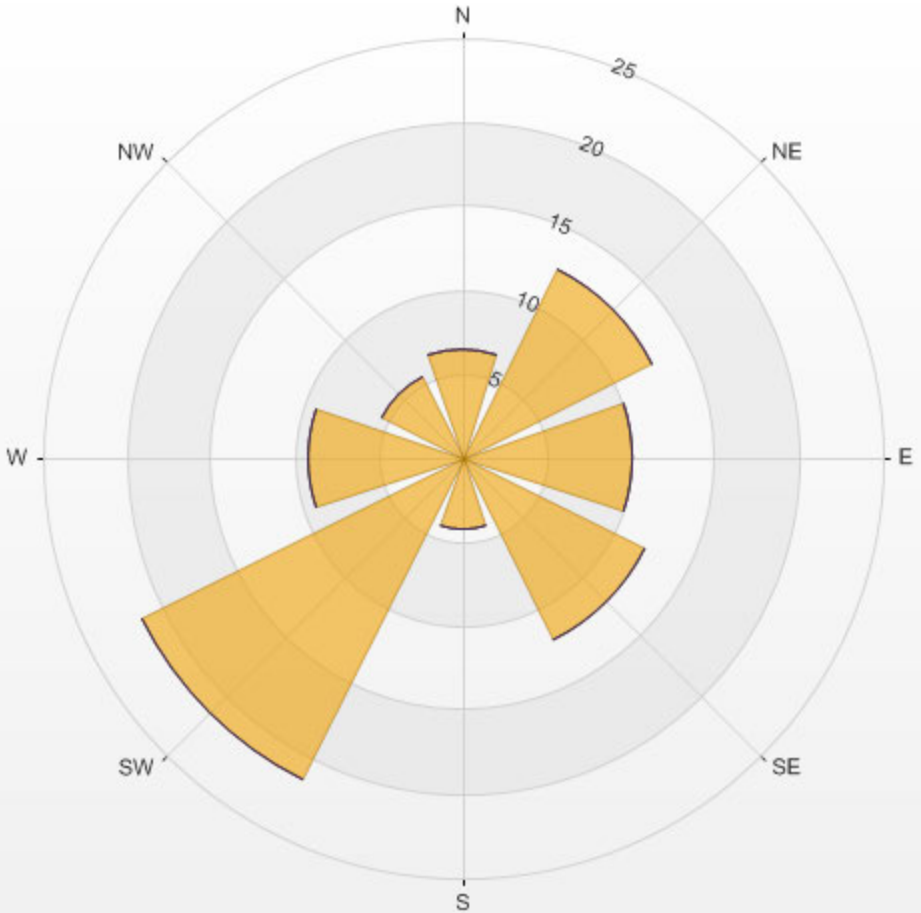
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.33% Calm Avg: 0.20 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	6.5	0.0	0.0	0.0	6.5
NE	12.6	0.0	0.0	0.0	12.6
E	10.1	0.0	0.0	0.0	10.1
SE	12.2	0.0	0.0	0.0	12.2
S	4.3	0.0	0.0	0.0	4.3
SW	21.4	0.0	0.0	0.0	21.4
W	9.2	0.0	0.0	0.0	9.2
NW	5.4	0.0	0.0	0.0	5.4
Summary	81.7	0.0	0.0	0.0	81.7

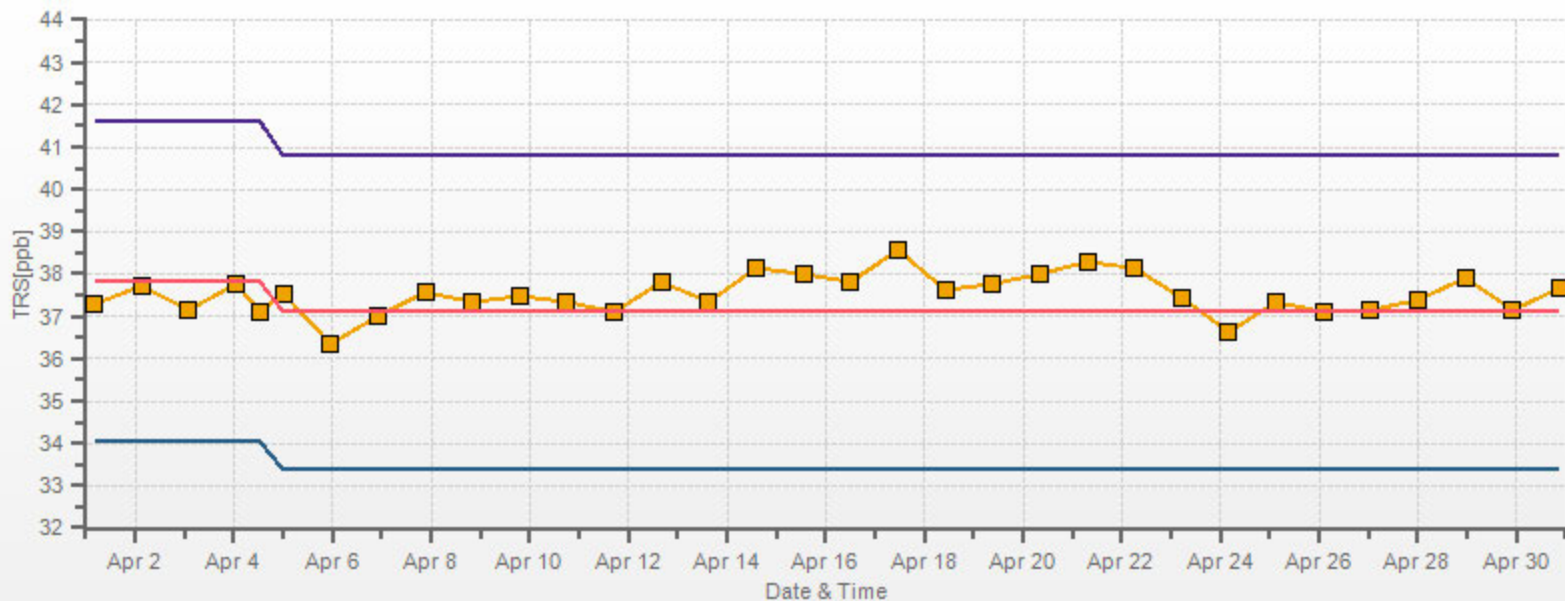
% Icon	Classes (ppb)	82	0	0	0
	0.0-0.7		0.7-1.3		1.3-2.0
	>2.0				

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.33% Calm Poll Avg: 0.20[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



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

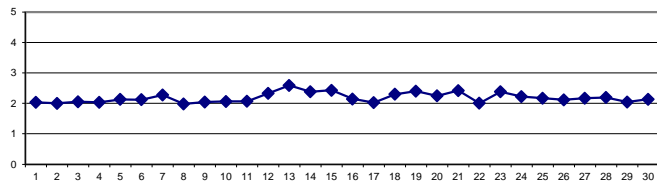
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.07	2.07	2.07	2.13	S	2.15	2.19	2.22	2.16	2.07	2.02	2.05	1.97	1.92	1.93	1.91	1.94	1.94	1.96	2.00	1.97	2.00	2.02	1.99	1.91	2.22	2.03	24
2	2.05	2.23	2.22	S	2.07	2.05	2.04	2.06	2.01	1.93	1.93	1.88	1.94	1.96	1.93	1.94	1.97	1.99	1.97	1.97	2.00	1.99	1.95	1.99	1.88	2.23	2.00	24
3	1.99	2.02	S	2.08	2.13	2.08	2.20	2.18	2.08	2.05	2.01	2.05	2.07	2.00	1.96	2.03	2.01	2.04	2.03	2.06	2.06	2.07	2.08	2.03	1.96	2.20	2.06	24
4	2.07	S	2.07	2.08	2.09	2.11	2.07	2.06	2.06	2.10	2.06	1.98	1.96	2.00	2.00	1.97	1.95	1.95	1.99	2.03	2.01	2.03	2.07	2.08	1.95	2.11	2.03	24
5	S	2.12	2.14	2.18	2.23	2.25	2.28	2.33	C	C	C	Y	Y	C	C	C	2.08	2.07	2.03	2.02	2.05	2.05	2.00	S	2.00	2.33	2.13	22
6	2.08	2.09	2.05	2.04	2.06	2.09	2.09	2.33	2.03	1.86	1.86	X	X	X	X	X	X	2.18	2.27	2.24	2.24	2.25	S	2.35	1.86	2.35	2.12	18
7	2.38	2.39	2.37	2.40	2.43	2.43	S1	2.20	2.04	1.87	X	X	X	X	X	S1	X	X	X	X	X	S	X	X	1.87	2.43	2.28	10
8	X	X	X	X	X	X	X	X	X	C1	C1	Y	Y	C1	C1	C1	C1	1.97	1.96	1.96	S	2.02	2.00	2.00	1.96	2.02	1.99	7
9	1.96	1.96	1.97	1.97	1.97	2.03	2.10	2.16	2.11	1.93	1.94	1.94	2.05	2.00	1.99	2.02	2.01	1.98	1.97	S	2.14	2.21	2.31	2.24	1.93	2.31	2.04	24
10	2.20	2.19	2.21	2.28	2.33	2.41	2.33	2.24	S1	2.08	2.03	2.01	1.97	1.94	1.89	1.89	1.85	1.87	S	1.95	1.99	1.95	1.93	1.95	1.85	2.41	2.07	23
11	1.94	1.94	1.91	1.88	1.87	1.87	1.88	1.91	2.12	2.13	2.12	2.09	2.12	2.16	2.14	2.14	2.10	S	2.08	2.18	2.21	2.20	2.25	2.34	1.87	2.34	2.07	24
12	2.39	2.39	2.54	2.43	2.50	2.41	2.31	2.25	2.24	2.24	2.24	2.19	2.15	2.11	2.07	2.09	S	2.27	2.32	2.40	2.41	2.50	2.55	2.56	2.07	2.56	2.33	24
13	2.56	2.66	2.69	2.74	2.86	2.94	2.73	2.82	2.71	2.59	2.50	2.47	2.49	2.50	2.44	S	2.47	2.47	2.54	2.55	2.51	2.47	2.43	2.46	2.43	2.94	2.59	24
14	2.36	2.37	2.26	2.25	2.29	2.31	2.25	2.31	2.27	2.24	2.31	2.36	2.41	2.43	S	2.43	2.42	2.39	2.37	2.36	2.52	2.58	2.61	2.67	2.24	2.67	2.38	24
15	2.77	2.70	2.70	2.75	2.69	2.72	2.64	2.53	2.48	2.36	2.39	2.35	2.33	S	2.20	2.21	2.18	2.21	2.24	2.29	2.31	2.30	2.29	2.31	2.18	2.77	2.43	24
16	2.34	2.34	2.34	2.35	2.35	2.34	2.26	2.27	2.23	2.18	2.11	2.04	S	2.08	2.15	2.11	2.05	2.00	1.89	1.98	2.01	2.02	2.00	1.95	1.89	2.35	2.15	24
17	1.99	1.96	1.99	2.00	1.96	1.98	1.97	1.91	1.88	1.85	1.86	S	1.91	1.97	2.05	2.13	2.14	2.19	2.16	2.18	2.18	2.13	2.14	2.16	1.85	2.19	2.03	24
18	2.28	2.30	2.29	2.31	2.38	2.47	2.47	2.47	2.28	2.16	S	2.12	2.18	2.24	2.20	2.17	2.17	2.13	2.13	2.22	2.42	2.48	2.54	2.53	2.12	2.54	2.30	24
19	2.50	2.62	2.69	2.85	2.84	2.91	2.92	2.57	2.55	S	2.34	2.35	2.35	2.26	2.24	2.19	2.10	2.11	2.12	2.17	2.12	2.14	2.17	2.17	2.10	2.92	2.40	24
20	2.23	2.26	2.29	2.45	2.52	2.58	2.64	2.37	S	2.27	2.28	2.19	2.07	2.03	2.01	1.92	1.86	1.84	X	1.95	2.15	2.25	2.50	2.82	1.84	2.82	2.25	23
21	2.63	3.03	3.01	2.62	2.71	2.63	2.47	S	2.12	2.06	2.02	1.92	1.85	X	X	X	X	X	X	X	X	X	X	X	1.85	3.03	2.42	13
22	X	X	X	X	X	1.80	S	1.84	1.88	1.89	1.90	1.92	1.93	1.91	1.88	1.88	1.90	1.95	2.01	2.08	2.22	2.41	2.36	2.37	1.80	2.41	2.01	19
23	2.47	2.54	2.60	2.62	2.63	S	2.72	2.65	2.54	2.38	2.42	2.34	2.22	2.17	2.14	2.13	2.12	2.17	2.13	2.17	2.33	2.45	2.35	2.52	2.12	2.72	2.38	24
24	3.32	2.65	2.54	2.98	S	2.84	2.76	2.67	2.42	2.19	2.07	1.98	2.01	2.02	1.92	1.84	1.88	1.84	1.86	1.84	1.88	1.87	1.87	1.95	1.84	3.32	2.23	24
25	2.00	1.97	1.96	S	2.14	2.26	3.48	2.30	1.92	1.84	1.85	C1	C1	Y	Y	Y	Y	C1	C1	C1	2.07	2.22	2.22	2.13	1.84	3.48	2.17	15
26	2.11	2.20	S	2.17	2.18	2.24	2.25	2.28	2.09	2.02	2.04	2.05	2.06	2.06	2.05	2.06	2.03	2.03	2.04	2.05	2.09	2.09	2.36	2.20	2.02	2.36	2.12	24
27	2.14	S	2.18	2.27	2.41	2.51	2.34	2.16	2.19	2.12	2.14	2.13	2.14	2.10	2.14	2.13	2.15	2.14	2.14	2.12	2.10	2.10	2.07	2.05	2.05	2.51	2.17	24
28	S	2.06	2.09	2.13	2.18	2.25	2.33	2.17	2.19	2.22	2.25	2.24	2.23	2.19	2.17	2.18	2.12	2.13	2.16	2.18	2.15	2.26	2.44	S	2.06	2.44	2.20	24
29	2.06	2.04	2.01	2.00	2.07	2.10	2.05	2.04	2.05	2.04	2.03	2.04	2.04	2.03	2.00	2.03	2.03	2.01	2.00	2.04	2.07	2.05	S	2.23	2.00	2.23	2.05	24
30	2.22	2.24	2.26	2.29	2.36	2.50	2.47	2.23	2.08	2.05	2.03	1.98	2.03	2.03	2.08	2.03	1.99	1.99	2.04	2.00	2.04	S	2.08	2.15	1.98	2.50	2.14	24
HOURLY MAX	3.32	3.03	3.01	2.98	2.86	2.94	3.48	2.82	2.71	2.59	2.50	2.47	2.49	2.50	2.44	2.43	2.47	2.47	2.54	2.55	2.52	2.58	2.61	2.82				
HOURLY AVG	2.27	2.28	2.29	2.32	2.32	2.33	2.38	2.27	2.18	2.10	2.11	2.11	2.10	2.09	2.07	2.06	2.06	2.07	2.10	2.12	2.16	2.19	2.22	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

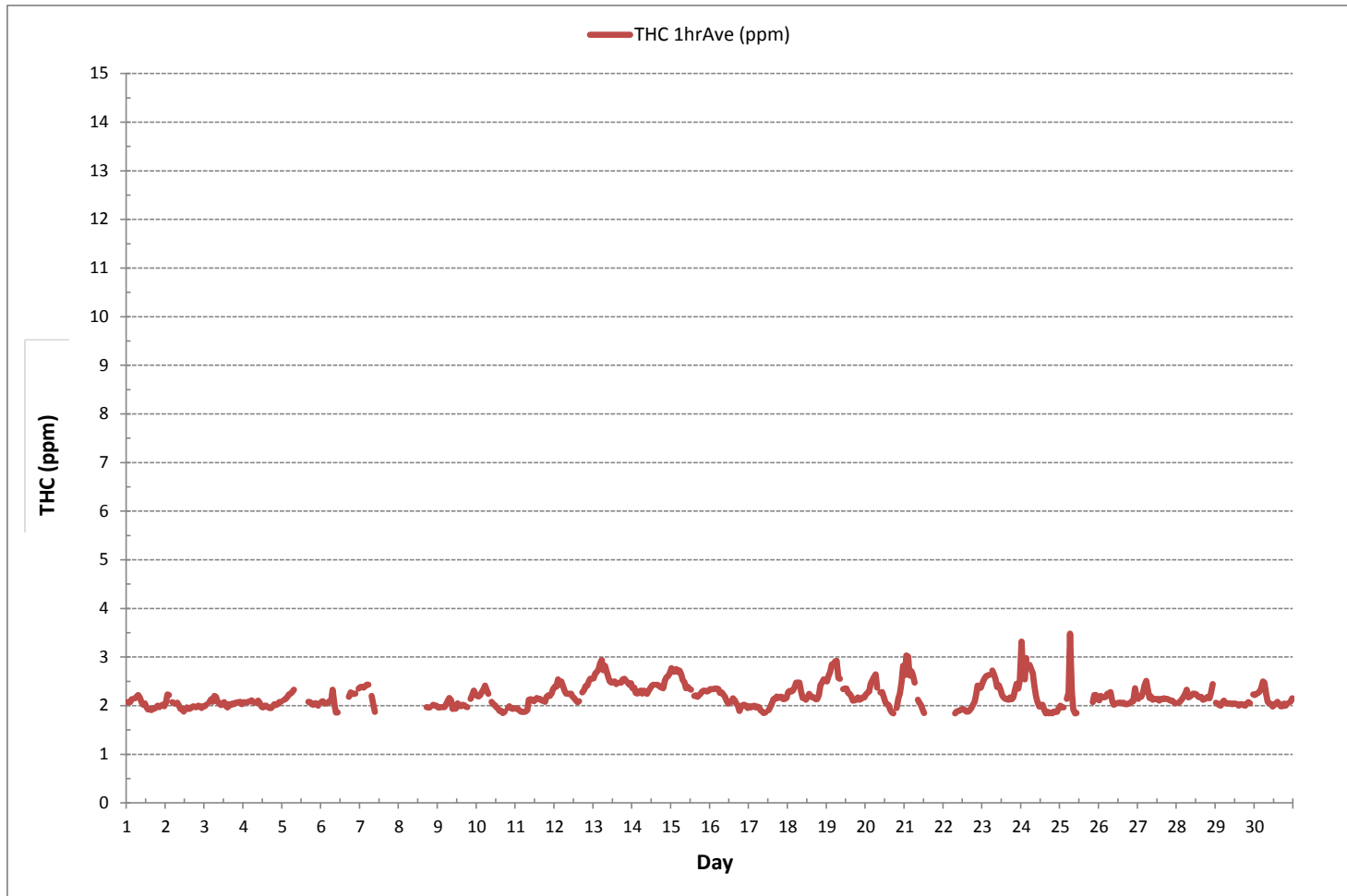
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	616			
MINIMUM 1-HR AVERAGE:	1.80 ppm	@ HOUR	5	ON DAY 22
MAXIMUM 1-HR AVERAGE:	3.48 ppm	@ HOUR	6	ON DAY 25
MAXIMUM 24-HR AVERAGE:	2.59 ppm			ON DAY 13
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	654 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	90.8 %	
STANDARD DEVIATION:	0.24	MONTHLY AVERAGE:	2.19 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



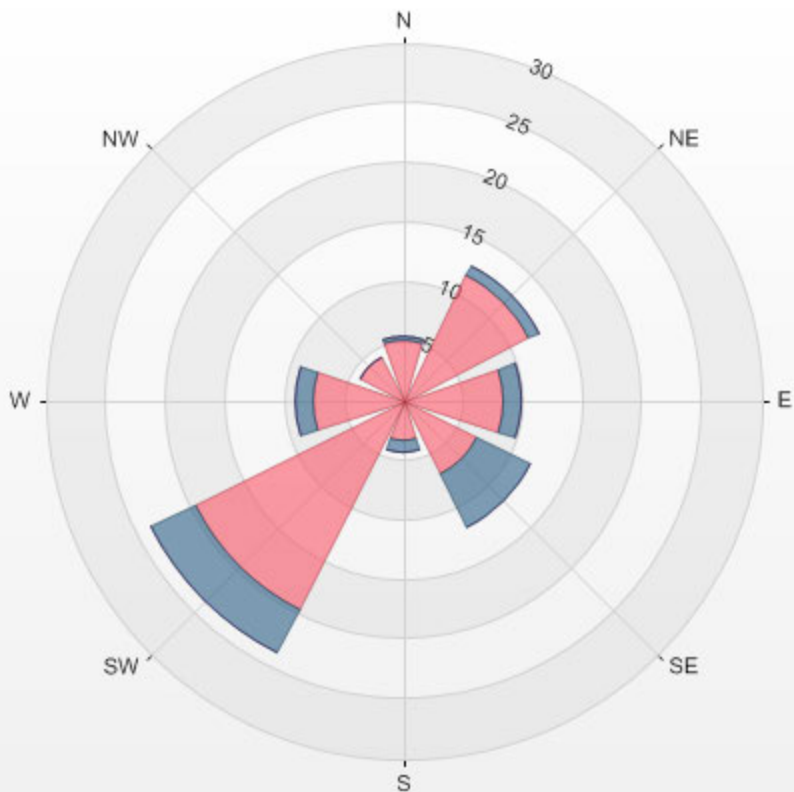
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.76% Calm Avg: 2.36 [ppm]

Direction	0.0-1.2	1.2-2.3	2.3-3.5	>3.5	Total
N	0.0	5.1	0.3	0.0	5.4
NE	0.0	11.8	1.0	0.0	12.7
E	0.0	8.3	1.6	0.0	10.0
SE	0.0	6.9	5.1	0.0	11.9
S	0.0	3.4	1.0	0.0	4.4
SW	0.0	19.6	4.1	0.0	23.7
W	0.0	7.7	1.5	0.0	9.1
NW	0.0	4.1	0.0	0.0	4.1
Summary	0.0	66.7	14.5	0.0	81.3

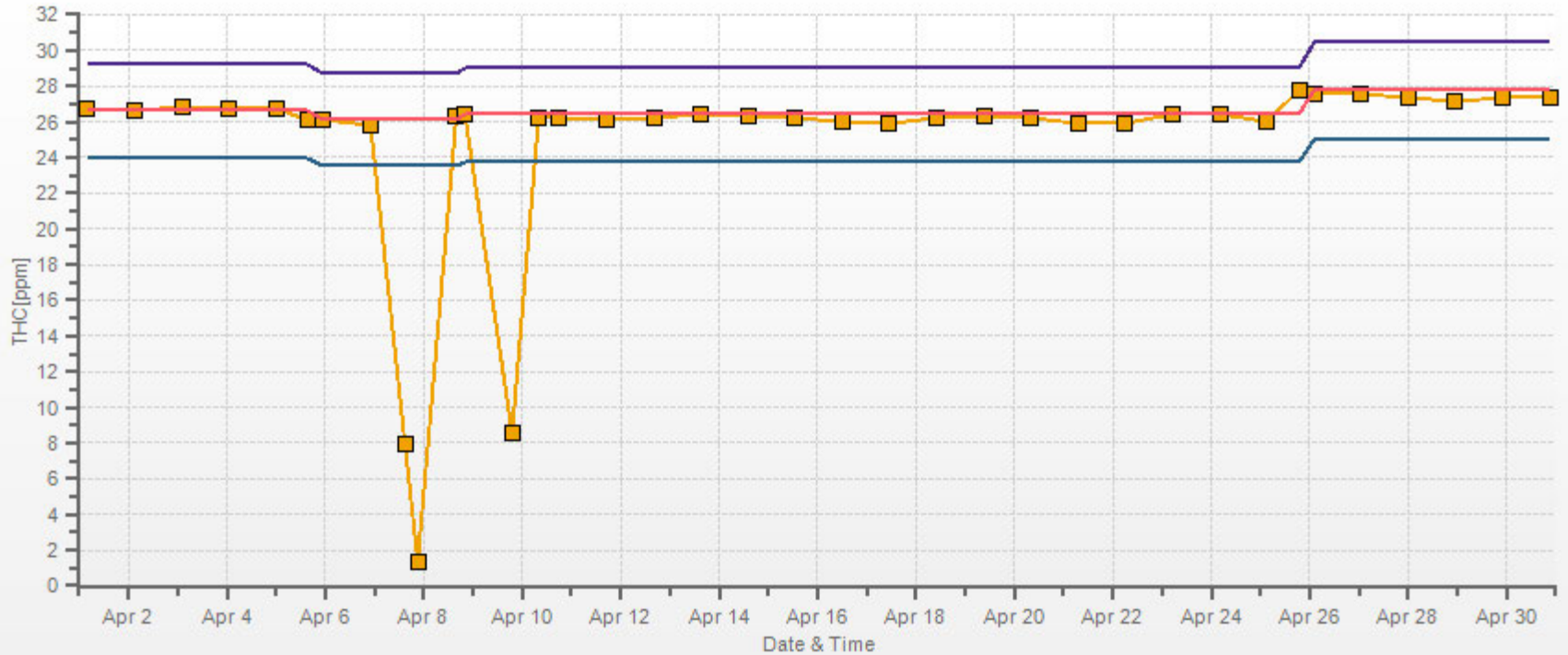
% Icon	Classes (ppm)	0	0.0-1.2	67	1.2-2.3	15	2.3-3.5	0	>3.5

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.76% Calm Poll Avg: 2.36[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



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

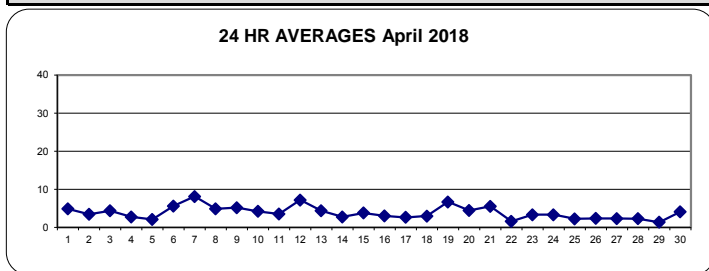
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	5	6	S	7	6	11	10	9	7	6	4	3	2	2	2	2	3	6	4	3	3	3	2	11	5	24	
2	3	9	7	S	7	7	4	5	2	1	1	2	1	2	2	2	3	3	2	5	3	2	2	4	1	9	3	24	
3	6	4	S	6	7	5	10	17	7	4	4	2	2	2	2	2	2	2	2	2	4	3	3	2	2	17	4	24	
4	3	S	6	4	4	6	4	4	1	C	C	C	C	C	C	C	C	1	1	1	1	1	2	2	1	6	3	24	
5	S	4	3	2	2	2	2	3	3	3	2	2	1	1	1	1	1	1	2	1	2	2	4	S	1	4	2	24	
6	4	4	5	5	5	8	14	17	13	4	5	4	4	3	3	2	2	2	2	2	3	5	7	S	7	2	17	6	24
7	7	6	8	18	20	19	21	31	16	5	4	3	2	1	1	1	1	1	1	1	2	S	7	10	1	31	8	24	
8	12	9	14	21	11	10	9	3	2	1	1	1	1	2	1	1	2	2	2	2	S	2	2	2	2	1	21	5	24
9	2	2	2	3	3	4	11	8	6	7	7	4	3	3	3	3	4	4	S	8	18	7	4	2	2	18	5	24	
10	4	5	5	5	5	15	13	8	3	3	2	2	2	3	2	2	2	2	S	3	4	2	2	2	2	15	4	24	
11	2	2	2	3	2	3	6	4	2	3	2	2	3	3	1	2	2	S	2	7	7	9	6	5	1	9	3	24	
12	11	9	12	13	20	24	19	14	3	2	1	1	1	1	1	S	2	2	8	8	3	4	5	1	24	7	24		
13	3	10	10	14	11	14	4	3	2	3	2	2	2	2	S	2	2	2	2	2	2	2	2	2	2	14	4	24	
14	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	3	3	3	6	5	4	3	4	2	6	3	24		
15	6	3	3	3	4	5	9	4	4	3	3	3	S	4	3	3	6	4	3	3	3	2	3	2	9	4	24		
16	3	3	4	4	4	6	4	5	3	3	3	3	S	2	3	3	2	2	2	2	2	2	2	2	2	6	3	24	
17	2	2	2	2	3	3	5	4	3	2	2	S	2	3	3	3	3	3	3	2	2	2	2	2	2	5	3	24	
18	2	2	2	2	3	3	5	5	5	4	S	2	3	2	2	2	2	2	2	2	3	7	3	2	7	3	24		
19	3	4	8	14	18	30	44	7	3	S	2	1	1	1	1	1	1	2	2	2	2	2	2	2	1	44	7	24	
20	2	2	3	6	12	13	11	4	S	5	5	5	4	3	2	2	1	1	2	2	5	5	3	4	1	13	4	24	
21	6	7	11	11	11	8	16	S	10	4	5	5	4	3	4	4	3	3	2	2	2	3	2	1	1	16	6	24	
22	2	2	2	2	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	4	1	4	2	24	
23	5	5	5	4	6	S	10	8	6	4	3	2	1	1	1	1	1	1	2	2	2	2	2	2	1	10	3	24	
24	3	2	2	4	S	10	6	6	6	5	4	3	3	2	1	2	2	2	2	2	3	2	2	2	1	10	3	24	
25	1	1	2	S	3	4	10	8	6	2	1	1	1	1	1	1	0	0	1	1	2	2	1	1	0	10	2	24	
26	1	2	S	3	4	4	7	7	3	1	1	1	1	1	1	1	1	1	2	2	4	2	2	2	1	7	2	24	
27	2	S	2	2	4	14	6	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	14	2	24	
28	S	1	1	1	2	4	3	2	2	2	2	2	2	3	1	1	1	1	1	1	3	5	5	5	S	1	5	2	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	S	5	1	5	1	24
30	4	3	4	4	12	21	23	3	1	1	1	1	1	1	1	1	1	1	1	2	3	S	2	2	1	23	4	24	
HOURLY MAX	12	10	14	21	20	30	44	31	16	9	7	6	4	3	4	4	3	6	4	8	8	18	7	10					
HOURLY AVG	4	4	5	6	7	9	10	7	4	3	3	2	2	2	2	2	2	2	2	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

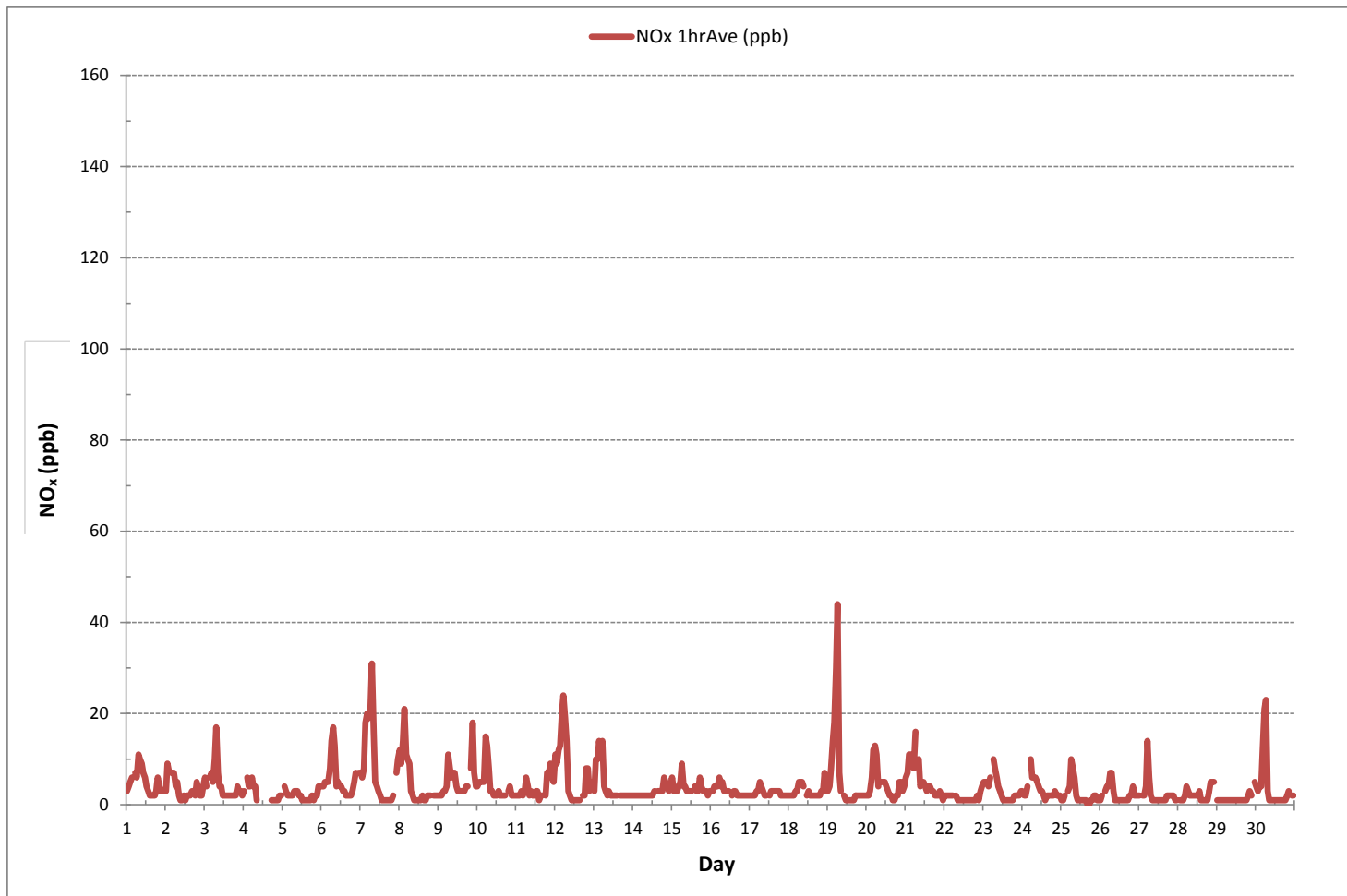
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	678			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	16	ON DAY 25
MAXIMUM 1-HR AVERAGE:	44	ppb @ HOUR	6	ON DAY 19
MAXIMUM 24-HR AVERAGE:	8	ppb		ON DAY 7
I2S CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4		MONTHLY AVERAGE:	4 ppb




OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



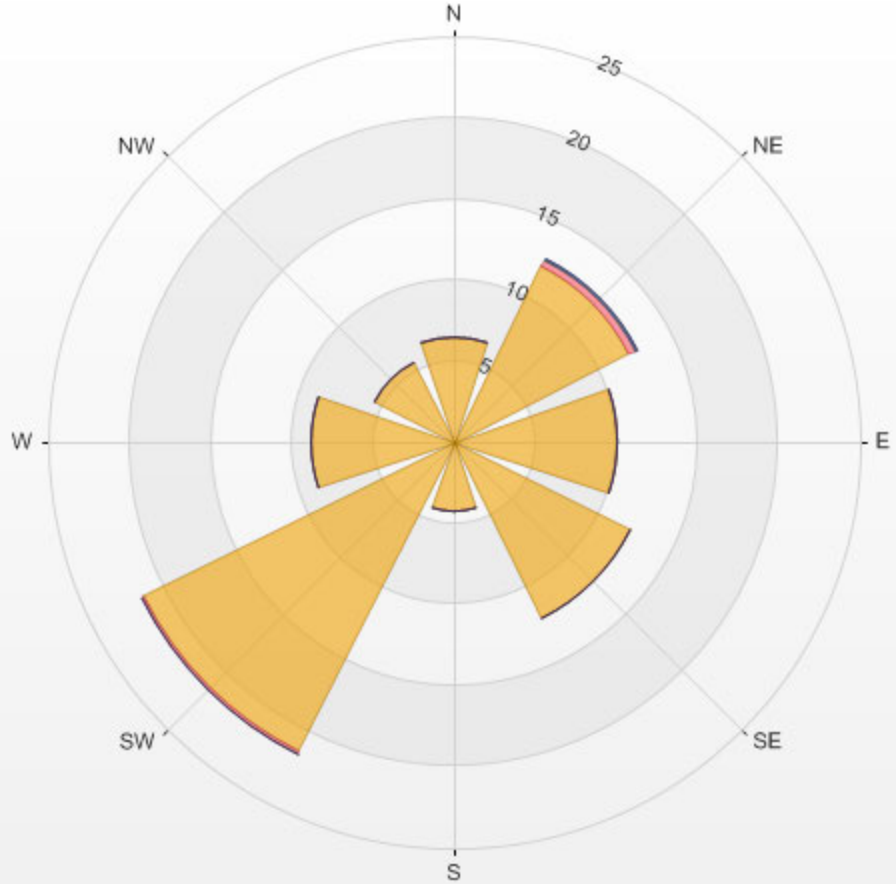
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NOX[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.41% Calm Avg: 8.01 [ppb]

Direction	0.0-15.0	15.0-30.0	30.0-45.0	>45.0	Total
N	6.5	0.0	0.0	0.0	6.5
NE	12.1	0.4	0.2	0.0	12.7
E	10.2	0.0	0.0	0.0	10.2
SE	12.2	0.0	0.0	0.0	12.2
S	4.3	0.0	0.0	0.0	4.3
SW	21.4	0.2	0.0	0.0	21.5
W	8.8	0.0	0.0	0.0	8.8
NW	5.5	0.0	0.0	0.0	5.5
Summary	80.9	0.6	0.2	0.0	81.6

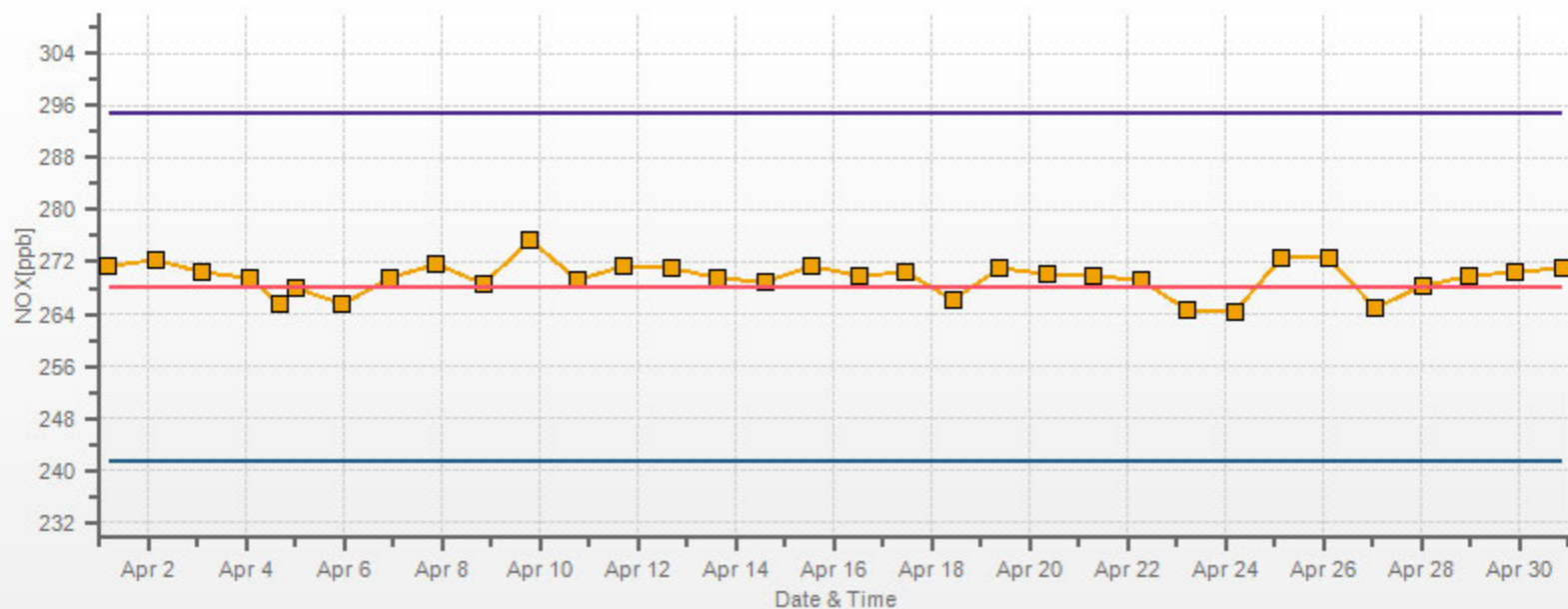
%	Icon	Classes (ppb)	81	1	0	0
						
			0.0-15.0	15.0-30.0	30.0-45.0	>45.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.41% Calm Poll Avg: 8.01[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES



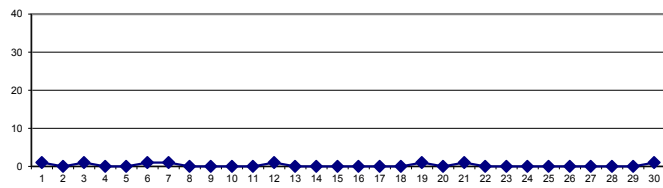
NITRIC OXIDE Hourly Averages (NO ppb)

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

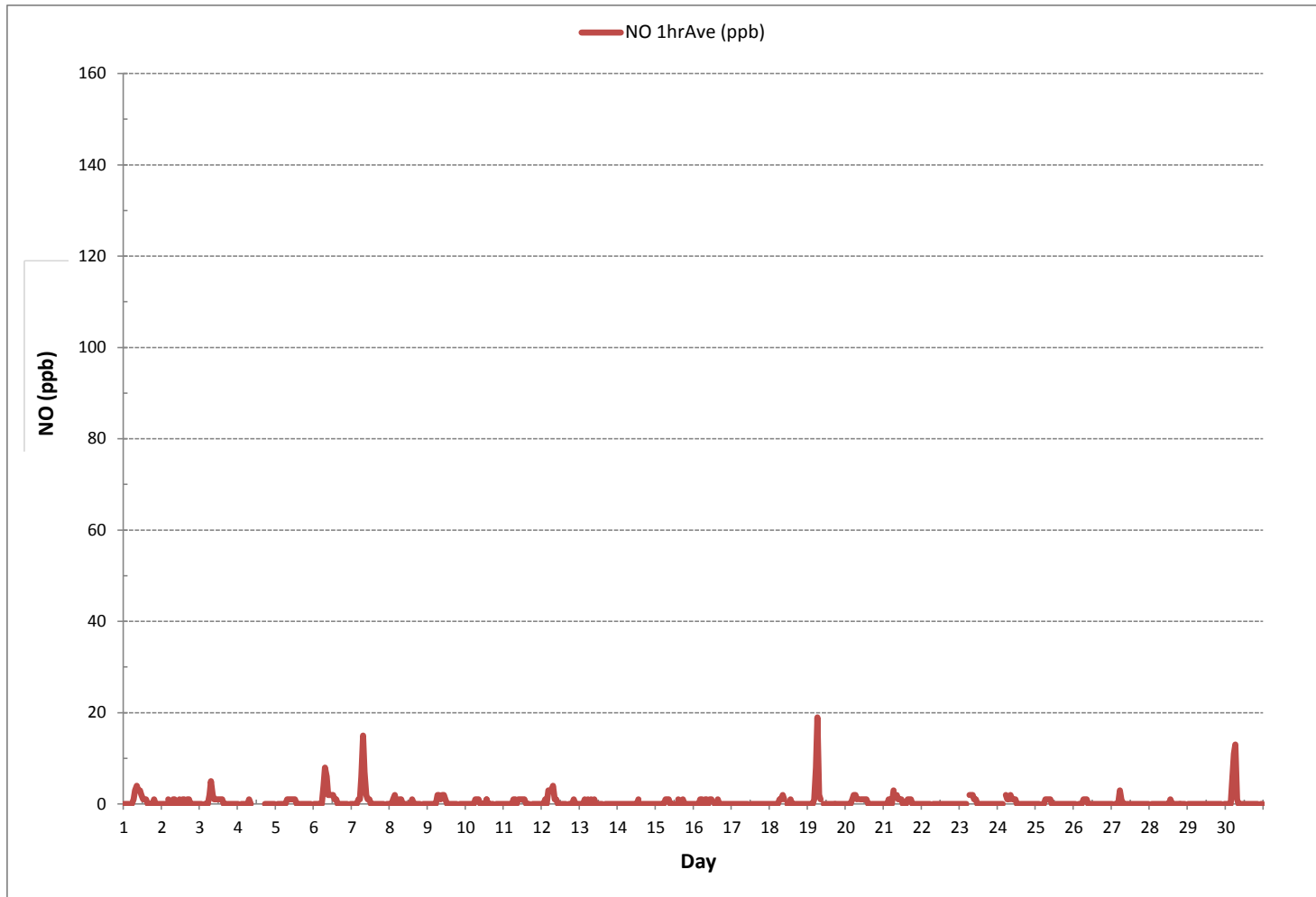
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	153				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	19	ppb @ HOUR	6	ON DAY 19	
MAXIMUM 24-HR AVERAGE:	1	ppb		ON DAY 1	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	720	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



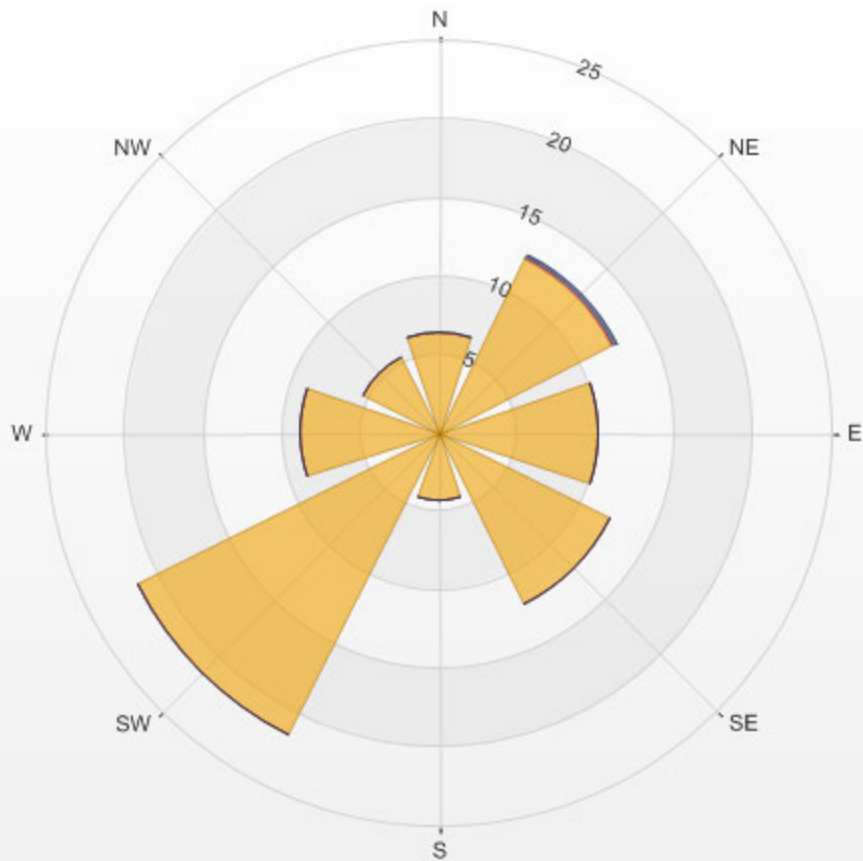
Wind: LICA COLD LAKE SOUTH
Poll.: LICA COLD LAKE SOUTH-NO[ppb]
Monthly: 18/04
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 18.41% Calm Avg: 0.99 [ppb]

Direction	0.0-6.7	6.7-13.3	13.3-20.0	>20.0	Total
N	6.5	0.0	0.0	0.0	6.5
NE	12.4	0.2	0.2	0.0	12.7
E	10.2	0.0	0.0	0.0	10.2
SE	12.2	0.0	0.0	0.0	12.2
S	4.3	0.0	0.0	0.0	4.3
SW	21.5	0.0	0.0	0.0	21.5
W	8.8	0.0	0.0	0.0	8.8
NW	5.5	0.0	0.0	0.0	5.5
Summary	81.3	0.2	0.2	0.0	81.6

% Icon Classes (ppb) 81 0.0-6.7 0 6.7-13.3 0 13.3-20.0 0 >20.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.41% Calm Poll Avg: 0.99[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ 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	5	5	S	6	6	8	7	5	4	4	2	2	2	1	2	2	3	5	4	3	2	3	1	8	4	24	
2	3	9	7	S	6	6	4	4	2	1	1	1	1	1	1	2	2	3	2	4	3	2	2	3	1	9	3	24	
3	5	3	S	6	7	5	9	12	5	3	3	2	2	2	2	2	1	2	2	2	3	3	3	2	1	12	4	24	
4	3	S	6	4	4	6	4	3	1	C	C	C	C	C	C	C	C	1	1	1	1	1	2	2	1	6	3	24	
5	S	4	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	2	1	2	2	4	S	1	4	2	24	
6	4	4	5	5	5	7	10	9	7	2	3	2	2	2	2	2	2	2	2	3	5	7	S	7	2	10	4	24	
7	7	6	8	17	20	18	14	17	9	3	2	2	1	1	1	1	1	1	1	1	2	S	7	10	1	20	7	24	
8	11	9	14	20	11	9	8	2	1	1	1	1	1	1	1	1	1	1	2	2	S	2	2	2	1	20	5	24	
9	2	2	2	3	3	4	10	6	5	5	3	2	3	3	3	3	4	3	S	8	18	6	4	2	18	5	24		
10	4	5	5	5	5	14	12	7	3	2	2	2	1	2	2	2	2	2	S	2	4	2	2	2	1	14	4	24	
11	2	2	2	2	2	2	5	3	2	2	2	2	2	2	2	1	1	S	2	7	7	9	6	5	1	9	3	24	
12	11	9	11	13	17	22	16	10	2	2	1	1	1	1	1	1	S	1	2	8	8	3	3	5	1	22	6	24	
13	3	10	10	14	11	14	3	3	2	2	1	1	2	2	1	S	2	2	2	2	2	2	2	2	2	1	14	4	24
14	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	3	2	3	3	6	5	4	3	4	2	6	3	24	
15	6	3	3	3	3	4	8	4	3	3	3	3	2	S	3	3	3	5	3	3	3	2	2	3	2	8	3	24	
16	3	3	3	4	4	5	3	4	3	2	2	2	S	2	2	2	2	2	2	1	2	2	2	2	1	5	3	24	
17	2	2	2	2	3	3	4	3	2	2	2	S	2	2	2	3	3	3	2	2	2	2	2	2	2	4	2	24	
18	2	2	2	2	3	3	4	4	3	3	S	2	2	2	2	2	1	2	1	1	2	3	7	3	1	7	3	24	
19	3	4	7	13	17	22	25	6	3	S	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	25	5	24	
20	2	2	3	5	12	11	9	3	S	4	3	3	3	2	2	2	1	1	2	2	5	5	3	4	1	12	4	24	
21	6	7	10	10	10	8	12	S	8	4	4	4	4	3	4	3	3	2	2	2	2	3	2	1	1	12	5	24	
22	1	2	2	2	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	4	1	4	2	24	
23	5	5	5	4	5	S	8	6	5	3	2	1	1	1	1	1	1	1	1	2	2	2	2	2	1	8	3	24	
24	3	2	2	4	S	8	5	5	4	3	2	2	2	1	1	1	1	2	2	2	3	2	2	2	1	8	3	24	
25	1	1	2	S	3	4	9	7	4	1	1	1	1	1	1	1	0	0	1	1	2	2	1	1	0	9	2	24	
26	1	2	S	3	4	4	6	5	2	1	1	1	1	1	1	1	1	1	1	2	4	2	2	2	1	6	2	24	
27	2	S	2	2	3	11	5	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	11	2	24	
28	S	1	1	1	1	4	3	1	1	2	2	2	2	2	1	1	1	1	1	3	4	4	5	S	1	5	2	24	
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	S	5	1	5	1	24	
30	4	3	4	3	8	11	10	2	1	1	1	1	1	1	1	1	1	1	1	2	3	S	2	2	1	11	3	24	
HOURLY MAX	11	10	14	20	20	22	25	17	9	5	5	4	4	3	4	3	3	5	3	8	8	18	7	10					
HOURLY AVG	4	4	5	6	6	8	7	5	3	2	2	2	2	2	2	2	2	2	2	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

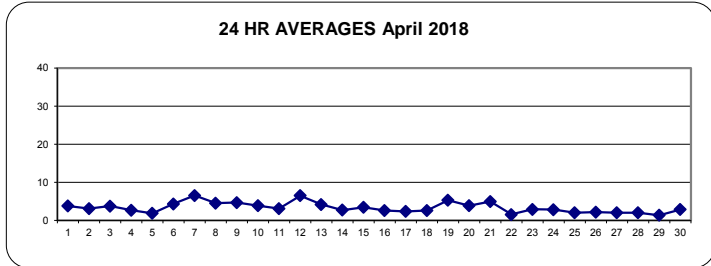
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

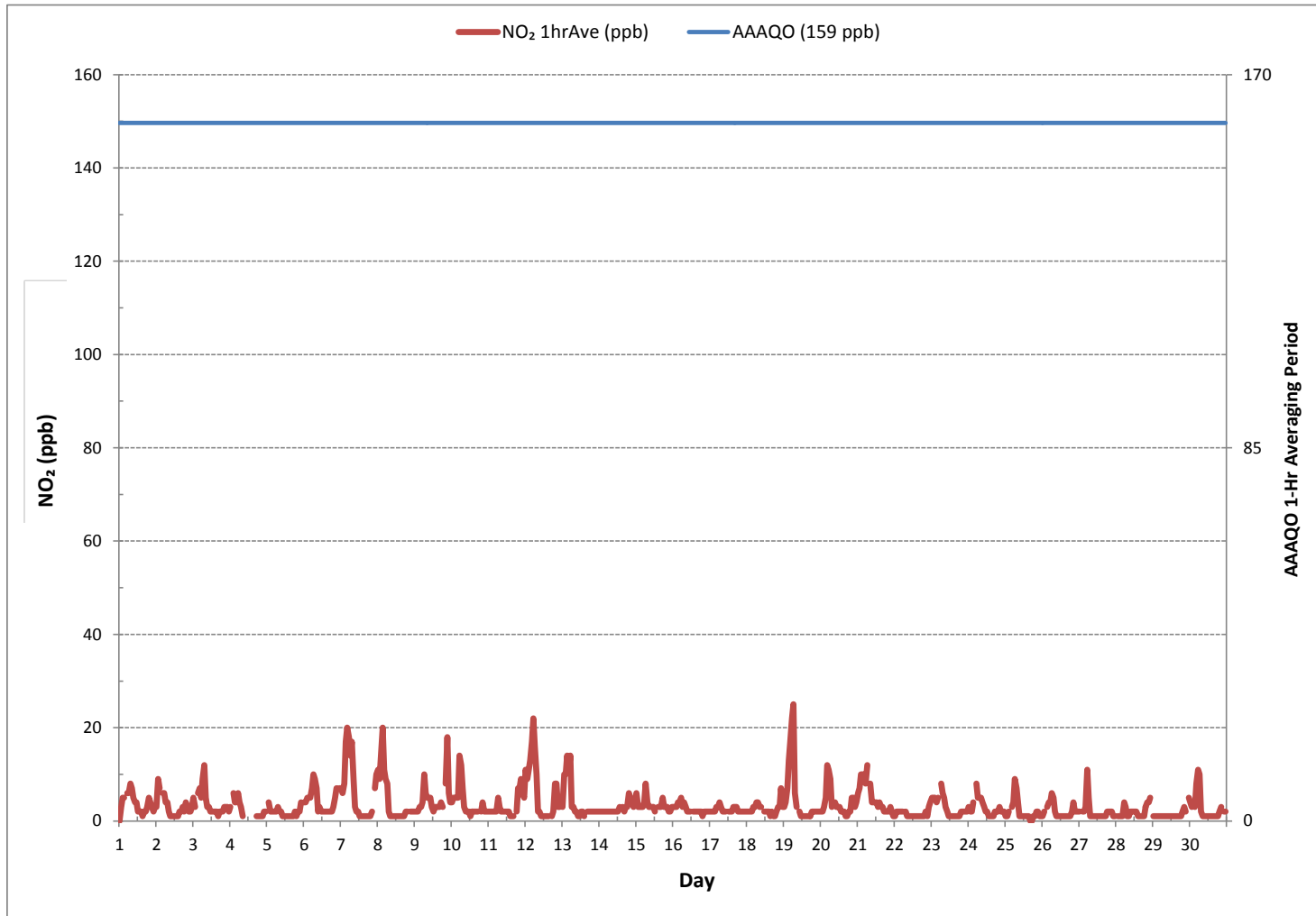
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	678				
MINIMUM 1-HR AVERAGE:	25	ppb @ HOUR	16	ON DAY 25	
MAXIMUM 1-HR AVERAGE:	0	ppb @ HOUR	6	ON DAY 19	
MAXIMUM 24-HR AVERAGE:	7	ppb		ON DAY 7	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	720	hrs
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	3	ppb

24 HR AVERAGES April 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



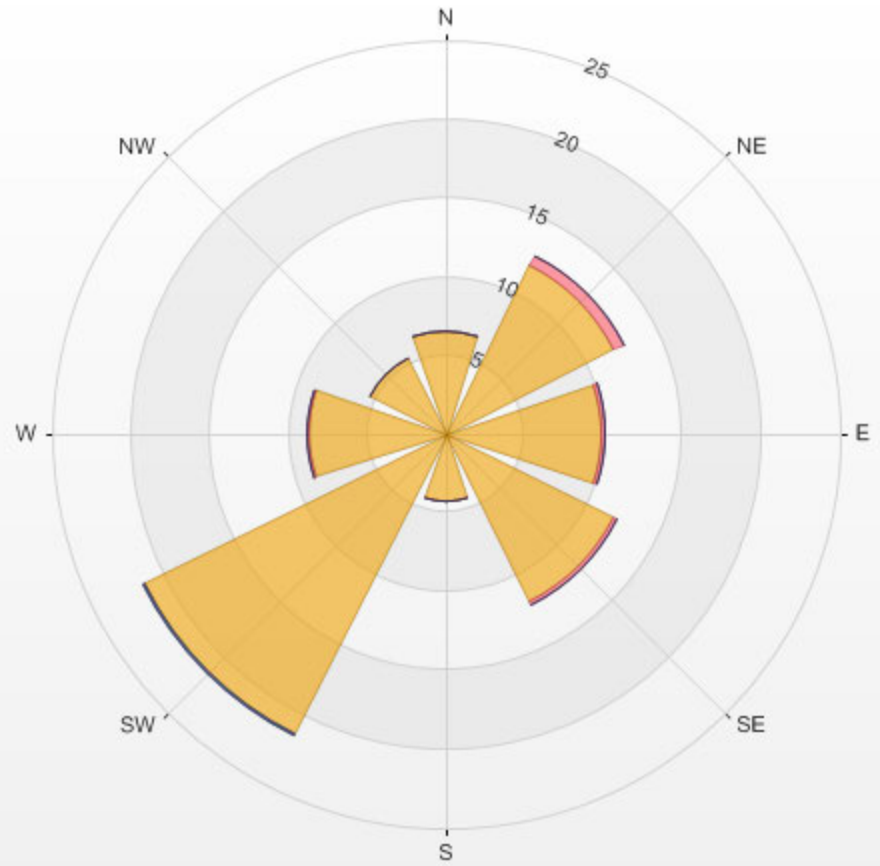
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO2[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.41% Calm Avg: 7.02 [ppb]

Direction	0.0-8.7	8.7-17.3	17.3-26.0	>26.0	Total
N	6.5	0.0	0.0	0.0	6.5
NE	11.9	0.7	0.0	0.0	12.7
E	9.9	0.3	0.0	0.0	10.2
SE	11.9	0.3	0.0	0.0	12.2
S	4.3	0.0	0.0	0.0	4.3
SW	21.4	0.0	0.2	0.0	21.5
W	8.7	0.2	0.0	0.0	8.8
NW	5.5	0.0	0.0	0.0	5.5
Summary	80.0	1.5	0.2	0.0	81.6

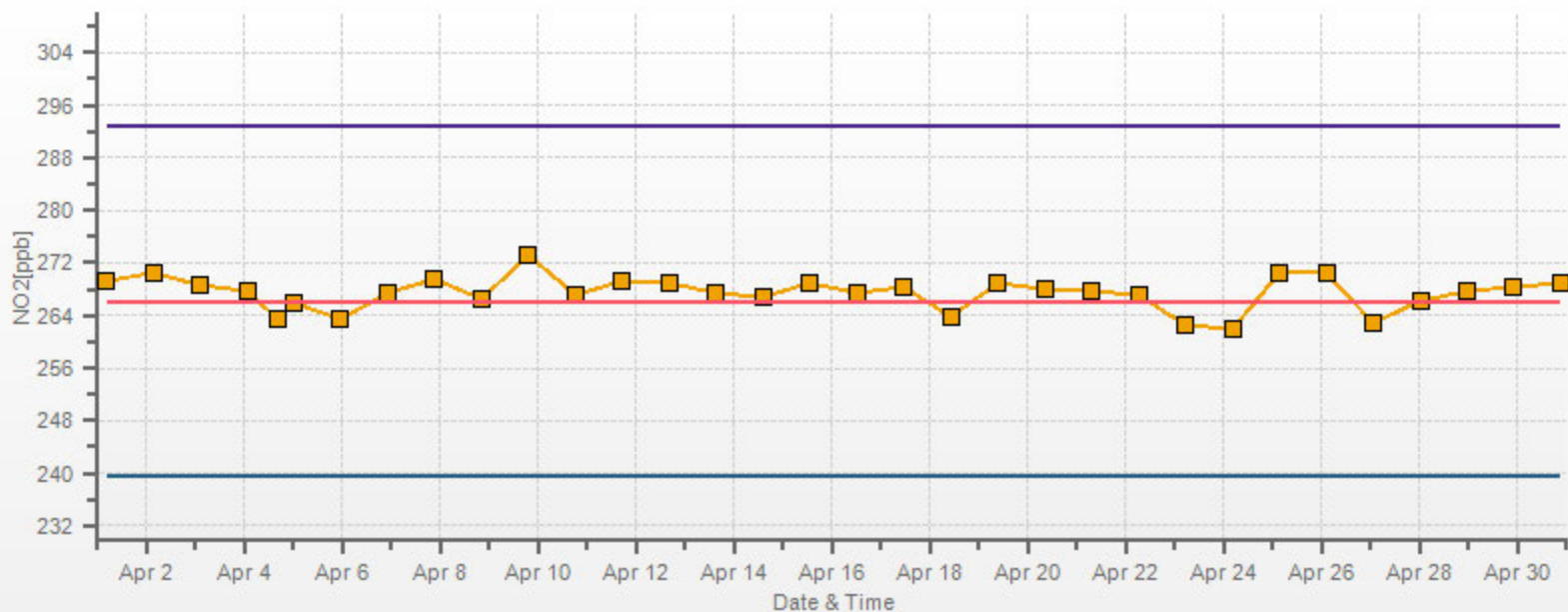
% Icon Classes (ppb) 80 0.0-8.7 1 8.7-17.3 0 17.3-26.0 0 >26.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.41% Calm Poll Avg: 7.02[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



OZONE



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

OZONE Hourly Averages (O₃ 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 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	44.8	43.7	41.8	39.7	S	32.9	30.5	35.2	37.4	39.5	41.2	42.4	44.4	45.5	47.2	48.0	48.2	48.0	46.4	44.1	45.1	43.8	41.3	37.8	30.5	48.2	42.1	24	
2	34.0	29.6	29.0	S	38.0	36.0	38.3	38.7	42.1	43.3	43.5	43.7	44.6	44.8	44.9	45.0	44.6	44.2	45.1	41.4	42.2	43.2	42.3	41.2	29.0	45.1	40.9	24	
3	39.0	39.3	S	31.1	28.5	29.0	25.5	29.2	38.8	42.3	44.9	45.4	45.9	46.2	46.7	47.6	48.1	47.5	47.3	46.3	44.5	45.1	44.2	43.5	25.5	48.1	41.1	24	
4	42.1	S	37.2	35.2	33.9	32.8	37.8	40.0	41.7	41.3	40.8	41.1	42.6	43.5	44.9	45.4	46.2	46.5	46.0	44.9	43.5	43.6	40.9	39.6	32.8	46.5	41.4	24	
5	S	34.8	36.9	36.7	35.9	33.5	33.0	32.2	C	C	C	C	C	33.8	33.7	34.5	33.7	31.9	29.8	29.7	28.9	26.1	22.1	S	22.1	36.9	32.2	24	
6	20.5	19.5	17.9	16.8	16.0	13.9	12.3	16.6	24.6	32.7	37.3	35.7	37.5	40.5	42.4	43.9	44.2	43.5	42.7	38.9	33.9	30.4	S	24.0	12.3	44.2	29.8	24	
7	23.5	23.6	19.6	10.3	6.8	7.9	12.3	17.9	28.6	36.9	39.4	41.3	43.5	44.5	44.5	44.2	44.5	44.0	43.3	41.6	40.4	S	29.5	24.0	6.8	44.5	31.0	24	
8	21.8	21.2	19.2	13.9	18.7	24.0	29.9	39.9	42.9	44.4	45.2	45.0	45.4	45.5	46.1	45.8	46.4	48.2	49.0	48.4	S	46.7	46.0	46.3	13.9	49.0	38.3	24	
9	45.1	39.9	36.4	30.8	29.2	27.3	21.0	35.4	44.1	47.4	49.6	52.9	54.3	55.0	57.6	57.0	S	58.1	56.8	57.4	S	51.6	42.7	50.0	50.2	21.0	58.1	45.6	24
10	48.1	51.6	53.1	52.1	45.6	32.2	33.7	44.0	46.0	46.9	47.4	47.0	46.7	46.2	46.0	45.7	45.3	46.6	S	46.6	45.5	47.2	48.8	49.7	32.2	53.1	46.2	24	
11	49.7	49.5	48.4	47.8	47.6	47.0	44.4	45.7	46.7	46.9	46.9	46.0	47.4	47.8	48.5	48.8	49.4	S	48.2	40.7	36.0	31.1	34.4	34.7	31.1	49.7	44.9	24	
12	24.0	20.4	15.5	17.7	12.8	15.5	28.0	38.0	46.8	48.2	49.5	50.3	51.2	52.1	52.7	53.0	S	52.9	52.1	41.2	37.6	47.8	43.0	36.1	12.8	53.0	38.5	24	
13	34.0	24.6	25.7	22.0	23.3	23.0	45.0	45.7	46.3	48.0	50.7	51.1	50.4	50.9	51.0	S	50.5	50.0	50.4	49.2	48.0	46.9	45.6	44.4	22.0	51.1	42.5	24	
14	42.5	40.7	39.6	39.2	39.0	38.5	38.1	37.5	37.4	38.1	39.0	41.0	44.5	46.7	S	50.3	52.4	52.4	51.3	43.2	45.5	49.7	48.7	40.7	37.4	52.4	43.3	24	
15	37.1	44.0	42.6	40.3	39.8	34.3	31.3	36.0	39.3	43.4	45.5	45.3	43.9	S	39.3	40.1	41.4	39.4	40.5	38.5	37.8	37.0	35.7	39.6	31.3	45.5	39.7	24	
16	42.3	40.9	40.3	39.0	40.8	39.3	39.6	37.6	36.6	34.6	33.1	34.4	S	37.7	43.5	46.9	51.7	54.1	55.6	55.8	54.1	53.6	53.3	52.9	33.1	55.8	44.2	24	
17	52.5	51.2	50.2	49.1	48.5	46.2	44.4	44.9	44.6	43.7	43.9	S	41.2	38.3	35.6	34.7	33.1	35.1	42.5	40.4	33.3	33.6	33.5	36.1	33.1	52.5	41.6	24	
18	36.5	36.4	35.5	34.8	32.9	32.2	31.0	32.8	33.9	37.5	S	46.8	46.7	48.5	49.7	50.5	51.5	54.0	52.5	49.2	39.7	42.3	26.6	32.7	26.6	54.0	40.6	24	
19	36.6	36.6	25.1	15.1	10.7	6.0	9.6	39.4	43.7	S	51.6	53.4	54.7	55.6	55.7	54.1	53.2	51.8	49.7	47.5	46.3	44.5	42.8	41.4	6.0	55.7	40.2	24	
20	39.4	37.8	33.8	20.4	14.3	13.3	17.9	28.9	S	30.6	33.3	35.2	40.7	48.6	49.5	51.7	50.7	49.5	46.3	44.1	34.1	28.3	27.1	22.6	13.3	51.7	34.7	24	
21	20.0	15.0	9.0	12.1	11.8	10.7	10.5	S	32.1	37.4	36.5	36.2	36.3	38.0	36.1	36.8	36.0	39.2	40.1	37.4	39.4	41.2	40.4	41.1	9.0	41.2	30.1	24	
22	41.0	41.1	38.2	35.1	33.5	34.3	S	37.3	37.7	35.9	33.9	33.4	33.7	34.7	33.6	32.2	33.1	35.7	34.4	35.7	31.1	20.7	26.6	25.2	20.7	41.1	33.8	24	
23	25.8	25.0	22.9	18.2	18.8	S	22.8	27.8	30.2	36.0	39.9	44.0	45.3	46.3	46.8	47.6	48.2	47.8	45.4	41.7	38.8	33.1	29.0	26.1	18.2	48.2	35.1	24	
24	20.4	30.4	25.8	14.5	S	9.5	24.2	33.3	36.1	38.3	41.5	45.8	50.6	54.2	56.4	56.2	54.8	52.8	50.5	47.5	43.7	51.7	53.4	51.7	9.5	56.4	41.0	24	
25	53.8	51.2	46.8	S	41.1	35.6	33.9	41.9	45.2	49.2	49.5	49.0	48.7	47.9	47.3	47.3	47.6	48.4	48.9	47.6	40.6	39.4	41.1	41.4	33.9	53.8	45.4	24	
26	42.4	39.3	S	36.9	34.5	33.6	34.9	39.6	45.0	49.0	50.5	54.5	56.0	56.9	57.7	57.9	57.0	55.8	52.1	48.0	50.7	43.9	38.1	33.6	57.9	47.5	24		
27	40.4	S	36.4	24.7	17.6	8.5	32.8	41.0	45.3	47.3	49.8	51.3	52.6	54.1	55.4	54.7	55.3	57.6	57.3	54.4	50.3	49.1	48.7	47.5	8.5	57.6	44.9	24	
28	S	46.3	46.0	44.7	41.8	35.0	38.4	42.0	42.8	43.2	44.4	46.6	50.3	52.2	54.4	55.7	56.6	56.3	54.4	45.6	40.4	28.9	24.2	S	24.2	56.6	45.0	24	
29	45.9	44.0	41.2	40.3	35.6	35.0	39.4	42.1	43.3	42.8	44.6	42.3	40.6	42.0	44.2	45.3	46.9	48.8	49.0	44.7	33.8	29.8	S	18.4	18.4	49.0	40.9	24	
30	16.1	13.3	11.4	9.3	4.6	2.3	8.1	35.9	43.3	45.2	48.3	51.7	53.5	53.2	53.5	54.4	54.7	52.9	52.5	50.2	42.8	S	44.9	43.1	2.3	54.7	36.7	24	
HOURLY MAX	53.8	51.6	53.1	52.1	48.5	47.0	45.0	45.7	46.8	49.2	51.6	54.5	56.0	56.9	57.7	57.9	58.1	57.6	57.4	55.8	54.1	53.6	53.4	52.9					
HOURLY AVG	36.4	35.4	33.1	29.6	28.6	26.5	29.3	36.4	40.1	41.8	43.6	44.7	46.2	46.6	47.1	47.4	47.7	48.0	47.7	44.4	41.3	40.3	39.6	38.2					

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

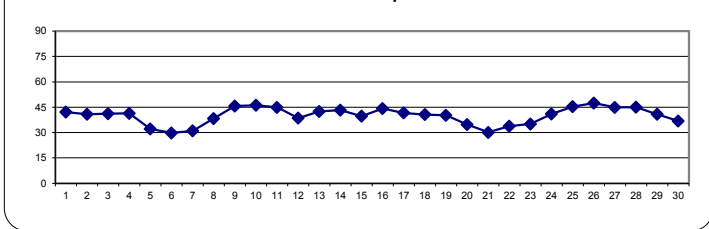
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

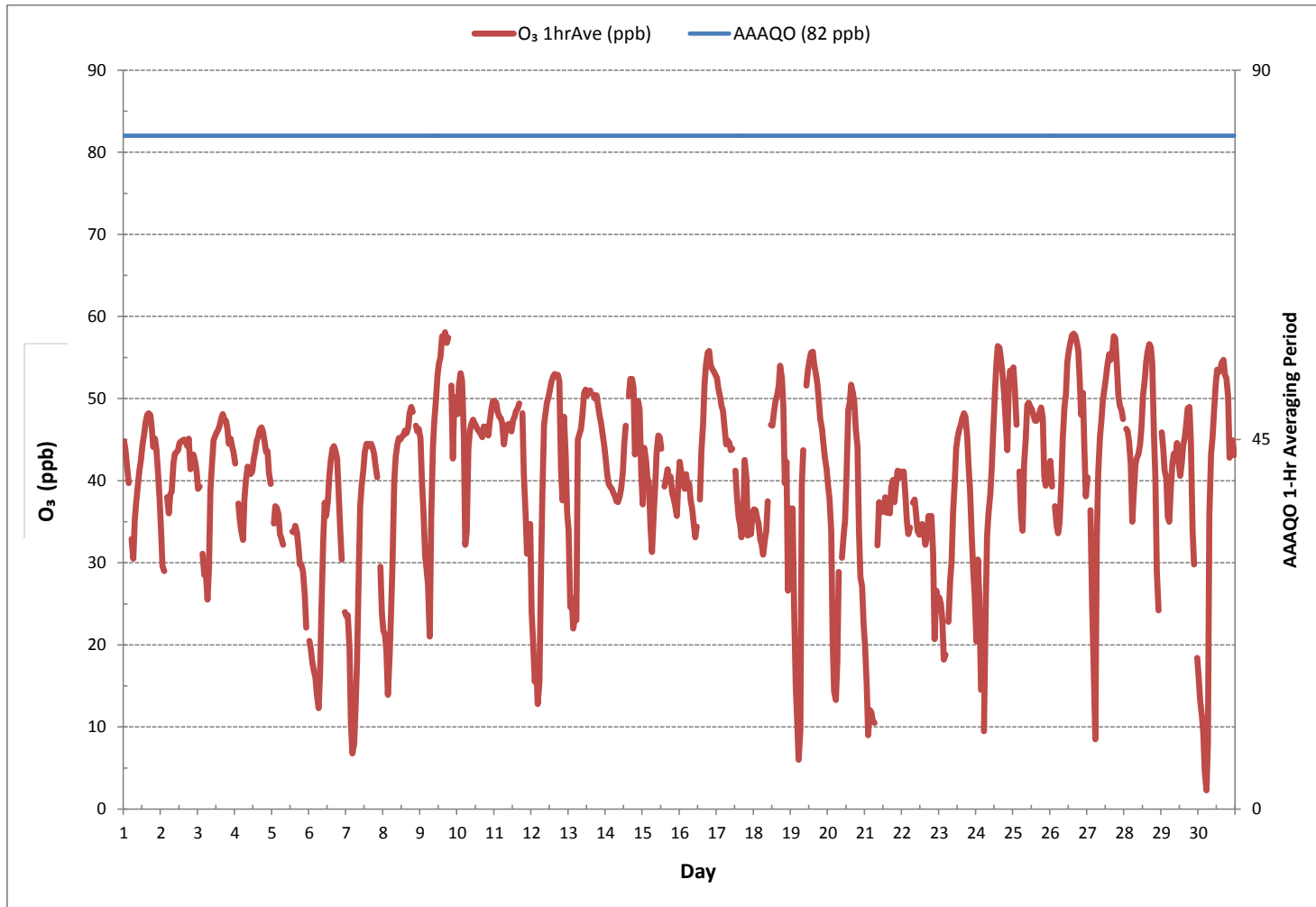
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	683				
MINIMUM 1-HR AVERAGE:	2.3 ppb	@ HOUR	5	ON DAY	30
MAXIMUM 1-HR AVERAGE:	58.1 ppb	@ HOUR	16	ON DAY	9
MAXIMUM 24-HR AVERAGE:	47.5 ppb			ON DAY	26
I2S CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	720 hrs		
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %		
STANDARD DEVIATION:	10.8	MONTHLY AVERAGE:	40.0 ppb		

24 HR AVERAGES April 2018



OZONE Hourly Averages (O₃ ppb)



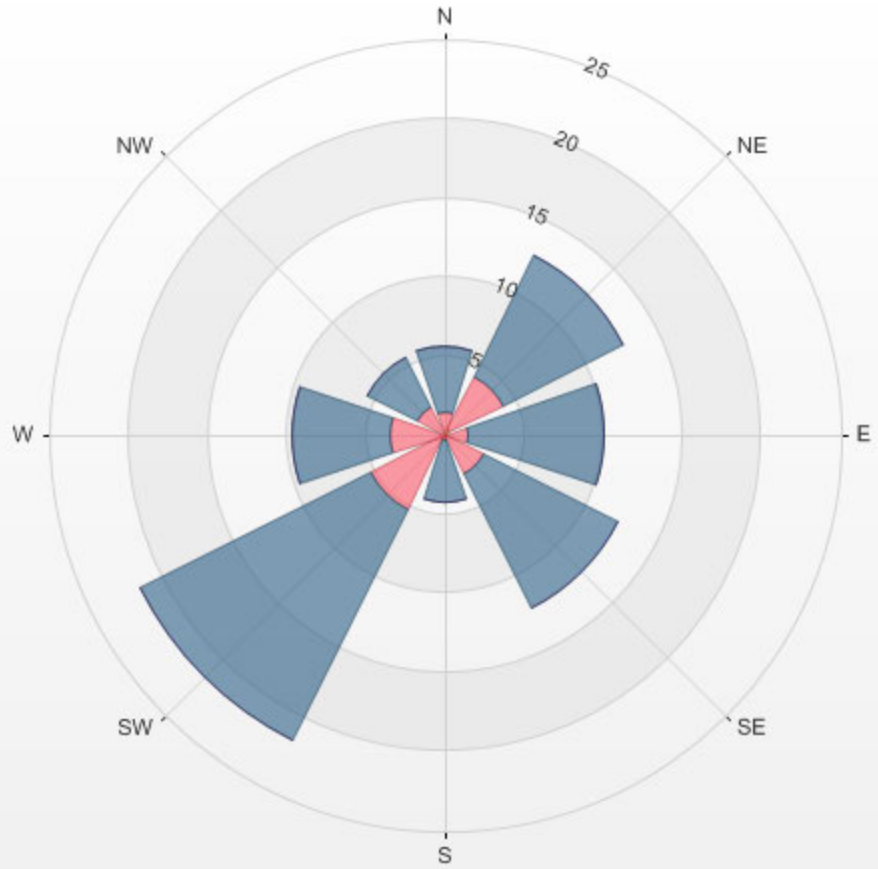
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O3[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.50% Calm Avg: 25.81 [ppb]

Direction	0.0-19.4	19.4-38.8	38.8-58.2	>58.2	Total
N	0.0	1.5	4.1	0.0	5.6
NE	0.4	3.7	8.5	0.0	12.6
E	0.0	1.5	8.7	0.0	10.1
SE	0.2	2.6	9.4	0.0	12.2
S	0.0	0.4	3.8	0.0	4.3
SW	0.3	5.0	16.3	0.0	21.6
W	0.0	3.5	6.2	0.0	9.7
NW	0.0	1.9	3.5	0.0	5.4
Summary	0.9	20.1	60.5	0.0	81.5

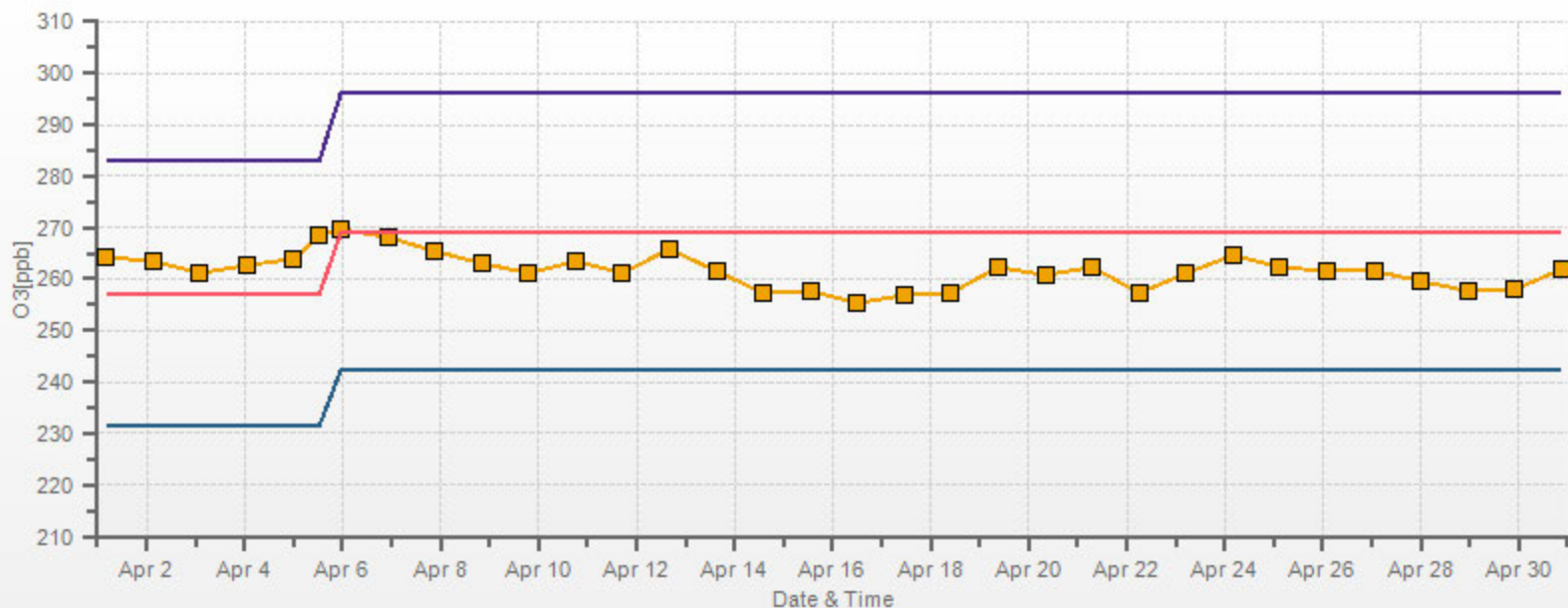
% Icon Classes (ppb) 1 0.0-19.4 20 19.4-38.8 61 38.8-58.2 0 >58.2

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.50% Calm Poll Avg: 25.81[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

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	5	5	5	5	5	5	5	4	3	2	1	2	1	2	2	1	1	1	1	2	1	1	1	1	1	5	3	24	
2	1	3	3	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	3	24	
3	2	2	3	3	2	2	2	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	24	
4	1	1	1	1	1	2	2	2	1	1	1	2	2	2	1	1	1	1	1	1	0	1	1	1	1	0	2	1	24
5	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	1	3	24	
6	2	2	2	2	2	3	4	3	3	2	2	2	2	2	2	1	1	1	1	2	2	3	4	3	2	1	4	24	
7	2	3	4	6	6	5	5	5	3	8	1	1	1	1	0	0	0	0	0	0	0	0	0	2	2	0	8	24	
8	2	1	2	3	4	2	3	2	2	1	1	2	2	2	3	2	2	3	5	7	8	8	8	10	1	10	4	24	
9	12	11	10	9	9	12	14	14	12	11	12	11	9	7	8	8	9	9	10	10	11	11	11	10	7	14	10	24	
10	10	11	13	15	16	18	19	13	3	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	19	6	24	
11	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	3	4	1	4	1	24	
12	7	6	6	8	6	5	3	3	2	2	1	1	1	2	2	2	3	3	4	6	7	5	5	5	1	8	4	24	
13	5	6	7	7	6	7	5	3	3	4	4	3	3	3	3	2	3	5	6	6	7	7	7	7	2	7	5	24	
14	7	8	9	9	7	6	5	5	4	4	3	3	4	5	7	7	7	7	5	5	6	9	9	9	3	9	6	24	
15	11	10	10	10	11	14	37	7	6	4	15	9	2	3	3	3	3	4	3	2	2	2	2	4	2	37	7	24	
16	5	5	5	6	8	8	8	7	7	8	8	8	6	5	3	2	2	2	2	2	2	2	3	3	2	8	5	24	
17	3	3	3	3	3	4	4	4	4	4	3	3	3	5	12	11	11	13	11	4	1	1	1	1	1	13	5	24	
18	1	1	1	1	2	3	3	3	3	2	1	1	3	3	2	1	1	2	2	3	3	3	4	4	1	4	2	24	
19	5	6	5	6	6	6	8	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	1	8	3	24	
20	3	2	2	2	3	4	3	2	2	4	3	2	2	2	2	2	1	1	1	2	4	5	5	6	1	6	3	24	
21	8	9	11	9	7	7	7	7	11	8	8	8	8	7	11	11	9	7	4	2	2	1	1	1	1	11	7	24	
22	1	1	1	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	
23	1	1	1	1	1	1	1	1	1	1	C	C	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	24	
24	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	4	3	3	3	3	4	8	8	8	1	8	3	24	
25	8	8	8	8	9	9	9	6	2	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	9	3	24	
26	1	1	1	1	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	2	1	24	
27	0	0	0	0	0	1	1	0	0	0	1	1	1	2	3	1	2	7	16	20	6	4	3	3	0	20	3	24	
28	2	3	3	3	2	3	2	2	2	2	2	2	3	3	4	4	5	5	6	8	10	19	32	13	2	32	6	24	
29	8	7	6	5	4	3	3	3	3	2	1	1	0	1	1	1	2	2	3	9	4	3	5	0	9	3	24		
30	5	4	4	4	5	6	10	3	2	2	2	3	4	3	2	2	2	1	2	3	8	5	3	3	1	10	4	24	
HOURLY MAX	12	11	13	15	16	18	37	14	12	11	15	11	9	7	12	11	11	13	16	20	11	19	32	13					
HOURLY AVG	4	4	4	4	4	5	6	4	3	3	3	3	2	2	3	2	3	3	3	3	4	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

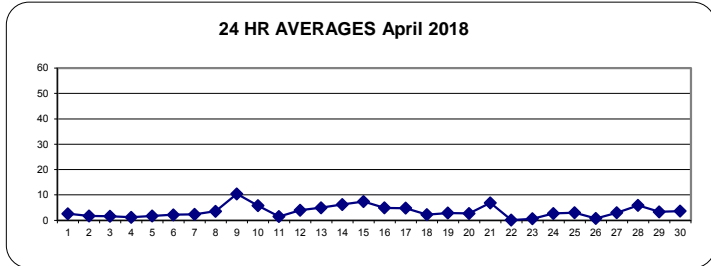
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80	µg/m ³	24-HR	30	µg/m ³
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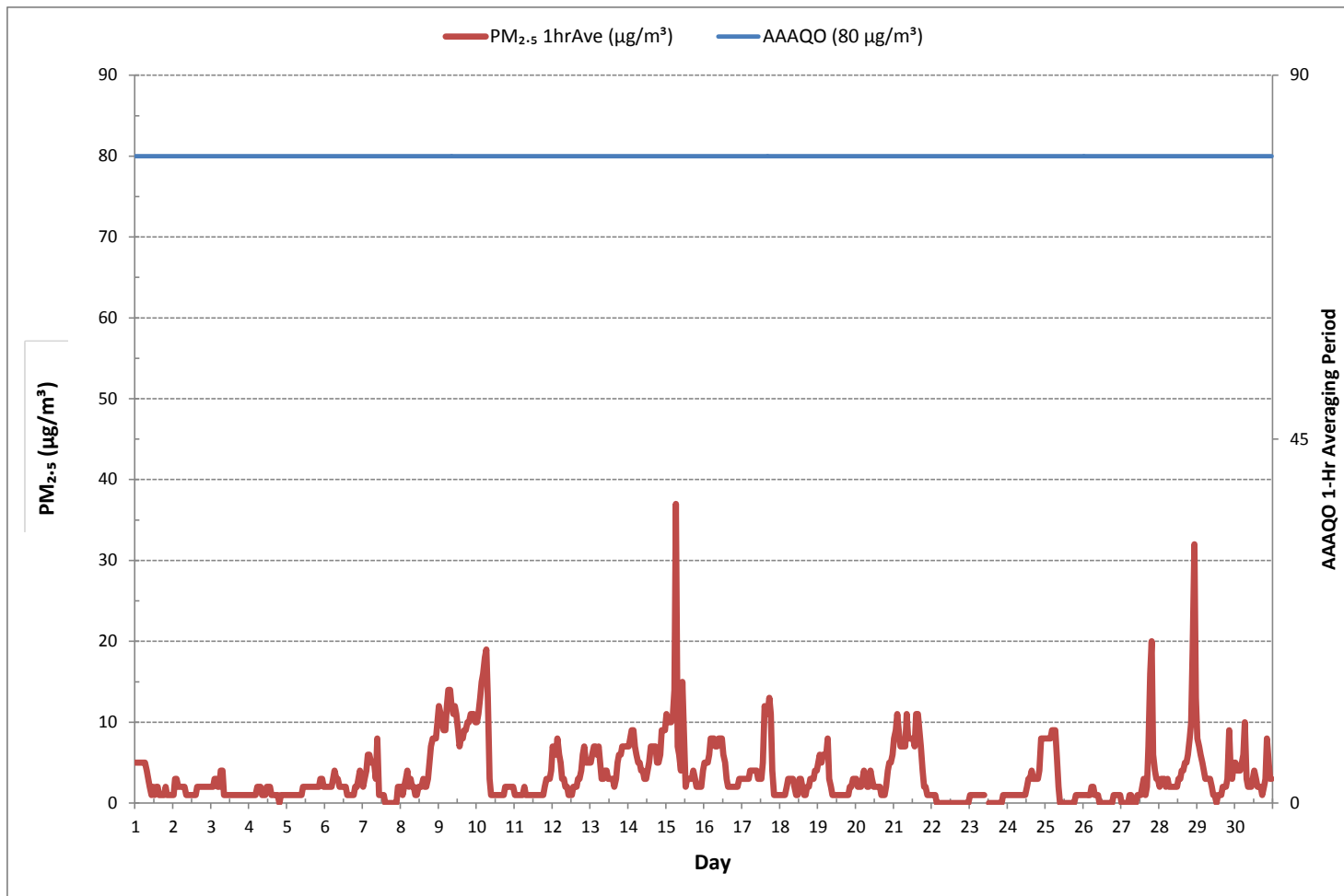
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	651				
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	19	ON DAY	4	
MAXIMUM 1-HR AVERAGE:	37 µg/m ³ @ HOUR	6	ON DAY	15	
MAXIMUM 24-HR AVERAGE:	10 µg/m ³		ON DAY	9	
MONTHLY CALIBRATION TIME:	2	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	4		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	3	µg/m ³

24 HR AVERAGES April 2018



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM2.5[ug/m3(L)]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

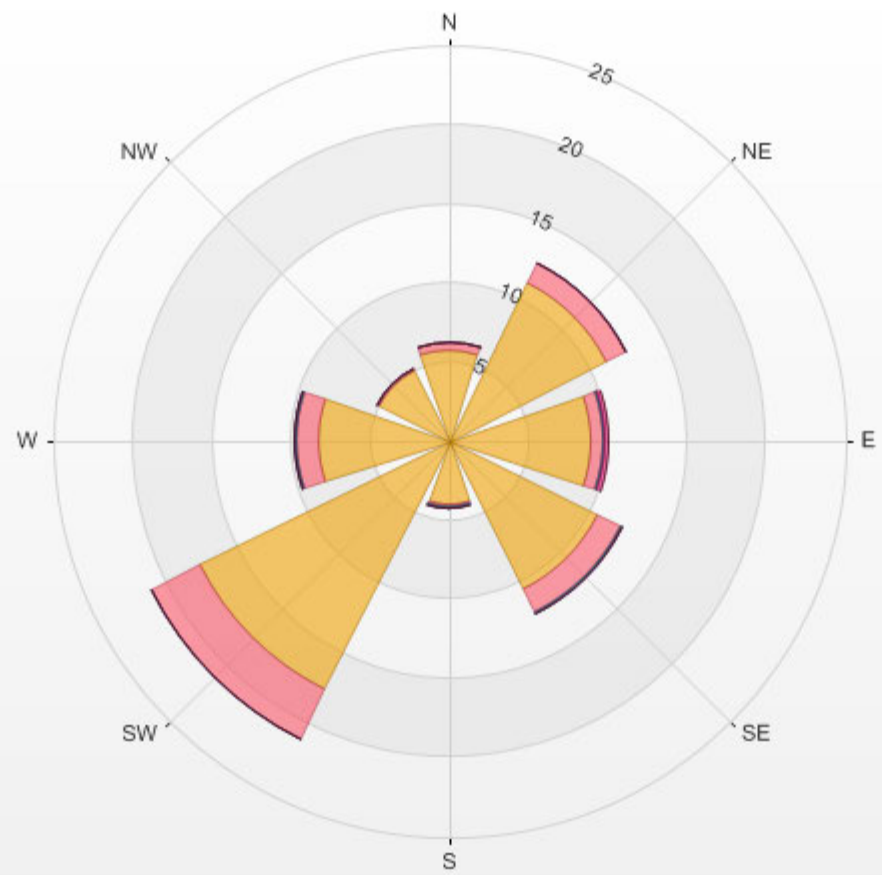
Calm: 18.55%

Calm Avg: 4.63 [ug/m3(L)]

Direction	0.0-7.6	7.6-15.2	15.2-22.8	22.8-30.4	30.4-38.0	>38.0	Total
N	5.7	0.6	0.0	0.0	0.0	0.0	6.3
NE	11.2	1.4	0.0	0.0	0.0	0.0	12.6
E	8.9	0.8	0.1	0.0	0.1	0.0	10.1
SE	10.5	1.7	0.1	0.0	0.0	0.0	12.3
S	4.0	0.1	0.1	0.0	0.0	0.0	4.3
SW	17.6	3.5	0.0	0.0	0.0	0.0	21.1
W	8.2	1.4	0.1	0.0	0.0	0.0	9.8
NW	5.0	0.1	0.0	0.0	0.0	0.0	5.2
Summary	71.1	9.6	0.6	0.0	0.1	0.0	81.5

% Icon Classes (ug/m3(L)) 71 0.0-7.6 10 7.6-15.2 1 15.2-22.8 0 22.8-30.4 0 30.4-38.0 0 >38.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.55% Calm Poll Avg: 4.63[ug/m3(L)]



WIND SPEED



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

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	8.3	6.8	6.8	5.6	4.9	3.0	3.7	4.7	5.2	4.9	3.5	7.3	4.9	4.0	4.7	3.7	0.9	8.8	5.9	5.3	5.1	2.0	0.8	0.4	0.4	0.4	8.8	2.0	24
2	0.7	1.3	0.7	3.4	3.4	1.4	0.8	2.6	7.6	8.8	9.8	7.2	5.8	6.7	5.6	4.8	5.1	6.0	0.7	2.7	3.7	10.4	11.7	7.0	0.7	11.7	4.6	24	
3	2.7	2.9	0.4	0.2	0.2	0.9	0.9	3.2	3.1	0.9	3.4	3.6	5.0	4.9	6.1	5.8	6.3	6.2	7.1	6.8	5.0	4.4	4.6	7.8	0.2	7.8	2.1	24	
4	7.8	4.8	1.6	0.1	0.5	2.7	4.1	6.0	5.6	1.0	4.7	10.3	10.9	11.9	11.5	13.4	13.2	14.0	11.0	7.7	6.5	9.7	5.7	3.3	0.1	14.0	4.6	24	
5	0.3	3.7	7.3	8.5	8.1	11.7	9.8	14.9	15.4	13.7	16.1	15.7	15.8	15.6	14.6	12.8	11.7	9.1	6.9	5.1	2.4	1.2	1.4	0.6	0.3	16.1	8.6	24	
6	0.7	0.3	0.4	0.8	1.1	0.5	0.4	0.9	3.0	1.3	4.8	2.6	1.1	2.1	3.5	4.2	2.7	3.7	4.8	3.0	3.8	5.1	1.2	0.5	0.3	5.1	1.6	24	
7	0.4	0.3	0.4	0.1	0.7	0.5	0.5	2.8	3.2	4.1	7.1	7.1	7.9	7.5	9.4	10.9	9.3	10.5	6.8	2.7	1.4	1.4	1.9	1.2	0.1	10.9	3.6	24	
8	1.4	0.5	1.5	1.4	0.7	1.3	2.0	4.1	5.8	5.8	6.5	5.6	4.1	4.0	7.5	6.3	0.8	6.3	4.9	6.6	8.2	5.2	4.2	3.9	0.5	8.2	1.2	24	
9	2.6	0.7	0.9	0.5	0.6	0.8	0.3	4.1	6.1	7.0	6.3	9.5	9.1	10.6	11.6	10.8	12.3	11.6	9.3	6.6	4.9	4.8	4.8	4.2	0.3	12.3	5.7	24	
10	4.5	6.0	5.3	5.7	2.4	0.3	1.0	4.9	7.3	7.9	12.1	10.4	8.9	9.7	8.7	10.3	10.2	10.2	6.7	6.5	5.3	7.8	8.2	8.9	0.3	12.1	4.6	24	
11	8.5	9.0	8.9	6.5	5.0	4.4	5.7	5.9	6.2	6.3	7.9	10.1	9.1	6.1	6.4	3.9	5.2	4.4	1.6	2.0	0.4	0.6	1.8	1.3	0.4	10.1	4.0	24	
12	1.9	0.7	0.8	0.4	1.1	1.1	1.5	2.6	4.3	5.0	6.7	6.2	4.9	4.0	4.3	7.5	6.3	5.1	3.0	0.7	1.5	4.3	1.4	1.2	0.4	7.5	2.2	24	
13	0.6	1.5	1.8	0.5	0.9	2.7	6.0	6.6	9.4	8.5	13.1	10.3	12.4	13.0	12.2	12.0	13.5	9.4	12.5	13.1	9.9	11.6	12.1	13.1	0.5	13.5	8.5	24	
14	10.2	11.5	13.2	10.8	11.4	11.4	9.4	9.5	12.2	8.6	7.3	4.8	7.0	7.6	6.7	5.7	7.6	6.6	4.0	1.8	3.0	3.0	1.6	0.5	0.5	13.2	5.1	24	
15	2.9	6.4	5.3	5.9	6.0	2.0	3.2	3.8	4.8	7.1	7.5	8.1	8.8	10.6	8.5	8.8	8.6	6.6	6.1	5.9	5.5	6.6	5.6	5.7	2.0	10.6	5.5	24	
16	5.3	3.3	4.9	3.4	5.2	4.4	8.7	7.4	8.3	11.1	10.8	12.0	12.4	11.8	15.9	14.6	15.2	16.1	13.5	14.6	9.6	8.8	10.6	11.6	3.3	16.1	9.2	24	
17	7.8	8.0	10.0	7.3	8.5	6.9	8.9	8.7	8.4	7.8	8.4	10.5	10.5	10.1	7.9	6.9	4.0	4.5	9.2	8.3	11.5	8.4	9.3	11.2	4.0	11.5	5.2	24	
18	8.9	9.4	9.7	9.9	8.1	6.5	5.6	8.0	10.1	11.0	11.3	12.4	11.4	12.1	11.6	12.1	11.1	11.6	8.1	3.6	2.5	3.2	0.6	1.0	0.6	12.4	8.1	24	
19	0.9	0.5	0.3	1.1	0.8	1.1	0.6	3.1	3.0	4.7	7.0	8.3	10.6	10.1	10.6	10.7	7.8	9.1	6.8	7.4	7.1	7.9	9.3	7.5	0.3	10.7	4.5	24	
20	6.0	4.2	1.0	0.6	1.8	1.8	1.5	2.8	5.2	4.5	3.4	4.9	5.5	6.4	6.3	10.0	7.3	8.0	7.6	4.5	1.3	0.7	0.6	0.9	0.6	10.0	2.9	24	
21	0.9	0.3	1.4	2.5	1.0	0.1	1.9	2.5	3.9	4.5	5.8	4.9	4.3	3.1	6.5	8.9	7.3	6.2	11.8	12.5	13.7	14.6	10.0	11.1	0.1	14.6	2.9	24	
22	11.4	12.3	12.8	13.8	12.7	13.0	13.6	14.6	14.8	14.4	15.5	14.9	15.5	17.8	14.9	18.1	15.8	18.9	11.2	9.5	3.6	2.9	5.5	5.4	2.9	18.9	12.1	24	
23	5.3	4.3	4.3	4.2	5.0	4.7	4.4	6.0	7.3	7.9	8.1	8.3	12.1	13.0	12.9	12.5	10.6	7.9	9.2	7.6	4.4	2.8	1.5	1.7	1.5	13.0	6.4	24	
24	0.8	1.2	1.1	0.9	0.3	0.4	1.8	6.3	10.7	8.5	8.3	10.0	11.3	14.6	16.4	16.0	14.8	13.1	9.5	6.3	5.5	6.9	6.5	4.4	0.3	16.4	6.7	24	
25	5.0	3.8	4.6	3.8	2.5	2.4	3.1	4.4	7.0	13.1	16.9	16.5	12.5	14.3	12.9	11.1	9.1	8.8	9.9	5.9	3.9	5.7	6.1	5.3	2.4	16.9	6.3	24	
26	6.2	4.6	5.6	6.2	6.5	6.7	6.7	8.3	12.3	15.5	12.4	12.5	14.3	15.5	16.4	15.2	13.1	10.5	7.1	5.1	4.0	6.5	3.2	3.1	3.1	16.4	6.0	24	
27	3.6	3.0	1.8	1.0	0.5	1.4	3.4	4.4	7.3	9.8	8.2	11.4	9.7	10.3	11.2	9.8	9.2	7.7	6.3	6.9	7.2	7.2	7.2	6.3	0.5	11.4	5.7	24	
28	5.5	5.4	4.0	2.0	1.8	2.2	2.3	4.9	7.4	6.9	7.4	8.9	9.9	11.8	10.7	10.9	12.3	8.2	4.5	1.8	1.7	0.6	0.3	10.3	0.3	12.3	4.7	24	
29	11.0	13.9	9.9	9.7	13.3	13.7	16.5	15.5	15.9	16.0	15.9	13.3	11.7	15.0	13.7	11.5	7.7	10.8	8.5	3.7	0.5	0.8	0.2	0.7	0.2	16.5	9.9	24	
30	0.3	0.5	0.4	0.2	0.8	0.3	1.2	2.3	4.0	5.4	6.5	8.6	9.3	9.8	8.5	9.7	9.2	7.5	7.5	2.3	3.6	5.5	7.2	6.3	0.2	9.8	4.2	24	
HOURLY MAX	11.4	13.9	13.2	13.8	13.3	13.7	16.5	15.5	15.9	16.0	16.9	16.5	15.8	17.8	16.4	18.1	15.8	18.9	13.5	14.6	13.7	14.6	12.1	13.1					
HOURLY AVG	0.7	0.6	0.6	0.5	0.4	0.3	0.5	0.2	0.5	0.6	0.5	0.9	1.2	1.4	1.8	1.8	1.6	1.2	1.7	1.1	0.8	0.8	1.0	1.0					

STATUS FLAG CODES

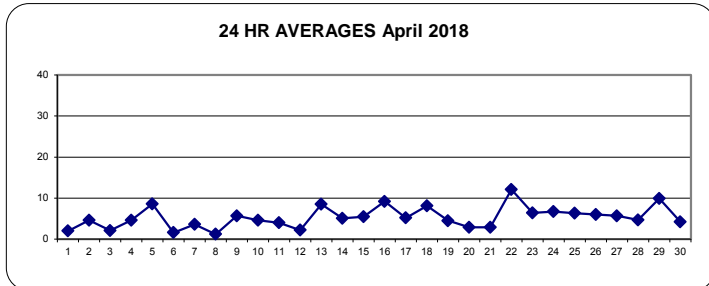
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

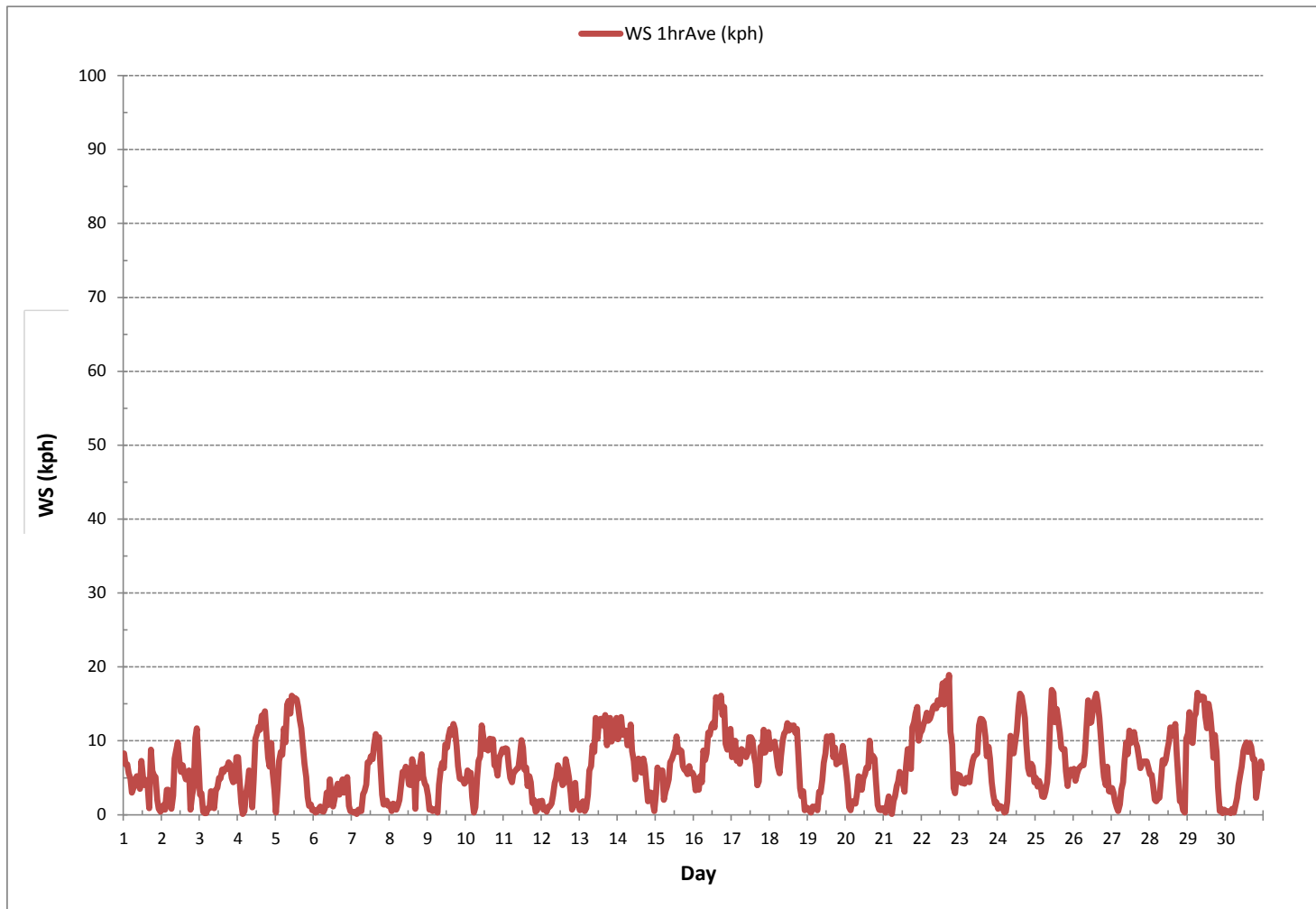
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	720
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 3 ON DAY 4
MAXIMUM 1-HR AVERAGE:	18.9 kph @ HOUR 17 ON DAY 22
MAXIMUM 24-HR AVERAGE:	12.1 kph ON DAY 22
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.3
MONTHLY AVERAGE:	0.6 kph

24 HR AVERAGES April 2018



WIND SPEED Hourly Averages (WS kph)



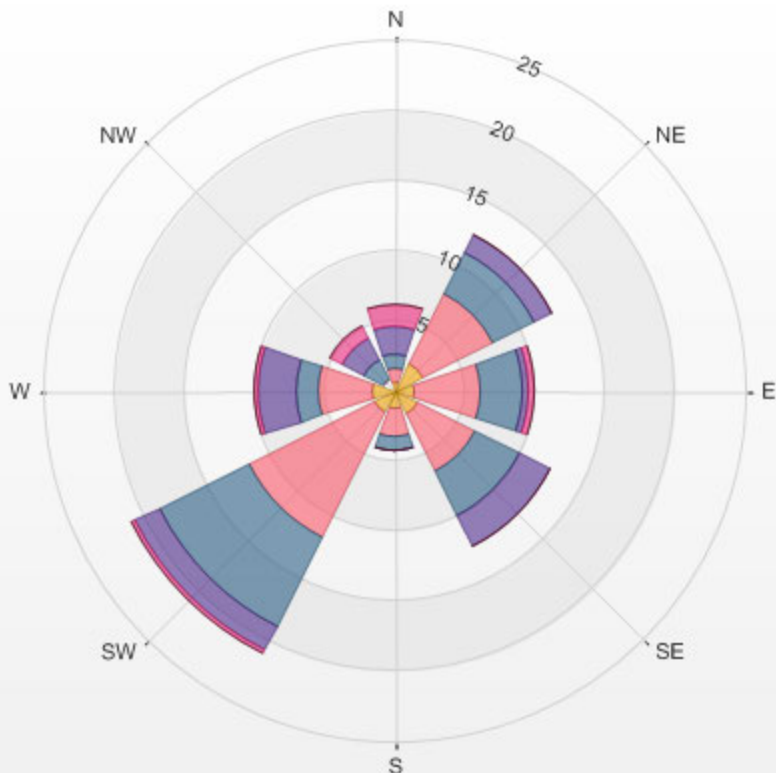
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 18/04
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.47%

Direction	1.8-3.8	3.8-7.6	7.6-11.4	11.4-15.2	15.2-19.0	>19.0	Total
N	0.7	1.0	1.0	1.9	1.7	0.0	6.2
NE	2.2	5.6	3.3	1.4	0.0	0.0	12.5
E	1.4	4.7	3.1	0.4	0.4	0.0	10.0
SE	1.8	4.6	3.6	2.4	0.0	0.0	12.4
S	1.3	2.1	1.0	0.0	0.0	0.0	4.3
SW	1.7	10.0	7.1	1.9	0.3	0.0	21.0
W	1.7	3.8	1.7	2.6	0.3	0.0	10.0
NW	0.1	0.8	1.5	1.7	1.0	0.0	5.1
Summary	10.8	32.5	22.2	12.4	3.6	0.0	81.5

% Icon Classes (kph) 11 1.8-3.8 32 3.8-7.6 22 7.6-11.4 12 11.4-15.2 4 15.2-19.0 0 >19.0

LICA COLD LAKE SOUTH 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 18.47% Calm Wind Avg Speed: 0.87(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 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	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	WSW	SW	SSW	SSE	WSW	WSW	NNE	NE	NE	ENE	NE	NNE	E	NNW	WSW	24	
2	NNE	NE	ENE	ENE	ENE	NE	NNW	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ESE	E	ENE	SSE	NE	NNE	NE	NE	NE	NE	NE	24
3	ENE	N	E	NNE	ESE	W	NE	NNE	NE	S	W	WSW	SW	SW	WSW	SW	SW	SW	WSW	SW	WSW	W	WNW	NNE	WSW	24	
4	NNE	NE	NE	WNW	WSW	NNE	NNE	NNE	N	SW	WSW	SW	WSW	W	W	WNW	WNW	NW	NW	NNW	NNW	NNW	NNE	N	NW	24	
5	SSE	NW	NW	NW	NW	N	NNW	NNW	NNW	N	NNW	N	N	N	N	N	N	NE	NE	NNW	N	WSW	WSW	S	NNW	24	
6	SSW	SW	WNW	SW	WSW	S	NNW	SE	E	SSW	WSW	W	SSW	SSE	S	WSW	SW	WSW	WSW	W	WSW	WSW	WSW	SE	SW	24	
7	SE	NE	E	E	WSW	NNW	NNE	NE	NE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	SE	SE	SSE	S	SSE	NE	ENE	ESE	24	
8	ENE	ENE	NE	NE	NNE	NNE	NE	ESE	E	ESE	SE	ESE	ESE	ENE	NE	NNE	N	WSW	SW	SW	SW	SW	SW	SW	SW	SE	24
9	SSW	S	S	SE	SSE	WSW	WSW	WSW	SW	WSW	SW	SW	SW	SW	SW	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	SW	24
10	WSW	SW	WSW	WSW	W	NNW	WSW	N	NE	NE	NE	NE	ENE	NE	ENE	ENE	ENE	NE	NE	NE	NE	E	E	E	ENE	24	
11	E	E	E	E	E	ESE	ENE	ENE	NE	NE	NE	NE	NE	NNE	N	NE	SE	SE	S	WSW	SE	SE	SE	ESE	ENE	24	
12	ENE	ENE	ENE	ENE	NE	ENE	ENE	E	ESE	ESE	ESE	ESE	ESE	E	E	NNE	NE	NE	NNE	SSE	SSE	SW	SW	SE	E	24	
13	SSW	ESE	ESE	ENE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	24
14	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SSW	WSW	WSW	WSW	SW	SW	WSW	WSW	S	SSE	SSE	SSW	S	SSE	24	
15	ESE	SE	SE	SE	SE	N	ENE	ESE	E	E	E	E	E	E	E	E	E	ENE	NE	NE	NE	NE	E	E	E	24	
16	E	ENE	NE	NE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	NE	NE	E	E	E	E	E	SE	ESE	ESE	ESE	E	E	24	
17	ESE	ESE	E	ESE	E	ESE	E	ESE	ESE	ESE	SE	SE	SE	SE	SSE	SSE	SSE	SSW	SW	SW	SW	SW	SW	SW	WSW	SE	24
18	WSW	SW	WSW	WSW	SW	WSW	SW	SW	WSW	WSW	W	W	WSW	SW	SW	SW	WSW	SW	WSW	SW	SW	SW	SE	SE	SE	WSW	24
19	S	SW	ESE	ENE	E	ESE	E	SE	SSE	SSE	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	24	
20	SE	SE	SSW	E	SE	SE	SE	S	W	WSW	WSW	SE	SSE	SW	SW	WSW	SW	SW	WSW	SW	SW	SE	SSW	ESE	SSW	24	
21	ESE	ESE	E	ENE	SE	S	ENE	ESE	ENE	E	ENE	ENE	NE	E	E	ENE	NE	NNE	NNW	NW	NW	NW	WNW	WNW	N	24	
22	W	W	W	W	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	24
23	W	W	W	WSW	WSW	WSW	WSW	WSW	SW	SW	W	W	W	WNW	W	W	W	W	WSW	SW	SW	SW	WSW	SW	W	24	
24	SSE	SW	WSW	SE	SSE	SE	SSW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	SW	SW	SW	SW	WNW	WNW	NW	WNW	WSW	24	
25	W	WSW	WSW	WSW	WSW	W	WSW	W	NW	NNW	NW	NW	NNW	NW	NNW	NNW	NNW	NNW	NNW	W	WSW	SW	SW	SW	WNW	24	
26	WSW	W	WSW	SW	WSW	WSW	W	W	NW	N	N	NNW	NNW	NNW	NNW	NNW	N	NNE	NNE	NE	ENE	ENE	E	ESE	NNW	24	
27	ESE	SE	ESE	SSE	ESE	ESE	SE	SSE	S	SSE	SSE	SW	SSW	SSW	SSW	SSW	S	S	S	SE	SE	SE	SSE	SSE	S	24	
28	S	S	S	SSE	SSE	SE	SE	S	SSW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	N	SSW	24	
29	NNE	N	N	NNE	N	N	N	N	N	N	N	NNE	NNE	NNE	NE	NNE	NNE	NNE	NE	NE	NNW	WSW	NE	SE	NNE	24	
30	WSW	SW	SSE	SSW	ENE	ESE	WSW	S	SSE	SSE	SW	SW	SSW	SSW	SSW	SSW	SW	SSW	SW	S	SE	SE	SE	SE	SSW	24	

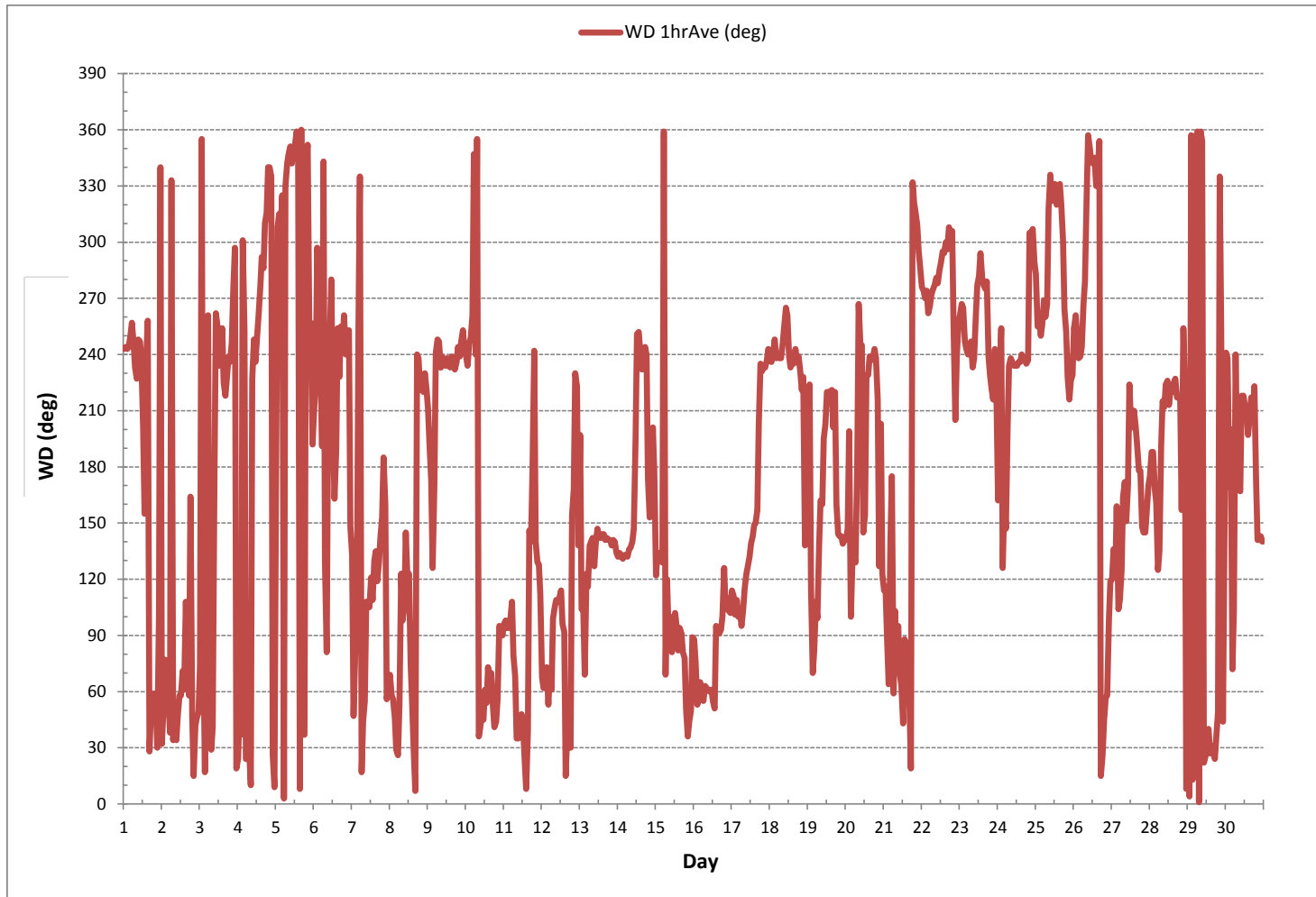
STATUS FLAG CODES

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:	720	hrs
STANDARD DEVIATION:	93		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	238	(SW)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 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	
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	RDGS.
DAY																									
1	14	13	12	11	13	36	16	14	15	23	42	22	35	51	56	56	46	18	16	15	16	28	37	68	24
2	65	29	35	20	17	30	47	29	17	19	20	23	34	25	28	41	24	20	37	24	32	17	16	15	24
3	37	38	48	62	64	42	45	29	33	43	43	60	49	55	36	33	32	24	15	14	15	20	17	16	24
4	16	16	66	67	63	21	20	20	31	46	39	20	22	22	23	21	21	19	14	14	14	15	21	20	24
5	40	43	12	12	15	16	16	17	18	20	21	20	20	23	20	20	20	21	18	18	34	39	46	37	24
6	60	54	61	48	43	61	69	36	27	56	34	58	47	65	45	37	49	40	15	21	9	11	28	34	24
7	55	69	52	69	41	58	65	34	27	34	25	29	32	27	25	20	24	20	16	23	58	53	20	24	24
8	24	49	26	15	40	26	40	26	22	28	29	27	54	44	21	32	48	17	17	20	17	20	15	16	24
9	20	53	27	47	46	52	58	23	21	22	29	19	22	19	18	17	17	17	18	16	15	11	10	11	24
10	12	12	12	11	20	50	67	28	18	18	16	17	21	20	23	21	21	16	15	18	15	19	19	18	24
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12	21	38	62	48	36	35	27	40	25	25	24	33	40	40	47	30	21	21	20	54	34	18	31	42	24
13	35	24	34	62	53	22	13	13	13	20	16	25	19	18	21	23	13	19	15	13	14	15	14	13	24
14	16	16	17	19	16	16	18	16	16	22	40	37	29	20	25	30	20	18	16	18	34	38	43	69	24
15	23	12	13	15	23	36	21	22	22	24	21	22	23	21	19	22	20	20	19	15	18	15	14	18	24
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17	25	24	21	23	18	23	19	21	21	22	22	19	18	15	22	22	29	27	16	16	17	15	17	17	24
18	17	16	16	19	16	16	17	16	19	20	22	19	20	16	18	18	18	17	16	18	30	27	62	60	24
19	69	75	51	38	54	36	66	42	35	37	36	34	28	29	26	26	36	25	27	17	16	15	11	13	24
20	16	28	40	59	25	43	53	34	31	33	48	44	27	28	33	22	31	21	15	13	35	44	38	36	24
21	55	65	27	19	33	49	22	25	21	28	24	31	43	45	18	16	17	21	13	12	12	13	17	18	24
22	19	19	19	19	17	18	19	20	20	20	20	20	21	21	20	20	20	17	19	20	16	19	12	15	24
23	13	14	14	8	9	11	18	20	17	24	29	33	26	28	25	25	25	24	17	14	18	24	35	32	24
24	59	62	41	58	71	76	46	19	17	20	23	21	20	19	18	19	17	16	16	16	19	14	10	15	24
25	18	14	12	13	31	23	22	23	27	25	19	20	26	26	24	27	31	22	19	15	19	18	16	17	24
26	14	34	12	11	12	12	18	20	18	20	26	26	26	25	20	22	22	21	19	17	16	14	16	21	24
27	18	23	27	50	56	23	23	39	39	33	40	25	36	37	35	37	39	40	39	22	19	20	31	41	24
28	44	43	54	57	49	31	40	36	30	36	35	30	38	29	29	28	22	29	25	37	51	51	70	23	24
29	18	16	17	17	16	16	17	17	17	19	19	19	19	20	23	20	22	21	18	33	48	37	59	55	24
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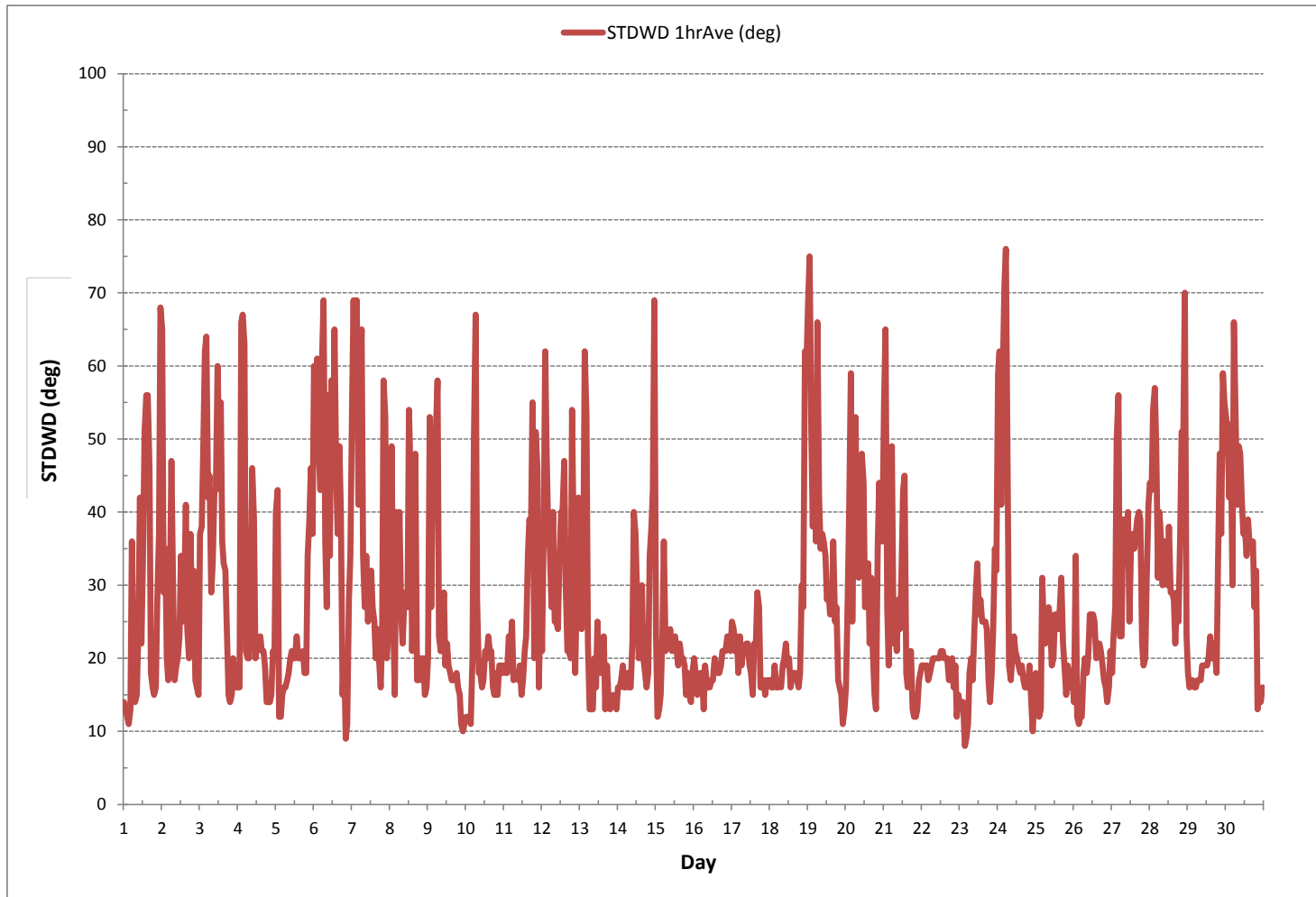
STATUS FLAG CODES

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: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



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

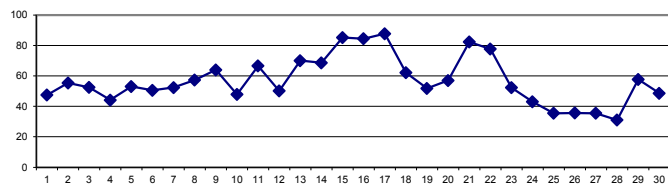
RELATIVE HUMIDITY Hourly Averages (RH %)

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

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

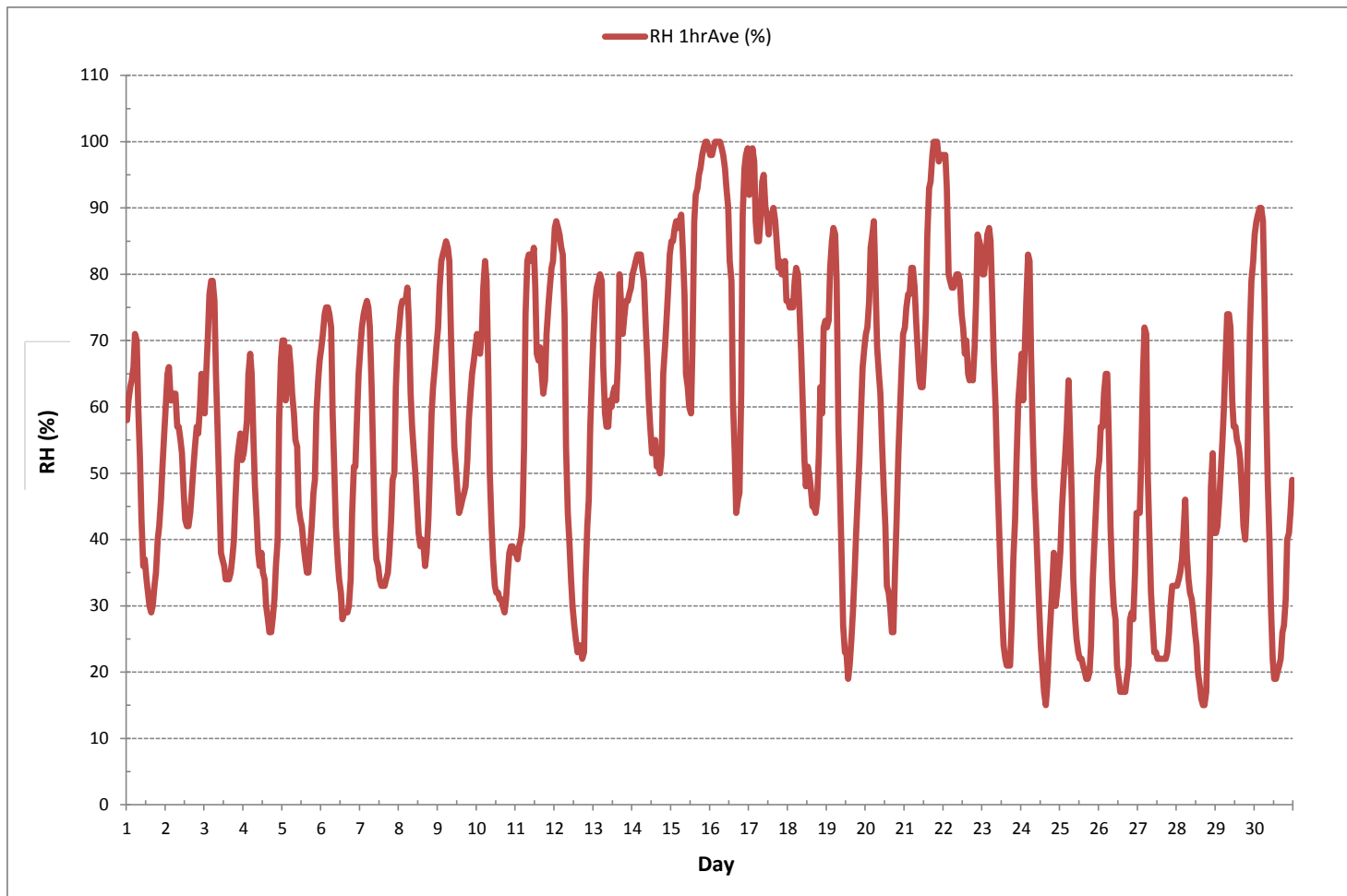
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	15	%	@ HOUR	15	ON DAY	24
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	21	ON DAY	15
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY	17
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	22		MONTHLY AVERAGE:			57 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



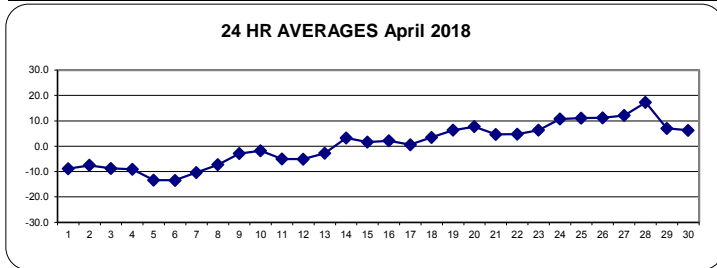
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 2018

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	-13.0	-13.8	-14.6	-15.3	-16.3	-18.3	-18.2	-14.7	-12.2	-8.9	-6.4	-5.8	-4.5	-3.3	-2.3	-1.5	-1.5	-2.7	-3.8	-5.2	-6.3	-7.4	-8.2	-8.6	-18.3	-1.5	-8.9	24
2	-9.8	-11.3	-11.3	-11.1	-11.5	-11.7	-11.7	-10.7	-10.0	-8.0	-7.3	-5.7	-4.5	-3.7	-3.4	-3.4	-3.5	-4.0	-4.2	-4.7	-5.1	-7.1	-8.3	-9.0	-11.7	-3.4	-7.5	24
3	-8.9	-10.2	-12.0	-14.3	-16.0	-17.6	-16.2	-12.4	-10.6	-8.0	-6.1	-5.2	-4.7	-4.3	-3.6	-3.7	-4.1	-4.5	-5.1	-6.6	-7.9	-8.7	-9.6	-9.9	-17.6	-3.6	-8.8	24
4	-10.6	-11.3	-12.1	-13.6	-14.3	-14.7	-14.0	-13.0	-11.8	-9.5	-8.0	-7.1	-5.8	-5.0	-4.2	-3.8	-3.6	-4.1	-5.0	-6.6	-8.1	-8.8	-10.6	-11.7	-14.7	-3.6	-9.1	24
5	-12.3	-13.1	-13.0	-13.5	-14.1	-15.1	-15.7	-15.4	-14.9	-14.3	-13.7	-12.8	-11.8	-10.8	-9.9	-9.6	-9.5	-10.0	-11.2	-13.2	-14.4	-16.8	-18.1	-19.2	-19.2	-9.5	-13.4	24
6	-20.4	-21.3	-22.4	-23.2	-23.9	-24.4	-22.7	-17.7	-14.4	-12.1	-10.7	-9.1	-7.9	-6.5	-6.0	-5.0	-4.7	-4.5	-6.1	-8.7	-11.2	-11.2	-13.3	-15.4	-24.4	-4.5	-13.5	24
7	-17.1	-18.4	-19.4	-20.5	-21.5	-22.2	-20.6	-15.9	-12.3	-9.1	-7.0	-5.1	-3.9	-2.8	-2.1	-2.1	-2.1	-2.7	-3.6	-5.1	-6.5	-7.3	-10.0	-11.7	-22.2	-2.1	-10.4	24
8	-12.6	-14.2	-15.3	-16.4	-17.5	-17.9	-14.9	-11.3	-9.4	-7.2	-6.1	-4.5	-3.0	-1.6	-1.5	-0.9	0.0	-1.0	-1.9	-2.4	-3.0	-3.7	-4.0	-4.4	-17.9	0.0	-7.3	24
9	-4.9	-6.8	-8.6	-9.2	-10.3	-11.3	-10.4	-7.6	-4.9	-3.2	-1.0	0.2	1.3	2.1	2.6	2.7	2.6	2.4	1.8	0.5	-0.4	-1.3	-2.1	-3.0	-11.3	2.7	-2.9	24
10	-4.1	-3.9	-4.1	-4.9	-6.7	-7.8	-6.0	-3.4	-2.0	-1.1	-0.6	0.1	1.4	2.1	3.0	3.0	2.6	1.7	0.6	-0.9	-2.1	-2.3	-3.0	-3.8	-7.8	3.0	-1.8	24
11	-4.3	-4.9	-5.5	-5.8	-6.0	-6.6	-7.6	-7.7	-7.1	-6.7	-6.3	-6.0	-5.0	-3.9	-3.6	-2.8	-2.1	-1.7	-2.3	-4.0	-4.5	-4.8	-5.5	-6.1	-7.7	-1.7	-5.0	24
12	-8.1	-10.2	-11.9	-13.1	-14.2	-14.7	-11.9	-7.9	-6.1	-4.7	-2.8	-1.5	-0.3	0.5	1.0	1.2	1.4	1.6	1.3	-1.8	-3.9	-3.6	-5.5	-7.1	-14.7	1.6	-5.1	24
13	-8.3	-8.8	-9.2	-9.9	-10.9	-10.2	-6.9	-5.5	-3.9	-1.5	0.0	1.1	1.1	1.0	1.4	1.0	0.2	0.6	0.6	0.2	0.1	0.3	0.3	0.0	-10.9	1.4	-2.8	24
14	-0.3	0.0	0.2	0.2	0.3	0.2	0.3	0.7	1.7	3.0	4.5	5.7	6.9	7.0	6.4	7.9	7.9	8.3	7.5	3.7	2.8	2.5	1.4	-0.2	-0.3	8.3	3.3	24
15	-0.6	-0.5	-0.8	-0.8	-0.3	-1.0	-1.2	0.6	2.2	4.6	5.1	5.7	5.9	4.6	2.9	2.8	2.5	1.9	1.1	0.6	0.5	0.5	0.7	0.9	-1.2	5.9	1.6	24
16	0.8	0.8	0.6	0.5	0.4	0.4	0.5	0.9	1.3	1.7	2.2	3.2	4.6	5.0	6.2	6.4	6.4	5.2	4.2	2.4	0.0	-0.6	-0.8	-1.1	-1.1	6.4	2.1	24
17	-1.0	-1.2	-1.3	-1.2	-1.2	-0.7	-0.5	-0.7	-0.7	-0.1	0.3	0.7	1.3	1.5	2.0	2.3	2.5	2.8	2.5	2.2	1.9	1.6	1.1	0.3	-1.3	2.8	0.6	24
18	-0.3	0.3	0.5	0.6	-0.5	-1.0	-0.4	1.3	3.1	4.7	6.1	7.0	7.3	7.5	8.0	8.2	8.3	7.9	7.1	5.0	2.0	1.9	-0.5	-1.0	-1.0	8.3	3.5	24
19	-0.5	-0.7	-2.3	-3.1	-3.5	-3.1	-0.7	4.2	7.1	10.0	11.5	12.0	12.2	12.9	12.9	13.0	13.1	12.7	11.5	9.1	7.3	6.2	5.3	4.5	-3.5	13.1	6.3	24
20	4.0	3.7	2.9	0.7	0.3	-0.1	2.9	4.9	6.8	8.0	10.1	11.8	12.7	14.1	15.1	15.4	15.6	15.0	12.7	10.1	7.3	5.4	3.5	2.3	-0.1	15.6	7.7	24
21	2.0	1.4	1.2	0.9	0.4	0.4	1.3	3.5	6.0	7.0	7.6	8.0	8.3	7.8	6.9	6.6	6.4	5.6	5.7	5.4	5.0	4.5	4.4	4.4	0.4	8.3	4.6	24
22	4.2	4.0	4.0	4.1	3.3	3.1	3.8	4.0	4.4	4.6	4.9	6.3	6.7	7.3	7.3	7.7	7.8	6.7	7.0	5.9	3.8	1.2	1.5	1.1	1.1	7.8	4.8	24
23	0.9	0.3	-0.6	-1.7	-2.0	-1.6	0.8	3.3	5.0	7.4	9.6	11.1	11.8	12.9	13.4	13.5	13.7	13.9	12.5	10.1	7.7	5.1	2.9	2.1	-2.0	13.9	6.3	24
24	1.8	2.6	1.1	0.0	-0.9	-0.9	3.2	6.8	9.8	12.1	14.3	16.5	17.5	18.8	19.3	19.3	19.0	17.5	16.5	14.8	12.9	12.8	11.6	10.7	-0.9	19.3	10.7	24
25	10.2	8.4	7.4	6.8	5.6	4.1	6.5	9.1	12.2	13.2	13.5	14.1	14.6	15.3	15.6	16.0	15.9	15.5	15.1	13.3	10.0	8.7	7.9	7.1	4.1	16.0	11.1	24
26	6.4	5.0	5.0	3.9	3.6	3.6	6.2	9.7	13.1	14.5	15.5	16.8	17.3	17.8	18.1	18.0	17.8	16.9	15.7	12.3	9.9	9.6	7.5	5.1	3.6	18.1	11.2	24
27	5.1	4.7	2.9	0.3	-1.0	-0.3	4.9	8.4	10.8	12.7	14.6	15.8	17.3	18.6	19.5	20.2	20.5	20.6	19.8	17.9	15.9	14.5	14.0	13.2	-1.0	20.6	12.1	24
28	12.2	11.2	10.7	9.8	8.6	7.4	10.2	12.4	14.2	15.9	18.2	20.7	22.9	24.8	26.4	27.2	27.3	27.1	25.6	21.5	17.6	14.2	12.5	15.6	7.4	27.3	17.3	24
29	15.3	14.3	12.4	10.7	8.7	7.2	6.2	5.5	5.5	5.1	6.2	6.5	6.6	7.4	7.4	7.5	8.2	8.8	8.8	7.1	3.8	1.4	-0.4	-1.2	-1.2	15.3	7.0	24
30	-2.0	-2.6	-3.3	-3.8	-4.4	-3.6	0.3	3.8	6.3	7.8	9.3	10.3	11.3	12.1	12.8	13.2	13.5	13.6	13.0	11.3	8.4	8.1	7.7	6.8	-4.4	13.6	6.2	24
HOURLY MAX	15.3	14.3	12.4	10.7	8.7	7.4	10.2	12.4	14.2	15.9	18.2	20.7	22.9	24.8	26.4	27.2	27.3	27.1	25.6	21.5	17.6	14.5	14.0	15.6				
HOURLY AVG	-2.5	-3.2	-4.0	-4.8	-5.5	-5.9	-4.4	-2.2	-0.4	1.3	2.6	3.7	4.6	5.3	5.7	6.0	6.1	5.7	4.9	3.1	1.5	0.5	-0.6	-1.3				

STATUS FLAG CODES

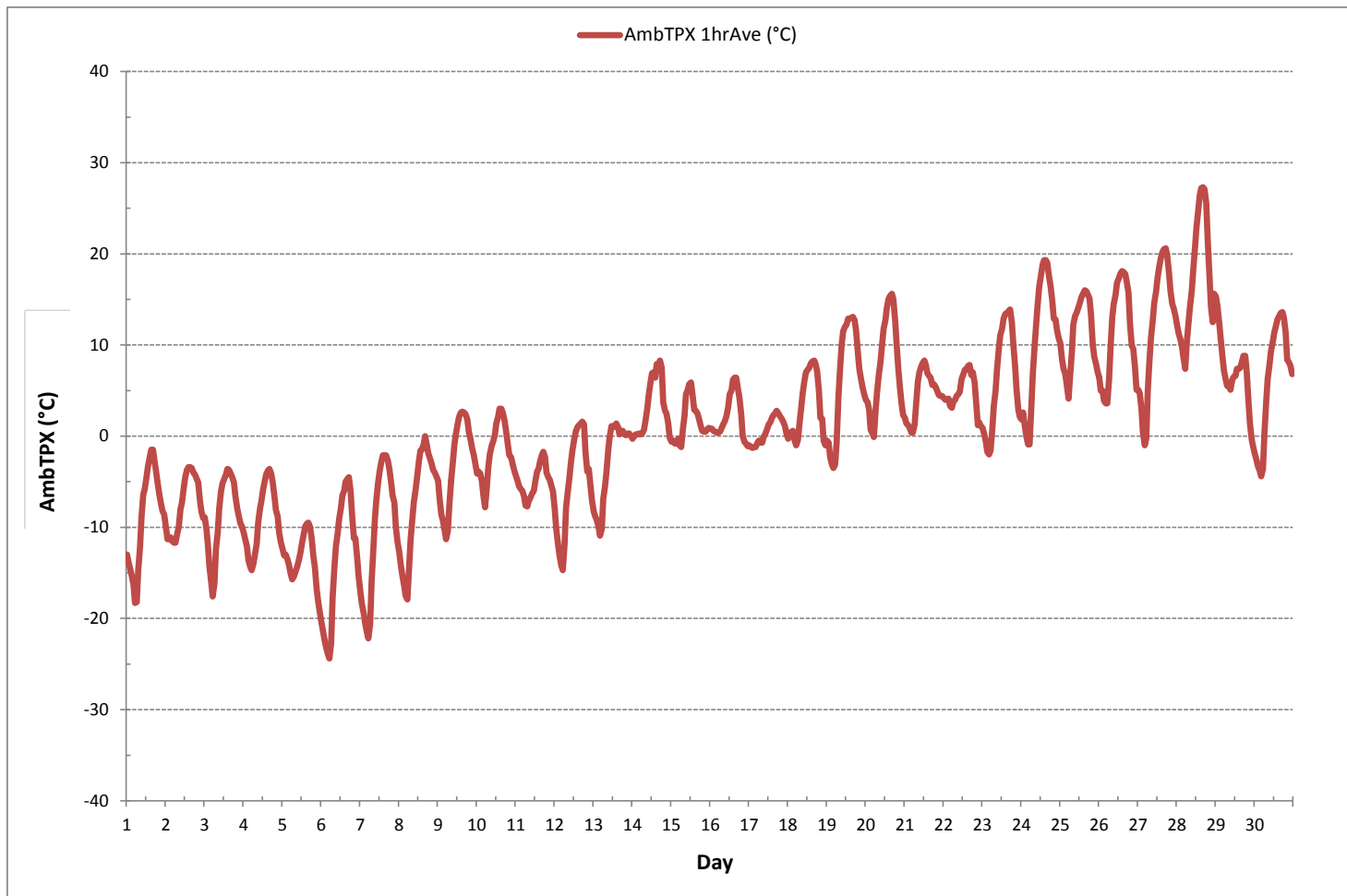
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-24.4 °C	@ HOUR	5	ON DAY	6
MAXIMUM 1-HR AVERAGE:	27.3 °C	@ HOUR	16	ON DAY	28
MAXIMUM 24-HR AVERAGE:	17.3 °C			ON DAY	28
OPERATIONAL TIME:				720	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	9.4	MONTHLY AVERAGE:		0.7	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration

Date:	April 4, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	943	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	9:02	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	13:28	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:	March 19, 2018	As Found C.F.:	0.997		
Previous C.F.:	1.001	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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	Standard Calibration Points for Ranges <table border="1"> <tr><th>Point</th><th>ppb</th></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								

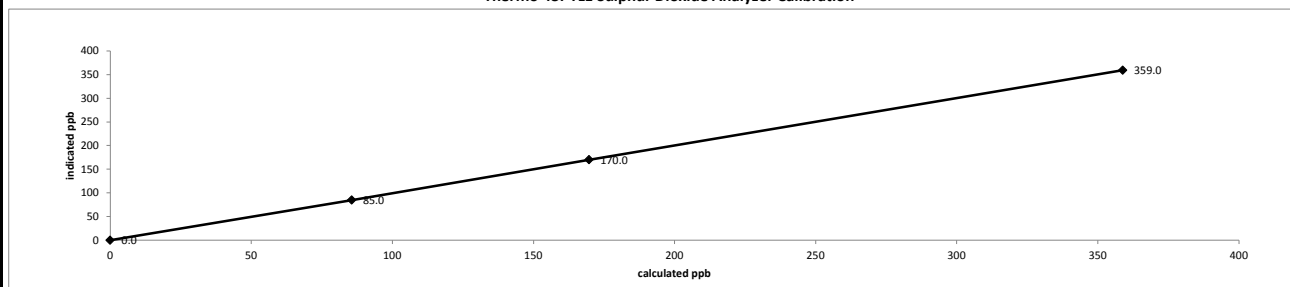
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5028	0.00	5028	0.0	0.0	n/a
as found high	4995	36.70	5032	358.8	360.0	0.997
adjusted zero	5028	0.00	5028	0.0	0.0	n/a
adjusted high	4995	36.70	5032	358.8	359.0	1.000
mid	5013	17.35	5030	169.7	170.0	0.998
low	5020	8.75	5029	85.6	85.0	1.007
calibrator zero	5028	0.00	5028	0.0	0.0	n/a
Average C.F. =						1.002

Linear Regression/Calibration Results:

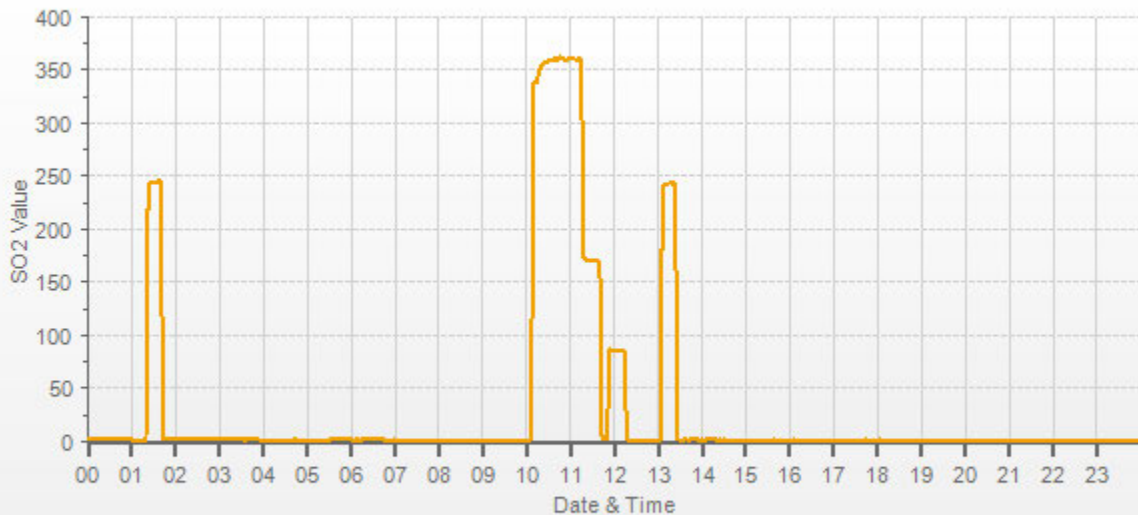
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.999		0.95-1.05
b (Intercept as % of full scale) =	0.04%		± 3% F.S.
% change in C.F. from last cal =	0.42%		± 10%

Thermo 43I-TLE Sulphur Dioxide Analyzer Calibration



As found: Bkg: 8.7 Coef: 0.983 Pmt: -623.8 Flash: 769 Internal: 28.6 Chamber: 45.0 Perm Oven Gas: 35.00 Perm Oven Heater: 34.24 Pressure: 682.2 Sample Flow: 0.475 Lamp Intensity: 96 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 245.0	As left: Bkg: 8.6 Coef: 0.975 Pmt: -623.5 Flash: 768 Internal: 29.2 Chamber: 45.1 Perm Oven Gas: 35.00 Perm Oven Heater: 34.24 Pressure: 681.6 Sample Flow: 0.474 Lamp Intensity: 96 Converter: n/a Converter Set: n/a Averaging Time: 120 Expected Value: 243.0
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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]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	April 4, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	943	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	9:02	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	13:31	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:	March 19, 2018	As Found C.F.:	0.999		
Previous C.F.:	1.000	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: Envionics id# 4760 expires March 2, 2019 Cal Gas Cylinder I.D. #: EY 0000654 Cal Gas Conc. (ppm): 10.2	Standard Calibration Points for Ranges <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	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: 10:05 / 10:15 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									

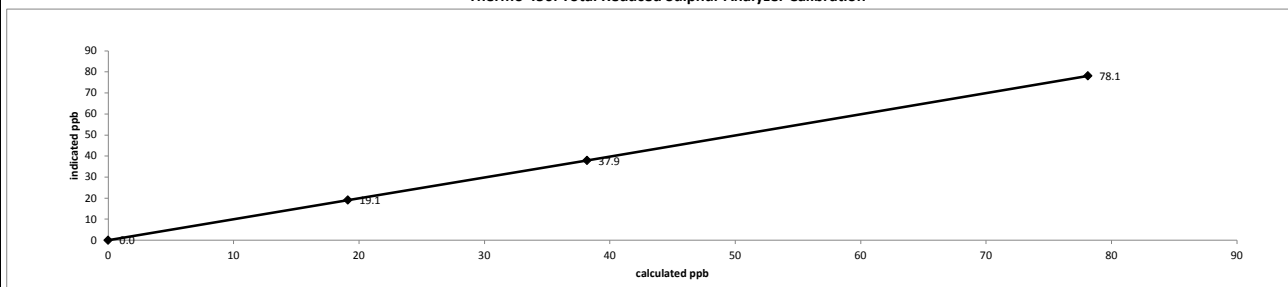
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	7420	0.00	7420	0.0	0.0	n/a
as found high	7357	56.78	7414	78.1	78.2	0.999
adjusted zero	7420	0.00	7420	0.0	0.0	n/a
adjusted high	7357	56.78	7414	78.1	78.1	1.000
mid	7386	27.76	7414	38.2	37.9	1.008
low	7397	13.89	7411	19.1	19.1	1.001
calibrator zero	7420	0.00	7420	0.0	0.0	n/a
Average C.F. =						1.003

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.001		0.95-1.05
b (Intercept as % of full scale) =	0.06%		± 3% F.S.
% change in C.F. from last cal =	0.11%		± 10%

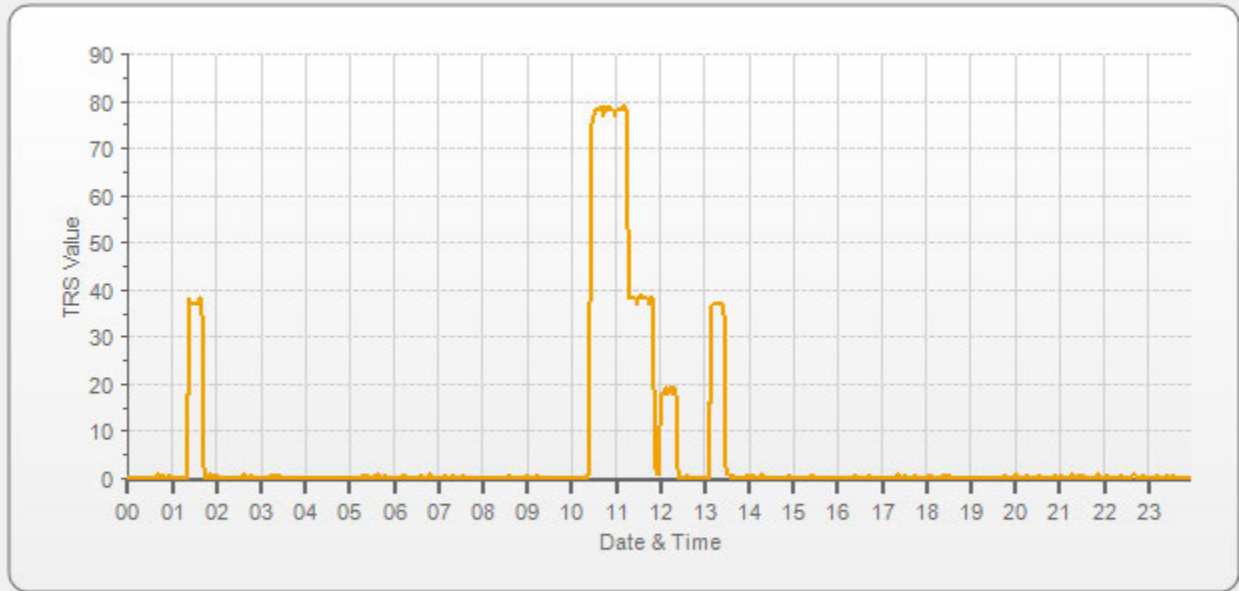
Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:		As left:	
Bkg:	14.6	Bkg:	14.5
Coef:	0.911	Coef:	0.904
Pmt:	-650.5	Pmt:	-650.5
Flash:	742	Flash:	742
Internal:	31.4	Internal:	32.3
Chamber:	45.0	Chamber:	45.0
Converter Temp:	825	Converter Temp:	825
Converter Set:	825	Converter Set:	825
Perm Oven Gas:	45.00	Perm Oven Gas:	45.00
Perm Oven Htr:	44.37	Perm Oven Htr:	44.38
Pressure:	636.1	Pressure:	635.5
Sample Flow:	0.495	Sample Flow:	0.495
Lamp Intensity:	91	Lamp Intensity:	91
Averaging Time:	120	Averaging Time:	120
Expected Value:	37.8	Expected Value:	37.1

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 51C Total Hydrocarbon Analyzer Calibration

Date: <u>April 5, 2018</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>Cold Lake South</u> Parameter: <u>Total Hydrocarbon</u> Start/End Time 24 hr. (mst): <u>8:37 / 10:34</u> Calibration Method: <u>Gas Dilution</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u> <u>950</u> <u>millibars</u> Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>22</u> <u>°C</u> Weather Conditions: <u>Mainly sunny</u> Calibration Purpose: <u>shut down</u> Performed By/Reviewer: <u>Alex Yakupov</u> <u>Rob Fisher</u> Cal Gas Expiry Date: <u>November 24, 2020</u>
Analyzer: Serial Number/Owner: <u>51CLT-77021-384</u> <u>LICA</u> Last Calibration Date: <u>March 20, 2018</u> Previous Cal High Point C.F.: <u>1.000</u>	Range ppm: <u>50</u> As Found C.F.: <u>0.998</u> New C.F.: <u>n/a</u>

Calibration Standards:

Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	Standard Calibration Points for a Range of 50 ppm <table border="1" style="margin: auto;"> <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
Point		Target ppm							
High		38							
Mid		18							
Low	9								
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>									
Calibrator ID/Expiry Date: <u>Enviroconics id# 4760 expires March 2, 2019</u>									
Cal Gas Cylinder I.D. #: <u>LL 165367</u>									

CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	<u>590.0</u>	<u>207.0</u>
CH ₄ as propane/total CH ₄ equivalents (ppm):	<u>569.3</u>	<u>1159.3</u>

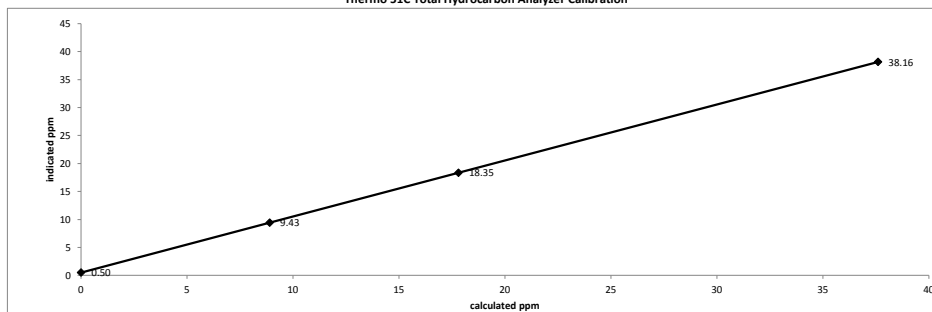
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
as found zero	2501	0.00	2501	0.0	0.50	n/a
as found high	2420	81.12	2501	37.60	38.16	0.998
mid	2462	38.41	2500	17.81	18.35	0.998
low	2482	19.21	2501	8.90	9.43	0.997
Average C.F. =						0.998

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u> Slope = <u>0.998</u> b (Intercept as % of full scale) = <u>-1.01%</u> % change in C.F. from last cal = <u>0.16%</u>	LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10%
---	--

Thermo 51C Total Hydrocarbon Analyzer Calibration



As found: H2 cylinder (psi): <u>950</u> H2 cylinder reg set (psi): <u>22</u> Span Cylinder (psi): <u>900</u> Span Cylinder Reg Set (psi): <u>22</u> Zero Air Gen Pressure: <u>40</u> measurement alarms: <u>None</u> service alarms: <u>None</u> cnt: <u>2904</u> rng: <u>1</u> try: <u>0</u> flm: <u>205.3</u> det: <u>125.1</u> Flame: <u>105</u> Filter: <u>125</u> Base: <u>125</u> Sample psi: <u>06.20</u> Internal Air Pressure: <u>20</u> Internal Fuel Pressure: <u>13</u> Measured Flow: <u>1.031</u> Expected Value: <u>26.60</u>	As left: H2 cylinder (psi): <u>n/a</u> H2 cylinder reg set (psi): <u>n/a</u> Span Cylinder (psi): <u>n/a</u> Span Cylinder Reg Set (psi): <u>n/a</u> Zero Air Gen Pressure: <u>n/a</u> measurement alarms: <u>n/a</u> service alarms: <u>n/a</u> cnt: <u>n/a</u> rng: <u>n/a</u> try: <u>n/a</u> flm: <u>n/a</u> det: <u>n/a</u> Flame: <u>n/a</u> Filter: <u>n/a</u> Base: <u>n/a</u> Sample psi: <u>n/a</u> Internal Air Pressure: <u>n/a</u> Internal Fuel Pressure: <u>n/a</u> Measured Flow: <u>n/a</u> Expected Value: <u>n/a</u>
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Comments:

The manifold blower was found to be working normally.

A Shutdown calibration was completed to adjust fuel pressureregulator to stabilize the Zero value; the adjustment was recommended by Alberta Environment.



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	April 5, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	950	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	post repair		
Start/End Time 24 hr. (mst):	13:06 / 16:01	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2020		
Analyzer:		Range ppm:	50		
Serial Number/Owner:	51CLT-77021-384 LICA	As Found C.F.:	n/a		
Last Calibration Date:	March 20, 2018	New C.F.:	1.000		
Previous Cal High Point 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: Enviroics id# 4760 expires March 2, 2019
 Cal Gas Cylinder I.D. #: LL 165367
 CH₄/C₂H₄ Cylinder Conc. (ppm): 590.0 207.0
 CH₄ as propane/total CH₄ equivalents (ppm): 569.3 1159.3

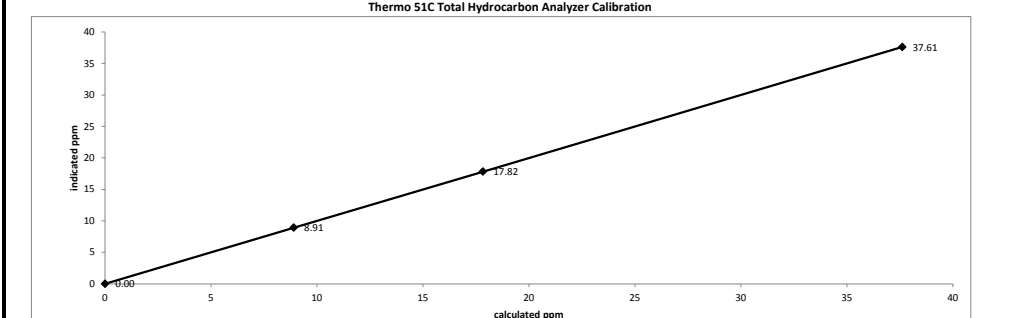
Point	Target ppm
High	38
Mid	18
Low	9

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			
adjusted zero	2500	0.00	2500	0.0	0.00	n/a
adjusted high	2422	81.21	2503	37.61	37.61	1.000
mid	2462	38.45	2500	17.83	17.82	1.001
low	2482	19.21	2501	8.90	8.91	0.999
calibrator zero	2500	0.00	2500	0.00	0.00	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

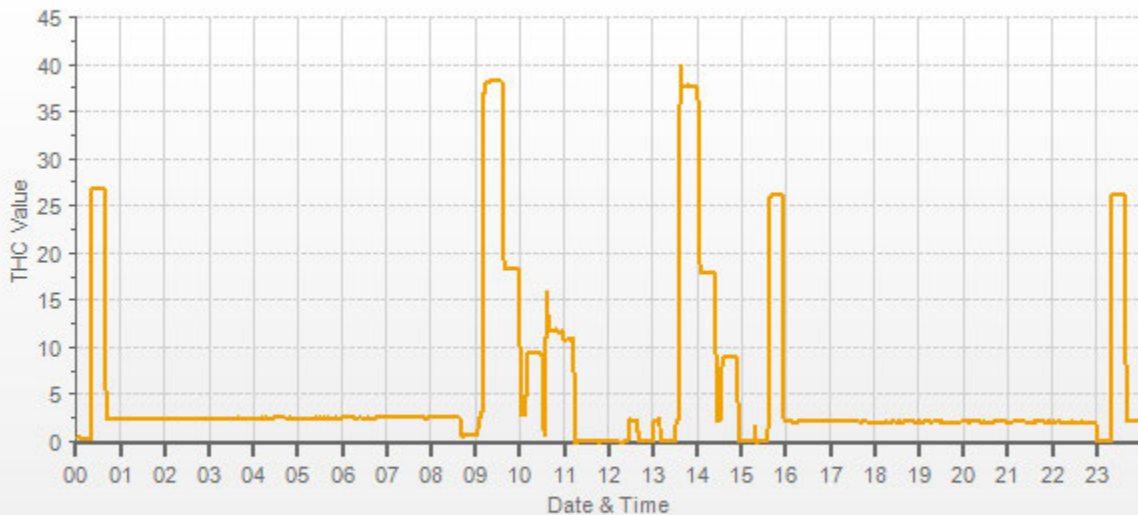
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale) =	0.00%		± 3% F.S.
% change in C.F. from last cal =	n/a		n/a



As found:		As left:	
H2 cylinder (psi):	n/a	H2 cylinder (psi):	950
H2 cylinder reg set (psi):	n/a	H2 cylinder reg set (psi):	35
Span Cylinder (psi):	n/a	Span Cylinder (psi):	900
Span Cylinder Reg Set (psi):	n/a	Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	n/a	Zero Air Gen Pressure:	40
measurement alarms:	n/a	measurement alarms:	None
service alarms:	n/a	service alarms:	None
cnt:	n/a	cnt:	7158
rng:	n/a	rng:	1
try:	n/a	try:	0
flm:	n/a	flm:	237.3
det:	n/a	det:	125.8
Flame:	n/a	Flame:	237
Filter:	n/a	Filter:	125
Base:	n/a	Base:	125
Sample psi:	n/a	Sample psi:	06.20
Internal Air Pressure:	n/a	Internal Air Pressure:	20
Internal Fuel Pressure:	n/a	Internal Fuel Pressure:	17
Measured Flow:	n/a	Measured Flow:	1.033
Expected Value:	n/a	Expected Value:	26.10

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.

A Post-Repair calibration was completed after the fuel pressure regulator was adjusted (pressure increased from 13 psi to 17 psi) and analyzer was given one hour to stabilize. The adjustment was undertaken in order to stabilize the Zero value; this procedure was recommended by the Alberta Environment.



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: <u>April 8, 2018</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>Cold Lake South</u> Parameter: <u>Total Hydrocarbon</u> Start/End Time 24 hr. (mst): <u>8:49 / 10:54</u> Calibration Method: <u>Gas Dilution</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u> <u>940</u> <u>millibars</u> Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>22</u> <u>°C</u> Weather Conditions: <u>Mainly sunny</u> Calibration Purpose: <u>shut down</u> Performed By/Reviewer: <u>Alex Yakupov</u> <u>Rob Fisher</u> Cal Gas Expiry Date: <u>November 24, 2022</u>
Analyzer: Serial Number/Owner: <u>51CLT-77021-384</u> <u>LICA</u> Last Calibration Date: <u>April 5, 2018</u> Previous Cal High Point C.F.: <u>1.000</u>	Range ppm: <u>50</u> As Found C.F.: <u>1.007</u> New C.F.: <u>n/a</u>

Calibration Standards:

Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	Standard Calibration Points for a Range of 50 ppm <table border="1" style="margin: auto;"> <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
Point		Target ppm							
High		38							
Mid		18							
Low	9								
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>									
Calibrator ID/Expiry Date: <u>Enviroincs id# 4760 expires March 2, 2019</u>									
Cal Gas Cylinder I.D. #: <u>LL 165367</u>									

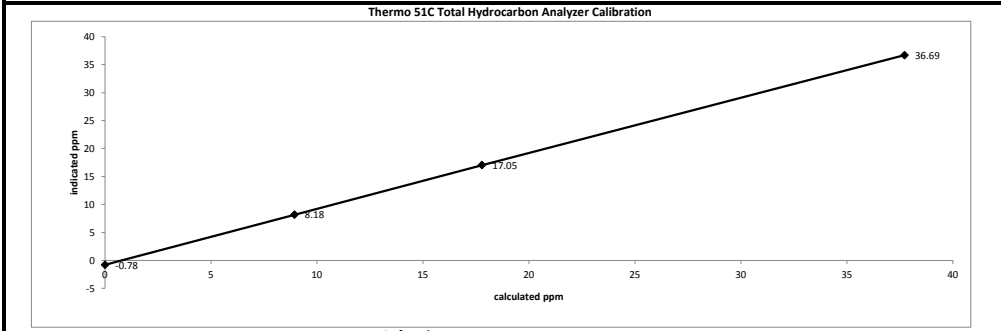
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	<u>590.0</u>	<u>207.0</u>
CH ₄ as propane/total CH ₄ equivalents (ppm):	<u>569.3</u>	<u>1159.3</u>

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	2499	0.00	2499	0.0	-0.78	n/a
as found high	2421	81.41	2502	37.72	36.69	1.007
mid	2463	38.37	2501	17.79	17.05	0.997
low	2484	19.30	2503	8.94	8.18	0.998
Average C.F. =						1.001

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u> Slope = <u>1.007</u> b (Intercept as % of full scale) = <u>1.44%</u> % change in C.F. from last cal = <u>-0.67%</u>	LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10%
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Comments:

The manifold blower was found to be working normally.

A Shutdown calibration was completed because of low readings. The analyzer readings drifted to values lower than 1.6 ppm; also, the analyzer was unstable with both the Zero and the SPAN. The last daily ZS check failed. An installation of a different analyzer is required.



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	April 8, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	940	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	Installation		
Start/End Time 24 hr. (mst):	12:43 / 16:32	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2022		
Analyzer:		Range ppm:	50		
Serial Number/Owner:	436609739 LICA	As Found C.F.:	n/a		
Last Calibration Date:	n/a	New C.F.:	1.000		
Previous Cal High Point C.F.:	n/a				

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: EnviroNics id# 4760 expires March 2, 2019
 Cal Gas Cylinder I.D. #: LL 165367
 CH₄/C₂H₄ Cylinder Conc. (ppm): 590.0 207.0
 CH₄ as propane/total CH₄ equivalents (ppm): 569.3 1159.3

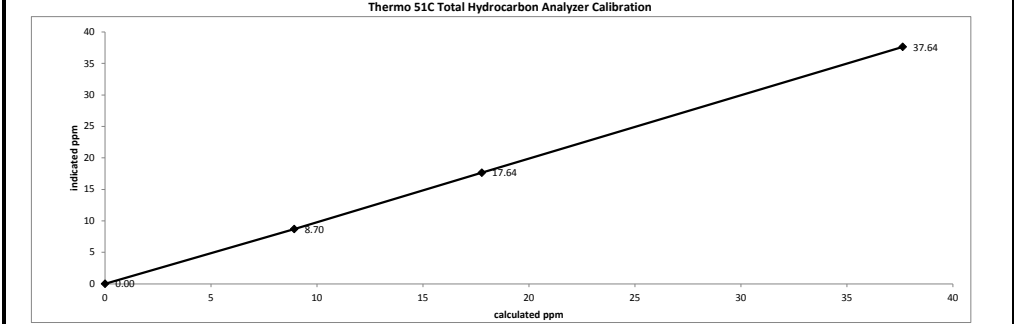
Point	Target ppm
High	38
Mid	18
Low	9

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			
adjusted zero	2500	0.00	2500	0.0	0.00	n/a
adjusted high	2422	81.26	2503	37.64	37.64	1.000
mid	2463	38.35	2501	17.78	17.64	1.008
low	2483	19.27	2502	8.93	8.70	1.026
calibrator zero	2500	0.00	2500	0.00	0.00	n/a
Average C.F.=						1.011

Linear Regression/Calibration Results:

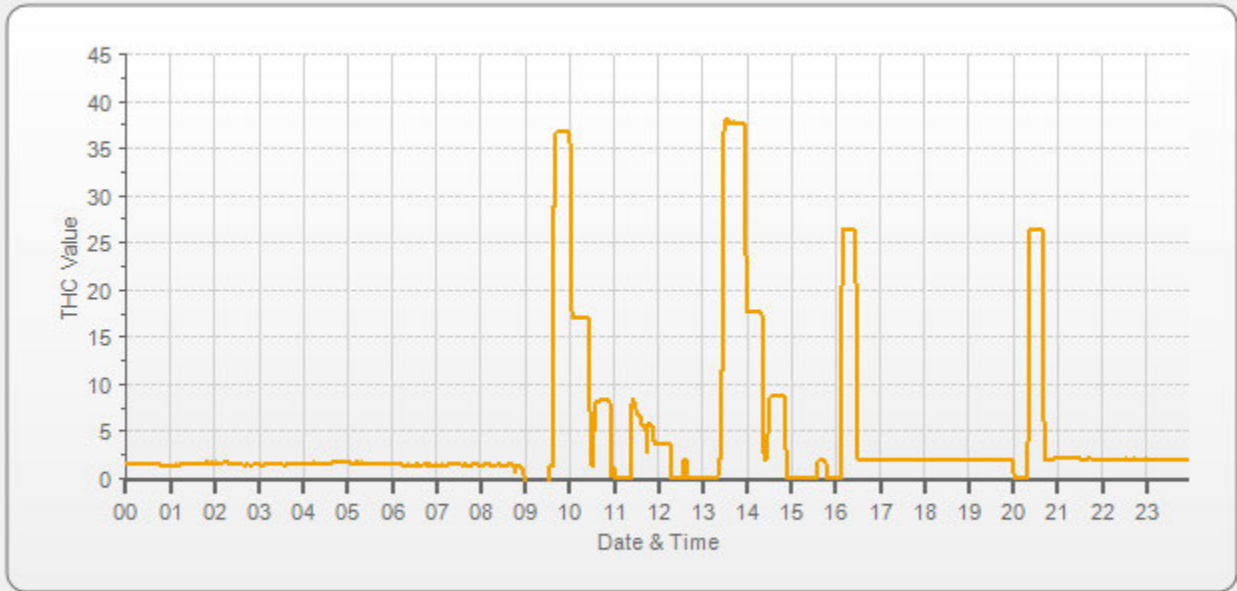
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		0.95-1.05
b (Intercept as % of full scale)=	0.24%		± 3% F.S.
% change in C.F. from last cal=	n/a		n/a




As found:		As left:	
H2 cylinder (psi):	n/a	H2 cylinder (psi):	800
H2 cylinder reg set (psi):	n/a	H2 cylinder reg set (psi):	25
Span Cylinder (psi):	n/a	Span Cylinder (psi):	900
Span Cylinder Reg Set (psi):	n/a	Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	n/a	Zero Air Gen Pressure:	40
measurement alarms:	n/a	measurement alarms:	None
service alarms:	n/a	service alarms:	None
cnt:	n/a	cnt:	5208
rng:	n/a	rng:	1
try:	n/a	try:	2
flm:	n/a	flm:	223.5
det:	n/a	det:	125.6
Flame:	n/a	Flame:	223
Filter:	n/a	Filter:	125
Base:	n/a	Base:	125
Sample psi:	n/a	Sample psi:	06.80
Internal Air Pressure:	n/a	Internal Air Pressure:	20
Internal Fuel Pressure:	n/a	Internal Fuel Pressure:	16
Measured Flow:	n/a	Measured Flow:	0.9337
Expected Value:	n/a	Expected Value:	26.40

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.

An Installation calibration was completed to replace the analyzer #51CLT-77021-384 due to the unstable daily Zero checks.



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: April 25, 2018

Company/Airshed: LICA

Location/Station Name: Cold Lake South

Parameter: Total Hydrocarbon

Start/End Time 24 hr. (mst): 11:53/13:20

Calibration Method: Gas Dilution

Barometer/B.P./units: Brunton 05535 expires December 15, 2018 28.15 inHg

Thermometer/Station Temp: F.S. 160348895 expires April 8, 2018 25.6 °C

Weather Conditions: Mainly sunny

Calibration Purpose: shut down

Performed By/Reviewer: Limin Li Rob Fisher

Cal Gas Expiry Date: October 18, 2025

Analyzer:

Serial Number/Owner: 436609739 LICA

Last Calibration Date: April 8, 2018

Previous Cal High Point C.F.: 1.000

Range ppm: 50

As Found C.F.: 1.043

New C.F.: n/a

Calibration Standards:

Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018

High Flow Meter ID/Expiry Date: SIA Defender High 152571 expires January 24, 2019

Calibrator ID/Expiry Date: Enviroconics id# 1991 expires March 15, 2019

Cal Gas Cylinder I.D. #: LL168404

CH₄/C₂H₆ Cylinder Conc. (ppm): 597.0 206.0

CH₄ as propane/total CH₄ equivalents (ppm): 566.5 1163.5

Standard Calibration Points for a Range of: 50 ppm

Point	Target ppm
High	38
Mid	18
Low	9

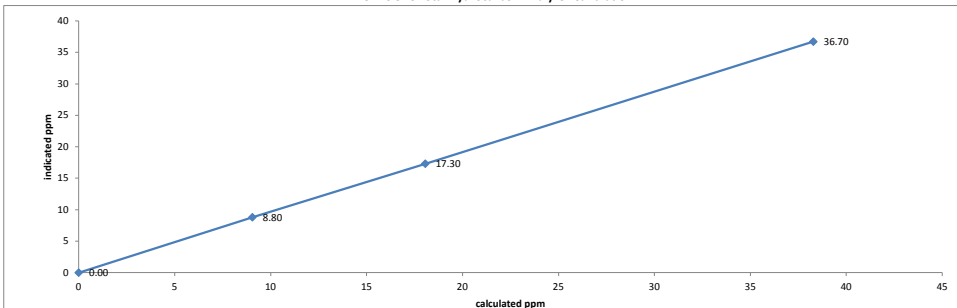
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2502	0.00	2502	0.0	0.00	n/a
as found high	2418	82.26	2500	38.28	36.70	1.043
mid	2460	38.79	2499	18.06	17.30	1.044
low	2484	19.48	2503	9.06	8.80	1.029
						Average C.F.= 1.039

Linear Regression/Calibration Results:

<p>Correlation Coefficient = 1.000</p> <p>Slope = 1.044</p> <p>b (Intercept as % of full scale) = -0.09%</p> <p>% change in C.F. from last cal = -4.32%</p>	<p>LIMITS</p> <p>> or = 0.995</p> <p>0.90-1.10</p> <p>± 3% F.S.</p> <p>± 10%</p>
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Thermo 51C Total Hydrocarbon Analyzer Calibration



As found:

measurement alarms: no

service alarms: no

cnt: 5208

rng: 1

try: 2

det: 125.3 °C

Flame: 223.2 °C

Filter: 125 °C

Base: 125.0 °C

Sample psi: 6.80 psi

Internal Air Pressure: 20 psi

Internal Fuel Pressure: 16 psi

As left:

measurement alarms: n/a

service alarms: n/a

cnt: n/a

rng: n/a

try: n/a

det: n/a

Flame: n/a

Filter: n/a

Base: n/a

Sample psi: n/a

Internal Air Pressure: n/a

Internal Fuel Pressure: n/a

Cylinder/Regulator Pressures:

H2 Cylinder (psi): 2000

H2 cylinder reg.set (psi): 25

Zero Air Gen Pressure: 40

Span Cylinder (psi): 500

Span Cylinder reg.set (psi): 26

Measured Flow: n/a

Expected Value: 26.40

H2 Cylinder (psi): n/a

H2 cylinder reg.set (psi): n/a

Zero Air Gen Pressure: n/a

Span Cylinder (psi): n/a

Span Cylinder reg.set (psi): 15

Measured Flow: n/a

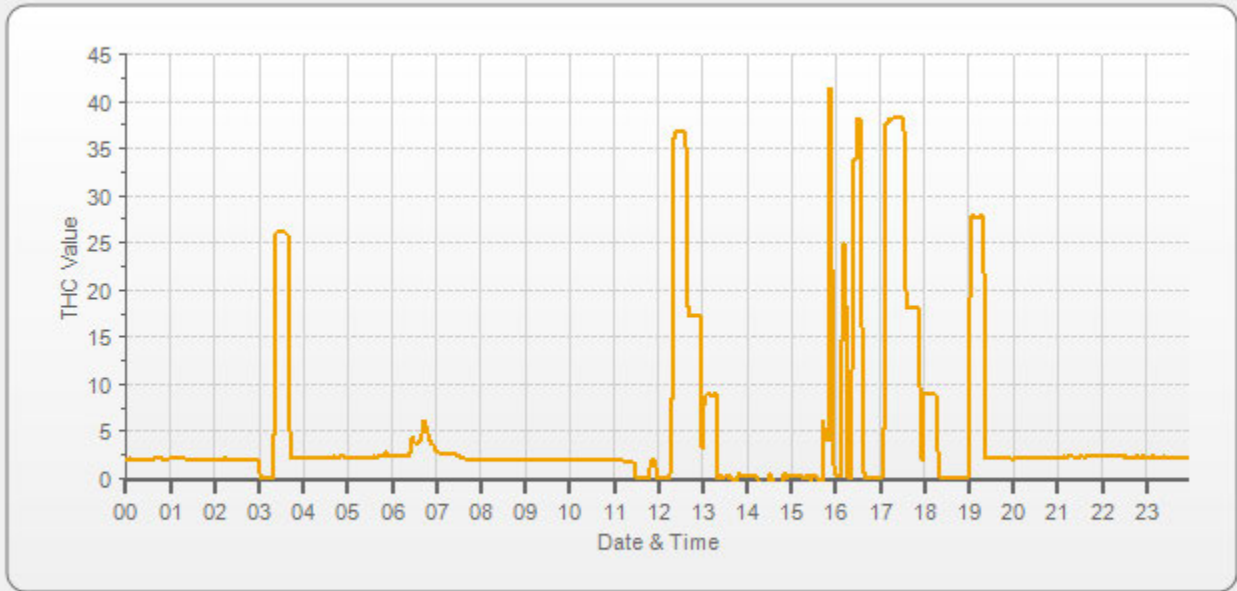
Expected Value: n/a

Comments:

The manifold blower was found to be working normally.

A Shutdown calibration was performed to remove LICA 51C Analyzer #436609739 due to an unstable zero.

Maxxam <small>ANALYTICAL SERVICES</small>		Thermo 51i Total Hydrocarbon Analyzer Calibration			
Date: April 25, 2018		Barometer/B.P./units: Brunton 05535 expires December 15, 2018		28.15	inHg
Company/Airshed: LICA		Thermometer/Station Temp: F.S. 160348895 expires April 8, 2018		22.3	°C
Location/Station Name: Cold Lake South		Weather Conditions: Mainly sunny			
Parameter: Total Hydrocarbon		Calibration Purpose: installation			
Start/End Time 24 hr. (mst): 16:40/19:30		Performed By/Reviewer: Limin Li		Rob Fisher	
Calibration Method: Gas Dilution		Cal Gas Expiry Date: October 18, 2025			
Analyzer:		Serial Number/Owner: 1118249035 Maxxam		Range ppm: 50	
Last Calibration Date: n/a		As Found C.F.: n/a		New C.F.: 0.999	
Previous Cal High Point C.F.: n/a					
Calibration Standards:					
Low Flow Meter ID/Expiry Date: Defender Low 156151 expires October 2, 2018					
High Flow Meter ID/Expiry Date: SIA Defender High 152571 expires January 24, 2019					
Calibrator ID/Expiry Date: Environics id# 1991 expires March 15, 2019					
Cal Gas Cylinder I.D. #: LL168404					
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):		597.0	206.0		
CH ₄ as propane/total CH ₄ equivalents (ppm):		566.5	1163.5		
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:		Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)
adjusted zero	2498	0.00	2498	0.00	n/a
adjusted high	2416	81.92	2498	38.16	0.999
mid	2460	38.68	2499	18.01	1.003
low	2481	19.36	2500	9.01	1.001
calibrator zero	2500	0.00	2500	0.00	n/a
Average C.F. =					1.001
Linear Regression/Calibration Results:					
Correlation Coefficient = 1.000			LIMITS		
Slope = 0.999			> or = 0.995		
b (Intercept as % of full scale) = 0.05%			0.95-1.05		
% change in C.F. from last cal = n/a			± 3% F.S.		
			n/a		
Thermo 51i Total Hydrocarbon Analyzer Calibration					
As found:			As left:		
Bkg:	n/a		Bkg:	1.15	
Coef:	n/a		Coef:	4.572	
Bias Supply:	n/a		Bias Supply:	-291	
Detector Base:	n/a		Detector Base:	125.0 °C	
Filter:	n/a		Filter:	125.0 °C	
Flame:	n/a		Flame:	156.0 °C	
Internal:	n/a		Internal:	29.8 °C	
Sample:	n/a		Sample:	8.3 psi	
Fuel:	n/a		Fuel:	20.9 psi	
Air:	n/a		Air:	39.4 psi	
Signal:	n/a		Signal:	215 HZ	
Status:	n/a		Status:	LIT	
Cylinder/Regulator Pressures:			Cylinder/Regulator Pressures:		
H2 Cylinder (psi):	n/a		H2 Cylinder (psi):	2000	
H2 cylinder reg set (psi):	n/a		H2 cylinder reg set (psi):	50	
Zero Air Gen Pressure:	n/a		Zero Air Gen Pressure:	50	
Span Cylinder (psi):	n/a		Span Cylinder (psi):	500	
Span Cylinder reg set (psi):	n/a		Span Cylinder reg set (psi):	26	
Measured Flow:	n/a		Measured Flow:	1300 SCCM	
Expected Value:	n/a		Expected Value:	27.73	
Comments:					
The manifold blower was found to be working normally.					
Installed Maxxam 51i Analyzer #1118249035 to replace LICA 51C Analyzer #436609739 due to an unstable zero.					



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: April 4, 2018	Barometer/B.P./units: F.S. 05544 expires January 5, 2019	943	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Cold Lake South	Weather Conditions: Mainly sunny		
Start/End Time 24 hr. (mst): 9:02 / 16:49	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone?: Yes with 500 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: 1505664393	LICA	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: March 19, 2018		NO = 1.000	0.999	0.999
Range ppb: 500		NO ₂ = 1.000	1.000	1.000
		NOx = 0.999	0.998	1.001

Calibration Standards:		Standard Calibration Points for a Range of: 500 ppb			
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018		Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018		High	380	330	<-high ozone
Calibrator ID/Expiry Date: Envirionics id# 5212 expires March 1, 2019		Mid	180	245	n/a
Cal Gas Cylinder I.D. #: LL 104225		Low	90	175	n/a
Cal Gas Conc. (ppm): 51.5	51.6	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	5028	0.0	5028	0	0	0.0	0.0	n/a	n/a	
as found high	4995	36.7	5032	375.6	376.3	376.0	377.0	0.999	0.998	
adjusted zero	5028	0.00	5028	0.0	0.0	0.0	0.0	n/a	n/a	
adjusted high	4995	36.70	5032	375.6	376.3	376.0	376.0	0.999	1.001	
mid	5013	17.35	5030	177.6	178.0	178.0	178.0	0.998	1.000	
low	5020	8.75	5029	89.6	89.8	90.0	90.0	0.996	0.998	
calibrator zero	5028	0.00	5028	0	0	0.0	0.0	n/a	n/a	
								Average C.F.=	0.998	0.999

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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4995	36.70	5032	0.0	376.0	376.0	0.0	0.0	0.0	
as found high NO2	4995	36.70	5032	255.0	127.0	376.0	249.0	249.0	249.0	1.000
adjusted high NO2	4995	36.70	5032	255.0	127.0	376.0	249.0	249.0	249.0	1.000
gpt mid	4995	36.70	5032	135.0	245.0	376.0	131.0	131.0	131.0	1.000
gpt low	4995	36.70	5032	50.0	325.0	376.0	51.0	51.0	51.0	1.000
										Average NO ₂ C.F.= 1.000

Linear Regression/Calibration Results:				
	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.999	1.001	1.000	0.95-1.05
b (Intercept as % of full scale)=	0.03%	0.03%	0.00%	± 3% F.S.
% change in C.F. from last cal=	0.10%	0.08%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	4.1	NO Bkg:	4.1
NOx Bkg:	4.5	NOx Bkg:	4.2
NO Coef:	1.013	NO Coef:	1.009
NO ₂ Coef:	1.000	NO ₂ Coef:	1.000
NOx Coef:	1.000	NOx Coef:	1.000
PMT:	-854.7	PMT:	-854.7
Internal:	26.2	Internal:	26.8
Chamber:	50.6	Chamber:	50.5
Cooler:	-3.0	Cooler:	-3.0
NO ₂ Converter:	324.2	NO ₂ Converter:	324.5
NO ₂ Converter Set:	325.0	NO ₂ 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:	178.7	Pressure:	177.2
Flow:	0.778	Flow:	0.767
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	2
Expected Value NO ₂ :	266	Expected Value NO ₂ :	264
Expected Value NOx:	268	Expected Value NOx:	266

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

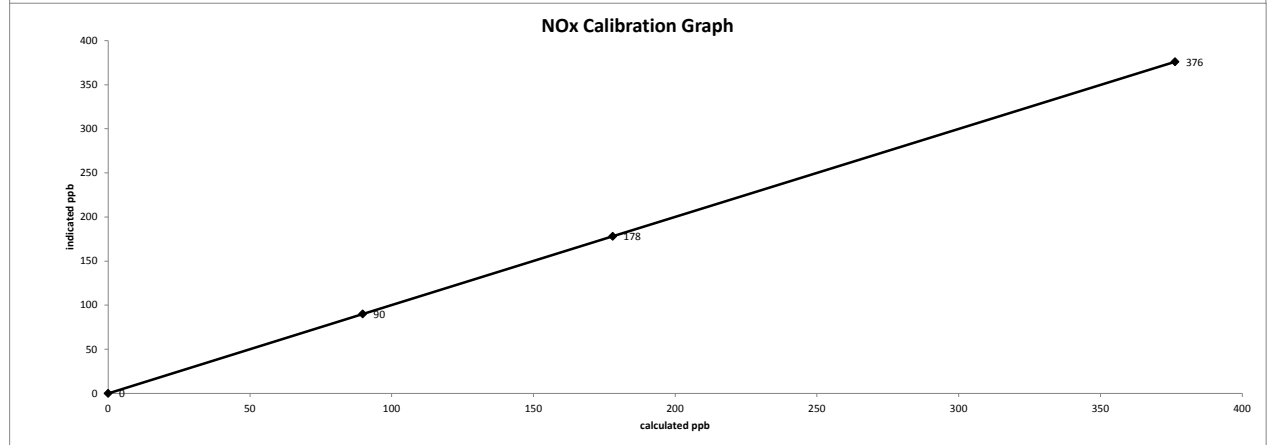
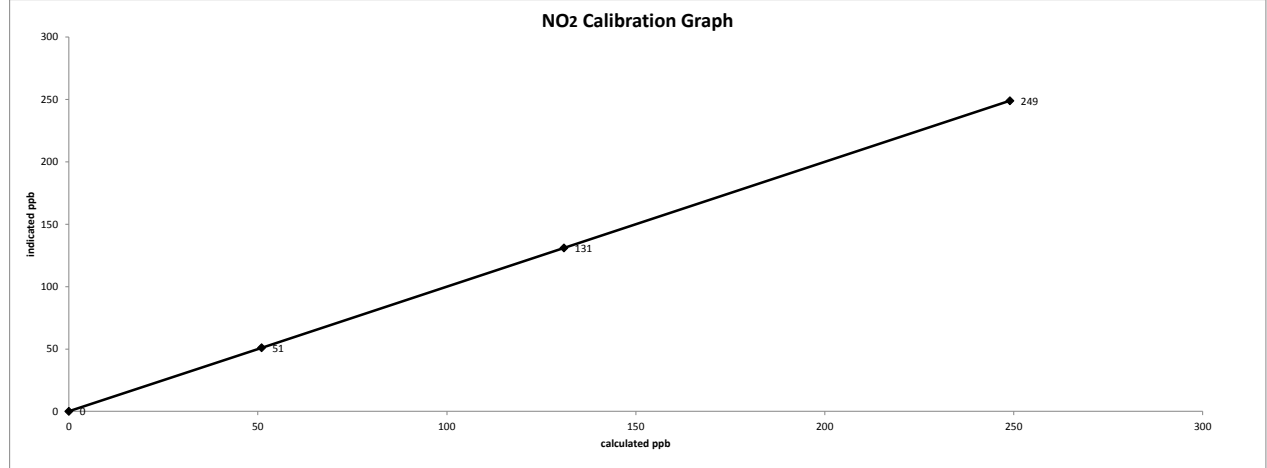
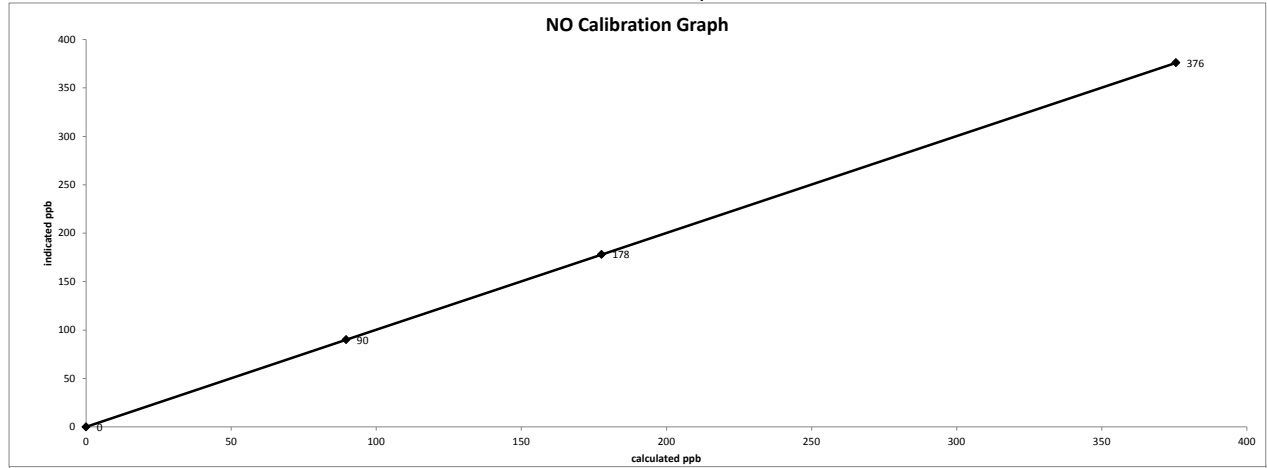
The analyzer cooling fan filter(s) were cleaned.

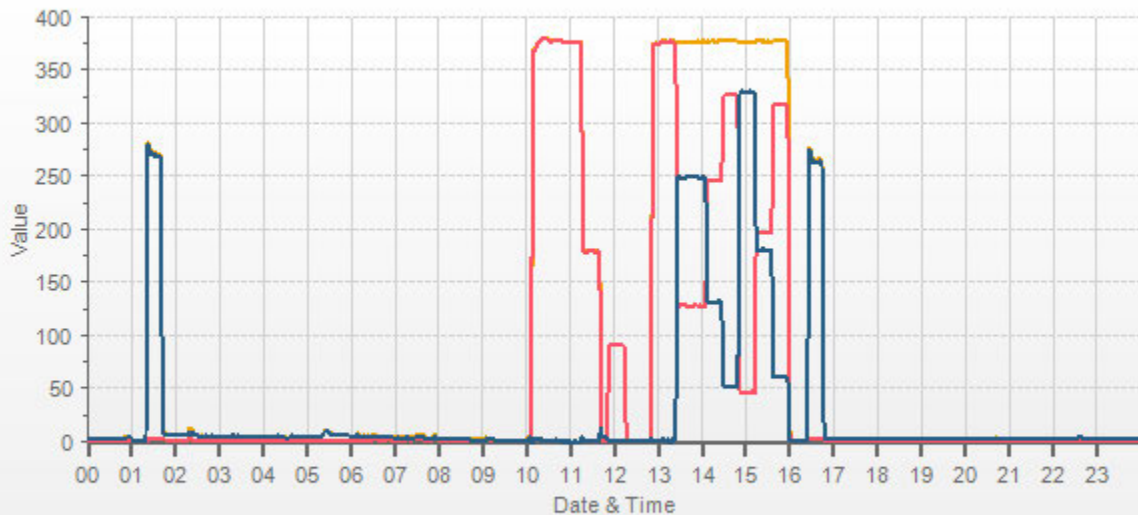
Second GPT for O3 calibration was started at 14:52.

Date: April 4, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 9:02 / 16:49
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NO_x[ppb] — NO[ppb] — NO₂[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: April 5, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 8:37 / 13:07 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: April 4, 2018 Analyzer: Serial Number/Owner: 700419951 LICA Last Calibration Date: March 20, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 5, 2019 950 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Ozone Range ppb: 500 As Found C.F.: 1.009 New C.F.: 1.000
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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: Enviroics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: 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								

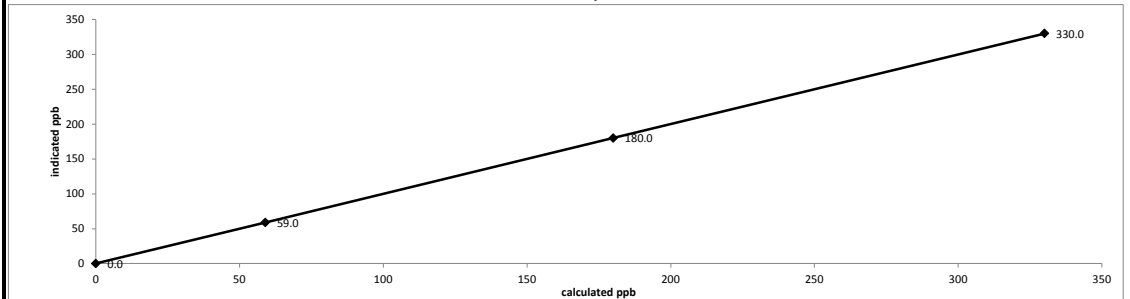
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	330.0	330.0	327.0	1.009
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	330.0	330.0	330.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	59.0	59.0	59.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

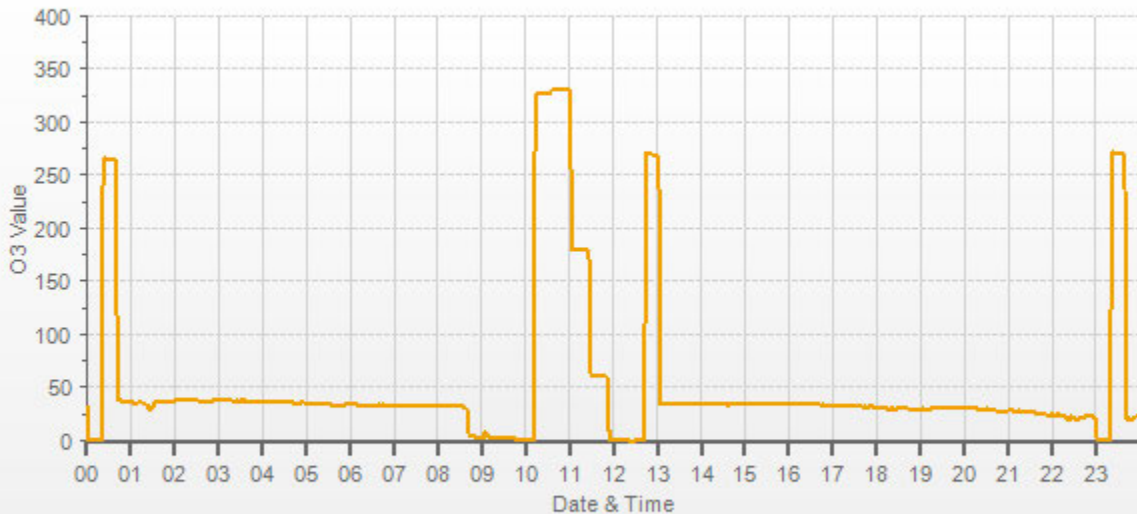
Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = 0.00% % change in C.F. from last cal = -0.92%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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Thermo 49i Ozone Analyzer Calibration



As found: O3 Bkg: 0.1 O3 Coef: 1.005 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 27.8 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 716.5 Cell A lpm: 0.722 Cell B lpm: 0.763 O3 ppb: -0.1 Cell A ppb: 4.7 Cell B ppb: -0.1 Cell A int: 82550 Cell B int: 83432 Expected Value: 257.0	As left: O3 Bkg: 0.1 O3 Coef: 1.015 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 28.0 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 718.0 Cell A lpm: 0.722 Cell B lpm: 0.764 O3 ppb: 0.0 Cell A ppb: -0.5 Cell B ppb: 0.6 Cell A int: 82563 Cell B int: 83439 Expected Value: 269.0
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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]

PARTICULATE MATTER 2.5



Thermo 5030 SHARP Monitor Audit

Date:	April 23, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	9:59	
Station Name/Location:	Cold Lake South	End Time (mst):	11:37	
Previous Audit Date:	March 26, 2018	Calibration Purpose:	routine monthly	
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny	

SHARP Information and Status:				
Serial Number/Owner:	CM-2209	LICA	Status Code	0
Approx. % Tape Reaming	3/5		Error Code	0

Reference Standards/I.D./Cert. Date:	
High Flow:	Airmetrics/Chinook High Maxxam ID #4 expires March 15, 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 5, 2019

As Found Temperatures, Pressure, Humidity:						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	11	n/a	n/a	n/a	959	n/a
Reference:	11.2	n/a	n/a	n/a	960.0	n/a
Difference:	0.2	#VALUE!	#VALUE!	#VALUE!	1.0	#VALUE!
						Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%

As Left Temperature and Pressure (same as above if as found adequate):						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	11	n/a	n/a	n/a	959	n/a
Reference:	11.2	n/a	n/a	n/a	960.0	n/a
Difference:	0.2	#VALUE!	#VALUE!	#VALUE!	1.0	#VALUE!
						Temp Limit: ± 4 °C Pressure Limit: ± 13.33 hPa RH Limit: ± 2%

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

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

Flow rate:					
	As Found			As Left	
SHARP AirFlow l/hr	1000			1000	
Reference AirFlow (l/min)	16.66			16.66	
Reference AirFlow (l/hr)	1000			1000	
% Difference:	0.0%			Difference: 0.0%	
					$%D = 100 \times \frac{Q_m - Q_i}{Q_i}$ Tolerance +/- 5%

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

Pump Assembly:		
	Yes/No?	If no, explain:
Pump Inspected / Cleaned	yes	
Pump Vanes Replaced	no	not required

Comments:	

WIND SYSTEM



Met One Instruments

Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H Sensor Serial No.: F1644
 Sensor Output Swing: 0V - 1.0V Sensor Output Range: 0 - 50.0 MPS
 Customer: Maxxam Analytics Sales Order No.: 125713
 Tested per PO: PO0000003392 Calibration Date: 11/09/2017
 Calibrated by: David Frith QC Inspection: Dyson Paulsen

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: 11/09/2017

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

50.5 - 9600 Rev A

October 2016

CALIBRATORS

Company: Maxxam **Operator:** Chris W

Calibrator:			Flow Measurement Device:		
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 ₂	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 ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% 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)*

NO₂	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	NO_x Analyzer
Audit Calibrator	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 SO₂.

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 ₂	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 ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% 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 ₂		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 _x 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 SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 2, 2018
Location: McIntyre Center Edmonton

Company: <u>Maxxam</u>		Operator: <u>Chris W</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>EnviroNics 2000</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>1991</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>March 2017</u>	Temperature (°C)	<u>25.0 C</u>
NO Cylinder S/N	<u>LL108015</u>	Barometric Pressure	<u>695 mmHg</u>
NO [PPM]	<u>52.2</u>	NOx [PPM]	<u>52.3</u>
Expiry Date	<u>Oct 2020</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 ₂	NOx	NO	NOx
5000	0.0	0.000	0.000	0.000	0.000	0.000	Limit ± 10%	
4988	75.1	0.786	0.787	0.785	-0.002	0.783	0%	-1%
4988	36.5	0.382	0.383	0.382	0.001	0.383	0%	0%
4988	18.3	0.192	0.192	0.190	0.000	0.190	-1%	-1%
Absolute Average Percent Difference							0%	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)= 0.9996	0.90-1.10	m (Slope)= 0.9956
b (Intercept % of FS)= -0.0599	± 3% F.S.	b (Intercept % of FS)= -0.0005

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4988	0.000	0.000	0.788	-0.001	0.787	NO ₂	% Diff. Limit
4988	0.350	0.519	0.269	0.512	0.780	-1%	± 10%
4988	0.160	0.231	0.557	0.229	0.786	0%	± 10%
4988	0.070	0.099	0.689	0.097	0.787	-1%	± 10%
Absolute Average Percent Difference						1%	± 10%

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

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9885	0.90-1.10
b (Intercept % of FS)= -0.0567	± 3% F.S.

<p align="center">AENV Standards</p> <p align="center">Audit Calibrator</p> <p>Make/Model <u>Teco 146i</u></p> <p>Serial/AMU Number <u>AMU 1809</u></p> <p>SRM Gas Cylinder No. <u>APEX1170572</u></p> <p>Cylinder Conc. (ppm) <u>49.99</u></p>	<p align="center">NO_x Analyzer</p> <p>Make/Model <u>Teco 42i</u></p> <p>Serial/AMU Number <u>AMU 1868</u></p> <p>Last Calibration Date <u>March 14, 2018</u></p> <p>Full Scale (ppm) <u>1.0</u></p> <p>Cylinder Gas Expiry Date <u>November 2020</u></p>
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COMMENTS: Cylinder contains 47.9 ppm SO2.

Auditor: Al Clark

Operator Signature:

Date: March 15, 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&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:					47.9

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. 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:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u> Serial Number: <u>AMU 1690</u> Last Verification Date: <u>October 19, 2016</u> Gas Type: <u>H2S</u> Conc. <u>20.43</u> Cylinder Number: <u>CAL015584</u> Expiry Date: <u>January 2019</u>	Make/Model: <u>Bios DC2</u> Serial Number: <u>AMU 1659</u> Temp. °C: <u>24.0 C</u> B.P. <u>706 mmhg</u>

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 (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	/	/	/
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:					10.1

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 **Date:** October 19, 2016
Operator Signature: *Al Clark* **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&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	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2600	0.0	0.00	0.00	0.02005	49.883	602	206
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:						600	207

	<u>CH4</u>	<u>C3H8</u>
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

CH4 / C3H8 Cylinder Gas

File No. 2017-488CGA

Company: Maxxam **Operators name:** Mike
Cylinder #: LL168404 **Conc CH4 (PPM)** 597/206 **Tolerance (%)** 2 **Certified By:** Praxair
Expiry Date: October 2025

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&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>23.1 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>990.4</u>	B.P.	<u>707 mmHg</u>
Cylinder Number	<u>5604875</u>	Expiry Date	<u>July 2021</u>		
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF003845B</u>	Expiry Date	<u>July 2022</u>		

Reference Analyzer:
Make/Model Teco 55i **Serial/AMU Number:** 2108
Instrument Settings **Zero:** N/A **Span:** N/A **Range:** 20.0
Last Calibration: **Date:** Dec 12/17 **C.F.** 1.000 **Done By:** Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
3500	0.0	0.00	0.00	0.02	45.00	595	208
3618	80.4	13.22	12.69	0.02	45.00	595	208
3547	39.8	6.64	6.42	0.01	89.12	592	208
3560	19.8	3.33	3.23	0.01	179.80	599	211
Average Cylinder Concentration:						595	209

CH4	C3H8
Previous Stated Concentration PPM: <u>597</u>	<u>206</u>
Percent variance from Stated: <u>0</u>	<u>1</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:** December 13, 2017
Operator Signature: *Al Clark* **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:						51.3	51.1

<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
Cold Lake South Continuous Monitoring Station - April 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ 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 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	0	0	0	0	S	0	0	1	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	0	2	1	24	
2	1	0	0	S	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	3	0	3	1	24
3	3	2	S	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	3	1	24	
4	2	S	2	1	1	1	1	1	1	C	C	C	C	C	1	1	1	1	1	1	1	0	1	1	0	2	1	24	
5	S	1	1	1	1	1	1	2	2	1	1	1	1	1	1	0	0	0	1	0	0	0	0	S	0	2	1	24	
6	0	0	0	0	0	0	0	1	4	1	1	1	1	1	1	1	1	0	0	1	1	1	S	0	0	4	1	24	
7	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	0	1	0	24
8	0	0	0	0	0	0	0	1	0	0	1	P	1	1	1	1	0	1	1	1	S	1	1	1	1	0	1	1	23
9	1	0	0	0	0	0	0	0	1	2	2	2	1	1	2	2	2	3	2	S	1	1	1	1	0	3	1	24	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	S	1	1	0	0	0	0	1	1	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	S	0	0	1	0	0	0	0	0	0	1	0	24
13	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	S	1	0	0	1	0	0	0	0	0	0	1	0	24
14	1	1	0	0	0	0	0	0	0	1	1	1	1	1	S	1	1	1	1	1	1	0	1	0	0	0	1	1	24
15	0	0	0	1	1	0	1	1	1	1	1	1	1	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	0	0	0	0	S	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	24
17	0	0	0	0	1	1	0	0	0	0	0	S	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	24
18	0	0	1	1	1	1	1	1	1	1	S	0	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	24
19	0	0	0	0	0	0	1	1	1	S	1	0	1	1	1	1	1	1	0	1	0	0	1	0	0	0	1	1	24
20	0	1	1	1	0	0	0	1	S	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	0	24
21	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	24
22	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
23	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
24	0	0	0	0	S	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	24
25	1	1	0	S	0	1	2	2	3	1	1	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	3	1	24
26	0	1	S	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	1	1	0	0	1	1	24	
27	1	S	0	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	0	2	1	24	
28	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	S	0	1	1	24	
29	1	1	0	0	1	1	0	1	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	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	1	0	1	0	24
HOURLY MAX	3	2	2	1	1	1	2	2	4	2	2	2	1	1	2	2	2	3	2	2	2	2	2	3					
HOURLY AVG	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0					

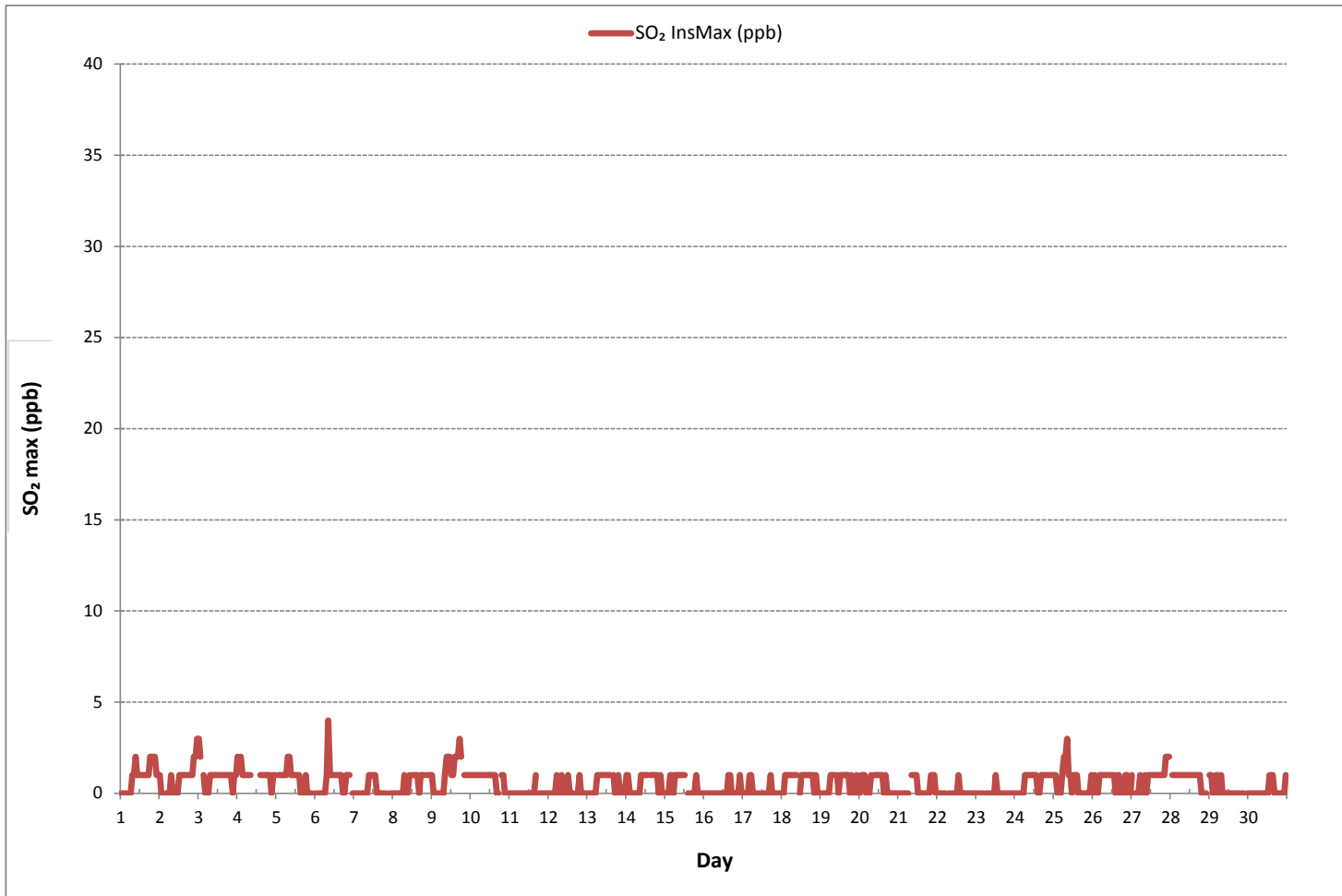
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	327
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 8 ON DAY 6
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	719 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 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 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	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	
2	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	
3	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	
4	1	S	1	1	1	1	1	1	1	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	S	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	1	
6	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	1	1	
7	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	1	1	
8	1	1	1	1	1	1	1	1	1	1	1	P	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	
9	1	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	
10	1	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	
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	
12	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	
13	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	
14	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	
15	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	
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17	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	
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	
19	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	
20	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	
21	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	
22	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	
23	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	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	
25	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	
26	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	
27	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	
28	S	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	1	
29	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	1	1	
30	1	1	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	
HOURLY MAX	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	
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	

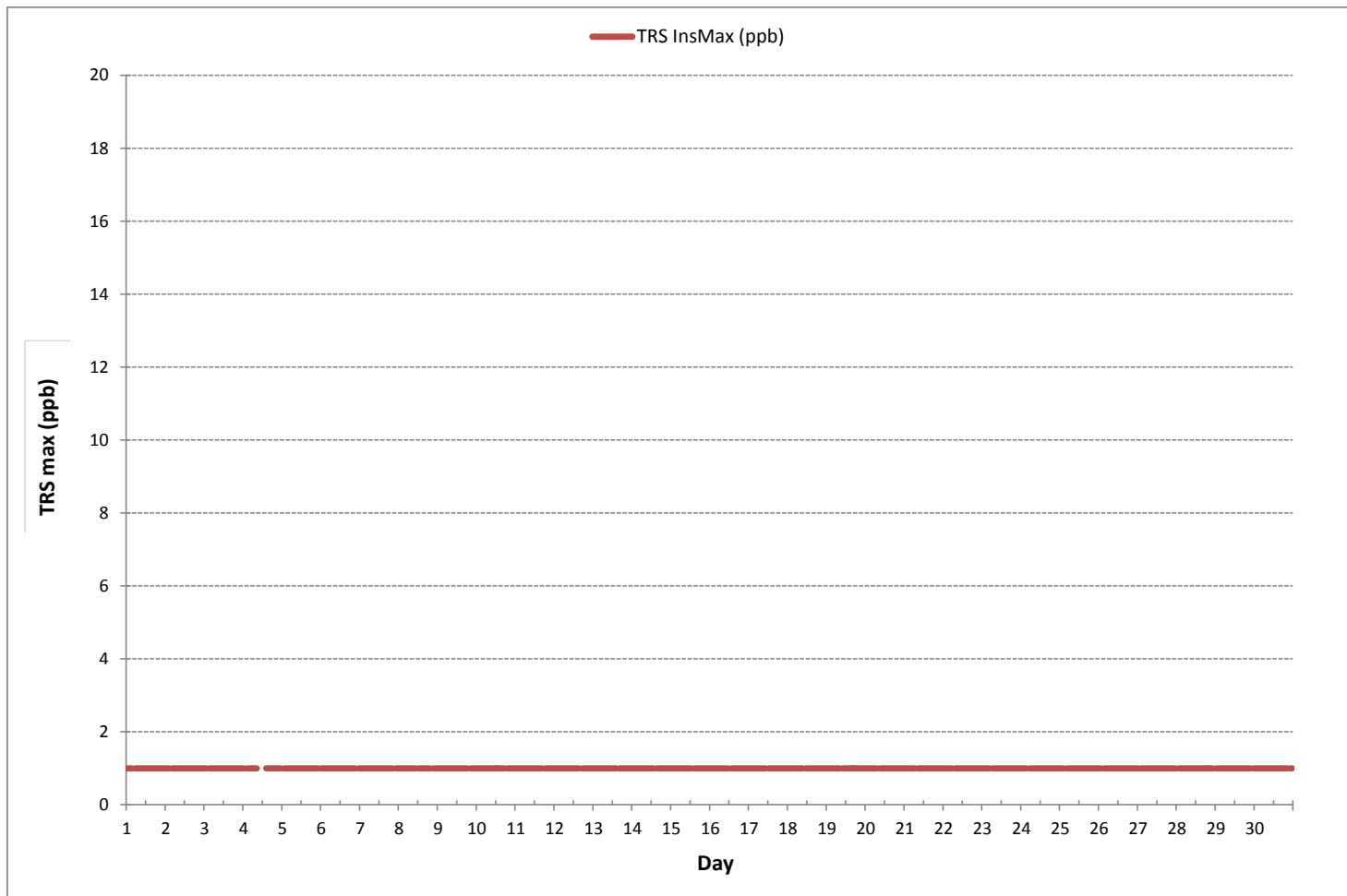
STATUS FLAG CODES

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:	682
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	719 hrs

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 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	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	2.47	2.46	2.47	2.50	S	2.50	2.56	2.55	2.53	2.40	2.35	2.35	2.28	2.47	2.23	2.19	2.20	2.23	2.23	2.66	2.23	2.26	2.26	2.25	2.19	2.66	2.38	24
2	2.35	2.53	2.53	S	2.32	2.29	2.32	2.32	2.32	2.20	2.22	2.19	2.23	2.25	2.22	2.26	2.28	2.31	2.35	2.32	2.35	2.37	2.31	2.37	2.19	2.53	2.31	24
3	2.35	2.44	S	2.46	2.49	2.44	2.65	2.65	2.44	2.41	2.47	2.36	2.38	2.35	2.35	2.41	2.32	2.35	2.35	2.35	2.35	2.35	2.34	2.32	2.32	2.65	2.41	24
4	2.34	S	2.34	2.35	2.38	2.41	2.35	2.69	2.38	2.40	2.39	2.34	2.29	2.31	2.32	2.29	2.29	2.26	2.33	2.38	2.38	2.38	2.42	2.44	2.26	2.69	2.37	24
5	S	2.45	2.45	2.50	2.50	2.53	2.54	2.57	C	C	C	Y	Y	C	C	C	C	2.20	2.17	2.17	2.17	2.14	3.07	S	2.14	3.07	2.42	22
6	2.20	2.20	2.18	2.16	2.17	2.20	2.32	2.72	2.48	1.92	1.96	X	X	X	X	X	X	2.42	2.38	2.35	2.37	2.37	S	2.46	1.92	2.72	2.29	18
7	2.51	2.49	2.50	2.52	2.53	2.59	S1	S1	2.17	2.17	X	X	X	X	X	S1	X	X	X	X	X	S	X	X	2.17	2.59	2.44	9
8	X	X	X	X	X	X	X	X	X	X	C1	C1	Y	Y	C1	C1	C1	1.99	1.99	1.99	S	2.05	2.02	2.03	1.99	2.05	2.01	7
9	2.03	2.00	2.00	2.03	2.03	2.08	2.18	2.23	2.18	2.01	2.41	1.99	2.12	2.03	2.03	2.09	2.09	2.05	2.00	S	2.18	2.27	2.39	2.36	1.99	2.41	2.12	24
10	2.24	2.27	2.25	2.37	2.40	2.58	2.49	S1	S1	2.15	2.04	2.03	2.00	1.99	1.93	1.91	1.90	1.90	S	2.06	2.09	1.98	2.00	1.99	1.90	2.58	2.12	22
11	2.00	1.99	1.96	1.90	1.90	1.90	1.91	2.20	2.20	2.15	2.15	2.14	2.17	2.21	2.18	2.18	2.12	S	2.14	2.28	2.30	2.28	2.33	2.43	1.90	2.43	2.13	24
12	2.55	2.52	2.64	2.48	2.59	2.46	2.37	2.34	2.30	2.28	2.27	2.23	2.17	2.14	2.09	2.11	S	2.32	2.35	2.48	2.52	2.58	2.61	2.67	2.09	2.67	2.39	24
13	2.67	2.73	2.75	2.86	2.96	3.14	2.81	2.93	2.86	2.70	2.52	2.49	2.52	2.54	2.48	S	2.49	2.51	2.58	2.61	2.57	2.52	2.49	2.52	2.48	3.14	2.66	24
14	2.42	2.44	2.36	2.32	2.35	2.36	2.30	2.33	2.30	2.29	2.35	2.39	2.47	2.46	S	2.46	2.47	2.41	2.41	2.42	2.61	2.65	2.65	2.73	2.29	2.73	2.43	24
15	2.86	2.86	2.76	2.89	2.75	2.76	2.70	2.58	2.91	2.41	2.61	2.46	2.38	S	2.29	2.24	2.18	2.23	2.27	2.30	2.33	2.32	2.30	2.33	2.18	2.91	2.51	24
16	2.36	2.36	2.36	2.37	2.36	2.38	2.30	2.30	2.32	2.30	2.13	2.09	S	2.17	2.23	2.18	2.14	2.12	1.90	2.03	2.03	2.03	2.02	2.00	1.90	2.38	2.19	24
17	2.00	2.00	2.00	2.01	2.00	2.03	2.00	1.95	1.90	1.89	1.92	S	1.97	2.03	2.14	2.21	2.22	2.24	2.19	2.27	2.24	2.15	2.18	2.27	1.89	2.27	2.08	24
18	2.31	2.33	2.30	2.33	2.46	2.49	2.49	2.52	2.50	2.20	S	2.15	2.24	2.29	2.29	2.24	2.24	2.20	2.18	2.36	2.53	2.55	2.76	2.76	2.15	2.76	2.38	24
19	2.61	2.67	2.98	2.94	2.98	3.13	3.04	2.76	2.64	S	2.36	2.36	2.39	2.32	2.27	2.26	2.14	2.17	2.20	2.27	2.15	2.17	2.27	2.20	2.14	3.13	2.49	24
20	2.29	2.30	2.42	2.80	2.82	2.95	3.10	2.83	S	2.33	2.30	2.24	2.18	2.11	2.09	2.05	1.96	1.93	X	2.08	2.39	2.89	3.19	4.08	1.93	4.08	2.52	23
21	3.99	3.93	4.62	2.76	3.58	2.86	2.70	S	2.17	2.09	2.03	1.99	1.90	X	X	X	X	X	X	X	X	X	X	X	1.90	4.62	2.89	13
22	X	X	X	X	X	1.85	S	1.88	1.93	1.93	1.93	1.94	1.96	1.93	1.90	1.90	1.91	2.00	2.05	2.14	2.27	2.93	2.44	2.43	1.85	2.93	2.07	19
23	2.57	2.61	2.77	2.79	2.70	S	2.76	2.76	2.58	2.45	2.48	2.41	2.26	2.24	2.18	2.18	2.15	2.21	2.17	2.27	2.43	2.65	2.46	2.86	2.15	2.86	2.48	24
24	3.96	3.10	2.73	4.34	S	3.12	2.83	2.81	2.58	2.27	2.14	2.06	2.09	2.08	2.00	1.91	1.93	2.02	2.03	1.90	1.93	1.90	1.91	2.00	1.90	4.34	2.42	24
25	2.05	2.08	2.06	S	2.40	2.76	6.15	2.97	2.03	1.87	1.88	C1	C1	Y	Y	Y	Y	C1	C1	C1	2.28	2.40	2.41	2.25	1.87	6.15	2.54	15
26	2.24	2.34	S	2.29	2.29	2.36	2.37	2.40	2.25	2.13	2.13	2.24	2.19	2.20	2.16	2.22	2.13	2.16	2.19	2.18	2.21	2.29	3.22	2.37	2.13	3.22	2.29	24
27	2.28	S	2.36	2.48	2.65	2.67	2.58	2.27	2.32	2.21	2.24	2.25	2.29	2.18	2.23	2.23	2.25	2.21	2.28	2.20	2.18	2.15	2.18	2.11	2.11	2.67	2.30	24
28	S	2.13	2.12	2.16	2.24	2.36	2.39	2.24	2.21	2.25	2.27	2.26	2.26	2.18	2.18	2.17	2.12	2.09	2.14	2.19	2.15	2.29	2.45	S	2.09	2.45	2.22	24
29	2.03	1.99	2.00	2.00	2.05	2.13	2.13	2.05	2.05	2.05	2.07	2.05	2.09	2.08	2.07	2.12	2.12	2.12	2.07	2.23	2.17	2.20	S	2.43	1.99	2.43	2.10	24
30	2.35	2.34	2.37	2.41	2.71	2.62	2.64	2.45	2.19	2.20	2.10	2.09	2.16	2.12	2.19	2.13	2.07	2.11	2.13	2.08	2.16	S	2.19	2.29	2.07	2.71	2.27	24
HOURLY MAX	3.99	3.93	4.62	4.34	3.58	3.14	6.15	2.97	2.91	2.70	2.61	2.49	2.52	2.54	2.48	2.46	2.49	2.51	2.58	2.66	2.61	2.93	3.22	4.08				
HOURLY AVG	2.46	2.44	2.47	2.50	2.49	2.50	2.63	2.47	2.34	2.21	2.22	2.21	2.21	2.20	2.18	2.17	2.16	2.18	2.20	2.25	2.28	2.34	2.42	2.42				

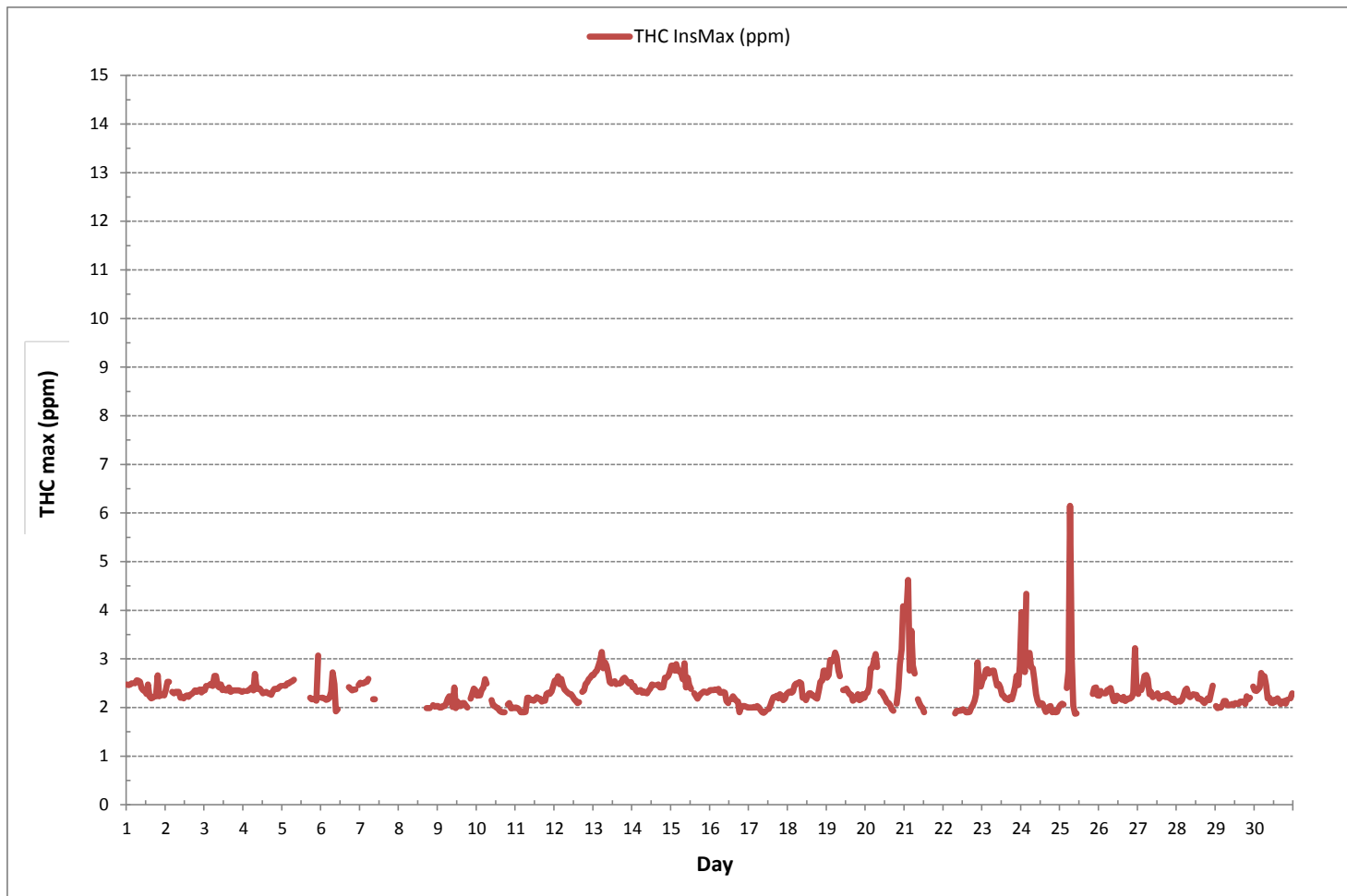
STATUS FLAG CODES

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:	613
MAXIMUM INSTANTANEOUS VALUE:	6.15 ppm @ HOUR 6 ON DAY 25
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	652 hrs
STANDARD DEVIATION:	0.35

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





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

OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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 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	4	5	7	7	S	9	9	12	11	11	12	7	4	4	3	2	3	5	6	13	7	4	5	5	2	13	7	24	
2	9	18	10	S	16	12	5	9	5	2	3	5	2	2	4	4	10	8	3	7	12	3	6	8	2	18	7	24	
3	10	5	S	10	9	11	25	24	21	7	11	3	4	3	3	7	3	3	3	4	6	5	6	4	3	25	8	24	
4	3	S	13	6	6	11	8	10	2	C	C	C	C	C	C	C	C	2	2	2	3	1	4	3	1	13	5	24	
5	S	14	4	3	4	3	3	4	4	4	4	3	2	6	2	2	2	3	7	2	3	4	14	S	2	14	4	24	
6	6	6	8	9	7	12	20	22	24	7	7	5	5	5	6	3	3	3	3	6	7	9	S	11	3	24	8	24	
7	10	9	18	25	25	22	29	48	30	8	7	11	3	2	1	3	2	3	4	8	4	S	16	19	1	48	13	24	
8	17	12	20	41	17	17	18	5	4	2	3	P	8	2	4	4	3	3	3	2	S	2	4	2	2	41	9	23	
9	3	3	5	7	9	8	18	11	7	13	24	7	4	5	4	20	20	5	5	S	12	25	16	8	3	25	10	24	
10	7	7	9	8	9	23	18	14	5	5	3	4	3	36	3	5	6	4	S	7	11	5	3	5	3	36	9	24	
11	4	3	4	6	5	19	13	12	5	12	5	5	9	17	3	3	4	S	4	12	12	14	10	9	3	19	8	24	
12	16	16	22	19	75	46	25	26	6	6	4	2	3	3	3	2	S	4	5	22	42	7	6	16	2	75	16	24	
13	7	19	15	38	26	6	7	4	4	3	2	2	2	2	3	S	13	3	3	3	3	3	3	3	2	38	9	24	
14	3	3	3	3	3	3	3	3	5	4	3	3	3	7	S	4	6	9	4	18	17	6	5	14	3	18	6	24	
15	17	8	5	6	6	7	21	6	8	5	4	4	5	S	6	5	5	15	8	7	4	5	3	6	3	21	7	24	
16	5	5	9	8	9	11	6	9	6	4	5	5	S	4	4	9	4	4	5	2	3	5	3	2	2	21	6	24	
17	3	3	4	8	4	5	10	8	4	5	4	S	3	4	3	4	6	5	4	3	3	4	3	3	3	10	4	24	
18	3	3	3	4	4	4	7	7	6	8	S	3	7	4	3	2	9	2	4	4	6	8	18	6	2	18	5	24	
19	6	7	24	20	30	69	62	32	9	S	3	2	4	2	3	3	2	3	2	3	5	5	4	3	2	69	13	24	
20	3	4	7	20	22	24	20	7	S	7	6	5	5	6	4	3	2	2	3	4	14	9	6	8	2	24	8	24	
21	11	10	19	20	22	13	23	S	22	6	8	11	7	5	7	6	12	7	2	2	4	4	4	2	2	23	10	24	
22	3	3	3	3	3	3	S	3	2	3	2	2	2	1	1	1	1	1	1	1	3	4	3	5	6	1	6	3	24
23	6	8	9	7	12	S	11	14	8	6	5	3	3	2	1	1	2	1	1	4	4	4	5	5	1	14	5	24	
24	11	6	3	10	S	21	9	11	11	8	6	4	6	3	2	6	4	2	3	3	5	4	2	4	2	21	6	24	
25	2	2	3	S	10	21	18	10	8	6	2	1	2	3	3	2	1	1	3	2	4	3	2	3	1	21	5	24	
26	3	5	S	5	6	7	9	11	5	6	2	4	2	7	1	1	1	2	3	4	10	4	5	5	1	11	5	24	
27	8	S	4	6	14	22	17	7	1	1	2	2	3	2	3	2	2	2	2	5	2	2	2	1	1	22	5	24	
28	S	2	1	2	4	8	5	2	2	2	2	2	10	19	2	3	2	8	8	8	25	8	9	S	1	25	6	24	
29	2	2	2	2	2	2	2	2	2	2	4	4	2	3	2	2	4	2	2	5	15	4	S	9	2	15	3	24	
30	6	5	9	7	27	29	34	8	2	2	2	3	4	1	2	4	2	1	13	7	S	2	3	1	34	8	24		
HOURLY MAX	17	19	24	41	75	69	62	48	30	13	24	11	10	36	7	20	20	15	8	22	42	25	18	19					
HOURLY AVG	7	7	9	11	14	16	16	12	8	6	5	4	4	6	3	4	5	4	4	6	9	6	6	6					

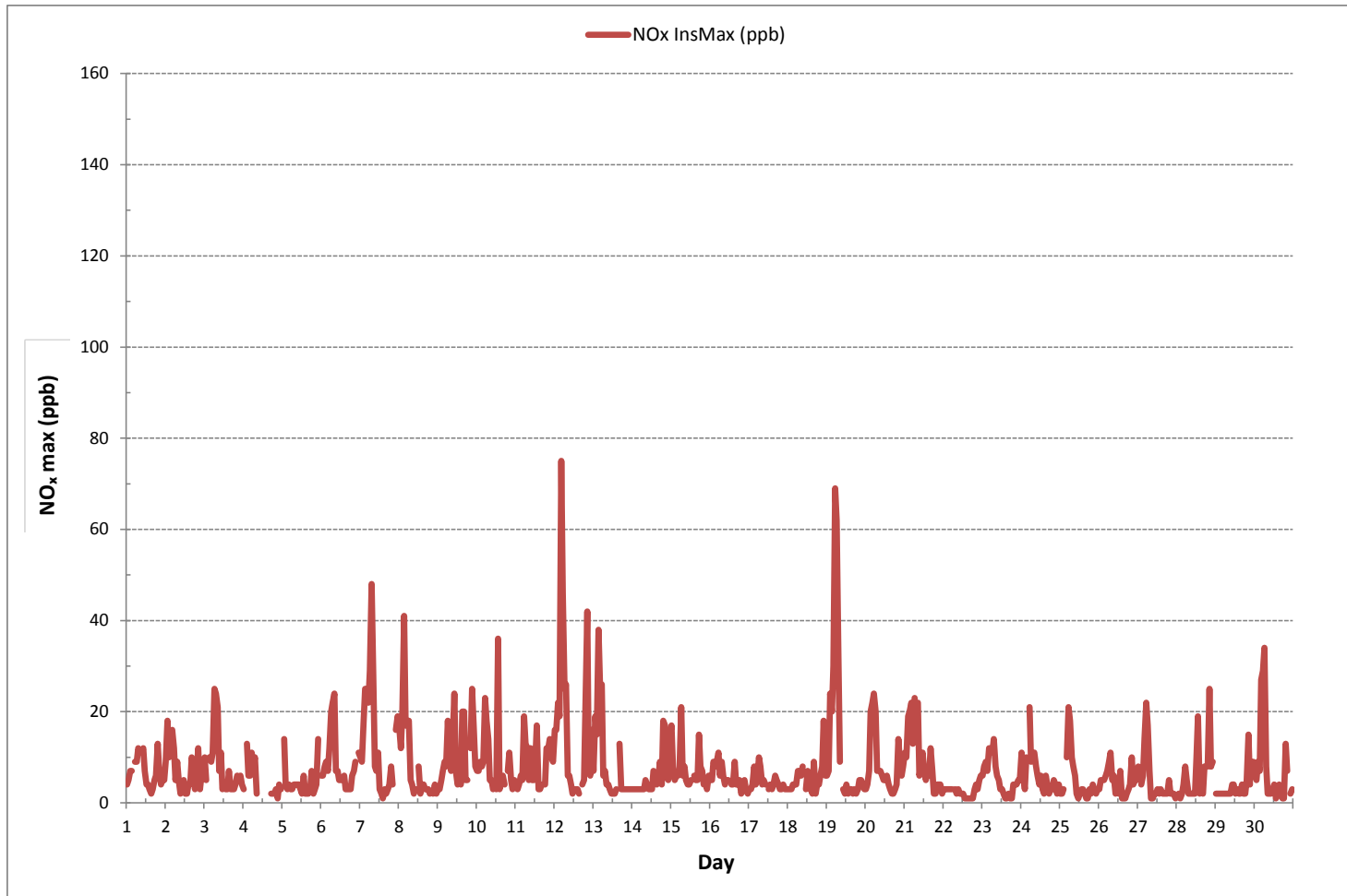
STATUS FLAG CODES

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:	679
MAXIMUM INSTANTANEOUS VALUE:	75 ppb @ HOUR 4 ON DAY 12
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	719 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 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	1	2	1	1	S	1	1	3	4	5	4	3	2	1	1	1	1	2	2	4	2	0	0	0	0	0	5	2	24
2	0	2	1	S	4	1	0	2	2	0	2	2	1	1	6	6	3	3	1	1	2	1	2	2	0	6	2	24	
3	3	0	S	1	0	0	6	7	10	3	4	2	1	2	1	1	1	1	1	0	2	1	1	1	0	10	2	24	
4	0	S	4	0	0	0	1	3	1	C	C	C	C	C	C	C	C	0	0	0	0	0	1	0	0	4	1	24	
5	S	2	0	0	0	0	1	1	2	2	6	1	1	1	1	1	1	3	1	1	0	5	S	0	6	1	24		
6	1	1	1	1	1	2	8	11	12	3	3	2	2	2	10	1	1	1	1	1	1	2	S	1	1	12	3	24	
7	0	0	1	1	2	2	11	30	14	3	3	4	1	0	0	2	1	0	2	3	0	S	2	2	0	30	4	24	
8	1	0	6	9	2	2	2	1	1	1	1	P	1	1	6	1	1	1	1	0	S	0	1	0	0	9	2	23	
9	0	0	0	0	1	0	4	3	2	4	9	1	1	1	0	7	7	1	0	S	1	1	2	1	0	9	2	24	
10	1	1	2	2	1	1	2	6	1	1	2	2	1	10	2	1	5	1	S	3	2	1	1	1	1	10	2	24	
11	1	1	1	1	1	9	3	3	2	9	1	2	3	11	1	1	1	S	0	1	0	0	1	0	0	11	2	24	
12	1	1	3	2	40	12	5	9	2	1	2	1	1	1	1	S	1	0	1	0	1	13	1	1	1	0	40	4	24
13	1	1	1	6	4	4	1	2	1	3	3	1	1	1	1	S	2	1	1	0	1	1	0	0	0	6	2	24	
14	1	1	0	0	1	1	1	2	3	1	1	1	1	4	S	1	2	3	1	0	1	0	0	3	0	4	1	24	
15	3	1	1	1	1	1	5	1	3	1	1	1	1	S	2	2	1	4	2	1	1	1	1	2	1	5	2	24	
16	1	1	3	2	2	2	3	3	2	1	15	3	S	1	1	6	1	1	2	1	1	1	1	0	0	15	2	24	
17	1	0	1	1	1	1	1	1	1	2	2	S	1	1	1	1	2	1	0	0	0	0	0	1	0	2	1	24	
18	0	0	0	1	1	1	1	3	2	3	S	1	1	2	1	0	3	1	1	0	1	2	1	0	3	1	24		
19	1	1	4	2	8	44	33	11	2	S	1	0	2	1	1	0	1	0	0	0	1	1	1	1	0	44	5	24	
20	0	0	1	3	5	9	5	2	S	3	2	2	1	3	1	2	1	0	0	0	0	0	0	1	0	9	2	24	
21	1	1	3	5	5	1	7	S	6	1	2	5	1	1	1	2	7	10	0	0	0	0	0	1	0	10	3	24	
22	1	1	1	1	1	1	S	2	1	1	1	0	1	1	0	0	0	0	0	1	2	1	1	2	0	2	1	24	
23	1	2	2	0	2	S	3	5	2	2	2	1	1	1	0	1	1	0	0	0	0	1	1	1	0	5	1	24	
24	3	2	1	2	S	6	2	4	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	1	0	6	1	24	
25	0	0	0	S	1	4	2	2	2	6	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	6	1	24	
26	1	1	S	1	1	2	2	3	1	2	0	2	1	3	0	0	0	0	0	0	2	0	1	0	0	3	1	24	
27	1	S	0	1	2	7	4	3	1	0	1	0	1	1	0	0	0	0	0	2	0	0	0	0	0	7	1	24	
28	S	0	0	0	0	1	1	0	0	0	1	0	2	10	2	2	1	2	2	1	3	0	0	S	0	10	1	24	
29	0	0	0	1	0	1	0	0	0	1	2	2	1	1	0	1	2	1	0	1	2	0	S	1	0	2	1	24	
30	1	1	2	2	14	17	21	2	1	0	1	2	0	0	1	1	0	0	0	1	1	S	0	0	0	21	3	24	
HOURLY MAX	3	2	6	9	40	44	33	30	14	9	15	5	3	11	10	7	7	10	3	4	13	2	5	3					
HOURLY AVG	1	1	1	2	4	5	5	4	3	2	3	2	1	2	2	2	2	1	1	1	1	1	1	1					

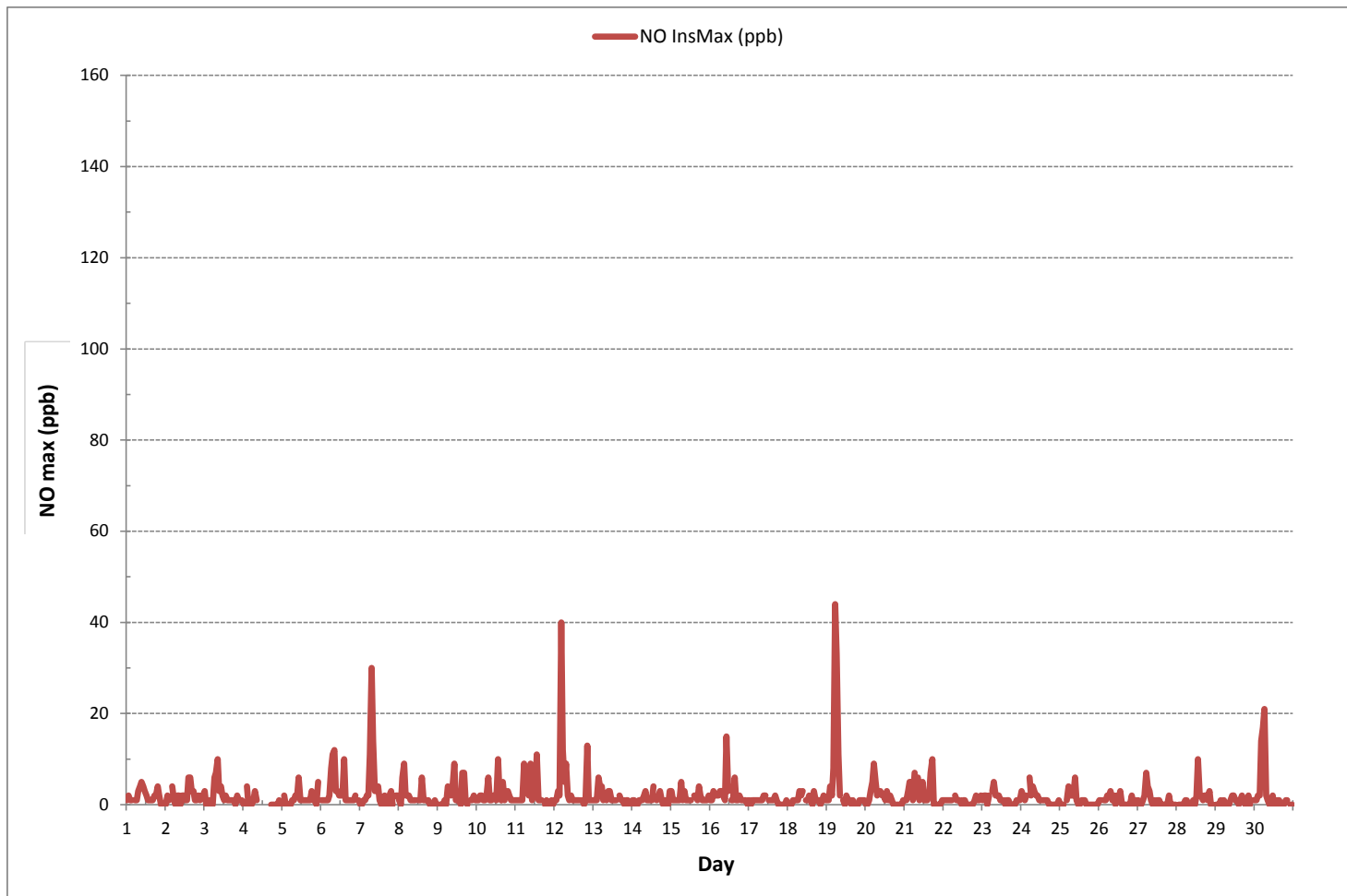
STATUS FLAG CODES

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:	514
MAXIMUM INSTANTANEOUS VALUE:	44 ppb @ HOUR 5 ON DAY 19
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	4
OPERATIONAL TIME:	719 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





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

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ 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 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	3	4	6	7	S	8	7	9	8	7	8	4	2	2	2	1	2	3	6	9	5	4	5	5	1	9	5	24
2	8	16	10	S	12	10	5	7	3	1	2	3	1	1	3	3	7	5	2	6	10	3	4	5	1	16	6	24
3	8	5	S	9	9	10	20	17	14	5	7	2	2	2	2	6	1	3	2	4	6	5	5	3	1	20	6	24
4	3	S	10	6	5	11	7	7	2	C	C	C	C	C	C	C	C	2	2	2	3	1	4	3	1	11	5	24
5	S	12	4	2	4	3	3	3	2	2	2	2	1	5	1	1	1	1	4	2	3	4	10	S	1	12	3	24
6	5	5	7	8	6	11	12	11	12	4	4	3	3	3	3	2	3	3	3	5	7	8	S	10	2	12	6	24
7	9	9	17	24	24	20	18	24	16	5	5	9	2	1	1	1	1	2	2	5	4	S	15	18	1	24	10	24
8	16	12	19	32	17	15	16	3	3	2	2	P	8	1	3	2	2	3	3	2	S	2	3	2	1	32	8	23
9	3	3	5	7	8	7	13	8	6	9	16	6	3	4	3	13	13	5	4	S	12	24	16	8	3	24	9	24
10	6	6	8	7	8	21	17	12	4	3	3	3	2	29	2	4	4	3	S	5	9	4	3	4	2	29	7	24
11	3	3	3	5	4	11	11	10	3	6	4	3	8	9	2	2	3	S	3	11	11	14	10	9	2	14	6	24
12	16	15	19	19	35	37	20	18	5	5	2	1	2	2	2	1	S	3	4	21	29	7	5	15	1	37	12	24
13	7	18	15	32	22	22	5	5	3	3	2	2	2	2	2	S	11	2	2	2	3	3	2	2	2	32	7	24
14	2	2	2	2	2	2	3	2	3	3	2	2	2	6	S	3	4	6	4	17	17	5	5	12	2	17	5	24
15	14	7	5	5	6	7	16	5	5	4	3	3	4	S	4	4	4	12	6	5	4	4	3	4	3	16	6	24
16	4	5	7	8	7	9	5	7	5	3	4	3	S	3	3	3	3	3	3	2	2	4	3	2	2	9	4	24
17	2	3	3	6	3	4	9	7	3	3	3	S	2	3	3	3	5	4	3	3	3	4	3	3	2	9	4	24
18	2	3	3	3	4	4	6	6	4	5	S	2	7	3	2	2	6	2	3	4	6	8	16	5	2	16	5	24
19	5	7	20	18	24	30	31	21	8	S	2	2	2	1	2	2	1	2	2	3	4	4	3	3	1	31	9	24
20	3	3	6	17	18	17	15	5	S	4	5	4	4	4	3	3	2	2	2	4	14	9	5	8	2	18	7	24
21	11	10	16	17	18	13	17	S	17	5	5	7	6	4	6	5	5	5	2	2	4	4	4	2	2	18	8	24
22	2	2	2	2	2	2	S	2	1	2	2	1	1	1	1	1	1	1	1	2	3	2	4	5	1	5	2	24
23	5	6	8	6	11	S	9	9	5	4	4	2	2	2	1	1	1	1	1	4	4	3	4	4	1	11	4	24
24	9	5	3	9	S	14	7	9	8	5	4	3	5	2	1	5	4	2	2	3	4	4	2	4	1	14	5	24
25	2	2	3	S	9	18	15	9	6	3	1	1	1	2	2	1	1	3	2	4	3	2	2	2	1	18	4	24
26	2	4	S	4	6	5	7	8	4	4	1	3	2	4	1	1	1	2	3	4	9	3	4	5	1	9	4	24
27	6	S	4	6	12	16	13	4	1	1	1	2	2	1	2	1	1	2	2	3	2	2	1	1	1	16	4	24
28	S	2	1	1	3	8	5	2	2	2	2	2	9	11	2	1	1	6	6	7	22	7	8	S	1	22	5	24
29	2	1	1	1	2	2	2	1	1	2	2	2	2	2	2	2	2	1	2	5	14	4	S	8	1	14	3	24
30	6	4	7	6	14	12	14	6	2	1	1	2	4	1	2	3	1	1	1	12	7	S	2	3	1	14	5	24
HOURLY MAX	16	18	20	32	35	37	31	24	17	9	16	9	9	29	6	13	13	12	6	21	29	24	16	18				
HOURLY AVG	6	6	8	10	11	12	11	8	5	4	4	3	3	4	2	3	3	3	3	5	8	5	5	6				

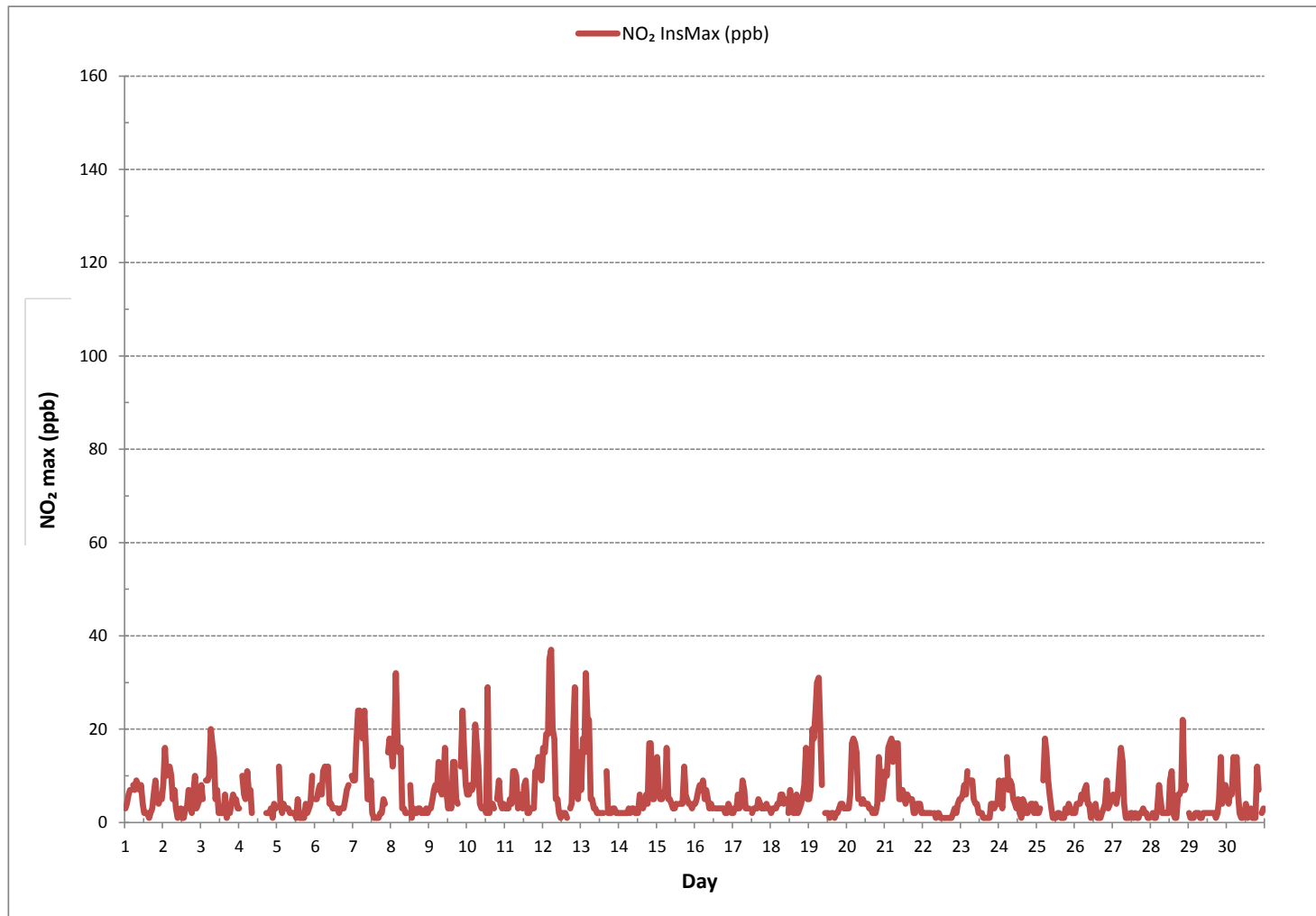
STATUS FLAG CODES

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:	679
MAXIMUM INSTANTANEOUS VALUE:	37 ppb @ HOUR 5 ON DAY 12
	VAR-VARIOUS
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	719 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

OZONE Instantaneous Maximum (O₃ 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 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	45.4	44.8	42.9	41.1	S	36.2	33.2	36.2	38.5	41.4	41.7	43.9	45.2	46.4	48.3	48.7	48.9	48.7	47.8	46.3	46.4	44.8	44.8	50.7	33.2	50.7	44.0	24
2	50.3	32.6	32.2	S	40.1	38.0	40.3	41.4	43.0	43.9	43.9	44.5	45.1	45.2	45.4	45.9	45.4	45.1	46.3	44.9	44.2	44.2	43.0	42.0	32.2	50.3	42.9	24
3	41.3	40.3	S	36.1	35.1	32.9	31.0	35.3	41.6	44.2	46.3	46.3	46.6	46.9	47.5	48.2	48.5	48.1	48.0	47.2	45.5	46.4	45.2	44.5	31.0	48.5	43.2	24
4	43.0	S	38.8	37.0	36.3	37.7	39.4	41.5	42.1	42.4	42.1	41.6	43.8	44.2	46.1	46.0	47.2	47.4	46.6	45.7	44.5	43.9	43.6	40.3	36.3	47.4	42.7	24
5	S	36.8	37.7	37.1	36.5	34.6	33.7	32.5	C	C	C	C	C	C	34.7	35.0	34.7	32.8	31.0	30.3	30.6	29.0	25.3	S	25.3	37.7	33.3	24
6	22.1	20.9	19.7	18.9	18.0	15.5	15.6	19.3	30.8	36.2	46.7	37.1	40.0	42.1	43.7	44.6	44.6	44.5	43.7	41.7	36.8	31.9	S	26.2	15.5	46.7	32.2	24
7	24.7	25.6	24.4	14.7	8.1	10.3	14.6	21.4	35.3	40.5	41.0	42.7	44.7	45.1	44.9	44.6	44.9	44.8	43.9	43.3	43.3	S	40.3	26.1	8.1	45.1	33.4	24
8	24.1	24.7	23.3	19.8	22.9	31.8	39.0	41.8	44.2	45.2	45.6	P	45.8	46.2	47.4	46.6	47.4	49.4	49.5	49.4	S	47.0	46.9	47.2	19.8	49.5	40.2	23
9	47.2	44.0	41.6	36.3	34.8	29.6	27.8	42.1	47.9	49.8	52.4	54.5	54.8	57.4	58.4	57.7	59.0	58.7	58.4	S	54.5	50.5	52.1	52.3	27.8	59.0	48.8	24
10	52.6	53.5	55.1	54.3	50.4	45.5	42.1	46.9	47.2	47.6	47.9	47.7	47.2	46.9	46.6	46.4	46.3	47.5	S	48.0	47.9	48.7	50.0	50.6	42.1	55.1	48.6	24
11	50.4	50.3	48.9	48.9	48.6	48.3	47.1	46.9	47.2	47.6	47.8	46.4	48.5	48.5	49.1	49.3	50.0	S	49.5	47.0	39.7	38.4	37.1	39.7	37.1	50.4	46.7	24
12	31.0	23.3	23.7	22.1	20.4	25.3	35.1	44.0	48.1	49.5	50.7	50.9	52.2	53.4	53.3	53.4	S	54.3	53.7	51.1	45.2	50.7	47.4	44.6	20.4	54.3	42.8	24
13	40.2	40.1	34.7	29.5	32.9	42.5	46.6	46.6	47.1	49.1	51.6	51.8	50.8	51.8	51.6	S	51.0	50.7	50.7	50.4	48.4	48.0	46.3	45.1	29.5	51.8	46.0	24
14	43.8	41.6	40.1	39.8	39.9	39.1	38.7	38.1	37.9	39.0	40.1	42.6	46.4	49.1	S	51.9	53.0	53.1	52.8	50.1	51.2	50.8	50.6	45.2	37.9	53.1	45.0	24
15	44.2	46.0	44.2	41.7	40.8	40.2	34.7	37.7	41.9	45.4	49.1	50.1	44.9	S	40.1	41.4	42.6	41.1	41.7	40.1	38.4	38.2	36.7	42.9	34.7	50.1	41.9	24
16	43.3	43.3	43.0	42.1	41.7	41.1	40.4	39.3	38.2	35.4	34.0	35.9	S	42.9	45.1	50.6	53.3	56.0	56.5	57.0	54.9	54.3	53.7	53.5	34.0	57.0	45.9	24
17	53.1	52.3	50.7	49.9	49.3	47.9	46.4	46.2	45.0	44.2	44.6	S	42.1	40.2	36.5	35.3	34.3	42.4	43.0	42.1	34.6	34.2	35.6	36.8	34.2	53.1	42.9	24
18	36.8	36.9	36.5	35.1	34.2	32.5	31.7	33.7	34.5	41.9	S	47.8	48.0	49.7	50.6	51.3	53.9	54.5	53.7	52.7	46.6	48.4	42.0	39.5	31.7	54.5	43.2	24
19	42.0	41.7	37.4	19.2	21.2	11.5	23.6	43.3	46.2	S	53.1	54.4	55.7	56.4	56.5	55.6	53.7	53.1	50.7	48.9	47.5	45.2	43.6	42.1	11.5	56.5	43.6	24
20	40.5	39.3	37.4	30.2	18.7	21.1	25.8	30.2	S	32.0	34.7	37.0	47.8	50.0	51.0	52.8	52.5	50.9	47.4	45.7	41.7	32.7	32.7	29.7	18.7	52.8	38.3	24
21	30.2	22.4	10.4	17.3	21.7	15.2	16.1	S	36.5	38.4	38.1	37.6	39.0	44.2	38.6	38.0	37.3	42.1	42.1	38.2	41.4	41.9	41.3	41.8	10.4	44.2	33.5	24
22	41.8	41.8	41.0	35.7	34.7	37.1	S	38.1	38.2	37.1	35.0	33.9	34.2	35.1	35.8	33.3	33.6	36.7	35.7	37.3	36.1	25.2	29.1	27.0	25.2	41.8	35.4	24
23	26.7	26.1	24.9	23.6	22.3	S	24.9	30.5	33.6	39.2	42.5	45.8	46.3	47.2	47.5	48.9	49.1	48.6	48.1	43.5	42.4	37.5	32.7	30.7	22.3	49.1	37.5	24
24	31.2	35.7	31.6	23.5	S	18.9	32.9	35.3	37.9	40.7	42.7	48.7	52.2	56.8	57.7	57.5	56.9	54.7	51.8	49.2	48.6	53.4	55.0	54.1	18.9	57.7	44.7	24
25	55.4	55.1	49.4	S	47.7	43.3	40.5	43.5	49.1	50.0	50.4	49.8	49.5	48.7	48.1	48.1	48.4	49.4	49.8	49.2	47.4	43.8	43.3	44.1	40.5	55.4	48.0	24
26	44.5	42.3	S	39.9	36.1	35.0	37.6	41.5	47.2	50.3	53.9	57.3	57.2	58.1	58.6	S	58.6	57.8	57.2	54.3	50.1	51.9	48.4	44.2	35.0	S	49.6	24
27	44.2	S	44.1	31.8	23.2	21.8	40.2	44.6	46.2	48.7	50.4	52.5	53.6	55.3	56.5	56.0	57.1	59.1	58.1	56.8	51.9	50.4	49.7	48.3	21.8	59.1	47.8	24
28	S	46.8	46.4	45.8	44.8	41.9	41.3	42.9	43.5	43.8	45.8	48.7	52.3	53.4	55.6	56.7	57.5	57.4	56.0	54.0	48.3	35.0	36.2	S	35.0	57.5	47.9	24
29	46.6	45.2	42.1	41.4	38.3	36.4	41.4	43.2	44.0	45.2	45.4	43.6	41.6	44.5	44.9	46.8	48.4	50.1	50.0	48.7	42.9	35.1	S	24.1	24.1	50.1	43.0	24
30	19.0	16.7	14.2	11.7	9.6	3.3	24.8	42.2	44.6	46.4	52.1	53.3	54.8	54.1	54.3	55.0	55.1	54.2	53.3	53.0	47.5	S	45.8	44.2	3.3	55.1	39.5	24
HOURLY MAX	55.4	55.1	55.1	54.3	50.4	48.3	47.1	46.9	49.1	50.3	53.9	57.3	57.2	58.1	58.6	59.7	59.0	59.1	58.4	57.0	54.9	54.3	55.0	54.1				
HOURLY AVG	39.8	38.2	36.3	33.0	32.4	31.5	34.0	38.8	42.1	43.4	45.3	46.2	47.5	48.6	48.1	48.5	48.7	49.4	48.9	47.1	44.8	42.9	42.8	41.3				

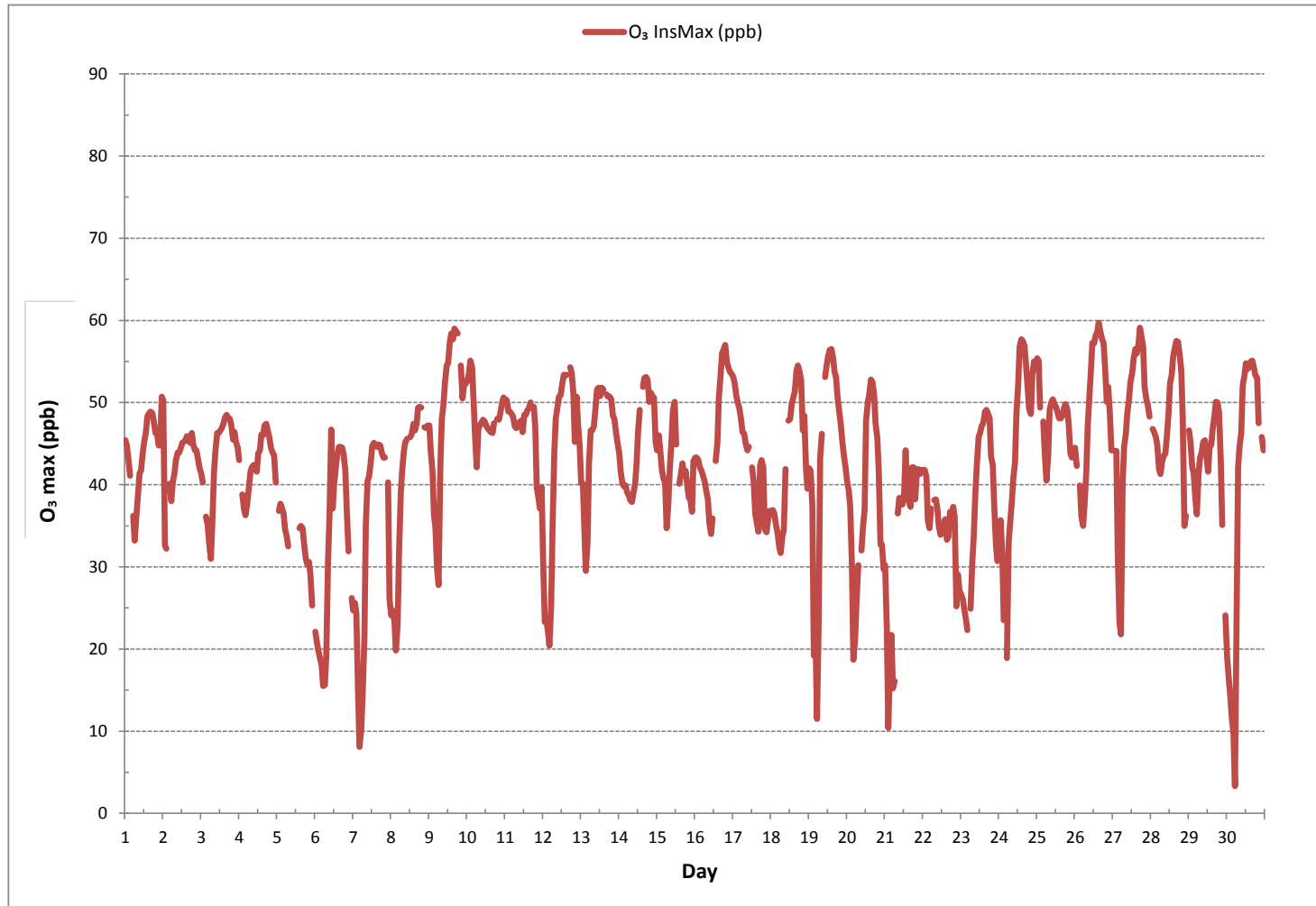
STATUS FLAG CODES

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:	681
MAXIMUM INSTANTANEOUS VALUE:	59.7 ppb @ HOUR 15 ON DAY 26
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	9.7
OPERATIONAL TIME:	719 hrs

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - April 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	12.8	9.8	9.1	7.4	6.5	6.3	5.7	6.8	7.5	7.8	7.0	11.7	12.7	10.8	11.3	9.1	10.8	12.5	10.9	8.4	9.7	5.2	2.4	1.5	1.5	12.8	8.5	24
2	3.2	3.2	1.8	7.0	5.7	4.1	3.1	10.6	12.7	16.0	15.1	11.0	12.2	11.0	11.1	13.4	11.7	11.3	7.3	6.8	11.2	17.3	17.3	11.9	1.8	17.3	9.8	24
3	6.8	7.4	2.4	2.2	3.0	9.2	2.4	7.3	6.4	7.0	7.6	10.6	11.3	13.7	12.9	11.3	12.4	12.5	10.8	10.4	8.1	7.2	10.7	11.9	2.2	13.7	8.6	24
4	12.8	7.9	5.8	3.3	1.7	6.0	8.1	10.0	10.2	9.5	14.5	17.8	15.9	19.4	18.3	19.5	21.1	24.8	17.9	12.2	9.9	15.4	10.7	6.5	1.7	24.8	12.5	24
5	2.2	14.4	12.9	12.5	13.3	19.2	18.3	23.0	23.7	19.7	23.4	24.3	25.3	23.4	23.3	21.0	17.8	16.1	12.4	7.5	7.7	3.5	4.6	4.4	2.2	25.3	15.6	24
6	3.1	6.3	2.6	3.1	3.9	2.3	1.8	3.3	4.9	8.0	8.3	7.9	8.6	9.7	9.1	9.0	6.3	8.8	7.6	5.4	5.9	7.1	4.7	2.3	1.8	9.7	5.8	24
7	6.5	1.6	3.5	1.2	2.2	2.1	2.5	5.0	5.4	8.4	11.2	12.0	15.7	12.7	15.8	17.1	16.6	17.6	10.7	7.3	4.2	4.6	2.9	2.5	1.2	17.6	7.9	24
8	3.2	1.5	3.5	2.7	2.2	3.6	5.4	7.5	8.4	10.8	10.7	P	11.9	9.5	12.6	11.8	7.9	10.1	7.1	12.2	13.4	8.8	6.5	6.0	1.5	13.4	7.7	23
9	4.8	1.8	2.1	3.6	2.0	2.9	2.3	7.6	11.3	10.6	12.2	12.9	13.9	16.5	16.5	17.2	18.8	17.1	15.6	9.7	6.7	7.6	7.2	6.0	1.8	18.8	9.5	24
10	7.5	8.2	8.8	8.0	4.7	3.9	4.4	11.7	11.4	12.1	17.0	16.0	15.2	15.5	14.2	14.8	16.3	15.5	10.3	12.1	10.4	14.1	12.9	14.5	3.9	17.0	11.6	24
11	14.3	14.6	14.1	12.2	10.3	8.2	8.7	8.6	10.7	9.8	15.1	14.1	14.8	9.4	10.9	8.9	10.0	8.3	7.1	4.6	1.8	2.2	3.0	2.8	1.8	15.1	9.4	24
12	3.1	2.3	3.2	3.7	3.1	3.2	3.8	7.8	7.0	10.3	13.1	10.8	10.6	8.9	11.2	12.6	13.8	8.0	5.7	3.2	3.8	9.0	3.4	2.7	2.3	13.8	6.8	24
13	2.1	3.8	4.6	2.9	3.7	6.4	9.8	10.6	12.5	15.2	17.5	18.8	17.0	18.7	20.2	21.8	18.5	14.5	18.2	18.0	17.4	18.5	19.3	17.9	2.1	21.8	13.7	24
14	14.6	16.1	21.7	17.1	17.0	19.1	16.6	15.1	18.4	13.5	16.1	14.3	10.8	12.7	13.5	10.4	12.1	10.5	7.4	3.8	7.0	5.7	3.6	2.8	2.8	21.7	12.5	24
15	6.7	9.1	7.5	9.4	10.4	5.1	5.5	6.0	8.4	12.9	12.0	13.0	14.6	20.8	17.7	16.3	15.2	10.6	11.2	9.0	9.1	9.2	8.9	9.7	5.1	20.8	10.8	24
16	10.2	6.5	7.0	6.9	9.1	7.3	14.4	13.8	13.9	16.8	16.5	17.4	18.6	20.3	25.7	20.3	23.2	28.1	22.0	27.9	15.4	13.1	17.3	19.7	6.5	28.1	16.3	24
17	13.6	12.3	14.0	11.2	12.5	11.8	18.2	14.2	12.9	15.1	16.3	17.0	15.3	16.6	12.4	11.4	7.4	11.5	13.9	14.8	15.8	12.4	15.0	18.1	7.4	18.2	13.9	24
18	15.3	13.2	14.2	14.7	12.2	10.2	8.8	14.5	15.2	15.4	17.8	18.1	19.2	16.0	16.3	17.3	16.6	16.6	12.5	7.2	4.8	7.8	2.4	2.9	2.4	19.2	12.9	24
19	2.8	2.6	2.2	2.4	2.6	2.9	3.2	6.9	6.0	8.9	12.4	14.7	18.9	20.9	17.4	18.7	16.6	16.6	11.2	9.9	10.1	9.8	12.6	10.9	2.2	20.9	10.1	24
20	8.9	7.6	6.6	4.7	3.8	4.1	3.6	8.4	9.4	8.9	7.9	11.6	13.5	13.5	14.1	18.0	14.3	14.6	11.4	7.3	3.7	2.1	3.6	2.8	2.1	18.0	8.5	24
21	4.8	4.3	2.5	4.2	4.0	2.5	3.6	5.4	6.7	9.6	9.1	10.8	10.0	14.5	10.6	12.9	13.2	14.5	17.9	16.2	19.0	22.1	14.2	14.6	2.5	22.1	10.3	24
22	18.5	16.5	17.6	19.9	18.5	18.9	24.4	20.4	22.4	24.6	22.3	21.8	23.1	25.4	23.3	27.9	24.7	29.7	21.8	19.7	6.3	5.8	7.6	8.2	5.8	29.7	19.6	24
23	6.7	6.2	6.5	5.4	6.5	6.2	7.0	10.0	10.1	13.6	14.1	18.1	23.2	25.6	21.2	20.5	17.6	13.4	14.1	10.6	8.8	5.5	3.7	3.9	3.7	25.6	11.6	24
24	3.2	3.2	2.0	2.6	3.1	2.3	8.2	11.5	15.5	14.4	15.6	17.6	18.7	23.6	26.8	24.6	23.5	19.0	16.5	10.2	12.3	12.7	9.3	7.2	2.0	26.8	12.7	24
25	8.3	7.2	6.3	6.1	5.0	4.2	5.2	9.3	12.6	22.0	25.8	27.4	26.3	26.5	24.5	20.0	19.6	18.3	15.5	9.9	6.4	8.3	8.5	8.1	4.2	27.4	13.8	24
26	10.0	8.3	7.7	8.6	9.1	8.9	10.2	12.6	21.0	23.5	22.0	25.5	26.0	28.4	24.8	24.4	21.5	18.5	13.5	8.8	7.1	8.4	5.1	4.9	4.9	28.4	15.0	24
27	5.4	5.7	3.2	2.6	2.3	2.8	7.0	9.8	16.3	19.6	15.9	19.8	17.2	19.2	18.5	16.5	16.5	15.3	13.6	10.7	10.3	9.9	11.3	11.8	2.3	19.8	11.7	24
28	11.1	11.2	9.8	6.0	4.9	4.7	6.3	11.0	14.6	14.4	16.3	15.8	21.9	21.8	20.3	19.3	20.3	13.9	10.9	6.2	4.5	8.1	5.8	19.4	4.5	21.9	12.4	24
29	17.4	22.6	14.8	16.1	22.3	22.7	25.0	22.9	23.9	24.3	24.3	20.6	20.2	24.2	20.9	19.1	13.2	16.5	14.2	10.1	2.5	2.5	2.1	2.3	2.1	25.0	16.9	24
30	1.1	3.1	1.9	1.9	2.0	4.3	6.6	10.2	14.2	15.4	18.5	19.0	20.8	19.6	21.3	21.6	16.6	14.3	6.4	6.1	7.4	10.5	12.2	1.1	21.6	10.7	24	
HOURLY MAX	18.5	22.6	21.7	19.9	22.3	22.7	25.0	23.0	23.9	24.6	25.8	27.4	26.3	28.4	26.8	27.9	24.7	29.7	22.0	27.9	19.0	22.1	19.3	19.7				
HOURLY AVG	8.0	8.0	7.3	7.0	6.9	7.1	8.3	10.6	12.3	13.9	15.1	16.2	16.7	17.7	17.2	16.9	16.0	15.4	12.8	10.2	8.6	9.0	8.2	8.3				

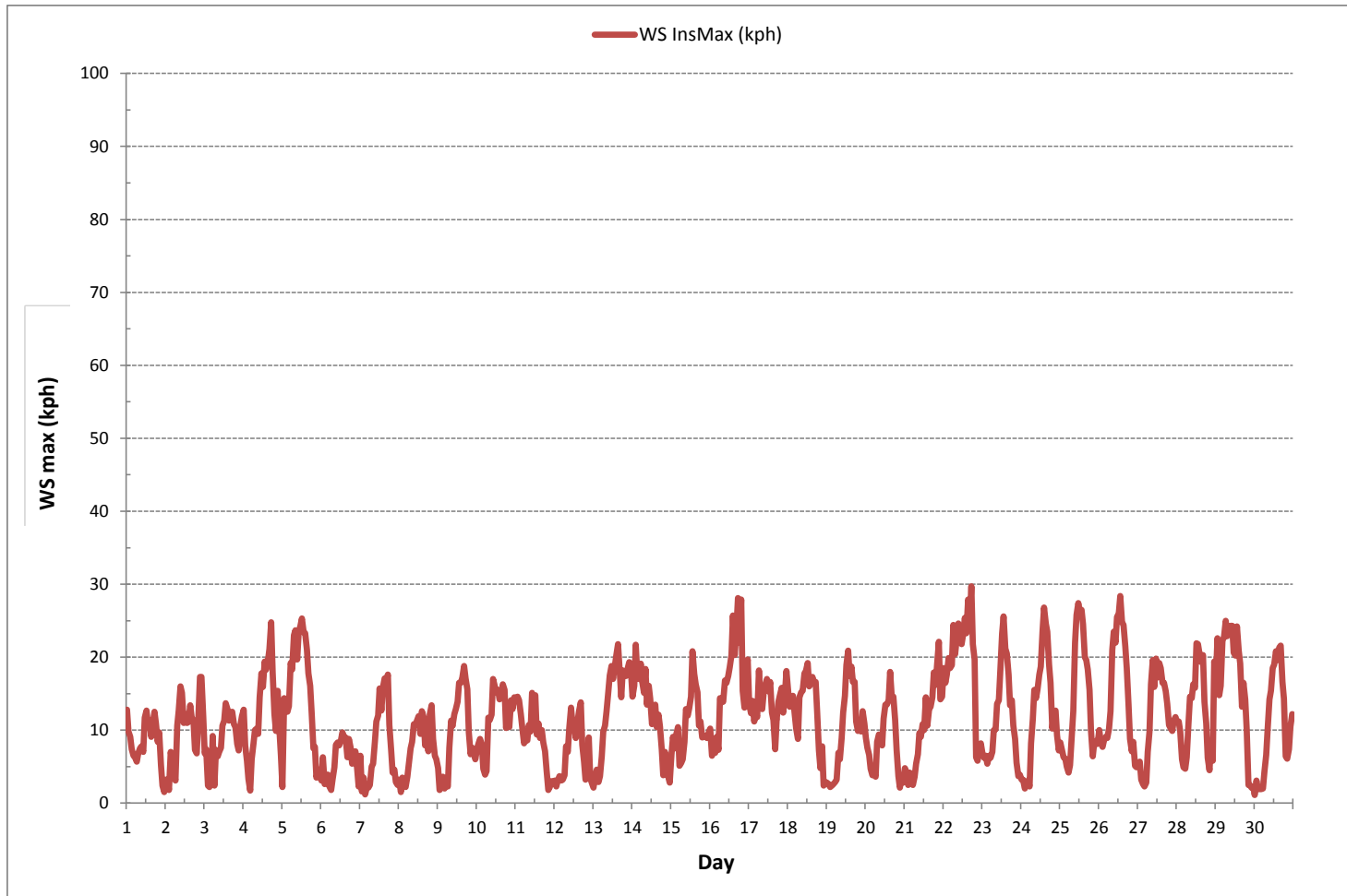
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	29.7	kph	@ HOUR	17	ON DAY	22	
OPERATIONAL TIME:						719	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

30-05-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-04-1-C</u>
Site: <u>Cold Lake South Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalab</u>	Date <u>May 16, 2018</u>
Level 1 Primary Validation	<u>Maram Ghalab</u>	Date <u>May 16, 2018</u>
Level 2 Final Validation	<u>Maram Ghalab</u>	Date <u>May 29, 2018</u>
Level 3 Independent Data Review	<u>msdmba</u>	Date <u>May 30, 2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
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

May 31, 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 April 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), 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 this month was compliant with the requirements outlined in the AMD, 2016.

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

NO₂/NO/NO_x: The Maxxam-owned API 200A analyzer, s/n: 2051, was removed for required maintenance on April 26. Another Maxxam-owned API 200A analyzer, s/n: 1899, was installed on April 27.

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,



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

Lily Lin
Data & Reporting Specialist
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Fax 403-219-3673

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

JOB #: 2833-2018-04-30-C

April 2018

Prepared for:

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

Attention: MIKE BISAGA

DATE: **May 25, 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 April 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.

All data collected this month 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.

THC: The span gas cylinder was replaced on April 27 and a zero-span verification was completed afterwards as a quality check. One hour of downtime was recorded at hour 09:00 due to the additional quality check.

NO_x/NO/NO₂: Thirty-four hours of downtime were recorded this month.

- On April 26, the Maxxam-owned API 200A (s/n: 2051) was removed for required maintenance and was replaced with another Maxxam-owned API 200A unit (s/n: 1899) on April 27, resulting in 29 hours of downtime.
- Between April 23 and April 29, additional zero-span response checks were initiated to assess instability in span response, resulting in 5 hours of downtime.

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, Maskwa Continuous Monitoring Station.

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 ₂ (ppb)	172	48	0	0	1	19	22	19	7.0	NW	3	22	100.0
H ₂ S (ppb)	10	3	0	0	0	1	3	6	0.6	SSW	0	1	100.0
THC (ppm)	-	-	-	-	2.09	2.55	7	7	1.90	NNE	2.21	6	99.9
NO ₂ (ppb)	159	-	0	-	2	23	25	3	2.6	WNW	5	6	95.3
NO (ppb)	-	-	-	-	0	10	6	9	2.6	NNW	2	6	95.3
NO _x (ppb)	-	-	-	-	3	25	22	19	7.0	NW	7	6	95.3
RELATIVE HUMIDITY (%)	-	-	-	-	54	92	16	5	5.4	NE	88	16	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	942	958	6	2	0.7	WSW	954	6	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	0.9	27.0	28	16	9.10	SSW	16.1	28	100.0
PRECIPITATION (mm)	-	-	-	-	0.1	3.8	21	17	3.80	N	0.8	21	100.0
VECTOR WS (kph)	-	-	-	-	0.6	15.0	29	13	-	NNE	9.4	22	100.0
VECTOR WD (sec)	-	-	-	-	225 (SW)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), 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 (SO₂)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on April 10.
- One instance of maximum instantaneous data was discarded on April 10 at hour 10:00, due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on April 10.
- One instance of maximum instantaneous data was discarded on April 10 at hour 10:00, due to a brief power outage.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 99.9 %, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on April 10.
- The span gas cylinder was replaced on April 27 and a successful zero-span verification was completed as a quality check. The expected span value was updated to reflect the concentration of the new gas. One hour of downtime was recorded at hour 09:00 due to the additional quality check.
- One instance of maximum instantaneous data was discarded on April 10 at hour 10:00, due to a brief power outage.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time for the monitoring period was 95.3 %, equivalent to 34 hours of downtime.
- The routine monthly calibration was performed on April 10.
- The analyzer exhibited an abrupt span drift between April 21 and 22, however the results were still within AMD requirements. In addition, the results of the daily zero-span check on April 23 and a subsequent repeat zero-span check on the same day showed a large drift towards the lower acceptance limit, demonstrating instability in span response. Between April 24 and 25, span response stabilized and the results were closer to the mean. Analyzer replacement was, however, deemed necessary as a precautionary measure. On April 26, following a successful shut-down calibration, the Maxxam-owned API 200A (s/n: 2051) was removed for required maintenance and was replaced with another Maxxam-owned API 200A unit (s/n: 1899). The analyzer was left in "maintenance" mode overnight to stabilize. On April 27, the span gas was replaced, an analog output calibration was conducted, a leak test was performed, the zero-span oven temperature was adjusted, the scrubber material was renewed and a successful post-repair calibration was subsequently completed. Thirty-one hours of downtime were incurred due to these events.
- The span response for the newly-installed analyzer did not stabilize after the installation calibration, as the analyzer required a new permeation tube. This was confirmed by the results of two additional zero-span checks conducted on April 29 at hours 06:00-08:00. The permeation tube was replaced on April 30 and allowed time to stabilize. The expected span value was updated on May 4 following a calibration. Three hours of downtime were incurred due to the additional zero-span checks
- One instance of maximum instantaneous data was discarded on April 10 at hour 10:00, due to a brief power outage.

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

- Operational time for the monitoring period was 100%.
- One instance of maximum instantaneous data was discarded on April 10 at hour 10:00, due to a brief power outage.
- 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

All data collected this month 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.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

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
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x 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 51C FID Analyzer
- Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
- Wind System - RM Young Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

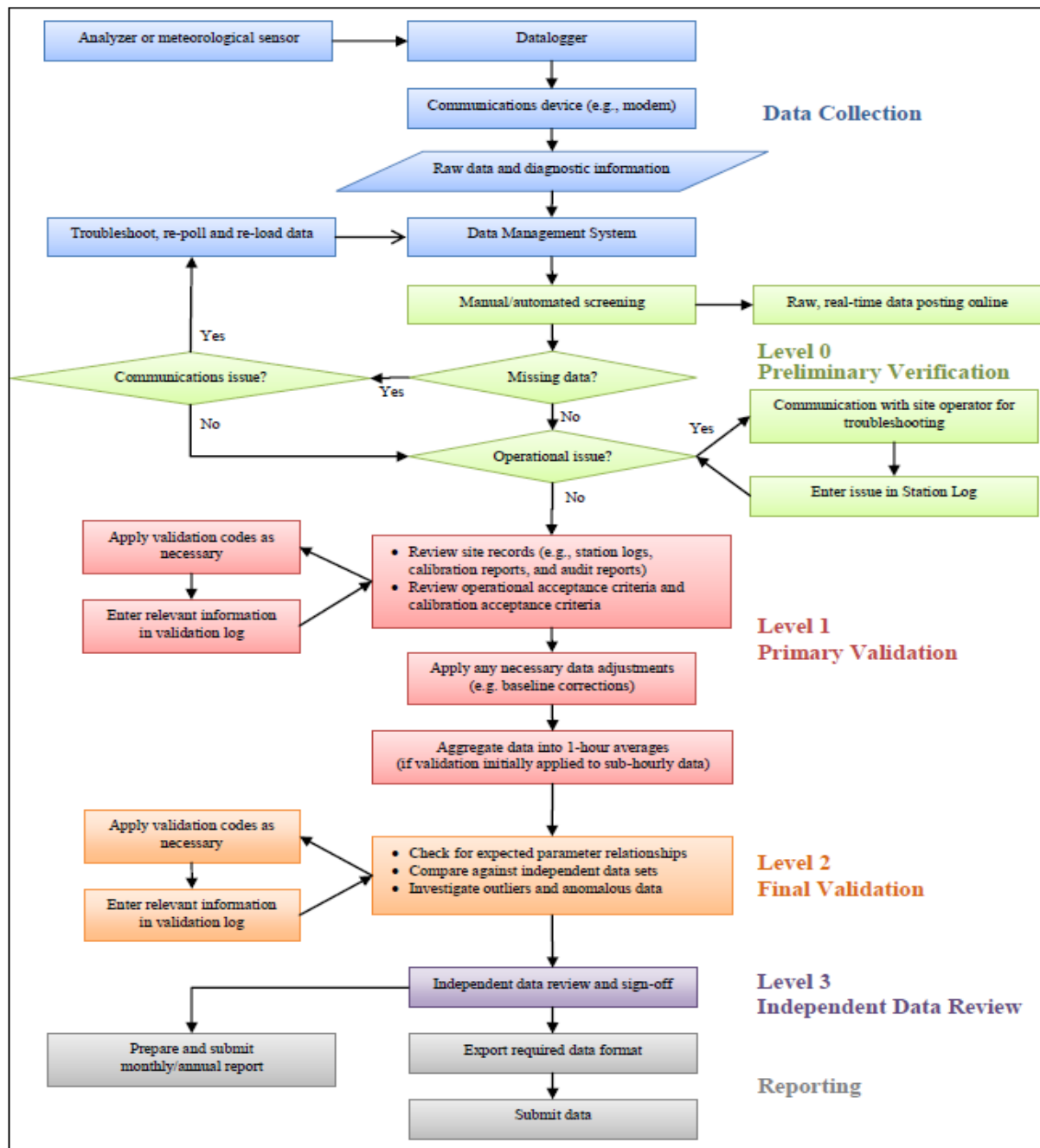
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (SO₂ 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	S	0	0	1	6	5	1	3	3	6	2	1	2	2	1	1	1	1	1	1	1	1	1	0	6	2	24	
2	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	2	2	1	S	0	2	1	24	
3	1	1	0	0	0	0	0	0	5	6	1	1	1	1	0	0	0	0	0	0	1	0	S	0	0	6	1	24	
4	1	1	1	1	1	0	0	0	0	1	3	4	2	3	2	3	4	4	0	0	0	0	S	0	1	0	4	1	24
5	1	1	5	3	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	5	1	24	
6	0	2	0	0	0	0	0	1	6	12	6	7	4	2	1	0	0	0	0	S	0	0	0	0	0	12	2	24	
7	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	1	0	24	
8	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	S	0	1	0	0	0	0	0	1	0	24	
9	0	0	0	0	0	0	0	2	2	2	2	1	1	1	1	S	0	0	0	0	0	0	1	1	0	2	1	24	
10	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0	1	1	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	0	0	0	1	2	1	S	0	0	0	1	1	1	0	0	0	0	0	2	0	24	
13	0	0	0	0	0	0	0	1	1	2	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
14	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	1	2	S	0	1	2	3	2	0	0	0	0	0	0	0	0	0	3	0	24	
16	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	3	4	3	1	0	4	0	24
17	3	5	1	3	0	3	2	3	S	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	24	
18	0	0	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	24	
19	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	24
20	2	1	1	0	0	S	0	0	1	6	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	24	
21	0	0	0	0	S	0	0	0	0	2	1	0	1	1	1	1	1	1	1	1	1	1	4	7	2	0	7	1	24
22	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	8	6	12	11	19	12	1	0	1	0	19	3	24	
23	0	1	S	1	0	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
24	0	S	0	0	0	0	0	1	2	2	2	1	0	0	0	0	0	0	0	1	18	14	6	8	0	18	2	24	
25	S	7	5	18	7	1	1	1	3	0	2	2	3	2	1	2	1	0	0	0	0	0	0	S	0	18	3	24	
26	0	0	0	0	0	0	4	12	0	0	0	0	0	1	0	0	0	1	0	0	0	0	S	3	0	12	1	24	
27	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	
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	1	0	1	0	24
29	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
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	1	0	0	0	1	0	24
HOURLY MAX	3	7	5	18	7	6	5	12	6	12	6	7	4	3	3	8	6	12	11	19	18	14	7	8					
HOURLY AVG	0	1	1	1	0	0	0	1	1	1	1	1	1	1	0	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

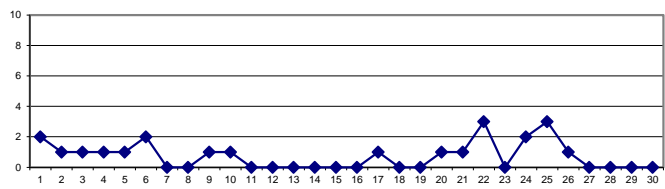
OBJECTIVE LIMIT:

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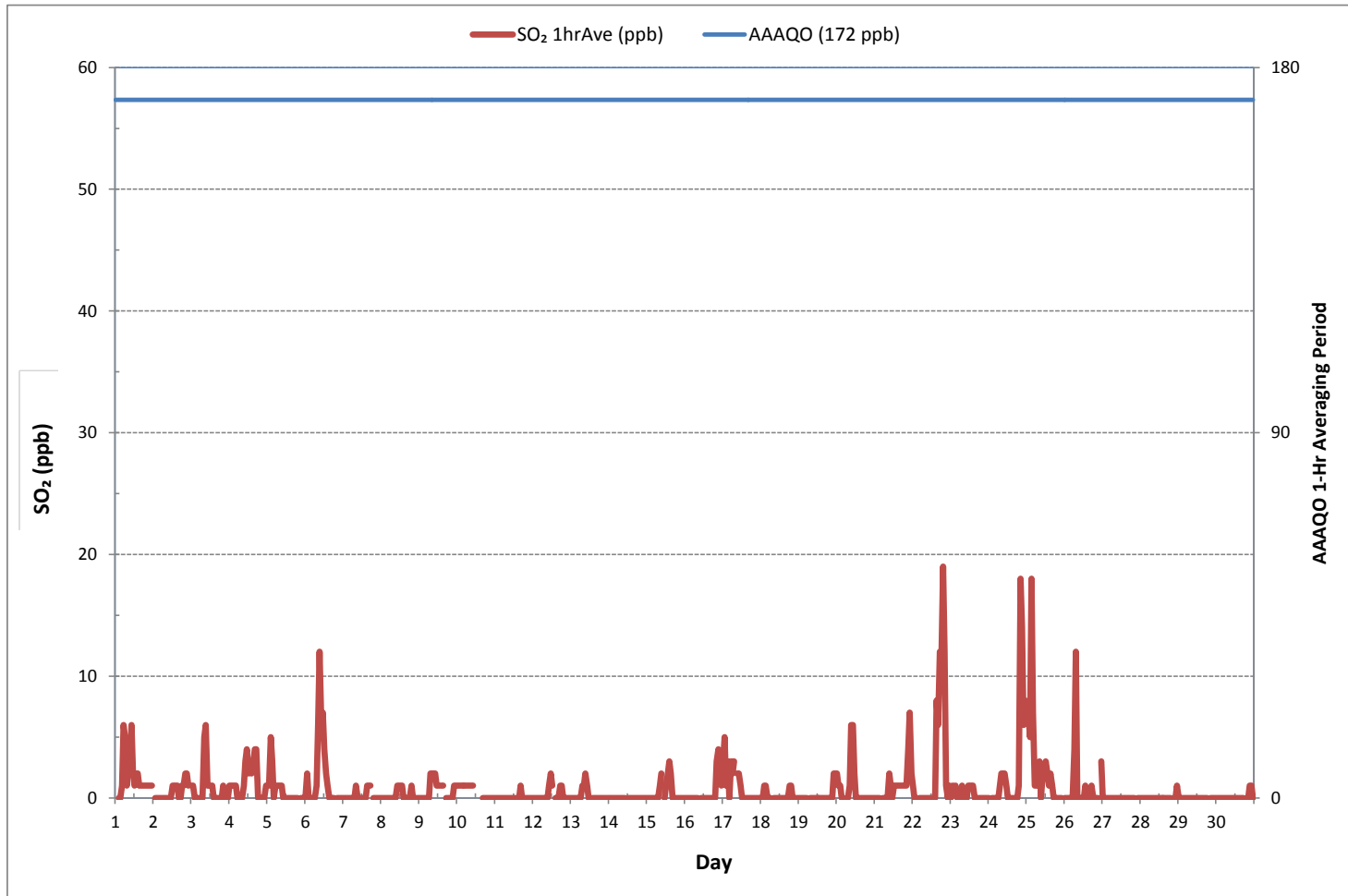
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	208		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	19 ppb @ HOUR	19 ON DAY	22
MAXIMUM 24-HR AVERAGE:	3 ppb	ON DAY	22
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	1 ppb

24 HR AVERAGES April 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO2[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.30%

Calm Avg: 0.56 [ppb]

Direction	0.0-4.0	4.0-8.0	8.0-12.0	12.0-16.0	16.0-20.0	>20.0	Total
N	9.4	0.0	0.0	0.0	0.0	0.0	9.4
NE	13.9	0.0	0.0	0.0	0.0	0.0	13.9
E	6.4	0.3	0.0	0.0	0.0	0.0	6.7
SE	6.2	0.0	0.0	0.0	0.0	0.0	6.2
S	11.3	0.0	0.0	0.0	0.0	0.0	11.3
SW	22.8	0.2	0.0	0.0	0.0	0.0	23.0
W	7.6	0.2	0.0	0.0	0.0	0.0	7.8
NW	5.9	2.2	0.6	0.4	0.4	0.0	9.5
Summary	83.5	2.8	0.6	0.4	0.4	0.0	87.7

% Icon Classes (ppb)

83



0.0-4.0

3



4.0-8.0

1



8.0-12.0

0



12.0-16.0

0



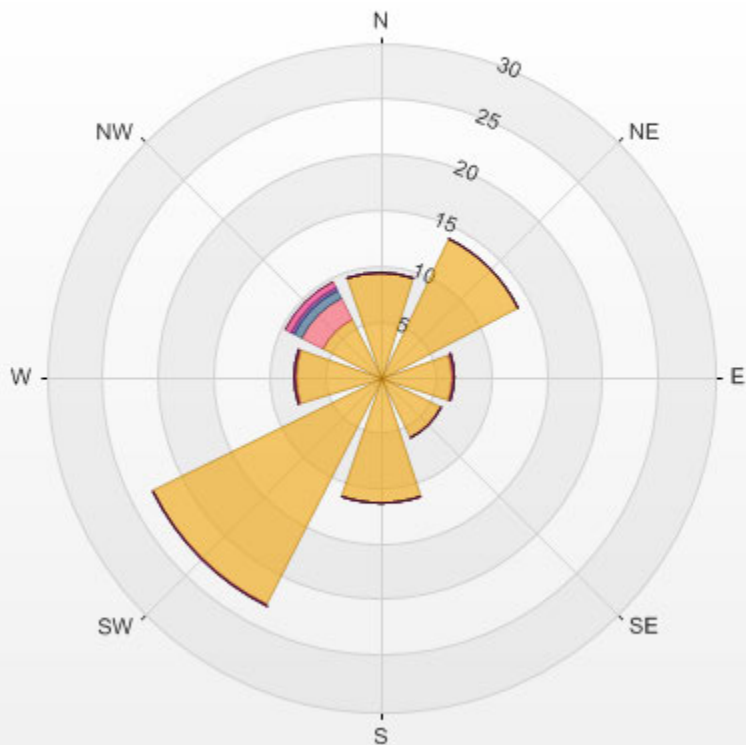
16.0-20.0

0



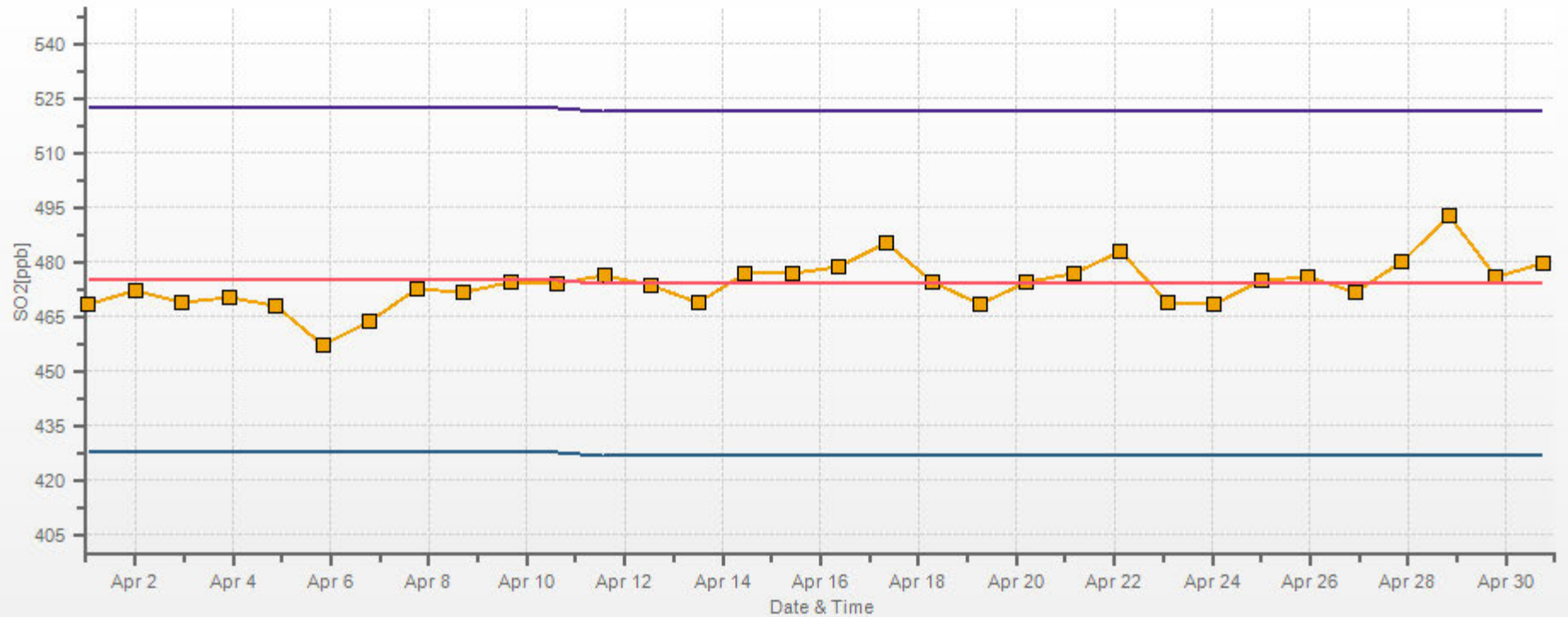
>20.0

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.30% Calm Poll Avg: 0.56[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S 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	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	S	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	24	
3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	S	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	S	0	0	0	0	0	0	24	
7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24	
8	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	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	C	C	C	C	C	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	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	S	0	0	0	0	0	0	0	0	0	0	0	0	24	
13	0	0	0	0	0	0	0	0	0	1	0	0	S	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	S	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	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	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	S	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	S	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	S	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	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	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24	
23	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	
24	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24	
25	S	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	
26	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	
27	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	
28	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	
29	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	
30	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	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	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					

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

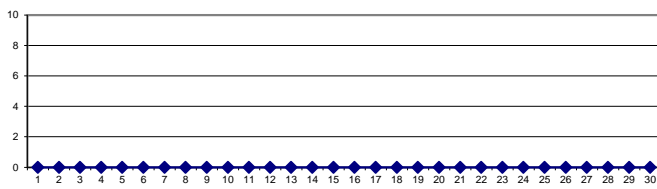
OBJECTIVE LIMIT:

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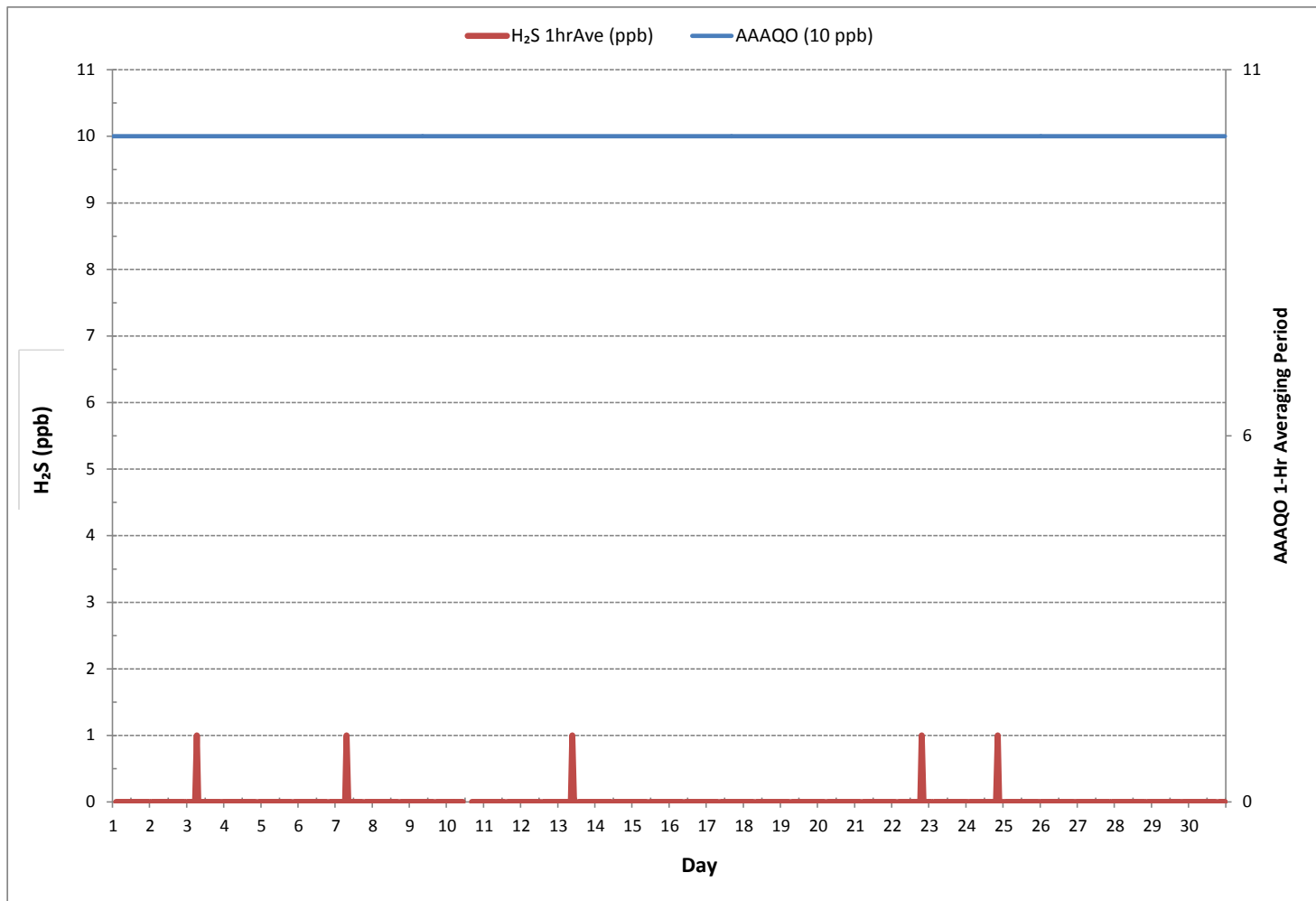
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	5		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	6 ON DAY	3
MAXIMUM 24-HR AVERAGE:	0 ppb	ON DAY	1
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES April 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-H2S[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.30% Calm Avg: 0.15 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	9.4	0.0	0.0	0.0	9.4
NE	13.9	0.0	0.0	0.0	13.9
E	6.7	0.0	0.0	0.0	6.7
SE	6.2	0.0	0.0	0.0	6.2
S	11.3	0.0	0.0	0.0	11.3
SW	23.0	0.0	0.0	0.0	23.0
W	7.8	0.0	0.0	0.0	7.8
NW	9.4	0.2	0.0	0.0	9.5
Summary	87.6	0.2	0.0	0.0	87.7

% Icon Classes (ppb)

88



0.0-0.7

0



0.7-1.3

0



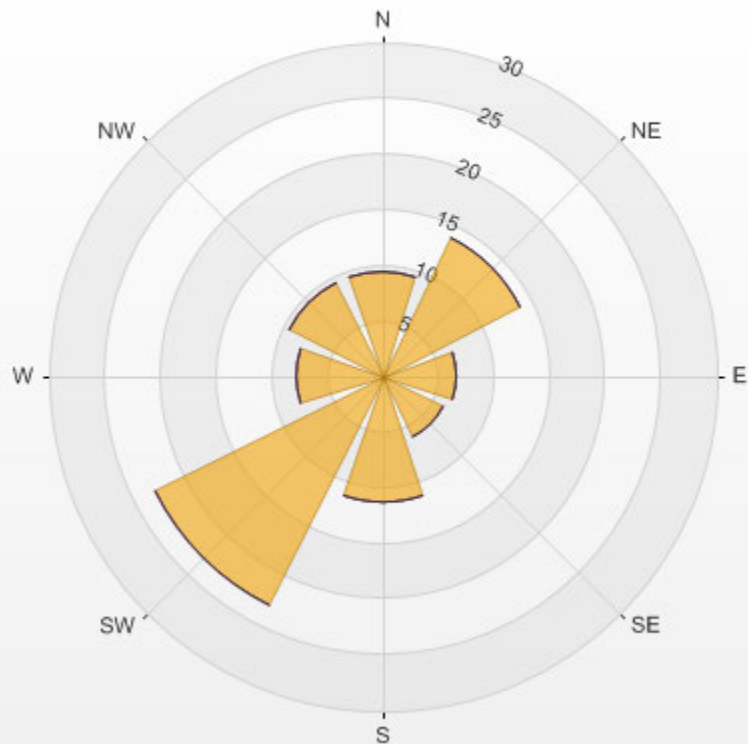
1.3-2.0

0



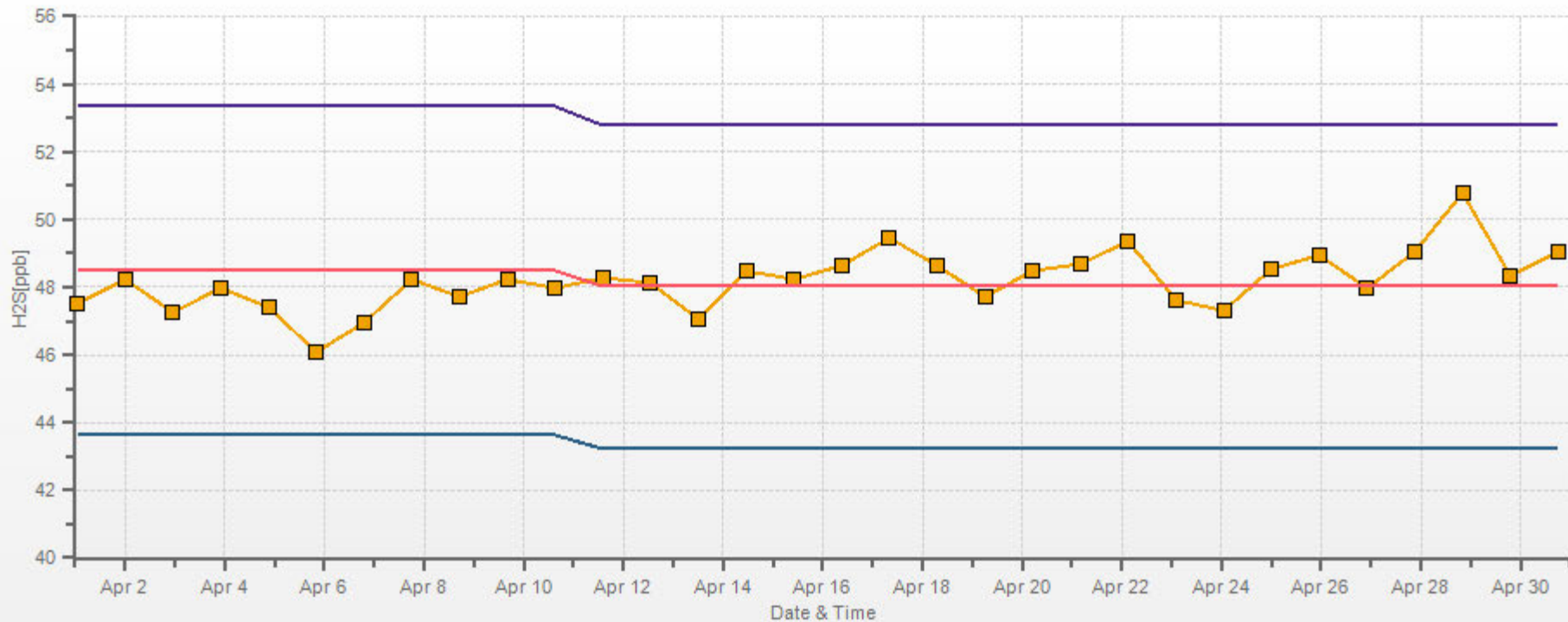
>2.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.30% Calm Poll Avg: 0.15[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



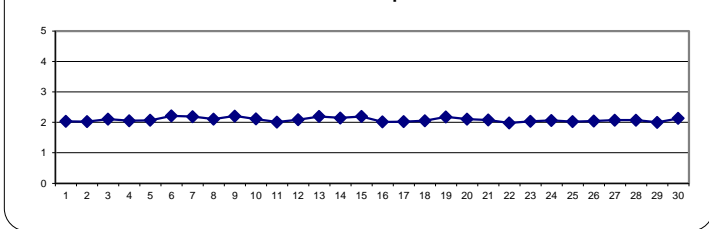
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.07	S	2.08	2.09	2.09	2.17	2.15	2.08	2.06	2.04	2.07	1.99	1.97	1.96	1.97	1.98	1.98	1.99	1.99	2.01	2.04	2.03	2.05	2.06	1.96	2.17	2.04	24	
2	S	2.12	2.07	2.05	2.04	2.04	2.04	2.15	2.03	2.00	1.99	1.99	1.99	1.98	1.98	1.98	1.98	1.99	2.01	2.03	2.04	2.04	2.06	S	1.98	2.15	2.03	24	
3	2.06	2.12	2.15	2.15	2.27	2.24	2.34	2.25	2.16	2.08	2.05	2.04	2.02	2.01	2.03	2.04	2.06	2.05	2.07	2.05	2.07	2.09	S	2.08	2.01	2.34	2.11	24	
4	2.13	2.12	2.12	2.14	2.16	2.10	2.20	2.07	2.05	2.04	2.02	2.01	2.00	1.99	1.99	2.01	2.00	2.01	2.02	2.03	2.03	S	2.04	2.05	1.99	2.20	2.06	24	
5	2.04	2.04	2.06	2.06	2.07	2.09	2.07	2.09	2.09	2.08	2.07	2.08	2.06	2.07	2.05	2.05	2.04	2.03	2.05	2.07	S	2.09	2.12	2.12	2.03	2.12	2.07	24	
6	2.14	2.24	2.32	2.33	2.38	2.52	2.47	2.31	2.30	2.14	2.12	2.11	2.10	2.12	2.12	2.08	2.06	2.05	2.05	S	2.16	2.21	2.27	2.34	2.05	2.52	2.21	24	
7	2.33	2.32	2.40	2.37	2.37	2.35	2.43	2.55	2.36	2.13	2.10	2.05	2.07	2.07	2.05	2.02	2.01	2.02	S	2.04	2.08	2.07	2.07	2.10	2.01	2.55	2.19	24	
8	2.12	2.13	2.11	2.11	2.11	2.12	2.15	2.14	2.04	2.05	2.04	2.04	2.04	2.04	2.05	2.05	2.08	S	2.11	2.11	2.15	2.18	2.22	2.24	2.04	2.24	2.11	24	
9	2.26	2.27	2.28	2.30	2.34	2.33	2.31	2.31	2.26	2.25	2.24	2.15	2.16	2.16	2.11	2.11	S	2.07	2.06	2.08	2.10	2.21	2.21	2.25	2.06	2.34	2.21	24	
10	2.28	2.29	2.31	2.35	2.36	2.28	2.18	2.15	2.08	2.05	2.08	2.03	2.01	1.97	1.97	C	C	C	C	1.98	1.98	1.98	1.97	1.98	1.97	2.36	2.11	24	
11	1.98	1.98	1.97	1.99	1.99	2.01	2.00	2.00	1.99	2.00	2.00	2.00	2.00	2.01	S	2.00	2.01	2.00	2.01	2.04	2.06	2.07	2.07	2.06	1.97	2.07	2.01	24	
12	2.11	2.11	2.08	2.16	2.09	2.10	2.12	2.08	2.07	2.04	2.04	2.03	2.03	S	2.02	2.03	2.05	2.04	2.03	2.04	2.12	2.18	2.20	2.27	2.02	2.27	2.09	24	
13	2.29	2.29	2.37	2.50	2.41	2.46	2.37	2.21	2.18	2.18	2.14	2.10	S	2.08	2.09	2.10	2.08	2.10	2.10	2.11	2.11	2.11	2.10	2.08	2.08	2.50	2.20	24	
14	2.06	2.05	2.04	2.04	2.03	2.03	2.04	2.05	2.06	2.07	2.10	S	2.17	2.19	2.21	2.20	2.19	2.24	2.17	2.15	2.16	2.19	2.43	2.50	2.03	2.50	2.15	24	
15	2.51	2.47	2.51	2.53	2.49	2.41	2.35	2.31	2.28	2.18	S	2.08	2.06	2.07	2.06	2.03	1.98	1.98	2.03	2.03	2.04	2.03	2.04	1.98	2.53	2.20	2.24	24	
16	2.05	2.03	2.02	2.05	2.05	2.05	2.03	2.03	2.03	S	2.01	2.00	2.00	2.00	1.99	1.99	1.98	1.98	1.97	2.00	2.04	2.05	2.02	2.00	1.97	2.05	2.02	24	
17	2.05	2.06	2.01	2.02	1.97	2.04	2.01	2.02	S	1.96	1.96	1.96	1.96	1.98	2.01	2.07	2.12	2.11	2.07	2.06	2.05	2.03	2.01	2.02	1.96	2.12	2.02	24	
18	2.02	2.05	2.06	2.08	2.08	2.10	2.10	S	2.12	2.03	2.02	2.03	2.04	2.04	2.03	2.04	2.05	2.05	2.04	2.04	2.05	2.06	2.01	2.12	2.02	2.12	2.06	24	
19	2.12	2.12	2.24	2.33	2.35	2.40	S	2.37	2.25	2.20	2.16	2.15	2.10	2.06	2.09	2.09	2.08	2.06	2.12	2.14	2.15	2.17	2.21	2.19	2.06	2.40	2.18	24	
20	2.18	2.16	2.19	2.23	2.23	S	2.34	2.32	2.27	2.22	2.14	2.03	1.97	2.00	1.97	1.96	1.95	1.97	1.99	2.02	2.07	2.07	2.05	2.12	1.95	2.34	2.11	24	
21	2.23	2.29	2.28	2.28	S	2.24	2.17	2.12	2.05	2.04	2.08	2.16	2.14	2.11	2.06	1.99	1.98	1.98	1.98	1.91	1.93	1.94	1.95	2.00	1.97	1.91	2.29	2.08	24
22	1.94	1.95	1.96	S	1.93	1.93	1.93	1.94	1.94	1.95	1.95	1.95	1.96	1.96	1.96	2.02	2.02	2.04	2.05	2.09	2.08	2.03	2.03	2.03	1.93	2.09	1.98	24	
23	2.01	2.02	S	2.05	2.06	2.09	2.10	2.08	2.04	2.02	2.06	2.03	2.01	1.98	1.98	2.00	2.01	2.01	1.99	2.03	2.07	2.08	2.09	2.11	1.98	2.11	2.04	24	
24	2.21	S	2.12	2.15	2.17	2.18	2.19	2.15	2.22	2.26	2.14	2.08	1.99	1.96	1.96	1.95	1.94	1.94	1.98	1.98	1.95	1.97	2.02	1.94	2.26	2.06	24		
25	S	2.05	2.03	2.05	2.05	2.03	2.05	2.03	2.04	2.01	2.00	1.99	1.99	2.00	2.01	2.03	2.04	2.02	2.01	2.02	2.05	2.07	2.08	S	1.99	2.08	2.03	24	
26	2.07	2.11	2.13	2.13	2.13	2.13	2.13	2.04	1.98	1.98	1.99	1.99	2.02	2.02	2.04	2.02	2.00	2.01	1.99	2.01	2.03	2.03	S	2.13	1.98	2.13	2.05	24	
27	2.07	2.10	2.11	2.11	2.11	2.11	2.14	2.15	2.07	S1	2.06	2.09	2.07	2.05	2.02	2.04	2.05	2.04	2.05	2.04	2.03	2.02	2.01	S	2.09	2.10	2.01	23	
28	2.10	2.09	2.09	2.12	2.15	2.18	2.17	2.16	2.11	2.10	2.07	2.08	2.09	2.08	2.05	2.03	2.00	2.00	2.00	1.98	S	2.02	2.05	1.98	1.98	2.18	2.07	24	
29	1.97	1.97	1.96	1.97	2.01	2.02	2.01	2.00	2.01	2.00	2.01	2.01	2.01	2.00	2.00	1.99	1.98	1.95	1.96	S	1.99	2.07	2.09	2.14	1.95	2.14	2.01	24	
30	2.16	2.30	2.39	2.36	2.43	2.31	2.31	2.09	2.05	2.10	2.10	2.06	2.05	2.02	2.03	2.03	2.02	2.00	S	1.98	2.04	2.06	2.07	2.06	1.98	2.43	2.13	24	
HOURLY MAX	2.51	2.47	2.51	2.53	2.49	2.52	2.47	2.55	2.36	2.26	2.24	2.16	2.17	2.19	2.21	2.20	2.19	2.24	2.17	2.15	2.16	2.21	2.43	2.50					
HOURLY AVG	2.13	2.14	2.15	2.18	2.17	2.17	2.17	2.15	2.11	2.08	2.06	2.05	2.04	2.03	2.03	2.03	2.03	2.03	2.03	2.04	2.06	2.08	2.10	2.11					

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

24 HR AVERAGES April 2018



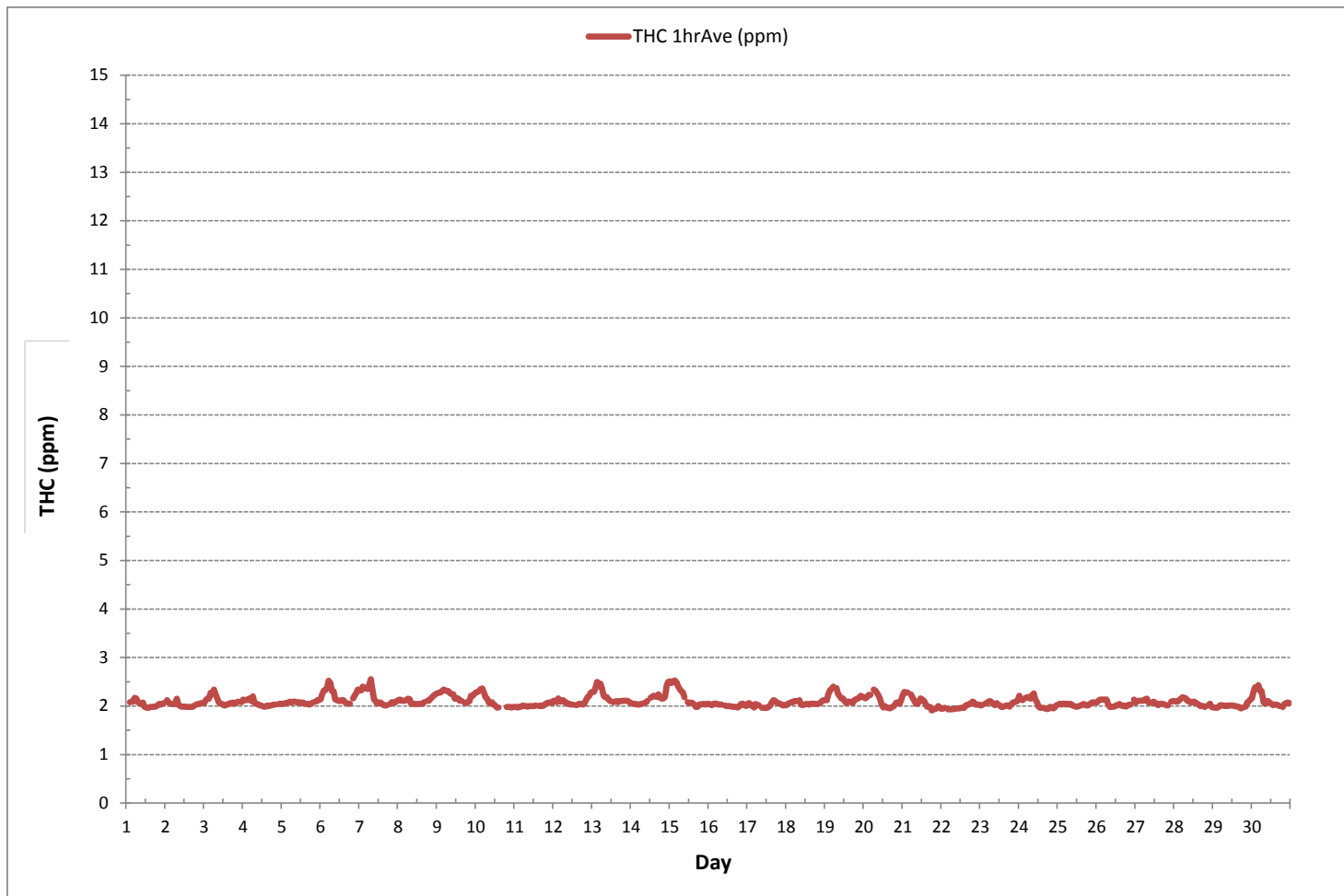
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	684			
MINIMUM 1-HR AVERAGE:	1.91 ppm	@ HOUR	18	ON DAY 21
MAXIMUM 1-HR AVERAGE:	2.55 ppm	@ HOUR	7	ON DAY 7
MAXIMUM 24-HR AVERAGE:	2.21 ppm			ON DAY 6
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	0.11	MONTHLY AVERAGE:	2.09 ppm	



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

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC[ppm]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.30% Calm Avg: 2.23 [ppm]

Direction	0.0-0.9	0.9-1.7	1.7-2.6	>2.6	Total
N	0.0	0.0	9.7	0.0	9.7
NE	0.0	0.0	13.9	0.0	13.9
E	0.0	0.0	6.6	0.0	6.6
SE	0.0	0.0	6.2	0.0	6.2
S	0.0	0.0	11.1	0.0	11.1
SW	0.0	0.0	23.0	0.0	23.0
W	0.0	0.0	7.8	0.0	7.8
NW	0.0	0.0	9.5	0.0	9.5
Summary	0.0	0.0	87.7	0.0	87.7

% Icon Classes (ppm)

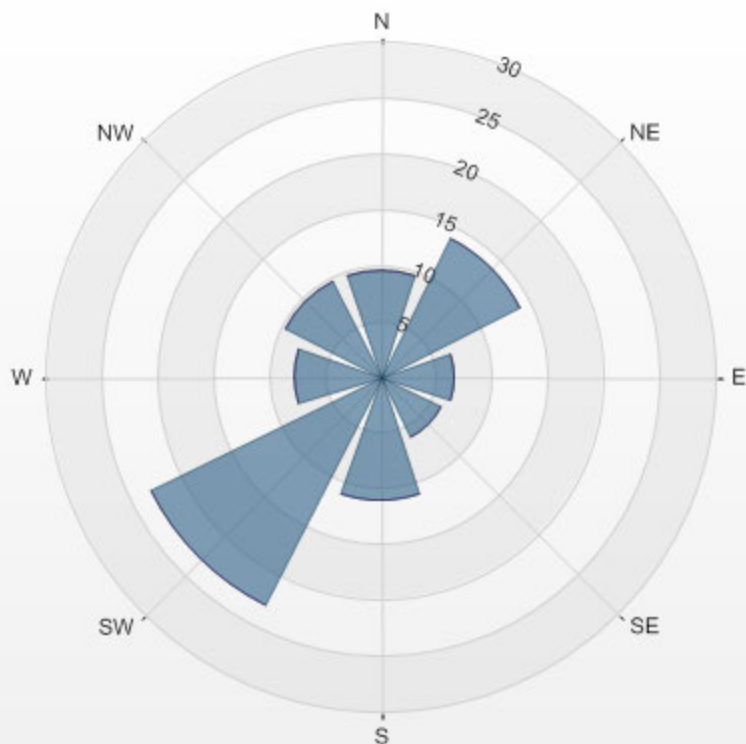
0 0.0-0.9

0 0.9-1.7

88 1.7-2.6

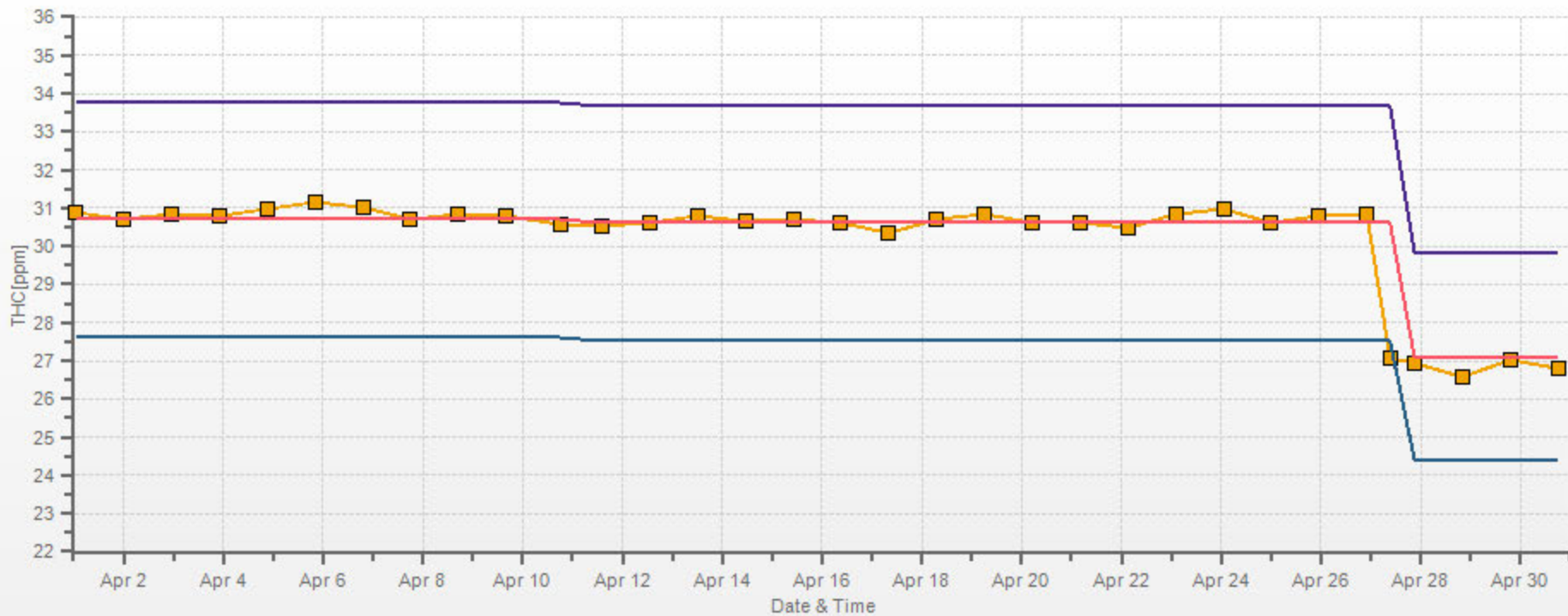
0 >2.6

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.30% Calm Poll Avg: 2.23[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



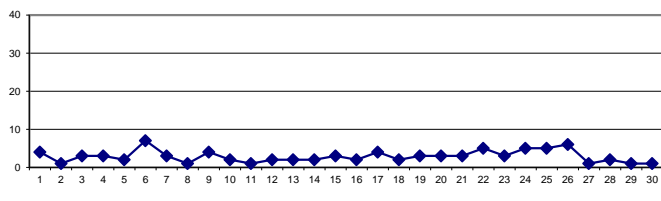
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	S	2	4	9	17	16	4	6	5	8	2	1	3	1	1	1	1	0	0	0	0	1	1	0	17	4	24	
2	S	1	1	1	1	1	4	8	1	1	1	0	2	1	1	1	0	0	1	1	1	1	1	S	0	8	1	24	
3	2	1	1	1	1	4	10	6	12	15	2	2	2	2	1	2	2	1	1	1	4	4	S	2	1	15	3	24	
4	1	1	1	2	2	2	1	1	1	3	5	5	3	4	3	6	6	6	1	1	1	S	1	2	1	6	3	24	
5	2	3	6	4	1	2	3	3	3	2	2	2	1	1	1	1	1	0	1	S	2	3	3	0	6	2	24		
6	4	7	5	8	9	8	12	10	15	19	10	11	8	5	4	3	1	1	0	S	4	3	4	5	0	19	7	24	
7	3	3	3	3	4	8	10	10	6	3	2	1	1	1	1	2	3	3	S	1	2	2	2	2	1	10	3	24	
8	3	2	1	1	1	1	1	1	0	1	1	1	0	0	0	0	1	S	2	1	2	2	2	3	0	3	1	24	
9	3	3	4	4	4	4	7	8	8	7	7	4	4	4	3	3	S	2	1	1	1	3	5	5	1	8	4	24	
10	5	5	4	6	7	5	3	2	1	1	1	C	C	C	C	C	C	C	0	0	0	0	0	0	0	7	2	24	
11	0	0	0	0	0	0	1	0	0	1	1	0	0	S	1	2	2	2	2	2	1	1	0	1	0	2	1	24	
12	2	0	0	0	0	0	0	2	1	4	8	6	4	S	2	1	1	2	2	1	5	3	3	3	0	8	2	24	
13	3	2	2	2	2	2	3	4	4	4	2	2	S	2	2	2	2	2	1	2	1	1	2	2	1	4	2	24	
14	1	1	1	2	1	1	1	1	1	2	1	S	2	3	2	3	2	2	2	2	2	4	4	5	1	5	2	24	
15	5	4	4	5	4	3	3	2	5	8	S	3	3	5	7	6	1	1	1	1	1	1	1	1	1	1	8	3	24
16	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	2	11	13	7	2	1	13	2	24	
17	9	12	4	9	1	8	5	8	S	5	6	3	1	2	3	3	3	4	3	2	2	3	2	2	1	12	4	24	
18	2	2	3	3	2	3	4	S	5	2	2	2	1	1	1	1	1	1	1	2	1	2	2	3	1	5	2	24	
19	2	2	3	4	4	4	S	6	5	4	3	2	2	2	2	2	2	2	2	2	2	3	6	5	2	6	3	24	
20	5	4	3	2	3	S	2	6	5	11	10	4	1	1	1	0	0	1	2	3	1	3	1	0	11	3	24		
21	1	1	1	1	S	1	1	2	1	4	3	1	1	2	1	3	1	1	1	1	1	8	14	7	1	14	3	24	
22	1	0	0	S	0	0	1	1	0	1	1	0	1	2	1	11	9	15	15	25	16	4	1	5	0	25	5	24	
23	2	6	S	11	8	3	S1	S1	8	1	2	2	2	2	1	0	0	0	1	2	1	2	1	0	11	3	22		
24	3	S	2	3	3	4	5	5	7	7	5	4	2	1	1	1	0	0	1	1	22	17	8	14	0	22	5	24	
25	S	11	12	24	9	2	5	3	4	1	3	4	4	3	3	3	3	1	1	1	2	2	2	S	1	24	5	24	
26	4	3	3	3	4	7	15	20	2	2	C1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	2	20	6	10	
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	1	1	1	1	1	S	2	2	1	2	1	9		
28	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	S	1	8	10	1	10	2	24
29	2	1	1	1	1	2	S1	S1	S1	2	2	1	1	1	1	1	1	1	1	1	S	1	2	1	1	1	2	1	21
30	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	S	1	1	2	2	2	1	2	1	24
HOURLY MAX	9	12	12	24	9	17	16	20	15	19	10	11	8	5	7	11	9	15	15	25	22	17	14	14					
HOURLY AVG	3	3	3	4	3	3	5	5	4	4	3	3	2	2	2	2	2	2	2	2	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

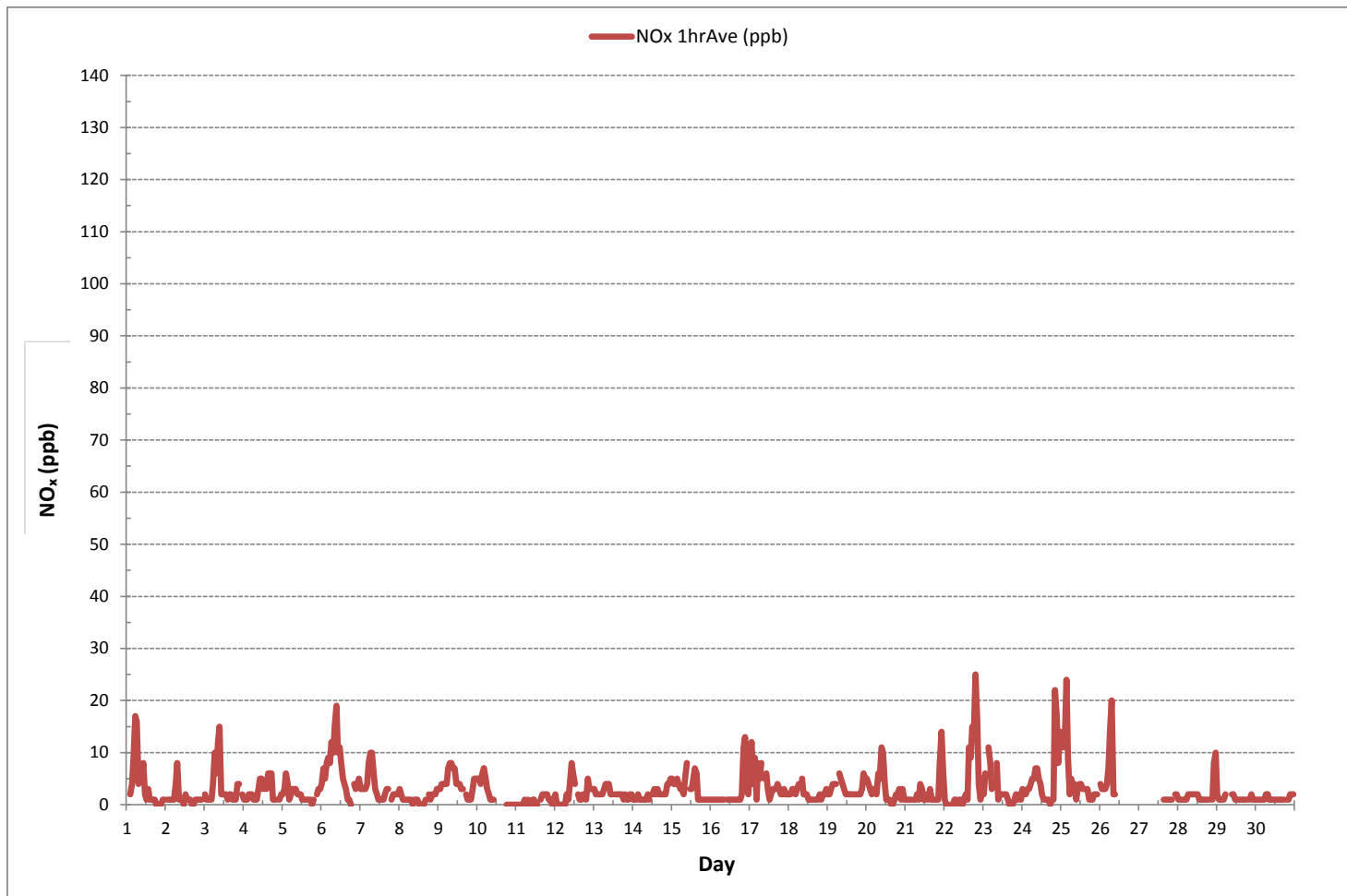
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	599			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	25 ppb	@ HOUR	19	ON DAY 22
MAXIMUM 24-HR AVERAGE:	7 ppb			ON DAY 6
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	686 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	95.3 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	3 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NOX[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.98% Calm Avg: 3.50 [ppb]

Direction	0.0-8.7	8.7-17.3	17.3-26.0	>26.0	Total
N	7.9	0.0	0.0	0.0	7.9
NE	13.9	0.3	0.0	0.0	14.2
E	6.0	0.6	0.0	0.0	6.7
SE	6.0	0.2	0.0	0.0	6.2
S	10.4	0.0	0.0	0.0	10.4
SW	23.8	0.0	0.0	0.0	23.8
W	7.6	0.3	0.0	0.0	7.9
NW	7.0	2.3	0.8	0.0	10.1
Summary	82.5	3.7	0.8	0.0	87.0

% Icon Classes (ppb)

83



0.0-8.7

4



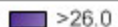
8.7-17.3

1



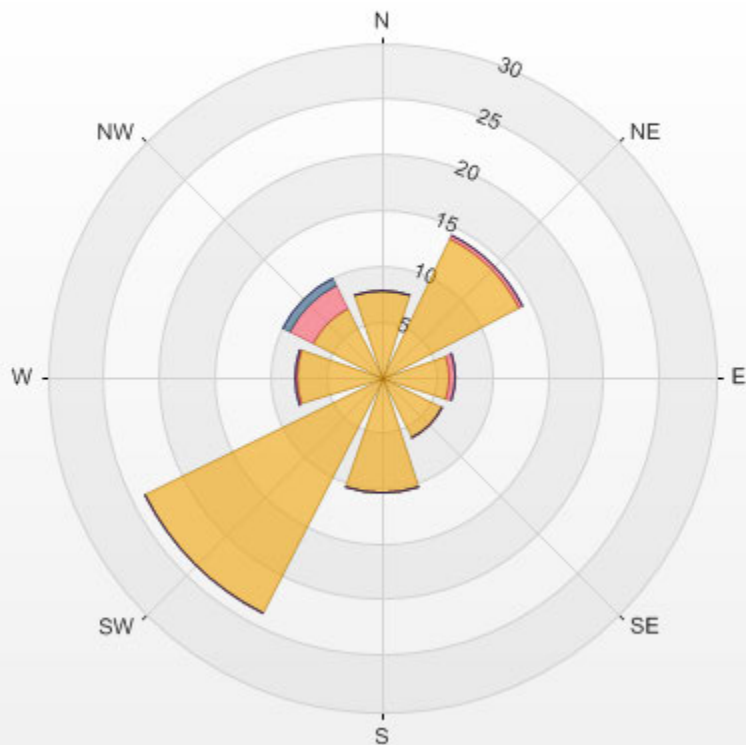
17.3-26.0

0

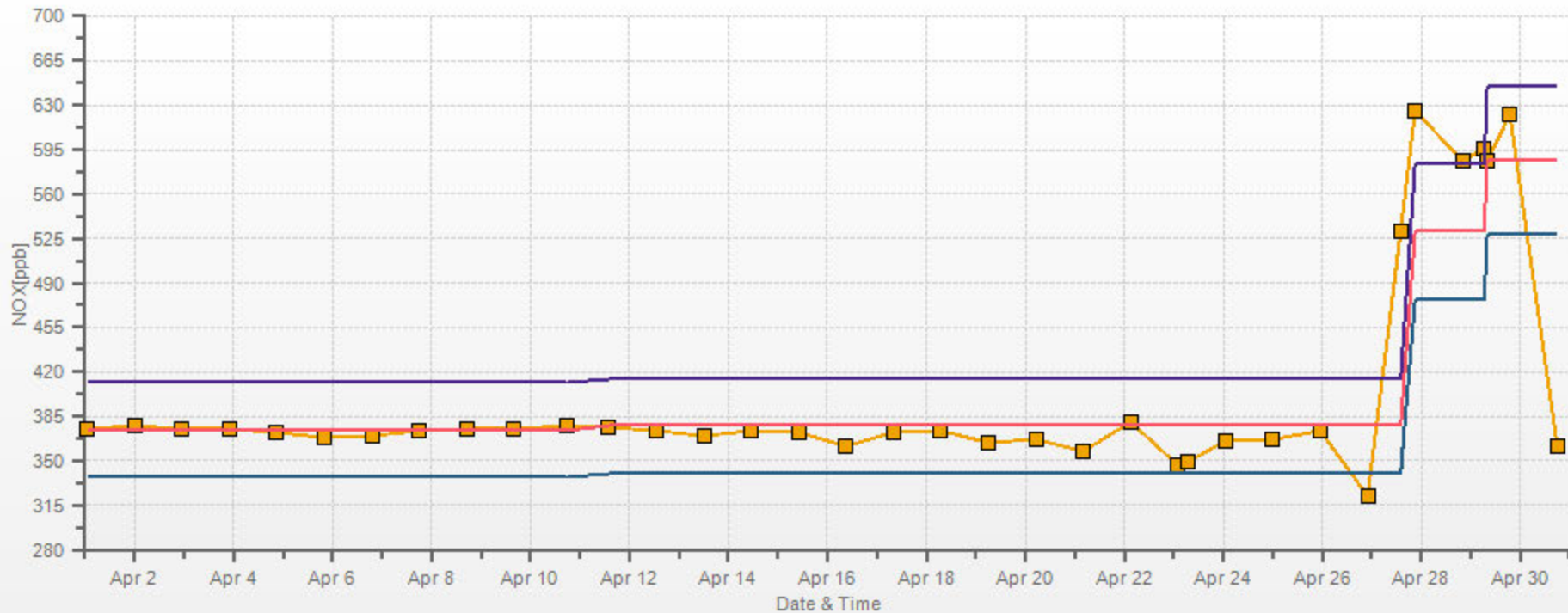


>26.0

LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.98% Calm Poll Avg: 3.50[ppb]



■ Span Meas
 — Span Ref
 — Span Low
 — Span High



NITRIC OXIDES



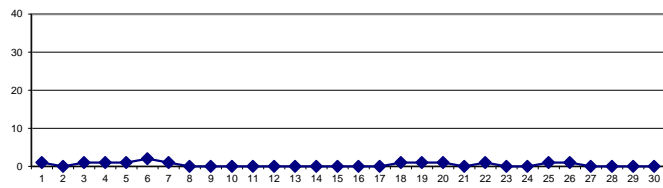
NITRIC OXIDE Hourly Averages (NO ppb)

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

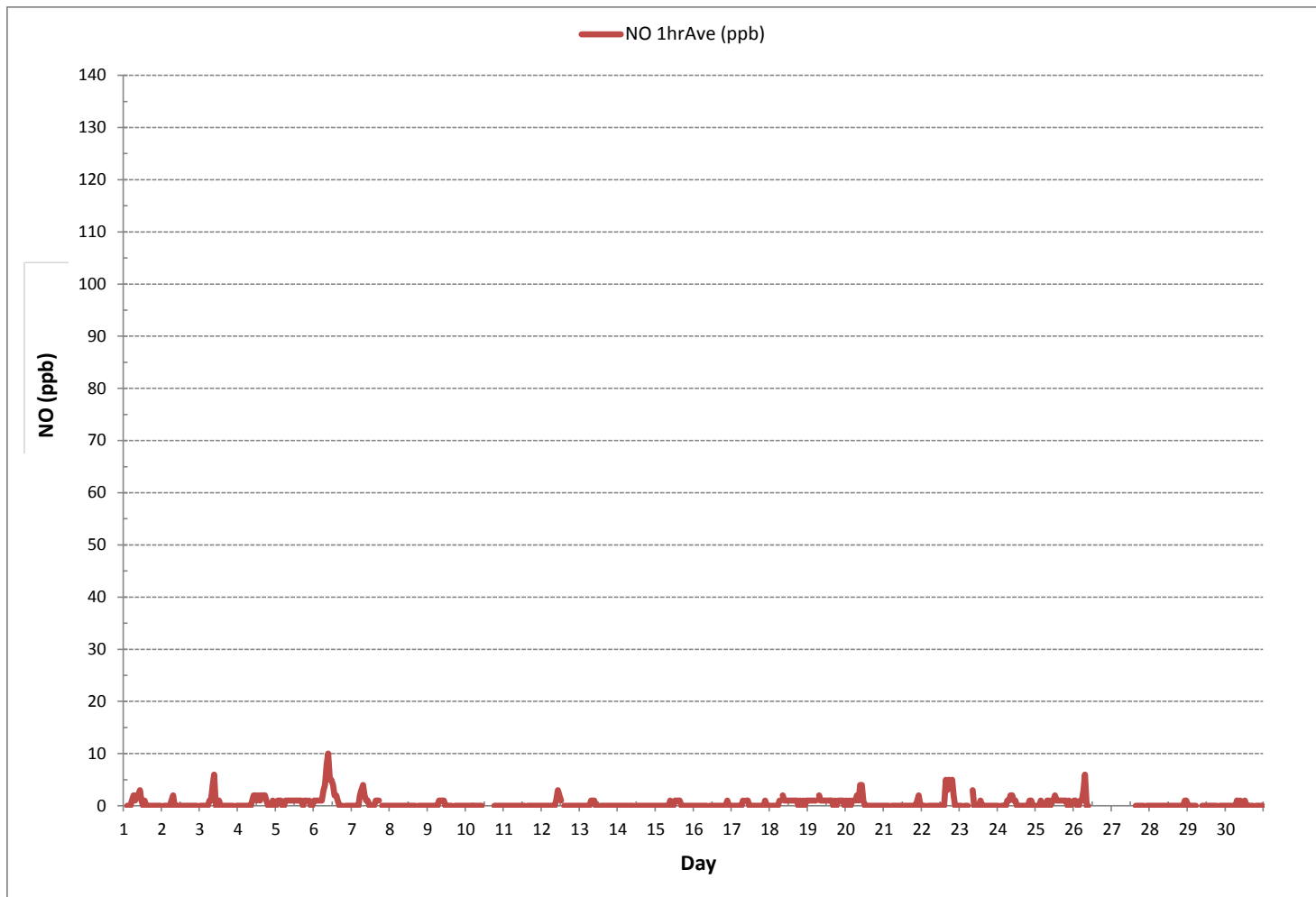
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	176			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	10 ppb	@ HOUR	9	ON DAY 6
MAXIMUM 24-HR AVERAGE:	2 ppb			ON DAY 6
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	686 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	95.3 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

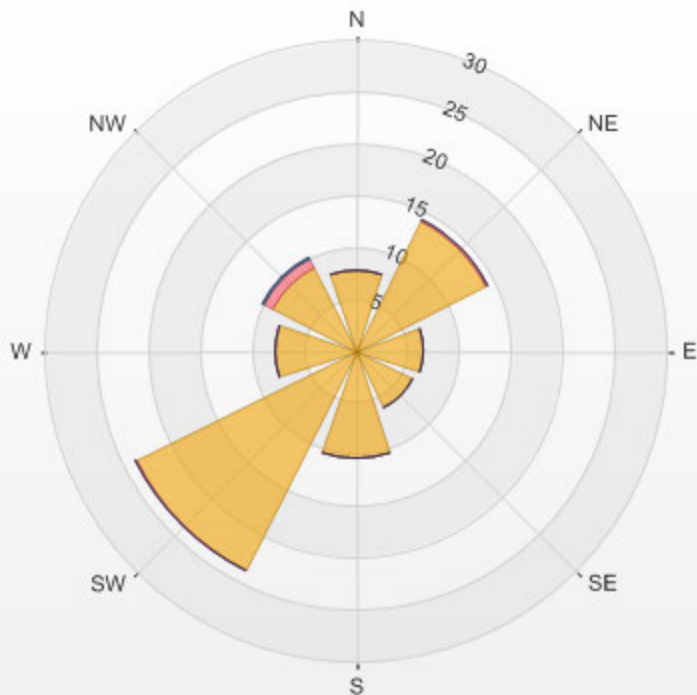
Calm: 12.98%

Calm Avg: 0.63 [ppb]

Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	7.9	0.0	0.0	0.0	7.9
NE	14.1	0.2	0.0	0.0	14.2
E	6.7	0.0	0.0	0.0	6.7
SE	6.2	0.0	0.0	0.0	6.2
S	10.4	0.0	0.0	0.0	10.4
SW	23.7	0.2	0.0	0.0	23.8
W	7.9	0.0	0.0	0.0	7.9
NW	9.0	0.9	0.2	0.0	10.0
Summary	85.6	1.2	0.2	0.0	87.0

% Icon	Classes (ppb)	86	0.0-3.7	1	3.7-7.3	0	7.3-11.0	0	>11.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.98% Calm Poll Avg: 0.63 [ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ 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 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	0	S	2	4	9	16	14	4	4	3	5	1	1	2	1	1	1	0	0	0	0	1	1	0	16	3	24	
2	S	1	1	1	1	1	3	6	1	1	1	0	1	1	1	0	0	1	1	1	1	1	S	0	6	1	24	
3	2	1	1	1	1	4	9	4	7	9	1	2	2	1	1	2	1	1	1	1	4	4	S	2	1	9	3	
4	1	1	1	2	2	2	1	1	1	2	3	3	2	2	2	3	4	4	0	0	0	S	1	2	0	4	2	
5	1	2	5	3	0	2	2	2	2	1	1	1	0	0	0	0	0	0	0	S	1	3	3	0	5	1	24	
6	4	6	5	7	8	7	9	6	8	9	5	5	4	2	2	2	1	1	0	S	4	3	4	4	0	9	5	
7	3	3	3	3	3	6	8	6	3	2	1	1	1	1	1	1	2	3	S	1	2	2	2	2	1	8	3	
8	2	2	1	1	1	0	0	1	0	1	1	1	0	0	0	0	0	1	S	2	1	2	2	3	0	3	1	
9	3	3	4	4	4	4	6	7	7	6	5	3	4	4	3	3	S	2	1	1	1	3	5	5	1	7	4	
10	5	5	4	6	7	5	3	2	1	1	1	C	C	C	C	C	C	C	0	0	0	0	0	0	0	7	2	
11	0	0	0	0	0	1	0	1	0	0	1	1	0	0	S	1	2	2	2	2	2	1	1	0	2	1	24	
12	2	0	0	0	0	0	0	2	1	3	5	4	3	S	1	1	1	2	2	1	5	3	2	3	0	5	2	
13	3	2	2	2	2	2	3	3	3	3	2	1	S	1	1	2	2	2	1	2	1	1	2	2	1	3	2	
14	1	1	1	1	1	1	1	1	1	2	1	S	2	2	2	2	3	2	2	2	2	4	4	4	1	4	2	
15	5	4	4	5	4	3	3	2	4	6	S	2	3	4	6	5	1	1	1	1	1	1	0	1	0	6	3	
16	1	1	0	0	1	0	1	0	0	S	0	0	0	0	1	0	1	1	0	2	11	13	7	2	0	13	2	
17	9	12	4	9	1	8	5	7	S	5	5	2	1	1	3	3	3	4	3	2	2	2	2	2	1	12	4	
18	1	2	3	3	2	3	3	S	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	2	
19	2	2	2	3	3	3	S	4	3	3	2	2	1	1	1	1	1	1	1	1	1	3	5	5	1	5	2	
20	5	3	2	2	2	S	2	4	4	7	7	3	1	1	1	0	0	0	1	2	3	1	3	1	0	7	2	
21	1	1	1	1	S	1	1	2	1	3	3	1	1	2	1	3	1	1	1	1	1	7	12	7	1	12	2	
22	1	0	0	S	0	0	1	1	0	1	0	0	1	2	1	7	6	10	11	20	14	4	1	5	0	20	4	
23	2	6	S	11	8	3	S1	S1	5	1	2	1	2	1	2	1	0	0	0	1	2	1	2	1	0	11	2	
24	3	S	2	3	3	4	5	4	5	5	4	3	2	1	1	1	0	1	1	1	21	16	8	14	0	21	5	
25	S	11	12	23	9	2	4	3	3	1	2	3	3	2	2	2	2	0	0	1	2	1	2	S	0	23	4	
26	4	3	3	3	4	6	12	13	2	1	C1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	1	13	5	
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	1	1	1	1	1	S	2	2	2	1	2	1	
28	1	1	1	1	1	1	2	1	1	2	2	2	2	1	1	1	1	1	1	1	S	1	7	9	1	9	2	
29	2	1	1	1	1	2	S1	S1	S1	2	2	1	1	1	1	1	1	1	1	S	1	2	1	1	1	2	1	
30	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	S	1	1	2	2	2	1	2	1	
HOURLY MAX	9	12	12	23	9	16	14	13	8	9	7	5	4	4	6	7	6	10	11	20	21	16	12	14				
HOURLY AVG	2	3	2	4	3	3	4	3	3	3	2	2	2	1	1	2	1	2	1	2	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

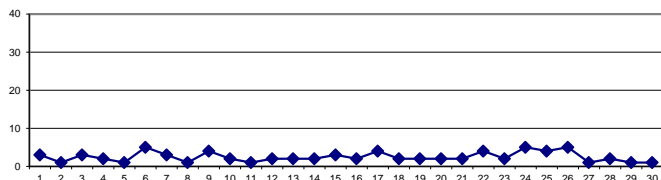
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

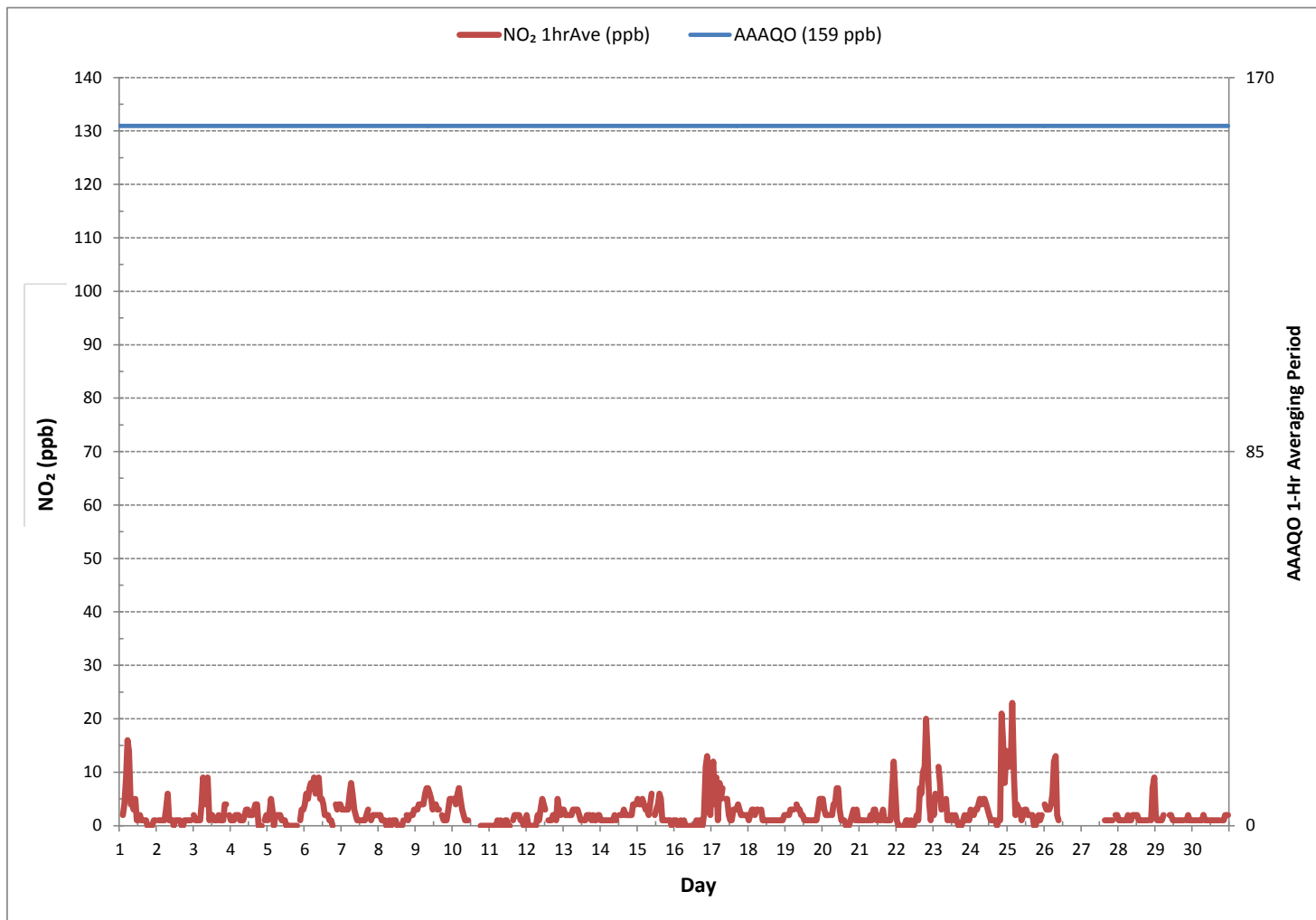
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	570			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY
MAXIMUM 1-HR AVERAGE:	23	ppb @ HOUR	3	ON DAY
MAXIMUM 24-HR AVERAGE:	5	ppb		ON DAY
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	686
MONTHLY CALIBRATION TIME:	7	hrs	AMD OPERATION UPTIME:	95.3
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	2
				ppb

24 HR AVERAGES April 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



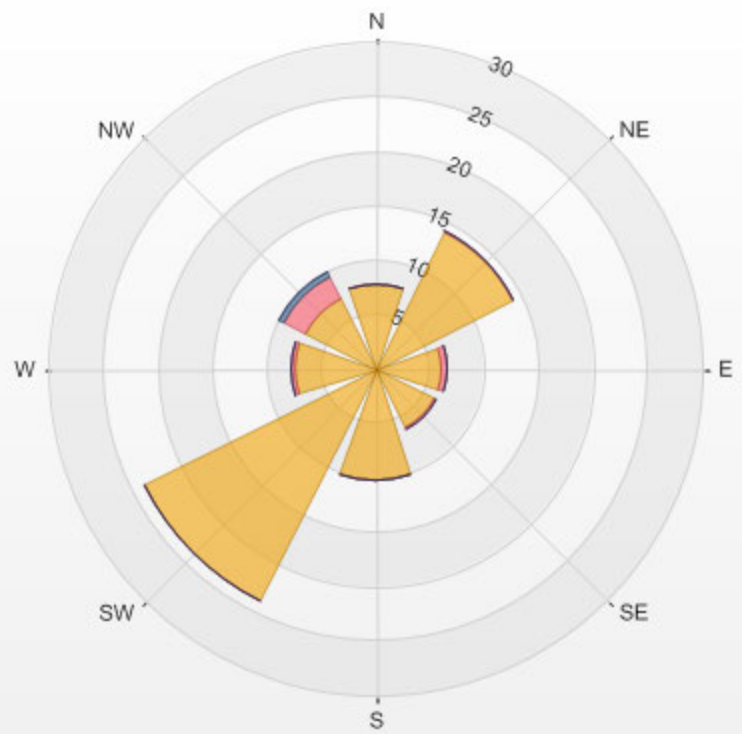
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO2[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.98% Calm Avg: 2.86 [ppb]

Direction	0.0-8.0	8.0-16.0	16.0-24.0	>24.0	Total
N	7.9	0.0	0.0	0.0	7.9
NE	14.1	0.2	0.0	0.0	14.2
E	6.0	0.6	0.0	0.0	6.7
SE	6.0	0.2	0.0	0.0	6.2
S	10.4	0.0	0.0	0.0	10.4
SW	23.8	0.0	0.0	0.0	23.8
W	7.4	0.3	0.2	0.0	7.9
NW	7.3	2.2	0.6	0.0	10.0
Summary	82.8	3.4	0.8	0.0	87.0

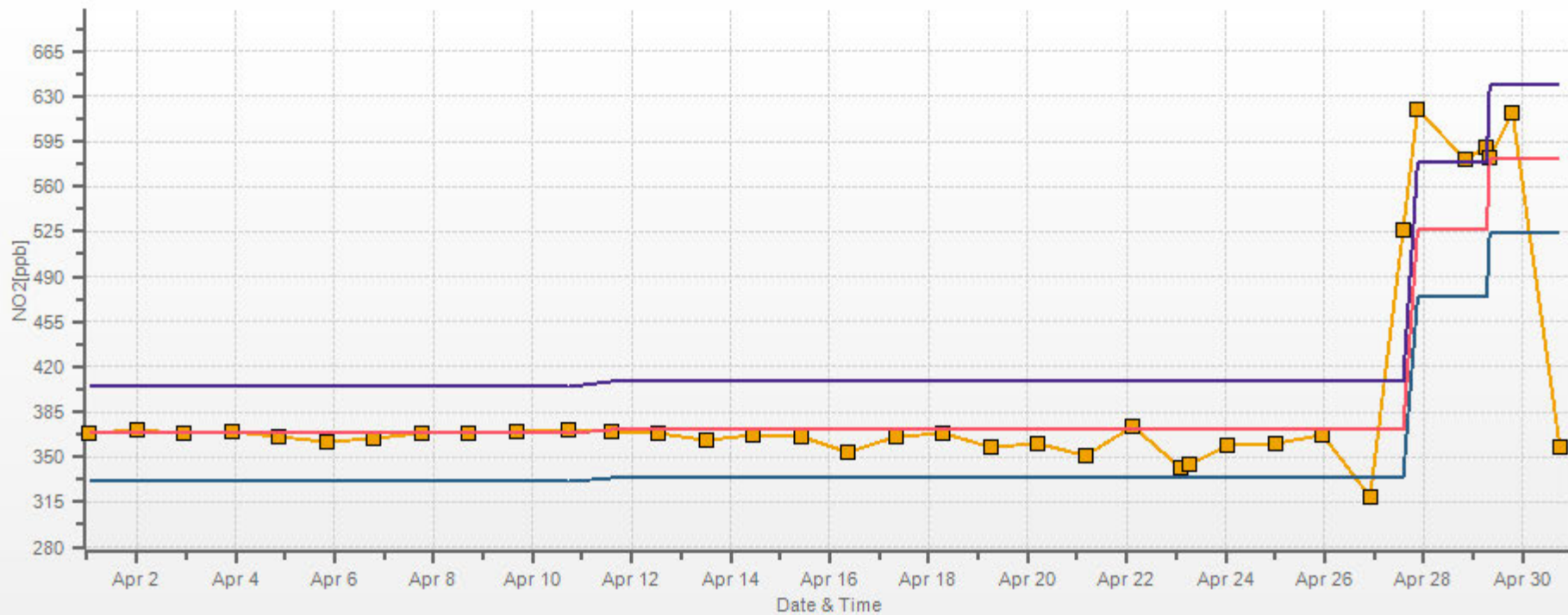
% Icon Classes (ppb) 83 0.0-8.0 3 8.0-16.0 1 16.0-24.0 0 >24.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.98% Calm Poll Avg: 2.86[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



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	5.0	4.0	6.2	4.1	3.1	2.5	2.5	3.0	3.0	4.3	5.4	6.3	6.9	4.9	5.0	8.7	10.2	9.6	8.1	4.7	4.3	3.5	0.3	0.8	0.3	0.3	10.2	3.3	24
2	1.0	0.7	1.2	1.8	2.4	1.3	0.1	3.1	5.6	4.8	4.9	5.6	4.5	4.4	3.6	3.8	4.8	6.8	6.9	7.9	10.9	11.1	7.2	3.6	0.1	11.1	4.1	24	
3	0.2	0.2	0.4	0.8	0.6	1.1	0.6	1.7	0.8	2.0	3.9	3.4	1.6	5.0	6.4	8.9	9.7	10.3	8.2	5.3	1.8	1.1	4.1	3.7	0.2	10.3	1.9	24	
4	3.1	1.6	1.7	0.7	4.0	2.5	4.3	5.8	4.0	5.6	6.0	7.6	7.1	7.5	7.5	8.7	8.1	8.0	6.7	3.4	5.7	4.5	6.8	2.8	0.7	8.7	4.5	24	
5	5.7	3.6	5.0	4.9	6.1	7.9	4.9	7.2	8.7	8.8	9.9	10.9	10.9	13.2	10.2	12.2	11.5	8.5	5.8	3.8	3.0	1.5	1.2	1.4	1.2	13.2	6.7	24	
6	1.2	1.2	0.7	1.2	1.3	2.0	0.4	0.6	1.6	2.6	0.7	1.7	4.3	6.1	5.7	7.9	8.7	6.6	5.2	1.9	2.6	3.3	1.5	1.2	0.4	8.7	2.6	24	
7	0.3	0.3	0.6	0.8	0.3	0.1	0.0	1.9	2.6	7.2	8.2	8.6	7.3	6.6	6.7	7.6	8.1	6.7	5.5	3.4	2.0	2.5	2.9	0.6	0.0	8.6	3.4	24	
8	1.8	1.1	2.6	3.6	2.5	2.0	3.1	3.1	4.4	6.0	5.5	3.6	3.8	4.0	3.9	4.0	5.7	6.8	7.2	6.2	5.1	4.1	4.7	3.9	1.1	7.2	2.6	24	
9	3.9	2.9	3.2	2.6	3.0	3.9	3.2	5.0	2.9	2.8	7.1	9.0	8.8	7.9	9.1	9.9	9.8	5.8	5.0	2.2	2.5	4.4	3.1	4.2	2.2	9.9	4.8	24	
10	3.6	4.8	4.4	2.6	0.6	1.1	2.5	8.5	8.7	8.5	8.8	8.8	9.1	5.8	7.4	7.8	7.6	8.7	6.8	5.4	5.2	5.2	5.8	4.6	0.6	9.1	4.3	24	
11	4.4	4.9	5.3	4.0	3.4	3.0	3.8	5.5	7.1	5.3	7.1	8.9	6.0	6.4	4.4	2.4	3.6	4.6	2.8	1.4	0.4	0.9	3.5	2.3	0.4	8.9	3.1	24	
12	2.6	2.5	2.6	3.0	1.9	2.2	3.9	3.1	1.2	3.6	4.4	4.6	4.3	3.8	2.8	1.5	2.1	2.6	4.1	3.3	2.4	4.6	4.6	3.4	1.2	4.6	1.5	24	
13	3.3	1.2	0.5	1.8	0.4	1.4	2.1	5.5	6.7	7.7	7.8	8.5	9.8	9.5	9.5	9.9	10.1	7.9	8.8	7.9	7.6	6.7	6.2	6.1	0.4	10.1	5.9	24	
14	6.4	7.3	6.5	7.1	6.9	6.9	7.0	7.4	6.9	6.2	6.9	7.7	5.7	5.9	8.1	5.4	8.7	8.9	7.6	5.4	4.8	5.9	7.8	5.1	4.8	8.9	5.7	24	
15	1.6	2.7	0.9	0.6	1.4	1.3	3.6	2.2	3.7	6.4	7.7	7.1	7.5	10.2	8.8	7.5	7.5	6.3	5.9	4.5	3.9	3.3	4.4	3.7	0.6	10.2	4.1	24	
16	3.4	4.0	4.5	4.6	4.6	5.4	7.5	6.8	8.8	9.1	9.5	11.2	11.3	11.7	10.5	12.2	8.9	8.1	9.1	9.1	9.0	7.1	7.7	8.8	3.4	12.2	7.3	24	
17	7.7	6.3	7.4	7.1	6.8	6.3	7.8	6.4	7.4	6.5	6.9	6.1	6.8	4.9	4.8	5.1	5.7	6.8	6.5	6.1	6.2	3.2	4.8	5.3	3.2	7.8	4.0	24	
18	5.4	6.8	4.1	5.6	3.7	3.4	3.7	4.1	6.3	6.7	5.3	5.4	6.3	6.2	6.6	9.7	9.4	9.5	8.7	5.7	5.0	4.5	4.8	5.8	3.4	9.7	5.6	24	
19	6.2	5.4	4.5	4.8	3.9	2.4	1.7	6.2	8.9	11.1	14.1	11.4	11.2	11.7	12.0	10.9	10.4	10.3	8.3	7.3	5.7	5.9	5.4	4.4	1.7	14.1	7.5	24	
20	3.3	3.8	2.5	0.8	1.2	0.7	0.4	2.3	2.8	1.4	2.2	2.1	4.4	3.4	5.1	6.2	4.9	5.1	3.9	4.1	3.8	3.2	2.8	1.1	0.4	6.2	2.2	24	
21	1.1	1.2	1.0	2.5	2.9	2.1	1.2	2.9	3.5	2.5	4.4	5.4	4.2	4.9	3.3	4.0	6.3	3.8	4.9	5.6	6.0	6.7	8.0	9.1	1.0	9.1	2.5	24	
22	8.4	9.6	10.1	10.4	9.7	11.5	11.9	11.4	11.3	10.9	11.8	12.4	11.3	10.4	11.9	12.3	12.7	9.8	9.3	7.0	4.7	3.1	3.1	4.2	3.1	12.7	9.4	24	
23	4.7	4.7	3.3	2.7	2.2	2.5	2.5	2.4	5.7	6.9	7.0	6.2	7.3	7.9	7.1	7.0	7.1	4.8	4.1	2.9	4.6	4.8	5.1	5.0	2.2	7.9	4.3	24	
24	6.3	7.9	7.7	5.9	5.8	8.4	8.8	5.9	5.7	5.6	8.3	6.8	8.0	8.3	8.5	8.2	6.9	5.5	4.0	4.0	5.7	4.9	3.6	4.8	3.6	8.8	5.3	24	
25	5.2	4.5	3.8	2.6	1.8	2.4	3.1	4.9	6.0	8.6	8.3	8.4	7.8	7.3	7.6	6.0	5.8	5.4	4.8	3.4	3.7	5.4	5.7	6.7	1.8	8.6	4.0	24	
26	5.0	3.3	3.0	2.9	2.9	5.1	7.9	7.5	6.0	10.2	7.0	10.0	9.0	9.5	9.3	8.9	8.5	6.3	8.8	4.7	3.8	4.9	4.0	3.8	2.9	10.2	4.3	24	
27	3.6	4.8	5.8	4.8	4.5	3.3	6.1	8.4	11.8	10.7	10.9	10.1	11.1	11.9	13.6	13.1	13.4	13.8	9.1	7.3	9.6	10.6	10.8	9.8	3.3	13.8	8.7	24	
28	8.0	8.1	7.6	2.0	2.7	2.3	5.0	5.6	8.0	8.6	7.3	8.6	11.1	11.5	12.0	10.8	9.1	8.8	4.1	2.7	1.4	0.5	3.6	9.0	0.5	12.0	5.4	24	
29	11.6	10.3	9.2	8.7	9.1	8.7	11.2	10.2	13.5	14.3	14.7	12.2	13.0	15.0	14.0	12.2	11.1	8.4	3.3	2.2	0.2	0.9	0.2	0.9	0.2	15.0	8.5	24	
30	0.4	0.5	0.4	0.1	0.3	0.5	0.3	6.5	9.5	9.1	9.0	8.2	10.1	11.7	13.8	12.1	12.0	11.1	9.0	4.7	4.8	6.0	8.0	5.6	0.1	13.8	6.0	24	
HOURLY MAX	11.6	10.3	10.1	10.4	9.7	11.5	11.9	11.4	13.5	14.3	14.7	12.4	13.0	15.0	14.0	13.1	13.4	13.8	9.3	9.1	10.9	11.1	10.8	9.8					
HOURLY AVG	0.8	0.8	0.6	0.1	0.2	0.3	0.5	0.6	0.3	0.1	0.3	1.0	1.2	1.2	1.8	1.5	1.6	1.7	1.4	1.1	1.0	1.3	1.2	1.1					

STATUS FLAG CODES

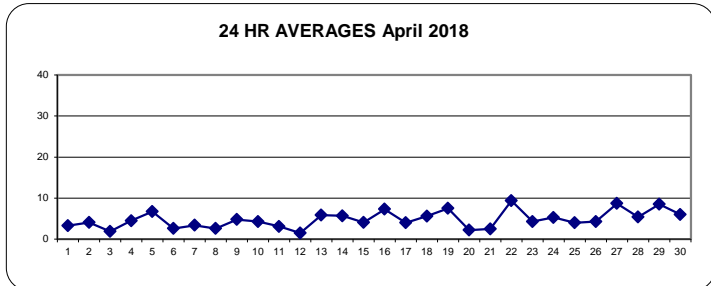
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	December 28, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

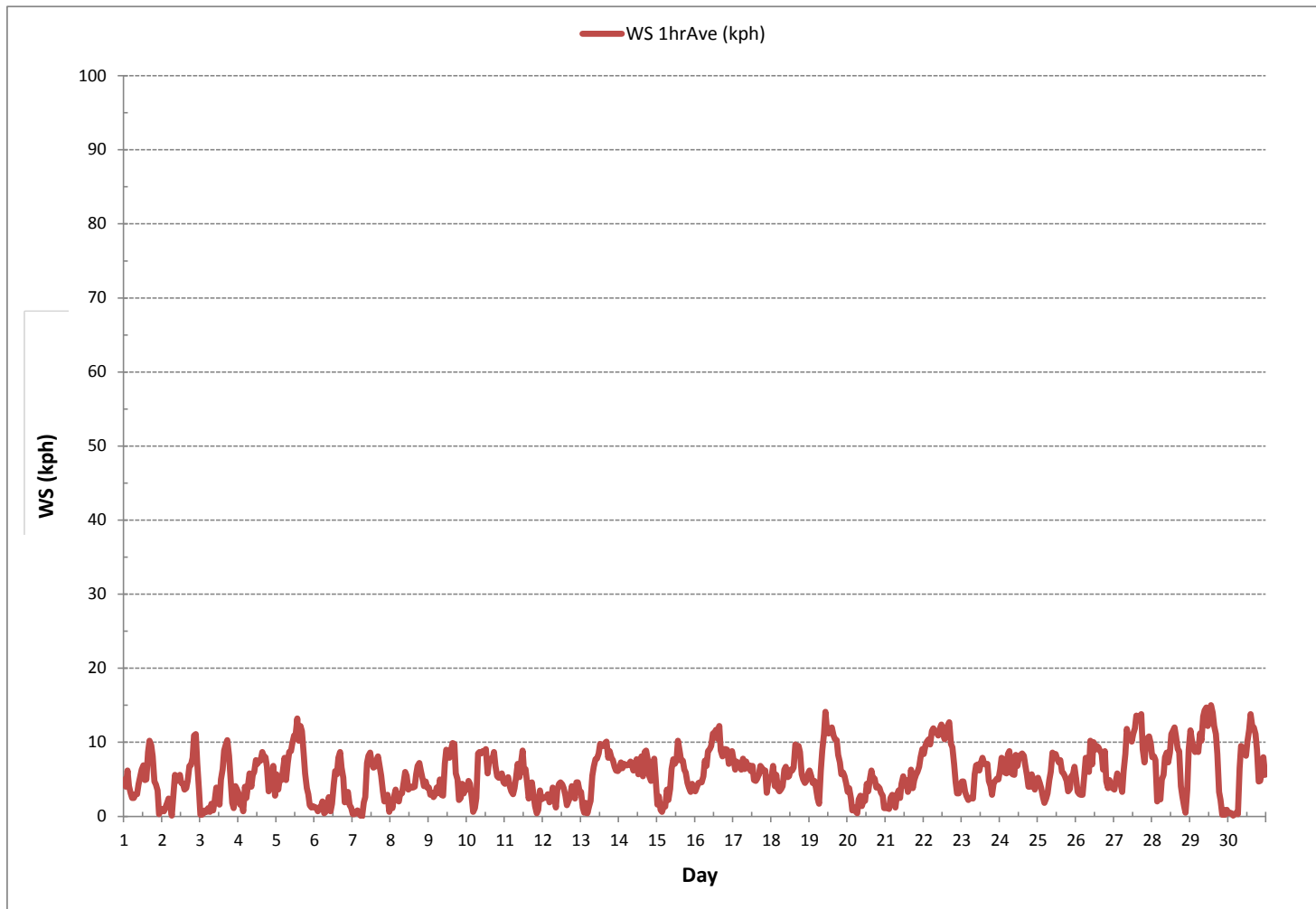
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	719
MINIMUM 1-HR AVERAGE	0.0 kph @ HOUR 6 ON DAY 7
MAXIMUM 1-HR AVERAGE:	15.0 kph @ HOUR 13 ON DAY 29
MAXIMUM 24-HR AVERAGE:	9.4 kph ON DAY 22
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	720 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	3.2
MONTHLY AVERAGE:	0.6 kph

24 HR AVERAGES April 2018



WIND SPEED Hourly Averages (WS kph)



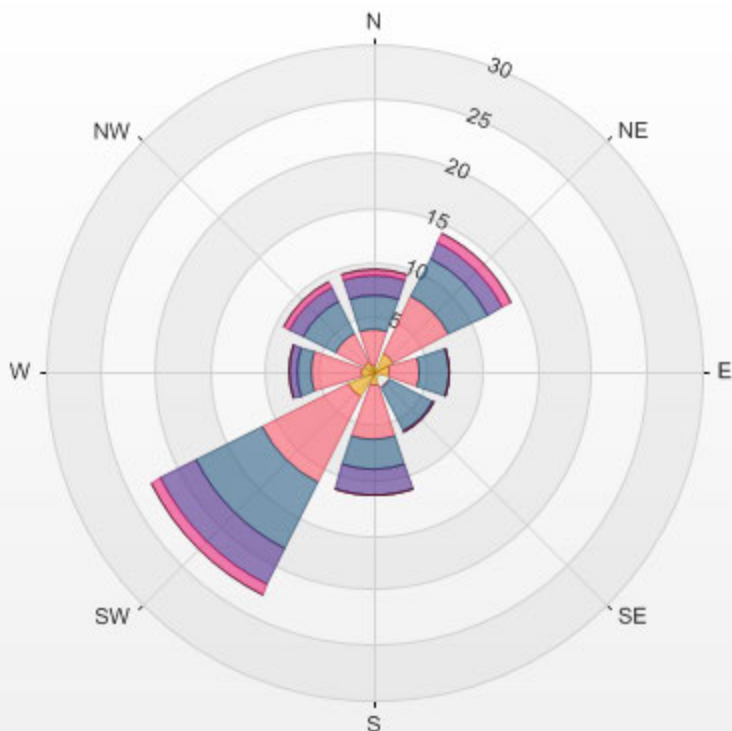
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 18/04
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 12.22%

Direction	1.8-3.0	3.0-6.0	6.0-9.1	9.1-12.1	12.1-15.1	>15.1	Total
N	0.6	3.3	3.2	1.8	0.6	0.0	9.5
NE	1.9	5.8	3.9	1.5	1.0	0.0	14.2
E	1.5	2.6	2.8	0.0	0.0	0.0	7.0
SE	0.1	1.5	4.3	0.3	0.0	0.0	6.3
S	1.3	5.0	2.8	2.2	0.0	0.0	11.3
SW	2.6	8.8	6.8	3.6	1.0	0.0	22.8
W	1.3	4.4	1.4	0.7	0.0	0.0	7.8
NW	1.0	2.9	3.3	1.5	0.4	0.0	9.2
Summary	10.3	34.4	28.5	11.7	2.9	0.0	87.8

% Icon	Classes (kph)	10		1.8-3.0	34		3.0-6.0	28		6.0-9.1	12		9.1-12.1	3		12.1-15.1	0		>15.1
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LICA MASKWA 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 12.22% Calm Wind Avg Speed: 0.91(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - April 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	W	W	WNW	W	W	WNW	WNW	NNW	NW	NW	NW	NNW	N	NNW	N	NNE	NNE	NE	NE	NE	NE	E	ESE	NNE	N	24	
2	ENE	E	E	E	ENE	E	ENE	NE	NE	NE	NNE	NNE	NNW	N	N	N	NNE	NNE	NE	NE	NNE	NE	NE	NE	NNE	24	
3	NE	ESE	SSW	ESE	S	W	SSW	NE	WNW	NNW	N	W	NNW	SW	SW	SSW	SSW	SSW	SSW	SW	WSW	W	NNE	NE	SW	24	
4	NE	NE	NE	NNE	NNE	NNE	NNE	NNE	NW	NNW	NW	NW	NW	NW	NW	NW	NNW	N	N	N	NNE	NNE	NNW	NNW	NNW	24	
5	NNW	N	NNW	NW	NNE	NNE	N	N	N	N	N	N	N	NNE	N	NNE	NNE	NNE	N	N	NNE	NNW	NW	N	N	24	
6	SW	SW	WSW	W	SW	SW	WSW	WNW	NNW	NNW	W	W	SSW	SW	SW	SSW	SSW	SW	SSW	SW	SW	WSW	SW	SW	SW	24	
7	S	SE	ESE	ENE	E	SSW	NW	NNE	NE	SE	SE	SE	SSE	SE	SE	SE	SE	SE	SE	SSE	S	S	SSE	SSE	SE	24	
8	SE	ESE	E	ENE	E	NE	NE	ENE	SSE	SSE	S	S	S	SSW	SW	SSW	SW	SSW	SSW	SW	SW	SW	SW	SW	SW	24	
9	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SW	SW	SW	SW	SSW	WNW	WNW	W	SW	SW	SW	SW	SW	SW	24	
10	SW	SW	SW	SW	WSW	NNW	ENE	NE	NE	NE	NE	NNE	NNE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24	
11	ENE	E	ENE	E	ENE	ENE	ENE	NE	NE	NE	NE	NE	ENE	NE	E	ENE	SSW	SSW	SW	WSW	SSE	NE	NE	ESE	ENE	24	
12	E	ENE	ENE	NE	NE	ENE	NE	NE	E	SSE	SE	ESE	S	S	S	SE	N	NE	SE	S	SSW	SW	SSW	SSW	SE	24	
13	SW	SSE	NE	NNE	SE	SSE	S	SSE	SSE	SSE	SSE	S	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	24	
14	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SSE	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	S	24	
15	S	SSE	SE	SE	NE	NNE	NE	NE	ESE	SE	ESE	E	E	ESE	ESE	E	ENE	E	ENE	ENE	ENE	ENE	ENE	ENE	E	24	
16	NE	NE	ENE	ENE	NE	NE	NE	NE	ENE	NE	NE	NE	NE	NE	NE	ENE	E	E	SE	ESE	ESE	E	E	E	ENE	24	
17	ESE	ESE	E	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SSE	SSE	S	S	SSW	SW	SW	SW	WSW	WSW	WSW	SE	24	
18	WSW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SW	24
19	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSE	SSE	S	S	SSW	24	
20	S	S	S	ENE	SSE	N	NE	W	WSW	NW	NNW	W	WSW	WSW	W	W	WNW	SW	SW	SW	SW	SW	SW	SE	WSW	24	
21	SSE	NE	E	ENE	ENE	ENE	NE	NE	NE	E	ENE	ENE	ENE	NE	E	ESE	NE	N	N	N	NNW	NW	NW	NNW	NNE	24	
22	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	NW	WNW	WSW	W	W	WNW	24
23	WNW	WNW	WNW	W	WSW	WSW	WSW	W	WNW	WNW	NW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	SW	SW	SW	SW	SSW	W	24	
24	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	WSW	SW	WSW	W	W	W	W	NW	NW	NW	NW	NNW	WSW	WSW	24	
25	NW	WNW	WNW	WNW	NNW	NNW	NNW	NNW	NW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NW	WNW	W	W	SSW	SW	SW	NW	24
26	WSW	W	WSW	SW	SW	WNW	WNW	NW	N	NNE	NNW	N	NNW	NNW	NNW	NNW	N	NNW	NNE	NE	ENE	ENE	E	ESE	NNW	24	
27	SE	SSE	SSE	SSE	SSE	SSE	S	SSW	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	24	
28	S	SSW	S	S	SSW	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SSW	SSW	NNE	SSW	24
29	NNE	NNE	NNE	NNE	N	NNE	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NE	ESE	E	ESE	SSE	SSW	SSE	NNE	24
30	SE	ESE	E	SE	E	ESE	NNE	SSW	SSW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSE	SSE	SSE	S	SSW	24	

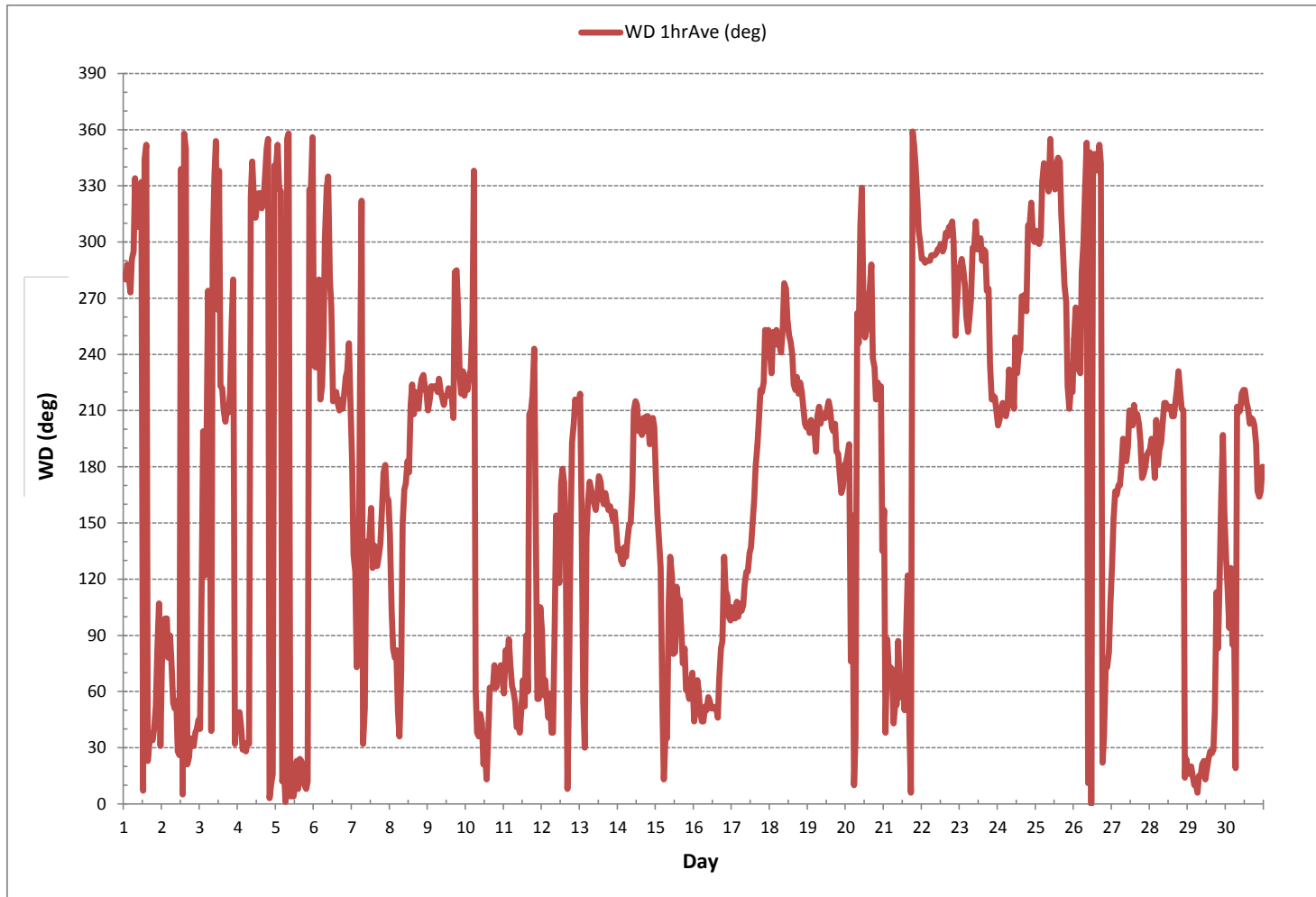
STATUS FLAG CODES

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:	December 28, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	720	hrs
STANDARD DEVIATION:	99		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	225 (SW)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - April 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			
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	RDGS.		
DAY																											
1	28	23	18	23	25	34	30	37	35	34	37	37	36	43	44	27	23	20	13	15	18	23	48	16	24		
2	34	37	29	11	19	23	44	20	26	36	44	41	42	47	45	37	36	23	18	17	14	15	14	17	24		
3	18	49	30	41	45	34	41	40	54	66	53	54	60	45	35	25	24	19	16	16	48	24	16	13	24		
4	18	27	19	34	11	14	12	23	41	35	37	34	40	38	41	36	39	38	33	33	30	28	23	27	24		
5	36	28	37	35	25	22	30	34	33	32	32	31	31	26	30	23	23	26	26	21	22	26	29	25	24		
6	59	26	41	19	25	13	50	53	43	47	79	70	43	31	38	27	22	23	18	21	13	18	23	13	24		
7	27	53	27	29	28	32	32	9	37	32	34	32	39	42	42	34	32	32	26	15	15	14	17	25	24		
8	18	18	14	15	17	18	7	26	36	32	39	57	61	45	44	54	34	24	21	24	26	27	22	19	24		
9	13	14	14	15	11	17	23	27	32	46	23	23	27	29	23	24	22	33	27	26	21	14	18	14	24		
10	15	13	13	19	54	34	24	15	17	25	25	26	23	33	35	35	29	24	24	23	24	25	25	22	24		
11	23	27	25	30	29	30	28	24	17	25	20	23	32	31	43	69	42	26	24	38	60	41	19	24	24		
12	19	16	14	14	29	16	13	17	51	44	47	45	50	63	65	57	59	49	25	17	19	16	15	13	24		
13	19	22	37	12	48	33	39	26	30	29	31	30	27	29	28	26	26	27	26	28	28	28	28	26	24		
14	31	30	34	29	33	34	31	26	31	35	29	28	34	35	22	39	23	23	16	12	12	13	16	17	24		
15	37	19	54	46	30	54	15	13	35	35	30	30	33	30	29	27	28	26	24	23	23	21	23	24	24		
16	17	20	23	22	22	19	18	24	21	25	24	23	23	22	22	20	25	29	29	32	27	29	28	28	24		
17	31	32	29	28	24	28	27	31	30	32	31	31	32	30	28	25	22	18	21	20	26	37	36	36	24		
18	31	26	40	32	34	31	32	32	35	37	42	43	37	37	36	28	24	25	20	21	17	14	14	14	24		
19	14	15	14	23	43	56	52	21	20	19	20	22	25	24	23	26	25	22	25	21	19	18	21	25	24		
20	26	22	17	51	69	43	56	40	32	61	55	45	46	44	45	38	44	37	27	19	14	12	28	29	24		
21	37	27	18	33	15	25	28	21	21	28	27	25	33	21	32	28	15	25	27	30	35	33	27	25	24		
22	25	25	28	26	29	25	28	27	30	28	30	26	30	28	27	30	30	30	30	30	29	29	24	24	21	24	
23	21	21	22	25	31	26	33	40	30	32	35	40	39	36	40	40	31	36	33	25	15	14	13	13	24		
24	13	16	15	15	16	16	16	28	24	27	21	35	32	36	37	39	35	38	37	36	30	33	35	26	24		
25	27	19	22	42	39	42	35	36	37	36	41	39	40	40	39	44	41	35	37	30	17	11	17	18	24		
26	34	36	27	19	16	20	25	33	38	32	38	33	40	38	39	37	38	39	21	18	18	21	22	23	24		
27	25	20	19	18	18	22	29	25	25	28	27	28	26	29	24	24	23	21	23	23	24	23	22	23	24		
28	22	22	24	45	20	33	26	28	25	27	30	28	25	27	26	26	28	26	26	19	46	45	29	18	24		
29	21	23	21	24	26	26	31	26	24	22	22	28	25	23	20	21	22	26	29	17	38	24	51	21	24		
30	14	20	37	23	48	19	19	31	25	27	31	35	31	28	24	26	26	23	20	16	10	14	22	23	24		

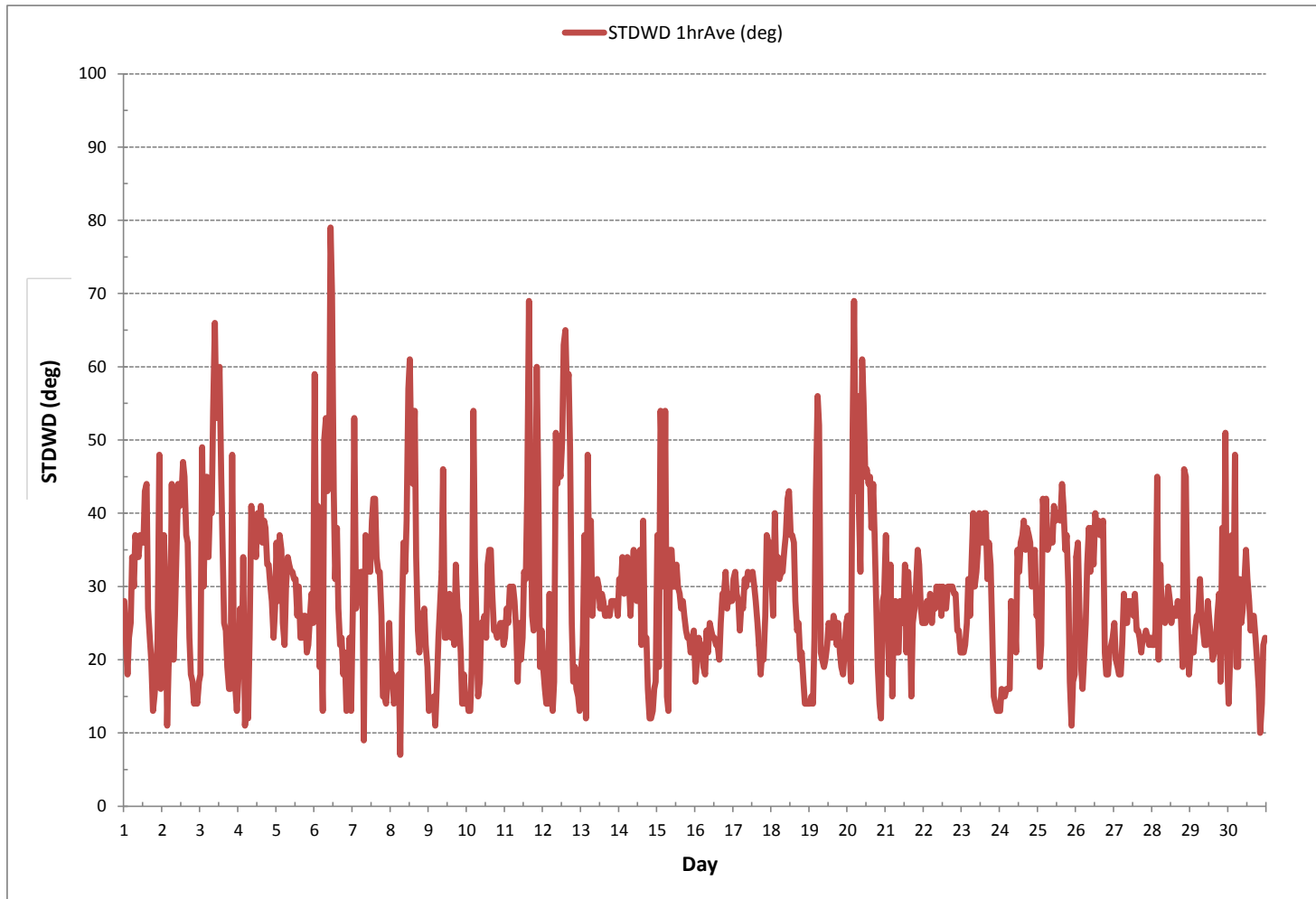
STATUS FLAG CODES

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: December 28, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 720 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



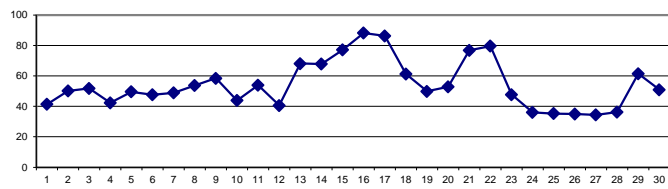
RELATIVE HUMIDITY Hourly Averages (RH %)

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	48	53	54	58	61	63	61	47	38	31	27	23	22	23	24	26	28	31	35	41	44	46	52	58	22	63	41	24
2	66	67	66	68	68	67	67	55	48	45	38	36	33	33	32	32	34	37	42	47	51	57	58	59	32	68	50	24
3	67	75	78	78	76	75	74	64	45	34	30	27	28	30	32	37	39	44	48	55	63	58	58	27	78	52	24	
4	55	58	62	66	65	63	62	45	36	32	28	26	24	24	24	22	24	26	29	34	38	46	61	67	22	67	42	24
5	60	61	64	66	68	66	63	58	54	46	40	36	35	33	30	32	33	35	39	43	51	55	60	63	30	68	50	24
6	66	70	70	72	72	71	70	55	40	32	26	23	25	28	28	30	30	32	36	44	52	52	59	63	23	72	48	24
7	68	71	72	71	72	71	69	54	40	30	29	29	28	26	26	28	30	33	38	44	53	60	63	70	26	72	49	24
8	74	76	78	78	77	76	75	62	51	46	39	34	32	30	30	31	35	35	40	49	54	58	63	68	30	78	54	24
9	74	79	79	82	84	84	82	73	62	49	47	42	42	41	41	41	45	36	39	45	49	58	63	67	36	84	59	24
10	69	68	69	72	77	74	64	54	42	33	29	30	29	26	27	27	25	27	30	34	36	38	35	38	25	77	44	24
11	42	40	39	39	39	42	51	66	69	72	75	73	64	55	47	38	40	49	52	63	65	63	50	62	38	75	54	24
12	74	70	68	67	66	67	57	49	37	28	24	21	19	19	16	15	15	17	21	31	38	42	52	62	15	74	41	24
13	68	73	75	75	78	77	68	56	52	52	53	57	61	60	60	66	71	73	76	74	75	78	78	80	52	80	68	24
14	81	81	81	82	82	82	80	77	72	65	59	56	55	52	54	49	51	55	59	65	68	71	74	78	49	82	68	24
15	80	84	85	86	86	86	85	79	70	58	50	51	46	45	65	79	86	88	89	90	91	91	91	91	45	91	77	24
16	91	91	91	91	91	92	92	91	91	91	91	91	90	88	87	86	84	83	80	69	87	89	90	90	69	92	88	24
17	89	89	89	89	89	87	87	86	86	83	78	79	82	82	84	87	87	88	90	90	89	89	87	85	78	90	86	24
18	83	83	81	81	83	84	82	75	68	59	51	46	42	37	36	41	45	45	48	54	58	61	64	63	36	84	61	24
19	63	66	67	67	69	73	70	55	50	41	35	31	25	23	24	26	30	36	44	52	54	59	66	71	23	73	50	24
20	76	77	80	85	87	86	82	72	67	51	37	28	25	25	23	20	20	26	39	44	48	51	55	66	20	87	53	24
21	70	72	73	76	82	80	73	67	60	53	56	64	62	65	77	87	90	91	91	91	91	91	91	91	53	91	77	24
22	91	91	89	85	84	84	84	83	82	84	80	78	75	75	76	72	69	69	70	71	74	80	84	81	69	91	80	24
23	79	77	79	79	80	79	71	58	46	42	35	30	26	24	23	23	22	22	25	33	42	48	51	53	22	80	48	24
24	54	53	54	58	63	62	61	56	49	40	32	22	17	10	9	8	13	18	22	27	30	32	37	39	8	63	36	24
25	43	46	51	53	57	58	52	40	34	27	24	23	22	22	20	20	18	19	21	28	36	39	43	51	18	58	35	24
26	53	55	56	60	63	59	45	39	34	30	23	20	18	17	16	16	18	19	22	30	33	34	38	41	16	63	35	24
27	45	46	45	48	50	52	45	40	36	29	26	24	23	23	24	24	24	24	26	30	32	34	37	39	23	52	34	24
28	41	42	41	52	54	58	44	38	36	33	31	29	27	24	22	19	18	18	24	32	43	51	50	42	18	58	36	24
29	44	48	52	57	61	66	75	75	73	70	63	61	59	56	56	51	48	45	46	57	68	78	81	85	44	85	61	24
30	86	88	88	88	89	88	79	56	50	45	35	27	24	23	24	24	25	28	30	38	47	46	46	50	23	89	51	24
HOURLY MAX	91	91	91	91	91	92	92	91	91	91	91	91	90	88	87	87	90	91	91	91	91	91	91	91	91			
HOURLY AVG	67	68	69	71	72	72	69	61	54	48	43	41	39	37	38	38	40	41	45	50	55	59	61	64				

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

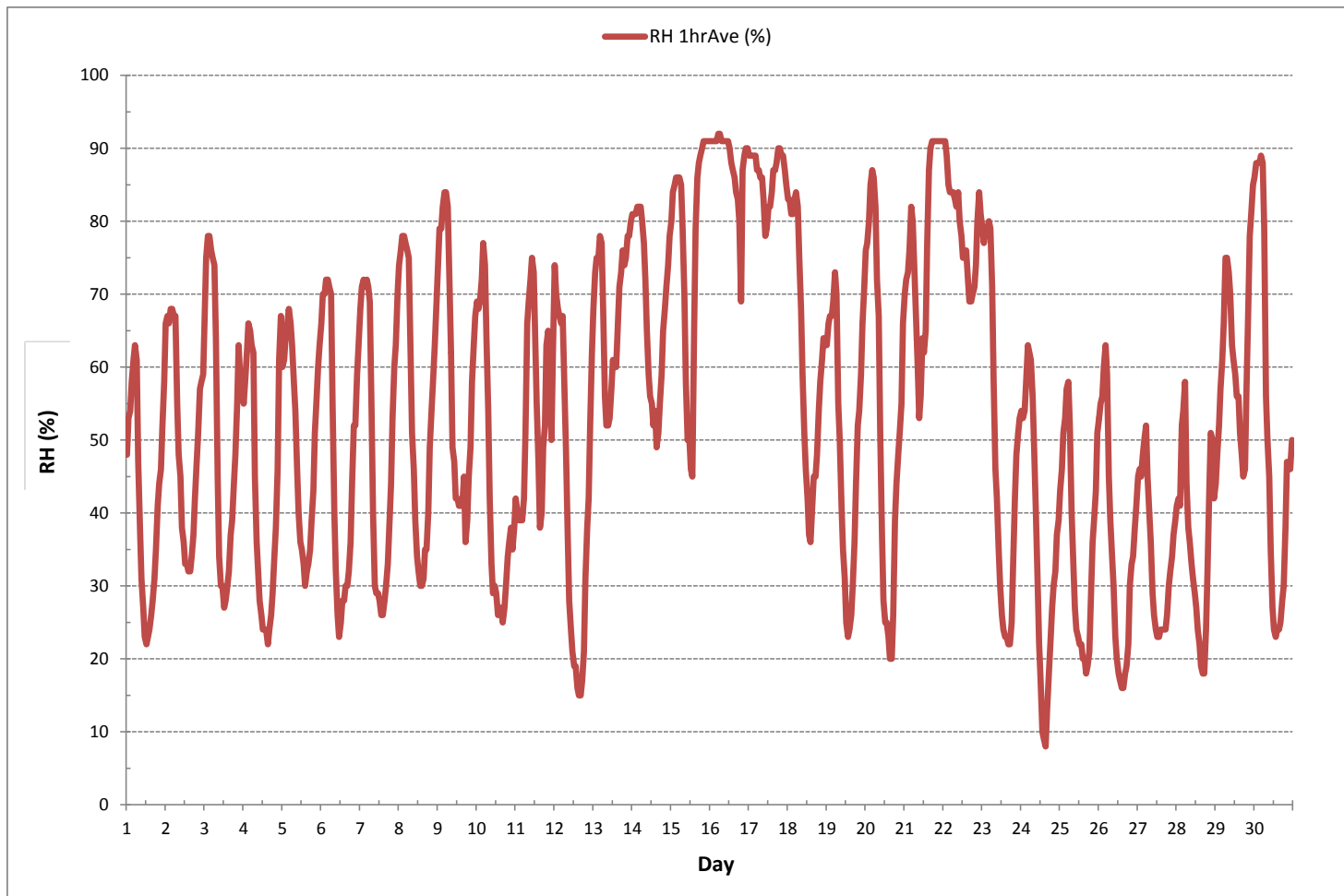
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	8	%	@ HOUR	15	ON DAY	24
MAXIMUM 1-HR AVERAGE:	92	%	@ HOUR	5	ON DAY	16
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY	16
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	22		MONTHLY AVERAGE:			54 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



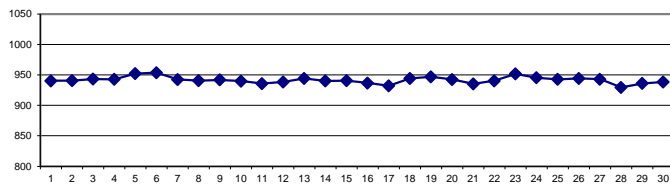
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	944	943	943	942	942	942	942	942	942	941	941	941	940	940	939	939	938	938	938	938	939	939	939	939	939	938	944	940	24	
2	939	939	939	939	939	939	939	940	940	940	941	941	941	941	941	941	941	941	941	941	942	942	943	943	944	939	944	941	24	
3	944	944	944	944	944	944	944	945	945	945	945	945	945	944	944	943	942	942	942	941	942	942	942	942	942	941	945	944	24	
4	942	942	942	942	942	942	943	943	943	943	943	943	943	943	943	942	942	943	943	943	944	945	945	946	942	946	943	24		
5	946	946	947	947	948	949	949	950	951	951	952	953	953	954	954	954	955	955	955	955	956	956	957	957	957	946	957	952	24	
6	957	957	958	958	957	957	957	957	956	956	956	955	955	954	954	953	952	951	951	950	949	949	948	948	948	948	958	954	24	
7	948	948	947	947	947	946	945	945	944	943	943	943	943	942	941	940	939	939	939	939	939	939	938	938	938	938	948	943	24	
8	938	938	938	938	938	939	939	939	940	941	941	942	942	942	942	942	942	942	941	941	941	942	942	942	942	938	942	941	24	
9	942	942	942	942	942	942	942	943	943	943	943	943	943	942	942	942	941	941	941	941	941	941	941	941	940	940	943	942	24	
10	940	940	940	940	940	940	940	941	941	941	942	942	942	942	941	941	940	939	939	938	938	938	938	938	938	938	942	940	24	
11	937	937	936	936	936	935	935	935	935	935	936	935	935	936	936	936	936	936	936	936	936	936	936	936	936	935	937	936	24	
12	936	936	936	936	936	936	937	937	938	939	939	939	939	939	939	939	939	939	939	940	940	940	941	941	942	936	942	938	24	
13	942	942	942	942	943	943	944	945	945	946	946	946	946	946	946	946	946	946	945	944	944	944	943	942	942	946	944	24		
14	942	941	940	939	939	939	939	939	939	939	940	940	940	940	941	941	941	941	941	941	940	940	940	941	941	939	942	940	24	
15	941	941	940	939	941	941	941	941	941	941	941	941	941	941	941	940	940	940	940	940	940	940	940	940	940	940	941	941	24	
16	940	940	939	939	939	940	939	939	939	938	938	937	937	936	936	936	935	935	934	935	935	934	933	933	933	933	940	937	24	
17	932	932	931	931	931	930	930	930	930	930	931	931	931	932	932	933	934	934	935	935	936	936	936	937	930	937	932	24		
18	938	938	939	939	940	941	942	942	943	944	945	946	947	947	947	947	947	947	947	947	947	947	947	947	947	938	947	944	24	
19	948	948	948	948	948	948	948	949	949	950	950	949	949	949	948	947	947	946	945	944	944	944	943	943	943	943	950	947	24	
20	942	942	942	941	941	941	942	943	944	944	944	944	944	944	943	943	943	943	943	942	942	942	942	941	941	944	943	24		
21	941	941	940	939	938	938	938	938	937	937	936	935	935	934	933	932	932	931	931	931	932	932	933	933	933	931	941	935	24	
22	933	934	934	934	935	935	935	936	937	938	939	940	941	942	943	944	944	945	945	946	947	947	948	948	933	948	940	24		
23	949	949	950	950	950	951	951	952	953	954	954	954	954	954	953	953	953	952	951	951	951	951	951	951	949	954	952	24		
24	951	950	950	949	949	948	948	948	948	948	948	947	946	945	944	944	943	942	941	941	941	941	941	941	941	941	951	946	24	
25	940	940	940	941	941	941	942	943	944	944	945	945	945	945	945	945	944	944	944	943	943	942	942	942	940	945	943	24		
26	942	942	941	941	941	941	942	943	944	945	946	946	946	946	946	946	946	946	946	946	946	946	946	947	941	947	944	24		
27	947	947	947	947	947	947	947	947	947	946	946	945	944	943	942	941	940	940	939	938	938	937	937	936	936	947	943	24		
28	936	935	934	934	933	932	932	932	932	931	931	930	929	929	928	927	926	926	925	925	924	924	924	926	924	936	929	24		
29	927	928	929	930	931	932	933	934	936	936	937	938	938	939	940	940	940	940	940	940	940	940	940	940	940	927	940	936	24	
30	941	941	941	941	941	941	941	942	942	942	942	941	940	939	938	937	936	935	935	934	933	933	933	933	933	942	939	24		
HOURLY MAX	957	957	958	957	958	957	957	957	956	956	956	955	954	954	954	954	955	955	955	955	956	956	957	957	957					
HOURLY AVG	942	941	941	941	941	941	942	942	942	942	943	943	942	942	942	942	941	941	941	941	941	941	941	941	941	941	941	941	941	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

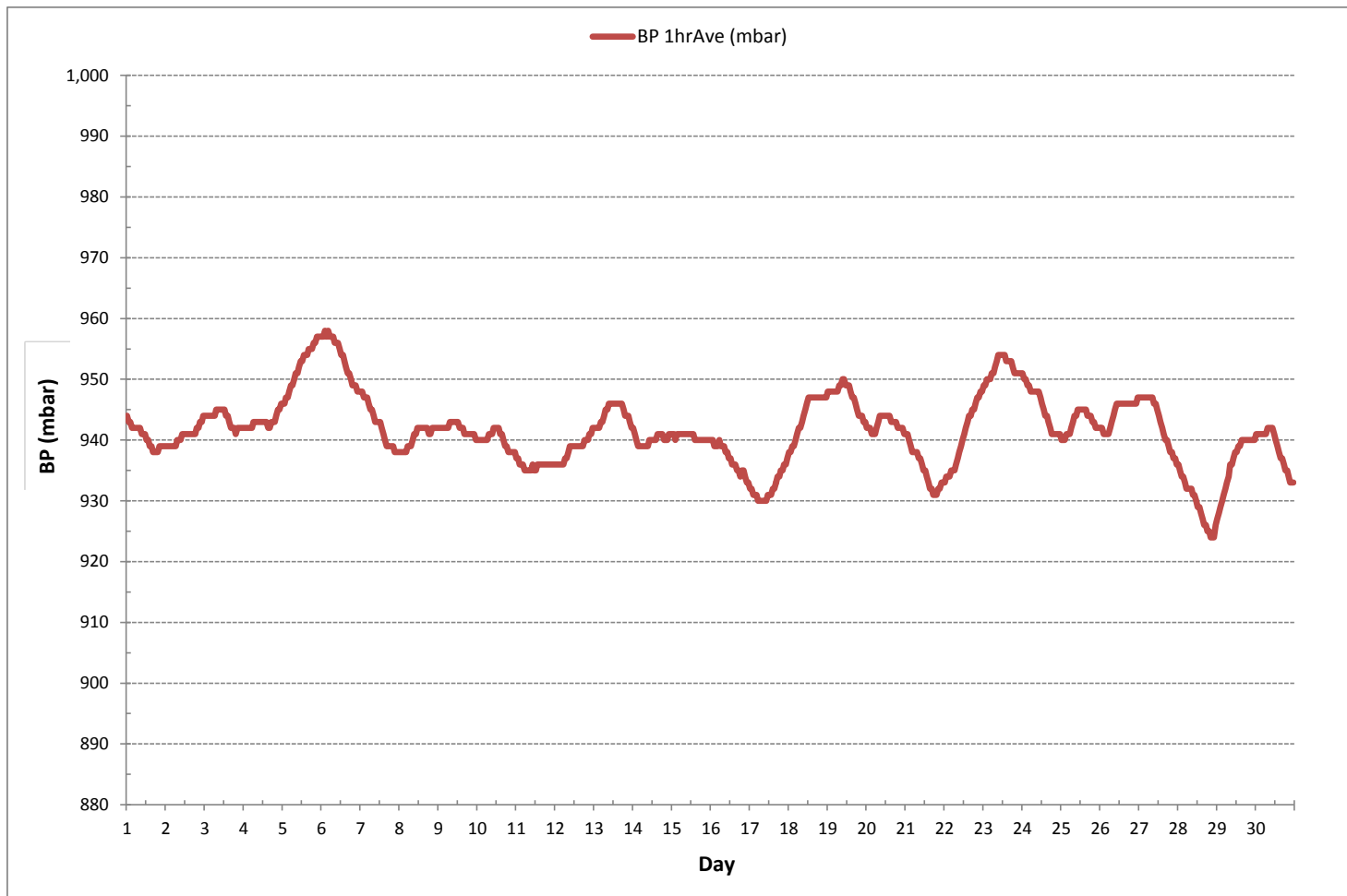
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	924	mbar	@ HOUR	20	ON DAY	28
MAXIMUM 1-HR AVERAGE:	958	mbar	@ HOUR	2	ON DAY	6
MAXIMUM 24-HR AVERAGE:	954	mbar			ON DAY	6
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	6				MONTHLY AVERAGE:	942 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



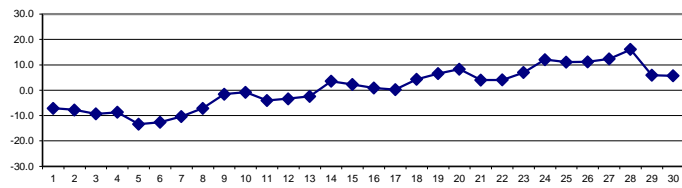
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-12.6	-13.0	-14.0	-15.2	-15.7	-15.0	-10.7	-7.2	-4.1	-1.8	-0.4	-0.2	1.2	1.3	-0.3	-1.2	-2.5	-4.3	-6.6	-7.8	-8.5	-9.7	-12.2	-15.7	1.3	-7.1	24
2	-14.6	-14.8	-14.4	-15.0	-14.7	-14.5	-14.2	-10.6	-8.1	-5.4	-2.7	-2.1	-0.6	-1.1	-1.0	-0.7	-2.5	-3.5	-4.7	-5.9	-7.0	-8.4	-9.6	-10.1	-15.0	-0.6	-7.8	24
3	-12.9	-15.6	-17.2	-18.6	-20.1	-20.5	-19.7	-14.0	-7.5	-3.6	-2.3	-2.0	-0.7	-0.6	-0.9	-1.4	-3.3	-4.0	-5.7	-7.2	-9.1	-10.9	-12.2	-13.3	-20.5	-0.6	-9.3	24
4	-12.0	-12.5	-14.3	-15.6	-15.6	-16.7	-16.9	-12.9	-8.7	-6.4	-4.2	-3.0	-1.7	-1.3	-1.4	-1.6	-2.5	-4.2	-6.3	-8.2	-9.1	-10.6	-11.3	-12.2	-16.9	-1.3	-8.7	24
5	-12.4	-13.4	-13.5	-14.4	-14.8	-16.2	-16.7	-15.5	-14.9	-13.6	-11.7	-10.5	-9.4	-9.0	-8.0	-8.5	-9.2	-10.4	-11.9	-13.7	-16.2	-17.4	-18.8	-20.0	-20.0	-8.0	-13.3	24
6	-20.9	-22.0	-22.5	-23.2	-24.1	-24.2	-22.1	-16.0	-10.5	-7.8	-5.1	-3.3	-3.1	-3.3	-2.9	-3.7	-4.6	-5.8	-7.6	-10.5	-13.1	-12.8	-15.5	-17.7	-24.2	-2.9	-12.6	24
7	-19.7	-21.0	-22.3	-23.5	-24.1	-24.7	-22.4	-15.0	-8.8	-4.6	-2.9	-1.6	-0.6	0.1	0.6	0.4	-0.3	-1.7	-4.2	-6.7	-9.6	-11.2	-12.2	-14.4	-24.7	0.6	-10.4	24
8	-16.0	-17.4	-18.2	-18.3	-20.2	-20.7	-18.3	-11.5	-6.4	-4.5	-2.0	0.1	1.3	2.1	2.2	1.8	0.1	-1.4	-2.4	-3.2	-3.8	-4.3	-4.6	-5.3	-20.7	2.2	-7.1	24
9	-6.9	-8.2	-7.7	-9.4	-10.5	-9.9	-8.0	-5.8	-2.9	1.2	2.0	3.2	4.2	4.7	5.0	4.9	4.1	4.7	3.2	1.3	-0.3	-1.7	-2.4	-3.0	-10.5	5.0	-1.6	24
10	-3.9	-4.0	-4.4	-5.4	-7.1	-6.4	-4.0	-2.2	-0.6	1.3	3.2	3.7	4.5	6.0	6.1	5.2	4.1	1.6	0.0	-1.9	-3.1	-3.9	-4.2	-4.7	-7.1	6.1	-0.8	24
11	-5.2	-5.3	-5.7	-5.9	-6.0	-6.1	-6.7	-6.8	-6.6	-5.6	-4.8	-4.2	-2.8	-2.8	-0.3	1.0	1.0	-0.3	-1.9	-3.5	-3.6	-3.8	-4.5	-6.6	-6.8	1.0	-4.0	24
12	-8.0	-9.3	-11.5	-11.3	-13.1	-14.4	-11.2	-7.7	-3.7	-0.7	1.7	3.4	4.3	3.8	4.7	5.5	4.9	3.2	0.6	-2.4	-4.5	-4.5	-4.7	-5.9	-14.4	5.5	-3.4	24
13	-6.4	-8.2	-9.9	-11.0	-11.9	-11.6	-7.6	-3.6	-1.3	0.5	1.5	2.1	1.8	2.2	2.6	1.9	1.3	0.5	0.1	-0.2	-0.4	-0.4	-0.3	-1.0	-11.9	2.6	-2.5	24
14	-1.1	-0.9	-0.5	-0.3	-0.3	-0.3	0.1	0.8	2.0	4.0	6.3	7.3	7.5	8.7	7.8	9.7	9.1	7.7	6.2	3.9	2.4	1.4	1.6	1.0	-1.1	9.7	3.5	24
15	0.1	-0.9	-2.1	-2.7	-2.6	-2.8	-1.8	0.6	3.7	6.8	9.0	8.2	9.4	10.0	6.2	4.6	3.1	2.4	1.3	0.4	0.3	0.3	0.3	0.3	-2.8	10.0	2.3	24
16	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.8	0.9	1.1	1.6	1.9	2.3	2.9	2.9	3.4	2.9	1.4	1.5	-0.5	-1.0	-1.3	-1.5	-1.5	3.4	0.9	24
17	-1.6	-1.6	-1.8	-1.8	-1.8	-1.5	-1.3	-1.1	-0.8	0.7	2.2	2.2	1.5	2.2	2.2	2.0	2.2	1.6	1.1	0.8	0.7	0.4	0.1	-0.5	-1.8	2.2	0.3	24
18	-1.1	-1.0	-0.6	-0.5	-1.6	-1.7	-0.7	1.6	4.4	7.1	9.2	10.4	10.6	10.9	11.2	10.1	9.3	8.2	6.6	4.8	3.0	1.8	0.8	0.9	-1.7	11.2	4.3	24
19	0.9	0.1	-0.5	-0.3	-0.7	-1.6	0.1	4.6	7.0	8.9	10.4	12.1	13.1	13.3	13.2	13.2	13.0	12.3	10.6	8.4	6.6	5.1	4.3	3.8	-1.6	13.3	6.6	24
20	2.7	2.8	1.7	-0.5	-1.6	-1.1	0.3	5.1	7.0	11.4	14.6	16.3	16.8	17.0	17.0	16.6	16.6	14.9	11.1	8.8	7.5	6.4	4.9	1.7	-1.6	17.0	8.3	24
21	1.3	0.8	0.2	-0.9	-1.9	-1.1	0.8	3.1	5.1	7.8	8.4	7.1	7.7	8.2	7.4	6.3	5.6	5.3	5.0	4.5	4.1	3.9	4.1	3.9	-1.9	8.4	4.0	24
22	3.6	3.5	3.4	2.7	2.3	2.5	2.9	3.4	3.7	3.7	5.0	5.5	6.4	6.6	6.7	7.1	6.6	6.1	5.8	4.6	3.4	1.6	0.3	0.1	0.1	7.1	4.1	24
23	-0.4	-0.6	-1.5	-2.1	-2.6	-2.2	0.8	5.2	8.2	10.3	12.1	13.4	13.6	14.1	14.3	14.3	14.2	13.9	11.8	8.5	6.6	5.5	5.0	4.6	-2.6	14.3	7.0	24
24	4.6	4.9	4.6	3.6	2.8	3.7	4.8	7.1	9.9	13.4	16.0	18.4	19.2	20.8	20.8	20.9	19.2	18.2	16.4	14.3	12.9	12.0	10.8	10.1	2.8	20.9	12.1	24
25	9.0	8.1	6.8	6.4	5.0	4.9	6.7	10.8	12.8	13.8	14.5	15.6	16.0	15.7	16.3	16.2	16.4	15.5	14.7	11.7	8.1	7.1	7.4	6.9	4.9	16.4	11.1	24
26	6.6	5.4	4.9	3.4	2.3	3.5	8.2	11.3	14.0	15.1	17.3	17.7	18.2	18.4	18.4	18.1	17.6	16.8	15.0	11.3	8.0	7.1	5.7	5.0	2.3	18.4	11.2	24
27	3.8	3.8	4.1	3.5	2.8	2.7	5.5	8.1	10.0	12.8	14.7	16.4	18.0	19.1	19.6	20.2	20.5	20.3	19.4	16.9	15.6	14.5	13.4	12.0	2.7	20.5	12.4	24
28	10.7	9.9	9.3	5.9	5.1	4.3	9.0	11.7	13.9	16.1	18.5	20.4	22.1	24.2	25.5	26.6	27.0	26.3	23.6	19.5	15.1	12.6	12.8	15.3	4.3	27.0	16.1	24
29	14.2	11.8	9.9	8.1	6.9	6.0	4.8	4.8	4.3	4.5	5.7	6.2	6.4	7.1	7.1	8.0	8.2	9.1	8.8	4.8	1.5	-0.5	-1.9	-2.7	-2.7	14.2	6.0	24
30	-3.0	-3.7	-4.6	-5.1	-5.7	-5.0	-0.8	5.1	6.7	8.4	9.7	11.2	11.9	12.3	12.6	13.1	13.3	12.9	12.1	9.4	6.1	6.0	7.0	6.4	-5.7	13.3	5.7	24
HOURLY MAX	14.2	11.8	9.9	8.1	6.9	6.0	9.0	11.7	14.0	16.1	18.5	20.4	22.1	24.2	25.5	26.6	27.0	26.3	23.6	19.5	15.6	14.5	13.4	15.3				
HOURLY AVG	-3.3	-4.1	-4.7	-5.5	-6.3	-6.4	-4.8	-1.7	0.9	3.1	4.9	5.8	6.6	7.1	7.2	7.1	6.6	5.7	4.2	2.2	0.5	-0.5	-1.2	-2.0				

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

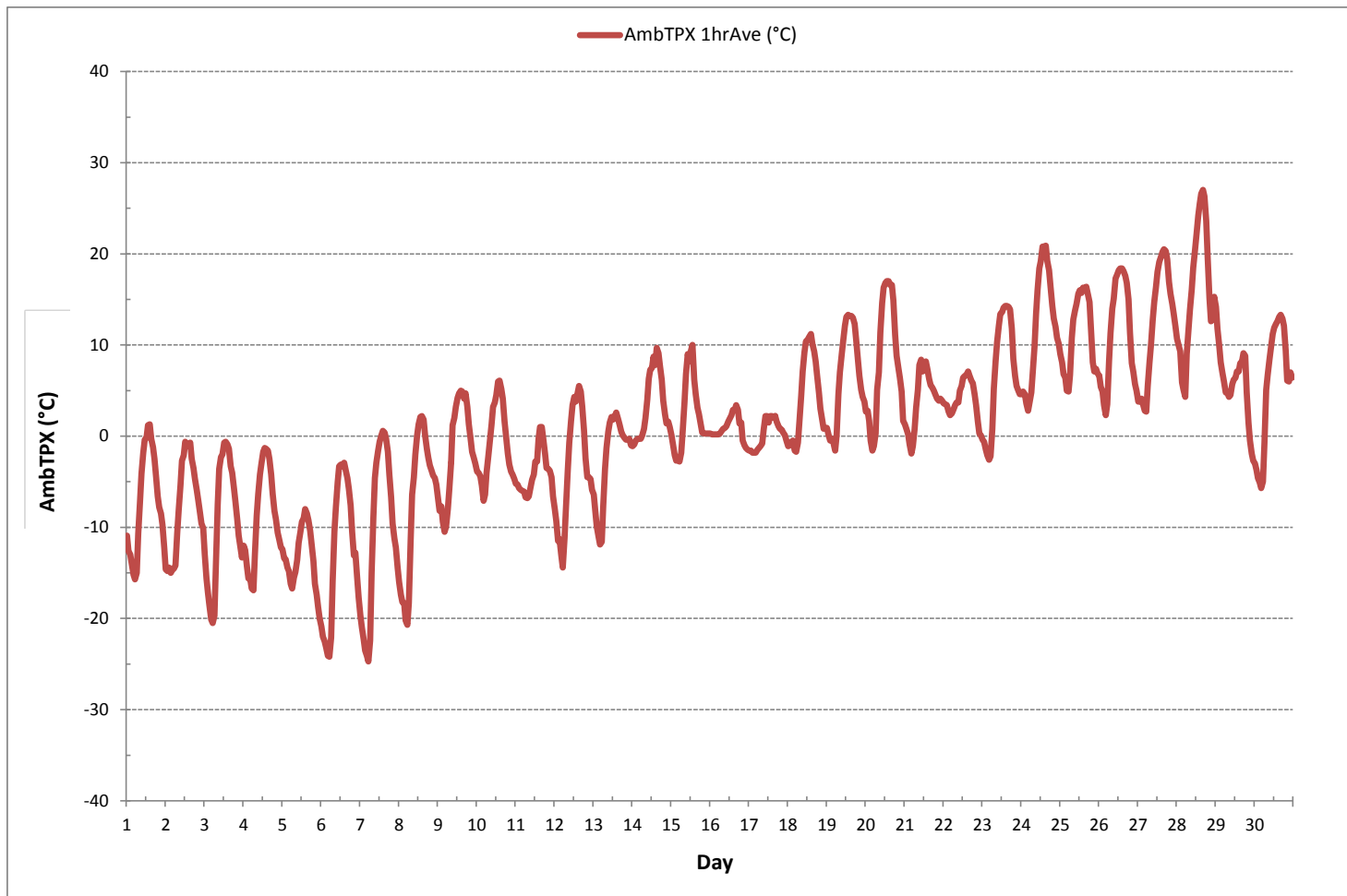
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-24.7 °C	@ HOUR	5	ON DAY	7
MAXIMUM 1-HR AVERAGE:	27.0 °C	@ HOUR	16	ON DAY	28
MAXIMUM 24-HR AVERAGE:	16.1 °C			ON DAY	28
OPERATIONAL TIME:					720 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	9.6	MONTHLY AVERAGE:			0.9 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



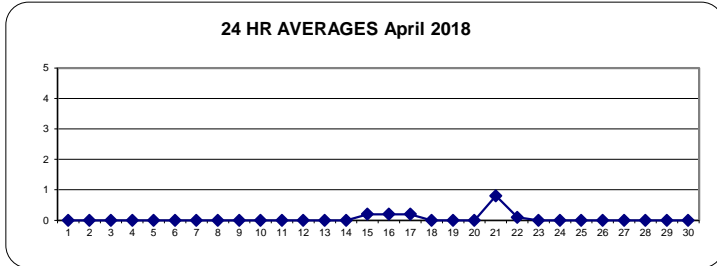
PRECIPITATION Hourly Averages (mm)

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.	AVG.	
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	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	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	0.0	0.0	0.0	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
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	0.4	1.9	0.6	0.6	0.7	0.5	0.4	0.1	0.2	0.0	0.0	1.9	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	0.1	0.2	0.1	1.1	1.4	1.7	0.9	0.0	0.0	1.7	24	
17	0.8	0.8	1.1	0.3	0.4	0.0	0.0	0.0	0.4	1.1	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	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	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	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
21	0.0	0.0	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	3.1	1.8	3.8	3.0	2.0	3.1	0.6	0.4	0.5	0.0	3.8	0.8	24
22	0.6	0.6	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	0.6	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	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	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.8	0.8	1.1	0.3	0.4	0.0	0.0	0.0	0.4	1.1	0.2	0.2	0.1	0.1	0.6	3.1	1.9	3.8	3.0	2.0	3.1	1.4	1.7	0.9				
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	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1				

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

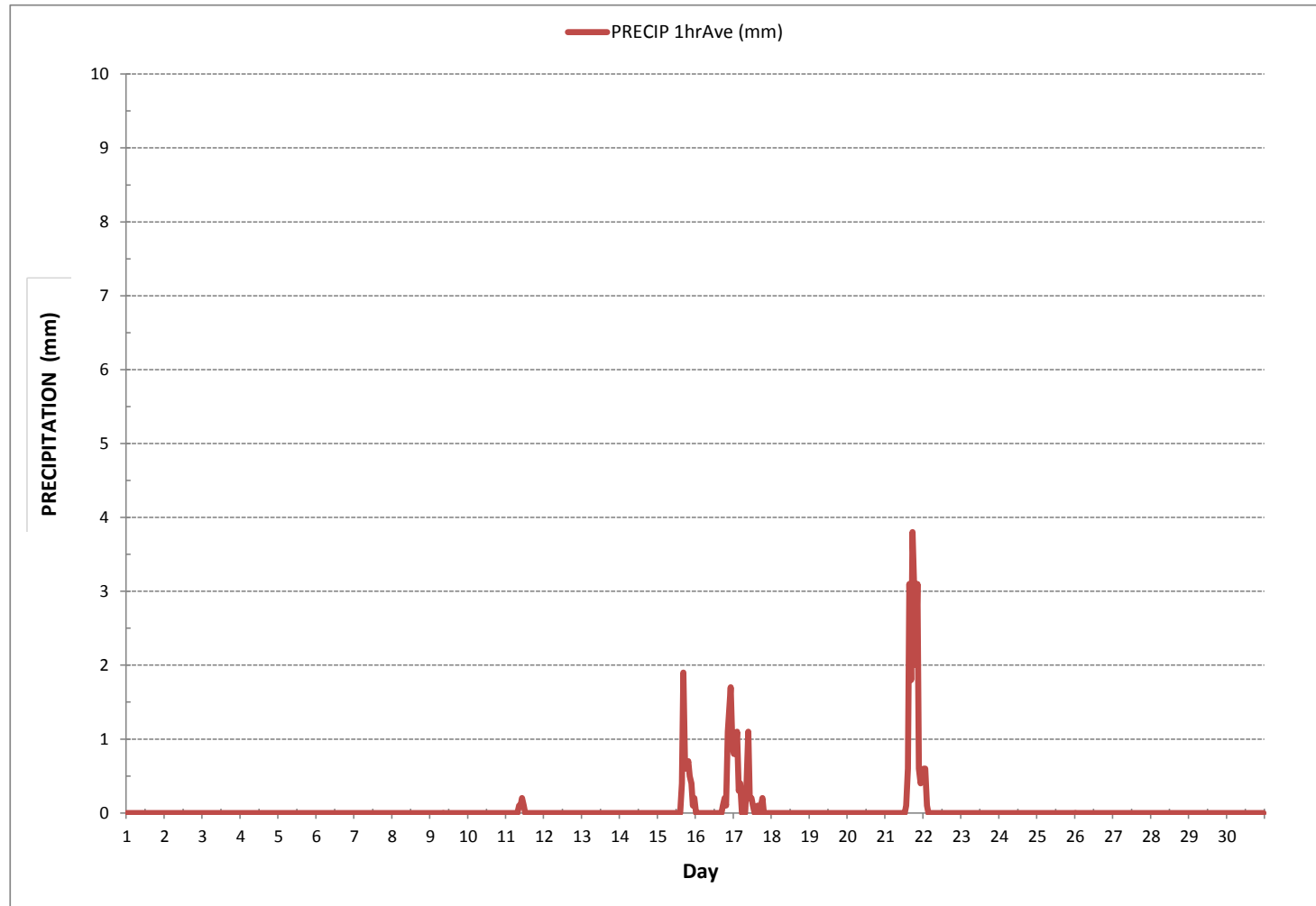
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	3.8	mm	@ HOUR	17	ON DAY	21
MAXIMUM 24-HR AVERAGE:	0.8	mm			ON DAY	21
MONTHLY TOTAL	37.5	mm				
OPERATIONAL TIME:					720	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.3		MONTHLY AVERAGE:		0.1	mm

PRECIPITATION Hourly Averages (mm)



***APPENDIX II
EQUIPMENT CALIBRATION RESULTS***

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	April 10, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	942	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	A few clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:30	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:43	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:	March 16, 2018	As Found C.F.:	1.005		
Previous C.F.:	1.000	New C.F.:	1.001		

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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	Standard Calibration Points for Ranges <table border="1"> <tr><th>Point</th><th>ppb</th></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								

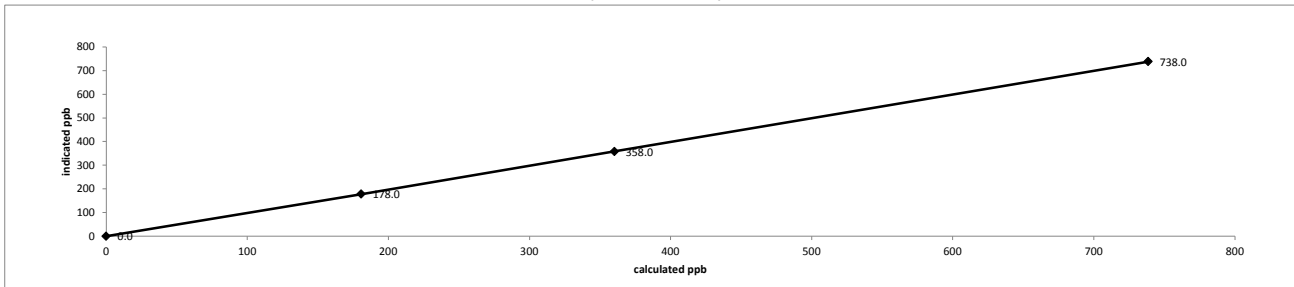
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5034	0.00	5034	0.0	2.0	n/a
as found high	4954	75.49	5029	738.5	737.0	1.005
adjusted zero	5034	0.00	5034	0.0	0.0	n/a
adjusted high	4954	75.49	5029	738.5	738.0	1.001
mid	4992	36.82	5029	360.2	358.0	1.006
low	5009	18.47	5027	180.8	178.0	1.016
Calibrator zero	5034	0.00	5034	0.0	0.0	n/a
Average C.F. =						1.007

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) =	0.15%		± 3% F.S.
% change in C.F. from last cal =	-0.48%		± 10%

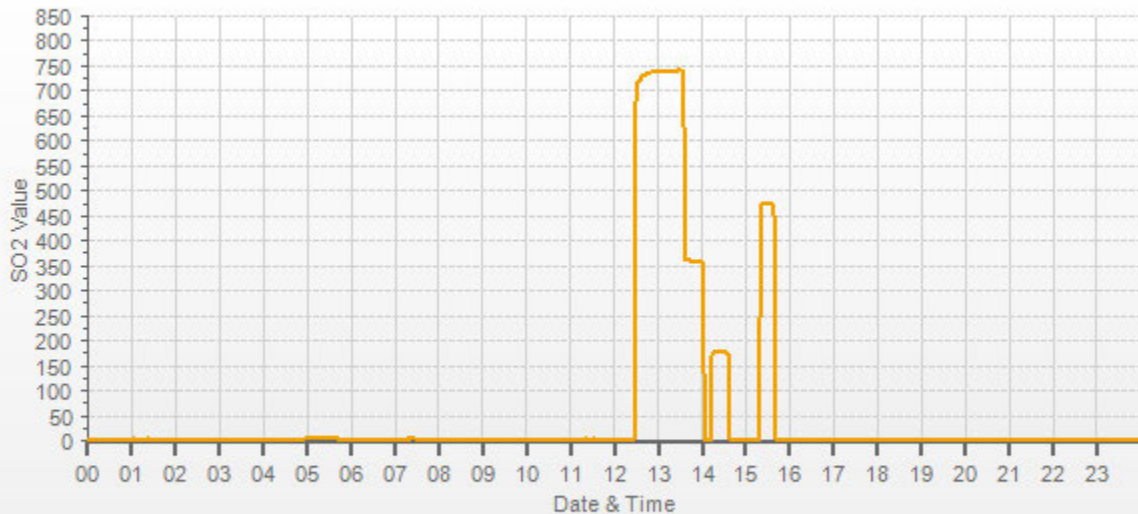
API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
Slope: 0.938	Slope: 0.938
Offset: 170.3	Offset: 171.9
Hvps: 483	Hvps: 483
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 30.4	Box Temp: 31.3
Pmt Temp: 7.6	Pmt Temp: 7.7
Izs Temp: 50.0	Izs Temp: 50.0
Pres: 24.7	Pres: 24.7
Samp Fl: 580	Samp Fl: 580
Norm Pmt: 171.9	Norm Pmt: 172.7
Uv Lamp: 2301.4	Uv Lamp: 2299.3
Lamp Ratio: 84.0	Lamp Ratio: 84.0
Str Lgt: 79.9	Str Lgt: 80.6
Drk Pmt: 10.4	Drk Pmt: 10.5
Expected Value: 475.0	Expected Value: 474.0

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

SO2[ppb] Station: LICA MASKWA Daily: 18/04/10 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>April 10, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>942</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>A few clouds</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>11:30</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Rob Fisher</u>
End Time 24 hr. (mst): <u>15:55</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		
Analyzer: Serial Number/Owner: <u>510</u> <u>LICA</u>	Range ppb: <u>100</u>		
Last Calibration Date: <u>March 16, 2018</u>	As Found C.F.: <u>0.998</u>		
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>		

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u> Calibrator ID/Expiry Date: <u>Envionics id# 4760 expires March 2, 2019</u> Cal Gas Cylinder I.D. #: <u>EY 0000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <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	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: <u>12:21 / 12:31</u> SO2 Analyzer Range: <u>1000</u> Target Concentration (ppb): <u>780</u> As Found Zero: <u>0.0</u> Analyzer Response: (ppb): <u>0.0</u> Zero Corrected Result (ppb): <u>0.0</u>
Point	ppb									
High	78									
Mid	38									
Low	19									

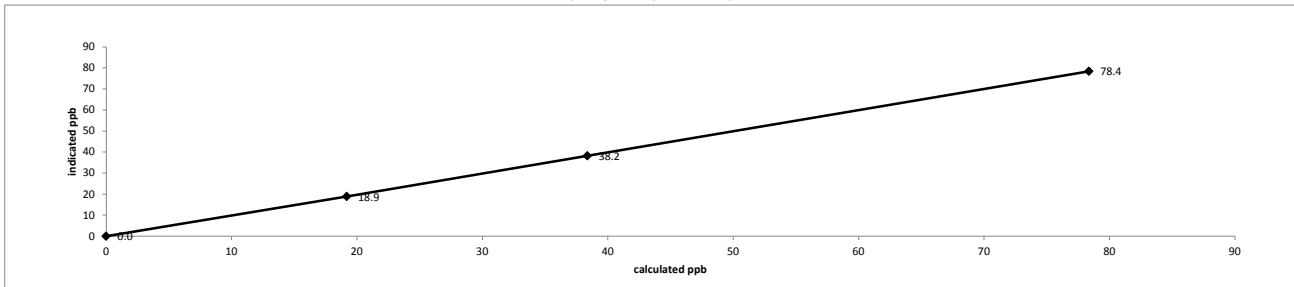
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7418	0.00	7418	0.0	-0.2	n/a
as found high	7362	57.00	7419	78.4	78.3	0.998
adjusted zero	7418	0.00	7418	0.0	0.0	n/a
adjusted high	7362	57.00	7419	78.4	78.4	1.000
mid	7395	27.92	7423	38.4	38.2	1.004
low	7407	13.96	7421	19.2	18.9	1.015
Calibrator zero	7418	0.00	7418	0.0	0.0	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	> or = 0.995
Slope =	<u>0.998</u>		0.95-1.05
b (Intercept as % of full scale) =	<u>0.16%</u>		± 3% F.S.
% change in C.F. from last cal =	<u>0.17%</u>		± 10%

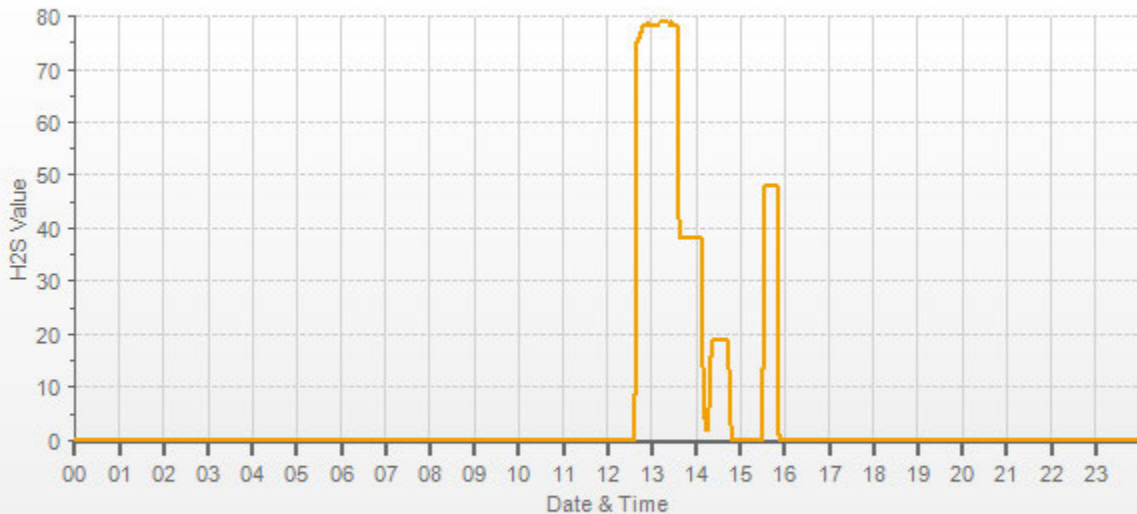
API 101E Hydrogen Sulphide Analyzer Calibration



As found: Slope: <u>0.978</u> Offset: <u>34.4</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.6</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>314.6</u> Pres: <u>20.1</u> Samp Fl: <u>526</u> Uv Lamp: <u>2830.7</u> Lamp Ratio: <u>84.3</u> Str Lgt: <u>16.8</u> Drk Pmt: <u>32.5</u> Expected Value: <u>48.5</u>	As left: Slope: <u>0.970</u> Offset: <u>34.0</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>35.2</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>314.9</u> Pres: <u>20.1</u> Samp Fl: <u>525</u> Uv Lamp: <u>2827.8</u> Lamp Ratio: <u>84.3</u> Str Lgt: <u>16.5</u> Drk Pmt: <u>32.9</u> Expected Value: <u>48.0</u>
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Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.

H2S[ppb] Station: LICA MASKWA Daily: 18/04/10 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: April 10, 2018		Barometer/B.P./units: F.S. 05544 expires January 5, 2019		942	millibars
Company/Airshed: LICA		Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019		22	°C
Location/Station Name: Maskwa		Weather Conditions: A few clouds			
Parameter: Total Hydrocarbon		Calibration Purpose: routine monthly			
Start/End Time 24 hr. (mst): 15:04 / 18:58		Performed By/Reviewer: Alex Yakupov		Rob Fisher	
Calibration Method: Gas Dilution		Cal Gas Expiry Date: November 24, 2022			
Analyzer:					
Serial Number/Owner: 436609738 LICA		Range ppm: 50			
Last Calibration Date: March 16, 2018		As Found C.F.: 0.994			
Previous Cal High Point C.F.: 0.999		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: EnviroNics id# 4760 expires March 2, 2019
 Cal Gas Cylinder I.D. #: LL 165367
 CH₄/C₂H₆ Cylinder Conc. (ppm): 590.0 207.0
 CH₄ as propane/total CH₄ equivalents (ppm): 569.3 1159.3

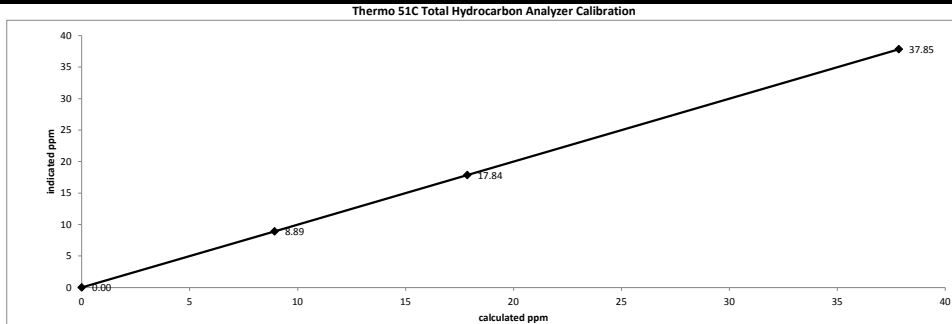
Point	Target ppm
High	38
Mid	18
Low	9

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	2502	0.00	2502	0.0	-0.07	n/a
as found high	2423	81.79	2505	37.85	38.01	0.994
adjusted zero	2502	0.00	2502	0.00	0.00	n/a
adjusted high	2423	81.79	2505	37.85	37.85	1.000
mid	2467	38.61	2506	17.86	17.84	1.001
low	2488	19.32	2507	8.93	8.89	1.005
calibrator zero	2502	0.00	2502	0.0	0.00	n/a
Average C.F.=						1.002

Linear Regression/Calibration Results:

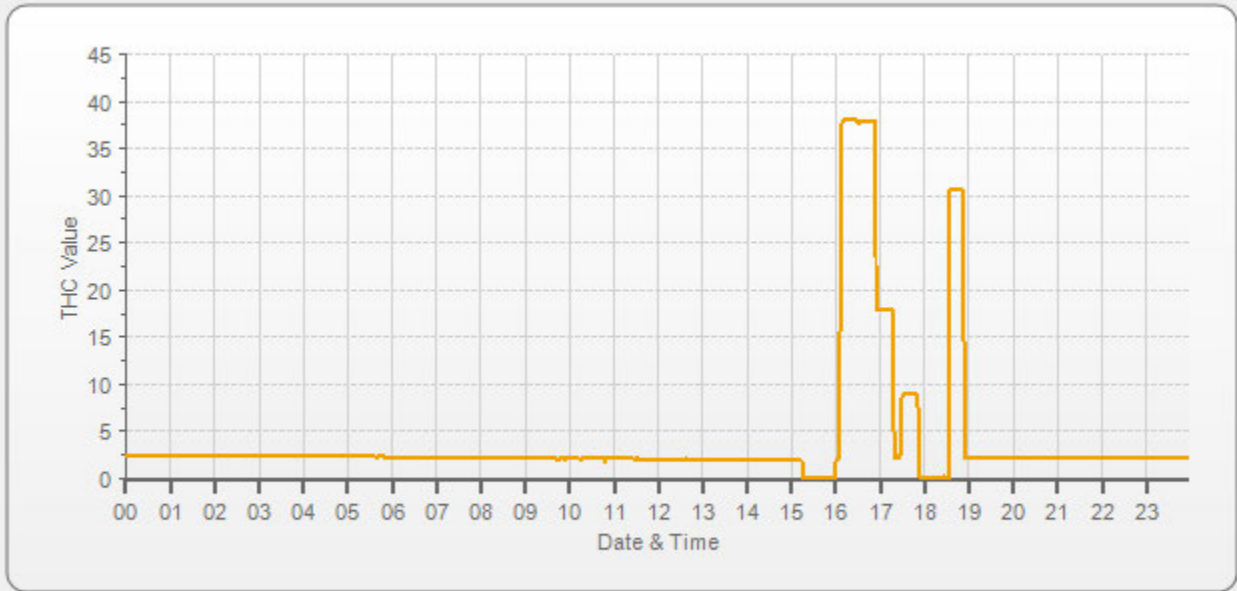
Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.95-1.05
b (Intercept as % of full scale)=	0.04%		± 3% F.S.
% change in C.F. from last cal=	0.50%		± 10%



<p style="text-align: center;">As found:</p> <p>measurement alarms: <u>None</u></p> <p>service alarms: <u>None</u></p> <p>cnt: <u>1905</u></p> <p>rng: <u>1</u></p> <p>try: <u>2</u></p> <p>flm: <u>202.5</u></p> <p>det: <u>125.4</u></p> <p>Flame: <u>202</u></p> <p>Filter: <u>125</u></p> <p>Base: <u>125</u></p> <p>Sample psi: <u>07.50</u></p> <p>Internal Air Pressure: <u>20</u></p> <p>Internal Fuel Pressure: <u>14</u></p>	<p style="text-align: center;">As left:</p> <p>measurement alarms: <u>None</u></p> <p>service alarms: <u>None</u></p> <p>cnt: <u>1914</u></p> <p>rng: <u>1</u></p> <p>try: <u>2</u></p> <p>flm: <u>202.9</u></p> <p>det: <u>125.5</u></p> <p>Flame: <u>202</u></p> <p>Filter: <u>125</u></p> <p>Base: <u>125</u></p> <p>Sample psi: <u>07.50</u></p> <p>Internal Air Pressure: <u>20</u></p> <p>Internal Fuel Pressure: <u>14</u></p>
<p>Cylinder/Regulator Pressures:</p> <p>H2 Cylinder (psi): <u>1100</u></p> <p>H2 cylinder reg set (psi): <u>26</u></p> <p>Zero Air Gen Pressure: <u>41</u></p> <p>Span Cylinder (psi): <u>500</u></p> <p>Span Cylinder reg set (psi): <u>26</u></p> <p>Measured Flow: <u>0.972</u></p> <p>Expected Value: <u>30.70</u></p>	<p>H2 Cylinder (psi): <u>1100</u></p> <p>H2 cylinder reg set (psi): <u>26</u></p> <p>Zero Air Gen Pressure: <u>41</u></p> <p>Span Cylinder (psi): <u>500</u></p> <p>Span Cylinder reg set (psi): <u>26</u></p> <p>Measured Flow: <u>n/a</u></p> <p>Expected Value: <u>30.60</u></p>

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]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: April 10, 2018	Barometer/B.P./units: F.S. 05544 expires January 5, 2019	942	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: A few clouds		
Start/End Time 24 hr. (mst): 11:30 / 17:58	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		

Analyzer: Serial Number/Owner: 2051 Maxxam Last Calibration Date: March 16, 2018 Range ppb: 1000	Correction Factors: <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>0.999</td> <td>1.009</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.010</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	0.999	1.009	1.000	NO ₂ =	1.000	1.000	1.000	NOx =	1.000	1.010	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	0.999	1.009	1.000														
NO ₂ =	1.000	1.000	1.000														
NOx =	1.000	1.010	0.999														

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: EnviroNics id# 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 NO₂ (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 ₂ (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 ₂ (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	5034	0.0	5034	0	0	0.0	0.0	n/a	n/a
as found high	4954	75.5	5029	773.1	774.6	766.0	767.0	1.009	1.010
adjusted zero	5034	0.00	5034	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4954	75.49	5029	773.1	774.6	773.0	775.0	1.000	0.999
mid	4992	36.82	5029	377.1	377.8	372.0	373.0	1.014	1.013
low	5009	18.47	5027	189.2	189.6	183.0	183.0	1.034	1.036
calibrator zero	5034	0.00	5034	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.016	1.016

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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4954	75.49	5029	0.0	776.0	777.0	1.0	0.0	1.0	
as found high NO2	4954	75.49	5029	510.0	284.0	777.0	493.0	492.0	492.0	1.000
adjusted high NO2	4954	75.49	5029	510.0	284.0	777.0	493.0	492.0	492.0	1.000
gpt mid	4954	75.49	5029	285.0	499.0	777.0	278.0	277.0	277.0	1.000
gpt low	4954	75.49	5029	105.0	677.0	777.0	100.0	99.0	99.0	1.000
Average NO ₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.997	1.002	0.95-1.05
b (Intercept as % of full scale)=	-0.35%	-0.37%	0.06%	± 3% F.S.
% change in C.F. from last cal=	-1.02%	-0.99%	0.00%	± 10%
NO2 converter efficiency			0.99	0.96 to 1.04

As found:	As left:
NOx SLOPE: 1.031	NOx SLOPE: 1.040
NOx OFFS: -2.2	NOx OFFS: -2.2
NO SLOPE: 1.031	NO SLOPE: 1.041
NO OFFS: -2.8	NO OFFS: -2.8
SAMP FLW: 501	SAMP FLW: 501
OZONE FL: 81	OZONE FL: 81
NORM PMT: -3.3	NORM PMT: -2.4
AZERO: 45.2	AZERO: 45.2
HVPS: 707	HVPS: 707
DCPS: 2569	DCPS: 2569
RCELL: 50.5	RCELL: 50.6
BOX TEMP: 28.1	BOX TEMP: 29.7
IZS TEMP: 43.0	IZS TEMP: 6.5
MOLY TEMP: 316.1	MOLY TEMP: 316.2
RCEL: 7.0	RCEL: 7.0
SAMP: 29.5	SAMP: 29.5
Expected Value NO: 6	Expected Value NO: 7
Expected Value NO2: 368	Expected Value NO2: 371
Expected Value NOx: 374	Expected Value NOx: 377

Comments:

The analyzer sample inlet filter was changed.

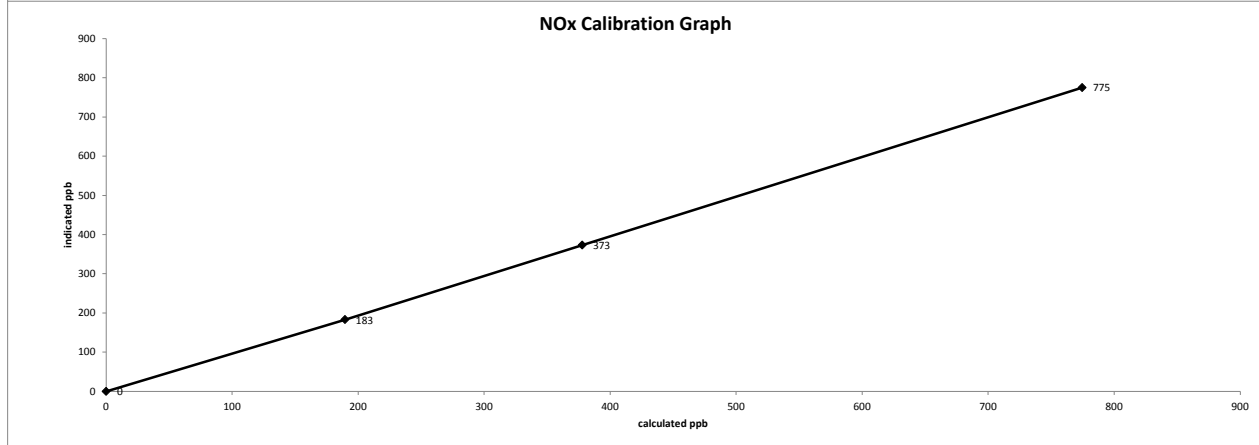
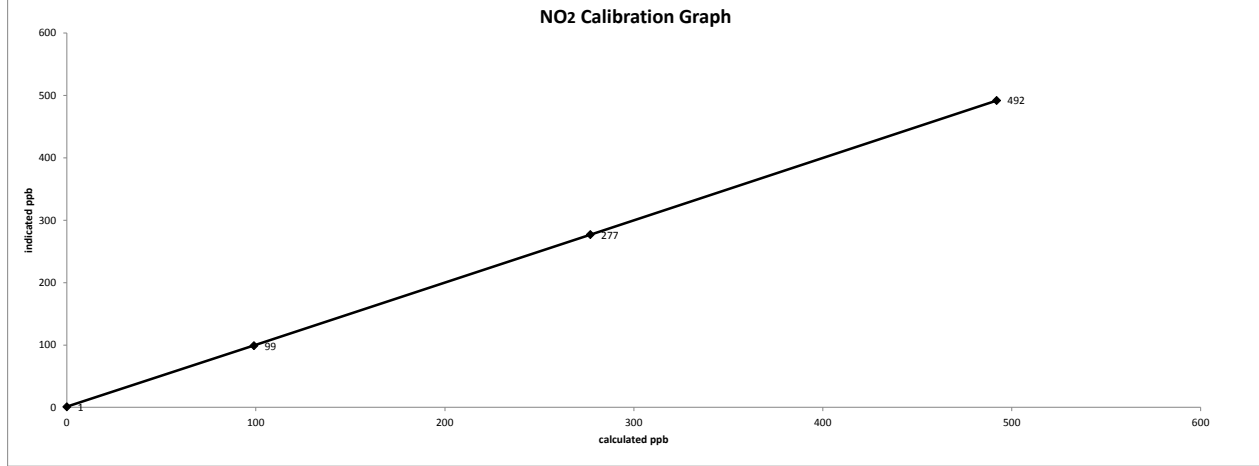
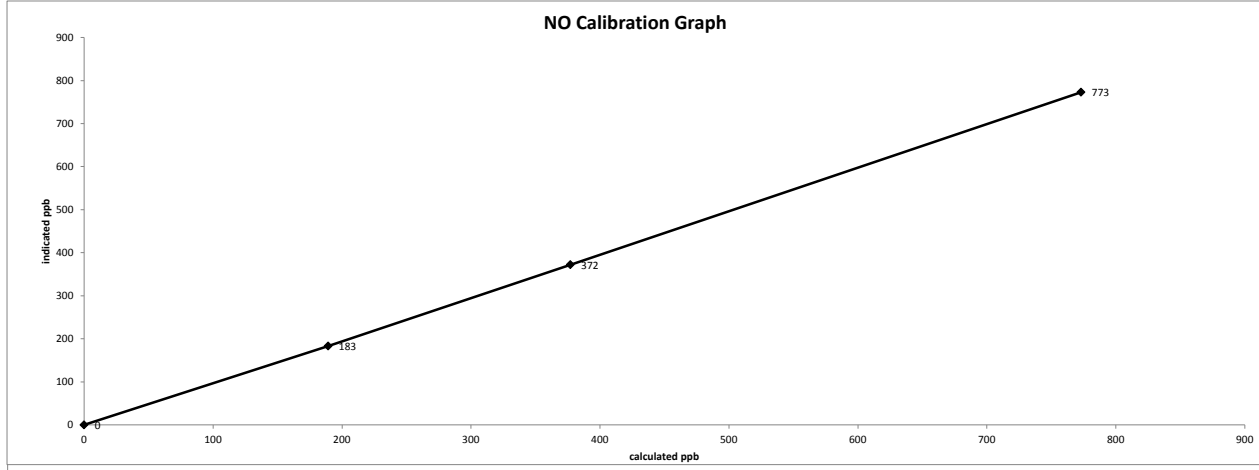
The manifold blower was found to be working normally.

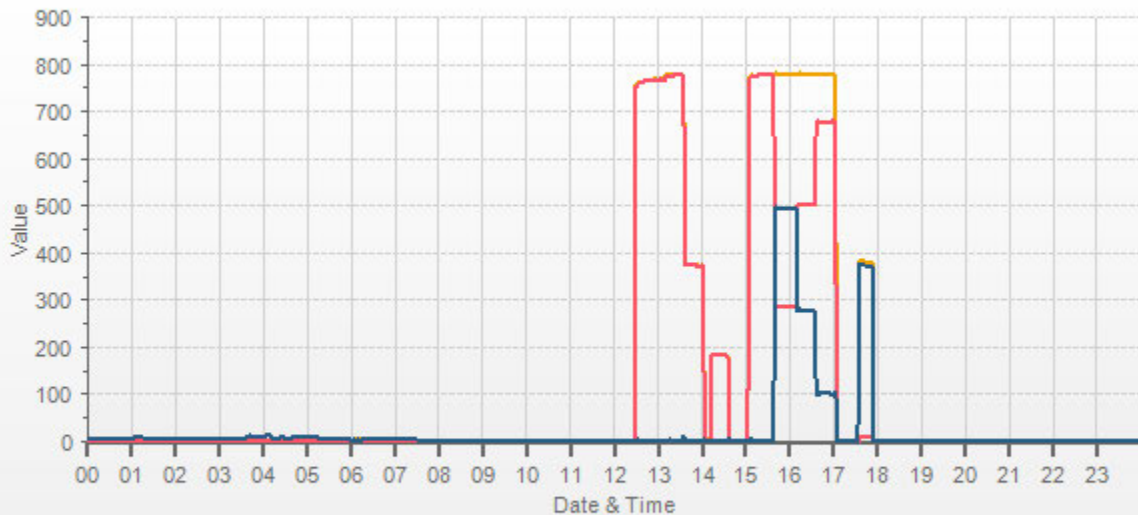
No high point NO2 adjustment was required/made.

Date: April 10, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 11:30 / 17:58
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration





— NOx[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date:	April 26, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	945	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):	10:25 / 15:03	Calibration Purpose:	shut down		
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		

Analyzer: Serial Number/Owner: 2051 Maxxam Last Calibration Date: April 10, 2018 Range ppb: 1000	Correction Factors: <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>1.010</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.000</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>1.012</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.010	n/a	NO ₂ =	1.000	1.000	n/a	NOx =	0.999	1.012	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.010	n/a														
NO ₂ =	1.000	1.000	n/a														
NOx =	0.999	1.012	n/a														

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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	Standard Calibration Points for a Range of: 1000 ppb <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (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>	Point	Target NO (ppb)	Target NO ₂ (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
Point	Target NO (ppb)	Target NO ₂ (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	5034	0.0	5034	0	0	0.0	0.0	n/a	n/a
as found high	4955	75.7	5031	774.5	776.0	767.0	767.0	1.010	1.012
mid	4998	36.90	5035	377.4	378.2	368.0	368.0	1.026	1.028
low	5020	18.46	5038	188.7	189.1	181.0	182.0	1.043	1.039
Average C.F. =								1.026	1.026

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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4955	75.66	5031	0.0	771.0	772.0	1.0	0.0	1.0	
as found high NO ₂	4955	75.66	5031	520.0	268.0	772.0	504.0	503.0	503.0	1.000
gpt mid	4955	75.66	5031	290.0	487.0	770.0	284.0	284.0	283.0	1.004
gpt low	4955	75.66	5031	100.0	676.0	772.0	96.0	95.0	95.0	1.000
Average NO₂ C.F. =										1.001

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.008	1.010	1.002	0.90-1.10
b (Intercept as % of full scale) =	-0.35%	-0.31%	0.04%	± 3% F.S.
% change in C.F. from last cal =	-0.98%	0.00%	-1.27%	± 10%
NO ₂ converter efficiency			0.99	0.96 to 1.04

As found: NOx SLOPE: 1.040 NOx OFFS: -2.2 NO SLOPE: 1.041 NO OFFS: -2.8 SAMP FLW: 502 OZONE FL: 81 NORM PMT: -2.6 AZERO: 45.2 HVPS: 707 DCPS: 2570 RCELL: 49.9 BOX TEMP: 29.5 IZS TEMP: 43.3 MOLY TEMP: 315.9 RCEL: 7.0 SAMP: 29.6 Expected Value NO: 7 Expected Value NO ₂ : 371 Expected Value NOx: 377	As left: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a DCPS: n/a RCELL: n/a BOX TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO ₂ : n/a Expected Value NOx: n/a
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Comments:

No high point NO₂ adjustment was required/made.

The manifold blower was found to be working normally.

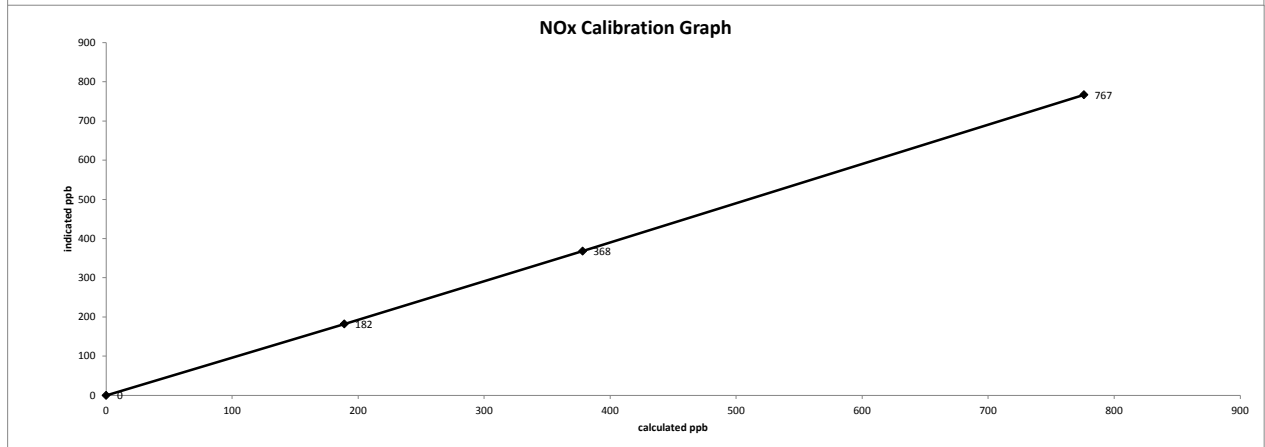
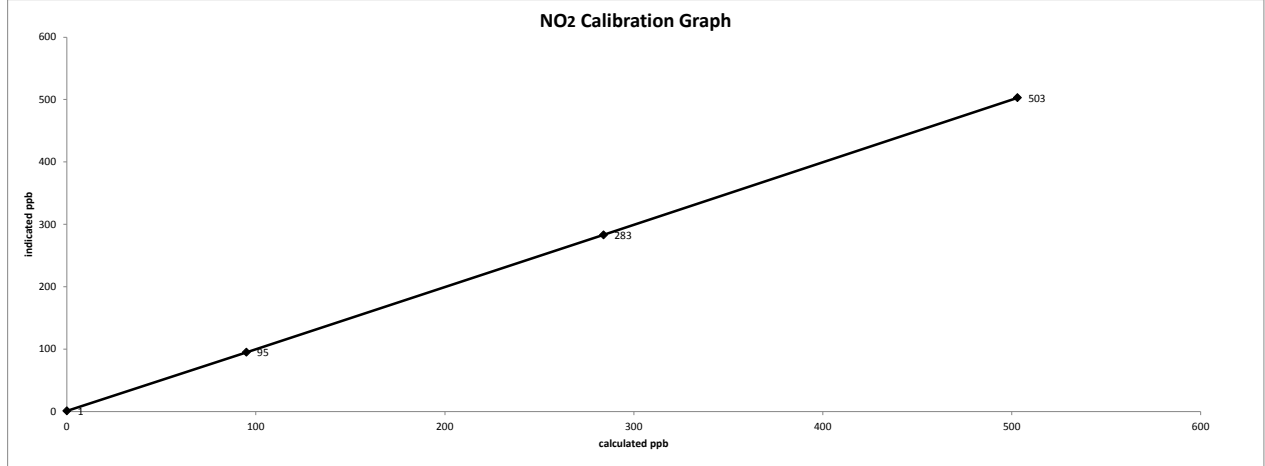
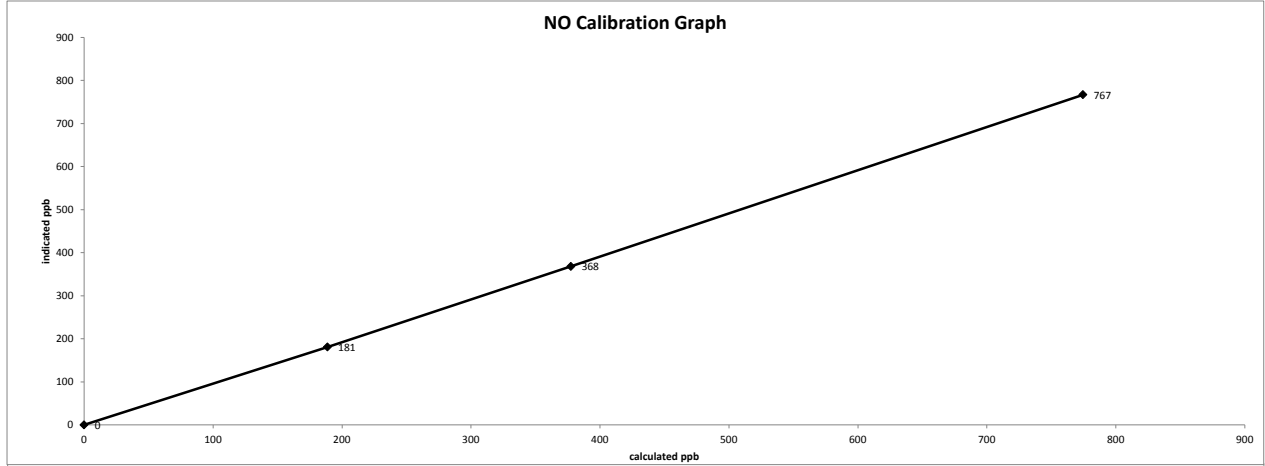
No zero adjustment was required/made.

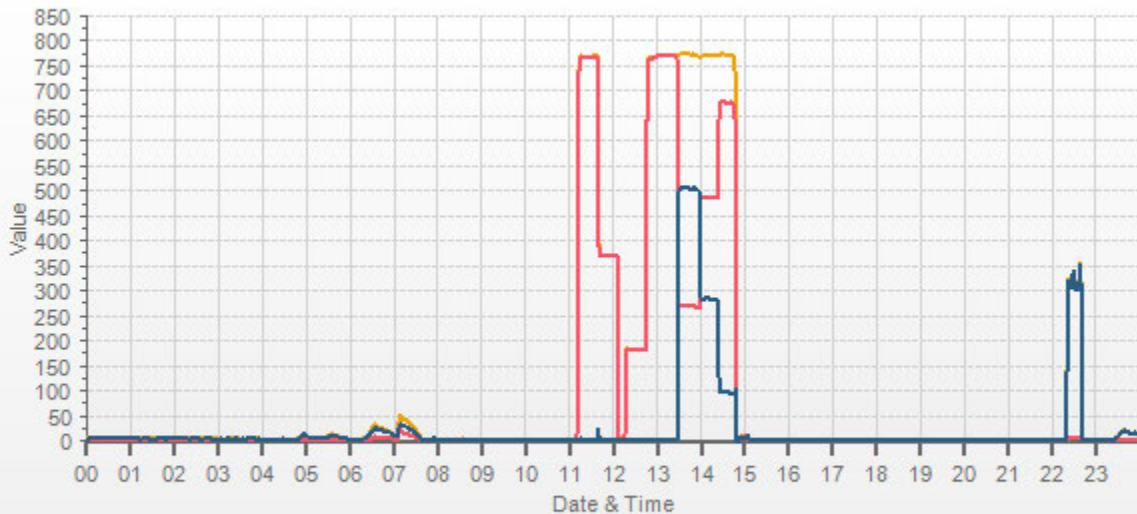
A Shutdown calibration was completed to replace the Analyzer #2051 with the Analyzer #1899; Analyzer #2051 showed unstable SPAN readings fluctuating between 3%-7%.

Date: April 26, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:25 / 15:03
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date: April 27, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Start/End Time 24 hr. (mst): 8:14 / 14:45 G.P.T. to be used for Ozone? No Calibration Method: Gas Dilution & Gas Phase Titration	Barometer/B.P./units: F.S. 05544 expires January 5, 2019 947 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: Installation Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020
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Analyzer: Serial Number/Owner: 1899 Maxxam Last Calibration Date: n/a Range ppb: 1000	Correction Factors: <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>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>n/a</td> <td>n/a</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>n/a</td> <td>n/a</td> <td>0.999</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	n/a	n/a	1.000	NO ₂ =	n/a	n/a	1.000	NOx =	n/a	n/a	0.999
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	n/a	n/a	1.000														
NO ₂ =	n/a	n/a	1.000														
NOx =	n/a	n/a	0.999														

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: Envionics id# 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" style="text-align: center;">Standard Calibration Points for a Range of: 1000 ppb</th> </tr> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (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 ₂ (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 ₂ (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)		
adjusted zero	5038	0.0	5038	0	0	0.0	0.0	n/a	n/a
adjusted high	4967	75.5	5042	771.0	772.5	771.0	773.0	1.000	0.999
mid	5001	36.95	5038	377.7	378.4	371.0	372.0	1.018	1.017
low	5016	18.46	5034	188.9	189.2	182.0	182.0	1.038	1.040
calibrator zero	5038	0.00	5038	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.019	1.019

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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4967	75.48	5042	0.0	771.0	773.0	1.0	0.0	1.0	
adjusted high NO2	4967	75.48	5042	520.0	259.0	772.0	513.0	512.0	512.0	1.000
gpt mid	4967	75.48	5042	290.0	482.0	772.0	290.0	289.0	289.0	1.000
gpt low	4967	75.48	5042	100.0	671.0	773.0	101.0	100.0	100.0	1.000
Average NO₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.998	0.997	1.001	0.95-1.05
b (Intercept as % of full scale)=	-0.41%	-0.43%	0.06%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	n/a
NO2 converter efficiency			0.97	0.96 to 1.04

As found: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a DCPS: n/a RCELL: n/a BOX TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO2: n/a Expected Value NOx: n/a	As left: NOx SLOPE: 1.055 NOx OFFS: -0.1 NO SLOPE: 1.058 NO OFFS: -0.8 SAMP FLW: 554 OZONE FL: 78 NORM PMT: -0.3 AZERO: 21.2 HVPS: 670 DCPS: 2564 RCELL: 50.3 BOX TEMP: 30.1 IZS TEMP: 55.5 MOLY TEMP: 315.1 RCEL: 6.4 SAMP: 26.6 Expected Value NO: 5 Expected Value NO2: 526 Expected Value NOx: 530
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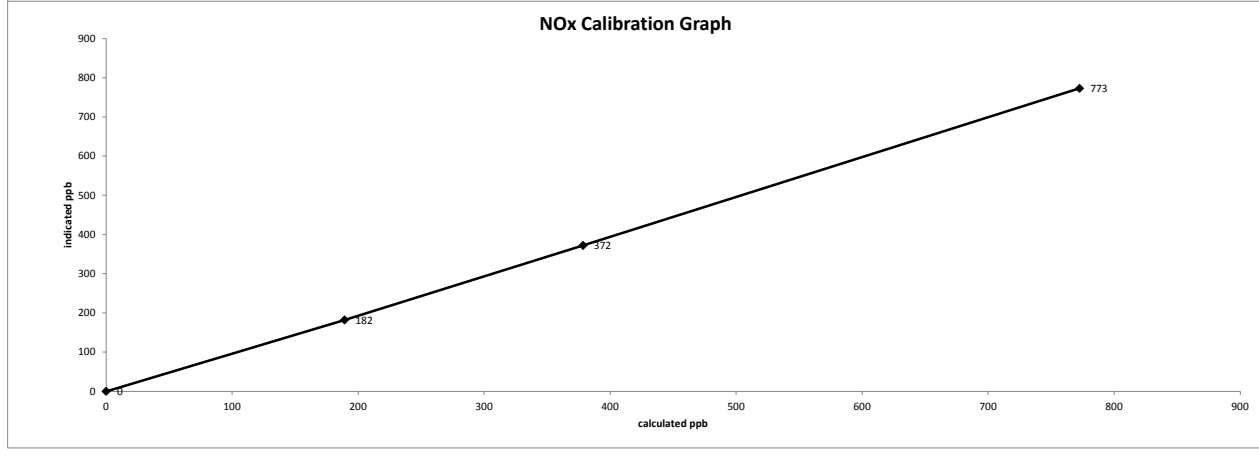
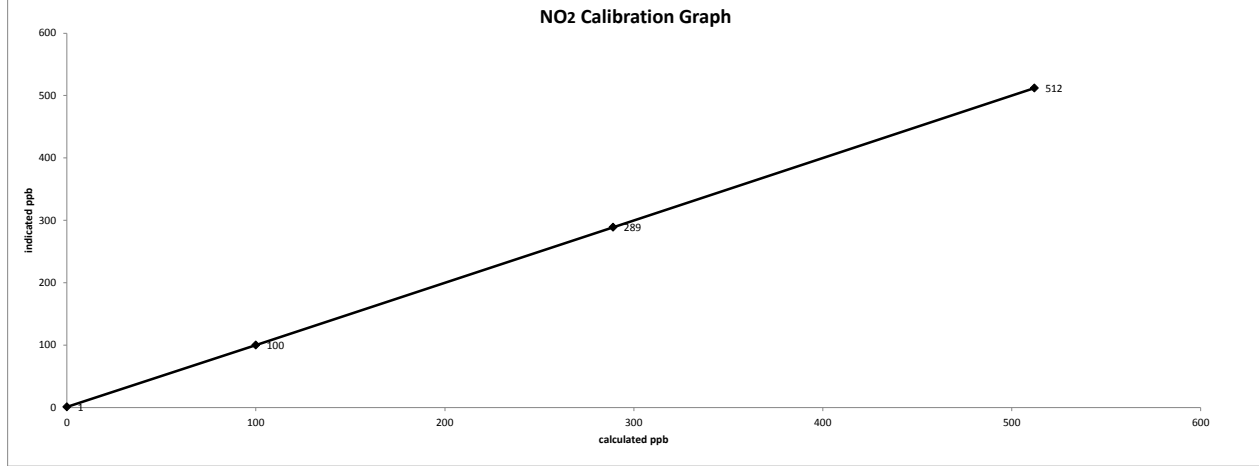
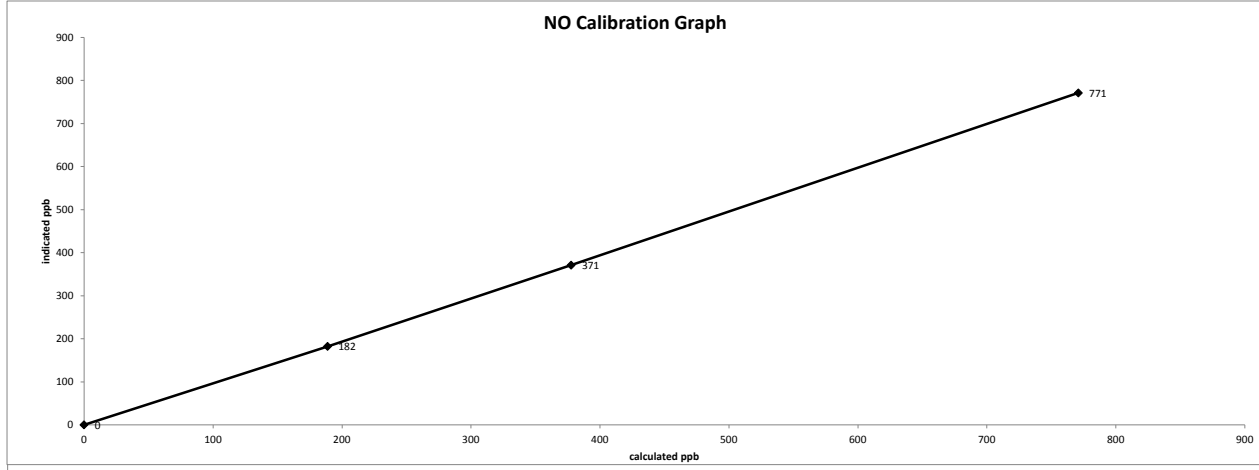
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.

The analyzer #1899 was installed to replace #2051 due to unstable daily SPAN checks. The following actions were performed prior to the installation calibration: the output voltage was calibrated, a leak check was performed, the IZS TEMP was adjusted from 47 to 55 degrees, the ZERO scrubber charcoal and Purafil were renewed, and stabilized for an hour after checks and adjustments. The new EVs will be updated after stabilization.

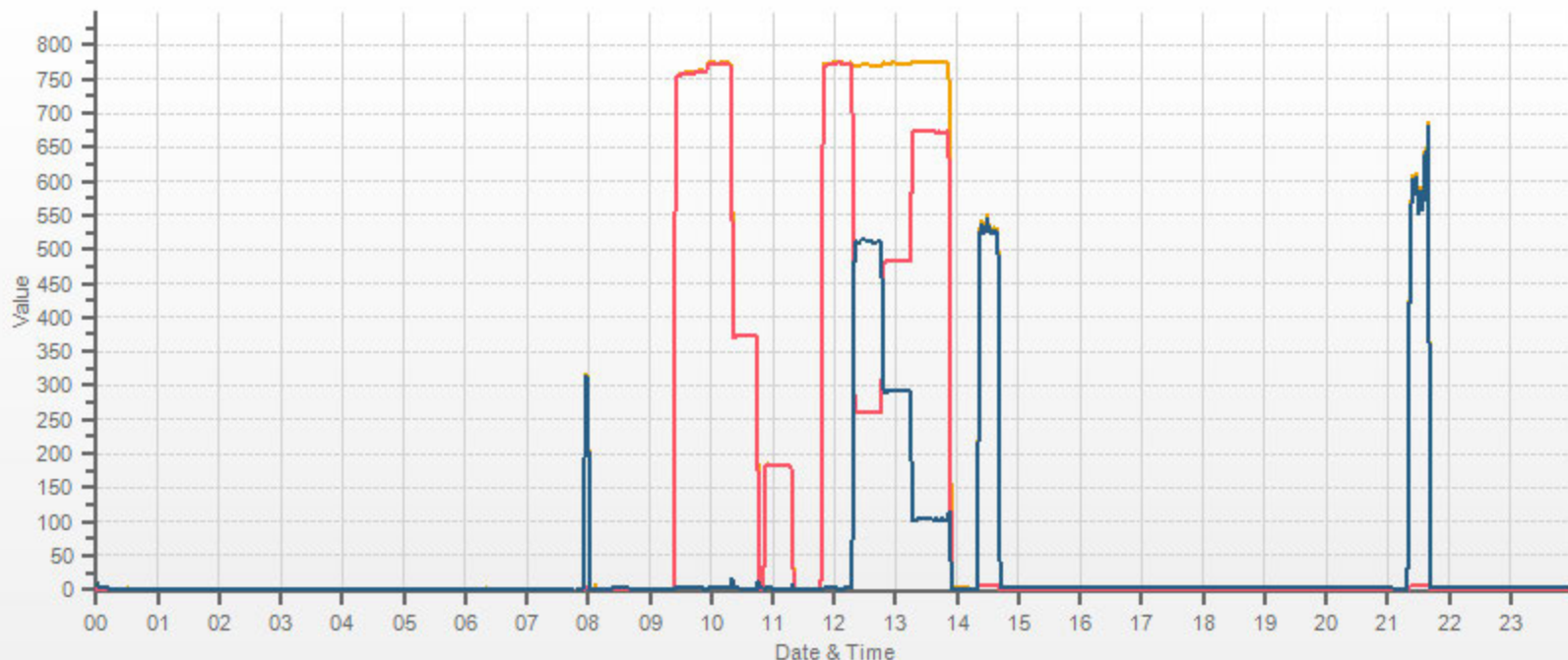
Date: April 27, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 8:14 / 14:45
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration



NOX[ppb] NO[ppb] NO2[ppb]



WIND SYSTEM



Meteorological Sensor Audit/Calibration

Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Maskwa	Reviewed By:	Rob Fisher
Audit Date:	December 28, 2017	Start/End Time (mst):	14:16 / 18:15
Calibration Purpose:	installation	Weather Conditions:	Mix of sun and clouds

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1 V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 km/h
Serial #:	92411	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:	October 23, 2017	Direction Unit Output Range:	0-360 degrees

Wind Calibrator Information

Calibrator I.D. and Expiry Date: RM Young 18802 id# CA03309 expires September 25, 2018

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	18.4	18.5	18.5	0.996
2000	36.9	36.9	36.9	1.000
3000	55.3	55.4	55.4	0.999
4000	73.7	73.9	73.8	0.998
5000	92.2	92.3	92.3	0.999
6000	110.6	110.7	110.7	0.999
7000	129.0	129.1	129.1	0.999
8000	147.4	147.6	147.6	0.999
9000	165.9	166.0	166.0	0.999
10000	184.3	184.4	184.4	0.999
The audit meets AMD requirements.			Average Correction Factor=	0.999

Wind Direction Audit Data ****+/- 3° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	356	0.0	-0.8	0.4
30	330	32	332	-1.6	-1.8	1.7
60	300	62	302	-2.0	-2.2	2.1
90	270	91	272	-1.4	-1.7	1.6
120	240	121	242	-1.3	-1.5	1.4
150	210	151	212	-1.2	-2.0	1.6
180	180	181	181	-1.4	-1.0	1.2
210	150	212	151	-2.4	-0.7	1.6
240	120	242	121	-2.2	-1.2	1.7
270	90	272	91	-2.4	-1.1	1.7
300	60	302	61	-2.0	-1.4	1.7
330	30	332	31	-2.0	-1.1	1.6
355	0	356	0	-0.8	0.4	0.6
The audit meets AMD requirements.				Average Absolute Degrees Difference=		1.4

Comments:

The Sonic Wind System was removed due high unrealistic mesurements. The RM Young Wind System was installed.

CALIBRATORS

Company: Maxxam Operator: Chris W

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

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 ₂	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 ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% 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)*

NO ₂		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 _x Analyzer	
Make/Model	Teco 146i	Make/Model	Teco 42i
Serial/AMU Number	AMU 1809	Serial/AMU Number	AMU 1868
SRM Gas Cylinder No.	APEX1170572	Last Calibration Date	March 1, 2018
Cylinder Conc. (ppm)	49.99	Full Scale (ppm)	1.0
		Cylinder Gas Expiry Date	November 2020

COMMENTS: Cylinder contains 25 ppm SO₂.

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 ₂	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 ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% 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 ₂		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 _x 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 SO₂.

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&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	0.000	0.000	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:					47.9

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. 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:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

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 (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
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:					10.1

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 Date: October 19, 2016
 Operator Signature: *Al Clark* 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&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						
<u>2600</u>	<u>0.0</u>	<u>0.00</u>	<u>0.00</u>	0.02005	49.883	602	206
<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:						600	207

	<u>CH4</u>		<u>C3H8</u>
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:						51.3	51.1

<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 (SO₂ 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 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	S	2	3	6	13	10	7	11	8	19	7	5	10	10	4	3	3	3	3	3	4	4	4	2	19	6	24	
2	S	3	3	3	3	3	3	3	3	3	3	3	11	5	5	5	3	3	3	3	5	4	4	S	3	11	4	24	
3	3	3	3	2	2	2	2	2	16	15	4	4	5	3	3	3	3	3	3	3	4	3	S	3	2	16	4	24	
4	4	4	4	4	3	3	3	3	3	5	12	10	8	12	13	14	17	22	5	2	3	S	2	6	2	22	7	24	
5	8	18	18	10	2	2	3	3	3	2	2	2	1	1	1	1	1	1	1	1	S	1	1	1	1	18	4	24	
6	2	3	2	2	2	1	2	3	10	27	16	14	8	3	3	2	2	2	2	S	2	2	2	2	2	1	27	5	24
7	2	2	2	2	2	2	2	2	4	3	3	3	3	3	3	4	5	7	S	3	3	3	3	3	2	7	3	24	
8	3	3	3	3	3	3	3	3	3	3	4	4	3	3	3	3	3	S	3	3	3	3	3	3	3	4	3	24	
9	3	2	3	2	2	2	4	7	5	5	5	4	4	4	4	S	4	3	3	3	3	3	4	5	2	7	4	24	
10	3	4	3	3	4	4	3	4	3	3	P	C	C	C	C	C	2	2	2	2	2	2	2	2	2	4	3	23	
11	2	3	3	3	3	4	3	3	3	3	3	3	3	3	S	3	4	3	3	3	3	3	3	3	2	4	3	24	
12	4	2	2	3	3	2	2	3	3	5	5	6	4	S	3	2	4	3	4	2	2	2	2	2	2	6	3	24	
13	2	2	2	2	2	2	2	3	3	4	3	3	S	2	2	3	3	3	2	2	2	2	2	2	2	4	2	24	
14	2	2	3	3	2	2	2	2	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	24	
15	3	3	3	2	2	2	2	2	9	9	S	6	6	8	10	8	4	3	3	3	2	3	3	3	2	10	4	24	
16	3	3	3	3	3	3	2	3	3	S	3	3	3	3	3	3	3	3	3	7	8	9	8	5	2	9	4	24	
17	9	11	7	9	5	11	11	9	S	7	8	6	4	4	4	4	3	4	3	3	3	3	3	4	4	3	11	6	24
18	4	4	4	4	3	3	2	S	3	3	3	2	2	2	2	2	2	2	3	4	3	2	2	2	2	4	3	24	
19	2	2	2	2	2	2	S	2	2	2	3	3	2	2	3	3	3	3	3	3	3	3	4	5	5	2	5	3	24
20	5	4	4	3	3	S	3	3	4	14	13	8	3	4	3	3	3	3	3	3	3	3	3	3	3	14	4	24	
21	3	3	3	3	S	3	3	3	4	6	7	4	4	5	4	6	4	4	4	4	4	4	16	24	7	3	24	6	24
22	5	4	4	S	4	4	4	3	4	3	3	3	3	4	4	27	28	28	32	38	27	4	3	3	3	38	10	24	
23	2	5	S	5	4	2	2	5	5	2	3	5	11	11	8	4	2	2	2	4	4	2	2	2	2	11	4	24	
24	2	S	2	2	2	2	3	4	5	5	4	4	3	3	3	3	3	3	6	38	41	23	27	2	41	8	24		
25	S	15	24	37	20	4	5	5	13	5	16	9	14	12	11	9	10	5	3	3	3	4	3	S	3	37	10	24	
26	5	3	3	3	4	4	13	45	3	3	4	3	8	15	7	5	3	8	3	3	3	3	S	11	3	45	7	24	
27	5	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	S	4	4	2	5	3	24	
28	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	5	6	5	5	5	S	5	5	7	4	7	5	24	
29	6	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	S	3	3	3	3	6	4	24	
30	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	S	4	4	6	5	5	3	6	4	24
HOURLY MAX	9	18	24	37	20	13	13	45	16	27	19	14	14	15	13	27	28	28	32	38	38	41	24	27	3	6	4	24	
HOURLY AVG	4	4	4	5	4	3	4	5	5	6	6	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	24

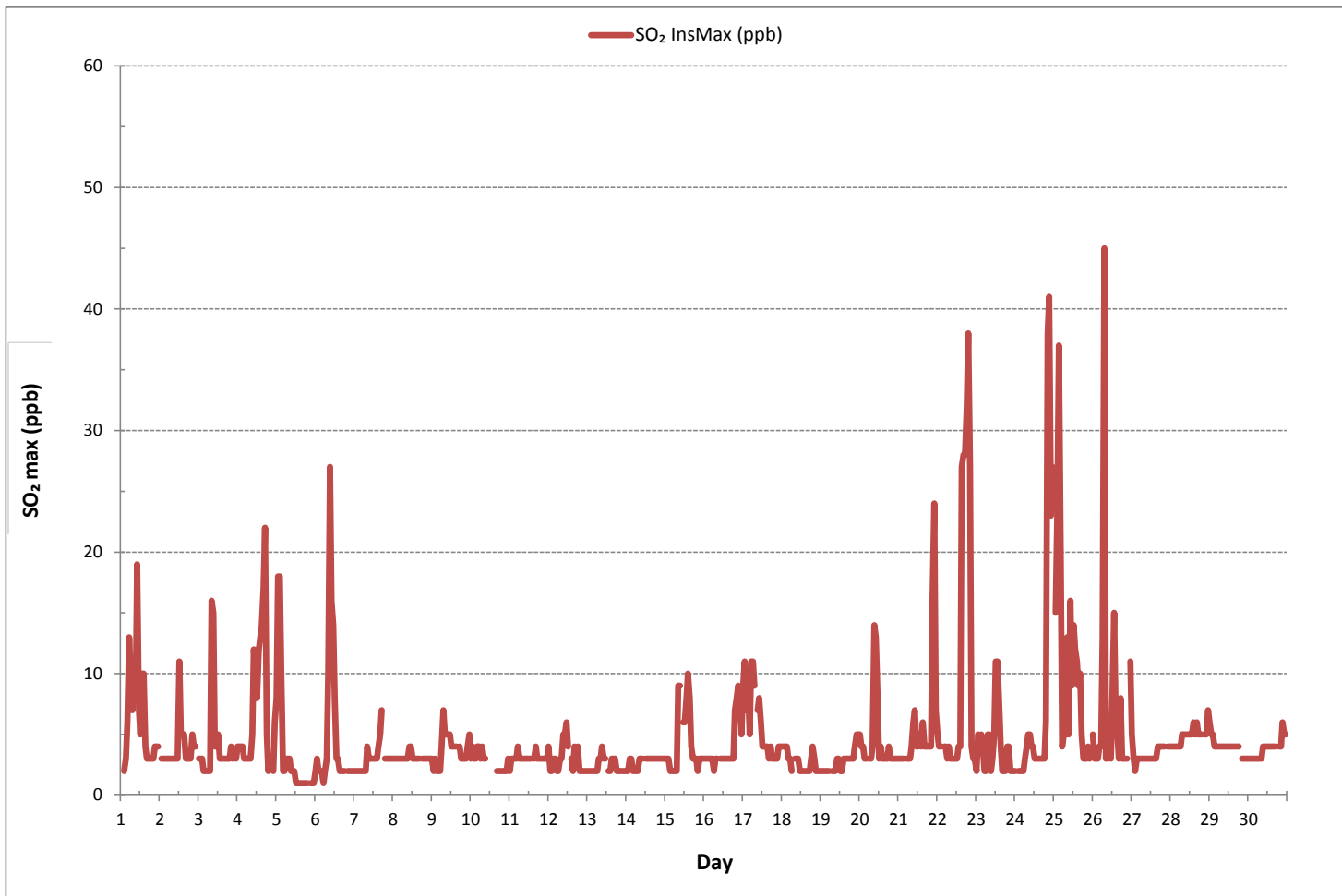
STATUS FLAG CODES

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:	683
MAXIMUM INSTANTANEOUS VALUE:	45 ppb @ HOUR 7 ON DAY 26
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	719 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S 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 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	0	S	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
2	S	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24
3	0	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	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	S	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	S	0	0	0	0	0	0	24
6	0	0	0	0	0	0	0	0	1	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	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
8	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
9	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
10	0	0	0	0	0	0	0	0	0	0	P	C	C	C	C	C	C	0	0	0	1	1	0	1	1	0	1	0	23
11	1	1	0	0	0	0	0	0	0	0	0	1	1	1	S	1	0	1	1	1	1	0	0	0	0	0	1	0	24
12	1	1	0	0	0	1	1	0	0	0	0	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
13	0	1	0	0	0	0	1	0	0	1	0	0	S	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	24
14	0	0	1	1	0	1	0	1	0	1	0	S	1	0	0	0	1	1	1	1	1	0	0	1	1	0	1	1	24
15	0	1	1	1	0	1	0	0	0	1	S	0	0	0	1	1	0	0	1	1	1	1	0	1	1	0	1	1	24
16	0	0	1	1	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	24
17	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	24
18	1	0	1	1	1	1	1	S	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	0	1	0	S	0	0	0	0	0	0	0	1	0	1	0	1	1	1	1	1	0	0	0	1	0	24
20	1	1	1	1	1	S	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	0	1	1	1	0	1	1	24
21	1	1	0	1	S	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
22	1	1	1	S	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1	2	2	1	1	0	0	2	1	24
23	0	0	S	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	0	24
24	0	S	1	1	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	24
25	S	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	S	0	1	1	24
26	1	1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	0	1	1	1	1	0	0	S	1	0	1	1	24
27	0	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	0	1	1	24
28	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	S	1	1	1	0	3	1	24
29	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	S	1	0	1	1	0	1	1	1	24
30	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	1	0	S	1	1	1	1	1	0	0	1	1	24
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	2	2	1	1	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	1	1	0	0	1	1	0	0		

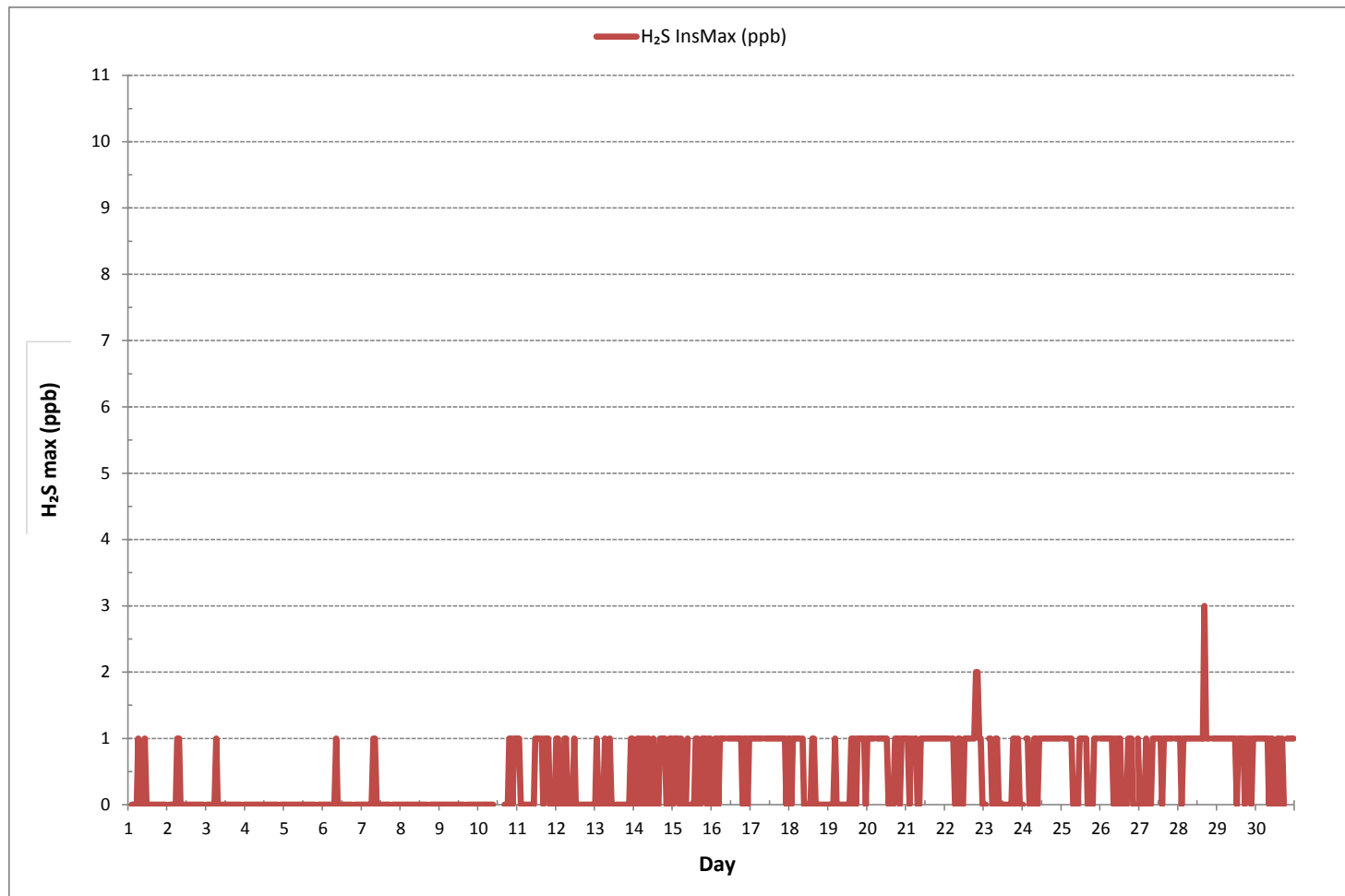
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	297
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 16 ON DAY 28
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	1
OPERATIONAL TIME:	719 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - April 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	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	2.16	S	2.17	2.20	2.20	2.32	2.26	2.23	2.13	2.13	2.79	2.07	2.05	2.04	2.04	2.04	2.04	2.04	2.05	2.07	2.19	2.10	2.14	2.20	2.04	2.79	2.16	24	
2	S	2.23	2.16	2.10	2.10	2.10	2.10	2.35	2.11	2.07	2.05	2.05	2.07	2.05	2.04	2.05	2.07	2.07	2.10	2.11	2.13	2.13	2.14	S	2.04	2.35	2.11	24	
3	2.17	2.23	2.23	2.37	2.47	2.32	2.51	2.41	2.26	2.20	2.13	2.13	2.10	2.08	2.10	2.11	2.13	2.13	2.14	2.13	2.14	2.17	S	2.17	2.08	2.51	2.21	24	
4	2.28	2.20	2.23	2.22	2.26	2.19	2.35	2.22	2.14	2.13	2.13	2.11	2.10	2.10	2.10	2.13	2.13	2.13	2.11	2.13	2.13	S	2.16	2.19	2.10	2.35	2.17	24	
5	2.17	2.19	2.20	2.20	2.20	2.23	2.23	2.25	2.26	2.26	2.25	2.25	2.26	2.26	2.23	2.25	2.26	2.23	2.26	2.29	S	2.31	2.34	2.32	2.17	2.34	2.25	24	
6	2.34	2.63	2.72	2.57	2.82	2.87	2.72	2.63	2.66	2.37	2.29	2.28	2.28	2.29	2.26	2.23	2.20	2.17	2.19	S	2.29	2.35	2.40	2.53	2.17	2.87	2.44	24	
7	2.45	2.44	2.53	2.50	2.44	2.44	3.02	3.36	2.56	2.22	2.19	2.13	2.13	2.13	2.11	2.07	2.05	2.07	S	2.10	2.13	2.13	2.10	2.13	2.05	3.36	2.32	24	
8	2.17	2.17	2.17	2.16	2.17	2.17	2.32	2.26	2.07	2.08	2.08	2.08	2.08	2.08	2.10	2.10	2.13	S	2.14	2.16	2.20	2.22	2.28	2.26	2.07	2.32	2.16	24	
9	2.29	2.29	2.31	2.35	2.37	2.37	2.37	2.38	2.29	2.29	2.32	2.29	2.20	2.19	2.13	2.13	S	2.10	2.08	2.10	2.14	2.32	2.25	2.28	2.08	2.38	2.25	24	
10	2.31	2.32	2.32	2.38	2.38	2.38	2.25	2.23	2.11	2.08	P	2.07	2.04	1.99	1.99	C	C	C	C	C	2.13	2.11	2.10	2.08	2.08	1.99	2.38	2.18	23
11	2.08	2.07	2.07	2.10	2.07	2.10	2.08	2.07	2.07	2.07	2.07	2.05	2.05	2.05	S	2.04	2.05	2.04	2.05	2.10	2.10	2.13	2.13	2.20	2.04	2.20	2.08	24	
12	2.22	2.22	2.14	2.32	2.17	2.20	2.23	2.14	2.14	2.10	2.10	2.08	2.08	S	2.08	2.10	2.13	2.11	2.11	2.13	2.26	2.47	2.32	2.37	2.08	2.47	2.18	24	
13	2.40	2.40	2.69	2.63	2.57	2.66	2.64	2.37	2.32	2.34	2.31	2.23	S	2.22	2.23	2.23	2.20	2.23	2.23	2.22	2.22	2.23	2.20	2.19	2.19	2.69	2.35	24	
14	2.16	2.14	2.13	2.13	2.11	2.10	2.13	2.13	2.13	2.13	2.17	S	2.26	2.26	2.28	2.28	2.28	2.32	2.25	2.21	2.23	2.32	2.57	2.57	2.10	2.67	2.23	24	
15	2.59	2.55	2.61	2.66	2.60	2.48	2.45	2.38	2.44	2.29	S	2.19	2.17	2.17	2.16	2.13	2.05	2.07	2.10	2.10	2.10	2.11	2.10	2.10	2.05	2.66	2.29	24	
16	2.11	2.10	2.08	2.11	2.10	2.11	2.08	2.10	2.10	S	2.05	2.07	2.05	2.05	2.02	2.04	2.01	2.01	1.99	2.07	2.08	2.10	2.08	2.04	1.99	2.11	2.07	24	
17	2.10	2.07	2.04	2.05	1.98	2.13	2.07	2.04	S	1.96	1.98	1.98	1.98	2.01	2.07	2.13	2.17	2.17	2.13	2.11	2.11	2.10	2.10	2.10	1.96	2.17	2.07	24	
18	2.11	2.13	2.17	2.17	2.20	2.21	2.21	S	2.25	2.17	2.14	2.17	2.29	2.17	2.17	2.17	2.20	2.18	2.19	2.17	2.20	2.21	2.26	2.28	2.11	2.29	2.19	24	
19	2.26	2.32	2.41	2.53	2.53	2.60	S	2.57	2.44	2.38	2.34	2.29	2.28	2.20	2.26	2.25	2.26	2.19	2.26	2.26	2.28	2.32	2.35	2.31	2.19	2.60	2.34	24	
20	2.29	2.29	2.34	2.45	2.35	S	2.45	2.44	2.40	2.37	2.26	2.16	2.11	2.13	2.07	2.07	2.04	2.08	2.10	2.13	2.17	2.23	2.16	2.29	2.04	2.45	2.23	24	
21	2.41	2.43	2.44	2.54	S	2.49	2.32	2.25	2.13	2.14	2.19	2.23	2.22	2.20	2.16	2.13	2.07	2.05	2.01	1.98	1.98	2.10	2.08	2.02	1.98	2.54	2.20	24	
22	1.98	1.99	1.99	S	1.98	1.98	2.01	1.99	2.01	2.04	2.04	2.04	2.11	2.11	2.11	2.17	2.18	2.17	2.29	2.29	2.31	2.28	2.18	2.20	1.98	2.31	2.11	24	
23	2.19	2.21	S	2.23	2.23	2.26	2.28	2.26	2.22	2.20	2.23	2.21	2.19	2.15	2.17	2.20	2.20	2.17	2.17	2.23	2.25	2.26	2.26	2.31	2.15	2.31	2.22	24	
24	2.41	S	2.29	2.31	2.32	2.32	2.34	2.32	2.44	2.44	2.29	2.26	2.13	2.07	2.07	2.07	2.05	2.04	2.07	2.18	2.10	2.08	2.10	2.14	2.04	2.44	2.21	24	
25	S	2.14	2.13	2.14	2.13	2.16	2.15	2.10	2.11	2.07	2.07	2.05	2.04	2.11	2.08	2.07	2.13	2.07	2.07	2.07	2.07	2.12	2.15	2.13	2.04	2.16	2.10	24	
26	2.16	2.19	2.19	2.20	2.19	2.20	2.29	2.20	2.04	2.04	2.05	2.05	2.10	2.13	2.11	2.10	2.07	2.07	2.07	2.10	2.10	2.10	S	2.54	2.04	2.54	2.14	24	
27	2.17	2.17	2.17	2.19	2.19	2.19	2.23	2.23	2.19	S1	2.13	2.15	2.13	2.11	2.07	2.07	2.07	2.07	2.04	2.04	2.01	S	2.08	2.08	2.01	2.23	2.13	23	
28	2.08	2.07	2.07	2.11	2.10	2.21	2.13	2.10	2.07	2.04	2.02	1.99	2.01	2.01	1.96	1.93	1.90	1.89	1.89	1.86	S	2.13	1.98	1.89	1.86	2.21	2.02	24	
29	1.89	1.90	1.90	1.95	1.98	1.99	2.01	2.01	2.01	2.01	2.04	2.04	2.05	2.05	2.05	2.05	2.04	2.13	S	2.08	2.19	2.26	2.29	1.89	1.89	2.29	2.04	24	
30	2.29	2.48	2.51	2.48	2.76	2.54	2.44	2.41	2.11	2.17	2.15	2.08	2.10	2.04	2.04	2.04	2.04	2.01	S	2.01	2.10	2.07	2.10	2.08	2.01	2.76	2.22	24	
HOURLY MAX	2.59	2.63	2.72	2.66	2.82	2.87	3.02	3.36	2.66	2.44	2.79	2.29	2.29	2.29	2.28	2.28	2.32	2.29	2.29	2.31	2.47	2.57	2.57						
HOURLY AVG	2.22	2.23	2.26	2.29	2.27	2.29	2.30	2.29	2.21	2.17	2.17	2.13	2.13	2.12	2.11	2.12	2.11	2.10	2.12	2.12	2.15	2.19	2.19	2.22					

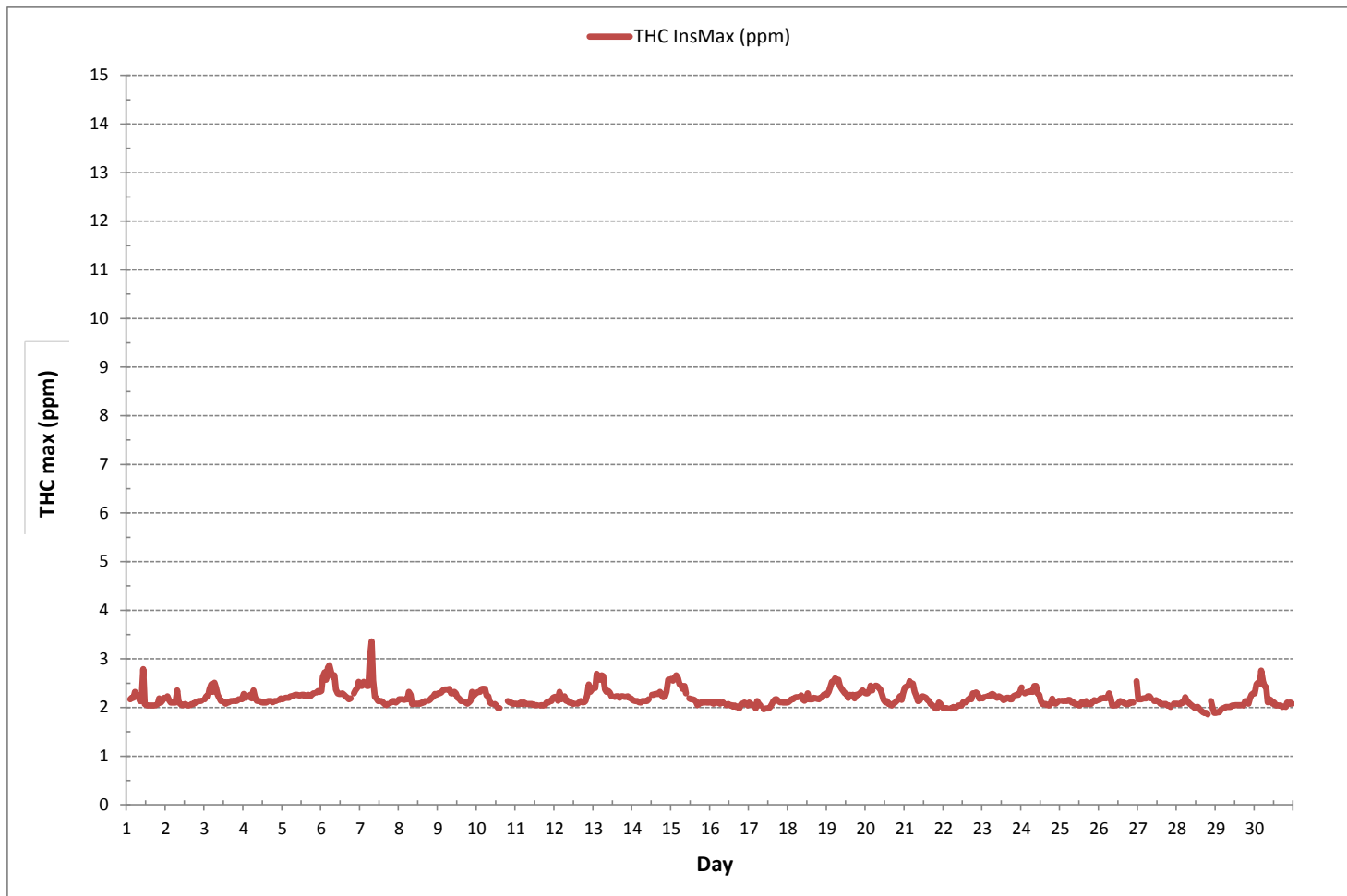
STATUS FLAG CODES

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:	683
MAXIMUM INSTANTANEOUS VALUE:	3.36 ppm @ HOUR 7 ON DAY 7
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	718 hrs
STANDARD DEVIATION:	0.16

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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 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	1	S	4	9	13	26	24	13	13	11	18	7	3	10	7	2	2	1	1	1	1	1	2	2	1	26	7	24	
2	S	2	2	1	2	1	20	21	3	2	2	2	11	7	4	4	1	2	2	2	3	2	2	S	1	21	4	24	
3	3	2	2	2	2	11	12	11	24	22	4	4	6	3	2	10	2	2	2	2	3	7	4	S	3	2	24	6	24
4	2	2	2	6	3	7	3	2	3	6	14	11	8	14	13	30	21	24	4	1	2	S	2	7	1	30	8	24	
5	10	20	20	10	2	3	4	4	4	3	3	17	1	1	2	2	2	0	0	0	S	3	4	3	0	20	5	24	
6	7	8	6	10	13	9	18	17	19	37	18	16	23	6	5	4	2	2	0	S	5	3	5	5	0	37	10	24	
7	4	3	3	3	9	45	20	16	7	6	3	2	2	2	3	6	5	9	S	2	3	3	3	3	2	45	7	24	
8	4	4	2	2	1	1	3	3	1	2	2	2	1	2	1	1	1	S	3	3	3	3	3	3	3	1	4	2	24
9	4	4	7	5	5	11	11	10	9	8	7	5	5	23	3	S	4	2	2	2	2	6	8	7	2	23	7	24	
10	6	8	6	12	14	9	4	4	2	2	P	C	C	C	C	C	C	C	2	1	1	1	1	1	1	14	5	23	
11	0	0	0	2	1	3	1	2	1	1	2	2	1	1	S	2	3	2	2	3	2	2	2	2	0	3	2	24	
12	5	1	0	0	1	2	2	4	4	14	13	10	6	S	30	2	4	3	4	2	18	5	3	4	0	30	6	24	
13	4	3	3	3	3	3	4	4	5	4	3	3	S	2	3	3	3	3	2	2	2	2	2	2	2	2	5	3	24
14	2	2	2	2	2	2	2	2	2	3	3	S	3	4	3	4	3	3	3	2	4	11	4	5	2	11	3	24	
15	7	6	6	6	5	4	4	3	16	16	S	10	9	14	14	14	5	1	1	2	1	1	1	1	1	16	6	24	
16	1	1	1	1	1	2	2	2	2	S	1	1	1	2	1	2	2	2	2	10	16	16	14	6	1	16	4	24	
17	18	16	10	16	7	20	14	16	S	9	10	6	2	2	4	4	4	4	4	3	3	7	4	3	2	20	8	24	
18	3	4	4	6	3	4	4	S	6	3	3	11	2	2	3	2	2	1	2	2	2	2	2	3	1	11	3	24	
19	2	2	3	4	4	4	S	7	6	5	6	3	2	3	2	2	2	2	2	2	2	4	6	6	2	7	4	24	
20	6	4	3	3	3	S	4	43	8	18	16	11	2	3	2	1	1	2	2	9	8	2	22	2	1	43	8	24	
21	2	2	1	2	S	2	2	2	2	10	8	2	2	5	3	15	2	2	2	2	2	2	27	38	14	1	38	6	24
22	13	1	1	S	1	1	13	2	1	2	20	1	4	7	6	31	32	29	42	42	28	11	1	9	1	42	13	24	
23	4	20	S	18	18	4	S1	S1	36	4	4	4	10	10	25	3	2	1	1	3	4	3	4	2	1	36	9	22	
24	4	S	3	6	6	4	7	7	9	47	6	6	4	2	2	2	23	1	2	4	41	48	25	29	1	48	13	24	
25	S	17	24	40	27	4	7	4	10	3	17	8	13	10	9	7	8	3	0	3	6	3	3	S	0	40	10	24	
26	6	3	3	3	14	13	33	55	3	1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	1	55	13	10	
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	2	2	1	1	1	2	S	2	2	1	2	2	9	
28	1	1	1	1	1	2	4	2	2	2	2	2	2	2	2	1	1	1	4	2	S	2	22	22	1	22	4	24	
29	3	1	1	1	2	2	S1	S1	S1	S1	2	1	1	1	1	1	1	1	2	S	1	2	1	1	1	3	1	20	
30	1	1	1	1	1	2	4	4	1	2	1	2	3	1	1	1	1	1	S	2	2	4	3	3	1	4	2	24	
HOURLY MAX	18	20	24	40	27	45	33	55	36	47	20	17	23	14	30	31	32	29	42	42	41	48	38	29					
HOURLY AVG	5	5	4	6	6	7	9	10	7	9	7	6	5	5	7	6	5	4	3	4	6	7	7	6					

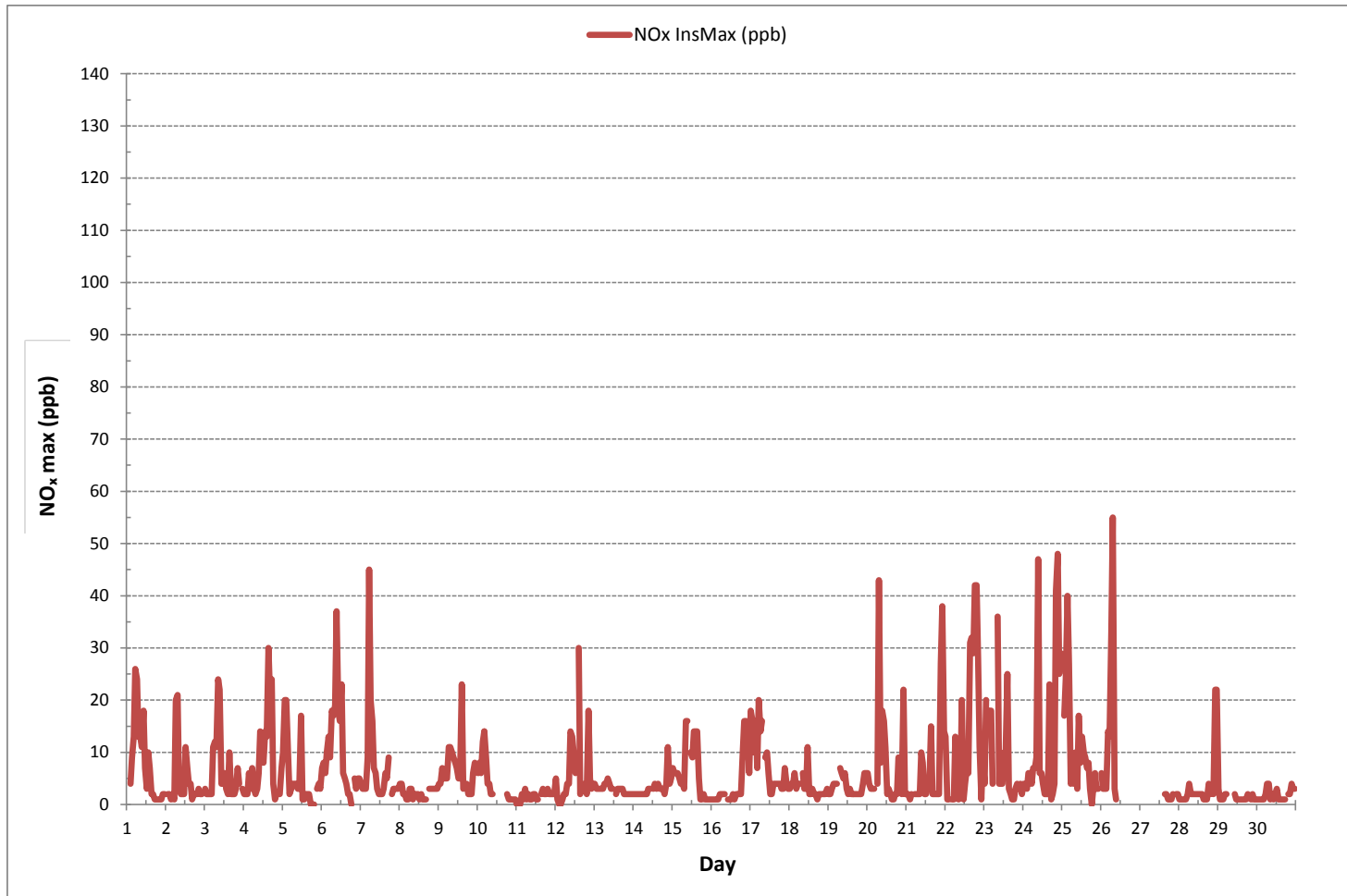
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	637
MAXIMUM INSTANTANEOUS VALUE:	55 ppb @ HOUR 7 ON DAY 26
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	684 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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	S	1	0	0	3	4	3	5	4	8	4	1	4	3	0	0	0	0	0	0	0	0	0	0	0	8	2	24	
2	S	0	0	0	0	0	4	7	1	1	0	1	4	3	1	1	0	0	0	0	0	0	0	S	0	0	7	1	24	
3	0	0	0	0	0	1	3	3	10	10	1	1	2	1	1	5	0	0	0	0	0	1	0	S	0	0	10	2	24	
4	0	0	0	0	0	1	0	0	1	3	6	5	3	6	5	15	7	8	1	0	0	S	0	0	0	0	15	3	24	
5	1	3	3	1	0	0	1	1	1	1	1	10	0	1	1	1	1	0	0	0	S	1	0	0	0	0	10	1	24	
6	0	0	0	0	1	1	7	7	10	21	10	8	12	3	2	2	0	0	0	S	0	0	0	0	0	0	21	4	24	
7	0	0	0	0	0	27	5	6	3	2	1	0	1	1	1	1	1	2	S	0	0	0	0	0	0	0	27	2	24	
8	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24	
9	0	0	0	0	0	0	2	2	2	2	2	2	1	1	13	0	S	0	0	0	0	0	1	0	0	0	13	1	24	
10	0	0	0	1	0	0	1	1	0	0	P	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	0	23	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	0	1	0	24	
12	0	0	0	0	0	0	0	1	1	5	5	4	2	S	12	0	1	1	1	0	1	0	0	0	0	0	12	1	24	
13	0	0	0	0	0	1	0	1	1	1	1	1	S	0	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	1	0	S	1	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	24	
15	0	0	0	0	0	0	0	0	3	3	S	3	3	4	3	1	0	0	0	0	0	0	0	0	0	0	4	1	24	
16	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	24	
17	1	1	1	1	0	1	1	2	S	2	3	1	0	0	0	1	1	0	0	0	0	0	2	0	0	0	3	1	24	
18	0	0	0	0	0	0	1	S	3	1	2	5	0	1	1	0	0	0	0	0	0	0	0	0	0	0	5	1	24	
19	0	0	0	0	0	0	S	2	1	1	2	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2	0	24	
20	0	0	0	0	0	S	1	33	2	7	6	4	0	1	0	0	0	0	0	1	0	0	5	0	0	0	33	3	24	
21	0	0	0	0	S	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	4	8	0	0	0	8	1	24	
22	0	0	0	S	0	0	8	1	0	0	15	0	1	2	1	14	14	12	18	13	5	0	0	0	0	0	18	5	24	
23	0	1	S	1	1	1	S1	S1	17	1	1	1	3	4	10	1	1	0	0	0	1	0	1	0	0	17	2	22		
24	0	S	0	1	1	0	1	2	2	31	1	1	1	0	1	0	12	0	0	0	4	8	1	1	0	31	3	24		
25	S	1	1	4	4	0	1	1	3	1	6	3	4	3	3	2	2	0	0	0	0	0	0	0	S	0	6	2	24	
26	0	0	0	0	1	3	7	22	1	0	C1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	0	22	3	10	
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	0	1	0	0	0	0	S	0	0	0	0	1	0	9	
28	0	0	0	0	0	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	S	0	2	2	0	2	0	24	
29	0	0	0	0	0	0	S1	S1	S1	S1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	20
30	0	0	0	0	0	1	1	1	0	1	1	1	2	0	1	0	0	0	S	0	0	0	0	0	0	0	0	2	0	24
HOURLY MAX	1	3	3	4	4	27	8	33	17	31	15	10	12	6	13	15	14	12	18	13	5	8	8	2						
HOURLY AVG	0	0	0	0	0	1	2	4	3	4	3	2	2	1	2	2	2	1	1	1	0	1	1	0						

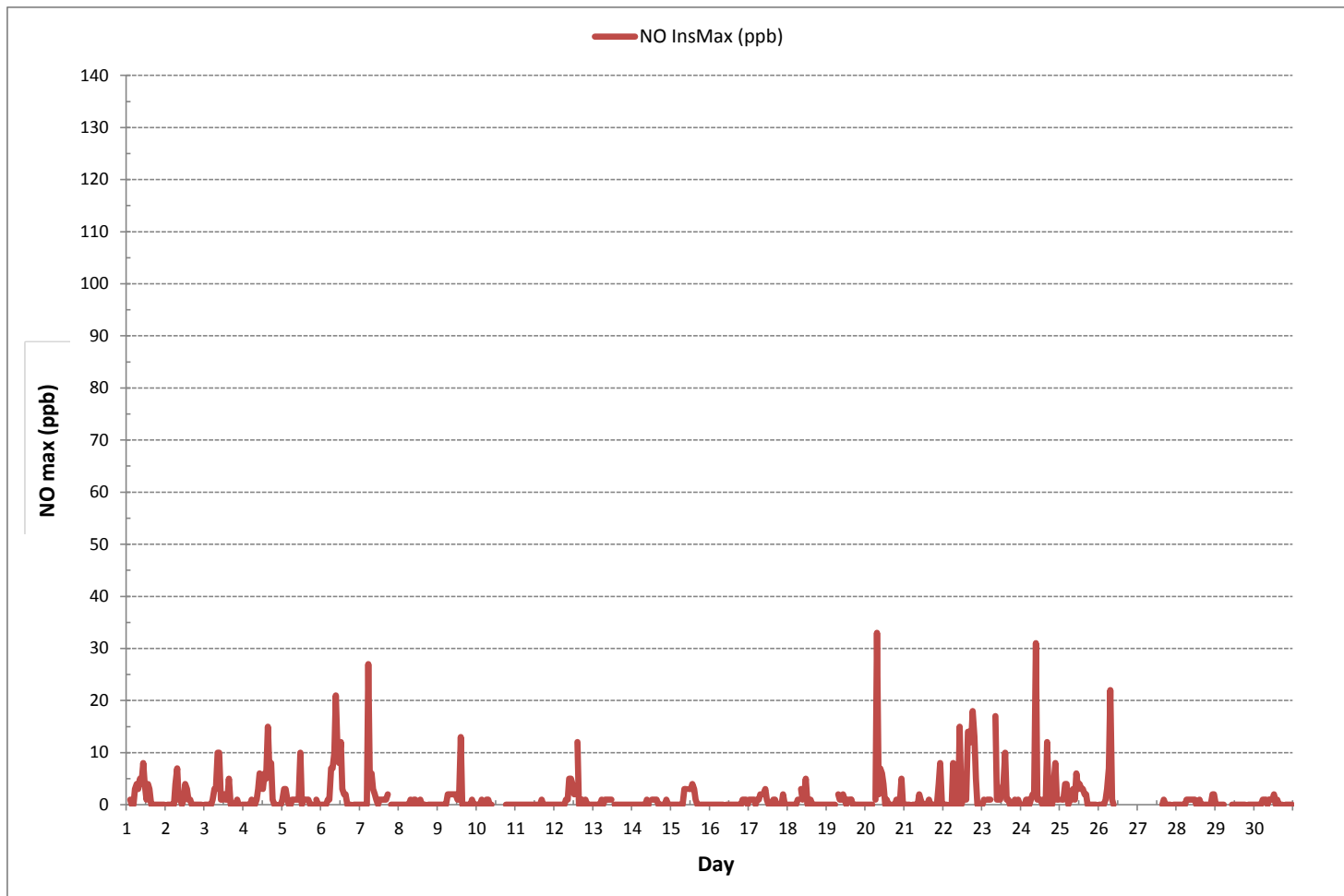
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	255
MAXIMUM INSTANTANEOUS VALUE:	33 ppb @ HOUR 7 ON DAY 20
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	684 hrs
STANDARD DEVIATION:	3

NITRIC OXIDE Instantaneous Maximum (NO ppb)





NITROGEN DIOXIDE Instantaneous Maximum (NO₂ 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 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	1	S	4	8	13	24	22	10	8	7	11	4	2	6	5	1	1	1	1	1	1	1	2	2	1	24	6	24	
2	S	2	1	1	1	1	16	15	2	2	1	1	7	4	3	3	1	1	2	2	3	1	1	S	1	16	3	24	
3	3	2	2	1	2	11	11	9	14	13	3	3	4	2	2	5	2	2	2	3	7	5	S	3	1	14	5	24	
4	2	2	2	6	4	6	3	2	2	4	8	6	5	8	7	17	14	17	3	1	1	S	1	7	1	17	6	24	
5	10	17	17	8	2	4	3	3	3	2	2	9	1	1	1	1	1	1	1	1	S	3	4	3	1	17	4	24	
6	7	8	6	10	12	8	12	11	10	16	9	8	13	3	3	3	1	1	1	S	5	4	5	5	1	16	7	24	
7	4	3	3	3	8	21	14	10	5	4	3	1	1	2	3	4	4	7	S	1	3	3	3	3	1	21	5	24	
8	4	4	2	1	1	1	3	3	1	1	2	1	1	2	1	1	1	S	3	3	3	3	3	3	4	1	4	2	24
9	4	4	7	5	5	5	9	10	8	7	6	6	4	4	13	3	S	4	2	3	2	5	8	8	2	13	6	24	
10	6	8	6	12	14	8	4	3	2	1	P	C	C	C	C	C	C	C	C	1	1	1	1	1	1	1	14	4	23
11	1	1	1	2	1	3	1	1	1	1	1	1	1	1	S	1	3	2	2	3	3	1	1	2	1	3	2	24	
12	5	1	1	1	1	1	1	4	3	9	8	6	4	S	19	1	3	3	4	2	18	5	4	4	1	19	5	24	
13	4	4	3	3	3	3	4	4	4	4	3	3	S	3	3	3	3	3	3	3	2	2	3	3	2	4	3	24	
14	2	2	2	3	2	2	2	2	3	3	3	S	3	3	3	4	3	3	3	3	4	11	5	5	2	11	3	24	
15	7	5	5	6	5	4	4	3	13	14	S	7	7	10	11	12	5	1	1	1	1	1	1	1	1	14	5	24	
16	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	2	2	2	10	15	15	14	5	1	15	3	24	
17	17	15	10	15	7	18	14	14	S	8	8	5	2	2	4	4	4	4	4	3	3	5	4	3	2	18	8	24	
18	3	4	4	5	3	4	4	S	4	3	1	8	1	2	2	1	1	1	1	1	1	1	3	3	1	8	3	24	
19	3	3	3	4	4	4	S	5	4	4	4	3	1	2	2	1	2	2	2	2	2	5	6	5	1	6	3	24	
20	5	4	3	3	3	S	3	12	6	11	10	8	1	2	1	1	1	1	3	7	8	2	18	2	1	18	5	24	
21	2	2	1	1	S	2	2	2	2	8	7	2	2	5	3	14	2	2	1	2	2	23	30	14	1	30	6	24	
22	13	1	1	S	1	1	8	1	1	1	7	1	3	5	4	17	18	18	27	28	23	11	1	9	1	28	9	24	
23	4	19	S	18	17	4	S1	S1	20	3	3	4	7	7	16	3	1	1	1	3	4	3	4	2	1	20	7	22	
24	4	S	3	5	5	4	6	6	6	17	5	4	3	1	1	1	12	1	1	4	37	41	24	28	1	41	10	24	
25	S	17	23	36	24	4	7	4	7	3	11	5	9	8	7	5	6	3	1	3	5	3	3	S	1	36	9	24	
26	6	3	3	3	13	12	25	32	2	1	C1	C1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	1	32	10	10	
27	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	2	2	2	2	2	2	S	2	2	2	2	2	2	9
28	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	1	3	2	S	3	21	20	1	21	4	24	
29	3	2	1	1	3	3	S1	S1	S1	S1	2	2	2	2	2	1	1	1	2	S	2	2	1	2	1	3	2	20	
30	2	1	1	1	1	2	3	3	2	2	1	2	2	1	1	1	1	1	S	2	2	3	3	3	1	3	2	20	
HOURLY MAX	17	19	23	36	24	24	25	32	20	17	11	9	13	10	19	17	18	18	27	28	37	41	30	28	1	3	2	24	
HOURLY AVG	5	5	4	6	6	6	7	7	5	6	5	4	3	3	5	4	4	3	3	4	6	6	6	6	1	3	2	24	

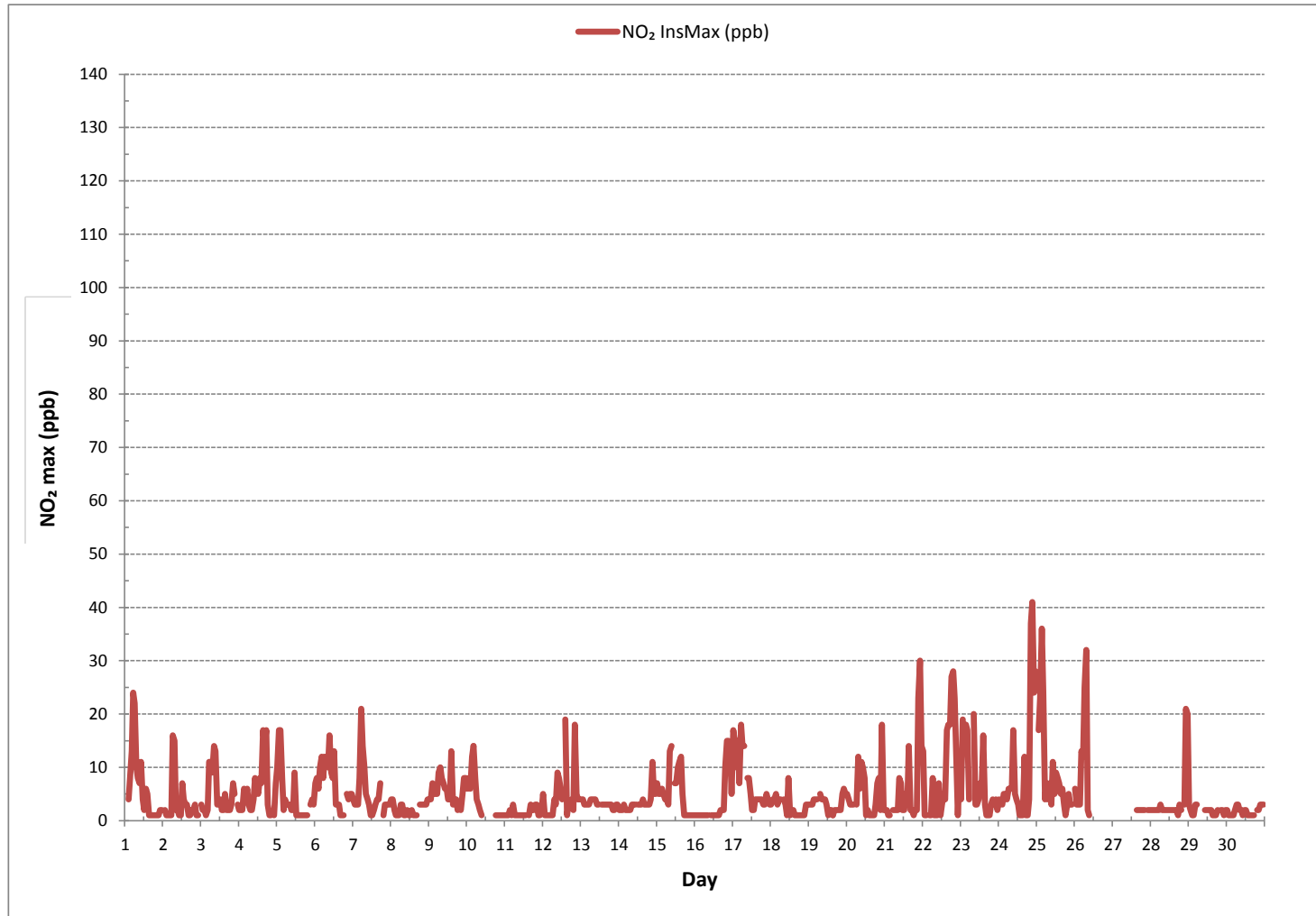
STATUS FLAG CODES

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:	647
MAXIMUM INSTANTANEOUS VALUE:	41 ppb @ HOUR 21 ON DAY 24
	VAR-VARIOUS
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	684 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ 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	16.9	15.8	17.3	14.6	12.8	9.8	9.9	14.3	9.2	13.9	19.6	26.2	23.7	22.5	22.2	23.7	24.2	23.8	18.4	15.3	11.6	11.6	7.7	3.5	3.5	26.2	16.2	24	
2	4.0	3.8	4.1	5.2	7.0	4.7	2.3	12.0	13.7	12.5	18.2	21.2	17.3	17.9	16.0	17.9	14.9	20.1	20.6	21.2	23.3	27.4	15.3	8.8	2.3	27.4	13.7	24	
3	3.3	2.2	3.5	4.5	3.0	4.2	4.1	8.4	5.6	12.7	21.4	17.6	15.5	18.6	19.4	23.9	24.1	21.9	17.2	12.3	8.8	5.1	11.5	8.3	2.2	24.1	11.5	24	
4	8.4	6.2	5.0	3.5	10.6	7.8	11.0	14.2	16.0	21.0	20.6	25.8	25.5	25.3	30.5	36.5	30.0	30.2	27.0	20.4	19.6	15.4	25.5	11.8	3.5	36.5	18.7	24	
5	25.3	17.1	22.4	20.1	19.5	22.3	18.9	30.3	34.9	26.4	32.1	36.8	35.6	35.3	28.2	32.6	31.9	26.1	19.0	12.1	8.5	6.9	5.3	5.9	5.3	36.8	23.1	24	
6	5.2	6.8	5.1	4.3	6.2	4.9	3.1	4.8	6.2	9.9	9.5	13.7	16.5	16.1	17.5	21.9	23.8	17.2	13.9	7.9	5.8	11.0	5.7	3.8	3.1	23.8	10.0	24	
7	3.7	2.4	2.7	3.0	2.2	1.8	2.9	4.8	13.4	20.5	25.8	26.3	23.9	20.2	23.7	24.5	26.6	23.8	16.0	9.5	7.6	8.8	7.5	6.0	1.8	26.6	12.8	24	
8	8.0	3.3	9.0	8.4	5.7	4.2	5.5	13.0	16.1	17.1	18.0	17.5	17.9	15.6	13.6	17.9	15.4	22.1	20.3	17.0	17.0	13.8	13.4	11.9	3.3	22.1	13.4	24	
9	7.9	6.5	7.2	6.0	7.4	9.5	8.6	12.4	8.6	10.5	17.8	20.2	20.9	21.9	25.4	28.7	24.7	19.5	16.8	10.0	9.6	10.2	7.2	8.8	6.0	28.7	13.6	24	
10	8.9	9.5	10.5	7.9	5.4	7.6	9.2	20.8	22.9	19.6	P	19.1	24.6	21.8	21.9	23.4	22.5	25.5	22.8	15.7	16.5	14.5	19.4	13.8	5.4	25.5	16.7	23	
11	12.7	16.8	15.5	13.8	11.6	10.3	10.3	15.1	14.4	13.4	19.9	22.2	16.6	19.7	20.9	15.3	12.4	11.0	9.5	7.4	3.9	4.2	9.6	8.3	3.9	22.2	13.1	24	
12	10.6	7.2	6.5	7.3	6.0	7.1	8.9	6.5	11.0	14.2	18.4	17.6	16.5	20.2	13.7	15.3	9.8	10.7	11.6	8.0	4.9	11.2	9.3	7.7	4.9	20.2	10.8	24	
13	11.4	4.9	4.1	3.4	5.5	8.0	11.2	15.7	20.2	24.5	22.8	26.2	30.0	30.4	28.1	32.1	28.6	22.1	27.0	22.0	21.9	21.6	19.6	18.5	3.4	32.1	19.2	24	
14	20.9	25.5	21.6	22.7	27.4	25.1	23.6	24.2	19.6	22.7	19.1	21.8	17.8	17.5	19.7	15.5	23.3	21.6	16.7	11.2	10.0	13.4	18.7	13.3	10.0	27.4	19.7	24	
15	6.7	8.5	7.7	5.7	6.2	5.1	7.4	5.4	18.1	22.2	23.9	22.0	26.9	31.9	27.1	23.8	24.5	21.9	21.1	13.1	10.6	8.8	12.2	10.4	5.1	31.9	15.5	24	
16	9.8	10.2	14.4	13.5	12.1	12.7	17.5	18.5	22.1	24.7	30.8	29.0	30.0	31.1	26.4	27.3	29.9	41.8	36.9	50.5	27.5	30.3	26.2	29.5	9.8	50.5	25.1	24	
17	30.5	21.2	23.7	26.8	20.5	23.1	23.8	20.8	24.7	21.7	21.6	20.8	22.3	15.0	16.1	18.3	13.9	19.2	23.3	18.1	17.2	17.7	22.6	23.0	13.9	30.5	21.1	24	
18	19.6	19.5	19.7	23.8	14.0	13.2	14.5	16.8	23.6	28.9	20.8	21.0	21.6	21.1	23.2	26.6	28.3	28.8	27.4	17.0	11.7	9.9	9.8	12.4	9.8	28.9	19.7	24	
19	12.8	13.7	11.2	14.6	15.3	10.7	11.6	15.0	23.0	26.5	31.2	29.2	36.9	30.7	30.7	30.1	27.0	29.0	21.9	24.6	14.9	16.6	15.2	15.3	10.7	36.9	21.2	24	
20	9.8	12.0	8.7	5.5	5.3	2.8	6.2	11.5	11.1	8.1	11.5	14.4	18.3	23.4	25.1	26.1	22.4	22.1	16.0	12.7	10.2	6.5	8.6	3.2	2.8	26.1	12.6	24	
21	8.9	5.3	4.7	8.0	8.7	8.0	5.0	7.9	7.7	11.1	13.5	15.4	12.8	15.9	12.4	15.6	13.9	13.4	17.9	19.4	21.9	21.5	23.0	26.5	4.7	26.5	13.3	24	
22	28.0	28.7	34.0	36.7	36.9	34.5	36.1	35.3	35.5	34.3	38.8	36.9	33.5	32.0	42.1	40.7	47.1	36.2	29.4	24.2	16.9	9.4	10.8	14.4	9.4	47.1	31.4	24	
23	12.8	14.3	10.1	8.8	9.8	9.8	10.1	10.4	18.5	21.3	31.3	25.0	29.6	30.4	26.4	22.8	21.8	21.1	18.0	11.2	10.6	9.9	11.8	11.5	8.8	31.3	17.0	24	
24	13.4	20.0	15.7	13.9	12.9	19.9	18.8	17.3	16.2	15.2	19.3	22.8	24.8	30.7	29.4	40.1	26.6	26.3	23.0	19.6	19.2	17.6	21.3	19.7	12.9	40.1	21.0	24	
25	17.5	13.4	10.5	12.1	10.6	10.5	14.6	15.8	24.8	30.8	30.1	32.1	31.1	28.3	28.1	24.9	25.6	21.1	21.5	14.0	8.0	11.3	14.0	16.6	8.0	32.1	19.5	24	
26	19.3	13.4	11.9	7.7	6.6	18.3	22.5	28.0	24.2	37.3	29.0	35.6	39.6	36.5	35.8	39.1	33.0	24.7	22.8	15.8	11.4	12.9	11.6	15.0	6.6	39.6	23.0	24	
27	11.6	12.1	17.0	15.5	13.3	12.3	19.0	23.5	34.1	32.0	29.0	28.8	27.4	34.6	36.2	35.8	34.5	31.2	24.1	24.1	30.0	31.1	27.3	25.8	11.6	36.2	25.4	24	
28	20.1	23.7	21.7	9.9	8.5	11.0	16.6	16.4	19.5	23.0	20.4	24.4	27.8	39.2	31.6	27.0	28.9	27.7	16.7	7.5	6.2	4.3	16.9	29.0	4.3	39.2	19.9	24	
29	35.0	32.0	24.4	29.9	28.4	29.2	39.9	35.4	36.1	40.6	41.3	34.0	35.0	41.0	36.2	31.4	26.8	25.6	13.0	8.3	3.3	2.7	2.1	3.0	2.1	41.3	26.4	24	
30	2.5	2.6	2.6	1.9	2.2	3.0	2.7	20.6	22.9	23.8	26.2	26.6	27.6	34.2	35.5	30.2	34.5	28.2	22.4	15.1	9.8	21.6	24.4	15.8	1.9	35.5	18.2	24	
HOURLY MAX	35.0	32.0	34.0	36.7	36.9	34.5	39.9	35.4	36.1	40.6	41.3	36.9	39.6	41.0	42.1	40.7	47.1	41.8	36.9	50.5	30.0	31.1	27.3	29.5					
HOURLY AVG	13.5	12.6	12.4	12.0	11.4	11.7	13.2	16.5	19.1	21.3	23.5	24.3	24.9	26.0	25.4	26.3	25.0	23.8	20.4	16.2	13.3	13.6	14.5	13.4					

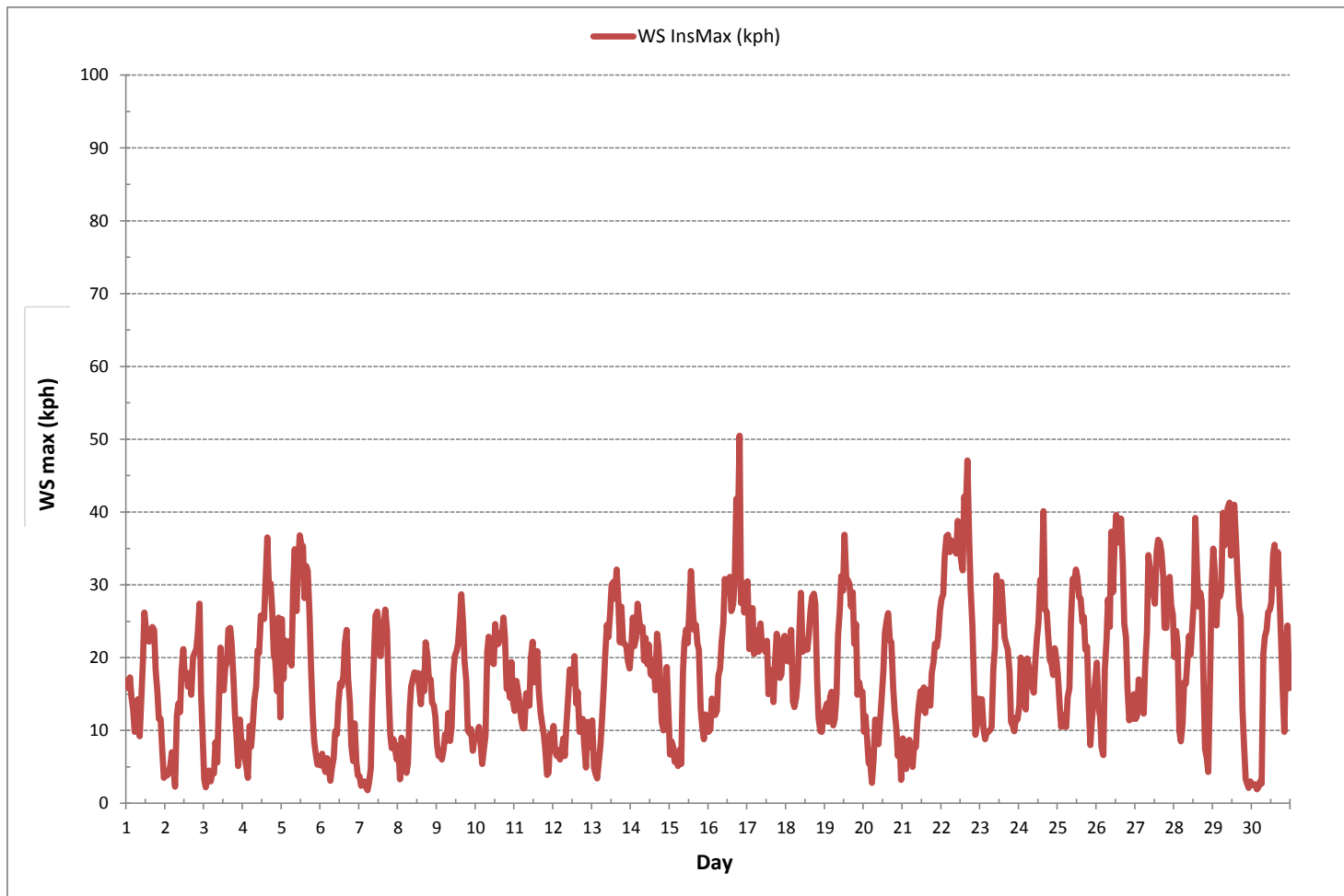
STATUS FLAG CODES

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:	50.5 kph	@ HOUR	19	ON DAY	16
OPERATIONAL TIME:			719	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 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

25-05-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-04-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>May 10, 2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>May 10, 2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>May 24, 2018</u>
Level 3 Independent Data Review	<u>CSA/lnhg</u>	Date <u>May 25, 2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
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

May 31, 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 April 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), 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 April 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.

NO_x/NO/NO₂: The Maxxam-supplied API 200A analyzer, s/n: 1746, was removed on April 16. A LICA-owned API 200E analyzer, s/n: 594, was installed on April 17. The API 200E had undergone maintenance at Maxxam shop.

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

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

Lily Lin
Data & Reporting Specialist
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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 #: 2833-2018-04-31-C

April 2018

Prepared for:

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

Attention: MIKE BISAGA

DATE: **May 28, 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 April 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.

All data collected this month 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.

Gas and Wind Parameters: Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

NO_x/NO/NO₂:

- One hour of downtime was recorded due to an additional zero-span check that was performed on April 15 at hour 06:00 to assess analyzer response.
- Maxxam's API 200A (s/n: 1746) was removed on April 16 and replaced with LICA's API 200E (s/n: 594) on April 17. Thirty hours of downtime were recorded due to this analyzer replacement event.

Ambient Temperature: The channel was placed in "maintenance" mode from April 11 at hour 14:00 to April 12 at hour 10:00 to verify its performance. Twenty-one hours of downtime were incurred as a result.

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, St. Lina Continuous Monitoring Station.

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 ₂ (ppb)	172	48	0	0	0	5	9	13	14.2	SW	1	2	99.9
H ₂ S (ppb)	10	3	0	0	0	1	11	0	10.7	E	1	11	99.9
THC (ppm)	-	-	-	-	2.24	2.81	21	9	14.6	E	2.40	21	99.9
NO ₂ (ppb)	159	-	0	-	1	6	2	4	9.2	NE	2	14	95.6
NO (ppb)	-	-	-	-	0	2	4	7	9.5	NE	1	4	95.6
NO _x (ppb)	-	-	-	-	1	7	4	6	10.7	NE	2	4	95.6
O ₃ (ppb)	82	-	0	-	46.2	60.2	24	23	18.0	NW	52.9	25	99.9
PM _{2.5} (µg/m ³)	80	30	0	0	5	28	10	3	8.3	SW	12	9	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	52	90	15	23	8.6	ENE	89	16	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	929	943	23	10	11.6	SW	941	23	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	0.5	26.3	28	15	18.2	SW	16.6	28	97.1
PRECIPITATION (mm)	-	-	-	-	0.0	1.9	16	20	23.1	E	0.4	21	100.0
VECTOR WS (kph)	-	-	-	-	2.0	25.6	16	16	-	ENE	16.8	22	99.9
VECTOR WD (sec)	-	-	-	-	183 (S)	-	-	-	-	-	-	-	99.9

Exceedance Summary Report

SO₂ 1-Hour Exceedances

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

SO₂ 24-Hour Exceedances

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

H₂S 1-Hour Exceedances

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

H₂S 24-Hour Exceedances

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

NO₂ 1-Hour Exceedances

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

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 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.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), 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 (SO₂)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on April 11.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel on April 12 at hours 13:00 - 14:00, due to activities on the Ozone channel.
- Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. This was likely a result of interference from station activities. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on April 11.
- Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. This was likely a result of interference from station activities. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The routine monthly calibration was performed on April 6.
- Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. This was likely a result of interference from station activities. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time for the monitoring period was 95.6 %, equivalent to 32 hours of downtime.
- The routine monthly calibration was performed on April 11. The zero air scrubber material was renewed during this site visit.
- The analyzer spanned towards the upper acceptance limit on April 14. An additional zero-span check was performed on April 15 at hour 06:00 to assess analyzer response. The results were also elevated, prompting a site visit on April 16 to perform an analyzer replacement. Following a successful shut-down calibration on April 16, the Maxxam-supplied analyzer (API 200A, s/n: 1746) was removed. The LICA-owned analyzer (API 200E, s/n: 594) that was replaced in March was then installed after it had undergone maintenance at Maxxam Lab. The analyzer was left offline overnight to stabilize. On April 17, the sample pump was rebuilt, the output voltage was calibrated, the zero-span oven temperature was adjusted, a leak check was performed and a successful installation calibration was subsequently completed. Thirty-one hours of downtime were incurred due to this event.
- The expected span value was updated immediately after the installation calibration on April 17. However, this was performed prematurely as the result of the daily span check on April 18 reflected a more stable concentration. As such, a new expected span value was set.
- Both SO₂ and NO_x calibrations were performed concurrently on April 11 with the same gas. High Point starts at 12:37 because leak check was conducted and calibration equipment re-checked for NO_x.
- Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. This was likely a result of interference from station activities. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

OZONE (O₃)

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the Ozone channel on April 11 at hour 14:00 due to activities on the SO₂ channel.
- The routine monthly calibration was performed on April 12.
- Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. This was likely a result of interference from station activities. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- The routine monthly audit was performed on April 24.

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

- Operational time for the monitoring period was 99.9%, equivalent to 1 hour of downtime.
- Over 15 minutes of data at hour 10:00 on April 26 were missing and could not be recovered after several attempts. This was likely a result of interference from station activities. As the AMD's data completion criteria for this hour was not met, the data was discarded, incurring one hour of downtime.
- 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%.

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 97.1 %, equivalent to 21 hours of downtime.
- The channel was placed in "maintenance" mode from April 11 at hour 14:00 to April 12 at hour 10:00 to cross-check the ambient temperature sensor against the station temperature sensor. Twenty-one hours of downtime were recorded as a result.
- The cross-check on April 11 was performed upon the recommendation of an AEP auditor, as there was a slight discrepancy in the audit results and the station sensor's readings. The cross-check results revealed that the ambient temperature sensor was reading a degree higher than the station temperature while they were both placed inside the trailer. Another cross-check with an alternate Maxxam-supplied sensor (RM Young Model: 41372VC, S/N: 1920/01983) was carried out on April 26. This sensor was then installed on May 1, in order to send out the LICA-owned sensor (MetOne Model: 083D, S/N: F4091) for factory calibration.

2.0 Project Personnel

Mike Bisaga was the contact for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov and Limin Li.

3.0 Plant Monthly Required AMD Summary

All data collected this month 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.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

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 O₃ Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance
- 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 - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51i FID Analyzer
- Oxides of Nitrogen - API 200A & API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo SHARP 5030i Unit
- Wind System - Met One Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

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

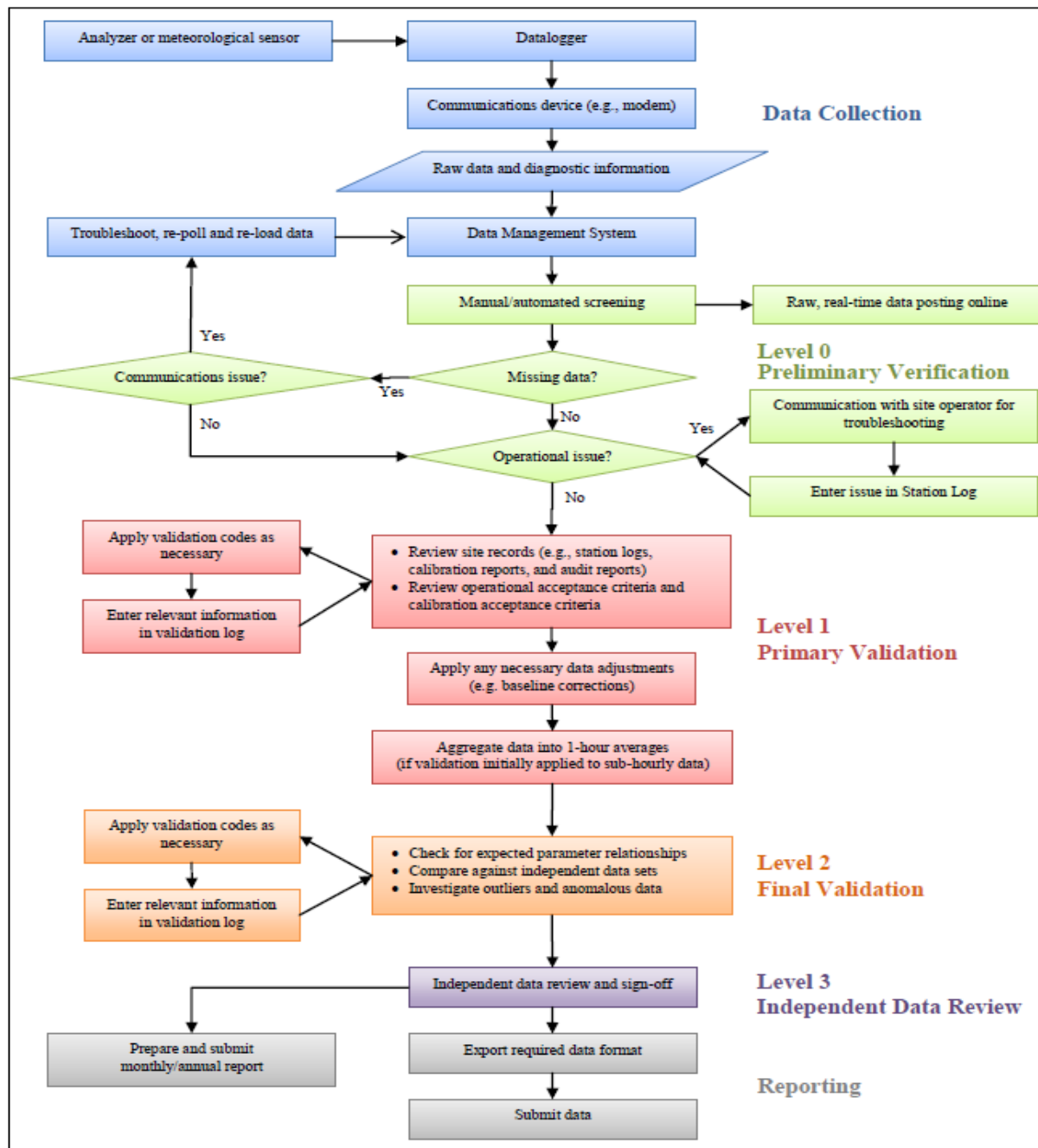
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

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 (SO₂ 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	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	24	
2	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	1	1	24
3	S	1	2	2	2	2	2	2	2	1	1	0	0	1	1	1	1	0	0	0	0	0	0	S	0	2	1	24	
4	0	1	1	1	1	2	2	2	2	3	2	2	1	1	1	1	1	1	0	0	0	0	0	S	0	3	1	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	24	
6	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	1	1	1	S	0	0	0	0	1	0	24	
7	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	0	0	0	1	0	24	
8	0	0	0	0	1	0	0	0	1	1	1	0	0	1	0	1	0	0	S	1	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	0	0	0	0	1	2	3	4	S	1	0	0	S	0	0	0	0	1	1	0	5	1	24	
10	1	1	1	1	1	2	2	2	1	0	0	0	0	0	0	0	S	0	0	0	0	1	1	1	1	0	2	1	24
11	1	1	1	2	2	2	2	2	2	2	3	C	C	C	C	C	0	0	0	0	0	0	0	S	0	3	1	24	
12	0	0	0	0	0	0	0	0	0	1	1	0	0	Q	Q	0	1	1	1	0	0	0	S	0	0	1	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	S	0	0	0	0	0	24
14	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	24
15	0	0	0	0	0	0	0	4	4	3	2	1	1	0	0	0	0	0	S	0	0	0	0	0	0	4	1	24	
16	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
17	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24
18	0	1	2	2	1	2	1	2	1	1	0	0	0	0	0	S	2	3	1	0	1	1	1	0	0	3	1	24	
19	0	0	0	0	0	0	0	0	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	1	24
20	1	1	0	1	0	0	0	0	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
21	0	0	0	0	0	0	0	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
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	S	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	1	1	S	0	1	1	1	1	1	2	1	1	1	1	1	1	1	0	2	1	24	
25	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	24	
26	0	0	1	2	2	1	0	S	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	23	
27	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	0	24	
28	0	0	0	0	0	S	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
29	1	1	1	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
30	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	2	2	2	2	2	2	2	4	4	3	3	3	4	5	1	1	2	3	1	1	1	1	1	1	1	1	1	24	
HOURLY AVG	0	0	0	1	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	

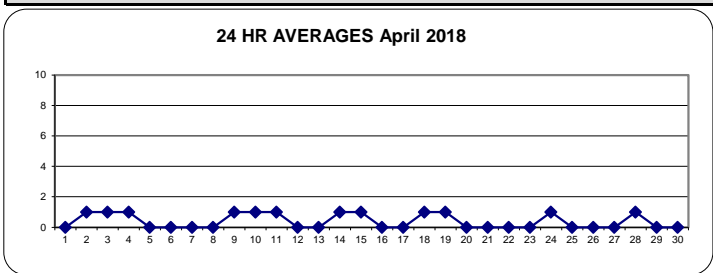
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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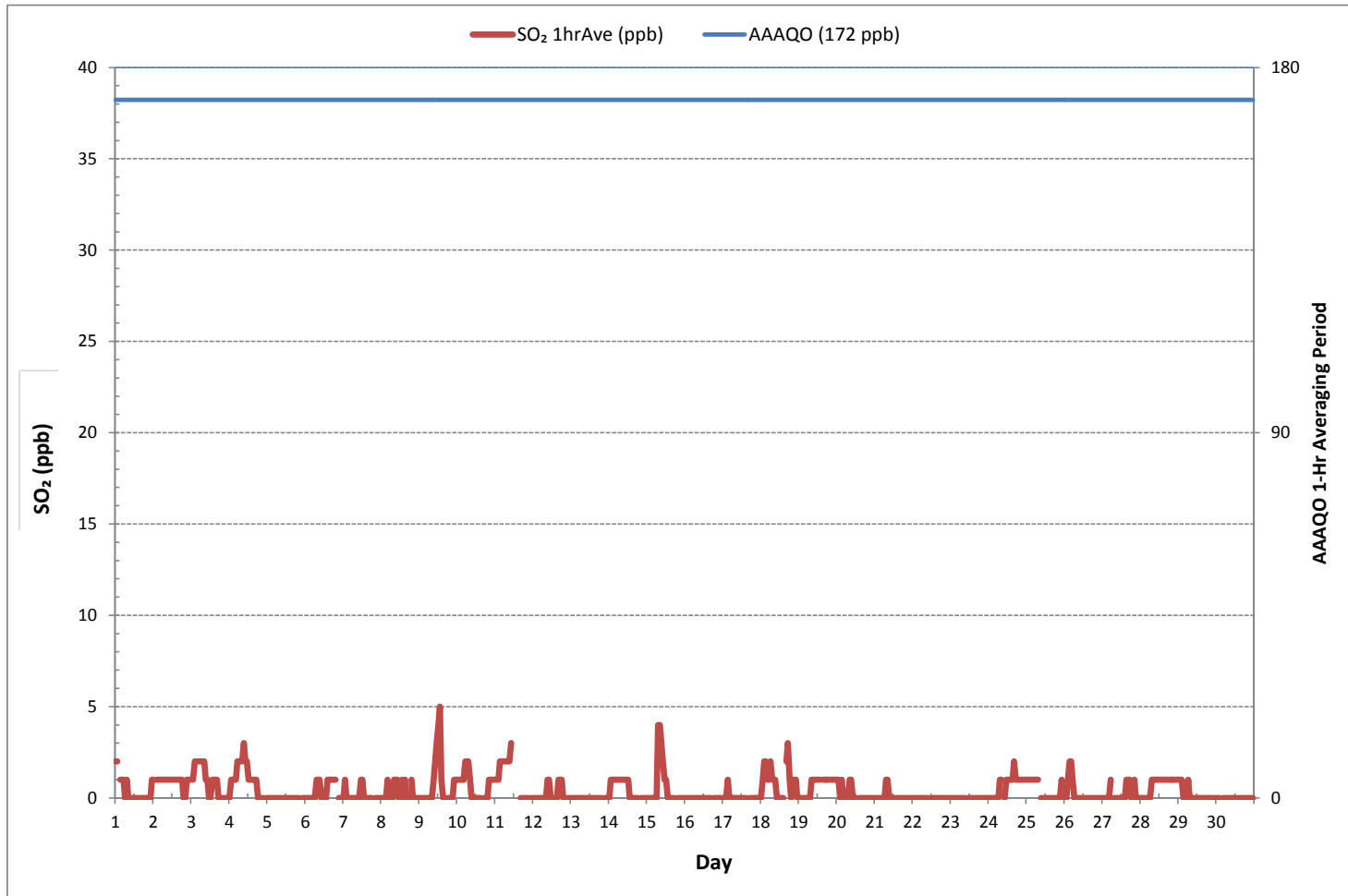
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	225		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	6 ON DAY	1
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR	13 ON DAY	9
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	2
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

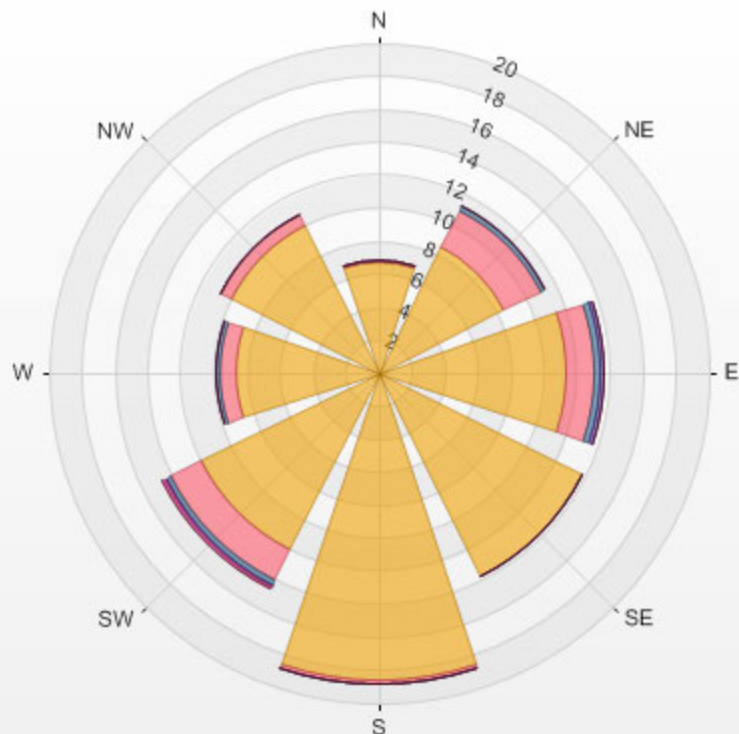
Calm: 0.15%

Calm Avg: 0.14 [ppb]

Direction	0.0-1.2	1.2-2.4	2.4-3.6	3.6-4.8	4.8-6.0	>6.0	Total
N	6.8	0.2	0.0	0.0	0.0	0.0	6.9
NE	8.5	2.5	0.3	0.0	0.0	0.0	11.3
E	11.5	1.6	0.4	0.2	0.0	0.0	13.7
SE	13.8	0.0	0.0	0.0	0.0	0.0	13.8
S	18.7	0.3	0.0	0.0	0.0	0.0	18.9
SW	12.0	2.1	0.3	0.2	0.2	0.0	14.7
W	8.7	1.0	0.2	0.0	0.0	0.0	9.8
NW	10.0	0.7	0.0	0.0	0.0	0.0	10.7
Summary	89.9	8.4	1.2	0.3	0.2	0.0	100.0

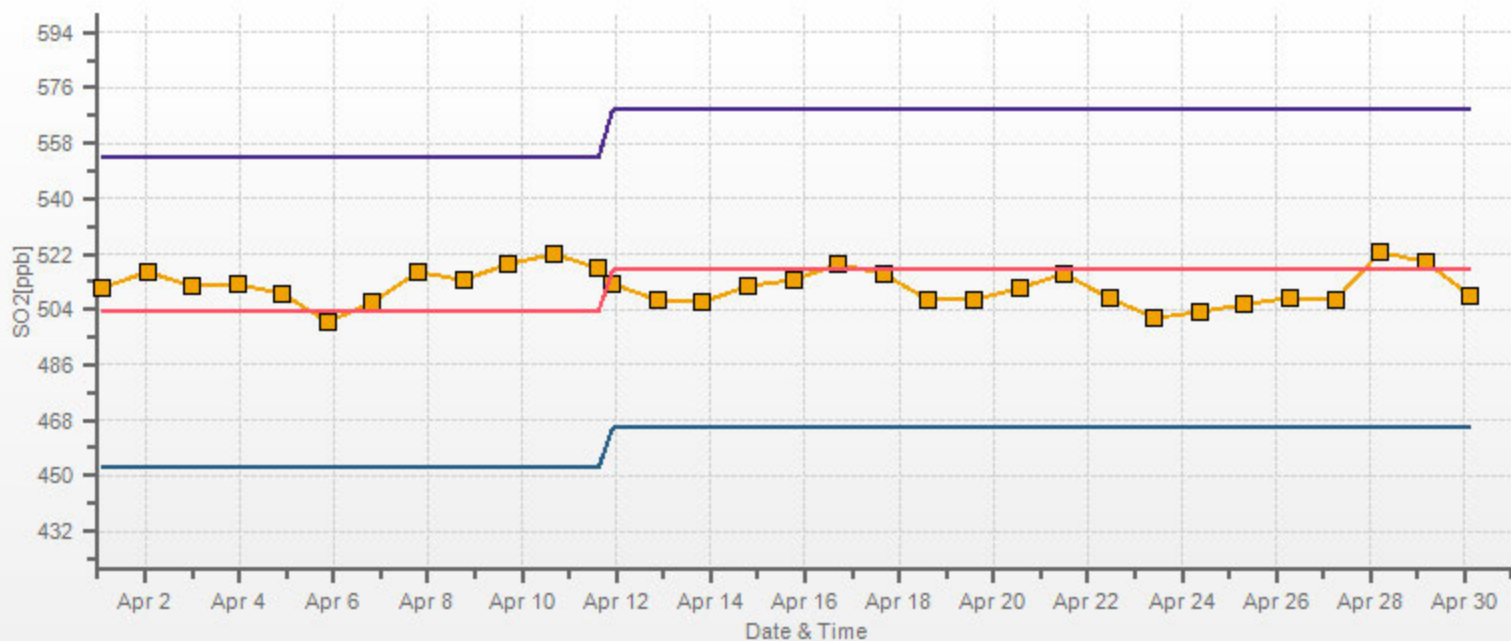
% Icon Classes (ppb) 90 0.0-1.2 8 1.2-2.4 1 2.4-3.6 0 3.6-4.8 0 4.8-6.0 0 >6.0

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 0.14[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/04 Type: Span

■ Span Meas
 — Span Ref
 — Span Low
 — Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S 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 MIN.	DAILY MAX.	24-HR AVG.	RDGS.
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	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	24
3	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	24
4	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
5	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
6	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
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	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	24
9	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
10	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	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	0	0	0	0	0	0	0	S	0	1	1	1	24
12	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	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	24
15	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	0	0	0	0	0	0	0	0	S	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	S	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	24
19	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	0	0	0	0	0	0	0	0	24
21	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
22	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	S	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	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	1	0	0	0	0	S	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	23
27	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
28	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24
29	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	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
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	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				

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

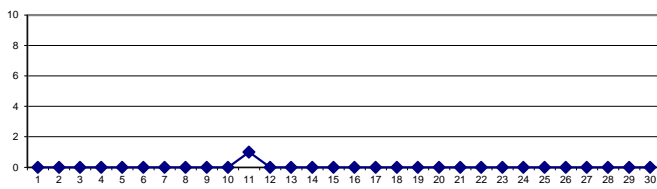
OBJECTIVE LIMIT:

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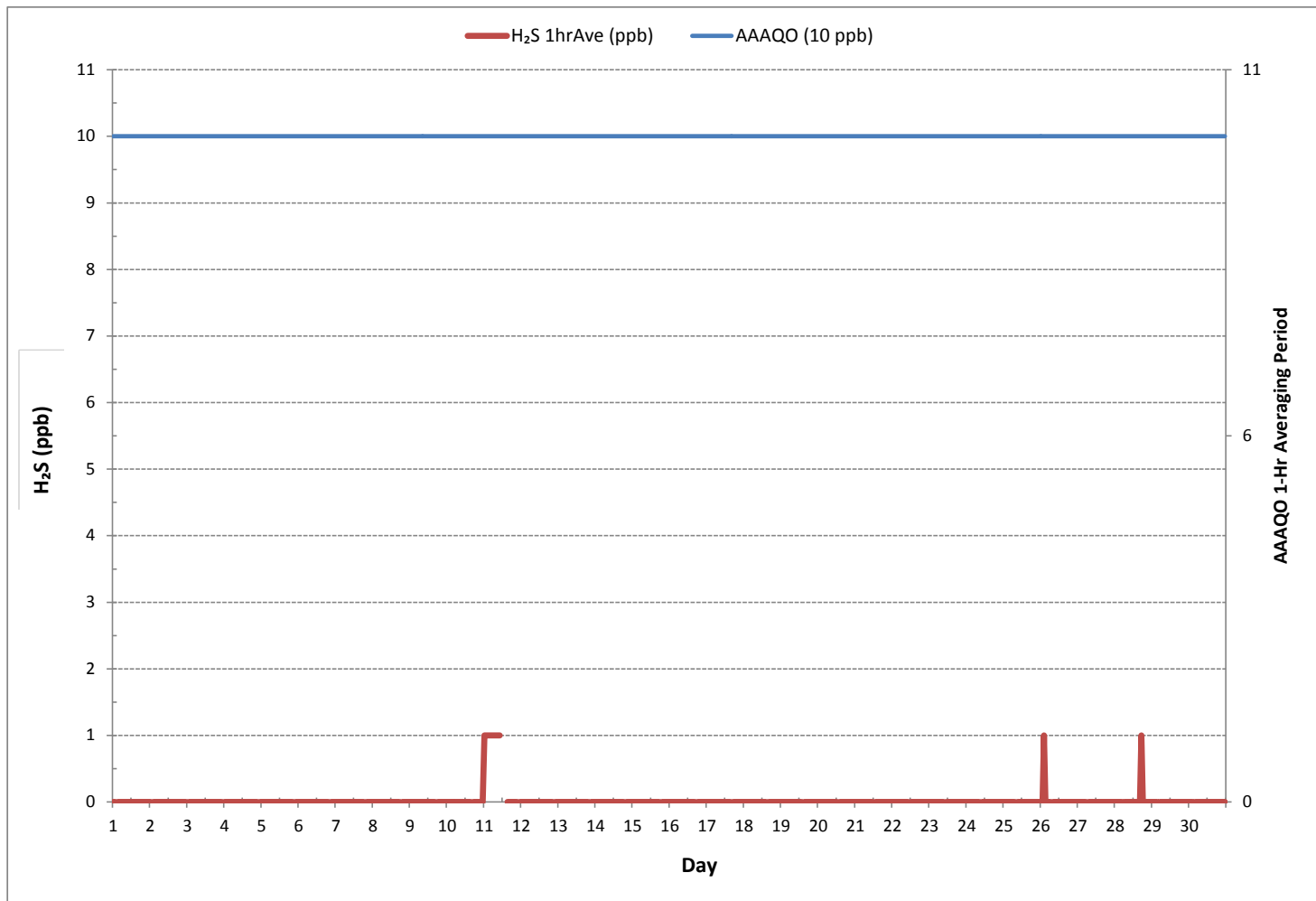
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	13		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0 ON DAY	1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	0 ON DAY	11
MAXIMUM 24-HR AVERAGE:	1 ppb	ON DAY	11
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES April 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



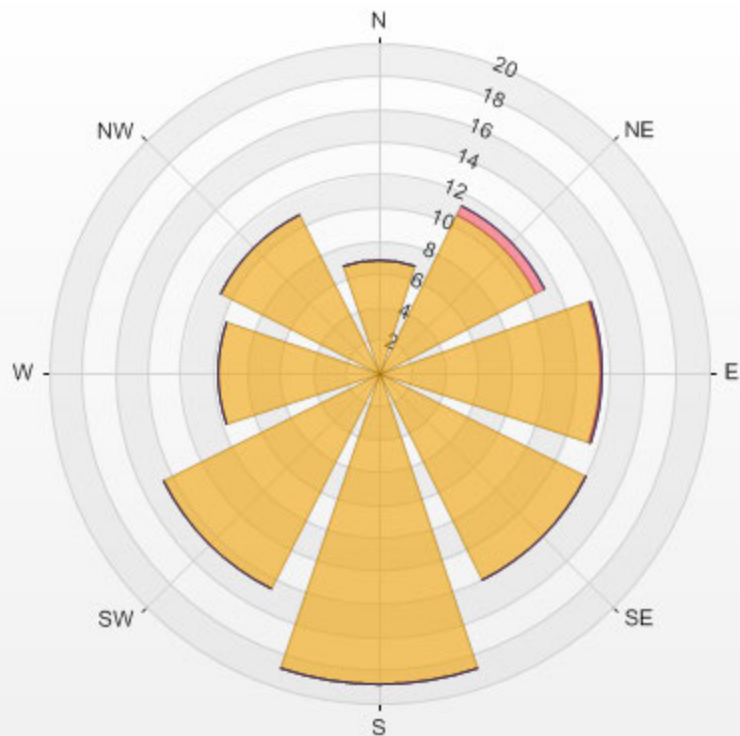
Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-H2S[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.15% Calm Avg: 0.00 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	6.9	0.0	0.0	0.0	6.9
NE	10.7	0.6	0.0	0.0	11.3
E	13.5	0.2	0.0	0.0	13.6
SE	14.1	0.0	0.0	0.0	14.1
S	18.9	0.0	0.0	0.0	18.9
SW	14.6	0.0	0.0	0.0	14.6
W	9.8	0.0	0.0	0.0	9.8
NW	10.7	0.0	0.0	0.0	10.7
Summary	99.1	0.7	0.0	0.0	100.0

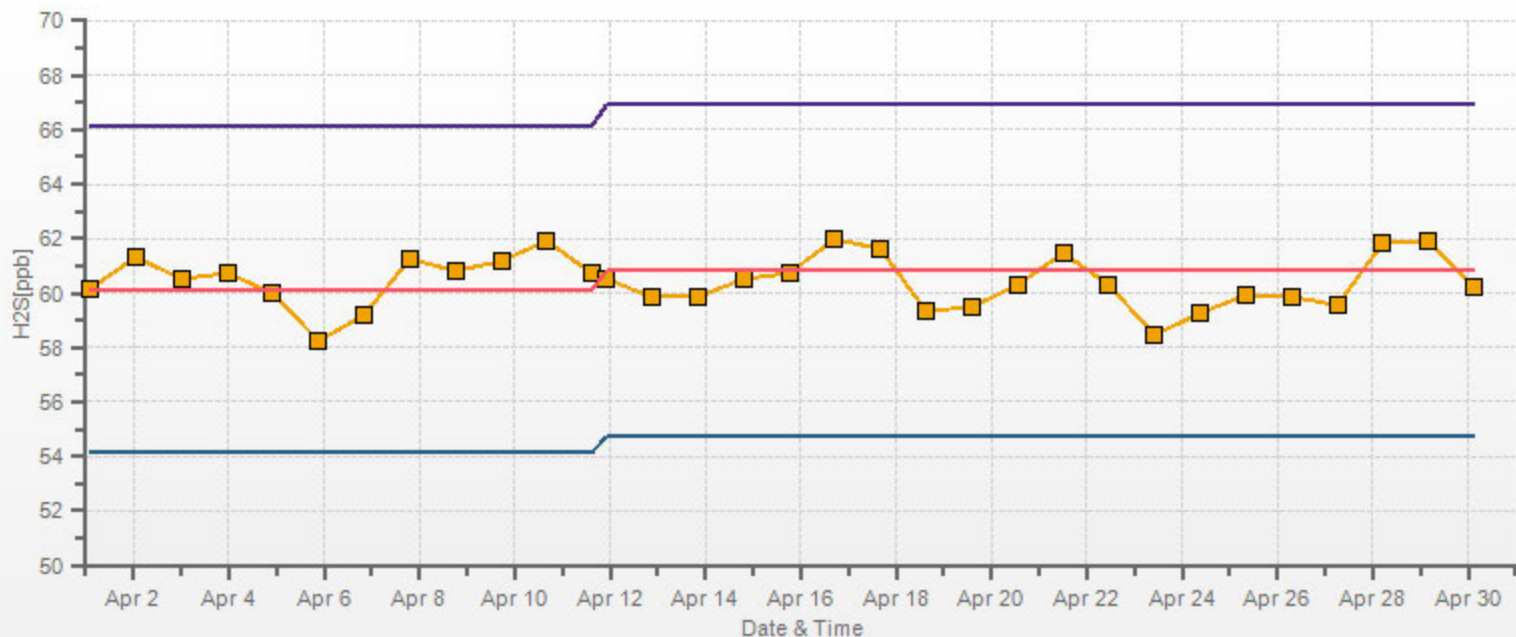
% Icon Classes (ppb) 99 0.0-0.7 1 0.7-1.3 0 1.3-2.0 0 >2.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 0.00[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



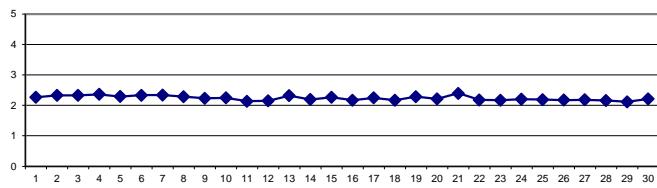
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.35	S	2.32	2.31	2.30	2.30	2.29	2.28	2.27	2.28	2.27	2.25	2.24	2.24	2.21	2.21	2.22	2.24	2.24	2.24	2.24	2.29	2.29	2.21	2.35	2.27	24
2	2.26	S	2.29	2.36	2.57	2.53	2.50	2.38	2.28	2.25	2.23	2.26	2.28	2.30	2.29	2.31	2.35	2.38	2.40	2.38	2.26	2.26	2.27	2.30	2.23	2.57	2.33	24
3	S	2.36	2.38	2.42	2.35	2.37	2.50	2.46	2.35	2.31	2.28	2.29	2.25	2.27	2.28	2.27	2.28	2.28	2.28	2.30	2.32	2.30	2.31	S	2.25	2.50	2.33	24
4	2.32	2.34	2.38	2.40	2.45	2.60	2.60	2.52	2.50	2.45	2.36	2.36	2.28	2.28	2.28	2.28	2.28	2.28	2.27	2.28	2.27	2.28	S	2.30	2.27	2.60	2.36	24
5	2.30	2.30	2.29	2.28	2.31	2.31	2.31	2.29	2.28	2.28	2.27	2.26	2.26	2.27	2.27	2.28	2.28	2.28	2.28	2.28	2.30	2.30	S	2.35	2.36	2.26	2.36	24
6	2.38	2.42	2.42	2.42	2.42	2.39	2.38	2.40	2.35	2.35	C	C	C	C	C	2.20	2.23	2.22	2.23	2.29	S	2.33	2.31	2.30	2.20	2.42	2.34	24
7	2.28	2.27	2.30	2.31	2.39	2.47	2.60	2.48	2.46	2.47	2.42	2.40	2.33	2.30	2.26	2.31	2.31	2.26	2.29	S	2.26	2.21	2.23	2.25	2.21	2.60	2.34	24
8	2.28	2.33	2.37	2.33	2.36	2.37	2.35	2.34	2.30	2.29	2.30	2.26	2.22	2.22	2.24	2.26	2.27	2.27	S	2.22	2.23	2.25	2.25	2.23	2.22	2.37	2.28	24
9	2.22	2.25	2.26	2.28	2.32	2.34	2.33	2.33	2.33	2.29	2.29	2.20	2.17	2.17	2.19	2.13	2.14	S	2.10	2.12	2.17	2.21	2.28	2.32	2.10	2.34	2.24	24
10	2.31	2.31	2.35	2.39	2.34	2.35	2.33	2.34	2.30	2.45	2.43	2.34	2.28	2.18	2.12	2.07	S	2.07	2.07	2.08	2.10	2.12	2.17	2.22	2.07	2.45	2.25	24
11	2.20	2.16	2.16	2.16	2.19	2.18	2.16	2.17	2.17	2.19	2.19	2.15	2.12	2.07	2.04	2.02	2.02	2.02	2.02	2.09	2.12	2.14	S	2.26	2.02	2.26	2.14	24
12	2.25	2.23	2.19	2.19	2.22	2.24	2.23	2.19	2.19	2.18	2.16	2.14	2.07	2.08	2.08	1.99	1.99	1.99	2.02	2.06	2.16	S	2.26	2.31	1.99	2.31	2.15	24
13	2.32	2.34	2.35	2.39	2.38	2.41	2.42	2.38	2.40	2.43	2.43	2.37	2.26	2.28	2.28	2.26	2.25	2.19	2.26	2.29	S	2.25	2.24	2.24	2.19	2.43	2.32	24
14	2.24	2.23	2.24	2.28	2.31	2.33	2.34	2.34	2.38	2.38	2.25	2.15	2.10	2.10	2.08	2.07	2.14	2.13	2.08	S	2.06	2.06	2.10	2.13	2.06	2.38	2.20	24
15	2.17	2.19	2.17	2.22	2.28	2.36	2.64	2.64	2.57	2.50	2.51	2.39	2.26	2.12	2.09	2.08	2.13	2.11	S	2.12	2.17	2.18	2.17	2.18	2.08	2.64	2.27	24
16	2.21	2.18	2.21	2.26	2.23	2.24	2.21	2.22	2.18	2.20	2.16	2.18	2.08	2.08	2.11	2.12	2.13	S	2.12	2.12	2.14	2.15	2.15	2.17	2.08	2.26	2.17	24
17	2.19	2.20	2.21	2.24	2.23	2.24	2.23	2.24	2.27	2.29	2.30	2.27	2.24	2.21	2.28	2.29	S	2.29	2.26	2.26	2.24	2.24	2.25	2.25	2.19	2.30	2.25	24
18	2.29	2.28	2.27	2.25	2.22	2.27	2.30	2.30	2.20	2.16	2.13	2.14	2.12	2.11	2.10	S	2.08	2.10	2.10	2.10	2.10	2.08	2.08	2.15	2.08	2.30	2.17	24
19	2.16	2.20	2.21	2.24	2.26	2.26	2.28	2.29	2.30	2.26	2.20	2.19	2.27	2.23	S	2.26	2.24	2.18	2.28	2.45	2.50	2.44	2.41	2.41	2.16	2.50	2.28	24
20	2.38	2.36	2.38	2.39	2.37	2.38	2.41	2.38	2.33	2.27	2.21	2.10	2.07	S	2.08	2.11	2.10	2.09	2.09	2.07	2.11	2.13	2.11	2.10	2.07	2.41	2.22	24
21	2.09	2.09	2.11	2.17	2.39	2.62	2.66	2.72	2.79	2.81	2.73	2.73	S	2.50	2.52	2.50	2.25	2.19	2.21	2.17	2.20	2.22	2.29	2.20	2.09	2.81	2.40	24
22	2.16	2.15	2.16	2.18	2.16	2.15	2.15	2.17	2.17	2.17	2.16	S	2.16	2.17	2.17	2.18	2.17	2.16	2.19	2.19	2.22	2.23	2.23	2.25	2.15	2.25	2.18	24
23	2.24	2.24	2.25	2.24	2.25	2.25	2.23	2.24	2.24	2.21	S	2.09	2.09	2.11	2.10	2.11	2.12	2.10	2.09	2.10	2.09	2.09	2.13	2.25	2.09	2.25	2.17	24
24	2.22	2.20	2.18	2.17	2.19	2.18	2.16	2.16	2.31	S	2.28	2.25	2.23	2.22	2.22	2.20	2.23	2.20	2.19	2.21	2.15	2.20	2.17	2.18	2.15	2.31	2.20	24
25	2.18	2.18	2.20	2.19	2.21	2.20	2.22	2.22	S	2.17	2.08	2.16	2.18	2.19	2.19	2.19	2.20	2.18	2.21	2.22	2.23	2.21	2.22	2.21	2.08	2.23	2.19	24
26	2.23	2.24	2.25	2.27	2.30	2.32	2.28	S	2.09	2.03	X	2.10	2.14	2.13	2.13	2.16	2.14	2.11	2.09	2.15	2.12	2.25	2.18	2.17	2.03	2.32	2.18	23
27	2.16	2.17	2.20	2.23	2.24	2.23	S	2.20	2.16	2.25	2.26	2.19	2.18	2.21	2.20	2.17	2.18	2.17	2.17	2.16	2.12	2.13	2.17	2.14	2.12	2.26	2.19	24
28	2.11	2.12	2.14	2.14	2.14	S	2.19	2.17	2.14	2.24	2.22	2.21	2.19	2.17	2.17	2.15	2.15	2.15	2.16	2.15	2.14	2.15	2.18	2.17	2.11	2.24	2.16	24
29	2.19	2.17	2.18	2.20	S	2.22	2.23	2.21	2.21	2.14	2.06	2.02	2.06	2.07	2.06	2.07	2.07	2.08	2.08	2.10	2.07	2.06	2.07	2.07	2.02	2.23	2.12	24
30	2.11	2.14	2.20	S	2.22	2.26	2.30	2.28	2.24	2.23	2.23	2.23	2.22	2.22	2.22	2.20	2.20	2.21	2.20	2.20	2.24	2.24	2.21	2.22	2.11	2.30	2.22	24
HOURLY MAX	2.38	2.42	2.42	2.42	2.57	2.62	2.66	2.72	2.79	2.81	2.73	2.73	2.33	2.50	2.52	2.50	2.35	2.38	2.40	2.45	2.50	2.44	2.41	2.41				
HOURLY AVG	2.23	2.24	2.25	2.27	2.30	2.32	2.34	2.32	2.30	2.29	2.27	2.24	2.19	2.20	2.19	2.18	2.18	2.18	2.19	2.19	2.20	2.22	2.23					

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 April 2018



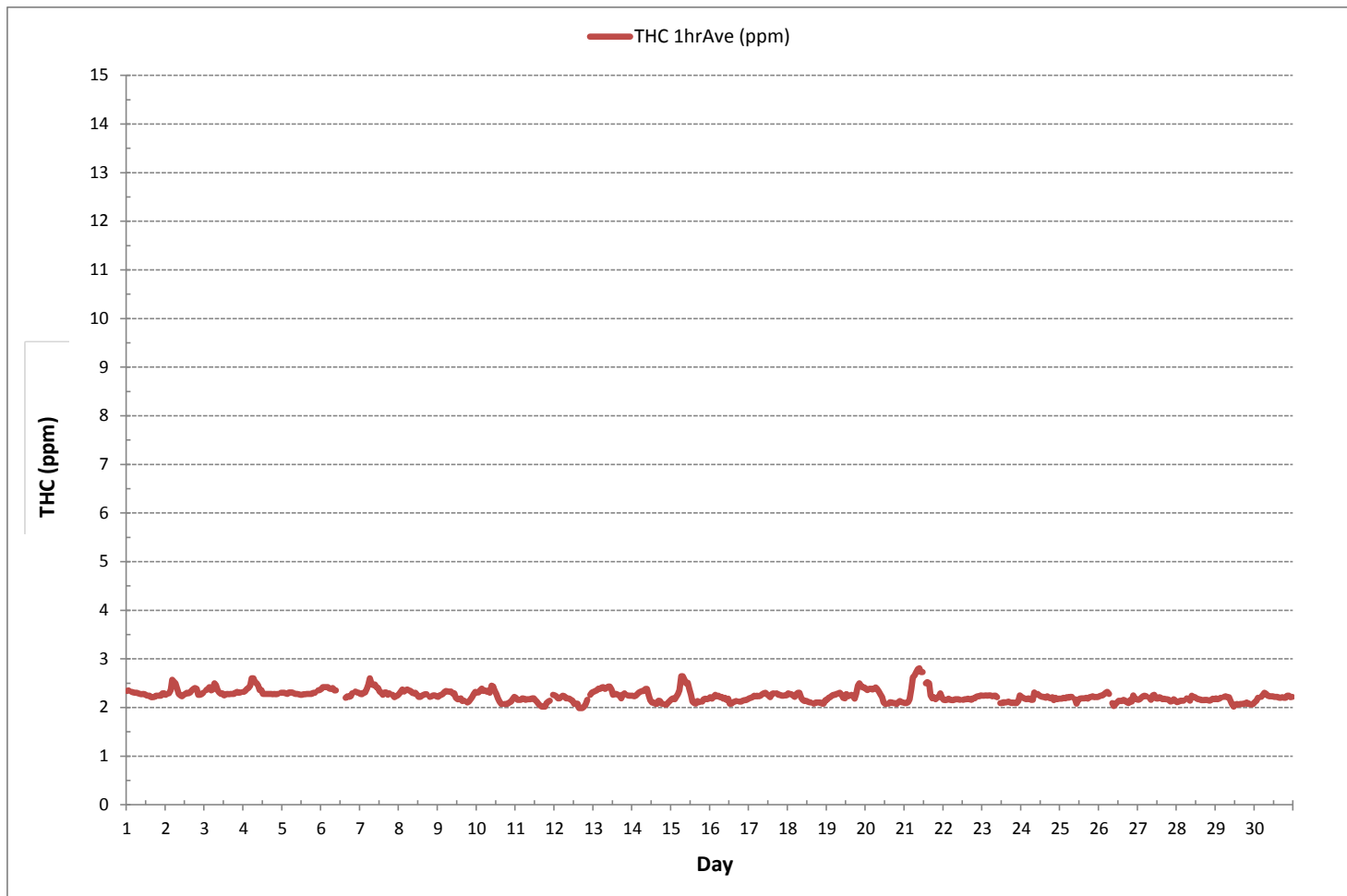
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	683			
MINIMUM 1-HR AVERAGE:	1.99 ppm	@ HOUR	15	ON DAY
MAXIMUM 1-HR AVERAGE:	2.81 ppm	@ HOUR	9	ON DAY
MAXIMUM 24-HR AVERAGE:	2.40 ppm			ON DAY
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	0.12	MONTHLY AVERAGE:	2.24 ppm	



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 2018

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-THC[ppm]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.15% Calm Avg: 2.07 [ppm]

Direction	0.0-0.9	0.9-1.9	1.9-2.8	>2.8	Total
N	0.0	0.0	6.9	0.0	6.9
NE	0.0	0.0	12.0	0.0	12.0
E	0.0	0.0	13.6	0.0	13.6
SE	0.0	0.0	13.6	0.0	13.6
S	0.0	0.0	18.5	0.0	18.5
SW	0.0	0.0	14.7	0.0	14.7
W	0.0	0.0	9.8	0.0	9.8
NW	0.0	0.0	10.7	0.0	10.7
Summary	0.0	0.0	100.0	0.0	100.0

% Icon Classes (ppm)

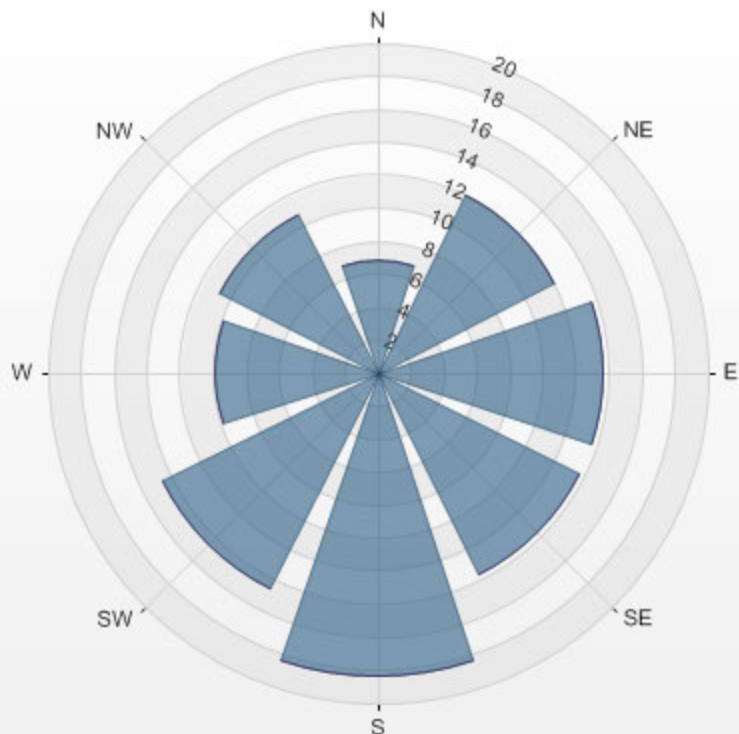
0 0.0-0.9

0 0.9-1.9

100 1.9-2.8

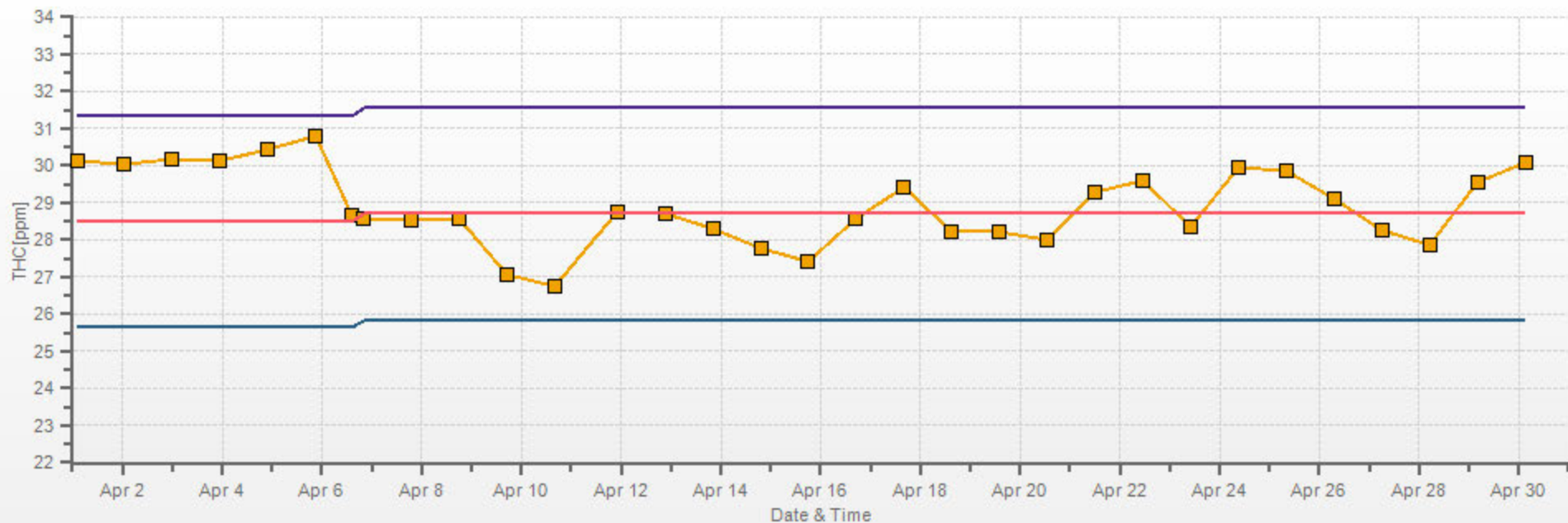
0 >2.8

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 2.07[ppm]



THC[ppm] Calibration: LICA ST. LINA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



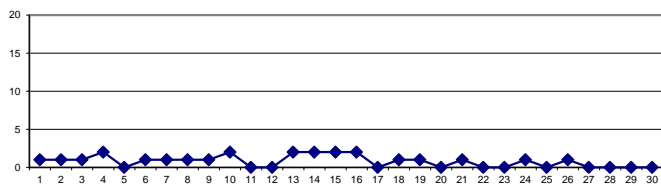
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24			
2	0	S	1	1	6	6	5	2	0	0	0	0	0	0	0	1	3	4	3	1	0	0	0	0	0	6	1	24			
3	S	3	3	3	2	2	4	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	4	1	24			
4	1	1	2	2	3	6	7	5	5	5	4	3	0	0	0	0	0	0	0	0	0	0	S	0	0	7	2	24			
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	2	1	0	2	0	24			
6	1	3	4	3	2	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	4	1	24		
7	0	0	0	0	0	1	3	2	1	2	2	1	0	0	0	0	0	0	0	S	1	0	0	0	0	0	3	1	24		
8	0	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	S	1	1	1	1	0	0	0	1	1	24		
9	0	0	0	0	1	1	1	1	3	1	2	2	3	4	1	0	0	S	1	0	1	0	0	1	0	0	0	4	1	24	
10	2	2	2	2	3	3	4	4	2	3	4	3	2	0	0	0	S	1	0	0	0	0	0	0	0	0	0	4	2	24	
11	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	C	0	0	0	S	0	0	0	0	0	0	24
12	0	0	0	0	2	1	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	S	1	1	0	0	0	2	0	24
13	1	1	1	1	1	2	2	2	2	3	3	2	1	2	1	1	1	1	1	1	1	S	3	1	1	1	1	3	2	24	
14	1	1	1	2	2	2	2	3	3	2	2	2	2	2	1	1	1	2	1	S	3	2	2	2	2	1	1	3	2	24	
15	1	1	1	1	1	1	S1	7	4	4	4	3	2	2	1	1	1	1	S	3	2	2	1	1	1	1	1	7	2	23	
16	1	1	1	2	2	2	2	2	1	2	1	1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	2	12	
17	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	0	0	6	
18	0	2	3	4	3	3	4	3	2	1	1	1	0	0	0	S	0	0	0	1	1	1	1	1	0	1	0	4	1	24	
19	1	0	0	0	1	1	1	1	2	2	2	1	1	0	S	1	0	0	1	1	1	1	1	0	0	0	0	2	1	24	
20	0	0	1	1	1	1	1	1	2	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
21	0	0	0	0	1	2	3	3	3	3	3	4	S	3	3	4	1	0	0	0	0	0	0	0	0	0	0	4	1	24	
22	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	0	24	
23	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	24	
24	2	1	1	1	2	3	3	3	3	S	2	1	0	1	1	1	3	1	1	1	1	0	0	0	0	0	0	3	1	24	
25	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	24	
26	1	1	2	3	4	4	2	S	0	0	X	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	1	23	
27	0	0	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
28	0	0	0	0	0	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
29	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	0	0	1	0	24	
30	1	0	0	S	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	24	
HOURLY MAX	4	4	4	4	6	6	7	7	5	5	4	4	3	4	3	4	3	3	4	3	3	3	3	2	2						
HOURLY AVG	1	1	1	1	1	2	2	2	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	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

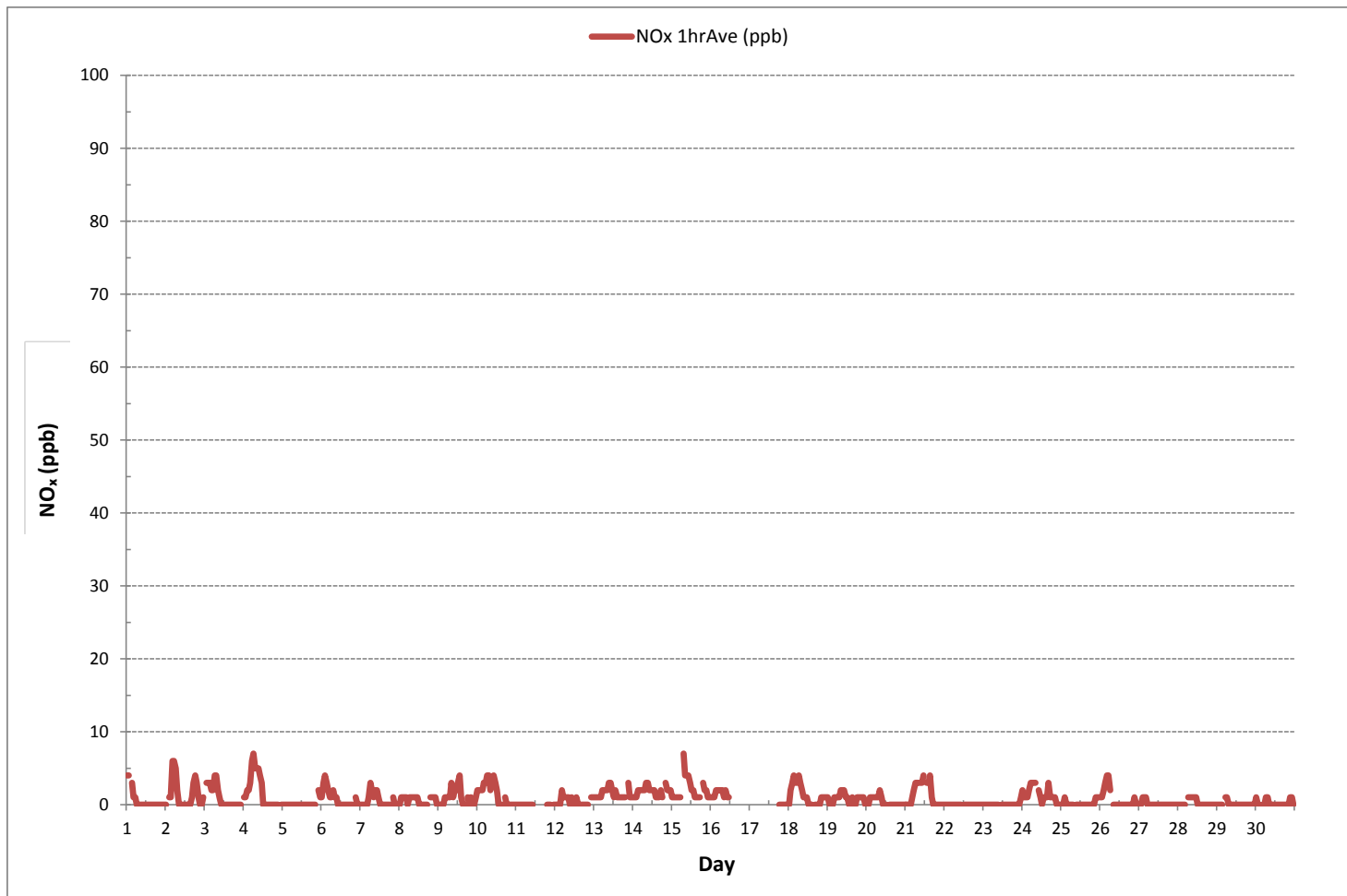
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	289		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	6 ON DAY 1
MAXIMUM 1-HR AVERAGE:	7 ppb	@ HOUR	6 ON DAY 4
MAXIMUM 24-HR AVERAGE:	2 ppb		ON DAY 4
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	688 hrs
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	95.6 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NOX[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.15% Calm Avg: 0.00 [ppb]

Direction	0.0-2.7	2.7-5.3	5.3-8.0	>8.0	Total
N	6.9	0.3	0.0	0.0	7.2
NE	7.7	2.6	0.6	0.0	10.9
E	10.0	1.7	0.0	0.0	11.7
SE	13.6	0.5	0.0	0.0	14.0
S	19.4	0.2	0.0	0.0	19.6
SW	13.1	1.7	0.0	0.0	14.8
W	9.1	1.2	0.0	0.0	10.3
NW	10.8	0.5	0.0	0.0	11.3
Summary	90.6	8.6	0.6	0.0	100.0

% Icon Classes (ppb)

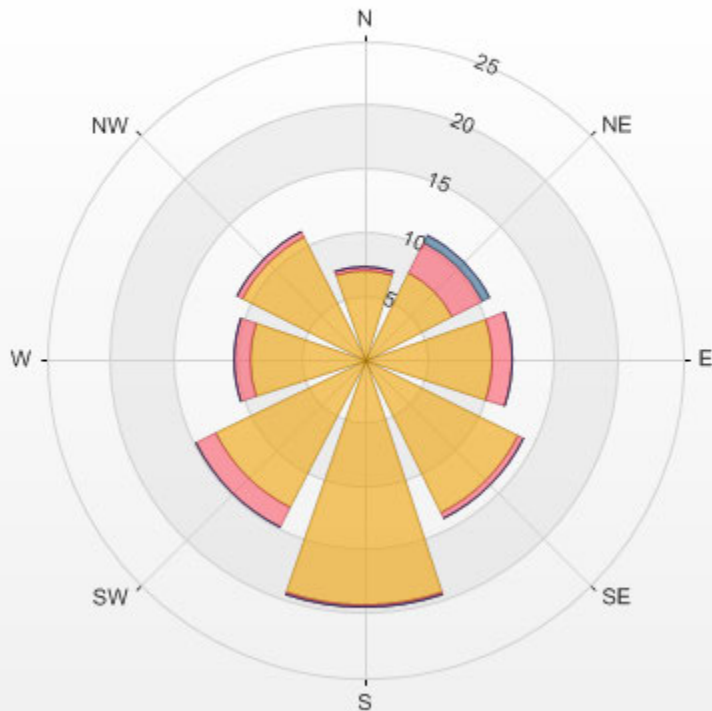
91 0.0-2.7

9 2.7-5.3

1 5.3-8.0

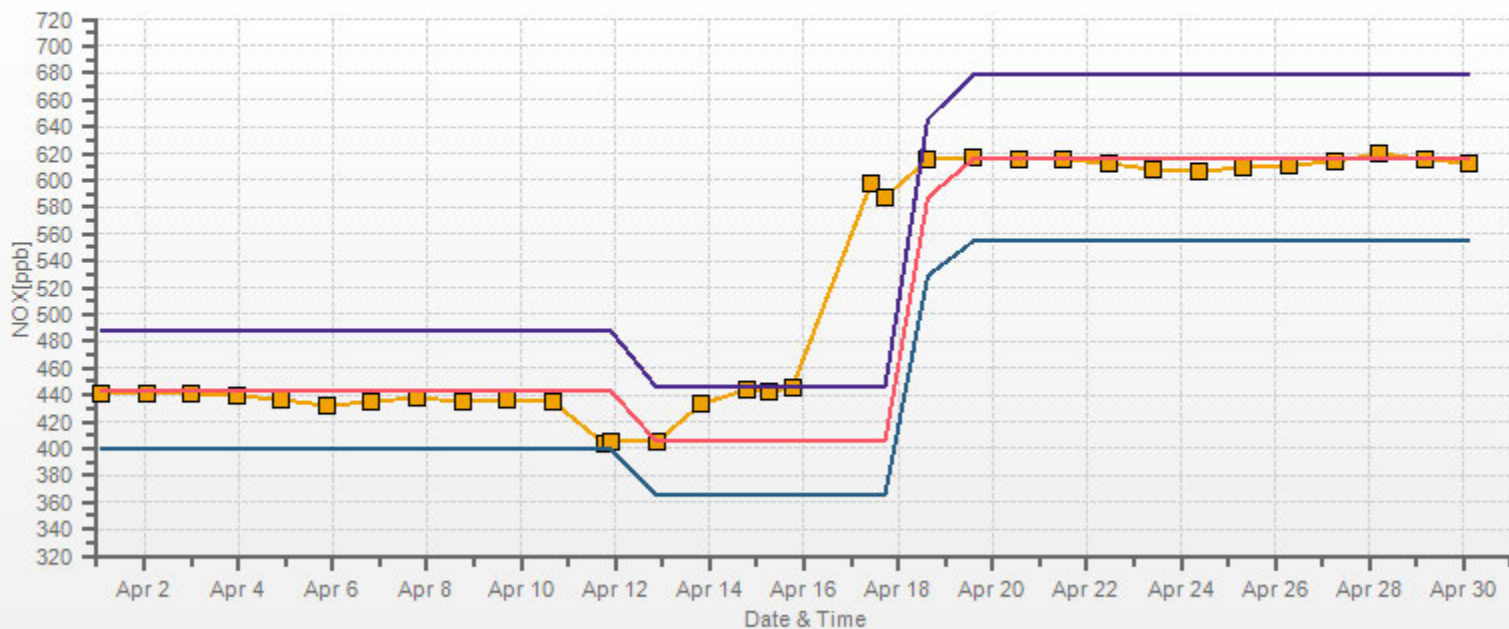
0 >8.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 0.00[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/04 Type: Span

■ Span Meas
 — Span Ref
 — Span Low
 — Span High



NITRIC OXIDES

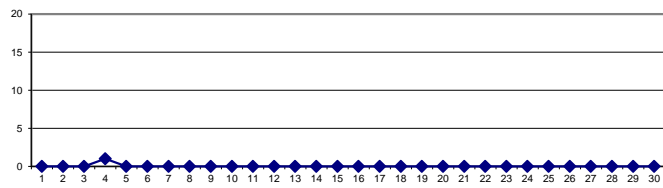
NITRIC OXIDE Hourly Averages (NO ppb)

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 MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
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	24
2	0	S	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	24
3	S	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24
4	0	0	0	0	0	0	1	2	2	2	2	2	0	0	0	1	0	0	0	0	0	0	0	S	0	0	2	1	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	24
6	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24
7	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
8	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
9	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	S	0	0	1	0	0	0	0	1	0	24
10	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	2	0	24
11	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	S	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	0	0	S	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24
14	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
15	0	0	0	0	0	0	S1	1	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	23
16	0	0	0	0	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	0	0	0	12	
17	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	0	0	6
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	0	S	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	0	0	0	0	0	0	0	0	0	24
21	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	24
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	0	0	0	0	0	0	0	0	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	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
27	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
28	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
29	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
30	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	0	1	2	2	2	2	2	1	1	1	1	0	1	0	0	0	1	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

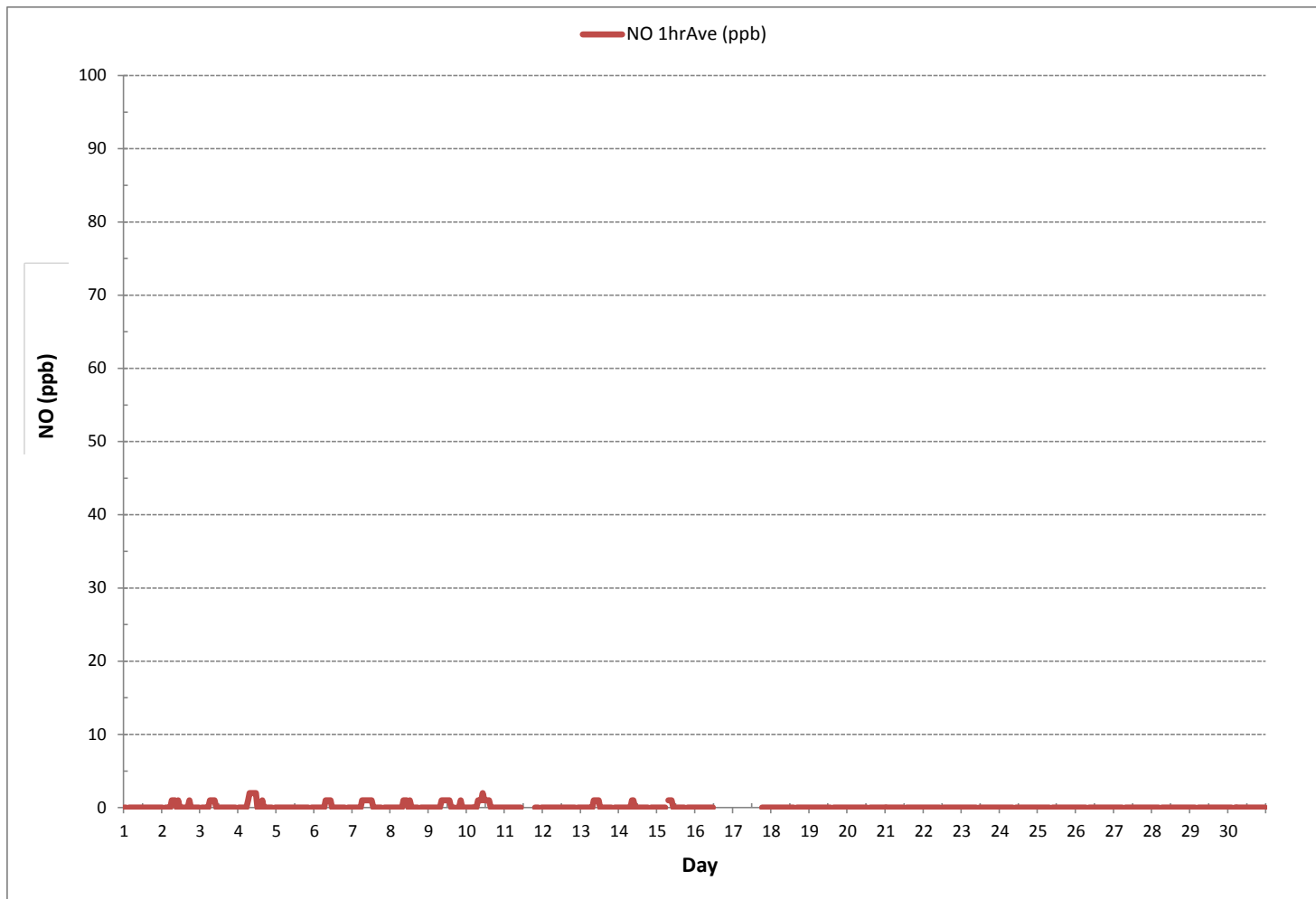
24 HR AVERAGES April 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	55		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb	@ HOUR	7 ON DAY 4
MAXIMUM 24-HR AVERAGE:	1 ppb		ON DAY 4
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	688 hrs
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	95.6 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

NITRIC OXIDE Hourly Averages (NO ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.15% Calm Avg: 0.00 [ppb]

Direction	0.0-1.0	1.0-2.0	2.0-3.0	>3.0	Total
N	7.2	0.0	0.0	0.0	7.2
NE	10.2	0.6	0.2	0.0	10.9
E	10.8	0.8	0.2	0.0	11.7
SE	13.7	0.3	0.0	0.0	14.0
S	19.6	0.0	0.0	0.0	19.6
SW	14.3	0.5	0.0	0.0	14.8
W	10.3	0.0	0.0	0.0	10.3
NW	10.9	0.2	0.2	0.0	11.2
Summary	97.1	2.3	0.5	0.0	100.0

% Icon Classes (ppb)

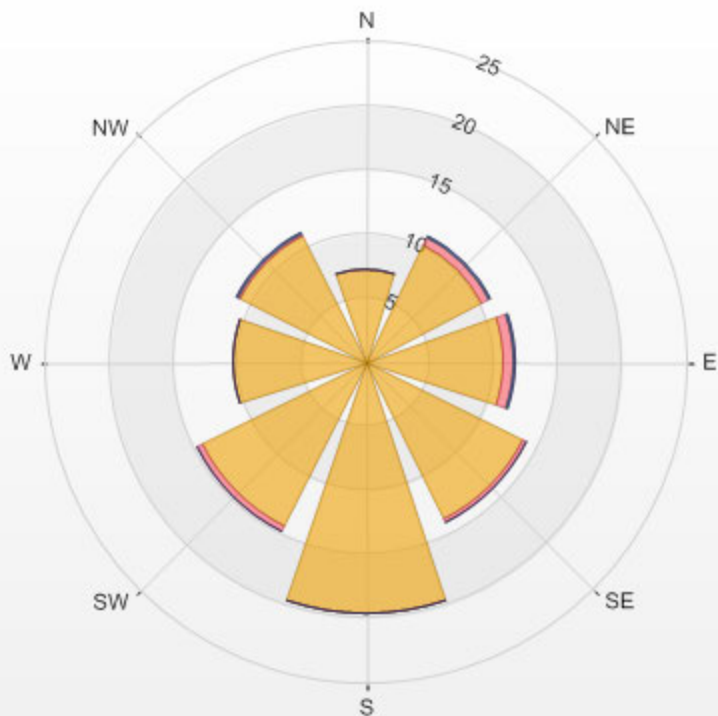
97 0.0-1.0

2 1.0-2.0

0 2.0-3.0

0 >3.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 0.00[ppb]



NITROGEN DIOXIDE



NITROGEN DIOXIDE Hourly Averages (NO₂ 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 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	4	4	S	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24
2	0	S	1	1	6	5	4	2	0	0	0	0	0	0	0	1	2	4	3	0	0	0	0	0	0	0	6	1	24
3	S	3	3	3	2	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	3	1	24
4	1	1	2	2	3	6	6	3	3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	S	0	6	1	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	1	1	0	1	0	24
6	1	2	4	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	4	1	24
7	0	0	0	0	0	1	2	1	0	1	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	2	0	24
8	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	1	0	24
9	0	0	0	0	0	1	1	1	2	1	1	1	1	2	1	0	0	S	1	0	0	0	0	1	0	0	2	1	24
10	2	2	2	2	3	3	4	3	1	2	2	2	1	0	0	0	S	1	0	0	0	0	0	0	0	0	4	1	24
11	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	C	C	C	0	0	0	S	0	0	0	0	0	24
12	0	0	0	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	2	0	24
13	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	S	3	1	1	1	3	1	24
14	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	1	S	2	2	2	2	2	1	2	2	24
15	1	1	1	1	1	1	S1	6	3	3	3	3	2	2	1	1	1	1	S	3	2	2	2	1	1	1	6	2	23
16	1	1	1	2	2	2	2	2	1	1	1	1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	Y	1	2	1	12
17	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	0	0	6
18	0	2	3	4	3	3	4	3	2	1	1	1	0	0	0	S	0	0	0	1	1	1	1	1	0	4	1	24	
19	1	0	0	0	1	1	1	1	2	2	2	1	1	0	S	1	0	0	1	1	1	1	1	1	0	0	2	1	24
20	0	0	1	1	1	1	1	1	2	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
21	0	0	0	0	1	2	3	3	3	3	3	4	S	3	3	4	1	0	0	0	0	0	0	0	0	0	4	1	24
22	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
23	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	24	
24	2	1	1	1	2	3	3	3	3	S	2	1	0	1	1	1	3	1	1	1	1	1	0	0	0	0	3	1	24
25	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	24
26	1	1	2	3	4	4	2	S	0	0	X	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	1	23	
27	0	0	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
28	0	0	0	0	0	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
29	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	0	1	0	24
30	1	0	0	S	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	24
HOURLY MAX	4	4	4	4	6	6	6	6	3	3	3	4	2	3	3	4	3	2	4	3	2	3	2	2	2				
HOURLY AVG	1	1	1	1	1	2	2	1	1	1	1	1	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

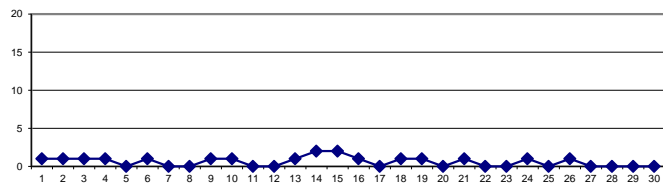
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

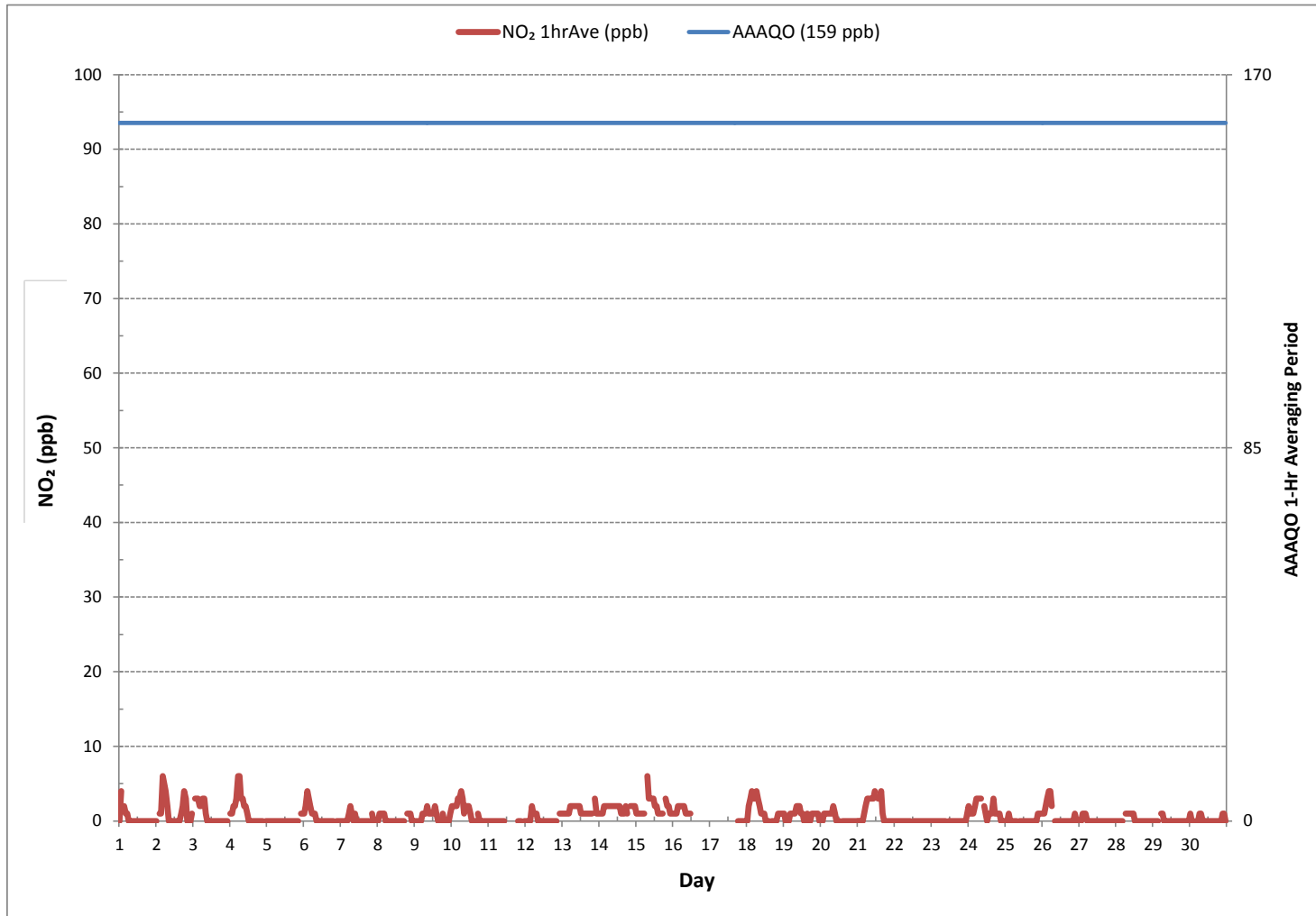
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	269		
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	6 ON DAY 1
MAXIMUM 1-HR AVERAGE:	6 ppb	@ HOUR	4 ON DAY 2
MAXIMUM 24-HR AVERAGE:	2 ppb		ON DAY 14
IZS CALIBRATION TIME:	29 hrs	OPERATIONAL TIME:	688 hrs
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	95.6 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb

24 HR AVERAGES April 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO2[ppb]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.15% Calm Avg: 0.00 [ppb]

Direction	0.0-2.3	2.3-4.7	4.7-7.0	>7.0	Total
N	6.9	0.3	0.0	0.0	7.2
NE	8.2	2.2	0.6	0.0	11.0
E	10.2	1.5	0.0	0.0	11.7
SE	13.7	0.3	0.0	0.0	14.0
S	19.4	0.2	0.0	0.0	19.6
SW	12.8	2.0	0.0	0.0	14.8
W	8.9	1.4	0.0	0.0	10.3
NW	11.1	0.2	0.0	0.0	11.2
Summary	91.2	8.0	0.6	0.0	100.0

% Icon Classes (ppb)

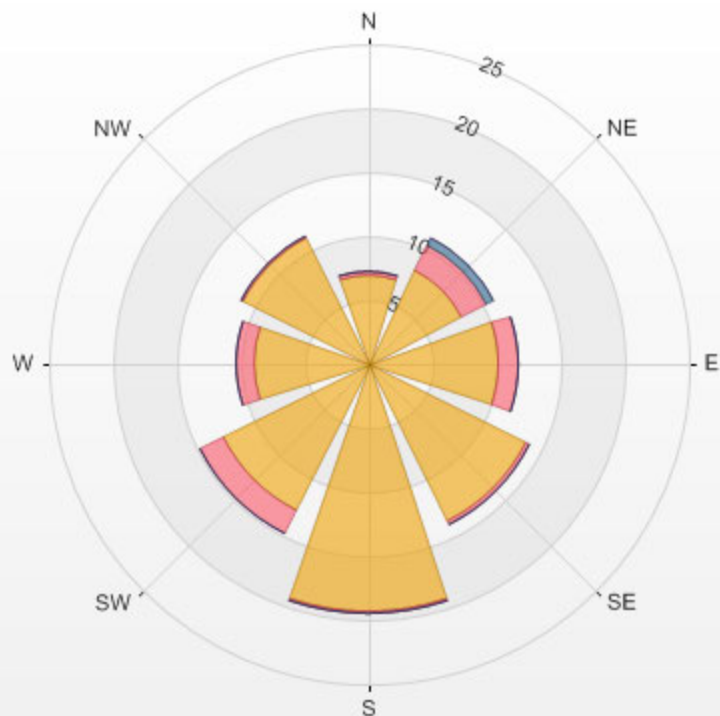
91 0.0-2.3

8 2.3-4.7

1 4.7-7.0

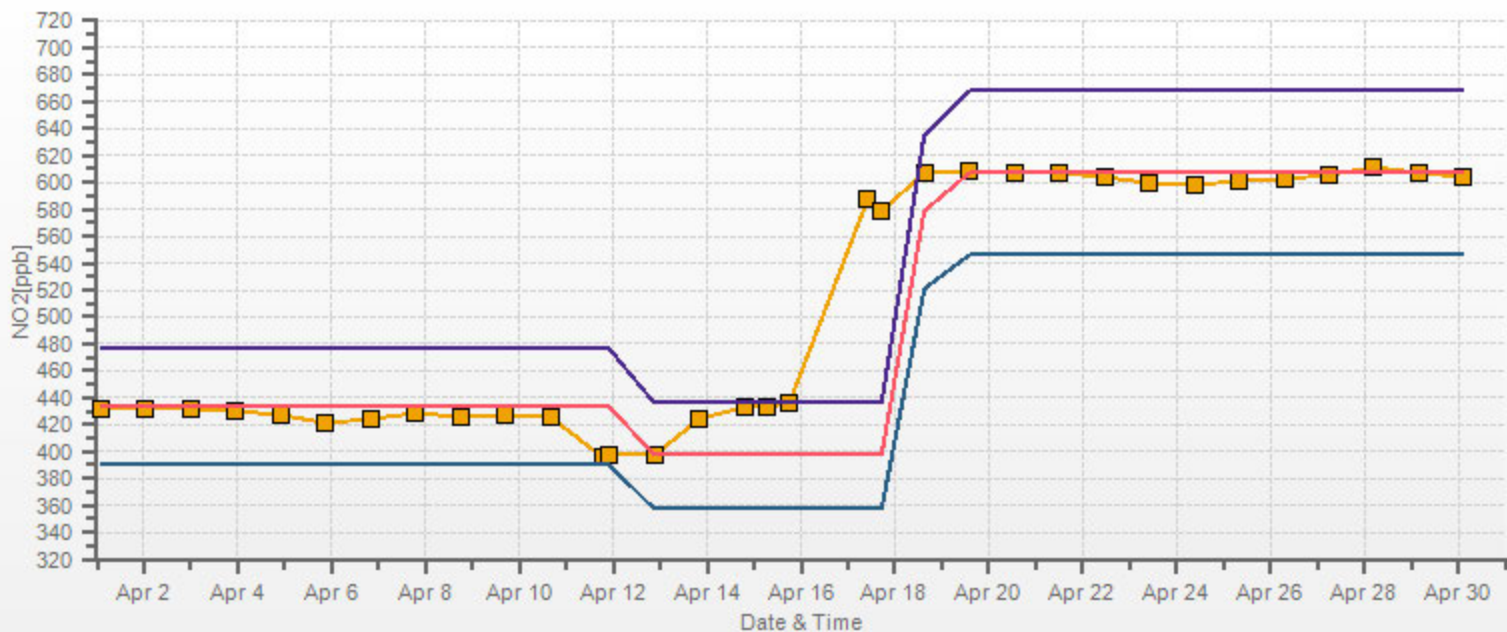
0 >7.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 0.00[ppb]



NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



OZONE

OZONE Hourly Averages (O₃ 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 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	37.3	37.4	S	41.5	42.9	44.9	45.9	45.9	45.4	45.1	45.8	47.1	47.5	47.9	48.8	48.4	48.2	48.2	47.9	47.8	47.7	47.2	45.1	46.3	37.3	48.8	45.7	24	
2	46.7	S	47.3	44.4	36.1	35.7	37.9	43.5	46.6	46.7	47.4	49.0	50.5	51.7	52.4	53.7	54.7	54.8	53.7	52.5	49.0	46.8	45.6	43.1	35.7	54.8	47.4	24	
3	S	40.2	38.9	38.5	40.8	41.0	36.9	37.9	41.0	43.5	46.2	47.0	47.8	48.2	49.1	49.6	49.4	50.0	50.1	49.3	48.8	48.1	47.7	S	36.9	50.1	45.0	24	
4	47.6	45.4	42.1	41.8	39.8	33.4	33.3	37.4	38.4	39.6	40.9	41.8	44.8	46.3	45.3	45.3	46.7	47.3	46.6	46.3	46.1	45.1	S	42.7	33.3	47.6	42.8	24	
5	41.8	41.5	41.0	39.8	39.0	38.0	36.5	35.8	35.6	35.1	35.0	34.7	34.9	34.6	34.7	36.3	36.5	34.7	32.8	31.5	30.5	S	29.6	29.0	29.0	41.8	35.6	24	
6	28.2	26.4	24.2	26.0	26.9	27.8	27.5	27.2	29.4	30.5	31.9	32.6	34.6	37.1	39.1	40.1	40.2	41.1	41.3	41.1	S	39.8	39.2	39.0	24.2	41.3	33.5	24	
7	39.2	39.0	38.3	38.0	37.4	35.4	33.9	37.0	39.0	40.6	42.0	42.5	44.7	46.7	47.7	47.7	46.2	47.0	46.2	S	45.4	45.1	44.0	44.2	33.9	47.7	42.1	24	
8	44.8	43.9	42.8	42.4	41.5	41.8	42.4	43.1	44.0	45.8	46.6	47.2	47.5	48.0	48.7	49.3	50.2	51.4	S	53.1	53.2	52.4	52.3	52.5	41.5	53.2	47.2	24	
9	51.8	51.6	51.4	50.3	48.8	47.6	46.9	46.4	45.9	48.6	50.5	50.3	50.9	51.0	58.2	58.5	57.4	S	54.0	53.8	54.3	57.3	59.4	60.1	45.9	60.1	52.4	24	
10	58.8	57.7	55.8	55.0	51.9	49.3	49.4	51.3	51.7	47.8	46.0	47.2	49.3	50.3	50.6	51.1	S	51.1	48.1	46.3	46.1	47.1	47.3	46.5	46.0	58.8	50.2	24	
11	45.7	46.9	48.6	50.1	49.6	49.5	49.2	48.8	48.3	48.5	48.9	48.7	48.7	48.6	49.5	Q	51.7	51.6	51.6	50.7	50.5	50.8	S	50.3	45.7	51.7	49.4	24	
12	49.0	48.7	47.5	47.5	46.1	45.6	45.7	48.0	49.6	50.7	C	C	C	C	C	C	57.5	59.2	60.1	59.6	58.9	57.7	S	58.0	57.2	45.6	60.1	52.6	24
13	56.2	53.6	51.7	50.5	49.6	48.8	48.6	49.2	50.1	51.0	50.9	52.2	53.0	53.9	55.4	55.5	53.8	51.6	51.1	47.2	S	44.5	44.9	43.7	43.7	56.2	50.7	24	
14	42.4	41.9	40.7	39.5	38.1	37.0	36.3	36.5	36.8	37.8	41.0	44.6	48.7	52.3	54.3	54.7	56.0	57.0	57.4	S	56.0	56.8	58.2	58.9	36.3	58.9	47.1	24	
15	58.7	59.4	57.0	54.8	53.8	51.0	45.8	48.3	50.7	51.8	52.5	54.0	54.0	51.8	50.1	47.6	45.9	43.4	S	41.3	40.3	39.8	39.2	38.6	38.6	59.4	49.1	24	
16	37.9	37.3	35.4	34.9	34.7	36.4	35.5	35.0	37.5	37.3	38.3	36.8	35.7	35.8	36.8	36.5	41.3	S	53.2	55.8	55.3	54.4	53.1	52.5	34.7	55.8	41.2	24	
17	51.8	50.3	48.8	47.2	46.0	45.0	44.0	42.7	41.5	40.3	39.5	38.1	36.6	38.6	41.9	42.3	S	57.8	59.6	58.5	57.0	54.3	51.0	49.4	48.5	31.6	59.6	44.6	24
18	36.6	35.3	34.6	33.3	33.9	33.0	31.6	34.1	37.2	39.3	42.2	44.9	49.1	52.3	53.3	S	57.8	59.6	58.5	57.0	54.3	51.0	49.4	48.5	31.6	59.6	44.6	24	
19	48.3	47.9	48.2	46.6	45.1	44.5	44.5	45.7	48.3	49.9	53.5	55.9	57.2	56.5	S	55.2	53.4	53.1	49.7	47.6	44.7	42.0	40.5	39.0	39.0	57.2	48.6	24	
20	37.5	35.9	34.5	33.3	32.6	31.0	28.0	31.3	39.7	46.8	48.9	48.8	50.4	S	50.8	51.3	51.1	50.9	51.3	52.2	50.0	48.2	48.5	49.6	28.0	52.2	43.6	24	
21	50.2	49.1	48.1	48.8	46.0	38.1	39.4	42.0	41.2	39.1	39.9	38.1	S	36.0	35.9	36.9	43.7	46.0	45.8	48.0	47.4	46.8	41.4	41.2	35.9	50.2	43.0	24	
22	37.9	39.3	37.2	38.5	40.7	42.1	41.9	41.2	40.0	39.6	38.9	S	37.4	39.6	39.2	39.9	41.7	42.3	42.0	41.4	41.9	41.6	41.1	41.2	37.2	42.3	40.3	24	
23	42.4	42.6	42.3	41.9	41.8	41.6	41.3	41.5	43.0	44.0	S	45.1	46.3	45.7	46.1	46.3	47.5	47.8	47.8	46.4	45.2	44.8	44.7	44.3	41.3	47.8	44.4	24	
24	43.2	43.2	42.3	40.3	36.9	33.9	31.5	31.0	33.8	S	47.5	54.6	57.0	56.3	55.4	54.8	53.2	53.2	52.2	50.6	51.8	56.9	58.0	60.2	31.0	60.2	47.7	24	
25	59.3	58.4	57.8	57.0	56.7	55.8	53.4	51.7	S	51.4	50.4	51.0	51.0	51.7	52.0	52.6	53.2	53.7	52.8	51.3	50.2	49.0	48.8	48.5	48.5	59.3	52.9	24	
26	47.6	48.2	46.6	43.8	41.7	40.4	44.4	S	46.0	49.3	X	53.7	54.2	55.5	55.6	55.6	55.3	54.6	54.5	53.7	53.0	50.4	50.8	50.6	40.4	55.6	50.3	23	
27	50.1	49.5	46.9	44.3	43.0	43.8	S	46.3	47.3	49.2	51.6	56.5	55.8	54.7	55.9	56.7	56.0	55.7	55.2	53.5	51.1	49.0	46.6	46.9	43.0	56.7	50.7	24	
28	46.9	46.2	45.8	44.7	43.5	S	39.0	39.4	39.5	40.6	43.1	46.7	50.3	53.7	56.2	58.1	58.0	57.7	57.3	57.0	57.0	54.0	47.7	47.0	39.0	58.1	49.1	24	
29	45.9	46.3	47.0	46.0	S	36.8	39.7	44.8	46.0	46.6	47.2	45.8	45.8	47.0	48.5	48.7	49.1	49.9	50.3	50.6	51.0	50.8	50.7	50.4	36.8	51.0	47.2	24	
30	48.5	49.7	50.0	S	49.7	49.0	44.7	43.4	48.5	48.8	50.0	50.1	50.7	51.6	52.8	53.7	54.5	55.3	56.1	55.9	53.5	52.9	51.7	49.7	43.4	56.1	50.9	24	
HOURLY MAX	59.3	59.4	57.8	57.0	56.7	55.8	53.4	51.7	51.7	51.8	53.5	56.5	57.2	56.5	58.2	58.5	59.2	60.1	59.6	58.9	57.7	57.3	59.4	60.2					
HOURLY AVG	45.9	45.3	44.6	43.5	42.6	41.3	40.5	41.6	42.8	44.3	45.1	46.6	47.7	48.0	48.7	49.4	50.4	50.2	50.1	49.2	48.9	48.3	47.2	46.9					

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

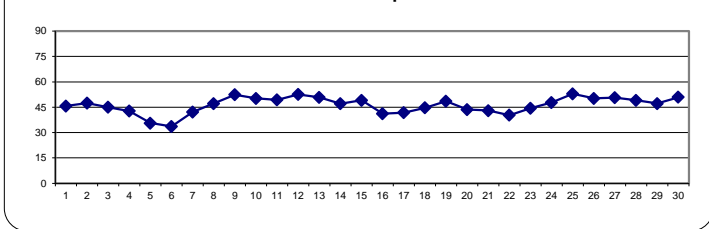
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

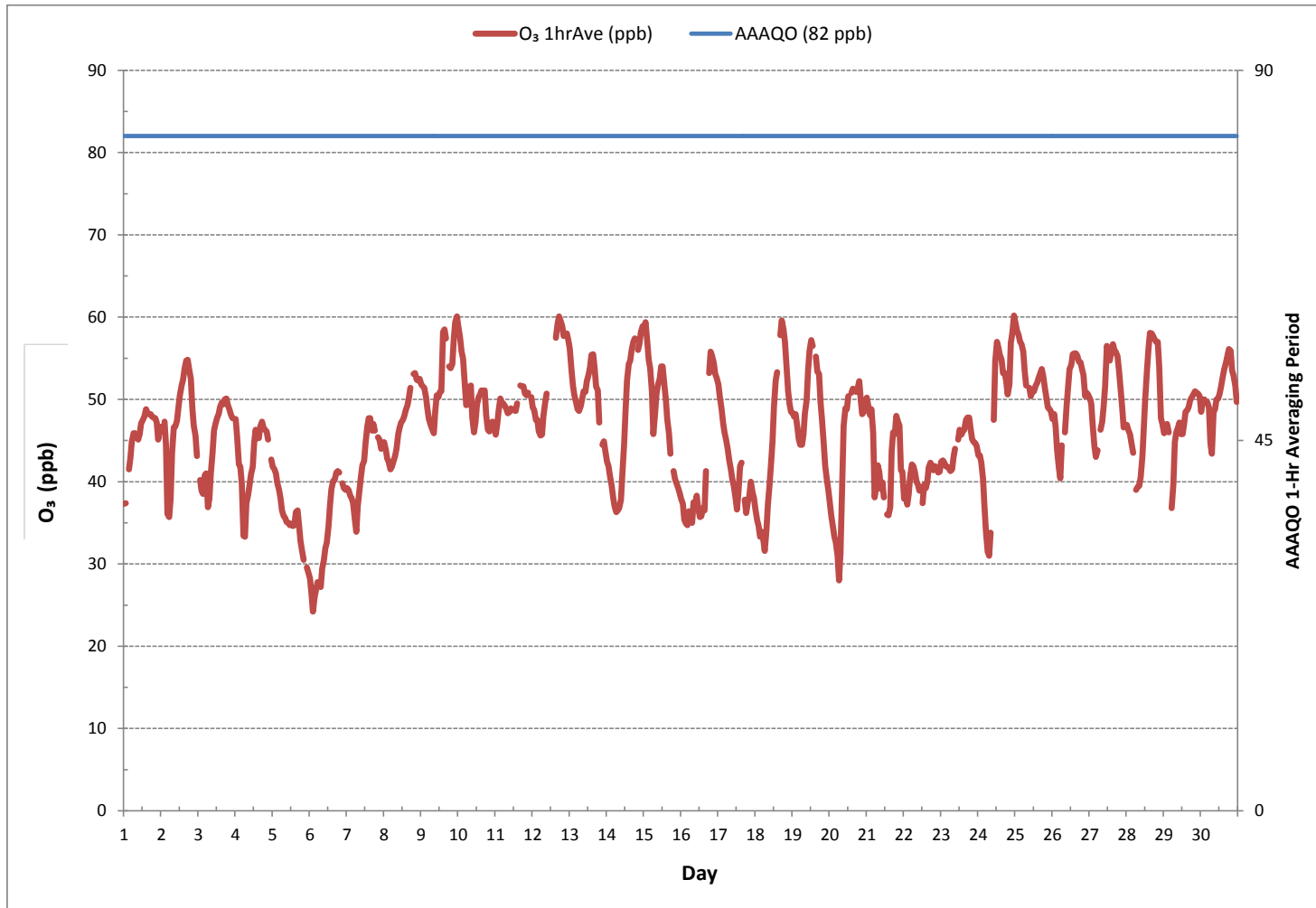
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	682			
MINIMUM 1-HR AVERAGE:	24.2 ppb	@ HOUR	2	ON DAY
MAXIMUM 1-HR AVERAGE:	60.2 ppb	@ HOUR	23	ON DAY
MAXIMUM 24-HR AVERAGE:	52.9 ppb			ON DAY
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	719 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.9 %	
STANDARD DEVIATION:	7.1	MONTHLY AVERAGE:	46.2 ppb	

24 HR AVERAGES April 2018



OZONE Hourly Averages (O₃ ppb)



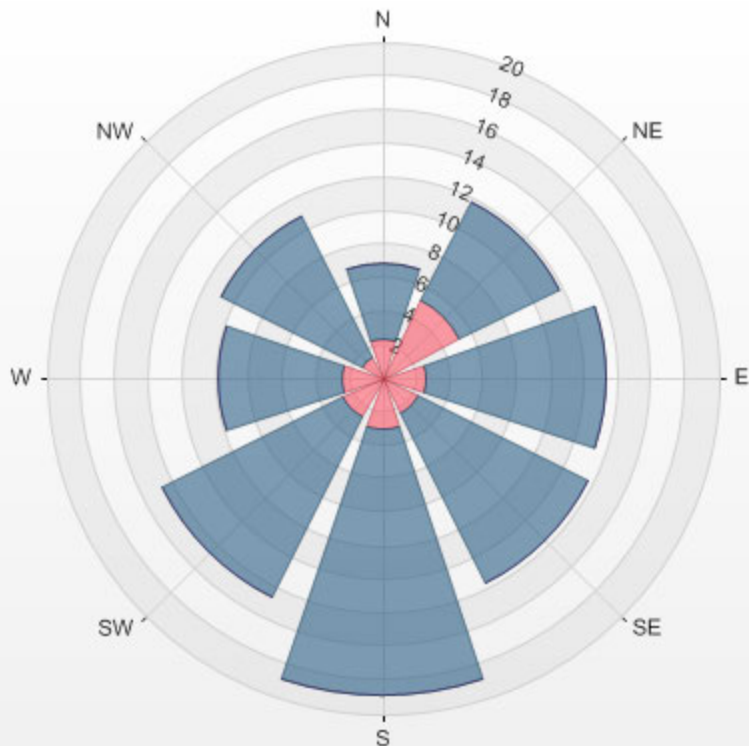
Wind: LICA ST. LINA
Poll.: LICA ST. LINA-O3[ppb]
Monthly: 18/04
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.15% Calm Avg: 50.96 [ppb]

Direction	0.0-20.1	20.1-40.2	40.2-60.3	>60.3	Total
N	0.0	2.4	4.6	0.0	6.9
NE	0.0	5.1	6.6	0.0	11.8
E	0.0	2.5	10.9	0.0	13.4
SE	0.0	2.4	11.3	0.0	13.7
S	0.0	3.1	15.9	0.0	18.9
SW	0.0	2.6	12.0	0.0	14.7
W	0.0	2.5	7.3	0.0	9.8
NW	0.0	1.3	9.4	0.0	10.7
Summary	0.0	21.9	78.0	0.0	100.0

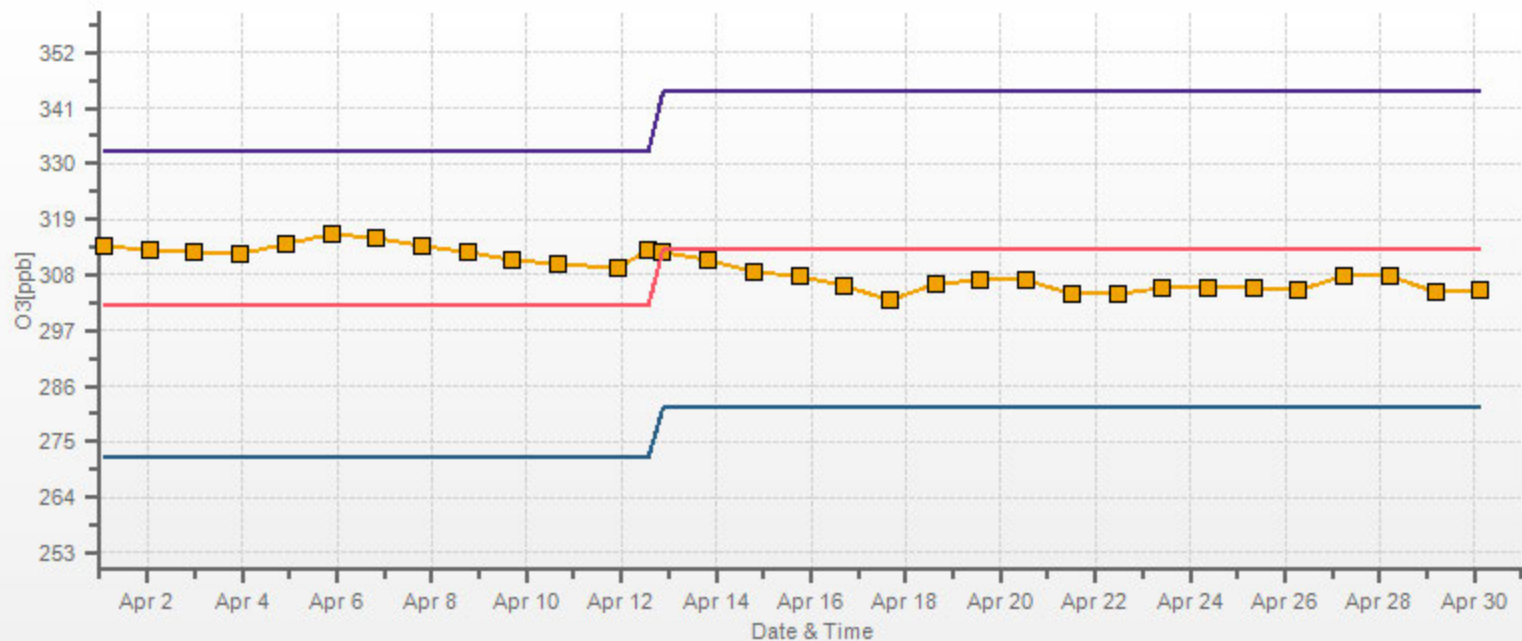
% Icon Classes (ppb) 0 0.0-20.1 22 20.1-40.2 78 40.2-60.3 0 >60.3

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.15% Calm Poll Avg: 50.96[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 18/04 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

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	5	5	6	5	4	4	5	4	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	6	3	24
2	2	2	2	3	3	3	3	2	2	2	2	3	3	3	4	8	11	12	11	6	5	3	3	2	12	4	24		
3	3	3	3	3	3	3	4	3	3	3	2	2	2	2	3	3	3	3	3	3	6	5	5	4	2	6	3	24	
4	4	3	4	6	6	3	4	4	4	5	5	5	4	3	4	4	5	4	3	2	2	2	2	3	2	6	4	24	
5	3	3	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	2	4	3	24		
6	4	3	3	3	3	3	3	3	3	3	3	3	3	3	5	4	4	3	3	3	3	4	5	5	3	5	3	24	
7	4	3	3	3	3	3	3	3	3	3	2	3	2	4	3	3	2	2	2	1	1	1	1	1	1	4	2	24	
8	4	6	6	7	7	7	8	8	8	10	11	9	6	5	5	5	5	5	6	7	8	10	13	14	4	14	8	24	
9	13	14	12	12	13	13	14	14	15	16	18	14	12	12	14	12	11	8	7	8	8	9	12	15	7	18	12	24	
10	17	17	25	28	25	25	20	15	11	6	5	4	5	3	2	3	3	3	3	2	2	2	2	2	2	2	28	10	24
11	2	3	4	3	3	3	2	2	3	3	3	3	3	4	4	3	3	3	3	3	4	3	3	3	2	4	3	24	
12	3	3	3	3	5	3	3	3	4	4	5	6	6	5	5	5	5	5	4	5	5	6	7	3	7	5	24		
13	8	8	10	11	9	9	9	9	9	9	12	12	11	11	10	7	6	7	8	10	10	9	6	6	6	6	12	9	24
14	7	7	8	9	10	9	8	7	6	7	8	10	9	5	2	3	5	7	2	1	2	3	6	8	1	10	6	24	
15	8	6	5	7	8	11	17	16	14	13	12	10	7	5	4	4	4	5	5	3	2	3	5	5	2	17	7	24	
16	5	3	2	2	2	2	2	3	5	4	8	10	10	10	10	8	6	3	3	4	3	4	4	4	4	2	10	5	24
17	4	4	4	5	6	7	7	7	7	7	7	8	8	15	15	14	7	2	2	3	2	2	2	3	2	15	6	24	
18	2	3	4	5	6	6	7	5	4	3	3	3	3	2	2	2	3	3	4	5	5	4	3	2	7	4	24		
19	3	3	3	3	3	5	7	11	14	15	13	10	9	5	5	7	5	3	4	7	5	22	7	5	3	22	7	24	
20	4	3	4	5	6	6	6	6	5	2	2	1	2	1	2	1	2	2	2	2	2	4	4	3	1	6	3	24	
21	2	2	4	6	7	7	9	13	14	12	11	14	13	6	8	7	4	3	2	2	2	4	4	2	14	7	24		
22	2	1	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1	2	2	0	2	1	24	
23	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	1	3	2	24	
24	3	3	5	7	8	8	7	9	9	7	7	C	C	7	6	5	5	4	4	4	6	9	9	3	9	6	24		
25	12	19	18	14	13	11	10	9	6	2	2	2	2	1	2	2	2	3	3	3	4	4	5	5	1	19	6	24	
26	5	7	8	11	11	10	7	6	4	4	5	5	4	3	3	3	2	2	2	2	2	2	3	3	2	11	5	24	
27	3	3	4	3	2	2	2	2	3	5	11	7	7	7	7	6	6	5	5	7	7	7	4	3	2	11	5	24	
28	3	3	3	3	4	5	5	5	5	5	6	7	8	8	9	9	8	7	7	7	7	7	5	6	3	9	6	24	
29	7	7	6	6	6	4	5	7	7	4	5	5	3	2	2	2	2	2	2	2	2	2	3	3	2	7	4	24	
30	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	5	5	6	5	5	5	4	5	3	6	4	24	
HOURLY MAX	17	19	25	28	25	25	20	16	15	16	18	14	13	15	15	14	11	11	12	11	10	22	13	15					
HOURLY AVG	5	5	6	6	6	6	6	6	6	5	6	6	5	5	5	5	4	4	4	4	4	5	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

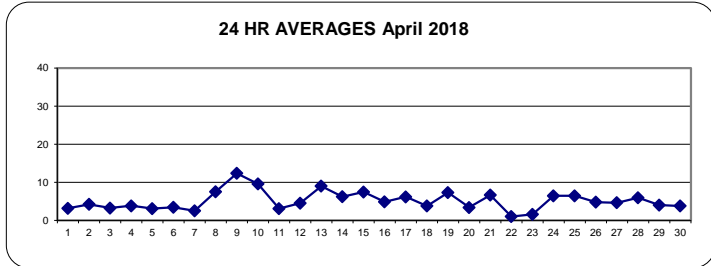
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80	µg/m ³	24-HR	30	µg/m ³
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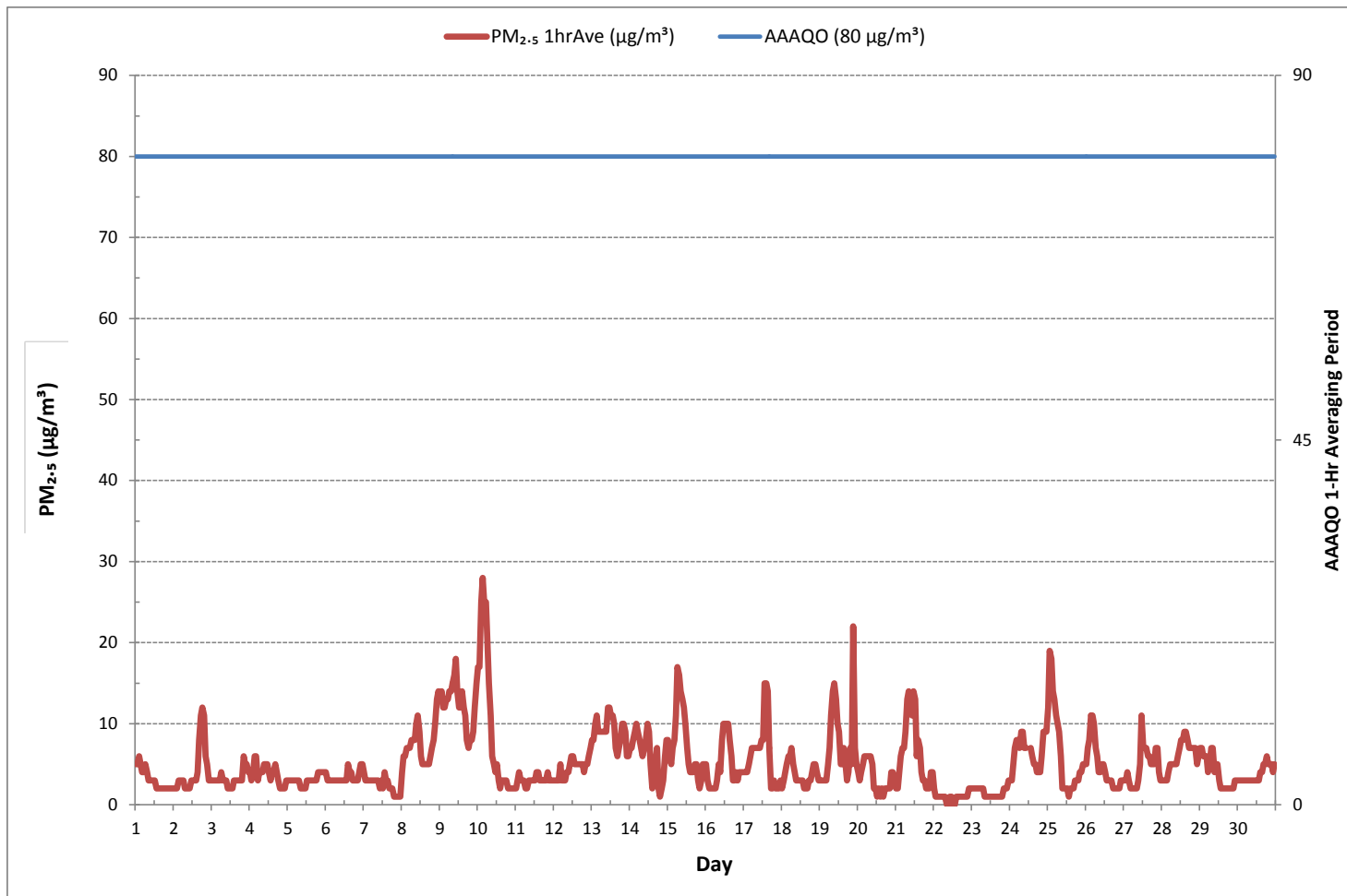
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	714		
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	8 ON DAY	22
MAXIMUM 1-HR AVERAGE:	28 µg/m ³ @ HOUR	3 ON DAY	10
MAXIMUM 24-HR AVERAGE:	12 µg/m ³	ON DAY	9
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	720 hrs
STANDARD DEVIATION:	4	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	5 µg/m ³

24 HR AVERAGES April 2018



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m3(L)]
 Monthly: 18/04
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

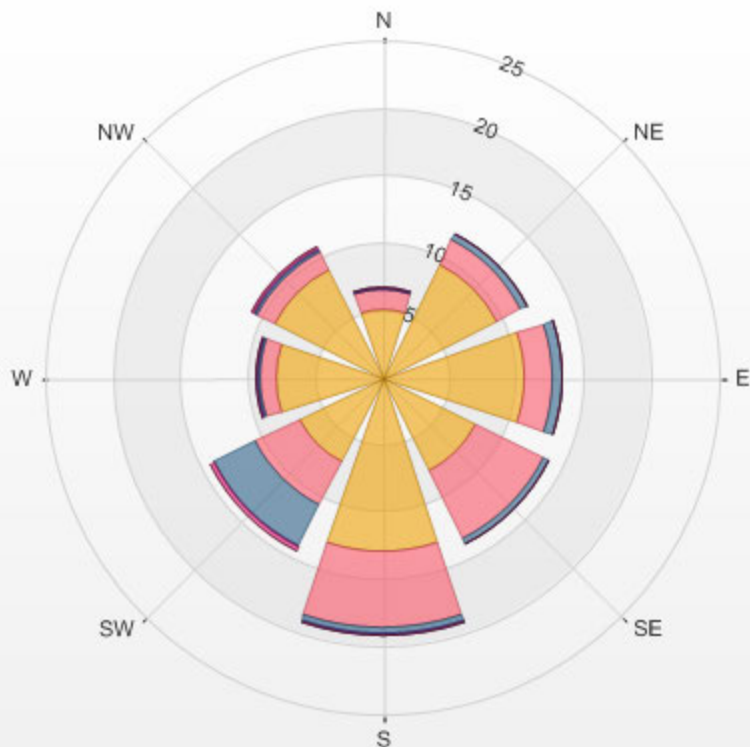
Calm: 0.28%

Calm Avg: 2.83 [ug/m3(L)]

Direction	0.0-5.8	5.8-11.6	11.6-17.4	17.4-23.2	23.2-29.0	>29.0	Total
N	5.2	1.4	0.0	0.1	0.0	0.0	6.7
NE	9.5	2.0	0.6	0.0	0.0	0.0	12.0
E	10.6	2.0	0.8	0.0	0.0	0.0	13.4
SE	7.7	5.7	0.4	0.0	0.0	0.0	13.8
S	13.0	5.6	0.4	0.1	0.0	0.0	19.1
SW	7.0	3.6	3.4	0.1	0.3	0.0	14.4
W	8.0	1.1	0.1	0.1	0.1	0.0	9.5
NW	8.9	1.5	0.1	0.1	0.1	0.0	10.9
Summary	69.7	22.9	5.9	0.7	0.6	0.0	100.0

% Icon	Classes (ug/m3(L))	70	 0.0-5.8	23	 5.8-11.6	6	 11.6-17.4	1	 17.4-23.2	1	 23.2-29.0	0	 >29.0
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LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.28% Calm Poll Avg: 2.83[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	13.0	13.0	11.6	10.5	9.9	10.6	11.9	10.7	6.4	2.4	5.3	6.2	8.8	12.0	9.6	8.6	7.4	7.4	7.0	6.8	6.6	8.4	11.5	11.4	2.4	13.0	6.6	24
2	9.7	8.7	6.8	7.6	9.2	10.7	10.1	9.2	9.4	8.9	8.8	5.9	4.5	4.9	2.8	6.1	5.3	6.5	6.6	2.7	7.1	12.7	11.5	12.6	2.7	12.7	5.4	24
3	8.8	7.9	5.7	6.3	7.3	5.6	5.7	4.9	3.0	2.2	4.4	4.7	3.2	2.7	4.4	5.0	5.9	8.0	7.5	7.0	9.3	9.2	7.6	4.7	2.2	9.3	0.6	24
4	6.6	9.2	9.4	5.2	7.7	9.6	10.7	9.5	7.5	4.6	5.1	4.5	13.1	14.4	12.6	13.6	15.7	15.0	14.3	12.0	11.6	10.4	10.0	9.8	4.5	15.7	6.6	24
5	9.3	9.5	7.7	9.7	10.3	9.1	7.5	13.4	16.3	16.6	15.8	16.8	15.2	14.3	14.5	13.0	12.8	12.1	9.9	8.7	8.1	8.3	9.0	11.3	7.5	16.8	10.2	24
6	7.9	5.9	6.9	6.8	9.6	8.2	8.4	6.0	6.5	5.5	4.9	4.7	5.1	5.5	8.0	7.1	9.0	7.7	5.3	5.0	7.1	7.1	8.3	9.1	4.7	9.6	5.2	24
7	9.1	9.5	8.5	9.2	8.6	10.0	9.4	9.4	10.5	12.0	14.9	16.5	15.1	14.6	15.6	16.8	16.2	14.6	10.2	11.2	9.6	11.4	9.9	9.2	8.5	16.8	11.2	24
8	10.8	9.8	10.1	10.3	9.7	11.2	10.7	9.5	9.1	8.3	9.5	9.4	9.5	13.5	11.7	11.1	8.6	10.2	8.4	9.2	8.0	7.0	6.9	6.6	6.6	13.5	7.7	24
9	8.1	6.3	6.3	7.3	6.3	6.7	7.2	6.9	5.1	6.6	7.0	9.2	11.3	14.2	12.6	12.3	10.3	11.4	11.7	8.3	9.2	11.7	12.8	9.7	5.1	14.2	9.1	24
10	9.1	8.2	6.6	8.3	7.2	7.0	8.8	8.6	11.7	12.9	10.6	10.3	10.3	11.0	14.5	11.4	10.0	11.5	10.0	11.3	11.7	13.8	12.7	12.7	6.6	14.5	6.4	24
11	10.7	12.0	11.3	13.9	12.8	14.7	13.6	11.8	8.2	9.1	11.4	8.2	9.8	8.5	9.1	10.7	11.4	9.1	5.9	4.3	4.5	3.3	6.0	7.9	3.3	14.7	8.3	24
12	7.2	6.5	8.8	9.2	8.8	8.8	8.3	6.3	6.9	7.8	9.9	9.6	10.6	10.2	7.9	5.0	6.7	5.2	5.4	5.6	7.7	7.6	7.9	7.8	5.0	10.6	6.4	24
13	7.7	8.8	9.5	9.3	9.2	8.1	8.1	9.0	13.4	14.9	12.7	14.7	14.7	15.5	17.9	17.4	16.9	17.0	17.6	15.8	15.1	17.0	16.3	14.8	7.7	17.9	13.2	24
14	15.8	15.6	12.6	13.7	11.9	10.5	11.0	9.2	7.8	5.9	10.0	6.0	7.7	4.4	4.7	3.7	9.3	10.4	8.6	8.8	8.4	11.8	9.6	7.9	3.7	15.8	6.4	24
15	9.9	7.3	10.4	10.1	6.7	8.3	8.6	7.2	9.4	6.8	7.9	10.4	14.1	16.1	18.7	20.7	15.2	14.0	10.8	11.2	11.0	10.7	8.6	8.6	6.7	20.7	8.7	24
16	7.0	7.4	7.5	8.7	7.1	11.0	14.9	18.6	15.8	18.3	21.7	23.4	23.3	21.0	20.5	17.1	25.6	17.1	13.7	22.7	23.1	21.5	19.3	20.0	7.0	25.6	15.7	24
17	18.2	17.4	15.3	14.3	14.4	13.6	12.9	11.8	9.0	9.0	8.2	8.3	5.7	11.4	16.2	18.0	16.1	21.6	22.5	19.1	15.8	18.2	11.7	14.9	5.7	22.5	6.0	24
18	15.2	17.0	17.9	16.8	13.9	14.0	13.0	14.8	13.5	13.0	8.8	12.5	15.2	18.6	17.2	22.6	21.1	20.1	14.2	8.9	9.7	11.3	10.8	11.5	8.8	22.6	13.9	24
19	12.1	12.9	12.3	11.5	10.2	10.1	10.8	10.4	11.1	10.1	9.0	10.9	14.4	14.1	13.7	10.8	11.2	10.4	8.8	9.1	10.4	10.8	10.2	12.3	8.8	14.4	10.6	24
20	12.4	11.9	9.9	9.9	6.8	7.2	8.2	6.3	5.9	3.7	4.7	3.0	5.2	4.2	11.1	15.3	11.6	11.2	8.5	6.1	7.0	7.7	8.4	10.2	3.0	15.3	5.8	24
21	10.0	10.6	11.3	11.0	10.1	10.8	13.1	13.6	13.9	14.6	11.7	11.1	10.2	9.9	9.3	10.3	12.8	14.4	13.9	13.0	14.4	13.6	13.4	12.5	9.3	14.6	3.0	24
22	18.0	20.5	21.0	20.4	20.0	19.1	19.5	19.1	18.5	20.4	19.6	20.0	20.8	22.8	19.1	20.5	19.6	16.5	15.2	9.3	8.1	9.2	9.4	8.8	8.1	22.8	16.8	24
23	10.0	9.7	9.8	10.7	9.8	11.0	12.1	10.8	10.9	10.1	11.6	11.7	15.7	23.3	21.2	18.4	18.0	17.6	13.4	7.8	9.0	8.1	10.5	11.3	7.8	23.3	11.5	24
24	11.1	9.5	9.8	8.3	9.9	9.6	10.6	14.2	11.8	10.8	9.7	12.7	19.5	22.9	23.4	22.9	24.2	20.1	12.9	7.0	9.2	10.9	12.6	18.0	7.0	24.2	11.0	24
25	11.3	13.0	9.8	10.7	10.4	12.3	9.7	9.1	10.0	13.5	14.9	17.6	16.5	17.6	14.5	15.5	11.8	11.1	14.9	16.0	11.1	10.7	14.0	13.9	9.1	17.6	10.5	24
26	13.7	12.7	11.1	10.0	10.0	12.5	11.4	11.9	10.3	13.1	X	14.2	13.4	13.9	14.2	14.8	12.3	11.8	9.1	7.1	8.3	12.0	16.3	14.7	7.1	16.3	6.3	23
27	14.4	13.4	11.4	12.6	12.6	15.0	16.7	18.7	21.5	21.0	20.0	18.3	18.4	19.9	18.3	20.1	19.5	17.9	13.4	12.3	15.5	17.5	16.8	18.4	11.4	21.5	15.7	24
28	18.3	17.1	17.7	16.6	18.3	17.4	18.3	16.8	14.0	11.7	12.5	15.0	15.1	14.7	17.2	18.2	17.6	14.4	9.3	6.8	5.9	11.3	14.6	14.1	5.9	18.3	10.9	24
29	17.3	20.3	15.8	16.2	17.7	18.0	19.9	20.7	21.2	22.8	21.4	20.8	19.1	17.7	17.6	15.4	11.9	11.5	8.7	2.9	0.2	4.1	3.8	5.4	0.2	22.8	13.4	24
30	4.2	3.4	2.5	1.1	6.3	9.5	8.6	10.3	13.5	12.3	13.2	14.3	15.2	16.6	16.8	15.7	15.3	14.1	11.6	8.0	9.6	13.9	14.2	11.1	1.1	16.8	10.2	24
HOURLY MAX	18.3	20.5	21.0	20.4	20.0	19.1	19.9	20.7	21.5	22.8	21.7	23.4	23.3	23.3	23.4	22.9	25.6	21.6	22.5	22.7	23.1	21.5	19.3	20.0				
HOURLY AVG	11.2	11.2	10.5	10.5	10.4	11.0	11.3	11.3	11.1	11.0	11.2	11.7	12.7	13.7	13.8	13.9	13.6	13.0	11.0	9.5	9.7	11.0	11.2	11.4				

STATUS FLAG CODES

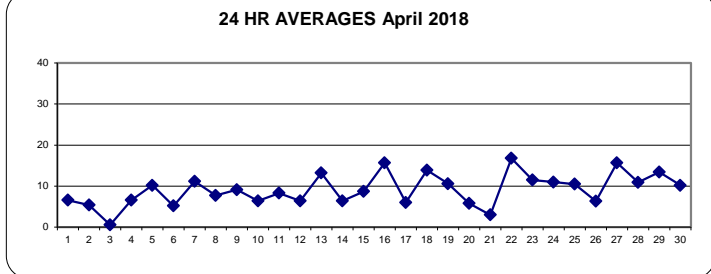
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

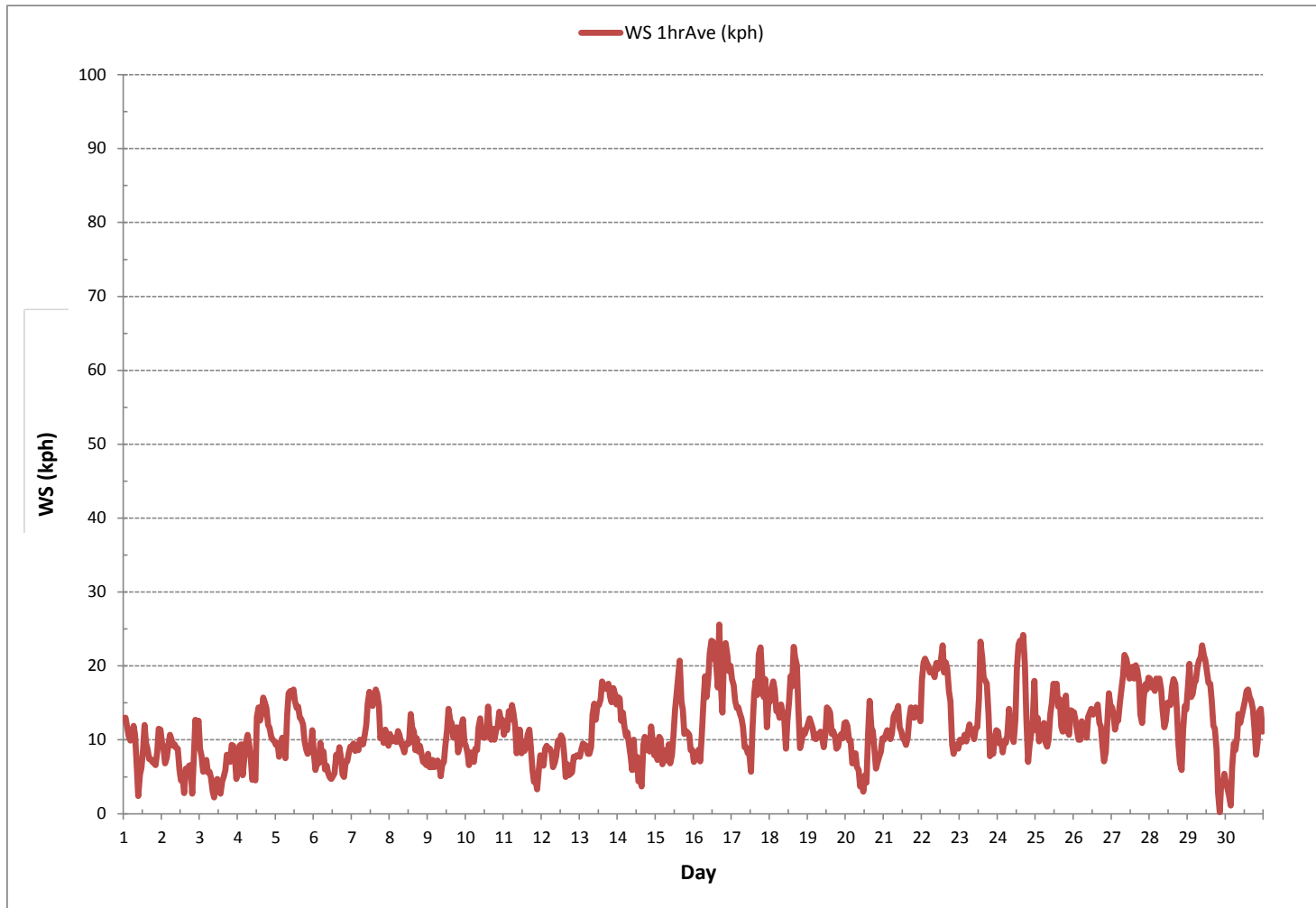
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	719
MINIMUM 1-HR AVERAGE	0.2 kph @ HOUR 20 ON DAY 29
MAXIMUM 1-HR AVERAGE:	25.6 kph @ HOUR 16 ON DAY 16
MAXIMUM 24-HR AVERAGE:	16.8 kph ON DAY 22
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	719 hrs
AMSD OPERATION UPTIME:	99.9 %
STANDARD DEVIATION:	4.5
MONTHLY AVERAGE:	2.0 kph

24 HR AVERAGES April 2018



WIND SPEED Hourly Averages (WS kph)



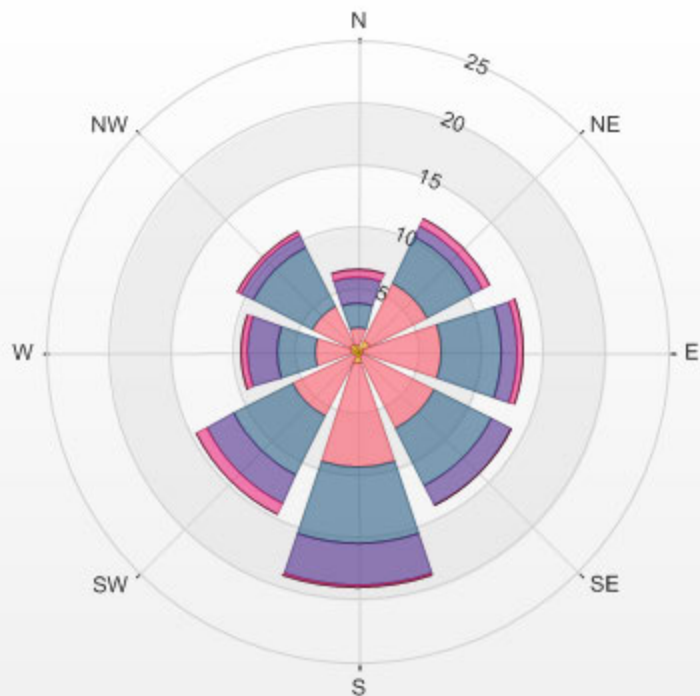
Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 18/04
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.28%

Direction	1.8-5.1	5.1-10.3	10.3-15.4	15.4-20.6	20.6-25.7	>25.7	Total
N	0.6	1.5	1.8	2.1	0.7	0.0	6.7
NE	1.1	5.2	4.0	1.0	0.7	0.0	12.0
E	0.6	6.3	4.7	1.3	0.6	0.0	13.4
SE	0.6	6.4	5.2	1.7	0.0	0.0	13.8
S	1.0	8.3	6.1	3.3	0.3	0.0	19.1
SW	0.4	5.4	5.3	2.5	1.0	0.0	14.6
W	0.6	2.9	3.1	2.4	0.6	0.0	9.5
NW	0.7	3.5	5.2	1.3	0.3	0.0	10.9
Summary	5.4	39.5	35.3	15.4	4.1	0.0	100.0

% Icon Classes (kph) 5 1.8-5.1 40 5.1-10.3 35 10.3-15.4 15 15.4-20.6 4 20.6-25.7 0 >25.7

LICA ST. LINA 2018/04/01 00:00 - 2018/04/30 23:00 Calm: 0.28% Calm Wind Avg Speed: 0.65(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 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	W	W	W	W	WNW	NW	NW	NW	WNW	W	NW	NW	NW	NW	N	NNW	NW	NW	NW	NW	N	NE	ENE	NW	24	
2	E	ESE	ESE	NE	NE	ENE	ENE	E	ESE	ESE	ESE	ESE	ENE	ESE	ENE	ESE	SSE	SSW	SSW	SW	N	NNE	NNE	NE	E	24	
3	NE	NE	NE	ENE	E	ENE	NE	NNE	NE	NNE	N	NNE	NE	NNE	SE	S	SSW	SSW	S	SW	SW	SW	WSW	WNW	E	24	
4	N	NE	ENE	E	NE	NE	NE	NE	ENE	ENE	NW	NW	WNW	NW	NW	NW	NW	NW	WNW	WNW	NW	WNW	WNW	NW	NNW	24	
5	NW	NW	WNW	WNW	NW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNE	N	N	N	NE	NE	ENE	NNW	24	
6	NE	NE	ENE	E	E	E	E	E	E	SE	S	SSE	SSE	SSE	SE	SSE	SE	SE	SE	SSE	SSE	S	S	S	SE	24	
7	S	SSE	SE	SSE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	ESE	ESE	SE	ESE	24	
8	ESE	SE	ESE	ESE	E	E	E	E	ESE	ESE	ESE	ESE	SE	ESE	SE	SSE	S	S	S	S	SSW	SSW	SSW	SSW	SE	24	
9	SW	SW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	24
10	SW	SSW	SSW	SW	W	WNW	NNE	NE	ENE	ENE	NE	ENE	ENE	ENE	ENE	E	E	E	E	ENE	ENE	ENE	E	ENE	ENE	24	
11	E	E	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	SSE	S	SSE	SSE	SSE	ENE	24	
12	SSE	SE	E	E	E	E	ESE	ESE	E	ESE	ESE	SE	SE	SE	S	SE	SSE	SSW	S	SSW	S	SSE	SSE	SE	24		
13	SE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	24	
14	SE	ESE	ESE	SE	SE	SE	SE	SE	SE	SSE	SW	W	NW	NNW	NW	SE	SSE	S	S	S	SSW	S	SSW	S	SSE	24	
15	S	S	SSE	SSE	SE	NE	ENE	ESE	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	ENE	ENE	ENE	ENE	ENE	24	
16	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	NE	ENE	E	ESE	E	E	E	E	ESE	ENE	24	
17	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	ESE	SE	S	S	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	SW	S	24	
18	SW	SW	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	S	S	S	SW	24	
19	S	S	SSW	S	S	S	S	SSW	S	SSW	S	S	S	SSE	SSE	SE	SSE	S	SE	SSE	SSE	S	S	S	S	24	
20	S	S	SSW	SW	SSW	S	SW	W	NNW	NNE	N	ENE	NNE	S	SW	SW	SW	SW	SW	SW	S	S	S	SSE	SSW	24	
21	SSE	SSE	SSE	SE	ESE	E	ESE	SE	E	E	ENE	NE	NNE	N	NNW	NNW	NW	NW	WNW	NW	W	W	W	W	NE	24	
22	W	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	24
23	WNW	WNW	W	W	W	W	W	W	WSW	WSW	SW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SSW	SSW	SSW	S	WSW	24
24	S	SSW	SSW	SSW	S	SSW	SSW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	SW	WSW	WSW	WSW	WSW	NNW	NNW	NW	NW	WSW	24	
25	WNW	WNW	WNW	WNW	WNW	WNW	NW	NW	WNW	NW	NNW	NW	NW	NW	WNW	W	WNW	W	WSW	WSW	SW	SSW	SSW	SSW	WNW	24	
26	SW	WSW	WSW	WSW	WSW	WSW	W	WNW	NW	NNW	X	NW	NW	NNW	NNW	NNW	NNW	N	N	NNE	NE	ENE	E	E	NW	23	
27	E	ESE	SE	SE	SSE	SSE	S	SSE	S	S	S	S	S	S	S	S	S	S	S	S	SSE	SSE	SSE	S	S	24	
28	S	S	S	S	S	S	S	SSW	SSW	S	S	S	S	S	SSW	SSW	SW	SW	SW	SSW	SW	W	NNW	N	N	SSW	24
29	N	NNE	NNE	N	NNW	NNW	NNW	NNW	NNW	N	N	N	N	N	N	N	NNE	NE	NE	E	WNW	W	W	W	N	24	
30	WSW	WSW	WSW	S	SSE	SSE	S	SSE	S	SSW	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	S	SSE	SSE	SSE	S	S	24	

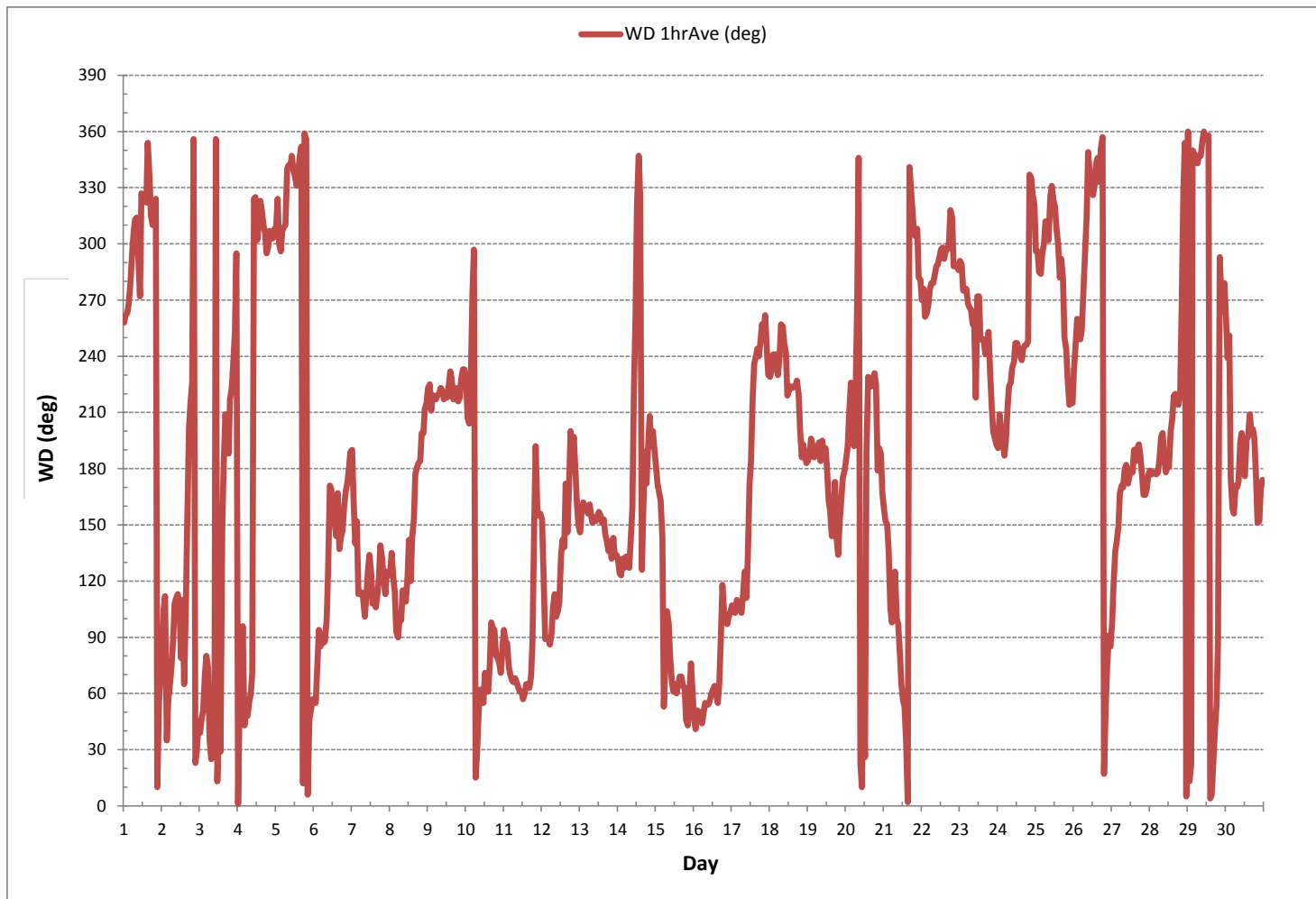
STATUS FLAG CODES

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:	719	hrs
STANDARD DEVIATION:	91		AMD OPERATION UPTIME:	99.9	%
			MONTHLY AVERAGE:	183	(S)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 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	4	5	6	7	9	11	11	12	15	19	21	20	22	18	20	20	21	16	13	10	11	8	10	9	24	
2	7	6	16	5	4	3	5	9	13	17	18	36	32	34	39	28	26	20	12	17	16	10	10	9	24	
3	9	9	18	14	4	9	5	6	13	30	33	27	40	49	53	36	23	18	14	8	5	5	4	35	24	
4	9	7	7	26	9	7	9	10	13	25	24	40	22	19	18	18	17	15	15	14	12	12	12	13	24	
5	12	10	12	12	12	12	13	15	20	17	18	18	18	20	20	21	21	15	15	12	15	7	7	5	24	
6	8	7	3	9	3	2	4	10	15	23	34	38	40	35	22	27	19	19	16	7	6	6	6	5	24	
7	6	6	8	7	9	8	9	13	12	14	16	16	16	15	15	14	14	14	13	11	11	12	11	24		
8	12	12	11	10	9	7	10	12	13	15	16	20	25	17	22	18	18	14	14	12	11	10	9	8	24	
9	6	5	5	5	4	3	4	4	7	5	8	10	10	12	15	11	8	11	6	7	6	5	5	4	24	
10	4	5	6	6	10	11	10	11	13	11	15	15	15	17	14	12	13	11	11	11	11	10	11	24		
11	11	11	13	11	11	11	11	12	12	12	11	14	11	12	14	12	12	14	14	10	5	9	3	5	24	
12	6	7	3	4	4	6	7	14	18	16	15	14	22	28	27	39	24	29	14	9	9	9	9	10	24	
13	12	12	10	10	10	12	13	15	14	13	15	15	14	15	15	15	15	14	13	14	12	13	13	14	24	
14	13	12	12	13	14	13	14	16	23	22	13	28	24	26	30	46	21	14	12	10	6	7	9	9	24	
15	9	14	11	11	12	8	13	14	13	16	14	13	14	12	12	12	13	12	11	12	11	11	11	11	24	
16	10	12	12	12	12	12	11	11	11	11	11	12	11	11	12	11	11	13	13	12	11	11	12	12	24	
17	13	12	12	13	12	12	12	14	15	15	16	17	15	9	9	9	8	8	10	10	11	7	6	24		
18	6	7	7	7	7	6	8	9	11	13	22	12	11	11	10	8	8	7	8	8	8	8	7	7	24	
19	7	9	9	9	10	9	9	11	12	15	17	16	16	16	17	18	17	16	13	10	11	11	10	10	24	
20	9	9	8	7	6	8	6	18	19	23	21	39	15	33	16	7	10	9	6	8	10	7	7	5	24	
21	8	9	10	10	9	8	11	13	12	15	14	10	10	9	11	13	14	13	13	14	14	14	15	15	24	
22	13	13	9	10	12	14	15	16	15	16	16	17	17	17	17	16	16	15	14	12	10	10	11	11	24	
23	12	11	8	9	8	7	8	10	12	19	15	25	20	14	15	14	13	11	9	6	6	7	7	8	24	
24	8	7	8	8	8	8	7	6	9	13	16	18	13	14	11	11	9	9	7	5	20	14	12	13	24	
25	14	14	13	14	13	12	12	16	17	21	21	19	19	20	24	19	22	18	12	7	6	6	7	8	24	
26	8	8	7	5	4	3	12	15	17	20	X	21	26	22	23	20	22	20	16	10	7	7	9	10	23	
27	8	10	11	11	12	11	13	15	15	15	16	17	18	18	17	16	15	14	14	12	12	12	11	12	24	
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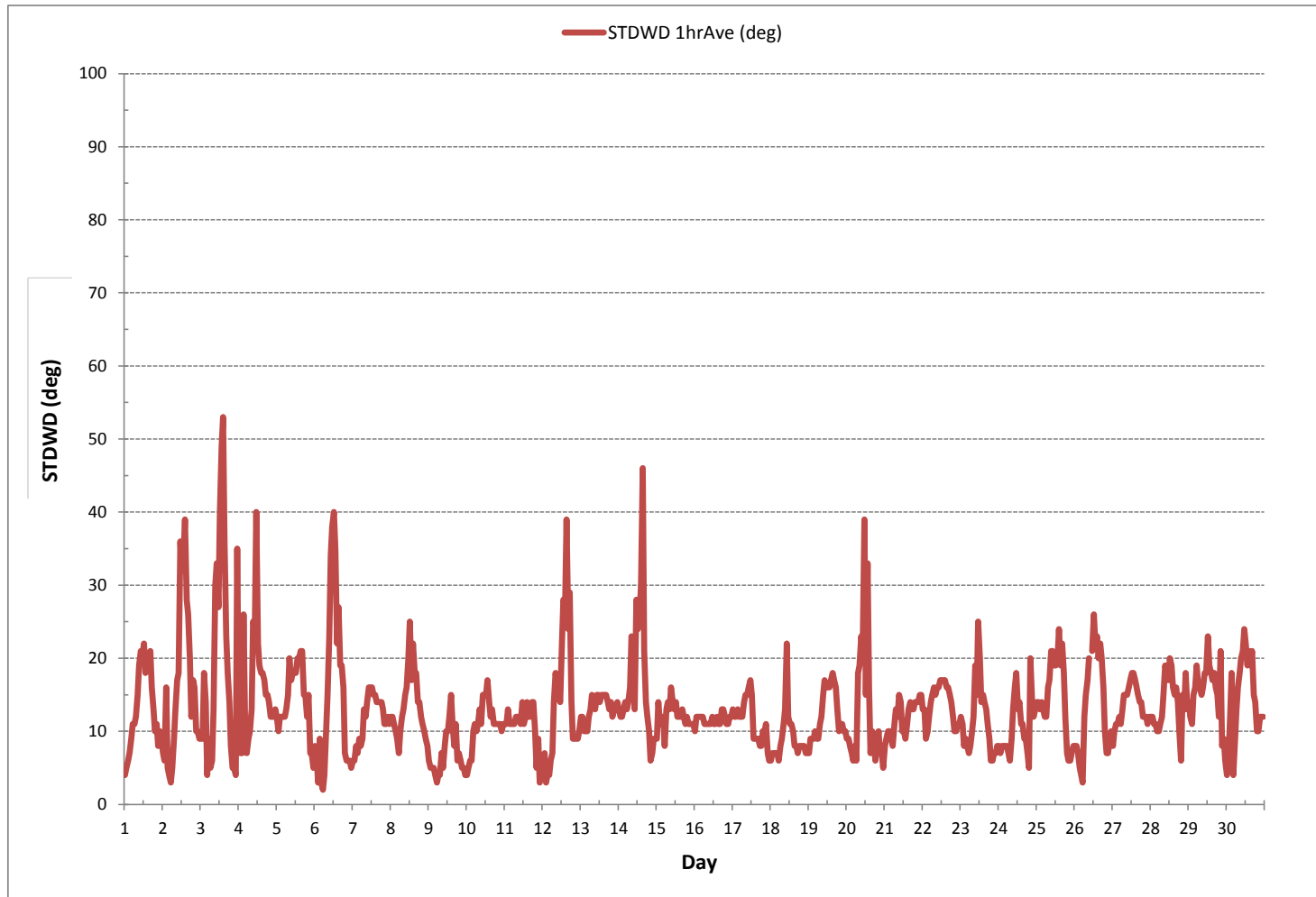
STATUS FLAG CODES

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: 719 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY

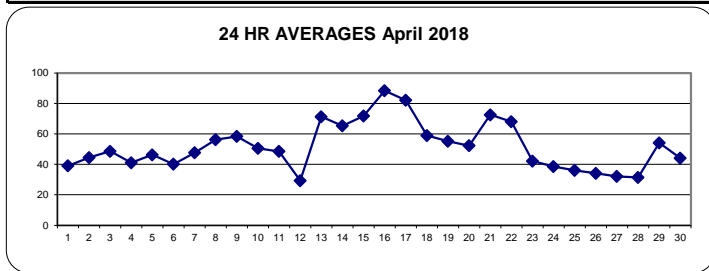


RELATIVE HUMIDITY Hourly Averages (RH %)

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	57	58	57	57	56	54	50	44	36	27	27	26	25	23	22	25	25	28	33	36	38	42	45	47	22	58	39	24
2	49	49	48	55	59	60	58	47	41	38	36	33	31	31	29	32	35	41	44	47	44	50	53	58	29	60	45	24
3	62	64	66	67	67	68	66	54	43	36	30	30	29	28	33	35	36	40	46	49	53	55	55	56	28	68	49	24
4	58	55	55	55	60	60	56	46	39	35	30	27	29	27	30	30	29	30	33	36	39	41	41	44	27	60	41	24
5	45	49	54	61	64	67	67	58	46	44	41	39	36	34	33	33	33	35	39	43	45	47	48	50	33	67	46	24
6	51	51	52	53	55	55	50	40	36	33	30	28	28	28	28	28	28	30	33	37	42	46	50	51	28	55	40	24
7	54	56	60	61	63	64	59	48	41	32	29	35	37	37	36	37	37	37	43	49	54	56	58	60	29	64	48	24
8	63	66	67	69	71	74	69	61	56	52	48	44	41	40	38	39	42	45	49	54	60	65	67	69	38	74	56	24
9	72	76	79	80	81	81	80	67	55	47	43	42	42	43	44	44	44	45	50	54	58	57	58	60	42	81	58	24
10	63	66	70	74	73	70	63	57	54	46	43	40	38	34	35	38	41	42	46	44	44	41	44	49	34	74	51	24
11	61	75	80	83	83	82	82	81	79	78	75	73	60	15	11	10	9	8	7	7	8	8	8	7	83	49	24	
12	8	8	7	6	6	6	6	6	5	5	7	29	30	34	35	34	34	42	53	62	67	70	71	72	5	72	29	24
13	72	68	69	70	70	68	67	64	64	63	64	64	69	70	69	70	70	74	77	81	83	83	81	82	63	83	71	24
14	82	83	84	84	85	86	84	78	67	57	52	45	45	42	38	40	47	55	59	64	70	72	75	75	38	86	65	24
15	77	74	74	75	75	79	79	70	65	58	54	52	52	52	53	60	65	78	85	88	89	89	89	90	52	90	72	24
16	90	90	90	90	90	90	90	90	90	89	89	89	89	89	85	84	85	87	88	88	89	89	88	86	84	90	89	24
17	83	84	86	86	87	88	88	88	87	85	85	85	85	80	80	82	80	78	78	77	76	72	75	77	72	88	82	24
18	78	78	78	79	80	83	75	63	54	50	45	46	46	46	44	45	45	46	49	57	60	62	62	62	44	83	59	24
19	61	61	61	62	63	65	62	59	56	51	44	40	39	35	37	41	44	43	53	62	65	70	75	77	35	77	55	24
20	79	80	83	84	85	86	84	71	53	39	33	30	27	28	29	32	33	35	39	40	44	49	48	45	27	86	52	24
21	42	43	49	54	57	65	65	68	68	67	68	68	75	81	84	86	87	87	88	88	89	89	89	89	42	89	73	24
22	85	69	73	71	68	68	72	75	78	79	75	73	68	65	64	62	60	59	57	61	62	64	63	61	57	85	68	24
23	59	59	59	60	62	61	54	47	41	35	36	26	24	28	28	27	26	29	31	38	43	44	47	49	24	62	42	24
24	51	57	62	67	71	73	68	60	49	38	26	17	13	15	18	21	19	18	22	26	28	33	36	38	13	73	39	24
25	40	43	46	50	53	56	56	47	38	30	25	23	23	20	19	18	19	20	26	35	41	46	47	47	18	56	36	24
26	49	49	50	53	55	54	42	37	33	30	28	25	23	20	20	20	20	22	24	28	32	34	35	35	20	55	34	24
27	37	38	42	45	47	45	40	34	30	27	25	23	22	22	22	23	23	24	26	30	32	35	39	40	22	47	32	24
28	40	41	41	43	45	50	47	42	38	35	33	29	26	22	20	18	17	17	20	22	25	26	28	31	17	50	32	24
29	37	43	44	46	53	59	66	74	74	66	57	58	52	51	50	50	49	47	47	52	54	55	57	58	37	74	54	24
30	61	61	61	63	64	60	56	51	42	40	34	36	34	29	29	30	31	32	34	39	42	43	42	44	29	64	44	24
HOURLY MAX	90	90	90	90	90	90	90	90	90	89	89	89	89	89	85	86	87	87	88	88	89	89	89	90				
HOURLY AVG	59	60	62	63	65	66	63	58	52	47	44	43	42	40	39	40	40	42	46	50	52	54	56	57				

STATUS FLAG CODES

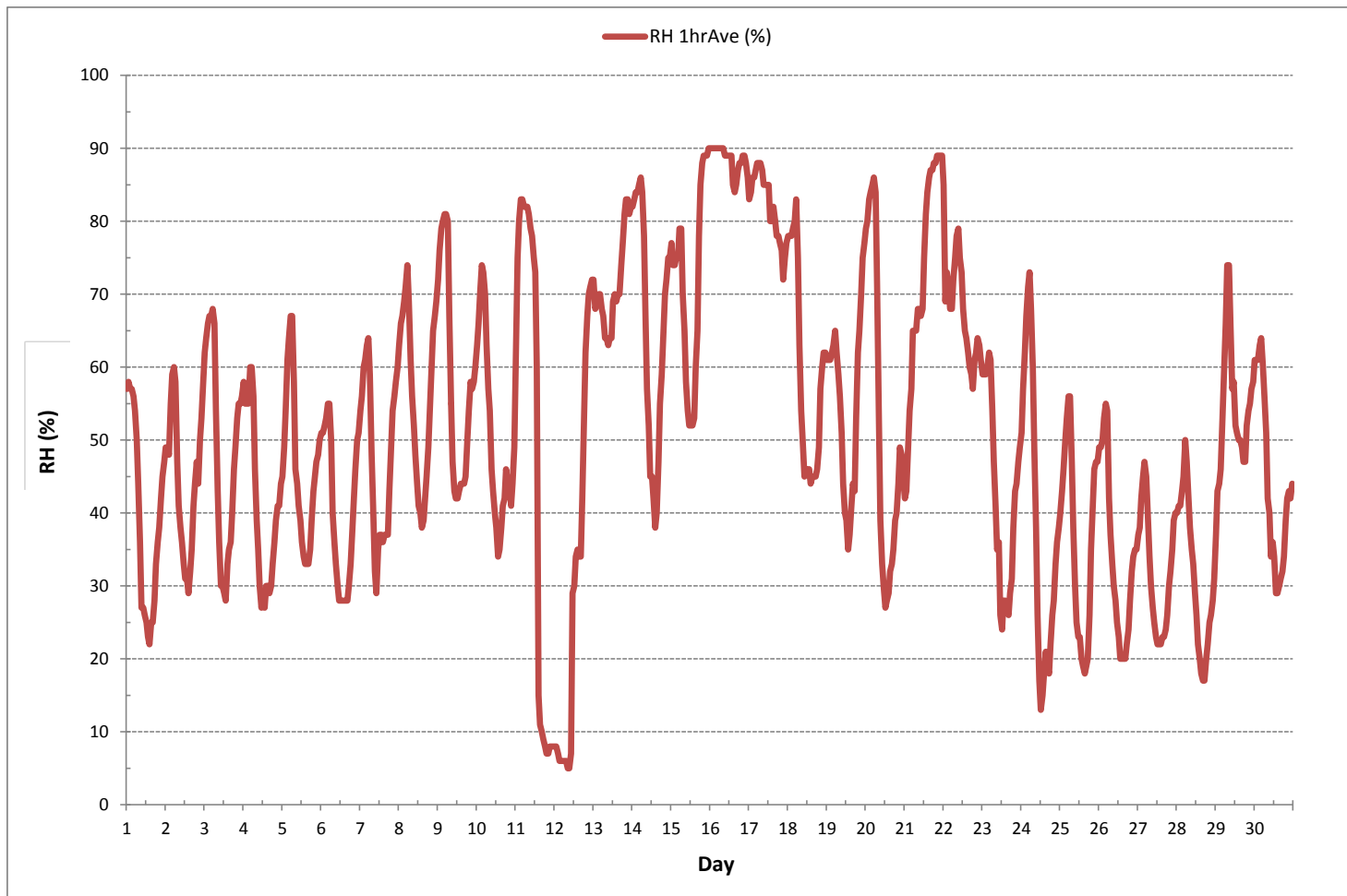
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	5	%	@ HOUR	8	ON DAY	12
MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR	23	ON DAY	15
MAXIMUM 24-HR AVERAGE:	89	%			ON DAY	16
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	21		MONTHLY AVERAGE:			52 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



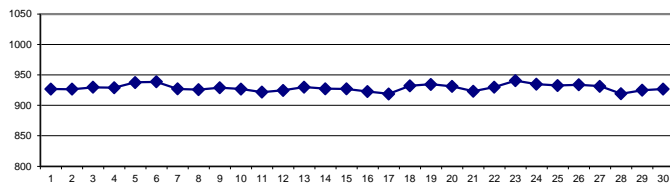
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	930	930	929	928	928	928	927	927	927	928	928	928	928	927	927	927	927	926	926	925	925	924	924	924	924	924	930	927	24	
2	924	924	924	924	924	924	924	925	926	926	927	927	928	928	929	929	929	928	928	928	928	928	928	929	929	924	929	927	24	
3	929	929	929	929	929	929	929	930	931	931	932	932	932	932	931	931	930	929	928	928	928	928	928	928	928	928	928	932	930	24
4	927	927	927	927	927	927	927	928	929	929	930	930	930	930	930	930	930	931	930	930	931	931	931	931	932	927	932	929	24	
5	932	933	933	933	933	934	935	935	936	937	938	939	939	940	940	941	941	942	941	941	941	941	941	941	941	932	942	938	24	
6	941	941	941	941	941	941	941	941	941	941	941	941	940	940	939	938	938	937	936	935	934	934	933	933	933	933	941	939	24	
7	932	931	930	930	930	929	929	928	928	928	928	928	927	927	927	926	925	925	924	924	924	924	924	924	923	923	932	927	24	
8	923	923	922	922	923	923	923	924	925	926	927	927	928	928	928	928	928	928	928	928	928	928	928	928	928	922	928	926	24	
9	928	928	928	928	928	928	928	929	930	931	931	931	931	931	931	931	931	931	930	929	928	928	928	928	928	928	928	931	929	24
10	928	927	927	927	927	927	927	928	928	928	929	929	929	929	929	929	928	927	926	925	925	924	924	923	923	923	929	927	24	
11	923	922	922	921	921	920	920	920	921	921	921	922	922	923	923	923	923	923	923	923	922	922	922	922	922	920	923	922	24	
12	922	922	921	921	921	922	922	923	924	925	925	926	926	926	926	926	926	927	927	927	927	927	927	927	927	921	927	925	24	
13	928	928	928	928	929	929	929	930	930	931	932	932	932	932	932	932	932	931	930	930	930	930	929	928	928	928	932	930	24	
14	927	926	925	925	924	924	925	925	925	926	928	928	929	930	931	930	930	929	929	929	928	928	928	928	928	924	931	927	24	
15	928	928	927	927	927	927	927	928	928	928	928	928	928	928	927	927	927	926	926	926	926	926	926	926	926	926	926	928	927	24
16	927	926	926	926	926	926	925	925	925	924	924	923	922	922	922	921	920	920	920	920	919	919	918	918	918	918	927	923	24	
17	918	917	916	916	916	916	916	916	916	916	917	917	917	919	919	920	921	922	922	923	923	924	924	925	916	925	919	24		
18	925	926	926	927	928	928	929	930	931	933	934	935	935	935	936	936	936	936	936	935	935	935	935	935	935	925	936	932	24	
19	935	935	935	935	935	935	935	936	936	937	937	937	937	936	936	936	935	935	934	932	932	931	930	930	930	930	937	935	24	
20	929	929	929	929	929	929	929	930	932	933	933	933	934	934	934	933	933	933	932	931	931	930	930	929	929	929	934	931	24	
21	929	929	928	927	927	926	925	925	924	923	923	922	922	921	920	920	920	921	921	922	922	923	923	923	920	920	929	923	24	
22	923	924	924	924	925	925	925	926	927	928	929	930	931	932	933	933	934	934	935	936	936	936	937	937	923	937	930	24		
23	937	938	938	938	939	939	940	941	941	942	943	943	943	943	943	943	942	942	941	940	940	939	939	937	937	943	941	24		
24	939	938	938	937	937	936	936	936	937	937	937	937	937	936	935	935	934	933	932	931	931	931	931	931	931	931	939	935	24	
25	930	930	930	930	930	930	931	932	933	934	934	935	935	935	935	935	935	935	935	933	933	932	931	931	930	930	935	933	24	
26	931	931	930	930	930	930	931	932	933	934	935	936	936	937	937	937	937	937	936	935	935	935	935	930	937	934	24			
27	934	934	935	934	934	934	934	934	934	934	934	933	932	932	931	930	930	929	928	927	926	925	925	925	925	925	935	932	24	
28	924	923	922	922	921	920	920	920	920	920	920	920	920	919	919	918	918	917	917	916	915	916	916	915	915	924	919	24		
29	917	918	918	919	920	921	922	923	924	924	925	926	927	928	928	928	929	929	930	929	929	929	929	929	929	917	930	925	24	
30	929	929	929	929	929	929	929	929	930	930	930	929	928	928	927	926	925	925	925	923	922	922	921	921	921	921	930	927	24	
HOURLY MAX	941	941	941	941	941	941	941	941	941	942	943	943	943	943	943	943	943	942	942	941	941	941	941	941	941	941	943	941	24	
HOURLY AVG	928	928	928	928	928	928	928	929	929	929	930	930	930	930	930	930	930	930	929	929	928	928	928	928	928	928	928	928	927	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

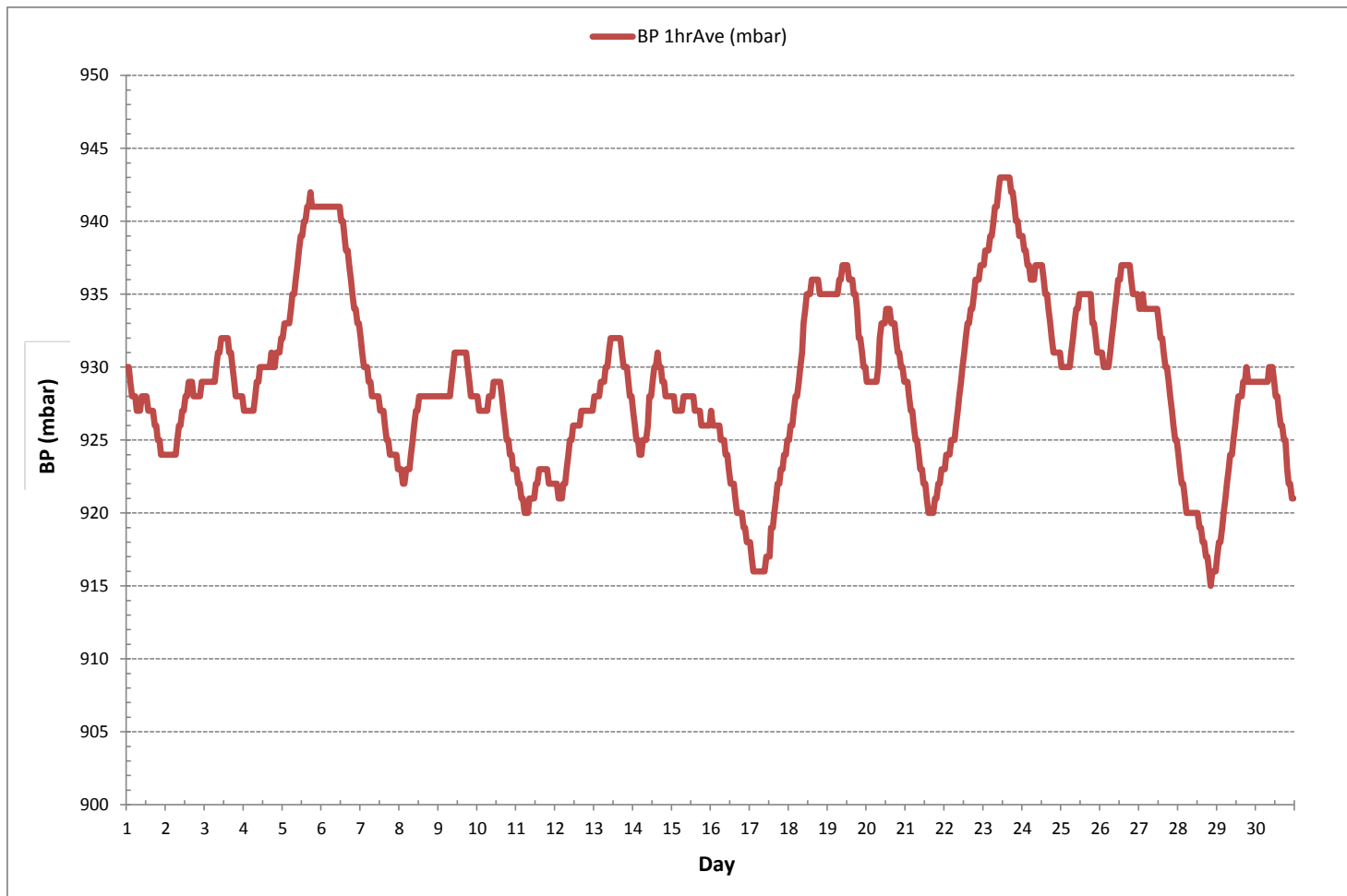
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	915	mbar	@ HOUR	20	ON DAY	28
MAXIMUM 1-HR AVERAGE:	943	mbar	@ HOUR	10	ON DAY	23
MAXIMUM 24-HR AVERAGE:	941	mbar			ON DAY	23
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	6				MONTHLY AVERAGE:	929 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

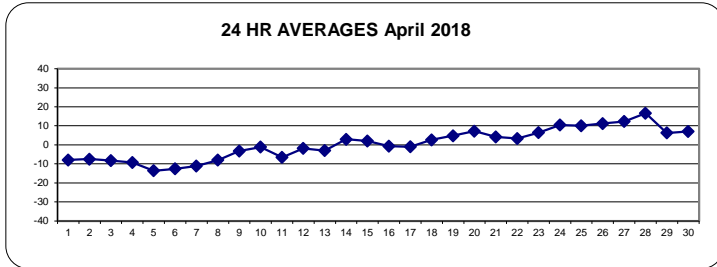


AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	-15.2	-15.4	-15.3	-15.5	-15.5	-14.8	-13.5	-11.7	-8.2	-3.5	-3.0	-1.7	-1.2	-1.5	-1.3	-1.5	-1.5	-2.8	-5.2	-6.8	-7.6	-8.3	-9.3	-10.6	-15.5	-1.2	-8.0	24	
2	-11.3	-11.3	-11.4	-13.2	-14.2	-14.8	-13.6	-9.2	-6.5	-4.6	-3.4	-2.0	-0.9	-1.1	-0.1	-1.3	-3.1	-4.6	-6.3	-7.9	-8.0	-8.9	-10.5	-11.6	-14.8	-0.1	-7.5	24	
3	-12.4	-13.2	-13.6	-13.6	-13.6	-14.1	-13.4	-10.0	-6.5	-3.9	-2.6	-2.5	-1.9	-1.1	-3.0	-3.7	-4.0	-5.4	-7.5	-9.0	-10.1	-11.1	-11.1	-11.2	-14.1	-1.1	-8.3	24	
4	-12.0	-12.5	-13.3	-13.6	-15.0	-15.5	-14.4	-11.3	-8.9	-7.2	-5.2	-3.0	-4.0	-4.0	-4.5	-4.8	-5.1	-5.8	-7.3	-9.0	-10.3	-11.2	-12.1	-13.2	-15.5	-3.0	-9.3	24	
5	-14.0	-14.9	-15.9	-17.0	-17.7	-18.2	-17.7	-15.2	-13.3	-12.7	-11.3	-10.5	-9.6	-8.9	-8.6	-8.6	-9.1	-10.4	-12.2	-14.0	-15.1	-16.0	-16.9	-17.9	-18.2	-8.6	-13.6	24	
6	-18.1	-17.9	-18.1	-18.6	-19.0	-19.1	-17.2	-13.4	-11.3	-10.1	-8.7	-7.3	-6.6	-6.6	-7.0	-7.1	-7.5	-8.4	-10.2	-12.1	-13.2	-14.2	-15.0	-15.3	-19.1	-6.6	-12.6	24	
7	-15.9	-16.4	-16.7	-16.7	-18.4	-19.0	-17.6	-14.1	-11.8	-10.3	-8.7	-7.9	-6.7	-5.6	-5.3	-4.9	-5.0	-6.2	-8.0	-9.0	-10.0	-10.2	-10.9	-11.8	-19.0	-4.9	-11.1	24	
8	-12.5	-13.0	-13.4	-14.1	-15.0	-15.8	-14.3	-11.4	-9.6	-7.2	-5.1	-3.4	-2.9	-2.6	-2.4	-3.2	-3.9	-4.7	-5.2	-5.6	-6.2	-6.9	-7.3	-7.6	-15.8	-2.4	-8.1	24	
9	-8.0	-9.2	-10.0	-10.7	-10.8	-11.3	-10.8	-7.8	-4.0	-1.0	1.4	2.4	2.7	2.5	2.6	2.6	3.0	2.3	0.5	-1.2	-2.5	-2.9	-3.4	-3.4	-11.3	3.0	-3.2	24	
10	-3.5	-4.4	-4.8	-5.7	-4.3	-3.4	-2.5	-1.6	-1.4	-0.2	1.7	2.6	3.2	3.8	3.5	2.5	1.6	0.4	-0.8	-1.5	-2.2	-2.7	-3.4	-3.8	-5.7	3.8	-1.1	24	
11	-4.5	-5.5	-6.3	-7.2	-7.7	-8.5	-8.7	-8.6	-7.5	-6.6	-6.1	-5.4	-5.1	-3.9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	-8.7	-3.9	-6.5	14
12	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1.0	1.4	1.2	1.7	1.6	0.7	-0.7	-2.7	-4.3	-5.4	-6.1	-6.4	-6.6	-6.6	1.7	-1.9	13	
13	-7.0	-7.4	-7.5	-8.1	-8.3	-8.0	-7.1	-5.6	-4.0	-2.6	-1.3	0.2	-0.1	0.5	0.6	0.3	0.3	-0.5	-1.0	-1.2	-1.2	-0.8	-0.8	-1.4	-8.3	0.6	-3.0	24	
14	-1.5	-1.8	-2.1	-2.1	-2.5	-2.8	-2.2	-1.1	1.6	4.3	5.8	8.5	9.1	10.2	10.7	10.0	7.9	6.3	4.8	3.4	1.8	1.1	0.7	0.6	-2.8	10.7	2.9	24	
15	-0.1	0.3	-0.2	-0.2	-0.2	-1.3	-0.9	1.4	3.0	5.0	6.1	6.9	6.6	6.9	6.7	4.9	4.3	1.7	0.3	-0.5	-0.7	-0.9	-1.0	-1.0	-1.3	6.9	2.0	24	
16	-1.0	-1.1	-1.1	-1.1	-1.2	-1.2	-1.1	-0.9	-0.6	-0.2	0.1	0.2	0.3	0.6	1.3	1.4	0.9	-0.1	-0.8	-1.6	-2.3	-2.5	-2.5	-2.4	-2.5	1.4	-0.7	24	
17	-2.4	-2.4	-2.3	-2.3	-2.3	-2.2	-2.1	-1.9	-1.4	-0.7	-0.5	-0.2	0.5	1.3	1.0	0.4	0.7	0.7	0.0	-0.4	-1.2	-1.6	-2.3	-2.8	-2.8	1.3	-1.0	24	
18	-2.6	-2.5	-2.2	-1.9	-2.1	-2.5	-0.7	2.2	4.8	5.8	7.4	6.7	6.5	6.3	6.6	6.2	6.0	5.5	4.8	3.7	2.4	1.9	0.9	0.5	-2.6	7.4	2.7	24	
19	0.3	-0.2	-0.1	-0.6	-1.0	-1.4	0.1	2.3	4.2	6.2	7.9	8.8	9.1	9.8	10.0	10.5	10.4	9.9	8.3	6.0	4.7	3.7	3.2	2.7	-1.4	10.5	4.8	24	
20	2.5	2.3	1.8	1.6	1.4	0.6	0.9	4.1	8.1	11.3	12.1	13.0	13.1	13.1	13.0	12.2	11.5	10.6	8.8	7.8	6.9	5.9	5.5	5.8	0.6	13.1	7.2	24	
21	6.3	5.8	5.5	5.6	4.7	2.3	3.3	4.6	5.1	5.0	5.3	5.2	4.9	4.4	4.2	4.1	4.0	3.5	3.2	2.6	2.5	2.3	2.5	2.6	2.3	6.3	4.1	24	
22	2.5	3.0	1.9	1.4	1.5	1.9	2.0	2.2	2.2	2.3	3.0	3.7	4.7	5.0	5.2	5.3	5.2	5.4	5.6	4.3	3.5	2.9	2.2	1.7	1.4	5.6	3.3	24	
23	1.6	1.2	0.6	0.1	-0.4	-0.1	2.2	4.8	7.5	9.1	9.7	11.4	11.6	11.1	11.3	11.8	11.5	10.6	9.7	7.9	6.4	5.8	5.1	4.6	-0.4	11.8	6.5	24	
24	4.2	3.2	3.1	2.4	1.6	1.3	2.7	5.3	8.8	12.3	15.6	17.2	17.6	17.7	17.4	17.5	17.3	16.4	14.8	13.0	11.8	10.7	10.0	10.1	1.3	17.7	10.5	24	
25	9.4	8.4	7.6	6.3	5.2	4.5	4.6	7.8	10.4	12.4	13.3	13.4	13.8	14.1	14.8	14.9	15.0	14.2	12.9	10.7	8.7	7.3	6.5	6.1	4.5	15.0	10.1	24	
26	5.5	5.6	5.0	4.0	3.5	3.6	7.5	10.1	12.8	14.7	16.3	16.7	17.1	17.5	17.5	17.2	17.0	15.8	14.3	12.3	10.6	9.3	8.0	6.5	3.5	17.5	11.2	24	
27	5.4	5.2	4.3	3.5	3.3	3.7	5.7	7.9	9.8	11.8	13.8	15.7	17.6	18.5	19.9	20.2	20.4	20.1	19.2	17.4	15.5	13.9	11.8	10.9	3.3	20.4	12.3	24	
28	10.3	9.4	8.7	7.9	7.4	6.1	7.4	9.9	12.5	15.0	17.3	19.4	22.0	24.4	25.6	26.3	26.0	25.2	23.3	21.3	19.9	19.6	17.4	15.4	6.1	26.3	16.6	24	
29	13.4	11.7	10.5	9.8	7.7	5.8	4.6	3.3	2.9	4.1	5.9	5.3	6.7	7.0	7.0	6.6	7.0	7.1	6.5	4.6	3.9	3.6	3.0	2.9	2.9	13.4	6.3	24	
30	2.3	2.3	2.1	1.7	1.3	1.5	2.6	4.7	6.4	7.8	8.7	9.2	10.2	11.2	11.8	12.3	12.4	12.0	11.2	9.5	8.0	7.4	7.0	6.3	1.3	12.4	7.1	24	
HOURLY MAX	13.4	11.7	10.5	9.8	7.7	6.1	7.5	10.1	12.8	15.0	17.3	19.4	22.0	24.4	25.6	26.3	26.0	25.2	23.3	21.3	19.9	19.6	17.4	15.4					
HOURLY AVG	-2.7	-3.1	-3.6	-4.1	-4.5	-4.9	-3.9	-1.8	0.2	1.9	3.3	4.1	4.7	5.1	5.5	5.3	5.0	4.1	2.8	1.4	0.4	-0.3	-1.0	-1.5					

STATUS FLAG CODES

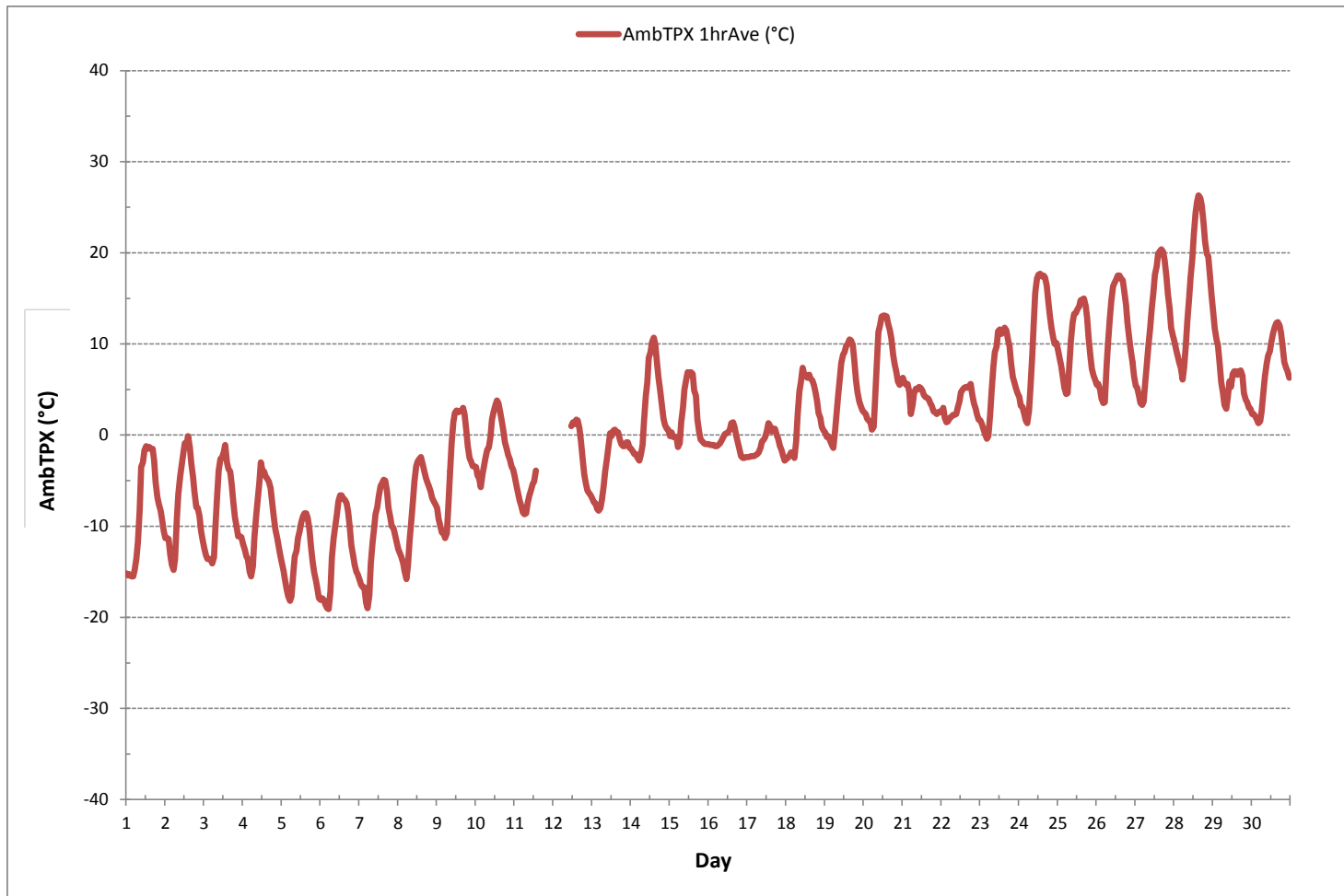
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-19.1 °C	@ HOUR	5	ON DAY	6
MAXIMUM 1-HR AVERAGE:	26.3 °C	@ HOUR	15	ON DAY	28
MAXIMUM 24-HR AVERAGE:	16.6 °C			ON DAY	28
OPERATIONAL TIME:					699 hrs
AMD OPERATION UPTIME:					97.1 %
STANDARD DEVIATION:	9.0	MONTHLY AVERAGE:			0.5 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION



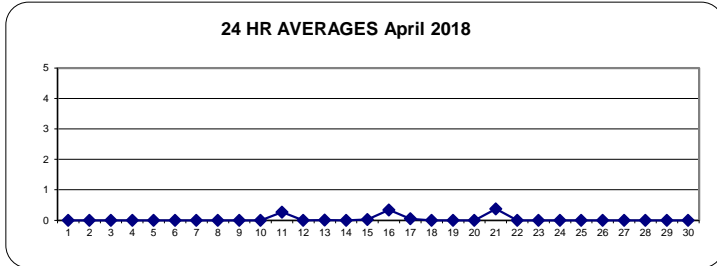
PRECIPITATION Hourly Averages (mm)

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.	AVG.		
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	24	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.1	0.9	0.9	1.3	0.8	0.7	0.3	0.6	0.0	0.6	0.1	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	1.3	0.3	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	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	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	0.1	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.5	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	0.2	1.3	1.6	1.2	1.3	1.9	0.3	0.3	0.0	0.0	0.0	1.9	0.3	0.0	24
17	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	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	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	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.8	1.3	1.0	0.9	1.3	1.0	1.0	1.0	0.2	0.0	0.0	1.3	0.4	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	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	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.9	0.9	1.3	0.8	0.7	0.3	0.6	0.0	0.6	0.1	0.9	0.6	0.8	1.3	1.3	1.6	1.3	1.3	1.9	0.3	0.3	0.0					
HOURLY AVG	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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

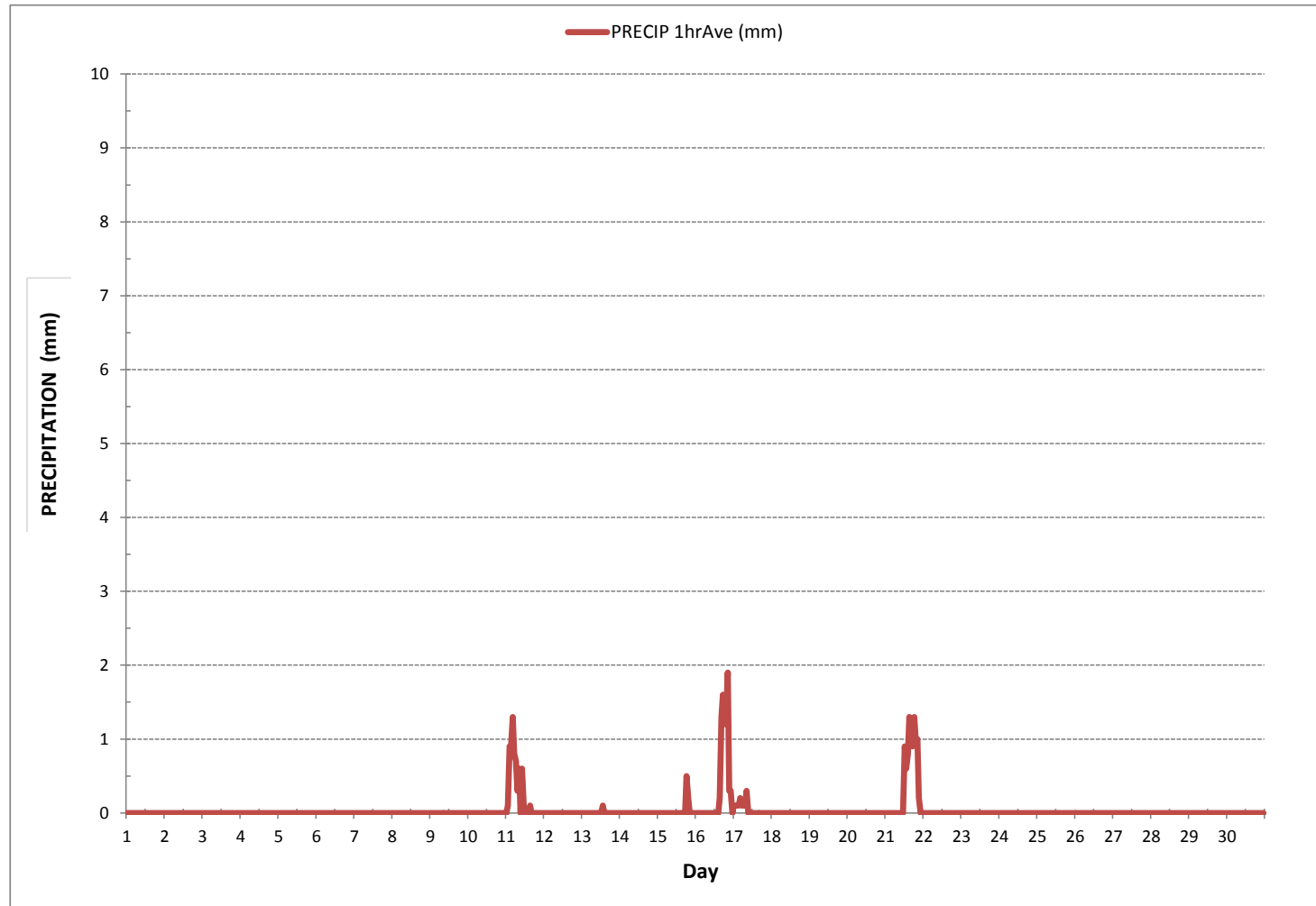
24 HR AVERAGES April 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	1.9	mm	@ HOUR	20	ON DAY	16
MAXIMUM 24-HR AVERAGE:	0.4	mm			ON DAY	21
MONTHLY TOTAL	25.5	mm				
OPERATIONAL TIME:						720 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	0.2					
MONTHLY AVERAGE:						0.0 mm

PRECIPITATION Hourly Averages (mm)



***APPENDIX II
EQUIPMENT CALIBRATION RESULTS***

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: April 11, 2018	Barometer/B.P./units: F.S. 05544 expires January 5, 2019	920	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: St. Lina	Weather Conditions: Light snow		
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): 15:40	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: March 2, 2018	As Found C.F.: 0.989		
Previous C.F.: 1.000	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: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 49.2	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <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								

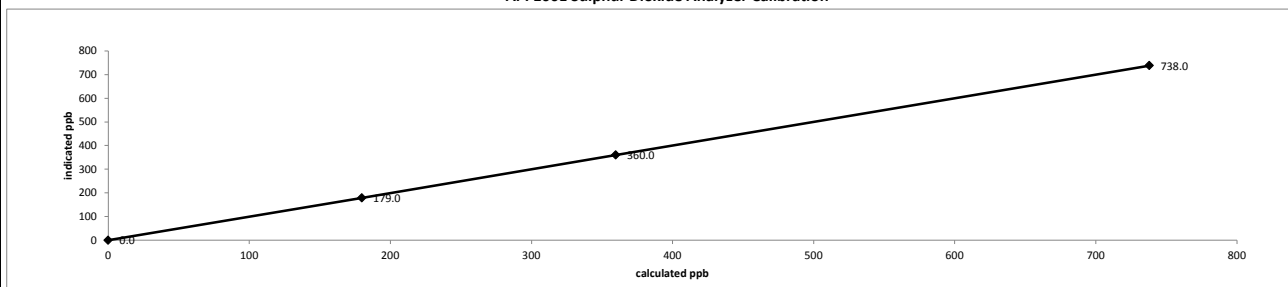
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5036	0.00	5036	0.0	3.5	n/a
as found high	4958	75.49	5033	738.0	750.0	0.989
adjusted zero	5036	0.00	5036	0.0	0.0	n/a
adjusted high	4958	75.49	5033	738.0	738.0	1.000
mid	4986	36.73	5023	359.8	360.0	0.999
low	5007	18.36	5025	179.8	179.0	1.004
Calibrator zero	5036	0.00	5036	0.0	0.0	n/a
Average C.F. =						1.001

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) =	0.03%		± 3% F.S.
% change in C.F. from last cal =	1.15%		± 10%

API 100E Sulphur Dioxide Analyzer Calibration



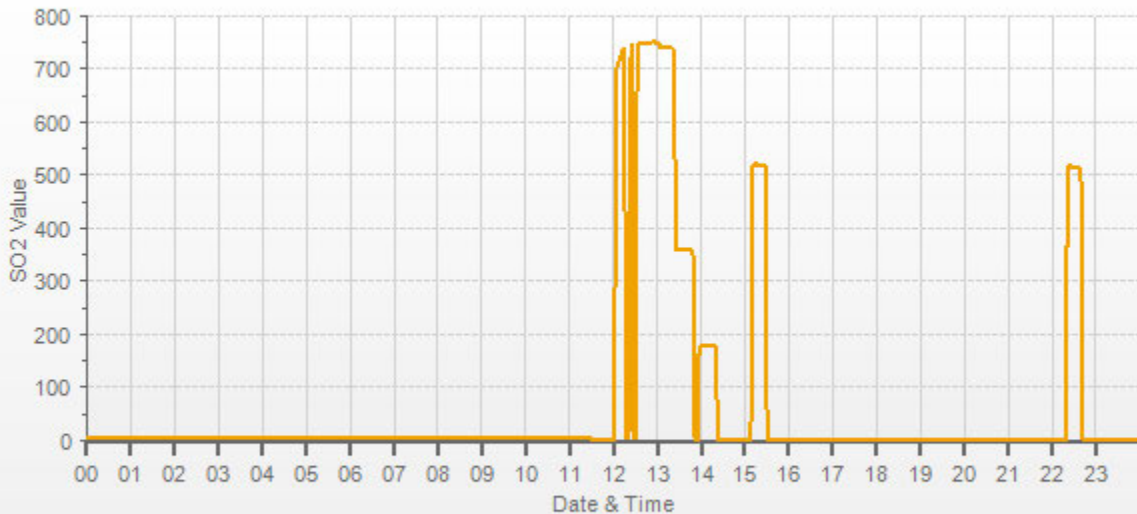
As found: Slope: 0.972 Offset: 144.5 Hvps: 651 Rcell Temp: 50.0 Box Temp: 31.7 Pmt Temp: 7.9 Izs Temp: 45.0 Pres: 23.6 Samp Fl: 593 Norm Pmt: 151.5 Uv Lamp: 2797.2 Lamp Ratio: 88.8 Str Lgt: 70.2 Drk Pmt: 6.0 Expected Value: 503.0	As left: Slope: 0.959 Offset: 151.1 Hvps: 651 Rcell Temp: 50.0 Box Temp: 33.5 Pmt Temp: 7.9 Izs Temp: 45.0 Pres: 23.6 Samp Fl: 591 Norm Pmt: 150.7 Uv Lamp: 2795.6 Lamp Ratio: 88.8 Str Lgt: 72.5 Drk Pmt: 6.5 Expected Value: 517.0
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Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

SO2[ppb] Station: LICA ST. LINA Daily: 18/04/11 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>April 11, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>920</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Light snow</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>11:04</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Rob Fisher</u>	
End Time 24 hr. (mst): <u>15:08</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		
Analyzer: Serial Number/Owner: <u>509</u> <u>LICA</u>	Range ppb: <u>100</u>		
Last Calibration Date: <u>March 5, 2018</u>	As Found C.F.: <u>0.983</u>		
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>		

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u> Calibrator ID/Expiry Date: <u>Envionics id# 4760 expires March 2, 2019</u> Cal Gas Cylinder I.D. #: <u>EY 0000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <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	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: <u>11:54 / 12:04</u> SO2 Analyzer Range: <u>1000</u> Target Concentration (ppb): <u>780</u> As Found Zero: <u>0.0</u> Analyzer Response: (ppb): <u>0.0</u> Zero Corrected Result (ppb): <u>0.0</u>
Point	ppb									
High	78									
Mid	38									
Low	19									

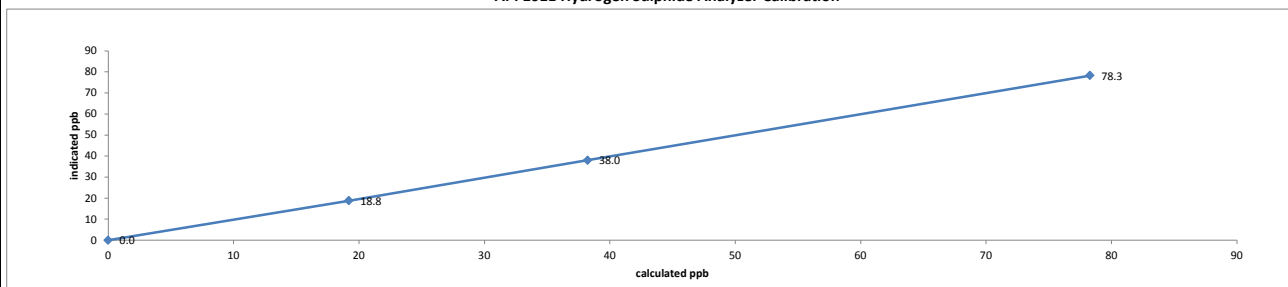
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7428	0.00	7428	0.0	0.9	n/a
as found high	7367	56.98	7424	78.3	80.5	0.983
adjusted zero	7428	0.00	7428	0.0	0.0	n/a
adjusted high	7367	56.98	7424	78.3	78.3	1.000
mid	7396	27.83	7424	38.2	38.0	1.006
low	7404	13.96	7418	19.2	18.8	1.021
calibrator zero	7428	0.00	7428	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.998</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.21%</u>	0.95-1.05
% change in C.F. from last cal = <u>1.65%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



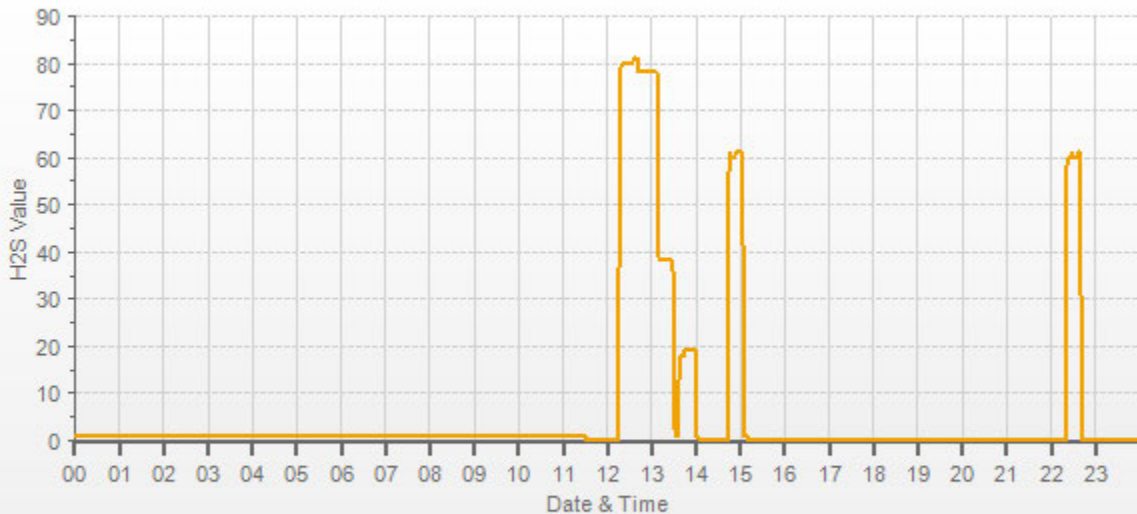
<p style="text-align: center;">As found:</p> Slope: <u>0.904</u> Offset: <u>70.2</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>33.0</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>314.2</u> Pres: <u>20.1</u> Samp Fl: <u>517</u> Uv Lamp: <u>3184.2</u> Lamp Ratio: <u>94.9</u> Str Lgt: <u>31.8</u> Drk Pmt: <u>0.7</u> Expected Value: <u>60.1</u>	<p style="text-align: center;">As left:</p> Slope: <u>0.894</u> Offset: <u>72.4</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.5</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>314.1</u> Pres: <u>20.1</u> Samp Fl: <u>516</u> Uv Lamp: <u>3181.0</u> Lamp Ratio: <u>94.8</u> Str Lgt: <u>32.3</u> Drk Pmt: <u>0.7</u> Expected Value: <u>60.8</u>
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Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

H2S[ppb] Station: LICA ST. LINA Daily: 18/04/11 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date:	April 6, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	940	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	10:40 / 15:02	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2022		

Analyzer:	Serial Number/Owner:	925436893	Maxxam	Range ppm:	50
	Last Calibration Date:	March 6, 2018		As Found C.F.:	0.944
	Previous Cal High Point C.F.:	0.998		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: Envionics id# 4760 expires March 2, 2019
 Cal Gas Cylinder I.D. #: LL 165367

CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	590.0	207.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	569.3	1159.3

Point	Target ppm
High	38
Mid	18
Low	9

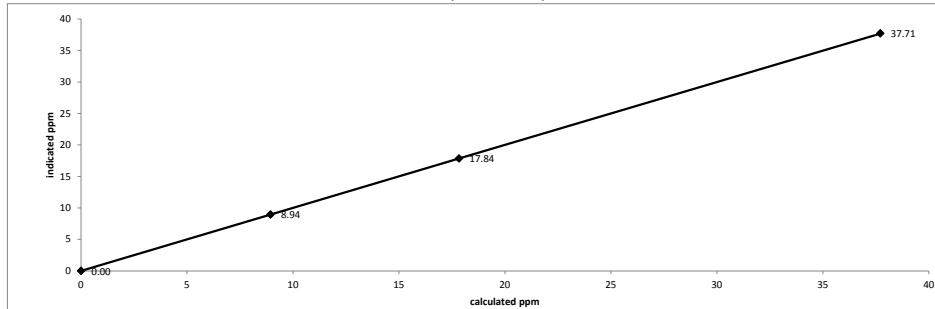
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2498	0.00	2498	0.0	0.00	n/a
as found high	2423	81.45	2504	37.71	39.95	0.944
adjusted zero	2498	0.00	2498	0.00	0.00	n/a
adjusted high	2423	81.45	2504	37.71	37.71	1.000
mid	2465	38.52	2504	17.83	17.84	1.000
low	2483	19.30	2502	8.94	8.94	1.000
calibrator zero	2498	0.00	2498	0.0	0.00	n/a
Average C.F. =						1.000

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) =	0.00%		± 3% F.S.
% change in C.F. from last cal =	5.42%		± 10%

Thermo 51i Total Hydrocarbon Analyzer Calibration



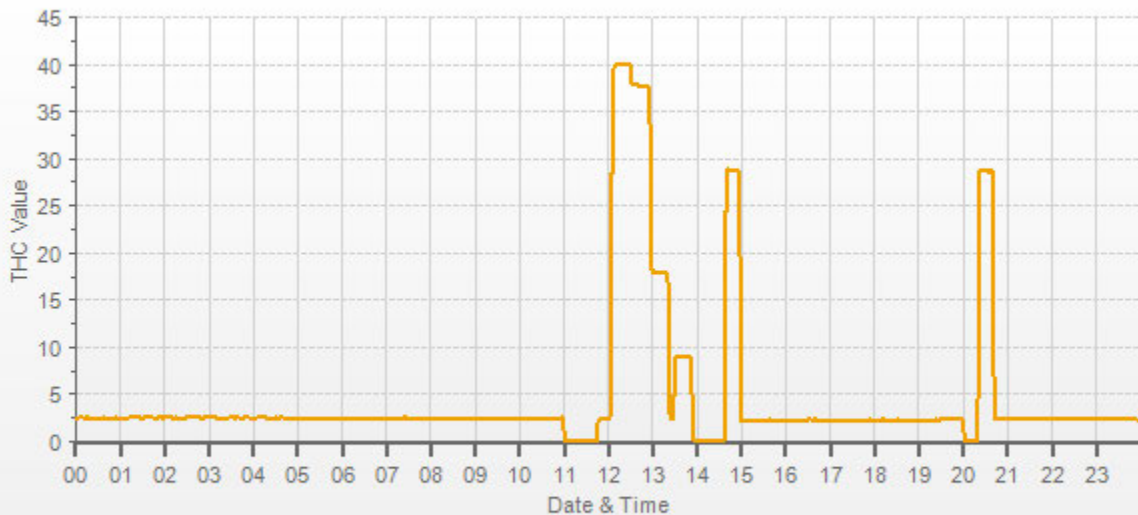
As found:		As left:	
Bkg:	3.91	Bkg:	3.73
Coef:	3.562	Coef:	3.362
H2 cylinder (psi):	1900	H2 cylinder (psi):	1900
H2 cylinder reg set (psi):	50	H2 cylinder reg set (psi):	50
Span Cylinder (psi):	1100	Span Cylinder (psi):	1100
Span Cylinder Reg Set (psi):	23	Span Cylinder Reg Set (psi):	23
Zero Air Gen Pressure:	44	Zero Air Gen Pressure:	44
Bias Supply:	-298.2	Bias Supply:	-298.2
Detector Base:	125.0	Detector Base:	125.0
Filter:	125.0	Filter:	125.0
Pump:	n/a	Pump:	n/a
Flame:	143.5	Flame:	143.5
Internal:	29.9	Internal:	29.9
Sample:	9.7	Sample:	9.7
Fuel:	19.9	Fuel:	19.9
Air:	39.7	Air:	39.7
Signal:	925	Signal:	929
Status:	LIT	Status:	LIT
Measured Flow:	0.8370	Measured Flow:	n/a
Expected Value:	28.50	Expected Value:	28.70

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 ST. LINA Daily: 18/04/06 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date:	April 11, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	920	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Light snow		
Start/End Time 24 hr. (mst):	11:04 / 19:08	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:	1746 Maxxam	Previous C.F.:	As Found C.F.:	New C.F.:	
Last Calibration Date:	March 1, 2018	NO =	1.000	1.068	0.999
Range ppb:	1000	NO ₂ =	1.000	1.000	1.000
		NOx =	1.000	1.070	1.000

Calibration Standards:		Standard Calibration Points for a Range of: 1000 ppb			
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	High	610	375	<-high ozone
Calibrator ID/Expiry Date:	EnviroNics id# 5212 expires March 1, 2019	Mid	380	190	<-mid ozone
Cal Gas Cylinder I.D. #:	LL 104225	Low	190	70	<-low ozone
Cal Gas Conc. (ppm):	51.5 51.6	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	5036	0.0	5036	0	0	0.0	0.0	n/a	n/a
as found high	4958	75.5	5033	772.4	773.9	723.0	723.0	1.068	1.070
adjusted zero	5036	0.00	5036	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4958	75.49	5033	772.4	773.9	773.0	774.0	0.999	1.000
mid	4986	36.73	5023	376.6	377.3	372.0	373.0	1.012	1.012
low	5007	18.36	5025	188.2	188.5	183.0	184.0	1.028	1.025
calibrator zero	5036	0.00	5036	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	1.013 1.012

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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.	
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	
NOx reference	4958	75.49	5033	0.0	776.0	776.0	0.0	0.0	0.0		
as found high NO2	4958	75.49	5033	515.0	291.0	776.0	485.0	485.0	485.0	1.000	
adjusted high NO2	4958	75.49	5033	515.0	291.0	776.0	485.0	485.0	485.0	1.000	
gpt mid	4958	75.49	5033	290.0	500.0	776.0	276.0	276.0	276.0	1.000	
gpt low	4958	75.49	5033	105.0	681.0	776.0	95.0	95.0	95.0	1.000	
										Average NO ₂ C.F.=	1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.997	0.998	1.000	0.95-1.05
b (Intercept as % of full scale)=	-0.31%	-0.27%	0.00%	± 3% F.S.
% change in C.F. from last cal=	-6.84%	-7.05%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

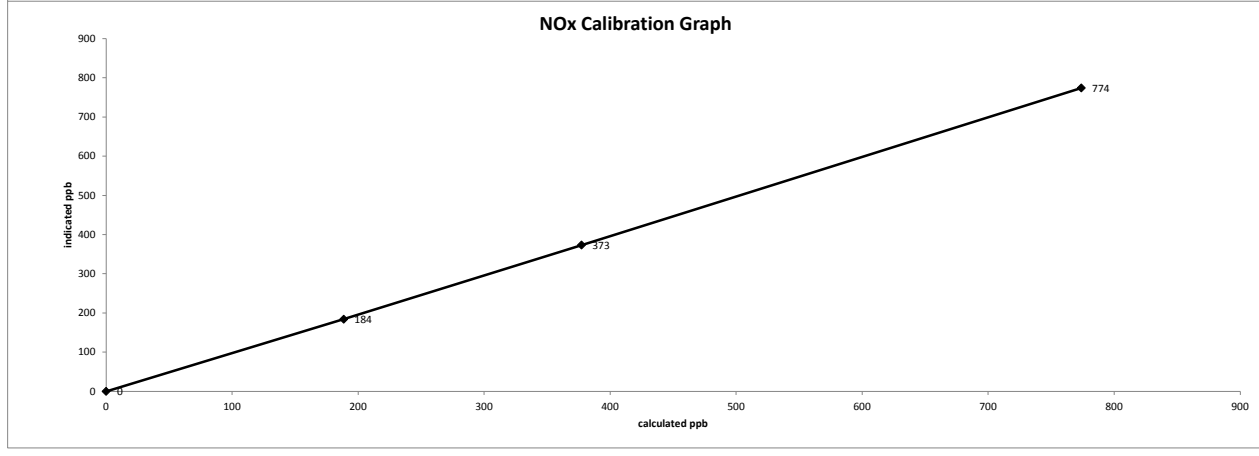
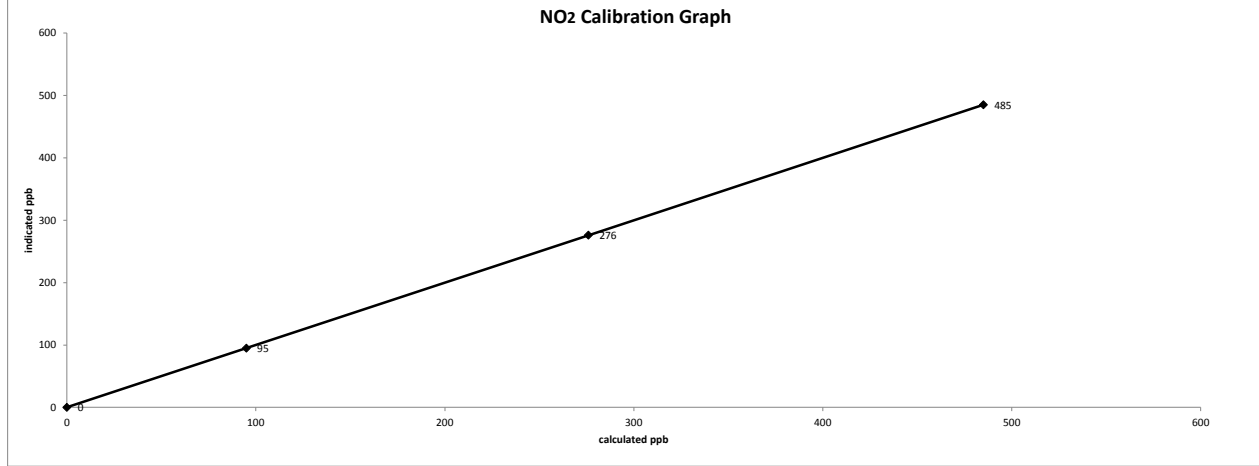
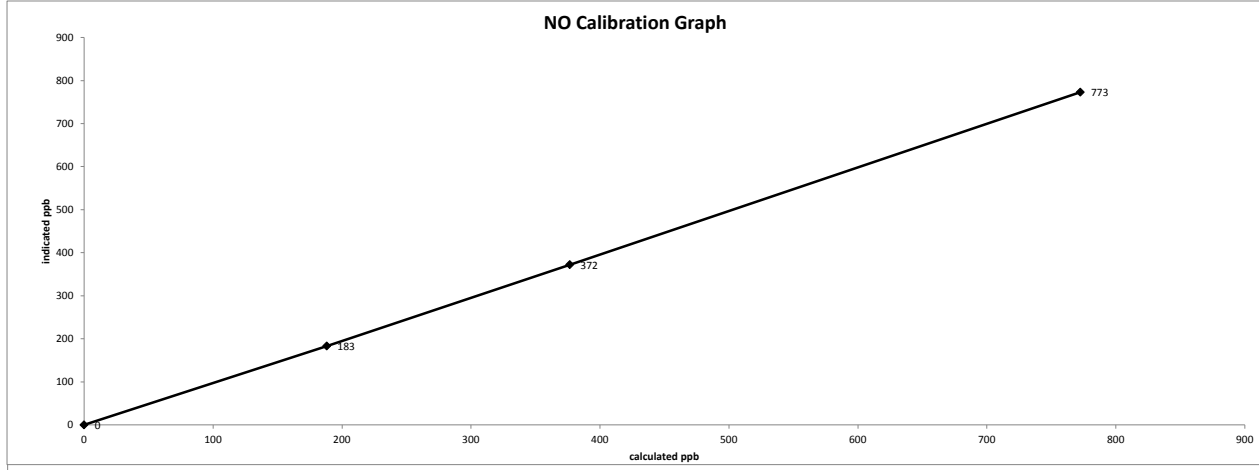
As found:		As left:	
NOx SLOPE:	1.133	NOx SLOPE:	1.261
NOx OFFS:	0.4	NOx OFFS:	0.4
NO SLOPE:	1.134	NO SLOPE:	1.261
NO OFFS:	-0.7	NO OFFS:	-0.7
SAMP FLW:	441	SAMP FLW:	439
OZONE FL:	80	OZONE FL:	80
NORM PMT:	1.4	NORM PMT:	1.1
AZERO:	19.9	AZERO:	21.4
HVPS:	731	HVPS:	731
DCPS:	2559	DCPS:	2557
RCELL:	50.6	RCELL:	50.5
BOX TEMP:	31.4	BOX TEMP:	34.5
IZS TEMP:	46.1	IZS TEMP:	46.3
MOLY TEMP:	315.4	MOLY TEMP:	315.9
RCEL:	6.6	RCEL:	6.6
SAMP:	26.7	SAMP:	26.6
Expected Value NO:	11	Expected Value NO:	8
Expected Value NO ₂ :	433	Expected Value NO ₂ :	397
Expected Value NOx:	443	Expected Value NOx:	405

Comments:
The analyzer sample inlet filter was changed. No high point NO2 adjustment was required/made.
The manifold blower was found to be working normally.
Zero Air scrubber was renewed. High Point starts at 12:37 because leak check was conducted and calibration equipment re-checked. (Reason - lower than expected High Point As Found response of the analyzer). No issues found. GPT for O3 calibration (ppb): High O3 point = 400, NO drop = 381; Mid O3 point = 195, NO drop = 185; Low O3 point = 65, NO drop = 60.

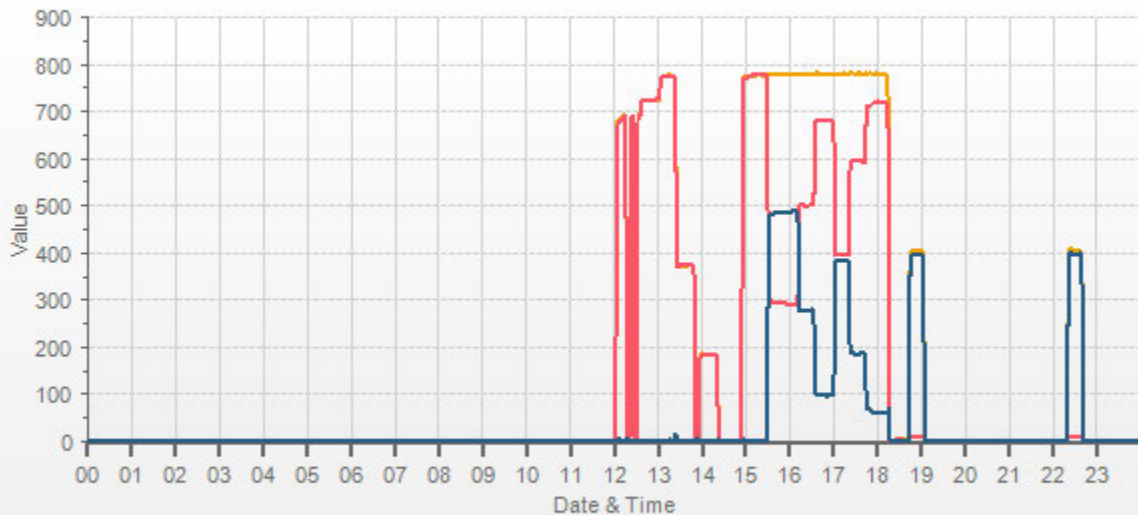
Date: April 11, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 11:04 / 19:08
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/04/11 Type: AVG 1 Min. [1 Min.]



— NOx[ppb] — NO[ppb] — NO2[ppb]



API 200A NO-NO2-NOx Analyzer Calibration

Date:	April 16, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	923	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Light rain/scattered showers		
Start/End Time 24 hr. (mst):	12:06 / 16:20	Calibration Purpose:	shut down		
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		

Analyzer:		Correction Factors:			
Serial Number/Owner:	1746 Maxxam	NO =	Previous C.F.: 0.999	As Found C.F.: 1.023	New C.F.: n/a
Last Calibration Date:	April 11, 2018	NO ₂ =	1.000	1.000	n/a
Range ppb:	1000	NOx =	1.000	1.024	n/a

Calibration Standards:		Standard Calibration Points for a Range of: 1000 ppb			
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	High	780	500	n/a
Calibrator ID/Expiry Date:	Environics id# 5212 expires March 1, 2019	Mid	380	275	n/a
Cal Gas Cylinder I.D. #:	LL 104225	Low	190	100	n/a
Cal Gas Conc. (ppm):	51.5 51.6	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	5042	0.0	5042	0	0	0.0	0.0	n/a	n/a	
as found high	4961	75.6	5037	772.7	774.2	755.0	756.0	1.023	1.024	
mid	5013	36.86	5050	375.9	376.6	362.0	363.0	1.038	1.038	
low	5031	18.34	5049	187.1	187.4	178.0	178.0	1.051	1.053	
								Average C.F.=	1.038	1.038

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 ₂	NO drop	NO ₂ gain	NO ₂ C.F.	
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	
NOx reference	4961	75.57	5037	0.0	755.0	755.0	0.0	0.0	0.0		
as found high NO2	4961	75.57	5037	515.0	280.0	755.0	475.0	475.0	475.0	1.000	
gpt mid	4961	75.57	5037	290.0	486.0	755.0	269.0	269.0	269.0	1.000	
gpt low	4961	75.57	5037	105.0	660.0	755.0	95.0	95.0	95.0	1.000	
										Average NO ₂ C.F. =	1.000

Linear Regression/Calibration Results:				LIMITS > or = 0.995 0.90-1.10 ± 3% F.S. ± 10% 0.96 to 1.04
	NO	NOx	NO ₂	
Correlation Coefficient =	1.000	1.000	1.000	
Slope =	1.022	1.022	1.000	
b (Intercept as % of full scale) =	-0.30%	-0.30%	0.00%	
% change in C.F. from last cal =	-2.44%	0.00%	-2.40%	
NO ₂ converter efficiency	1.00			

<p style="text-align: center;">As found:</p> NOx SLOPE: 1.261 NOx OFFS: 0.4 NO SLOPE: 1.261 NO OFFS: -0.7 SAMP FLW: 439 OZONE FL: 80 NORM PMT: -0.7 AZERO: 20.1 HVPS: 731 DCPS: 2564 RCELL: 50.3 BOX TEMP: 32.1 IZS TEMP: 46.0 MOLY TEMP: 314.6 RCEL: 6.6 SAMP: 26.6 Expected Value NO: 8 Expected Value NO ₂ : 397 Expected Value NOx: 405	<p style="text-align: center;">As left:</p> NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a DCPS: n/a RCELL: n/a BOX TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO ₂ : n/a Expected Value NOx: n/a
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Comments:

No high point NO2 adjustment was required/made.

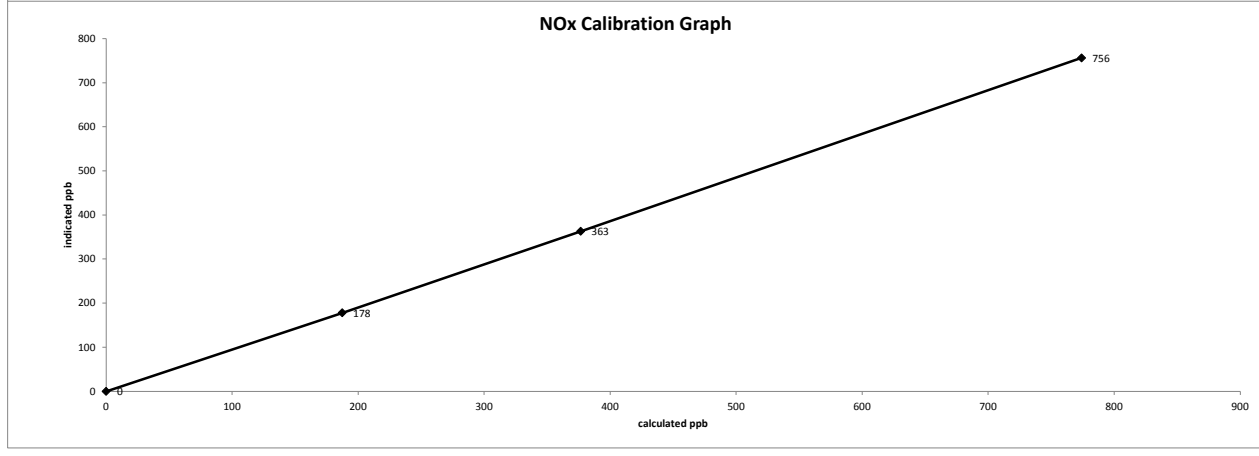
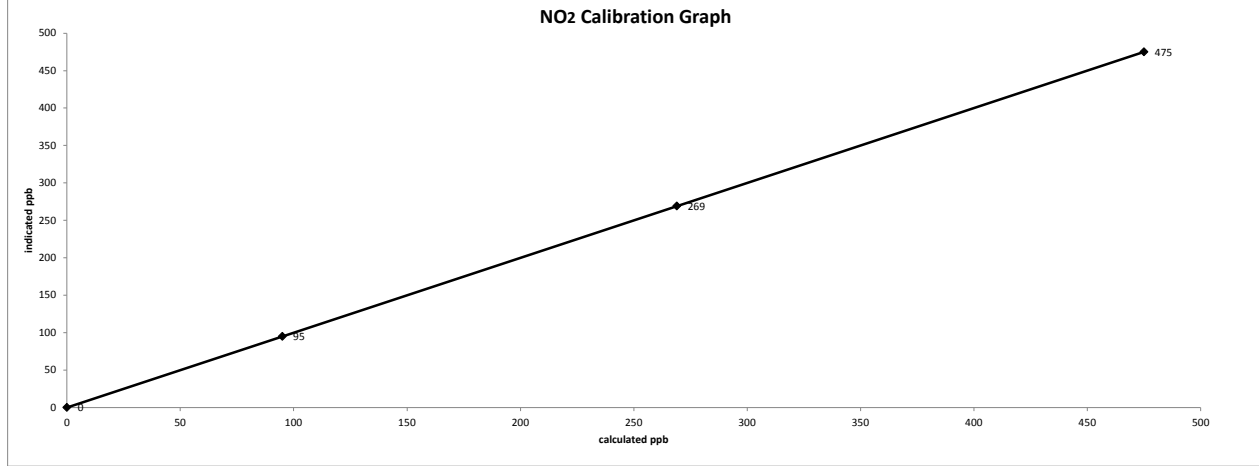
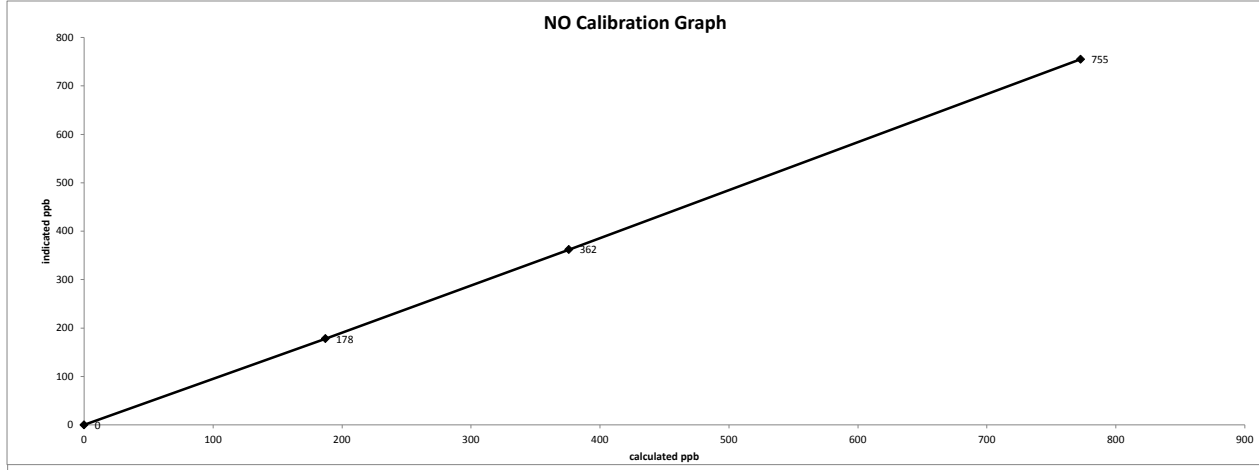
The manifold blower was found to be working normally.
No zero adjustment was required/made. As found zero values were copied to adjusted zero values for linearity calculation purposes.

A Shutdown calibration was completed to remove the Maxxam analyzer 1746. The LICA NOx analyzer #594 will be installed.

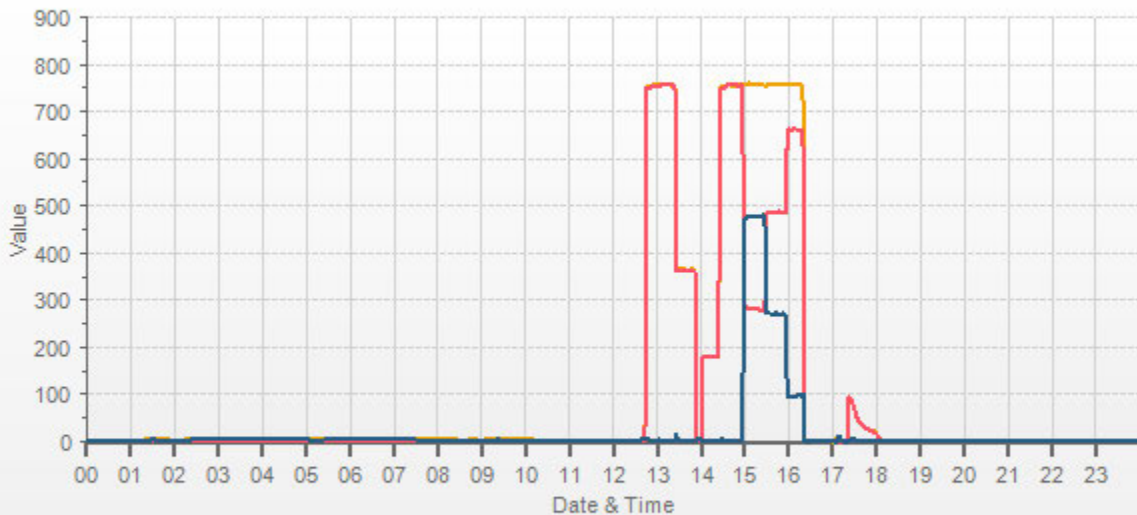
Date: April 16, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 12:06 / 16:20
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/04/16 Type: AVG 1 Min. [1 Min.]



— NOx[ppb] — NO[ppb] — NO2[ppb]



API 200E NO-NO2-NOx Analyzer Calibration

Date: April 17, 2018	Barometer/B.P./units: F.S. 05544 expires January 5, 2019	917	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: St. Lina	Weather Conditions: Light snow		
Start/End Time 24 hr. (mst): 10:57 / 17:56	Calibration Purpose: installation		
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		

Analyzer:		Correction Factors:	
Serial Number/Owner: 594 LICA	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: n/a	NO = n/a	n/a	1.000
Range ppb: 1000	NO ₂ = n/a	n/a	1.000
	NOx = n/a	n/a	1.000

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: Environics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. #: LL 104225 Cal Gas Conc. (ppm): 51.5 51.6	Standard Calibration Points for a Range of: 1000 ppb																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target NO (ppb)</th> <th>Target NO₂ (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>	Point	Target NO (ppb)	Target NO ₂ (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
Point	Target NO (ppb)	Target NO ₂ (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

Point	Diluent	Cal Gas	Total Flow	Calculated NO (ppb)	Calculated NOx (ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	NO C.F.	NOx C.F.
adjusted zero	5046	0.0	5046	0	0	0.0	0.0	n/a	n/a
adjusted high	4959	75.7	5035	774.2	775.7	774.0	776.0	1.000	1.000
mid	5003	36.78	5040	375.8	376.6	375.0	376.0	1.002	1.001
low	5028	18.36	5046	187.4	187.7	186.0	186.0	1.007	1.009
calibrator zero	5046	0.00	5046	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F.=								1.003	1.003

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

Point	Diluent	Cal Gas	Total Flow	Calibrator Setting (volts or ppb)	Indicated NO (ppb)	Indicated NOx (ppb)	Indicated NO ₂ (ppb)	NO drop (ppb)	NO ₂ gain (ppb)	NO ₂ C.F. (ppb)
NOx reference	4959	75.69	5035	0.0	768.0	769.0	1.0	0.0	1.0	n/a
adjusted high NO2	4959	75.69	5035	525.0	268.0	769.0	501.0	500.0	500.0	1.000
gpt mid	4959	75.69	5035	285.0	498.0	769.0	271.0	270.0	270.0	1.000
gpt low	4959	75.69	5035	115.0	664.0	769.0	105.0	104.0	104.0	1.000
Average NO₂ C.F.=										1.000

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	1.002	0.95-1.05
b (Intercept as % of full scale)=	-0.07%	-0.09%	0.06%	± 3% F.S.
% change in C.F. from last cal=	n/a	n/a	n/a	n/a
NO ₂ converter efficiency	0.98			0.96 to 1.04

As found: NOx SLOPE: n/a NOx OFFS: n/a NO SLOPE: n/a NO OFFS: n/a SAMP FLW: n/a OZONE FL: n/a PMT: n/a NORM PMT: n/a AZERO: n/a HVPS: n/a RCELL TEMP: n/a BOX TEMP: n/a PMT TEMP: n/a IZS TEMP: n/a MOLY TEMP: n/a RCEL: n/a SAMP: n/a Expected Value NO: n/a Expected Value NO ₂ : n/a Expected Value NOx: n/a	As left: NOx SLOPE: 1.069 NOx OFFS: 0.7 NO SLOPE: 1.066 NO OFFS: 0.2 SAMP FLW: 477 OZONE FL: 77 PMT: 20.3 NORM PMT: 1.2 AZERO: 21.2 HVPS: 759 RCELL TEMP: 50.0 BOX TEMP: 30.8 PMT TEMP: 6.7 IZS TEMP: 45.2 MOLY TEMP: 316.1 RCEL: 5.4 SAMP: 25.8 Expected Value NO: 9 Expected Value NO ₂ : 578 Expected Value NOx: 587
---	---

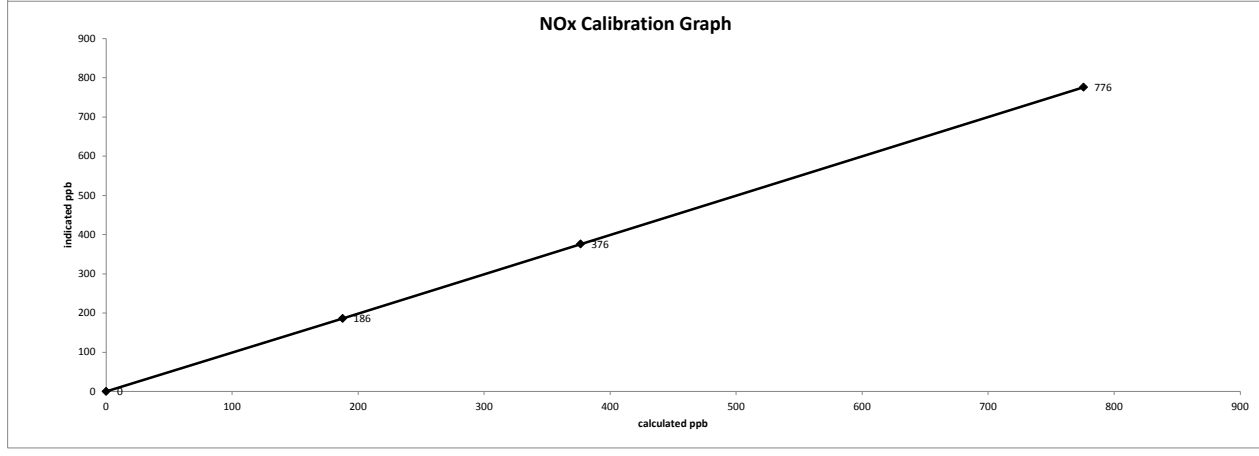
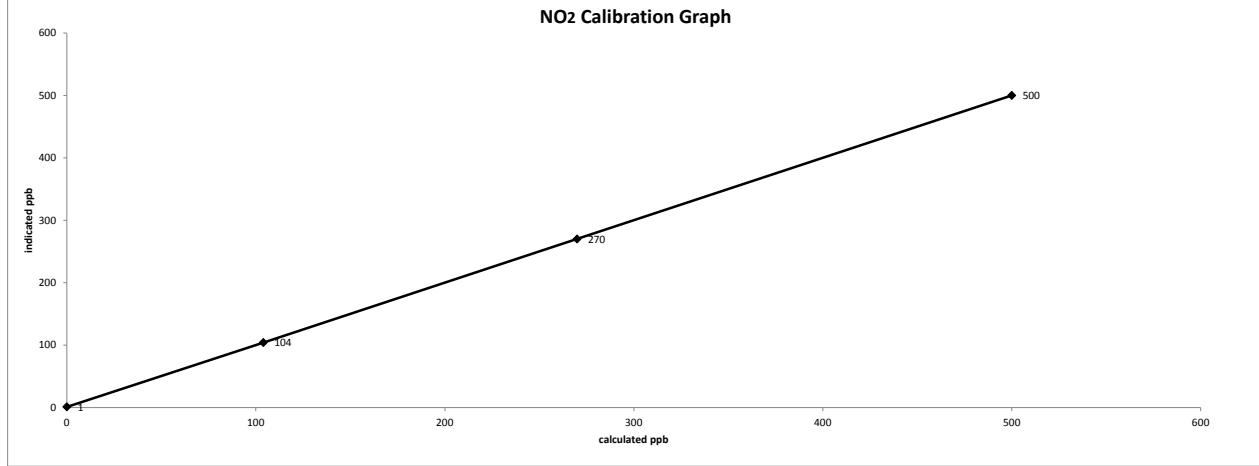
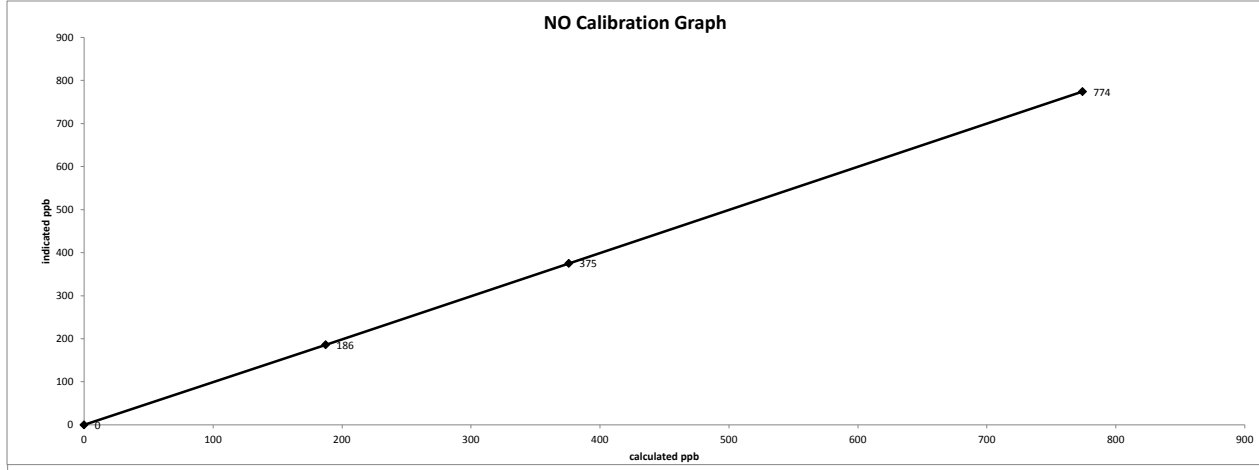
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.

An installation calibration was completed to install the LICA Analyzer 594 which was repaired in Calgary. Prior to the installation, the sample pump was rebuilt, the output voltage was calibrated, the ZS Temperature was adjusted, and a leak check was performed.

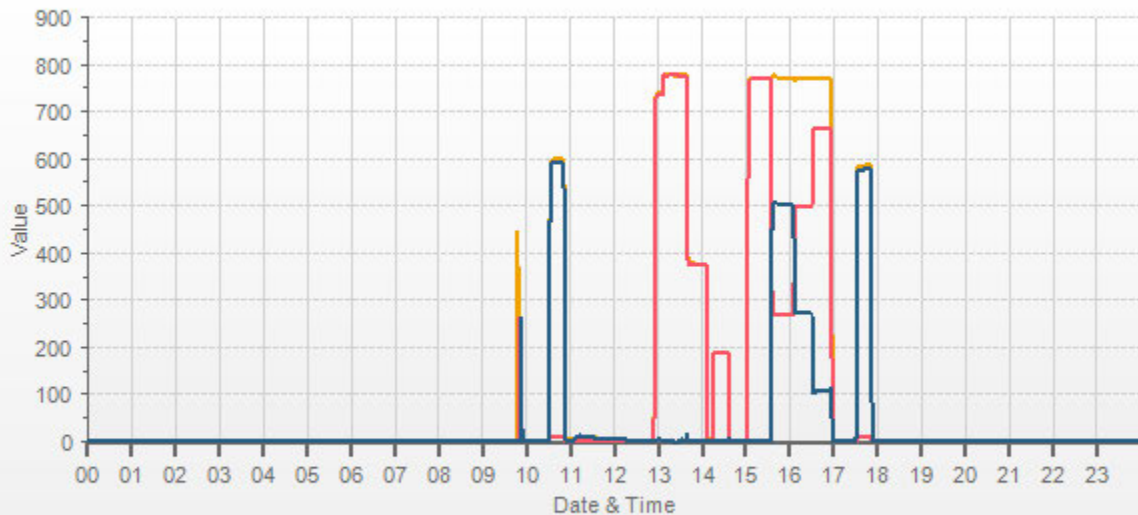
Date: April 17, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:57 / 17:56
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/04/17 Type: AVG 1 Min. [1 Min.]



— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: April 12, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 10:12 / 14:21 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: April 11, 2018 Analyzer: Serial Number/Owner: 1002240371 LICA Last Calibration Date: March 1, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 5, 2019 925 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Ozone Range ppb: 500 As Found C.F.: 1.008 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: Environics id# 5212 expires March 1, 2019

Cal Gas Cylinder I.D. #: LL 104225

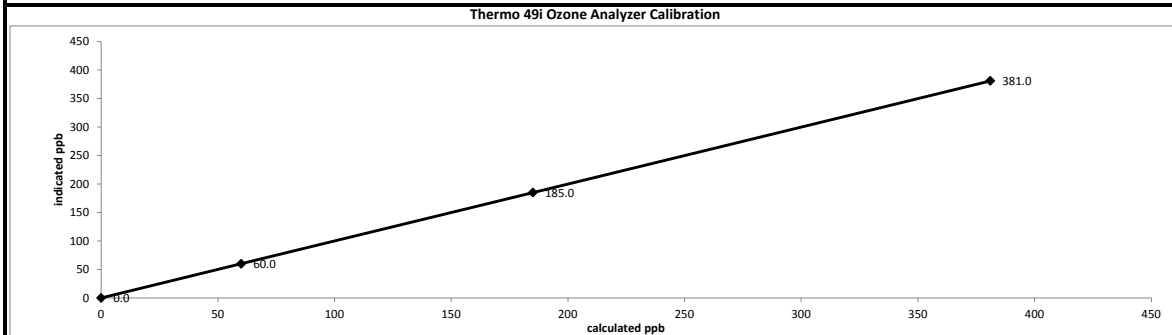
Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-100 ppb

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	381.0	381.0	378.0	1.008
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	381.0	381.0	381.0	1.000
mid	5000	5000	185.0	185.0	185.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

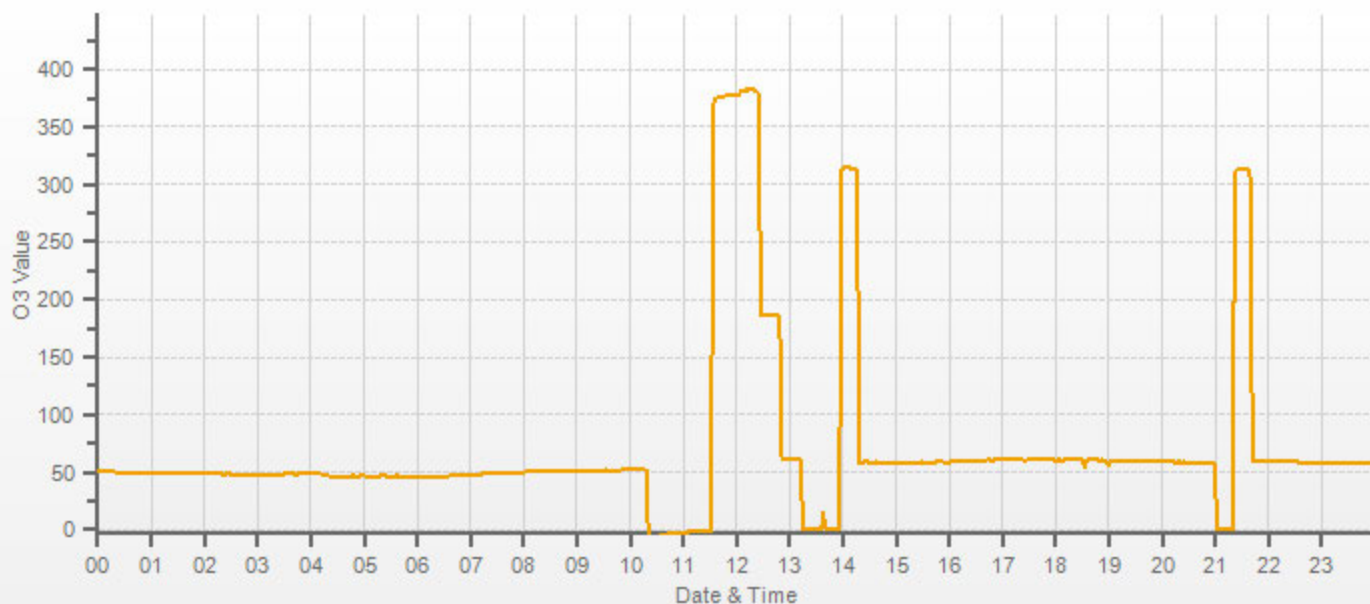
Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.000</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.00%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-0.79%</u>	± 10%



As found:	As left:
O3 Bkg: <u>-0.1</u>	O3 Bkg: <u>-0.1</u>
O3 Coef: <u>0.965</u>	O3 Coef: <u>0.971</u>
Photo Lamp: <u>10.7</u>	Photo Lamp: <u>10.7</u>
O3 Lamp: <u>8.2</u>	O3 Lamp: <u>8.2</u>
Bench: <u>30.2</u>	Bench: <u>32.2</u>
Bench Lamp: <u>53.7</u>	Bench Lamp: <u>53.7</u>
O3 Lamp: <u>67.8</u>	O3 Lamp: <u>67.9</u>
Pressure: <u>678.2</u>	Pressure: <u>678.8</u>
Cell A lpm: <u>0.730</u>	Cell A lpm: <u>0.730</u>
Cell B lpm: <u>0.767</u>	Cell B lpm: <u>0.769</u>
O3 ppb: <u>-12.7</u>	O3 ppb: <u>-1.0</u>
Cell A ppb: <u>-4.7</u>	Cell A ppb: <u>0.9</u>
Cell B ppb: <u>-20.8</u>	Cell B ppb: <u>-2.9</u>
Cell A int (Hz): <u>77398</u>	Cell A int (Hz): <u>77398</u>
Cell B int (Hz): <u>97446</u>	Cell B int (Hz): <u>97446</u>
Expected Value: <u>302.0</u>	Expected Value: <u>313.0</u>

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.

O3[ppb]



PARTICULATE MATTER 2.5



Thermo 5030i SHARP Monitor Monthly Audit

Date: April 24, 2018
Company: LICA
Station Name/Location: St Lina
Previous Audit Date: March 6, 2018
Parameter: PM 2.5

Performed By/Reviewer: Alex Yakupov | Rob Fisher
Start Time (mst): 11:04
End Time (mst): 12:33
Calibration Purpose: monthly
Weather Conditions: Mainly sunny

SHARP 5030i Information and Status:

Serial Number: CM17091001 **Filter Tape Counter:** 448

Reference Standards:

Air Flow

	Manometer	Orifice	Pressure:	Temp / RH:
Make:	Dwyer	Chinook	F.S. ID 05544	Fisher Scientific
Model:	475 Mk.III	CHN0901	FB 61291	11-661-7A 11745843
Serial Number:	#3	#4	130168457	170286131
Calibration Date:	January 9, 2019	March 15, 2019	January 15, 2019	April 19, 2019

Ambient Temperature (°C)				Range	Action
	Reference	SHARP	Difference	< ± 2°C	OK
#1	17.50	17.7	-0.2	2-3 °C	Recalibrate
				> 3°C	Fail

Ambient Relative Humidity (%RH)				Range	Action
As Found:					
	Reference	SHARP	Difference	< ± 2 %RH	OK
#1	18.50	18.8	-0.3	2-5 %RH	Recalibrate
				> 5 %RH	Fail

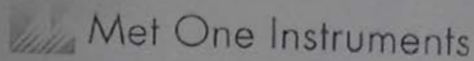
Barometric Pressure (mmHg)				Range	Action
As Found:					
	Reference	SHARP	Difference	< ± 10 mmHg	OK
#1	702.0	702.0	0.0	10-12 mmHg	Recalibrate
				> 12 %RH	Fail

Flow Audit (L/min)						Range	Action
As Found:						< ± 4%	OK
	Reference	SHARP		% Difference	0.020016013	4-5%	Recalibrate
#1	16.65	16.65				>5%	Fail
#2	16.65	16.67					
#3	16.66	16.65					
Average	16.65	16.66					

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.66	-0.01	16.60	16.63	-0.03
LEAK RATE:						-0.02

Leak Limit: 0.08 L/min

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

Calibrator:			Flow Measurement Device:		
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 ₂	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 ₃ Conc	NO Decrease	NO	NO ₂	NOx	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% 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)*

NO₂	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	NO_x Analyzer
Audit Calibrator	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 SO₂.

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 ₂	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 ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% 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)*

NO₂	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		NO_x Analyzer	
Audit Calibrator		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 2, 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 SO₂.

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	0.000	0.000	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:					47.9

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	0.0000	132.895	10.2
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:					10.1

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

Date: October 19, 2016

Operator Signature: *Al Clark*

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&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	
		CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
Dilution	Gas						
2600	0.0	0.00	0.00	0.02005	49.883	602	206
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:						600	207

<u>CH₄</u>	<u>C₃H₈</u>
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:						51.3	51.1

<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
St. Lina Continuous Monitoring Station - April 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ 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 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	6	6	S	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	4	6	4	24	
2	5	S	5	5	5	5	5	5	4	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	5	4	5	24	
3	S	5	5	5	6	6	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	S	4	6	5	24	
4	4	4	5	5	5	5	6	6	6	6	6	6	5	4	5	5	5	4	4	4	4	4	4	S	3	6	5	24	
5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	3	24	
6	3	3	2	3	3	3	3	3	4	3	3	3	3	3	3	3	4	3	3	S	3	S	3	3	3	2	4	24	
7	4	4	4	4	4	4	4	4	4	4	4	4	5	5	4	4	5	5	5	S	4	4	4	5	4	4	5	24	
8	5	4	5	5	5	4	5	5	5	5	5	4	4	5	5	4	4	4	S	5	5	5	4	4	4	4	5	24	
9	4	4	4	4	4	4	4	4	5	5	7	8	9	11	7	4	5	S	4	4	4	4	5	5	5	4	11	24	
10	5	5	5	5	6	7	6	7	6	5	5	5	5	5	5	5	S	5	5	5	5	5	4	4	5	4	7	24	
11	5	5	5	5	5	5	5	5	5	5	5	C	C	C	C	C	2	2	2	2	2	2	2	S	1	1	5	24	
12	2	2	2	2	2	2	2	2	2	2	2	1	2	Q	Q	2	2	2	2	1	1	S	1	1	1	1	2	2	24
13	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	1	1	1	24
14	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	1	S	1	2	1	1	1	1	2	2	24
15	1	2	2	2	1	2	2	9	6	5	4	3	2	2	2	2	1	1	S	2	2	2	2	2	2	1	9	3	24
16	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	2	2	2	24
17	2	2	3	3	3	3	3	3	3	3	3	2	3	3	2	2	S	2	2	2	2	2	2	2	2	2	3	2	24
18	2	2	3	3	3	2	3	2	2	2	2	1	1	1	1	S	4	5	2	1	1	1	1	1	1	1	5	2	24
19	1	1	1	1	1	1	1	1	2	2	2	2	2	2	S	1	2	1	1	1	1	1	2	2	2	1	2	1	24
20	1	1	2	2	1	2	2	2	2	2	2	2	2	2	S	2	2	2	1	1	2	1	1	2	2	1	2	2	24
21	2	2	2	2	2	2	2	4	3	3	3	3	S	3	3	3	2	2	2	2	2	2	2	2	2	2	4	2	24
22	2	2	2	2	2	2	2	2	2	2	2	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
23	1	1	1	0	1	0	1	0	0	1	S	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24
24	1	1	1	1	1	1	1	2	2	S	1	1	1	1	2	2	3	2	2	2	2	2	2	2	2	1	3	2	24
25	2	2	2	2	2	2	2	2	S	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	1	2	2	24
26	2	2	4	4	4	3	2	S	2	2	X	2	1	2	2	2	2	2	1	1	2	1	2	1	1	4	2	23	
27	2	1	1	2	1	2	S	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	1	3	2	24
28	3	3	3	3	3	S	3	3	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	24
29	4	4	4	3	S	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	3	24
30	2	2	2	S	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2	3	2	24
HOURLY MAX	6	6	5	5	6	7	6	9	6	6	7	8	9	11	7	5	5	5	5	5	5	5	5	5	5	2	3	2	24
HOURLY AVG	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	24

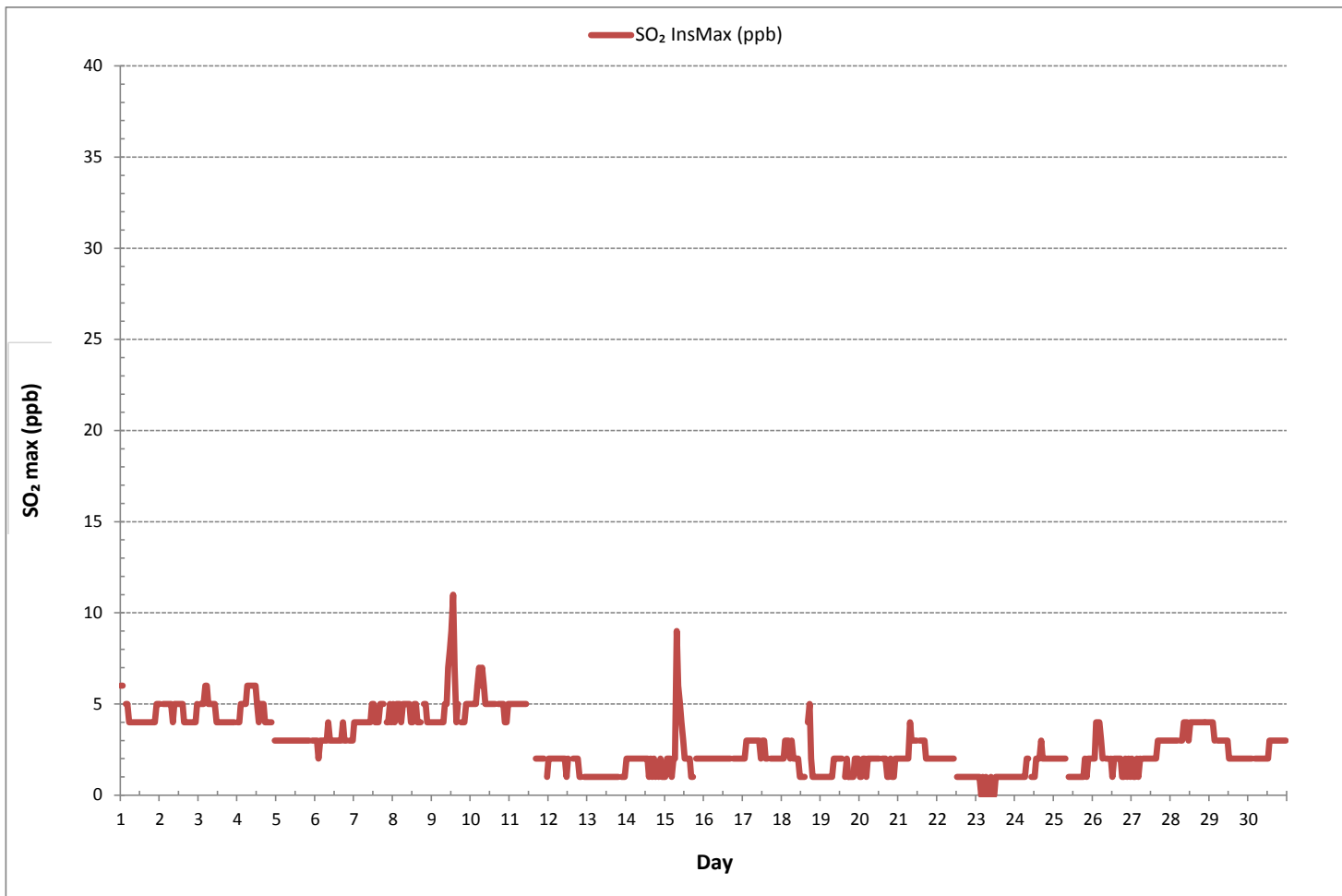
STATUS FLAG CODES

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:	676
MAXIMUM INSTANTANEOUS VALUE:	11 ppb @ HOUR 13 ON DAY 9
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	719 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 2018

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S 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 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	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	
2	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	
3	S	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	1	
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	
5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	1	0	
7	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	0	1	1	
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	
9	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	
10	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	
11	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	0	0	0	0	0	0	S	0	0	1	1	
12	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	
13	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	
14	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	
15	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	
16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	1	0	0	1	0	0	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	1	1
18	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0
19	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
20	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
21	0	0	0	0	0	0	0	1	1	1	1	1	S	1	1	1	1	1	1	1	0	0	1	1	0	1	1	
22	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
23	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	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
25	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
26	0	0	0	0	0	0	0	S	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	
28	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
29	1	1	1	1	S	1	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
30	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	
HOURLY MAX	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
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

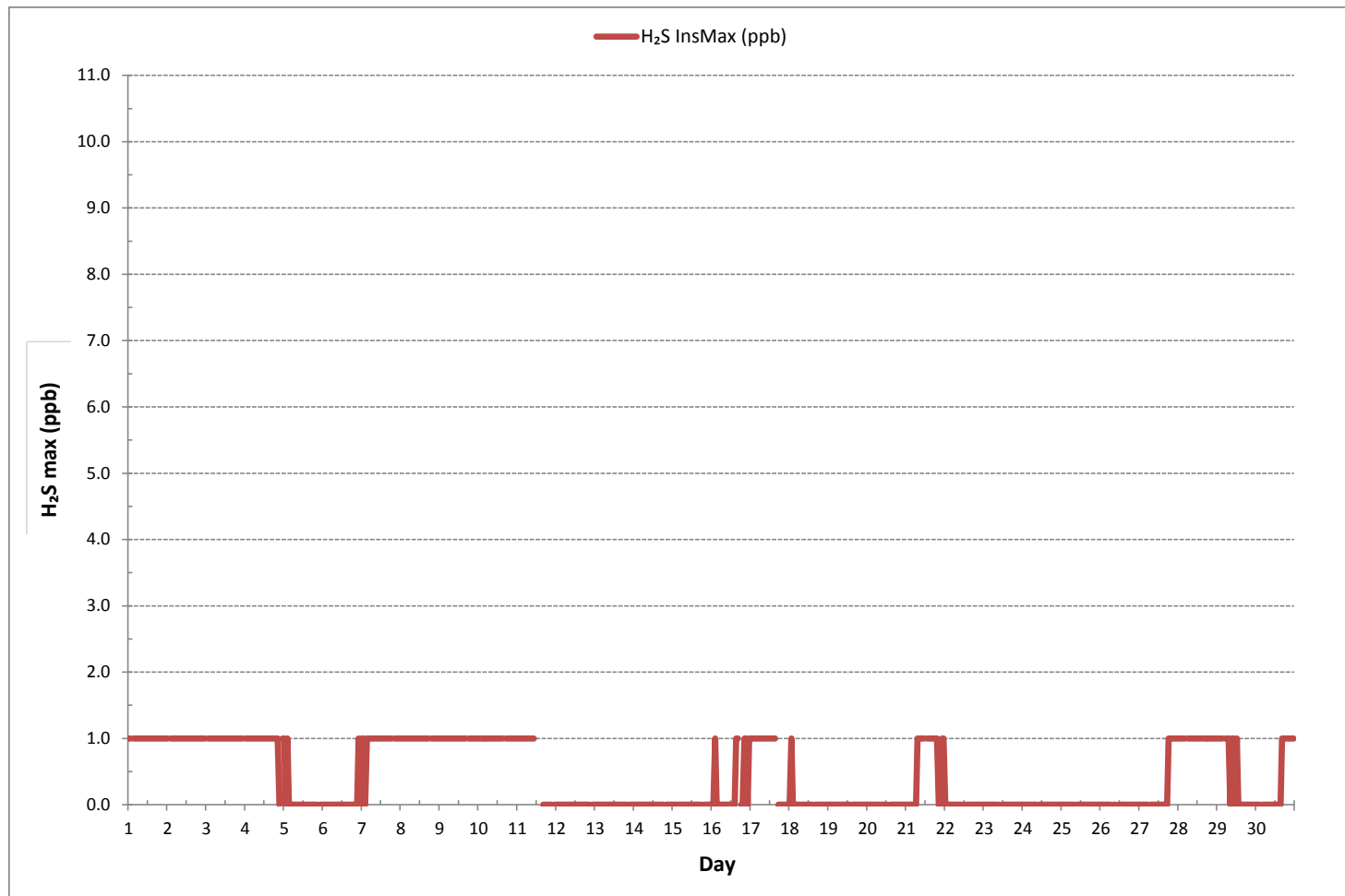
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	279
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	0
OPERATIONAL TIME:	719 hrs

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 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	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	2.40	2.41	S	2.39	2.37	2.37	2.36	2.37	2.36	2.36	2.35	2.35	2.32	2.32	2.35	2.30	2.28	2.31	2.30	2.32	2.32	2.31	2.41	2.37	2.28	2.41	2.35	24	
2	2.35	S	2.36	2.58	2.66	2.61	2.58	2.53	2.36	2.35	2.31	2.35	2.35	2.37	2.39	2.39	2.45	2.47	2.45	2.45	2.41	2.32	2.35	2.37	2.31	2.66	2.43	24	
3	S	2.44	2.46	2.49	2.42	2.45	2.58	2.54	2.45	2.36	2.36	2.35	2.30	2.33	2.33	2.33	2.35	2.35	2.35	2.36	2.39	2.35	2.36	S	2.30	2.58	2.40	24	
4	2.36	2.42	2.44	2.49	2.59	2.74	2.74	2.58	2.56	2.54	2.46	2.41	2.35	2.33	2.35	2.33	2.36	2.33	2.32	2.35	2.33	2.35	S	2.36	2.32	2.74	2.44	24	
5	2.36	2.36	2.36	2.36	2.37	2.36	2.37	2.38	2.36	2.37	2.36	2.36	2.35	2.36	2.37	2.37	2.39	2.39	2.40	2.41	2.40	S	2.42	2.45	2.35	2.45	2.38	24	
6	2.51	2.50	2.50	2.50	2.49	2.46	2.45	2.48	2.41	2.44	C	C	C	C	C	C	2.26	2.25	2.25	2.35	S	2.37	2.31	2.32	2.25	2.51	2.40	24	
7	2.28	2.29	2.36	2.38	2.56	2.52	2.60	2.54	2.48	2.48	2.42	2.40	2.41	2.31	2.28	2.30	2.31	2.26	2.29	S	2.26	2.22	2.26	2.26	2.22	2.60	2.37	24	
8	2.33	2.36	2.38	2.36	2.41	2.39	2.36	2.35	2.30	2.29	2.30	2.30	2.25	2.24	2.26	2.29	2.28	2.29	S	2.25	2.25	2.26	2.28	2.25	2.24	2.41	2.31	24	
9	2.24	2.25	2.26	2.30	2.33	2.35	2.35	2.33	2.33	2.28	2.31	2.21	2.14	2.17	2.17	2.11	2.11	S	2.10	2.11	2.13	2.18	2.30	2.31	2.10	2.35	2.23	24	
10	2.29	2.30	2.35	2.37	2.30	2.31	2.30	2.31	2.26	2.49	2.45	2.32	2.28	2.15	2.09	2.00	S	2.04	2.05	2.04	2.05	2.09	2.18	2.19	2.00	2.49	2.23	24	
11	2.19	2.13	2.14	2.14	2.17	2.15	2.15	2.15	2.17	2.17	2.19	2.17	2.13	2.13	2.09	2.03	2.02	2.02	2.01	2.18	2.15	2.14	S	2.26	2.01	2.26	2.13	24	
12	2.26	2.25	2.21	2.21	2.24	2.28	2.25	2.21	2.22	2.21	2.19	2.15	2.14	2.13	2.19	2.02	2.03	2.05	2.06	2.10	2.26	S	2.30	2.37	2.02	2.37	2.19	24	
13	2.41	2.37	2.37	2.44	2.43	2.45	2.48	2.40	2.44	2.46	2.50	2.42	2.29	2.33	2.30	2.30	2.28	2.24	2.29	2.36	S	2.26	2.29	2.26	2.24	2.50	2.36	24	
14	2.28	2.25	2.29	2.33	2.35	2.36	2.39	2.39	2.40	2.42	2.31	2.21	2.14	2.13	2.10	2.15	2.19	2.17	2.11	S	2.09	2.12	2.13	2.15	2.09	2.42	2.24	24	
15	2.21	2.23	2.19	2.26	2.32	2.66	2.67	2.67	2.60	2.55	2.54	2.48	2.29	2.15	2.09	2.10	2.14	2.13	S	2.15	2.18	2.18	2.18	2.19	2.09	2.67	2.31	24	
16	2.22	2.20	2.24	2.29	2.26	2.28	2.25	2.25	2.19	2.22	2.21	2.22	2.13	2.09	2.13	2.15	2.15	S	2.15	2.14	2.19	2.18	2.17	2.19	2.09	2.29	2.20	24	
17	2.22	2.22	2.23	2.26	2.25	2.26	2.24	2.26	2.29	2.29	2.31	2.32	2.28	2.26	2.29	2.30	S	2.30	2.28	2.28	2.26	2.26	2.26	2.28	2.22	2.33	2.27	24	
18	2.32	2.31	2.29	2.28	2.26	2.30	2.39	2.38	2.26	2.19	2.15	2.17	2.15	2.15	2.13	S	2.13	2.13	2.13	2.13	2.13	2.13	2.11	2.19	2.11	2.39	2.21	24	
19	2.19	2.26	2.26	2.26	2.30	2.29	2.31	2.33	2.33	2.31	2.22	2.22	2.32	2.31	S	2.31	2.28	2.24	2.35	2.58	2.58	2.50	2.46	2.44	2.19	2.58	2.33	24	
20	2.42	2.39	2.41	2.40	2.41	2.41	2.44	2.42	2.37	2.30	2.26	2.13	2.09	S	2.11	2.14	2.12	2.11	2.11	2.10	2.15	2.15	2.15	2.15	2.09	2.44	2.25	24	
21	2.10	2.14	2.15	2.28	2.63	2.66	2.70	2.79	2.87	2.86	2.79	2.77	S	2.58	2.56	2.53	2.37	2.25	2.26	2.22	2.25	2.26	2.38	2.25	2.10	2.87	2.46	24	
22	2.24	2.21	2.19	2.24	2.24	2.21	2.21	2.22	2.22	2.24	2.21	S	2.21	2.21	2.25	2.24	2.22	2.22	2.22	2.24	2.25	2.26	2.28	2.30	2.19	2.30	2.23	24	
23	2.30	2.30	2.28	2.28	2.30	2.30	2.26	2.26	2.28	2.22	S	2.13	2.12	2.14	2.15	2.15	2.15	2.15	2.15	2.13	2.15	2.15	2.14	2.22	2.32	2.12	2.32	2.21	24
24	2.29	2.25	2.26	2.24	2.25	2.25	2.22	2.21	2.37	S	2.35	2.31	2.28	2.29	2.30	2.26	2.30	2.29	2.25	2.26	2.26	2.26	2.22	2.25	2.21	2.37	2.27	24	
25	2.23	2.25	2.25	2.24	2.26	2.26	2.26	2.28	S	2.25	2.15	2.25	2.21	2.25	2.25	2.25	2.25	2.24	2.28	2.30	2.29	2.28	2.29	2.29	2.15	2.30	2.25	24	
26	2.29	2.30	2.32	2.37	2.37	2.37	2.35	S	2.15	2.09	X	2.18	2.21	2.18	2.21	2.21	2.19	2.15	2.15	2.24	2.19	2.37	2.25	2.19	2.09	2.37	2.24	23	
27	2.18	2.22	2.25	2.25	2.28	2.25	S	2.23	2.17	2.28	2.26	2.25	2.21	2.22	2.31	2.17	2.18	2.18	2.15	2.15	2.13	2.15	2.15	2.14	2.13	2.31	2.21	24	
28	2.11	2.14	2.13	2.14	2.14	S	2.18	2.18	2.14	2.25	2.23	2.19	2.18	2.18	2.19	2.15	2.17	2.15	2.18	2.18	2.17	2.18	2.20	2.19	2.11	2.25	2.17	24	
29	2.23	2.18	2.21	2.24	S	2.25	2.25	2.26	2.25	2.21	2.10	2.06	2.10	2.11	2.11	2.13	2.10	2.13	2.11	2.14	2.10	2.10	2.10	2.13	2.06	2.26	2.16	24	
30	2.15	2.20	2.25	S	2.28	2.34	2.37	2.36	2.28	2.28	2.26	2.26	2.26	2.28	2.25	2.24	2.24	2.24	2.25	2.23	2.26	2.26	2.24	2.25	2.15	2.37	2.26	24	
HOURLY MAX	2.51	2.50	2.50	2.58	2.66	2.74	2.74	2.79	2.87	2.86	2.79	2.77	2.41	2.58	2.56	2.53	2.45	2.47	2.45	2.58	2.58	2.50	2.46	2.45					
HOURLY AVG	2.27	2.28	2.29	2.32	2.35	2.38	2.38	2.37	2.34	2.34	2.32	2.28	2.23	2.24	2.24	2.22	2.23	2.22	2.21	2.24	2.24	2.26	2.26	2.26					

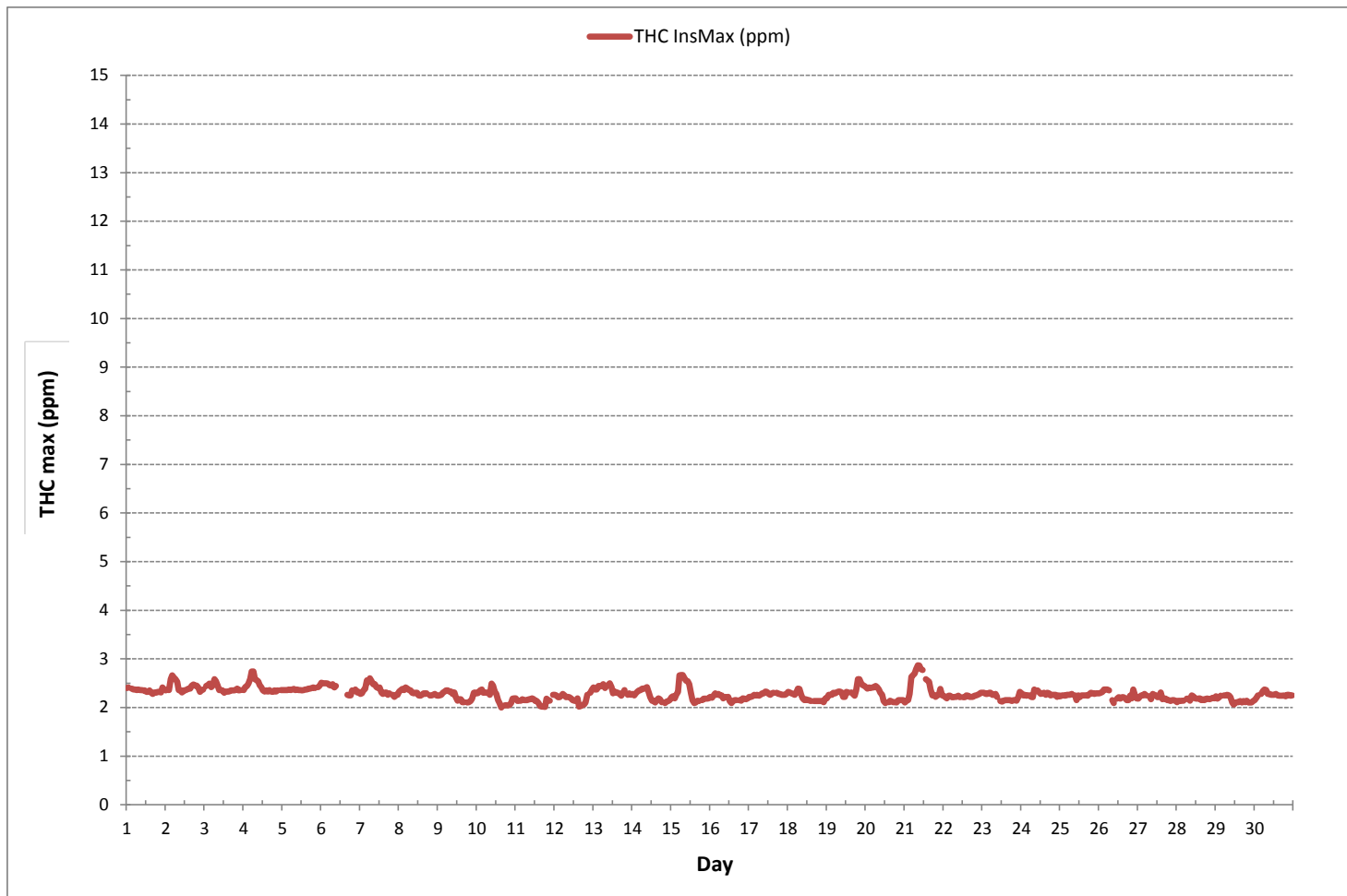
STATUS FLAG CODES

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:	682
MAXIMUM INSTANTANEOUS VALUE:	2.87 ppm @ HOUR 8 ON DAY 21
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	719 hrs
STANDARD DEVIATION:	0.13

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x 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 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	6	6	S	7	4	3	2	1	1	3	2	1	1	1	1	1	1	1	1	1	1	0	3	2	0	7	2	24	
2	1	S	4	5	9	8	7	5	2	1	1	1	1	1	1	1	4	5	6	6	5	1	1	3	1	9	3	24	
3	S	6	5	5	4	3	7	6	5	3	2	1	1	1	1	1	2	1	1	1	1	1	1	S	1	7	3	24	
4	4	3	4	4	6	10	10	7	7	7	6	5	3	1	2	2	2	1	9	1	0	4	S	3	0	10	4	24	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	S	4	3	0	4	1	24
6	3	4	7	7	4	3	3	4	3	3	1	1	1	1	1	1	1	1	1	1	1	S	4	2	2	1	7	3	24
7	1	1	1	2	2	4	5	4	3	3	3	3	3	1	1	1	1	1	1	1	S	4	2	2	2	1	5	2	24
8	2	3	3	2	3	2	2	2	3	3	3	3	2	1	1	1	2	2	S	5	3	4	3	2	1	5	2	24	
9	2	2	3	3	25	3	6	4	22	4	4	5	6	7	5	4	4	S	6	3	30	3	3	21	2	30	8	24	
10	5	5	6	6	6	7	8	7	6	7	7	7	7	4	3	3	S	7	3	2	2	1	1	1	1	1	8	5	24
11	1	1	1	1	2	1	1	1	2	2	2	C	C	C	C	C	C	C	C	C	C	1	1	S	1	1	2	1	24
12	1	1	1	1	3	3	3	2	1	2	2	1	1	1	1	1	1	1	4	3	1	S	2	1	1	1	4	2	24
13	2	2	3	3	3	3	3	3	3	4	4	3	3	3	2	2	2	2	2	2	3	S	6	3	2	2	6	3	24
14	3	2	3	3	3	3	3	3	4	3	3	3	3	8	1	2	2	3	2	S	5	3	3	3	1	8	3	24	
15	3	3	2	3	3	4	S1	S1	6	6	6	6	4	3	3	3	3	3	S	7	4	3	3	3	2	7	4	22	
16	3	3	3	3	3	3	4	4	3	3	3	2	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	2	4	3	12	
17	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	2	1	1	1	1	1	1	2	1	6	
18	2	3	4	5	4	5	5	5	4	3	3	2	2	1	1	S	2	3	2	2	3	3	2	2	1	5	3	24	
19	2	2	2	2	2	3	4	3	3	4	3	3	2	2	S	3	2	2	2	3	2	2	2	2	2	2	4	2	24
20	2	2	2	2	2	2	4	3	3	3	2	1	1	S	1	2	2	2	1	1	2	2	2	2	1	4	2	24	
21	1	1	1	1	3	4	4	5	5	5	5	6	S	6	5	7	4	2	2	1	2	2	2	2	1	7	3	24	
22	2	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	24	
23	1	1	1	1	1	1	1	1	2	2	S	2	2	1	2	1	1	1	12	1	1	2	2	2	2	1	12	2	24
24	6	2	2	2	3	5	4	5	6	S	4	2	1	2	3	2	4	10	2	3	3	1	1	1	1	10	3	24	
25	1	1	2	1	1	1	2	2	S	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	1	2	1	24	
26	2	2	4	5	5	5	4	S	2	1	X	1	1	1	1	2	1	1	1	1	1	2	2	1	1	5	2	23	
27	1	1	2	2	2	2	S	2	1	1	2	2	2	1	2	1	2	1	1	1	1	1	2	2	1	2	2	24	
28	2	2	2	2	2	S	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	2	2	1	1	3	2	24	
29	2	2	1	1	S	2	2	2	2	1	2	2	2	1	1	1	2	2	1	1	1	1	3	2	1	3	2	24	
30	2	2	1	S	2	2	2	2	1	2	1	1	1	1	1	1	1	2	2	2	2	1	2	2	1	2	2	24	
HOURLY MAX	6	6	7	7	25	10	10	7	22	7	7	7	7	8	5	7	4	12	9	7	30	6	4	21					
HOURLY AVG	2	2	3	3	4	3	4	3	4	3	3	3	2	2	2	2	2	3	2	2	3	2	2	3					

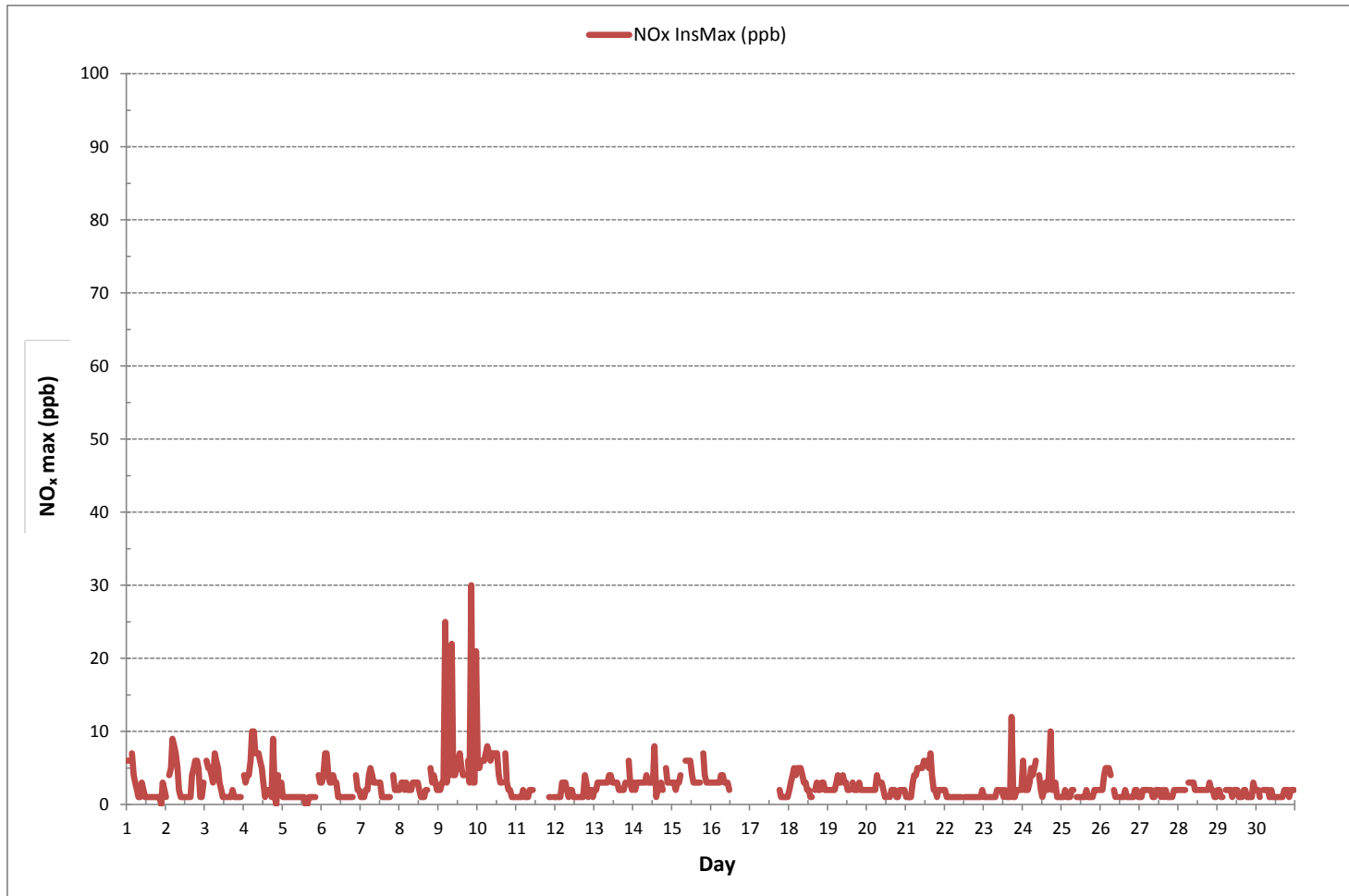
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	645
MAXIMUM INSTANTANEOUS VALUE:	30 ppb @ HOUR 20 ON DAY 9
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	687 hrs

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 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	1	S	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0	0	0	1	0	1	1	0	1	1	24		
2	1	S	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	24		
3	S	1	1	1	1	0	1	2	1	1	1	1	1	1	0	1	1	1	0	1	1	0	0	S	0	0	2	24		
4	1	1	1	1	1	1	1	2	3	3	3	3	1	1	1	1	1	1	8	1	1	2	S	1	1	1	8	24		
5	1	0	1	1	0	1	1	1	1	0	1	1	1	1	0	0	0	0	1	1	0	S	1	1	0	1	1	24		
6	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	2	24		
7	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	S	1	1	0	1	0	1	1	24		
8	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	S	1	1	1	1	1	0	1	1	24		
9	0	0	0	1	5	0	1	1	12	1	1	1	1	2	1	1	1	S	1	1	24	0	0	7	0	24	3	24		
10	0	0	1	1	0	0	1	1	1	1	2	2	2	1	1	1	S	1	1	0	1	0	0	1	0	2	1	24		
11	0	0	0	0	0	0	0	0	1	1	1	C	C	C	C	C	C	C	C	C	C	0	0	S	1	0	1	24		
12	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	S	1	0	0	1	24		
13	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	1	S	1	0	0	1	24		
14	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	1	S	1	1	0	1	0	1	1	24		
15	0	1	1	0	1	0	S1	S1	1	1	1	1	0	0	1	0	1	1	S	1	0	1	0	0	0	0	1	22		
16	0	0	0	0	1	0	1	1	1	1	1	1	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	Y	0	1	12		
17	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	0	0	0	0	0	0	0	0	0	6		
18	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24	
19	0	0	0	0	0	0	1	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
20	0	0	0	0	0	0	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
21	0	0	0	0	0	0	0	0	1	1	0	1	S	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
22	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	1	0	0	0	0	0	0	1	1	0	1	0	24	
23	0	1	0	0	0	1	1	1	1	1	S	1	0	1	0	0	0	7	0	0	0	0	0	0	0	0	7	1	24	
24	1	0	0	0	0	1	1	1	2	S	0	0	1	0	1	1	1	1	1	0	0	1	0	0	0	0	2	1	24	
25	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	1	0	24	
26	0	1	1	0	1	1	1	S	0	0	X	1	1	1	1	1	1	0	0	0	0	0	1	0	0	1	1	23		
27	0	0	0	0	0	1	S	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
28	0	1	0	0	1	S	1	1	1	1	1	1	0	1	0	0	1	1	1	0	0	1	1	1	1	0	1	1	24	
29	0	1	0	0	1	S	0	1	0	1	0	1	0	0	0	0	1	0	0	1	0	0	1	1	1	0	1	0	24	
30	0	0	1	S	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
HOURLY MAX	1	1	1	1	5	1	1	2	12	3	3	3	2	2	1	1	1	7	8	1	24	2	1	7						
HOURLY AVG	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1						

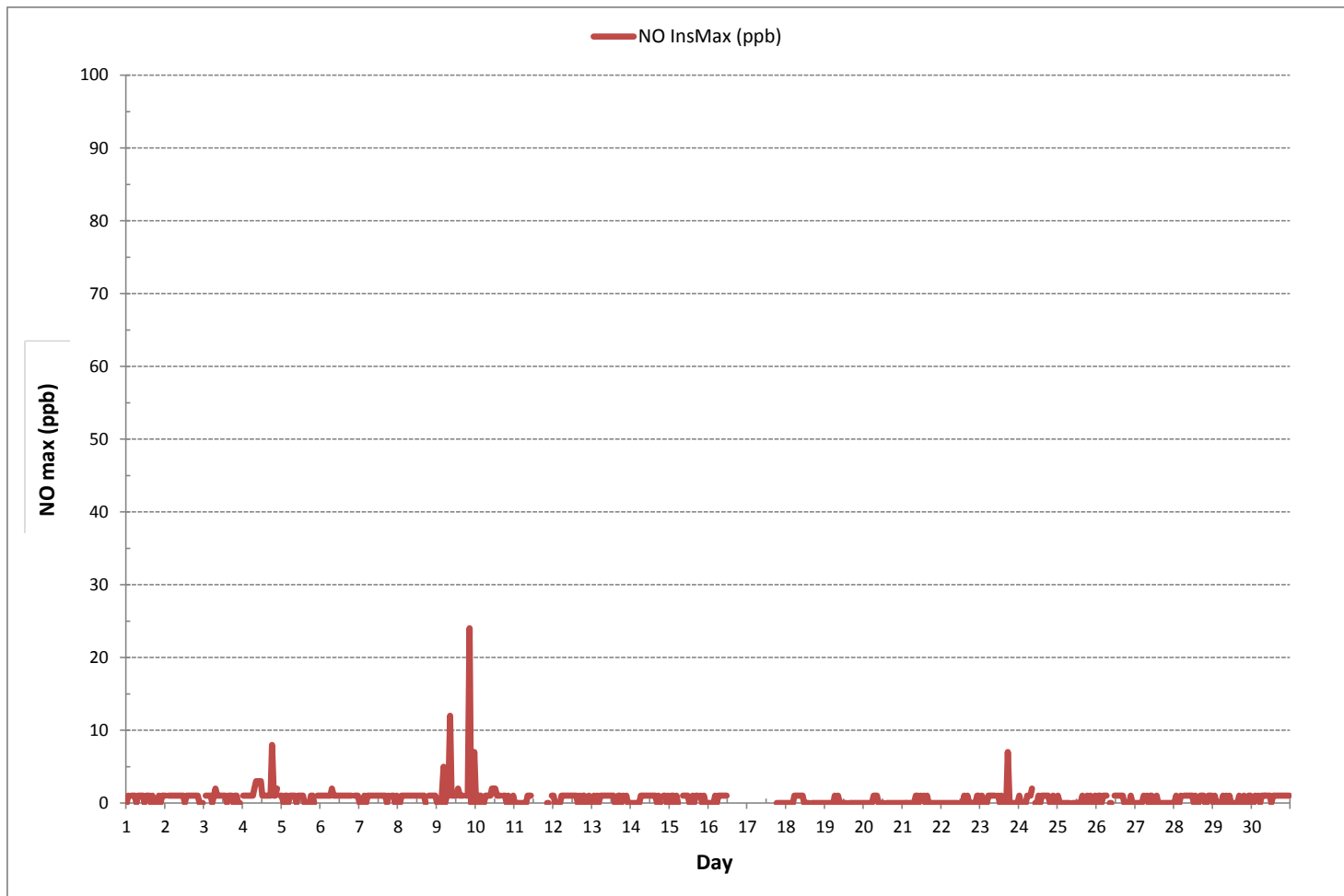
STATUS FLAG CODES

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:	354
MAXIMUM INSTANTANEOUS VALUE:	24 ppb @ HOUR 20 ON DAY 9
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	687 hrs
STANDARD DEVIATION:	1

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ 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 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	6	6	S	7	4	3	2	1	1	3	2	1	1	1	1	1	1	1	1	1	1	0	3	2	0	7	2	24	
2	1	S	4	5	9	8	7	5	2	1	1	1	1	1	1	1	4	5	6	6	5	1	1	3	1	9	3	24	
3	S	6	5	5	4	3	7	6	5	3	2	1	1	1	1	1	2	1	1	1	1	1	1	S	1	7	3	24	
4	4	3	4	4	6	10	10	7	7	7	6	5	3	1	2	2	2	1	9	1	0	4	S	3	0	10	4	24	
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	S	4	3	0	4	1	24
6	3	4	7	7	4	3	3	4	3	3	1	1	1	1	1	1	1	1	1	1	1	S	4	2	2	1	7	3	24
7	1	1	1	2	2	4	5	4	3	3	3	3	3	1	1	1	1	1	1	1	S	4	2	2	2	1	5	2	24
8	2	3	3	2	3	2	2	2	3	3	3	3	2	1	1	1	2	2	S	5	3	4	3	2	1	5	2	24	
9	2	2	3	3	25	3	6	4	22	4	4	5	6	7	5	4	4	S	6	3	30	3	3	21	2	30	8	24	
10	5	5	6	6	6	7	8	7	6	7	7	7	7	4	3	3	S	7	3	2	2	1	1	1	1	1	8	5	24
11	1	1	1	1	2	1	1	1	2	2	2	C	C	C	C	C	C	C	C	C	C	1	1	S	1	1	2	1	24
12	1	1	1	1	3	3	3	2	1	2	2	1	1	1	1	1	1	1	4	3	1	S	2	1	1	1	4	2	24
13	2	2	3	3	3	3	3	3	3	4	4	3	3	3	2	2	2	2	2	2	3	S	6	3	2	2	6	3	24
14	3	2	3	3	3	3	3	3	4	3	3	3	3	8	1	2	2	3	2	S	5	3	3	3	1	8	3	24	
15	3	3	2	3	3	4	S1	S1	6	6	6	6	4	3	3	3	3	3	S	7	4	3	3	3	2	7	4	22	
16	3	3	3	3	3	3	4	4	3	3	3	2	C1	C1	C1	C1	C1	C1	Y	Y	Y	Y	Y	Y	2	4	3	12	
17	Y	Y	Y	Y	Y	Y	Y	Y	Y	C1	C1	C1	C1	C1	C1	C1	C1	C1	2	1	1	1	1	1	1	2	1	6	
18	2	3	4	5	4	5	5	5	4	3	3	2	2	1	1	S	2	3	2	2	3	3	2	2	1	5	3	24	
19	2	2	2	2	2	3	4	3	3	4	3	3	2	2	S	3	2	2	2	3	2	2	2	2	2	2	4	2	24
20	2	2	2	2	2	2	4	3	3	3	2	1	1	S	1	2	2	2	1	1	2	2	2	2	1	4	2	24	
21	1	1	1	1	3	4	4	5	5	5	5	6	S	6	5	7	4	2	2	1	2	2	2	2	1	7	3	24	
22	2	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	24	
23	1	1	1	1	1	1	1	1	2	2	S	2	2	1	2	1	1	1	12	1	1	2	2	2	2	1	12	2	24
24	6	2	2	2	3	5	4	5	6	S	4	2	1	2	3	2	4	10	2	3	3	1	1	1	1	10	3	24	
25	1	1	2	1	1	1	2	2	S	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	1	2	1	24	
26	2	2	4	5	5	5	4	S	2	1	X	1	1	1	1	2	1	1	1	1	1	2	2	1	1	5	2	23	
27	1	1	2	2	2	2	S	2	1	1	2	2	2	1	2	1	2	1	1	1	1	1	2	2	1	2	2	24	
28	2	2	2	2	2	S	3	3	3	3	2	2	2	2	2	2	2	2	2	3	2	2	1	1	1	3	2	24	
29	2	2	1	1	S	2	2	2	2	1	2	2	2	1	1	1	2	2	1	1	1	1	3	2	1	3	2	24	
30	2	2	1	S	2	2	2	2	1	2	1	1	1	1	1	1	1	2	2	2	1	2	2	2	1	2	2	24	
HOURLY MAX	6	6	7	7	25	10	10	7	22	7	7	7	7	8	5	7	4	12	9	7	30	6	4	21					
HOURLY AVG	2	2	3	3	4	3	4	3	4	3	3	3	2	2	2	2	2	3	2	2	3	2	2	3					

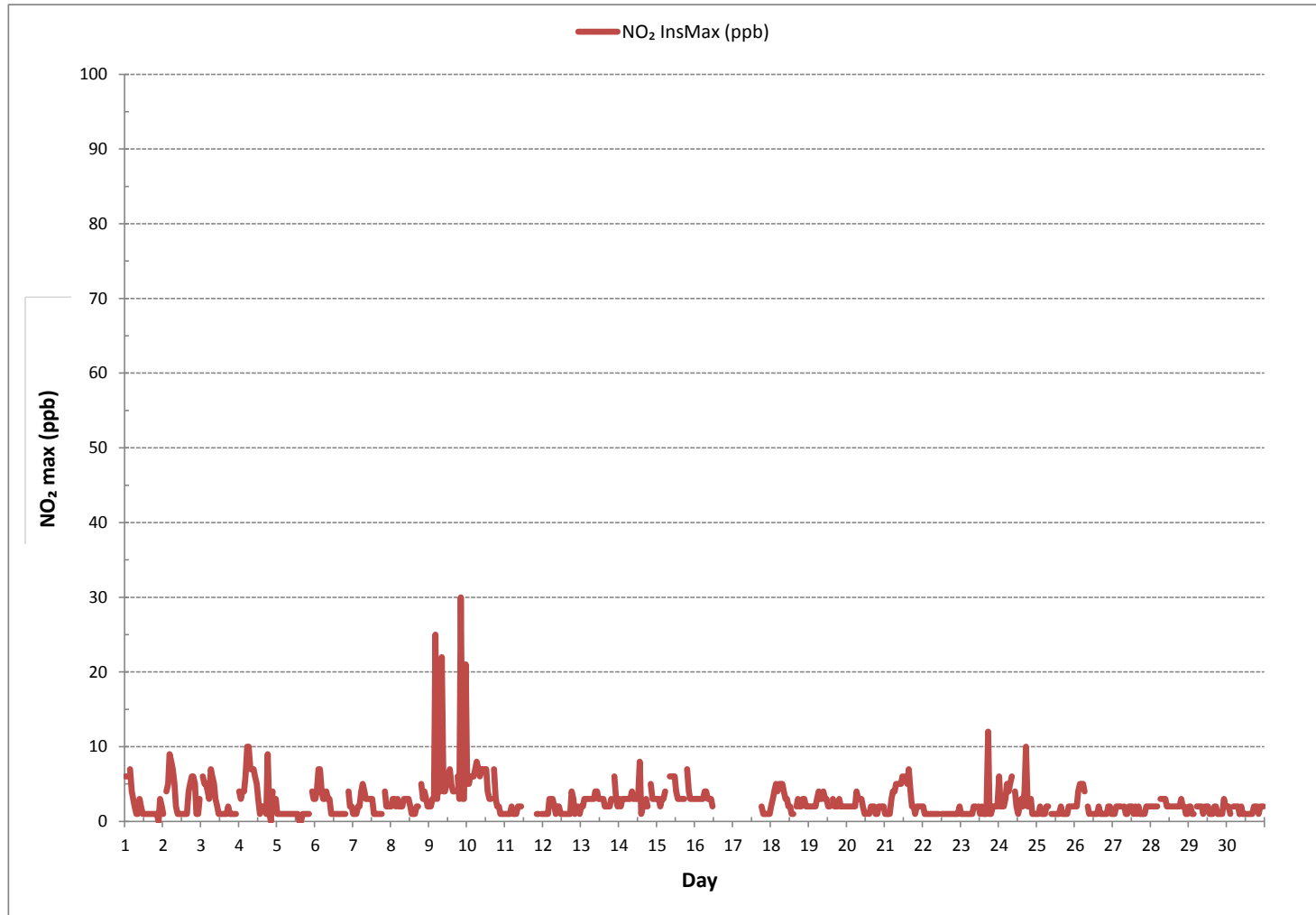
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	645
MAXIMUM INSTANTANEOUS VALUE:	30 ppb @ HOUR 20 ON DAY 9
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	687 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





OZONE Instantaneous Maximum (O₃ 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 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	38.1	38.9	S	43.5	44.7	45.8	46.2	46.3	45.9	45.8	46.7	47.7	48.0	48.5	49.4	48.7	48.6	48.5	48.2	48.2	48.0	47.8	47.2	46.9	38.1	49.4	46.4	24
2	47.1	S	47.6	47.1	39.6	36.3	39.8	46.3	47.2	47.1	48.2	49.9	51.3	52.5	53.3	54.7	55.7	56.1	54.6	53.4	52.2	48.2	46.3	44.6	36.3	56.1	48.7	24
3	S	41.0	39.8	39.9	41.5	42.3	39.9	38.9	42.9	44.6	47.3	47.6	48.3	48.7	49.7	49.9	50.1	50.7	50.4	49.8	49.3	48.5	48.1	S	38.9	50.7	45.9	24
4	48.1	47.2	43.1	42.8	42.2	35.3	36.0	38.4	39.2	40.5	41.8	43.5	46.3	46.9	45.9	46.3	47.6	47.9	47.3	46.7	46.7	46.0	S	43.9	35.3	48.1	43.9	24
5	42.6	41.9	41.7	40.7	39.7	38.8	37.3	36.2	36.0	35.6	35.4	35.2	35.7	35.1	35.3	37.0	37.0	36.0	33.9	31.9	31.3	S	30.0	29.6	29.6	42.6	36.3	24
6	29.2	27.3	26.0	26.9	27.8	28.1	28.0	28.0	30.8	32.2	32.7	33.4	36.2	38.4	40.1	40.6	41.5	41.5	41.9	42.0	S	40.2	39.7	39.3	26.0	42.0	34.4	24
7	39.4	39.4	38.8	38.4	38.0	36.6	34.8	39.3	39.9	41.8	42.4	43.6	46.0	48.4	48.6	48.9	46.8	48.5	46.8	S	45.9	45.6	44.7	44.6	34.8	48.9	42.9	24
8	45.4	44.7	43.5	42.8	42.2	42.4	43.0	43.7	45.4	46.5	47.1	47.7	48.0	48.6	49.4	49.9	51.1	52.6	S	53.8	53.8	53.2	53.0	53.0	42.2	53.8	47.9	24
9	52.2	52.0	51.8	51.2	49.8	48.5	47.7	47.1	47.5	50.6	50.8	51.7	52.8	55.5	59.9	59.6	58.1	S	54.4	54.3	56.5	58.2	61.1	61.2	47.1	61.2	53.6	24
10	59.4	58.6	56.7	55.7	53.8	50.7	50.6	52.7	53.0	50.2	46.7	49.0	51.6	51.1	51.2	53.1	S	51.9	50.0	47.2	47.2	47.6	47.7	47.3	46.7	59.4	51.4	24
11	46.2	48.2	49.9	50.6	50.3	49.9	49.5	49.3	48.7	48.9	49.4	49.5	49.1	49.3	Q	Q	52.2	52.1	52.2	51.2	51.1	51.2	S	50.7	46.2	52.2	50.0	24
12	50.2	49.1	48.6	48.1	48.0	46.3	47.1	49.3	50.3	51.6	C	C	C	C	58.5	60.3	60.8	60.6	59.8	58.9	S	58.9	57.7	46.3	60.8	53.6	24	
13	57.3	55.0	52.4	51.4	50.0	49.5	49.4	49.7	50.7	51.4	52.1	52.8	53.6	54.8	56.0	56.0	54.8	52.5	51.8	49.8	S	45.1	45.2	44.7	44.7	57.3	51.6	24
14	43.0	42.4	41.5	40.2	38.9	37.5	36.6	36.8	37.3	38.9	43.1	46.5	50.7	54.9	55.2	55.6	57.1	57.5	57.8	S	56.8	57.8	58.9	59.5	36.6	59.5	48.0	24
15	59.5	60.1	58.8	55.7	54.4	54.3	46.8	51.2	51.3	52.6	53.1	55.0	54.8	54.4	50.8	49.1	46.7	45.0	S	42.6	41.0	40.6	39.9	39.4	39.4	60.1	50.3	24
16	38.8	38.4	36.7	35.6	35.6	39.0	39.7	37.3	38.9	38.5	39.0	37.9	36.5	36.3	37.3	37.1	46.6	S	55.2	56.6	56.0	55.3	53.9	52.9	35.6	56.6	42.6	24
17	52.4	51.3	49.7	48.0	46.8	45.9	44.7	43.6	42.7	40.9	40.4	39.0	37.5	41.8	42.4	43.2	S	43.8	37.5	37.9	39.2	40.9	39.4	38.3	37.5	52.4	42.9	24
18	37.9	35.5	35.3	33.6	34.4	33.9	32.4	37.0	38.7	40.8	44.9	46.8	51.2	53.0	54.1	S	59.4	60.6	59.6	58.1	56.2	52.5	49.9	49.0	32.4	60.6	45.9	24
19	48.6	48.5	48.6	47.7	45.6	44.9	45.3	47.1	49.3	51.5	55.3	57.1	58.2	57.3	S	56.1	54.7	53.9	51.7	48.6	46.6	43.2	41.3	39.8	39.8	58.2	49.6	24
20	38.4	36.8	35.6	33.6	33.4	32.2	28.9	36.5	42.8	49.1	49.4	49.4	50.8	S	52.2	51.8	52.0	51.8	52.2	52.6	52.4	48.6	49.0	50.4	28.9	52.6	44.8	24
21	50.7	49.5	48.6	49.8	49.5	39.7	40.9	42.9	43.9	41.0	41.5	39.2	S	37.0	37.1	40.5	45.8	46.8	48.3	48.9	48.4	48.1	45.8	41.9	37.0	50.7	44.6	24
22	40.5	40.1	39.0	40.0	41.3	42.7	42.5	41.9	40.4	40.0	39.6	S	38.7	40.1	39.7	41.0	42.2	42.8	42.8	41.8	42.3	42.0	41.9	41.9	38.7	42.8	41.1	24
23	42.8	42.9	42.7	42.3	42.3	42.5	41.9	42.2	45.1	45.5	S	47.1	47.0	46.3	46.7	47.3	48.5	48.7	48.9	47.2	46.0	45.8	45.5	45.0	41.9	48.9	45.2	24
24	44.6	44.2	43.6	41.5	38.9	35.4	33.0	32.4	36.6	S	52.6	57.4	58.0	58.4	56.6	55.7	55.2	54.4	53.7	51.2	55.0	57.9	58.9	61.2	32.4	61.2	49.4	24
25	60.8	59.3	58.6	57.5	57.0	56.7	54.7	52.9	S	52.1	50.9	51.5	51.6	52.3	52.7	53.1	54.1	54.1	54.3	52.0	51.3	49.7	49.5	49.5	49.5	60.8	53.7	24
26	48.5	48.7	48.9	45.2	42.3	41.5	46.8	S	46.8	51.1	X	56.1	56.0	56.6	56.8	57.7	56.2	55.6	55.4	54.1	54.0	51.6	51.5	51.4	41.5	57.7	51.5	23
27	50.7	50.4	48.7	45.5	43.6	44.4	S	47.2	48.1	50.2	53.4	59.2	58.8	55.3	56.9	57.3	57.0	56.6	56.1	54.7	52.1	50.4	47.6	47.3	43.6	59.2	51.8	24
28	47.5	46.7	46.1	45.4	44.4	S	39.3	39.8	40.2	41.9	45.2	49.0	52.6	55.4	57.0	59.7	59.3	58.8	58.6	57.4	57.6	56.8	49.5	47.5	39.3	59.7	50.2	24
29	46.7	46.8	47.6	47.2	S	37.1	43.6	46.4	47.2	47.2	48.1	47.5	46.9	48.6	49.3	49.5	50.0	51.1	51.1	50.9	51.5	51.5	51.7	51.5	37.1	51.7	48.2	24
30	49.4	50.8	50.6	S	50.6	50.6	47.7	47.1	49.4	50.3	51.5	51.1	51.7	52.7	53.8	54.4	55.4	56.1	57.4	57.0	54.7	53.8	52.5	51.3	47.1	57.4	52.2	24
HOURLY MAX	60.8	60.1	58.8	57.5	57.0	56.7	54.7	52.9	53.0	52.6	55.3	59.2	58.8	58.4	59.9	59.7	60.3	60.8	60.6	59.8	58.9	58.2	61.1	61.2				
HOURLY AVG	46.8	46.1	45.5	44.4	43.7	42.4	41.9	43.0	44.0	45.5	46.2	47.9	48.9	49.2	49.5	50.4	51.6	51.3	51.2	50.0	50.1	49.2	48.2	47.6				

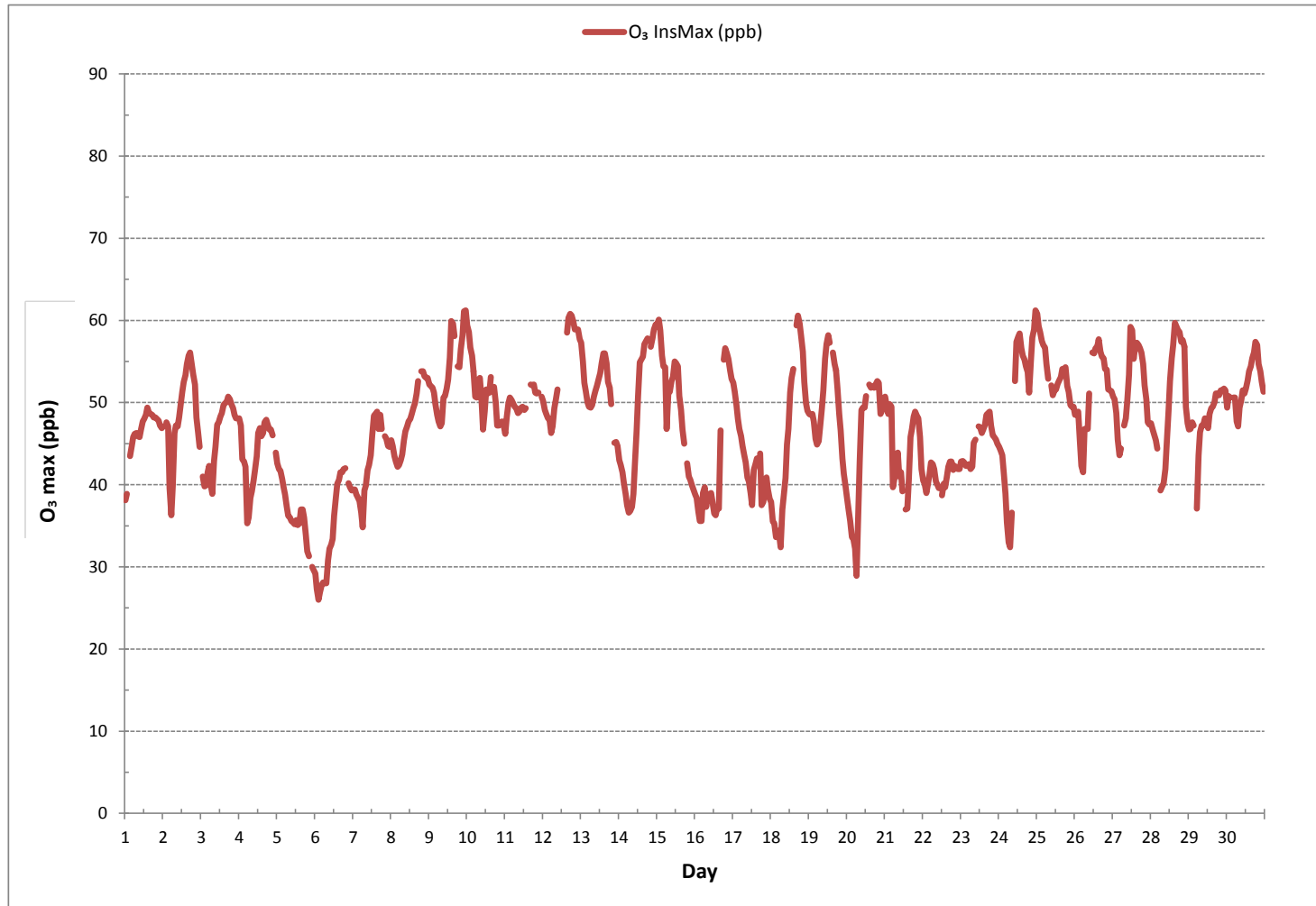
STATUS FLAG CODES

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:	681
MAXIMUM INSTANTANEOUS VALUE:	61.2 ppb @ HOUR 23 ON DAY 9
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	7.1
OPERATIONAL TIME:	719 hrs

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - April 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	23.3	25.2	24.6	24.6	18.9	21.7	21.7	22.6	18.9	12.3	17.4	19.6	25.5	29.5	23.8	25.7	27.0	17.9	15.7	13.0	18.0	18.8	28.0	29.0	12.3	29.5	21.8	24	
2	22.2	16.5	13.0	11.6	13.0	13.9	20.2	20.2	21.8	20.5	20.2	16.4	15.7	14.0	12.0	17.4	21.2	16.3	13.5	10.4	19.8	26.8	23.1	24.4	10.4	26.8	17.7	24	
3	17.9	15.2	14.3	15.4	15.0	20.0	7.7	11.3	10.7	12.6	17.2	17.3	13.5	15.7	19.2	17.4	15.0	20.1	19.0	14.5	15.2	12.6	16.3	19.0	7.7	20.1	15.5	24	
4	15.2	15.7	17.2	18.5	14.5	16.3	20.9	19.0	22.2	17.2	16.8	22.9	33.6	32.1	31.4	31.6	37.3	34.5	34.1	27.0	29.4	23.5	21.1	21.1	14.5	37.3	23.9	24	
5	21.1	21.3	15.8	21.2	23.0	21.2	18.4	42.1	41.9	41.7	39.5	43.9	42.6	42.3	41.0	41.9	34.2	32.0	25.7	20.8	19.7	13.6	14.6	16.5	13.6	43.9	29.0	24	
6	14.7	12.4	15.1	20.4	17.6	17.3	16.5	15.4	17.2	20.2	19.6	21.8	22.6	19.3	21.3	22.9	21.4	19.9	15.6	14.3	21.4	16.8	17.8	17.1	12.4	22.9	18.3	24	
7	18.5	19.8	16.1	17.8	15.2	16.0	17.6	19.1	26.5	26.4	33.8	32.1	33.7	34.0	31.9	40.9	37.6	32.6	27.1	25.7	20.7	27.5	20.2	19.8	15.2	40.9	25.4	24	
8	25.1	20.9	19.8	24.6	20.2	22.6	22.6	22.0	20.0	18.9	21.3	23.1	26.9	29.3	30.4	29.5	24.2	25.7	22.2	23.0	18.5	12.8	13.9	11.5	11.5	30.4	22.0	24	
9	13.1	10.6	9.1	11.3	8.6	8.6	9.1	10.0	9.3	10.1	11.2	16.5	21.0	26.2	24.0	21.6	16.8	18.4	19.8	13.7	15.2	20.3	19.2	15.0	8.6	26.2	14.9	24	
10	12.9	14.4	12.9	11.7	12.2	14.8	22.0	18.8	27.1	26.9	39.6	26.3	27.6	30.7	40.1	28.2	25.6	32.4	28.9	37.6	39.1	37.2	37.0	29.1	11.7	40.1	26.4	24	
11	36.7	30.2	39.8	32.3	29.7	33.6	32.2	25.7	25.7	22.9	26.8	22.9	20.8	20.8	22.3	27.6	26.7	25.2	18.0	13.4	6.9	10.6	9.3	15.5	6.9	39.8	24.0	24	
12	10.0	10.2	17.9	18.7	17.8	19.6	18.5	15.6	18.3	17.3	24.1	18.8	27.3	28.9	19.2	16.8	18.1	15.0	12.2	15.4	19.8	17.5	18.6	22.2	10.0	28.9	18.2	24	
13	15.9	20.5	22.0	21.8	22.2	19.4	22.0	26.2	30.2	31.2	28.6	32.2	31.7	36.7	40.0	40.4	39.1	36.7	37.6	36.5	27.7	34.1	33.2	32.1	15.9	40.4	29.9	24	
14	40.2	37.6	26.4	29.5	28.8	24.0	23.8	23.8	17.7	17.3	19.9	19.5	20.6	15.8	14.2	20.2	27.2	26.0	22.6	18.4	17.0	19.0	19.0	13.5	13.5	40.2	22.6	24	
15	20.3	16.8	30.2	24.3	20.1	15.3	18.1	16.6	20.1	15.9	19.5	22.8	40.5	39.0	51.6	53.6	47.0	44.0	27.3	26.2	23.4	26.7	16.6	17.5	15.3	53.6	27.2	24	
16	15.9	17.3	16.2	18.8	16.2	27.1	31.5	37.1	42.4	37.6	47.6	53.1	51.0	55.2	50.8	41.4	65.6	54.9	34.1	64.3	61.4	60.5	46.7	45.5	15.9	65.6	41.3	24	
17	42.2	46.1	32.3	34.7	33.0	28.6	30.3	24.9	22.3	19.0	20.1	23.6	12.2	25.6	28.2	33.1	30.5	41.4	45.0	45.0	35.4	50.7	22.5	24.0	12.2	50.7	31.3	24	
18	26.2	30.0	38.1	28.9	25.6	23.0	22.5	25.8	26.3	27.7	20.7	19.5	25.5	30.1	31.2	35.2	34.0	32.3	27.0	19.8	18.4	19.7	17.1	18.0	17.1	38.1	25.9	24	
19	20.3	26.0	25.8	20.1	18.3	19.4	19.7	20.1	25.4	22.4	20.8	26.0	36.2	34.9	34.6	28.9	29.6	27.6	17.5	17.0	20.0	24.5	26.7	27.6	17.0	36.2	24.6	24	
20	23.6	22.9	16.1	16.0	9.6	11.3	12.4	14.4	16.9	13.4	15.1	10.2	11.2	20.8	21.3	23.5	20.4	20.6	18.8	9.4	11.8	12.0	14.9	14.4	9.4	23.6	15.9	24	
21	17.3	17.9	20.1	22.5	20.1	22.9	26.6	28.0	36.3	41.5	37.4	20.9	22.0	19.2	19.2	26.8	32.3	31.0	30.1	30.1	33.0	31.0	33.9	31.0	17.3	41.5	27.1	24	
22	53.1	52.5	49.6	50.2	48.7	52.2	58.8	48.1	47.0	54.2	53.1	57.7	62.8	48.3	45.5	53.8	48.3	46.4	42.0	24.0	15.3	19.9	19.2	19.9	15.3	62.8	44.6	24	
23	21.5	17.7	15.7	19.2	19.6	17.5	19.9	19.7	18.7	24.4	23.1	48.3	53.7	49.1	43.9	43.2	44.0	39.2	29.0	13.8	13.5	15.3	17.7	19.7	13.5	53.7	27.0	24	
24	21.9	17.1	18.4	13.8	16.2	17.1	17.5	21.2	17.8	19.8	24.6	39.3	46.7	50.6	47.5	44.9	52.9	34.0	29.4	10.8	27.2	25.6	35.6	38.3	10.8	52.9	28.7	24	
25	31.3	28.4	29.3	25.3	21.4	22.7	22.0	21.5	20.2	34.6	39.2	43.6	43.1	42.3	37.3	45.6	35.7	33.7	32.4	26.5	18.1	17.3	24.5	27.8	17.3	45.6	30.2	24	
26	24.7	25.6	20.3	14.6	12.7	16.1	24.1	26.5	25.2	39.5	X	36.2	42.1	39.2	38.6	41.0	32.0	37.2	28.9	12.8	16.9	27.6	41.8	40.5	12.7	42.1	28.9	23	
27	27.8	28.2	21.2	24.9	30.3	34.1	38.5	42.7	51.9	53.2	43.6	39.3	40.6	46.9	42.1	44.7	42.7	42.8	36.2	30.7	38.1	44.4	35.0	39.9	21.2	53.2	38.3	24	
28	41.4	38.3	40.5	35.7	36.3	36.7	39.0	36.8	35.7	28.1	32.2	34.7	37.5	37.9	39.3	40.2	37.6	29.0	20.9	11.1	16.7	32.2	38.1	36.9	11.1	41.4	33.9	24	
29	44.8	50.3	33.3	41.6	45.3	45.2	52.4	59.0	62.4	61.4	55.7	52.6	52.2	48.7	47.4	38.2	33.4	31.7	22.5	10.9	2.1	7.8	7.0	8.1	2.1	62.4	38.1	24	
30	7.4	5.4	3.9	5.0	10.2	17.2	18.1	31.9	33.0	30.2	32.0	41.4	38.8	53.6	40.3	36.8	39.8	35.7	29.4	18.4	19.2	36.1	34.4	29.8	3.9	53.6	27.0	24	
HOURLY MAX	53.1	52.5	49.6	50.2	48.7	52.2	58.8	59.0	62.4	61.4	55.7	57.7	62.8	55.2	51.6	53.8	65.6	54.9	45.0	64.3	61.4	60.5	46.7	45.5					
HOURLY AVG	24.2	23.7	22.5	22.5	21.3	22.5	24.2	25.5	27.0	27.3	28.3	30.1	32.6	33.9	33.0	33.8	33.2	31.1	26.1	21.8	22.0	24.7	24.1	24.2					

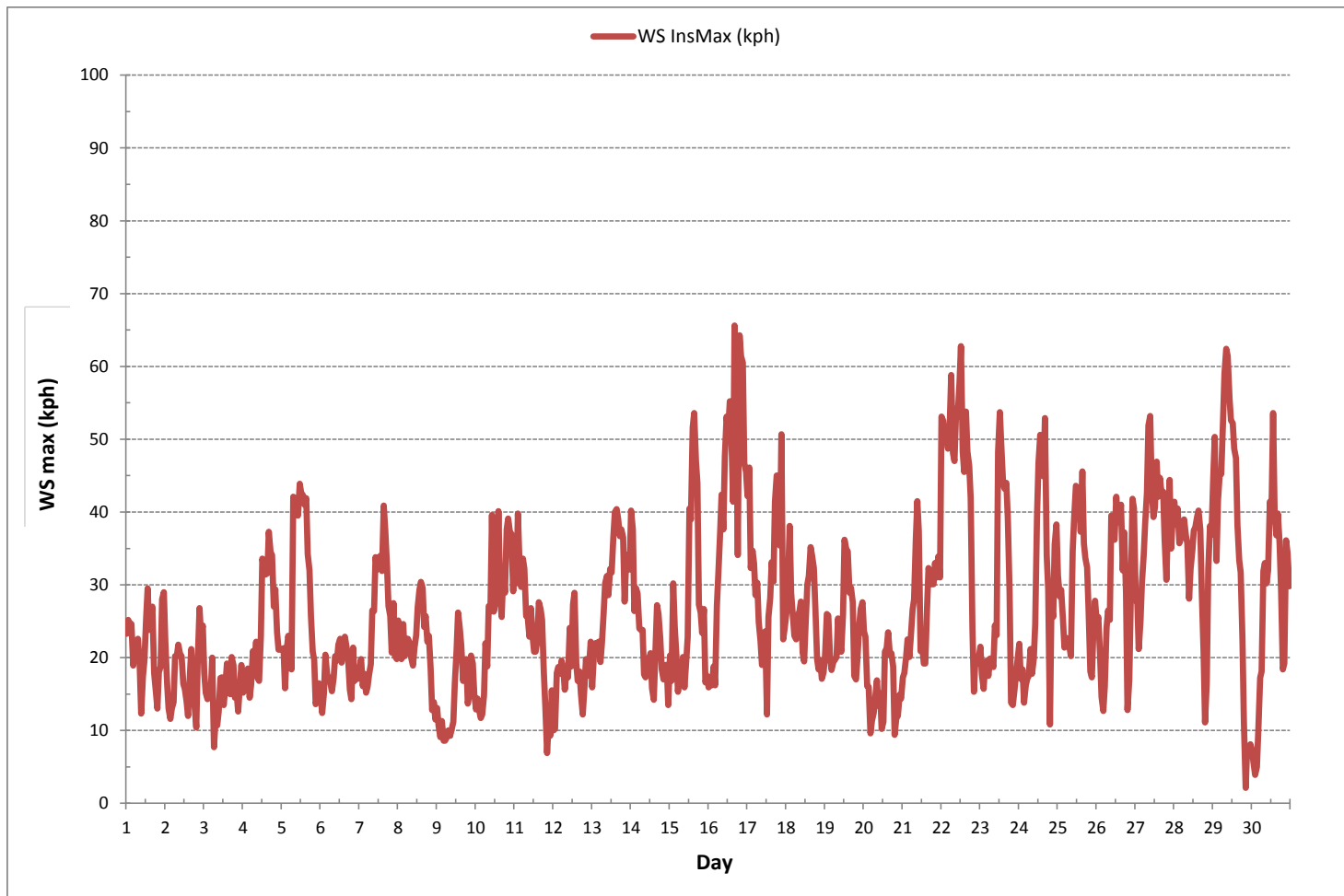
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	65.6	kph	@ HOUR	16	ON DAY	16	
OPERATIONAL TIME:						719	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	ST. LINA 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

28-05-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-04-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>22-May-18</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>22-May-18</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>25-May-18</u>
Level 3 Independent Data Review	<u>msalmbg</u>	Date <u>28-May-18</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
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.