

Alberta Environment and Parks (AEP)
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September 14, 2018

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

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of May 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 May 2018, with the exception of PM2.5, was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

Non-Conformance: A one-hour exceedance for PM2.5 was recorded this month: concentration of 94 µg/m³ on May 15 at hour 20:00. AEP reference number: 338254.

Data Logger Upgrade: A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832.

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".

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

JOB #: 2833-2018-05-1-C

May 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

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Attention: MIKE BISAGA

DATE: **August 10, 2018**

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SUMMARY

In May 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, with the exception of PM_{2.5}, 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.

Non-Conformance: A one-hour exceedance for PM_{2.5} was recorded this month: concentration of 94 µg/m³ on May 15 at hour 20:00. This was reported under AEP reference number: 338254.

Data Logger Upgrade: A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Downtime ranging from two to three hours were recorded across parameters due to activities surrounding the upgrade.

Power failure: A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime on all parameters.

SO₂: Nine hours of downtime were incurred between May 16 and May 25, due to a biased low drift in span response and the corrective actions performed to address it.

THC, O₃, NO_x/NO/NO₂: Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for May 31 was not properly executed. A valid zero-span check was manually triggered on June 1. One hour of downtime was incurred due to the failed execution.

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	2	22	7	2.4	WSW	0	1	98.3
TRS (ppb)	-	-	-	-	0	1	3	1	6.3	WSW	0	1	99.5
THC (ppm)	-	-	-	-	2.16	2.72	21	6	1.6	WSW	2.35	24	99.3
NO ₂ (ppb)	159	-	0	-	2	11	9	4	3.6	NNE	4	4	99.3
NO (ppb)	-	-	-	-	0	22	9	4	3.6	NNE	3	9	99.3
NO _x (ppb)	-	-	-	-	3	33	9	4	3.6	NNE	5	9	99.3
O ₃ (ppb)	82	-	0	-	35.5	64.2	23	18	1.5	SSE	45.1	28	99.3
PM _{2.5} (µg/m ³)	80	30	1	0	8	94	15	20	10.7	SE	26	25	99.2
RELATIVE HUMIDITY (%)	-	-	-	-	52	100	25	1	2.3	WSW	84	24	99.3
AMBIENT TEMPERATURE (°C)	-	-	-	-	14.2	29.5	28	15	8.4	WSW	21.5	28	99.2
VECTOR WS (kph)	-	-	-	-	1.2	21.2	13	13	-	NW	9.6	16	99.3
VECTOR WD (sec)	-	-	-	-	314 (NW)	-	-	-	-	-	-	-	99.3

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 above the 1-hour AAAQO of 80 µg/m³.

DATE	TIME (MST)	READING (ppb)	WS (kph)	WD (deg)	ESRD Reference #
May 15	20:00	94	10.7	SE	338254

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.

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	2
MONTHLY CONTINUOUS DATA SUMMARY REPORT	3
EXCEEDANCE SUMMARY REPORT	4
TABLE OF CONTENTS	5
1.0 Discussion	7
2.0 Project Personnel	11
3.0 Plant Monthly Required AMD Summary	11
4.0 Calculations and Results	11
5.0 Methods and Procedures	12
Appendix I	15
Continuous Monitoring Data Results	
Sulphur Dioxide	16
Total Reduced Sulphur	22
Total Hydrocarbon	28
Oxides of Nitrogen	34
Nitric Oxides	40
Nitrogen Dioxide	45
Ozone	51
Particulate Matter 2.5	57
Wind Speed	62
Wind Direction	67
Standard Deviation Wind Direction	70
Relative Humidity	73
Ambient Temperature	76

Appendix II	Equipment Calibration Results	79
	Sulphur Dioxide	80
	Total Reduced Sulphur	87
	Total Hydrocarbon	90
	Nitrogen Dioxide	93
	Ozone	97
	Particulate Matter	100
	Wind System	102
	Calibrators	104
	Calibration Gases	107
Appendix III	Maximum Instantaneous Data	112
Appendix IV	Report Certification Form	129
Appendix V	Data Validation Certification Form	131

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 98.3%, equivalent to 13 hours of downtime.
- The routine monthly calibration was performed on May 8.
- The analyzer spanned close to the lower acceptance limit on May 16. A repeat zero-span check conducted on the same day at hours 06:00-07:00 drifted further away from the mean. This demonstrated that the permeation tube was depleted, prompting an immediate site visit. Following a successful as-found response check, the permeation tube was replaced and the oven temperature was adjusted. Four hours of downtime were recorded due to the additional quality checks.
- The newly-installed permeation tube was allowed time to stabilize and the expected span value was updated on May 25, following a successful repeat calibration. Five hours of downtime were recorded due to this event.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 09:00 - 10:00, and ten instances of maximum instantaneous data at 09:00 - 18:00 were lost as a result of the activities surrounding this upgrade.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 99.5%, equivalent to 4 hours of downtime.
- The routine monthly calibration was performed on May 8.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 09:00 - 10:00, and ten instances of maximum instantaneous data at 09:00 - 18:00 were lost as a result of activities surrounding this upgrade.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- The routine monthly calibration was performed on May 9. The span gas cylinder was replaced during this site visit.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 09:00 - 10:00, and ten instances of maximum instantaneous data at 09:00 - 18:00 were lost as a result of activities surrounding this upgrade.
- Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 13:00 on May 31 was not properly executed. A valid zero-span check was manually triggered at hour 09:00 on June 1. One hour of downtime was incurred due to the failed execution.
- Baseline corrections for May 31 were performed incrementally using daily zero results for May 30 and June 1, which were both valid.

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

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- The routine monthly calibration was performed on May 8.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 09:00 - 10:00, and ten instances of maximum instantaneous data at 09:00 - 18:00 were lost as a result of activities surrounding this upgrade.
- Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 13:00 on May 31 was not properly executed. A valid zero-span check was manually triggered at hour 09:00 on June 1. One hour of downtime was incurred due to the failed execution.
- Baseline corrections for May 31 were performed incrementally using daily zero results for May 30 and June 1, which were both valid.

OZONE (O₃)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- The routine monthly calibration was performed on May 9.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 09:00 - 10:00, and ten instances of maximum instantaneous data at 09:00 - 18:00 were lost as a result of activities surrounding this upgrade.
- Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 13:00 on May 31 was not properly executed. A valid zero-span check was manually triggered at hour 09:00 on June 1. One hour of downtime was incurred due to the failed execution.
- Baseline corrections for May 31 were performed incrementally using daily zero results for May 30 and June 1, which were both valid.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 99.2%, equivalent to 6 hours of downtime.
- The quarterly audit was performed on May 11.
- A one-hour exceedance was recorded this month: concentration of 94 µg/m³ on May 15 at hour 20:00. This was reported under AEP reference number: 338254.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Four hours of data were lost at hours 09:00 - 10:00 on May 30 and 03:00 - 04:00 on May 31 as a result of activities surrounding this upgrade.

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

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 09:00 - 11:00 on May 30, and twelve instances of maximum instantaneous data at 09:00 - 19:00 on May 30 and 12:00 on May 31, were lost as a result of activities surrounding this upgrade.
- 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 99.3%, equivalent to 5 hours of downtime.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data were lost at hours 09:00 - 11:00 as a result of activities surrounding this upgrade.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 99.2%, equivalent to 6 hours of downtime.
- A power failure occurred on May 23 at hours 05:00 - 06:00, resulting in two hours of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Four hours of data were lost at hours 09:00 - 12:00 as a result of activities surrounding this upgrade.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technicians were Alexander Yakupov and Christopher Wesson.

3.0 Plant Monthly Required AMD Summary

All data collected this month, with the exception of WS/WD/STDWD and PM_{2.5}, was compliant with the requirements outlined in the AMD, 2016.

A one-hour exceedance for PM_{2.5} was recorded this month: concentration of 94 µg/m³ on May 15 at hour 20:00. This was reported under AEP reference number: 338254.

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, except for WS/WD/STDWD, follow the methods described in the AMD, 2016.

WS/WD/STDWD:

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings for WS and WD, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. The calm threshold was set at 1.8 kph for the STDWD channel, therefore the population of rejected instant data will be larger. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected between May 30, hour 12:00 and May 31, hour 23:00 was re-calculated from the available 1-minute vector averages. To incorporate the highest number of instant data, minute data that contained less than 45 seconds were averaged based on the remaining sample set and not excluded when calculating hourly averages. This data treatment had a minor impact on data; applicable hours are outlined in the table below. Overall, in comparison with the original hourly averages, the change was insignificant. On July 31, the DAS vendor modified the datalogger configuration, in order to optimize the collection of wind data. The criteria of the calm threshold was eased and hourly data is calculated based on 1-minute vector averages.

Summary of Hourly Wind Data Revised After Data Treatment			
Date	Time	Date	Time
30/05/2018	12:00	31/05/2018	03:00
30/05/2018	15:00	31/05/2018	04:00
30/05/2018	17:00	31/05/2018	05:00
30/05/2018	18:00	31/05/2018	06:00
30/05/2018	19:00	31/05/2018	07:00
30/05/2018	20:00	31/05/2018	08:00
30/05/2018	21:00	31/05/2018	15:00
30/05/2018	22:00	31/05/2018	16:00
30/05/2018	23:00	31/05/2018	20:00
31/05/2018	00:00	31/05/2018	21:00
31/05/2018	01:00	31/05/2018	22:00
31/05/2018	02:00		

5.0 Methods and Procedures

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

Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient 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 51i FID Analyzer
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 and Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

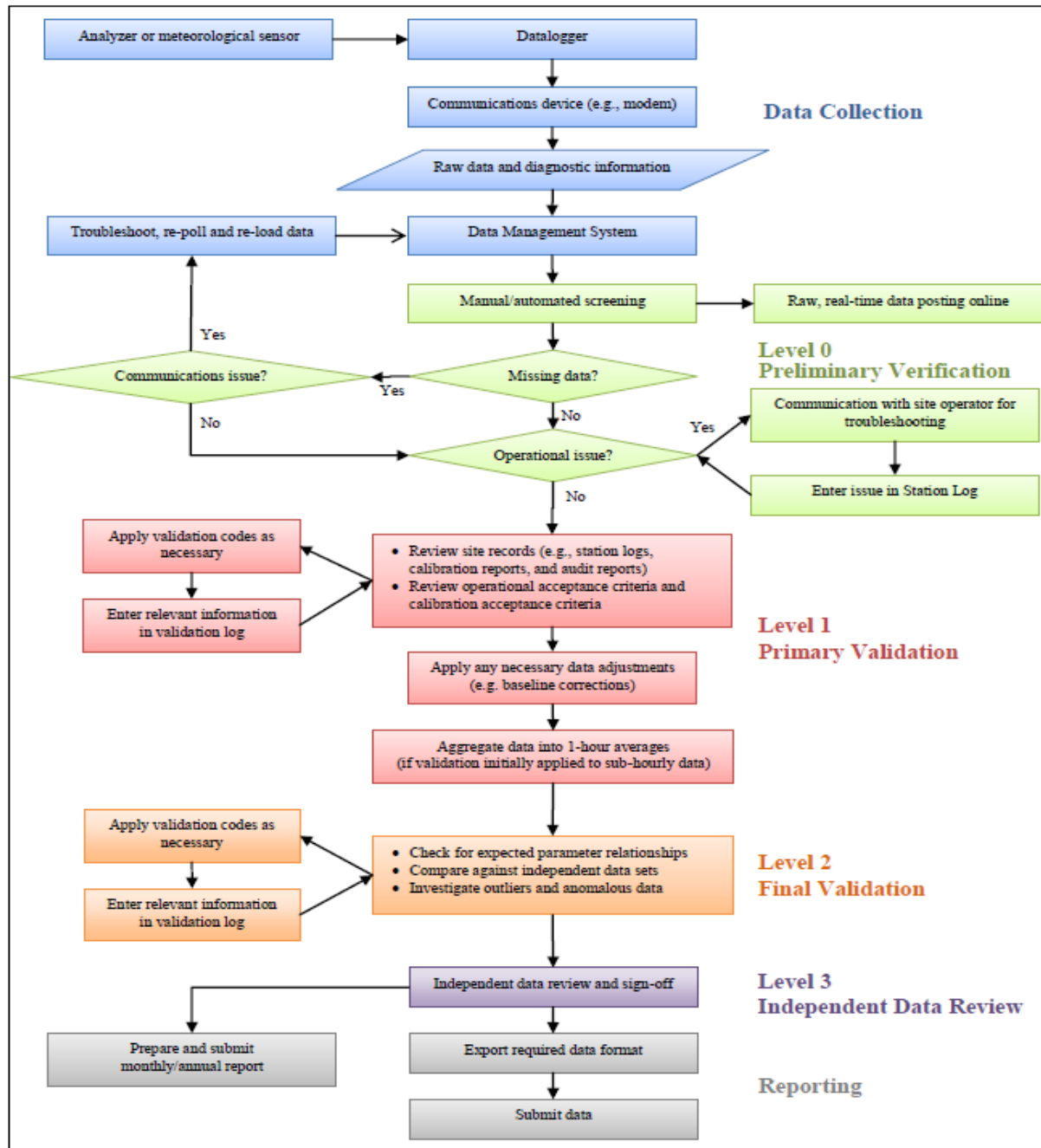
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (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	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	S	0	0	0	0	1	0	24			
2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24			
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	0	0	0	1	0	24				
4	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				
5	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24				
6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24				
7	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				
8	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
9	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				
10	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				
11	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				
12	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				
13	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24				
14	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				
15	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				
16	0	0	0	0	0	S	S1	S1	0	0	0	0	0	0	0	0	0	C1	C1	0	0	0	0	0	0	0	0	20				
17	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				
18	0	0	0	S	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24				
19	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				
20	0	S	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24				
21	S	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	24				
22	0	0	0	0	0	0	0	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	2	0	24				
23	0	0	0	0	0	P	P	0	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	22				
24	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				
25	0	0	0	0	0	0	0	0	C1	C1	C1	C1	C1	1	0	0	0	0	0	S	0	0	0	0	0	1	0	19				
26	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				
27	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				
28	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	1	0	24				
29	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24				
30	0	0	0	0	0	0	0	0	0	X	X	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	22				
31	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				
HOURLY MAX	0	0	0	0	1	0	0	2	2	1	1	1	1	1	1	0	0	1	1	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								

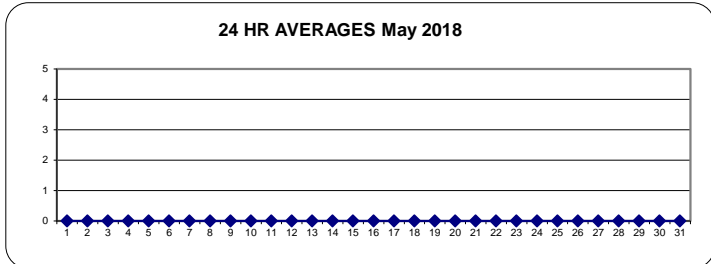
STATUS FLAG CODES

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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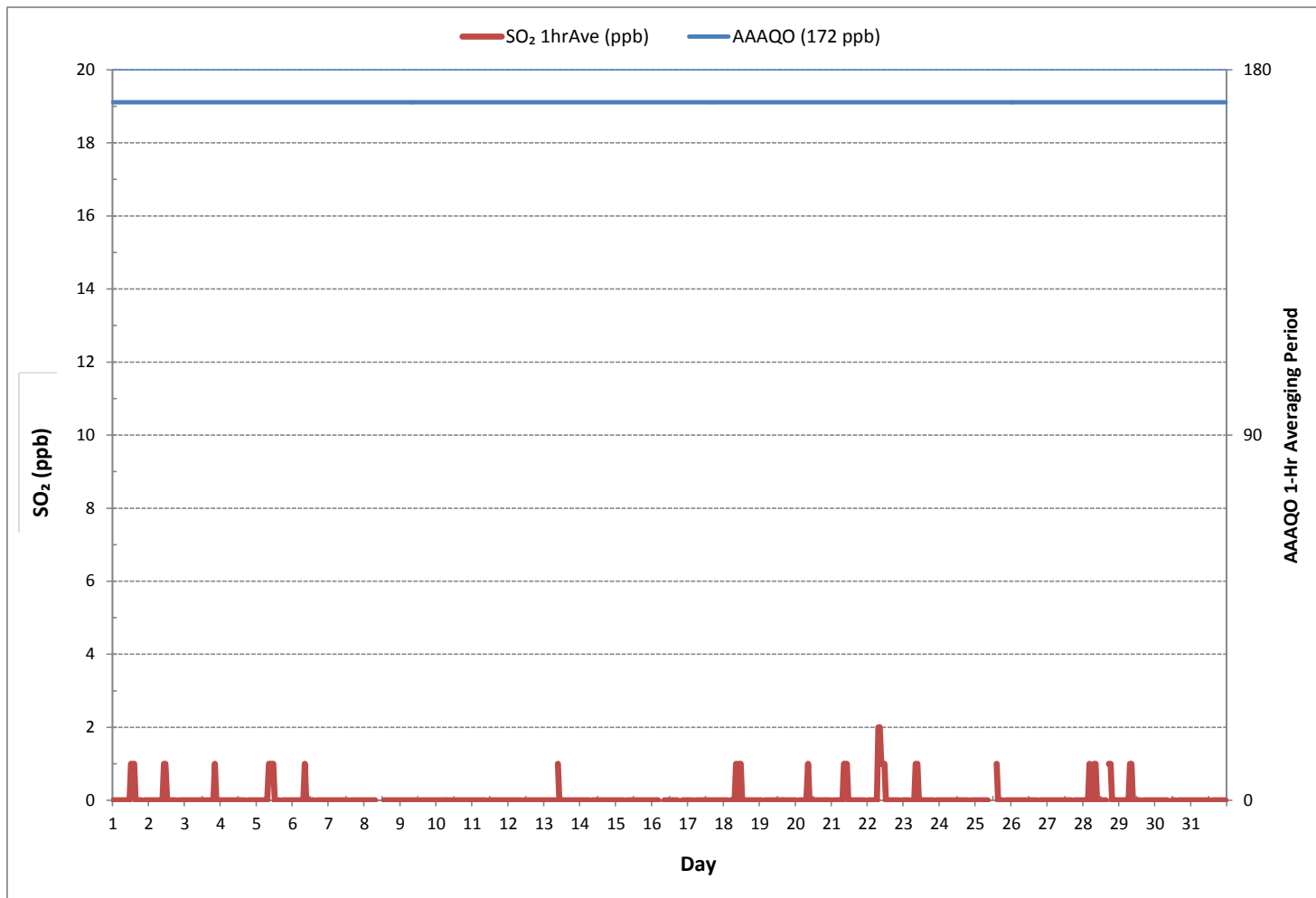
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	34
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	2 ppb @ HOUR ON DAY 22
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	731 hrs
AMD OPERATION UPTIME:	98.3 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)









Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO₂ [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

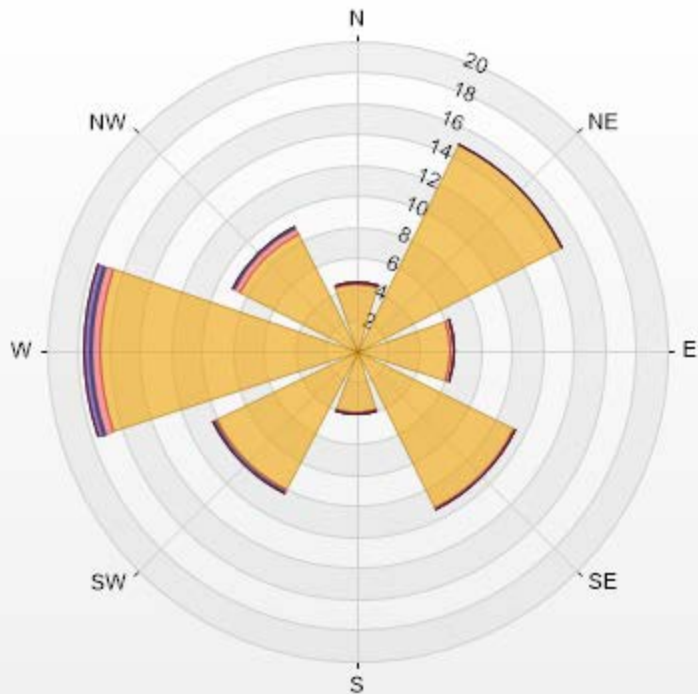
Calm: 21.76%

Calm Avg: 0.11 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
N	4.3	0.1	0.0	0.0	0.0	0.0	4.5
NE	14.8	0.0	0.0	0.0	0.0	0.0	14.8
E	6.1	0.3	0.0	0.0	0.0	0.0	6.3
SE	11.4	0.1	0.0	0.0	0.0	0.0	11.5
S	4.0	0.1	0.0	0.0	0.0	0.0	4.2
SW	10.1	0.1	0.1	0.0	0.0	0.0	10.4
W	16.6	0.6	0.1	0.3	0.0	0.0	17.6
NW	8.5	0.3	0.1	0.0	0.0	0.0	8.9
Summary	75.8	1.7	0.4	0.3	0.0	0.0	78.2

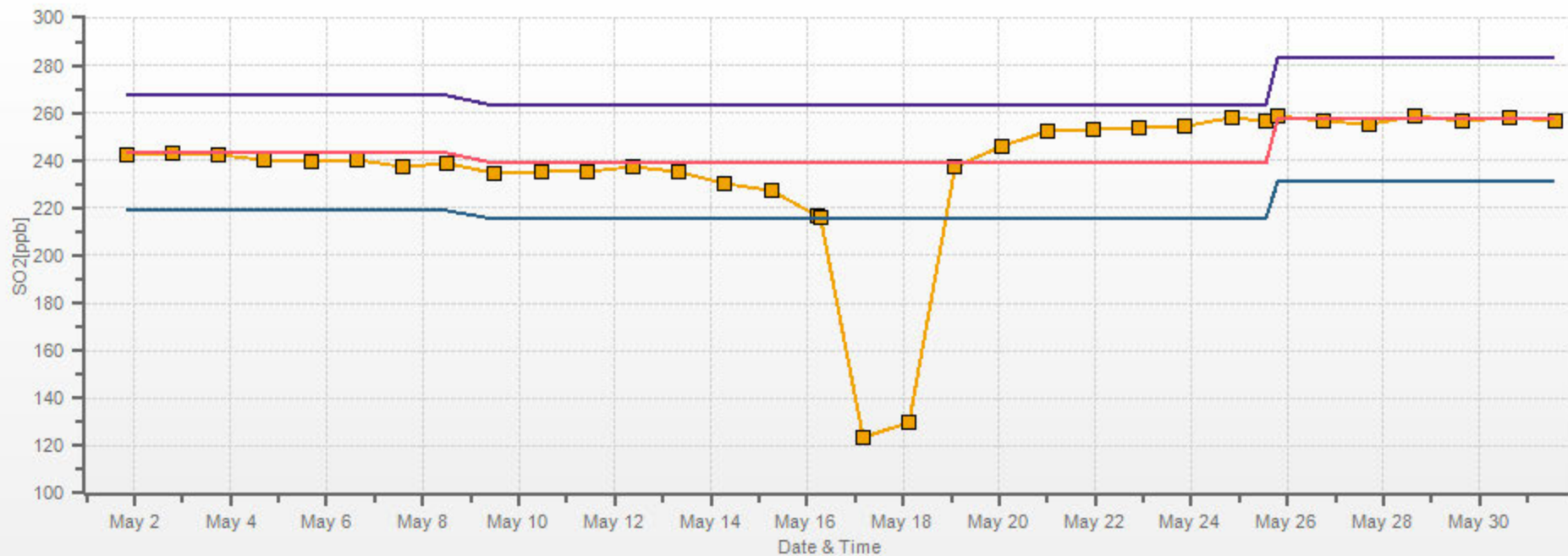
% Icon	Classes (ppb)	76		0.0-0.6	2		0.6-1.2	0		1.2-1.8	0		1.8-2.4	0		2.4-3.0	0		>3.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO₂[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.76% Calm Poll Avg: 0.11[ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL REDUCED SULPHUR



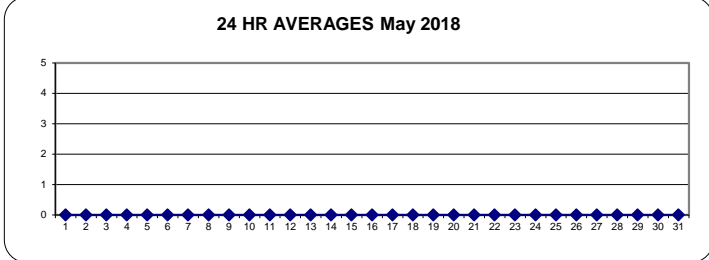
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

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

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

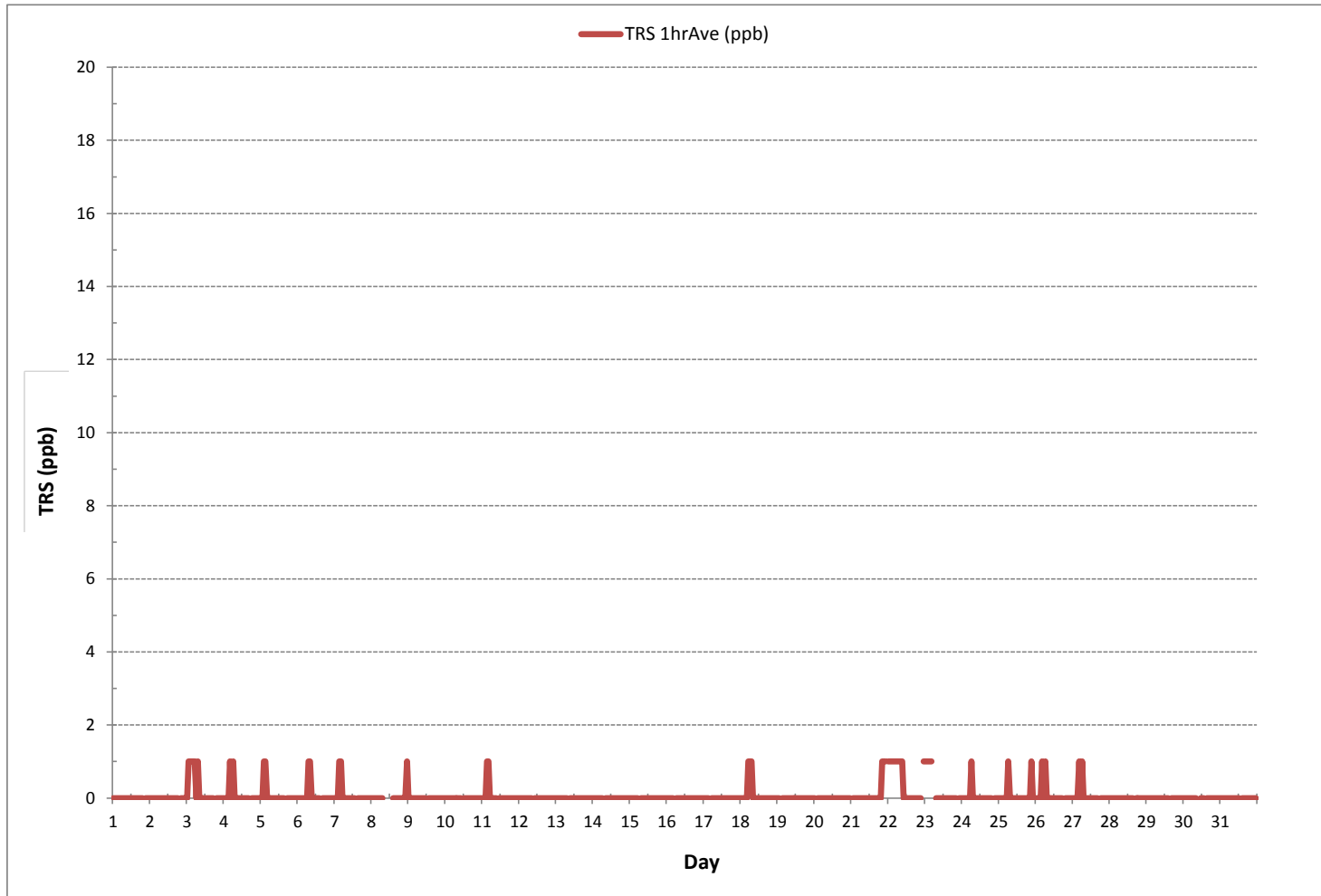
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	46				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	1	ppb @ HOUR	1	ON DAY 3	
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	740	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	99.5	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



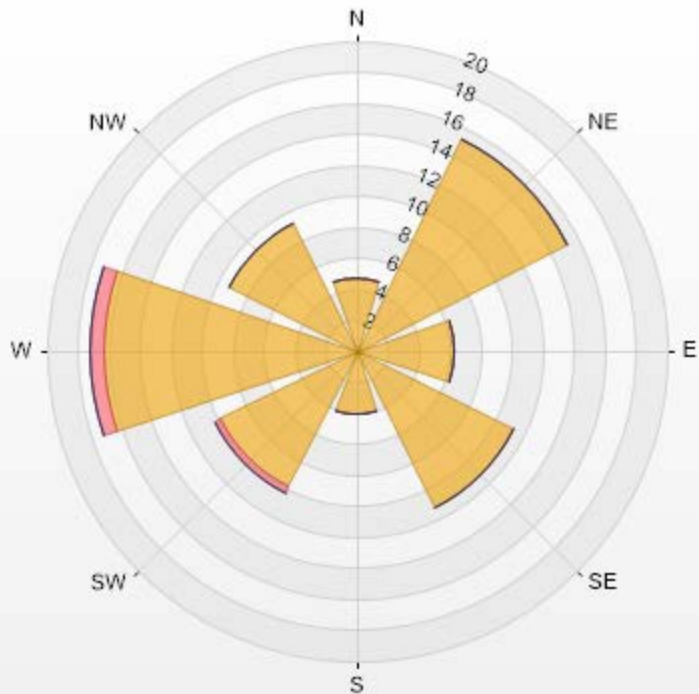
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.51% Calm Avg: 0.34 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	4.7	0.0	0.0	0.0	4.7
NE	15.2	0.0	0.0	0.0	15.2
E	6.3	0.0	0.0	0.0	6.3
SE	11.4	0.0	0.0	0.0	11.4
S	4.1	0.0	0.0	0.0	4.1
SW	9.8	0.4	0.0	0.0	10.3
W	16.4	0.9	0.0	0.0	17.2
NW	9.3	0.0	0.0	0.0	9.3
Summary	77.2	1.3	0.0	0.0	78.5

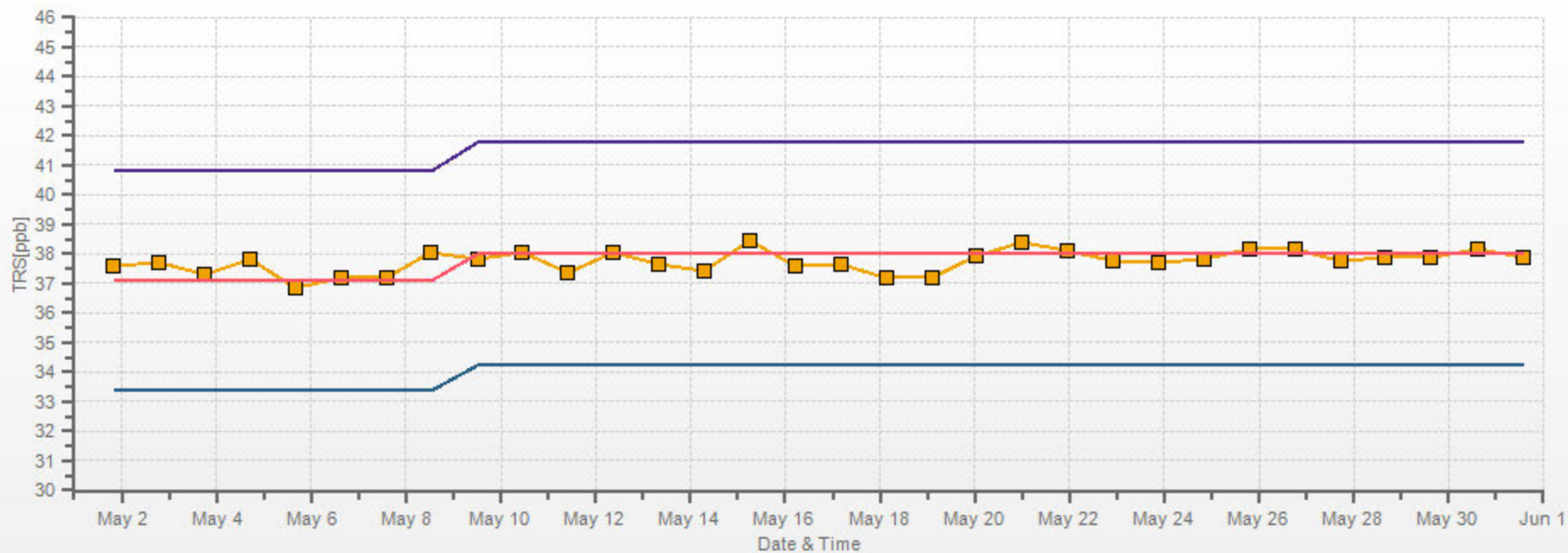
% Icon Classes (ppb) 77 0.0-0.7 1 0.7-1.3 0 1.3-2.0 0 >2.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.51% Calm Poll Avg: 0.34[ppb]



TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/05 Type: Span

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



TOTAL HYDROCARBON



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

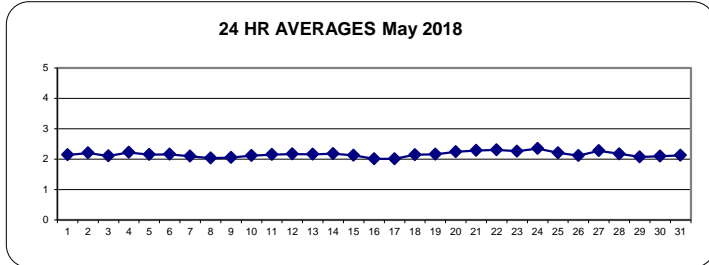
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.20	2.33	2.28	2.22	2.29	2.28	2.25	2.27	2.21	2.19	2.04	2.02	2.01	2.01	2.00	2.01	2.00	2.00	2.00	2.04	S	2.17	2.18	2.21	2.00	2.33	2.14	24	
2	2.33	2.37	2.42	2.58	2.55	2.52	2.51	2.42	2.20	2.09	2.08	2.06	2.07	2.06	2.04	2.06	2.05	2.02	2.04	S	2.00	2.04	2.07	2.12	2.00	2.58	2.20	24	
3	2.12	2.14	2.15	2.19	2.24	2.16	2.11	2.11	2.04	2.08	2.16	2.05	2.03	2.02	2.03	2.04	2.03	2.00	S	2.05	2.05	2.18	2.26	2.30	2.00	2.30	2.11	24	
4	2.25	2.25	2.31	2.48	2.54	2.56	2.66	2.63	2.30	2.07	2.03	2.02	2.07	2.06	2.09	2.10	2.07	S	2.10	2.10	2.09	2.17	2.12	2.10	2.02	2.66	2.22	24	
5	2.15	2.36	2.55	2.33	2.32	2.29	2.23	2.16	2.06	2.04	2.07	2.05	2.06	2.03	2.02	2.05	S	2.02	2.02	2.04	2.07	2.04	2.27	2.23	2.02	2.55	2.15	24	
6	2.31	2.27	2.31	2.34	2.31	2.30	2.27	2.38	2.15	2.05	2.04	2.01	2.03	2.02	2.04	S	2.01	2.00	2.01	2.05	2.12	2.23	2.22	2.29	2.00	2.38	2.16	24	
7	2.33	2.48	2.49	2.52	2.24	2.03	1.98	1.94	1.96	2.01	2.02	2.02	2.04	2.06	S	2.01	2.04	2.06	2.05	2.01	1.99	2.00	1.96	1.98	1.94	2.52	2.10	24	
8	1.98	1.96	1.99	1.99	1.99	1.98	2.01	2.05	2.07	2.08	2.13	2.15	2.11	S	2.07	2.05	2.02	2.02	2.01	2.03	2.01	2.00	2.07	2.08	1.96	2.15	2.04	24	
9	2.07	2.02	2.01	2.06	2.08	2.06	2.08	2.08	C	C	C	C	2.05	2.05	2.01	2.01	2.03	2.02	2.00	2.04	2.15	2.15	2.05	2.07	2.00	2.15	2.05	24	
10	2.07	2.10	2.09	2.14	2.17	2.20	2.20	2.20	2.17	2.15	2.16	S	2.12	2.09	2.09	2.06	2.08	2.07	2.05	2.06	2.07	2.14	2.11	2.14	2.05	2.20	2.12	24	
11	2.18	2.23	2.27	2.33	2.34	2.38	2.31	2.19	2.20	2.09	S	2.10	2.07	2.07	2.06	2.10	2.06	2.09	2.03	2.05	2.09	2.04	2.04	2.18	2.03	2.38	2.15	24	
12	2.23	2.37	2.41	2.34	2.49	2.46	2.26	2.14	2.10	S	2.14	2.14	2.12	2.09	2.07	2.07	2.07	2.06	2.07	2.03	2.05	2.05	2.08	2.13	2.03	2.49	2.17	24	
13	2.14	2.21	2.29	2.35	2.30	2.33	2.26	2.18	S	2.09	2.13	2.12	2.09	2.09	2.07	2.07	2.07	2.08	2.04	2.04	2.06	2.10	2.20	2.27	2.04	2.36	2.16	24	
14	2.31	2.33	2.31	2.33	2.31	2.35	2.21	S	2.15	2.14	2.13	2.12	2.09	2.09	2.07	2.05	2.10	2.07	2.11	2.17	2.26	2.22	2.11	2.18	2.05	2.35	2.18	24	
15	2.31	2.37	2.29	2.34	2.49	2.52	S	2.18	2.11	2.07	2.01	2.02	1.99	2.00	2.01	2.02	2.01	2.01	2.03	2.04	2.08	2.04	2.02	2.01	1.99	2.52	2.13	24	
16	2.03	2.13	2.01	2.02	2.09	S	2.03	1.98	1.98	2.02	2.05	2.00	2.01	2.02	2.00	1.99	1.95	1.97	2.06	2.06	2.01	1.96	1.97	1.96	1.95	2.13	2.01	24	
17	1.97	1.96	1.99	2.02	S	2.03	2.00	1.99	1.98	1.94	2.05	1.98	1.99	1.99	2.01	1.98	1.98	1.99	2.00	2.01	2.03	2.08	2.17	2.23	1.94	2.23	2.01	24	
18	2.25	2.26	2.27	S	2.47	2.44	2.30	2.17	2.07	2.07	2.08	2.10	2.06	2.05	2.06	2.05	2.05	2.01	2.05	2.03	2.04	2.06	2.15	2.22	2.01	2.47	2.14	24	
19	2.27	2.28	S	2.37	2.42	2.50	2.37	2.33	2.28	2.13	2.11	2.09	2.06	2.04	2.02	2.05	2.03	2.03	2.01	2.02	2.07	2.04	2.09	2.08	2.01	2.50	2.16	24	
20	2.13	S	2.38	2.37	2.42	2.45	2.31	2.30	2.31	2.17	2.18	2.17	2.18	2.15	2.14	2.17	2.15	2.19	2.19	2.17	2.20	2.36	2.32	2.16	2.13	2.45	2.24	24	
21	S	2.29	2.36	2.40	2.45	2.61	2.72	2.32	2.25	2.35	2.30	2.19	2.26	2.21	2.19	2.16	2.17	2.16	2.17	2.14	2.13	2.19	2.30	S	2.13	2.72	2.29	24	
22	2.30	2.32	2.43	2.52	2.55	2.50	2.67	2.60	2.52	2.36	2.30	2.21	2.16	2.12	2.12	2.11	2.10	2.09	2.09	2.13	2.20	2.24	S	2.38	2.09	2.67	2.31	24	
23	2.45	2.50	2.62	2.57	2.58	P	P	2.39	2.34	2.26	2.23	2.13	2.11	2.12	2.11	2.10	2.07	2.08	2.09	2.14	2.17	S	2.13	2.26	2.07	2.62	2.26	22	
24	2.37	2.39	2.39	2.34	2.31	2.40	2.42	2.40	2.42	2.42	2.46	2.35	2.42	2.35	2.40	2.33	2.28	2.29	2.24	2.25	S	2.21	2.26	2.26	2.21	2.46	2.35	24	
25	2.15	2.25	2.33	2.35	2.44	2.41	2.34	2.29	2.21	2.22	2.15	2.20	2.14	2.07	2.10	2.11	2.07	2.07	S	2.12	2.21	2.27	2.21	2.07	2.44	2.21	24		
26	2.18	2.15	2.20	2.23	2.34	2.23	2.09	2.05	2.06	2.04	2.05	2.03	2.06	2.03	2.07	2.07	2.06	2.06	S	2.07	2.12	2.20	2.15	2.20	2.03	2.34	2.12	24	
27	2.24	2.34	2.37	2.52	2.63	2.53	2.35	2.33	2.21	2.21	2.20	2.20	2.16	2.15	2.13	2.15	2.16	S	2.13	2.19	2.26	2.18	2.34	2.40	2.13	2.63	2.28	24	
28	2.41	2.31	2.35	2.43	2.42	2.36	2.36	2.19	2.15	2.15	2.13	2.19	2.11	2.10	2.11	2.08	S	2.02	2.06	2.05	2.02	1.99	2.02	2.01	1.99	2.43	2.17	24	
29	2.01	1.99	2.00	2.03	2.05	2.17	2.13	2.14	2.10	2.10	2.09	2.10	2.08	2.08	2.10	S	2.08	2.11	2.10	2.10	2.09	2.05	2.01	2.03	1.99	2.17	2.08	24	
30	2.02	2.03	2.06	2.08	2.07	2.09	2.14	2.21	2.17	X	X	2.12	2.02	2.03	S	2.06	2.08	2.08	2.09	2.10	2.12	2.17	2.19	2.17	2.02	2.21	2.10	22	
31	2.16	2.18	2.22	2.17	2.21	2.24	2.17	2.16	2.10	2.09	2.08	2.08	2.08	X	2.08	2.07	2.08	2.05	2.06	2.08	2.07	2.09	2.14	2.16	2.05	2.24	2.12	23	
HOURLY MAX	2.45	2.50	2.62	2.58	2.63	2.61	2.72	2.63	2.52	2.42	2.46	2.35	2.42	2.35	2.40	2.33	2.28	2.29	2.24	2.25	2.26	2.36	2.34	2.40					
HOURLY AVG	2.20	2.24	2.27	2.30	2.34	2.32	2.27	2.23	2.17	2.13	2.13	2.10	2.09	2.08	2.08	2.08	2.07	2.06	2.07	2.08	2.09	2.12	2.14	2.17					

STATUS FLAG CODES

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

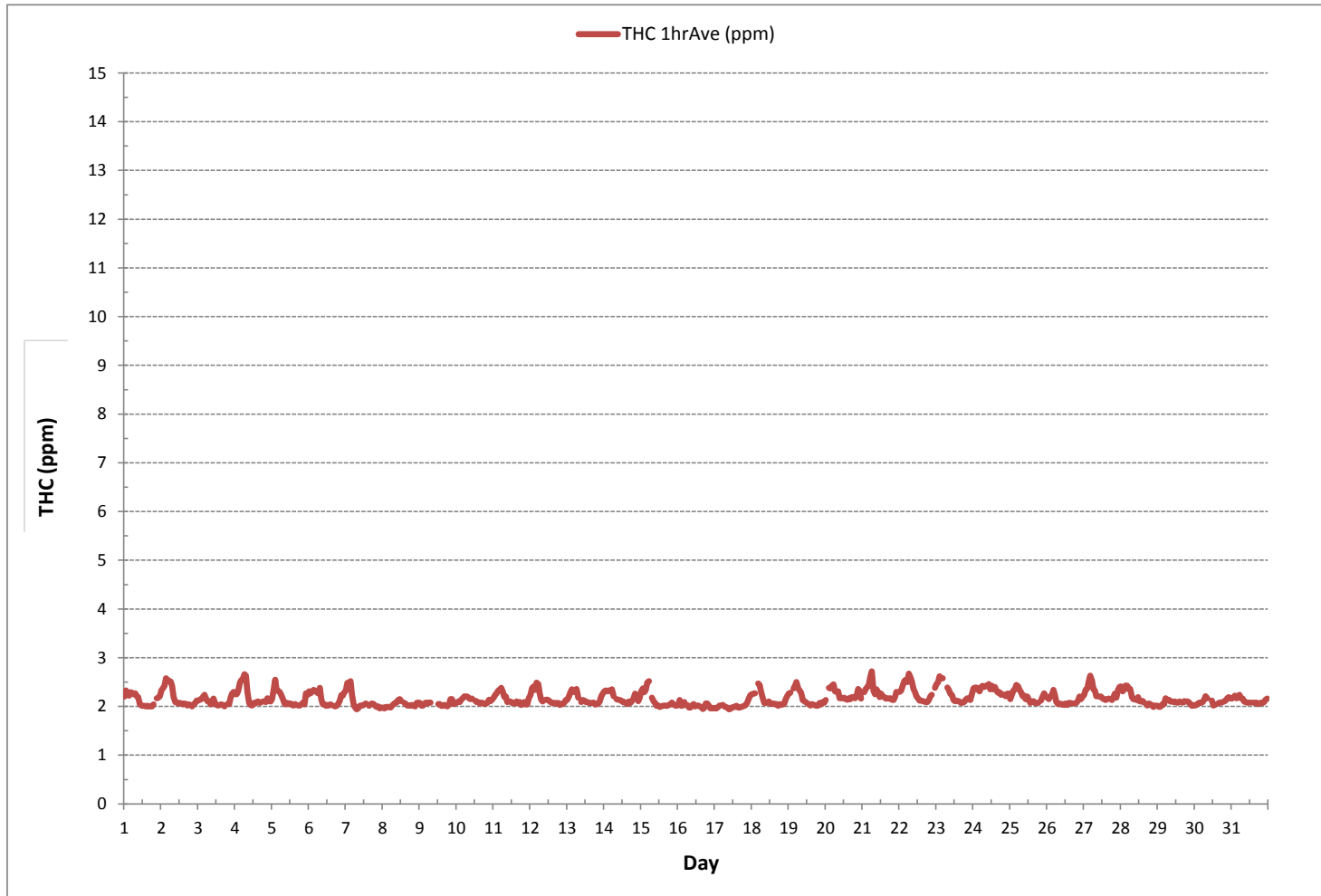
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MINIMUM 1-HR AVERAGE:	1.94 ppm @ HOUR 7 ON DAY 7
MAXIMUM 1-HR AVERAGE:	2.72 ppm @ HOUR 6 ON DAY 21
MAXIMUM 24-HR AVERAGE:	2.35 ppm ON DAY 24
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	4 hrs
OPERATIONAL TIME:	739 hrs
AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	0.15
MONTHLY AVERAGE:	2.16 ppm

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



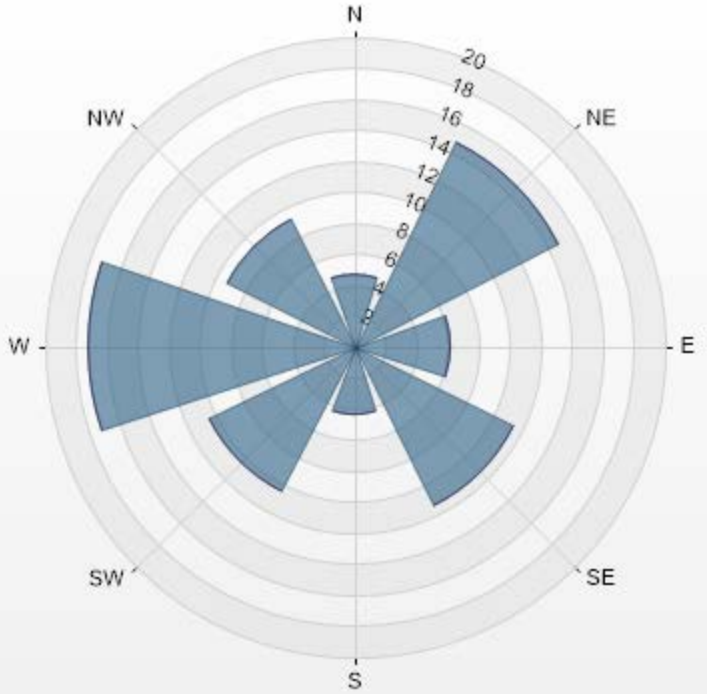
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC [ppm]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.45% Calm Avg: 2.30 [ppm]

Direction	0.0-0.9	0.9-1.8	1.8-2.7	>2.7	Total
N	0.0	0.0	4.7	0.0	4.7
NE	0.0	0.0	14.8	0.0	14.8
E	0.0	0.0	6.3	0.0	6.3
SE	0.0	0.0	11.5	0.0	11.5
S	0.0	0.0	4.4	0.0	4.4
SW	0.0	0.0	10.5	0.0	10.5
W	0.0	0.0	17.2	0.0	17.2
NW	0.0	0.0	9.2	0.0	9.2
Summary	0.0	0.0	78.6	0.0	78.6

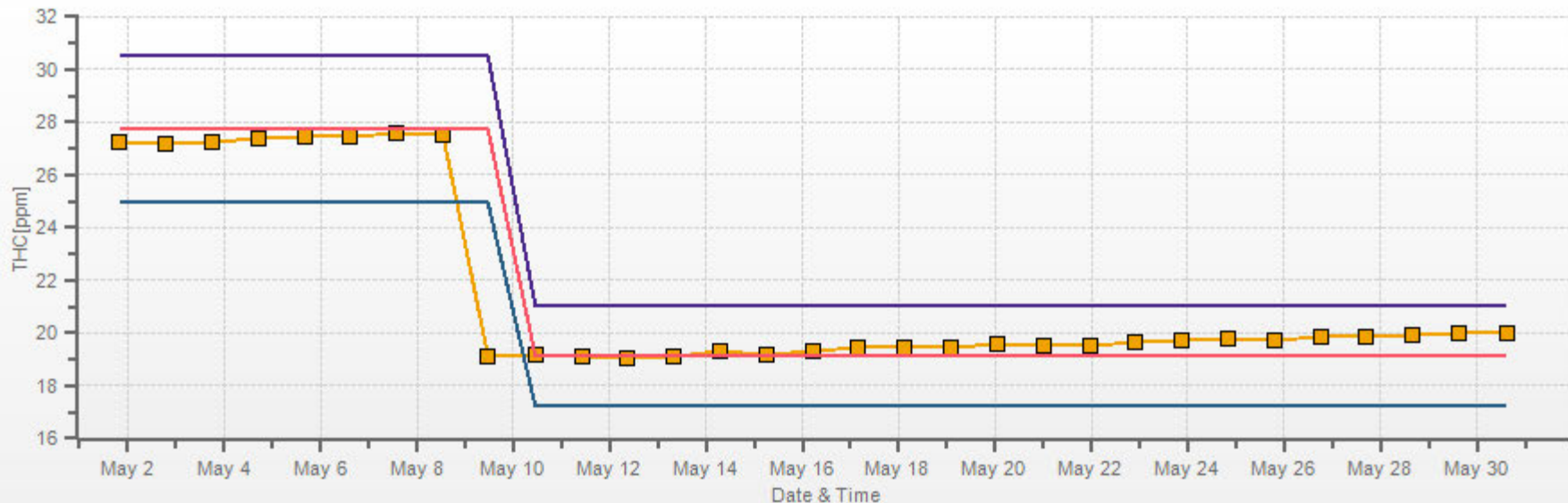
% Icon Classes (ppm) 0 0.0-0.9 0 0.9-1.8 79 1.8-2.7 0 >2.7

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.45% Calm Poll Avg: 2.30[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



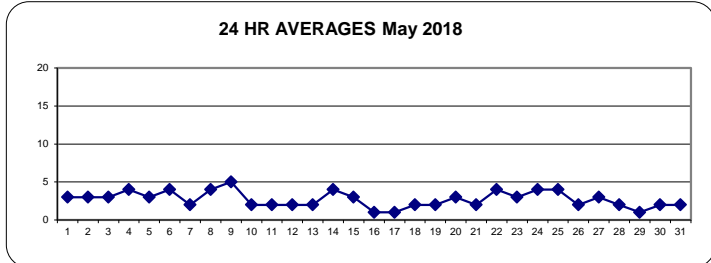
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	3	6	5	2	7	3	3	3	3	4	2	2	2	3	3	2	2	1	1	3	S	4	3	2	1	7	3	24	
2	2	3	3	12	11	6	7	4	3	2	1	1	2	1	1	2	1	1	1	1	S	2	2	2	4	1	12	3	24
3	3	3	3	4	4	3	4	3	3	3	3	1	1	1	1	1	0	1	S	2	4	4	4	3	0	4	3	24	
4	3	2	6	8	7	7	11	10	5	2	1	1	1	2	1	2	1	S	2	4	6	5	2	2	1	11	4	24	
5	2	2	6	4	5	5	5	4	3	3	2	1	1	1	1	1	S	1	1	2	5	3	4	3	1	6	3	24	
6	7	5	4	4	5	5	3	5	4	3	2	1	1	1	1	S	1	1	1	1	4	10	11	8	1	11	4	24	
7	7	8	6	6	6	2	1	2	1	1	1	1	1	S	1	1	1	1	1	2	2	3	1	1	1	8	2	24	
8	1	1	1	1	2	2	2	3	C	C	C	C	C	C	C	C	C	C	1	1	1	1	25	16	5	1	25	4	24
9	5	1	1	19	33	20	10	4	1	1	1	1	S	1	1	1	1	1	1	3	8	5	1	1	1	33	5	24	
10	1	1	1	1	3	3	2	2	1	1	1	S	1	2	1	1	1	1	1	1	2	2	2	2	2	1	3	2	24
11	2	2	2	3	3	7	7	5	4	2	S	1	1	1	1	1	1	1	1	1	1	3	2	1	2	1	7	2	24
12	2	2	3	3	4	5	4	3	3	S	3	2	2	1	1	1	1	1	1	1	2	2	2	3	1	5	2	24	
13	3	3	4	3	3	3	4	3	S	3	1	1	1	0	1	1	1	1	1	1	2	3	3	2	3	0	4	2	24
14	5	4	4	5	6	13	12	S	2	2	2	2	2	1	1	1	2	2	5	6	6	4	2	3	1	13	4	24	
15	4	3	3	4	6	6	S	5	3	1	1	1	1	1	1	1	1	1	2	3	3	3	2	2	1	6	3	24	
16	2	2	2	2	S	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
17	1	1	1	1	S	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	3	2	3	3	1	3	1	24	
18	2	2	3	S	3	2	3	4	3	2	3	2	2	1	1	1	1	1	1	2	2	2	2	2	1	4	2	24	
19	2	3	S	3	3	6	6	4	3	2	1	1	1	1	1	1	1	1	1	1	3	4	2	2	1	6	2	24	
20	2	S	4	3	5	6	3	3	2	1	1	1	1	1	1	1	1	1	1	1	3	7	5	4	1	7	3	24	
21	S	3	2	2	2	3	5	3	3	4	2	1	2	1	2	1	1	2	1	2	2	3	3	S	1	5	2	24	
22	3	3	3	3	3	5	10	10	9	5	4	2	2	1	2	1	1	1	2	2	5	4	S	5	1	10	4	24	
23	6	7	6	4	5	P	P	6	4	3	3	1	1	1	2	2	2	2	2	3	3	S	3	5	1	7	3	22	
24	4	3	2	3	3	3	4	4	3	4	6	4	6	4	6	5	3	3	2	3	S	4	4	3	2	6	4	24	
25	2	4	3	3	5	6	6	5	4	4	4	5	3	2	3	3	2	2	S	5	6	5	3	2	6	4	24		
26	2	2	2	2	3	3	2	2	2	2	1	1	1	1	1	1	1	1	S	1	2	4	3	3	1	4	2	24	
27	3	5	5	6	6	6	5	3	1	1	1	1	1	1	1	1	1	S	1	2	3	2	4	3	1	6	3	24	
28	3	1	1	2	2	3	3	3	2	2	2	2	2	2	3	2	S	2	2	2	1	1	1	1	1	3	2	24	
29	1	1	1	1	1	2	3	3	2	2	1	1	1	1	1	S	1	1	1	2	2	1	1	1	1	3	1	24	
30	1	1	1	1	2	3	3	2	13	X	X	2	3	1	S	2	2	2	2	2	1	1	1	1	1	13	2	22	
31	1	1	1	1	1	2	1	2	2	2	1	1	X	1	1	1	2	2	1	2	3	2	4	2	1	4	2	23	
HOURLY MAX	7	8	6	19	33	20	12	10	13	5	6	5	6	4	6	5	3	3	5	6	8	25	16	8					
HOURLY AVG	3	3	3	4	5	5	5	4	3	2	2	1	2	1	1	1	1	1	1	2	3	4	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

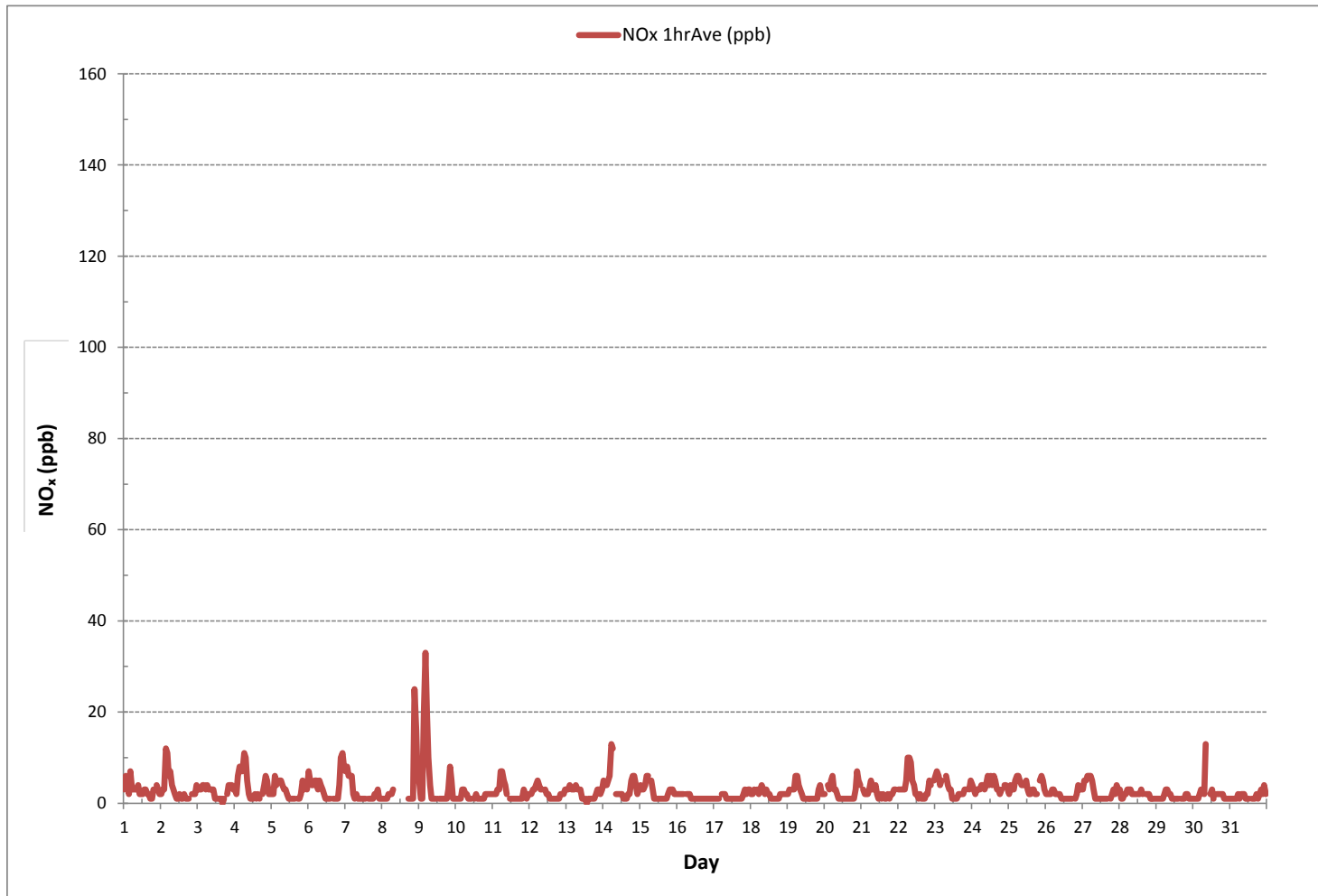
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	698			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	16	ON DAY 3
MAXIMUM 1-HR AVERAGE:	33 ppb	@ HOUR	4	ON DAY 9
MAXIMUM 24-HR AVERAGE:	5 ppb			ON DAY 9
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	739 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	99.3 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	3 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



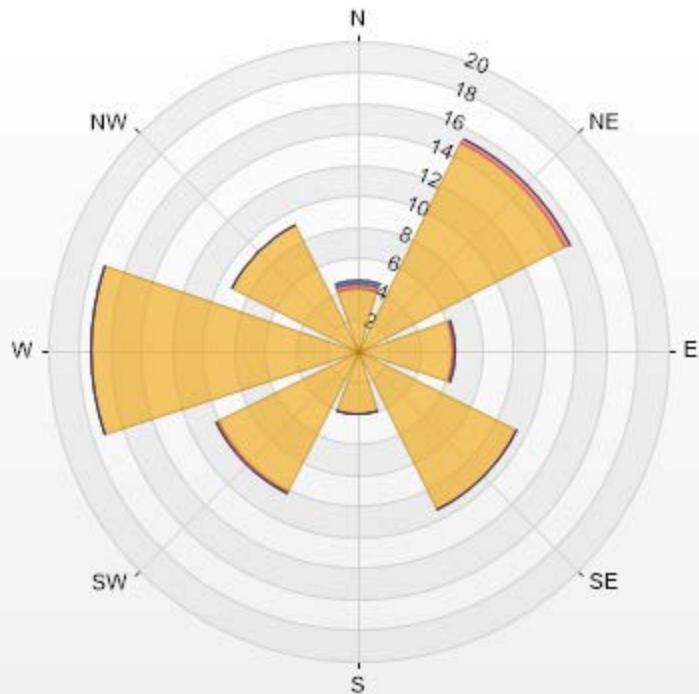
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NOx [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.60% Calm Avg: 3.86 [ppb]

Direction	0.0-11.3	11.3-22.7	22.7-34.0	>34.0	Total
N	4.0	0.3	0.3	0.0	4.6
NE	15.0	0.3	0.0	0.0	15.3
E	6.2	0.1	0.0	0.0	6.3
SE	11.4	0.0	0.0	0.0	11.4
S	4.2	0.0	0.0	0.0	4.2
SW	10.2	0.1	0.0	0.0	10.3
W	17.2	0.0	0.0	0.0	17.2
NW	9.2	0.0	0.0	0.0	9.2
Summary	77.3	0.9	0.3	0.0	78.4

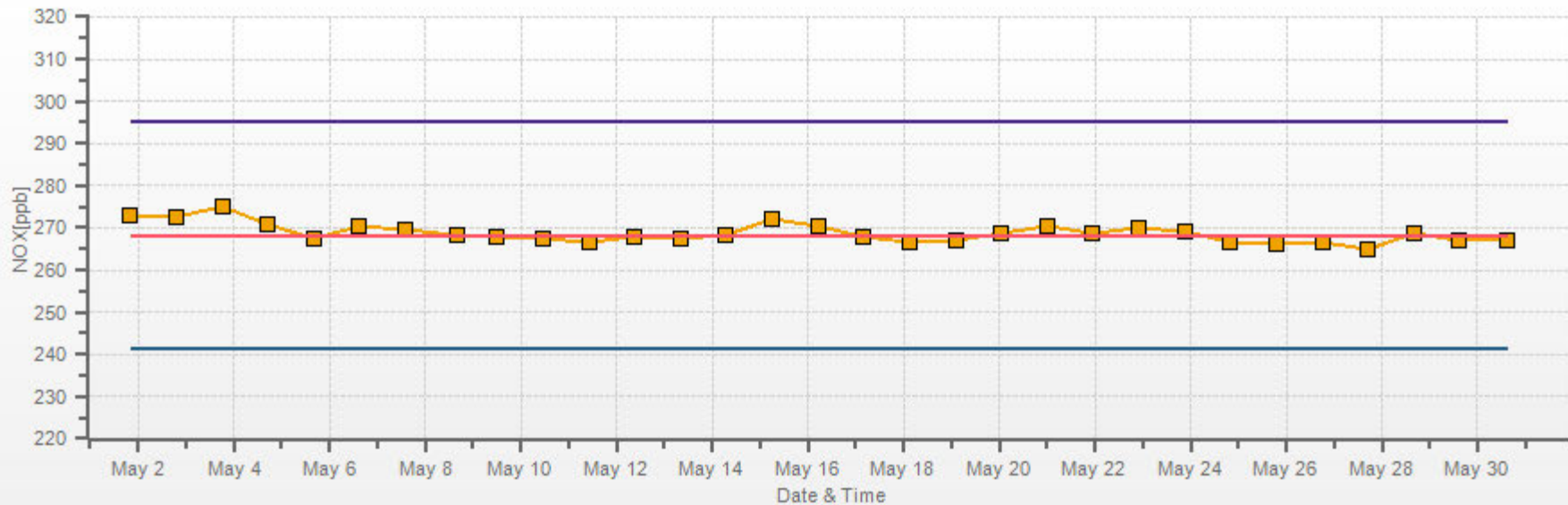
% Icon Classes (ppb)	77	0.0-11.3	1	11.3-22.7	0	22.7-34.0	0	>34.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.60% Calm Poll Avg: 3.86[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES



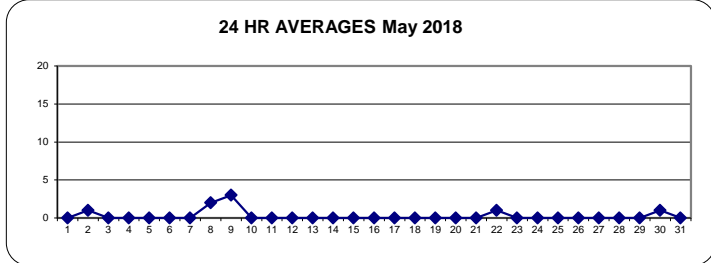
NITRIC OXIDE Hourly Averages (NO ppb)

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

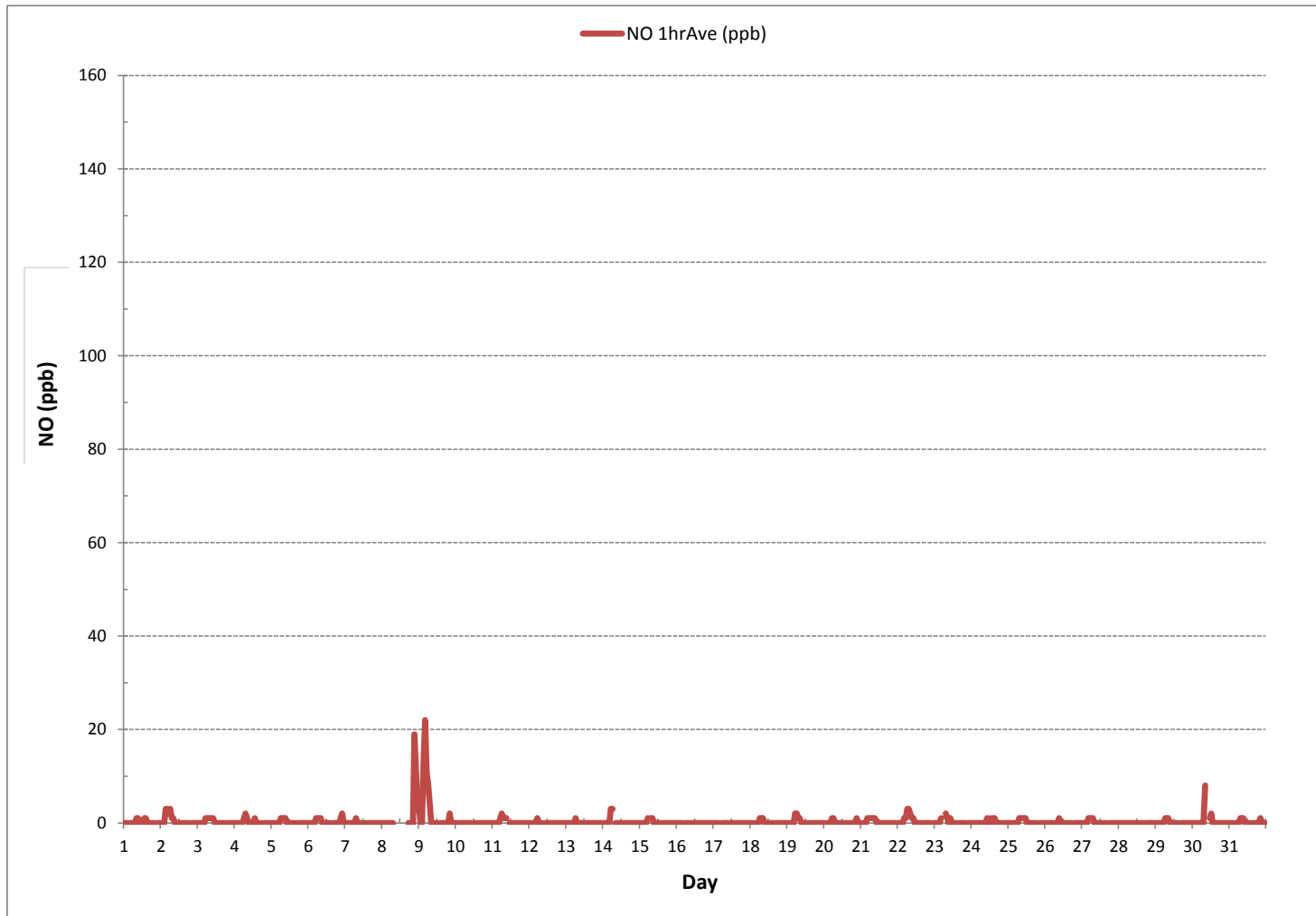
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	104			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	22 ppb	@ HOUR	4	ON DAY 9
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 9
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	739 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	99.3 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	0 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



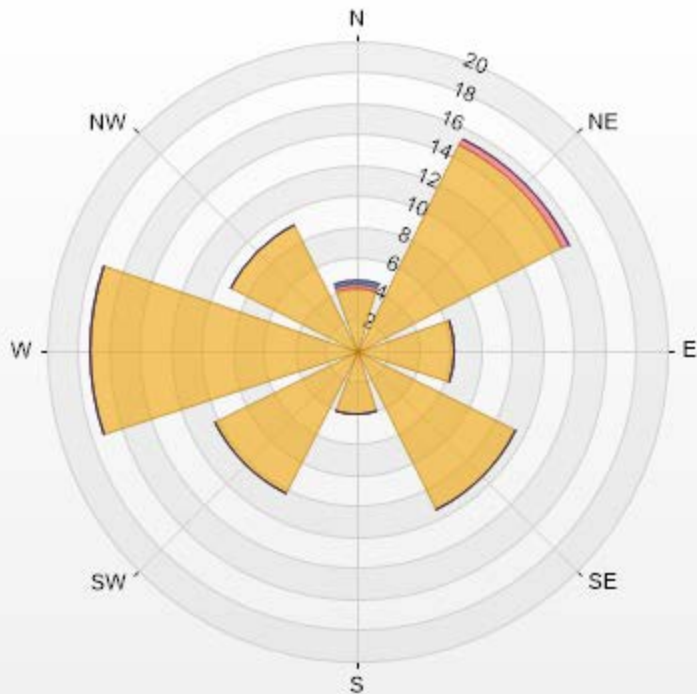
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.60% Calm Avg: 0.35 [ppb]

Direction	0.0-7.7	7.7-15.3	15.3-23.0	>23.0	Total
N	4.0	0.3	0.3	0.0	4.6
NE	14.9	0.4	0.0	0.0	15.3
E	6.3	0.0	0.0	0.0	6.3
SE	11.4	0.0	0.0	0.0	11.4
S	4.2	0.0	0.0	0.0	4.2
SW	10.3	0.0	0.0	0.0	10.3
W	17.2	0.0	0.0	0.0	17.2
NW	9.2	0.0	0.0	0.0	9.2
Summary	77.4	0.7	0.3	0.0	78.4

% Icon Classes (ppb) 77 0.0-7.7 1 7.7-15.3 0 15.3-23.0 0 >23.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.60% Calm Poll Avg: 0.35[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	6	5	2	6	3	2	2	2	3	2	1	2	2	2	2	1	1	1	3	S	3	3	2	1	6	3	24	
2	2	3	3	8	8	4	5	3	2	1	1	1	2	1	1	2	1	1	1	S	2	2	2	3	1	8	3	24	
3	3	3	3	4	4	3	3	3	2	2	3	1	1	1	1	1	1	1	S	2	4	4	3	3	1	4	2	24	
4	3	2	6	8	6	7	10	8	4	2	1	1	1	1	1	1	1	S	2	4	5	5	2	1	1	10	4	24	
5	2	2	6	4	5	5	4	3	2	2	2	1	1	0	1	0	S	1	1	2	4	3	3	3	0	6	2	24	
6	7	4	3	3	4	4	2	3	3	2	1	1	1	1	1	S	1	1	1	1	4	9	9	7	1	9	3	24	
7	7	8	6	5	5	2	1	1	1	1	1	1	1	1	S	1	1	1	1	1	2	3	1	1	1	8	2	24	
8	1	1	1	1	2	1	2	3	C	C	C	C	C	C	C	C	C	C	1	1	1	1	6	4	2	1	6	2	24
9	2	1	1	6	11	9	2	0	1	1	1	1	S	1	1	1	1	1	1	2	7	5	1	1	0	11	3	24	
10	1	1	1	1	3	3	1	1	1	1	1	S	1	1	1	1	1	1	1	2	2	2	2	2	1	3	1	24	
11	2	2	2	3	3	6	5	4	3	2	S	1	1	1	1	1	1	1	1	1	3	2	1	2	1	6	2	24	
12	2	2	3	2	3	4	3	3	3	S	2	2	1	1	1	1	1	1	1	1	1	2	2	2	1	4	2	24	
13	3	3	4	3	2	2	3	3	S	2	1	1	1	0	1	1	1	1	1	2	2	2	2	3	0	4	2	24	
14	5	4	3	5	6	10	9	S	2	2	2	2	1	1	1	1	2	4	6	6	4	2	3	1	10	4	24		
15	3	3	2	3	5	5	S	4	2	1	0	0	0	0	1	1	1	1	2	2	3	2	1	2	0	5	2	24	
16	2	1	1	2	2	S	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24	
17	1	1	1	1	S	2	1	1	1	1	1	0	1	1	1	1	1	1	2	3	2	2	3	0	3	1	24		
18	2	2	3	S	3	2	2	3	3	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	1	3	2	24	
19	2	3	S	2	3	4	5	3	3	1	1	1	1	1	1	1	1	1	1	3	4	2	2	1	5	2	24		
20	2	S	4	3	5	5	3	2	2	1	1	1	1	1	1	1	1	1	1	2	7	5	4	1	7	2	24		
21	S	2	2	2	2	3	4	2	3	3	2	1	1	1	1	1	2	1	2	2	3	3	S	1	4	2	24		
22	3	2	3	3	3	7	7	7	4	3	2	1	1	2	1	1	1	1	2	5	4	S	5	1	7	3	24		
23	6	7	5	4	5	P	P	5	3	2	2	1	1	1	1	2	2	1	3	3	S	3	5	1	7	3	22		
24	4	3	2	2	3	3	3	3	3	3	5	4	5	4	5	4	3	3	2	2	S	3	3	3	2	5	3	24	
25	2	4	3	3	5	5	4	3	3	4	5	2	2	2	2	2	2	2	S	5	6	5	2	2	6	3	24		
26	2	1	1	1	3	3	2	2	2	1	1	1	1	1	1	1	1	1	S	1	2	4	2	2	1	4	2	24	
27	3	5	5	6	6	5	4	2	1	1	1	1	0	0	0	1	1	S	1	2	3	2	4	3	0	6	2	24	
28	3	1	1	2	2	2	3	2	2	1	1	1	2	1	2	S	2	2	2	2	1	1	1	1	1	3	2	24	
29	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	S	1	1	1	2	2	1	1	1	1	2	1	24	
30	1	1	1	1	1	3	3	2	5	X	X	1	1	1	1	S	2	2	2	2	2	1	1	1	1	5	2	22	
31	1	1	1	1	1	1	1	1	1	1	1	0	X	1	1	1	1	1	1	2	3	2	4	2	0	4	1	23	
HOURLY MAX	7	8	6	8	11	10	10	8	7	4	5	5	5	4	5	4	3	3	4	6	7	9	9	7					
HOURLY AVG	3	3	3	3	4	4	3	3	2	2	2	1	1	1	1	1	1	1	1	2	3	3	3	2					

STATUS FLAG CODES

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

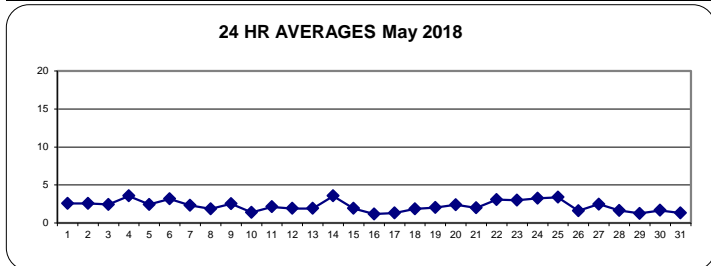
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

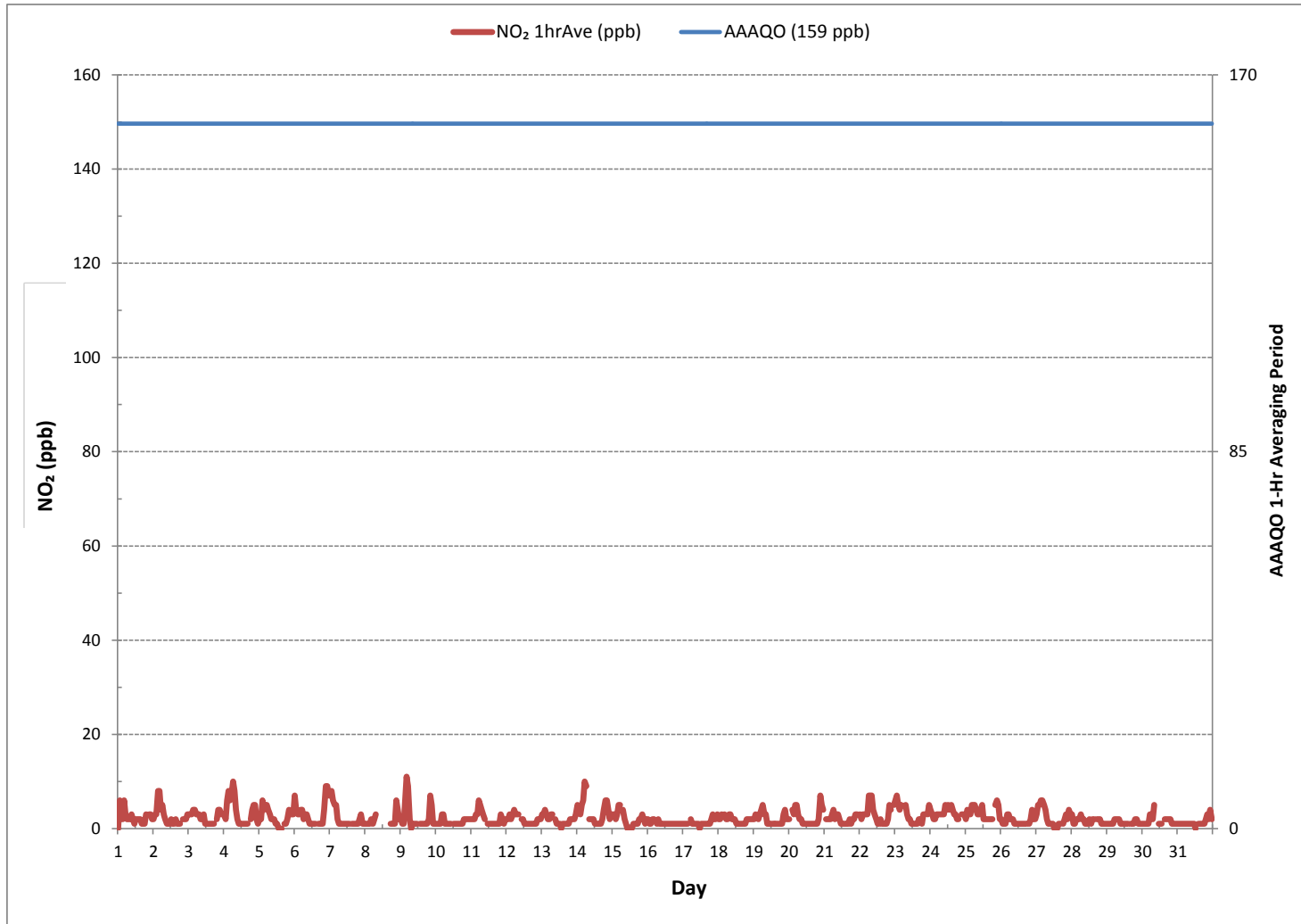
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0					
NUMBER OF NON-ZERO READINGS:	686					
MINIMUM 1-HR AVERAGE:	0	ppb	@ HOUR	13	ON DAY	5
MAXIMUM 1-HR AVERAGE:	11	ppb	@ HOUR	4	ON DAY	9
MAXIMUM 24-HR AVERAGE:	4	ppb			ON DAY	4
IZS CALIBRATION TIME:	30	hrs	OPERATIONAL TIME:	739	hrs	
MONTHLY CALIBRATION TIME:	9	hrs	AMD OPERATION UPTIME:	99.3	%	
STANDARD DEVIATION:	2		MONTHLY AVERAGE:	2	ppb	

24 HR AVERAGES May 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



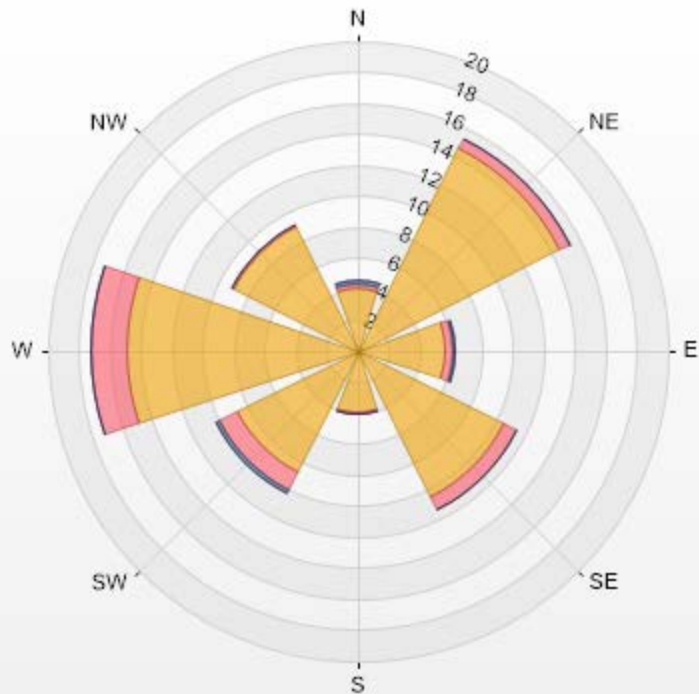
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO₂ [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.60% Calm Avg: 3.50 [ppb]

Direction	0.0-4.0	4.0-8.0	8.0-12.0	>12.0	Total
N	4.0	0.3	0.3	0.0	4.6
NE	14.6	0.7	0.0	0.0	15.3
E	5.7	0.4	0.1	0.0	6.3
SE	10.6	0.9	0.0	0.0	11.5
S	4.0	0.1	0.0	0.0	4.2
SW	8.7	1.3	0.3	0.0	10.3
W	14.9	2.3	0.0	0.0	17.2
NW	9.0	0.1	0.0	0.0	9.2
Summary	71.5	6.2	0.7	0.0	78.4

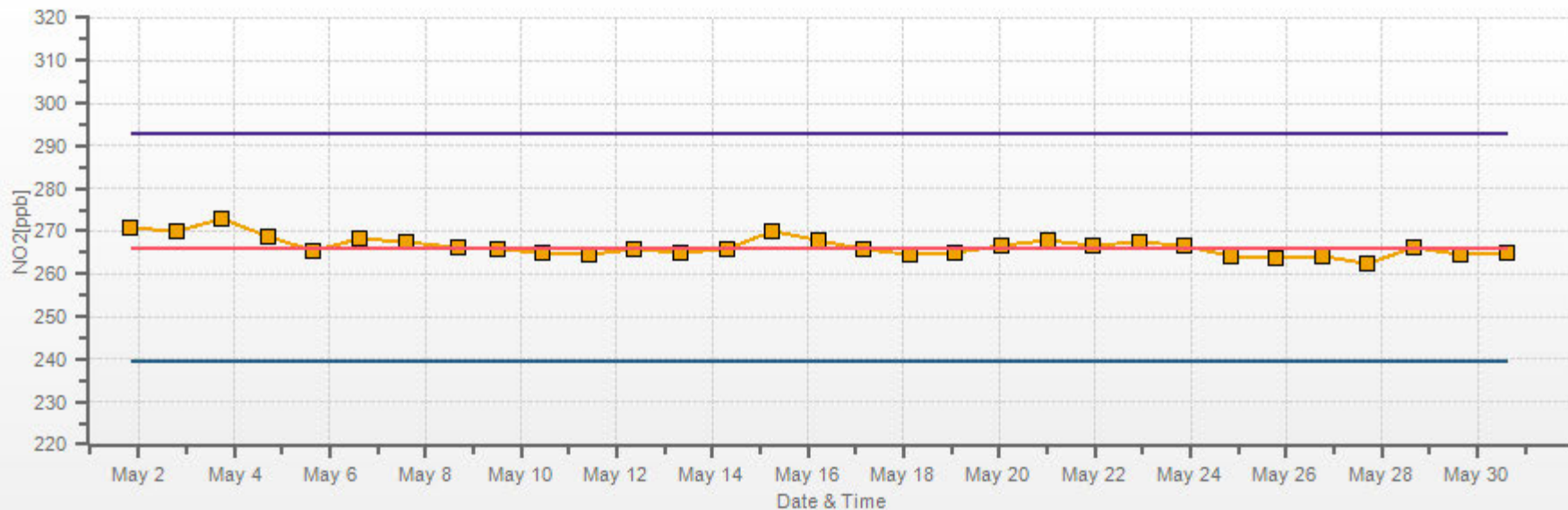
% Icon Classes (ppb) 72 0.0-4.0 6 4.0-8.0 1 8.0-12.0 0 >12.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.60% Calm Poll Avg: 3.50[ppb]



NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



OZONE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	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	35.5	24.6	28.0	36.8	26.3	32.8	35.1	35.3	37.7	39.6	43.6	44.1	44.9	41.8	42.8	43.2	44.0	45.2	43.0	38.9	S	23.7	17.8	14.0	14.0	45.2	35.6	24	
2	11.5	7.6	7.8	2.4	2.3	5.5	18.4	30.1	37.5	45.6	51.0	52.6	51.7	51.6	50.9	48.7	47.4	42.0	38.7	S	38.3	35.3	34.5	31.0	2.3	52.6	32.3	24	
3	29.1	26.4	18.7	17.4	18.7	22.0	24.3	29.1	34.1	35.3	37.4	50.8	53.3	52.6	52.5	52.4	51.9	51.8	S	48.7	42.6	29.6	24.7	19.9	17.4	53.3	35.8	24	
4	19.0	17.7	11.4	12.2	11.9	11.6	17.0	25.8	36.0	42.7	46.6	46.9	47.4	42.3	43.7	45.3	45.6	S	45.8	41.5	31.5	22.6	36.0	38.5	11.4	47.4	32.1	24	
5	27.4	23.0	24.8	27.6	28.8	31.7	31.1	32.1	34.8	40.3	46.9	50.6	51.3	50.7	50.3	49.8	S	48.8	49.3	44.7	31.0	28.5	22.2	23.0	22.2	51.3	36.9	24	
6	18.1	19.2	17.9	11.9	10.4	12.0	23.6	33.0	37.0	41.8	46.0	49.1	50.9	51.3	51.7	S	51.3	50.8	50.7	47.2	36.5	21.6	16.4	13.7	10.4	51.7	33.1	24	
7	14.0	9.1	8.9	14.0	22.7	34.8	36.7	35.2	34.7	39.3	42.8	44.8	44.3	43.7	S	47.1	45.2	45.4	46.6	46.5	44.6	43.1	47.3	47.9	8.9	47.9	36.5	24	
8	47.4	45.8	46.0	45.8	42.5	42.4	35.2	30.7	27.9	29.0	30.7	38.4	44.9	S	46.6	45.3	46.0	47.8	48.2	50.1	48.7	36.7	35.6	37.6	27.9	50.1	41.3	24	
9	36.9	38.1	38.8	35.0	28.8	28.2	37.2	39.6	C	C	C	C	C	C	43.5	43.5	43.7	44.3	44.5	43.8	40.9	27.8	28.5	39.2	39.6	27.8	44.5	38.0	24
10	37.7	38.0	37.6	36.8	33.0	32.0	35.4	38.0	42.0	44.8	45.4	S	45.5	47.1	48.8	49.4	50.3	50.6	50.5	45.9	45.7	43.2	39.8	36.5	32.0	50.6	42.3	24	
11	28.1	20.5	16.0	21.0	16.7	14.0	23.0	30.4	37.9	45.4	S	52.2	53.7	53.5	54.3	54.3	54.7	53.4	51.9	49.6	44.0	43.8	47.1	40.9	14.0	54.7	39.4	24	
12	35.0	26.3	20.3	21.8	14.2	14.5	29.2	34.4	33.7	S	38.8	43.1	46.9	48.0	49.4	49.6	47.9	46.7	45.4	42.5	38.8	34.1	32.9	27.0	14.2	49.6	35.7	24	
13	26.7	19.6	15.0	13.1	13.8	12.5	17.4	33.5	S	49.6	54.1	54.1	54.0	53.7	54.4	55.2	56.0	53.8	53.5	50.8	42.8	35.3	28.1	20.7	12.5	56.0	37.7	24	
14	16.4	16.4	16.4	14.1	11.0	11.1	18.9	S	41.2	43.9	48.1	49.0	50.5	51.9	55.6	56.9	57.7	57.4	47.7	39.8	29.6	34.4	42.9	26.4	11.0	57.7	36.4	24	
15	21.6	18.9	23.0	18.4	15.3	13.7	S	35.6	43.7	48.2	49.3	51.3	52.2	52.8	47.1	47.3	47.4	48.6	47.2	44.5	49.8	47.6	45.7	42.1	13.7	52.8	39.6	24	
16	32.5	27.7	38.4	34.9	34.5	S	39.8	40.7	39.3	36.4	37.4	42.7	45.0	44.6	39.9	34.0	38.7	38.3	40.1	40.9	39.1	35.9	33.9	30.5	27.7	45.0	37.6	24	
17	29.9	31.5	29.6	27.5	S	26.1	28.0	34.0	38.8	39.8	39.6	39.5	39.9	40.4	40.0	40.0	40.4	39.2	39.8	39.0	30.8	25.9	23.5	20.7	20.7	40.4	34.1	24	
18	18.5	14.9	16.6	S	7.7	10.9	20.7	32.3	39.8	43.8	43.8	45.1	46.6	47.7	48.9	48.1	46.7	47.6	48.8	44.8	36.0	31.0	27.6	24.9	7.7	48.9	34.5	24	
19	21.2	15.8	S	9.9	7.7	6.9	21.2	30.7	36.5	44.9	46.6	47.0	47.5	48.9	49.9	51.6	54.1	56.3	55.7	52.9	42.5	37.6	38.3	40.3	6.9	56.3	37.6	24	
20	36.1	S	24.6	28.4	18.5	22.0	34.3	36.0	38.8	43.5	45.8	44.7	44.8	45.0	45.1	44.8	45.5	45.9	45.9	44.0	32.3	24.6	21.8	30.8	18.5	45.9	36.7	24	
21	S	19.8	15.8	9.7	7.4	8.3	19.6	29.3	36.7	42.3	48.7	49.9	52.1	53.2	50.2	50.2	51.8	51.0	49.5	46.7	40.4	31.9	24.8	S	7.4	53.2	35.9	24	
22	27.9	20.0	13.0	7.9	4.9	7.3	16.5	25.0	34.0	46.7	55.6	58.6	59.2	57.8	58.9	59.2	59.1	58.4	57.4	48.4	31.4	26.7	S	16.6	4.9	59.2	37.0	24	
23	12.8	8.9	7.8	8.4	6.7	P	P	32.6	41.7	46.9	51.6	55.5	55.3	57.6	59.5	58.6	59.2	61.8	64.2	54.2	50.0	S	39.3	31.1	6.7	64.2	41.1	22	
24	24.6	21.0	20.8	20.6	19.7	22.5	31.8	38.3	38.5	30.4	24.6	28.3	25.2	27.1	22.8	28.3	38.5	36.0	38.0	29.7	S	24.8	22.5	29.2	19.7	38.5	28.0	24	
25	38.1	24.7	21.1	12.9	14.3	16.4	19.6	20.4	24.8	30.3	27.3	25.4	43.7	54.6	52.7	53.2	53.1	52.3	51.2	S	32.3	21.2	20.8	33.8	12.9	54.6	32.4	24	
26	33.2	31.6	25.3	24.8	19.6	24.0	21.6	25.5	24.3	31.2	35.2	39.4	46.2	47.8	47.4	46.9	46.7	48.4	S	47.8	37.4	26.5	28.5	22.0	19.6	48.4	34.0	24	
27	22.1	29.6	24.0	16.5	13.0	20.2	30.3	34.6	38.5	40.1	42.2	44.6	47.4	47.4	45.2	45.8	46.7	S	46.5	43.2	28.5	24.3	19.9	20.5	13.0	47.4	33.5	24	
28	25.3	34.3	31.0	33.1	35.4	33.4	34.3	43.4	47.4	53.0	55.1	57.3	60.0	63.2	64.2	61.8	S	60.1	53.3	42.6	37.4	36.0	36.6	39.6	25.3	64.2	45.1	24	
29	44.8	48.9	48.9	36.5	28.0	28.8	31.6	33.8	35.8	38.2	40.3	42.2	41.7	41.7	41.8	S	40.9	41.2	39.6	35.6	34.4	35.2	32.3	30.8	28.0	48.9	38.0	24	
30	31.7	29.6	24.5	23.3	24.8	22.9	20.7	20.2	17.9	X	X	24.5	24.2	26.8	S	26.2	24.6	23.4	21.7	21.8	17.7	11.2	12.6	12.7	11.2	31.7	22.0	22	
31	12.3	12.2	9.7	12.4	10.5	8.4	15.6	17.5	19.4	22.9	24.6	23.9	27.6	X	30.0	29.7	30.5	31.2	29.3	25.6	26.2	26.4	19.6	22.9	8.4	31.2	21.2	23	
HOURLY MAX	47.4	48.9	48.9	45.8	42.5	42.4	39.8	43.4	47.4	53.0	55.6	58.6	60.0	63.2	64.2	61.8	59.2	61.8	64.2	54.2	50.0	47.6	47.3	47.9					
HOURLY AVG	27.2	24.1	22.7	21.2	18.3	19.9	26.5	31.9	35.5	40.6	42.8	44.7	46.6	47.9	47.9	47.1	47.1	47.5	46.3	43.1	36.8	30.9	30.4	28.8					

STATUS FLAG CODES

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

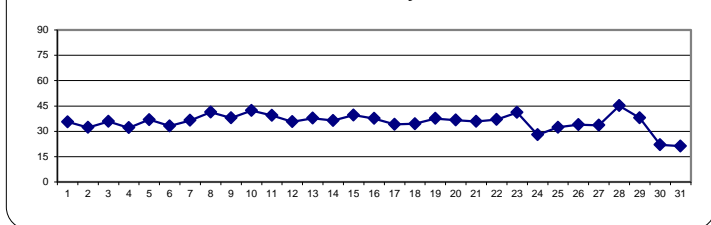
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

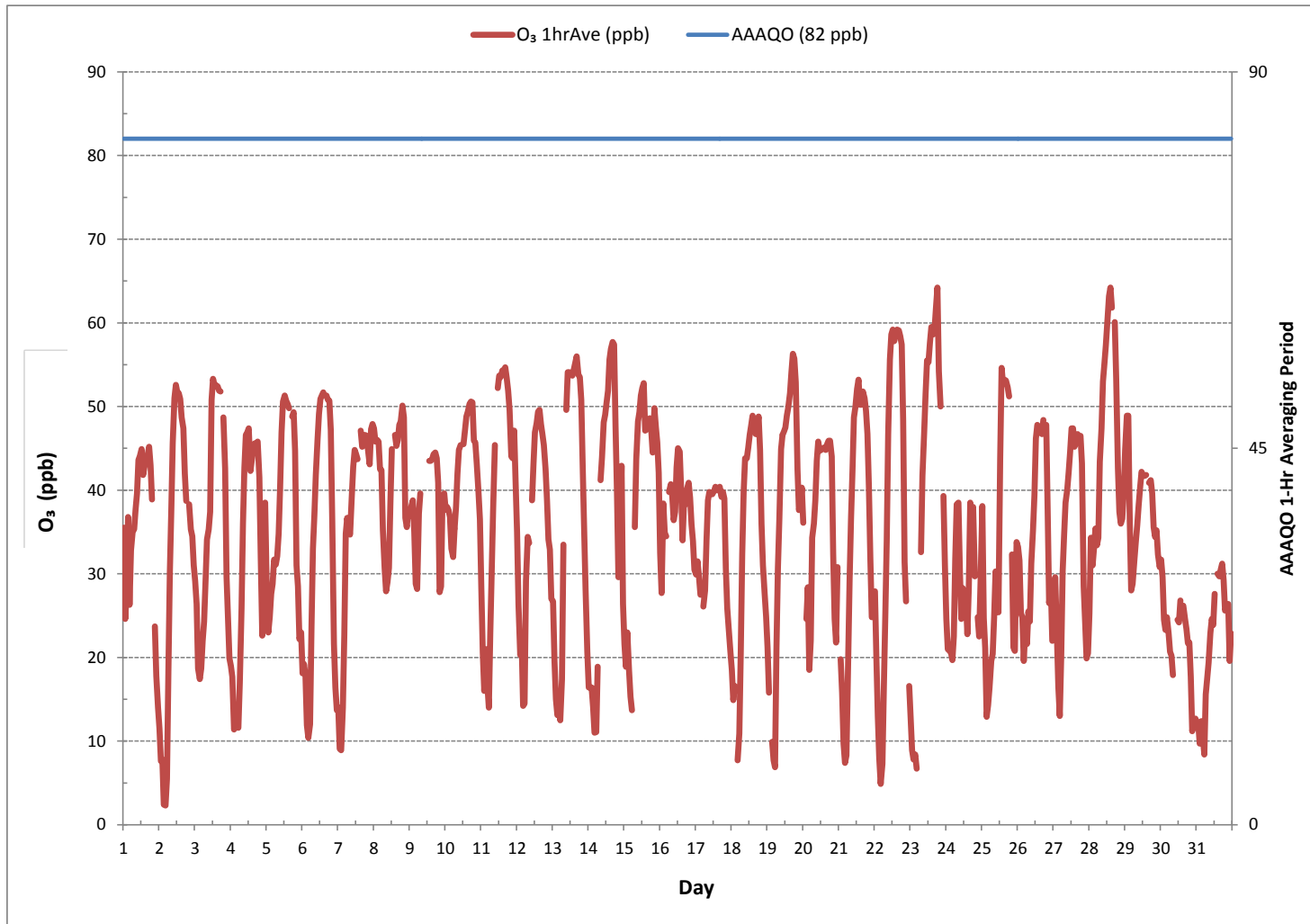
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	704			
MINIMUM 1-HR AVERAGE:	2.3 ppb	@ HOUR	4	ON DAY 2
MAXIMUM 1-HR AVERAGE:	64.2 ppb	@ HOUR	18	ON DAY 23
MAXIMUM 24-HR AVERAGE:	45.1 ppb			ON DAY 28
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	739 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	99.3 %	
STANDARD DEVIATION:	13.3	MONTHLY AVERAGE:	35.5 ppb	

24 HR AVERAGES May 2018



OZONE Hourly Averages (O₃ ppb)



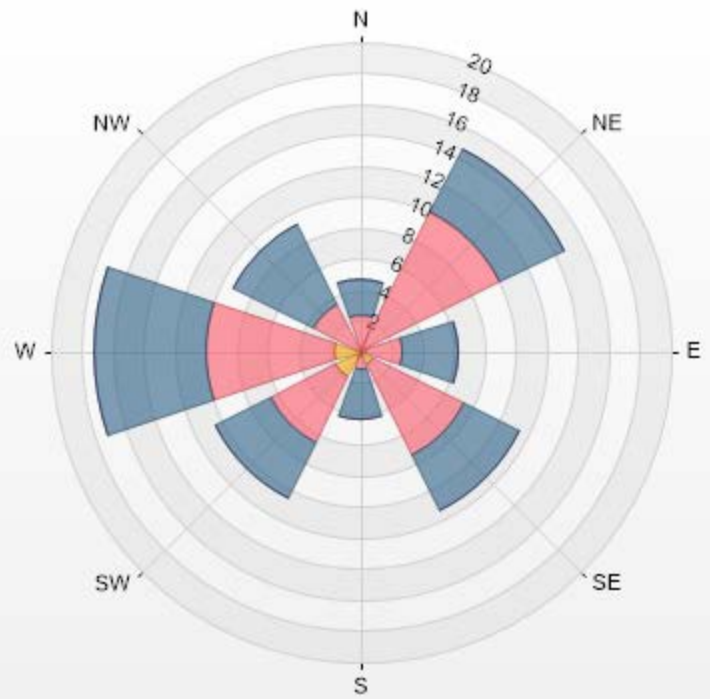
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O₃ [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.48% Calm Avg: 21.19 [ppb]

Direction	0.0-21.4	21.4-42.9	42.9-64.3	>64.3	Total
N	0.0	2.4	2.3	0.0	4.7
NE	0.1	10.0	4.6	0.0	14.7
E	0.4	2.3	3.6	0.0	6.3
SE	0.9	6.7	4.0	0.0	11.5
S	0.3	0.9	3.3	0.0	4.4
SW	1.9	4.7	4.0	0.0	10.5
W	1.7	8.3	7.3	0.0	17.2
NW	0.0	3.4	5.8	0.0	9.2
Summary	5.3	38.6	34.7	0.0	78.5

% Icon Classes (ppb) 5 0.0-21.4 39 21.4-42.9 35 42.9-64.3 0 >64.3

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.48% Calm Poll Avg: 21.19[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/05 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	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	3	3	3	3	5	4	3	3	3	3	4	5	6	7	6	4	4	7	4	4	4	4	5	5	3	7	4	24
2	5	5	5	6	6	5	4	3	2	2	2	2	3	4	3	2	2	2	3	3	4	5	4	4	2	6	4	24
3	4	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3	4	6	6	6	2	6	3	24
4	7	7	14	9	8	7	6	5	3	2	1	1	1	2	2	2	1	1	1	4	9	9	6	5	1	14	5	24
5	5	5	5	4	4	4	4	4	3	2	1	1	1	1	1	1	2	2	2	4	6	7	9	9	1	9	4	24
6	10	9	8	8	8	7	6	4	4	3	2	1	2	1	2	2	2	3	3	4	6	9	14	16	1	16	6	24
7	14	12	11	10	7	4	3	2	2	2	2	2	1	1	1	3	3	3	2	2	3	4	4	4	1	14	4	24
8	5	5	6	7	7	7	8	8	7	7	4	2	2	2	2	2	3	4	3	3	3	6	8	4	2	8	5	24
9	1	1	1	2	2	2	2	2	2	2	3	2	3	3	3	3	2	2	3	4	7	7	3	3	1	7	3	24
10	3	3	3	3	3	3	3	2	3	3	3	4	4	4	4	5	4	3	4	5	5	5	6	8	2	8	4	24
11	8	7	6	7	8	7	7	4	3	C	C	C	4	3	4	4	4	4	4	5	9	11	10	10	3	11	6	24
12	12	11	10	12	14	11	9	8	8	6	4	3	3	2	1	2	2	3	3	7	2	3	16	21	1	21	7	24
13	14	13	14	13	16	13	10	4	5	3	3	2	2	2	2	2	1	2	2	3	6	7	7	7	1	16	6	24
14	7	7	6	6	6	7	9	6	14	25	21	16	11	9	8	8	10	12	15	17	18	16	14	16	6	25	12	24
15	19	22	34	29	27	20	9	7	5	4	4	4	4	4	5	5	6	5	5	6	94	62	21	18	4	94	17	24
16	20	19	14	14	43	42	16	8	9	12	12	9	6	4	4	3	3	3	2	2	3	3	4	2	43	11	24	
17	4	3	4	6	6	4	3	2	1	1	2	1	1	1	1	1	1	0	1	1	4	9	11	10	0	11	3	24
18	8	9	9	9	9	9	10	9	5	4	4	4	3	3	3	3	2	2	3	5	9	18	22	16	2	22	7	24
19	17	16	15	15	14	16	12	8	5	3	4	2	2	2	2	6	7	5	2	4	8	11	12	12	2	17	8	24
20	9	10	10	10	9	9	7	6	5	3	2	1	1	1	2	2	2	2	3	9	48	17	15	1	48	8	24	
21	15	14	14	14	14	15	13	14	9	8	6	5	4	7	5	5	3	3	4	7	10	14	17	18	3	18	10	24
22	19	20	21	20	20	24	27	21	14	9	7	6	8	10	8	9	8	10	9	10	17	21	22	23	6	27	15	24
23	24	26	24	21	18	P	P	23	20	19	19	19	18	16	18	16	20	20	18	28	23	9	14	16	9	28	20	22
24	16	18	20	21	20	19	13	8	6	6	7	7	9	10	13	13	10	16	14	16	14	11	11	10	6	21	13	24
25	7	13	20	24	32	40	47	42	38	30	27	27	15	14	22	25	24	21	22	23	25	27	26	23	7	47	26	24
26	17	15	16	20	24	19	15	10	11	6	4	3	2	2	1	1	1	1	1	1	1	2	3	3	1	24	7	24
27	3	3	3	3	3	4	3	2	2	1	1	1	1	0	0	0	1	1	1	1	2	4	6	7	0	7	2	24
28	6	5	5	6	5	5	6	6	5	4	4	6	8	9	9	8	8	8	12	11	5	13	4	4	4	13	7	24
29	5	3	2	2	2	3	3	3	6	7	6	12	15	11	12	13	13	13	10	9	8	6	8	2	15	8	24	
30	13	9	9	7	5	5	5	6	9	X	X	1	1	3	1	0	0	0	0	0	1	1	1	1	0	13	4	22
31	1	1	0	X	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	22
HOURLY MAX	24	26	34	29	43	42	47	42	38	30	27	27	18	16	22	25	24	21	22	28	94	62	26	23				
HOURLY AVG	10	10	10	10	12	11	9	8	7	6	6	5	5	5	5	5	5	5	5	6	10	12	10	10				

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

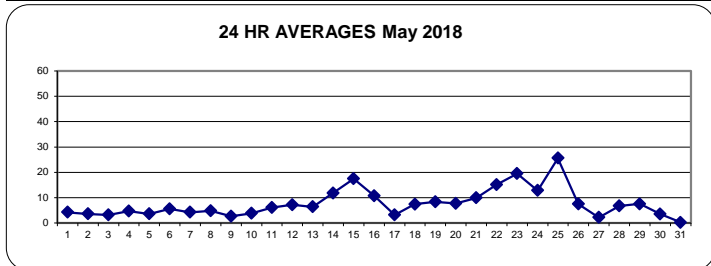
OBJECTIVE LIMIT:

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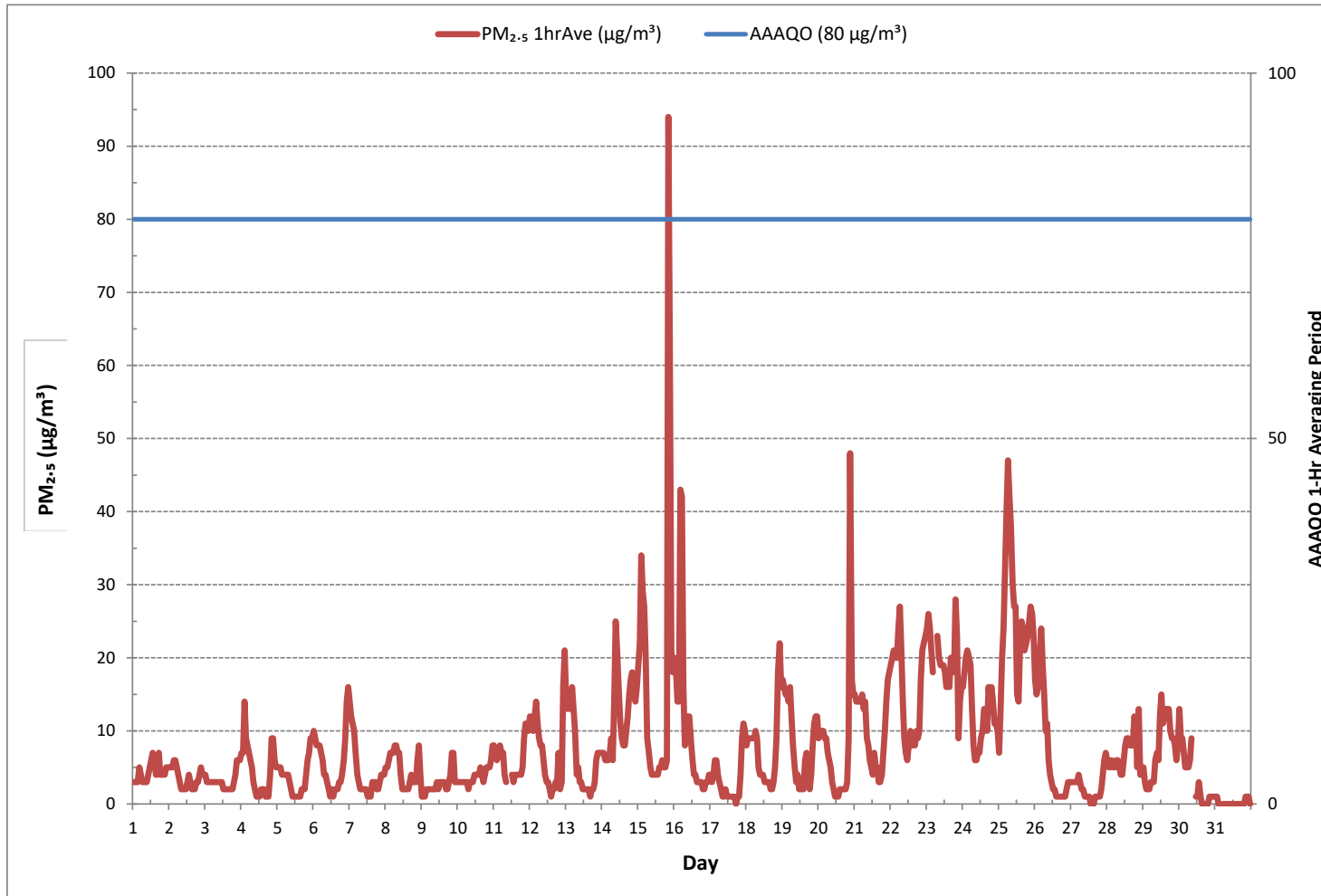
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	1			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	709			
MINIMUM 1-HR AVERAGE	0 µg/m ³ @ HOUR	17	ON DAY	17
MAXIMUM 1-HR AVERAGE:	94 µg/m ³ @ HOUR	20	ON DAY	15
MAXIMUM 24-HR AVERAGE:	26 µg/m ³		ON DAY	25
MONTHLY CALIBRATION TIME:	3 hrs	OPERATIONAL TIME:	738 hrs	
STANDARD DEVIATION:	8	AMD OPERATION UPTIME:	99.2 %	
		MONTHLY AVERAGE:	8 µg/m ³	

24 HR AVERAGES May 2018



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



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM_{2.5} [$\mu\text{g}/\text{m}^3$]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

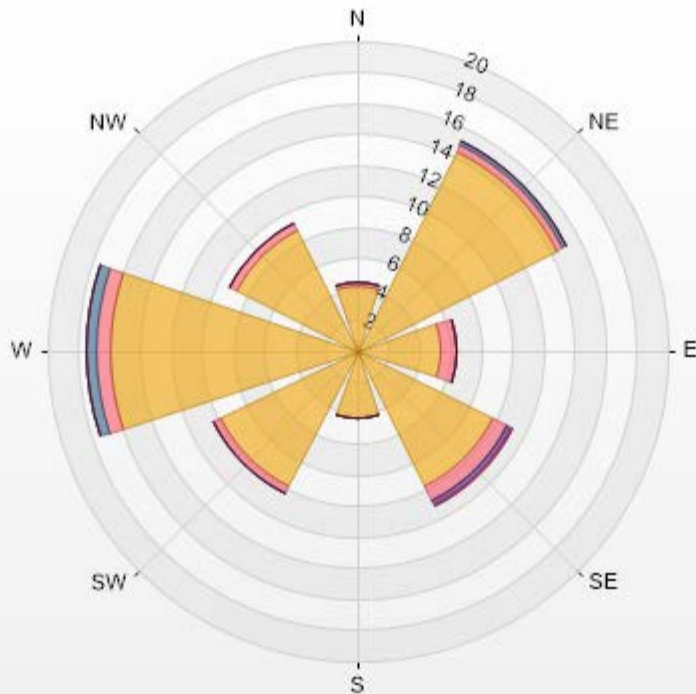
Calm: 21.39%

Calm Avg: 11.83 [$\mu\text{g}/\text{m}^3$]

Direction	0.0-19.0	19.0-38.0	38.0-57.0	57.0-76.0	76.0-95.0	>95.0	Total
N	4.2	0.3	0.0	0.0	0.0	0.0	4.5
NE	14.4	0.4	0.3	0.0	0.0	0.0	15.1
E	5.5	1.0	0.0	0.0	0.0	0.0	6.4
SE	9.8	1.1	0.0	0.1	0.1	0.0	11.2
S	4.4	0.0	0.0	0.0	0.0	0.0	4.4
SW	9.8	0.5	0.0	0.0	0.0	0.0	10.4
W	15.9	1.0	0.5	0.0	0.0	0.0	17.4
NW	8.7	0.5	0.0	0.0	0.0	0.0	9.3
Summary	72.8	4.8	0.8	0.1	0.1	0.0	78.6

% Icon Classes (ug/m3(L)) 73 0.0-19.0 5 19.0-38.0 1 38.0-57.0 0 57.0-76.0 0 76.0-95.0 0 >95.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.39% Calm Poll Avg: 11.83[ug/m3(L)]



WIND SPEED



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	0.7	1.9	3.1	2.1	1.8	1.7	2.9	4.8	6.3	6.8	8.5	10.3	14.1	17.3	17.4	15.0	8.7	5.7	9.1	3.2	3.0	1.9	0.5	0.5	0.5	17.4	4.2	24
2	1.1	0.4	2.0	0.5	1.5	0.9	3.3	5.2	7.2	11.7	13.2	11.8	13.6	9.7	11.6	13.2	11.3	7.5	5.8	12.4	6.8	7.9	6.0	7.4	0.4	13.6	6.6	24
3	7.5	6.3	2.0	5.2	5.9	5.4	5.7	7.5	10.2	9.0	8.9	14.1	11.4	14.6	15.2	14.0	11.8	9.5	7.4	4.5	2.6	0.6	0.5	0.8	0.5	15.2	6.7	24
4	0.7	0.4	0.8	0.5	1.1	2.6	3.6	3.8	6.1	10.6	14.5	12.9	9.6	11.9	9.4	7.3	9.4	5.7	5.4	3.5	0.8	1.2	6.5	2.6	0.4	14.5	1.4	24
5	0.2	3.0	2.7	5.0	6.0	7.3	4.3	5.6	6.6	6.0	8.2	9.3	9.3	9.0	7.9	8.7	8.4	8.1	4.5	2.9	1.1	0.9	1.1	1.4	0.2	9.3	4.5	24
6	1.6	0.3	0.5	0.5	0.5	0.4	3.3	5.2	6.8	7.2	10.3	13.6	15.1	12.7	12.5	10.5	10.6	9.7	7.7	5.2	1.1	0.3	1.3	0.7	0.3	15.1	5.4	24
7	0.8	0.6	1.0	1.6	3.5	5.3	10.2	12.9	11.9	16.6	14.8	18.3	15.9	15.4	14.1	13.4	11.9	10.7	10.6	7.7	5.1	4.7	8.5	7.5	0.6	18.3	8.7	24
8	5.8	6.6	7.8	5.6	4.8	9.4	5.6	5.7	4.4	2.9	4.8	7.3	7.8	8.0	8.3	9.8	7.9	19.7	19.3	18.5	16.2	17.2	19.1	12.9	2.9	19.7	3.6	24
9	8.2	10.4	7.0	6.9	3.6	3.1	8.4	9.9	10.5	10.1	10.2	10.8	11.7	9.9	7.5	8.7	7.5	8.0	7.4	3.8	1.9	3.1	7.0	6.9	1.9	11.7	6.9	24
10	6.0	8.2	6.1	4.9	3.3	2.5	5.3	4.7	5.5	8.2	5.7	5.3	6.3	4.3	5.3	3.0	3.8	2.2	3.9	0.6	7.0	7.3	6.5	4.1	0.6	8.2	3.8	24
11	2.4	0.8	1.6	3.4	0.1	1.2	4.1	5.0	6.5	7.7	8.3	8.1	6.7	7.2	5.9	5.6	5.0	4.8	4.7	3.3	2.1	3.0	4.5	2.4	0.1	8.3	3.7	24
12	1.5	1.5	0.7	1.0	0.6	1.2	3.7	9.0	10.5	10.7	12.2	13.1	13.9	12.9	12.6	12.0	14.3	12.7	11.5	8.6	4.7	3.4	4.6	3.2	0.6	14.3	6.9	24
13	2.3	1.1	0.2	0.6	1.3	1.1	2.1	2.2	4.7	9.8	14.2	16.2	17.6	21.2	20.4	19.4	16.0	14.8	10.3	6.5	1.2	0.6	0.2	0.3	0.2	21.2	6.0	24
14	0.7	0.5	0.3	0.8	0.5	1.6	2.9	5.0	7.4	6.6	4.2	5.8	8.2	6.1	5.5	6.3	5.8	3.9	2.0	2.2	0.7	4.2	5.6	0.6	0.3	8.2	2.7	24
15	0.4	0.1	1.4	0.2	0.6	1.6	5.5	7.6	11.6	16.0	18.4	17.7	15.3	16.0	10.8	11.1	8.1	8.7	6.2	5.1	10.7	8.4	4.1	2.8	0.1	18.4	3.0	24
16	0.7	0.7	2.7	0.4	3.5	8.2	9.3	9.2	11.5	13.7	14.3	13.8	13.4	15.2	16.4	16.8	16.4	14.1	12.7	10.5	10.0	7.0	7.2	5.2	0.4	16.8	9.6	24
17	6.7	5.7	3.9	6.9	7.0	5.2	7.5	8.1	9.1	8.4	6.5	8.2	5.1	6.6	6.7	7.2	7.8	8.6	7.3	4.6	2.4	2.7	0.6	0.8	0.6	9.1	5.3	24
18	1.2	0.6	0.7	0.7	1.3	1.5	3.5	5.3	6.0	8.5	4.2	5.2	7.3	5.3	5.3	4.3	6.9	3.9	3.6	1.9	1.3	1.2	2.3	0.9	0.6	8.5	0.3	24
19	0.9	0.7	0.2	1.2	0.1	0.9	2.9	2.9	5.3	9.1	10.3	10.9	10.2	10.6	9.8	9.0	7.8	6.8	5.4	4.5	3.4	3.6	4.9	3.8	0.1	10.9	4.4	24
20	3.1	0.2	0.3	1.1	0.4	2.5	4.8	6.1	10.8	11.5	12.6	11.2	11.3	11.0	10.4	9.2	9.4	8.8	5.2	3.3	1.1	1.4	1.2	1.4	0.2	12.6	5.4	24
21	0.4	0.6	0.6	0.7	0.9	1.2	1.6	3.2	2.0	4.2	4.1	6.4	7.8	6.0	7.9	11.8	8.6	7.1	1.8	8.1	3.2	0.3	1.2	1.1	0.3	11.8	1.7	24
22	3.1	2.3	0.7	0.9	0.4	1.9	3.6	2.4	2.3	1.0	2.4	2.6	3.1	4.2	1.5	2.7	1.6	1.2	1.9	1.1	0.9	0.1	0.3	0.6	0.1	4.2	0.7	24
23	1.0	0.2	0.1	0.4	0.4	P	P	2.2	3.4	4.7	6.4	5.5	6.5	2.8	7.4	7.0	6.0	4.5	1.5	1.8	3.3	1.1	1.3	0.6	0.1	7.4	2.7	22
24	0.2	0.1	0.3	0.6	0.1	0.2	3.4	5.7	3.3	1.5	2.9	1.9	1.2	1.4	1.0	4.3	5.6	4.9	2.0	2.5	3.1	2.8	2.6	4.5	0.1	5.7	0.5	24
25	3.4	2.3	2.5	2.5	2.9	4.2	5.6	5.1	5.2	6.0	6.0	3.4	4.7	6.8	4.3	6.4	5.5	3.7	4.2	3.5	2.4	1.5	3.2	4.4	1.5	6.8	1.2	24
26	4.0	4.0	4.4	3.2	5.5	6.5	4.4	4.5	1.5	7.2	10.1	10.0	10.6	11.8	10.9	11.8	11.5	10.4	9.7	6.0	3.0	2.8	3.9	2.8	1.5	11.8	5.3	24
27	3.1	4.9	3.9	2.0	1.8	4.8	8.2	9.0	11.4	13.0	13.4	14.8	14.1	14.4	15.3	13.0	11.9	9.0	6.5	2.3	1.3	1.1	1.3	1.5	1.1	15.3	7.0	24
28	4.5	5.9	4.6	6.9	6.8	4.6	4.0	6.9	9.2	8.1	8.9	11.5	8.4	8.7	6.5	8.4	10.4	13.2	13.9	11.0	7.8	8.7	10.6	9.9	4.0	13.9	0.6	24
29	17.5	14.3	6.2	0.5	2.5	4.0	7.1	11.2	11.6	10.7	12.7	9.2	8.1	8.7	8.3	7.7	8.6	6.4	5.4	3.0	4.2	4.6	5.1	7.9	0.5	17.5	6.7	24
30	9.4	3.4	0.8	2.5	2.7	2.8	2.7	1.9	2.9	X	X	X	6.3	9.8	11.0	6.1	5.5	3.9	4.2	4.1	2.6	1.1	1.6	1.6	0.8	11.0	3.2	21
31	1.3	2.6	1.2	2.1	1.8	1.2	2.2	2.8	4.6	7.9	9.4	8.2	9.8	8.5	7.3	5.7	5.6	7.5	7.1	3.6	4.2	3.7	3.2	4.5	1.2	9.8	3.5	24
HOURLY MAX	17.5	14.3	7.8	6.9	7.0	9.4	10.2	12.9	11.9	16.6	18.4	18.3	17.6	21.2	20.4	19.4	16.4	19.7	19.3	18.5	16.2	17.2	19.1	12.9				

STATUS FLAG CODES

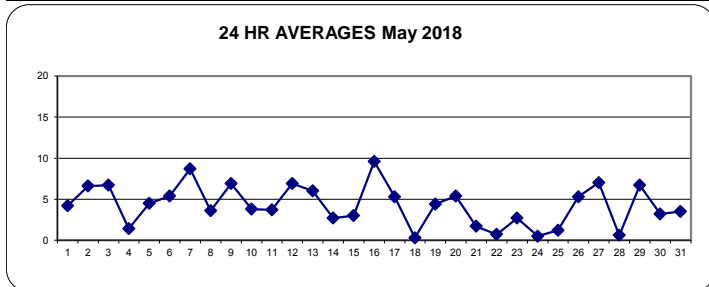
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

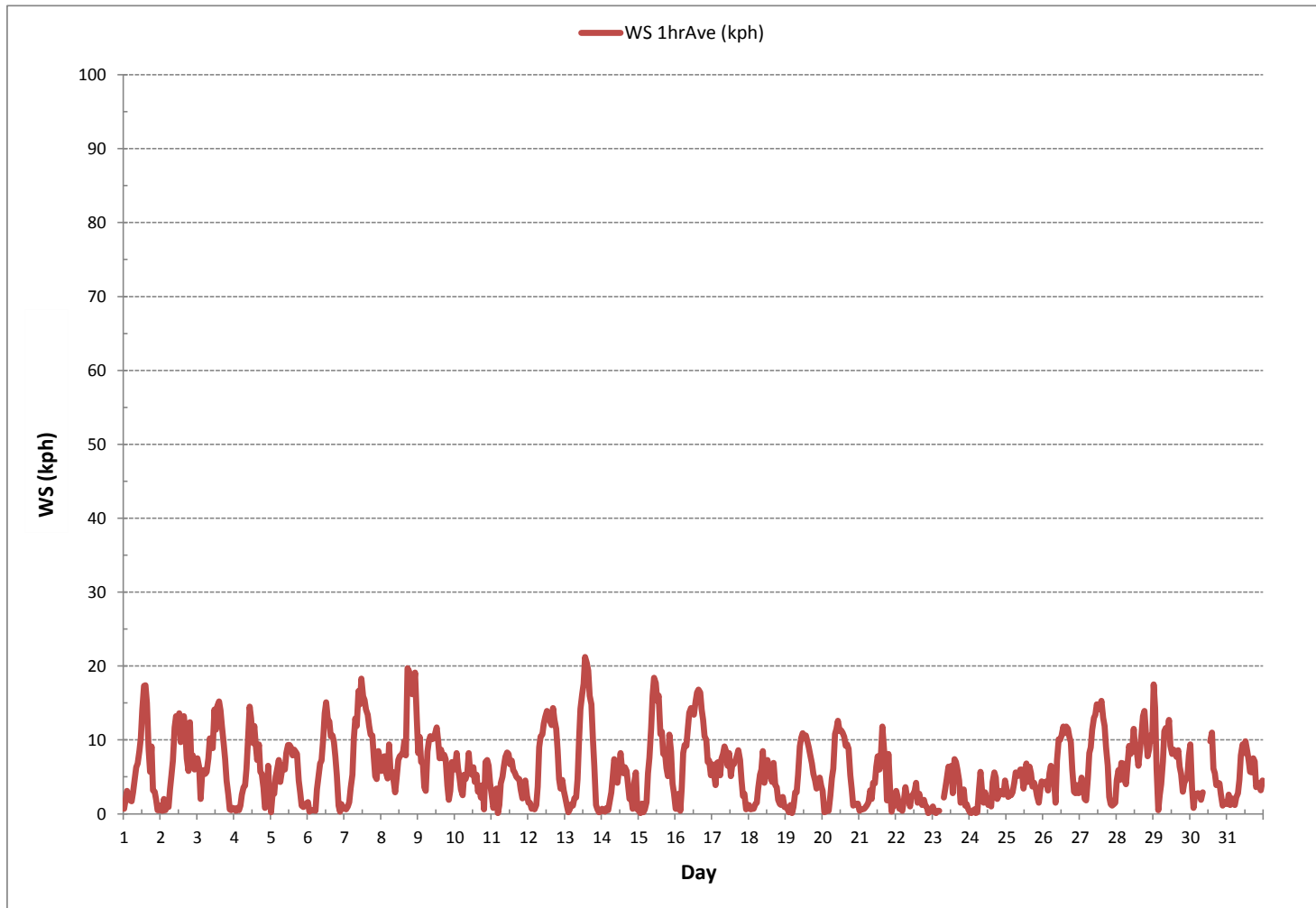
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	739
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 4 ON DAY 11
MAXIMUM 1-HR AVERAGE:	21.2 kph @ HOUR 13 ON DAY 13
MAXIMUM 24-HR AVERAGE:	9.6 kph ON DAY 16
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	739 hrs
AMT OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	4.5
MONTHLY AVERAGE:	1.2 kph

24 HR AVERAGES May 2018



WIND SPEED Hourly Averages (WS kph)



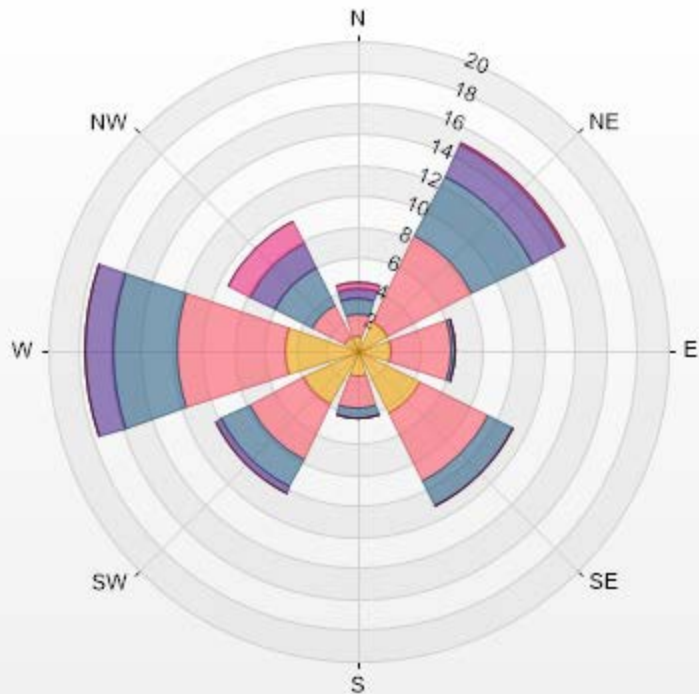
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 05/2018
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 21.38%

Direction	1.8-4.3	4.3-8.5	8.5-12.8	12.8-17.0	17.0-21.3	>21.3	Total
N	1.0	1.5	1.0	0.7	0.4	0.0	4.5
NE	2.2	6.1	4.3	2.3	0.1	0.0	15.0
E	2.2	3.9	0.3	0.0	0.0	0.0	6.4
SE	4.5	5.0	1.8	0.0	0.0	0.0	11.2
S	1.6	2.2	0.5	0.0	0.0	0.0	4.3
SW	3.9	3.9	2.0	0.4	0.0	0.0	10.3
W	4.7	6.9	4.2	1.8	0.0	0.0	17.6
NW	1.0	2.3	2.7	1.9	1.5	0.0	9.3
Summary	21.0	31.8	16.8	7.0	2.0	0.0	78.7

% Icon Classes (kph) 21 1.8-4.3 32 4.3-8.5 17 8.5-12.8 7 12.8-17.0 2 17.0-21.3 0 >21.3

LICA COLD LAKE SOUTH 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 21.38% Calm Wind Avg Speed: 0.87(kph)



WIND DIRECTION



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

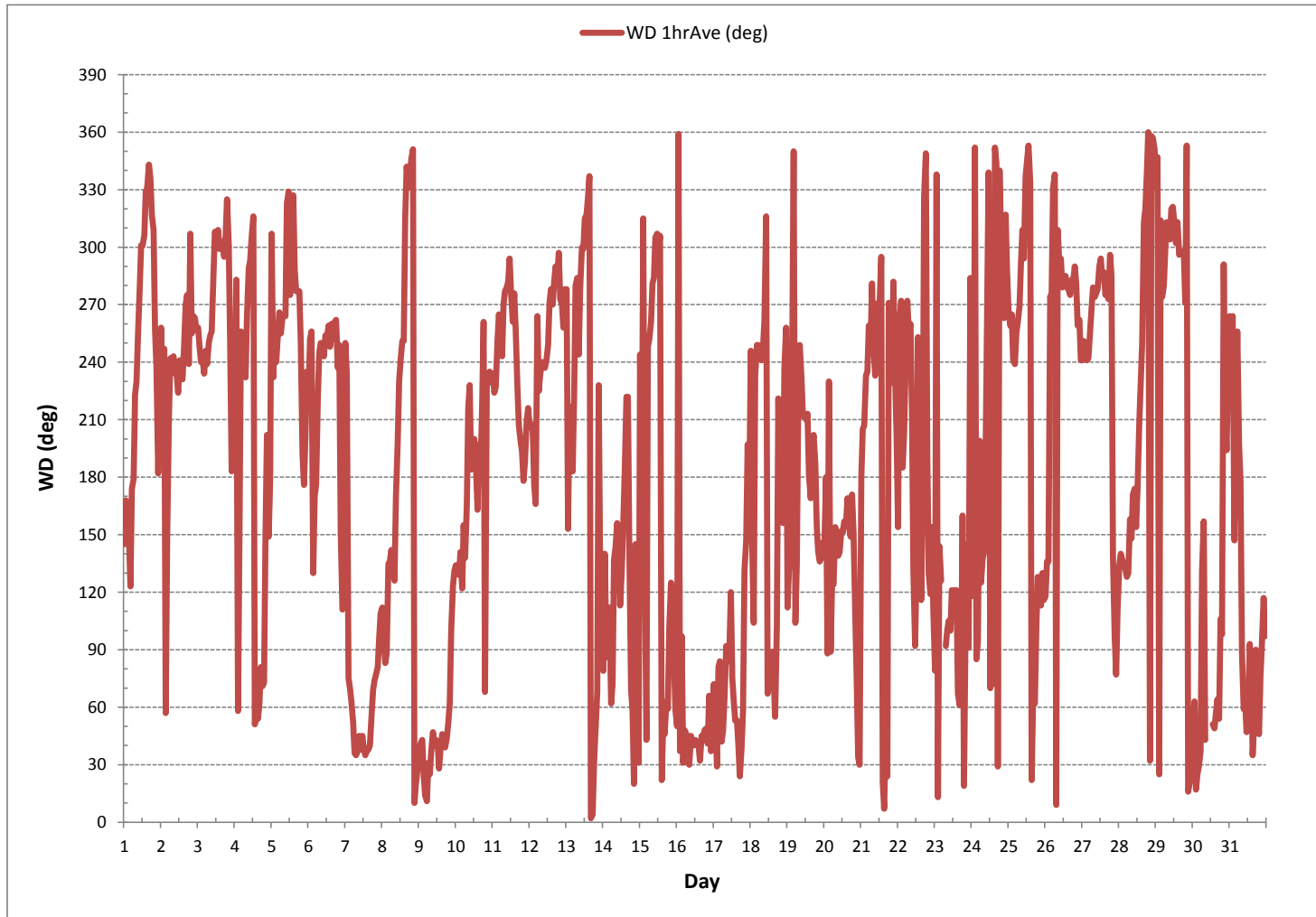
STATUS FLAG CODES

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:	739 hrs
STANDARD DEVIATION:	97	AMD OPERATION UPTIME:	99.3 %
		MONTHLY AVERAGE:	314 (NW)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	45	66	39	48	54	49	40	25	30	33	31	24	22	16	20	17	24	23	15	20	14	26	46	54	24
2	57	40	34	57	25	37	35	20	24	20	21	23	23	22	23	20	23	28	22	22	18	16	17	16	24
3	16	15	47	12	13	16	17	20	20	22	23	23	29	21	23	23	21	20	18	15	15	43	56	21	24
4	52	51	52	57	56	18	19	20	21	22	23	22	25	20	19	29	23	23	20	18	53	39	13	27	24
5	63	24	20	12	16	17	18	21	26	29	31	31	40	35	41	27	27	24	22	15	23	31	38	43	24
6	30	51	47	53	60	54	22	18	21	23	22	22	22	24	26	28	26	25	22	14	51	50	34	42	24
7	45	44	36	46	22	17	19	19	18	16	19	17	19	19	19	18	17	18	19	18	17	15	19	23	24
8	24	23	28	39	23	17	21	17	32	45	40	33	32	34	35	35	29	16	16	18	35	18	17	18	24
9	18	18	18	19	23	28	17	21	21	23	26	25	20	27	33	27	28	21	17	17	17	26	21	17	24
10	16	13	17	18	21	40	23	40	42	32	50	48	43	54	43	54	45	44	27	46	22	15	16	15	24
11	18	35	29	19	47	34	20	28	29	32	37	35	41	45	56	45	44	44	33	33	33	33	32	28	24
12	36	28	32	29	50	71	32	18	18	21	20	22	25	26	30	27	23	24	22	18	18	16	12	23	24
13	31	32	71	64	27	43	22	40	36	27	23	22	23	20	18	20	23	20	20	16	44	60	49	51	24
14	61	47	49	41	55	20	20	23	25	36	54	42	36	40	49	36	35	38	23	35	64	46	31	72	24
15	77	76	71	62	38	43	19	22	23	22	21	19	23	22	29	20	22	21	27	30	23	20	37	30	24
16	50	55	33	63	27	17	16	19	20	20	19	20	22	20	19	18	17	17	16	18	19	24	24	17	24
17	21	21	21	24	21	21	16	24	26	29	35	34	40	39	37	34	25	22	20	19	24	24	52	40	24
18	42	41	54	45	48	29	21	26	33	28	42	42	32	46	41	39	42	45	53	22	31	48	22	39	24
19	54	45	77	51	53	58	34	39	36	26	35	36	37	35	38	39	43	40	39	23	12	9	11	17	24
20	36	55	73	68	70	40	26	29	19	24	23	33	33	36	33	38	33	33	34	23	27	17	39	28	24
21	47	67	51	60	45	46	59	37	59	40	45	36	29	37	24	21	21	25	37	20	17	44	52	47	24
22	53	35	69	44	52	35	22	33	53	63	50	57	63	47	55	60	64	53	48	31	29	58	41	53	24
23	30	54	62	44	37	P	P	43	36	32	27	46	42	61	33	35	39	45	44	34	37	34	15	46	22
24	50	46	65	74	76	66	26	24	27	57	37	39	39	64	59	22	19	22	38	20	17	17	23	20	24
25	20	27	27	29	17	17	17	21	24	24	21	24	35	30	43	33	28	38	24	19	18	44	18	18	24
26	17	20	33	52	49	32	26	27	33	31	24	25	26	28	31	28	25	24	22	19	14	11	13	11	24
27	20	15	13	13	13	16	20	25	25	25	26	23	25	26	25	24	27	28	24	41	30	26	25	24	24
28	13	12	13	14	15	17	24	31	27	38	36	34	36	36	41	28	20	17	18	20	21	19	18	20	24
29	17	20	23	66	22	20	21	21	20	24	21	33	37	42	35	37	23	28	16	14	22	20	19	19	24
30	16	26	62	30	20	24	25	39	37	X	X	X	12	18	17	16	19	16	15	15	11	12	10	12	21
31	12	12	14	13	12	13	16	15	17	23	25	24	24	31	45	15	17	28	26	25	14	13	13	19	24

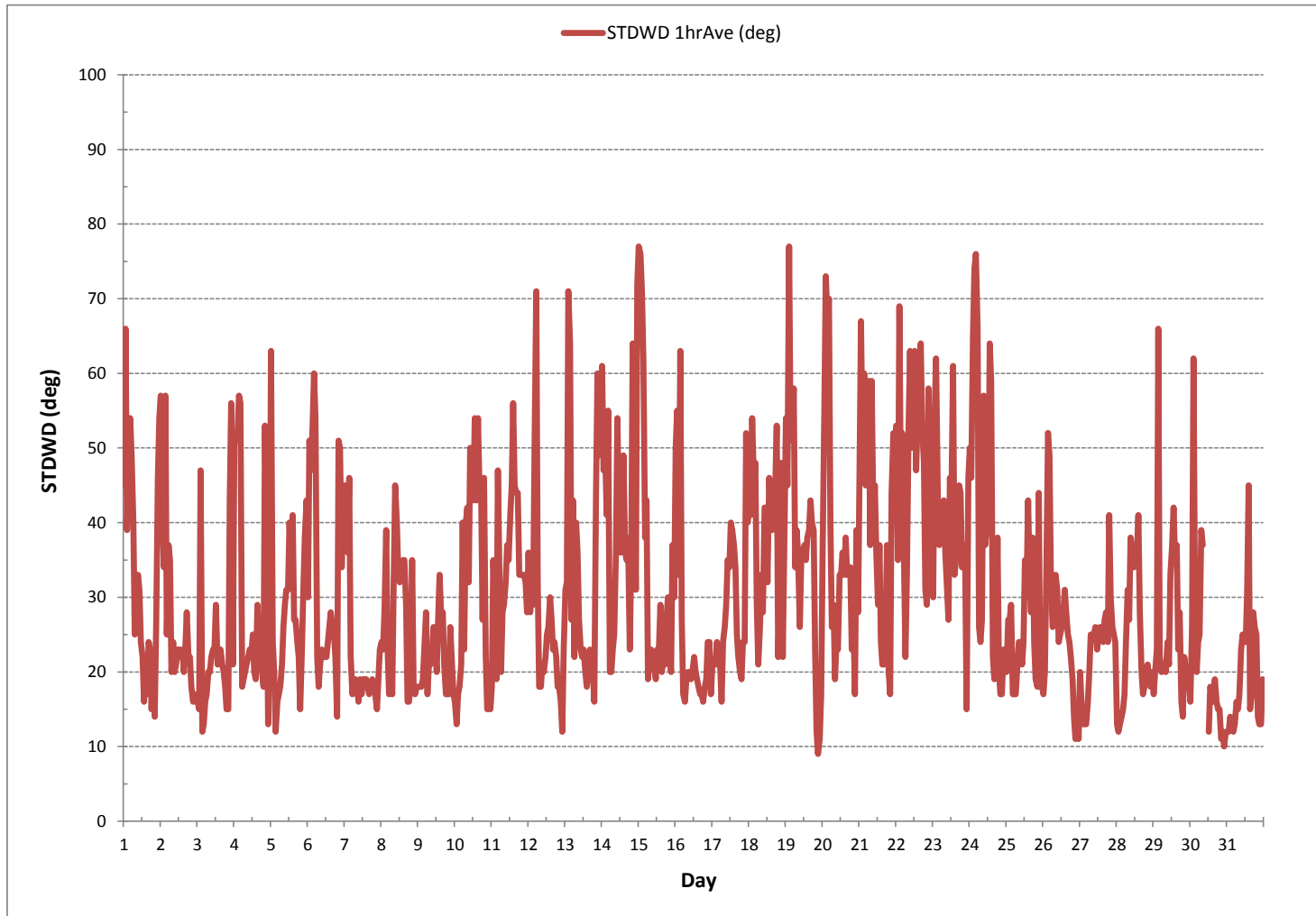
STATUS FLAG CODES

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

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 739 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



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

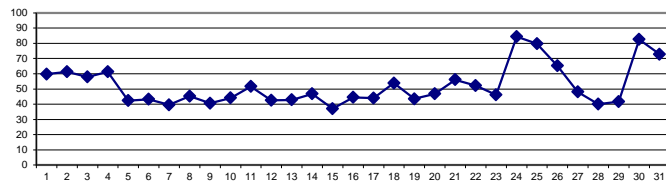
RELATIVE HUMIDITY Hourly Averages (RH %)

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

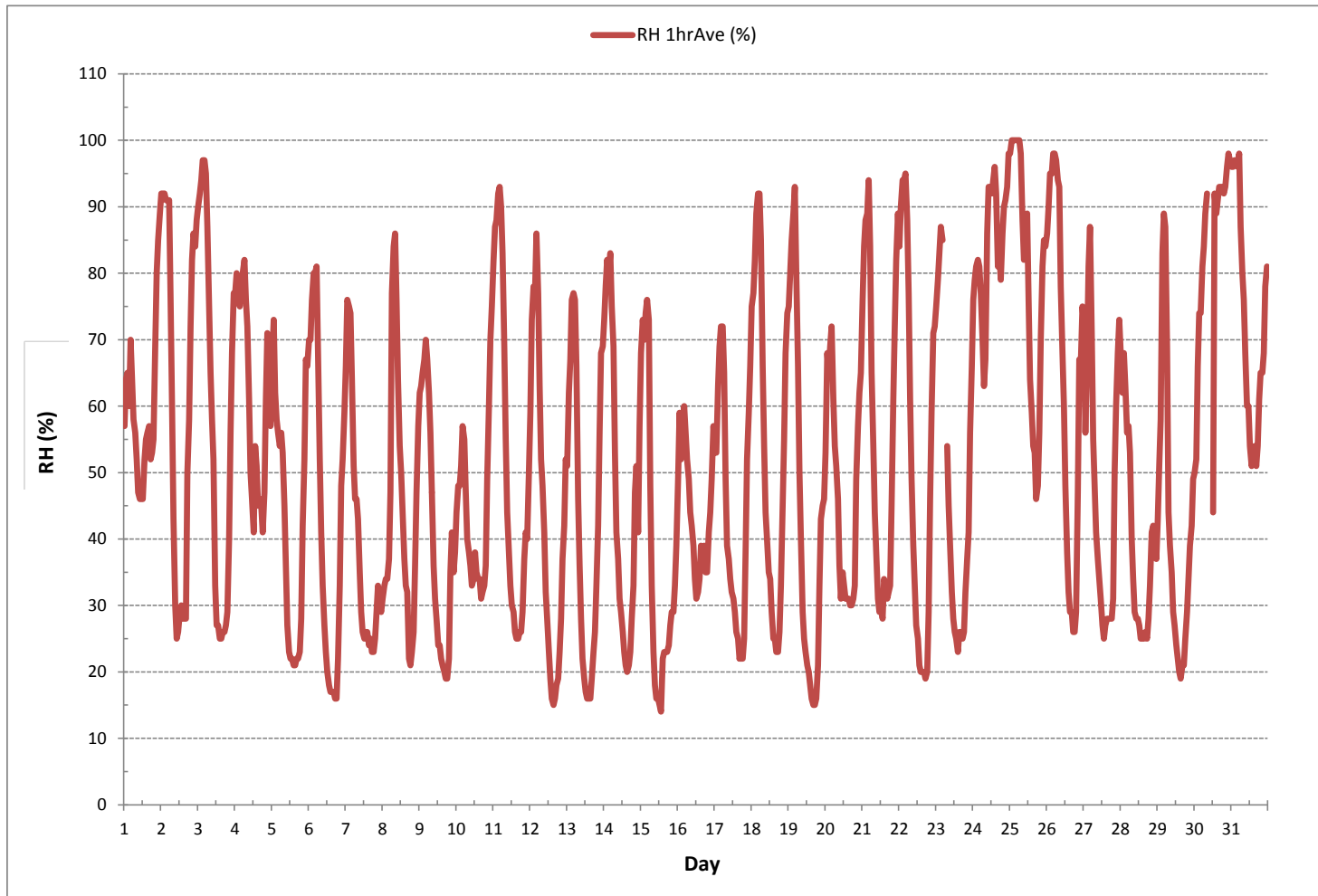
24 HR AVERAGES May 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	14	%	@ HOUR	13	ON DAY	15
MAXIMUM 1-HR AVERAGE:	100	%	@ HOUR	1	ON DAY	25
MAXIMUM 24-HR AVERAGE:	84	%			ON DAY	24
OPERATIONAL TIME:						739 hrs
AMD OPERATION UPTIME:						99.3 %
STANDARD DEVIATION:	24					MONTHLY AVERAGE: 52 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



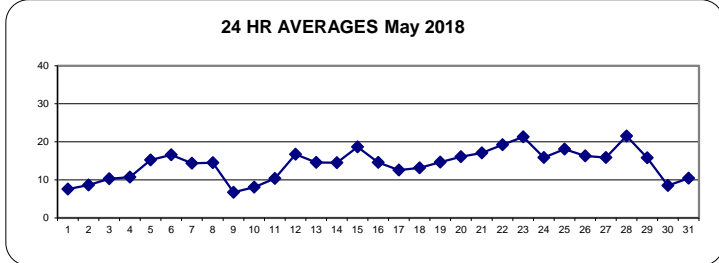
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

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	5.1	3.4	3.5	4.6	2.5	4.2	5.6	6.9	8.9	11.2	12.7	13.1	13.3	11.7	11.1	10.5	10.2	10.6	10.3	9.5	6.2	3.4	1.9	0.6	0.6	13.3	7.5	24
2	-0.6	-1.0	-1.4	-1.8	-2.2	-1.4	3.3	6.8	11.0	13.7	15.1	15.1	15.2	15.3	16.7	17.7	18.3	14.7	13.6	9.8	8.3	7.2	7.1	6.4	-2.2	18.3	8.6	24
3	5.7	4.6	3.2	2.5	2.7	3.2	4.5	7.7	9.7	11.5	13.1	15.6	16.7	16.7	17.5	17.4	16.7	16.8	16.0	15.4	11.7	7.6	5.5	4.4	2.5	17.5	10.3	24
4	3.6	2.6	3.6	3.9	3.9	4.6	5.8	8.2	10.4	13.1	14.8	15.3	16.2	14.0	14.4	16.1	15.6	15.9	16.5	15.0	11.2	9.1	11.1	11.9	2.6	16.5	10.7	24
5	10.0	9.1	9.8	9.9	10.0	10.9	11.0	12.2	14.7	17.3	19.2	20.3	20.6	21.1	22.0	22.0	21.6	20.5	18.4	13.9	11.1	9.4	8.3	8.3	22.0	15.2	24	
6	7.5	6.7	5.5	4.6	3.7	4.0	8.3	12.6	16.7	19.2	22.4	24.0	25.2	26.0	26.5	26.8	26.7	26.7	26.0	23.3	18.4	14.4	12.2	10.2	3.7	26.8	16.6	24
7	8.4	7.0	6.1	5.9	7.2	10.5	12.3	12.5	14.2	15.6	17.1	17.9	19.0	19.6	19.7	19.3	19.4	20.1	19.5	17.6	15.4	13.6	13.9	13.5	5.9	20.1	14.4	24
8	12.7	12.0	12.2	12.6	11.7	10.9	8.3	7.5	8.0	10.3	13.4	16.7	18.8	20.7	22.6	22.3	22.0	22.9	21.6	18.7	15.5	12.8	8.9	5.5	5.5	22.9	14.5	24
9	4.1	3.3	2.4	1.8	1.1	1.7	2.9	3.6	4.3	5.7	7.2	8.4	9.5	10.7	11.5	11.9	12.1	12.2	11.8	10.9	7.4	5.3	6.5	5.7	1.1	12.2	6.8	24
10	4.3	4.1	3.9	3.1	1.9	2.8	5.1	7.7	9.5	10.4	11.0	11.3	10.8	11.3	11.4	11.9	12.1	12.1	12.2	11.5	8.6	7.0	5.4	4.1	1.9	12.2	8.1	24
11	2.2	0.5	-0.5	-0.7	-1.2	0.6	3.6	6.9	9.9	11.9	13.1	14.4	15.5	16.2	17.3	18.0	18.2	18.7	18.4	17.2	13.9	12.1	12.6	10.7	-1.2	18.7	10.4	24
12	8.2	6.3	5.0	4.1	3.3	5.2	10.5	13.2	14.6	17.5	20.7	22.9	24.7	25.7	26.3	26.5	26.0	25.7	25.0	23.4	20.7	17.5	15.3	12.7	3.3	26.5	16.7	24
13	12.9	10.3	9.4	8.4	7.2	7.8	10.5	14.5	16.9	19.1	20.4	21.2	21.8	22.0	21.9	21.7	20.6	19.4	17.4	14.6	12.1	8.7	6.6	5.1	5.1	22.0	14.6	24
14	4.0	3.1	2.0	1.6	1.1	3.4	7.2	11.0	14.0	15.6	17.6	19.3	21.1	22.8	24.1	25.0	24.8	24.3	23.2	21.6	17.1	15.4	16.3	12.0	1.1	25.0	14.5	24
15	9.4	8.3	9.7	8.7	8.1	9.2	15.1	19.6	23.0	24.3	24.7	24.9	25.8	26.2	25.0	24.4	24.1	24.2	23.7	22.2	19.1	17.9	16.6	14.3	8.1	26.2	18.7	24
16	11.8	9.7	10.4	10.0	8.7	10.0	11.0	12.6	14.6	16.5	18.1	19.7	20.8	20.7	20.2	19.3	18.3	16.8	16.1	15.1	13.4	13.0	12.0	10.6	8.7	20.8	14.6	24
17	11.3	10.1	7.7	7.9	7.9	7.2	7.8	9.9	11.6	12.7	14.1	15.4	16.5	17.2	17.8	18.1	18.3	18.0	17.3	16.2	13.1	10.4	8.8	7.3	7.2	18.3	12.6	24
18	6.1	5.3	4.4	3.6	3.4	4.8	8.1	12.2	14.8	16.8	17.8	18.2	18.3	19.2	19.9	19.6	20.1	19.9	20.1	18.0	14.7	11.8	9.9	8.4	3.4	20.1	13.1	24
19	7.1	5.7	4.6	3.6	2.9	5.7	10.7	14.0	17.0	18.8	19.3	20.1	20.7	21.2	21.6	21.8	22.0	22.1	21.5	20.0	16.0	12.5	11.4	11.4	2.9	22.1	14.7	24
20	9.5	7.3	6.7	6.7	5.6	8.9	12.1	14.3	16.4	18.2	19.3	20.3	21.4	22.1	23.0	23.1	23.2	23.5	23.3	22.2	17.9	15.3	13.4	11.5	5.6	23.5	16.1	24
21	9.8	8.3	7.1	6.4	5.9	8.5	13.6	16.5	20.0	22.6	24.4	25.1	25.1	25.7	23.6	23.7	24.1	24.2	23.7	20.1	16.6	13.5	11.6	10.1	5.9	25.7	17.1	24
22	10.8	9.2	8.1	7.2	7.0	9.3	13.2	17.0	20.6	23.3	24.9	26.0	27.0	27.7	28.0	28.2	28.3	28.0	25.7	20.0	16.4	14.0	12.8	7.0	28.3	19.2	24	
23	11.4	10.2	9.1	8.1	7.9	P	P	19.6	22.2	24.2	26.1	27.3	27.8	28.2	29.0	28.3	28.4	28.1	27.9	26.2	24.2	21.9	17.7	15.1	7.9	29.0	21.3	22
24	13.0	11.7	10.8	10.6	11.5	13.6	16.4	18.7	18.4	16.8	16.3	16.6	16.3	16.8	17.2	18.0	19.1	18.3	18.5	17.7	16.9	16.5	15.9	15.0	10.6	19.1	15.9	24
25	14.4	14.2	14.5	14.2	14.3	14.4	14.7	15.4	17.2	18.3	18.3	17.9	19.7	21.6	22.6	23.4	23.5	24.0	23.5	22.0	18.9	16.4	15.3	15.8	14.2	24.0	18.1	24
26	15.6	15.0	14.4	14.5	14.2	14.2	14.1	13.8	14.1	16.9	18.0	18.9	19.8	20.1	20.7	20.6	20.6	19.8	19.0	15.0	11.4	10.5	10.0	10.0	10.0	20.7	16.3	24
27	9.7	11.8	9.9	7.4	6.6	9.5	12.4	14.5	15.8	16.6	17.7	18.8	20.1	21.1	21.6	22.3	22.5	22.8	22.8	22.3	17.4	13.9	12.1	10.8	6.6	22.8	15.9	24
28	11.8	12.9	11.8	12.6	13.9	14.0	15.7	19.7	22.4	25.0	26.1	27.0	27.8	29.0	29.3	29.5	28.9	28.8	27.3	25.1	21.0	19.7	19.0	18.6	11.8	29.5	21.5	24
29	17.2	14.9	13.1	10.9	10.3	10.6	13.0	14.5	15.2	16.2	16.9	18.1	18.8	19.2	20.1	19.9	19.1	19.8	18.6	18.0	15.6	13.8	13.4	12.5	10.3	20.1	15.8	24
30	12.1	11.6	10.7	9.6	9.2	8.6	9.0	9.0	9.1	X	X	X	X	8.0	7.4	7.1	7.1	7.4	7.6	7.6	7.4	7.3	7.2	7.1	7.1	12.1	8.5	20
31	7.0	6.8	6.8	6.7	6.8	7.1	7.8	8.7	10.1	11.7	12.8	12.9	13.6	13.8	14.0	14.0	14.3	13.3	12.6	12.4	11.3	10.2	8.3	8.3	6.7	14.3	10.5	24
HOURLY MAX	17.2	15.0	14.5	14.5	14.3	14.4	16.4	19.7	23.0	25.0	26.1	27.3	27.8	29.0	29.3	29.5	28.9	28.8	28.0	26.2	24.2	21.9	19.0	18.6				
HOURLY AVG	8.9	7.9	7.2	6.7	6.4	7.5	9.8	12.3	14.4	16.4	17.8	18.8	19.6	19.7	20.1	20.3	20.2	20.1	19.5	18.0	14.8	12.5	11.3	10.0				

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

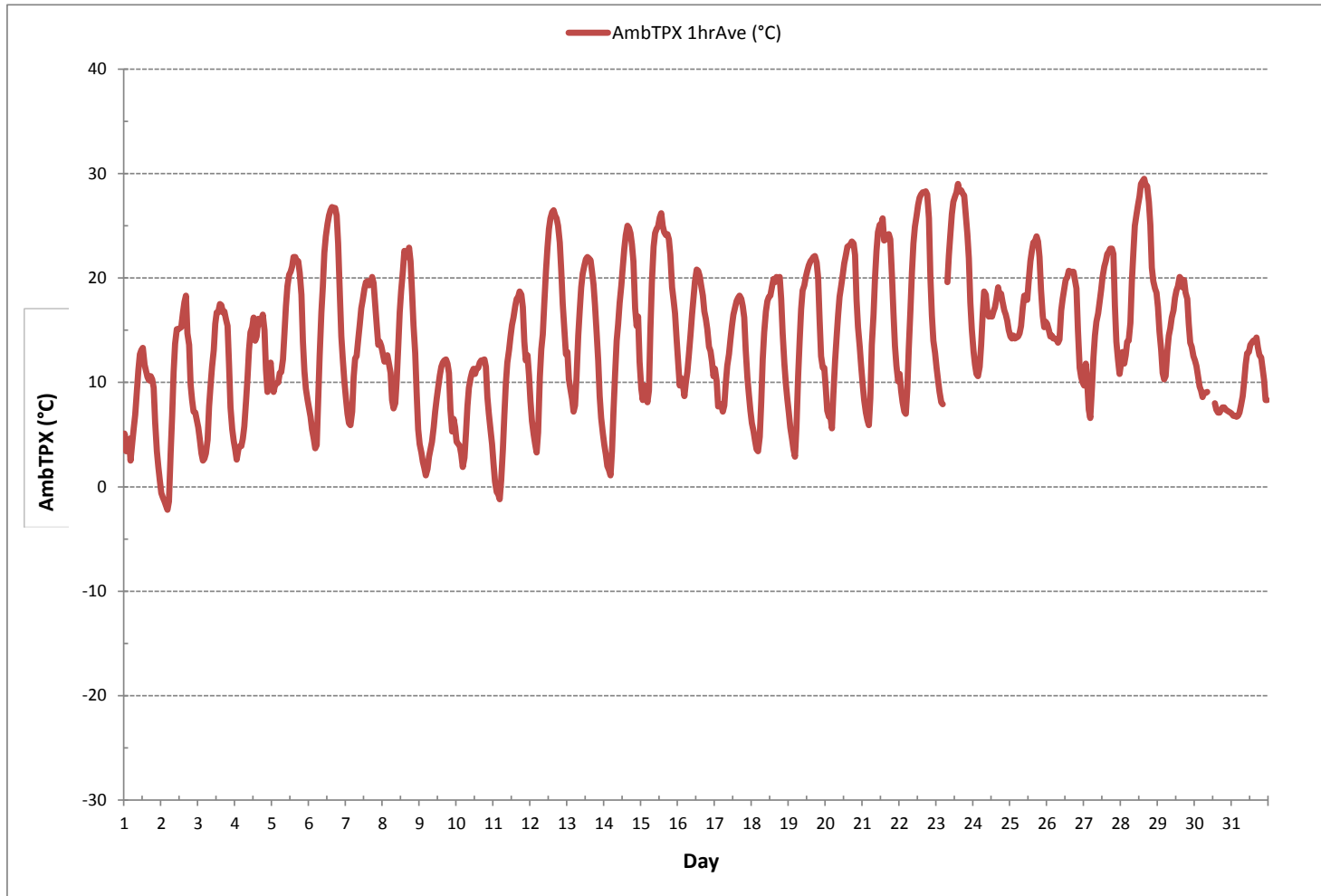
24 HR AVERAGES May 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-2.2 °C	@ HOUR	4	ON DAY	2	
MAXIMUM 1-HR AVERAGE:	29.5 °C	@ HOUR	15	ON DAY	28	
MAXIMUM 24-HR AVERAGE:	21.5 °C			ON DAY	28	
OPERATIONAL TIME:				738	hrs	
AMD OPERATION UPTIME:				99.2	%	
STANDARD DEVIATION:	6.8	MONTHLY AVERAGE:				14.2 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	May 8, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	941	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Moderate rain		
Parameter:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	8:43	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	13:13	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:	April 4, 2018	As Found C.F.:	0.996		
Previous C.F.:	1.001	New C.F.:	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): 49.2	Standard Calibration Points for Ranges <table border="1"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

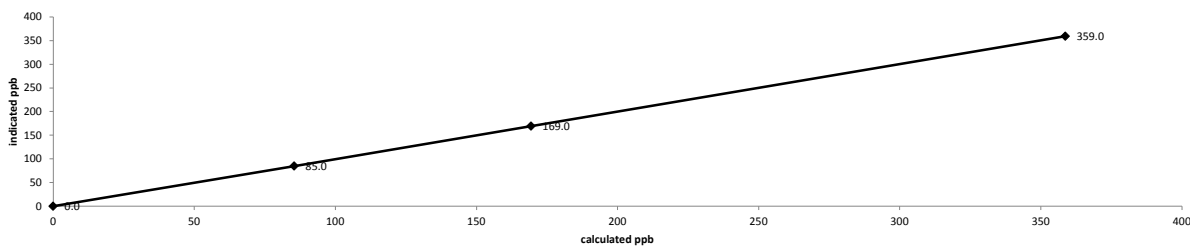
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5056	0.00	5056	0.0	0.0	n/a
as found high	5012	36.81	5049	358.7	360.0	0.996
adjusted zero	5056	0.00	5056	0.0	0.0	n/a
adjusted high	5012	36.81	5049	358.7	359.0	0.999
mid	5043	17.42	5060	169.4	169.0	1.002
low	5043	8.77	5052	85.4	85.0	1.005
calibrator zero	5056	0.00	5056	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) =	0.06%		± 3% F.S.
% change in C.F. from last cal =	0.46%		± 10%

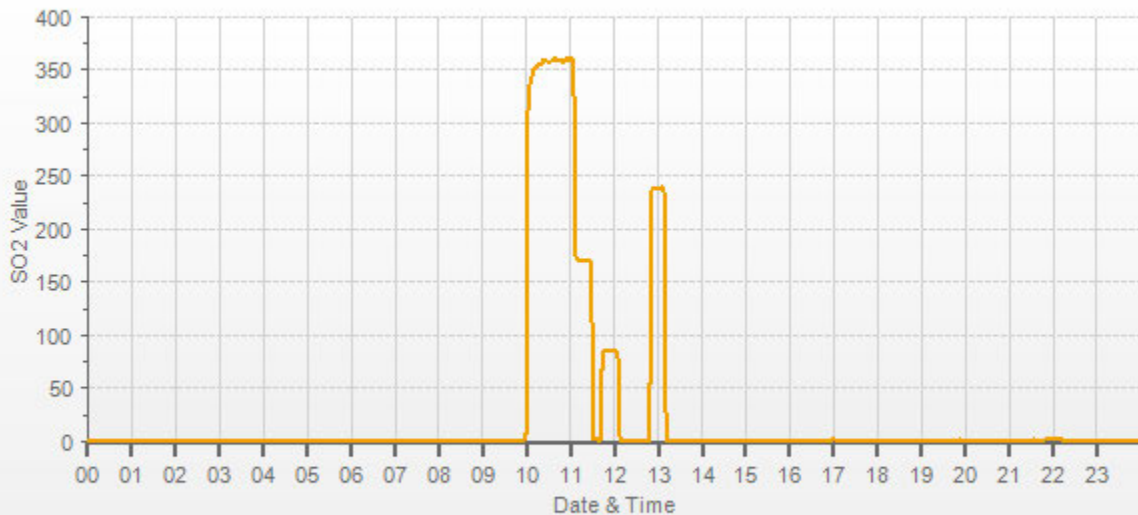
Thermo 43i Sulphur Dioxide Analyzer Calibration



As found:		As left:	
Bkg:	8.6	Bkg:	8.6
Coef:	0.975	Coef:	0.970
Pmt:	-624.2	Pmt:	-624.2
Flash:	769	Flash:	770
Internal:	29.0	Internal:	29.1
Chamber:	45.0	Chamber:	45.0
Perm Oven Gas:	34.99	Perm Oven Gas:	35.00
Perm Oven Heater:	34.24	Perm Oven Heater:	34.24
Pressure:	679.8	Pressure:	678.6
Sample Flow:	0.471	Sample Flow:	0.471
Lamp Intensity:	96	Lamp Intensity:	96
Converter:	n/a	Converter:	n/a
Converter Set:	n/a	Converter Set:	n/a
Averaging Time:	120	Averaging Time:	120
Expected Value:	243.0	Expected Value:	239.0

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

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/05/08 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: May 16, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	932	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Cold Lake South	Weather Conditions: Mix of sun and clouds		
Parameter: Sulphur Dioxide	Calibration Purpose: as found		
Start Time 24 hr. (mst): 18:22	Performed By/Reviewer: Alex Yakupov Rob Fisher		
End Time 24 hr. (mst): 20:09	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: May 8, 2018	As Found C.F.: 0.990		
Previous C.F.: 0.999	New C.F.: n/a		

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018									
Calibrator ID/Expiry Date: Enviroconics id# 5212 expires March 1, 2019									
Cal Gas Cylinder I.D. #: LL 104225									
Cal Gas Conc. (ppm): 49.2									

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

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	5065	0.00	5065	0.0	0.0	n/a
as found high	5030	38.46	5068	373.4	377.0	0.990
Average C.F.=						n/a

Linear Regression/Calibration Results:

Correlation Coefficient = n/a	LIMITS n/a
Slope = n/a	n/a
b (Intercept as % of full scale)= n/a	n/a
% change in C.F. from last cal= 0.86%	n/a

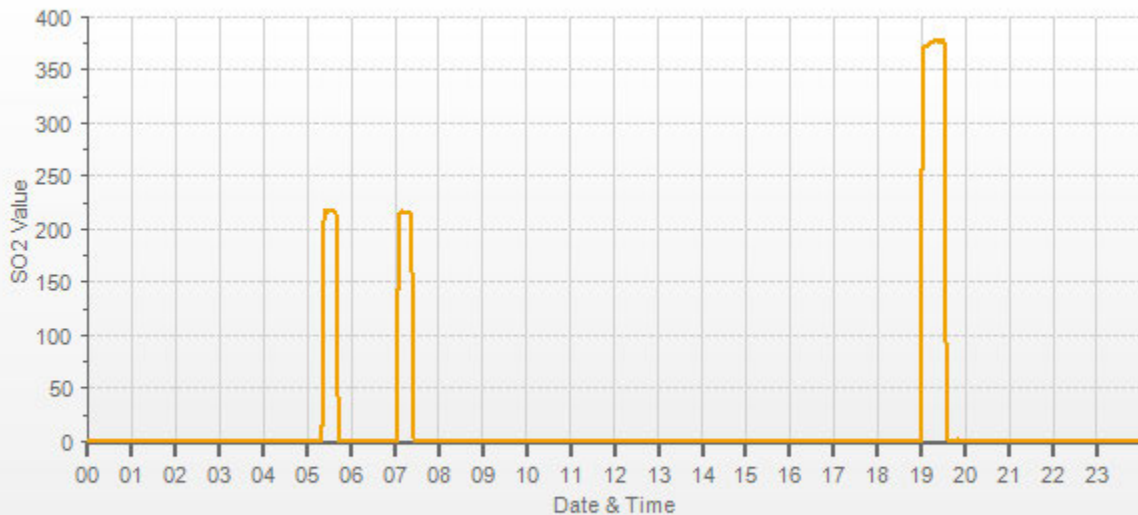
As found:	As left:
Bkg: 8.6	Bkg: 8.6
Coef: 0.970	Coef: 0.970
Pmt: -623.8	Pmt: -623.8
Flash: 767	Flash: 767
Internal: 27.9	Internal: 28.0
Chamber: 45.0	Chamber: 45.0
Perm Oven Gas: 34.99	Perm Oven Gas: 35.00
Perm Oven Heater: 34.23	Perm Oven Heater: 34.23
Pressure: 682.5	Pressure: 682.5
Sample Flow: 0.471	Sample Flow: 0.471
Lamp Intensity: 96.0	Lamp Intensity: 96.0
Converter: n/a	Converter: n/a
Converter Set: n/a	Converter Set: n/a
Averaging Time: 120	Averaging Time: 120
Expected Value: 239.0	Expected Value: 239.0

Comments:

The manifold blower was found to be working normally.
The analyzer perm tube was changed, the new expected value will be updated once the perm tube temperature has stabilized.

An As Found calibration was completed because the daily SPAN check was low: -9%. A depleted permeation tube was suspected; therefore, the tube was replaced.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/05/16 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date:	May 25, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	934	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	A few clouds		
Parameter:	Sulphur Dioxide	Calibration Purpose:	repeat		
Start Time 24 hr. (mst):	9:33	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	13:56	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:	May 8, 2018	As Found C.F.:	1.003		
Previous 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: 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								

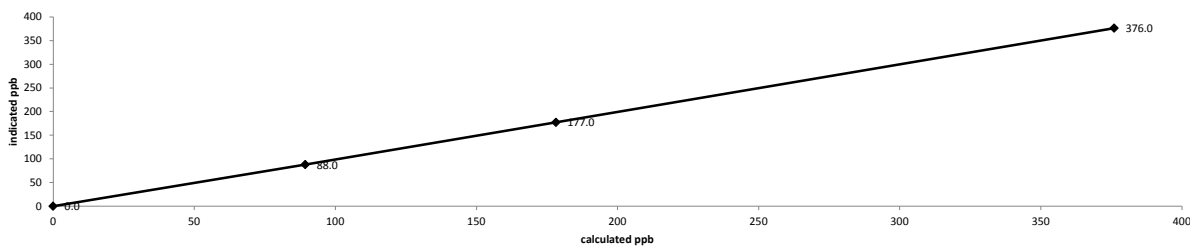
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5069	0.00	5069	0.0	0.0	n/a
as found high	5030	38.74	5069	376.0	375.0	1.003
adjusted zero	5069	0.00	5069	0.0	0.0	n/a
adjusted high	5030	38.74	5069	376.0	376.0	1.000
mid	5052	18.36	5070	178.2	177.0	1.007
low	5058	9.20	5067	89.3	88.0	1.015
Calibrator zero	5069	0.00	5069	0.0	0.0	n/a
Average C.F. =						1.007

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) =	0.16%		± 3% F.S.
% change in C.F. from last cal =	-0.37%		± 10%

Thermo 43i Sulphur Dioxide Analyzer Calibration

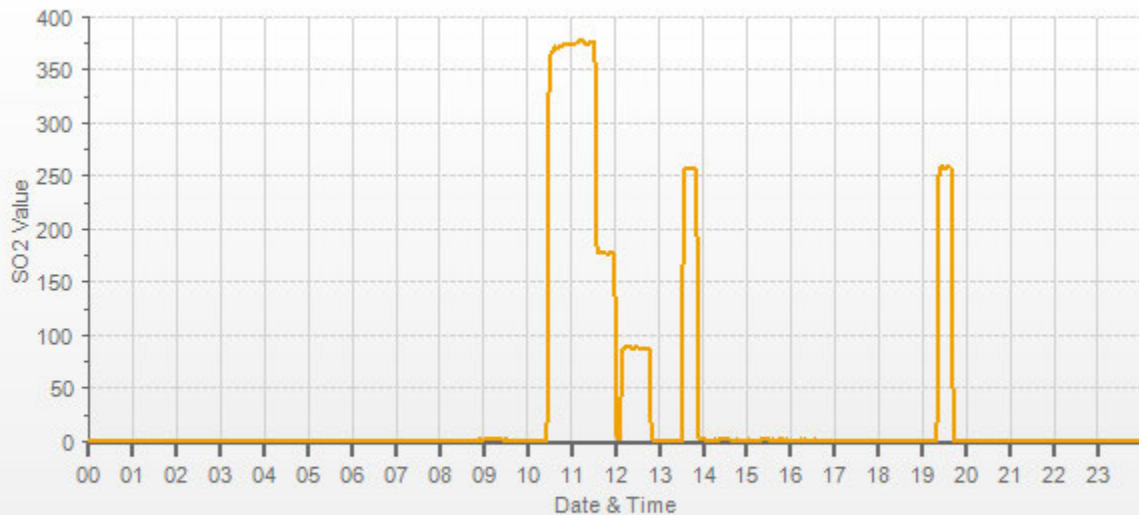


As found:	As left:
Bkg:	8.6
Coef:	0.970
Pmt:	-624.2
Flash:	764
Internal:	29.3
Chamber:	45.1
Perm Oven Gas:	45.00
Perm Oven Heater:	44.25
Pressure:	674.7
Sample Flow:	0.465
Lamp Intensity:	97
Converter:	n/a
Converter Set:	n/a
Averaging Time:	120
Expected Value:	239.0

Comments:

The manifold blower was found to be working normally.

A Repeat calibration was completed to correct the EV after a new permeation tube stabilized.



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date:	May 8, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	941	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Moderate rain		
Parameter:	Total Reduced Sulphur	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	8:43	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	13:19	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:	April 4, 2018	As Found C.F.:	0.998		
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.: 09:49 / 09:59 SO2 Analyzer Range: 500 Target Concentration (ppb): 380 As Found Zero: 0.0 Analyzer Response (ppb): 0.0 Zero Corrected Result (ppb): 0.0
Point	ppb									
High	78									
Mid	38									
Low	19									

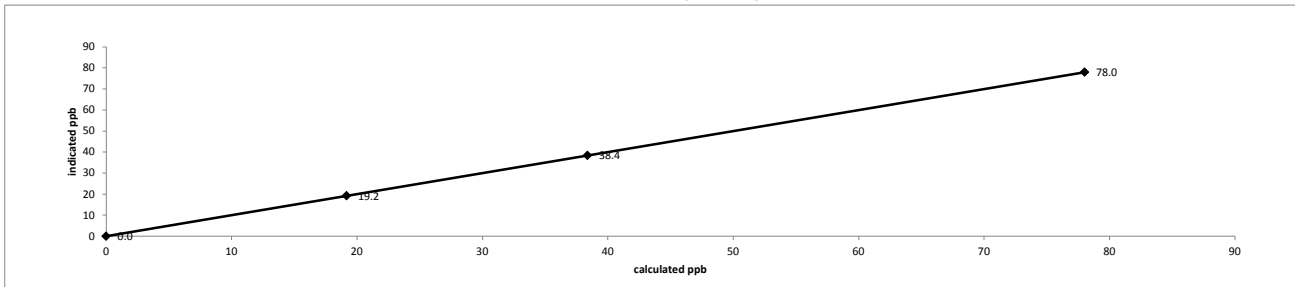
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7456	0.00	7456	0.0	0.0	n/a
as found high	7410	57.11	7467	78.0	78.2	0.998
adjusted zero	7456	0.00	7456	0.0	0.0	n/a
adjusted high	7410	57.11	7467	78.0	78.0	1.000
mid	7426	28.05	7454	38.4	38.4	1.000
low	7449	14.03	7463	19.2	19.2	0.999
calibrator zero	7456	0.00	7456	0.0	0.0	n/a
Average C.F. =						0.999

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) =	-0.02%		± 3% F.S.
% change in C.F. from last cal =	0.24%		± 10%

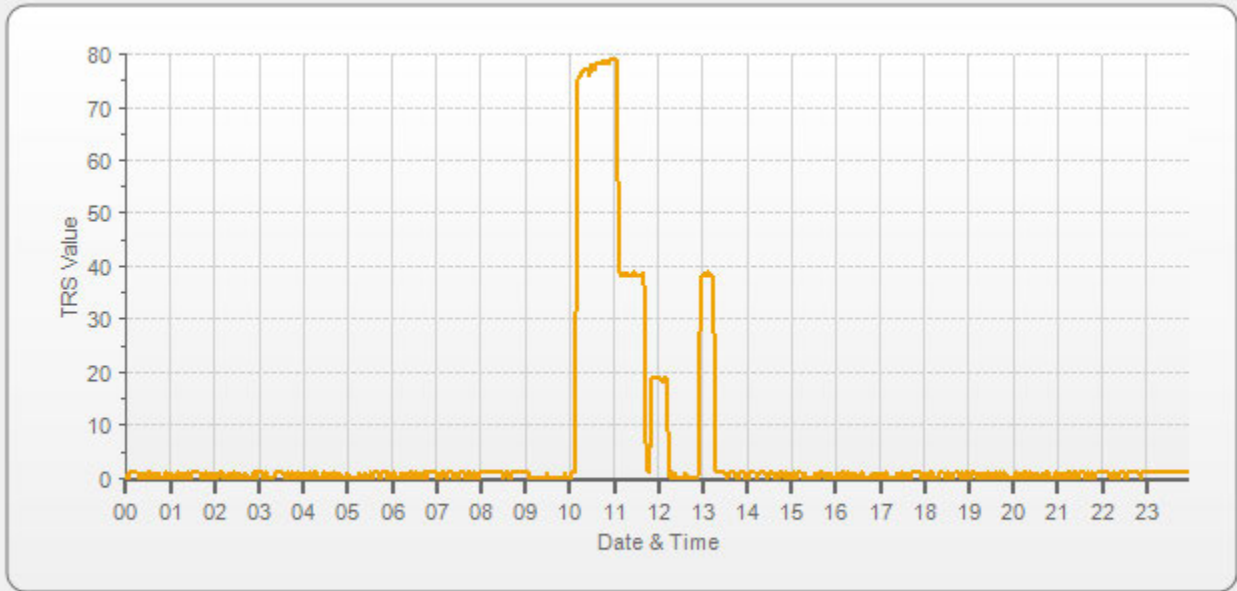
Thermo 450i Total Reduced Sulphur Analyzer Calibration



As found:		As left:	
Bkg:	14.5	Bkg:	14.6
Coef:	0.904	Coef:	0.910
Pmt:	-650.8	Pmt:	-650.8
Flash:	743	Flash:	743
Internal:	31.9	Internal:	32.1
Chamber:	45.0	Chamber:	45.0
Converter Temp:	825	Converter Temp:	825
Converter Set:	825	Converter Set:	825
Perm Oven Gas:	44.99	Perm Oven Gas:	45.00
Perm Oven Htr:	44.37	Perm Oven Htr:	44.38
Pressure:	632.2	Pressure:	632.2
Sample Flow:	0.491	Sample Flow:	0.491
Lamp Intensity:	92	Lamp Intensity:	92
Averaging Time:	120	Averaging Time:	120
Expected Value:	37.1	Expected Value:	38.0


Comments:

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



— TRS[ppb]

TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: May 9, 2018

Company/Airshed: LICA

Location/Station Name: Cold Lake South

Parameter: Total Hydrocarbon

Start/End Time 24 hr. (mst): 8:06 / 12:10

Calibration Method: Gas Dilution

Analyzer:

Serial Number/Owner: 1118249035 | Maxxam

Last Calibration Date: April 25, 2018

Previous Cal High Point C.F.: 0.999

Barometer/B.P./units: F.S. 05544 expires January 15, 2019 | 951 | 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: November 24, 2022

Range ppm: 50

As Found C.F.: 0.984

New C.F.: 1.001

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):

CH ₄ as propane/total CH ₄ equivalents (ppm):	590.0	207.0
	569.3	1159.3

Standard Calibration Points for a Range of: 50 ppm

Point	Target ppm
High	38
Mid	18
Low	9

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

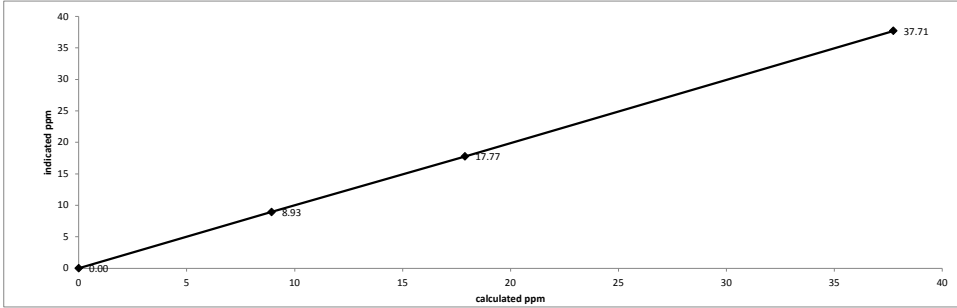
Point	Diluent	Cal Gas	Total	Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
as found zero	2506	0.00	2506	0.0	0.00	n/a
as found high	2427	81.67	2509	37.73	38.33	0.984
adjusted zero	2506	0.00	2506	0.00	0.00	n/a
adjusted high	2427	81.67	2509	37.73	37.71	1.001
mid	2467	38.68	2506	17.89	17.77	1.007
low	2488	19.32	2507	8.93	8.93	1.000
calibrator zero	2506	0.00	2506	0.0	0.00	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) =	0.05%		± 3% F.S.
% change in C.F. from last cal =	1.45%		± 10%

Thermo 51i Total Hydrocarbon Analyzer Calibration



As found:	Bkg: 1.15	Coef: 4.572	Bias Supply: -291	Detector Base: 125.0	Filter: 125	Pump: n/a	Flame: 155.6	Internal: 30.2	Sample: 8.3	Fuel: 20.9	Air: 39.4	Signal: 229	Status: LIT
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As left:	Bkg: 1.05	Coef: 4.473	Bias Supply: -291	Detector Base: 125.0	Filter: 125	Pump: n/a	Flame: 155.6	Internal: 29.0	Sample: 8.3	Fuel: 20.9	Air: 39.4	Signal: 201	Status: LIT
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Cylinder/Regulator Pressures:	H2 Cylinder (psi): 1600	H2 cylinder reg.set (psi): 50	Zero Air Gen Pressure: 50	Span Cylinder (psi): 200	Span Cylinder reg.set (psi): 22	Measured Flow: 1208	Expected Value: 27.73
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	H2 Cylinder (psi): 1600	H2 cylinder reg.set (psi): 50	Zero Air Gen Pressure: 50	Span Cylinder (psi): 2000	Span Cylinder reg.set (psi): 22	Measured Flow: n/a	Expected Value: 19.10
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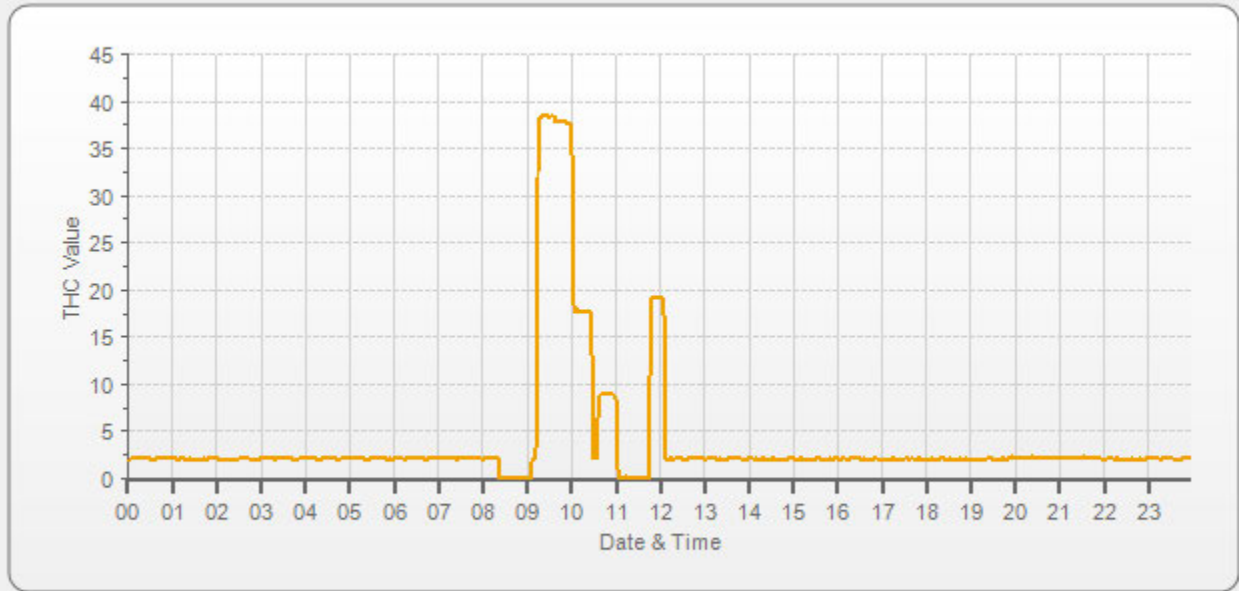
Comments:

The analyzer sample inlet filter was changed.

A new span gas cylinder was installed.

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

The new SPAN gas cylinder is a CH₄/C₃H₈ gas cylinder.



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date:	May 8, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	941	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Moderate rain		
Start/End Time 24 hr. (mst):	8:43 / 16:48	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:	April 4, 2018	NO =	0.999	0.991
Range ppb:	500	NO ₂ =	1.000	1.000
		NOx =	1.001	0.993
				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:	EnviroNics 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	5056	0.0	5056	0	0	0.0	0.0	n/a	n/a
as found high	5012	36.8	5049	375.5	376.2	379.0	379.0	0.991	0.993
adjusted zero	5056	0.00	5056	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5012	36.81	5049	375.5	376.2	376.0	376.0	0.999	1.001
mid	5043	17.42	5060	177.3	177.6	178.0	178.0	0.996	0.998
low	5043	8.77	5052	89.4	89.6	90.0	90.0	0.993	0.995
calibrator zero	5056	0.00	5056	0	0	0.0	0.0	n/a	n/a
								Average C.F.=	0.996 0.998

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	5012	36.81	5049	0.0	376.0	376.0	0.0	0.0	0.0		
as found high NO2	5012	36.81	5049	255.0	127.0	376.0	249.0	249.0	249.0	1.000	
adjusted high NO2	5012	36.81	5049	255.0	127.0	376.0	249.0	249.0	249.0	1.000	
gpt mid	5012	36.81	5049	135.0	245.0	376.0	131.0	131.0	131.0	1.000	
gpt low	5012	36.81	5049	49.0	326.0	376.0	50.0	50.0	50.0	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)=	0.06%	0.06%	0.00%	± 3% F.S.
% change in C.F. from last cal=	0.83%	0.84%	0.00%	± 10%
NO ₂ converter efficiency			1.00	0.96 to 1.04

As found:		As left:	
NO Bkg:	4.1	NO Bkg:	4.0
NOx Bkg:	4.2	NOx Bkg:	4.2
NO Coef:	1.009	NO Coef:	1.002
NO ₂ Coef:	1.000	NO ₂ Coef:	1.000
NOx Coef:	1.000	NOx Coef:	1.001
PMT:	-854.7	PMT:	-854.7
Internal:	26.3	Internal:	25.9
Chamber:	50.5	Chamber:	50.1
Cooler:	-3.0	Cooler:	-3.0
NO ₂ Converter:	323.2	NO ₂ Converter:	326.0
NO ₂ Converter Set:	325.0	NO ₂ Converter Set:	325.0
Perm Oven Gas:	34.97	Perm Oven Gas:	35.00
Perm Oven Heater:	34.19	Perm Oven Heater:	34.24
Pressure:	178.1	Pressure:	176.9
Flow:	0.770	Flow:	0.770
Ozonator Flow:	OK	Ozonator Flow:	OK
Expected Value NO:	2	Expected Value NO:	2
Expected Value NO ₂ :	266	Expected Value NO ₂ :	266
Expected Value NOx:	268	Expected Value NOx:	268

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.

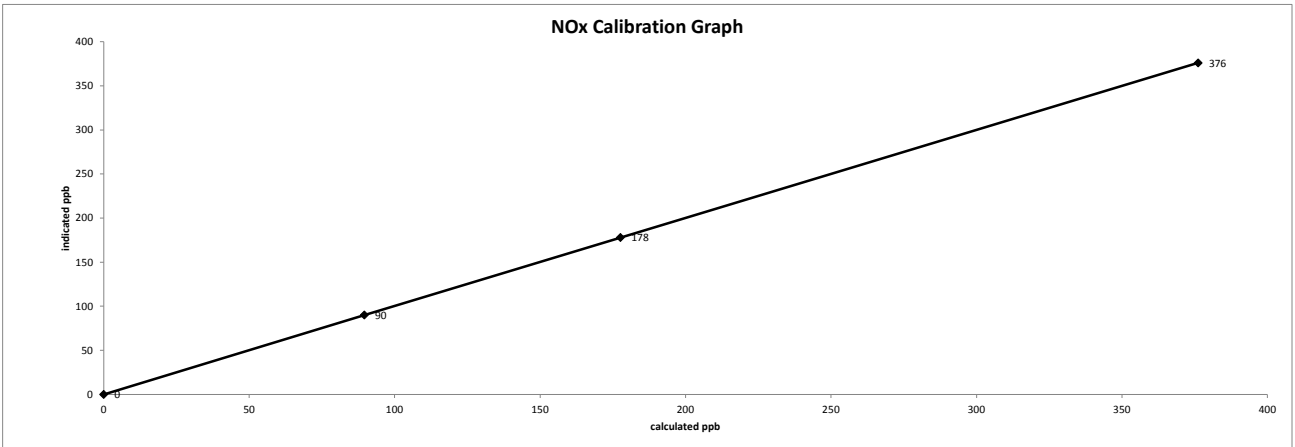
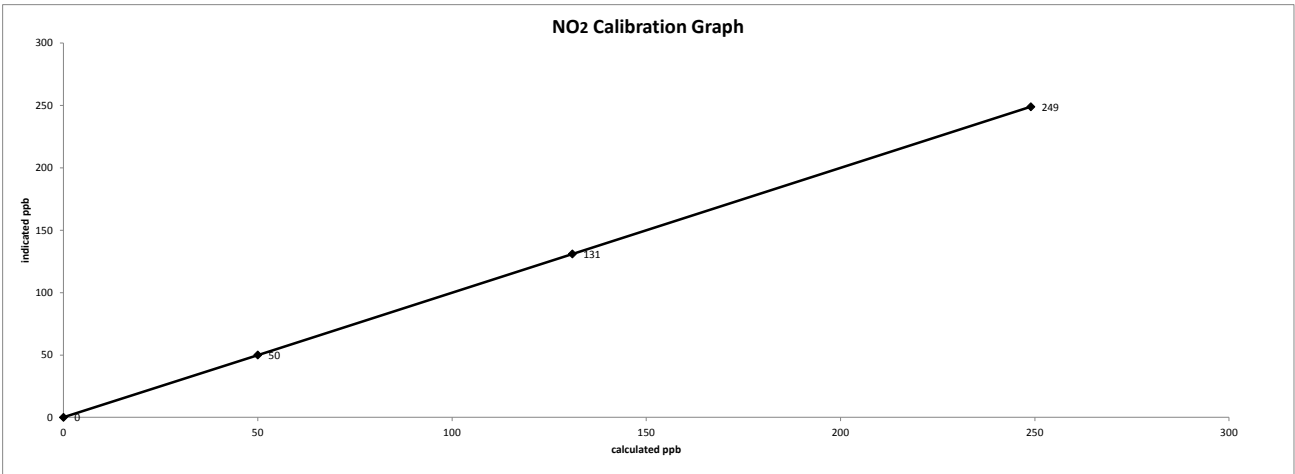
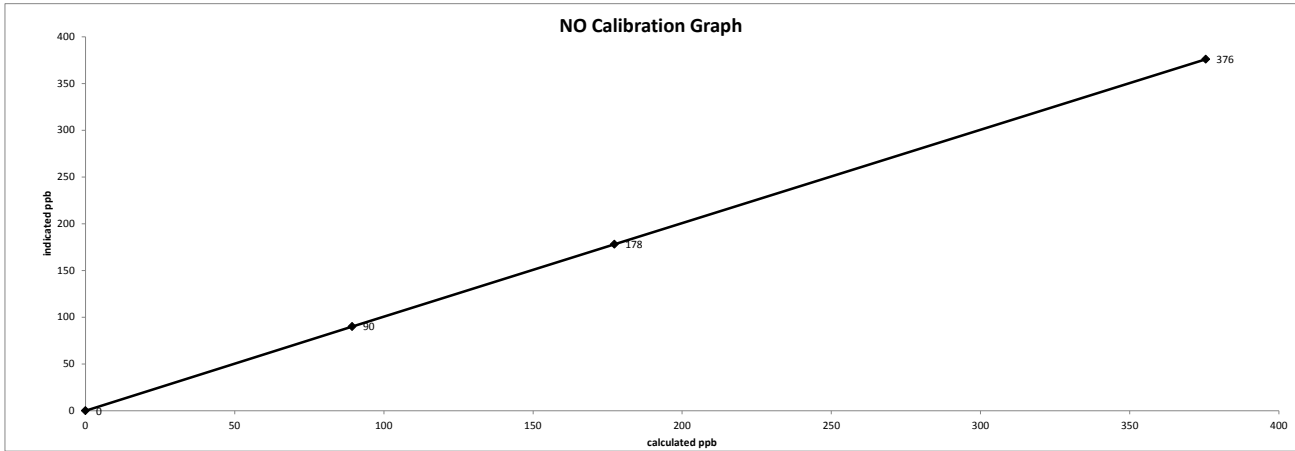
The analyzer cooling fan filter(s) were cleaned.

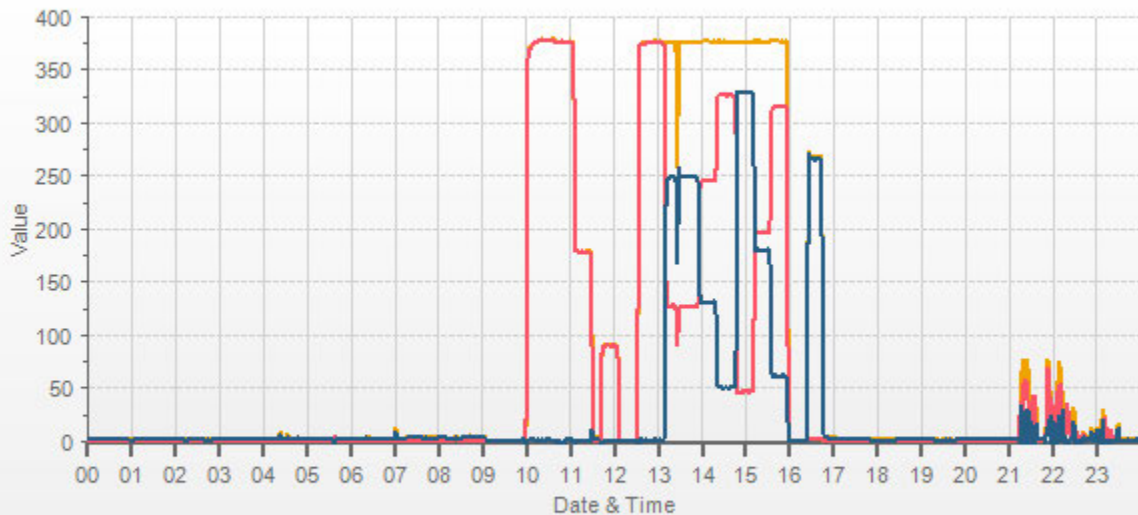
A power disruption occurred at 13:25 for the calibrator. The High GPT point starts from at 13:32. Additional GPT points were obtained for the Ozone monthly calibration.

Date: May 8, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 8:43 / 16:48
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NOx[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: May 9, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 8:06 / 12:45 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: May 8, 2018 Analyzer: Serial Number/Owner: 700419951 LICA Last Calibration Date: April 5, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 951 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.: 1.006 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: Envirionics 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

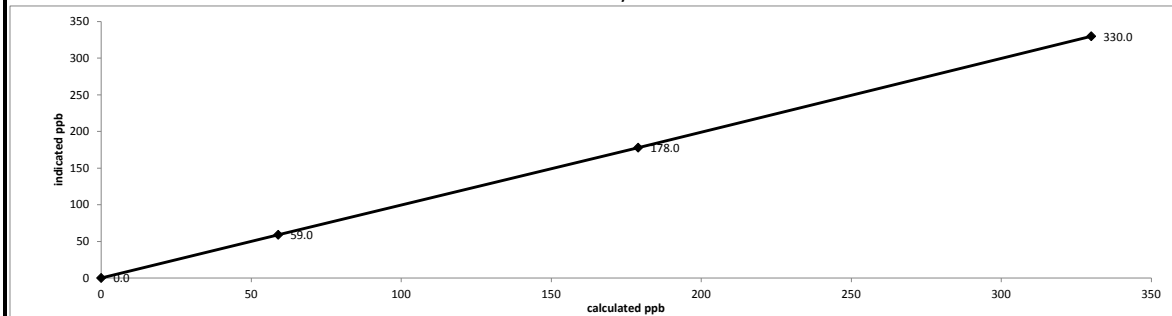
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

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	330.0	330.0	328.0	1.006
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	179.0	179.0	178.0	1.006
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.=						1.002

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.001</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.03%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-0.61%</u>	± 10%

Thermo 49i Ozone Analyzer Calibration



As found:

O3 Bkg:	<u>0.1</u>
O3 Coef:	<u>1.015</u>
Photo Lamp:	<u>9.6</u>
O3 Lamp:	<u>9.0</u>
Bench:	<u>28.8</u>
Bench Lamp:	<u>53.5</u>
O3 Lamp:	<u>67.3</u>
Pressure:	<u>715.6</u>
Cell A lpm:	<u>0.722</u>
Cell B lpm:	<u>0.763</u>
O3 ppb:	<u>3.3</u>
Cell A ppb:	<u>2.3</u>
Cell B ppb:	<u>4.2</u>
Cell A int (Hz):	<u>81733</u>
Cell B int (Hz):	<u>82812</u>
Expected Value:	<u>269.0</u>

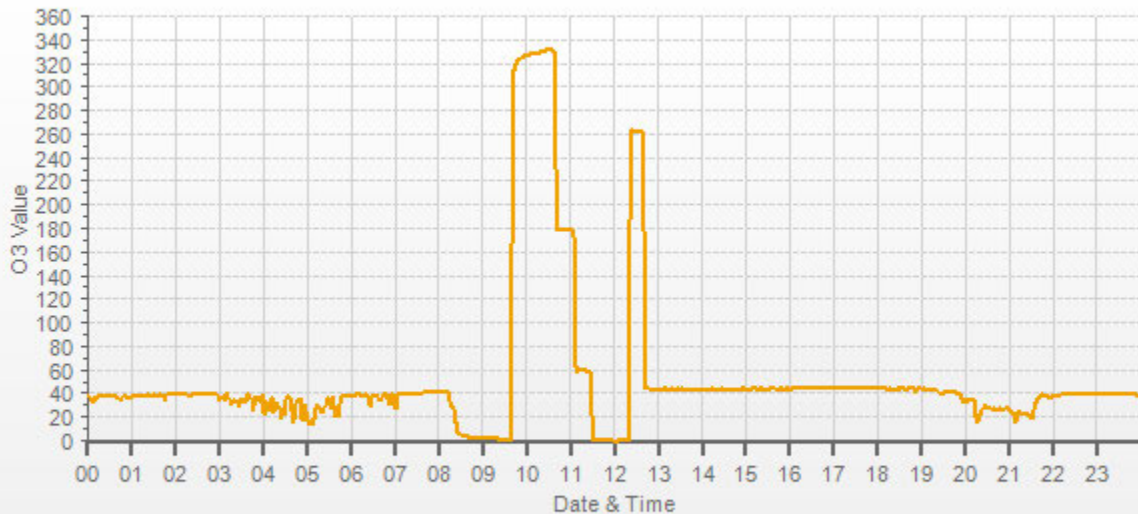
As left:

O3 Bkg:	<u>0.1</u>
O3 Coef:	<u>1.024</u>
Photo Lamp:	<u>9.6</u>
O3 Lamp:	<u>9.0</u>
Bench:	<u>29.5</u>
Bench Lamp:	<u>53.5</u>
O3 Lamp:	<u>67.4</u>
Pressure:	<u>714.7</u>
Cell A lpm:	<u>0.721</u>
Cell B lpm:	<u>0.762</u>
O3 ppb:	<u>0.0</u>
Cell A ppb:	<u>1.9</u>
Cell B ppb:	<u>-1.9</u>
Cell A int (Hz):	<u>81775</u>
Cell B int (Hz):	<u>82870</u>
Expected Value:	<u>262.0</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.

O3[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/05/09 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER 2.5



Thermo 5030 SHARP Monitor Audit

Date:	May 11, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	9:01	
Station Name/Location:	Cold Lake South	End Time (mst):	11:34	
Previous Audit Date:	April 23, 2018	Calibration Purpose:	quarterly	
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny	

SHARP Information and Status:				
Serial Number/Owner:	CM - 2209	LICA	Status Code	0
Approx. % Tape Reaming	65%		Error Code	0

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

As Found Temperatures, Pressure, Humidity:						
	T1 (°C)	T2 (°C)	T3 (°C)	T4 (°C)	P3 (hPa)	RH (%)
SHARP:	12	24	24	24	952	20
Reference:	11.9	23.2	23.2	23.2	952.0	19.7
Difference:	0.1	0.9	0.9	0.9	0.0	-0.3
	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:	12	23	23	23	952	20
Reference:	12.0	23.0	23.0	23.0	952.0	20.0
Difference:	0.0	0.0	0.0	0.0	0.0	0.0%
	Temp Limit: ± 4 °C					
	Pressure Limit: ± 13.33 hPa					
	RH Limit: ± 2%					

Mass Foil Calibration:			
	Mass Foil:	ZERO:	Span Sensitivity
Mass Foil ID:	9015	QLF:	2
Spanfoil Value (µg):	1294	CONFID:	9
		OLD:	6968
		NEW:	7000

Nephelometer Zero:				
	As Found		As Left	
Analog	159.00		159.00	
NEPH	0.40		-0.10	
C14	22.50		28.80	
Conc	0.40		-0.10	

Flow rate:				
	As Found		As Left	
SHARP AirFlow l/hr	1000		1000	
Reference AirFlow (l/min)	16.67		16.67	
Reference AirFlow (l/hr)	1000		1000	
% Difference:	0.0%		0.0%	
	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:

A successful leak check was performed. Without adapter (-16.67) compared to with adapter (-16.55); the difference is -0.12 lpm (Pass: < 0.42 lpm).

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

CALIBRATORS

Company: Maxxam Operator: Chris W

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

Dilution Flow (sccm)					
Pt. #1	<u>5000</u>	Pt. #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

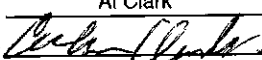
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						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	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 1, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
Operator Signature: 

Date: March 1, 2018
Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

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

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

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO 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 ₂ 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:	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 (sccm)		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:

Make/Model R&R MFC 201
 Serial Number AMU 1691
 Last Verification Date May 21, 2015
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:

Make/Model Bios DC2
 Serial Number AMU 1650
 Temp. °C 24.0 C
 B.P. 703 mmhg

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

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

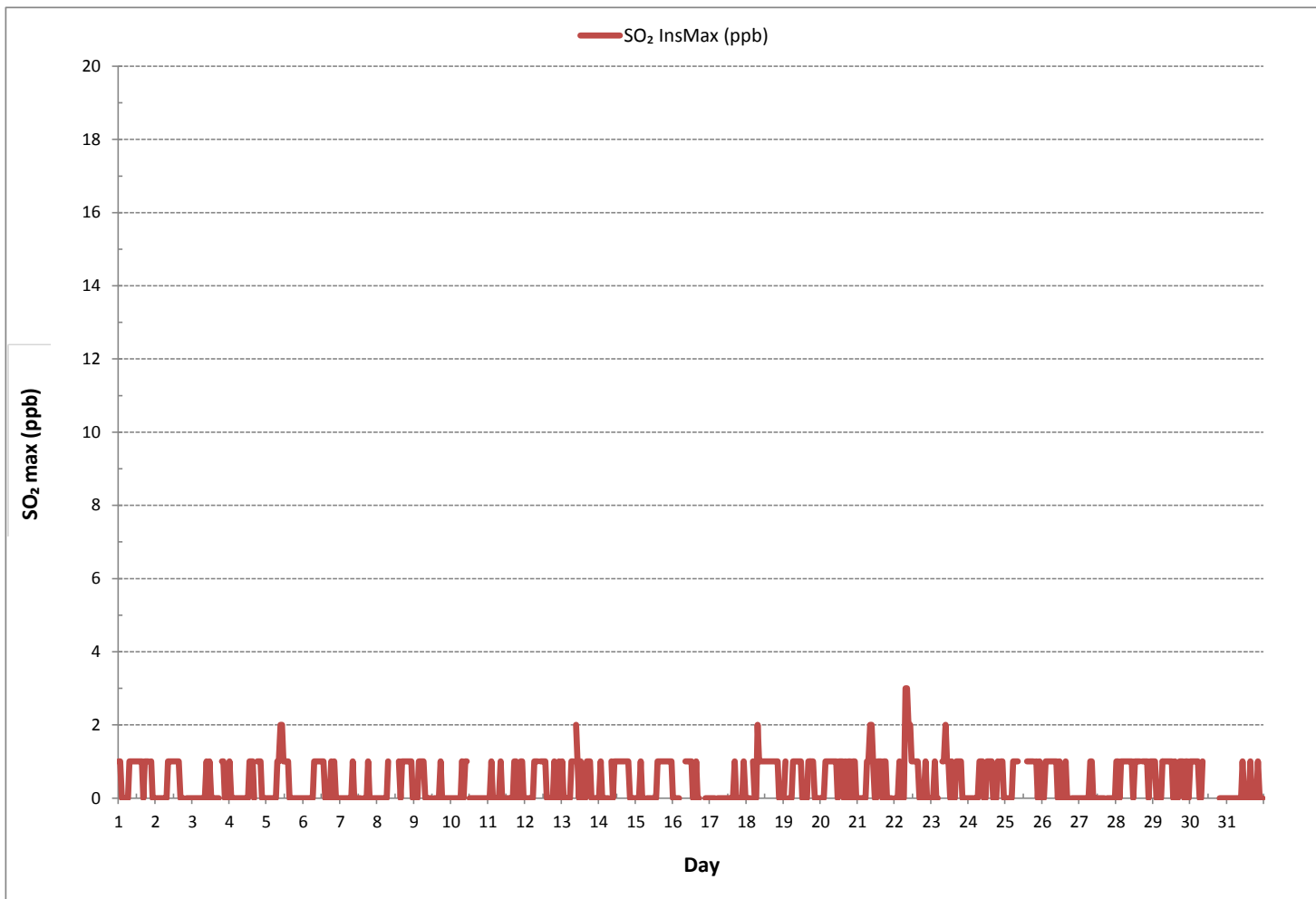
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	277
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 7 ON DAY 22
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	722 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





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

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

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

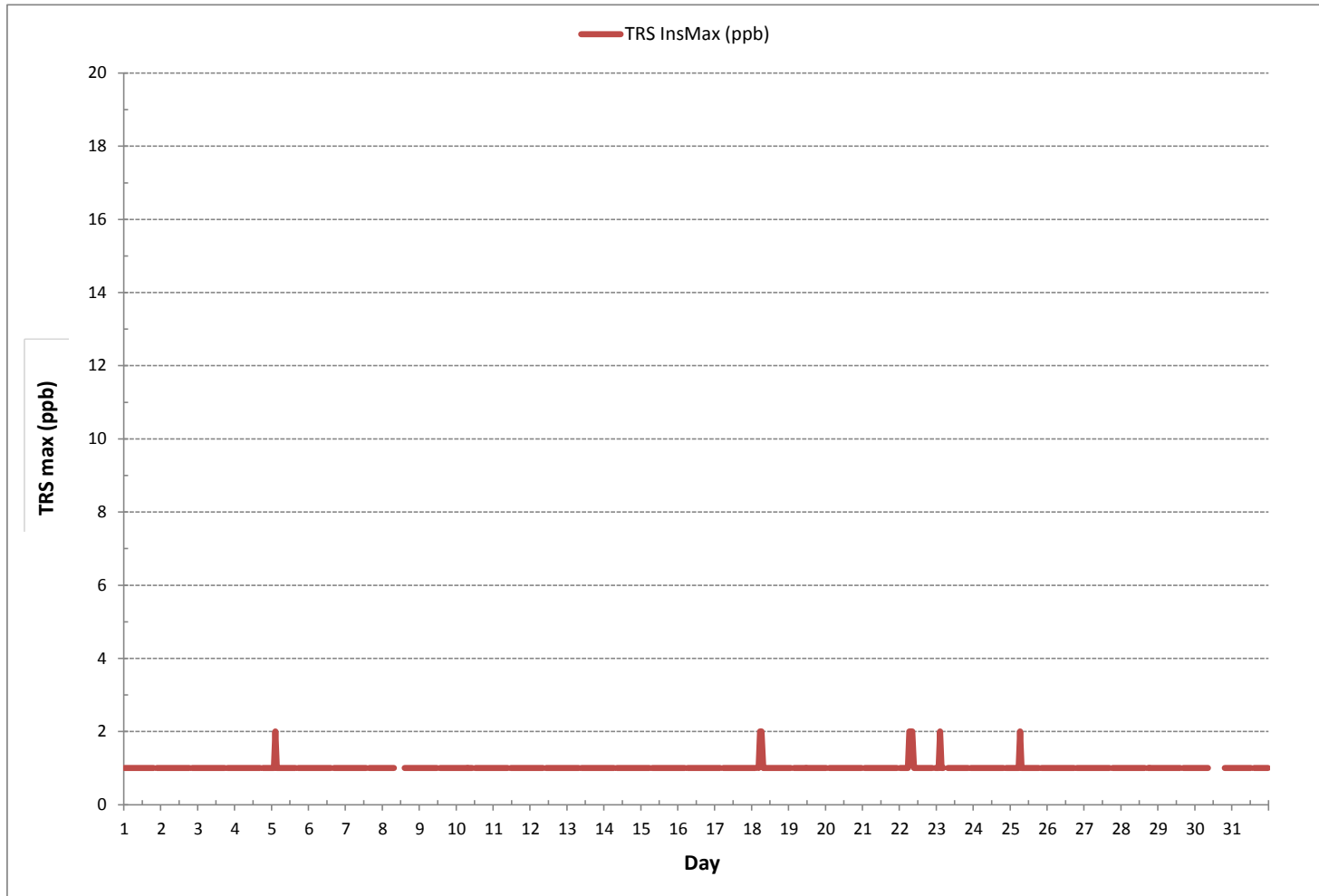
STATUS FLAG CODES

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:	696
MAXIMUM INSTANTANEOUS VALUE:	2 ppb @ HOUR 2 ON DAY 5
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	732 hrs
STANDARD DEVIATION:	0

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)





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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	2.28	2.42	2.37	2.30	2.51	2.41	2.36	2.34	2.28	2.24	2.09	2.07	2.04	2.07	2.04	2.07	2.04	2.07	2.07	2.08	S	2.33	2.34	2.24	2.04	2.51	2.22	24	
2	2.38	2.42	2.50	2.65	2.63	2.58	2.57	2.50	2.37	2.14	2.08	2.07	2.08	2.08	2.05	2.07	2.07	2.05	2.07	S	1.99	2.10	2.09	2.16	1.99	2.65	2.25	24	
3	2.13	2.16	2.19	2.26	2.29	2.17	2.16	2.14	2.07	2.09	2.19	2.13	2.08	2.06	2.05	2.08	2.08	2.03	S	2.13	2.07	2.27	2.37	2.37	2.03	2.37	2.16	24	
4	2.27	2.29	2.41	2.55	2.54	2.59	2.71	2.74	2.44	2.13	2.09	2.03	2.11	2.09	2.07	2.08	2.05	S	2.08	2.12	2.13	2.24	2.17	2.14	2.03	2.74	2.26	24	
5	2.26	2.44	2.61	2.55	2.40	2.40	2.27	2.20	2.13	2.11	2.12	2.13	2.15	2.13	2.13	2.11	S	2.12	2.11	2.13	2.16	2.20	2.44	2.34	2.11	2.61	2.25	24	
6	2.46	2.37	2.38	2.46	2.48	2.44	2.46	2.52	2.39	2.13	2.12	2.08	2.12	2.09	2.12	S	2.09	2.09	2.09	2.14	2.28	2.41	2.42	2.50	2.08	2.52	2.29	24	
7	2.49	2.61	2.62	2.63	2.40	2.13	2.05	2.03	2.07	2.09	2.11	2.14	2.13	2.17	S	2.14	2.16	2.20	2.14	2.12	2.12	2.11	2.08	2.07	2.03	2.62	2.21	24	
8	2.07	2.04	2.12	2.08	2.09	2.08	2.11	2.16	2.14	2.20	2.26	2.33	2.23	S	2.17	2.20	2.13	2.13	2.13	2.13	2.11	2.16	2.20	2.16	2.04	2.33	2.15	24	
9	2.17	2.14	2.14	2.19	2.23	2.14	2.19	2.18	C	C	C	C	C	C	2.17	2.12	2.15	2.11	2.12	2.12	2.42	2.30	2.28	2.15	2.14	2.11	2.42	2.18	24
10	2.13	2.16	2.16	2.26	2.25	2.21	2.29	2.27	2.24	2.19	2.20	S	2.17	2.16	2.16	2.13	2.17	2.13	2.13	2.14	2.14	2.24	2.17	2.23	2.10	2.29	2.19	24	
11	2.29	2.33	2.37	2.43	2.42	2.46	2.46	2.33	2.29	2.21	S	2.24	2.20	2.19	2.13	2.17	2.12	2.17	2.10	2.08	2.12	2.12	2.07	2.25	2.07	2.46	2.24	24	
12	2.29	2.50	2.51	2.44	2.55	2.56	2.36	2.16	2.09	S	2.16	2.18	2.13	2.09	2.08	2.07	2.08	2.03	2.05	2.05	2.08	2.09	2.24	2.03	2.56	2.21	24		
13	2.17	2.28	2.42	2.38	2.36	2.38	2.37	2.33	S	2.07	2.16	2.13	2.13	2.14	2.13	2.12	2.12	2.12	2.10	2.10	2.07	2.14	2.29	2.30	2.07	2.42	2.21	24	
14	2.41	2.40	2.41	2.38	2.41	2.58	2.30	S	2.24	2.20	2.20	2.17	2.20	2.14	2.16	2.12	2.17	2.13	2.16	2.20	2.42	2.59	2.24	2.29	2.12	2.59	2.28	24	
15	2.45	2.43	2.33	2.44	2.56	2.65	S	2.23	2.19	2.13	2.07	2.07	2.05	2.08	2.08	2.07	2.07	2.08	2.09	2.17	2.13	2.16	2.12	2.15	2.05	2.65	2.21	24	
16	2.16	2.33	2.18	2.08	2.19	S	2.11	2.09	2.14	2.14	2.19	2.11	2.13	2.16	2.16	2.19	2.12	2.12	2.25	2.21	2.21	2.14	2.13	2.14	2.08	2.33	2.16	24	
17	2.14	2.14	2.20	2.21	S	2.20	2.19	2.15	2.16	2.15	2.17	2.21	2.15	2.17	2.21	2.16	2.17	2.17	2.19	2.19	2.23	2.29	2.36	2.40	2.14	2.40	2.20	24	
18	2.46	2.43	2.46	S	2.68	2.63	2.59	2.36	2.28	2.25	2.26	2.24	2.24	2.22	2.23	2.25	2.21	2.20	2.24	2.20	2.27	2.24	2.32	2.44	2.20	2.68	2.33	24	
19	2.48	2.50	S	2.58	2.63	2.73	2.57	2.50	2.45	2.34	2.24	2.25	2.26	2.22	2.20	2.24	2.20	2.26	2.20	2.22	2.25	2.23	2.29	2.25	2.20	2.73	2.35	24	
20	2.36	S	2.61	2.61	2.61	2.70	2.48	2.45	2.43	2.27	2.30	2.25	2.25	2.20	2.20	2.20	2.17	2.22	2.22	2.18	2.28	2.40	2.32	2.13	2.13	2.70	2.34	24	
21	S	2.28	2.34	2.44	2.42	2.77	2.84	2.37	2.24	2.41	2.36	2.19	2.34	2.24	2.20	2.20	2.20	2.20	2.22	2.20	2.21	2.34	3.18	S	2.19	3.18	2.37	24	
22	2.43	2.37	2.53	2.58	2.61	2.56	2.79	2.66	2.59	2.45	2.39	2.29	2.30	2.21	2.18	2.20	2.22	2.21	2.20	2.26	2.30	2.38	S	2.52	2.18	2.79	2.40	24	
23	2.60	2.67	2.81	2.77	2.71	P	P	2.55	2.47	2.36	2.47	2.28	2.24	2.22	2.21	2.24	2.17	2.16	2.20	2.29	2.47	S	2.27	2.43	2.16	2.81	2.41	22	
24	2.46	2.62	2.54	2.45	2.41	2.59	2.62	2.42	2.48	2.52	2.54	2.43	2.46	2.42	2.48	2.40	2.29	2.32	2.30	2.32	S	2.22	2.33	2.36	2.22	2.62	2.43	24	
25	2.24	2.33	2.40	2.43	2.53	2.50	2.38	2.37	2.25	2.34	2.25	2.29	2.21	2.16	2.25	2.21	2.20	2.17	2.20	S	2.27	2.44	2.48	2.33	2.16	2.53	2.31	24	
26	2.36	2.29	2.36	2.36	2.51	2.45	2.24	2.17	2.20	2.20	2.17	2.13	2.15	2.13	2.19	2.17	2.20	2.17	S	2.15	2.23	2.28	2.27	2.32	2.13	2.51	2.25	24	
27	2.38	2.45	2.42	2.59	2.73	2.65	2.48	2.46	2.27	2.29	2.27	2.29	2.21	2.22	2.16	2.19	2.21	S	2.20	2.25	2.36	2.33	2.48	2.55	2.16	2.73	2.37	24	
28	2.66	2.45	2.49	2.58	2.56	2.50	2.50	2.31	2.31	2.30	2.29	2.33	2.33	2.26	2.29	2.29	S	2.20	2.27	2.20	2.24	2.16	2.20	2.17	2.16	2.66	2.34	24	
29	2.23	2.12	2.16	2.24	2.24	2.35	2.29	2.29	2.24	2.26	2.25	2.25	2.22	2.23	2.25	S	2.21	2.25	2.25	2.29	2.27	2.20	2.13	2.16	2.12	2.35	2.23	24	
30	2.14	2.14	2.23	2.27	2.21	2.23	2.28	2.34	2.33	X	X	X	X	X	X	X	X	X	X	X	2.19	2.23	2.31	2.30	2.30	2.14	2.34	2.25	14
31	2.29	2.33	2.36	2.29	2.37	2.36	2.29	2.29	2.23	2.24	2.29	2.22	2.23	X	2.22	2.21	2.27	2.21	2.20	2.25	2.26	2.29	2.27	2.32	2.20	2.37	2.27	23	
HOURLY MAX	2.66	2.67	2.81	2.77	2.73	2.77	2.84	2.74	2.59	2.52	2.54	2.43	2.46	2.42	2.48	2.40	2.29	2.32	2.30	2.42	2.47	2.59	3.18	2.55					
HOURLY AVG	2.32	2.35	2.39	2.42	2.45	2.45	2.39	2.33	2.28	2.23	2.22	2.20	2.19	2.17	2.17	2.15	2.15	2.16	2.19	2.21	2.26	2.29	2.28						

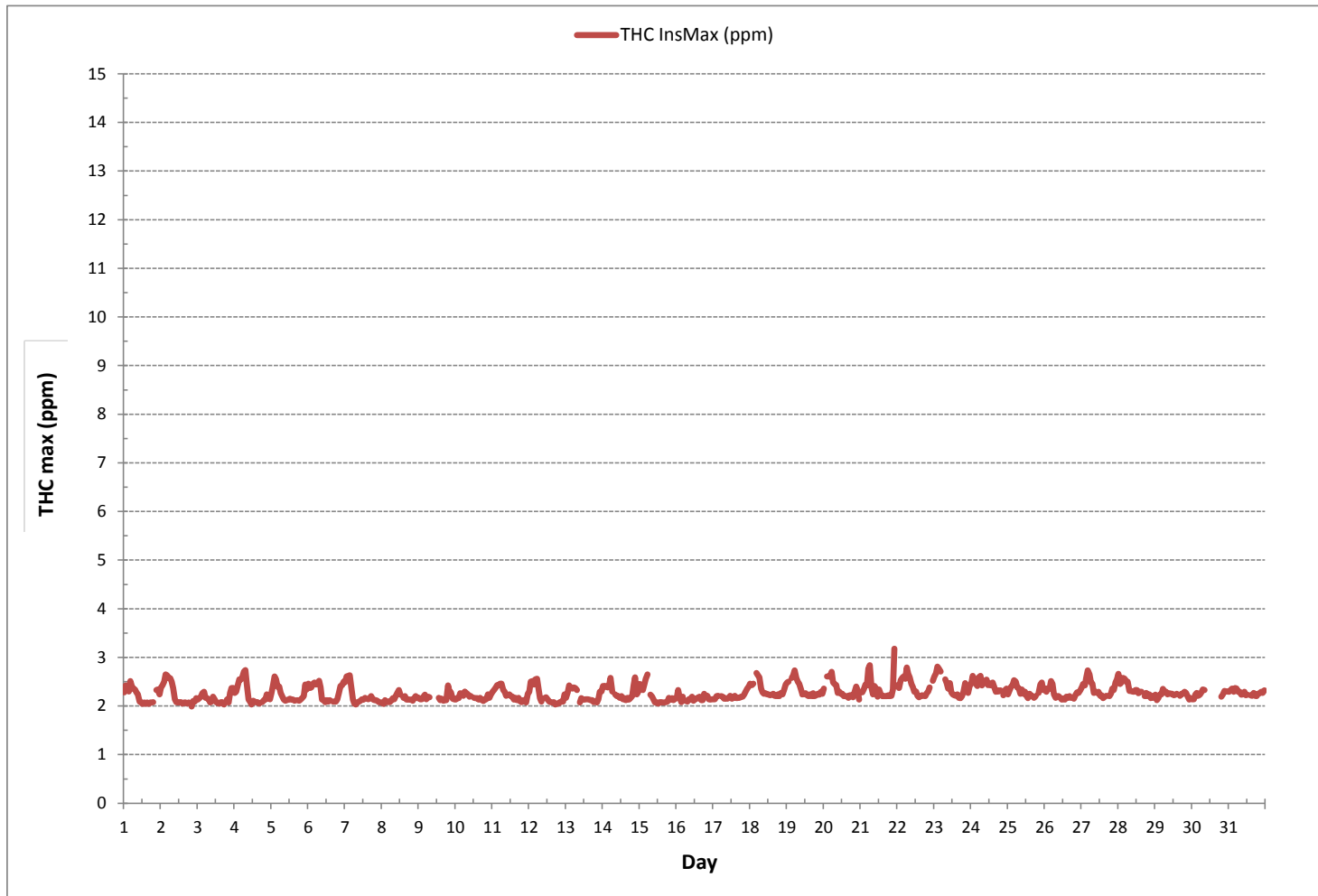
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697
MAXIMUM INSTANTANEOUS VALUE:	3.18 ppm @ HOUR 22 ON DAY 21
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	731 hrs
STANDARD DEVIATION:	0.16

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	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	9	11	5	14	7	4	4	4	9	5	2	2	4	5	3	2	3	2	13	S	5	7	3	2	14	6	24	
2	6	8	4	17	21	11	13	6	16	6	3	2	14	4	2	5	2	2	2	S	3	4	4	6	2	21	7	24	
3	6	4	6	7	6	6	6	6	7	5	6	3	1	1	1	1	1	1	S	4	11	5	5	5	1	11	5	24	
4	6	3	12	11	9	10	15	16	7	4	2	1	3	11	3	12	3	S	3	8	12	9	5	3	1	16	7	24	
5	3	5	11	6	7	7	7	5	4	4	3	2	1	2	1	1	S	1	1	3	8	8	9	5	1	11	5	24	
6	14	11	16	8	8	7	4	8	6	3	2	3	2	2	3	S	4	1	1	3	10	54	62	14	1	62	11	24	
7	14	11	10	7	12	5	2	4	3	2	4	2	2	1	S	3	3	3	6	6	6	4	2	2	1	14	5	24	
8	1	3	2	2	10	4	4	13	C	C	C	C	C	C	C	C	C	3	1	1	2	81	80	37	1	81	16	24	
9	42	20	29	85	121	140	51	74	3	1	4	4	S	1	3	1	2	2	6	9	55	18	2	2	1	140	29	24	
10	4	1	3	3	19	11	3	5	6	6	2	S	4	20	3	2	3	1	2	7	2	3	4	3	1	20	5	24	
11	3	5	3	6	6	11	10	6	6	3	S	2	3	2	2	4	1	2	3	3	5	4	2	2	1	11	4	24	
12	3	3	5	3	9	9	6	4	4	S	3	2	3	2	2	2	1	1	1	1	3	3	3	4	1	9	3	24	
13	5	4	6	4	5	4	5	5	S	3	2	1	1	1	1	1	1	1	3	4	5	5	4	5	1	6	3	24	
14	8	5	9	7	7	18	17	S	3	3	5	3	3	2	2	3	4	5	8	10	8	8	3	6	2	18	6	24	
15	5	4	4	5	8	9	S	8	5	2	2	1	1	1	2	3	4	3	3	7	6	3	2	2	1	9	4	24	
16	4	3	3	5	5	S	2	3	2	2	3	2	2	4	2	3	2	2	5	6	3	2	2	3	2	6	3	24	
17	2	1	1	2	S	4	3	3	3	2	6	1	1	1	2	2	3	1	4	5	7	3	4	5	1	7	3	24	
18	4	3	7	S	7	4	5	6	4	3	5	3	2	2	2	3	2	2	14	3	4	3	3	3	5	2	14	4	24
19	5	5	S	5	6	14	10	5	4	2	1	1	1	2	1	1	4	1	1	2	5	27	9	2	1	27	5	24	
20	3	S	5	4	10	22	5	3	3	4	5	2	1	2	2	11	3	4	1	2	8	20	8	13	1	22	6	24	
21	S	4	5	3	10	5	6	6	4	9	10	2	2	2	3	5	2	3	2	2	3	5	4	S	2	10	4	24	
22	4	3	7	5	4	10	12	11	10	8	8	6	3	2	12	6	7	4	2	3	14	8	S	7	2	14	7	24	
23	9	9	7	10	10	P	P	16	9	9	13	3	6	4	2	2	10	3	3	4	6	S	6	8	2	16	7	22	
24	6	7	3	3	4	5	7	11	4	6	10	6	7	6	12	9	4	4	3	4	S	5	10	4	3	12	6	24	
25	3	5	4	4	6	7	7	10	5	4	6	6	5	4	3	7	4	3	5	S	7	11	10	5	3	11	6	24	
26	2	2	3	2	7	4	3	2	3	3	1	1	1	3	1	2	1	1	S	2	4	5	4	4	1	7	3	24	
27	5	7	6	7	9	8	7	4	2	1	1	1	1	1	1	1	3	S	2	5	7	15	7	4	1	15	5	24	
28	6	2	2	2	3	5	4	6	8	3	3	3	11	2	16	8	S	2	3	7	2	1	1	2	1	16	4	24	
29	2	2	2	2	2	3	4	5	3	2	2	3	3	2	2	S	2	1	2	3	4	2	2	2	2	1	5	2	24
30	2	2	2	3	3	5	9	23	98	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2	2	2	98	11	14
31	2	1	2	2	2	3	3	10	4	12	3	1	2	X	1	3	3	3	4	4	17	7	7	4	1	17	4	23	
HOURLY MAX	42	20	29	85	121	140	51	74	98	12	13	6	14	20	16	12	10	5	14	13	55	81	80	37					
HOURLY AVG	6	5	6	8	12	12	8	10	8	4	4	2	3	3	3	4	3	2	3	5	8	11	9	6					

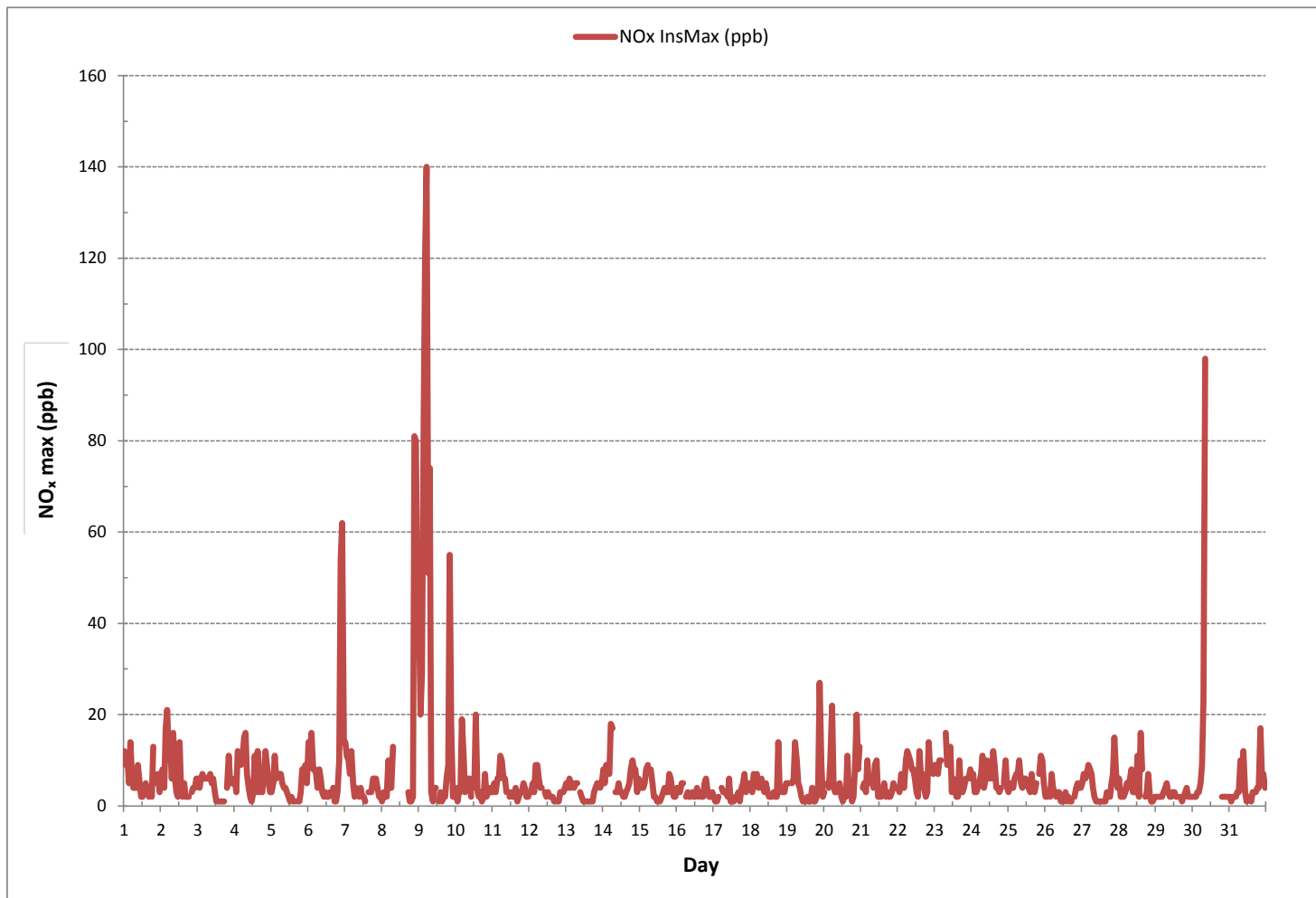
STATUS FLAG CODES

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:	693
MAXIMUM INSTANTANEOUS VALUE:	140 ppb @ HOUR 5 ON DAY 9
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	731 hrs
STANDARD DEVIATION:	11

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	1	1	0	1	1	0	1	1	4	1	0	1	1	2	1	1	1	0	1	S	0	2	1	0	4	1	24	
2	2	2	1	6	9	5	6	2	7	3	1	0	2	1	0	1	0	0	0	0	S	0	1	1	1	0	9	2	24
3	2	1	1	2	1	2	2	2	2	1	2	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	2	1	24
4	2	0	1	1	1	2	4	5	2	1	1	0	1	6	1	5	2	S	1	3	1	0	1	0	0	6	2	24	
5	0	0	1	1	1	1	2	1	1	1	1	0	0	1	0	0	S	0	0	0	0	0	0	0	0	2	0	24	
6	2	0	3	1	1	1	1	4	1	1	1	1	0	1	0	S	1	0	0	0	0	0	39	45	2	0	45	5	24
7	1	1	1	0	2	1	1	4	2	1	2	1	2	1	S	2	2	2	2	2	4	4	0	0	0	4	2	24	
8	0	1	0	0	4	6	0	3	C	C	C	C	C	C	C	C	C	0	0	1	1	72	58	25	0	72	11	24	
9	24	5	9	65	82	98	47	94	2	1	1	1	S	0	3	1	2	1	2	2	26	4	1	0	0	98	20	24	
10	1	0	1	1	7	2	1	2	2	2	1	S	1	3	1	1	2	0	0	3	0	0	2	0	0	7	1	24	
11	1	1	0	2	1	3	3	2	2	1	S	0	1	0	0	2	0	0	1	0	0	0	0	0	0	3	1	24	
12	0	0	1	1	2	2	1	1	1	S	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	1	24	
13	1	1	0	1	0	1	1	1	S	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	24	
14	5	0	4	1	1	5	6	S	1	1	3	0	1	0	0	1	2	1	1	1	1	1	0	0	0	6	2	24	
15	0	1	0	1	1	3	S	5	2	0	0	0	0	0	1	2	2	2	1	1	4	4	0	0	0	5	1	24	
16	0	0	0	1	1	S	1	1	1	0	2	1	0	2	1	2	1	1	3	3	1	1	1	1	0	3	1	24	
17	1	0	0	1	S	1	1	2	2	1	1	0	0	1	1	1	0	3	2	0	0	1	0	0	0	3	1	24	
18	0	0	2	S	1	1	1	2	1	1	1	1	1	0	0	1	0	0	5	0	1	0	0	1	0	5	1	24	
19	0	0	S	1	2	6	4	2	1	1	0	0	0	1	0	0	1	0	0	0	2	6	1	0	0	6	1	24	
20	0	S	0	0	1	10	1	1	1	2	0	0	1	1	0	1	2	1	0	0	1	7	1	3	0	10	1	24	
21	S	1	1	1	6	2	2	2	1	3	3	0	0	0	0	1	1	0	5	0	0	0	0	S	0	6	1	24	
22	0	0	2	1	1	3	4	4	3	2	5	4	0	0	5	3	3	0	0	0	3	0	S	0	0	5	2	24	
23	0	1	1	3	2	P	P	10	2	2	9	2	3	1	1	0	2	0	0	0	0	0	S	0	0	10	2	22	
24	0	1	0	0	1	1	1	2	1	2	2	1	1	1	3	2	1	1	1	0	S	0	2	0	0	3	1	24	
25	0	0	0	1	1	1	1	4	1	1	1	1	1	1	0	2	1	1	1	S	0	2	1	1	0	4	1	24	
26	0	0	0	0	3	0	0	0	1	1	0	0	0	2	0	1	0	0	S	0	0	0	0	0	0	0	3	0	24
27	0	0	1	1	3	1	2	1	1	0	0	0	0	0	1	0	1	S	0	0	2	6	0	1	0	6	1	24	
28	1	0	0	0	0	1	1	2	2	1	2	1	1	0	2	2	S	0	1	4	0	0	0	0	0	4	1	24	
29	0	0	1	0	0	1	1	1	1	1	0	1	1	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
30	1	0	0	0	1	1	2	17	56	X	X	X	X	X	X	X	X	X	X	0	0	0	1	0	0	56	6	14	
31	1	0	0	1	0	1	1	5	2	19	1	1	1	X	0	2	1	1	2	1	6	2	2	1	0	19	2	23	
HOURLY MAX	24	5	9	65	82	98	47	94	56	19	9	4	3	6	5	5	3	2	5	4	26	72	58	25					
HOURLY AVG	2	1	1	3	5	6	3	6	4	2	2	1	1	1	1	1	0	1	1	1	2	5	4	1					

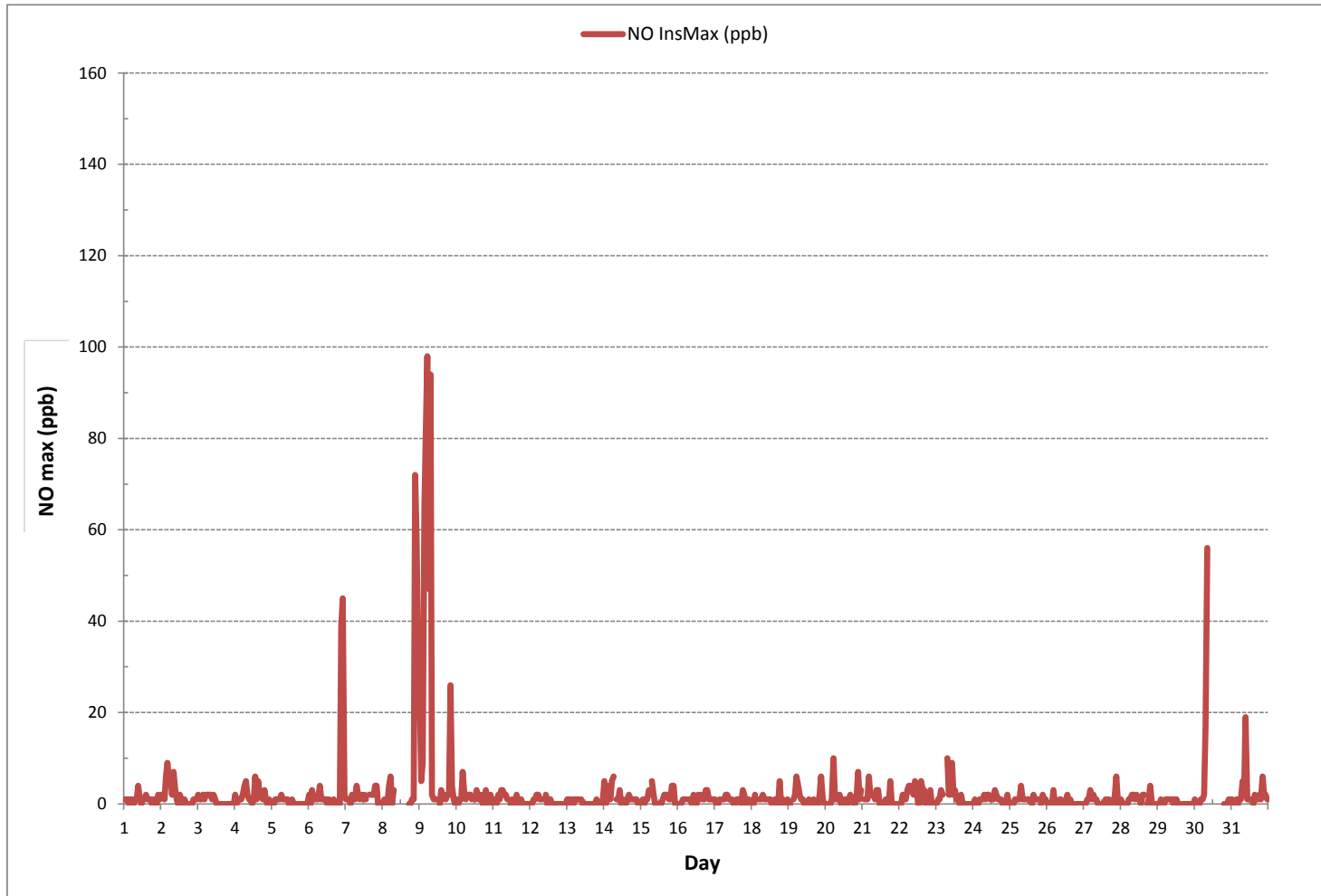
STATUS FLAG CODES

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:	433
MAXIMUM INSTANTANEOUS VALUE:	98 ppb @ HOUR 5 ON DAY 9
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	731 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	11	8	10	5	14	7	3	3	3	6	4	2	2	3	3	2	2	2	1	13	S	5	6	3	1	14	5	24	
2	4	6	4	11	12	7	7	4	9	4	2	2	12	3	1	4	2	2	2	S	3	3	3	4	1	12	5	24	
3	4	4	5	6	5	4	4	4	5	3	4	2	1	1	1	1	1	1	S	3	11	5	5	5	1	11	4	24	
4	4	3	11	11	8	10	13	12	6	3	2	1	2	6	2	8	2	S	3	7	12	9	5	3	1	13	6	24	
5	3	5	9	5	7	6	5	4	3	3	3	1	1	1	1	S	1	1	3	8	8	9	4	1	9	4	24		
6	12	11	13	7	7	6	3	5	4	2	2	2	1	2	2	S	3	1	1	3	10	26	17	12	1	26	7	24	
7	13	11	10	7	10	4	2	3	2	1	2	1	1	1	S	3	2	3	4	2	3	4	2	2	1	13	4	24	
8	1	3	1	2	6	2	3	10	C	C	C	C	C	C	C	C	C	2	1	1	1	39	35	25	1	39	9	24	
9	32	15	21	26	44	59	19	13	2	1	3	2	S	1	2	1	1	1	4	7	31	13	2	1	1	59	13	24	
10	3	1	2	2	12	9	2	3	3	4	2	S	3	17	2	2	1	1	1	6	2	2	4	3	1	17	4	24	
11	3	5	2	5	5	8	7	4	5	2	S	2	2	2	1	3	1	1	2	3	5	3	1	2	1	8	3	24	
12	3	3	5	3	7	8	5	3	3	S	3	2	2	2	1	2	1	1	1	1	3	3	3	4	1	8	3	24	
13	5	3	5	4	4	3	4	4	S	3	1	1	1	1	1	1	1	1	2	3	4	4	4	4	1	5	3	24	
14	6	5	6	7	7	14	13	S	2	3	3	2	2	1	2	2	3	4	7	9	7	8	3	6	1	14	5	24	
15	4	4	4	5	7	6	S	7	4	2	1	1	1	1	1	2	3	1	2	6	6	3	2	2	1	7	3	24	
16	3	3	3	4	4	S	2	2	1	1	1	1	1	1	2	1	2	2	1	4	5	3	2	2	2	1	5	2	24
17	1	1	1	1	S	3	2	2	2	1	6	1	1	1	2	2	2	1	2	4	7	3	4	4	1	7	2	24	
18	4	3	6	S	6	3	3	5	3	2	4	2	2	2	2	2	1	2	10	3	4	3	3	4	1	10	3	24	
19	4	5	S	4	5	8	7	4	3	2	1	1	1	1	1	1	4	1	1	1	5	22	7	2	1	22	4	24	
20	3	S	4	4	10	12	4	2	2	5	1	1	1	1	10	3	3	1	1	7	13	7	10	1	13	5	24		
21	S	3	4	3	4	4	4	4	3	6	7	1	2	1	2	3	2	2	2	3	5	4	S	1	7	3	24		
22	3	3	5	4	3	7	8	8	7	6	5	3	2	2	7	3	4	3	2	3	12	7	S	7	2	12	5	24	
23	9	9	7	8	8	P	P	8	7	7	10	1	3	3	2	2	8	2	2	4	6	S	5	7	1	10	6	22	
24	5	6	3	3	4	4	6	9	3	5	9	5	6	5	9	7	3	3	3	S	5	8	4	3	9	5	24		
25	3	4	3	4	6	6	6	8	4	4	5	5	4	3	3	5	3	3	4	S	7	11	9	4	3	11	5	24	
26	2	2	2	2	5	4	3	2	2	2	1	1	1	1	1	1	1	1	1	S	2	4	5	4	4	1	5	2	24
27	5	6	6	7	7	6	6	3	1	1	1	1	1	1	1	1	2	S	2	4	7	9	7	4	1	9	4	24	
28	5	1	2	2	2	4	3	4	7	3	2	2	10	1	14	6	S	2	2	5	2	1	1	1	1	14	4	24	
29	2	2	2	2	2	2	3	3	2	2	1	2	1	1	S	1	1	1	3	3	2	1	1	1	1	3	2	24	
30	1	1	2	3	2	4	6	6	41	X	X	X	X	X	X	X	X	X	X	2	1	2	2	2	1	41	5	14	
31	2	1	1	2	2	2	2	5	3	3	2	1	1	X	1	2	2	2	2	3	11	5	6	3	1	11	3	23	
HOURLY MAX	32	15	21	26	44	59	19	13	41	7	10	5	12	17	14	10	8	4	10	13	31	39	35	25					
HOURLY AVG	5	5	5	5	8	8	5	5	5	3	3	2	2	2	2	3	2	2	3	4	6	8	6	5					

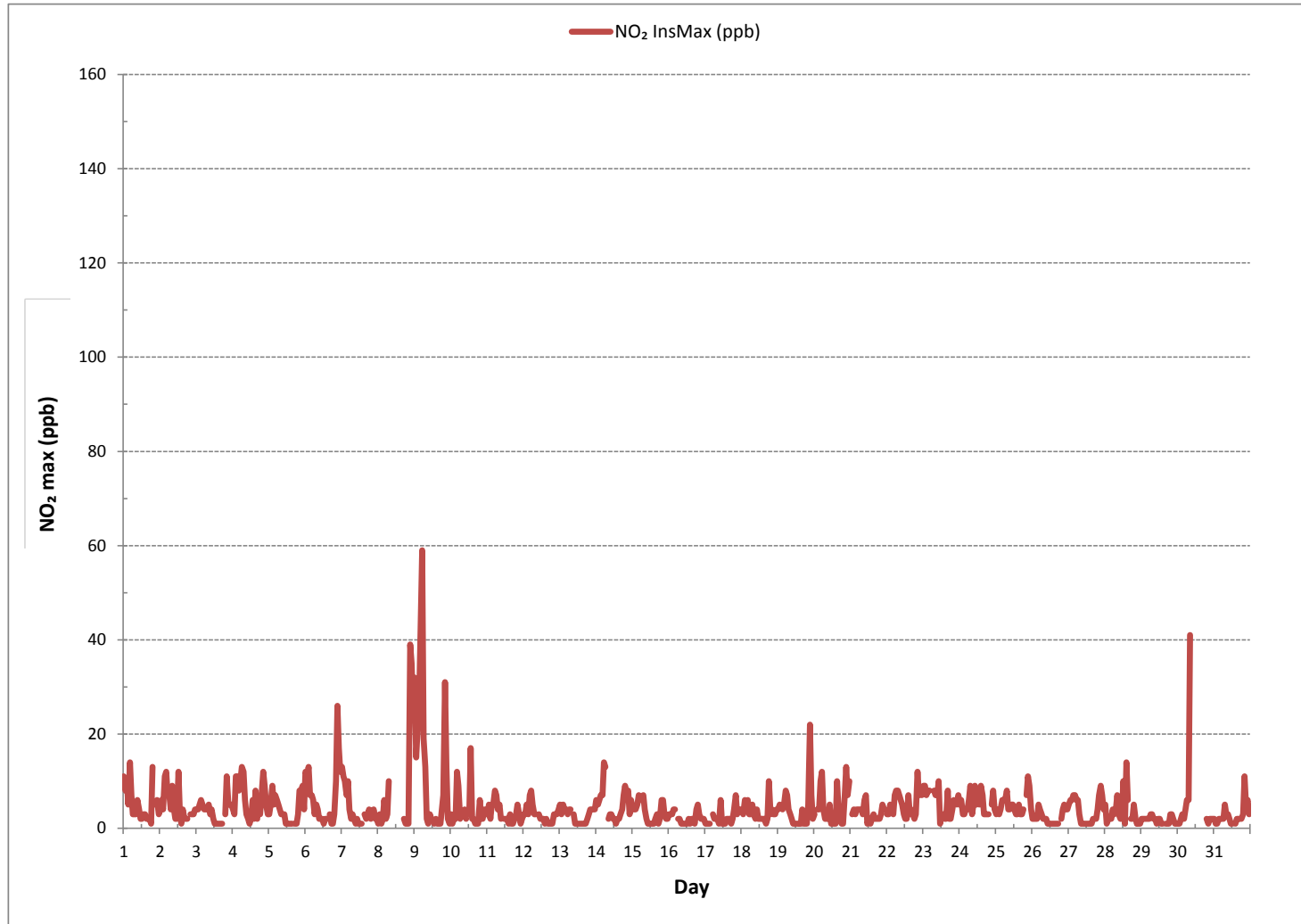
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	693
MAXIMUM INSTANTANEOUS VALUE:	59 ppb @ HOUR 5 ON DAY 9
	VAR-VARIOUS
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	731 hrs
STANDARD DEVIATION:	5

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	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	41.9	33.9	39.4	39.0	33.8	36.2	35.9	36.4	40.7	41.3	44.6	45.4	45.6	44.2	44.6	44.2	45.4	46.2	43.9	43.0	S	30.1	21.8	17.4	17.4	46.2	38.9	24	
2	14.9	10.7	12.4	9.9	6.4	7.5	28.6	31.7	43.8	48.0	54.1	53.6	53.4	52.2	52.2	50.4	48.7	45.8	41.8	S	42.3	36.4	37.7	31.9	6.4	54.1	35.4	24	
3	30.5	28.3	25.2	21.2	21.7	24.0	25.6	33.2	35.6	37.0	41.4	55.0	54.2	53.3	53.9	53.7	52.7	52.5	S	50.6	48.0	36.9	30.5	25.9	21.2	55.0	38.7	24	
4	25.0	20.2	18.3	16.7	18.5	16.7	22.6	30.7	39.5	45.2	47.4	47.8	49.7	43.9	44.8	46.9	46.2	S	46.9	45.1	38.7	26.7	43.2	42.4	16.7	49.7	35.8	24	
5	36.2	32.0	31.3	30.1	30.4	32.4	31.9	33.5	36.7	45.5	49.2	51.7	52.2	51.6	51.0	50.5	S	49.9	50.5	48.3	40.5	33.5	25.8	28.6	25.8	52.2	40.1	24	
6	30.1	26.4	25.5	17.2	14.6	16.5	34.7	34.5	40.5	43.2	48.8	49.8	51.9	52.2	53.4	S	51.7	51.4	52.0	50.1	45.1	28.2	21.2	18.0	14.6	53.4	37.3	24	
7	17.2	14.1	13.7	24.6	33.6	36.2	37.4	36.1	36.7	40.9	44.2	45.7	44.8	44.5	S	48.1	45.8	47.3	47.6	47.8	45.6	45.1	48.7	48.7	13.7	48.7	38.9	24	
8	48.4	46.8	47.2	46.8	45.4	44.2	39.0	34.5	29.8	31.6	33.5	43.9	46.3	S	48.3	47.1	47.2	49.1	49.4	51.1	50.0	47.2	39.1	39.3	29.8	51.1	43.7	24	
9	38.2	39.0	39.8	40.2	38.1	38.4	39.8	41.4	C	C	C	C	C	44.1	44.1	44.3	45.1	45.1	44.6	44.2	35.6	38.9	40.0	40.0	35.6	45.1	41.1	24	
10	38.9	38.2	38.1	37.9	36.2	34.7	36.8	41.1	44.4	45.7	46.1	S	46.4	48.4	50.1	50.3	51.3	51.6	51.5	51.6	47.8	44.8	41.7	38.7	34.7	51.6	44.0	24	
11	34.1	28.5	19.8	23.9	22.1	20.7	26.4	34.1	43.3	47.4	S	53.7	54.6	54.3	55.9	56.0	55.6	54.2	53.4	51.6	48.9	47.1	48.4	46.8	19.8	56.0	42.6	24	
12	37.7	32.4	26.8	25.3	18.3	20.5	33.2	35.3	34.4	S	41.6	45.2	48.7	49.4	51.3	53.4	52.5	52.5	48.9	43.9	40.8	37.0	35.0	33.5	18.3	53.4	39.0	24	
13	32.4	23.6	19.8	15.0	16.8	15.0	23.6	44.9	S	53.1	55.7	55.2	55.4	55.1	54.8	56.0	58.1	55.0	54.6	52.2	48.4	40.0	34.8	25.0	15.0	58.1	41.1	24	
14	18.9	20.3	21.4	16.8	15.9	16.5	30.4	S	42.1	47.8	49.4	51.0	51.5	54.0	57.2	57.8	59.0	58.9	55.9	46.3	34.5	45.2	45.1	37.1	15.9	59.0	40.6	24	
15	28.0	23.0	27.9	21.1	20.2	19.2	S	40.7	46.6	49.4	50.0	54.0	54.5	54.5	53.1	48.0	48.1	49.5	49.4	51.0	53.7	48.9	47.5	45.8	19.2	54.5	42.8	24	
16	36.2	33.5	40.8	39.8	37.3	S	41.7	41.7	40.7	38.3	41.8	44.5	46.4	46.6	42.1	36.5	39.9	38.9	41.7	41.8	40.2	38.2	35.1	32.7	32.7	46.6	39.8	24	
17	32.0	32.7	30.7	29.1	S	27.3	29.7	40.5	40.2	40.8	40.7	40.5	41.4	41.4	41.1	40.8	41.2	39.9	40.8	40.6	37.0	29.2	26.9	25.3	25.3	41.4	36.1	24	
18	22.4	18.9	18.8	S	11.3	13.8	31.7	36.1	43.5	44.8	44.6	46.6	47.7	49.3	50.4	49.8	49.2	48.6	49.9	48.4	41.4	37.0	31.5	30.7	11.3	50.4	37.7	24	
19	26.2	19.1	S	13.7	10.3	8.8	29.4	31.9	42.3	47.5	47.9	48.5	49.2	50.4	51.1	53.4	56.3	57.5	56.8	55.5	50.1	41.3	43.0	42.8	8.8	57.5	40.6	24	
20	40.0	S	30.8	34.2	30.1	34.1	35.7	37.3	42.4	45.7	47.5	45.8	45.5	46.1	45.8	45.8	46.4	46.6	46.9	45.8	40.6	30.3	25.2	34.4	25.2	47.5	40.1	24	
21	S	22.7	19.5	12.8	10.5	14.7	26.4	33.9	39.2	46.3	51.4	51.4	54.6	54.6	52.5	52.3	53.2	52.9	52.3	48.2	46.3	38.1	28.6	S	10.5	54.6	39.2	24	
22	32.7	25.8	15.5	10.6	6.0	11.8	22.0	28.8	39.4	51.6	58.7	60.2	60.6	59.3	60.6	60.8	60.2	60.5	59.7	55.5	39.9	33.9	S	19.5	6.0	60.8	40.6	24	
23	18.5	10.6	14.4	14.9	9.0	P	P	37.7	45.2	50.2	54.4	57.4	56.6	59.3	61.2	61.5	61.8	66.3	68.1	58.1	64.2	S	46.4	35.3	9.0	68.1	45.3	22	
24	34.1	27.9	22.7	25.6	26.1	24.9	36.2	40.8	39.9	36.7	28.0	33.2	32.9	30.7	28.2	35.6	42.8	43.0	44.4	33.6	S	26.9	27.1	40.5	22.7	44.4	33.1	24	
25	41.6	32.6	25.3	17.1	16.1	21.8	21.1	22.6	28.0	32.4	28.4	27.1	54.6	56.6	56.5	54.8	54.0	53.6	53.6	S	37.9	33.9	33.2	35.9	16.1	56.6	36.5	24	
26	34.4	33.5	29.7	30.2	23.0	25.2	23.2	27.1	27.3	37.1	38.2	43.3	48.5	49.8	49.5	48.2	48.4	50.0	S	50.3	45.4	34.5	33.0	24.5	23.0	50.3	37.1	24	
27	30.5	31.3	29.8	19.9	16.7	29.1	32.4	37.3	39.6	41.8	44.0	45.9	49.8	50.5	45.9	46.8	47.5	S	47.2	46.9	39.6	29.5	26.5	26.1	16.7	50.5	37.2	24	
28	36.3	35.1	33.5	35.7	35.9	34.8	40.5	45.4	50.7	54.5	56.8	59.0	61.8	64.6	66.0	64.0	S	60.9	58.2	46.0	38.1	36.8	38.4	40.5	33.5	66.0	47.5	24	
29	47.8	49.7	49.8	47.5	33.5	33.3	33.0	36.6	37.3	40.8	41.6	43.6	43.4	43.0	S	42.2	42.4	41.3	37.9	37.7	35.9	33.9	31.6	31.6	49.8	40.3	24		
30	32.2	30.8	29.4	25.5	26.2	24.4	23.2	21.8	20.9	X	X	X	X	X	X	X	X	X	X	22.7	21.3	17.6	18.4	19.4	17.6	32.2	23.8	14	
31	13.5	15.3	13.9	14.4	14.5	14.4	18.2	18.9	20.5	24.7	25.8	25.7	30.8	X	31.7	31.2	31.8	32.3	32.5	27.8	29.7	28.1	22.6	24.0	13.5	32.5	23.6	23	
HOURLY MAX	48.4	49.7	49.8	47.5	45.4	44.2	41.7	45.4	50.7	54.5	58.7	60.2	61.8	64.6	66.0	64.0	61.8	66.3	68.1	58.1	64.2	48.9	48.7	48.7					
HOURLY AVG	31.7	27.9	27.0	25.2	22.6	24.0	30.7	34.9	38.3	43.2	44.9	47.3	49.4	50.2	49.7	49.6	49.4	50.1	49.4	46.1	42.4	35.9	34.3	32.7					

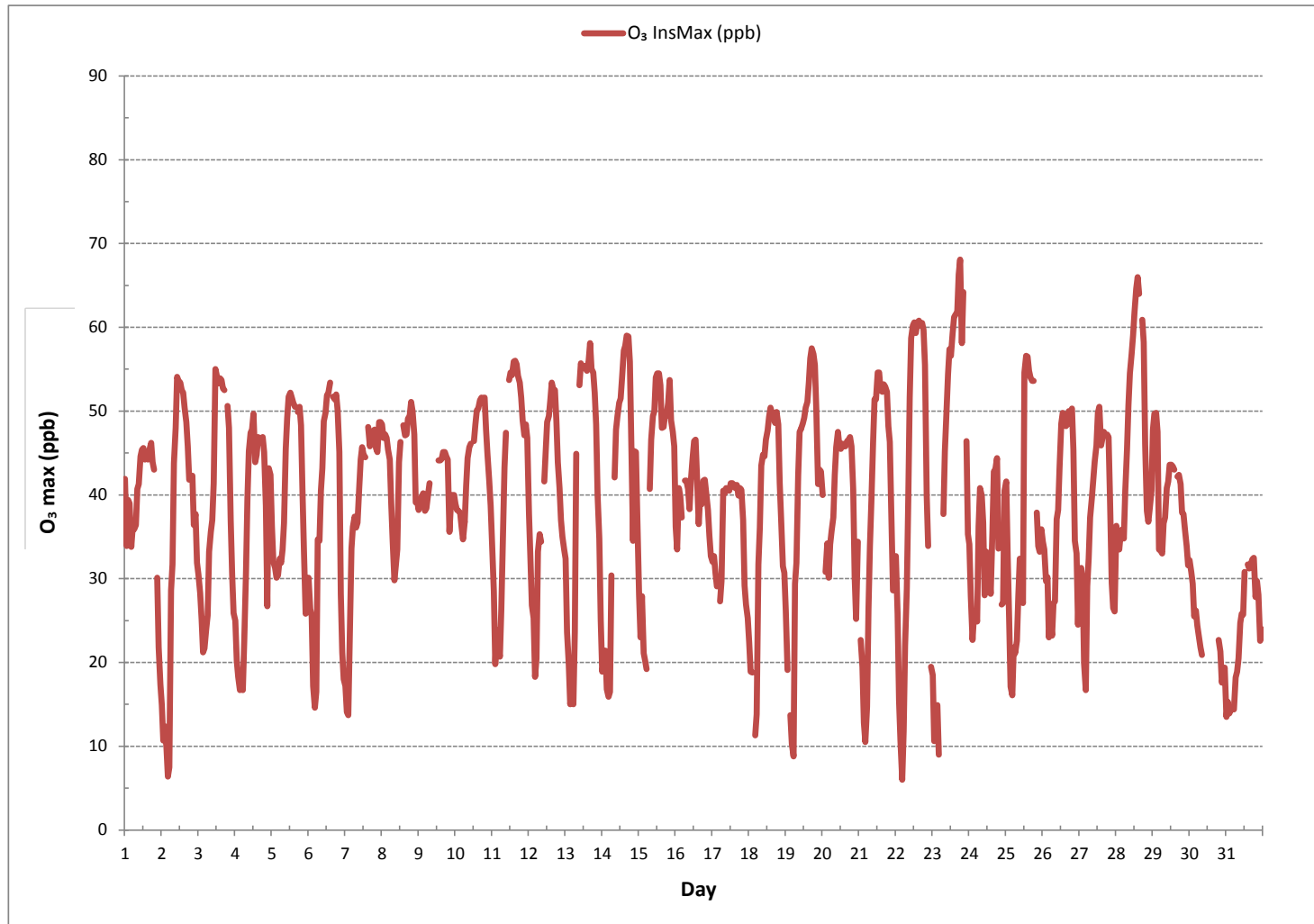
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697
MAXIMUM INSTANTANEOUS VALUE:	68.1 ppb @ HOUR 18 ON DAY 23
IZS CALIBRATION TIME:	29 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	731 hrs
STANDARD DEVIATION:	12.4

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - May 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	4.1	7.6	5.8	4.9	5.1	5.7	7.0	9.4	13.9	14.0	15.6	22.2	26.0	24.5	25.3	22.5	18.1	13.8	16.5	6.1	5.0	4.0	2.8	2.2	2.2	26.0	11.8	24	
2	3.4	2.3	3.8	2.1	3.9	3.1	7.1	7.7	13.4	17.2	24.5	19.7	23.7	16.2	21.0	21.3	18.9	37.6	22.3	38.2	10.1	11.3	9.9	10.6	2.1	38.2	14.6	24	
3	9.8	10.5	6.7	8.5	8.2	9.0	8.8	12.7	17.2	14.3	16.7	23.2	20.9	22.7	25.3	23.3	21.9	15.1	14.2	8.5	6.3	2.8	1.4	1.4	1.4	25.3	12.9	24	
4	2.7	2.4	7.0	2.6	5.1	4.2	6.6	7.7	11.1	17.1	23.3	19.3	21.6	20.3	14.8	15.3	16.6	10.9	8.5	7.4	3.1	3.4	9.7	8.3	2.4	23.3	10.4	24	
5	2.9	6.2	7.3	7.2	9.6	10.2	7.7	9.6	9.6	12.6	16.4	17.3	18.2	17.9	21.4	16.4	15.8	13.9	8.5	6.5	2.5	2.2	3.6	4.1	2.2	21.4	10.3	24	
6	3.3	2.1	3.4	1.5	2.2	1.7	6.5	11.2	11.0	12.1	16.9	20.6	22.1	21.3	22.6	17.2	20.8	17.4	14.6	9.5	5.9	2.5	3.7	2.3	1.5	22.6	10.5	24	
7	2.1	2.4	4.1	4.3	6.4	8.6	19.3	18.6	20.6	21.6	23.5	25.0	22.9	23.0	20.1	19.3	18.8	18.3	16.3	13.9	6.9	6.6	13.2	12.2	2.1	25.0	14.5	24	
8	13.2	12.8	18.5	16.3	10.7	16.1	11.6	9.3	9.5	6.3	10.0	13.7	14.3	15.8	18.0	37.2	19.2	29.4	30.2	27.0	24.1	27.9	28.9	23.5	6.3	37.2	18.5	24	
9	15.1	14.7	12.1	11.0	8.8	7.1	12.4	21.0	17.9	17.1	20.0	17.0	17.4	15.1	16.0	17.1	14.5	13.8	10.5	8.3	4.6	7.2	10.2	13.3	4.6	21.0	13.4	24	
10	10.6	11.0	10.2	7.8	6.3	6.5	10.4	9.9	12.3	16.7	14.8	15.8	11.9	12.8	12.9	10.0	12.1	8.8	7.6	7.1	11.8	11.1	10.2	6.6	6.3	16.7	10.6	24	
11	4.2	2.5	3.6	5.3	1.9	3.8	6.9	9.1	12.8	12.2	18.9	16.5	15.8	18.3	14.9	12.2	14.0	12.6	9.3	7.5	4.2	7.5	8.6	5.3	1.9	18.9	9.5	24	
12	3.2	3.1	1.9	2.3	3.3	5.2	7.4	16.7	15.4	16.4	19.2	21.5	21.2	22.8	21.2	19.9	20.4	24.8	17.4	15.1	9.9	5.2	5.9	7.1	1.9	24.8	12.8	24	
13	6.1	5.0	2.3	2.8	2.6	2.9	4.7	4.9	10.3	18.9	25.5	23.4	27.8	31.1	33.2	28.8	25.2	23.6	17.8	10.3	4.5	1.8	1.9	1.9	1.8	33.2	13.2	24	
14	2.8	2.3	2.2	2.2	1.7	2.9	5.5	8.3	13.1	16.3	11.8	12.8	15.3	13.6	13.8	13.7	15.9	10.0	5.4	4.3	4.1	15.7	11.4	4.5	1.7	16.3	8.7	24	
15	3.9	8.5	12.5	5.5	4.8	4.0	9.9	13.2	22.9	26.1	26.9	26.0	24.1	24.2	18.6	17.8	14.0	16.5	10.3	13.0	19.8	13.7	8.6	8.5	3.9	26.9	14.7	24	
16	3.4	5.8	5.9	4.0	10.1	12.9	15.9	14.4	19.9	19.6	20.5	19.3	19.6	23.0	23.2	26.4	22.9	19.1	19.0	17.1	16.7	13.0	13.9	8.8	3.4	26.4	15.6	24	
17	12.6	12.3	6.7	14.0	12.0	10.1	11.1	16.6	15.3	17.4	14.2	18.1	14.2	13.6	16.7	13.5	13.5	12.9	13.4	7.8	3.7	4.6	2.6	3.5	2.6	18.1	11.7	24	
18	3.0	2.3	1.8	2.6	2.9	4.0	9.0	9.3	10.7	15.2	14.6	13.2	15.1	12.0	12.2	10.2	13.2	11.6	9.5	4.0	2.8	3.0	4.2	4.3	1.8	15.2	7.9	24	
19	2.2	2.7	2.2	3.6	3.0	4.6	4.9	6.4	11.7	14.5	18.9	22.3	21.1	19.8	19.5	18.7	15.8	15.3	11.7	8.3	4.6	5.3	6.2	5.7	2.2	22.3	10.4	24	
20	5.9	3.4	2.2	3.7	1.9	7.3	10.3	11.0	17.9	18.1	22.0	21.9	22.9	23.5	20.8	19.2	16.7	18.3	10.9	8.6	2.5	2.9	2.7	2.7	1.9	23.5	11.6	24	
21	4.2	5.1	2.5	2.7	3.0	2.4	6.0	6.5	6.7	8.1	12.7	14.7	14.4	17.4	15.0	18.3	13.4	12.7	13.3	13.7	8.3	3.2	3.9	7.5	2.4	18.3	9.0	24	
22	12.1	5.1	4.8	5.3	2.6	4.1	6.7	5.5	5.8	5.5	8.6	8.5	14.4	11.0	8.8	11.1	9.2	7.9	5.7	3.8	1.8	2.9	5.1	2.3	1.8	14.4	6.6	24	
23	3.0	3.3	2.5	2.9	1.9	P	P	4.6	7.5	10.0	11.8	15.7	16.1	10.7	16.0	13.6	12.7	11.5	9.8	3.8	14.1	4.3	2.9	3.4	1.9	16.1	8.3	22	
24	2.7	3.8	5.8	4.1	6.7	6.2	6.6	13.1	6.6	8.0	5.8	7.1	6.2	4.8	3.7	8.0	9.0	9.1	4.4	4.6	5.0	4.5	5.7	8.9	2.7	13.1	6.3	24	
25	5.9	4.9	5.4	5.3	5.0	6.3	7.6	9.1	9.4	9.3	9.5	9.7	11.6	13.7	14.0	14.5	9.4	7.7	7.9	7.4	4.3	3.6	6.2	9.0	3.6	14.5	8.2	24	
26	6.3	6.8	14.0	9.5	20.6	19.0	8.8	10.5	8.0	14.3	17.4	17.8	17.7	28.4	20.5	18.2	19.8	16.9	16.4	13.1	4.5	3.7	5.6	3.8	3.7	28.4	13.4	24	
27	5.5	9.2	6.5	4.0	2.9	9.6	12.8	14.2	17.0	21.0	21.3	22.9	26.1	27.3	22.4	19.8	19.2	15.2	12.2	7.0	2.9	3.0	2.4	2.3	2.3	27.3	12.8	24	
28	7.8	8.5	7.7	9.7	9.7	7.5	7.8	12.9	18.0	20.1	16.9	24.2	21.3	19.6	13.5	16.2	16.5	22.8	21.7	21.7	11.8	15.3	17.6	15.8	7.5	24.2	15.2	24	
29	26.6	21.1	13.4	4.3	4.7	7.0	15.1	17.7	16.5	18.9	19.4	17.5	16.4	19.8	16.1	13.9	17.9	11.9	12.4	4.6	11.6	7.0	9.9	11.6	4.3	26.6	14.0	24	
30	13.8	9.3	6.8	4.7	4.2	5.2	5.0	5.9	5.6	X	X	X	X	X	X	X	X	X	X	X	X	6.0	3.4	3.6	4.5	3.4	13.8	6.0	13
31	2.7	7.8	3.8	6.0	5.3	4.3	6.0	6.1	10.2	17.6	20.6	22.0	X	24.4	23.8	18.7	22.5	20.4	19.8	10.4	12.8	8.7	10.0	11.9	2.7	24.4	12.9	23	
HOURLY MAX	26.6	21.1	18.5	16.3	20.6	19.0	19.3	21.0	22.9	26.1	26.9	26.0	27.8	31.1	33.2	37.2	25.2	37.6	30.2	38.2	24.1	27.9	28.9	23.5					

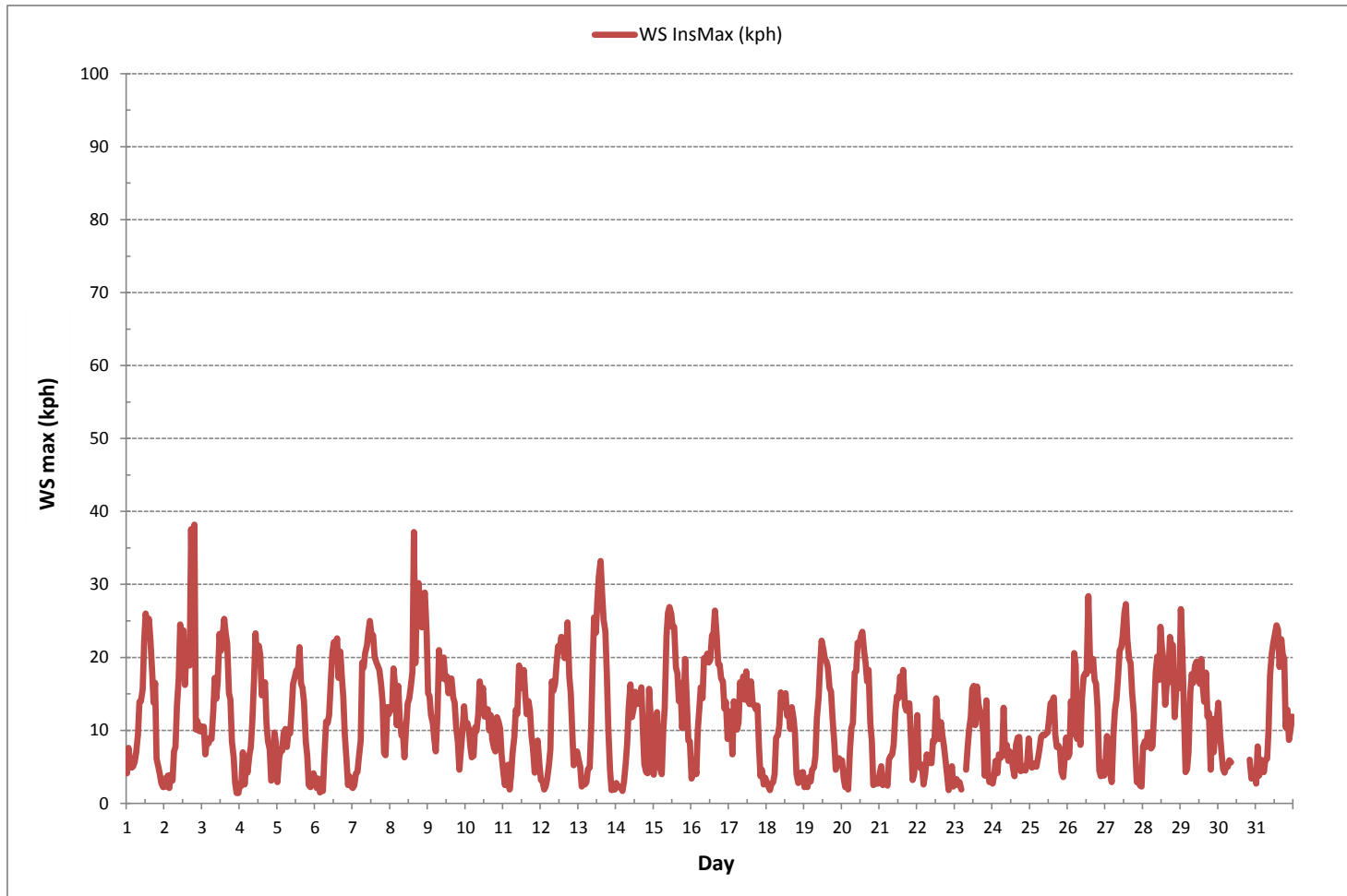
STATUS FLAG CODES

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

MAXIMUM INSTANTANEOUS VALUE:	38.2	kph	@ HOUR	19	ON DAY	2	
OPERATIONAL TIME:						730	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

26-06-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-05-1-C</u>
Site: <u>Cold Lake South Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>June 07, 2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>June 07, 2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>June 11, 2018</u>
Level 3 Independent Data Review	<u>CSA-Lmhq</u>	Date <u>June 26, 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

September 14, 2018

Subject: Monthly Report Submission for the LICA Maskwa station

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

PM2.5: A TEOM unit was installed on May 16 upon LICA's request for a temporary PM2.5 monitoring program during the forest fire season. May was considered a period of equipment stabilization. AMD data completeness criteria (Chapter 6, DQ 4-C) is not applicable to data collected during this period.

Data Logger Upgrade: A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832.

Wind Data: The Maxxam-supplied RM Young wind system (s/n: 92411) malfunctioned on May 13. The wind system was removed and the LICA-owned Met One (s/n: H10703) was installed on May 13.

Ambient Temperature/Relative Humidity: On the recommendation of Alberta Environment and Parks (AEP) following the station audit in March 2018, the temperature/RH sensor was replaced on May 22. LICA's Met One sensor (s/n: F4090, Model: 083D-1-35) was removed and a LICA Rotronic sensor (s/n: 20221366, Model: HC2A-S3) was installed.

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



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

required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

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

Respectfully,

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

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

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

Lily Lin
Data & Reporting Specialist
587-225-2248
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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA CONTINUOUS MONITORING STATION

JOB #: 2833-2018-05-30-C

May 2018

Prepared for:

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

Attention: MIKE BISAGA

DATE: **August 10, 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 May 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.

Data Logger Upgrade: A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Downtime ranging from two to five hours were recorded across parameters due to activities surrounding the upgrade.

Power Failure: A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime on all parameters.

SO₂: One hour of downtime was recorded due to an additional zero-span check performed on May 9 at hour 21:00 to assess a biased low drift in span response.

THC: Fifty-four hours of downtime were recorded between May 14 and May 20 due to two instances of sample pump failure and the subsequent corrective actions performed.

NO_x/NO/NO₂: Two hours of downtime were recorded due to an additional zero-span check performed on May 1 to assess span response after a permeation tube replacement.

PM_{2.5}:

- A TEOM unit was installed on May 16 upon LICA's request for a temporary PM_{2.5} monitoring program during the forest fire season. May was considered a period of equipment stabilization. AMD data completeness criteria (Chapter 6, DQ 4-C) is not applicable to data collected during this period.
- The audit performed on May 28 did not meet the AMD's as-found requirements. Data was invalidated back to the point of malfunction, determined as to be May 24 at hour 09:00. Ninety-eight hours of downtime were incurred.

Wind Data:

- Between May 3 and May 13, forty-three hours of downtime were recorded as a result of two separate events of wind system malfunction and the subsequent corrective actions performed.
- The resident wind system, RM Young (s/n: 92411) from Maxxam's inventory, was removed and sent to the manufacturer for maintenance. LICA-owned Met One (s/n: H10703) was installed as a replacement on May 13.
- Due to a polling error, one hour of Standard Deviation Wind Direction and one instance of maximum instantaneous data were lost on May 18 at 09:00. The corresponding Wind Speed and Wind Direction data were invalidated to protect the parameter relationship.

AmbTPX/RH: On the recommendation of Alberta Environment and Parks (AEP) following the station audit in March 2018, the temperature/RH sensor was replaced on May 22. LICA's Met One sensor (s/n: F4090, Model: 083D-1-35) was removed and a newly-procured LICA Rotronic sensor (s/n: 20221366, Model: HC2A-S3) was installed.

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	15	21	7	2.8	WNW	2	1	99.1
H ₂ S (ppb)	10	3	0	0	0	10	15	0	0.1	S	2	23	99.2
THC (ppm)	-	-	-	-	2.05	3.24	19	5	1.8	SW	2.18	21	92.2
NO ₂ (ppb)	159	-	0	-	2	20	26	23	3.6	W	4	3	98.9
NO (ppb)	-	-	-	-	0	16	21	7	2.8	WNW	1	1	98.9
NO _x (ppb)	-	-	-	-	2	35	21	7	2.8	WNW	5	3	98.9
RELATIVE HUMIDITY (%)	-	-	-	-	54	98	26	2	2.5	NE	87	24	99.3
BAROMETRIC PRESSURE (millibar)	-	-	-	-	941	953	18	5	3.5	SSW	952	18	99.6
AMBIENT TEMPERATURE (°C)	-	-	-	-	13.6	28.6	28	15	5.2	WNW	20.5	28	99.3
PRECIPITATION (mm)	-	-	-	-	0.0	2.2	26	7	2.1	ENE	0.3	30	99.6
VECTOR WS (kph)	-	-	-	-	0.5	18.9	8	23	-	NNE	9.9	16	93.5
VECTOR WD (sec)	-	-	-	-	340 (NNW)	-	-	-	-	-	-	-	93.5

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.

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	2
MONTHLY CONTINUOUS DATA SUMMARY REPORT	4
EXCEEDANCE SUMMARY REPORT	5
TABLE OF CONTENTS	6
1.0 Discussion	8
2.0 Project Personnel	13
3.0 Plant Monthly Required AMD Summary	13
4.0 Calculations and Results	13
5.0 Methods and Procedures	14
Appendix I	Continuous Monitoring Data Results 17
	Sulphur Dioxide 18
	Hydrogen Sulphide 24
	Total Hydrocarbon 30
	Oxides of Nitrogen 36
	Nitric Oxides 42
	Nitrogen Dioxide 47
	Particulate Matter 2.5 53
	Wind Speed 58
	Wind Direction 63
	Standard Deviation Wind Direction 66
	Relative Humidity 69
	Barometric Pressure 72
	Ambient Temperature 75
	Precipitation 78

Appendix II	Equipment Calibration Results	81
	Sulphur Dioxide	82
	Hydrogen Sulphide	86
	Total Hydrocarbon	89
	Nitrogen Dioxide	94
	Particulate Matter	98
	Wind System	101
	Meteorological System	104
	Calibrators	107
	Calibration Gases	110
Appendix III	Maximum Instantaneous Data	115
Appendix IV	Report Certification Form	130
Appendix V	Data Validation Certification Form	132

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), 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 99.1%, equivalent to 7 hours of downtime.
- On May 9, the analyzer spanned outside the lower acceptance limit. A repeat zero-span check conducted on the same day at hour 21:00 drifted further outside the limit. This demonstrated that the permeation tube was depleted, prompting a site visit on May 10. Following a successful shut-down calibration, a new permeation tube was installed and the sample pump was rebuilt. The output voltage was also calibrated prior to successfully performing a post-repair calibration. One hour of downtime was recorded due to the additional quality check.
- The newly-installed permeation tube was allowed time to stabilize and the expected span value was updated on May 13.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Five hours of data at 13:00 – 16:00 and 22:00, and six instances of maximum instantaneous data were lost as a result of the activities surrounding this upgrade.
- Two instances of maximum instantaneous data were discarded on May 4 at hour 17:00 and May 13 at hour 10:00, due to brief power outages.
- Due to a polling error, one instance of maximum instantaneous data was lost on May 18 at 09:00.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 99.2%, equivalent to 6 hours of downtime.
- The routine monthly calibration was performed on May 16.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Five hours of data at 13:00 – 16:00 and 22:00, and six instances of maximum instantaneous data were lost as a result of the activities surrounding this upgrade.
- Two instances of maximum instantaneous data were discarded on May 4 at hour 17:00 and May 13 at hour 10:00 due to brief power outages.
- Due to a polling error, one instance of maximum instantaneous data was lost on May 18 at 09:00.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 92.2%, equivalent to 58 hours of downtime.
- The fuel (H₂) gas cylinder was replaced on May 10.
- The analyzer started recording unusually low concentrations towards the end of day on May 14. This prompted a site visit on May 16 where it was discovered that the sample pump had failed. The sample pump was repaired, followed by a successful post-repair calibration. Data was invalidated back to the point of failure which was determined to be at hour 18:00 on May 14. Forty-one hours of downtime were incurred due to this event.
- A technician was dispatched to site on May 20, in response to a low concentration alarm. The sample pump was found seized as the bearing had failed from over-heating. An alternate sample pump was installed and given time to stabilize. A successful post-repair calibration was subsequently completed. Data was invalidated back to the point of failure which was determined to be at hour 03:00 on May 20. Thirteen hours of downtime were incurred due to this event.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 15:00 – 16:00 and 22:00, and five instances of maximum instantaneous data were lost as a result of the activities surrounding this upgrade.
- Two instances of maximum instantaneous data were discarded on May 4 at hour 17:00 and May 13 at hour 10:00 due to brief power outages.
- Due to a polling error, one instance of maximum instantaneous data was lost on May 18 at 09:00.

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

- Operational time for the monitoring period was 98.9%, equivalent to 8 hours of downtime.
- A repeat zero-span check was triggered on May 1, at hours 06:00-07:00, to assess span response after the permeation tube was replaced on April 30, incurring two hours of downtime. The permeation was allowed more time to stabilize and the expected span value was updated following the routine monthly calibration on May 4.
- The analyzer spanned outside the lower acceptance limit on May 12 and 13, due to an erroneous adjustment of the zero-span oven temperature during a site visit on May 10. The temperature adjustment was reverted onsite on May 13 and span response recovered. No further issue was identified.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Five hours of data at 13:00 – 16:00 and 22:00, and six instances of maximum instantaneous data were lost as a result of the activities surrounding this upgrade.
- Two instances of maximum instantaneous data were discarded on May 4 at hour 17:00 and May 13 at hour 10:00 due to brief power outages.
- Due to a polling error, one instance of maximum instantaneous data was lost on May 18 at 09:00.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 64.3%, based on 373 hours recorded during the monitoring period. There was 133 hours of downtime recorded, yielding 240 hours of valid measurements. May was considered a period of equipment stabilization. AMD data completeness criteria (Chapter 6, DQ 4-C) is not applicable to data collected during this period.
- The TEOM unit was installed on May 16 upon LICA's request for a temporary PM_{2.5} monitoring program for the forest fire season.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- The audit performed on May 28 did not meet the AMD's as-found requirements. This was attributed to rain interfering with the wiring of the internal temperature/RH sensor of the instrument and compromising the connection. The connection was re-established and the instrument was tested twice to confirm its functionality. A complete audit, including flows calibration, was then successfully completed. Data was invalidated back to the start of the precipitation event, determined as May 24 at hour 09:00, resulting in 98 hours of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Four hours of data at 13:00 – 16:00 were lost as a result of the activities surrounding this upgrade.
- Data was corrected in accordance with AMD (2016), Chapter 6, Table 2, Zero Adjustment Criteria. Data recorded between 0 and $-3 \mu\text{g}/\text{m}^3$ was corrected to $0 \mu\text{g}/\text{m}^3$. Data recorded below $-3 \mu\text{g}/\text{m}^3$ was invalidated. Thirty hours of data were invalidated as the data was below $-3 \mu\text{g}/\text{m}^3$ this month.

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

- Operational time for the monitoring period was 93.5%, equivalent to 48 hours of downtime.
- The wind system started producing “over-range” data sporadically on May 3. This prompted a site visit on May 4 where it was discovered that water infiltration into the wind system, as a result of a severe thunderstorm, had caused problems with the wiring connections. All connections were re-established and the wind system was back online after it was tested for 30 minutes to confirm functionality. Twenty-eight hours of downtime were recorded due to this event.
- An electronic failure of the wind system occurred on May 12, prompting a site visit on May 13 where the wind system was replaced for manufacturer maintenance. The resident wind system, RM Young (s/n: 92411) from Maxxam's inventory, was replaced with LICA-owned Met One (s/n: H10703). Fifteen hours of downtime were recorded due to this event.
- Due to a polling error, one hour of Standard Deviation Wind Direction and one instance of maximum instantaneous data were lost on May 18 at 09:00. The corresponding Wind Speed and Wind Direction data were invalidated to protect the parameter relationship.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 12:00 – 14:00, and six instances of maximum instantaneous data were lost as a result of the activities surrounding this upgrade.
- One instance of maximum instantaneous data was discarded on May 4 at hour 17:00 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 99.3%, equivalent to 5 hours of downtime.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- On the recommendation of AEP following the station audit in March 2018, the temperature/RH sensor was replaced on May 22. Following a successful shut-down audit, LICA's Met One sensor (s/n: F4090, Model: 083D-1-35) was removed and a newly-procured LICA Rotronic sensor (s/n: 20221366, Model: HC2A-S3) was installed. An installation audit was subsequently completed. Two hours of downtime were incurred at hours 12:00 and 14:00 as a result.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 13:00 – 14:00 were lost as a result of the activities surrounding this upgrade.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 13:00 – 14:00 were lost as a result of the activities surrounding this upgrade.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 13:00 – 14:00 were lost as a result of the activities surrounding this upgrade.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- A power failure occurred on May 22 at hour 13:00, resulting in one hour of downtime.
- On the recommendation of AEP following the station audit in March 2018, the temperature/RH sensor was replaced on May 22. Following a successful shut-down audit, LICA's Met One sensor (s/n: F4090, Model: 083D-1-35) was removed and a newly-procured LICA Rotronic sensor (s/n: 20221366, Model: HC2A-S3) was installed. An installation audit was subsequently completed. Two hours of downtime were incurred at hours 12:00 and 14:00 as a result.
- A data logger upgrade was implemented on May 31. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 13:00 – 14:00 were lost as a result of the activities surrounding this upgrade.

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 and Bim Adeniji.

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, except for WS/WD/STDWD, follow the methods described in the AMD, 2016.

WS/WD/STDWD:

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected between May 31, hour 15:00 and 23:00 was re-calculated from the available 1-minute vector averages. To incorporate the highest number of instant data, minute data that contained less than 45 seconds were averaged based on the remaining sample set and not excluded when calculating hourly averages. This data treatment had a minor impact on data collected on May 31, at hour 16:00 and 20:00. Overall, in comparison with the original hourly averages, the change was insignificant. On July 31, the DAS vendor modified the datalogger configuration, in order to optimize the collection of wind data. The criteria of the calm threshold was eased and hourly data is calculated based on 1-minute vector averages.

5.0 Methods and Procedures

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

Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration
MET One Instruments: Operation Manual Document No. 50.5-9800
Maxxam AIR SOP-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
Maxxam AIR SOP-00215: TEOM Operation

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
Particulate Matter (PM_{2.5}) - R&P 1405F TEOM Unit
Wind System - RM Young Unit and MET One Unit
Relative Humidity - Met One and Rotronic
Barometric Pressure - Met One Unit
Ambient Temperature - Met One and Rotronic
Precipitation - Met One Unit
Datalogger - ESC 8832 and Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

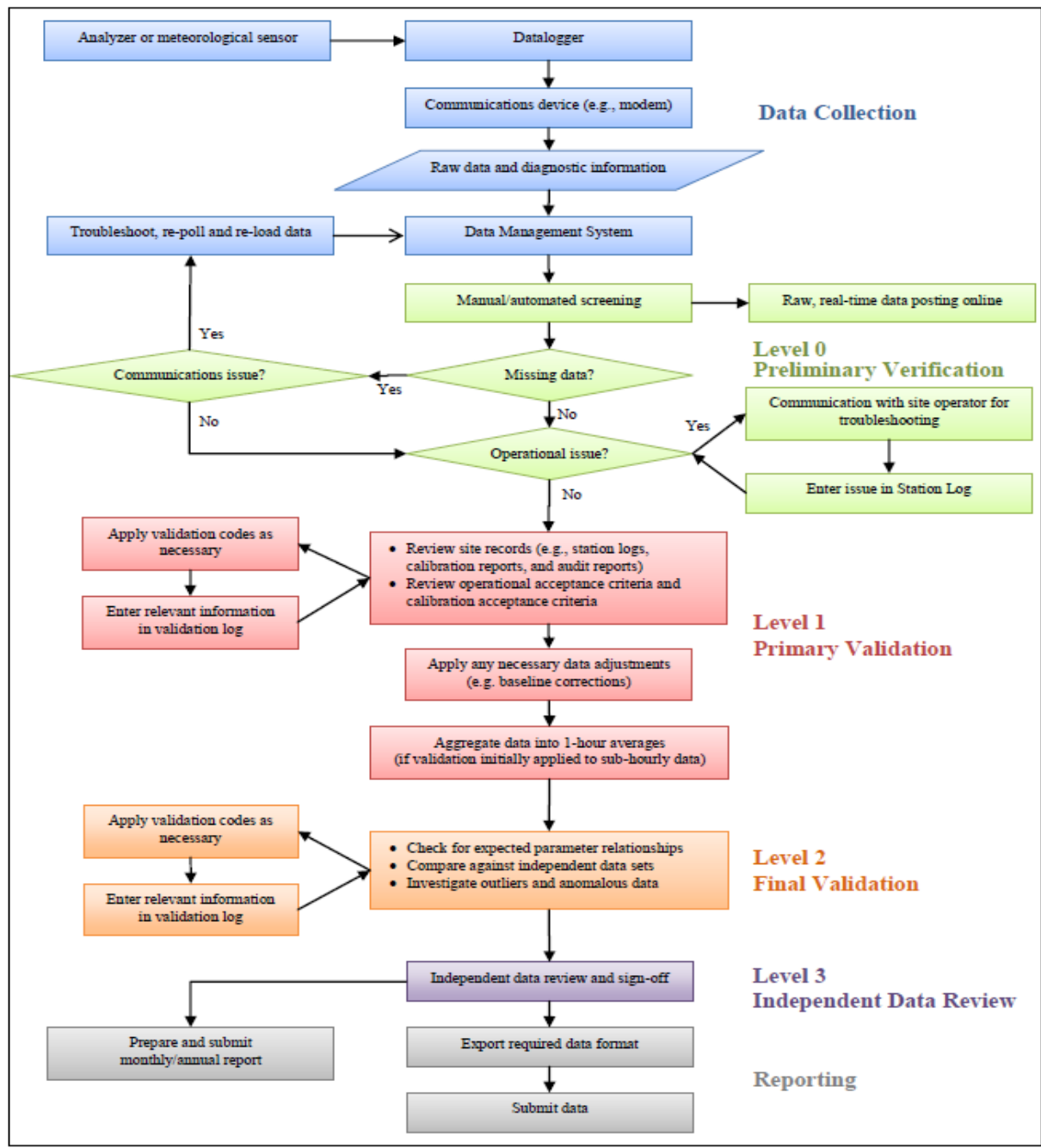
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (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	1	1	0	1	1	4	4	3	5	7	3	1	1	3	S	4	0	0	0	0	0	0	0	7	2	24	
2	0	0	0	0	0	0	0	0	2	1	0	1	0	0	0	0	0	S	0	0	2	0	0	0	0	0	0	2	0	24
3	1	0	1	1	0	0	1	1	2	2	3	1	0	2	7	S	5	4	0	0	0	0	0	1	0	0	0	7	1	24
4	0	0	0	0	0	0	0	0	1	0	3	1	1	2	S	0	1	1	3	1	0	0	0	0	0	0	0	3	1	24
5	0	0	1	0	0	0	6	10	14	3	2	1	1	2	S	0	1	2	1	0	0	0	0	0	0	0	0	14	2	24
6	0	0	0	0	1	1	2	3	2	2	1	0	S	0	0	0	1	1	7	10	1	6	2	1	1	0	0	10	2	24
7	1	1	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	1	0	24
8	0	1	2	0	0	0	0	0	0	0	S	0	1	1	1	4	5	2	1	1	1	1	1	0	0	0	0	5	1	24
9	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	S1	1	0	0	0	1	0	23
10	2	0	0	0	0	0	1	0	S	1	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	0	0	2	0	24
11	0	0	0	0	0	0	1	7	S	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	7	0	24
12	0	0	0	0	0	0	S	0	1	2	1	0	0	0	0	1	1	1	0	0	1	1	0	0	1	0	0	2	0	24
13	1	5	2	0	0	S	1	5	3	1	1	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	5	1	24
14	0	0	0	0	S	0	0	0	0	0	0	2	0	1	1	2	2	0	0	1	1	0	0	0	0	0	0	2	0	24
15	0	0	0	S	0	0	0	0	0	1	1	0	1	1	1	0	1	1	1	0	3	3	0	0	0	0	0	3	1	24
16	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	S	1	0	0	0	0	0	0	1	1	2	1	1	1	1	1	0	1	0	0	0	0	0	0	S	0	0	2	1	24
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	0	0	0	1	0	24
20	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24
21	0	0	0	0	0	0	0	0	15	11	2	1	0	0	1	0	0	0	0	5	0	S	0	0	0	0	0	15	2	24
22	0	0	0	0	0	0	5	2	3	4	2	0	0	P	0	0	0	0	0	0	S	0	0	0	0	0	0	5	1	23
23	0	0	0	0	0	0	0	0	6	5	0	0	0	0	0	0	1	S	1	1	0	0	0	0	0	0	0	6	1	24
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	S	0	0	0	0	0	1	0	0	0	2	0	24
25	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
26	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	1	3	0	0	3	0	24
27	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
28	0	0	0	1	1	1	1	1	0	0	0	0	0	S	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	X	X	X	X	1	0	0	0	0	X	1	0	1	0	24
HOURLY MAX	2	5	2	1	1	6	10	15	11	5	3	5	7	3	7	4	5	7	10	2	6	3	1	3						
HOURLY AVG	0	0	0	0	0	0	1	2	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0						

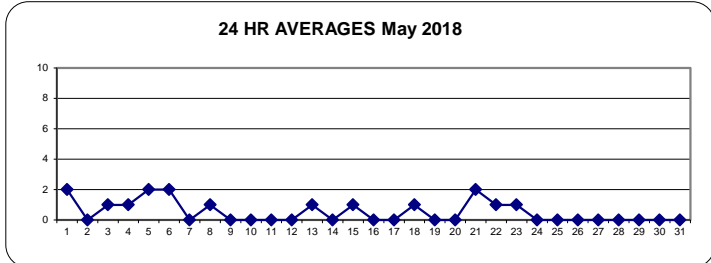
STATUS FLAG CODES

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

OBJECTIVE LIMIT:

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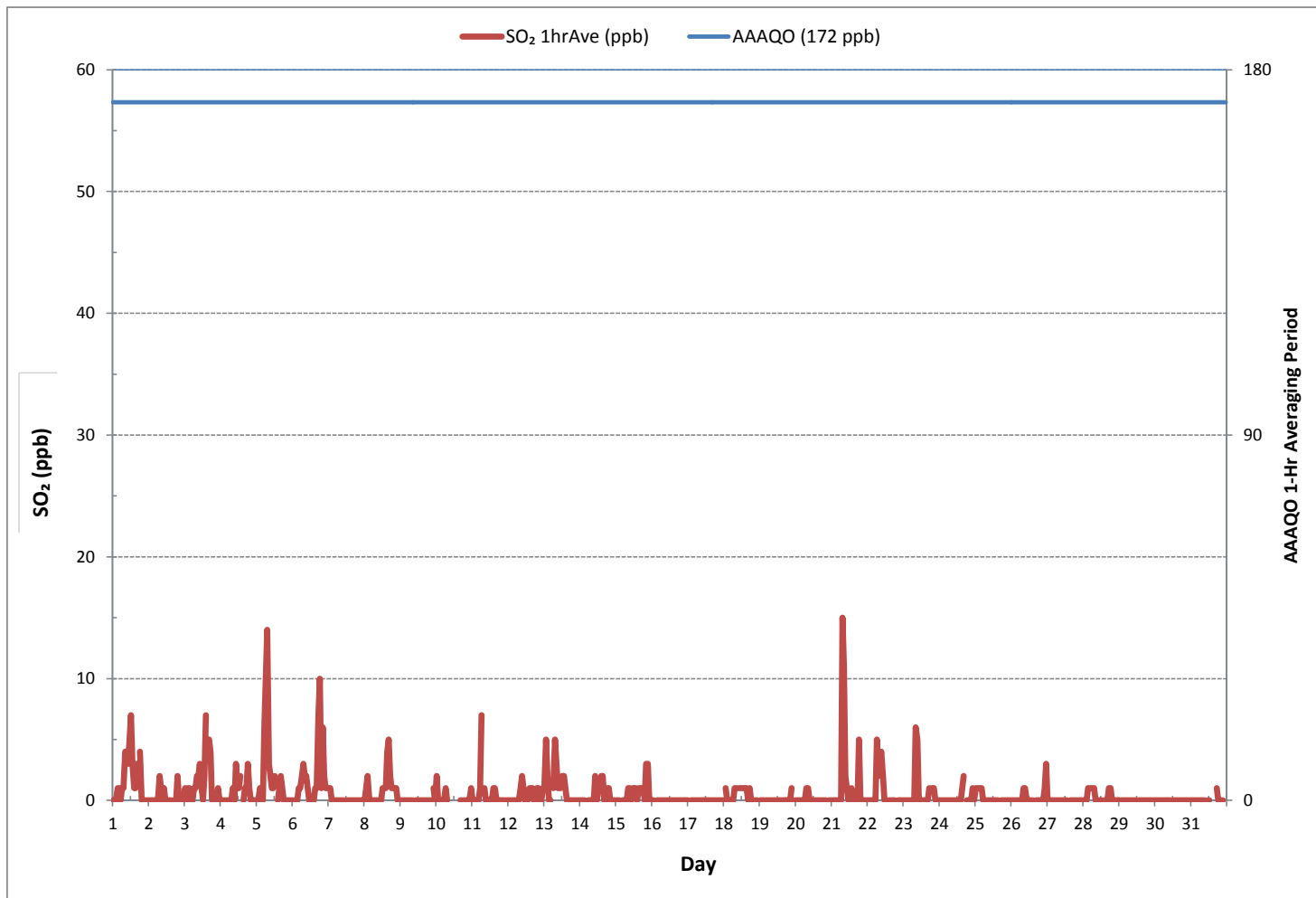
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	183
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	15 ppb @ HOUR ON DAY 21
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	737 hrs
AMD OPERATION UPTIME:	99.1 %
STANDARD DEVIATION:	1
MONTHLY AVERAGE:	1 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO₂ [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

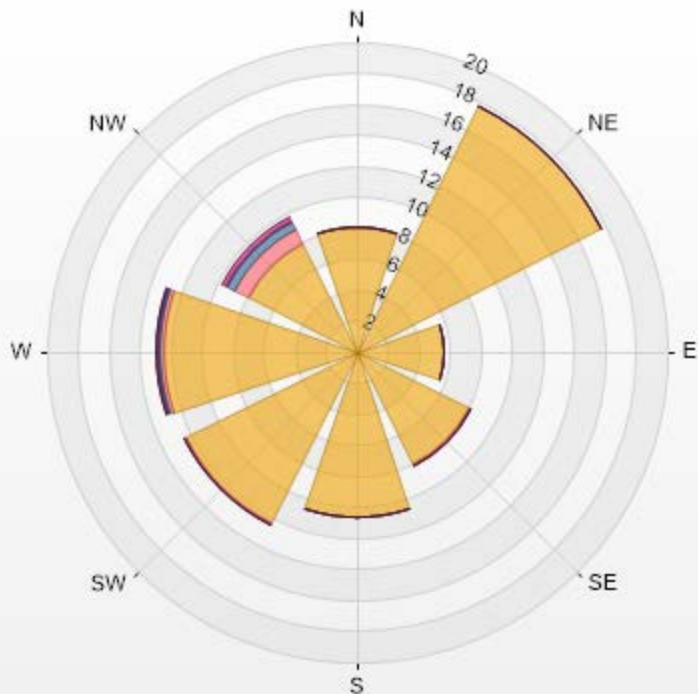
Calm: 14.48%

Calm Avg: 0.38 [ppb]

Direction	0.0-3.2	3.2-6.4	6.4-9.6	9.6-12.8	12.8-16.0	>16.0	Total
N	8.1	0.0	0.0	0.0	0.0	0.0	8.1
NE	17.7	0.0	0.0	0.0	0.0	0.0	17.7
E	5.6	0.0	0.0	0.0	0.0	0.0	5.6
SE	8.1	0.2	0.0	0.0	0.0	0.0	8.2
S	10.7	0.0	0.0	0.0	0.0	0.0	10.7
SW	12.4	0.2	0.0	0.0	0.0	0.0	12.5
W	12.5	0.2	0.2	0.2	0.0	0.0	13.0
NW	7.8	1.1	0.5	0.2	0.3	0.0	9.8
Summary	82.8	1.5	0.6	0.3	0.3	0.0	85.5

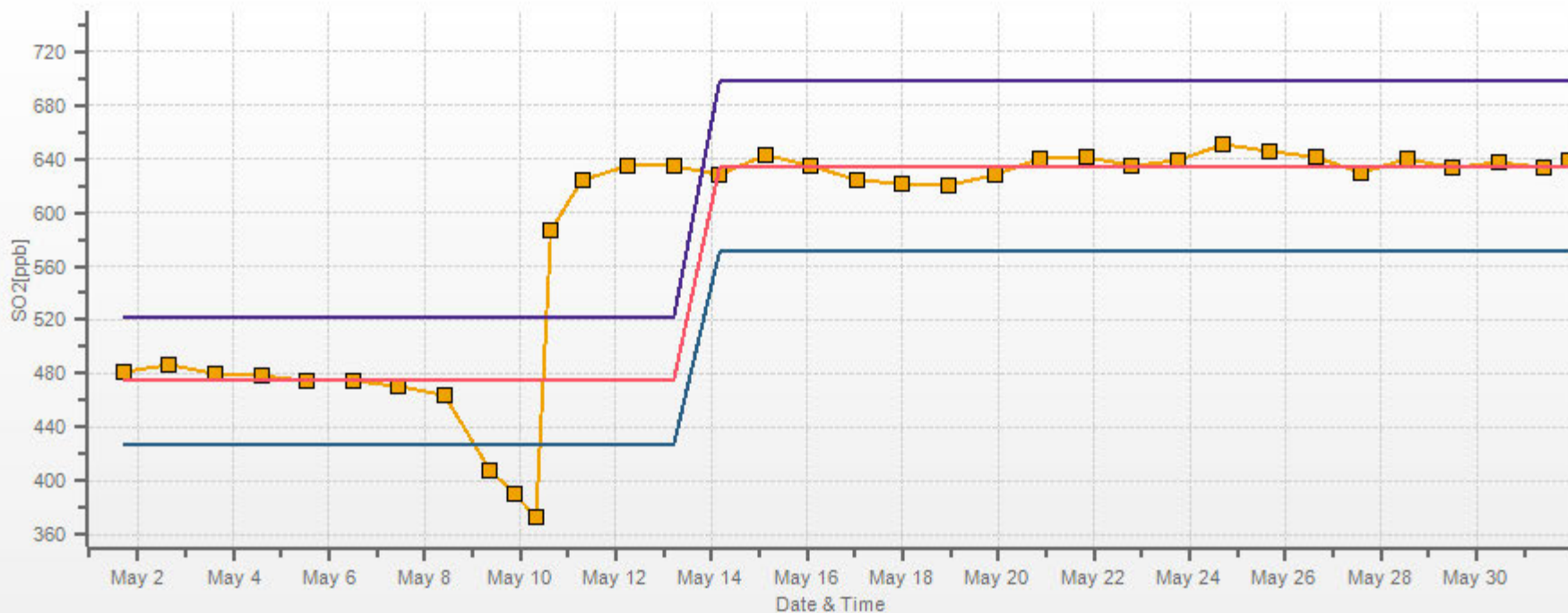
%	Icon	Classes (ppb)
83		0.0-3.2
2		3.2-6.4
1		6.4-9.6
0		9.6-12.8
0		12.8-16.0
0		>16.0

LICA MASKWA Poll.: LICA MASKWA-SO₂[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.48% Calm Poll Avg: 0.38[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 18/05 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	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	S	1	0	0	0	0	0	0	0	0	1	0	24		
2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24		
3	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	24		
4	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		
5	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
6	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	24		
7	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		
8	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	24		
9	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	24		
10	1	1	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	1	0	24		
11	0	0	0	0	0	0	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24		
12	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	24		
13	0	1	1	0	0	S	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	24		
14	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	2	0	0	2	0	24		
15	10	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	10	1	24		
16	0	0	S	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
17	0	S	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	1	0	24		
18	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	S	0	0	1	0	24		
19	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	0	0	1	0	24		
20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	6	6	0	0	6	6	1	24		
21	3	1	2	1	1	6	10	4	2	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	10	1	24		
22	0	0	1	0	1	1	4	0	0	0	0	0	0	P	0	0	0	0	0	0	S	0	0	0	0	0	0	4	0	23		
23	4	7	8	3	4	2	1	1	3	2	0	0	0	0	0	0	0	0	S	0	2	3	1	1	0	0	0	8	2	24		
24	1	1	0	0	0	0	0	1	0	1	0	0	1	0	1	3	1	S	1	1	1	1	1	1	0	0	0	3	1	24		
25	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	S	0	1	0	0	2	0	0	0	0	0	2	0	24		
26	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
27	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		
28	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	0	0	1	0	24		
29	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	24		
30	0	0	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24		
31	0	0	0	0	0	1	0	0	0	0	S	0	1	X	X	X	X	0	0	0	0	0	X	1	0	0	0	1	0	19		
HOURLY MAX	10	7	8	3	4	6	10	4	3	2	1	1	1	1	3	1	1	1	2	2	2	3	6	6								
HOURLY AVG	1	1	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					

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

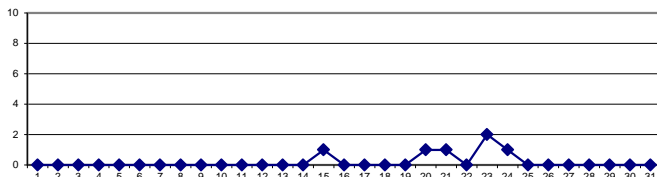
OBJECTIVE LIMIT:

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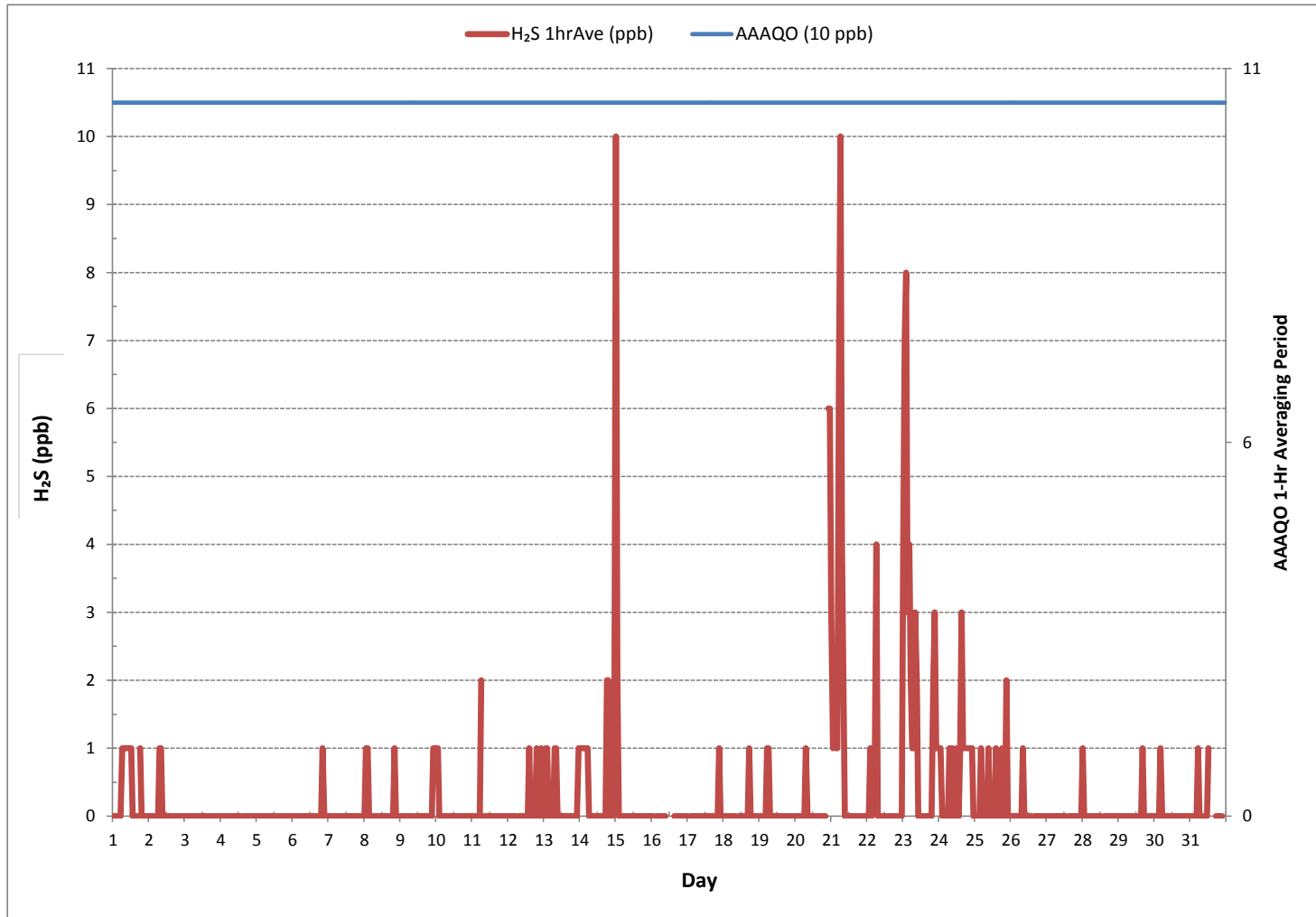
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	96				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	10 ppb @ HOUR	0	ON DAY	15	
MAXIMUM 24-HR AVERAGE:	2 ppb		ON DAY	23	
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	738	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	99.2	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES May 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



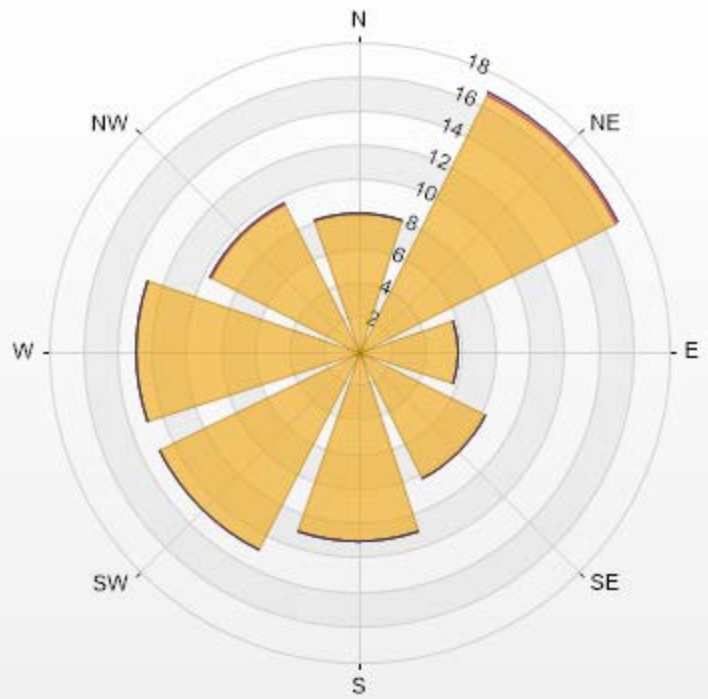
Wind: LICA MASKWA
 Poll.: LICA MASKWA-H₂S [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.44% Calm Avg: 1.14 [ppb]

Direction	0.0-3.7	3.7-7.3	7.3-11.0	>11.0	Total
N	8.1	0.0	0.0	0.0	8.1
NE	16.7	0.2	0.0	0.0	16.9
E	5.8	0.0	0.0	0.0	5.8
SE	8.2	0.0	0.0	0.0	8.2
S	11.1	0.0	0.0	0.0	11.1
SW	12.9	0.0	0.0	0.0	12.9
W	12.9	0.0	0.0	0.0	12.9
NW	9.6	0.2	0.0	0.0	9.7
Summary	85.3	0.3	0.0	0.0	85.6

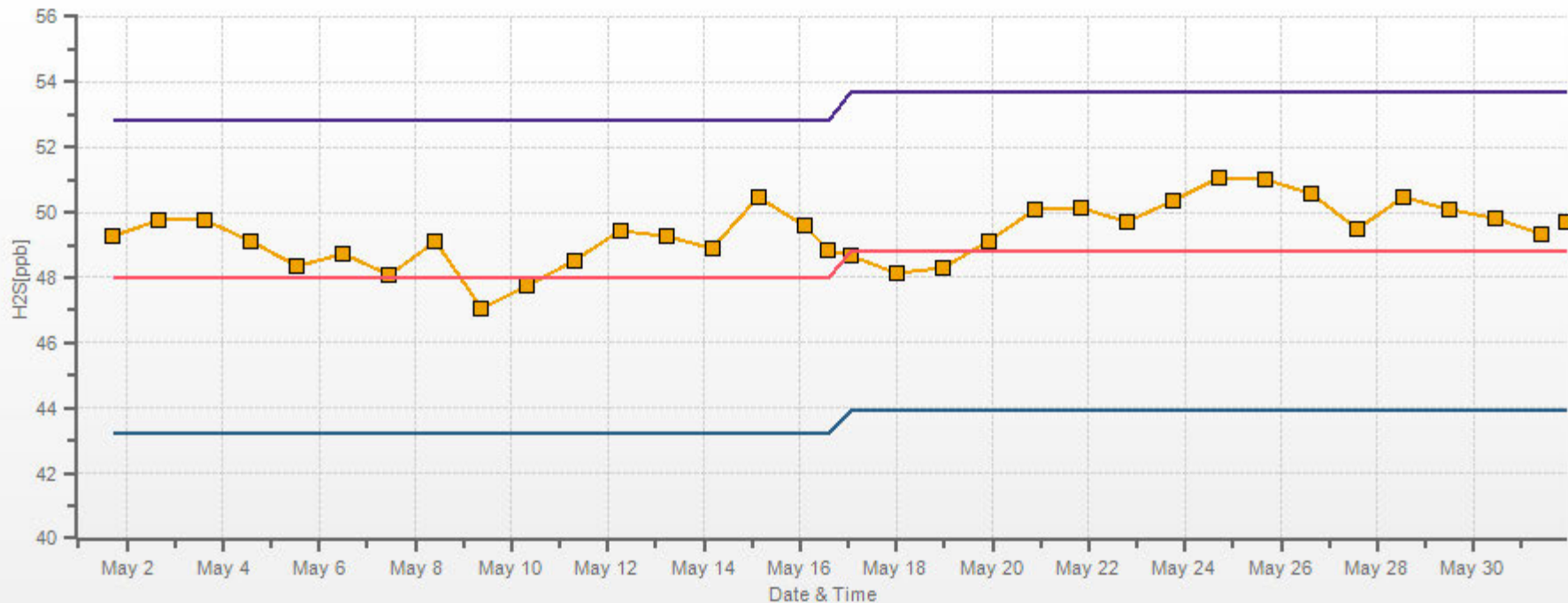
% Icon Classes (ppb) 85 0.0-3.7 0 3.7-7.3 0 7.3-11.0 0 >11.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.44% Calm Poll Avg: 1.14[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON

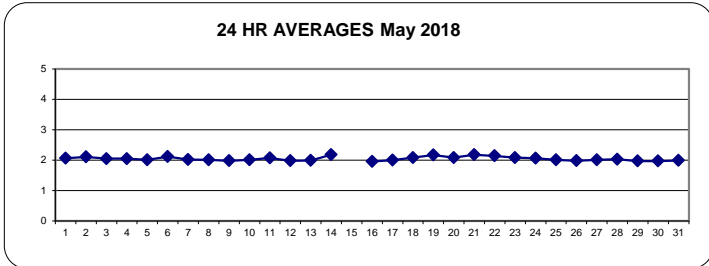
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.08	2.09	2.12	2.12	2.20	2.22	2.24	2.24	2.11	1.97	1.95	1.96	1.98	1.96	1.95	1.96	1.96	S	1.96	1.99	2.10	2.07	2.16	2.10	1.95	2.24	2.06	24																							
2	2.19	2.29	2.31	2.24	2.34	2.44	2.33	2.21	2.21	2.17	2.00	1.99	1.98	1.98	1.96	1.96	S	1.92	1.95	1.96	1.96	2.01	2.03	2.00	1.92	2.44	2.11	24																							
3	2.01	2.00	2.02	2.02	2.06	2.11	2.13	2.20	2.27	2.10	1.98	1.98	1.97	1.99	1.99	S	1.99	2.00	1.98	1.99	2.02	2.06	2.14	2.14	1.97	2.27	2.05	24																							
4	2.12	2.20	2.32	2.25	2.34	2.34	2.27	2.00	1.95	1.92	1.95	1.91	1.92	1.94	S	1.93	1.96	1.97	1.93	1.92	1.92	1.99	2.08	2.10	1.91	2.34	2.05	24																							
5	2.01	2.03	2.08	2.07	2.07	2.03	2.08	2.00	1.96	1.96	1.97	1.99	2.00	S	1.96	1.96	2.00	2.01	1.97	1.95	1.99	1.97	2.16	2.11	1.95	2.16	2.01	24																							
6	2.15	2.15	2.19	2.27	2.34	2.36	2.39	2.31	2.25	2.28	2.19	2.01	S	1.98	1.97	2.00	2.00	2.08	2.05	1.97	1.95	1.96	1.95	2.03	1.95	2.39	2.12	24																							
7	2.02	2.05	2.09	2.12	2.12	2.03	1.99	1.93	1.96	1.97	1.97	S	2.00	2.02	2.02	2.02	2.00	2.00	1.99	2.02	2.02	2.08	2.11	1.93	2.12	2.02	24																								
8	2.10	2.06	2.07	2.09	2.07	2.05	2.07	2.08	2.08	2.07	S	2.01	1.95	1.97	1.94	1.93	1.95	1.93	1.94	1.97	1.93	1.94	1.96	2.01	1.93	2.10	2.01	24																							
9	2.02	2.01	2.00	2.00	2.01	2.00	1.99	2.01	2.01	S	1.98	1.96	1.92	1.94	1.95	1.96	1.95	1.95	1.95	1.94	1.98	2.01	2.01	2.00	1.92	2.02	1.98	24																							
10	2.03	2.03	2.01	2.03	2.05	2.08	2.05	2.09	S	2.07	2.02	2.00	1.98	1.95	1.95	1.96	1.96	1.96	1.96	1.96	2.01	2.04	2.00	2.01	1.95	2.09	2.01	24																							
11	2.04	2.09	2.15	2.18	2.15	2.26	2.58	S	2.06	2.02	1.98	1.98	1.97	1.97	1.99	2.00	2.00	2.02	2.01	1.98	1.99	2.09	2.12	2.06	1.97	2.58	2.07	24																							
12	2.05	2.03	2.03	2.08	2.10	2.11	S	2.10	2.08	2.04	2.00	1.94	1.93	1.92	1.96	1.97	1.95	1.93	1.93	1.90	1.88	1.89	1.91	1.92	1.88	2.11	1.98	24																							
13	1.91	2.00	2.10	2.02	2.03	S	2.01	2.08	1.99	1.95	1.96	1.99	1.99	2.00	1.96	1.96	1.97	1.94	1.94	1.92	1.95	2.01	2.04	2.08	1.91	2.10	1.99	24																							
14	2.07	2.18	2.18	2.10	S	2.19	2.15	2.15	2.20	2.21	2.19	2.18	2.21	2.20	2.22	2.22	2.20	2.22	X	X	X	X	X	X	2.07	2.22	2.18	18																							
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0																						
16	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	1.96	1.94	1.92	1.93	1.97	1.98	1.97	1.97	1.92	1.98	1.96	13																							
17	1.98	S	2.02	2.03	2.02	2.03	2.03	2.02	1.99	1.98	1.99	1.97	1.98	1.98	1.99	1.99	2.00	2.00	1.99	1.98	2.02	2.02	2.03	2.06	1.97	2.06	2.00	24																							
18	S	2.17	2.17	2.23	2.28	2.26	2.17	2.16	2.11	2.00	1.99	2.00	2.01	2.01	2.01	2.01	2.00	2.00	2.00	1.98	2.02	2.04	2.10	S	1.98	2.28	2.08	24																							
19	2.20	2.25	2.24	2.34	2.43	3.24	2.57	2.11	2.14	2.12	2.02	2.04	2.02	2.03	2.02	2.03	2.03	2.04	2.01	2.00	2.02	2.05	S	2.05	2.00	3.24	2.17	24																							
20	2.09	2.16	2.22	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	2.01	2.00	2.00	1.98	1.98	S	2.27	2.13	1.98	2.27	2.08	11																							
21	2.04	2.06	2.19	2.39	2.65	2.99	3.05	2.51	2.12	1.98	1.99	2.00	1.99	2.01	1.96	1.97	1.98	1.98	2.09	1.94	S	2.01	2.09	2.10	1.94	3.05	2.18	24																							
22	2.17	2.33	2.37	2.37	2.46	2.56	2.67	2.14	2.03	2.00	1.98	1.97	1.97	P	2.04	1.99	1.97	1.97	1.98	S	1.93	2.01	2.10	2.16	1.93	2.67	2.14	23																							
23	2.25	2.28	2.27	2.23	2.34	2.28	2.15	2.09	2.13	2.05	2.00	1.97	1.96	2.00	1.98	1.98	1.97	1.98	S	1.99	1.95	2.00	2.03	2.07	1.95	2.34	2.08	24																							
24	2.06	2.08	2.07	2.10	2.12	2.14	2.13	2.14	2.10	2.12	2.14	2.08	2.11	2.06	2.10	2.06	1.97	S	1.94	1.98	1.97	1.99	1.95	1.91	1.91	2.14	2.06	24																							
25	2.04	1.97	1.96	1.97	2.31	2.04	2.07	2.22	2.21	2.16	1.98	1.97	1.99	1.97	1.98	1.93	S	1.93	1.95	1.94	1.91	1.93	1.92	1.96	1.91	2.31	2.01	24																							
26	1.95	1.93	1.93	2.29	2.21	1.98	1.91	1.90	2.14	1.94	1.90	1.90	1.90	1.96	1.98	S	1.95	1.93	1.94	1.93	1.94	2.02	2.01	1.99	1.90	2.29	1.98	24																							
27	1.96	1.97	2.00	2.05	2.07	2.05	1.97	1.98	1.97	1.95	2.03	1.99	1.95	1.97	S	1.95	1.95	1.96	2.00	2.02	1.94	2.07	2.18	2.16	1.94	2.18	2.01	24																							
28	2.11	2.16	2.15	2.13	2.17	2.20	2.17	2.09	2.07	2.03	2.02	1.97	S	1.96	1.98	1.98	2.02	1.95	1.94	1.90	1.88	1.88	1.91	1.90	1.88	2.20	2.03	24																							
29	1.89	1.90	1.90	1.94	1.94	1.98	2.06	1.98	1.97	1.94	1.99	1.96	S	2.01	1.99	2.00	1.98	1.97	1.97	1.95	1.96	2.00	2.02	1.98	1.89	2.06	1.97	24																							
30	1.96	1.97	2.00	1.99	2.01	2.01	1.99	1.98	1.96	1.95	1.93	S	1.90	1.91	1.93	1.95	1.95	1.96	1.95	1.97	1.97	2.00	2.00	2.00	1.90	2.01	1.97	24																							
31	1.99	1.99	2.02	2.10	2.03	2.04	2.06	2.05	1.99	1.96	S	1.94	1.93	1.95	1.96	X	X	1.93	1.93	1.95	1.94	1.90	X	2.09	1.90	2.10	1.99	21																							
HOURLY MAX	2.25	2.33	2.37	2.39	2.65	3.24	3.05	2.51	2.27	2.28	2.19	2.18	2.21	2.20	2.22	2.22	2.20	2.22	2.09	2.02	2.10	2.09	2.27	2.16																											
HOURLY AVG	2.05	2.09	2.11	2.13	2.18	2.22	2.20	2.10	2.08	2.03	2.00	1.99	1.98	1.99	1.99	1.99	1.99	1.98	1.97	1.96	1.97	2.00	2.05	2.04																											

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

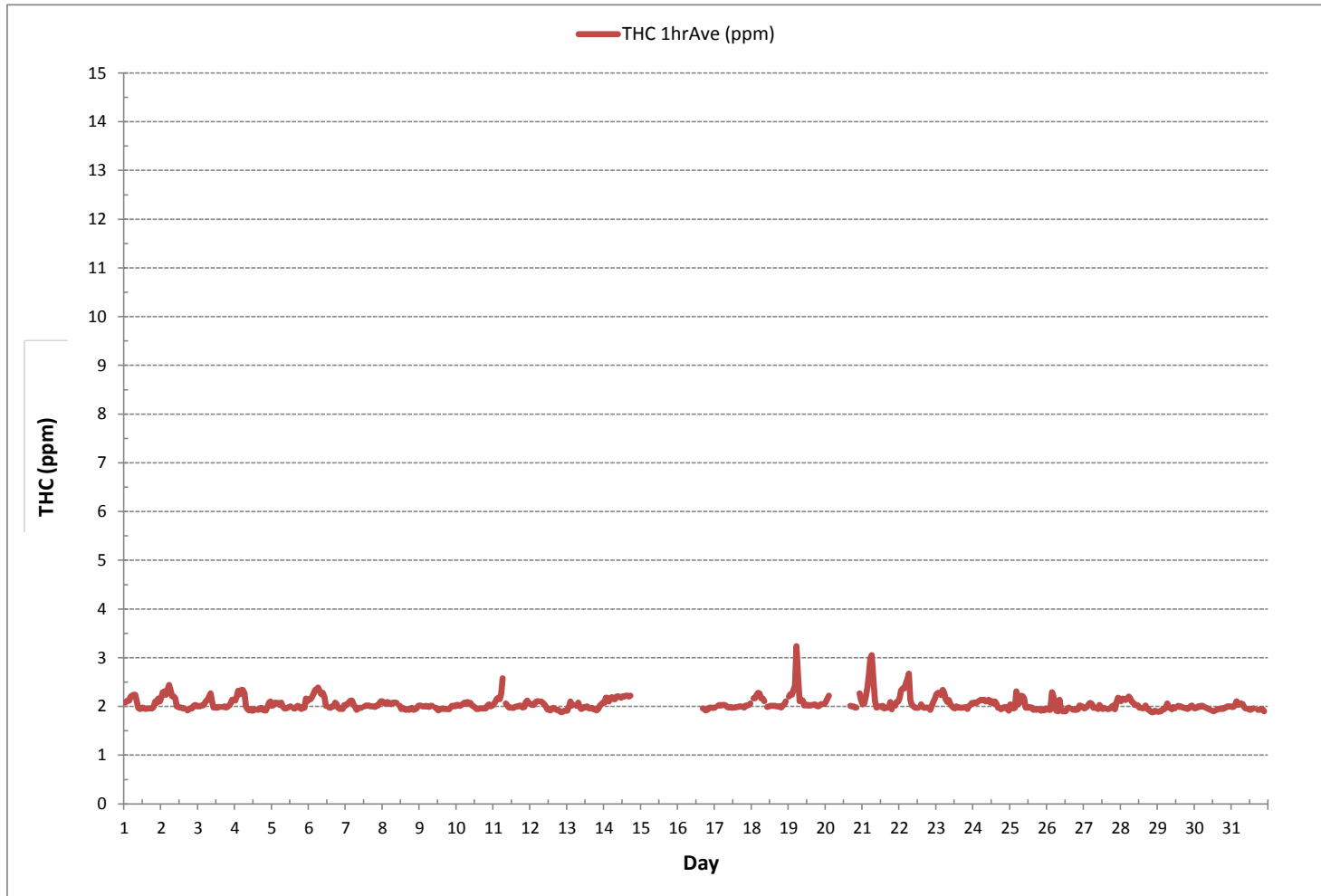
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	651			
MINIMUM 1-HR AVERAGE:	1.88 ppm	@ HOUR	20	ON DAY 12
MAXIMUM 1-HR AVERAGE:	3.24 ppm	@ HOUR	5	ON DAY 19
MAXIMUM 24-HR AVERAGE:	2.18 ppm			ON DAY 21
IZS CALIBRATION TIME:	30 hrs	OPERATIONAL TIME:	686 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	92.2 %	
STANDARD DEVIATION:	0.14	MONTHLY AVERAGE:	2.05 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



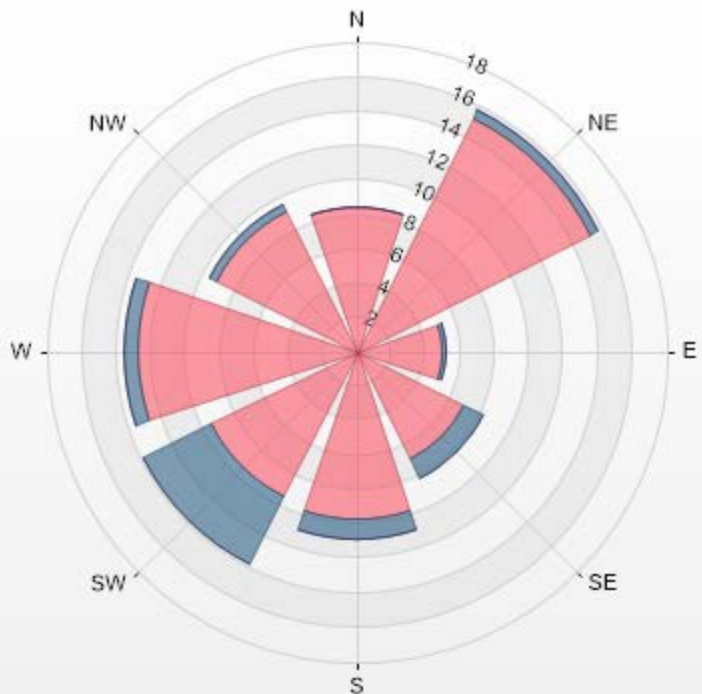
Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC [ppm]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.52% Calm Avg: 2.16 [ppm]

Direction	0.0-1.1	1.1-2.2	2.2-3.3	>3.3	Total
N	0.0	8.4	0.0	0.0	8.4
NE	0.0	15.2	0.5	0.0	15.7
E	0.0	5.0	0.3	0.0	5.3
SE	0.0	6.9	1.3	0.0	8.3
S	0.0	9.7	1.2	0.0	10.9
SW	0.0	9.4	4.5	0.0	13.9
W	0.0	12.7	0.8	0.0	13.5
NW	0.0	9.1	0.5	0.0	9.6
Summary	0.0	76.4	9.1	0.0	85.5

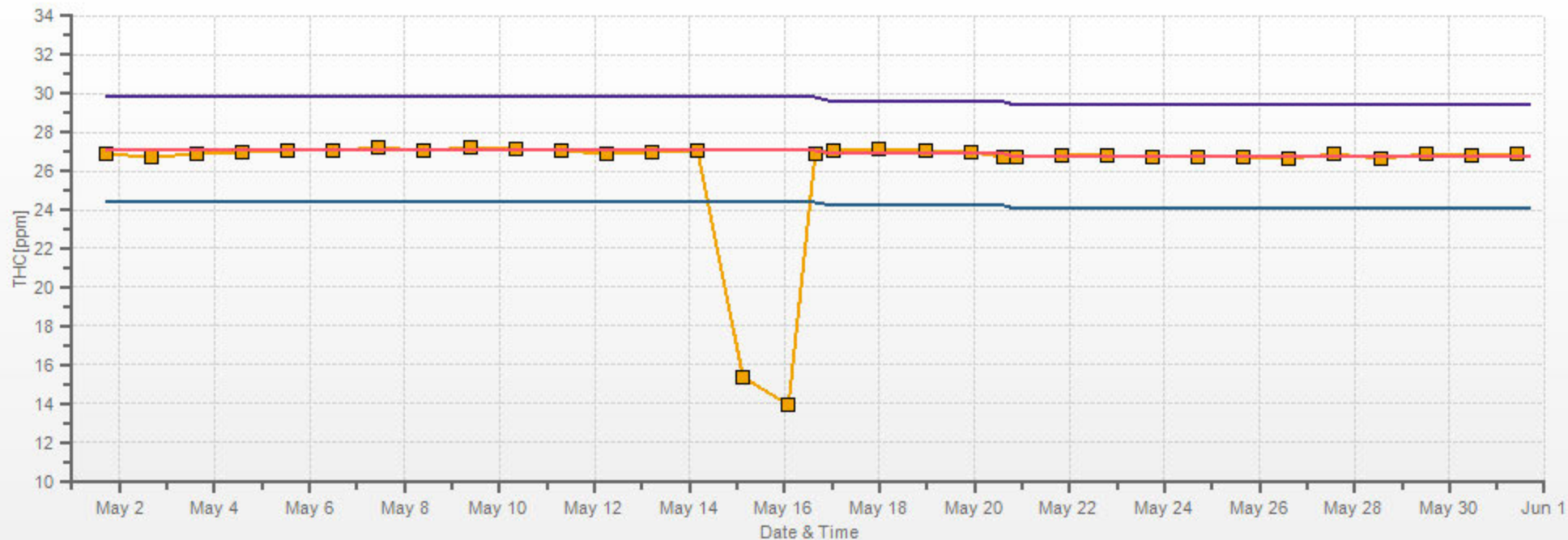
% Icon Classes (ppm) 0 0.0-1.1 76 1.1-2.2 9 2.2-3.3 0 >3.3

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.52% Calm Poll Avg: 2.16[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



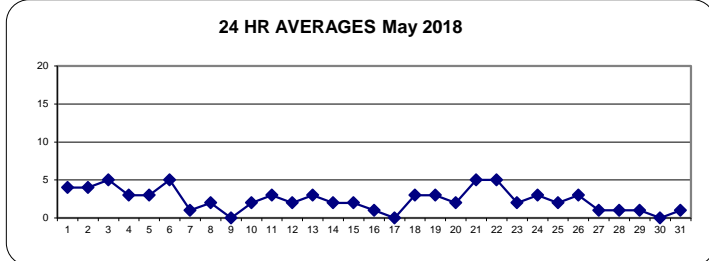
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	1	1	2	2	3	3	S1	S1	8	5	5	6	10	5	2	3	3	S	6	1	2	2	1	3	1	10	4	22
2	2	1	1	4	7	15	13	7	5	4	3	1	2	1	1	2	S	1	1	8	2	1	1	1	1	15	4	24
3	8	1	5	10	2	5	10	9	9	7	7	3	1	3	9	S	8	5	1	1	1	1	3	3	1	10	5	24
4	4	3	3	5	3	6	7	3	2	1	4	C	C	C	C	C	C	2	4	1	1	1	1	2	1	7	3	24
5	1	2	3	2	1	14	20	14	3	3	1	1	2	S	1	1	3	1	0	1	0	1	3	2	0	20	3	24
6	3	4	3	4	5	9	12	12	9	8	6	1	S	1	1	1	1	8	9	1	6	5	2	2	1	12	5	24
7	2	4	3	3	1	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24
8	1	4	4	1	2	0	1	1	1	2	S	2	2	2	1	4	6	2	0	1	0	1	0	0	0	6	2	24
9	0	1	0	0	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	3	0	24
10	6	1	0	0	4	1	3	1	S	2	2	1	1	1	1	1	1	1	1	1	3	1	1	3	0	6	2	24
11	2	3	9	3	4	7	15	S	7	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	1	15	3	24
12	2	2	2	2	2	3	S	4	5	5	3	1	1	0	2	1	1	0	0	4	2	0	1	1	0	5	2	24
13	3	7	5	2	1	S	6	7	9	2	2	2	2	2	1	1	1	0	0	1	1	1	1	1	0	9	3	24
14	1	1	1	1	S	1	1	1	2	2	3	2	3	2	3	1	1	2	2	1	1	1	1	1	1	3	2	24
15	2	1	1	S	4	3	3	2	4	4	1	1	2	1	1	1	1	1	2	0	6	8	1	1	0	8	2	24
16	1	1	S	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	2	0	0	0	2	1	24
17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	2	0	2	0	24
18	S	5	4	3	4	4	4	5	5	4	1	2	2	2	2	1	1	1	1	1	1	2	2	S	1	5	3	24
19	3	6	4	4	17	9	7	2	2	2	1	1	1	1	1	1	1	1	1	1	2	5	S	3	1	17	3	24
20	3	4	5	5	5	3	3	4	3	2	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	5	2	24
21	1	1	1	2	8	6	9	35	12	2	2	1	1	1	1	1	1	1	6	1	S	3	4	5	1	35	5	24
22	9	9	8	7	12	6	14	7	7	6	3	1	1	P	1	1	1	1	1	S	1	3	2	2	1	14	5	23
23	1	1	1	1	1	1	0	1	7	6	2	1	1	1	1	1	2	1	1	S	2	1	1	1	0	7	2	24
24	1	1	1	1	1	1	2	3	2	2	2	4	2	3	5	6	5	S	1	1	2	5	8	1	1	8	3	24
25	5	4	3	2	4	3	3	4	3	3	2	2	2	1	1	S	1	1	1	1	1	1	1	1	1	5	2	24
26	1	0	1	2	2	3	1	1	8	3	1	1	0	0	S	1	0	0	1	1	4	10	20	0	20	3	24	
27	1	1	1	1	2	1	2	1	0	0	1	1	0	0	S	1	0	0	1	2	1	1	2	2	0	2	1	24
28	1	1	2	3	3	3	3	3	2	2	1	1	S	1	1	2	1	1	0	0	0	1	1	0	3	1	24	
29	0	0	0	1	1	2	4	1	1	1	1	0	S	1	1	1	1	1	0	0	0	0	1	0	0	4	1	24
30	0	0	2	1	2	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	24
31	0	0	0	3	2	1	1	1	0	0	S	0	0	X	X	X	X	2	0	0	0	1	X	7	0	7	1	19
HOURLY MAX	9	9	9	10	17	15	20	35	12	8	7	6	10	5	9	6	8	8	9	8	6	8	10	20				
HOURLY AVG	2	2	3	3	4	4	5	5	4	3	2	1	1	1	1	1	2	1	1	1	1	2	2	2				

STATUS FLAG CODES

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

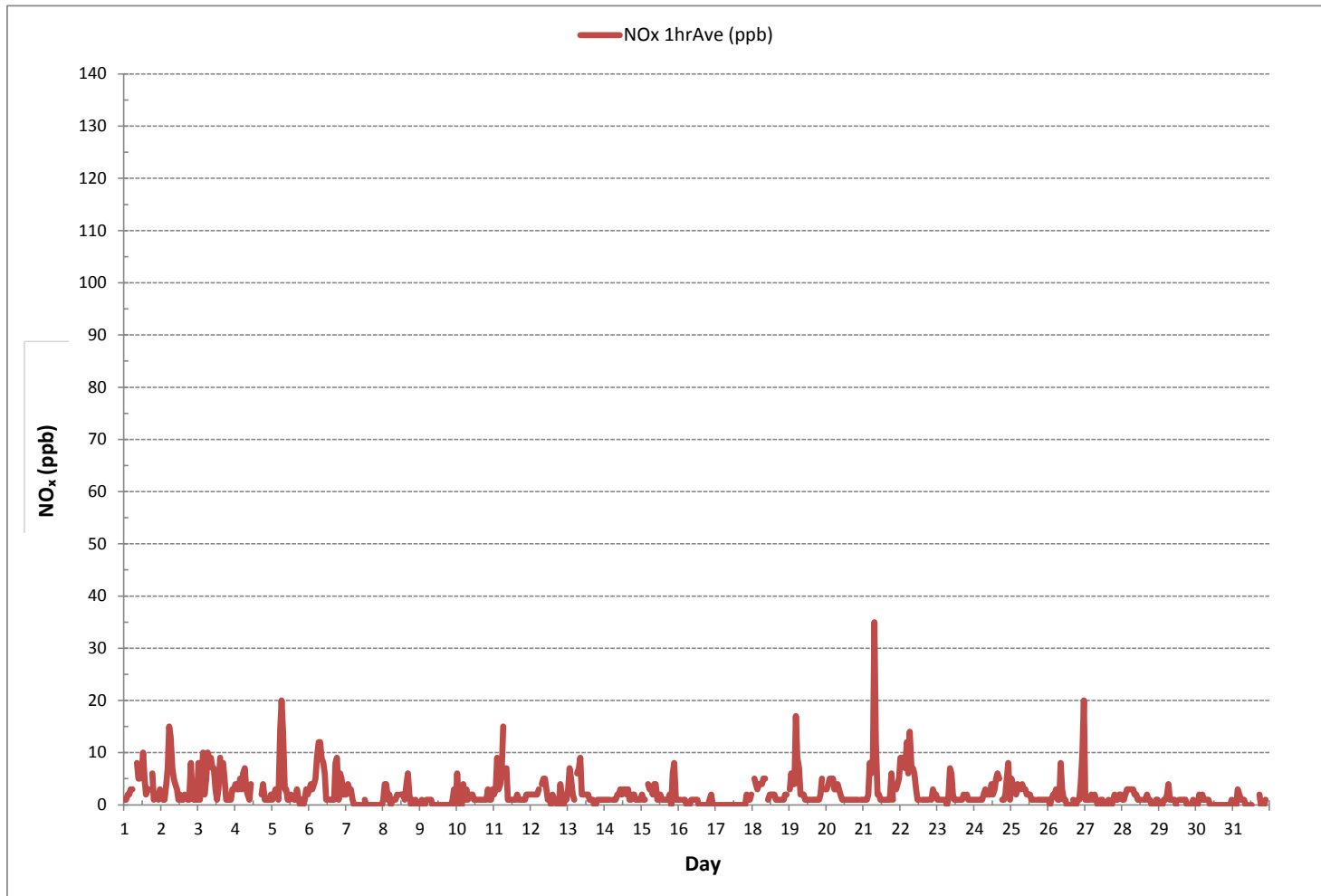
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	569				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	18	ON DAY 5	
MAXIMUM 1-HR AVERAGE:	35	ppb @ HOUR	7	ON DAY 21	
MAXIMUM 24-HR AVERAGE:	5	ppb		ON DAY 3	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	736	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	98.9	%
STANDARD DEVIATION:	3		MONTHLY AVERAGE:	2	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



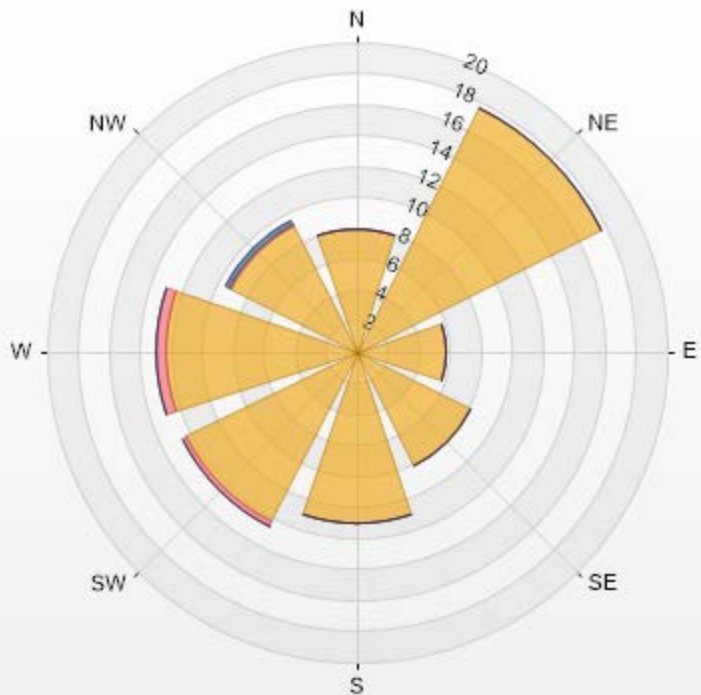
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NOx [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.44% Calm Avg: 2.96 [ppb]

Direction	0.0-12.0	12.0-24.0	24.0-36.0	>36.0	Total
N	7.9	0.0	0.0	0.0	7.9
NE	17.6	0.0	0.0	0.0	17.6
E	5.8	0.0	0.0	0.0	5.8
SE	8.2	0.0	0.0	0.0	8.2
S	11.1	0.0	0.0	0.0	11.1
SW	12.3	0.3	0.0	0.0	12.6
W	12.3	0.6	0.0	0.0	12.9
NW	9.1	0.2	0.2	0.0	9.4
Summary	84.4	1.1	0.2	0.0	85.6

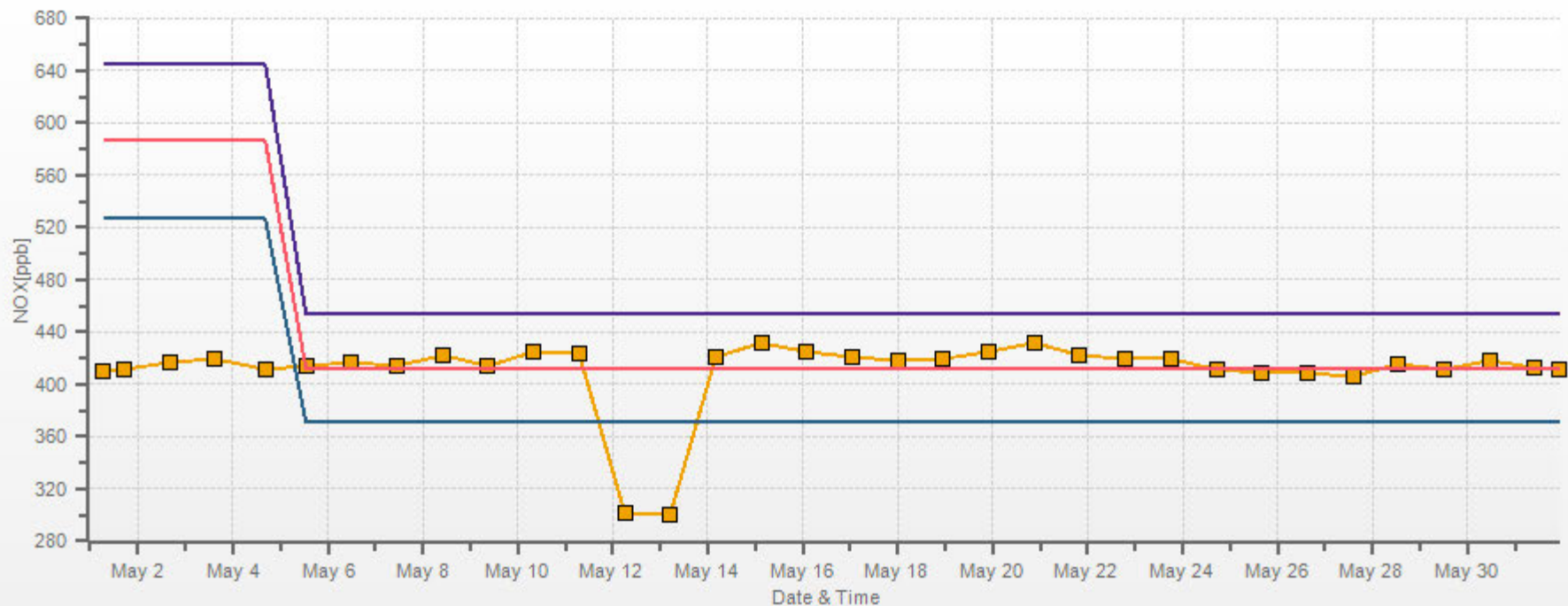
% Icon	Classes (ppb)	84	0.0-12.0	1	12.0-24.0	0	24.0-36.0	0	>36.0
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LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.44% Calm Poll Avg: 2.96[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES



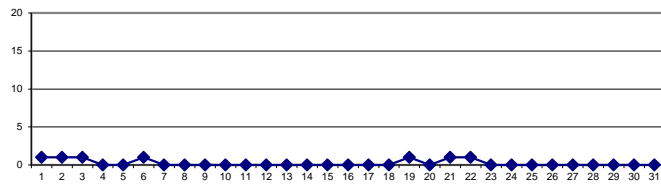
NITRIC OXIDE Hourly Averages (NO ppb)

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

STATUS FLAG CODES

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

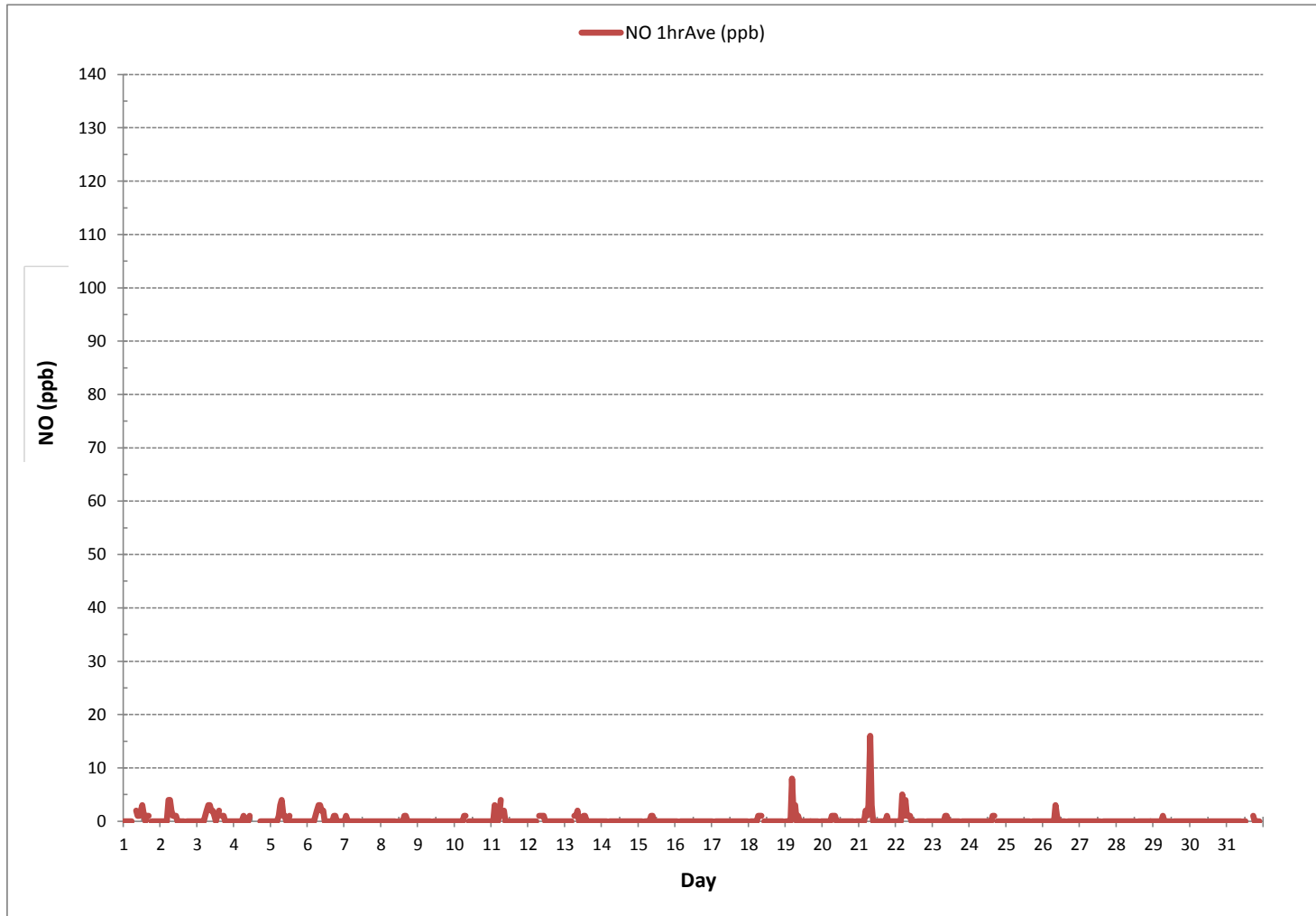
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	92				
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1	
MAXIMUM 1-HR AVERAGE:	16	ppb @ HOUR	7	ON DAY 21	
MAXIMUM 24-HR AVERAGE:	1	ppb		ON DAY 1	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	736	hrs
MONTHLY CALIBRATION TIME:	6	hrs	AMD OPERATION UPTIME:	98.9	%
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	0	ppb

NITRIC OXIDE Hourly Averages (NO ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.44% Calm Avg: 0.39 [ppb]

Direction	0.0-5.7	5.7-11.3	11.3-17.0	>17.0	Total
N	7.9	0.0	0.0	0.0	7.9
NE	17.6	0.0	0.0	0.0	17.6
E	5.8	0.0	0.0	0.0	5.8
SE	8.2	0.0	0.0	0.0	8.2
S	11.1	0.0	0.0	0.0	11.1
SW	12.6	0.0	0.0	0.0	12.6
W	12.9	0.0	0.0	0.0	12.9
NW	9.3	0.0	0.2	0.0	9.4
Summary	85.4	0.0	0.2	0.0	85.6

% Icon Classes (ppb)

85

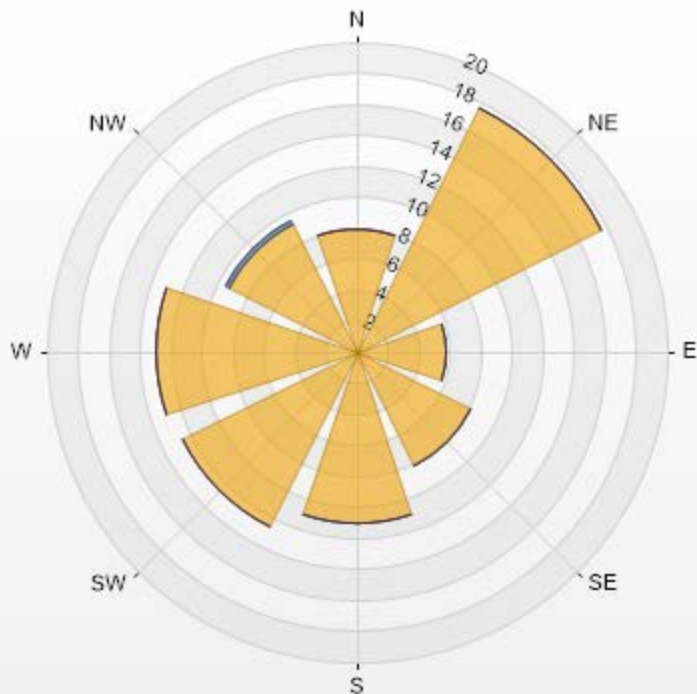
0.0-5.7

0 5.7-11.3

0 11.3-17.0

0 >17.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.44% Calm Poll Avg: 0.39[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	1	1	2	2	3	3	S1	S1	6	4	3	5	7	4	2	2	3	S	5	1	2	2	1	3	1	7	3	22	
2	2	1	1	4	7	11	9	5	4	3	2	1	1	1	1	1	S	1	1	7	2	1	1	1	1	1	11	3	24
3	8	1	5	9	2	4	8	7	6	5	5	2	1	2	7	S	6	5	1	1	1	1	3	3	1	9	4	24	
4	4	3	3	5	3	6	7	3	2	1	3	C	C	C	C	C	C	2	4	1	1	1	1	2	1	7	3	24	
5	1	2	3	2	1	12	17	10	2	2	1	1	2	S	1	1	2	1	0	1	0	1	3	2	0	17	3	24	
6	3	4	3	4	5	8	9	9	6	6	5	1	S	1	1	1	1	7	8	1	6	5	2	2	1	9	4	24	
7	2	3	3	3	1	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1	24	
8	1	4	4	1	2	0	1	1	1	1	2	S	2	2	2	1	3	4	1	0	1	0	1	0	0	4	1	24	
9	0	1	0	0	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	3	0	3	0	24	
10	6	1	0	0	3	1	2	1	S	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	3	0	6	1	24
11	2	3	6	3	4	6	11	S	5	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	11	3	24	
12	2	2	2	2	2	3	S	4	4	4	3	1	1	0	1	1	1	0	0	4	2	0	1	1	0	4	2	24	
13	3	7	5	2	1	S	5	6	7	2	1	1	2	1	1	1	1	0	0	1	1	1	1	1	0	7	2	24	
14	1	1	1	1	S	1	1	1	1	2	3	2	3	2	2	2	1	1	2	2	1	1	1	1	1	3	1	24	
15	2	1	1	S	4	3	3	2	3	3	1	1	2	1	1	1	1	1	2	0	6	8	1	1	0	8	2	24	
16	1	1	S	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	1	2	0	0	0	2	1	24	
17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	0	2	0	24	
18	S	5	4	3	4	4	4	4	4	3	1	1	2	2	2	1	1	1	1	1	1	2	2	S	1	5	2	24	
19	3	5	4	4	9	6	4	1	2	2	1	1	1	1	1	1	1	1	1	1	2	5	S	3	1	9	3	24	
20	3	4	5	5	5	3	2	3	3	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	5	2	24	
21	1	1	1	2	5	5	6	18	8	2	2	1	1	1	1	1	1	1	6	1	S	3	4	5	1	18	3	24	
22	9	9	8	7	7	5	9	5	6	5	3	1	1	P	1	1	1	1	1	S	1	3	2	2	1	9	4	23	
23	1	1	1	1	1	1	0	1	6	5	2	1	1	1	1	1	2	1	1	S	2	1	1	1	1	0	6	1	24
24	1	1	1	1	1	1	2	3	2	2	2	4	2	2	4	6	5	S	1	1	2	5	8	1	1	8	3	24	
25	5	4	3	2	4	3	3	4	3	3	2	2	2	1	1	S	1	1	1	1	1	1	1	1	1	5	2	24	
26	1	0	1	2	2	3	1	1	5	3	1	1	0	0	0	S	1	0	0	1	1	4	10	20	20	3	24		
27	1	1	1	1	2	1	2	1	0	0	1	1	0	0	S	1	0	0	1	2	1	1	2	2	0	2	1	24	
28	1	1	2	3	3	3	3	3	2	2	1	1	1	S	1	1	2	1	1	0	0	0	1	1	0	3	1	24	
29	0	0	0	1	1	2	3	1	1	1	1	0	S	1	1	1	1	1	0	0	0	0	1	0	0	3	1	24	
30	0	0	2	1	2	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	24	
31	0	0	0	3	2	1	1	1	0	0	S	0	0	X	X	X	X	2	0	0	0	1	X	7	0	7	1	19	
HOURLY MAX	9	9	8	9	9	12	17	18	8	6	5	5	7	4	7	6	6	7	8	7	6	8	10	20					
HOURLY AVG	2	2	2	3	3	3	4	3	3	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2					

STATUS FLAG CODES

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

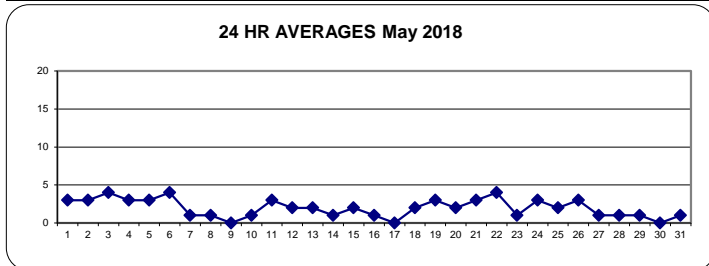
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

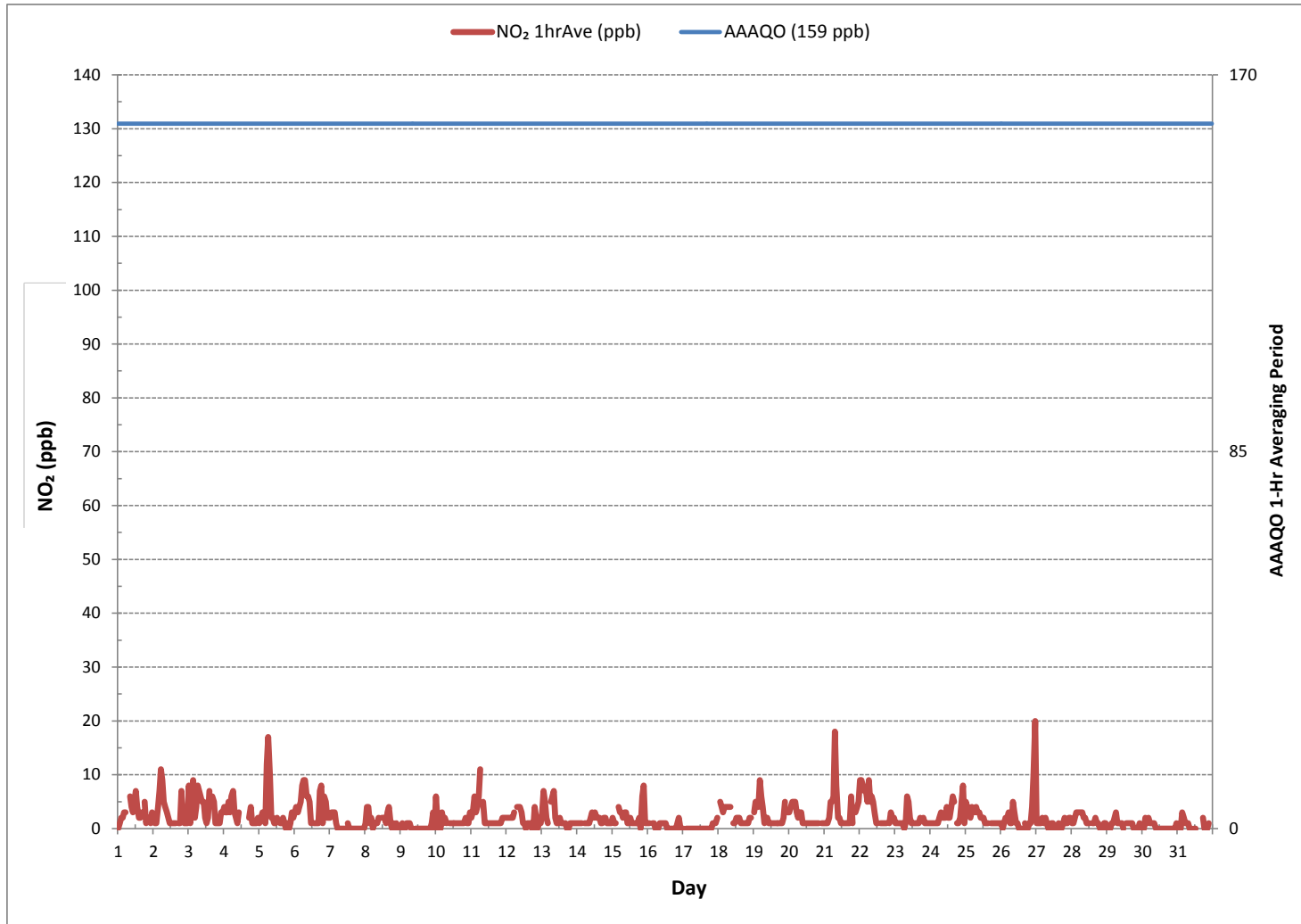
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	568				
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	18	ON DAY	5
MAXIMUM 1-HR AVERAGE:	20 ppb	@ HOUR	23	ON DAY	26
MAXIMUM 24-HR AVERAGE:	4 ppb			ON DAY	3
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	736 hrs		
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	98.9 %		
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	2 ppb		

24 HR AVERAGES May 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



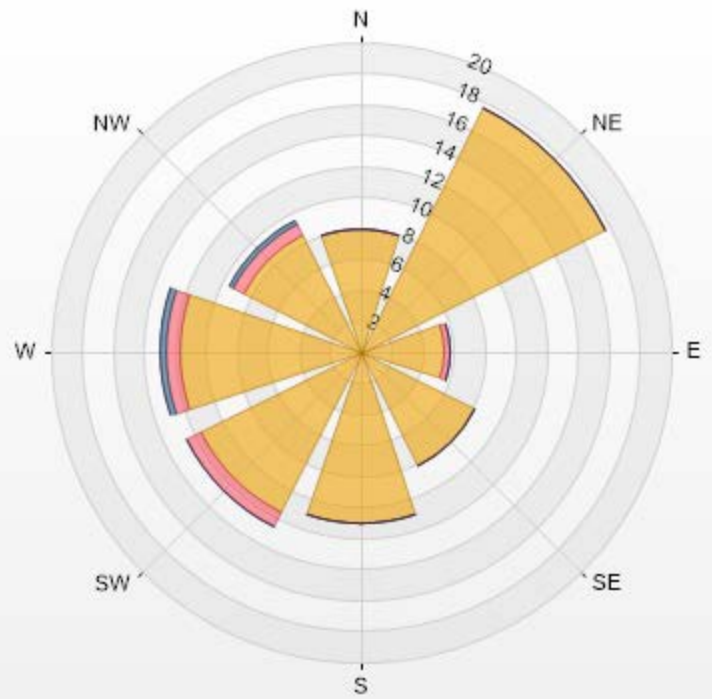
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO₂ [ppb]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.44% Calm Avg: 2.57 [ppb]

Direction	0.0-7.0	7.0-14.0	14.0-21.0	>21.0	Total
N	7.9	0.0	0.0	0.0	7.9
NE	17.6	0.0	0.0	0.0	17.6
E	5.5	0.3	0.0	0.0	5.8
SE	8.2	0.0	0.0	0.0	8.2
S	11.1	0.0	0.0	0.0	11.1
SW	11.6	1.1	0.0	0.0	12.6
W	11.7	0.9	0.3	0.0	12.9
NW	8.5	0.8	0.2	0.0	9.4
Summary	82.1	3.0	0.5	0.0	85.5

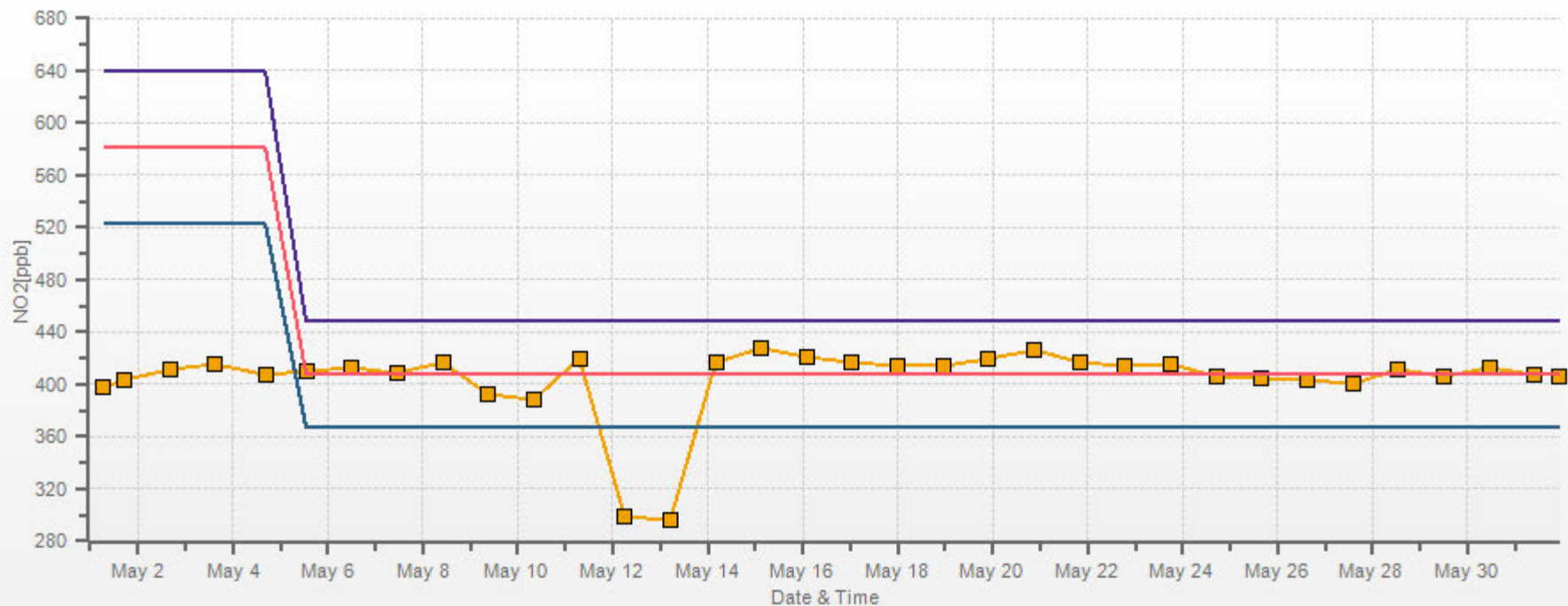
% Icon	Classes (ppb)	82		0.0-7.0	3		7.0-14.0	0		14.0-21.0	0		>21.0
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LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.44% Calm Poll Avg: 2.57[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 18/05 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	DAILY	24-HR	RDGS.									
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.										
DAY																																					
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
17	0	9	6	2	3	X	X	1	X	0	5		C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	25	6	19
18	X	1	0	11	0	8	4	1	7	3	0	1	7	8	X	15	6	X	X	9	15	8	10	6	0	0	15	6	20	20	20	20	20	20	20		
19	20	10	2	1	1	10	16	6	0	5	0	0	X	X	X	X	X	X	8	X	8	0	4	3	0	20	5	18	18	18	18	18	18	18	18		
20	0	13	4	0	0	X	6	1	1	0	24	6	0	0	2	0	6	0	0	1	3	0	0	3	0	24	3	23	23	23	23	23	23	23	23		
21	3	4	2	11	9	10	5	1	0	2	6	3	5	8	0	3	2	0	X	0	1	0	4	5	0	11	4	23	23	23	23	23	23	23	23		
22	0	0	4	5	3	3	0	1	4	0	0	2	5	P	0	3	4	2	3	2	X	1	3	5	0	5	2	22	22	22	22	22	22	22	22		
23	3	5	0	3	2	2	5	0	8	5	5	5	2	2	0	7	6	6	5	10	7	X	8	6	0	10	4	23	23	23	23	23	23	23	23		
24	6	5	5	3	6	4	4	4	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	6	4	9	9	9	9	9	9	9	9	9	
25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	
27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	
28	X	X	X	X	X	X	X	X	X	X	X	C	C	C	6	6	X	11	5	13	14	11	17	1	1	17	9	12	12	12	12	12	12	12	12		
29	9	11	5	9	7	10	10	21	22	22	20	16	16	22	7	12	22	23	12	17	21	22	22	22	5	23	16	24	24	24	24	24	24	24	24		
30	21	24	24	21	20	18	22	20	19	8	11	11	12	14	20	18	20	16	14	16	14	18	21	22	8	24	18	24	24	24	24	24	24	24	24		
31	21	16	19	26	26	27	23	19	14	15	12	13	4	X	X	X	X	14	17	19	17	16	22	23	4	27	18	24	24	24	24	24	24	24	24		
HOURLY MAX	21	24	24	26	26	27	23	21	22	22	24	16	16	22	20	18	22	23	25	19	21	22	23														
HOURLY AVG	8	9	6	8	7	10	10	7	8	6	8	6	7	10	4	9	9	8	10	9	11	8	10	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

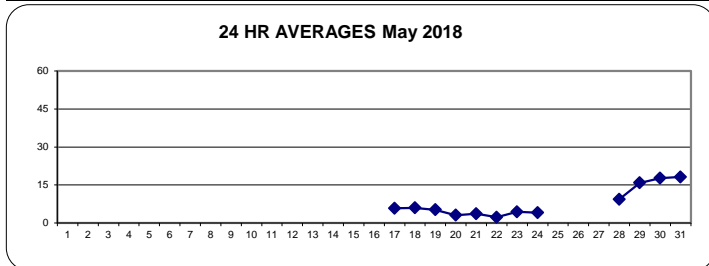
OBJECTIVE LIMIT:

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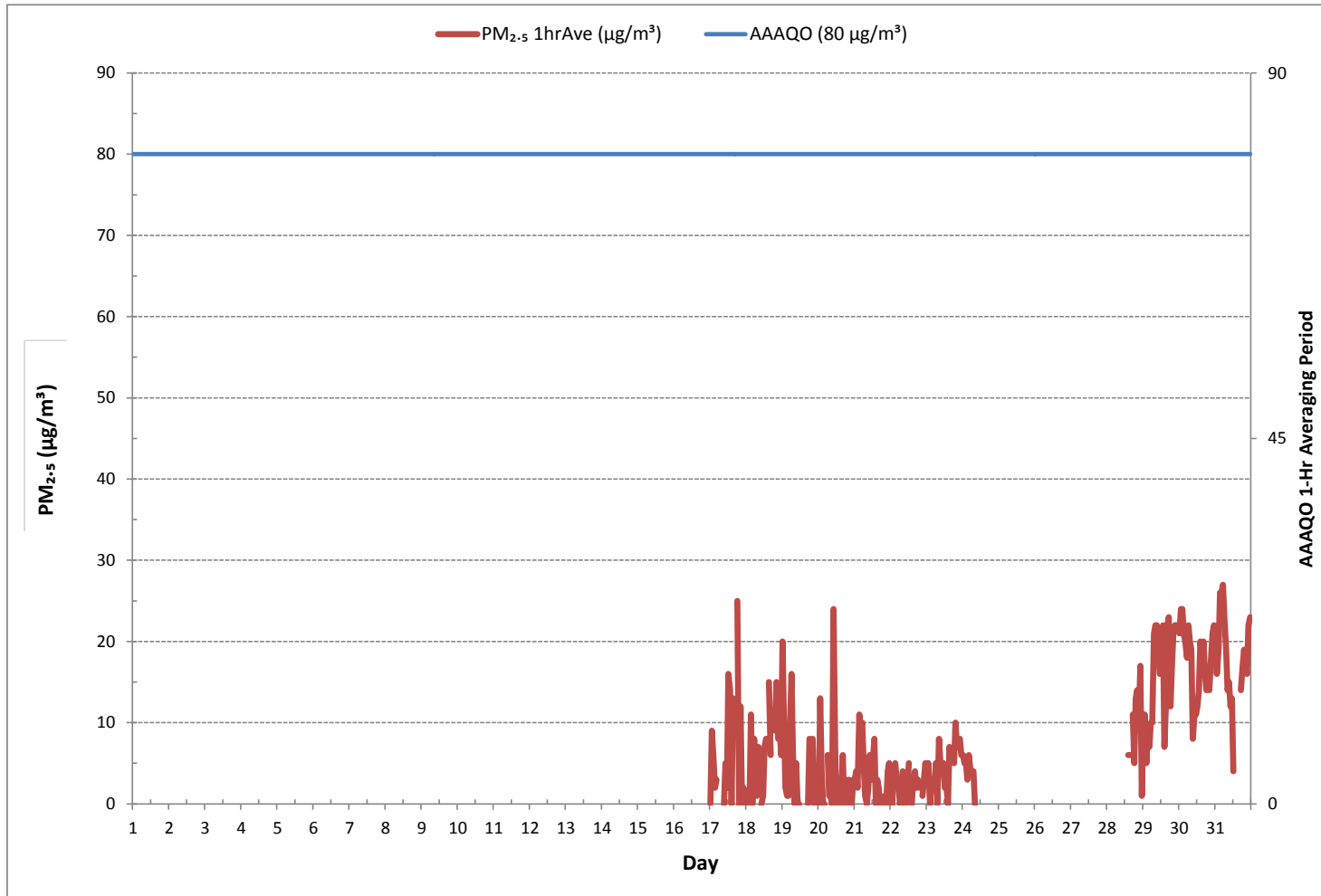
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	194			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	0	ON DAY	17
MAXIMUM 1-HR AVERAGE:	27 µg/m ³ @ HOUR	5	ON DAY	31
MAXIMUM 24-HR AVERAGE:	18 µg/m ³		ON DAY	30
MONTHLY CALIBRATION TIME:	6 hrs	OPERATIONAL TIME:	240 hrs	
STANDARD DEVIATION:	8	AMD OPERATION UPTIME:	64.3 %	
		MONTHLY AVERAGE:	8 µg/m ³	

24 HR AVERAGES May 2018



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



Wind: LICA MASKWA
 Poll.: LICA MASKWA-PM_{2.5} [µg/m³]
 Monthly: 05/2018
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

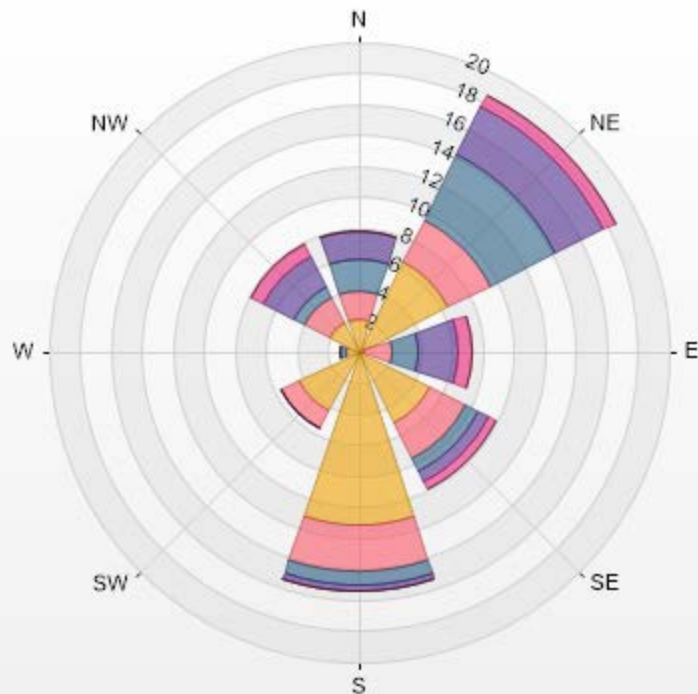
Calm: 26.29%

Calm Avg: 7.52 [µg/m³]

Direction	0.0-5.6	5.6-11.2	11.2-16.8	16.8-22.4	22.4-28.0	>28.0	Total
N	2.2	1.7	2.2	1.7	0.0	0.0	7.8
NE	6.5	3.0	4.7	3.5	0.9	0.0	18.5
E	0.4	1.7	1.7	2.6	0.9	0.0	7.3
SE	5.2	2.6	0.9	0.9	0.4	0.0	9.9
S	11.2	3.0	0.9	0.4	0.0	0.0	15.5
SW	4.3	1.3	0.0	0.0	0.0	0.0	5.6
W	0.9	0.0	0.4	0.0	0.0	0.0	1.3
NW	2.2	1.7	0.9	2.2	0.9	0.0	7.8
Summary	32.8	15.1	11.6	11.2	3.0	0.0	73.7

% Icon Classes (ug/m3(L)) 33 0.0-5.6 15 5.6-11.2 12 11.2-16.8 11 16.8-22.4 3 22.4-28.0 0 >28.0

LICA MASKWA Poll.: LICA MASKWA-PM25[ug/m3(L)] 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 26.29% Calm Poll Avg: 7.52[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	2.7	2.4	5.2	4.0	4.6	4.5	4.3	4.4	5.0	6.3	7.0	7.5	8.3	8.8	7.8	6.8	6.4	5.8	4.3	3.0	3.0	2.2	2.3	1.8	1.8	8.8	2.3	24
2	1.8	1.9	2.7	3.2	3.1	3.4	5.3	5.4	6.8	8.9	8.0	9.5	7.3	6.4	9.6	6.5	8.2	4.4	7.4	4.2	2.9	4.0	6.0	7.9	1.8	9.6	4.5	24
3	6.5	5.7	4.6	3.3	2.7	4.2	5.2	5.4	5.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2.7	6.5	4.7	9
4	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	7.1	6.4	6.1	4.5	6.0	0.8	3.3	2.0	0.1	1.2	2.7	0.1	7.1	1.9	11
5	3.1	3.5	3.4	2.7	5.7	5.5	5.1	5.7	4.8	5.4	6.7	6.7	7.2	5.8	3.9	4.5	4.7	5.2	4.4	1.9	3.2	4.3	5.4	5.5	1.9	7.2	3.3	24
6	6.6	6.0	3.7	4.7	5.2	4.7	6.2	5.6	5.9	5.7	8.8	8.1	8.7	10.1	7.6	6.5	5.9	5.9	5.1	2.0	1.4	0.1	0.7	0.5	0.1	10.1	4.2	24
7	0.3	0.7	0.6	2.9	4.1	5.8	9.3	12.7	14.3	15.3	16.2	16.9	17.4	14.6	14.2	11.4	12.0	10.4	9.5	5.0	3.5	3.4	4.2	3.4	0.3	17.4	8.5	24
8	2.7	5.2	2.2	3.1	5.6	7.5	6.4	4.2	2.4	5.2	9.6	8.4	6.4	6.3	9.6	5.9	10.5	10.6	10.5	12.8	9.8	15.3	14.8	18.9	2.2	18.9	2.1	24
9	14.1	9.3	10.1	7.2	5.3	6.0	11.1	12.0	7.2	7.9	10.0	9.1	8.8	6.7	6.3	6.7	6.9	5.4	4.4	3.2	2.5	1.9	6.0	5.9	1.9	14.1	6.4	24
10	3.4	3.7	3.2	3.1	3.1	1.7	5.3	5.1	6.0	7.4	6.9	7.1	8.3	7.9	5.2	3.4	4.7	4.5	4.4	1.8	1.7	7.8	6.3	3.5	1.7	8.3	3.6	24
11	1.7	2.6	2.4	2.2	2.4	1.6	2.6	3.1	5.0	4.9	5.7	4.7	3.1	2.7	2.5	2.0	3.7	2.8	3.7	3.9	5.3	6.7	7.9	7.0	1.6	7.9	3.0	24
12	6.6	7.7	7.7	7.7	8.5	7.0	6.7	7.2	7.6	7.5	8.3	9.0	10.4	9.3	9.7	10.1	9.0	8.3	9.2	6.3	2.0	2.4	X	X	2.0	10.4	6.2	22
13	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	11.9	10.7	10.3	11.0	10.5	8.3	6.4	2.6	2.3	0.5	0.8	0.5	11.9	6.0	11
14	2.1	1.1	1.3	0.8	1.0	2.5	3.3	5.0	1.9	4.9	4.6	6.3	6.4	5.9	4.4	3.6	6.6	4.0	4.2	2.8	0.7	0.6	0.6	0.1	0.1	6.6	2.0	24
15	0.1	1.0	2.7	1.1	2.1	2.7	5.2	7.1	10.6	10.9	7.8	9.4	8.1	6.4	5.3	4.3	4.4	3.8	6.4	4.6	5.5	4.9	3.4	3.4	0.1	10.9	2.4	24
16	3.3	3.7	4.4	4.1	5.8	7.4	9.6	11.4	13.3	13.6	10.7	11.3	13.7	15.3	15.3	14.9	14.4	15.1	11.7	10.3	6.6	9.8	7.7	4.6	3.3	15.3	9.9	24
17	4.5	4.1	5.0	5.2	5.3	5.6	8.3	8.3	8.5	7.7	8.1	8.8	5.8	7.4	5.4	5.8	7.1	6.0	5.1	3.7	2.8	3.7	5.8	5.9	2.8	8.8	5.1	24
18	5.5	3.5	3.3	0.8	3.8	3.5	4.1	4.7	5.0	X	2.7	1.7	5.5	3.6	5.8	6.0	4.4	4.5	4.1	4.1	3.9	3.7	3.4	3.0	0.8	6.0	2.5	23
19	2.3	1.3	0.3	0.8	1.1	1.8	0.4	6.6	6.7	6.8	13.1	14.1	14.2	13.0	12.8	11.0	9.7	9.5	7.6	4.8	4.0	5.5	5.9	5.7	0.3	14.2	6.3	24
20	5.1	4.8	4.2	4.0	1.1	2.2	3.9	3.8	6.0	8.8	9.8	9.1	10.5	9.2	9.7	9.9	9.6	8.1	5.7	3.0	1.7	1.0	1.3	2.3	1.0	10.5	4.9	24
21	1.4	0.7	1.5	0.7	1.1	0.6	1.6	2.8	2.9	2.9	2.8	4.1	3.6	4.7	11.3	9.1	8.8	4.3	4.5	0.5	2.9	1.0	1.7	1.6	0.5	11.3	1.6	24
22	1.6	1.4	0.9	1.8	1.7	0.5	1.4	1.9	2.9	1.0	3.3	2.2	5.0	P	5.0	5.2	3.9	4.9	4.5	3.3	3.0	1.4	0.4	0.6	0.4	5.2	1.8	23
23	0.5	1.6	0.3	1.0	1.0	2.3	2.7	1.5	1.2	3.9	5.3	5.2	4.2	4.6	5.5	4.6	4.7	4.0	4.4	2.9	3.3	3.4	1.2	2.8	0.3	5.5	2.6	24
24	2.0	1.1	0.4	0.9	2.0	1.0	2.1	1.8	6.3	6.8	4.7	1.8	2.7	0.5	1.0	1.6	2.7	2.0	2.1	0.7	1.1	1.9	2.0	2.6	0.4	6.8	0.7	24
25	2.9	4.6	5.0	3.2	3.2	2.0	1.6	2.3	3.6	4.3	3.3	3.1	2.5	4.7	5.5	5.6	6.6	5.6	3.9	2.7	2.1	4.0	3.6	1.6	6.6	2.0	24	
26	2.7	2.2	2.5	1.1	5.8	3.3	4.3	2.1	5.6	7.3	7.1	7.4	6.9	9.6	9.3	8.5	6.3	7.3	5.5	3.7	1.9	2.6	3.4	3.6	1.1	9.6	4.1	24
27	3.0	2.3	2.2	1.6	2.1	3.5	7.4	7.5	8.5	8.0	7.8	9.3	8.7	10.5	11.3	5.9	8.0	6.0	3.7	1.5	3.1	2.8	1.9	2.2	1.5	11.3	4.5	24
28	4.0	1.9	2.9	5.9	5.9	4.0	4.6	7.3	8.1	9.5	10.0	10.6	11.3	11.8	8.1	5.2	6.2	7.3	8.6	8.6	8.7	8.3	8.6	7.7	1.9	11.8	1.5	24
29	9.1	7.9	1.7	1.6	1.5	1.8	4.2	6.0	7.1	5.8	7.4	7.1	4.4	4.2	4.8	4.1	2.8	2.9	4.8	5.1	3.4	1.1	5.6	9.6	1.1	9.6	3.8	24
30	5.6	1.6	3.0	3.6	6.3	3.2	4.6	3.2	2.5	3.5	6.1	8.1	6.6	9.3	8.0	7.5	5.5	3.4	3.9	5.2	2.3	1.9	0.8	1.9	0.8	9.3	3.9	24
31	1.7	1.5	0.8	1.3	1.5	1.0	1.0	1.5	3.6	4.5	7.3	5.9	X	X	X	5.0	4.5	6.6	6.8	3.0	2.1	2.0	2.9	2.7	0.8	7.3	2.7	21
HOURLY MAX	14.1	9.3	10.1	7.7	8.5	7.5	11.1	12.7	14.3	15.3	16.2	16.9	17.4	15.3	15.3	14.9	14.4	15.1	11.7	12.8	9.8	15.3	14.8	18.9				

STATUS FLAG CODES

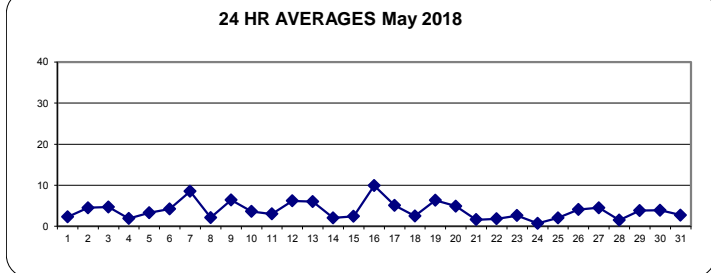
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

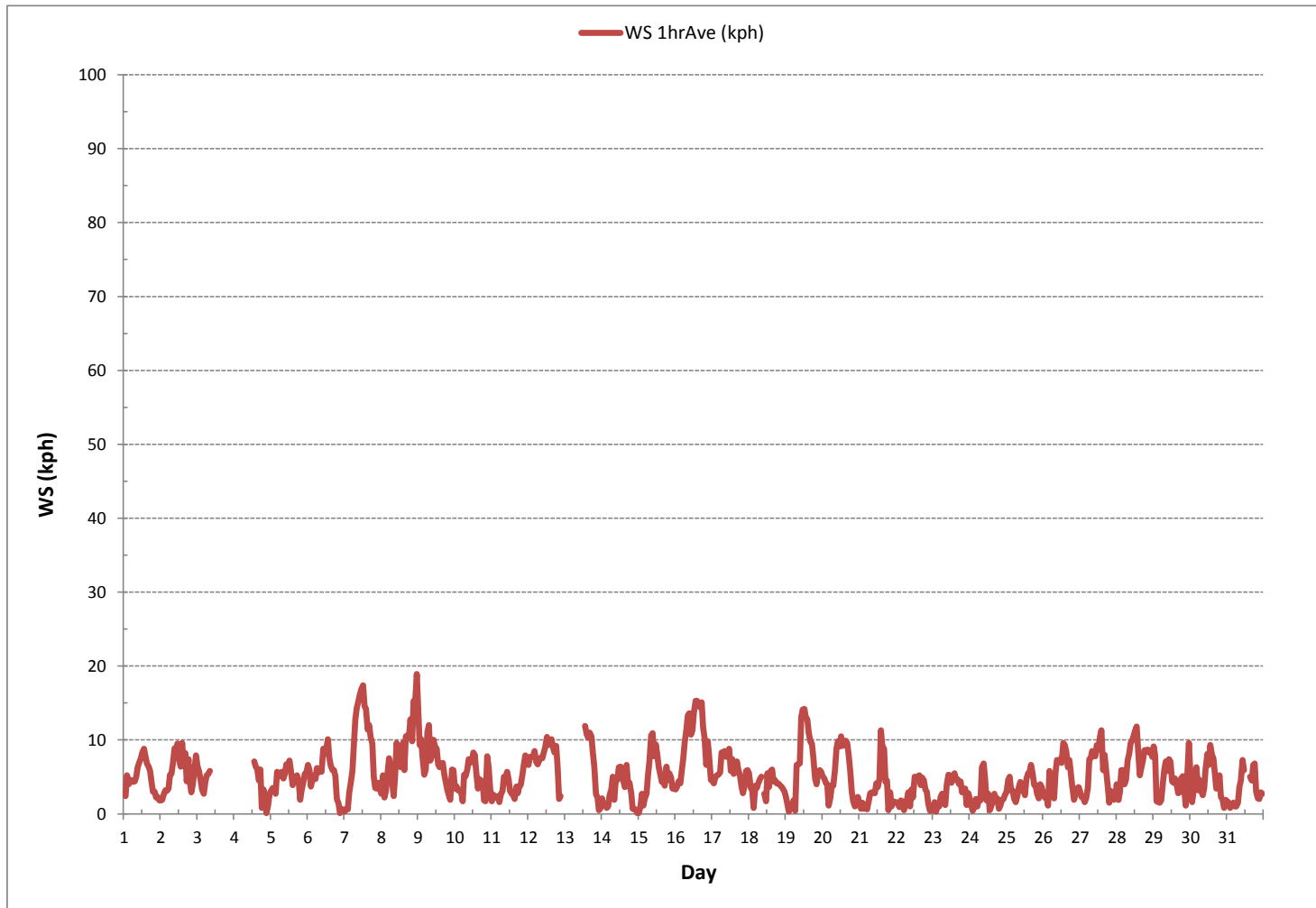
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	696
MINIMUM 1-HR AVERAGE	0.1 kph @ HOUR 21 ON DAY 4
MAXIMUM 1-HR AVERAGE:	18.9 kph @ HOUR 23 ON DAY 8
MAXIMUM 24-HR AVERAGE:	9.9 kph ON DAY 16
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	696 hrs
AMT OPERATION UPTIME:	93.5 %
STANDARD DEVIATION:	3.3
MONTHLY AVERAGE:	0.5 kph

24 HR AVERAGES May 2018



WIND SPEED Hourly Averages (WS kph)



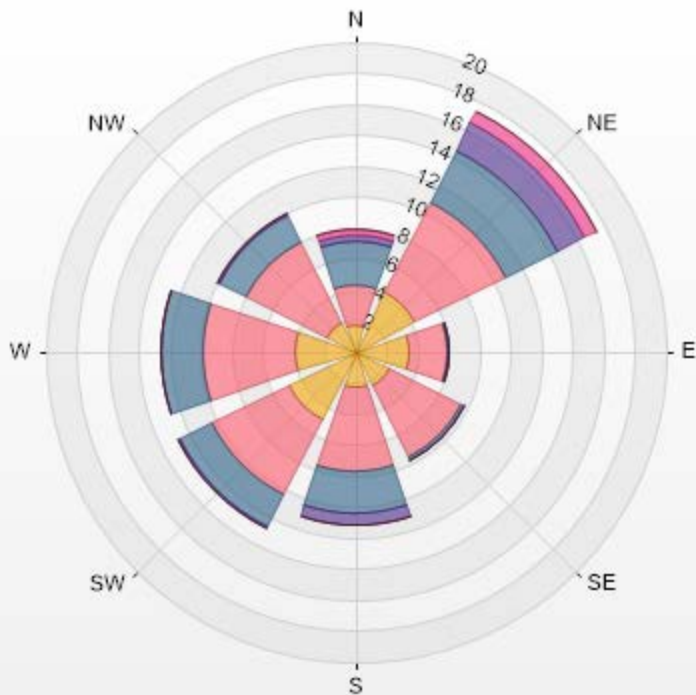
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 05/2018
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 14.08%

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	1.7	2.6	2.9	0.4	0.3	0.0	7.9
NE	4.3	6.5	3.7	2.0	0.9	0.0	17.4
E	3.5	2.4	0.1	0.0	0.0	0.0	6.0
SE	2.4	5.2	0.3	0.0	0.0	0.0	7.9
S	2.3	5.5	2.7	0.7	0.0	0.0	11.2
SW	4.9	5.5	2.3	0.1	0.0	0.0	12.8
W	3.9	6.0	2.7	0.0	0.0	0.0	12.6
NW	2.2	5.8	2.0	0.1	0.0	0.0	10.1
Summary	25.2	39.4	16.8	3.4	1.2	0.0	85.9

% Icon	Classes (kph)	25	39	17	3	1	0
	1.8-3.8		3.8-7.6		7.6-11.4		11.4-15.2
	15.2-19.0		>19.0				

LICA MASKWA 01/05/2018 00:00 - 31/05/2018 23:00 Calm: 14.08% Calm Wind Avg Speed: 1.07(kph)



WIND DIRECTION



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

WIND DIRECTION Hourly Averages (WD)

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

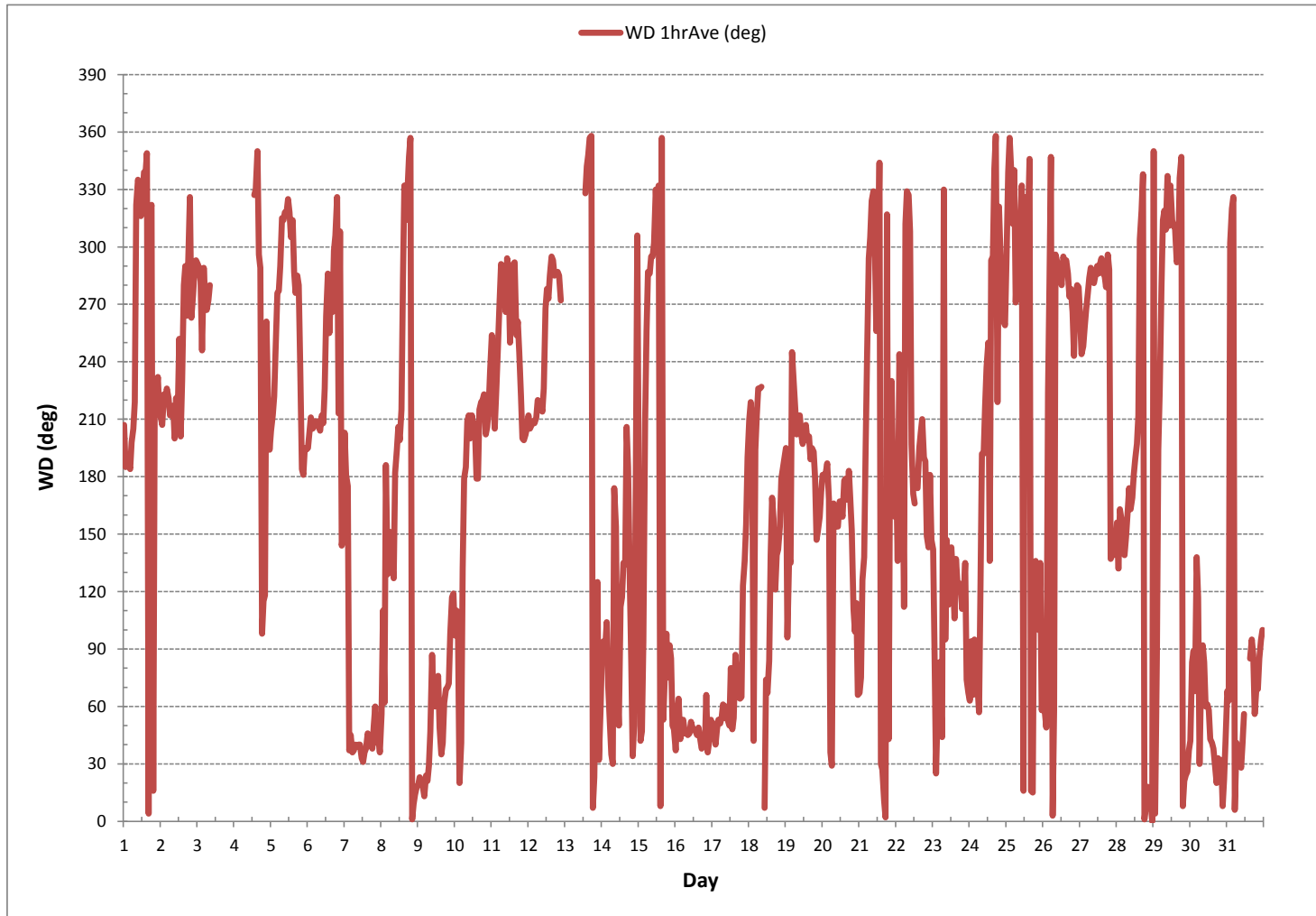
STATUS FLAG CODES

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

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

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	696	hrs
STANDARD DEVIATION:	102		AMD OPERATION UPTIME:	93.5	%
			MONTHLY AVERAGE:	340	(NNW)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - May 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	30	32	18	25	26	24	21	28	37	36	40	38	38	37	36	38	35	35	37	51	24	20	19	18	24
2	21	26	15	11	16	17	17	22	26	22	30	26	35	25	33	42	34	39	35	35	35	27	25	22	24
3	25	23	27	25	26	19	15	20	24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9
4	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	38	41	34	46	32	47	26	29	62	49	37	11
5	20	17	19	25	21	23	28	37	41	40	35	41	39	45	48	44	46	35	31	33	7	9	12	12	24
6	12	13	21	10	13	17	18	24	23	29	25	34	35	31	40	35	42	40	39	36	20	42	19	24	24
7	46	51	45	24	20	17	21	26	25	25	25	24	22	25	25	28	27	25	23	22	18	18	18	17	24
8	26	29	47	51	20	21	24	47	51	33	26	26	35	43	36	45	36	39	36	30	27	23	22	18	24
9	16	15	14	14	14	15	18	22	34	36	34	35	36	48	47	44	34	42	34	19	15	19	22	25	24
10	30	24	29	19	12	53	27	28	36	37	39	42	36	33	44	55	49	38	35	27	23	19	23	35	24
11	30	17	14	20	31	40	28	36	42	43	45	50	63	51	59	67	54	56	41	26	13	16	15	16	24
12	19	16	15	15	19	20	24	23	22	27	35	40	37	38	35	32	34	39	29	29	39	26	X	X	22
13	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	37	40	39	33	30	26	17	15	18	39	56	11
14	34	41	35	50	50	27	22	12	52	41	46	39	38	41	47	53	35	27	23	26	57	54	62	79	24
15	63	79	43	41	58	28	23	30	31	33	41	37	43	47	35	49	49	57	37	26	32	31	23	21	24
16	24	21	27	32	19	22	22	23	24	26	30	32	27	25	25	26	24	21	21	18	25	27	21	20	24
17	17	19	18	22	23	23	26	29	31	36	37	34	50	41	49	48	38	38	33	22	17	17	19	20	24
18	17	21	17	50	14	29	34	35	42	X	67	64	40	48	35	41	44	37	25	16	11	14	40	23	23
19	40	31	59	45	26	31	70	24	29	37	28	25	25	27	29	28	30	25	26	20	10	14	17	22	24
20	20	15	17	15	38	24	7	34	37	38	37	44	36	40	36	34	31	35	31	24	36	48	27	23	24
21	33	58	25	39	18	42	43	40	45	55	56	51	45	50	16	24	29	28	42	53	43	50	39	33	24
22	46	62	65	30	38	38	58	48	51	78	56	62	52	P	67	56	60	39	30	14	9	31	33	63	23
23	44	34	79	40	38	27	31	41	62	42	44	52	56	57	48	57	42	43	26	15	14	25	43	22	24
24	19	52	59	65	35	38	37	29	29	22	33	56	52	45	66	52	47	55	27	60	47	42	51	40	24
25	42	39	34	44	43	44	43	43	44	43	44	43	67	42	45	45	32	33	38	22	29	36	22	22	24
26	29	36	45	53	52	45	34	45	37	40	42	44	46	38	40	45	47	43	44	45	41	37	36	37	24
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30	18	41	45	31	21	42	24	31	37	27	26	27	29	21	20	19	18	21	22	18	32	23	50	37	24
31	36	39	48	44	49	38	50	48	26	21	27	35	X	X	X	34	38	31	26	28	13	26	26	25	21

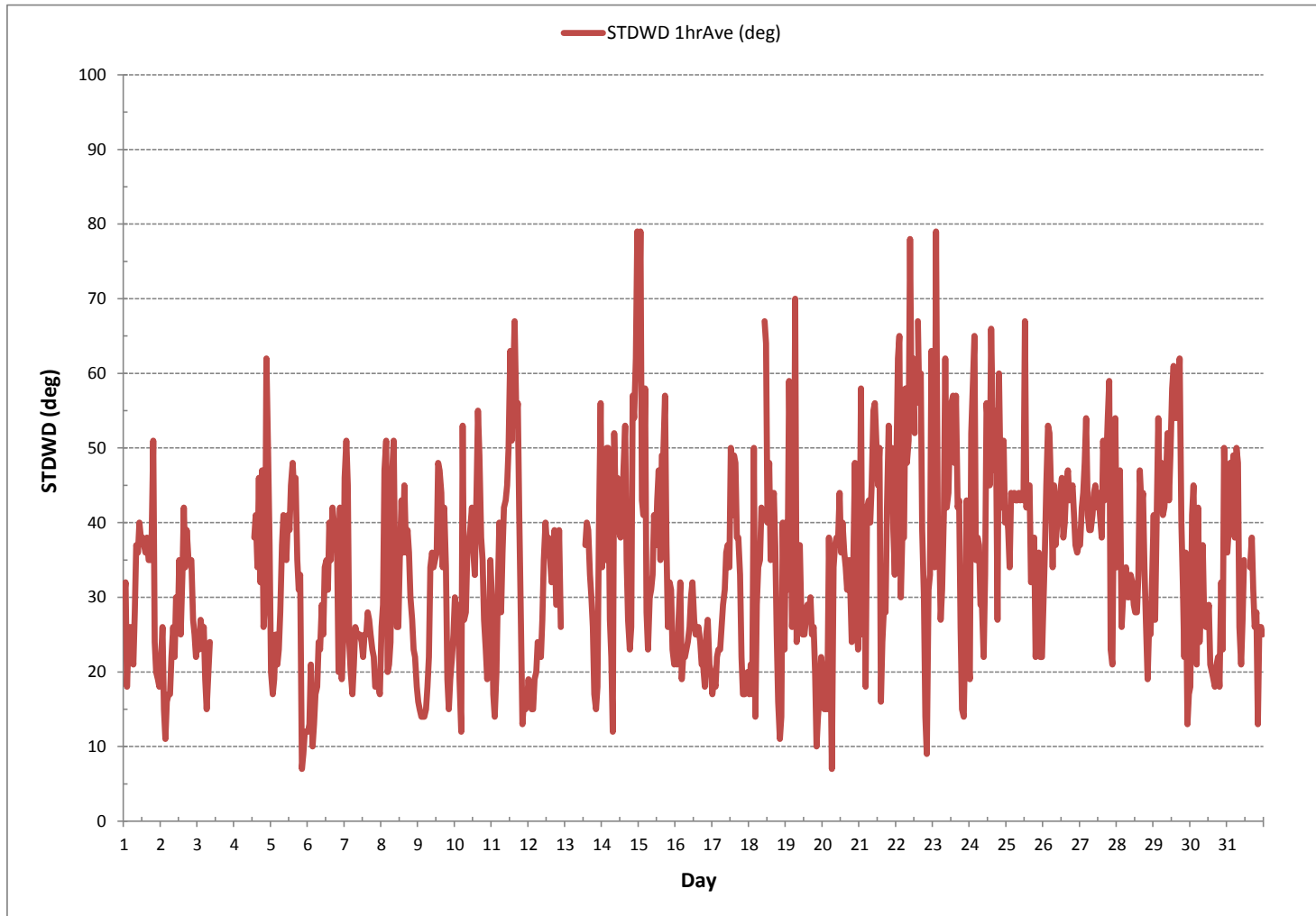
STATUS FLAG CODES

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

LAST CALIBRATION: January 9, 2018

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 696 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



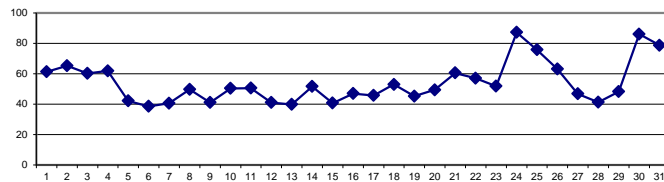
RELATIVE HUMIDITY Hourly Averages (RH %)

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

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

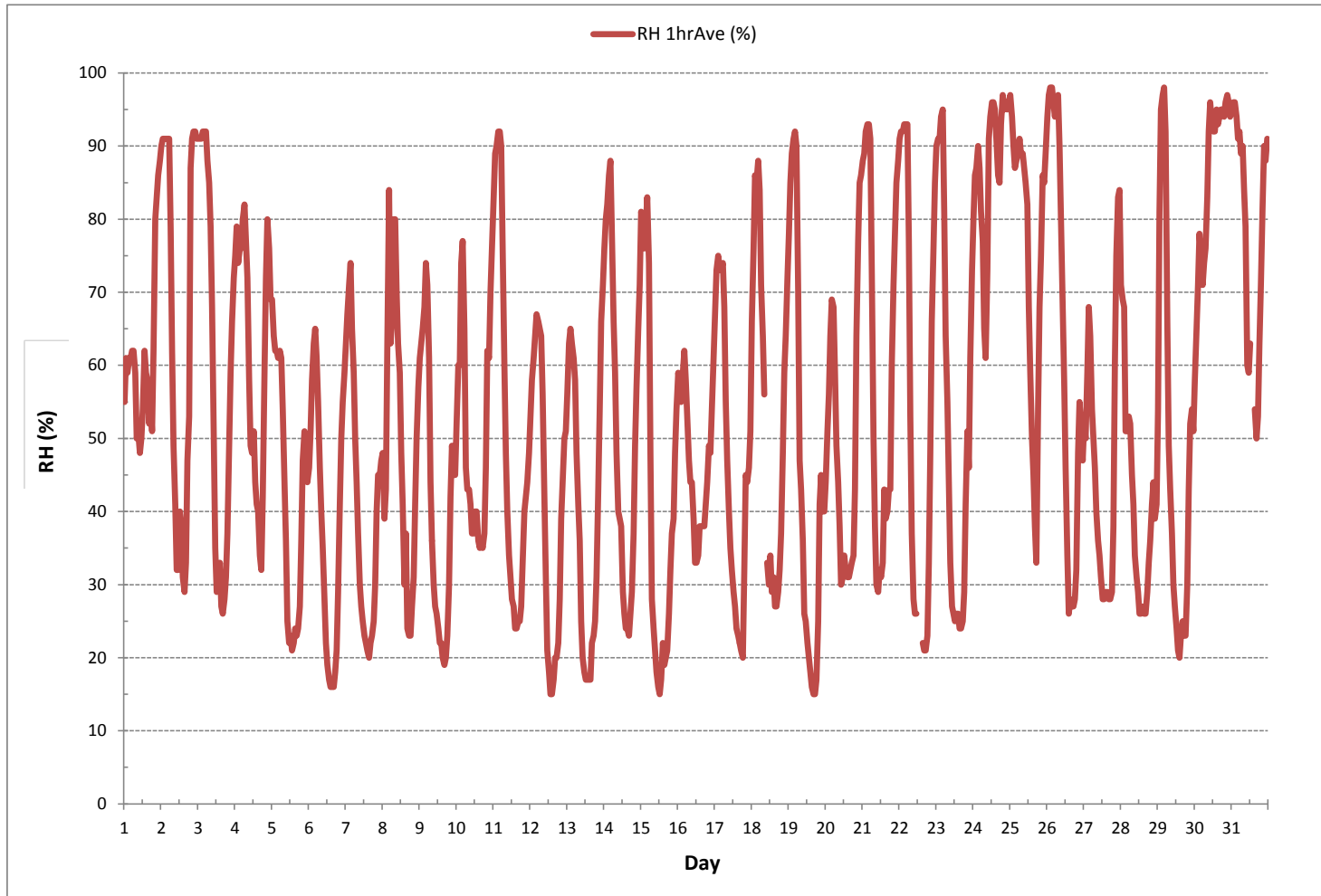
24 HR AVERAGES May 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	15	%	@ HOUR	13	ON DAY	12
MAXIMUM 1-HR AVERAGE:	98	%	@ HOUR	2	ON DAY	26
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY	24
OPERATIONAL TIME:						739 hrs
AMD OPERATION UPTIME:						99.3 %
STANDARD DEVIATION:	24					MONTHLY AVERAGE: 54 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

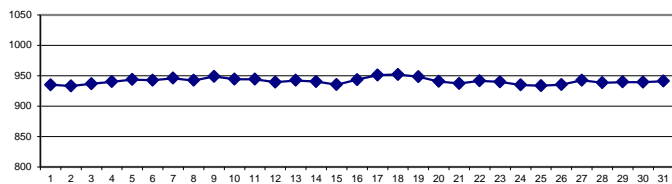
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

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	933	933	932	932	932	933	933	933	934	935	935	936	936	937	937	937	937	937	937	937	937	937	936	936	932	937	935	24					
2	936	935	935	935	935	934	934	935	935	934	934	933	932	932	931	930	930	931	931	931	932	932	933	930	936	933	936	933	24				
3	933	933	934	934	934	934	935	935	936	937	937	938	938	938	938	939	939	939	939	939	939	938	939	938	933	939	937	24					
4	938	938	939	939	939	939	939	940	940	940	941	941	941	941	941	941	941	941	941	941	941	940	941	941	938	941	940	24					
5	941	941	941	942	942	942	943	944	945	945	946	946	946	945	945	945	945	945	944	944	944	944	944	944	941	946	944	24					
6	944	944	944	944	943	944	944	944	944	944	944	944	944	943	942	942	941	941	941	941	941	940	940	940	940	940	944	943	24				
7	941	941	941	942	942	943	945	946	947	948	948	949	949	949	949	948	948	948	948	947	947	946	946	946	941	949	946	24					
8	945	945	945	945	944	943	943	942	942	942	941	941	940	939	939	939	939	940	941	942	943	944	945	946	939	946	942	24					
9	947	947	948	948	949	949	950	951	951	952	952	951	950	950	950	949	948	948	948	947	946	946	946	946	946	952	949	24					
10	946	945	945	945	944	945	945	946	946	946	945	945	944	944	944	943	943	943	943	942	942	942	943	943	942	946	944	24					
11	943	943	943	943	943	944	944	945	946	946	946	946	945	945	945	945	944	944	944	944	944	944	943	943	943	943	944	940	24				
12	943	943	942	942	941	941	941	941	941	941	941	940	940	939	938	938	938	938	937	937	937	937	937	937	937	937	943	940	24				
13	938	938	939	939	940	940	942	943	943	943	943	943	943	943	943	943	944	944	944	944	944	944	944	944	938	944	942	24					
14	944	944	944	944	943	944	944	944	944	944	944	943	943	942	941	940	939	938	937	936	935	935	934	933	933	933	944	940	24				
15	932	932	932	932	932	933	934	935	935	936	936	936	936	937	937	937	937	937	937	937	937	937	938	938	938	932	938	935	24				
16	938	939	939	939	940	940	941	942	943	943	944	944	944	945	945	945	945	946	946	947	947	947	948	948	938	948	944	24					
17	948	948	948	949	949	950	950	951	951	952	952	952	952	951	951	951	951	951	951	952	952	951	951	951	948	952	951	24					
18	952	952	952	952	952	953	953	953	953	953	953	953	953	952	952	952	952	951	951	951	951	950	950	950	950	953	952	24					
19	950	950	950	950	950	950	951	951	951	951	951	950	950	949	948	947	947	946	946	945	944	944	944	944	944	944	951	948	24				
20	944	943	943	943	943	943	943	943	944	943	942	942	941	940	940	939	939	938	938	937	937	936	936	935	935	944	941	24					
21	935	935	935	935	935	936	936	937	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	935	938	937	24					
22	939	939	939	940	940	941	942	943	943	943	944	943	943	P	942	942	942	942	942	941	941	941	941	941	939	944	942	23					
23	940	940	940	940	940	941	941	942	942	942	942	942	941	940	940	939	939	939	938	938	938	938	937	937	937	942	940	24					
24	936	936	936	935	935	935	936	936	937	936	935	935	935	935	935	935	934	934	934	933	933	933	933	933	933	937	935	24					
25	933	932	932	932	933	933	934	934	934	935	935	935	935	935	935	935	934	934	934	934	933	933	933	932	932	935	934	24					
26	932	932	932	932	933	934	934	934	935	935	935	936	936	936	936	936	936	936	936	937	937	937	938	939	932	939	935	24					
27	939	939	939	940	940	942	943	943	944	944	944	944	944	944	944	944	944	944	944	944	943	943	943	939	944	943	24						
28	942	943	942	942	942	941	941	940	939	938	938	937	936	936	935	935	935	935	935	935	935	936	937	937	935	943	938	24					
29	939	939	939	939	939	939	940	940	941	941	940	940	940	940	940	940	939	939	939	939	939	939	939	940	939	941	940	24					
30	940	940	940	940	940	939	939	939	939	939	939	939	939	938	938	938	938	938	939	939	939	939	940	940	938	940	939	24					
31	940	940	940	940	941	941	942	942	943	943	943	943	X	X	940	940	940	940	940	940	940	940	940	940	940	940	943	941	22				
HOURLY MAX	952	952	952	952	952	953	953	953	953	953	953	953	953	952	952	952	951	951	951	951	951	951	951	951	952	952	952	24					
HOURLY AVG	940	940	940	940	940	941	941	942	942	942	942	942	942	942	941	941	941	941	941	941	940	940	941	941	940	940	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

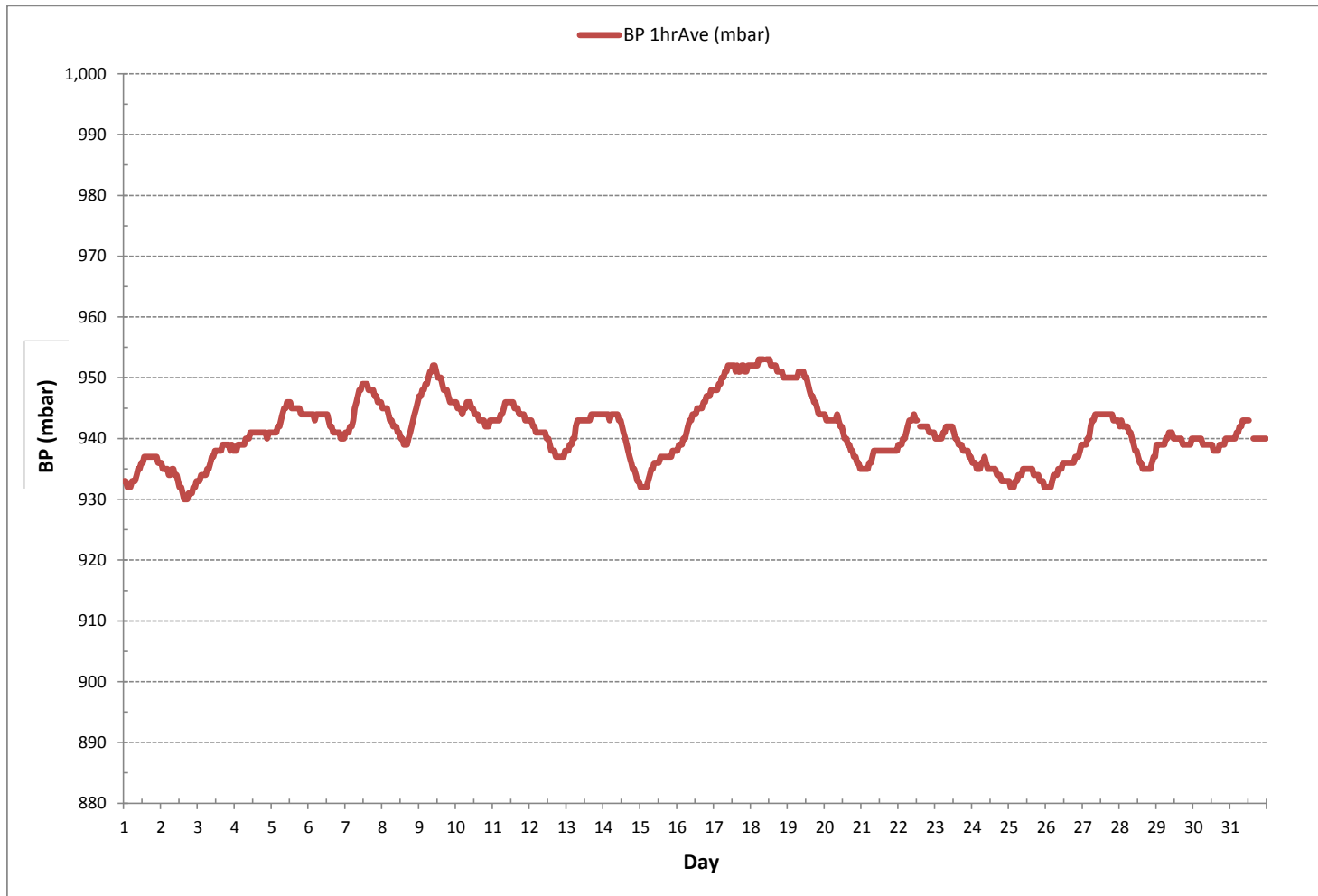
24 HR AVERAGES May 2018



MONTHLY SUMMARY

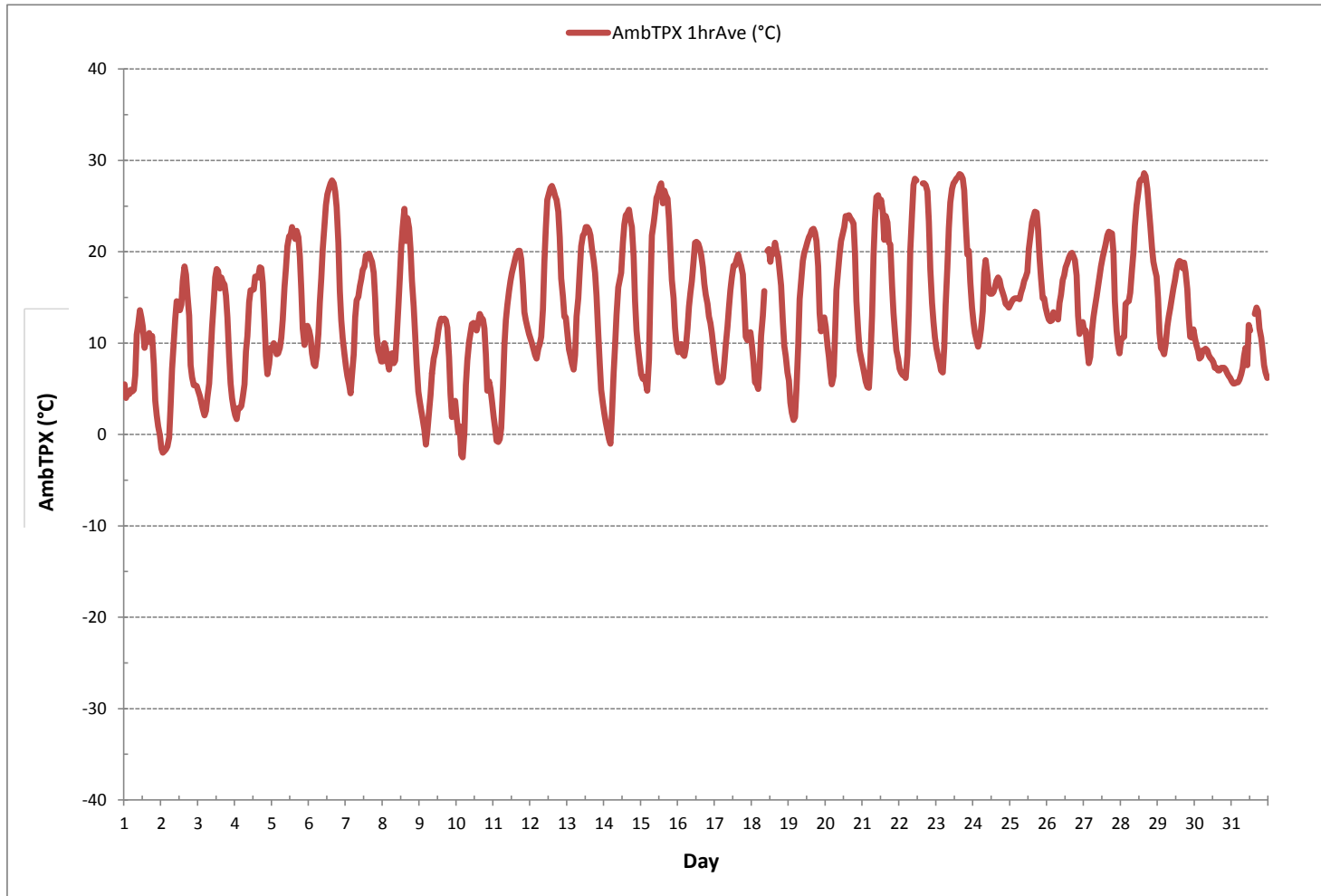
MINIMUM 1-HR AVERAGE:	930	mbar	@ HOUR	15	ON DAY	2
MAXIMUM 1-HR AVERAGE:	953	mbar	@ HOUR	5	ON DAY	18
MAXIMUM 24-HR AVERAGE:	952	mbar			ON DAY	18
OPERATIONAL TIME:						741 hrs
AMD OPERATION UPTIME:						99.6 %
STANDARD DEVIATION:	5				MONTHLY AVERAGE:	941 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

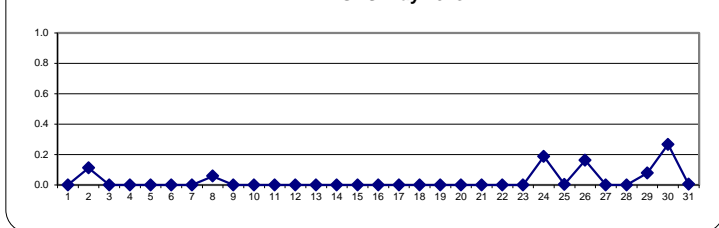
PRECIPITATION Hourly Averages (mm)

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	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	0.2	0.0	1.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.1	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	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	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	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	24
8	0.0	0.0	0.0	1.0	0.0	0.0	0.2	0.1	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	1.0	0.1	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	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	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
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	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	P	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
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	0.4	0.9	0.6	0.0	0.3	0.1	0.2	0.0	0.0	0.0	0.8	0.0	0.0	0.9	0.3	0.0	0.9	0.2	0.0	24
25	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
26	0.0	0.0	0.0	0.1	0.5	1.1	0.0	2.2	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	2.2	0.2	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	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.1	24
30	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.8	1.9	0.9	0.7	0.1	0.4	0.4	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.3	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	X	X	0.0	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	22
HOURLY MAX	0.0	1.1	0.8	1.0	0.5	1.1	0.2	2.2	0.2	0.8	1.9	0.9	0.7	0.3	0.4	0.4	0.2	0.4	1.1	1.4	0.0	0.0	0.9	0.3					
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0					

STATUS FLAG CODES

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

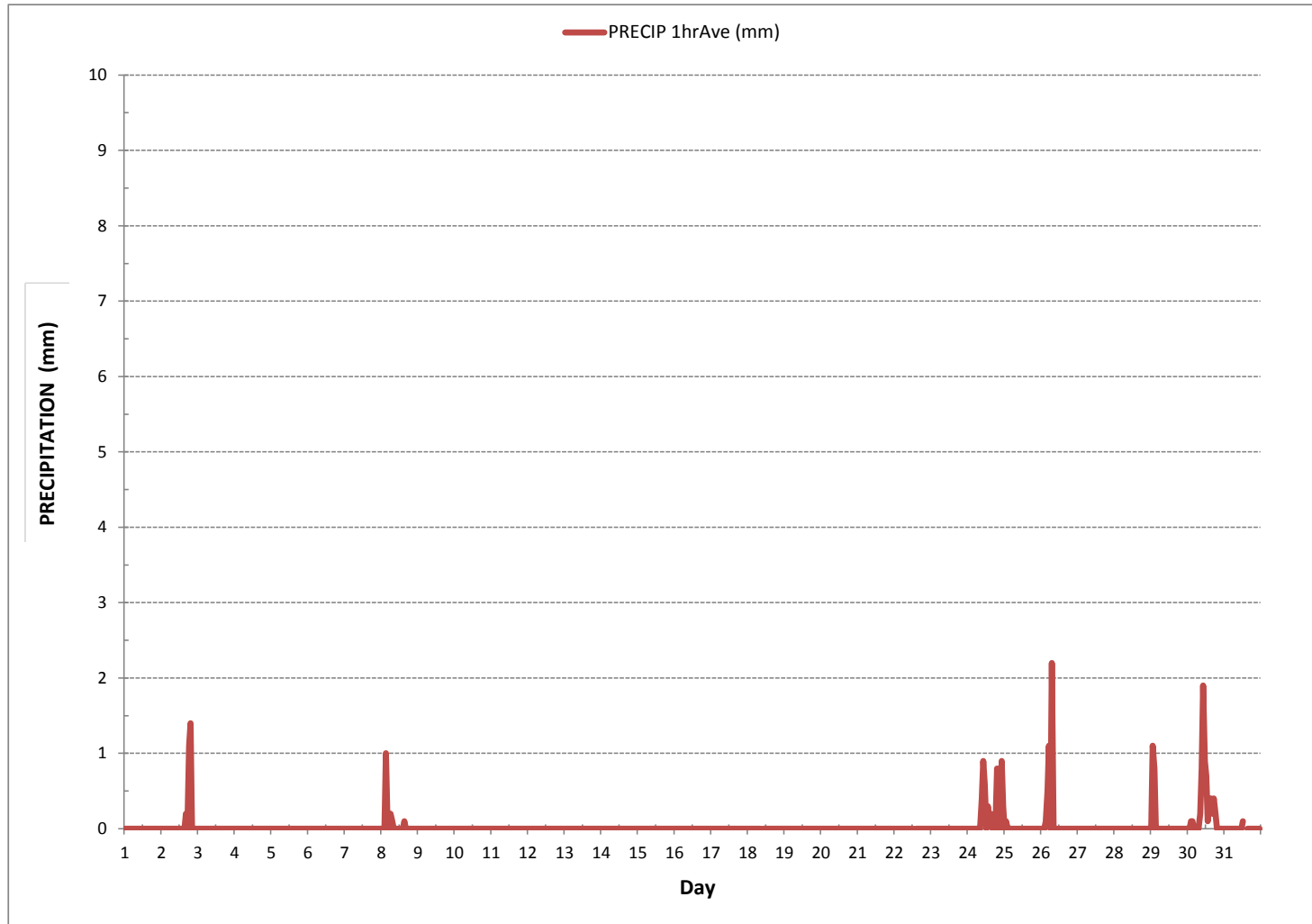
24 HR AVERAGES May 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0 mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	2.2 mm	@ HOUR	7	ON DAY	26
MAXIMUM 24-HR AVERAGE:	0.3 mm			ON DAY	30
MONTHLY TOTAL	21.0 mm				
		OPERATIONAL TIME:		741 hrs	
		AMD OPERATION UPTIME:		99.6 %	
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:	May 10, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 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		
Parameter:	Sulphur Dioxide	Calibration Purpose:	shut down		
Start Time 24 hr. (mst):	10:09	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	12:28	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:	April 10, 2018	As Found C.F.:	1.004		
Previous C.F.:	1.001	New 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: 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><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								

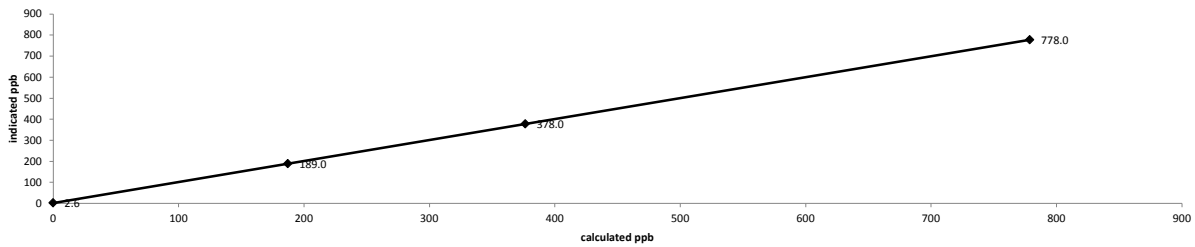
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
as found zero	5033	0.00	5033	0.0	2.6	n/a
as found high	4944	79.50	5023	778.7	778.0	1.004
mid	4997	38.53	5036	376.4	378.0	1.003
low	5015	19.15	5034	187.2	189.0	1.004
Average C.F. =						1.004

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.004		0.90-1.10
b (Intercept as % of full scale) =	-0.27%		± 3% F.S.
% change in C.F. from last cal =	-0.33%		± 10%

API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
Slope: 0.938	Slope: n/a
Offset: 171.9	Offset: n/a
Hvps: 483	Hvps: n/a
Rcell Temp: 50.0	Rcell Temp: n/a
Box Temp: 31.2	Box Temp: n/a
Pmt Temp: 7.7	Pmt Temp: n/a
Izs Temp: 50.0	Izs Temp: n/a
Pres: 24.8	Pres: n/a
Samp Fl: 581	Samp Fl: n/a
Norm Pmt: 175.5	Norm Pmt: n/a
Uv Lamp: 2256.8	Uv Lamp: n/a
Lamp Ratio: 82.4	Lamp Ratio: n/a
Str Lgt: 80.6	Str Lgt: n/a
Drk Pmt: 11.0	Drk Pmt: n/a
Expected Value: 474.0	Expected Value: n/a

Comments:

The manifold blower was found to be working normally.

The SPAN check result was -17%. Shutdown calibration was completed to perform preventative repair to a sample pump and to install a new permeation tube.



API 100E Sulphur Dioxide Analyzer Calibration

Date: May 10, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Sulphur Dioxide Start Time 24 hr. (mst): 12:29 End Time 24 hr. (mst): 16:12 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 508 LICA Last Calibration Date: April 10, 2018 Previous C.F.: 1.001	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 945 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Converter Model & s/n (if applicable): n/a Range ppb: 1000 As Found C.F.: n/a 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	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Standard Calibration Points for Ranges</th> </tr> <tr> <th style="text-align: center;">Point</th> <th style="text-align: center;">ppb</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">High</td> <td style="text-align: center;">780</td> </tr> <tr> <td style="text-align: center;">Mid</td> <td style="text-align: center;">380</td> </tr> <tr> <td style="text-align: center;">Low</td> <td style="text-align: center;">190</td> </tr> </tbody> </table>	Standard Calibration Points for Ranges		Point	ppb	High	780	Mid	380	Low	190
Standard Calibration Points for Ranges											
Point	ppb										
High	780										
Mid	380										
Low	190										

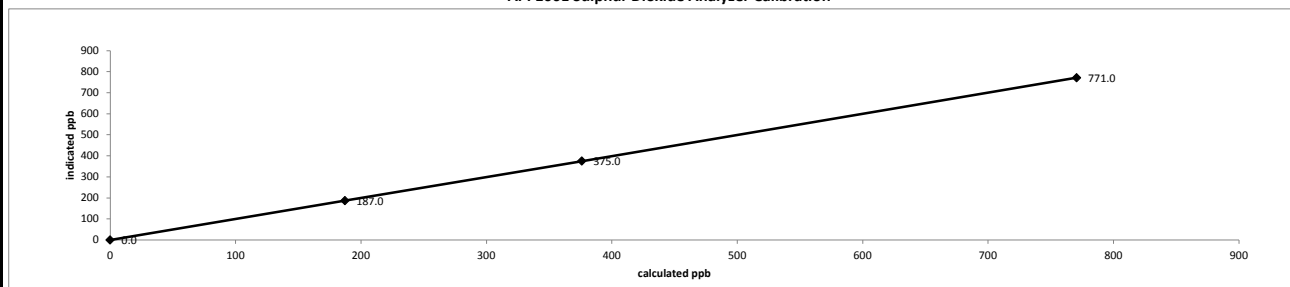
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
adjusted zero	5038	0.00	5038	0.0	0.0	n/a
adjusted high	4961	78.95	5040	770.7	771.0	1.000
mid	4998	38.51	5037	376.2	375.0	1.003
low	5017	19.16	5036	187.2	187.0	1.001
Calibrator zero	5038	0.00	5038	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) =	0.04%		± 3% F.S.
% change in C.F. from last cal =	n/a		n/a

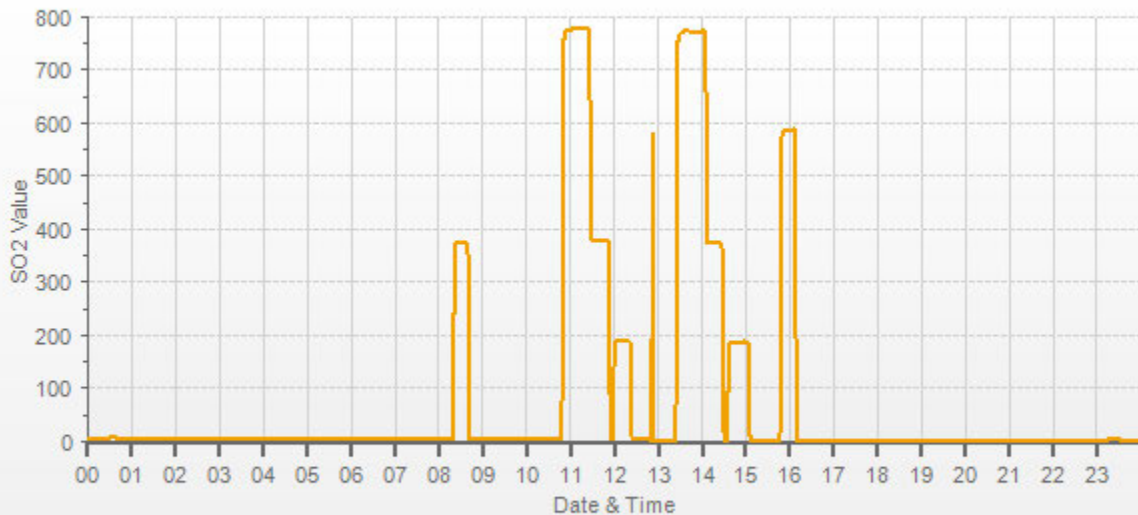
API 100E Sulphur Dioxide Analyzer Calibration



As found:	As left:
Slope: n/a	Slope: 0.935
Offset: n/a	Offset: 176.0
Hvps: n/a	Hvps: 483
Rcell Temp: n/a	Rcell Temp: 50.0
Box Temp: n/a	Box Temp: 31.2
Pmt Temp: n/a	Pmt Temp: 7.7
Izs Temp: n/a	Izs Temp: 50.0
Pres: n/a	Pres: 24.8
Samp Fl: n/a	Samp Fl: 580
Norm Pmt: n/a	Norm Pmt: 175.7
Uv Lamp: n/a	Uv Lamp: 2260.1
Lamp Ratio: n/a	Lamp Ratio: 82.5
Str Lgt: n/a	Str Lgt: 82.2
Drk Pmt: n/a	Drk Pmt: 10.8
Expected Value: n/a	Expected Value: 474.0

Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 The analyzer perm tube was changed, the new expected value will be updated once the perm tube temperature has stabilized.
 The sample pump was rebuilt, a new permeation tube was installed, the output voltage was calibrated prior to the post-repair calibration.

SO2[ppb] Station: LICA MASKWA Daily: 18/05/10 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>May 16, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 15, 2019</u>	<u>943</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>Mix of sun and clouds</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>10:03</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Rob Fisher</u>
End Time 24 hr. (mst): <u>14:46</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>April 10, 2018</u>	As Found C.F.: <u>1.010</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# 5212 expires March 1, 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>10:55/11:05</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									

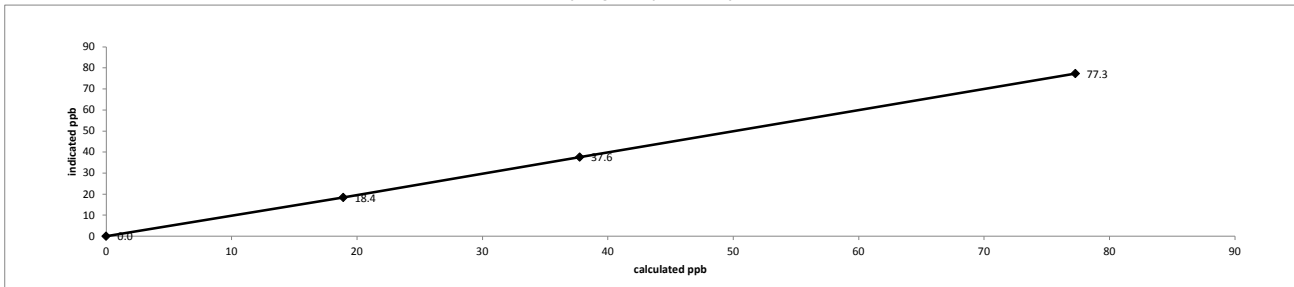
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7540	0.00	7540	0.0	0.2	n/a
as found high	7515	57.37	7572	77.3	76.7	1.010
adjusted zero	7540	0.00	7540	0.0	0.0	n/a
adjusted high	7515	57.37	7572	77.3	77.3	1.000
mid	7535	28.00	7563	37.8	37.6	1.004
low	7556	14.03	7570	18.9	18.4	1.027
Calibrator zero	7540	0.00	7540	0.0	0.0	n/a
Average C.F. =						1.010

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>0.24%</u>	0.95-1.05
% change in C.F. from last cal = <u>-1.02%</u>	± 3% F.S.
	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



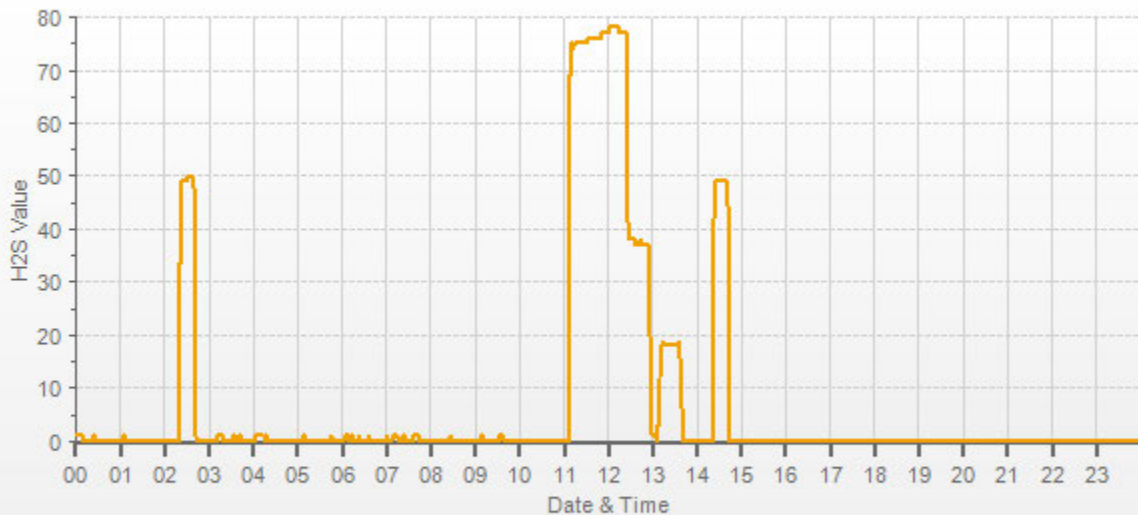
As found: Slope: <u>0.970</u> Offset: <u>34.0</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>35.4</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>315.1</u> Pres: <u>20.0</u> Samp Fl: <u>524</u> Uv Lamp: <u>2795.8</u> Lamp Ratio: <u>83.2</u> Str Lgt: <u>16.5</u> Drk Pmt: <u>33.5</u> Expected Value: <u>48.0</u>	As left: Slope: <u>0.978</u> Offset: <u>34.6</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>35.8</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>314.4</u> Pres: <u>20.1</u> Samp Fl: <u>526</u> Uv Lamp: <u>2794.4</u> Lamp Ratio: <u>83.3</u> Str Lgt: <u>16.9</u> Drk Pmt: <u>33.3</u> Expected Value: <u>48.8</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 MASKWA Daily: 18/05/16 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: May 16, 2018 Company/Airshed: LICA Location/Station Name: Maskwa Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 11:01 /16:12 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 944 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mix of sun and clouds Calibration Purpose: post repair Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: November 24, 2022
Analyzer: Serial Number/Owner: 436609738 LICA Last Calibration Date: April 10, 2018 Previous Cal High Point C.F.: 1.000	Range ppm: 50 As Found C.F.: n/a 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: Enviroincs id# 4760 expires March 2, 2019
 Cal Gas Cylinder I.D. #: LL 165367

Point	Target ppm
High	38
Mid	18
Low	9

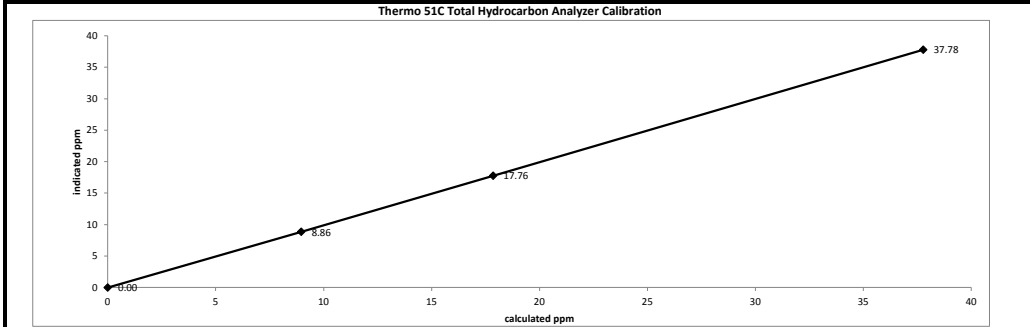
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm)	207.0
590.0	
CH ₄ as propane/total CH ₄ equivalents (ppm)	1159.3

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)	
adjusted zero	2510	0.00	2510	0.0	0.00	n/a
adjusted high	2428	81.80	2510	37.78	37.78	1.000
mid	2472	38.67	2511	17.85	17.76	1.005
low	2491	19.41	2510	8.96	8.86	1.012
calibrator zero	2510	0.00	2510	0.00	0.00	n/a
Average C.F.=						1.006

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 0.999 b (Intercept as % of full scale) = 0.12% % change in C.F. from last cal = n/a	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. n/a
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As found: measurement alarms: Flow Low service alarms: Flow Reg Fail cnt: n/a rng: n/a try: n/a flm: 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	As left: measurement alarms: None service alarms: None cnt: 1935 rng: 1 try: 3 flm: 203.2 det: 125.7 Flame: 203 Filter: 125 Base: 125 Sample psi: 07.50 Internal Air Pressure: 20 Internal Fuel Pressure: 14
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Cylinder/Regulator Pressures:	
H2 Cylinder (psi):	800
H2 cylinder reg set (psi):	25
Zero Air Gen Pressure:	41
Span Cylinder (psi):	2000
Span Cylinder reg set (psi):	25
Measured Flow:	0.291
Expected Value:	27.08

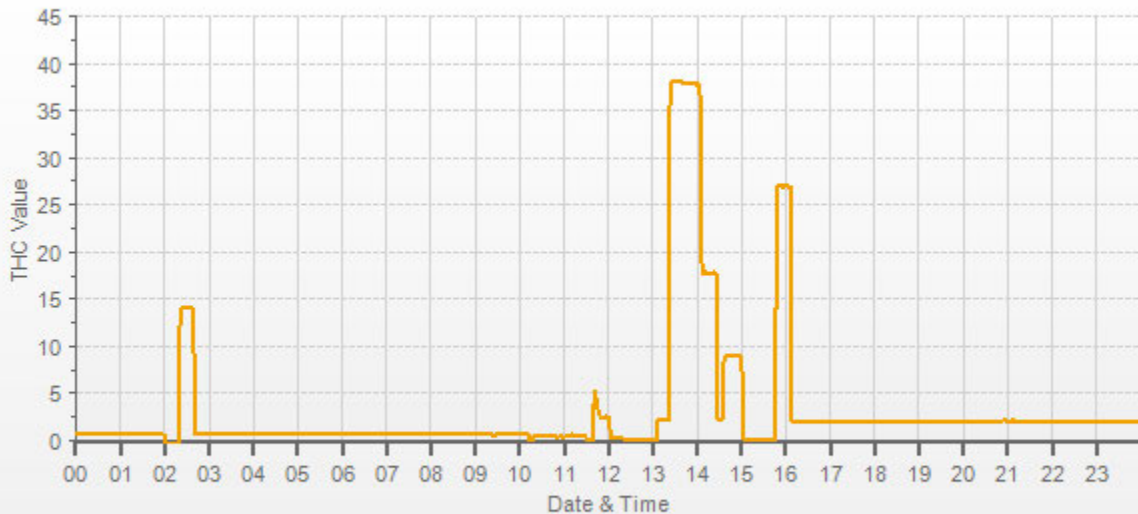
Comments:

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 shutdown calibration was not possible due to a failed sample pump resulting in a Low Flow Alarm. The sample pump was repaired and a Post-Repair calibration was completed.



— THC[ppm]



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	May 20, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	941	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	post repair		
Start/End Time 24 hr. (mst):	12:44 / 15:44	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:	436609738 LICA	As Found C.F.:	n/a		
Last Calibration Date:	May 16, 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
 Calorator ID/Expiry Date: Enviroconics 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

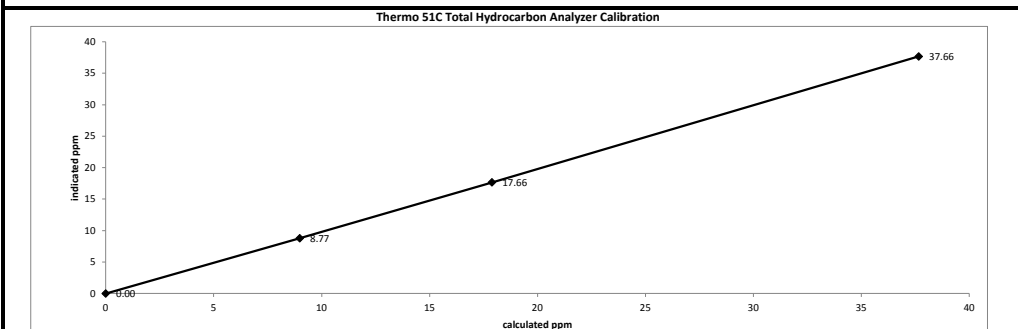
Point	Target ppm
High	38
Mid	18
Low	9

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

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Diluent	Cal Gas	Total	(ppm)	(ppm)	
adjusted zero	2508	0.00	2508	0.0	0.00	n/a
adjusted high	2433	81.71	2515	37.66	37.66	1.000
mid	2474	38.78	2513	17.89	17.66	1.013
low	2491	19.46	2510	8.99	8.77	1.025
calibrator zero	2508	0.00	2508	0.00	0.00	n/a
Average C.F.=						1.013

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	> or = 0.995
Slope =	<u>0.999</u>		0.95-1.05
b (Intercept as % of full scale)=	<u>0.27%</u>		± 3% F.S.
% change in C.F. from last cal=	<u>n/a</u>		n/a



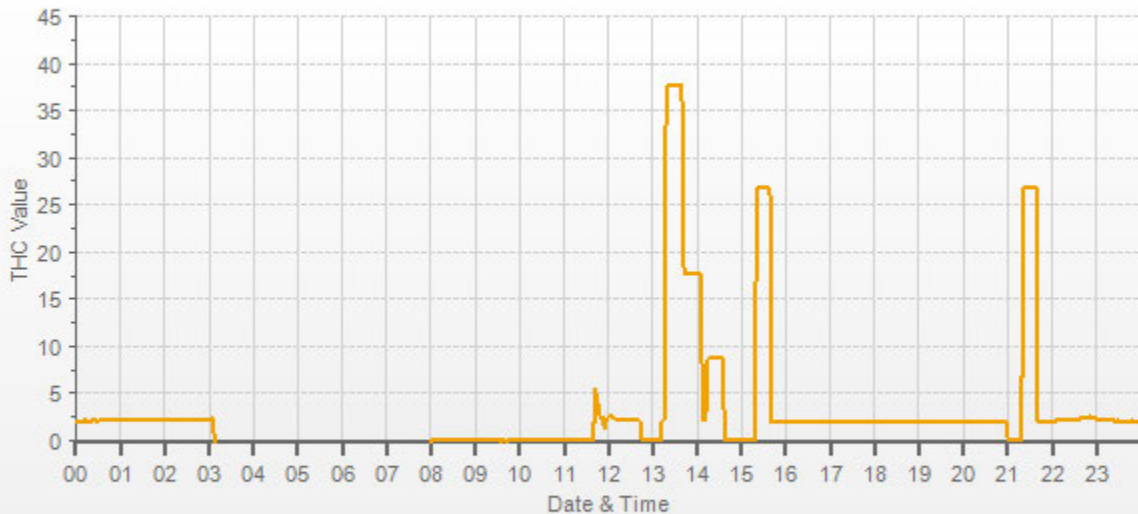
measurement alarms:	<u>As found:</u>	measurement alarms:	<u>As left:</u>
service alarms:	Flow Low alarm	service alarms:	None
	Flow Reg Fail		None
cnt:	n/a	cnt:	1955
rng:	n/a	rng:	1
try:	n/a	try:	0
flm:	n/a	flm:	203.1
det:	n/a	det:	125.4
Flame:	n/a	Flame:	203
Filter:	n/a	Filter:	125
Base:	n/a	Base:	125
Sample psi:	n/a	Sample psi:	07.50
Internal Air Pressure:	n/a	Internal Air Pressure:	20
Internal Fuel Pressure:	n/a	Internal Fuel Pressure:	14

Cylinder/Regulator Pressures:	H2 Cylinder (psi): <u>750</u>	H2 Cylinder (psi): <u>750</u>
	H2 cylinder reg set (psi): <u>25</u>	H2 cylinder reg set (psi): <u>25</u>
	Zero Air Gen Pressure: <u>42</u>	Zero Air Gen Pressure: <u>41</u>
	Span Cylinder (psi): <u>1950</u>	Span Cylinder (psi): <u>1950</u>
	Span Cylinder reg set (psi): <u>25</u>	Span Cylinder reg set (psi): <u>25</u>
	Measured Flow: <u>n/a</u>	Measured Flow: <u>0.896</u>
	Expected Value: <u>26.90</u>	Expected Value: <u>26.70</u>

Comments:

The manifold blower was found to be working normally.

The detector flame was out upon arrival. A shutdown calibration was not possible due to a seized pump. Further investigation revealed a pump bearing was damaged. A spare pump was installed and a post-repair calibration was performed.



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: May 4, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	941	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Maskwa	Weather Conditions: Mix of sun and clouds		
Start/End Time 24 hr. (mst): 10:52 / 17:11	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: 1899 Maxxam Last Calibration Date: April 27, 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>0.985</td> <td>1.000</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.004</td> <td>1.000</td> </tr> <tr> <td>NOx =</td> <td>0.999</td> <td>0.981</td> <td>1.000</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	0.985	1.000	NO ₂ =	1.000	1.004	1.000	NOx =	0.999	0.981	1.000
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	0.985	1.000														
NO ₂ =	1.000	1.004	1.000														
NOx =	0.999	0.981	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: Envirionics 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	5056	0.0	5056	0	0	0.0	0.0	n/a	n/a
as found high	4976	75.8	5052	773.1	774.6	785.0	790.0	0.985	0.981
adjusted zero	5056	0.00	5056	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4976	75.84	5052	773.1	774.6	773.0	775.0	1.000	1.000
mid	5017	36.88	5054	375.8	376.5	371.0	372.0	1.013	1.012
low	5037	18.44	5055	187.9	188.2	182.0	182.0	1.032	1.034
calibrator zero	5056	0.00	5056	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.015	1.015

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	4976	75.84	5052	0.0	774.0	775.0	1.0	0.0	1.0	
as found high NO2	4976	75.84	5052	510.0	271.0	773.0	502.0	503.0	501.0	1.004
adjusted high NO2	4976	75.84	5052	510.0	271.0	775.0	504.0	503.0	503.0	1.000
gpt mid	4976	75.84	5052	280.0	495.0	777.0	282.0	279.0	281.0	0.993
gpt low	4976	75.84	5052	100.0	677.0	776.0	99.0	97.0	98.0	0.990
Average NO ₂ C.F.=										0.994

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)=	-0.33%	-0.35%	0.13%	± 3% F.S.
% change in C.F. from last cal=	1.51%	1.85%	-0.40%	± 10%
NO2 converter efficiency			0.96	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	1.055	NOx SLOPE:	1.035
NOx OFFS:	-0.1	NOx OFFS:	-0.1
NO SLOPE:	1.058	NO SLOPE:	1.042
NO OFFS:	-0.8	NO OFFS:	-0.8
SAMP FLW:	550	SAMP FLW:	552
OZONE FL:	78	OZONE FL:	78
NORM PMT:	-0.9	NORM PMT:	-0.2
AZERO:	21.2	AZERO:	21.1
HVPS:	670	HVPS:	670
DCPS:	2556	DCPS:	2556
RCELL:	50.6	RCELL:	50.8
BOX TEMP:	30.4	BOX TEMP:	30.1
IZS TEMP:	50.5	IZS TEMP:	50.2
MOLY TEMP:	316.4	MOLY TEMP:	314.7
RCEL:	6.4	RCEL:	6.4
SAMP:	25.9	SAMP:	25.9
Expected Value NO:	6	Expected Value NO:	4
Expected Value NO2:	581	Expected Value NO2:	407
Expected Value NOx:	586	Expected Value NOx:	412

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

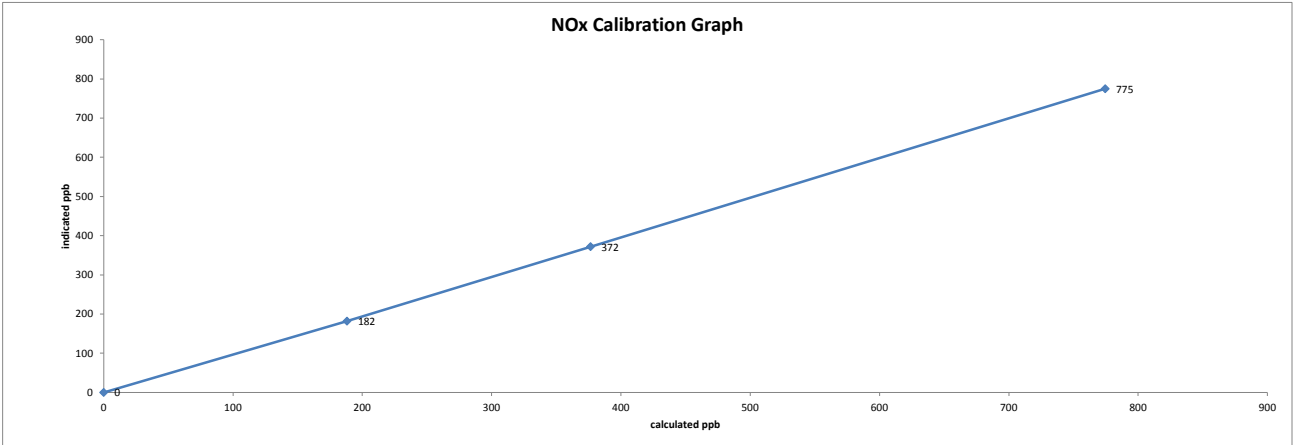
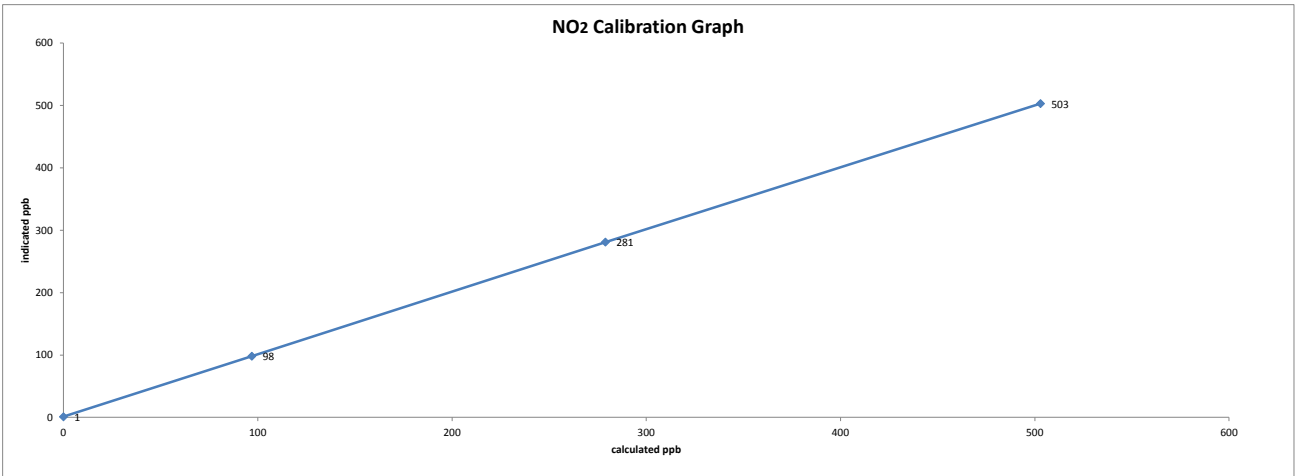
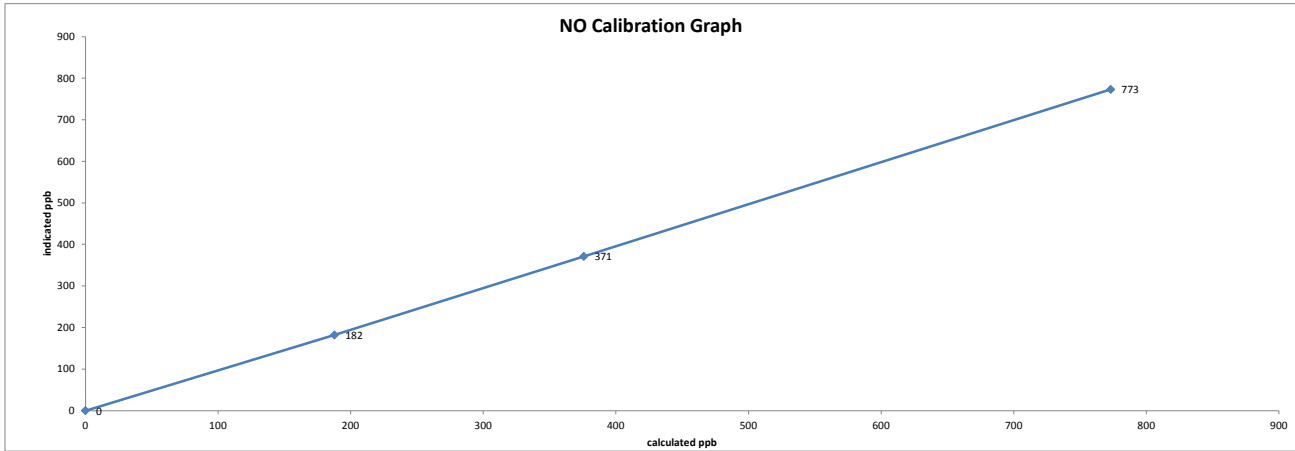
The analyzer perm tube was changed , new expected value to be updated once the perm tube temperature has stabilized.

A new permeation device was installed.

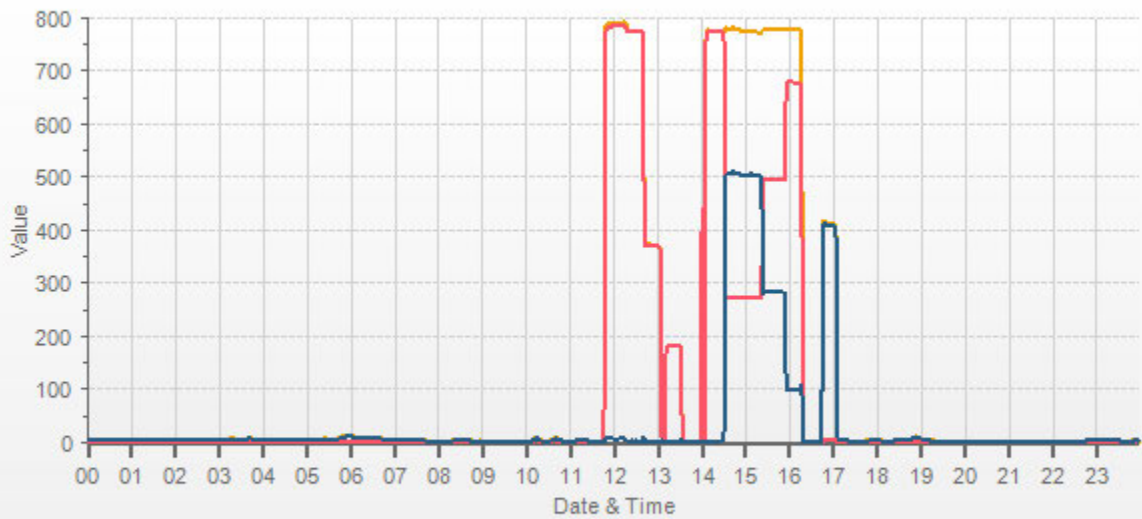
Date: May 4, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:52 / 17:11
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration



Station: LICA MASKWA Daily: 18/05/04 Type: AVG 1 Min. [1 Min.]



— NOx[ppb] — NO[ppb] — NO2[ppb]

PARTICULATE MATTER 2.5



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

Date:	May 16, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	11:12	
Station Name/Location:	Maskwa	End Time (mst):	13:49	
Previous Audit Date:	n/a	Calibration Purpose:	installation	
Parameter:	PM 2.5	Weather Conditions:	Mix of sun and clouds	

1400A Information and Status:

Serial Number/Owner:	1405A208301003	LICA	As Found Filter Loading %:	n/a
Ko Factor:	13125		As Left Filter Loading %:	4%
Ambient Temperature °C:	21.1		As Found Noise:	n/a
Ambient Pressure atm:	0.931		As Left Noise:	0.006
Main Flow Reading lpm:	3.00		Pump Vacuum:	0.29
Aux Flow Reading lpm:	13.67		Warnings:	None

Reference Standards/I.D./Expiry Date:

Low Flow:	Airmetrics/Chinook Low Maxxam ID #3 expires April 24, 2019
High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires April 24, 2019
Digital Manometer:	Dwyer 475 Mark III id# 3 expires January 9, 2019
Temperature:	F.S. 170286131 expires April 19, 2019
Pressure:	F.S. 05544 expires January 5, 2019

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	n/a	n/a	n/a	n/a
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	n/a	n/a	n/a	n/a
	limit	0.60	0.60	0.60	0.60

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.01	2.28	0.00	2.29
	limit	0.15	0.15	0.15	0.15
Bypass Flow	actual	-0.01	-1.01	0.00	-1.02
	limit	0.60	0.60	0.60	0.60

As found temperature and pressure:

1405F temperature °C:	n/a	tolerance +/- 2.0°C	1405F pressure atm:	n/a	tolerance +/- 0.01 atm
reference temperature °C:	n/a		reference pressure:	n/a	
difference °C:	#VALUE!		difference :	#VALUE!	

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

1405F temperature °C:	21.1	tolerance +/- 2.0°C	1405F pressure atm:	0.931	tolerance +/- 0.01 atm
reference temperature °C:	21.1		reference pressure:	0.931	
difference °C:	0.0		difference :	0.000	

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: n/a	1400A total/aux flow lpm: n/a
reference main flow lpm: n/a	reference total/aux flow lpm: n/a
difference lpm: #VALUE!	difference lpm: #VALUE!

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

main flow tolerance 3.00 lpm +/- 0.20 lpm	total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm +/- 7%
1405F main flow lpm: 3.00	1400A total/aux flow lpm: 13.67
reference main flow lpm: 3.02	reference total/aux flow lpm: 13.68
difference lpm: 0.02	difference lpm: 0.01

K_o Audit:

Last K _o audit date:	May 16, 2018
1405F K _o factor:	13125
Measured K _o factor:	13095.4000
% difference:	0.23%

Comments:
 The TEOM sample filter was changed.
 The bypass (auxillary) flow filter was changed.
 The 47 mm FDMS filter was changed.
 The TEOM intake head and associated sharp cut components were cleaned.

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

Date: May 28, 2018 Performed By/Reviewer: Alex Yakupov Rob Fisher
 Company: LICA Start Time (mst): 10:54
 Station Name/Location: Maskwa End Time (mst): 13:01
 Previous Audit Date: May 16, 2018 Calibration Purpose: Bi-monthly #2
 Parameter: PM 2.5 Weather Conditions: Mainly sunny

1400A Information and Status:

Serial Number/Owner: 1405A208301003 LICA As Found Filter Loading %: 3%
 Ko Factor: 13125 As Left Filter Loading %: 7%
 Ambient Temperature °C: -272.93 As Found Noise: 0.010
 Ambient Pressure atm: 0.922 As Left Noise: 0.000
 Main Flow Reading lpm: 3.00 Pump Vacuum: 0.28
 Aux Flow Reading lpm: 13.67 Warnings: None

Reference Standards/I.D./Expiry Date:

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

As found leak check:

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.07	2.42	-0.01	2.49
	limit	0.15	2.42	0.15	2.49
Bypass Flow	actual	-0.04	-1.21	0.00	-1.25
	limit	0.60	-1.21	0.60	-1.25

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

		Base	Zero	Reference	Zero
PM 2.5 Flow	actual	0.07	2.42	-0.01	2.49
	limit	0.15	2.42	0.15	2.49
Bypass Flow	actual	-0.04	-1.21	0.00	-1.25
	limit	0.60	-1.21	0.60	-1.25

As found temperature and pressure:

tolerance +/- 2.0°C tolerance +/- 0.01 atm
 1405F temperature °C: -272.9 1405F pressure atm: 0.922
 reference temperature °C: 26.2 reference pressure: 0.921
 difference °C: 299.1 difference : 0.001

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

tolerance +/- 2.0°C tolerance +/- 0.01 atm
 1405F temperature °C: 26.4 1405F pressure atm: 0.922
 reference temperature °C: 26.4 reference pressure: 0.922
 difference °C: 0.0 difference : 0.000

As found flows:

main flow tolerance 3.00 lpm +/- 0.20 lpm total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1405F main flow lpm: 3.00 1400A total/aux flow lpm: 13.67
 reference main flow lpm: 3.04 reference total/aux flow lpm: 13.79
 difference lpm: 0.04 difference lpm: 0.12

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

main flow tolerance 3.00 lpm +/- 0.20 lpm total/aux flow tolerance 16.67/13.67 lpm +/- 1.00 lpm/+/- 7%
 1405F main flow lpm: 3.00 1400A total/aux flow lpm: 16.67
 reference main flow lpm: 3.04 reference total/aux flow lpm: 16.67
 difference lpm: 0.04 difference lpm: 0.00

K_o Audit:

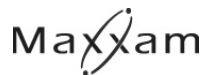
Last K_o audit date: May 16, 2018
 1405F K_o factor: 13125
 Measured K_o factor: 13125.0000
 % difference: 0.23%

Comments:

The TEOM sample filter was changed. The TEOM intake head and associated sharp cut components were cleaned.
 The 47 mm FDMS filter was changed.

The As Found temperature failed due to a faulty Temperature/RH sensor. The Temperature/RH sensor passed after disconnecting and re-connecting the cable. The Temperature/RH sensor requires replacement.

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.

METEOROLOGICAL SYSTEM



Meteorological System Checklist

Date:	May 22, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Met One	083D-1-35 - Relative Humidity /w Temp	F 4090
Relative Humidity Sensor:	Met One	083D-1-35 - Relative Humidity /w Temp	F4090
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	March 15, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	25.8		
Station - Ambient Temperature (°C):	25.1		
Temperature Difference (°C):	0.7		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	March 15, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	27.39		
Station Hygrometer % RH- Reading:	27.48		
Pressure Tolerance +/- 15% of difference:	23.28 - 31.50	-0.3%	



Meteorological System Checklist

Date:	May 22, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	Maskwa		
Unit:	Make:	Model:	Serial #:
Temperature Sensor:	Campbell Scientific	HC2A-S3 Relative Humidity /w Temp	20221366
Relative Humidity Sensor:	Campbell Scientific	HC2A-S3 Relative Humidity /w Temp	20221366
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	May 22, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	28.5		
Station - Ambient Temperature (°C):	28.1		
Temperature Difference (°C):	0.4		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	May 22, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	20.21		
Station Hygrometer % RH- Reading:	21.57		
Pressure Tolerance +/- 15% of difference:	17.18 - 23.24	-6.7%	

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)

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

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018
 Operator Signature: [Signature] 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 Date: March 2, 2018
 Operator Signature: *Chris W* 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

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
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
Maskwa Continuous Monitoring Station - May 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	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	5	5	5	5	5	6	14	12	14	16	24	18	12	14	41	S	12	4	4	4	4	4	4	4	41	10	24	
2	4	4	4	4	4	4	5	8	7	5	7	5	5	5	5	5	S	5	6	12	6	5	4	5	4	4	12	5	24	
3	7	5	7	7	5	5	5	7	7	9	8	9	4	22	23	S	25	17	4	4	5	4	5	4	4	4	25	9	24	
4	5	4	4	4	4	4	4	4	6	4	16	11	10	15	S	4	11	P	14	7	4	4	4	4	4	4	16	7	23	
5	4	4	4	4	5	15	33	39	16	12	9	13	9	S	5	8	17	12	4	4	3	4	3	4	3	39	10	24		
6	4	4	4	4	5	6	7	7	7	6	5	4	S	4	4	9	12	28	38	9	17	6	4	4	4	4	38	9	24	
7	4	4	4	4	4	4	4	4	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	4	3	4	3	24	
8	6	9	10	5	4	4	5	4	4	5	S	5	5	5	7	25	20	11	6	4	4	4	4	3	3	25	7	24		
9	4	4	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	4	4	3	S1	5	4	3	5	3	23		
10	8	4	4	4	4	4	6	4	S	4	C	C	C	C	C	C	C	C	2	2	2	2	2	2	3	2	8	4	24	
11	1	2	2	1	2	5	11	S	4	2	2	2	2	2	4	4	3	4	4	2	2	2	2	2	2	1	11	3	24	
12	2	2	2	2	2	S	2	3	4	4	2	2	2	2	8	6	9	2	2	4	4	2	2	3	2	2	9	3	24	
13	8	10	5	3	2	S	4	10	12	7	P	10	10	11	10	3	2	2	2	2	2	2	2	2	2	2	12	6	23	
14	2	2	2	2	S	2	2	2	3	3	7	4	5	6	9	9	3	3	5	4	4	3	3	3	3	2	9	4	24	
15	3	3	3	S	3	3	3	3	5	10	3	8	9	5	3	5	4	4	6	3	12	11	3	3	3	12	5	24		
16	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	1	2	1	4	2	24		
17	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	2	1	2	1	24
18	S	2	1	1	1	1	1	2	3	X	3	3	3	3	3	2	2	3	2	2	2	2	1	S	1	3	2	23		
19	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	S	2	1	3	2	24		
20	2	2	2	2	2	2	3	4	4	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	2	4	3	24		
21	3	3	3	3	3	3	4	26	27	6	6	3	4	4	3	3	3	15	20	3	S	3	3	3	3	27	7	24		
22	3	3	3	3	3	3	11	5	18	16	6	3	4	P	3	3	3	3	3	3	S	3	3	3	3	18	5	23		
23	3	3	3	3	3	3	3	4	13	11	6	4	4	5	4	3	5	9	S	4	5	3	4	4	3	13	5	24		
24	4	4	4	3	4	3	3	5	4	4	4	4	4	4	4	7	7	S	4	4	4	5	8	4	3	8	4	24		
25	7	6	5	5	5	5	4	4	4	4	4	4	5	4	4	4	S	4	4	4	4	4	4	4	4	7	4	24		
26	4	4	4	4	4	4	4	4	6	5	4	4	4	4	4	S	4	4	4	4	4	5	6	9	4	9	4	24		
27	4	4	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	4	3	3	3	3	4	3	24		
28	3	4	4	5	5	4	5	5	4	4	4	5	4	S	4	4	4	4	4	4	5	4	4	4	4	3	5	4	24	
29	4	4	4	4	4	4	4	4	4	4	4	4	4	4	S	4	4	4	4	4	4	4	4	4	4	4	4	4	24	
30	3	4	5	4	5	4	4	4	4	4	4	4	S	4	4	4	4	4	4	4	4	4	4	4	4	3	5	4	24	
31	4	4	4	4	4	3	4	4	4	4	S	4	4	X	X	X	X	6	3	3	2	X	X	5	2	6	4	18		
HOURLY MAX	8	10	10	7	5	15	33	39	27	16	16	16	24	22	23	25	41	28	38	12	17	11	8	9						
HOURLY AVG	4	4	4	3	3	4	5	6	7	5	5	5	5	6	5	5	7	6	6	4	4	4	3	4						

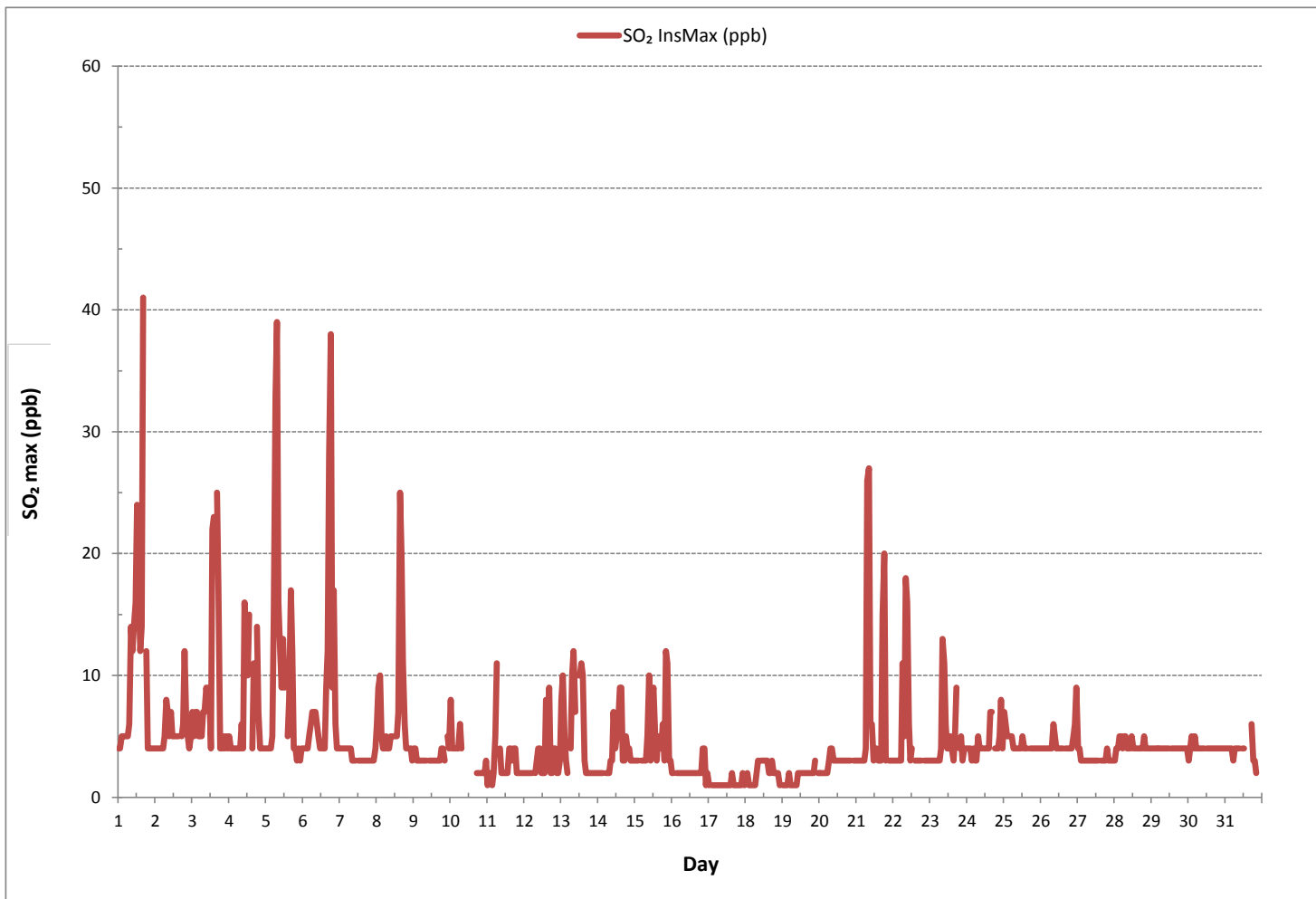
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	694
MAXIMUM INSTANTANEOUS VALUE:	41 ppb @ HOUR 16 ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	733 hrs
STANDARD DEVIATION:	4

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - May 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	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	24	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	24	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	S	1	0	1	1	0	1	1	1	1	0	2	24	
4	1	1	1	1	1	1	1	1	0	1	1	1	0	1	S	1	1	P	1	1	1	1	1	1	1	0	1	23	
5	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	1	1	1	1	0	0	1	0	0	1	1	24	
6	1	1	1	0	1	1	1	1	1	1	1	1	S	2	0	0	1	1	1	1	1	1	1	1	1	0	2	24	
7	1	1	1	1	1	1	1	1	1	1	1	S	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	24	
8	1	2	2	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	2	1	1	1	0	2	1	24	
9	1	1	1	0	0	0	0	0	S	0	0	1	0	0	0	0	1	0	1	1	1	1	3	2	0	3	1	24	
10	3	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	3	24	
11	1	1	1	1	1	1	4	S	1	1	2	1	1	0	1	1	1	1	1	1	1	1	1	1	0	4	1	24	
12	1	0	1	1	1	1	S	1	1	1	1	1	1	2	2	2	2	1	1	2	1	1	1	1	0	2	1	24	
13	1	2	1	1	1	S	1	2	2	1	P	1	1	1	1	1	1	1	1	1	1	0	1	2	0	2	1	23	
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15	17	7	2	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	2	24
16	1	1	S	1	1	1	1	1	1	1	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	1	1	24
17	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	24
18	S	0	0	0	0	1	0	0	0	X	0	1	0	0	1	0	0	2	0	0	0	0	0	S	0	2	0	23	
19	0	1	0	0	1	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	3	0	24	
20	0	0	0	0	2	1	1	3	1	1	1	0	0	0	1	1	0	0	1	1	0	1	S	11	11	0	11	2	24
21	7	2	2	2	5	15	21	11	4	1	1	0	1	2	0	1	1	1	2	1	S	2	2	2	2	0	21	4	24
22	1	2	2	1	3	6	7	3	2	2	1	0	0	P	0	0	1	1	0	S	1	0	0	0	0	7	2	23	
23	11	9	9	6	7	4	2	2	4	3	1	1	1	1	1	0	1	1	S	1	6	8	2	2	2	0	11	4	24
24	1	2	1	1	1	1	1	1	1	1	1	1	3	1	2	8	1	S	2	3	5	5	2	1	1	8	2	24	
25	1	1	1	1	2	1	1	1	1	3	1	0	1	1	3	1	S	1	3	1	3	4	2	1	0	4	2	24	
26	2	1	1	1	1	1	1	1	5	2	2	1	1	0	1	S	1	1	1	1	1	1	1	1	0	5	1	24	
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	1	1	1	1	1	1	1	0	1	1	24	
28	2	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	2	1	1	1	0	1	1	1	0	2	1	24	
29	1	1	1	2	2	1	2	1	1	0	1	1	S	2	1	2	2	2	1	1	0	1	1	1	0	2	1	24	
30	1	1	2	1	3	2	1	1	0	1	1	S	1	1	1	1	1	1	1	1	0	1	1	1	0	3	1	24	
31	1	1	1	1	1	1	1	1	1	1	S	1	1	X	X	X	X	1	1	1	1	X	X	1	1	1	1	18	
HOURLY MAX	17	9	9	6	7	15	21	11	5	3	2	1	3	2	3	8	2	2	4	4	6	8	11	11					
HOURLY AVG	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				

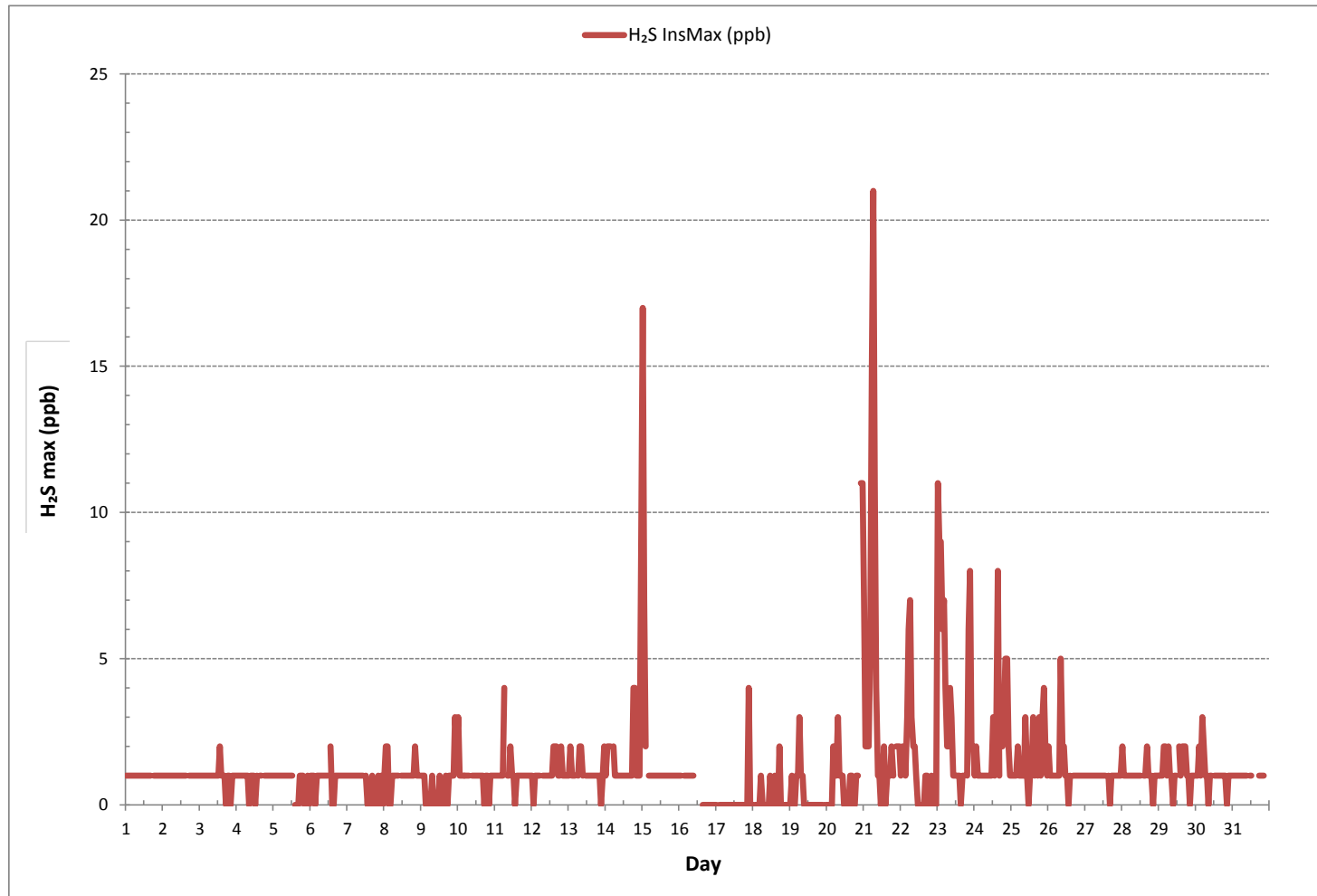
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	564
MAXIMUM INSTANTANEOUS VALUE:	21 ppb @ HOUR 6 ON DAY 21
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	2

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





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

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	2.11	2.13	2.16	2.17	2.23	2.23	2.26	2.26	2.26	2.01	1.96	2.01	2.04	2.01	1.99	2.01	1.99	S	2.01	2.01	2.41	2.13	2.41	2.13	1.96	2.41	2.13	24	
2	2.45	2.66	2.66	2.35	2.38	2.43	2.38	2.20	2.29	2.28	1.99	1.93	1.93	1.92	1.92	1.89	S	1.86	1.93	1.95	1.93	1.98	1.98	1.96	1.86	2.66	2.14	24	
3	1.98	1.95	2.07	2.01	2.07	2.08	2.13	2.21	2.29	2.24	1.98	1.98	1.98	1.99	1.98	S	2.01	2.01	1.98	2.01	2.04	2.10	2.21	2.20	1.95	2.29	2.07	24	
4	2.16	2.66	2.63	2.32	2.41	2.38	2.44	2.13	2.01	2.01	2.07	2.01	1.99	2.04	S	2.02	2.07	P	2.01	2.01	1.99	2.13	2.23	2.44	1.99	2.66	2.19	23	
5	2.33	2.13	2.17	2.17	2.17	2.13	2.28	2.20	2.07	2.07	2.12	2.17	2.14	S	2.10	2.13	2.13	2.17	2.08	2.05	2.10	2.11	2.41	2.21	2.05	2.41	2.16	24	
6	2.25	2.23	2.32	2.35	2.44	2.44	2.51	2.47	2.33	2.48	2.45	2.13	S	2.11	2.07	2.19	2.14	2.48	2.24	2.10	2.07	2.07	2.12	2.41	2.07	2.51	2.28	24	
7	2.14	2.17	2.20	2.25	2.33	2.13	2.11	2.04	2.07	2.07	2.07	S	2.10	2.10	2.11	2.10	2.07	2.08	2.10	2.07	2.08	2.14	2.19	2.24	2.04	2.33	2.13	24	
8	2.21	2.17	2.16	2.17	2.13	2.11	2.13	2.13	2.13	2.13	S	2.07	2.04	2.04	2.12	2.55	2.07	2.04	2.08	2.10	2.04	2.07	2.11	2.14	2.04	2.55	2.13	24	
9	2.17	2.17	2.16	2.17	2.17	2.17	2.18	2.20	2.21	S	2.17	2.16	2.10	2.11	2.13	2.13	2.13	2.11	2.10	2.10	2.17	2.20	2.20	2.15	2.10	2.21	2.15	24	
10	2.24	2.18	2.17	2.17	2.23	2.32	2.21	2.23	S	2.20	2.15	2.12	2.13	2.08	2.10	2.08	2.07	2.07	2.07	2.07	2.26	2.19	2.13	2.13	2.07	2.32	2.16	24	
11	2.17	2.23	2.29	2.32	2.33	2.51	3.50	S	2.44	2.32	2.12	2.13	2.11	2.32	2.10	2.21	2.19	2.13	2.16	2.10	2.10	2.20	2.20	2.19	2.10	3.50	2.28	24	
12	2.13	2.11	2.11	2.19	2.18	2.19	S	2.17	2.15	2.13	2.11	2.01	2.01	2.01	2.15	2.20	2.08	2.02	2.05	2.04	1.98	1.98	2.02	2.08	1.98	2.20	2.09	24	
13	2.02	2.13	2.26	2.10	2.13	S	2.13	2.35	2.39	2.17	P	2.45	2.38	2.38	2.14	2.10	2.07	2.04	2.04	2.01	2.04	2.13	2.16	2.20	2.01	2.45	2.17	23	
14	2.19	2.38	2.29	2.23	S	2.29	2.18	2.17	2.21	2.17	2.20	2.12	2.11	2.10	2.08	2.12	2.02	2.01	X	X	X	X	X	X	2.01	2.38	2.17	18	
15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	0
16	X	X	X	X	X	X	X	X	X	X	X	X	C	C	C	C	C	1.98	1.98	1.98	2.10	2.11	2.01	2.01	1.98	2.11	2.02	13	
17	2.02	S	2.07	2.07	2.07	2.07	2.07	2.07	2.02	2.01	2.04	2.01	2.01	2.01	2.02	2.07	2.04	2.04	2.02	2.04	2.10	2.07	2.08	2.13	2.01	2.13	2.05	24	
18	S	2.23	2.21	2.35	2.44	2.33	2.26	2.23	2.18	X	2.05	2.10	2.07	2.07	2.04	2.04	2.07	2.05	2.04	2.04	2.08	2.08	2.23	S	2.04	2.44	2.15	23	
19	2.25	2.35	2.32	2.41	2.69	4.34	3.00	2.13	2.17	2.18	2.02	2.04	2.01	2.01	2.01	2.02	2.01	1.98	1.98	2.02	2.02	S	2.02	1.98	1.98	4.34	2.26	24	
20	2.08	2.17	2.21	X	X	X	X	X	X	X	X	X	C1	C1	C1	C1	2.01	2.01	1.98	1.98	1.95	S	2.65	2.35	1.95	2.65	2.14	11	
21	2.04	2.04	2.21	3.12	3.21	3.40	4.19	3.06	2.35	1.96	1.95	1.95	1.95	2.05	1.90	1.90	1.90	2.23	2.21	1.88	S	2.07	2.18	2.09	1.88	4.19	2.34	24	
22	2.21	2.35	2.42	2.35	2.60	2.94	3.15	2.63	2.11	2.09	1.96	1.95	1.99	P	2.02	2.01	1.96	1.96	1.98	S	1.96	2.07	2.12	2.20	1.95	3.15	2.23	23	
23	2.29	2.38	2.35	2.38	2.46	2.41	2.32	2.07	2.12	2.08	1.98	1.95	1.93	2.20	1.96	1.95	1.95	1.98	S	1.95	1.93	1.96	1.98	2.05	1.93	2.46	2.11	24	
24	2.00	2.01	2.01	2.04	2.09	2.08	2.08	2.09	2.01	2.04	2.04	1.98	2.18	1.99	2.05	2.05	1.93	S	1.83	2.07	2.17	2.02	1.95	1.86	1.83	2.18	2.02	24	
25	2.08	2.01	1.87	1.88	3.80	2.63	2.65	2.63	2.52	2.60	2.04	1.92	2.07	1.98	2.05	1.89	S	1.89	1.90	1.90	1.87	1.95	1.89	2.01	1.87	3.80	2.18	24	
26	1.96	1.90	1.91	3.18	2.46	2.17	1.89	1.87	2.68	2.15	1.99	1.98	1.98	2.02	2.05	S	1.98	1.97	1.95	1.92	1.95	2.09	2.12	2.04	1.87	3.18	2.10	24	
27	1.96	1.98	2.02	2.08	2.11	2.08	2.02	2.38	2.32	2.29	2.45	2.24	1.99	2.04	S	2.04	1.99	1.99	2.12	2.18	1.98	2.31	2.29	2.23	1.96	2.45	2.13	24	
28	2.27	2.32	2.29	2.15	2.17	2.21	2.20	2.09	2.08	2.04	2.01	2.01	1.98	S	1.95	2.07	2.17	1.93	1.93	1.90	1.87	1.87	1.89	1.89	1.87	2.32	2.06	24	
29	1.88	1.89	1.93	1.95	1.93	2.24	2.48	2.17	2.00	2.01	2.29	1.99	S	2.07	2.04	2.01	2.03	1.99	1.95	1.95	1.95	1.99	2.04	1.96	1.88	2.48	2.03	24	
30	1.95	1.95	2.05	2.04	2.05	2.01	1.98	1.98	1.98	1.92	1.91	S	1.87	1.89	1.90	1.92	1.92	1.93	1.95	1.95	1.95	1.99	1.98	1.98	1.87	2.05	1.96	24	
31	1.98	2.01	2.09	2.15	2.04	2.07	2.07	2.05	2.02	1.96	S	X	2.09	2.60	X	X	X	1.95	1.94	1.96	1.95	X	X	2.15	1.94	2.60	2.06	18	
HOURLY MAX	2.45	2.66	2.66	3.18	3.80	4.34	4.19	3.06	2.68	2.60	2.45	2.45	2.38	2.60	2.15	2.55	2.19	2.48	2.24	2.18	2.41	2.31	2.65	2.44					
HOURLY AVG	2.13	2.17	2.19	2.25	2.35	2.38	2.40	2.23	2.20	2.14	2.08	2.06	2.05	2.09	2.04	2.07	2.04	2.03	2.02	2.01	2.04	2.08	2.14	2.12					

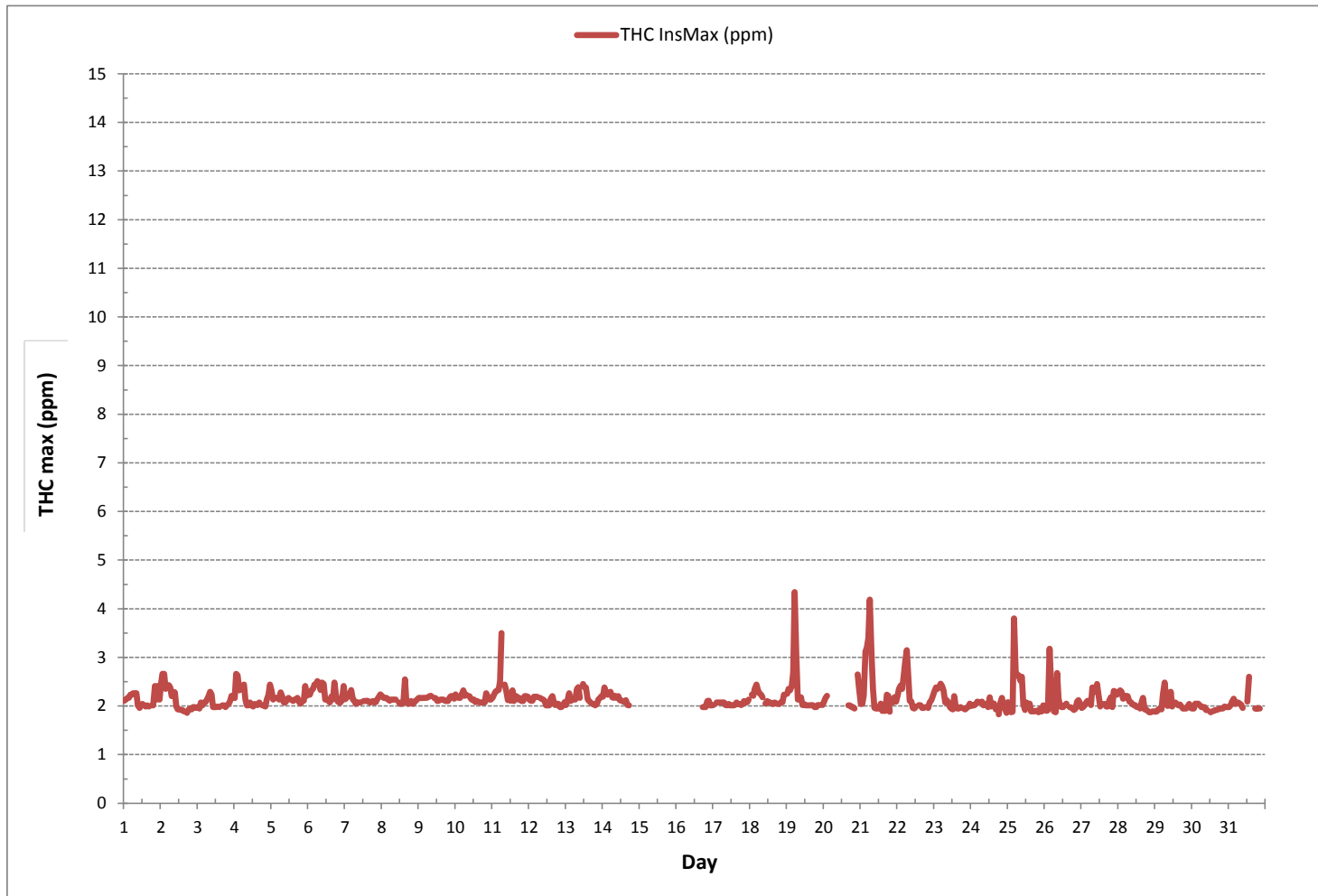
STATUS FLAG CODES

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:	644
MAXIMUM INSTANTANEOUS VALUE:	4.34 ppm @ HOUR 5 ON DAY 19
IZS CALIBRATION TIME:	30 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	680 hrs
STANDARD DEVIATION:	0.24

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - May 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	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	2	3	3	4	S1	S1	12	9	12	13	24	11	7	11	37	S	11	1	4	3	2	4	1	37	8	22	
2	4	2	3	10	11	66	39	8	12	6	4	2	3	1	3	4	S	2	3	19	8	1	1	5	1	66	9	24	
3	17	2	20	25	3	8	13	11	11	12	9	5	1	32	18	S	26	8	1	1	2	2	4	4	1	32	10	24	
4	5	4	4	6	4	12	12	5	5	1	C	C	C	C	C	C	C	P	10	6	1	1	2	3	1	12	5	23	
5	1	3	5	2	8	24	25	35	8	8	4	6	6	S	2	2	8	5	1	1	1	6	9	2	1	35	7	24	
6	4	4	4	5	8	13	14	14	11	9	8	4	S	1	1	4	7	12	16	4	12	8	2	2	1	16	7	24	
7	4	48	4	4	1	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	48	3	24	
8	6	6	12	3	2	1	3	2	2	2	S	2	4	2	11	19	13	6	4	2	1	1	1	0	0	19	5	24	
9	1	1	1	1	2	2	2	1	0	S	1	1	1	1	1	0	0	0	1	1	1	2	5	1	0	5	1	24	
10	14	4	1	0	8	2	4	2	S	2	3	2	2	2	1	1	1	1	1	2	20	2	2	5	0	20	4	24	
11	3	6	86	5	5	13	19	S	16	1	2	1	1	1	2	2	2	2	2	1	1	2	2	2	1	86	8	24	
12	3	2	2	2	3	4	S	4	6	6	5	1	1	1	4	4	5	0	1	9	9	1	1	3	0	9	3	24	
13	9	12	6	3	1	S	8	9	18	5	P	6	6	5	5	1	1	1	1	1	1	2	1	1	1	18	5	23	
14	1	2	2	2	S	2	1	1	2	2	6	4	4	4	5	5	1	1	2	2	2	1	1	2	1	6	2	24	
15	3	2	1	S	8	5	5	29	8	15	1	4	5	2	1	2	2	2	5	1	14	15	2	1	1	29	6	24	
16	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	11	12	0	0	12	2	24	
17	0	S	1	1	0	0	0	0	0	0	1	1	1	0	0	2	0	0	0	0	16	2	1	2	0	16	1	24	
18	S	6	5	5	5	5	5	7	6	X	2	3	5	5	5	1	1	2	1	1	1	3	2	S	1	7	4	23	
19	3	13	7	6	97	19	13	2	2	2	1	1	1	1	1	1	1	1	1	1	4	6	S	5	1	97	8	24	
20	6	6	9	6	6	4	4	5	4	2	2	1	2	1	1	1	1	1	1	1	2	S	1	1	1	9	3	24	
21	2	1	1	3	39	9	14	56	26	2	4	1	2	2	1	1	1	6	11	1	S	5	5	7	1	56	9	24	
22	11	12	9	9	58	14	20	9	13	14	5	1	1	P	1	9	1	1	1	S	2	5	2	2	1	58	9	23	
23	2	1	1	1	1	1	1	2	11	11	5	1	2	2	1	1	2	S	S	2	2	1	1	1	1	11	3	24	
24	1	1	1	1	1	2	2	4	4	3	2	5	4	5	8	11	14	S	2	2	5	9	21	1	1	21	5	24	
25	17	16	5	4	6	5	5	6	4	5	3	2	4	2	2	1	S	1	1	1	1	1	1	1	2	1	17	4	24
26	3	1	1	3	3	8	1	1	38	5	2	2	1	1	0	S	1	1	1	1	1	11	19	27	0	38	6	24	
27	4	1	1	2	2	4	1	1	1	1	1	1	1	1	S	1	1	1	4	5	1	2	4	4	1	5	2	24	
28	2	3	3	4	4	3	3	4	3	2	2	1	1	S	1	2	2	1	1	1	1	1	1	1	1	4	2	24	
29	1	1	1	1	2	4	26	2	2	1	1	S	2	2	2	1	1	1	1	1	1	1	1	1	1	26	2	24	
30	0	1	4	4	6	2	1	2	1	1	0	S	0	0	0	0	1	1	1	1	0	1	1	1	0	6	1	24	
31	1	0	1	4	2	2	1	1	1	1	S	0	1	X	X	X	X	5	1	0	0	X	X	12	0	12	2	18	
HOURLY MAX	17	48	86	25	97	66	39	56	38	15	12	13	24	32	18	19	37	12	16	19	20	15	21	27					
HOURLY AVG	4	5	7	4	10	8	8	8	8	4	3	3	3	3	3	3	5	2	3	2	4	4	3	3					

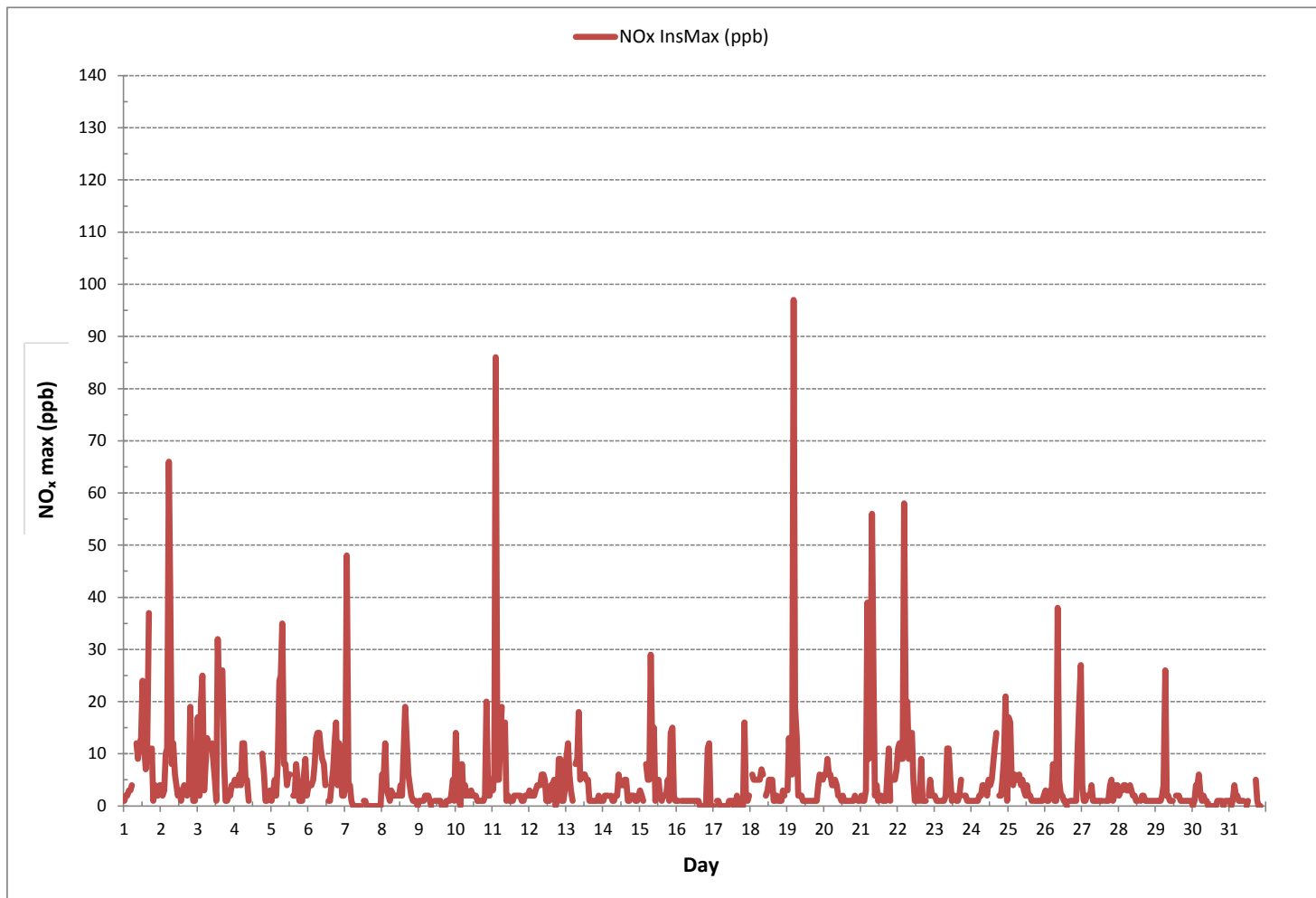
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	639
MAXIMUM INSTANTANEOUS VALUE:	97 ppb @ HOUR 4 ON DAY 19
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	732 hrs
STANDARD DEVIATION:	8

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	0	0	0	0	0	S1	S1	3	3	3	4	7	3	2	3	14	S	1	0	0	0	0	0	0	0	14	2	22
2	0	0	0	1	1	44	22	2	3	2	1	0	1	0	1	1	S	0	0	1	0	0	0	0	0	0	44	3	24
3	0	0	1	1	0	2	3	3	4	3	2	1	0	12	5	S	6	2	0	0	0	0	0	0	0	0	12	2	24
4	0	0	0	1	0	2	1	1	1	1	C	C	C	C	C	C	C	P	1	0	0	0	0	0	0	0	2	1	23
5	0	0	0	0	3	3	7	11	2	2	1	2	2	S	0	1	2	1	0	0	0	0	0	0	0	0	11	2	24
6	0	0	0	0	1	2	3	3	3	2	2	1	S	0	0	1	1	3	2	0	0	0	0	0	0	0	3	1	24
7	0	20	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	20	1	24	
8	0	0	0	0	0	0	0	0	0	0	S	1	1	0	6	3	3	1	1	0	0	0	0	0	0	0	6	1	24
9	0	0	0	0	0	1	1	1	0	S	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	24
10	1	0	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	0	0	0	6	0	1	0	0	6	1	24	
11	0	0	67	0	1	3	5	S	5	0	1	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	67	4	24
12	0	0	0	0	0	0	S	1	2	2	1	1	1	0	1	1	1	0	0	1	1	0	0	0	0	0	2	1	24
13	0	0	0	0	0	S	1	2	5	1	P	1	2	1	1	0	0	0	0	0	0	0	0	0	0	5	1	23	
14	0	0	0	0	S	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
15	0	0	0	S	1	1	1	16	2	5	1	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0	16	1	24
16	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	24	
17	0	S	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	5	0	0	0	0	5	0	24	
18	S	0	0	0	1	1	1	2	2	X	1	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	2	1	23
19	0	2	1	0	81	6	6	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	81	4	24
20	0	0	0	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24
21	0	0	0	1	26	3	5	30	9	1	1	0	0	0	0	0	0	1	1	0	S	0	0	0	0	30	3	24	
22	0	0	0	0	40	4	7	2	3	3	1	0	0	P	0	1	0	0	0	S	0	0	0	0	0	40	3	23	
23	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	2	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	3	S	0	0	0	0	0	0	0	3	0	24	
25	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24	
26	0	0	0	0	0	0	0	0	25	1	0	1	0	0	0	S	1	0	0	0	0	0	1	0	0	25	1	24	
27	0	0	0	0	0	0	1	0	0	0	0	1	1	0	S	0	0	0	1	1	0	0	0	0	0	1	0	24	
28	0	0	1	0	0	0	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	1	11	1	1	1	0	0	S	1	1	1	0	0	0	0	0	0	0	0	0	0	11	1	24
30	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
31	0	0	0	0	0	0	0	0	0	0	S	0	0	X	X	X	X	1	0	0	0	0	X	X	1	0	1	0	18
HOURLY MAX	1	20	67	1	81	44	22	30	25	5	3	4	7	12	6	3	14	3	2	1	6	1	1	1	1	0	0	0	0
HOURLY AVG	0	1	2	0	5	3	3	3	3	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0

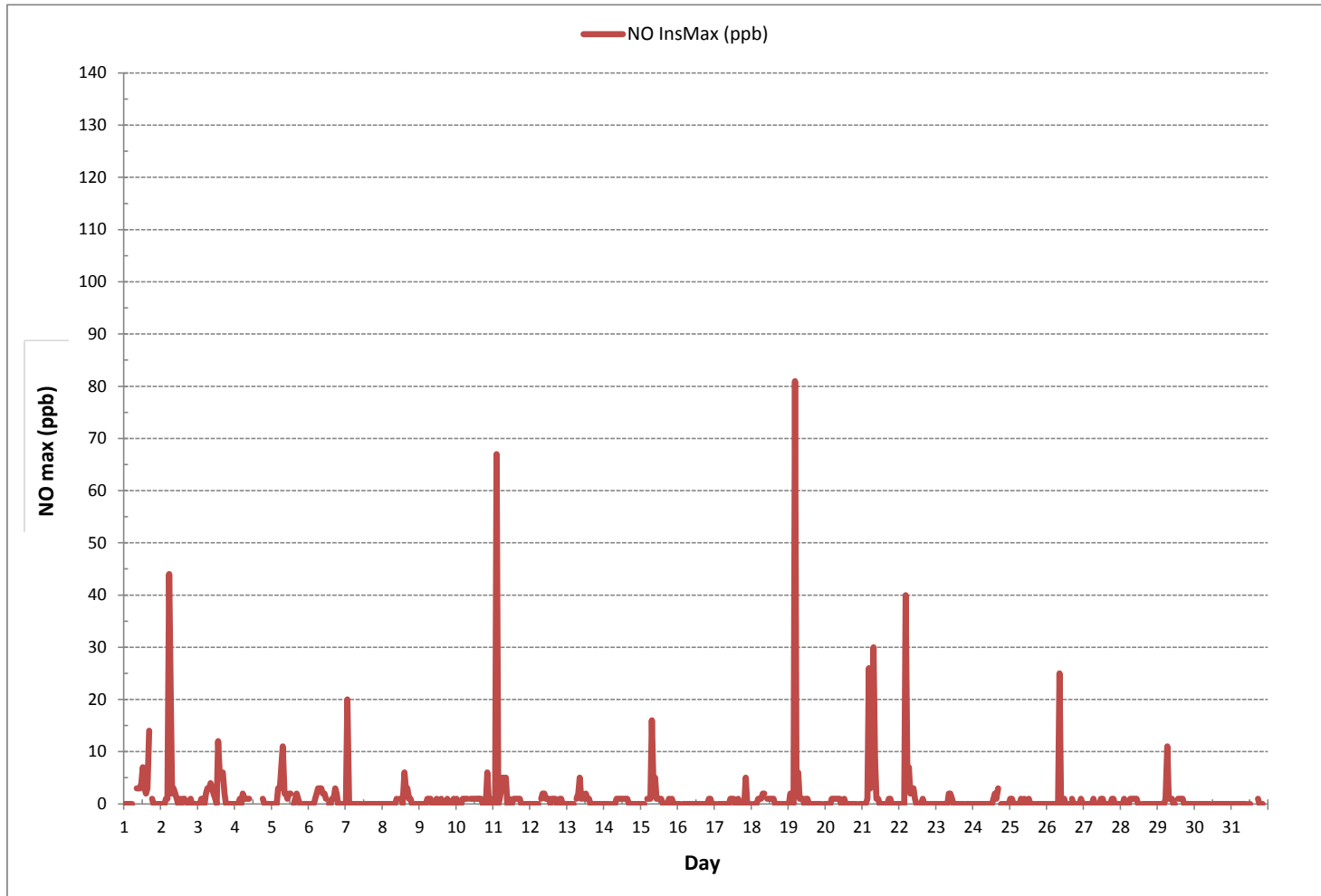
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	238
MAXIMUM INSTANTANEOUS VALUE:	81 ppb @ HOUR 4 ON DAY 19
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	732 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - May 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	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	3	3	3	3	S1	S1	9	7	9	9	16	8	6	8	24	S	10	2	3	3	2	4	2	24	6	22	
2	4	2	3	10	10	24	18	6	10	5	3	2	2	2	3	3	S	2	3	19	9	1	1	4	1	24	6	24	
3	17	3	19	23	3	7	11	8	7	9	7	4	1	21	13	S	20	7	1	1	2	2	4	4	1	23	8	24	
4	5	5	4	7	4	11	10	5	5	2	C	C	C	C	C	C	C	P	10	6	1	2	3	3	1	11	5	23	
5	2	3	5	3	5	20	21	23	6	6	3	5	5	S	2	2	6	4	1	1	1	6	8	3	1	23	6	24	
6	3	4	4	4	8	11	11	10	8	7	6	3	S	1	1	3	6	10	14	4	13	7	3	2	1	14	6	24	
7	5	28	4	4	2	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	28	2	24	
8	6	7	12	3	2	1	3	2	2	2	S	2	3	2	6	16	10	5	3	2	2	1	1	0	0	16	4	24	
9	1	2	1	2	2	2	2	1	0	S	1	1	1	1	1	1	1	1	2	1	1	2	5	2	0	5	1	24	
10	13	4	2	1	7	3	4	2	S	2	2	2	2	2	1	1	1	1	1	2	14	2	2	5	1	14	3	24	
11	3	7	19	4	5	10	13	S	12	1	1	1	1	1	2	2	2	2	2	2	1	3	2	2	1	19	4	24	
12	3	3	2	3	3	4	S	4	4	4	4	1	1	0	3	3	4	0	0	8	8	0	2	3	0	8	3	24	
13	8	12	6	3	2	S	7	8	13	4	P	4	5	4	4	1	1	0	0	1	1	2	2	1	0	13	4	23	
14	1	2	2	2	S	3	1	2	2	3	5	3	4	3	5	4	2	2	3	2	2	1	1	2	1	5	2	24	
15	3	2	1	S	7	5	4	16	6	11	1	3	4	2	1	2	2	3	5	0	14	15	2	1	0	16	5	24	
16	1	1	S	2	2	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	10	11	0	0	0	11	1	24	
17	0	S	0	0	0	0	0	0	0	0	1	1	1	0	0	2	0	0	0	0	14	2	2	3	0	14	1	24	
18	S	6	6	5	5	5	4	6	5	X	2	3	4	4	4	2	1	2	1	1	2	3	3	S	1	6	4	23	
19	3	12	7	6	23	12	7	2	2	2	1	1	1	2	1	1	1	1	1	1	4	6	S	4	1	23	4	24	
20	6	7	9	7	7	3	3	4	3	2	2	1	2	1	1	1	1	1	1	1	2	S	2	2	1	9	3	24	
21	3	2	2	3	17	7	9	26	17	3	3	1	2	2	1	1	1	6	10	2	S	6	6	7	1	26	6	24	
22	12	12	9	9	25	10	13	7	10	11	4	2	2	P	1	9	1	1	1	S	2	5	3	2	1	25	7	23	
23	2	2	2	1	1	1	1	2	9	9	4	2	2	2	2	2	3	6	S	3	3	1	2	2	1	9	3	24	
24	2	2	1	1	1	2	2	3	3	3	6	4	4	7	10	11	S	3	3	6	9	21	2	1	21	5	24		
25	16	16	5	4	6	5	4	6	4	4	3	2	4	2	2	2	S	1	2	2	2	2	2	2	1	16	4	24	
26	3	1	1	3	3	8	2	2	17	4	2	2	1	1	0	S	1	0	1	1	1	1	12	19	27	0	27	5	24
27	4	1	2	2	3	2	3	2	1	0	1	1	1	0	S	2	0	0	4	5	1	2	4	4	0	5	2	24	
28	2	3	3	4	4	3	3	3	3	2	2	2	2	S	2	2	2	1	2	1	0	1	1	1	0	4	2	24	
29	1	2	1	2	2	3	17	2	1	1	1	1	S	2	2	2	1	1	1	1	1	1	1	1	1	1	17	2	24
30	0	0	4	4	6	2	2	2	1	0	0	S	0	0	0	0	0	1	1	0	0	0	0	1	0	6	1	24	
31	0	0	1	4	2	2	2	1	1	0	S	0	1	X	X	X	X	4	1	0	0	X	X	11	0	11	2	18	
HOURLY MAX	17	28	19	23	25	24	21	26	17	11	9	9	16	21	13	16	24	10	14	19	14	15	21	27					
HOURLY AVG	4	5	5	4	6	6	6	5	5	4	3	2	3	3	3	3	4	2	3	2	4	4	4	4					

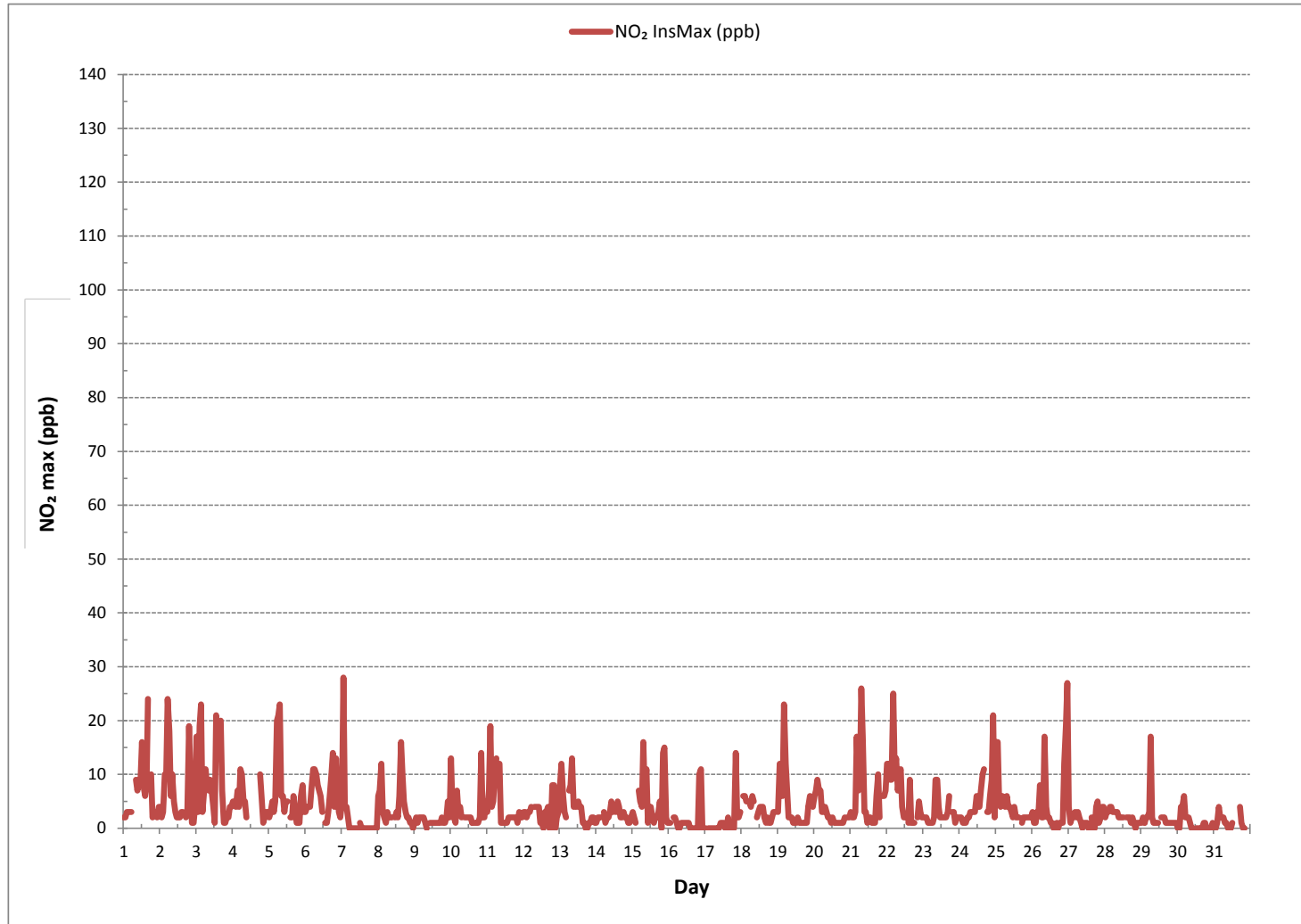
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	617
MAXIMUM INSTANTANEOUS VALUE:	28 ppb @ HOUR 1 ON DAY 7
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	732 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





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

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	10.7	12.8	12.3	11.1	15.3	14.7	11.2	14.5	21.9	23.8	24.7	27.2	29.8	34.5	28.3	33.7	31.6	27.3	16.2	12.4	7.0	6.9	6.7	5.3	5.3	34.5	18.3	24	
2	4.6	5.4	6.5	7.8	6.9	8.6	10.8	14.5	19.4	21.6	25.8	25.9	38.2	17.8	32.4	26.9	39.6	17.0	55.4	36.3	13.5	17.6	20.4	23.8	4.6	55.4	20.7	24	
3	20.5	17.7	13.9	11.0	7.7	13.1	12.8	12.1	16.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	7.7	20.5	13.9	9
4	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	28.1	25.7	21.5	24.9	19.2	15.8	10.2	6.2	6.1	8.0	9.0	6.1	28.1	15.9	11	
5	8.6	10.4	8.8	11.0	19.5	17.7	18.3	20.3	18.2	20.1	24.6	24.3	27.7	23.0	24.1	19.9	20.8	17.3	17.9	7.4	6.0	10.7	12.9	11.5	6.0	27.7	16.7	24	
6	13.6	13.7	11.8	8.9	12.6	11.4	13.8	14.6	14.8	14.9	27.0	28.0	30.3	34.5	30.6	25.2	22.5	25.3	21.3	13.4	3.5	8.7	2.8	2.8	2.8	34.5	16.9	24	
7	7.2	3.3	4.7	9.1	9.9	14.9	32.9	35.1	43.5	45.1	40.9	39.8	41.6	40.5	32.8	40.0	34.6	27.6	25.0	15.8	9.0	8.8	11.2	7.3	3.3	45.1	24.2	24	
8	13.9	22.0	17.5	13.6	16.7	19.6	20.3	26.8	11.6	19.8	24.2	21.3	19.5	28.2	33.9	48.9	43.2	43.9	38.8	44.2	35.8	43.6	40.0	46.2	11.6	48.9	28.9	24	
9	33.8	26.8	22.1	16.3	12.7	18.5	27.2	27.1	26.4	24.9	31.5	27.0	32.5	25.7	26.0	21.1	21.6	20.5	13.9	11.2	6.1	7.9	18.7	18.8	6.1	33.8	21.6	24	
10	16.0	12.3	14.2	6.6	6.9	14.0	18.0	13.8	19.5	25.7	27.3	25.2	29.1	25.2	20.7	18.8	20.6	17.7	15.3	7.6	15.2	19.4	18.8	13.5	6.6	29.1	17.6	24	
11	9.1	6.1	5.5	7.7	8.2	8.0	7.5	11.0	17.5	20.4	22.0	23.3	19.6	20.4	21.7	15.7	19.7	17.4	18.8	14.8	12.0	15.3	18.0	16.9	5.5	23.3	14.9	24	
12	16.4	18.5	19.2	15.9	18.3	15.4	17.8	21.6	18.9	23.2	27.0	33.3	38.7	35.8	36.1	32.9	32.7	31.6	30.1	24.9	11.0	7.9	X	X	7.9	38.7	24.0	22	
13	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	52.0	43.7	50.7	44.3	30.6	29.0	18.3	14.4	13.7	10.7	12.7	10.7	52.0	29.1	11	
14	13.2	11.1	10.4	9.8	9.8	11.1	12.9	9.1	16.6	18.5	23.8	21.6	25.1	28.6	21.6	17.0	23.1	15.0	11.1	13.9	11.1	14.6	10.0	9.6	9.1	28.6	15.4	24	
15	10.9	15.6	15.8	12.4	11.3	10.0	22.0	30.6	49.1	46.3	41.5	35.1	49.1	44.1	23.1	18.1	27.0	28.4	27.3	22.0	31.7	23.6	16.8	19.2	10.0	49.1	26.3	24	
16	15.9	15.9	18.8	17.5	19.0	29.7	26.0	43.9	37.2	49.2	30.8	43.5	47.6	43.5	46.7	40.6	39.6	39.0	33.3	26.7	28.8	25.8	22.5	19.6	15.9	49.2	31.7	24	
17	17.2	15.9	19.7	20.5	21.6	22.3	30.2	29.3	26.6	26.4	30.1	29.0	28.4	27.5	23.6	25.1	30.8	23.1	20.1	16.4	13.3	12.0	15.6	17.1	12.0	30.8	22.6	24	
18	16.2	9.7	8.9	15.7	14.2	9.8	14.2	14.8	22.7	X	20.7	25.1	24.4	31.7	21.6	21.6	23.8	17.0	15.0	11.7	7.8	7.6	13.5	9.3	7.6	31.7	16.4	23	
19	10.0	3.4	2.1	1.9	13.4	13.8	14.4	17.4	18.1	23.3	43.3	38.4	39.8	40.8	38.9	31.7	31.6	30.6	25.5	16.1	8.0	12.8	15.5	20.7	1.9	43.3	21.3	24	
20	14.1	11.8	12.4	8.0	8.5	6.5	6.9	16.4	28.6	38.2	34.3	32.6	36.7	36.5	33.2	32.5	29.5	29.7	20.5	14.9	5.2	3.5	4.9	9.4	3.5	38.2	19.8	24	
21	5.4	3.6	3.9	3.9	4.1	10.0	11.1	8.0	13.3	17.6	17.6	24.2	26.0	26.8	29.5	23.8	29.2	27.7	25.3	10.9	8.5	6.5	5.0	4.3	3.6	29.5	14.4	24	
22	6.3	7.6	5.4	6.1	5.8	6.2	6.4	10.5	11.0	11.6	14.6	22.2	31.2	P	23.2	21.9	17.5	16.4	13.4	10.0	5.8	12.8	3.0	3.2	3.0	31.2	11.8	23	
23	3.0	5.4	3.0	5.2	6.9	8.0	10.4	5.6	13.1	19.4	26.6	29.7	25.7	37.5	28.1	24.9	24.0	24.4	18.8	6.7	7.1	12.0	5.8	9.1	3.0	37.5	15.0	24	
24	6.1	6.1	4.1	10.7	11.3	3.7	6.3	17.3	18.0	20.0	16.5	10.3	11.3	12.0	5.6	8.7	15.2	10.2	7.1	7.6	12.6	10.0	11.1	12.4	3.7	20.0	10.6	24	
25	13.9	16.4	18.3	14.8	12.0	13.5	8.7	10.7	16.6	23.6	14.1	11.8	16.8	31.9	33.2	23.8	20.7	20.9	15.0	12.0	8.5	9.6	15.5	12.6	8.5	33.2	16.5	24	
26	10.7	8.5	9.1	9.1	29.2	21.7	15.1	11.9	27.7	28.6	31.9	33.0	33.2	37.1	41.5	34.7	34.5	30.8	30.1	25.7	8.5	11.8	14.4	17.0	8.5	41.5	23.2	24	
27	15.0	10.7	10.4	9.6	12.4	19.0	30.2	37.1	36.3	41.3	37.1	43.5	36.7	45.9	52.4	38.9	37.6	30.1	22.9	10.3	4.4	7.0	13.4	18.7	4.4	52.4	25.9	24	
28	20.3	14.1	19.6	17.7	18.5	22.5	21.8	29.3	28.1	35.6	31.9	30.8	35.6	36.9	29.9	29.9	30.1	28.3	33.4	28.6	23.6	26.4	29.7	36.3	14.1	36.9	27.5	24	
29	39.6	40.7	10.9	8.5	7.6	10.9	16.4	23.1	29.9	28.8	36.8	27.2	29.6	29.6	30.9	24.5	16.9	17.7	21.6	21.1	13.9	8.7	15.9	22.5	7.6	40.7	22.2	24	
30	14.8	6.7	16.6	13.5	21.0	17.0	13.3	10.9	9.8	11.1	21.0	31.7	21.8	28.8	26.0	20.6	14.7	8.4	12.2	17.0	10.0	6.9	5.2	8.9	5.2	31.7	15.3	24	
31	8.7	5.2	5.6	10.7	9.8	3.9	6.3	6.7	10.0	11.3	22.6	21.7	37.9	X	X	X	X	25.3	32.8	9.8	X	X	12.3	8.5	3.9	37.9	13.8	18	
HOURLY MAX	39.6	40.7	22.1	20.5	29.2	29.7	32.9	43.9	49.1	49.2	43.3	43.5	49.1	52.0	52.4	50.7	44.3	43.9	55.4	44.2	35.8	43.6	40.0	46.2					

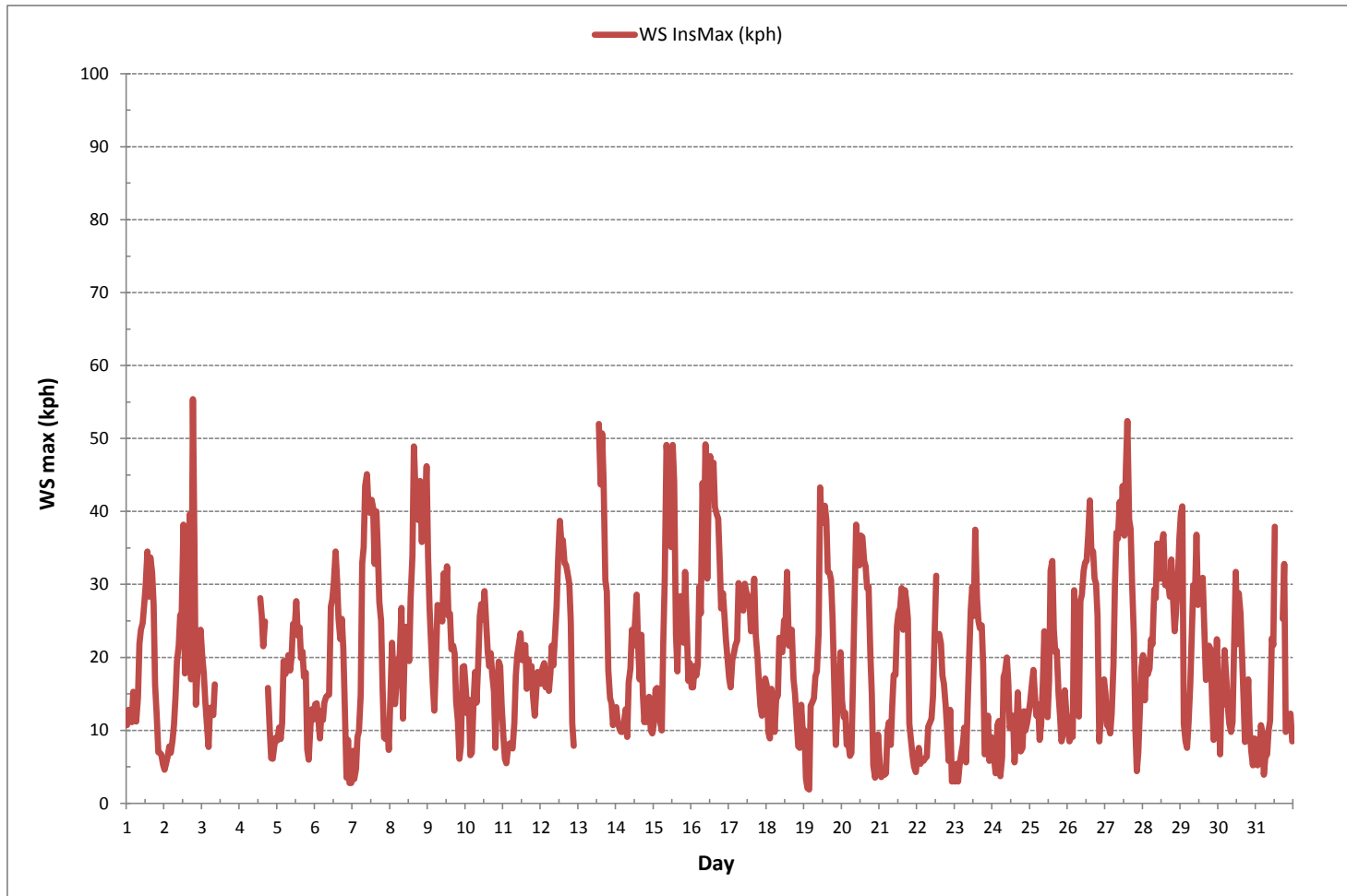
STATUS FLAG CODES

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:	55.4	kph	@ HOUR	18	ON DAY	2	
OPERATIONAL TIME:						693	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

10-08-2018

Report Issued Date (dd-mm-yyyy)

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



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-05-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>June 13, 2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>June 13, 2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>August 10, 2018</u>
Level 3 Independent Data Review	<u>MA Ghaleb</u>	Date <u>August 10, 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

September 14, 2018

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

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

Data Logger Upgrade: A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832.

Relative Humidity/Ambient Temperature: On the recommendation of Alberta Environment and Parks (AEP) following the station audit in March 2018, the temperature/RH sensor was replaced on May 1. A Maxxam-supplied sensor (RM Young Model: 41372VC, s/n: 1920/01983) was installed, to replace the LICA-owned sensor (MetOne Model: 083D, s/n: F4091).

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

JOB #: 2833-2018-05-31-C

May 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION

5107 50 ST.

BONNYVILLE, ALBERTA

T9N 2J7

Attention: MIKE BISAGA

DATE: **August 10, 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 May 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.

Data Logger Upgrade: A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Downtime ranging from two to twenty hours were recorded across parameters due to activities surrounding the upgrade.

Power failure: A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.

SO₂: Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 18:00 on May 31 was not properly executed. A valid zero-span check was successfully triggered at hour 17:00 on June 1. One hour of downtime was incurred due to the failed execution.

THC: Six hours of downtime were recorded between May 22 and May 23 due to additional quality checks performed to address a sudden drift in span response.

NO_x/NO/NO₂:

- Nineteen hours of downtime were incurred between May 13 and 15 due to an analyzer maintenance event and the additional quality checks performed around it.
- An as-found GPT calibration was performed on May 23 to obtain reference points for the Ozone analyzer routine monthly calibration. Four hours of downtime were incurred as a result.

O₃:

- Two hours of downtime were incurred on May 22, due an additional quality check performed to assess a biased low drift in span response.
- Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 18:00 on May 31 failed.

RH/AmbTPX: On the recommendation of Alberta Environment and Parks (AEP) following the station audit in March 2018, the temperature/RH sensor was replaced on May 1. A Maxxam-supplied sensor (RM Young Model: 41372VC, s/n: 1920/01983) was installed, to replace the LICA-owned sensor (MetOne Model: 083D, s/n: F4091). Twenty-seven hours of downtime were incurred due to this event.

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	1	2	9	12.6	SSW	1	14	99.3
H ₂ S (ppb)	10	3	0	0	0	1	2	17	9.5	W	0	1	99.3
THC (ppm)	-	-	-	-	2.15	2.60	23	7	4.0	S	2.35	23	98.7
NO ₂ (ppb)	159	-	0	-	1	6	13	5	6.6	N	2	12	96.8
NO (ppb)	-	-	-	-	0	3	12	8	13.6	SW	1	12	96.8
NO _x (ppb)	-	-	-	-	1	9	12	8	13.6	SW	3	12	96.8
O ₃ (ppb)	82	-	0	-	42.4	64.3	23	19	8.2	ESE	55.2	23	99.1
PM _{2.5} (µg/m ³)	80	30	0	0	7	42	16	7	13.6	NE	16	23	99.5
RELATIVE HUMIDITY (%)	-	-	-	-	46	95	30	5	9.2	ENE	87	30	96.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	931	943	18	9	8.8	W	941	18	99.5
AMBIENT TEMPERATURE (°C)	-	-	-	-	16.2	29.6	23	15	7.3	SE	24.2	23	93.7
PRECIPITATION (mm)	-	-	-	-	0.1	5.1	26	3	11.8	WNW	0.6	30	99.6
VECTOR WS (kph)	-	-	-	-	2.3	26.9	2	13	-	WSW	15.4	7	99.5
VECTOR WD (sec)	-	-	-	-	280 (W)	-	-	-	-	-	-	-	99.5

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.

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
SUMMARY	2
MONTHLY CONTINUOUS DATA SUMMARY REPORT	4
EXCEEDANCE SUMMARY REPORT	5
TABLE OF CONTENTS	6
1.0 Discussion	8
2.0 Project Personnel	13
3.0 Plant Monthly Required AMD Summary	13
4.0 Calculations and Results	13
5.0 Methods and Procedures	14
Appendix I	17
Continuous Monitoring Data Results	17
Sulphur Dioxide	18
Hydrogen Sulphide	24
Total Hydrocarbon	30
Oxides of Nitrogen	36
Nitric Oxides	42
Nitrogen Dioxide	47
Ozone	53
Particulate Matter 2.5	59
Wind Speed	64
Wind Direction	69
Standard Deviation Wind Direction	72
Relative Humidity	75
Barometric Pressure	78
Ambient Temperature	81
Precipitation	84

Appendix II	Equipment Calibration Results	87
	Sulphur Dioxide	88
	Hydrogen Sulphide	91
	Total Hydrocarbon	94
	Nitrogen Dioxide	99
	Ozone	106
	Particulate Matter	109
	Wind System	111
	Meteorological System	113
	Calibrators	116
	Calibration Gases	119
Appendix III	Maximum Instantaneous Data	124
Appendix IV	Report Certification Form	141
Appendix V	Data Validation Certification Form	143

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 99.3%, equivalent to 5 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- The routine monthly calibration was performed on May 14.
- The Ozone and SO₂ span programs are designed to run concurrently. Additional quality checks were recorded on the SO₂ channel on May 22 at hours 06:00 - 07:00 and on May 23 at hour 18:00, due to activities on the Ozone channel.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00, and six instances of maximum instantaneous data at 11:00 - 16:00 were lost as a result of the activities surrounding this upgrade.
- Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 18:00 on May 31 was not properly executed. A valid zero-span check was successfully triggered at hour 17:00 on June 1. One hour of downtime was incurred due to the failed execution.
- Baseline corrections for May 31 were performed incrementally using daily zero results for May 30 and June 1, which were both valid.
- One instance of maximum instantaneous data was discarded on May 24 at hour 10:00 due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 99.3%, equivalent to 5 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- The routine monthly calibration was performed on May 14.
- One hour of downtime was recorded on May 29 at hour 15:00 as the channel was placed in "maintenance" mode for preparatory activities in anticipation of a data logger upgrade.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three more hours of data at 11:00 - 13:00, and six instances of maximum instantaneous data at 11:00 - 16:00 were lost as a result of the activities surrounding this upgrade.
- One instance of maximum instantaneous data was discarded on May 24 at hour 10:00 due to a brief power outage.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 98.7%, equivalent to 10 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- The routine monthly calibration was performed on May 15.
- The analyzer exhibited a sudden span drift on May 22; however the results were still within AMD requirements. A repeat zero-span check conducted on May 22 at hour 07:00 also confirmed the drift. This prompted a site visit on May 23, where a successful repeat calibration was performed and the span gas cylinder was replaced. Expected span value was updated on May 25. Six hours of downtime were incurred due to the additional quality checks.
- The span response on May 29 was impacted by the preparatory activities in anticipation of a data logger upgrade. A valid daily zero-span check was completed on May 30.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00, and six instances of maximum instantaneous data at 11:00 - 16:00 were lost as a result of the activities surrounding this upgrade.
- One instance of maximum instantaneous data was discarded on May 24 at hour 10:00 due to a brief power outage.
- One instance of maximum instantaneous data was discarded on May 29 at hour 13:00 as the channel was briefly placed in "maintenance" mode for preparatory activities in anticipation of the data logger upgrade.

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

- Operational time for the monitoring period was 96.8%, equivalent to 24 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- Towards the end of day on May 12, the analyzer started to record negative readings. An additional and the scheduled zero-span checks performed on May 13 showed an unusual negative drift in zero response. This prompted a site visit on May 14, where it was discovered that the analyzer's display screen had burnt, causing an electrical short circuit. A successful shut-down calibration was performed nonetheless, and the screen was replaced. The analyzer was left in "maintenance" mode overnight to stabilize and a successful post-repair calibration was performed on May 15, following an output voltage calibration. The expected value was updated immediately after the post-repair calibration and again on May 17 once the analyzer had stabilized. Upon baseline correction, the negative readings were offset by the negative drift in zero response. Data collected before the shut-down calibration are, therefore, considered valid. However, nineteen hours of downtime were incurred due to the analyzer maintenance event and the additional zero-span check.
- An as-found GPT calibration was performed on May 23 to obtain reference points for the Ozone analyzer routine monthly calibration.
- One hour of downtime was recorded on May 29 at hour 16:00 as the channel was placed in "maintenance" mode for preparatory activities in anticipation of a data logger upgrade.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00, and seven instances of maximum instantaneous data at 10:00 - 16:00 were lost as a result of the activities surrounding this upgrade.
- One instance of maximum instantaneous data was invalidated on May 14 at hour 09:00, due to an anomalous spike. The spike was not supported by minute data.
- One instance of maximum instantaneous data was discarded on May 24 at hour 10:00 due to a brief power outage.

OZONE (O₃)

- Operational time for the monitoring period was 99.1%, equivalent to 7 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one 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 May 14 at hour 15:00 due to activities on the SO₂ channel.
- The analyzer spanned towards the lower acceptance limit on May 22. A repeat zero-span check triggered later that day had the same outcome. The routine monthly calibration was performed on May 23 and the expected span value was updated, correcting the span drift. The pump for the daily zero system was also rebuilt on May 23. No further issues were identified. Two hours of downtime were, however, incurred due to the additional quality check.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Four hours of data at 11:00 - 13:00 and 16:00, and six instances of maximum instantaneous data at 11:00 - 16:00 were lost as a result of the activities surrounding this upgrade.
- Due to issues arising from the data logger transition process, the automated daily zero-span check scheduled for hour 18:00 on May 31 spanned outside acceptance limits. A valid zero-span check was not obtained on June 1, prompting a calibration on June 2. While all the calibration acceptance criteria were met, the drift persisted. As there was no indication of analyzer malfunction, the zero-span system was examined. It was determined that the datalogger reset the analyzer's Level 1 span reference unexpectedly. The Level 1 span reference was re-established on June 4, bringing the span results back into control.
- One instance of maximum instantaneous data was discarded on May 24 at hour 10:00 due to a brief power outage.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 99.5%, equivalent to 4 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- The quarterly audit/calibration audit was performed on May 24.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00 were lost as a result of the activities surrounding this upgrade.

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

- Operational time for the monitoring period was 99.5%, equivalent to 4 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00 and seven instances of maximum instantaneous data were lost as a result of the activities surrounding this upgrade.
- One instance of maximum instantaneous data was discarded on May 24 at hour 10:00 due to a brief power outage.
- Two instances of maximum instantaneous data were invalidated on May 30 at hour 19:00 and May 31 at hour 18:00, due to anomalous spikes, as they were not supported by minute data.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 96.0%, equivalent to 30 hours of downtime.
- On the recommendation of Alberta Environment and Parks (AEP), following the station audit in March 2018, the temperature/RH sensor was replaced. Following a removal audit, the LICA-owned sensor (Met One Model: 083D, S/N: F4091) was removed on May 1 for factory calibration and a Maxxam-supplied sensor (RM Young Model: 41372VC, s/n: 1920/01983) was installed. The newly-installed sensor was left offline for a function check and an installation audit was completed on May 2. Twenty-seven hours of downtime were incurred due to this event.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00 were lost as a result of the activities surrounding this upgrade.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 99.5%, equivalent to 4 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Three hours of data at 11:00 - 13:00 were lost as a result of the activities surrounding this upgrade.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 99.6%, equivalent to 3 hours of downtime.
- A power failure occurred on May 2 at hour 11:00, resulting in one hour of downtime.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Two hours of data at 11:00 - 12:00 were lost as a result of the activities surrounding this upgrade.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 93.7%, equivalent to 47 hours of downtime.
- On the recommendation of Alberta Environment and Parks (AEP), following the station audit in March 2018, the temperature/RH sensor was replaced. Following a removal audit, the LICA-owned sensor (Met One Model: 083D, s/n: F4091) was removed on May 1 for factory calibration and a Maxxam-supplied sensor (RM Young Model: 41372VC, s/n: 1920/01983) was installed. The newly-installed sensor was left offline for a function check and an installation audit was completed on May 2. Twenty-seven hours of downtime were incurred due to this event.
- A data logger upgrade was implemented on May 30. The Ultimate data logger was installed to replace the resident ESC 8832. Twenty hours of data on May 30 at hour 11:00 to May 31 at hour 06:00 were lost as a result of the activities surrounding this upgrade.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technicians were Alexander Yakupov and Christopher Wesson.

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, except for WS/WD/STDWD, follow the methods described in the AMD, 2016.

WS/WD/STDWD:

- During the initial datalogger configuration, the wind channels were programmed to use a calm threshold. Based on these calm settings, the 1-minute average excludes any individual sample (instant data) that is less than 0.36 kph. As data collection ensued, it was observed that the datalogger was applying inconsistent flags across the three wind channels: WS, WD, and STDWD. To validate the data, attempts to retrieve the instant data were made. However, due to the datalogger's short retention time for instant data, access to the original 1-second data, was not possible. Subsequently, the wind data required an alternative validation process to obtain the most representative data-set. To achieve this, the hourly data collected between May 30, hour 14:00 and May 31, hour 23:00 was re-calculated from the available 1-minute vector averages. To incorporate the highest number of instant data, minute data that contained less than 45 seconds were averaged based on the remaining sample set and not excluded when calculating hourly averages. This data treatment had a minor impact on data; applicable hours are outlined in the table below. Overall, in comparison with the original hourly averages, the change was insignificant. On July 31, the DAS vendor modified the datalogger configuration, in order to optimize the collection of wind data. The criteria of the calm threshold was eased and hourly data is calculated based on 1-minute vector averages.

Summary of Hourly Wind Data Revised After Data Treatment	
Date	Time
30/05/2018	14:00
30/05/2018	17:00
30/05/2018	22:00
31/05/2018	07:00
31/05/2018	12:00
31/05/2018	13:00
31/05/2018	14:00
31/05/2018	15:00

5.0 Methods and Procedures

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

- Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration
- MET One Instruments: Operation Manual Document No. 50.5-9800
- Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00212: Ambient 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

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51i FID Analyzer
- Oxides of Nitrogen - API 200E Chemiluminescent Analyzer
- Ozone - Thermo 49i Photometric Analyzer
- Particulate Matter (PM_{2.5}) - Thermo SHARP 5030i Unit
- Wind System - Met One
- Relative Humidity - Met One and RM Young Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One and RM Young Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832 and Envidas Ultimate

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

Level 0 Preliminary Verification

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

Level 1 Primary Validation

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

Level 2 Final Validation

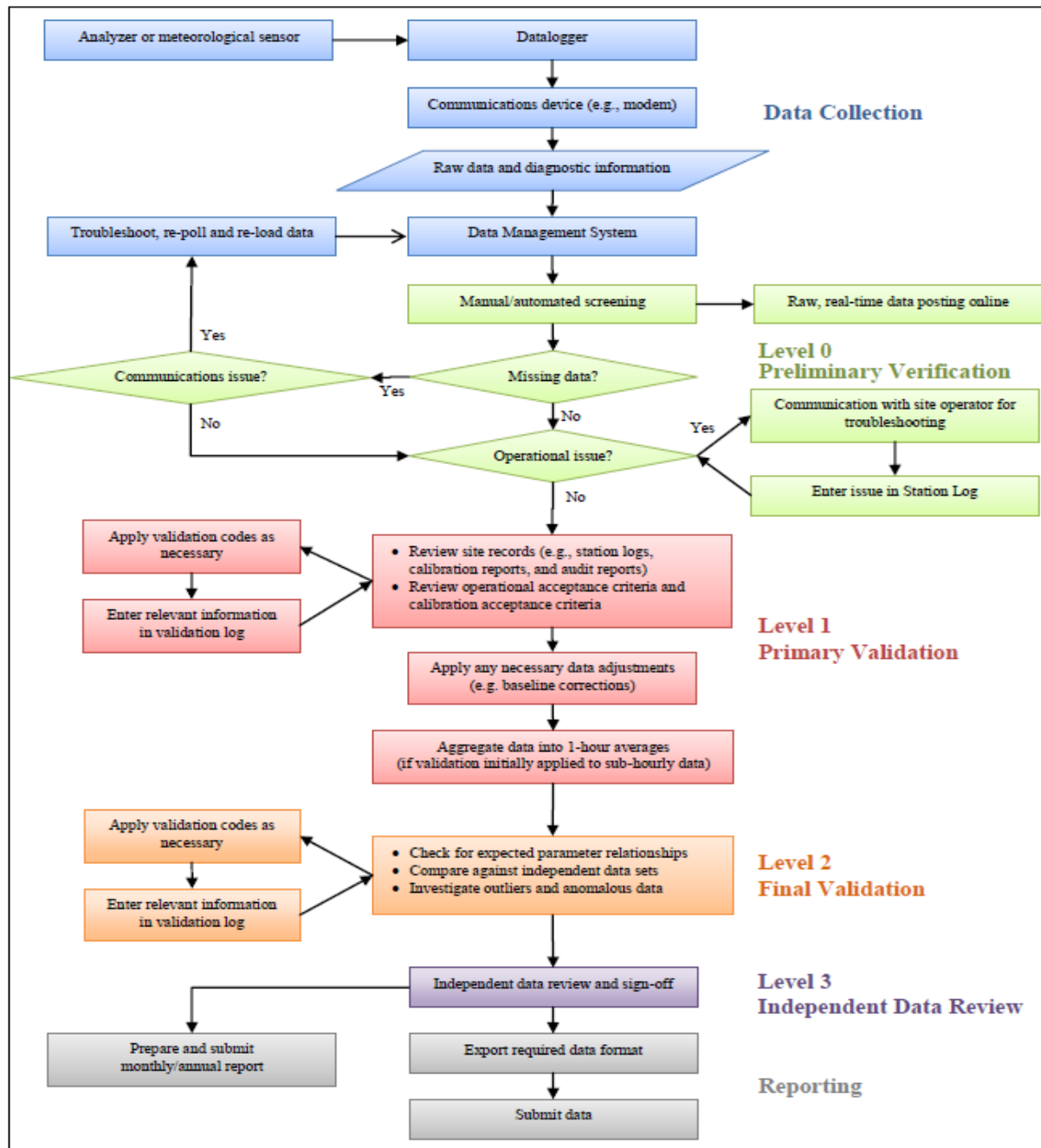
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

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

Post-Final Validation

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



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

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	S	0	0	0	0	0	0	0	0	1	1	P	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	23
3	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
6	0	1	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	S	0	0	0	0	0	0	0	0	1	0	24
7	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24
8	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	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	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	0	0	0	0	24
11	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
12	0	0	0	0	0	0	0	1	1	1	0	0	0	0	S	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14	0	0	0	1	1	1	1	1	1	1	1	C	C	C	C	C	0	1	1	0	1	1	0	0	0	0	0	0	0	1	1	24
15	0	0	1	1	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	1	0	24
16	0	0	0	0	0	0	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	0	24
18	0	0	0	1	1	1	1	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	24
20	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	S	0	Q	Q	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	S	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	Q	0	0	0	0	0	0	0	0	0	1	0	24
24	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	S	1	0	0	0	0	1	0	24
28	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	1	0	S	0	0	0	0	0	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	S	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	0	0	0	0	0	0	0	X	X	X	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	21
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	0	0	0	0	0	0	0	23
HOURLY MAX	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	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							

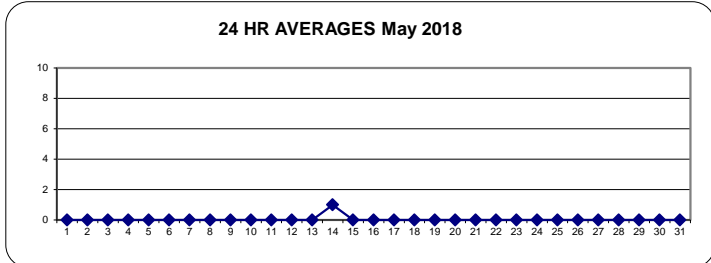
STATUS FLAG CODES

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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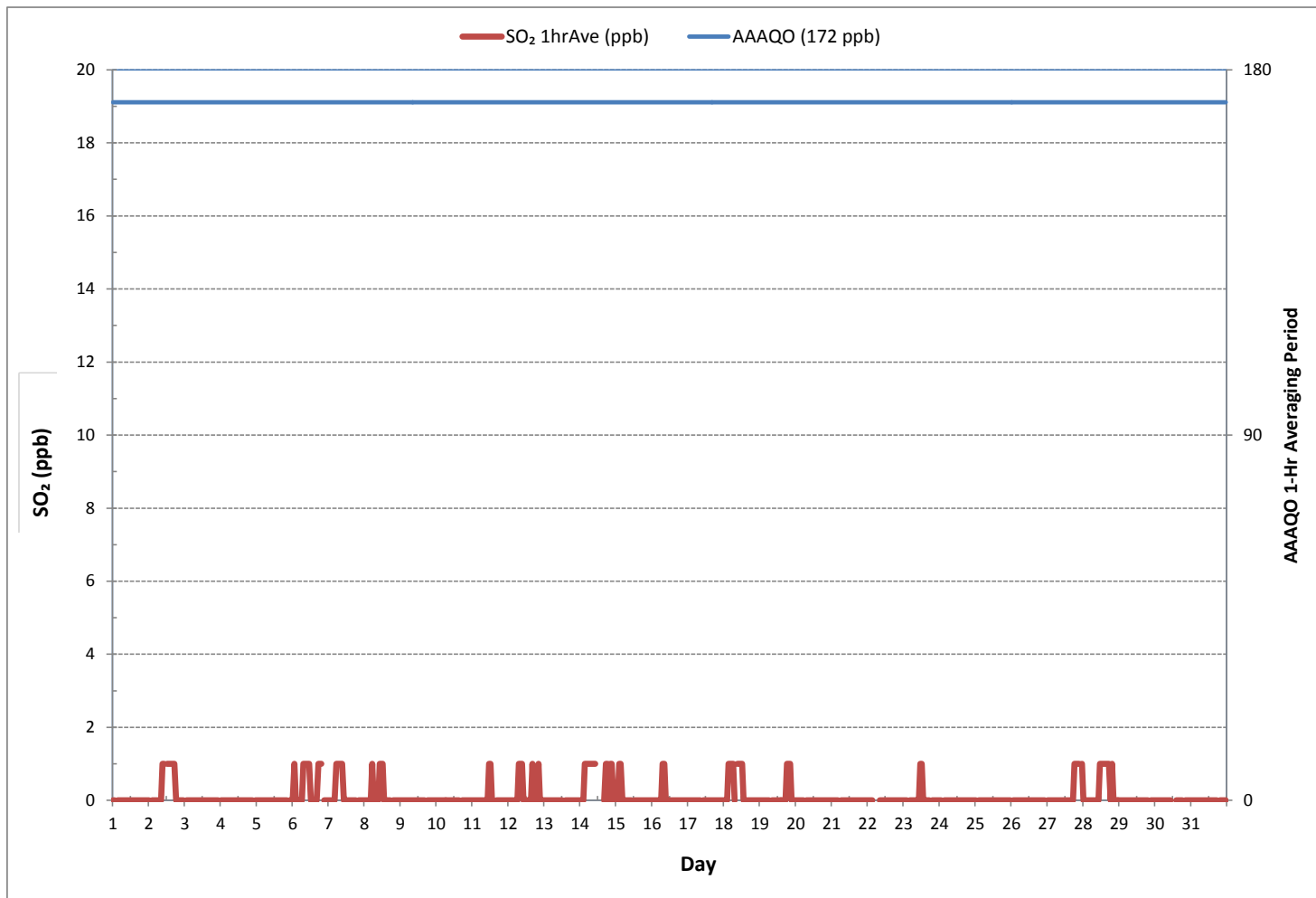
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	75
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR ON DAY 2
MAXIMUM 24-HR AVERAGE:	1 ppb ON DAY 14
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	739 hrs
AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 18/05
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

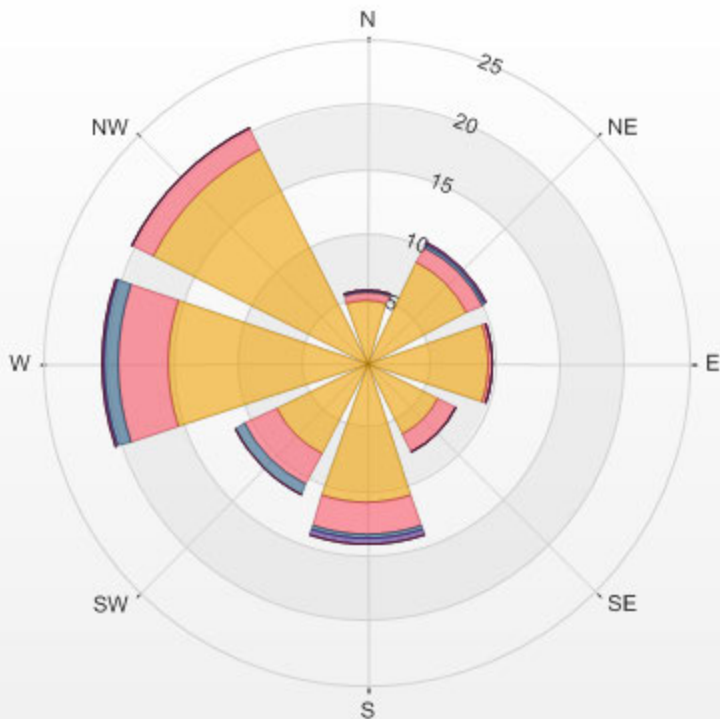
Calm: 0.00%

Calm Avg: 0.00 [ppb]

Direction	0.0-0.4	0.4-0.8	0.8-1.2	1.2-1.6	1.6-2.0	>2.0	Total
N	4.9	0.7	0.1	0.0	0.0	0.0	5.7
NE	8.7	1.3	0.3	0.1	0.0	0.0	10.4
E	9.4	0.3	0.0	0.0	0.0	0.0	9.7
SE	6.1	1.6	0.0	0.0	0.0	0.0	7.7
S	10.9	2.4	0.3	0.4	0.0	0.0	14.0
SW	7.9	2.7	0.9	0.0	0.0	0.0	11.4
W	15.4	3.9	1.0	0.3	0.0	0.0	20.6
NW	18.4	1.9	0.1	0.0	0.0	0.0	20.4
Summary	81.7	14.7	2.7	0.9	0.0	0.0	100.0

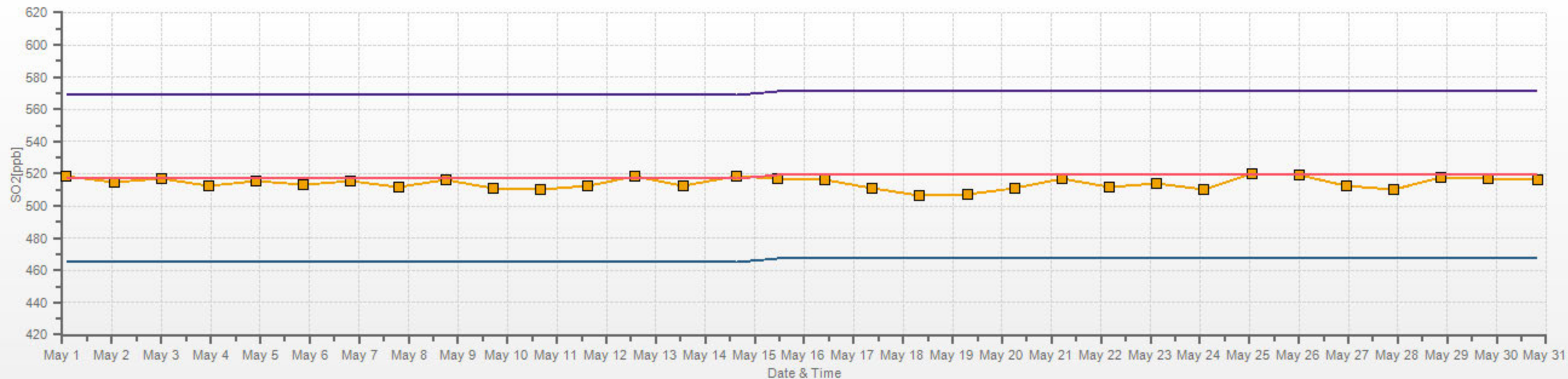
% Icon Classes (ppb) 82 0.0-0.4 15 0.4-0.8 3 0.8-1.2 1 1.2-1.6 0 1.6-2.0 0 >2.0

LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/05 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	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	S	0	0	0	0	0	0	0	0	0	0	P	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	23
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	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	S	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	S	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	S	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	S	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	S	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	S	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	S	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	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	S	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	C	C	C	C	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	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	0	0	0	0	S	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	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
20	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	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	0	0	1	0	24
23	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	S	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
25	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
27	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
28	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Y	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	23
30	0	0	0	0	0	0	0	0	0	0	0	X	X	X	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	21
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	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

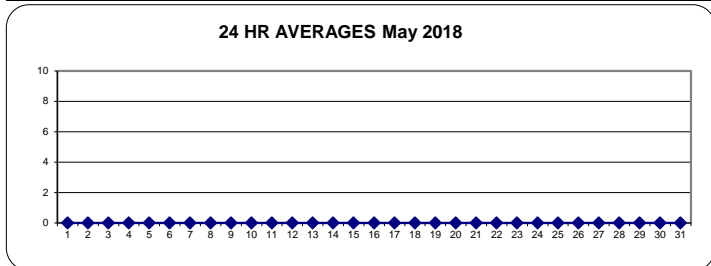
OBJECTIVE LIMIT:

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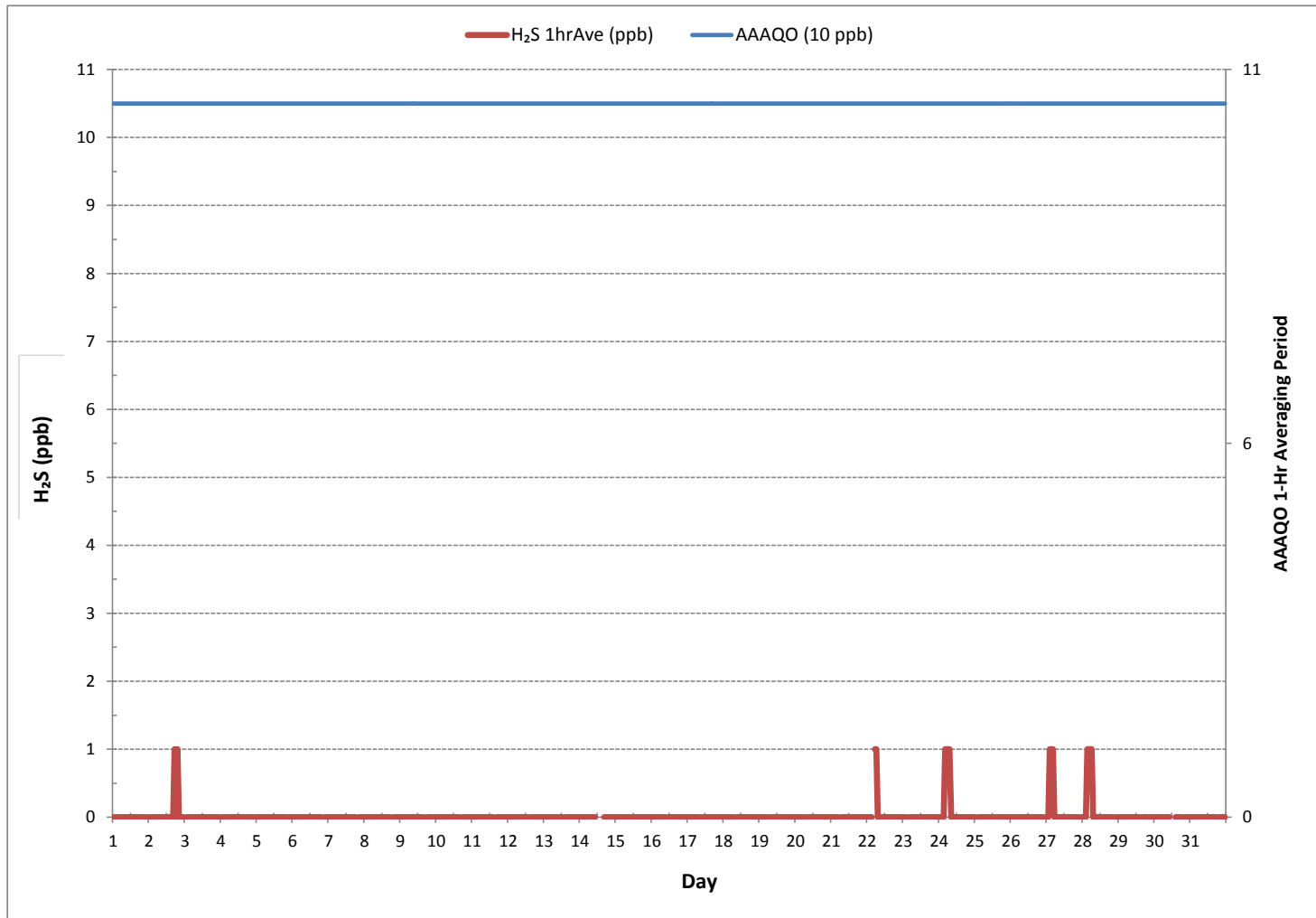
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	15
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR 17 ON DAY 2
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	739 hrs
AMD OPERATION UPTIME:	99.3 %
STANDARD DEVIATION:	0
MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES May 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



% Icon Classes (ppb)

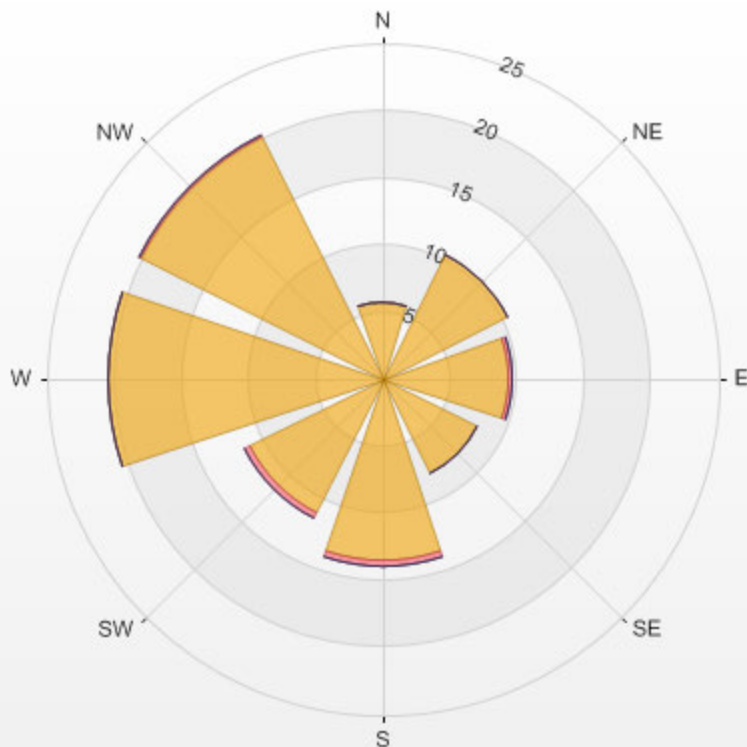
99 0.0-0.7

1 0.7-1.3

0 1.3-2.0

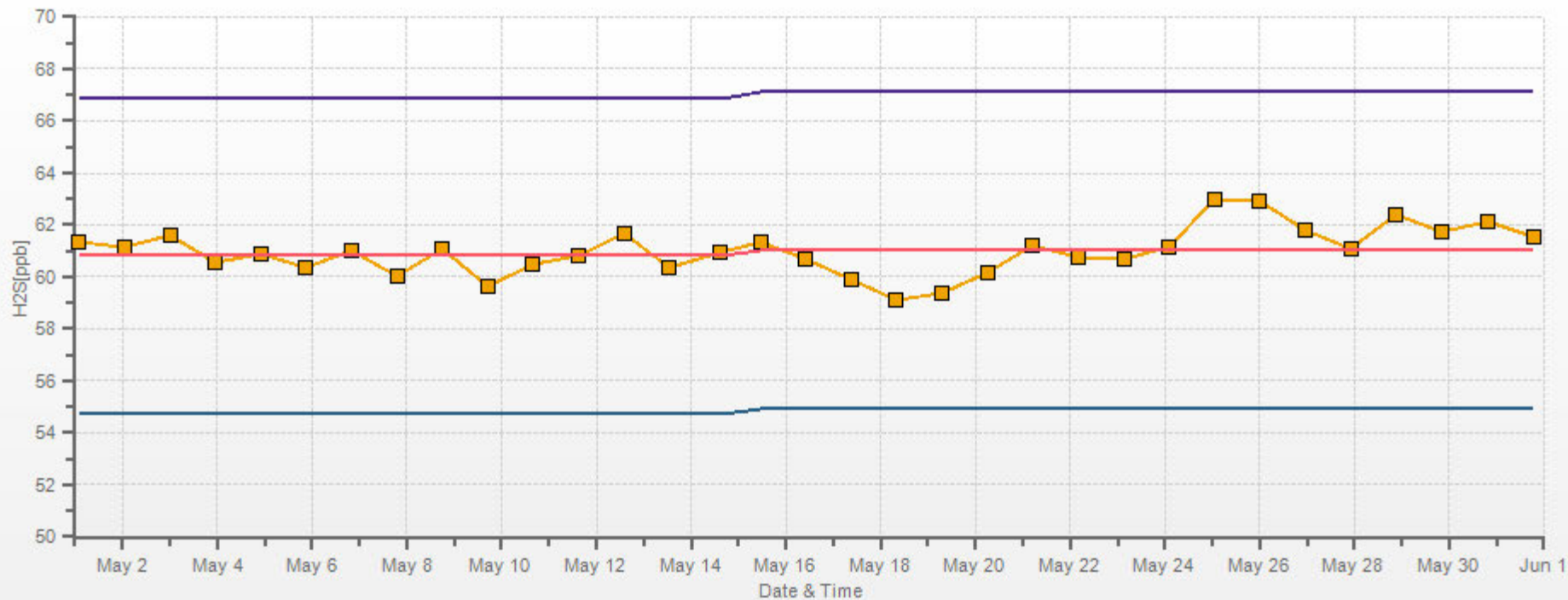
0 >2.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON

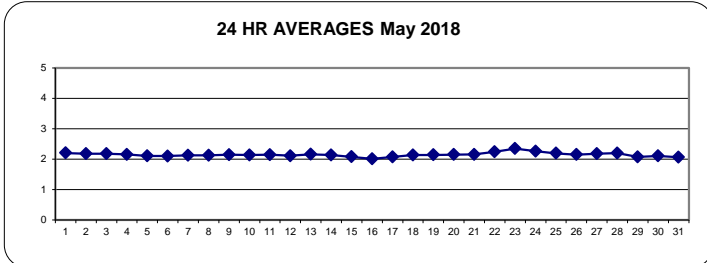
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

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	2.23	2.22	S	2.25	2.23	2.25	2.22	2.22	2.21	2.08	2.17	2.21	2.20	2.19	2.20	2.22	2.20	2.20	2.20	2.20	2.19	2.19	2.23	2.22	2.08	2.25	2.21	24
2	2.21	S	2.27	2.26	2.27	2.29	2.31	2.27	2.15	2.11	2.19	P	2.15	2.16	2.15	2.13	2.13	2.12	2.11	2.12	2.12	2.14	2.14	2.12	2.11	2.31	2.18	23
3	S	2.14	2.17	2.16	2.19	2.23	2.21	2.14	2.04	2.15	2.16	2.17	2.17	2.16	2.17	2.19	2.19	2.20	2.19	2.21	2.20	2.24	2.23	S	2.04	2.24	2.18	24
4	2.22	2.24	2.27	2.25	2.24	2.24	2.26	2.24	2.12	2.16	2.15	2.17	2.18	2.18	2.11	2.03	2.04	2.03	2.05	2.07	2.10	S	2.05	2.03	2.27	2.16	24	
5	2.08	2.11	2.10	2.10	2.09	2.09	2.14	2.10	2.14	2.13	2.11	2.11	2.12	2.12	2.13	2.14	2.13	2.12	2.07	2.07	S	2.06	2.06	2.06	2.06	2.14	2.11	24
6	2.06	2.08	2.09	2.10	2.10	2.13	2.16	2.20	2.14	2.14	2.14	2.12	2.08	2.08	2.06	2.09	2.09	2.10	2.10	2.11	S	2.07	2.05	2.04	2.04	2.20	2.10	24
7	2.04	2.03	2.04	2.05	2.07	2.15	2.27	2.24	2.10	2.02	2.14	2.15	2.14	2.16	2.14	2.14	2.13	2.16	2.17	S	2.12	2.12	2.11	2.14	2.02	2.27	2.12	24
8	2.13	2.12	2.13	2.16	2.17	2.14	2.14	2.19	2.20	2.16	2.12	2.13	2.09	2.08	2.10	2.09	2.10	2.11	S	2.10	2.08	2.08	2.09	2.10	2.08	2.20	2.12	24
9	2.10	2.12	2.14	2.13	2.14	2.14	2.14	2.13	2.16	2.15	2.15	2.12	2.13	2.13	2.11	2.12	2.14	S	2.14	2.16	2.15	2.19	2.19	2.24	2.10	2.24	2.14	24
10	2.22	2.22	2.23	2.28	2.18	2.05	2.03	2.03	2.03	2.02	2.03	2.06	2.16	2.16	2.16	2.17	S	2.12	2.11	2.13	2.15	2.17	2.16	2.17	2.02	2.28	2.13	24
11	2.16	2.17	2.19	2.19	2.18	2.24	2.21	2.21	2.14	2.09	2.07	2.06	2.15	2.16	2.17	S	2.15	2.12	2.09	2.09	2.15	2.16	2.11	2.10	2.06	2.24	2.15	24
12	2.08	2.11	2.11	2.12	2.16	2.20	2.19	2.21	2.21	2.19	2.16	2.10	2.09	2.08	S	2.07	2.07	2.09	2.08	2.07	2.01	1.97	2.09	2.13	1.97	2.21	2.11	24
13	2.12	2.12	2.12	2.13	2.16	2.14	2.16	2.19	2.17	2.14	2.15	2.14	2.14	S	2.14	2.12	2.15	2.15	2.16	2.16	2.20	2.24	2.25	2.21	2.12	2.25	2.16	24
14	2.11	2.08	2.13	2.20	2.15	2.10	2.09	2.08	2.11	2.12	2.16	2.19	S	2.17	2.16	2.13	2.13	2.09	2.12	2.18	2.19	2.17	2.19	2.08	2.20	2.20	2.14	24
15	2.23	2.20	2.23	2.23	2.20	2.18	2.19	2.17	2.11	2.09	C	C	C	C	C	2.05	2.05	2.02	2.04	2.02	1.88	1.81	1.90	1.91	1.81	2.23	2.08	24
16	1.93	1.97	1.99	2.00	2.04	2.26	2.23	2.10	2.00	2.01	S	2.00	2.00	1.99	2.00	1.99	2.00	2.01	1.95	1.95	1.98	1.98	1.96	1.96	1.93	2.26	2.01	24
17	2.03	2.11	2.03	2.00	2.02	2.03	1.99	2.01	2.01	S	1.97	2.02	2.05	2.07	2.16	2.20	2.14	2.14	2.12	2.13	2.15	2.12	2.12	2.13	1.97	2.20	2.08	24
18	2.14	2.16	2.14	2.17	2.18	2.19	2.19	2.10	S	1.95	2.09	2.15	2.15	2.13	2.13	2.13	2.13	2.17	2.11	2.14	2.13	2.12	2.16	2.12	1.95	2.19	2.13	24
19	2.12	2.16	2.16	2.16	2.15	2.16	2.16	S	2.11	2.12	2.10	2.12	2.14	2.12	2.13	2.10	2.11	2.11	2.14	2.17	2.19	2.19	2.20	2.16	2.10	2.20	2.14	24
20	2.17	2.16	2.17	2.16	2.18	2.17	S	2.24	2.20	2.11	2.10	2.10	2.09	2.10	2.10	2.11	2.13	2.12	2.14	2.16	2.17	2.19	2.22	2.21	2.09	2.24	2.15	24
21	2.17	2.13	2.12	2.17	2.14	S	2.25	2.23	2.16	2.14	2.12	2.16	2.13	2.14	2.11	2.11	2.10	2.12	2.16	2.17	2.18	2.19	2.18	2.18	2.10	2.25	2.15	24
22	2.15	2.14	2.15	2.29	S	2.38	2.39	S1	2.21	2.23	2.26	2.24	2.22	2.22	2.20	2.22	2.24	2.25	2.26	2.27	2.27	2.25	2.22	2.28	2.14	2.39	2.24	23
23	2.28	2.21	2.26	S	2.43	2.48	2.56	2.60	2.50	2.31	2.20	C1	C1	C1	C1	C1	2.20	2.13	2.18	2.28	2.37	2.41	2.43	2.52	2.13	2.60	2.35	19
24	2.45	2.43	S	2.47	2.49	2.60	2.42	2.30	2.43	2.35	2.32	2.27	2.28	2.19	2.10	2.06	2.05	2.10	2.10	2.13	2.14	2.11	2.11	2.11	2.05	2.60	2.26	24
25	2.11	2.12	2.20	2.22	2.21	2.19	2.26	S	2.24	2.26	2.27	2.25	2.24	2.19	2.17	2.18	2.18	2.14	2.16	2.17	2.14	2.12	2.21	2.24	2.11	2.27	2.19	24
26	S	2.31	2.32	2.19	2.06	2.07	2.10	2.10	2.11	2.10	2.10	2.11	2.13	2.13	2.14	2.14	2.14	2.15	2.18	2.16	2.18	2.18	2.20	S	2.06	2.32	2.15	24
27	2.19	2.20	2.27	2.33	2.26	2.25	2.20	2.20	2.17	2.16	2.16	2.13	2.12	2.13	2.13	2.13	2.14	2.14	2.15	2.14	2.15	2.18	S	2.17	2.12	2.33	2.18	24
28	2.18	2.23	2.33	2.39	2.40	2.34	2.28	2.21	2.21	2.20	2.19	2.20	2.17	2.14	2.16	2.16	2.18	2.17	2.14	2.13	2.08	S	2.06	2.04	2.04	2.40	2.20	24
29	2.00	1.93	2.00	1.93	2.05	2.09	2.08	2.10	2.09	2.08	2.14	2.14	2.13	2.08	2.03	2.06	2.01	2.11	2.11	2.10	S	2.15	2.14	2.16	1.93	2.16	2.07	24
30	2.17	2.23	2.19	2.15	2.13	2.04	2.00	2.02	2.07	2.11	2.10	X	X	X	2.14	2.12	2.11	2.06	2.05	S	2.08	2.12	2.13	2.13	2.00	2.23	2.11	21
31	2.15	2.08	2.05	2.06	2.07	2.07	2.07	2.06	2.07	2.06	2.03	2.04	2.03	2.06	2.07	2.03	2.04	2.04	S	2.07	2.10	2.06	2.03	2.15	2.03	2.15	2.06	24
HOURLY MAX	2.45	2.43	2.33	2.47	2.49	2.60	2.56	2.60	2.50	2.35	2.32	2.27	2.28	2.22	2.20	2.22	2.24	2.25	2.26	2.28	2.37	2.41	2.43	2.52				
HOURLY AVG	2.15	2.15	2.16	2.18	2.18	2.20	2.20	2.17	2.15	2.13	2.14	2.14	2.14	2.13	2.13	2.12	2.12	2.12	2.12	2.12	2.13	2.13	2.14	2.15				

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

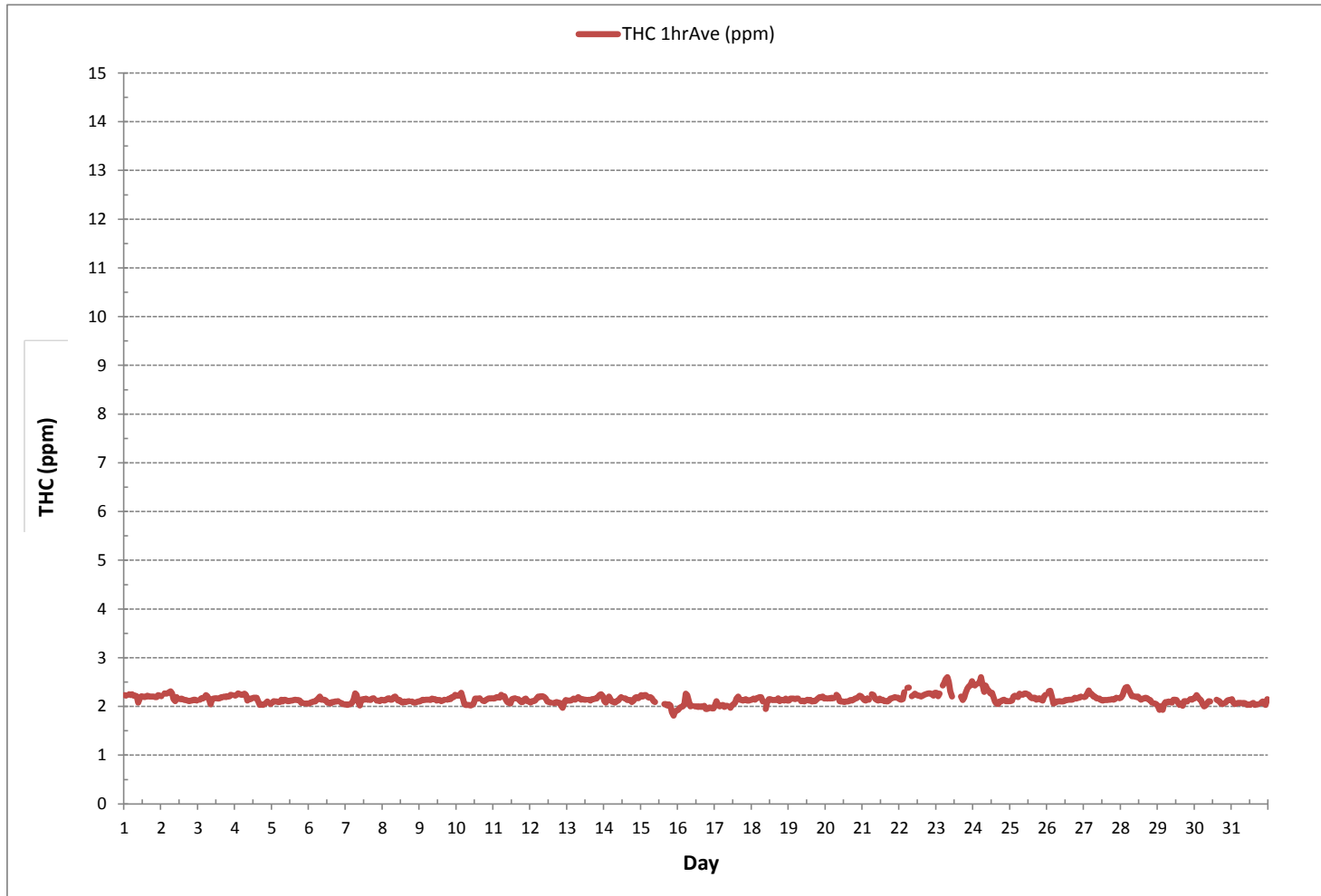
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	697			
MINIMUM 1-HR AVERAGE:	1.81 ppm	@ HOUR	21	ON DAY 15
MAXIMUM 1-HR AVERAGE:	2.60 ppm	@ HOUR	7	ON DAY 23
MAXIMUM 24-HR AVERAGE:	2.35 ppm			ON DAY 23
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	734 hrs	
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	98.7 %	
STANDARD DEVIATION:	0.09	MONTHLY AVERAGE:	2.15 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



% Icon Classes (ppm)

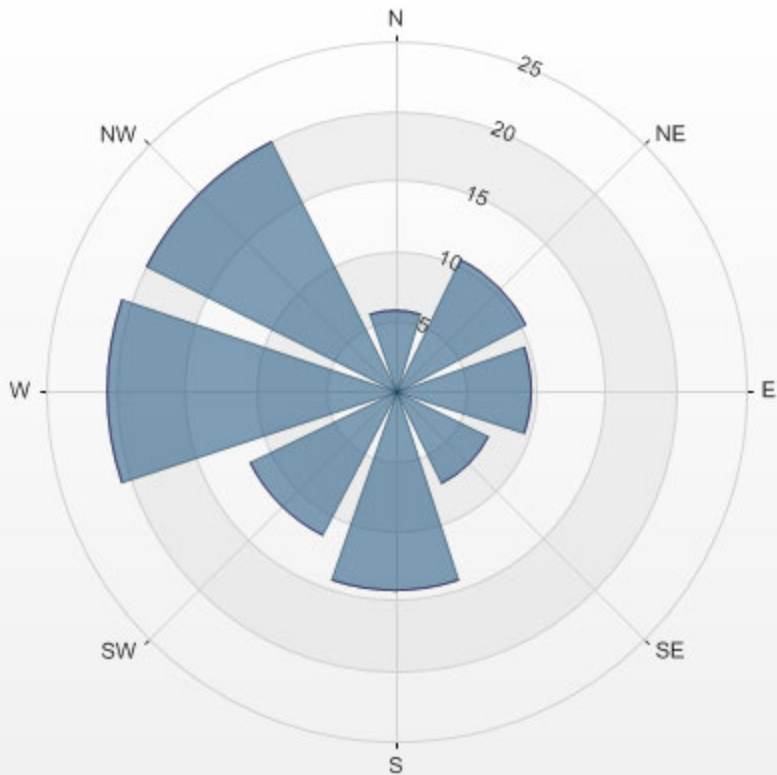
0 0.0-0.9

0 0.9-1.7

100 1.7-2.6

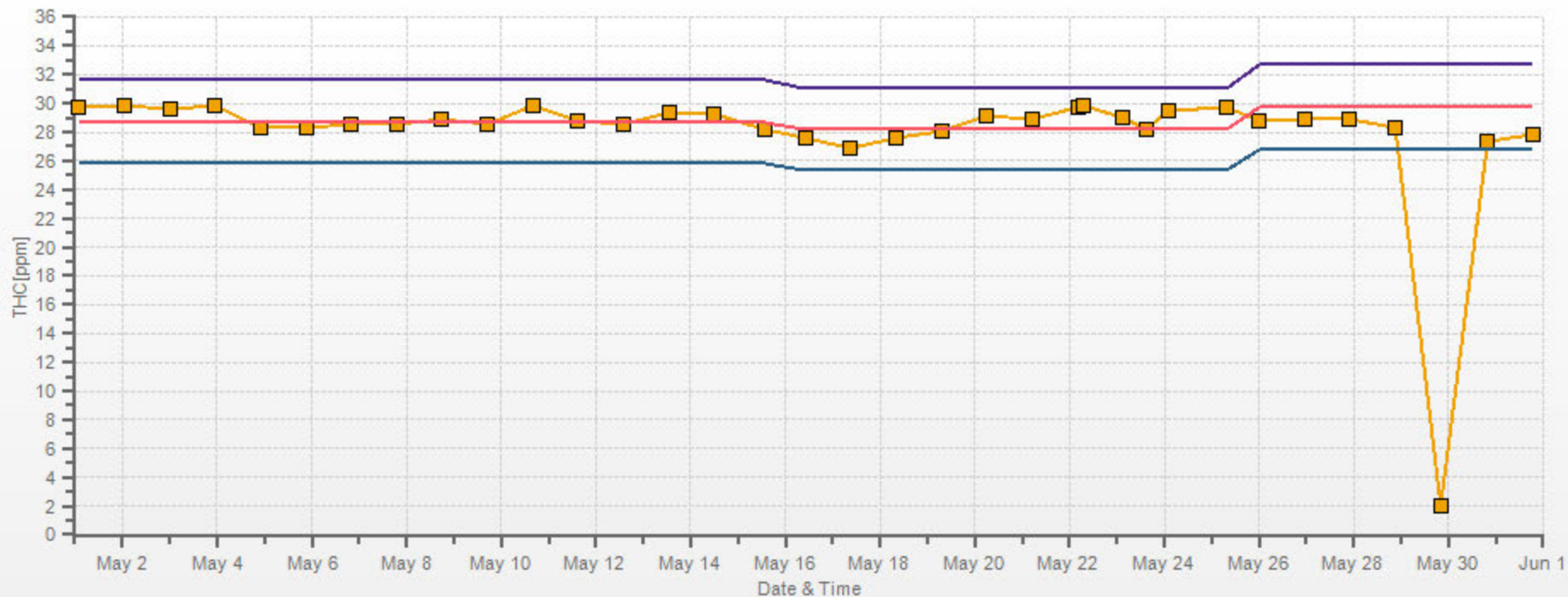
0 >2.6

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



THC[ppm] Calibration: LICA ST. LINA Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



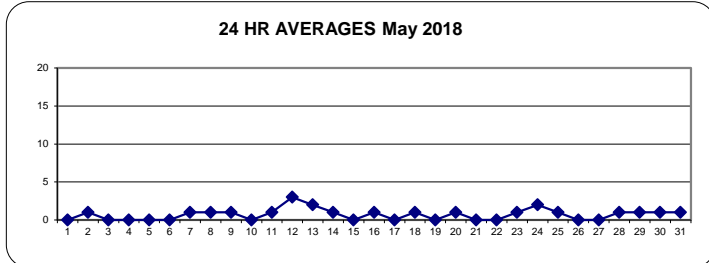
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

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	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
2	0	S	0	0	0	1	2	2	1	2	1	P	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	23
3	S	0	0	0	0	1	1	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	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24	
5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24	
6	0	0	0	1	1	1	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	2	0	24	
7	0	0	0	0	0	2	4	4	2	1	0	0	0	0	0	0	0	0	0	S	1	0	1	0	0	4	1	24	
8	0	0	1	1	0	1	1	1	2	1	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	2	1	24	
9	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	S	0	0	1	1	2	2	0	2	1	24	
10	2	2	1	1	1	0	0	0	0	0	0	0	0	1	0	0	S	0	0	1	0	1	0	1	0	2	0	24	
11	0	1	1	1	1	1	1	1	0	0	2	0	1	0	0	S	0	0	0	0	0	1	1	1	0	2	1	24	
12	1	1	2	2	2	2	2	5	9	4	2	2	1	3	S	4	4	3	3	3	3	4	2	0	0	9	3	24	
13	0	0	0	0	1	9	S1	S1	7	4	3	2	3	S	3	2	1	0	0	0	0	0	0	0	0	9	2	22	
14	0	0	0	0	1	3	1	0	0	0	C	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	0	3	1	17	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	14	
16	0	0	2	7	2	3	4	4	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	24	
17	0	0	0	0	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	24	
18	0	0	0	2	1	2	1	1	S	2	1	1	0	0	0	2	1	0	1	3	1	2	1	1	0	3	1	24	
19	1	1	1	1	2	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	24	
20	1	1	1	1	1	2	S	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	1	24	
21	0	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24	
22	0	0	0	0	S	2	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	24	
23	2	2	2	S	2	2	5	2	1	1	0	0	Q	Q	Q	Q	1	1	1	1	1	0	1	2	0	5	1	24	
24	2	1	S	3	3	3	4	4	3	2	3	3	2	1	0	0	0	1	1	2	1	0	0	0	0	4	2	24	
25	0	S	1	0	0	1	0	2	1	1	1	0	1	1	1	1	2	0	0	0	0	1	1	0	0	2	1	24	
26	S	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	3	0	24	
27	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	S	1	0	1	0	24	
28	1	2	2	3	3	3	3	2	2	1	1	1	1	1	1	1	0	0	0	0	0	S	0	0	0	3	1	24	
29	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	Y	0	1	1	S	1	1	1	0	1	1	23	
30	1	2	1	1	1	1	0	0	1	0	0	X	X	X	0	0	1	0	0	S	1	1	1	2	0	2	1	21	
31	2	1	0	0	1	1	0	0	1	2	1	0	0	0	0	0	0	0	0	S	1	0	1	1	0	2	1	24	
HOURLY MAX	2	3	2	7	3	9	5	5	9	4	3	3	3	3	3	4	4	3	3	3	3	4	2	2					
HOURLY AVG	0	1	1	1	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1					

STATUS FLAG CODES

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

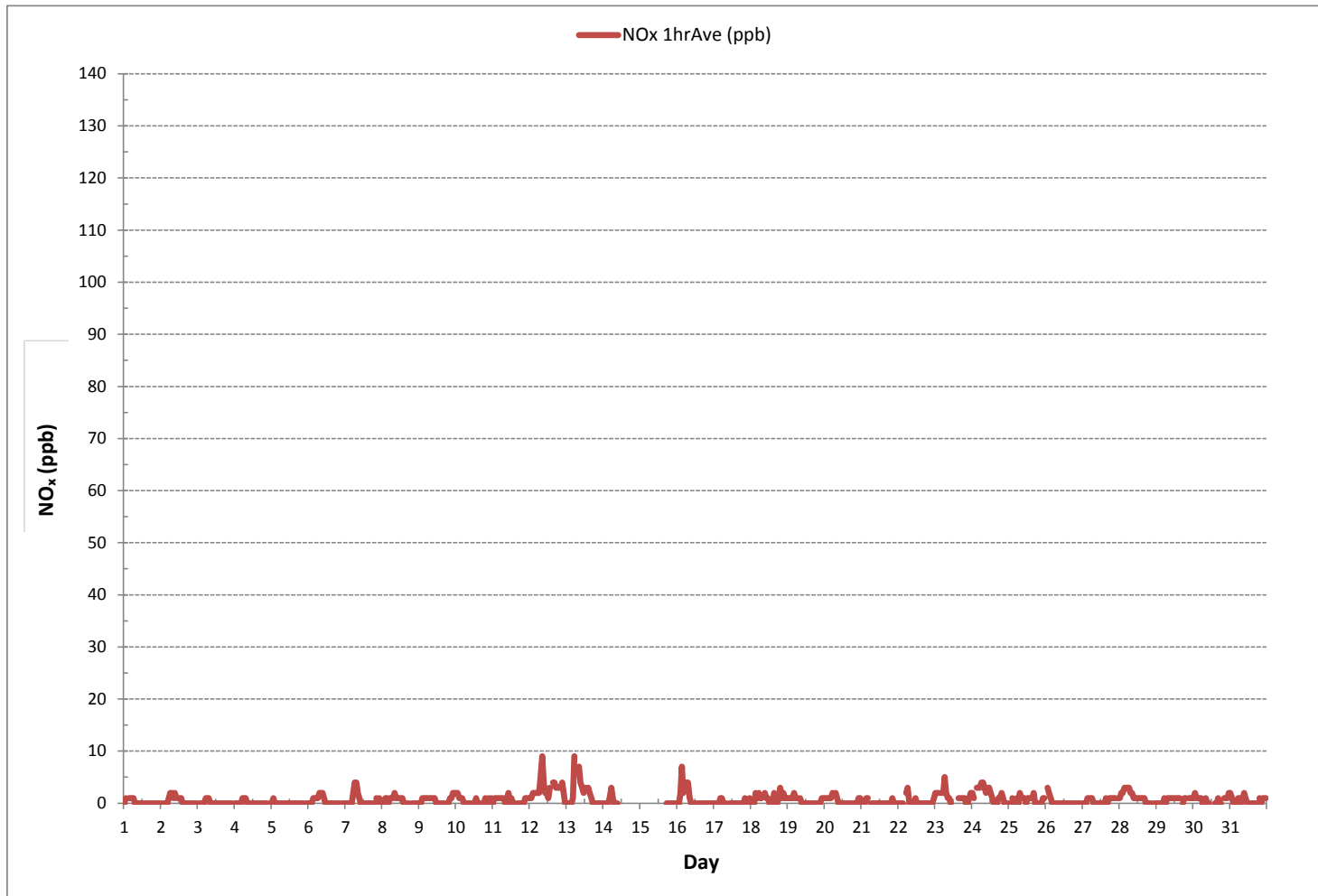
24 HR AVERAGES May 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	284			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	9 ppb	@ HOUR	8	ON DAY 12
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 12
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	720 hrs	
MONTHLY CALIBRATION TIME:	14 hrs	AMD OPERATION UPTIME:	96.8 %	
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1	ppb

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



% Icon Classes (ppb)

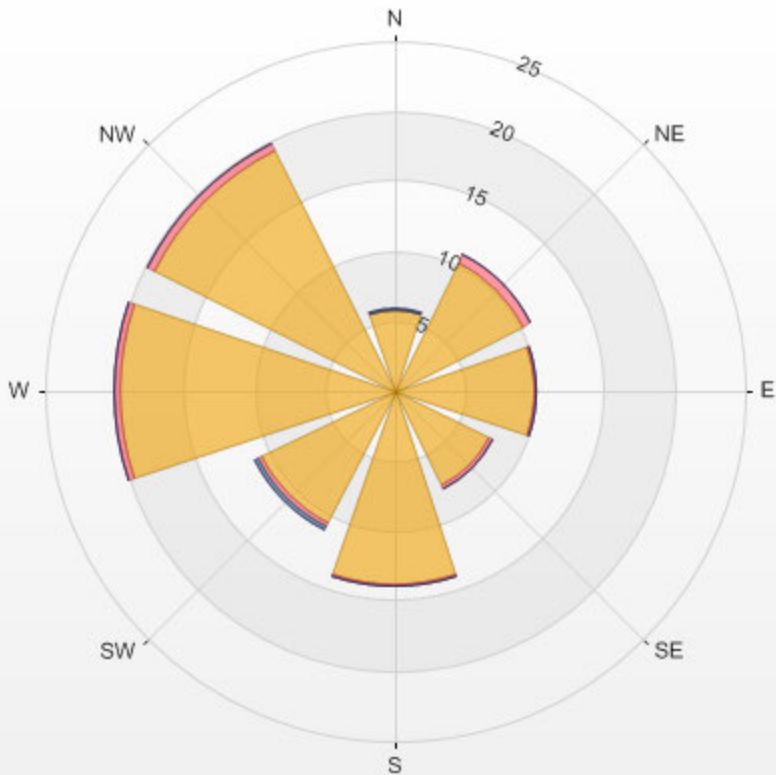
97 0.0-3.3

3 3.3-6.7

0 6.7-10.0

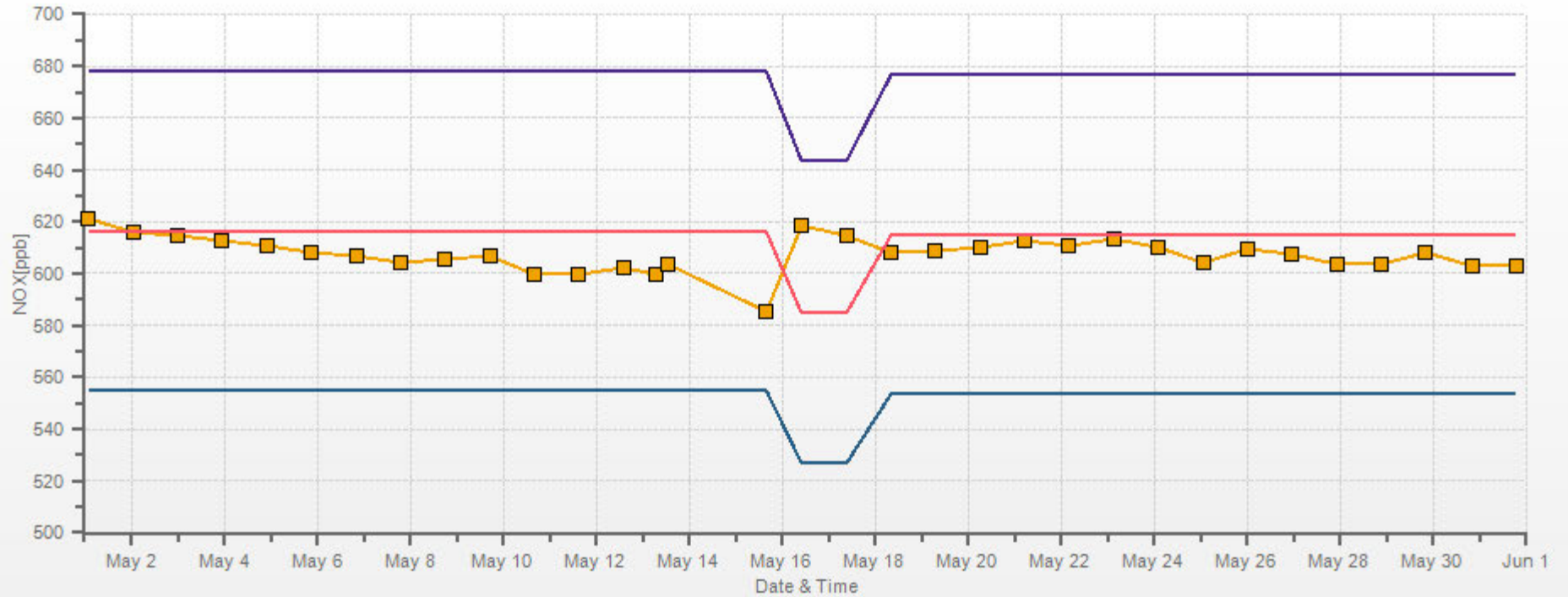
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LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



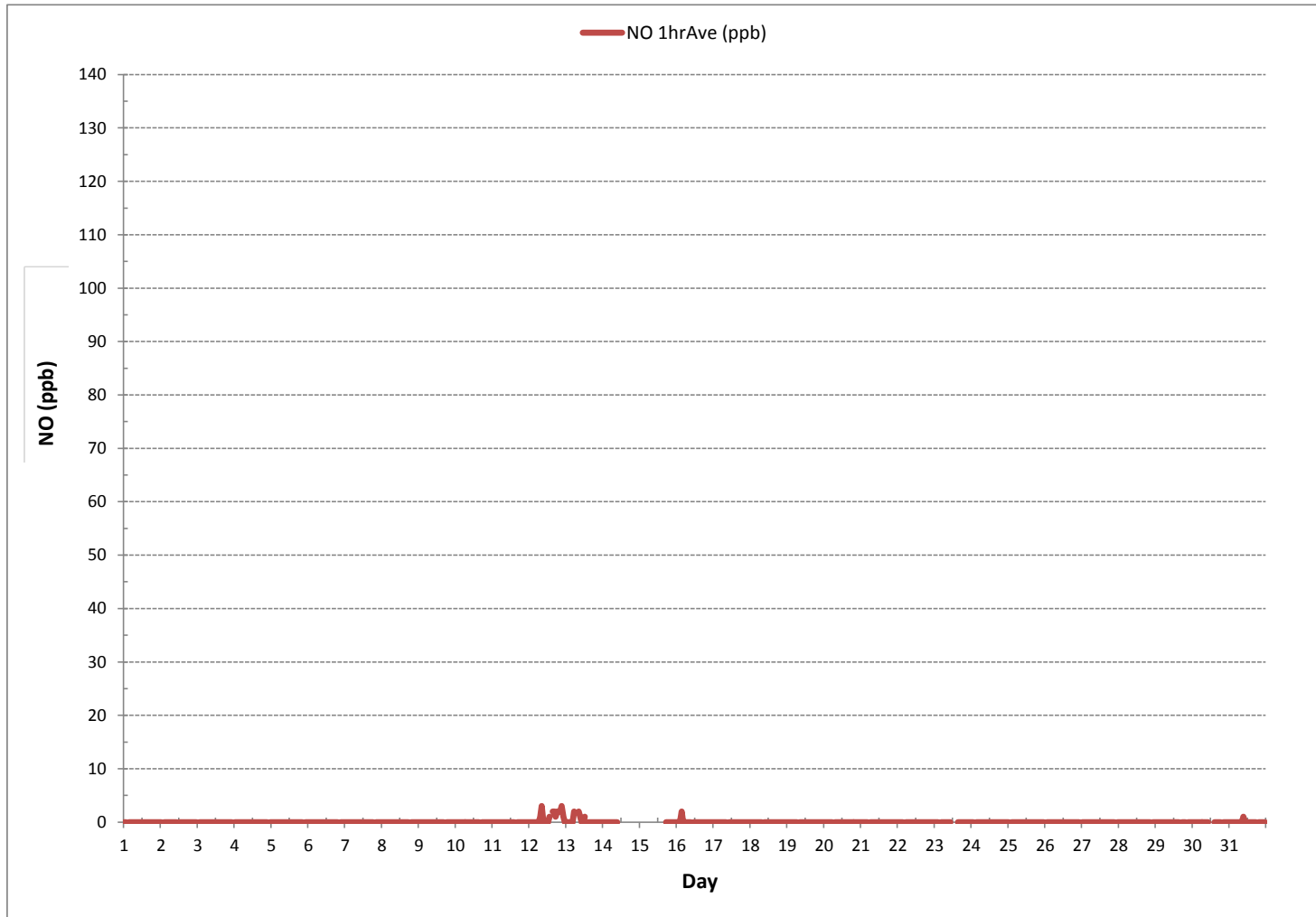
NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/05 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES

NITRIC OXIDE Hourly Averages (NO ppb)



% Icon Classes (ppb)

99 0.0-1.3

1

1.3-2.7

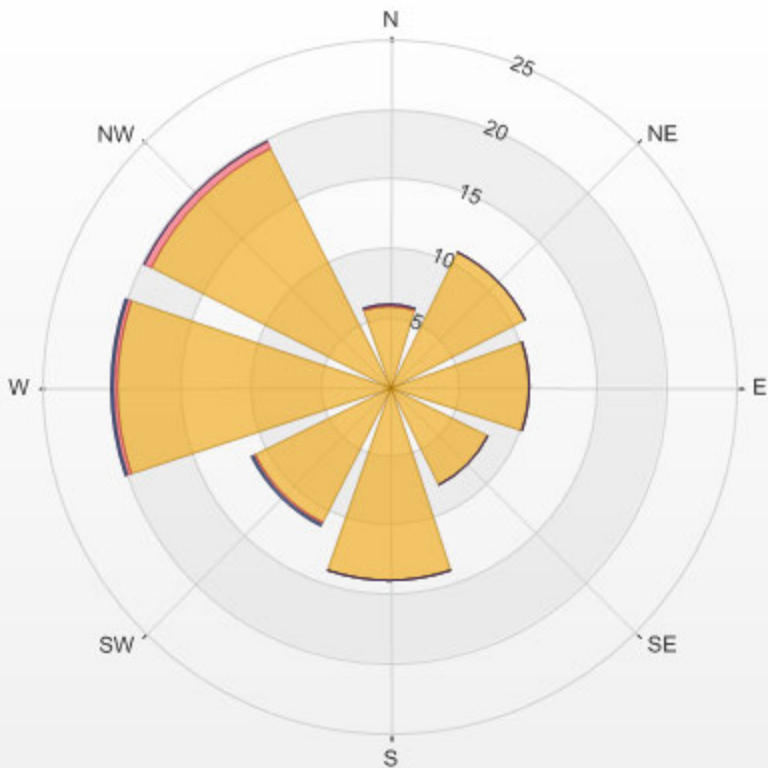
0

2.7-4.0

0

>4.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



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	0	0	S	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	
2	0	S	0	0	0	1	2	1	1	1	0	P	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	23	
3	S	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
4	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
5	1	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	0	0	1	0	24	
6	1	1	1	1	1	1	1	1	2	2	1	1	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	2	1	24	
7	0	0	0	0	0	2	4	3	2	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	4	1	24	
8	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
9	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	0	0	1	1	1	2	0	0	0	0	2	1	24	
10	2	2	1	2	1	0	0	0	0	0	0	0	0	1	0	1	S	1	0	1	1	1	1	1	0	0	0	0	2	1	24	
11	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	S	0	0	0	0	1	1	1	1	0	0	0	0	1	1	24	
12	1	1	2	2	2	2	2	3	4	3	2	1	1	1	S	3	3	2	3	3	4	4	2	0	0	0	0	0	4	2	24	
13	0	0	0	0	1	6	S1	S1	3	1	1	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	22	
14	0	0	0	0	1	2	0	0	0	0	C	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	0	0	2	0	17	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
16	0	0	1	4	2	3	4	4	2	1	S	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	1	24	
17	0	0	0	0	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	24	
18	1	0	1	2	2	2	2	1	S	2	1	1	0	0	0	1	1	0	1	2	1	2	2	1	0	0	0	0	2	1	24	
19	1	2	2	2	2	1	1	S	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	2	1	24	
20	1	1	1	1	2	2	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	1	24	
21	1	0	0	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	24	
22	0	0	0	1	S	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	24	
23	2	2	2	S	2	2	4	2	2	1	1	Q	Q	Q	Q	1	1	1	1	1	1	1	2	1	4	2	2	1	4	2	24	
24	2	1	S	3	3	3	4	4	3	2	4	3	3	2	1	0	0	1	2	3	2	1	1	0	0	0	0	0	4	2	24	
25	0	S	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	1	2	0	0	0	0	2	1	24	
26	S	3	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	3	0	24	
27	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	S	2	0	0	0	0	2	1	24	
28	1	2	2	3	3	3	3	2	1	1	1	1	1	1	1	1	0	1	1	1	1	S	0	0	0	0	0	0	3	1	24	
29	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	Y	0	1	1	S	1	1	1	0	0	0	0	1	0	23	
30	2	3	1	1	1	1	1	1	1	1	1	X	X	X	0	0	1	0	0	S	1	1	1	2	0	0	0	0	3	1	21	
31	2	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	1	1	1	0	0	0	2	0	24	
HOURLY MAX	2	3	3	4	3	6	4	4	4	3	4	3	3	2	1	3	3	2	3	3	4	4	2	2	2	2	2					
HOURLY AVG	1	1	1	1	1	2	1	1	1	1	1	0	0	0	0	0	0	0	0	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

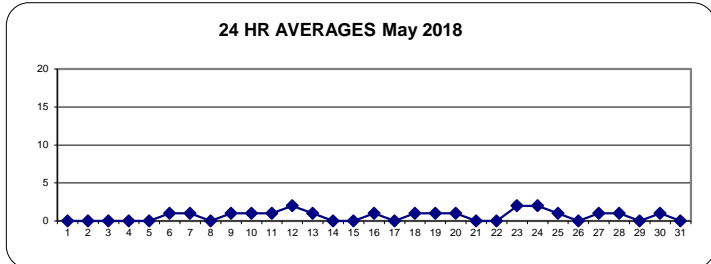
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

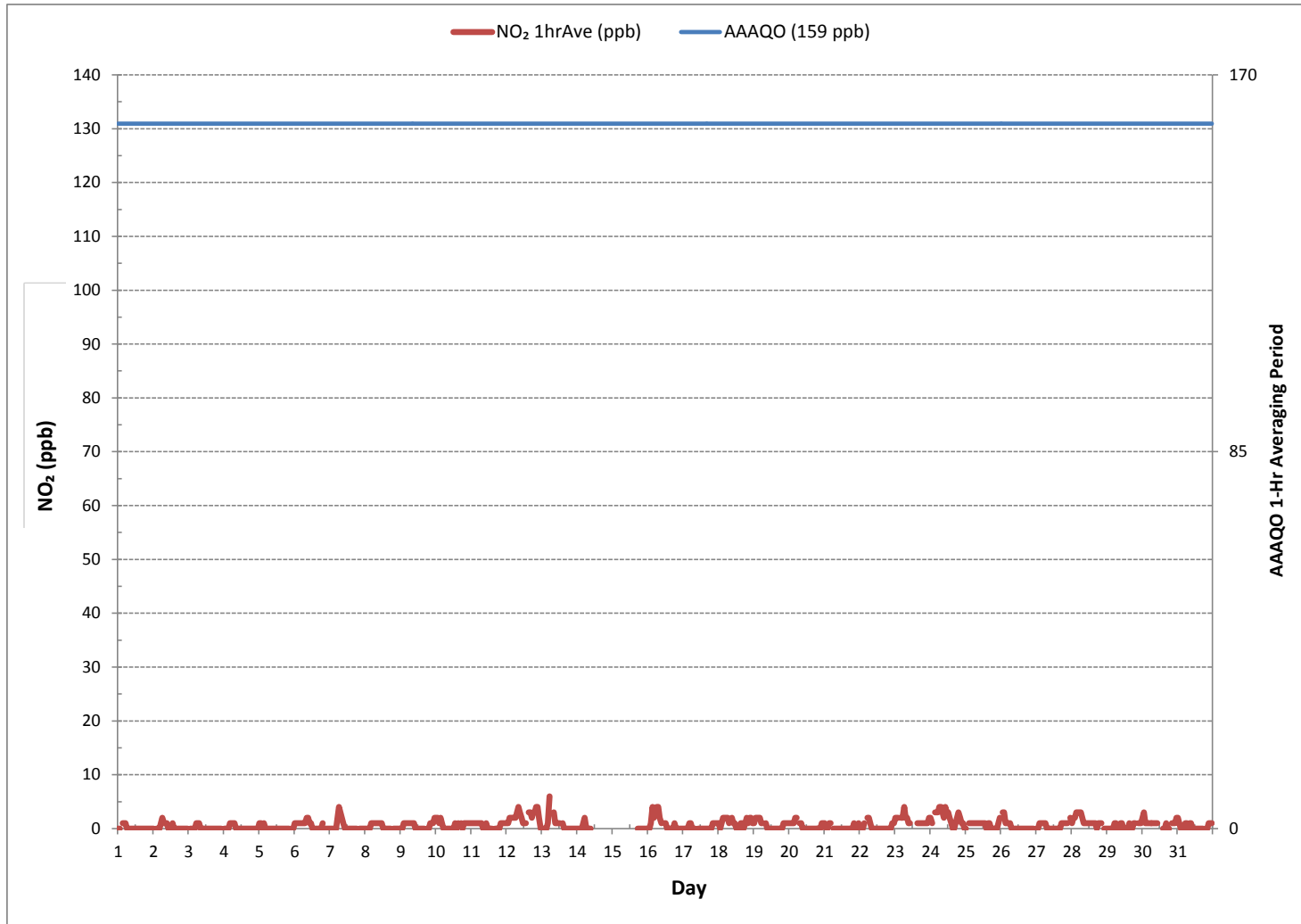
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	310			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY
MAXIMUM 1-HR AVERAGE:	6	ppb @ HOUR	5	ON DAY
MAXIMUM 24-HR AVERAGE:	2	ppb		ON DAY
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	720
MONTHLY CALIBRATION TIME:	14	hrs	AMD OPERATION UPTIME:	96.8
STANDARD DEVIATION:	1		MONTHLY AVERAGE:	1
				ppb

24 HR AVERAGES May 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



% Icon Classes (ppb)

94 0.0-2.3

6

2.3-4.7

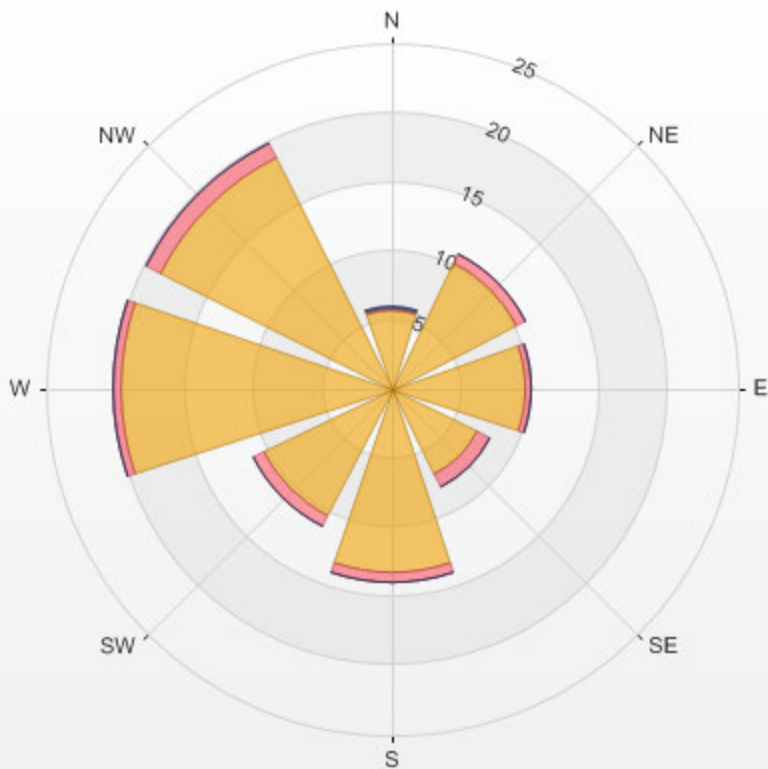
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4.7-7.0

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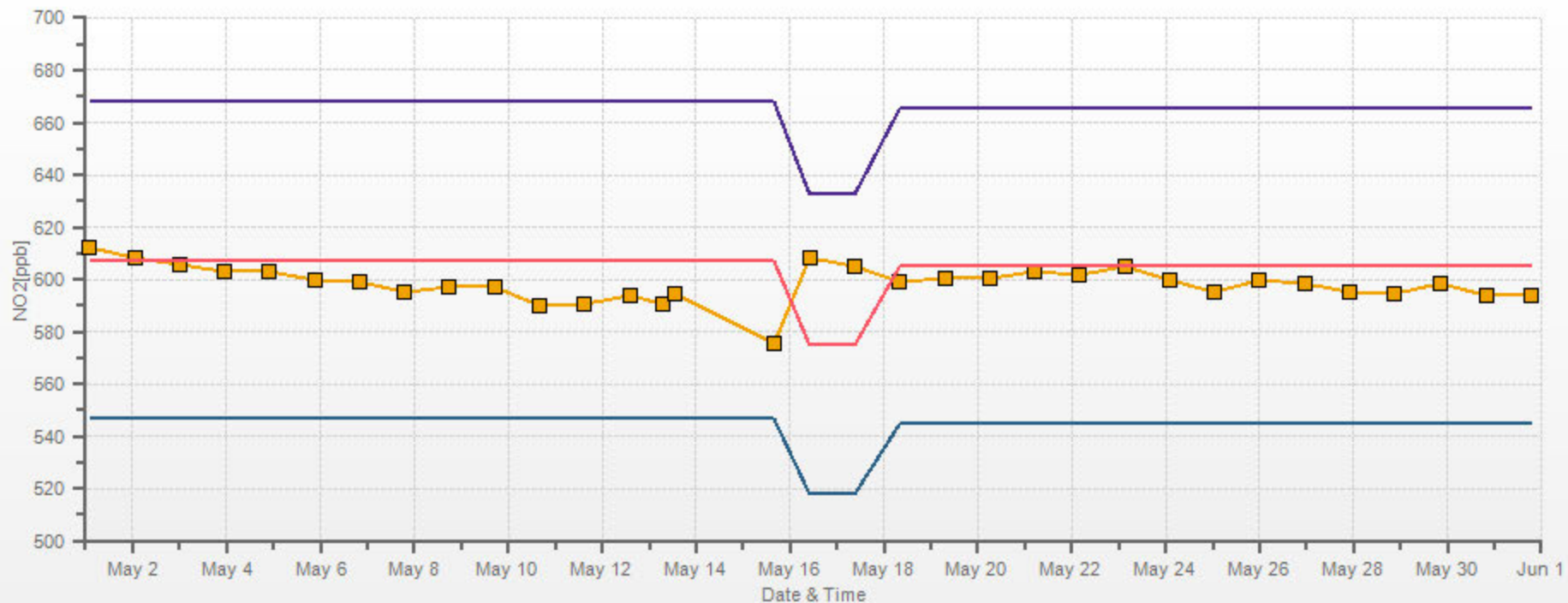
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LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/05 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	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	47.9	47.0	S	39.9	38.2	39.8	42.5	42.8	43.7	45.1	46.0	45.6	44.9	45.4	46.5	47.5	48.4	47.5	46.5	46.8	46.7	46.6	45.4	44.4	38.2	48.4	45.0	24	
2	44.2	S	38.2	35.7	33.5	30.7	28.5	28.4	34.9	39.4	47.1	P	50.3	48.3	47.4	46.2	45.5	45.1	48.7	46.5	44.7	43.5	42.6	41.7	28.4	50.3	41.4	23	
3	S	42.6	41.6	39.4	37.3	32.2	29.4	34.7	40.7	46.3	48.9	49.9	51.2	54.3	54.8	56.0	56.7	56.5	56.5	55.9	56.0	56.4	56.0	S	29.4	56.7	47.9	24	
4	54.9	52.8	48.4	49.1	49.9	48.4	43.2	41.2	48.6	50.8	50.7	51.4	50.4	50.5	50.6	50.3	49.5	49.2	48.7	48.3	48.5	48.6	S	49.0	41.2	54.9	49.3	24	
5	46.4	42.4	42.8	42.2	42.1	40.0	38.2	37.7	38.3	40.7	45.1	46.8	48.8	48.8	48.7	49.7	50.1	50.3	49.5	48.7	47.1	S	45.1	44.6	37.7	50.3	45.0	24	
6	43.4	41.6	40.1	39.4	38.7	37.9	36.1	34.3	39.2	44.6	48.7	50.8	50.2	50.8	51.0	52.7	53.1	56.6	57.1	57.3	S	52.6	51.1	50.7	34.3	57.3	46.9	24	
7	48.6	47.4	46.6	46.1	43.3	38.5	33.4	33.6	36.4	38.8	40.1	42.1	43.6	44.6	45.4	45.2	44.8	45.3	46.5	S	43.0	42.8	41.3	39.9	33.4	48.6	42.5	24	
8	41.5	42.6	42.0	40.5	35.4	34.2	31.0	28.7	27.3	32.1	37.6	43.6	46.2	45.9	46.1	50.7	50.0	49.2	S	50.9	47.9	45.4	39.3	38.1	27.3	50.9	41.1	24	
9	38.9	38.0	37.0	36.7	38.0	38.9	39.6	40.7	41.9	42.8	44.8	46.9	45.4	45.7	46.5	45.9	46.4	S	46.4	45.2	40.8	39.4	39.1	39.0	36.7	46.9	41.9	24	
10	37.7	36.7	36.7	35.8	37.6	43.6	43.5	44.1	44.5	44.6	45.3	49.3	49.8	50.1	50.7	50.5	S	49.3	48.3	45.6	44.2	41.0	40.7	38.8	35.8	50.7	43.8	24	
11	38.8	37.4	36.3	35.6	35.6	30.9	29.9	39.4	46.9	49.6	50.8	51.8	50.0	49.0	48.8	S	49.3	49.9	50.6	50.7	48.0	43.4	43.6	43.9	29.9	51.8	43.9	24	
12	42.7	40.7	37.2	34.1	31.4	29.2	27.8	26.8	27.1	35.1	40.9	43.2	47.0	46.9	S	46.9	47.7	47.8	45.4	42.3	41.2	41.8	41.6	41.2	26.8	47.8	39.4	24	
13	40.9	39.6	38.8	36.6	37.5	35.6	33.1	33.8	35.7	47.7	52.0	51.5	50.7	S	50.3	51.6	51.8	54.2	54.6	50.9	47.4	48.1	48.3	49.3	33.1	54.6	45.2	24	
14	50.5	49.1	45.1	41.2	40.4	39.4	40.0	40.4	40.3	42.7	45.6	49.5	S	54.5	56.9	Q	58.7	62.6	56.8	53.7	52.2	51.0	50.1	46.8	39.4	62.6	48.5	24	
15	40.6	40.0	37.5	36.4	37.0	36.9	36.0	36.8	43.3	48.3	48.0	S	49.4	50.3	50.5	50.7	51.9	52.6	52.0	51.7	52.4	53.3	53.4	54.1	36.0	54.1	46.2	24	
16	52.8	48.3	45.9	41.4	39.4	29.5	32.0	39.7	43.9	45.3	S	46.6	43.3	46.5	48.4	48.2	43.4	39.5	40.7	45.7	42.6	37.1	41.2	42.8	29.5	52.8	42.8	24	
17	33.0	29.2	27.1	27.7	26.1	25.4	23.4	26.4	30.8	S	38.0	41.0	43.1	44.1	43.9	44.5	45.7	44.7	43.1	40.4	36.5	35.8	34.8	34.6	23.4	45.7	35.6	24	
18	34.9	36.8	36.1	34.2	33.1	27.4	29.1	34.8	S	39.9	44.3	45.4	45.8	46.6	47.2	46.6	47.7	48.4	46.7	43.0	41.4	40.6	38.6	38.7	27.4	48.4	40.3	24	
19	37.7	35.7	35.8	35.3	33.9	35.0	32.6	S	38.8	43.7	46.2	48.5	49.9	51.7	53.2	52.8	52.9	54.3	55.6	55.0	51.6	49.2	47.8	46.8	32.6	55.6	45.4	24	
20	45.1	43.3	41.5	40.1	37.8	36.7	S	36.0	39.6	42.3	43.0	42.6	42.8	42.4	42.3	43.6	45.1	45.0	45.1	43.8	43.8	42.2	39.3	40.5	36.0	45.1	41.9	24	
21	43.1	44.8	45.7	38.4	39.6	S	29.4	28.9	33.9	40.6	47.9	50.1	50.2	48.9	47.7	46.3	45.3	44.9	47.8	45.3	41.0	41.8	43.6	40.0	28.9	50.2	42.8	24	
22	41.6	44.3	41.4	27.5	S	23.8	S1	S1	39.5	46.4	48.1	50.9	52.3	53.2	53.7	54.2	55.5	56.1	55.8	53.1	53.9	55.6	54.7	57.3	23.8	57.3	48.5	22	
23	52.9	51.5	49.7	S	46.6	46.0	42.4	44.6	49.5	57.7	60.8	62.0	63.0	58.1	61.0	C	C	C	C	64.3	62.0	59.5	60.1	56.8	42.4	64.3	55.2	24	
24	57.3	56.2	S	47.9	42.6	37.5	32.4	33.1	37.6	42.2	33.6	28.1	31.1	33.7	46.5	47.6	46.3	36.6	27.8	28.8	26.5	37.3	43.2	49.9	26.5	57.3	39.3	24	
25	46.8	S	28.7	30.5	31.9	31.7	31.1	28.1	28.1	27.9	32.9	45.6	49.5	49.6	44.8	43.8	42.5	40.3	40.3	40.3	40.0	39.9	33.3	28.5	27.9	49.6	37.2	24	
26	S	34.8	34.7	29.4	28.8	29.5	28.1	33.9	37.6	41.7	39.4	38.6	41.8	42.2	44.9	46.2	49.4	50.4	48.8	47.2	46.4	46.4	41.6	S	28.1	50.4	40.1	24	
27	40.5	41.3	33.0	30.1	33.5	34.3	35.8	36.6	37.6	39.0	40.6	43.5	44.4	45.4	45.7	47.7	49.3	50.7	53.8	55.2	56.5	55.7	S	50.8	30.1	56.5	43.5	24	
28	47.5	47.1	43.7	41.2	39.0	38.0	38.3	41.8	45.8	48.7	52.2	55.8	53.9	56.8	59.6	55.6	50.4	46.3	43.3	43.4	37.0	S	36.7	39.0	36.7	59.6	46.1	24	
29	35.5	34.1	32.1	35.5	35.3	34.1	34.1	34.7	35.8	38.5	39.6	39.8	41.0	41.3	41.0	40.6	41.0	41.3	40.1	38.4	S	35.7	34.7	31.8	31.8	41.3	37.2	24	
30	29.4	25.8	26.7	26.8	23.4	23.7	28.3	30.6	31.9	33.4	33.4	X	X	X	26.9	28.4	X	27.5	27.7	S	23.8	19.9	17.8	19.1	17.8	33.4	26.6	20	
31	19.5	21.1	19.6	19.0	21.3	18.1	19.1	20.2	21.6	24.8	28.8	30.4	31.5	30.6	29.4	28.0	26.1	28.2	S	29.0	27.0	25.5	24.7	24.4	18.1	31.5	24.7	24	
HOURLY MAX	57.3	56.2	49.7	49.1	49.9	48.4	43.5	44.6	49.5	57.7	60.8	62.0	63.0	58.1	61.0	56.0	58.7	62.6	57.1	64.3	62.0	59.5	60.1	57.3					
HOURLY AVG	42.6	41.1	38.3	36.5	36.3	34.2	33.4	34.9	38.0	42.0	44.0	46.1	46.9	47.5	47.7	47.1	48.0	47.3	47.3	47.2	44.5	44.0	42.4	42.2					

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

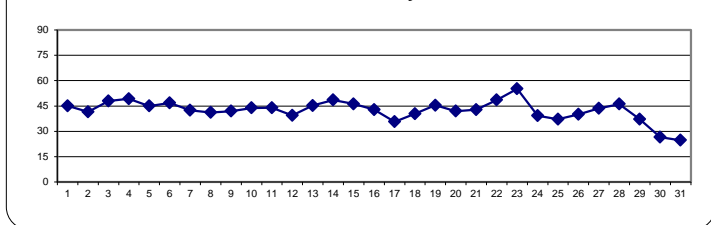
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 82 ppb

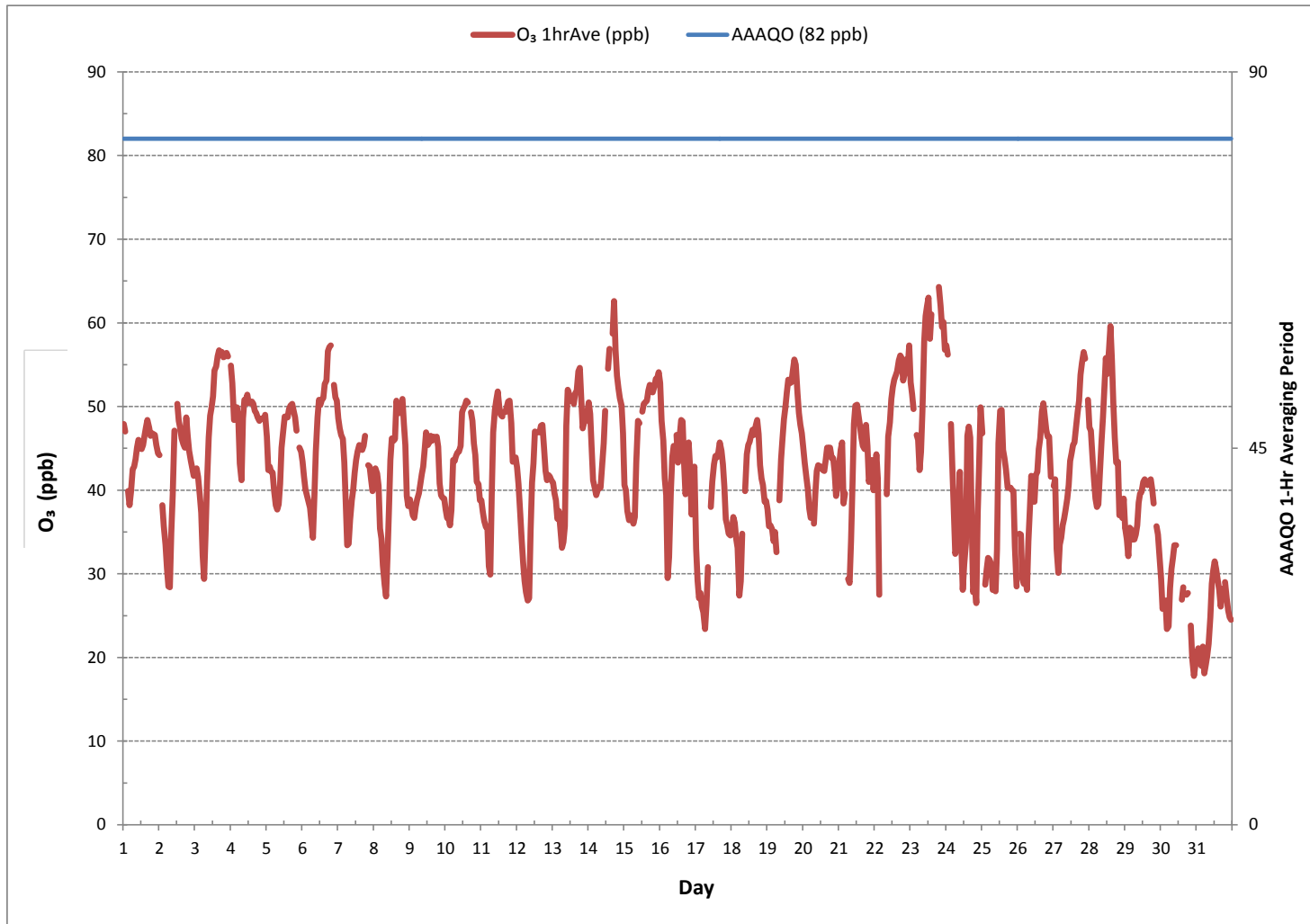
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	699			
MINIMUM 1-HR AVERAGE:	17.8 ppb	@ HOUR	22	ON DAY 30
MAXIMUM 1-HR AVERAGE:	64.3 ppb	@ HOUR	19	ON DAY 23
MAXIMUM 24-HR AVERAGE:	55.2 ppb			ON DAY 23
IZS CALIBRATION TIME:	33 hrs	OPERATIONAL TIME:	737 hrs	
MONTHLY CALIBRATION TIME:	4 hrs	AMD OPERATION UPTIME:	99.1 %	
STANDARD DEVIATION:	8.5	MONTHLY AVERAGE:	42.4 ppb	

24 HR AVERAGES May 2018



OZONE Hourly Averages (O₃ ppb)



% Icon Classes (ppb)

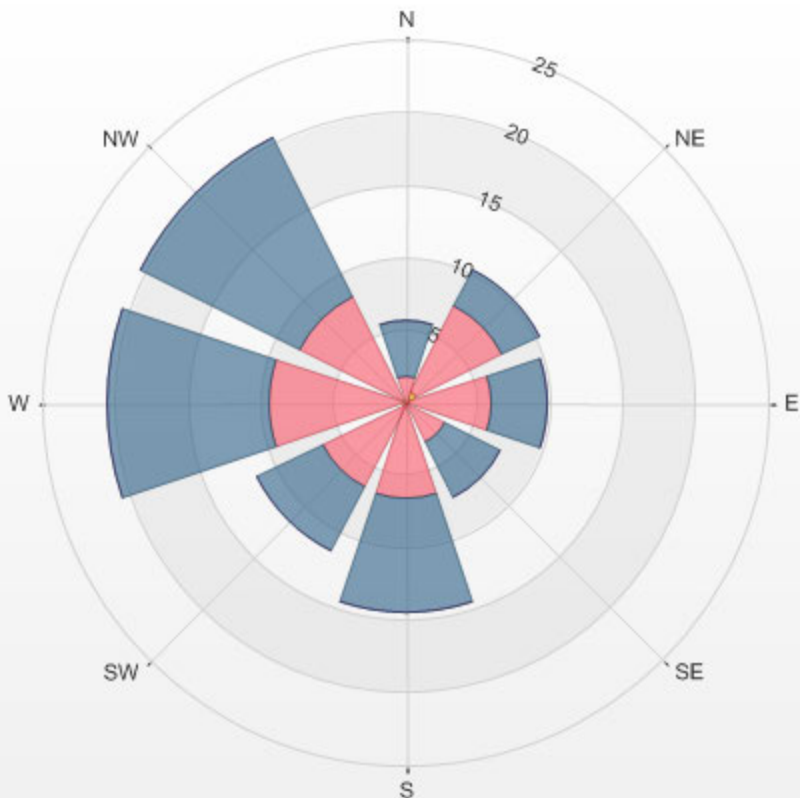
2 0.0-21.5

47 21.5-42.9

51 42.9-64.4

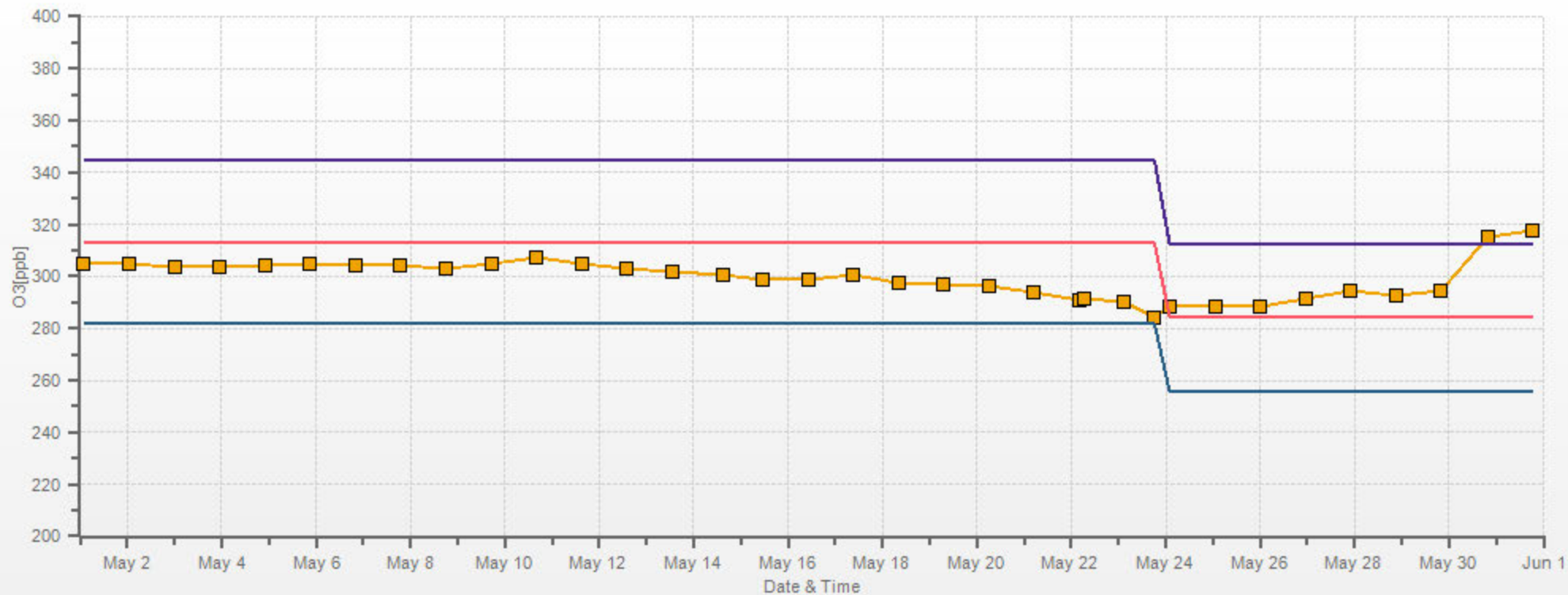
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LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



O3[ppb] Calibration: LICA ST. LINA Monthly: 18/05 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	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	8	7	6	7	8	14	9	6	6	6	6	6	5	3	4	5	4	4	4	3	4	4	4	4	3	14	6	24
2	5	6	6	6	6	7	7	6	5	5	6	P	6	5	3	3	3	3	4	3	2	2	2	2	2	2	7	4	23
3	2	2	2	2	3	4	5	6	7	6	6	7	6	5	4	4	3	3	3	3	3	3	3	3	3	2	7	4	24
4	4	4	4	5	5	5	5	5	4	2	2	2	2	1	2	2	2	2	2	2	2	2	2	3	4	1	5	3	24
5	5	5	4	4	4	4	4	3	4	4	3	3	3	3	5	5	5	4	4	3	4	5	6	6	6	3	6	4	24
6	7	8	8	7	6	6	6	6	6	6	6	5	4	4	4	4	5	5	5	6	6	5	5	5	5	4	8	6	24
7	4	3	3	2	3	4	3	3	2	2	1	2	2	2	2	2	2	2	2	3	2	2	3	3	3	1	4	2	24
8	3	3	3	4	5	4	5	6	6	6	7	7	6	6	6	8	10	10	8	6	3	3	1	8	1	10	6	24	
9	4	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	4	3	1	4	2	24	
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14	6	6	6	6	6	5	7	10	17	23	20	14	16	13	8	8	8	9	7	7	8	8	9	10	5	23	10	24	
15	11	12	13	10	10	8	8	8	7	6	7	7	7	7	7	7	7	7	8	8	9	9	9	9	9	6	13	8	24
16	9	9	10	10	12	16	18	42	33	14	11	11	13	12	2	3	3	3	3	3	2	2	2	2	2	42	10	24	
17	2	2	2	2	2	3	6	4	3	3	3	3	4	5	4	4	3	3	3	3	5	6	6	7	2	7	4	24	
18	7	7	8	14	13	14	10	7	7	6	6	7	6	6	5	6	5	5	6	6	7	8	10	9	5	14	8	24	
19	9	9	9	15	16	9	7	6	4	4	4	4	4	3	3	3	3	3	4	5	5	5	6	6	3	16	6	24	
20	6	7	7	8	8	9	8	7	6	6	5	5	4	3	3	3	3	3	4	4	4	5	6	6	3	9	5	24	
21	6	5	5	9	7	11	15	15	12	12	10	9	8	7	7	6	5	6	11	6	6	7	9	11	5	15	9	24	
22	10	10	13	17	18	23	28	19	14	12	11	9	9	8	7	7	6	6	7	7	8	8	10	13	6	28	12	24	
23	15	16	17	19	19	18	17	15	13	9	9	10	11	13	14	16	21	32	25	21	16	15	14	14	9	32	16	24	
24	10	8	10	10	14	19	16	9	7	5	7	C	C	C	C	8	6	6	8	10	13	11	13	12	5	19	10	24	
25	13	16	21	20	19	19	20	17	15	27	36	33	5	4	4	5	4	3	4	4	5	5	6	7	3	36	13	24	
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27	3	4	5	5	5	5	4	3	3	2	2	2	3	2	2	3	4	4	4	5	6	6	7	7	2	7	4	24	
28	7	7	8	9	9	9	9	9	8	8	9	10	9	9	10	11	12	16	22	32	19	12	5	4	4	32	11	24	
29	4	4	5	4	4	4	3	3	4	18	26	23	13	11	11	8	5	5	5	9	8	22	30	19	3	30	10	24	
30	11	10	12	10	10	7	12	18	24	26	22	X	X	X	11	11	6	4	4	4	3	3	3	3	3	26	10	21	
31	3	3	3	3	3	4	4	3	2	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	1	4	3	24	
HOURLY MAX	15	16	21	20	19	23	28	42	33	27	36	33	14	16	14	16	21	32	25	32	19	22	30	19					
HOURLY AVG	6	7	7	8	8	8	9	9	8	8	8	8	6	5	5	5	5	6	6	6	6	6	6	7					

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

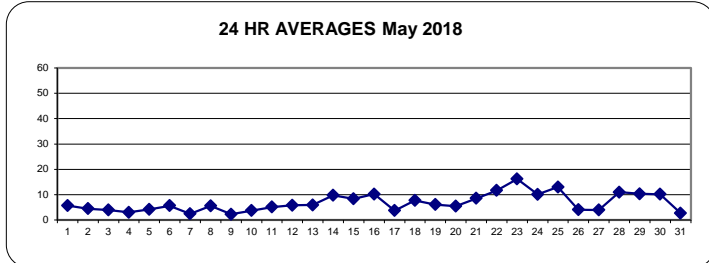
OBJECTIVE LIMIT:

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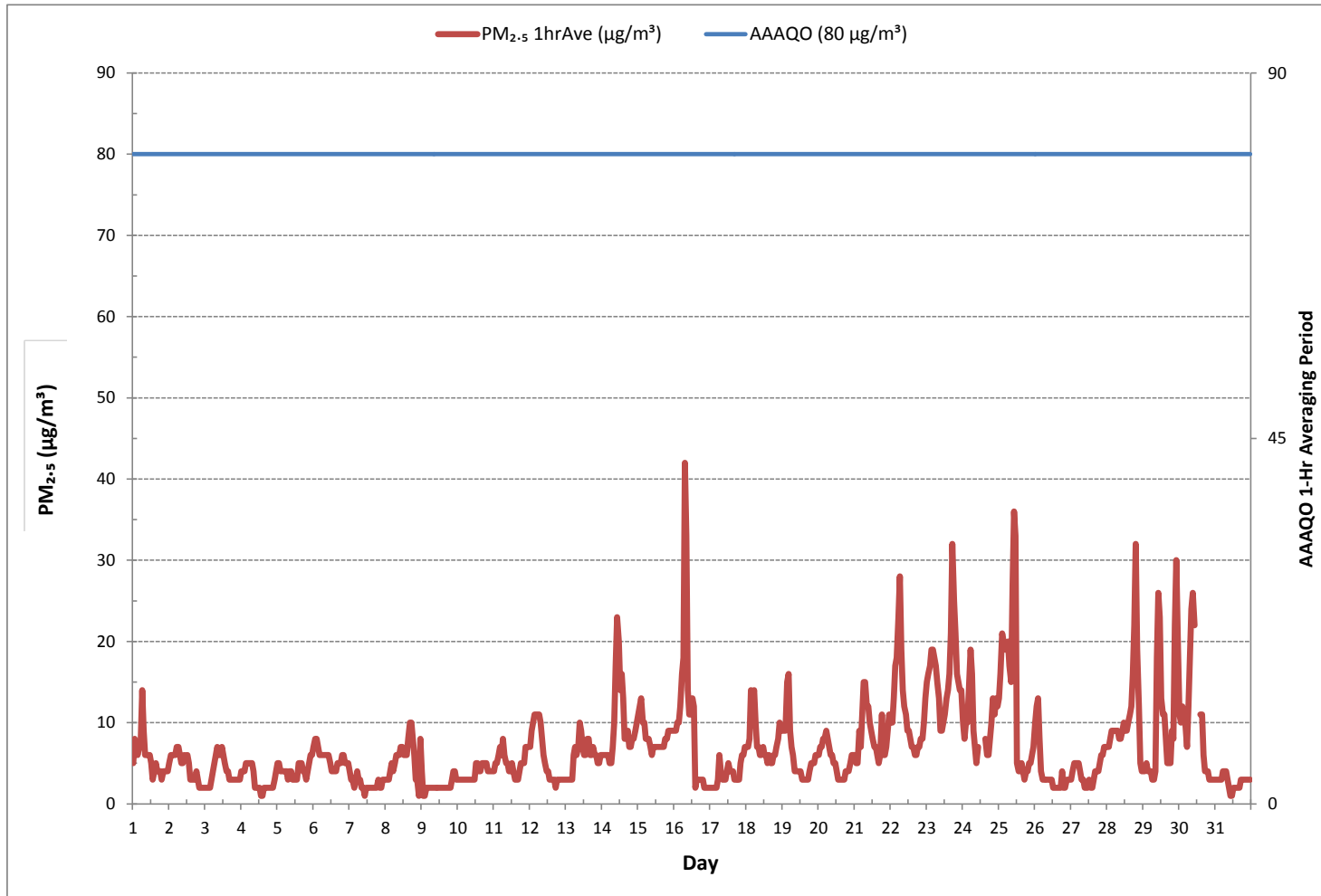
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	736		
MINIMUM 1-HR AVERAGE:	1 µg/m ³ @ HOUR	13 ON DAY	4
MAXIMUM 1-HR AVERAGE:	42 µg/m ³ @ HOUR	7 ON DAY	16
MAXIMUM 24-HR AVERAGE:	16 µg/m ³	ON DAY	23
MONTHLY CALIBRATION TIME:	4 hrs	OPERATIONAL TIME:	740 hrs
STANDARD DEVIATION:	5	AMD OPERATION UPTIME:	99.5 %
		MONTHLY AVERAGE:	7 µg/m ³

24 HR AVERAGES May 2018



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



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m3]
 Monthly: 18/05
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

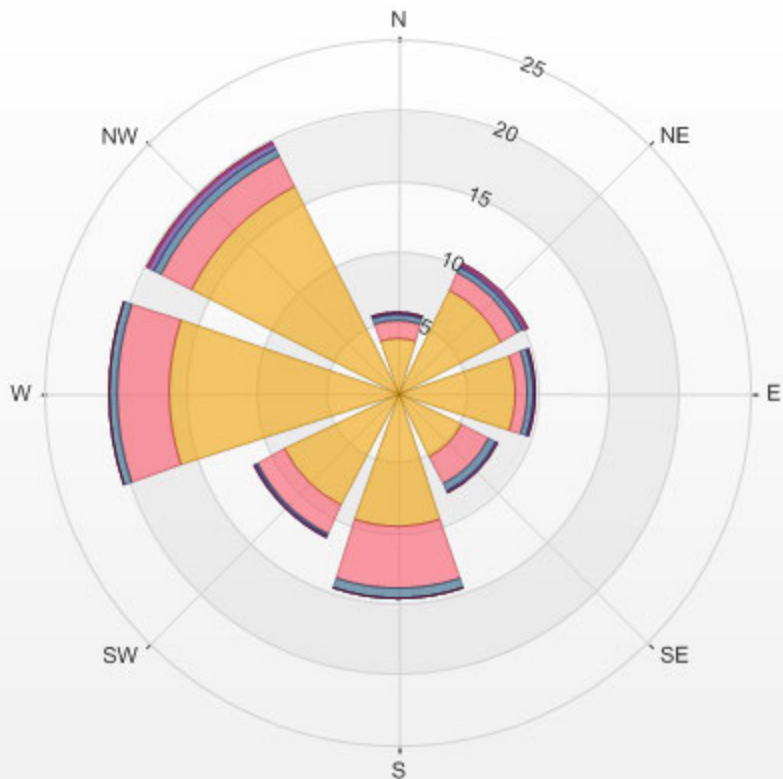
Calm: 0.00%

Calm Avg: 0.00 [ug/m3(L)]

Direction	0.0-8.6	8.6-17.2	17.2-25.8	25.8-34.4	34.4-43.0	>43.0	Total
N	3.9	1.2	0.4	0.1	0.0	0.0	5.7
NE	8.2	1.4	0.4	0.3	0.1	0.0	10.3
E	8.3	1.0	0.4	0.1	0.0	0.0	9.8
SE	5.2	2.0	0.5	0.1	0.0	0.0	7.9
S	9.5	4.4	0.7	0.0	0.0	0.0	14.5
SW	9.0	2.2	0.1	0.1	0.0	0.0	11.4
W	16.2	3.8	0.5	0.0	0.0	0.0	20.5
NW	16.3	2.5	0.5	0.4	0.1	0.0	19.8
Summary	76.5	18.3	3.7	1.2	0.3	0.0	100.0

% Icon	Classes (ug/m3(L))	76	 0.0-8.6	18	 8.6-17.2	4	 17.2-25.8	1	 25.8-34.4	0	 34.4-43.0	0	 >43.0
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LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



WIND SPEED



WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	8.7	5.8	7.7	9.7	11.9	13.3	16.2	17.4	16.8	20.3	18.2	18.8	17.9	17.3	15.5	16.2	13.1	9.0	6.3	2.0	2.3	3.3	7.1	9.1	2.0	20.3	9.3	24
2	9.3	8.9	7.4	7.3	7.3	7.9	8.1	9.2	12.3	12.6	17.1	P	25.9	26.9	21.6	20.2	15.5	9.5	13.2	13.9	12.5	14.9	12.8	10.1	7.3	26.9	10.3	23
3	11.2	11.6	11.2	11.0	10.0	9.2	12.0	12.1	14.0	15.7	16.1	17.0	18.9	22.0	19.6	19.2	17.9	16.2	12.5	9.6	8.0	7.6	7.7	7.3	7.3	22.0	11.8	24
4	6.9	8.0	8.9	8.9	8.2	5.3	2.7	5.6	12.7	14.2	19.2	18.5	17.9	20.3	18.9	17.7	13.0	11.8	11.3	8.8	8.1	6.5	5.7	6.6	2.7	20.3	10.1	24
5	6.6	8.0	8.2	10.2	10.8	11.1	11.2	12.8	11.4	7.8	5.1	9.5	12.4	9.8	11.3	9.2	8.4	9.4	6.7	3.4	7.8	8.7	8.4	8.2	3.4	12.8	7.8	24
6	8.7	8.1	8.9	9.8	10.1	8.4	8.0	8.8	6.4	8.8	11.4	20.1	21.8	17.7	18.7	16.8	14.9	11.8	7.5	4.6	5.8	7.8	8.4	9.0	4.6	21.8	8.3	24
7	10.4	9.4	10.4	10.1	11.5	13.4	13.8	17.1	19.9	24.4	23.1	22.6	21.9	20.1	18.8	18.3	16.1	16.7	18.5	15.0	13.3	14.0	12.7	13.6	9.4	24.4	15.4	24
8	13.3	10.0	4.0	6.0	11.0	10.6	8.5	7.0	7.3	9.3	9.6	8.4	10.1	17.0	15.6	21.2	21.2	22.8	26.1	21.0	18.0	19.9	18.6	19.2	4.0	26.1	6.3	24
9	19.7	15.2	11.0	12.7	14.3	8.3	10.3	15.3	12.3	10.4	12.6	12.3	12.1	15.7	13.7	10.5	8.9	8.4	9.7	8.0	9.4	10.0	11.4	14.4	8.0	19.7	10.5	24
10	13.7	14.6	11.1	8.5	7.2	11.1	13.1	15.7	15.8	15.2	13.4	14.3	12.9	11.5	11.9	8.0	7.6	7.9	8.0	11.5	11.0	9.6	8.9	8.7	7.2	15.8	9.9	24
11	7.5	8.2	7.8	8.0	7.8	6.1	6.9	6.8	10.0	10.2	16.0	13.4	10.5	7.3	7.7	7.4	8.6	6.1	2.8	4.2	8.8	11.4	12.9	16.2	2.8	16.2	7.0	24
12	14.4	11.7	10.6	9.5	11.3	13.0	12.5	11.5	13.6	16.7	17.0	22.2	24.0	19.1	17.8	15.6	15.8	14.9	14.0	10.8	8.8	8.3	9.8	10.1	8.3	24.0	10.9	24
13	10.5	10.5	11.1	10.3	10.2	6.6	3.8	5.2	7.4	14.8	16.4	18.9	21.5	22.8	21.3	17.5	18.0	14.4	12.1	8.3	8.3	9.9	8.8	10.4	3.8	22.8	9.4	24
14	10.3	11.1	12.9	14.0	14.5	14.3	16.8	16.0	13.5	11.2	10.3	11.5	11.1	9.4	8.2	7.6	5.2	13.1	16.0	7.2	6.8	6.5	7.2	7.8	5.2	16.8	9.4	24
15	8.0	10.5	9.1	9.3	9.3	10.1	9.3	8.8	14.5	22.2	21.2	21.1	16.7	16.6	16.4	14.9	13.9	10.4	8.9	7.3	6.6	8.0	9.4	7.3	6.6	22.2	10.9	24
16	5.5	2.3	5.9	6.5	6.8	7.4	10.0	13.6	17.9	20.8	19.9	20.2	18.2	17.0	17.7	16.9	15.8	17.9	17.9	14.1	14.2	13.2	11.5	7.6	2.3	20.8	11.8	24
17	10.6	11.1	9.8	9.9	11.8	13.3	13.6	14.4	14.3	14.3	15.6	14.5	14.4	10.6	9.9	9.2	8.5	5.4	2.8	4.9	7.7	13.6	11.6	10.5	2.8	15.6	6.9	24
18	10.6	8.8	7.1	7.6	7.5	6.7	8.7	10.8	9.4	8.8	10.2	9.4	11.0	7.8	7.1	6.0	9.0	10.5	5.6	6.0	7.9	7.3	8.2	8.0	5.6	11.0	7.7	24
19	8.8	9.1	9.2	9.9	9.3	8.9	9.6	8.2	13.1	19.4	21.9	19.7	17.4	16.1	13.7	12.7	13.5	12.6	10.2	9.3	9.3	9.7	9.7	10.8	8.2	21.9	11.9	24
20	8.7	8.4	9.4	8.4	9.6	8.7	8.1	11.2	13.9	17.7	16.8	16.4	16.3	14.9	14.8	13.6	12.8	10.3	9.9	7.0	7.7	8.3	8.1	7.2	7.0	17.7	10.3	24
21	8.8	6.2	2.7	6.6	8.4	6.3	6.4	6.5	7.8	10.0	9.6	12.5	9.9	9.8	8.5	12.0	15.3	8.8	11.4	5.4	5.9	9.7	9.3	4.8	2.7	15.3	5.5	24
22	2.8	6.5	6.6	6.4	1.1	4.5	4.9	2.4	2.7	3.2	2.9	3.3	3.1	3.2	6.6	2.8	3.2	2.2	0.8	2.2	2.1	5.3	7.7	7.5	0.8	7.7	2.0	24
23	8.9	9.5	8.3	9.6	9.0	6.8	4.5	4.0	3.6	2.3	5.7	7.6	9.7	6.7	5.5	7.3	10.0	9.3	8.6	8.2	10.4	9.8	10.6	10.3	2.3	10.6	7.0	24
24	11.2	10.5	9.1	9.6	6.8	8.5	10.1	9.3	8.4	5.3	3.6	3.4	5.8	5.7	8.2	9.4	3.9	1.3	1.1	3.6	7.7	9.2	10.3	7.3	1.1	11.2	1.1	24
25	7.6	8.9	10.3	10.5	10.9	7.5	9.5	10.2	10.8	10.1	10.6	9.3	8.6	11.9	11.0	7.0	6.1	5.6	4.2	4.1	5.3	6.1	5.5	3.9	3.9	11.9	5.9	24
26	8.7	10.9	5.1	11.8	13.4	10.2	9.2	10.8	14.3	13.5	14.0	14.1	13.4	12.6	15.1	14.9	14.0	11.7	10.1	7.8	6.1	7.4	6.9	6.5	5.1	15.1	8.9	24
27	7.1	7.1	6.2	9.2	11.4	11.2	11.6	15.1	16.1	18.2	15.7	16.6	12.5	13.1	14.0	15.3	12.9	12.3	11.7	6.5	4.3	8.6	8.9	10.7	4.3	18.2	9.3	24
28	11.6	12.9	11.4	12.7	13.1	12.7	13.6	18.0	17.8	12.2	10.6	9.7	9.9	7.1	10.8	17.1	17.8	18.5	15.4	16.2	16.5	17.8	15.8	14.8	7.1	18.5	2.3	24
29	9.1	9.8	5.0	10.1	12.5	12.2	12.5	13.6	12.0	15.1	16.6	12.3	10.8	11.7	11.3	9.6	9.4	10.6	7.2	4.0	4.7	8.2	9.1	10.9	4.0	16.6	9.0	24
30	10.0	10.4	12.9	9.8	7.2	9.2	10.4	11.0	10.0	12.0	12.8	X	X	X	10.6	12.4	12.6	15.0	12.0	9.2	8.2	5.3	4.1	5.3	4.1	15.0	9.2	21
31	5.7	6.7	8.7	9.3	7.5	6.3	6.2	4.9	7.7	11.2	12.0	10.9	8.4	7.3	5.6	6.6	7.4	10.3	9.6	8.7	10.2	11.4	10.1	9.9	4.9	12.0	7.1	24
HOURLY MAX	19.7	15.2	12.9	14.0	14.5	14.3	16.8	18.0	19.9	24.4	23.1	22.6	25.9	26.9	21.6	21.2	21.2	22.8	26.1	21.0	18.0	19.9	18.6	19.2				

STATUS FLAG CODES

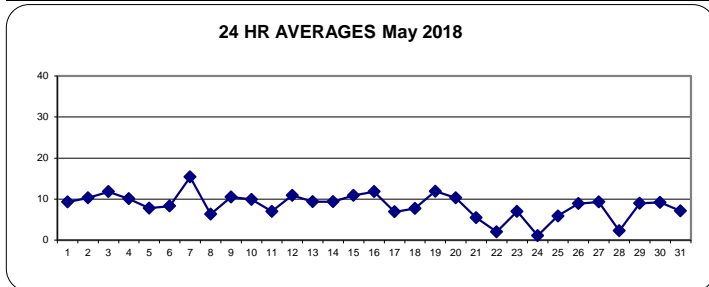
C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

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

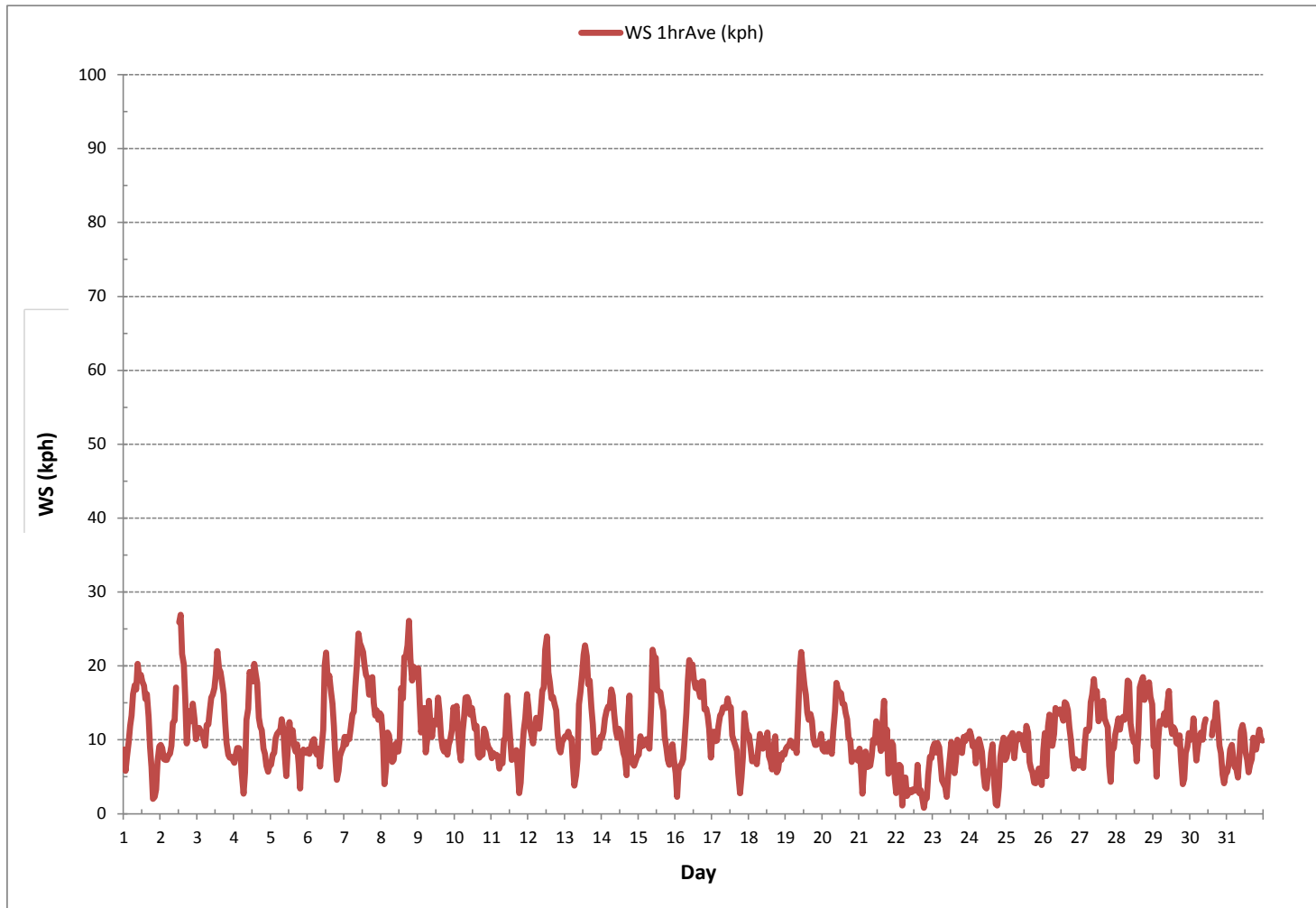
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	740
MINIMUM 1-HR AVERAGE	0.8 kph @ HOUR 18 ON DAY 22
MAXIMUM 1-HR AVERAGE:	26.9 kph @ HOUR 13 ON DAY 2
MAXIMUM 24-HR AVERAGE:	15.4 kph ON DAY 7
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	740 hrs
AMD OPERATION UPTIME:	99.5 %
STANDARD DEVIATION:	4.5
MONTHLY AVERAGE:	2.3 kph

24 HR AVERAGES May 2018



WIND SPEED Hourly Averages (WS kph)



Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 18/05
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.00%

Direction	0.4-5.4	5.4-10.8	10.8-16.2	16.2-21.6	21.6-27.0	>27.0	Total
N	0.7	2.8	0.5	1.6	0.1	0.0	5.8
NE	0.5	3.4	3.9	1.9	0.5	0.0	10.3
E	0.5	5.5	3.0	0.7	0.0	0.0	9.7
SE	1.1	4.1	2.3	0.4	0.0	0.0	7.8
S	1.6	7.0	4.7	1.0	0.1	0.0	14.5
SW	0.8	7.8	2.0	0.5	0.1	0.0	11.4
W	1.2	10.7	6.8	1.4	0.5	0.0	20.6
NW	2.0	7.2	5.8	4.5	0.5	0.0	20.0
Summary	8.5	48.5	29.1	11.9	2.0	0.0	100.0

% Icon Classes (kph)

9 0.4-5.4

49 5.4-10.8

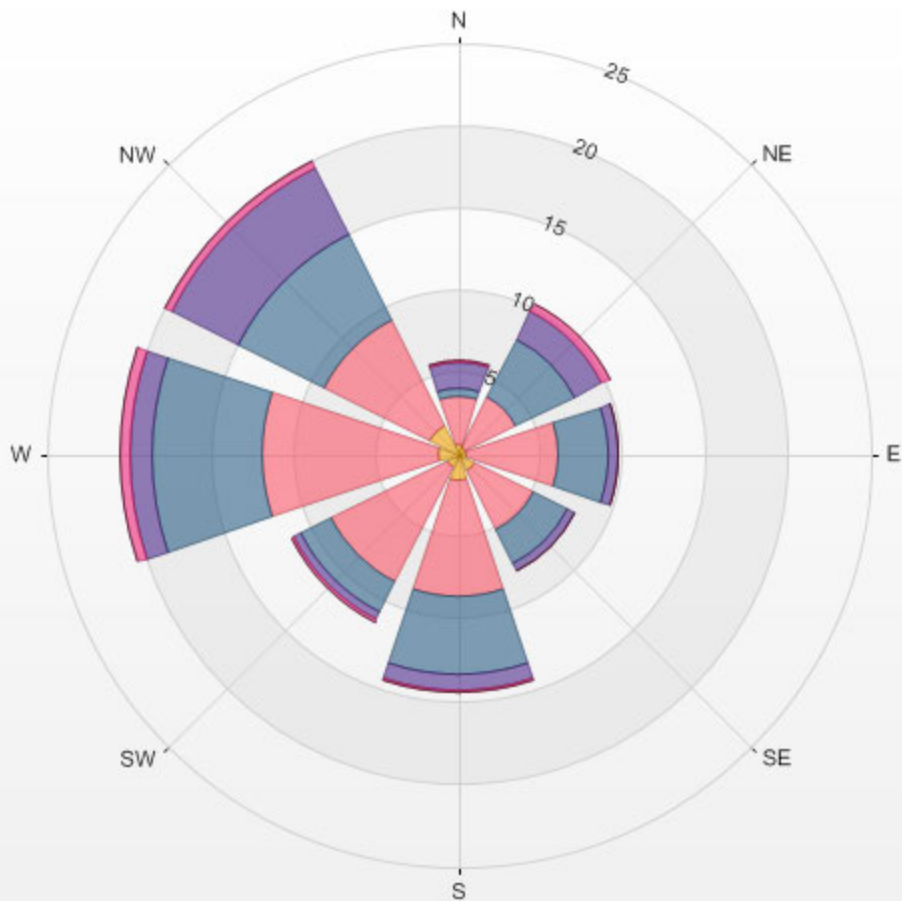
29 10.8-16.2

12 16.2-21.6

2 21.6-27.0

0 >27.0

LICA ST. LINA 2018/05/01 00:00 - 2018/05/31 23:00 Calm: 0.00%



WIND DIRECTION



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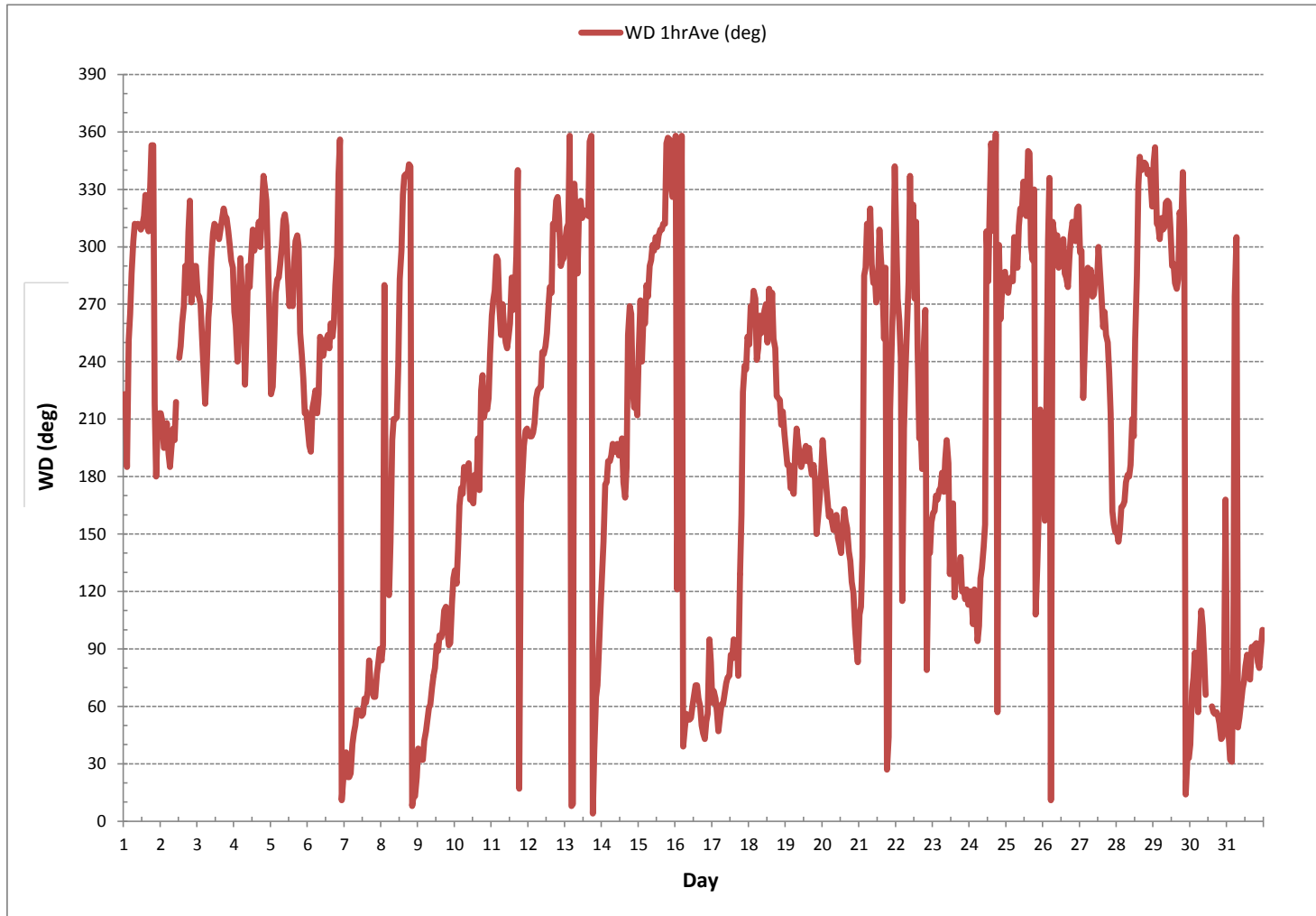
STATUS FLAG CODES

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
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	740	hrs
STANDARD DEVIATION:	95		AMD OPERATION UPTIME:	99.5	%
			MONTHLY AVERAGE:	280	(W)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	32	15	18	10	8	13	15	15	17	16	16	15	16	15	17	17	16	18	18	26	10	9	3	6	24	
2	6	6	5	6	5	7	11	13	11	16	14	P	13	14	18	17	20	20	18	19	12	14	13	12	23	
3	9	8	9	6	6	7	6	12	15	20	20	22	20	18	20	19	17	18	16	12	11	9	7	7	24	
4	9	11	8	13	14	13	18	13	17	20	22	20	20	19	19	19	23	18	15	13	10	11	7	4	24	
5	5	4	8	11	12	13	15	16	19	26	60	27	32	33	32	38	30	23	26	16	7	5	7	6	24	
6	7	7	8	7	7	5	7	9	24	22	22	16	15	19	17	23	18	20	24	13	9	10	5	6	24	
7	7	7	5	6	8	11	11	12	13	13	13	15	15	16	17	17	18	14	12	11	9	11	10	10	24	
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11	5	6	9	11	10	8	8	17	19	23	21	23	29	43	42	35	25	31	30	25	8	11	11	12	24	
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21	3	7	11	15	11	17	20	21	22	24	28	22	29	30	31	27	15	19	19	14	40	6	11	22	24	
22	19	6	6	10	36	14	13	36	42	59	59	51	59	60	39	68	52	52	53	13	30	7	10	4	24	
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30	14	14	14	14	13	12	13	12	14	14	16	X	X	X	14	13	14	12	13	13	12	18	10	18	21	
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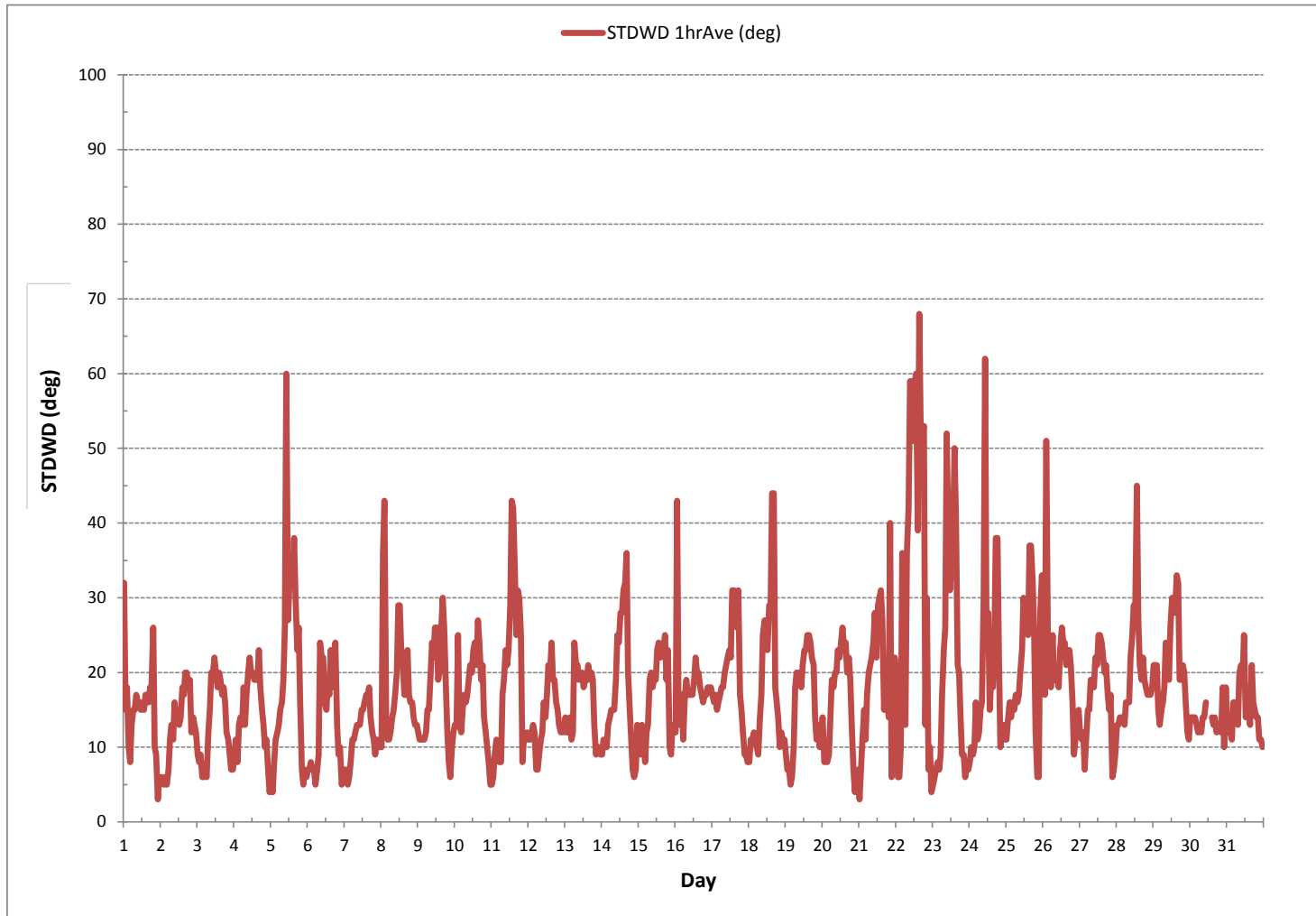
STATUS FLAG CODES

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: 740 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



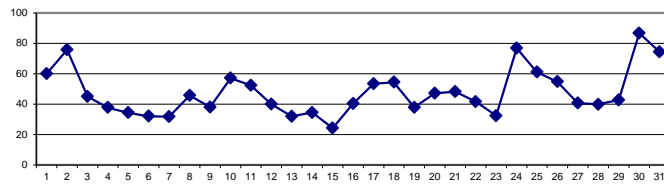
RELATIVE HUMIDITY Hourly Averages (RH %)

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

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

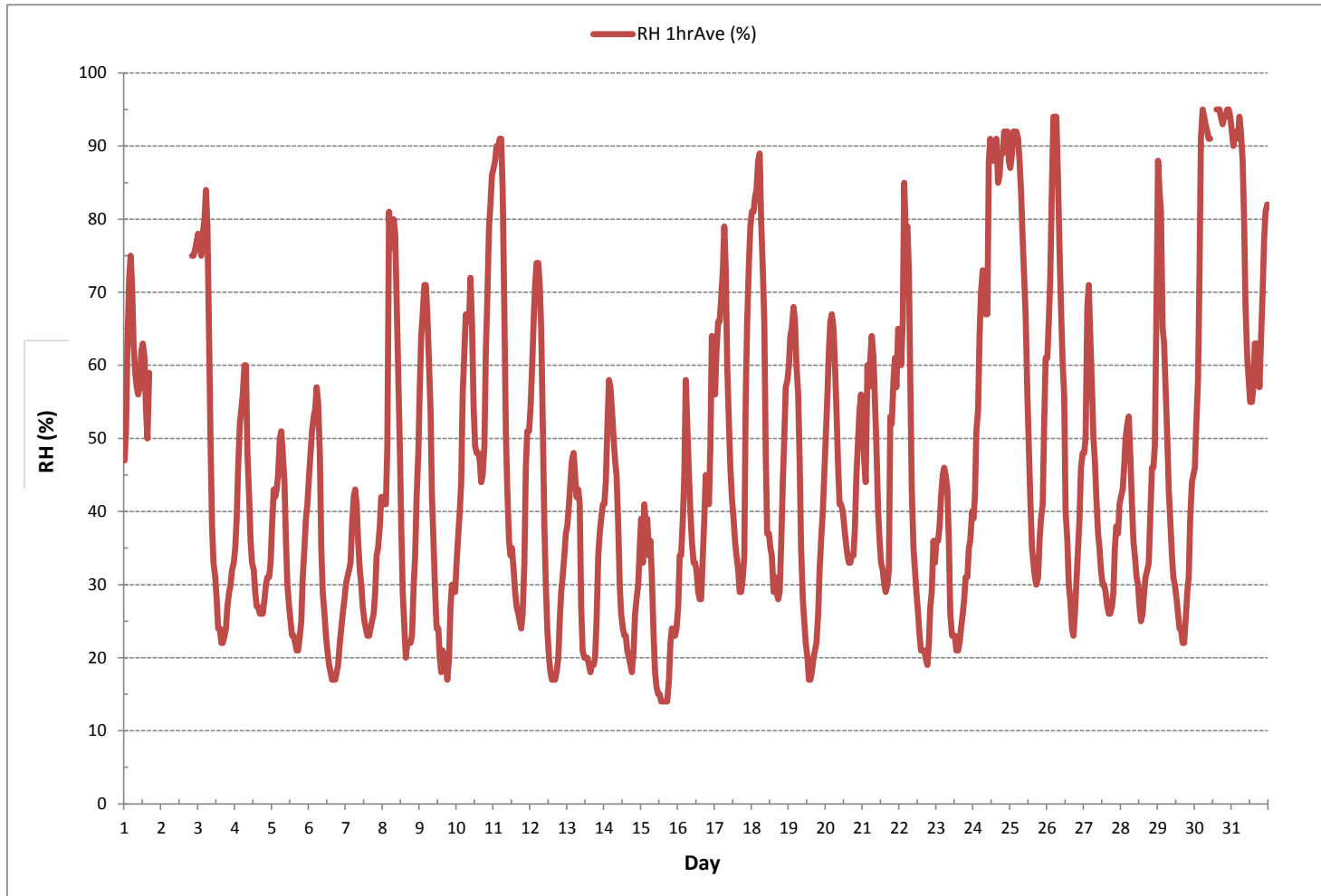
24 HR AVERAGES May 2018



MONTHLY SUMMARY

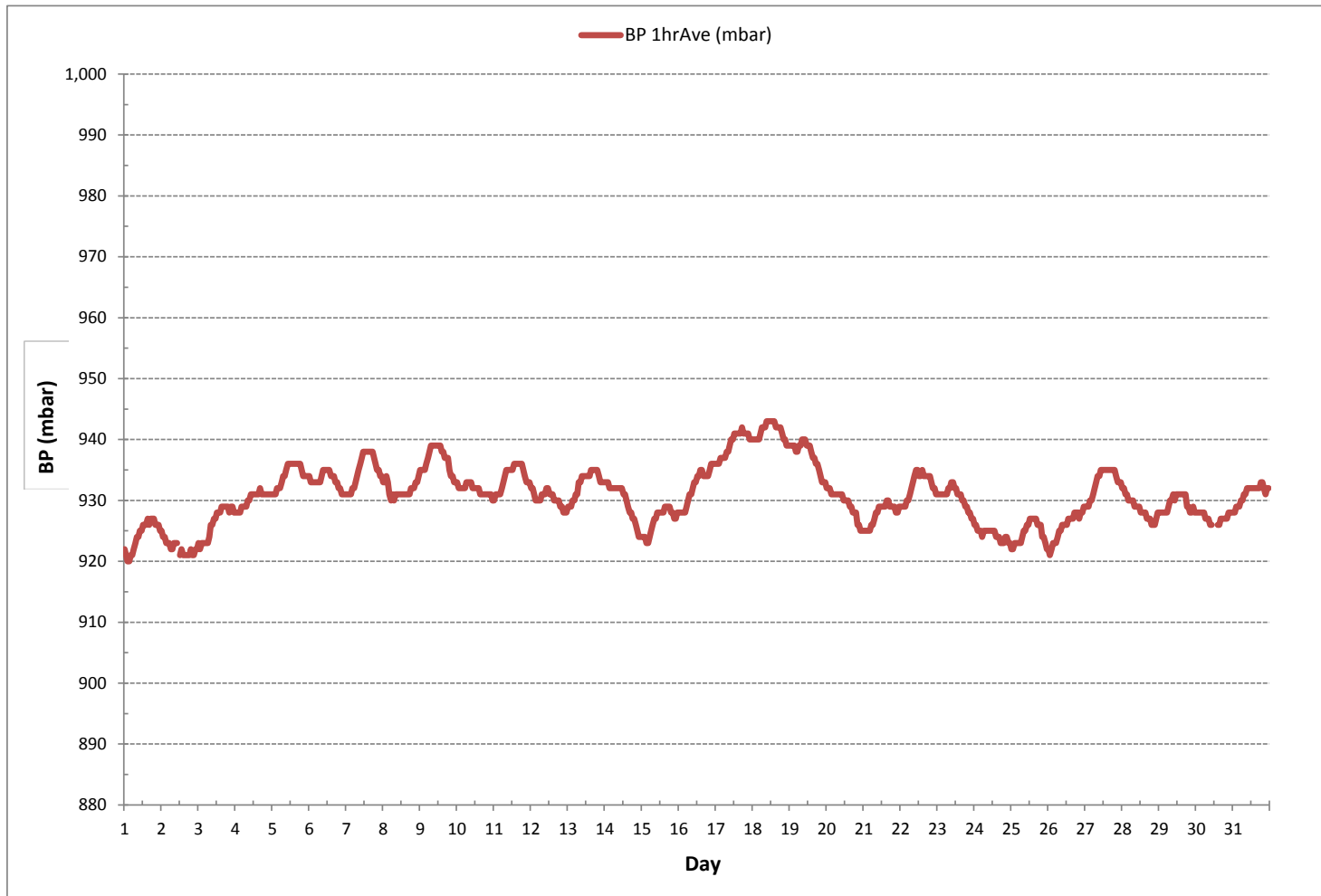
MINIMUM 1-HR AVERAGE:	14	%	@ HOUR	13	ON DAY	15
MAXIMUM 1-HR AVERAGE:	95	%	@ HOUR	5	ON DAY	30
MAXIMUM 24-HR AVERAGE:	87	%			ON DAY	30
OPERATIONAL TIME:						714 hrs
AMD OPERATION UPTIME:						96.0 %
STANDARD DEVIATION:	22					MONTHLY AVERAGE: 46 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



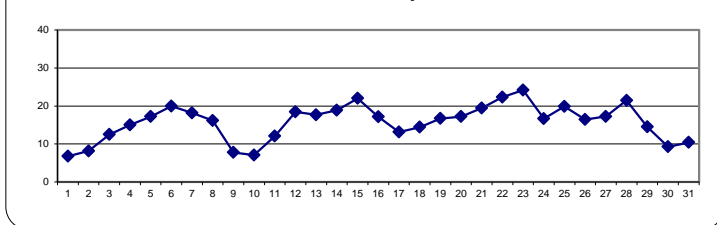
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY 1	6.0	5.6	4.5	3.8	4.1	4.3	5.9	7.3	8.6	9.0	8.4	7.2	7.2	7.6	8.6	9.7	7.4	Y	Y	Y	Y	Y	Y	Y	3.8	9.7	6.8	17				
DAY 2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	9.0	8.6	7.9	7.1	7.1	9.0	8.2	4
DAY 3	6.6	6.8	6.5	5.7	5.0	4.3	5.6	9.4	12.0	14.2	15.7	16.5	17.3	17.5	17.8	18.3	18.2	17.9	17.1	15.4	14.1	13.4	12.5	12.1	4.3	18.3	12.5	24				
DAY 4	11.1	10.4	9.9	10.4	10.6	10.0	10.1	11.0	14.0	15.3	16.8	17.7	17.9	18.4	18.6	18.8	19.3	19.6	19.2	17.9	16.3	16.1	15.9	14.9	9.9	19.6	15.0	24				
DAY 5	13.5	12.8	13.2	13.1	12.7	12.1	12.5	13.8	15.2	16.9	18.6	19.8	20.4	21.3	21.9	22.1	22.5	22.5	22.0	20.4	18.3	16.8	15.6	14.9	12.1	22.5	17.2	24				
DAY 6	13.8	12.7	11.7	11.4	11.1	10.7	11.7	14.6	18.7	20.9	23.0	24.3	25.3	26.0	26.5	26.5	27.0	26.9	26.4	25.1	23.3	21.5	20.5	19.4	10.7	27.0	20.0	24				
DAY 7	18.4	17.7	16.9	16.1	14.5	13.4	14.1	15.5	17.7	19.7	20.4	21.3	21.6	22.2	22.4	22.4	22.2	21.5	20.2	18.2	16.0	15.3	14.6	13.8	13.4	22.4	18.2	24				
DAY 8	13.3	12.8	13.0	12.2	9.7	10.2	10.3	10.6	12.0	15.0	17.7	20.3	22.2	23.9	24.5	24.0	23.2	22.5	21.1	19.3	16.1	13.5	11.1	8.7	8.7	24.5	16.1	24				
DAY 9	5.5	3.8	2.6	1.6	1.2	2.1	3.9	5.0	6.4	7.8	9.2	10.0	11.0	11.6	12.0	12.8	13.1	13.1	12.6	11.1	9.0	7.7	7.1	7.0	1.2	13.1	7.8	24				
DAY 10	6.4	5.5	4.8	5.1	5.4	6.3	6.3	6.3	6.5	6.3	7.1	8.7	9.5	10.2	9.6	9.9	10.1	10.2	9.7	8.1	6.4	4.8	3.7	3.5	3.5	10.2	7.1	24				
DAY 11	3.5	3.6	3.4	3.8	3.6	3.3	4.8	7.6	9.6	11.3	12.5	13.7	15.4	17.2	18.7	19.7	20.2	20.6	20.4	19.3	16.7	14.5	13.4	13.4	3.3	20.6	12.1	24				
DAY 12	12.6	11.3	10.0	9.2	8.7	9.1	10.0	11.7	15.0	18.7	21.8	24.1	24.8	25.3	26.0	26.5	26.4	25.9	25.0	23.2	21.0	19.7	18.7	17.7	8.7	26.5	18.4	24				
DAY 13	17.3	16.2	15.4	14.9	14.1	13.8	15.1	15.7	17.2	19.1	20.6	21.2	21.7	21.9	22.2	22.4	21.7	21.2	20.4	18.3	15.3	13.8	12.9	12.1	12.1	22.4	17.7	24				
DAY 14	11.9	11.3	9.8	9.1	9.8	10.7	12.4	13.7	14.6	17.4	20.8	22.6	24.0	25.1	25.5	27.0	27.6	27.3	26.5	24.7	22.1	20.8	19.7	17.9	9.1	27.6	18.8	24				
DAY 15	16.5	18.0	16.0	16.5	16.1	17.5	17.9	20.0	22.9	24.2	24.8	25.5	26.0	26.5	26.9	27.2	27.3	27.1	26.0	23.7	21.6	20.9	19.9	19.1	16.0	27.3	22.0	24				
DAY 16	17.8	15.6	15.8	15.1	13.8	11.8	13.3	15.3	17.2	18.5	20.5	21.4	22.3	22.6	22.6	22.3	20.7	18.8	16.7	16.0	15.5	14.1	12.0	12.2	11.8	22.6	17.2	24				
DAY 17	11.6	10.8	9.8	9.0	8.0	7.7	8.2	9.3	11.3	12.9	14.6	15.9	16.7	17.7	18.0	18.1	18.2	18.2	17.1	16.4	13.7	12.1	10.4	9.4	7.7	18.2	13.1	24				
DAY 18	8.9	8.8	8.3	8.1	7.5	7.4	10.0	11.4	13.4	16.6	18.0	17.9	19.1	18.6	19.8	19.5	20.1	20.5	20.4	18.3	15.2	13.8	12.5	12.1	7.4	20.5	14.4	24				
DAY 19	11.7	10.9	10.4	9.5	9.1	9.8	11.4	14.6	16.9	18.6	19.2	20.0	20.9	21.6	21.9	22.7	22.5	22.4	22.1	20.6	18.1	16.6	15.2	14.3	9.1	22.7	16.7	24				
DAY 20	13.5	12.3	10.8	10.1	9.8	10.9	12.8	14.6	16.5	17.6	18.5	19.4	20.5	21.4	22.3	22.8	22.8	22.8	22.8	21.4	19.2	17.7	16.5	15.9	9.8	22.8	17.2	24				
DAY 21	16.5	17.4	18.1	14.6	15.1	14.7	14.7	16.6	18.7	20.4	22.2	23.3	24.2	24.7	25.5	25.7	25.0	23.9	18.9	19.3	17.6	16.4	17.2	15.5	14.6	25.7	19.4	24				
DAY 22	15.7	16.2	15.0	12.3	12.7	12.8	15.0	19.2	22.4	23.9	25.1	26.0	26.6	28.1	28.7	28.7	28.1	28.9	29.0	28.2	24.8	23.9	21.8	22.4	12.3	29.0	22.3	24				
DAY 23	20.8	20.2	19.4	18.8	18.2	18.4	19.7	21.7	24.8	27.8	28.3	28.4	28.5	29.3	29.0	29.6	29.0	27.9	26.6	25.4	24.0	22.3	21.9	20.5	18.2	29.6	24.2	24				
DAY 24	20.6	19.6	17.6	17.4	16.1	14.9	15.8	17.7	18.7	19.0	16.5	16.5	16.0	16.3	15.7	15.6	16.7	16.7	16.5	16.1	15.8	14.9	14.5	14.9	14.5	20.6	16.7	24				
DAY 25	14.9	14.7	14.2	14.1	13.8	13.6	14.4	15.6	17.0	18.5	20.0	22.0	23.7	24.6	25.3	25.7	26.2	26.4	25.9	24.2	22.6	21.9	19.8	18.1	13.6	26.4	19.9	24				
DAY 26	18.4	17.3	16.6	14.6	12.9	12.6	13.6	14.6	14.8	15.2	16.4	17.7	18.6	19.4	20.1	20.6	20.7	20.2	18.2	16.4	15.6	14.2	13.8	12.6	12.6	20.7	16.5	24				
DAY 27	13.8	13.5	10.6	9.7	10.1	10.8	12.2	13.0	14.4	15.7	17.0	18.4	19.8	20.8	21.7	22.7	23.2	23.6	23.6	23.3	20.3	19.1	18.7	17.6	9.7	23.6	17.2	24				
DAY 28	17.4	16.8	16.1	16.1	15.9	15.9	17.7	19.8	21.7	23.7	26.2	27.2	27.8	28.5	28.6	27.5	26.5	25.3	24.3	21.6	19.9	18.6	17.5	14.8	14.8	28.6	21.5	24				
DAY 29	11.8	11.5	11.3	11.5	10.5	10.8	11.8	12.8	13.8	14.5	15.1	16.0	16.8	17.4	17.9	18.2	18.6	18.4	17.1	16.3	15.3	14.0	13.2	12.9	10.5	18.6	14.5	24				
DAY 30	12.6	11.8	11.3	10.0	8.2	7.7	7.8	7.8	8.1	8.4	8.6	X	X	X	X	X	X	X	X	X	X	X	X	X	7.7	12.6	9.3	11				
DAY 31	X	X	X	X	X	X	X	7.1	8.6	10.7	11.3	11.5	12.3	12.3	12.0	11.1	11.6	11.7	12.4	11.1	9.7	8.5	7.7	7.2	7.1	12.4	10.4	17				
HOURLY MAX	20.8	20.2	19.4	18.8	18.2	18.4	19.7	21.7	24.8	27.8	28.3	28.4	28.5	29.3	29.0	29.6	29.0	28.9	29.0	28.2	24.8	23.9	21.9	22.4								
HOURLY AVG	13.2	12.6	11.8	11.2	10.6	10.6	11.7	13.1	15.0	16.6	17.8	19.1	19.9	20.6	21.0	21.3	21.2	21.5	20.7	19.3	17.0	15.8	14.7	13.9								

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

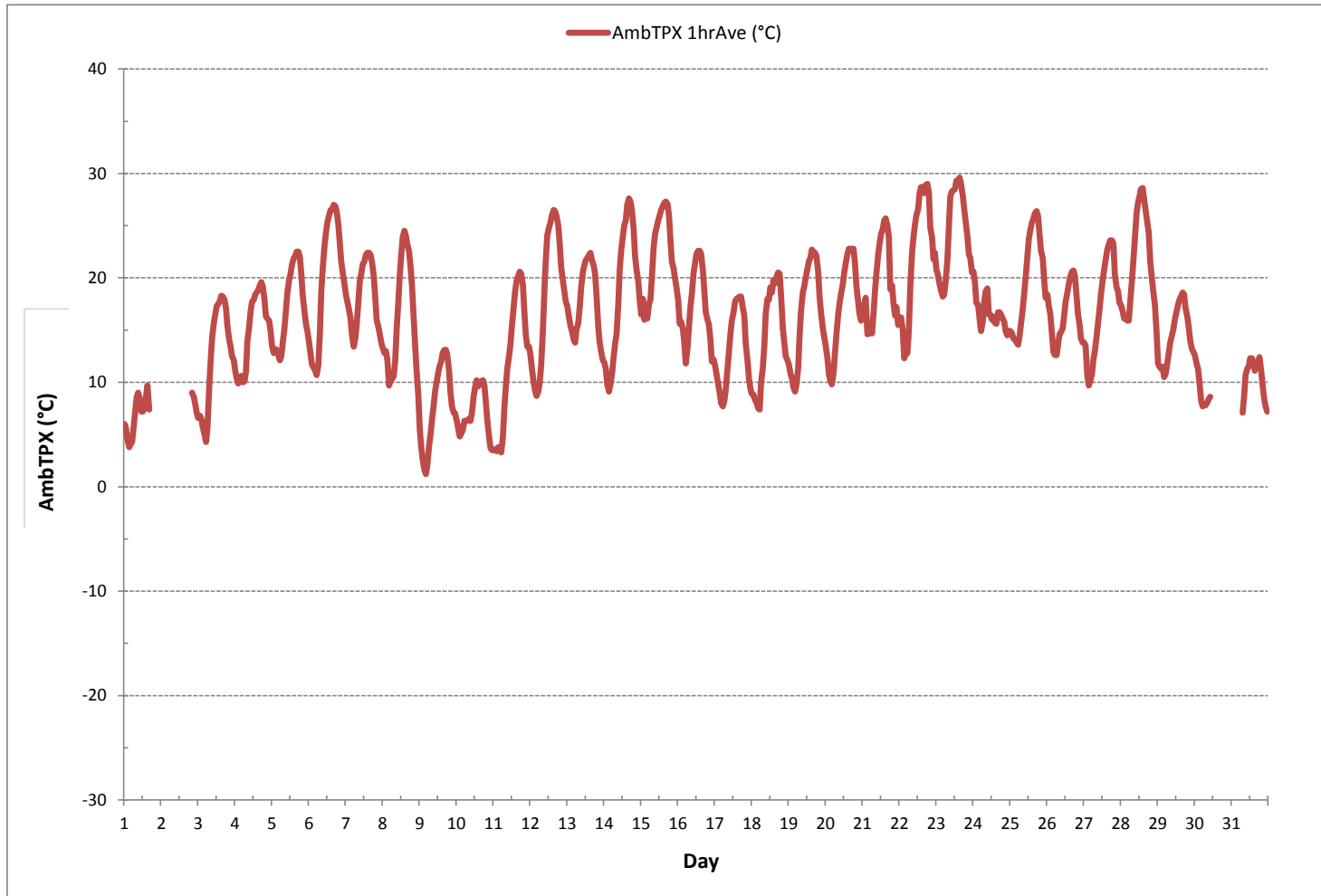
24 HR AVERAGES May 2018



MONTHLY SUMMARY

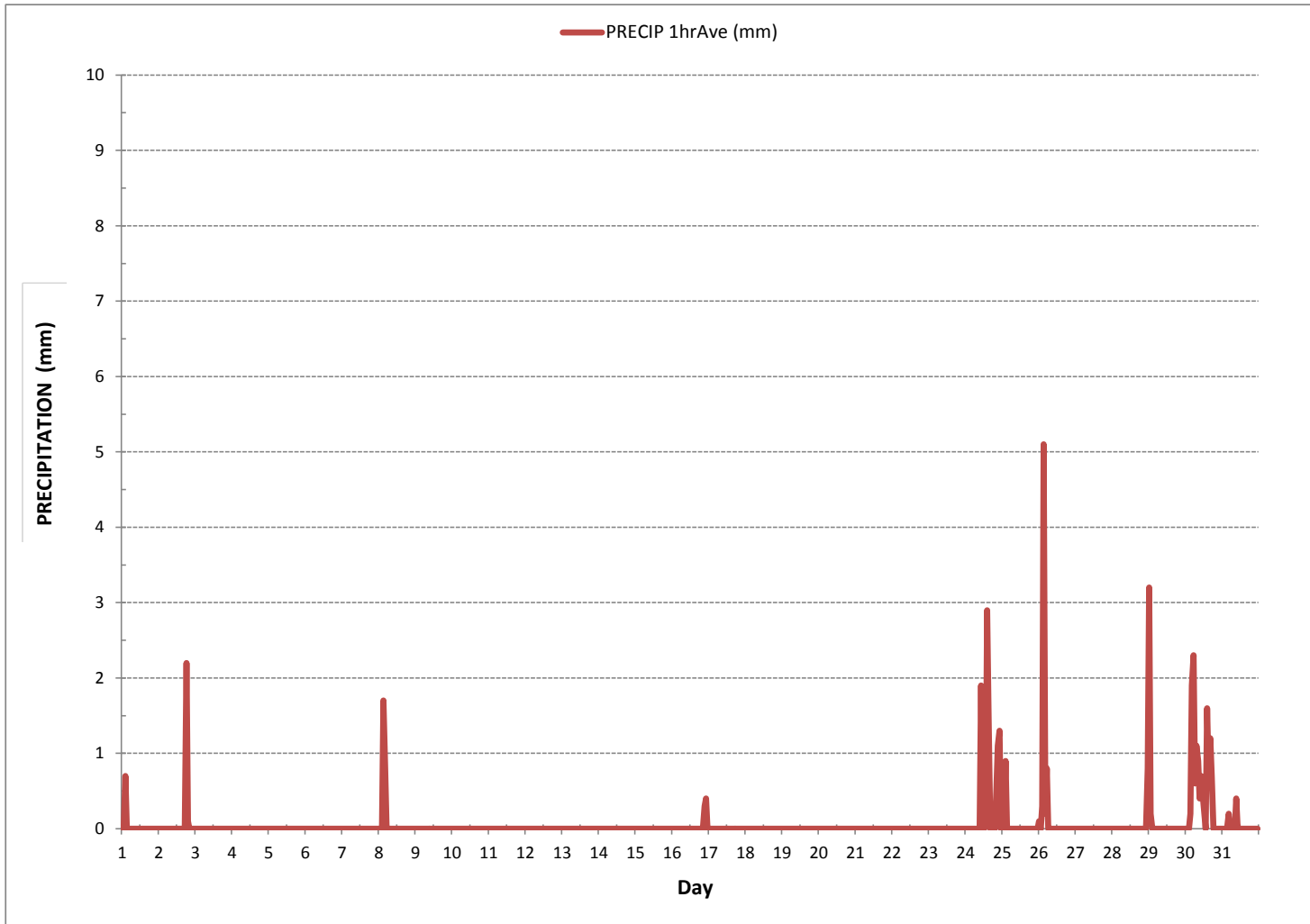
MINIMUM 1-HR AVERAGE:	1.2 °C	@ HOUR	4	ON DAY	9
MAXIMUM 1-HR AVERAGE:	29.6 °C	@ HOUR	15	ON DAY	23
MAXIMUM 24-HR AVERAGE:	24.2 °C			ON DAY	23
OPERATIONAL TIME:					697 hrs
AMD OPERATION UPTIME:					93.7 %
STANDARD DEVIATION:	6.1	MONTHLY AVERAGE:			16.2 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date:	May 14, 2018	Barometer/B.P./units:	F.S. 05544 expires January 15, 2019	932	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:	Sulphur Dioxide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	11:22	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	15:41	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:	April 11, 2018	As Found C.F.:	0.997		
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								

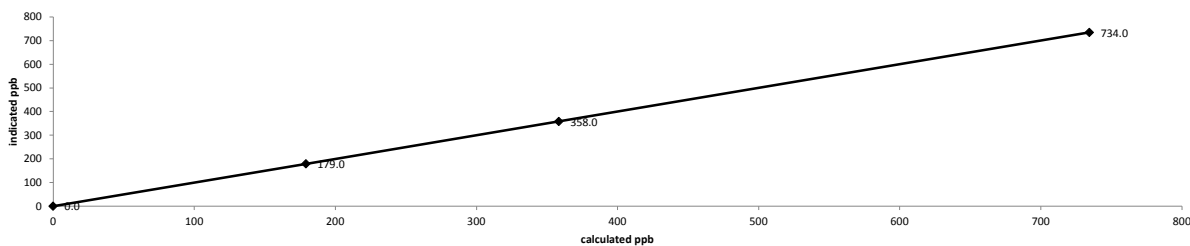
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5054	0.00	5054	0.0	1.4	n/a
as found high	4986	75.56	5062	734.4	738.0	0.997
adjusted zero	5054	0.00	5054	0.0	0.0	n/a
adjusted high	4986	75.56	5062	734.4	734.0	1.001
mid	5016	36.81	5053	358.4	358.0	1.001
low	5036	18.41	5054	179.2	179.0	1.001
calibrator zero	5054	0.00	5054	0.0	0.0	n/a
Average C.F. =						1.001

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.001		0.95-1.05
b (Intercept as % of full scale) =	0.01%		± 3% F.S.
% change in C.F. from last cal =	0.30%		± 10%

API 100E Sulphur Dioxide Analyzer Calibration



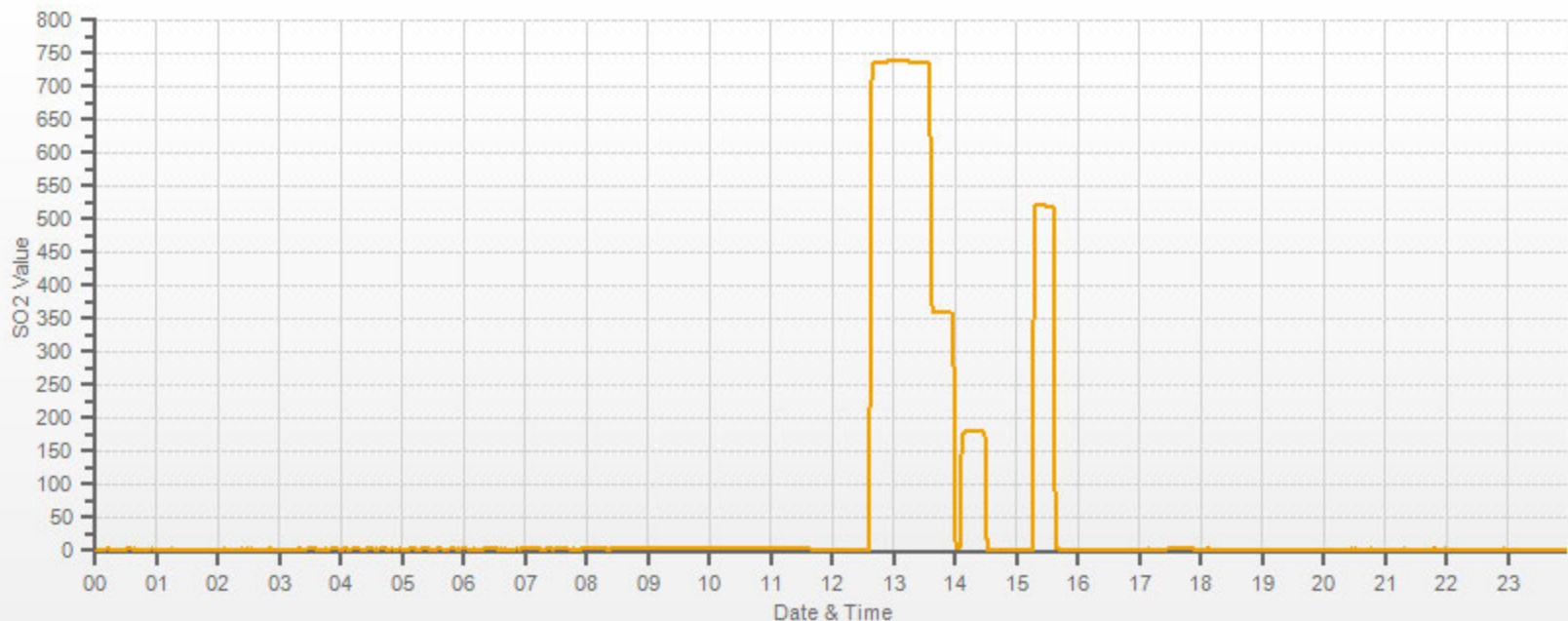
As found:	As left:		
Slope:	0.959	Slope:	0.955
Offset:	151.1	Offset:	153.6
Hvps:	651	Hvps:	651
Rcell Temp:	50.0	Rcell Temp:	50.0
Box Temp:	30.9	Box Temp:	31.2
Pmt Temp:	7.9	Pmt Temp:	7.9
Izs Temp:	45.0	Izs Temp:	45.0
Pres:	23.7	Pres:	23.6
Samp Fl:	597	Samp Fl:	594
Norm Pmt:	153.7	Norm Pmt:	153.7
Uv Lamp:	2768.2	Uv Lamp:	2766.8
Lamp Ratio:	88.0	Lamp Ratio:	88.0
Str Lgt:	72.5	Str Lgt:	73.4
Drk Pmt:	6.0	Drk Pmt:	6.4
Expected Value:	517.0	Expected Value:	519.0

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

SO2[ppb]



HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>May 14, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 15, 2019</u> <u>932</u> <u>millibars</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>22</u> <u>°C</u>
Company/Airshed: <u>LICA</u>	Weather Conditions: <u>Mainly sunny</u>	Calibration Purpose: <u>routine monthly</u>
Location/Station Name: <u>St. Lina</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Rob Fisher</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>
Parameter: <u>Hydrogen Sulphide</u>	Converter Model & s/n (if applicable): <u>n/a</u>	
Start Time 24 hr. (mst): <u>11:22</u>		
End Time 24 hr. (mst): <u>15:45</u>		
Calibration Method: <u>Gas Dilution</u>		
Analyzer: Serial Number/Owner: <u>509</u> <u>LICA</u>	Range ppb: <u>100</u>	
Last Calibration Date: <u>April 11, 2018</u>	As Found C.F.: <u>0.992</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><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.: <u>12:22 / 12:32</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									

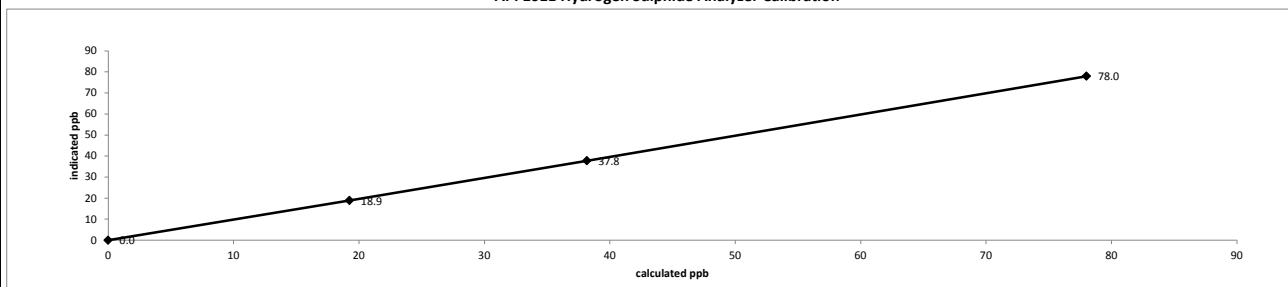
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	7448	0.00	7448	0.0	0.2	n/a
as found high	7392	56.97	7449	78.0	78.8	0.992
adjusted zero	7448	0.00	7448	0.0	0.0	n/a
adjusted high	7392	56.97	7449	78.0	78.0	1.000
mid	7423	27.89	7451	38.2	37.8	1.010
low	7422	14.03	7436	19.2	18.9	1.018
calibrator zero	7448	0.00	7448	0.0	0.0	n/a
Average C.F. =						1.009

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	<u>> or = 0.995</u>
Slope =	<u>0.999</u>		<u>0.95-1.05</u>
b (Intercept as % of full scale) =	<u>0.21%</u>		<u>± 3% F.S.</u>
% change in C.F. from last cal =	<u>0.75%</u>		<u>± 10%</u>

API 101E Hydrogen Sulphide Analyzer Calibration

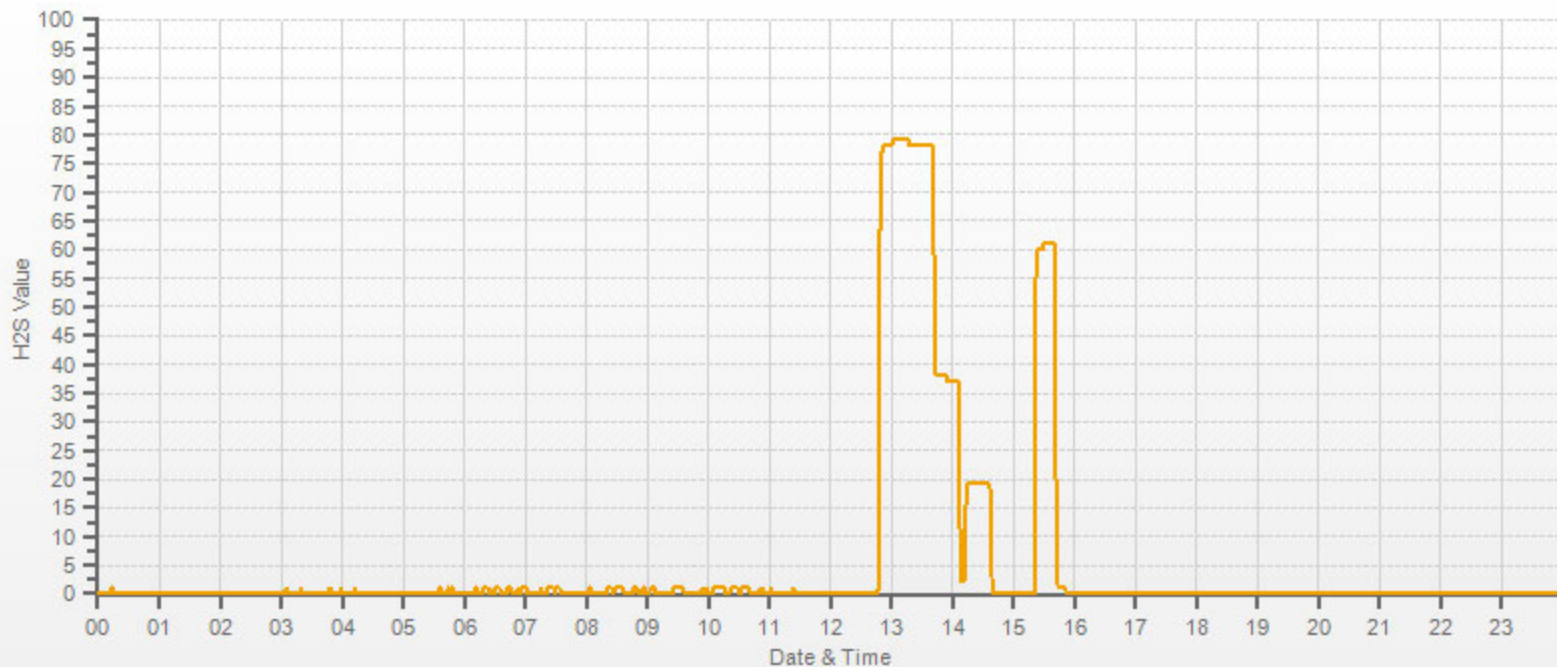


As found: Slope: <u>0.894</u> Offset: <u>72.4</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>32.9</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>315.6</u> Pres: <u>20.2</u> Samp Fl: <u>520</u> Uv Lamp: <u>3155.8</u> Lamp Ratio: <u>94.1</u> Str Lgt: <u>32.3</u> Drk Pmt: <u>0.6</u> Expected Value: <u>60.8</u>	As left: Slope: <u>0.894</u> Offset: <u>73.5</u> Hvps: <u>671</u> Rcell Temp: <u>50.0</u> Box Temp: <u>33.3</u> Pmt Temp: <u>8.0</u> Izs Temp: <u>48.0</u> Converter Temp: <u>315.0</u> Pres: <u>20.1</u> Samp Fl: <u>517</u> Uv Lamp: <u>3154.9</u> Lamp Ratio: <u>94.0</u> Str Lgt: <u>32.8</u> Drk Pmt: <u>0.6</u> Expected Value: <u>61.0</u>
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Comments:

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

H2S[ppb]



TOTAL HYDROCARBON



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: May 15, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 10:37 / 14:30 Calibration Method: Gas Dilution	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 927 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: November 24, 2022
Analyzer: Serial Number/Owner: 925436893 Maxxam Last Calibration Date: April 6, 2018 Previous Cal High Point C.F.: 1.000	Range ppm: 50 As Found C.F.: 0.983 New C.F.: 1.000

Calibration Standards:

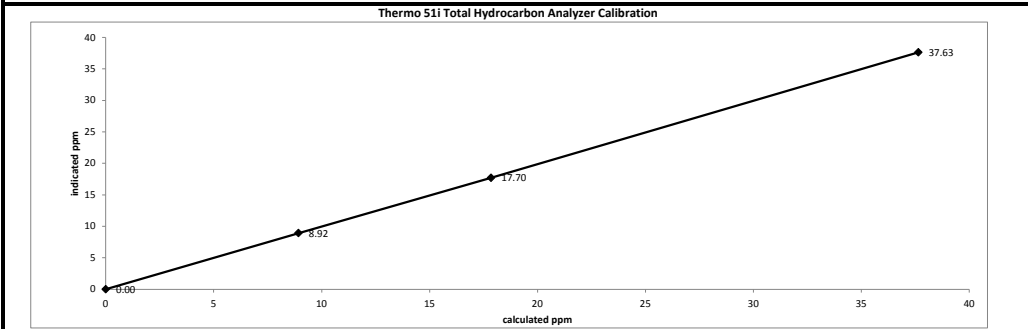
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of: 50 ppm <table border="1" style="margin: auto;"> <tr><th>Point</th><th>Target ppm</th></tr> <tr><td>High</td><td>38</td></tr> <tr><td>Mid</td><td>18</td></tr> <tr><td>Low</td><td>9</td></tr> </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: Defender High 148944 expires December 13, 2018									
Calibrator ID/Expiry Date: Enviroconics id# 4760 expires March 2, 2019									
Cal Gas Cylinder I.D. #: LL 165367									
CH₄/C₂H₆ Cylinder Conc. (ppm): CH ₄ as propane/total CH ₄ equivalents (ppm):	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>590.0</td><td>207.0</td></tr> <tr><td>569.3</td><td>1159.3</td></tr> </table>	590.0	207.0	569.3	1159.3				
590.0	207.0								
569.3	1159.3								

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	2505	0.00	2505	0.0	0.00	n/a
as found high	2428	81.47	2509	37.64	38.30	0.983
adjusted zero	2505	0.00	2505	0.00	0.00	n/a
adjusted high	2428	81.47	2509	37.64	37.63	1.000
mid	2467	38.59	2506	17.85	17.70	1.009
low	2490	19.32	2509	8.93	8.92	1.001
calibrator zero	2505	0.00	2505	0.0	0.00	n/a
Average C.F.=						1.003

Linear Regression/Calibration Results:

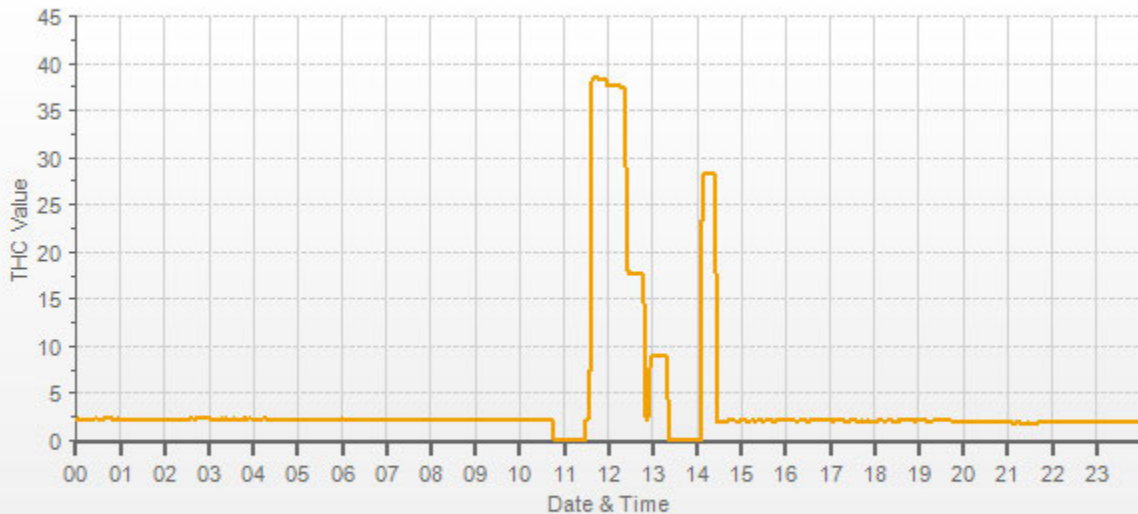
Correlation Coefficient = 1.000 Slope = 1.001 b (Intercept as % of full scale) = 0.07% % change in C.F. from last cal = 1.72%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
--	--



As found: Bkg: 3.73 Coef: 3.362 Bias Supply: -298 Detector Base: 125.0 Filter: 125 Pump: n/a Flame: 143.4 Internal: 28.4 Sample: 9.6 Fuel: 19.9 Air: 39.8 Signal: 919 Status: LIT	As left: Bkg: 3.62 Coef: 3.308 Bias Supply: -298 Detector Base: 125.0 Filter: 125 Pump: n/a Flame: 143.3 Internal: 29.6 Sample: 9.5 Fuel: 19.9 Air: 39.8 Signal: 915 Status: LIT
---	--

Cylinder/Regulator Pressures: H2 Cylinder (psi): 1500 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 44 Span Cylinder (psi): 400 Span Cylinder reg set (psi): 23 Measured Flow: 0.793 Expected Value: 28.70	H2 Cylinder (psi): 1500 H2 cylinder reg set (psi): 50 Zero Air Gen Pressure: 44 Span Cylinder (psi): 400 Span Cylinder reg set (psi): 23 Measured Flow: n/a Expected Value: 28.20
---	---

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.



— THC[ppm]



Thermo 51i Total Hydrocarbon Analyzer Calibration

Date: May 23, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Parameter: Total Hydrocarbon Start/End Time 24 hr. (mst): 10:57 / 15:20 Calibration Method: Gas Dilution Analyzer: Serial Number/Owner: 925436893 Maxxam Last Calibration Date: May 3, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 933 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 20 °C Weather Conditions: Mainly sunny Calibration Purpose: repeat Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: November 24, 2022 Range ppm: 50 As Found C.F.: 1.016 New C.F.: 1.000
---	--

Calibration Standards:

Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of: 50 ppm								
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Point</th> <th>Target ppm</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>38</td> </tr> <tr> <td>Mid</td> <td>18</td> </tr> <tr> <td>Low</td> <td>9</td> </tr> </tbody> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point		Target ppm							
High	38								
Mid	18								
Low	9								
Calibrator ID/Expiry Date: Envionics id# 4760 expires March 2, 2019									
Cal Gas Cylinder I.D. #: LL 165367									
CH₄/C₂H₆ Cylinder Conc. (ppm): CH ₄ as propane/total CH ₄ equivalents (ppm):	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>590.0</td> <td>207.0</td> </tr> <tr> <td>569.3</td> <td>1159.3</td> </tr> </table>	590.0	207.0	569.3	1159.3				
590.0	207.0								
569.3	1159.3								

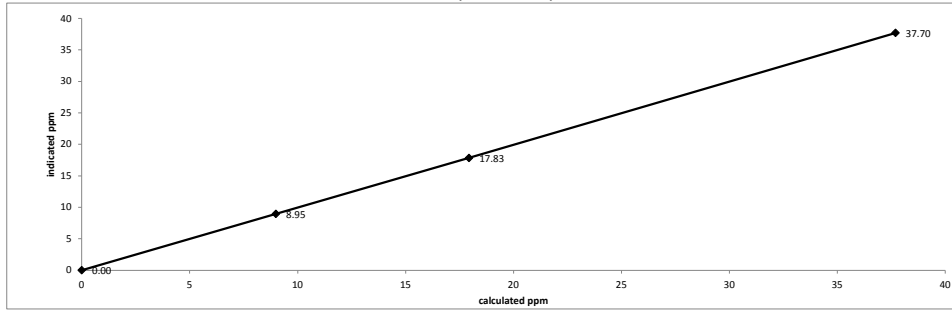
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration: (ppm)	Indicated Concentration: (ppm)	Correction Factors:
	Diluent	Cal Gas	Total			
as found zero	2515	0.00	2515	0.0	0.00	n/a
as found high	2436	81.88	2518	37.70	37.10	1.016
adjusted zero	2515	0.00	2515	0.00	0.00	n/a
adjusted high	2436	81.88	2518	37.70	37.70	1.000
mid	2473	38.87	2512	17.94	17.83	1.006
low	2491	19.47	2510	8.99	8.95	1.005
calibrator zero	2515	0.00	2515	0.0	0.00	n/a
Average C.F.=						1.004

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 1.000 b (Intercept as % of full scale) = 0.08% % change in C.F. from last cal = -1.61%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
---	--

Thermo 51i Total Hydrocarbon Analyzer Calibration



As found:	As left:
Bkg: 3.62	Bkg: 3.70
Coef: 3.308	Coef: 3.373
Bias Supply: -298	Bias Supply: -298
Detector Base: 125.0	Detector Base: 125.0
Filter: 125	Filter: 125
Pump: n/a	Pump: n/a
Flame: 143.4	Flame: 143.5
Internal: 27.7	Internal: 29.6
Sample: 9.5	Sample: 9.4
Fuel: 19.9	Fuel: 19.4
Air: 39.8	Air: 39.8
Signal: 914	Signal: 926
Status: LIT	Status: LIT

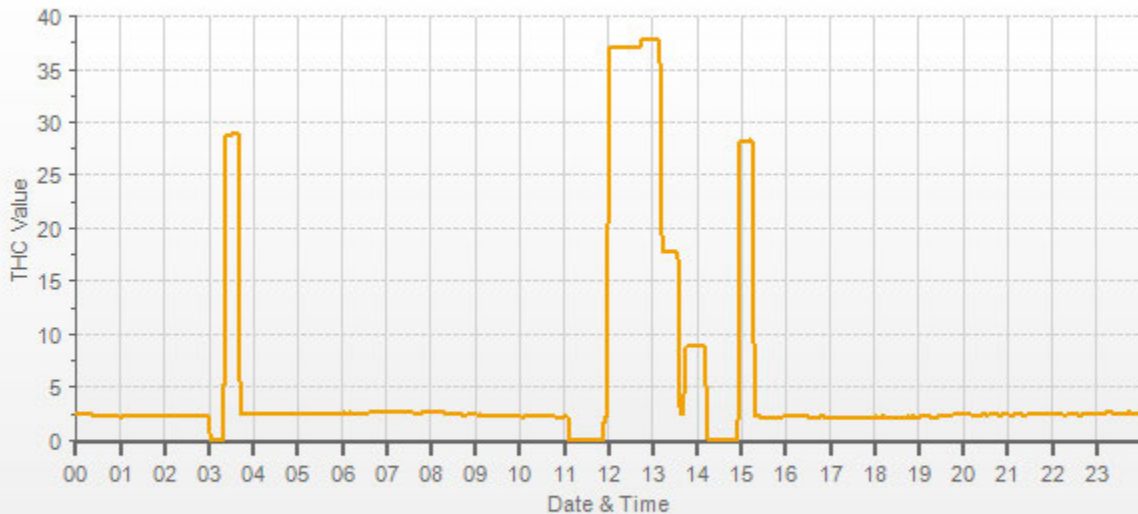
Cylinder/Regulator Pressures:	
H2 Cylinder (psi): 1300	H2 Cylinder (psi): 1300
H2 cylinder reg set (psi): 50	H2 cylinder reg set (psi): 50
Zero Air Gen Pressure: 44	Zero Air Gen Pressure: 44
Span Cylinder (psi): 200	Span Cylinder (psi): 2000
Span Cylinder reg set (psi): 23	Span Cylinder reg set (psi): 23
Measured Flow: 0.7986	Measured Flow: n/a
Expected Value: 28.20	Expected Value: 28.20

Comments:

The manifold blower was found to be working normally.

A new span gas cylinder was installed.

A Repeat calibration was performed due to a daily span drift greater than 5%. The EV has not changed after the calibration and the SPAN gas cylinder change.



— THC[ppm]

NITROGEN DIOXIDE



API 200E NO-NO2-NOx Analyzer Calibration

Date: May 14, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 10:27 / 17:08 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 15, 2019 932 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Mainly sunny Calibration Purpose: shut down Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020
---	---

Analyzer: Serial Number/Owner: 594 LICA Last Calibration Date: April 17, 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>1.026</td> <td>n/a</td> </tr> <tr> <td>NO₂ =</td> <td>1.000</td> <td>1.002</td> <td>n/a</td> </tr> <tr> <td>NOx =</td> <td>1.000</td> <td>1.027</td> <td>n/a</td> </tr> </tbody> </table>		Previous C.F.:	As Found C.F.:	New C.F.:	NO =	1.000	1.026	n/a	NO ₂ =	1.000	1.002	n/a	NOx =	1.000	1.027	n/a
	Previous C.F.:	As Found C.F.:	New C.F.:														
NO =	1.000	1.026	n/a														
NO ₂ =	1.000	1.002	n/a														
NOx =	1.000	1.027	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	<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)		
as found zero	5054	0.0	5054	0	0	-7.0	-1.0	n/a	n/a
as found high	4986	75.6	5062	768.7	770.2	742.0	749.0	1.026	1.027
mid	5016	36.81	5053	375.2	375.9	358.0	361.0	1.028	1.038
low	5036	18.41	5054	187.6	188.0	176.0	178.0	1.025	1.050
Average C.F.=								1.026	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	4986	75.56	5062	0.0	747.0	747.0	-7.0	-7.0	-7.0	
as found high NO ₂	4986	75.56	5062	550.0	229.0	747.0	510.0	518.0	517.0	1.002
gpt mid	4986	75.56	5062	295.0	469.0	747.0	270.0	278.0	277.0	1.004
gpt low	4986	75.56	5062	110.0	645.0	747.0	95.0	102.0	102.0	1.000
Average NO₂ C.F.=										1.002

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.027	1.026	1.002	0.90-1.10
b (Intercept as % of full scale) =	-0.70%	-0.34%	0.00%	± 3% F.S.
% change in C.F. from last cal =	-2.63%	-0.19%	-2.70%	± 10%
NO ₂ converter efficiency			n/a	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: 9 Expected Value NO ₂ : 607 Expected Value NOx: 616	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 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
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Comments:

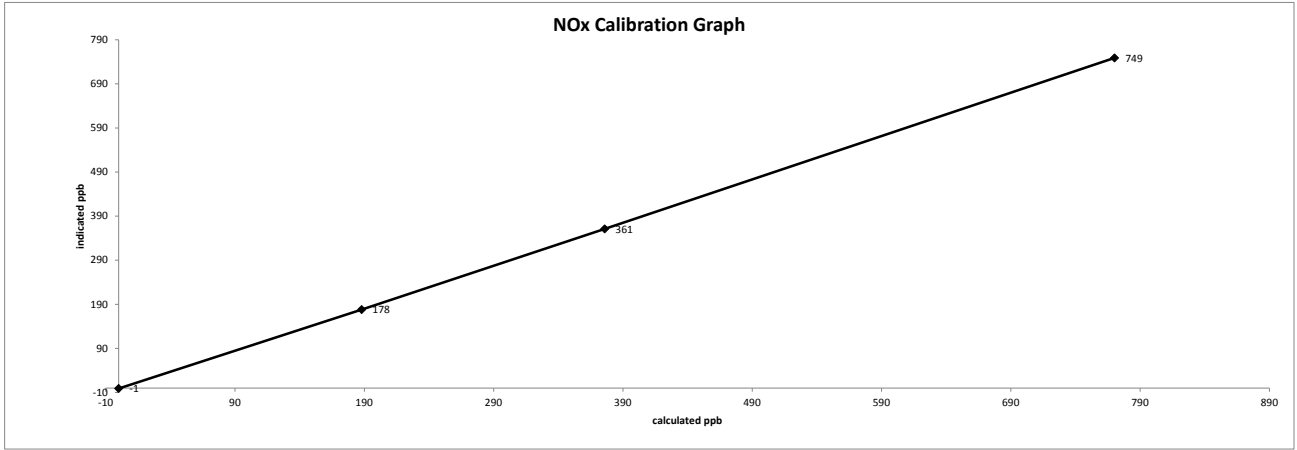
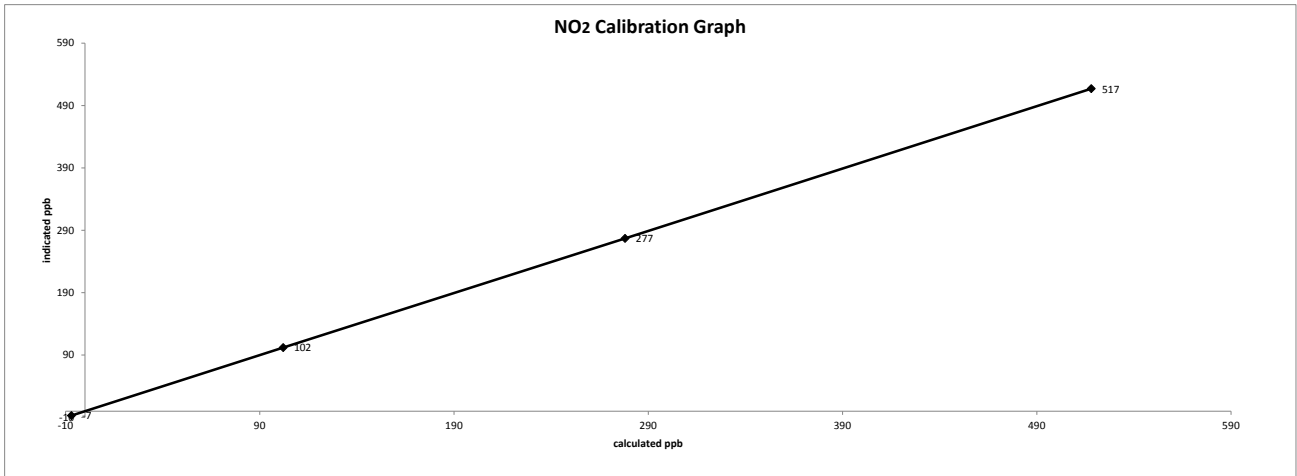
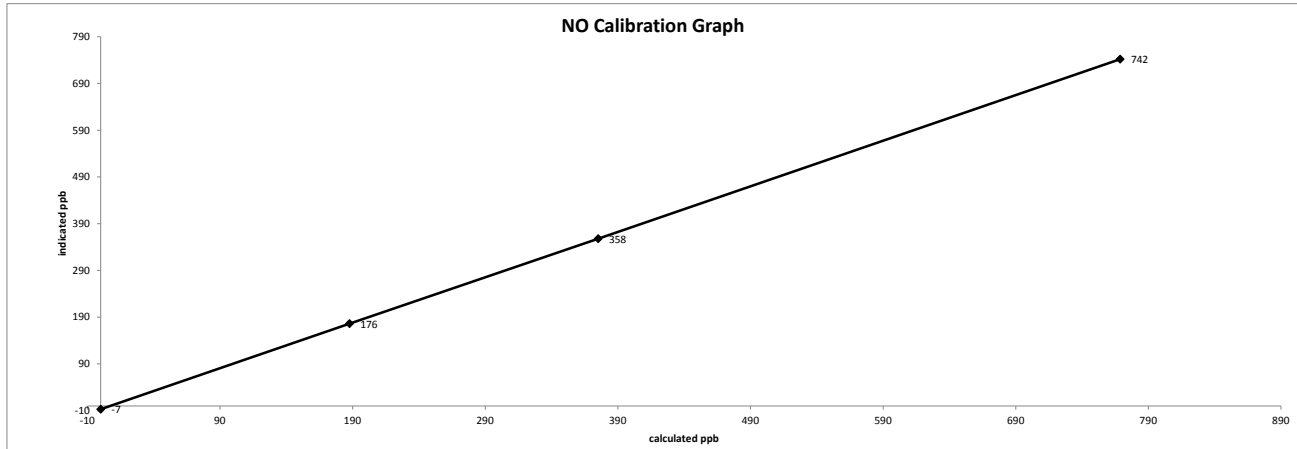
The manifold blower was found to be working normally.

A Shutdown calibration was completed to repair the analyzer. The analyzer was found with a malfunctioning display and a "FAULT" LED indicator blinking. The As Found diagnostic information is unavailable. All channels read negative data. NO₂ converter efficiency value cannot be checked as the screen is not operable.

Date: May 14, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

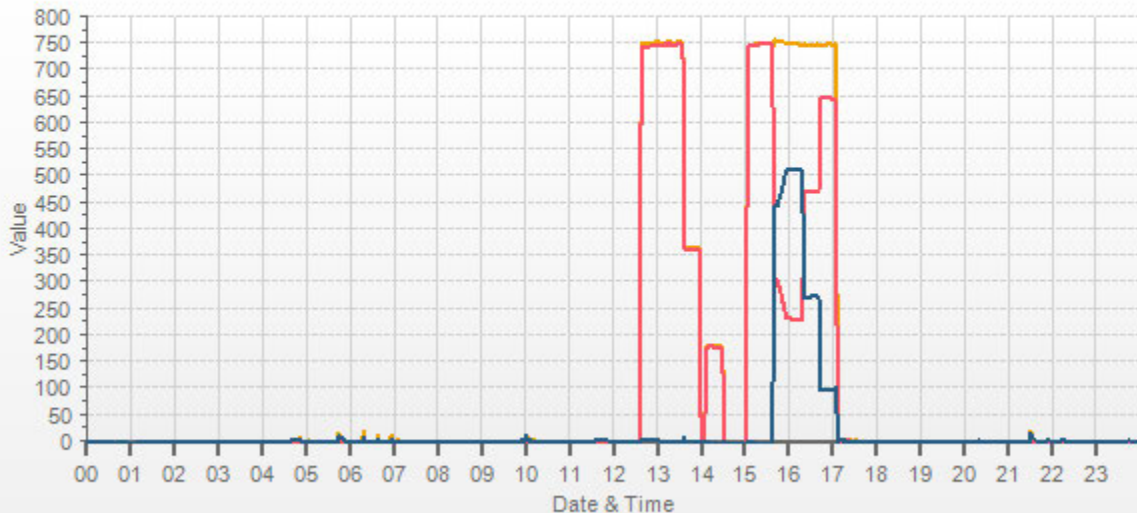
Start/End Time 24 hr. (mst): 10:27 / 17:08
Calibration Purpose: shut down
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/05/14 Type: AVG 1 Min. [1 Min.]

— NOX[ppb] — NO[ppb] — NO2[ppb]





API 200E NO-NO2-NOx Analyzer Calibration

Date: May 15, 2018	Barometer/B.P./units: F.S. 05544 expires January 15, 2019	927	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		
Start/End Time 24 hr. (mst): 10:02 / 16:35	Calibration Purpose: post repair		
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	NO =	Previous C.F.: 1.000	As Found C.F.: n/a	New C.F.: 1.000
Last Calibration Date: April 17, 2018	NO ₂ =	1.000	n/a	1.000
Range ppb: 1000	NOx =	1.000	n/a	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	High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
Calibrator ID/Expiry Date: Environics id# 5212 expires March 1, 2019	Cal Gas Cylinder I.D. #: LL 104225	High	780	500	n/a
Cal Gas Conc. (ppm): 51.5 51.6		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	5056	0.0	5056	0	0	0.0	0.0	n/a	n/a
adjusted high	4980	75.8	5056	771.7	773.2	772.0	773.0	1.000	1.000
mid	5014	36.91	5051	376.3	377.1	377.0	378.0	0.998	0.998
low	5037	18.42	5055	187.7	188.0	187.0	187.0	1.004	1.005
calibrator zero	5056	0.00	5056	0.0	0.0	0.0	0.0	n/a	n/a
Average C.F. =								1.000	1.001

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	4980	75.76	5056	0.0	773.0	772.0	0.0	0.0	0.0	
adjusted high NO2	4980	75.76	5056	520.0	270.0	773.0	503.0	503.0	503.0	1.000
gpt mid	4980	75.76	5056	290.0	491.0	772.0	281.0	282.0	281.0	1.004
gpt low	4980	75.76	5056	105.0	672.0	772.0	101.0	101.0	101.0	1.000
Average NO ₂ 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 =	0.999	1.000	1.000	0.95-1.05
b (Intercept as % of full scale) =	-0.02%	-0.02%	-0.02%	± 3% F.S.
% change in C.F. from last cal =	n/a	n/a	n/a	n/a
NO2 converter efficiency			0.98	0.96 to 1.04

As found:		As left:	
NOx SLOPE:	n/a	NOx SLOPE:	1.103
NOx OFFS:	n/a	NOx OFFS:	0.1
NO SLOPE:	n/a	NO SLOPE:	1.099
NO OFFS:	n/a	NO OFFS:	-1.3
SAMP FLW:	n/a	SAMP FLW:	478
OZONE FL:	n/a	OZONE FL:	77
PMT:	n/a	PMT:	18.3
NORM PMT:	n/a	NORM PMT:	0.5
AZERO:	n/a	AZERO:	16.5
HVPS:	n/a	HVPS:	759
RCELL TEMP:	n/a	RCELL TEMP:	50.0
BOX TEMP:	n/a	BOX TEMP:	32.0
PMT TEMP:	n/a	PMT TEMP:	6.7
IZS TEMP:	n/a	IZS TEMP:	45.0
MOLY TEMP:	n/a	MOLY TEMP:	314.0
RCEL:	n/a	RCEL:	5.2
SAMP:	n/a	SAMP:	26.4
Expected Value NO:	n/a	Expected Value NO:	11
Expected Value NO2:	n/a	Expected Value NO2:	575
Expected Value NOx:	n/a	Expected Value NOx:	585

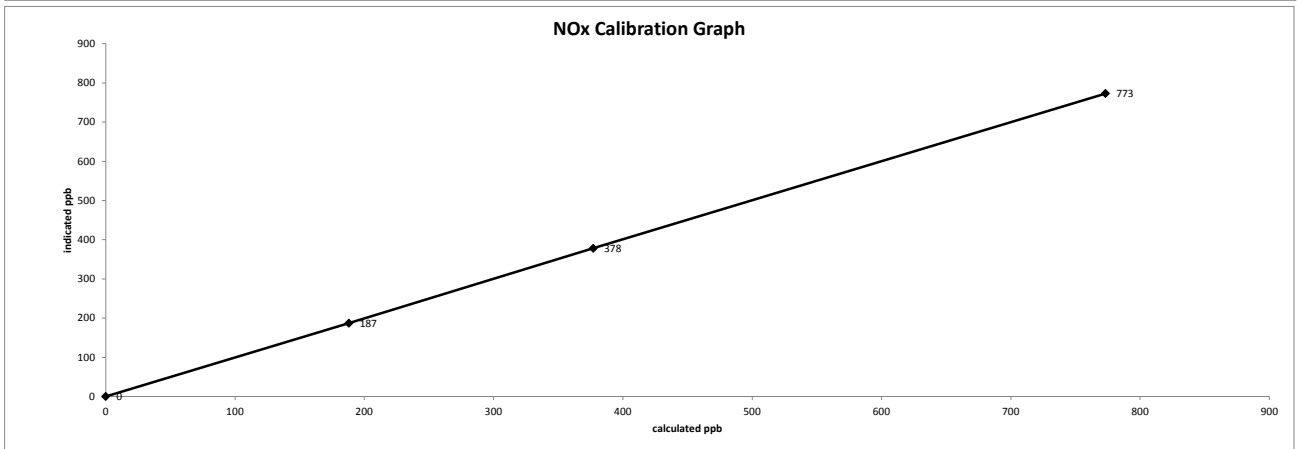
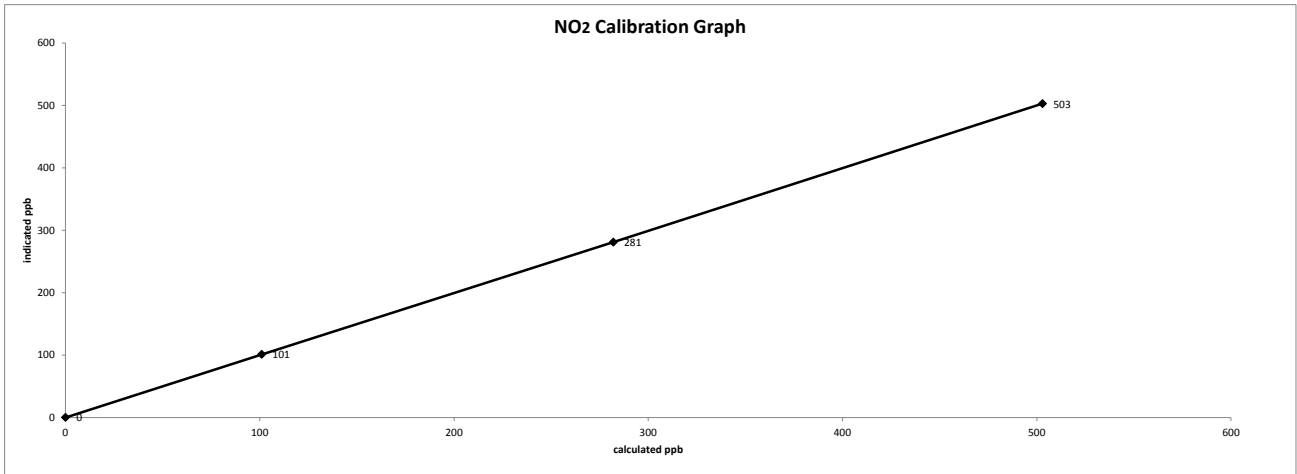
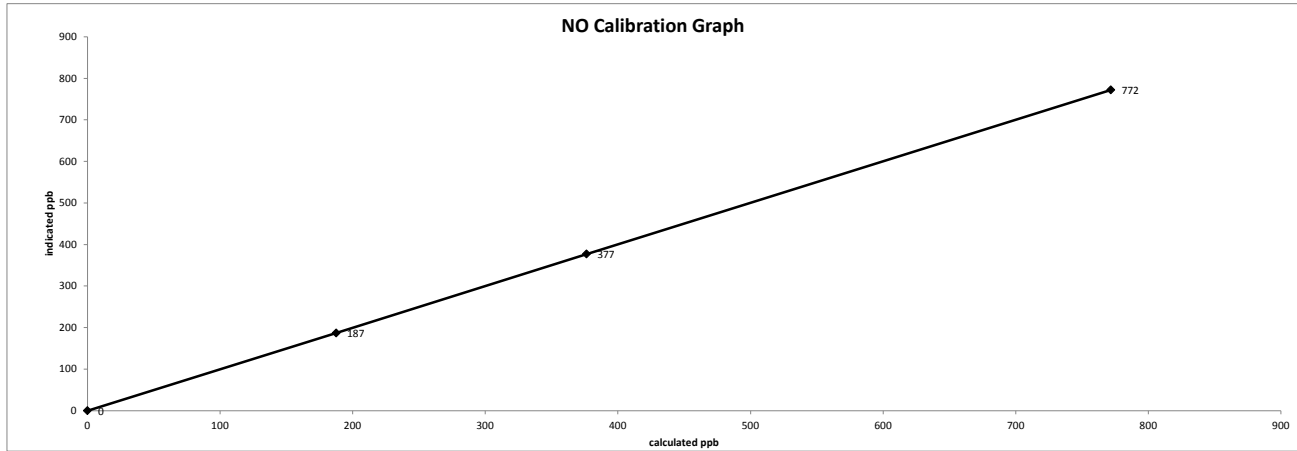
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.

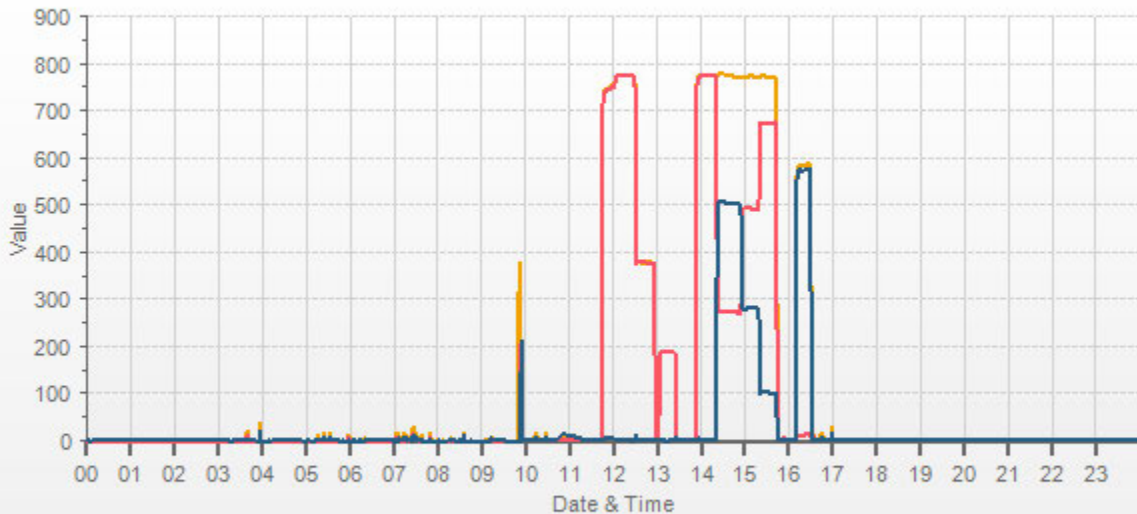
The Post-repair calibration was completed after replacing the NOx analyzer screen. The output voltage calibration was completed prior to the post-repair calibration.

Date: May 15, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

Start/End Time 24 hr. (mst): 10:02 / 16:35
Calibration Purpose: post repair
Calibration Method: Gas Dilution & Gas Phase Titration

API 200E NO-NO2-NOx Analyzer Calibration





— NOX[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: May 23, 2018 Company/Airshed: LICA Location/Station Name: St. Lina Start/End Time 24 hr. (mst): 15:10 / 19:03 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: May 23, 2018 Analyzer: Serial Number/Owner: 1002240371 LICA Last Calibration Date: April 12, 2018 Previous Cal High Point C.F.: 1.000	Barometer/B.P./units: F.S. 05544 expires January 15, 2019 933 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 20 °C Weather Conditions: Mainly sunny Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Rob Fisher Cal Gas Expiry Date: October 24, 2020 Ozone Range ppb: 500 As Found C.F.: 0.995 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: Enviroconics id# 5212 expires March 1, 2019
 Cal Gas Cylinder I.D. #: LL 104225

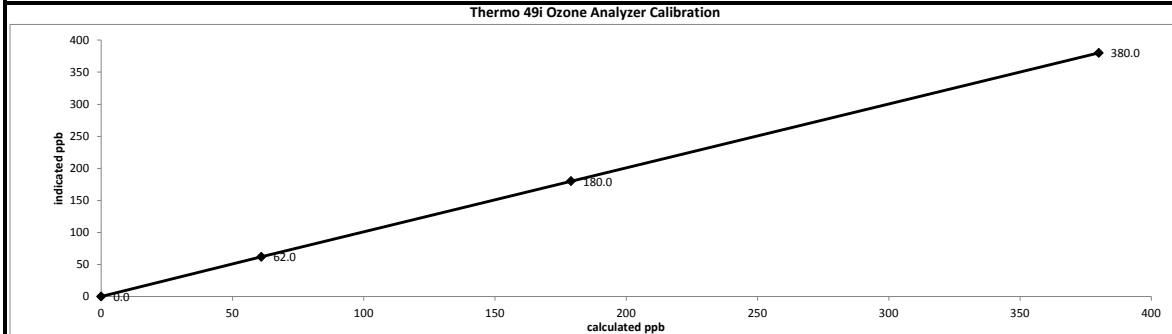
Point	AMD Required Range of Ozone Calibration Points
High	300-400 ppb
Mid	150-200 ppb
Low	50-100 ppb

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	380.0	380.0	382.0	0.995
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	179.0	179.0	180.0	0.994
low	5000	5000	61.0	61.0	62.0	0.984
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						0.993

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS > or = 0.995
Slope = <u>1.001</u>	0.95-1.05
b (Intercept as % of full scale) = <u>-0.13%</u>	± 3% F.S.
% change in C.F. from last cal = <u>0.52%</u>	± 10%



As found:	As left:
O3 Bkg: <u>-0.1</u>	O3 Bkg: <u>-0.8</u>
O3 Coef: <u>0.971</u>	O3 Coef: <u>0.961</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>28.9</u>	Bench: <u>28.7</u>
Bench Lamp: <u>53.6</u>	Bench Lamp: <u>53.6</u>
O3 Lamp: <u>67.7</u>	O3 Lamp: <u>67.7</u>
Pressure: <u>677.2</u>	Pressure: <u>677.0</u>
Cell A lpm: <u>0.729</u>	Cell A lpm: <u>0.730</u>
Cell B lpm: <u>0.774</u>	Cell B lpm: <u>0.774</u>
O3 ppb: <u>-0.2</u>	O3 ppb: <u>-0.7</u>
Cell A ppb: <u>-1.2</u>	Cell A ppb: <u>7.3</u>
Cell B ppb: <u>0.8</u>	Cell B ppb: <u>-8.7</u>
Cell A int (Hz): <u>77118</u>	Cell A int (Hz): <u>77117</u>
Cell B int (Hz): <u>96650</u>	Cell B int (Hz): <u>96652</u>
Expected Value: <u>313.0</u>	Expected Value: <u>284.0</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.

The Zero check pump was rebuilt.

O3[ppb] Station: LICA ST. LINA Daily: 18/05/23 Type: AVG 1 Min. [1 Min.]



— O3[ppb]

PARTICULATE MATTER 2.5



Thermo 5030i SHARP Monitor Quarterly Audit/Calibration

Date:	May 24, 2018	Performed By/Reviewer:	Alex Yakupov Rob Fisher
Company:	LICA	Start Time (mst):	11:02
Station Name/Location:	St. Lina	End Time (mst):	14:19
Previous Audit Date:	April 24, 2018	Calibration Purpose:	quarterly
Parameter:	PM 2.5	Weather Conditions:	Light rain/scattered showers

SHARP 5030i Information and Status:			
Serial Number:	CM17091001	Filter Tape Counter	30

Reference Standards:			
Air Flow			
Make:	Manometer	Orifice	Pressure:
	Dwyer	Chinook	Fisher Scientific
Model:	475 Mk.III	CHN0901	FB61291
Serial Number:	#3	#2	130168457 / 05544
Expiry Date:	January 9, 2019	April 24, 2019	January 15, 2019
			Temp / RH: Fisher Scientific
			11-661-7A, 11745843
			170286131
			April 19, 2019

Ambient Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.32	16.2	0.1	16.32	16.2	0.1
#2	16.38	16.2	0.2	16.38	16.2	0.2
#3	16.34	16.2	0.1	16.34	16.2	0.1
Average	16.3	16.2	0.1	16.3	16.2	0.1
<i>Temp Limit: ± 2°C</i>						

Ambient Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Offset (ZERO)	Reference	SHARP	Offset (ZERO)
#1	88.87	88.2	0.7	89.10	89.1	0.0
#2	89.21	88.7	0.5	89.40	89.2	0.2
#3	88.71	88.5	0.2	89.50	89.2	0.3
Average	88.9	88.5	0.5	89.3	89.2	0.2
<i>RH Limit: ± 2 %RH</i>						

Flow Temperature (°C)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	22.56	22.9	-0.3	22.51	22.6	-0.1
#2	22.55	22.9	-0.3	22.60	22.7	-0.1
#3	22.58	22.9	-0.3	22.52	22.6	-0.1
Average	22.6	22.9	-0.3	22.5	22.6	-0.1
<i>Temp Limit: ± 2°C</i>						

Barometric Pressure (mmHg)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	693.1	693.2	-0.1	693.1	693.2	-0.1
<i>BP Limit: ± 2 mmHg</i>						

Nephelometer Relative Humidity (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	49.49	48.9	0.6	51.46	51.5	0.0
<i>RH Limit: ± 2 %RH</i>						

Nephelometer Temperature (%RH)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	22.19	22.7	-0.5	22.14	22.1	0.0
<i>Temp Limit: ± 2°C</i>						

Nephelometer Source Level						
As Found:			As Left: (same as found if acceptable)			
	Variable	Value		Variable	Value	
	IRE D	66		IRE D	66	
	SRC LEVEL	47		SRC LEVEL	47	
<i>IRE D Limit (as found): 60-70 mA</i>						
<i>Adjusted IRE D Limit (as left): 65 mA</i>						

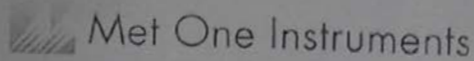
Detector Calibration (Auto)						
As Found:			As Left:			
Detector Auto Calibration Completed:			Variable	Value		
YES			HIGH VOLT	1380		
			BETA REF TH	310		
			ALPHA TH	770		
			DIFF HV	2		

Mass Coefficient (Auto)						
Zero			Span			
	Variable	Value		Variable	Value	
	MASS COEF	7125.9		MASS COEF	7131.1	
	FOIL VALUE	0		FOIL VALUE	1045	
	Beta Avg	9545		Beta Avg	8244	
	difference	N/A		difference	0.1	
Foil Set: 4804						

Flow Calibration (L/min)						
As Found:			As Left: (same as found if acceptable)			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.65	16.67	-0.02	16.65	16.67	-0.02
#2	16.65	16.67	-0.02	16.65	16.67	-0.02
#3	16.66	16.68	-0.02	16.66	16.68	-0.02
Average	16.65	16.67	-0.02	16.65	16.67	-0.02
<i>Flow Limit: 16.67 ± 0.33 L/min</i>						

Leak Check (L/min)						
Without Leak Check Adapter			With leak Check Adapter			
	Reference	SHARP	Difference	Reference	SHARP	Difference
#1	16.66	16.67	-0.01	16.60	16.64	-0.04
<i>Leak Limit: 0.08 L/min</i>						
LEAK RATE: -0.03						

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

METEOROLOGICAL SYSTEM



Meteorological System Checklist

Date:	May 1, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	St. Lina		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	n/a	n/a	n/a
Temperature Sensor:	Met One	Part 083D-1-35	F4091
Barometric Pressure Sensor:	n/a	n/a	n/a
Relative Humidity Sensor:	Met One	Part 083D-1-35	F4091
Anemometer:	n/a	n/a	n/a
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	February 13, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	10.3		
Station - Ambient Temperature (°C):	9.8		
Temperature Difference (°C):	0.5		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	February 13, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	49.98		
Station Hygrometer % RH- Reading:	50.00		
RH Tolerance +/- 15% of error:	42.48 - 57.48	0.0%	



Meteorological System Checklist

Date:	May 2, 2018		
Technician:	Alex Yakupov		
Reviewer:	Rob Fisher		
Station:	St. Lina		
Unit:	Make:	Model:	Serial #:
Precipitation Sampler:	n/a	n/a	n/a
Temperature Sensor:	RM Young	41372VC Temp Sensor	1920 / 01983
Barometric Pressure Sensor:	n/a	n/a	n/a
Relative Humidity Sensor:	RM Young	41372VC Temp Sensor	1920 / 01983
Anemometer:	n/a	n/a	n/a
AMBIENT TEMPERATURE SENSOR CHECK			
Previous check date:	February 13, 2018		
Parameter:	Temperature @ 2 metres (1 C tolerance)		
Reference Thermometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Temperature (°C):	16.5		
Station - Ambient Temperature (°C):	17.1		
Temperature Difference (°C):	-0.6		
RELATIVE HUMIDITY (HYGROMETER) SENSOR CHECK			
Previous check date:	February 13, 2018		
Reference Hygrometer ID:	F.S. 170286131 expires April 19, 2019		
Reference Hygrometer % RH- Reading:	29.91		
Station Hygrometer % RH- Reading:	30.90		
RH Tolerance +/- 15% of error:	25.42 - 34.40	-3.3%	

CALIBRATORS

Company: Maxxam Operator: Chris W

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

Dilution Flow (sccm)					
Pt. #1	<u>5000</u>	Pt. #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	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 1, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018
 Operator Signature: [Signature] 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			
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:

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
Operator Signature: *Al Clark*

Date: October 19, 2016
Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2015-029CGA

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

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&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 - May 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	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	3	3	S	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	2	2	2	2	3	3	2	3	3	24		
2	3	S	3	3	3	3	3	3	3	3	3	P	P	4	3	3	3	3	3	3	3	3	3	3	3	4	3	22		
3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	S	2	2	3	24		
4	2	2	2	2	2	3	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	S	2	2	3	24		
5	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	S	2	2	2	3	24		
6	2	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	3	S	3	3	3	2	4	3	24		
7	3	3	3	2	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	2	3	24		
8	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	S	2	2	2	2	2	3	2	3	24		
9	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	
10	2	2	3	3	3	3	2	2	2	2	2	2	2	2	3	3	S	2	2	3	2	2	2	2	2	2	3	2	24	
11	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	S	2	3	3	3	2	2	3	3	2	3	2	2	24	
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	24	
13	3	3	3	3	3	3	3	3	3	3	3	3	3	S	2	3	2	3	3	3	3	2	2	3	2	2	3	2	24	
14	3	3	3	3	3	3	3	3	3	4	3	C	C	C	C	C	2	3	3	3	3	3	3	3	3	2	4	3	24	
15	2	3	3	3	3	3	3	3	2	2	3	S	2	3	2	2	2	2	2	2	2	2	3	2	2	2	3	2	24	
16	2	2	3	3	2	2	3	3	3	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
17	2	1	1	2	1	1	1	1	1	S	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	24	
18	1	1	1	2	3	2	2	1	S	2	2	1	2	2	1	1	1	1	1	2	2	1	1	1	1	1	1	3	1	24
19	1	1	1	1	2	2	1	S	2	1	2	1	2	1	2	2	2	2	2	3	3	2	2	2	2	2	1	3	2	24
20	2	2	2	2	2	2	S	2	2	2	2	2	2	3	3	3	2	3	3	3	3	3	3	3	3	2	3	2	24	
21	3	3	3	3	3	S	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	24	
22	3	2	2	2	S	2	Q	Q	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	24	
23	2	2	2	S	2	3	2	2	2	2	3	3	4	2	2	2	2	2	Q	Q	2	2	2	2	2	2	4	2	24	
24	2	2	S	2	2	2	3	3	2	3	P	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	23		
25	3	S	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	2	3	3	24	
26	S	3	3	3	3	3	3	2	3	3	2	3	3	2	3	3	3	3	3	2	2	2	2	S	2	3	3	24		
27	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	S	3	2	3	2	24	
28	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	S	2	2	2	3	3	24	
29	3	3	3	3	3	2	2	2	2	2	2	3	2	3	2	2	3	3	2	3	S	3	3	3	3	2	3	3	24	
30	3	3	2	2	2	3	3	3	2	3	3	X	X	X	X	X	X	1	1	S	1	1	1	1	1	1	3	2	18	
31	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	X	1	1	1	1	1	1	1	2	1	23	
HOURLY MAX	3	3	3	3	3	3	3	3	3	4	3	3	3	4	3	3	3	4	4	3	3	3	3	3	3	3	3	3	24	
HOURLY AVG	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	24

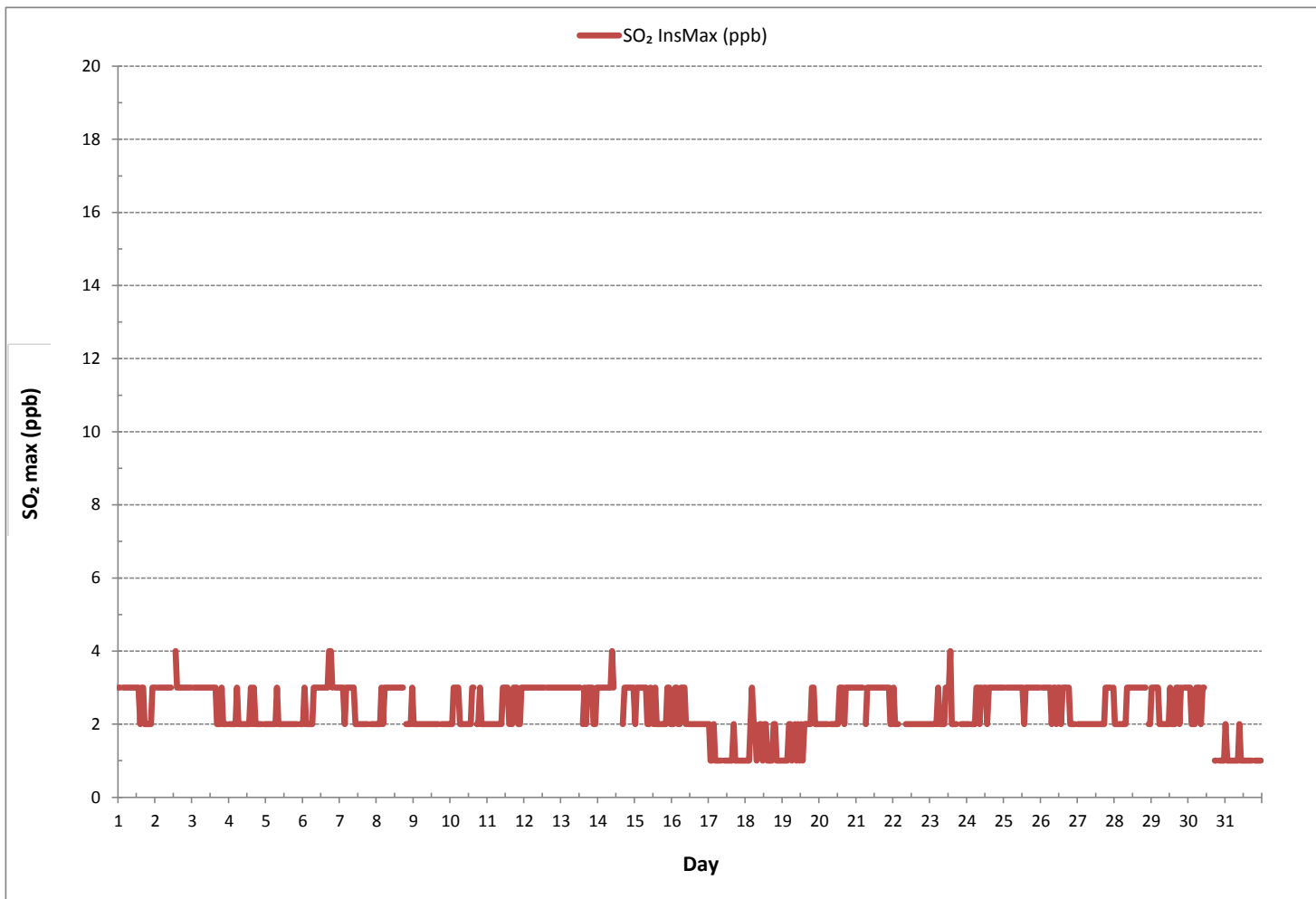
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	694
MAXIMUM INSTANTANEOUS VALUE:	4 ppb @ HOUR 13 ON DAY 2
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	734 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY																														
1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	24		
2	1	S	1	1	1	1	1	1	1	1	1	P	P	1	1	1	1	1	1	2	1	1	1	1	1	2	1	22		
3	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	0	S	0	1	1	24		
4	0	1	1	1	1	1	1	1	0	0	0	0	1	0	1	0	0	0	1	1	1	1	S	0	0	1	1	24		
5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	0	24		
6	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	1	0	1	0	1	0	S	1	1	1	0	1	0	24	
7	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24	
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	1	0	0	0	0	0	1	1	24	
9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	24	
10	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	S	0	1	1	1	1	0	0	1	0	1	0	24	
11	1	1	1	1	0	0	0	0	0	0	1	0	0	0	1	S	1	1	1	0	0	0	1	1	0	1	0	1	0	24
12	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	1	1	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	0	0	1	1	0	1	0	1	0	1	0	1	1	24
14	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	1	1	1	0	1	1	1	0	0	1	1	1	24	
15	1	1	1	1	1	1	1	1	1	1	0	S	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	24
16	0	0	0	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
17	0	0	0	0	0	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
18	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	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
20	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	1	0	24
21	1	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	24
22	0	0	0	1	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
23	0	0	1	S	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	24
24	1	1	S	1	1	2	2	1	1	1	P	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	23	
25	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
26	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24	
27	1	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	2	0	24		
28	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	1	24
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Y	Y	1	1	1	1	1	S	1	1	1	1	1	1	1	22
30	1	1	1	1	1	1	1	1	1	1	1	X	X	X	X	X	X	1	1	S	1	1	1	1	1	1	1	1	1	18
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	24
HOURLY MAX	1	1	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1	

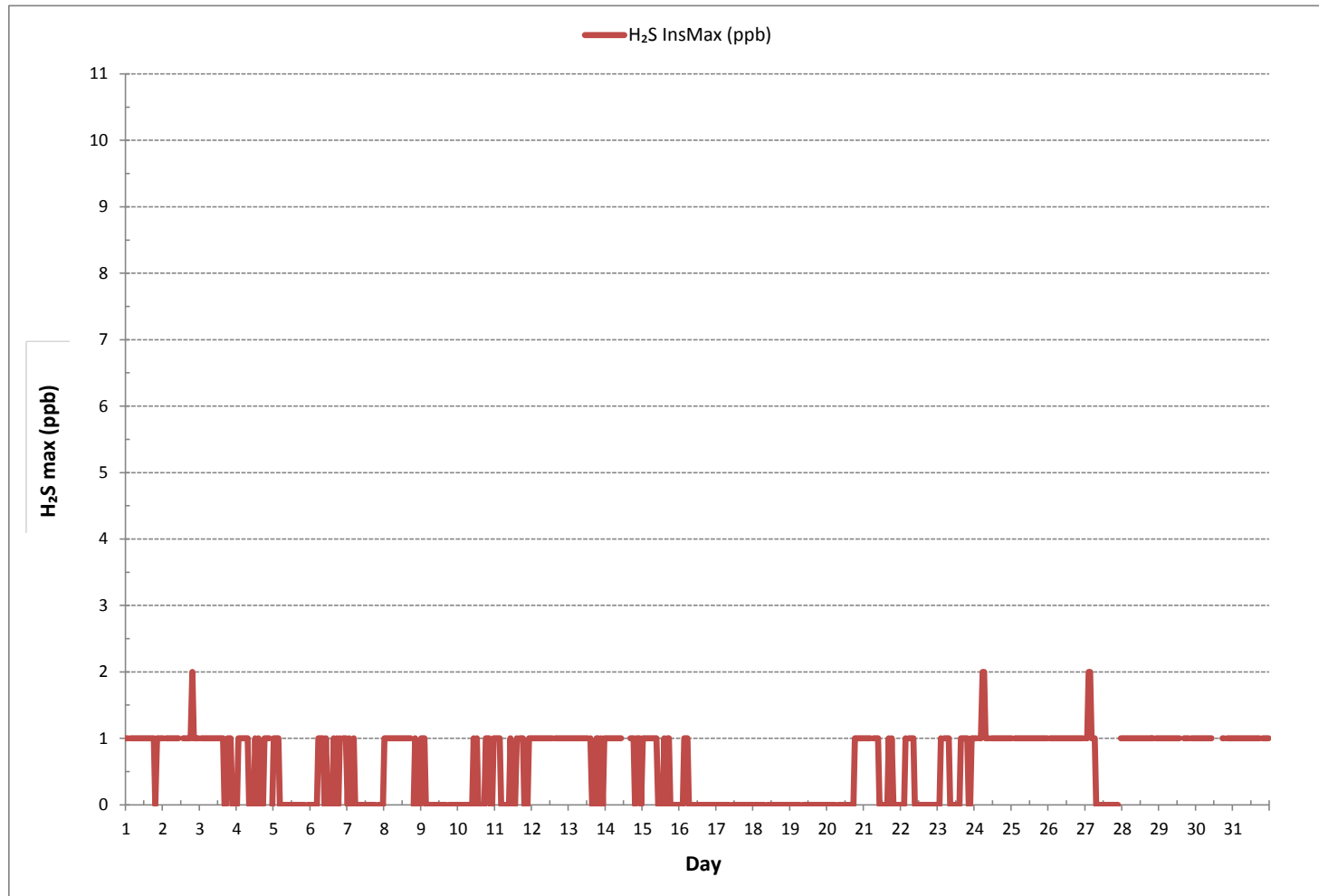
STATUS FLAG CODES

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:	397
MAXIMUM INSTANTANEOUS VALUE:	2 ppb @ HOUR 19 ON DAY 2
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	733 hrs
STANDARD DEVIATION:	1

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	2.25	2.26	S	2.28	2.26	2.28	2.26	2.26	2.28	2.15	2.21	2.23	2.24	2.24	2.23	2.26	2.24	2.23	2.24	2.24	2.21	2.24	2.26	2.26	2.15	2.28	2.24	24
2	2.24	S	2.30	2.30	2.30	2.32	2.35	2.31	2.26	2.21	2.23	P	P	2.21	2.18	2.21	2.18	2.17	2.17	2.18	2.18	2.18	2.19	2.15	2.15	2.35	2.23	22
3	S	2.19	2.24	2.22	2.25	2.32	2.26	2.28	2.07	2.21	2.19	2.23	2.21	2.18	2.24	2.25	2.23	2.24	2.24	2.25	2.26	2.28	2.25	S	2.07	2.32	2.23	24
4	2.26	2.28	2.30	2.32	2.32	2.26	2.37	2.42	2.18	2.17	2.19	2.20	2.23	2.19	2.19	2.15	2.11	2.10	2.07	2.09	2.13	2.13	S	2.07	2.07	2.42	2.21	24
5	2.10	2.14	2.13	2.13	2.13	2.15	2.17	2.14	2.17	2.18	2.15	2.13	2.15	2.15	2.15	2.15	2.18	2.15	2.17	2.15	2.10	S	2.10	2.09	2.09	2.18	2.14	24
6	2.10	2.12	2.12	2.11	2.13	2.15	2.21	2.24	2.18	2.15	2.15	2.17	2.10	2.10	2.09	2.10	2.11	2.11	2.12	2.11	S	2.11	2.07	2.06	2.06	2.24	2.13	24
7	2.06	2.05	2.07	2.07	2.09	2.24	2.28	2.30	2.17	2.09	2.15	2.15	2.15	2.17	2.21	2.15	2.18	2.18	S	2.14	2.13	2.14	2.17	2.05	2.30	2.15	24	
8	2.14	2.15	2.18	2.19	2.20	2.18	2.17	2.23	2.25	2.22	2.14	2.14	2.12	2.09	2.14	2.10	2.11	2.13	S	2.14	2.09	2.09	2.14	2.13	2.09	2.25	2.15	24
9	2.12	2.14	2.17	2.15	2.15	2.14	2.15	2.16	2.17	2.17	2.15	2.14	2.13	2.14	2.14	2.11	2.15	S	2.15	2.17	2.17	2.24	2.28	2.29	2.11	2.29	2.16	24
10	2.27	2.28	2.27	2.33	2.28	2.10	2.09	2.09	2.07	2.06	2.09	2.19	2.24	2.24	2.25	2.26	S	2.18	2.17	2.21	2.23	2.24	2.25	2.25	2.06	2.33	2.20	24
11	2.23	2.25	2.23	2.23	2.21	2.26	2.21	2.25	2.18	2.10	2.09	2.07	2.15	2.14	2.18	S	2.15	2.15	2.11	2.10	2.23	2.15	2.12	2.10	2.07	2.26	2.17	24
12	2.06	2.12	2.15	2.15	2.18	2.21	2.21	2.21	2.23	2.21	2.17	2.10	2.10	2.09	S	2.07	2.09	2.13	2.10	2.09	2.06	2.00	2.18	2.19	2.00	2.23	2.13	24
13	2.14	2.15	2.17	2.18	2.19	2.21	2.19	2.25	2.21	2.17	2.19	2.21	2.19	S	2.21	2.17	2.21	2.21	2.24	2.21	2.28	2.29	2.30	2.26	2.14	2.30	2.21	24
14	2.24	2.15	2.21	2.24	2.21	2.15	2.17	2.13	2.18	2.18	2.19	2.21	S	2.24	2.19	2.18	2.18	2.21	2.13	2.19	2.24	2.22	2.23	2.24	2.13	2.24	2.20	24
15	2.27	2.24	2.32	2.28	2.28	2.25	2.25	2.21	2.14	2.13	C	C	C	C	C	2.12	2.09	2.08	2.10	2.10	1.98	1.86	1.98	1.97	1.86	2.32	2.14	24
16	2.00	2.05	2.07	2.07	2.25	2.35	2.30	2.25	2.07	2.10	S	2.07	2.10	2.06	2.06	2.04	2.06	2.07	2.01	2.01	2.05	2.03	2.01	2.01	2.00	2.35	2.10	24
17	2.11	2.14	2.14	2.02	2.09	2.07	2.04	2.06	2.02	S	2.02	2.11	2.07	2.17	2.21	2.25	2.18	2.20	2.15	2.17	2.21	2.18	2.18	2.23	2.02	2.25	2.13	24
18	2.21	2.24	2.20	2.26	2.24	2.30	2.26	2.21	S	2.06	2.23	2.24	2.29	2.23	2.19	2.21	2.23	2.25	2.23	2.23	2.35	2.20	2.29	2.18	2.06	2.35	2.23	24
19	2.20	2.21	2.21	2.24	2.19	2.23	2.21	S	2.17	2.21	2.24	2.21	2.21	2.19	2.21	2.18	2.21	2.18	2.24	2.26	2.30	2.28	2.29	2.26	2.17	2.30	2.22	24
20	2.26	2.26	2.28	2.26	2.29	2.29	S	2.35	2.35	2.23	2.20	2.21	2.21	2.21	2.18	2.23	2.21	2.24	2.23	2.26	2.30	2.28	2.35	2.33	2.18	2.35	2.26	24
21	2.25	2.24	2.19	2.28	2.22	S	2.35	2.30	2.29	2.25	2.21	2.26	2.28	2.24	2.20	2.19	2.21	2.23	2.26	2.29	2.32	2.33	2.32	2.30	2.19	2.35	2.26	24
22	2.30	2.26	2.31	2.45	S	2.50	S1	S1	2.32	2.35	2.39	2.36	2.33	2.33	2.29	2.33	2.33	2.35	2.35	2.62	2.42	2.63	2.40	2.26	2.63	2.38	22	
23	2.45	2.30	2.36	S	2.55	2.54	2.71	2.68	2.66	2.44	C1	C1	C1	C1	C1	C1	2.25	2.15	2.24	2.44	2.41	2.46	2.53	2.58	2.15	2.71	2.46	18
24	2.53	2.55	S	2.55	2.67	2.80	2.57	2.41	2.49	2.45	P	2.33	2.32	2.26	2.15	2.10	2.10	2.28	2.19	2.18	2.17	2.14	2.15	2.14	2.10	2.80	2.34	23
25	2.13	2.17	2.25	2.26	2.24	2.25	2.29	S	S	2.31	2.30	2.30	2.26	2.24	2.24	2.24	2.24	2.22	2.24	2.29	2.26	2.26	2.30	2.36	2.13	2.36	2.26	24
26	S	2.39	2.48	2.31	2.17	2.15	2.18	2.18	2.19	2.17	2.17	2.15	2.19	2.19	2.19	2.18	2.19	2.21	2.22	2.18	2.19	2.25	2.22	S	2.15	2.48	2.22	24
27	2.21	2.24	2.44	2.44	2.32	2.29	2.25	2.25	2.20	2.22	2.21	2.19	2.19	2.19	2.21	2.20	2.22	2.22	2.21	2.25	2.25	S	2.24	2.19	2.44	2.24	24	
28	2.26	2.35	2.44	2.44	2.51	2.45	2.36	2.26	2.30	2.26	2.25	2.25	2.24	2.21	2.25	2.23	2.23	2.21	2.18	2.21	2.13	S	2.09	2.09	2.09	2.51	2.27	24
29	2.04	1.97	2.05	1.97	2.11	2.11	2.09	2.13	2.10	2.10	2.17	2.17	2.17	Y	2.05	2.09	2.05	2.17	2.15	2.09	S	2.15	2.17	2.15	1.97	2.17	2.10	23
30	2.21	2.24	2.21	2.14	2.15	2.09	2.02	2.05	2.13	2.13	2.13	X	X	X	X	X	X	2.04	2.09	S	2.09	2.15	2.15	2.14	2.02	2.24	2.13	18
31	2.16	2.09	2.09	2.08	2.09	2.10	2.07	2.08	2.09	2.09	2.07	2.07	2.06	2.11	2.11	2.07	2.08	2.06	S	2.11	2.14	2.09	2.09	2.24	2.06	2.24	2.10	24
HOURLY MAX	2.53	2.55	2.48	2.55	2.67	2.80	2.71	2.68	2.66	2.45	2.39	2.36	2.33	2.33	2.29	2.33	2.33	2.33	2.35	2.44	2.62	2.46	2.63	2.58				
HOURLY AVG	2.20	2.21	2.23	2.23	2.25	2.26	2.24	2.24	2.21	2.19	2.18	2.19	2.19	2.19	2.18	2.17	2.17	2.18	2.18	2.19	2.21	2.19	2.22	2.20				

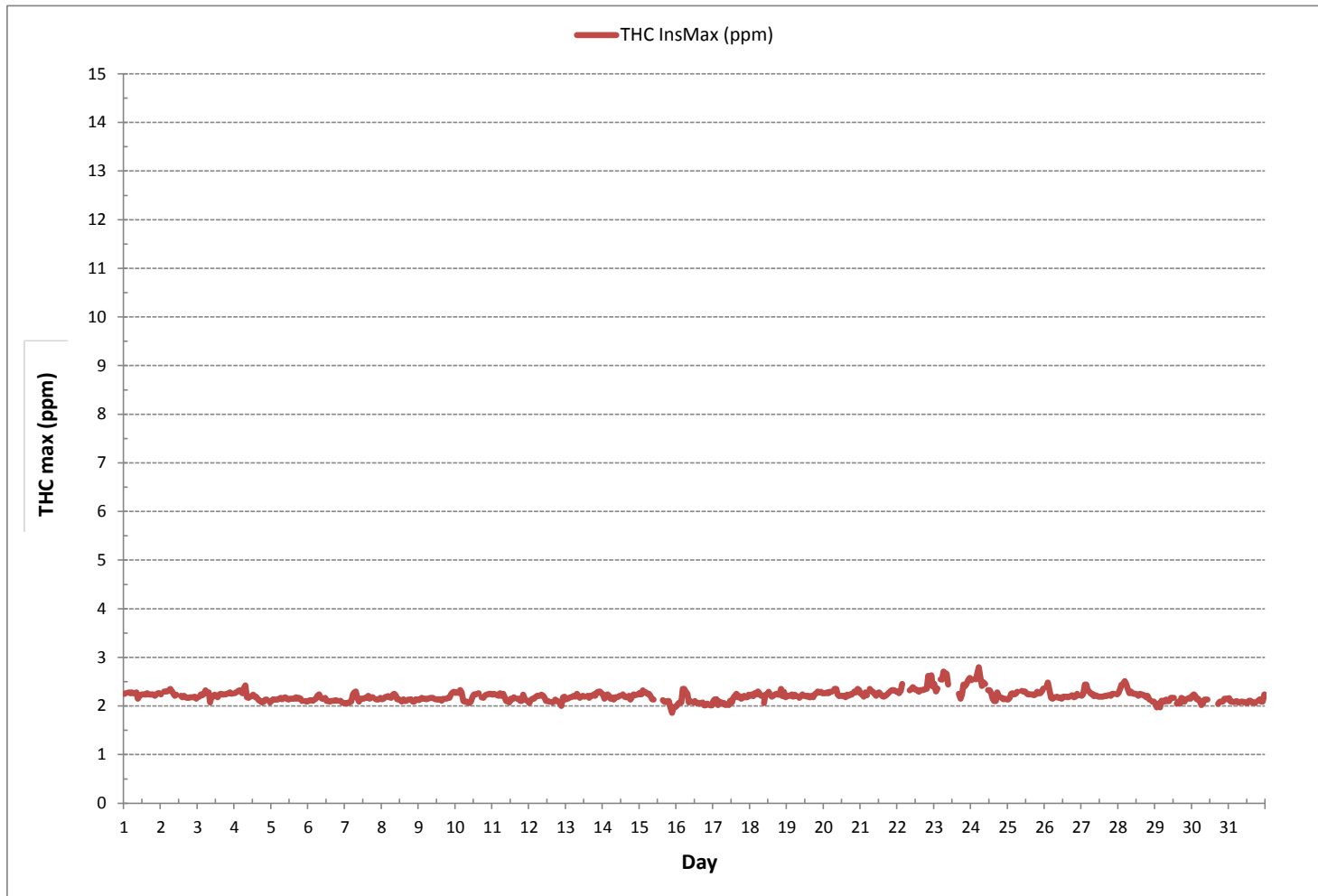
STATUS FLAG CODES

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:	688
MAXIMUM INSTANTANEOUS VALUE:	2.80 ppm @ HOUR 5 ON DAY 24
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	726 hrs
STANDARD DEVIATION:	0.11

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	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	2	2	2	2	2	1	1	1	1	1	2	2	1	1	3	3	1	1	2	1	1	1	3	2	24	
2	1	S	2	2	2	4	4	4	3	30	3	P	P	3	2	2	1	1	2	2	1	1	1	1	1	1	30	3	22
3	S	2	2	2	2	3	3	3	2	3	1	1	1	1	2	2	1	1	2	2	2	2	2	1	S	1	3	2	24
4	2	2	2	2	31	17	7	3	2	2	2	2	1	1	1	2	2	3	2	2	1	1	S	2	1	31	4	24	
5	5	3	2	2	2	1	1	2	1	2	2	2	1	1	2	1	2	1	2	6	2	S	3	2	1	6	2	24	
6	2	2	2	2	3	3	3	3	4	4	3	2	2	2	2	2	2	2	2	3	S	2	2	1	1	4	2	24	
7	1	2	1	1	1	5	7	7	4	3	2	2	2	1	1	1	1	1	2	S	2	2	2	2	2	1	7	2	24
8	2	2	2	2	2	2	3	3	7	3	3	23	4	4	3	2	2	2	S	2	1	1	1	2	1	23	3	24	
9	2	2	2	3	3	2	3	3	3	3	3	2	2	2	2	2	1	S	2	2	3	3	3	4	1	4	2	24	
10	4	4	3	3	2	2	3	2	3	2	2	2	2	34	2	3	S	2	3	2	3	2	2	3	2	34	4	24	
11	2	3	2	3	3	4	3	5	2	3	63	3	5	3	2	S	4	2	3	2	3	3	3	3	2	63	6	24	
12	3	3	4	4	4	4	4	58	72	24	5	19	15	42	S	38	48	7	2	2	2	3	3	21	0	72	17	24	
13	0	0	0	0	0	86	S1	S1	70	2	1	26	20	S	15	14	0	0	0	0	0	0	0	0	0	86	11	22	
14	0	0	0	13	19	23	0	0	X	C	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	Y	0	23	6	16	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	2	1	0	1	1	1	0	0	2	1	14	
16	0	1	78	101	11	5	6	6	3	1	S	2	1	0	0	0	1	1	1	1	1	1	1	1	0	101	10	24	
17	1	1	1	1	2	2	1	1	1	S	2	1	1	1	1	1	0	1	1	1	1	3	1	3	3	0	3	1	24
18	1	1	3	3	2	3	3	4	S	4	4	4	2	2	65	31	4	5	27	6	33	6	2	1	65	9	24		
19	2	2	2	3	3	2	2	S	3	2	1	2	1	1	1	2	2	2	1	1	2	2	2	2	1	3	2	24	
20	2	2	2	2	2	3	S	3	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2	1	3	2	24	
21	1	1	1	1	1	S	1	1	1	4	4	1	1	1	3	2	1	1	1	1	37	1	1	1	1	37	3	24	
22	1	1	1	1	S	31	56	1	1	1	27	23	3	4	1	1	2	0	0	3	1	1	1	2	0	56	7	24	
23	3	3	2	S	3	4	34	3	2	3	Q	Q	Q	Q	Q	Q	2	1	2	1	1	1	2	3	1	34	4	24	
24	2	2	S	3	3	4	5	5	4	3	P	39	4	3	1	0	0	2	5	28	2	1	0	0	0	39	5	23	
25	0	S	2	1	1	3	3	28	2	3	4	1	3	2	2	3	31	2	1	0	1	1	2	2	0	31	4	24	
26	S	3	3	2	0	2	1	1	1	2	1	1	1	1	2	1	1	2	1	1	3	2	1	S	0	3	2	24	
27	1	1	1	1	2	24	3	2	9	3	2	14	3	15	20	9	2	30	3	4	2	2	S	2	1	30	7	24	
28	2	2	3	3	4	4	4	3	3	4	3	3	16	4	3	2	2	2	2	1	1	S	1	0	0	16	3	24	
29	1	1	1	1	1	3	3	2	2	3	2	2	3	4	20	Y	Y	1	8	2	S	2	2	2	2	1	20	3	22
30	3	4	3	1	2	2	1	1	1	1	X	X	X	X	X	X	X	1	2	S	2	2	2	3	1	4	2	17	
31	3	2	1	1	1	5	3	1	2	3	2	1	1	1	1	1	1	1	S	2	2	2	2	2	1	5	2	24	
HOURLY MAX	5	4	78	101	31	86	56	58	72	30	63	39	20	42	20	65	48	30	8	28	37	33	21	4					
HOURLY AVG	2	2	5	5	4	9	7	6	7	4	6	7	4	5	4	6	6	3	2	4	3	3	3	2					

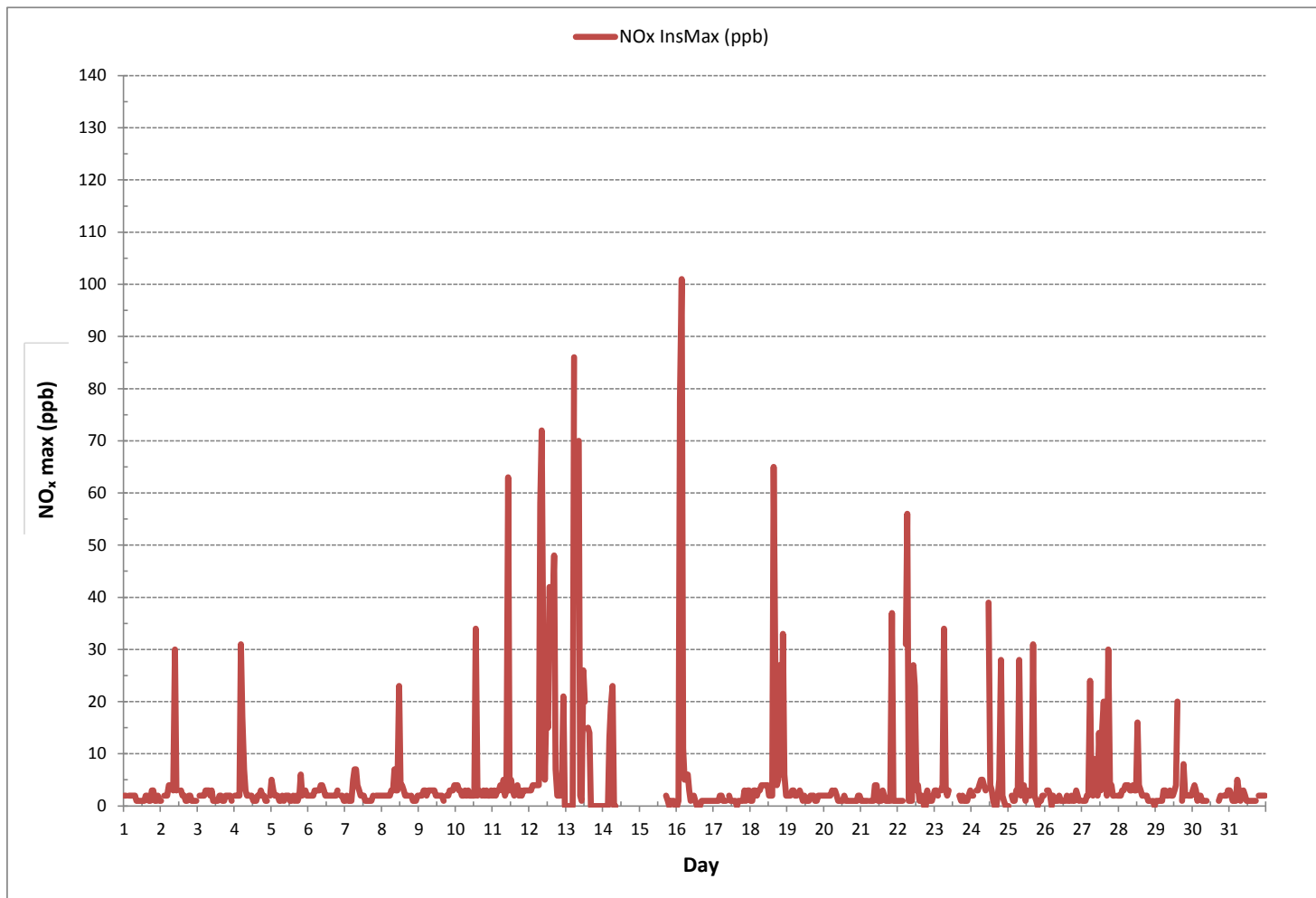
STATUS FLAG CODES

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

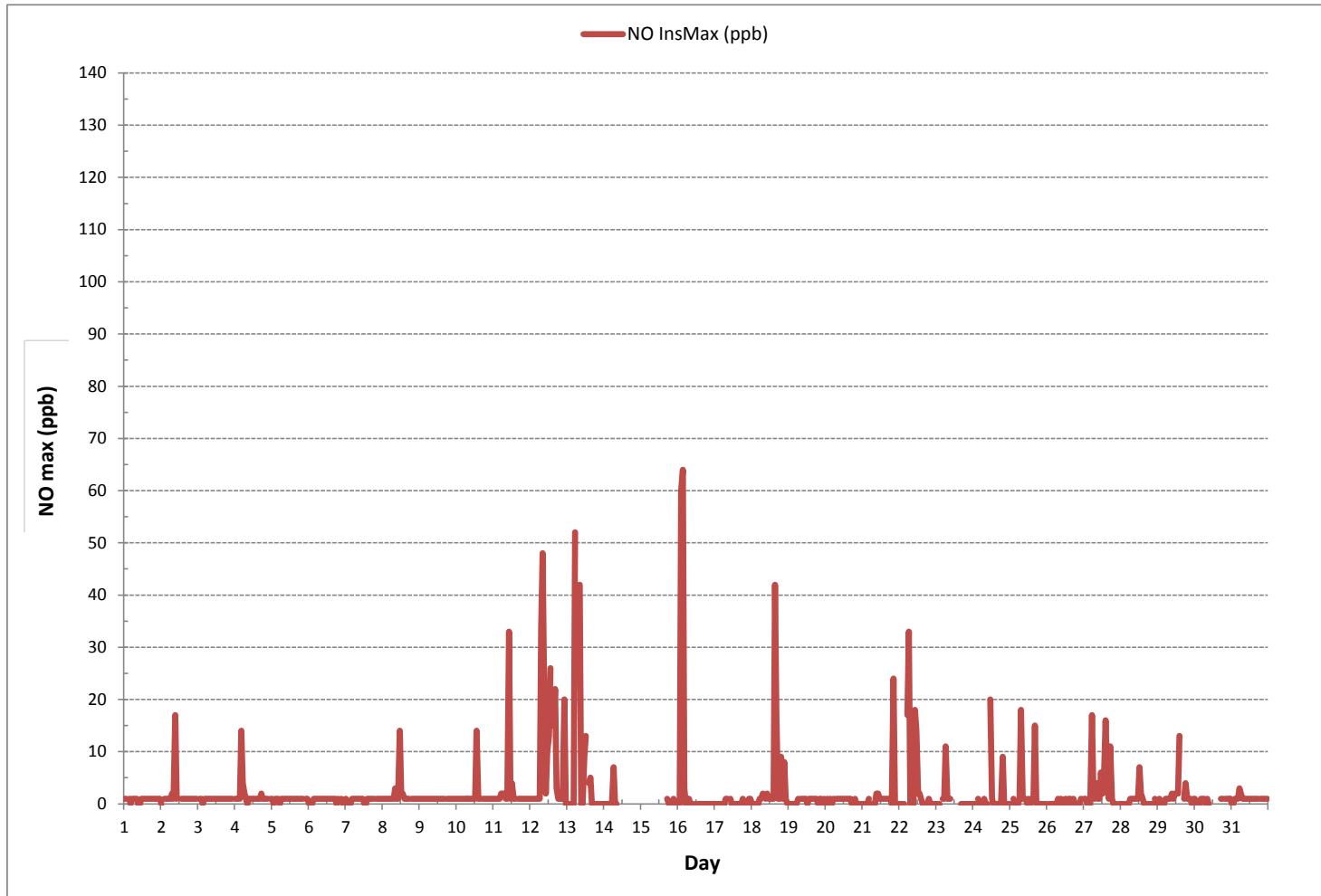
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	624
MAXIMUM INSTANTANEOUS VALUE:	101 ppb @ HOUR 3 ON DAY 16
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	14 hrs
OPERATIONAL TIME:	712 hrs
STANDARD DEVIATION:	10

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)



NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2	3	S	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	3	4	2	2	2	2	2	2	4	2	24
2	2	S	3	3	3	4	4	4	4	15	3	P	P	4	3	2	2	2	3	2	2	2	2	2	2	2	15	3	22
3	S	3	3	3	3	4	3	3	3	3	2	2	2	2	3	2	2	2	2	2	3	2	2	S	2	2	4	3	24
4	2	2	3	3	23	14	7	3	2	2	2	2	2	2	2	2	2	3	2	2	2	2	S	2	2	23	4	24	
5	6	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	6	3	S	3	3	2	6	3	24	
6	3	3	3	3	3	3	4	4	4	4	4	3	2	2	2	3	2	3	3	4	S	3	3	2	2	4	3	24	
7	2	3	2	2	2	5	6	6	5	4	2	2	2	2	2	2	2	2	2	S	3	3	3	3	3	2	6	3	24
8	3	2	3	3	3	3	4	4	5	3	3	11	3	4	3	2	2	2	S	2	2	2	2	3	2	11	3	24	
9	3	3	3	3	3	3	3	4	3	3	3	3	2	2	2	3	2	S	3	3	3	4	4	4	2	4	3	24	
10	4	4	4	4	4	3	3	3	3	3	3	3	3	22	3	3	S	3	3	3	3	3	3	3	4	3	22	4	24
11	3	4	3	3	4	4	3	4	3	32	3	4	4	3	S	4	3	3	3	3	4	4	4	4	3	32	5	24	
12	4	4	4	4	5	5	5	25	28	19	5	12	9	18	S	24	28	6	3	3	3	4	22	0	0	28	10	24	
13	0	0	0	0	0	39	S1	S1	25	0	0	11	11	S	11	7	0	0	0	0	0	0	0	0	0	0	39	5	22
14	0	0	0	0	10	13	10	0	0	X	C	C	C	C	C	C	C	C	Y	Y	Y	Y	Y	Y	0	13	4	16	
15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	2	1	1	1	1	1	1	1	1	2	1	14
16	1	1	22	43	9	5	6	6	3	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	43	5	24	
17	1	1	1	1	2	2	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	3	1	2	2	1	3	1	24
18	1	1	3	3	3	3	3	3	3	S	3	3	1	1	2	27	16	3	4	19	5	25	6	2	1	27	6	24	
19	2	3	3	3	3	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	1	3	2	24	
20	2	2	2	2	3	3	S	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	3	2	24	
21	1	1	1	2	1	S	1	1	1	2	2	1	1	1	2	2	1	1	1	1	15	1	2	2	1	15	2	24	
22	1	1	1	2	S	15	23	2	1	2	13	9	2	3	1	2	2	1	1	3	1	1	1	2	1	23	4	24	
23	3	2	3	S	3	3	23	3	2	3	Q	Q	Q	Q	Q	Q	2	2	2	2	2	2	2	3	2	23	4	24	
24	3	2	S	3	4	4	5	5	4	3	P	19	4	4	2	1	1	3	6	20	3	2	1	1	1	20	5	23	
25	1	S	2	2	2	3	3	12	2	3	3	2	3	2	2	2	18	2	1	1	1	1	2	3	1	18	3	24	
26	S	4	4	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	1	S	1	4	2	24		
27	1	1	2	2	2	11	2	1	7	1	1	9	1	10	10	7	2	22	2	4	2	2	S	2	1	22	5	24	
28	2	2	3	3	4	4	3	3	2	2	3	3	11	3	3	2	2	2	2	1	1	S	1	1	1	11	3	24	
29	1	1	1	1	1	2	2	1	1	1	1	1	2	3	12	Y	Y	1	4	2	S	2	2	2	1	12	2	22	
30	3	4	3	1	2	2	1	1	1	1	X	X	X	X	X	X	X	1	1	S	1	2	2	2	1	4	2	17	
31	2	1	1	1	1	2	2	0	1	2	1	1	1	1	1	1	1	1	S	1	1	1	1	1	0	2	1	24	
HOURLY MAX	6	4	22	43	23	39	23	25	28	19	32	19	11	22	12	27	28	22	6	20	15	25	22	4					
HOURLY AVG	2	2	3	4	4	6	5	4	4	3	4	4	3	4	3	4	4	3	2	3	3	3	3	2					

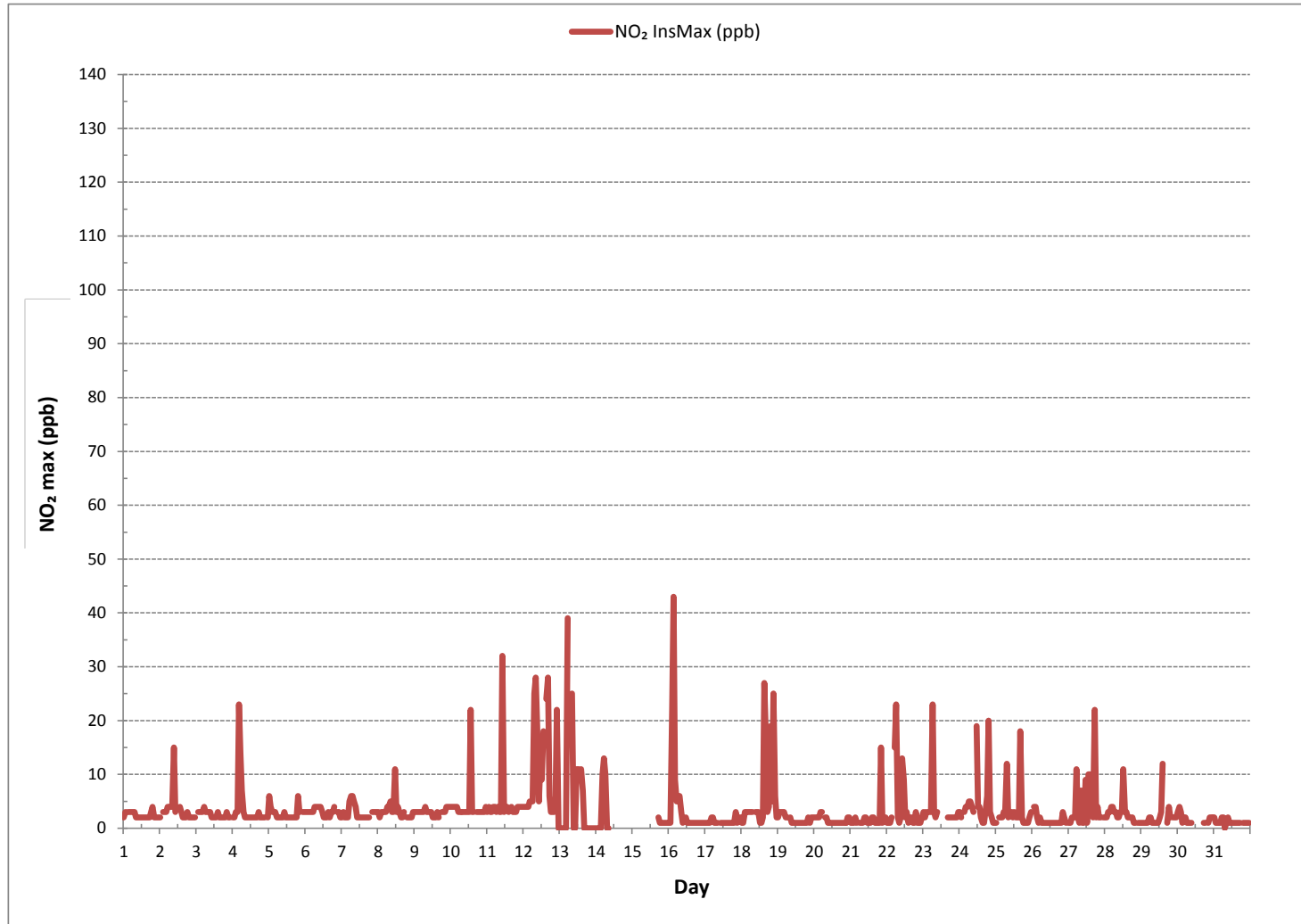
STATUS FLAG CODES

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

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	638
MAXIMUM INSTANTANEOUS VALUE:	43 ppb @ HOUR 3 ON DAY 16
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	14 hrs
STANDARD DEVIATION:	5
OPERATIONAL TIME:	712 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	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	48.9	48.3	S	43.0	39.7	41.9	43.1	43.5	45.2	45.9	46.8	46.3	45.8	47.0	47.2	49.5	49.7	48.6	47.5	47.6	47.1	46.9	46.6	45.0	39.7	49.7	46.1	24	
2	44.9	S	39.8	37.2	34.7	31.7	30.4	31.3	36.7	46.0	52.6	P	P	50.0	48.7	47.0	46.8	47.5	50.2	49.5	45.8	44.7	43.0	42.3	30.4	52.6	42.9	22	
3	S	43.5	42.8	40.6	39.6	36.5	32.2	38.4	43.9	48.3	50.0	50.9	52.5	55.3	55.7	56.8	57.3	57.2	57.0	56.9	56.6	56.9	56.5	S	32.2	57.3	49.3	24	
4	56.1	54.7	50.7	53.1	51.3	49.9	49.4	46.1	51.5	51.5	52.3	52.1	51.3	51.3	51.2	51.0	50.3	49.8	49.4	49.0	49.4	49.4	S	49.3	46.1	56.1	50.9	24	
5	48.6	42.8	43.9	43.2	42.7	41.5	39.1	38.0	39.0	43.9	47.9	48.4	49.2	49.4	49.7	50.4	50.9	50.9	50.0	49.5	48.6	S	45.8	45.1	38.0	50.9	46.0	24	
6	44.4	42.4	40.9	40.1	39.7	38.5	37.7	36.1	43.8	46.6	50.9	51.8	50.9	52.2	53.0	53.7	54.3	59.4	59.0	58.4	S	54.1	51.8	51.8	36.1	59.4	48.3	24	
7	49.7	47.9	47.6	46.9	44.6	42.4	35.1	35.6	37.2	40.1	41.8	43.4	44.4	45.6	46.1	46.6	45.4	46.3	47.3	S	44.3	43.5	42.2	40.6	35.1	49.7	43.7	24	
8	42.7	43.4	42.8	42.2	38.2	37.2	32.1	30.6	28.8	36.1	40.6	47.2	47.2	47.0	48.9	52.5	51.1	49.8	S	51.7	51.3	48.7	41.6	39.4	28.8	52.5	43.1	24	
9	39.4	38.8	37.3	37.1	39.8	39.6	41.1	41.3	42.8	43.5	46.9	47.6	46.1	47.0	47.2	46.4	47.2	S	47.6	47.6	42.6	40.2	39.7	39.4	37.1	47.6	42.9	24	
10	39.4	37.2	37.2	36.6	41.6	44.6	44.4	45.5	45.9	45.9	47.5	50.2	50.7	51.2	51.2	51.6	S	50.3	49.5	46.4	46.4	42.9	41.7	40.7	36.6	51.6	45.2	24	
11	39.6	38.5	37.2	36.1	37.0	37.2	37.2	43.5	51.3	51.8	52.1	53.0	51.1	50.6	49.8	S	50.0	50.8	51.7	51.7	49.8	45.0	44.0	44.7	36.1	53.0	45.8	24	
12	43.6	42.3	39.2	35.6	33.4	30.9	28.6	28.0	31.2	38.9	43.0	45.6	49.4	48.6	S	48.7	49.5	49.0	47.3	43.5	41.9	42.4	42.2	41.6	28.0	49.5	41.1	24	
13	41.7	40.2	39.7	37.9	40.1	41.0	39.3	39.2	43.1	54.5	54.2	53.8	52.8	S	53.1	53.0	53.7	55.4	55.3	54.4	48.4	49.9	49.9	50.4	37.9	55.4	47.9	24	
14	51.3	50.3	47.3	43.0	42.2	42.1	42.0	41.8	41.4	43.9	48.6	50.9	S	56.2	Q	Q	60.3	67.3	59.0	55.3	53.7	52.8	51.2	49.2	41.4	67.3	50.0	24	
15	43.5	41.4	40.9	38.9	39.6	39.4	38.6	40.6	47.5	49.9	49.7	S	52.0	52.4	52.5	52.8	53.7	53.8	53.1	52.3	53.3	54.0	54.1	54.5	38.6	54.5	48.2	24	
16	54.0	51.2	48.9	48.0	49.7	31.3	36.0	42.6	44.7	46.8	S	47.6	46.3	48.6	49.3	49.8	47.5	41.1	46.5	49.7	50.7	40.1	46.7	46.7	31.3	54.0	46.3	24	
17	37.1	31.2	28.8	28.8	27.2	26.6	24.3	28.5	33.5	S	39.8	42.3	44.6	45.2	44.7	47.0	46.6	46.7	45.8	41.7	39.4	36.8	36.4	37.0	24.3	47.0	37.4	24	
18	35.8	38.4	37.6	36.5	34.6	34.5	35.2	37.2	S	44.4	46.2	46.3	47.0	47.9	49.2	48.3	49.2	49.4	48.9	46.3	42.6	42.5	40.1	39.8	34.5	49.4	42.5	24	
19	38.5	36.6	36.2	36.3	35.2	35.6	34.2	S	40.7	46.0	47.1	49.9	51.0	53.4	54.4	53.9	54.4	55.3	56.8	56.2	54.7	49.6	48.7	47.2	34.2	56.8	46.6	24	
20	46.8	44.6	42.5	41.3	38.9	37.6	S	37.9	41.7	43.7	43.7	43.0	43.4	43.1	43.1	45.0	45.9	45.6	45.7	45.2	44.4	43.2	40.8	42.5	37.6	46.8	43.0	24	
21	43.9	45.4	45.9	45.4	41.1	S	36.5	31.3	35.9	44.6	49.9	51.2	51.3	50.1	48.9	48.2	46.1	46.8	48.6	46.3	45.8	43.5	43.9	44.2	31.3	51.3	45.0	24	
22	44.6	46.4	43.4	37.9	S	30.5	S1	S1	47.7	48.6	51.3	52.5	53.8	54.3	55.1	55.7	57.0	57.6	57.8	56.0	56.4	57.5	58.8	58.5	30.5	58.8	51.5	22	
23	54.9	52.3	51.2	S	47.5	47.2	45.3	47.6	55.5	60.3	62.8	64.0	64.6	63.7	63.7	C	C	C	C	C	C	63.5	61.5	62.5	60.1	45.3	64.6	57.1	24
24	60.4	60.3	S	49.3	46.0	41.8	34.7	36.4	42.2	45.0	P	38.7	37.9	42.6	49.9	50.7	51.1	47.6	45.8	35.6	31.3	43.5	46.7	56.8	31.3	60.4	45.2	23	
25	55.3	S	31.3	33.2	33.9	33.5	33.0	30.8	29.3	31.7	37.5	49.7	53.7	54.2	48.1	45.5	44.9	41.9	42.3	42.5	41.8	41.1	38.3	34.0	29.3	55.3	40.3	24	
26	S	38.1	41.3	42.6	31.1	32.9	30.6	37.3	41.1	44.7	41.7	40.5	44.3	44.4	47.0	48.9	51.7	52.1	51.7	48.6	48.3	48.3	45.5	S	30.6	52.1	43.3	24	
27	42.2	42.8	42.3	35.7	36.0	36.1	37.3	38.5	39.0	41.1	43.2	45.8	46.3	47.2	47.5	49.7	51.5	53.7	58.6	59.6	59.7	57.5	S	53.9	35.7	59.7	46.3	24	
28	48.9	48.7	45.9	42.3	40.6	39.3	40.9	43.4	48.7	51.7	54.9	58.5	57.5	61.1	62.5	57.5	54.1	48.5	44.9	44.7	40.7	S	39.0	40.7	39.0	62.5	48.5	24	
29	37.9	36.6	34.8	37.6	36.6	35.8	35.4	36.0	38.4	40.5	41.1	41.5	43.1	42.6	42.6	42.2	42.3	42.6	42.1	40.4	S	37.6	36.8	33.6	33.6	43.1	39.0	24	
30	31.5	27.7	28.9	28.5	26.2	27.4	31.7	33.5	34.0	35.9	36.0	X	X	X	X	X	X	29.9	29.8	S	25.3	22.7	20.3	21.2	20.3	36.0	28.9	18	
31	22.2	23.3	21.3	20.9	23.0	20.7	22.3	22.9	24.0	28.5	30.8	32.3	33.3	32.1	32.3	30.1	28.3	30.3	S	30.8	28.7	26.6	25.9	25.8	20.7	33.3	26.8	24	
HOURLY MAX	60.4	60.3	51.2	53.1	51.3	49.9	49.4	47.6	55.5	60.3	62.8	64.0	64.6	63.7	63.7	57.5	60.3	67.3	59.0	59.6	63.5	61.5	62.5	60.1					
HOURLY AVG	44.4	42.6	40.3	39.2	38.4	36.8	36.1	37.4	40.9	44.7	46.6	48.0	48.6	49.5	49.7	49.4	49.7	49.1	49.6	48.5	46.6	45.6	44.2	44.0					

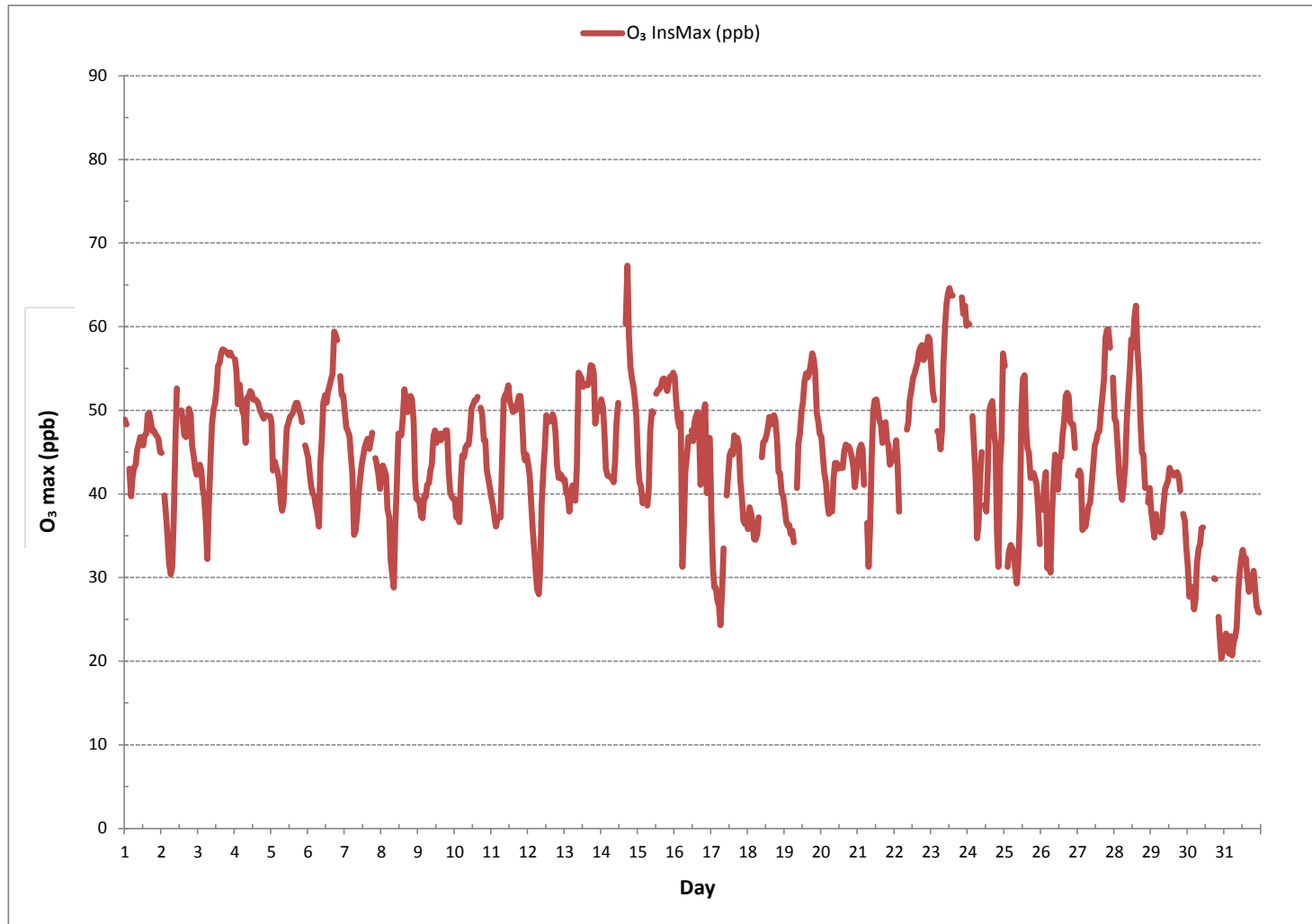
STATUS FLAG CODES

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:	693
MAXIMUM INSTANTANEOUS VALUE:	67.3 ppb @ HOUR 17 ON DAY 14
IZS CALIBRATION TIME:	33 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	733 hrs
STANDARD DEVIATION:	8.2

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - May 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	21.6	15.5	16.7	15.5	20.9	26.6	35.4	43.9	40.5	42.7	37.2	44.8	39.0	35.9	39.1	49.2	46.3	26.6	17.9	8.0	4.6	6.1	12.2	14.8	4.6	49.2	27.5	24	
2	14.0	15.1	10.0	10.5	11.8	12.8	17.4	19.9	23.3	28.1	39.5	P	P	59.7	52.9	57.5	54.8	84.6	74.0	51.0	37.2	33.4	27.2	20.4	10.0	84.6	34.3	22	
3	19.4	20.2	20.2	15.8	14.0	13.8	20.9	32.7	36.3	40.0	40.8	45.6	47.2	46.7	49.0	52.0	59.2	40.4	34.4	22.2	17.8	14.1	12.6	12.1	12.1	59.2	30.3	24	
4	10.6	13.0	16.0	21.3	22.6	12.8	7.7	14.6	33.0	45.6	55.4	45.8	41.1	54.0	48.5	50.6	35.8	26.8	23.4	26.6	15.2	11.9	12.1	8.4	7.7	55.4	27.2	24	
5	8.7	11.7	13.9	22.5	23.1	24.2	25.7	30.7	26.1	20.7	24.2	28.7	41.6	29.6	51.8	30.9	24.2	26.2	17.2	10.4	13.5	14.6	13.5	13.7	8.7	51.8	22.8	24	
6	16.5	13.9	16.8	17.8	18.3	12.9	13.1	13.6	15.8	74.2	32.3	53.0	52.8	44.0	51.2	48.8	39.8	35.2	19.1	31.5	10.9	12.7	13.3	15.7	10.9	74.2	28.1	24	
7	18.2	15.7	14.9	17.5	23.4	28.0	28.8	38.2	45.3	63.2	55.1	54.5	54.0	59.7	55.1	51.0	40.9	48.3	43.5	33.9	23.8	40.2	38.7	36.5	14.9	63.2	38.7	24	
8	40.2	50.7	51.1	11.9	25.4	26.3	18.0	16.7	16.5	22.8	20.6	28.7	30.2	53.0	45.5	59.2	56.2	65.8	76.7	62.8	54.8	47.6	52.2	41.5	11.9	76.7	40.6	24	
9	48.7	39.3	24.6	27.9	31.6	20.6	31.7	43.0	36.7	36.7	42.8	45.7	44.2	51.2	41.9	38.2	26.8	23.6	25.3	24.1	22.2	19.1	24.3	30.8	19.1	51.2	33.4	24	
10	36.0	32.2	30.4	22.2	18.5	27.9	33.1	38.8	37.1	38.0	39.4	38.8	33.9	34.2	36.0	23.3	21.3	25.6	31.4	25.0	24.1	21.6	16.7	12.5	12.5	39.4	29.1	24	
11	12.5	12.7	17.5	14.9	14.3	11.2	11.7	14.5	22.7	24.3	44.3	42.6	29.7	32.1	31.7	27.3	33.4	19.7	14.9	10.9	18.3	21.4	26.1	33.4	10.9	44.3	22.6	24	
12	29.7	23.2	19.4	18.5	20.5	20.9	20.2	20.4	25.8	28.2	33.7	53.8	52.5	52.1	46.6	47.5	43.5	40.2	36.7	26.6	18.6	17.0	20.5	19.7	17.0	53.8	30.7	24	
13	26.0	25.4	20.7	27.0	20.5	18.7	9.2	12.6	22.6	37.1	42.0	49.0	52.7	65.6	53.4	43.7	50.6	45.2	34.3	20.9	15.0	17.9	16.6	17.9	9.2	65.6	31.0	24	
14	18.2	22.0	29.1	30.8	36.6	34.1	44.2	39.1	35.8	28.8	29.1	35.9	31.8	29.4	34.6	32.6	27.9	42.2	44.8	19.4	11.1	10.4	12.2	15.5	10.4	44.8	29.0	24	
15	13.5	17.9	20.9	32.6	17.9	20.3	18.8	23.2	43.8	49.5	48.3	53.2	46.7	45.9	44.4	37.5	46.9	33.0	32.1	24.8	14.3	15.0	23.5	17.4	13.5	53.2	30.9	24	
16	9.7	11.8	10.6	12.2	19.4	19.8	31.3	36.2	58.6	51.1	55.6	50.1	63.2	53.3	53.1	50.2	53.8	43.7	47.4	36.2	38.4	47.0	45.3	22.6	9.7	63.2	38.4	24	
17	28.2	34.4	23.6	24.7	32.5	34.7	47.8	39.7	47.6	49.2	52.4	58.2	47.0	41.1	40.7	38.4	26.4	19.7	10.7	14.8	18.3	26.3	20.3	22.0	10.7	58.2	33.3	24	
18	20.7	20.7	14.8	15.9	17.0	12.4	18.5	21.3	20.3	22.7	30.6	27.3	28.9	31.7	25.1	22.0	25.3	20.7	15.1	15.2	14.5	15.9	15.3	15.0	12.4	31.7	20.3	24	
19	15.4	14.6	16.5	14.8	16.3	14.8	22.5	21.9	34.5	58.0	57.1	44.3	51.8	44.4	37.1	40.2	38.5	36.5	33.4	27.5	18.5	18.9	17.4	21.1	14.6	58.0	29.8	24	
20	19.8	15.9	17.9	16.1	17.9	17.7	22.3	29.5	36.5	45.4	51.3	39.9	45.2	42.6	45.2	36.5	38.9	28.6	30.4	16.6	12.3	10.8	10.9	11.1	10.8	51.3	27.5	24	
21	11.3	9.0	6.1	19.1	19.0	15.0	16.2	16.8	21.0	25.6	29.5	34.7	32.8	34.6	47.3	40.2	37.8	45.2	34.3	16.1	14.6	15.2	15.9	13.7	6.1	47.3	23.8	24	
22	7.7	10.4	10.6	12.2	13.6	9.5	9.4	10.5	10.8	17.1	15.3	17.4	17.5	16.9	20.6	26.3	14.0	12.7	5.7	5.4	9.4	8.3	11.8	10.0	5.4	26.3	12.6	24	
23	13.6	13.7	14.2	16.5	15.0	12.2	11.7	9.0	10.4	11.9	27.0	27.2	31.3	28.9	27.3	32.2	25.4	24.0	20.1	15.9	19.7	14.9	18.8	18.8	9.0	32.2	19.2	24	
24	21.0	27.1	17.5	16.4	13.5	14.8	22.5	21.6	19.8	17.6	P	12.1	15.9	18.7	22.6	30.1	11.2	6.8	11.0	11.3	18.0	17.6	19.8	16.6	6.8	30.1	17.5	23	
25	14.0	16.9	23.5	22.2	22.7	23.1	21.5	22.4	31.7	29.7	32.6	30.2	30.0	36.7	33.4	34.5	24.9	17.9	13.0	8.3	7.6	11.1	23.0	16.4	7.6	36.7	22.8	24	
26	24.0	39.8	17.3	43.0	39.3	38.9	28.3	29.4	37.3	34.1	36.5	32.8	34.1	34.9	40.6	46.8	36.4	32.5	29.2	23.3	11.7	18.9	18.0	13.8	11.7	46.8	30.9	24	
27	14.1	14.3	12.6	17.3	26.4	25.5	29.9	43.0	49.6	52.5	44.6	52.7	36.0	47.9	36.1	46.1	35.5	29.2	33.1	18.0	8.2	15.0	15.3	21.1	8.2	52.7	30.2	24	
28	26.0	27.3	24.9	29.9	31.7	32.5	34.7	43.7	47.2	31.8	30.4	28.2	31.5	33.9	42.2	47.6	49.6	46.1	45.9	45.4	42.3	44.1	44.1	41.7	24.9	49.6	37.6	24	
29	27.4	34.8	14.3	25.4	27.2	30.3	34.2	34.9	32.6	35.8	39.5	35.6	33.6	39.3	34.3	24.6	24.2	26.8	20.6	13.4	11.2	19.6	20.9	27.0	11.2	39.5	27.9	24	
30	22.9	25.7	37.7	28.3	15.6	23.4	23.3	21.9	24.3	39.4	40.3	X	X	X	X	X	X	X	X	0.3	X	0.3	0.4	0.5	0.3	0.3	40.3	19.0	16
31	0.5	0.3	0.2	0.2	0.2	0.9	0.6	0.2	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	X	0.3	0.3	0.4	0.3	0.3	0.2	0.9	0.3	23	
HOURLY MAX	48.7	50.7	51.1	43.0	39.3	38.9	47.8	43.9	58.6	74.2	57.1	58.2	63.2	65.6	55.1	59.2	59.2	84.6	76.7	62.8	54.8	47.6	52.2	41.7					

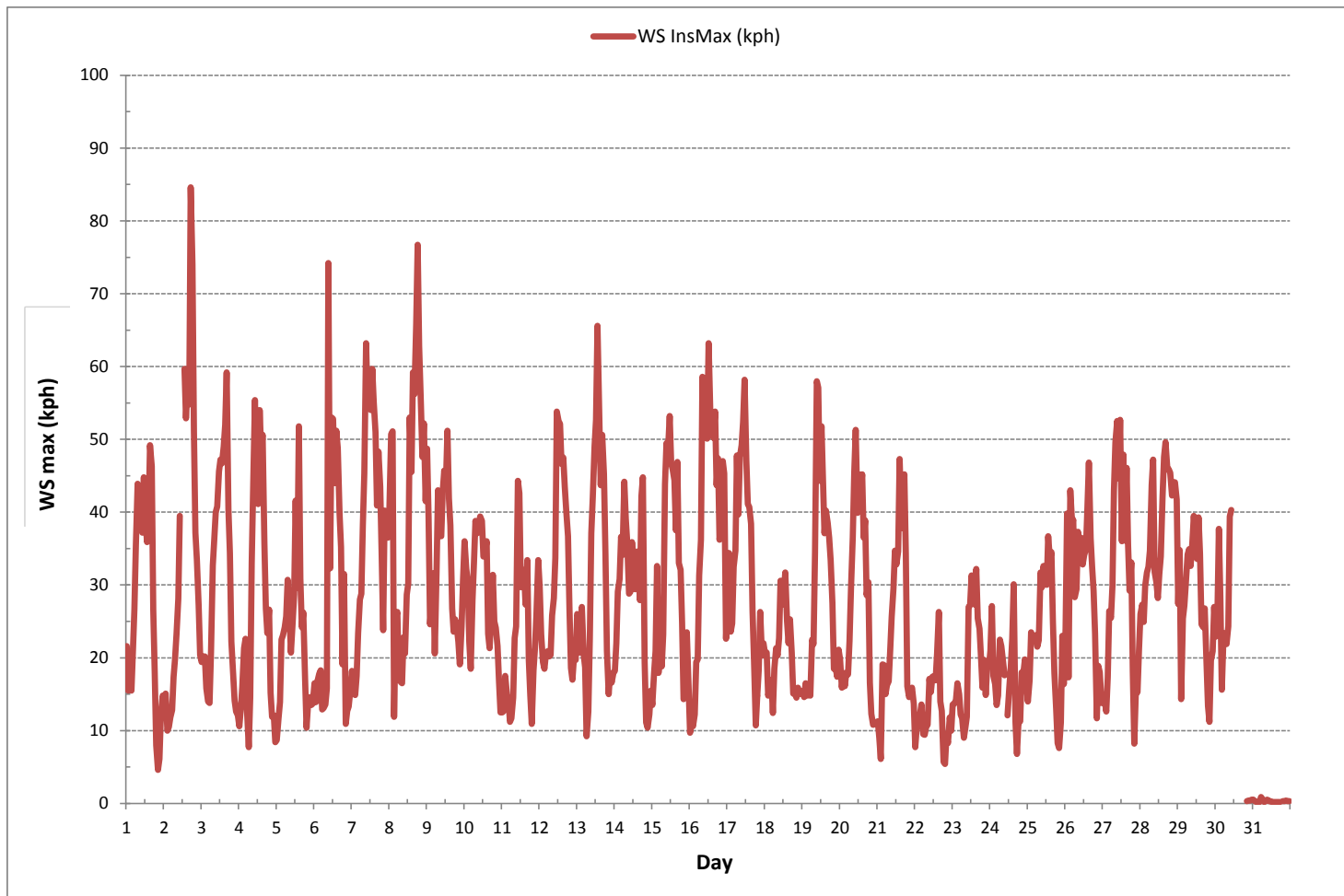
STATUS FLAG CODES

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:	84.6	kph	@ HOUR	17	ON DAY	2	
OPERATIONAL TIME:						732	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

06-07-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX V
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-05-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalet</u>	Date <u>June 27, 2018</u>
Level 1 Primary Validation	<u>Maram Ghalet</u>	Date <u>June 27, 2018</u>
Level 2 Final Validation	<u>Maram Ghalet</u>	Date <u>June 29, 2018</u>
Level 3 Independent Data Review	<u>msdlnka</u>	Date <u>July 06, 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.